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Statistical Evaluation of Groundwater Stability

Former Tecumseh Products Company Site
Tecumseh, Michigan

RCRA-05-2010-0012

June 2012

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Prepared For
Tecumseh Products Company

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Executive Summary

An evaluation of groundwater stability was prepared to support completion of RCRA Form CA750, Documentation of Environmental Indicator Determination – Migration of Contaminated Groundwater Under Control (Contaminated Groundwater Under Control EI Determination), for the former Tecumseh Products Company Site located in Tecumseh, Michigan. This Evaluation describes the monitoring well network; defines the constituents of concern (COCs) used to evaluate groundwater stability; describes the statistical methods used to evaluate groundwater stability including methodology, equations and example calculations; and describes the results of the statistical evaluation including an explanation of the significance of any upward or downward trends identified.

The groundwater stability evaluation was conducted using quarterly groundwater monitoring data from 40 monitoring wells (previously 41 monitoring wells), including 14 upgradient/sidegradient wells, 12 on-site monitoring wells (including MW-09s which was excavated during installation of the permeable reactive barrier), and 15 downgradient wells. Groundwater chemistry data collected between March 2009 and April 2012 were used to conduct intra-well data comparisons and trend analysis for the evaluation of groundwater stability. A minimum of 8 sample events have been conducted at each monitoring location. Statistical evaluation and analysis was performed on compounds that have been detected above Michigan Part 201 residential drinking water criteria at one or more of the 41 monitoring locations: PCE, TCE, 1,1-DCE, cis-1,2-DCE, trans-1,2-DCE, vinyl chloride, 1,1,1-TCA, and 1,1-DCA.

For 322 of the 328 parameter-well combinations evaluated, the trend was downward or stable. Using Mann-Kendall trend analysis, statistically significant trends were identified for 21 parameter-well combinations: 6 upward trends and 15 downward trends. Using Sen's slope trend analysis, statistically significant trends were identified for 18 parameter-well combinations: 6 upward trends and 12 downward trends. All of the trends identified using Sen's slope trend tests were also identified using Mann-Kendall trend tests. This evaluation concludes that overall, the plume is stable. The few parameter-well combinations that had increasing concentrations represent local variability in groundwater flow and transport or the represent increases in breakdown products of TCA and TCE caused by natural reductive dechlorination.

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Section 1
Introduction

This Statistical Evaluation of Groundwater Stability (Evaluation) was prepared to support completion of RCRA Form CA750, Documentation of Environmental Indicator Determination – Migration of Contaminated Groundwater Under Control (Contaminated Groundwater Under Control EI Determination), for the former Tecumseh Products Company Site located in Tecumseh, Michigan. This Determination is required under Section VI, Paragraph 13(b) of the RCRA 3008(h) Administrative Order on Consent (AOC), effective March 29, 2010. This Evaluation was prepared by TRC Environmental Corporation (TRC) on behalf of the Respondent, Tecumseh Products Company (TPC). The United States Environmental Protection Agency (USEPA) facility identification number for the site is MID-005-049-440 and the AOC identification number is RCRA-05-2010-0012.

1.1 Purpose and Scope

As noted above, this Evaluation was prepared to support the Contaminated Groundwater Under Control EI Determination as required under the AOC. During a March 2012 meeting with USEPA, USEPA requested that a statistical evaluation of groundwater stability be prepared and submitted to USEPA for review and comment prior to submittal of the final Contaminated Groundwater Under Control Environmental Indicator Report (due September 29, 2012). Specifically, Paragraph 13(b) of the AOC requires that TPC prepare an Environmental Indicators Report demonstrating that: "Migration of contaminated groundwater at or from the facility is stabilized. That is, the migration of all groundwater known or reasonably suspected to be contaminated with hazardous wastes or hazardous constituents above acceptable levels is stabilized to remain within any existing areas of contamination as defined by monitoring locations designated at the time of the demonstration. In addition, any discharge of groundwater to surface water is either insignificant or currently acceptable according to an appropriate interim assessment. Tecumseh Products shall collect monitoring and measurement data in the future necessary to verify that migration of any contaminated groundwater is stabilized."

As required under Paragraph 14 of the AOC, TPC will complete the following in order to prepare and provide this Contaminated Groundwater Under Control Environmental Indicator Report and Demonstration:

- "Determine appropriate risk screening criteria under current use scenarios and provide the basis and justification for the use of these criteria."

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- "Determine any current unacceptable risks to human health and the environment and describe why other identified risks are acceptable."
- "Stabilize the migration of contaminated groundwater. This includes implementing any corrective measures necessary to stabilize the migration of contaminated groundwater."
- "Conduct groundwater monitoring to confirm that any contaminated groundwater remains within the original area of contamination."
- "Prepare a report, either prior to or as part of the Environmental Indicators Report, that describes and justifies any interim actions performed to meet the requirements of Section VI, Work to Be Performed, including sampling documentation, construction completion documentation and/or confirmatory sampling results."

Groundwater chemistry data collected between March 2009 and April 2012 were used to evaluate groundwater stability. This Evaluation describes the monitoring well network; defines the constituents of concern (COCs) used to evaluate groundwater stability; describes the statistical methods used to evaluate groundwater stability including methodology, equations and example calculations; and describes the results of the statistical evaluation including an explanation of the significance of any upward or downward trends identified.

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Section 2
Background

2.1 Site Description

The former TPC Site is located at 100 East Patterson Street in Tecumseh, Michigan (Figure 1). The site is comprised of two parcels which occupy a total of approximately 50.5 acres. Parcel number 325-0241-00 occupies 47.1 acres and is located along the northern portion of the site. This parcel includes an expanse of interconnected buildings/building additions that occupy approximately 750,000 square feet. Parcel Number 325-0250-00 is a 3.4-acre grassy parcel located outside of the southern site fence.

2.2 Site Operations

TPC began manufacturing and storage operations at the site in the 1930s. Products manufactured by TPC included automotive parts, refrigeration systems, small tools, and toys. By June 2008, when manufacturing operations ceased at the site, TPC operations focused on the production and reconditioning of compressors and condensing units for refrigeration and air conditioning units. During these processes solvents composed primarily of trichloroethene and later 1,1,1-trichloroethane were used for parts degreasing. TPC records indicate that the use of these solvents was discontinued in March 1992.

Between June 2008 and January 2012, the site was occupied by on-site security (S-building) and as many as 30 TPC employees in the office and engineering portions of the main building (Areas H and J). The site was purchased by Tecumseh Bakery, LLC, a holding company for Consolidated Biscuit Company (CBC), in December 2009. When CBC was purchased by Healthside Food Solutions, in April 2010, Tecumseh Bakery, LLC, became an independent entity, and plans to occupy the site for bakery operations were terminated.

In February 2012, the site was purchased by Tecumseh Food Machinery & Engineering, LLC (TFME). TFME subsequently dismissed on-site security. Currently the site is occupied by the new TFME site manager who works out of an office located in the old security area (S-Building), and temporary TFME employees who are in the process of scrapping the equipment TFME has stored on site. TPC employees, who have occupied the engineering area (Area H and Area J) under a lease with the new owners since December 2009, are in the process of completing their relocation to the new TPC facility. Only three TPC employees still occupy the site on a daily basis.

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Currently TFME plans to separate P-Building and S-Building from the remainder of the plant, so that, that portion of the facility can be leased or sold as a separate parcel, and to demolish the remainder of the facility.

2.3 Site Geology

The site is located near the southeast rim of the Michigan Basin. Topographically, the region is relatively flat and characterized by glaciofluvial sediments at the surface (Figure 1). The geology consists of a series of unconsolidated Holocene and Pleistocene age glacial deposits, predominantly gravel and sand with areas of silt and clay overlying Mississippian age shales. The thickness of the glacial deposits varies from a few feet to over 200 feet thick throughout the region. Local water well logs within one mile of the site indicate bedrock in that area is approximately 150 to 200 feet below ground surface (ft bgs).

TRC evaluated the unconsolidated materials underlying the site through a review of logs from soil borings advanced at the site during field activities conducted by TRC from April 2009 through August 2011. Site geology generally consists of a surficial silty/sandy clay interval ranging from 3 to 7 feet thick, underlain by unconsolidated fine to coarse sand and gravel. A deep clay layer having a hydraulic conductivity between 1.8×10^{-8} centimeters per second (cm/s) to 1.9×10^{-8} cm/s is present beneath the site (RMT, 2010a). Soil boring data suggests that this second clay layer is continuous across the study area. The elevation of the top of the clay confining unit clay ranges from approximately 745 feet above mean sea level (ft MSL) along the western perimeter of the site to an elevation ranging from approximately 745 ft MSL to 765 ft MSL along the eastern extent of the area affected by VOCs. In the area northeast of the site, an intermediate clay layer is observed between the surficial clay and the deep clay confining unit. The top of this intermediate clay layer ranges from approximately 779 ft MSL to 785 ft MSL, with the observed clay thickness ranging from approximately 1 foot to 6 feet. The intermediate clay layer appears to be continuous in the study area east of Maumee Street and north of Patterson Street. Perched groundwater has consistently been observed in this area during soil boring and monitoring well installation activities. The intermediate clay layer and associated perched groundwater are discontinuous west of Maumee Street and in the south where ground surface elevations approach the elevation of the top of clay.

2.4 Hydrogeology

Data collected from the soil borings and monitoring wells installed during subsurface investigation activities indicate that shallow groundwater typically ranges in depth from 3 to 30 ft bgs within the sand and gravel aquifer. The variation in groundwater depth is largely a result of site topography, which slopes downward to the east, toward the Raisin River. The deep clay unit represents a significant confining layer for vertical groundwater movement into deeper aquifers.

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Groundwater elevation data are collected quarterly. Each quarter a groundwater contour map is constructed. A groundwater contour map, developed using data from the most recent quarterly sample event, April 2012, is included as Figure 2. The depth to groundwater and the direction of groundwater flow has been generally consistent. Groundwater flow at the TPC site is generally east toward the River Raisin, the nearest body of water located 1,500 to 2,500 feet east of the site. The River Raisin is the regional discharge feature for groundwater beneath the TPC site. A mean horizontal hydraulic gradient of 0.001 was measured across the former TPC site using the April 2012 groundwater elevation data. Data from *in situ* hydraulic conductivity tests indicates that the hydraulic conductivity of the unconfined sand and gravel aquifer ranges from 0.014 to 0.077 cm/s (RMT, 2010b). Assuming a porosity of 0.3, the resultant estimated groundwater flow velocity ranges from 4.7×10^{-5} to 2.6×10^{-4} cm/s (48 to 265 feet per year).

The vertical hydraulic gradient in the upper sand/gravel aquifer during April 2012 was evaluated at nine of the ten nested well pairs (MW-10s/d, MW-12s/d, MW-19s/d, MW-20s/d, MW-24s/d, MW-27s/d, MW-28s/d, MW-29s/d, and MW-30s/d). Because water at MW-14s is perched with an unsaturated zone between MW-14s and MW-14d, the vertical gradient at this nested well pair was not evaluated. At MW-19s/d, MW-24s/d, and MW-28s/d along the western (upgradient) portion of the site, the measured vertical hydraulic was essentially neutral (ranging from -0.0005 to 0.0033). Northeast of the site the hydraulic gradient varied from downward at MW-29s/d (-0.062) and MW-12s/d (-0.016) to near neutral at MW-30s/d (0.0069). At MW-10s/d, MW-20s/d, and MW-27s/d east/southeast (downgradient) of the site, a downward hydraulic gradient ranging from (-0.20 to -0.68) was measured, with the downward hydraulic gradient increasing to the south. This significant vertical downward gradient in the upper sand/gravel aquifer east/southeast of the site, is the result of the presence of a higher hydraulic conductivity sand and gravel deposit that underlies the sand deposit and a significant change in surface topography.

The surface topography drops steeply downgradient of the southern half of the site from an approximate elevation of 780 ft MSL to an approximate elevation of 750 ft MSL in the wetland area adjacent to the River Raisin. East of the site, in proximity to the change in surface elevation, the horizontal hydraulic gradient increases (Figure 2).

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Section 3
Monitoring Program

3.1 Monitoring Well Network

The former TPC site monitoring well network is shown on Figure 1. Groundwater flow is generally east/northeast toward the River Raisin.

- Upgradient and/or sidegradient monitoring wells include: MW-11s, MW-12s, MW-12d, MW-15s, MW-18s, MW-19s, MW-19d, MW-24s, MW-24d, MW-26s, MW-27s, MW-27d, MW-28s, and MW-28d.
- On-site monitoring wells include: MW-01s, MW-02s, MW-03s, MW-04s, MW-05s, MW-06s, MW-07s, MW-25s, MW-32s, MW-33s, and MW-34s. Note: Monitoring well MW-08s was eliminated from the sampling program after the installation of MW-18s; and monitoring well MW-09s was excavated and eliminated from the sampling program in May 2011 during permeable reactive barrier installation activities.
- Downgradient monitoring wells include: MW-10s, MW-13s, MW-14s, MW-14d, MW-17s, MW-20s, MW-20d, MW-21, MW-22, MW-23, MW-29s, MW-29d, MW-30s, MW-30d, and MW-31. Note: Monitoring well MW-10d is screened immediately below MW-10s. These wells share similar chemistry so monitoring well MW-10s is included in the monitoring program, but MW-10d is not. Monitoring well MW-16s is screened in a thin perched layer, and has remained dry since installation.

3.2 Sampling Plan

The sampling plan is summarized below:

- Quarterly Monitoring
  - Collect static groundwater measurements at each of the groundwater monitoring wells. Note that monitoring well MW-09s was excavated during the installation of the permeable reactive barrier (PRB) in May 2011, and is no longer part of the monitoring program. Since that time, static water levels at monitoring wells PRB-01s and PRB-02s, which are part of the PRB monitoring network, have been collected in conjunction with regular quarterly monitoring to help define groundwater elevations and flow direction along the eastern perimeter of the site.
  - Collect static water levels at each of the two gauge point locations on the River Raisin.
  - Use low-flow sampling techniques to collect groundwater samples at all groundwater monitoring well locations, except at monitoring wells MW-08s, MW-10d, and MW-16s. The following field parameters are measured during groundwater sample collection:

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pH, specific conductivity, redox potential, dissolved oxygen, turbidity and temperature. Groundwater samples are submitted to the analytical laboratory for VOCs analysis.

  - Collect a surface water sample from the wetland area for VOCs analysis.

- Semi-Annual Monitoring (conducted during the second and fourth quarters)
  - Conduct all quarterly monitoring as described above.
  - At a subset of the groundwater monitoring wells (MW-01s, MW-03s, MW-04s, MW-06s, MW-10s, MW-14d, MW-17s, MW-18s, MW-19s, MW-19d, MW-21, MW-23, MW-24s, MW-24d, MW-27s, MW-27d, MW-32s, MW-33s, and MW-34s) collect samples for analysis of monitored natural attenuation (MNA) parameters: chloride, nitrate, sulfate and ferrous iron.
  - Previous semi-annual monitoring included the collection of drinking water samples from private wells identified in and around the area of VOC-affected groundwater for VOCs analysis. A groundwater use ordinance, restricting the use of private wells within the area of VOC-affected groundwater was passed by the City of Tecumseh during the second quarter of 2011. These wells were decommissioned in December 2011 and are no longer part of the monitoring program; properties not previously connected to municipal water were connected prior to well decommissioning in November 2011.

This sampling plan was developed to determine the stability of VOC concentrations in groundwater. As such, sampling activities are conducted in accordance with the QAPP which was submitted to the USEPA for review in August 2010, and VOC data are evaluated based on level 4 data quality objectives (RMT, 2010c). Once the stability of chlorinated VOCs in groundwater has been assessed using appropriate statistical methods, the sampling plan (*e.g.* sample locations, frequency, and data quality objectives) may be modified to reflect changing project objectives.

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Section 4
Methodology

4.1 Parameter Selection

The primary constituents of concern for the site are volatile organic compounds (VOCs), particularly chlorinated VOCs (CVOCs). Compounds that have been detected above Michigan Part 201 residential drinking water criteria at one or more of the monitoring locations described in Section 3.1 above were used to assess groundwater stability. Groundwater chemistry data are tabulated in Table 1. Intra-well data comparisons and trend analysis of following parameters were conducted:

- tetrachloroethene (PCE)
- trichloroethene (TCE)
- 1,1,1-trichloroethane (1,1,1-TCA)
- 1,1-dichloroethene (1,1-DCE)
- cis-1,2-dichloroethene (cis-DCE)
- trans-1,2-dichloroethene (trans-DCE)
- vinyl chloride
- 1,1-dichloroethane (1,1-DCA)

4.2 Non-Detect Values

There are large percentages of non-detect observations encountered for some monitoring locations at the former TPC site. The Mann-Kendall trend test and the Sen's slope trend test, are both non-parametric methods to evaluate upward and downward trends in concentration data. Because these tests do not depend on normally distributed data, consideration of non-detect observations is simplified. For the purposes of the intra-well comparisons described below, a value equal to the reporting limit (RL) was assigned to data reported as below the RL.

4.3 Trend Plots

Individual trend plots were prepared for each parameter-well combination. To simplify review and further analysis, parameter-well combinations were divided into two categories:

- Parameter-well combinations in which the specified parameter was detected during no more than three sample events are referred to as "non-detect" parameter-well combinations for purposes of this report. These parameter-well combinations are dominated by non-detect values which did not merit further evaluation, *i.e.* statistical trend analysis.
- Parameter-well combinations in which the specified parameter was detected during at least four sample events are referred to as "detect" parameter-well combinations for purposes of this report. These "detect" parameter-well combinations were evaluated using statistical trend tests as described below.

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Trend plots for each parameter-well combination were generated using ChemStat™ Version 6.2.1.0 Software. Each sample event is represented by a single data point on the trend plots. As described above, non-detect values were assigned a value equal to the reporting limit. Detections are designated with a closed circle, whereas non-detect values are designated with an open circle.

4.4 Mann-Kendall Trend Tests

The purpose of statistical trend tests, such as the Mann-Kendall trend test, is to identify potential trends in measured concentrations over time. The Mann-Kendall trend test involves listing sample data in temporal order and computing all differences that may be formed between each datum and its earlier value across a triangular table. If there is an underlying upward or downward trend, then these differences will tend to be sufficiently large enough to suggest the presence of an actual upward or downward trend. This approach is particularly useful because it can accommodate missing values and the data need not conform to any particular distribution.

The trend tests are calculated utilizing a sample of independent groundwater observations from each well as follows. The first step is to list the data in the order in which they were collected over time: x_1, x_2, …to x_n where x_i is the datum at time i. Then determine the sign of all n(n-1)/2 possible differences where $x_j - x_k$, where j > k. Let Sign($x_j - x_k$) be an indicator function that takes on the values of 1, 0, or -1 as described below:

- Sign($x_j - x_k$) = 1 if ($x_j - x_k$) > 0
- Sign($x_j - x_k$) = 0 if ($x_j - x_k$) = 0
- Sign($x_j - x_k$) = -1 if ($x_j - x_k$) < 0

Then compute the Mann-Kendall statistic:

$$S = \sum_{k=1}^{n-1} \sum_{j=k+1}^{n} Sign(x_j - x_k)$$

Where S = the Mann-Kendall statistic

If there are 10 or fewer observations, the significance level (α) is determined from tabulated values (Gilbert, 1987). A copy of these tabulated values is provided as Appendix A.

If there are more than 10 observations, the Mann-Kendall statistic is evaluated using a normal approximation as described below:

- Determine the number of tied groups (g)

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- Determine the number of tied values in each group of ties (t_p)
- Determine the number of time periods with multiple observations (h)
- Determine the number of observations per period with multiple observations (u_q)
- Calculate the variance, VAR(S) using the following equation:

$$VAR(S) = \frac{1}{18}\left[a - A - B + \frac{C \times D}{b} + \frac{E \times F}{c}\right]$$

where:

$$A = \sum_{p=1}^{g} t_p(t_p - 1)(2t_p + 5)$$

$$B = \sum_{q=1}^{h} u_q(u_q - 1)(2u_q + 5)$$

$$C = \sum_{p=1}^{g} t_p(t_p - 1)(t_p - 2)$$

$$D = \sum_{q=1}^{h} u_q(u_q - 1)(u_q - 2)$$

$$E = \sum_{p=1}^{g} t_p(t_p - 1)$$

$$F = \sum_{q=1}^{h} u_q(u_q - 1)$$

$$a = n(n-1)(2n+5)$$

$$b = 9n(n-1)(n-2)$$

$$c = 2n(n-1)$$

- Calculate the Z-statistic using one of the following equations:
  - if S > 0, $Z = \frac{S-1}{[VAR(S)]^{0.5}}$
  - if S = 0, Z = 0
  - if S < 0, $Z = \frac{S+1}{[VAR(S)]^{0.5}}$
- Compare the Z-statistic to the percentile of the standard normal distribution for the selected confidence level (Appendix A). If the Z-statistic exceeds the percentile of the standard normal distribution, then there is evidence of a trend, and the null hypothesis (no trend) is rejected.

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For the TPC project, Mann-Kendall trend analysis was conducted using ChemStat™ Version 6.2.1.0 Software. Trends were evaluated using a 95-percent (one-tailed) confidence level, *i.e.* a significance level (α) of 0.05. Example calculations are provided in Appendix B. In some cases where the data set included 10 or fewer values, tied values within the data set resulted in a Mann-Kendall statistic (S) that is not included in the tabulated values (Appendix A). In these cases the results of the Mann-Kendall trend tests were manually approximated by conservatively comparing the tabulated significance level of the next lower Mann-Kendall statistic (|S|-1) to the 95-percent (one-tailed) confidence level (*i.e.* an α of 0.05).

4.5 Sen's Slope Trend Tests

As noted above, the purpose of statistical trend tests, such as the Mann-Kendall trend test and the Sen's Slope trend test, is to identify potential trends in measured concentrations over time. Sen's Slope trend tests were conducted to verify the result of the Mann-Kendall trend tests. Sen's Slope analysis is a non-parametric method of estimating the slope, *i.e.* the change in concentration over time, of groundwater chemistry data. If data show a positive slope, there is evidence of an increasing trend, and if data show a negative slope there is evidence of a decreasing trend. Sen's slope trend tests were performed as described below:

- List the data in the order in which they were collected over time: x_1, x_2, …to x_n where x_i is the datum at time i. Then determine the simple pairwise slope (Q) for each pair:

$$Q = \frac{x_j - x_k}{j - k}$$

  where x_j, x_k are parameter concentrations at time j and k respectively and j > k.

- Determine number of Q values, N', with the following formula

$$N' = \frac{n(n-1)}{2}$$

  where n is the number of observations.

- Determine the Sen's Slope Estimator (S), which is equal to the median of the Q values calculated as described above.
- Determine the number of tied groups (g)
- Determine the number of tied values in each group of ties (t_p)
- Determine the number of time periods with multiple observations (h)
- Determine the number of observation per period with multiple observations (u_q)
- Calculate the variance as described in Section 4.4 above

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- Compute the confidence interval or tolerance, C_α, on the median ordered value, *i.e.* rank, (1 through N′) for the slope (Q) with the following formula

$$C_\alpha = Z_{(1-\alpha)/2}\sqrt{VAR(S)}$$

  where α is the confidence level

- Compute the upper and lower bounds for median ordered value or rank (1 through N′) for the slope (Q) using following equations:

$$M_1 = (N' - C_\alpha)/2$$
$$M_2 = (N' + C_\alpha)/2$$

- Using the computed upper and lower bounds for the median rank (1 through N′), determine the lower and upper confidence intervals on the Sen's Slope estimator. Where the median slope (Q_{median}) is the Sen's Slope Estimator, Q_{M1} is the lower confidence interval on the median value for the ordered Q-values, and Q_{M2+1} is the upper confidence interval on the median value for the ordered Q-values.
- Interpret the results:
  - If the lower confidence interval is greater than 0 there is an upward trend;
  - If the upper confidence interval is less than 0 there is a downward trend;
  - If the lower confidence interval is less than or equal to 0 and the upper confidence interval is greater than or equal to 0, there is no evidence of a statistically significant trend and the null hypothesis is confirmed.

For the TPC project, Sen's Slope trend tests were conducted using ChemStat™ Version 6.2.1.0 Software. Trends were evaluated using a 90-percent (two-tailed) confidence level. Example calculations are provided in Appendix B.

4.6 Stability Evaluation for "No-Trend" Parameter-Well Combinations

Using either Mann-Kendall or Sen's Slope trend tests, a "no-trend" determination does not inherently mean that concentrations are stable. Therefore "no trend" parameter-well combinations were evaluated further to access the stability. As recommended by the Wisconsin Department of Natural Resources (WDNR), stability was evaluated by comparing the coefficient of variation (CV) to 1. If the CV is less than or equal to 1 the concentration is considered stable (WDNR, 2004).

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For the TPC project, the mean concentration and standard deviation for each parameter-well combination was computed using ChemStat™ Version 6.2.1.0 Software. Using the mean (μ) and standard deviation (σ) from the Chemstat™ output, the CV was computed as follows:

$$CV = \frac{\sigma}{\mu}$$

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Section 5
Results

5.1 Trend Plots

As described in Section 4.3 trend plots were prepared for each parameter-well combination. To simplify review and further analysis, parameter-well combinations were divided into two categories: "detect" parameter-well combinations and "non-detect" parameter-well combinations. Trend plots for "detect" parameter-well combinations (57 total) are included in Appendix C, and trend plots for "non-detect" parameter-well combinations (271 total) are included in Appendix D.

"Detect" parameter-well combinations, *i.e.* parameter-well combinations in which the specified parameter was detected during four or more sample events, are listed below. Statistical analysis as described in Sections 5.2 and 5.3 was performed on these parameter-well combinations.

"Detect" Parameter-Well Combinations

Detected Parameter	Monitoring Wells
PCE	MW-02s, MW-05s, MW-12s, and MW-19s
TCE	MW-01s, MW-02s, MW-04s, MW-05s, MW-06s, MW-07s, MW-09s, MW-19s, MW-20s, MW-21, MW-25s, MW-31, MW-32s, MW-33s and MW-34s
1,1-DCE	MW-20s
cis-DCE	MW-02s, MW-03s, MW-04s, MW-20s, MW-20d, MW-21, MW-29s, MW-31, MW-32s, and MW-33s
trans-DCE	MW-03s, MW-04s, and MW-31
vinyl chloride	MW-03s, MW-04s, MW-20d, MW-22, MW-23, and MW-33s
1,1,1-TCA	MW-01s, MW-02s, MW-07s, MW-09s, MW-19s, MW-20s, MW-21, MW-25s, MW-31, MW-32s, MW-33s and MW-34s
1,1-DCA	MW-03s, MW-20s, MW-21, MW-25s, MW-31, and MW-33s

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5.2 Mann-Kendall Trend Tests

Mann-Kendall trend tests were performed on all "detect" parameter-well combinations in order to identify potential trends in measured concentrations over time. As described in Section 4.4, Mann-Kendall trend tests were performed using ChemStat™ Version 6.2.1.0 Software. Trends were evaluated using a 95-percent (one-tailed) confidence level, *i.e.* a significance level (α) of 0.05. ChemStat™ output files are provided in Appendix E.

Of the 57 "detect" parameter-well combinations, statistically significant trends were identified for 21 parameter-well combinations: 6 upward trends and 15 downward trends. Identified trends are listed below.

Parameter-Well Combinations with Trends Identified using Mann-Kendall Trend Tests

Parameter	Monitoring Wells with an Upward Trend	Monitoring Wells with a Downward Trend
PCE	None	None
TCE	MW-20s and MW-25s	MW-01s and MW-32s
1,1-DCE	None	MW-20s
cis-DCE	MW-20d	MW-02s, MW-20s, and MW-32s
trans-DCE	MW-03s	MW-04s
vinyl chloride	MW-23	MW-04s and MW-33s
1,1,1-TCA	MW-25s	MW-01s, MW-07s, and MW-09s
1,1-DCA	None	MW-20s, MW-21, and MW-25s

Mann-Kendall trend test results are illustrated in a series of figures. A separate figure was prepared for each statistically evaluated parameter. Figures 3 thru 10 illustrate the Mann-Kendall trend test results for PCE, TCE, 1,1-DCE, cis-DCE, trans-DCE, vinyl chloride, 1,1,1-TCA and 1,1-DCA, respectively. In each figure, sample locations for which no trend was identified are highlighted yellow; sample locations for which a downward trend was identified are highlighted green; and sample locations for which an upward trend was identified are highlighted pink.

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5.3 Sen's Slope Trend Tests

Sen's Slope trend tests were performed on all "detect" parameter-well combinations in order to identify potential trends in measured concentrations over time and to confirm Mann-Kendall trend test results. As described in Section 4.5, Sen's Slope trend tests were performed using ChemStat™ Version 6.2.1.0 Software. Trends were evaluated using a 90-percent (two-tailed) confidence level. ChemStat™ output files are provided in Appendix F.

Of the 57 "detect" parameter-well combinations, statistically significant trends were identified for 18 parameter-well combinations: 6 upward trends and 12 downward trends. All of the trends identified using Sen's slope trend tests were also identified using Mann-Kendall trend tests. Downward trends identified for three parameter-well combinations using Mann-Kendall trend tests were not confirmed with Sen's slope trend tests (cis-DCE at MW-02s, 1,1-DCA at MW-25s, and TCE at MW-32s). Trends identified using Sen's slope trend tests are listed below.

Parameter-Well Combinations with Trends Identified using Sen's Slope Trend Tests

Parameter	Monitoring Wells with an Upward Trend	Monitoring Wells with a Downward Trend
PCE	None	None
TCE	MW-20s and MW-25s	MW-01s
1,1-DCE	None	MW-20s
cis-DCE	MW-20d	MW-20s and MW-32s
trans-DCE	MW-03s	MW-04s
vinyl chloride	MW-23	MW-04s and MW-33s
1,1,1-TCA	MW-25s	MW-01s, MW-07s, and MW-09s
1,1-DCA	None	MW-20s and MW-21,

5.4 Stability Evaluation of "No-Trend" Parameter-Well Combinations

Of the 57 "detect" parameter-well combinations, no statistically significant trend was identified for 36 parameter-well combinations. A "no-trend" determination does not inherently mean that concentrations are stable. These "no trend" parameter-well combinations were evaluated

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further to access the stability. As described in Section 4.6, basic statistics, including the mean and standard deviation of concentration data for each of the target "no-trend" parameter-well combinations, were computed using ChemStat™ Version 6.2.1.0 Software. ChemStat™ output files are provided in Appendix G. Computed mean and standard deviation of concentration data for each of the target "no-trend" parameter-well combinations were used to compute the coefficient of variance. Mean, standard deviation and coefficient of variance are tabulated in Table G1 of Appendix G. The coefficient of variance for all of the "no trend" parameter-well combinations was less than 1.0, indicating that the concentration data for these parameter-well combinations are stable. No trend parameter-well combinations are listed below:

"No Trend" Parameter-Well Combinations

Detected Parameter	Monitoring Wells
PCE	MW-02s, MW-05s, MW-12s, and MW-19s
TCE	MW-02s, MW-04s, MW-05s, MW-06s, MW-07s, MW-09s, MW-19s, MW-21, MW-31, MW-33s and MW-34s
1,1-DCE	None
cis-DCE	MW-03s, MW-04s, MW-21, MW-29s, MW-31, and MW-33s
trans-DCE	MW-31
vinyl chloride	MW-03s, MW-20d, and MW-22
1,1,1-TCA	MW-02s, MW-19s, MW-20s, MW-21, MW-31, MW-32s, MW-33s and MW-34s
1,1-DCA	MW-03s, MW-31, and MW-33s

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Section 6
Summary and Conclusions

A statistical evaluation of groundwater stability was prepared to support completion of RCRA Form CA750, Documentation of Environmental Indicator Determination – Migration of Contaminated Groundwater Under Control (Contaminated Groundwater Under Control EI Determination), for the former Tecumseh Products Company Site located in Tecumseh, Michigan. To facilitate the groundwater stability evaluation, quarterly groundwater monitoring is conducted at 40 monitoring wells (previously 41 monitoring wells), including 14 upgradient/sidegradient wells, 12 on-site monitoring wells (including MW-09s which was excavated during installation of the permeable reactive barrier), and 15 downgradient wells.

The primary constituents of concern for the site are VOCs, particularly CVOCs. Compounds that have been detected above Michigan Part 201 residential drinking water criteria at one or more of the 41 monitoring locations were used to assess groundwater stability. A total of 8 compounds have been detected at these monitoring locations above Part 201 criteria: PCE, TCE, 1,1-DCE, cis-1,2-DCE, trans-1,2-DCE, vinyl chloride, 1,1,1-TCA, and 1,1-DCA.

Groundwater chemistry data collected between March 2009 and April 2012 were used to conduct intra-well data comparisons and trend analysis for the evaluation of groundwater stability. A minimum of 8 sample events have been conducted at each monitoring location.

A total of 328 trend charts were prepared, one for each parameter-well combination. Of the parameter-well combinations considered, only 57 "detect" (*i.e.* the target constituent was detected during at least four sample events) parameter-well combinations were identified. Statistical analysis was conducted on those 57 parameter-well combinations. By definition "non-detect" parameter-well combinations are stable, having no upward or downward concentration trend. Therefore, "non-detect" parameter-well combinations do not require further evaluation.

Both Mann-Kendall trend tests and Sen's slope trend tests were conducted on "detect" parameter-well combinations using ChemStat™ Version 6.2.1.0 Software. Both of these trend tests are non-parametric methods which can accommodate missing values and do not require the data to conform to any particular distribution. However, the non-parametric nature of these methods means the overall magnitude of the change in concentration is not considered directly in the calculations.

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For the vast majority of the 328 parameter-well combinations evaluated, no upward or downward trend was observed. Using Mann-Kendall trend analysis, statistically significant trends were identified for 21 parameter-well combinations: 6 upward trends and 15 downward trends. Using Sen's slope trend analysis, statistically significant trends were identified for 18 parameter-well combinations: 6 upward trends and 12 downward trends. All of the trends identified using Sen's slope trend tests were also identified using Mann-Kendall trend tests. Downward trends identified for three parameter-well combinations using Mann-Kendall trend tests were not confirmed with Sen's slope trend tests (cis-DCE at MW-02s, 1,1-DCA at MW-25s, and TCE at MW-32s). The coefficient of variance was computed for "detect" parameter-well combinations with no statistically significant trend. The computed coefficient of variance for all no trend parameter-well combinations was less than 1.0, indicating that the concentration data for these parameter-well combinations are stable.

Statistically significant upward and/or downward trends were observed at 13 monitoring locations as described below:

- **Downward trends for TCE and 1,1,1-TCA were identified at monitoring well MW-01s:** The statistically significant downward trends for TCE and 1,1,1-TCA at monitoring well MW-01s can be visually confirmed using the associated trend charts (pages 1 and 2 of Appendix C). A decrease and stabilization of groundwater concentrations is particularly apparent since May 2011 when the injected portion of the permeable reactive barrier (PRB) was installed adjacent to this location. However, comparably low concentrations were also observed during the two sample events prior to PRB installation. These lower concentrations in combination with the downward trend for 1,1,1-TCA observed at MW-09s (see evaluation below) may be indicative of a reduction of available contaminant mass within the southern source area. These trends merit further observation and evaluation.
- **A downward trend for cis-DCE was identified at monitoring well MW-02s:** The statistically significant downward trend for cis-DCE was identified using Mann-Kendall trend analysis, but was not confirmed with Sen's Slope analysis. As shown on the trend chart for cis-DCE at monitoring well MW-02s (page 4 of Appendix C), the detected concentration of cis-DCE has ranged from 2.0 to 4.1 micrograms per liter (ug/L). By contrast TCE concentrations at MW-02s range from 130 to 290 ug/L. Although concentrations have been lower and even non-detect (<2.0) during recent events, this trend, if it persists, is unlikely to be important to overall plume stability.
- **An upward trend for trans-DCE was identified at monitoring well MW-03s:** The statistically significant upward trend for trans-DCE can be visually confirmed using the associated trend chart (page 9 of Appendix C). However, the increasing concentration of this breakdown product appears to have stabilized over the past 2 years. The detected concentration of trans-DCE has ranges from 9.1 to 110 ug/L. By contrast cis-DCE concentrations at MW-03s range from 240 to 2,200 ug/L. Given the apparent stabilization of

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trans-DCE concentrations over the past two years and the comparably low total concentrations, this statistically significant trend is unlikely to be indicative of an expanding plume.

- **Downward trends for trans-DCE and vinyl chloride were identified at monitoring well MW-04s:** The statistically significant downward trends for trans-DCE and vinyl chloride at monitoring well MW-04s can be visually confirmed using the associated trend charts for monitoring well MW-04s (pages 11 thru 14 of Appendix C). The downward trend is particularly apparent for vinyl chloride. The observed concentrations of trans-DCE (50 - 91 ug/L) and vinyl chloride (170 – 520 ug/L) are relatively low compared to the observed concentrations of TCE (4,000 – 7,500 ug/L) and cis-DCE (1,600 – 2,900 ug/L). However the decrease in these degradation products without an associated increase in the parent compound or other degradation products near the source area, may be indicative of a reduction of available contaminant mass within the northern source area. These trends merit further observation and evaluation.
- **A downward trend for 1,1,1-TCA was identified at monitoring well MW-07s:** The statistically significant downward trend for 1,1,1-TCA was identified using both Mann-Kendall trend analysis and Sen's Slope analysis. As shown on the trend chart for 1,1,1-TCA at monitoring well MW-07s (page 18 of Appendix C), the detected concentration of 1,1,1-TCA has ranged from 1.2 to 2.1 ug/L. Given the low concentrations observed, this trend, if it persists, is unlikely to be important to overall plume stability.
- **A downward trend for 1,1,1-TCA was identified at monitoring well MW-09s:** Monitoring well MW-09s was excavated during PRB installation in May 2011. However, eight groundwater sample events had been conducted prior to well abandonment, allowing statistical trend analysis prior to PRB installation. The statistically significant downward trend for 1,1,1-TCA at monitoring well MW-09s can be visually confirmed using the associated trend charts for monitoring well MW-09s (pages 20 and 21 of Appendix C). The decrease in this parent compound without an associated increase in one or more degradation products downgradient of the southern source area, may be indicative of a reduction of available contaminant mass within the southern source area.
- **An upward trend for TCE and a downward trend for 1,1-DCE, cis-DCE and 1,1-DCA were identified at monitoring well MW-20s:** Trend charts for monitoring well MW-20s can be found on pages 28 thru 32 of Appendix C. Review of these trend charts indicates that groundwater concentration during the first three to four sample events were different than those observed since that time. This concentration shift is particularly apparent for TCE (64-110 ug/L) and 1,1-DCA (5.8-58 ug/L) which have higher concentrations than 1,1-DCE (1.1-5.1 ug/L) and cis-DCE (1.9-12 ug/L). Concentrations of TCE in particular are very stable since May 2010 (89 to 110 ug/L compared to concentrations ranging from 64 to 71 ug/L from December 2009 thru March 2010). Given the apparent stability of parameters over the last 7 sample events, these trends are unlikely to be important to overall plume stability.

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- **An upward trend for cis-DCE was identified at monitoring well MW-20d:** The statistically significant upward trend for cis-DCE can be visually confirmed using the associated trend chart (page 26 of Appendix C). However review of the trend chart illustrates a relatively stable cis-DCE concentrations from December 2009 thru September 2010 (85 – 120 ug/L) and different, higher, but relatively stable, cis-DCE concentrations from December 2010 thru April 2012 (140 – 200 ug/L). Given the apparent stability of cis-DCE concentrations over the last 7 sample events, this trend is unlikely to be important to overall plume stability.
- **A downward trend for 1,1-DCA was identified at monitoring well MW-21:** The statistically significant downward trend for cis-DCE was identified using both Mann-Kendall trend analysis and Sen's Slope analysis. As shown on the trend chart for 1,1-DCA at monitoring well MW-21 (page 34 of Appendix C), the detected concentration of 1,1-DCA has ranged from 22 to 35 ug/L. By contrast TCE concentrations at MW-21 range from 730 to 1,000 ug/L. Given the relatively low concentrations of 1,1-DCA observed and the relatively tight concentration range, this trend, if it persists, is unlikely to be important to overall plume stability.
- **An upward trend for vinyl chloride was identified at monitoring well MW-23**: The statistically significant upward trend for vinyl chloride at monitoring well MW-23 can be visually confirmed using the associated trend chart (page 38 of Appendix C). No other parameters are detected at monitoring well MW-23. The concentration of this breakdown product has increased over the last several years. However, vinyl chloride concentrations remain non-detect at sentinel wells downgradient of monitoring well MW-23, particularly monitoring wells MW-29s and MW-29d. TRC will continue to monitor this trend and its potential effect on overall groundwater plume stability. **The presence of an increasing trend in breakdown products does not indicate plume instability. The lack of TCE (parent product) in this well and other upgradient monitoring wells in the northern portion of the site shows that the plume is stable.**
- **Upward trends for TCE and 1,1,1-TCA as well as a downward trend for 1,1-DCA were identified at monitoring well MW-25s:** Trend charts for monitoring well MW-25s can be found on pages 39 thru 41 of Appendix C. For TCE the upward trend is visually apparent however the concentrations range is small (<1.0 to 3.6 ug/L). Similarly the downward trend for 1,1-DCA is visually apparent however the concentrations range for 1,1,-DCA is also very small from <1.0 to 1.7 ug/L. Given the relatively low concentrations of TCE and 1,1-DCA observed and the relatively tight concentration range, these trends, if they persist, are unlikely to be important to overall plume stability. With the exception of a single outlier in December 2009 (4.8 ug/L) the 1,1,1-TCA concentration is clearly stable (17-26 ug/L). The statistically significant upward trend for 1,1,1-TCA is unlikely to persist and is not indicative of an expanding plume.
- **Downward trends for both TCE and cis-DCE were identified at monitoring well MW-32s:** The statistically significant downward trend for TCE was identified using Mann-

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Kendall trend analysis, but was not confirmed with Sen's Slope analysis. As shown on the trend chart for TCE at monitoring well MW-32s (page 50 of Appendix C), the detected concentration of TCE has ranged from 2,200 to 2,800 ug/L. Given the relatively tight concentration range compared to the observed concentrations, additional sample events are necessary to determine if this trend is a true indicator of slowly decreasing source area concentrations. The statistically significant downward trend for cis-DCE was identified using both Mann-Kendall trend analysis and Sen's Slope analysis. As shown on the trend chart for cis-DCE at monitoring well MW-32s (page 49 of Appendix C), the detected concentration of cis-DCE has ranged from 130 to 270 ug/L. This decrease in the degradation product cis-DCE with an associated decrease in the parent compound may be indicative of a reduction of available contaminant mass within the northern source area.

- **A downward trend for vinyl chloride was identified at monitoring well MW-33s:** The statistically significant downward trend for vinyl chloride was identified using both Mann-Kendall trend analysis and Sen's Slope analysis, and can be visually confirmed using the associated trend chart (page 55 of Appendix C). Vinyl chloride concentrations appear to be decreasing slowly. However concentrations of other parameters including TCE, cis-DCE and 1,1-DCA appear stable. This decrease in this degradation product without an associated increase in the parent compound or other degradation products may be indicative of a reduction of available contaminant mass within the northern source area.

Downward trends at monitoring wells MW-01s, MW-04s, MW-09s, MW-32s, and MW-33s may be indicative of a reduction in the available contaminant mass within the source areas. The upward trend of vinyl chloride (a degradation product) at monitoring well MW-23 may indicate increasing concentrations of degradation products within the groundwater plume. However, concentrations of vinyl chloride remain non-detect at sentinel wells downgradient of monitoring well MW-23, particularly monitoring wells MW-29s and MW-29d. Furthermore, the presence of an increasing trend in breakdown products does not indicate plume instability. The lack of TCE (parent product) in this well and other upgradient monitoring wells in the northern portion of the site shows that the plume is stable. Overall the statistical evaluation of groundwater stability supports a favorable Environmental Indicator – Groundwater Stabilized determination.

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Section 7
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Table

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Table 1
Summary of Detected Volatile Organic Compounds in Groundwater
Former Tecumseh Products Company Site
Tecumseh, Michigan
Second Quarter 2012

Analyte		2-Butanone	Chloroethane	1,1-Dichloroethane	1,1-Dichloroethene[2]	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Tetrachloroethene	1,1,1-Trichloroethane	Trichloroethene	Trichloro-fluoromethane	Vinyl Chloride
Residential DW Criteria		13,000	430	880	7.0	70	100	5.0	200	5.0	2,600	2.0
Non-Residential DW Criteria		38,000	1,700	2,500	7.0	70	100	5.0	200	5.0	7,300	2.0
GSI Criteria		2,200	1,100	740	130	620	1,500[1]	60[1]	89	200[1]	NC	13[1]
Residential GWSLs for Vapor Intrusion		4.5E+06	NC	130	390	440	330	11	15,000	9.9	370	5.0
Non-Residential GWSLs for Vapor Intrusion		1.9E+07	NC	670	1,600	1,800	1,400	55	63,000	42	1,600	50
Groundwater Contact Criteria		2.4E+08	4.4E+05	2.4E+06	11,000	2.0E+05	2.2E+05	12,000	1.3E+06	22,000	1.1E+06	1,000
Units		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
MW-01s (16-21')	3/13/2009	<100	<100	<20	<20	<20	<20	<20	**750**	**2,700**	<20	<20
	4/20/2009	NA	<500	<100	<100	<100	<100	<100	**1,100**	**2,200**	NA	<100
	12/9/2009	<100	<100	<20	<20	<20	<20	<20	**1,000**	**3,400**	<20	<20
	3/17/2010	<100	<100	<20	<20	<20	<20	<20	**1,400**	**2,500**	<20	<20
	5/18/2010	<100	<100	<20	<20	<20	<20	<20	**1,000**	**2,700**	<20	<20
	9/10/2010	<100	<100	<20	<20	<20	<20	<20	**750**	**2,400**	<20	<20
	12/28/2010	<100	<100	<20	<20	<20	<20	<20	**1,100**	**2,500**	<20	<20
	2/25/2011	<50	<50	<10	<10	<10	<10	<10	**560**	**1,300**	<10	<10
	5/11/2011[3]	<50	<50	<10	<10	<10	<10	<10	**860**	**1,900**	<10	<10
	7/28/2011	<100	<100	<20	<20	<20	<20	<20	**500**	**1,900**	<20	<20
	10/6/2011	<100	<100	<20	<20	<20	<20	<20	**540**	**2,000**	<20	<20
	1/9/2012	<100	<100	<20	<20	**31**	<20	<20	**530**	**2,000**	<20	<20
	4/4/2012	<100	<100	<20	<20	**38**	<20	<20	**480**	**1,900**	<20	<20
DUP-01 (MW-01s)	3/13/2009	<20	<20	<20	<20	<20	<20	<20	**720**	**2,700**	<20	<20
MW-02s (23-28')	3/13/2009	<10	<10	<2.0	<2.0	**2.4**	<2.0	**2.2**	**2.5**	**280**	<2.0	<2.0
	4/20/2009	NA	<50	<10	<10	<10	<10	<10	<10	**130**	NA	<10
	12/9/2009	<10	<10	<2.0	<2.0	**3.7**	<2.0	**2.7**	**2.9**	**250**	<2.0	<2.0
	3/17/2010	**13**	<10	<2.0	<2.0	**4.1**	<2.0	**2.3**	**3.1**	**290**	<2.0	<2.0
	5/18/2010	<10	<10	<2.0	<2.0	**2.3**	<2.0	**2.4**	**2.6**	**210**	<2.0	<2.0
	9/10/2010	<10	<10	<2.0	<2.0	**2.3**	<2.0	**2.3**	**2.3**	**220**	<2.0	<2.0
	12/22/2010	<10	<10	<2.0	<2.0	**2.4**	<2.0	**2.3**	**3.1**	**240**	<2.0	<2.0
	2/24/2011	<10	<10	<2.0	<2.0	**2.0**	<2.0	<2.0	**2.6**	**240**	<2.0	<2.0
	5/10/2011[3]	<10	<10	<2.0	<2.0	<2.0	<2.0	<2.0	**2.3**	**250**	<2.0	<2.0
	7/28/2011[4]	<10	<10	<2.0	<2.0	**2.0**	<2.0	**2.2**	**2.4**	**280**	<2.0	<2.0
	10/7/2011	<10	<10	<2.0	<2.0	<2.0	<2.0	**2.5**	**2.5**	**220**	<2.0	<2.0
	1/10/2012	<10	<10	<2.0	<2.0	<2.0	<2.0	**2.8**	**2.5**	**190**	<2.0	<2.0
	4/5/2012	<10	<10	<2.0	<2.0	**2.7**	<2.0	**3.5**	**3.4**	**210**	<2.0	<2.0

Notes:
Residential and Non-Residential Drinking Water (DW) Criteria, Groundwater Surface Water Interface (GSI) Criteria, and Groundwater Contact Criteria from MDEQ RRD Op Memo 1 Part 201 Generic Cleanup Criteria/Part 213 Risk Based Cleanup Levels, January 23, 2006, as amended March 25, 2011.
Groundwater Screening Levels (GWSLs) for Vapor Intrusion were calculated in accordance with the MDEQ Remediation and Redevelopment Division Program Redesign 2009 document titled *Background Document: Draft Proposed Vapor Intrusion Indoor Air Criteria (IAC), Soil Gas Criteria (SGC), and Groundwater Screening Levels (GW_{VI} SLs) for Vapor Intrusion,* using both residential and non-residential exposure scenarios and the most recent chemical specific toxicity values accepted and/or published by the United States Environmental Protection Agency (USEPA) as of February 1, 2012.
ug/L = micrograms per liter
NC = No criteria
NA = Not analyzed
Bold font denotes concentrations detected above laboratory reporting limits
Denotes concentrations above one or more criteria
1) Criterion is not protective for surface water used as a drinking water source as described in footnote {X} of MDEQ Op Memo 1 Part 201, Attachment 1.
2) Compound may exhibit characteristic ignitability as defined in 40 C.F.R. § 261.21
3) The average temperature in this sample shipment exceeded the recommended temperature range. Sample results are approximate.
4) Quality control results for trichloroethene are outside the established control limits, the result is approximate.
5) Headspace present in the sample, results are approximate.

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Table 1
Summary of Detected Volatile Organic Compounds in Groundwater
Former Tecumseh Products Company Site
Tecumseh, Michigan
Second Quarter 2012

Analyte		2-Butanone	Chloroethane	1,1-Dichloroethane	1,1-Dichloroethene[2]	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Tetrachloroethene	1,1,1-Trichloroethane	Trichloroethene	Trichloro-fluoromethane	Vinyl Chloride
Residential DW Criteria		13,000	430	880	7.0	70	100	5.0	200	5.0	2,600	2.0
Non-Residential DW Criteria		38,000	1,700	2,500	7.0	70	100	5.0	200	5.0	7,300	2.0
GSI Criteria		2,200	1,100	740	130	620	1,500[1]	60[1]	89	200[1]	NC	13[1]
Residential GWSLs for Vapor Intrusion		4.5E+06	NC	130	390	440	330	11	15,000	9.9	370	5.0
Non-Residential GWSLs for Vapor Intrusion		1.9E+07	NC	670	1,600	1,800	1,400	55	63,000	42	1,600	50
Groundwater Contact Criteria		2.4E+08	4.4E+05	2.4E+06	11,000	2.0E+05	2.2E+05	12,000	1.3E+06	22,000	1.1E+06	1,000
Units		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
MW-03s (9-14')	3/13/2009	<10	<10	**9.1**	<2.0	**240**	**9.1**	<2.0	<2.0	<2.0	<2.0	**140**
	4/20/2009	NA	<50	**18**	<10	**490**	**18**	<10	<10	<10	NA	**210**
	12/8/2009	<120	<120	**46**	<25	**2,200**	**83**	<25	<25	<25	<25	**130**
	3/17/2010	<25	<25	**11**	<5.0	**460**	**17**	<5.0	<5.0	<5.0	<5.0	**42**
	5/18/2010	<25	<25	**14**	<5.0	**630**	**24**	<5.0	<5.0	<5.0	<5.0	**34**
	9/10/2010	<50	<50	**29**	<10	**1,600**	**63**	<10	<10	<10	<10	**83**
	12/22/2010	<50	<50	**32**	<10	**1,800**	**82**	<10	<10	<10	<10	**70**
	2/25/2011	<100	<100	**33**	<20	**2,200**	**110**	<20	<20	<20	<20	**75**
	5/10/2011[3]	<100	<100	**25**	<20	**1,600**	**77**	<20	<20	<20	<20	**52**
	7/28/2011	<100	<100	**23**	<20	**1,700**	**78**	<20	<20	<20	<20	**65**
	10/6/2011	<100	<100	**24**	<20	**2,100**	**100**	<20	<20	<20	<20	**91**
	1/10/2012	<50	<50	**22**	<10	**1,300**	**81**	<10	<10	<10	<10	**51**
	4/4/2012	<100	<100	<20	<20	**1,600**	**84**	<20	<20	**20**	<20	**170**
DUP-01 (MW-03s)	12/8/2009	<120	<120	**42**	<25	**2,000**	**73**	<25	<25	<25	<25	**120**
MW-04s (15-20')	3/13/2009	<120	<120	<25	<25	**2,100**	**70**	<25	<25	**5,000**	<25	**460**
	4/20/2009	NA	<500	<100	<100	**1,700**	<100	<100	<100	**4,000**	NA	**520**
	12/9/2009	<250	<250	<50	<50	**2,500**	**90**	<50	<50	**7,100**	<50	**270**
	3/17/2010	<250	<250	<50	<50	**2,900**	**82**	<50	<50	**7,500**	<50	**520**
	5/18/2010	<250	<250	<50	<50	**2,100**	**58**	<50	<50	**4,700**	<50	**280**
	9/17/2010	<250	<250	<50	<50	**2,400**	**70**	<50	<50	**5,200**	<50	**200**
	12/22/2010	<250	<250	<50	<50	**2,700**	**91**	<50	<50	**6,700**	<50	**270**
	2/25/2011	<250	<250	<50	<50	**2,500**	**82**	<50	<50	**5,900**	<50	**280**
	5/11/2011[3]	<250	<250	<50	<50	**1,900**	**58**	<50	<50	**4,600**	<50	**270**
	7/28/2011	<250	<250	<50	<50	**1,700**	**50**	<50	<50	**4,600**	<50	**190**
	10/6/2011	<250	<250	<50	<50	**2,000**	**58**	<50	<50	**4,600**	<50	**190**
	1/10/2012	<250	<250	<50	<50	**1,800**	**72**	<50	<50	**4,800**	<50	**190**
	4/4/2012	<250	<250	<50	<50	**1,600**	**54**	<50	<50	**4,300**	<50	**170**

Notes:
Residential and Non-Residential Drinking Water (DW) Criteria, Groundwater Surface Water Interface (GSI) Criteria, and Groundwater Contact Criteria from MDEQ RRD Op Memo 1 Part 201 Generic Cleanup Criteria/Part 213 Risk Based Cleanup Levels, January 23, 2006, as amended March 25, 2011.
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ug/L = micrograms per liter
NC = No criteria
NA = Not analyzed
Bold font denotes concentrations detected above laboratory reporting limits
Denotes concentrations above one or more criteria
1) Criterion is not protective for surface water used as a drinking water source as described in footnote {X} of MDEQ Op Memo 1 Part 201, Attachment 1.
2) Compound may exhibit characteristic ignitability as defined in 40 C.F.R. § 261.21
3) The average temperature in this sample shipment exceeded the recommended temperature range. Sample results are approximate.
4) Quality control results for trichloroethene are outside the established control limits, the result is approximate.
5) Headspace present in the sample, results are approximate.

US EPA ARCHIVE DOCUMENT

Table 1
Summary of Detected Volatile Organic Compounds in Groundwater
Former Tecumseh Products Company Site
Tecumseh, Michigan
Second Quarter 2012

Analyte		2-Butanone	Chloroethane	1,1-Dichloroethane	1,1-Dichloroethene[2]	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Tetrachloroethene	1,1,1-Trichloroethane	Trichloroethene	Trichloro-fluoromethane	Vinyl Chloride
Residential DW Criteria		13,000	430	880	7.0	70	100	5.0	200	5.0	2,600	2.0
Non-Residential DW Criteria		38,000	1,700	2,500	7.0	70	100	5.0	200	5.0	7,300	2.0
GSI Criteria		2,200	1,100	740	130	620	1,500[1]	60[1]	89	200[1]	NC	13[1]
Residential GWSLs for Vapor Intrusion		4.5E+06	NC	130	390	440	330	11	15,000	9.9	370	5.0
Non-Residential GWSLs for Vapor Intrusion		1.9E+07	NC	670	1,600	1,800	1,400	55	63,000	42	1,600	50
Groundwater Contact Criteria		2.4E+08	4.4E+05	2.4E+06	11,000	2.0E+05	2.2E+05	12,000	1.3E+06	22,000	1.1E+06	1,000
Units		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
MW-05s (25-30')	3/13/2009	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	**3.5**	<1.0	**120**	<1.0	<1.0
	4/20/2009	NA	<25	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	**140**	NA	<5.0
	12/10/2009	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	**5.3**	<1.0	**190**	<1.0	<1.0
	3/17/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	**6.3**	<1.0	**160**	<1.0	<1.0
	5/17/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	**4.6**	<1.0	**160**	<1.0	<1.0
	9/9/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	**4.6**	<1.0	**140**	<1.0	<1.0
	12/21/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	**4.9**	<1.0	**160**	<1.0	<1.0
	2/24/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	**4.4**	<1.0	**130**	<1.0	<1.0
	5/13/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	**4.9**	<1.0	**160**	<1.0	<1.0
	7/27/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	**4.8**	<1.0	**150**	<1.0	<1.0
	10/10/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	**5.1**	<1.0	**150**	<1.0	<1.0
	1/9/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	**5.8**	<1.0	**150**	<1.0	<1.0
	4/9/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	**5.7**	<1.0	**160**	<1.0	<1.0
MW-06s (24-29')	3/16/2009	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**21**	<1.0	<1.0
	4/20/2009	NA	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**23**	NA	<1.0
	12/9/2009	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**37**	<1.0	<1.0
	3/18/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**31**	<1.0	<1.0
	5/17/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**33**	<1.0	<1.0
	9/10/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**29**	<1.0	<1.0
	12/21/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**34**	<1.0	<1.0
	2/18/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**35**	<1.0	<1.0
	5/10/2011[3]	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**27**	<1.0	<1.0
	7/27/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**27**	<1.0	<1.0
	10/5/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**30**	<1.0	<1.0
	1/9/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**31**	<1.0	<1.0
	4/3/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**32**	<1.0	<1.0

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GSI Criteria		2,200	1,100	740	130	620	1,500[1]	60[1]	89	200[1]	NC	13[1]
Residential GWSLs for Vapor Intrusion		4.5E+06	NC	130	390	440	330	11	15,000	9.9	370	5.0
Non-Residential GWSLs for Vapor Intrusion		1.9E+07	NC	670	1,600	1,800	1,400	55	63,000	42	1,600	50
Groundwater Contact Criteria		2.4E+08	4.4E+05	2.4E+06	11,000	2.0E+05	2.2E+05	12,000	1.3E+06	22,000	1.1E+06	1,000
Units		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
MW-07s (23.5-28.5')	3/16/2009	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	**2.1**	**10**	<1.0	<1.0
	4/20/2009	NA	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	**1.6**	**11**	NA	<1.0
	12/10/2009	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	**1.8**	**14**	<1.0	<1.0
	3/17/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	**1.9**	**13**	<1.0	<1.0
	5/17/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	**1.9**	**13**	<1.0	<1.0
	9/10/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	**1.4**	**12**	<1.0	<1.0
	12/21/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	**2.1**	**16**	<1.0	<1.0
	2/24/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	**1.6**	**12**	<1.0	<1.0
	5/13/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	**1.5**	**12**	<1.0	<1.0
	7/27/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	**1.2**	**11**	<1.0	<1.0
	10/10/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	**1.4**	**13**	<1.0	<1.0
	1/9/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	**1.6**	**14**	<1.0	<1.0
	4/9/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	**1.3**	**12**	<1.0	<1.0
MW-08s (23.5-28.5')	3/16/2009	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**11**	<1.0	<1.0
	4/20/2009	NA	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**10**	NA	<1.0
	12/10/2009	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**11**	<1.0	<1.0
DUP-01 (MW-08s)	4/20/2009	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**10**	NA	<1.0
MW-09s (7-12')	3/16/2009	<100	<100	<20	<20	<20	<20	<20	**160**	**1,700**	<20	<20
	4/20/2009	NA	<500	<100	<100	<100	<100	<100	**220**	**2,100**	NA	<100
	12/9/2009	<100	<100	<20	<20	<20	<20	<20	**150**	**2,400**	<20	<20
	3/18/2010	<100	<100	<20	<20	<20	<20	<20	**120**	**1,500**	<20	<20
	5/18/2010	<100	<100	<20	<20	<20	<20	<20	**120**	**1,700**	<20	<20
	9/17/2010	<100	<100	<20	<20	<20	<20	<20	**120**	**1,700**	<20	<20
	2/25/2011	<50	<50	<10	<10	<10	<10	<10	**84**	**1,100**	<10	<10
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Groundwater Contact Criteria		2.4E+08	4.4E+05	2.4E+06	11,000	2.0E+05	2.2E+05	12,000	1.3E+06	22,000	1.1E+06	1,000
Units		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
MW-10s (8-13')	5/15/2009	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/9/2009	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	3/16/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/12/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	9/3/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/16/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	2/15/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/9/2011[3]	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/20/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	10/4/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	1/4/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	4/2/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
DUP-02 (MW-10s)	5/15/2009	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW-10d (14-19')	12/9/2009	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW-11s (29-34')	5/14/2009	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	1/13/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	3/15/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/14/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	9/3/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/17/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	2/17/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/12/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/22/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	10/7/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	1/4/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	4/5/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
DUP-02 (MW-11s)	5/14/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
DUP-01 (MW-11s)	9/3/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

Notes:
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Table 1
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Former Tecumseh Products Company Site
Tecumseh, Michigan
Second Quarter 2012

Analyte		2-Butanone	Chloroethane	1,1-Dichloroethane	1,1-Dichloroethene[2]	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Tetrachloroethene	1,1,1-Trichloroethane	Trichloroethene	Trichloro-fluoromethane	Vinyl Chloride
Residential DW Criteria		13,000	430	880	7.0	70	100	5.0	200	5.0	2,600	2.0
Non-Residential DW Criteria		38,000	1,700	2,500	7.0	70	100	5.0	200	5.0	7,300	2.0
GSI Criteria		2,200	1,100	740	130	620	1,500[1]	60[1]	89	200[1]	NC	13[1]
Residential GWSLs for Vapor Intrusion		4.5E+06	NC	130	390	440	330	11	15,000	9.9	370	5.0
Non-Residential GWSLs for Vapor Intrusion		1.9E+07	NC	670	1,600	1,800	1,400	55	63,000	42	1,600	50
Groundwater Contact Criteria		2.4E+08	4.4E+05	2.4E+06	11,000	2.0E+05	2.2E+05	12,000	1.3E+06	22,000	1.1E+06	1,000
Units		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
MW-12s (12-17')	5/15/2009	NA	<1.0	<1.0	<1.0	<1.0	<1.0	**1.4**	<1.0	<1.0	<1.0	<1.0
	12/30/2009	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	**1.4**	<1.0	<1.0	<1.0	<1.0
	3/15/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/14/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	**1.0**	<1.0	<1.0	<1.0	<1.0
	9/3/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	**1.6**	<1.0	<1.0	<1.0	<1.0
	12/14/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	2/14/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/12/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	**1.6**	<1.0	<1.0	<1.0	<1.0
	7/20/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	**1.4**	<1.0	<1.0	<1.0	<1.0
	10/7/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	**1.9**	<1.0	<1.0	<1.0	<1.0
	1/4/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	**2.2**	<1.0	<1.0	<1.0	<1.0
	4/5/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	**1.2**	<1.0	<1.0	<1.0	<1.0
MW-12d (33-38')	3/18/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/14/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	9/3/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/14/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	2/14/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/12/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/20/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	10/7/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	1/4/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	4/5/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

Notes:
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Second Quarter 2012

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Residential DW Criteria		13,000	430	880	7.0	70	100	5.0	200	5.0	2,600	2.0
Non-Residential DW Criteria		38,000	1,700	2,500	7.0	70	100	5.0	200	5.0	7,300	2.0
GSI Criteria		2,200	1,100	740	130	620	1,500[1]	60[1]	89	200[1]	NC	13[1]
Residential GWSLs for Vapor Intrusion		4.5E+06	NC	130	390	440	330	11	15,000	9.9	370	5.0
Non-Residential GWSLs for Vapor Intrusion		1.9E+07	NC	670	1,600	1,800	1,400	55	63,000	42	1,600	50
Groundwater Contact Criteria		2.4E+08	4.4E+05	2.4E+06	11,000	2.0E+05	2.2E+05	12,000	1.3E+06	22,000	1.1E+06	1,000
Units		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
MW-13s (13-18')	5/15/2009	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/10/2009	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	3/15/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/14/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	9/3/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/14/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	2/14/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/12/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/20/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	10/10/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	1/4/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	4/9/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW-14s (4-9')	5/14/2009	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/8/2009	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	3/15/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/12/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	9/3/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/20/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	2/16/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/11/2011[3]	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/21/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	10/7/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	1/4/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
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Groundwater Contact Criteria		2.4E+08	4.4E+05	2.4E+06	11,000	2.0E+05	2.2E+05	12,000	1.3E+06	22,000	1.1E+06	1,000
Units		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
MW-14d (37.5-42.5')	3/23/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/14/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	9/3/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/16/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	2/16/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/9/2011[3]	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/21/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	10/5/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	1/4/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	4/2/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
DUP-01 (MW-14d)	2/16/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/9/2011[3]	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/21/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	10/5/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	1/4/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	4/2/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW-15s (30-35')	5/15/2009	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/30/2009	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	3/15/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/14/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	9/8/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/17/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	2/17/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/12/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/25/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	10/7/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	1/5/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	4/5/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

Notes:
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Analyte		2-Butanone	Chloroethane	1,1-Dichloroethane	1,1-Dichloroethene[2]	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Tetrachloroethene	1,1,1-Trichloroethane	Trichloroethene	Trichloro-fluoromethane	Vinyl Chloride
Residential DW Criteria		13,000	430	880	7.0	70	100	5.0	200	5.0	2,600	2.0
Non-Residential DW Criteria		38,000	1,700	2,500	7.0	70	100	5.0	200	5.0	7,300	2.0
GSI Criteria		2,200	1,100	740	130	620	1,500[1]	60[1]	89	200[1]	NC	13[1]
Residential GWSLs for Vapor Intrusion		4.5E+06	NC	130	390	440	330	11	15,000	9.9	370	5.0
Non-Residential GWSLs for Vapor Intrusion		1.9E+07	NC	670	1,600	1,800	1,400	55	63,000	42	1,600	50
Groundwater Contact Criteria		2.4E+08	4.4E+05	2.4E+06	11,000	2.0E+05	2.2E+05	12,000	1.3E+06	22,000	1.1E+06	1,000
Units		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
MW-17s (3-8')	7/23/2009	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/7/2009	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	3/18/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/12/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	9/8/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/16/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	2/15/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/11/2011[3]	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/21/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	10/4/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	1/5/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	4/2/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW-18s (26-31')	12/8/2009	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	3/16/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/12/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	9/8/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/20/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	2/17/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/9/2011[3]	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/22/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	10/5/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	1/5/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	4/3/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

Notes:
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Analyte		2-Butanone	Chloroethane	1,1-Dichloroethane	1,1-Dichloroethene[2]	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Tetrachloroethene	1,1,1-Trichloroethane	Trichloroethene	Trichloro-fluoromethane	Vinyl Chloride
Residential DW Criteria		13,000	430	880	7.0	70	100	5.0	200	5.0	2,600	2.0
Non-Residential DW Criteria		38,000	1,700	2,500	7.0	70	100	5.0	200	5.0	7,300	2.0
GSI Criteria		2,200	1,100	740	130	620	1,500[1]	60[1]	89	200[1]	NC	13[1]
Residential GWSLs for Vapor Intrusion		4.5E+06	NC	130	390	440	330	11	15,000	9.9	370	5.0
Non-Residential GWSLs for Vapor Intrusion		1.9E+07	NC	670	1,600	1,800	1,400	55	63,000	42	1,600	50
Groundwater Contact Criteria		2.4E+08	4.4E+05	2.4E+06	11,000	2.0E+05	2.2E+05	12,000	1.3E+06	22,000	1.1E+06	1,000
Units		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
MW-19s (25-30')	12/8/2009	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	**1.8**	**31**	<1.0	<1.0
	1/13/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	**1.2**	**2.3**	**36**	<1.0	<1.0
	3/16/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	**1.1**	**1.7**	**36**	<1.0	<1.0
	5/18/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	**1.6**	**32**	<1.0	<1.0
	9/10/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	**1.2**	**1.8**	**33**	<1.0	<1.0
	12/20/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	**1.8**	**37**	<1.0	<1.0
	2/18/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	**1.1**	**1.8**	**41**	<1.0	<1.0
	5/10/2011[3]	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	**1.5**	**28**	<1.0	<1.0
	7/25/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	**1.0**	**1.4**	**27**	<1.0	<1.0
	10/5/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	**1.1**	**1.7**	**28**	<1.0	<1.0
	1/9/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	**1.2**	**1.9**	**34**	<1.0	<1.0
	4/3/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	**1.1**	**1.5**	**32**	<1.0	<1.0
DUP-03 (MW-19s)	9/10/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	**1.0**	**1.7**	**32**	<1.0	<1.0
DUP-02 (MW-19s)	2/18/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	**1.1**	**1.8**	**39**	<1.0	<1.0
	5/10/2011[3]	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	**1.6**	**29**	<1.0	<1.0
	7/25/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	**1.1**	**1.4**	**27**	<1.0	<1.0
	10/5/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	**1.1**	**1.6**	**28**	<1.0	<1.0
	1/9/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	**1.2**	**1.8**	**34**	<1.0	<1.0
	4/3/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	**1.1**	**1.6**	**32**	<1.0	<1.0
MW-19d (40-45')	12/8/2009	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	3/16/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/12/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	9/8/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/20/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	2/18/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/10/2011[3]	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/25/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	10/5/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	1/5/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	4/3/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
DUP-01 (MW-19d)	5/12/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

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Residential DW Criteria		13,000	430	880	7.0	70	100	5.0	200	5.0	2,600	2.0
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Groundwater Contact Criteria		2.4E+08	4.4E+05	2.4E+06	11,000	2.0E+05	2.2E+05	12,000	1.3E+06	22,000	1.1E+06	1,000
Units		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
MW-20s (8-13')	12/30/2009	<5.0	<5.0	**48**	**4.0**	**9.6**	<1.0	<1.0	**150**	**71**	**2.9**	<1.0
	1/13/2010	<5.0	<5.0	**50**	**3.5**	**9.0**	<1.0	<1.0	**170**	**70**	**2.8**	<1.0
	3/17/2010	<5.0	<5.0	**51**	**3.8**	**9.4**	<1.0	<1.0	**160**	**64**	**3.2**	<1.0
	5/18/2010	<10	<10	**58**	**5.1**	**12**	<2.0	<2.0	**210**	**94**	**3.4**	<2.0
	9/10/2010	<10	<10	**34**	**4.2**	**9.7**	<2.0	<2.0	**230**	**110**	**3.8**	<2.0
	12/21/2010	<10	<10	**24**	**3.6**	**6.1**	<2.0	<2.0	**200**	**89**	**3.6**	<2.0
	2/18/2011	<10	<10	**19**	**3.3**	**5.5**	<2.0	<2.0	**190**	**93**	**3.5**	<2.0
	5/13/2011	<10	<10	**14**	**2.8**	**4.1**	<2.0	<2.0	**190**	**91**	**2.9**	<2.0
	7/25/2011	<10	<10	**6.5**	<2.0	**2.4**	<2.0	<2.0	**190**	**100**	**2.3**	<2.0
	10/10/2011	<10	<10	**5.8**	<2.0	<2.0	<2.0	<2.0	**190**	**110**	**3.1**	<2.0
	1/9/2012	<5.0	<5.0	**6.0**	**1.4**	**1.9**	<1.0	<1.0	**190**	**100**	**3.2**	<1.0
	4/9/2012	<5.0	<5.0	**11**	**1.1**	**2.0**	<1.0	<1.0	**180**	**100**	**2.6**	<1.0
MW-20d (38.5-43.5')	12/30/2009	<5.0	<5.0	**1.2**	<1.0	**86**	<1.0	<1.0	**1.9**	<1.0	<1.0	**3.5**
	1/13/2010	<5.0	<5.0	<1.0	<1.0	**94**	**2.0**	<1.0	<1.0	<1.0	<1.0	**3.7**
	3/17/2010	<5.0	<5.0	<1.0	<1.0	**85**	<1.0	<1.0	<1.0	<1.0	<1.0	**4.4**
	5/18/2010	<5.0	<5.0	<1.0	<1.0	**120**	<1.0	<1.0	<1.0	<1.0	<1.0	**3.7**
	9/10/2010	<5.0	<5.0	<1.0	<1.0	**95**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/21/2010	<5.0	<5.0	<1.0	<1.0	**200**	<1.0	<1.0	<1.0	<1.0	<1.0	**3.5**
	2/18/2011	<10	<10	<2.0	<2.0	**190**	<2.0	<2.0	<2.0	<2.0	<2.0	**3.2**
	5/13/2011	<10	<10	<2.0	<2.0	**170**	<2.0	<2.0	<2.0	<2.0	<2.0	**2.6**
	7/25/2011	<5.0	<5.0	<1.0	<1.0	**170**	<1.0	<1.0	<1.0	<1.0	<1.0	**2.6**
	10/10/2011	<10	<10	<2.0	<2.0	**200**	<2.0	<2.0	<2.0	<2.0	<2.0	**2.5**
	1/9/2012	<5.0	<5.0	<1.0	<1.0	**140**	<1.0	<1.0	<1.0	<1.0	<1.0	**6.0**
	4/9/2012	<5.0	<5.0	<1.0	<1.0	**190**	<1.0	<1.0	<1.0	**1.0**	<1.0	**10**
DUP-03 (MW-20d)	5/18/2010	<5.0	<5.0	<1.0	<1.0	**120**	**1.0**	<1.0	<1.0	<1.0	<1.0	**3.7**

Notes:
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US EPA ARCHIVE DOCUMENT

Table 1
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Former Tecumseh Products Company Site
Tecumseh, Michigan
Second Quarter 2012

Analyte		2-Butanone	Chloroethane	1,1-Dichloroethane	1,1-Dichloroethene[2]	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Tetrachloroethene	1,1,1-Trichloroethane	Trichloroethene	Trichloro-fluoromethane	Vinyl Chloride
Residential DW Criteria		13,000	430	880	7.0	70	100	5.0	200	5.0	2,600	2.0
Non-Residential DW Criteria		38,000	1,700	2,500	7.0	70	100	5.0	200	5.0	7,300	2.0
GSI Criteria		2,200	1,100	740	130	620	1,500[1]	60[1]	89	200[1]	NC	13[1]
Residential GWSLs for Vapor Intrusion		4.5E+06	NC	130	390	440	330	11	15,000	9.9	370	5.0
Non-Residential GWSLs for Vapor Intrusion		1.9E+07	NC	670	1,600	1,800	1,400	55	63,000	42	1,600	50
Groundwater Contact Criteria		2.4E+08	4.4E+05	2.4E+06	11,000	2.0E+05	2.2E+05	12,000	1.3E+06	22,000	1.1E+06	1,000
Units		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
MW-21 (28.5-33.5')	12/8/2009	<50	<50	**31**	<10	**59**	<10	<10	**54**	**840**	<10	<10
	1/13/2010	<50	<50	**28**	<10	**62**	<10	<10	**56**	**730**	<10	<10
	3/23/2010	<5.0	<5.0	**33**	**2.2**	**81**	**7.5**	<1.0	**62**	**850**	<1.0	<1.0
	5/18/2010	<50	<50	**35**	<10	**89**	<10	<10	**63**	**830**	<10	<10
	10/15/2010	<50	<50	**26**	<10	**80**	<10	<10	**59**	**810**	<10	<10
	12/22/2010	<50	<50	**25**	<10	**69**	<10	<10	**55**	**730**	<10	<10
	2/24/2011	<50	<50	**25**	<10	**66**	<10	<10	**52**	**730**	<10	<10
	5/11/2011[3]	<50	<50	**24**	<10	**65**	<10	<10	**49**	**740**	<10	<10
	7/28/2011	<50	<50	**22**	<10	**77**	<10	<10	**54**	**1,000**	<10	<10
	10/6/2011	<50	<50	**22**	<10	**74**	<10	<10	**55**	**960**	<10	<10
	1/10/2012	<50	<50	**27**	<10	**79**	<10	<10	**64**	**990**	<10	<10
	4/4/2012	<50	<50	**25**	<10	**81**	<10	<10	**55**	**980**	<10	<10
DUP-02 (MW-21)	3/23/2010	<5.0	<5.0	**33**	**2.2**	**79**	**7.8**	<1.0	**61**	**810**	<1.0	<1.0
DUP-03 (MW-21)	2/24/2011	<50	<50	**24**	<10	**66**	<10	<10	**50**	**740**	<10	<10
	5/11/2011[3]	<50	<50	**24**	<10	**66**	<10	<10	**49**	**750**	<10	<10
	7/28/2011	<50	<50	**23**	<10	**78**	<10	<10	**57**	**1,000**	<10	<10
	10/6/2011	<50	<50	**21**	<10	**73**	<10	<10	**52**	**910**	<10	<10
	1/10/2012	<50	<50	**27**	<10	**85**	<10	<10	**66**	**1,000**	<10	<10
	4/4/2012	<50	<50	**24**	<10	**81**	<10	<10	**61**	**970**	<10	<10
MW-22 (25-30')	12/7/2009	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**10**
	3/18/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**8.5**
	5/18/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**2.0**
	9/10/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**4.3**
	12/22/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**3.0**
	2/24/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**2.3**
	5/11/2011[3]	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**1.4**
	7/21/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**2.8**
	10/4/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**6.2**
	1/9/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**8.4**
	4/5/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**12**

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GSI Criteria		2,200	1,100	740	130	620	1,500[1]	60[1]	89	200[1]	NC	13[1]
Residential GWSLs for Vapor Intrusion		4.5E+06	NC	130	390	440	330	11	15,000	9.9	370	5.0
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Groundwater Contact Criteria		2.4E+08	4.4E+05	2.4E+06	11,000	2.0E+05	2.2E+05	12,000	1.3E+06	22,000	1.1E+06	1,000
Units		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
MW-23 (17-22')	12/8/2009	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**3.2**
	1/13/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**7.6**
	3/16/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**4.0**
	5/18/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**6.1**
	9/10/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**9.0**
	12/21/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**17**
	2/18/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**18**
	5/10/2011[3]	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**25**
	7/25/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**23**
	10/5/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**56**
	11/4/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**11**
	1/9/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**48**
	4/3/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**85**
MW-24s (18.5'-23.5')	12/8/2009	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	3/15/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/12/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	9/8/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/14/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	2/14/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/9/2011[3]	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/19/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	10/4/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	1/5/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	4/2/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

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Residential DW Criteria		13,000	430	880	7.0	70	100	5.0	200	5.0	2,600	2.0
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GSI Criteria		2,200	1,100	740	130	620	1,500[1]	60[1]	89	200[1]	NC	13[1]
Residential GWSLs for Vapor Intrusion		4.5E+06	NC	130	390	440	330	11	15,000	9.9	370	5.0
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Groundwater Contact Criteria		2.4E+08	4.4E+05	2.4E+06	11,000	2.0E+05	2.2E+05	12,000	1.3E+06	22,000	1.1E+06	1,000
Units		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
MW-24d (39-44')	12/8/2009	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	3/15/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/12/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	9/8/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/14/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	2/14/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/9/2011[3]	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/19/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	10/4/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	1/5/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	4/2/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW-25s (20-25')	12/10/2009	<5.0	<5.0	**1.7**	<1.0	**8.8**	<1.0	<1.0	**4.8**	<1.0	<1.0	<1.0
	3/16/2010	<5.0	<5.0	**1.2**	<1.0	<1.0	<1.0	<1.0	**17**	**1.1**	<1.0	<1.0
	5/14/2010	<5.0	<5.0	**1.2**	<1.0	<1.0	<1.0	<1.0	**18**	**1.0**	<1.0	<1.0
	9/8/2010	<5.0	<5.0	**1.0**	<1.0	<1.0	<1.0	<1.0	**19**	**1.4**	<1.0	<1.0
	12/22/2010	<5.0	<5.0	**1.2**	<1.0	<1.0	<1.0	<1.0	**26**	**2.4**	<1.0	<1.0
	2/24/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	**19**	**2.2**	<1.0	<1.0
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	7/28/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	**19**	**2.5**	<1.0	<1.0
	10/10/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	**20**	**2.8**	<1.0	<1.0
	1/5/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	**20**	**3.0**	<1.0	<1.0
	4/9/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	**20**	**3.6**	<1.0	<1.0
DUP-01 (MW-25s)	3/16/2010	<5.0	<5.0	**1.3**	<1.0	<1.0	<1.0	<1.0	**18**	**1.0**	<1.0	<1.0

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Tecumseh, Michigan
Second Quarter 2012

Analyte		2-Butanone	Chloroethane	1,1-Dichloroethane	1,1-Dichloroethene[2]	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Tetrachloroethene	1,1,1-Trichloroethane	Trichloroethene	Trichloro-fluoromethane	Vinyl Chloride
Residential DW Criteria		13,000	430	880	7.0	70	100	5.0	200	5.0	2,600	2.0
Non-Residential DW Criteria		38,000	1,700	2,500	7.0	70	100	5.0	200	5.0	7,300	2.0
GSI Criteria		2,200	1,100	740	130	620	1,500[1]	60[1]	89	200[1]	NC	13[1]
Residential GWSLs for Vapor Intrusion		4.5E+06	NC	130	390	440	330	11	15,000	9.9	370	5.0
Non-Residential GWSLs for Vapor Intrusion		1.9E+07	NC	670	1,600	1,800	1,400	55	63,000	42	1,600	50
Groundwater Contact Criteria		2.4E+08	4.4E+05	2.4E+06	11,000	2.0E+05	2.2E+05	12,000	1.3E+06	22,000	1.1E+06	1,000
Units		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
MW-26s (28-33')	4/6/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/14/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	9/8/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/17/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	2/17/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/12/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/25/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	10/7/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	1/5/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	4/5/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW-27s (7-12')	3/23/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/17/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**3.0**	<1.0	<1.0
	9/9/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/20/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	2/16/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**1.4**	<1.0	<1.0
	5/9/2011[3]	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**1.1**	<1.0	<1.0
	7/21/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	10/5/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	1/6/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	4/3/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
DUP-02 (MW-27s)	9/9/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW-27d (37.5-42.5')	3/23/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/17/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	9/9/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/20/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	2/16/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/9/2011[3]	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/22/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	10/5/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	1/6/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	4/3/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

Notes:
Residential and Non-Residential Drinking Water (DW) Criteria, Groundwater Surface Water Interface (GSI) Criteria, and Groundwater Contact Criteria from MDEQ RRD Op Memo 1 Part 201 Generic Cleanup Criteria/Part 213 Risk Based Cleanup Levels, January 23, 2006, as amended March 25, 2011.
Groundwater Screening Levels (GWSLs) for Vapor Intrusion were calculated in accordance with the MDEQ Remediation and Redevelopment Division Program Redesign 2009 document titled *Background Document: Draft Proposed Vapor Intrusion Indoor Air Criteria (IAC), Soil Gas Criteria (SGC), and Groundwater Screening Levels (GW $_{VI}$ SLs) for Vapor Intrusion,* using both residential and non-residential exposure scenarios and the most recent chemical specific toxicity values accepted and/or published by the United States Environmental Protection Agency (USEPA) as of February 1, 2012.
ug/L = micrograms per liter
NC = No criteria
NA = Not analyzed
Bold font denotes concentrations detected above laboratory reporting limits
Denotes concentrations above one or more criteria
1) Criterion is not protective for surface water used as a drinking water source as described in footnote {X} of MDEQ Op Memo 1 Part 201, Attachment 1.
2) Compound may exhibit characteristic ignitability as defined in 40 C.F.R. § 261.21
3) The average temperature in this sample shipment exceeded the recommended temperature range. Sample results are approximate.
4) Quality control results for trichloroethene are outside the established control limits, the result is approximate.
5) Headspace present in the sample, results are approximate.

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Table 1
Summary of Detected Volatile Organic Compounds in Groundwater
Former Tecumseh Products Company Site
Tecumseh, Michigan
Second Quarter 2012

Analyte		2-Butanone	Chloroethane	1,1-Dichloroethane	1,1-Dichloroethene(2)	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Tetrachloroethene	1,1,1-Trichloroethane	Trichloroethene	Trichloro-fluoromethane	Vinyl Chloride
Residential DW Criteria		13,000	430	880	7.0	70	100	5.0	200	5.0	2,600	2.0
Non-Residential DW Criteria		38,000	1,700	2,500	7.0	70	100	5.0	200	5.0	7,300	2.0
GSI Criteria		2,200	1,100	740	130	620	1,500(1)	60(1)	89	200(1)	NC	13(1)
Residential GWSLs for Vapor Intrusion		4.5E+06	NC	130	390	440	330	11	15,000	9.9	370	5.0
Non-Residential GWSLs for Vapor Intrusion		1.9E+07	NC	670	1,600	1,800	1,400	55	63,000	42	1,600	50
Groundwater Contact Criteria		2.4E+08	4.4E+05	2.4E+06	11,000	2.0E+05	2.2E+05	12,000	1.3E+06	22,000	1.1E+06	1,000
Units		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
MW-28s (25-30')	3/23/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/17/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	9/9/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/17/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	2/16/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/12/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/22/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	10/7/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	1/6/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**1.1**	<1.0	<1.0
	4/5/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW-28d (49-54')	3/23/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/17/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	9/9/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/17/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	2/16/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/12/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/22/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	10/7/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	1/6/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	4/5/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW-29s (13-18')	3/18/2010	<5.0	<5.0	<1.0	<1.0	**1.3**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/17/2010	<5.0	<5.0	<1.0	<1.0	**1.2**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	9/9/2010	<5.0	<5.0	<1.0	<1.0	**1.4**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/15/2010	<5.0	<5.0	<1.0	<1.0	**1.5**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	2/15/2011	<5.0	<5.0	<1.0	<1.0	**1.7**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/12/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/20/2011	<5.0	<5.0	<1.0	<1.0	**1.1**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	10/10/2011	<5.0	<5.0	<1.0	<1.0	**1.3**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	1/6/2012	<5.0	<5.0	<1.0	<1.0	**1.2**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	4/5/2012	<5.0	<5.0	<1.0	<1.0	**1.1**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

Notes:
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Residential DW Criteria		13,000	430	880	7.0	70	100	5.0	200	5.0	2,600	2.0
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GSI Criteria		2,200	1,100	740	130	620	1,500[1]	60[1]	89	200[1]	NC	13[1]
Residential GWSLs for Vapor Intrusion		4.5E+06	NC	130	390	440	330	11	15,000	9.9	370	5.0
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Groundwater Contact Criteria		2.4E+08	4.4E+05	2.4E+06	11,000	2.0E+05	2.2E+05	12,000	1.3E+06	22,000	1.1E+06	1,000
Units		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
MW-29d (58.5-63.5')	3/18/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/17/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	9/9/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/15/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	2/15/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/12/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/20/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	10/10/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	1/6/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	4/5/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW-30s (11-16')	3/23/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/17/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	9/9/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/16/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	2/15/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/13/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/20/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	10/10/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	1/6/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	4/9/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW-30d (25.5-30.5')	3/23/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/17/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	9/9/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	12/16/2010	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	2/15/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	5/13/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/20/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	10/10/2011	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	1/6/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	4/9/2012	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

Notes:
Residential and Non-Residential Drinking Water (DW) Criteria, Groundwater Surface Water Interface (GSI) Criteria, and Groundwater Contact Criteria from MDEQ RRD Op Memo 1 Part 201 Generic Cleanup Criteria/Part 213 Risk Based Cleanup Levels, January 23, 2006, as amended March 25, 2011.
Groundwater Screening Levels (GWSLs) for Vapor Intrusion were calculated in accordance with the MDEQ Remediation and Redevelopment Division Program Redesign 2009 document titled *Background Document: Draft Proposed Vapor Intrusion Indoor Air Criteria (IAC), Soil Gas Criteria (SGC), and Groundwater Screening Levels (GW_{VI} SLs) for Vapor Intrusion,* using both residential and non-residential exposure scenarios and the most recent chemical specific toxicity values accepted and/or published by the United States Environmental Protection Agency (USEPA) as of February 1, 2012.
ug/L = micrograms per liter
NC = No criteria
NA = Not analyzed
Bold font denotes concentrations detected above laboratory reporting limits
Denotes concentrations above one or more criteria
1) Criterion is not protective for surface water used as a drinking water source as described in footnote {X} of MDEQ Op Memo 1 Part 201, Attachment 1.
2) Compound may exhibit characteristic ignitability as defined in 40 C.F.R. § 261.21
3) The average temperature in this sample shipment exceeded the recommended temperature range. Sample results are approximate.
4) Quality control results for trichloroethene are outside the established control limits, the result is approximate.
5) Headspace present in the sample, results are approximate.

US EPA ARCHIVE DOCUMENT

Table 1
Summary of Detected Volatile Organic Compounds in Groundwater
Former Tecumseh Products Company Site
Tecumseh, Michigan
Second Quarter 2012

Analyte		2-Butanone	Chloroethane	1,1-Dichloroethane	1,1-Dichloroethene[2]	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Tetrachloroethene	1,1,1-Trichloroethane	Trichloroethene	Trichloro-fluoromethane	Vinyl Chloride
Residential DW Criteria		13,000	430	880	7.0	70	100	5.0	200	5.0	2,600	2.0
Non-Residential DW Criteria		38,000	1,700	2,500	7.0	70	100	5.0	200	5.0	7,300	2.0
GSI Criteria		2,200	1,100	740	130	620	1,500[1]	60[1]	89	200[1]	NC	13[1]
Residential GWSLs for Vapor Intrusion		4.5E+06	NC	130	390	440	330	11	15,000	9.9	370	5.0
Non-Residential GWSLs for Vapor Intrusion		1.9E+07	NC	670	1,600	1,800	1,400	55	63,000	42	1,600	50
Groundwater Contact Criteria		2.4E+08	4.4E+05	2.4E+06	11,000	2.0E+05	2.2E+05	12,000	1.3E+06	22,000	1.1E+06	1,000
Units		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
MW-31 (33.3-38.3')	6/18/2010	<5.0	<5.0	**14**	<1.0	**19**	**2.2**	<1.0	**20**	**180**	<1.0	<1.0
	9/17/2010	<10	<10	<2.0	<2.0	**15**	<2.0	<2.0	**48**	**220**	<2.0	**2.5**
	12/22/2010[4]	<10	<10	**16**	<2.0	**29**	**2.9**	<2.0	**27**	**260**	<2.0	<2.0
	2/24/2011	<10	<10	**16**	<2.0	**31**	**3.1**	<2.0	**26**	**300**	<2.0	<2.0
	5/11/2011[3]	<10	<10	**15**	<2.0	**24**	**3.0**	<2.0	**22**	**250**	<2.0	<2.0
	7/21/2011	<5.0	<5.0	**7.4**	<1.0	**14**	**1.2**	<1.0	**11**	**130**	<1.0	<1.0
	10/4/2011	<5.0	<5.0	**18**	<1.0	**40**	**3.4**	<1.0	**28**	**340**	<1.0	<1.0
	1/10/2012	<10	<10	**17**	<2.0	**35**	**3.1**	<2.0	**24**	**290**	<2.0	<2.0
	4/5/2012	<10	<10	**16**	<2.0	**36**	**3.1**	<2.0	**24**	**290**	<2.0	<2.0
DUP-01 (MW-31)	6/18/2010	<5.0	<5.0	**12**	<1.0	**19**	**2.3**	<1.0	**21**	**170**	<1.0	<1.0
MW-32s (23-28')	9/17/2010	<100	<100	**150**	<20	**270**	**26**	<20	**220**	**2,400**	<20	<20
	11/18/2010	<100	<100	<20	<20	**190**	<20	<20	**560**	**2,800**	<20	<20
	12/28/2010	<100	<100	<20	<20	**200**	<20	<20	**510**	**2,300**	<20	<20
	2/25/2011	<100	<100	<20	<20	**190**	<20	<20	**420**	**2,300**	<20	<20
	5/10/2011[3]	<100	<100	<20	<20	**170**	<20	<20	**380**	**2,300**	<20	**31**
	7/28/2011	<100	<100	<20	<20	**140**	<20	<20	**380**	**2,400**	<20	<20
	10/6/2011	<100	<100	<20	<20	**160**	<20	<20	**350**	**2,200**	<20	<20
	1/10/2012	<100	<100	<20	<20	**170**	<20	<20	**400**	**2,300**	<20	<20
	4/4/2012	<100	<100	<20	<20	**130**	<20	<20	**340**	**2,200**	<20	<20
MW-33s (21-26')	9/17/2010	<5.0	<5.0	**12**	<1.0	**13**	<1.0	<1.0	<1.0	**76**	<1.0	**64**
	11/18/2010	<5.0	<5.0	**14**	<1.0	**22**	<1.0	<1.0	**1.1**	**150**	<1.0	**56**
	12/22/2010	<5.0	<5.0	**14**	<1.0	**22**	**1.2**	<1.0	**1.0**	**130**	<1.0	**57**
	2/24/2011	<5.0	<5.0	**12**	<1.0	**20**	**1.0**	<1.0	<1.0	**110**	<1.0	**60**
	5/10/2011[3]	<10	<10	**11**	<2.0	**21**	<2.0	<2.0	<2.0	**220**	<2.0	**55**
	7/28/2011	<10	<10	**8.9**	<2.0	**18**	<2.0	<2.0	<2.0	**260**	<2.0	**22**
	10/6/2011	<10	<10	**11**	<2.0	**19**	<2.0	<2.0	<2.0	**220**	<2.0	**48**
	1/9/2012[5]	<5.0	**8.9**	**15**	<1.0	**20**	**1.0**	<1.0	**1.3**	**170**	<1.0	**51**
	4/4/2012	<5.0	**5.6**	**17**	<1.0	**21**	<1.0	<1.0	**1.2**	**170**	<1.0	**48**

Notes:
Residential and Non-Residential Drinking Water (DW) Criteria, Groundwater Surface Water Interface (GSI) Criteria, and Groundwater Contact Criteria from MDEQ RRD Op Memo 1 Part 201 Generic Cleanup Criteria/Part 213 Risk Based Cleanup Levels, January 23, 2006, as amended March 25, 2011.
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Residential GWSLs for Vapor Intrusion		4.5E+06	NC	130	390	440	330	11	15,000	9.9	370	5.0
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Units		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
DUP-01 (MW-33s)	11/18/2010	<5.0	<5.0	**14**	<1.0	**23**	<1.0	<1.0	**1.2**	**150**	<1.0	**55**
MW-34s (23-28')	9/17/2010	<100	<100	<20	<20	<20	<20	<20	**1,600**	**1,100**	<20	<20
	11/18/2010	<100	<100	<20	<20	<20	<20	<20	**1,600**	**1,200**	<20	<20
	12/28/2010	<50	<50	<10	**13**	<10	<10	<10	**1,400**	**1,000**	<10	<10
	2/25/2011	<50	<50	<10	<10	<10	<10	<10	**1,100**	**900**	<10	<10
	5/10/2011(3)	<50	<50	<10	<10	<10	<10	<10	**1,200**	**970**	<10	<10
	7/28/2011	<50	<50	<10	<10	<10	<10	<10	**1,300**	**1,100**	<10	<10
	10/6/2011	<50	<50	<10	<10	<10	<10	<10	**1,200**	**1,000**	<10	<10
	1/10/2012	<50	<50	<10	**14**	<10	<10	<10	**1,500**	**1,100**	<10	<10
	4/4/2012	<50	<50	<10	<10	<10	<10	<10	**1,400**	**1,200**	<10	<10

Notes:
Residential and Non-Residential Drinking Water (DW) Criteria, Groundwater Surface Water Interface (GSI) Criteria, and Groundwater Contact Criteria from MDEQ RRD Op Memo 1 Part 201 Generic Cleanup Criteria/Part 213 Risk Based Cleanup Levels, January 23, 2006, as amended March 25, 2011.
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US EPA ARCHIVE DOCUMENT

Figures

US EPA ARCHIVE DOCUMENT

US EPA ARCHIVE DOCUMENT

PLOT DATA
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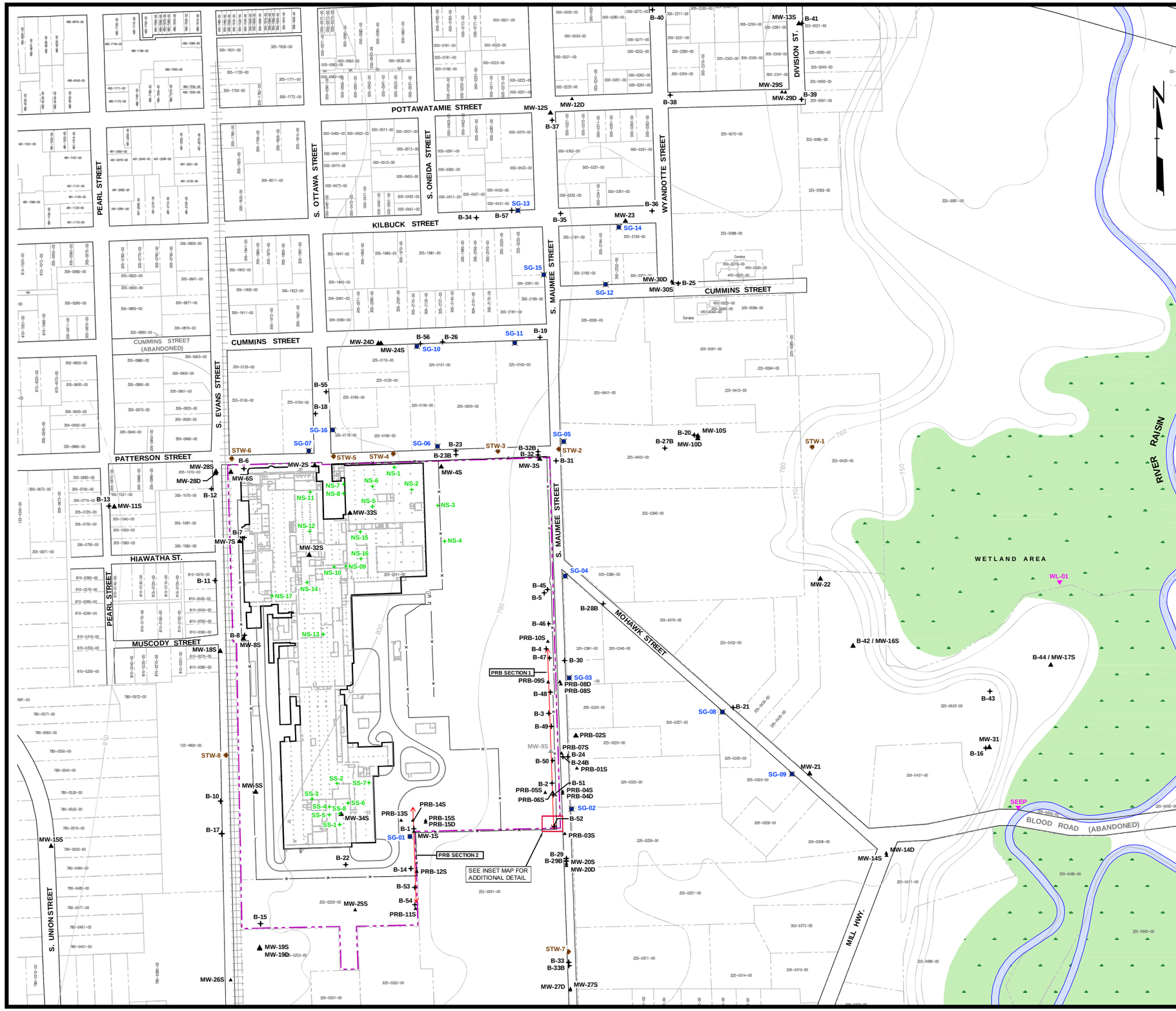
Attached Images:
Layout: FIG01 Surf Topo & Samples

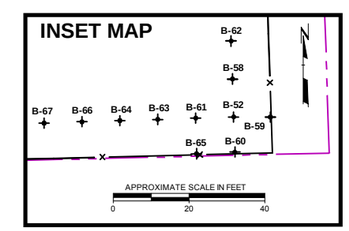


LEGEND

- FORMER TECUMSEH PRODUCTS SITE BOUNDARY
- PARCEL BOUNDARY
- RAILROAD TRACKS (APPROXIMATE LOCATION)
- 750 — APPROXIMATE GROUND TOPOGRAPHY BASED OFF 7.5 MINUTE U.S.G.S. TOPOGRAPHIC QUADRANGLE MAP
- B-2 — PERIMETER / OFF-SITE INVESTIGATION SOIL BORING LOCATION AND NUMBER
- MW-4S — MONITORING WELL LOCATION AND NUMBER
- MW-9S — DECOMMISSIONED MONITORING WELL LOCATION AND NUMBER
- SS-2 — SOURCE AREA INVESTIGATION BORING LOCATION AND NUMBER
- SG-02 — SOIL GAS SAMPLE LOCATION AND NUMBER
- STW-2 — STORM WATER SEWER SAMPLE LOCATION AND NUMBER
- WL-01 — APPROXIMATE SURFACE WATER SAMPLE LOCATION
- FLOODPLAIN / WOODED WETLAND AREA
- PRB LOCATION
- FENCE LINE

NOTES

1. BASE MAP DEVELOPED FROM SITE PLAN PROVIDED BY THE CITY OF TECUMSEH, DRAWING NO. CITY.DWG, MARCH 2009.
2. GROUND TOPOGRAPHY BASED OFF 7.5 MINUTE U.S.G.S TOPOGRAPHIC QUADRANGLE MAP AND GROUND SURVEY DATA.



APPROXIMATE HORIZONTAL SCALE
0 400' 800'

PROJECT:
FORMER TECUMSEH PRODUCTS SITE
TECUMSEH, MICHIGAN

TITLE:
SURFACE TOPOGRAPHY AND SAMPLE LOCATIONS

DRAWN BY: SJL/DGS	SCALE:	PROJ. NO.	004304.0001.03
CHECKED BY: SEM	AS INDICATED	FILE NO.	004304.0001.03.01.dwg
APPROVED BY: GC	DATE PRINTED:	**FIGURE 1**	
DATE: JUNE 2012			

TRC
1540 Eisenhower Place
Ann Arbor, MI 48108
Phone: 734.971.7080
Fax: 734.971.9022

US EPA ARCHIVE DOCUMENT

PLOT DATA
Drawing Name: J:_TRC\Tecumseh Products\Tecumseh MI\004304\03\GW Stability & Analysis\MAR2009-APR2012\004304.0001.03.02.dwg
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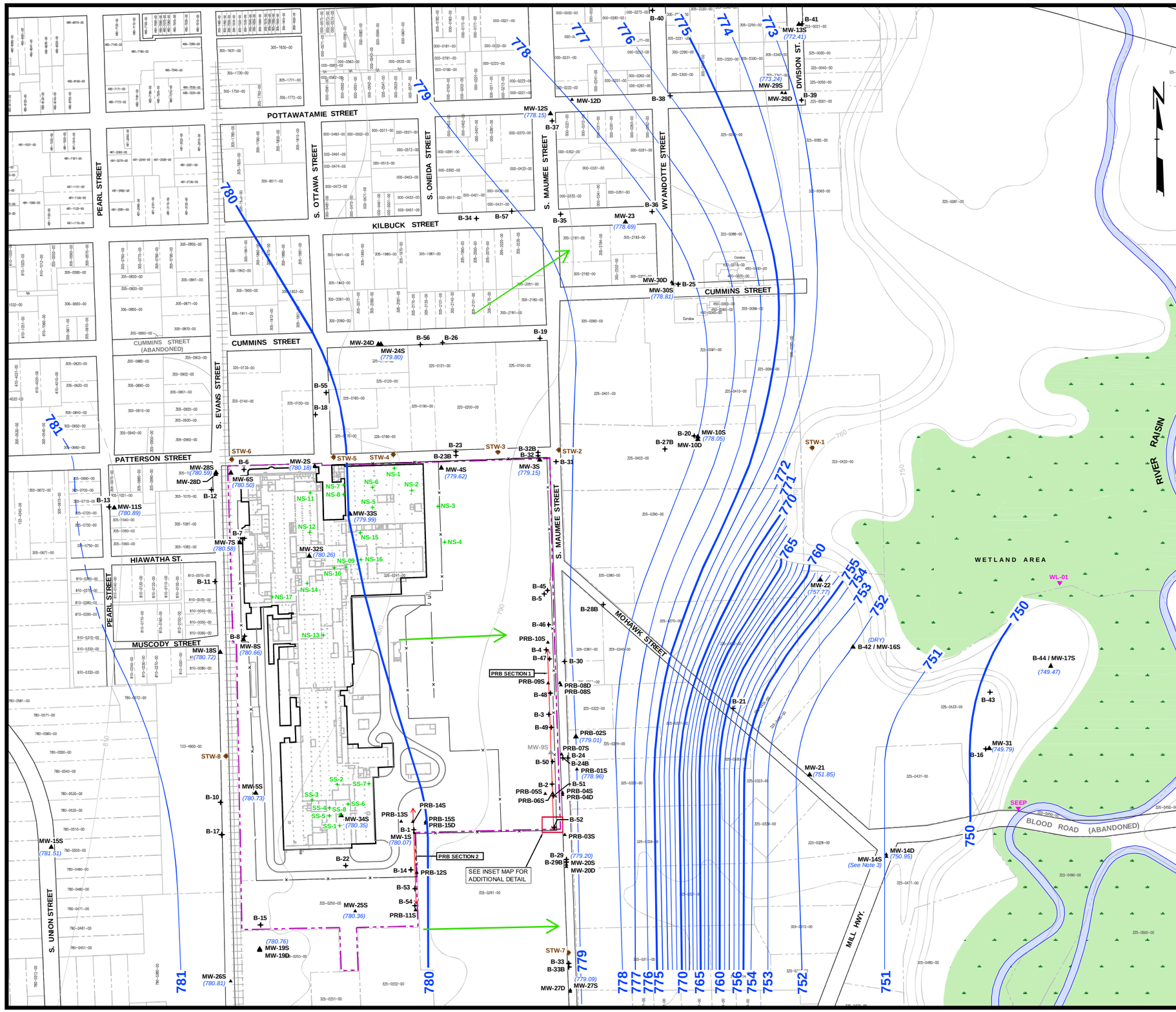
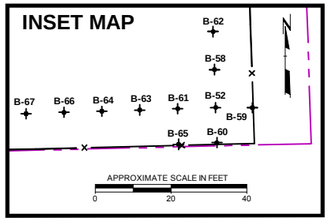


LEGEND

- FORMER TECUMSEH PRODUCTS SITE BOUNDARY
- PARCEL BOUNDARY
- RAILROAD TRACKS (APPROXIMATE LOCATION)
- 750 — APPROXIMATE GROUND TOPOGRAPHY BASED OFF 7.5 MINUTE U.S.G.S. TOPOGRAPHIC QUADRANGLE MAP
- B-2 — PERIMETER / OFF-SITE INVESTIGATION SOIL BORING LOCATION AND NUMBER
- MW-4S — MONITORING WELL LOCATION AND NUMBER
- MW-9S — DECOMMISSIONED MONITORING WELL LOCATION AND NUMBER
- SS-2 — SOURCE AREA INVESTIGATION BORING LOCATION AND NUMBER
- STW-2 — STORM WATER SEWER SAMPLE LOCATION AND NUMBER
- WL-01 — APPROXIMATE SURFACE WATER SAMPLE LOCATION
- FLOODPLAIN / WOODED WETLAND AREA
- PRB LOCATION
- FENCE LINE
- 770 — 5 FOOT GROUNDWATER CONTOUR LINE
- 771 — 1 FOOT GROUNDWATER CONTOUR LINE
- GROUNDWATER FLOW DIRECTION
- (750.95) — GROUNDWATER ELEVATION

NOTES

1. BASE MAP DEVELOPED FROM SITE PLAN PROVIDED BY THE CITY OF TECUMSEH, DRAWING NO. CITY.DWG, MARCH 2009.
2. GROUND TOPOGRAPHY BASED OFF 7.5 MINUTE U.S.G.S TOPOGRAPHIC QUADRANGLE MAP AND GROUND SURVEY DATA.
3. MW-14S IS SCREENED IN A DIFFERENT, PERCHED, WATER BEARING UNIT THAN THE OTHER SHALLOW MONITORING WELLS ON-SITE. THE GROUNDWATER ELEVATION MEASURED AT MW-14D WAS USED TO DEVELOP GROUNDWATER CONTOURS, BECAUSE MW-14D IS SCREENED IN THE DEEPER WATER BEARING UNIT WHICH IS HYDRAULICALLY CONNECTED TO THE SITE.



APPROXIMATE HORIZONTAL SCALE

0 400' 800'

PROJECT:
FORMER TECUMSEH PRODUCTS SITE
TECUMSEH, MICHIGAN

TITLE:
GROUNDWATER CONTOUR MAP
APRIL 2012

DRAWN BY: SJL/DGS	SCALE: AS INDICATED	PROJ. NO. 004304.0001.03	
CHECKED BY: SEM		FILE NO. 004304.0001.03.02.dwg	
APPROVED BY: GC	DATE PRINTED:	FIGURE 2	
DATE: JUNE 2012			

TRC
1540 Eisenhower Place
Ann Arbor, MI 48108
Phone: 734.971.7080
Fax: 734.971.9022

US EPA ARCHIVE DOCUMENT

PLOT DATA
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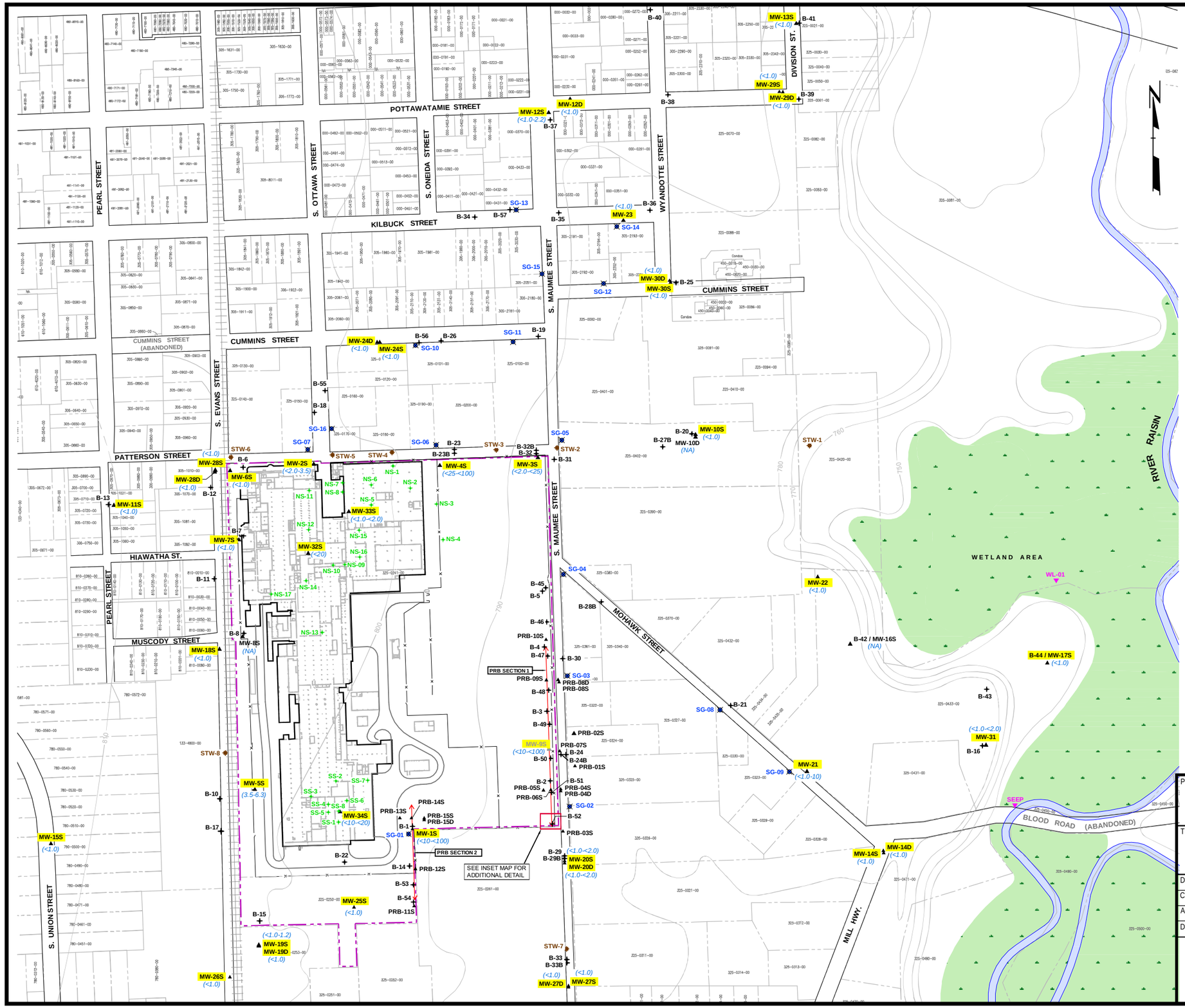

LEGEND

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- WL-01 — APPROXIMATE SURFACE WATER SAMPLE LOCATION
- FLOODPLAIN / WOODED WETLAND AREA
- PRB LOCATION
- X — FENCE LINE
- (<10-<20) — PCE CONCENTRATION RANGE IN ug/L
- NO TREND / STABLE
- DOWNWARD TREND
- UPWARD TREND
- (NA) — NOT APPLICABLE, INSUFFICIENT DATA FOR TREND ANALYSIS

NOTES

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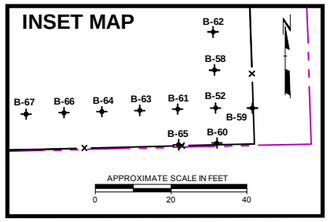
3. GROUNDWATER CONCENTRATION TRENDS EVALUATED FOR GROUNDWATER DATA COLLECTED BETWEEN MARCH 2009 AND APRIL 2012 USING MANN-KENDALL TREND ANALYSIS.



APPROXIMATE HORIZONTAL SCALE

0 400' 800'

PROJECT:
FORMER TECUMSEH PRODUCTS SITE
TECUMSEH, MICHIGAN

TITLE:
GROUNDWATER STABILITY
TETRACHLOROETHENE
MARCH 2009 - APRIL 2012

DRAWN BY: SJL/DGS	SCALE: AS INDICATED	PROJ. NO. 004304.0001.03	
CHECKED BY: SEM		FILE NO. 004304.0001.03.03.dwg	
APPROVED BY: GC	DATE PRINTED:	FIGURE 3	
DATE: JUNE 2012			

TRC
1540 Eisenhower Place
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Fax: 734.971.9022

US EPA ARCHIVE DOCUMENT

PLOT DATA
Drawing Name: J:_TRC\Tecumseh Products\Tecumseh MI\004304\03\GW Stability & Analysis\MAR2009-APR2012\004304.0001.03.04.dwg
Operator Name: STEHLE, DIANAH
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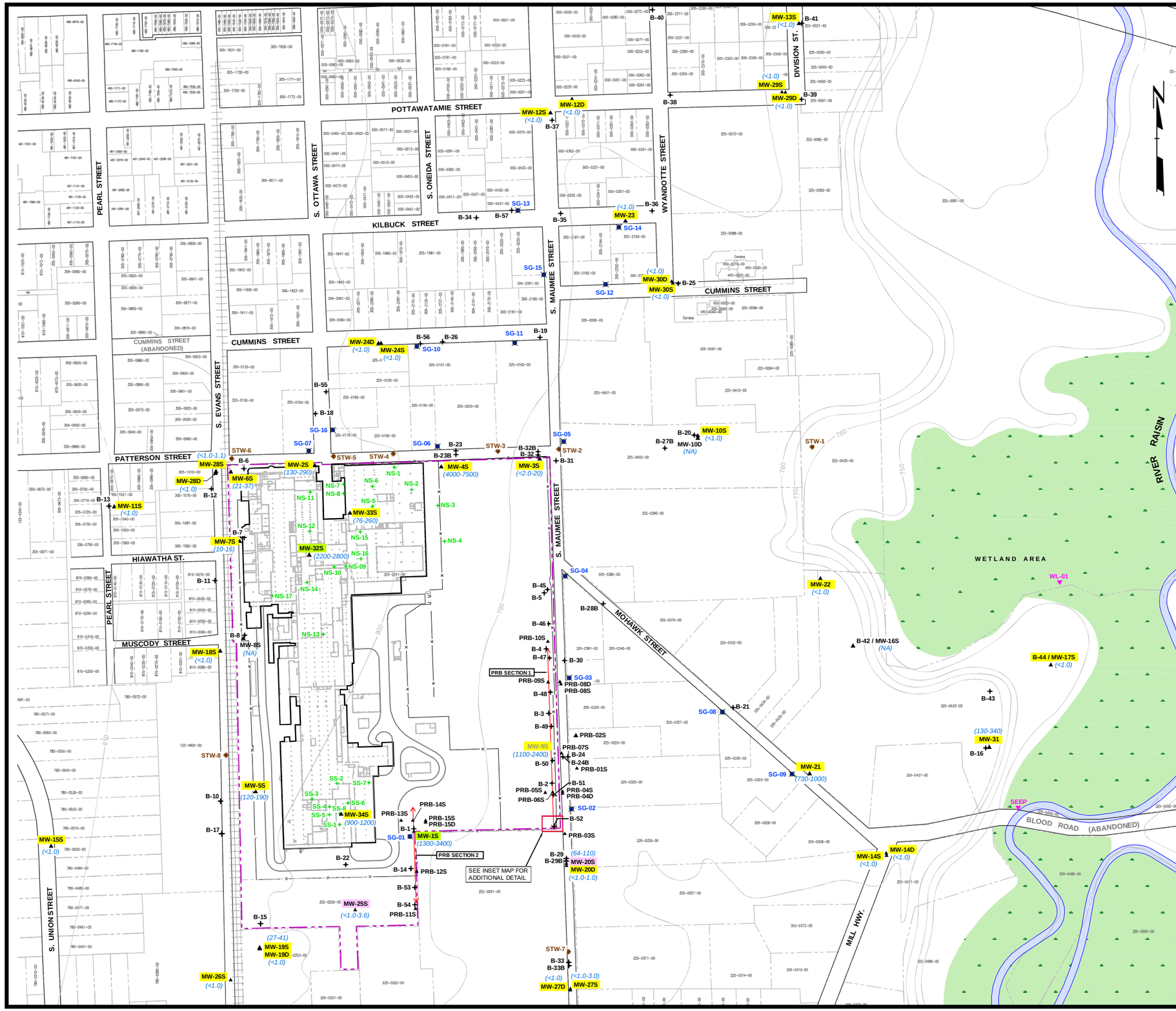
Layout: FIG04 GWS TCE



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- WL-01 — APPROXIMATE SURFACE WATER SAMPLE LOCATION
- FLOODPLAIN / WOODED WETLAND AREA
- PRB LOCATION
- X — FENCE LINE
- (64-110) — TCE CONCENTRATION RANGE IN ug/L
- NO TREND / STABLE
- DOWNWARD TREND
- UPWARD TREND
- (NA) — NOT APPLICABLE, INSUFFICIENT DATA FOR TREND ANALYSIS

NOTES

1. BASE MAP DEVELOPED FROM SITE PLAN PROVIDED BY THE CITY OF TECUMSEH, DRAWING NO. CITY.DWG, MARCH 2009.
2. GROUND TOPOGRAPHY BASED OFF 7.5 MINUTE U.S.G.S TOPOGRAPHIC QUADRANGLE MAP AND GROUND SURVEY DATA.
3. GROUNDWATER CONCENTRATION TRENDS EVALUATED FOR GROUNDWATER DATA COLLECTED BETWEEN MARCH 2009 AND APRIL 2012 USING MANN-KENDALL TREND ANALYSIS.

APPROXIMATE HORIZONTAL SCALE
0 400' 800'

PROJECT:
FORMER TECUMSEH PRODUCTS SITE
TECUMSEH, MICHIGAN

TITLE:
GROUNDWATER STABILITY
TRICHLOROETHENE
MARCH 2009 - APRIL 2012

DRAWN BY: SJL/DGS	SCALE: AS INDICATED	PROJ. NO. 004304.0001.03	
CHECKED BY: SEM		FILE NO. 004304.0001.03.04.dwg	
APPROVED BY: GC	DATE PRINTED:	FIGURE 4	
DATE: JUNE 2012			

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PLOT DATA
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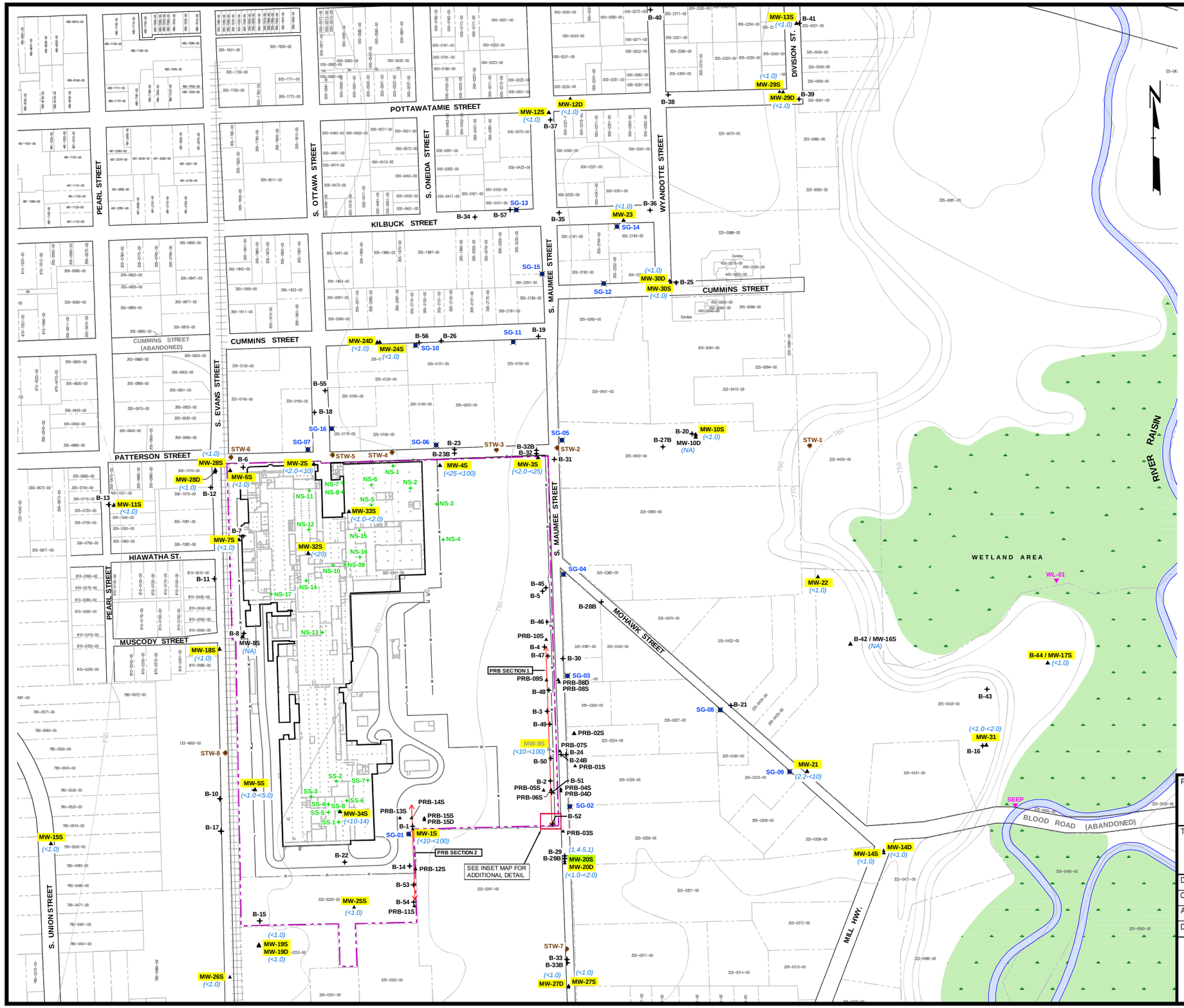
Layout: FIG05 GWS 11DCE

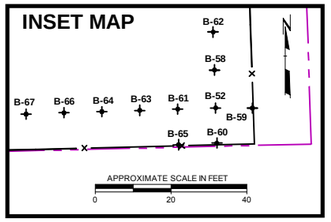


LEGEND

- FORMER TECUMSEH PRODUCTS SITE BOUNDARY
- PARCEL BOUNDARY
- RAILROAD TRACKS (APPROXIMATE LOCATION)
- 750 — APPROXIMATE GROUND TOPOGRAPHY BASED OFF 7.5 MINUTE U.S.G.S. TOPOGRAPHIC QUADRANGLE MAP
- B-2 — PERIMETER / OFF-SITE INVESTIGATION SOIL BORING LOCATION AND NUMBER
- MW-4S — MONITORING WELL LOCATION AND NUMBER
- MW-9S — DECOMMISSIONED MONITORING WELL LOCATION AND NUMBER
- SS-2 — SOURCE AREA INVESTIGATION BORING LOCATION AND NUMBER
- SG-02 — SOIL GAS SAMPLE LOCATION AND NUMBER
- STW-2 — STORM WATER SEWER SAMPLE LOCATION AND NUMBER
- WL-01 — APPROXIMATE SURFACE WATER SAMPLE LOCATION
- FLOODPLAIN / WOODED WETLAND AREA
- PRB LOCATION
- FENCE LINE
- (<10-14) — 1,1-DCE CONCENTRATION RANGE IN ug/L
- NO TREND / STABLE
- DOWNWARD TREND
- UPWARD TREND
- (NA) — NOT APPLICABLE, INSUFFICIENT DATA FOR TREND ANALYSIS

NOTES

1. BASE MAP DEVELOPED FROM SITE PLAN PROVIDED BY THE CITY OF TECUMSEH, DRAWING NO. CITY.DWG, MARCH 2009.
2. GROUND TOPOGRAPHY BASED OFF 7.5 MINUTE U.S.G.S TOPOGRAPHIC QUADRANGLE MAP AND GROUND SURVEY DATA.
3. GROUNDWATER CONCENTRATION TRENDS EVALUATED FOR GROUNDWATER DATA COLLECTED BETWEEN MARCH 2009 AND APRIL 2012 USING MANN-KENDALL TREND ANALYSIS.



APPROXIMATE HORIZONTAL SCALE

0 400' 800'

PROJECT:
FORMER TECUMSEH PRODUCTS SITE
TECUMSEH, MICHIGAN

TITLE:
GROUNDWATER STABILITY
1,1-DICHLOROETHENE
MARCH 2009 - APRIL 2012

DRAWN BY:	SJL/DGS	SCALE:	PROJ. NO. 004304.0001.03
CHECKED BY:	SEM	AS INDICATED	FILE NO. 004304.0001.03.05.dwg
APPROVED BY:	GC	DATE PRINTED:	**FIGURE 5**
DATE:	JUNE 2012		

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PLOT DATA
Drawing Name: J:_TRC\Tecumseh Products\Tecumseh MI\004304\03\GW Stability & Analysis\MAR2009-APR2012\004304.0001.03.06.dwg
Operator Name: STEHLE, DIANAH
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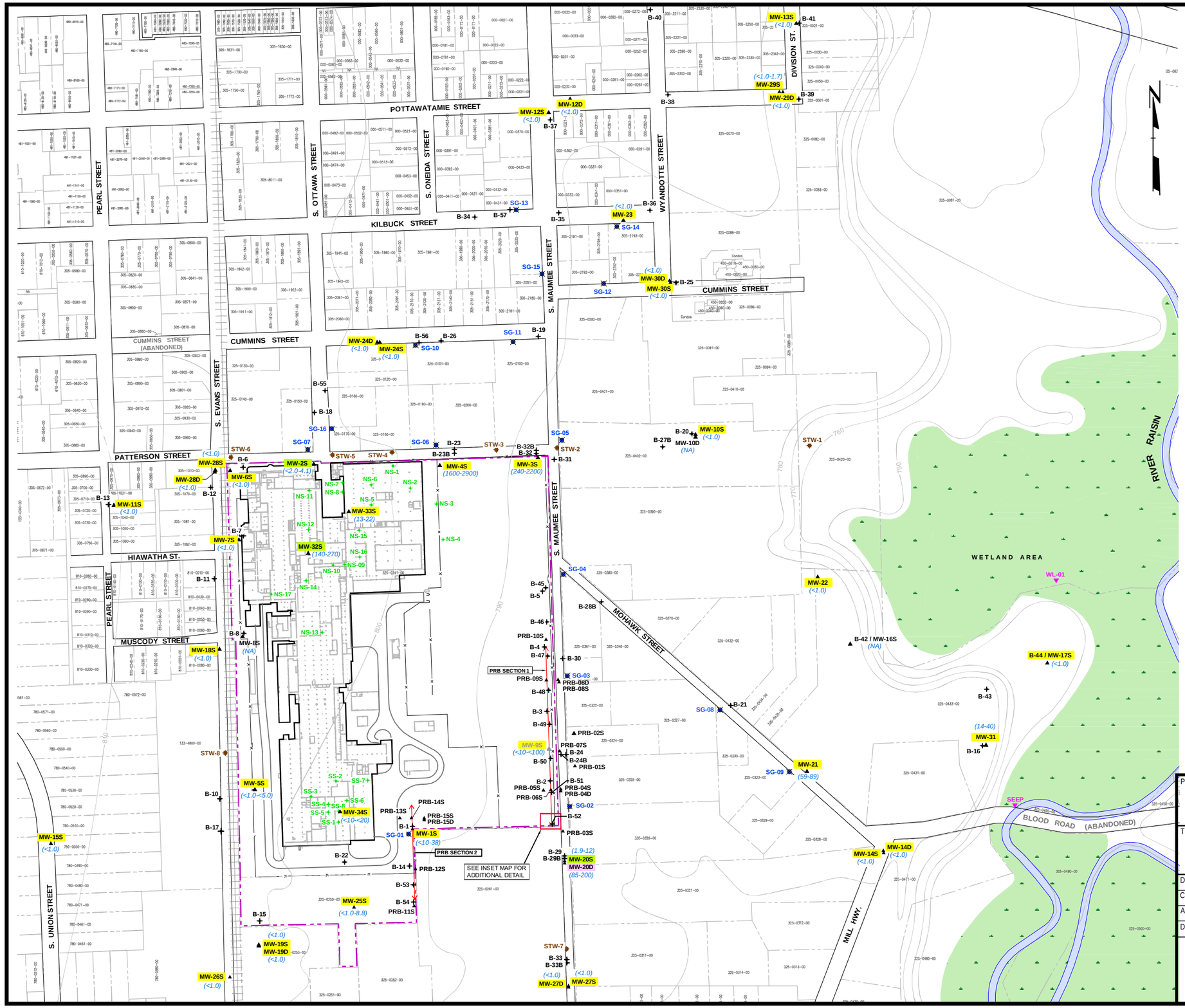
Layout: FIG06 GWS cis12DCE



LEGEND

- FORMER TECUMSEH PRODUCTS SITE BOUNDARY
- PARCEL BOUNDARY
- RAILROAD TRACKS (APPROXIMATE LOCATION)
- 750 — APPROXIMATE GROUND TOPOGRAPHY BASED OFF 7.5 MINUTE U.S.G.S. TOPOGRAPHIC QUADRANGLE MAP
- B-2 — PERIMETER / OFF-SITE INVESTIGATION SOIL BORING LOCATION AND NUMBER
- MW-4S — MONITORING WELL LOCATION AND NUMBER
- MW-9S — DECOMMISSIONED MONITORING WELL LOCATION AND NUMBER
- SS-2 — SOURCE AREA INVESTIGATION BORING LOCATION AND NUMBER
- SG-02 — SOIL GAS SAMPLE LOCATION AND NUMBER
- STW-2 — STORM WATER SEWER SAMPLE LOCATION AND NUMBER
- WL-01 — APPROXIMATE SURFACE WATER SAMPLE LOCATION
- FLOODPLAIN / WOODED WETLAND AREA
- PRB LOCATION
- X — FENCE LINE
- (13-22) — cis-1,2-DCE CONCENTRATION RANGE IN ug/L
- NO TREND / STABLE
- DOWNWARD TREND
- UPWARD TREND
- (NA) — NOT APPLICABLE, INSUFFICIENT DATA FOR TREND ANALYSIS

NOTES

1. BASE MAP DEVELOPED FROM SITE PLAN PROVIDED BY THE CITY OF TECUMSEH, DRAWING NO. CITY.DWG, MARCH 2009.
2. GROUND TOPOGRAPHY BASED OFF 7.5 MINUTE U.S.G.S TOPOGRAPHIC QUADRANGLE MAP AND GROUND SURVEY DATA.
3. GROUNDWATER CONCENTRATION TRENDS EVALUATED FOR GROUNDWATER DATA COLLECTED BETWEEN MARCH 2009 AND APRIL 2012 USING MANN-KENDALL TREND ANALYSIS.

APPROXIMATE HORIZONTAL SCALE
0 400' 800'

PROJECT: FORMER TECUMSEH PRODUCTS SITE
TECUMSEH, MICHIGAN

TITLE: GROUNDWATER STABILITY
cis-1,2-DICHLOROETHENE
MARCH 2009 - APRIL 2012

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CHECKED BY: SEM		FILE NO.	004304.0001.03.06.dwg
APPROVED BY: GC	DATE PRINTED:	FIGURE 6	
DATE: JUNE 2012			

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PLOT DATA
Drawing Name: J:_TRC\Tecumseh Products\Tecumseh MI\004304\03\GW Stability & Analysis\MAR2009-APR2012\004304.0001.03.07.dwg
Operator Name: STEHLE, DIANAH
Drawing Plot Scale: 0.386863
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Plot Time: 10:21 AM
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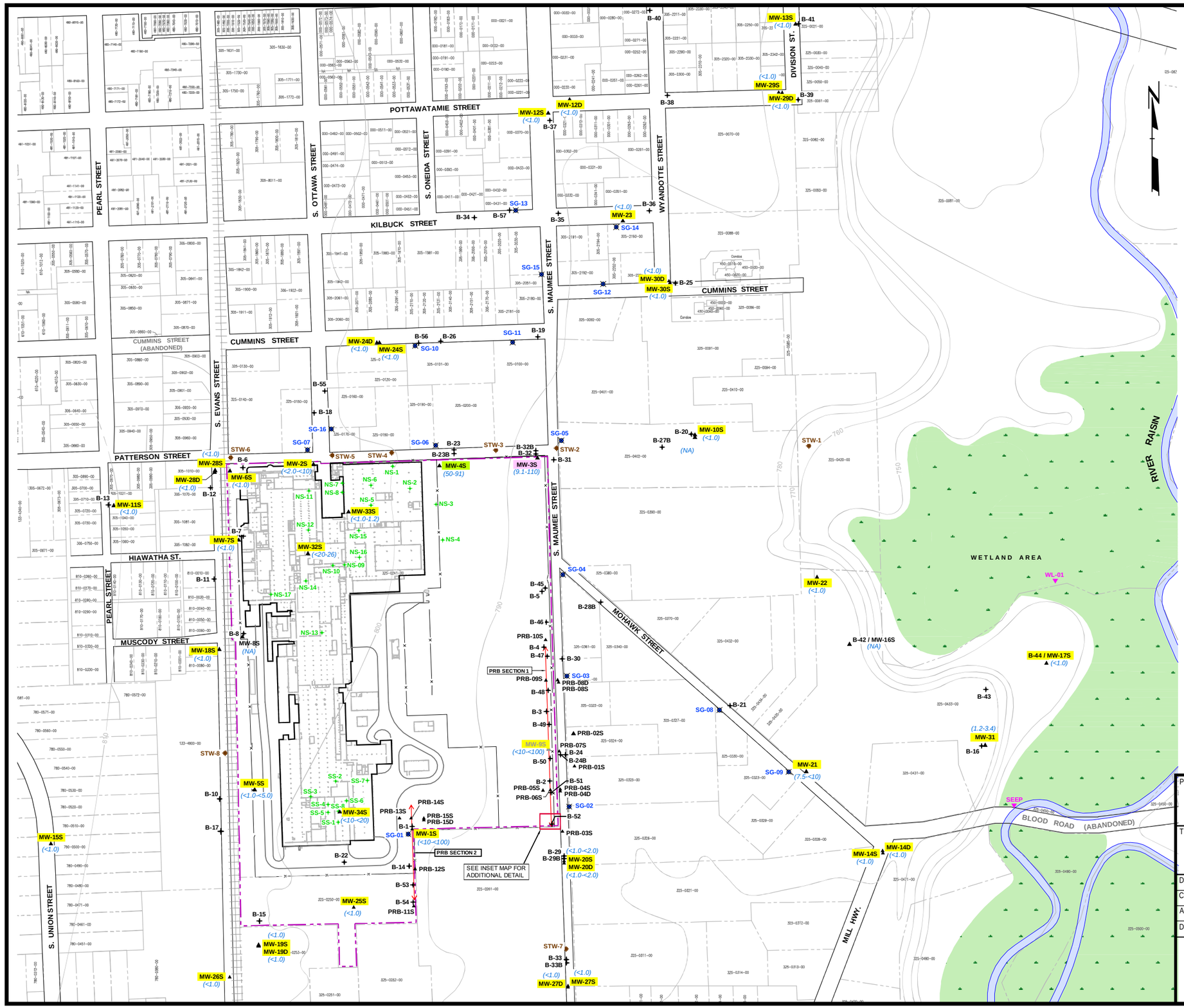
Attached Images:
Layout: FIG07 GWS trans12DCE



LEGEND

- FORMER TECUMSEH PRODUCTS SITE BOUNDARY
- PARCEL BOUNDARY
- RAILROAD TRACKS (APPROXIMATE LOCATION)
- 750 — APPROXIMATE GROUND TOPOGRAPHY BASED OFF 7.5 MINUTE U.S.G.S. TOPOGRAPHIC QUADRANGLE MAP
- B-2 — PERIMETER / OFF-SITE INVESTIGATION SOIL BORING LOCATION AND NUMBER
- MW-4S — MONITORING WELL LOCATION AND NUMBER
- MW-9S — DECOMMISSIONED MONITORING WELL LOCATION AND NUMBER
- SS-2 — SOURCE AREA INVESTIGATION BORING LOCATION AND NUMBER
- SG-02 — SOIL GAS SAMPLE LOCATION AND NUMBER
- STW-2 — STORM WATER SEWER SAMPLE LOCATION AND NUMBER
- WL-01 — APPROXIMATE SURFACE WATER SAMPLE LOCATION
- FLOODPLAIN / WOODED WETLAND AREA
- PRB LOCATION
- FENCE LINE
- (9.1-110) — trans-1,2-DCE CONCENTRATION RANGE IN ug/L
- NO TREND / STABLE
- DOWNWARD TREND
- UPWARD TREND
- (NA) — NOT APPLICABLE, INSUFFICIENT DATA FOR TREND ANALYSIS

NOTES

1. BASE MAP DEVELOPED FROM SITE PLAN PROVIDED BY THE CITY OF TECUMSEH, DRAWING NO. CITY.DWG, MARCH 2009.
2. GROUND TOPOGRAPHY BASED OFF 7.5 MINUTE U.S.G.S TOPOGRAPHIC QUADRANGLE MAP AND GROUND SURVEY DATA.
3. GROUNDWATER CONCENTRATION TRENDS EVALUATED FOR GROUNDWATER DATA COLLECTED BETWEEN MARCH 2009 AND APRIL 2012 USING MANN-KENDALL TREND ANALYSIS.

PROJECT:
FORMER TECUMSEH PRODUCTS SITE
TECUMSEH, MICHIGAN

TITLE:
GROUNDWATER STABILITY
trans-1,2-DICHLOROETHENE
MARCH 2009 - APRIL 2012

DRAWN BY: SJL/DGS	SCALE: AS INDICATED	PROJ. NO.	004304.0001.03
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APPROVED BY: GC	DATE PRINTED:	FIGURE 7	
DATE: JUNE 2012			

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PLOT DATA
Drawing Name: J:_TRC\Tecumseh Products\Tecumseh MI\004304\03\GW Stability & Analysis\MAR2009-APR2012\004304.0001.03.08.dwg
Operator Name: STEHLE, DIANAH
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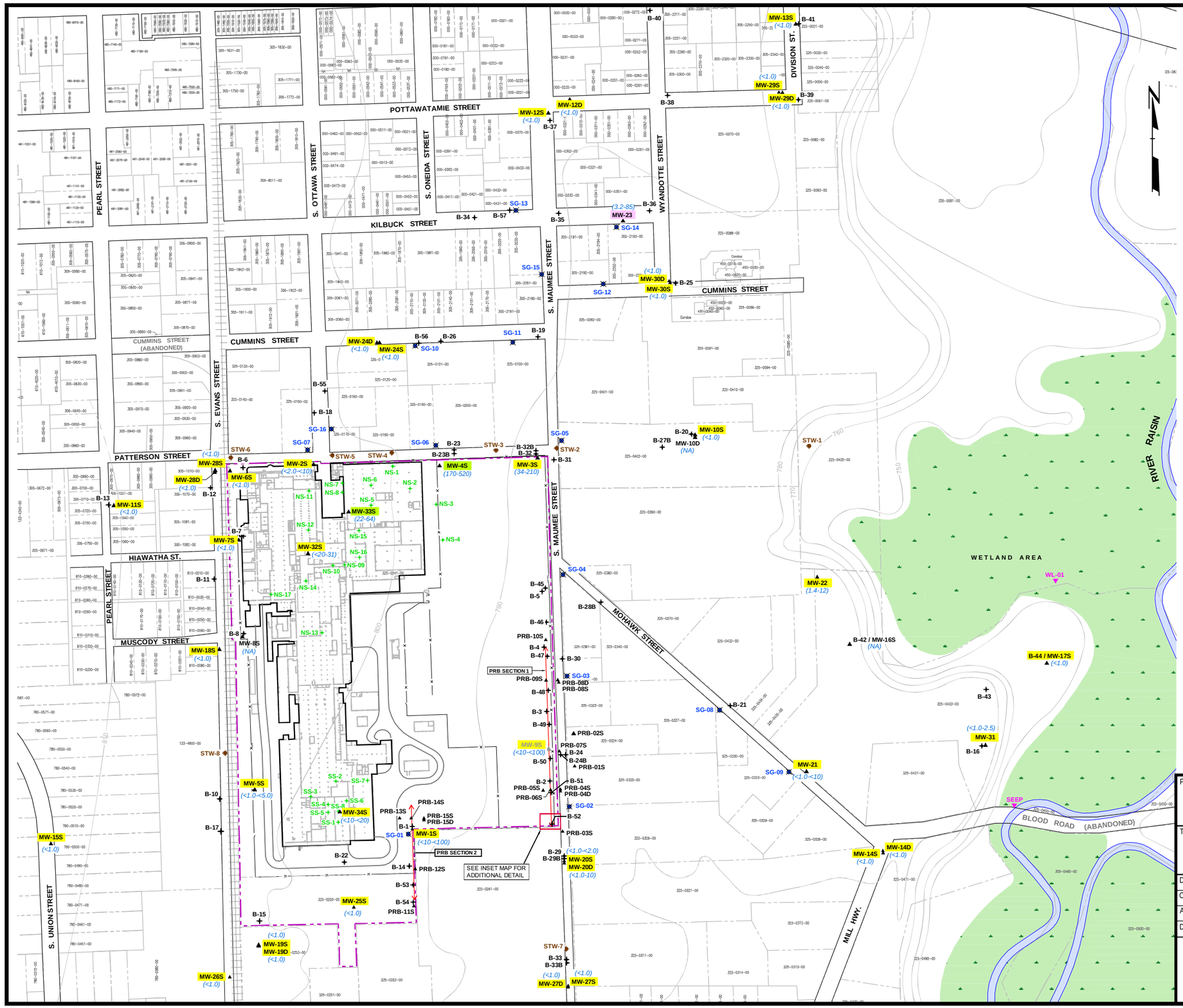
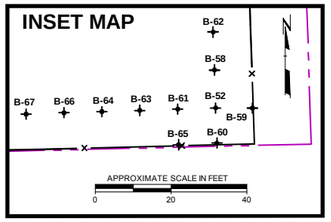


LEGEND

- FORMER TECUMSEH PRODUCTS SITE BOUNDARY
- PARCEL BOUNDARY
- RAILROAD TRACKS (APPROXIMATE LOCATION)
- 750 — APPROXIMATE GROUND TOPOGRAPHY BASED OFF 7.5 MINUTE U.S.G.S. TOPOGRAPHIC QUADRANGLE MAP
- B-2 — PERIMETER / OFF-SITE INVESTIGATION SOIL BORING LOCATION AND NUMBER
- MW-4S — MONITORING WELL LOCATION AND NUMBER
- MW-9S — DECOMMISSIONED MONITORING WELL LOCATION AND NUMBER
- SS-2 — SOURCE AREA INVESTIGATION BORING LOCATION AND NUMBER
- SG-02 — SOIL GAS SAMPLE LOCATION AND NUMBER
- STW-2 — STORM WATER SEWER SAMPLE LOCATION AND NUMBER
- WL-01 — APPROXIMATE SURFACE WATER SAMPLE LOCATION
- FLOODPLAIN / WOODED WETLAND AREA
- PRB LOCATION
- FENCE LINE
- (34-210) — VINYL CHLORIDE CONCENTRATION RANGE IN ug/L
- NO TREND / STABLE
- DOWNWARD TREND
- UPWARD TREND
- (NA) — NOT APPLICABLE, INSUFFICIENT DATA FOR TREND ANALYSIS

NOTES

1. BASE MAP DEVELOPED FROM SITE PLAN PROVIDED BY THE CITY OF TECUMSEH, DRAWING NO. CITY.DWG, MARCH 2009.
2. GROUND TOPOGRAPHY BASED OFF 7.5 MINUTE U.S.G.S TOPOGRAPHIC QUADRANGLE MAP AND GROUND SURVEY DATA.
3. GROUNDWATER CONCENTRATION TRENDS EVALUATED FOR GROUNDWATER DATA COLLECTED BETWEEN MARCH 2009 AND APRIL 2012 USING MANN-KENDALL TREND ANALYSIS.



APPROXIMATE HORIZONTAL SCALE

0 400' 800'

PROJECT:
FORMER TECUMSEH PRODUCTS SITE
TECUMSEH, MICHIGAN

TITLE:
GROUNDWATER STABILITY
VINYL CHLORIDE
MARCH 2009 - APRIL 2012

DRAWN BY: SJL/DGS	SCALE: AS INDICATED	PROJ. NO.	004304.0001.03
CHECKED BY: SEM		FILE NO.	004304.0001.03.08.dwg
APPROVED BY: GC	DATE PRINTED:	**FIGURE 8**	
DATE: JUNE 2012			

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PLOT DATA
Drawing Name: J:_TRC\Tecumseh Products\Tecumseh MI\004304\03\GW Stability & Analysis\MAR2009-APR2012\004304.0001.03.09.dwg
Operator Name: STEHLE, DIANAH
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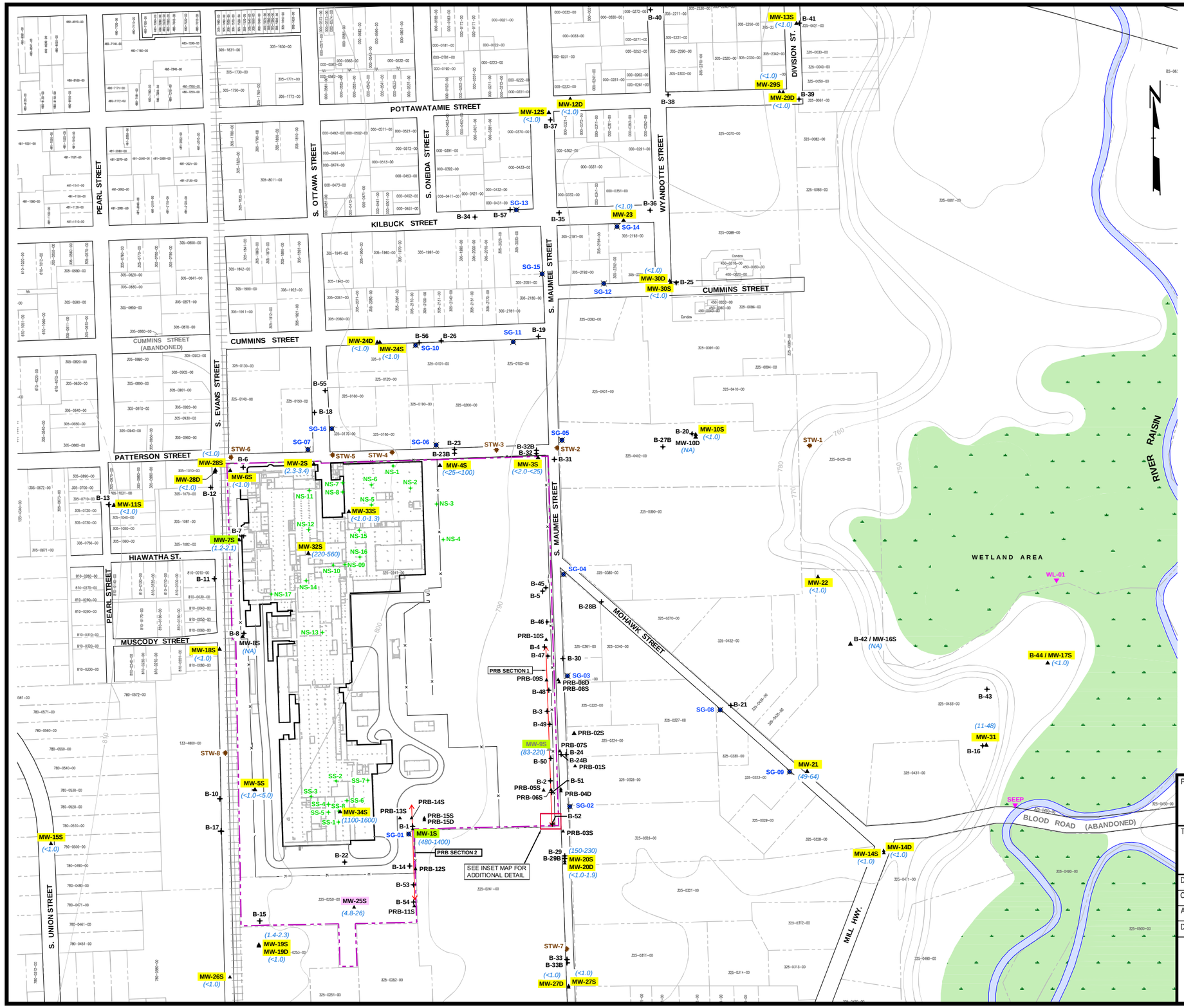

LEGEND

- FORMER TECUMSEH PRODUCTS SITE BOUNDARY
- PARCEL BOUNDARY
- RAILROAD TRACKS (APPROXIMATE LOCATION)
- 750 — APPROXIMATE GROUND TOPOGRAPHY BASED OFF 7.5 MINUTE U.S.G.S. TOPOGRAPHIC QUADRANGLE MAP
- B-2 — PERIMETER / OFF-SITE INVESTIGATION SOIL BORING LOCATION AND NUMBER
- MW-4S — MONITORING WELL LOCATION AND NUMBER
- MW-9S — DECOMMISSIONED MONITORING WELL LOCATION AND NUMBER
- SS-2 — SOURCE AREA INVESTIGATION BORING LOCATION AND NUMBER
- SG-02 — SOIL GAS SAMPLE LOCATION AND NUMBER
- STW-2 — STORM WATER SEWER SAMPLE LOCATION AND NUMBER
- WL-01 — APPROXIMATE SURFACE WATER SAMPLE LOCATION
- FLOODPLAIN / WOODED WETLAND AREA
- PRB LOCATION
- X — FENCE LINE
- (220-560) — 1,1,1-TCA CONCENTRATION RANGE IN ug/L
- NO TREND / STABLE
- DOWNWARD TREND
- UPWARD TREND
- (NA) — NOT APPLICABLE, INSUFFICIENT DATA FOR TREND ANALYSIS

NOTES

1. BASE MAP DEVELOPED FROM SITE PLAN PROVIDED BY THE CITY OF TECUMSEH, DRAWING NO. CITY.DWG, MARCH 2009.
2. GROUND TOPOGRAPHY BASED OFF 7.5 MINUTE U.S.G.S TOPOGRAPHIC QUADRANGLE MAP AND GROUND SURVEY DATA.
3. GROUNDWATER CONCENTRATION TRENDS EVALUATED FOR GROUNDWATER DATA COLLECTED BETWEEN MARCH 2009 AND APRIL 2012 USING MANN-KENDALL TREND ANALYSIS.

APPROXIMATE HORIZONTAL SCALE
0 400' 800'

PROJECT:
FORMER TECUMSEH PRODUCTS SITE
TECUMSEH, MICHIGAN

TITLE:
GROUNDWATER STABILITY
1,1,1-TRICHLOROETHANE
MARCH 2009 - APRIL 2012

DRAWN BY: SJL/DGS	SCALE: AS INDICATED	PROJ. NO. 004304.0001.03	
CHECKED BY: SEM		FILE NO. 004304.0001.03.09.dwg	
APPROVED BY: GC	DATE PRINTED:	FIGURE 9	
DATE: JUNE 2012			

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US EPA ARCHIVE DOCUMENT

PLOT DATA
Drawing Name: J:_TRC\Tecumseh Products\Tecumseh MI\004304\03\GW Stability & Analysis\MAR2009-APR2012\004304.0001.03.10.dwg
Operator Name: STEHLE, DIANAH
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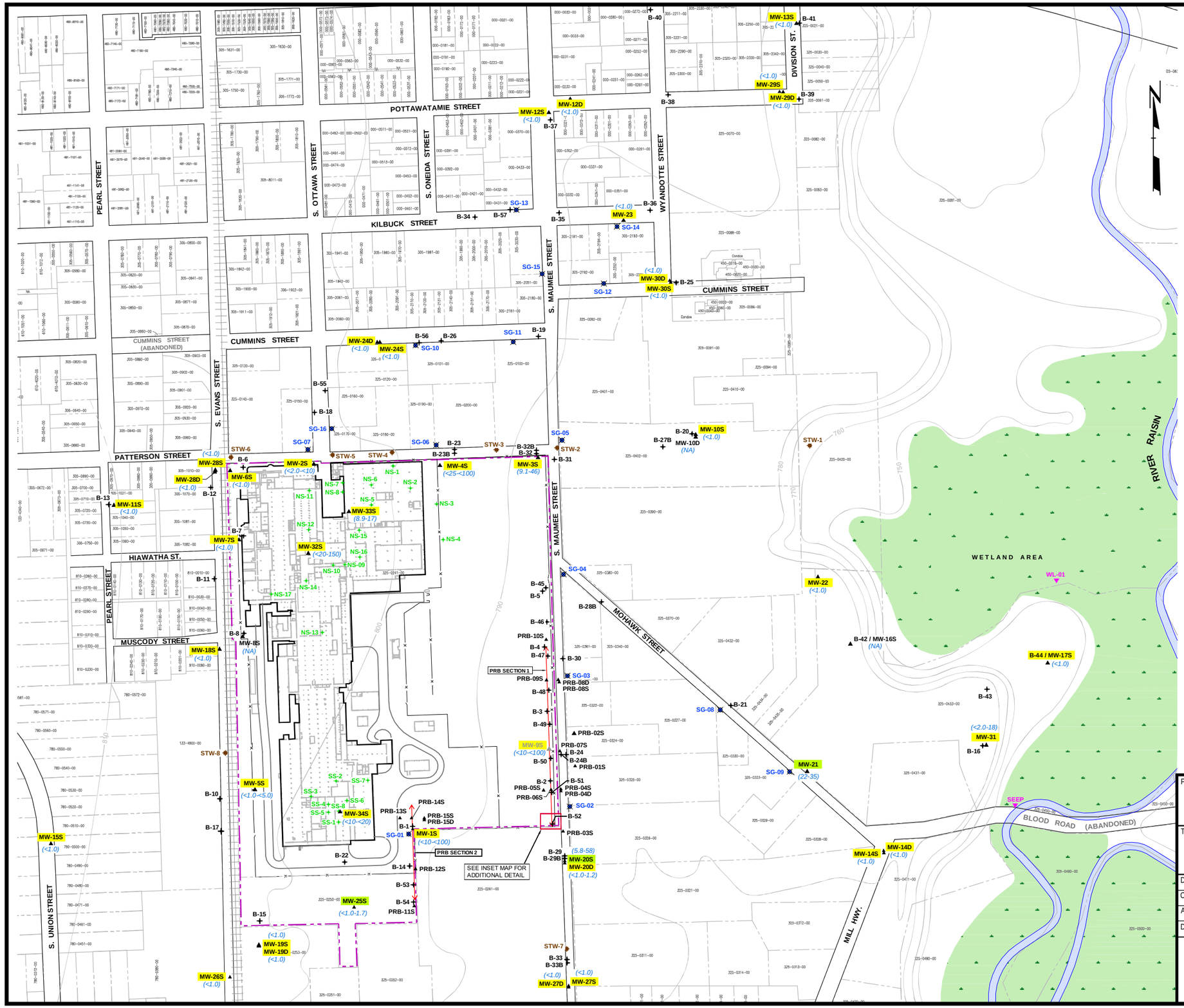
Layout: FIG10 GWS 11DCA

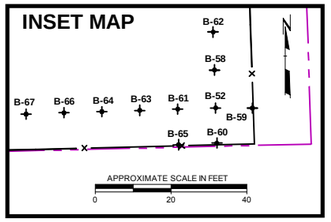


LEGEND

- FORMER TECUMSEH PRODUCTS SITE BOUNDARY
- PARCEL BOUNDARY
- RAILROAD TRACKS (APPROXIMATE LOCATION)
- 750 — APPROXIMATE GROUND TOPOGRAPHY BASED OFF 7.5 MINUTE U.S.G.S. TOPOGRAPHIC QUADRANGLE MAP
- B-2 — PERIMETER / OFF-SITE INVESTIGATION SOIL BORING LOCATION AND NUMBER
- MW-4S — MONITORING WELL LOCATION AND NUMBER
- MW-9S — DECOMMISSIONED MONITORING WELL LOCATION AND NUMBER
- SS-2 — SOURCE AREA INVESTIGATION BORING LOCATION AND NUMBER
- SG-02 — SOIL GAS SAMPLE LOCATION AND NUMBER
- STW-2 — STORM WATER SEWER SAMPLE LOCATION AND NUMBER
- WL-01 — APPROXIMATE SURFACE WATER SAMPLE LOCATION
- FLOODPLAIN / WOODED WETLAND AREA
- PRB LOCATION
- X — FENCE LINE
- (9.1-46) — 1,1-DCA CONCENTRATION RANGE IN ug/L
- NO TREND / STABLE
- DOWNWARD TREND
- UPWARD TREND
- (NA) — NOT APPLICABLE, INSUFFICIENT DATA FOR TREND ANALYSIS

NOTES

1. BASE MAP DEVELOPED FROM SITE PLAN PROVIDED BY THE CITY OF TECUMSEH, DRAWING NO. CITY.DWG, MARCH 2009.
2. GROUND TOPOGRAPHY BASED OFF 7.5 MINUTE U.S.G.S TOPOGRAPHIC QUADRANGLE MAP AND GROUND SURVEY DATA.
3. GROUNDWATER CONCENTRATION TRENDS EVALUATED FOR GROUNDWATER DATA COLLECTED BETWEEN MARCH 2009 AND APRIL 2012 USING MANN-KENDALL TREND ANALYSIS.



APPROXIMATE HORIZONTAL SCALE

0 400' 800'

PROJECT:
FORMER TECUMSEH PRODUCTS SITE
TECUMSEH, MICHIGAN

TITLE:
GROUNDWATER STABILITY
1,1-DICHLOROETHANE
MARCH 2009 - APRIL 2012

DRAWN BY: SJL/DGS	SCALE: AS INDICATED	PROJ. NO. 004304.0001.03	
CHECKED BY: SEM		FILE NO. 004304.0001.03.10.dwg	
APPROVED BY: GC	DATE PRINTED:	FIGURE 10	
DATE: JUNE 2012			

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Appendix A
Statistical Tables

US EPA ARCHIVE DOCUMENT

US EPA ARCHIVE DOCUMENT

Table 10-1. Percentiles of Standard Normal Distribution

P	0.000	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009
0.50	0.0000	0.0025	0.0050	0.0075	0.0100	0.0125	0.0150	0.0175	0.0201	0.0226
0.51	0.0251	0.0276	0.0301	0.0326	0.0351	0.0376	0.0401	0.0426	0.0451	0.0476
0.52	0.0502	0.0527	0.0552	0.0577	0.0602	0.0627	0.0652	0.0677	0.0702	0.0728
0.53	0.0753	0.0778	0.0803	0.0828	0.0853	0.0878	0.0904	0.0929	0.0954	0.0979
0.54	0.1004	0.1030	0.1055	0.1080	0.1105	0.1130	0.1156	0.1181	0.1206	0.1231
0.55	0.1257	0.1282	0.1307	0.1332	0.1358	0.1383	0.1408	0.1434	0.1459	0.1484
0.56	0.1510	0.1535	0.1560	0.1586	0.1611	0.1637	0.1662	0.1687	0.1713	0.1738
0.57	0.1764	0.1789	0.1815	0.1840	0.1866	0.1891	0.1917	0.1942	0.1968	0.1993
0.58	0.2019	0.2045	0.2070	0.2096	0.2121	0.2147	0.2173	0.2198	0.2224	0.2250
0.59	0.2275	0.2301	0.2327	0.2353	0.2378	0.2404	0.2430	0.2456	0.2482	0.2508
0.60	0.2533	0.2559	0.2585	0.2611	0.2637	0.2663	0.2689	0.2715	0.2741	0.2767
0.61	0.2793	0.2819	0.2845	0.2871	0.2898	0.2924	0.2950	0.2976	0.3002	0.3029
0.62	0.3055	0.3081	0.3107	0.3134	0.3160	0.3186	0.3213	0.3239	0.3266	0.3292
0.63	0.3319	0.3345	0.3372	0.3398	0.3425	0.3451	0.3478	0.3505	0.3531	0.3558
0.64	0.3585	0.3611	0.3638	0.3665	0.3692	0.3719	0.3745	0.3772	0.3799	0.3826
0.65	0.3853	0.3880	0.3907	0.3934	0.3961	0.3989	0.4016	0.4043	0.4070	0.4097
0.66	0.4125	0.4152	0.4179	0.4207	0.4234	0.4261	0.4289	0.4316	0.4344	0.4372
0.67	0.4399	0.4427	0.4454	0.4482	0.4510	0.4538	0.4565	0.4593	0.4621	0.4649
0.68	0.4677	0.4705	0.4733	0.4761	0.4789	0.4817	0.4845	0.4874	0.4902	0.4930
0.69	0.4959	0.4987	0.5015	0.5044	0.5072	0.5101	0.5129	0.5158	0.5187	0.5215
0.70	0.5244	0.5273	0.5302	0.5330	0.5359	0.5388	0.5417	0.5446	0.5476	0.5505
0.71	0.5534	0.5563	0.5592	0.5622	0.5651	0.5681	0.5710	0.5740	0.5769	0.5799
0.72	0.5828	0.5858	0.5888	0.5918	0.5948	0.5978	0.6008	0.6038	0.6068	0.6098
0.73	0.6128	0.6158	0.6189	0.6219	0.6250	0.6280	0.6311	0.6341	0.6372	0.6403
0.74	0.6433	0.6464	0.6495	0.6526	0.6557	0.6588	0.6620	0.6651	0.6682	0.6713
0.75	0.6745	0.6776	0.6808	0.6840	0.6871	0.6903	0.6935	0.6967	0.6999	0.7031

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Table 10-1. Percentiles of Standard Normal Distribution

P	0.000	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009
0.76	0.7063	0.7095	0.7128	0.7160	0.7192	0.7225	0.7257	0.7290	0.7323	0.7356
0.77	0.7388	0.7421	0.7454	0.7488	0.7521	0.7554	0.7588	0.7621	0.7655	0.7688
0.78	0.7722	0.7756	0.7790	0.7824	0.7858	0.7892	0.7926	0.7961	0.7995	0.8030
0.79	0.8064	0.8099	0.8134	0.8169	0.8204	0.8239	0.8274	0.8310	0.8345	0.8381
0.80	0.8416	0.8452	0.8488	0.8524	0.8560	0.8596	0.8633	0.8669	0.8705	0.8742
0.81	0.8779	0.8816	0.8853	0.8890	0.8927	0.8965	0.9002	0.9040	0.9078	0.9116
0.82	0.9154	0.9192	0.9230	0.9269	0.9307	0.9346	0.9385	0.9424	0.9463	0.9502
0.83	0.9542	0.9581	0.9621	0.9661	0.9701	0.9741	0.9782	0.9822	0.9863	0.9904
0.84	0.9945	0.9986	1.0027	1.0069	1.0110	1.0152	1.0194	1.0237	1.0279	1.0322
0.85	1.0364	1.0407	1.0450	1.0494	1.0537	1.0581	1.0625	1.0669	1.0714	1.0758
0.86	1.0803	1.0848	1.0893	1.0939	1.0985	1.1031	1.1077	1.1123	1.1170	1.1217
0.87	1.1264	1.1311	1.1359	1.1407	1.1455	1.1503	1.1552	1.1601	1.1650	1.1700
0.88	1.1750	1.1800	1.1850	1.1901	1.1952	1.2004	1.2055	1.2107	1.2160	1.2212
0.89	1.2265	1.2319	1.2372	1.2426	1.2481	1.2536	1.2591	1.2646	1.2702	1.2759
0.90	1.2816	1.2873	1.2930	1.2988	1.3047	1.3106	1.3165	1.3225	1.3285	1.3346
0.91	1.3408	1.3469	1.3532	1.3595	1.3658	1.3722	1.3787	1.3852	1.3917	1.3984
0.92	1.4051	1.4118	1.4187	1.4255	1.4325	1.4395	1.4466	1.4538	1.4611	1.4684
0.93	1.4758	1.4833	1.4909	1.4985	1.5063	1.5141	1.5220	1.5301	1.5382	1.5464
0.94	1.5548	1.5632	1.5718	1.5805	1.5893	1.5982	1.6072	1.6164	1.6258	1.6352
0.95	1.6449	1.6546	1.6646	1.6747	1.6849	1.6954	1.7060	1.7169	1.7279	1.7392
0.96	1.7507	1.7624	1.7744	1.7866	1.7991	1.8119	1.8250	1.8384	1.8522	1.8663
0.97	1.8808	1.8957	1.9110	1.9268	1.9431	1.9600	1.9774	1.9954	2.0141	2.0335
0.98	2.0537	2.0749	2.0969	2.1201	2.1444	2.1701	2.1973	2.2262	2.2571	2.2904
0.99	2.3263	2.3656	2.4089	2.4573	2.5121	2.5758	2.6521	2.7478	2.8782	3.0902

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Table 17-5. Significance Levels (α) for Mann-Kendall Trend Test for *n* = 4(1)10

n = 4		n = 5		n = 6		n = 7		n = 8		n = 9		n = 10	
S	α	S	α	S	α	S	α	S	α	S	α	S	α
0	0.6250	0	0.5920	1	0.5000	1	0.5000	0	0.5480	0	0.5400	1	0.5000
2	0.3750	2	0.4080	3	0.3600	3	0.3860	2	0.4520	2	0.4600	3	0.4310
4	0.1670	4	0.2420	5	0.2350	5	0.2810	4	0.3600	4	0.3810	5	0.3640
6	0.0420	6	0.1170	7	0.1360	7	0.1910	6	0.2740	6	0.3060	7	0.3000
		8	0.0420	9	0.0680	9	0.1190	8	0.1990	8	0.2380	9	0.2420
		10	0.0083	11	0.0280	11	0.0680	10	0.1380	10	0.1790	11	0.1900
				13	0.0083	13	0.0350	12	0.0890	12	0.1300	13	0.1460
				15	0.0014	15	0.0150	14	0.0540	14	0.0900	15	0.1080
						17	0.0054	16	0.0310	16	0.0600	17	0.0780
						19	0.0014	18	0.0160	18	0.0380	19	0.0540
						21	0.0002	20	0.0071	20	0.0220	21	0.0360
								22	0.0028	22	0.0120	23	0.0230
								24	0.0009	24	0.0063	25	0.0140
								26	0.0002	26	0.0029	27	0.0083
								28	0.0000	28	0.0012	29	0.0046
										30	0.0004	31	0.0023
										32	0.0001	33	0.0011
										34	0.0000	35	0.0005
										36	0.0000	37	0.0002
												39	0.0001
												41	0.0000
												43	0.0000
												45	0.0000

Source: Gilbert (1987)
Footnote: Notation *n* = 4(1)10 is shorthand for *n* from 4 to 10 by unit steps

Appendix B
Example Statistical Calculations

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SHEET NO. 1 OF 12
PROJECT NO. 004304, Phase 3
DATE 5/8/12
BY S. Metz
CHK'D J. Rice 6/11/12

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SUBJECT TPC - Statistical Evaluation

Mann-Kendall Trend Analysis - Example Calculation 1, where n < 10

Monitoring Well - MW-32s
Analyte - cis-DCE

Non Detects = Detection Limit
95% Confidence level

Data:

Date	Conc (µg/L)
9/17/10	270
11/18/10	190
12/28/10	200
2/25/11	190
5/10/11	170
7/28/11	140
10/6/11	160
1/10/12	170
4/4/12	130

Total number of observation (n)

n = 9

Compute S_j (Mann-Kendall Statistic)

	x_j	x_k	
9/17/10	190	270	-1
	200		-1
	190		-1
	170		-1
	140		-1
	160		-1
	170		-1
	130		-1
			-8

	x_j	x_k	
11/18/10	200	190	+1
	190		0
	170		-1
	140		-1
	160		-1
	170		-1
	130		-1
			-4

	x_j	x_k	
12/28/10	190	200	-1
	170		-1
	140		-1
	160		-1
	170		-1
	130		-1
			-6

	x_j	x_k	
2/25/11	170	190	-1
	140		-1
	160		-1
	170		-1
	130		-1
			-5

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	x_j	x_k	
5/10/11	140	170	-1
	160	↓	-1
	170		0
	130		-1
			-3

	x_j	x_k	
7/28/11	160	140	+1
	170	↓	+1
	130		-1
			+1

	x_j	x_k	
10/6/11	170	160	+1
	130	160	-1
			0

	x_j	x_k	
1/10/12	130	170	-1
			-1

$S = -8 - 4 - 6 - 5 - 3 + 1 + 0 - 1$

$S = -26$ → the negative value of S indicates a downward trend

From the tabulated values for $n = 9$ and $S = -26$, the observed downward trend has a significance level (α) of 0.0029

$0.0029 < 0.05$ and
$S < 0$

Indicating a Downward Trend at a greater than 95% Confidence Level

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PROJECT NO. 004304, Phase 3
DATE 05/08/12
BY S. Metz
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SUBJECT TPC - Statistical Evaluation

Mann-Kendall Trend Analysis - Example Calculation 2, where n > 10

Monitoring Well - MW-015
Analyte - TCE

Non Detects = Detection Limit
95% Confidence level

DATA

DATE	Concentration (µg/L)
3/13/09	2700
4/20/09	2200
12/9/09	3400
3/17/10	2500
5/18/10	2700
9/10/10	2400
12/28/10	2500
2/25/11	1300
5/11/11	1900
7/28/11	1900
10/6/11	2000
1/9/12	2000
4/4/12	1900

Total number of observations, n, = 13

Compute S:

3/13/09

x_j	x_k	
2200	2700	-1
3400	↓	+1
2500	↓	-1
2700	↓	0 * tie
2400	↓	-1
2500	↓	-1
1300	↓	-1
1900	↓	-1
1900	↓	-1
2000	↓	-1
2000	↓	-1
1900	↓	-1
		-9

4/20/09

x_j	x_k	
3400	2200	+1
2500	↓	+1
2700	↓	+1
2400	↓	+1
2500	↓	+1
1300	↓	-1
1900	↓	-1
1900	↓	-1
2000	↓	-1
2000	↓	-1
1900	↓	-1
		-1

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SUBJECT TPC - Statistical Evaluation

Mann-Kendall Trend Analysis, Example 2 Continued

12/9/09

x_j	x_k	
2500	3400	-1
2700	↓	-1
2400		-1
2500		-1
1300		-1
1900		-1
1900		-1
2000		-1
2000		-1
1900		-1
		-10

3/17/10

x_j	x_k	
2700	2500	+1
2400	↓	-1
2500		0 * tie
1300		-1
1900		-1
1900		-1
2000		-1
2000		-1
1900		-1
		-6

5/18/10

x_j	x_k	
2400	2700	-1
2500	↓	-1
1300		-1
1900		-1
1900		-1
2000		-1
2000		-1
1900		-1
		-8

9/10/10

x_j	x_k	
2500	2400	+1
1300	↓	-1
1900		-1
1900		-1
2000		-1
2000		-1
1900		-1
		-5

12/28/10

x_j	x_k	
1300	2500	-1
1900	↓	-1
1900		-1
2000		-1
2000		-1
1900		-1
		-6

2/25/11

x_j	x_k	
1900	1300	+1
1900	↓	+1
2000		+1
2000		+1
1900		+1
		+5

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Mann-Kendall Trend Analysis, Example 2 Continued

5/11/11

x_j	x_k	
1900	1900	* tie
2000	↓	+1
2000		+1
1900		* tie
		+2

7/28/11

x_j	x_k	
2000	1900	+1
2000	↓	+1
1900		0 * tie
		+2

10/6/11

x_j	x_k	
2000	2000	0 * tie
1900	↓	-1
		-1

1/9/12

x_j	x_k	
1900	2000	-1
		-1

$S = -10 - 6 - 8 - 5 - 6 + 5 + 2 + 2 - 1 - 1 - 9 - 1 = -38$

Tied groups:

Group	Value	Number
1	2700	2
2	2500	2
3	1900	3
4	2000	2

$g = 4$ (number of tied groups)

t_p = number of values in each tied group, p

$t_1 = 2$; $t_2 = 2$; $t_3 = 3$; $t_4 = 2$

Time Periods:

There are no time periods w/ multiple observations

$\therefore h = 0$; $u_q = 0$

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SUBJECT TPC Statistical Evaluation

Mann-Kendall Trend Analysis, Example 2 Cont'd

Calculate the Variance of the Mann-Kendall Statistic, VAR (S)

$$VAR(S) = \frac{1}{18}\left[a - A - B + \frac{C \times D}{b} + \frac{E \times F}{c}\right]$$

where $A = \sum_{p=1}^{g} t_p (t_p - 1)(2t_p + 5)$

$$A = t_1(t_1-1)(2t_1+5) + t_2(t_2-1)(2t_2+5) + t_3(t_3-1)(2t_3+5) + t_4(t_4-1)(2t_4+5)$$

$$A = 2(2-1)(4+5) + 2(2-1)(4+5) + 3(3-1)(6+5) + 2(2-1)(4+5)$$

$$A = 18 + 18 + 66 + 18$$

$$\boxed{A = 120}$$

$$B = \sum_{q=1}^{h} u_q (u_q - 1)(2u_q + 5) = 0$$

$$C = \sum_{p=1}^{g} t_p (t_p - 1)(t_p - 2)$$

$$C = 3 \times [2(2-1)(2-2)] + 3(3-1)(3-2)$$

$$C = 0 + 3(2)(1) = 6$$

$$\boxed{C = 6}$$

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SUBJECT TPC - Statistical Evaluation

Mann-Kendall Trend Analysis, Example 2, Cont'd

$$D = \sum_{q=1}^{n} u_q (u_q - 1)(u_q - 2)$$

$u_q = 0 \quad \therefore$

$$\boxed{D = 0}$$

$$E = \sum_{p=1}^{g} t_p (t_p - 1)$$

$$= 3 \times \left[2(2-1)\right] + 3(3-1)$$

$$= 3 \times 2 + 6$$

$$\boxed{E = 12}$$

$$F = \sum_{q=1}^{n} u_q (u_q - 1) \qquad \cancel{u_q} \quad u_q = 0 \quad \therefore$$

$$\boxed{F = 0}$$

$$a = n(n-1)(2n+5) = 13(13-1)(2 \times 13 + 5)$$

$$a = 13 \times 12 \times 31$$

$$\boxed{a = 4836}$$

$$b = 9n(n-1)(n-2) = 9 \times 13(13-1)(13-2)$$

$$b = 117(12)(11)$$

$$\boxed{b = 15,444}$$

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SUBJECT TPC - Statistical Evaluation

Mann-Kendall Trend Analysis, Example 2, Cont'd

$$C = 2n(n-1) = 2 \times 13 \times (13-1)$$

$$\boxed{C = 312}$$

$\therefore$

$$VAR(S) = \frac{1}{18}\left[a - A - B + \frac{C \times D}{b} + \frac{E \times F}{c}\right]$$

$$= \frac{1}{18}\left[4836 - 120 - 0 + \frac{6 \times 0}{15444} + \frac{12 \times 0}{312}\right]$$

$$= \frac{1}{18}\left(4836 - 120\right)$$

$$VAR(S) = 262$$

Calculate the Z-statistic

~~VAR(S) > 0~~ $S < 0$ $\therefore$ $Z = \dfrac{S+1}{[VAR(S)]^{0.5}}$

$$Z = \frac{-38+1}{262^{0.5}} = \frac{-37}{16.1864}$$

$$Z = -2.28587$$

Comparison level from tabulated values for 95% confidence level is -1.65463 (downward trend)

$-2.28587 < 1.65463$ & $S < 0$

Indicating a Downward trend at a greater than 95% Confidence level

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SUBJECT TPC - Statistical Evaluation

Sen's Slope Trend Test, Example Calculation

Monitoring Well - MW-01s
Analyte - TCE

Non-Detects = Detection Limit
90% Confidence Level

Data:	Date	Conc (µg/L)
1	3/13/09	2700
2	4/20/09	2200
3	12/9/09	3400
4	3/17/10	2500
5	5/18/10	2700
6	9/10/10	2400
7	12/28/10	2500
8	2/25/11	1300
9	5/11/11	1900
10	7/28/11	1900
11	10/6/11	2000
12	1/9/12	2000
13	4/4/12	1900

Total number of observations, n,

$n = 13$

Number of pairs, N'

$$N' = \frac{n(n-1)}{2}$$

$$N' = \frac{13(12)}{2}$$

$$N' = 78$$

See Attached Spreadsheet for determination of Q

where $Q = \frac{x_j - x_k}{j-k}$ ~~x_j & x_k are~~ SEN

- x_j & x_k are parameter concentrations at times j & k respectively
- $j > k$

The Sen's Slope Estimator (S) is the median Q value

& See Attached Spreadsheet

$S = -70.7143$

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Sheet 10 / 12
Project 004304, Phase 3
5/8/12
S. Metz

Checked
J. Rice
6/11/12

TPC - Statistical Evaluation

Determination of Q values for Sen's Slope Trend Test, Example Calculation

j	Xj	k	Xk	Q	Rank
2	2200	1	2700	-500	4
3	3400	1	2700	350	76
4	2500	1	2700	-66.6667	41
5	2700	1	2700	0	56
6	2400	1	2700	-60	47
7	2500	1	2700	-33.3333	52
8	1300	1	2700	-200	15
9	1900	1	2700	-100	28
10	1900	1	2700	-88.8889	36
11	2000	1	2700	-70	40
12	2000	1	2700	-63.6364	45
13	1900	1	2700	-66.6667	42

j	Xj	k	Xk	Q	Rank
3	3400	2	2200	1200	78
4	2500	2	2200	150	70
5	2700	2	2200	166.6667	71
6	2400	2	2200	50	64
7	2500	2	2200	60	66
8	1300	2	2200	-150	23
9	1900	2	2200	-42.8571	50
10	1900	2	2200	-37.5	51
11	2000	2	2200	-22.2222	54
12	2000	2	2200	-20	55
13	1900	2	2200	-27.2727	53

j	Xj	k	Xk	Q	Rank
4	2500	3	3400	-900	2
5	2700	3	3400	-350	7
6	2400	3	3400	-333.333	8
7	2500	3	3400	-225	13
8	1300	3	3400	-420	6
9	1900	3	3400	-250	12
10	1900	3	3400	-214.286	14
11	2000	3	3400	-175	18
12	2000	3	3400	-155.556	21
13	1900	3	3400	-150	22

j	Xj	k	Xk	Q	Rank
5	2700	4	2500	200	73
6	2400	4	2500	-50	49
7	2500	4	2500	0	60
8	1300	4	2500	-300	11
9	1900	4	2500	-120	26
10	1900	4	2500	-100	34
11	2000	4	2500	-71.4286	38
12	2000	4	2500	-62.5	46
13	1900	4	2500	-66.6667	43

j	Xj	k	Xk	Q	Rank
6	2400	5	2700	-300	9
7	2500	5	2700	-100	29
8	1300	5	2700	-466.667	5
9	1900	5	2700	-200	16
10	1900	5	2700	-160	20
11	2000	5	2700	-116.667	27
12	2000	5	2700	-100	30
13	1900	5	2700	-100	31

j	Xj	k	Xk	Q	Rank
7	2500	6	2400	100	67
8	1300	6	2400	-550	3
9	1900	6	2400	-166.667	19
10	1900	6	2400	-125	25
11	2000	6	2400	-80	37
12	2000	6	2400	-66.6667	44
13	1900	6	2400	-71.4286	39

j	Xj	k	Xk	Q	Rank
8	1300	7	2500	-1200	1
9	1900	7	2500	-300	10
10	1900	7	2500	-200	17
11	2000	7	2500	-125	24
12	2000	7	2500	-100	32
13	1900	7	2500	-100	33

j	Xj	k	Xk	Q	Rank
9	1900	8	1300	600	77
10	1900	8	1300	300	75
11	2000	8	1300	233.3333	74
12	2000	8	1300	175	72
13	1900	8	1300	120	69

j	Xj	k	Xk	Q	Rank
10	1900	9	1900	0	57
11	2000	9	1900	50	63
12	2000	9	1900	33.33333	62
13	1900	9	1900	0	58

j	Xj	k	Xk	Q	Rank
11	2000	10	1900	100	68
12	2000	10	1900	50	65
13	1900	10	1900	0	61

j	Xj	k	Xk	Q	Rank
12	2000	11	2000	0	59
13	1900	11	2000	-50	48

j	Xj	k	Xk	Q	Rank
13	1900	12	2000	-100	35

Sen's Slope Estimator, S, is the median Q value

S = -70.7143

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SUBJECT TPL - Statistical Evaluation

Sen's Slope Trend Test, Example Calculation Cont'd

Compute Variance (Already Calc'd for Man-Kendall See Sheets 6-8)

$$VAR(S) = 262$$

For 90% confidence level (two-tailed) $\alpha = 0.9$

$$Z_{(1-0.9)/2} = 1.6449$$

Compute the tolerance, C_α, on the median ordered value (rank), 1 through N', for the slope (Q)

$$C_\alpha = Z_{\left(\frac{1-\alpha}{2}\right)} \sqrt{VAR(S)}$$

$$C_\alpha = 1.6449 \sqrt{262}$$

$$C_\alpha = 26.625$$

Compute the upper and lower bounds for the median rank (1 throug N') for the slope

$$M_1 = \left(\frac{N'}{2} - C_\alpha\right) = \frac{78}{2} - 26.625$$

$$M_1 = 25.6875$$

$$M_2 = \left(\frac{N_1}{2} + C_\alpha\right) = \frac{78}{2} + 26.625$$

$$M_2 = 52.3125$$

$$M_2 + 1 = 53.3125$$

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SUBJECT TPC - Statistical Evaluation

Sens Slope Trend Test, Example Calc Cont'd

Determine the upper & lower bounds on the Sen's Slope Estimator

$Q(M_1) = Q(26) = -120$ (from sheet 10)

$Q(M_2+1) = Q(53) = -27.27$ (from sheet 10)

The upper confidence limit (-27.27) is less than 0; therefore there is evidence of a DOWNWARD trend.

S. Metz

A

Appendix C
"Detect" Trend Plots

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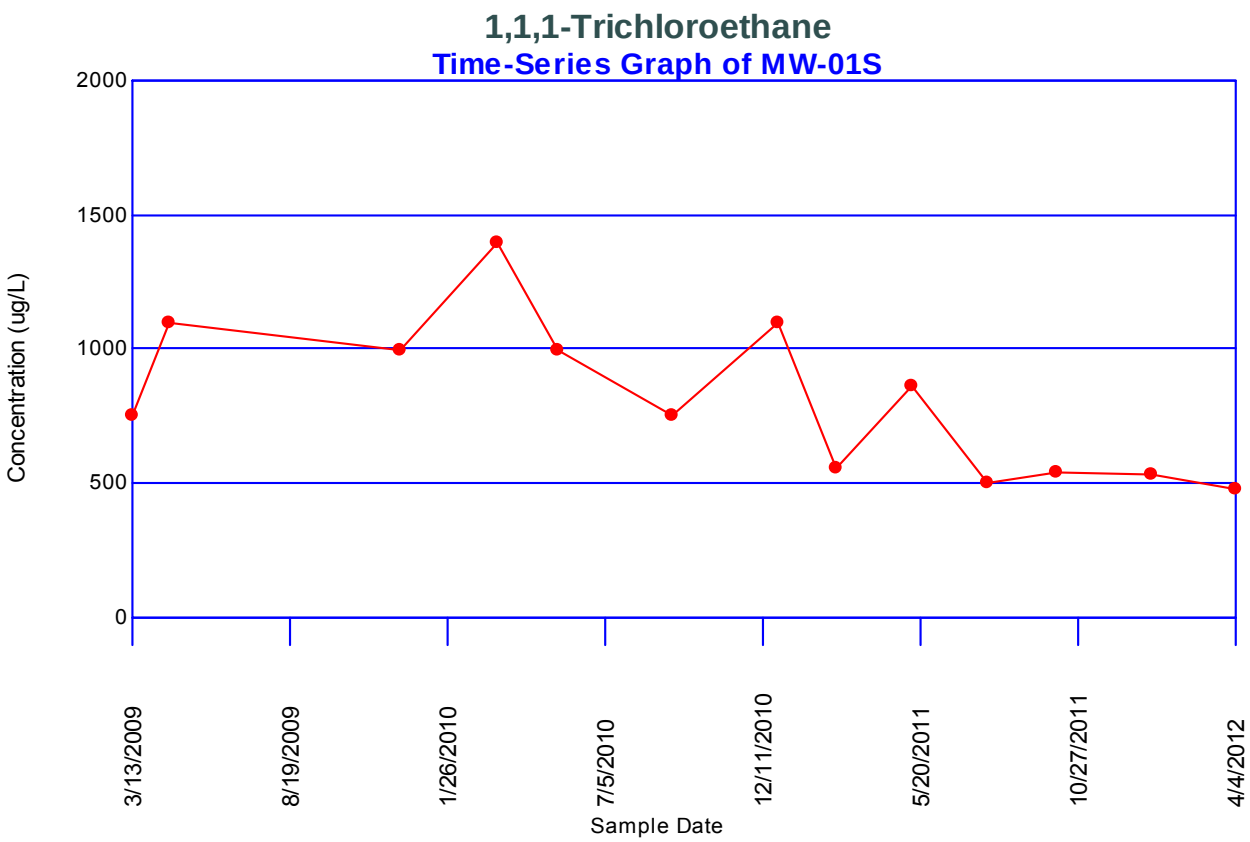

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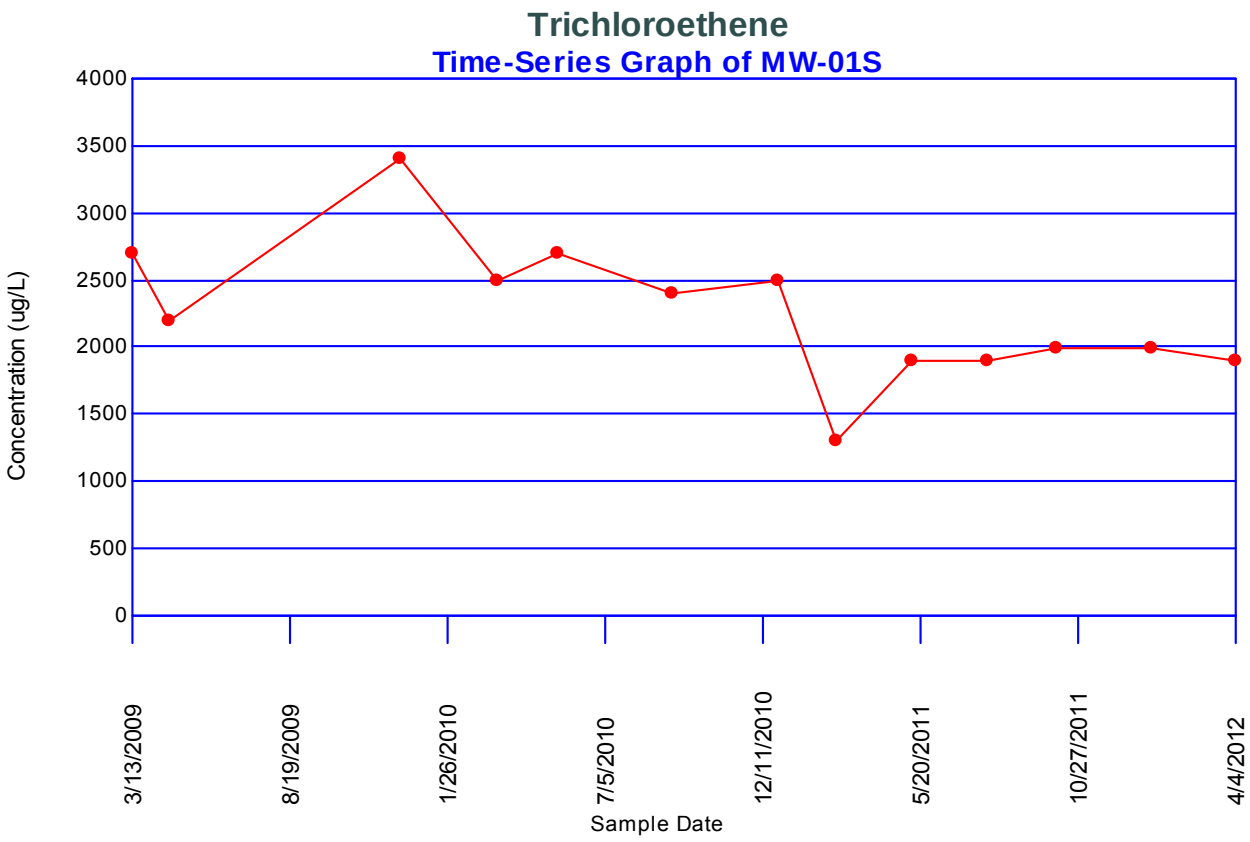

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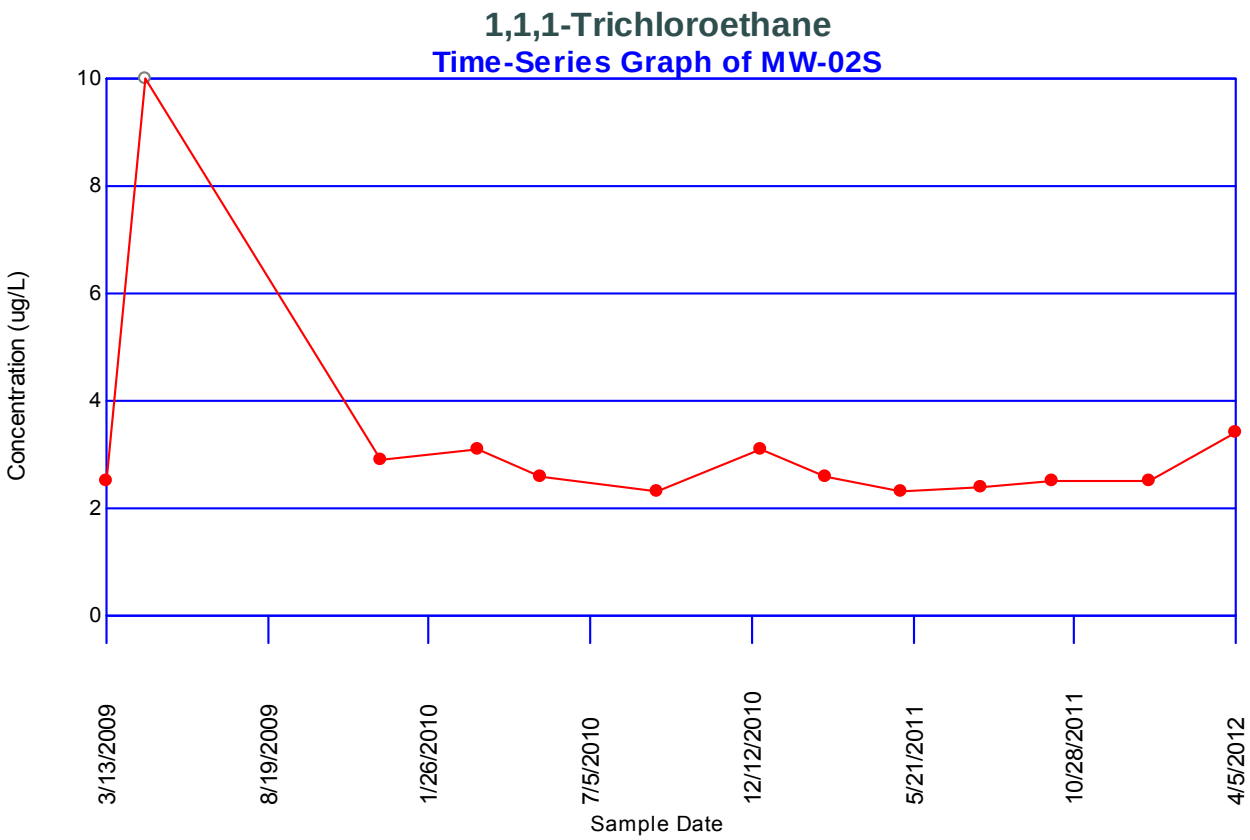

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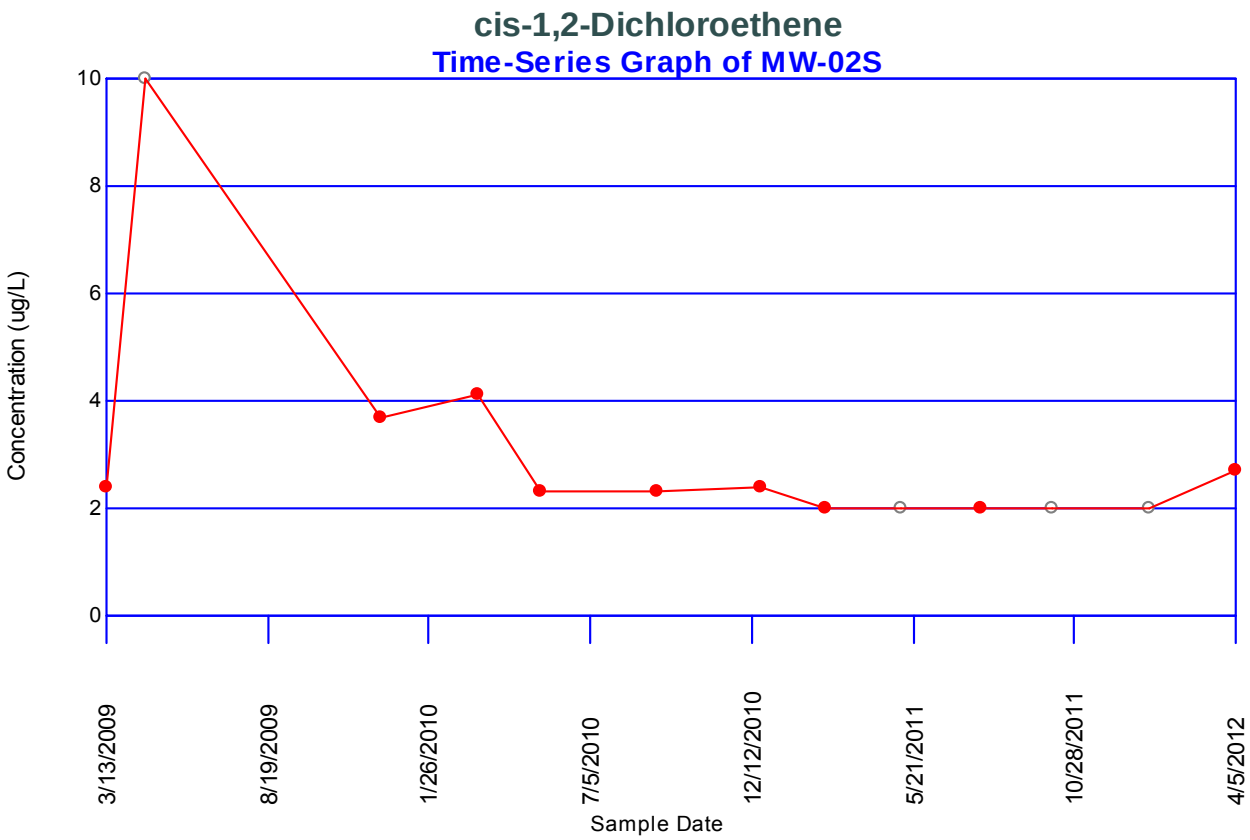

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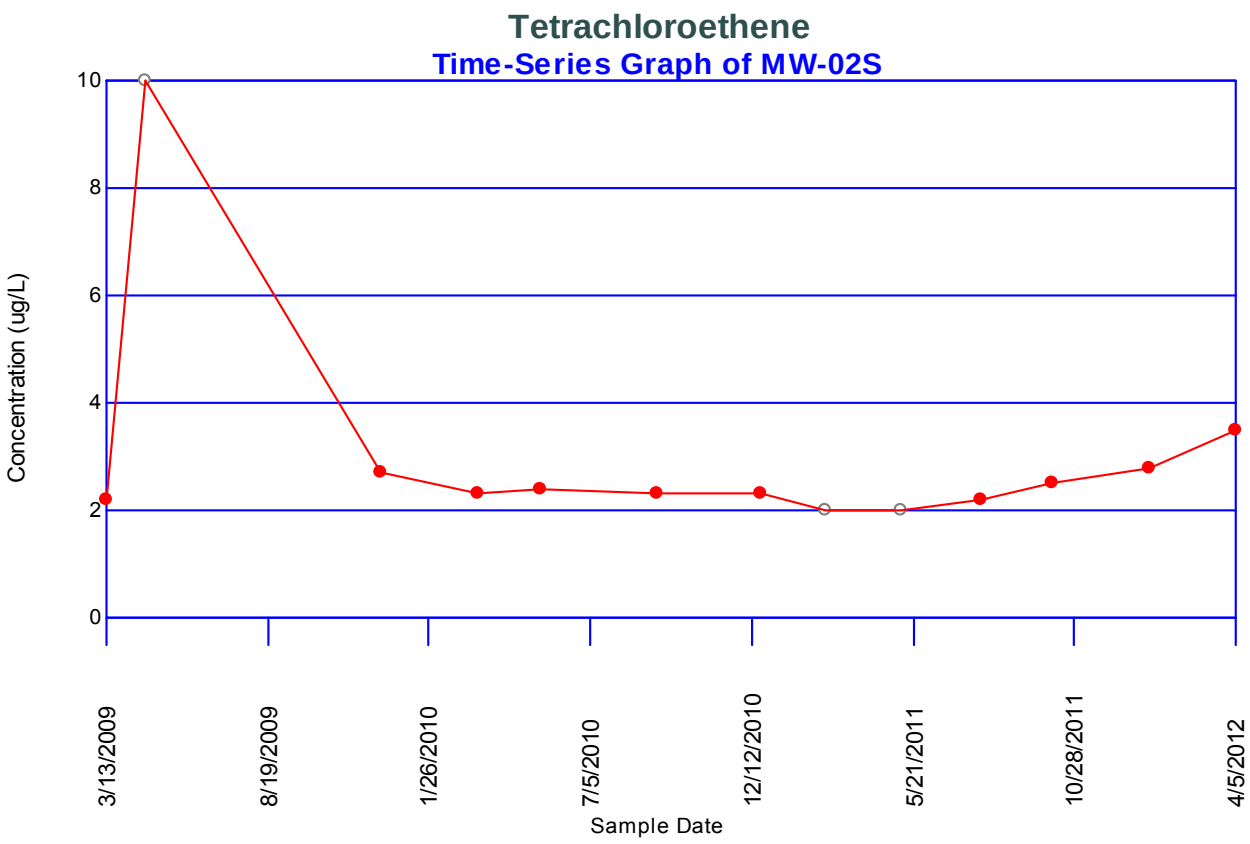

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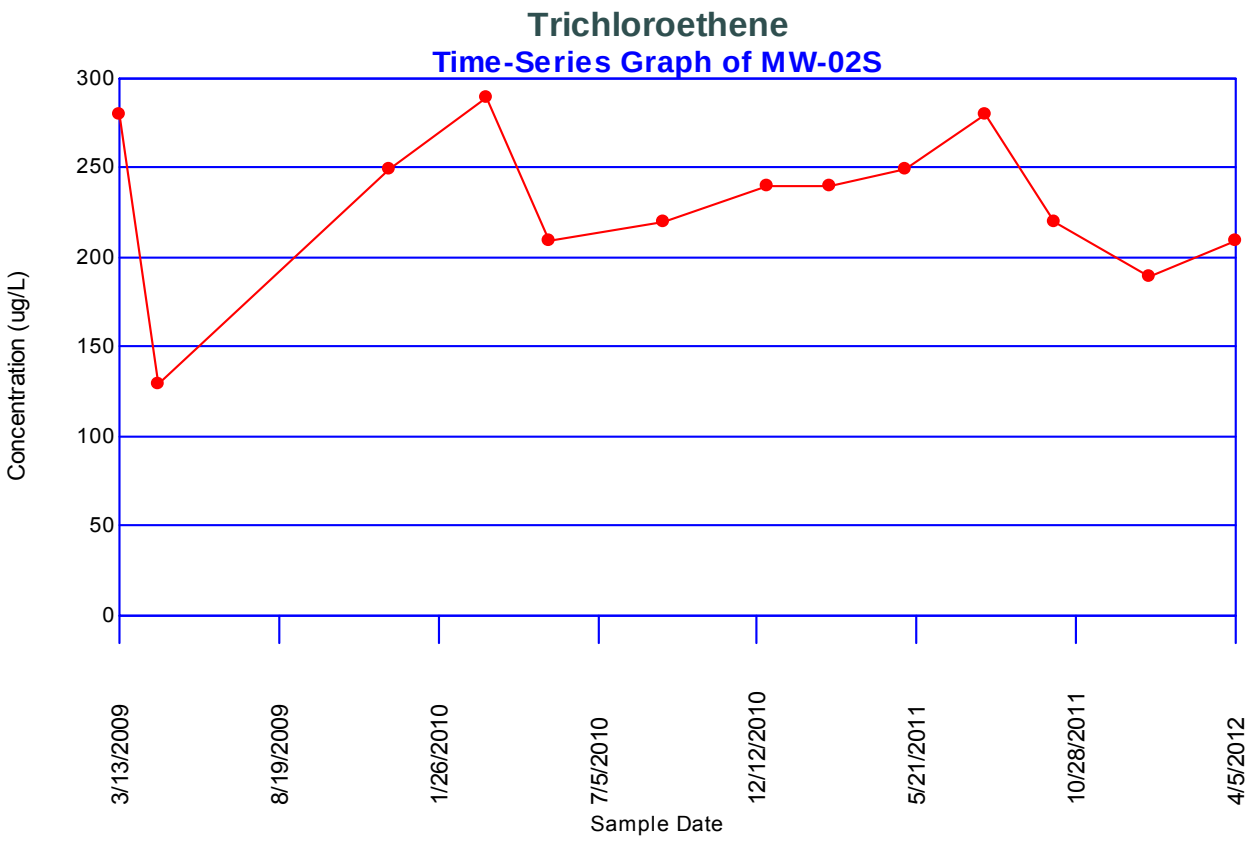

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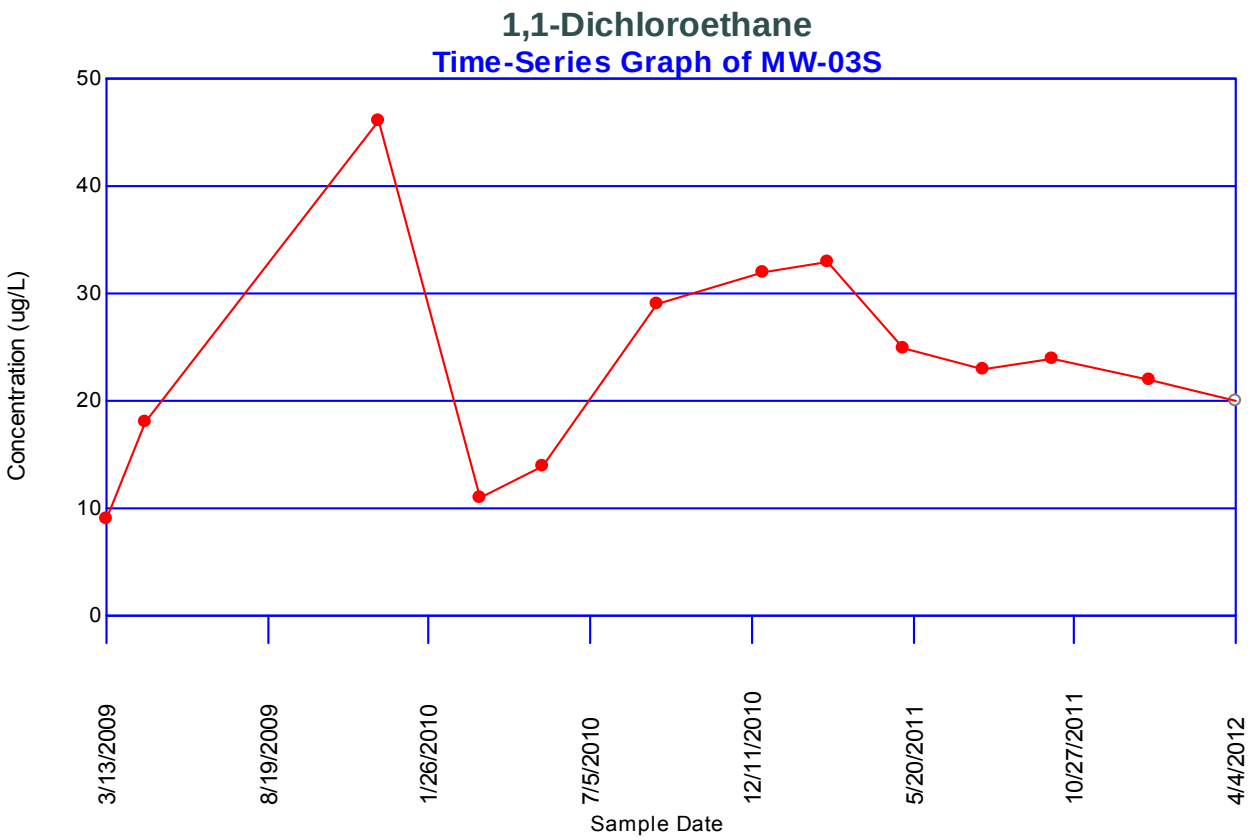

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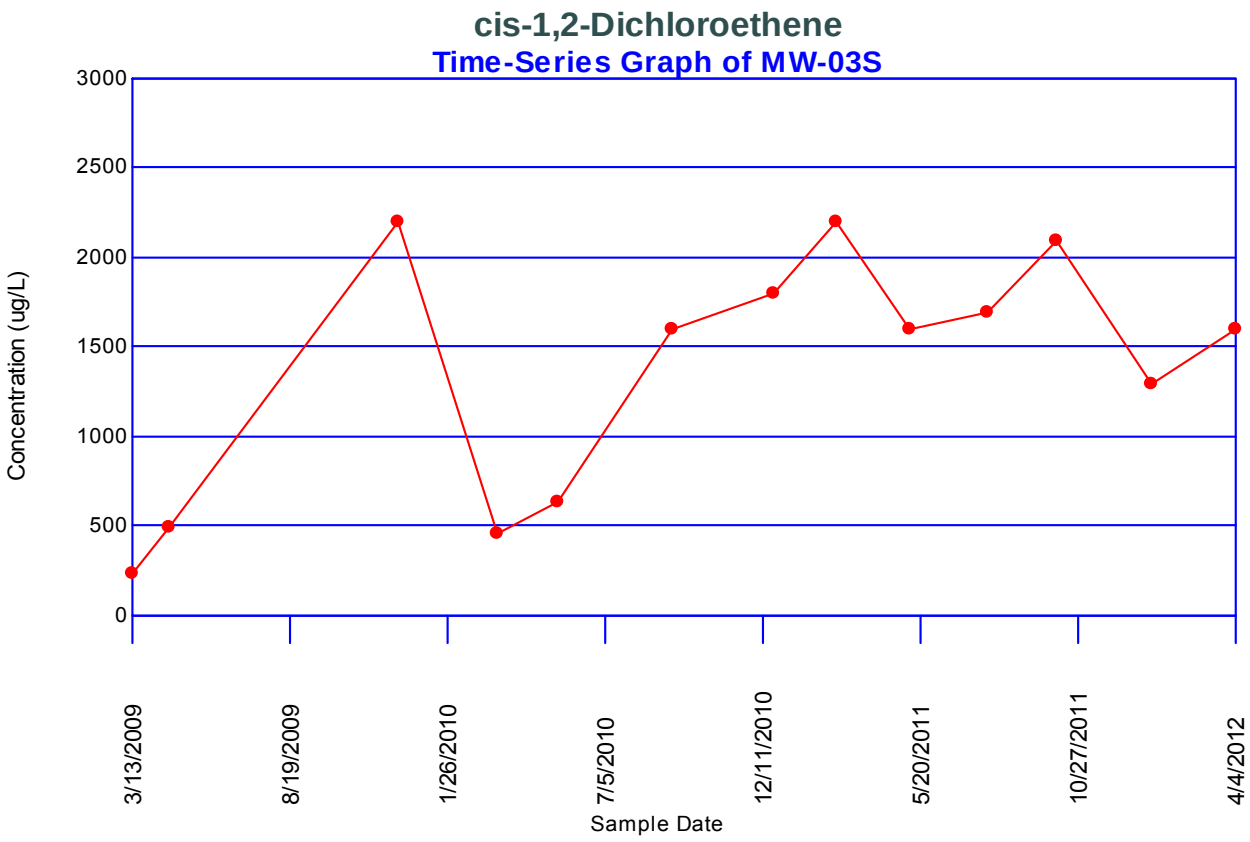

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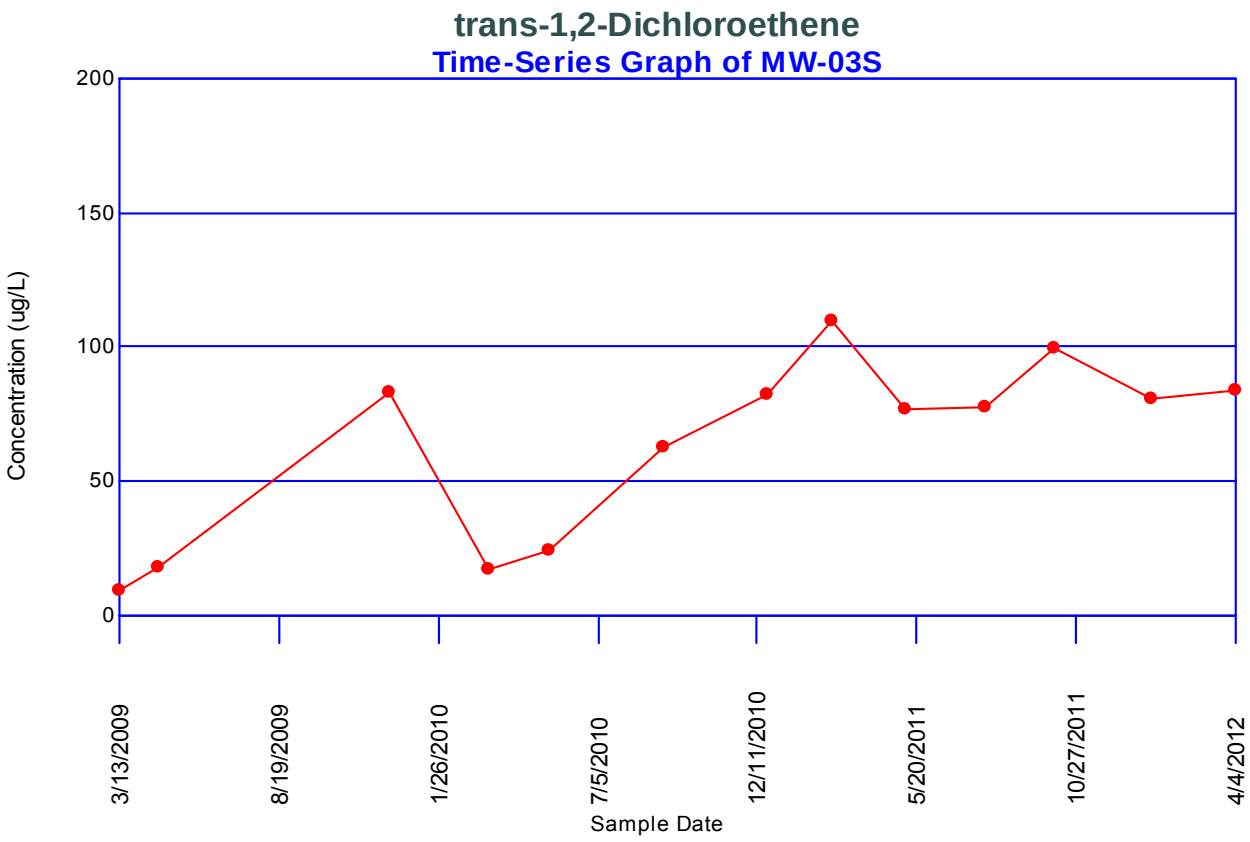

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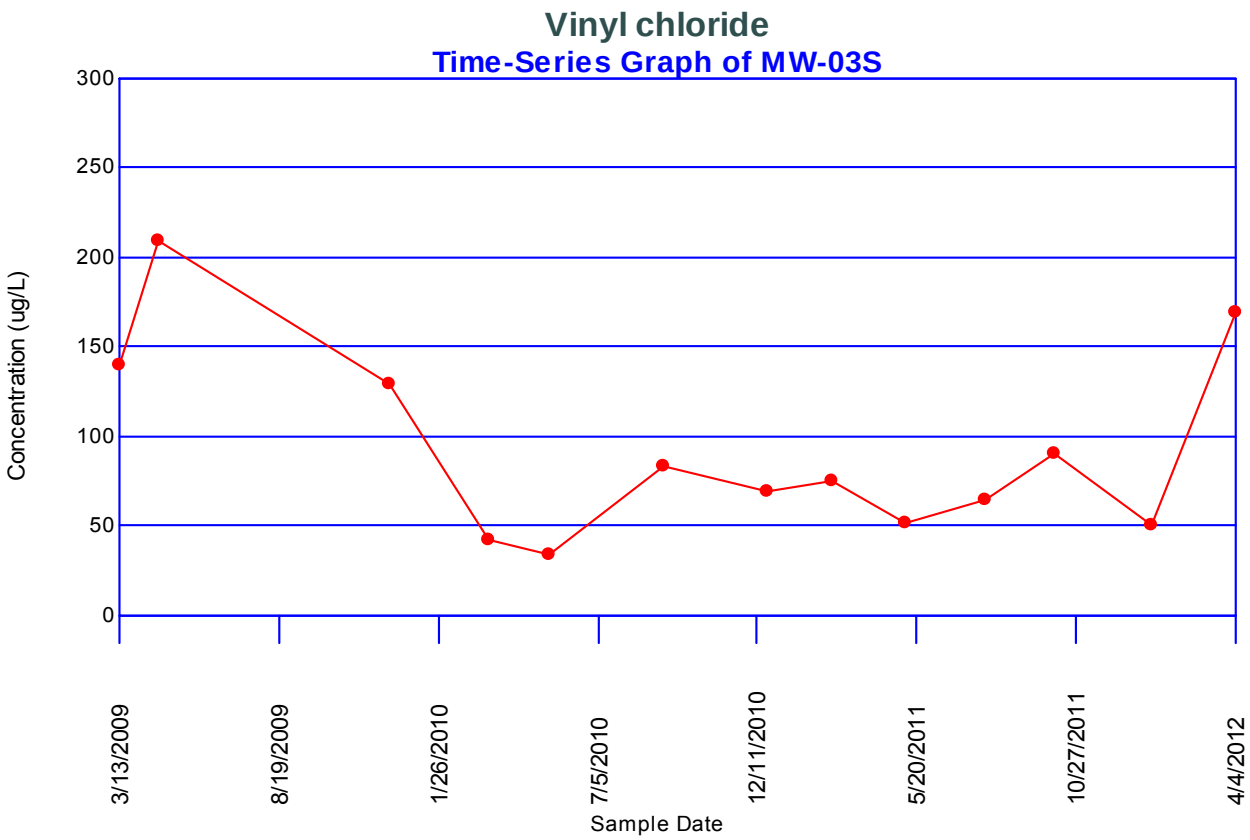

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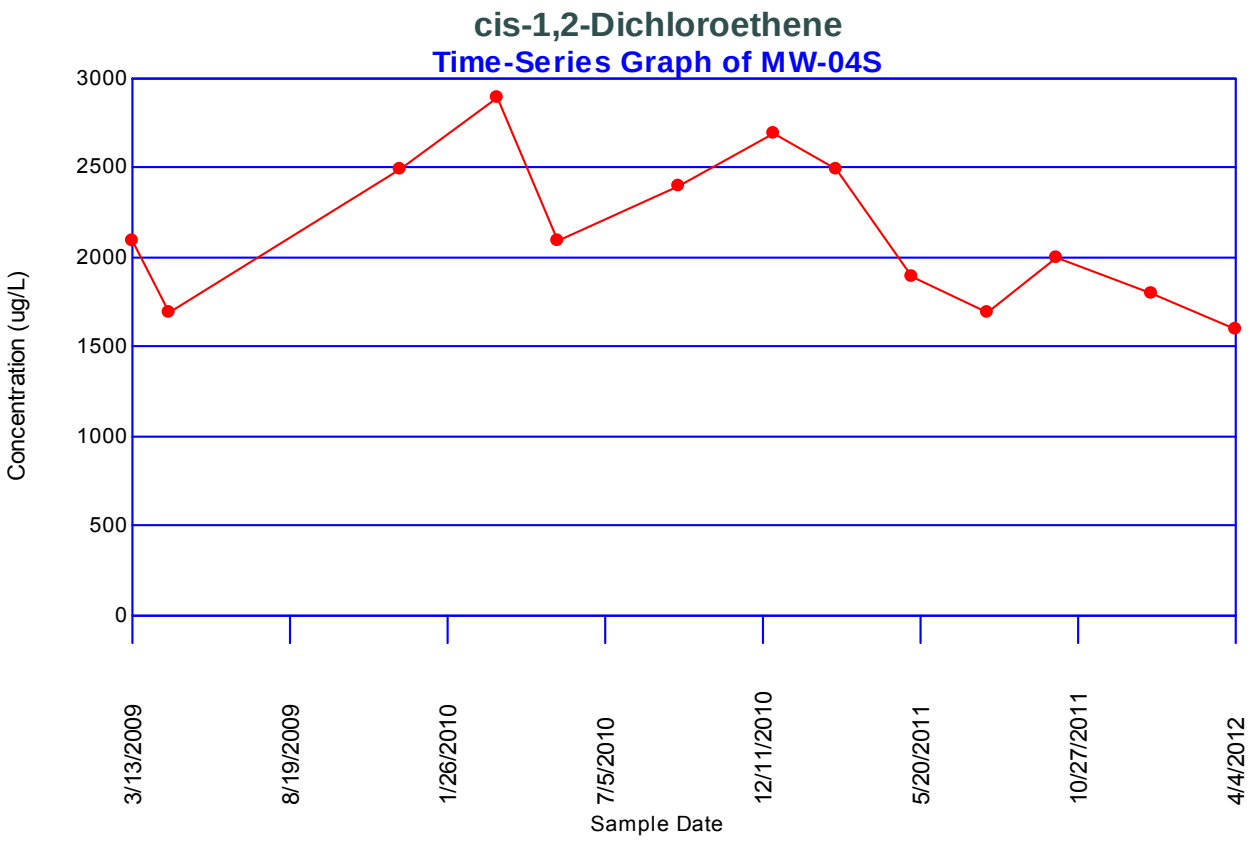

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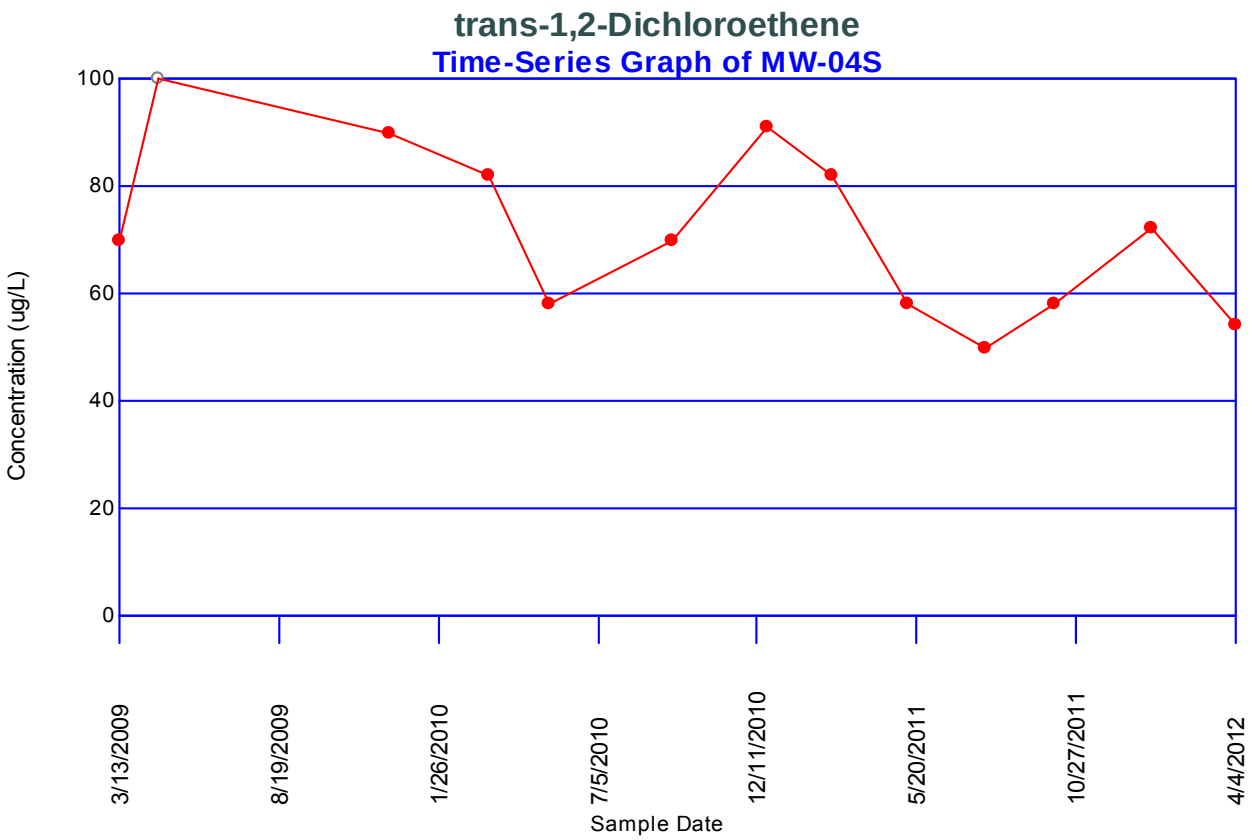

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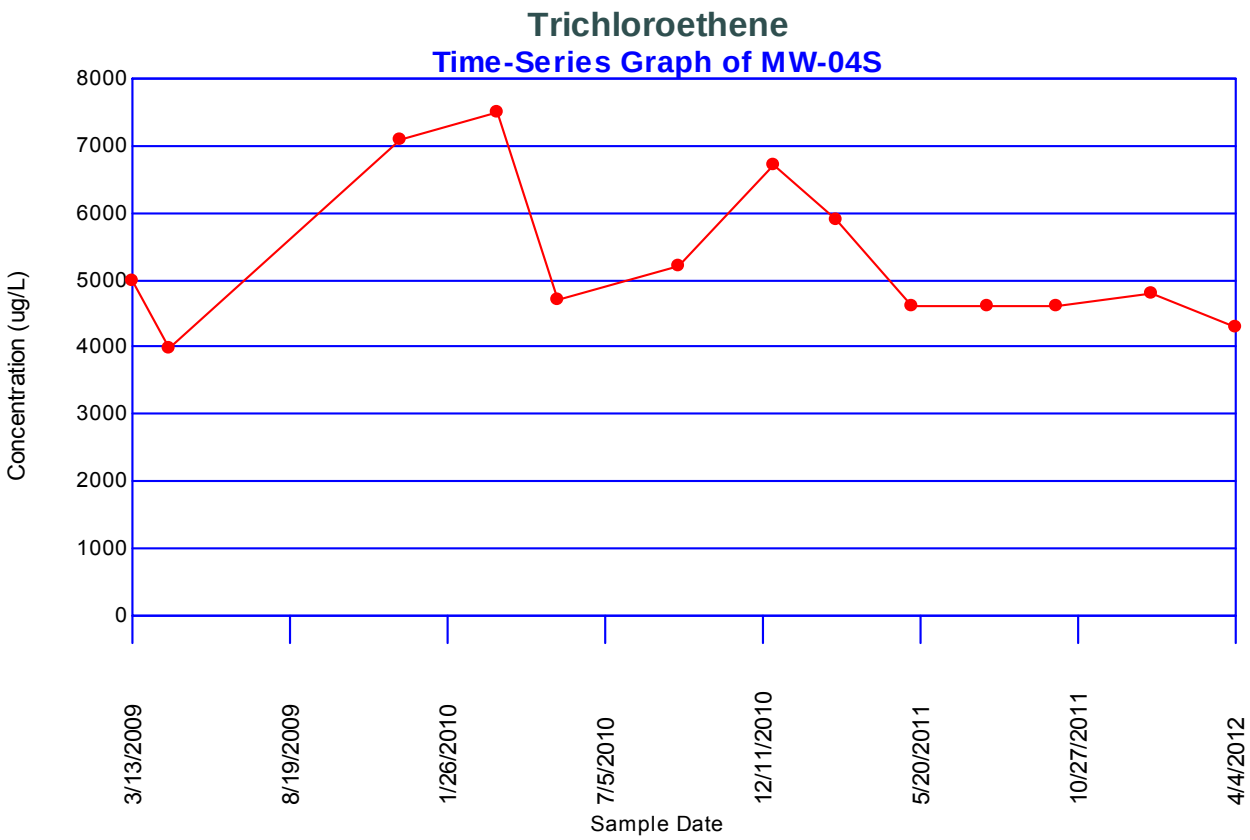

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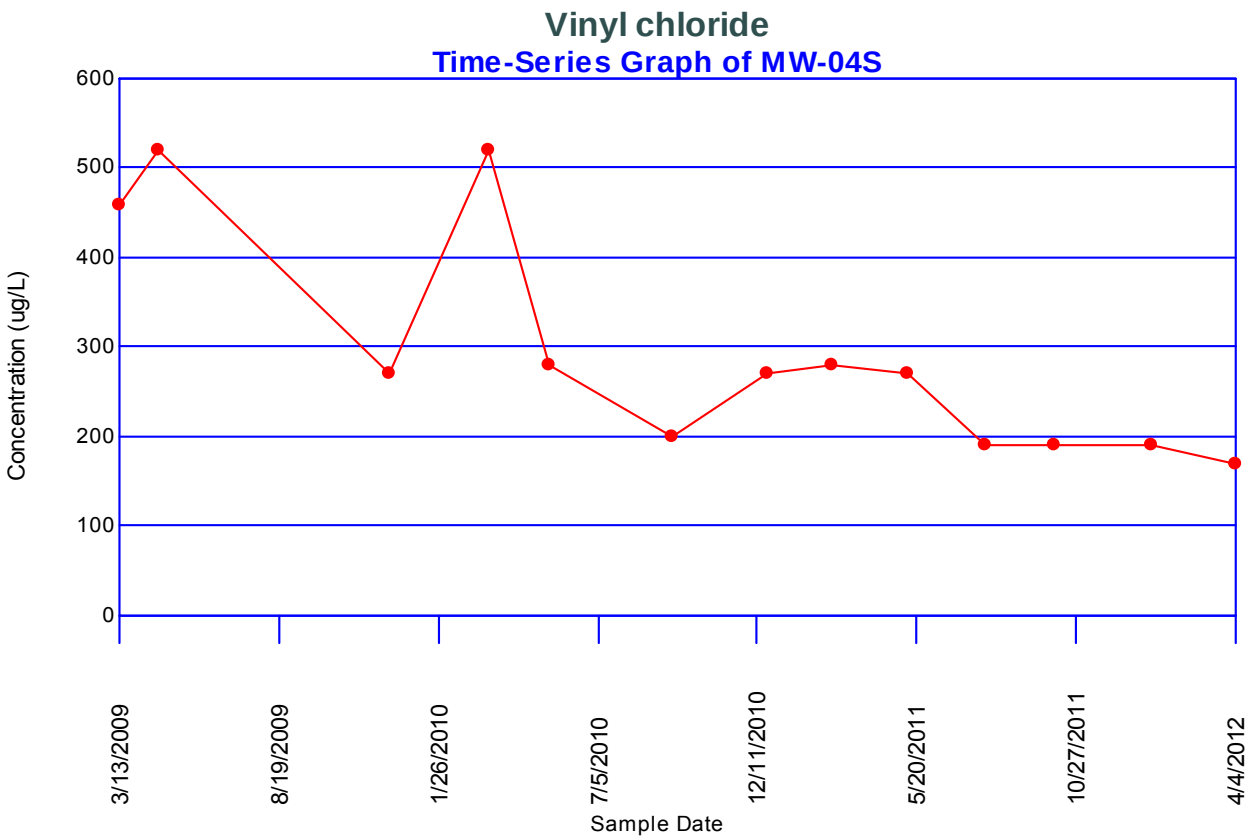

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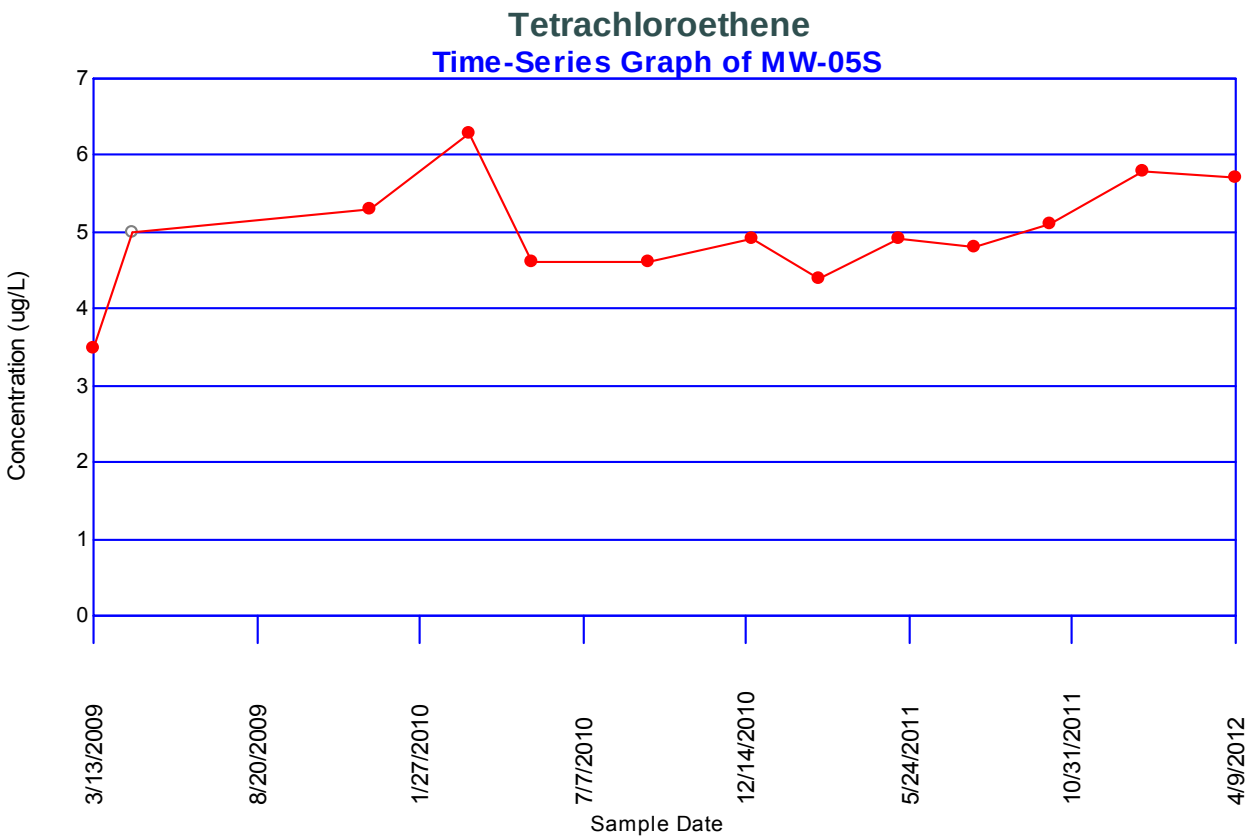

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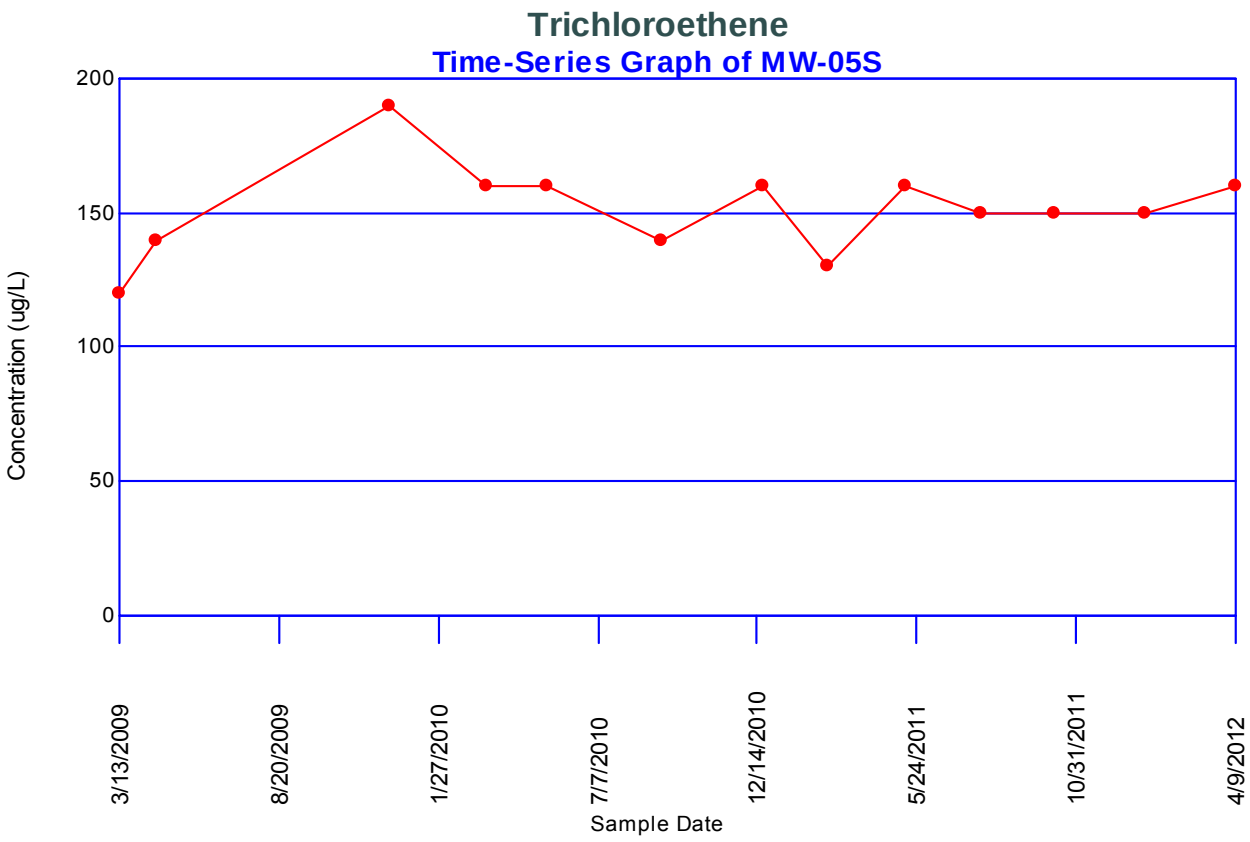

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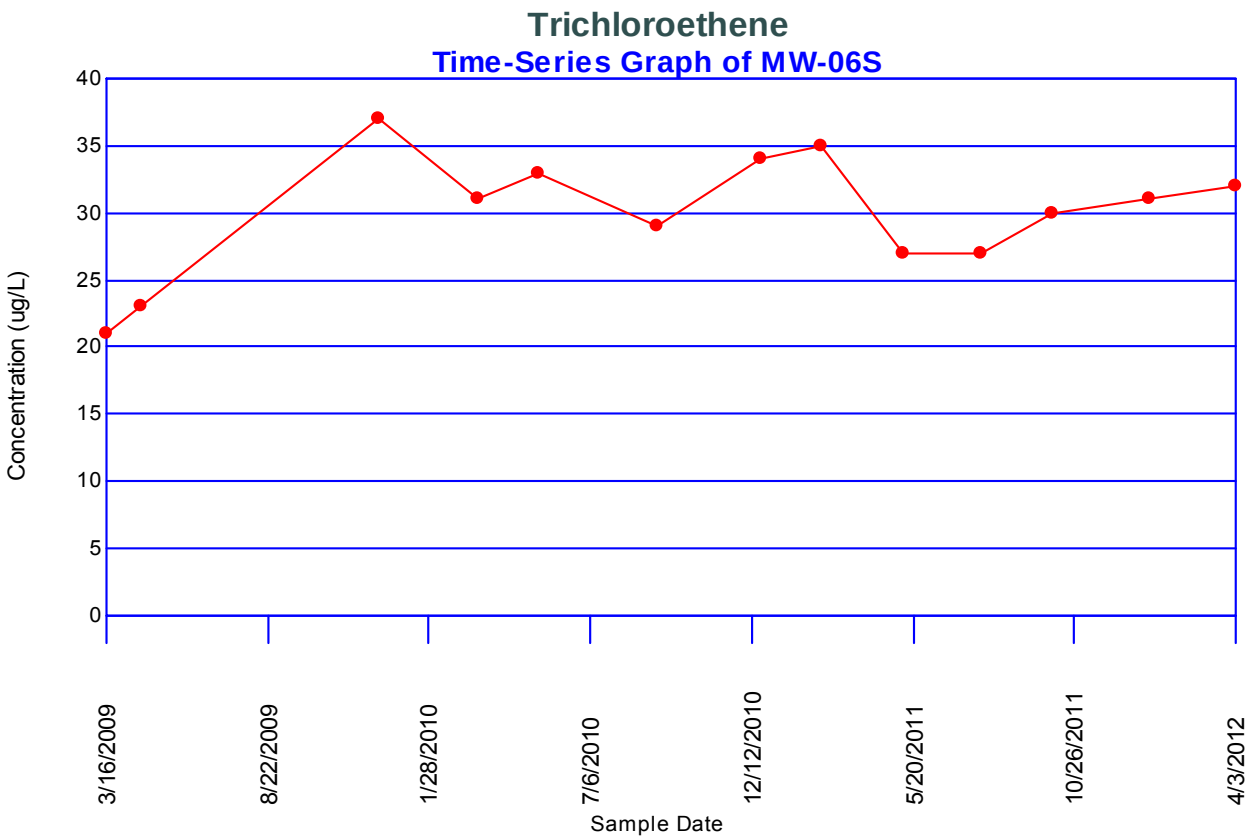

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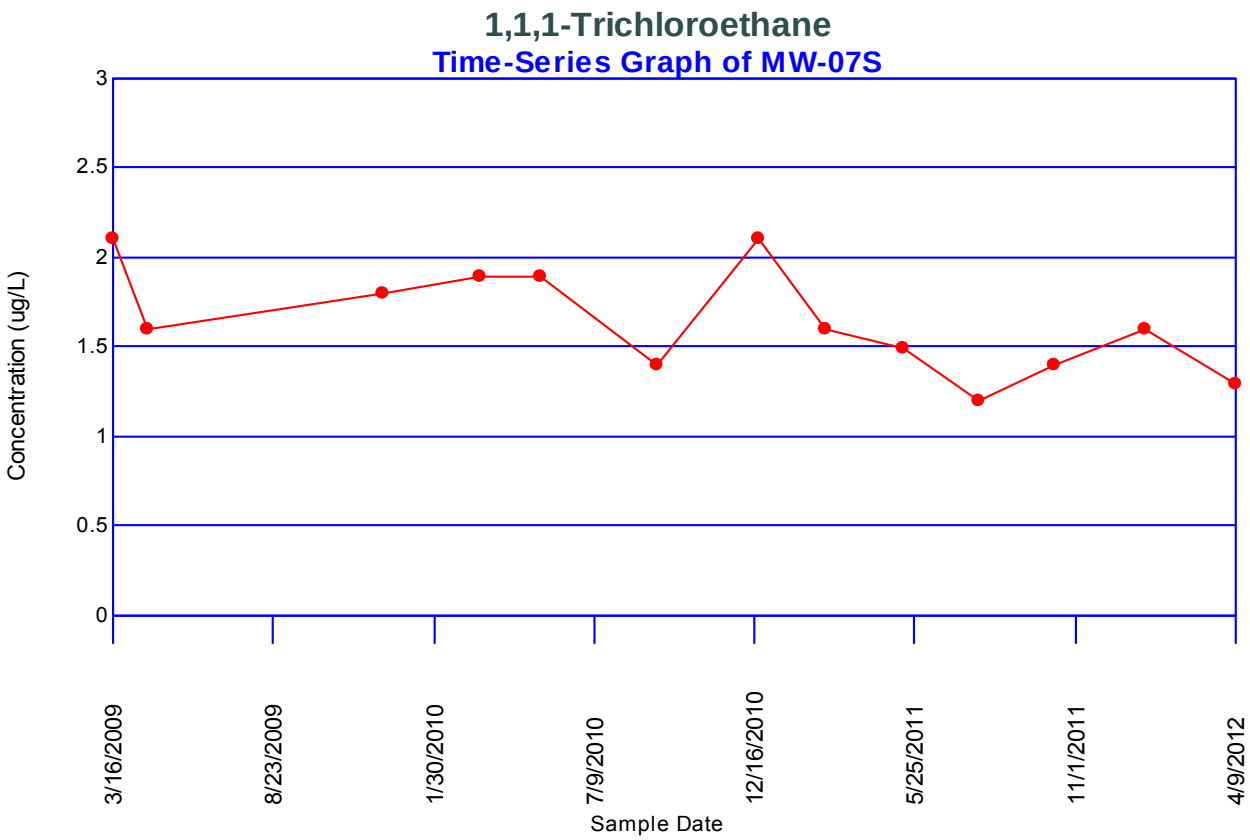

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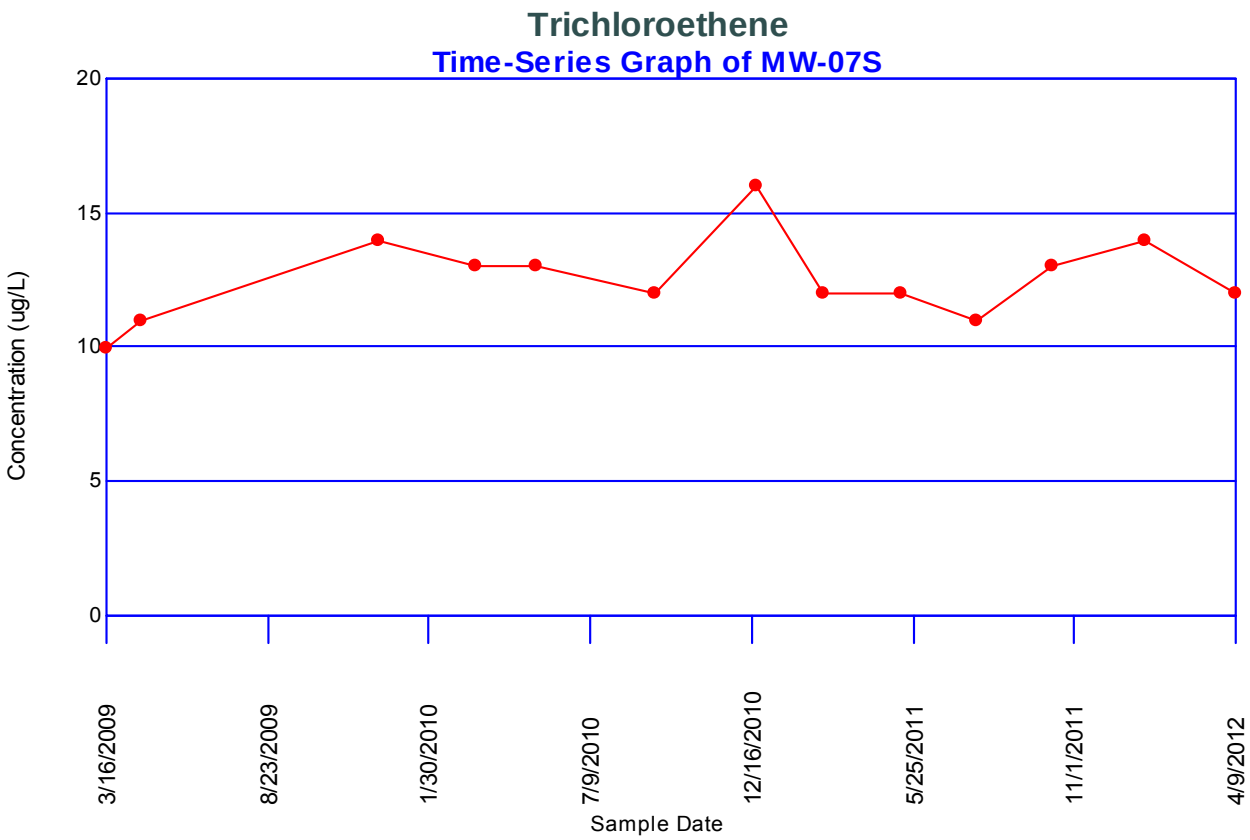

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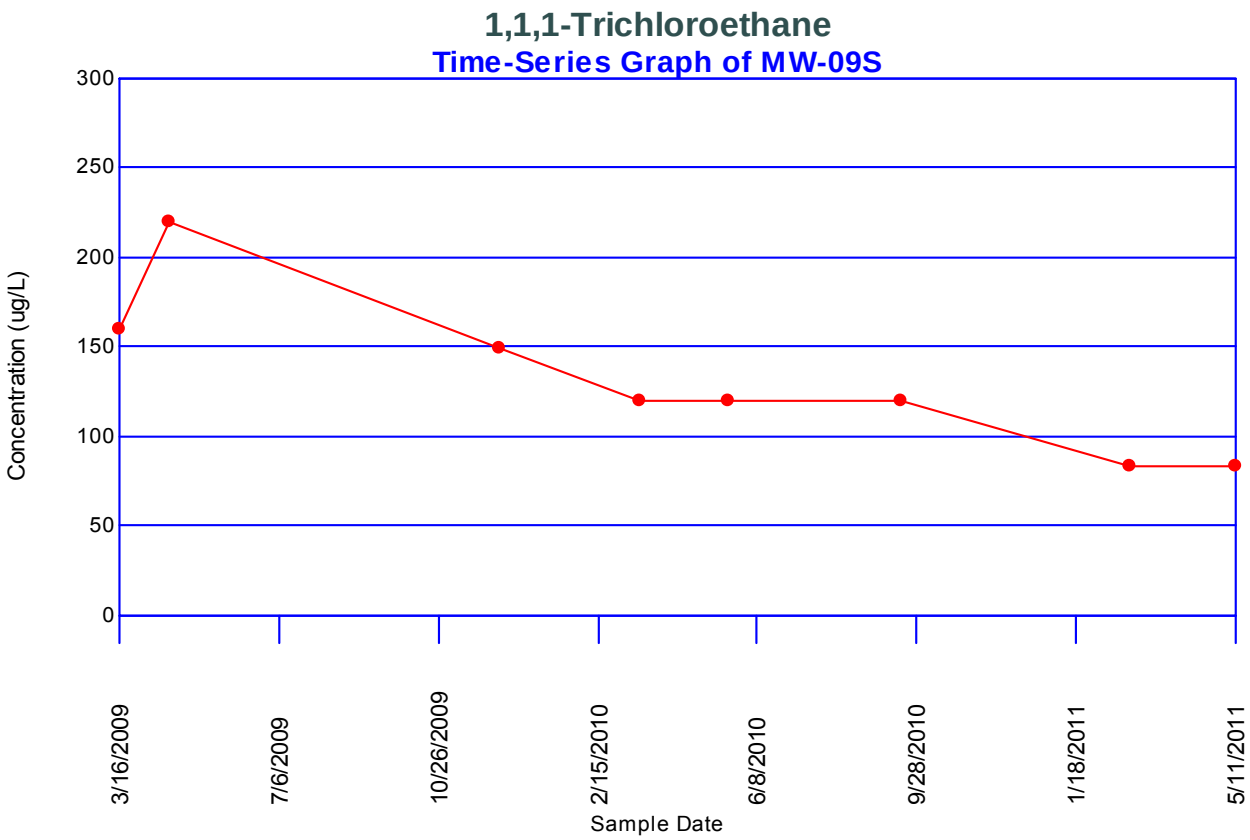

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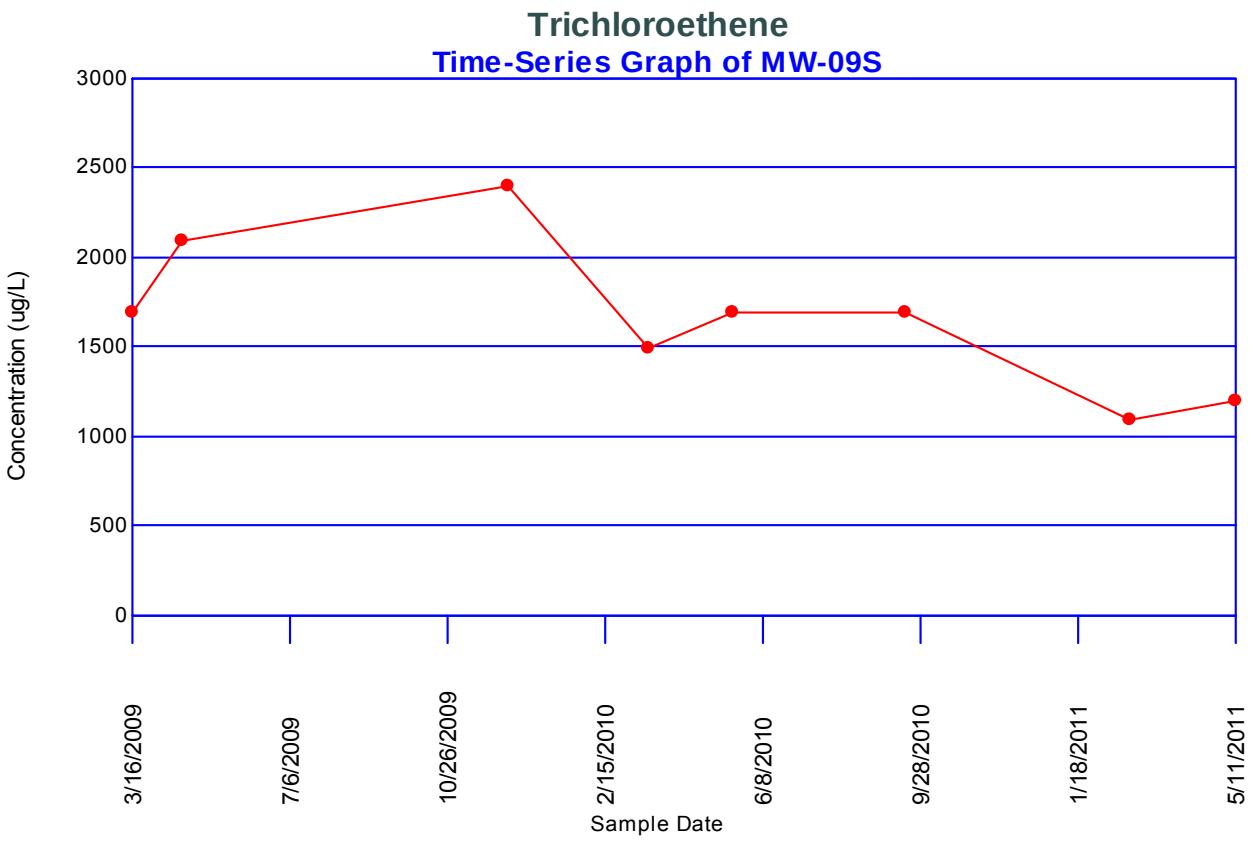

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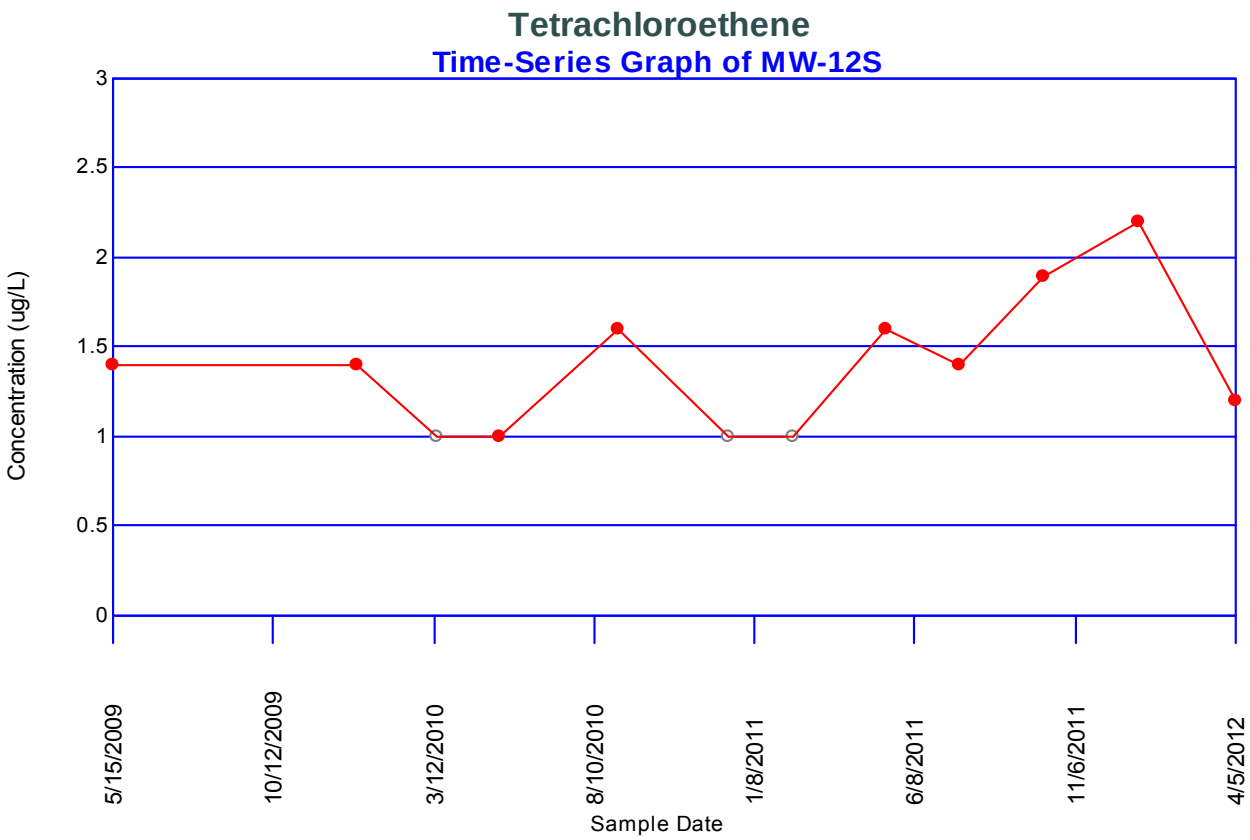

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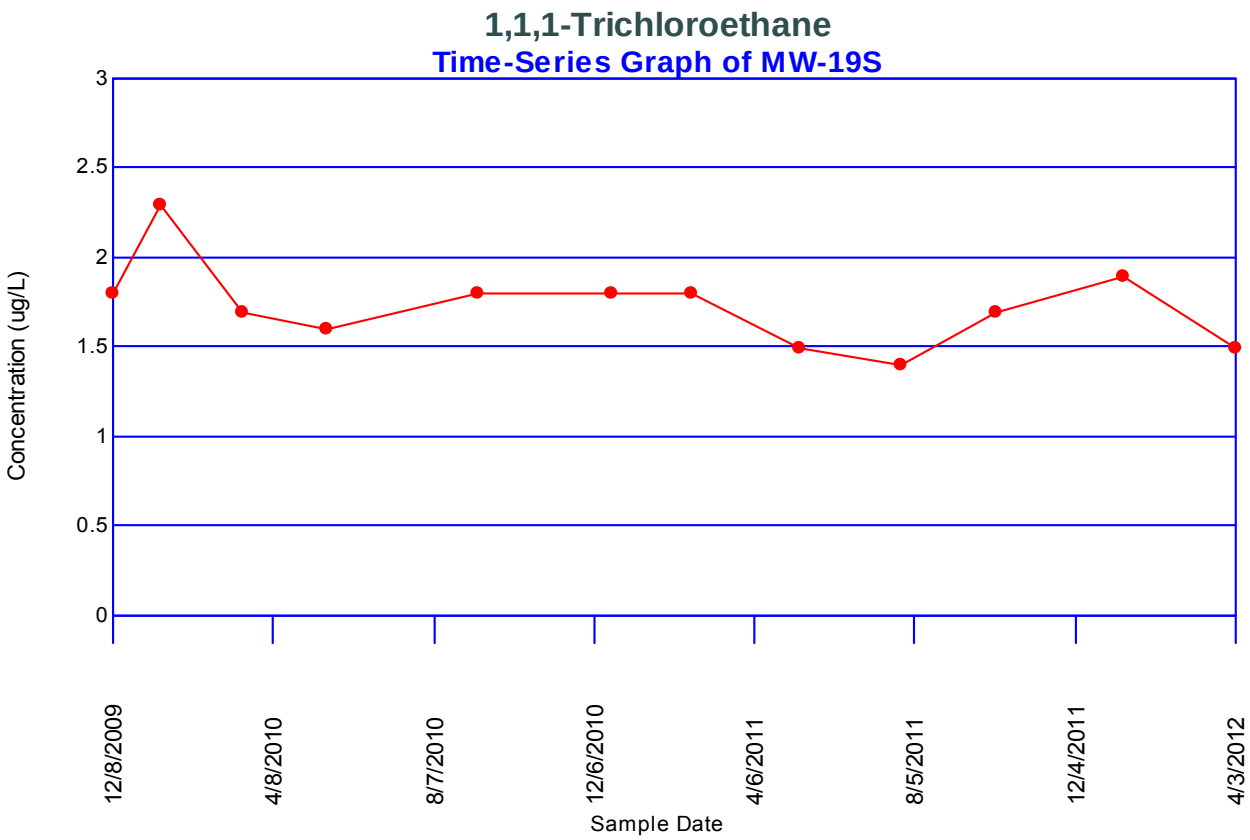

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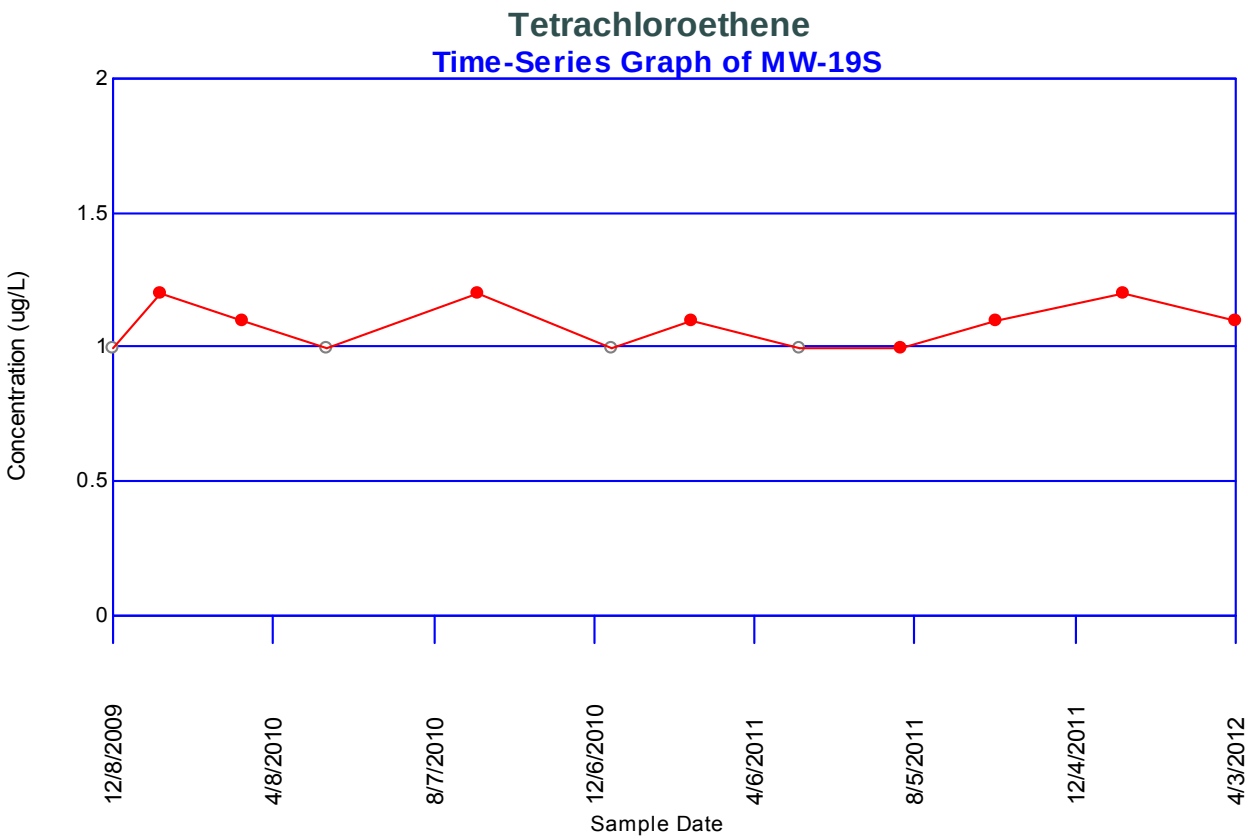

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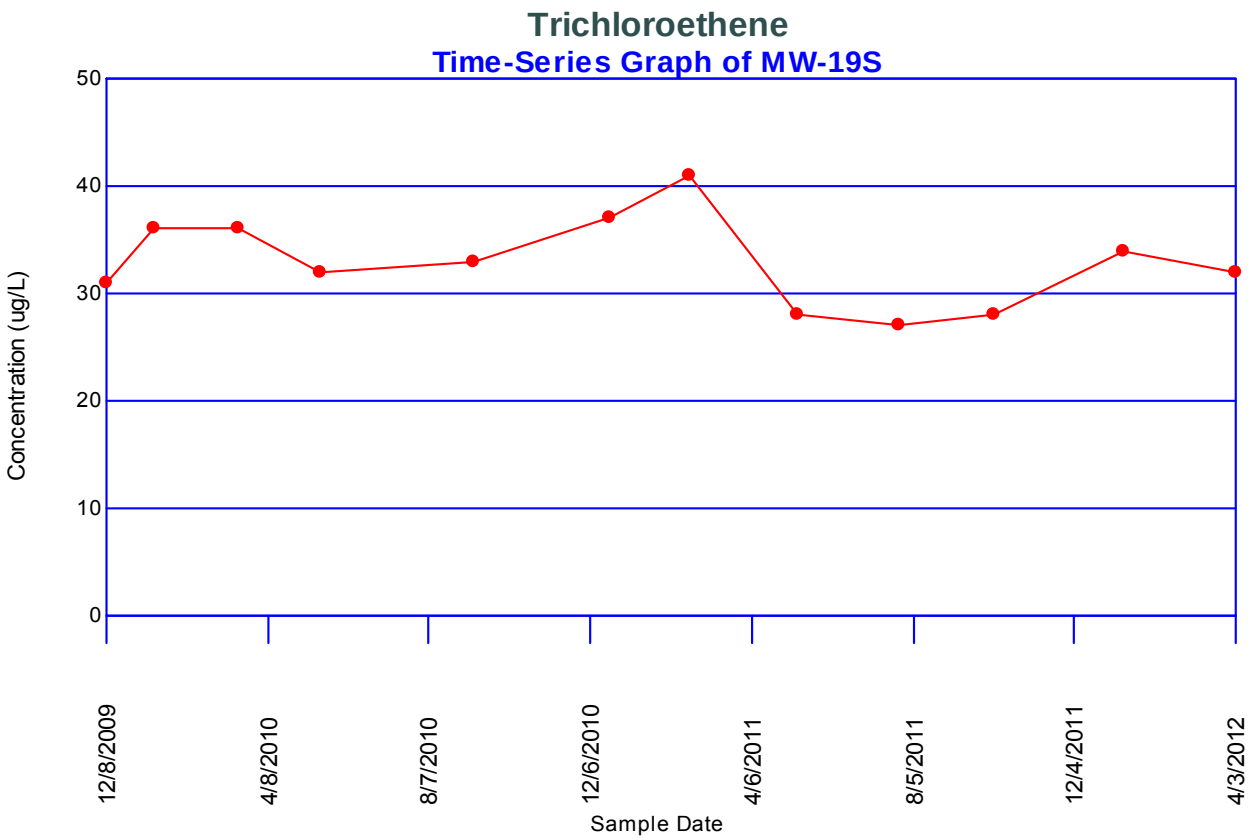

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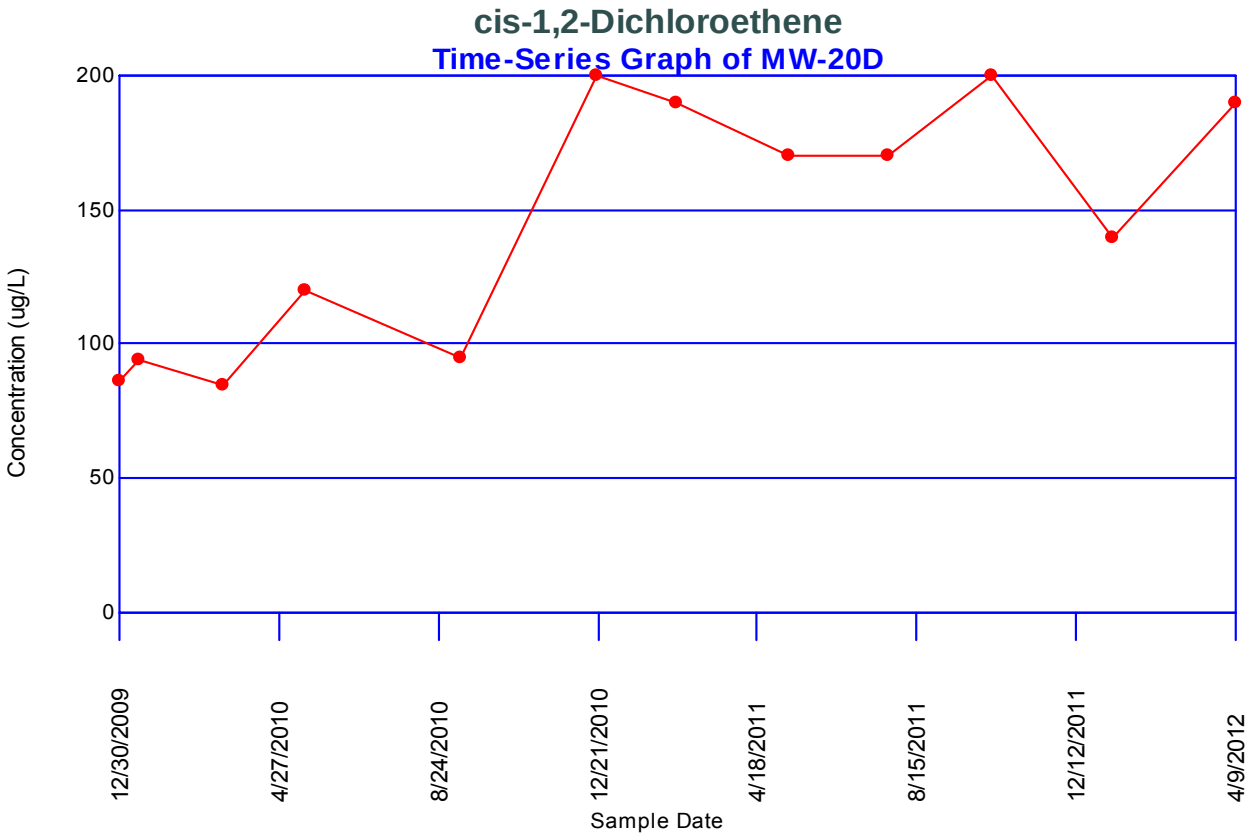

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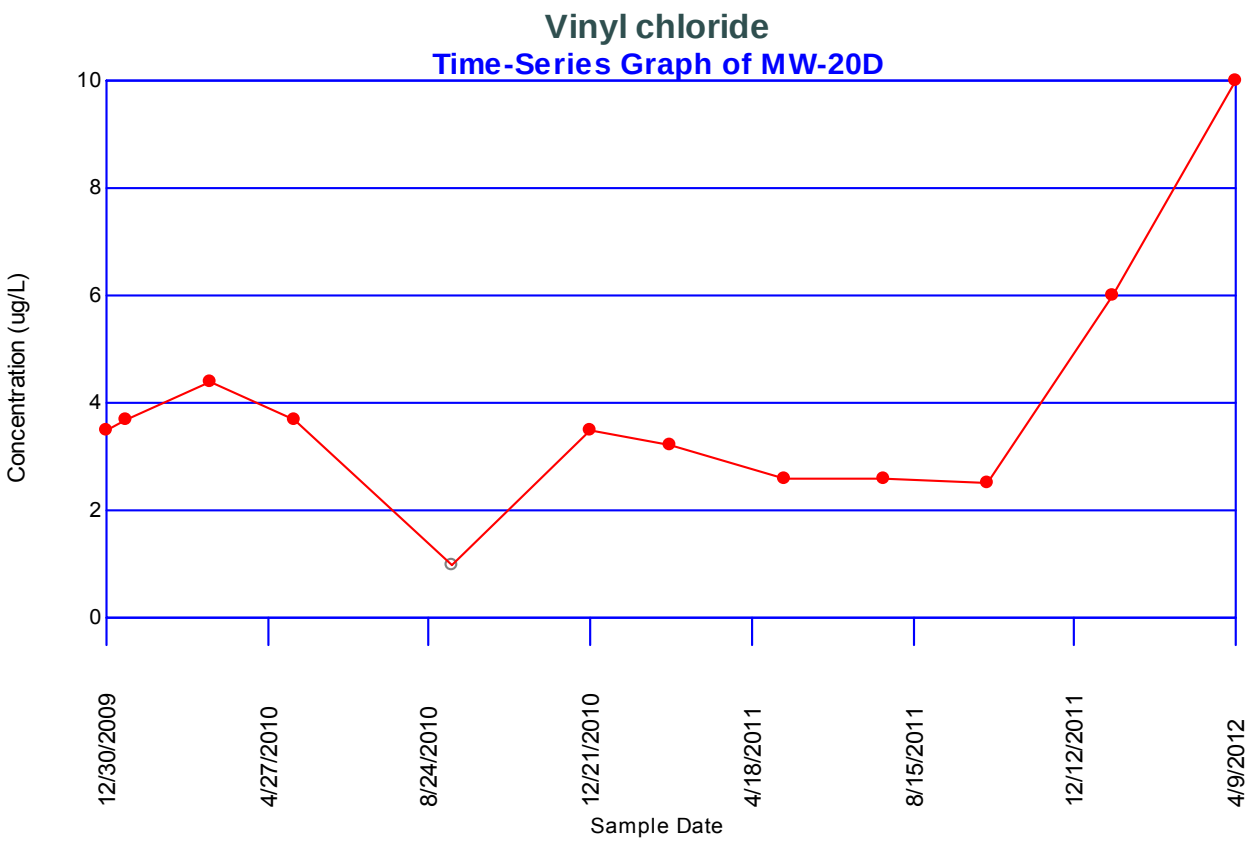

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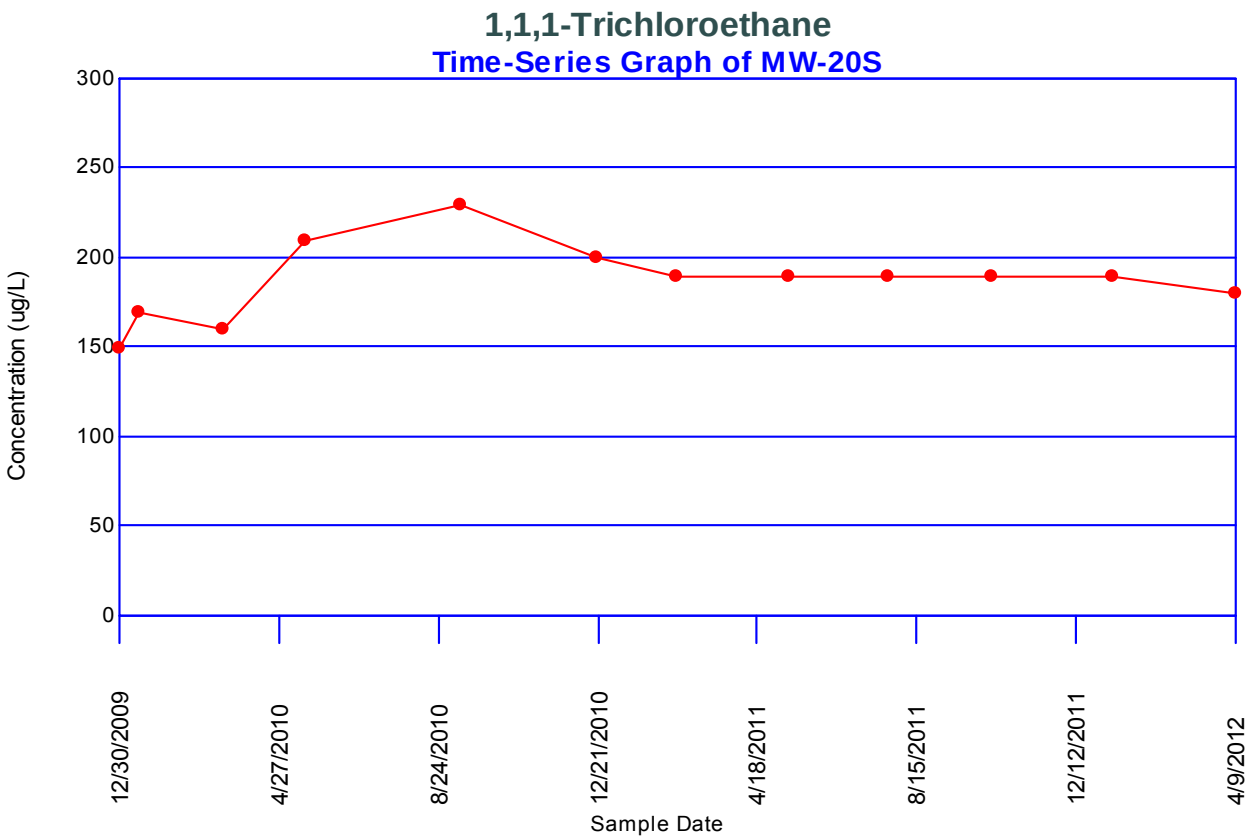

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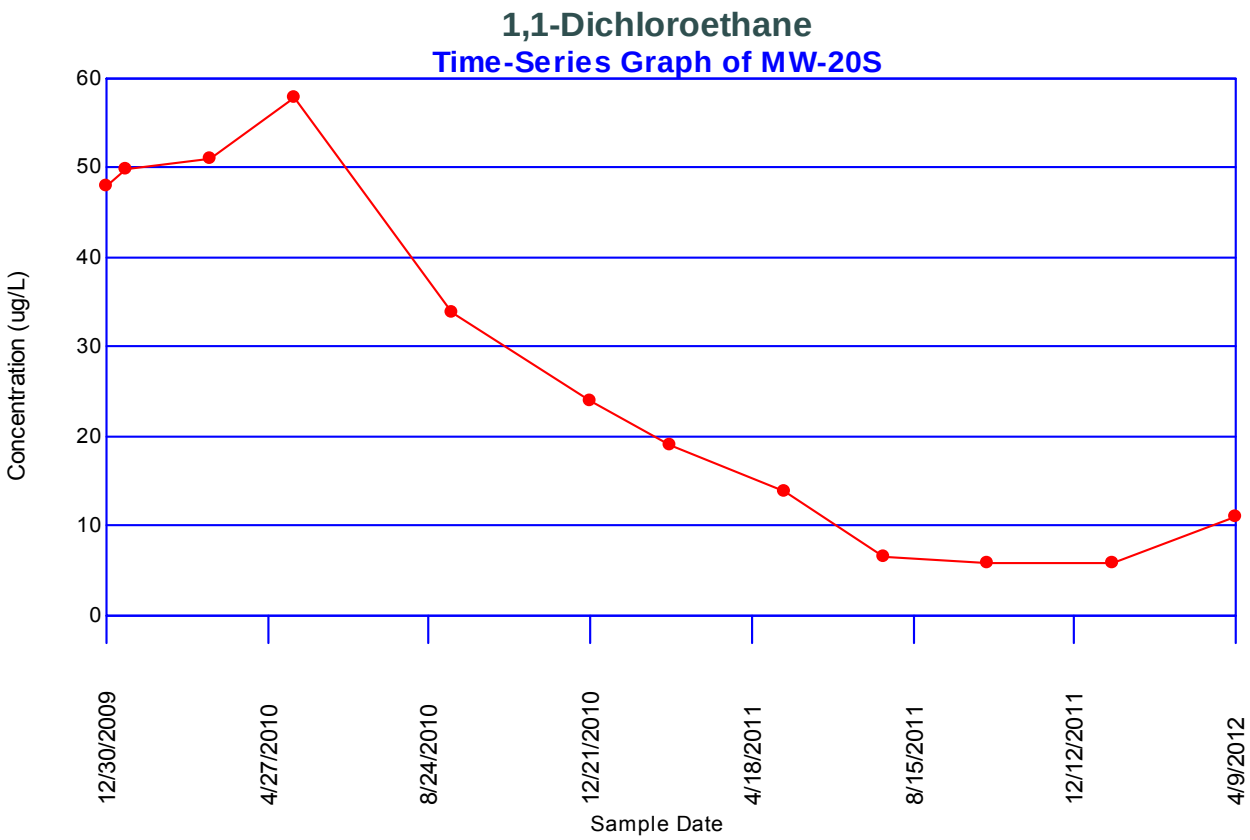

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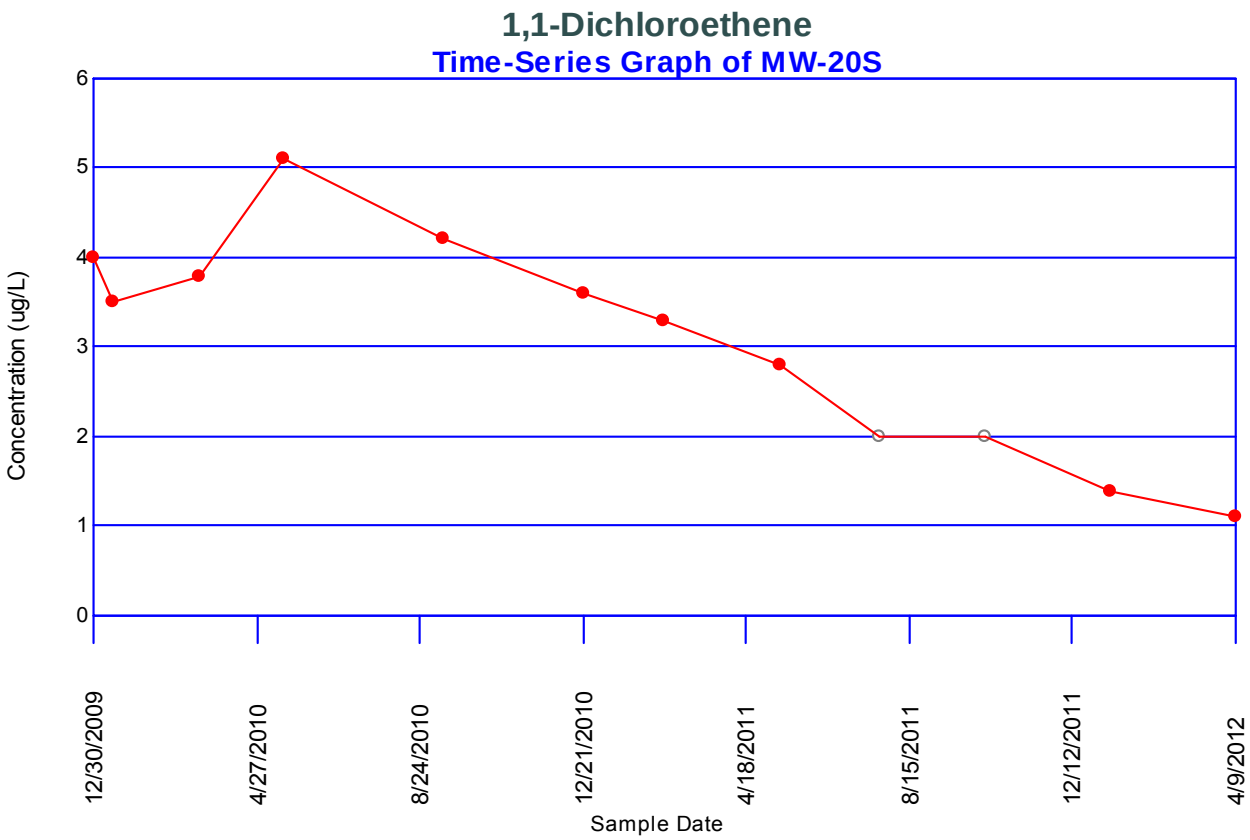

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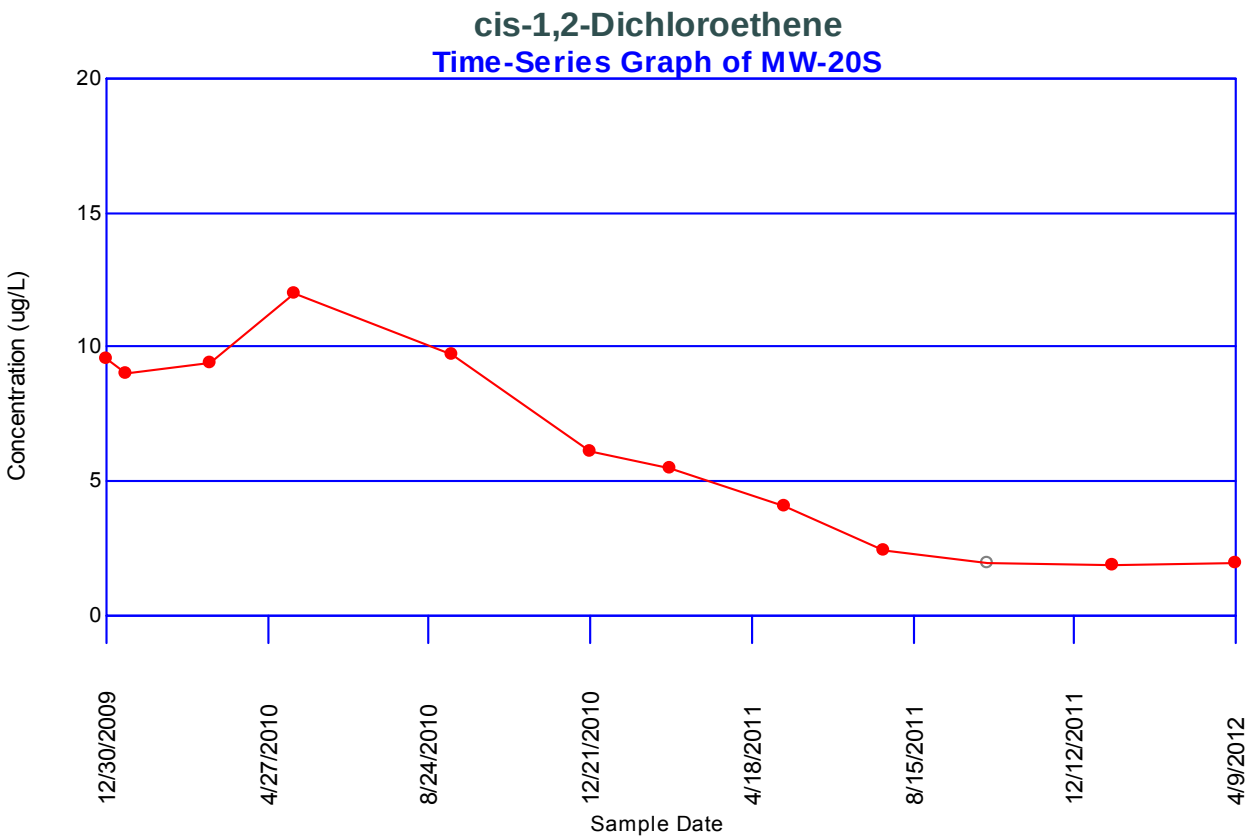

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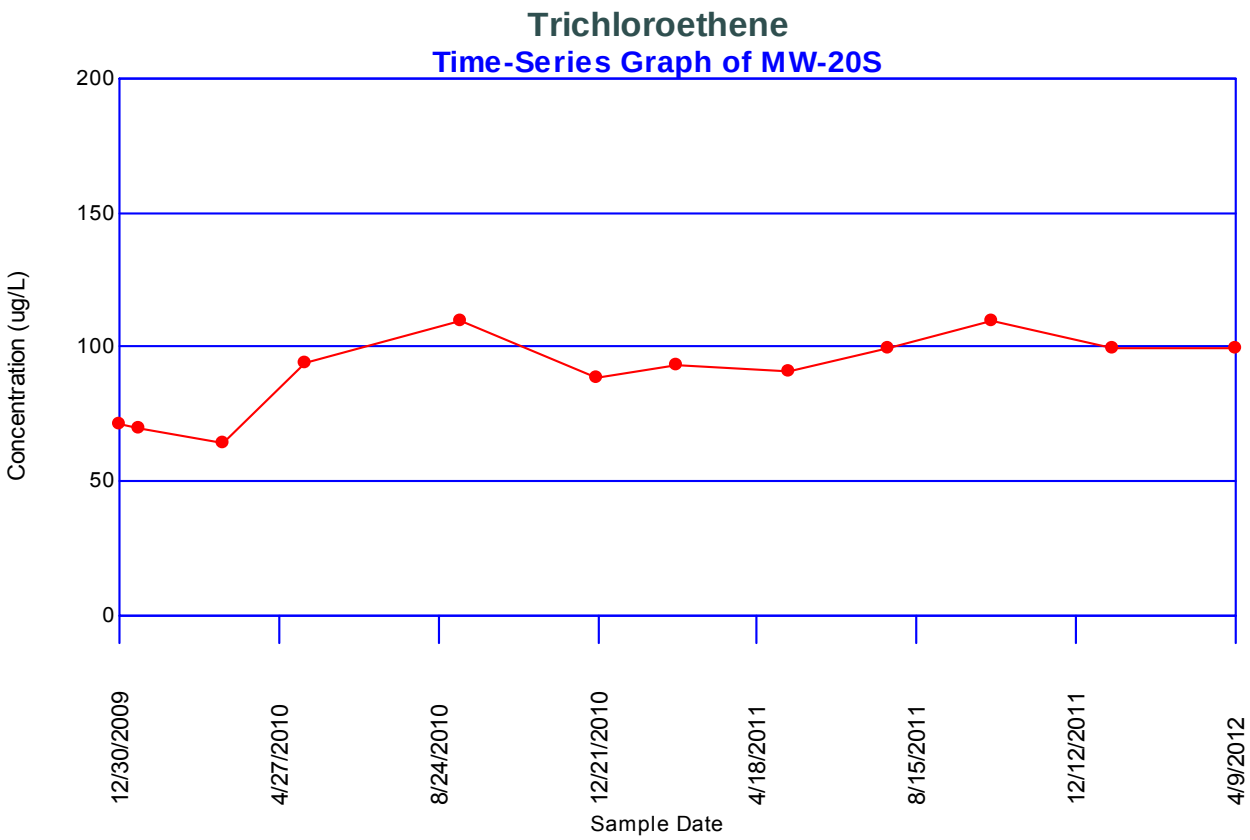

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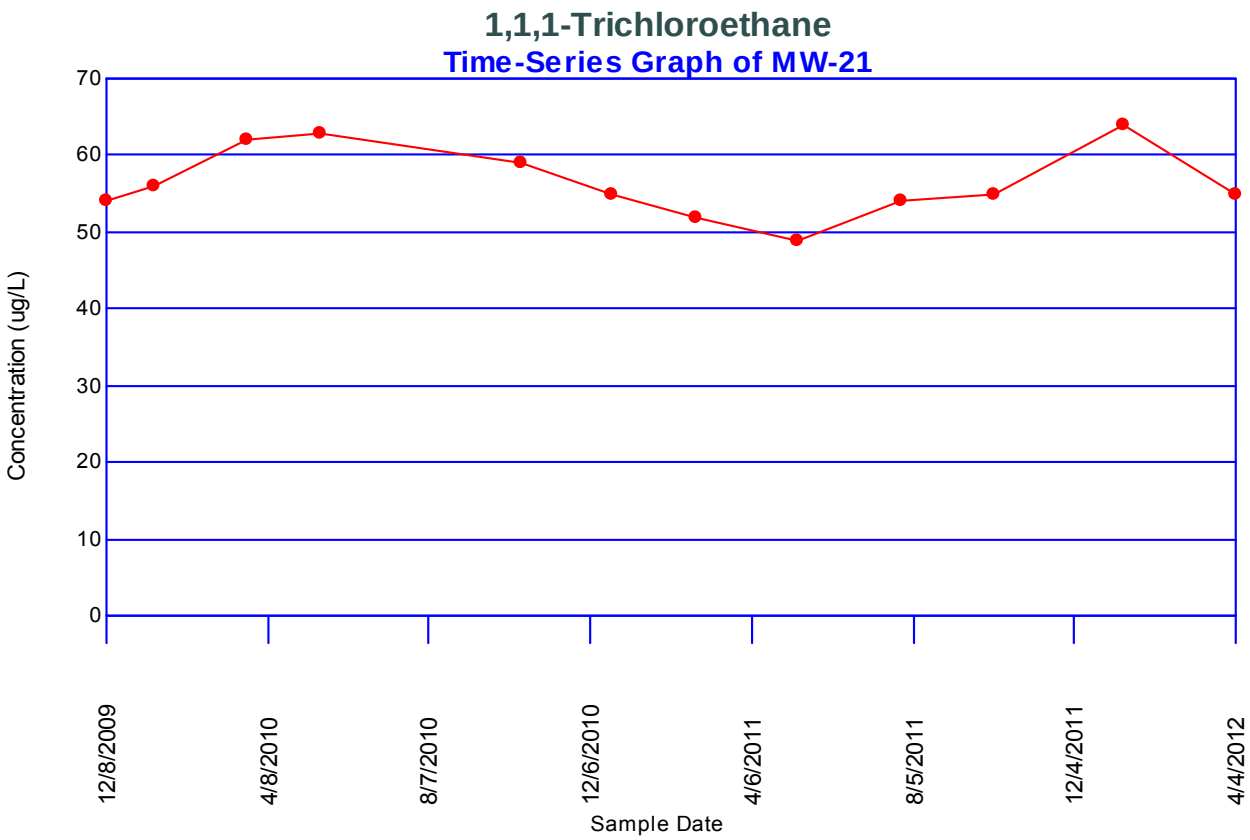

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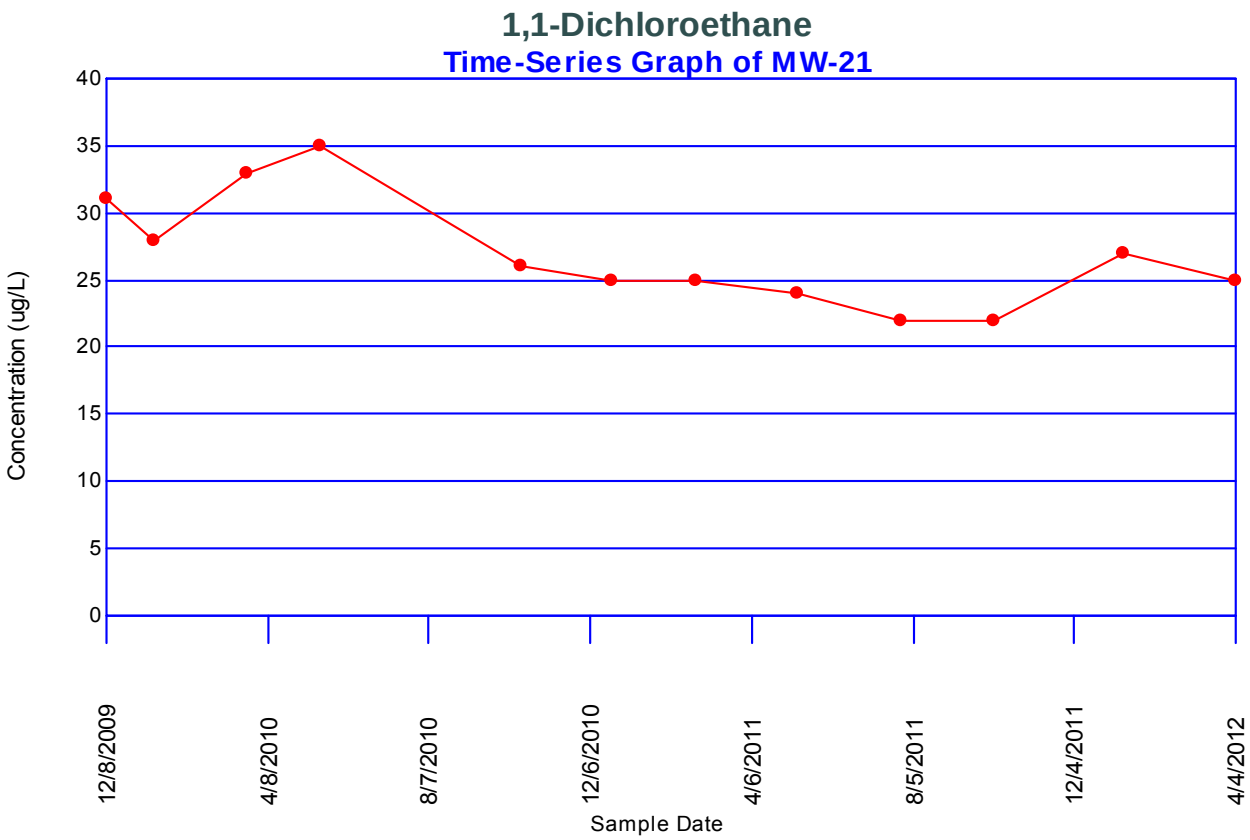

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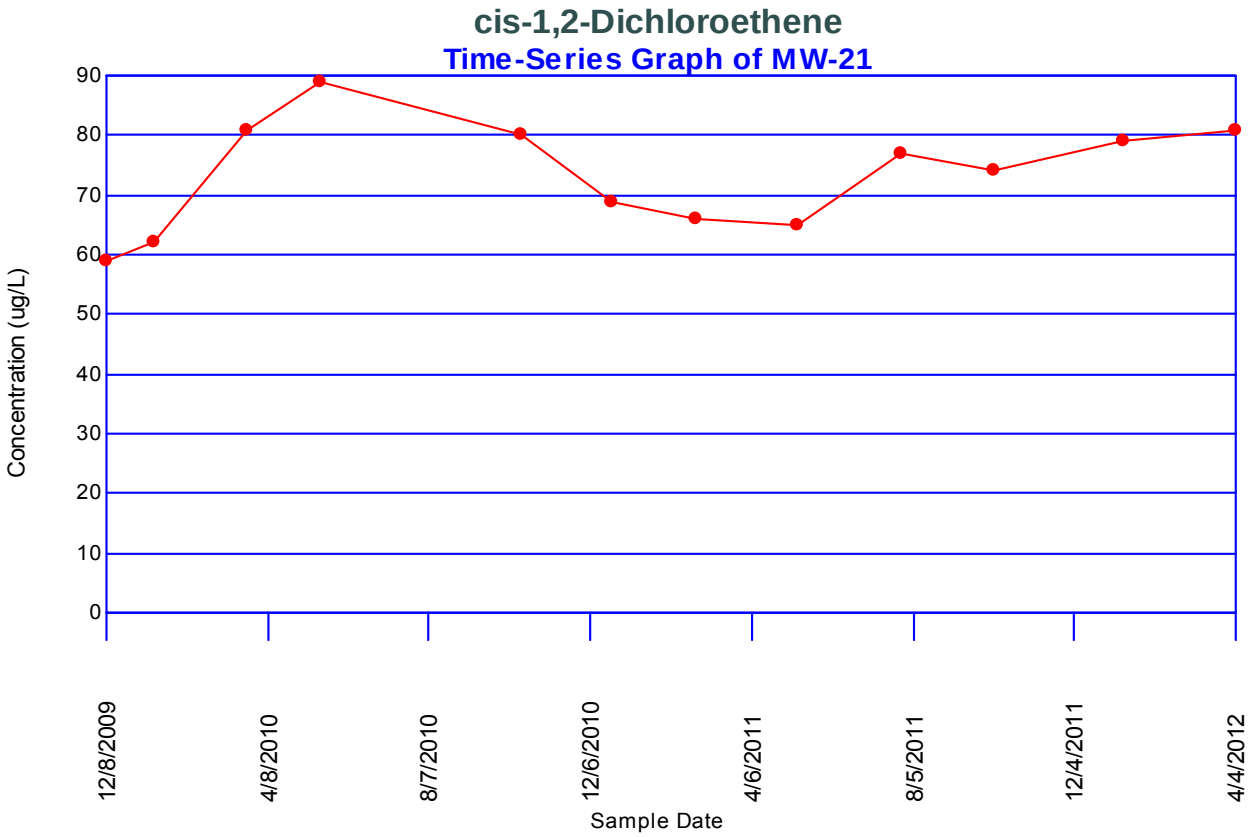

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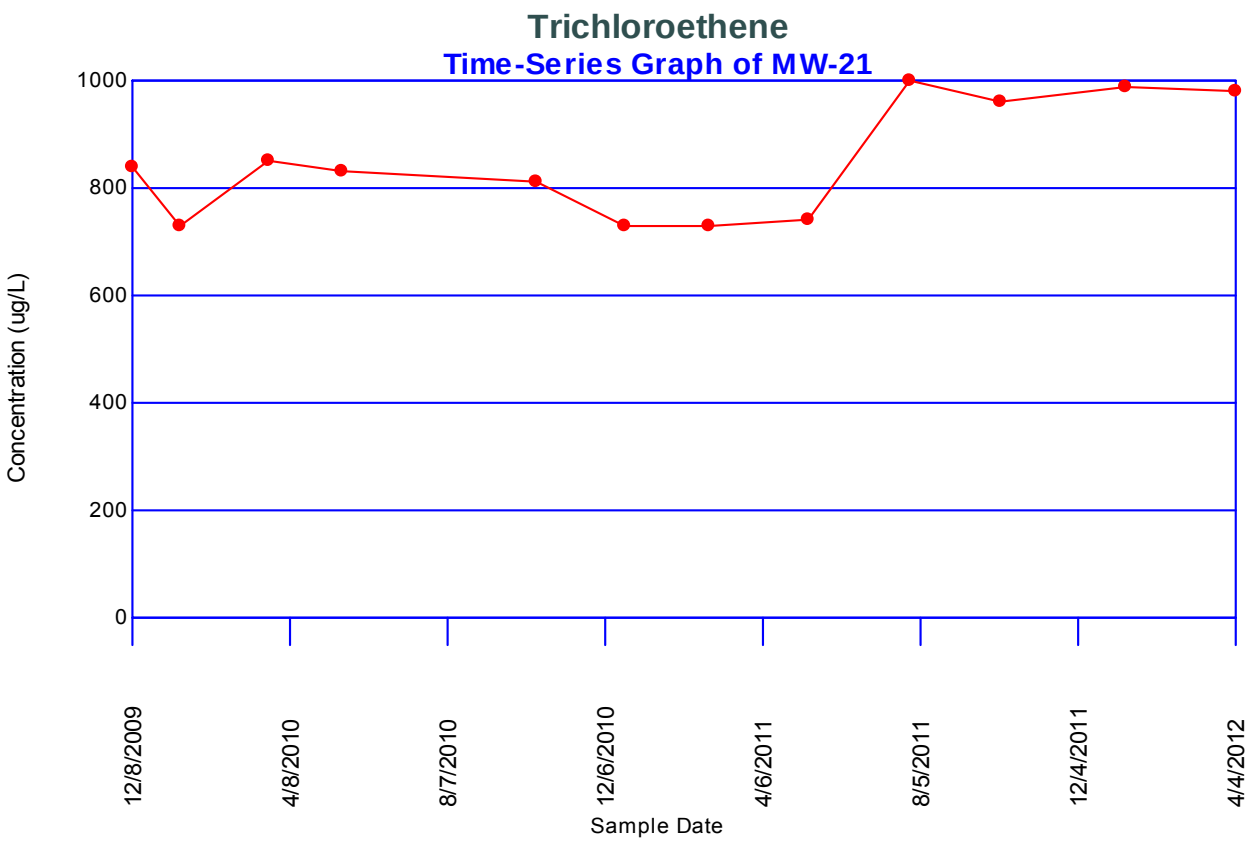

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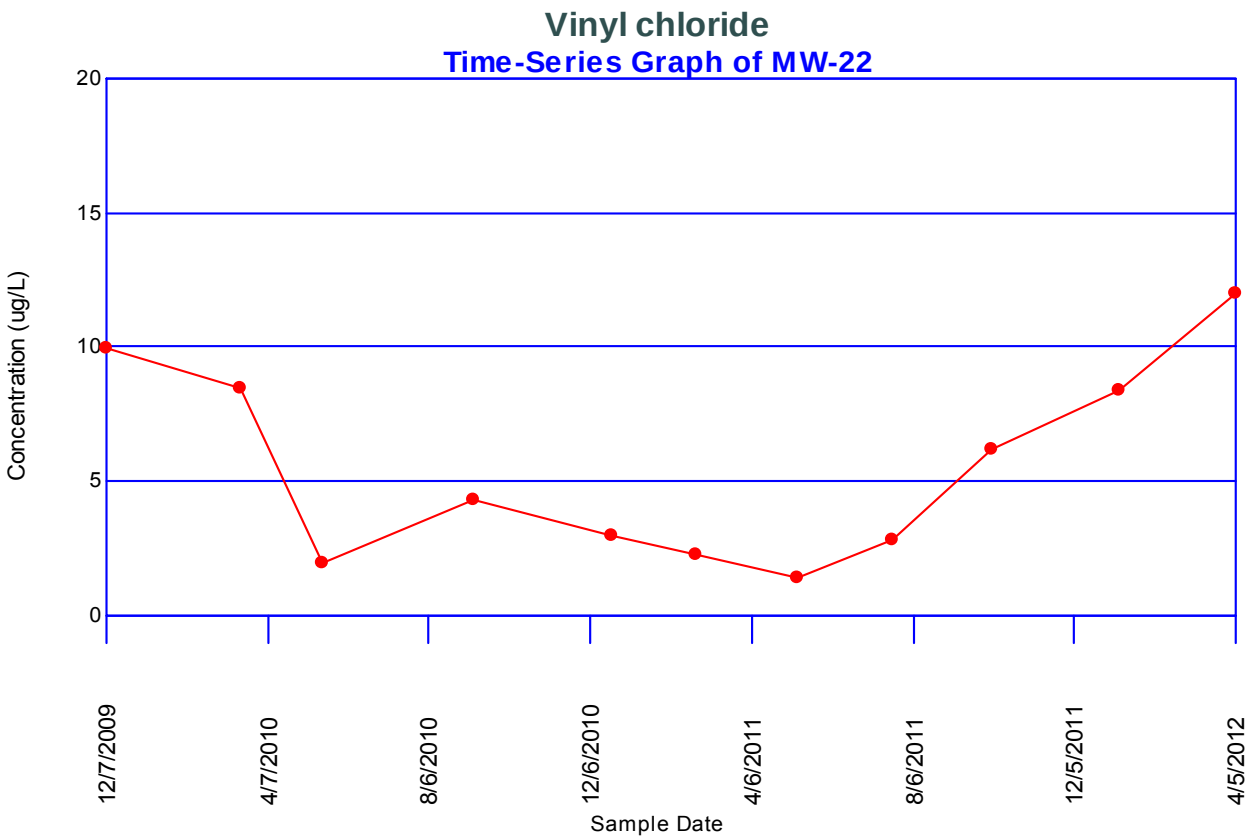

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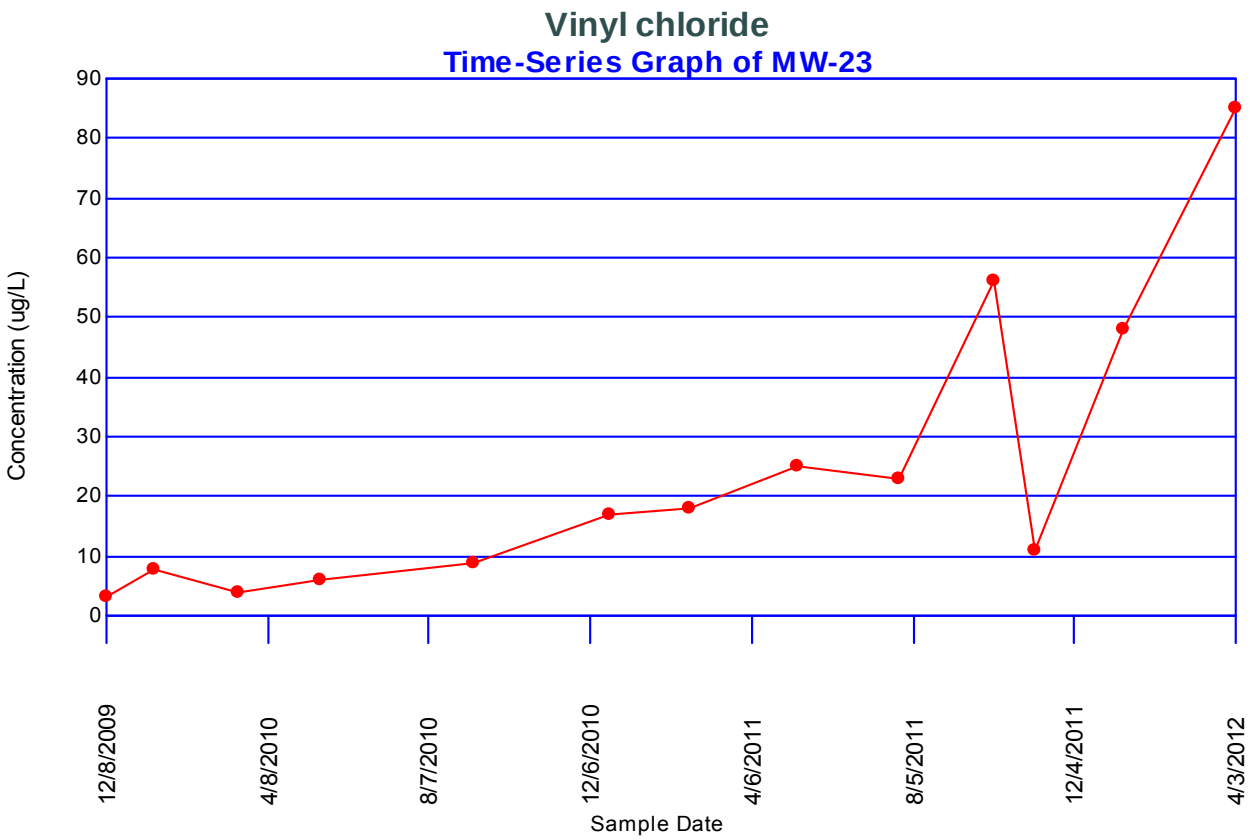

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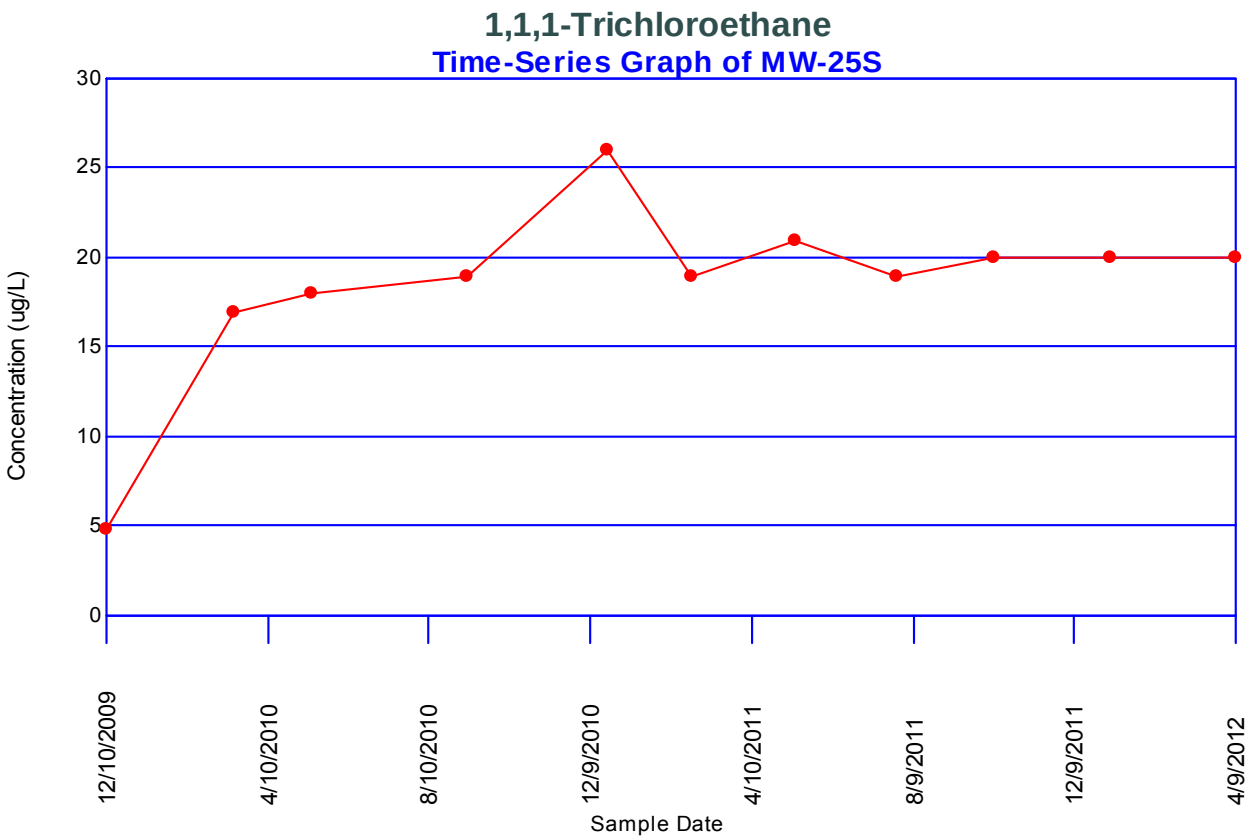

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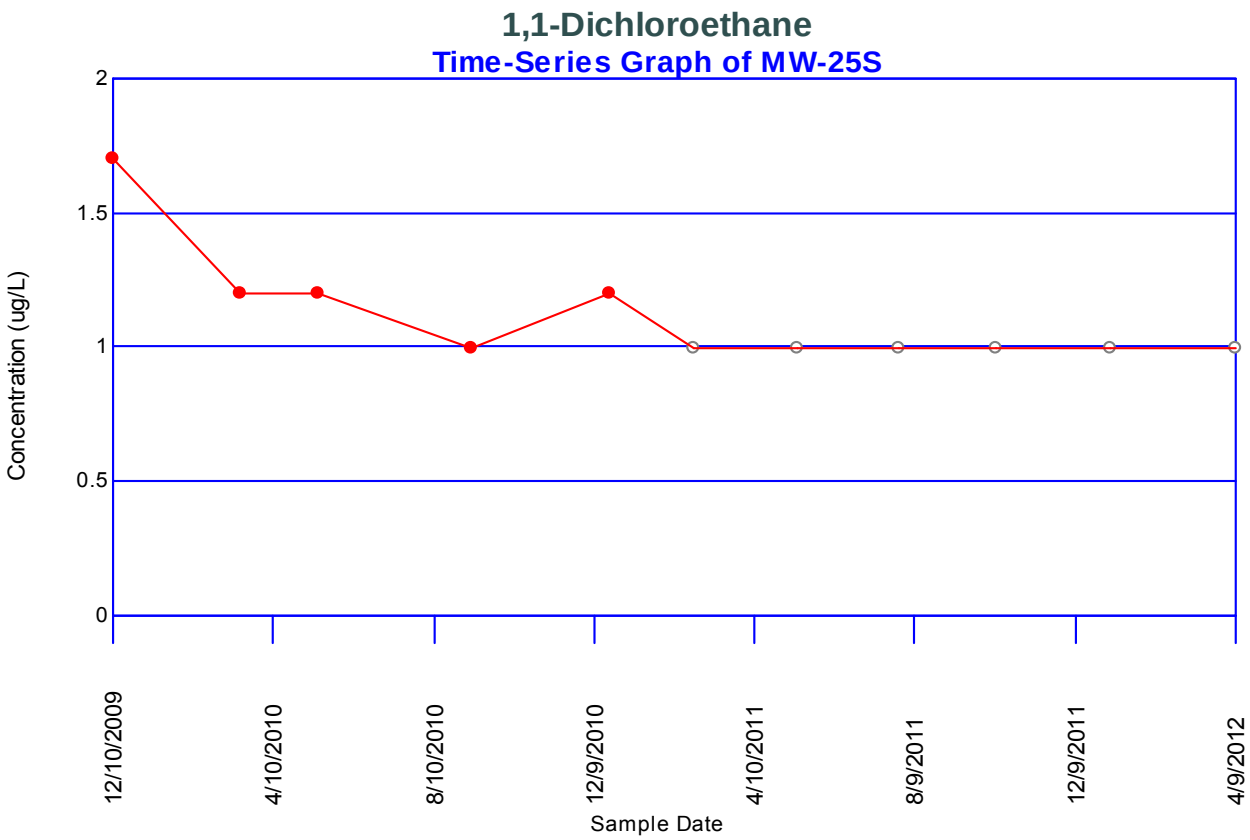

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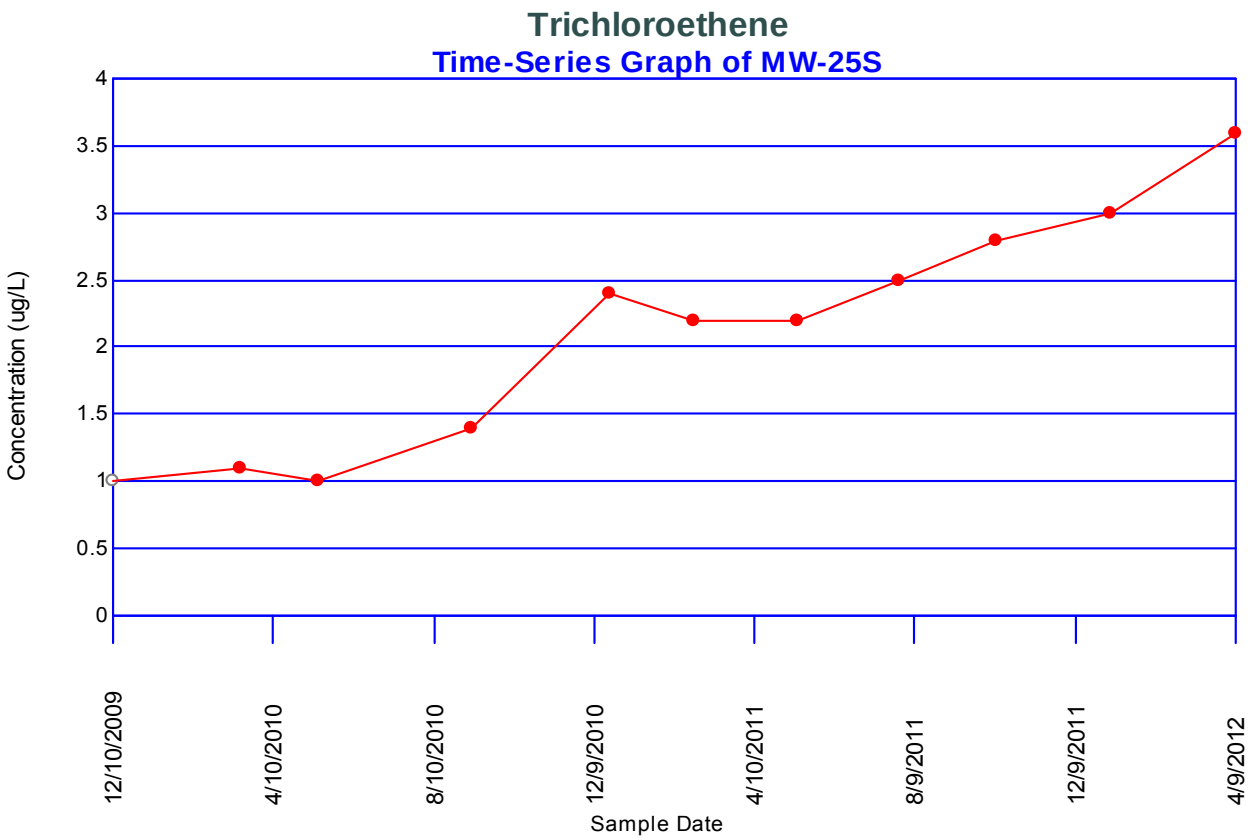

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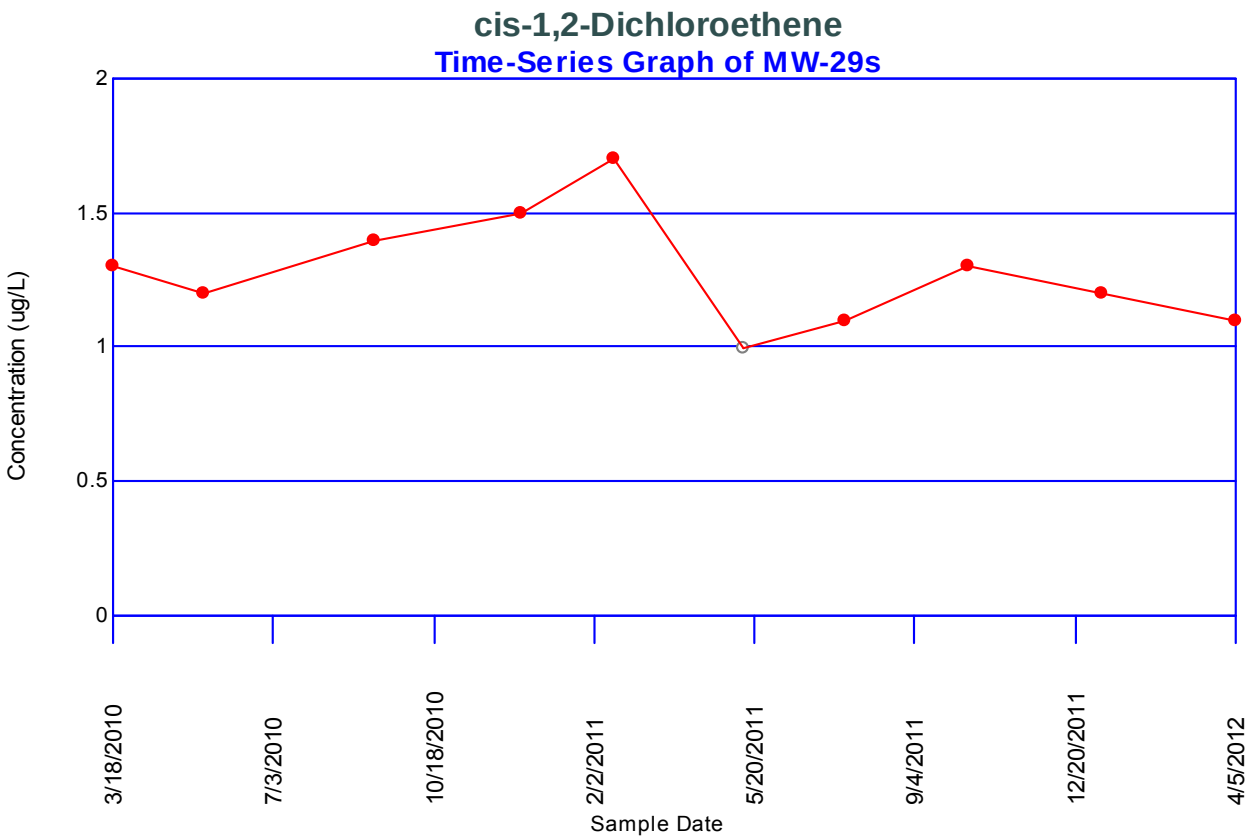

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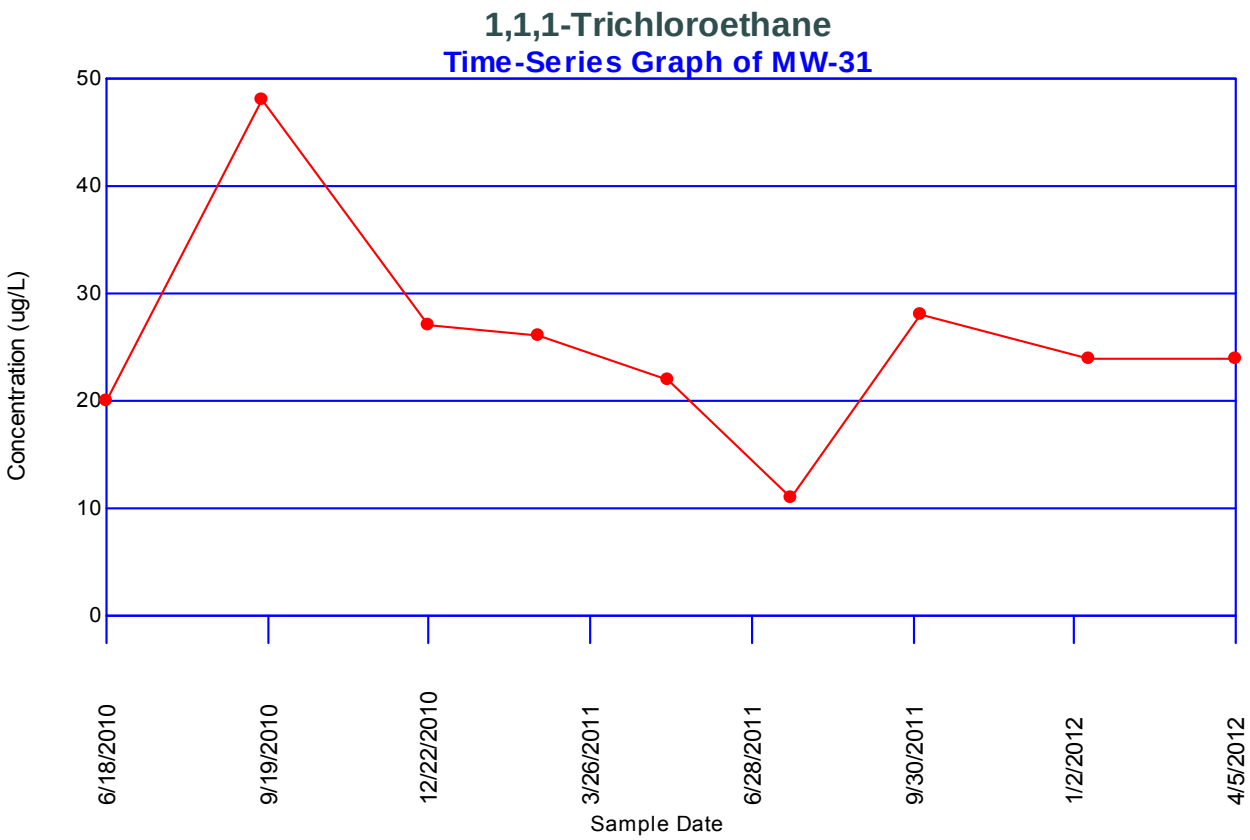

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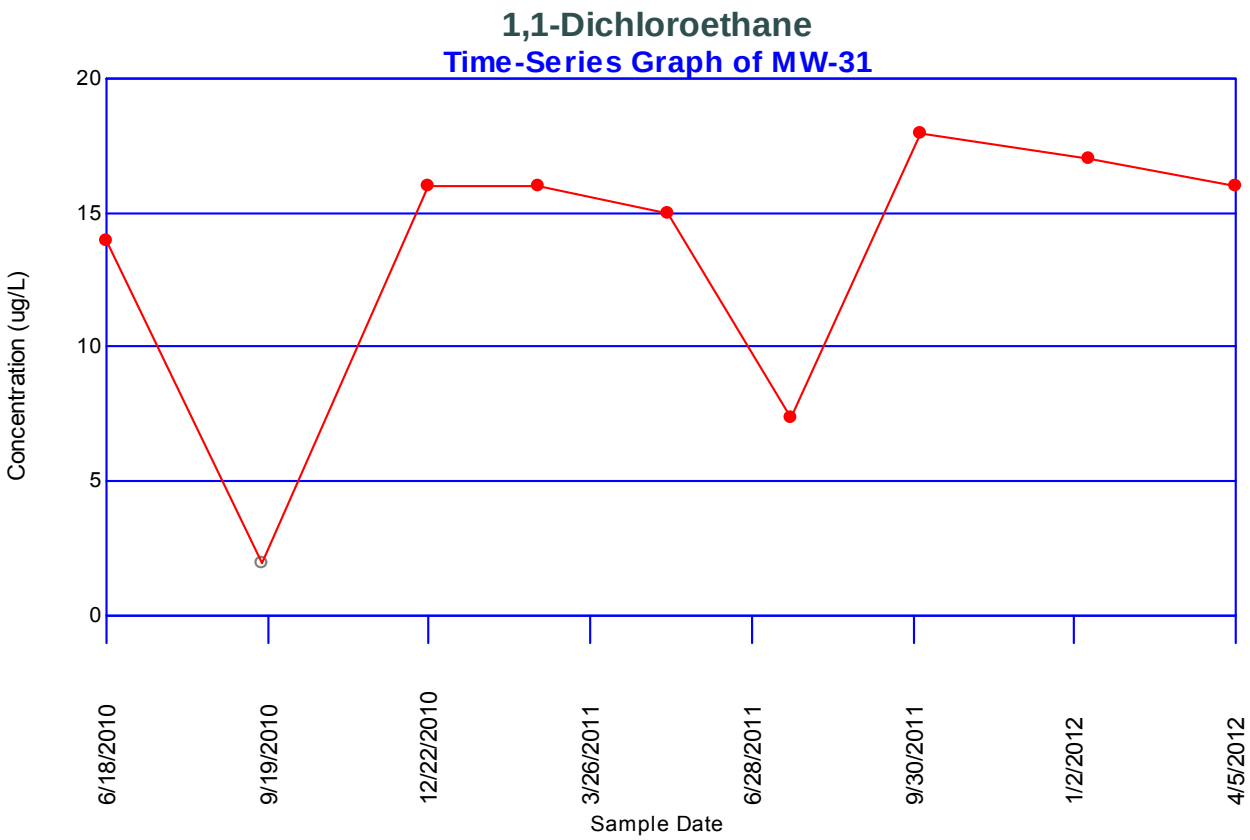

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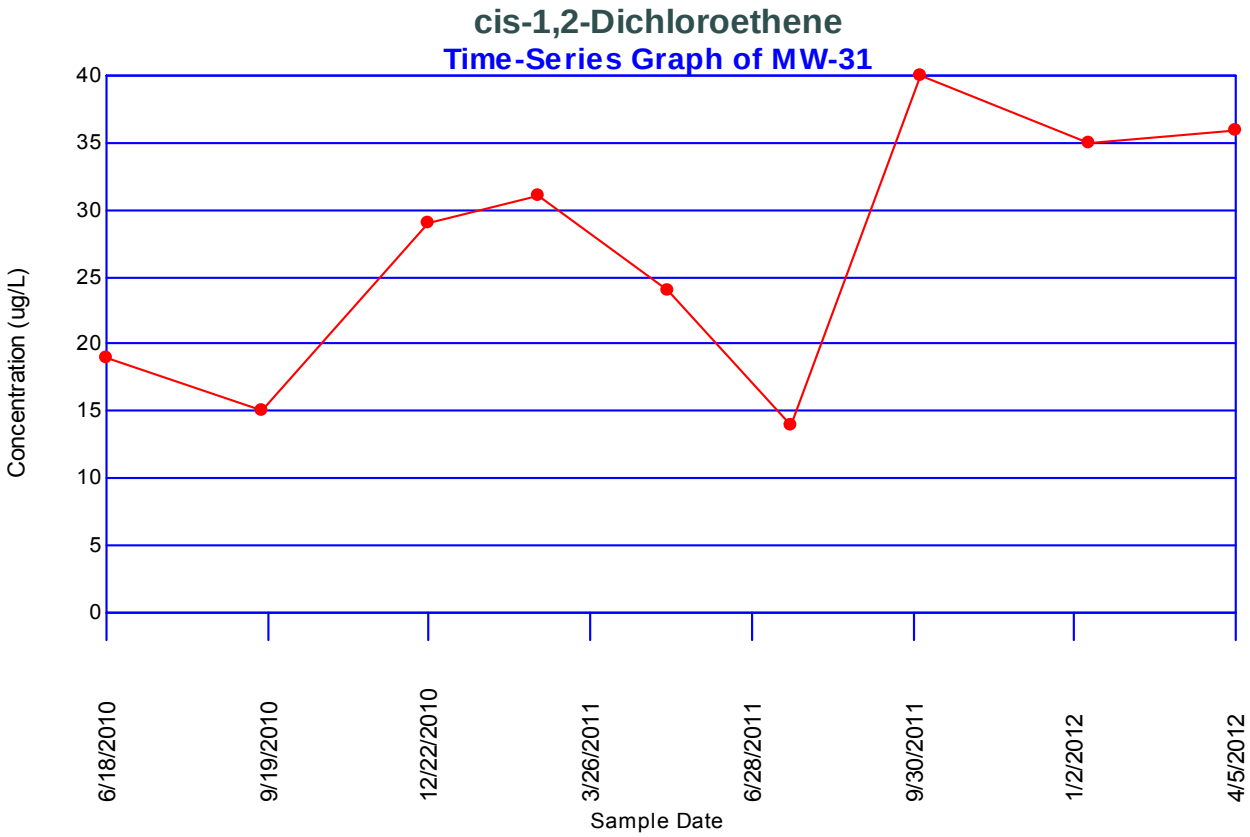

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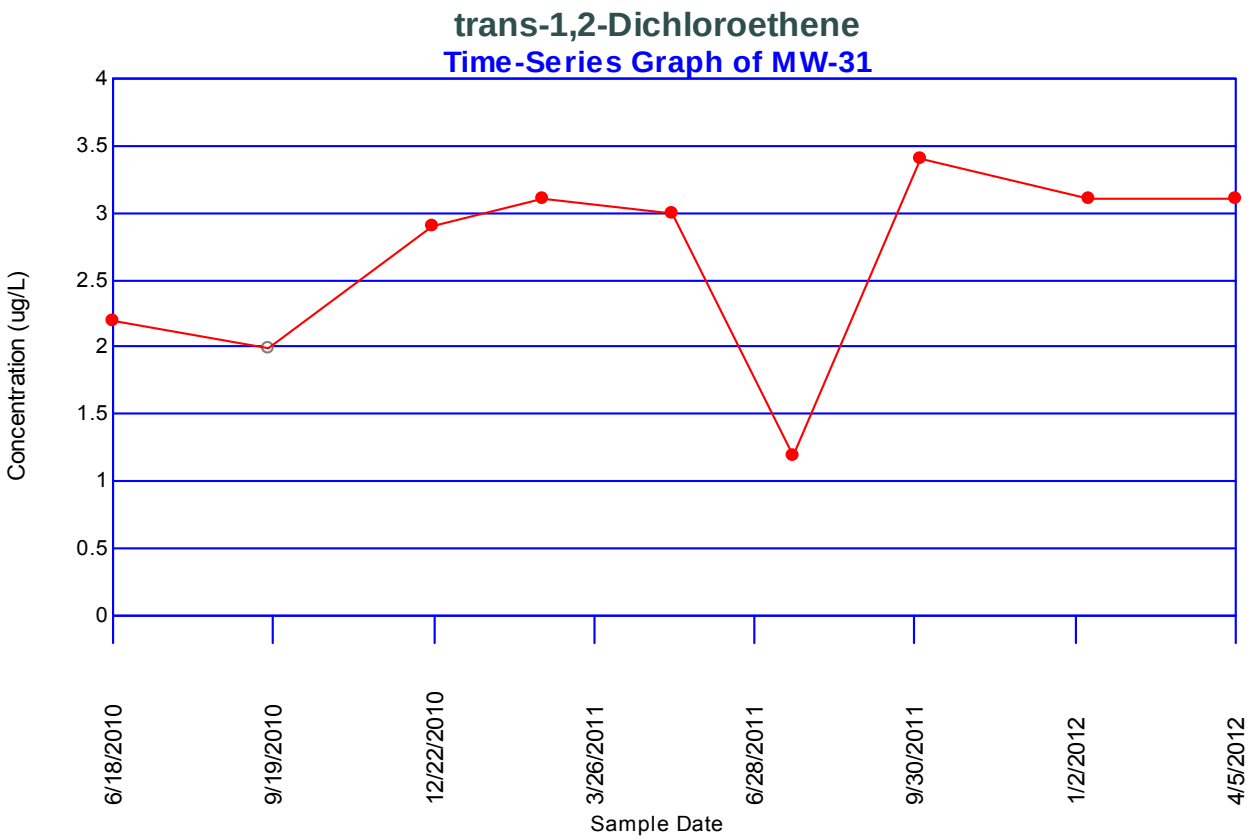

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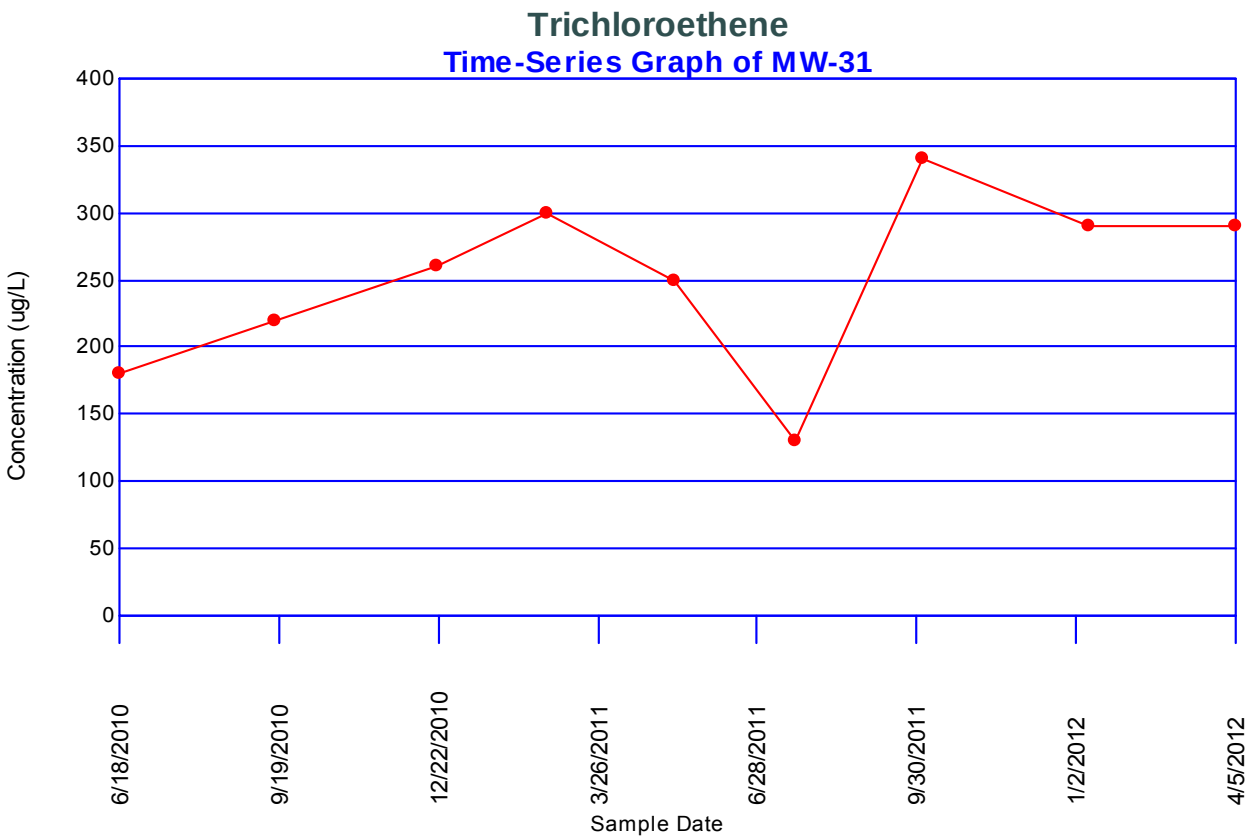

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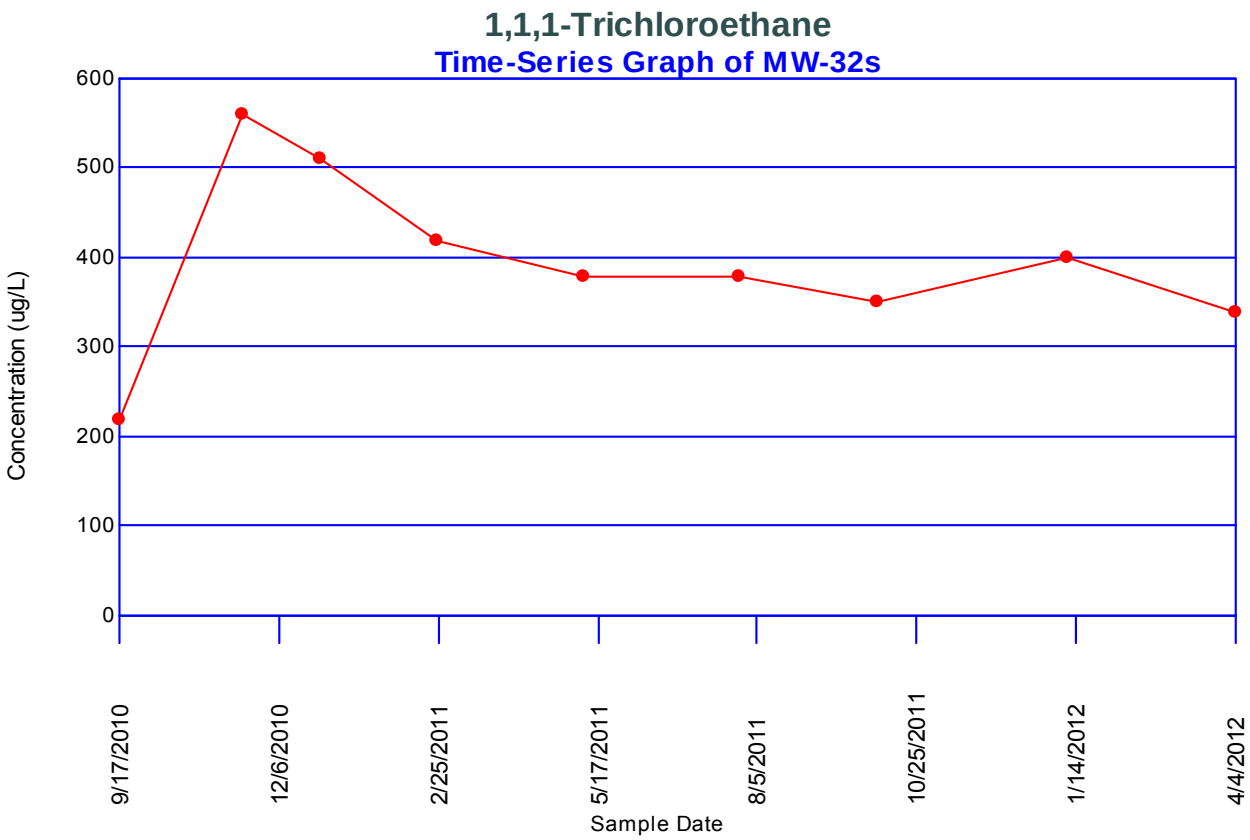

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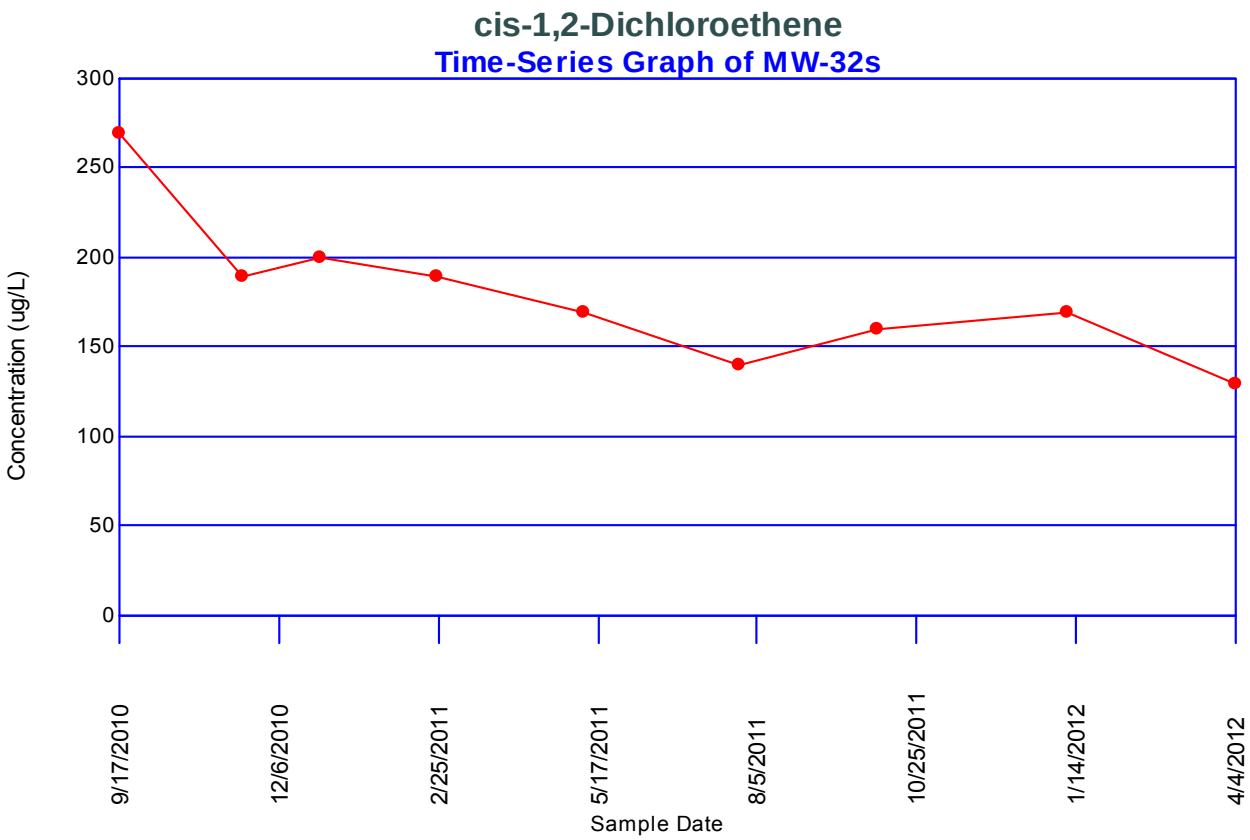

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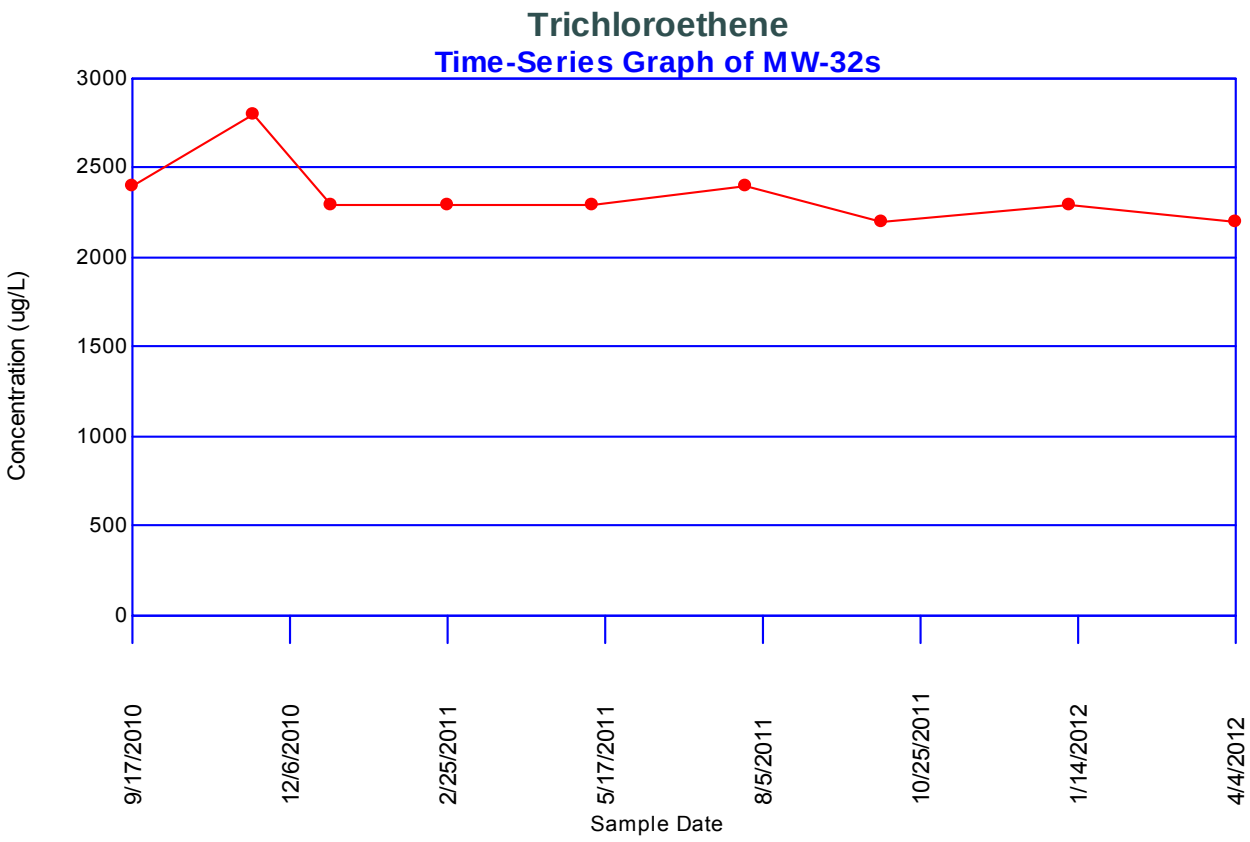

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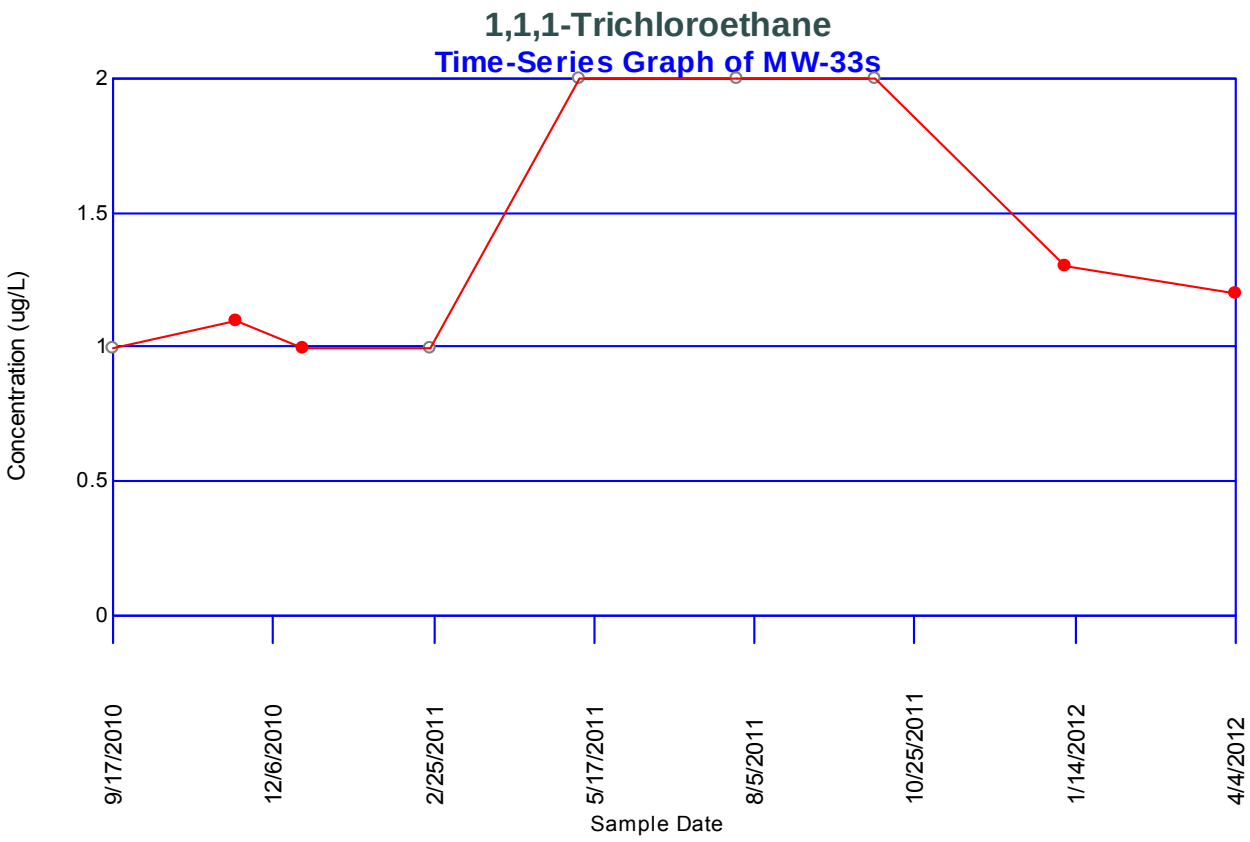

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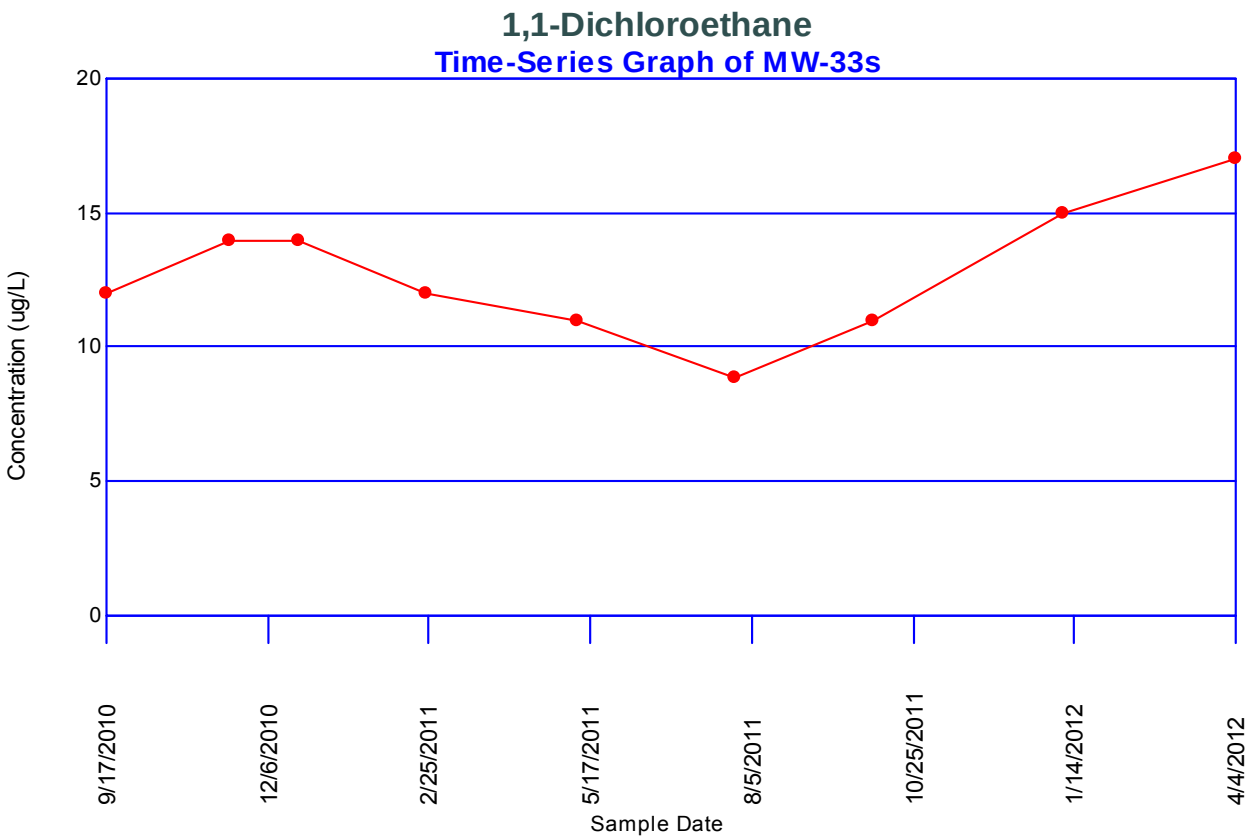

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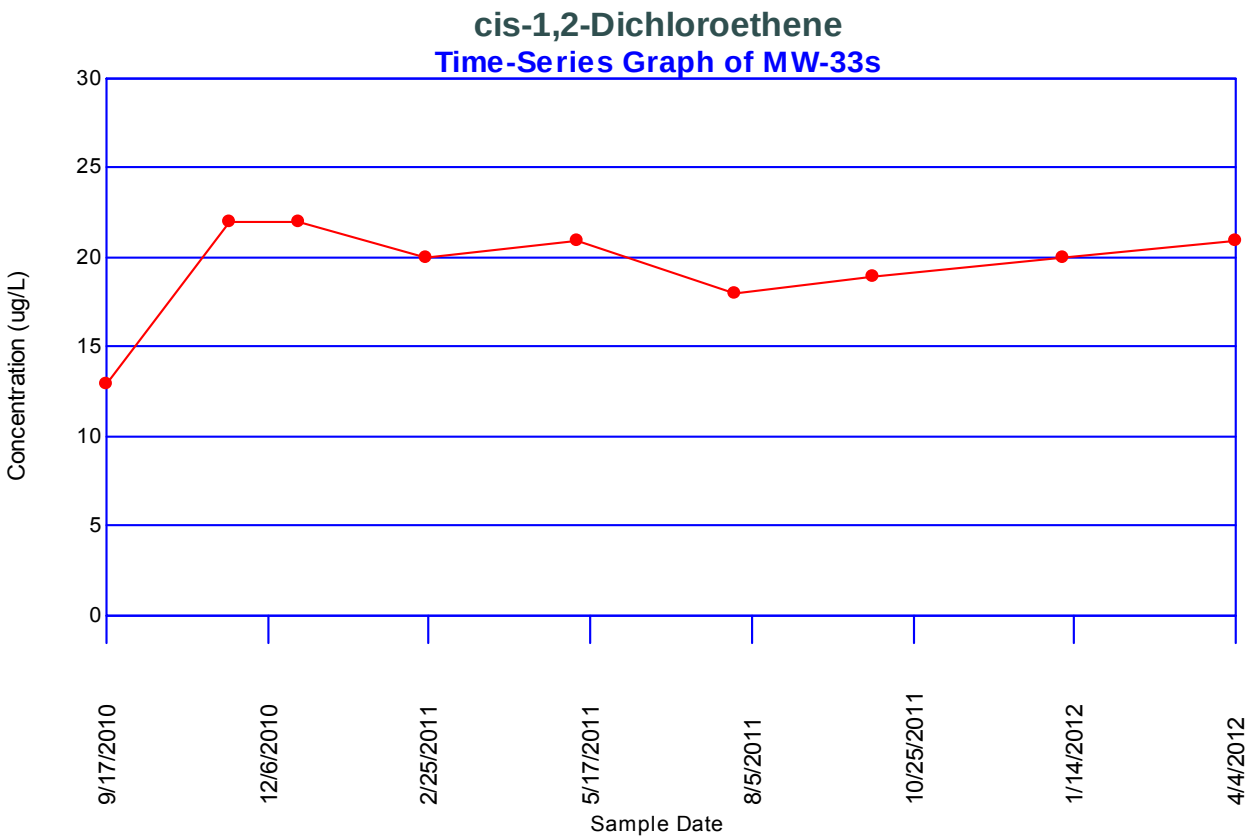

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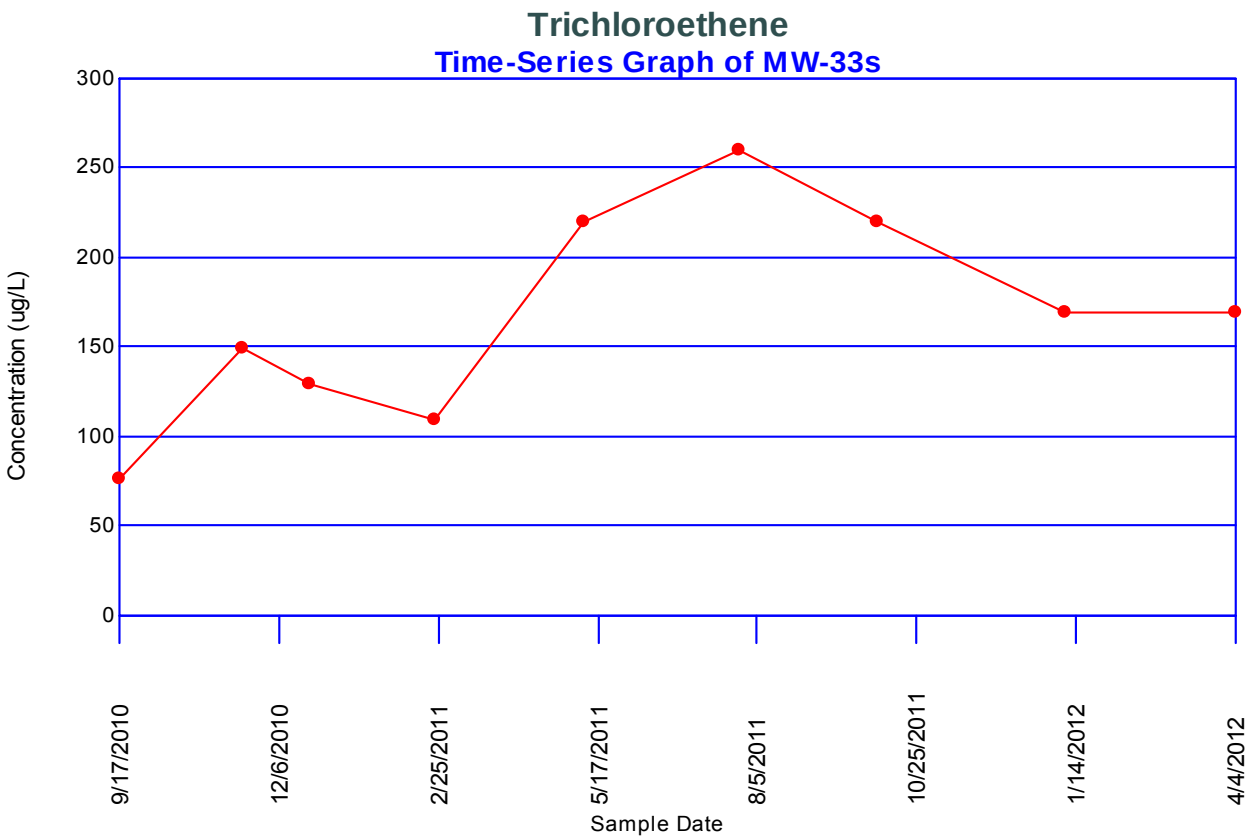

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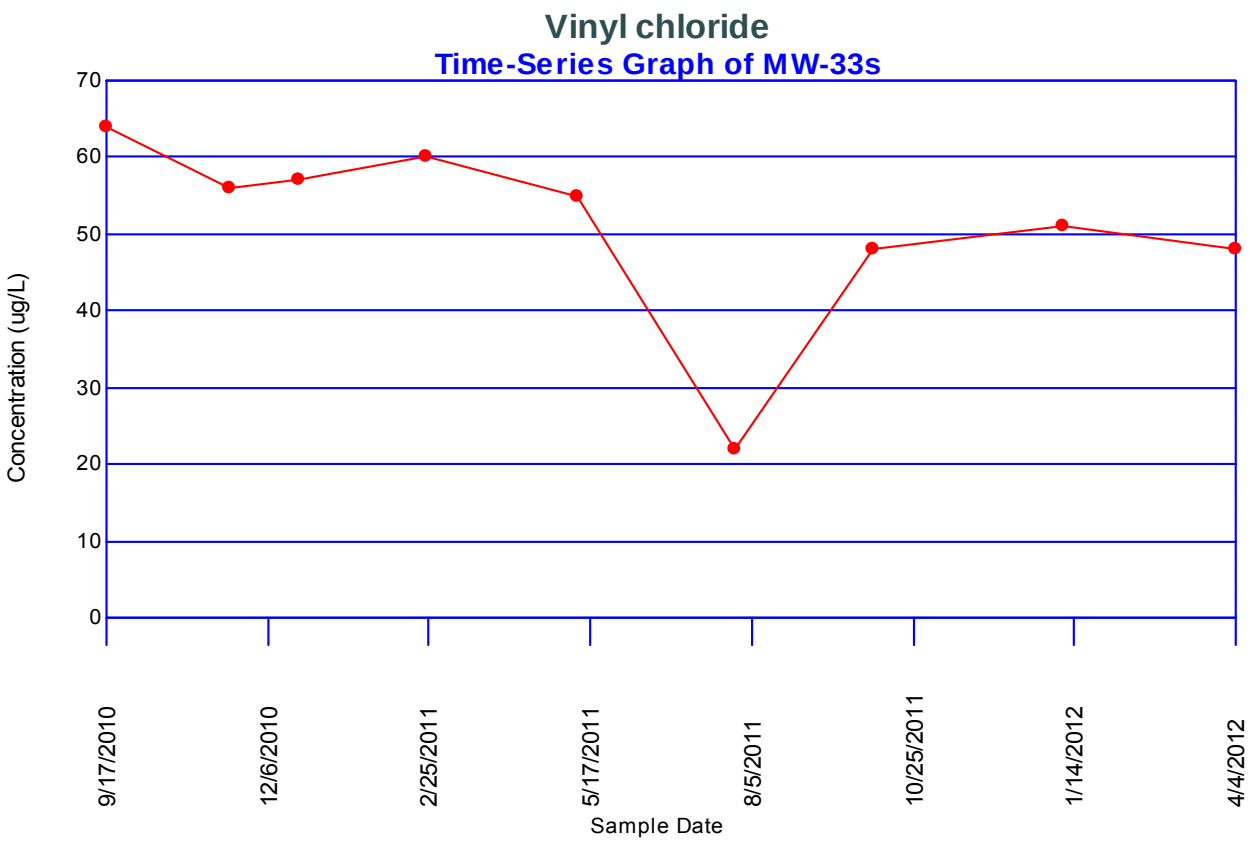

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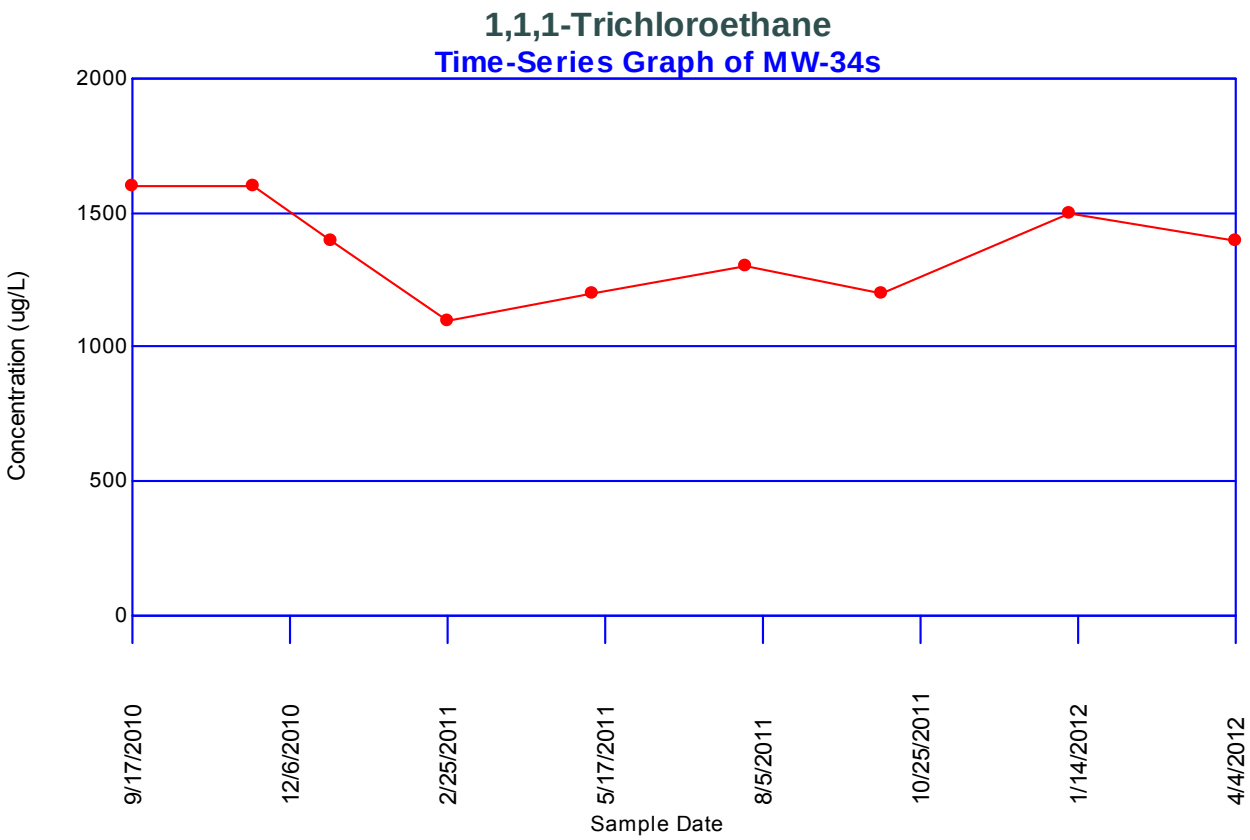

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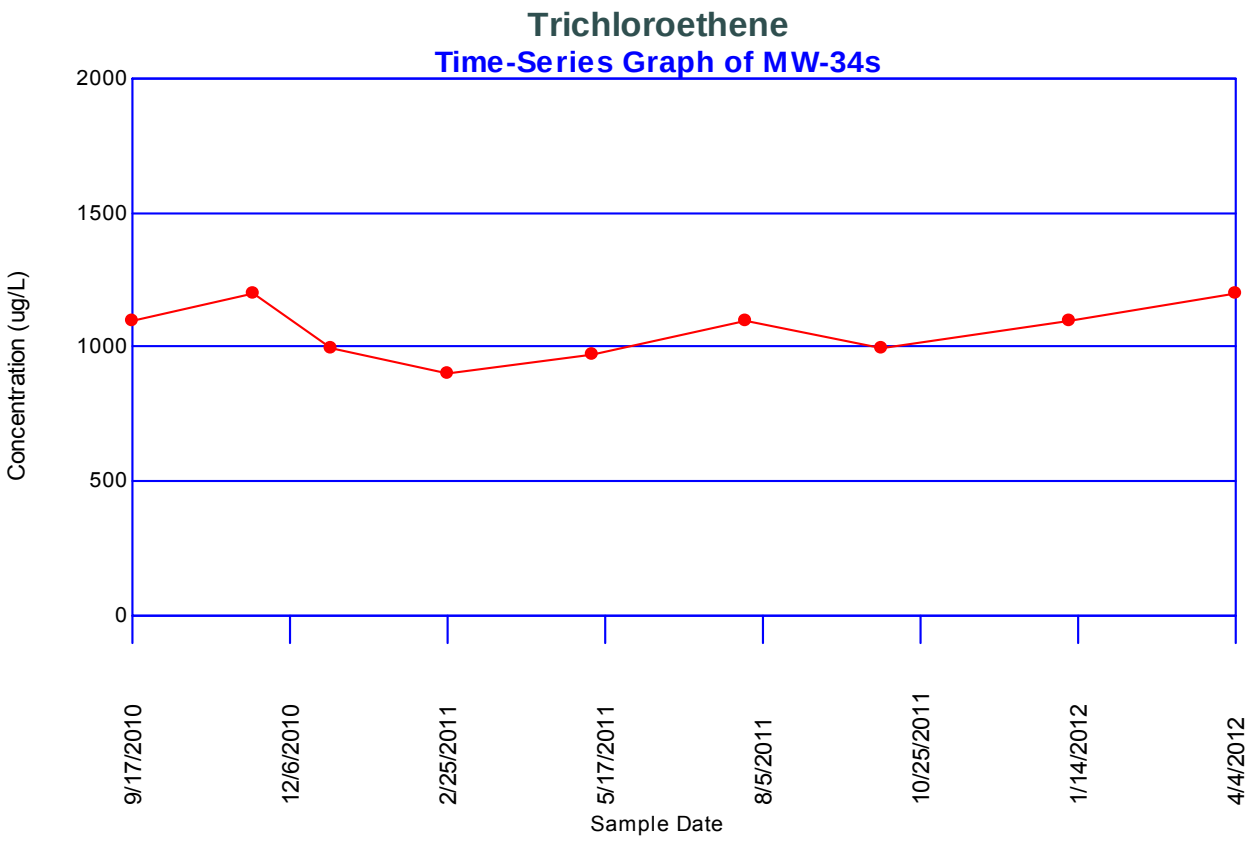

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Appendix D
"Non-Detect" Trend Plots

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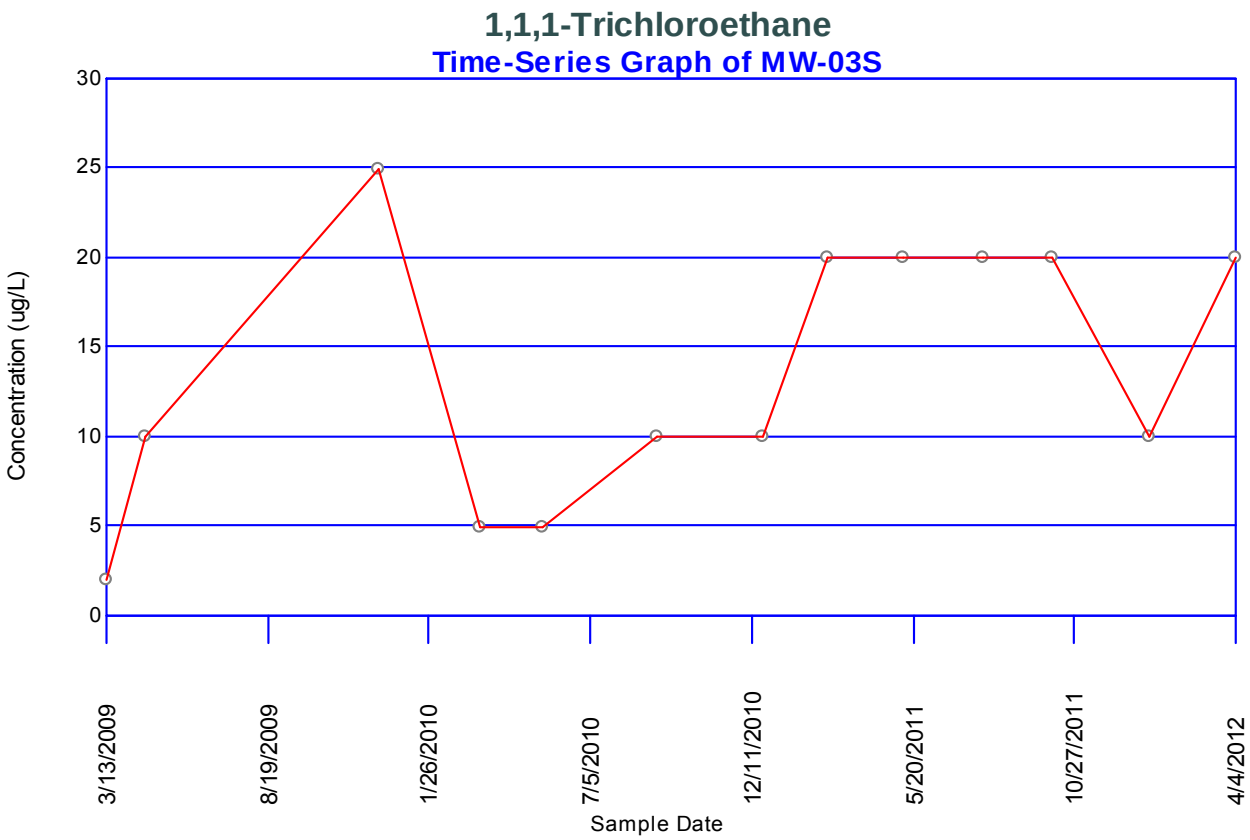

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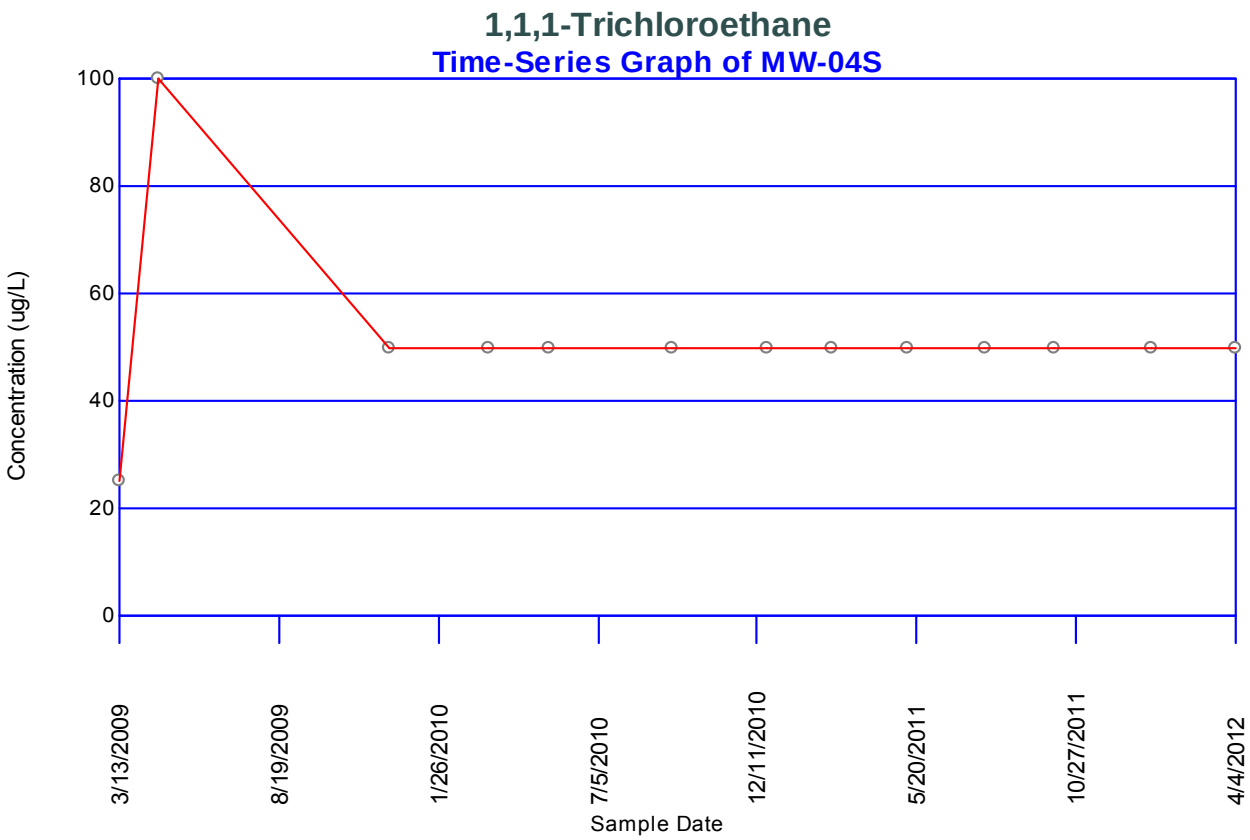

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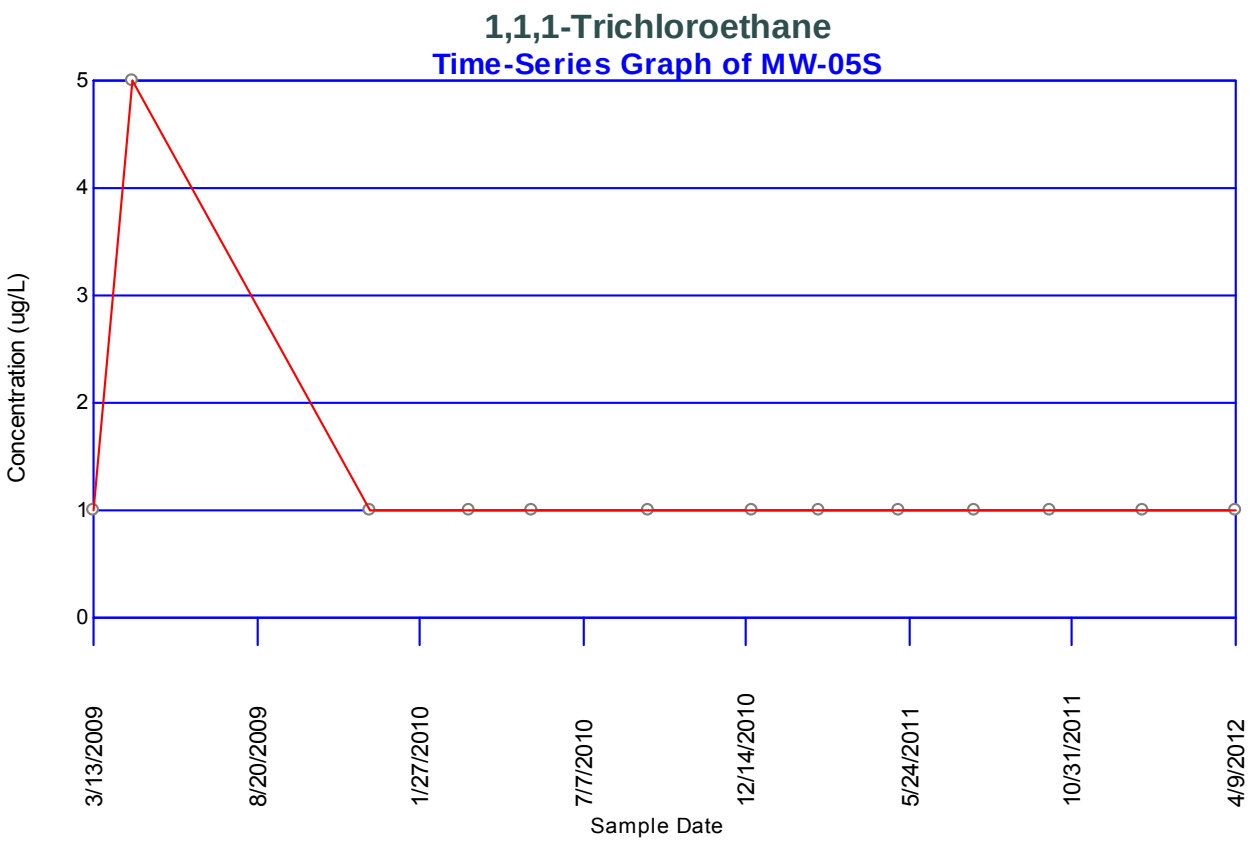

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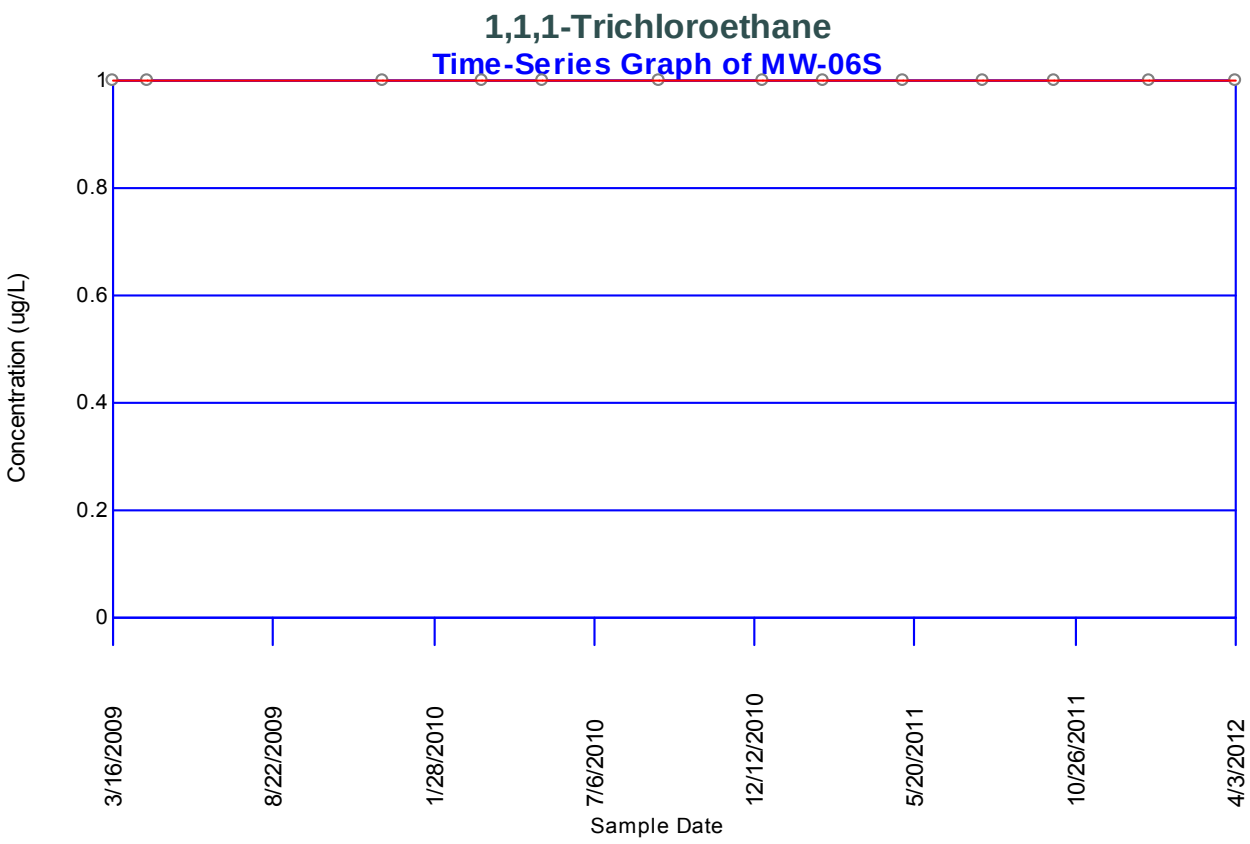

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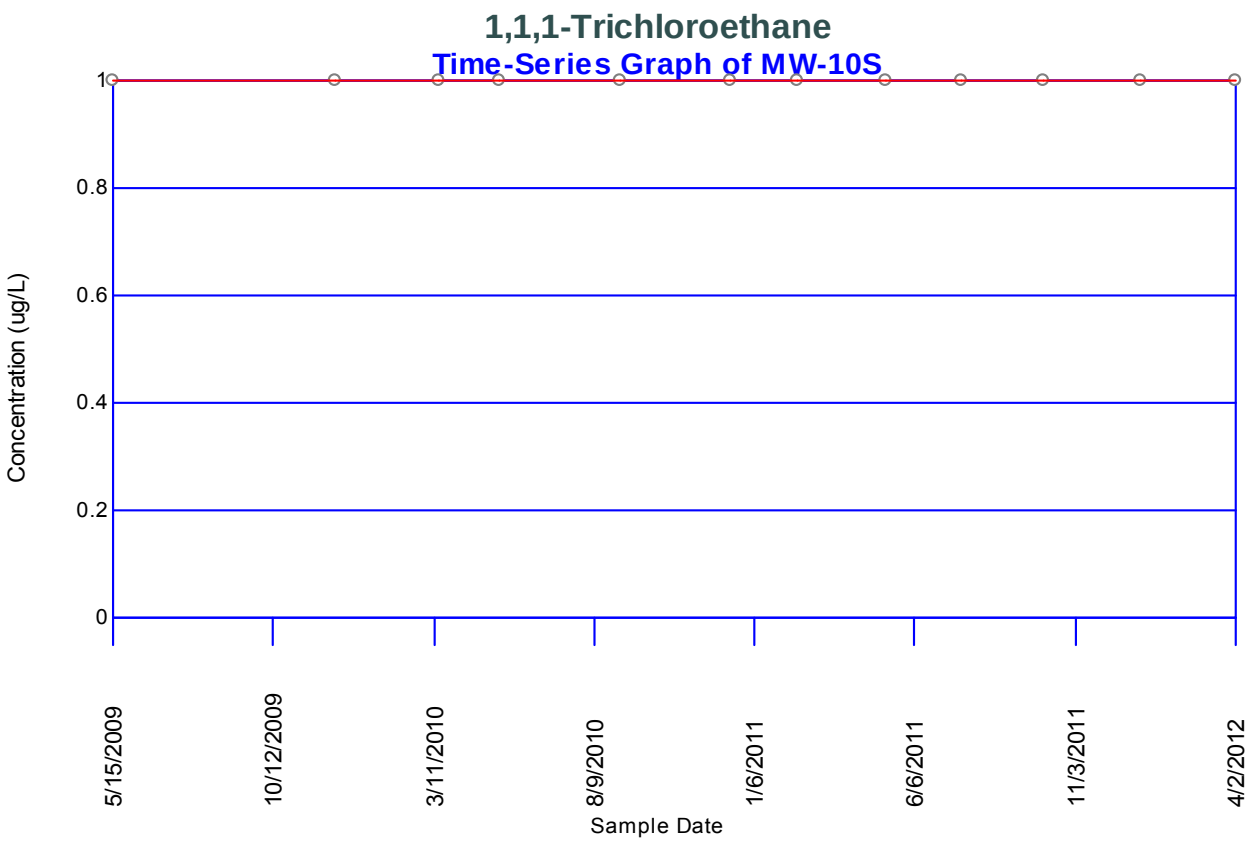

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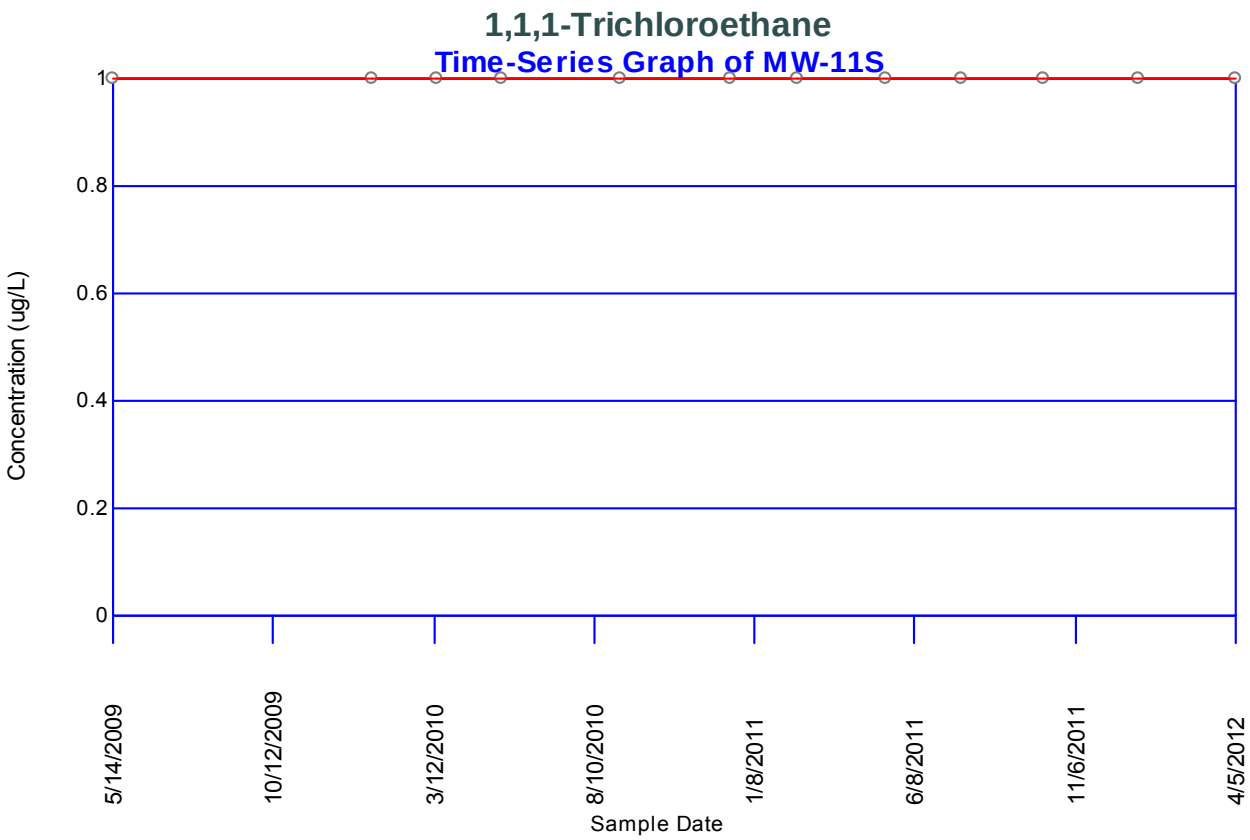

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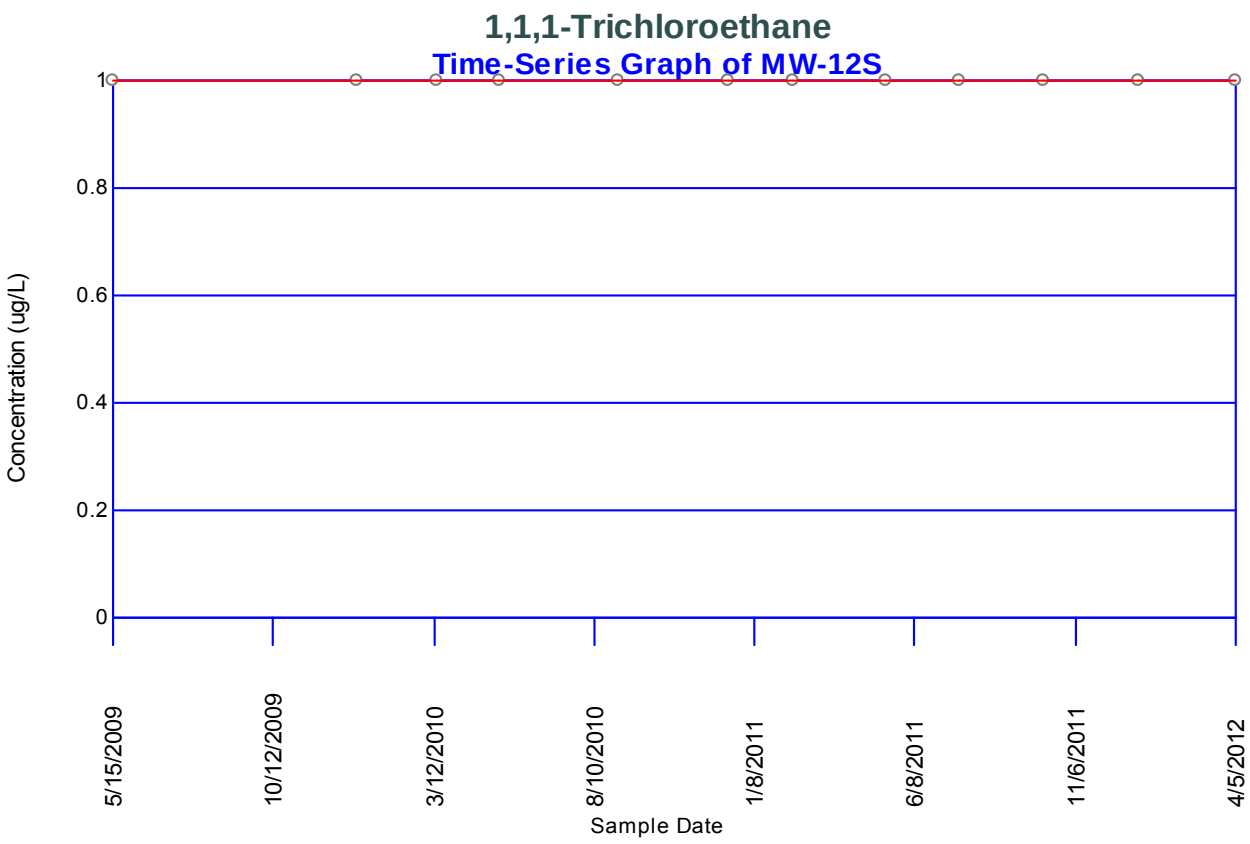

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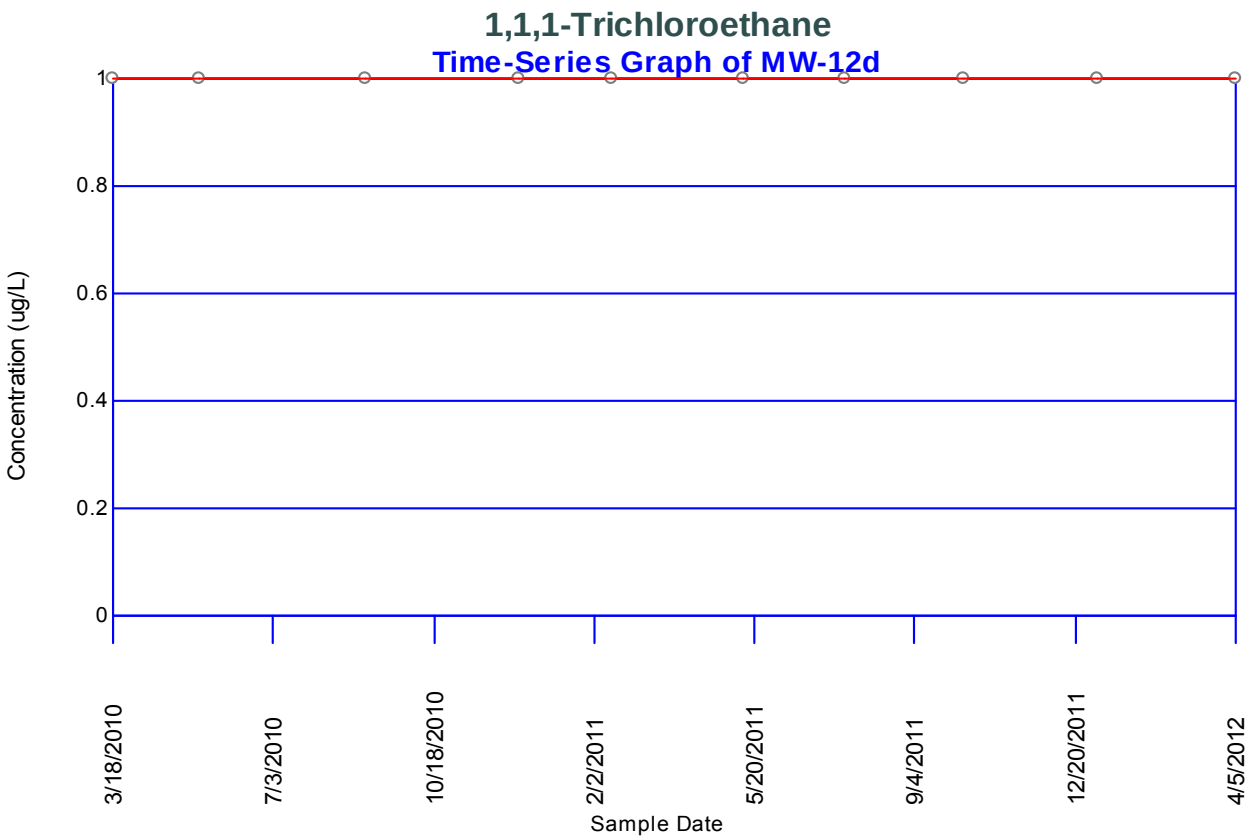

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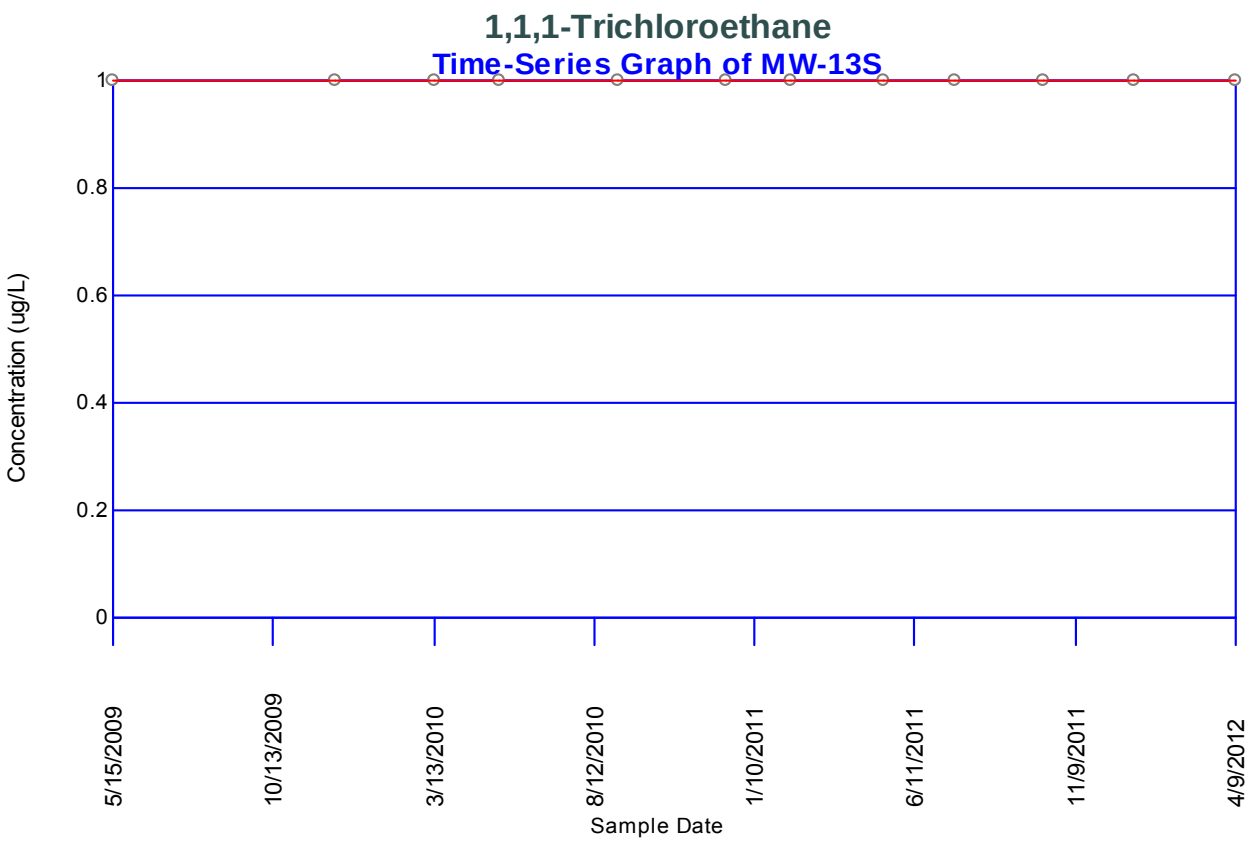

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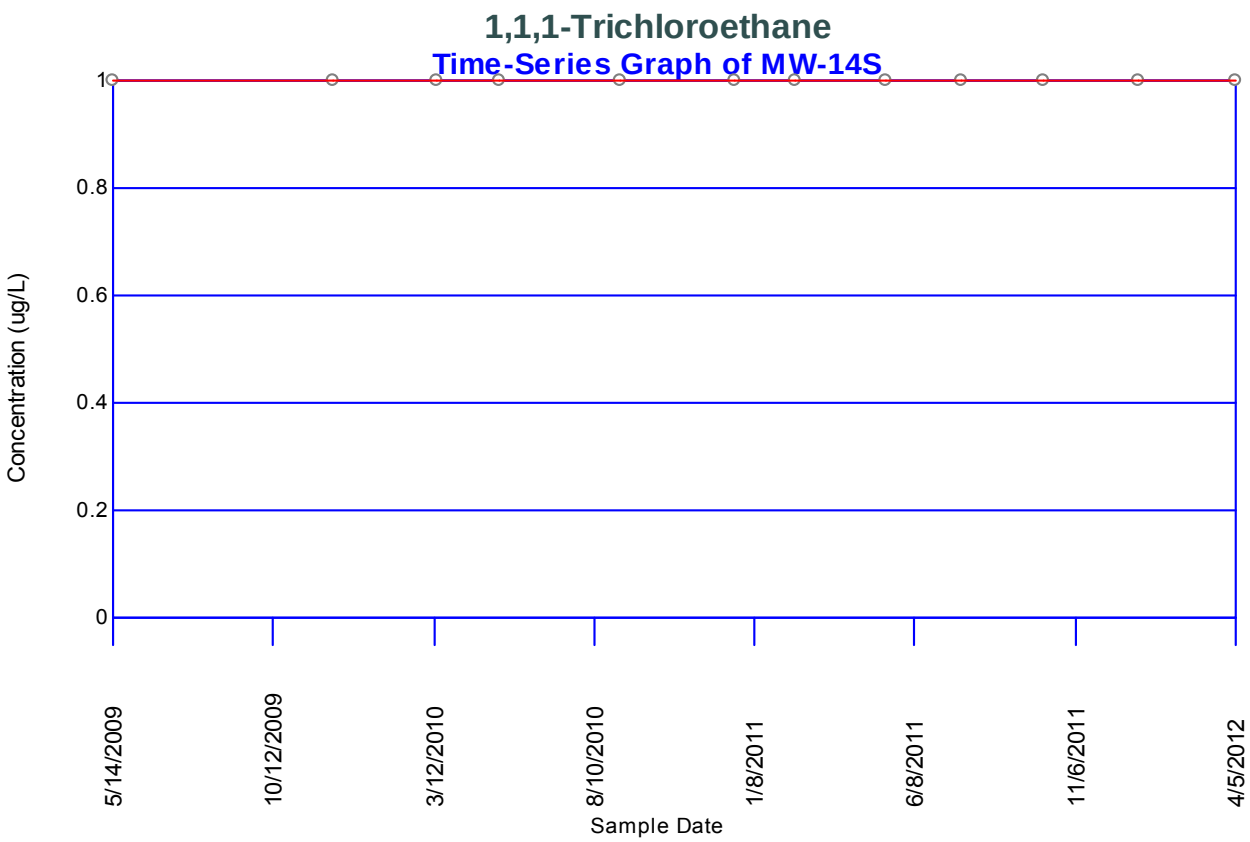

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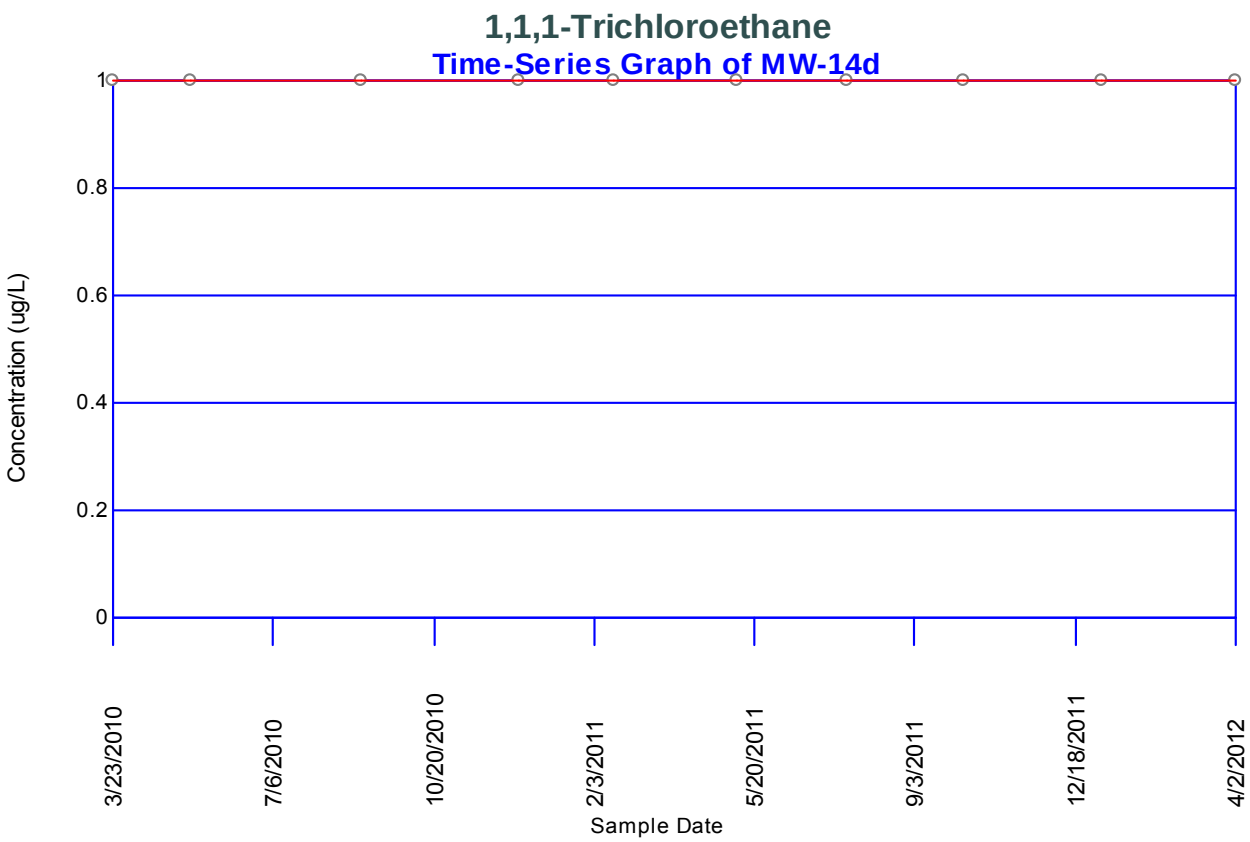

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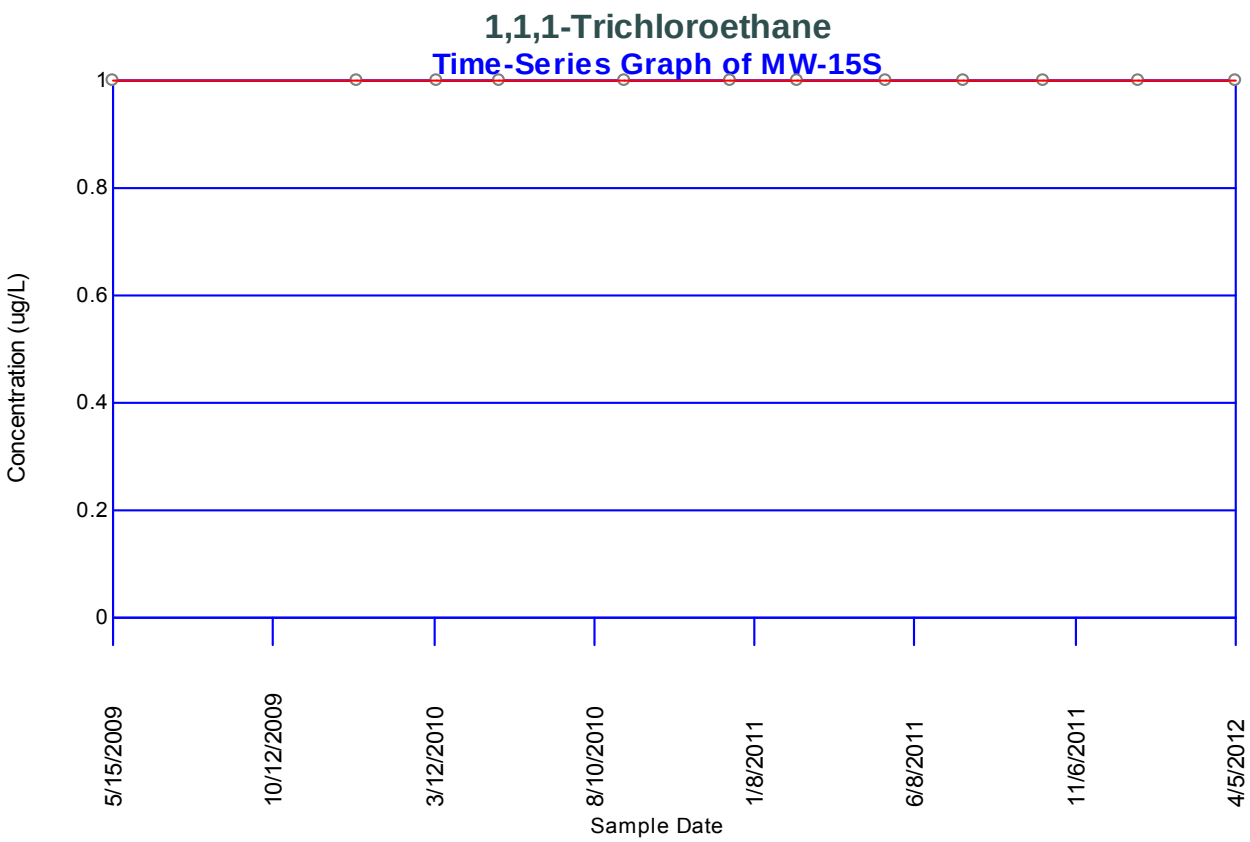

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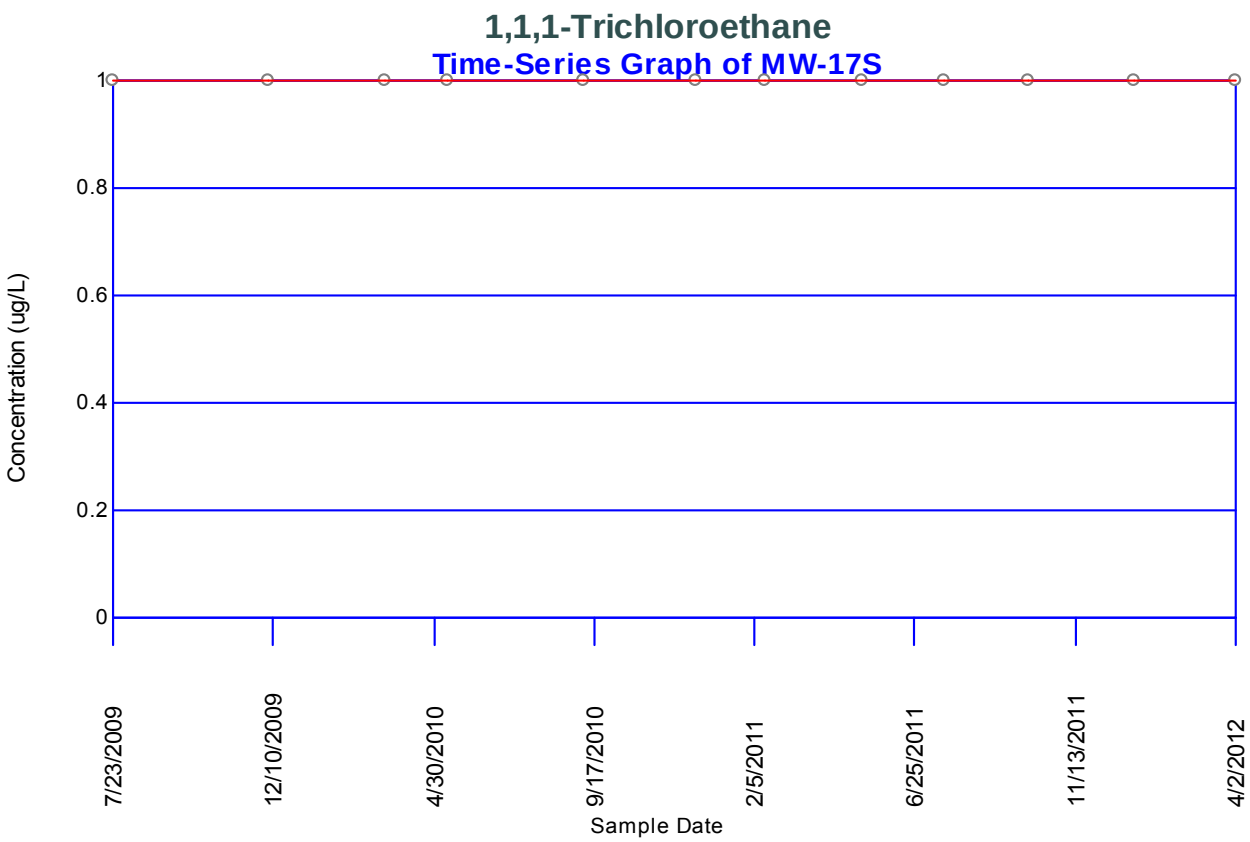

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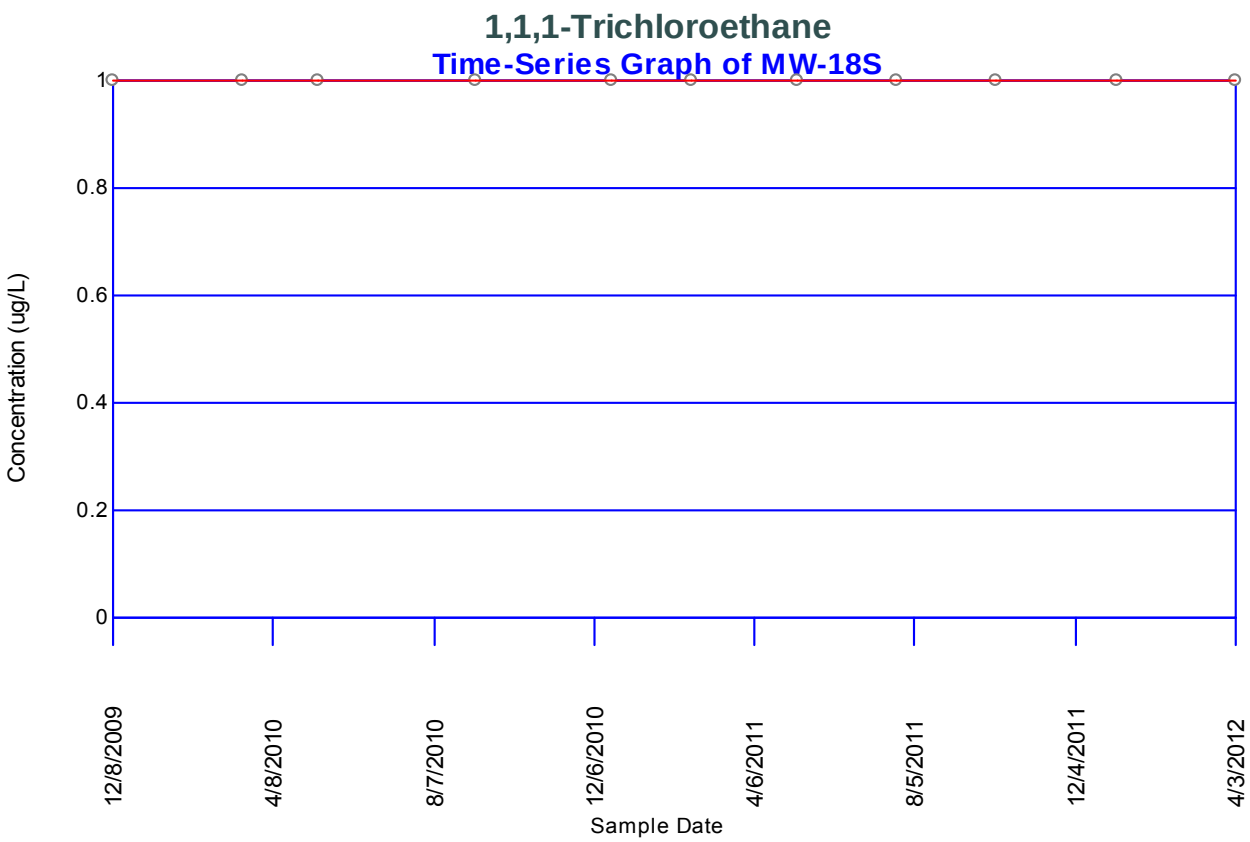

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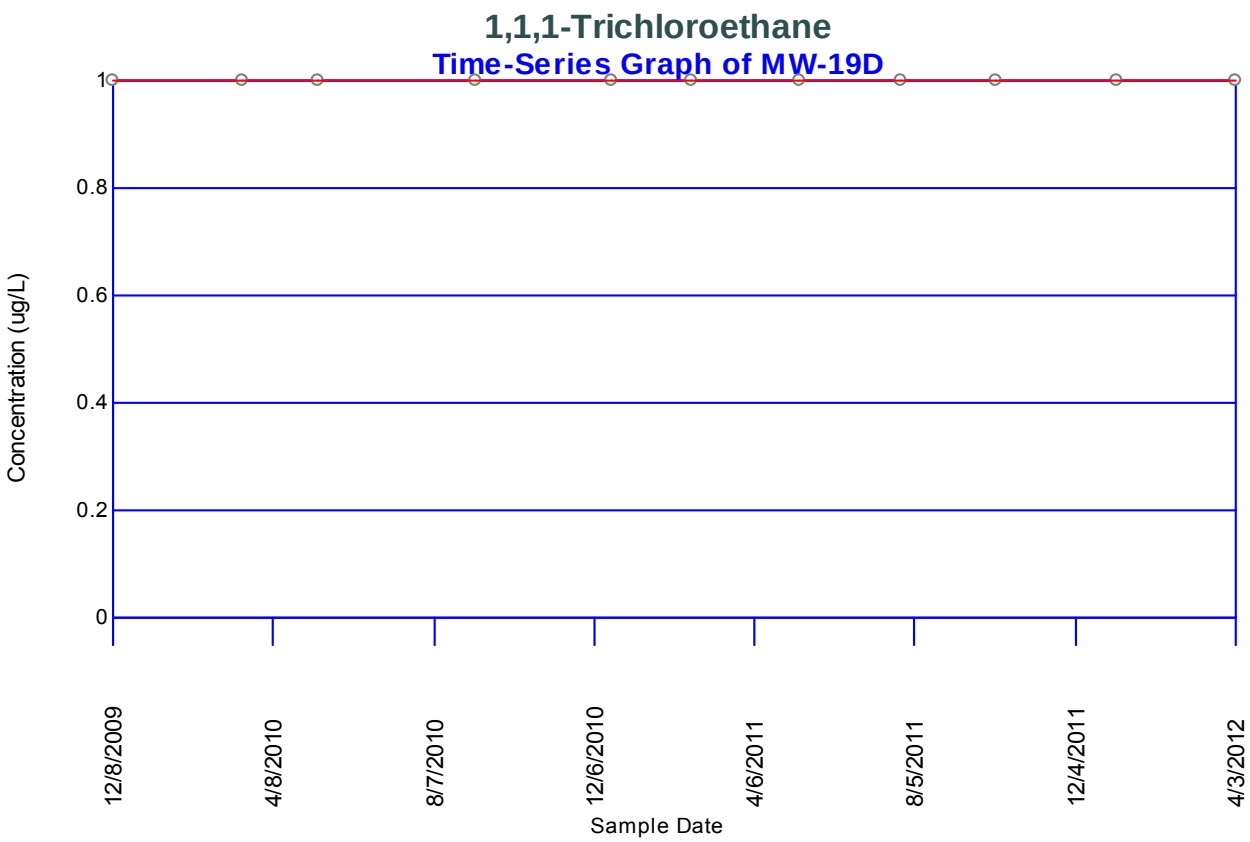

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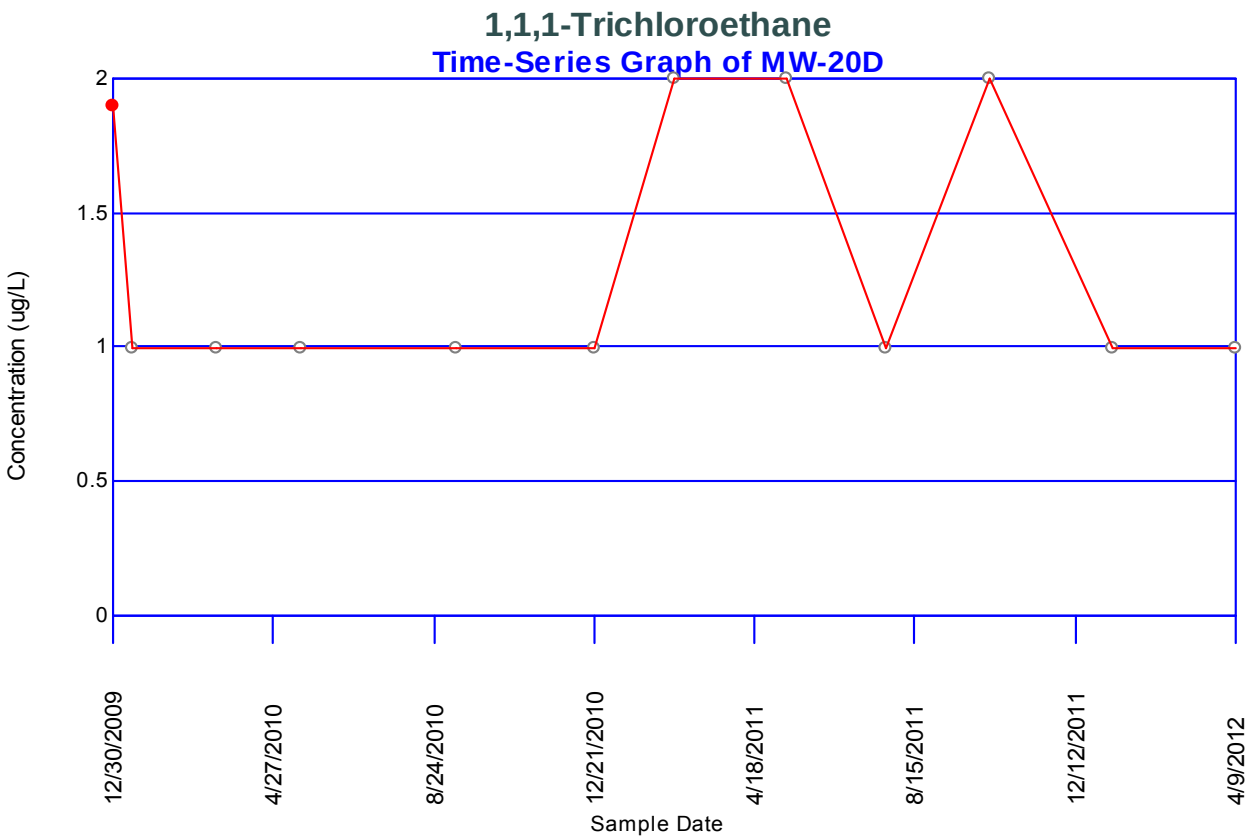

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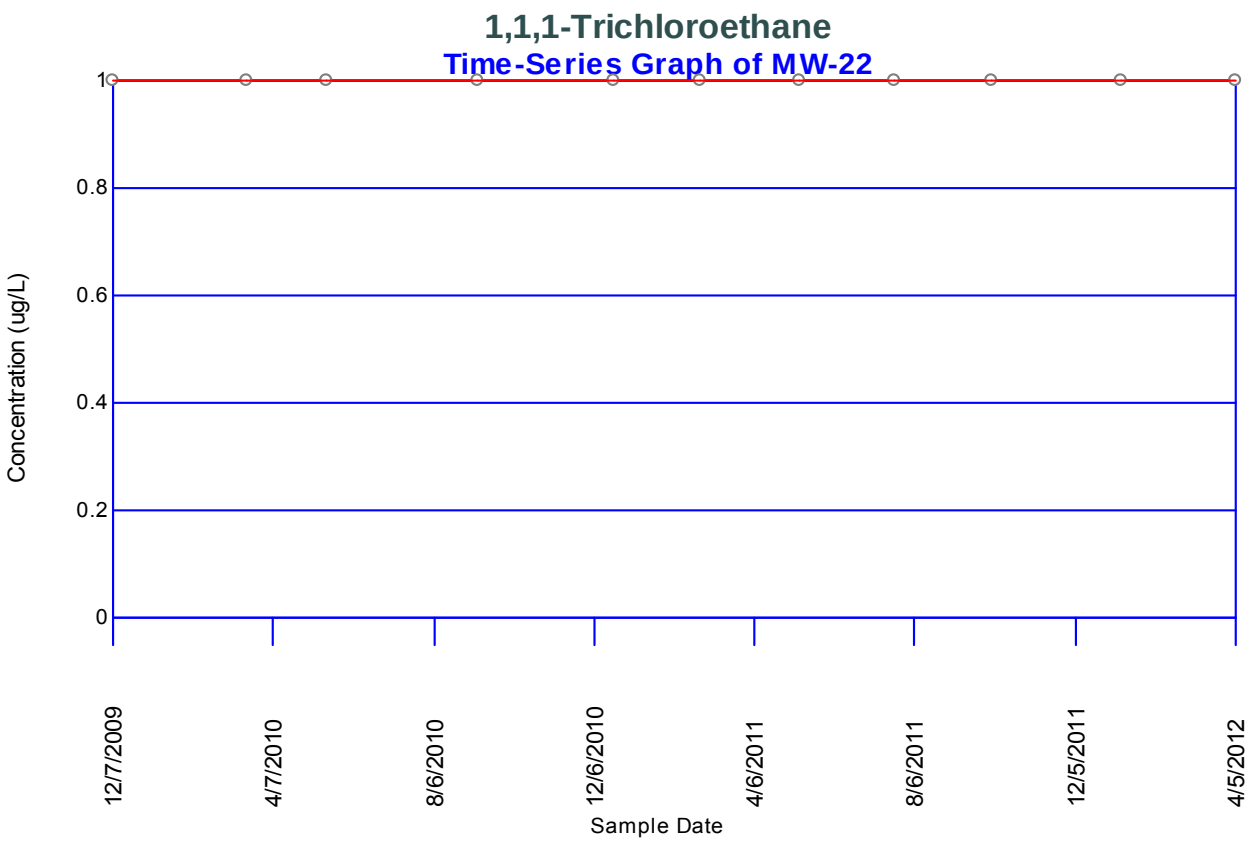

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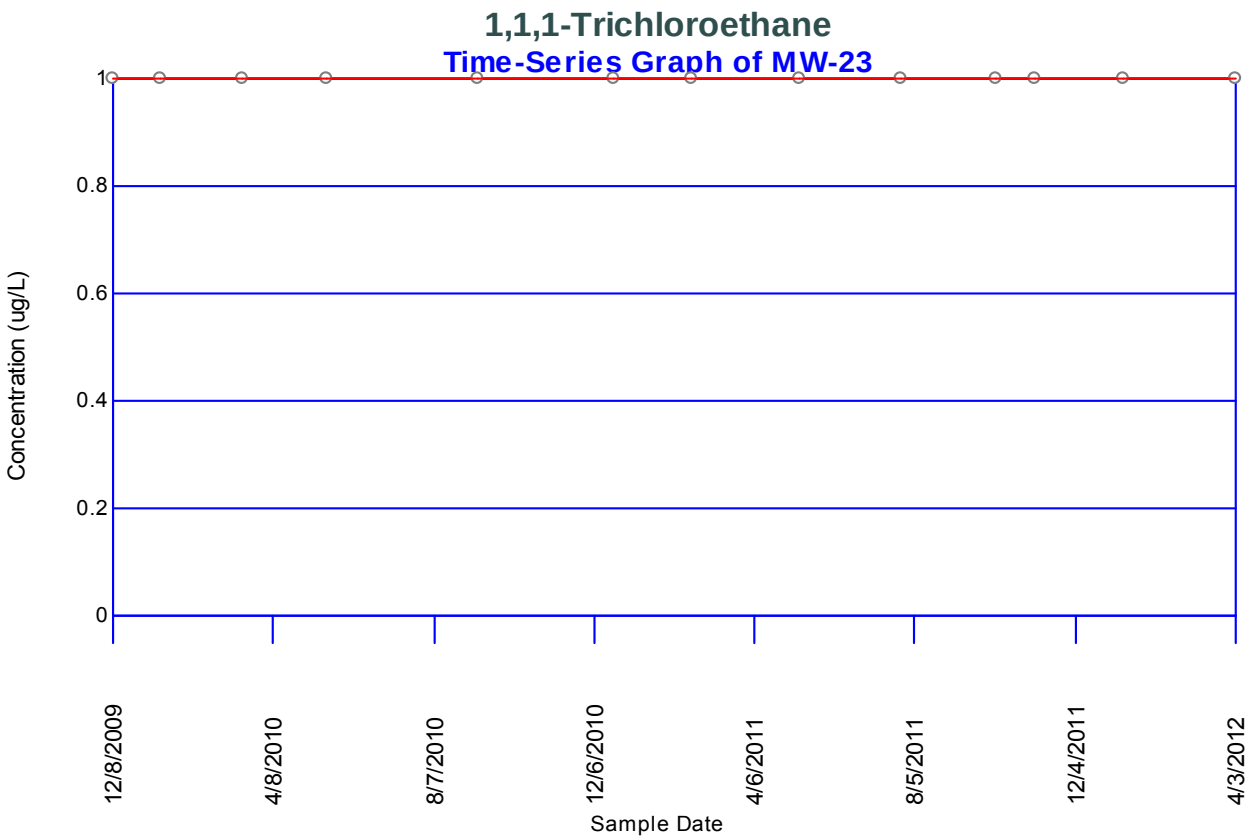

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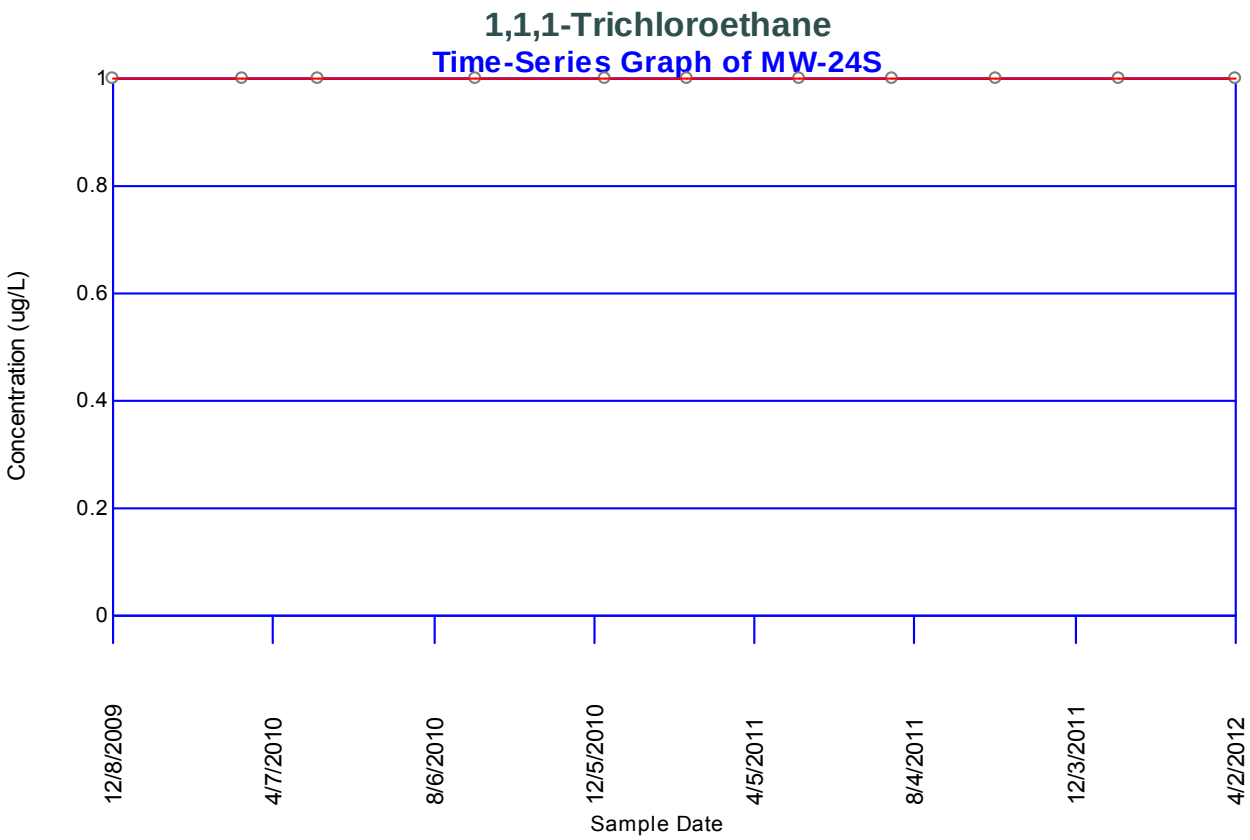

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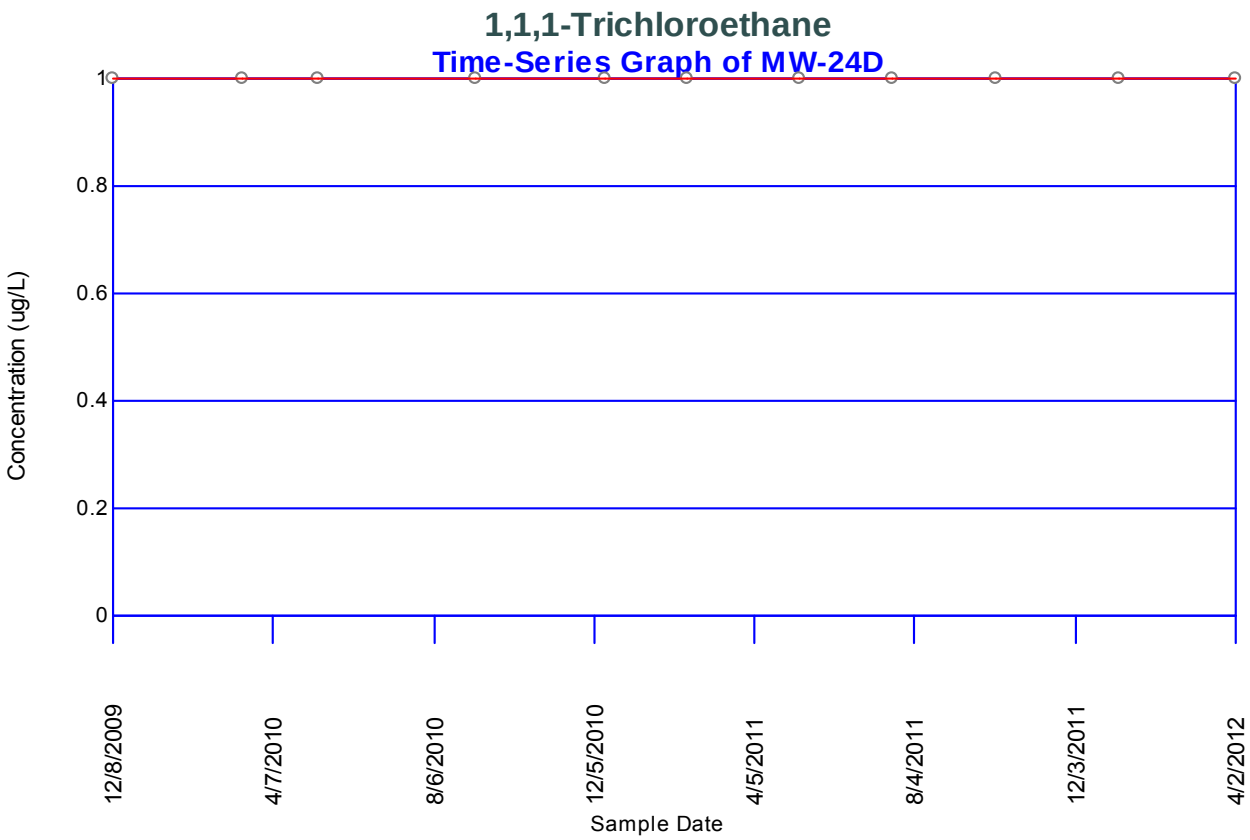

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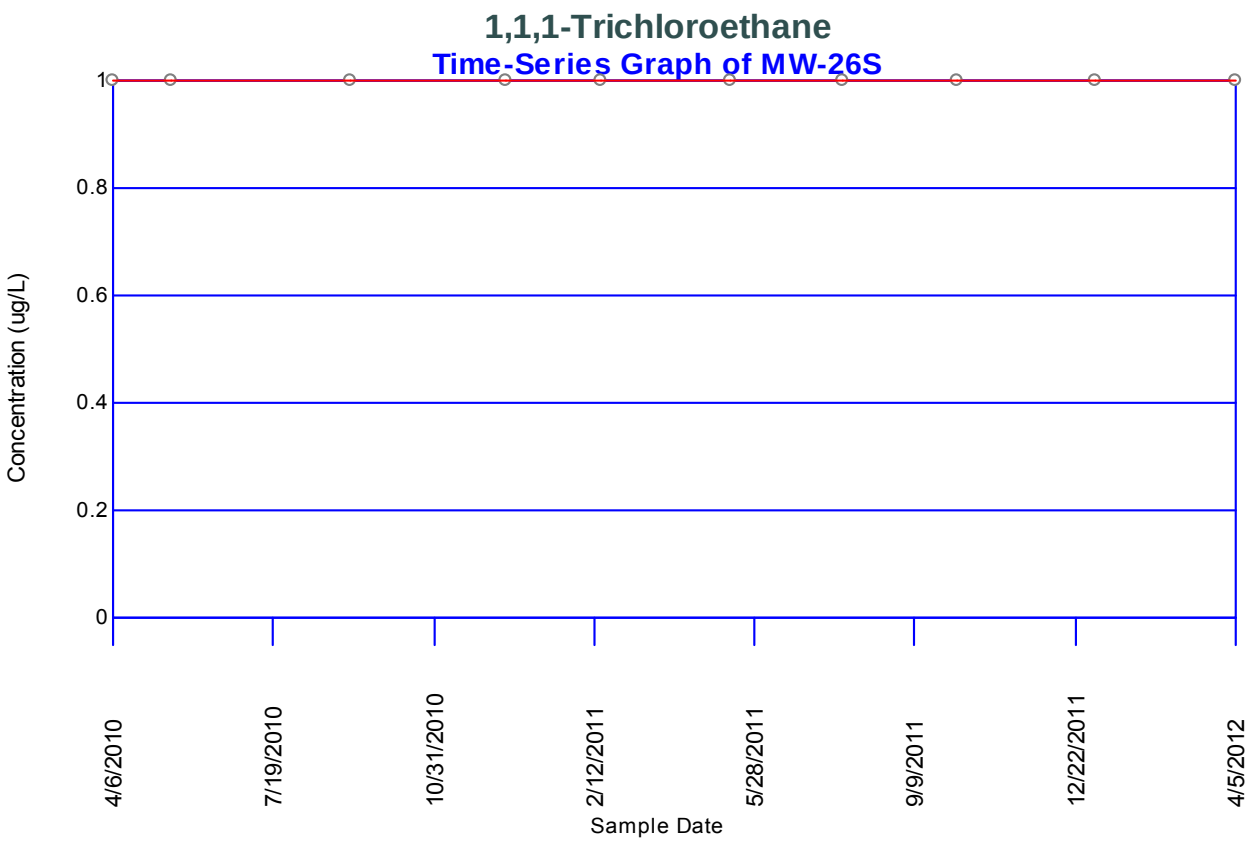

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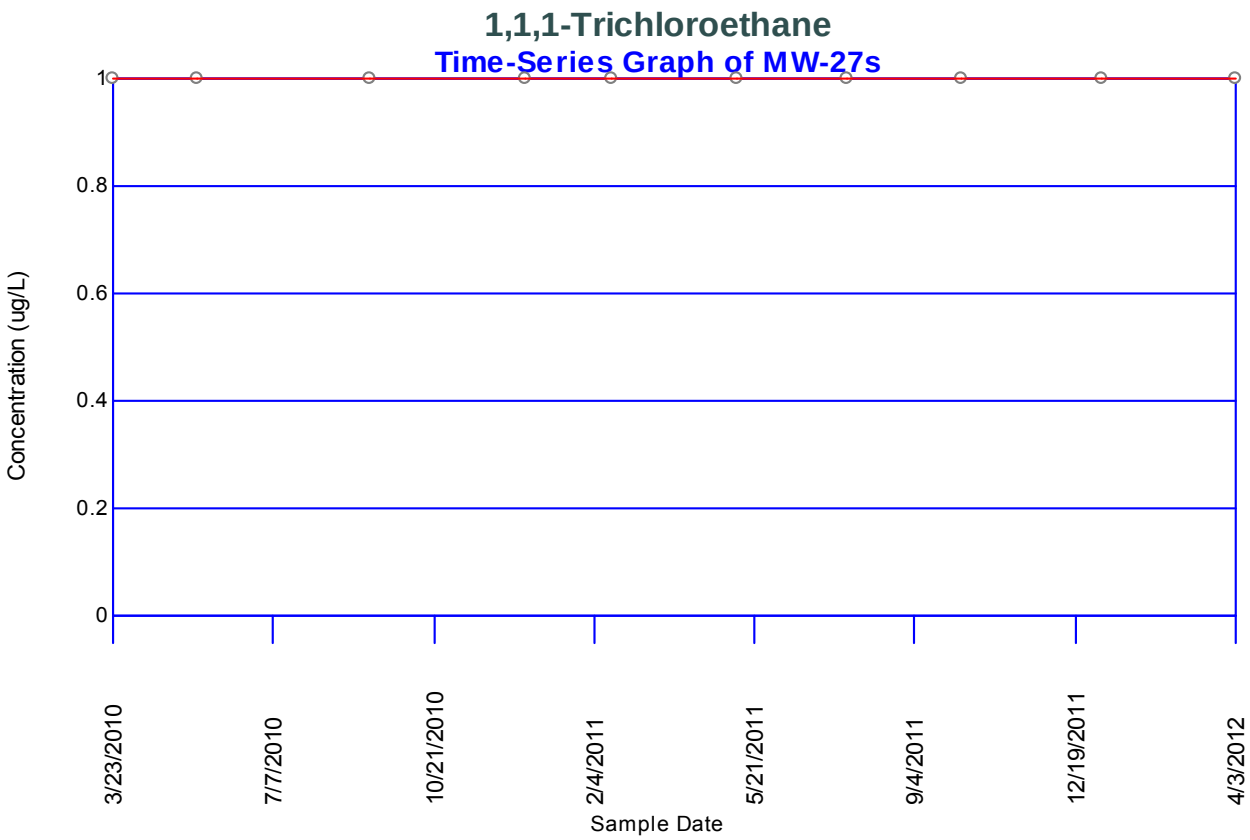

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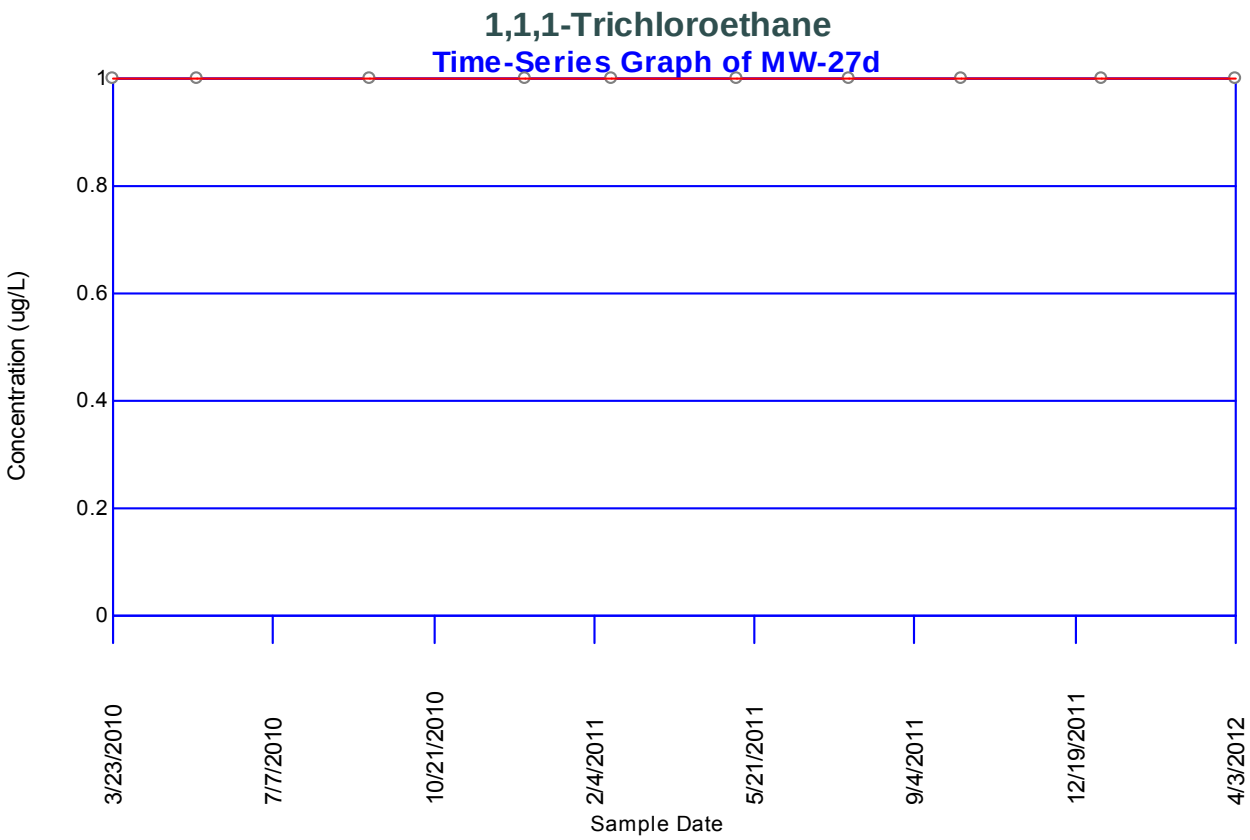

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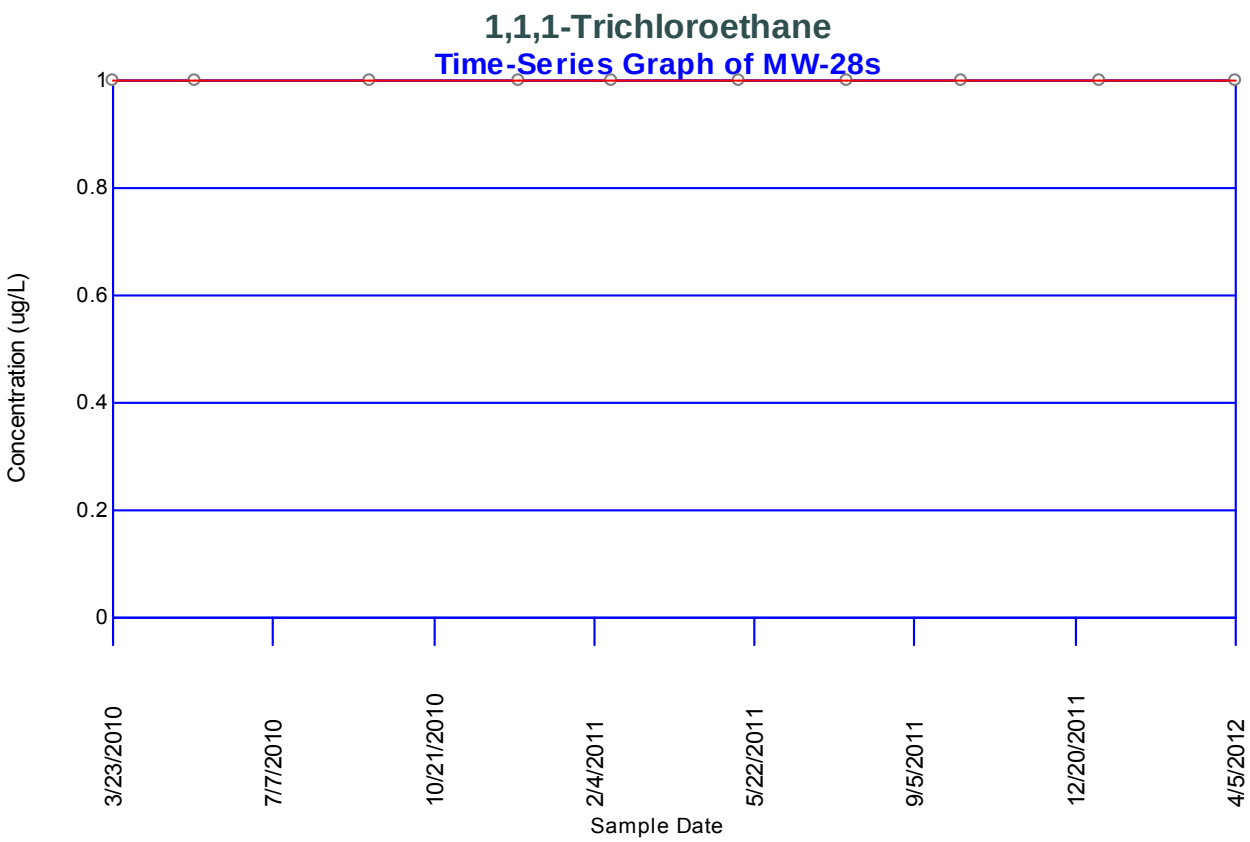

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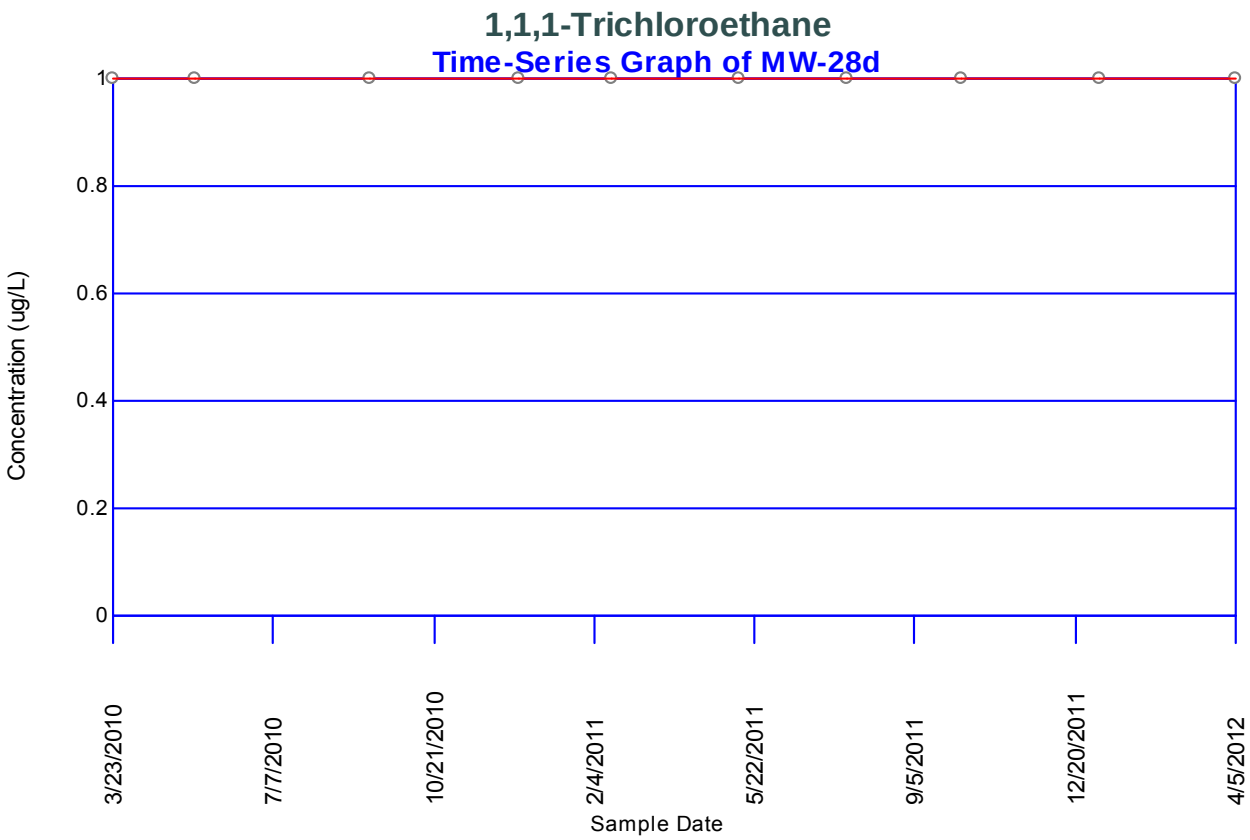

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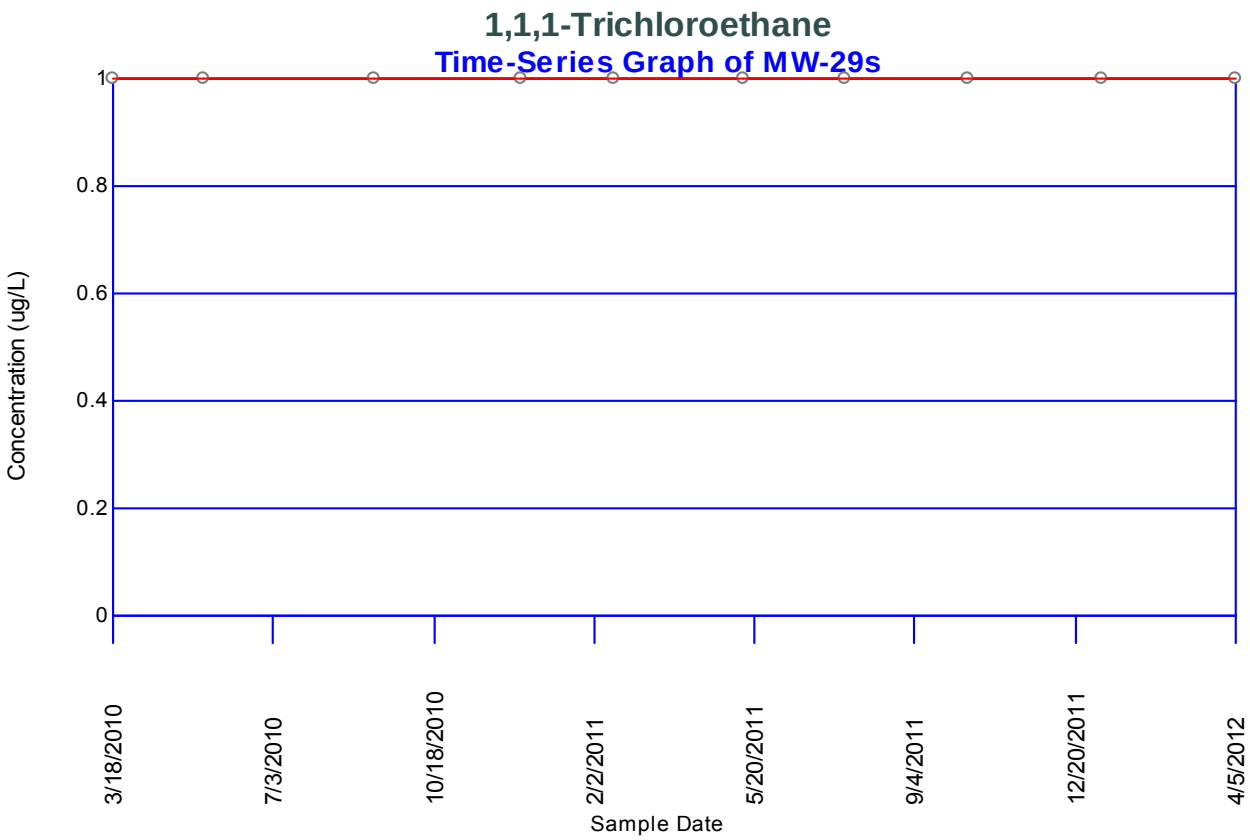

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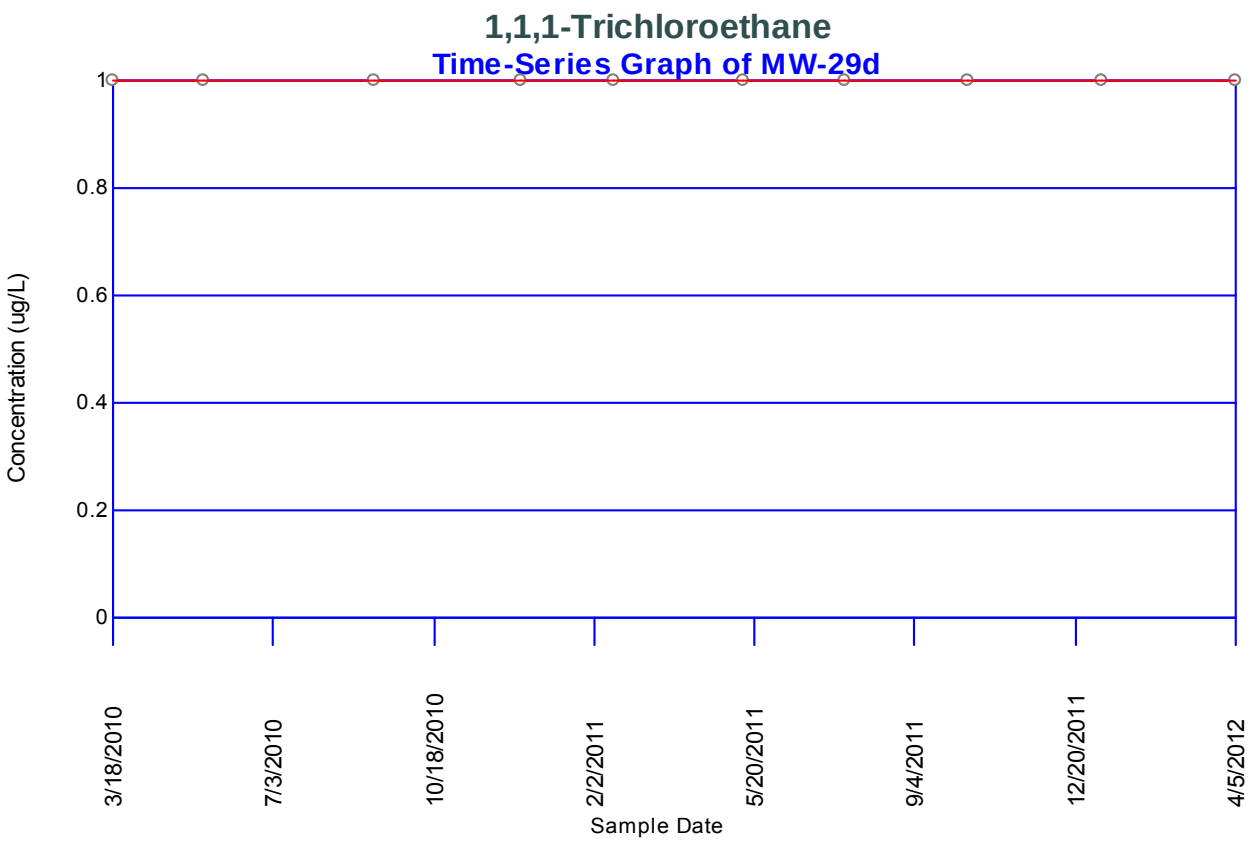

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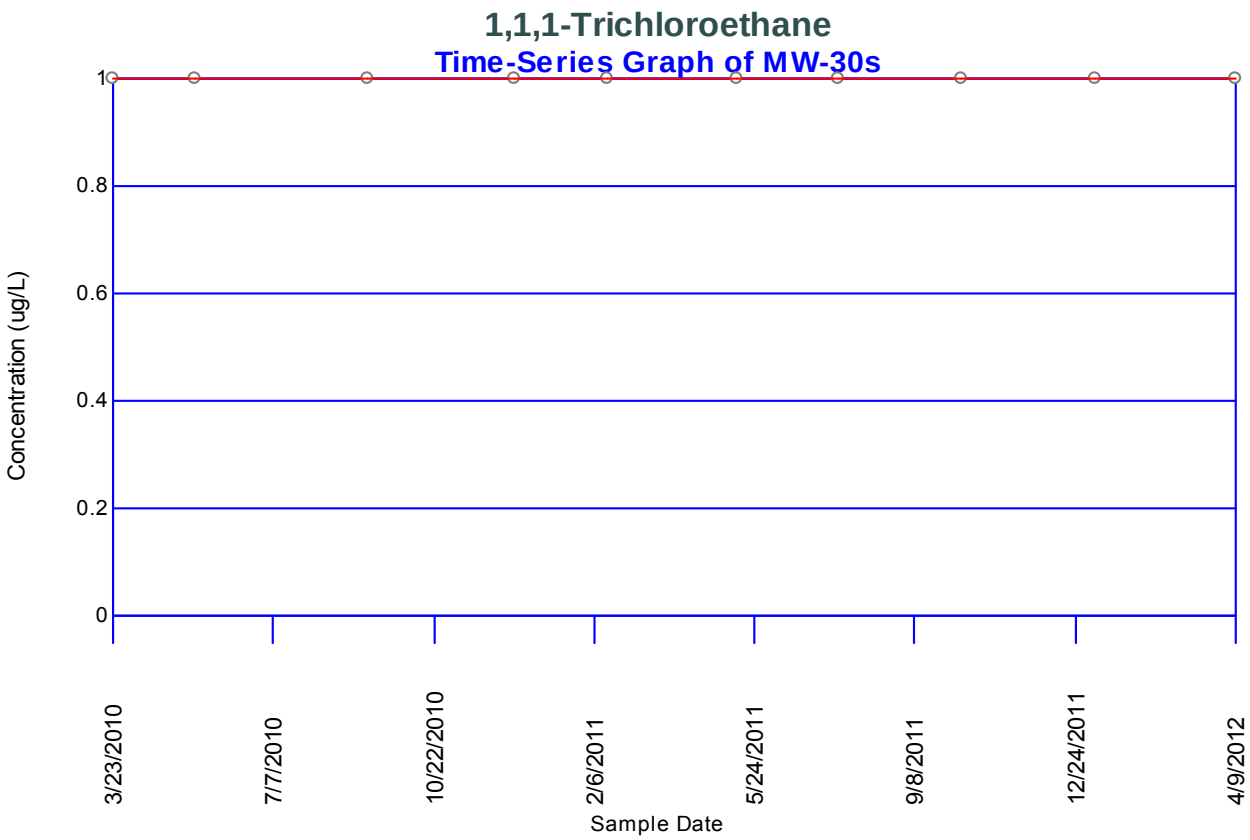

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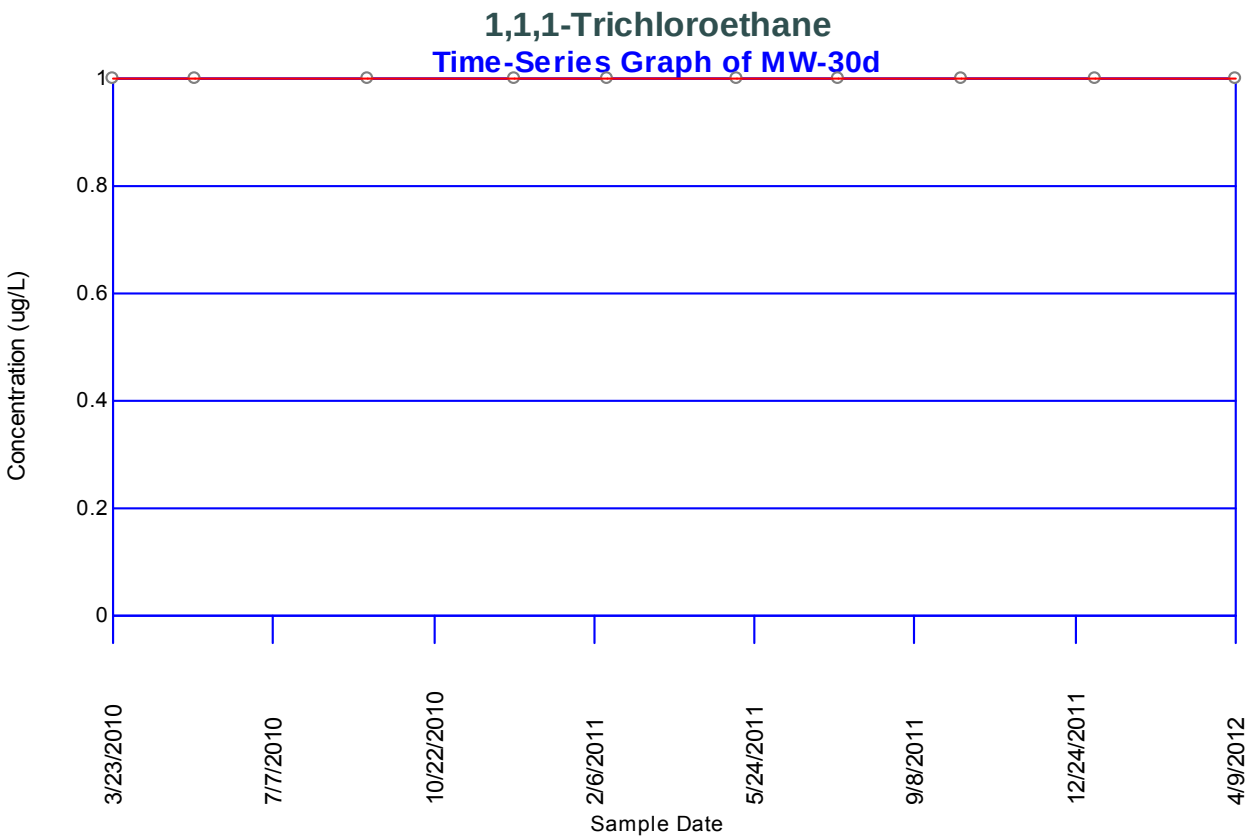

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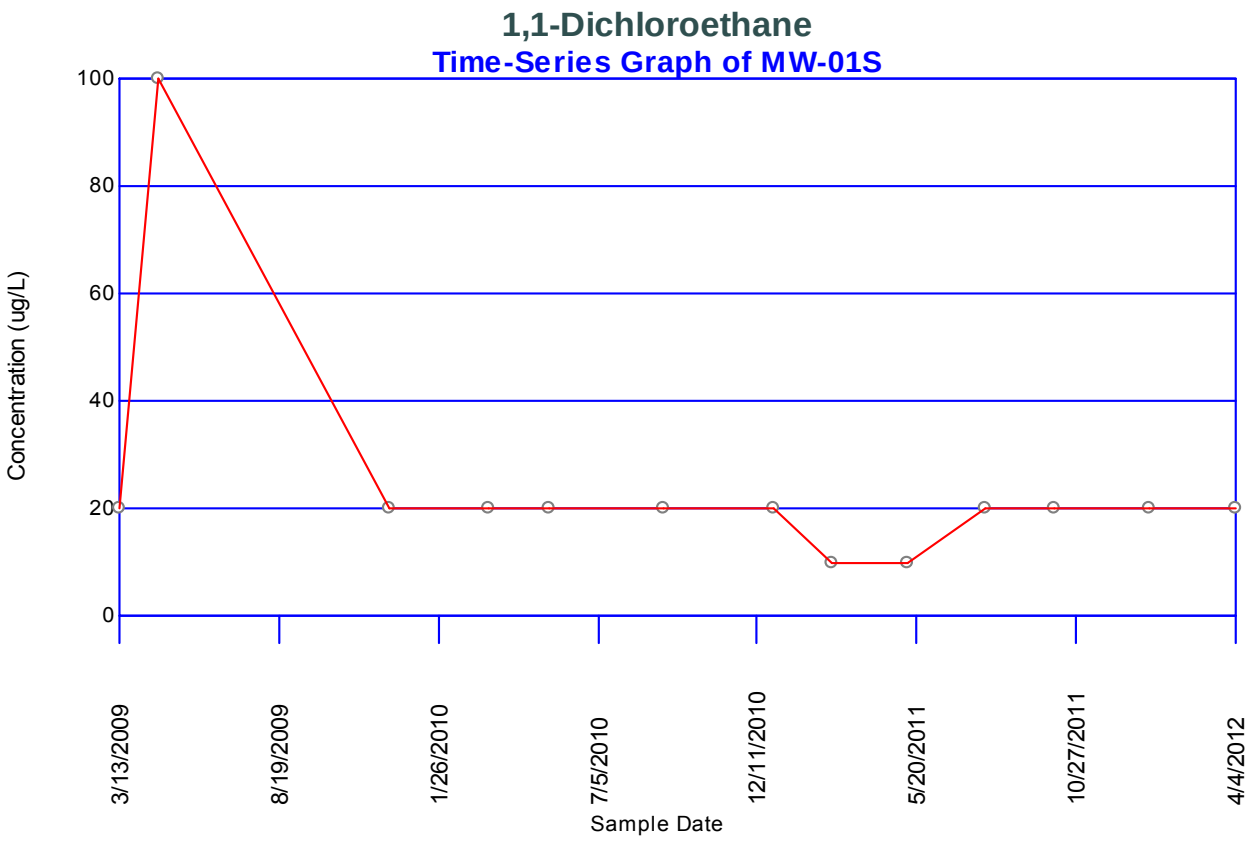

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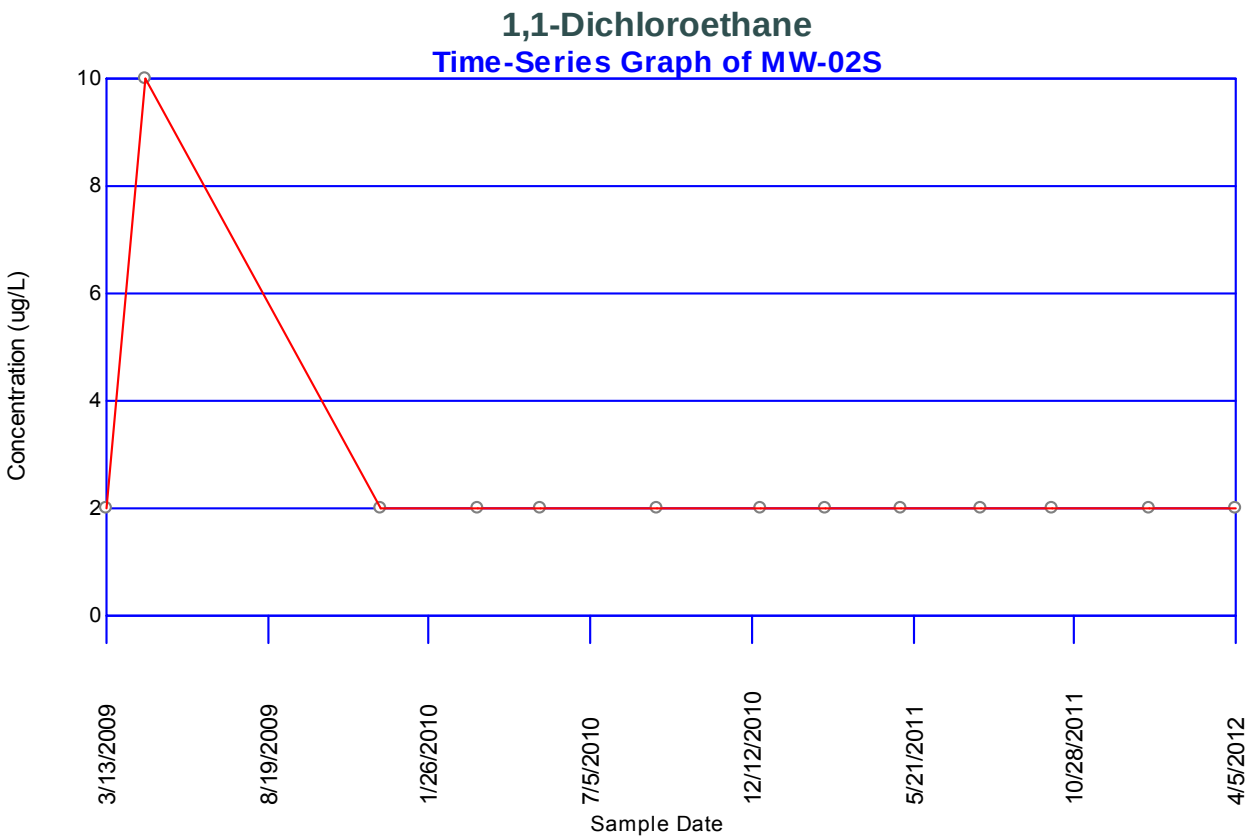

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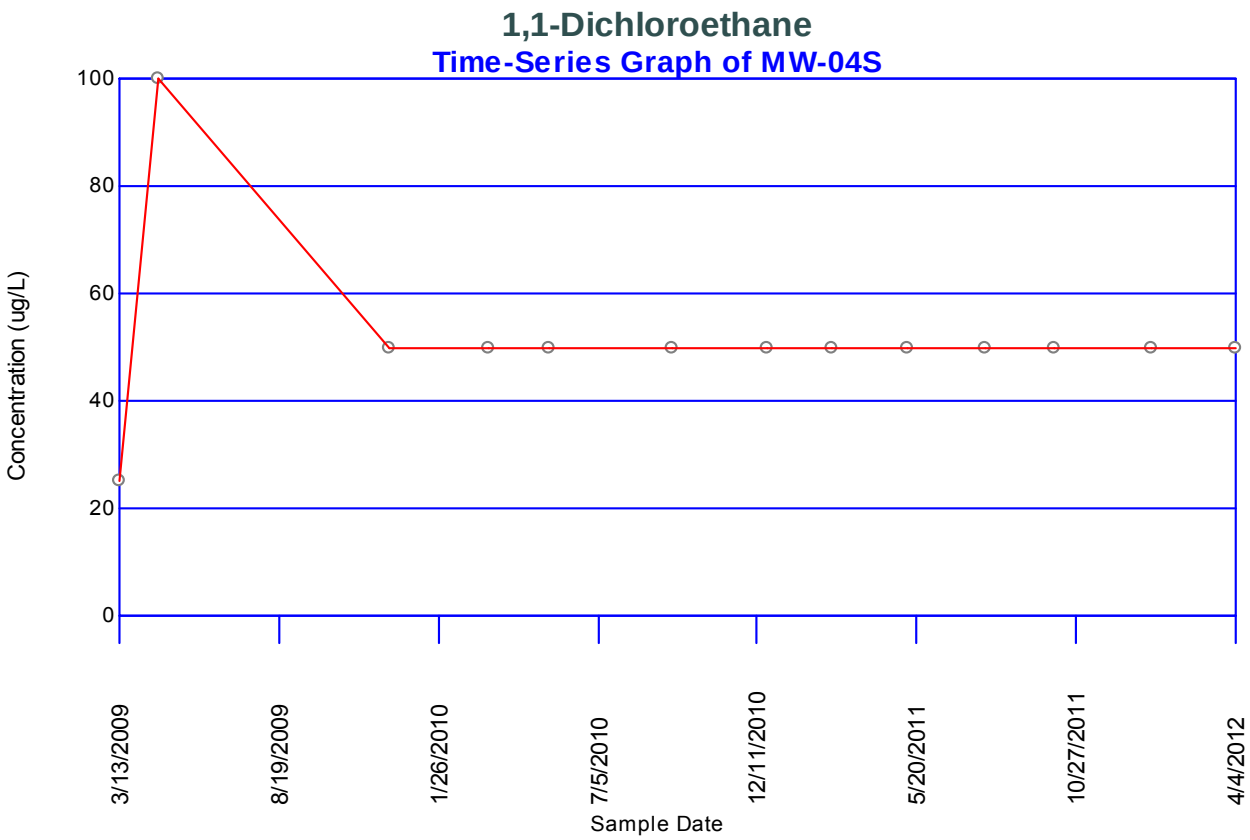

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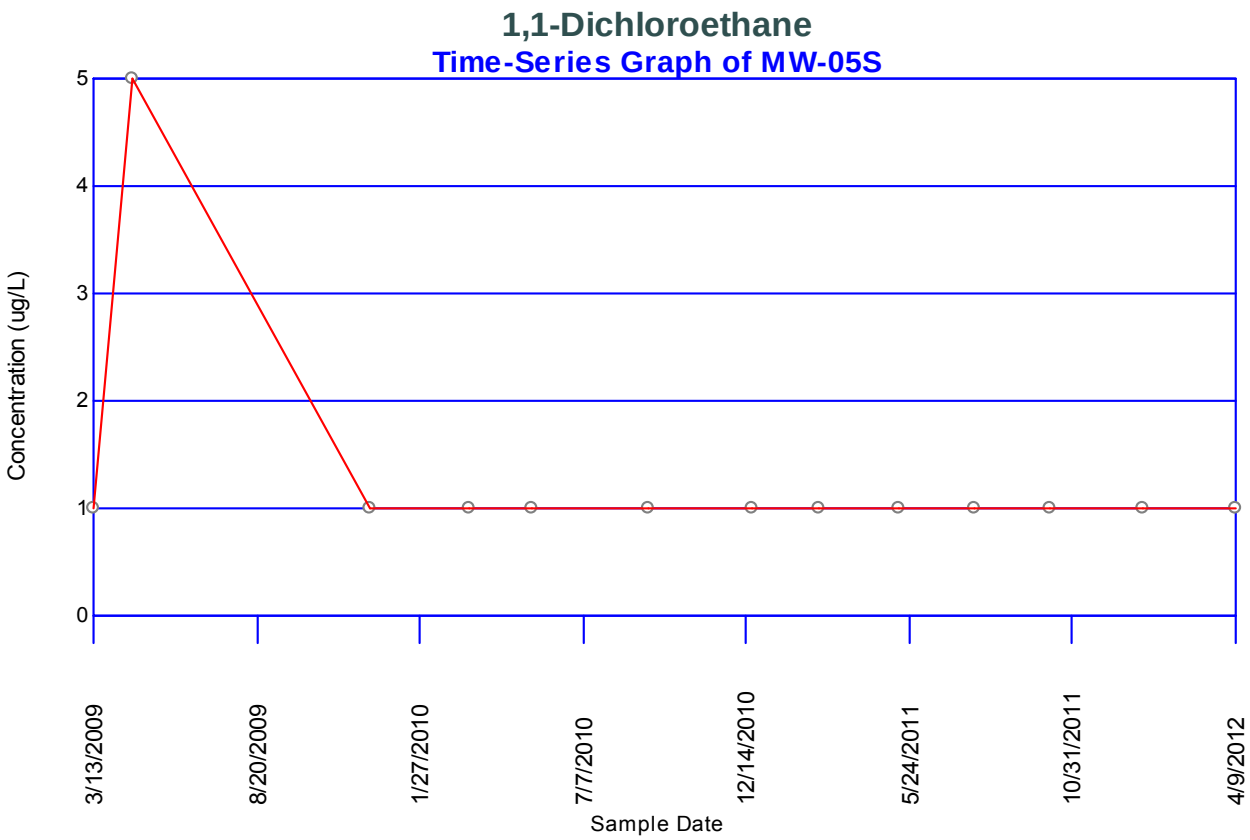

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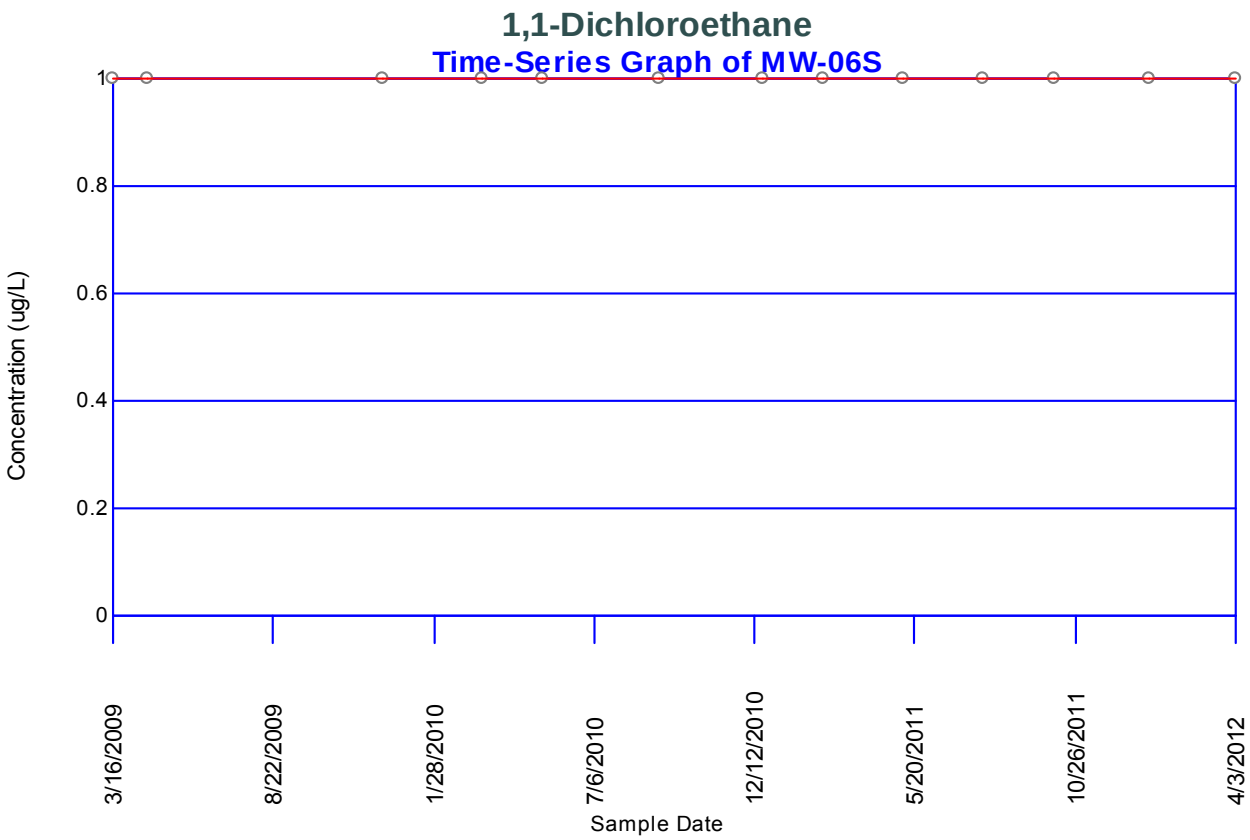

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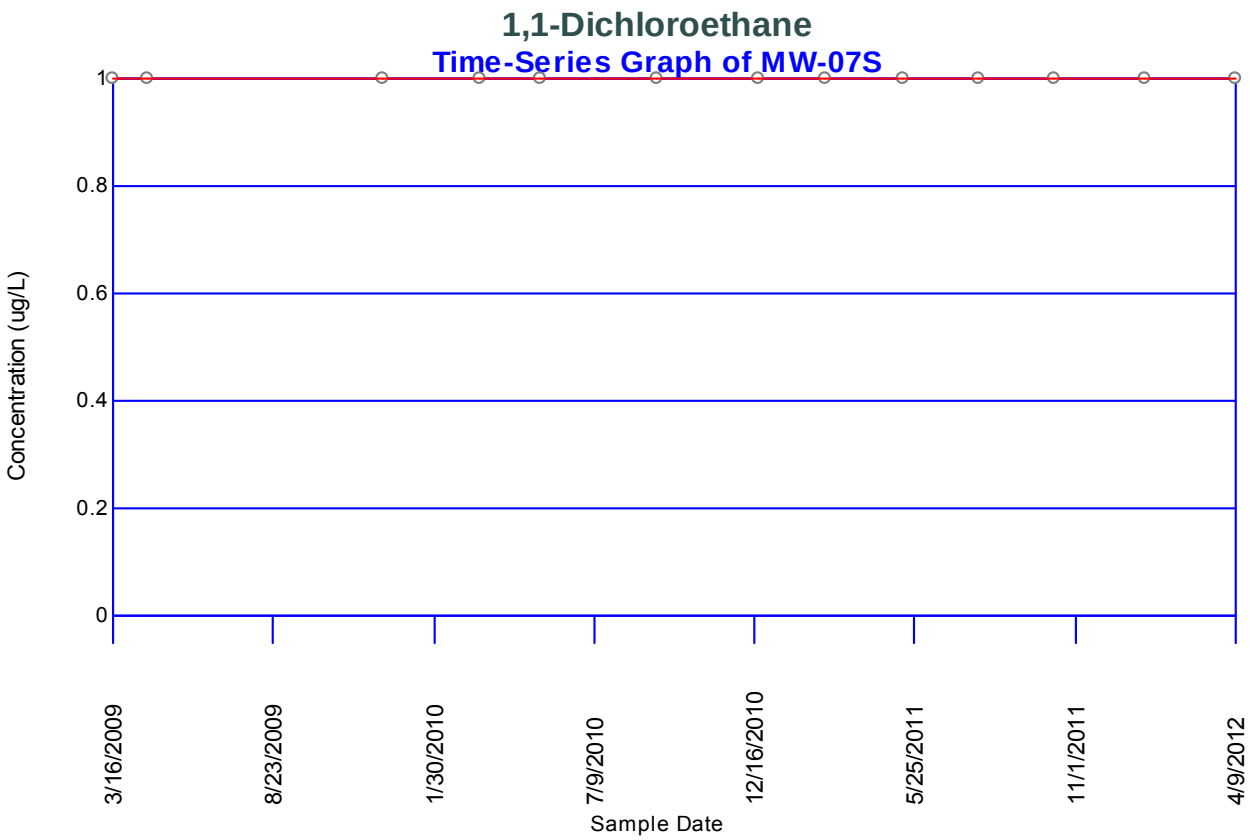

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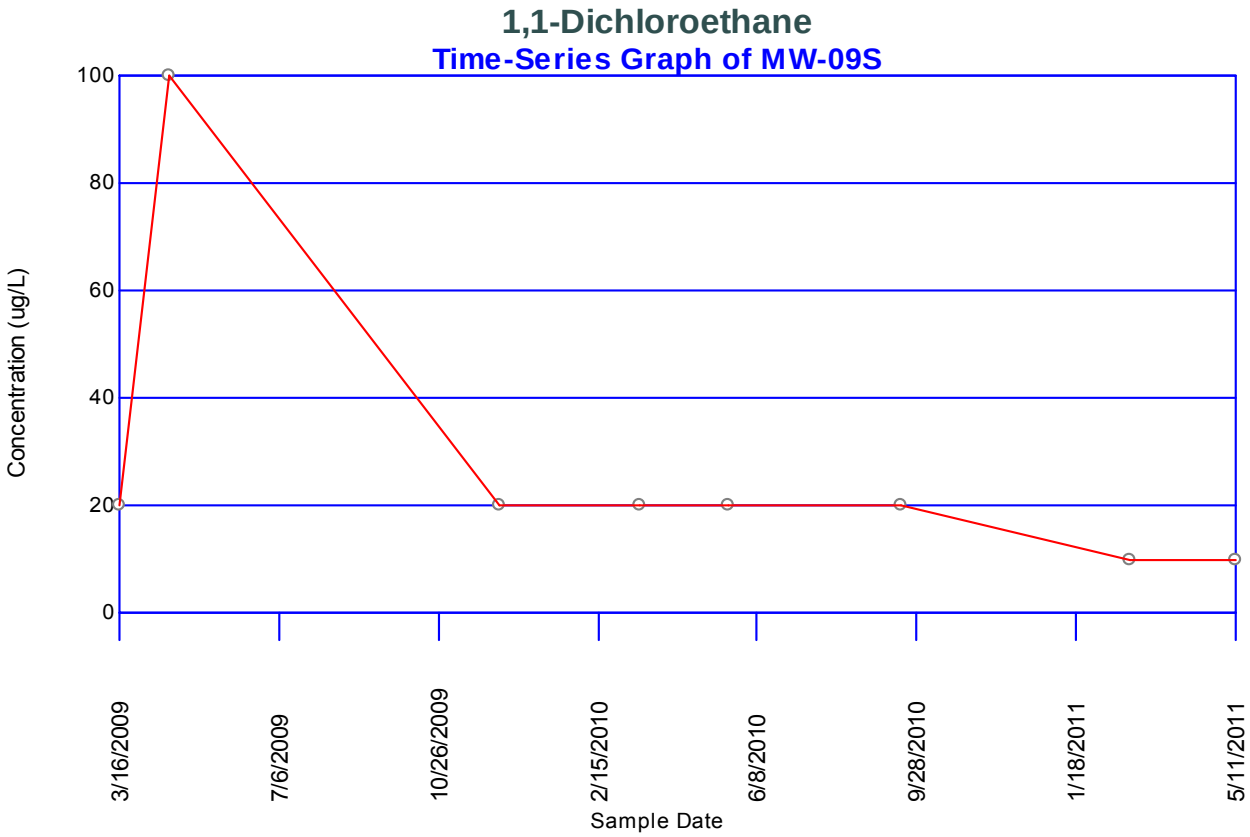

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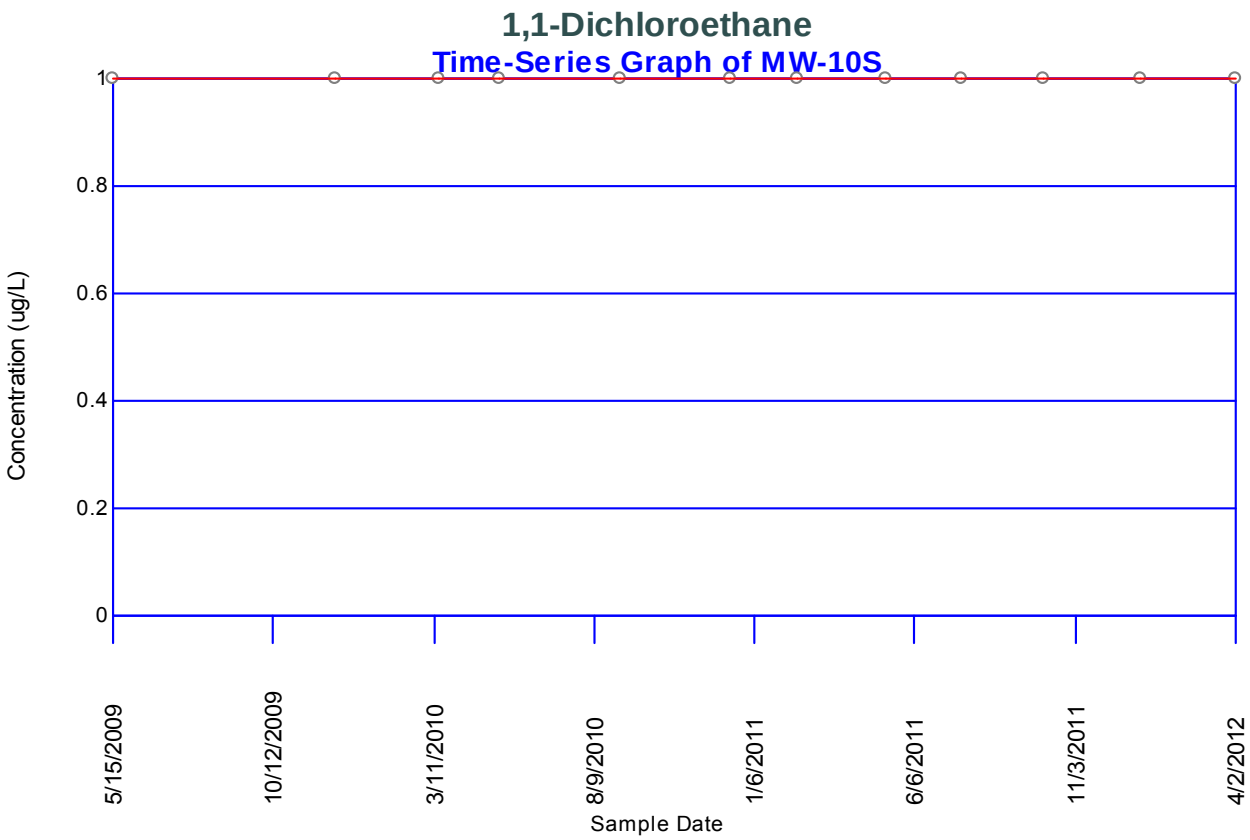

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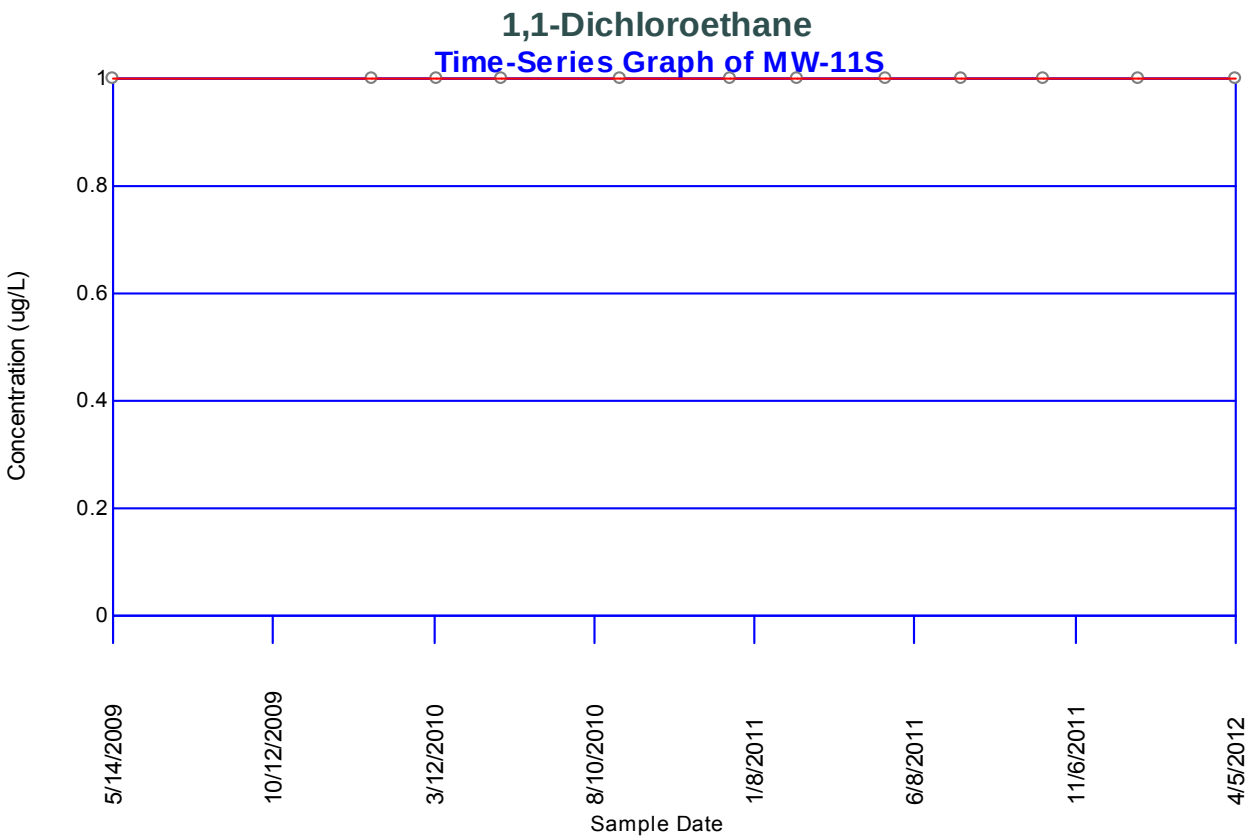

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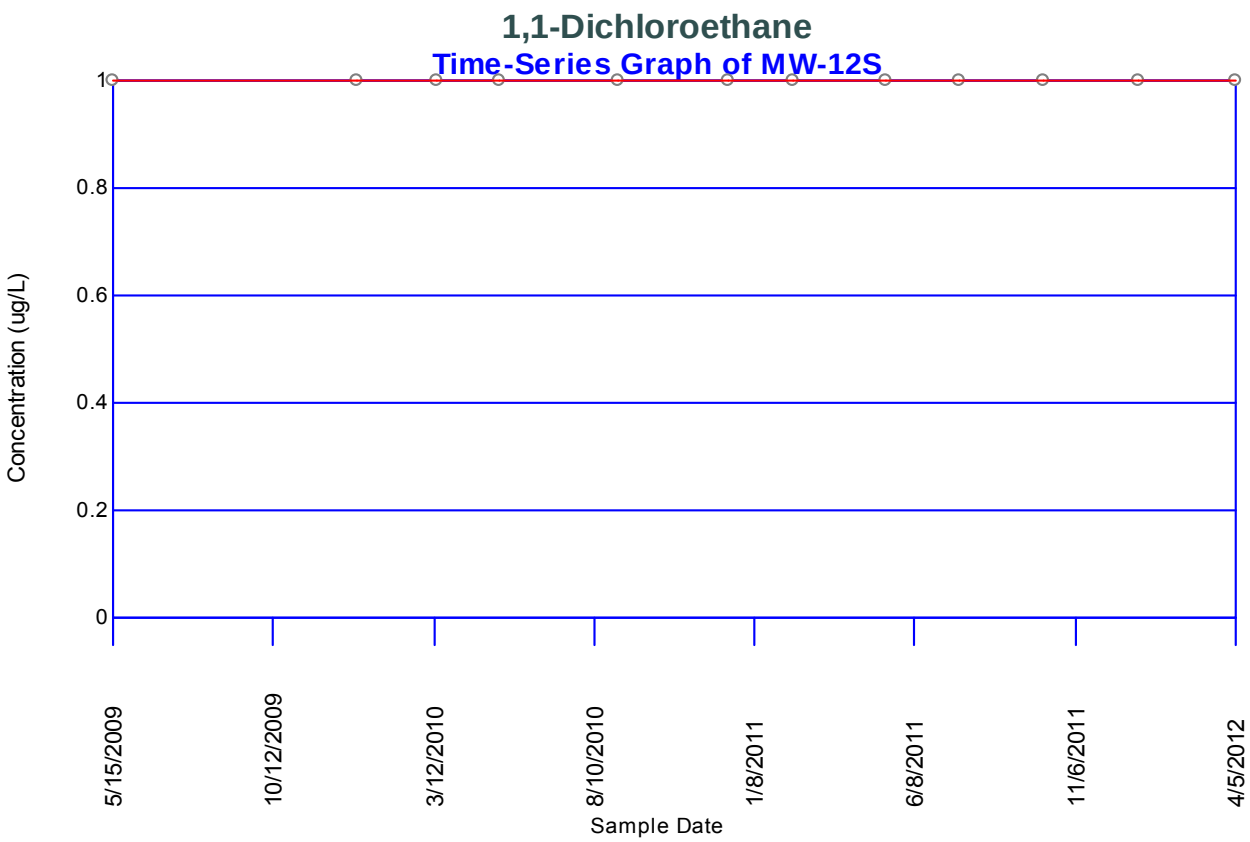

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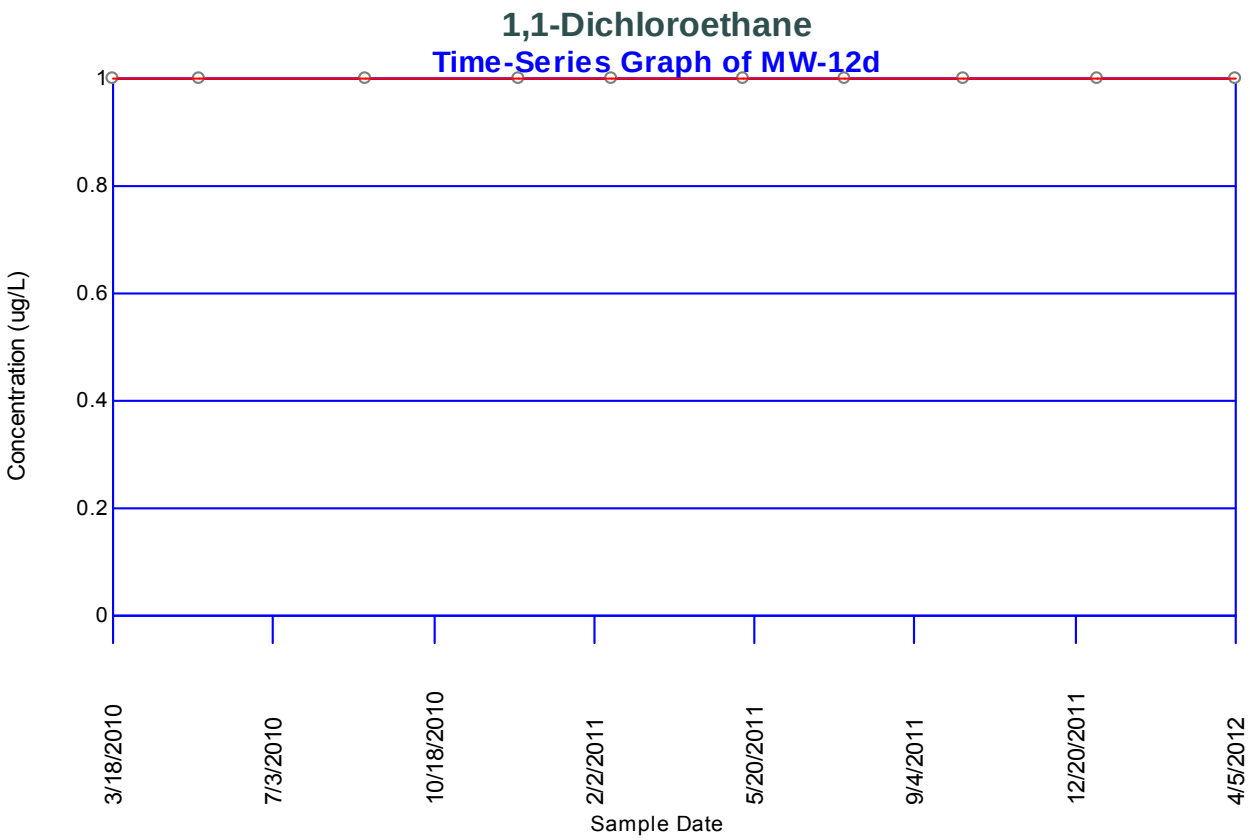

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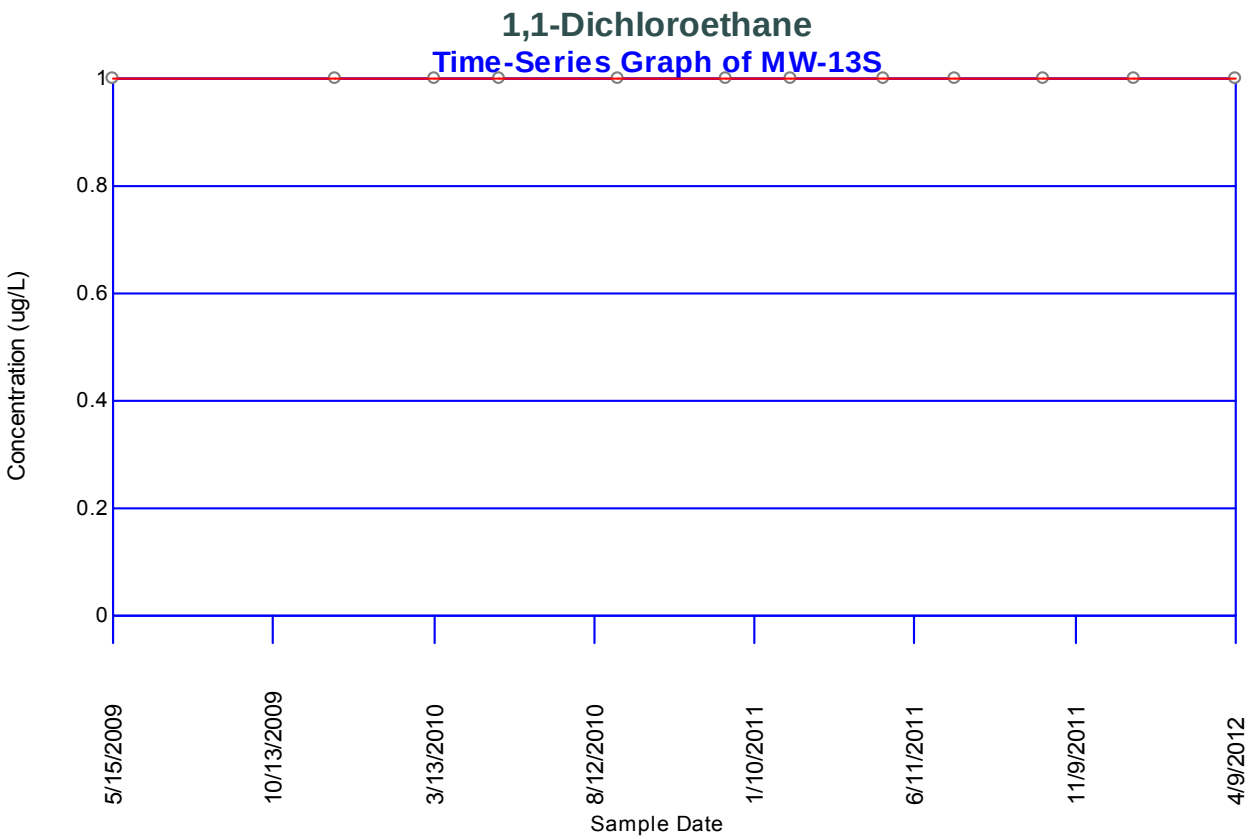

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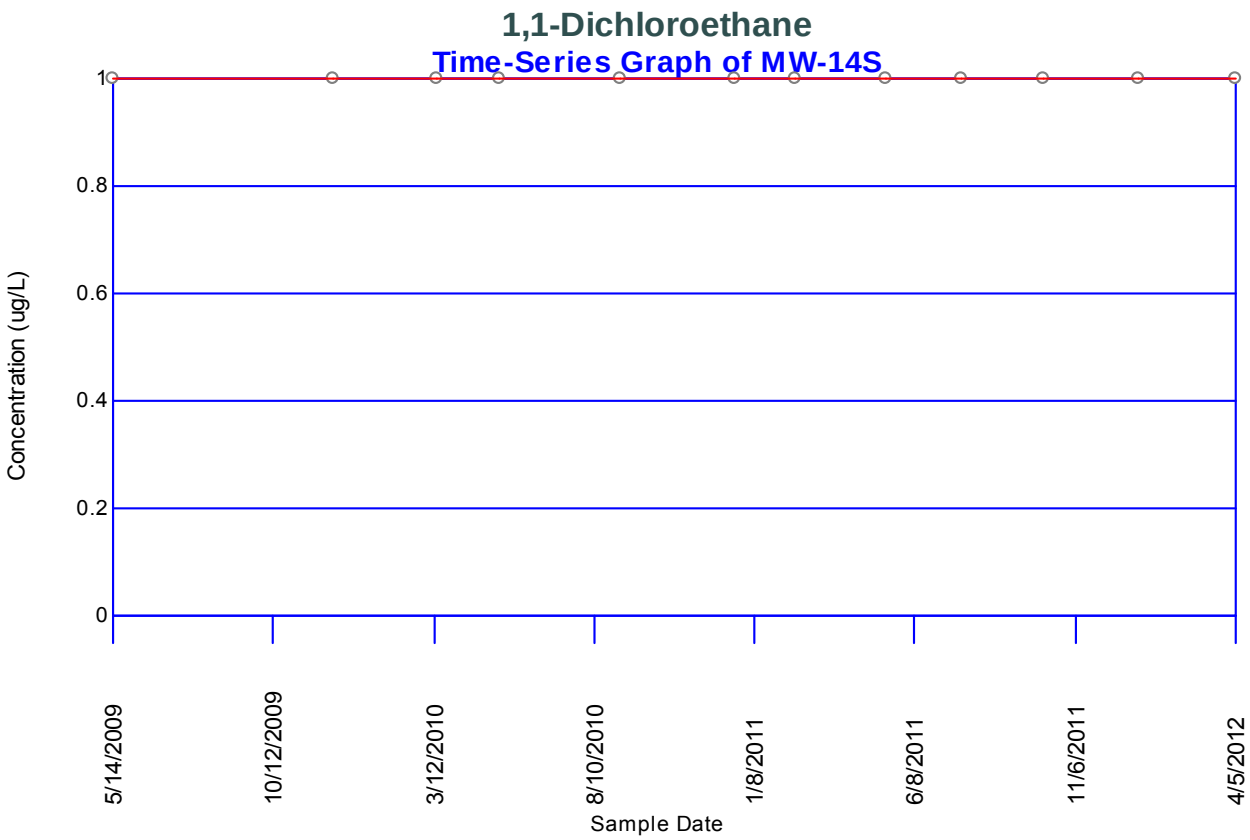

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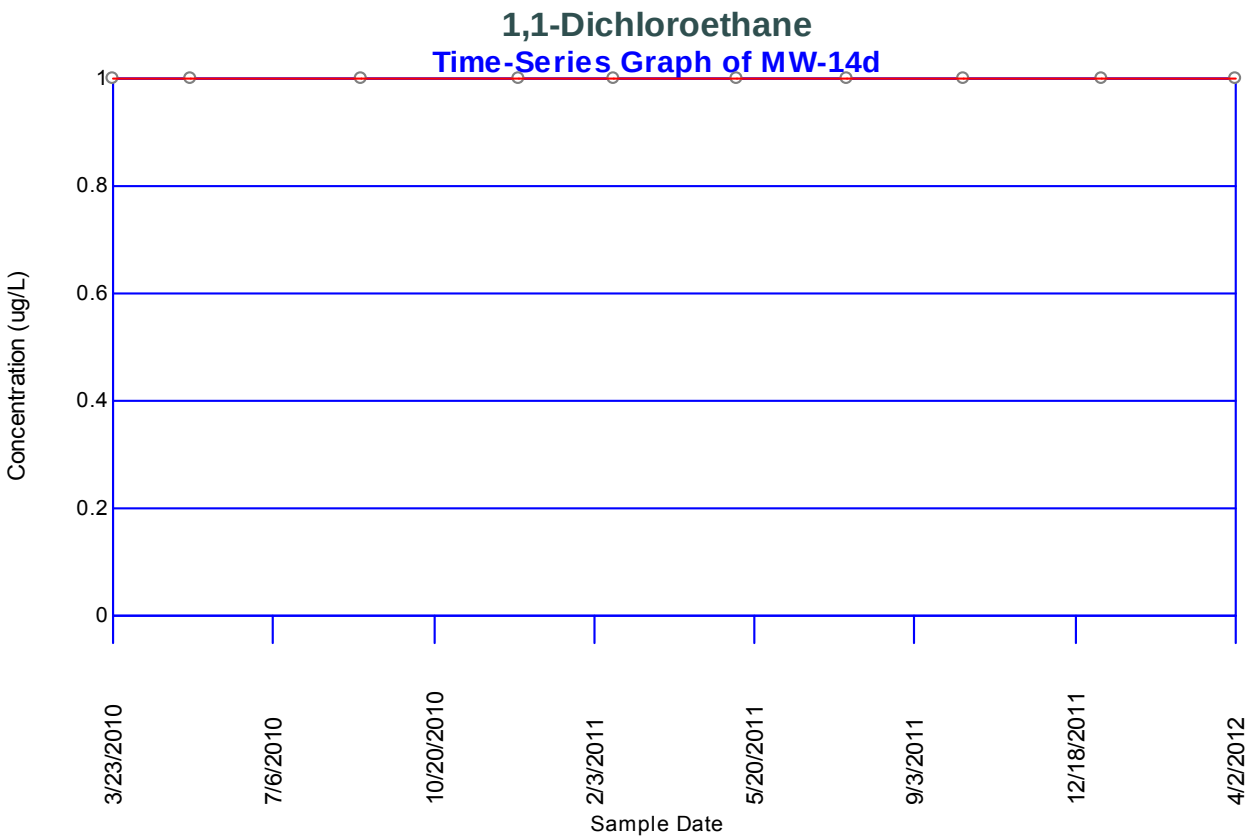

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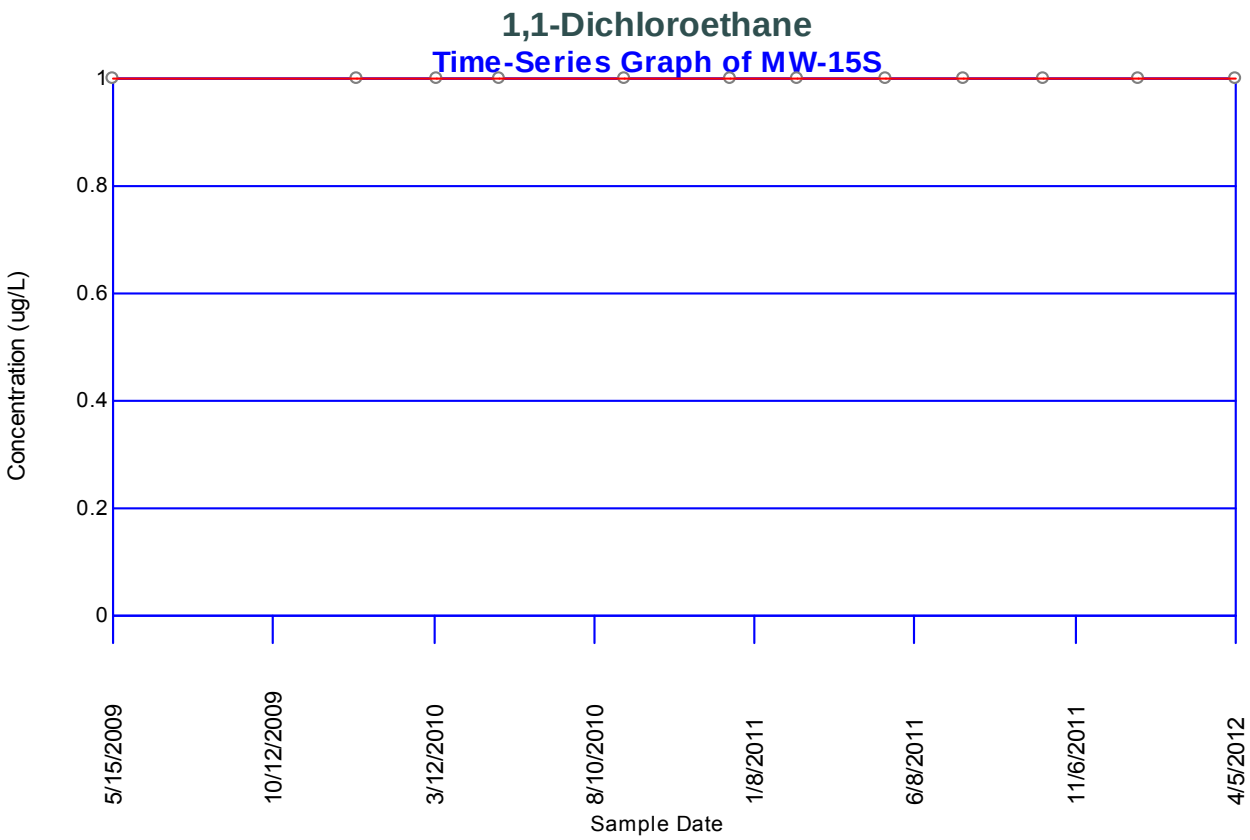

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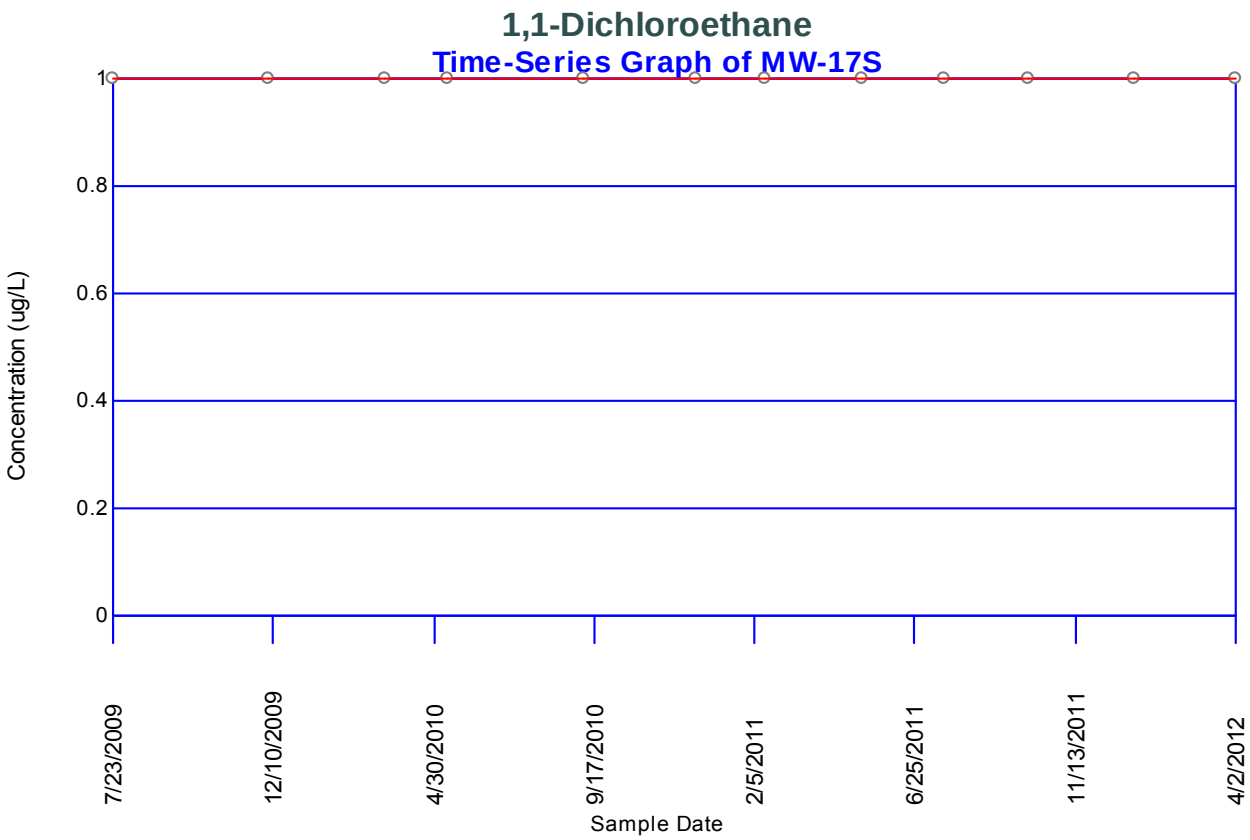

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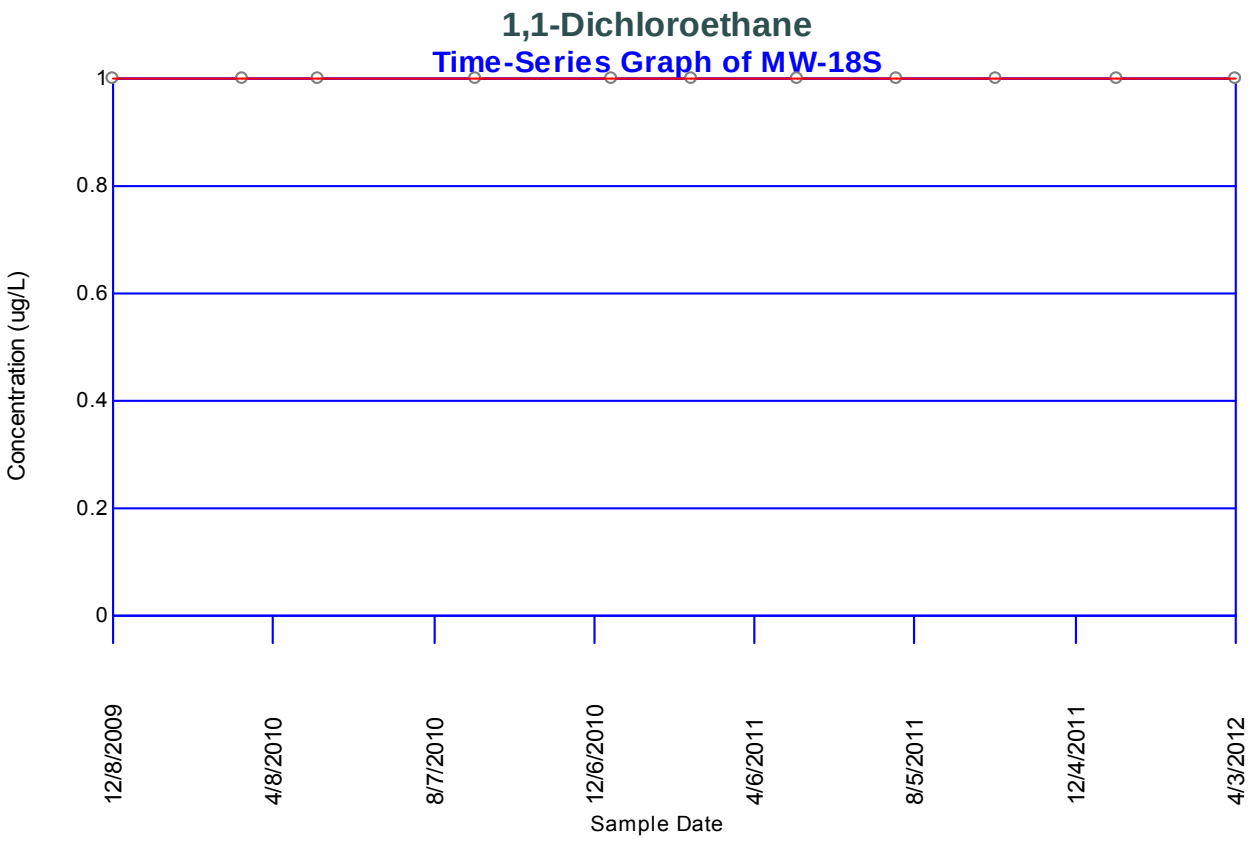

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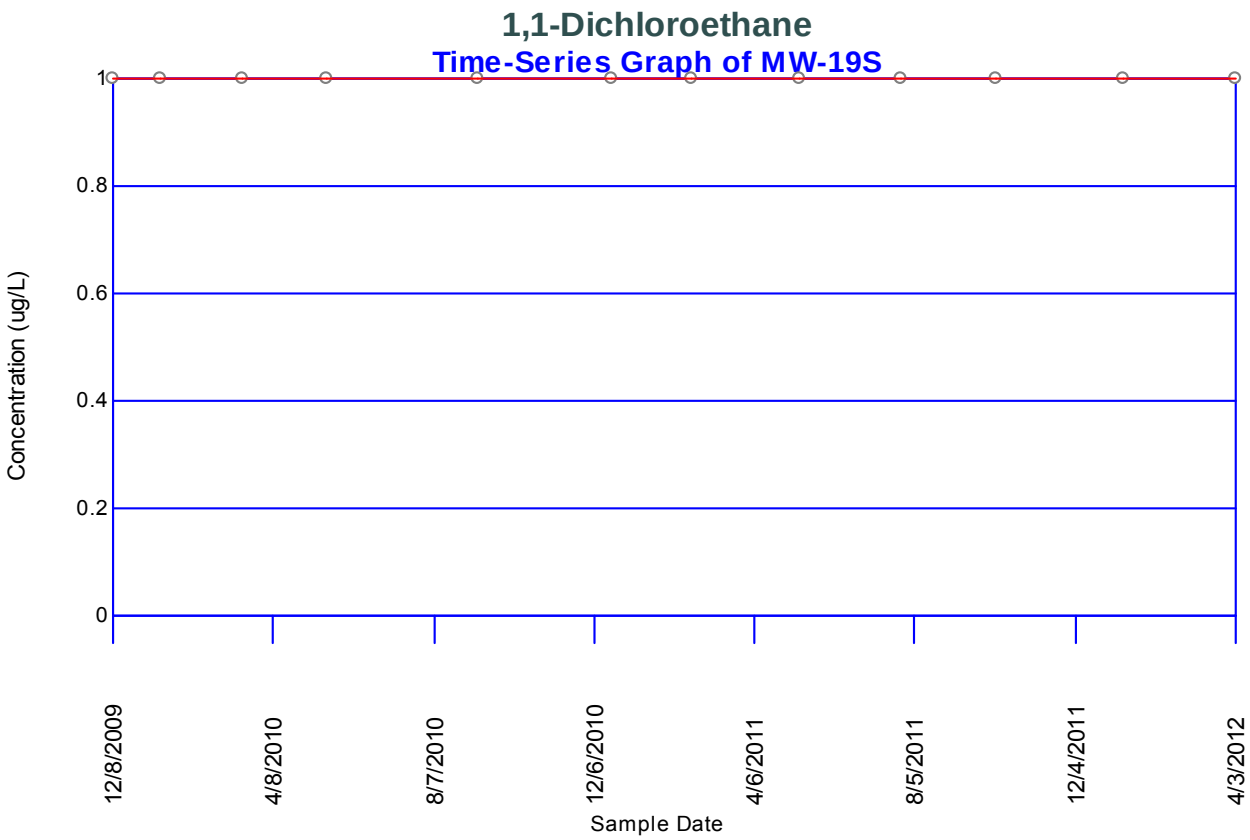

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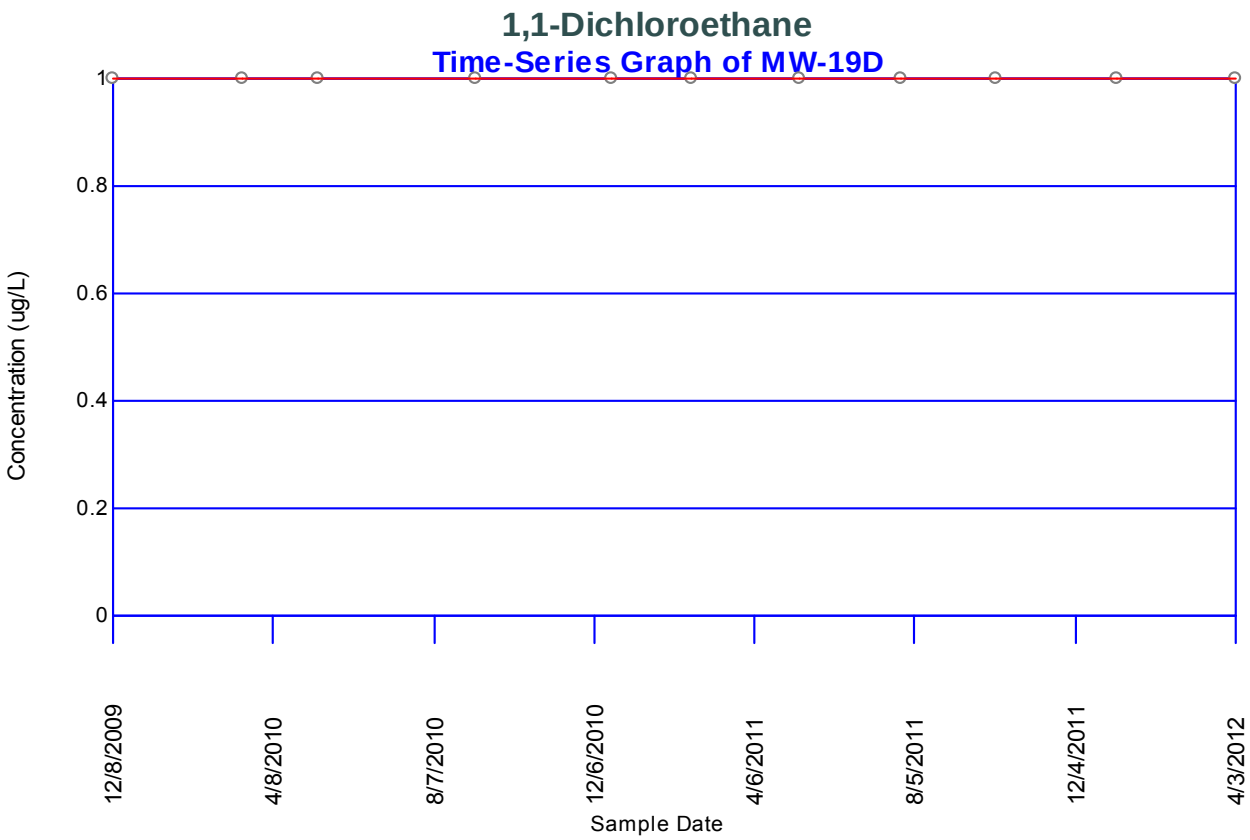

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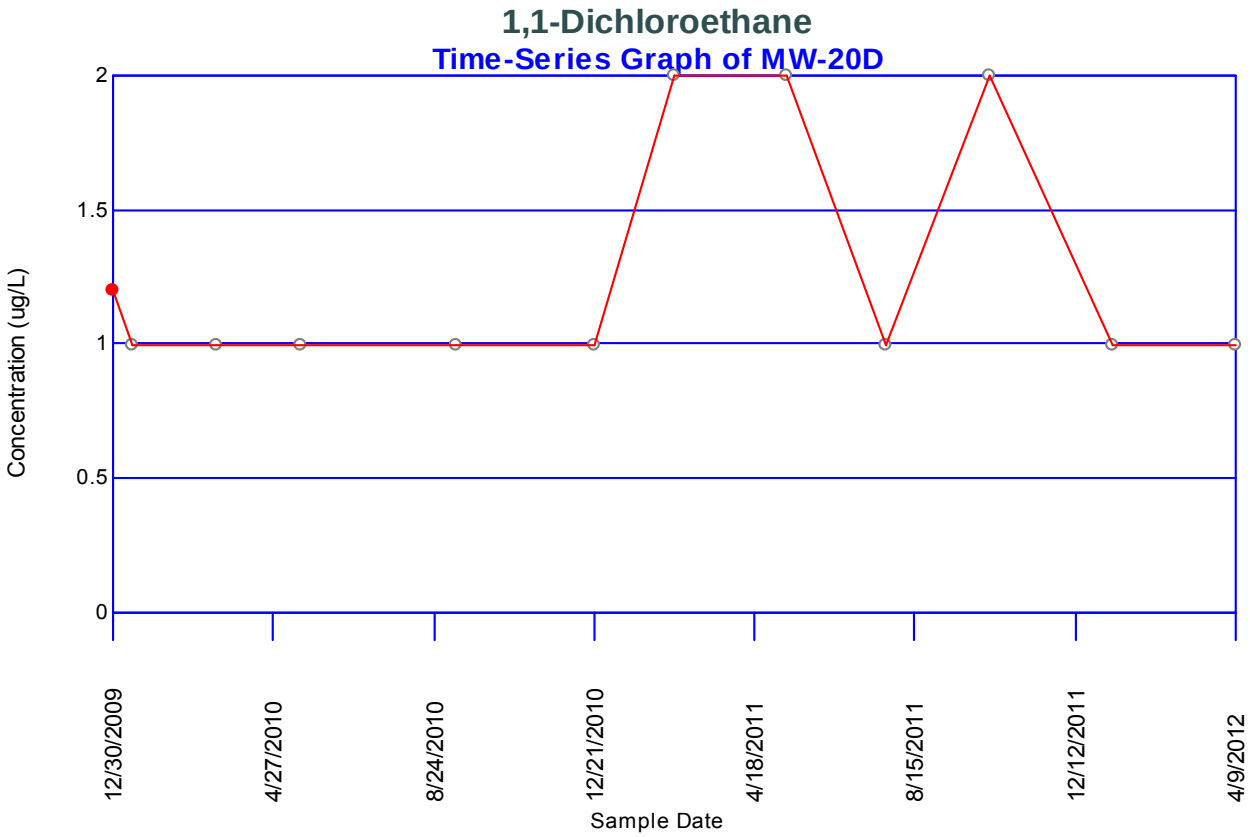

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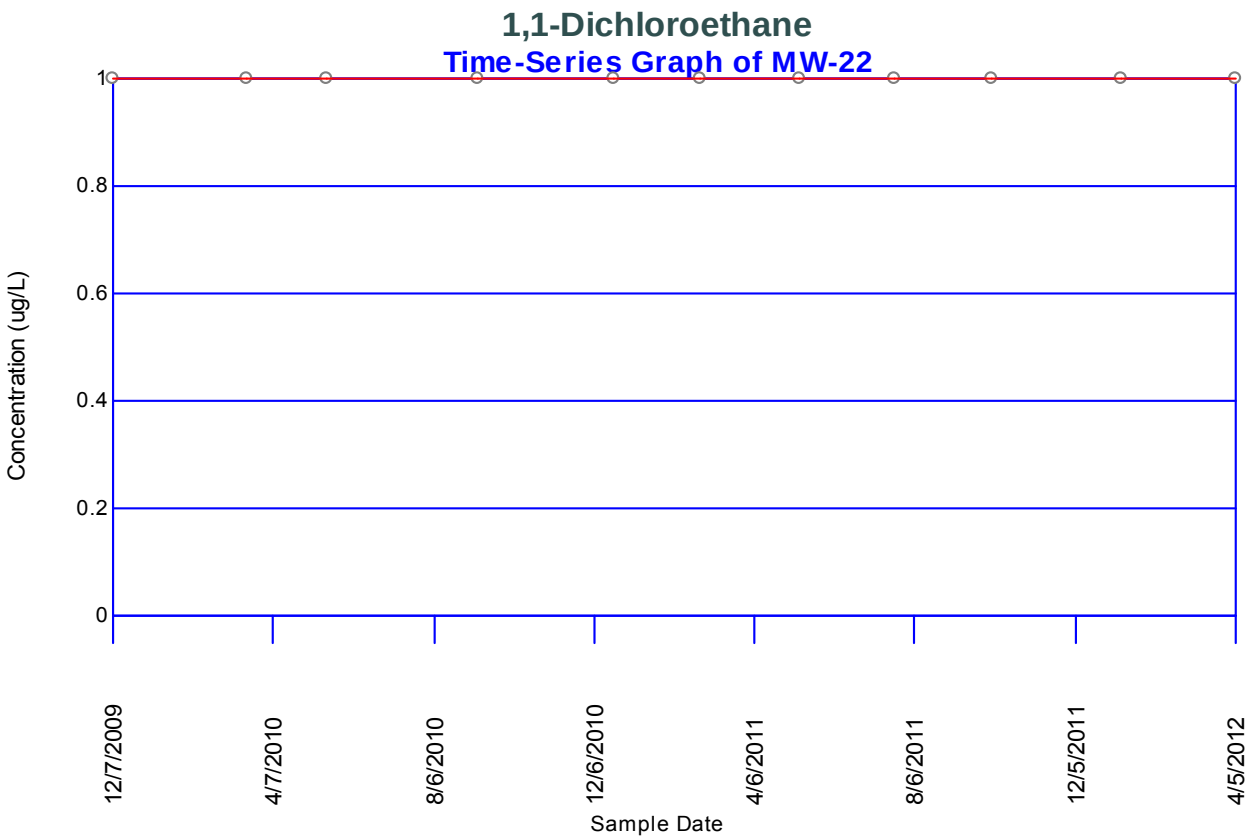

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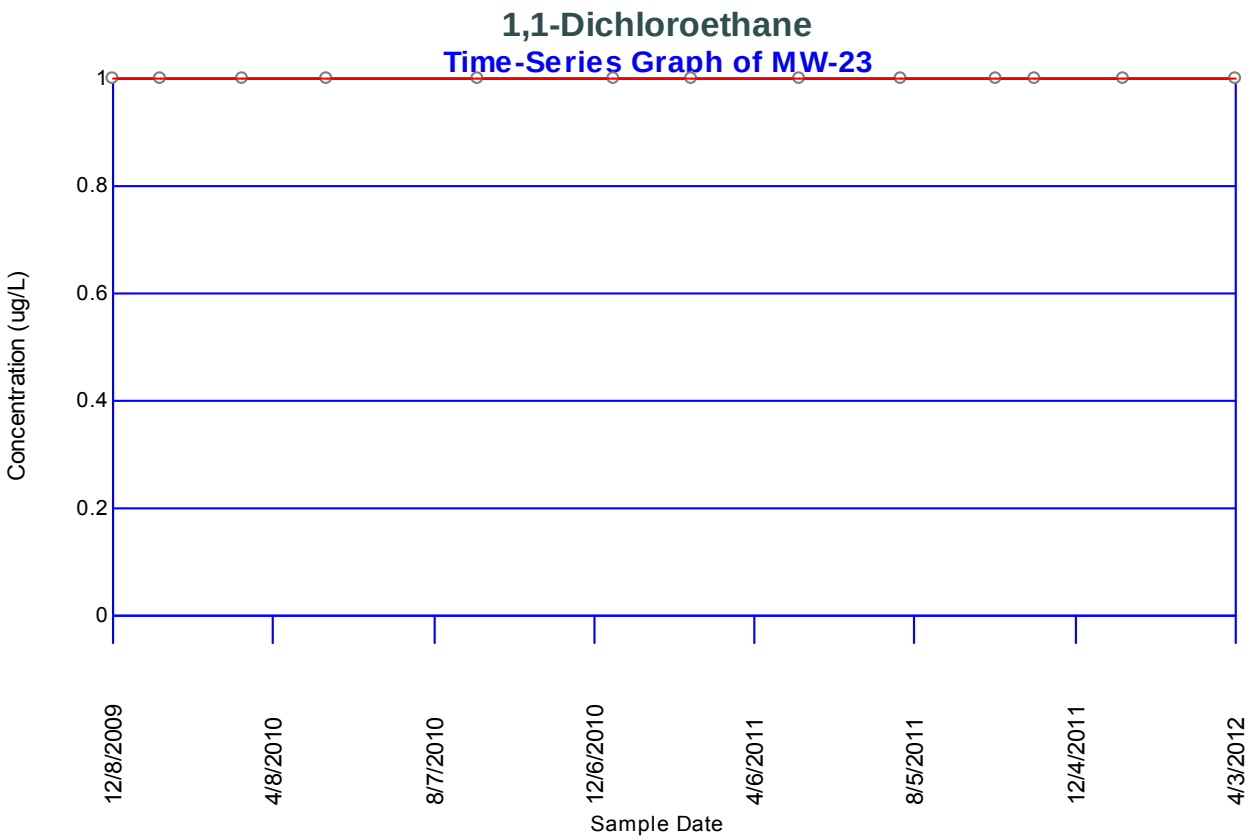

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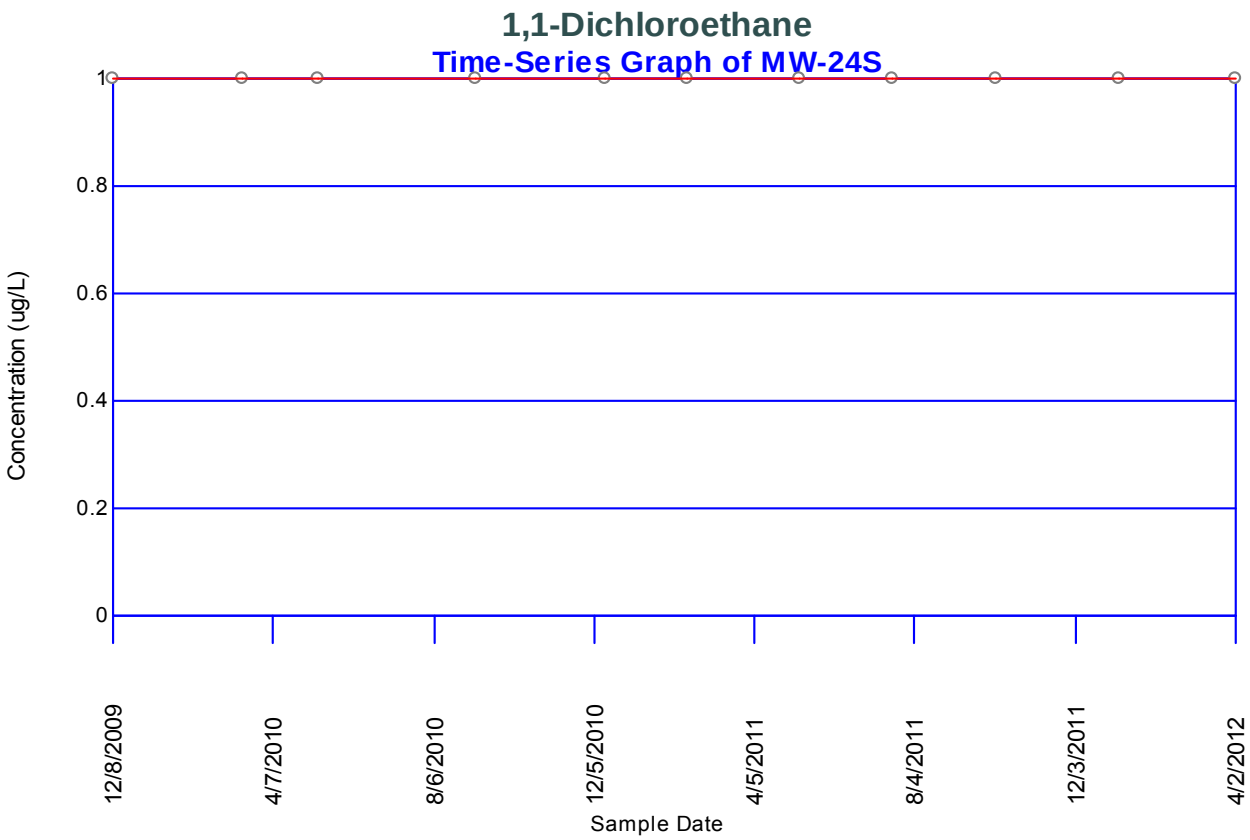

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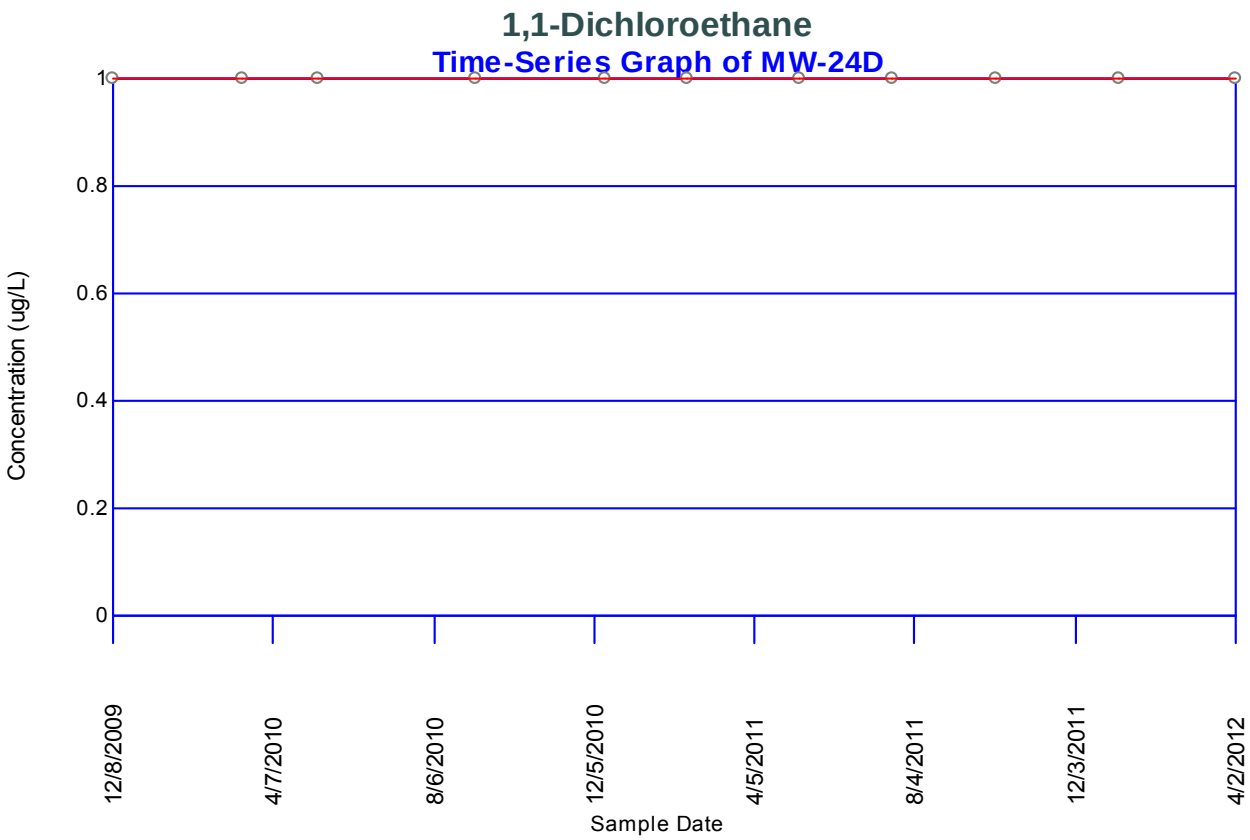

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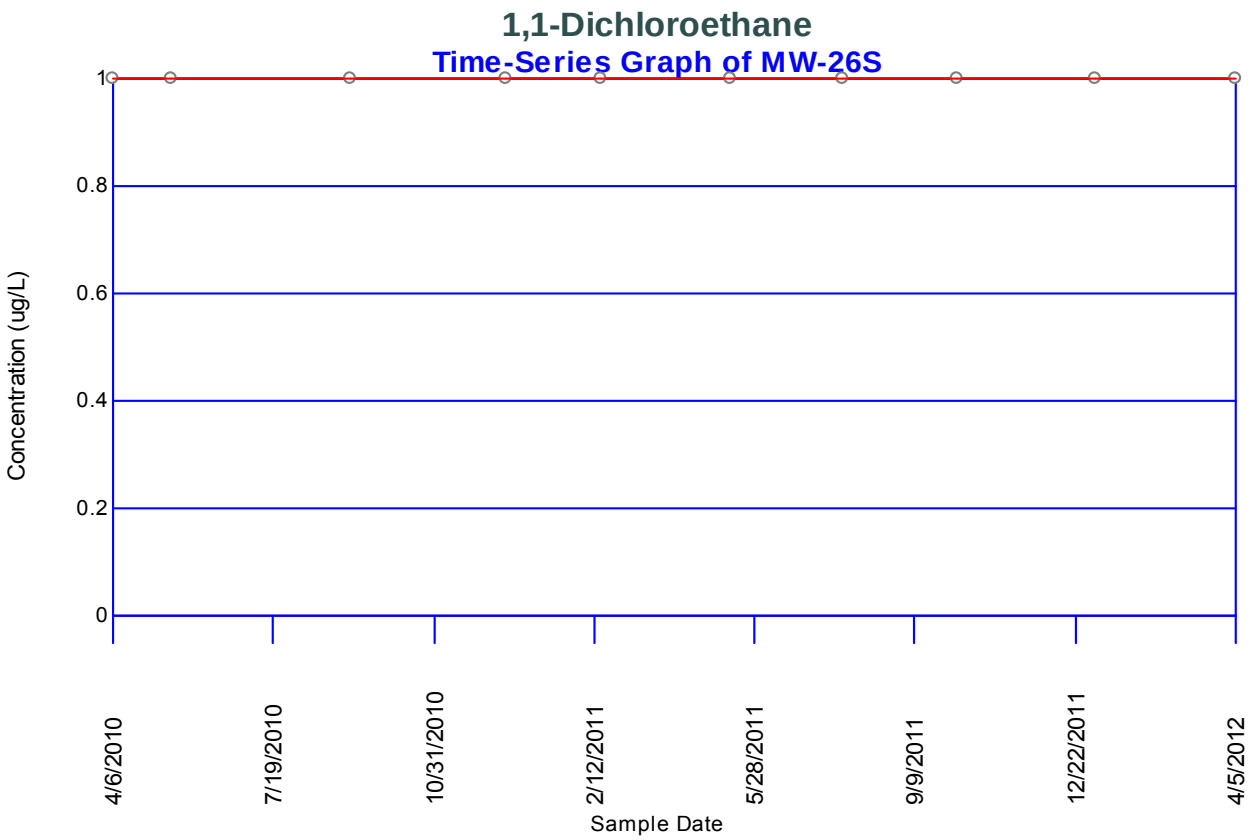

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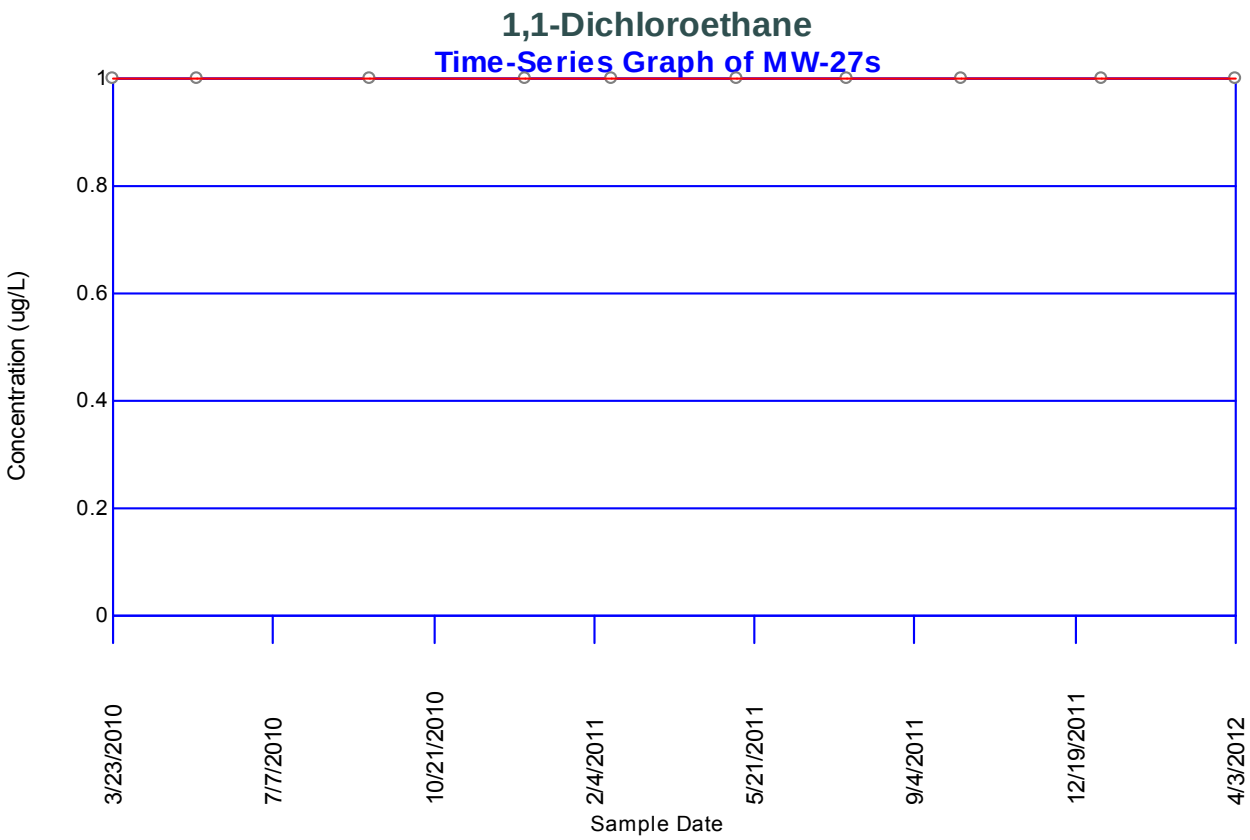

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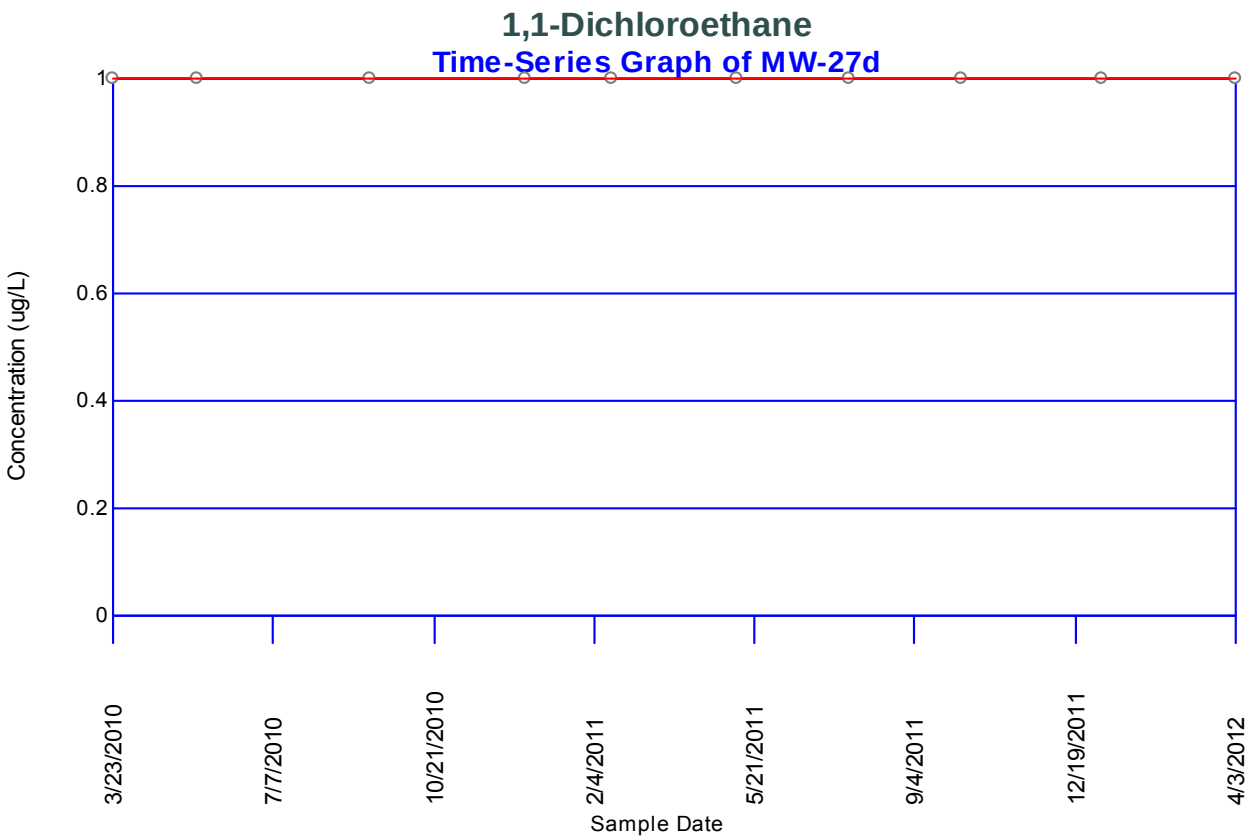

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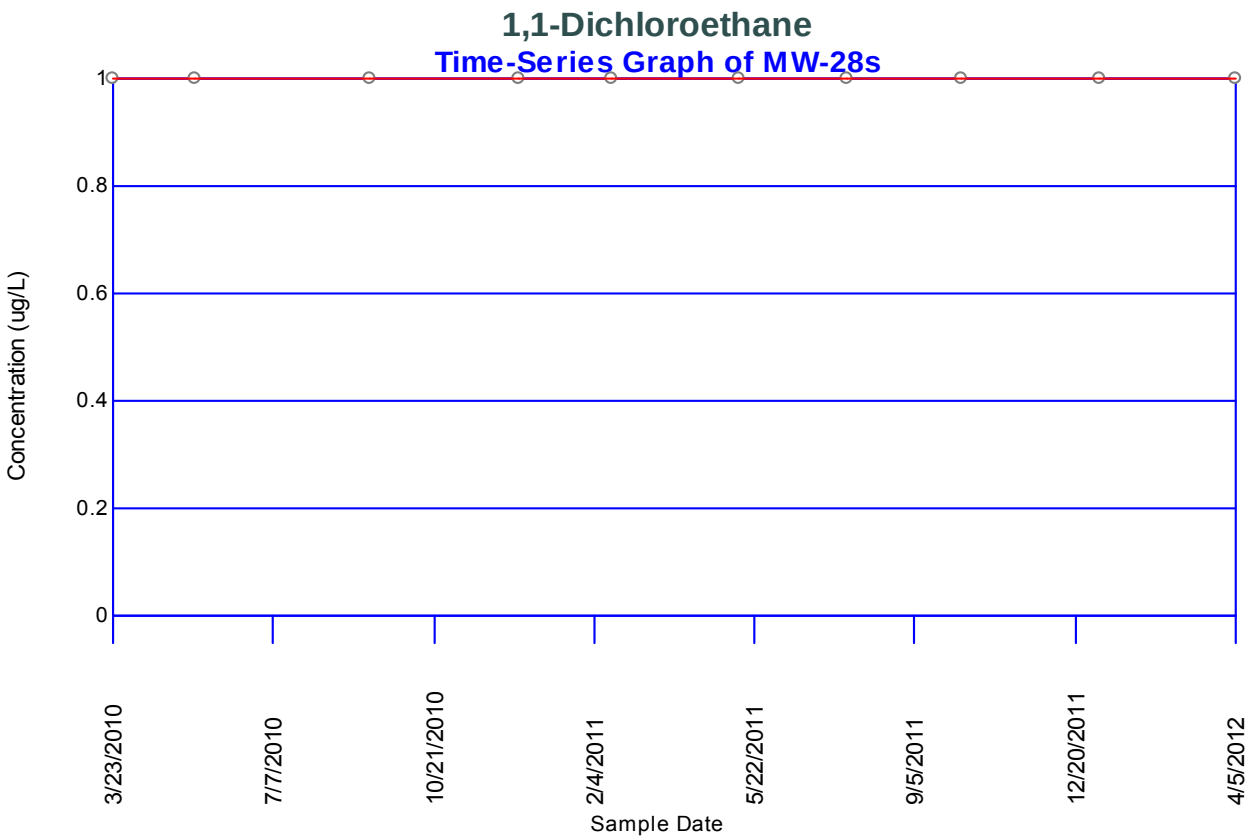

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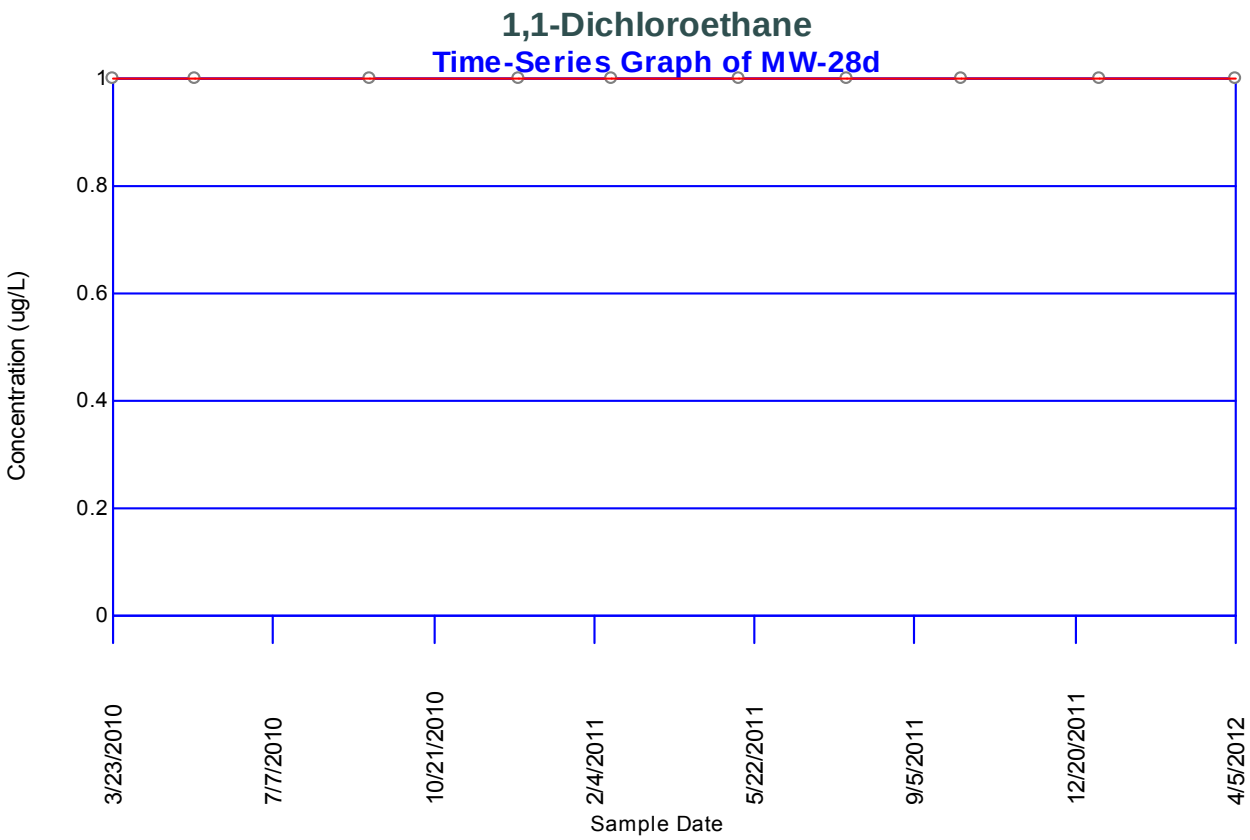

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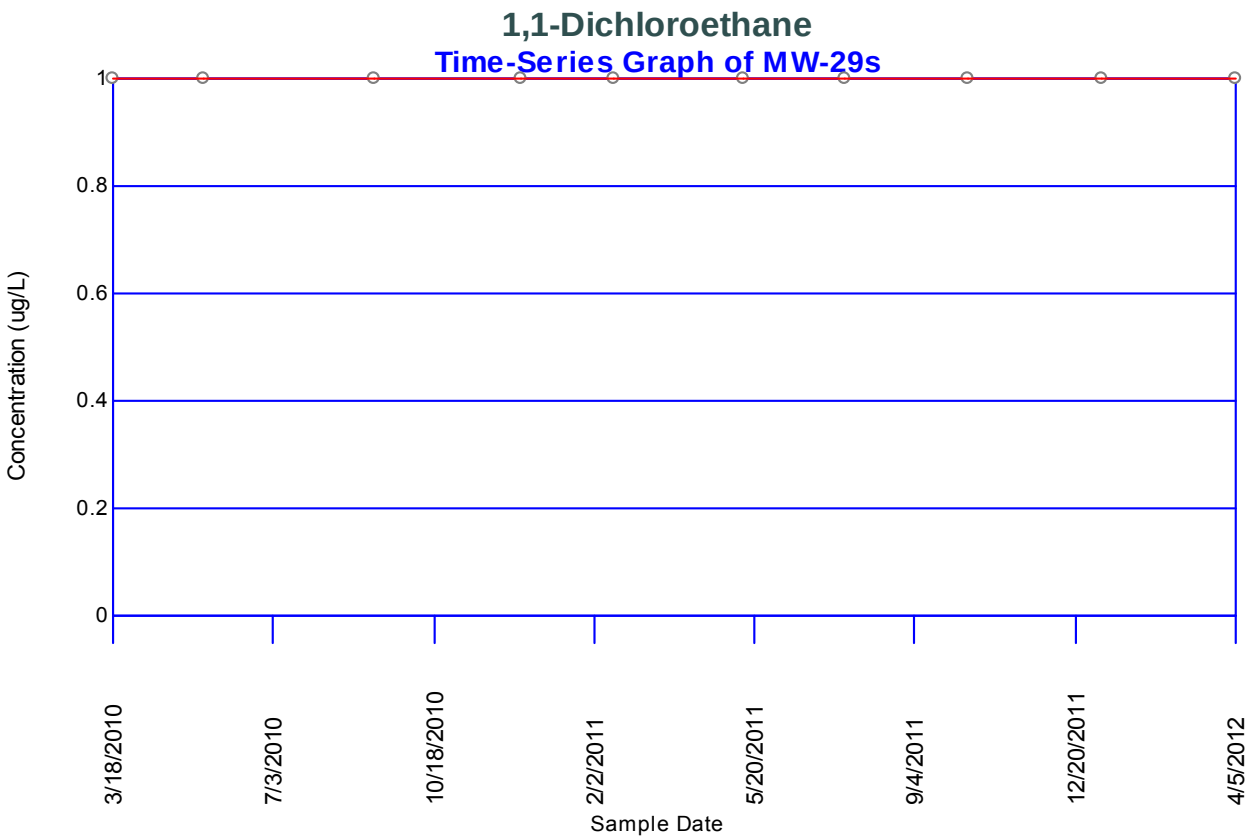

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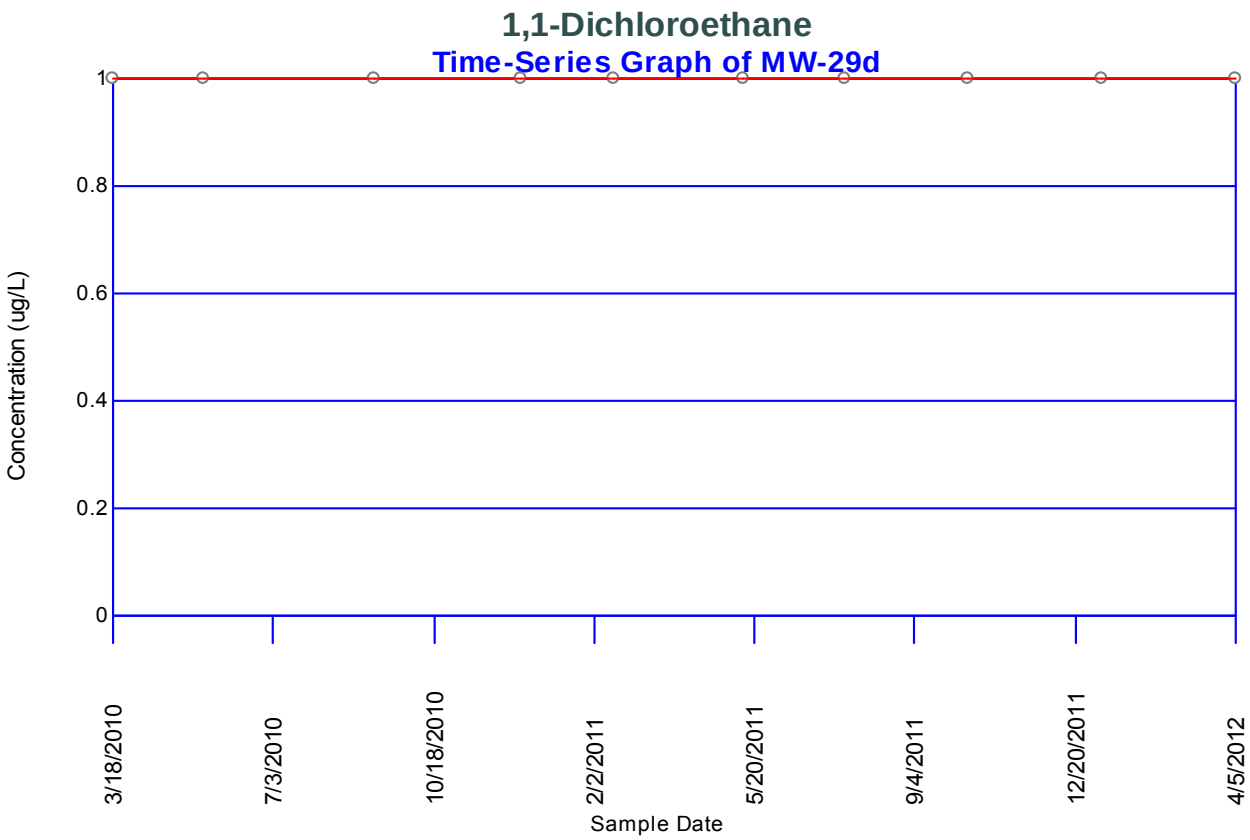

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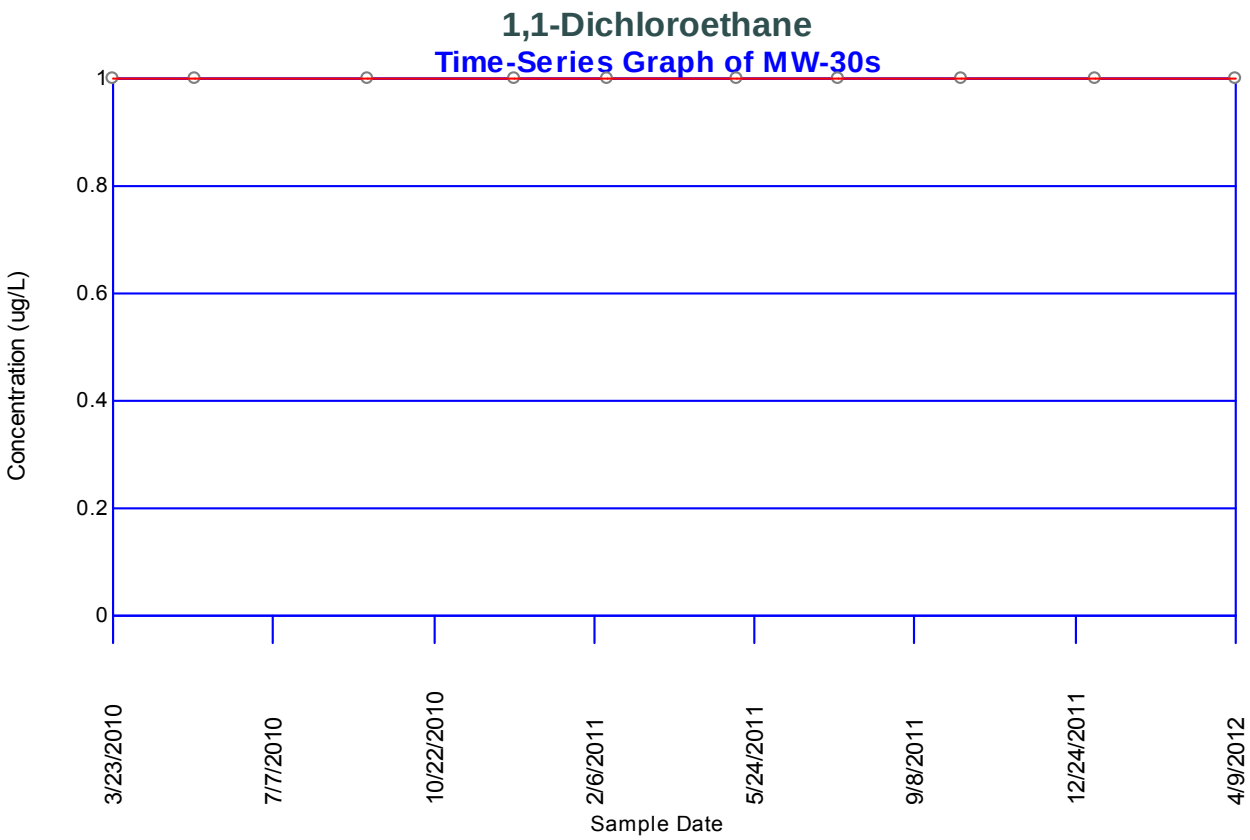

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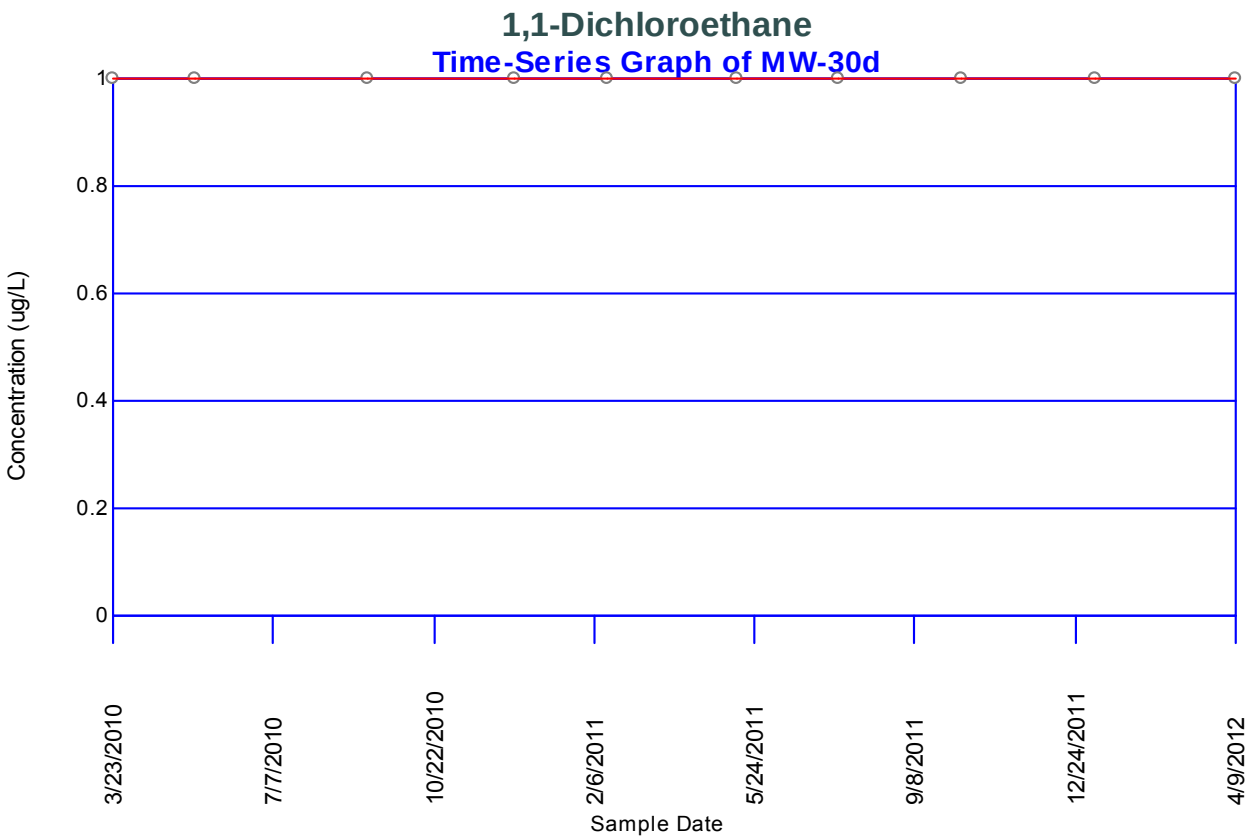

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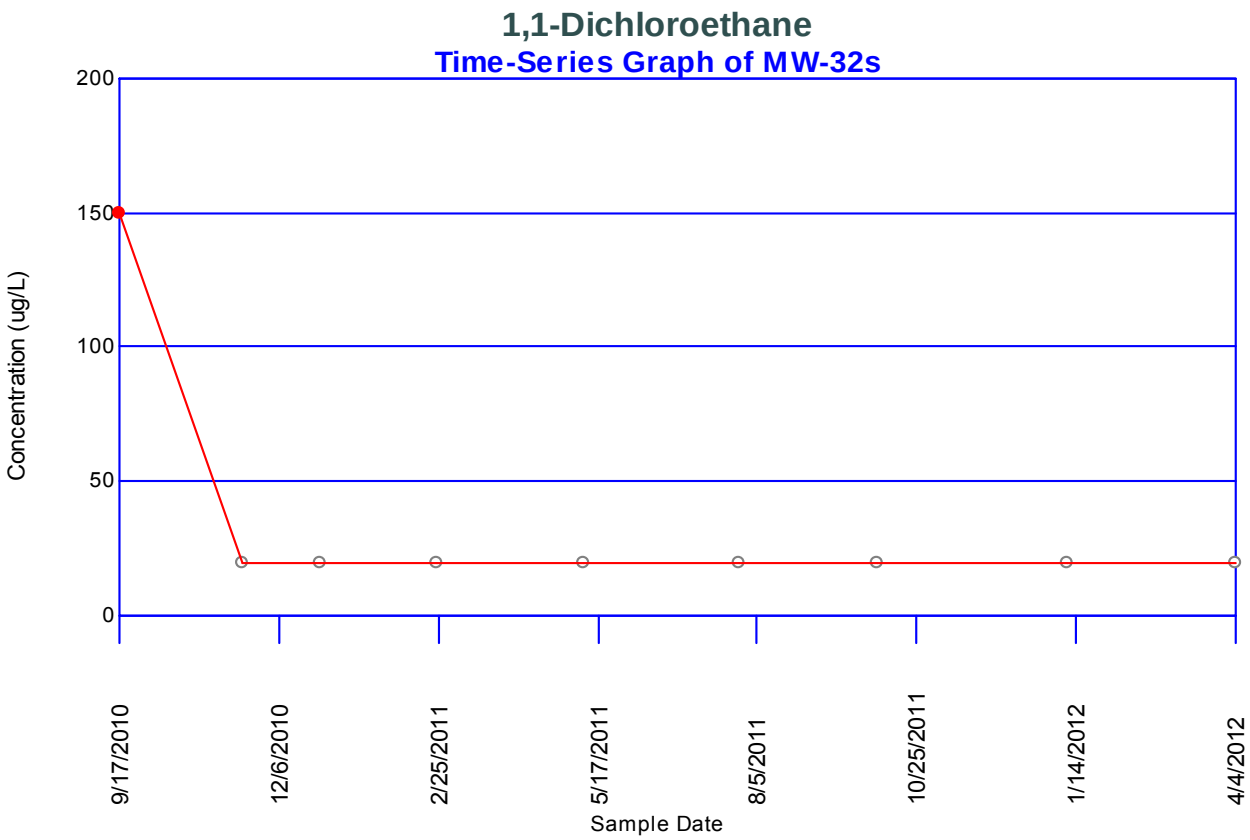

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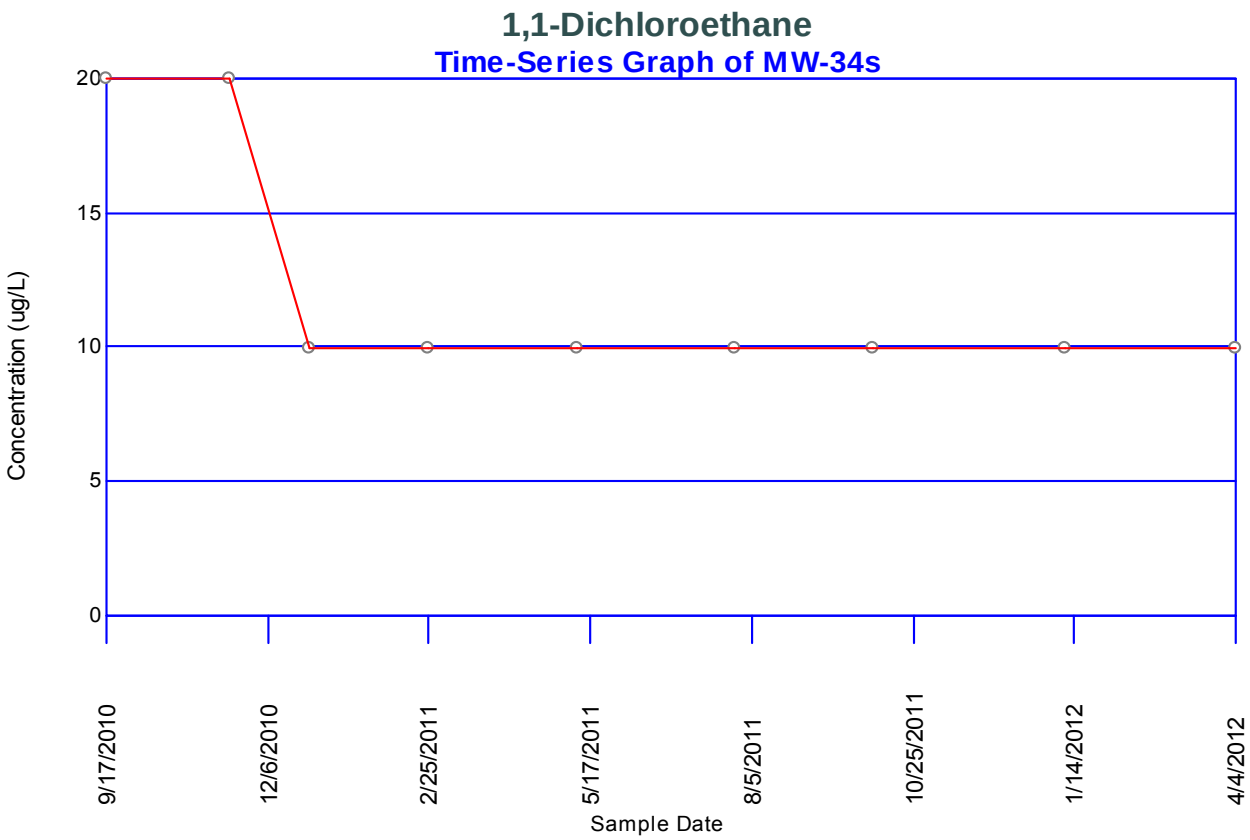

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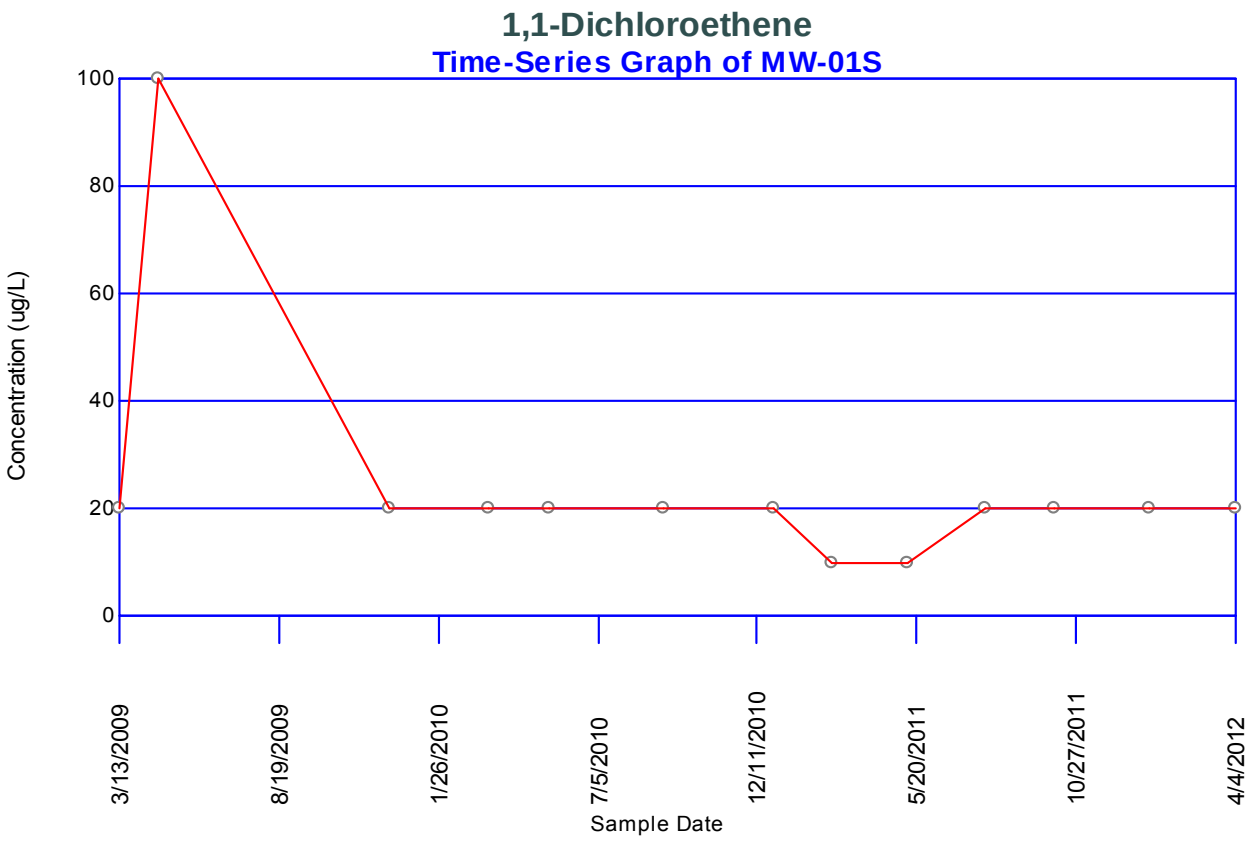

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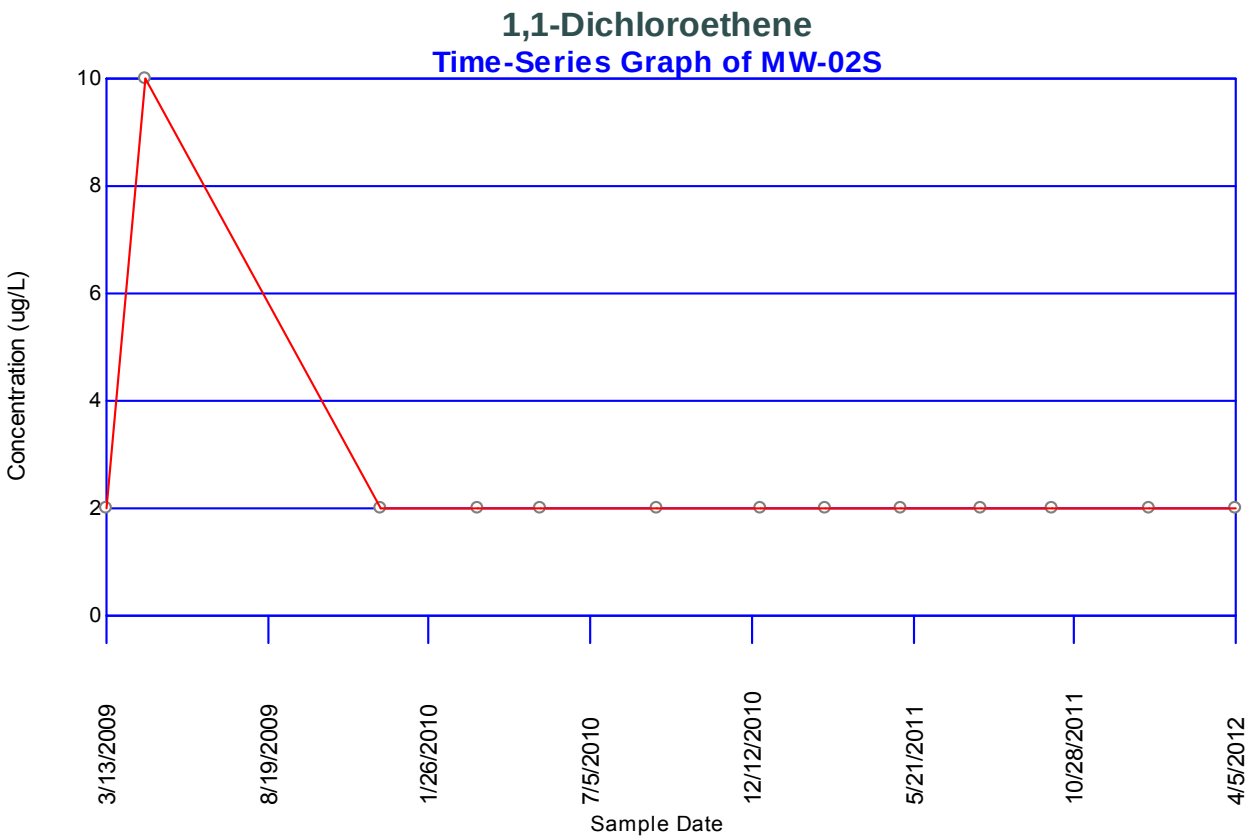

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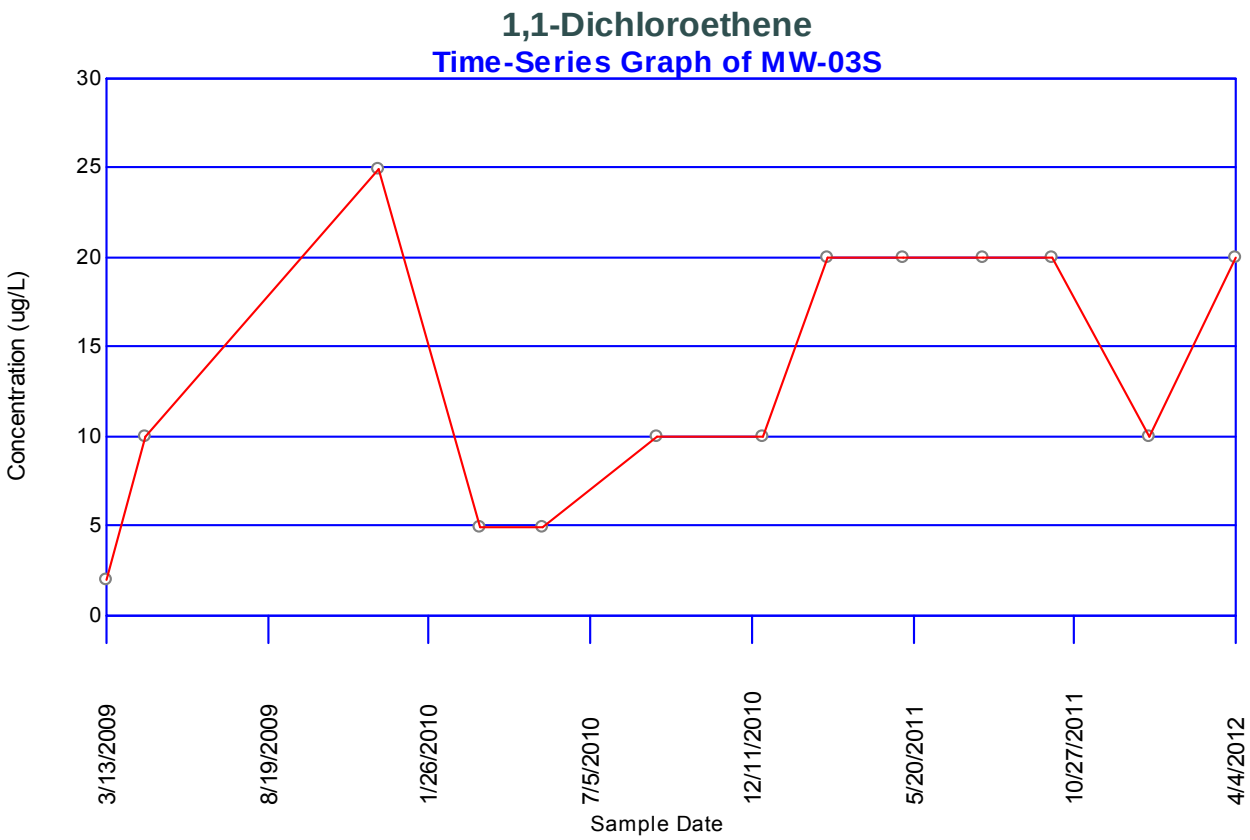

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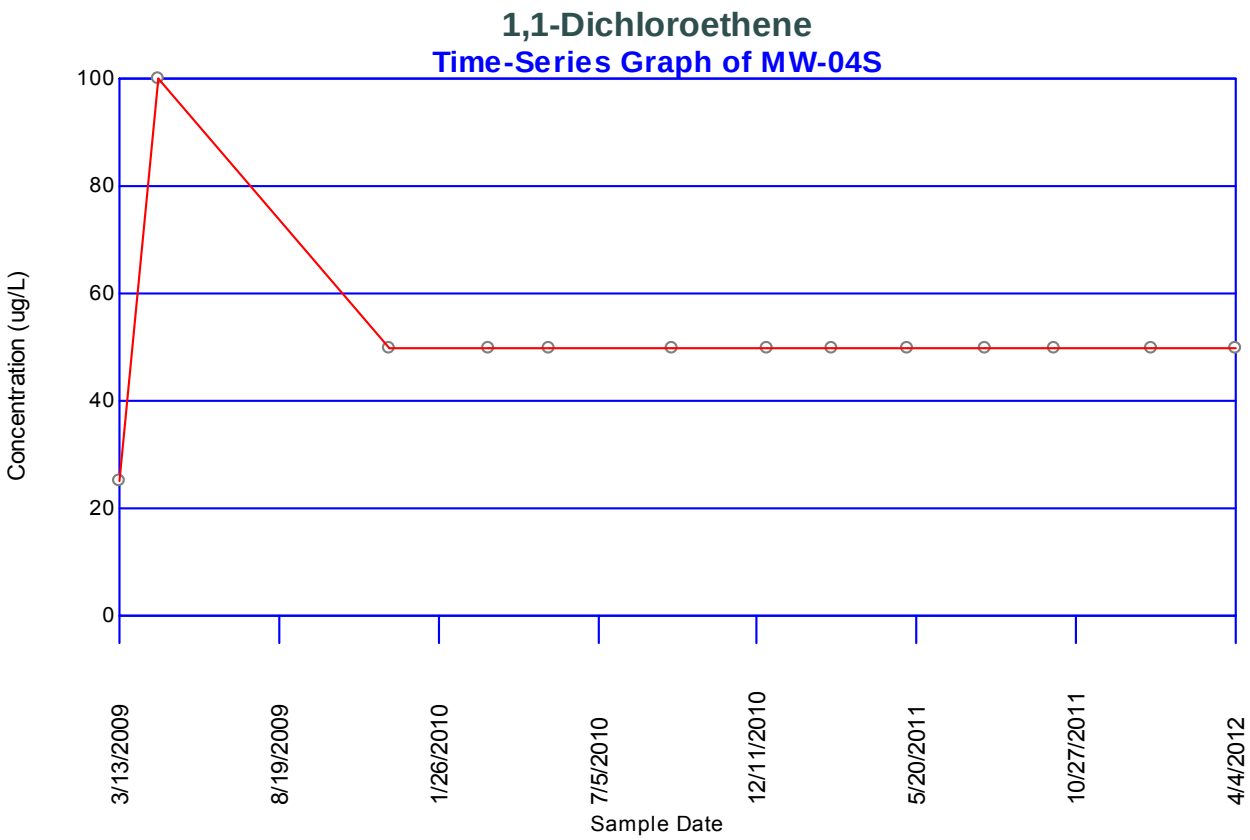

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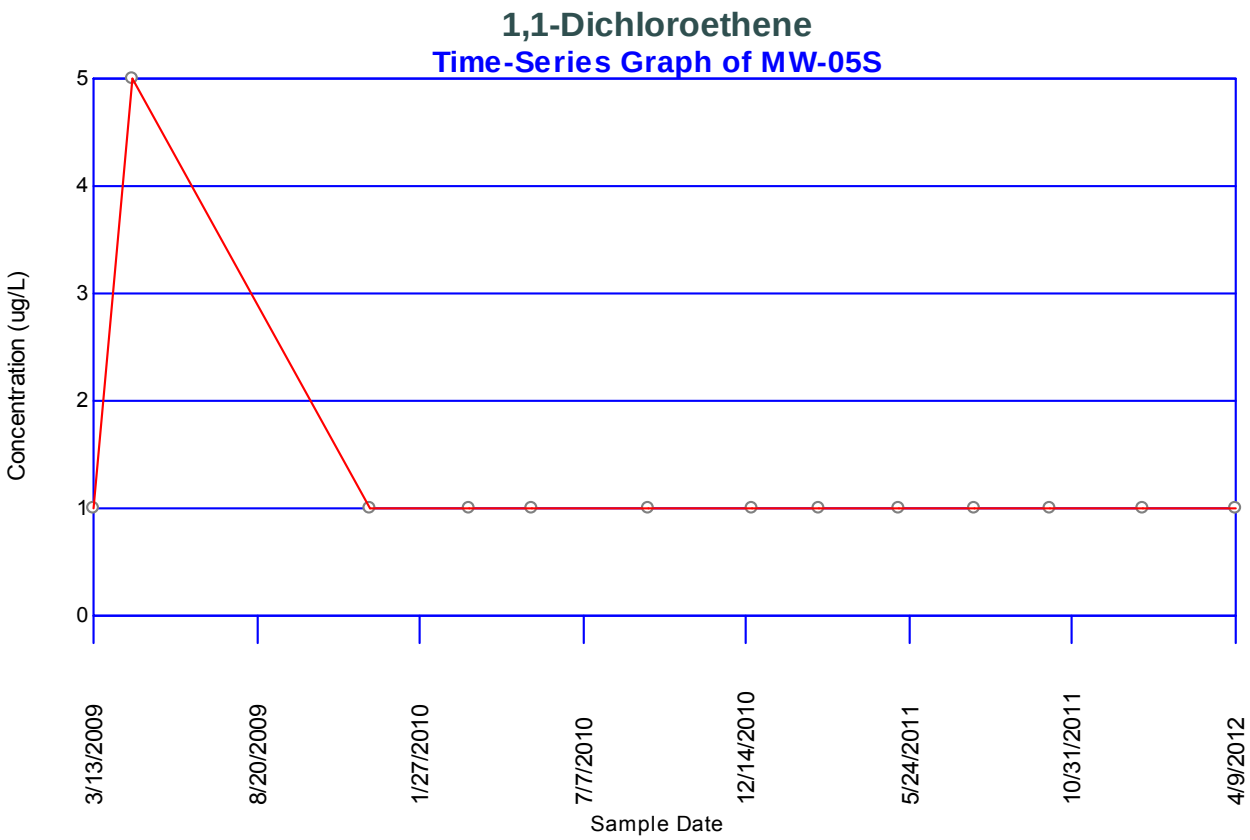

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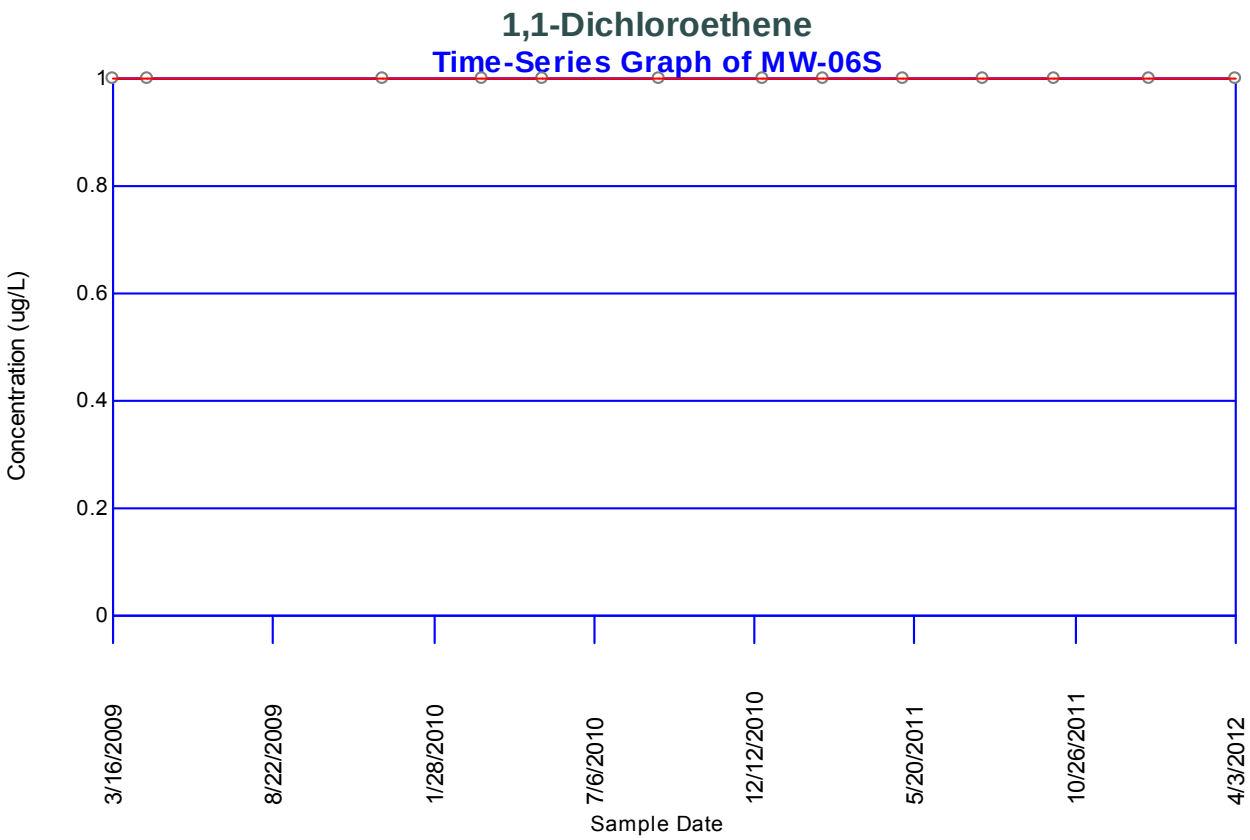

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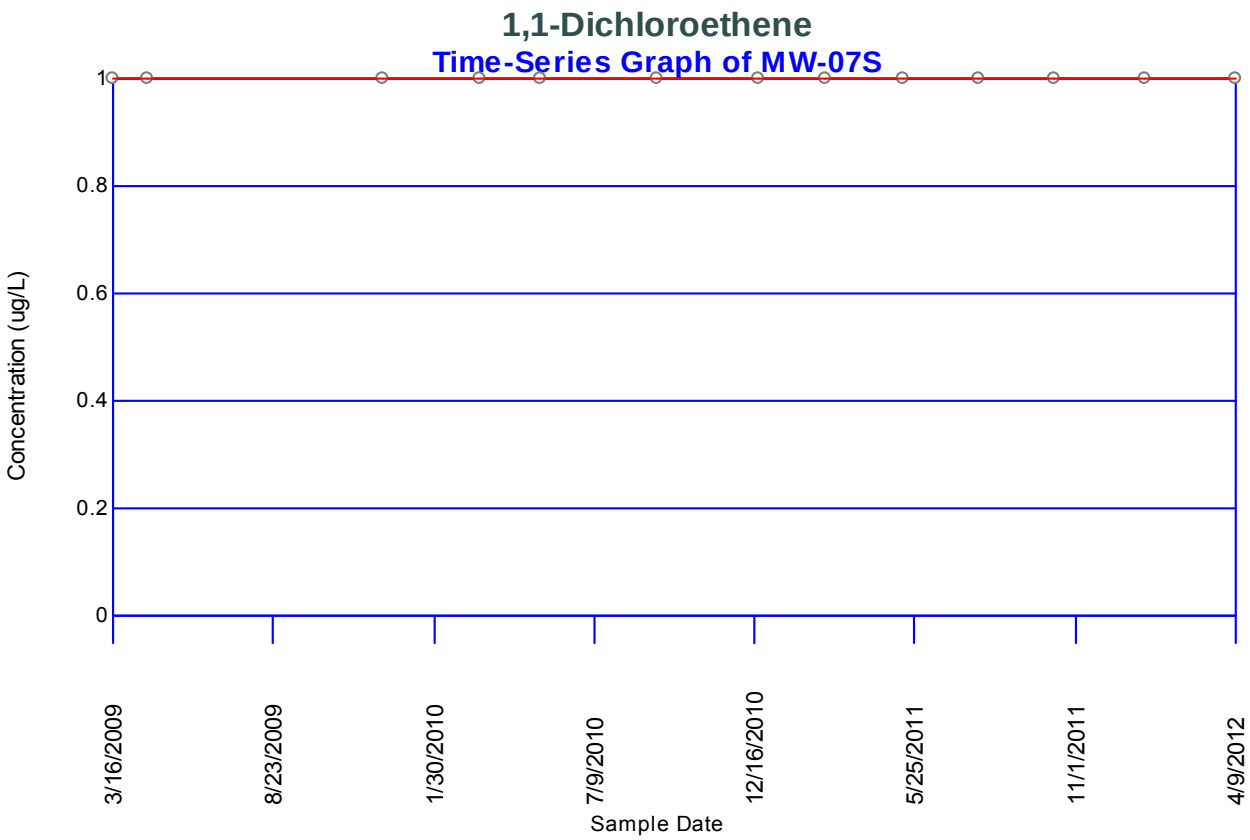

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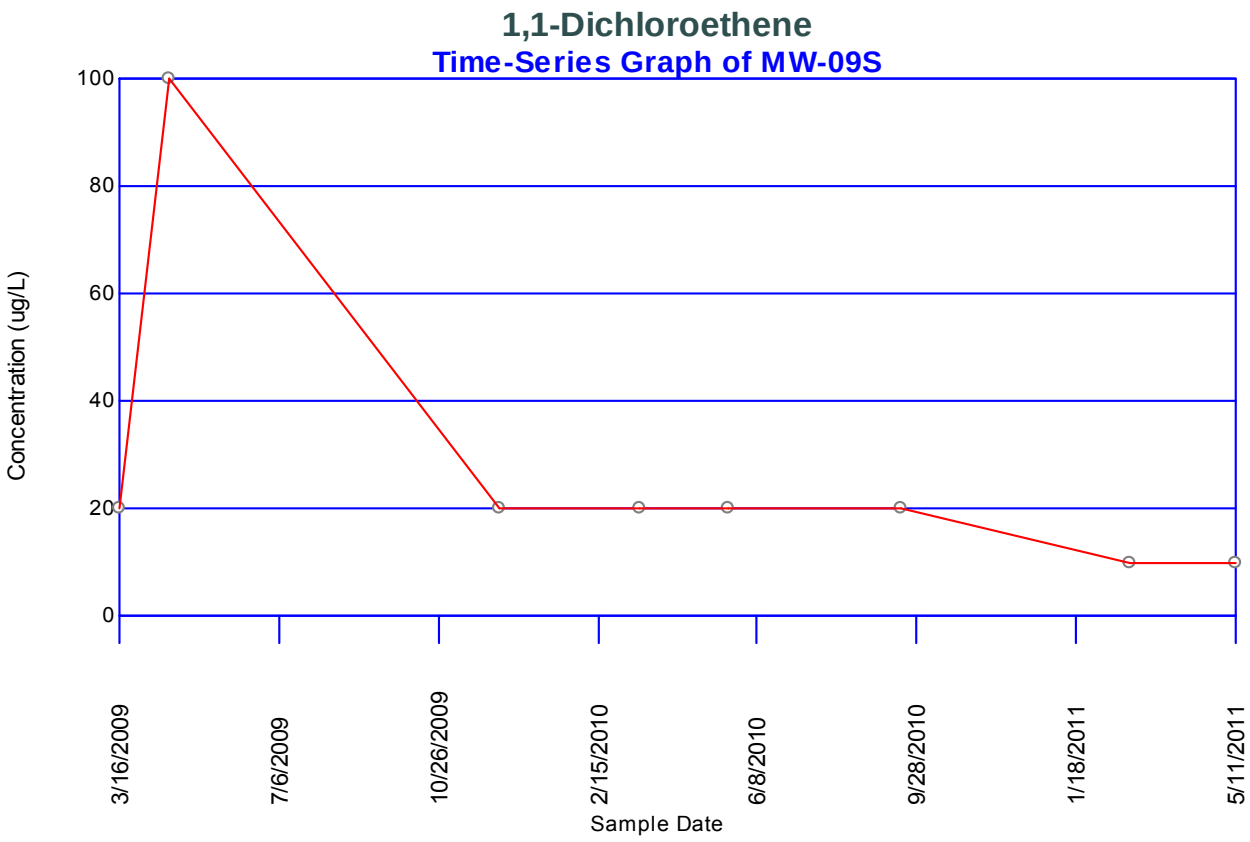

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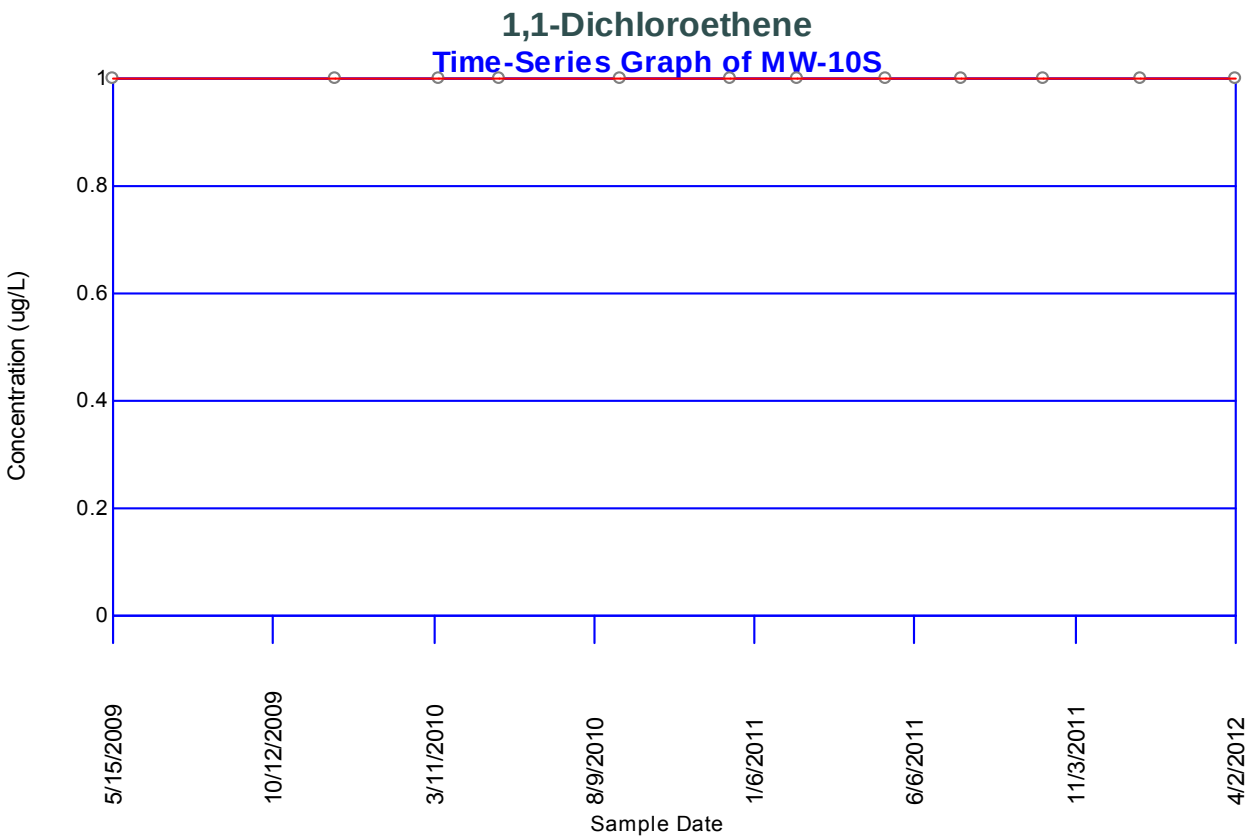

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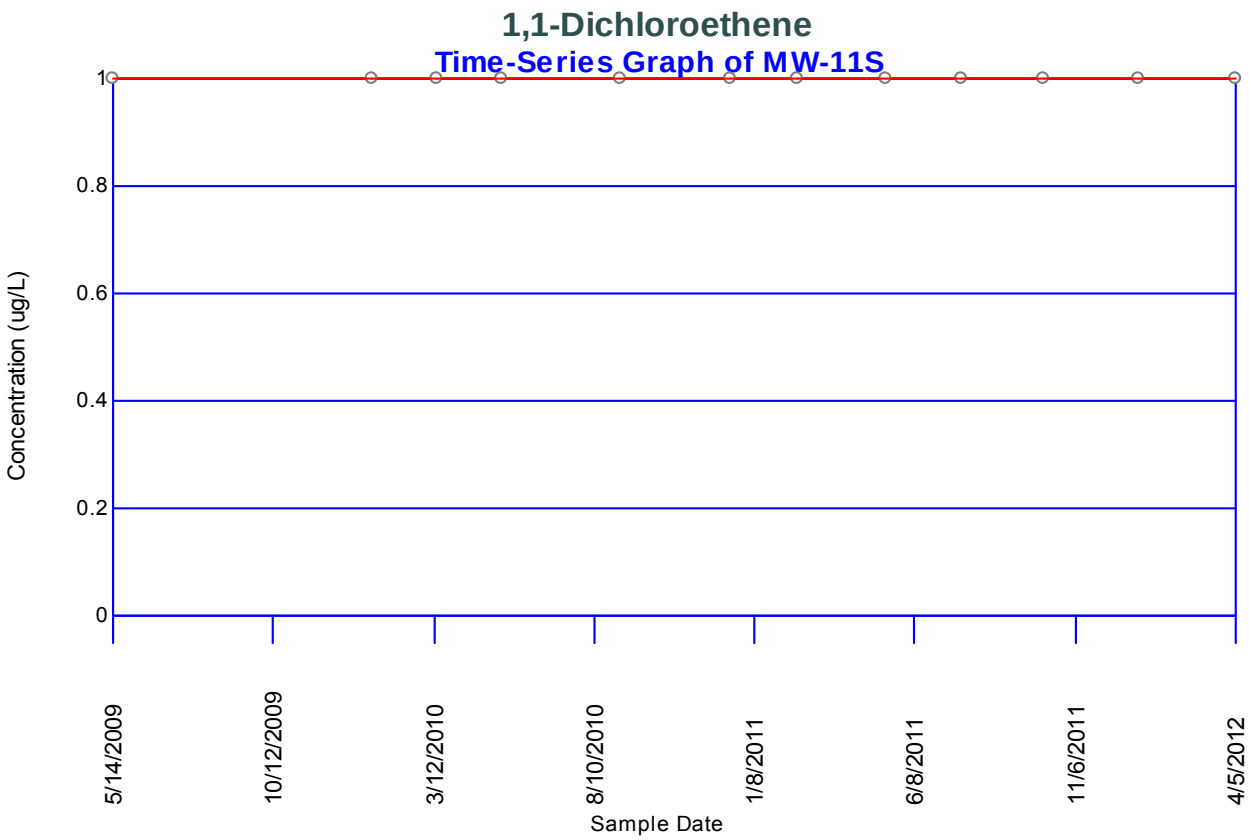

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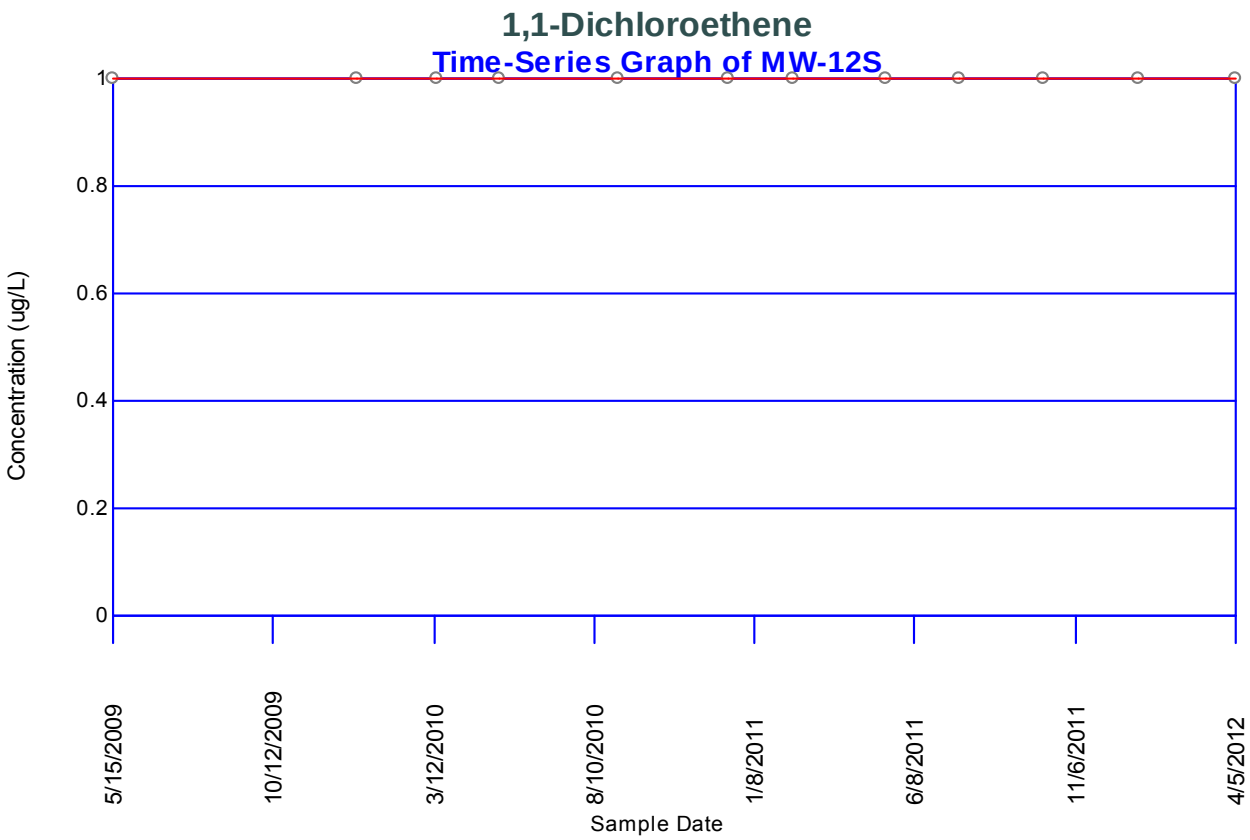

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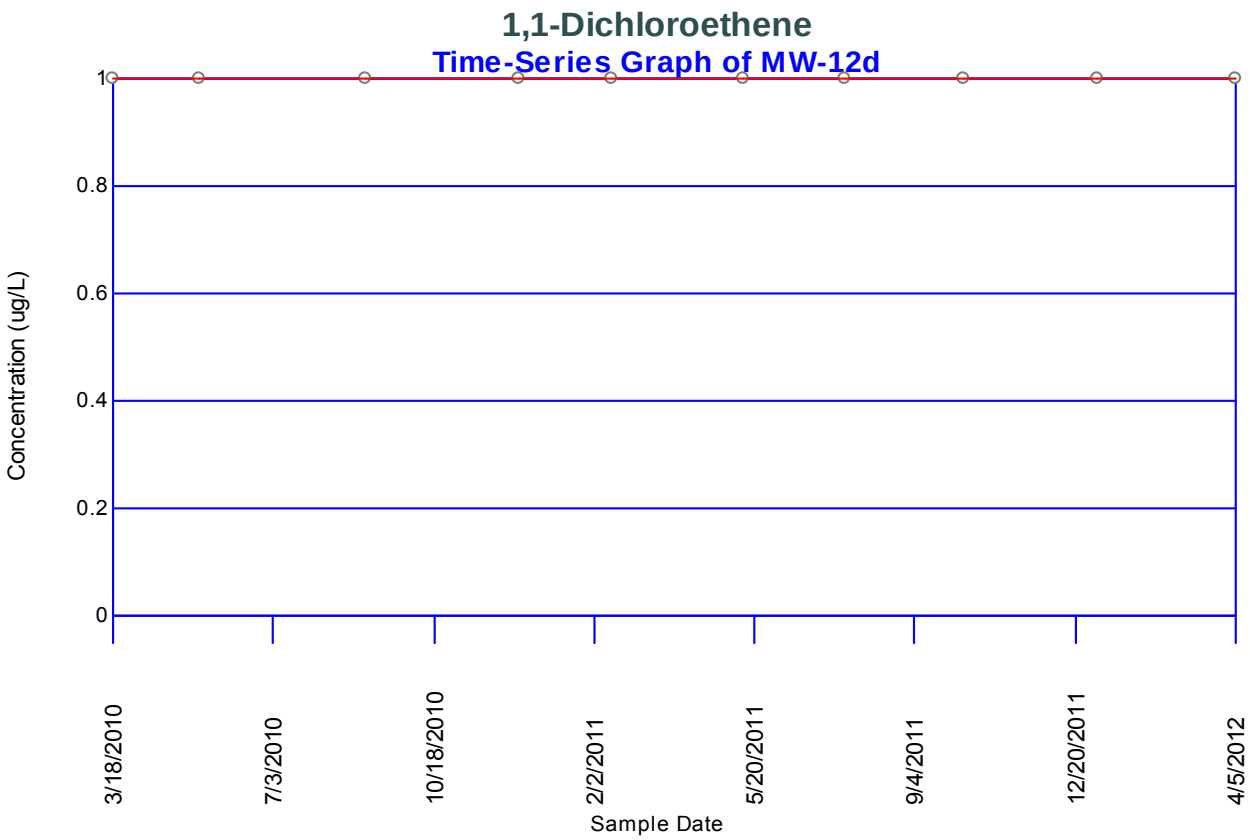

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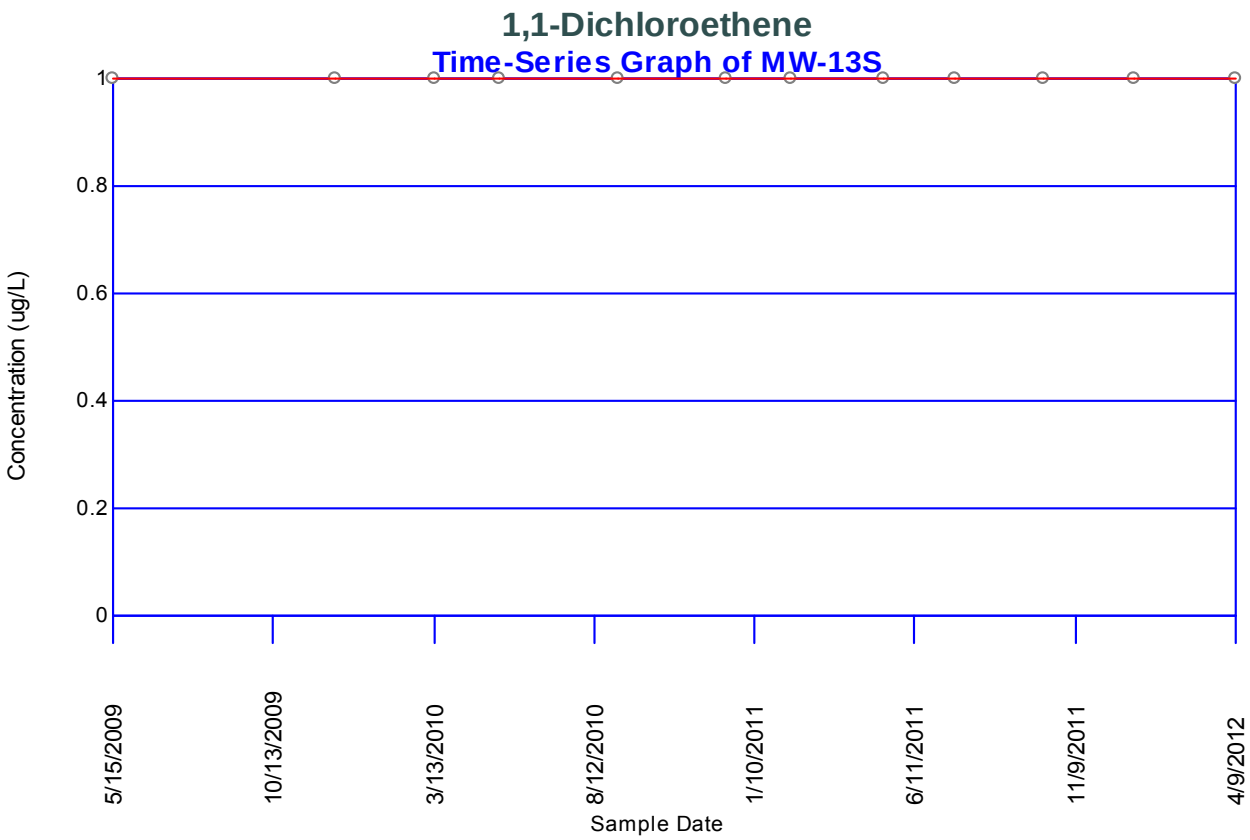

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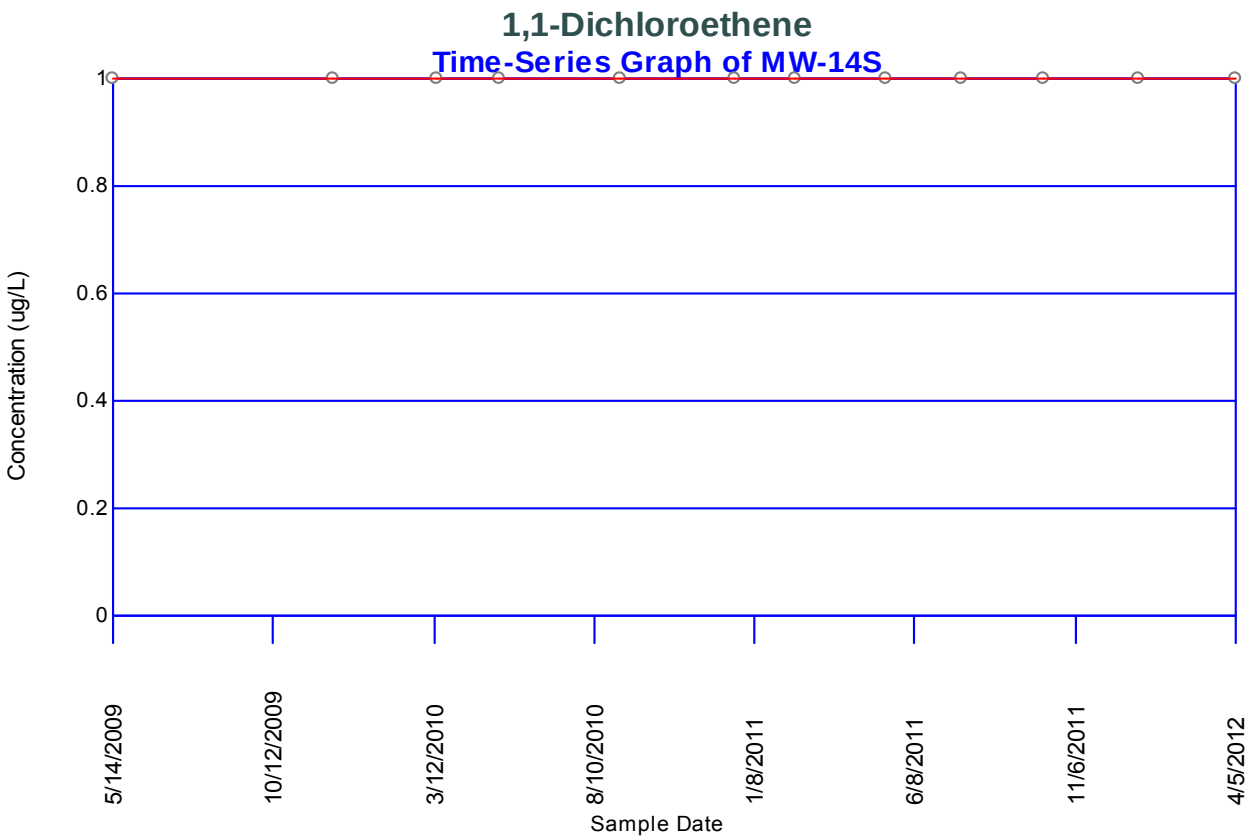

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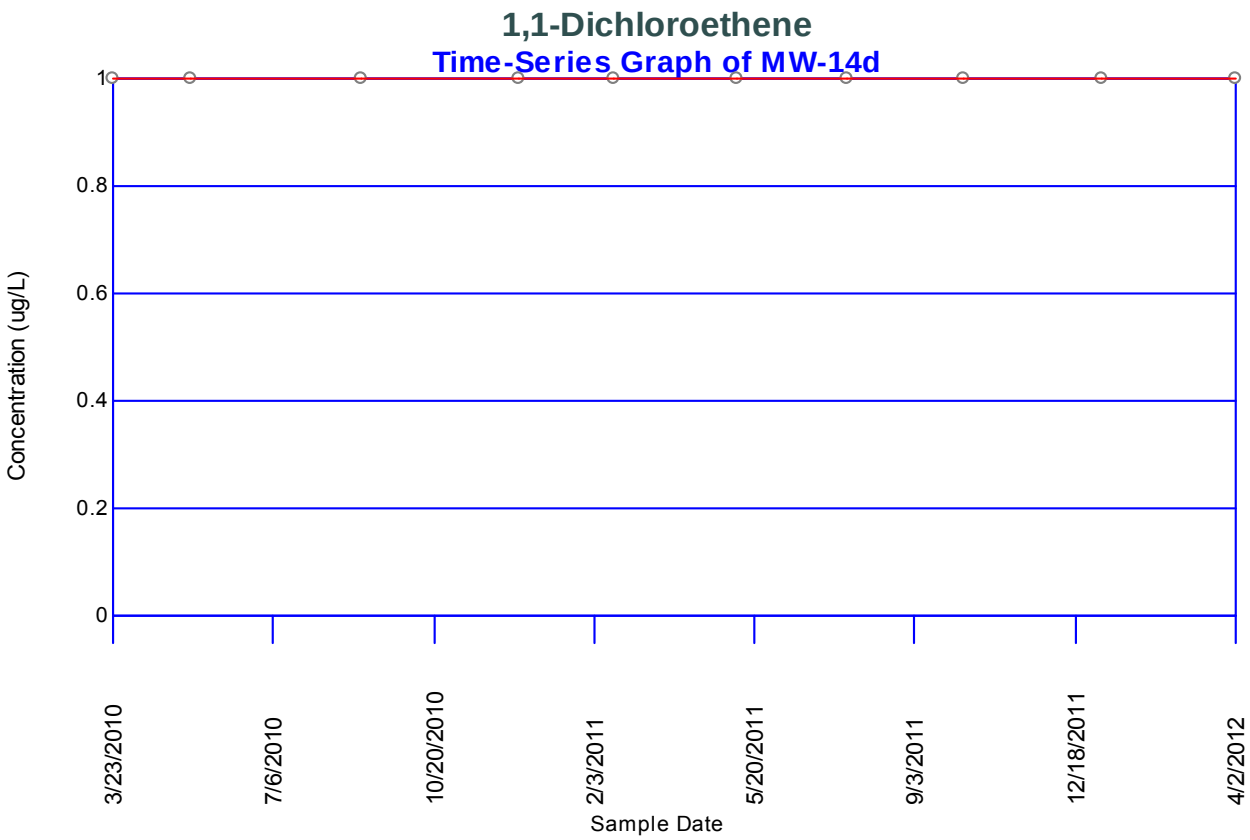

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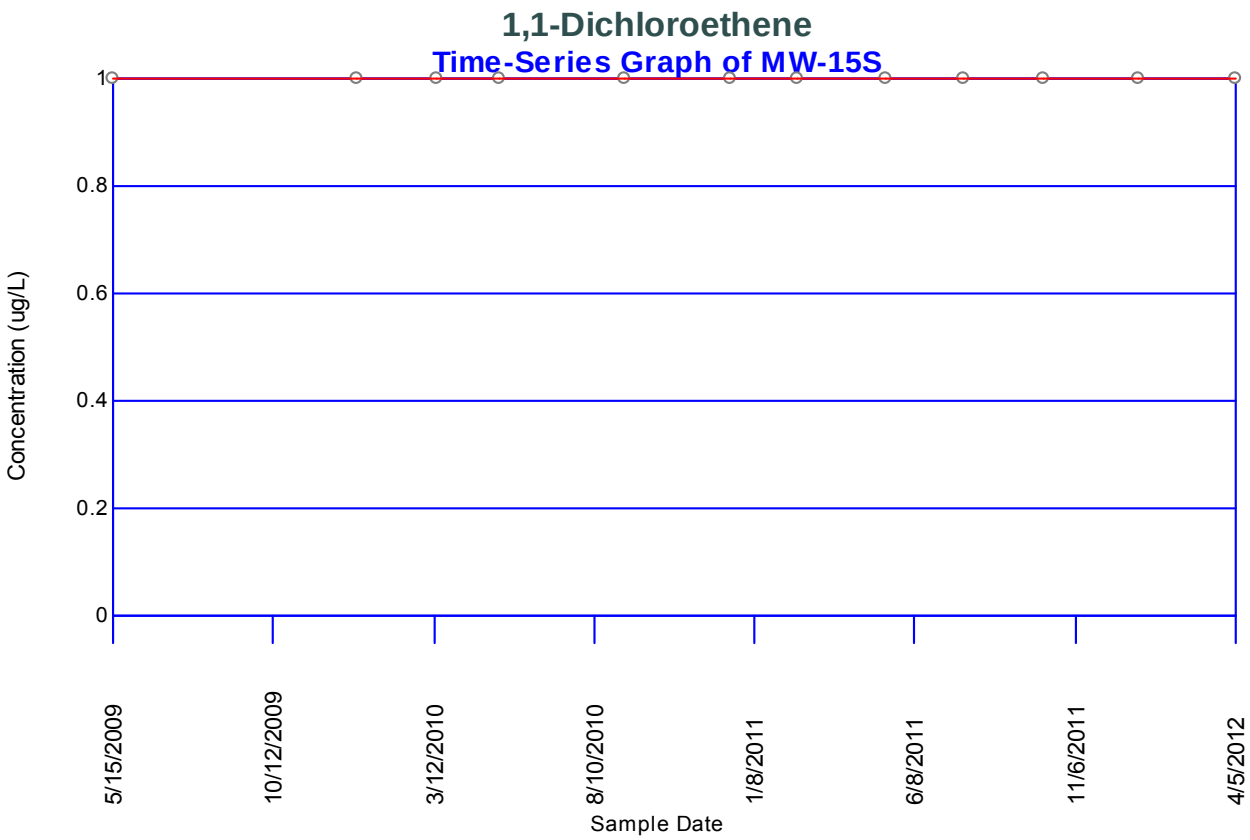

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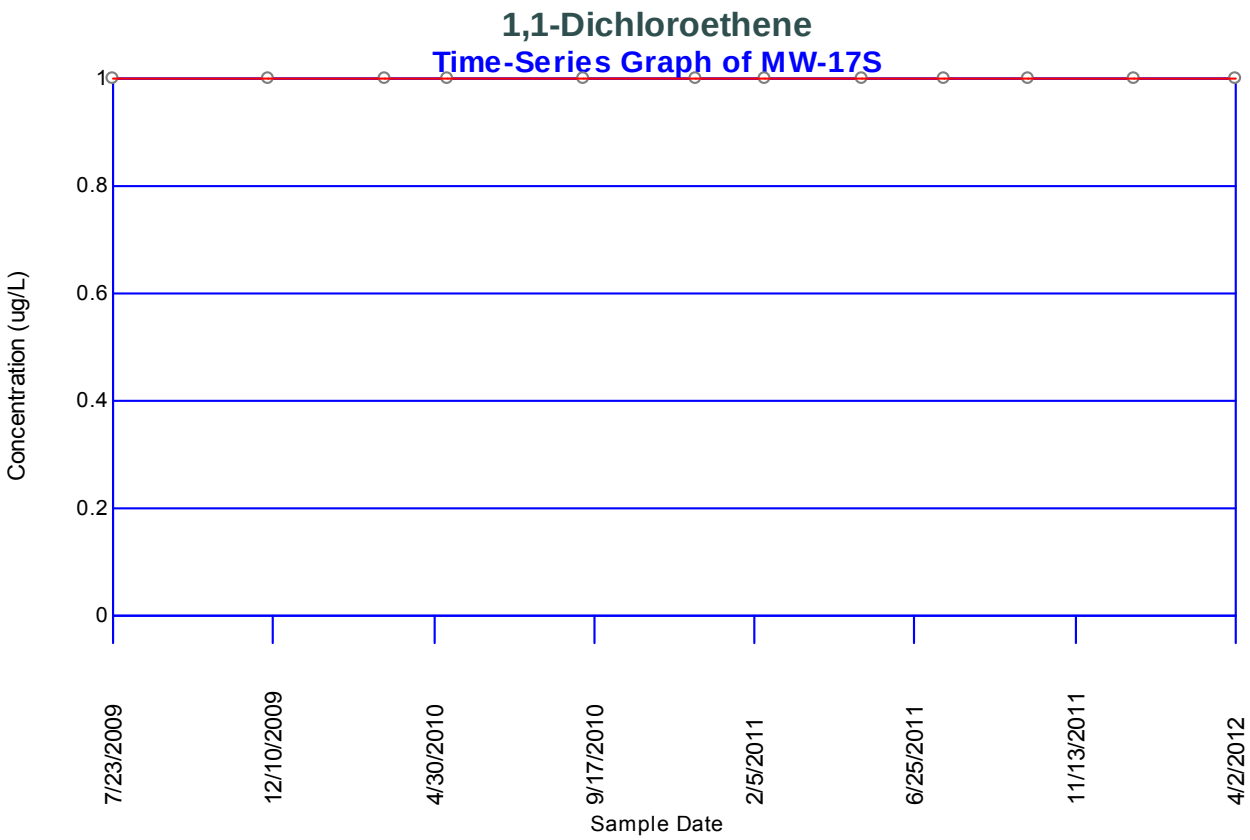

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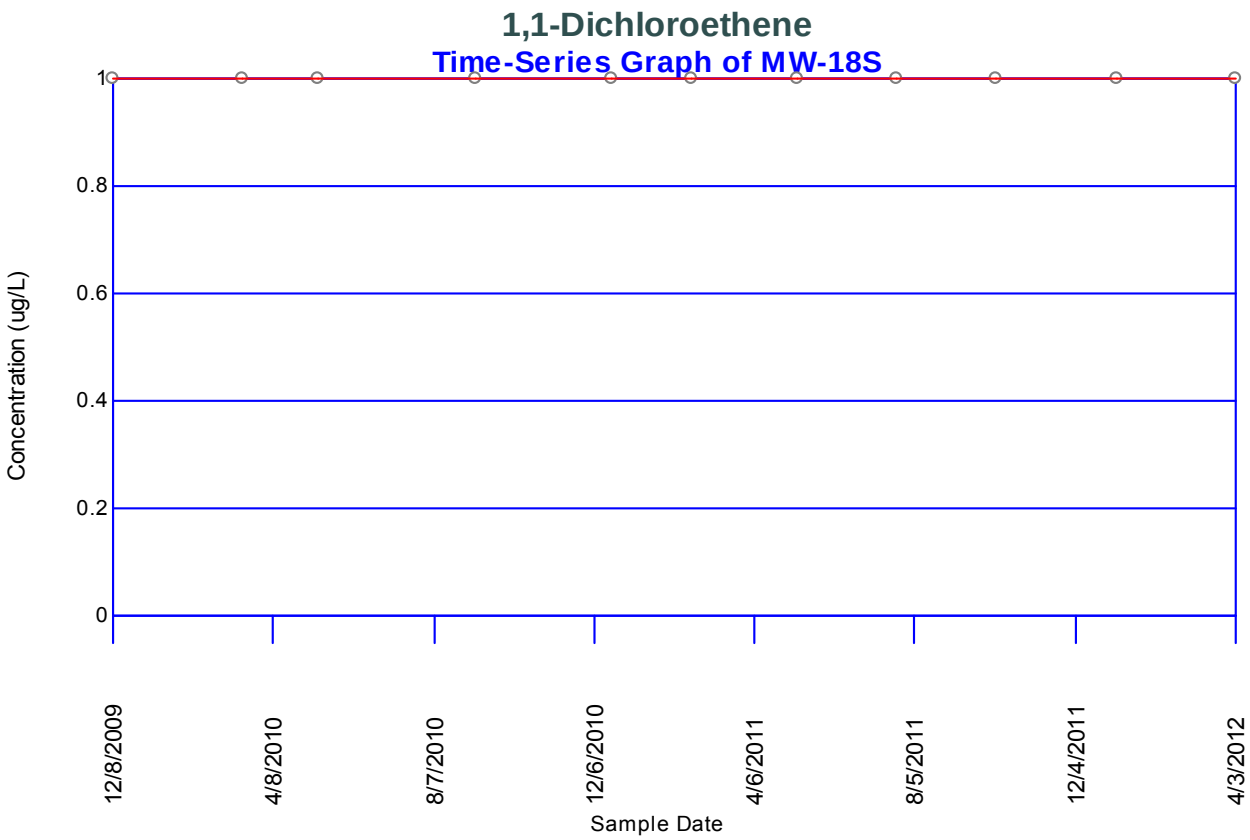

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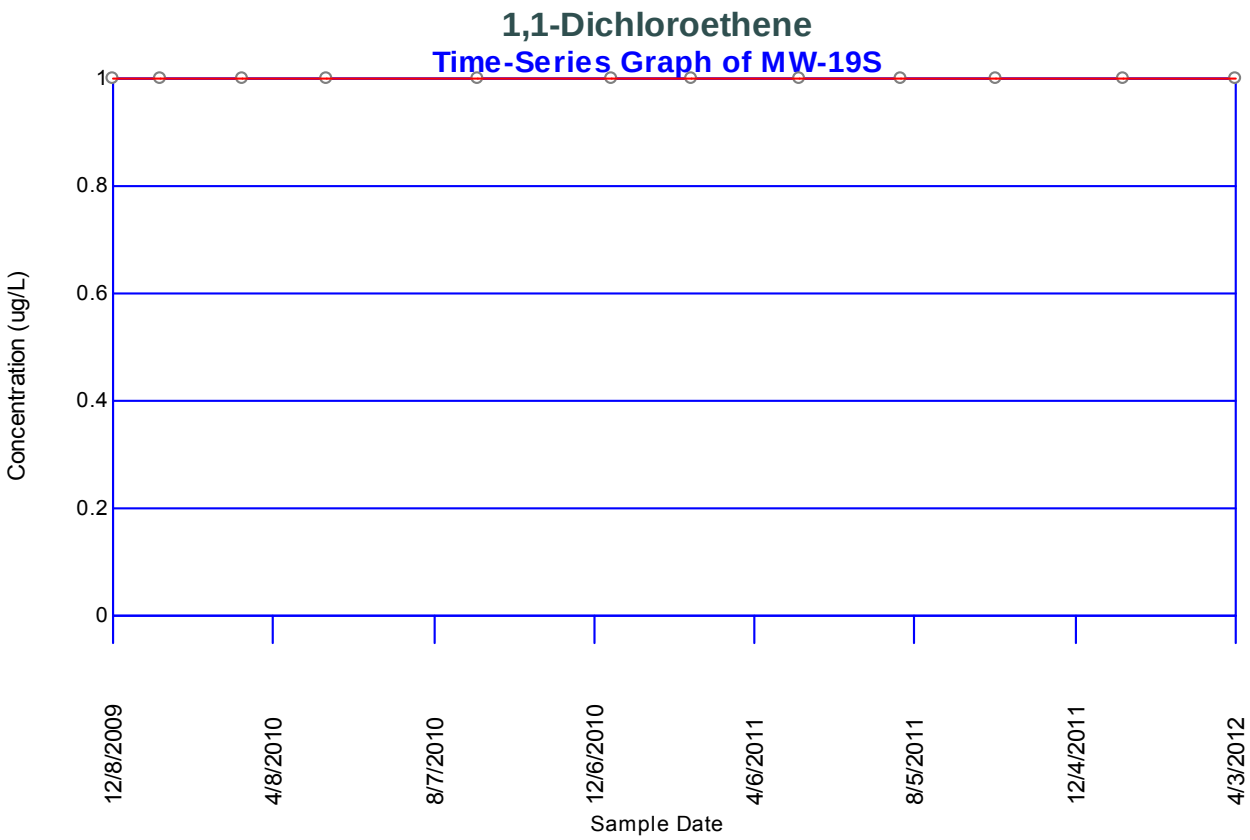

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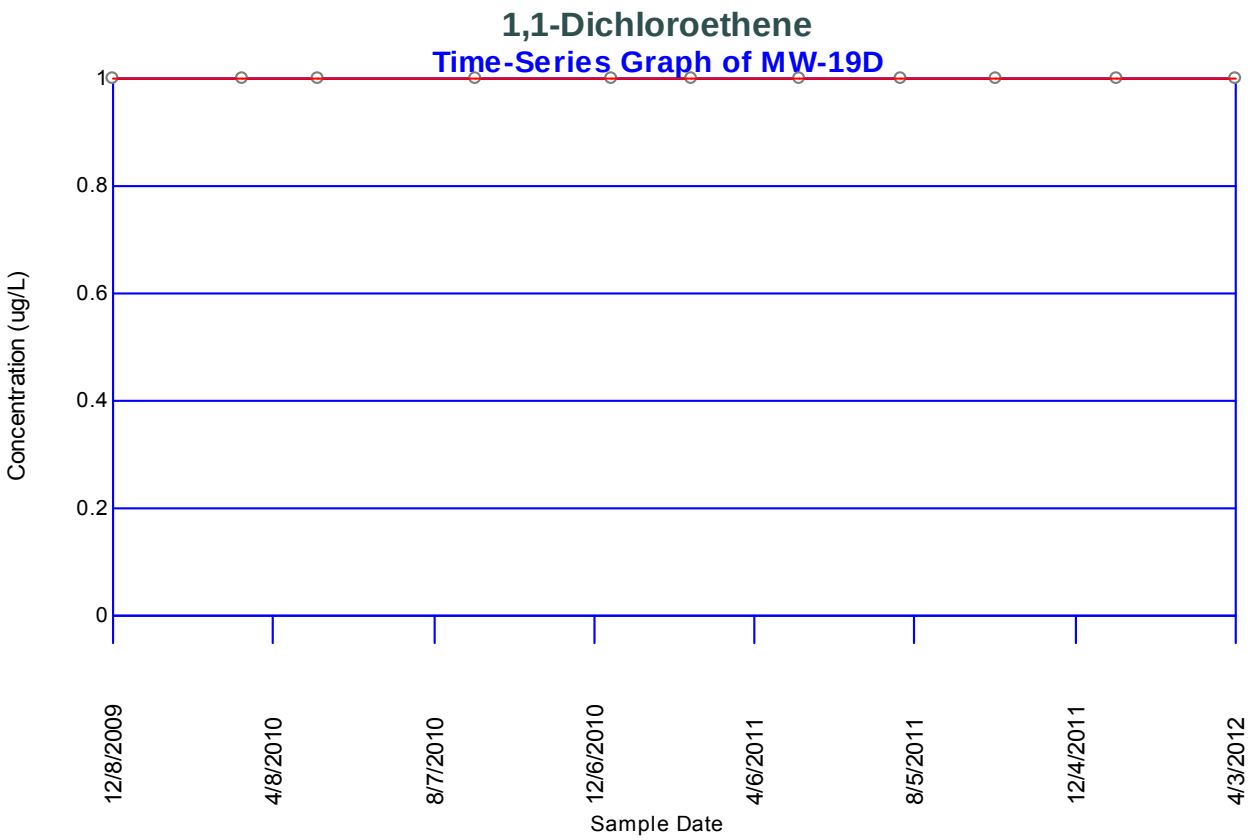

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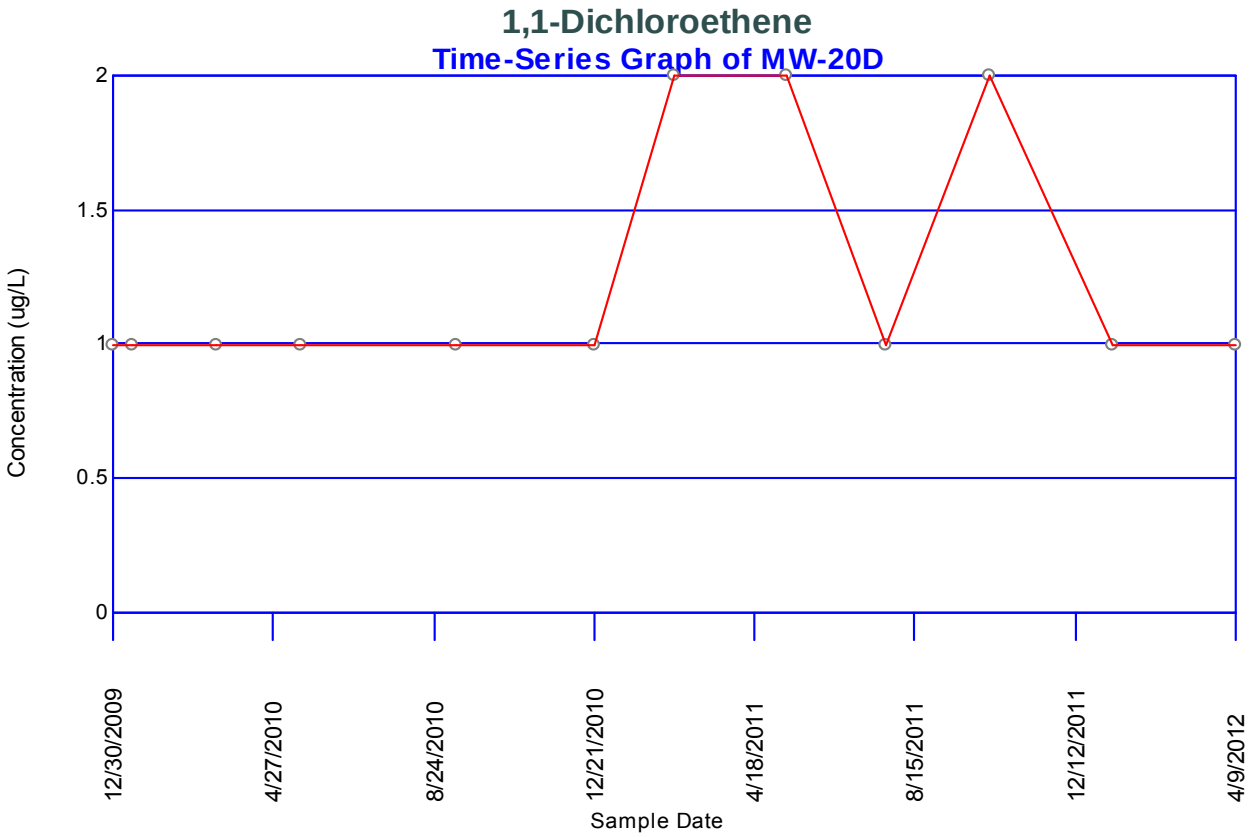

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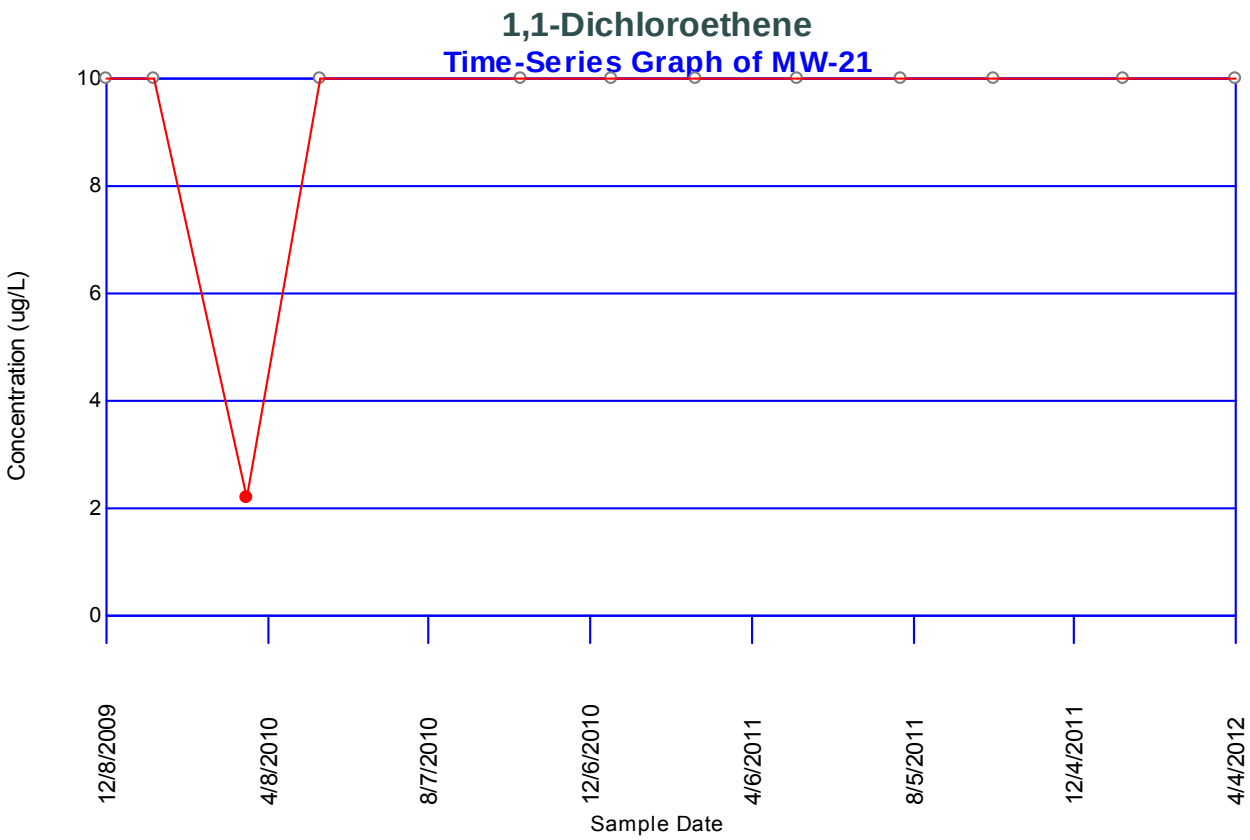

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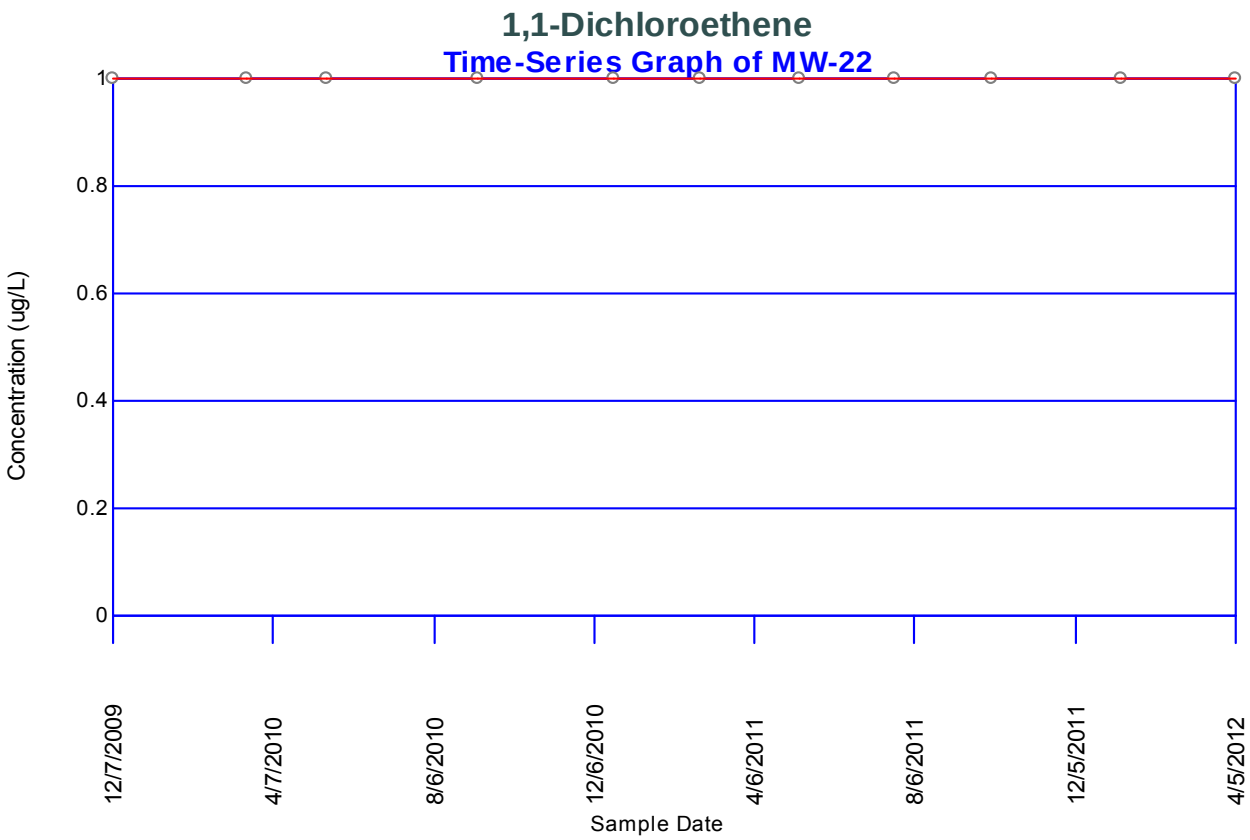

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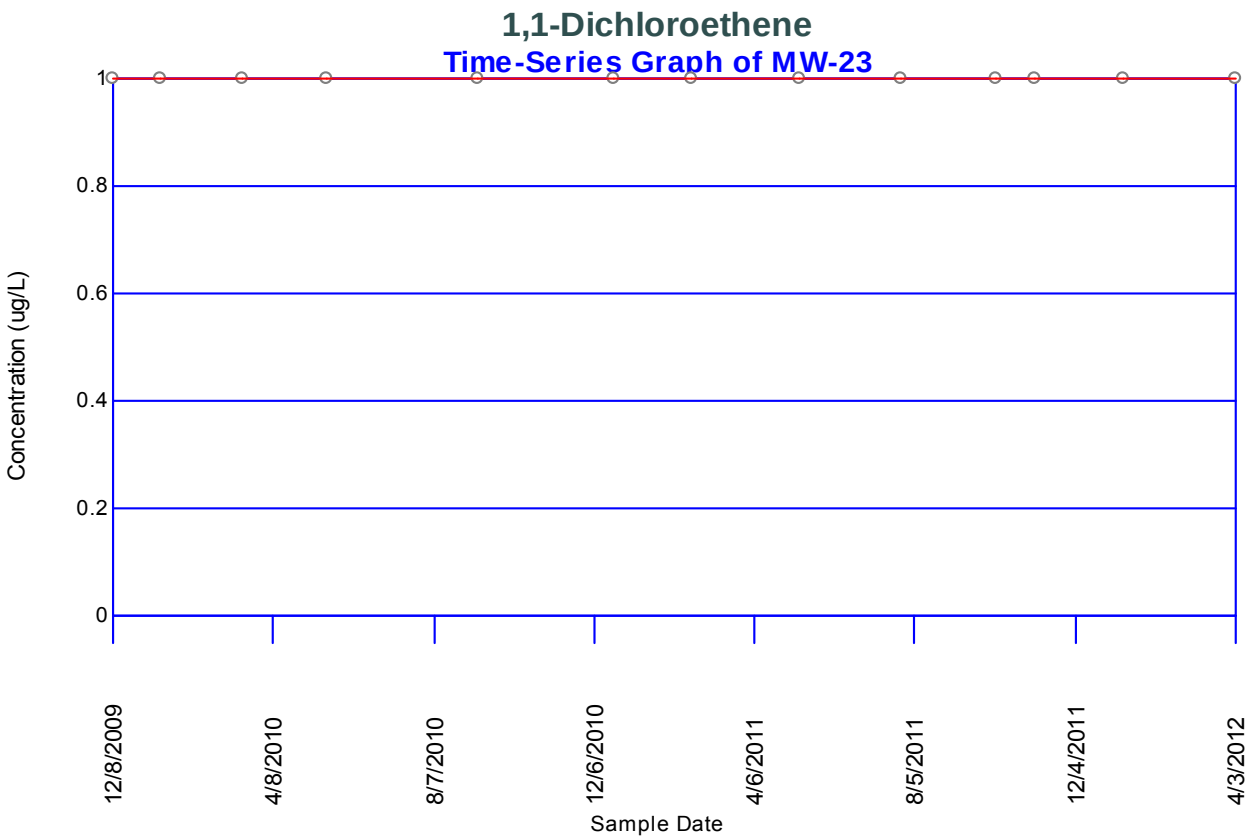

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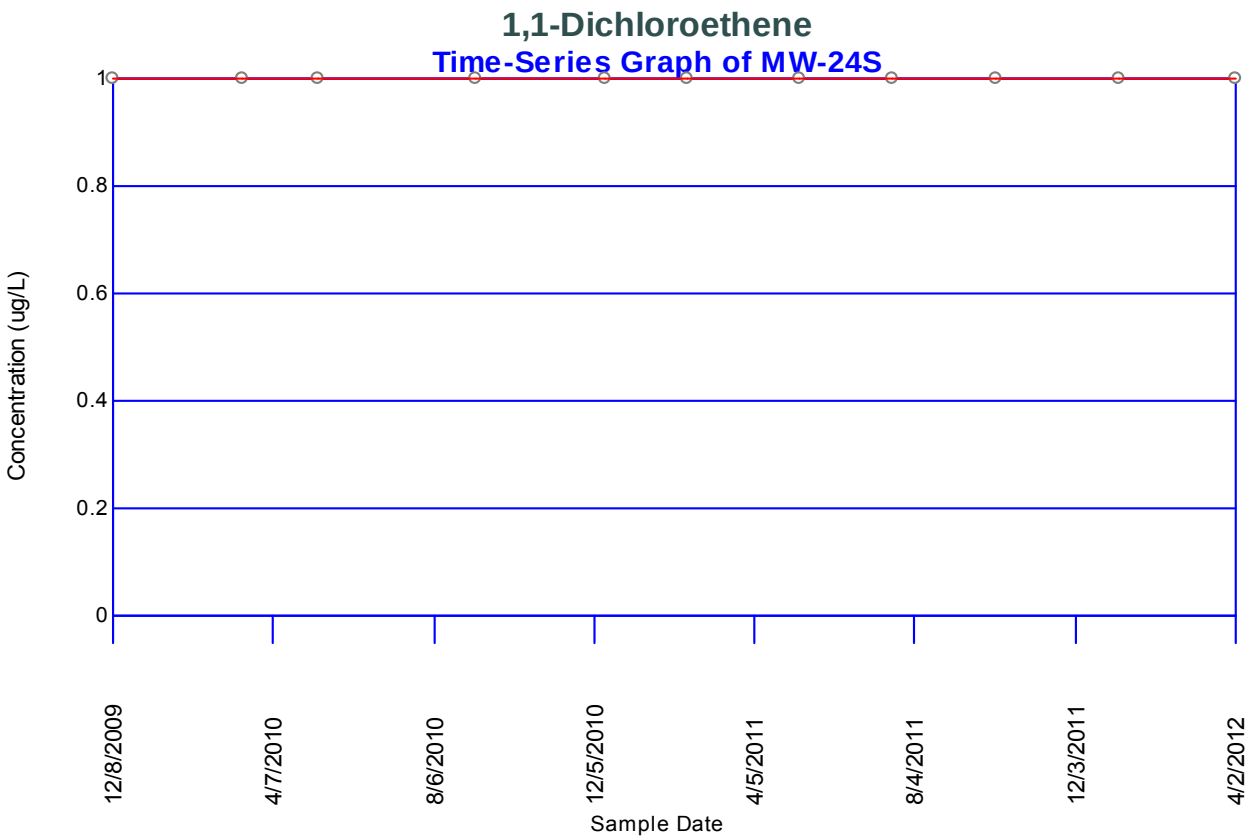

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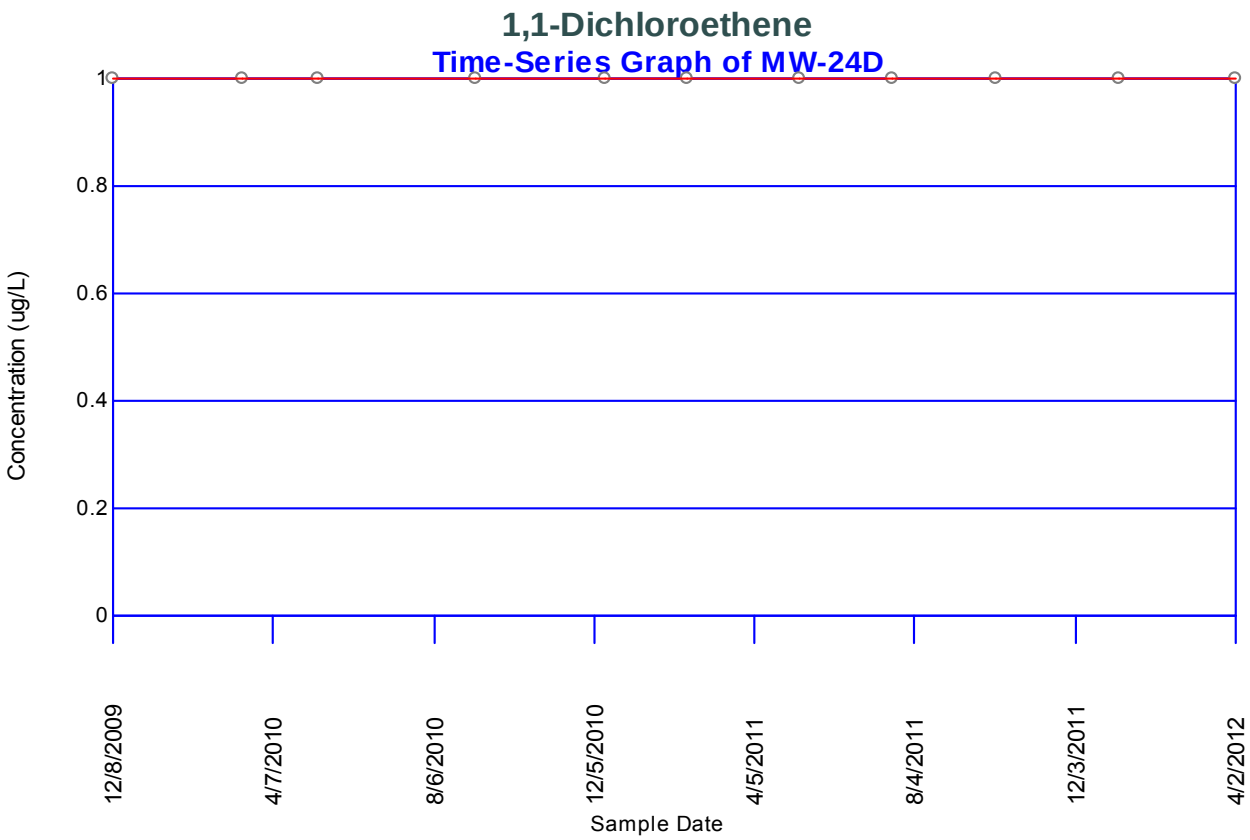

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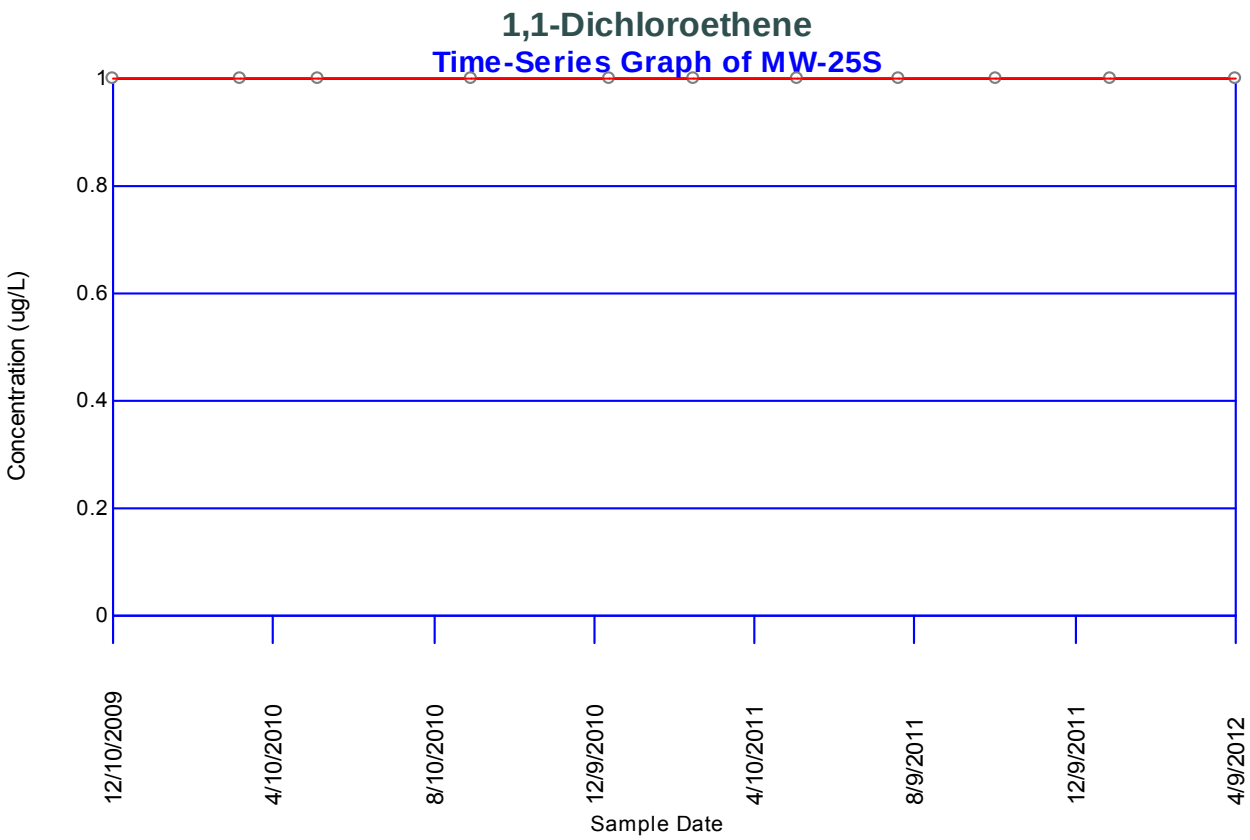

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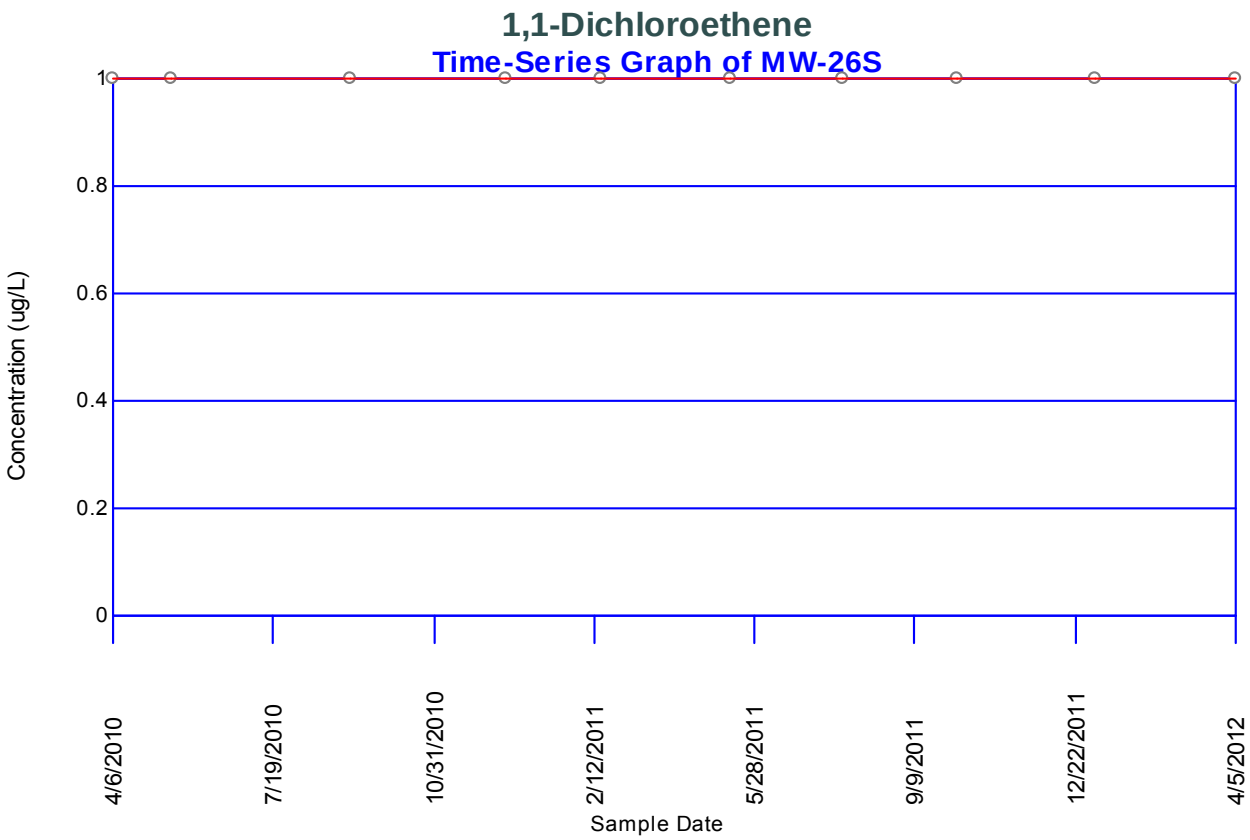

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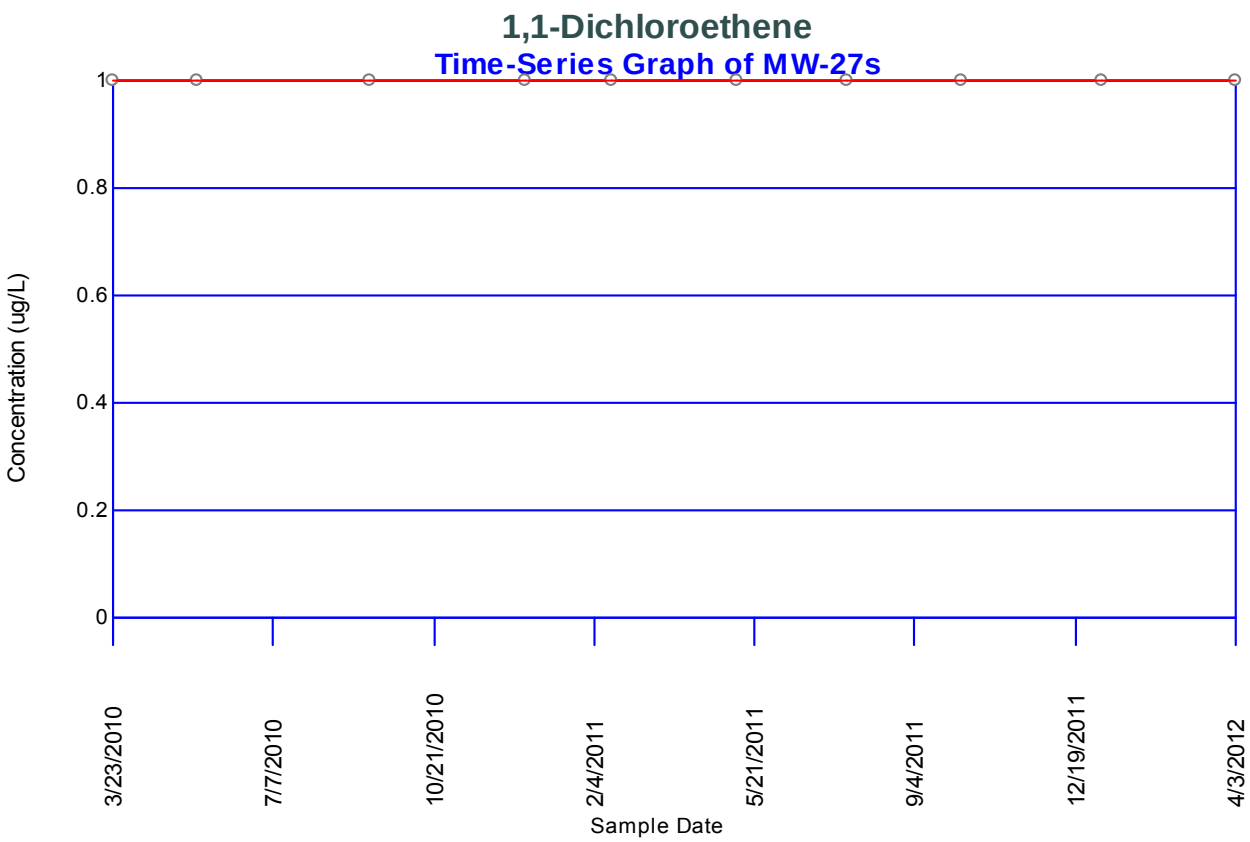

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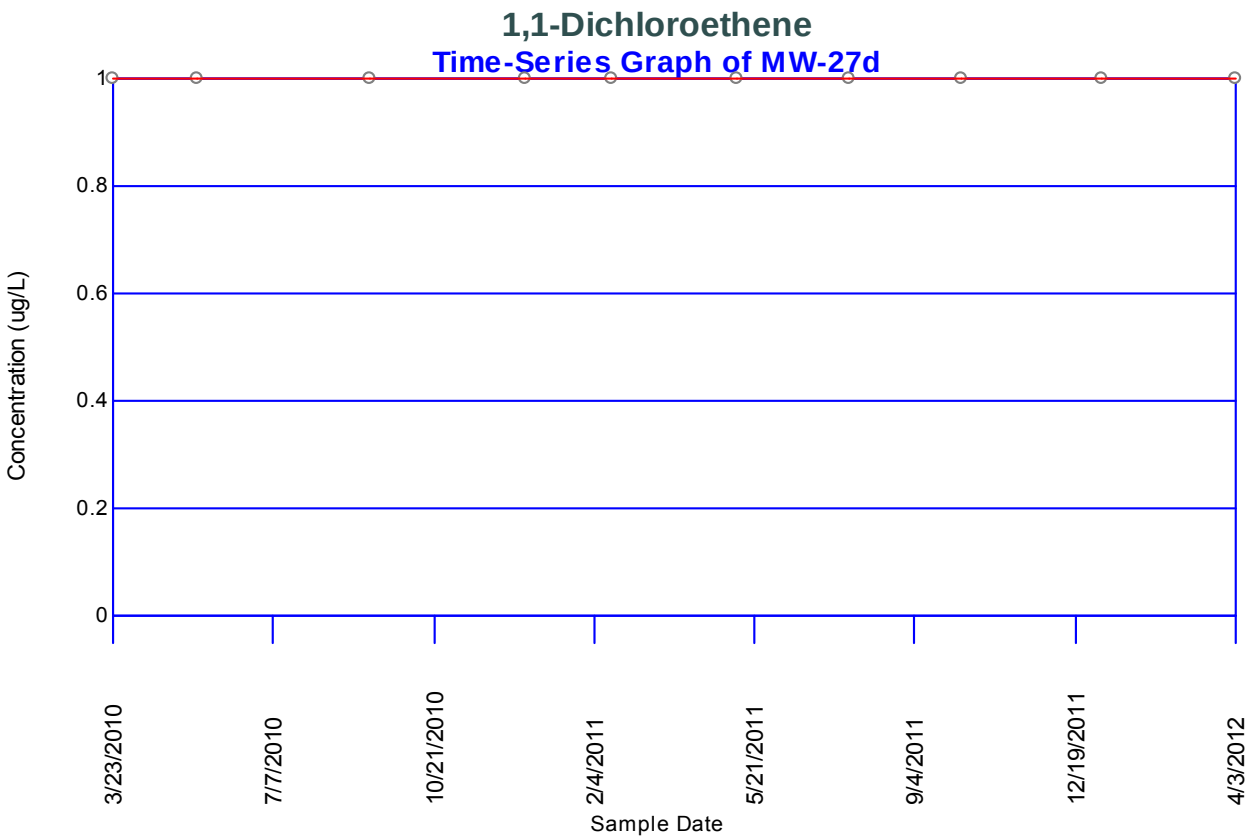

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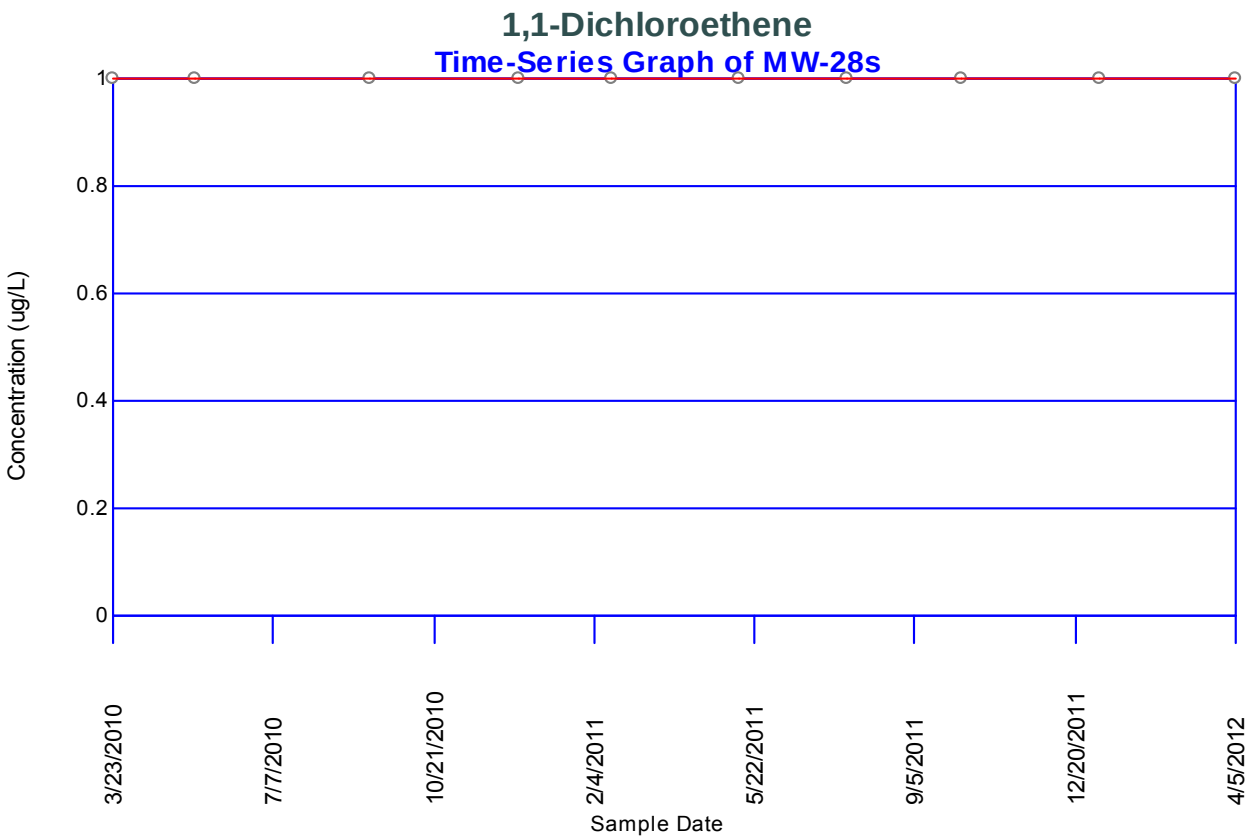

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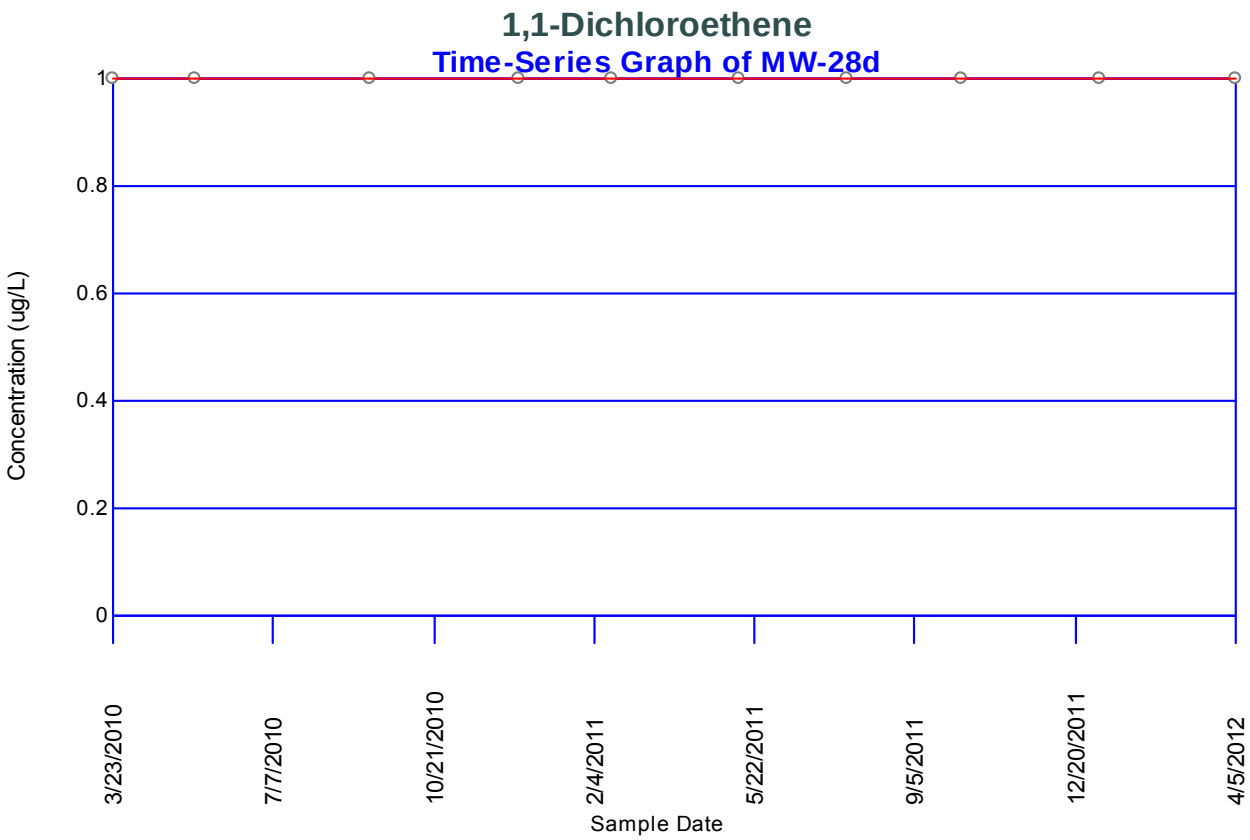

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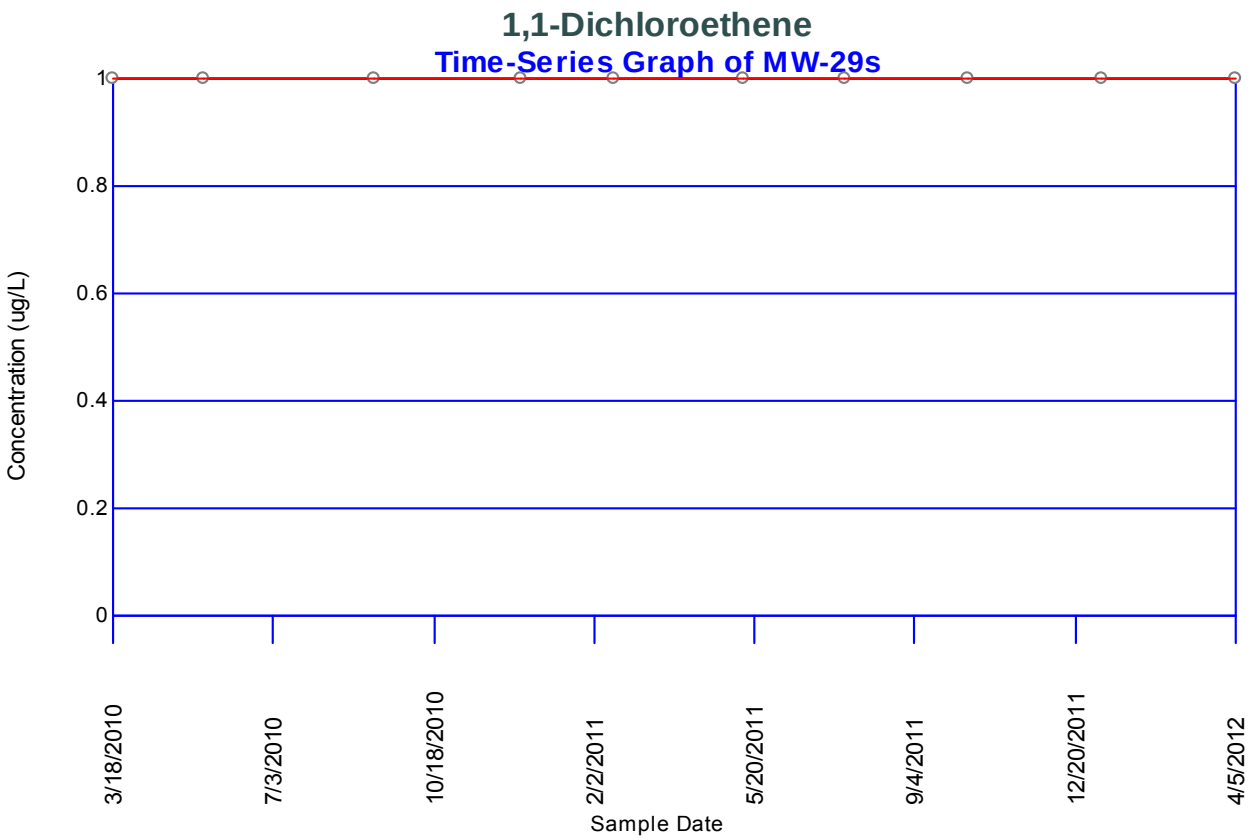

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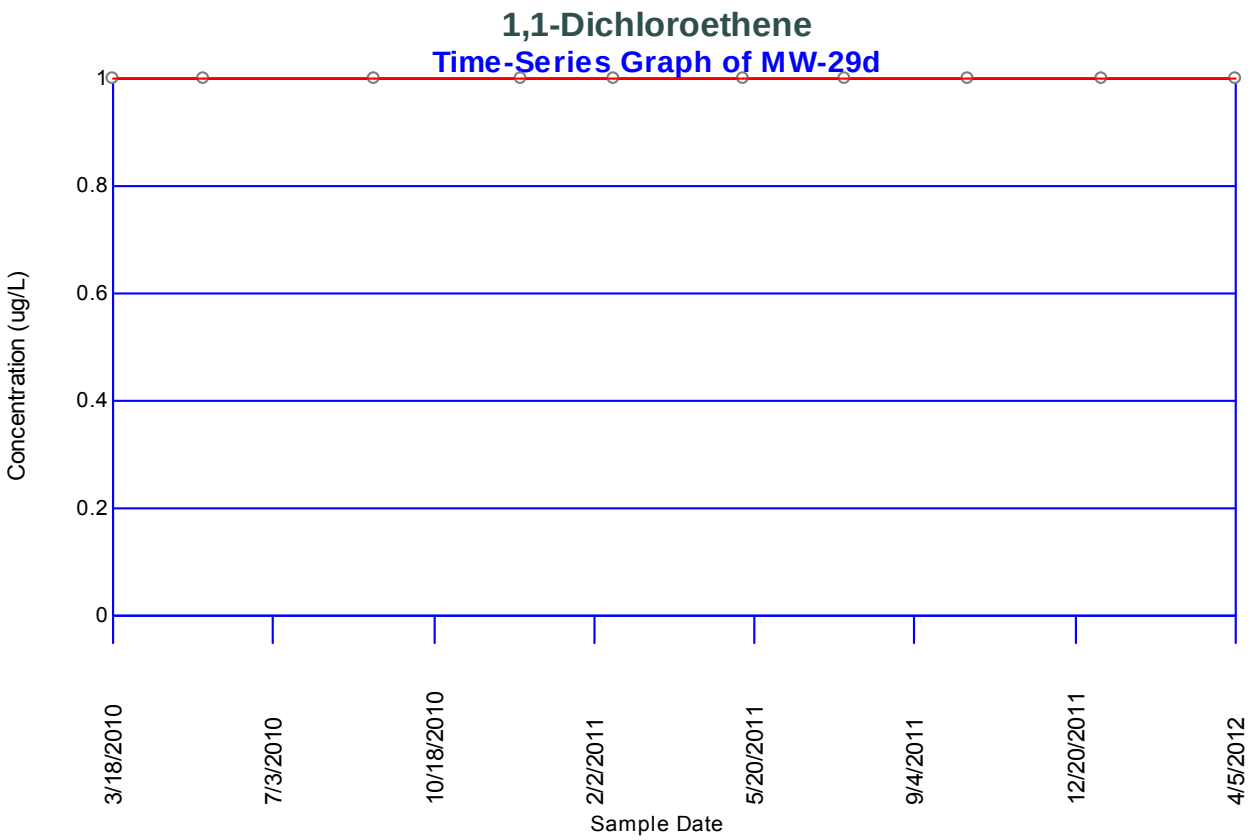

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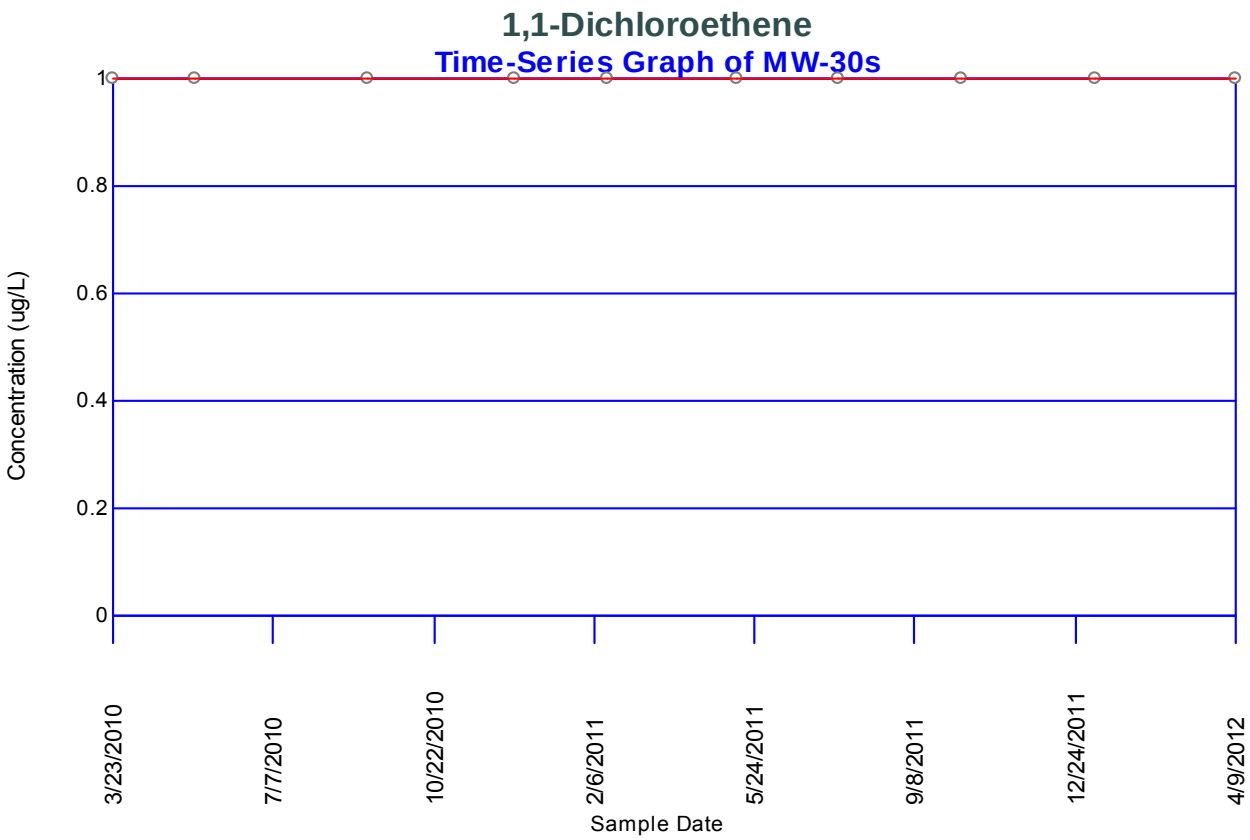

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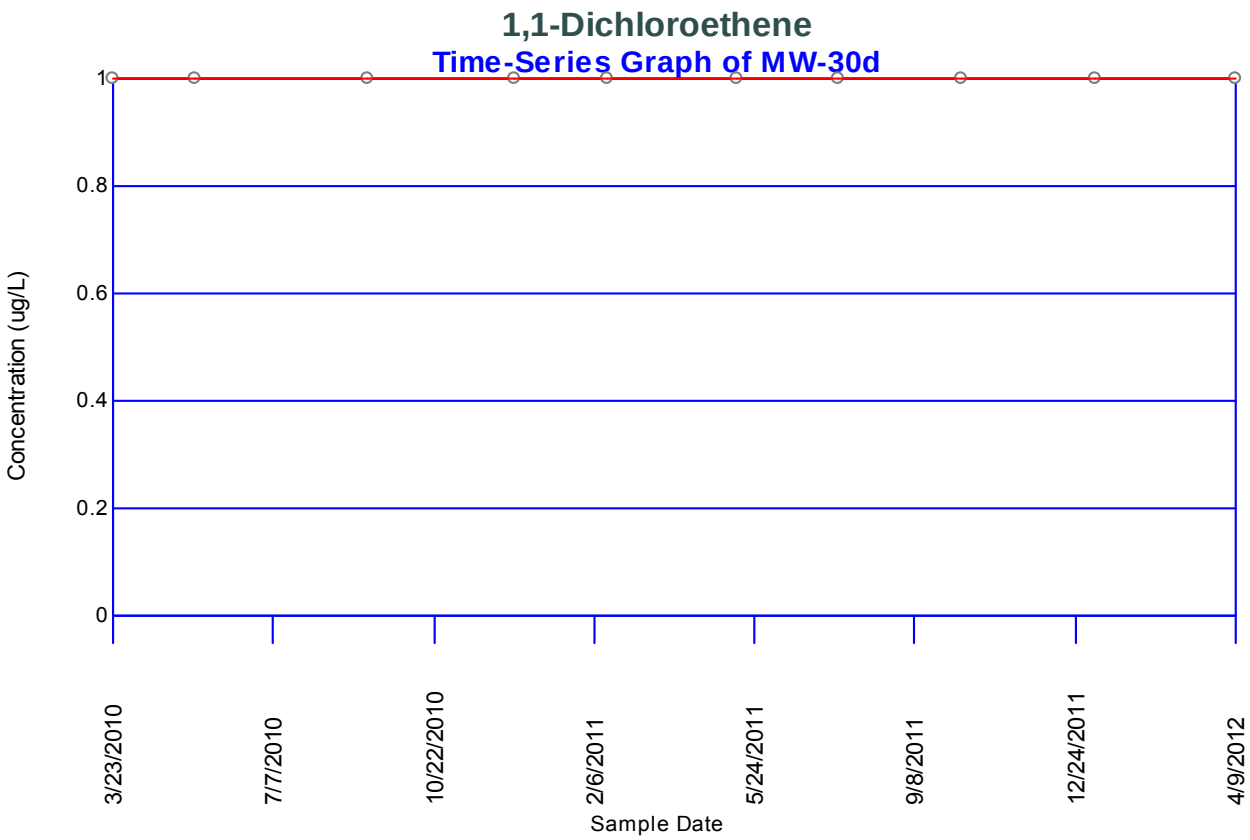

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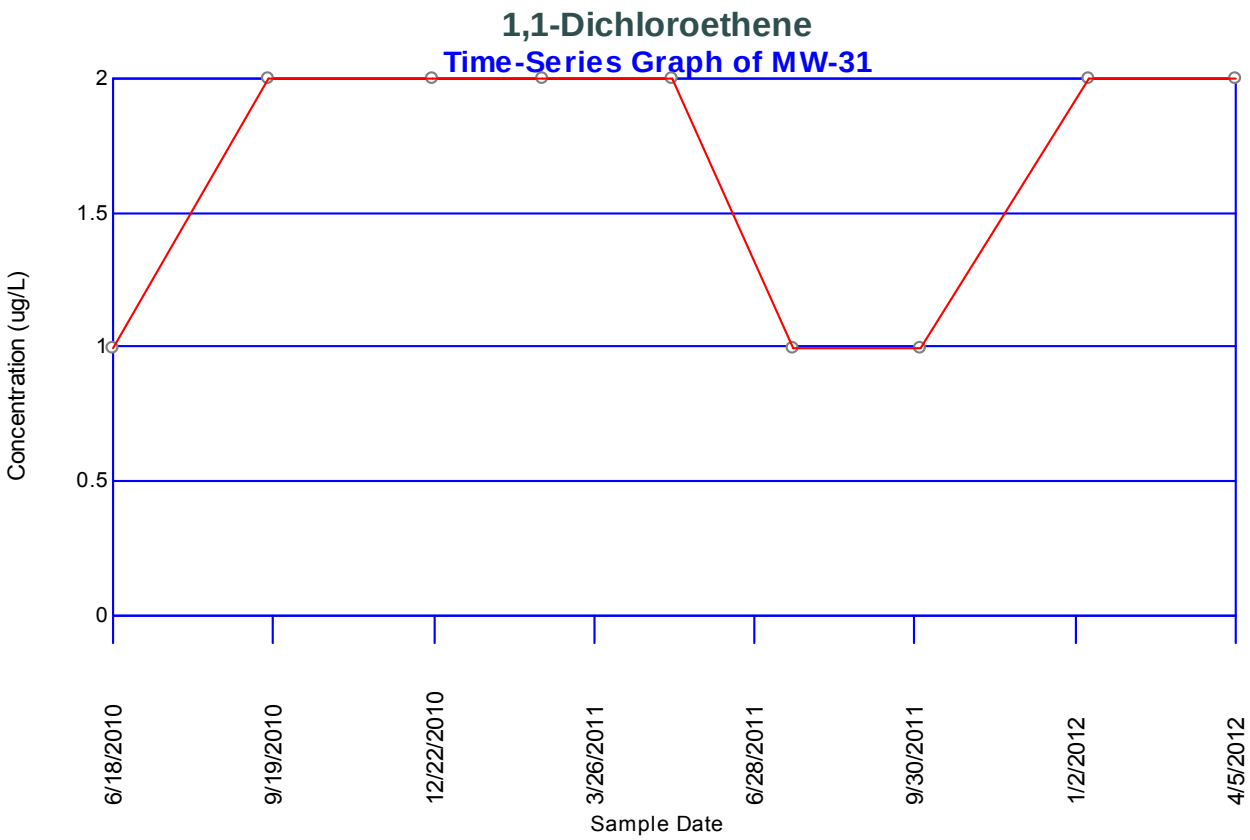

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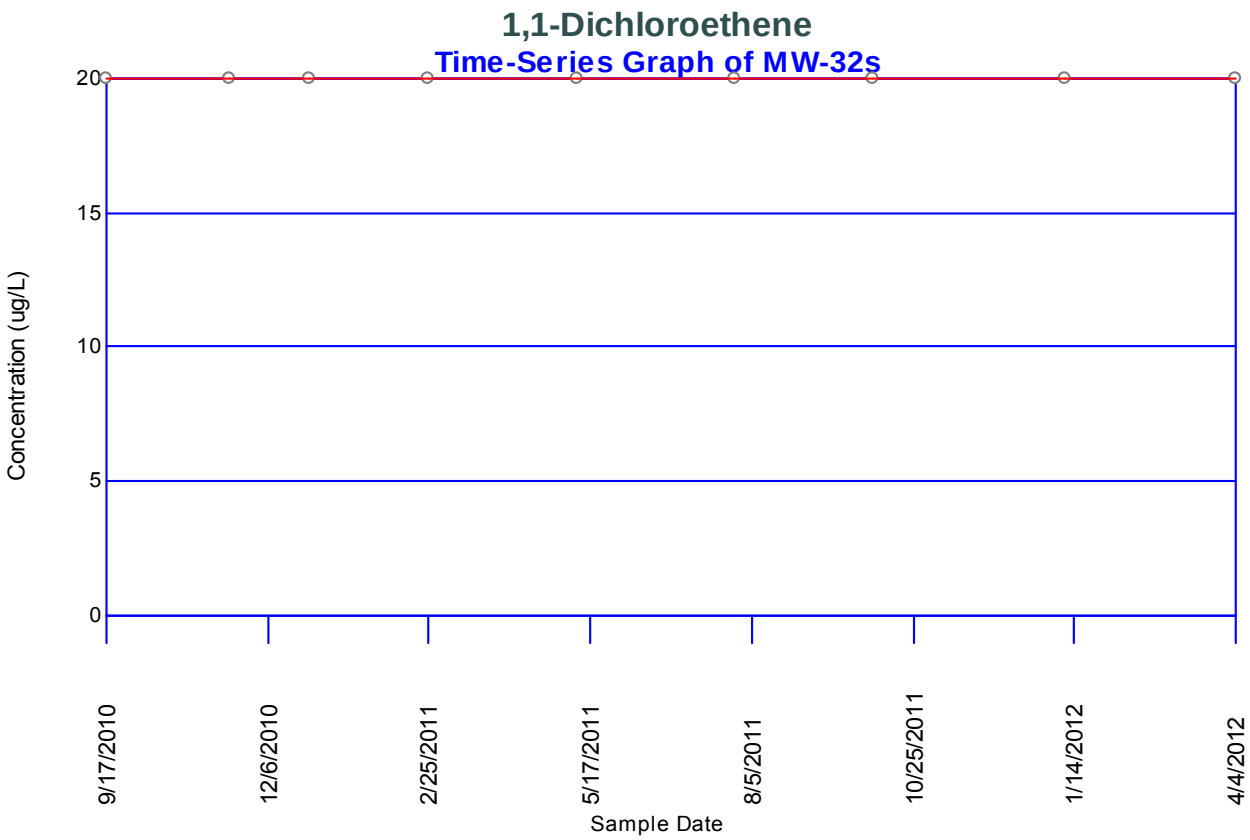

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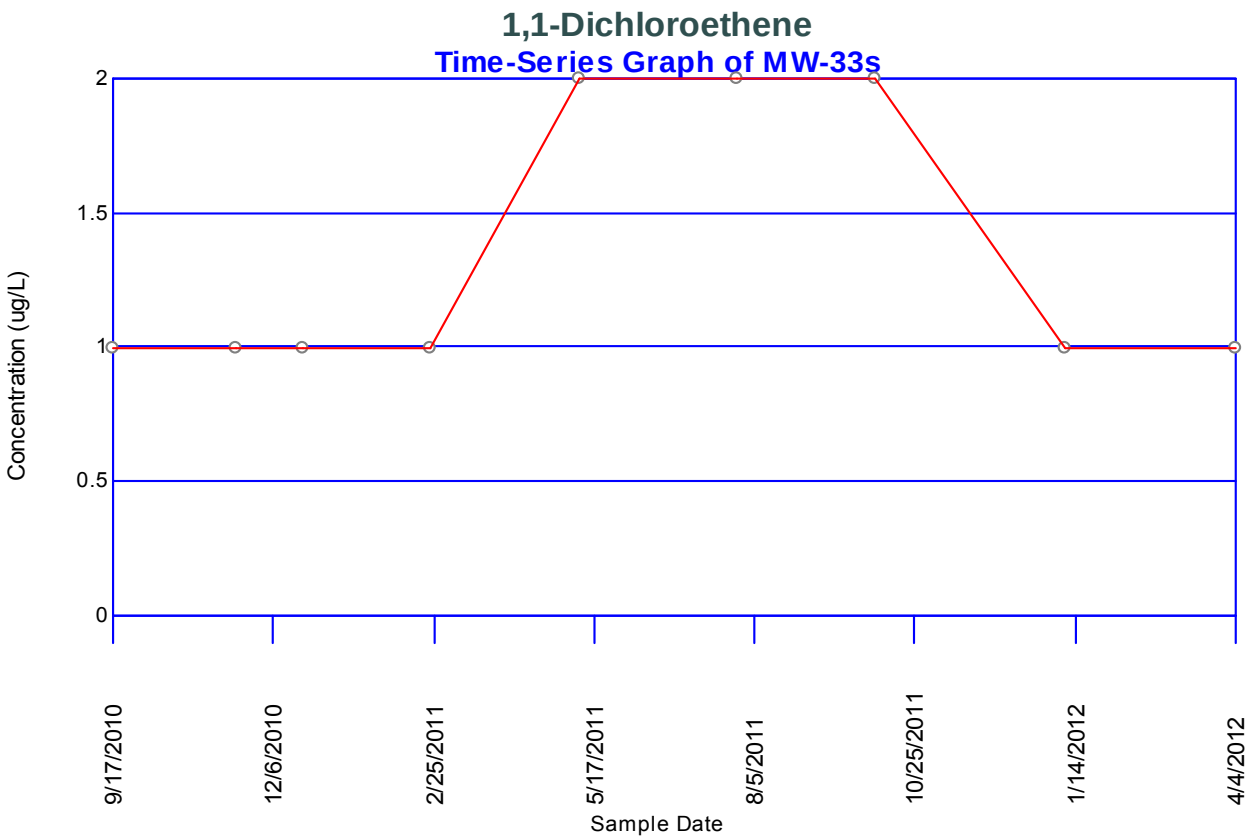

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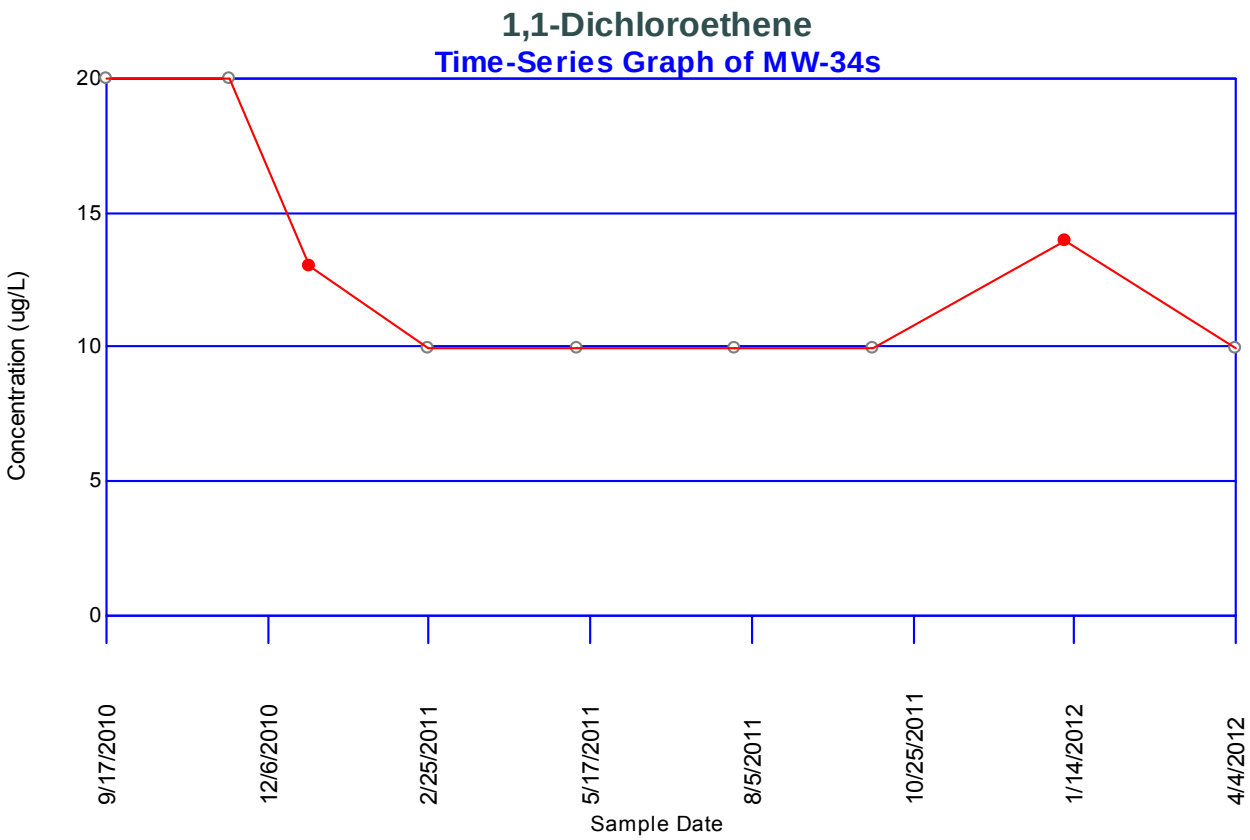

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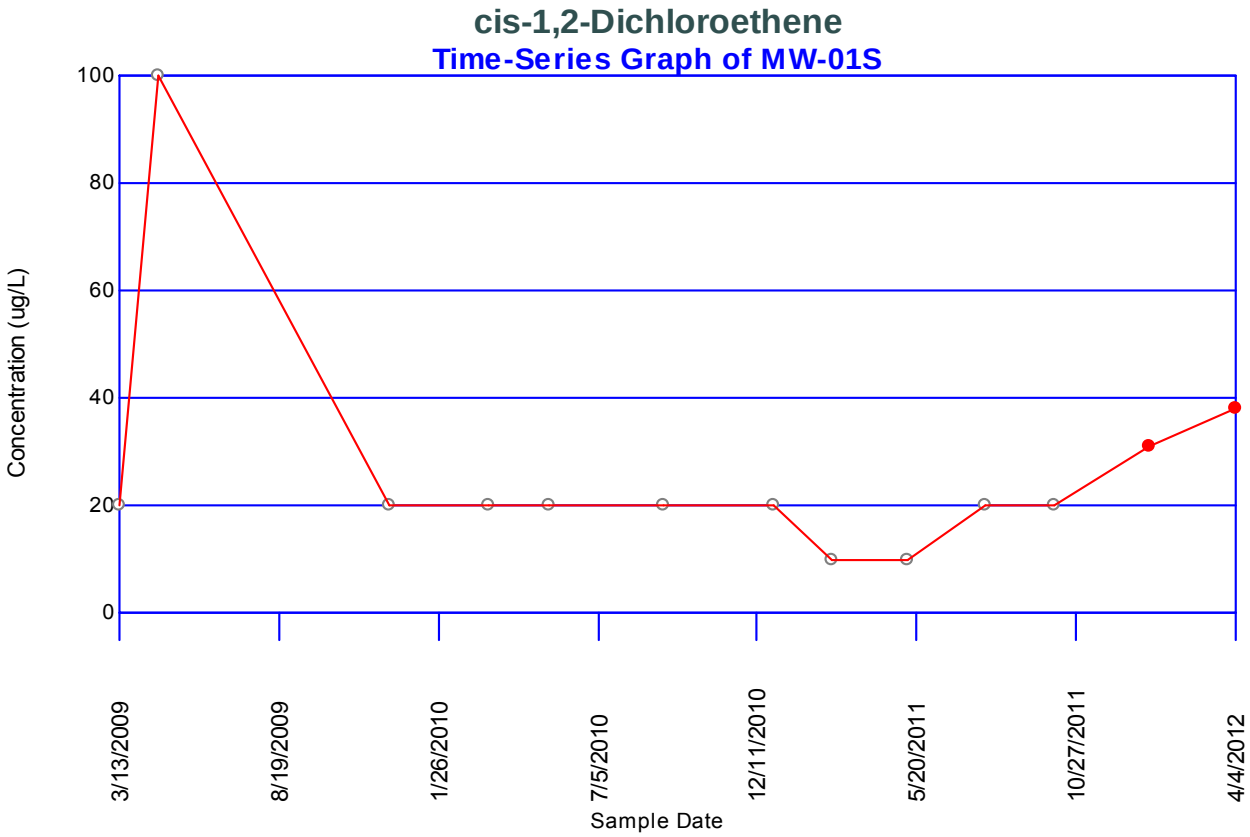

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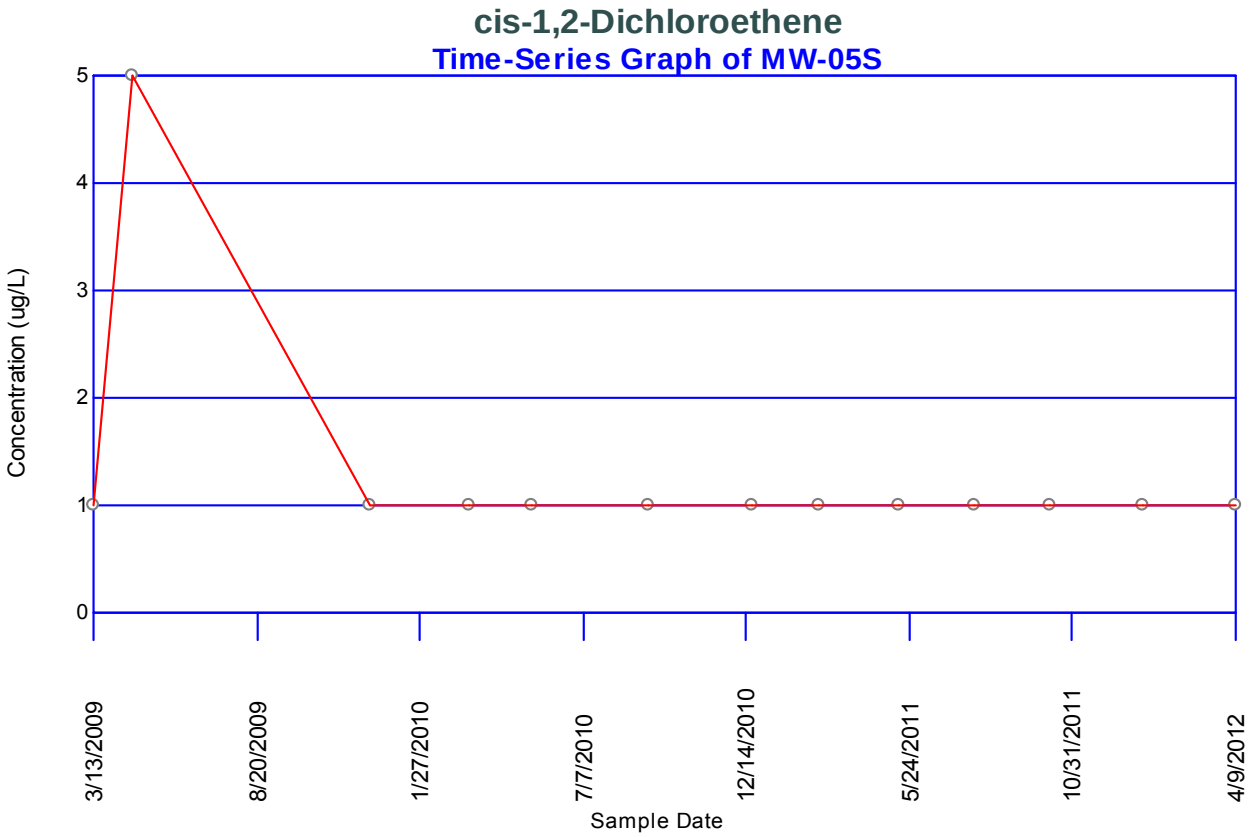

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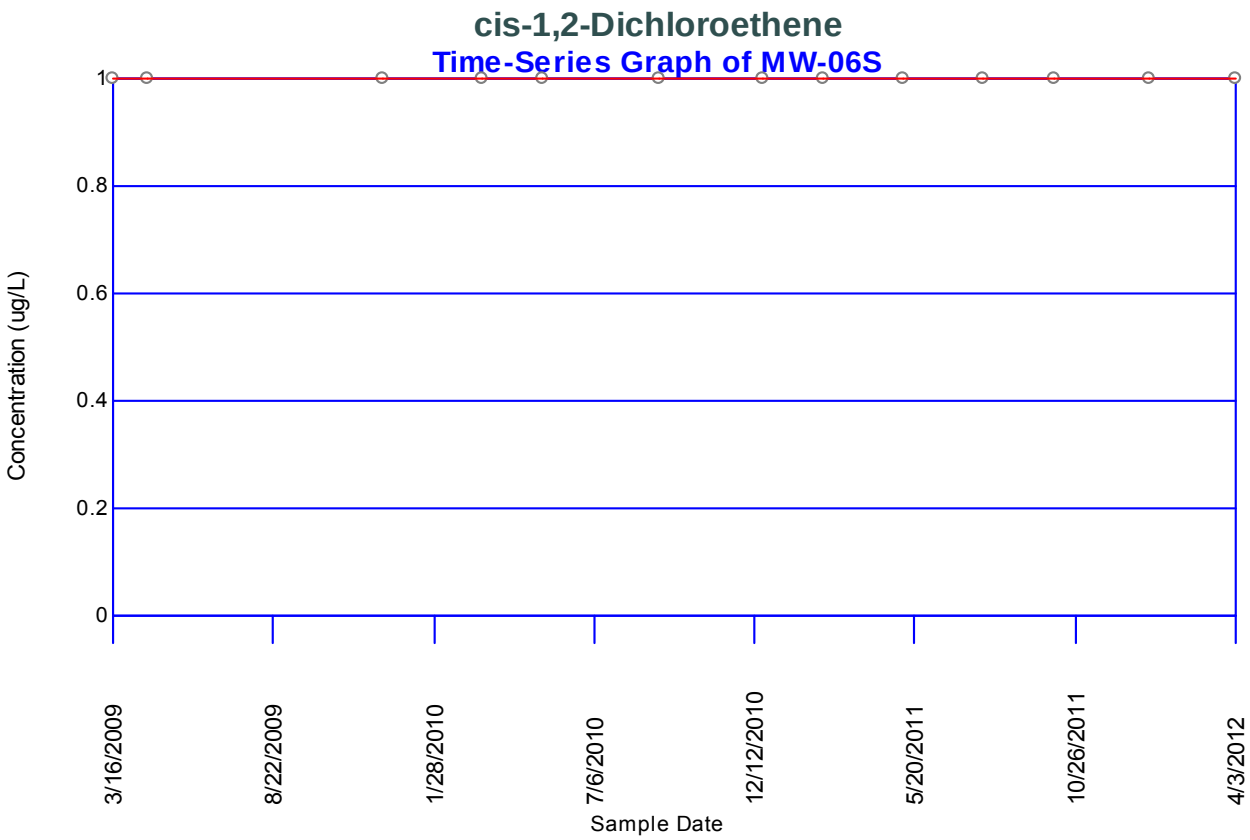

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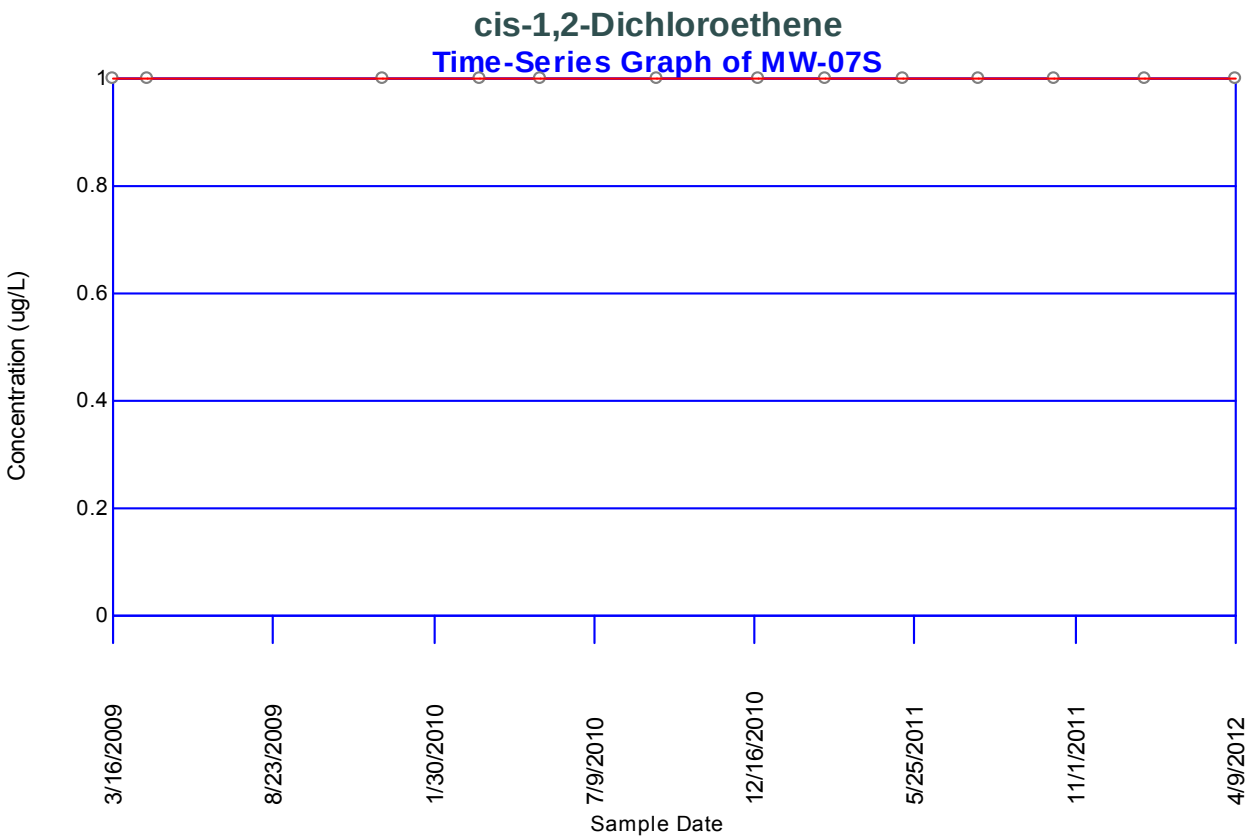

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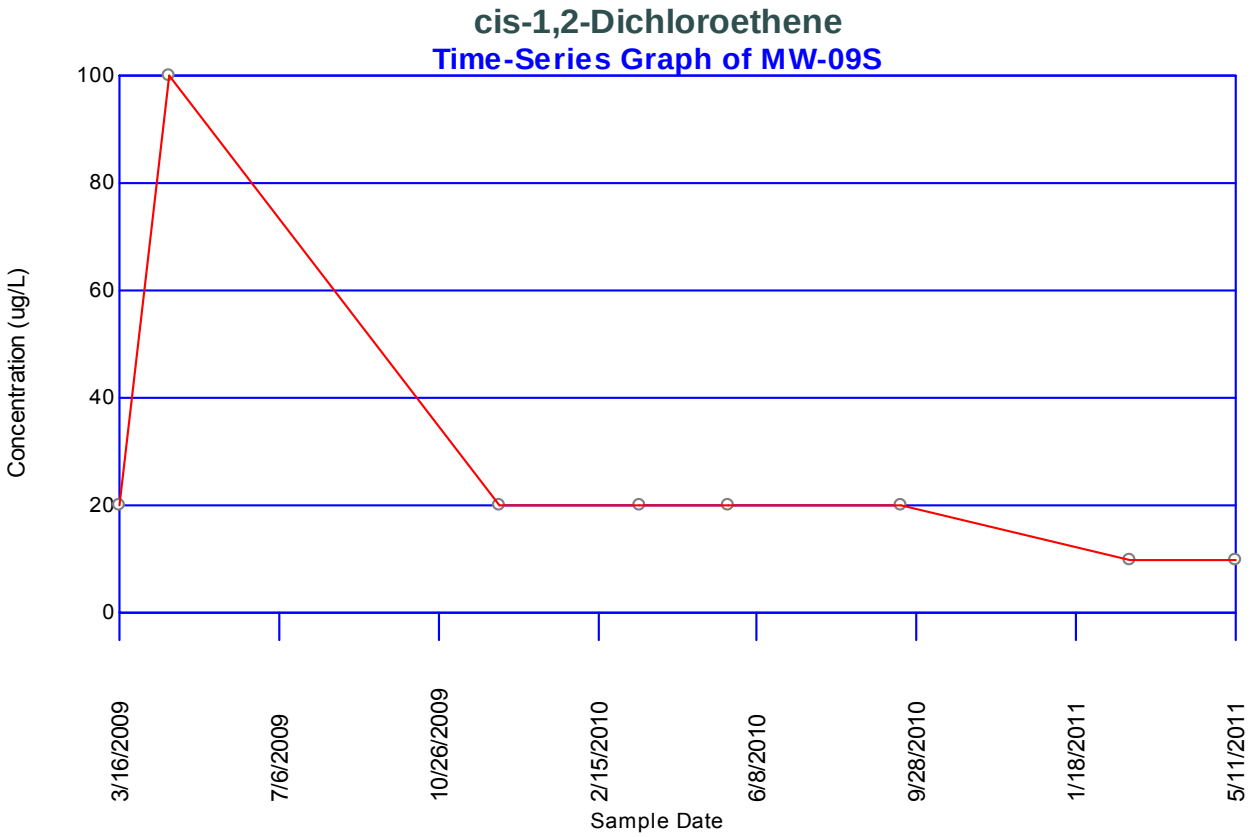

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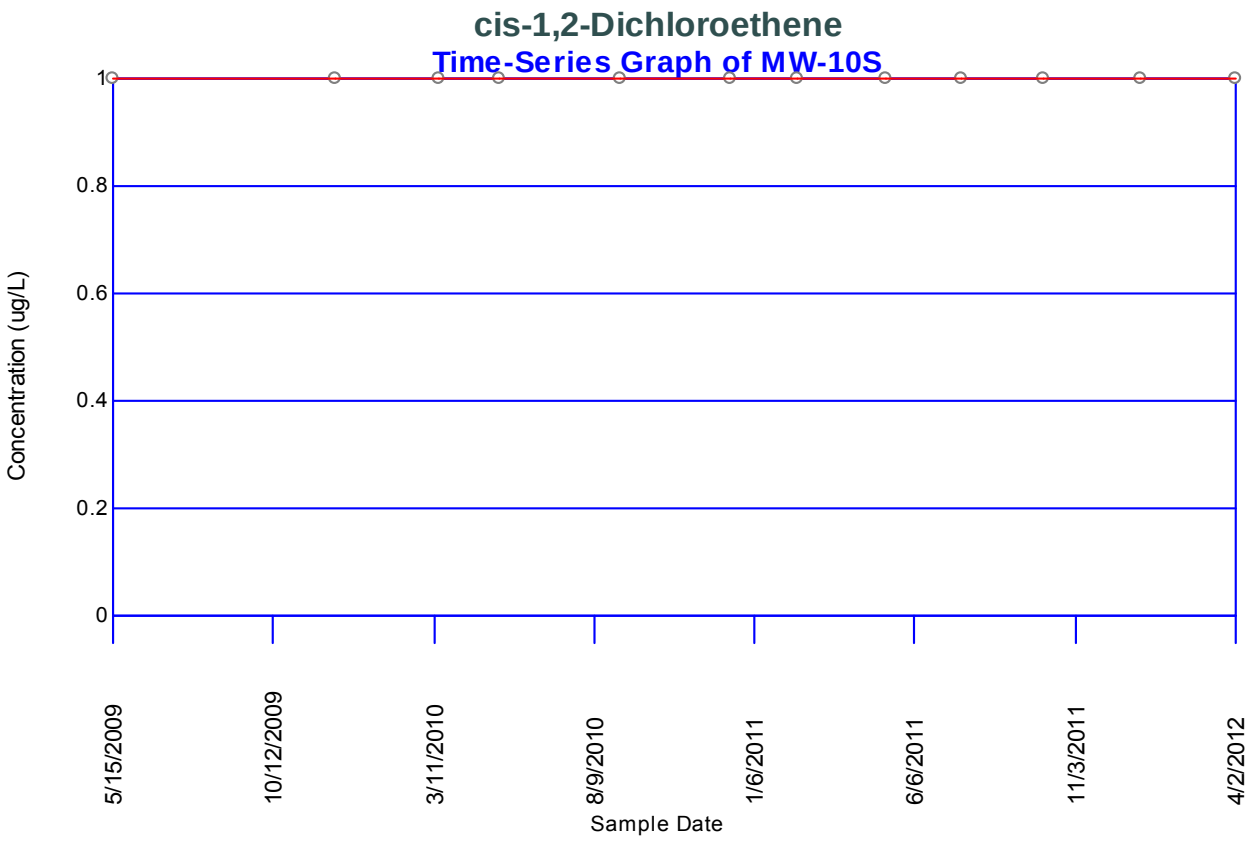

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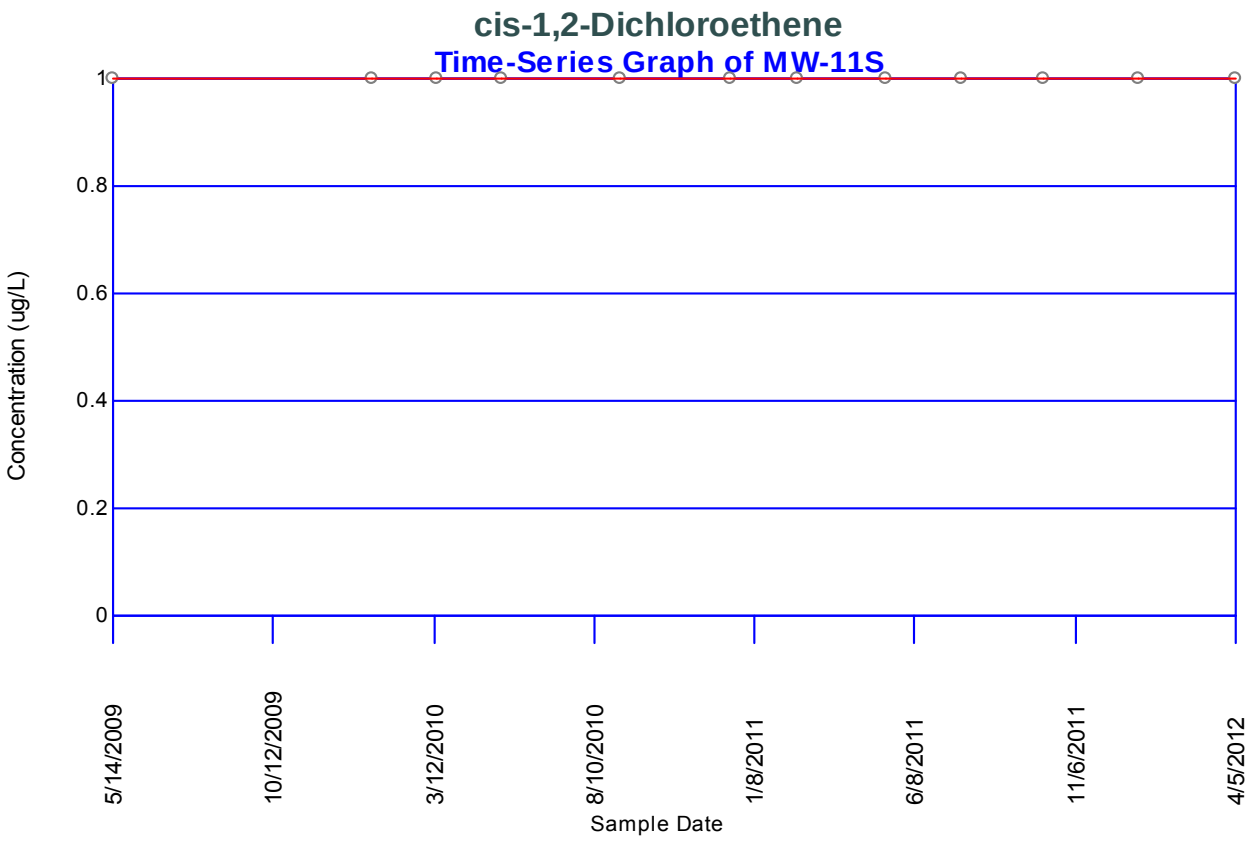

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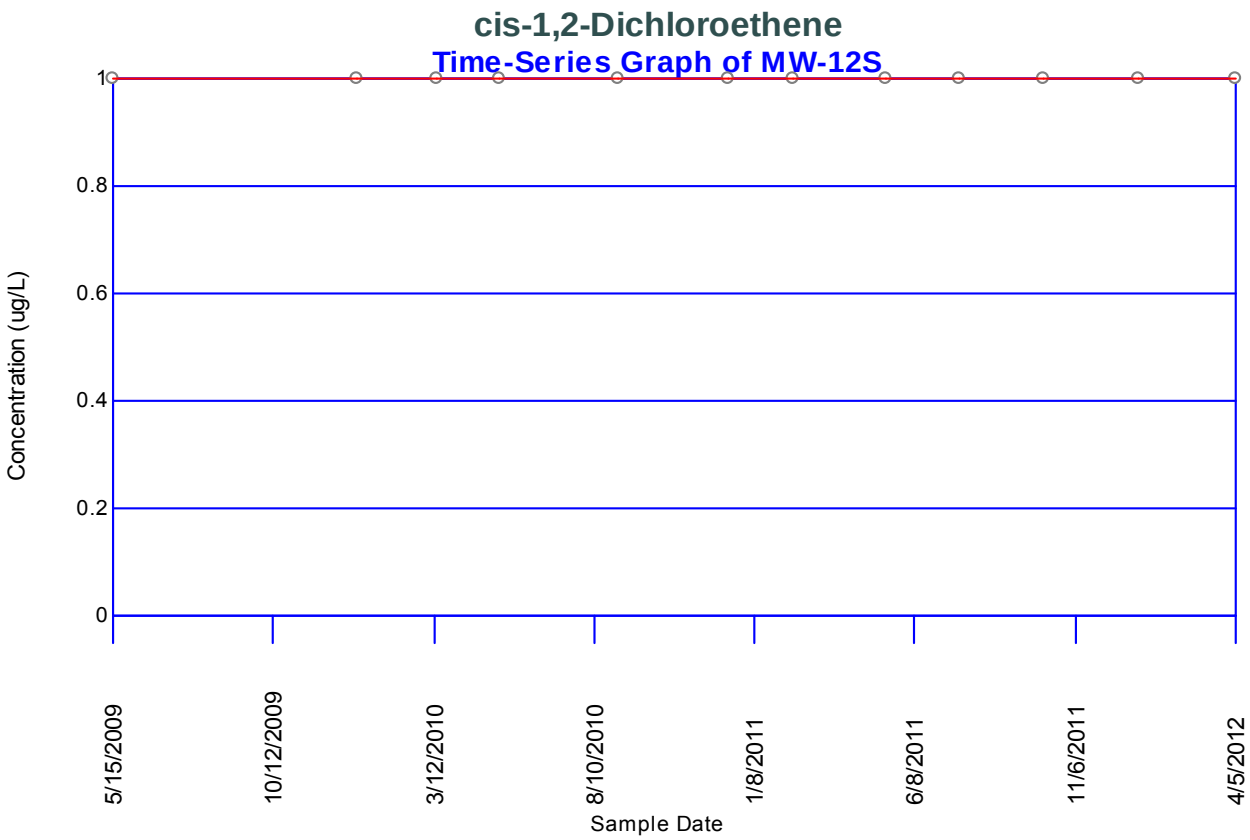

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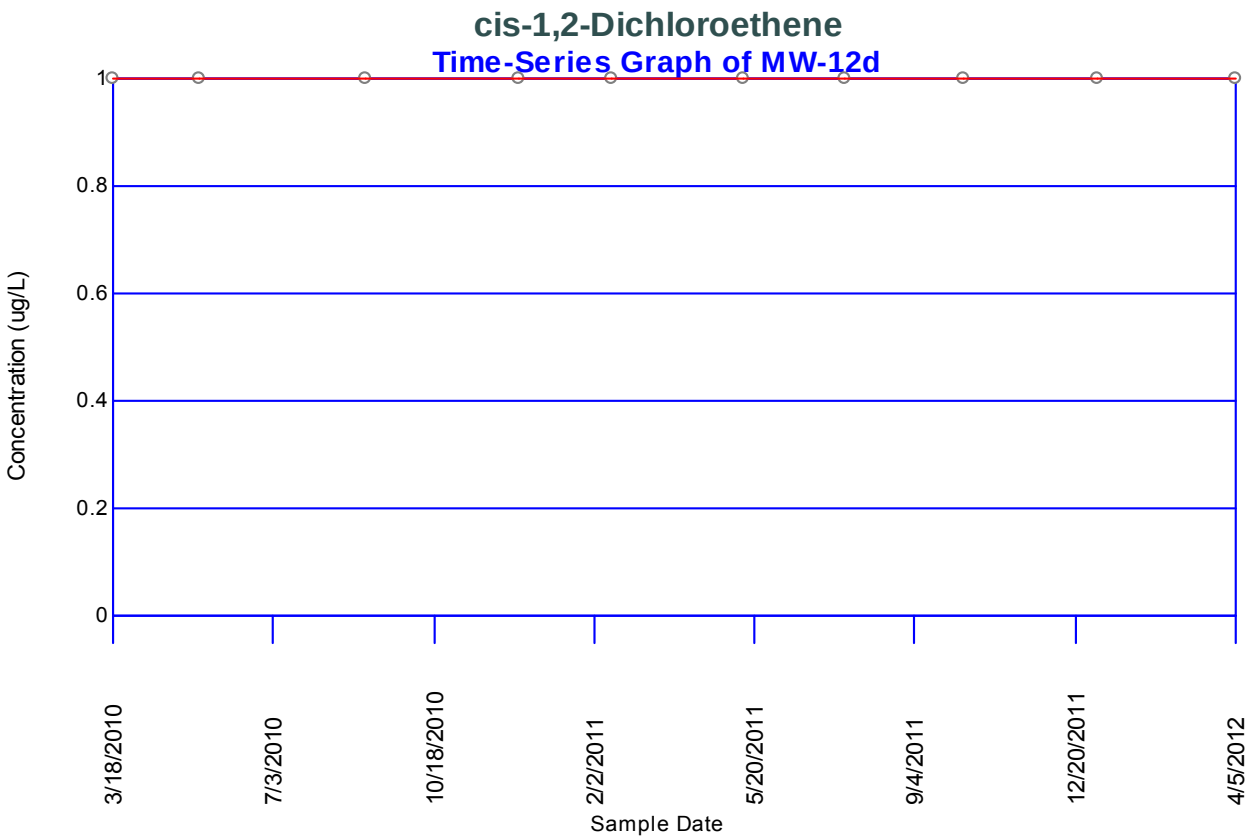

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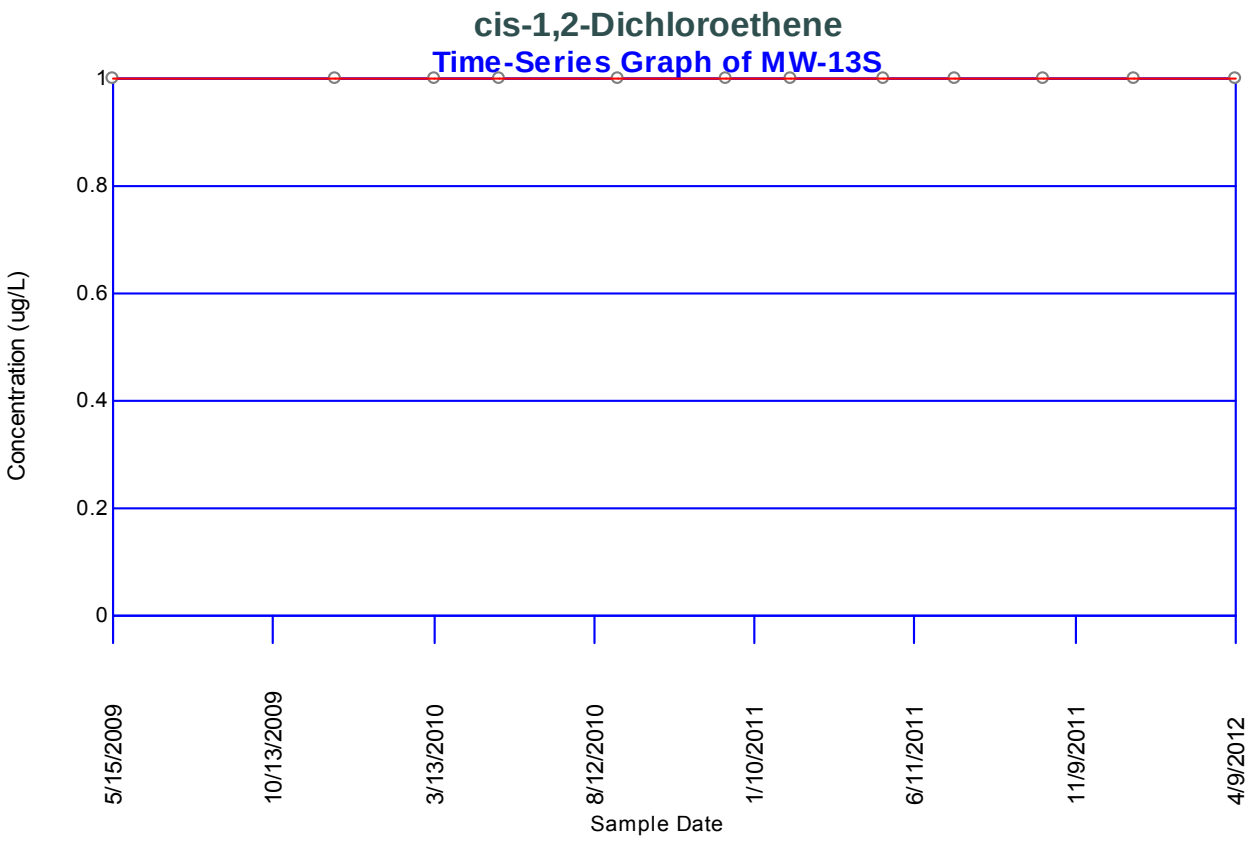

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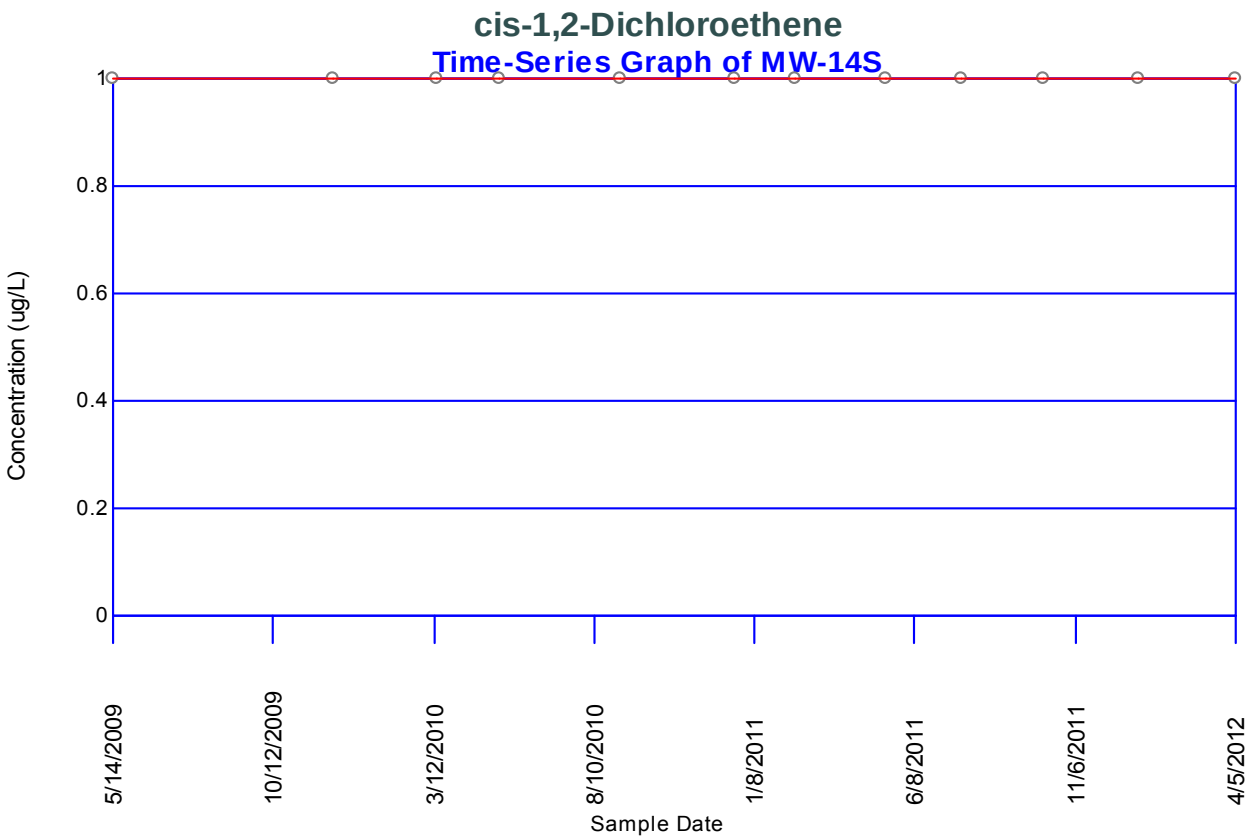

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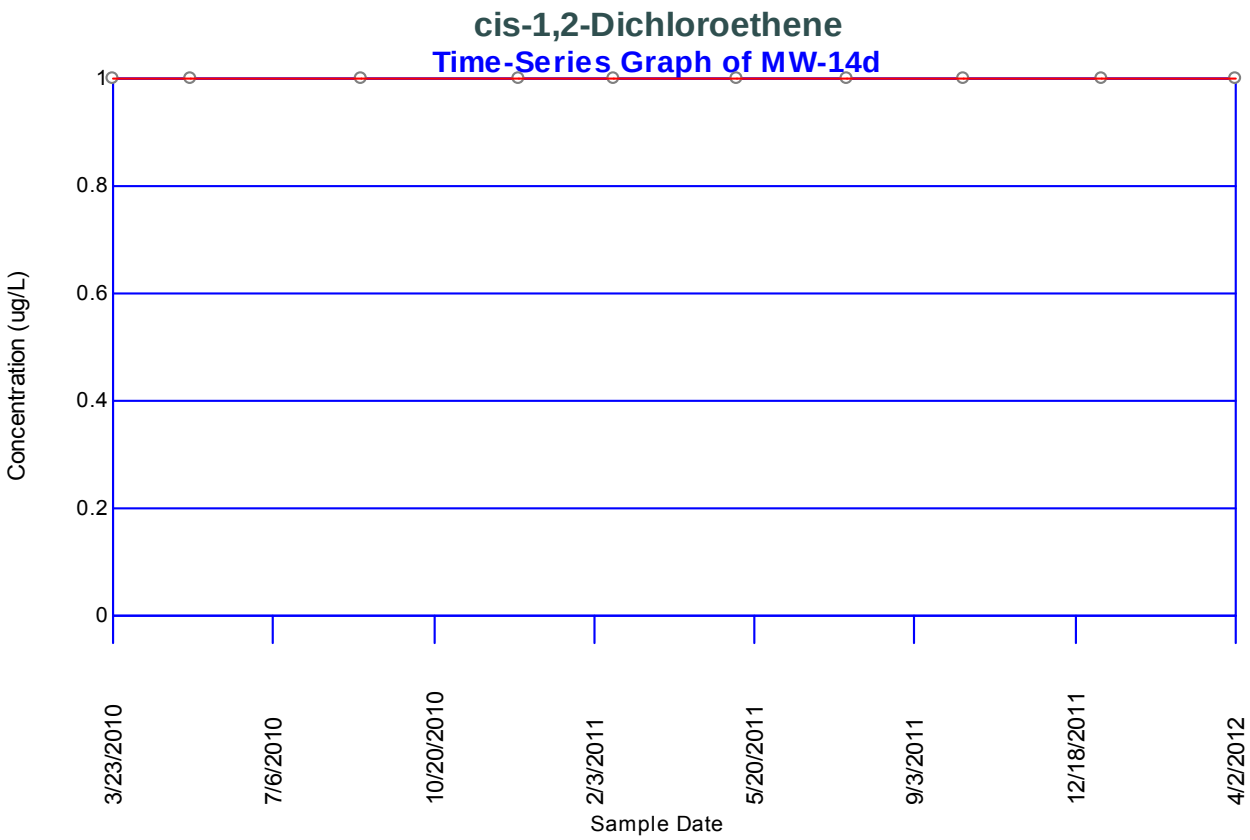

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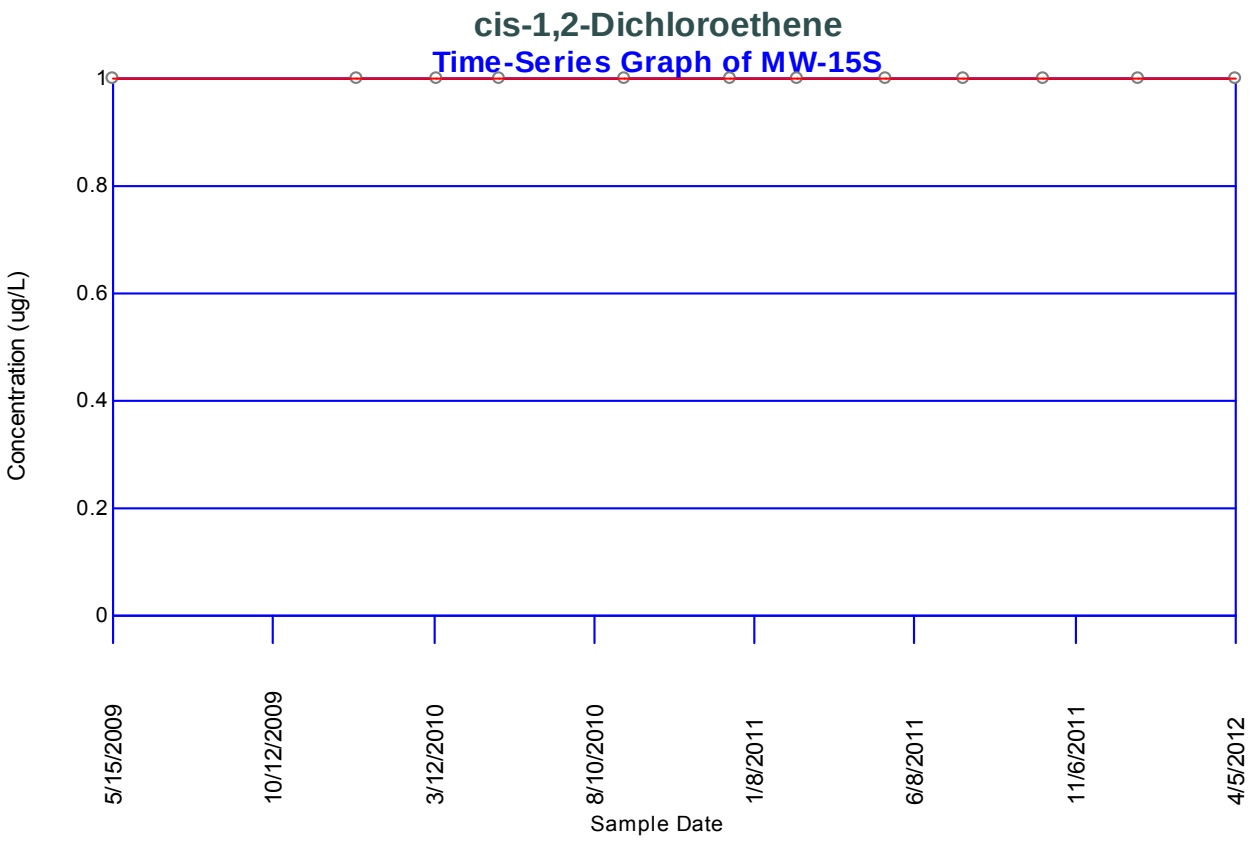

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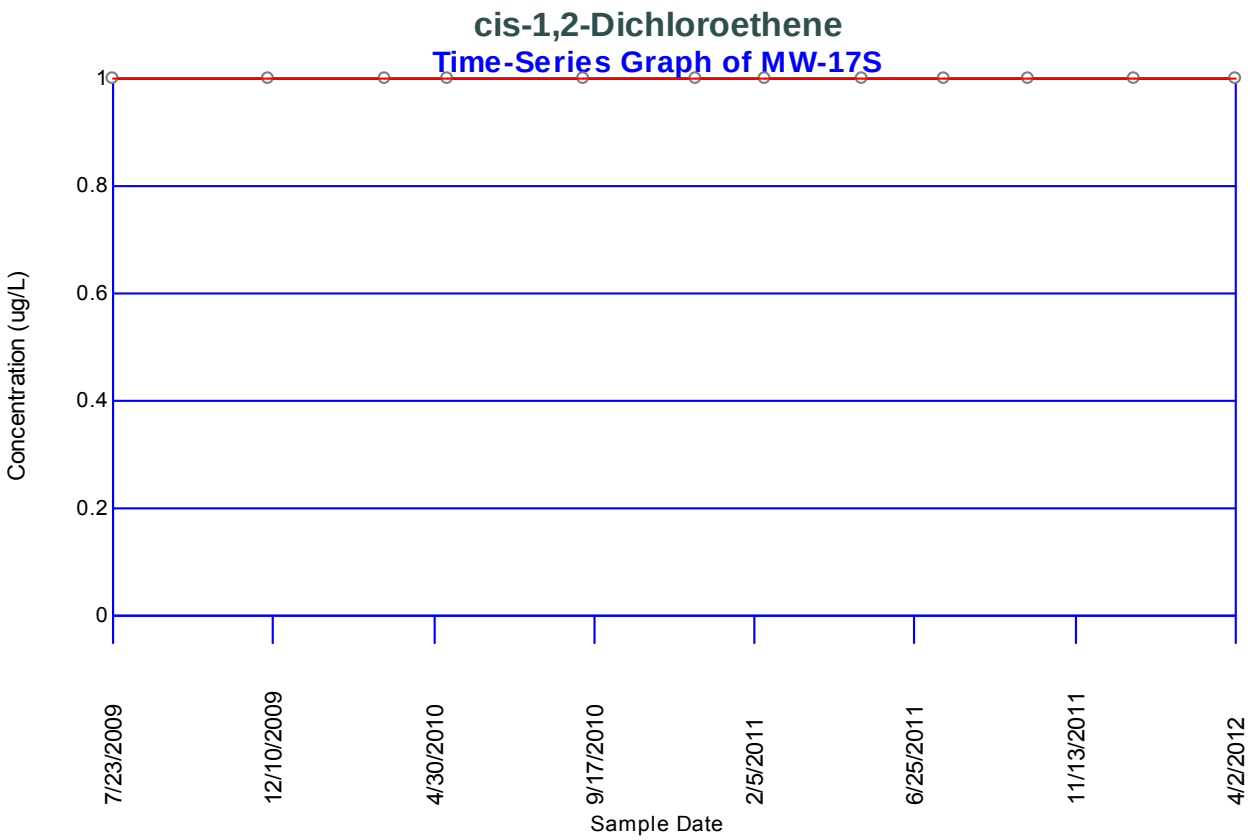

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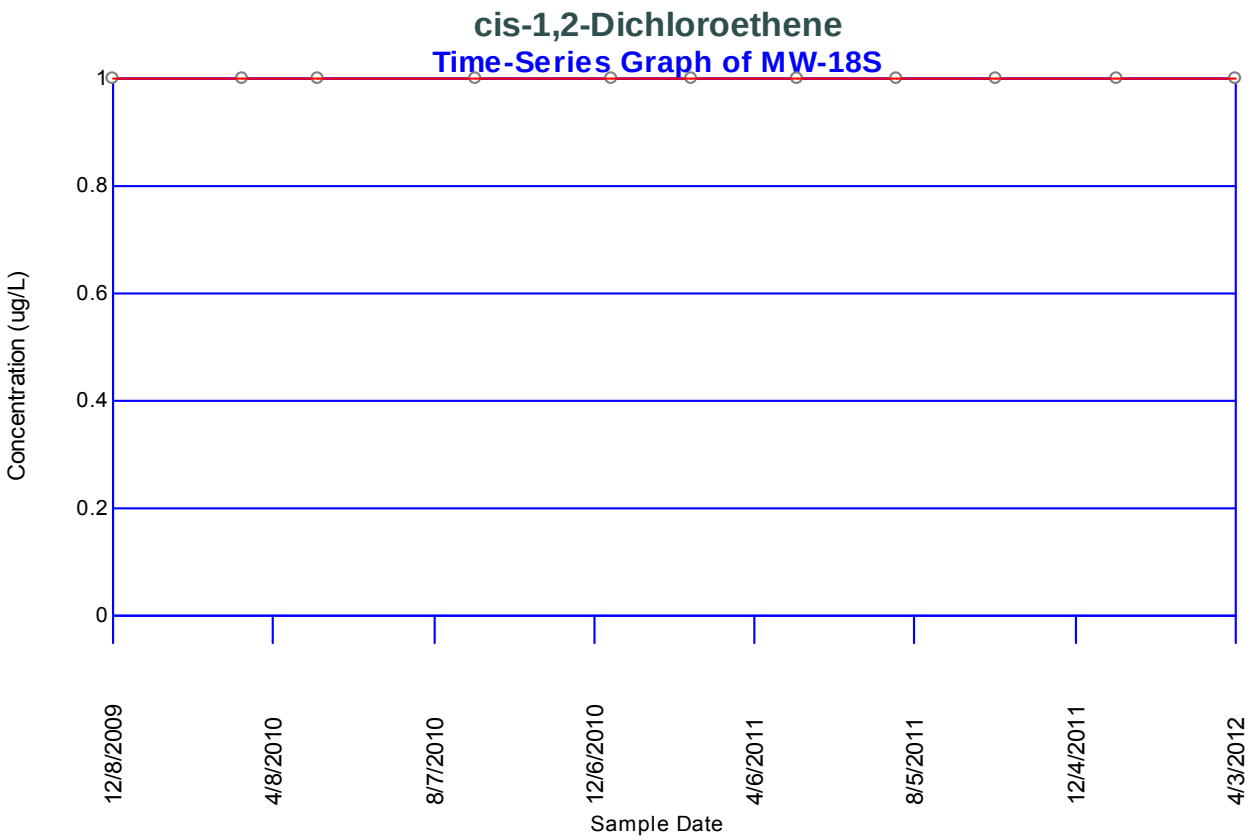

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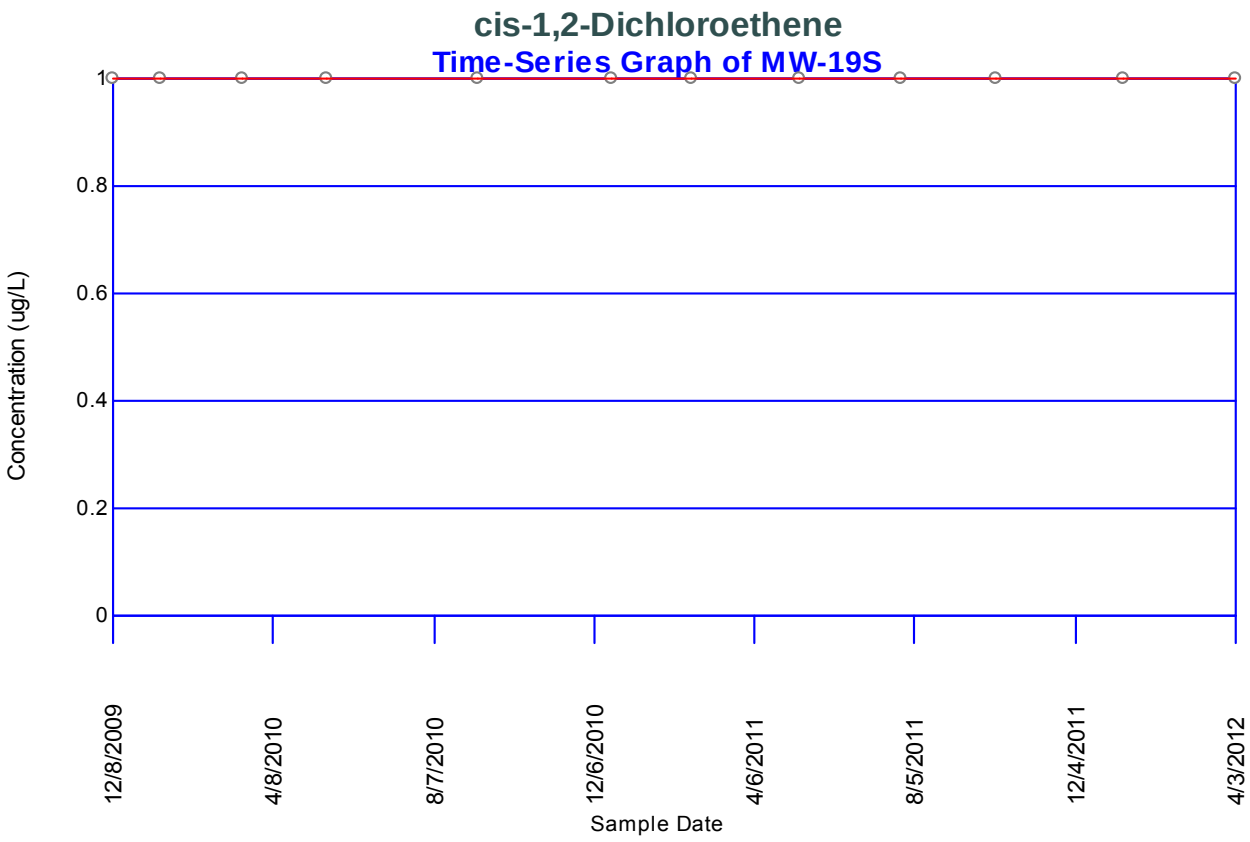

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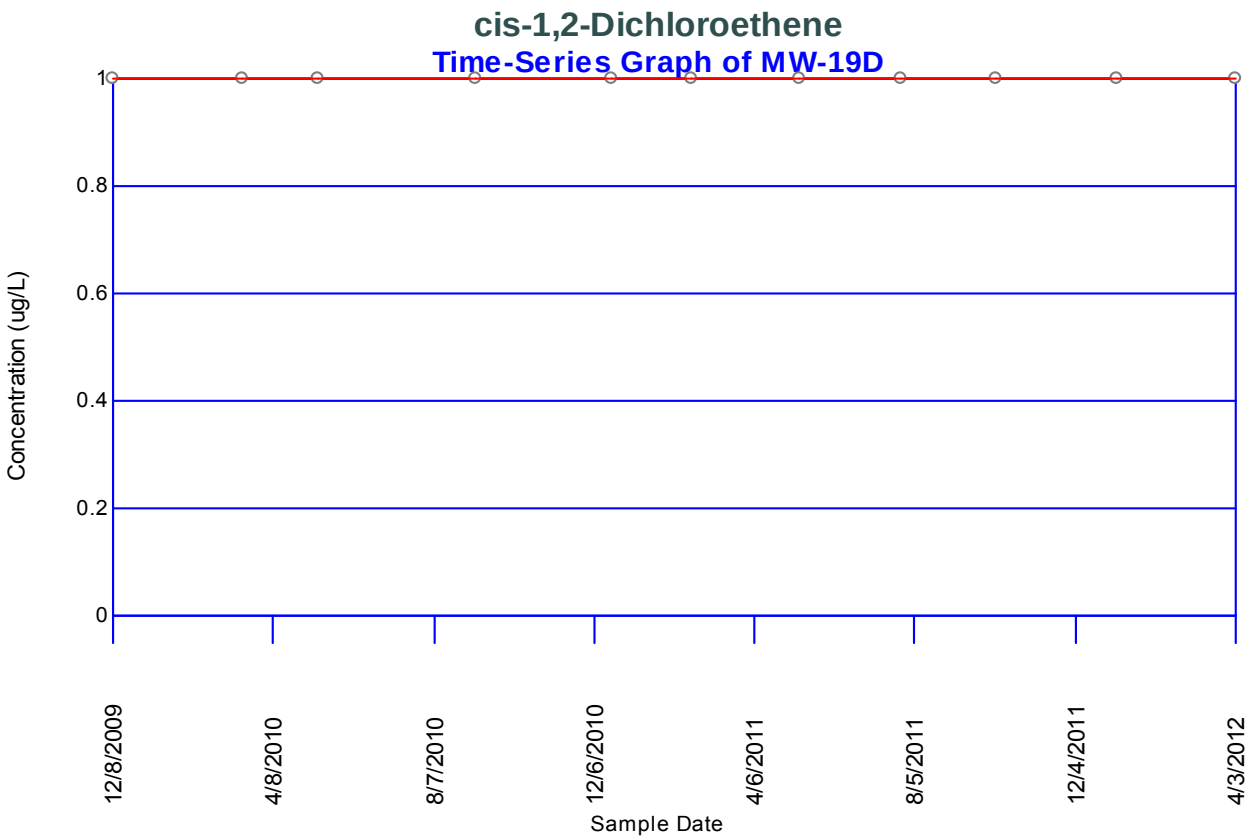

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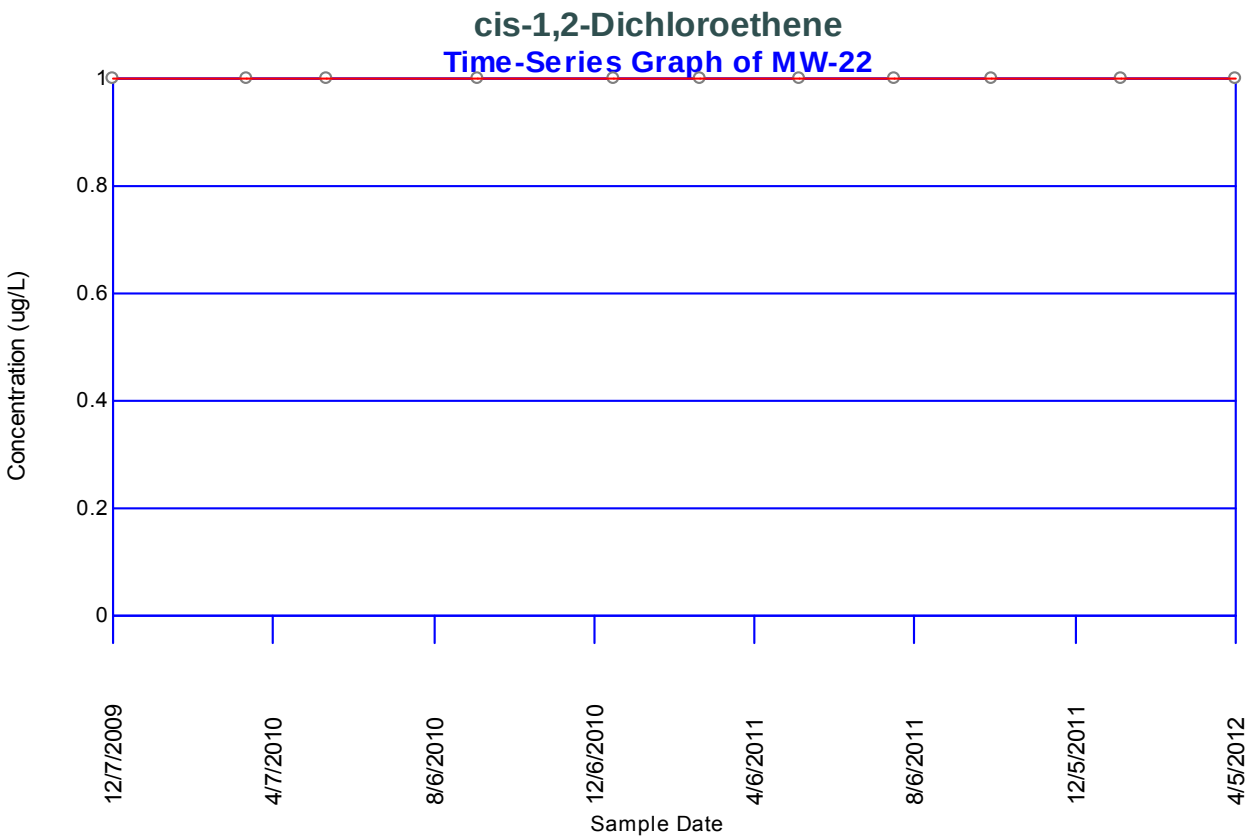

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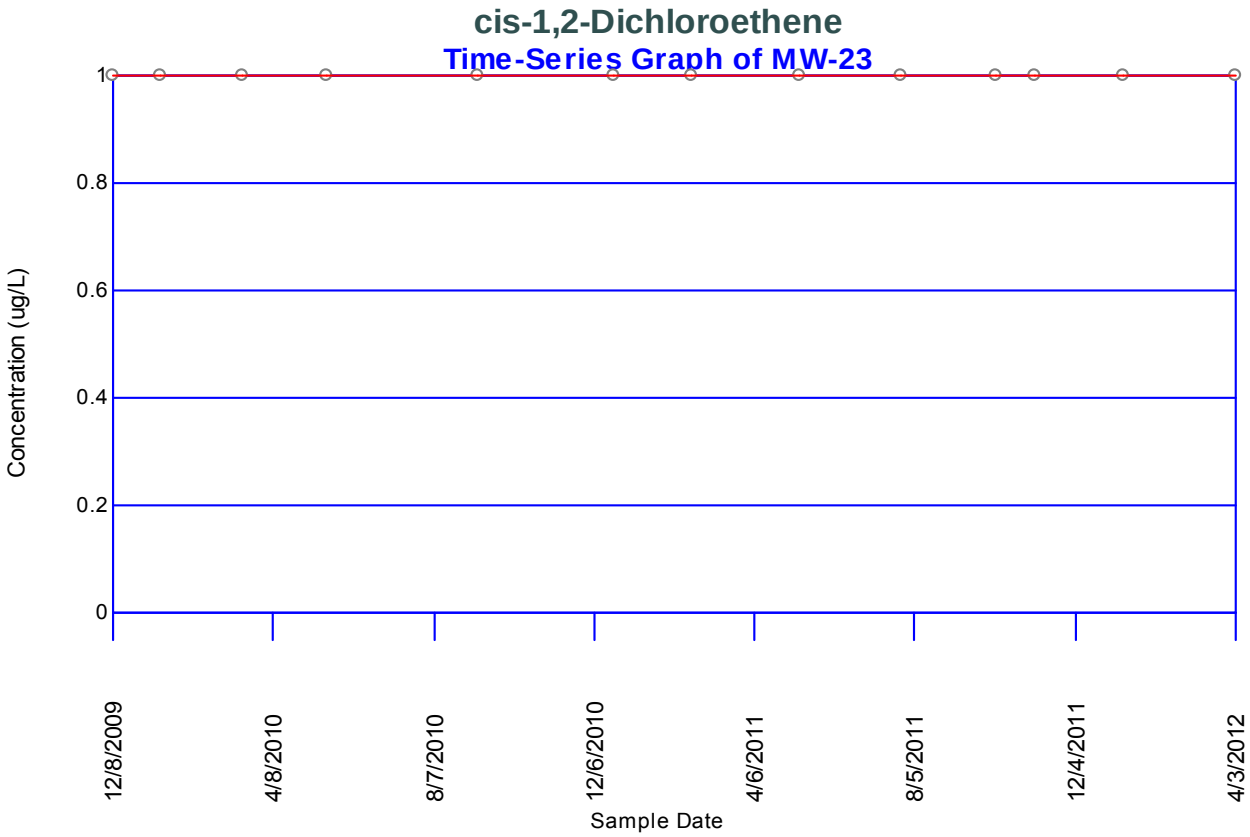

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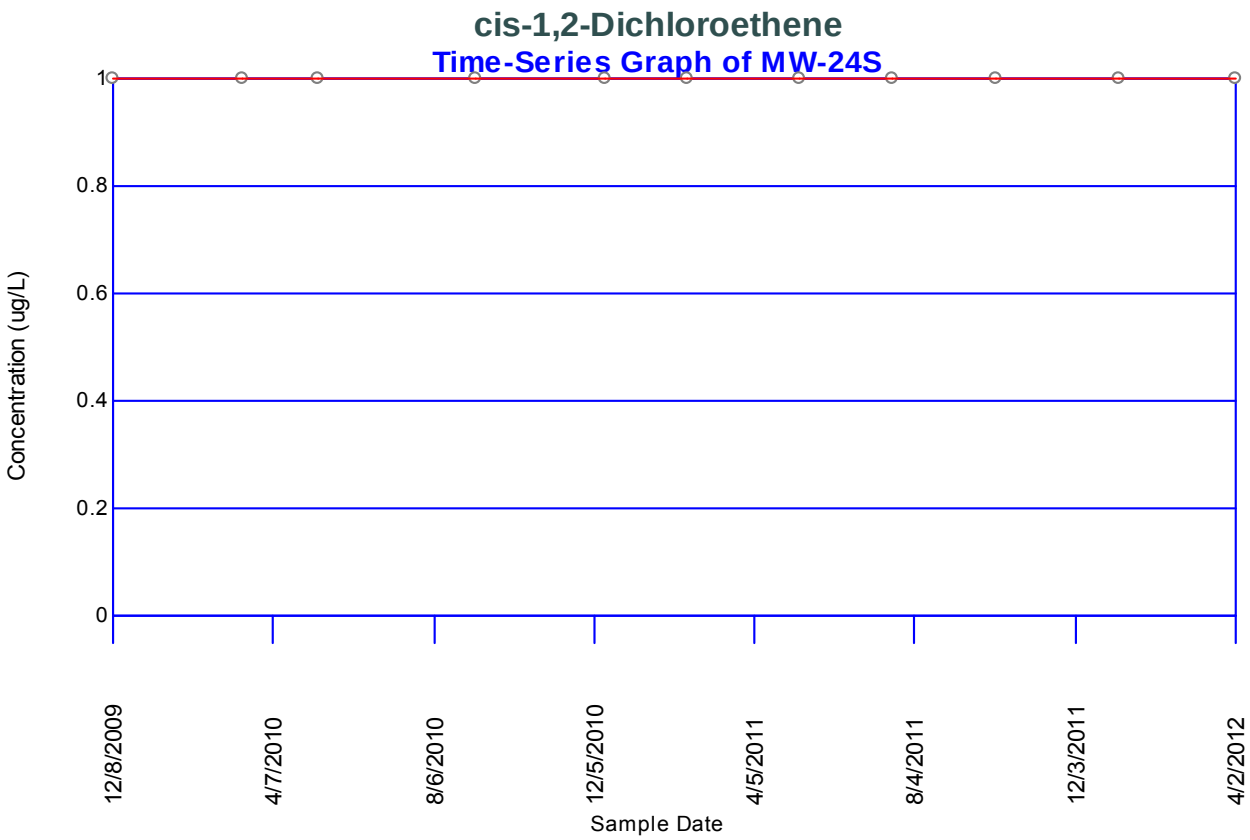

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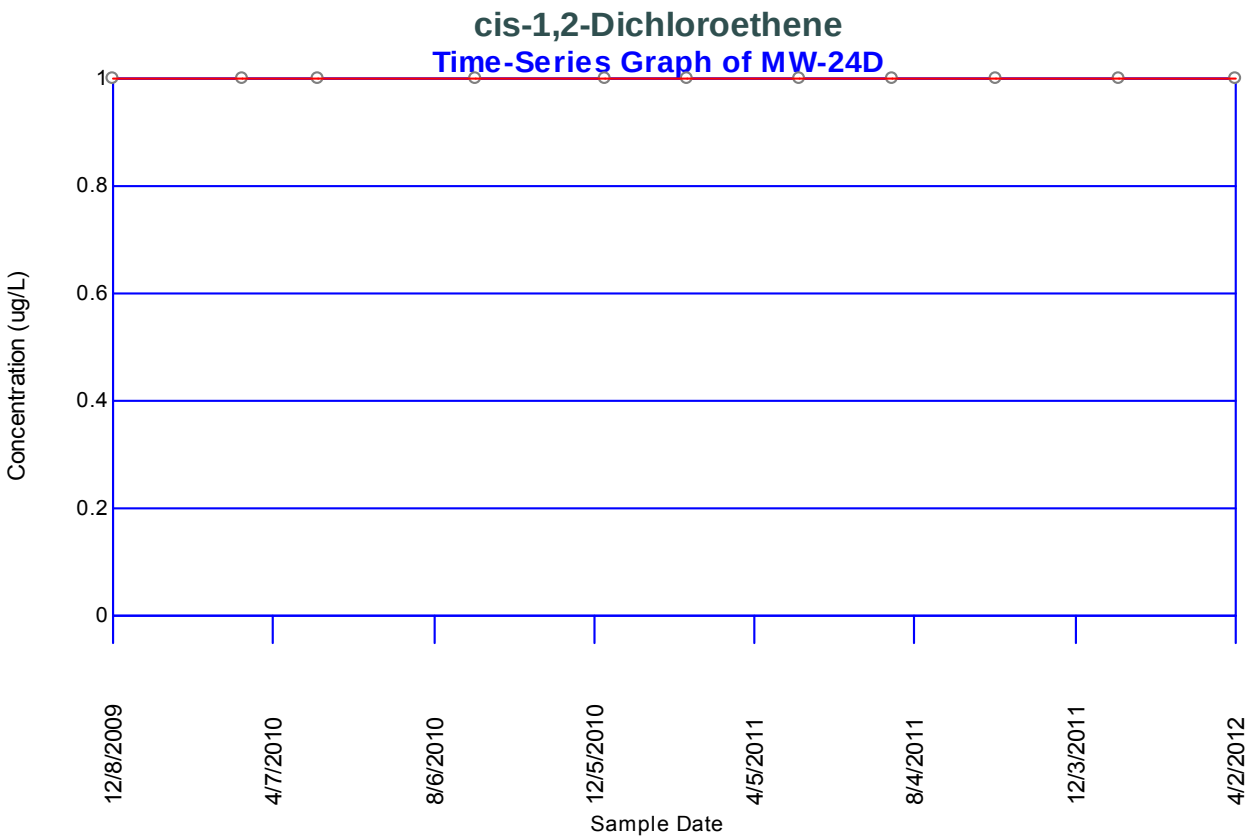

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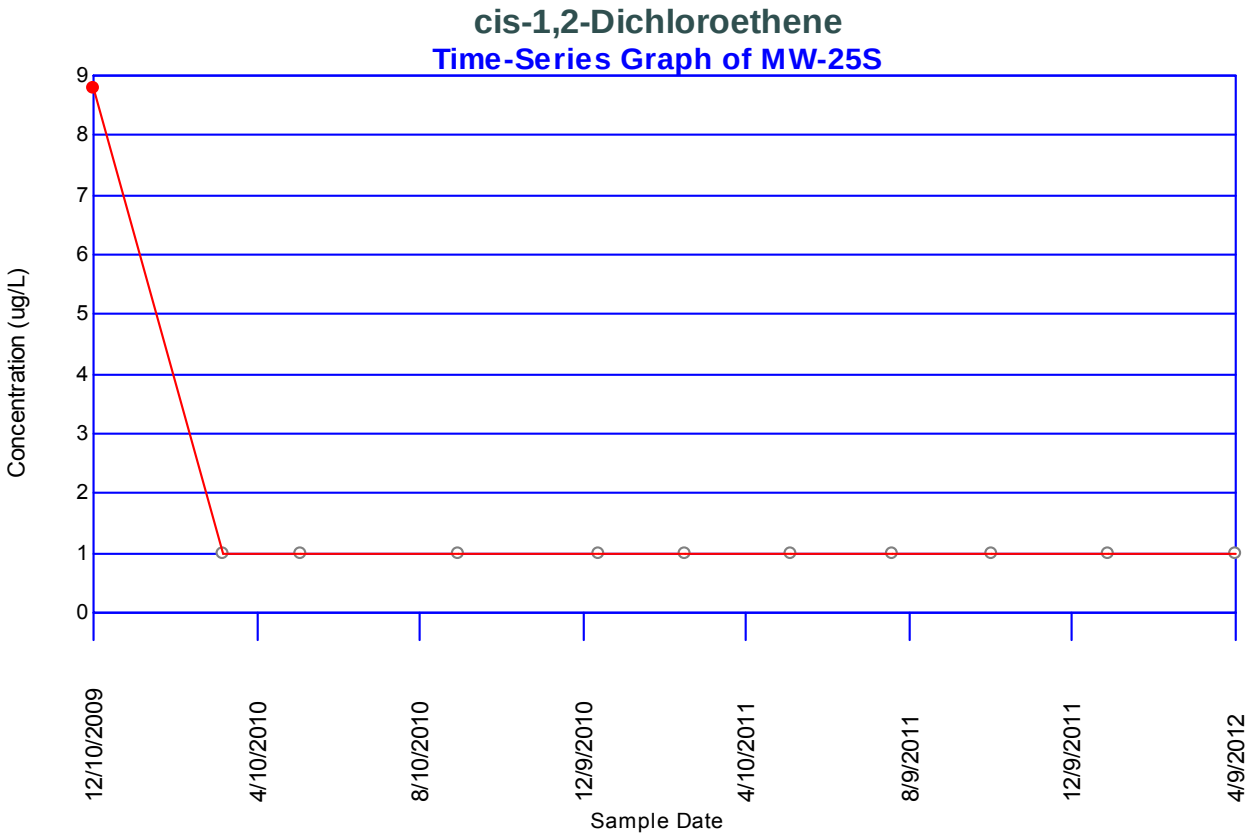

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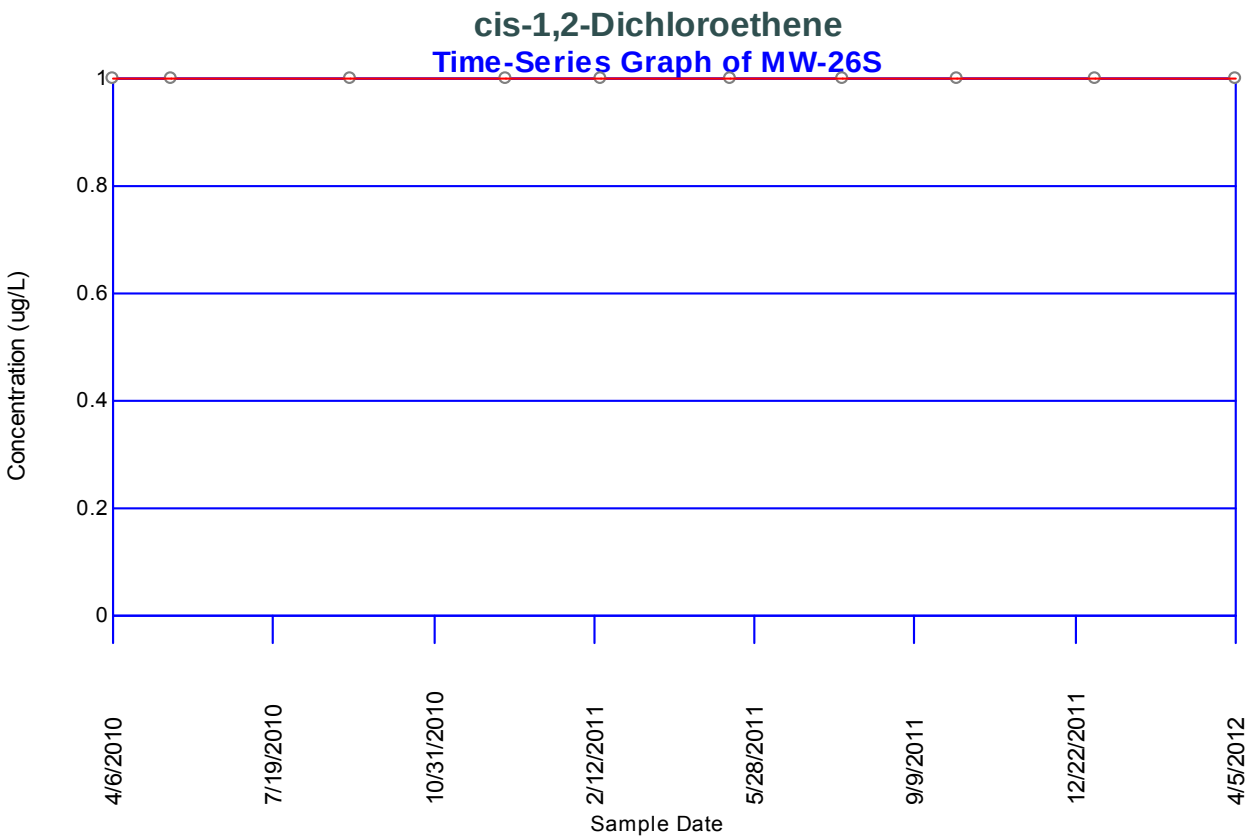

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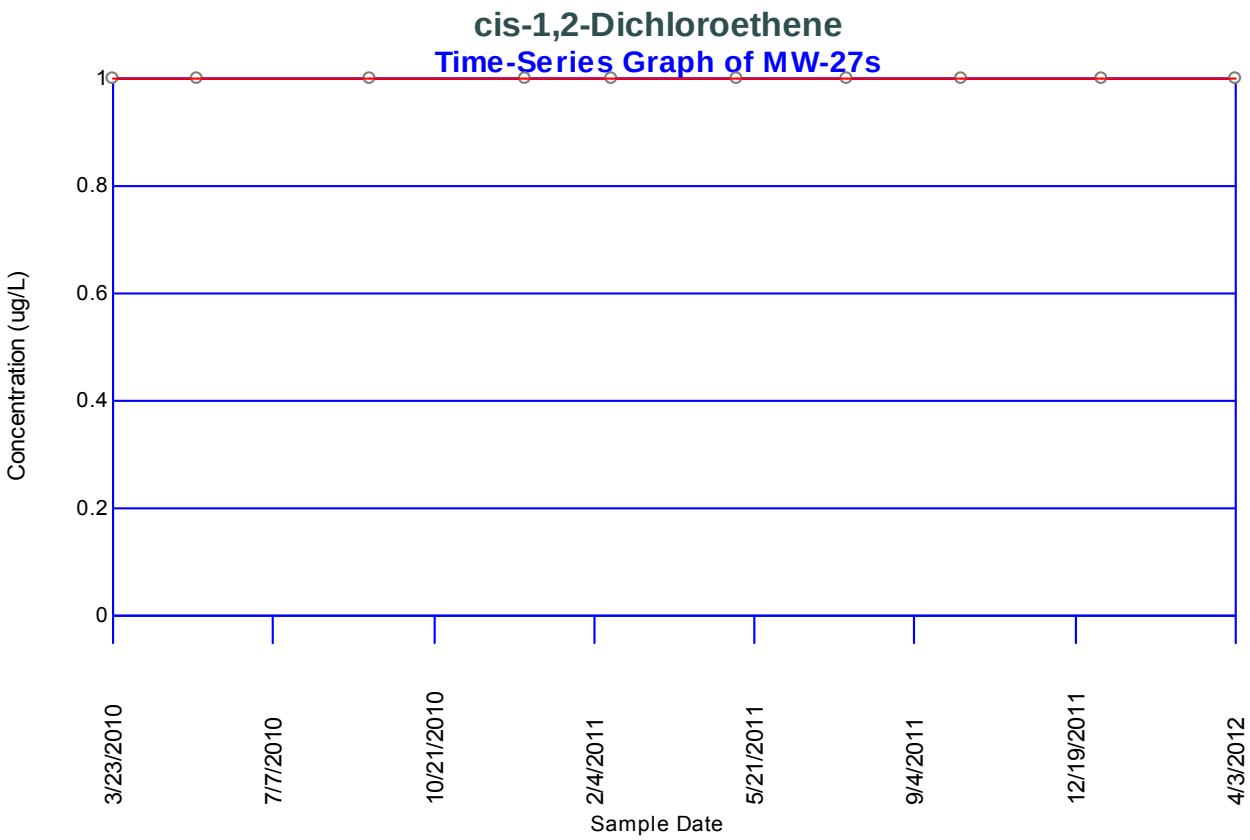

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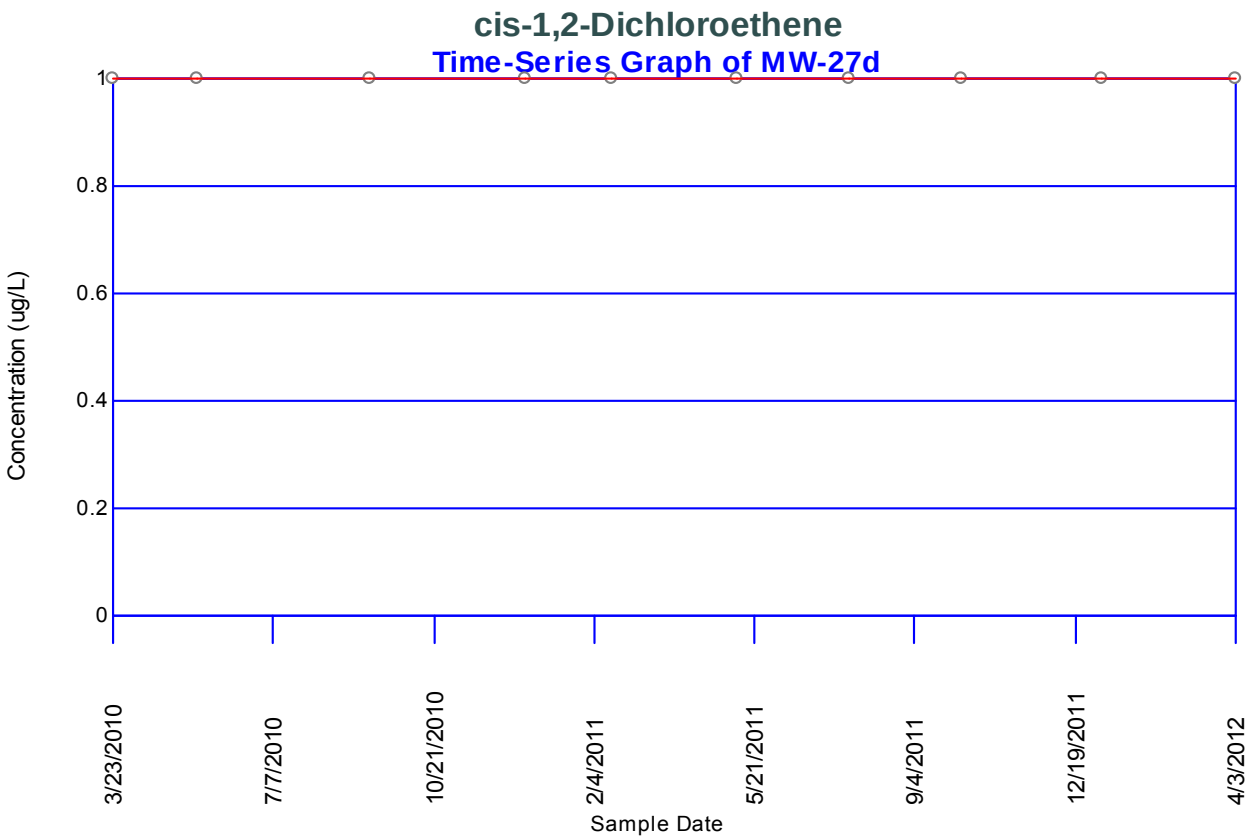

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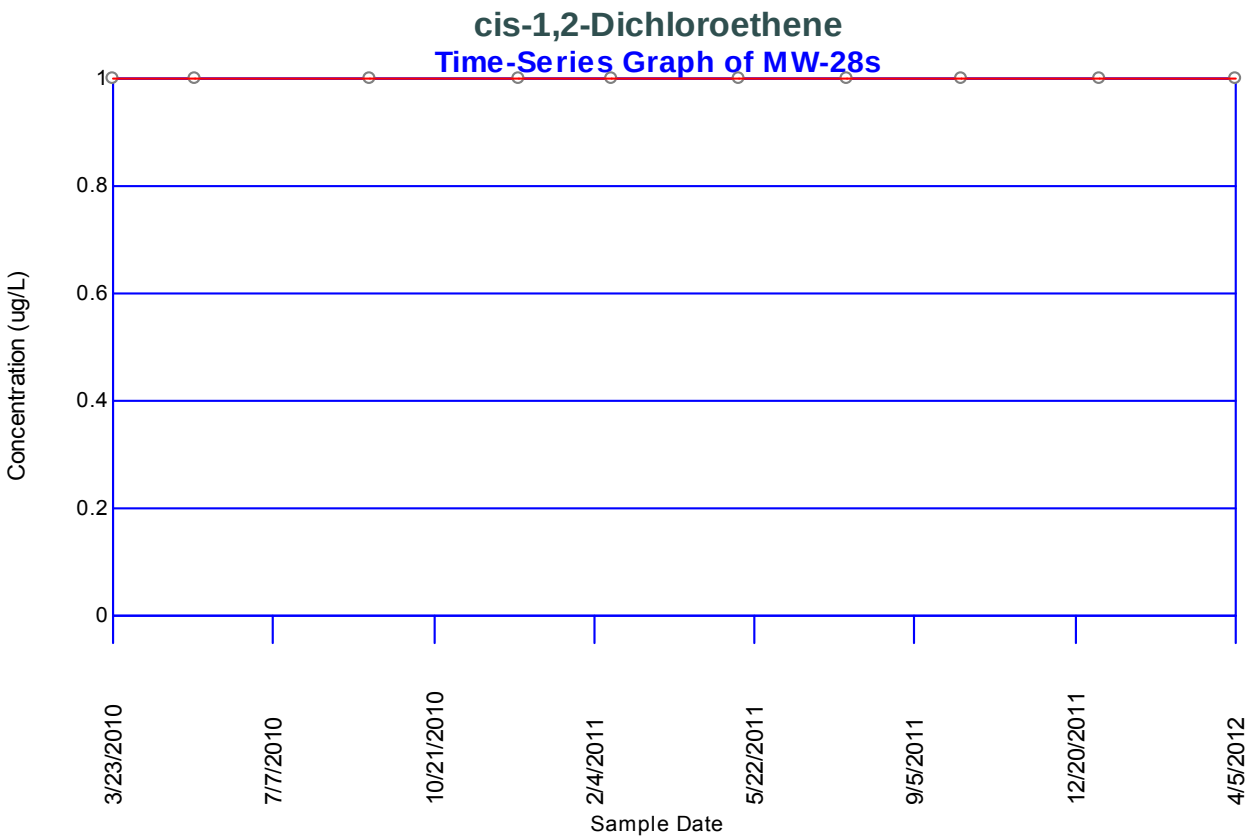

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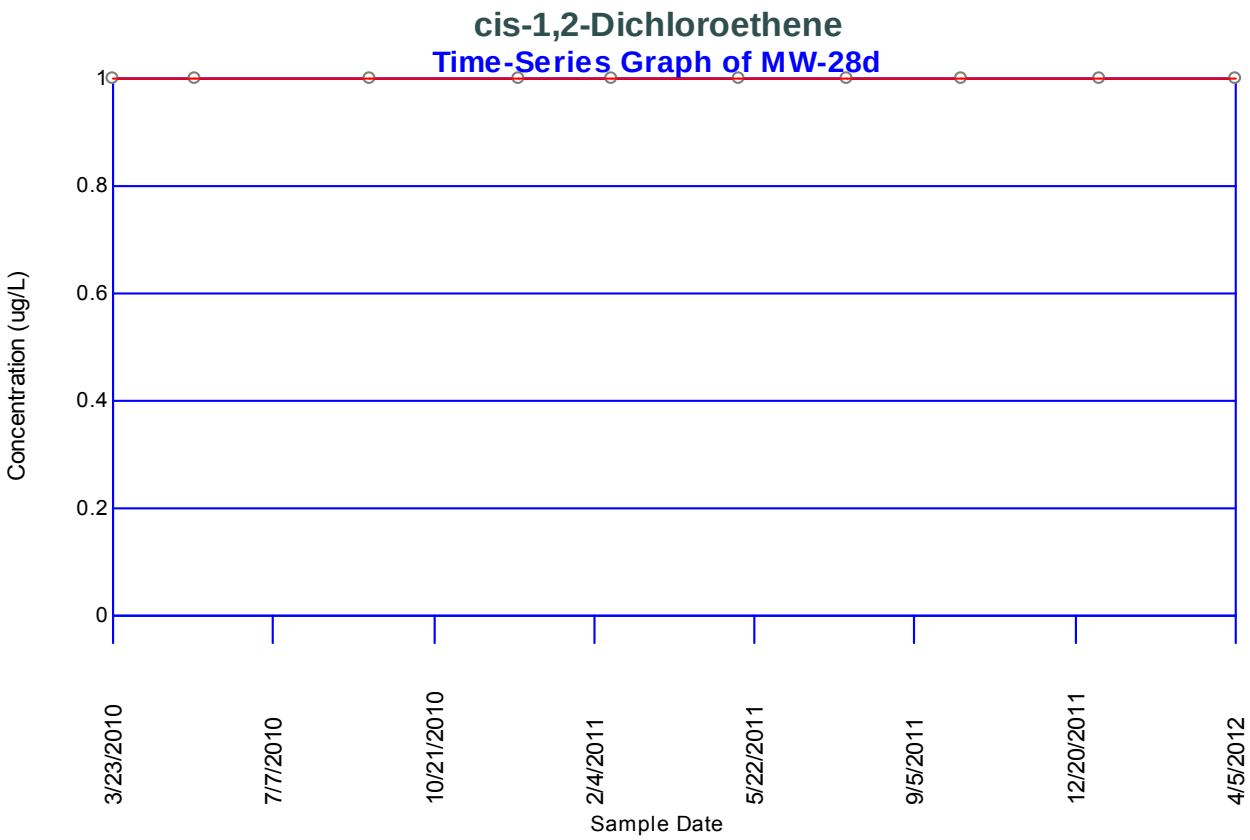

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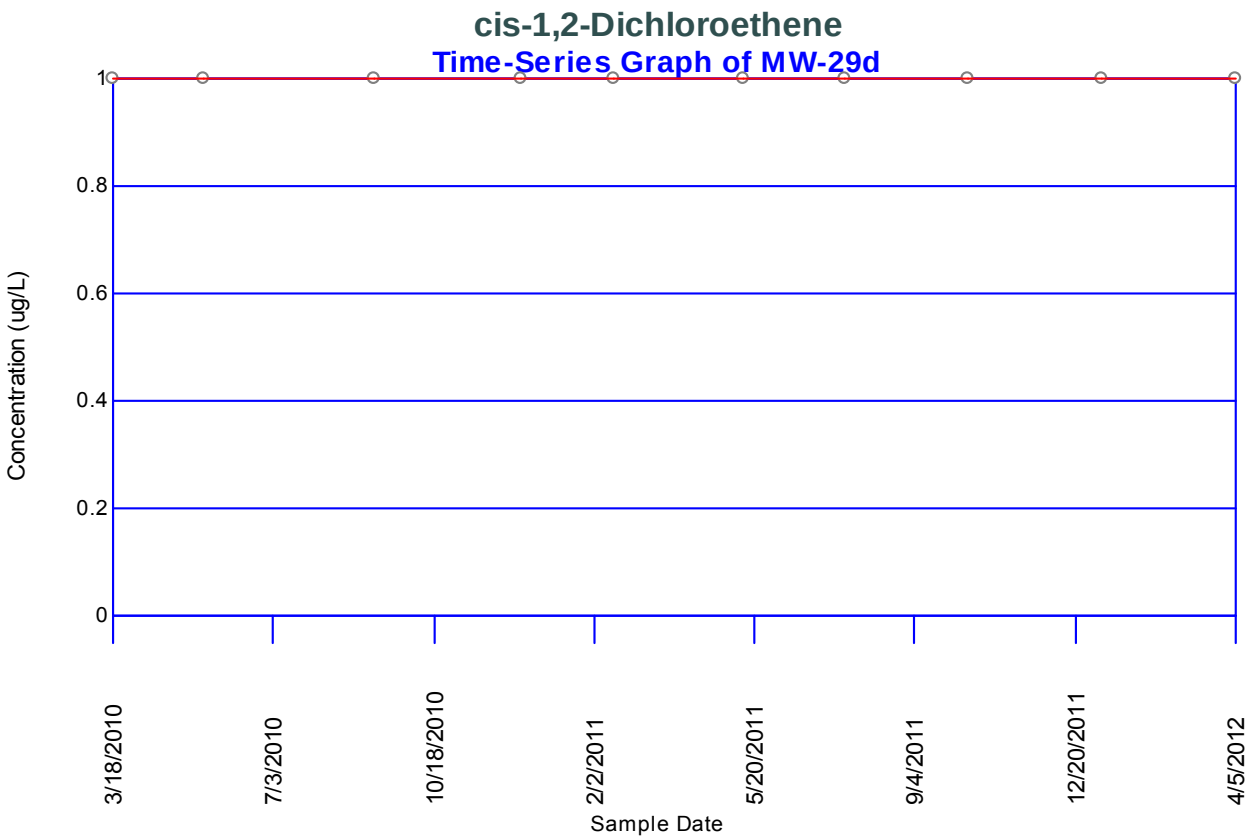

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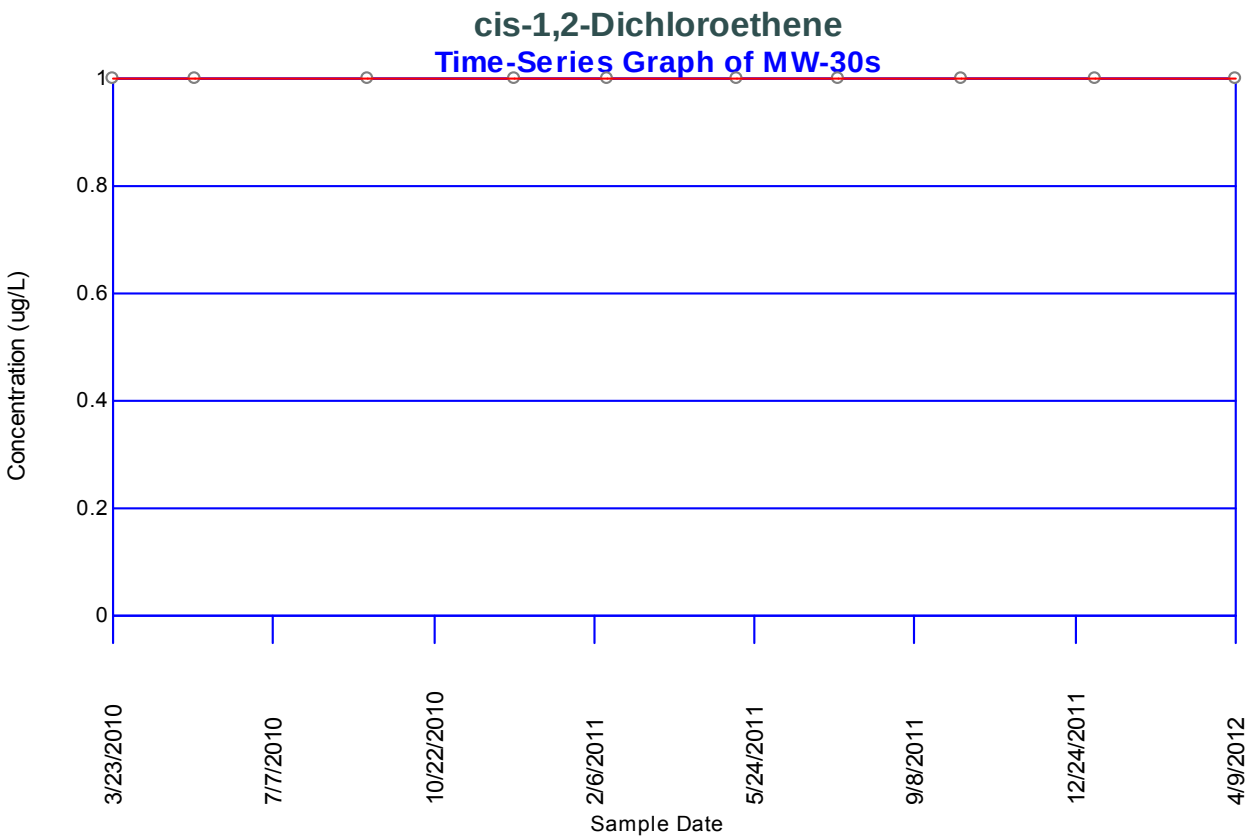

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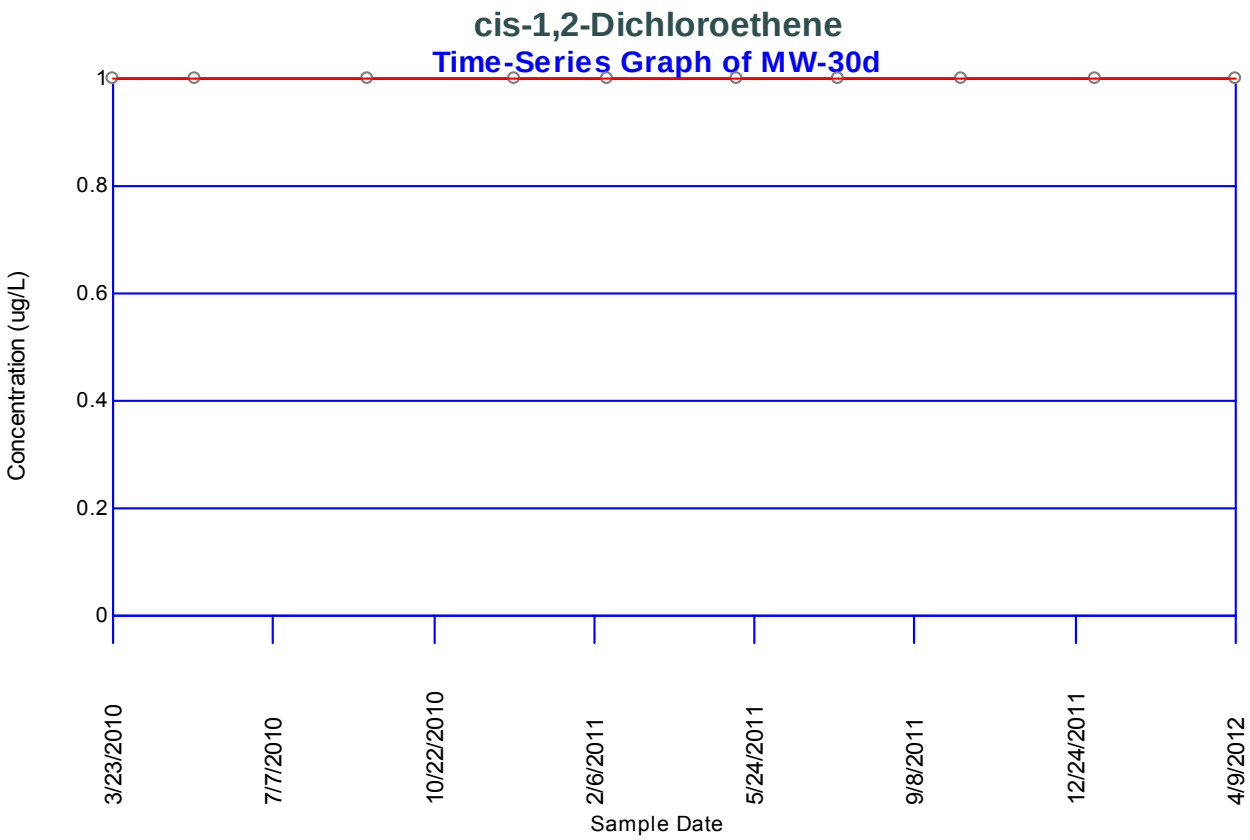

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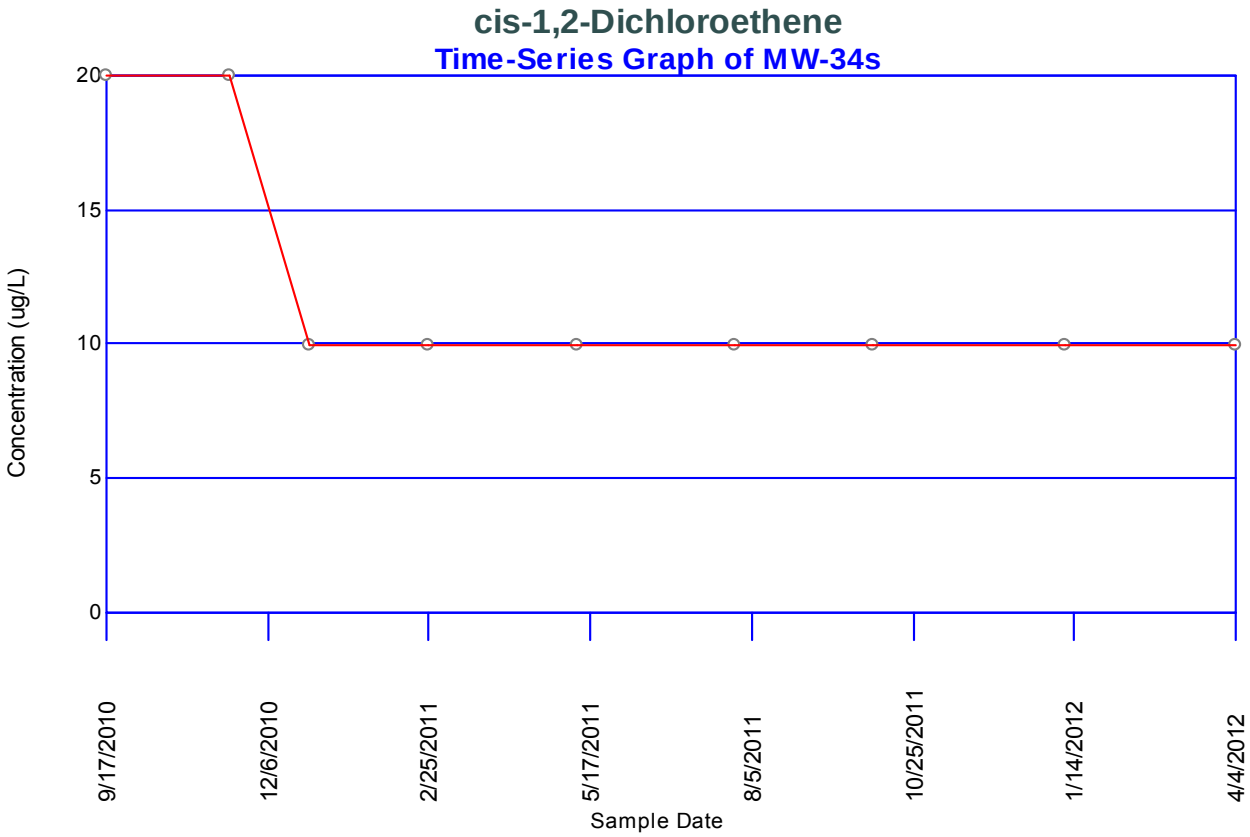

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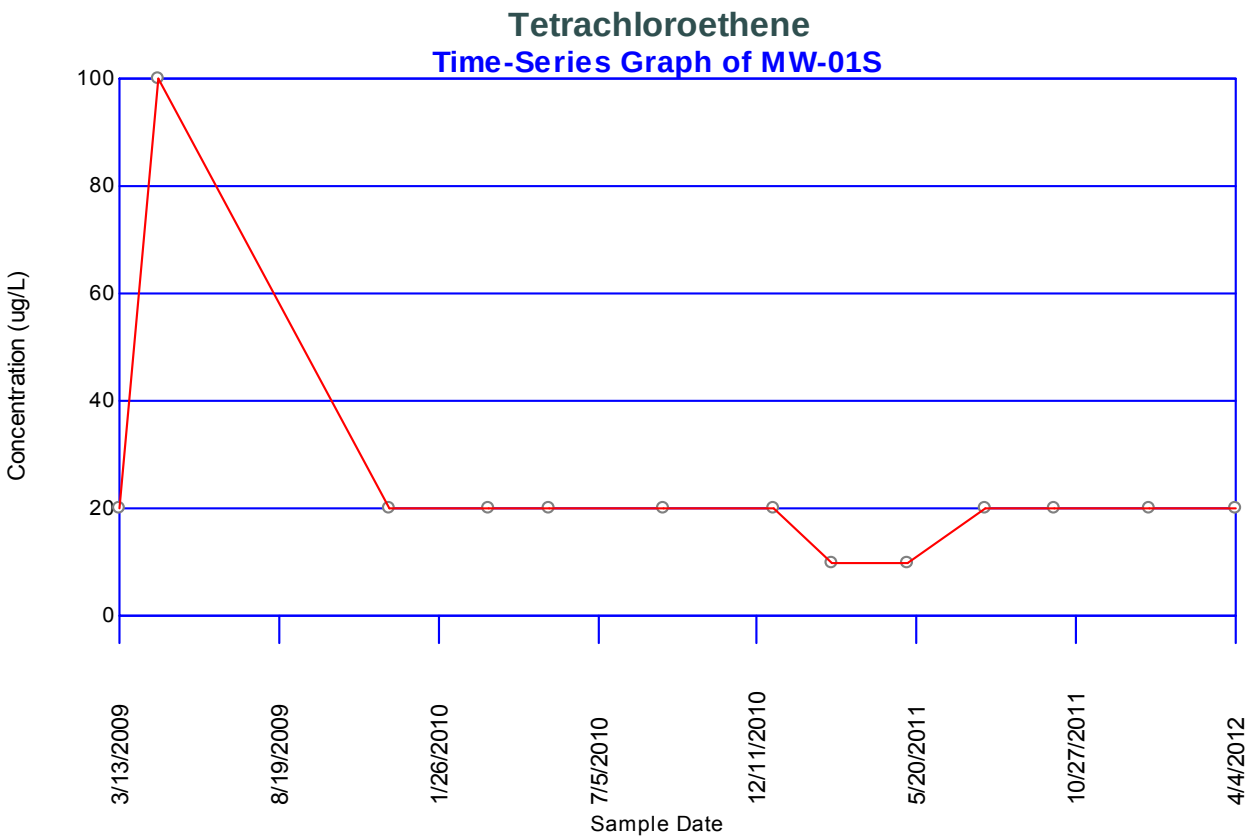

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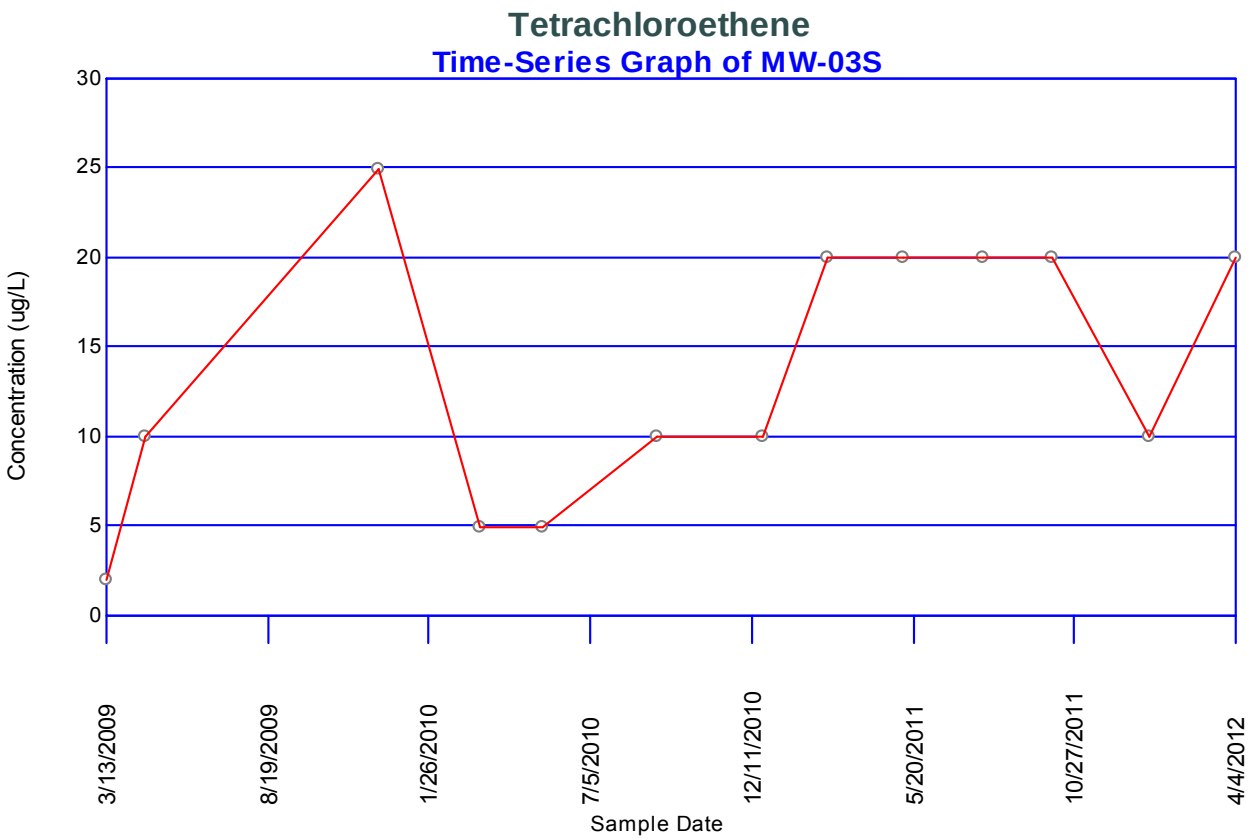

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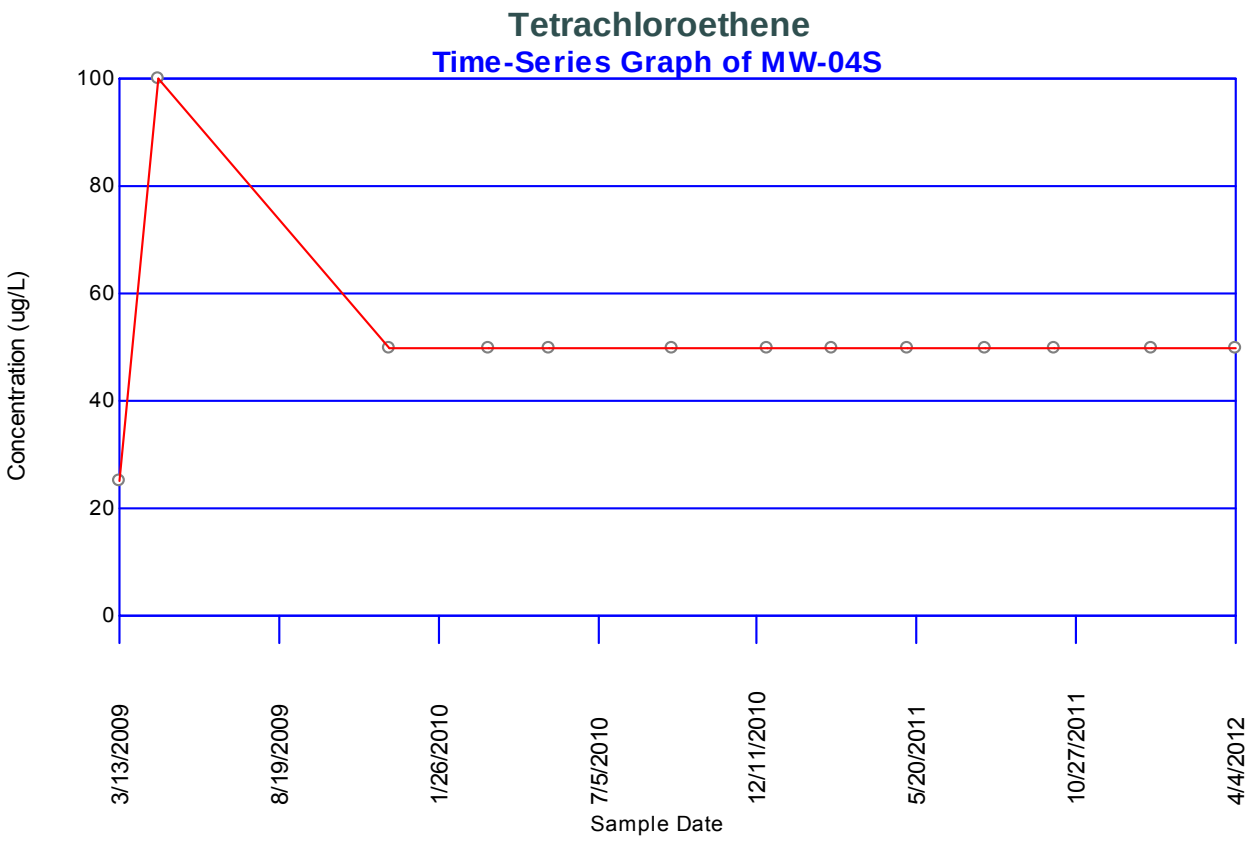

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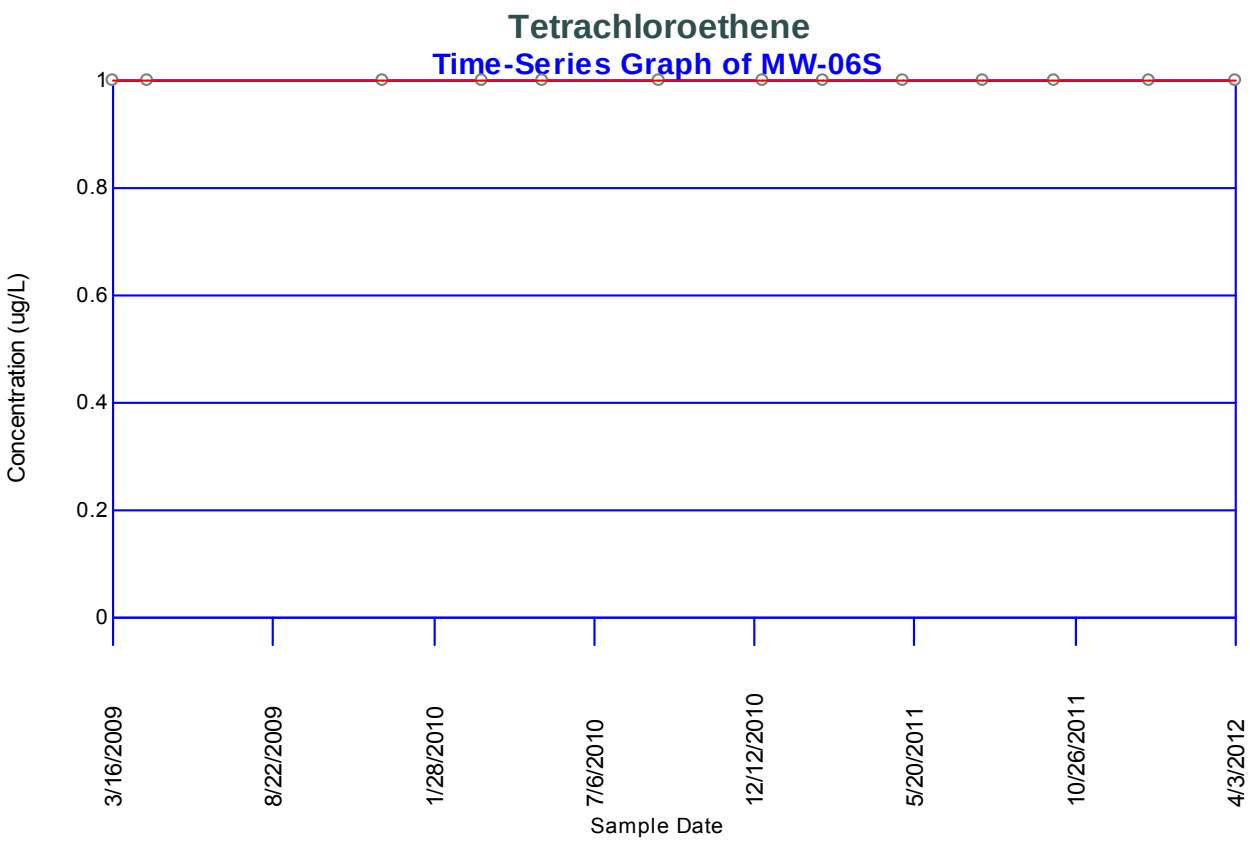

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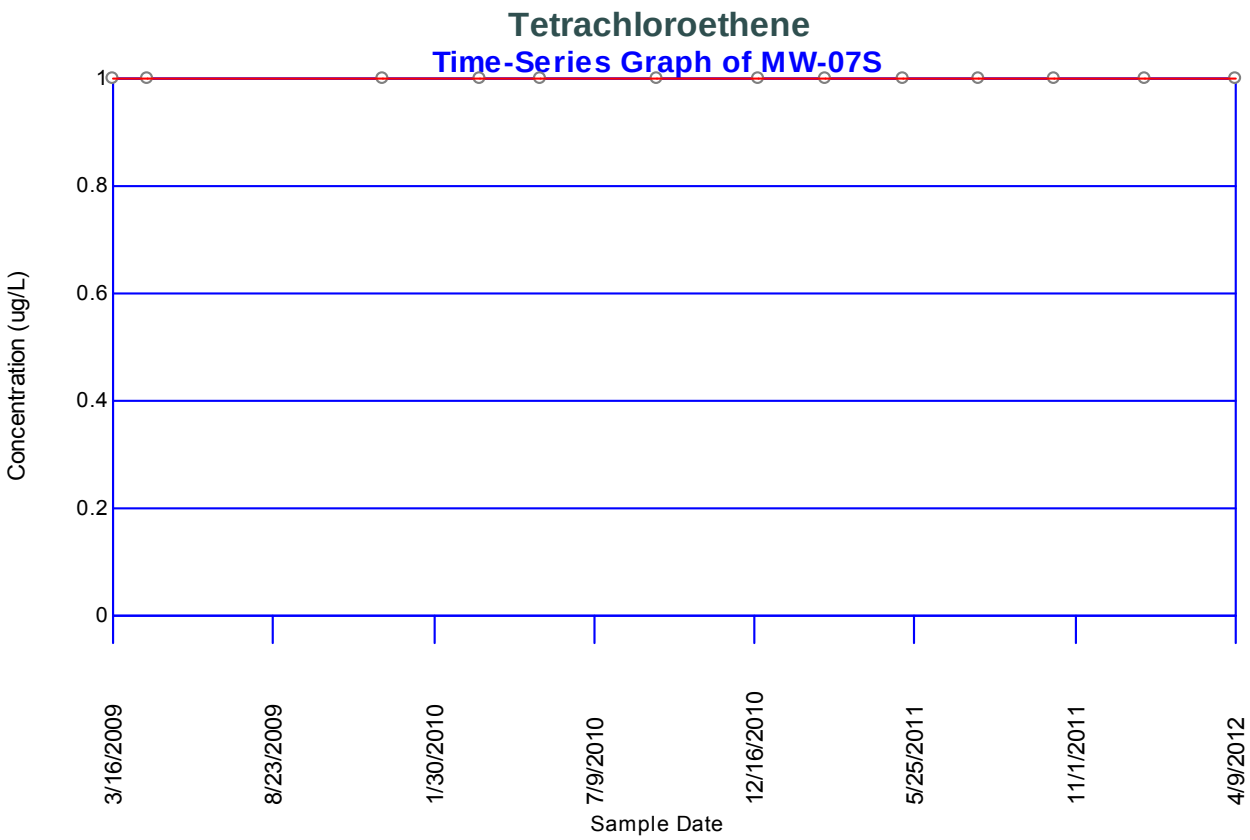

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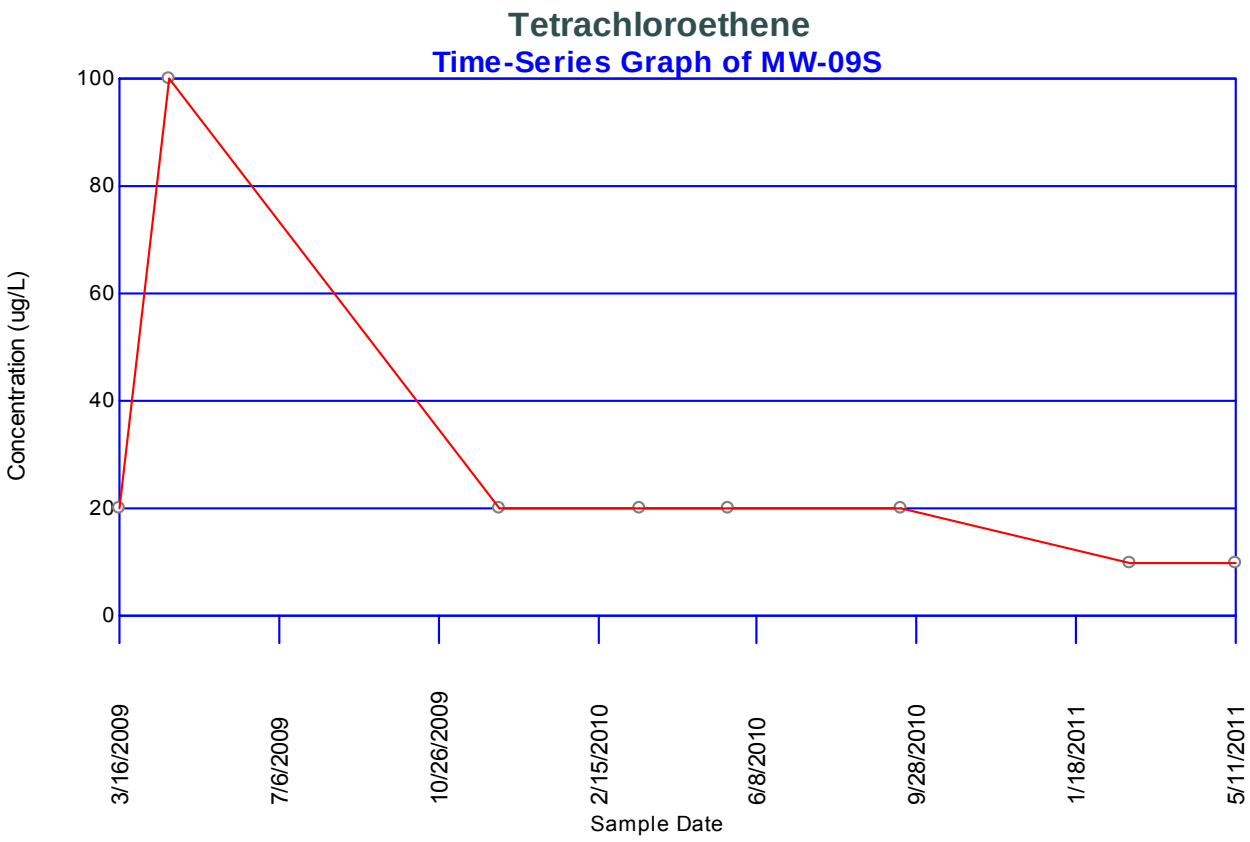

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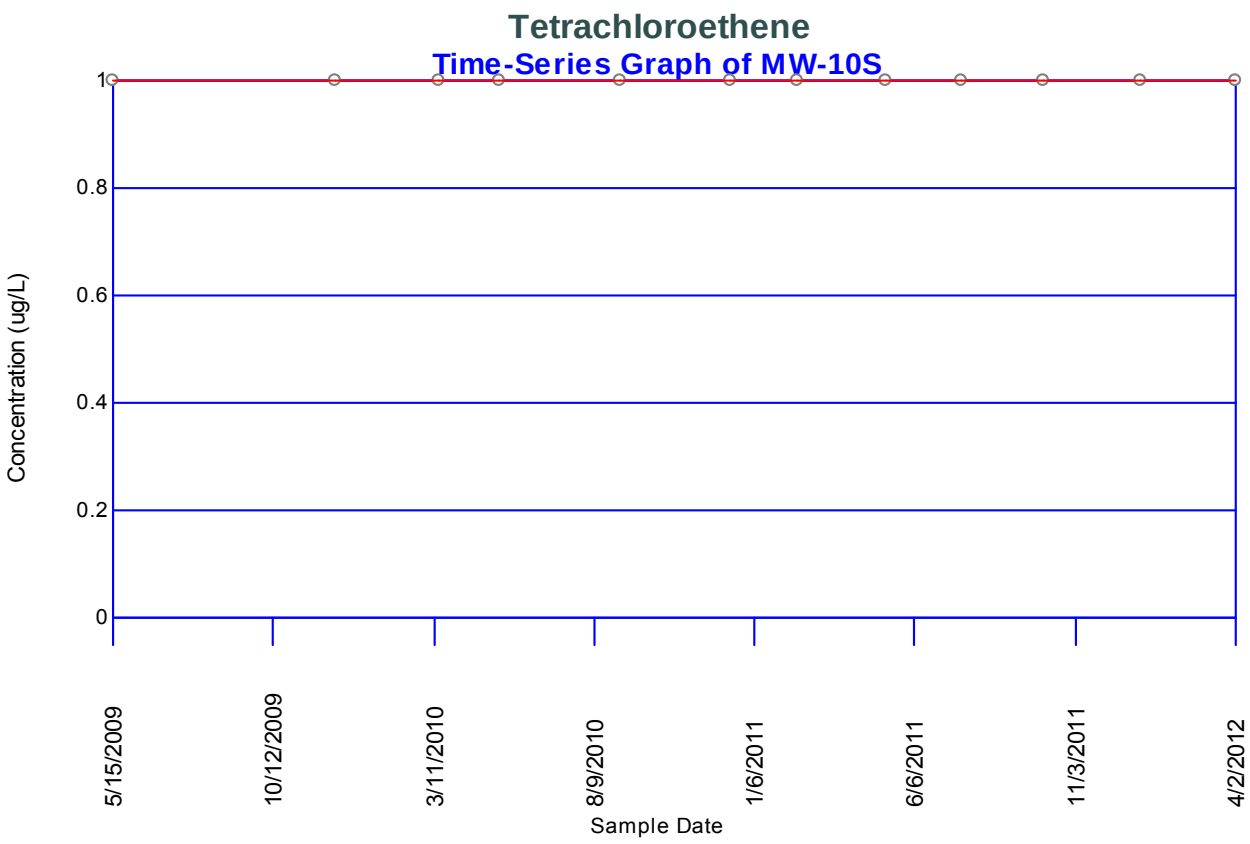

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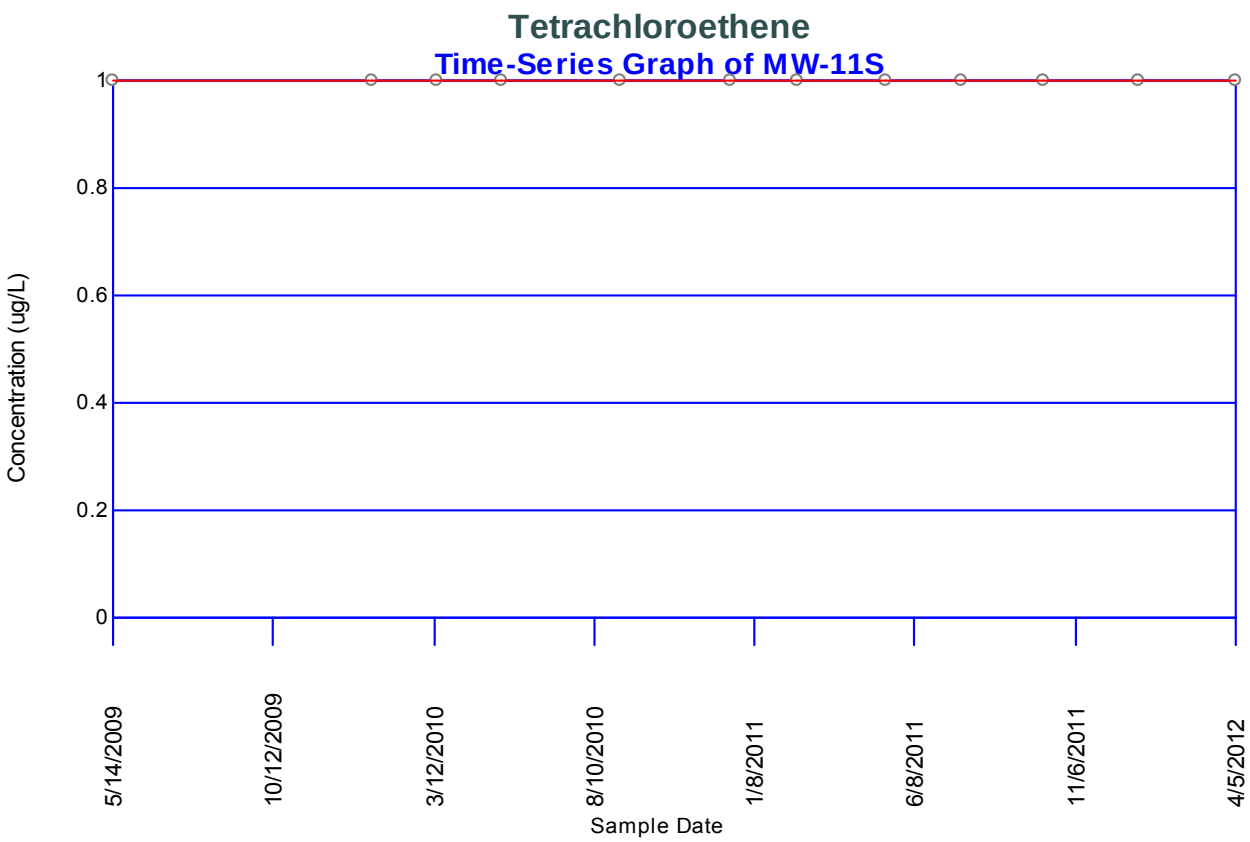

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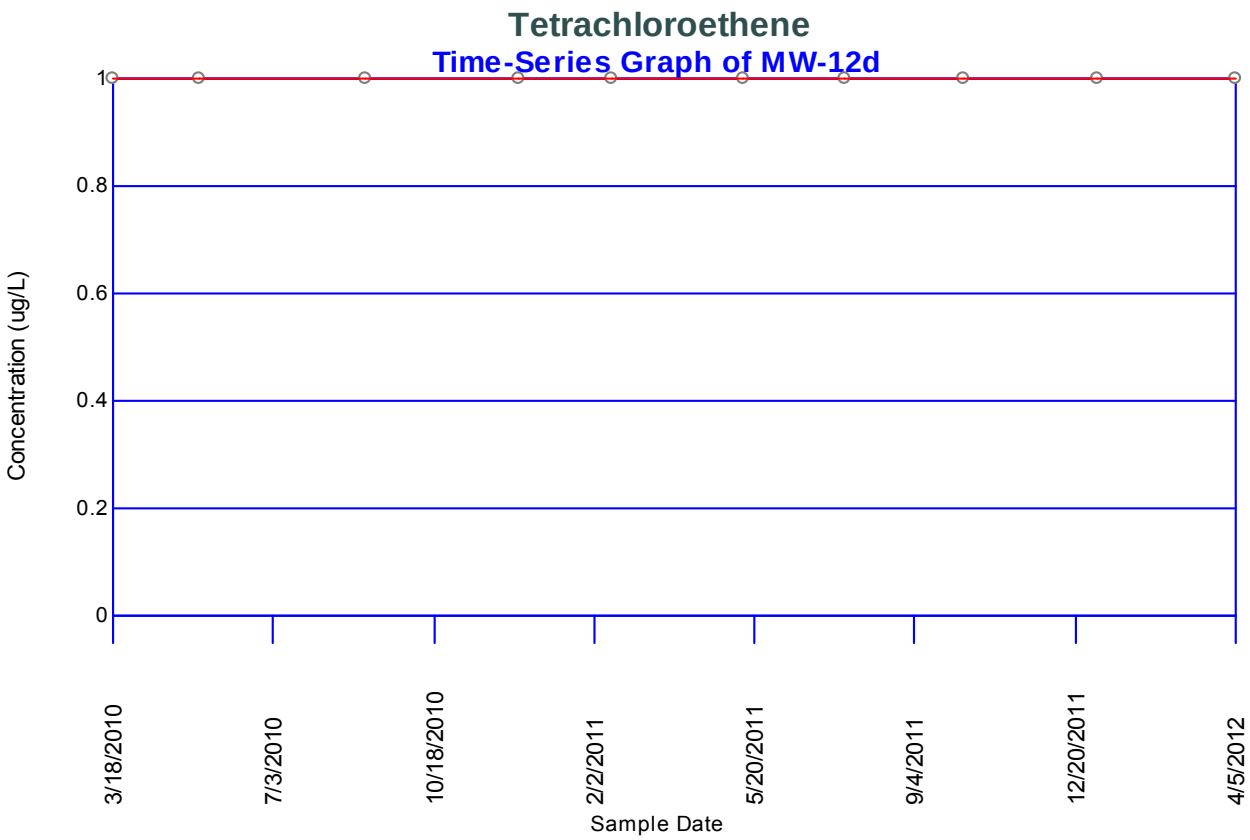

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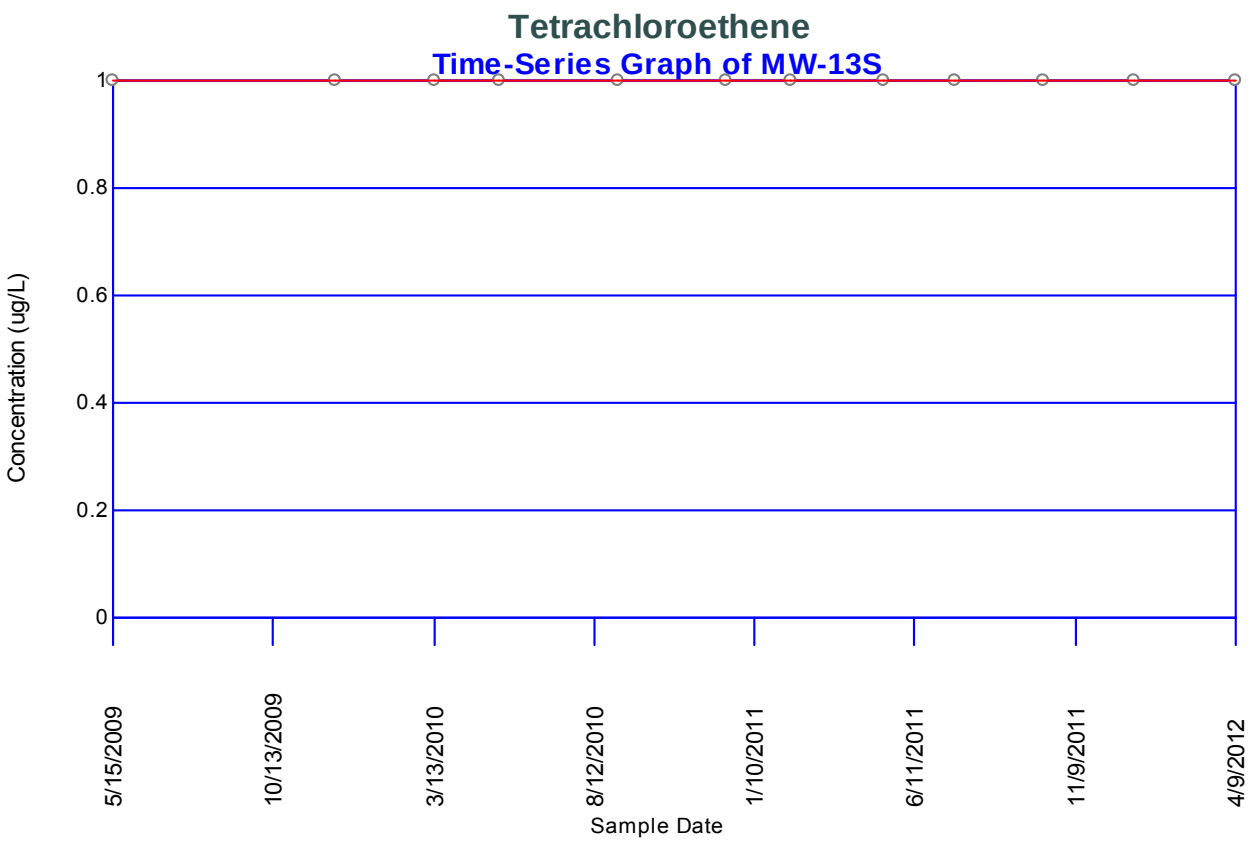

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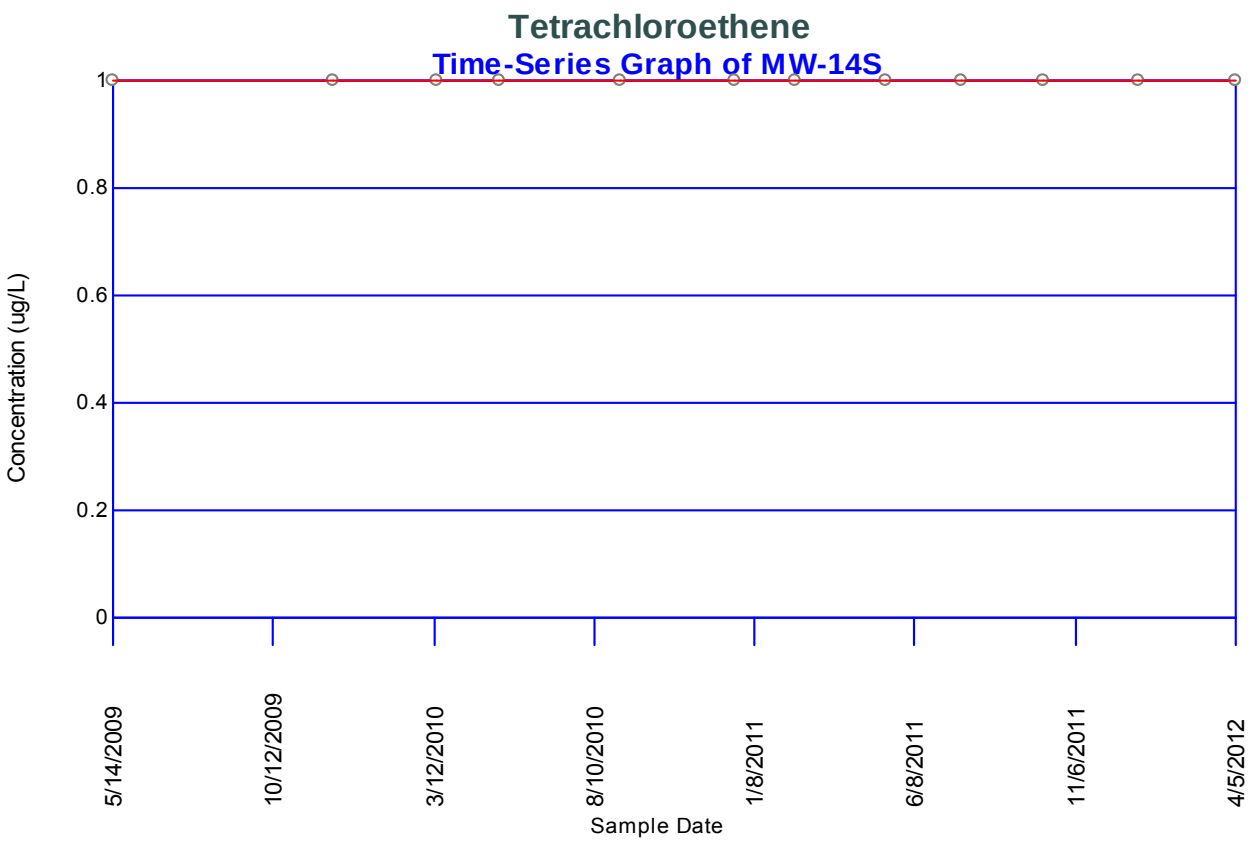

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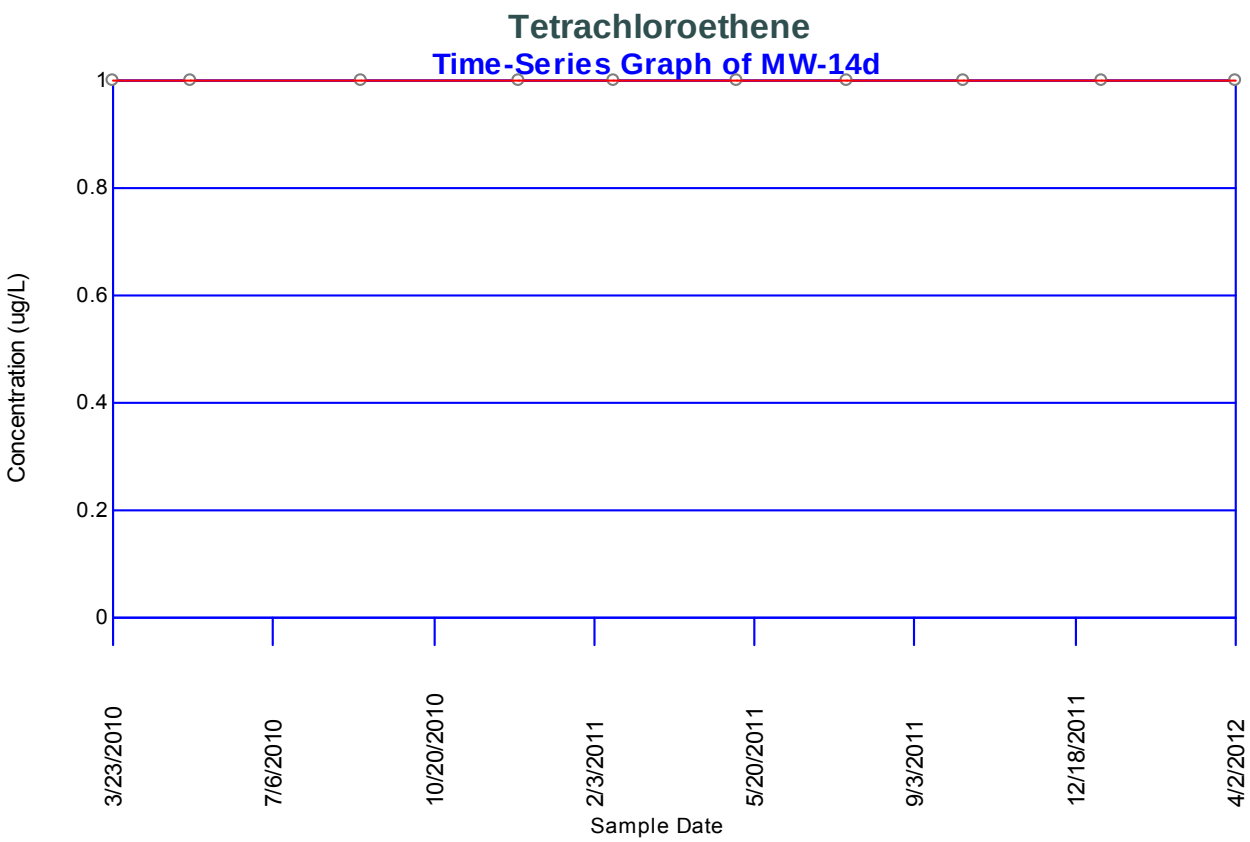

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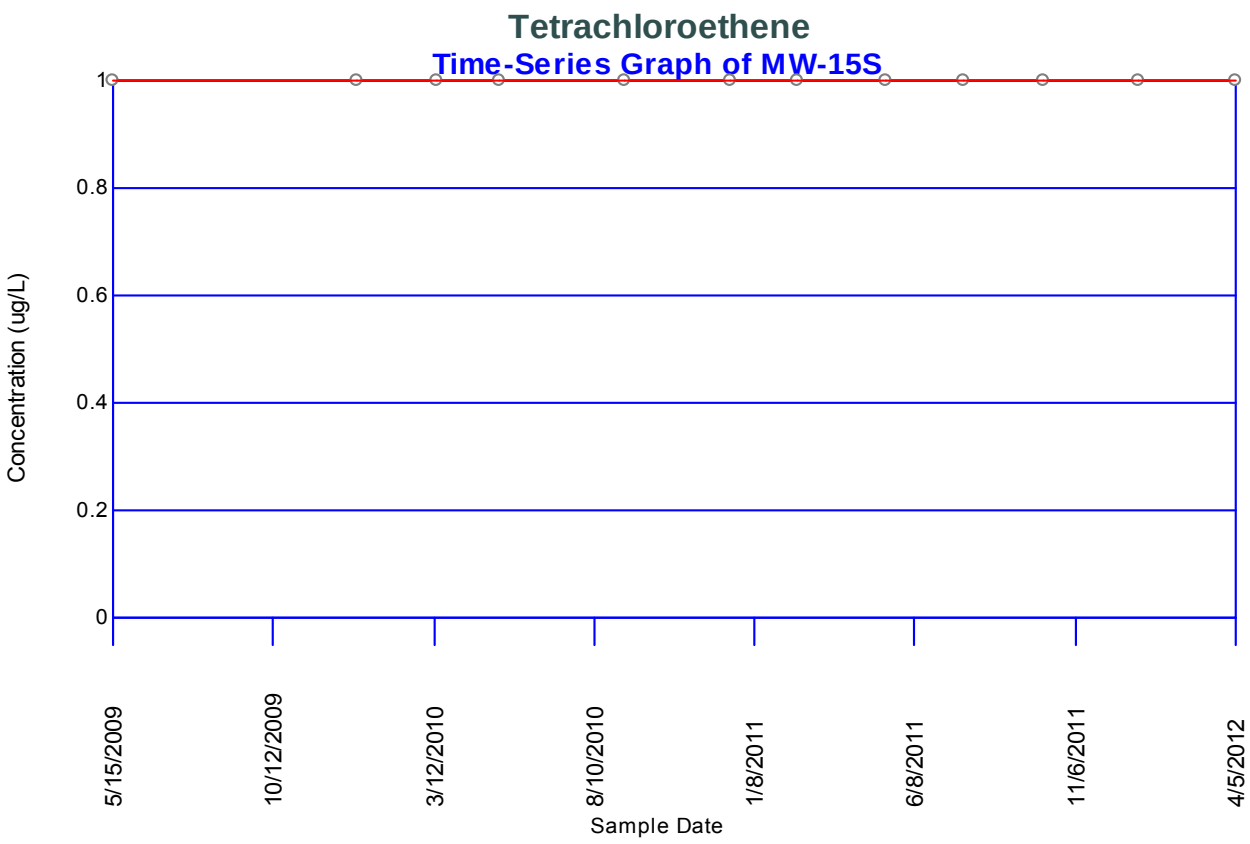

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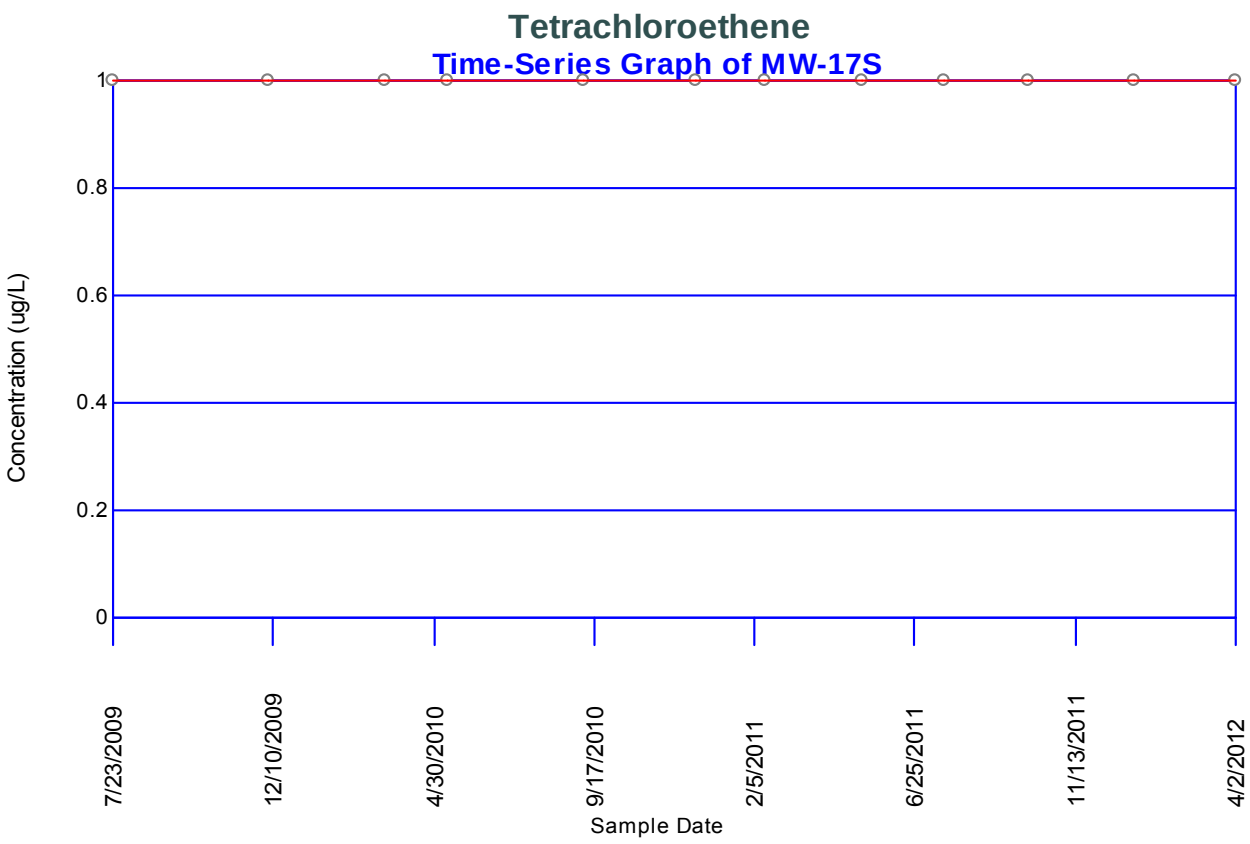

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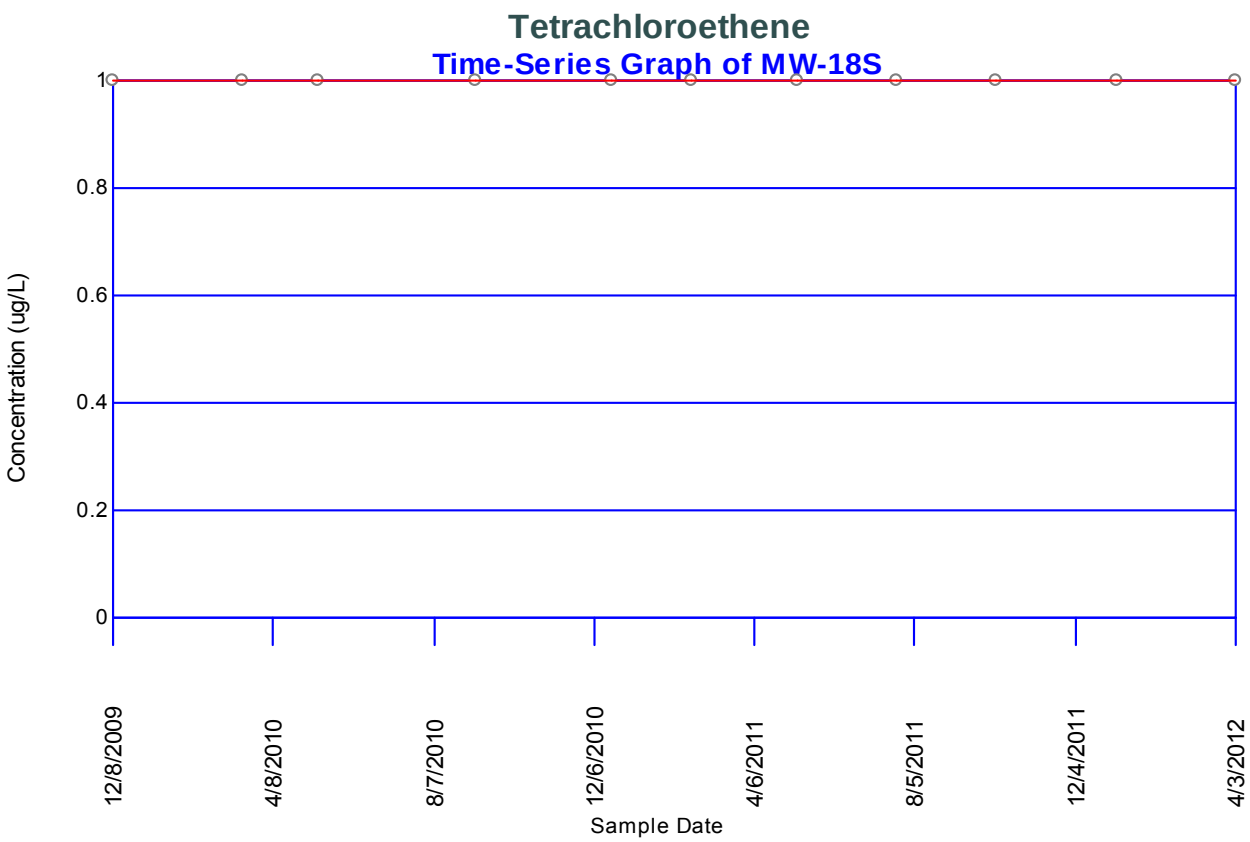

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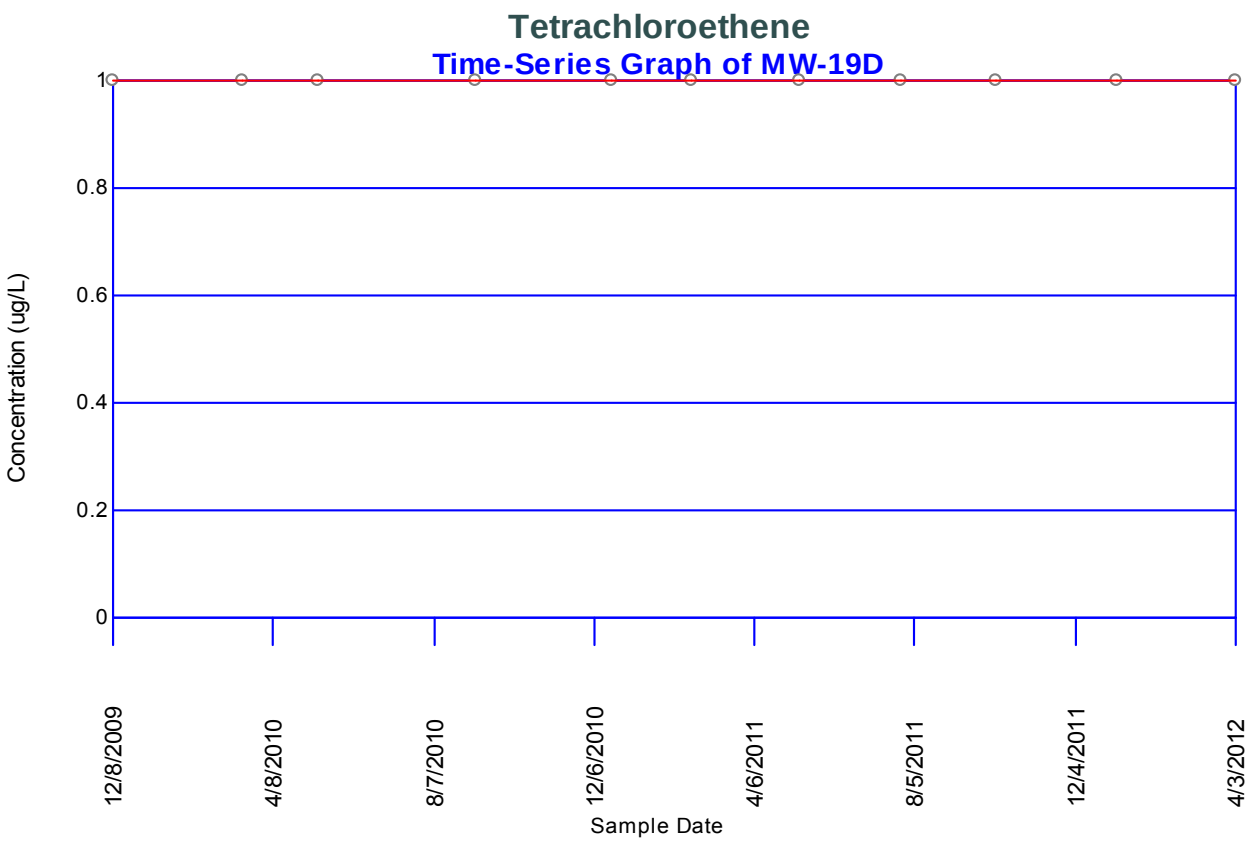

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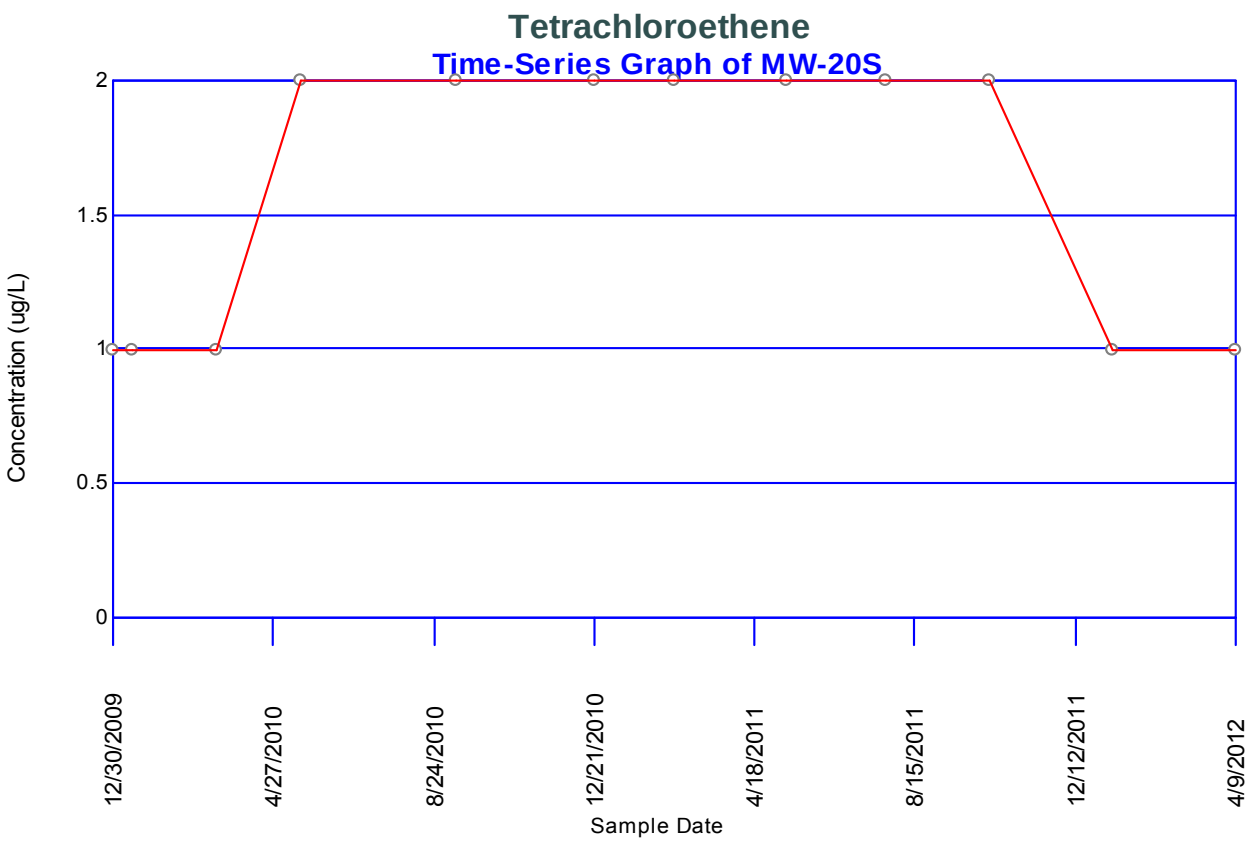

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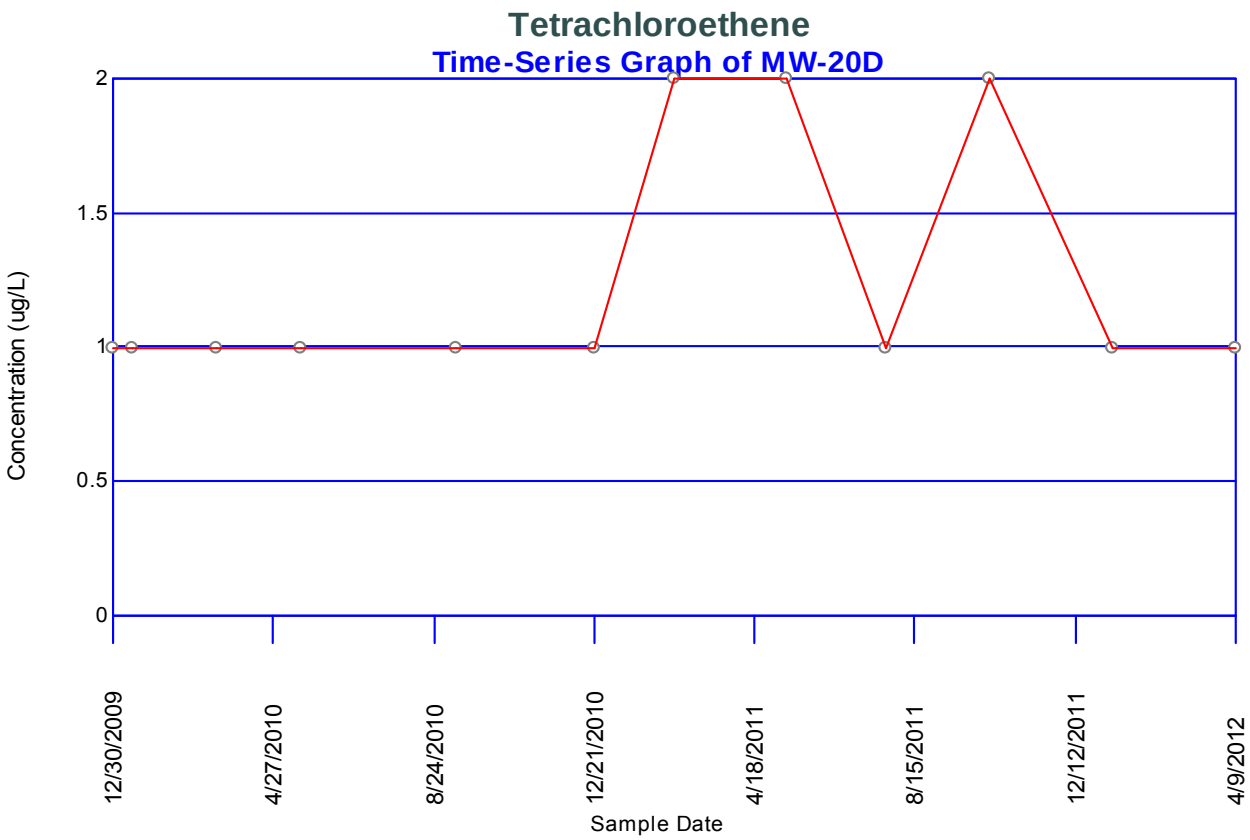

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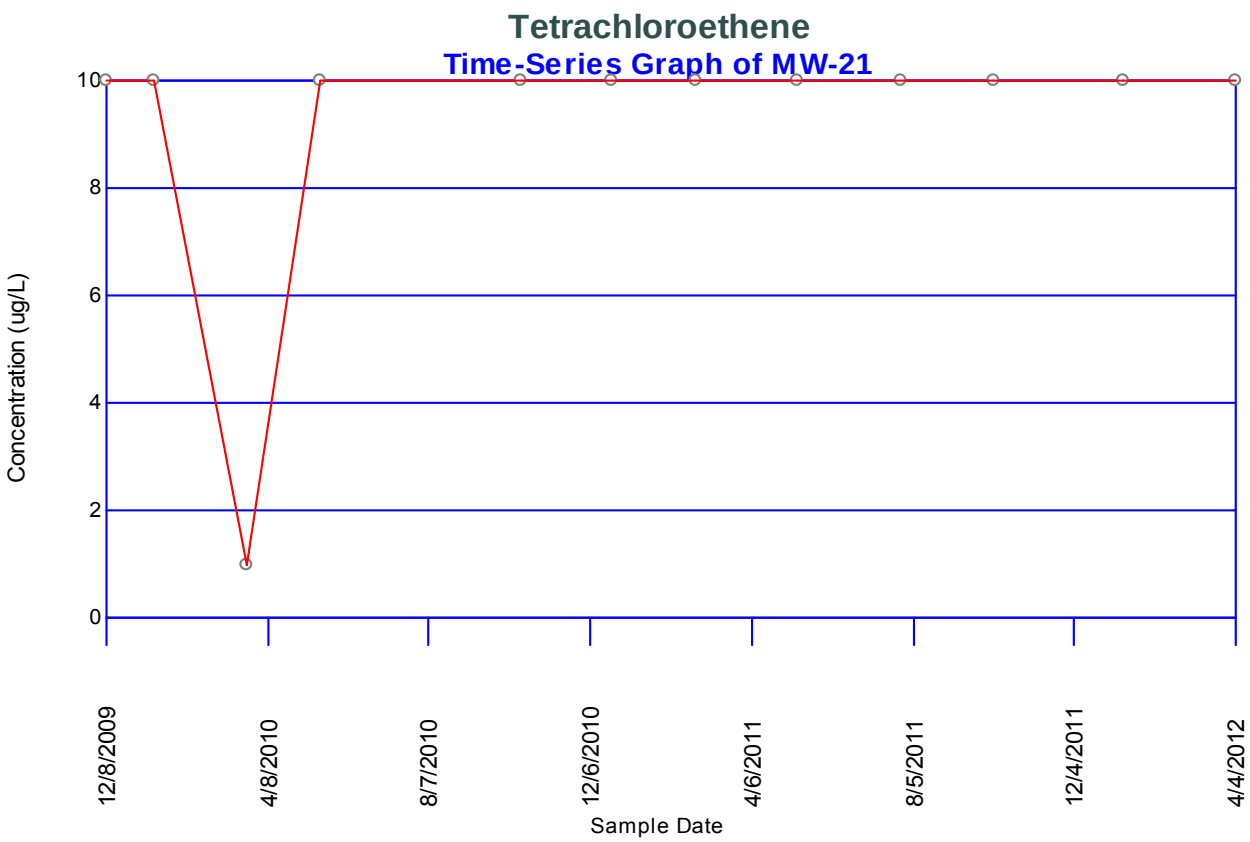

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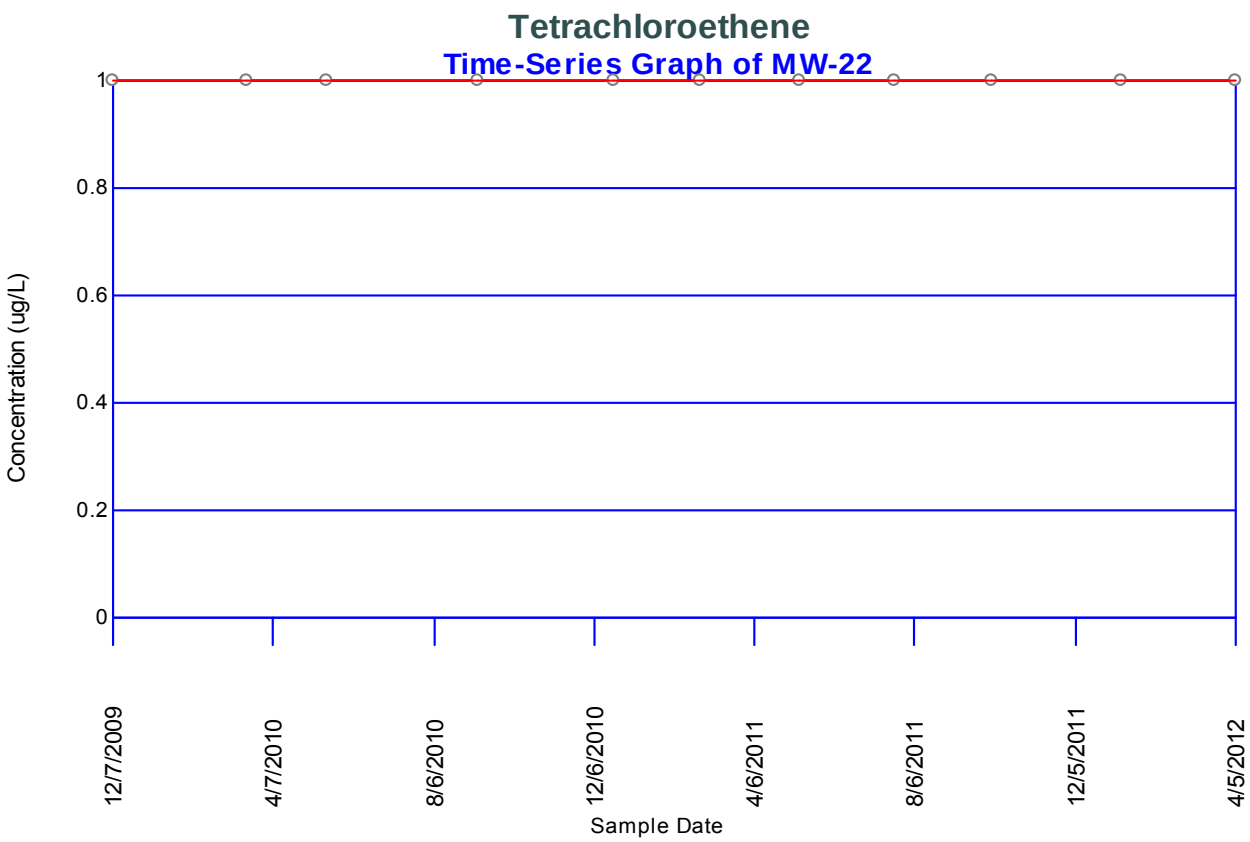

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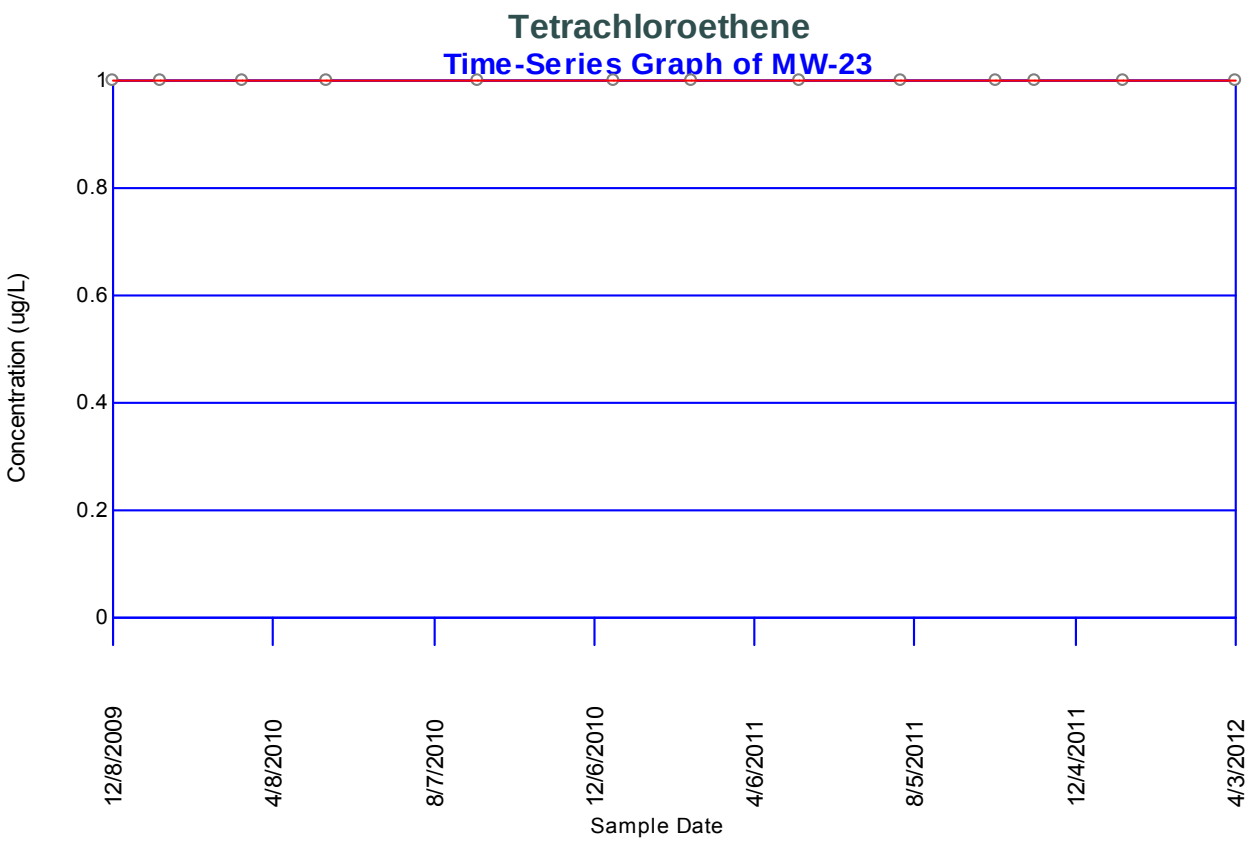

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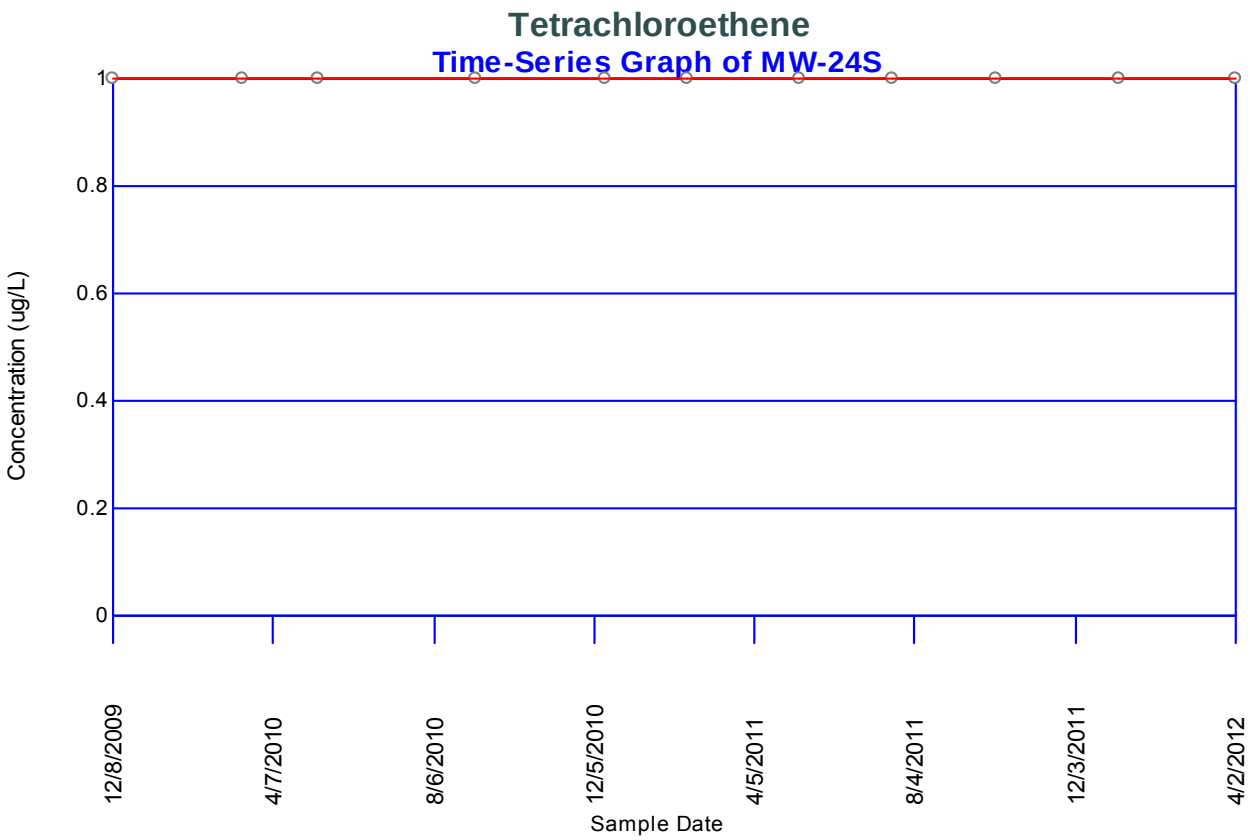

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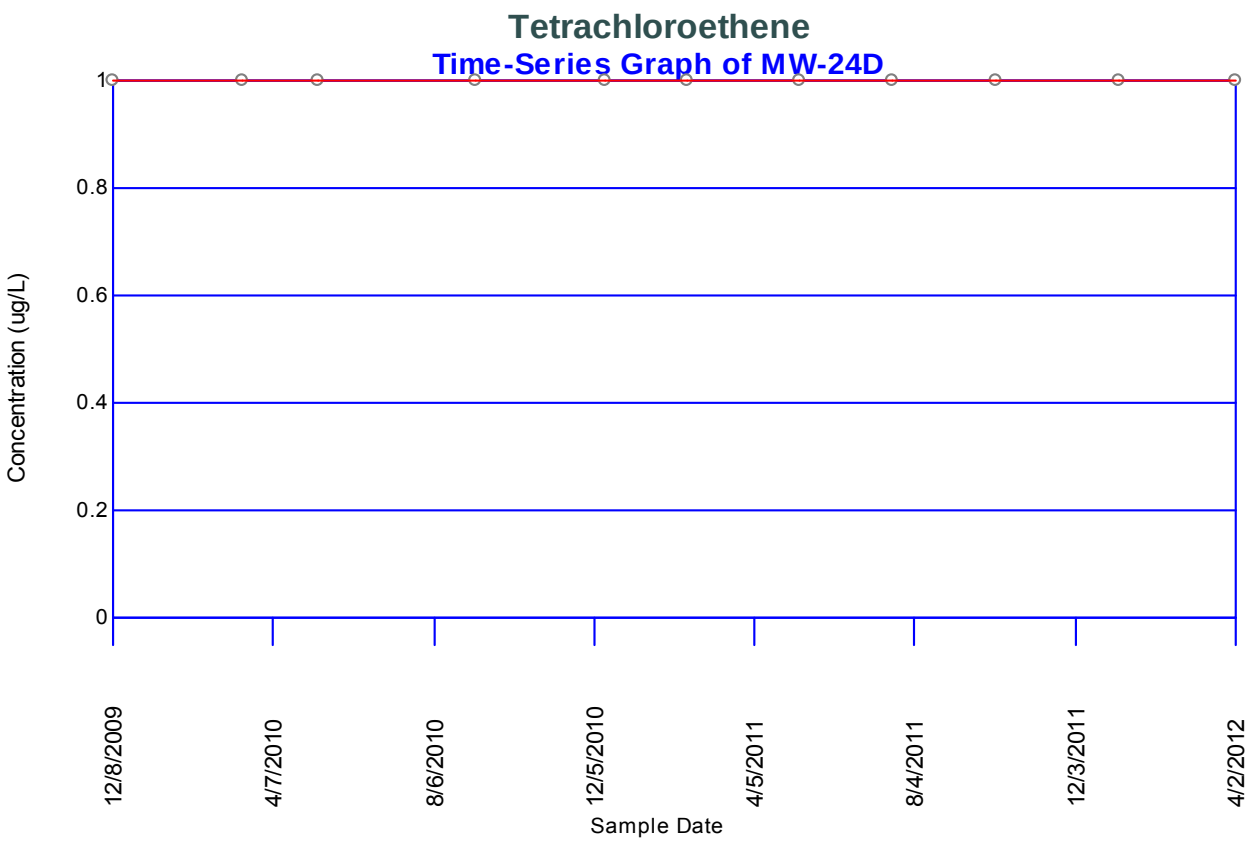

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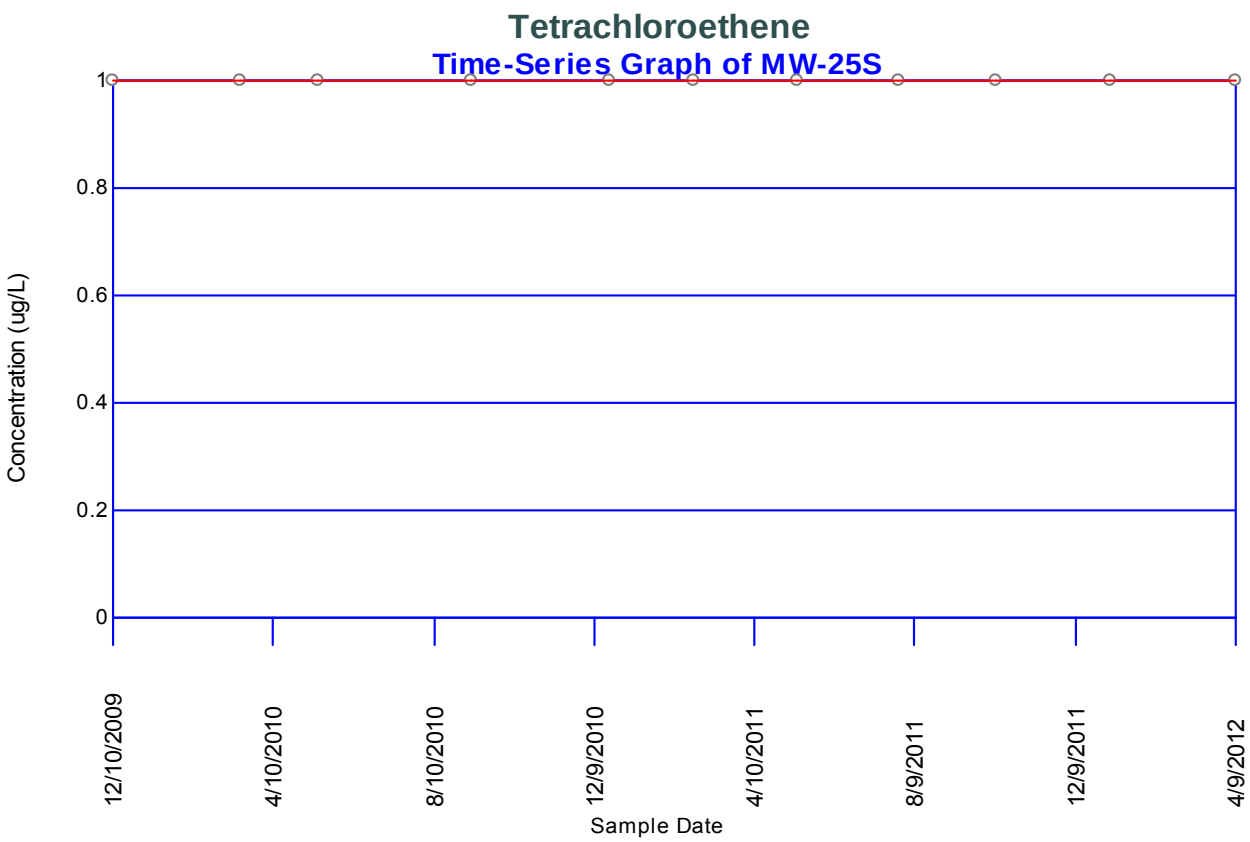

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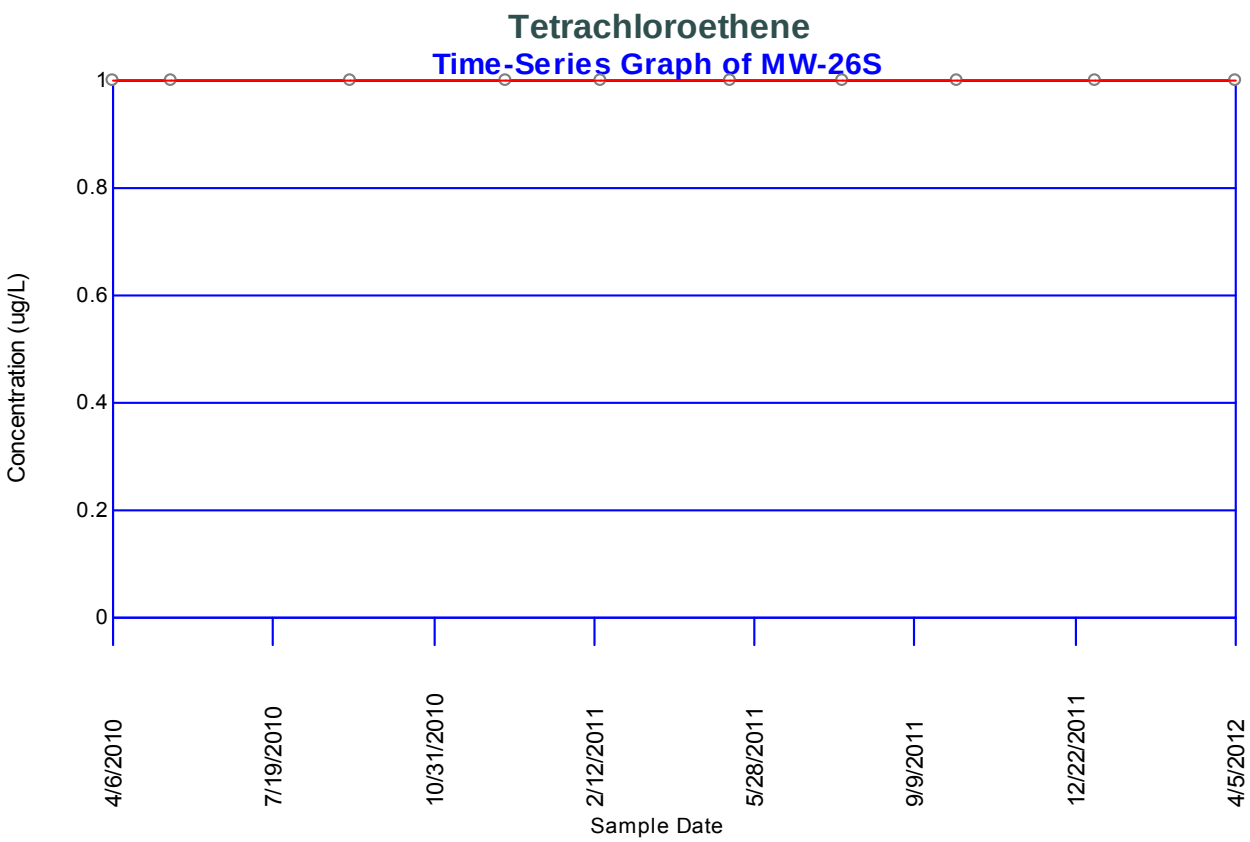

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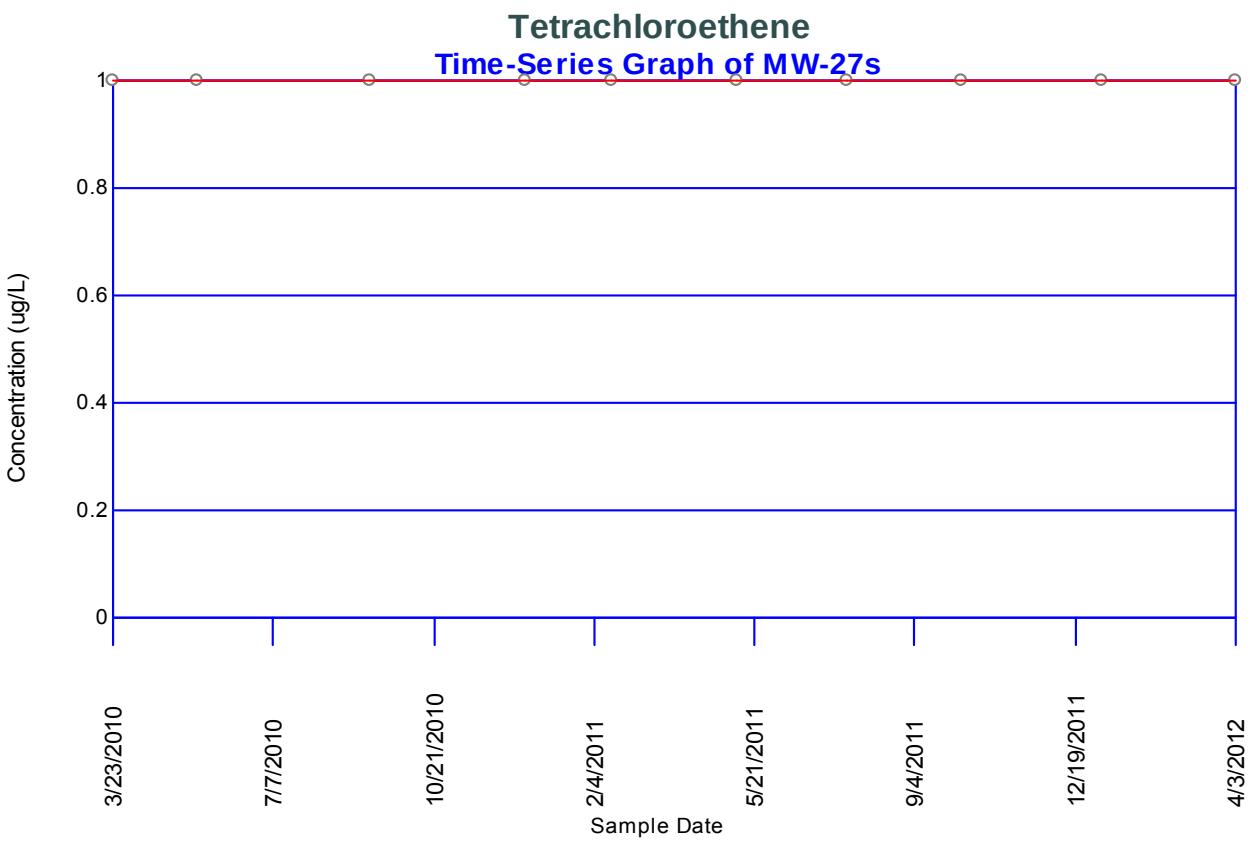

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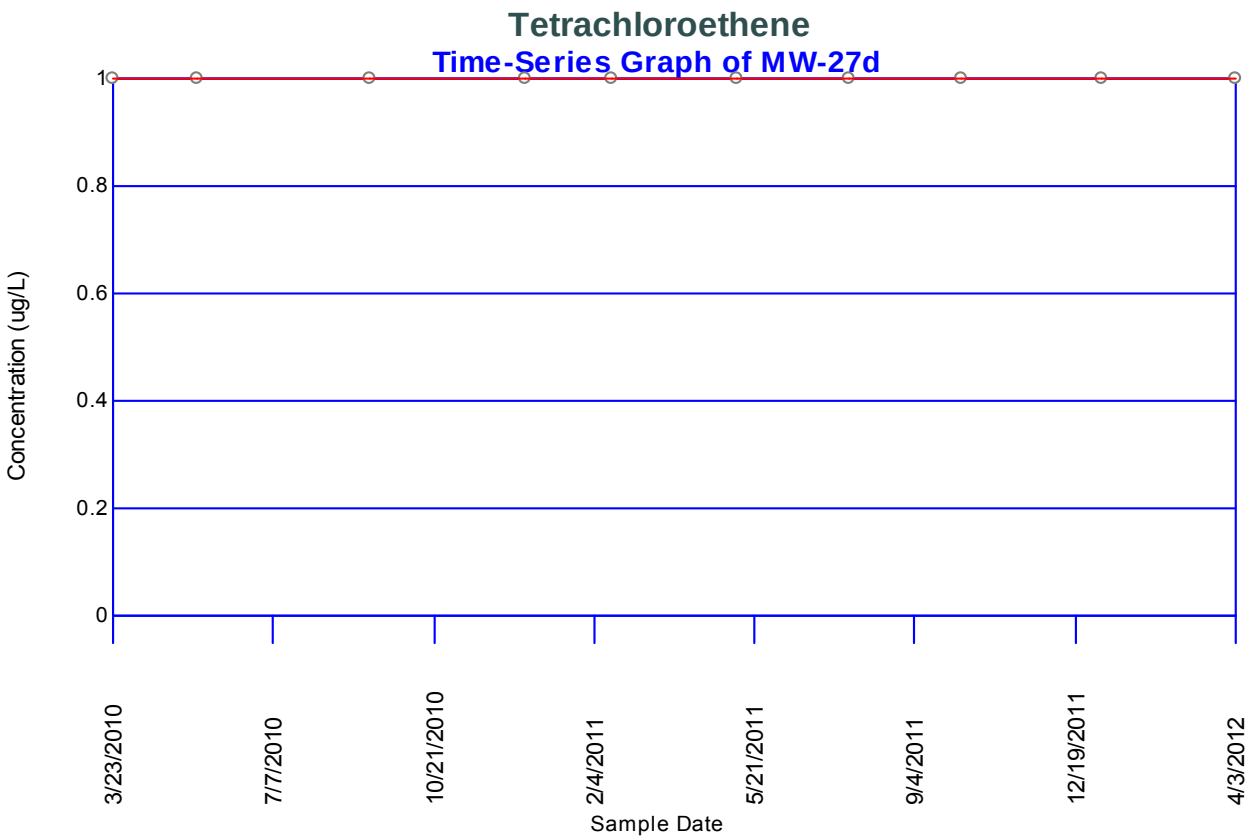

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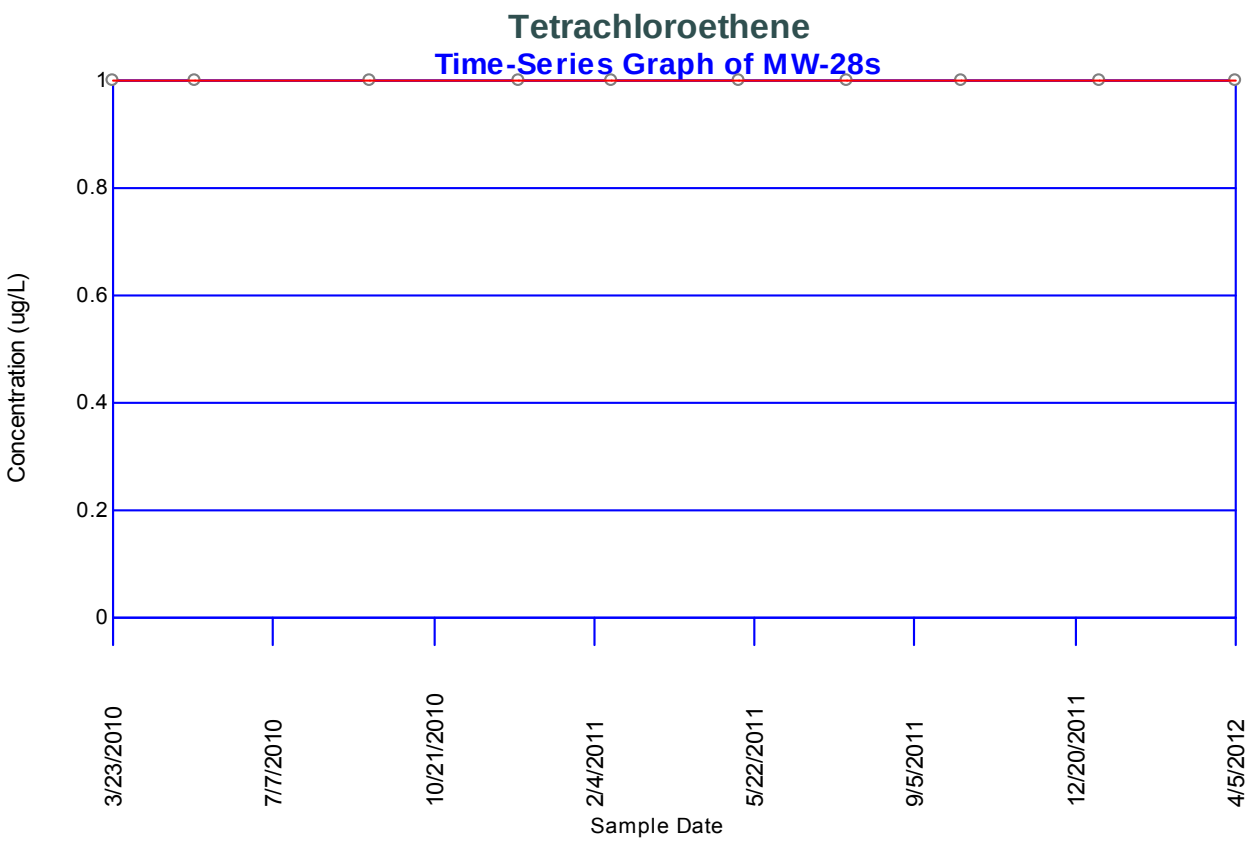

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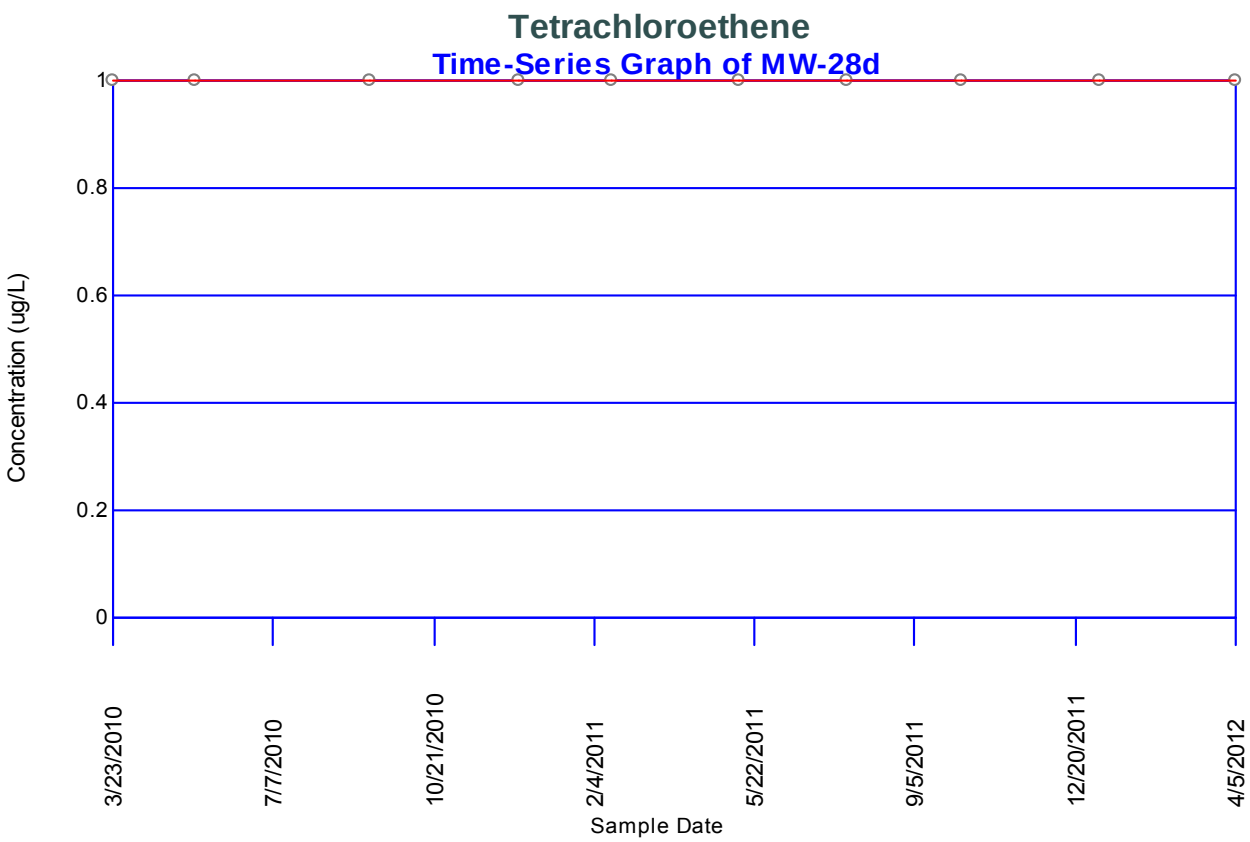

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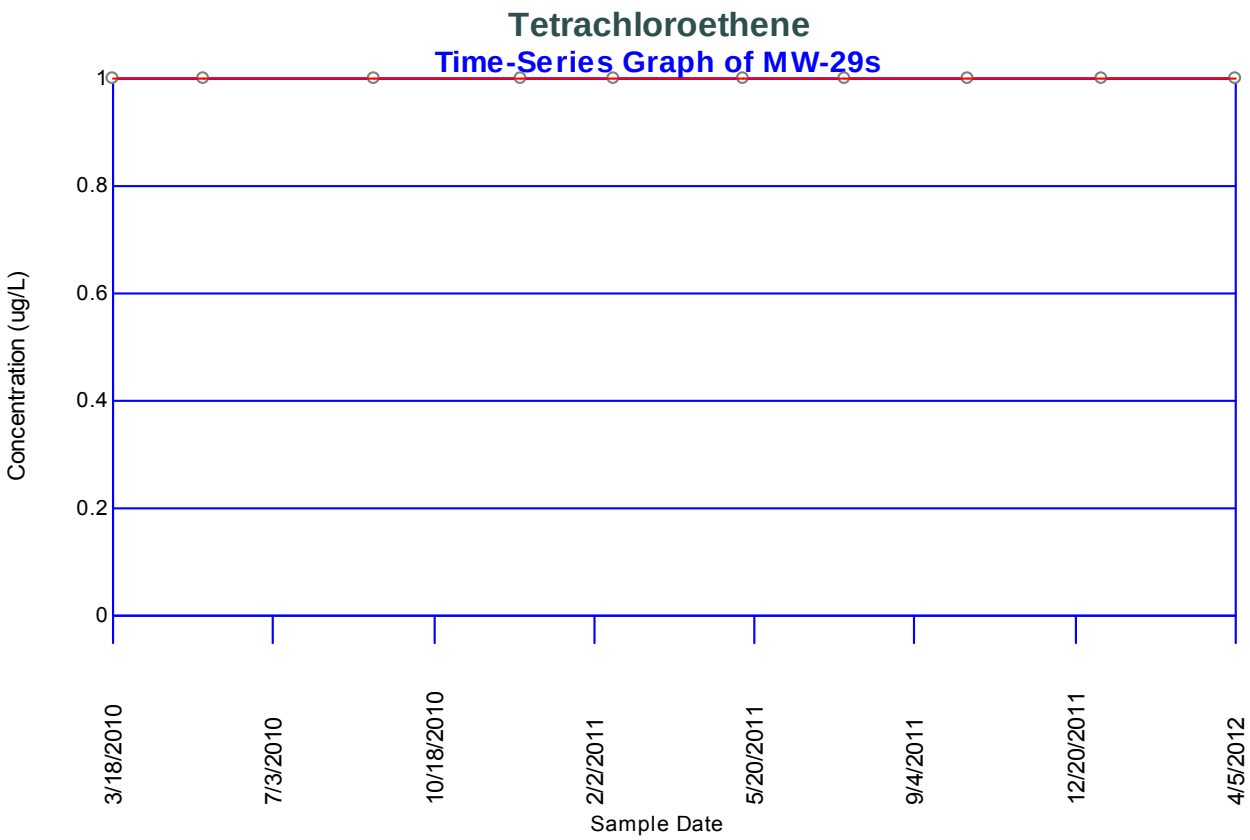

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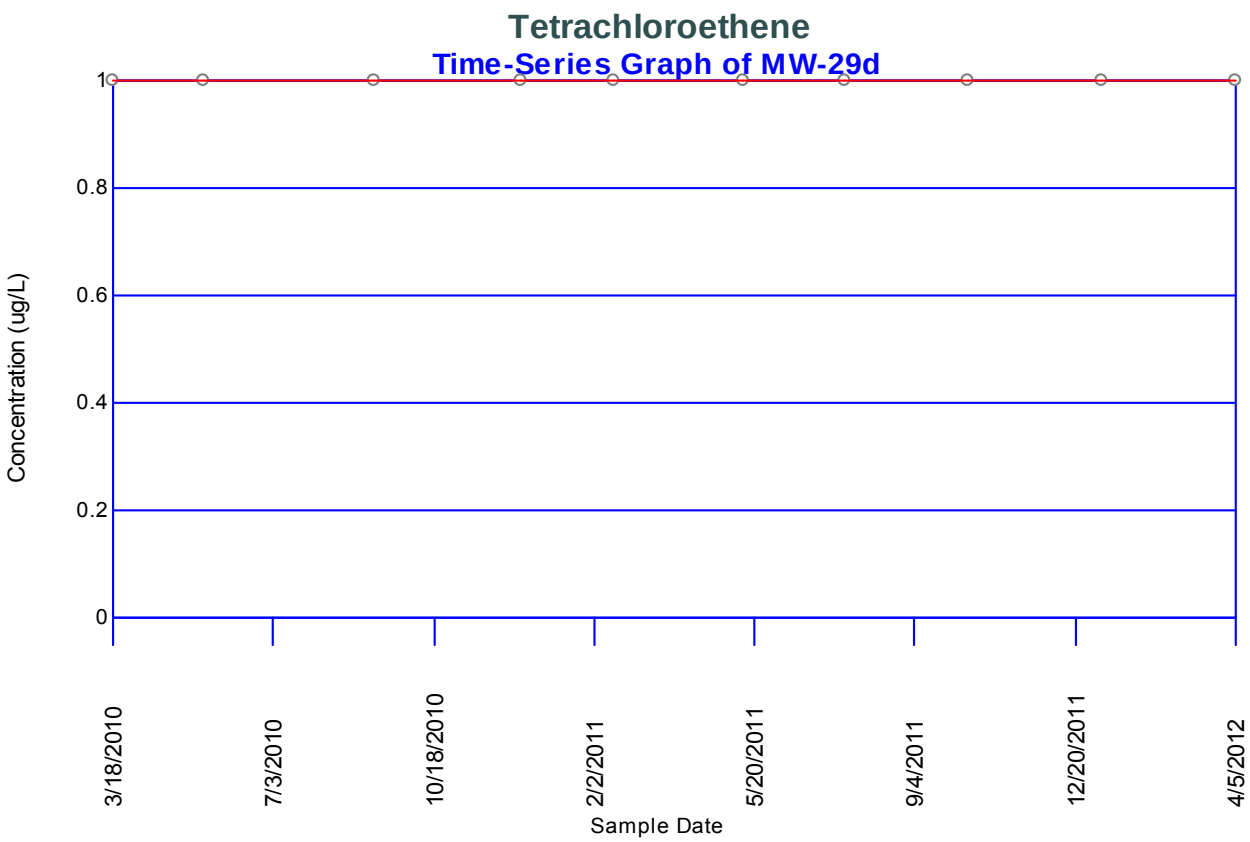

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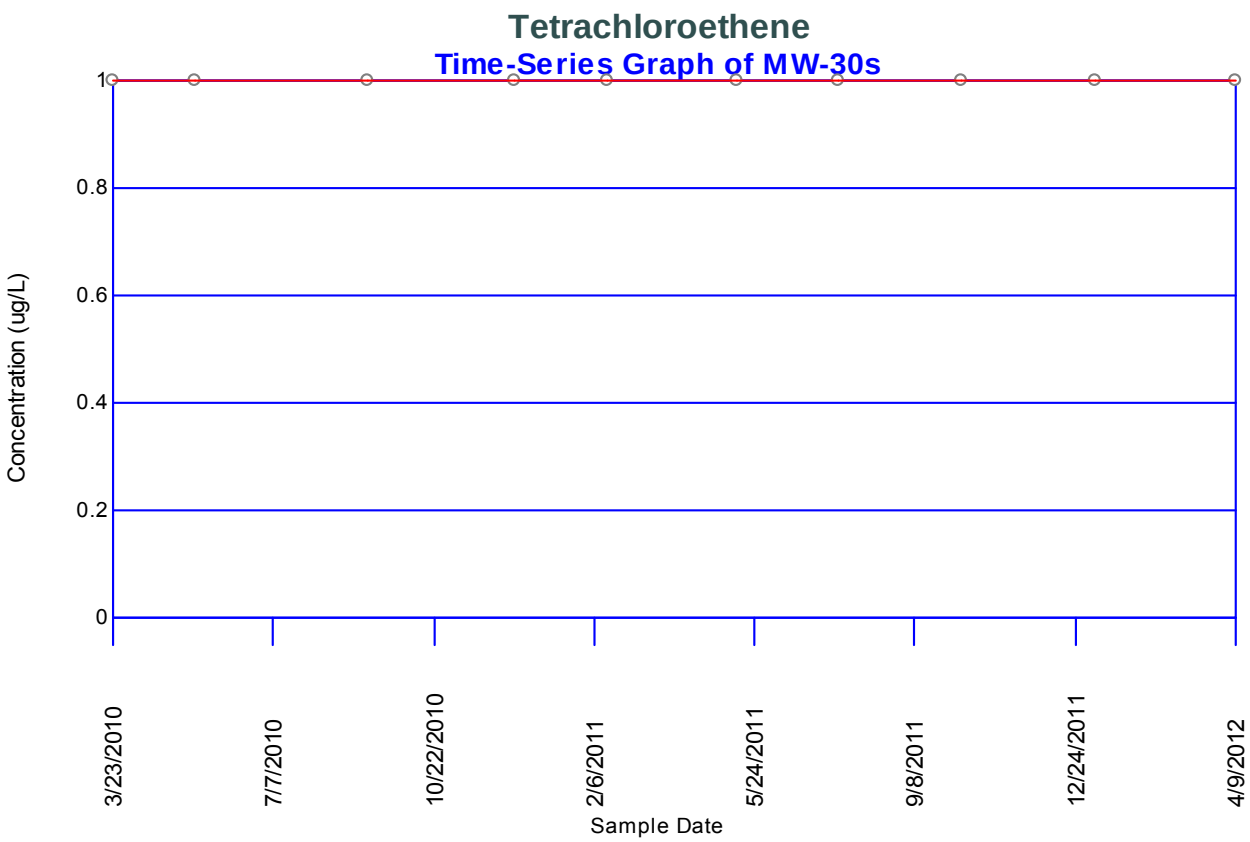

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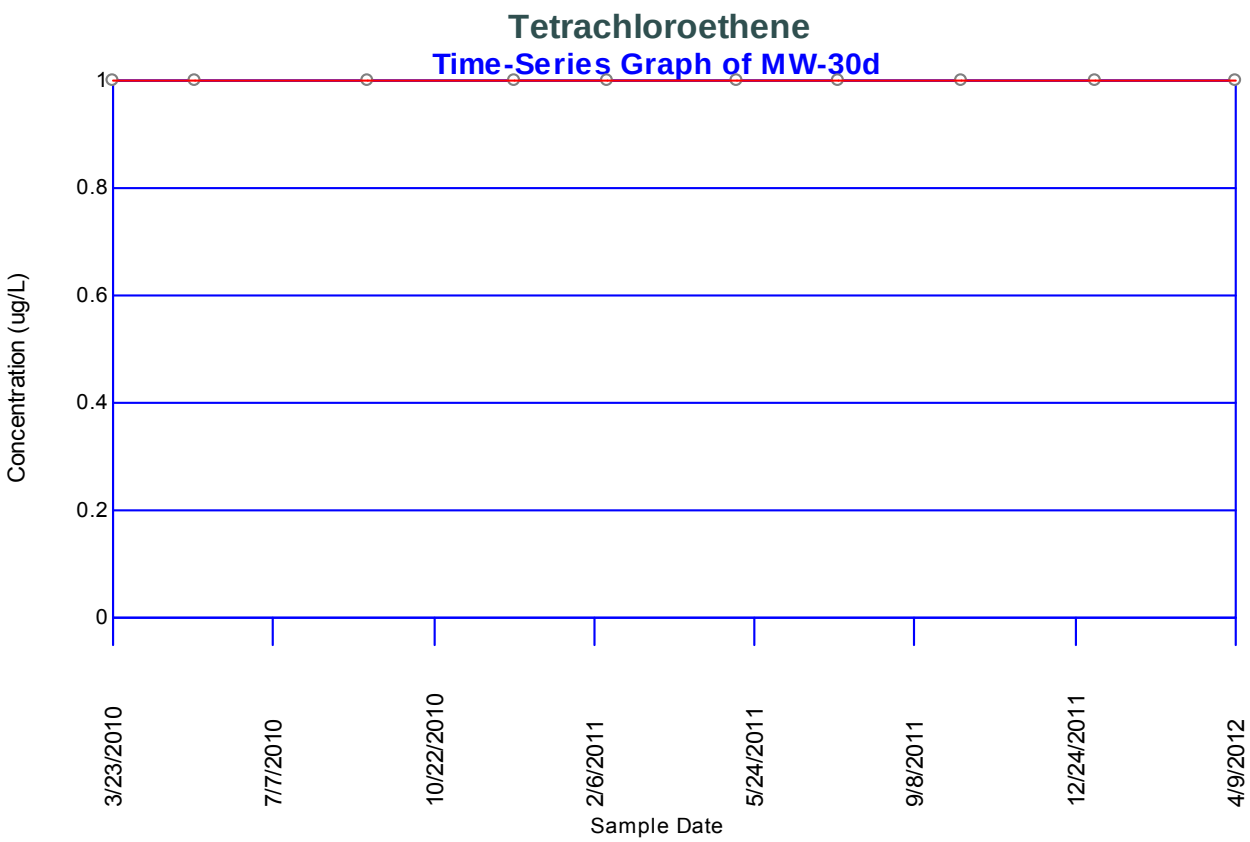

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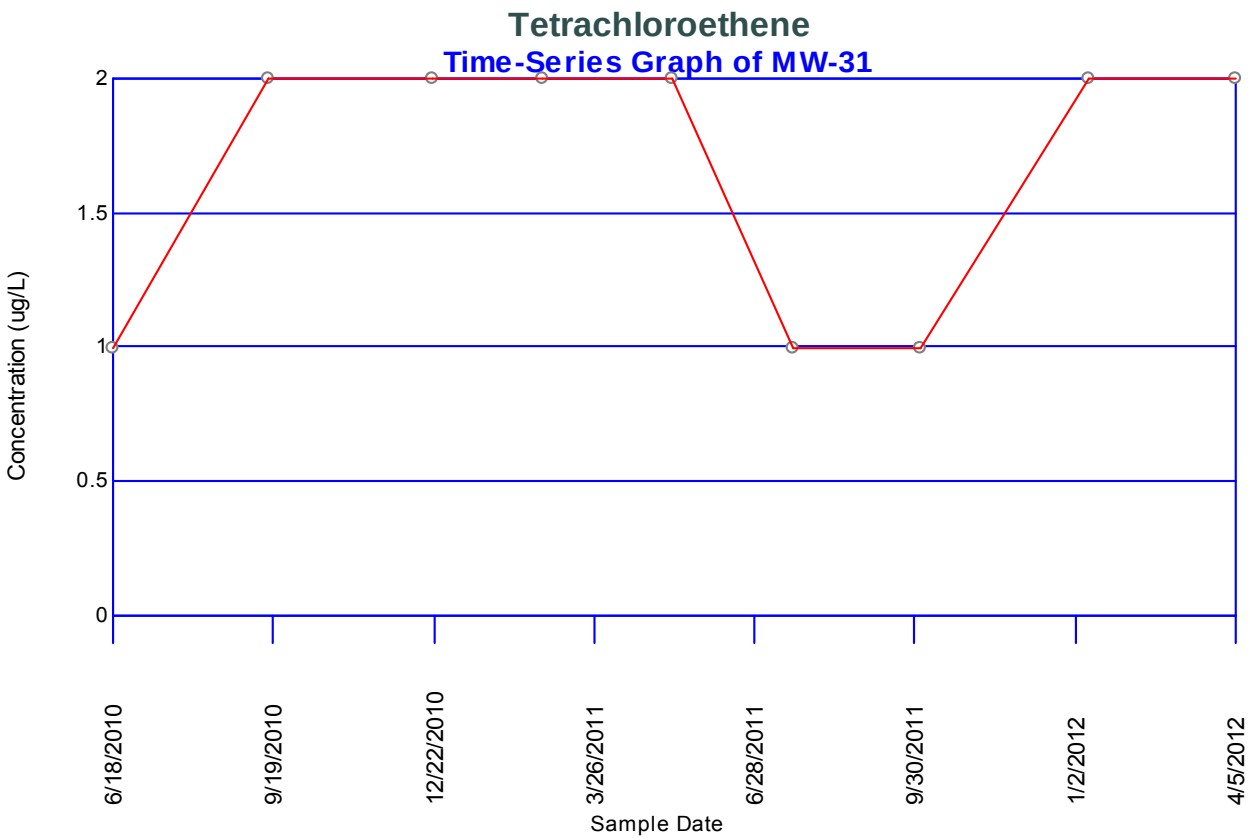

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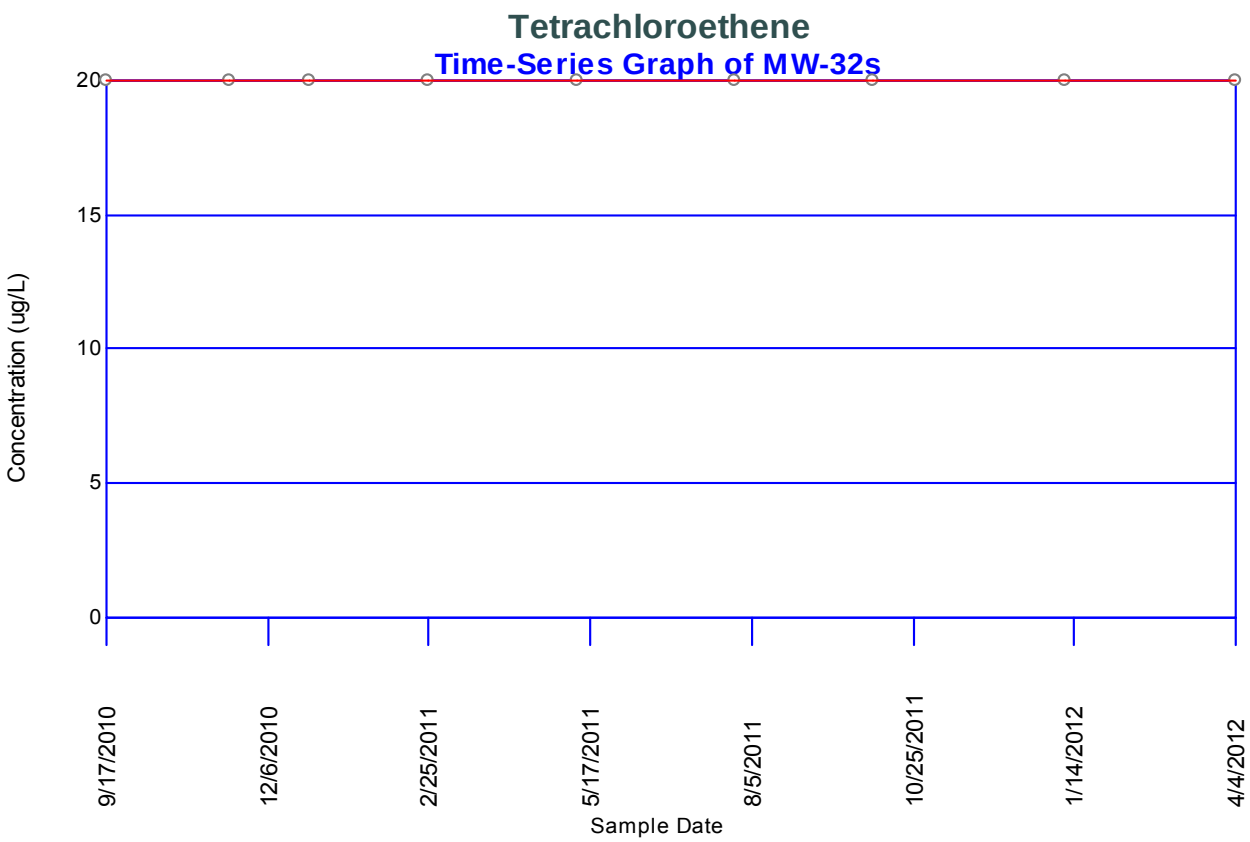

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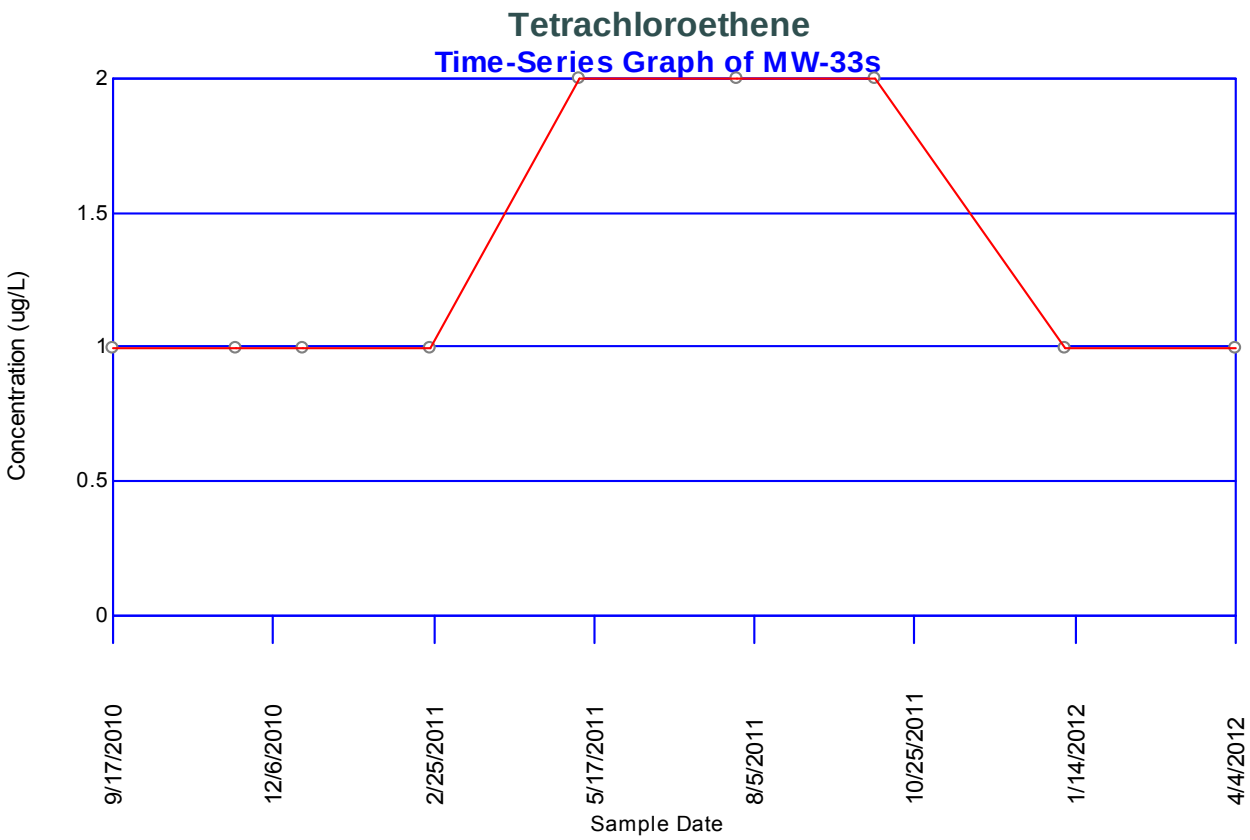

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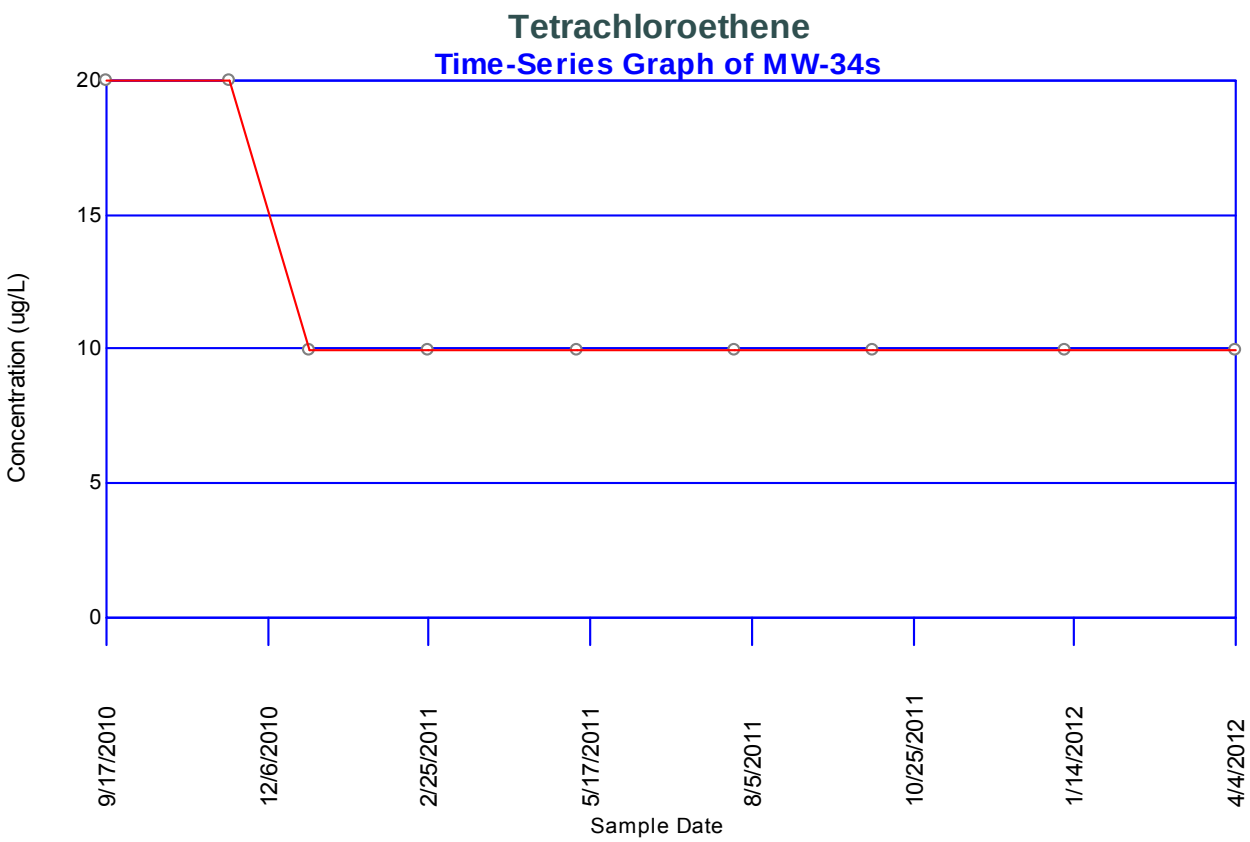

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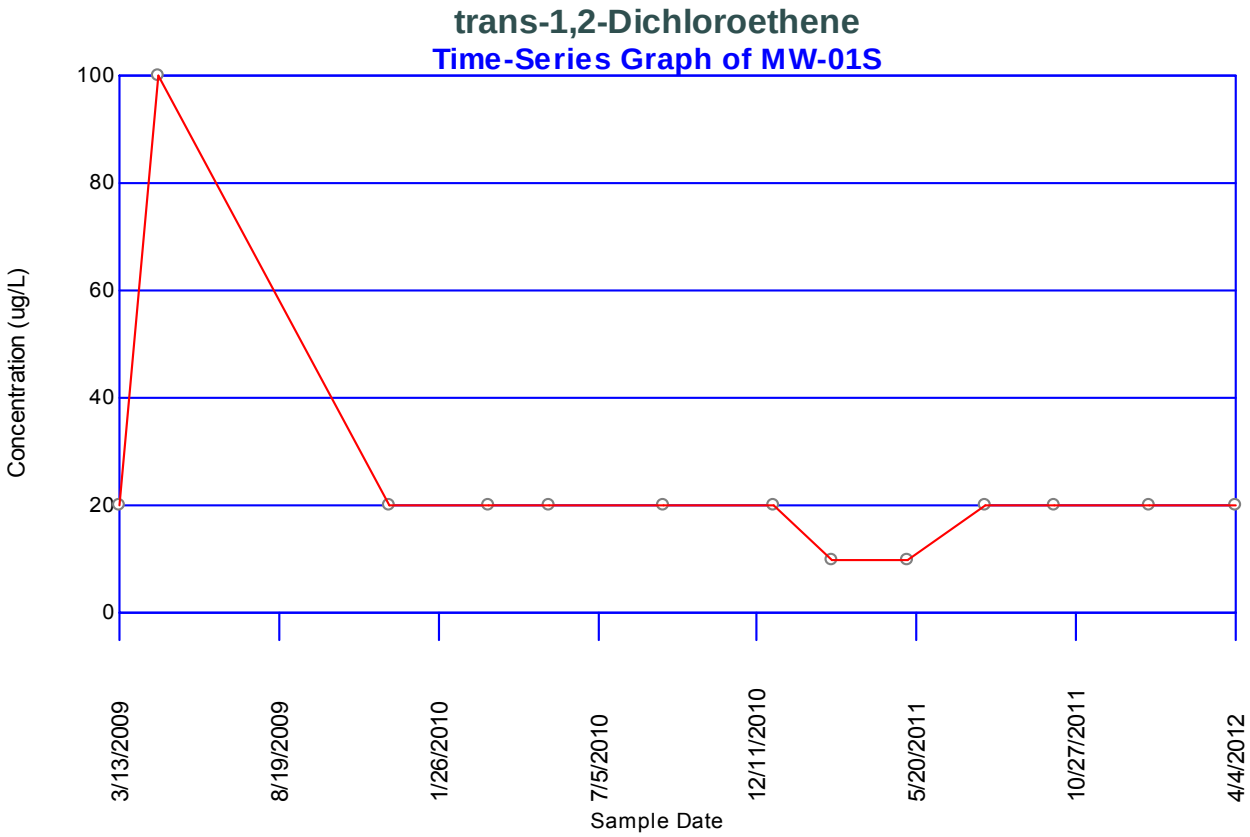

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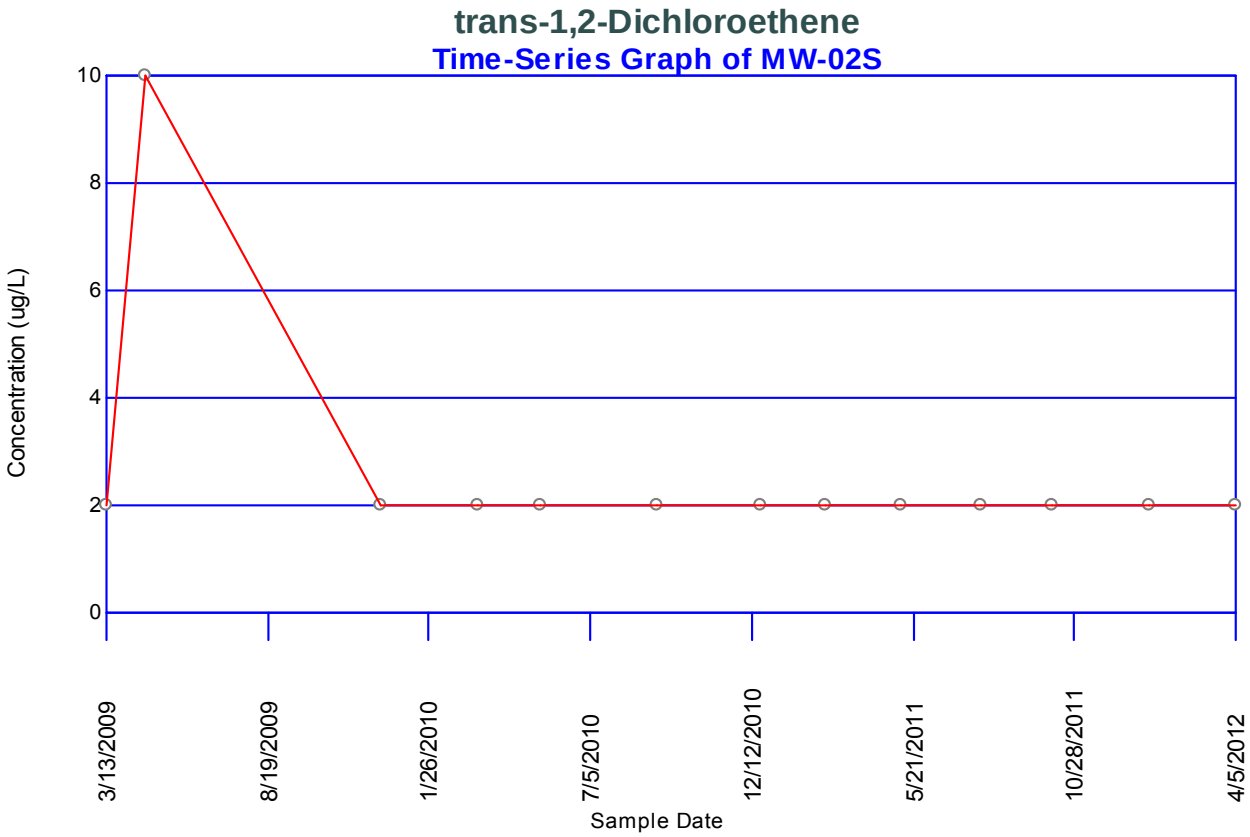

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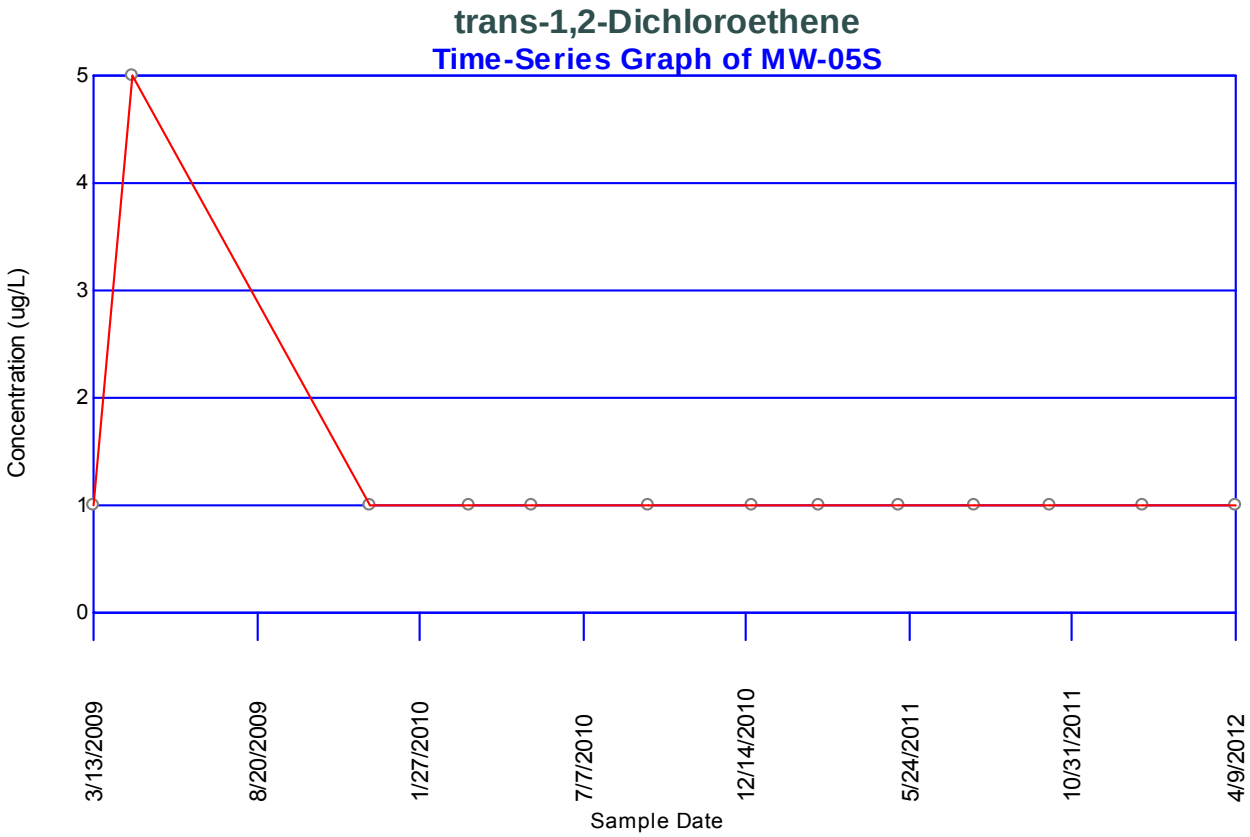

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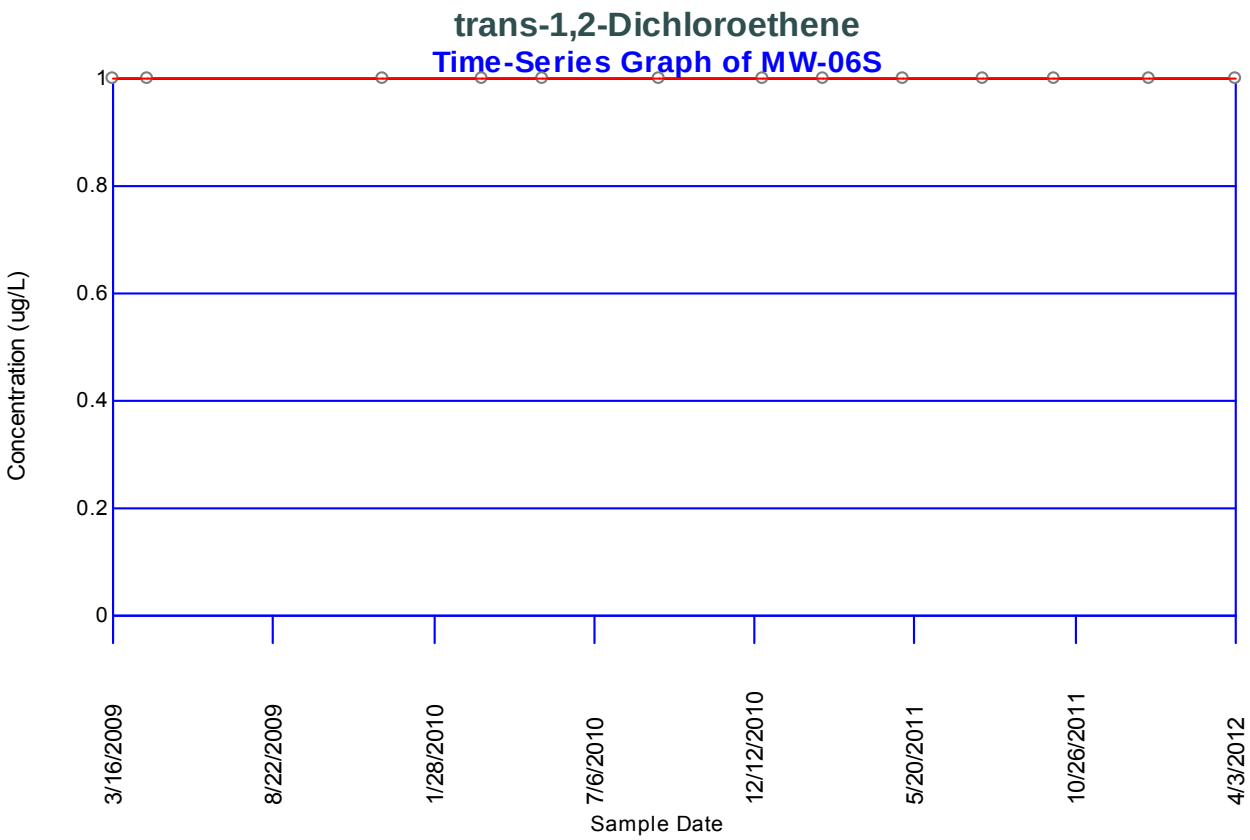

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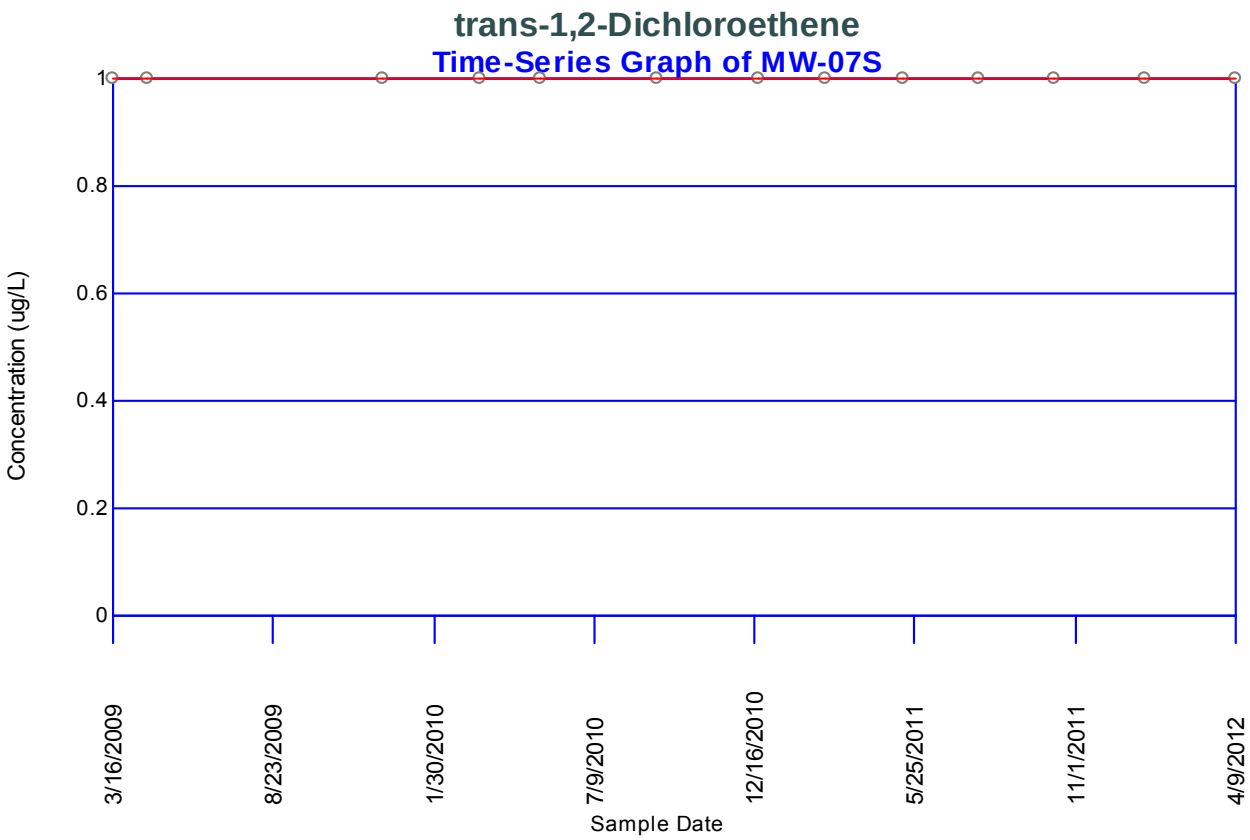

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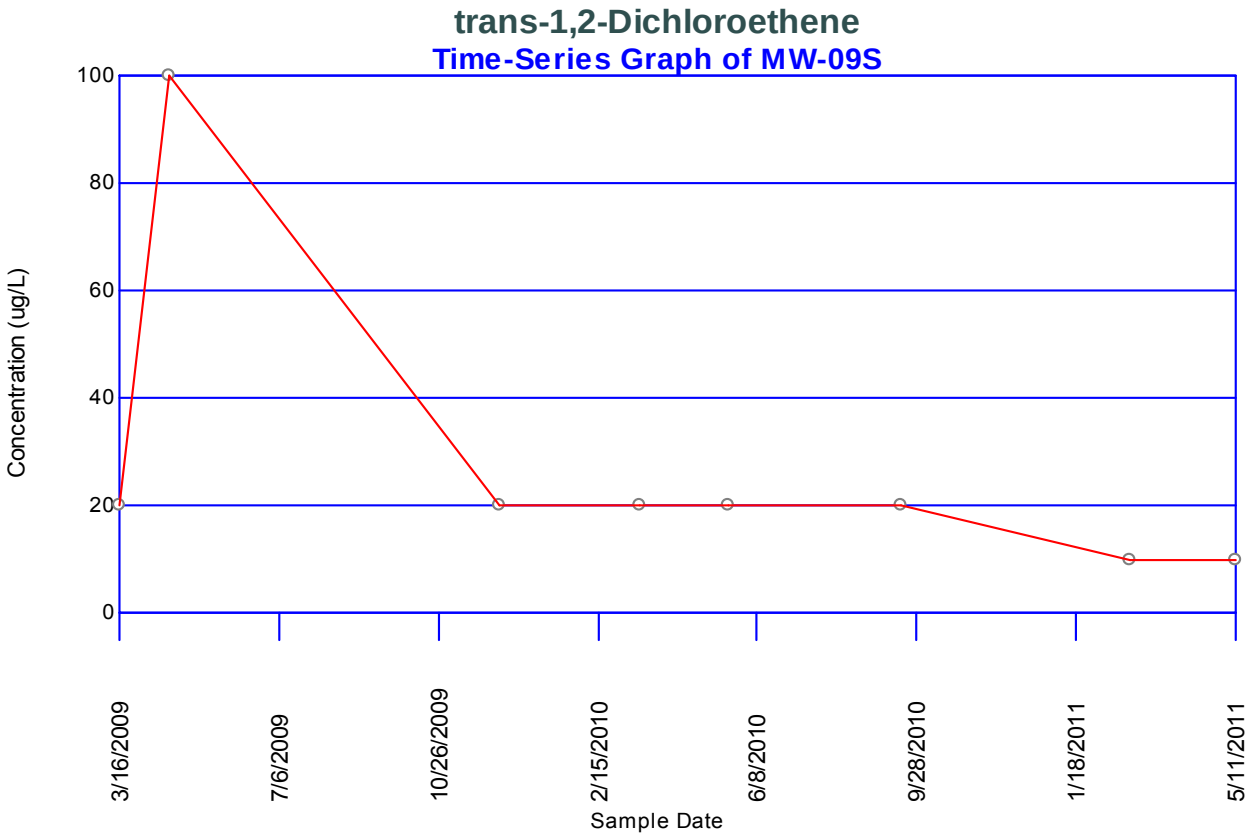

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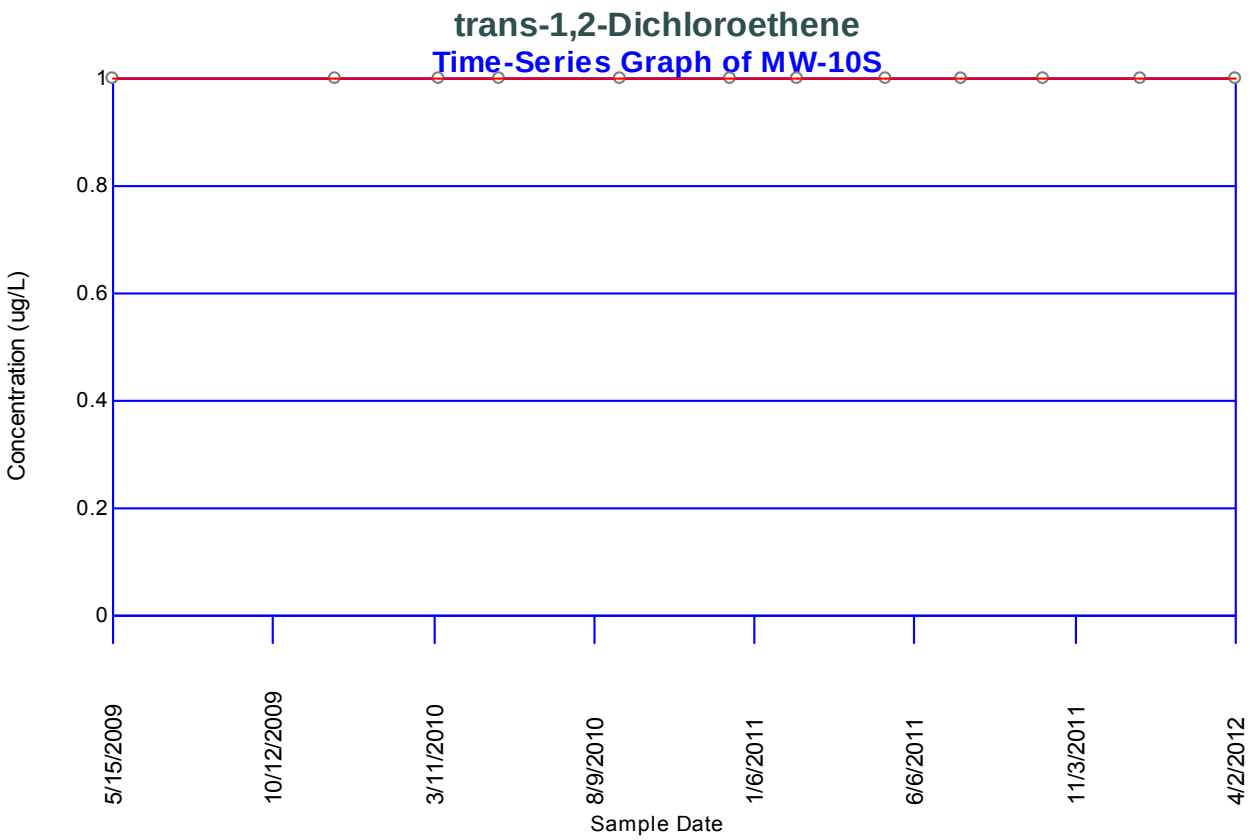

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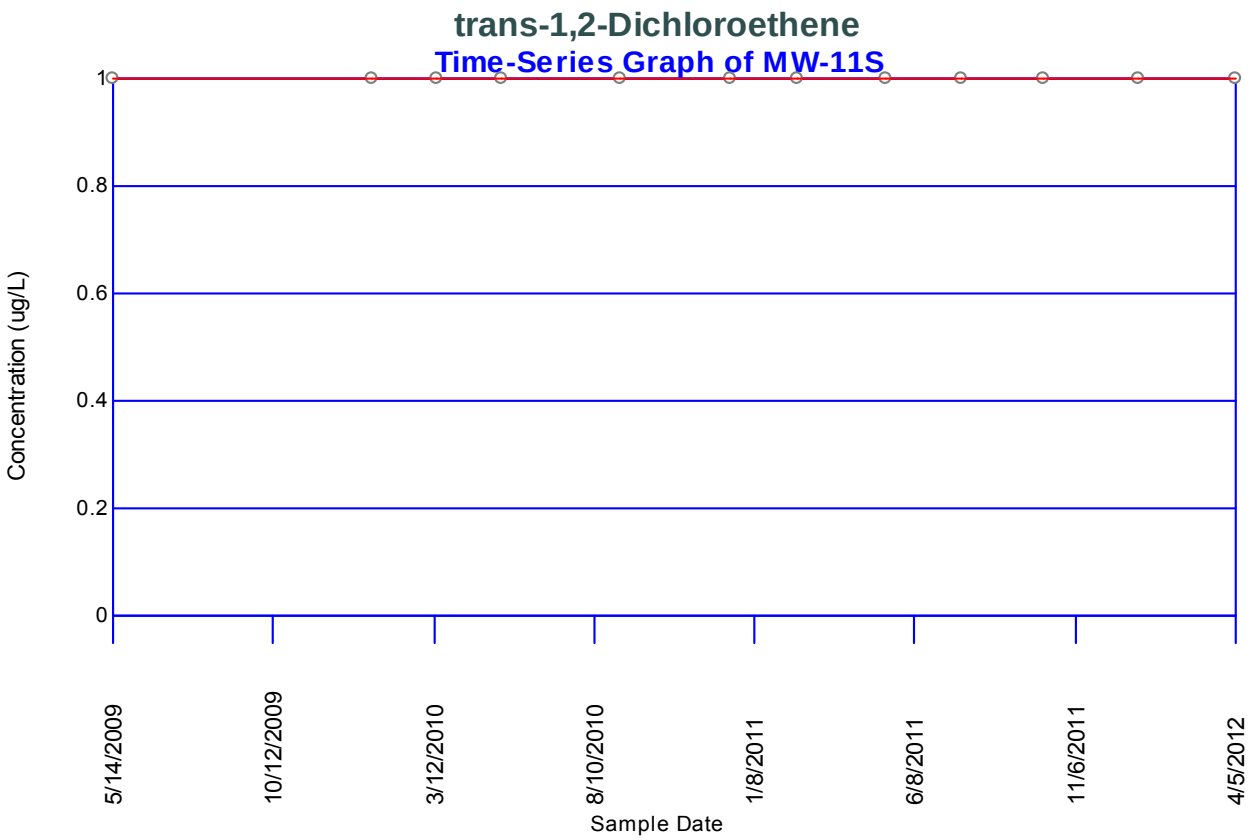

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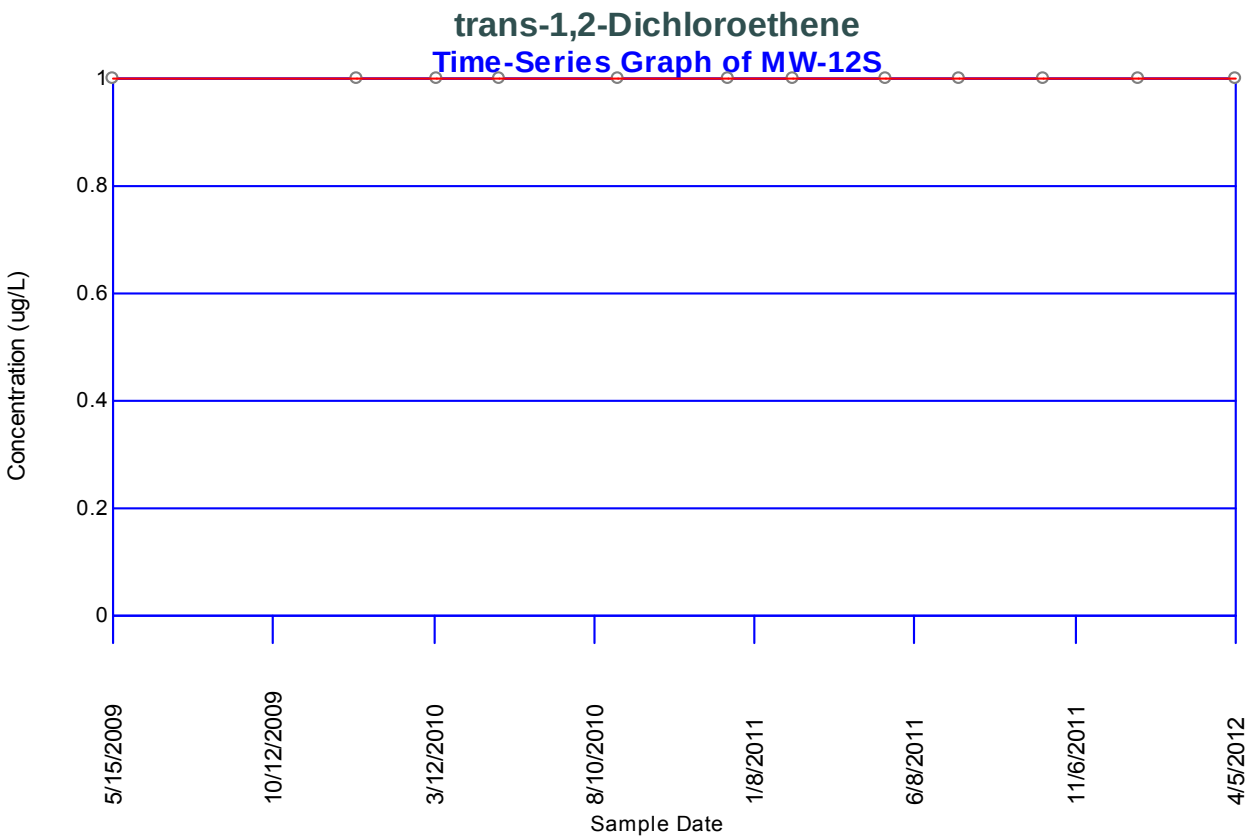

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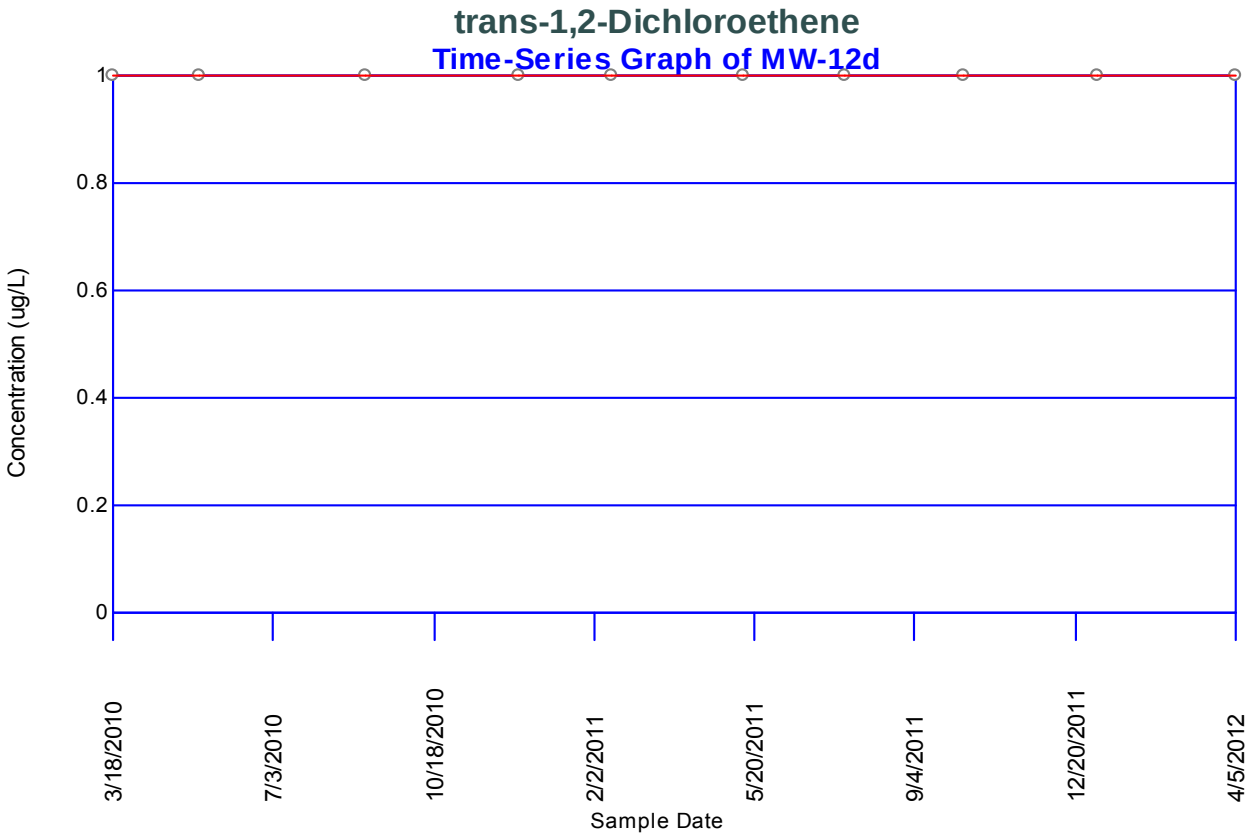

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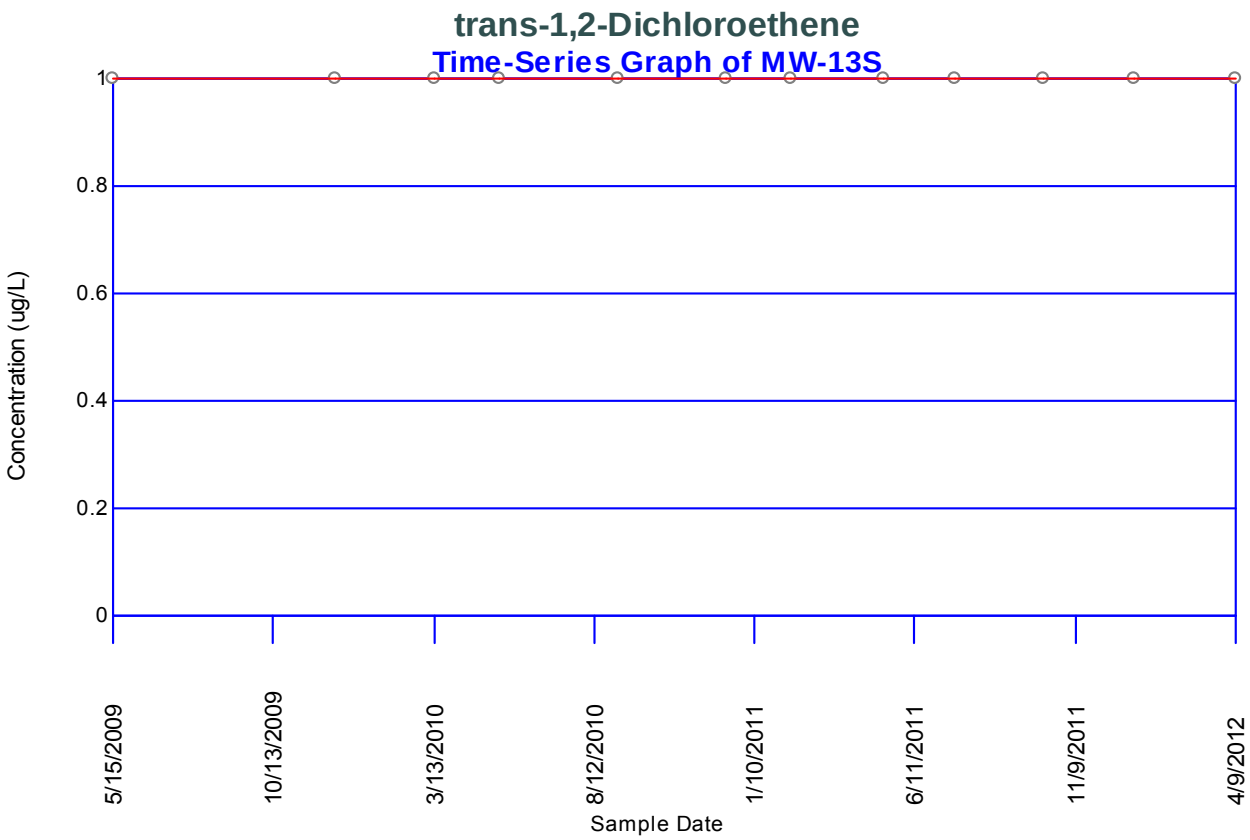

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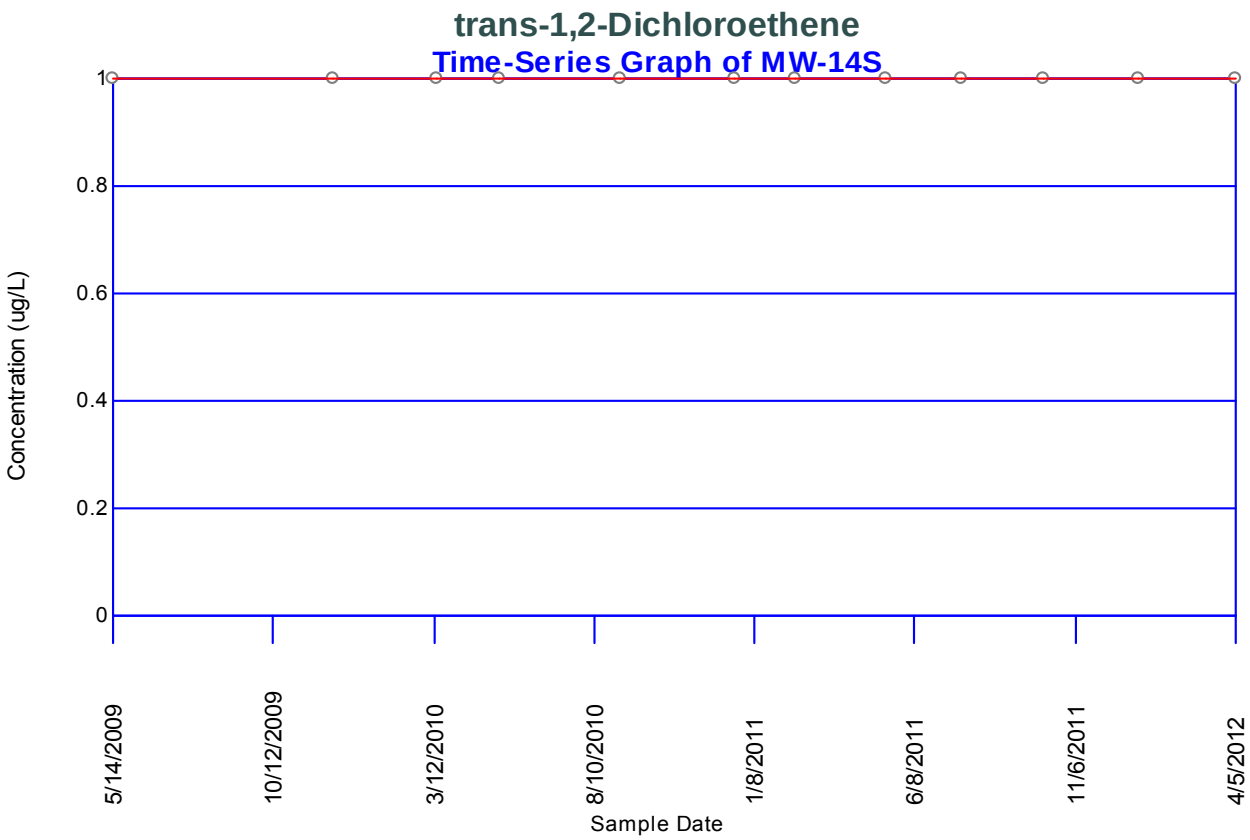

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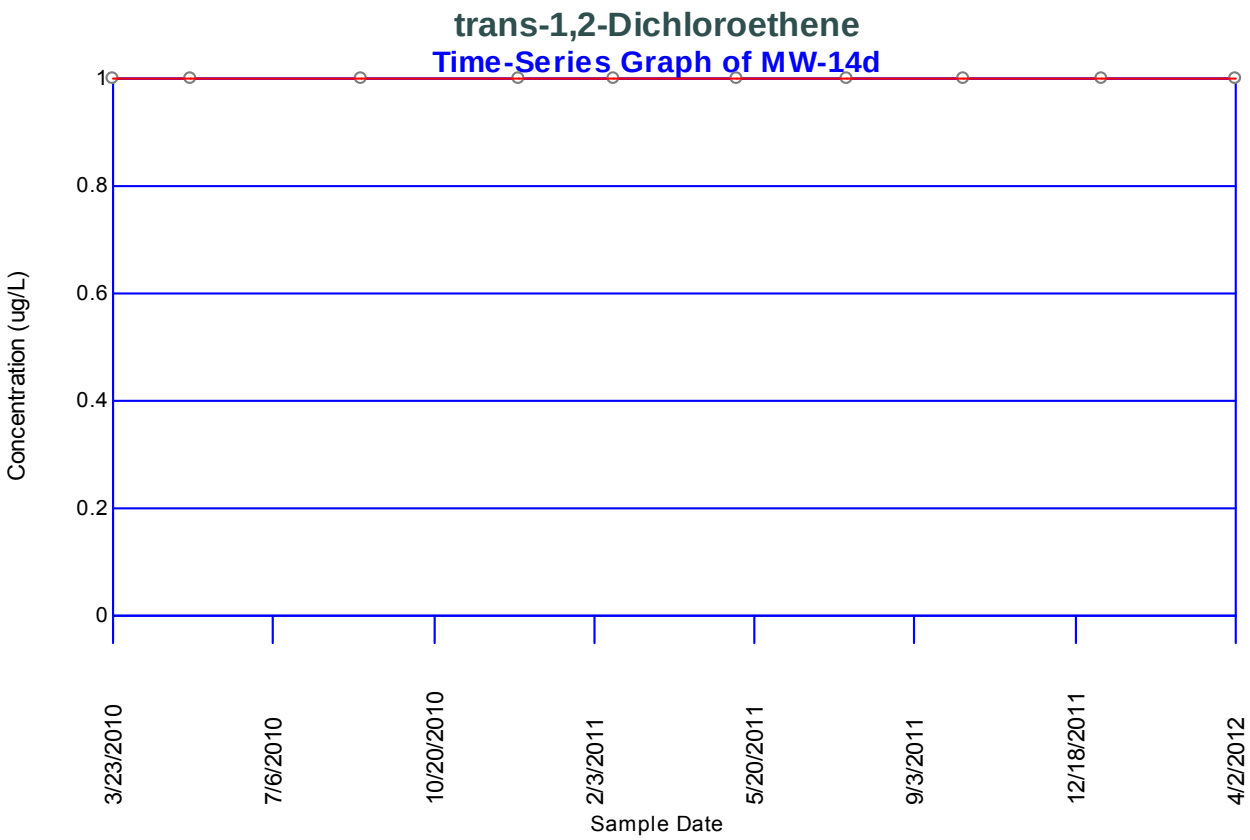

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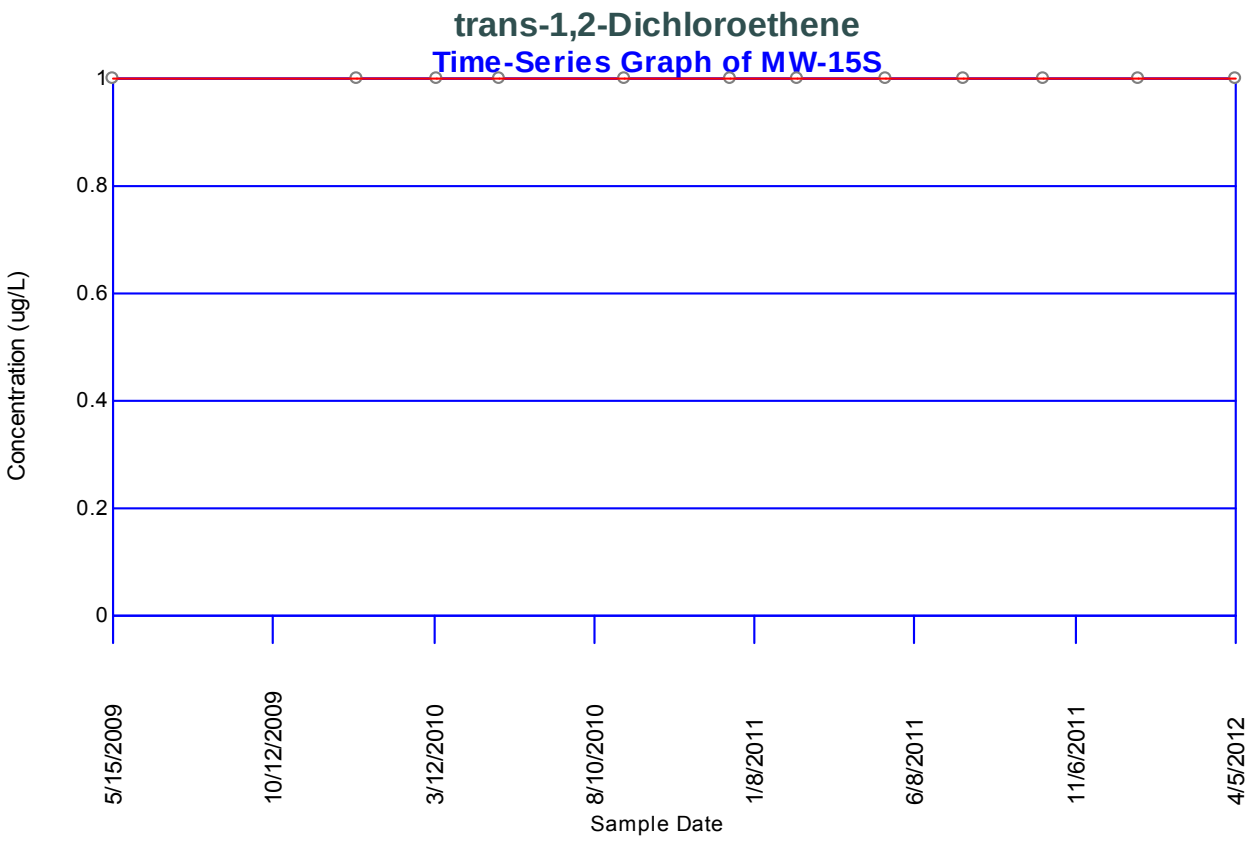

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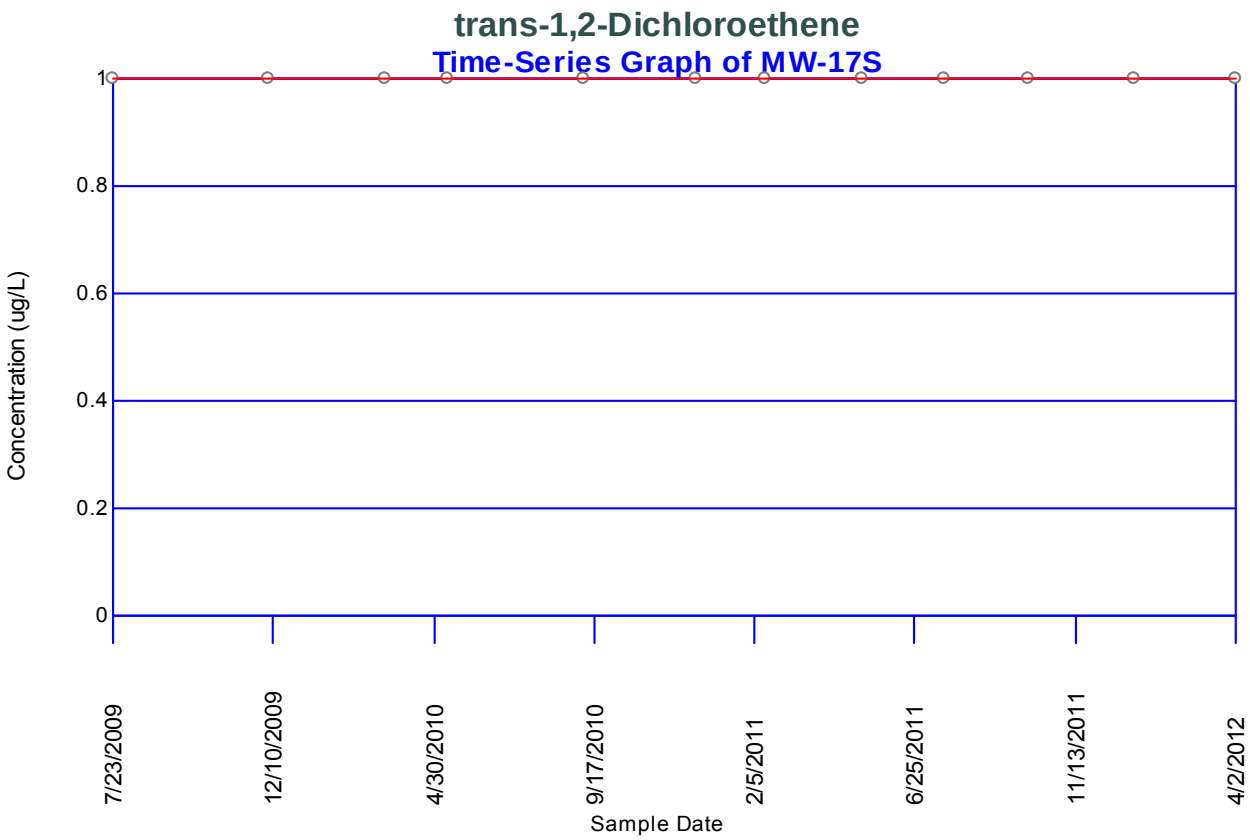

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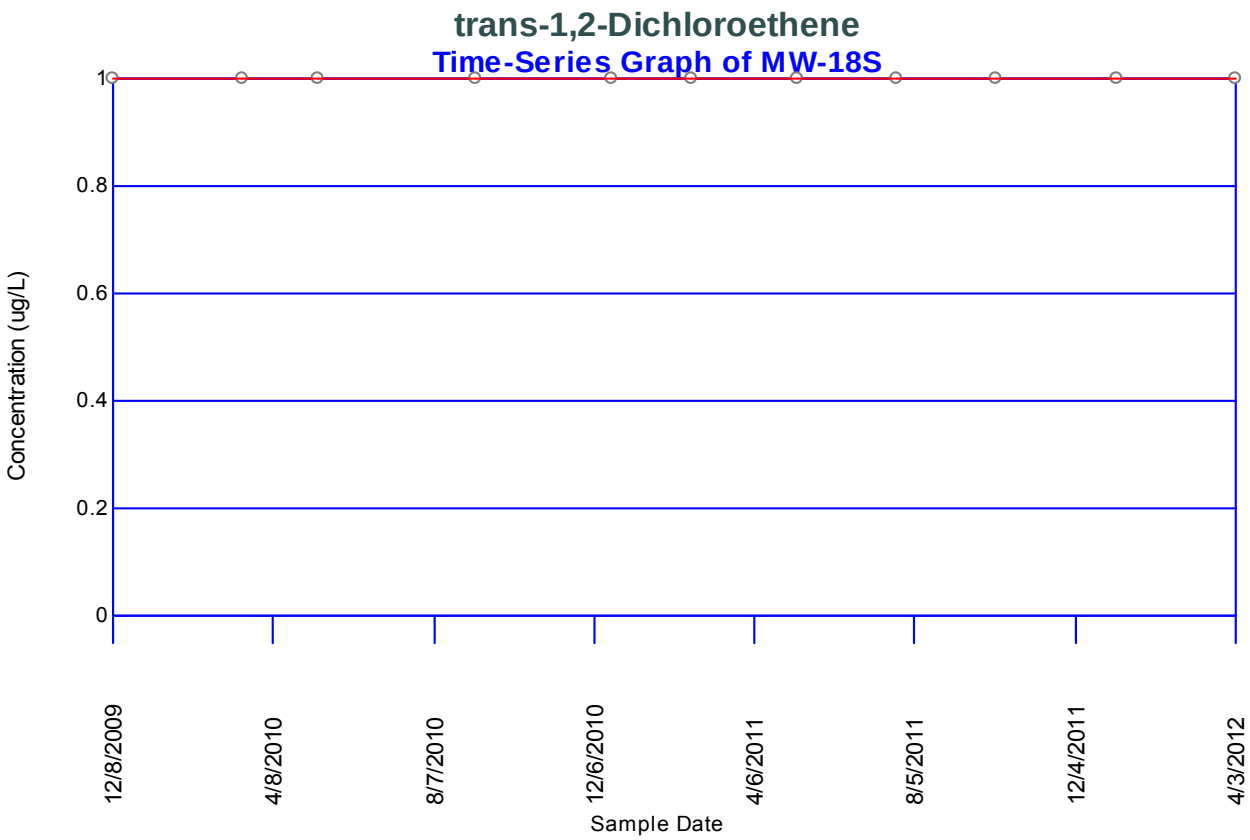

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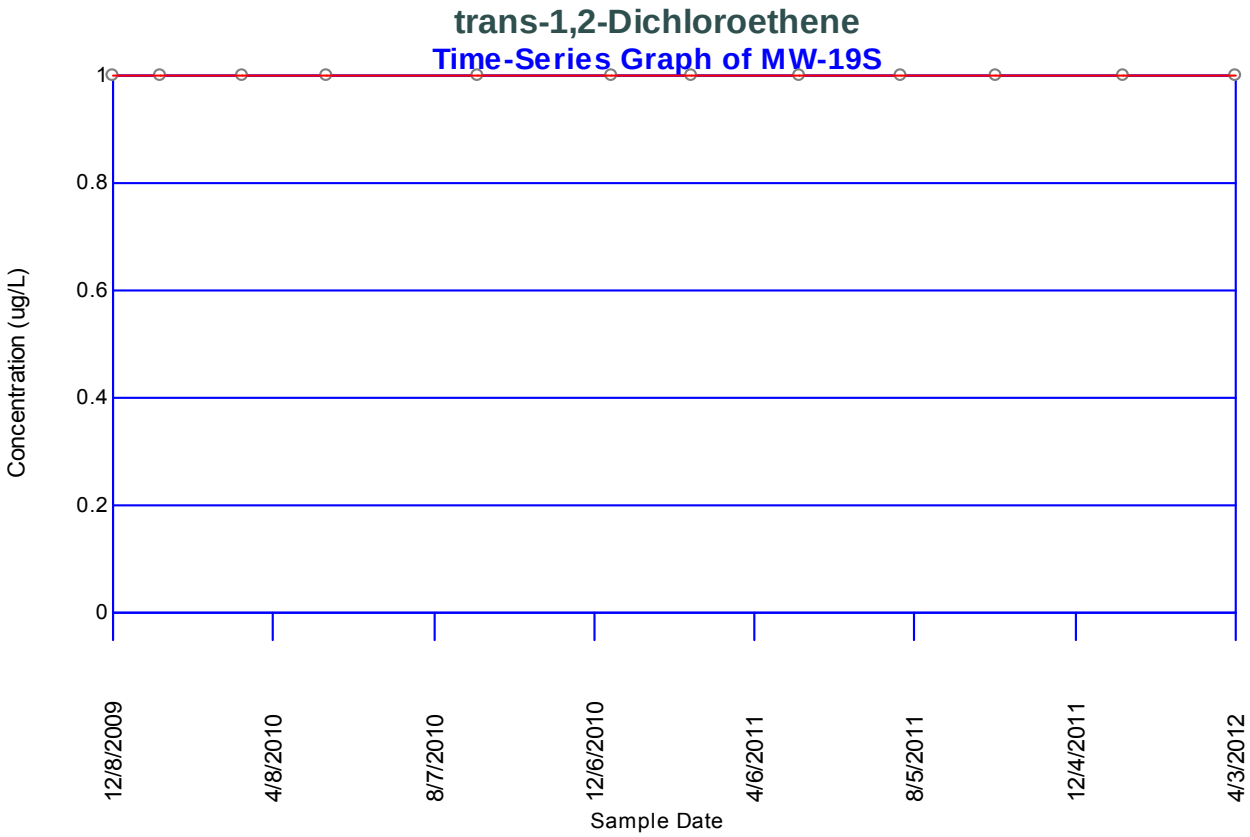

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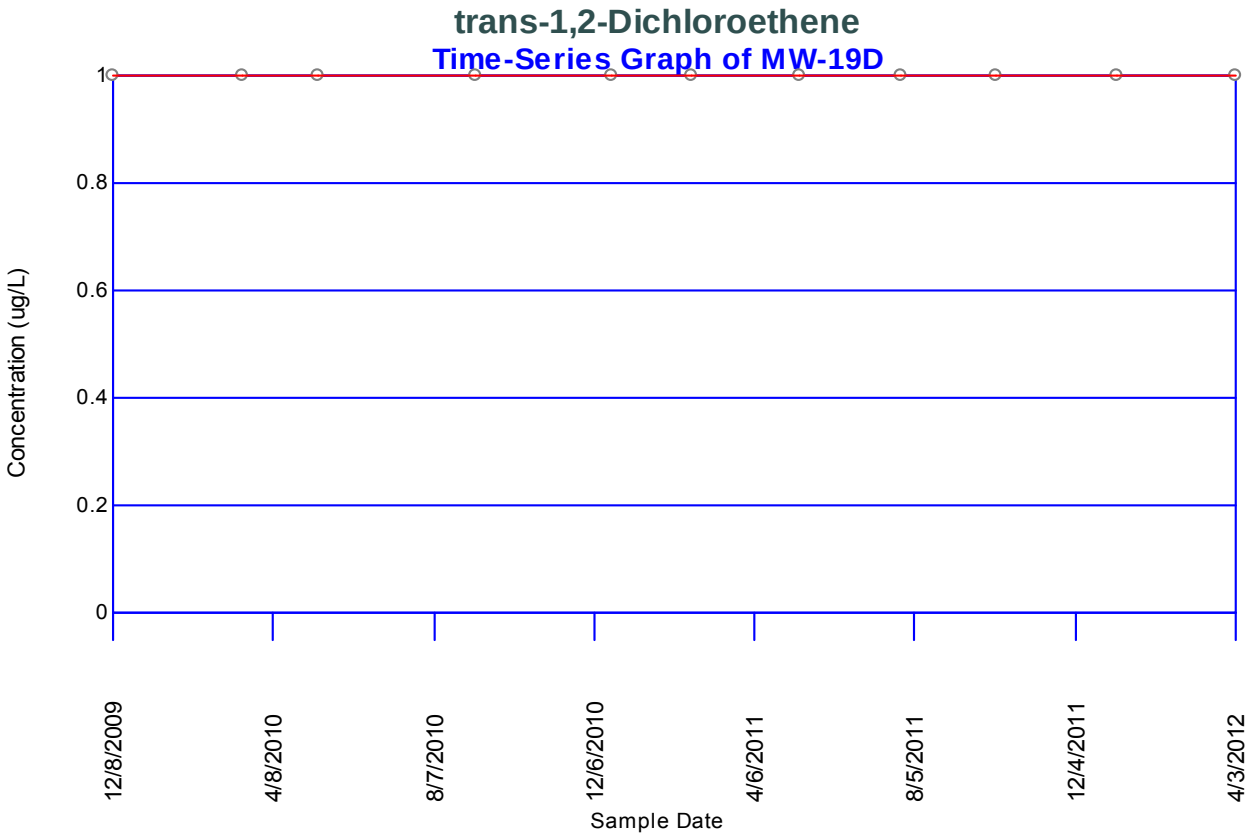

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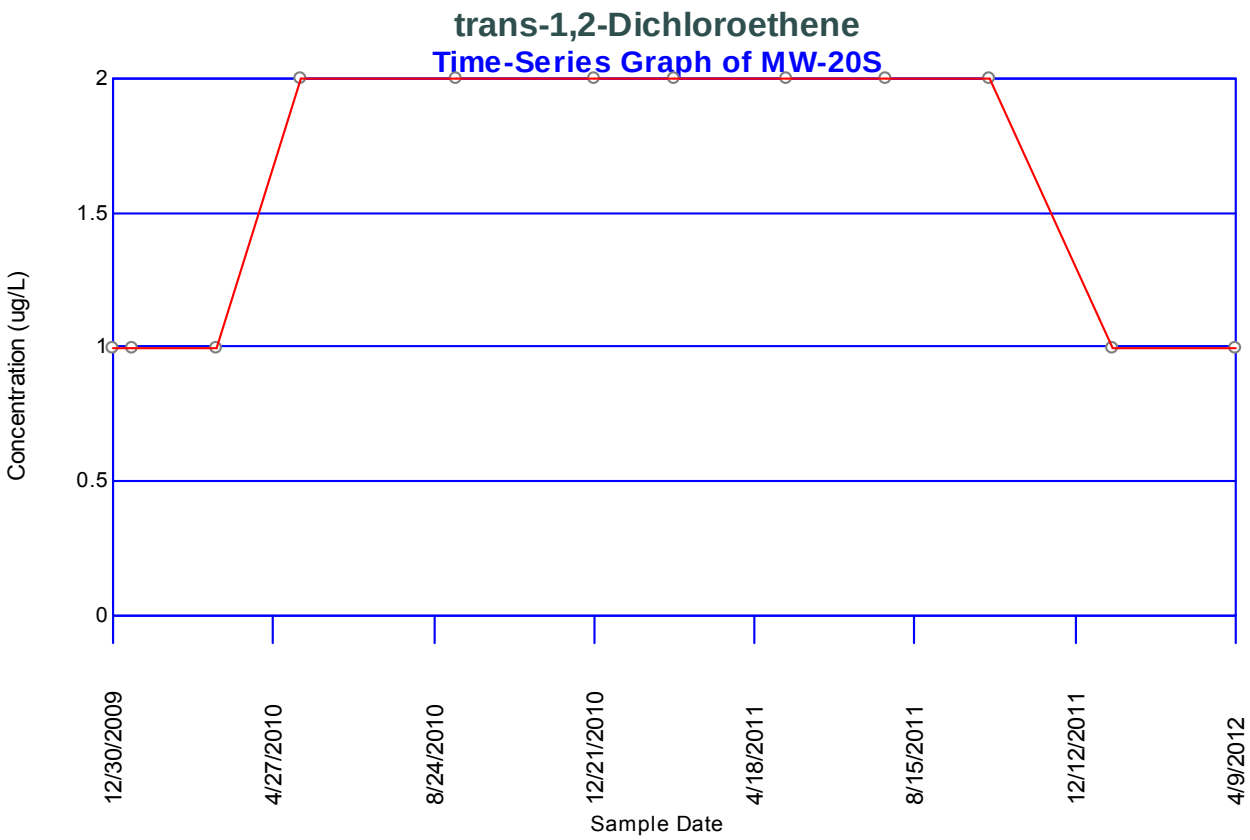

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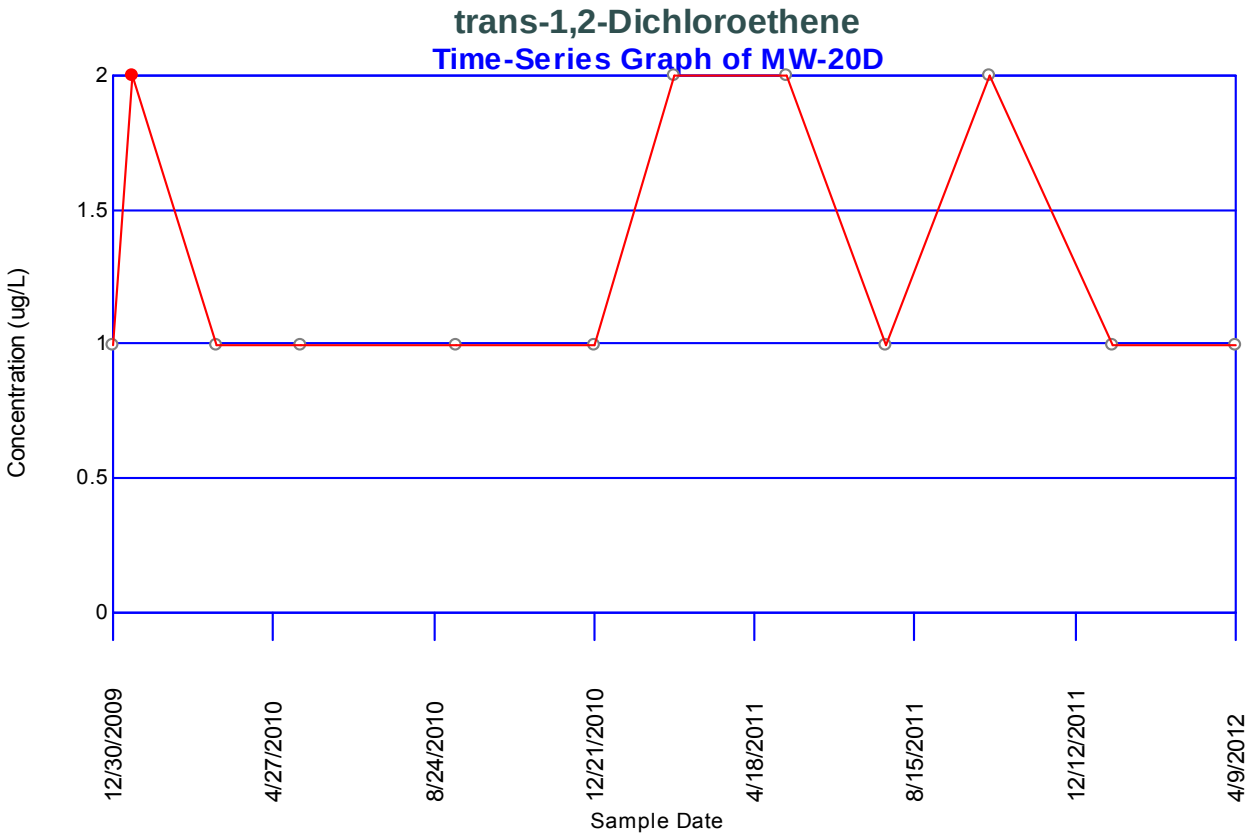

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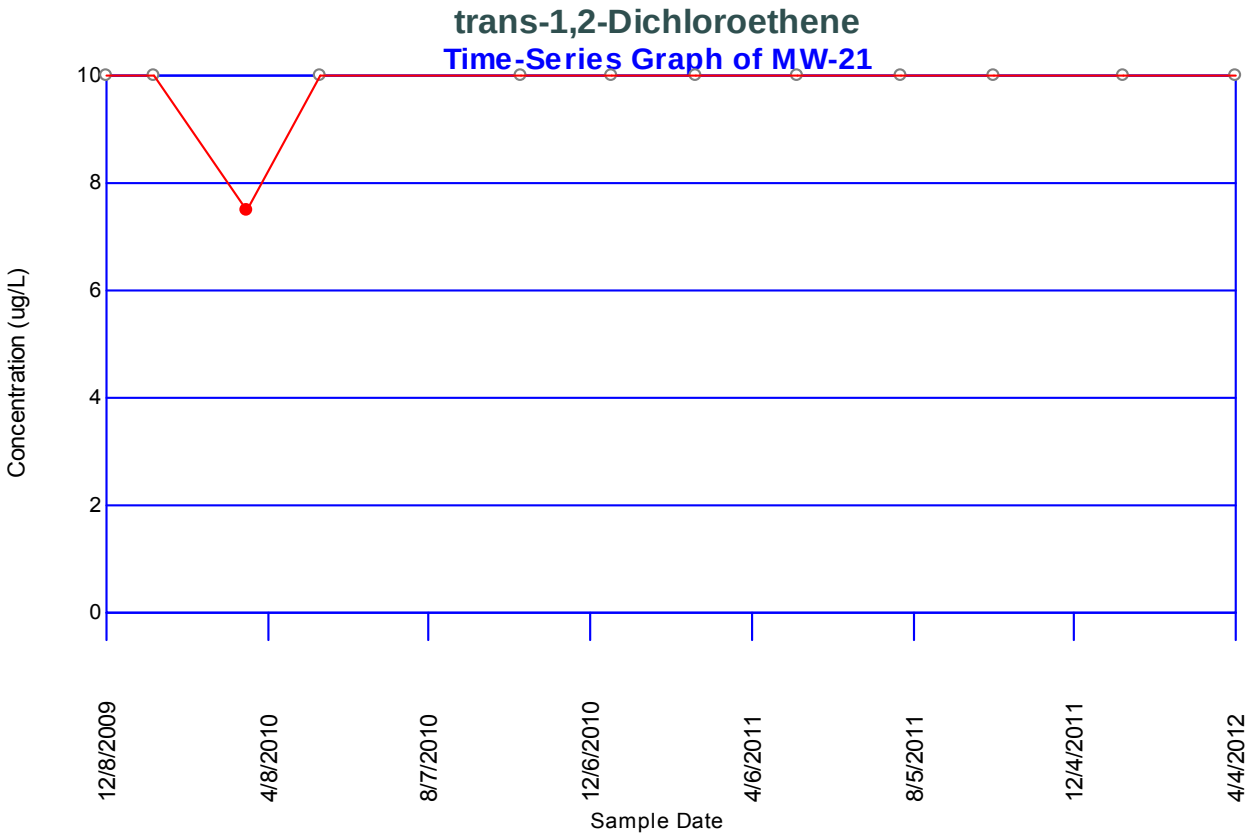

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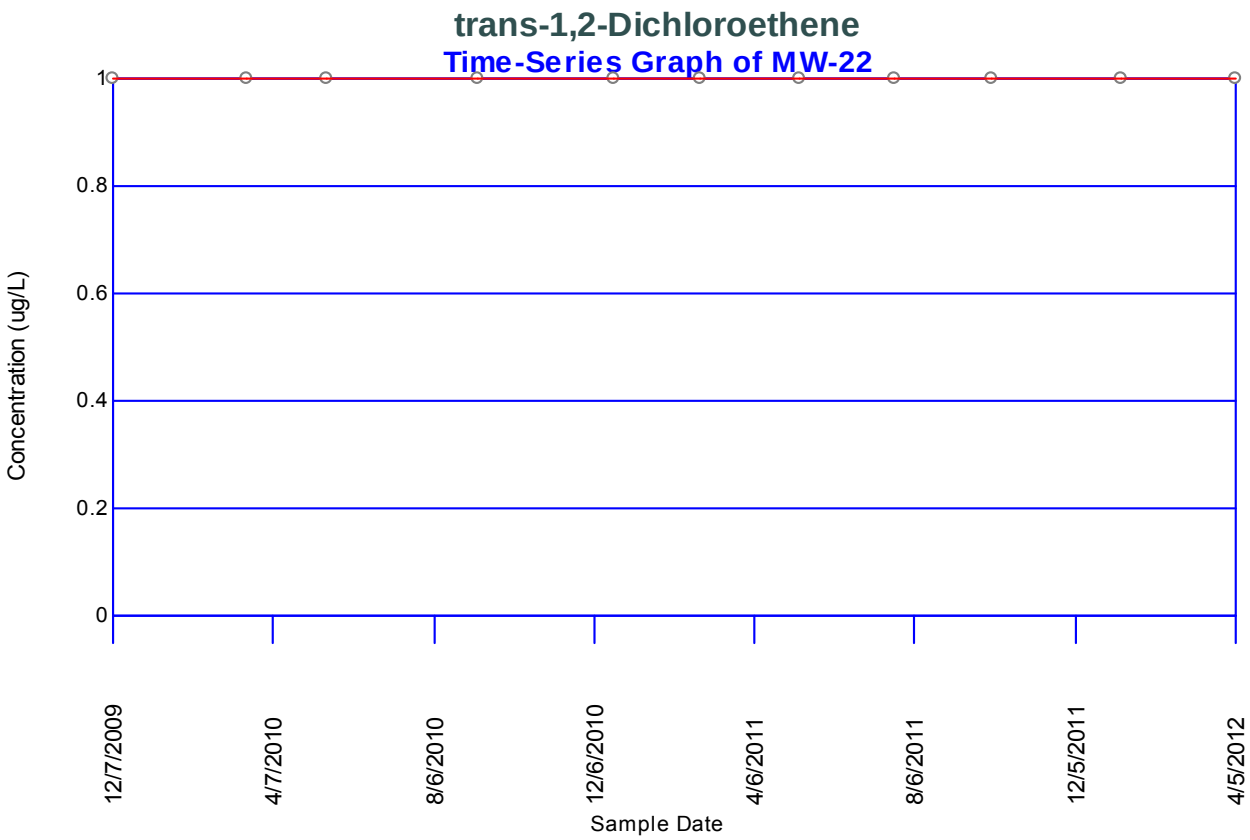

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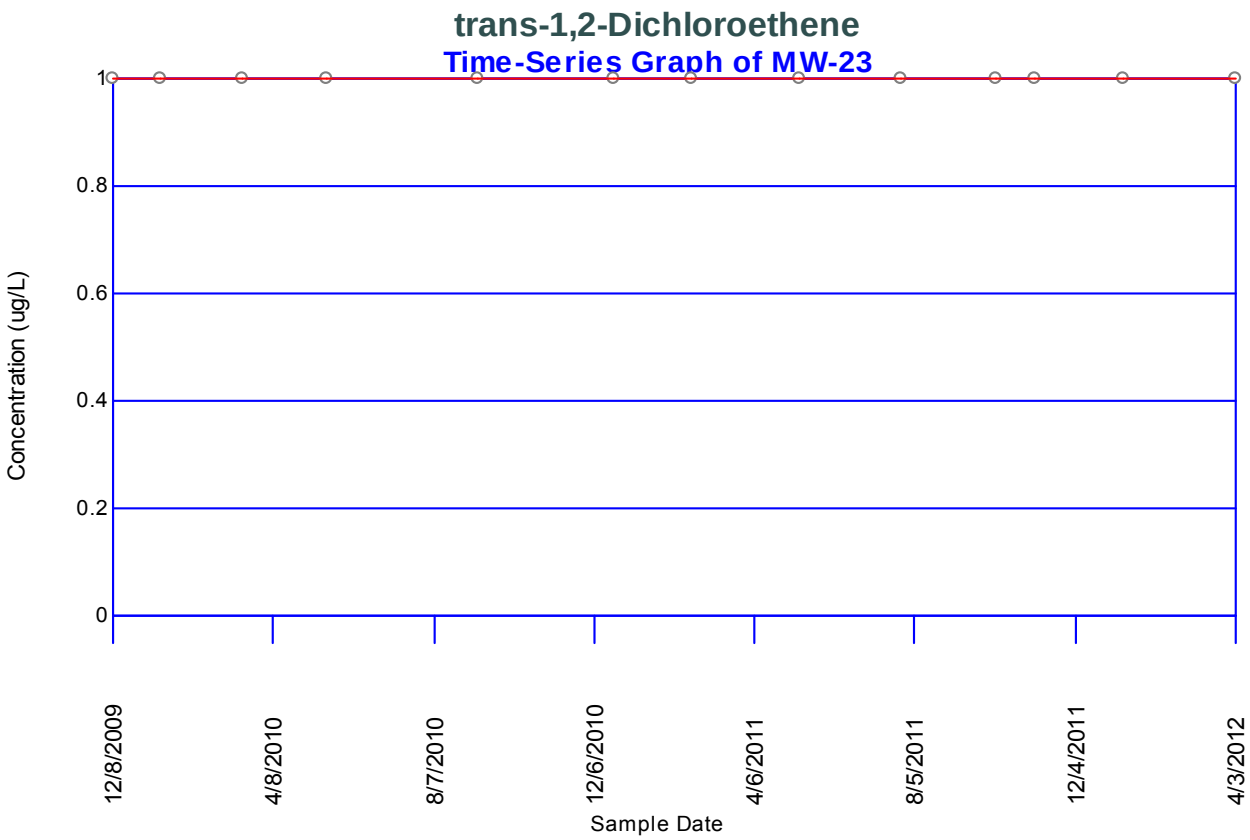

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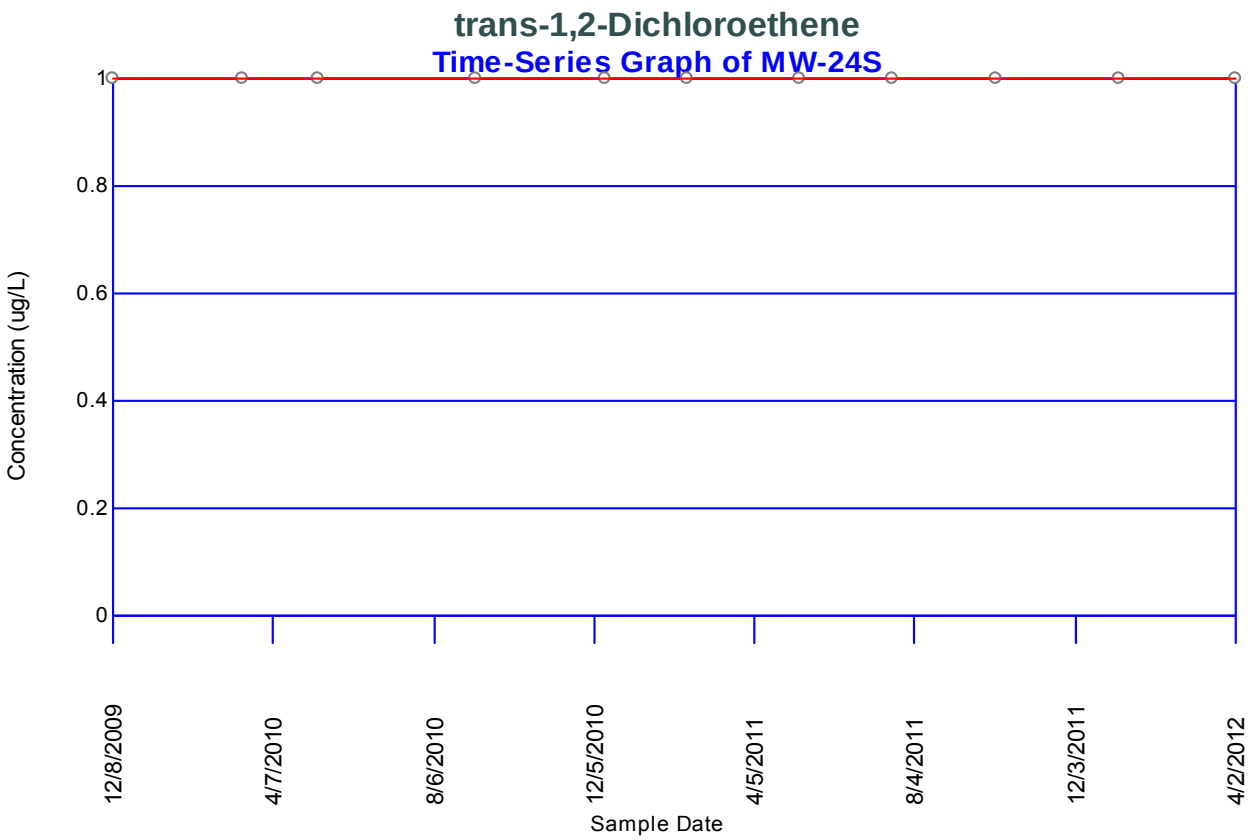

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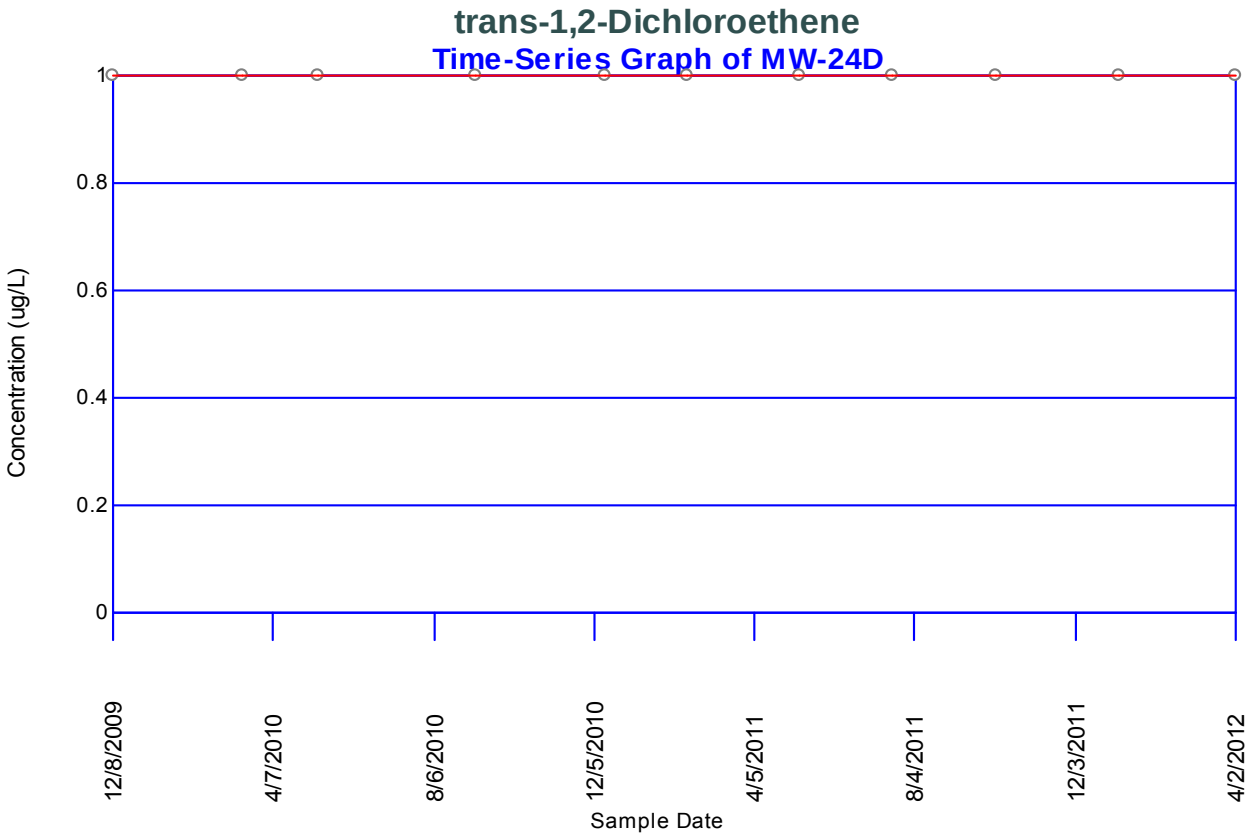

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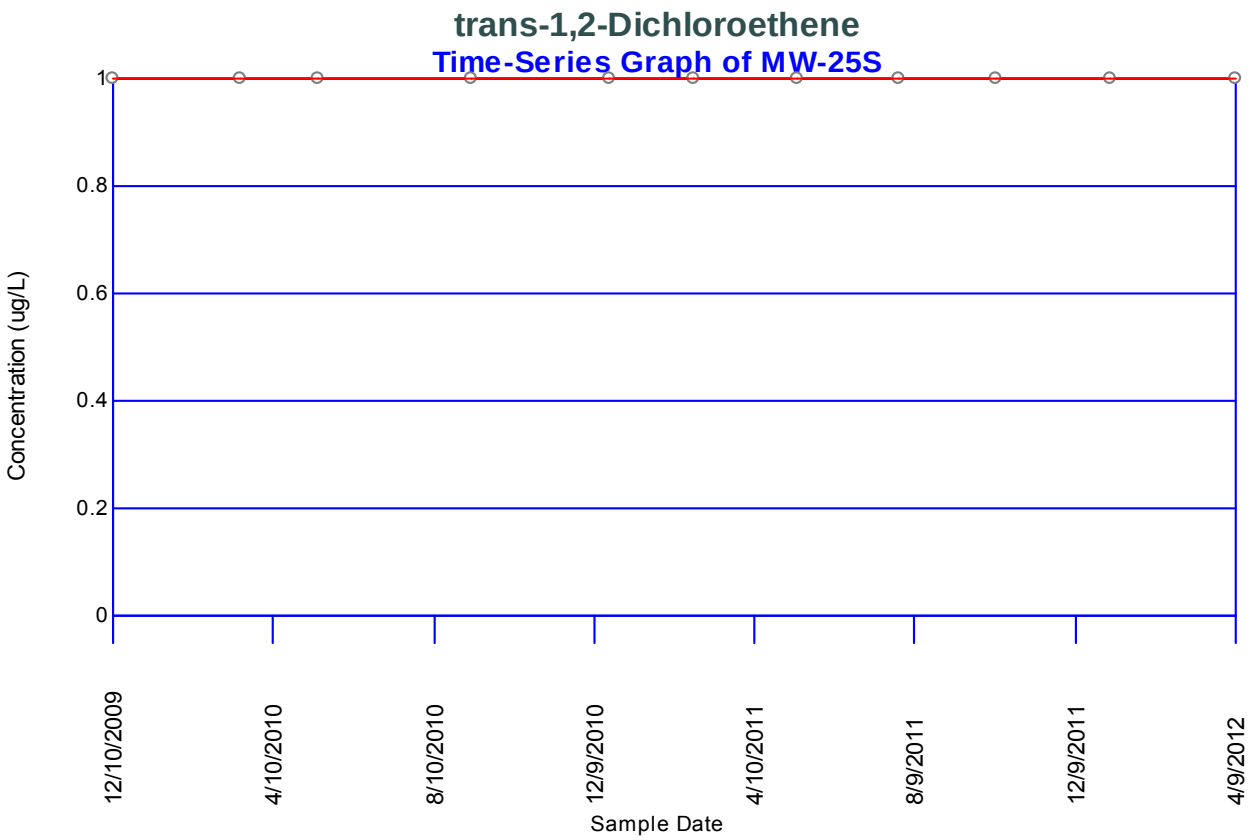

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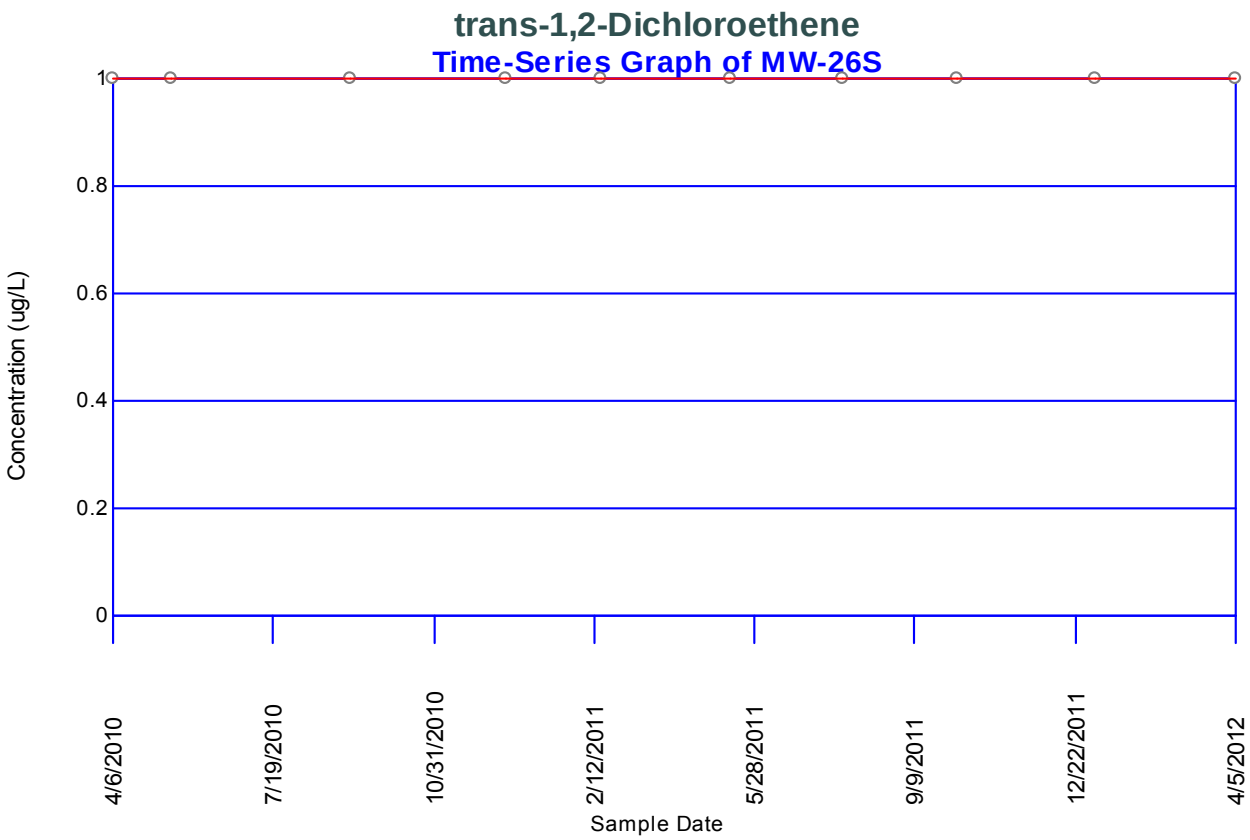

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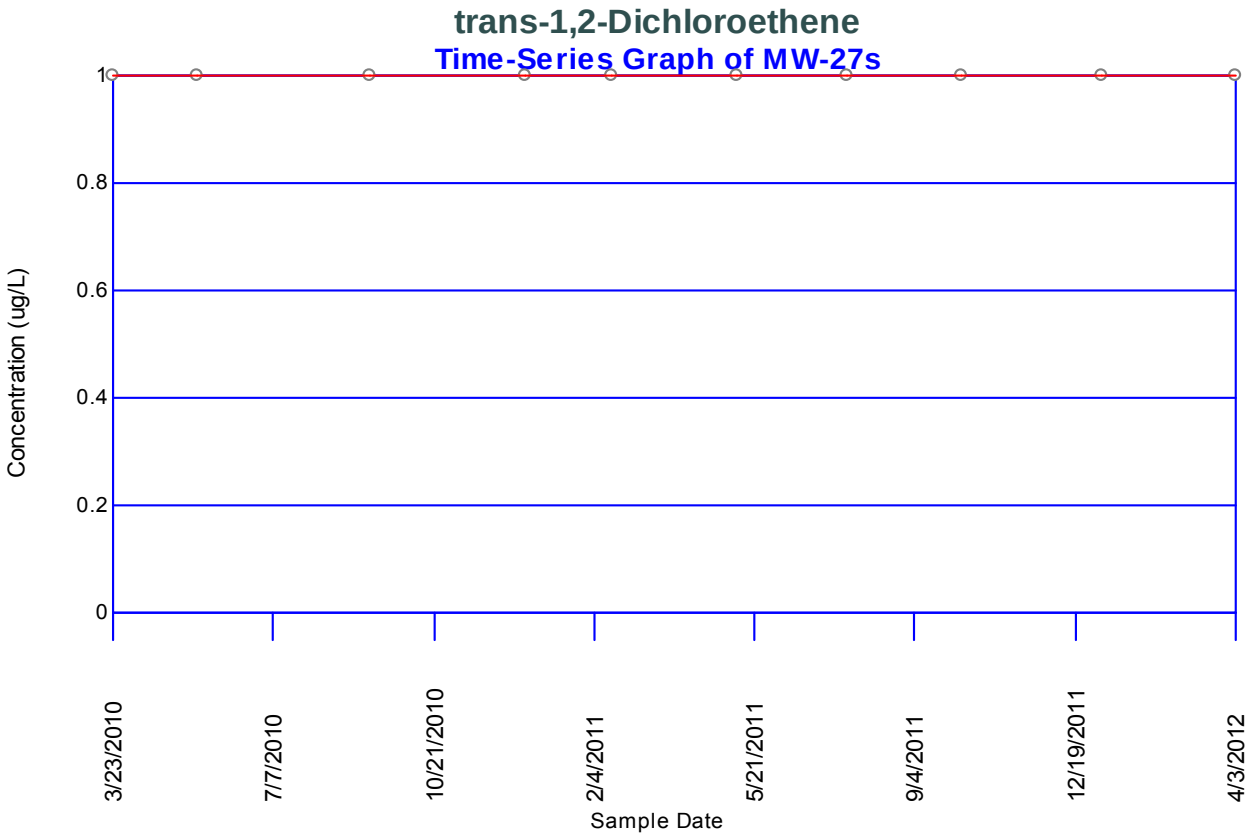

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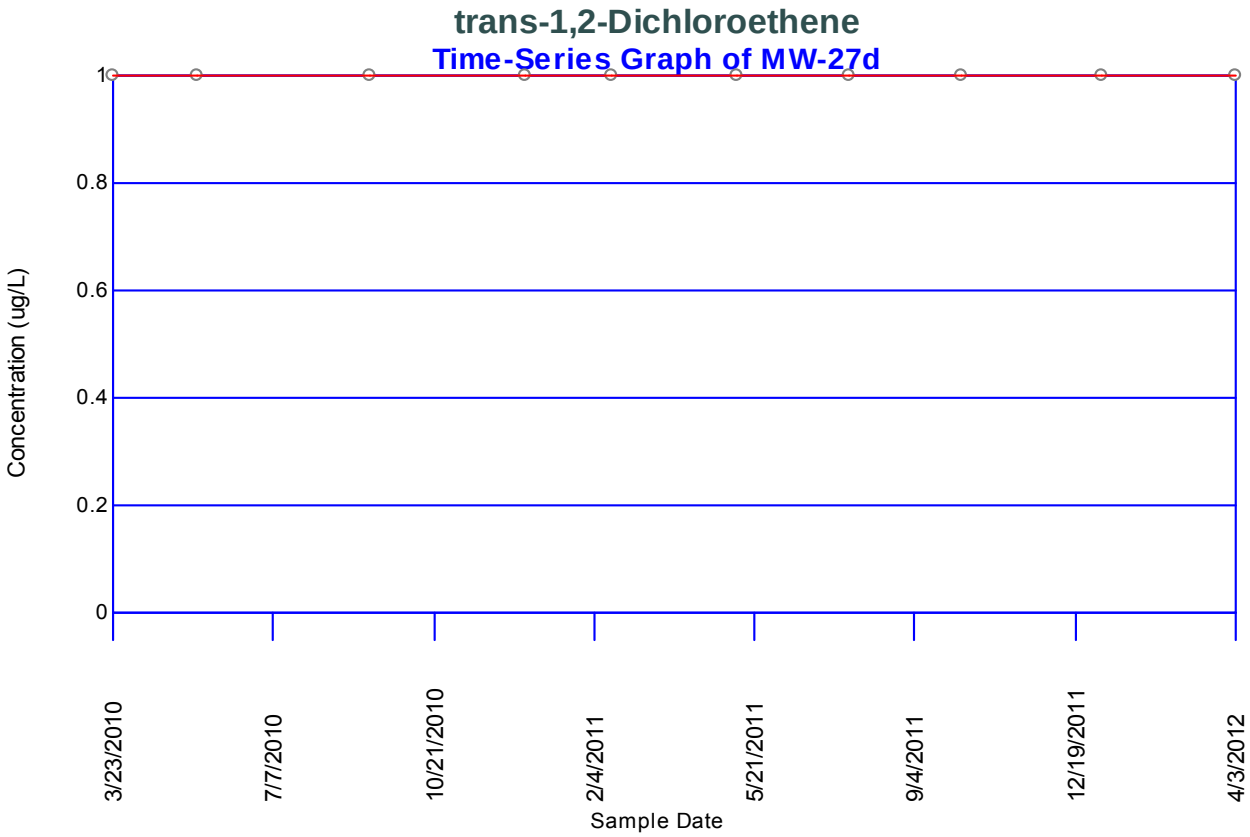

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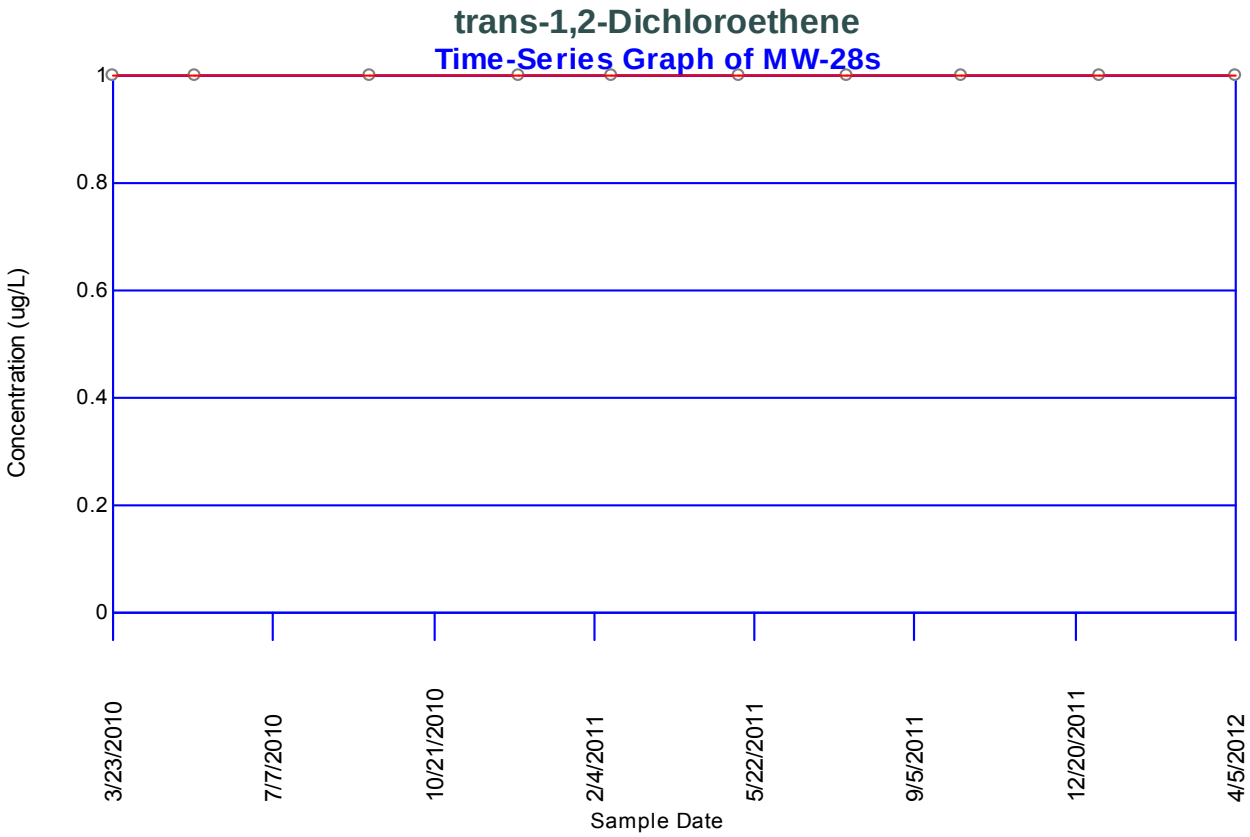

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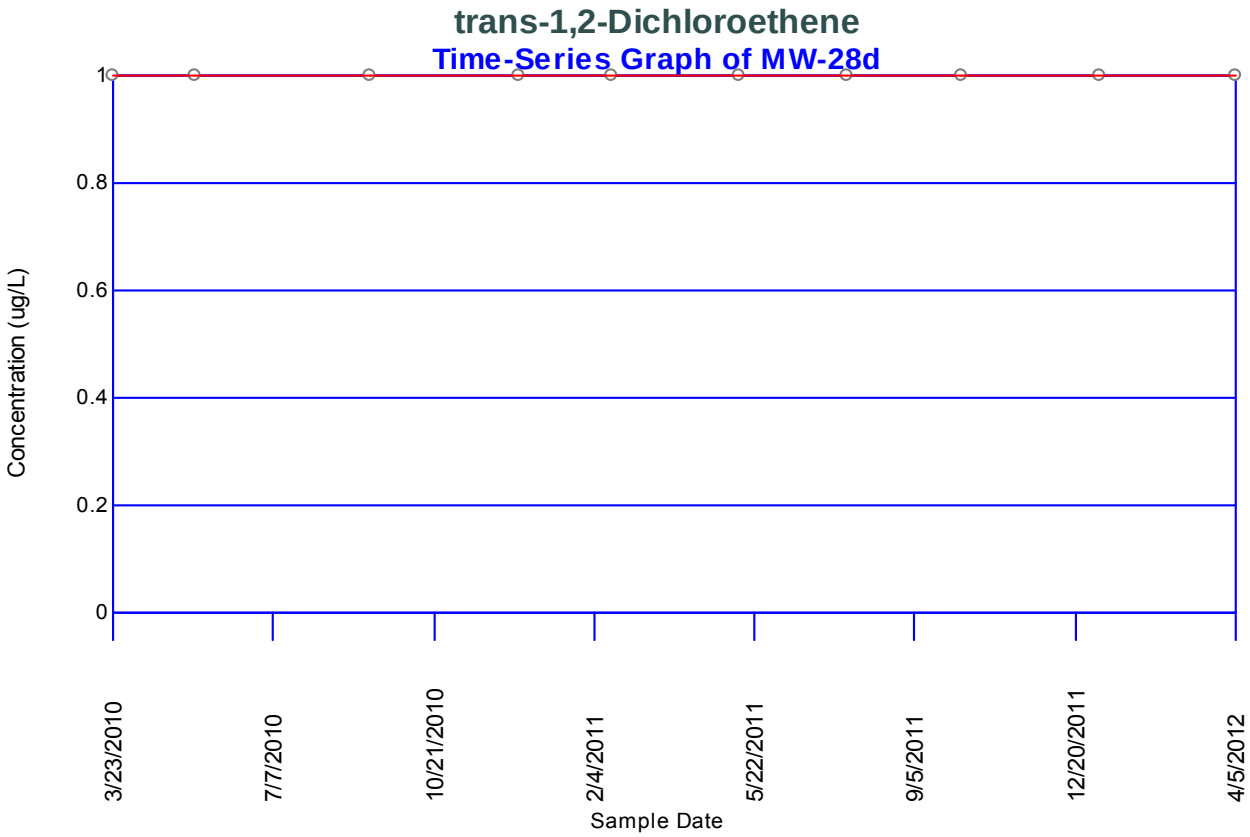

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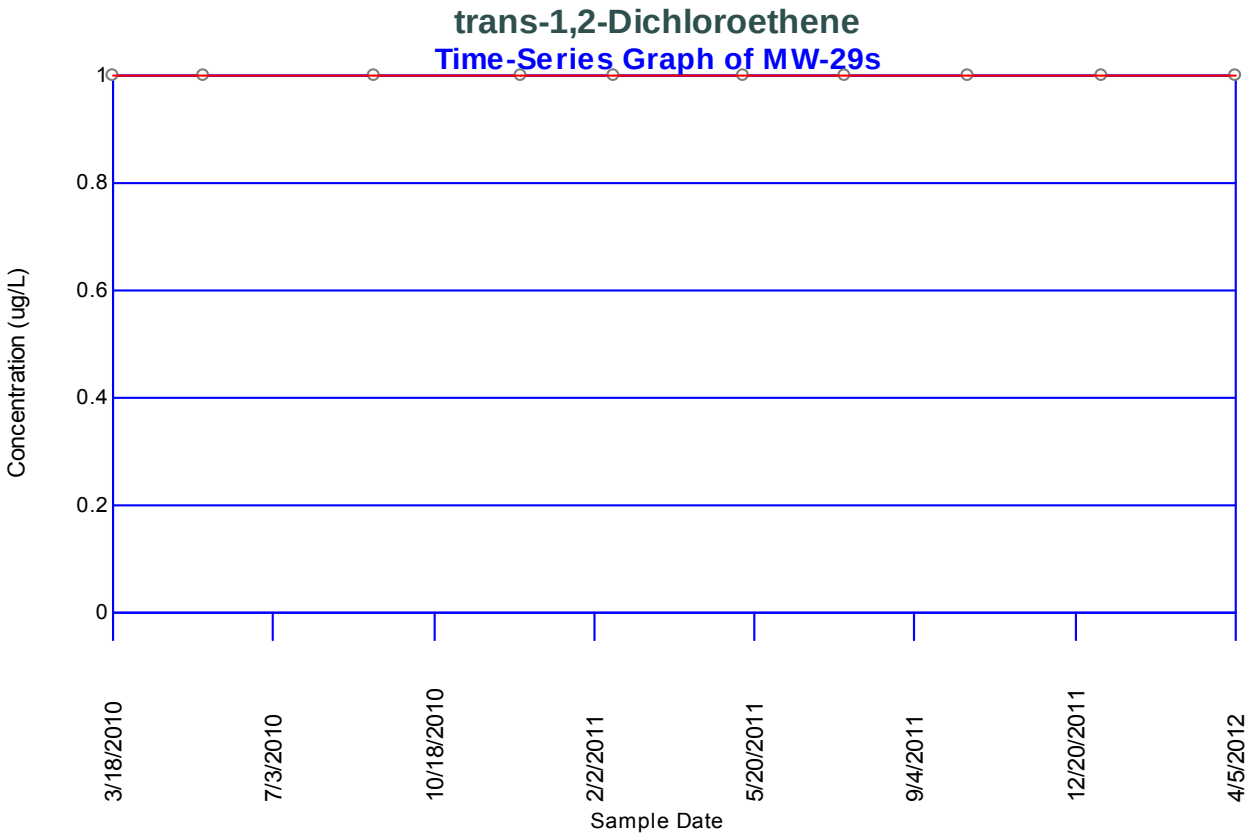

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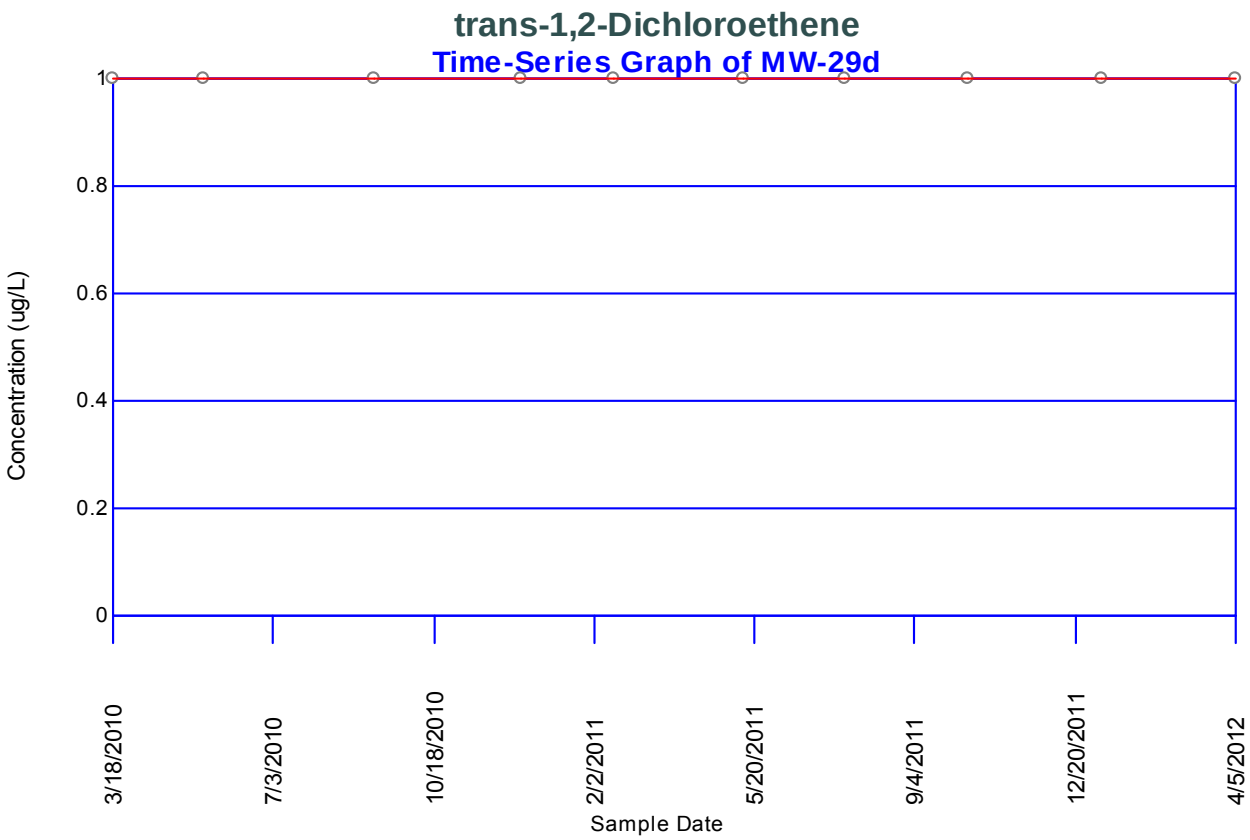

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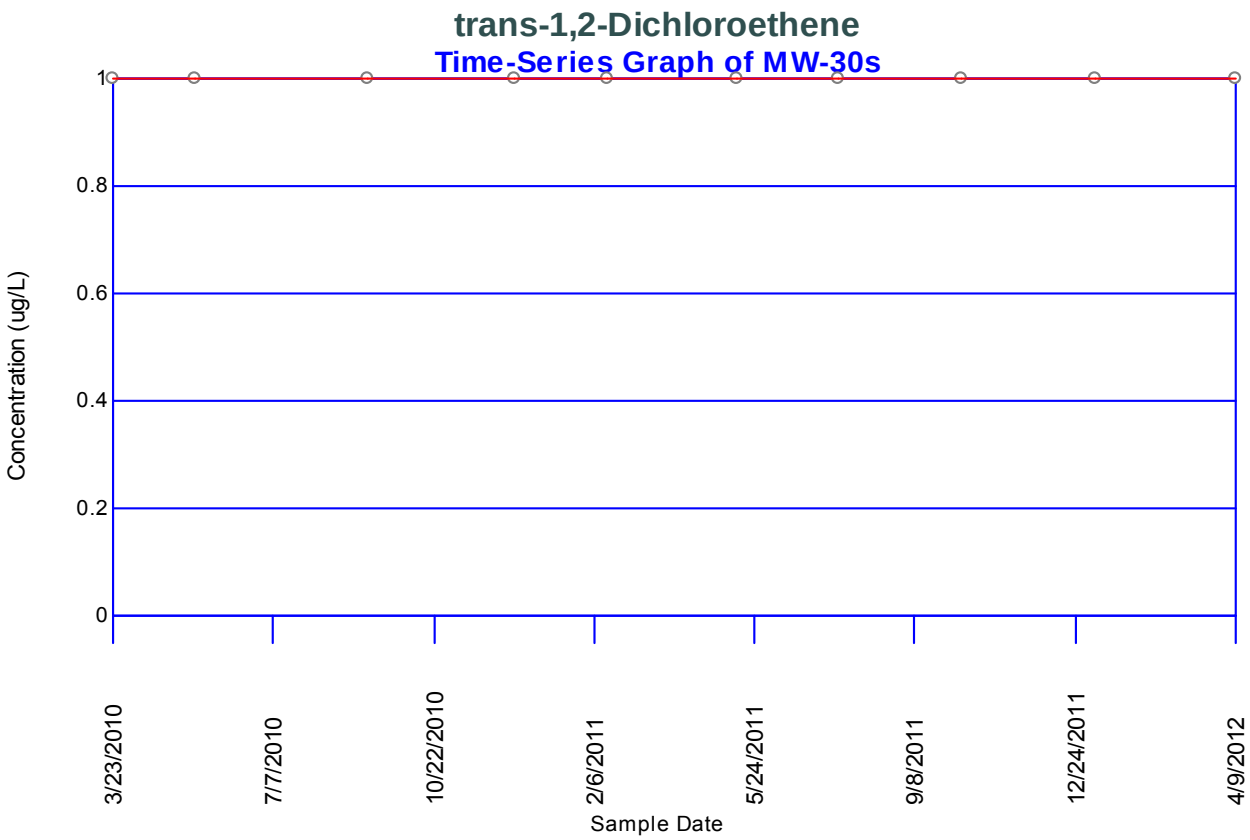

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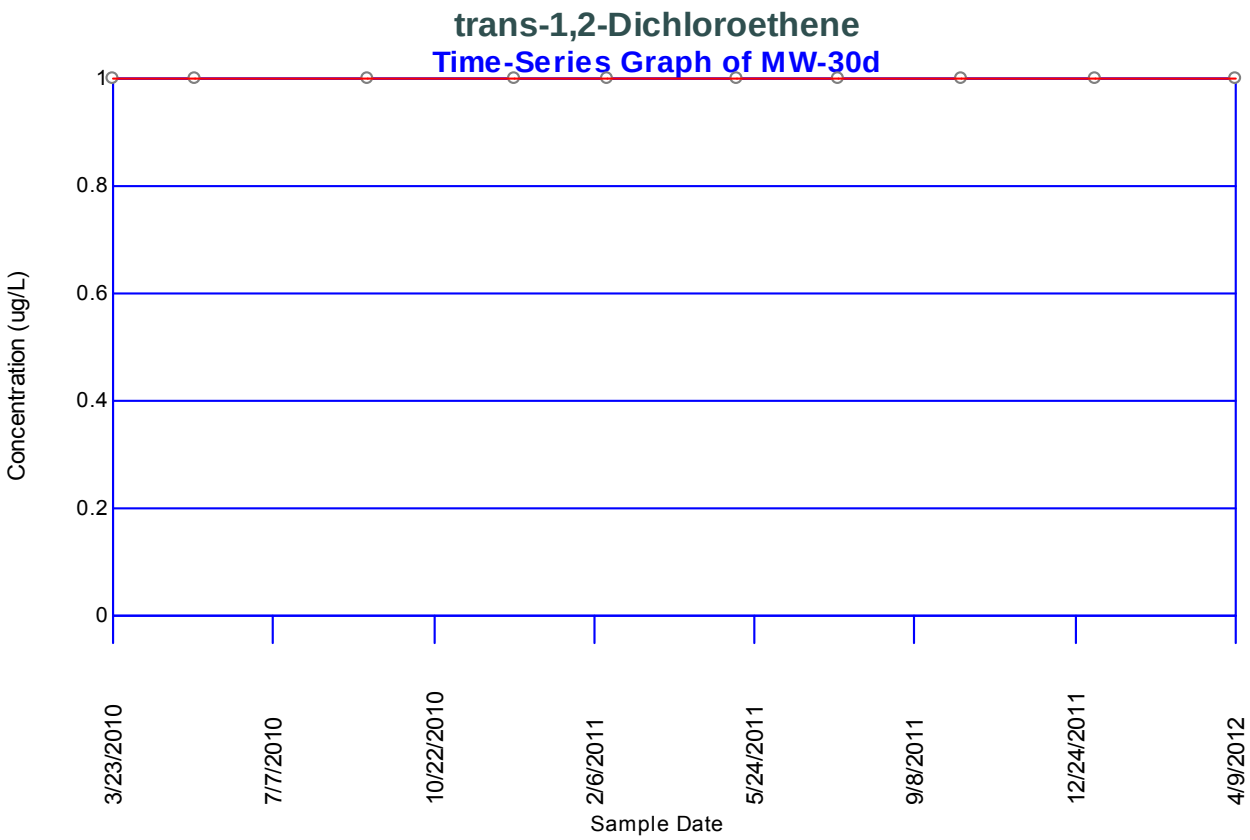

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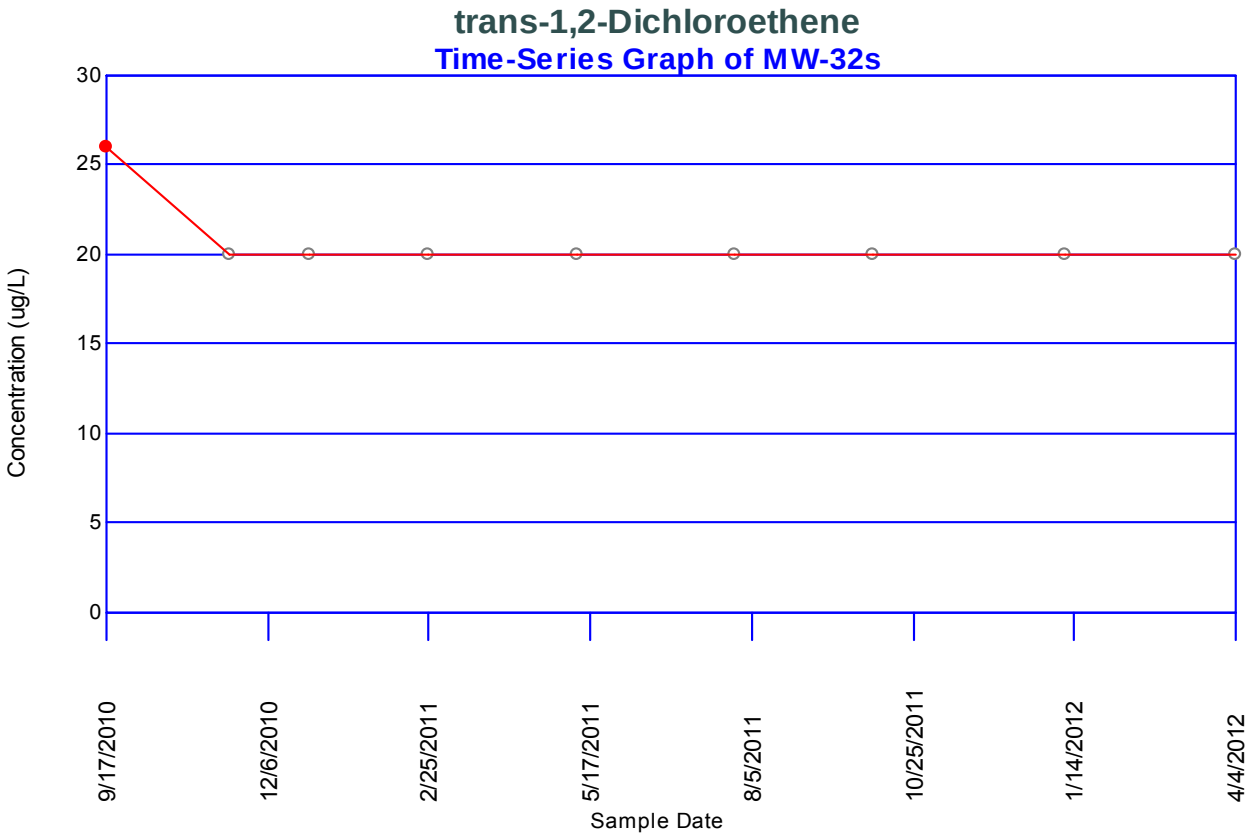

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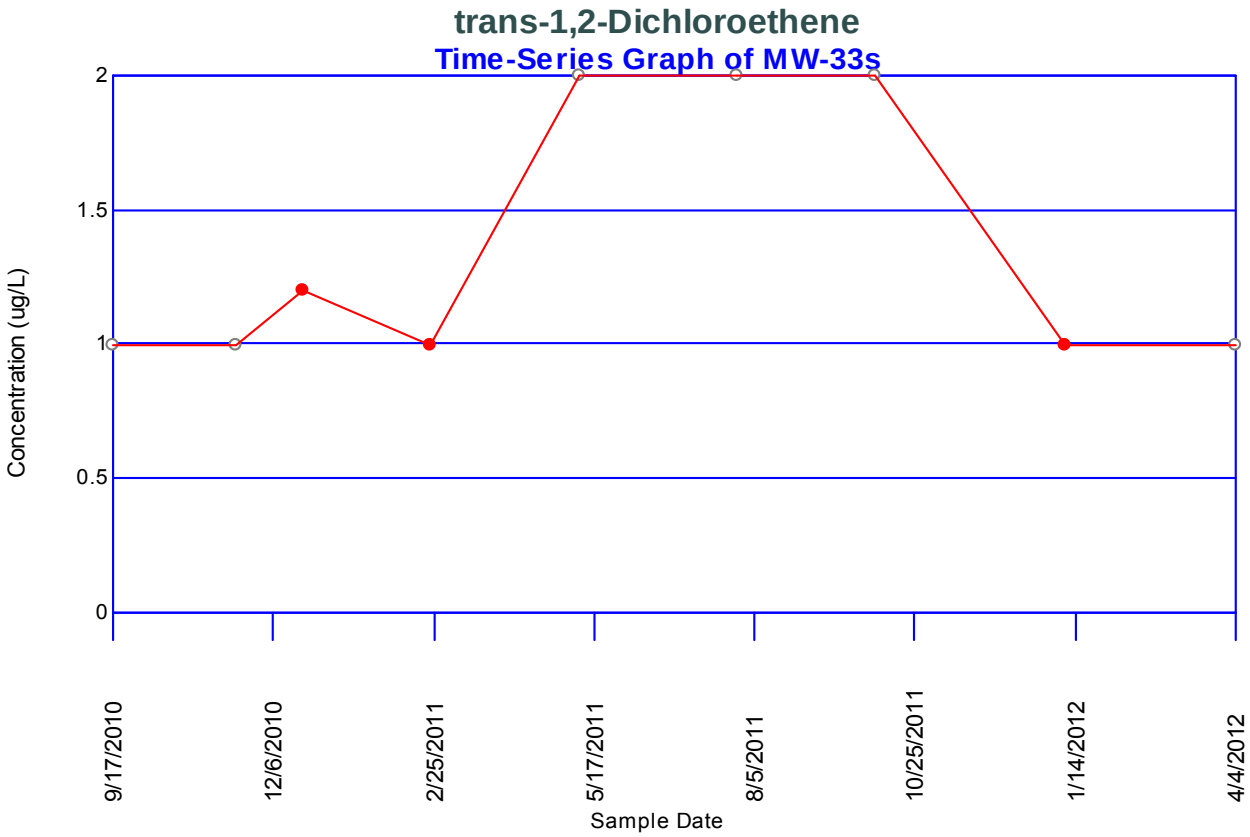

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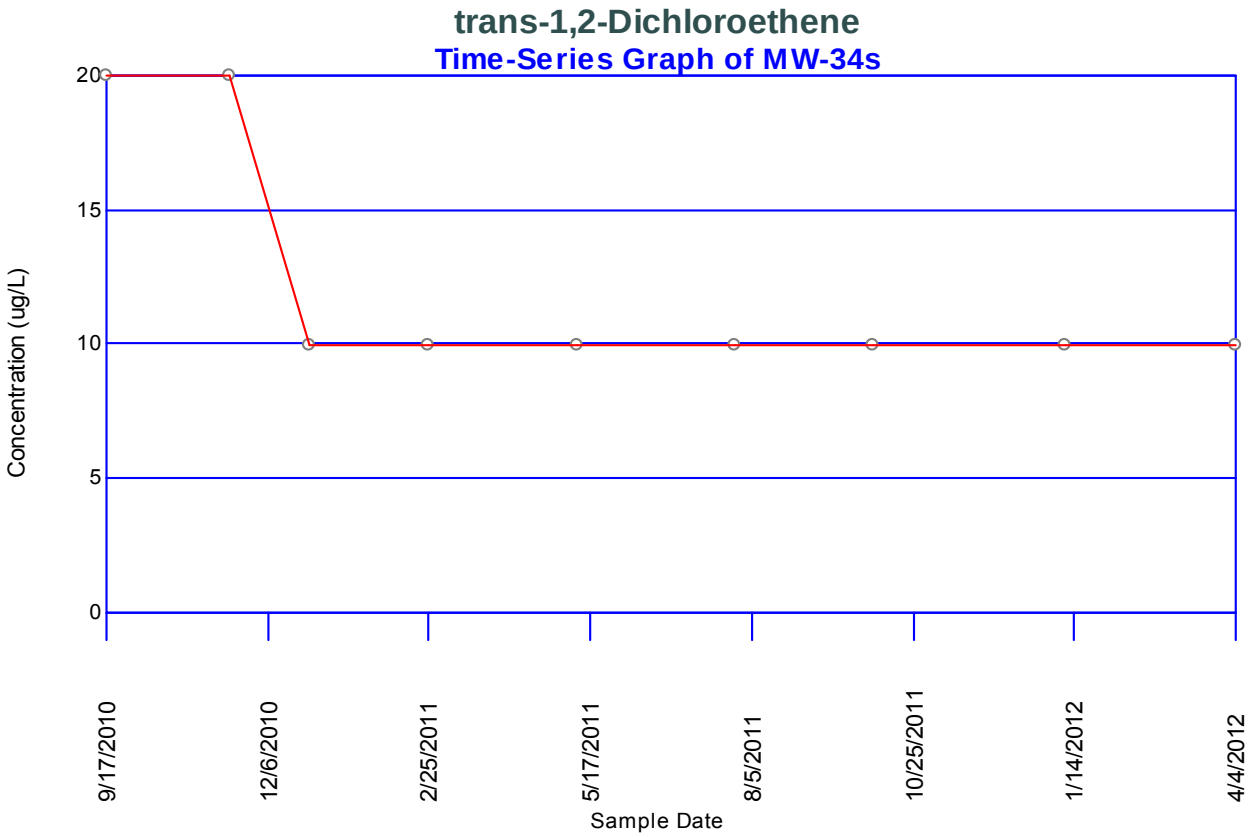

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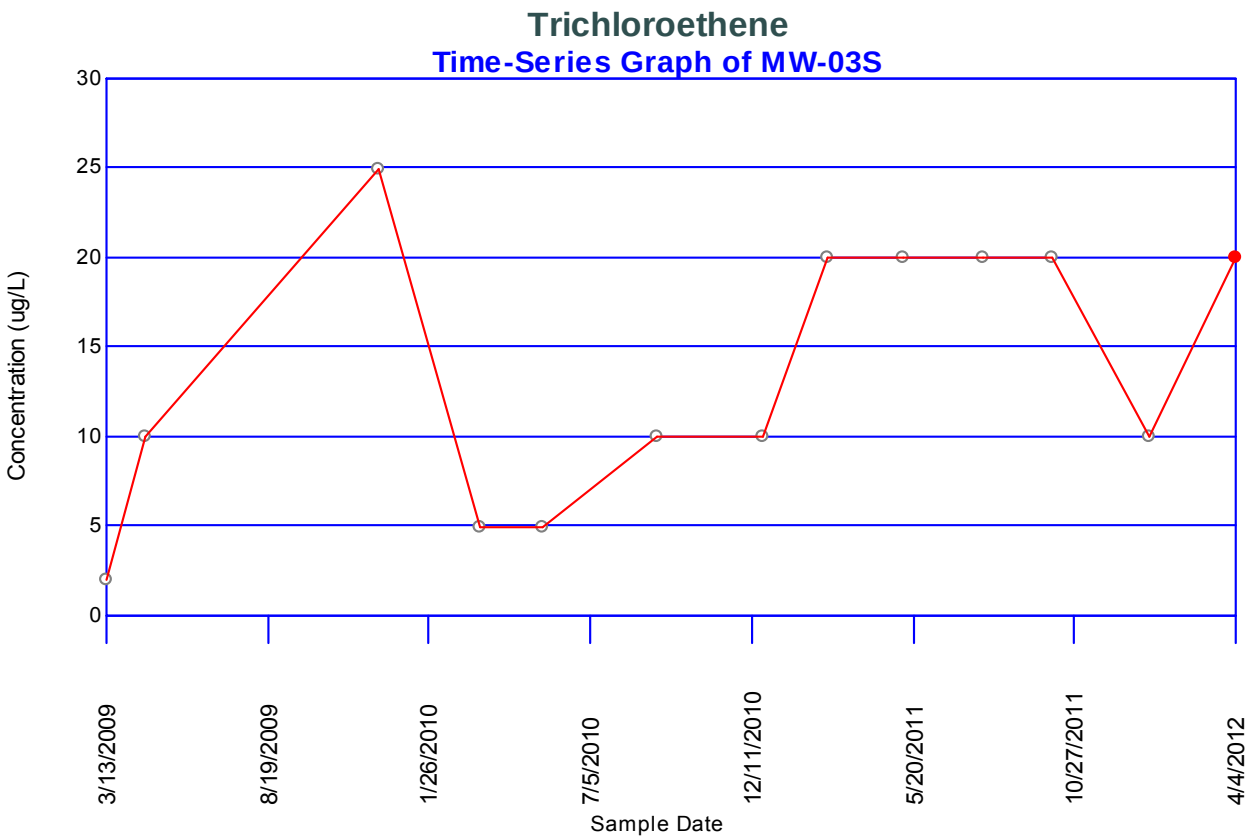

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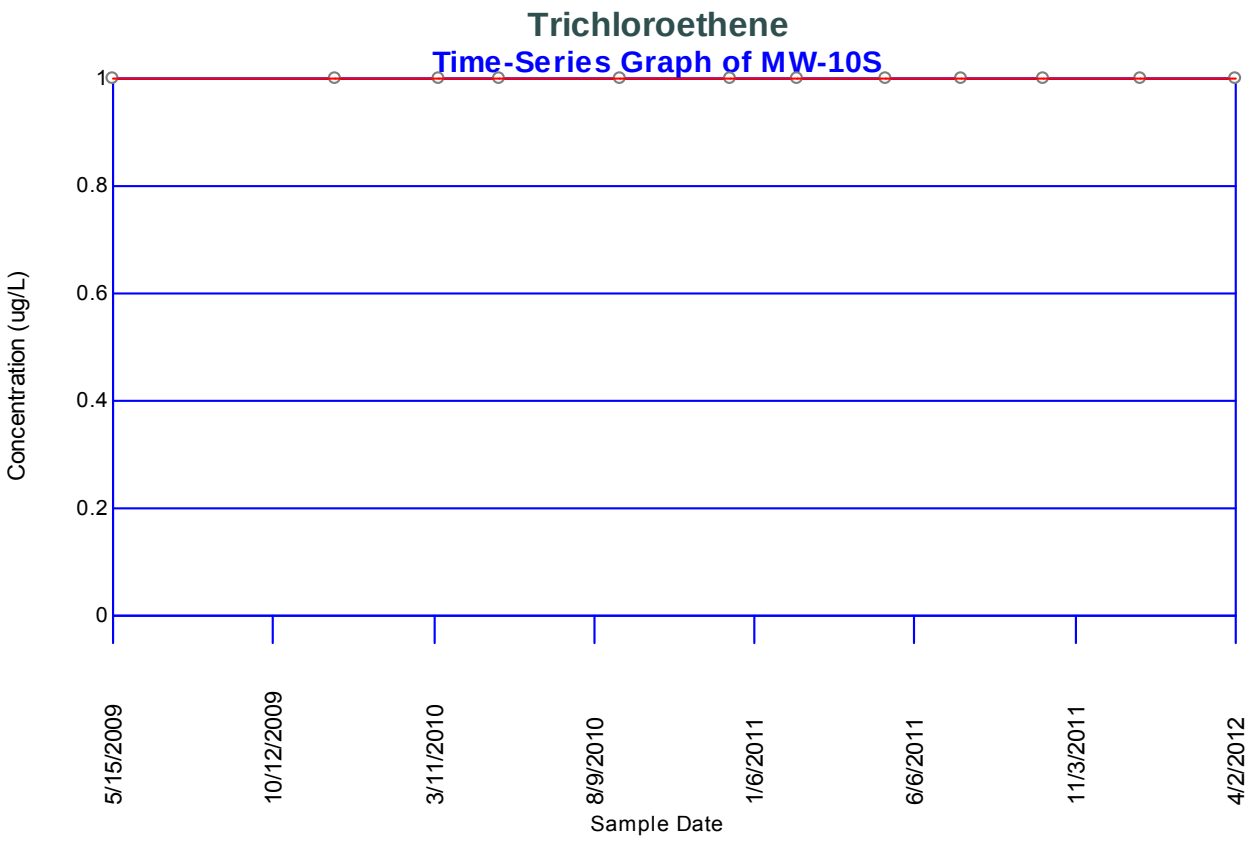

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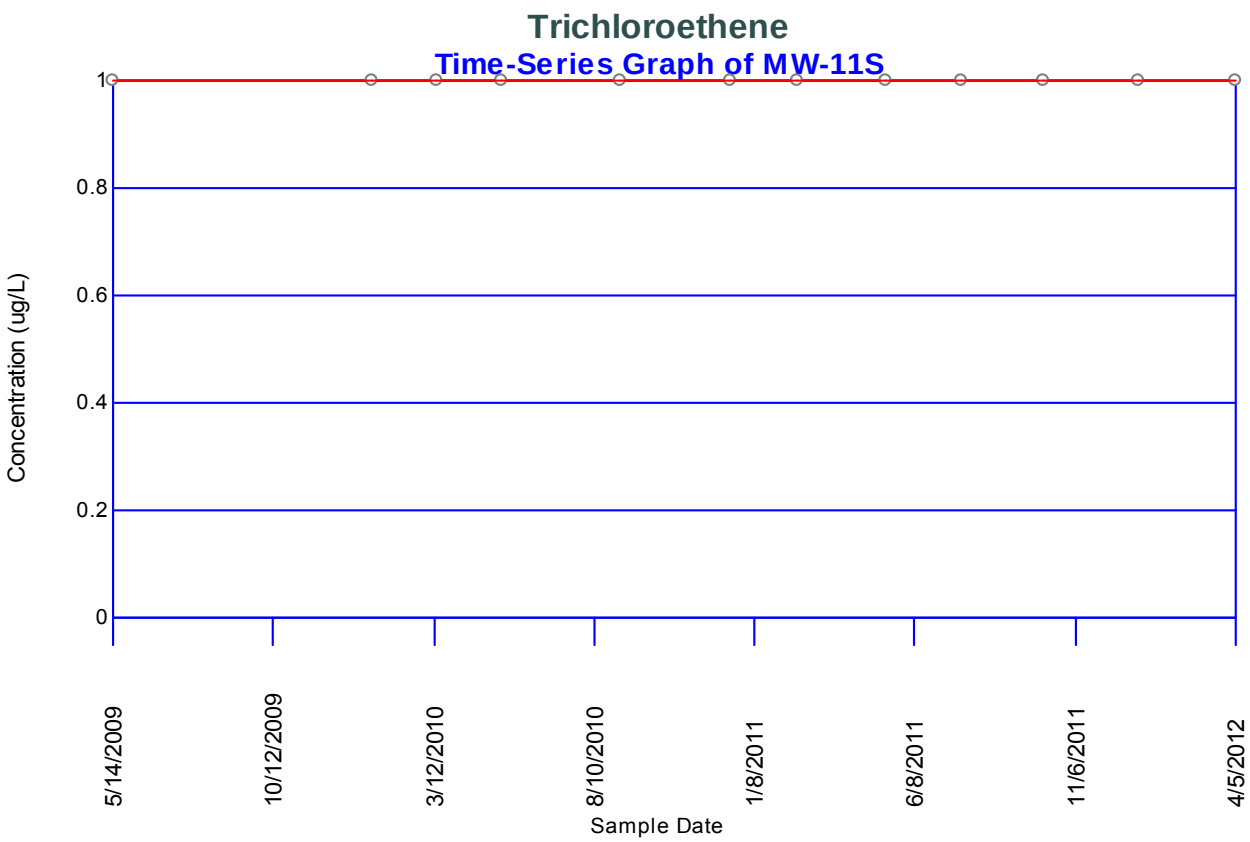

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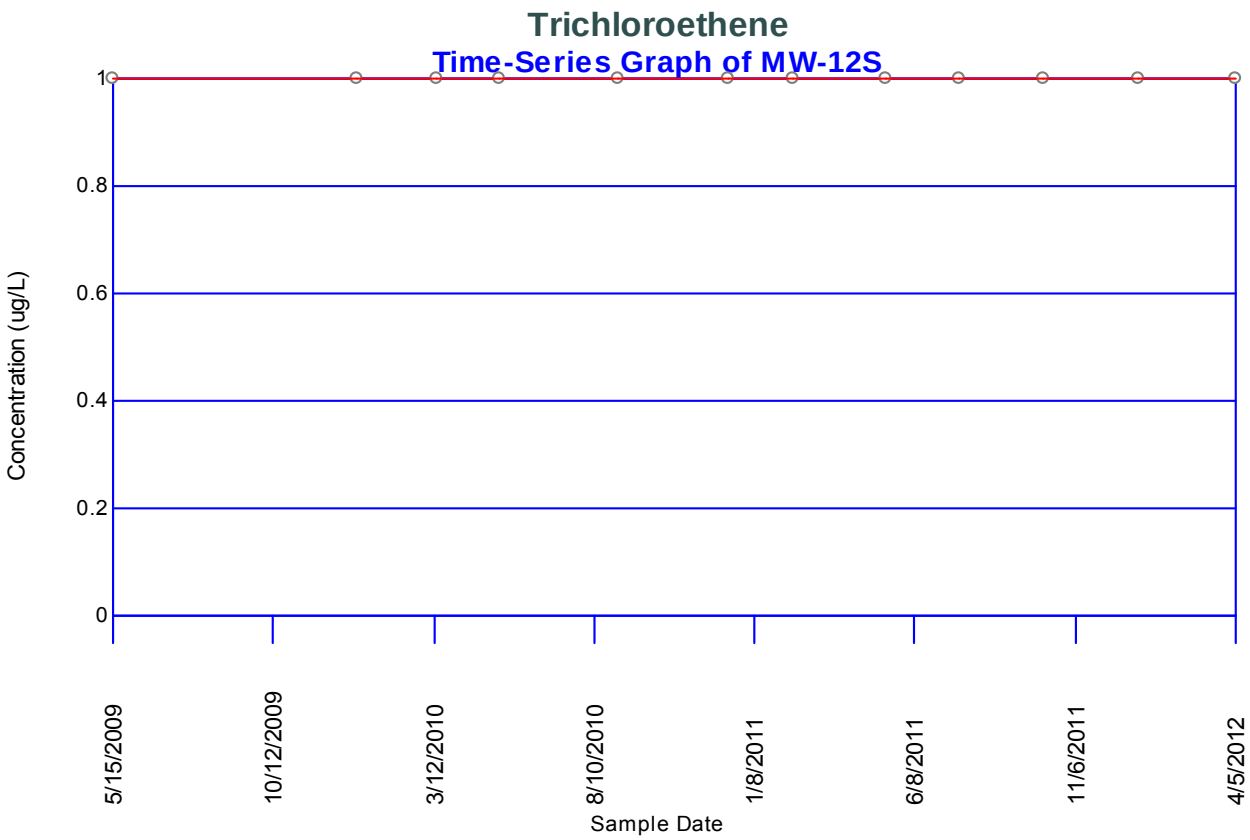

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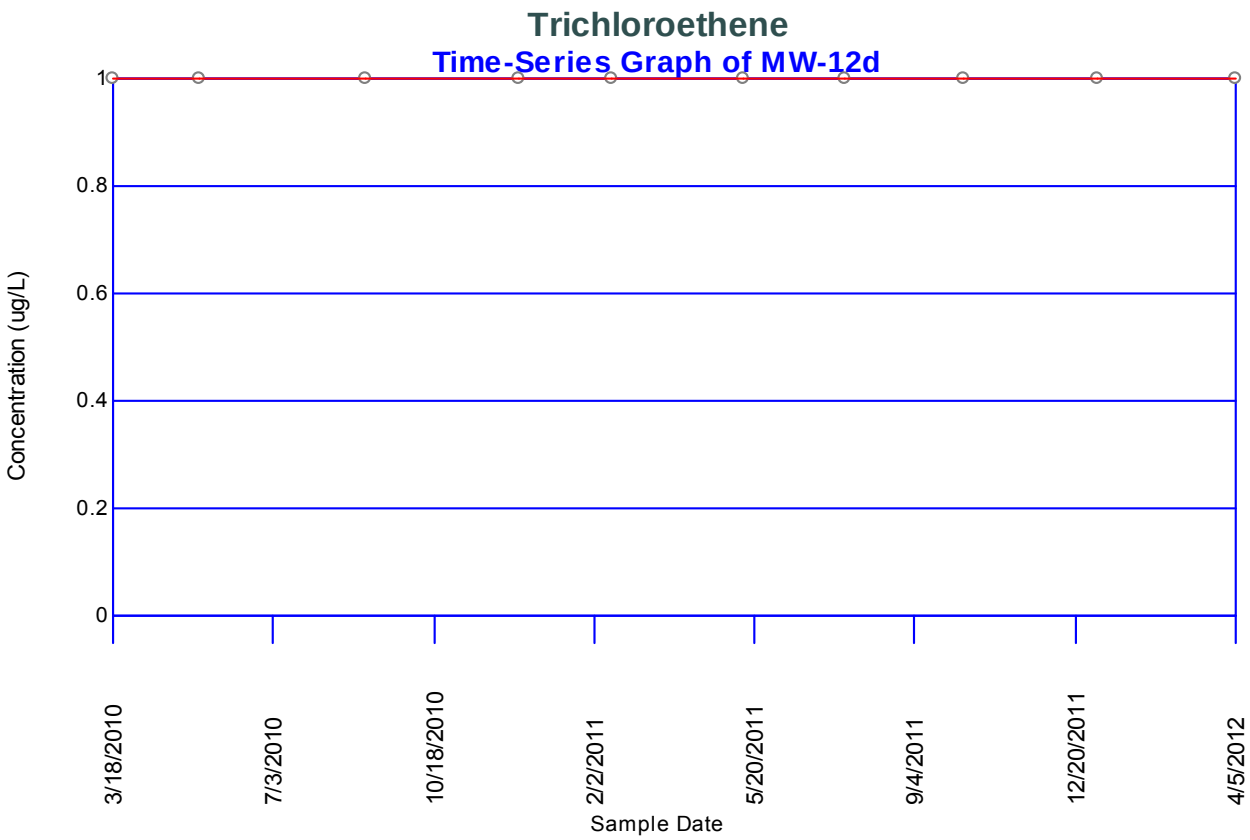

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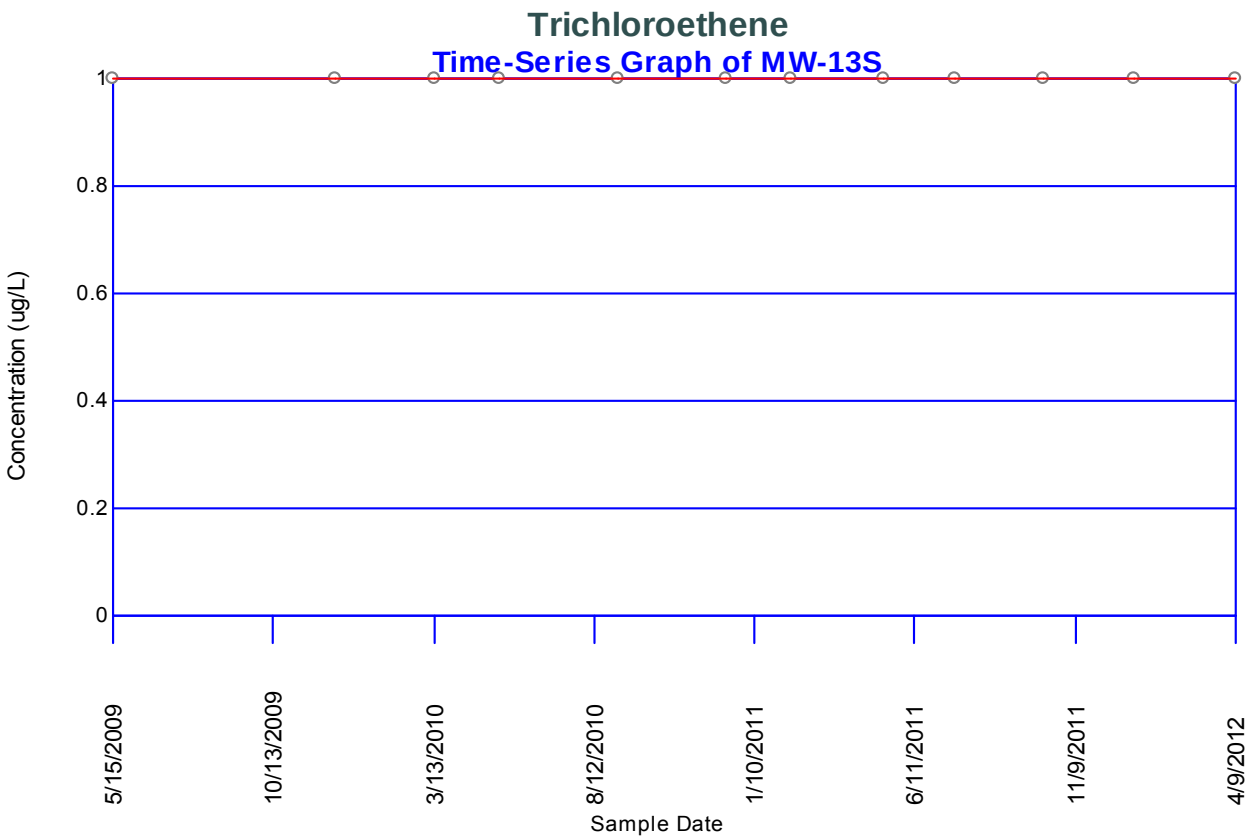

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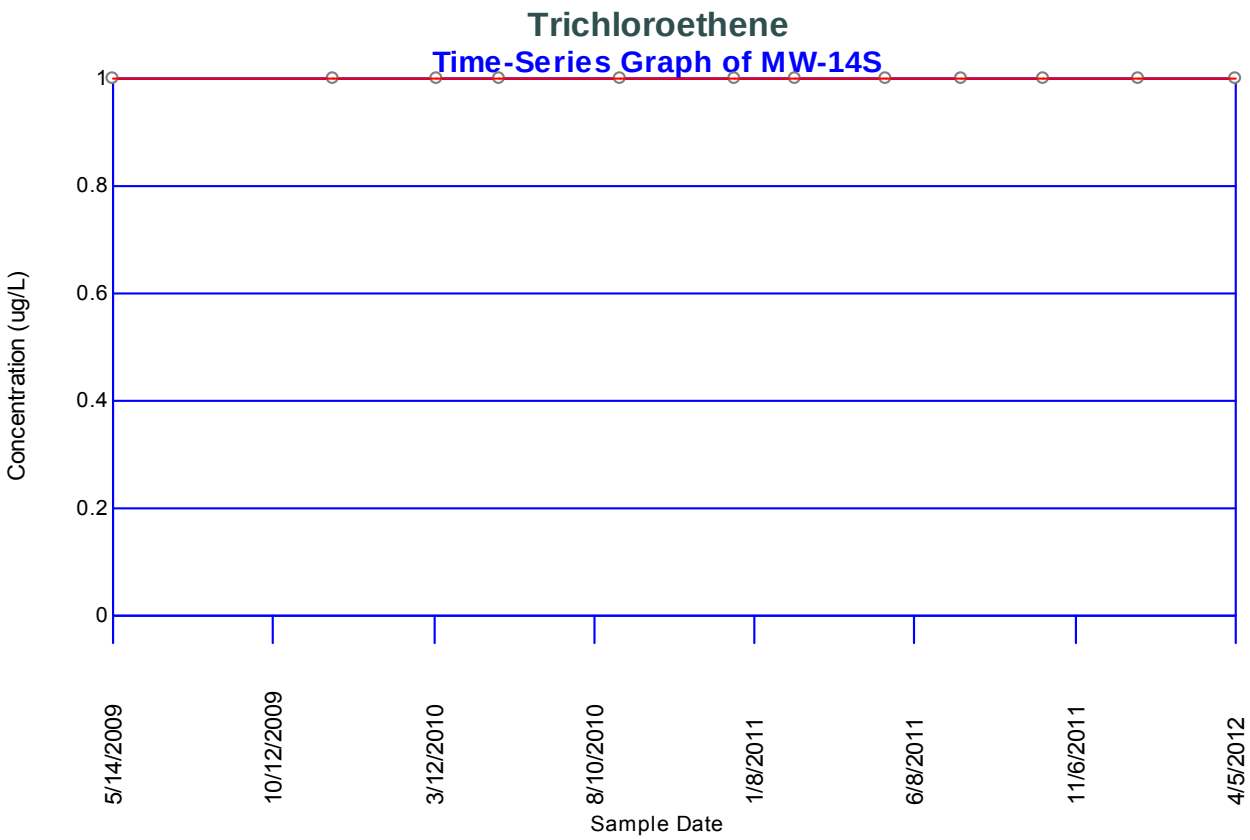

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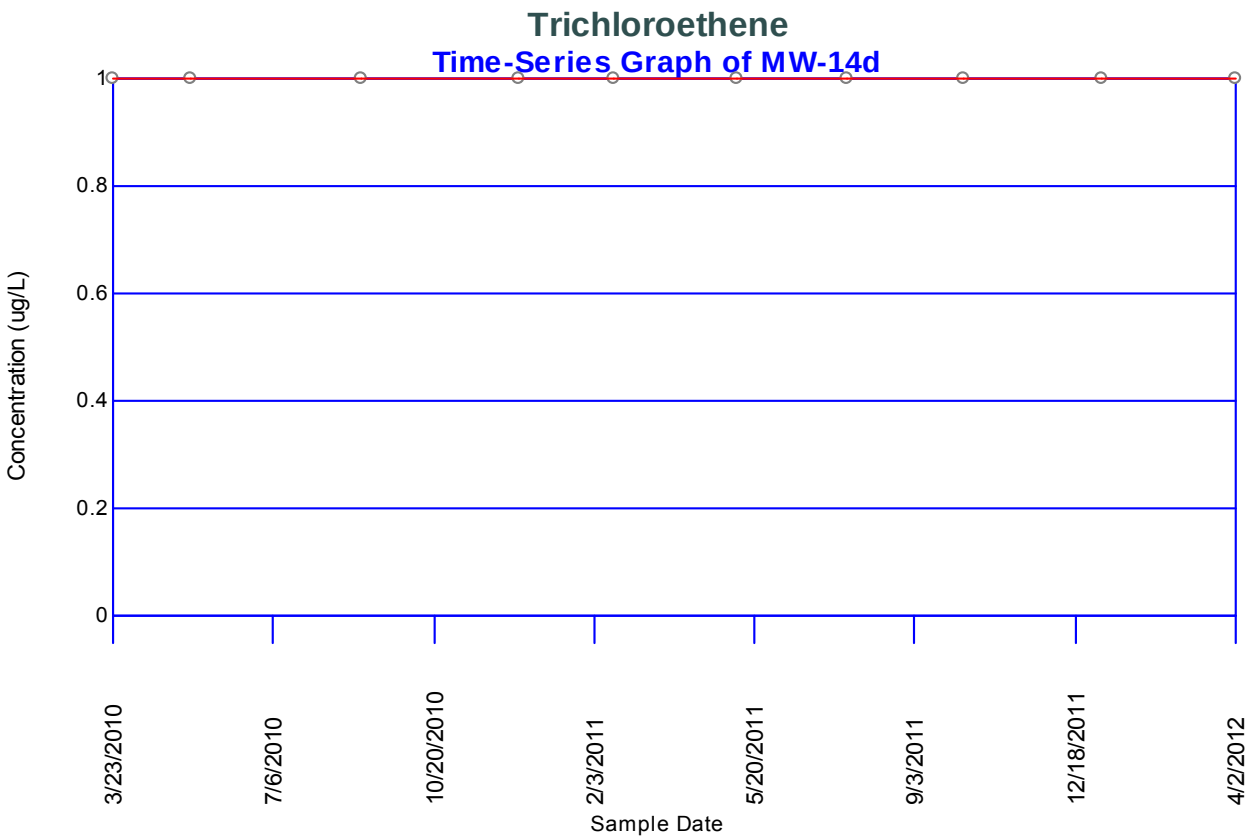

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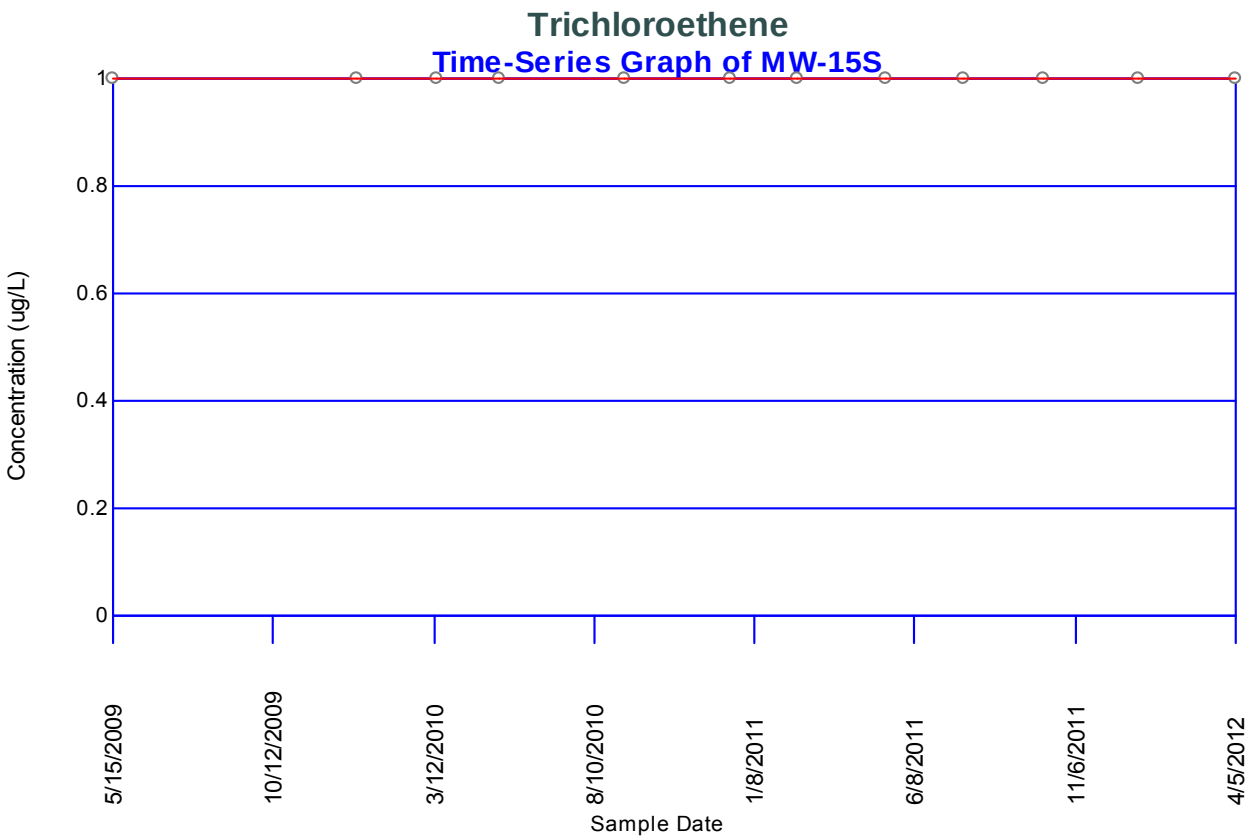

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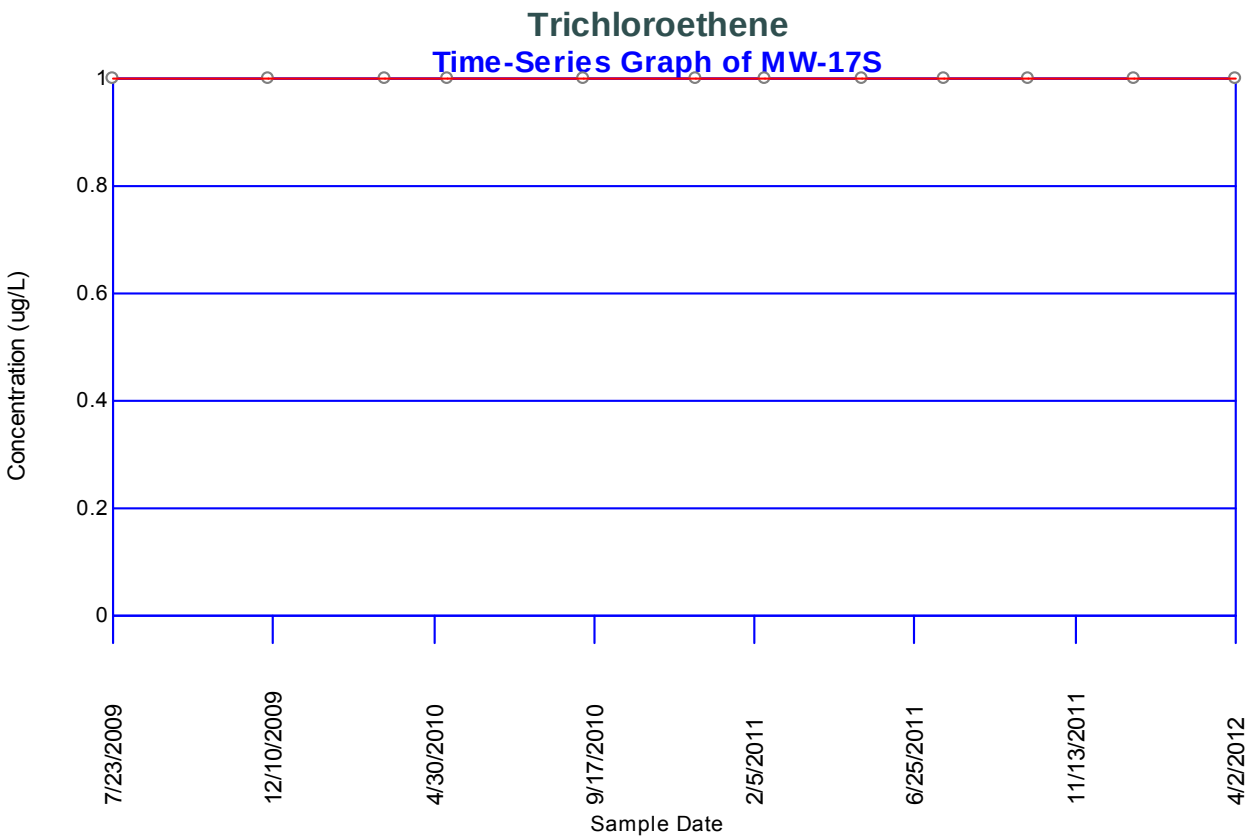

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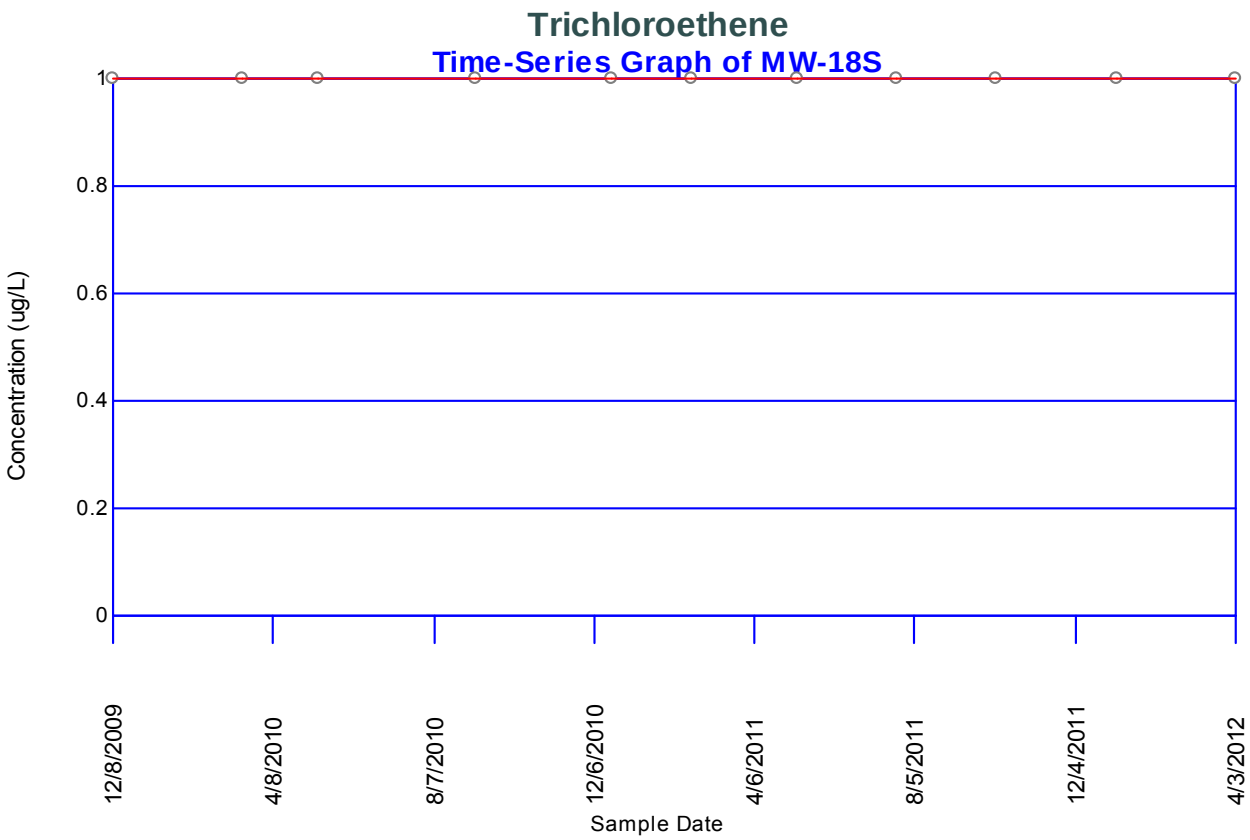

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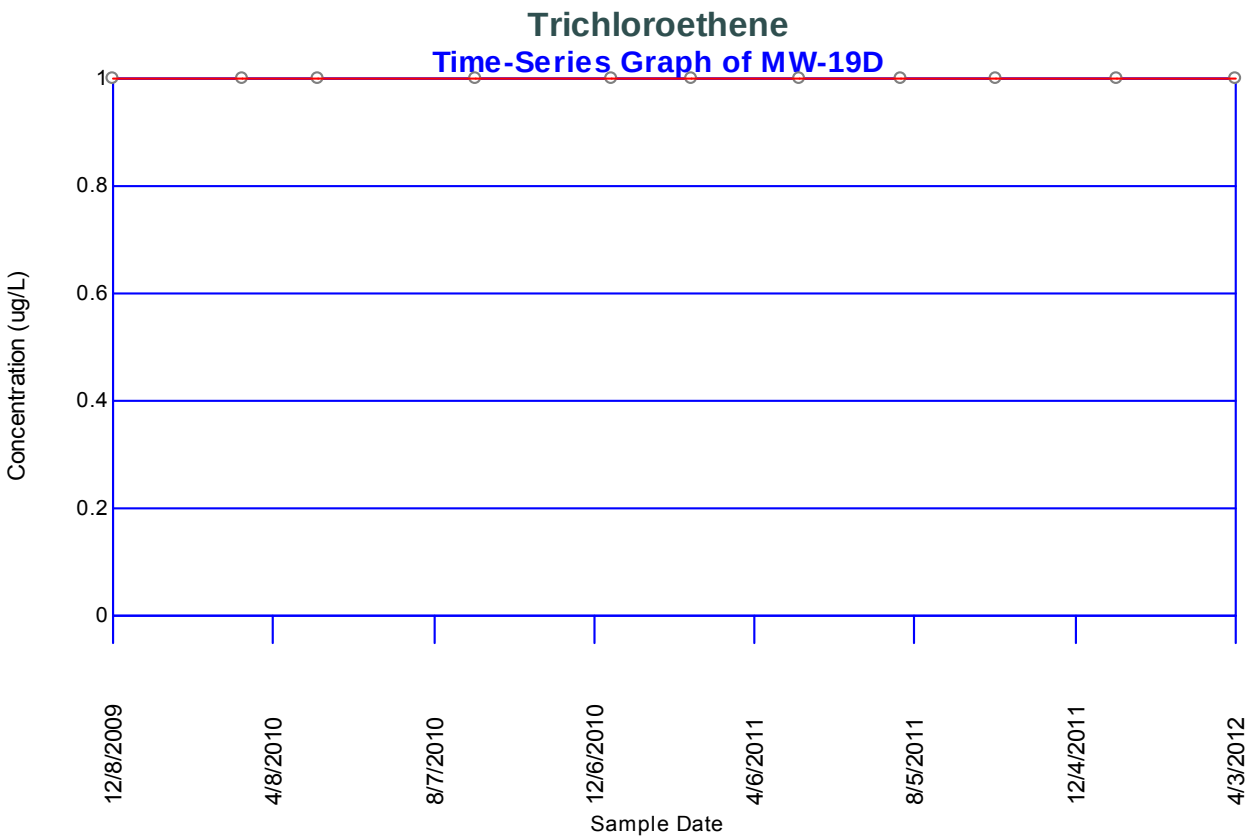

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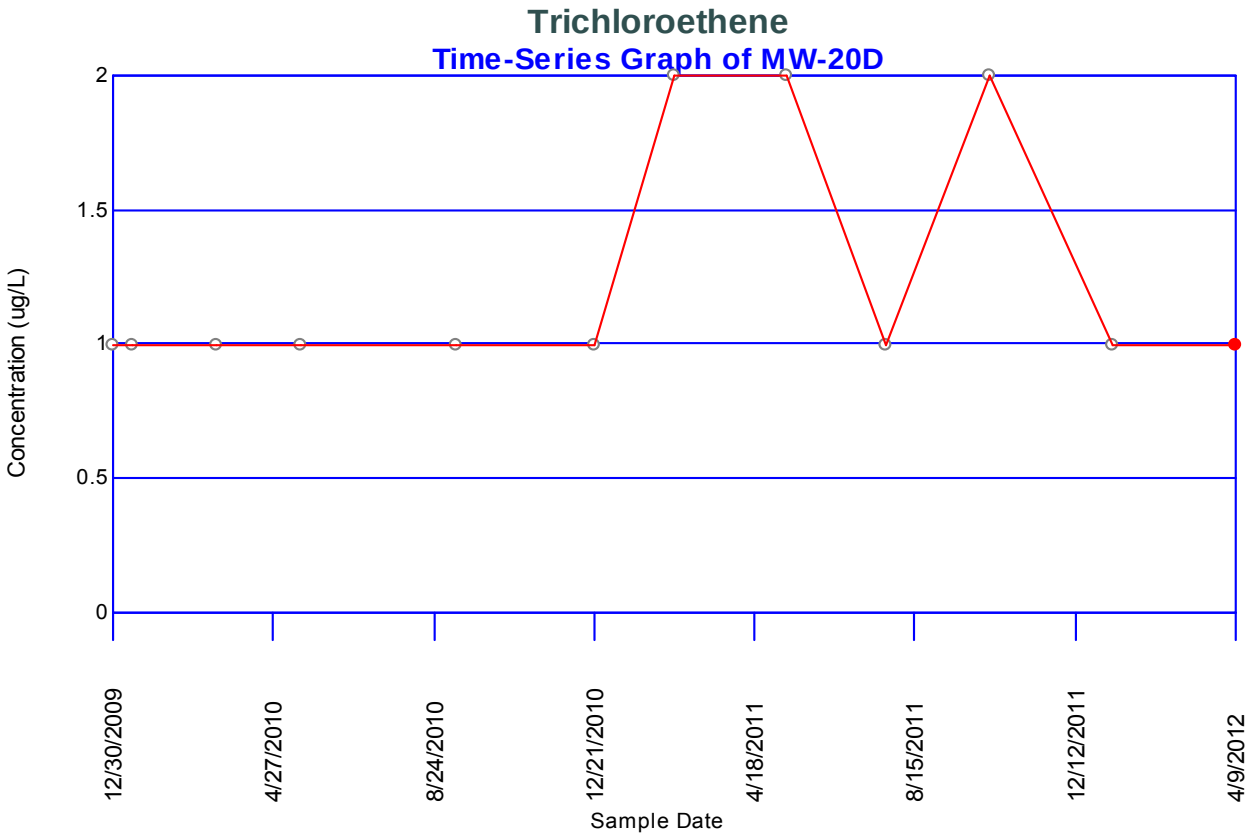

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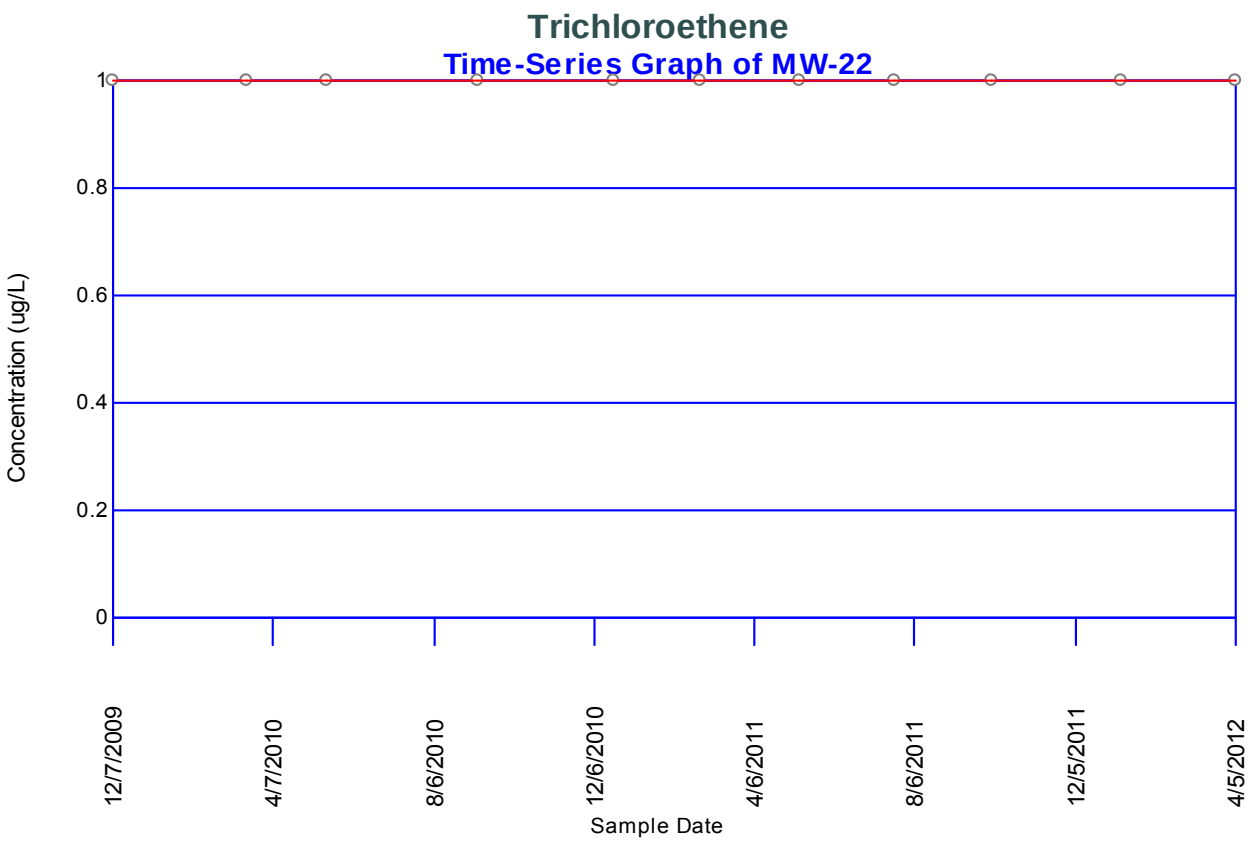

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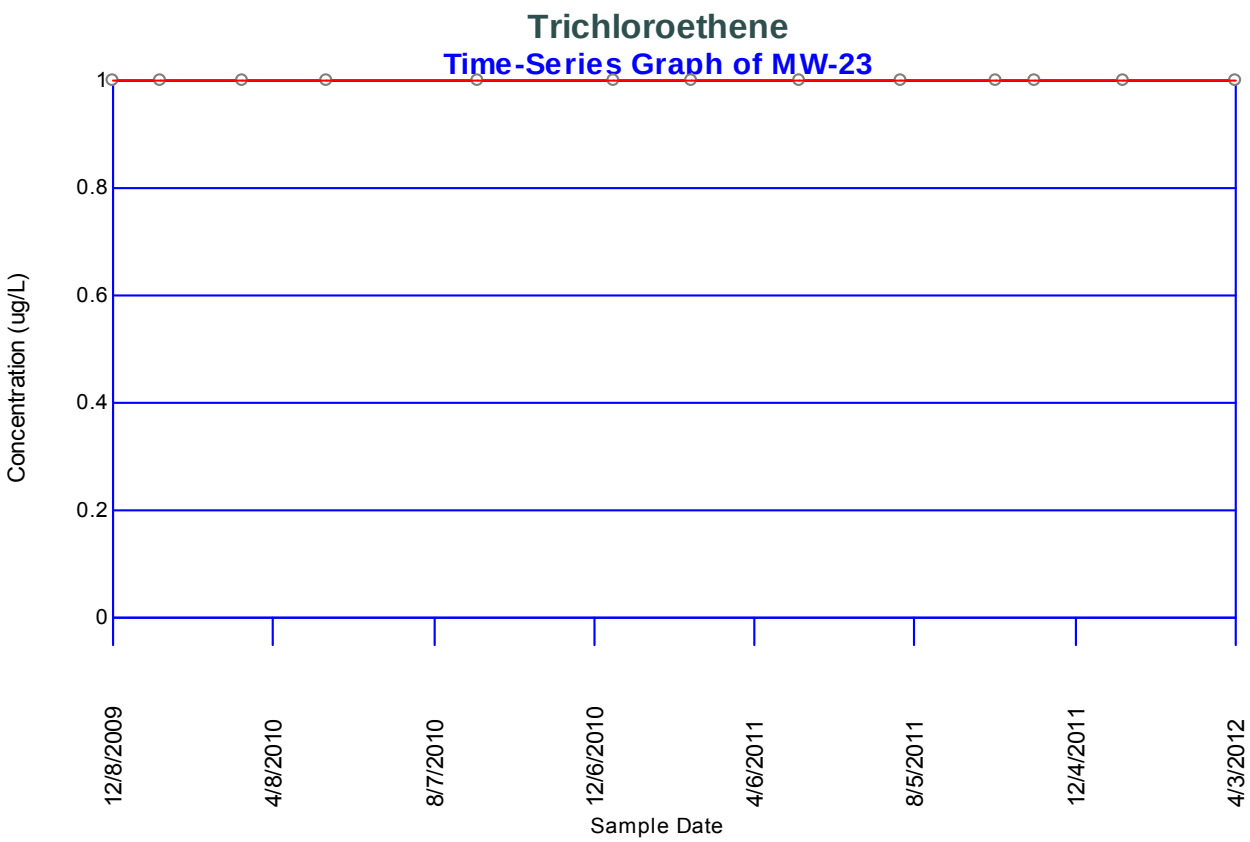

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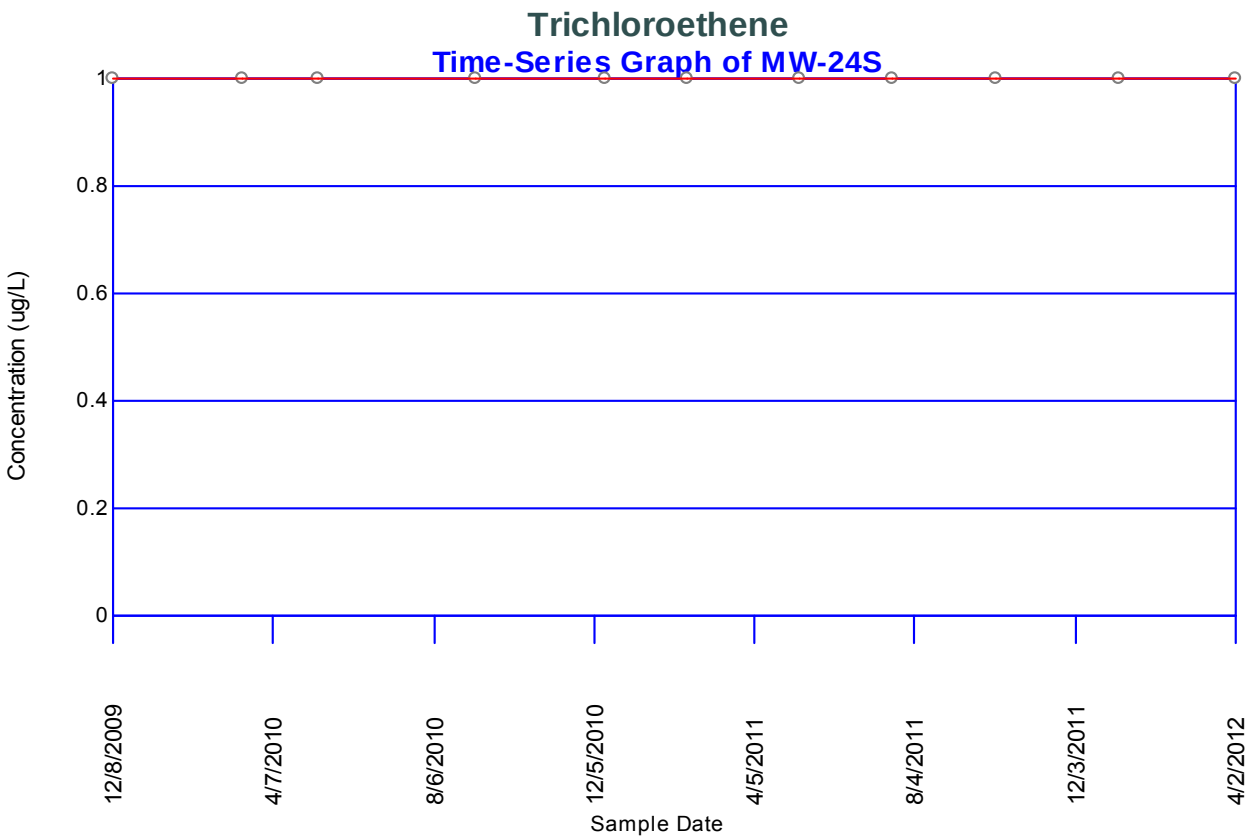

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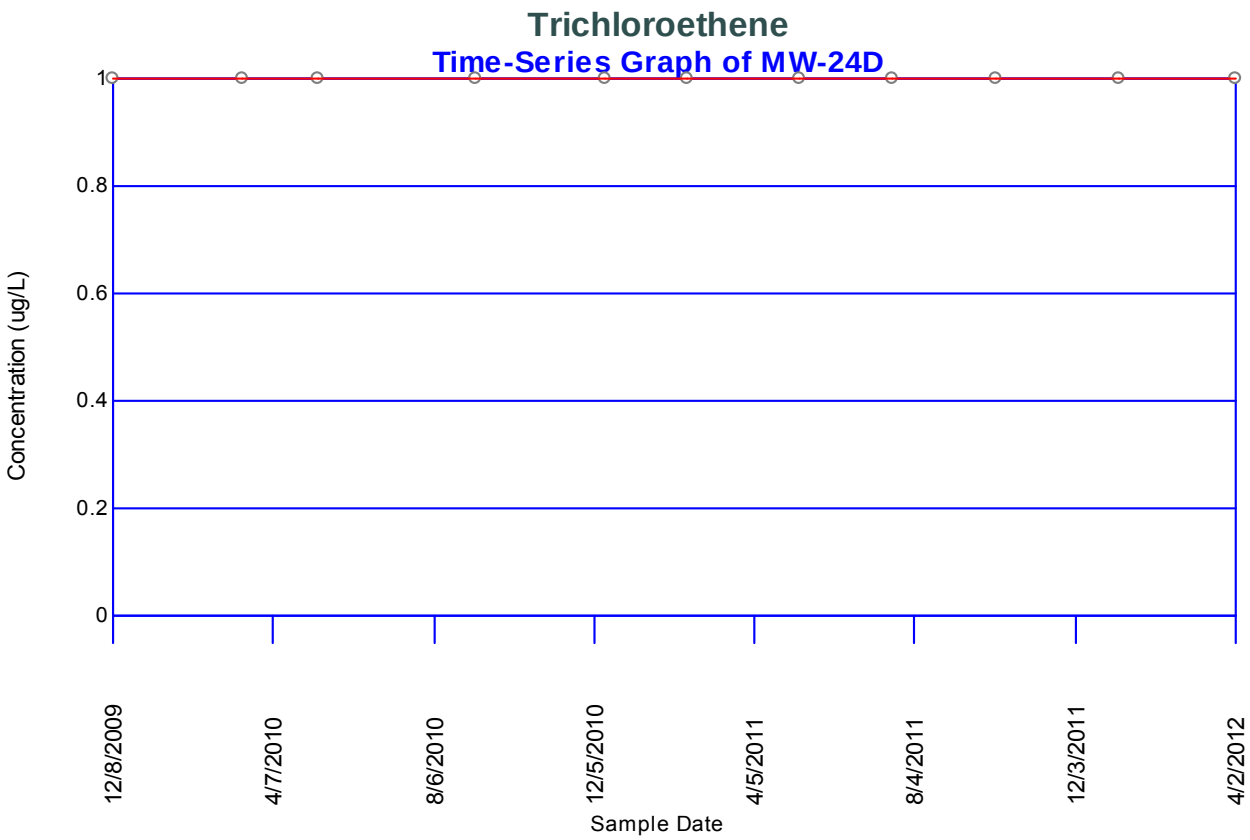

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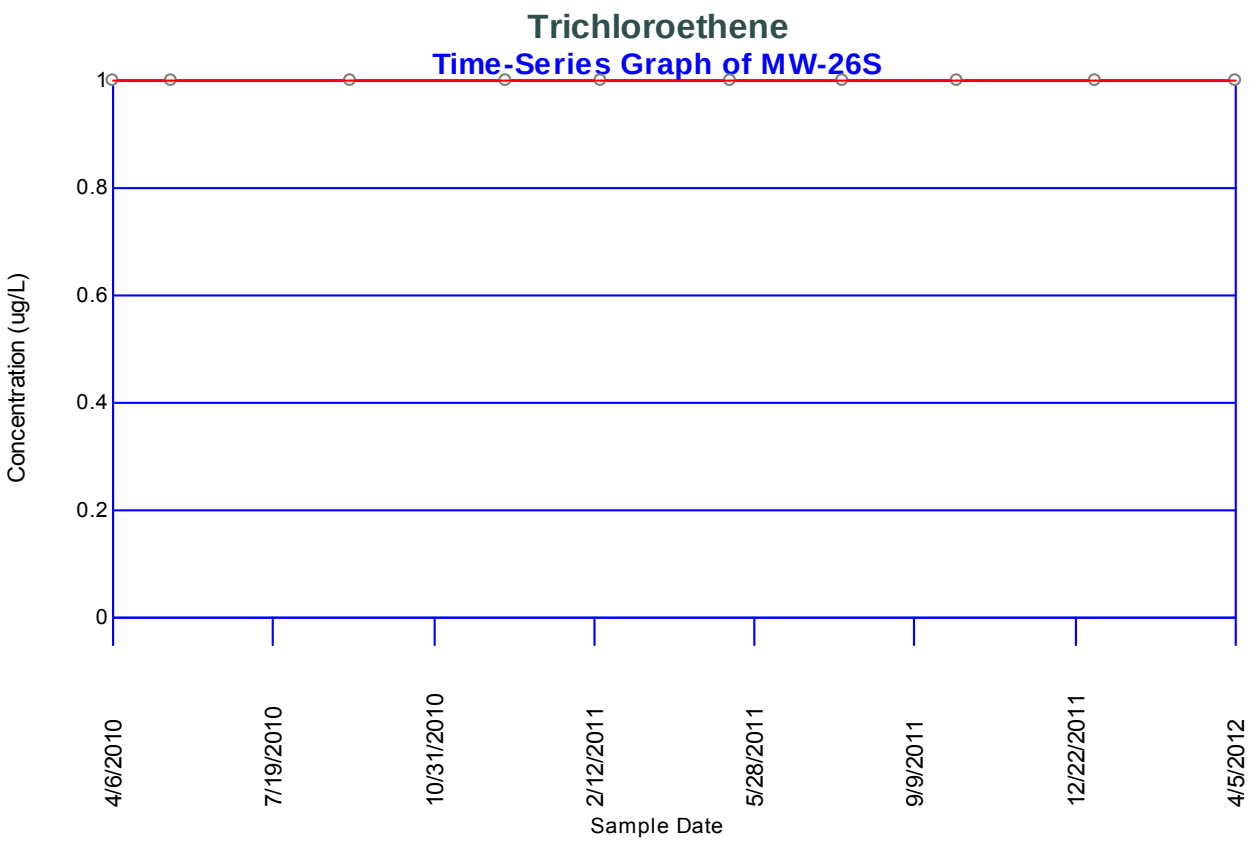

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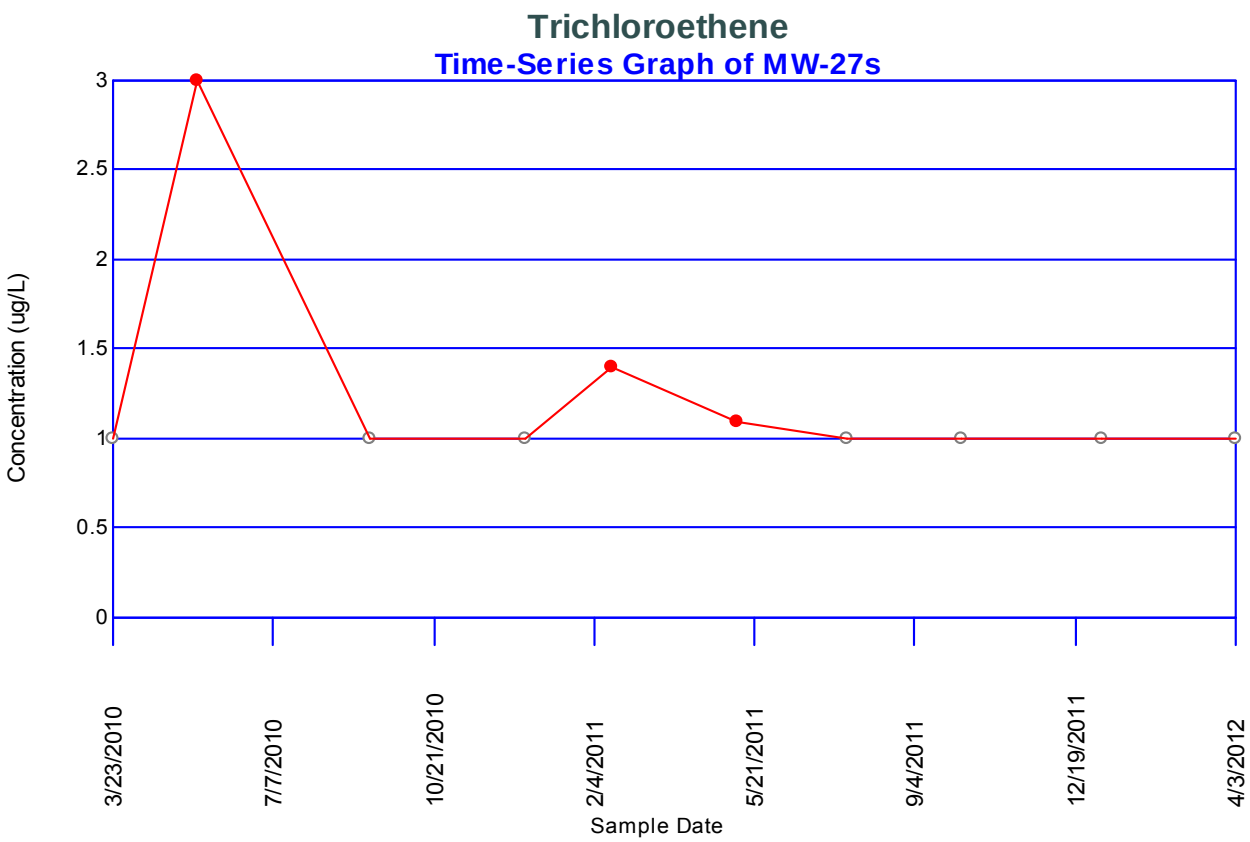

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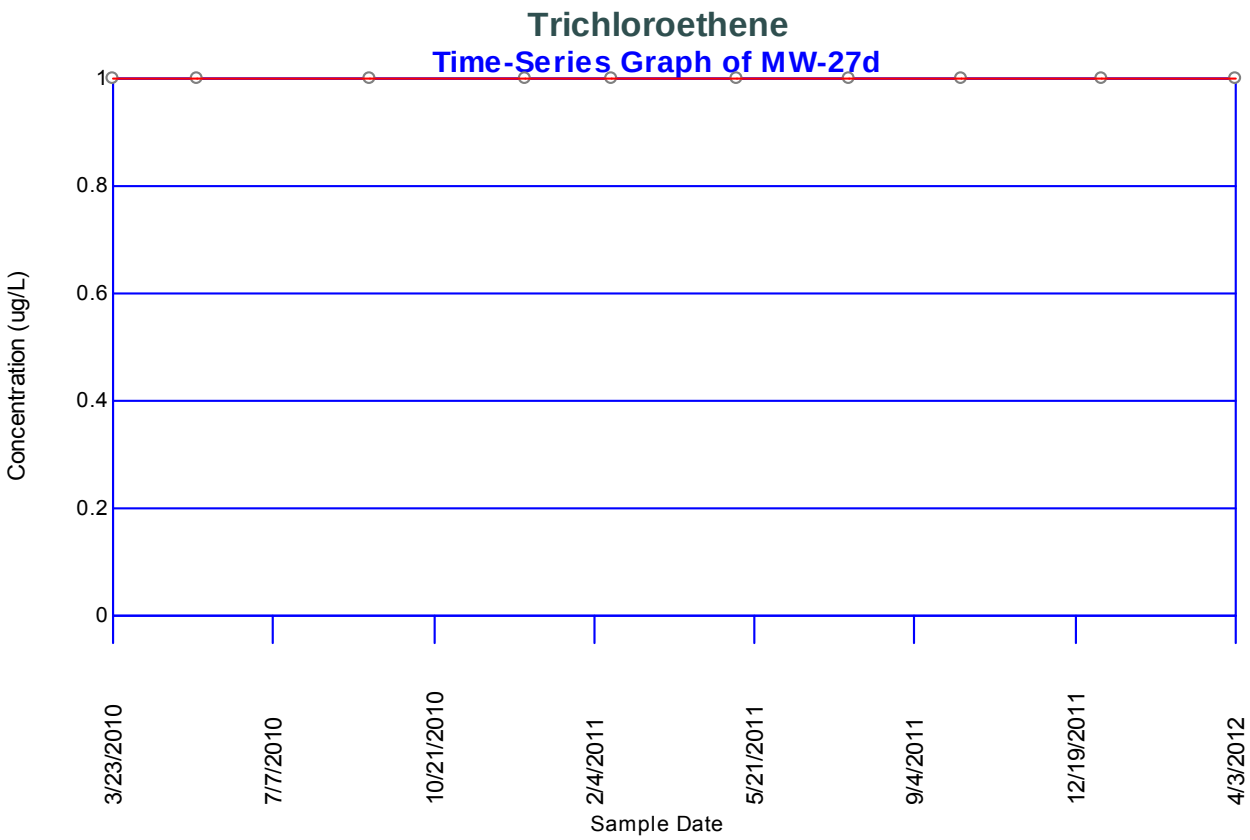

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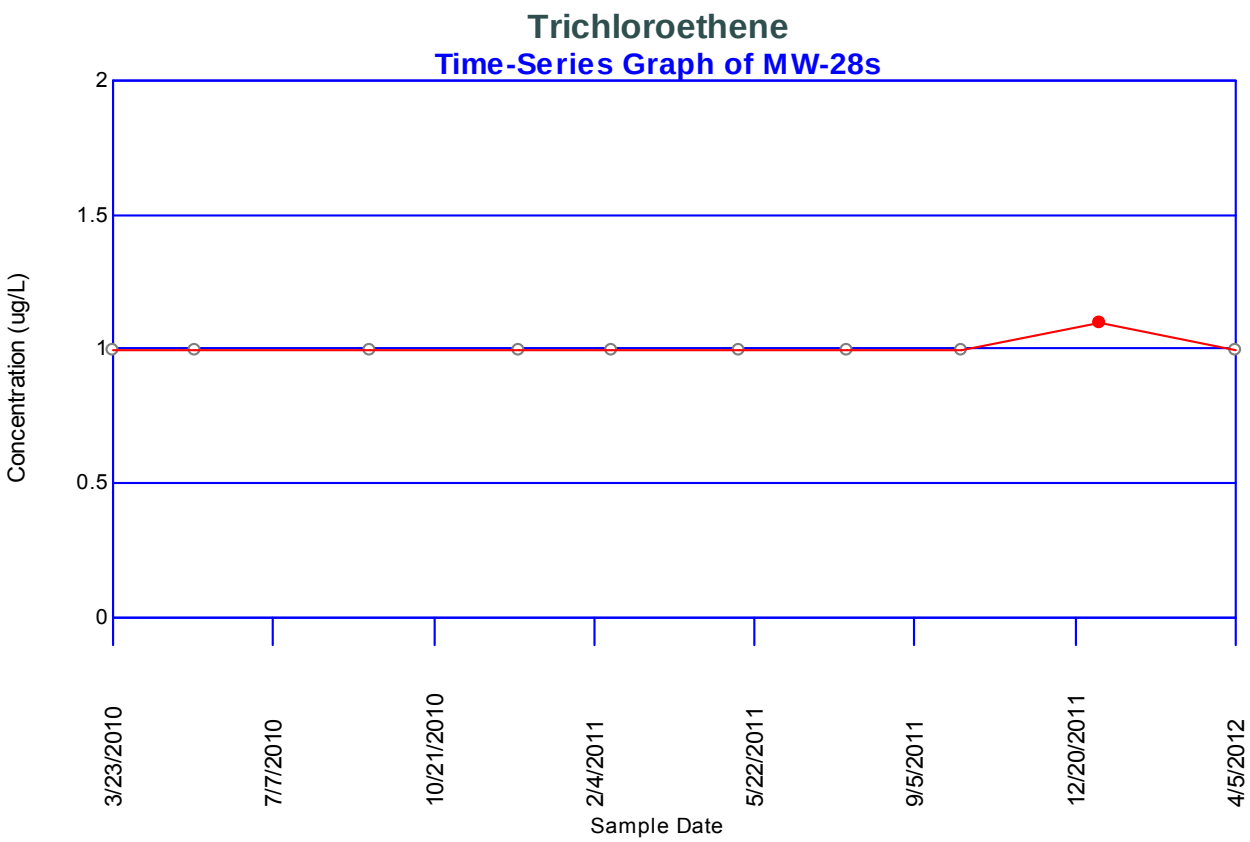

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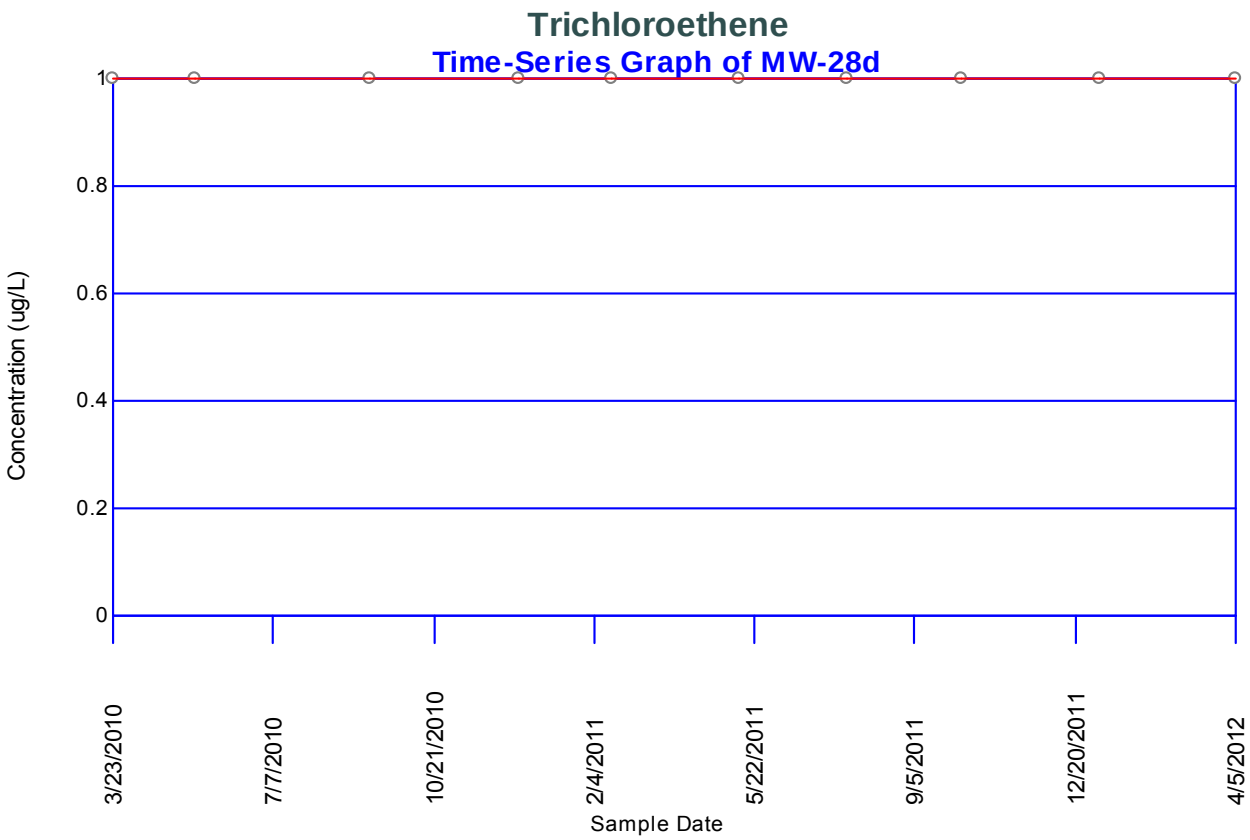

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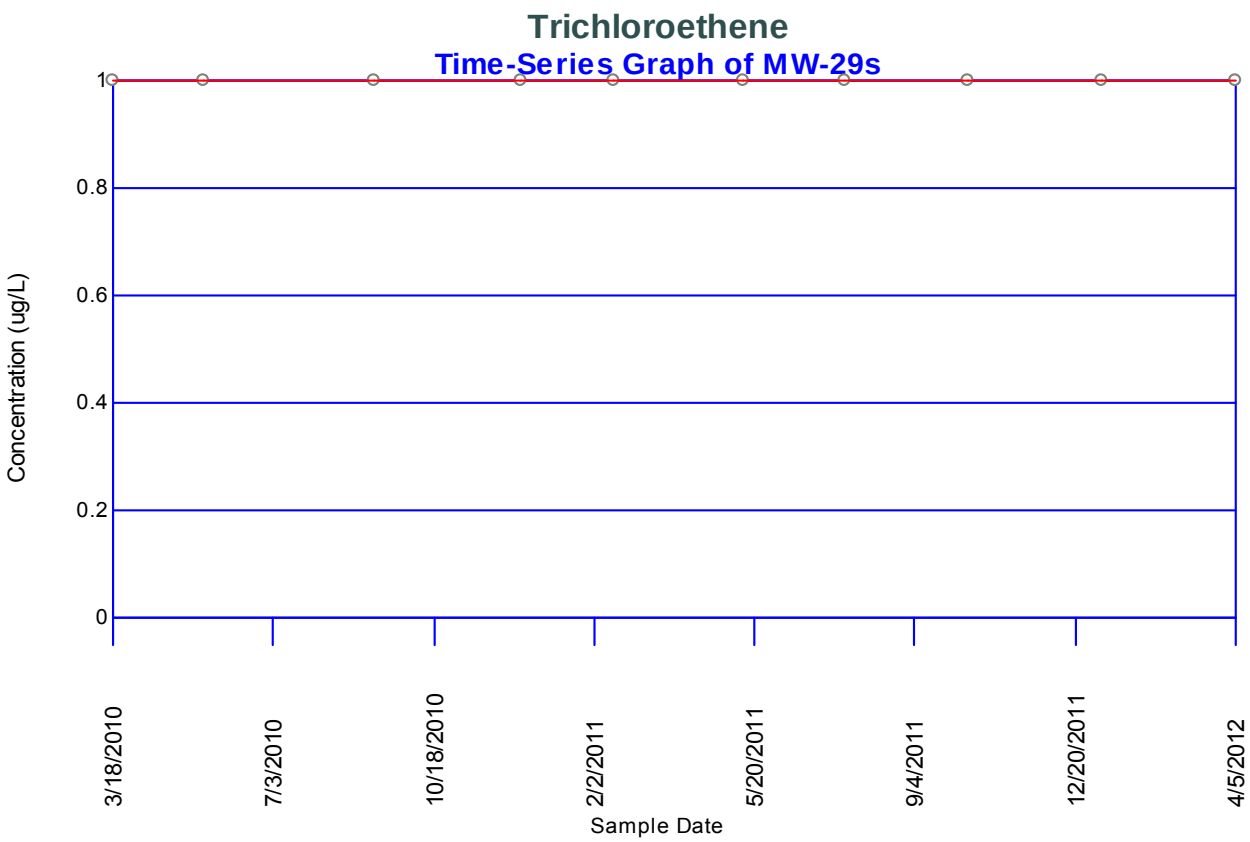

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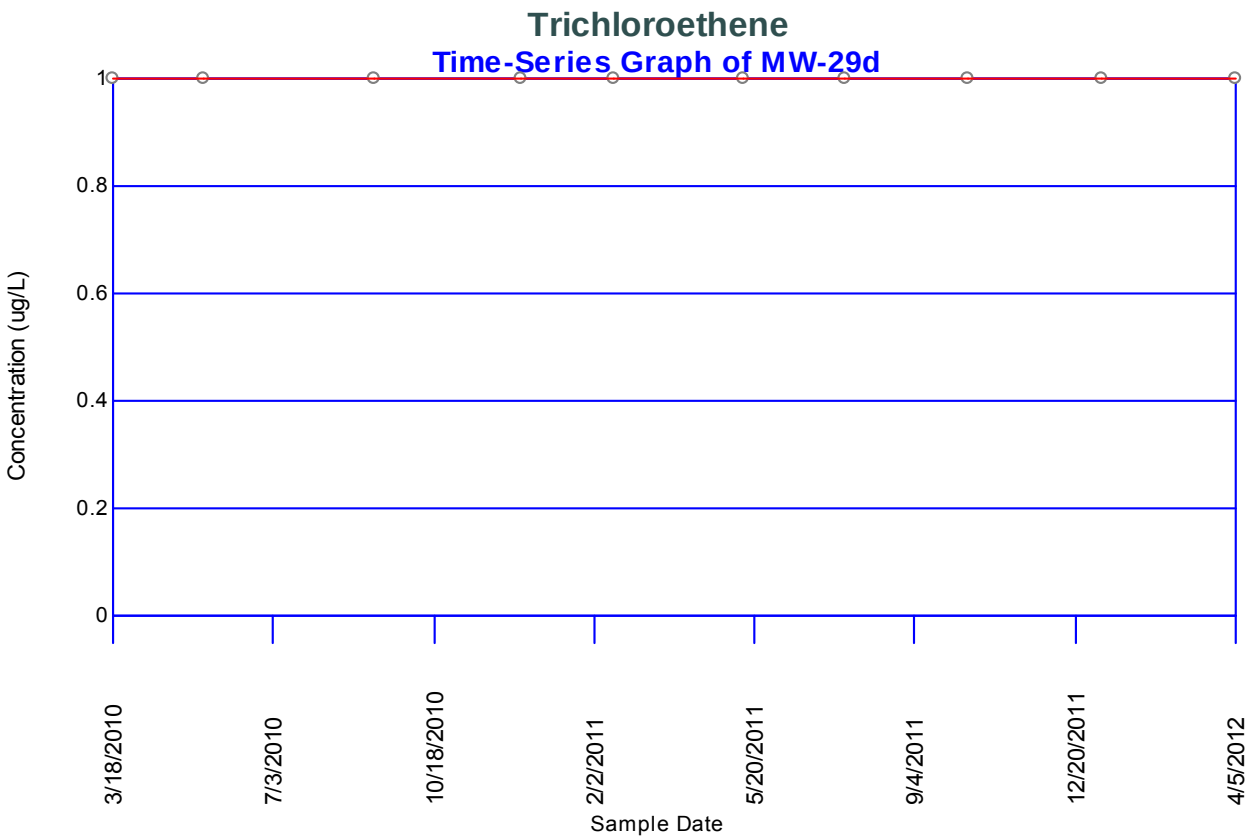

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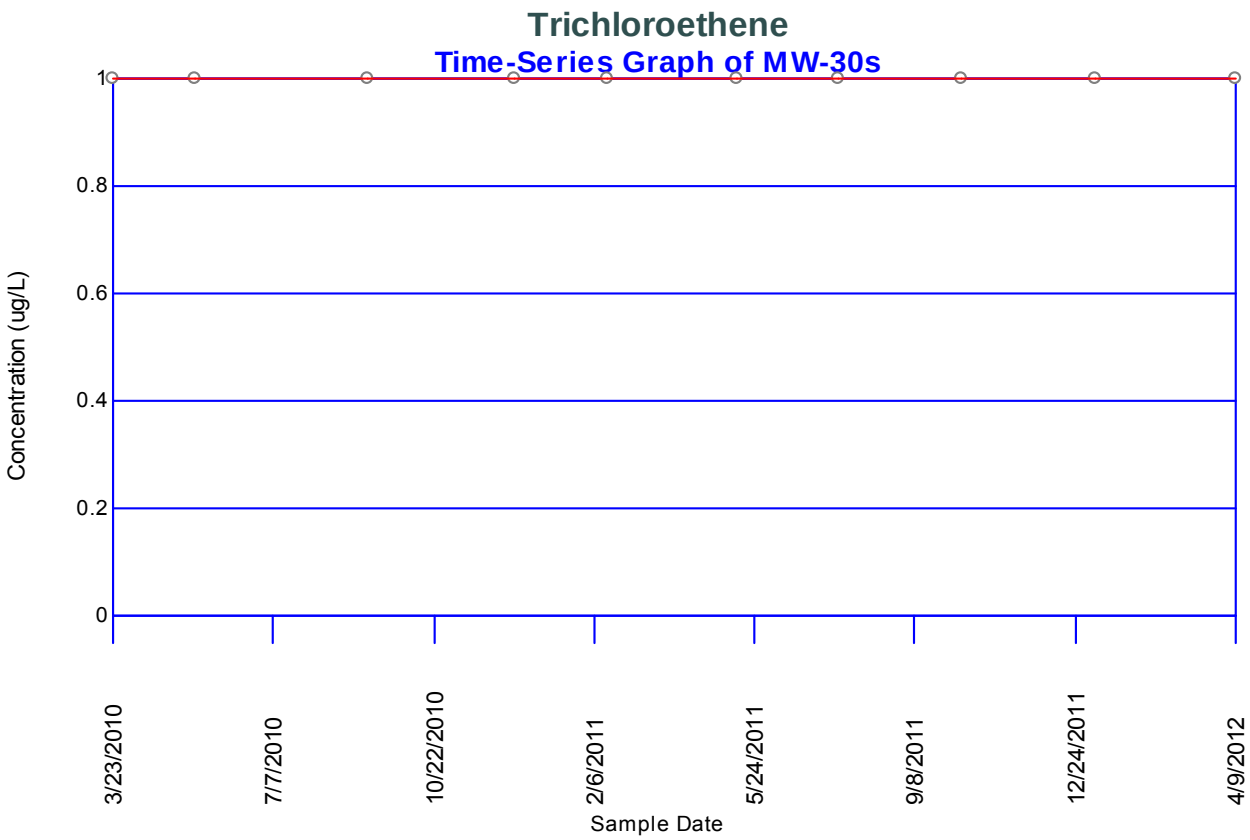

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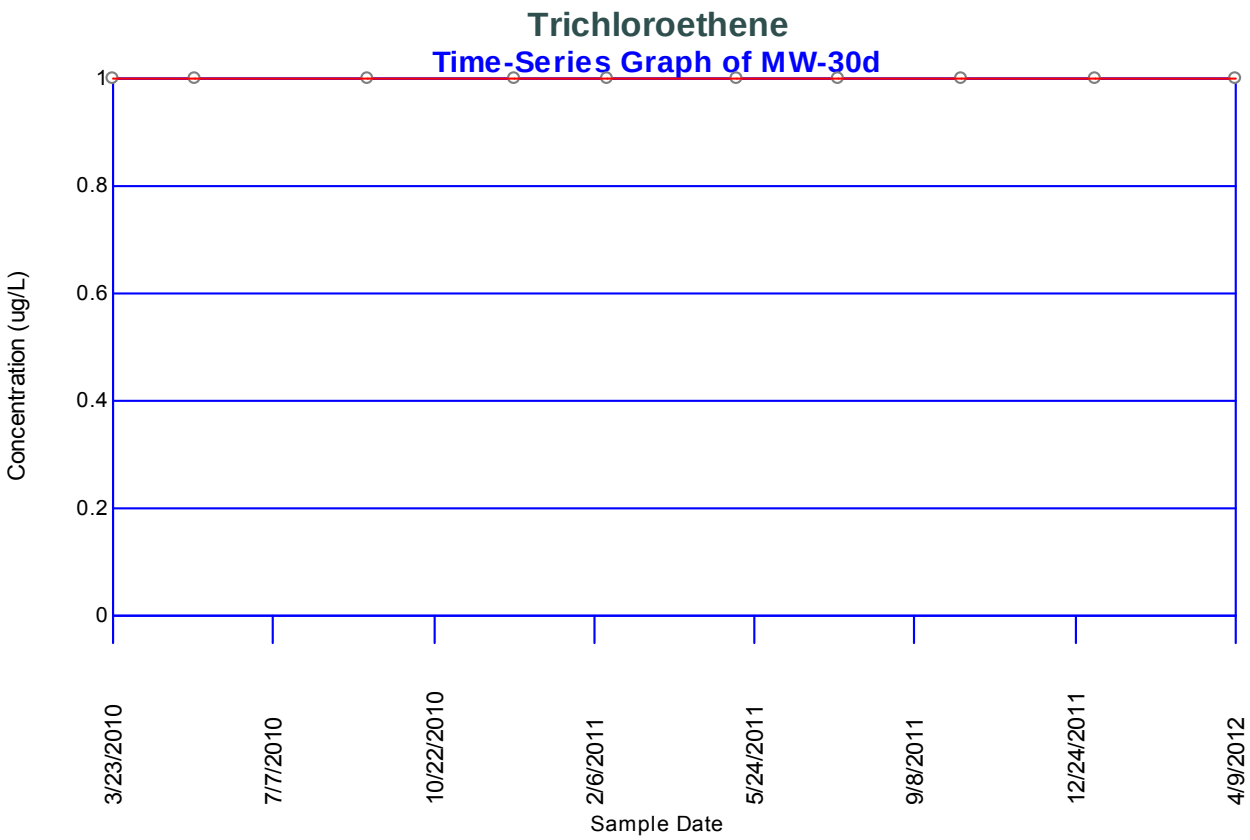

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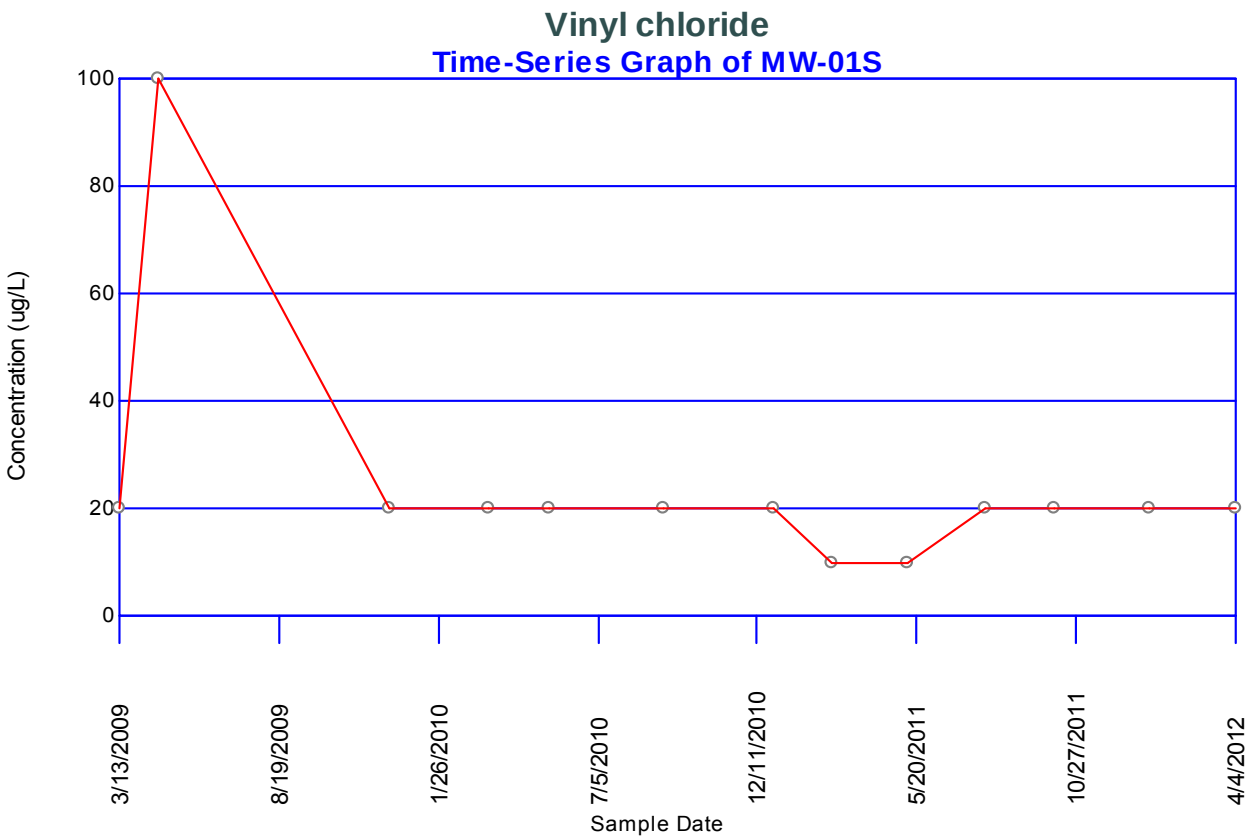

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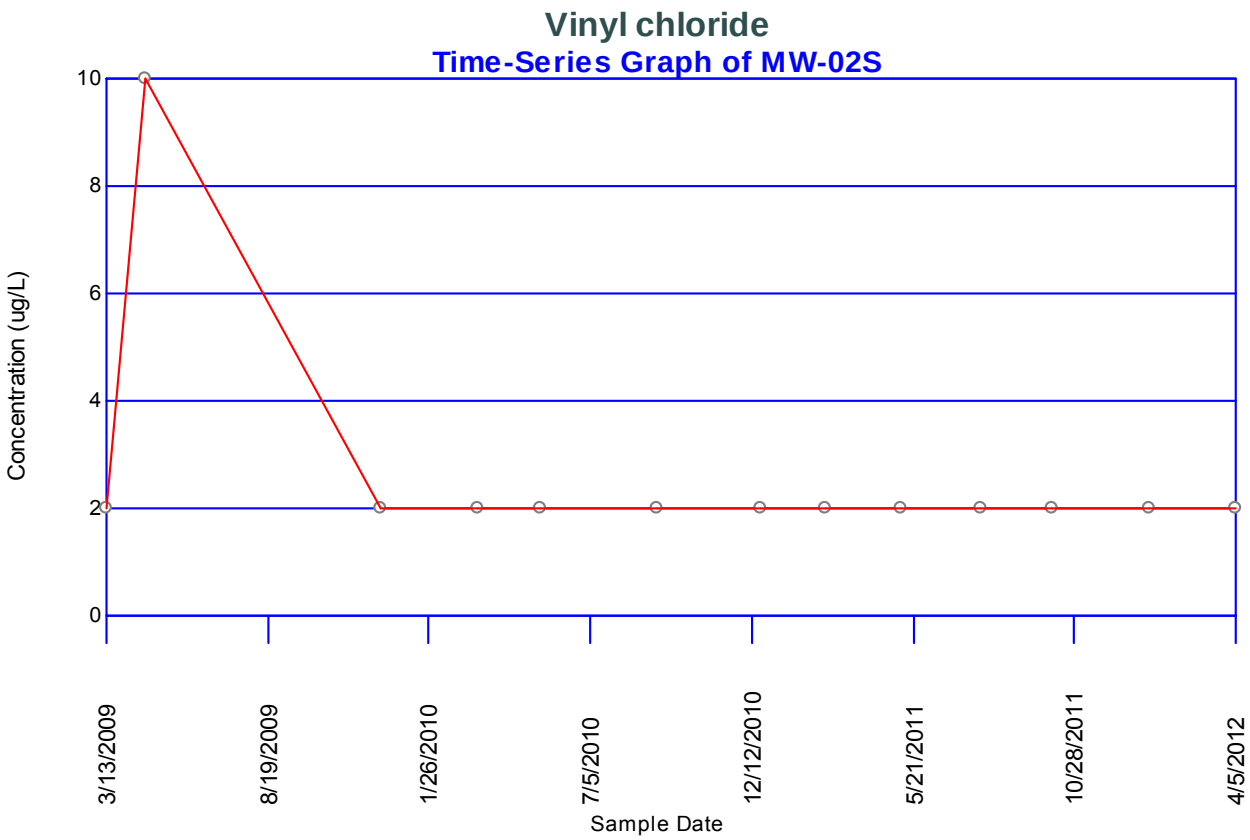

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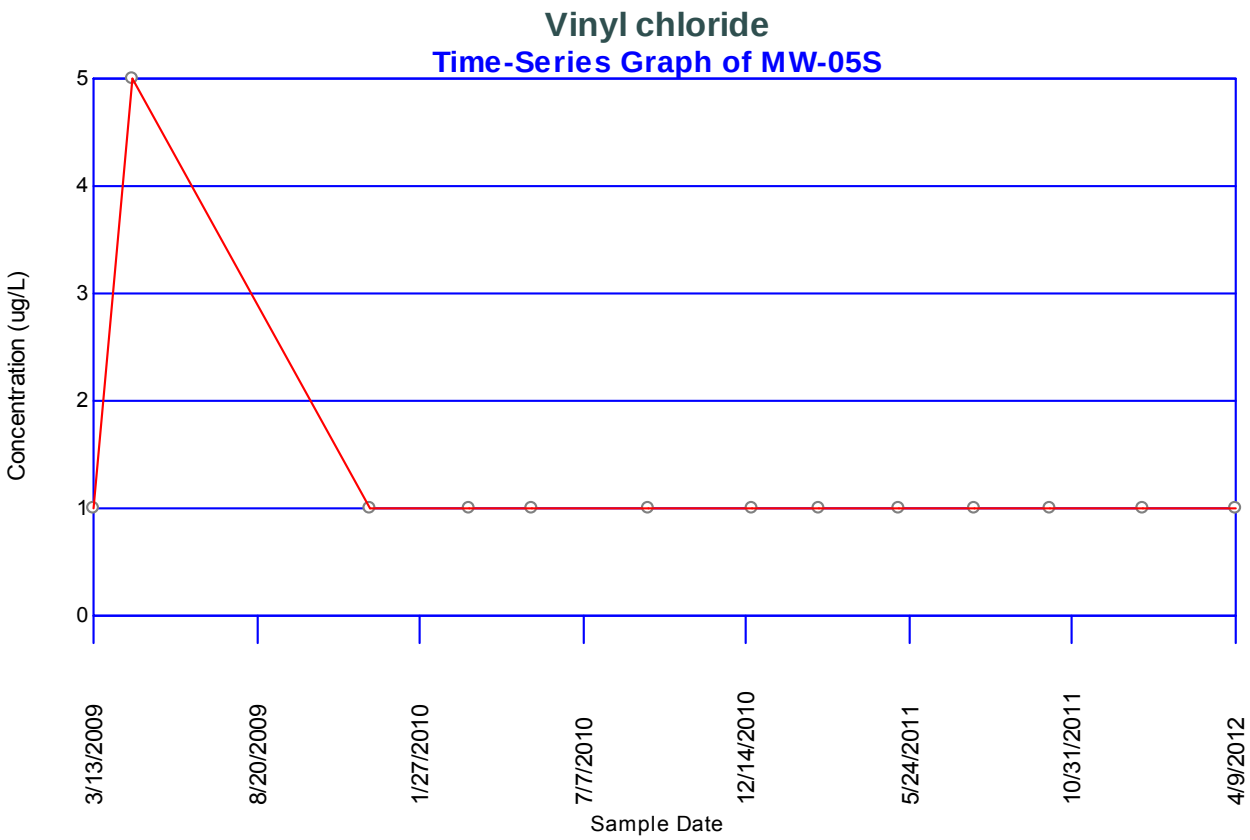

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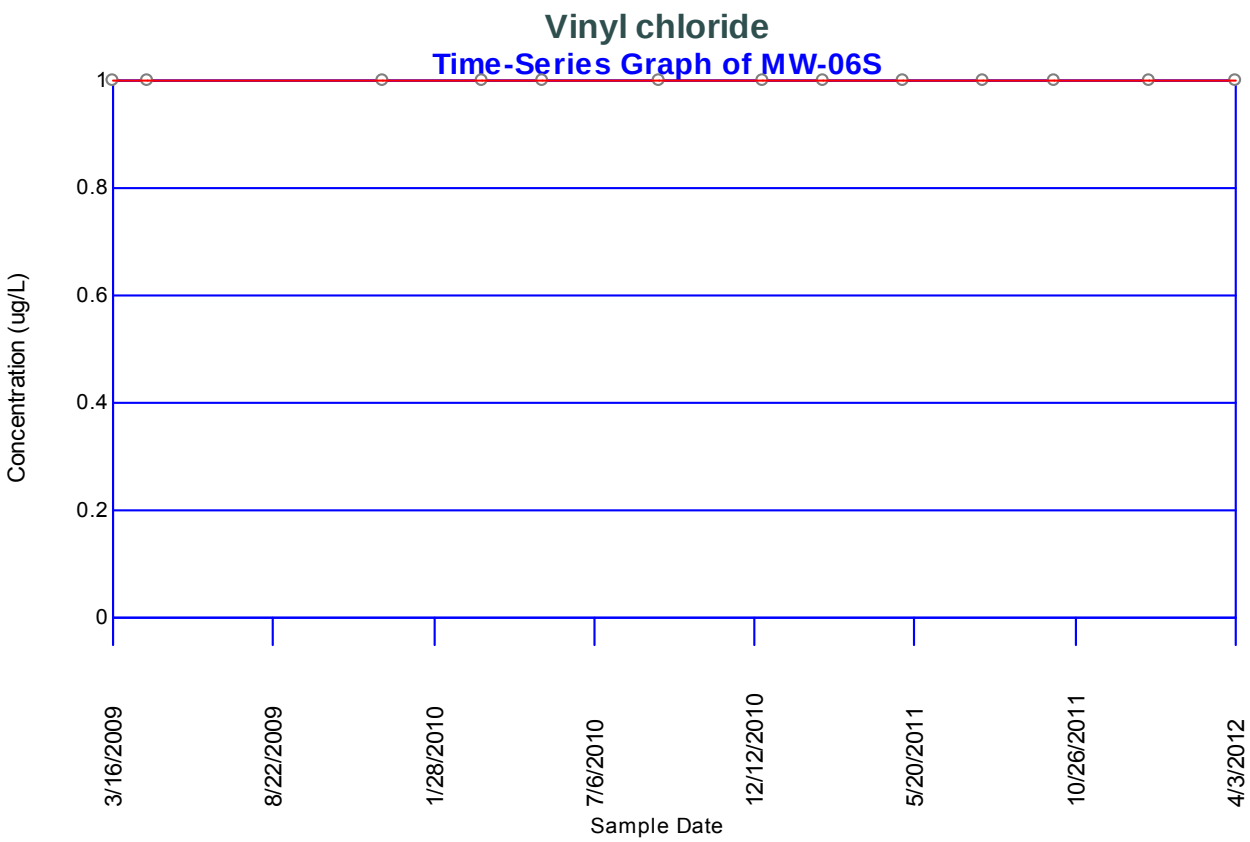

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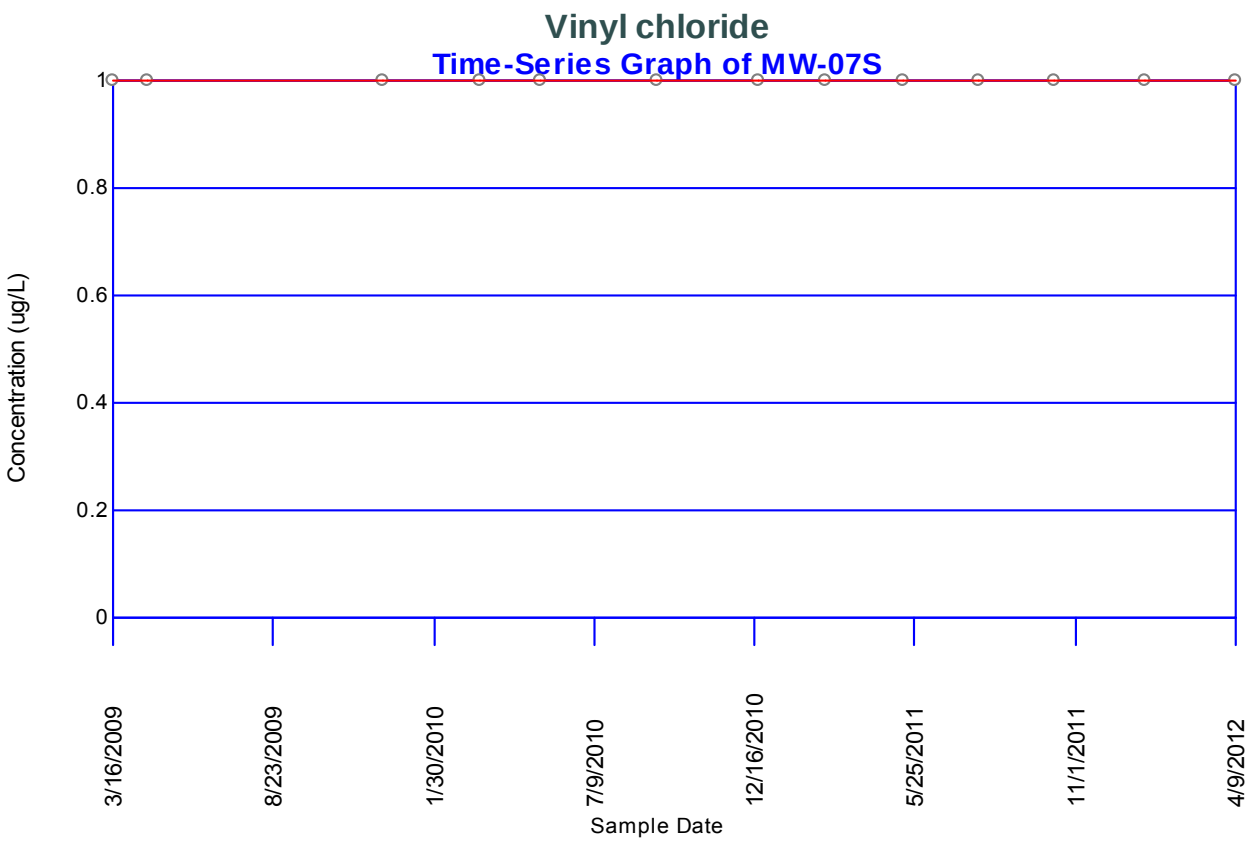

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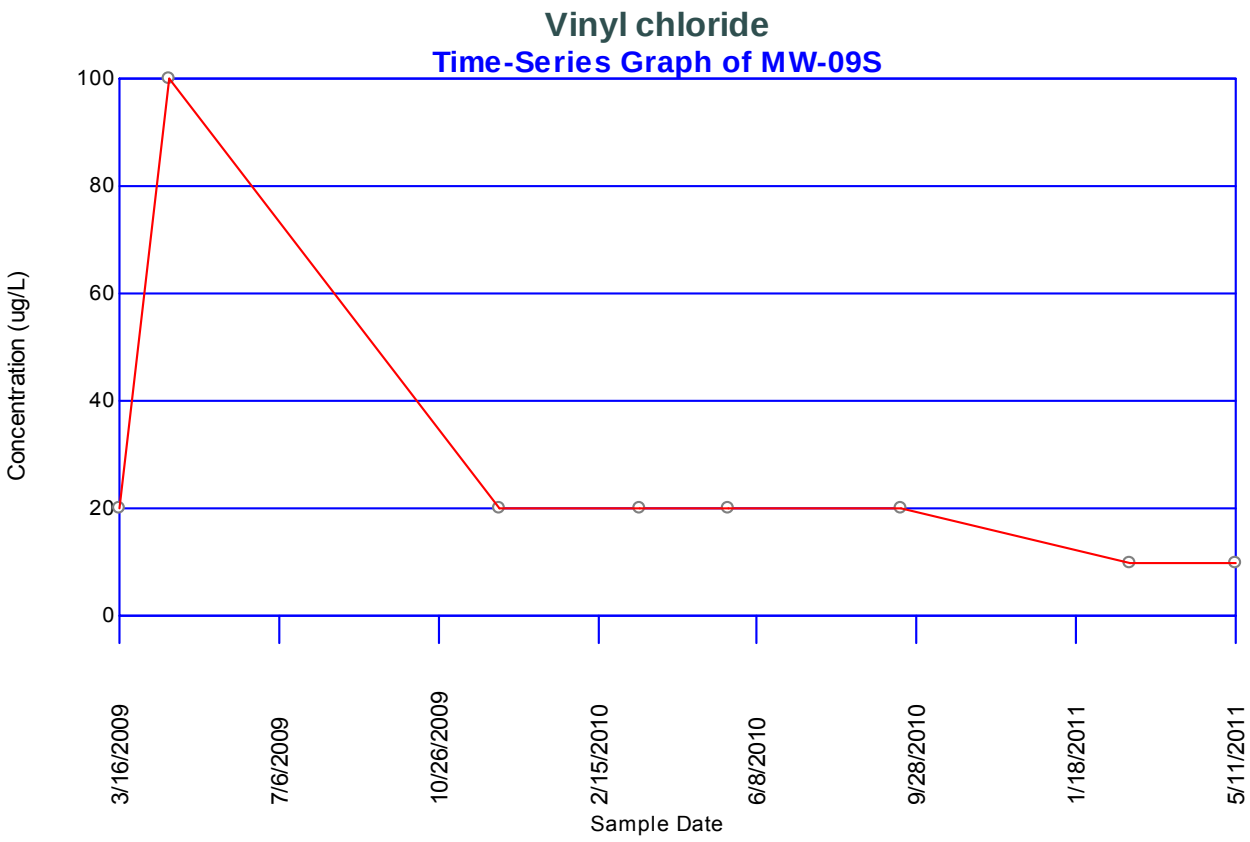

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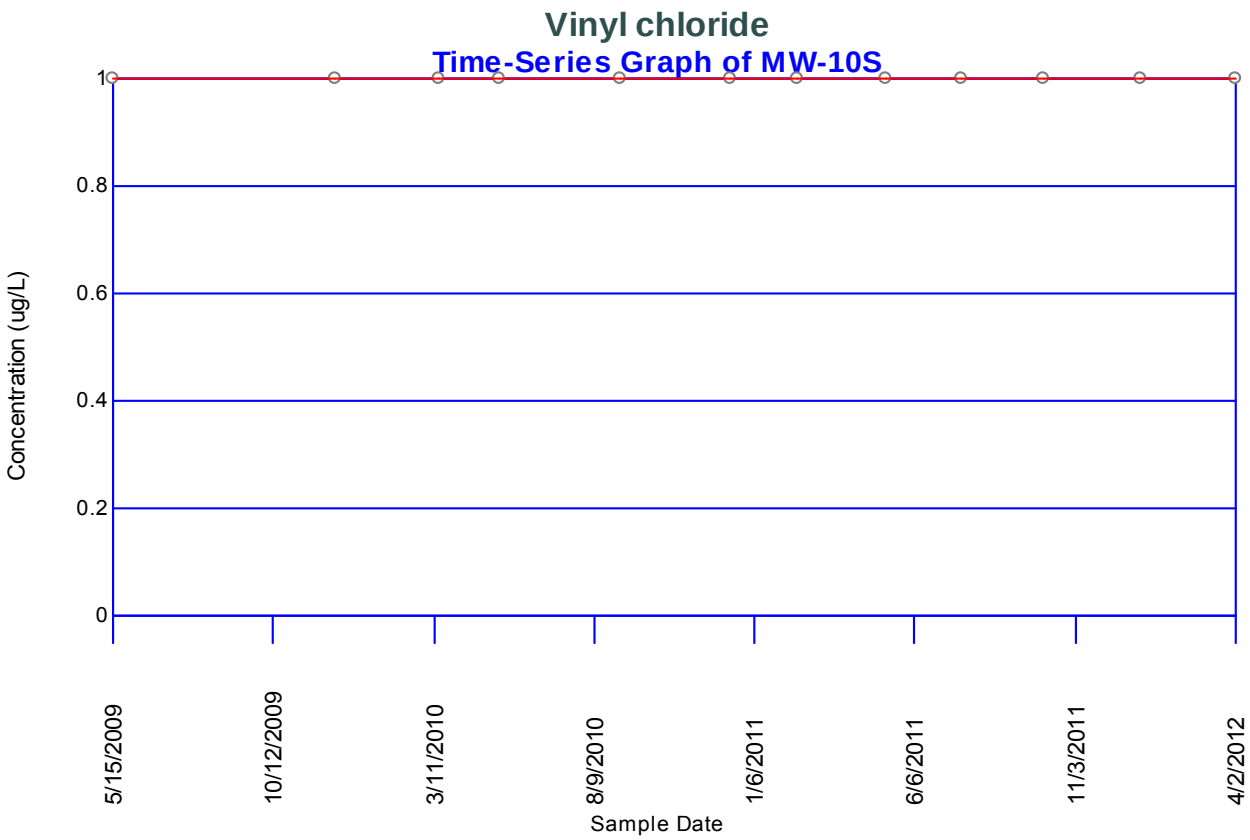

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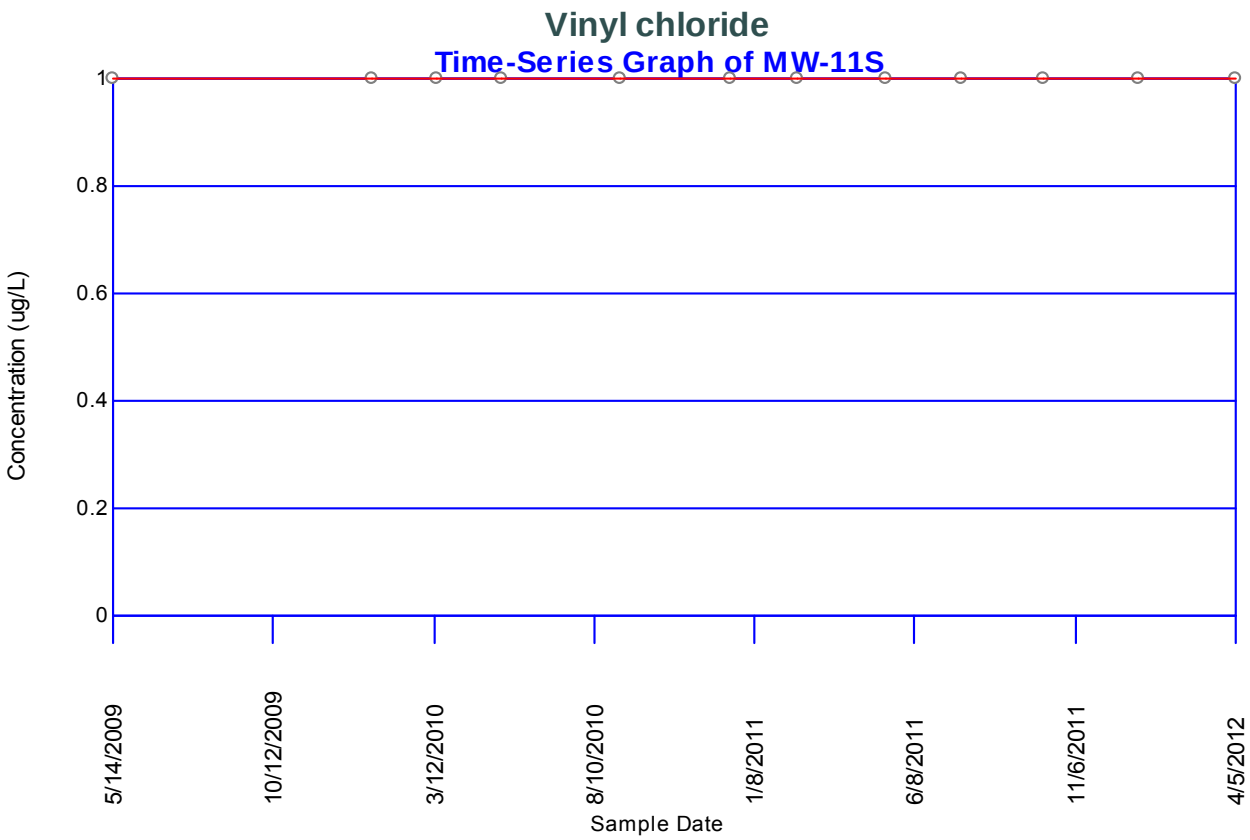

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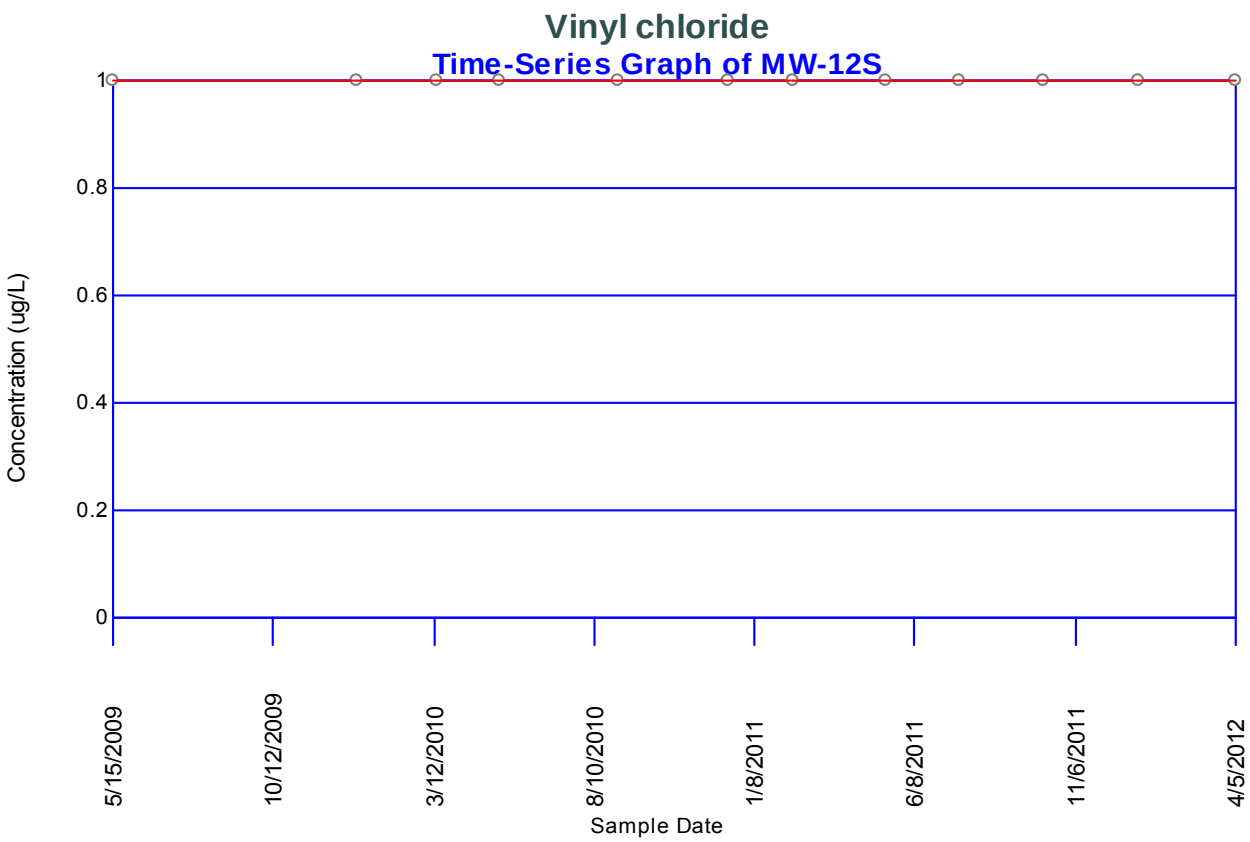

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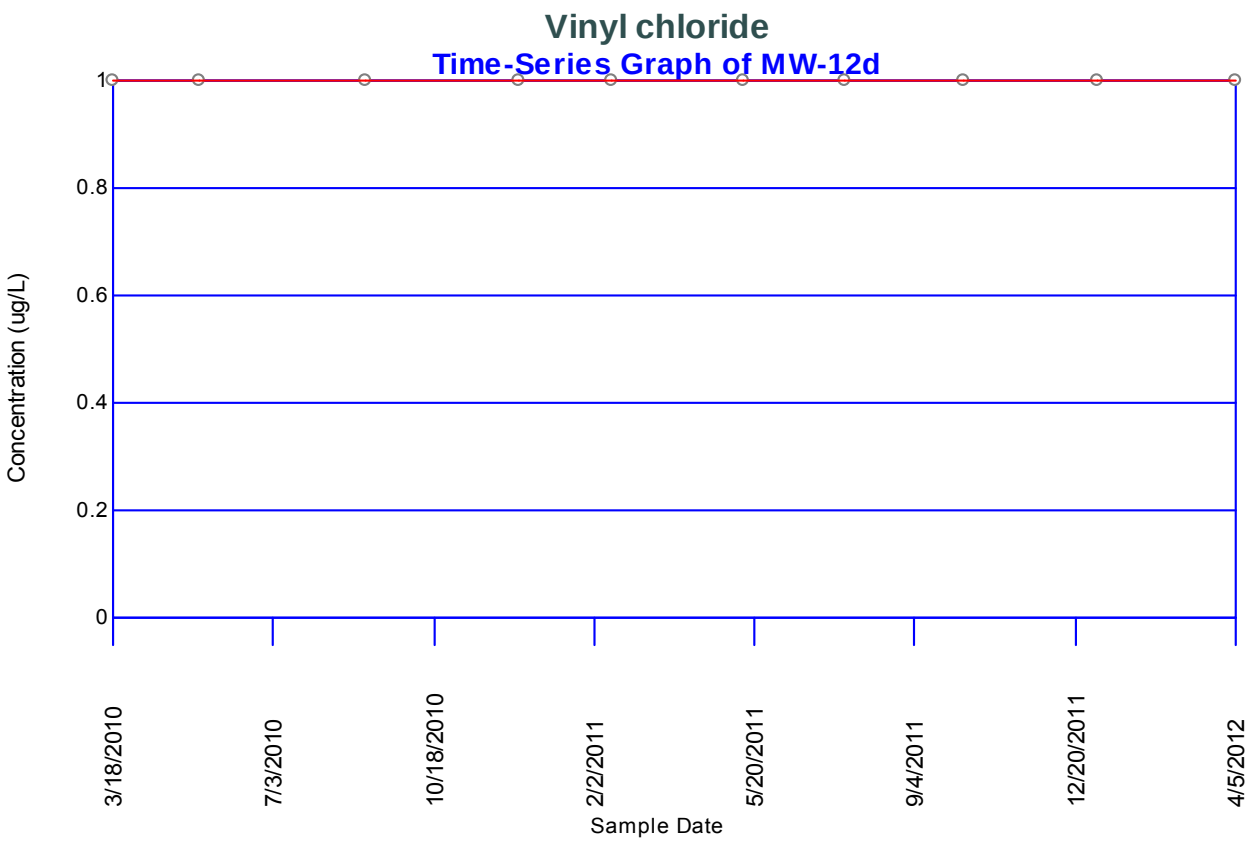

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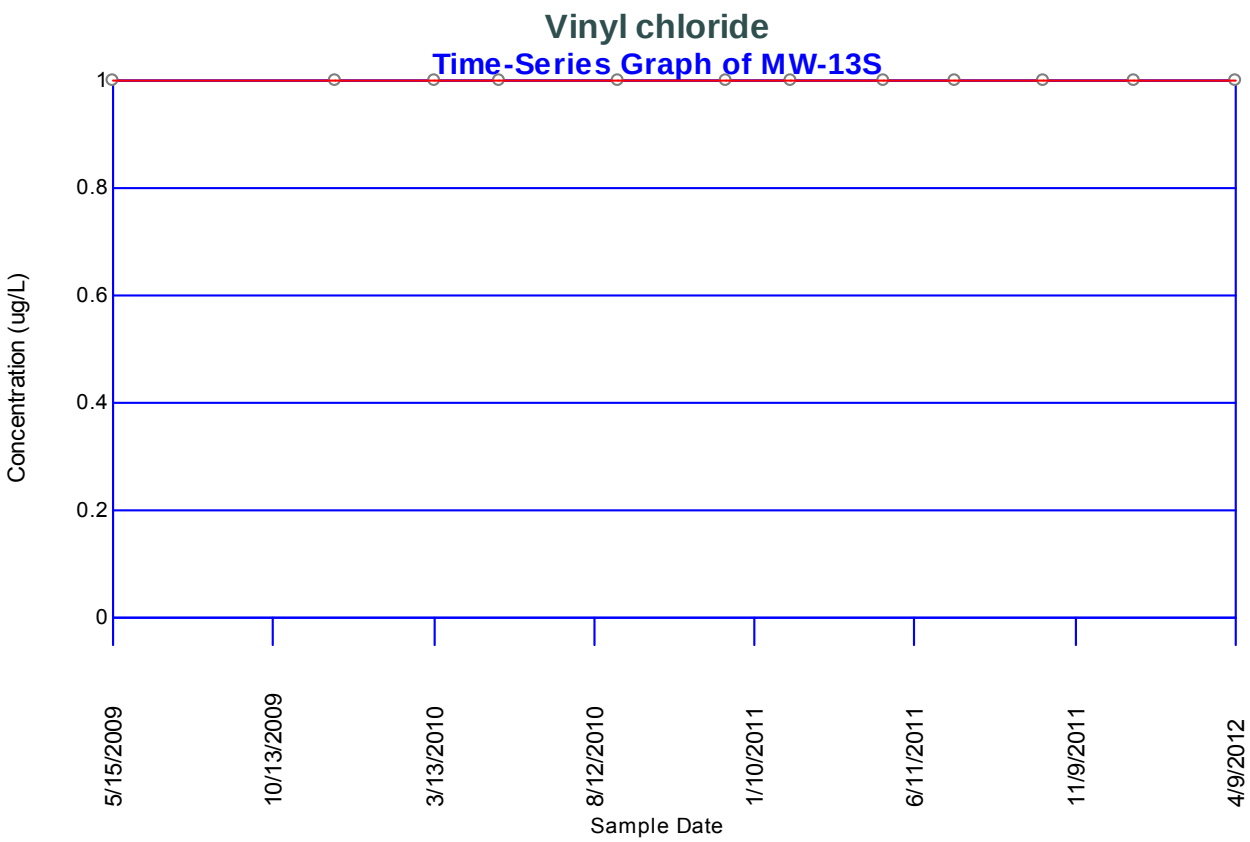

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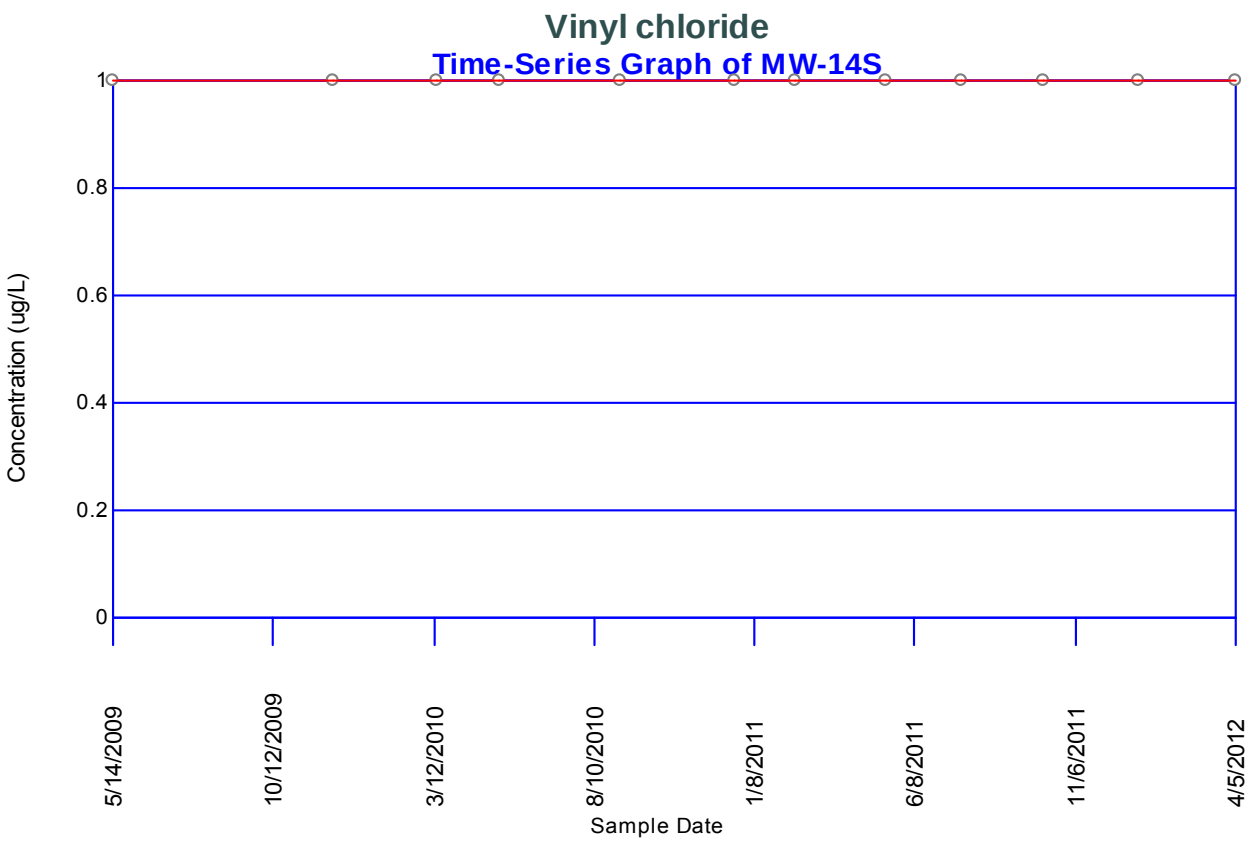

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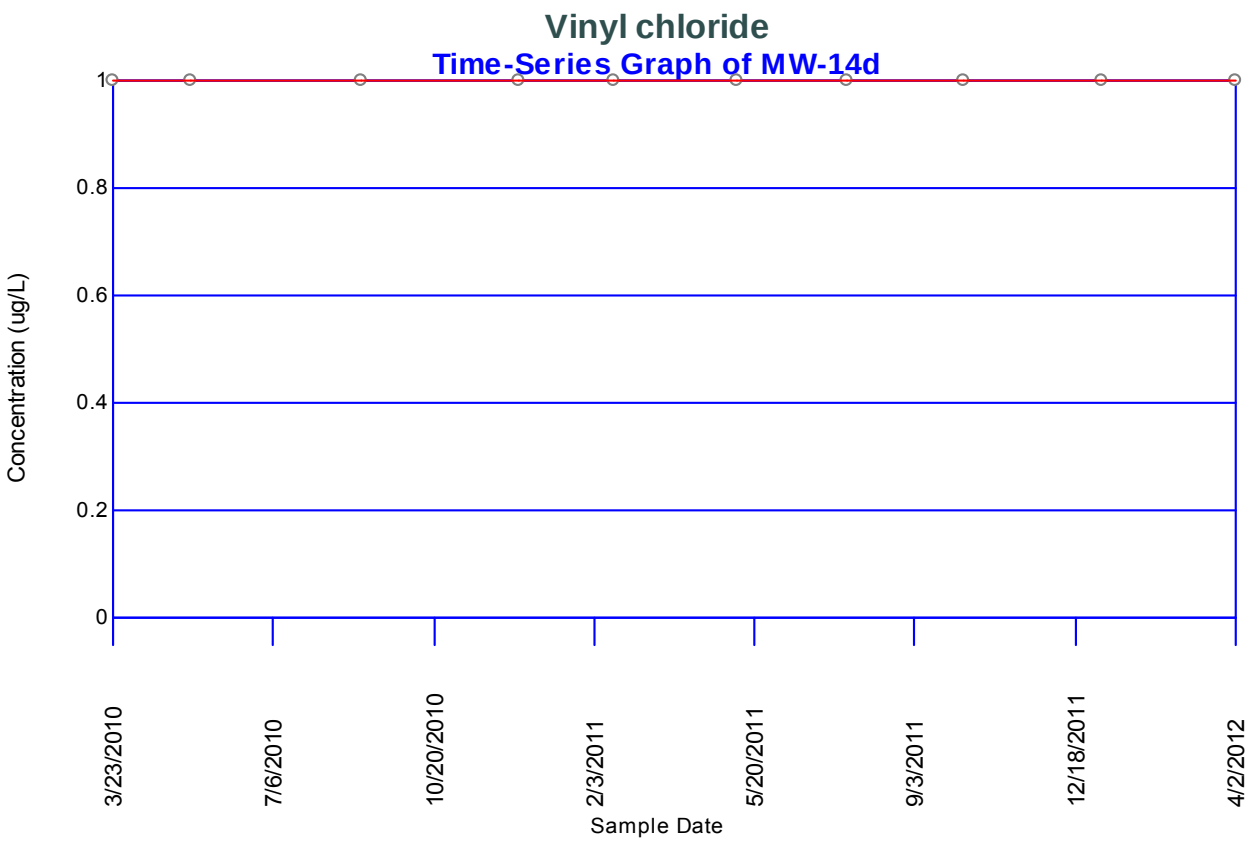

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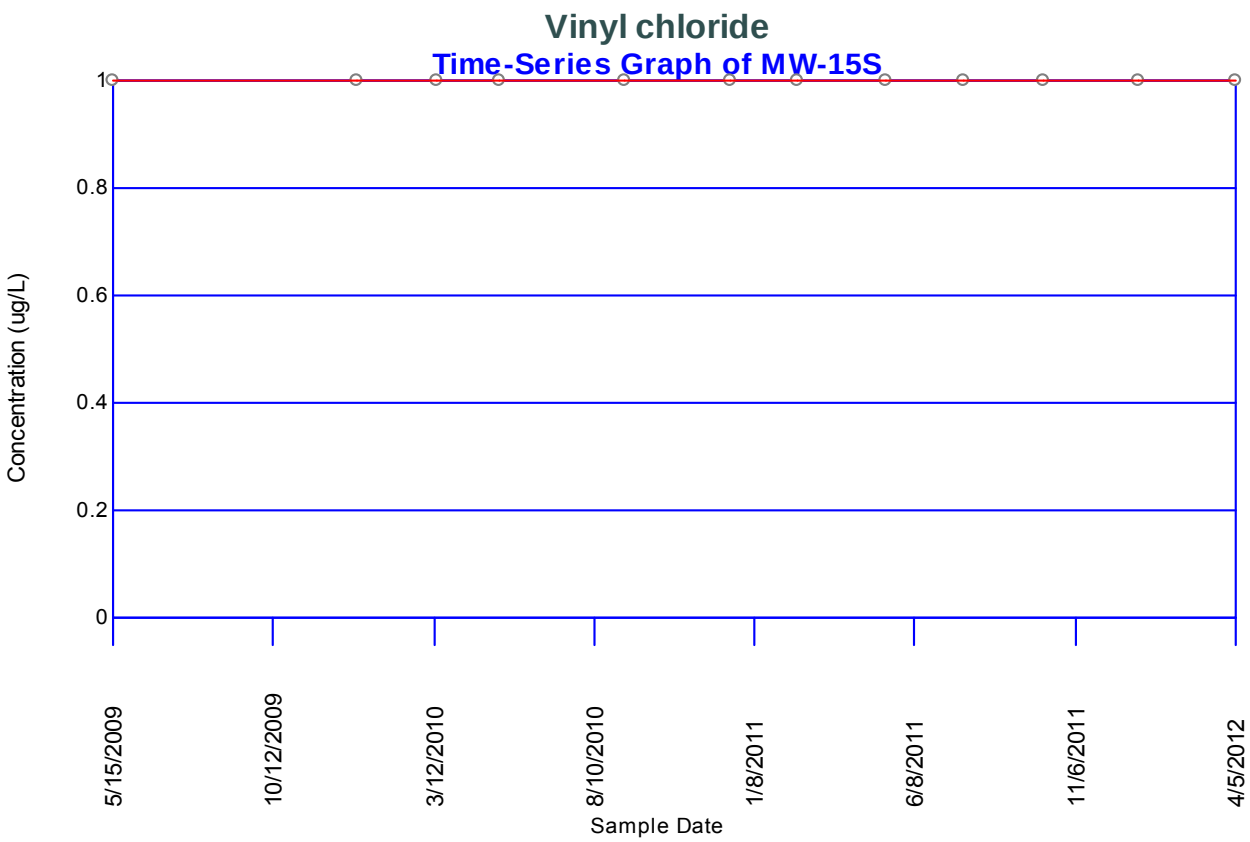

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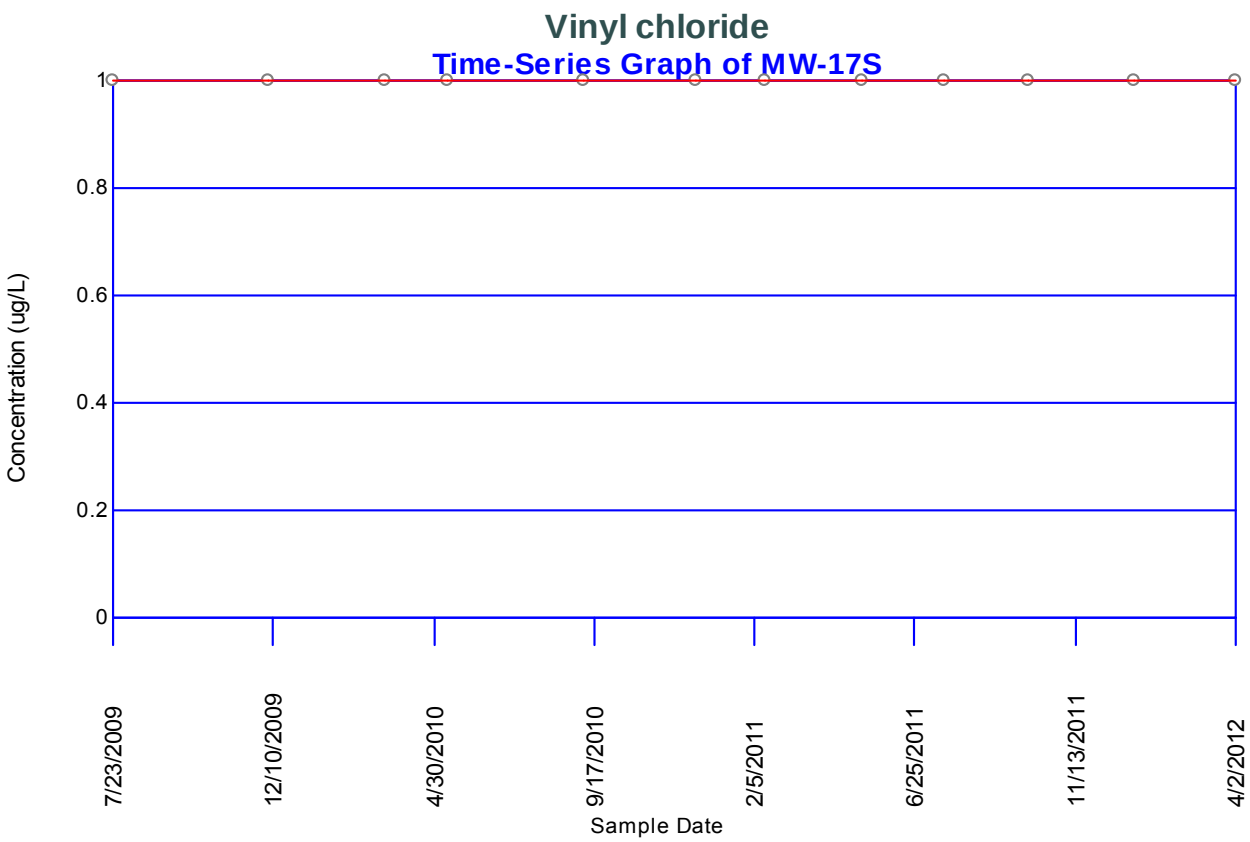

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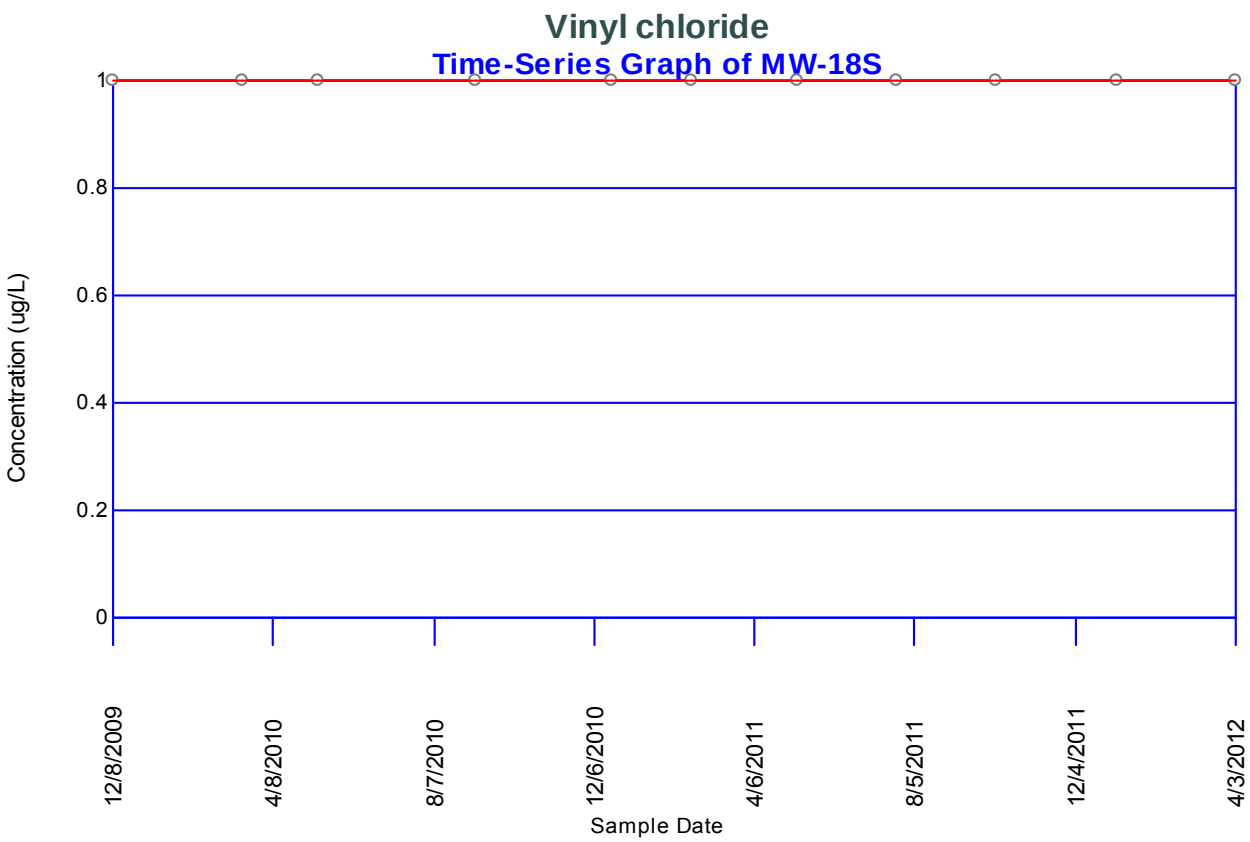

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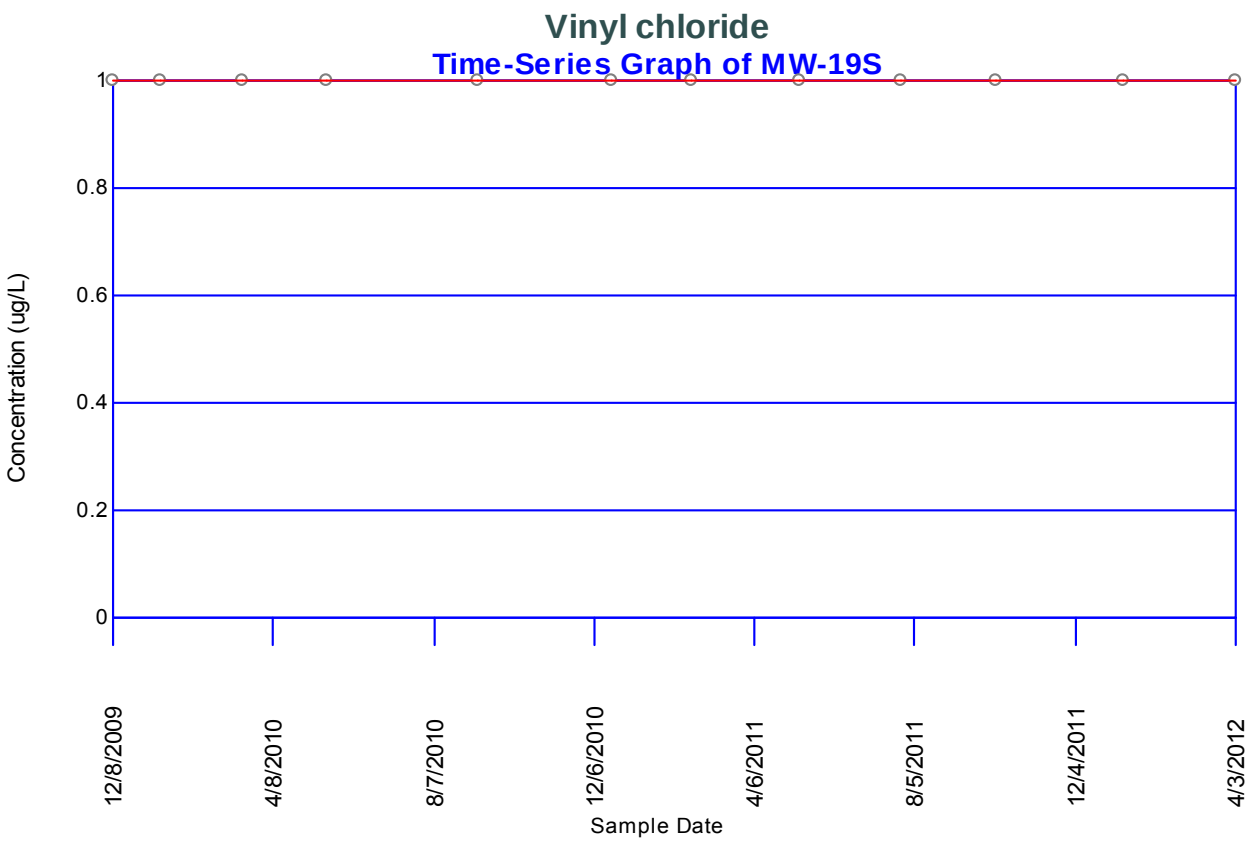

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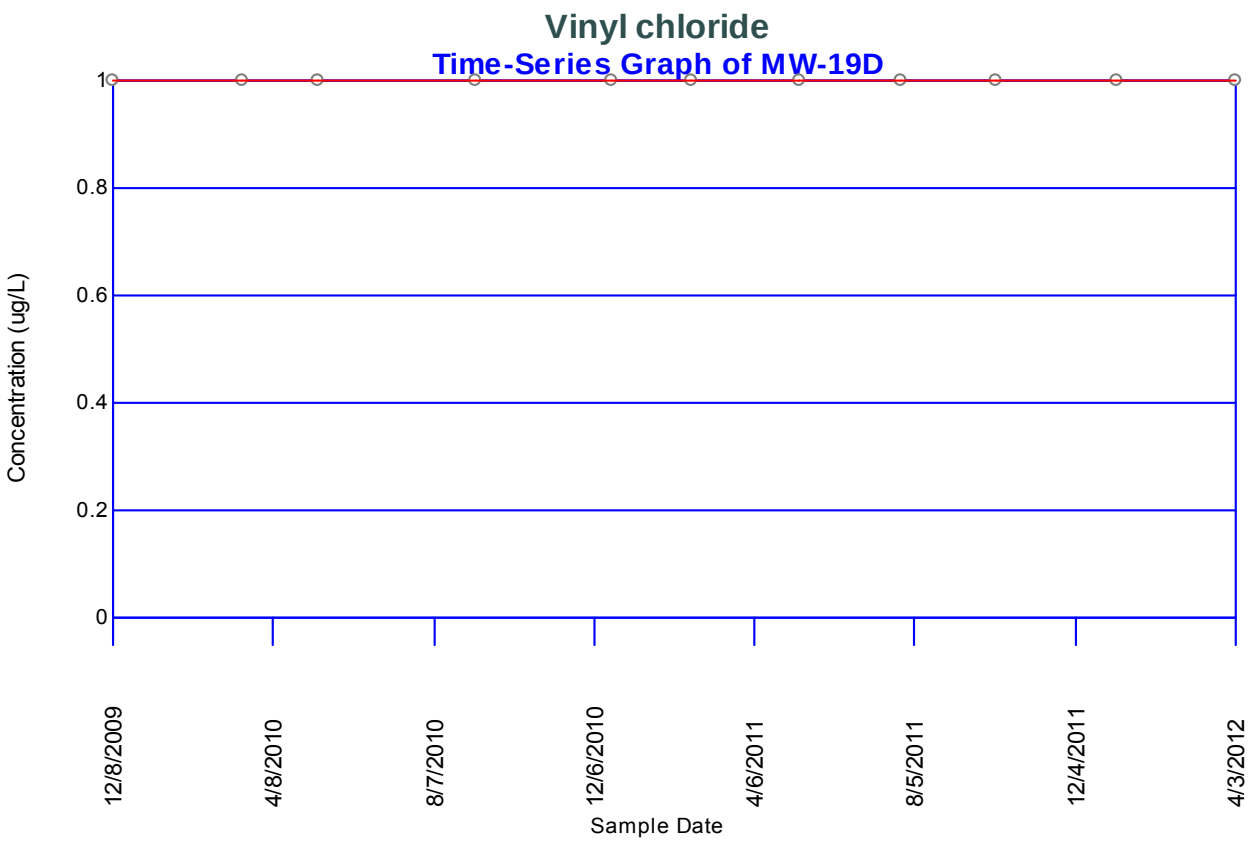

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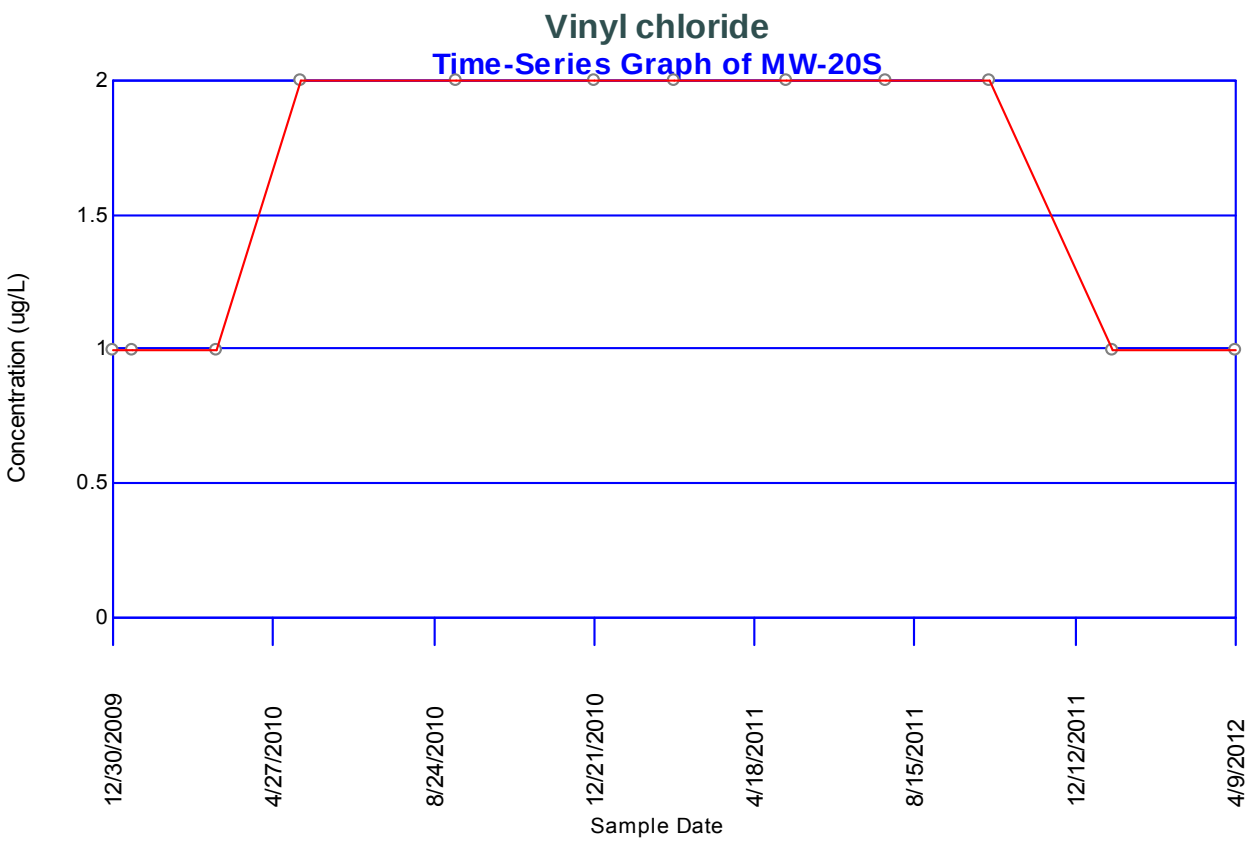

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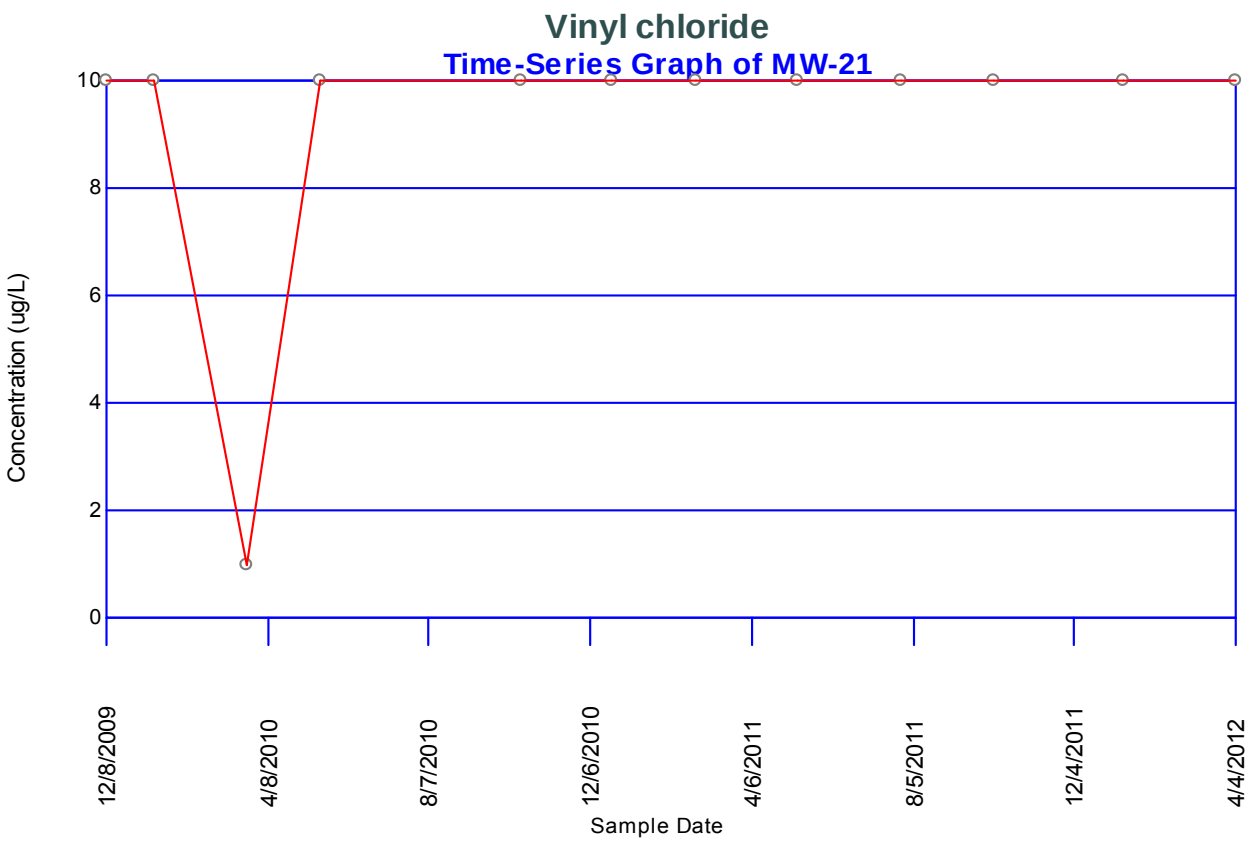

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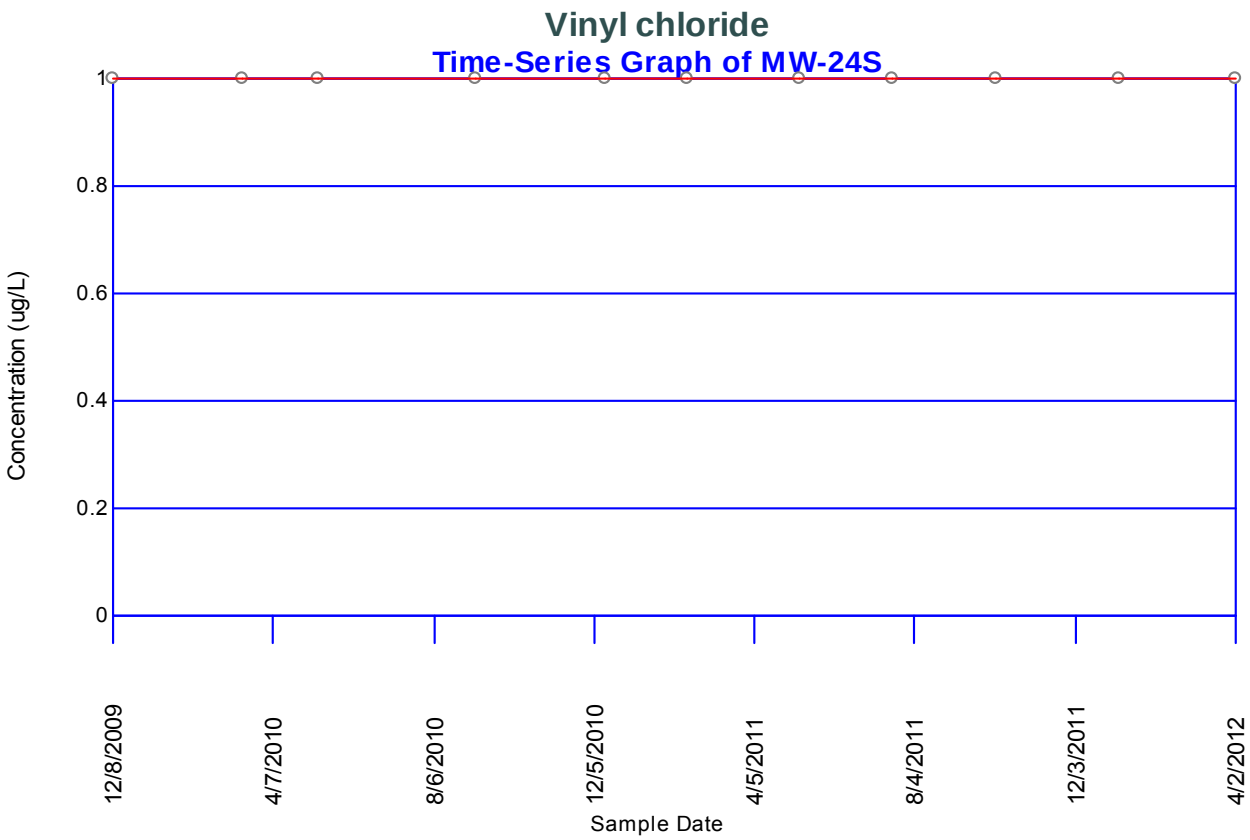

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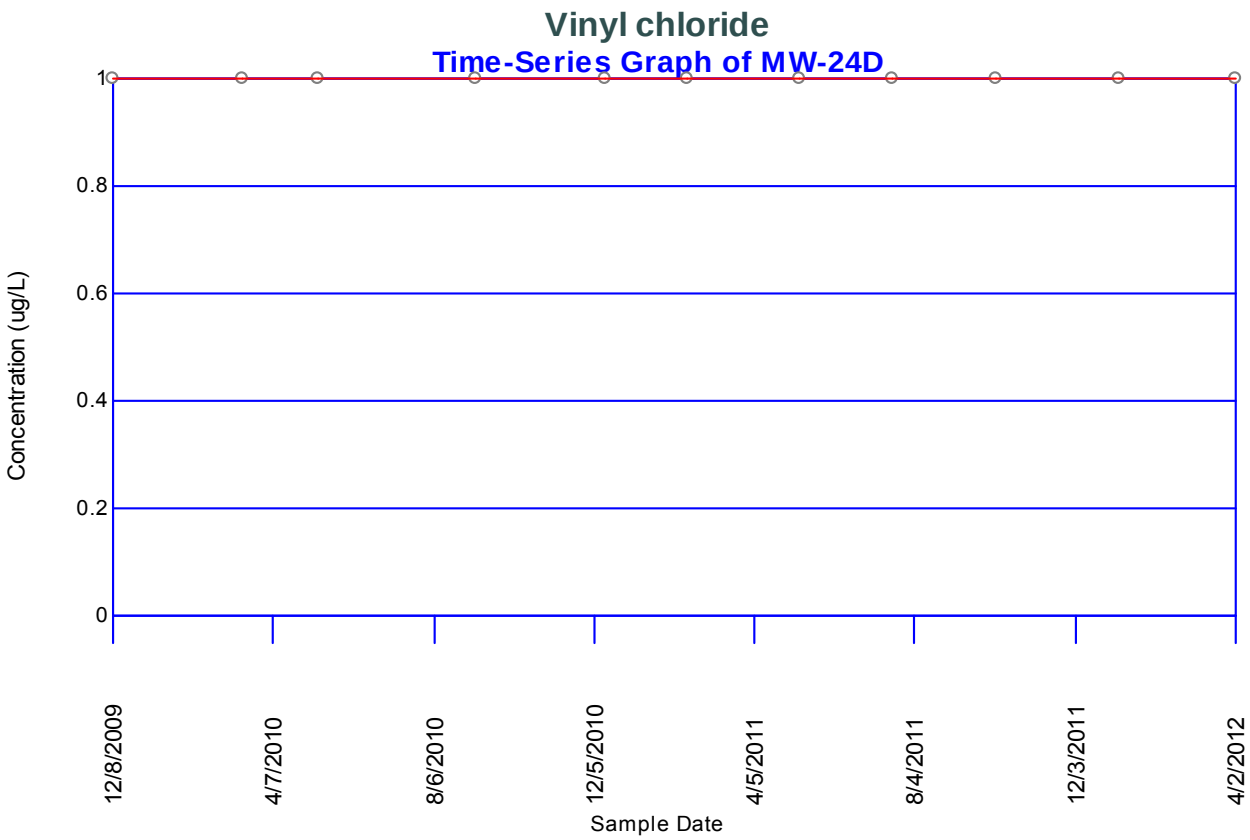

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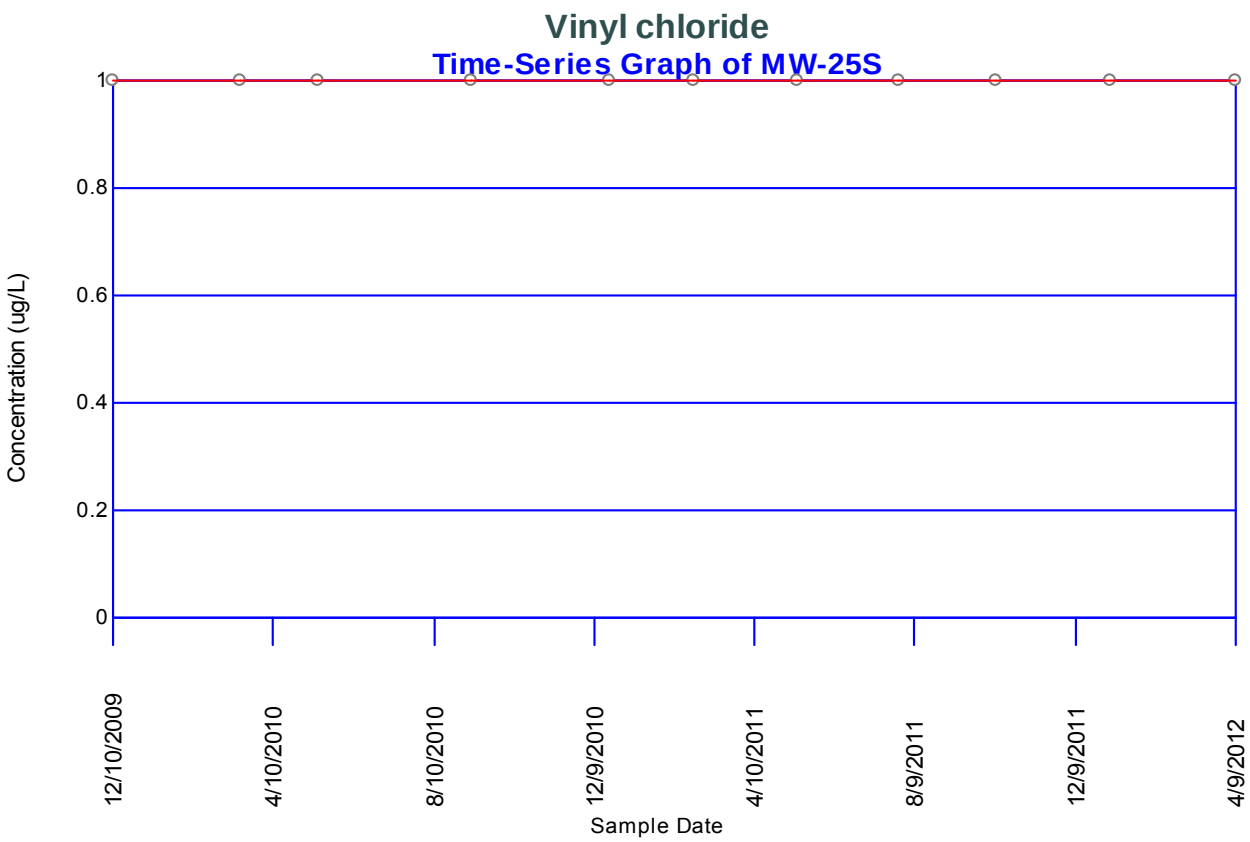

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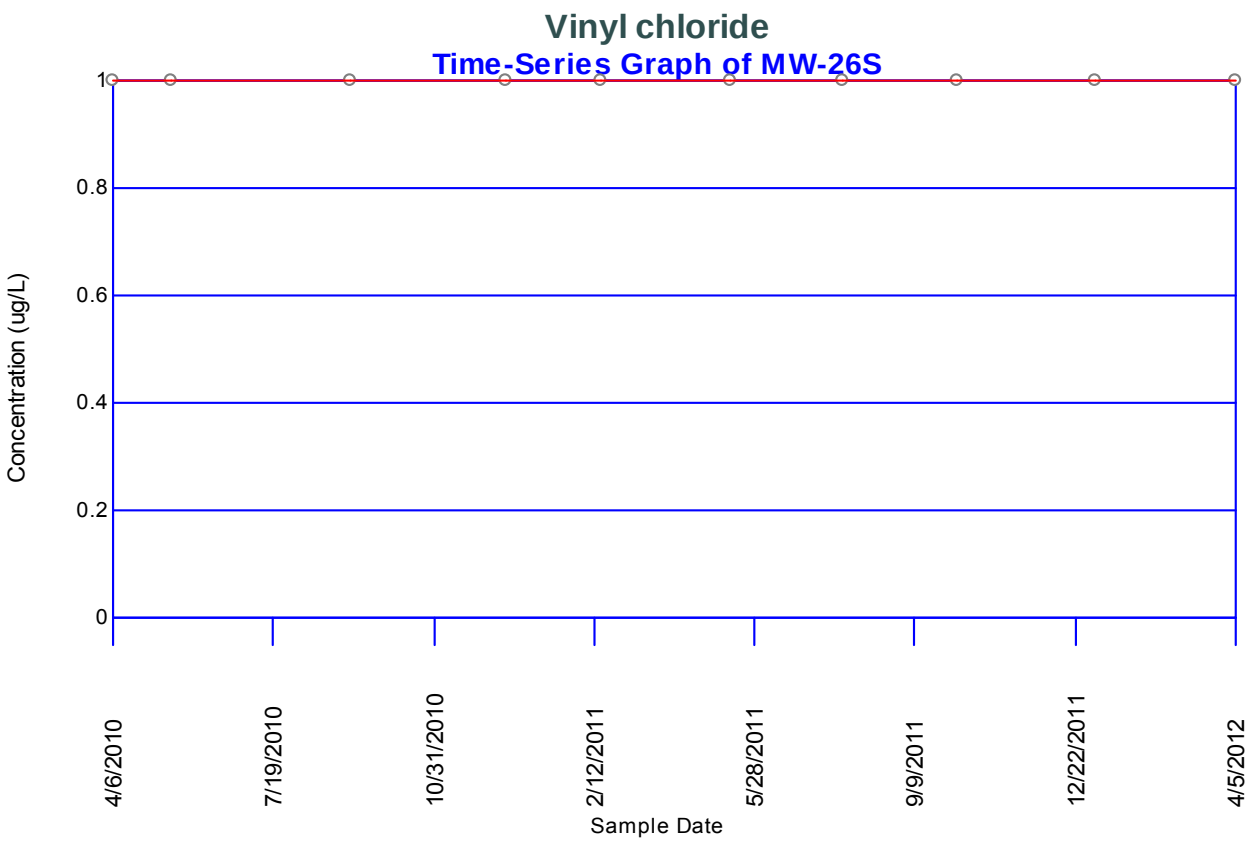

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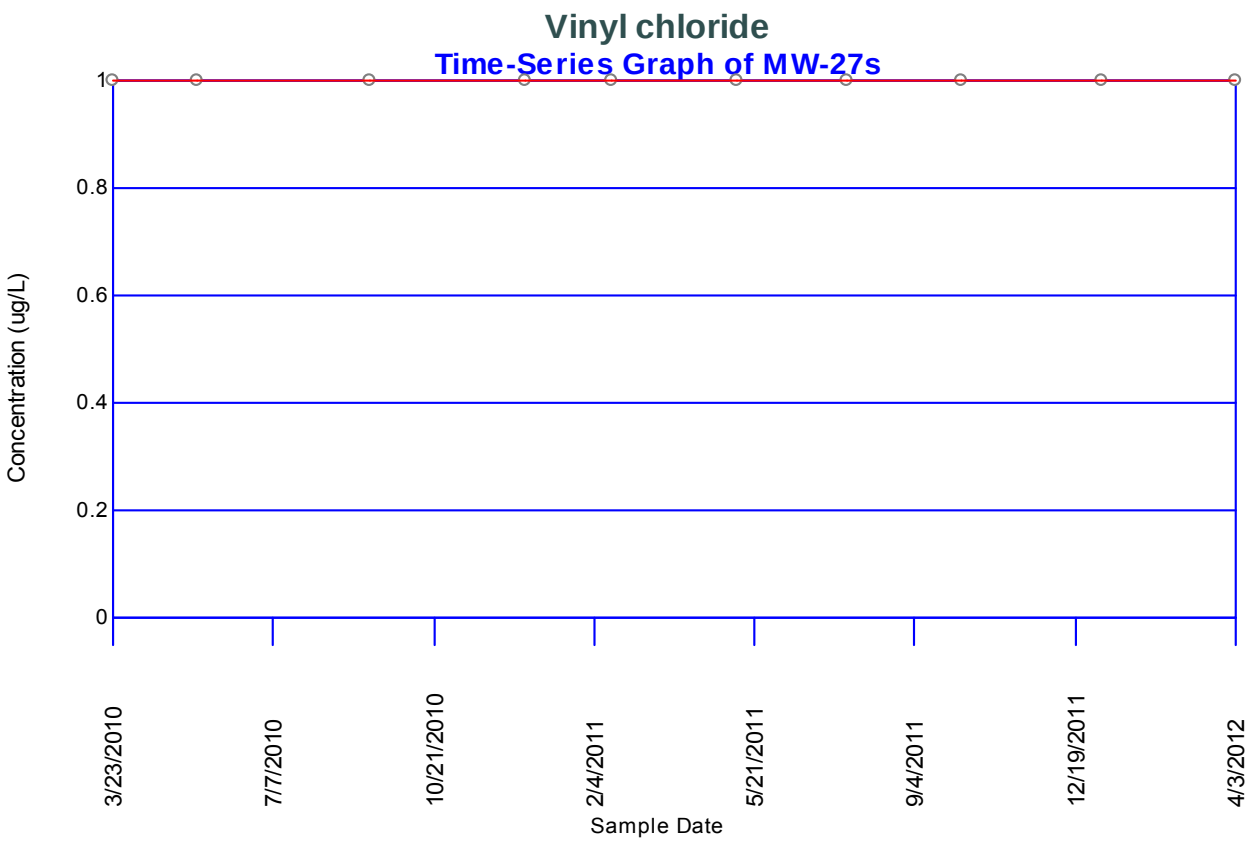

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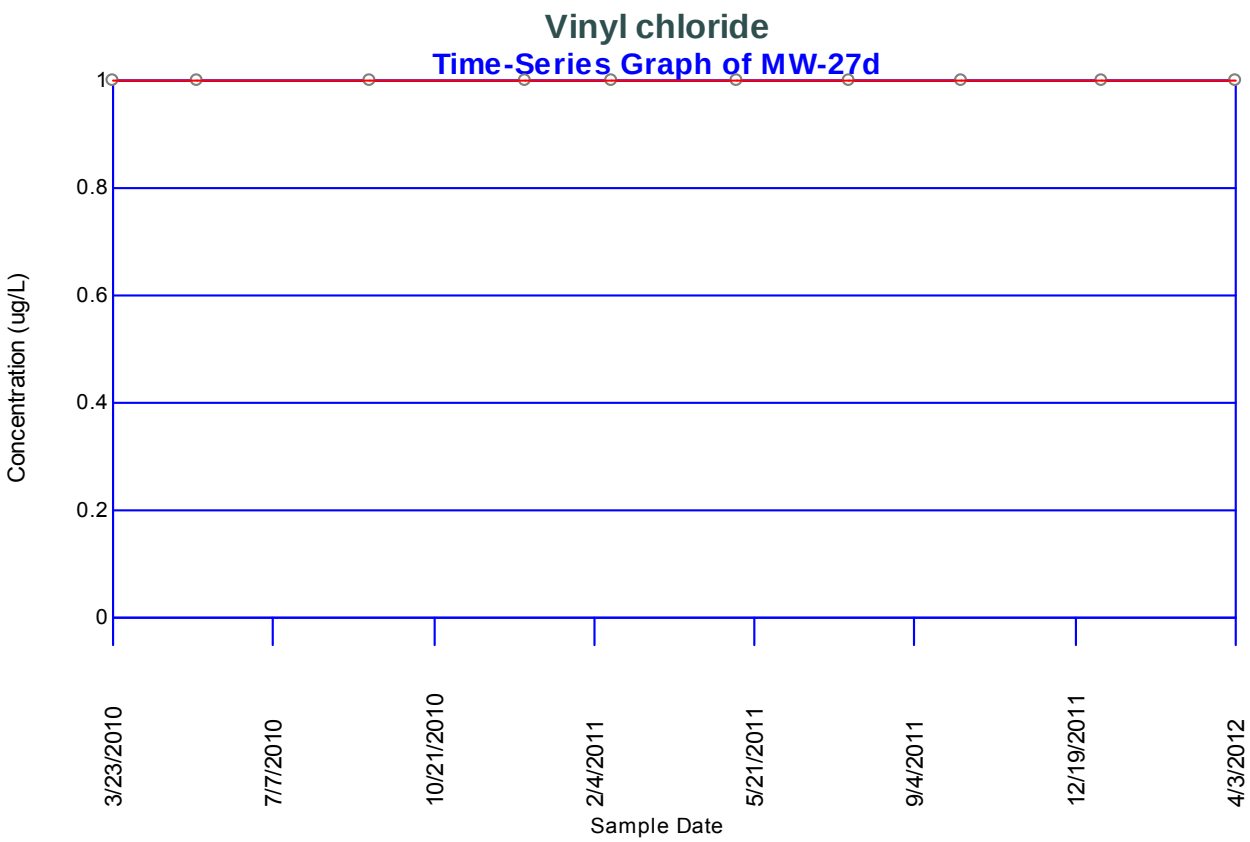
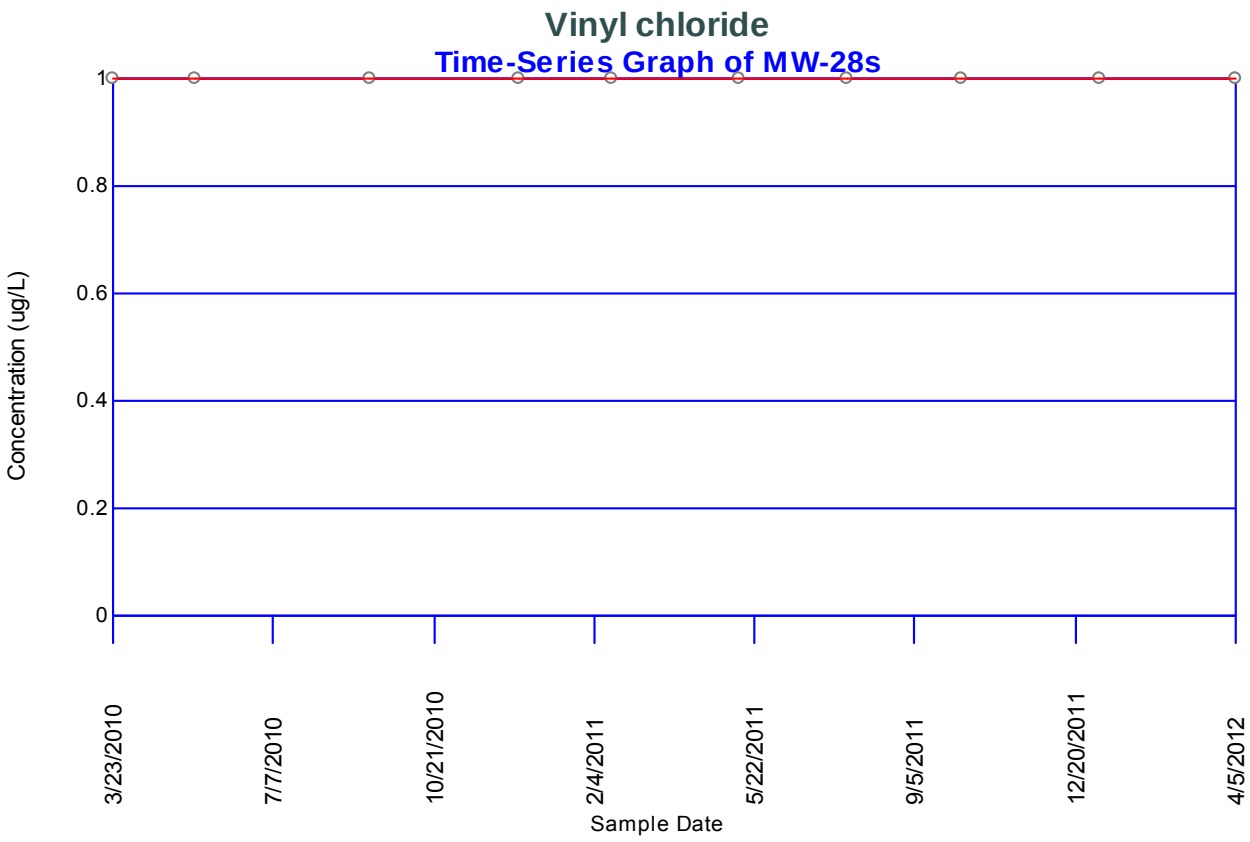
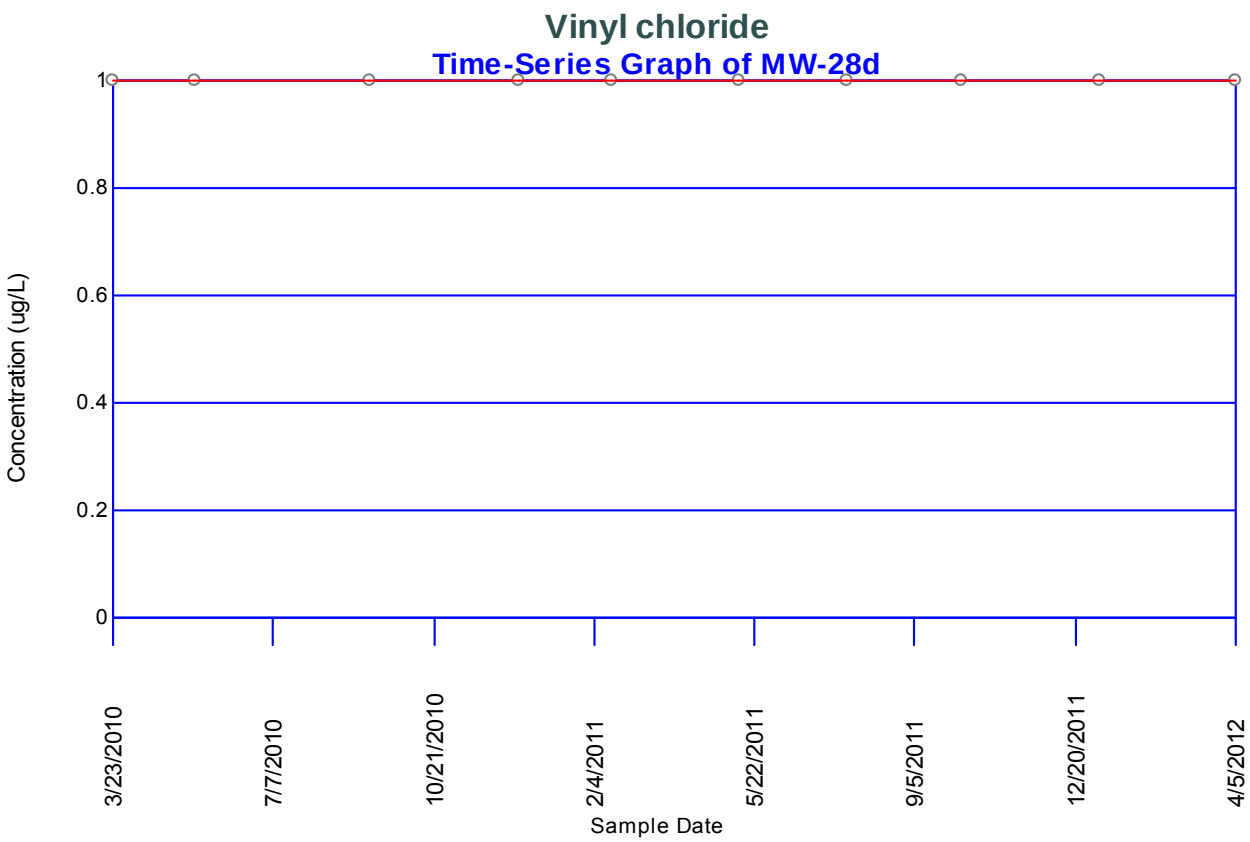


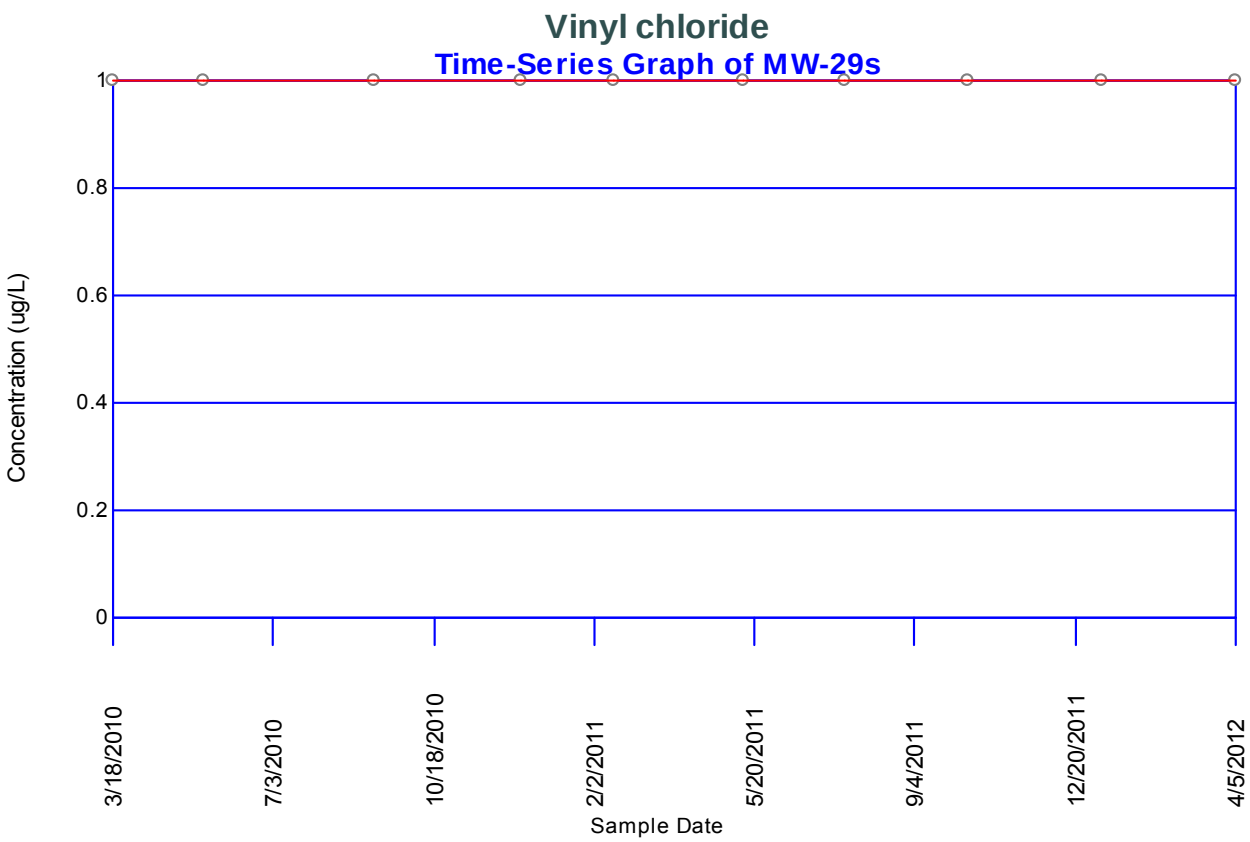
US EPA ARCHIVE DOCUMENT



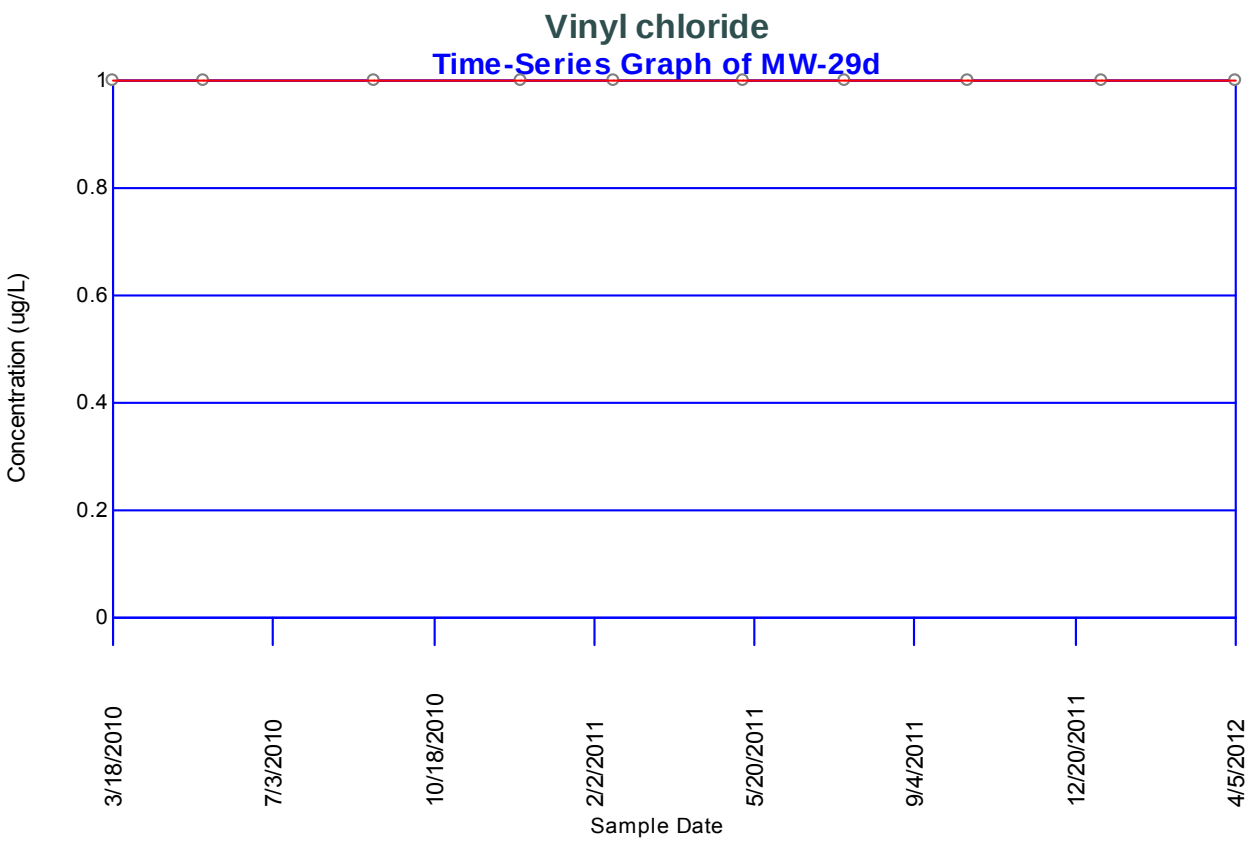
US EPA ARCHIVE DOCUMENT



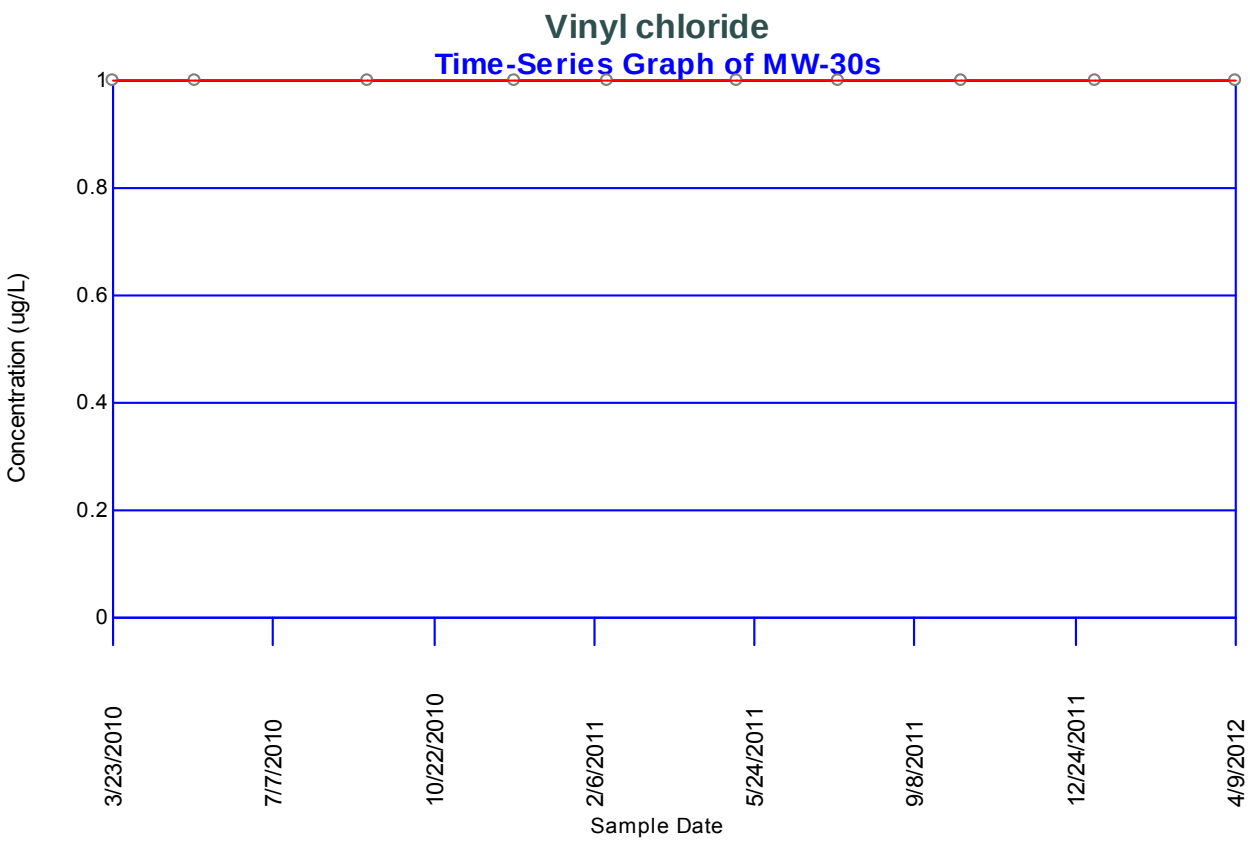
US EPA ARCHIVE DOCUMENT



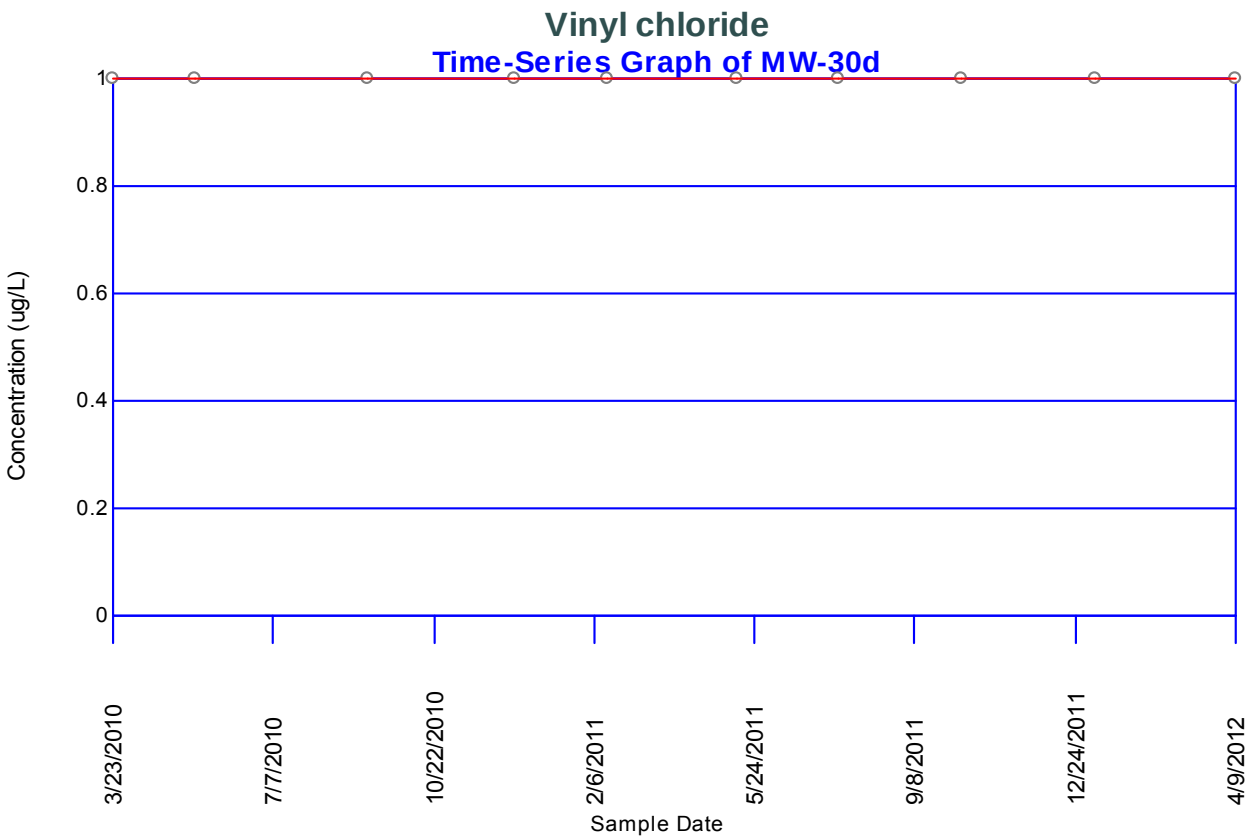
US EPA ARCHIVE DOCUMENT



US EPA ARCHIVE DOCUMENT



US EPA ARCHIVE DOCUMENT



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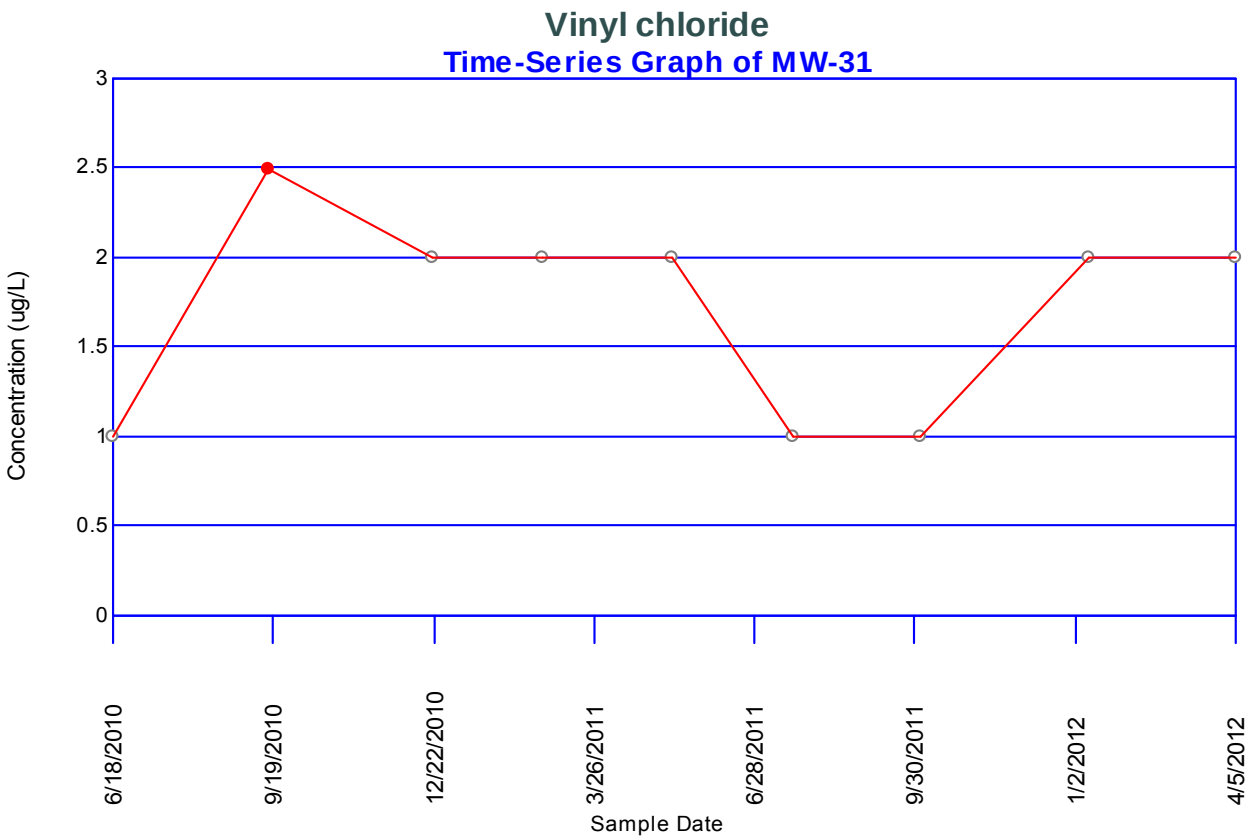

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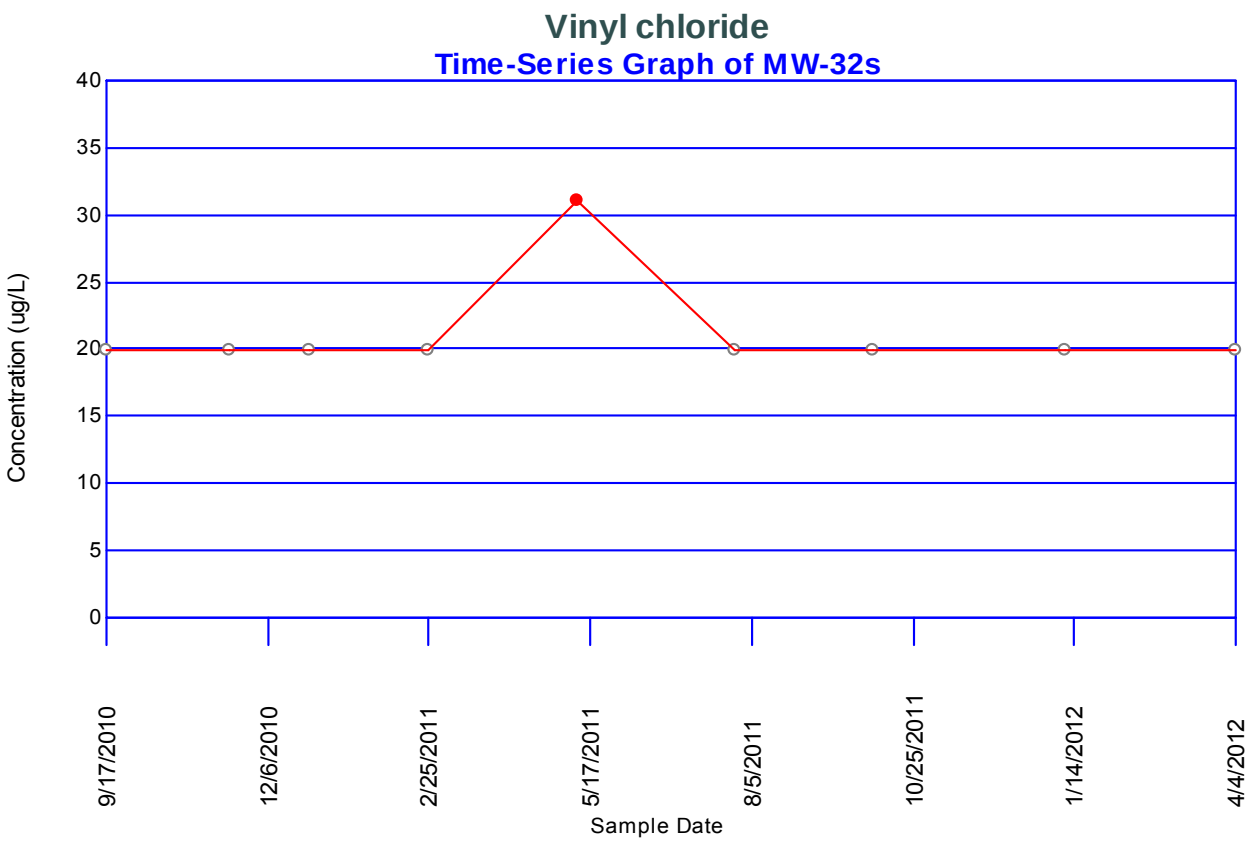

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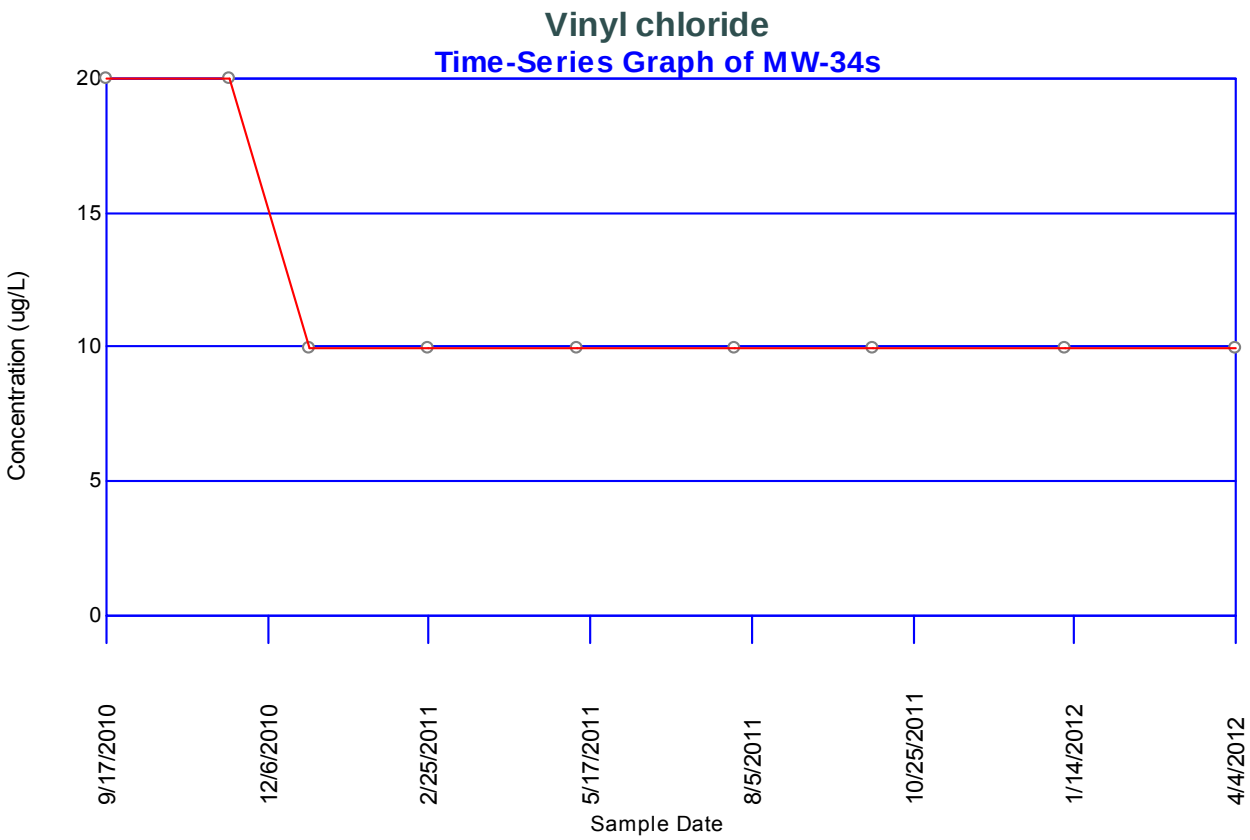

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Appendix E
Mann-Kendall Trend Tests – Model Output

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Mann-Kendall Trend Analysis

Parameter: 1,1,1-Trichloroethane

Location: MW-01S

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
1100	750	350	1	0
1000	750	250	2	0
1400	750	650	3	0
1000	750	250	4	0
750	750	0	4	0
1100	750	350	5	0
560	750	-190	5	1
860	750	110	6	1
500	750	-250	6	2
540	750	-210	6	3
530	750	-220	6	4
480	750	-270	6	5
1000	1100	-100	6	6
1400	1100	300	7	6
1000	1100	-100	7	7
750	1100	-350	7	8
1100	1100	0	7	8
560	1100	-540	7	9
860	1100	-240	7	10
500	1100	-600	7	11
540	1100	-560	7	12
530	1100	-570	7	13
480	1100	-620	7	14
1400	1000	400	8	14
1000	1000	0	8	14
750	1000	-250	8	15
1100	1000	100	9	15
560	1000	-440	9	16
860	1000	-140	9	17
500	1000	-500	9	18
540	1000	-460	9	19
530	1000	-470	9	20
480	1000	-520	9	21
1000	1400	-400	9	22
750	1400	-650	9	23
1100	1400	-300	9	24
560	1400	-840	9	25
860	1400	-540	9	26
500	1400	-900	9	27
540	1400	-860	9	28
530	1400	-870	9	29
480	1400	-920	9	30
750	1000	-250	9	31

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1100	1000	100	10	31
560	1000	-440	10	32
860	1000	-140	10	33
500	1000	-500	10	34
540	1000	-460	10	35
530	1000	-470	10	36
480	1000	-520	10	37
1100	750	350	11	37
560	750	-190	11	38
860	750	110	12	38
500	750	-250	12	39
540	750	-210	12	40
530	750	-220	12	41
480	750	-270	12	42
560	1100	-540	12	43
860	1100	-240	12	44
500	1100	-600	12	45
540	1100	-560	12	46
530	1100	-570	12	47
480	1100	-620	12	48
860	560	300	13	48
500	560	-60	13	49
540	560	-20	13	50
530	560	-30	13	51
480	560	-80	13	52
500	860	-360	13	53
540	860	-320	13	54
530	860	-330	13	55
480	860	-380	13	56
540	500	40	14	56
530	500	30	15	56
480	500	-20	15	57
530	540	-10	15	58
480	540	-60	15	59
480	530	-50	15	60

S Statistic = 15 - 60 = -45

Tied Group	Value	Members
1	750	2
2	1100	2
3	1000	2

Time Period	Observations
3/13/2009	1
4/20/2009	1
12/9/2009	1
3/17/2010	1
5/18/2010	1

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9/10/2010	1
12/28/2010	1
2/25/2011	1
5/11/2011	1
7/28/2011	1
10/6/2011	1
1/9/2012	1
4/4/2012	1

There are 0 time periods with multiple data

A = 54
B = 0
C = 0
D = 0
E = 6
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 265.667
Z-Score = -2.69951
Comparison Level at 95% confidence level = -1.65463 (downward trend)
-2.69951 < -1.65463 indicating a downward trend

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Mann-Kendall Trend Analysis

Parameter: 1,1,1-Trichloroethane

Location: MW-01S

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
1100	750	350	1	0
1000	750	250	2	0
1400	750	650	3	0
1000	750	250	4	0
750	750	0	4	0
1100	750	350	5	0
560	750	-190	5	1
860	750	110	6	1
500	750	-250	6	2
540	750	-210	6	3
530	750	-220	6	4
480	750	-270	6	5
1000	1100	-100	6	6
1400	1100	300	7	6
1000	1100	-100	7	7
750	1100	-350	7	8
1100	1100	0	7	8
560	1100	-540	7	9
860	1100	-240	7	10
500	1100	-600	7	11
540	1100	-560	7	12
530	1100	-570	7	13
480	1100	-620	7	14
1400	1000	400	8	14
1000	1000	0	8	14
750	1000	-250	8	15
1100	1000	100	9	15
560	1000	-440	9	16
860	1000	-140	9	17
500	1000	-500	9	18
540	1000	-460	9	19
530	1000	-470	9	20
480	1000	-520	9	21
1000	1400	-400	9	22
750	1400	-650	9	23
1100	1400	-300	9	24
560	1400	-840	9	25
860	1400	-540	9	26
500	1400	-900	9	27
540	1400	-860	9	28
530	1400	-870	9	29
480	1400	-920	9	30
750	1000	-250	9	31

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1100	1000	100	10	31
560	1000	-440	10	32
860	1000	-140	10	33
500	1000	-500	10	34
540	1000	-460	10	35
530	1000	-470	10	36
480	1000	-520	10	37
1100	750	350	11	37
560	750	-190	11	38
860	750	110	12	38
500	750	-250	12	39
540	750	-210	12	40
530	750	-220	12	41
480	750	-270	12	42
560	1100	-540	12	43
860	1100	-240	12	44
500	1100	-600	12	45
540	1100	-560	12	46
530	1100	-570	12	47
480	1100	-620	12	48
860	560	300	13	48
500	560	-60	13	49
540	560	-20	13	50
530	560	-30	13	51
480	560	-80	13	52
500	860	-360	13	53
540	860	-320	13	54
530	860	-330	13	55
480	860	-380	13	56
540	500	40	14	56
530	500	30	15	56
480	500	-20	15	57
530	540	-10	15	58
480	540	-60	15	59
480	530	-50	15	60

S Statistic = 15 - 60 = -45

Tied Group	Value	Members
1	750	2
2	1100	2
3	1000	2

Time Period	Observations
3/13/2009	1
4/20/2009	1
12/9/2009	1
3/17/2010	1
5/18/2010	1

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9/10/2010	1
12/28/2010	1
2/25/2011	1
5/11/2011	1
7/28/2011	1
10/6/2011	1
1/9/2012	1
4/4/2012	1

There are 0 time periods with multiple data

A = 54
B = 0
C = 0
D = 0
E = 6
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 265.667
Z-Score = -2.69951
Comparison Level at 95% confidence level = 1.65463 (upward trend)
-2.69951 <= 1.65463 indicating no evidence of an upward trend

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Mann-Kendall Trend Analysis

Parameter: Trichloroethene
Location: MW-01S
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
2200	2700	-500	0	1
3400	2700	700	1	1
2500	2700	-200	1	2
2700	2700	0	1	2
2400	2700	-300	1	3
2500	2700	-200	1	4
1300	2700	-1400	1	5
1900	2700	-800	1	6
1900	2700	-800	1	7
2000	2700	-700	1	8
2000	2700	-700	1	9
1900	2700	-800	1	10
3400	2200	1200	2	10
2500	2200	300	3	10
2700	2200	500	4	10
2400	2200	200	5	10
2500	2200	300	6	10
1300	2200	-900	6	11
1900	2200	-300	6	12
1900	2200	-300	6	13
2000	2200	-200	6	14
2000	2200	-200	6	15
1900	2200	-300	6	16
2500	3400	-900	6	17
2700	3400	-700	6	18
2400	3400	-1000	6	19
2500	3400	-900	6	20
1300	3400	-2100	6	21
1900	3400	-1500	6	22
1900	3400	-1500	6	23
2000	3400	-1400	6	24
2000	3400	-1400	6	25
1900	3400	-1500	6	26
2700	2500	200	7	26
2400	2500	-100	7	27
2500	2500	0	7	27
1300	2500	-1200	7	28
1900	2500	-600	7	29
1900	2500	-600	7	30
2000	2500	-500	7	31
2000	2500	-500	7	32
1900	2500	-600	7	33
2400	2700	-300	7	34

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2500	2700	-200	7	35
1300	2700	-1400	7	36
1900	2700	-800	7	37
1900	2700	-800	7	38
2000	2700	-700	7	39
2000	2700	-700	7	40
1900	2700	-800	7	41
2500	2400	100	8	41
1300	2400	-1100	8	42
1900	2400	-500	8	43
1900	2400	-500	8	44
2000	2400	-400	8	45
2000	2400	-400	8	46
1900	2400	-500	8	47
1300	2500	-1200	8	48
1900	2500	-600	8	49
1900	2500	-600	8	50
2000	2500	-500	8	51
2000	2500	-500	8	52
1900	2500	-600	8	53
1900	1300	600	9	53
1900	1300	600	10	53
2000	1300	700	11	53
2000	1300	700	12	53
1900	1300	600	13	53
1900	1900	0	13	53
2000	1900	100	14	53
2000	1900	100	15	53
1900	1900	0	15	53
2000	1900	100	16	53
2000	1900	100	17	53
1900	1900	0	17	53
2000	2000	0	17	53
1900	2000	-100	17	54
1900	2000	-100	17	55

S Statistic = 17 - 55 = -38

Tied Group	Value	Members
1	2700	2
2	2500	2
3	1900	3
4	2000	2

Time Period	Observations
3/13/2009	1
4/20/2009	1
12/9/2009	1
3/17/2010	1

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5/18/2010	1
9/10/2010	1
12/28/2010	1
2/25/2011	1
5/11/2011	1
7/28/2011	1
10/6/2011	1
1/9/2012	1
4/4/2012	1

There are 0 time periods with multiple data

A = 120
B = 0
C = 6
D = 0
E = 12
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 262
Z-Score = -2.28587
Comparison Level at 95% confidence level = -1.65463 (downward trend)
-2.28587 < -1.65463 indicating a downward trend

US EPA ARCHIVE DOCUMENT

Mann-Kendall Trend Analysis

Parameter: Trichloroethene
Location: MW-01S
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
2200	2700	-500	0	1
3400	2700	700	1	1
2500	2700	-200	1	2
2700	2700	0	1	2
2400	2700	-300	1	3
2500	2700	-200	1	4
1300	2700	-1400	1	5
1900	2700	-800	1	6
1900	2700	-800	1	7
2000	2700	-700	1	8
2000	2700	-700	1	9
1900	2700	-800	1	10
3400	2200	1200	2	10
2500	2200	300	3	10
2700	2200	500	4	10
2400	2200	200	5	10
2500	2200	300	6	10
1300	2200	-900	6	11
1900	2200	-300	6	12
1900	2200	-300	6	13
2000	2200	-200	6	14
2000	2200	-200	6	15
1900	2200	-300	6	16
2500	3400	-900	6	17
2700	3400	-700	6	18
2400	3400	-1000	6	19
2500	3400	-900	6	20
1300	3400	-2100	6	21
1900	3400	-1500	6	22
1900	3400	-1500	6	23
2000	3400	-1400	6	24
2000	3400	-1400	6	25
1900	3400	-1500	6	26
2700	2500	200	7	26
2400	2500	-100	7	27
2500	2500	0	7	27
1300	2500	-1200	7	28
1900	2500	-600	7	29
1900	2500	-600	7	30
2000	2500	-500	7	31
2000	2500	-500	7	32
1900	2500	-600	7	33
2400	2700	-300	7	34

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2500	2700	-200	7	35
1300	2700	-1400	7	36
1900	2700	-800	7	37
1900	2700	-800	7	38
2000	2700	-700	7	39
2000	2700	-700	7	40
1900	2700	-800	7	41
2500	2400	100	8	41
1300	2400	-1100	8	42
1900	2400	-500	8	43
1900	2400	-500	8	44
2000	2400	-400	8	45
2000	2400	-400	8	46
1900	2400	-500	8	47
1300	2500	-1200	8	48
1900	2500	-600	8	49
1900	2500	-600	8	50
2000	2500	-500	8	51
2000	2500	-500	8	52
1900	2500	-600	8	53
1900	1300	600	9	53
1900	1300	600	10	53
2000	1300	700	11	53
2000	1300	700	12	53
1900	1300	600	13	53
1900	1900	0	13	53
2000	1900	100	14	53
2000	1900	100	15	53
1900	1900	0	15	53
2000	1900	100	16	53
2000	1900	100	17	53
1900	1900	0	17	53
2000	2000	0	17	53
1900	2000	-100	17	54
1900	2000	-100	17	55

S Statistic = 17 - 55 = -38

Tied Group	Value	Members
1	2700	2
2	2500	2
3	1900	3
4	2000	2

Time Period	Observations
3/13/2009	1
4/20/2009	1
12/9/2009	1
3/17/2010	1

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5/18/2010	1
9/10/2010	1
12/28/2010	1
2/25/2011	1
5/11/2011	1
7/28/2011	1
10/6/2011	1
1/9/2012	1
4/4/2012	1

There are 0 time periods with multiple data

A = 120
B = 0
C = 6
D = 0
E = 12
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 262
Z-Score = -2.28587
Comparison Level at 95% confidence level = 1.65463 (upward trend)
-2.28587 <= 1.65463 indicating no evidence of an upward trend

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Mann-Kendall Trend Analysis

Parameter: 1,1,1-Trichloroethane

Location: MW-02S

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
ND<10	2.5	7.5	1	0
2.9	2.5	0.4	2	0
3.1	2.5	0.6	3	0
2.6	2.5	0.1	4	0
2.3	2.5	-0.2	4	1
3.1	2.5	0.6	5	1
2.6	2.5	0.1	6	1
2.3	2.5	-0.2	6	2
2.4	2.5	-0.1	6	3
2.5	2.5	0	6	3
2.5	2.5	0	6	3
3.4	2.5	0.9	7	3
2.9	ND<10	-7.1	7	4
3.1	ND<10	-6.9	7	5
2.6	ND<10	-7.4	7	6
2.3	ND<10	-7.7	7	7
3.1	ND<10	-6.9	7	8
2.6	ND<10	-7.4	7	9
2.3	ND<10	-7.7	7	10
2.4	ND<10	-7.6	7	11
2.5	ND<10	-7.5	7	12
2.5	ND<10	-7.5	7	13
3.4	ND<10	-6.6	7	14
3.1	2.9	0.2	8	14
2.6	2.9	-0.3	8	15
2.3	2.9	-0.6	8	16
3.1	2.9	0.2	9	16
2.6	2.9	-0.3	9	17
2.3	2.9	-0.6	9	18
2.4	2.9	-0.5	9	19
2.5	2.9	-0.4	9	20
2.5	2.9	-0.4	9	21
3.4	2.9	0.5	10	21
2.6	3.1	-0.5	10	22
2.3	3.1	-0.8	10	23
3.1	3.1	0	10	23
2.6	3.1	-0.5	10	24
2.3	3.1	-0.8	10	25
2.4	3.1	-0.7	10	26
2.5	3.1	-0.6	10	27
2.5	3.1	-0.6	10	28
3.4	3.1	0.3	11	28
2.3	2.6	-0.3	11	29

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3.1	2.6	0.5	12	29
2.6	2.6	0	12	29
2.3	2.6	-0.3	12	30
2.4	2.6	-0.2	12	31
2.5	2.6	-0.1	12	32
2.5	2.6	-0.1	12	33
3.4	2.6	0.8	13	33
3.1	2.3	0.8	14	33
2.6	2.3	0.3	15	33
2.3	2.3	0	15	33
2.4	2.3	0.1	16	33
2.5	2.3	0.2	17	33
2.5	2.3	0.2	18	33
3.4	2.3	1.1	19	33
2.6	3.1	-0.5	19	34
2.3	3.1	-0.8	19	35
2.4	3.1	-0.7	19	36
2.5	3.1	-0.6	19	37
2.5	3.1	-0.6	19	38
3.4	3.1	0.3	20	38
2.3	2.6	-0.3	20	39
2.4	2.6	-0.2	20	40
2.5	2.6	-0.1	20	41
2.5	2.6	-0.1	20	42
3.4	2.6	0.8	21	42
2.4	2.3	0.1	22	42
2.5	2.3	0.2	23	42
2.5	2.3	0.2	24	42
3.4	2.3	1.1	25	42
2.5	2.4	0.1	26	42
2.5	2.4	0.1	27	42
3.4	2.4	1	28	42
2.5	2.5	0	28	42
3.4	2.5	0.9	29	42
3.4	2.5	0.9	30	42

S Statistic = 30 - 42 = -12

Tied Group	Value	Members
1	2.5	3
2	3.1	2
3	2.6	2
4	2.3	2

Time Period	Observations
3/13/2009	1
4/20/2009	1
12/9/2009	1
3/17/2010	1

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5/18/2010	1
9/10/2010	1
12/22/2010	1
2/24/2011	1
5/10/2011	1
7/28/2011	1
10/7/2011	1
1/10/2012	1
4/5/2012	1

There are 0 time periods with multiple data

A = 120
B = 0
C = 6
D = 0
E = 12
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 262
Z-Score = -0.679582
Comparison Level at 95% confidence level = -1.65463 (downward trend)
-0.679582 >= -1.65463 indicating no evidence of a downward trend

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Mann-Kendall Trend Analysis

Parameter: 1,1,1-Trichloroethane

Location: MW-02S

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
ND<10	2.5	7.5	1	0
2.9	2.5	0.4	2	0
3.1	2.5	0.6	3	0
2.6	2.5	0.1	4	0
2.3	2.5	-0.2	4	1
3.1	2.5	0.6	5	1
2.6	2.5	0.1	6	1
2.3	2.5	-0.2	6	2
2.4	2.5	-0.1	6	3
2.5	2.5	0	6	3
2.5	2.5	0	6	3
3.4	2.5	0.9	7	3
2.9	ND<10	-7.1	7	4
3.1	ND<10	-6.9	7	5
2.6	ND<10	-7.4	7	6
2.3	ND<10	-7.7	7	7
3.1	ND<10	-6.9	7	8
2.6	ND<10	-7.4	7	9
2.3	ND<10	-7.7	7	10
2.4	ND<10	-7.6	7	11
2.5	ND<10	-7.5	7	12
2.5	ND<10	-7.5	7	13
3.4	ND<10	-6.6	7	14
3.1	2.9	0.2	8	14
2.6	2.9	-0.3	8	15
2.3	2.9	-0.6	8	16
3.1	2.9	0.2	9	16
2.6	2.9	-0.3	9	17
2.3	2.9	-0.6	9	18
2.4	2.9	-0.5	9	19
2.5	2.9	-0.4	9	20
2.5	2.9	-0.4	9	21
3.4	2.9	0.5	10	21
2.6	3.1	-0.5	10	22
2.3	3.1	-0.8	10	23
3.1	3.1	0	10	23
2.6	3.1	-0.5	10	24
2.3	3.1	-0.8	10	25
2.4	3.1	-0.7	10	26
2.5	3.1	-0.6	10	27
2.5	3.1	-0.6	10	28
3.4	3.1	0.3	11	28
2.3	2.6	-0.3	11	29

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3.1	2.6	0.5	12	29
2.6	2.6	0	12	29
2.3	2.6	-0.3	12	30
2.4	2.6	-0.2	12	31
2.5	2.6	-0.1	12	32
2.5	2.6	-0.1	12	33
3.4	2.6	0.8	13	33
3.1	2.3	0.8	14	33
2.6	2.3	0.3	15	33
2.3	2.3	0	15	33
2.4	2.3	0.1	16	33
2.5	2.3	0.2	17	33
2.5	2.3	0.2	18	33
3.4	2.3	1.1	19	33
2.6	3.1	-0.5	19	34
2.3	3.1	-0.8	19	35
2.4	3.1	-0.7	19	36
2.5	3.1	-0.6	19	37
2.5	3.1	-0.6	19	38
3.4	3.1	0.3	20	38
2.3	2.6	-0.3	20	39
2.4	2.6	-0.2	20	40
2.5	2.6	-0.1	20	41
2.5	2.6	-0.1	20	42
3.4	2.6	0.8	21	42
2.4	2.3	0.1	22	42
2.5	2.3	0.2	23	42
2.5	2.3	0.2	24	42
3.4	2.3	1.1	25	42
2.5	2.4	0.1	26	42
2.5	2.4	0.1	27	42
3.4	2.4	1	28	42
2.5	2.5	0	28	42
3.4	2.5	0.9	29	42
3.4	2.5	0.9	30	42

S Statistic = 30 - 42 = -12

Tied Group	Value	Members
1	2.5	3
2	3.1	2
3	2.6	2
4	2.3	2

Time Period	Observations
3/13/2009	1
4/20/2009	1
12/9/2009	1
3/17/2010	1

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5/18/2010	1
9/10/2010	1
12/22/2010	1
2/24/2011	1
5/10/2011	1
7/28/2011	1
10/7/2011	1
1/10/2012	1
4/5/2012	1

There are 0 time periods with multiple data

A = 120
B = 0
C = 6
D = 0
E = 12
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 262
Z-Score = -0.679582
Comparison Level at 95% confidence level = 1.65463 (upward trend)
-0.679582 <= 1.65463 indicating no evidence of an upward trend

US EPA ARCHIVE DOCUMENT

Mann-Kendall Trend Analysis

Parameter: cis-1,2-Dichloroethene
Location: MW-02S
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
ND<10	2.4	7.6	1	0
3.7	2.4	1.3	2	0
4.1	2.4	1.7	3	0
2.3	2.4	-0.1	3	1
2.3	2.4	-0.1	3	2
2.4	2.4	0	3	2
2	2.4	-0.4	3	3
ND<2	2.4	-0.4	3	4
2	2.4	-0.4	3	5
ND<2	2.4	-0.4	3	6
ND<2	2.4	-0.4	3	7
2.7	2.4	0.3	4	7
3.7	ND<10	-6.3	4	8
4.1	ND<10	-5.9	4	9
2.3	ND<10	-7.7	4	10
2.3	ND<10	-7.7	4	11
2.4	ND<10	-7.6	4	12
2	ND<10	-8	4	13
ND<2	ND<10	-8	4	14
2	ND<10	-8	4	15
ND<2	ND<10	-8	4	16
ND<2	ND<10	-8	4	17
2.7	ND<10	-7.3	4	18
4.1	3.7	0.4	5	18
2.3	3.7	-1.4	5	19
2.3	3.7	-1.4	5	20
2.4	3.7	-1.3	5	21
2	3.7	-1.7	5	22
ND<2	3.7	-1.7	5	23
2	3.7	-1.7	5	24
ND<2	3.7	-1.7	5	25
ND<2	3.7	-1.7	5	26
2.7	3.7	-1	5	27
2.3	4.1	-1.8	5	28
2.3	4.1	-1.8	5	29
2.4	4.1	-1.7	5	30
2	4.1	-2.1	5	31
ND<2	4.1	-2.1	5	32
2	4.1	-2.1	5	33
ND<2	4.1	-2.1	5	34
ND<2	4.1	-2.1	5	35
2.7	4.1	-1.4	5	36
2.3	2.3	0	5	36

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2.4	2.3	0.1	6	36
2	2.3	-0.3	6	37
ND<2	2.3	-0.3	6	38
2	2.3	-0.3	6	39
ND<2	2.3	-0.3	6	40
ND<2	2.3	-0.3	6	41
2.7	2.3	0.4	7	41
2.4	2.3	0.1	8	41
2	2.3	-0.3	8	42
ND<2	2.3	-0.3	8	43
2	2.3	-0.3	8	44
ND<2	2.3	-0.3	8	45
ND<2	2.3	-0.3	8	46
2.7	2.3	0.4	9	46
2	2.4	-0.4	9	47
ND<2	2.4	-0.4	9	48
2	2.4	-0.4	9	49
ND<2	2.4	-0.4	9	50
ND<2	2.4	-0.4	9	51
2.7	2.4	0.3	10	51
ND<2	2	0	10	51
2	2	0	10	51
ND<2	2	0	10	51
ND<2	2	0	10	51
2.7	2	0.7	11	51
2	ND<2	0	11	51
ND<2	ND<2	0	11	51
ND<2	ND<2	0	11	51
2.7	ND<2	0.7	12	51
ND<2	2	0	12	51
ND<2	2	0	12	51
2.7	2	0.7	13	51
ND<2	ND<2	0	13	51
2.7	ND<2	0.7	14	51
2.7	ND<2	0.7	15	51

S Statistic = 15 - 51 = -36

Tied Group	Value	Members
1	2.4	2
2	2.3	2
3	2	5

Time Period	Observations
3/13/2009	1
4/20/2009	1
12/9/2009	1
3/17/2010	1
5/18/2010	1

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9/10/2010	1
12/22/2010	1
2/24/2011	1
5/10/2011	1
7/28/2011	1
10/7/2011	1
1/10/2012	1
4/5/2012	1

There are 0 time periods with multiple data

A = 336
B = 0
C = 60
D = 0
E = 24
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 250
Z-Score = -2.21359
Comparison Level at 95% confidence level = -1.65463 (downward trend)
-2.21359 < -1.65463 indicating a downward trend

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Mann-Kendall Trend Analysis

Parameter: cis-1,2-Dichloroethene
Location: MW-02S
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
ND<10	2.4	7.6	1	0
3.7	2.4	1.3	2	0
4.1	2.4	1.7	3	0
2.3	2.4	-0.1	3	1
2.3	2.4	-0.1	3	2
2.4	2.4	0	3	2
2	2.4	-0.4	3	3
ND<2	2.4	-0.4	3	4
2	2.4	-0.4	3	5
ND<2	2.4	-0.4	3	6
ND<2	2.4	-0.4	3	7
2.7	2.4	0.3	4	7
3.7	ND<10	-6.3	4	8
4.1	ND<10	-5.9	4	9
2.3	ND<10	-7.7	4	10
2.3	ND<10	-7.7	4	11
2.4	ND<10	-7.6	4	12
2	ND<10	-8	4	13
ND<2	ND<10	-8	4	14
2	ND<10	-8	4	15
ND<2	ND<10	-8	4	16
ND<2	ND<10	-8	4	17
2.7	ND<10	-7.3	4	18
4.1	3.7	0.4	5	18
2.3	3.7	-1.4	5	19
2.3	3.7	-1.4	5	20
2.4	3.7	-1.3	5	21
2	3.7	-1.7	5	22
ND<2	3.7	-1.7	5	23
2	3.7	-1.7	5	24
ND<2	3.7	-1.7	5	25
ND<2	3.7	-1.7	5	26
2.7	3.7	-1	5	27
2.3	4.1	-1.8	5	28
2.3	4.1	-1.8	5	29
2.4	4.1	-1.7	5	30
2	4.1	-2.1	5	31
ND<2	4.1	-2.1	5	32
2	4.1	-2.1	5	33
ND<2	4.1	-2.1	5	34
ND<2	4.1	-2.1	5	35
2.7	4.1	-1.4	5	36
2.3	2.3	0	5	36

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2.4	2.3	0.1	6	36
2	2.3	-0.3	6	37
ND<2	2.3	-0.3	6	38
2	2.3	-0.3	6	39
ND<2	2.3	-0.3	6	40
ND<2	2.3	-0.3	6	41
2.7	2.3	0.4	7	41
2.4	2.3	0.1	8	41
2	2.3	-0.3	8	42
ND<2	2.3	-0.3	8	43
2	2.3	-0.3	8	44
ND<2	2.3	-0.3	8	45
ND<2	2.3	-0.3	8	46
2.7	2.3	0.4	9	46
2	2.4	-0.4	9	47
ND<2	2.4	-0.4	9	48
2	2.4	-0.4	9	49
ND<2	2.4	-0.4	9	50
ND<2	2.4	-0.4	9	51
2.7	2.4	0.3	10	51
ND<2	2	0	10	51
2	2	0	10	51
ND<2	2	0	10	51
ND<2	2	0	10	51
2.7	2	0.7	11	51
2	ND<2	0	11	51
ND<2	ND<2	0	11	51
ND<2	ND<2	0	11	51
2.7	ND<2	0.7	12	51
ND<2	2	0	12	51
ND<2	2	0	12	51
2.7	2	0.7	13	51
ND<2	ND<2	0	13	51
2.7	ND<2	0.7	14	51
2.7	ND<2	0.7	15	51

S Statistic = 15 - 51 = -36

Tied Group	Value	Members
1	2.4	2
2	2.3	2
3	2	5

Time Period	Observations
3/13/2009	1
4/20/2009	1
12/9/2009	1
3/17/2010	1
5/18/2010	1

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9/10/2010	1
12/22/2010	1
2/24/2011	1
5/10/2011	1
7/28/2011	1
10/7/2011	1
1/10/2012	1
4/5/2012	1

There are 0 time periods with multiple data

A = 336
B = 0
C = 60
D = 0
E = 24
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 250
Z-Score = -2.21359
Comparison Level at 95% confidence level = 1.65463 (upward trend)
-2.21359 <= 1.65463 indicating no evidence of an upward trend

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Mann-Kendall Trend Analysis

Parameter: Tetrachloroethene
Location: MW-02S
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
ND<10	2.2	7.8	1	0
2.7	2.2	0.5	2	0
2.3	2.2	0.1	3	0
2.4	2.2	0.2	4	0
2.3	2.2	0.1	5	0
2.3	2.2	0.1	6	0
ND<2	2.2	-0.2	6	1
ND<2	2.2	-0.2	6	2
2.2	2.2	0	6	2
2.5	2.2	0.3	7	2
2.8	2.2	0.6	8	2
3.5	2.2	1.3	9	2
2.7	ND<10	-7.3	9	3
2.3	ND<10	-7.7	9	4
2.4	ND<10	-7.6	9	5
2.3	ND<10	-7.7	9	6
2.3	ND<10	-7.7	9	7
ND<2	ND<10	-8	9	8
ND<2	ND<10	-8	9	9
2.2	ND<10	-7.8	9	10
2.5	ND<10	-7.5	9	11
2.8	ND<10	-7.2	9	12
3.5	ND<10	-6.5	9	13
2.3	2.7	-0.4	9	14
2.4	2.7	-0.3	9	15
2.3	2.7	-0.4	9	16
2.3	2.7	-0.4	9	17
ND<2	2.7	-0.7	9	18
ND<2	2.7	-0.7	9	19
2.2	2.7	-0.5	9	20
2.5	2.7	-0.2	9	21
2.8	2.7	0.1	10	21
3.5	2.7	0.8	11	21
2.4	2.3	0.1	12	21
2.3	2.3	0	12	21
2.3	2.3	0	12	21
ND<2	2.3	-0.3	12	22
ND<2	2.3	-0.3	12	23
2.2	2.3	-0.1	12	24
2.5	2.3	0.2	13	24
2.8	2.3	0.5	14	24
3.5	2.3	1.2	15	24
2.3	2.4	-0.1	15	25

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2.3	2.4	-0.1	15	26
ND<2	2.4	-0.4	15	27
ND<2	2.4	-0.4	15	28
2.2	2.4	-0.2	15	29
2.5	2.4	0.1	16	29
2.8	2.4	0.4	17	29
3.5	2.4	1.1	18	29
2.3	2.3	0	18	29
ND<2	2.3	-0.3	18	30
ND<2	2.3	-0.3	18	31
2.2	2.3	-0.1	18	32
2.5	2.3	0.2	19	32
2.8	2.3	0.5	20	32
3.5	2.3	1.2	21	32
ND<2	2.3	-0.3	21	33
ND<2	2.3	-0.3	21	34
2.2	2.3	-0.1	21	35
2.5	2.3	0.2	22	35
2.8	2.3	0.5	23	35
3.5	2.3	1.2	24	35
ND<2	ND<2	0	24	35
2.2	ND<2	0.2	25	35
2.5	ND<2	0.5	26	35
2.8	ND<2	0.8	27	35
3.5	ND<2	1.5	28	35
2.2	ND<2	0.2	29	35
2.5	ND<2	0.5	30	35
2.8	ND<2	0.8	31	35
3.5	ND<2	1.5	32	35
2.5	2.2	0.3	33	35
2.8	2.2	0.6	34	35
3.5	2.2	1.3	35	35
2.8	2.5	0.3	36	35
3.5	2.5	1	37	35
3.5	2.8	0.7	38	35

S Statistic = 38 - 35 = 3

Tied Group	Value	Members
1	2.2	2
2	2.3	3
3	2	2

Time Period	Observations
3/13/2009	1
4/20/2009	1
12/9/2009	1
3/17/2010	1
5/18/2010	1

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9/10/2010	1
12/22/2010	1
2/24/2011	1
5/10/2011	1
7/28/2011	1
10/7/2011	1
1/10/2012	1
4/5/2012	1

There are 0 time periods with multiple data

A = 102
B = 0
C = 6
D = 0
E = 10
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 263
Z-Score = 0.123325
Comparison Level at 95% confidence level = -1.65463 (downward trend)
0.123325 >= -1.65463 indicating no evidence of a downward trend

US EPA ARCHIVE DOCUMENT

Mann-Kendall Trend Analysis

Parameter: Tetrachloroethene
Location: MW-02S
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
ND<10	2.2	7.8	1	0
2.7	2.2	0.5	2	0
2.3	2.2	0.1	3	0
2.4	2.2	0.2	4	0
2.3	2.2	0.1	5	0
2.3	2.2	0.1	6	0
ND<2	2.2	-0.2	6	1
ND<2	2.2	-0.2	6	2
2.2	2.2	0	6	2
2.5	2.2	0.3	7	2
2.8	2.2	0.6	8	2
3.5	2.2	1.3	9	2
2.7	ND<10	-7.3	9	3
2.3	ND<10	-7.7	9	4
2.4	ND<10	-7.6	9	5
2.3	ND<10	-7.7	9	6
2.3	ND<10	-7.7	9	7
ND<2	ND<10	-8	9	8
ND<2	ND<10	-8	9	9
2.2	ND<10	-7.8	9	10
2.5	ND<10	-7.5	9	11
2.8	ND<10	-7.2	9	12
3.5	ND<10	-6.5	9	13
2.3	2.7	-0.4	9	14
2.4	2.7	-0.3	9	15
2.3	2.7	-0.4	9	16
2.3	2.7	-0.4	9	17
ND<2	2.7	-0.7	9	18
ND<2	2.7	-0.7	9	19
2.2	2.7	-0.5	9	20
2.5	2.7	-0.2	9	21
2.8	2.7	0.1	10	21
3.5	2.7	0.8	11	21
2.4	2.3	0.1	12	21
2.3	2.3	0	12	21
2.3	2.3	0	12	21
ND<2	2.3	-0.3	12	22
ND<2	2.3	-0.3	12	23
2.2	2.3	-0.1	12	24
2.5	2.3	0.2	13	24
2.8	2.3	0.5	14	24
3.5	2.3	1.2	15	24
2.3	2.4	-0.1	15	25

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2.3	2.4	-0.1	15	26
ND<2	2.4	-0.4	15	27
ND<2	2.4	-0.4	15	28
2.2	2.4	-0.2	15	29
2.5	2.4	0.1	16	29
2.8	2.4	0.4	17	29
3.5	2.4	1.1	18	29
2.3	2.3	0	18	29
ND<2	2.3	-0.3	18	30
ND<2	2.3	-0.3	18	31
2.2	2.3	-0.1	18	32
2.5	2.3	0.2	19	32
2.8	2.3	0.5	20	32
3.5	2.3	1.2	21	32
ND<2	2.3	-0.3	21	33
ND<2	2.3	-0.3	21	34
2.2	2.3	-0.1	21	35
2.5	2.3	0.2	22	35
2.8	2.3	0.5	23	35
3.5	2.3	1.2	24	35
ND<2	ND<2	0	24	35
2.2	ND<2	0.2	25	35
2.5	ND<2	0.5	26	35
2.8	ND<2	0.8	27	35
3.5	ND<2	1.5	28	35
2.2	ND<2	0.2	29	35
2.5	ND<2	0.5	30	35
2.8	ND<2	0.8	31	35
3.5	ND<2	1.5	32	35
2.5	2.2	0.3	33	35
2.8	2.2	0.6	34	35
3.5	2.2	1.3	35	35
2.8	2.5	0.3	36	35
3.5	2.5	1	37	35
3.5	2.8	0.7	38	35

S Statistic = 38 - 35 = 3

Tied Group	Value	Members
1	2.2	2
2	2.3	3
3	2	2

Time Period	Observations
3/13/2009	1
4/20/2009	1
12/9/2009	1
3/17/2010	1
5/18/2010	1

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9/10/2010	1
12/22/2010	1
2/24/2011	1
5/10/2011	1
7/28/2011	1
10/7/2011	1
1/10/2012	1
4/5/2012	1

There are 0 time periods with multiple data

A = 102
B = 0
C = 6
D = 0
E = 10
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 263
Z-Score = 0.123325
Comparison Level at 95% confidence level = 1.65463 (upward trend)
0.123325 <= 1.65463 indicating no evidence of an upward trend

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Mann-Kendall Trend Analysis

Parameter: Trichloroethene
Location: MW-02S
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
130	280	-150	0	1
250	280	-30	0	2
290	280	10	1	2
210	280	-70	1	3
220	280	-60	1	4
240	280	-40	1	5
240	280	-40	1	6
250	280	-30	1	7
280	280	0	1	7
220	280	-60	1	8
190	280	-90	1	9
210	280	-70	1	10
250	130	120	2	10
290	130	160	3	10
210	130	80	4	10
220	130	90	5	10
240	130	110	6	10
240	130	110	7	10
250	130	120	8	10
280	130	150	9	10
220	130	90	10	10
190	130	60	11	10
210	130	80	12	10
290	250	40	13	10
210	250	-40	13	11
220	250	-30	13	12
240	250	-10	13	13
240	250	-10	13	14
250	250	0	13	14
280	250	30	14	14
220	250	-30	14	15
190	250	-60	14	16
210	250	-40	14	17
210	290	-80	14	18
220	290	-70	14	19
240	290	-50	14	20
240	290	-50	14	21
250	290	-40	14	22
280	290	-10	14	23
220	290	-70	14	24
190	290	-100	14	25
210	290	-80	14	26
220	210	10	15	26

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240	210	30	16	26
240	210	30	17	26
250	210	40	18	26
280	210	70	19	26
220	210	10	20	26
190	210	-20	20	27
210	210	0	20	27
240	220	20	21	27
240	220	20	22	27
250	220	30	23	27
280	220	60	24	27
220	220	0	24	27
190	220	-30	24	28
210	220	-10	24	29
240	240	0	24	29
250	240	10	25	29
280	240	40	26	29
220	240	-20	26	30
190	240	-50	26	31
210	240	-30	26	32
250	240	10	27	32
280	240	40	28	32
220	240	-20	28	33
190	240	-50	28	34
210	240	-30	28	35
280	250	30	29	35
220	250	-30	29	36
190	250	-60	29	37
210	250	-40	29	38
220	280	-60	29	39
190	280	-90	29	40
210	280	-70	29	41
190	220	-30	29	42
210	220	-10	29	43
210	190	20	30	43

S Statistic = 30 - 43 = -13

Tied Group	Value	Members
1	280	2
2	250	2
3	210	2
4	220	2
5	240	2

Time Period	Observations
3/13/2009	1
4/20/2009	1
12/9/2009	1

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3/17/2010	1
5/18/2010	1
9/10/2010	1
12/22/2010	1
2/24/2011	1
5/10/2011	1
7/28/2011	1
10/7/2011	1
1/10/2012	1
4/5/2012	1

There are 0 time periods with multiple data

A = 90
B = 0
C = 0
D = 0
E = 10
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 263.667
Z-Score = -0.739016
Comparison Level at 95% confidence level = -1.65463 (downward trend)
-0.739016 >= -1.65463 indicating no evidence of a downward trend

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Mann-Kendall Trend Analysis

Parameter: Trichloroethene

Location: MW-02S

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
130	280	-150	0	1
250	280	-30	0	2
290	280	10	1	2
210	280	-70	1	3
220	280	-60	1	4
240	280	-40	1	5
240	280	-40	1	6
250	280	-30	1	7
280	280	0	1	7
220	280	-60	1	8
190	280	-90	1	9
210	280	-70	1	10
250	130	120	2	10
290	130	160	3	10
210	130	80	4	10
220	130	90	5	10
240	130	110	6	10
240	130	110	7	10
250	130	120	8	10
280	130	150	9	10
220	130	90	10	10
190	130	60	11	10
210	130	80	12	10
290	250	40	13	10
210	250	-40	13	11
220	250	-30	13	12
240	250	-10	13	13
240	250	-10	13	14
250	250	0	13	14
280	250	30	14	14
220	250	-30	14	15
190	250	-60	14	16
210	250	-40	14	17
210	290	-80	14	18
220	290	-70	14	19
240	290	-50	14	20
240	290	-50	14	21
250	290	-40	14	22
280	290	-10	14	23
220	290	-70	14	24
190	290	-100	14	25
210	290	-80	14	26
220	210	10	15	26

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240	210	30	16	26
240	210	30	17	26
250	210	40	18	26
280	210	70	19	26
220	210	10	20	26
190	210	-20	20	27
210	210	0	20	27
240	220	20	21	27
240	220	20	22	27
250	220	30	23	27
280	220	60	24	27
220	220	0	24	27
190	220	-30	24	28
210	220	-10	24	29
240	240	0	24	29
250	240	10	25	29
280	240	40	26	29
220	240	-20	26	30
190	240	-50	26	31
210	240	-30	26	32
250	240	10	27	32
280	240	40	28	32
220	240	-20	28	33
190	240	-50	28	34
210	240	-30	28	35
280	250	30	29	35
220	250	-30	29	36
190	250	-60	29	37
210	250	-40	29	38
220	280	-60	29	39
190	280	-90	29	40
210	280	-70	29	41
190	220	-30	29	42
210	220	-10	29	43
210	190	20	30	43

S Statistic = 30 - 43 = -13

Tied Group	Value	Members
1	280	2
2	250	2
3	210	2
4	220	2
5	240	2

Time Period	Observations
3/13/2009	1
4/20/2009	1
12/9/2009	1

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3/17/2010	1
5/18/2010	1
9/10/2010	1
12/22/2010	1
2/24/2011	1
5/10/2011	1
7/28/2011	1
10/7/2011	1
1/10/2012	1
4/5/2012	1

There are 0 time periods with multiple data

A = 90
B = 0
C = 0
D = 0
E = 10
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 263.667
Z-Score = -0.739016
Comparison Level at 95% confidence level = 1.65463 (upward trend)
-0.739016 <= 1.65463 indicating no evidence of an upward trend

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Mann-Kendall Trend Analysis

Parameter: 1,1-Dichloroethane

Location: MW-03S

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
18	9.1	8.9	1	0
46	9.1	36.9	2	0
11	9.1	1.9	3	0
14	9.1	4.9	4	0
29	9.1	19.9	5	0
32	9.1	22.9	6	0
33	9.1	23.9	7	0
25	9.1	15.9	8	0
23	9.1	13.9	9	0
24	9.1	14.9	10	0
22	9.1	12.9	11	0
ND<20	9.1	10.9	12	0
46	18	28	13	0
11	18	-7	13	1
14	18	-4	13	2
29	18	11	14	2
32	18	14	15	2
33	18	15	16	2
25	18	7	17	2
23	18	5	18	2
24	18	6	19	2
22	18	4	20	2
ND<20	18	2	21	2
11	46	-35	21	3
14	46	-32	21	4
29	46	-17	21	5
32	46	-14	21	6
33	46	-13	21	7
25	46	-21	21	8
23	46	-23	21	9
24	46	-22	21	10
22	46	-24	21	11
ND<20	46	-26	21	12
14	11	3	22	12
29	11	18	23	12
32	11	21	24	12
33	11	22	25	12
25	11	14	26	12
23	11	12	27	12
24	11	13	28	12
22	11	11	29	12
ND<20	11	9	30	12
29	14	15	31	12

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32	14	18	32	12
33	14	19	33	12
25	14	11	34	12
23	14	9	35	12
24	14	10	36	12
22	14	8	37	12
ND<20	14	6	38	12
32	29	3	39	12
33	29	4	40	12
25	29	-4	40	13
23	29	-6	40	14
24	29	-5	40	15
22	29	-7	40	16
ND<20	29	-9	40	17
33	32	1	41	17
25	32	-7	41	18
23	32	-9	41	19
24	32	-8	41	20
22	32	-10	41	21
ND<20	32	-12	41	22
25	33	-8	41	23
23	33	-10	41	24
24	33	-9	41	25
22	33	-11	41	26
ND<20	33	-13	41	27
23	25	-2	41	28
24	25	-1	41	29
22	25	-3	41	30
ND<20	25	-5	41	31
24	23	1	42	31
22	23	-1	42	32
ND<20	23	-3	42	33
22	24	-2	42	34
ND<20	24	-4	42	35
ND<20	22	-2	42	36

S Statistic = 42 - 36 = 6

Tied Group	Value	Members

Time Period	Observations
3/13/2009	1
4/20/2009	1
12/8/2009	1
3/17/2010	1
5/18/2010	1
9/10/2010	1
12/22/2010	1
2/25/2011	1

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5/10/2011	1
7/28/2011	1
10/6/2011	1
1/10/2012	1
4/4/2012	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 268.667
Z-Score = 0.305044
Comparison Level at 95% confidence level = -1.65463 (downward trend)
0.305044 >= -1.65463 indicating no evidence of a downward trend

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Mann-Kendall Trend Analysis

Parameter: 1,1-Dichloroethane

Location: MW-03S

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
18	9.1	8.9	1	0
46	9.1	36.9	2	0
11	9.1	1.9	3	0
14	9.1	4.9	4	0
29	9.1	19.9	5	0
32	9.1	22.9	6	0
33	9.1	23.9	7	0
25	9.1	15.9	8	0
23	9.1	13.9	9	0
24	9.1	14.9	10	0
22	9.1	12.9	11	0
ND<20	9.1	10.9	12	0
46	18	28	13	0
11	18	-7	13	1
14	18	-4	13	2
29	18	11	14	2
32	18	14	15	2
33	18	15	16	2
25	18	7	17	2
23	18	5	18	2
24	18	6	19	2
22	18	4	20	2
ND<20	18	2	21	2
11	46	-35	21	3
14	46	-32	21	4
29	46	-17	21	5
32	46	-14	21	6
33	46	-13	21	7
25	46	-21	21	8
23	46	-23	21	9
24	46	-22	21	10
22	46	-24	21	11
ND<20	46	-26	21	12
14	11	3	22	12
29	11	18	23	12
32	11	21	24	12
33	11	22	25	12
25	11	14	26	12
23	11	12	27	12
24	11	13	28	12
22	11	11	29	12
ND<20	11	9	30	12
29	14	15	31	12

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32	14	18	32	12
33	14	19	33	12
25	14	11	34	12
23	14	9	35	12
24	14	10	36	12
22	14	8	37	12
ND<20	14	6	38	12
32	29	3	39	12
33	29	4	40	12
25	29	-4	40	13
23	29	-6	40	14
24	29	-5	40	15
22	29	-7	40	16
ND<20	29	-9	40	17
33	32	1	41	17
25	32	-7	41	18
23	32	-9	41	19
24	32	-8	41	20
22	32	-10	41	21
ND<20	32	-12	41	22
25	33	-8	41	23
23	33	-10	41	24
24	33	-9	41	25
22	33	-11	41	26
ND<20	33	-13	41	27
23	25	-2	41	28
24	25	-1	41	29
22	25	-3	41	30
ND<20	25	-5	41	31
24	23	1	42	31
22	23	-1	42	32
ND<20	23	-3	42	33
22	24	-2	42	34
ND<20	24	-4	42	35
ND<20	22	-2	42	36

S Statistic = 42 - 36 = 6

Tied Group	Value	Members

Time Period	Observations
3/13/2009	1
4/20/2009	1
12/8/2009	1
3/17/2010	1
5/18/2010	1
9/10/2010	1
12/22/2010	1
2/25/2011	1

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5/10/2011	1
7/28/2011	1
10/6/2011	1
1/10/2012	1
4/4/2012	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 268.667
Z-Score = 0.305044
Comparison Level at 95% confidence level = 1.65463 (upward trend)
0.305044 <= 1.65463 indicating no evidence of an upward trend

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Mann-Kendall Trend Analysis

Parameter: cis-1,2-Dichloroethene

Location: MW-03S

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
490	240	250	1	0
2200	240	1960	2	0
460	240	220	3	0
630	240	390	4	0
1600	240	1360	5	0
1800	240	1560	6	0
2200	240	1960	7	0
1600	240	1360	8	0
1700	240	1460	9	0
2100	240	1860	10	0
1300	240	1060	11	0
1600	240	1360	12	0
2200	490	1710	13	0
460	490	-30	13	1
630	490	140	14	1
1600	490	1110	15	1
1800	490	1310	16	1
2200	490	1710	17	1
1600	490	1110	18	1
1700	490	1210	19	1
2100	490	1610	20	1
1300	490	810	21	1
1600	490	1110	22	1
460	2200	-1740	22	2
630	2200	-1570	22	3
1600	2200	-600	22	4
1800	2200	-400	22	5
2200	2200	0	22	5
1600	2200	-600	22	6
1700	2200	-500	22	7
2100	2200	-100	22	8
1300	2200	-900	22	9
1600	2200	-600	22	10
630	460	170	23	10
1600	460	1140	24	10
1800	460	1340	25	10
2200	460	1740	26	10
1600	460	1140	27	10
1700	460	1240	28	10
2100	460	1640	29	10
1300	460	840	30	10
1600	460	1140	31	10
1600	630	970	32	10

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1800	630	1170	33	10
2200	630	1570	34	10
1600	630	970	35	10
1700	630	1070	36	10
2100	630	1470	37	10
1300	630	670	38	10
1600	630	970	39	10
1800	1600	200	40	10
2200	1600	600	41	10
1600	1600	0	41	10
1700	1600	100	42	10
2100	1600	500	43	10
1300	1600	-300	43	11
1600	1600	0	43	11
2200	1800	400	44	11
1600	1800	-200	44	12
1700	1800	-100	44	13
2100	1800	300	45	13
1300	1800	-500	45	14
1600	1800	-200	45	15
1600	2200	-600	45	16
1700	2200	-500	45	17
2100	2200	-100	45	18
1300	2200	-900	45	19
1600	2200	-600	45	20
1700	1600	100	46	20
2100	1600	500	47	20
1300	1600	-300	47	21
1600	1600	0	47	21
2100	1700	400	48	21
1300	1700	-400	48	22
1600	1700	-100	48	23
1300	2100	-800	48	24
1600	2100	-500	48	25
1600	1300	300	49	25

S Statistic = 49 - 25 = 24

Tied Group	Value	Members
1	2200	2
2	1600	3

Time Period	Observations
3/13/2009	1
4/20/2009	1
12/8/2009	1
3/17/2010	1
5/18/2010	1
9/10/2010	1

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12/22/2010	1
2/25/2011	1
5/10/2011	1
7/28/2011	1
10/6/2011	1
1/10/2012	1
4/4/2012	1

There are 0 time periods with multiple data

A = 84
B = 0
C = 6
D = 0
E = 8
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 264
Z-Score = 1.41555
Comparison Level at 95% confidence level = -1.65463 (downward trend)
1.41555 >= -1.65463 indicating no evidence of a downward trend

US EPA ARCHIVE DOCUMENT

Mann-Kendall Trend Analysis

Parameter: cis-1,2-Dichloroethene

Location: MW-03S

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
490	240	250	1	0
2200	240	1960	2	0
460	240	220	3	0
630	240	390	4	0
1600	240	1360	5	0
1800	240	1560	6	0
2200	240	1960	7	0
1600	240	1360	8	0
1700	240	1460	9	0
2100	240	1860	10	0
1300	240	1060	11	0
1600	240	1360	12	0
2200	490	1710	13	0
460	490	-30	13	1
630	490	140	14	1
1600	490	1110	15	1
1800	490	1310	16	1
2200	490	1710	17	1
1600	490	1110	18	1
1700	490	1210	19	1
2100	490	1610	20	1
1300	490	810	21	1
1600	490	1110	22	1
460	2200	-1740	22	2
630	2200	-1570	22	3
1600	2200	-600	22	4
1800	2200	-400	22	5
2200	2200	0	22	5
1600	2200	-600	22	6
1700	2200	-500	22	7
2100	2200	-100	22	8
1300	2200	-900	22	9
1600	2200	-600	22	10
630	460	170	23	10
1600	460	1140	24	10
1800	460	1340	25	10
2200	460	1740	26	10
1600	460	1140	27	10
1700	460	1240	28	10
2100	460	1640	29	10
1300	460	840	30	10
1600	460	1140	31	10
1600	630	970	32	10

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1800	630	1170	33	10
2200	630	1570	34	10
1600	630	970	35	10
1700	630	1070	36	10
2100	630	1470	37	10
1300	630	670	38	10
1600	630	970	39	10
1800	1600	200	40	10
2200	1600	600	41	10
1600	1600	0	41	10
1700	1600	100	42	10
2100	1600	500	43	10
1300	1600	-300	43	11
1600	1600	0	43	11
2200	1800	400	44	11
1600	1800	-200	44	12
1700	1800	-100	44	13
2100	1800	300	45	13
1300	1800	-500	45	14
1600	1800	-200	45	15
1600	2200	-600	45	16
1700	2200	-500	45	17
2100	2200	-100	45	18
1300	2200	-900	45	19
1600	2200	-600	45	20
1700	1600	100	46	20
2100	1600	500	47	20
1300	1600	-300	47	21
1600	1600	0	47	21
2100	1700	400	48	21
1300	1700	-400	48	22
1600	1700	-100	48	23
1300	2100	-800	48	24
1600	2100	-500	48	25
1600	1300	300	49	25

S Statistic = 49 - 25 = 24

Tied Group	Value	Members
1	2200	2
2	1600	3

Time Period	Observations
3/13/2009	1
4/20/2009	1
12/8/2009	1
3/17/2010	1
5/18/2010	1
9/10/2010	1

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12/22/2010	1
2/25/2011	1
5/10/2011	1
7/28/2011	1
10/6/2011	1
1/10/2012	1
4/4/2012	1

There are 0 time periods with multiple data

A = 84
B = 0
C = 6
D = 0
E = 8
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 264
Z-Score = 1.41555
Comparison Level at 95% confidence level = 1.65463 (upward trend)
1.41555 <= 1.65463 indicating no evidence of an upward trend

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Mann-Kendall Trend Analysis

Parameter: trans-1,2-Dichloroethene
Location: MW-03S
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
18	9.1	8.9	1	0
83	9.1	73.9	2	0
17	9.1	7.9	3	0
24	9.1	14.9	4	0
63	9.1	53.9	5	0
82	9.1	72.9	6	0
110	9.1	100.9	7	0
77	9.1	67.9	8	0
78	9.1	68.9	9	0
100	9.1	90.9	10	0
81	9.1	71.9	11	0
84	9.1	74.9	12	0
83	18	65	13	0
17	18	-1	13	1
24	18	6	14	1
63	18	45	15	1
82	18	64	16	1
110	18	92	17	1
77	18	59	18	1
78	18	60	19	1
100	18	82	20	1
81	18	63	21	1
84	18	66	22	1
17	83	-66	22	2
24	83	-59	22	3
63	83	-20	22	4
82	83	-1	22	5
110	83	27	23	5
77	83	-6	23	6
78	83	-5	23	7
100	83	17	24	7
81	83	-2	24	8
84	83	1	25	8
24	17	7	26	8
63	17	46	27	8
82	17	65	28	8
110	17	93	29	8
77	17	60	30	8
78	17	61	31	8
100	17	83	32	8
81	17	64	33	8
84	17	67	34	8
63	24	39	35	8

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82	24	58	36	8
110	24	86	37	8
77	24	53	38	8
78	24	54	39	8
100	24	76	40	8
81	24	57	41	8
84	24	60	42	8
82	63	19	43	8
110	63	47	44	8
77	63	14	45	8
78	63	15	46	8
100	63	37	47	8
81	63	18	48	8
84	63	21	49	8
110	82	28	50	8
77	82	-5	50	9
78	82	-4	50	10
100	82	18	51	10
81	82	-1	51	11
84	82	2	52	11
77	110	-33	52	12
78	110	-32	52	13
100	110	-10	52	14
81	110	-29	52	15
84	110	-26	52	16
78	77	1	53	16
100	77	23	54	16
81	77	4	55	16
84	77	7	56	16
100	78	22	57	16
81	78	3	58	16
84	78	6	59	16
81	100	-19	59	17
84	100	-16	59	18
84	81	3	60	18

S Statistic = 60 - 18 = 42

Tied Group	Value	Members

Time Period	Observations
3/13/2009	1
4/20/2009	1
12/8/2009	1
3/17/2010	1
5/18/2010	1
9/10/2010	1
12/22/2010	1
2/25/2011	1

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5/10/2011	1
7/28/2011	1
10/6/2011	1
1/10/2012	1
4/4/2012	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 268.667
Z-Score = 2.50136
Comparison Level at 95% confidence level = -1.65463 (downward trend)
2.50136 >= -1.65463 indicating no evidence of a downward trend

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Mann-Kendall Trend Analysis

Parameter: trans-1,2-Dichloroethene
Location: MW-03S
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
18	9.1	8.9	1	0
83	9.1	73.9	2	0
17	9.1	7.9	3	0
24	9.1	14.9	4	0
63	9.1	53.9	5	0
82	9.1	72.9	6	0
110	9.1	100.9	7	0
77	9.1	67.9	8	0
78	9.1	68.9	9	0
100	9.1	90.9	10	0
81	9.1	71.9	11	0
84	9.1	74.9	12	0
83	18	65	13	0
17	18	-1	13	1
24	18	6	14	1
63	18	45	15	1
82	18	64	16	1
110	18	92	17	1
77	18	59	18	1
78	18	60	19	1
100	18	82	20	1
81	18	63	21	1
84	18	66	22	1
17	83	-66	22	2
24	83	-59	22	3
63	83	-20	22	4
82	83	-1	22	5
110	83	27	23	5
77	83	-6	23	6
78	83	-5	23	7
100	83	17	24	7
81	83	-2	24	8
84	83	1	25	8
24	17	7	26	8
63	17	46	27	8
82	17	65	28	8
110	17	93	29	8
77	17	60	30	8
78	17	61	31	8
100	17	83	32	8
81	17	64	33	8
84	17	67	34	8
63	24	39	35	8

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82	24	58	36	8
110	24	86	37	8
77	24	53	38	8
78	24	54	39	8
100	24	76	40	8
81	24	57	41	8
84	24	60	42	8
82	63	19	43	8
110	63	47	44	8
77	63	14	45	8
78	63	15	46	8
100	63	37	47	8
81	63	18	48	8
84	63	21	49	8
110	82	28	50	8
77	82	-5	50	9
78	82	-4	50	10
100	82	18	51	10
81	82	-1	51	11
84	82	2	52	11
77	110	-33	52	12
78	110	-32	52	13
100	110	-10	52	14
81	110	-29	52	15
84	110	-26	52	16
78	77	1	53	16
100	77	23	54	16
81	77	4	55	16
84	77	7	56	16
100	78	22	57	16
81	78	3	58	16
84	78	6	59	16
81	100	-19	59	17
84	100	-16	59	18
84	81	3	60	18

S Statistic = 60 - 18 = 42

Tied Group	Value	Members

Time Period	Observations
3/13/2009	1
4/20/2009	1
12/8/2009	1
3/17/2010	1
5/18/2010	1
9/10/2010	1
12/22/2010	1
2/25/2011	1

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5/10/2011	1
7/28/2011	1
10/6/2011	1
1/10/2012	1
4/4/2012	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 268.667
Z-Score = 2.50136
Comparison Level at 95% confidence level = 1.65463 (upward trend)
2.50136 > 1.65463 indicating an upward trend

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Mann-Kendall Trend Analysis

Parameter: Vinyl chloride
Location: MW-03S
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
210	140	70	1	0
130	140	-10	1	1
42	140	-98	1	2
34	140	-106	1	3
83	140	-57	1	4
70	140	-70	1	5
75	140	-65	1	6
52	140	-88	1	7
65	140	-75	1	8
91	140	-49	1	9
51	140	-89	1	10
170	140	30	2	10
130	210	-80	2	11
42	210	-168	2	12
34	210	-176	2	13
83	210	-127	2	14
70	210	-140	2	15
75	210	-135	2	16
52	210	-158	2	17
65	210	-145	2	18
91	210	-119	2	19
51	210	-159	2	20
170	210	-40	2	21
42	130	-88	2	22
34	130	-96	2	23
83	130	-47	2	24
70	130	-60	2	25
75	130	-55	2	26
52	130	-78	2	27
65	130	-65	2	28
91	130	-39	2	29
51	130	-79	2	30
170	130	40	3	30
34	42	-8	3	31
83	42	41	4	31
70	42	28	5	31
75	42	33	6	31
52	42	10	7	31
65	42	23	8	31
91	42	49	9	31
51	42	9	10	31
170	42	128	11	31
83	34	49	12	31

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70	34	36	13	31
75	34	41	14	31
52	34	18	15	31
65	34	31	16	31
91	34	57	17	31
51	34	17	18	31
170	34	136	19	31
70	83	-13	19	32
75	83	-8	19	33
52	83	-31	19	34
65	83	-18	19	35
91	83	8	20	35
51	83	-32	20	36
170	83	87	21	36
75	70	5	22	36
52	70	-18	22	37
65	70	-5	22	38
91	70	21	23	38
51	70	-19	23	39
170	70	100	24	39
52	75	-23	24	40
65	75	-10	24	41
91	75	16	25	41
51	75	-24	25	42
170	75	95	26	42
65	52	13	27	42
91	52	39	28	42
51	52	-1	28	43
170	52	118	29	43
91	65	26	30	43
51	65	-14	30	44
170	65	105	31	44
51	91	-40	31	45
170	91	79	32	45
170	51	119	33	45

S Statistic = 33 - 45 = -12

Tied Group	Value	Members

Time Period	Observations
3/13/2009	1
4/20/2009	1
12/8/2009	1
3/17/2010	1
5/18/2010	1
9/10/2010	1
12/22/2010	1
2/25/2011	1

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5/10/2011	1
7/28/2011	1
10/6/2011	1
1/10/2012	1
4/4/2012	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 268.667
Z-Score = -0.671098
Comparison Level at 95% confidence level = -1.65463 (downward trend)
-0.671098 >= -1.65463 indicating no evidence of a downward trend

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Mann-Kendall Trend Analysis

Parameter: Vinyl chloride
Location: MW-03S
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
210	140	70	1	0
130	140	-10	1	1
42	140	-98	1	2
34	140	-106	1	3
83	140	-57	1	4
70	140	-70	1	5
75	140	-65	1	6
52	140	-88	1	7
65	140	-75	1	8
91	140	-49	1	9
51	140	-89	1	10
170	140	30	2	10
130	210	-80	2	11
42	210	-168	2	12
34	210	-176	2	13
83	210	-127	2	14
70	210	-140	2	15
75	210	-135	2	16
52	210	-158	2	17
65	210	-145	2	18
91	210	-119	2	19
51	210	-159	2	20
170	210	-40	2	21
42	130	-88	2	22
34	130	-96	2	23
83	130	-47	2	24
70	130	-60	2	25
75	130	-55	2	26
52	130	-78	2	27
65	130	-65	2	28
91	130	-39	2	29
51	130	-79	2	30
170	130	40	3	30
34	42	-8	3	31
83	42	41	4	31
70	42	28	5	31
75	42	33	6	31
52	42	10	7	31
65	42	23	8	31
91	42	49	9	31
51	42	9	10	31
170	42	128	11	31
83	34	49	12	31

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70	34	36	13	31
75	34	41	14	31
52	34	18	15	31
65	34	31	16	31
91	34	57	17	31
51	34	17	18	31
170	34	136	19	31
70	83	-13	19	32
75	83	-8	19	33
52	83	-31	19	34
65	83	-18	19	35
91	83	8	20	35
51	83	-32	20	36
170	83	87	21	36
75	70	5	22	36
52	70	-18	22	37
65	70	-5	22	38
91	70	21	23	38
51	70	-19	23	39
170	70	100	24	39
52	75	-23	24	40
65	75	-10	24	41
91	75	16	25	41
51	75	-24	25	42
170	75	95	26	42
65	52	13	27	42
91	52	39	28	42
51	52	-1	28	43
170	52	118	29	43
91	65	26	30	43
51	65	-14	30	44
170	65	105	31	44
51	91	-40	31	45
170	91	79	32	45
170	51	119	33	45

S Statistic = 33 - 45 = -12

Tied Group	Value	Members

Time Period	Observations
3/13/2009	1
4/20/2009	1
12/8/2009	1
3/17/2010	1
5/18/2010	1
9/10/2010	1
12/22/2010	1
2/25/2011	1

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5/10/2011	1
7/28/2011	1
10/6/2011	1
1/10/2012	1
4/4/2012	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 268.667
Z-Score = -0.671098
Comparison Level at 95% confidence level = 1.65463 (upward trend)
-0.671098 <= 1.65463 indicating no evidence of an upward trend

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Mann-Kendall Trend Analysis

Parameter: cis-1,2-Dichloroethene

Location: MW-04S

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
1700	2100	-400	0	1
2500	2100	400	1	1
2900	2100	800	2	1
2100	2100	0	2	1
2400	2100	300	3	1
2700	2100	600	4	1
2500	2100	400	5	1
1900	2100	-200	5	2
1700	2100	-400	5	3
2000	2100	-100	5	4
1800	2100	-300	5	5
1600	2100	-500	5	6
2500	1700	800	6	6
2900	1700	1200	7	6
2100	1700	400	8	6
2400	1700	700	9	6
2700	1700	1000	10	6
2500	1700	800	11	6
1900	1700	200	12	6
1700	1700	0	12	6
2000	1700	300	13	6
1800	1700	100	14	6
1600	1700	-100	14	7
2900	2500	400	15	7
2100	2500	-400	15	8
2400	2500	-100	15	9
2700	2500	200	16	9
2500	2500	0	16	9
1900	2500	-600	16	10
1700	2500	-800	16	11
2000	2500	-500	16	12
1800	2500	-700	16	13
1600	2500	-900	16	14
2100	2900	-800	16	15
2400	2900	-500	16	16
2700	2900	-200	16	17
2500	2900	-400	16	18
1900	2900	-1000	16	19
1700	2900	-1200	16	20
2000	2900	-900	16	21
1800	2900	-1100	16	22
1600	2900	-1300	16	23
2400	2100	300	17	23

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2700	2100	600	18	23
2500	2100	400	19	23
1900	2100	-200	19	24
1700	2100	-400	19	25
2000	2100	-100	19	26
1800	2100	-300	19	27
1600	2100	-500	19	28
2700	2400	300	20	28
2500	2400	100	21	28
1900	2400	-500	21	29
1700	2400	-700	21	30
2000	2400	-400	21	31
1800	2400	-600	21	32
1600	2400	-800	21	33
2500	2700	-200	21	34
1900	2700	-800	21	35
1700	2700	-1000	21	36
2000	2700	-700	21	37
1800	2700	-900	21	38
1600	2700	-1100	21	39
1900	2500	-600	21	40
1700	2500	-800	21	41
2000	2500	-500	21	42
1800	2500	-700	21	43
1600	2500	-900	21	44
1700	1900	-200	21	45
2000	1900	100	22	45
1800	1900	-100	22	46
1600	1900	-300	22	47
2000	1700	300	23	47
1800	1700	100	24	47
1600	1700	-100	24	48
1800	2000	-200	24	49
1600	2000	-400	24	50
1600	1800	-200	24	51

S Statistic = 24 - 51 = -27

Tied Group	Value	Members
1	2100	2
2	1700	2
3	2500	2

Time Period	Observations
3/13/2009	1
4/20/2009	1
12/9/2009	1
3/17/2010	1
5/18/2010	1

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9/17/2010	1
12/22/2010	1
2/25/2011	1
5/11/2011	1
7/28/2011	1
10/6/2011	1
1/10/2012	1
4/4/2012	1

There are 0 time periods with multiple data

A = 54
B = 0
C = 0
D = 0
E = 6
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 265.667
Z-Score = -1.59516
Comparison Level at 95% confidence level = -1.65463 (downward trend)
-1.59516 >= -1.65463 indicating no evidence of a downward trend

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Mann-Kendall Trend Analysis

Parameter: cis-1,2-Dichloroethene

Location: MW-04S

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
1700	2100	-400	0	1
2500	2100	400	1	1
2900	2100	800	2	1
2100	2100	0	2	1
2400	2100	300	3	1
2700	2100	600	4	1
2500	2100	400	5	1
1900	2100	-200	5	2
1700	2100	-400	5	3
2000	2100	-100	5	4
1800	2100	-300	5	5
1600	2100	-500	5	6
2500	1700	800	6	6
2900	1700	1200	7	6
2100	1700	400	8	6
2400	1700	700	9	6
2700	1700	1000	10	6
2500	1700	800	11	6
1900	1700	200	12	6
1700	1700	0	12	6
2000	1700	300	13	6
1800	1700	100	14	6
1600	1700	-100	14	7
2900	2500	400	15	7
2100	2500	-400	15	8
2400	2500	-100	15	9
2700	2500	200	16	9
2500	2500	0	16	9
1900	2500	-600	16	10
1700	2500	-800	16	11
2000	2500	-500	16	12
1800	2500	-700	16	13
1600	2500	-900	16	14
2100	2900	-800	16	15
2400	2900	-500	16	16
2700	2900	-200	16	17
2500	2900	-400	16	18
1900	2900	-1000	16	19
1700	2900	-1200	16	20
2000	2900	-900	16	21
1800	2900	-1100	16	22
1600	2900	-1300	16	23
2400	2100	300	17	23

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2700	2100	600	18	23
2500	2100	400	19	23
1900	2100	-200	19	24
1700	2100	-400	19	25
2000	2100	-100	19	26
1800	2100	-300	19	27
1600	2100	-500	19	28
2700	2400	300	20	28
2500	2400	100	21	28
1900	2400	-500	21	29
1700	2400	-700	21	30
2000	2400	-400	21	31
1800	2400	-600	21	32
1600	2400	-800	21	33
2500	2700	-200	21	34
1900	2700	-800	21	35
1700	2700	-1000	21	36
2000	2700	-700	21	37
1800	2700	-900	21	38
1600	2700	-1100	21	39
1900	2500	-600	21	40
1700	2500	-800	21	41
2000	2500	-500	21	42
1800	2500	-700	21	43
1600	2500	-900	21	44
1700	1900	-200	21	45
2000	1900	100	22	45
1800	1900	-100	22	46
1600	1900	-300	22	47
2000	1700	300	23	47
1800	1700	100	24	47
1600	1700	-100	24	48
1800	2000	-200	24	49
1600	2000	-400	24	50
1600	1800	-200	24	51

S Statistic = 24 - 51 = -27

Tied Group	Value	Members
1	2100	2
2	1700	2
3	2500	2

Time Period	Observations
3/13/2009	1
4/20/2009	1
12/9/2009	1
3/17/2010	1
5/18/2010	1

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9/17/2010	1
12/22/2010	1
2/25/2011	1
5/11/2011	1
7/28/2011	1
10/6/2011	1
1/10/2012	1
4/4/2012	1

There are 0 time periods with multiple data

A = 54
B = 0
C = 0
D = 0
E = 6
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 265.667
Z-Score = -1.59516
Comparison Level at 95% confidence level = 1.65463 (upward trend)
-1.59516 <= 1.65463 indicating no evidence of an upward trend

US EPA ARCHIVE DOCUMENT

Mann-Kendall Trend Analysis

Parameter: trans-1,2-Dichloroethene
Location: MW-04S
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
ND<100	70	30	1	0
90	70	20	2	0
82	70	12	3	0
58	70	-12	3	1
70	70	0	3	1
91	70	21	4	1
82	70	12	5	1
58	70	-12	5	2
50	70	-20	5	3
58	70	-12	5	4
72	70	2	6	4
54	70	-16	6	5
90	ND<100	-10	6	6
82	ND<100	-18	6	7
58	ND<100	-42	6	8
70	ND<100	-30	6	9
91	ND<100	-9	6	10
82	ND<100	-18	6	11
58	ND<100	-42	6	12
50	ND<100	-50	6	13
58	ND<100	-42	6	14
72	ND<100	-28	6	15
54	ND<100	-46	6	16
82	90	-8	6	17
58	90	-32	6	18
70	90	-20	6	19
91	90	1	7	19
82	90	-8	7	20
58	90	-32	7	21
50	90	-40	7	22
58	90	-32	7	23
72	90	-18	7	24
54	90	-36	7	25
58	82	-24	7	26
70	82	-12	7	27
91	82	9	8	27
82	82	0	8	27
58	82	-24	8	28
50	82	-32	8	29
58	82	-24	8	30
72	82	-10	8	31
54	82	-28	8	32
70	58	12	9	32

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91	58	33	10	32
82	58	24	11	32
58	58	0	11	32
50	58	-8	11	33
58	58	0	11	33
72	58	14	12	33
54	58	-4	12	34
91	70	21	13	34
82	70	12	14	34
58	70	-12	14	35
50	70	-20	14	36
58	70	-12	14	37
72	70	2	15	37
54	70	-16	15	38
82	91	-9	15	39
58	91	-33	15	40
50	91	-41	15	41
58	91	-33	15	42
72	91	-19	15	43
54	91	-37	15	44
58	82	-24	15	45
50	82	-32	15	46
58	82	-24	15	47
72	82	-10	15	48
54	82	-28	15	49
50	58	-8	15	50
58	58	0	15	50
72	58	14	16	50
54	58	-4	16	51
58	50	8	17	51
72	50	22	18	51
54	50	4	19	51
72	58	14	20	51
54	58	-4	20	52
54	72	-18	20	53

S Statistic = 20 - 53 = -33

Tied Group	Value	Members
1	70	2
2	82	2
3	58	3

Time Period	Observations
3/13/2009	1
4/20/2009	1
12/9/2009	1
3/17/2010	1
5/18/2010	1

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9/17/2010	1
12/22/2010	1
2/25/2011	1
5/11/2011	1
7/28/2011	1
10/6/2011	1
1/10/2012	1
4/4/2012	1

There are 0 time periods with multiple data

A = 102
B = 0
C = 6
D = 0
E = 10
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 263
Z-Score = -1.9732
Comparison Level at 95% confidence level = -1.65463 (downward trend)
-1.9732 < -1.65463 indicating a downward trend

US EPA ARCHIVE DOCUMENT

Mann-Kendall Trend Analysis

Parameter: trans-1,2-Dichloroethene
Location: MW-04S
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
ND<100	70	30	1	0
90	70	20	2	0
82	70	12	3	0
58	70	-12	3	1
70	70	0	3	1
91	70	21	4	1
82	70	12	5	1
58	70	-12	5	2
50	70	-20	5	3
58	70	-12	5	4
72	70	2	6	4
54	70	-16	6	5
90	ND<100	-10	6	6
82	ND<100	-18	6	7
58	ND<100	-42	6	8
70	ND<100	-30	6	9
91	ND<100	-9	6	10
82	ND<100	-18	6	11
58	ND<100	-42	6	12
50	ND<100	-50	6	13
58	ND<100	-42	6	14
72	ND<100	-28	6	15
54	ND<100	-46	6	16
82	90	-8	6	17
58	90	-32	6	18
70	90	-20	6	19
91	90	1	7	19
82	90	-8	7	20
58	90	-32	7	21
50	90	-40	7	22
58	90	-32	7	23
72	90	-18	7	24
54	90	-36	7	25
58	82	-24	7	26
70	82	-12	7	27
91	82	9	8	27
82	82	0	8	27
58	82	-24	8	28
50	82	-32	8	29
58	82	-24	8	30
72	82	-10	8	31
54	82	-28	8	32
70	58	12	9	32

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91	58	33	10	32
82	58	24	11	32
58	58	0	11	32
50	58	-8	11	33
58	58	0	11	33
72	58	14	12	33
54	58	-4	12	34
91	70	21	13	34
82	70	12	14	34
58	70	-12	14	35
50	70	-20	14	36
58	70	-12	14	37
72	70	2	15	37
54	70	-16	15	38
82	91	-9	15	39
58	91	-33	15	40
50	91	-41	15	41
58	91	-33	15	42
72	91	-19	15	43
54	91	-37	15	44
58	82	-24	15	45
50	82	-32	15	46
58	82	-24	15	47
72	82	-10	15	48
54	82	-28	15	49
50	58	-8	15	50
58	58	0	15	50
72	58	14	16	50
54	58	-4	16	51
58	50	8	17	51
72	50	22	18	51
54	50	4	19	51
72	58	14	20	51
54	58	-4	20	52
54	72	-18	20	53

S Statistic = 20 - 53 = -33

Tied Group	Value	Members
1	70	2
2	82	2
3	58	3

Time Period	Observations
3/13/2009	1
4/20/2009	1
12/9/2009	1
3/17/2010	1
5/18/2010	1

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9/17/2010	1
12/22/2010	1
2/25/2011	1
5/11/2011	1
7/28/2011	1
10/6/2011	1
1/10/2012	1
4/4/2012	1

There are 0 time periods with multiple data

A = 102
B = 0
C = 6
D = 0
E = 10
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 263
Z-Score = -1.9732
Comparison Level at 95% confidence level = 1.65463 (upward trend)
-1.9732 <= 1.65463 indicating no evidence of an upward trend

US EPA ARCHIVE DOCUMENT

Mann-Kendall Trend Analysis

Parameter: Trichloroethene
Location: MW-04S
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
4000	5000	-1000	0	1
7100	5000	2100	1	1
7500	5000	2500	2	1
4700	5000	-300	2	2
5200	5000	200	3	2
6700	5000	1700	4	2
5900	5000	900	5	2
4600	5000	-400	5	3
4600	5000	-400	5	4
4600	5000	-400	5	5
4800	5000	-200	5	6
4300	5000	-700	5	7
7100	4000	3100	6	7
7500	4000	3500	7	7
4700	4000	700	8	7
5200	4000	1200	9	7
6700	4000	2700	10	7
5900	4000	1900	11	7
4600	4000	600	12	7
4600	4000	600	13	7
4600	4000	600	14	7
4800	4000	800	15	7
4300	4000	300	16	7
7500	7100	400	17	7
4700	7100	-2400	17	8
5200	7100	-1900	17	9
6700	7100	-400	17	10
5900	7100	-1200	17	11
4600	7100	-2500	17	12
4600	7100	-2500	17	13
4600	7100	-2500	17	14
4800	7100	-2300	17	15
4300	7100	-2800	17	16
4700	7500	-2800	17	17
5200	7500	-2300	17	18
6700	7500	-800	17	19
5900	7500	-1600	17	20
4600	7500	-2900	17	21
4600	7500	-2900	17	22
4600	7500	-2900	17	23
4800	7500	-2700	17	24
4300	7500	-3200	17	25
5200	4700	500	18	25

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6700	4700	2000	19	25
5900	4700	1200	20	25
4600	4700	-100	20	26
4600	4700	-100	20	27
4600	4700	-100	20	28
4800	4700	100	21	28
4300	4700	-400	21	29
6700	5200	1500	22	29
5900	5200	700	23	29
4600	5200	-600	23	30
4600	5200	-600	23	31
4600	5200	-600	23	32
4800	5200	-400	23	33
4300	5200	-900	23	34
5900	6700	-800	23	35
4600	6700	-2100	23	36
4600	6700	-2100	23	37
4600	6700	-2100	23	38
4800	6700	-1900	23	39
4300	6700	-2400	23	40
4600	5900	-1300	23	41
4600	5900	-1300	23	42
4600	5900	-1300	23	43
4800	5900	-1100	23	44
4300	5900	-1600	23	45
4600	4600	0	23	45
4600	4600	0	23	45
4800	4600	200	24	45
4300	4600	-300	24	46
4600	4600	0	24	46
4800	4600	200	25	46
4300	4600	-300	25	47
4800	4600	200	26	47
4300	4600	-300	26	48
4300	4800	-500	26	49

S Statistic = 26 - 49 = -23

Tied Group	Value	Members
1	4600	3

Time Period	Observations
3/13/2009	1
4/20/2009	1
12/9/2009	1
3/17/2010	1
5/18/2010	1
9/17/2010	1
12/22/2010	1

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2/25/2011	1
5/11/2011	1
7/28/2011	1
10/6/2011	1
1/10/2012	1
4/4/2012	1

There are 0 time periods with multiple data

A = 66
B = 0
C = 6
D = 0
E = 6
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 265
Z-Score = -1.35145
Comparison Level at 95% confidence level = -1.65463 (downward trend)
-1.35145 >= -1.65463 indicating no evidence of a downward trend

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Mann-Kendall Trend Analysis

Parameter: Trichloroethene

Location: MW-04S

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
4000	5000	-1000	0	1
7100	5000	2100	1	1
7500	5000	2500	2	1
4700	5000	-300	2	2
5200	5000	200	3	2
6700	5000	1700	4	2
5900	5000	900	5	2
4600	5000	-400	5	3
4600	5000	-400	5	4
4600	5000	-400	5	5
4800	5000	-200	5	6
4300	5000	-700	5	7
7100	4000	3100	6	7
7500	4000	3500	7	7
4700	4000	700	8	7
5200	4000	1200	9	7
6700	4000	2700	10	7
5900	4000	1900	11	7
4600	4000	600	12	7
4600	4000	600	13	7
4600	4000	600	14	7
4800	4000	800	15	7
4300	4000	300	16	7
7500	7100	400	17	7
4700	7100	-2400	17	8
5200	7100	-1900	17	9
6700	7100	-400	17	10
5900	7100	-1200	17	11
4600	7100	-2500	17	12
4600	7100	-2500	17	13
4600	7100	-2500	17	14
4800	7100	-2300	17	15
4300	7100	-2800	17	16
4700	7500	-2800	17	17
5200	7500	-2300	17	18
6700	7500	-800	17	19
5900	7500	-1600	17	20
4600	7500	-2900	17	21
4600	7500	-2900	17	22
4600	7500	-2900	17	23
4800	7500	-2700	17	24
4300	7500	-3200	17	25
5200	4700	500	18	25

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6700	4700	2000	19	25
5900	4700	1200	20	25
4600	4700	-100	20	26
4600	4700	-100	20	27
4600	4700	-100	20	28
4800	4700	100	21	28
4300	4700	-400	21	29
6700	5200	1500	22	29
5900	5200	700	23	29
4600	5200	-600	23	30
4600	5200	-600	23	31
4600	5200	-600	23	32
4800	5200	-400	23	33
4300	5200	-900	23	34
5900	6700	-800	23	35
4600	6700	-2100	23	36
4600	6700	-2100	23	37
4600	6700	-2100	23	38
4800	6700	-1900	23	39
4300	6700	-2400	23	40
4600	5900	-1300	23	41
4600	5900	-1300	23	42
4600	5900	-1300	23	43
4800	5900	-1100	23	44
4300	5900	-1600	23	45
4600	4600	0	23	45
4600	4600	0	23	45
4800	4600	200	24	45
4300	4600	-300	24	46
4600	4600	0	24	46
4800	4600	200	25	46
4300	4600	-300	25	47
4800	4600	200	26	47
4300	4600	-300	26	48
4300	4800	-500	26	49

S Statistic = 26 - 49 = -23

Tied Group	Value	Members
1	4600	3

Time Period	Observations
3/13/2009	1
4/20/2009	1
12/9/2009	1
3/17/2010	1
5/18/2010	1
9/17/2010	1
12/22/2010	1

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2/25/2011	1
5/11/2011	1
7/28/2011	1
10/6/2011	1
1/10/2012	1
4/4/2012	1

There are 0 time periods with multiple data

A = 66
B = 0
C = 6
D = 0
E = 6
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 265
Z-Score = -1.35145
Comparison Level at 95% confidence level = 1.65463 (upward trend)
-1.35145 <= 1.65463 indicating no evidence of an upward trend

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Mann-Kendall Trend Analysis

Parameter: Vinyl chloride
Location: MW-04S
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
520	460	60	1	0
270	460	-190	1	1
520	460	60	2	1
280	460	-180	2	2
200	460	-260	2	3
270	460	-190	2	4
280	460	-180	2	5
270	460	-190	2	6
190	460	-270	2	7
190	460	-270	2	8
190	460	-270	2	9
170	460	-290	2	10
270	520	-250	2	11
520	520	0	2	11
280	520	-240	2	12
200	520	-320	2	13
270	520	-250	2	14
280	520	-240	2	15
270	520	-250	2	16
190	520	-330	2	17
190	520	-330	2	18
190	520	-330	2	19
170	520	-350	2	20
520	270	250	3	20
280	270	10	4	20
200	270	-70	4	21
270	270	0	4	21
280	270	10	5	21
270	270	0	5	21
190	270	-80	5	22
190	270	-80	5	23
190	270	-80	5	24
170	270	-100	5	25
280	520	-240	5	26
200	520	-320	5	27
270	520	-250	5	28
280	520	-240	5	29
270	520	-250	5	30
190	520	-330	5	31
190	520	-330	5	32
190	520	-330	5	33
170	520	-350	5	34
200	280	-80	5	35

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270	280	-10	5	36
280	280	0	5	36
270	280	-10	5	37
190	280	-90	5	38
190	280	-90	5	39
190	280	-90	5	40
170	280	-110	5	41
270	200	70	6	41
280	200	80	7	41
270	200	70	8	41
190	200	-10	8	42
190	200	-10	8	43
190	200	-10	8	44
170	200	-30	8	45
280	270	10	9	45
270	270	0	9	45
190	270	-80	9	46
190	270	-80	9	47
190	270	-80	9	48
170	270	-100	9	49
270	280	-10	9	50
190	280	-90	9	51
190	280	-90	9	52
190	280	-90	9	53
170	280	-110	9	54
190	270	-80	9	55
190	270	-80	9	56
190	270	-80	9	57
170	270	-100	9	58
190	190	0	9	58
190	190	0	9	58
170	190	-20	9	59
190	190	0	9	59
170	190	-20	9	60
170	190	-20	9	61

S Statistic = 9 - 61 = -52

Tied Group	Value	Members
1	520	2
2	270	3
3	280	2
4	190	3

Time Period	Observations
3/13/2009	1
4/20/2009	1
12/9/2009	1
3/17/2010	1

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5/18/2010	1
9/17/2010	1
12/22/2010	1
2/25/2011	1
5/11/2011	1
7/28/2011	1
10/6/2011	1
1/10/2012	1
4/4/2012	1

There are 0 time periods with multiple data

A = 168
B = 0
C = 12
D = 0
E = 16
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 259.333
Z-Score = -3.16695
Comparison Level at 95% confidence level = -1.65463 (downward trend)
-3.16695 < -1.65463 indicating a downward trend

US EPA ARCHIVE DOCUMENT

Mann-Kendall Trend Analysis

Parameter: Vinyl chloride
Location: MW-04S
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
520	460	60	1	0
270	460	-190	1	1
520	460	60	2	1
280	460	-180	2	2
200	460	-260	2	3
270	460	-190	2	4
280	460	-180	2	5
270	460	-190	2	6
190	460	-270	2	7
190	460	-270	2	8
190	460	-270	2	9
170	460	-290	2	10
270	520	-250	2	11
520	520	0	2	11
280	520	-240	2	12
200	520	-320	2	13
270	520	-250	2	14
280	520	-240	2	15
270	520	-250	2	16
190	520	-330	2	17
190	520	-330	2	18
190	520	-330	2	19
170	520	-350	2	20
520	270	250	3	20
280	270	10	4	20
200	270	-70	4	21
270	270	0	4	21
280	270	10	5	21
270	270	0	5	21
190	270	-80	5	22
190	270	-80	5	23
190	270	-80	5	24
170	270	-100	5	25
280	520	-240	5	26
200	520	-320	5	27
270	520	-250	5	28
280	520	-240	5	29
270	520	-250	5	30
190	520	-330	5	31
190	520	-330	5	32
190	520	-330	5	33
170	520	-350	5	34
200	280	-80	5	35

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270	280	-10	5	36
280	280	0	5	36
270	280	-10	5	37
190	280	-90	5	38
190	280	-90	5	39
190	280	-90	5	40
170	280	-110	5	41
270	200	70	6	41
280	200	80	7	41
270	200	70	8	41
190	200	-10	8	42
190	200	-10	8	43
190	200	-10	8	44
170	200	-30	8	45
280	270	10	9	45
270	270	0	9	45
190	270	-80	9	46
190	270	-80	9	47
190	270	-80	9	48
170	270	-100	9	49
270	280	-10	9	50
190	280	-90	9	51
190	280	-90	9	52
190	280	-90	9	53
170	280	-110	9	54
190	270	-80	9	55
190	270	-80	9	56
190	270	-80	9	57
170	270	-100	9	58
190	190	0	9	58
190	190	0	9	58
170	190	-20	9	59
190	190	0	9	59
170	190	-20	9	60
170	190	-20	9	61

S Statistic = 9 - 61 = -52

Tied Group	Value	Members
1	520	2
2	270	3
3	280	2
4	190	3

Time Period	Observations
3/13/2009	1
4/20/2009	1
12/9/2009	1
3/17/2010	1

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5/18/2010	1
9/17/2010	1
12/22/2010	1
2/25/2011	1
5/11/2011	1
7/28/2011	1
10/6/2011	1
1/10/2012	1
4/4/2012	1

There are 0 time periods with multiple data

A = 168
B = 0
C = 12
D = 0
E = 16
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 259.333
Z-Score = -3.16695
Comparison Level at 95% confidence level = 1.65463 (upward trend)
-3.16695 <= 1.65463 indicating no evidence of an upward trend

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Mann-Kendall Trend Analysis

Parameter: Tetrachloroethene
Location: MW-05S
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
ND<5	3.5	1.5	1	0
5.3	3.5	1.8	2	0
6.3	3.5	2.8	3	0
4.6	3.5	1.1	4	0
4.6	3.5	1.1	5	0
4.9	3.5	1.4	6	0
4.4	3.5	0.9	7	0
4.9	3.5	1.4	8	0
4.8	3.5	1.3	9	0
5.1	3.5	1.6	10	0
5.8	3.5	2.3	11	0
5.7	3.5	2.2	12	0
5.3	ND<5	0.3	13	0
6.3	ND<5	1.3	14	0
4.6	ND<5	-0.4	14	1
4.6	ND<5	-0.4	14	2
4.9	ND<5	-0.1	14	3
4.4	ND<5	-0.6	14	4
4.9	ND<5	-0.1	14	5
4.8	ND<5	-0.2	14	6
5.1	ND<5	0.1	15	6
5.8	ND<5	0.8	16	6
5.7	ND<5	0.7	17	6
6.3	5.3	1	18	6
4.6	5.3	-0.7	18	7
4.6	5.3	-0.7	18	8
4.9	5.3	-0.4	18	9
4.4	5.3	-0.9	18	10
4.9	5.3	-0.4	18	11
4.8	5.3	-0.5	18	12
5.1	5.3	-0.2	18	13
5.8	5.3	0.5	19	13
5.7	5.3	0.4	20	13
4.6	6.3	-1.7	20	14
4.6	6.3	-1.7	20	15
4.9	6.3	-1.4	20	16
4.4	6.3	-1.9	20	17
4.9	6.3	-1.4	20	18
4.8	6.3	-1.5	20	19
5.1	6.3	-1.2	20	20
5.8	6.3	-0.5	20	21
5.7	6.3	-0.6	20	22
4.6	4.6	0	20	22

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4.9	4.6	0.3	21	22
4.4	4.6	-0.2	21	23
4.9	4.6	0.3	22	23
4.8	4.6	0.2	23	23
5.1	4.6	0.5	24	23
5.8	4.6	1.2	25	23
5.7	4.6	1.1	26	23
4.9	4.6	0.3	27	23
4.4	4.6	-0.2	27	24
4.9	4.6	0.3	28	24
4.8	4.6	0.2	29	24
5.1	4.6	0.5	30	24
5.8	4.6	1.2	31	24
5.7	4.6	1.1	32	24
4.4	4.9	-0.5	32	25
4.9	4.9	0	32	25
4.8	4.9	-0.1	32	26
5.1	4.9	0.2	33	26
5.8	4.9	0.9	34	26
5.7	4.9	0.8	35	26
4.9	4.4	0.5	36	26
4.8	4.4	0.4	37	26
5.1	4.4	0.7	38	26
5.8	4.4	1.4	39	26
5.7	4.4	1.3	40	26
4.8	4.9	-0.1	40	27
5.1	4.9	0.2	41	27
5.8	4.9	0.9	42	27
5.7	4.9	0.8	43	27
5.1	4.8	0.3	44	27
5.8	4.8	1	45	27
5.7	4.8	0.9	46	27
5.8	5.1	0.7	47	27
5.7	5.1	0.6	48	27
5.7	5.8	-0.1	48	28

S Statistic = 48 - 28 = 20

Tied Group	Value	Members
1	4.6	2
2	4.9	2

Time Period	Observations
3/13/2009	1
4/20/2009	1
12/10/2009	1
3/17/2010	1
5/17/2010	1
9/9/2010	1

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12/21/2010	1
2/24/2011	1
5/13/2011	1
7/27/2011	1
10/10/2011	1
1/9/2012	1
4/9/2012	1

There are 0 time periods with multiple data

A = 36
B = 0
C = 0
D = 0
E = 4
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 266.667
Z-Score = 1.16351
Comparison Level at 95% confidence level = -1.65463 (downward trend)
1.16351 >= -1.65463 indicating no evidence of a downward trend

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Mann-Kendall Trend Analysis

Parameter: Tetrachloroethene
Location: MW-05S
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
ND<5	3.5	1.5	1	0
5.3	3.5	1.8	2	0
6.3	3.5	2.8	3	0
4.6	3.5	1.1	4	0
4.6	3.5	1.1	5	0
4.9	3.5	1.4	6	0
4.4	3.5	0.9	7	0
4.9	3.5	1.4	8	0
4.8	3.5	1.3	9	0
5.1	3.5	1.6	10	0
5.8	3.5	2.3	11	0
5.7	3.5	2.2	12	0
5.3	ND<5	0.3	13	0
6.3	ND<5	1.3	14	0
4.6	ND<5	-0.4	14	1
4.6	ND<5	-0.4	14	2
4.9	ND<5	-0.1	14	3
4.4	ND<5	-0.6	14	4
4.9	ND<5	-0.1	14	5
4.8	ND<5	-0.2	14	6
5.1	ND<5	0.1	15	6
5.8	ND<5	0.8	16	6
5.7	ND<5	0.7	17	6
6.3	5.3	1	18	6
4.6	5.3	-0.7	18	7
4.6	5.3	-0.7	18	8
4.9	5.3	-0.4	18	9
4.4	5.3	-0.9	18	10
4.9	5.3	-0.4	18	11
4.8	5.3	-0.5	18	12
5.1	5.3	-0.2	18	13
5.8	5.3	0.5	19	13
5.7	5.3	0.4	20	13
4.6	6.3	-1.7	20	14
4.6	6.3	-1.7	20	15
4.9	6.3	-1.4	20	16
4.4	6.3	-1.9	20	17
4.9	6.3	-1.4	20	18
4.8	6.3	-1.5	20	19
5.1	6.3	-1.2	20	20
5.8	6.3	-0.5	20	21
5.7	6.3	-0.6	20	22
4.6	4.6	0	20	22

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4.9	4.6	0.3	21	22
4.4	4.6	-0.2	21	23
4.9	4.6	0.3	22	23
4.8	4.6	0.2	23	23
5.1	4.6	0.5	24	23
5.8	4.6	1.2	25	23
5.7	4.6	1.1	26	23
4.9	4.6	0.3	27	23
4.4	4.6	-0.2	27	24
4.9	4.6	0.3	28	24
4.8	4.6	0.2	29	24
5.1	4.6	0.5	30	24
5.8	4.6	1.2	31	24
5.7	4.6	1.1	32	24
4.4	4.9	-0.5	32	25
4.9	4.9	0	32	25
4.8	4.9	-0.1	32	26
5.1	4.9	0.2	33	26
5.8	4.9	0.9	34	26
5.7	4.9	0.8	35	26
4.9	4.4	0.5	36	26
4.8	4.4	0.4	37	26
5.1	4.4	0.7	38	26
5.8	4.4	1.4	39	26
5.7	4.4	1.3	40	26
4.8	4.9	-0.1	40	27
5.1	4.9	0.2	41	27
5.8	4.9	0.9	42	27
5.7	4.9	0.8	43	27
5.1	4.8	0.3	44	27
5.8	4.8	1	45	27
5.7	4.8	0.9	46	27
5.8	5.1	0.7	47	27
5.7	5.1	0.6	48	27
5.7	5.8	-0.1	48	28

S Statistic = 48 - 28 = 20

Tied Group	Value	Members
1	4.6	2
2	4.9	2

Time Period	Observations
3/13/2009	1
4/20/2009	1
12/10/2009	1
3/17/2010	1
5/17/2010	1
9/9/2010	1

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12/21/2010	1
2/24/2011	1
5/13/2011	1
7/27/2011	1
10/10/2011	1
1/9/2012	1
4/9/2012	1

There are 0 time periods with multiple data

A = 36
B = 0
C = 0
D = 0
E = 4
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 266.667
Z-Score = 1.16351
Comparison Level at 95% confidence level = 1.65463 (upward trend)
1.16351 <= 1.65463 indicating no evidence of an upward trend

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Mann-Kendall Trend Analysis

Parameter: Trichloroethene
Location: MW-05S
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
140	120	20	1	0
190	120	70	2	0
160	120	40	3	0
160	120	40	4	0
140	120	20	5	0
160	120	40	6	0
130	120	10	7	0
160	120	40	8	0
150	120	30	9	0
150	120	30	10	0
150	120	30	11	0
160	120	40	12	0
190	140	50	13	0
160	140	20	14	0
160	140	20	15	0
140	140	0	15	0
160	140	20	16	0
130	140	-10	16	1
160	140	20	17	1
150	140	10	18	1
150	140	10	19	1
150	140	10	20	1
160	140	20	21	1
160	190	-30	21	2
160	190	-30	21	3
140	190	-50	21	4
160	190	-30	21	5
130	190	-60	21	6
160	190	-30	21	7
150	190	-40	21	8
150	190	-40	21	9
150	190	-40	21	10
160	190	-30	21	11
160	160	0	21	11
140	160	-20	21	12
160	160	0	21	12
130	160	-30	21	13
160	160	0	21	13
150	160	-10	21	14
150	160	-10	21	15
150	160	-10	21	16
160	160	0	21	16
140	160	-20	21	17

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160	160	0	21	17
130	160	-30	21	18
160	160	0	21	18
150	160	-10	21	19
150	160	-10	21	20
150	160	-10	21	21
160	160	0	21	21
160	140	20	22	21
130	140	-10	22	22
160	140	20	23	22
150	140	10	24	22
150	140	10	25	22
150	140	10	26	22
160	140	20	27	22
130	160	-30	27	23
160	160	0	27	23
150	160	-10	27	24
150	160	-10	27	25
150	160	-10	27	26
160	160	0	27	26
160	130	30	28	26
150	130	20	29	26
150	130	20	30	26
150	130	20	31	26
160	130	30	32	26
150	160	-10	32	27
150	160	-10	32	28
150	160	-10	32	29
160	160	0	32	29
150	150	0	32	29
150	150	0	32	29
160	150	10	33	29
150	150	0	33	29
160	150	10	34	29
160	150	10	35	29

S Statistic = 35 - 29 = 6

Tied Group	Value	Members
1	140	2
2	160	5
3	150	3

Time Period	Observations
3/13/2009	1
4/20/2009	1
12/10/2009	1
3/17/2010	1
5/17/2010	1

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9/9/2010	1
12/21/2010	1
2/24/2011	1
5/13/2011	1
7/27/2011	1
10/10/2011	1
1/9/2012	1
4/9/2012	1

There are 0 time periods with multiple data

A = 384
B = 0
C = 66
D = 0
E = 28
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 247.333
Z-Score = 0.317928
Comparison Level at 95% confidence level = -1.65463 (downward trend)
0.317928 >= -1.65463 indicating no evidence of a downward trend

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Mann-Kendall Trend Analysis

Parameter: Trichloroethene

Location: MW-05S

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
140	120	20	1	0
190	120	70	2	0
160	120	40	3	0
160	120	40	4	0
140	120	20	5	0
160	120	40	6	0
130	120	10	7	0
160	120	40	8	0
150	120	30	9	0
150	120	30	10	0
150	120	30	11	0
160	120	40	12	0
190	140	50	13	0
160	140	20	14	0
160	140	20	15	0
140	140	0	15	0
160	140	20	16	0
130	140	-10	16	1
160	140	20	17	1
150	140	10	18	1
150	140	10	19	1
150	140	10	20	1
160	140	20	21	1
160	190	-30	21	2
160	190	-30	21	3
140	190	-50	21	4
160	190	-30	21	5
130	190	-60	21	6
160	190	-30	21	7
150	190	-40	21	8
150	190	-40	21	9
150	190	-40	21	10
160	190	-30	21	11
160	160	0	21	11
140	160	-20	21	12
160	160	0	21	12
130	160	-30	21	13
160	160	0	21	13
150	160	-10	21	14
150	160	-10	21	15
150	160	-10	21	16
160	160	0	21	16
140	160	-20	21	17

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160	160	0	21	17
130	160	-30	21	18
160	160	0	21	18
150	160	-10	21	19
150	160	-10	21	20
150	160	-10	21	21
160	160	0	21	21
160	140	20	22	21
130	140	-10	22	22
160	140	20	23	22
150	140	10	24	22
150	140	10	25	22
150	140	10	26	22
160	140	20	27	22
130	160	-30	27	23
160	160	0	27	23
150	160	-10	27	24
150	160	-10	27	25
150	160	-10	27	26
160	160	0	27	26
160	130	30	28	26
150	130	20	29	26
150	130	20	30	26
150	130	20	31	26
160	130	30	32	26
150	160	-10	32	27
150	160	-10	32	28
150	160	-10	32	29
160	160	0	32	29
150	150	0	32	29
150	150	0	32	29
160	150	10	33	29
150	150	0	33	29
160	150	10	34	29
160	150	10	35	29

S Statistic = 35 - 29 = 6

Tied Group	Value	Members
1	140	2
2	160	5
3	150	3

Time Period	Observations
3/13/2009	1
4/20/2009	1
12/10/2009	1
3/17/2010	1
5/17/2010	1

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9/9/2010	1
12/21/2010	1
2/24/2011	1
5/13/2011	1
7/27/2011	1
10/10/2011	1
1/9/2012	1
4/9/2012	1

There are 0 time periods with multiple data

A = 384
B = 0
C = 66
D = 0
E = 28
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 247.333
Z-Score = 0.317928
Comparison Level at 95% confidence level = 1.65463 (upward trend)
0.317928 <= 1.65463 indicating no evidence of an upward trend

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Mann-Kendall Trend Analysis

Parameter: Trichloroethene
Location: MW-06S
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
23	21	2	1	0
37	21	16	2	0
31	21	10	3	0
33	21	12	4	0
29	21	8	5	0
34	21	13	6	0
35	21	14	7	0
27	21	6	8	0
27	21	6	9	0
30	21	9	10	0
31	21	10	11	0
32	21	11	12	0
37	23	14	13	0
31	23	8	14	0
33	23	10	15	0
29	23	6	16	0
34	23	11	17	0
35	23	12	18	0
27	23	4	19	0
27	23	4	20	0
30	23	7	21	0
31	23	8	22	0
32	23	9	23	0
31	37	-6	23	1
33	37	-4	23	2
29	37	-8	23	3
34	37	-3	23	4
35	37	-2	23	5
27	37	-10	23	6
27	37	-10	23	7
30	37	-7	23	8
31	37	-6	23	9
32	37	-5	23	10
33	31	2	24	10
29	31	-2	24	11
34	31	3	25	11
35	31	4	26	11
27	31	-4	26	12
27	31	-4	26	13
30	31	-1	26	14
31	31	0	26	14
32	31	1	27	14
29	33	-4	27	15

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34	33	1	28	15
35	33	2	29	15
27	33	-6	29	16
27	33	-6	29	17
30	33	-3	29	18
31	33	-2	29	19
32	33	-1	29	20
34	29	5	30	20
35	29	6	31	20
27	29	-2	31	21
27	29	-2	31	22
30	29	1	32	22
31	29	2	33	22
32	29	3	34	22
35	34	1	35	22
27	34	-7	35	23
27	34	-7	35	24
30	34	-4	35	25
31	34	-3	35	26
32	34	-2	35	27
27	35	-8	35	28
27	35	-8	35	29
30	35	-5	35	30
31	35	-4	35	31
32	35	-3	35	32
27	27	0	35	32
30	27	3	36	32
31	27	4	37	32
32	27	5	38	32
30	27	3	39	32
31	27	4	40	32
32	27	5	41	32
31	30	1	42	32
32	30	2	43	32
32	31	1	44	32

S Statistic = 44 - 32 = 12

Tied Group	Value	Members
1	31	2
2	27	2

Time Period	Observations
3/16/2009	1
4/20/2009	1
12/9/2009	1
3/18/2010	1
5/17/2010	1
9/10/2010	1

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12/21/2010	1
2/18/2011	1
5/10/2011	1
7/27/2011	1
10/5/2011	1
1/9/2012	1
4/3/2012	1

There are 0 time periods with multiple data

A = 36
B = 0
C = 0
D = 0
E = 4
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 266.667
Z-Score = 0.67361
Comparison Level at 95% confidence level = -1.65463 (downward trend)
0.67361 >= -1.65463 indicating no evidence of a downward trend

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Mann-Kendall Trend Analysis

Parameter: Trichloroethene
Location: MW-06S
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
23	21	2	1	0
37	21	16	2	0
31	21	10	3	0
33	21	12	4	0
29	21	8	5	0
34	21	13	6	0
35	21	14	7	0
27	21	6	8	0
27	21	6	9	0
30	21	9	10	0
31	21	10	11	0
32	21	11	12	0
37	23	14	13	0
31	23	8	14	0
33	23	10	15	0
29	23	6	16	0
34	23	11	17	0
35	23	12	18	0
27	23	4	19	0
27	23	4	20	0
30	23	7	21	0
31	23	8	22	0
32	23	9	23	0
31	37	-6	23	1
33	37	-4	23	2
29	37	-8	23	3
34	37	-3	23	4
35	37	-2	23	5
27	37	-10	23	6
27	37	-10	23	7
30	37	-7	23	8
31	37	-6	23	9
32	37	-5	23	10
33	31	2	24	10
29	31	-2	24	11
34	31	3	25	11
35	31	4	26	11
27	31	-4	26	12
27	31	-4	26	13
30	31	-1	26	14
31	31	0	26	14
32	31	1	27	14
29	33	-4	27	15

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34	33	1	28	15
35	33	2	29	15
27	33	-6	29	16
27	33	-6	29	17
30	33	-3	29	18
31	33	-2	29	19
32	33	-1	29	20
34	29	5	30	20
35	29	6	31	20
27	29	-2	31	21
27	29	-2	31	22
30	29	1	32	22
31	29	2	33	22
32	29	3	34	22
35	34	1	35	22
27	34	-7	35	23
27	34	-7	35	24
30	34	-4	35	25
31	34	-3	35	26
32	34	-2	35	27
27	35	-8	35	28
27	35	-8	35	29
30	35	-5	35	30
31	35	-4	35	31
32	35	-3	35	32
27	27	0	35	32
30	27	3	36	32
31	27	4	37	32
32	27	5	38	32
30	27	3	39	32
31	27	4	40	32
32	27	5	41	32
31	30	1	42	32
32	30	2	43	32
32	31	1	44	32

S Statistic = 44 - 32 = 12

Tied Group	Value	Members
1	31	2
2	27	2

Time Period	Observations
3/16/2009	1
4/20/2009	1
12/9/2009	1
3/18/2010	1
5/17/2010	1
9/10/2010	1

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12/21/2010	1
2/18/2011	1
5/10/2011	1
7/27/2011	1
10/5/2011	1
1/9/2012	1
4/3/2012	1

There are 0 time periods with multiple data

A = 36
B = 0
C = 0
D = 0
E = 4
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 266.667
Z-Score = 0.67361
Comparison Level at 95% confidence level = 1.65463 (upward trend)
0.67361 <= 1.65463 indicating no evidence of an upward trend

US EPA ARCHIVE DOCUMENT

Mann-Kendall Trend Analysis

Parameter: 1,1,1-Trichloroethane
Location: MW-07S
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
1.6	2.1	-0.5	0	1
1.8	2.1	-0.3	0	2
1.9	2.1	-0.2	0	3
1.9	2.1	-0.2	0	4
1.4	2.1	-0.7	0	5
2.1	2.1	0	0	5
1.6	2.1	-0.5	0	6
1.5	2.1	-0.6	0	7
1.2	2.1	-0.9	0	8
1.4	2.1	-0.7	0	9
1.6	2.1	-0.5	0	10
1.3	2.1	-0.8	0	11
1.8	1.6	0.2	1	11
1.9	1.6	0.3	2	11
1.9	1.6	0.3	3	11
1.4	1.6	-0.2	3	12
2.1	1.6	0.5	4	12
1.6	1.6	0	4	12
1.5	1.6	-0.1	4	13
1.2	1.6	-0.4	4	14
1.4	1.6	-0.2	4	15
1.6	1.6	0	4	15
1.3	1.6	-0.3	4	16
1.9	1.8	0.1	5	16
1.9	1.8	0.1	6	16
1.4	1.8	-0.4	6	17
2.1	1.8	0.3	7	17
1.6	1.8	-0.2	7	18
1.5	1.8	-0.3	7	19
1.2	1.8	-0.6	7	20
1.4	1.8	-0.4	7	21
1.6	1.8	-0.2	7	22
1.3	1.8	-0.5	7	23
1.9	1.9	0	7	23
1.4	1.9	-0.5	7	24
2.1	1.9	0.2	8	24
1.6	1.9	-0.3	8	25
1.5	1.9	-0.4	8	26
1.2	1.9	-0.7	8	27
1.4	1.9	-0.5	8	28
1.6	1.9	-0.3	8	29
1.3	1.9	-0.6	8	30
1.4	1.9	-0.5	8	31

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2.1	1.9	0.2	9	31
1.6	1.9	-0.3	9	32
1.5	1.9	-0.4	9	33
1.2	1.9	-0.7	9	34
1.4	1.9	-0.5	9	35
1.6	1.9	-0.3	9	36
1.3	1.9	-0.6	9	37
2.1	1.4	0.7	10	37
1.6	1.4	0.2	11	37
1.5	1.4	0.1	12	37
1.2	1.4	-0.2	12	38
1.4	1.4	0	12	38
1.6	1.4	0.2	13	38
1.3	1.4	-0.1	13	39
1.6	2.1	-0.5	13	40
1.5	2.1	-0.6	13	41
1.2	2.1	-0.9	13	42
1.4	2.1	-0.7	13	43
1.6	2.1	-0.5	13	44
1.3	2.1	-0.8	13	45
1.5	1.6	-0.1	13	46
1.2	1.6	-0.4	13	47
1.4	1.6	-0.2	13	48
1.6	1.6	0	13	48
1.3	1.6	-0.3	13	49
1.2	1.5	-0.3	13	50
1.4	1.5	-0.1	13	51
1.6	1.5	0.1	14	51
1.3	1.5	-0.2	14	52
1.4	1.2	0.2	15	52
1.6	1.2	0.4	16	52
1.3	1.2	0.1	17	52
1.6	1.4	0.2	18	52
1.3	1.4	-0.1	18	53
1.3	1.6	-0.3	18	54

S Statistic = 18 - 54 = -36

Tied Group	Value	Members
1	2.1	2
2	1.6	3
3	1.9	2
4	1.4	2

Time Period	Observations
3/16/2009	1
4/20/2009	1
12/10/2009	1
3/17/2010	1

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5/17/2010	1
9/10/2010	1
12/21/2010	1
2/24/2011	1
5/13/2011	1
7/27/2011	1
10/10/2011	1
1/9/2012	1
4/9/2012	1

There are 0 time periods with multiple data

A = 120
B = 0
C = 6
D = 0
E = 12
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 262
Z-Score = -2.16231
Comparison Level at 95% confidence level = -1.65463 (downward trend)
-2.16231 < -1.65463 indicating a downward trend

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Mann-Kendall Trend Analysis

Parameter: 1,1,1-Trichloroethane

Location: MW-07S

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
1.6	2.1	-0.5	0	1
1.8	2.1	-0.3	0	2
1.9	2.1	-0.2	0	3
1.9	2.1	-0.2	0	4
1.4	2.1	-0.7	0	5
2.1	2.1	0	0	5
1.6	2.1	-0.5	0	6
1.5	2.1	-0.6	0	7
1.2	2.1	-0.9	0	8
1.4	2.1	-0.7	0	9
1.6	2.1	-0.5	0	10
1.3	2.1	-0.8	0	11
1.8	1.6	0.2	1	11
1.9	1.6	0.3	2	11
1.9	1.6	0.3	3	11
1.4	1.6	-0.2	3	12
2.1	1.6	0.5	4	12
1.6	1.6	0	4	12
1.5	1.6	-0.1	4	13
1.2	1.6	-0.4	4	14
1.4	1.6	-0.2	4	15
1.6	1.6	0	4	15
1.3	1.6	-0.3	4	16
1.9	1.8	0.1	5	16
1.9	1.8	0.1	6	16
1.4	1.8	-0.4	6	17
2.1	1.8	0.3	7	17
1.6	1.8	-0.2	7	18
1.5	1.8	-0.3	7	19
1.2	1.8	-0.6	7	20
1.4	1.8	-0.4	7	21
1.6	1.8	-0.2	7	22
1.3	1.8	-0.5	7	23
1.9	1.9	0	7	23
1.4	1.9	-0.5	7	24
2.1	1.9	0.2	8	24
1.6	1.9	-0.3	8	25
1.5	1.9	-0.4	8	26
1.2	1.9	-0.7	8	27
1.4	1.9	-0.5	8	28
1.6	1.9	-0.3	8	29
1.3	1.9	-0.6	8	30
1.4	1.9	-0.5	8	31

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2.1	1.9	0.2	9	31
1.6	1.9	-0.3	9	32
1.5	1.9	-0.4	9	33
1.2	1.9	-0.7	9	34
1.4	1.9	-0.5	9	35
1.6	1.9	-0.3	9	36
1.3	1.9	-0.6	9	37
2.1	1.4	0.7	10	37
1.6	1.4	0.2	11	37
1.5	1.4	0.1	12	37
1.2	1.4	-0.2	12	38
1.4	1.4	0	12	38
1.6	1.4	0.2	13	38
1.3	1.4	-0.1	13	39
1.6	2.1	-0.5	13	40
1.5	2.1	-0.6	13	41
1.2	2.1	-0.9	13	42
1.4	2.1	-0.7	13	43
1.6	2.1	-0.5	13	44
1.3	2.1	-0.8	13	45
1.5	1.6	-0.1	13	46
1.2	1.6	-0.4	13	47
1.4	1.6	-0.2	13	48
1.6	1.6	0	13	48
1.3	1.6	-0.3	13	49
1.2	1.5	-0.3	13	50
1.4	1.5	-0.1	13	51
1.6	1.5	0.1	14	51
1.3	1.5	-0.2	14	52
1.4	1.2	0.2	15	52
1.6	1.2	0.4	16	52
1.3	1.2	0.1	17	52
1.6	1.4	0.2	18	52
1.3	1.4	-0.1	18	53
1.3	1.6	-0.3	18	54

S Statistic = 18 - 54 = -36

Tied Group	Value	Members
1	2.1	2
2	1.6	3
3	1.9	2
4	1.4	2

Time Period	Observations
3/16/2009	1
4/20/2009	1
12/10/2009	1
3/17/2010	1

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5/17/2010	1
9/10/2010	1
12/21/2010	1
2/24/2011	1
5/13/2011	1
7/27/2011	1
10/10/2011	1
1/9/2012	1
4/9/2012	1

There are 0 time periods with multiple data

A = 120
B = 0
C = 6
D = 0
E = 12
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 262
Z-Score = -2.16231
Comparison Level at 95% confidence level = 1.65463 (upward trend)
-2.16231 <= 1.65463 indicating no evidence of an upward trend

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Mann-Kendall Trend Analysis

Parameter: Trichloroethene
Location: MW-07S
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
11	10	1	1	0
14	10	4	2	0
13	10	3	3	0
13	10	3	4	0
12	10	2	5	0
16	10	6	6	0
12	10	2	7	0
12	10	2	8	0
11	10	1	9	0
13	10	3	10	0
14	10	4	11	0
12	10	2	12	0
14	11	3	13	0
13	11	2	14	0
13	11	2	15	0
12	11	1	16	0
16	11	5	17	0
12	11	1	18	0
12	11	1	19	0
11	11	0	19	0
13	11	2	20	0
14	11	3	21	0
12	11	1	22	0
13	14	-1	22	1
13	14	-1	22	2
12	14	-2	22	3
16	14	2	23	3
12	14	-2	23	4
12	14	-2	23	5
11	14	-3	23	6
13	14	-1	23	7
14	14	0	23	7
12	14	-2	23	8
13	13	0	23	8
12	13	-1	23	9
16	13	3	24	9
12	13	-1	24	10
12	13	-1	24	11
11	13	-2	24	12
13	13	0	24	12
14	13	1	25	12
12	13	-1	25	13
12	13	-1	25	14

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16	13	3	26	14
12	13	-1	26	15
12	13	-1	26	16
11	13	-2	26	17
13	13	0	26	17
14	13	1	27	17
12	13	-1	27	18
16	12	4	28	18
12	12	0	28	18
12	12	0	28	18
11	12	-1	28	19
13	12	1	29	19
14	12	2	30	19
12	12	0	30	19
12	16	-4	30	20
12	16	-4	30	21
11	16	-5	30	22
13	16	-3	30	23
14	16	-2	30	24
12	16	-4	30	25
12	12	0	30	25
11	12	-1	30	26
13	12	1	31	26
14	12	2	32	26
12	12	0	32	26
11	12	-1	32	27
13	12	1	33	27
14	12	2	34	27
12	12	0	34	27
13	11	2	35	27
14	11	3	36	27
12	11	1	37	27
14	13	1	38	27
12	13	-1	38	28
12	14	-2	38	29

S Statistic = 38 - 29 = 9

Tied Group	Value	Members
1	11	2
2	14	2
3	13	3
4	12	4

Time Period	Observations
3/16/2009	1
4/20/2009	1
12/10/2009	1
3/17/2010	1

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5/17/2010	1
9/10/2010	1
12/21/2010	1
2/24/2011	1
5/13/2011	1
7/27/2011	1
10/10/2011	1
1/9/2012	1
4/9/2012	1

There are 0 time periods with multiple data

A = 258
B = 0
C = 30
D = 0
E = 22
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 254.333
Z-Score = 0.501636
Comparison Level at 95% confidence level = -1.65463 (downward trend)
0.501636 >= -1.65463 indicating no evidence of a downward trend

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Mann-Kendall Trend Analysis

Parameter: Trichloroethene
Location: MW-07S
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
11	10	1	1	0
14	10	4	2	0
13	10	3	3	0
13	10	3	4	0
12	10	2	5	0
16	10	6	6	0
12	10	2	7	0
12	10	2	8	0
11	10	1	9	0
13	10	3	10	0
14	10	4	11	0
12	10	2	12	0
14	11	3	13	0
13	11	2	14	0
13	11	2	15	0
12	11	1	16	0
16	11	5	17	0
12	11	1	18	0
12	11	1	19	0
11	11	0	19	0
13	11	2	20	0
14	11	3	21	0
12	11	1	22	0
13	14	-1	22	1
13	14	-1	22	2
12	14	-2	22	3
16	14	2	23	3
12	14	-2	23	4
12	14	-2	23	5
11	14	-3	23	6
13	14	-1	23	7
14	14	0	23	7
12	14	-2	23	8
13	13	0	23	8
12	13	-1	23	9
16	13	3	24	9
12	13	-1	24	10
12	13	-1	24	11
11	13	-2	24	12
13	13	0	24	12
14	13	1	25	12
12	13	-1	25	13
12	13	-1	25	14

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16	13	3	26	14
12	13	-1	26	15
12	13	-1	26	16
11	13	-2	26	17
13	13	0	26	17
14	13	1	27	17
12	13	-1	27	18
16	12	4	28	18
12	12	0	28	18
12	12	0	28	18
11	12	-1	28	19
13	12	1	29	19
14	12	2	30	19
12	12	0	30	19
12	16	-4	30	20
12	16	-4	30	21
11	16	-5	30	22
13	16	-3	30	23
14	16	-2	30	24
12	16	-4	30	25
12	12	0	30	25
11	12	-1	30	26
13	12	1	31	26
14	12	2	32	26
12	12	0	32	26
11	12	-1	32	27
13	12	1	33	27
14	12	2	34	27
12	12	0	34	27
13	11	2	35	27
14	11	3	36	27
12	11	1	37	27
14	13	1	38	27
12	13	-1	38	28
12	14	-2	38	29

S Statistic = 38 - 29 = 9

Tied Group	Value	Members
1	11	2
2	14	2
3	13	3
4	12	4

Time Period	Observations
3/16/2009	1
4/20/2009	1
12/10/2009	1
3/17/2010	1

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5/17/2010	1
9/10/2010	1
12/21/2010	1
2/24/2011	1
5/13/2011	1
7/27/2011	1
10/10/2011	1
1/9/2012	1
4/9/2012	1

There are 0 time periods with multiple data

A = 258
B = 0
C = 30
D = 0
E = 22
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 254.333
Z-Score = 0.501636
Comparison Level at 95% confidence level = 1.65463 (upward trend)
0.501636 <= 1.65463 indicating no evidence of an upward trend

US EPA ARCHIVE DOCUMENT

Mann-Kendall Trend Analysis

Parameter: 1,1,1-Trichloroethane
Location: MW-09S
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
220	160	60	1	0
150	160	-10	1	1
120	160	-40	1	2
120	160	-40	1	3
120	160	-40	1	4
84	160	-76	1	5
83	160	-77	1	6
150	220	-70	1	7
120	220	-100	1	8
120	220	-100	1	9
120	220	-100	1	10
84	220	-136	1	11
83	220	-137	1	12
120	150	-30	1	13
120	150	-30	1	14
120	150	-30	1	15
84	150	-66	1	16
83	150	-67	1	17
120	120	0	1	17
120	120	0	1	17
84	120	-36	1	18
83	120	-37	1	19
120	120	0	1	19
84	120	-36	1	20
83	120	-37	1	21
84	120	-36	1	22
83	120	-37	1	23
83	84	-1	1	24

S Statistic = 1 - 24 = -23
Comparing at 95% confidence level (downward trend)
Failed to calculate probability for S = -23
Table out of range

Manual Approximation
n = 8
23-1 = 22
Probability for S = 22 is 0.0028
S < 0 and 0.0028 < 0.05 indicating a downward trend

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Mann-Kendall Trend Analysis

Parameter: 1,1,1-Trichloroethane
Location: MW-09S
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
220	160	60	1	0
150	160	-10	1	1
120	160	-40	1	2
120	160	-40	1	3
120	160	-40	1	4
84	160	-76	1	5
83	160	-77	1	6
150	220	-70	1	7
120	220	-100	1	8
120	220	-100	1	9
120	220	-100	1	10
84	220	-136	1	11
83	220	-137	1	12
120	150	-30	1	13
120	150	-30	1	14
120	150	-30	1	15
84	150	-66	1	16
83	150	-67	1	17
120	120	0	1	17
120	120	0	1	17
84	120	-36	1	18
83	120	-37	1	19
120	120	0	1	19
84	120	-36	1	20
83	120	-37	1	21
84	120	-36	1	22
83	120	-37	1	23
83	84	-1	1	24

S Statistic = 1 - 24 = -23
Comparing at 95% confidence level (upward trend)
Failed to calculate probability for S = -23
Table out of range

Manual Approximation
S < 0 indicating no evidence of an upward trend

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Mann-Kendall Trend Analysis

Parameter: Trichloroethene
Location: MW-09S
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
2100	1700	400	1	0
2400	1700	700	2	0
1500	1700	-200	2	1
1700	1700	0	2	1
1700	1700	0	2	1
1100	1700	-600	2	2
1200	1700	-500	2	3
2400	2100	300	3	3
1500	2100	-600	3	4
1700	2100	-400	3	5
1700	2100	-400	3	6
1100	2100	-1000	3	7
1200	2100	-900	3	8
1500	2400	-900	3	9
1700	2400	-700	3	10
1700	2400	-700	3	11
1100	2400	-1300	3	12
1200	2400	-1200	3	13
1700	1500	200	4	13
1700	1500	200	5	13
1100	1500	-400	5	14
1200	1500	-300	5	15
1700	1700	0	5	15
1100	1700	-600	5	16
1200	1700	-500	5	17
1100	1700	-600	5	18
1200	1700	-500	5	19
1200	1100	100	6	19

S Statistic = 6 - 19 = -13
Comparing at 95% confidence level (downward trend)
Failed to calculate probability for S = -13
Table out of range

Manual Approximation
n = 8
13-1 = 12
Probability for S = 12 is 0.089
0.089 > 0.05 indicating no evidence of a downward trend

US EPA ARCHIVE DOCUMENT

Mann-Kendall Trend Analysis

Parameter: Trichloroethene
Location: MW-09S
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
2100	1700	400	1	0
2400	1700	700	2	0
1500	1700	-200	2	1
1700	1700	0	2	1
1700	1700	0	2	1
1100	1700	-600	2	2
1200	1700	-500	2	3
2400	2100	300	3	3
1500	2100	-600	3	4
1700	2100	-400	3	5
1700	2100	-400	3	6
1100	2100	-1000	3	7
1200	2100	-900	3	8
1500	2400	-900	3	9
1700	2400	-700	3	10
1700	2400	-700	3	11
1100	2400	-1300	3	12
1200	2400	-1200	3	13
1700	1500	200	4	13
1700	1500	200	5	13
1100	1500	-400	5	14
1200	1500	-300	5	15
1700	1700	0	5	15
1100	1700	-600	5	16
1200	1700	-500	5	17
1100	1700	-600	5	18
1200	1700	-500	5	19
1200	1100	100	6	19

S Statistic = 6 - 19 = -13
Comparing at 95% confidence level (upward trend)
Failed to calculate probability for S = -13
Table out of range

Manual Approximation
S < 0 indicating no evidence of an upward trend

US EPA ARCHIVE DOCUMENT

Mann-Kendall Trend Analysis

Parameter: Tetrachloroethene
Location: MW-12S
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
1.4	1.4	0	0	0
ND<1	1.4	-0.4	0	1
1	1.4	-0.4	0	2
1.6	1.4	0.2	1	2
ND<1	1.4	-0.4	1	3
ND<1	1.4	-0.4	1	4
1.6	1.4	0.2	2	4
1.4	1.4	0	2	4
1.9	1.4	0.5	3	4
2.2	1.4	0.8	4	4
1.2	1.4	-0.2	4	5
ND<1	1.4	-0.4	4	6
1	1.4	-0.4	4	7
1.6	1.4	0.2	5	7
ND<1	1.4	-0.4	5	8
ND<1	1.4	-0.4	5	9
1.6	1.4	0.2	6	9
1.4	1.4	0	6	9
1.9	1.4	0.5	7	9
2.2	1.4	0.8	8	9
1.2	1.4	-0.2	8	10
1	ND<1	0	8	10
1.6	ND<1	0.6	9	10
ND<1	ND<1	0	9	10
ND<1	ND<1	0	9	10
1.6	ND<1	0.6	10	10
1.4	ND<1	0.4	11	10
1.9	ND<1	0.9	12	10
2.2	ND<1	1.2	13	10
1.2	ND<1	0.2	14	10
1.6	1	0.6	15	10
ND<1	1	0	15	10
ND<1	1	0	15	10
1.6	1	0.6	16	10
1.4	1	0.4	17	10
1.9	1	0.9	18	10
2.2	1	1.2	19	10
1.2	1	0.2	20	10
ND<1	1.6	-0.6	20	11
ND<1	1.6	-0.6	20	12
1.6	1.6	0	20	12
1.4	1.6	-0.2	20	13
1.9	1.6	0.3	21	13

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2.2	1.6	0.6	22	13
1.2	1.6	-0.4	22	14
ND<1	ND<1	0	22	14
1.6	ND<1	0.6	23	14
1.4	ND<1	0.4	24	14
1.9	ND<1	0.9	25	14
2.2	ND<1	1.2	26	14
1.2	ND<1	0.2	27	14
1.6	ND<1	0.6	28	14
1.4	ND<1	0.4	29	14
1.9	ND<1	0.9	30	14
2.2	ND<1	1.2	31	14
1.2	ND<1	0.2	32	14
1.4	1.6	-0.2	32	15
1.9	1.6	0.3	33	15
2.2	1.6	0.6	34	15
1.2	1.6	-0.4	34	16
1.9	1.4	0.5	35	16
2.2	1.4	0.8	36	16
1.2	1.4	-0.2	36	17
2.2	1.9	0.3	37	17
1.2	1.9	-0.7	37	18
1.2	2.2	-1	37	19

S Statistic = 37 - 19 = 18

Tied Group	Value	Members
1	1.4	3
2	1	4
3	1.6	2

Time Period	Observations
5/15/2009	1
12/30/2009	1
3/15/2010	1
5/14/2010	1
9/3/2010	1
12/14/2010	1
2/14/2011	1
5/12/2011	1
7/20/2011	1
10/7/2011	1
1/4/2012	1
4/5/2012	1

There are 0 time periods with multiple data

A = 240
B = 0
C = 30
D = 0

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E = 20
F = 0
a = 3828
b = 11880
c = 264
Group Variance = 199.333
Z-Score = 1.20409
Comparison Level at 95% confidence level = -1.65463 (downward trend)
1.20409 >= -1.65463 indicating no evidence of a downward trend

US EPA ARCHIVE DOCUMENT

Mann-Kendall Trend Analysis

Parameter: Tetrachloroethene
Location: MW-12S
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
1.4	1.4	0	0	0
ND<1	1.4	-0.4	0	1
1	1.4	-0.4	0	2
1.6	1.4	0.2	1	2
ND<1	1.4	-0.4	1	3
ND<1	1.4	-0.4	1	4
1.6	1.4	0.2	2	4
1.4	1.4	0	2	4
1.9	1.4	0.5	3	4
2.2	1.4	0.8	4	4
1.2	1.4	-0.2	4	5
ND<1	1.4	-0.4	4	6
1	1.4	-0.4	4	7
1.6	1.4	0.2	5	7
ND<1	1.4	-0.4	5	8
ND<1	1.4	-0.4	5	9
1.6	1.4	0.2	6	9
1.4	1.4	0	6	9
1.9	1.4	0.5	7	9
2.2	1.4	0.8	8	9
1.2	1.4	-0.2	8	10
1	ND<1	0	8	10
1.6	ND<1	0.6	9	10
ND<1	ND<1	0	9	10
ND<1	ND<1	0	9	10
1.6	ND<1	0.6	10	10
1.4	ND<1	0.4	11	10
1.9	ND<1	0.9	12	10
2.2	ND<1	1.2	13	10
1.2	ND<1	0.2	14	10
1.6	1	0.6	15	10
ND<1	1	0	15	10
ND<1	1	0	15	10
1.6	1	0.6	16	10
1.4	1	0.4	17	10
1.9	1	0.9	18	10
2.2	1	1.2	19	10
1.2	1	0.2	20	10
ND<1	1.6	-0.6	20	11
ND<1	1.6	-0.6	20	12
1.6	1.6	0	20	12
1.4	1.6	-0.2	20	13
1.9	1.6	0.3	21	13

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2.2	1.6	0.6	22	13
1.2	1.6	-0.4	22	14
ND<1	ND<1	0	22	14
1.6	ND<1	0.6	23	14
1.4	ND<1	0.4	24	14
1.9	ND<1	0.9	25	14
2.2	ND<1	1.2	26	14
1.2	ND<1	0.2	27	14
1.6	ND<1	0.6	28	14
1.4	ND<1	0.4	29	14
1.9	ND<1	0.9	30	14
2.2	ND<1	1.2	31	14
1.2	ND<1	0.2	32	14
1.4	1.6	-0.2	32	15
1.9	1.6	0.3	33	15
2.2	1.6	0.6	34	15
1.2	1.6	-0.4	34	16
1.9	1.4	0.5	35	16
2.2	1.4	0.8	36	16
1.2	1.4	-0.2	36	17
2.2	1.9	0.3	37	17
1.2	1.9	-0.7	37	18
1.2	2.2	-1	37	19

S Statistic = 37 - 19 = 18

Tied Group	Value	Members
1	1.4	3
2	1	4
3	1.6	2

Time Period	Observations
5/15/2009	1
12/30/2009	1
3/15/2010	1
5/14/2010	1
9/3/2010	1
12/14/2010	1
2/14/2011	1
5/12/2011	1
7/20/2011	1
10/7/2011	1
1/4/2012	1
4/5/2012	1

There are 0 time periods with multiple data

A = 240
B = 0
C = 30
D = 0

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E = 20
F = 0
a = 3828
b = 11880
c = 264
Group Variance = 199.333
Z-Score = 1.20409
Comparison Level at 95% confidence level = 1.65463 (upward trend)
1.20409 <= 1.65463 indicating no evidence of an upward trend

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Mann-Kendall Trend Analysis

Parameter: 1,1,1-Trichloroethane

Location: MW-19S

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
2.3	1.8	0.5	1	0
1.7	1.8	-0.1	1	1
1.6	1.8	-0.2	1	2
1.8	1.8	0	1	2
1.8	1.8	0	1	2
1.8	1.8	0	1	2
1.5	1.8	-0.3	1	3
1.4	1.8	-0.4	1	4
1.7	1.8	-0.1	1	5
1.9	1.8	0.1	2	5
1.5	1.8	-0.3	2	6
1.7	2.3	-0.6	2	7
1.6	2.3	-0.7	2	8
1.8	2.3	-0.5	2	9
1.8	2.3	-0.5	2	10
1.8	2.3	-0.5	2	11
1.5	2.3	-0.8	2	12
1.4	2.3	-0.9	2	13
1.7	2.3	-0.6	2	14
1.9	2.3	-0.4	2	15
1.5	2.3	-0.8	2	16
1.6	1.7	-0.1	2	17
1.8	1.7	0.1	3	17
1.8	1.7	0.1	4	17
1.8	1.7	0.1	5	17
1.5	1.7	-0.2	5	18
1.4	1.7	-0.3	5	19
1.7	1.7	0	5	19
1.9	1.7	0.2	6	19
1.5	1.7	-0.2	6	20
1.8	1.6	0.2	7	20
1.8	1.6	0.2	8	20
1.8	1.6	0.2	9	20
1.5	1.6	-0.1	9	21
1.4	1.6	-0.2	9	22
1.7	1.6	0.1	10	22
1.9	1.6	0.3	11	22
1.5	1.6	-0.1	11	23
1.8	1.8	0	11	23
1.8	1.8	0	11	23
1.5	1.8	-0.3	11	24
1.4	1.8	-0.4	11	25
1.7	1.8	-0.1	11	26

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1.9	1.8	0.1	12	26
1.5	1.8	-0.3	12	27
1.8	1.8	0	12	27
1.5	1.8	-0.3	12	28
1.4	1.8	-0.4	12	29
1.7	1.8	-0.1	12	30
1.9	1.8	0.1	13	30
1.5	1.8	-0.3	13	31
1.5	1.8	-0.3	13	32
1.4	1.8	-0.4	13	33
1.7	1.8	-0.1	13	34
1.9	1.8	0.1	14	34
1.5	1.8	-0.3	14	35
1.4	1.5	-0.1	14	36
1.7	1.5	0.2	15	36
1.9	1.5	0.4	16	36
1.5	1.5	0	16	36
1.7	1.4	0.3	17	36
1.9	1.4	0.5	18	36
1.5	1.4	0.1	19	36
1.9	1.7	0.2	20	36
1.5	1.7	-0.2	20	37
1.5	1.9	-0.4	20	38

S Statistic = 20 - 38 = -18

Tied Group	Value	Members
1	1.8	4
2	1.7	2
3	1.5	2

Time Period	Observations
12/8/2009	1
1/13/2010	1
3/16/2010	1
5/18/2010	1
9/10/2010	1
12/20/2010	1
2/18/2011	1
5/10/2011	1
7/25/2011	1
10/5/2011	1
1/9/2012	1
4/3/2012	1

There are 0 time periods with multiple data

A = 192
B = 0
C = 24
D = 0

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E = 16
F = 0
a = 3828
b = 11880
c = 264
Group Variance = 202
Z-Score = -1.19612
Comparison Level at 95% confidence level = -1.65463 (downward trend)
-1.19612 >= -1.65463 indicating no evidence of a downward trend

US EPA ARCHIVE DOCUMENT

Mann-Kendall Trend Analysis

Parameter: 1,1,1-Trichloroethane
Location: MW-19S
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
2.3	1.8	0.5	1	0
1.7	1.8	-0.1	1	1
1.6	1.8	-0.2	1	2
1.8	1.8	0	1	2
1.8	1.8	0	1	2
1.8	1.8	0	1	2
1.5	1.8	-0.3	1	3
1.4	1.8	-0.4	1	4
1.7	1.8	-0.1	1	5
1.9	1.8	0.1	2	5
1.5	1.8	-0.3	2	6
1.7	2.3	-0.6	2	7
1.6	2.3	-0.7	2	8
1.8	2.3	-0.5	2	9
1.8	2.3	-0.5	2	10
1.8	2.3	-0.5	2	11
1.5	2.3	-0.8	2	12
1.4	2.3	-0.9	2	13
1.7	2.3	-0.6	2	14
1.9	2.3	-0.4	2	15
1.5	2.3	-0.8	2	16
1.6	1.7	-0.1	2	17
1.8	1.7	0.1	3	17
1.8	1.7	0.1	4	17
1.8	1.7	0.1	5	17
1.5	1.7	-0.2	5	18
1.4	1.7	-0.3	5	19
1.7	1.7	0	5	19
1.9	1.7	0.2	6	19
1.5	1.7	-0.2	6	20
1.8	1.6	0.2	7	20
1.8	1.6	0.2	8	20
1.8	1.6	0.2	9	20
1.5	1.6	-0.1	9	21
1.4	1.6	-0.2	9	22
1.7	1.6	0.1	10	22
1.9	1.6	0.3	11	22
1.5	1.6	-0.1	11	23
1.8	1.8	0	11	23
1.8	1.8	0	11	23
1.5	1.8	-0.3	11	24
1.4	1.8	-0.4	11	25
1.7	1.8	-0.1	11	26

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1.9	1.8	0.1	12	26
1.5	1.8	-0.3	12	27
1.8	1.8	0	12	27
1.5	1.8	-0.3	12	28
1.4	1.8	-0.4	12	29
1.7	1.8	-0.1	12	30
1.9	1.8	0.1	13	30
1.5	1.8	-0.3	13	31
1.5	1.8	-0.3	13	32
1.4	1.8	-0.4	13	33
1.7	1.8	-0.1	13	34
1.9	1.8	0.1	14	34
1.5	1.8	-0.3	14	35
1.4	1.5	-0.1	14	36
1.7	1.5	0.2	15	36
1.9	1.5	0.4	16	36
1.5	1.5	0	16	36
1.7	1.4	0.3	17	36
1.9	1.4	0.5	18	36
1.5	1.4	0.1	19	36
1.9	1.7	0.2	20	36
1.5	1.7	-0.2	20	37
1.5	1.9	-0.4	20	38

S Statistic = 20 - 38 = -18

Tied Group	Value	Members
1	1.8	4
2	1.7	2
3	1.5	2

Time Period	Observations
12/8/2009	1
1/13/2010	1
3/16/2010	1
5/18/2010	1
9/10/2010	1
12/20/2010	1
2/18/2011	1
5/10/2011	1
7/25/2011	1
10/5/2011	1
1/9/2012	1
4/3/2012	1

There are 0 time periods with multiple data

A = 192
B = 0
C = 24
D = 0

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E = 16
F = 0
a = 3828
b = 11880
c = 264
Group Variance = 202
Z-Score = -1.19612
Comparison Level at 95% confidence level = 1.65463 (upward trend)
-1.19612 <= 1.65463 indicating no evidence of an upward trend

US EPA ARCHIVE DOCUMENT

Mann-Kendall Trend Analysis

Parameter: Tetrachloroethene
Location: MW-19S
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
1.2	ND<1	0.2	1	0
1.1	ND<1	0.1	2	0
ND<1	ND<1	0	2	0
1.2	ND<1	0.2	3	0
ND<1	ND<1	0	3	0
1.1	ND<1	0.1	4	0
ND<1	ND<1	0	4	0
1	ND<1	0	4	0
1.1	ND<1	0.1	5	0
1.2	ND<1	0.2	6	0
1.1	ND<1	0.1	7	0
1.1	1.2	-0.1	7	1
ND<1	1.2	-0.2	7	2
1.2	1.2	0	7	2
ND<1	1.2	-0.2	7	3
1.1	1.2	-0.1	7	4
ND<1	1.2	-0.2	7	5
1	1.2	-0.2	7	6
1.1	1.2	-0.1	7	7
1.2	1.2	0	7	7
1.1	1.2	-0.1	7	8
ND<1	1.1	-0.1	7	9
1.2	1.1	0.1	8	9
ND<1	1.1	-0.1	8	10
1.1	1.1	0	8	10
ND<1	1.1	-0.1	8	11
1	1.1	-0.1	8	12
1.1	1.1	0	8	12
1.2	1.1	0.1	9	12
1.1	1.1	0	9	12
1.2	ND<1	0.2	10	12
ND<1	ND<1	0	10	12
1.1	ND<1	0.1	11	12
ND<1	ND<1	0	11	12
1	ND<1	0	11	12
1.1	ND<1	0.1	12	12
1.2	ND<1	0.2	13	12
1.1	ND<1	0.1	14	12
ND<1	1.2	-0.2	14	13
1.1	1.2	-0.1	14	14
ND<1	1.2	-0.2	14	15
1	1.2	-0.2	14	16
1.1	1.2	-0.1	14	17

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1.2	1.2	0	14	17
1.1	1.2	-0.1	14	18
1.1	ND<1	0.1	15	18
ND<1	ND<1	0	15	18
1	ND<1	0	15	18
1.1	ND<1	0.1	16	18
1.2	ND<1	0.2	17	18
1.1	ND<1	0.1	18	18
ND<1	1.1	-0.1	18	19
1	1.1	-0.1	18	20
1.1	1.1	0	18	20
1.2	1.1	0.1	19	20
1.1	1.1	0	19	20
1	ND<1	0	19	20
1.1	ND<1	0.1	20	20
1.2	ND<1	0.2	21	20
1.1	ND<1	0.1	22	20
1.1	1	0.1	23	20
1.2	1	0.2	24	20
1.1	1	0.1	25	20
1.2	1.1	0.1	26	20
1.1	1.1	0	26	20
1.1	1.2	-0.1	26	21

S Statistic = 26 - 21 = 5

Tied Group	Value	Members
1	1	5
2	1.2	3
3	1.1	4

Time Period	Observations
12/8/2009	1
1/13/2010	1
3/16/2010	1
5/18/2010	1
9/10/2010	1
12/20/2010	1
2/18/2011	1
5/10/2011	1
7/25/2011	1
10/5/2011	1
1/9/2012	1
4/3/2012	1

There are 0 time periods with multiple data

A = 522
B = 0
C = 90
D = 0

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E = 38
F = 0
a = 3828
b = 11880
c = 264
Group Variance = 183.667
Z-Score = 0.295151
Comparison Level at 95% confidence level = -1.65463 (downward trend)
0.295151 >= -1.65463 indicating no evidence of a downward trend

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Mann-Kendall Trend Analysis

Parameter: Tetrachloroethene
Location: MW-19S
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
1.2	ND<1	0.2	1	0
1.1	ND<1	0.1	2	0
ND<1	ND<1	0	2	0
1.2	ND<1	0.2	3	0
ND<1	ND<1	0	3	0
1.1	ND<1	0.1	4	0
ND<1	ND<1	0	4	0
1	ND<1	0	4	0
1.1	ND<1	0.1	5	0
1.2	ND<1	0.2	6	0
1.1	ND<1	0.1	7	0
1.1	1.2	-0.1	7	1
ND<1	1.2	-0.2	7	2
1.2	1.2	0	7	2
ND<1	1.2	-0.2	7	3
1.1	1.2	-0.1	7	4
ND<1	1.2	-0.2	7	5
1	1.2	-0.2	7	6
1.1	1.2	-0.1	7	7
1.2	1.2	0	7	7
1.1	1.2	-0.1	7	8
ND<1	1.1	-0.1	7	9
1.2	1.1	0.1	8	9
ND<1	1.1	-0.1	8	10
1.1	1.1	0	8	10
ND<1	1.1	-0.1	8	11
1	1.1	-0.1	8	12
1.1	1.1	0	8	12
1.2	1.1	0.1	9	12
1.1	1.1	0	9	12
1.2	ND<1	0.2	10	12
ND<1	ND<1	0	10	12
1.1	ND<1	0.1	11	12
ND<1	ND<1	0	11	12
1	ND<1	0	11	12
1.1	ND<1	0.1	12	12
1.2	ND<1	0.2	13	12
1.1	ND<1	0.1	14	12
ND<1	1.2	-0.2	14	13
1.1	1.2	-0.1	14	14
ND<1	1.2	-0.2	14	15
1	1.2	-0.2	14	16
1.1	1.2	-0.1	14	17

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1.2	1.2	0	14	17
1.1	1.2	-0.1	14	18
1.1	ND<1	0.1	15	18
ND<1	ND<1	0	15	18
1	ND<1	0	15	18
1.1	ND<1	0.1	16	18
1.2	ND<1	0.2	17	18
1.1	ND<1	0.1	18	18
ND<1	1.1	-0.1	18	19
1	1.1	-0.1	18	20
1.1	1.1	0	18	20
1.2	1.1	0.1	19	20
1.1	1.1	0	19	20
1	ND<1	0	19	20
1.1	ND<1	0.1	20	20
1.2	ND<1	0.2	21	20
1.1	ND<1	0.1	22	20
1.1	1	0.1	23	20
1.2	1	0.2	24	20
1.1	1	0.1	25	20
1.2	1.1	0.1	26	20
1.1	1.1	0	26	20
1.1	1.2	-0.1	26	21

S Statistic = 26 - 21 = 5

Tied Group	Value	Members
1	1	5
2	1.2	3
3	1.1	4

Time Period	Observations
12/8/2009	1
1/13/2010	1
3/16/2010	1
5/18/2010	1
9/10/2010	1
12/20/2010	1
2/18/2011	1
5/10/2011	1
7/25/2011	1
10/5/2011	1
1/9/2012	1
4/3/2012	1

There are 0 time periods with multiple data

A = 522
B = 0
C = 90
D = 0

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E = 38
F = 0
a = 3828
b = 11880
c = 264
Group Variance = 183.667
Z-Score = 0.295151
Comparison Level at 95% confidence level = 1.65463 (upward trend)
0.295151 <= 1.65463 indicating no evidence of an upward trend

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Mann-Kendall Trend Analysis

Parameter: Trichloroethene
Location: MW-19S
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
36	31	5	1	0
36	31	5	2	0
32	31	1	3	0
33	31	2	4	0
37	31	6	5	0
41	31	10	6	0
28	31	-3	6	1
27	31	-4	6	2
28	31	-3	6	3
34	31	3	7	3
32	31	1	8	3
36	36	0	8	3
32	36	-4	8	4
33	36	-3	8	5
37	36	1	9	5
41	36	5	10	5
28	36	-8	10	6
27	36	-9	10	7
28	36	-8	10	8
34	36	-2	10	9
32	36	-4	10	10
32	36	-4	10	11
33	36	-3	10	12
37	36	1	11	12
41	36	5	12	12
28	36	-8	12	13
27	36	-9	12	14
28	36	-8	12	15
34	36	-2	12	16
32	36	-4	12	17
33	32	1	13	17
37	32	5	14	17
41	32	9	15	17
28	32	-4	15	18
27	32	-5	15	19
28	32	-4	15	20
34	32	2	16	20
32	32	0	16	20
37	33	4	17	20
41	33	8	18	20
28	33	-5	18	21
27	33	-6	18	22
28	33	-5	18	23

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34	33	1	19	23
32	33	-1	19	24
41	37	4	20	24
28	37	-9	20	25
27	37	-10	20	26
28	37	-9	20	27
34	37	-3	20	28
32	37	-5	20	29
28	41	-13	20	30
27	41	-14	20	31
28	41	-13	20	32
34	41	-7	20	33
32	41	-9	20	34
27	28	-1	20	35
28	28	0	20	35
34	28	6	21	35
32	28	4	22	35
28	27	1	23	35
34	27	7	24	35
32	27	5	25	35
34	28	6	26	35
32	28	4	27	35
32	34	-2	27	36

S Statistic = 27 - 36 = -9

Tied Group	Value	Members
1	36	2
2	32	2
3	28	2

Time Period	Observations
12/8/2009	1
1/13/2010	1
3/16/2010	1
5/18/2010	1
9/10/2010	1
12/20/2010	1
2/18/2011	1
5/10/2011	1
7/25/2011	1
10/5/2011	1
1/9/2012	1
4/3/2012	1

There are 0 time periods with multiple data

A = 54
B = 0
C = 0
D = 0

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E = 6
F = 0
a = 3828
b = 11880
c = 264
Group Variance = 209.667
Z-Score = -0.552491
Comparison Level at 95% confidence level = -1.65463 (downward trend)
-0.552491 >= -1.65463 indicating no evidence of a downward trend

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Mann-Kendall Trend Analysis

Parameter: Trichloroethene
Location: MW-19S
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
36	31	5	1	0
36	31	5	2	0
32	31	1	3	0
33	31	2	4	0
37	31	6	5	0
41	31	10	6	0
28	31	-3	6	1
27	31	-4	6	2
28	31	-3	6	3
34	31	3	7	3
32	31	1	8	3
36	36	0	8	3
32	36	-4	8	4
33	36	-3	8	5
37	36	1	9	5
41	36	5	10	5
28	36	-8	10	6
27	36	-9	10	7
28	36	-8	10	8
34	36	-2	10	9
32	36	-4	10	10
32	36	-4	10	11
33	36	-3	10	12
37	36	1	11	12
41	36	5	12	12
28	36	-8	12	13
27	36	-9	12	14
28	36	-8	12	15
34	36	-2	12	16
32	36	-4	12	17
33	32	1	13	17
37	32	5	14	17
41	32	9	15	17
28	32	-4	15	18
27	32	-5	15	19
28	32	-4	15	20
34	32	2	16	20
32	32	0	16	20
37	33	4	17	20
41	33	8	18	20
28	33	-5	18	21
27	33	-6	18	22
28	33	-5	18	23

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34	33	1	19	23
32	33	-1	19	24
41	37	4	20	24
28	37	-9	20	25
27	37	-10	20	26
28	37	-9	20	27
34	37	-3	20	28
32	37	-5	20	29
28	41	-13	20	30
27	41	-14	20	31
28	41	-13	20	32
34	41	-7	20	33
32	41	-9	20	34
27	28	-1	20	35
28	28	0	20	35
34	28	6	21	35
32	28	4	22	35
28	27	1	23	35
34	27	7	24	35
32	27	5	25	35
34	28	6	26	35
32	28	4	27	35
32	34	-2	27	36

S Statistic = 27 - 36 = -9

Tied Group	Value	Members
1	36	2
2	32	2
3	28	2

Time Period	Observations
12/8/2009	1
1/13/2010	1
3/16/2010	1
5/18/2010	1
9/10/2010	1
12/20/2010	1
2/18/2011	1
5/10/2011	1
7/25/2011	1
10/5/2011	1
1/9/2012	1
4/3/2012	1

There are 0 time periods with multiple data

A = 54
B = 0
C = 0
D = 0

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E = 6
F = 0
a = 3828
b = 11880
c = 264
Group Variance = 209.667
Z-Score = -0.552491
Comparison Level at 95% confidence level = 1.65463 (upward trend)
-0.552491 <= 1.65463 indicating no evidence of an upward trend

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Mann-Kendall Trend Analysis

Parameter: cis-1,2-Dichloroethene
Location: MW-20D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
94	86	8	1	0
85	86	-1	1	1
120	86	34	2	1
95	86	9	3	1
200	86	114	4	1
190	86	104	5	1
170	86	84	6	1
170	86	84	7	1
200	86	114	8	1
140	86	54	9	1
190	86	104	10	1
85	94	-9	10	2
120	94	26	11	2
95	94	1	12	2
200	94	106	13	2
190	94	96	14	2
170	94	76	15	2
170	94	76	16	2
200	94	106	17	2
140	94	46	18	2
190	94	96	19	2
120	85	35	20	2
95	85	10	21	2
200	85	115	22	2
190	85	105	23	2
170	85	85	24	2
170	85	85	25	2
200	85	115	26	2
140	85	55	27	2
190	85	105	28	2
95	120	-25	28	3
200	120	80	29	3
190	120	70	30	3
170	120	50	31	3
170	120	50	32	3
200	120	80	33	3
140	120	20	34	3
190	120	70	35	3
200	95	105	36	3
190	95	95	37	3
170	95	75	38	3
170	95	75	39	3
200	95	105	40	3

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140	95	45	41	3
190	95	95	42	3
190	200	-10	42	4
170	200	-30	42	5
170	200	-30	42	6
200	200	0	42	6
140	200	-60	42	7
190	200	-10	42	8
170	190	-20	42	9
170	190	-20	42	10
200	190	10	43	10
140	190	-50	43	11
190	190	0	43	11
170	170	0	43	11
200	170	30	44	11
140	170	-30	44	12
190	170	20	45	12
200	170	30	46	12
140	170	-30	46	13
190	170	20	47	13
140	200	-60	47	14
190	200	-10	47	15
190	140	50	48	15

S Statistic = 48 - 15 = 33

Tied Group	Value	Members
1	200	2
2	190	2
3	170	2

Time Period	Observations
12/30/2009	1
1/13/2010	1
3/17/2010	1
5/18/2010	1
9/10/2010	1
12/21/2010	1
2/18/2011	1
5/13/2011	1
7/25/2011	1
10/10/2011	1
1/9/2012	1
4/9/2012	1

There are 0 time periods with multiple data

A = 54
B = 0
C = 0
D = 0

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E = 6
F = 0
a = 3828
b = 11880
c = 264
Group Variance = 209.667
Z-Score = 2.20996
Comparison Level at 95% confidence level = -1.65463 (downward trend)
2.20996 >= -1.65463 indicating no evidence of a downward trend

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Mann-Kendall Trend Analysis

Parameter: cis-1,2-Dichloroethene
Location: MW-20D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
94	86	8	1	0
85	86	-1	1	1
120	86	34	2	1
95	86	9	3	1
200	86	114	4	1
190	86	104	5	1
170	86	84	6	1
170	86	84	7	1
200	86	114	8	1
140	86	54	9	1
190	86	104	10	1
85	94	-9	10	2
120	94	26	11	2
95	94	1	12	2
200	94	106	13	2
190	94	96	14	2
170	94	76	15	2
170	94	76	16	2
200	94	106	17	2
140	94	46	18	2
190	94	96	19	2
120	85	35	20	2
95	85	10	21	2
200	85	115	22	2
190	85	105	23	2
170	85	85	24	2
170	85	85	25	2
200	85	115	26	2
140	85	55	27	2
190	85	105	28	2
95	120	-25	28	3
200	120	80	29	3
190	120	70	30	3
170	120	50	31	3
170	120	50	32	3
200	120	80	33	3
140	120	20	34	3
190	120	70	35	3
200	95	105	36	3
190	95	95	37	3
170	95	75	38	3
170	95	75	39	3
200	95	105	40	3

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140	95	45	41	3
190	95	95	42	3
190	200	-10	42	4
170	200	-30	42	5
170	200	-30	42	6
200	200	0	42	6
140	200	-60	42	7
190	200	-10	42	8
170	190	-20	42	9
170	190	-20	42	10
200	190	10	43	10
140	190	-50	43	11
190	190	0	43	11
170	170	0	43	11
200	170	30	44	11
140	170	-30	44	12
190	170	20	45	12
200	170	30	46	12
140	170	-30	46	13
190	170	20	47	13
140	200	-60	47	14
190	200	-10	47	15
190	140	50	48	15

S Statistic = 48 - 15 = 33

Tied Group	Value	Members
1	200	2
2	190	2
3	170	2

Time Period	Observations
12/30/2009	1
1/13/2010	1
3/17/2010	1
5/18/2010	1
9/10/2010	1
12/21/2010	1
2/18/2011	1
5/13/2011	1
7/25/2011	1
10/10/2011	1
1/9/2012	1
4/9/2012	1

There are 0 time periods with multiple data

A = 54
B = 0
C = 0
D = 0

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E = 6
F = 0
a = 3828
b = 11880
c = 264
Group Variance = 209.667
Z-Score = 2.20996
Comparison Level at 95% confidence level = 1.65463 (upward trend)
2.20996 > 1.65463 indicating an upward trend

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Mann-Kendall Trend Analysis

Parameter: Vinyl chloride
Location: MW-20D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
3.7	3.5	0.2	1	0
4.4	3.5	0.9	2	0
3.7	3.5	0.2	3	0
ND<1	3.5	-2.5	3	1
3.5	3.5	0	3	1
3.2	3.5	-0.3	3	2
2.6	3.5	-0.9	3	3
2.6	3.5	-0.9	3	4
2.5	3.5	-1	3	5
6	3.5	2.5	4	5
10	3.5	6.5	5	5
4.4	3.7	0.7	6	5
3.7	3.7	0	6	5
ND<1	3.7	-2.7	6	6
3.5	3.7	-0.2	6	7
3.2	3.7	-0.5	6	8
2.6	3.7	-1.1	6	9
2.6	3.7	-1.1	6	10
2.5	3.7	-1.2	6	11
6	3.7	2.3	7	11
10	3.7	6.3	8	11
3.7	4.4	-0.7	8	12
ND<1	4.4	-3.4	8	13
3.5	4.4	-0.9	8	14
3.2	4.4	-1.2	8	15
2.6	4.4	-1.8	8	16
2.6	4.4	-1.8	8	17
2.5	4.4	-1.9	8	18
6	4.4	1.6	9	18
10	4.4	5.6	10	18
ND<1	3.7	-2.7	10	19
3.5	3.7	-0.2	10	20
3.2	3.7	-0.5	10	21
2.6	3.7	-1.1	10	22
2.6	3.7	-1.1	10	23
2.5	3.7	-1.2	10	24
6	3.7	2.3	11	24
10	3.7	6.3	12	24
3.5	ND<1	2.5	13	24
3.2	ND<1	2.2	14	24
2.6	ND<1	1.6	15	24
2.6	ND<1	1.6	16	24
2.5	ND<1	1.5	17	24

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6	ND<1	5	18	24
10	ND<1	9	19	24
3.2	3.5	-0.3	19	25
2.6	3.5	-0.9	19	26
2.6	3.5	-0.9	19	27
2.5	3.5	-1	19	28
6	3.5	2.5	20	28
10	3.5	6.5	21	28
2.6	3.2	-0.6	21	29
2.6	3.2	-0.6	21	30
2.5	3.2	-0.7	21	31
6	3.2	2.8	22	31
10	3.2	6.8	23	31
2.6	2.6	0	23	31
2.5	2.6	-0.1	23	32
6	2.6	3.4	24	32
10	2.6	7.4	25	32
2.5	2.6	-0.1	25	33
6	2.6	3.4	26	33
10	2.6	7.4	27	33
6	2.5	3.5	28	33
10	2.5	7.5	29	33
10	6	4	30	33

S Statistic = 30 - 33 = -3

Tied Group	Value	Members
1	3.5	2
2	3.7	2
3	2.6	2

Time Period	Observations
12/30/2009	1
1/13/2010	1
3/17/2010	1
5/18/2010	1
9/10/2010	1
12/21/2010	1
2/18/2011	1
5/13/2011	1
7/25/2011	1
10/10/2011	1
1/9/2012	1
4/9/2012	1

There are 0 time periods with multiple data

A = 54
B = 0
C = 0
D = 0

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E = 6
F = 0
a = 3828
b = 11880
c = 264
Group Variance = 209.667
Z-Score = -0.138123
Comparison Level at 95% confidence level = -1.65463 (downward trend)
-0.138123 >= -1.65463 indicating no evidence of a downward trend

US EPA ARCHIVE DOCUMENT

Mann-Kendall Trend Analysis

Parameter: Vinyl chloride
Location: MW-20D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
3.7	3.5	0.2	1	0
4.4	3.5	0.9	2	0
3.7	3.5	0.2	3	0
ND<1	3.5	-2.5	3	1
3.5	3.5	0	3	1
3.2	3.5	-0.3	3	2
2.6	3.5	-0.9	3	3
2.6	3.5	-0.9	3	4
2.5	3.5	-1	3	5
6	3.5	2.5	4	5
10	3.5	6.5	5	5
4.4	3.7	0.7	6	5
3.7	3.7	0	6	5
ND<1	3.7	-2.7	6	6
3.5	3.7	-0.2	6	7
3.2	3.7	-0.5	6	8
2.6	3.7	-1.1	6	9
2.6	3.7	-1.1	6	10
2.5	3.7	-1.2	6	11
6	3.7	2.3	7	11
10	3.7	6.3	8	11
3.7	4.4	-0.7	8	12
ND<1	4.4	-3.4	8	13
3.5	4.4	-0.9	8	14
3.2	4.4	-1.2	8	15
2.6	4.4	-1.8	8	16
2.6	4.4	-1.8	8	17
2.5	4.4	-1.9	8	18
6	4.4	1.6	9	18
10	4.4	5.6	10	18
ND<1	3.7	-2.7	10	19
3.5	3.7	-0.2	10	20
3.2	3.7	-0.5	10	21
2.6	3.7	-1.1	10	22
2.6	3.7	-1.1	10	23
2.5	3.7	-1.2	10	24
6	3.7	2.3	11	24
10	3.7	6.3	12	24
3.5	ND<1	2.5	13	24
3.2	ND<1	2.2	14	24
2.6	ND<1	1.6	15	24
2.6	ND<1	1.6	16	24
2.5	ND<1	1.5	17	24

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6	ND<1	5	18	24
10	ND<1	9	19	24
3.2	3.5	-0.3	19	25
2.6	3.5	-0.9	19	26
2.6	3.5	-0.9	19	27
2.5	3.5	-1	19	28
6	3.5	2.5	20	28
10	3.5	6.5	21	28
2.6	3.2	-0.6	21	29
2.6	3.2	-0.6	21	30
2.5	3.2	-0.7	21	31
6	3.2	2.8	22	31
10	3.2	6.8	23	31
2.6	2.6	0	23	31
2.5	2.6	-0.1	23	32
6	2.6	3.4	24	32
10	2.6	7.4	25	32
2.5	2.6	-0.1	25	33
6	2.6	3.4	26	33
10	2.6	7.4	27	33
6	2.5	3.5	28	33
10	2.5	7.5	29	33
10	6	4	30	33

S Statistic = 30 - 33 = -3

Tied Group	Value	Members
1	3.5	2
2	3.7	2
3	2.6	2

Time Period	Observations
12/30/2009	1
1/13/2010	1
3/17/2010	1
5/18/2010	1
9/10/2010	1
12/21/2010	1
2/18/2011	1
5/13/2011	1
7/25/2011	1
10/10/2011	1
1/9/2012	1
4/9/2012	1

There are 0 time periods with multiple data

A = 54
B = 0
C = 0
D = 0

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E = 6
F = 0
a = 3828
b = 11880
c = 264
Group Variance = 209.667
Z-Score = -0.138123
Comparison Level at 95% confidence level = 1.65463 (upward trend)
-0.138123 <= 1.65463 indicating no evidence of an upward trend

US EPA ARCHIVE DOCUMENT

Mann-Kendall Trend Analysis

Parameter: 1,1,1-Trichloroethane

Location: MW-20S

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
170	150	20	1	0
160	150	10	2	0
210	150	60	3	0
230	150	80	4	0
200	150	50	5	0
190	150	40	6	0
190	150	40	7	0
190	150	40	8	0
190	150	40	9	0
190	150	40	10	0
180	150	30	11	0
160	170	-10	11	1
210	170	40	12	1
230	170	60	13	1
200	170	30	14	1
190	170	20	15	1
190	170	20	16	1
190	170	20	17	1
190	170	20	18	1
190	170	20	19	1
180	170	10	20	1
210	160	50	21	1
230	160	70	22	1
200	160	40	23	1
190	160	30	24	1
190	160	30	25	1
190	160	30	26	1
190	160	30	27	1
190	160	30	28	1
180	160	20	29	1
230	210	20	30	1
200	210	-10	30	2
190	210	-20	30	3
190	210	-20	30	4
190	210	-20	30	5
190	210	-20	30	6
190	210	-20	30	7
180	210	-30	30	8
200	230	-30	30	9
190	230	-40	30	10
190	230	-40	30	11
190	230	-40	30	12
190	230	-40	30	13

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190	230	-40	30	14
180	230	-50	30	15
190	200	-10	30	16
190	200	-10	30	17
190	200	-10	30	18
190	200	-10	30	19
190	200	-10	30	20
180	200	-20	30	21
190	190	0	30	21
190	190	0	30	21
190	190	0	30	21
190	190	0	30	21
180	190	-10	30	22
190	190	0	30	22
190	190	0	30	22
190	190	0	30	22
180	190	-10	30	23
190	190	0	30	23
190	190	0	30	23
180	190	-10	30	24
190	190	0	30	24
180	190	-10	30	25
180	190	-10	30	26

S Statistic = 30 - 26 = 4

Tied Group	Value	Members
1	190	5

Time Period	Observations
12/30/2009	1
1/13/2010	1
3/17/2010	1
5/18/2010	1
9/10/2010	1
12/21/2010	1
2/18/2011	1
5/13/2011	1
7/25/2011	1
10/10/2011	1
1/9/2012	1
4/9/2012	1

There are 0 time periods with multiple data

A = 300
B = 0
C = 60
D = 0
E = 20
F = 0

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a = 3828
b = 11880
c = 264
Group Variance = 196
Z-Score = 0.214286
Comparison Level at 95% confidence level = -1.65463 (downward trend)
0.214286 >= -1.65463 indicating no evidence of a downward trend

US EPA ARCHIVE DOCUMENT

Mann-Kendall Trend Analysis

Parameter: 1,1,1-Trichloroethane

Location: MW-20S

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
170	150	20	1	0
160	150	10	2	0
210	150	60	3	0
230	150	80	4	0
200	150	50	5	0
190	150	40	6	0
190	150	40	7	0
190	150	40	8	0
190	150	40	9	0
190	150	40	10	0
180	150	30	11	0
160	170	-10	11	1
210	170	40	12	1
230	170	60	13	1
200	170	30	14	1
190	170	20	15	1
190	170	20	16	1
190	170	20	17	1
190	170	20	18	1
190	170	20	19	1
180	170	10	20	1
210	160	50	21	1
230	160	70	22	1
200	160	40	23	1
190	160	30	24	1
190	160	30	25	1
190	160	30	26	1
190	160	30	27	1
190	160	30	28	1
180	160	20	29	1
230	210	20	30	1
200	210	-10	30	2
190	210	-20	30	3
190	210	-20	30	4
190	210	-20	30	5
190	210	-20	30	6
190	210	-20	30	7
180	210	-30	30	8
200	230	-30	30	9
190	230	-40	30	10
190	230	-40	30	11
190	230	-40	30	12
190	230	-40	30	13

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190	230	-40	30	14
180	230	-50	30	15
190	200	-10	30	16
190	200	-10	30	17
190	200	-10	30	18
190	200	-10	30	19
190	200	-10	30	20
180	200	-20	30	21
190	190	0	30	21
190	190	0	30	21
190	190	0	30	21
190	190	0	30	21
180	190	-10	30	22
190	190	0	30	22
190	190	0	30	22
190	190	0	30	22
180	190	-10	30	23
190	190	0	30	23
190	190	0	30	23
180	190	-10	30	24
190	190	0	30	24
180	190	-10	30	25
180	190	-10	30	26

S Statistic = 30 - 26 = 4

Tied Group	Value	Members
1	190	5

Time Period	Observations
12/30/2009	1
1/13/2010	1
3/17/2010	1
5/18/2010	1
9/10/2010	1
12/21/2010	1
2/18/2011	1
5/13/2011	1
7/25/2011	1
10/10/2011	1
1/9/2012	1
4/9/2012	1

There are 0 time periods with multiple data

A = 300
B = 0
C = 60
D = 0
E = 20
F = 0

US EPA ARCHIVE DOCUMENT

a = 3828
b = 11880
c = 264
Group Variance = 196
Z-Score = 0.214286
Comparison Level at 95% confidence level = 1.65463 (upward trend)
0.214286 <= 1.65463 indicating no evidence of an upward trend

US EPA ARCHIVE DOCUMENT

Mann-Kendall Trend Analysis

Parameter: 1,1-Dichloroethane

Location: MW-20S

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
50	48	2	1	0
51	48	3	2	0
58	48	10	3	0
34	48	-14	3	1
24	48	-24	3	2
19	48	-29	3	3
14	48	-34	3	4
6.5	48	-41.5	3	5
5.8	48	-42.2	3	6
6	48	-42	3	7
11	48	-37	3	8
51	50	1	4	8
58	50	8	5	8
34	50	-16	5	9
24	50	-26	5	10
19	50	-31	5	11
14	50	-36	5	12
6.5	50	-43.5	5	13
5.8	50	-44.2	5	14
6	50	-44	5	15
11	50	-39	5	16
58	51	7	6	16
34	51	-17	6	17
24	51	-27	6	18
19	51	-32	6	19
14	51	-37	6	20
6.5	51	-44.5	6	21
5.8	51	-45.2	6	22
6	51	-45	6	23
11	51	-40	6	24
34	58	-24	6	25
24	58	-34	6	26
19	58	-39	6	27
14	58	-44	6	28
6.5	58	-51.5	6	29
5.8	58	-52.2	6	30
6	58	-52	6	31
11	58	-47	6	32
24	34	-10	6	33
19	34	-15	6	34
14	34	-20	6	35
6.5	34	-27.5	6	36
5.8	34	-28.2	6	37

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6	34	-28	6	38
11	34	-23	6	39
19	24	-5	6	40
14	24	-10	6	41
6.5	24	-17.5	6	42
5.8	24	-18.2	6	43
6	24	-18	6	44
11	24	-13	6	45
14	19	-5	6	46
6.5	19	-12.5	6	47
5.8	19	-13.2	6	48
6	19	-13	6	49
11	19	-8	6	50
6.5	14	-7.5	6	51
5.8	14	-8.2	6	52
6	14	-8	6	53
11	14	-3	6	54
5.8	6.5	-0.7	6	55
6	6.5	-0.5	6	56
11	6.5	4.5	7	56
6	5.8	0.2	8	56
11	5.8	5.2	9	56
11	6	5	10	56

S Statistic = 10 - 56 = -46

Tied Group	Value	Members

Time Period	Observations
12/30/2009	1
1/13/2010	1
3/17/2010	1
5/18/2010	1
9/10/2010	1
12/21/2010	1
2/18/2011	1
5/13/2011	1
7/25/2011	1
10/10/2011	1
1/9/2012	1
4/9/2012	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 3828

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b = 11880
c = 264
Group Variance = 212.667
Z-Score = -3.08576
Comparison Level at 95% confidence level = -1.65463 (downward trend)
-3.08576 < -1.65463 indicating a downward trend

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Mann-Kendall Trend Analysis

Parameter: 1,1-Dichloroethane

Location: MW-20S

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
50	48	2	1	0
51	48	3	2	0
58	48	10	3	0
34	48	-14	3	1
24	48	-24	3	2
19	48	-29	3	3
14	48	-34	3	4
6.5	48	-41.5	3	5
5.8	48	-42.2	3	6
6	48	-42	3	7
11	48	-37	3	8
51	50	1	4	8
58	50	8	5	8
34	50	-16	5	9
24	50	-26	5	10
19	50	-31	5	11
14	50	-36	5	12
6.5	50	-43.5	5	13
5.8	50	-44.2	5	14
6	50	-44	5	15
11	50	-39	5	16
58	51	7	6	16
34	51	-17	6	17
24	51	-27	6	18
19	51	-32	6	19
14	51	-37	6	20
6.5	51	-44.5	6	21
5.8	51	-45.2	6	22
6	51	-45	6	23
11	51	-40	6	24
34	58	-24	6	25
24	58	-34	6	26
19	58	-39	6	27
14	58	-44	6	28
6.5	58	-51.5	6	29
5.8	58	-52.2	6	30
6	58	-52	6	31
11	58	-47	6	32
24	34	-10	6	33
19	34	-15	6	34
14	34	-20	6	35
6.5	34	-27.5	6	36
5.8	34	-28.2	6	37

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6	34	-28	6	38
11	34	-23	6	39
19	24	-5	6	40
14	24	-10	6	41
6.5	24	-17.5	6	42
5.8	24	-18.2	6	43
6	24	-18	6	44
11	24	-13	6	45
14	19	-5	6	46
6.5	19	-12.5	6	47
5.8	19	-13.2	6	48
6	19	-13	6	49
11	19	-8	6	50
6.5	14	-7.5	6	51
5.8	14	-8.2	6	52
6	14	-8	6	53
11	14	-3	6	54
5.8	6.5	-0.7	6	55
6	6.5	-0.5	6	56
11	6.5	4.5	7	56
6	5.8	0.2	8	56
11	5.8	5.2	9	56
11	6	5	10	56

S Statistic = 10 - 56 = -46

Tied Group	Value	Members

Time Period	Observations
12/30/2009	1
1/13/2010	1
3/17/2010	1
5/18/2010	1
9/10/2010	1
12/21/2010	1
2/18/2011	1
5/13/2011	1
7/25/2011	1
10/10/2011	1
1/9/2012	1
4/9/2012	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 3828

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b = 11880
c = 264
Group Variance = 212.667
Z-Score = -3.08576
Comparison Level at 95% confidence level = 1.65463 (upward trend)
-3.08576 <= 1.65463 indicating no evidence of an upward trend

US EPA ARCHIVE DOCUMENT

Mann-Kendall Trend Analysis

Parameter: 1,1-Dichloroethene
Location: MW-20S
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
3.5	4	-0.5	0	1
3.8	4	-0.2	0	2
5.1	4	1.1	1	2
4.2	4	0.2	2	2
3.6	4	-0.4	2	3
3.3	4	-0.7	2	4
2.8	4	-1.2	2	5
ND<2	4	-2	2	6
ND<2	4	-2	2	7
1.4	4	-2.6	2	8
1.1	4	-2.9	2	9
3.8	3.5	0.3	3	9
5.1	3.5	1.6	4	9
4.2	3.5	0.7	5	9
3.6	3.5	0.1	6	9
3.3	3.5	-0.2	6	10
2.8	3.5	-0.7	6	11
ND<2	3.5	-1.5	6	12
ND<2	3.5	-1.5	6	13
1.4	3.5	-2.1	6	14
1.1	3.5	-2.4	6	15
5.1	3.8	1.3	7	15
4.2	3.8	0.4	8	15
3.6	3.8	-0.2	8	16
3.3	3.8	-0.5	8	17
2.8	3.8	-1	8	18
ND<2	3.8	-1.8	8	19
ND<2	3.8	-1.8	8	20
1.4	3.8	-2.4	8	21
1.1	3.8	-2.7	8	22
4.2	5.1	-0.9	8	23
3.6	5.1	-1.5	8	24
3.3	5.1	-1.8	8	25
2.8	5.1	-2.3	8	26
ND<2	5.1	-3.1	8	27
ND<2	5.1	-3.1	8	28
1.4	5.1	-3.7	8	29
1.1	5.1	-4	8	30
3.6	4.2	-0.6	8	31
3.3	4.2	-0.9	8	32
2.8	4.2	-1.4	8	33
ND<2	4.2	-2.2	8	34
ND<2	4.2	-2.2	8	35

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1.4	4.2	-2.8	8	36
1.1	4.2	-3.1	8	37
3.3	3.6	-0.3	8	38
2.8	3.6	-0.8	8	39
ND<2	3.6	-1.6	8	40
ND<2	3.6	-1.6	8	41
1.4	3.6	-2.2	8	42
1.1	3.6	-2.5	8	43
2.8	3.3	-0.5	8	44
ND<2	3.3	-1.3	8	45
ND<2	3.3	-1.3	8	46
1.4	3.3	-1.9	8	47
1.1	3.3	-2.2	8	48
ND<2	2.8	-0.8	8	49
ND<2	2.8	-0.8	8	50
1.4	2.8	-1.4	8	51
1.1	2.8	-1.7	8	52
ND<2	ND<2	0	8	52
1.4	ND<2	-0.6	8	53
1.1	ND<2	-0.9	8	54
1.4	ND<2	-0.6	8	55
1.1	ND<2	-0.9	8	56
1.1	1.4	-0.3	8	57

S Statistic = 8 - 57 = -49

Tied Group	Value	Members
1	2	2

Time Period	Observations
12/30/2009	1
1/13/2010	1
3/17/2010	1
5/18/2010	1
9/10/2010	1
12/21/2010	1
2/18/2011	1
5/13/2011	1
7/25/2011	1
10/10/2011	1
1/9/2012	1
4/9/2012	1

There are 0 time periods with multiple data

A = 18
B = 0
C = 0
D = 0
E = 2
F = 0

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a = 3828
b = 11880
c = 264
Group Variance = 211.667
Z-Score = -3.29925
Comparison Level at 95% confidence level = -1.65463 (downward trend)
-3.29925 < -1.65463 indicating a downward trend

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Mann-Kendall Trend Analysis

Parameter: 1,1-Dichloroethene
Location: MW-20S
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
3.5	4	-0.5	0	1
3.8	4	-0.2	0	2
5.1	4	1.1	1	2
4.2	4	0.2	2	2
3.6	4	-0.4	2	3
3.3	4	-0.7	2	4
2.8	4	-1.2	2	5
ND<2	4	-2	2	6
ND<2	4	-2	2	7
1.4	4	-2.6	2	8
1.1	4	-2.9	2	9
3.8	3.5	0.3	3	9
5.1	3.5	1.6	4	9
4.2	3.5	0.7	5	9
3.6	3.5	0.1	6	9
3.3	3.5	-0.2	6	10
2.8	3.5	-0.7	6	11
ND<2	3.5	-1.5	6	12
ND<2	3.5	-1.5	6	13
1.4	3.5	-2.1	6	14
1.1	3.5	-2.4	6	15
5.1	3.8	1.3	7	15
4.2	3.8	0.4	8	15
3.6	3.8	-0.2	8	16
3.3	3.8	-0.5	8	17
2.8	3.8	-1	8	18
ND<2	3.8	-1.8	8	19
ND<2	3.8	-1.8	8	20
1.4	3.8	-2.4	8	21
1.1	3.8	-2.7	8	22
4.2	5.1	-0.9	8	23
3.6	5.1	-1.5	8	24
3.3	5.1	-1.8	8	25
2.8	5.1	-2.3	8	26
ND<2	5.1	-3.1	8	27
ND<2	5.1	-3.1	8	28
1.4	5.1	-3.7	8	29
1.1	5.1	-4	8	30
3.6	4.2	-0.6	8	31
3.3	4.2	-0.9	8	32
2.8	4.2	-1.4	8	33
ND<2	4.2	-2.2	8	34
ND<2	4.2	-2.2	8	35

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1.4	4.2	-2.8	8	36
1.1	4.2	-3.1	8	37
3.3	3.6	-0.3	8	38
2.8	3.6	-0.8	8	39
ND<2	3.6	-1.6	8	40
ND<2	3.6	-1.6	8	41
1.4	3.6	-2.2	8	42
1.1	3.6	-2.5	8	43
2.8	3.3	-0.5	8	44
ND<2	3.3	-1.3	8	45
ND<2	3.3	-1.3	8	46
1.4	3.3	-1.9	8	47
1.1	3.3	-2.2	8	48
ND<2	2.8	-0.8	8	49
ND<2	2.8	-0.8	8	50
1.4	2.8	-1.4	8	51
1.1	2.8	-1.7	8	52
ND<2	ND<2	0	8	52
1.4	ND<2	-0.6	8	53
1.1	ND<2	-0.9	8	54
1.4	ND<2	-0.6	8	55
1.1	ND<2	-0.9	8	56
1.1	1.4	-0.3	8	57

S Statistic = 8 - 57 = -49

Tied Group	Value	Members
1	2	2

Time Period	Observations
12/30/2009	1
1/13/2010	1
3/17/2010	1
5/18/2010	1
9/10/2010	1
12/21/2010	1
2/18/2011	1
5/13/2011	1
7/25/2011	1
10/10/2011	1
1/9/2012	1
4/9/2012	1

There are 0 time periods with multiple data

A = 18
B = 0
C = 0
D = 0
E = 2
F = 0

US EPA ARCHIVE DOCUMENT

a = 3828
b = 11880
c = 264
Group Variance = 211.667
Z-Score = -3.29925
Comparison Level at 95% confidence level = 1.65463 (upward trend)
-3.29925 <= 1.65463 indicating no evidence of an upward trend

US EPA ARCHIVE DOCUMENT

Mann-Kendall Trend Analysis

Parameter: cis-1,2-Dichloroethene
Location: MW-20S
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
9	9.6	-0.6	0	1
9.4	9.6	-0.2	0	2
12	9.6	2.4	1	2
9.7	9.6	0.1	2	2
6.1	9.6	-3.5	2	3
5.5	9.6	-4.1	2	4
4.1	9.6	-5.5	2	5
2.4	9.6	-7.2	2	6
ND<2	9.6	-7.6	2	7
1.9	9.6	-7.7	2	8
2	9.6	-7.6	2	9
9.4	9	0.4	3	9
12	9	3	4	9
9.7	9	0.7	5	9
6.1	9	-2.9	5	10
5.5	9	-3.5	5	11
4.1	9	-4.9	5	12
2.4	9	-6.6	5	13
ND<2	9	-7	5	14
1.9	9	-7.1	5	15
2	9	-7	5	16
12	9.4	2.6	6	16
9.7	9.4	0.3	7	16
6.1	9.4	-3.3	7	17
5.5	9.4	-3.9	7	18
4.1	9.4	-5.3	7	19
2.4	9.4	-7	7	20
ND<2	9.4	-7.4	7	21
1.9	9.4	-7.5	7	22
2	9.4	-7.4	7	23
9.7	12	-2.3	7	24
6.1	12	-5.9	7	25
5.5	12	-6.5	7	26
4.1	12	-7.9	7	27
2.4	12	-9.6	7	28
ND<2	12	-10	7	29
1.9	12	-10.1	7	30
2	12	-10	7	31
6.1	9.7	-3.6	7	32
5.5	9.7	-4.2	7	33
4.1	9.7	-5.6	7	34
2.4	9.7	-7.3	7	35
ND<2	9.7	-7.7	7	36

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1.9	9.7	-7.8	7	37
2	9.7	-7.7	7	38
5.5	6.1	-0.6	7	39
4.1	6.1	-2	7	40
2.4	6.1	-3.7	7	41
ND<2	6.1	-4.1	7	42
1.9	6.1	-4.2	7	43
2	6.1	-4.1	7	44
4.1	5.5	-1.4	7	45
2.4	5.5	-3.1	7	46
ND<2	5.5	-3.5	7	47
1.9	5.5	-3.6	7	48
2	5.5	-3.5	7	49
2.4	4.1	-1.7	7	50
ND<2	4.1	-2.1	7	51
1.9	4.1	-2.2	7	52
2	4.1	-2.1	7	53
ND<2	2.4	-0.4	7	54
1.9	2.4	-0.5	7	55
2	2.4	-0.4	7	56
1.9	ND<2	-0.1	7	57
2	ND<2	0	7	57
2	1.9	0.1	8	57

S Statistic = 8 - 57 = -49

Tied Group	Value	Members
1	2	2

Time Period	Observations
12/30/2009	1
1/13/2010	1
3/17/2010	1
5/18/2010	1
9/10/2010	1
12/21/2010	1
2/18/2011	1
5/13/2011	1
7/25/2011	1
10/10/2011	1
1/9/2012	1
4/9/2012	1

There are 0 time periods with multiple data

A = 18
B = 0
C = 0
D = 0
E = 2
F = 0

US EPA ARCHIVE DOCUMENT

a = 3828
b = 11880
c = 264
Group Variance = 211.667
Z-Score = -3.29925
Comparison Level at 95% confidence level = -1.65463 (downward trend)
-3.29925 < -1.65463 indicating a downward trend

US EPA ARCHIVE DOCUMENT

Mann-Kendall Trend Analysis

Parameter: cis-1,2-Dichloroethene
Location: MW-20S
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
9	9.6	-0.6	0	1
9.4	9.6	-0.2	0	2
12	9.6	2.4	1	2
9.7	9.6	0.1	2	2
6.1	9.6	-3.5	2	3
5.5	9.6	-4.1	2	4
4.1	9.6	-5.5	2	5
2.4	9.6	-7.2	2	6
ND<2	9.6	-7.6	2	7
1.9	9.6	-7.7	2	8
2	9.6	-7.6	2	9
9.4	9	0.4	3	9
12	9	3	4	9
9.7	9	0.7	5	9
6.1	9	-2.9	5	10
5.5	9	-3.5	5	11
4.1	9	-4.9	5	12
2.4	9	-6.6	5	13
ND<2	9	-7	5	14
1.9	9	-7.1	5	15
2	9	-7	5	16
12	9.4	2.6	6	16
9.7	9.4	0.3	7	16
6.1	9.4	-3.3	7	17
5.5	9.4	-3.9	7	18
4.1	9.4	-5.3	7	19
2.4	9.4	-7	7	20
ND<2	9.4	-7.4	7	21
1.9	9.4	-7.5	7	22
2	9.4	-7.4	7	23
9.7	12	-2.3	7	24
6.1	12	-5.9	7	25
5.5	12	-6.5	7	26
4.1	12	-7.9	7	27
2.4	12	-9.6	7	28
ND<2	12	-10	7	29
1.9	12	-10.1	7	30
2	12	-10	7	31
6.1	9.7	-3.6	7	32
5.5	9.7	-4.2	7	33
4.1	9.7	-5.6	7	34
2.4	9.7	-7.3	7	35
ND<2	9.7	-7.7	7	36

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1.9	9.7	-7.8	7	37
2	9.7	-7.7	7	38
5.5	6.1	-0.6	7	39
4.1	6.1	-2	7	40
2.4	6.1	-3.7	7	41
ND<2	6.1	-4.1	7	42
1.9	6.1	-4.2	7	43
2	6.1	-4.1	7	44
4.1	5.5	-1.4	7	45
2.4	5.5	-3.1	7	46
ND<2	5.5	-3.5	7	47
1.9	5.5	-3.6	7	48
2	5.5	-3.5	7	49
2.4	4.1	-1.7	7	50
ND<2	4.1	-2.1	7	51
1.9	4.1	-2.2	7	52
2	4.1	-2.1	7	53
ND<2	2.4	-0.4	7	54
1.9	2.4	-0.5	7	55
2	2.4	-0.4	7	56
1.9	ND<2	-0.1	7	57
2	ND<2	0	7	57
2	1.9	0.1	8	57

S Statistic = 8 - 57 = -49

Tied Group	Value	Members
1	2	2

Time Period	Observations
12/30/2009	1
1/13/2010	1
3/17/2010	1
5/18/2010	1
9/10/2010	1
12/21/2010	1
2/18/2011	1
5/13/2011	1
7/25/2011	1
10/10/2011	1
1/9/2012	1
4/9/2012	1

There are 0 time periods with multiple data

A = 18
B = 0
C = 0
D = 0
E = 2
F = 0

US EPA ARCHIVE DOCUMENT

a = 3828
b = 11880
c = 264
Group Variance = 211.667
Z-Score = -3.29925
Comparison Level at 95% confidence level = 1.65463 (upward trend)
-3.29925 <= 1.65463 indicating no evidence of an upward trend

US EPA ARCHIVE DOCUMENT

Mann-Kendall Trend Analysis

Parameter: Trichloroethene
Location: MW-20S
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
70	71	-1	0	1
64	71	-7	0	2
94	71	23	1	2
110	71	39	2	2
89	71	18	3	2
93	71	22	4	2
91	71	20	5	2
100	71	29	6	2
110	71	39	7	2
100	71	29	8	2
100	71	29	9	2
64	70	-6	9	3
94	70	24	10	3
110	70	40	11	3
89	70	19	12	3
93	70	23	13	3
91	70	21	14	3
100	70	30	15	3
110	70	40	16	3
100	70	30	17	3
100	70	30	18	3
94	64	30	19	3
110	64	46	20	3
89	64	25	21	3
93	64	29	22	3
91	64	27	23	3
100	64	36	24	3
110	64	46	25	3
100	64	36	26	3
100	64	36	27	3
110	94	16	28	3
89	94	-5	28	4
93	94	-1	28	5
91	94	-3	28	6
100	94	6	29	6
110	94	16	30	6
100	94	6	31	6
100	94	6	32	6
89	110	-21	32	7
93	110	-17	32	8
91	110	-19	32	9
100	110	-10	32	10
110	110	0	32	10

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100	110	-10	32	11
100	110	-10	32	12
93	89	4	33	12
91	89	2	34	12
100	89	11	35	12
110	89	21	36	12
100	89	11	37	12
100	89	11	38	12
91	93	-2	38	13
100	93	7	39	13
110	93	17	40	13
100	93	7	41	13
100	93	7	42	13
100	91	9	43	13
110	91	19	44	13
100	91	9	45	13
100	91	9	46	13
110	100	10	47	13
100	100	0	47	13
100	100	0	47	13
100	110	-10	47	14
100	110	-10	47	15
100	100	0	47	15

S Statistic = 47 - 15 = 32

Tied Group	Value	Members
1	110	2
2	100	3

Time Period	Observations
12/30/2009	1
1/13/2010	1
3/17/2010	1
5/18/2010	1
9/10/2010	1
12/21/2010	1
2/18/2011	1
5/13/2011	1
7/25/2011	1
10/10/2011	1
1/9/2012	1
4/9/2012	1

There are 0 time periods with multiple data

A = 84
B = 0
C = 6
D = 0
E = 8

US EPA ARCHIVE DOCUMENT

F = 0
a = 3828
b = 11880
c = 264
Group Variance = 208
Z-Score = 2.14946
Comparison Level at 95% confidence level = -1.65463 (downward trend)
2.14946 >= -1.65463 indicating no evidence of a downward trend

US EPA ARCHIVE DOCUMENT

Mann-Kendall Trend Analysis

Parameter: Trichloroethene
Location: MW-20S
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
70	71	-1	0	1
64	71	-7	0	2
94	71	23	1	2
110	71	39	2	2
89	71	18	3	2
93	71	22	4	2
91	71	20	5	2
100	71	29	6	2
110	71	39	7	2
100	71	29	8	2
100	71	29	9	2
64	70	-6	9	3
94	70	24	10	3
110	70	40	11	3
89	70	19	12	3
93	70	23	13	3
91	70	21	14	3
100	70	30	15	3
110	70	40	16	3
100	70	30	17	3
100	70	30	18	3
94	64	30	19	3
110	64	46	20	3
89	64	25	21	3
93	64	29	22	3
91	64	27	23	3
100	64	36	24	3
110	64	46	25	3
100	64	36	26	3
100	64	36	27	3
110	94	16	28	3
89	94	-5	28	4
93	94	-1	28	5
91	94	-3	28	6
100	94	6	29	6
110	94	16	30	6
100	94	6	31	6
100	94	6	32	6
89	110	-21	32	7
93	110	-17	32	8
91	110	-19	32	9
100	110	-10	32	10
110	110	0	32	10

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100	110	-10	32	11
100	110	-10	32	12
93	89	4	33	12
91	89	2	34	12
100	89	11	35	12
110	89	21	36	12
100	89	11	37	12
100	89	11	38	12
91	93	-2	38	13
100	93	7	39	13
110	93	17	40	13
100	93	7	41	13
100	93	7	42	13
100	91	9	43	13
110	91	19	44	13
100	91	9	45	13
100	91	9	46	13
110	100	10	47	13
100	100	0	47	13
100	100	0	47	13
100	110	-10	47	14
100	110	-10	47	15
100	100	0	47	15

S Statistic = 47 - 15 = 32

Tied Group	Value	Members
1	110	2
2	100	3

Time Period	Observations
12/30/2009	1
1/13/2010	1
3/17/2010	1
5/18/2010	1
9/10/2010	1
12/21/2010	1
2/18/2011	1
5/13/2011	1
7/25/2011	1
10/10/2011	1
1/9/2012	1
4/9/2012	1

There are 0 time periods with multiple data

A = 84
B = 0
C = 6
D = 0
E = 8

US EPA ARCHIVE DOCUMENT

F = 0
a = 3828
b = 11880
c = 264
Group Variance = 208
Z-Score = 2.14946
Comparison Level at 95% confidence level = 1.65463 (upward trend)
2.14946 > 1.65463 indicating an upward trend

US EPA ARCHIVE DOCUMENT

Mann-Kendall Trend Analysis

Parameter: 1,1,1-Trichloroethane

Location: MW-21

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
56	54	2	1	0
62	54	8	2	0
63	54	9	3	0
59	54	5	4	0
55	54	1	5	0
52	54	-2	5	1
49	54	-5	5	2
54	54	0	5	2
55	54	1	6	2
64	54	10	7	2
55	54	1	8	2
62	56	6	9	2
63	56	7	10	2
59	56	3	11	2
55	56	-1	11	3
52	56	-4	11	4
49	56	-7	11	5
54	56	-2	11	6
55	56	-1	11	7
64	56	8	12	7
55	56	-1	12	8
63	62	1	13	8
59	62	-3	13	9
55	62	-7	13	10
52	62	-10	13	11
49	62	-13	13	12
54	62	-8	13	13
55	62	-7	13	14
64	62	2	14	14
55	62	-7	14	15
59	63	-4	14	16
55	63	-8	14	17
52	63	-11	14	18
49	63	-14	14	19
54	63	-9	14	20
55	63	-8	14	21
64	63	1	15	21
55	63	-8	15	22
55	59	-4	15	23
52	59	-7	15	24
49	59	-10	15	25
54	59	-5	15	26
55	59	-4	15	27

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64	59	5	16	27
55	59	-4	16	28
52	55	-3	16	29
49	55	-6	16	30
54	55	-1	16	31
55	55	0	16	31
64	55	9	17	31
55	55	0	17	31
49	52	-3	17	32
54	52	2	18	32
55	52	3	19	32
64	52	12	20	32
55	52	3	21	32
54	49	5	22	32
55	49	6	23	32
64	49	15	24	32
55	49	6	25	32
55	54	1	26	32
64	54	10	27	32
55	54	1	28	32
64	55	9	29	32
55	55	0	29	32
55	64	-9	29	33

S Statistic = 29 - 33 = -4

Tied Group	Value	Members
1	54	2
2	55	3

Time Period	Observations
12/8/2009	1
1/13/2010	1
3/23/2010	1
5/18/2010	1
10/15/2010	1
12/22/2010	1
2/24/2011	1
5/11/2011	1
7/28/2011	1
10/6/2011	1
1/10/2012	1
4/4/2012	1

There are 0 time periods with multiple data

A = 84
B = 0
C = 6
D = 0
E = 8

US EPA ARCHIVE DOCUMENT

F = 0
a = 3828
b = 11880
c = 264
Group Variance = 208
Z-Score = -0.208013
Comparison Level at 95% confidence level = -1.65463 (downward trend)
-0.208013 >= -1.65463 indicating no evidence of a downward trend

US EPA ARCHIVE DOCUMENT

Mann-Kendall Trend Analysis

Parameter: 1,1,1-Trichloroethane

Location: MW-21

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
56	54	2	1	0
62	54	8	2	0
63	54	9	3	0
59	54	5	4	0
55	54	1	5	0
52	54	-2	5	1
49	54	-5	5	2
54	54	0	5	2
55	54	1	6	2
64	54	10	7	2
55	54	1	8	2
62	56	6	9	2
63	56	7	10	2
59	56	3	11	2
55	56	-1	11	3
52	56	-4	11	4
49	56	-7	11	5
54	56	-2	11	6
55	56	-1	11	7
64	56	8	12	7
55	56	-1	12	8
63	62	1	13	8
59	62	-3	13	9
55	62	-7	13	10
52	62	-10	13	11
49	62	-13	13	12
54	62	-8	13	13
55	62	-7	13	14
64	62	2	14	14
55	62	-7	14	15
59	63	-4	14	16
55	63	-8	14	17
52	63	-11	14	18
49	63	-14	14	19
54	63	-9	14	20
55	63	-8	14	21
64	63	1	15	21
55	63	-8	15	22
55	59	-4	15	23
52	59	-7	15	24
49	59	-10	15	25
54	59	-5	15	26
55	59	-4	15	27

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64	59	5	16	27
55	59	-4	16	28
52	55	-3	16	29
49	55	-6	16	30
54	55	-1	16	31
55	55	0	16	31
64	55	9	17	31
55	55	0	17	31
49	52	-3	17	32
54	52	2	18	32
55	52	3	19	32
64	52	12	20	32
55	52	3	21	32
54	49	5	22	32
55	49	6	23	32
64	49	15	24	32
55	49	6	25	32
55	54	1	26	32
64	54	10	27	32
55	54	1	28	32
64	55	9	29	32
55	55	0	29	32
55	64	-9	29	33

S Statistic = 29 - 33 = -4

Tied Group	Value	Members
1	54	2
2	55	3

Time Period	Observations
12/8/2009	1
1/13/2010	1
3/23/2010	1
5/18/2010	1
10/15/2010	1
12/22/2010	1
2/24/2011	1
5/11/2011	1
7/28/2011	1
10/6/2011	1
1/10/2012	1
4/4/2012	1

There are 0 time periods with multiple data

A = 84
B = 0
C = 6
D = 0
E = 8

US EPA ARCHIVE DOCUMENT

F = 0
a = 3828
b = 11880
c = 264
Group Variance = 208
Z-Score = -0.208013
Comparison Level at 95% confidence level = 1.65463 (upward trend)
-0.208013 <= 1.65463 indicating no evidence of an upward trend

US EPA ARCHIVE DOCUMENT

Mann-Kendall Trend Analysis

Parameter: 1,1-Dichloroethane

Location: MW-21

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
28	31	-3	0	1
33	31	2	1	1
35	31	4	2	1
26	31	-5	2	2
25	31	-6	2	3
25	31	-6	2	4
24	31	-7	2	5
22	31	-9	2	6
22	31	-9	2	7
27	31	-4	2	8
25	31	-6	2	9
33	28	5	3	9
35	28	7	4	9
26	28	-2	4	10
25	28	-3	4	11
25	28	-3	4	12
24	28	-4	4	13
22	28	-6	4	14
22	28	-6	4	15
27	28	-1	4	16
25	28	-3	4	17
35	33	2	5	17
26	33	-7	5	18
25	33	-8	5	19
25	33	-8	5	20
24	33	-9	5	21
22	33	-11	5	22
22	33	-11	5	23
27	33	-6	5	24
25	33	-8	5	25
26	35	-9	5	26
25	35	-10	5	27
25	35	-10	5	28
24	35	-11	5	29
22	35	-13	5	30
22	35	-13	5	31
27	35	-8	5	32
25	35	-10	5	33
25	26	-1	5	34
25	26	-1	5	35
24	26	-2	5	36
22	26	-4	5	37
22	26	-4	5	38

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27	26	1	6	38
25	26	-1	6	39
25	25	0	6	39
24	25	-1	6	40
22	25	-3	6	41
22	25	-3	6	42
27	25	2	7	42
25	25	0	7	42
24	25	-1	7	43
22	25	-3	7	44
22	25	-3	7	45
27	25	2	8	45
25	25	0	8	45
22	24	-2	8	46
22	24	-2	8	47
27	24	3	9	47
25	24	1	10	47
22	22	0	10	47
27	22	5	11	47
25	22	3	12	47
27	22	5	13	47
25	22	3	14	47
25	27	-2	14	48

S Statistic = 14 - 48 = -34

Tied Group	Value	Members
1	25	3
2	22	2

Time Period	Observations
12/8/2009	1
1/13/2010	1
3/23/2010	1
5/18/2010	1
10/15/2010	1
12/22/2010	1
2/24/2011	1
5/11/2011	1
7/28/2011	1
10/6/2011	1
1/10/2012	1
4/4/2012	1

There are 0 time periods with multiple data

A = 84
B = 0
C = 6
D = 0
E = 8

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F = 0
a = 3828
b = 11880
c = 264
Group Variance = 208
Z-Score = -2.28814
Comparison Level at 95% confidence level = -1.65463 (downward trend)
-2.28814 < -1.65463 indicating a downward trend

US EPA ARCHIVE DOCUMENT

Mann-Kendall Trend Analysis

Parameter: 1,1-Dichloroethane

Location: MW-21

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
28	31	-3	0	1
33	31	2	1	1
35	31	4	2	1
26	31	-5	2	2
25	31	-6	2	3
25	31	-6	2	4
24	31	-7	2	5
22	31	-9	2	6
22	31	-9	2	7
27	31	-4	2	8
25	31	-6	2	9
33	28	5	3	9
35	28	7	4	9
26	28	-2	4	10
25	28	-3	4	11
25	28	-3	4	12
24	28	-4	4	13
22	28	-6	4	14
22	28	-6	4	15
27	28	-1	4	16
25	28	-3	4	17
35	33	2	5	17
26	33	-7	5	18
25	33	-8	5	19
25	33	-8	5	20
24	33	-9	5	21
22	33	-11	5	22
22	33	-11	5	23
27	33	-6	5	24
25	33	-8	5	25
26	35	-9	5	26
25	35	-10	5	27
25	35	-10	5	28
24	35	-11	5	29
22	35	-13	5	30
22	35	-13	5	31
27	35	-8	5	32
25	35	-10	5	33
25	26	-1	5	34
25	26	-1	5	35
24	26	-2	5	36
22	26	-4	5	37
22	26	-4	5	38

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27	26	1	6	38
25	26	-1	6	39
25	25	0	6	39
24	25	-1	6	40
22	25	-3	6	41
22	25	-3	6	42
27	25	2	7	42
25	25	0	7	42
24	25	-1	7	43
22	25	-3	7	44
22	25	-3	7	45
27	25	2	8	45
25	25	0	8	45
22	24	-2	8	46
22	24	-2	8	47
27	24	3	9	47
25	24	1	10	47
22	22	0	10	47
27	22	5	11	47
25	22	3	12	47
27	22	5	13	47
25	22	3	14	47
25	27	-2	14	48

S Statistic = 14 - 48 = -34

Tied Group	Value	Members
1	25	3
2	22	2

Time Period	Observations
12/8/2009	1
1/13/2010	1
3/23/2010	1
5/18/2010	1
10/15/2010	1
12/22/2010	1
2/24/2011	1
5/11/2011	1
7/28/2011	1
10/6/2011	1
1/10/2012	1
4/4/2012	1

There are 0 time periods with multiple data

A = 84
B = 0
C = 6
D = 0
E = 8

US EPA ARCHIVE DOCUMENT

F = 0
a = 3828
b = 11880
c = 264
Group Variance = 208
Z-Score = -2.28814
Comparison Level at 95% confidence level = 1.65463 (upward trend)
-2.28814 <= 1.65463 indicating no evidence of an upward trend

US EPA ARCHIVE DOCUMENT

Mann-Kendall Trend Analysis

Parameter: cis-1,2-Dichloroethene

Location: MW-21

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
62	59	3	1	0
81	59	22	2	0
89	59	30	3	0
80	59	21	4	0
69	59	10	5	0
66	59	7	6	0
65	59	6	7	0
77	59	18	8	0
74	59	15	9	0
79	59	20	10	0
81	59	22	11	0
81	62	19	12	0
89	62	27	13	0
80	62	18	14	0
69	62	7	15	0
66	62	4	16	0
65	62	3	17	0
77	62	15	18	0
74	62	12	19	0
79	62	17	20	0
81	62	19	21	0
89	81	8	22	0
80	81	-1	22	1
69	81	-12	22	2
66	81	-15	22	3
65	81	-16	22	4
77	81	-4	22	5
74	81	-7	22	6
79	81	-2	22	7
81	81	0	22	7
80	89	-9	22	8
69	89	-20	22	9
66	89	-23	22	10
65	89	-24	22	11
77	89	-12	22	12
74	89	-15	22	13
79	89	-10	22	14
81	89	-8	22	15
69	80	-11	22	16
66	80	-14	22	17
65	80	-15	22	18
77	80	-3	22	19
74	80	-6	22	20

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79	80	-1	22	21
81	80	1	23	21
66	69	-3	23	22
65	69	-4	23	23
77	69	8	24	23
74	69	5	25	23
79	69	10	26	23
81	69	12	27	23
65	66	-1	27	24
77	66	11	28	24
74	66	8	29	24
79	66	13	30	24
81	66	15	31	24
77	65	12	32	24
74	65	9	33	24
79	65	14	34	24
81	65	16	35	24
74	77	-3	35	25
79	77	2	36	25
81	77	4	37	25
79	74	5	38	25
81	74	7	39	25
81	79	2	40	25

S Statistic = 40 - 25 = 15

Tied Group	Value	Members
1	81	2

Time Period	Observations
12/8/2009	1
1/13/2010	1
3/23/2010	1
5/18/2010	1
10/15/2010	1
12/22/2010	1
2/24/2011	1
5/11/2011	1
7/28/2011	1
10/6/2011	1
1/10/2012	1
4/4/2012	1

There are 0 time periods with multiple data

A = 18
B = 0
C = 0
D = 0
E = 2
F = 0

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a = 3828
b = 11880
c = 264
Group Variance = 211.667
Z-Score = 0.962281
Comparison Level at 95% confidence level = -1.65463 (downward trend)
0.962281 >= -1.65463 indicating no evidence of a downward trend

US EPA ARCHIVE DOCUMENT

Mann-Kendall Trend Analysis

Parameter: cis-1,2-Dichloroethene

Location: MW-21

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
62	59	3	1	0
81	59	22	2	0
89	59	30	3	0
80	59	21	4	0
69	59	10	5	0
66	59	7	6	0
65	59	6	7	0
77	59	18	8	0
74	59	15	9	0
79	59	20	10	0
81	59	22	11	0
81	62	19	12	0
89	62	27	13	0
80	62	18	14	0
69	62	7	15	0
66	62	4	16	0
65	62	3	17	0
77	62	15	18	0
74	62	12	19	0
79	62	17	20	0
81	62	19	21	0
89	81	8	22	0
80	81	-1	22	1
69	81	-12	22	2
66	81	-15	22	3
65	81	-16	22	4
77	81	-4	22	5
74	81	-7	22	6
79	81	-2	22	7
81	81	0	22	7
80	89	-9	22	8
69	89	-20	22	9
66	89	-23	22	10
65	89	-24	22	11
77	89	-12	22	12
74	89	-15	22	13
79	89	-10	22	14
81	89	-8	22	15
69	80	-11	22	16
66	80	-14	22	17
65	80	-15	22	18
77	80	-3	22	19
74	80	-6	22	20

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79	80	-1	22	21
81	80	1	23	21
66	69	-3	23	22
65	69	-4	23	23
77	69	8	24	23
74	69	5	25	23
79	69	10	26	23
81	69	12	27	23
65	66	-1	27	24
77	66	11	28	24
74	66	8	29	24
79	66	13	30	24
81	66	15	31	24
77	65	12	32	24
74	65	9	33	24
79	65	14	34	24
81	65	16	35	24
74	77	-3	35	25
79	77	2	36	25
81	77	4	37	25
79	74	5	38	25
81	74	7	39	25
81	79	2	40	25

S Statistic = 40 - 25 = 15

Tied Group	Value	Members
1	81	2

Time Period	Observations
12/8/2009	1
1/13/2010	1
3/23/2010	1
5/18/2010	1
10/15/2010	1
12/22/2010	1
2/24/2011	1
5/11/2011	1
7/28/2011	1
10/6/2011	1
1/10/2012	1
4/4/2012	1

There are 0 time periods with multiple data

A = 18
B = 0
C = 0
D = 0
E = 2
F = 0

US EPA ARCHIVE DOCUMENT

a = 3828
b = 11880
c = 264
Group Variance = 211.667
Z-Score = 0.962281
Comparison Level at 95% confidence level = 1.65463 (upward trend)
0.962281 <= 1.65463 indicating no evidence of an upward trend

US EPA ARCHIVE DOCUMENT

Mann-Kendall Trend Analysis

Parameter: Trichloroethene

Location: MW-21

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
730	840	-110	0	1
850	840	10	1	1
830	840	-10	1	2
810	840	-30	1	3
730	840	-110	1	4
730	840	-110	1	5
740	840	-100	1	6
1000	840	160	2	6
960	840	120	3	6
990	840	150	4	6
980	840	140	5	6
850	730	120	6	6
830	730	100	7	6
810	730	80	8	6
730	730	0	8	6
730	730	0	8	6
740	730	10	9	6
1000	730	270	10	6
960	730	230	11	6
990	730	260	12	6
980	730	250	13	6
830	850	-20	13	7
810	850	-40	13	8
730	850	-120	13	9
730	850	-120	13	10
740	850	-110	13	11
1000	850	150	14	11
960	850	110	15	11
990	850	140	16	11
980	850	130	17	11
810	830	-20	17	12
730	830	-100	17	13
730	830	-100	17	14
740	830	-90	17	15
1000	830	170	18	15
960	830	130	19	15
990	830	160	20	15
980	830	150	21	15
730	810	-80	21	16
730	810	-80	21	17
740	810	-70	21	18
1000	810	190	22	18
960	810	150	23	18

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990	810	180	24	18
980	810	170	25	18
730	730	0	25	18
740	730	10	26	18
1000	730	270	27	18
960	730	230	28	18
990	730	260	29	18
980	730	250	30	18
740	730	10	31	18
1000	730	270	32	18
960	730	230	33	18
990	730	260	34	18
980	730	250	35	18
1000	740	260	36	18
960	740	220	37	18
990	740	250	38	18
980	740	240	39	18
960	1000	-40	39	19
990	1000	-10	39	20
980	1000	-20	39	21
990	960	30	40	21
980	960	20	41	21
980	990	-10	41	22

S Statistic = 41 - 22 = 19

Tied Group	Value	Members
1	730	3

Time Period	Observations
12/8/2009	1
1/13/2010	1
3/23/2010	1
5/18/2010	1
10/15/2010	1
12/22/2010	1
2/24/2011	1
5/11/2011	1
7/28/2011	1
10/6/2011	1
1/10/2012	1
4/4/2012	1

There are 0 time periods with multiple data

A = 66
B = 0
C = 6
D = 0
E = 6
F = 0

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a = 3828
b = 11880
c = 264
Group Variance = 209
Z-Score = 1.24509
Comparison Level at 95% confidence level = -1.65463 (downward trend)
1.24509 >= -1.65463 indicating no evidence of a downward trend

US EPA ARCHIVE DOCUMENT

Mann-Kendall Trend Analysis

Parameter: Trichloroethene

Location: MW-21

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
730	840	-110	0	1
850	840	10	1	1
830	840	-10	1	2
810	840	-30	1	3
730	840	-110	1	4
730	840	-110	1	5
740	840	-100	1	6
1000	840	160	2	6
960	840	120	3	6
990	840	150	4	6
980	840	140	5	6
850	730	120	6	6
830	730	100	7	6
810	730	80	8	6
730	730	0	8	6
730	730	0	8	6
740	730	10	9	6
1000	730	270	10	6
960	730	230	11	6
990	730	260	12	6
980	730	250	13	6
830	850	-20	13	7
810	850	-40	13	8
730	850	-120	13	9
730	850	-120	13	10
740	850	-110	13	11
1000	850	150	14	11
960	850	110	15	11
990	850	140	16	11
980	850	130	17	11
810	830	-20	17	12
730	830	-100	17	13
730	830	-100	17	14
740	830	-90	17	15
1000	830	170	18	15
960	830	130	19	15
990	830	160	20	15
980	830	150	21	15
730	810	-80	21	16
730	810	-80	21	17
740	810	-70	21	18
1000	810	190	22	18
960	810	150	23	18

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990	810	180	24	18
980	810	170	25	18
730	730	0	25	18
740	730	10	26	18
1000	730	270	27	18
960	730	230	28	18
990	730	260	29	18
980	730	250	30	18
740	730	10	31	18
1000	730	270	32	18
960	730	230	33	18
990	730	260	34	18
980	730	250	35	18
1000	740	260	36	18
960	740	220	37	18
990	740	250	38	18
980	740	240	39	18
960	1000	-40	39	19
990	1000	-10	39	20
980	1000	-20	39	21
990	960	30	40	21
980	960	20	41	21
980	990	-10	41	22

S Statistic = 41 - 22 = 19

Tied Group	Value	Members
1	730	3

Time Period	Observations
12/8/2009	1
1/13/2010	1
3/23/2010	1
5/18/2010	1
10/15/2010	1
12/22/2010	1
2/24/2011	1
5/11/2011	1
7/28/2011	1
10/6/2011	1
1/10/2012	1
4/4/2012	1

There are 0 time periods with multiple data

A = 66
B = 0
C = 6
D = 0
E = 6
F = 0

US EPA ARCHIVE DOCUMENT

a = 3828
b = 11880
c = 264
Group Variance = 209
Z-Score = 1.24509
Comparison Level at 95% confidence level = 1.65463 (upward trend)
1.24509 <= 1.65463 indicating no evidence of an upward trend

US EPA ARCHIVE DOCUMENT

Mann-Kendall Trend Analysis

Parameter: Vinyl chloride
Location: MW-22
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
8.5	10	-1.5	0	1
2	10	-8	0	2
4.3	10	-5.7	0	3
3	10	-7	0	4
2.3	10	-7.7	0	5
1.4	10	-8.6	0	6
2.8	10	-7.2	0	7
6.2	10	-3.8	0	8
8.4	10	-1.6	0	9
12	10	2	1	9
2	8.5	-6.5	1	10
4.3	8.5	-4.2	1	11
3	8.5	-5.5	1	12
2.3	8.5	-6.2	1	13
1.4	8.5	-7.1	1	14
2.8	8.5	-5.7	1	15
6.2	8.5	-2.3	1	16
8.4	8.5	-0.1	1	17
12	8.5	3.5	2	17
4.3	2	2.3	3	17
3	2	1	4	17
2.3	2	0.3	5	17
1.4	2	-0.6	5	18
2.8	2	0.8	6	18
6.2	2	4.2	7	18
8.4	2	6.4	8	18
12	2	10	9	18
3	4.3	-1.3	9	19
2.3	4.3	-2	9	20
1.4	4.3	-2.9	9	21
2.8	4.3	-1.5	9	22
6.2	4.3	1.9	10	22
8.4	4.3	4.1	11	22
12	4.3	7.7	12	22
2.3	3	-0.7	12	23
1.4	3	-1.6	12	24
2.8	3	-0.2	12	25
6.2	3	3.2	13	25
8.4	3	5.4	14	25
12	3	9	15	25
1.4	2.3	-0.9	15	26
2.8	2.3	0.5	16	26

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6.2	2.3	3.9	17	26
8.4	2.3	6.1	18	26
12	2.3	9.7	19	26
2.8	1.4	1.4	20	26
6.2	1.4	4.8	21	26
8.4	1.4	7	22	26
12	1.4	10.6	23	26
6.2	2.8	3.4	24	26
8.4	2.8	5.6	25	26
12	2.8	9.2	26	26
8.4	6.2	2.2	27	26
12	6.2	5.8	28	26
12	8.4	3.6	29	26

S Statistic = 29 - 26 = 3

Tied Group	Value	Members

Time Period	Observations
12/7/2009	1
3/18/2010	1
5/18/2010	1
9/10/2010	1
12/22/2010	1
2/24/2011	1
5/11/2011	1
7/21/2011	1
10/4/2011	1
1/9/2012	1
4/5/2012	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 2970
b = 8910
c = 220
Group Variance = 165
Z-Score = 0.1557
Comparison Level at 95% confidence level = -1.65463 (downward trend)
0.1557 >= -1.65463 indicating no evidence of a downward trend

US EPA ARCHIVE DOCUMENT

Mann-Kendall Trend Analysis

Parameter: Vinyl chloride
Location: MW-22
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
8.5	10	-1.5	0	1
2	10	-8	0	2
4.3	10	-5.7	0	3
3	10	-7	0	4
2.3	10	-7.7	0	5
1.4	10	-8.6	0	6
2.8	10	-7.2	0	7
6.2	10	-3.8	0	8
8.4	10	-1.6	0	9
12	10	2	1	9
2	8.5	-6.5	1	10
4.3	8.5	-4.2	1	11
3	8.5	-5.5	1	12
2.3	8.5	-6.2	1	13
1.4	8.5	-7.1	1	14
2.8	8.5	-5.7	1	15
6.2	8.5	-2.3	1	16
8.4	8.5	-0.1	1	17
12	8.5	3.5	2	17
4.3	2	2.3	3	17
3	2	1	4	17
2.3	2	0.3	5	17
1.4	2	-0.6	5	18
2.8	2	0.8	6	18
6.2	2	4.2	7	18
8.4	2	6.4	8	18
12	2	10	9	18
3	4.3	-1.3	9	19
2.3	4.3	-2	9	20
1.4	4.3	-2.9	9	21
2.8	4.3	-1.5	9	22
6.2	4.3	1.9	10	22
8.4	4.3	4.1	11	22
12	4.3	7.7	12	22
2.3	3	-0.7	12	23
1.4	3	-1.6	12	24
2.8	3	-0.2	12	25
6.2	3	3.2	13	25
8.4	3	5.4	14	25
12	3	9	15	25
1.4	2.3	-0.9	15	26
2.8	2.3	0.5	16	26

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6.2	2.3	3.9	17	26
8.4	2.3	6.1	18	26
12	2.3	9.7	19	26
2.8	1.4	1.4	20	26
6.2	1.4	4.8	21	26
8.4	1.4	7	22	26
12	1.4	10.6	23	26
6.2	2.8	3.4	24	26
8.4	2.8	5.6	25	26
12	2.8	9.2	26	26
8.4	6.2	2.2	27	26
12	6.2	5.8	28	26
12	8.4	3.6	29	26

S Statistic = 29 - 26 = 3

Tied Group	Value	Members

Time Period	Observations
12/7/2009	1
3/18/2010	1
5/18/2010	1
9/10/2010	1
12/22/2010	1
2/24/2011	1
5/11/2011	1
7/21/2011	1
10/4/2011	1
1/9/2012	1
4/5/2012	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 2970
b = 8910
c = 220
Group Variance = 165
Z-Score = 0.1557
Comparison Level at 95% confidence level = 1.65463 (upward trend)
0.1557 <= 1.65463 indicating no evidence of an upward trend

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Mann-Kendall Trend Analysis

Parameter: Vinyl chloride
Location: MW-23
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
7.6	3.2	4.4	1	0
4	3.2	0.8	2	0
6.1	3.2	2.9	3	0
9	3.2	5.8	4	0
17	3.2	13.8	5	0
18	3.2	14.8	6	0
25	3.2	21.8	7	0
23	3.2	19.8	8	0
56	3.2	52.8	9	0
11	3.2	7.8	10	0
48	3.2	44.8	11	0
85	3.2	81.8	12	0
4	7.6	-3.6	12	1
6.1	7.6	-1.5	12	2
9	7.6	1.4	13	2
17	7.6	9.4	14	2
18	7.6	10.4	15	2
25	7.6	17.4	16	2
23	7.6	15.4	17	2
56	7.6	48.4	18	2
11	7.6	3.4	19	2
48	7.6	40.4	20	2
85	7.6	77.4	21	2
6.1	4	2.1	22	2
9	4	5	23	2
17	4	13	24	2
18	4	14	25	2
25	4	21	26	2
23	4	19	27	2
56	4	52	28	2
11	4	7	29	2
48	4	44	30	2
85	4	81	31	2
9	6.1	2.9	32	2
17	6.1	10.9	33	2
18	6.1	11.9	34	2
25	6.1	18.9	35	2
23	6.1	16.9	36	2
56	6.1	49.9	37	2
11	6.1	4.9	38	2
48	6.1	41.9	39	2
85	6.1	78.9	40	2
17	9	8	41	2

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18	9	9	42	2
25	9	16	43	2
23	9	14	44	2
56	9	47	45	2
11	9	2	46	2
48	9	39	47	2
85	9	76	48	2
18	17	1	49	2
25	17	8	50	2
23	17	6	51	2
56	17	39	52	2
11	17	-6	52	3
48	17	31	53	3
85	17	68	54	3
25	18	7	55	3
23	18	5	56	3
56	18	38	57	3
11	18	-7	57	4
48	18	30	58	4
85	18	67	59	4
23	25	-2	59	5
56	25	31	60	5
11	25	-14	60	6
48	25	23	61	6
85	25	60	62	6
56	23	33	63	6
11	23	-12	63	7
48	23	25	64	7
85	23	62	65	7
11	56	-45	65	8
48	56	-8	65	9
85	56	29	66	9
48	11	37	67	9
85	11	74	68	9
85	48	37	69	9

S Statistic = 69 - 9 = 60

Tied Group	Value	Members

Time Period	Observations
12/8/2009	1
1/13/2010	1
3/16/2010	1
5/18/2010	1
9/10/2010	1
12/21/2010	1
2/18/2011	1
5/10/2011	1

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7/25/2011	1
10/5/2011	1
11/4/2011	1
1/9/2012	1
4/3/2012	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 268.667
Z-Score = 3.59952
Comparison Level at 95% confidence level = -1.65463 (downward trend)
3.59952 >= -1.65463 indicating no evidence of a downward trend

US EPA ARCHIVE DOCUMENT

Mann-Kendall Trend Analysis

Parameter: Vinyl chloride
Location: MW-23
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
7.6	3.2	4.4	1	0
4	3.2	0.8	2	0
6.1	3.2	2.9	3	0
9	3.2	5.8	4	0
17	3.2	13.8	5	0
18	3.2	14.8	6	0
25	3.2	21.8	7	0
23	3.2	19.8	8	0
56	3.2	52.8	9	0
11	3.2	7.8	10	0
48	3.2	44.8	11	0
85	3.2	81.8	12	0
4	7.6	-3.6	12	1
6.1	7.6	-1.5	12	2
9	7.6	1.4	13	2
17	7.6	9.4	14	2
18	7.6	10.4	15	2
25	7.6	17.4	16	2
23	7.6	15.4	17	2
56	7.6	48.4	18	2
11	7.6	3.4	19	2
48	7.6	40.4	20	2
85	7.6	77.4	21	2
6.1	4	2.1	22	2
9	4	5	23	2
17	4	13	24	2
18	4	14	25	2
25	4	21	26	2
23	4	19	27	2
56	4	52	28	2
11	4	7	29	2
48	4	44	30	2
85	4	81	31	2
9	6.1	2.9	32	2
17	6.1	10.9	33	2
18	6.1	11.9	34	2
25	6.1	18.9	35	2
23	6.1	16.9	36	2
56	6.1	49.9	37	2
11	6.1	4.9	38	2
48	6.1	41.9	39	2
85	6.1	78.9	40	2
17	9	8	41	2

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18	9	9	42	2
25	9	16	43	2
23	9	14	44	2
56	9	47	45	2
11	9	2	46	2
48	9	39	47	2
85	9	76	48	2
18	17	1	49	2
25	17	8	50	2
23	17	6	51	2
56	17	39	52	2
11	17	-6	52	3
48	17	31	53	3
85	17	68	54	3
25	18	7	55	3
23	18	5	56	3
56	18	38	57	3
11	18	-7	57	4
48	18	30	58	4
85	18	67	59	4
23	25	-2	59	5
56	25	31	60	5
11	25	-14	60	6
48	25	23	61	6
85	25	60	62	6
56	23	33	63	6
11	23	-12	63	7
48	23	25	64	7
85	23	62	65	7
11	56	-45	65	8
48	56	-8	65	9
85	56	29	66	9
48	11	37	67	9
85	11	74	68	9
85	48	37	69	9

S Statistic = 69 - 9 = 60

Tied Group	Value	Members

Time Period	Observations
12/8/2009	1
1/13/2010	1
3/16/2010	1
5/18/2010	1
9/10/2010	1
12/21/2010	1
2/18/2011	1
5/10/2011	1

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7/25/2011	1
10/5/2011	1
11/4/2011	1
1/9/2012	1
4/3/2012	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 268.667
Z-Score = 3.59952
Comparison Level at 95% confidence level = 1.65463 (upward trend)
3.59952 > 1.65463 indicating an upward trend

US EPA ARCHIVE DOCUMENT

Mann-Kendall Trend Analysis

Parameter: 1,1,1-Trichloroethane

Location: MW-25S

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
17	4.8	12.2	1	0
18	4.8	13.2	2	0
19	4.8	14.2	3	0
26	4.8	21.2	4	0
19	4.8	14.2	5	0
21	4.8	16.2	6	0
19	4.8	14.2	7	0
20	4.8	15.2	8	0
20	4.8	15.2	9	0
20	4.8	15.2	10	0
18	17	1	11	0
19	17	2	12	0
26	17	9	13	0
19	17	2	14	0
21	17	4	15	0
19	17	2	16	0
20	17	3	17	0
20	17	3	18	0
20	17	3	19	0
19	18	1	20	0
26	18	8	21	0
19	18	1	22	0
21	18	3	23	0
19	18	1	24	0
20	18	2	25	0
20	18	2	26	0
20	18	2	27	0
26	19	7	28	0
19	19	0	28	0
21	19	2	29	0
19	19	0	29	0
20	19	1	30	0
20	19	1	31	0
20	19	1	32	0
19	26	-7	32	1
21	26	-5	32	2
19	26	-7	32	3
20	26	-6	32	4
20	26	-6	32	5
20	26	-6	32	6
21	19	2	33	6
19	19	0	33	6

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20	19	1	34	6
20	19	1	35	6
20	19	1	36	6
19	21	-2	36	7
20	21	-1	36	8
20	21	-1	36	9
20	21	-1	36	10
20	19	1	37	10
20	19	1	38	10
20	19	1	39	10
20	20	0	39	10
20	20	0	39	10
20	20	0	39	10

S Statistic = 39 - 10 = 29

Tied Group	Value	Members
1	19	3
2	20	3

Time Period	Observations
12/10/2009	1
3/16/2010	1
5/14/2010	1
9/8/2010	1
12/22/2010	1
2/24/2011	1
5/13/2011	1
7/28/2011	1
10/10/2011	1
1/5/2012	1
4/9/2012	1

There are 0 time periods with multiple data

A = 132
B = 0
C = 12
D = 0
E = 12
F = 0
a = 2970
b = 8910
c = 220
Group Variance = 157.667
Z-Score = 2.22991
Comparison Level at 95% confidence level = -1.65463 (downward trend)
2.22991 >= -1.65463 indicating no evidence of a downward trend

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Mann-Kendall Trend Analysis

Parameter: 1,1,1-Trichloroethane

Location: MW-25S

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
17	4.8	12.2	1	0
18	4.8	13.2	2	0
19	4.8	14.2	3	0
26	4.8	21.2	4	0
19	4.8	14.2	5	0
21	4.8	16.2	6	0
19	4.8	14.2	7	0
20	4.8	15.2	8	0
20	4.8	15.2	9	0
20	4.8	15.2	10	0
18	17	1	11	0
19	17	2	12	0
26	17	9	13	0
19	17	2	14	0
21	17	4	15	0
19	17	2	16	0
20	17	3	17	0
20	17	3	18	0
20	17	3	19	0
19	18	1	20	0
26	18	8	21	0
19	18	1	22	0
21	18	3	23	0
19	18	1	24	0
20	18	2	25	0
20	18	2	26	0
20	18	2	27	0
26	19	7	28	0
19	19	0	28	0
21	19	2	29	0
19	19	0	29	0
20	19	1	30	0
20	19	1	31	0
20	19	1	32	0
19	26	-7	32	1
21	26	-5	32	2
19	26	-7	32	3
20	26	-6	32	4
20	26	-6	32	5
20	26	-6	32	6
21	19	2	33	6
19	19	0	33	6

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20	19	1	34	6
20	19	1	35	6
20	19	1	36	6
19	21	-2	36	7
20	21	-1	36	8
20	21	-1	36	9
20	21	-1	36	10
20	19	1	37	10
20	19	1	38	10
20	19	1	39	10
20	20	0	39	10
20	20	0	39	10
20	20	0	39	10

S Statistic = 39 - 10 = 29

Tied Group	Value	Members
1	19	3
2	20	3

Time Period	Observations
12/10/2009	1
3/16/2010	1
5/14/2010	1
9/8/2010	1
12/22/2010	1
2/24/2011	1
5/13/2011	1
7/28/2011	1
10/10/2011	1
1/5/2012	1
4/9/2012	1

There are 0 time periods with multiple data

A = 132
B = 0
C = 12
D = 0
E = 12
F = 0
a = 2970
b = 8910
c = 220
Group Variance = 157.667
Z-Score = 2.22991
Comparison Level at 95% confidence level = 1.65463 (upward trend)
2.22991 > 1.65463 indicating an upward trend

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Mann-Kendall Trend Analysis

Parameter: 1,1-Dichloroethane
Location: MW-25S
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
1.2	1.7	-0.5	0	1
1.2	1.7	-0.5	0	2
1	1.7	-0.7	0	3
1.2	1.7	-0.5	0	4
ND<1	1.7	-0.7	0	5
ND<1	1.7	-0.7	0	6
ND<1	1.7	-0.7	0	7
ND<1	1.7	-0.7	0	8
ND<1	1.7	-0.7	0	9
ND<1	1.7	-0.7	0	10
1.2	1.2	0	0	10
1	1.2	-0.2	0	11
1.2	1.2	0	0	11
ND<1	1.2	-0.2	0	12
ND<1	1.2	-0.2	0	13
ND<1	1.2	-0.2	0	14
ND<1	1.2	-0.2	0	15
ND<1	1.2	-0.2	0	16
ND<1	1.2	-0.2	0	17
1	1.2	-0.2	0	18
1.2	1.2	0	0	18
ND<1	1.2	-0.2	0	19
ND<1	1.2	-0.2	0	20
ND<1	1.2	-0.2	0	21
ND<1	1.2	-0.2	0	22
ND<1	1.2	-0.2	0	23
ND<1	1.2	-0.2	0	24
1.2	1	0.2	1	24
ND<1	1	0	1	24
ND<1	1	0	1	24
ND<1	1	0	1	24
ND<1	1	0	1	24
ND<1	1	0	1	24
ND<1	1	0	1	24
ND<1	1.2	-0.2	1	25
ND<1	1.2	-0.2	1	26
ND<1	1.2	-0.2	1	27
ND<1	1.2	-0.2	1	28
ND<1	1.2	-0.2	1	29
ND<1	1.2	-0.2	1	30
ND<1	ND<1	0	1	30
ND<1	ND<1	0	1	30

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ND<1	ND<1	0	1	30
ND<1	ND<1	0	1	30
ND<1	ND<1	0	1	30
ND<1	ND<1	0	1	30
ND<1	ND<1	0	1	30
ND<1	ND<1	0	1	30
ND<1	ND<1	0	1	30
ND<1	ND<1	0	1	30
ND<1	ND<1	0	1	30
ND<1	ND<1	0	1	30
ND<1	ND<1	0	1	30
ND<1	ND<1	0	1	30
ND<1	ND<1	0	1	30
ND<1	ND<1	0	1	30

S Statistic = 1 - 30 = -29

Tied Group	Value	Members
1	1.2	3
2	1	7

Time Period	Observations
12/10/2009	1
3/16/2010	1
5/14/2010	1
9/8/2010	1
12/22/2010	1
2/24/2011	1
5/13/2011	1
7/28/2011	1
10/10/2011	1
1/5/2012	1
4/9/2012	1

There are 0 time periods with multiple data

A = 864
B = 0
C = 216
D = 0
E = 48
F = 0
a = 2970
b = 8910
c = 220
Group Variance = 117
Z-Score = -2.5886
Comparison Level at 95% confidence level = -1.65463 (downward trend)
-2.5886 < -1.65463 indicating a downward trend

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Mann-Kendall Trend Analysis

Parameter: 1,1-Dichloroethane
Location: MW-25S
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
1.2	1.7	-0.5	0	1
1.2	1.7	-0.5	0	2
1	1.7	-0.7	0	3
1.2	1.7	-0.5	0	4
ND<1	1.7	-0.7	0	5
ND<1	1.7	-0.7	0	6
ND<1	1.7	-0.7	0	7
ND<1	1.7	-0.7	0	8
ND<1	1.7	-0.7	0	9
ND<1	1.7	-0.7	0	10
1.2	1.2	0	0	10
1	1.2	-0.2	0	11
1.2	1.2	0	0	11
ND<1	1.2	-0.2	0	12
ND<1	1.2	-0.2	0	13
ND<1	1.2	-0.2	0	14
ND<1	1.2	-0.2	0	15
ND<1	1.2	-0.2	0	16
ND<1	1.2	-0.2	0	17
1	1.2	-0.2	0	18
1.2	1.2	0	0	18
ND<1	1.2	-0.2	0	19
ND<1	1.2	-0.2	0	20
ND<1	1.2	-0.2	0	21
ND<1	1.2	-0.2	0	22
ND<1	1.2	-0.2	0	23
ND<1	1.2	-0.2	0	24
1.2	1	0.2	1	24
ND<1	1	0	1	24
ND<1	1	0	1	24
ND<1	1	0	1	24
ND<1	1	0	1	24
ND<1	1	0	1	24
ND<1	1	0	1	24
ND<1	1.2	-0.2	1	25
ND<1	1.2	-0.2	1	26
ND<1	1.2	-0.2	1	27
ND<1	1.2	-0.2	1	28
ND<1	1.2	-0.2	1	29
ND<1	1.2	-0.2	1	30
ND<1	ND<1	0	1	30
ND<1	ND<1	0	1	30

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ND<1	ND<1	0	1	30
ND<1	ND<1	0	1	30
ND<1	ND<1	0	1	30
ND<1	ND<1	0	1	30
ND<1	ND<1	0	1	30
ND<1	ND<1	0	1	30
ND<1	ND<1	0	1	30
ND<1	ND<1	0	1	30
ND<1	ND<1	0	1	30
ND<1	ND<1	0	1	30
ND<1	ND<1	0	1	30
ND<1	ND<1	0	1	30
ND<1	ND<1	0	1	30

S Statistic = 1 - 30 = -29

Tied Group	Value	Members
1	1.2	3
2	1	7

Time Period	Observations
12/10/2009	1
3/16/2010	1
5/14/2010	1
9/8/2010	1
12/22/2010	1
2/24/2011	1
5/13/2011	1
7/28/2011	1
10/10/2011	1
1/5/2012	1
4/9/2012	1

There are 0 time periods with multiple data

A = 864
B = 0
C = 216
D = 0
E = 48
F = 0
a = 2970
b = 8910
c = 220
Group Variance = 117
Z-Score = -2.5886
Comparison Level at 95% confidence level = 1.65463 (upward trend)
-2.5886 <= 1.65463 indicating no evidence of an upward trend

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Mann-Kendall Trend Analysis

Parameter: Trichloroethene
Location: MW-25S
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
1.1	ND<1	0.1	1	0
1	ND<1	0	1	0
1.4	ND<1	0.4	2	0
2.4	ND<1	1.4	3	0
2.2	ND<1	1.2	4	0
2.2	ND<1	1.2	5	0
2.5	ND<1	1.5	6	0
2.8	ND<1	1.8	7	0
3	ND<1	2	8	0
3.6	ND<1	2.6	9	0
1	1.1	-0.1	9	1
1.4	1.1	0.3	10	1
2.4	1.1	1.3	11	1
2.2	1.1	1.1	12	1
2.2	1.1	1.1	13	1
2.5	1.1	1.4	14	1
2.8	1.1	1.7	15	1
3	1.1	1.9	16	1
3.6	1.1	2.5	17	1
1.4	1	0.4	18	1
2.4	1	1.4	19	1
2.2	1	1.2	20	1
2.2	1	1.2	21	1
2.5	1	1.5	22	1
2.8	1	1.8	23	1
3	1	2	24	1
3.6	1	2.6	25	1
2.4	1.4	1	26	1
2.2	1.4	0.8	27	1
2.2	1.4	0.8	28	1
2.5	1.4	1.1	29	1
2.8	1.4	1.4	30	1
3	1.4	1.6	31	1
3.6	1.4	2.2	32	1
2.2	2.4	-0.2	32	2
2.2	2.4	-0.2	32	3
2.5	2.4	0.1	33	3
2.8	2.4	0.4	34	3
3	2.4	0.6	35	3
3.6	2.4	1.2	36	3
2.2	2.2	0	36	3
2.5	2.2	0.3	37	3

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2.8	2.2	0.6	38	3
3	2.2	0.8	39	3
3.6	2.2	1.4	40	3
2.5	2.2	0.3	41	3
2.8	2.2	0.6	42	3
3	2.2	0.8	43	3
3.6	2.2	1.4	44	3
2.8	2.5	0.3	45	3
3	2.5	0.5	46	3
3.6	2.5	1.1	47	3
3	2.8	0.2	48	3
3.6	2.8	0.8	49	3
3.6	3	0.6	50	3

S Statistic = 50 - 3 = 47

Tied Group	Value	Members
1	1	2
2	2.2	2

Time Period	Observations
12/10/2009	1
3/16/2010	1
5/14/2010	1
9/8/2010	1
12/22/2010	1
2/24/2011	1
5/13/2011	1
7/28/2011	1
10/10/2011	1
1/5/2012	1
4/9/2012	1

There are 0 time periods with multiple data

A = 36
B = 0
C = 0
D = 0
E = 4
F = 0
a = 2970
b = 8910
c = 220
Group Variance = 163
Z-Score = 3.603
Comparison Level at 95% confidence level = -1.65463 (downward trend)
3.603 >= -1.65463 indicating no evidence of a downward trend

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Mann-Kendall Trend Analysis

Parameter: Trichloroethene
Location: MW-25S
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
1.1	ND<1	0.1	1	0
1	ND<1	0	1	0
1.4	ND<1	0.4	2	0
2.4	ND<1	1.4	3	0
2.2	ND<1	1.2	4	0
2.2	ND<1	1.2	5	0
2.5	ND<1	1.5	6	0
2.8	ND<1	1.8	7	0
3	ND<1	2	8	0
3.6	ND<1	2.6	9	0
1	1.1	-0.1	9	1
1.4	1.1	0.3	10	1
2.4	1.1	1.3	11	1
2.2	1.1	1.1	12	1
2.2	1.1	1.1	13	1
2.5	1.1	1.4	14	1
2.8	1.1	1.7	15	1
3	1.1	1.9	16	1
3.6	1.1	2.5	17	1
1.4	1	0.4	18	1
2.4	1	1.4	19	1
2.2	1	1.2	20	1
2.2	1	1.2	21	1
2.5	1	1.5	22	1
2.8	1	1.8	23	1
3	1	2	24	1
3.6	1	2.6	25	1
2.4	1.4	1	26	1
2.2	1.4	0.8	27	1
2.2	1.4	0.8	28	1
2.5	1.4	1.1	29	1
2.8	1.4	1.4	30	1
3	1.4	1.6	31	1
3.6	1.4	2.2	32	1
2.2	2.4	-0.2	32	2
2.2	2.4	-0.2	32	3
2.5	2.4	0.1	33	3
2.8	2.4	0.4	34	3
3	2.4	0.6	35	3
3.6	2.4	1.2	36	3
2.2	2.2	0	36	3
2.5	2.2	0.3	37	3

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2.8	2.2	0.6	38	3
3	2.2	0.8	39	3
3.6	2.2	1.4	40	3
2.5	2.2	0.3	41	3
2.8	2.2	0.6	42	3
3	2.2	0.8	43	3
3.6	2.2	1.4	44	3
2.8	2.5	0.3	45	3
3	2.5	0.5	46	3
3.6	2.5	1.1	47	3
3	2.8	0.2	48	3
3.6	2.8	0.8	49	3
3.6	3	0.6	50	3

S Statistic = 50 - 3 = 47

Tied Group	Value	Members
1	1	2
2	2.2	2

Time Period	Observations
12/10/2009	1
3/16/2010	1
5/14/2010	1
9/8/2010	1
12/22/2010	1
2/24/2011	1
5/13/2011	1
7/28/2011	1
10/10/2011	1
1/5/2012	1
4/9/2012	1

There are 0 time periods with multiple data

A = 36
B = 0
C = 0
D = 0
E = 4
F = 0
a = 2970
b = 8910
c = 220
Group Variance = 163
Z-Score = 3.603
Comparison Level at 95% confidence level = 1.65463 (upward trend)
3.603 > 1.65463 indicating an upward trend

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Mann-Kendall Trend Analysis

Parameter: cis-1,2-Dichloroethene

Location: MW-29s

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
1.2	1.3	-0.1	0	1
1.4	1.3	0.1	1	1
1.5	1.3	0.2	2	1
1.7	1.3	0.4	3	1
ND<1	1.3	-0.3	3	2
1.1	1.3	-0.2	3	3
1.3	1.3	0	3	3
1.2	1.3	-0.1	3	4
1.1	1.3	-0.2	3	5
1.4	1.2	0.2	4	5
1.5	1.2	0.3	5	5
1.7	1.2	0.5	6	5
ND<1	1.2	-0.2	6	6
1.1	1.2	-0.1	6	7
1.3	1.2	0.1	7	7
1.2	1.2	0	7	7
1.1	1.2	-0.1	7	8
1.5	1.4	0.1	8	8
1.7	1.4	0.3	9	8
ND<1	1.4	-0.4	9	9
1.1	1.4	-0.3	9	10
1.3	1.4	-0.1	9	11
1.2	1.4	-0.2	9	12
1.1	1.4	-0.3	9	13
1.7	1.5	0.2	10	13
ND<1	1.5	-0.5	10	14
1.1	1.5	-0.4	10	15
1.3	1.5	-0.2	10	16
1.2	1.5	-0.3	10	17
1.1	1.5	-0.4	10	18
ND<1	1.7	-0.7	10	19
1.1	1.7	-0.6	10	20
1.3	1.7	-0.4	10	21
1.2	1.7	-0.5	10	22
1.1	1.7	-0.6	10	23
1.1	ND<1	0.1	11	23
1.3	ND<1	0.3	12	23
1.2	ND<1	0.2	13	23
1.1	ND<1	0.1	14	23
1.3	1.1	0.2	15	23
1.2	1.1	0.1	16	23

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1.1	1.1	0	16	23
1.2	1.3	-0.1	16	24
1.1	1.3	-0.2	16	25
1.1	1.2	-0.1	16	26

S Statistic = 16 - 26 = -10
Comparing at 95% confidence level (downward trend)
Failed to calculate probability for S = -10
Table out of range

Manual Approximation
n = 10
10-1 = 9
Probability for S = 9 is 0.2420
0.2420 > 0.05 indicating no evidence of a downward trend

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Mann-Kendall Trend Analysis

Parameter: cis-1,2-Dichloroethene

Location: MW-29s

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
1.2	1.3	-0.1	0	1
1.4	1.3	0.1	1	1
1.5	1.3	0.2	2	1
1.7	1.3	0.4	3	1
ND<1	1.3	-0.3	3	2
1.1	1.3	-0.2	3	3
1.3	1.3	0	3	3
1.2	1.3	-0.1	3	4
1.1	1.3	-0.2	3	5
1.4	1.2	0.2	4	5
1.5	1.2	0.3	5	5
1.7	1.2	0.5	6	5
ND<1	1.2	-0.2	6	6
1.1	1.2	-0.1	6	7
1.3	1.2	0.1	7	7
1.2	1.2	0	7	7
1.1	1.2	-0.1	7	8
1.5	1.4	0.1	8	8
1.7	1.4	0.3	9	8
ND<1	1.4	-0.4	9	9
1.1	1.4	-0.3	9	10
1.3	1.4	-0.1	9	11
1.2	1.4	-0.2	9	12
1.1	1.4	-0.3	9	13
1.7	1.5	0.2	10	13
ND<1	1.5	-0.5	10	14
1.1	1.5	-0.4	10	15
1.3	1.5	-0.2	10	16
1.2	1.5	-0.3	10	17
1.1	1.5	-0.4	10	18
ND<1	1.7	-0.7	10	19
1.1	1.7	-0.6	10	20
1.3	1.7	-0.4	10	21
1.2	1.7	-0.5	10	22
1.1	1.7	-0.6	10	23
1.1	ND<1	0.1	11	23
1.3	ND<1	0.3	12	23
1.2	ND<1	0.2	13	23
1.1	ND<1	0.1	14	23
1.3	1.1	0.2	15	23
1.2	1.1	0.1	16	23

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1.1	1.1	0	16	23
1.2	1.3	-0.1	16	24
1.1	1.3	-0.2	16	25
1.1	1.2	-0.1	16	26

S Statistic = 16 - 26 = -10
Comparing at 95% confidence level (upward trend)
Failed to calculate probability for S = -10
Table out of range

Manual Approximation
S < 0 indicating no evidence of an upward trend

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Mann-Kendall Trend Analysis

Parameter: 1,1,1-Trichloroethane

Location: MW-31

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
48	20	28	1	0
27	20	7	2	0
26	20	6	3	0
22	20	2	4	0
11	20	-9	4	1
28	20	8	5	1
24	20	4	6	1
24	20	4	7	1
27	48	-21	7	2
26	48	-22	7	3
22	48	-26	7	4
11	48	-37	7	5
28	48	-20	7	6
24	48	-24	7	7
24	48	-24	7	8
26	27	-1	7	9
22	27	-5	7	10
11	27	-16	7	11
28	27	1	8	11
24	27	-3	8	12
24	27	-3	8	13
22	26	-4	8	14
11	26	-15	8	15
28	26	2	9	15
24	26	-2	9	16
24	26	-2	9	17
11	22	-11	9	18
28	22	6	10	18
24	22	2	11	18
24	22	2	12	18
28	11	17	13	18
24	11	13	14	18
24	11	13	15	18
24	28	-4	15	19
24	28	-4	15	20
24	24	0	15	20

S Statistic = 15 - 20 = -5

Comparing at 95% confidence level (downward trend)

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Failed to calculate probability for S = -5
Table out of range

Manual Approximation
n = 9
5-1 = 4
Probability for S = 4 is 0.3810
0.3810 > 0.05 indicating no evidence of a downward trend

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Mann-Kendall Trend Analysis

Parameter: 1,1,1-Trichloroethane
Location: MW-31
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
48	20	28	1	0
27	20	7	2	0
26	20	6	3	0
22	20	2	4	0
11	20	-9	4	1
28	20	8	5	1
24	20	4	6	1
24	20	4	7	1
27	48	-21	7	2
26	48	-22	7	3
22	48	-26	7	4
11	48	-37	7	5
28	48	-20	7	6
24	48	-24	7	7
24	48	-24	7	8
26	27	-1	7	9
22	27	-5	7	10
11	27	-16	7	11
28	27	1	8	11
24	27	-3	8	12
24	27	-3	8	13
22	26	-4	8	14
11	26	-15	8	15
28	26	2	9	15
24	26	-2	9	16
24	26	-2	9	17
11	22	-11	9	18
28	22	6	10	18
24	22	2	11	18
24	22	2	12	18
28	11	17	13	18
24	11	13	14	18
24	11	13	15	18
24	28	-4	15	19
24	28	-4	15	20
24	24	0	15	20

S Statistic = 15 - 20 = -5
Comparing at 95% confidence level (upward trend)

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Failed to calculate probability for S = -5
Table out of range

Manual Approximation

S < 0 indicating no evidence of an upward trend

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Mann-Kendall Trend Analysis

Parameter: 1,1-Dichloroethane
Location: MW-31
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
ND<2	14	-12	0	1
16	14	2	1	1
16	14	2	2	1
15	14	1	3	1
7.4	14	-6.6	3	2
18	14	4	4	2
17	14	3	5	2
16	14	2	6	2
16	ND<2	14	7	2
16	ND<2	14	8	2
15	ND<2	13	9	2
7.4	ND<2	5.4	10	2
18	ND<2	16	11	2
17	ND<2	15	12	2
16	ND<2	14	13	2
16	16	0	13	2
15	16	-1	13	3
7.4	16	-8.6	13	4
18	16	2	14	4
17	16	1	15	4
16	16	0	15	4
15	16	-1	15	5
7.4	16	-8.6	15	6
18	16	2	16	6
17	16	1	17	6
16	16	0	17	6
7.4	15	-7.6	17	7
18	15	3	18	7
17	15	2	19	7
16	15	1	20	7
18	7.4	10.6	21	7
17	7.4	9.6	22	7
16	7.4	8.6	23	7
17	18	-1	23	8
16	18	-2	23	9
16	17	-1	23	10

S Statistic = 23 - 10 = 13
Comparing at 95% confidence level (downward trend)

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Failed to calculate probability for S = 13
Table out of range

Manual Approximation

S > 0 indicating no evidence of a downward trend

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Mann-Kendall Trend Analysis

Parameter: 1,1-Dichloroethane
Location: MW-31
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
ND<2	14	-12	0	1
16	14	2	1	1
16	14	2	2	1
15	14	1	3	1
7.4	14	-6.6	3	2
18	14	4	4	2
17	14	3	5	2
16	14	2	6	2
16	ND<2	14	7	2
16	ND<2	14	8	2
15	ND<2	13	9	2
7.4	ND<2	5.4	10	2
18	ND<2	16	11	2
17	ND<2	15	12	2
16	ND<2	14	13	2
16	16	0	13	2
15	16	-1	13	3
7.4	16	-8.6	13	4
18	16	2	14	4
17	16	1	15	4
16	16	0	15	4
15	16	-1	15	5
7.4	16	-8.6	15	6
18	16	2	16	6
17	16	1	17	6
16	16	0	17	6
7.4	15	-7.6	17	7
18	15	3	18	7
17	15	2	19	7
16	15	1	20	7
18	7.4	10.6	21	7
17	7.4	9.6	22	7
16	7.4	8.6	23	7
17	18	-1	23	8
16	18	-2	23	9
16	17	-1	23	10

S Statistic = 23 - 10 = 13
Comparing at 95% confidence level (upward trend)

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Failed to calculate probability for S = 13
Table out of range

Manual Approximation
n = 9
13-1 = 12
Probability for S = 12 is 0.1300
0.1300 > 0.05 indicating no evidence of an upward trend

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Mann-Kendall Trend Analysis

Parameter: cis-1,2-Dichloroethene

Location: MW-31

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
15	19	-4	0	1
29	19	10	1	1
31	19	12	2	1
24	19	5	3	1
14	19	-5	3	2
40	19	21	4	2
35	19	16	5	2
36	19	17	6	2
29	15	14	7	2
31	15	16	8	2
24	15	9	9	2
14	15	-1	9	3
40	15	25	10	3
35	15	20	11	3
36	15	21	12	3
31	29	2	13	3
24	29	-5	13	4
14	29	-15	13	5
40	29	11	14	5
35	29	6	15	5
36	29	7	16	5
24	31	-7	16	6
14	31	-17	16	7
40	31	9	17	7
35	31	4	18	7
36	31	5	19	7
14	24	-10	19	8
40	24	16	20	8
35	24	11	21	8
36	24	12	22	8
40	14	26	23	8
35	14	21	24	8
36	14	22	25	8
35	40	-5	25	9
36	40	-4	25	10
36	35	1	26	10

S Statistic = 26 - 10 = 16

Comparing at 95% confidence level (downward trend)

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Probability of obtaining S >= 16 is 0.06
S > 0 or 0.06 > 0.05 indicating no evidence of a downward trend

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Mann-Kendall Trend Analysis

Parameter: cis-1,2-Dichloroethene
Location: MW-31
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
15	19	-4	0	1
29	19	10	1	1
31	19	12	2	1
24	19	5	3	1
14	19	-5	3	2
40	19	21	4	2
35	19	16	5	2
36	19	17	6	2
29	15	14	7	2
31	15	16	8	2
24	15	9	9	2
14	15	-1	9	3
40	15	25	10	3
35	15	20	11	3
36	15	21	12	3
31	29	2	13	3
24	29	-5	13	4
14	29	-15	13	5
40	29	11	14	5
35	29	6	15	5
36	29	7	16	5
24	31	-7	16	6
14	31	-17	16	7
40	31	9	17	7
35	31	4	18	7
36	31	5	19	7
14	24	-10	19	8
40	24	16	20	8
35	24	11	21	8
36	24	12	22	8
40	14	26	23	8
35	14	21	24	8
36	14	22	25	8
35	40	-5	25	9
36	40	-4	25	10
36	35	1	26	10

S Statistic = 26 - 10 = 16
Comparing at 95% confidence level (upward trend)

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Probability of obtaining S >= 16 is 0.06
S < 0 or 0.06 >= 0.05 indicating no evidence of an upward trend

US EPA ARCHIVE DOCUMENT

Mann-Kendall Trend Analysis

Parameter: trans-1,2-Dichloroethene
Location: MW-31
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
ND<2	2.2	-0.2	0	1
2.9	2.2	0.7	1	1
3.1	2.2	0.9	2	1
3	2.2	0.8	3	1
1.2	2.2	-1	3	2
3.4	2.2	1.2	4	2
3.1	2.2	0.9	5	2
3.1	2.2	0.9	6	2
2.9	ND<2	0.9	7	2
3.1	ND<2	1.1	8	2
3	ND<2	1	9	2
1.2	ND<2	-0.8	9	3
3.4	ND<2	1.4	10	3
3.1	ND<2	1.1	11	3
3.1	ND<2	1.1	12	3
3.1	2.9	0.2	13	3
3	2.9	0.1	14	3
1.2	2.9	-1.7	14	4
3.4	2.9	0.5	15	4
3.1	2.9	0.2	16	4
3.1	2.9	0.2	17	4
3	3.1	-0.1	17	5
1.2	3.1	-1.9	17	6
3.4	3.1	0.3	18	6
3.1	3.1	0	18	6
3.1	3.1	0	18	6
1.2	3	-1.8	18	7
3.4	3	0.4	19	7
3.1	3	0.1	20	7
3.1	3	0.1	21	7
3.4	1.2	2.2	22	7
3.1	1.2	1.9	23	7
3.1	1.2	1.9	24	7
3.1	3.4	-0.3	24	8
3.1	3.4	-0.3	24	9
3.1	3.1	0	24	9

S Statistic = 24 - 9 = 15
Comparing at 95% confidence level (downward trend)

US EPA ARCHIVE DOCUMENT

Failed to calculate probability for S = 15
Table out of range

Manual Approximation

S > 0 indicating no evidence of a downward trend

US EPA ARCHIVE DOCUMENT

Mann-Kendall Trend Analysis

Parameter: trans-1,2-Dichloroethene
Location: MW-31
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
ND<2	2.2	-0.2	0	1
2.9	2.2	0.7	1	1
3.1	2.2	0.9	2	1
3	2.2	0.8	3	1
1.2	2.2	-1	3	2
3.4	2.2	1.2	4	2
3.1	2.2	0.9	5	2
3.1	2.2	0.9	6	2
2.9	ND<2	0.9	7	2
3.1	ND<2	1.1	8	2
3	ND<2	1	9	2
1.2	ND<2	-0.8	9	3
3.4	ND<2	1.4	10	3
3.1	ND<2	1.1	11	3
3.1	ND<2	1.1	12	3
3.1	2.9	0.2	13	3
3	2.9	0.1	14	3
1.2	2.9	-1.7	14	4
3.4	2.9	0.5	15	4
3.1	2.9	0.2	16	4
3.1	2.9	0.2	17	4
3	3.1	-0.1	17	5
1.2	3.1	-1.9	17	6
3.4	3.1	0.3	18	6
3.1	3.1	0	18	6
3.1	3.1	0	18	6
1.2	3	-1.8	18	7
3.4	3	0.4	19	7
3.1	3	0.1	20	7
3.1	3	0.1	21	7
3.4	1.2	2.2	22	7
3.1	1.2	1.9	23	7
3.1	1.2	1.9	24	7
3.1	3.4	-0.3	24	8
3.1	3.4	-0.3	24	9
3.1	3.1	0	24	9

S Statistic = 24 - 9 = 15
Comparing at 95% confidence level (upward trend)

US EPA ARCHIVE DOCUMENT

Failed to calculate probability for S = 15
Table out of range

Manual Approximation
n = 9
15-1 = 14
Probability for S = 14 is 0.0900
0.0900 > 0.05 indicating no evidence of an upward trend

US EPA ARCHIVE DOCUMENT

Mann-Kendall Trend Analysis

Parameter: Trichloroethene

Location: MW-31

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
220	180	40	1	0
260	180	80	2	0
300	180	120	3	0
250	180	70	4	0
130	180	-50	4	1
340	180	160	5	1
290	180	110	6	1
290	180	110	7	1
260	220	40	8	1
300	220	80	9	1
250	220	30	10	1
130	220	-90	10	2
340	220	120	11	2
290	220	70	12	2
290	220	70	13	2
300	260	40	14	2
250	260	-10	14	3
130	260	-130	14	4
340	260	80	15	4
290	260	30	16	4
290	260	30	17	4
250	300	-50	17	5
130	300	-170	17	6
340	300	40	18	6
290	300	-10	18	7
290	300	-10	18	8
130	250	-120	18	9
340	250	90	19	9
290	250	40	20	9
290	250	40	21	9
340	130	210	22	9
290	130	160	23	9
290	130	160	24	9
290	340	-50	24	10
290	340	-50	24	11
290	290	0	24	11

S Statistic = 24 - 11 = 13

Comparing at 95% confidence level (downward trend)

US EPA ARCHIVE DOCUMENT

Failed to calculate probability for S = 13
Table out of range

Manual Approximation

S > 0 indicating no evidence of a downward trend

US EPA ARCHIVE DOCUMENT

Mann-Kendall Trend Analysis

Parameter: Trichloroethene
Location: MW-31
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
220	180	40	1	0
260	180	80	2	0
300	180	120	3	0
250	180	70	4	0
130	180	-50	4	1
340	180	160	5	1
290	180	110	6	1
290	180	110	7	1
260	220	40	8	1
300	220	80	9	1
250	220	30	10	1
130	220	-90	10	2
340	220	120	11	2
290	220	70	12	2
290	220	70	13	2
300	260	40	14	2
250	260	-10	14	3
130	260	-130	14	4
340	260	80	15	4
290	260	30	16	4
290	260	30	17	4
250	300	-50	17	5
130	300	-170	17	6
340	300	40	18	6
290	300	-10	18	7
290	300	-10	18	8
130	250	-120	18	9
340	250	90	19	9
290	250	40	20	9
290	250	40	21	9
340	130	210	22	9
290	130	160	23	9
290	130	160	24	9
290	340	-50	24	10
290	340	-50	24	11
290	290	0	24	11

S Statistic = 24 - 11 = 13
Comparing at 95% confidence level (upward trend)

US EPA ARCHIVE DOCUMENT

Failed to calculate probability for S = 13
Table out of range

Manual Approximation
n = 9
13-1 = 12
Probability for S = 12 is 0.1300
0.1300 > 0.05 indicating no evidence of an upward trend

US EPA ARCHIVE DOCUMENT

Mann-Kendall Trend Analysis

Parameter: 1,1,1-Trichloroethane

Location: MW-32s

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
560	220	340	1	0
510	220	290	2	0
420	220	200	3	0
380	220	160	4	0
380	220	160	5	0
350	220	130	6	0
400	220	180	7	0
340	220	120	8	0
510	560	-50	8	1
420	560	-140	8	2
380	560	-180	8	3
380	560	-180	8	4
350	560	-210	8	5
400	560	-160	8	6
340	560	-220	8	7
420	510	-90	8	8
380	510	-130	8	9
380	510	-130	8	10
350	510	-160	8	11
400	510	-110	8	12
340	510	-170	8	13
380	420	-40	8	14
380	420	-40	8	15
350	420	-70	8	16
400	420	-20	8	17
340	420	-80	8	18
380	380	0	8	18
350	380	-30	8	19
400	380	20	9	19
340	380	-40	9	20
350	380	-30	9	21
400	380	20	10	21
340	380	-40	10	22
400	350	50	11	22
340	350	-10	11	23
340	400	-60	11	24

S Statistic = 11 - 24 = -13

Comparing at 95% confidence level (downward trend)

US EPA ARCHIVE DOCUMENT

Failed to calculate probability for S = -13
Table out of range

Manual Approximation
n = 9
13-1 = 12
Probability for S = 12 is 0.1300
0.1300 > 0.05 indicating no evidence of a downward trend

US EPA ARCHIVE DOCUMENT

Mann-Kendall Trend Analysis

Parameter: 1,1,1-Trichloroethane
Location: MW-32s
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
560	220	340	1	0
510	220	290	2	0
420	220	200	3	0
380	220	160	4	0
380	220	160	5	0
350	220	130	6	0
400	220	180	7	0
340	220	120	8	0
510	560	-50	8	1
420	560	-140	8	2
380	560	-180	8	3
380	560	-180	8	4
350	560	-210	8	5
400	560	-160	8	6
340	560	-220	8	7
420	510	-90	8	8
380	510	-130	8	9
380	510	-130	8	10
350	510	-160	8	11
400	510	-110	8	12
340	510	-170	8	13
380	420	-40	8	14
380	420	-40	8	15
350	420	-70	8	16
400	420	-20	8	17
340	420	-80	8	18
380	380	0	8	18
350	380	-30	8	19
400	380	20	9	19
340	380	-40	9	20
350	380	-30	9	21
400	380	20	10	21
340	380	-40	10	22
400	350	50	11	22
340	350	-10	11	23
340	400	-60	11	24

S Statistic = 11 - 24 = -13
Comparing at 95% confidence level (upward trend)

US EPA ARCHIVE DOCUMENT

Failed to calculate probability for S = -13
Table out of range

Manual Approximation

S < 0 indicating no evidence of an upward trend

US EPA ARCHIVE DOCUMENT

Mann-Kendall Trend Analysis

Parameter: cis-1,2-Dichloroethene

Location: MW-32s

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
190	270	-80	0	1
200	270	-70	0	2
190	270	-80	0	3
170	270	-100	0	4
140	270	-130	0	5
160	270	-110	0	6
170	270	-100	0	7
130	270	-140	0	8
200	190	10	1	8
190	190	0	1	8
170	190	-20	1	9
140	190	-50	1	10
160	190	-30	1	11
170	190	-20	1	12
130	190	-60	1	13
190	200	-10	1	14
170	200	-30	1	15
140	200	-60	1	16
160	200	-40	1	17
170	200	-30	1	18
130	200	-70	1	19
170	190	-20	1	20
140	190	-50	1	21
160	190	-30	1	22
170	190	-20	1	23
130	190	-60	1	24
140	170	-30	1	25
160	170	-10	1	26
170	170	0	1	26
130	170	-40	1	27
160	140	20	2	27
170	140	30	3	27
130	140	-10	3	28
170	160	10	4	28
130	160	-30	4	29
130	170	-40	4	30

S Statistic = 4 - 30 = -26

Comparing at 95% confidence level (downward trend)

US EPA ARCHIVE DOCUMENT

Probability of obtaining S >= 26 is 0.0029
S < 0 and 0.0029 < 0.05 indicating a downward trend

US EPA ARCHIVE DOCUMENT

Mann-Kendall Trend Analysis

Parameter: cis-1,2-Dichloroethene

Location: MW-32s

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
190	270	-80	0	1
200	270	-70	0	2
190	270	-80	0	3
170	270	-100	0	4
140	270	-130	0	5
160	270	-110	0	6
170	270	-100	0	7
130	270	-140	0	8
200	190	10	1	8
190	190	0	1	8
170	190	-20	1	9
140	190	-50	1	10
160	190	-30	1	11
170	190	-20	1	12
130	190	-60	1	13
190	200	-10	1	14
170	200	-30	1	15
140	200	-60	1	16
160	200	-40	1	17
170	200	-30	1	18
130	200	-70	1	19
170	190	-20	1	20
140	190	-50	1	21
160	190	-30	1	22
170	190	-20	1	23
130	190	-60	1	24
140	170	-30	1	25
160	170	-10	1	26
170	170	0	1	26
130	170	-40	1	27
160	140	20	2	27
170	140	30	3	27
130	140	-10	3	28
170	160	10	4	28
130	160	-30	4	29
130	170	-40	4	30

S Statistic = 4 - 30 = -26

Comparing at 95% confidence level (upward trend)

US EPA ARCHIVE DOCUMENT

Probability of obtaining S >= -26 is 0.0029
S < 0 or 0.0029 >= 0.05 indicating no evidence of an upward trend

US EPA ARCHIVE DOCUMENT

Mann-Kendall Trend Analysis

Parameter: Trichloroethene
Location: MW-32s
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
2800	2400	400	1	0
2300	2400	-100	1	1
2300	2400	-100	1	2
2300	2400	-100	1	3
2400	2400	0	1	3
2200	2400	-200	1	4
2300	2400	-100	1	5
2200	2400	-200	1	6
2300	2800	-500	1	7
2300	2800	-500	1	8
2300	2800	-500	1	9
2400	2800	-400	1	10
2200	2800	-600	1	11
2300	2800	-500	1	12
2200	2800	-600	1	13
2300	2300	0	1	13
2300	2300	0	1	13
2400	2300	100	2	13
2200	2300	-100	2	14
2300	2300	0	2	14
2200	2300	-100	2	15
2300	2300	0	2	15
2400	2300	100	3	15
2200	2300	-100	3	16
2300	2300	0	3	16
2200	2300	-100	3	17
2400	2300	100	4	17
2200	2300	-100	4	18
2300	2300	0	4	18
2200	2300	-100	4	19
2200	2400	-200	4	20
2300	2400	-100	4	21
2200	2400	-200	4	22
2300	2200	100	5	22
2200	2200	0	5	22
2200	2300	-100	5	23

S Statistic = 5 - 23 = -18
Comparing at 95% confidence level (downward trend)

US EPA ARCHIVE DOCUMENT

Probability of obtaining S >= 18 is 0.038
S < 0 and 0.038 < 0.05 indicating a downward trend

US EPA ARCHIVE DOCUMENT

Mann-Kendall Trend Analysis

Parameter: Trichloroethene
Location: MW-32s
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
2800	2400	400	1	0
2300	2400	-100	1	1
2300	2400	-100	1	2
2300	2400	-100	1	3
2400	2400	0	1	3
2200	2400	-200	1	4
2300	2400	-100	1	5
2200	2400	-200	1	6
2300	2800	-500	1	7
2300	2800	-500	1	8
2300	2800	-500	1	9
2400	2800	-400	1	10
2200	2800	-600	1	11
2300	2800	-500	1	12
2200	2800	-600	1	13
2300	2300	0	1	13
2300	2300	0	1	13
2400	2300	100	2	13
2200	2300	-100	2	14
2300	2300	0	2	14
2200	2300	-100	2	15
2300	2300	0	2	15
2400	2300	100	3	15
2200	2300	-100	3	16
2300	2300	0	3	16
2200	2300	-100	3	17
2400	2300	100	4	17
2200	2300	-100	4	18
2300	2300	0	4	18
2200	2300	-100	4	19
2200	2400	-200	4	20
2300	2400	-100	4	21
2200	2400	-200	4	22
2300	2200	100	5	22
2200	2200	0	5	22
2200	2300	-100	5	23

S Statistic = 5 - 23 = -18
Comparing at 95% confidence level (upward trend)

US EPA ARCHIVE DOCUMENT

Probability of obtaining S >= -18 is 0.038
S < 0 or 0.038 >= 0.05 indicating no evidence of an upward trend

US EPA ARCHIVE DOCUMENT

Mann-Kendall Trend Analysis

Parameter: 1,1,1-Trichloroethane

Location: MW-33s

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
1.1	ND<1	0.1	1	0
1	ND<1	0	1	0
ND<1	ND<1	0	1	0
ND<2	ND<1	1	2	0
ND<2	ND<1	1	3	0
ND<2	ND<1	1	4	0
1.3	ND<1	0.3	5	0
1.2	ND<1	0.2	6	0
1	1.1	-0.1	6	1
ND<1	1.1	-0.1	6	2
ND<2	1.1	0.9	7	2
ND<2	1.1	0.9	8	2
ND<2	1.1	0.9	9	2
1.3	1.1	0.2	10	2
1.2	1.1	0.1	11	2
ND<1	1	0	11	2
ND<2	1	1	12	2
ND<2	1	1	13	2
ND<2	1	1	14	2
1.3	1	0.3	15	2
1.2	1	0.2	16	2
ND<2	ND<1	1	17	2
ND<2	ND<1	1	18	2
ND<2	ND<1	1	19	2
1.3	ND<1	0.3	20	2
1.2	ND<1	0.2	21	2
ND<2	ND<2	0	21	2
ND<2	ND<2	0	21	2
1.3	ND<2	-0.7	21	3
1.2	ND<2	-0.8	21	4
ND<2	ND<2	0	21	4
1.3	ND<2	-0.7	21	5
1.2	ND<2	-0.8	21	6
1.3	ND<2	-0.7	21	7
1.2	ND<2	-0.8	21	8
1.2	1.3	-0.1	21	9

S Statistic = 21 - 9 = 12

Comparing at 95% confidence level (downward trend)

US EPA ARCHIVE DOCUMENT

Probability of obtaining S >= 12 is 0.13
S > 0 or 0.13 > 0.05 indicating no evidence of a downward trend

US EPA ARCHIVE DOCUMENT

Mann-Kendall Trend Analysis

Parameter: 1,1,1-Trichloroethane

Location: MW-33s

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
1.1	ND<1	0.1	1	0
1	ND<1	0	1	0
ND<1	ND<1	0	1	0
ND<2	ND<1	1	2	0
ND<2	ND<1	1	3	0
ND<2	ND<1	1	4	0
1.3	ND<1	0.3	5	0
1.2	ND<1	0.2	6	0
1	1.1	-0.1	6	1
ND<1	1.1	-0.1	6	2
ND<2	1.1	0.9	7	2
ND<2	1.1	0.9	8	2
ND<2	1.1	0.9	9	2
1.3	1.1	0.2	10	2
1.2	1.1	0.1	11	2
ND<1	1	0	11	2
ND<2	1	1	12	2
ND<2	1	1	13	2
ND<2	1	1	14	2
1.3	1	0.3	15	2
1.2	1	0.2	16	2
ND<2	ND<1	1	17	2
ND<2	ND<1	1	18	2
ND<2	ND<1	1	19	2
1.3	ND<1	0.3	20	2
1.2	ND<1	0.2	21	2
ND<2	ND<2	0	21	2
ND<2	ND<2	0	21	2
1.3	ND<2	-0.7	21	3
1.2	ND<2	-0.8	21	4
ND<2	ND<2	0	21	4
1.3	ND<2	-0.7	21	5
1.2	ND<2	-0.8	21	6
1.3	ND<2	-0.7	21	7
1.2	ND<2	-0.8	21	8
1.2	1.3	-0.1	21	9

S Statistic = 21 - 9 = 12

Comparing at 95% confidence level (upward trend)

US EPA ARCHIVE DOCUMENT

Probability of obtaining S >= 12 is 0.13
S < 0 or 0.13 >= 0.05 indicating no evidence of an upward trend

US EPA ARCHIVE DOCUMENT

Mann-Kendall Trend Analysis

Parameter: 1,1-Dichloroethane
Location: MW-33s
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
14	12	2	1	0
14	12	2	2	0
12	12	0	2	0
11	12	-1	2	1
8.9	12	-3.1	2	2
11	12	-1	2	3
15	12	3	3	3
17	12	5	4	3
14	14	0	4	3
12	14	-2	4	4
11	14	-3	4	5
8.9	14	-5.1	4	6
11	14	-3	4	7
15	14	1	5	7
17	14	3	6	7
12	14	-2	6	8
11	14	-3	6	9
8.9	14	-5.1	6	10
11	14	-3	6	11
15	14	1	7	11
17	14	3	8	11
11	12	-1	8	12
8.9	12	-3.1	8	13
11	12	-1	8	14
15	12	3	9	14
17	12	5	10	14
8.9	11	-2.1	10	15
11	11	0	10	15
15	11	4	11	15
17	11	6	12	15
11	8.9	2.1	13	15
15	8.9	6.1	14	15
17	8.9	8.1	15	15
15	11	4	16	15
17	11	6	17	15
17	15	2	18	15

S Statistic = 18 - 15 = 3
Comparing at 95% confidence level (downward trend)

US EPA ARCHIVE DOCUMENT

Failed to calculate probability for S = 3
Table out of range

Manual Approximation

S > 0 indicating no evidence of a downward trend

US EPA ARCHIVE DOCUMENT

Mann-Kendall Trend Analysis

Parameter: 1,1-Dichloroethane
Location: MW-33s
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
14	12	2	1	0
14	12	2	2	0
12	12	0	2	0
11	12	-1	2	1
8.9	12	-3.1	2	2
11	12	-1	2	3
15	12	3	3	3
17	12	5	4	3
14	14	0	4	3
12	14	-2	4	4
11	14	-3	4	5
8.9	14	-5.1	4	6
11	14	-3	4	7
15	14	1	5	7
17	14	3	6	7
12	14	-2	6	8
11	14	-3	6	9
8.9	14	-5.1	6	10
11	14	-3	6	11
15	14	1	7	11
17	14	3	8	11
11	12	-1	8	12
8.9	12	-3.1	8	13
11	12	-1	8	14
15	12	3	9	14
17	12	5	10	14
8.9	11	-2.1	10	15
11	11	0	10	15
15	11	4	11	15
17	11	6	12	15
11	8.9	2.1	13	15
15	8.9	6.1	14	15
17	8.9	8.1	15	15
15	11	4	16	15
17	11	6	17	15
17	15	2	18	15

S Statistic = 18 - 15 = 3
Comparing at 95% confidence level (upward trend)

US EPA ARCHIVE DOCUMENT

Failed to calculate probability for S = 3
Table out of range

Manual Approximation
n = 9
3-1 = 2
Probability for S = 2 is 0.4600
0.4600 > 0.05 indicating no evidence of an upward trend

US EPA ARCHIVE DOCUMENT

Mann-Kendall Trend Analysis

Parameter: cis-1,2-Dichloroethene
Location: MW-33s
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
22	13	9	1	0
22	13	9	2	0
20	13	7	3	0
21	13	8	4	0
18	13	5	5	0
19	13	6	6	0
20	13	7	7	0
21	13	8	8	0
22	22	0	8	0
20	22	-2	8	1
21	22	-1	8	2
18	22	-4	8	3
19	22	-3	8	4
20	22	-2	8	5
21	22	-1	8	6
20	22	-2	8	7
21	22	-1	8	8
18	22	-4	8	9
19	22	-3	8	10
20	22	-2	8	11
21	22	-1	8	12
21	20	1	9	12
18	20	-2	9	13
19	20	-1	9	14
20	20	0	9	14
21	20	1	10	14
18	21	-3	10	15
19	21	-2	10	16
20	21	-1	10	17
21	21	0	10	17
19	18	1	11	17
20	18	2	12	17
21	18	3	13	17
20	19	1	14	17
21	19	2	15	17
21	20	1	16	17

S Statistic = 16 - 17 = -1
Comparing at 95% confidence level (downward trend)

US EPA ARCHIVE DOCUMENT

Failed to calculate probability for S = -1
Table out of range

Manual Approximation
n = 9
1-1 = 0
Probability for S = 0 is 0.5400
0.5400 > 0.05 indicating no evidence of a downward trend

US EPA ARCHIVE DOCUMENT

Mann-Kendall Trend Analysis

Parameter: cis-1,2-Dichloroethene
Location: MW-33s
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
22	13	9	1	0
22	13	9	2	0
20	13	7	3	0
21	13	8	4	0
18	13	5	5	0
19	13	6	6	0
20	13	7	7	0
21	13	8	8	0
22	22	0	8	0
20	22	-2	8	1
21	22	-1	8	2
18	22	-4	8	3
19	22	-3	8	4
20	22	-2	8	5
21	22	-1	8	6
20	22	-2	8	7
21	22	-1	8	8
18	22	-4	8	9
19	22	-3	8	10
20	22	-2	8	11
21	22	-1	8	12
21	20	1	9	12
18	20	-2	9	13
19	20	-1	9	14
20	20	0	9	14
21	20	1	10	14
18	21	-3	10	15
19	21	-2	10	16
20	21	-1	10	17
21	21	0	10	17
19	18	1	11	17
20	18	2	12	17
21	18	3	13	17
20	19	1	14	17
21	19	2	15	17
21	20	1	16	17

S Statistic = 16 - 17 = -1
Comparing at 95% confidence level (upward trend)

US EPA ARCHIVE DOCUMENT

Failed to calculate probability for S = -1
Table out of range

Manual Approximation

S < 0 indicating no evidence of an upward trend

US EPA ARCHIVE DOCUMENT

Mann-Kendall Trend Analysis

Parameter: Trichloroethene
Location: MW-33s
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
150	76	74	1	0
130	76	54	2	0
110	76	34	3	0
220	76	144	4	0
260	76	184	5	0
220	76	144	6	0
170	76	94	7	0
170	76	94	8	0
130	150	-20	8	1
110	150	-40	8	2
220	150	70	9	2
260	150	110	10	2
220	150	70	11	2
170	150	20	12	2
170	150	20	13	2
110	130	-20	13	3
220	130	90	14	3
260	130	130	15	3
220	130	90	16	3
170	130	40	17	3
170	130	40	18	3
220	110	110	19	3
260	110	150	20	3
220	110	110	21	3
170	110	60	22	3
170	110	60	23	3
260	220	40	24	3
220	220	0	24	3
170	220	-50	24	4
170	220	-50	24	5
220	260	-40	24	6
170	260	-90	24	7
170	260	-90	24	8
170	220	-50	24	9
170	220	-50	24	10
170	170	0	24	10

S Statistic = 24 - 10 = 14
Comparing at 95% confidence level (downward trend)

US EPA ARCHIVE DOCUMENT

Probability of obtaining S >= 14 is 0.09
S > 0 or 0.09 > 0.05 indicating no evidence of a downward trend

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Mann-Kendall Trend Analysis

Parameter: Trichloroethene
Location: MW-33s
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
150	76	74	1	0
130	76	54	2	0
110	76	34	3	0
220	76	144	4	0
260	76	184	5	0
220	76	144	6	0
170	76	94	7	0
170	76	94	8	0
130	150	-20	8	1
110	150	-40	8	2
220	150	70	9	2
260	150	110	10	2
220	150	70	11	2
170	150	20	12	2
170	150	20	13	2
110	130	-20	13	3
220	130	90	14	3
260	130	130	15	3
220	130	90	16	3
170	130	40	17	3
170	130	40	18	3
220	110	110	19	3
260	110	150	20	3
220	110	110	21	3
170	110	60	22	3
170	110	60	23	3
260	220	40	24	3
220	220	0	24	3
170	220	-50	24	4
170	220	-50	24	5
220	260	-40	24	6
170	260	-90	24	7
170	260	-90	24	8
170	220	-50	24	9
170	220	-50	24	10
170	170	0	24	10

S Statistic = 24 - 10 = 14
Comparing at 95% confidence level (upward trend)

US EPA ARCHIVE DOCUMENT

Probability of obtaining S >= 14 is 0.09
S < 0 or 0.09 >= 0.05 indicating no evidence of an upward trend

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Mann-Kendall Trend Analysis

Parameter: Vinyl chloride
Location: MW-33s
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
56	64	-8	0	1
57	64	-7	0	2
60	64	-4	0	3
55	64	-9	0	4
22	64	-42	0	5
48	64	-16	0	6
51	64	-13	0	7
48	64	-16	0	8
57	56	1	1	8
60	56	4	2	8
55	56	-1	2	9
22	56	-34	2	10
48	56	-8	2	11
51	56	-5	2	12
48	56	-8	2	13
60	57	3	3	13
55	57	-2	3	14
22	57	-35	3	15
48	57	-9	3	16
51	57	-6	3	17
48	57	-9	3	18
55	60	-5	3	19
22	60	-38	3	20
48	60	-12	3	21
51	60	-9	3	22
48	60	-12	3	23
22	55	-33	3	24
48	55	-7	3	25
51	55	-4	3	26
48	55	-7	3	27
48	22	26	4	27
51	22	29	5	27
48	22	26	6	27
51	48	3	7	27
48	48	0	7	27
48	51	-3	7	28

S Statistic = 7 - 28 = -21
Comparing at 95% confidence level (downward trend)

US EPA ARCHIVE DOCUMENT

Failed to calculate probability for S = -21
Table out of range

Manual Approximation
n = 9
21-1 = 20
Probability for S = 20 is 0.0220
S < 0 and 0.0220 < 0.05 indicating a downward trend

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Mann-Kendall Trend Analysis

Parameter: Vinyl chloride
Location: MW-33s
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
56	64	-8	0	1
57	64	-7	0	2
60	64	-4	0	3
55	64	-9	0	4
22	64	-42	0	5
48	64	-16	0	6
51	64	-13	0	7
48	64	-16	0	8
57	56	1	1	8
60	56	4	2	8
55	56	-1	2	9
22	56	-34	2	10
48	56	-8	2	11
51	56	-5	2	12
48	56	-8	2	13
60	57	3	3	13
55	57	-2	3	14
22	57	-35	3	15
48	57	-9	3	16
51	57	-6	3	17
48	57	-9	3	18
55	60	-5	3	19
22	60	-38	3	20
48	60	-12	3	21
51	60	-9	3	22
48	60	-12	3	23
22	55	-33	3	24
48	55	-7	3	25
51	55	-4	3	26
48	55	-7	3	27
48	22	26	4	27
51	22	29	5	27
48	22	26	6	27
51	48	3	7	27
48	48	0	7	27
48	51	-3	7	28

S Statistic = 7 - 28 = -21
Comparing at 95% confidence level (upward trend)

US EPA ARCHIVE DOCUMENT

Failed to calculate probability for S = -21
Table out of range

Manual Approximation

S < 0 indicating no evidence of an upward trend

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Mann-Kendall Trend Analysis

Parameter: 1,1,1-Trichloroethane

Location: MW-34s

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
1600	1600	0	0	0
1400	1600	-200	0	1
1100	1600	-500	0	2
1200	1600	-400	0	3
1300	1600	-300	0	4
1200	1600	-400	0	5
1500	1600	-100	0	6
1400	1600	-200	0	7
1400	1600	-200	0	8
1100	1600	-500	0	9
1200	1600	-400	0	10
1300	1600	-300	0	11
1200	1600	-400	0	12
1500	1600	-100	0	13
1400	1600	-200	0	14
1100	1400	-300	0	15
1200	1400	-200	0	16
1300	1400	-100	0	17
1200	1400	-200	0	18
1500	1400	100	1	18
1400	1400	0	1	18
1200	1100	100	2	18
1300	1100	200	3	18
1200	1100	100	4	18
1500	1100	400	5	18
1400	1100	300	6	18
1300	1200	100	7	18
1200	1200	0	7	18
1500	1200	300	8	18
1400	1200	200	9	18
1200	1300	-100	9	19
1500	1300	200	10	19
1400	1300	100	11	19
1500	1200	300	12	19
1400	1200	200	13	19
1400	1500	-100	13	20

S Statistic = 13 - 20 = -7

Comparing at 95% confidence level (downward trend)

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Failed to calculate probability for S = -7
Table out of range

Manual Approximation
n = 9
7-1 = 6
Probability for S = 6 is 0.3060
0.3060 > 0.05 indicating no evidence of a downward trend

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Mann-Kendall Trend Analysis

Parameter: 1,1,1-Trichloroethane

Location: MW-34s

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
1600	1600	0	0	0
1400	1600	-200	0	1
1100	1600	-500	0	2
1200	1600	-400	0	3
1300	1600	-300	0	4
1200	1600	-400	0	5
1500	1600	-100	0	6
1400	1600	-200	0	7
1400	1600	-200	0	8
1100	1600	-500	0	9
1200	1600	-400	0	10
1300	1600	-300	0	11
1200	1600	-400	0	12
1500	1600	-100	0	13
1400	1600	-200	0	14
1100	1400	-300	0	15
1200	1400	-200	0	16
1300	1400	-100	0	17
1200	1400	-200	0	18
1500	1400	100	1	18
1400	1400	0	1	18
1200	1100	100	2	18
1300	1100	200	3	18
1200	1100	100	4	18
1500	1100	400	5	18
1400	1100	300	6	18
1300	1200	100	7	18
1200	1200	0	7	18
1500	1200	300	8	18
1400	1200	200	9	18
1200	1300	-100	9	19
1500	1300	200	10	19
1400	1300	100	11	19
1500	1200	300	12	19
1400	1200	200	13	19
1400	1500	-100	13	20

S Statistic = 13 - 20 = -7

Comparing at 95% confidence level (upward trend)

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Failed to calculate probability for S = -7
Table out of range

Manual Approximation

S < 0 indicating no evidence of an upward trend

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Mann-Kendall Trend Analysis

Parameter: Trichloroethene

Location: MW-34s

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
1200	1100	100	1	0
1000	1100	-100	1	1
900	1100	-200	1	2
970	1100	-130	1	3
1100	1100	0	1	3
1000	1100	-100	1	4
1100	1100	0	1	4
1200	1100	100	2	4
1000	1200	-200	2	5
900	1200	-300	2	6
970	1200	-230	2	7
1100	1200	-100	2	8
1000	1200	-200	2	9
1100	1200	-100	2	10
1200	1200	0	2	10
900	1000	-100	2	11
970	1000	-30	2	12
1100	1000	100	3	12
1000	1000	0	3	12
1100	1000	100	4	12
1200	1000	200	5	12
970	900	70	6	12
1100	900	200	7	12
1000	900	100	8	12
1100	900	200	9	12
1200	900	300	10	12
1100	970	130	11	12
1000	970	30	12	12
1100	970	130	13	12
1200	970	230	14	12
1000	1100	-100	14	13
1100	1100	0	14	13
1200	1100	100	15	13
1100	1000	100	16	13
1200	1000	200	17	13
1200	1100	100	18	13

S Statistic = 18 - 13 = 5

Comparing at 95% confidence level (downward trend)

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Failed to calculate probability for S = 5
Table out of range

Manual Approximation

S > 0 indicating no evidence of a downward trend

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Mann-Kendall Trend Analysis

Parameter: Trichloroethene

Location: MW-34s

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
1200	1100	100	1	0
1000	1100	-100	1	1
900	1100	-200	1	2
970	1100	-130	1	3
1100	1100	0	1	3
1000	1100	-100	1	4
1100	1100	0	1	4
1200	1100	100	2	4
1000	1200	-200	2	5
900	1200	-300	2	6
970	1200	-230	2	7
1100	1200	-100	2	8
1000	1200	-200	2	9
1100	1200	-100	2	10
1200	1200	0	2	10
900	1000	-100	2	11
970	1000	-30	2	12
1100	1000	100	3	12
1000	1000	0	3	12
1100	1000	100	4	12
1200	1000	200	5	12
970	900	70	6	12
1100	900	200	7	12
1000	900	100	8	12
1100	900	200	9	12
1200	900	300	10	12
1100	970	130	11	12
1000	970	30	12	12
1100	970	130	13	12
1200	970	230	14	12
1000	1100	-100	14	13
1100	1100	0	14	13
1200	1100	100	15	13
1100	1000	100	16	13
1200	1000	200	17	13
1200	1100	100	18	13

S Statistic = 18 - 13 = 5

Comparing at 95% confidence level (upward trend)

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Failed to calculate probability for S = 5
Table out of range

Manual Approximation
n = 9
5-1 = 4
Probability for S = 4 is 0.3810
0.3810 > 0.05 indicating no evidence of an upward trend

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Appendix F
Sen's Slope Trend Tests – Model Output

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Sen's Slope Analysis

Parameter: 1,1,1-Trichloroethane

Location: MW-01S

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
1100 (4/20/2009)	750 (3/13/2009)	(1100 - 750)/(2 - 1)	350
1000 (12/9/2009)	750 (3/13/2009)	(1000 - 750)/(3 - 1)	125
1400 (3/17/2010)	750 (3/13/2009)	(1400 - 750)/(4 - 1)	216.667
1000 (5/18/2010)	750 (3/13/2009)	(1000 - 750)/(5 - 1)	62.5
750 (9/10/2010)	750 (3/13/2009)	(750 - 750)/(6 - 1)	0
1100 (12/28/2010)	750 (3/13/2009)	(1100 - 750)/(7 - 1)	58.3333
560 (2/25/2011)	750 (3/13/2009)	(560 - 750)/(8 - 1)	-27.1429
860 (5/11/2011)	750 (3/13/2009)	(860 - 750)/(9 - 1)	13.75
500 (7/28/2011)	750 (3/13/2009)	(500 - 750)/(10 - 1)	-27.7778
540 (10/6/2011)	750 (3/13/2009)	(540 - 750)/(11 - 1)	-21
530 (1/9/2012)	750 (3/13/2009)	(530 - 750)/(12 - 1)	-20
480 (4/4/2012)	750 (3/13/2009)	(480 - 750)/(13 - 1)	-22.5
1000 (12/9/2009)	1100 (4/20/2009)	(1000 - 1100)/(3 - 2)	-100
1400 (3/17/2010)	1100 (4/20/2009)	(1400 - 1100)/(4 - 2)	150
1000 (5/18/2010)	1100 (4/20/2009)	(1000 - 1100)/(5 - 2)	-33.3333
750 (9/10/2010)	1100 (4/20/2009)	(750 - 1100)/(6 - 2)	-87.5
1100 (12/28/2010)	1100 (4/20/2009)	(1100 - 1100)/(7 - 2)	0
560 (2/25/2011)	1100 (4/20/2009)	(560 - 1100)/(8 - 2)	-90
860 (5/11/2011)	1100 (4/20/2009)	(860 - 1100)/(9 - 2)	-34.2857
500 (7/28/2011)	1100 (4/20/2009)	(500 - 1100)/(10 - 2)	-75
540 (10/6/2011)	1100 (4/20/2009)	(540 - 1100)/(11 - 2)	-62.2222
530 (1/9/2012)	1100 (4/20/2009)	(530 - 1100)/(12 - 2)	-57
480 (4/4/2012)	1100 (4/20/2009)	(480 - 1100)/(13 - 2)	-56.3636
1400 (3/17/2010)	1000 (12/9/2009)	(1400 - 1000)/(4 - 3)	400
1000 (5/18/2010)	1000 (12/9/2009)	(1000 - 1000)/(5 - 3)	0
750 (9/10/2010)	1000 (12/9/2009)	(750 - 1000)/(6 - 3)	-83.3333
1100 (12/28/2010)	1000 (12/9/2009)	(1100 - 1000)/(7 - 3)	25
560 (2/25/2011)	1000 (12/9/2009)	(560 - 1000)/(8 - 3)	-88
860 (5/11/2011)	1000 (12/9/2009)	(860 - 1000)/(9 - 3)	-23.3333
500 (7/28/2011)	1000 (12/9/2009)	(500 - 1000)/(10 - 3)	-71.4286
540 (10/6/2011)	1000 (12/9/2009)	(540 - 1000)/(11 - 3)	-57.5
530 (1/9/2012)	1000 (12/9/2009)	(530 - 1000)/(12 - 3)	-52.2222
480 (4/4/2012)	1000 (12/9/2009)	(480 - 1000)/(13 - 3)	-52
1000 (5/18/2010)	1400 (3/17/2010)	(1000 - 1400)/(5 - 4)	-400
750 (9/10/2010)	1400 (3/17/2010)	(750 - 1400)/(6 - 4)	-325
1100 (12/28/2010)	1400 (3/17/2010)	(1100 - 1400)/(7 - 4)	-100
560 (2/25/2011)	1400 (3/17/2010)	(560 - 1400)/(8 - 4)	-210
860 (5/11/2011)	1400 (3/17/2010)	(860 - 1400)/(9 - 4)	-108
500 (7/28/2011)	1400 (3/17/2010)	(500 - 1400)/(10 - 4)	-150
540 (10/6/2011)	1400 (3/17/2010)	(540 - 1400)/(11 - 4)	-122.857
530 (1/9/2012)	1400 (3/17/2010)	(530 - 1400)/(12 - 4)	-108.75
480 (4/4/2012)	1400 (3/17/2010)	(480 - 1400)/(13 - 4)	-102.222
750 (9/10/2010)	1000 (5/18/2010)	(750 - 1000)/(6 - 5)	-250
1100 (12/28/2010)	1000 (5/18/2010)	(1100 - 1000)/(7 - 5)	50

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560 (2/25/2011)	1000 (5/18/2010)	(560 - 1000)/(8 - 5)	-146.667
860 (5/11/2011)	1000 (5/18/2010)	(860 - 1000)/(9 - 5)	-35
500 (7/28/2011)	1000 (5/18/2010)	(500 - 1000)/(10 - 5)	-100
540 (10/6/2011)	1000 (5/18/2010)	(540 - 1000)/(11 - 5)	-76.6667
530 (1/9/2012)	1000 (5/18/2010)	(530 - 1000)/(12 - 5)	-67.1429
480 (4/4/2012)	1000 (5/18/2010)	(480 - 1000)/(13 - 5)	-65
1100 (12/28/2010)	750 (9/10/2010)	(1100 - 750)/(7 - 6)	350
560 (2/25/2011)	750 (9/10/2010)	(560 - 750)/(8 - 6)	-95
860 (5/11/2011)	750 (9/10/2010)	(860 - 750)/(9 - 6)	36.6667
500 (7/28/2011)	750 (9/10/2010)	(500 - 750)/(10 - 6)	-62.5
540 (10/6/2011)	750 (9/10/2010)	(540 - 750)/(11 - 6)	-42
530 (1/9/2012)	750 (9/10/2010)	(530 - 750)/(12 - 6)	-36.6667
480 (4/4/2012)	750 (9/10/2010)	(480 - 750)/(13 - 6)	-38.5714
560 (2/25/2011)	1100 (12/28/2010)	(560 - 1100)/(8 - 7)	-540
860 (5/11/2011)	1100 (12/28/2010)	(860 - 1100)/(9 - 7)	-120
500 (7/28/2011)	1100 (12/28/2010)	(500 - 1100)/(10 - 7)	-200
540 (10/6/2011)	1100 (12/28/2010)	(540 - 1100)/(11 - 7)	-140
530 (1/9/2012)	1100 (12/28/2010)	(530 - 1100)/(12 - 7)	-114
480 (4/4/2012)	1100 (12/28/2010)	(480 - 1100)/(13 - 7)	-103.333
860 (5/11/2011)	560 (2/25/2011)	(860 - 560)/(9 - 8)	300
500 (7/28/2011)	560 (2/25/2011)	(500 - 560)/(10 - 8)	-30
540 (10/6/2011)	560 (2/25/2011)	(540 - 560)/(11 - 8)	-6.66667
530 (1/9/2012)	560 (2/25/2011)	(530 - 560)/(12 - 8)	-7.5
480 (4/4/2012)	560 (2/25/2011)	(480 - 560)/(13 - 8)	-16
500 (7/28/2011)	860 (5/11/2011)	(500 - 860)/(10 - 9)	-360
540 (10/6/2011)	860 (5/11/2011)	(540 - 860)/(11 - 9)	-160
530 (1/9/2012)	860 (5/11/2011)	(530 - 860)/(12 - 9)	-110
480 (4/4/2012)	860 (5/11/2011)	(480 - 860)/(13 - 9)	-95
540 (10/6/2011)	500 (7/28/2011)	(540 - 500)/(11 - 10)	40
530 (1/9/2012)	500 (7/28/2011)	(530 - 500)/(12 - 10)	15
480 (4/4/2012)	500 (7/28/2011)	(480 - 500)/(13 - 10)	-6.66667
530 (1/9/2012)	540 (10/6/2011)	(530 - 540)/(12 - 11)	-10
480 (4/4/2012)	540 (10/6/2011)	(480 - 540)/(13 - 11)	-30
480 (4/4/2012)	530 (1/9/2012)	(480 - 530)/(13 - 12)	-50

Number of Q values = 78

Ordered Q Values

n	Q
1	-540
2	-400
3	-360
4	-325
5	-250
6	-210
7	-200
8	-160
9	-150
10	-146.667

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11	-140
12	-122.857
13	-120
14	-114
15	-110
16	-108.75
17	-108
18	-103.333
19	-102.222
20	-100
21	-100
22	-100
23	-95
24	-95
25	-90
26	-88
27	-87.5
28	-83.3333
29	-76.6667
30	-75
31	-71.4286
32	-67.1429
33	-65
34	-62.5
35	-62.2222
36	-57.5
37	-57
38	-56.3636
39	-52.2222
40	-52
41	-50
42	-42
43	-38.5714
44	-36.6667
45	-35
46	-34.2857
47	-33.3333
48	-30
49	-30
50	-27.7778
51	-27.1429
52	-23.3333
53	-22.5
54	-21
55	-20
56	-16
57	-10
58	-7.5
59	-6.66667
60	-6.66667
61	0
62	0
63	0
64	13.75
65	15
66	25
67	36.6667

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68	40
69	50
70	58.3333
71	62.5
72	125
73	150
74	216.667
75	300
76	350
77	350
78	400

Sen's Estimator (Median Q) is -52.1111

Tied Group	Value	Members
1	750	2
2	1100	2
3	1000	2

Time Period	Observations
3/13/2009	1
4/20/2009	1
12/9/2009	1
3/17/2010	1
5/18/2010	1
9/10/2010	1
12/28/2010	1
2/25/2011	1
5/11/2011	1
7/28/2011	1
10/6/2011	1
1/9/2012	1
4/4/2012	1

There are 0 time periods with multiple data

A = 54
B = 0
C = 0
D = 0
E = 6
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 265.667
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 26.8099
M1 = (78 - 26.8099)/2.0 = 25.595
M2 = (78 + 26.8099)/2.0 + 1 = 53.405
Lower limit is -88 = Q(26)
Upper limit is -22.5 = Q(53)
-22.5 < 0 indicating a downward trend in data.

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Sen's Slope Analysis

Parameter: Trichloroethene

Location: MW-01S

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
2200 (4/20/2009)	2700 (3/13/2009)	(2200 - 2700)/(2 - 1)	-500
3400 (12/9/2009)	2700 (3/13/2009)	(3400 - 2700)/(3 - 1)	350
2500 (3/17/2010)	2700 (3/13/2009)	(2500 - 2700)/(4 - 1)	-66.6667
2700 (5/18/2010)	2700 (3/13/2009)	(2700 - 2700)/(5 - 1)	0
2400 (9/10/2010)	2700 (3/13/2009)	(2400 - 2700)/(6 - 1)	-60
2500 (12/28/2010)	2700 (3/13/2009)	(2500 - 2700)/(7 - 1)	-33.3333
1300 (2/25/2011)	2700 (3/13/2009)	(1300 - 2700)/(8 - 1)	-200
1900 (5/11/2011)	2700 (3/13/2009)	(1900 - 2700)/(9 - 1)	-100
1900 (7/28/2011)	2700 (3/13/2009)	(1900 - 2700)/(10 - 1)	-88.8889
2000 (10/6/2011)	2700 (3/13/2009)	(2000 - 2700)/(11 - 1)	-70
2000 (1/9/2012)	2700 (3/13/2009)	(2000 - 2700)/(12 - 1)	-63.6364
1900 (4/4/2012)	2700 (3/13/2009)	(1900 - 2700)/(13 - 1)	-66.6667
3400 (12/9/2009)	2200 (4/20/2009)	(3400 - 2200)/(3 - 2)	1200
2500 (3/17/2010)	2200 (4/20/2009)	(2500 - 2200)/(4 - 2)	150
2700 (5/18/2010)	2200 (4/20/2009)	(2700 - 2200)/(5 - 2)	166.667
2400 (9/10/2010)	2200 (4/20/2009)	(2400 - 2200)/(6 - 2)	50
2500 (12/28/2010)	2200 (4/20/2009)	(2500 - 2200)/(7 - 2)	60
1300 (2/25/2011)	2200 (4/20/2009)	(1300 - 2200)/(8 - 2)	-150
1900 (5/11/2011)	2200 (4/20/2009)	(1900 - 2200)/(9 - 2)	-42.8571
1900 (7/28/2011)	2200 (4/20/2009)	(1900 - 2200)/(10 - 2)	-37.5
2000 (10/6/2011)	2200 (4/20/2009)	(2000 - 2200)/(11 - 2)	-22.2222
2000 (1/9/2012)	2200 (4/20/2009)	(2000 - 2200)/(12 - 2)	-20
1900 (4/4/2012)	2200 (4/20/2009)	(1900 - 2200)/(13 - 2)	-27.2727
2500 (3/17/2010)	3400 (12/9/2009)	(2500 - 3400)/(4 - 3)	-900
2700 (5/18/2010)	3400 (12/9/2009)	(2700 - 3400)/(5 - 3)	-350
2400 (9/10/2010)	3400 (12/9/2009)	(2400 - 3400)/(6 - 3)	-333.333
2500 (12/28/2010)	3400 (12/9/2009)	(2500 - 3400)/(7 - 3)	-225
1300 (2/25/2011)	3400 (12/9/2009)	(1300 - 3400)/(8 - 3)	-420
1900 (5/11/2011)	3400 (12/9/2009)	(1900 - 3400)/(9 - 3)	-250
1900 (7/28/2011)	3400 (12/9/2009)	(1900 - 3400)/(10 - 3)	-214.286
2000 (10/6/2011)	3400 (12/9/2009)	(2000 - 3400)/(11 - 3)	-175
2000 (1/9/2012)	3400 (12/9/2009)	(2000 - 3400)/(12 - 3)	-155.556
1900 (4/4/2012)	3400 (12/9/2009)	(1900 - 3400)/(13 - 3)	-150
2700 (5/18/2010)	2500 (3/17/2010)	(2700 - 2500)/(5 - 4)	200
2400 (9/10/2010)	2500 (3/17/2010)	(2400 - 2500)/(6 - 4)	-50
2500 (12/28/2010)	2500 (3/17/2010)	(2500 - 2500)/(7 - 4)	0
1300 (2/25/2011)	2500 (3/17/2010)	(1300 - 2500)/(8 - 4)	-300
1900 (5/11/2011)	2500 (3/17/2010)	(1900 - 2500)/(9 - 4)	-120
1900 (7/28/2011)	2500 (3/17/2010)	(1900 - 2500)/(10 - 4)	-100
2000 (10/6/2011)	2500 (3/17/2010)	(2000 - 2500)/(11 - 4)	-71.4286
2000 (1/9/2012)	2500 (3/17/2010)	(2000 - 2500)/(12 - 4)	-62.5
1900 (4/4/2012)	2500 (3/17/2010)	(1900 - 2500)/(13 - 4)	-66.6667
2400 (9/10/2010)	2700 (5/18/2010)	(2400 - 2700)/(6 - 5)	-300
2500 (12/28/2010)	2700 (5/18/2010)	(2500 - 2700)/(7 - 5)	-100

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1300	(2/25/2011)	2700	(5/18/2010)	(1300 - 2700)/(8 - 5)	-466.667
1900	(5/11/2011)	2700	(5/18/2010)	(1900 - 2700)/(9 - 5)	-200
1900	(7/28/2011)	2700	(5/18/2010)	(1900 - 2700)/(10 - 5)	-160
2000	(10/6/2011)	2700	(5/18/2010)	(2000 - 2700)/(11 - 5)	-116.667
2000	(1/9/2012)	2700	(5/18/2010)	(2000 - 2700)/(12 - 5)	-100
1900	(4/4/2012)	2700	(5/18/2010)	(1900 - 2700)/(13 - 5)	-100
2500	(12/28/2010)	2400	(9/10/2010)	(2500 - 2400)/(7 - 6)	100
1300	(2/25/2011)	2400	(9/10/2010)	(1300 - 2400)/(8 - 6)	-550
1900	(5/11/2011)	2400	(9/10/2010)	(1900 - 2400)/(9 - 6)	-166.667
1900	(7/28/2011)	2400	(9/10/2010)	(1900 - 2400)/(10 - 6)	-125
2000	(10/6/2011)	2400	(9/10/2010)	(2000 - 2400)/(11 - 6)	-80
2000	(1/9/2012)	2400	(9/10/2010)	(2000 - 2400)/(12 - 6)	-66.6667
1900	(4/4/2012)	2400	(9/10/2010)	(1900 - 2400)/(13 - 6)	-71.4286
1300	(2/25/2011)	2500	(12/28/2010)	(1300 - 2500)/(8 - 7)	-1200
1900	(5/11/2011)	2500	(12/28/2010)	(1900 - 2500)/(9 - 7)	-300
1900	(7/28/2011)	2500	(12/28/2010)	(1900 - 2500)/(10 - 7)	-200
2000	(10/6/2011)	2500	(12/28/2010)	(2000 - 2500)/(11 - 7)	-125
2000	(1/9/2012)	2500	(12/28/2010)	(2000 - 2500)/(12 - 7)	-100
1900	(4/4/2012)	2500	(12/28/2010)	(1900 - 2500)/(13 - 7)	-100
1900	(5/11/2011)	1300	(2/25/2011)	(1900 - 1300)/(9 - 8)	600
1900	(7/28/2011)	1300	(2/25/2011)	(1900 - 1300)/(10 - 8)	300
2000	(10/6/2011)	1300	(2/25/2011)	(2000 - 1300)/(11 - 8)	233.333
2000	(1/9/2012)	1300	(2/25/2011)	(2000 - 1300)/(12 - 8)	175
1900	(4/4/2012)	1300	(2/25/2011)	(1900 - 1300)/(13 - 8)	120
1900	(7/28/2011)	1900	(5/11/2011)	(1900 - 1900)/(10 - 9)	0
2000	(10/6/2011)	1900	(5/11/2011)	(2000 - 1900)/(11 - 9)	50
2000	(1/9/2012)	1900	(5/11/2011)	(2000 - 1900)/(12 - 9)	33.3333
1900	(4/4/2012)	1900	(5/11/2011)	(1900 - 1900)/(13 - 9)	0
2000	(10/6/2011)	1900	(7/28/2011)	(2000 - 1900)/(11 - 10)	100
2000	(1/9/2012)	1900	(7/28/2011)	(2000 - 1900)/(12 - 10)	50
1900	(4/4/2012)	1900	(7/28/2011)	(1900 - 1900)/(13 - 10)	0
2000	(1/9/2012)	2000	(10/6/2011)	(2000 - 2000)/(12 - 11)	0
1900	(4/4/2012)	2000	(10/6/2011)	(1900 - 2000)/(13 - 11)	-50
1900	(4/4/2012)	2000	(1/9/2012)	(1900 - 2000)/(13 - 12)	-100

Number of Q values = 78

Ordered Q Values

n	Q
1	-1200
2	-900
3	-550
4	-500
5	-466.667
6	-420
7	-350
8	-333.333
9	-300
10	-300

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11	-300
12	-250
13	-225
14	-214.286
15	-200
16	-200
17	-200
18	-175
19	-166.667
20	-160
21	-155.556
22	-150
23	-150
24	-125
25	-125
26	-120
27	-116.667
28	-100
29	-100
30	-100
31	-100
32	-100
33	-100
34	-100
35	-100
36	-88.8889
37	-80
38	-71.4286
39	-71.4286
40	-70
41	-66.6667
42	-66.6667
43	-66.6667
44	-66.6667
45	-63.6364
46	-62.5
47	-60
48	-50
49	-50
50	-42.8571
51	-37.5
52	-33.3333
53	-27.2727
54	-22.2222
55	-20
56	0
57	0
58	0
59	0
60	0
61	0
62	33.3333
63	50
64	50
65	50
66	60
67	100

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68	100
69	120
70	150
71	166.667
72	175
73	200
74	233.333
75	300
76	350
77	600
78	1200

Sen's Estimator (Median Q) is -70.7143

Tied Group	Value	Members
1	2700	2
2	2500	2
3	1900	3
4	2000	2

Time Period	Observations
3/13/2009	1
4/20/2009	1
12/9/2009	1
3/17/2010	1
5/18/2010	1
9/10/2010	1
12/28/2010	1
2/25/2011	1
5/11/2011	1
7/28/2011	1
10/6/2011	1
1/9/2012	1
4/4/2012	1

There are 0 time periods with multiple data

A = 120
B = 0
C = 6
D = 0
E = 12
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 262
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 26.6243
M1 = (78 - 26.6243)/2.0 = 25.6879
M2 = (78 + 26.6243)/2.0 + 1 = 53.3121
Lower limit is -120 = Q(26)
Upper limit is -27.2727 = Q(53)
-27.2727 < 0 indicating a downward trend in data.

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Sen's Slope Analysis

Parameter: 1,1,1-Trichloroethane

Location: MW-02S

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
ND<10 (4/20/2009)	2.5 (3/13/2009)	(10 - 2.5)/(2 - 1)	7.5
2.9 (12/9/2009)	2.5 (3/13/2009)	(2.9 - 2.5)/(3 - 1)	0.2
3.1 (3/17/2010)	2.5 (3/13/2009)	(3.1 - 2.5)/(4 - 1)	0.2
2.6 (5/18/2010)	2.5 (3/13/2009)	(2.6 - 2.5)/(5 - 1)	0.025
2.3 (9/10/2010)	2.5 (3/13/2009)	(2.3 - 2.5)/(6 - 1)	-0.04
3.1 (12/22/2010)	2.5 (3/13/2009)	(3.1 - 2.5)/(7 - 1)	0.1
2.6 (2/24/2011)	2.5 (3/13/2009)	(2.6 - 2.5)/(8 - 1)	0.0142857
2.3 (5/10/2011)	2.5 (3/13/2009)	(2.3 - 2.5)/(9 - 1)	-0.025
2.4 (7/28/2011)	2.5 (3/13/2009)	(2.4 - 2.5)/(10 - 1)	-0.0111111
2.5 (10/7/2011)	2.5 (3/13/2009)	(2.5 - 2.5)/(11 - 1)	0
2.5 (1/10/2012)	2.5 (3/13/2009)	(2.5 - 2.5)/(12 - 1)	0
3.4 (4/5/2012)	2.5 (3/13/2009)	(3.4 - 2.5)/(13 - 1)	0.075
2.9 (12/9/2009)	ND<10 (4/20/2009)	(2.9 - 10)/(3 - 2)	-7.1
3.1 (3/17/2010)	ND<10 (4/20/2009)	(3.1 - 10)/(4 - 2)	-3.45
2.6 (5/18/2010)	ND<10 (4/20/2009)	(2.6 - 10)/(5 - 2)	-2.46667
2.3 (9/10/2010)	ND<10 (4/20/2009)	(2.3 - 10)/(6 - 2)	-1.925
3.1 (12/22/2010)	ND<10 (4/20/2009)	(3.1 - 10)/(7 - 2)	-1.38
2.6 (2/24/2011)	ND<10 (4/20/2009)	(2.6 - 10)/(8 - 2)	-1.23333
2.3 (5/10/2011)	ND<10 (4/20/2009)	(2.3 - 10)/(9 - 2)	-1.1
2.4 (7/28/2011)	ND<10 (4/20/2009)	(2.4 - 10)/(10 - 2)	-0.95
2.5 (10/7/2011)	ND<10 (4/20/2009)	(2.5 - 10)/(11 - 2)	-0.833333
2.5 (1/10/2012)	ND<10 (4/20/2009)	(2.5 - 10)/(12 - 2)	-0.75
3.4 (4/5/2012)	ND<10 (4/20/2009)	(3.4 - 10)/(13 - 2)	-0.6
3.1 (3/17/2010)	2.9 (12/9/2009)	(3.1 - 2.9)/(4 - 3)	0.2
2.6 (5/18/2010)	2.9 (12/9/2009)	(2.6 - 2.9)/(5 - 3)	-0.15
2.3 (9/10/2010)	2.9 (12/9/2009)	(2.3 - 2.9)/(6 - 3)	-0.2
3.1 (12/22/2010)	2.9 (12/9/2009)	(3.1 - 2.9)/(7 - 3)	0.05
2.6 (2/24/2011)	2.9 (12/9/2009)	(2.6 - 2.9)/(8 - 3)	-0.06
2.3 (5/10/2011)	2.9 (12/9/2009)	(2.3 - 2.9)/(9 - 3)	-0.1
2.4 (7/28/2011)	2.9 (12/9/2009)	(2.4 - 2.9)/(10 - 3)	-0.0714286
2.5 (10/7/2011)	2.9 (12/9/2009)	(2.5 - 2.9)/(11 - 3)	-0.05
2.5 (1/10/2012)	2.9 (12/9/2009)	(2.5 - 2.9)/(12 - 3)	-0.0444444
3.4 (4/5/2012)	2.9 (12/9/2009)	(3.4 - 2.9)/(13 - 3)	0.05
2.6 (5/18/2010)	3.1 (3/17/2010)	(2.6 - 3.1)/(5 - 4)	-0.5
2.3 (9/10/2010)	3.1 (3/17/2010)	(2.3 - 3.1)/(6 - 4)	-0.4
3.1 (12/22/2010)	3.1 (3/17/2010)	(3.1 - 3.1)/(7 - 4)	0
2.6 (2/24/2011)	3.1 (3/17/2010)	(2.6 - 3.1)/(8 - 4)	-0.125
2.3 (5/10/2011)	3.1 (3/17/2010)	(2.3 - 3.1)/(9 - 4)	-0.16
2.4 (7/28/2011)	3.1 (3/17/2010)	(2.4 - 3.1)/(10 - 4)	-0.116667
2.5 (10/7/2011)	3.1 (3/17/2010)	(2.5 - 3.1)/(11 - 4)	-0.0857143
2.5 (1/10/2012)	3.1 (3/17/2010)	(2.5 - 3.1)/(12 - 4)	-0.075
3.4 (4/5/2012)	3.1 (3/17/2010)	(3.4 - 3.1)/(13 - 4)	0.0333333
2.3 (9/10/2010)	2.6 (5/18/2010)	(2.3 - 2.6)/(6 - 5)	-0.3
3.1 (12/22/2010)	2.6 (5/18/2010)	(3.1 - 2.6)/(7 - 5)	0.25

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2.6 (2/24/2011)	2.6 (5/18/2010)	(2.6 - 2.6)/(8 - 5)	0
2.3 (5/10/2011)	2.6 (5/18/2010)	(2.3 - 2.6)/(9 - 5)	-0.075
2.4 (7/28/2011)	2.6 (5/18/2010)	(2.4 - 2.6)/(10 - 5)	-0.04
2.5 (10/7/2011)	2.6 (5/18/2010)	(2.5 - 2.6)/(11 - 5)	-0.0166667
2.5 (1/10/2012)	2.6 (5/18/2010)	(2.5 - 2.6)/(12 - 5)	-0.0142857
3.4 (4/5/2012)	2.6 (5/18/2010)	(3.4 - 2.6)/(13 - 5)	0.1
3.1 (12/22/2010)	2.3 (9/10/2010)	(3.1 - 2.3)/(7 - 6)	0.8
2.6 (2/24/2011)	2.3 (9/10/2010)	(2.6 - 2.3)/(8 - 6)	0.15
2.3 (5/10/2011)	2.3 (9/10/2010)	(2.3 - 2.3)/(9 - 6)	0
2.4 (7/28/2011)	2.3 (9/10/2010)	(2.4 - 2.3)/(10 - 6)	0.025
2.5 (10/7/2011)	2.3 (9/10/2010)	(2.5 - 2.3)/(11 - 6)	0.04
2.5 (1/10/2012)	2.3 (9/10/2010)	(2.5 - 2.3)/(12 - 6)	0.0333333
3.4 (4/5/2012)	2.3 (9/10/2010)	(3.4 - 2.3)/(13 - 6)	0.157143
2.6 (2/24/2011)	3.1 (12/22/2010)	(2.6 - 3.1)/(8 - 7)	-0.5
2.3 (5/10/2011)	3.1 (12/22/2010)	(2.3 - 3.1)/(9 - 7)	-0.4
2.4 (7/28/2011)	3.1 (12/22/2010)	(2.4 - 3.1)/(10 - 7)	-0.233333
2.5 (10/7/2011)	3.1 (12/22/2010)	(2.5 - 3.1)/(11 - 7)	-0.15
2.5 (1/10/2012)	3.1 (12/22/2010)	(2.5 - 3.1)/(12 - 7)	-0.12
3.4 (4/5/2012)	3.1 (12/22/2010)	(3.4 - 3.1)/(13 - 7)	0.05
2.3 (5/10/2011)	2.6 (2/24/2011)	(2.3 - 2.6)/(9 - 8)	-0.3
2.4 (7/28/2011)	2.6 (2/24/2011)	(2.4 - 2.6)/(10 - 8)	-0.1
2.5 (10/7/2011)	2.6 (2/24/2011)	(2.5 - 2.6)/(11 - 8)	-0.0333333
2.5 (1/10/2012)	2.6 (2/24/2011)	(2.5 - 2.6)/(12 - 8)	-0.025
3.4 (4/5/2012)	2.6 (2/24/2011)	(3.4 - 2.6)/(13 - 8)	0.16
2.4 (7/28/2011)	2.3 (5/10/2011)	(2.4 - 2.3)/(10 - 9)	0.1
2.5 (10/7/2011)	2.3 (5/10/2011)	(2.5 - 2.3)/(11 - 9)	0.1
2.5 (1/10/2012)	2.3 (5/10/2011)	(2.5 - 2.3)/(12 - 9)	0.0666667
3.4 (4/5/2012)	2.3 (5/10/2011)	(3.4 - 2.3)/(13 - 9)	0.275
2.5 (10/7/2011)	2.4 (7/28/2011)	(2.5 - 2.4)/(11 - 10)	0.1
2.5 (1/10/2012)	2.4 (7/28/2011)	(2.5 - 2.4)/(12 - 10)	0.05
3.4 (4/5/2012)	2.4 (7/28/2011)	(3.4 - 2.4)/(13 - 10)	0.333333
2.5 (1/10/2012)	2.5 (10/7/2011)	(2.5 - 2.5)/(12 - 11)	0
3.4 (4/5/2012)	2.5 (10/7/2011)	(3.4 - 2.5)/(13 - 11)	0.45
3.4 (4/5/2012)	2.5 (1/10/2012)	(3.4 - 2.5)/(13 - 12)	0.9

Number of Q values = 78

Ordered Q Values

n	Q
1	-7.1
2	-3.45
3	-2.46667
4	-1.925
5	-1.38
6	-1.23333
7	-1.1
8	-0.95
9	-0.833333
10	-0.75

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11	-0.6
12	-0.5
13	-0.5
14	-0.4
15	-0.4
16	-0.3
17	-0.3
18	-0.233333
19	-0.2
20	-0.16
21	-0.15
22	-0.15
23	-0.125
24	-0.12
25	-0.116667
26	-0.1
27	-0.1
28	-0.0857143
29	-0.075
30	-0.075
31	-0.0714286
32	-0.06
33	-0.05
34	-0.0444444
35	-0.04
36	-0.04
37	-0.0333333
38	-0.025
39	-0.025
40	-0.0166667
41	-0.0142857
42	-0.0111111
43	0
44	0
45	0
46	0
47	0
48	0
49	0.0142857
50	0.025
51	0.025
52	0.0333333
53	0.0333333
54	0.04
55	0.05
56	0.05
57	0.05
58	0.05
59	0.0666667
60	0.075
61	0.1
62	0.1
63	0.1
64	0.1
65	0.1
66	0.15
67	0.157143

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68	0.16
69	0.2
70	0.2
71	0.2
72	0.25
73	0.275
74	0.333333
75	0.45
76	0.8
77	0.9
78	7.5

Sen's Estimator (Median Q) is -0.0208333

Tied Group	Value	Members
1	2.5	3
2	3.1	2
3	2.6	2
4	2.3	2

Time Period	Observations
3/13/2009	1
4/20/2009	1
12/9/2009	1
3/17/2010	1
5/18/2010	1
9/10/2010	1
12/22/2010	1
2/24/2011	1
5/10/2011	1
7/28/2011	1
10/7/2011	1
1/10/2012	1
4/5/2012	1

There are 0 time periods with multiple data

A = 120
B = 0
C = 6
D = 0
E = 12
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 262
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 26.6243
M1 = (78 - 26.6243)/2.0 = 25.6879
M2 = (78 + 26.6243)/2.0 + 1 = 53.3121
Lower limit is -0.1 = Q(26)
Upper limit is 0.0333333 = Q(53)
-0.1 < 0 < 0.0333333 indicating no trend in data.

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Sen's Slope Analysis

Parameter: cis-1,2-Dichloroethene
Location: MW-02S

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
ND<10 (4/20/2009)	2.4 (3/13/2009)	(10 - 2.4)/(2 - 1)	7.6
3.7 (12/9/2009)	2.4 (3/13/2009)	(3.7 - 2.4)/(3 - 1)	0.65
4.1 (3/17/2010)	2.4 (3/13/2009)	(4.1 - 2.4)/(4 - 1)	0.566667
2.3 (5/18/2010)	2.4 (3/13/2009)	(2.3 - 2.4)/(5 - 1)	-0.025
2.3 (9/10/2010)	2.4 (3/13/2009)	(2.3 - 2.4)/(6 - 1)	-0.02
2.4 (12/22/2010)	2.4 (3/13/2009)	(2.4 - 2.4)/(7 - 1)	0
2 (2/24/2011)	2.4 (3/13/2009)	(2 - 2.4)/(8 - 1)	-0.0571429
ND<2 (5/10/2011)	2.4 (3/13/2009)	(2 - 2.4)/(9 - 1)	-0.05
2 (7/28/2011)	2.4 (3/13/2009)	(2 - 2.4)/(10 - 1)	-0.0444444
ND<2 (10/7/2011)	2.4 (3/13/2009)	(2 - 2.4)/(11 - 1)	-0.04
ND<2 (1/10/2012)	2.4 (3/13/2009)	(2 - 2.4)/(12 - 1)	-0.0363636
2.7 (4/5/2012)	2.4 (3/13/2009)	(2.7 - 2.4)/(13 - 1)	0.025
3.7 (12/9/2009)	ND<10 (4/20/2009)	(3.7 - 10)/(3 - 2)	-6.3
4.1 (3/17/2010)	ND<10 (4/20/2009)	(4.1 - 10)/(4 - 2)	-2.95
2.3 (5/18/2010)	ND<10 (4/20/2009)	(2.3 - 10)/(5 - 2)	-2.56667
2.3 (9/10/2010)	ND<10 (4/20/2009)	(2.3 - 10)/(6 - 2)	-1.925
2.4 (12/22/2010)	ND<10 (4/20/2009)	(2.4 - 10)/(7 - 2)	-1.52
2 (2/24/2011)	ND<10 (4/20/2009)	(2 - 10)/(8 - 2)	-1.33333
ND<2 (5/10/2011)	ND<10 (4/20/2009)	(2 - 10)/(9 - 2)	-1.14286
2 (7/28/2011)	ND<10 (4/20/2009)	(2 - 10)/(10 - 2)	-1
ND<2 (10/7/2011)	ND<10 (4/20/2009)	(2 - 10)/(11 - 2)	-0.888889
ND<2 (1/10/2012)	ND<10 (4/20/2009)	(2 - 10)/(12 - 2)	-0.8
2.7 (4/5/2012)	ND<10 (4/20/2009)	(2.7 - 10)/(13 - 2)	-0.663636
4.1 (3/17/2010)	3.7 (12/9/2009)	(4.1 - 3.7)/(4 - 3)	0.4
2.3 (5/18/2010)	3.7 (12/9/2009)	(2.3 - 3.7)/(5 - 3)	-0.7
2.3 (9/10/2010)	3.7 (12/9/2009)	(2.3 - 3.7)/(6 - 3)	-0.466667
2.4 (12/22/2010)	3.7 (12/9/2009)	(2.4 - 3.7)/(7 - 3)	-0.325
2 (2/24/2011)	3.7 (12/9/2009)	(2 - 3.7)/(8 - 3)	-0.34
ND<2 (5/10/2011)	3.7 (12/9/2009)	(2 - 3.7)/(9 - 3)	-0.283333
2 (7/28/2011)	3.7 (12/9/2009)	(2 - 3.7)/(10 - 3)	-0.242857
ND<2 (10/7/2011)	3.7 (12/9/2009)	(2 - 3.7)/(11 - 3)	-0.2125
ND<2 (1/10/2012)	3.7 (12/9/2009)	(2 - 3.7)/(12 - 3)	-0.188889
2.7 (4/5/2012)	3.7 (12/9/2009)	(2.7 - 3.7)/(13 - 3)	-0.1
2.3 (5/18/2010)	4.1 (3/17/2010)	(2.3 - 4.1)/(5 - 4)	-1.8
2.3 (9/10/2010)	4.1 (3/17/2010)	(2.3 - 4.1)/(6 - 4)	-0.9
2.4 (12/22/2010)	4.1 (3/17/2010)	(2.4 - 4.1)/(7 - 4)	-0.566667
2 (2/24/2011)	4.1 (3/17/2010)	(2 - 4.1)/(8 - 4)	-0.525
ND<2 (5/10/2011)	4.1 (3/17/2010)	(2 - 4.1)/(9 - 4)	-0.42
2 (7/28/2011)	4.1 (3/17/2010)	(2 - 4.1)/(10 - 4)	-0.35
ND<2 (10/7/2011)	4.1 (3/17/2010)	(2 - 4.1)/(11 - 4)	-0.3
ND<2 (1/10/2012)	4.1 (3/17/2010)	(2 - 4.1)/(12 - 4)	-0.2625
2.7 (4/5/2012)	4.1 (3/17/2010)	(2.7 - 4.1)/(13 - 4)	-0.155556
2.3 (9/10/2010)	2.3 (5/18/2010)	(2.3 - 2.3)/(6 - 5)	0
2.4 (12/22/2010)	2.3 (5/18/2010)	(2.4 - 2.3)/(7 - 5)	0.05

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2 (2/24/2011)	2.3 (5/18/2010)	(2 - 2.3)/(8 - 5)	-0.1
ND<2 (5/10/2011)	2.3 (5/18/2010)	(2 - 2.3)/(9 - 5)	-0.075
2 (7/28/2011)	2.3 (5/18/2010)	(2 - 2.3)/(10 - 5)	-0.06
ND<2 (10/7/2011)	2.3 (5/18/2010)	(2 - 2.3)/(11 - 5)	-0.05
ND<2 (1/10/2012)	2.3 (5/18/2010)	(2 - 2.3)/(12 - 5)	-0.0428571
2.7 (4/5/2012)	2.3 (5/18/2010)	(2.7 - 2.3)/(13 - 5)	0.05
2.4 (12/22/2010)	2.3 (9/10/2010)	(2.4 - 2.3)/(7 - 6)	0.1
2 (2/24/2011)	2.3 (9/10/2010)	(2 - 2.3)/(8 - 6)	-0.15
ND<2 (5/10/2011)	2.3 (9/10/2010)	(2 - 2.3)/(9 - 6)	-0.1
2 (7/28/2011)	2.3 (9/10/2010)	(2 - 2.3)/(10 - 6)	-0.075
ND<2 (10/7/2011)	2.3 (9/10/2010)	(2 - 2.3)/(11 - 6)	-0.06
ND<2 (1/10/2012)	2.3 (9/10/2010)	(2 - 2.3)/(12 - 6)	-0.05
2.7 (4/5/2012)	2.3 (9/10/2010)	(2.7 - 2.3)/(13 - 6)	0.0571429
2 (2/24/2011)	2.4 (12/22/2010)	(2 - 2.4)/(8 - 7)	-0.4
ND<2 (5/10/2011)	2.4 (12/22/2010)	(2 - 2.4)/(9 - 7)	-0.2
2 (7/28/2011)	2.4 (12/22/2010)	(2 - 2.4)/(10 - 7)	-0.133333
ND<2 (10/7/2011)	2.4 (12/22/2010)	(2 - 2.4)/(11 - 7)	-0.1
ND<2 (1/10/2012)	2.4 (12/22/2010)	(2 - 2.4)/(12 - 7)	-0.08
2.7 (4/5/2012)	2.4 (12/22/2010)	(2.7 - 2.4)/(13 - 7)	0.05
ND<2 (5/10/2011)	2 (2/24/2011)	(2 - 2)/(9 - 8)	0
2 (7/28/2011)	2 (2/24/2011)	(2 - 2)/(10 - 8)	0
ND<2 (10/7/2011)	2 (2/24/2011)	(2 - 2)/(11 - 8)	0
ND<2 (1/10/2012)	2 (2/24/2011)	(2 - 2)/(12 - 8)	0
2.7 (4/5/2012)	2 (2/24/2011)	(2.7 - 2)/(13 - 8)	0.14
2 (7/28/2011)	ND<2 (5/10/2011)	(2 - 2)/(10 - 9)	0
ND<2 (10/7/2011)	ND<2 (5/10/2011)	(2 - 2)/(11 - 9)	0
ND<2 (1/10/2012)	ND<2 (5/10/2011)	(2 - 2)/(12 - 9)	0
2.7 (4/5/2012)	ND<2 (5/10/2011)	(2.7 - 2)/(13 - 9)	0.175
ND<2 (10/7/2011)	2 (7/28/2011)	(2 - 2)/(11 - 10)	0
ND<2 (1/10/2012)	2 (7/28/2011)	(2 - 2)/(12 - 10)	0
2.7 (4/5/2012)	2 (7/28/2011)	(2.7 - 2)/(13 - 10)	0.233333
ND<2 (1/10/2012)	ND<2 (10/7/2011)	(2 - 2)/(12 - 11)	0
2.7 (4/5/2012)	ND<2 (10/7/2011)	(2.7 - 2)/(13 - 11)	0.35
2.7 (4/5/2012)	ND<2 (1/10/2012)	(2.7 - 2)/(13 - 12)	0.7

Number of Q values = 78

Ordered Q Values

n	Q
1	-6.3
2	-2.95
3	-2.56667
4	-1.925
5	-1.8
6	-1.52
7	-1.33333
8	-1.14286
9	-1
10	-0.9

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11	-0.888889
12	-0.8
13	-0.7
14	-0.663636
15	-0.566667
16	-0.525
17	-0.466667
18	-0.42
19	-0.4
20	-0.35
21	-0.34
22	-0.325
23	-0.3
24	-0.283333
25	-0.2625
26	-0.242857
27	-0.2125
28	-0.2
29	-0.188889
30	-0.155556
31	-0.15
32	-0.133333
33	-0.1
34	-0.1
35	-0.1
36	-0.1
37	-0.08
38	-0.075
39	-0.075
40	-0.06
41	-0.06
42	-0.0571429
43	-0.05
44	-0.05
45	-0.05
46	-0.0444444
47	-0.0428571
48	-0.04
49	-0.0363636
50	-0.025
51	-0.02
52	0
53	0
54	0
55	0
56	0
57	0
58	0
59	0
60	0
61	0
62	0
63	0
64	0.025
65	0.05
66	0.05
67	0.05

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68	0.0571429
69	0.1
70	0.14
71	0.175
72	0.233333
73	0.35
74	0.4
75	0.566667
76	0.65
77	0.7
78	7.6

Sen's Estimator (Median Q) is -0.0675

Tied Group	Value	Members
1	2.4	2
2	2.3	2
3	2	5

Time Period	Observations
3/13/2009	1
4/20/2009	1
12/9/2009	1
3/17/2010	1
5/18/2010	1
9/10/2010	1
12/22/2010	1
2/24/2011	1
5/10/2011	1
7/28/2011	1
10/7/2011	1
1/10/2012	1
4/5/2012	1

There are 0 time periods with multiple data

A = 336
B = 0
C = 60
D = 0
E = 24
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 250
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 26.0074
M1 = (78 - 26.0074)/2.0 = 25.9963
M2 = (78 + 26.0074)/2.0 + 1 = 53.0037
Lower limit is -0.242857 = Q(26)
Upper limit is 0 = Q(53)
-0.242857 < 0 < 0 indicating no trend in data.

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Sen's Slope Analysis

Parameter: Tetrachloroethene

Location: MW-02S

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
ND<10 (4/20/2009)	2.2 (3/13/2009)	(10 - 2.2)/(2 - 1)	7.8
2.7 (12/9/2009)	2.2 (3/13/2009)	(2.7 - 2.2)/(3 - 1)	0.25
2.3 (3/17/2010)	2.2 (3/13/2009)	(2.3 - 2.2)/(4 - 1)	0.0333333
2.4 (5/18/2010)	2.2 (3/13/2009)	(2.4 - 2.2)/(5 - 1)	0.05
2.3 (9/10/2010)	2.2 (3/13/2009)	(2.3 - 2.2)/(6 - 1)	0.02
2.3 (12/22/2010)	2.2 (3/13/2009)	(2.3 - 2.2)/(7 - 1)	0.0166667
ND<2 (2/24/2011)	2.2 (3/13/2009)	(2 - 2.2)/(8 - 1)	-0.0285714
ND<2 (5/10/2011)	2.2 (3/13/2009)	(2 - 2.2)/(9 - 1)	-0.025
2.2 (7/28/2011)	2.2 (3/13/2009)	(2.2 - 2.2)/(10 - 1)	0
2.5 (10/7/2011)	2.2 (3/13/2009)	(2.5 - 2.2)/(11 - 1)	0.03
2.8 (1/10/2012)	2.2 (3/13/2009)	(2.8 - 2.2)/(12 - 1)	0.0545455
3.5 (4/5/2012)	2.2 (3/13/2009)	(3.5 - 2.2)/(13 - 1)	0.108333
2.7 (12/9/2009)	ND<10 (4/20/2009)	(2.7 - 10)/(3 - 2)	-7.3
2.3 (3/17/2010)	ND<10 (4/20/2009)	(2.3 - 10)/(4 - 2)	-3.85
2.4 (5/18/2010)	ND<10 (4/20/2009)	(2.4 - 10)/(5 - 2)	-2.53333
2.3 (9/10/2010)	ND<10 (4/20/2009)	(2.3 - 10)/(6 - 2)	-1.925
2.3 (12/22/2010)	ND<10 (4/20/2009)	(2.3 - 10)/(7 - 2)	-1.54
ND<2 (2/24/2011)	ND<10 (4/20/2009)	(2 - 10)/(8 - 2)	-1.33333
ND<2 (5/10/2011)	ND<10 (4/20/2009)	(2 - 10)/(9 - 2)	-1.14286
2.2 (7/28/2011)	ND<10 (4/20/2009)	(2.2 - 10)/(10 - 2)	-0.975
2.5 (10/7/2011)	ND<10 (4/20/2009)	(2.5 - 10)/(11 - 2)	-0.833333
2.8 (1/10/2012)	ND<10 (4/20/2009)	(2.8 - 10)/(12 - 2)	-0.72
3.5 (4/5/2012)	ND<10 (4/20/2009)	(3.5 - 10)/(13 - 2)	-0.590909
2.3 (3/17/2010)	2.7 (12/9/2009)	(2.3 - 2.7)/(4 - 3)	-0.4
2.4 (5/18/2010)	2.7 (12/9/2009)	(2.4 - 2.7)/(5 - 3)	-0.15
2.3 (9/10/2010)	2.7 (12/9/2009)	(2.3 - 2.7)/(6 - 3)	-0.133333
2.3 (12/22/2010)	2.7 (12/9/2009)	(2.3 - 2.7)/(7 - 3)	-0.1
ND<2 (2/24/2011)	2.7 (12/9/2009)	(2 - 2.7)/(8 - 3)	-0.14
ND<2 (5/10/2011)	2.7 (12/9/2009)	(2 - 2.7)/(9 - 3)	-0.116667
2.2 (7/28/2011)	2.7 (12/9/2009)	(2.2 - 2.7)/(10 - 3)	-0.0714286
2.5 (10/7/2011)	2.7 (12/9/2009)	(2.5 - 2.7)/(11 - 3)	-0.025
2.8 (1/10/2012)	2.7 (12/9/2009)	(2.8 - 2.7)/(12 - 3)	0.0111111
3.5 (4/5/2012)	2.7 (12/9/2009)	(3.5 - 2.7)/(13 - 3)	0.08
2.4 (5/18/2010)	2.3 (3/17/2010)	(2.4 - 2.3)/(5 - 4)	0.1
2.3 (9/10/2010)	2.3 (3/17/2010)	(2.3 - 2.3)/(6 - 4)	0
2.3 (12/22/2010)	2.3 (3/17/2010)	(2.3 - 2.3)/(7 - 4)	0
ND<2 (2/24/2011)	2.3 (3/17/2010)	(2 - 2.3)/(8 - 4)	-0.075
ND<2 (5/10/2011)	2.3 (3/17/2010)	(2 - 2.3)/(9 - 4)	-0.06
2.2 (7/28/2011)	2.3 (3/17/2010)	(2.2 - 2.3)/(10 - 4)	-0.0166667
2.5 (10/7/2011)	2.3 (3/17/2010)	(2.5 - 2.3)/(11 - 4)	0.0285714
2.8 (1/10/2012)	2.3 (3/17/2010)	(2.8 - 2.3)/(12 - 4)	0.0625
3.5 (4/5/2012)	2.3 (3/17/2010)	(3.5 - 2.3)/(13 - 4)	0.133333
2.3 (9/10/2010)	2.4 (5/18/2010)	(2.3 - 2.4)/(6 - 5)	-0.1
2.3 (12/22/2010)	2.4 (5/18/2010)	(2.3 - 2.4)/(7 - 5)	-0.05

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ND<2 (2/24/2011)	2.4 (5/18/2010)	(2 - 2.4)/(8 - 5)	-0.133333
ND<2 (5/10/2011)	2.4 (5/18/2010)	(2 - 2.4)/(9 - 5)	-0.1
2.2 (7/28/2011)	2.4 (5/18/2010)	(2.2 - 2.4)/(10 - 5)	-0.04
2.5 (10/7/2011)	2.4 (5/18/2010)	(2.5 - 2.4)/(11 - 5)	0.0166667
2.8 (1/10/2012)	2.4 (5/18/2010)	(2.8 - 2.4)/(12 - 5)	0.0571429
3.5 (4/5/2012)	2.4 (5/18/2010)	(3.5 - 2.4)/(13 - 5)	0.1375
2.3 (12/22/2010)	2.3 (9/10/2010)	(2.3 - 2.3)/(7 - 6)	0
ND<2 (2/24/2011)	2.3 (9/10/2010)	(2 - 2.3)/(8 - 6)	-0.15
ND<2 (5/10/2011)	2.3 (9/10/2010)	(2 - 2.3)/(9 - 6)	-0.1
2.2 (7/28/2011)	2.3 (9/10/2010)	(2.2 - 2.3)/(10 - 6)	-0.025
2.5 (10/7/2011)	2.3 (9/10/2010)	(2.5 - 2.3)/(11 - 6)	0.04
2.8 (1/10/2012)	2.3 (9/10/2010)	(2.8 - 2.3)/(12 - 6)	0.0833333
3.5 (4/5/2012)	2.3 (9/10/2010)	(3.5 - 2.3)/(13 - 6)	0.171429
ND<2 (2/24/2011)	2.3 (12/22/2010)	(2 - 2.3)/(8 - 7)	-0.3
ND<2 (5/10/2011)	2.3 (12/22/2010)	(2 - 2.3)/(9 - 7)	-0.15
2.2 (7/28/2011)	2.3 (12/22/2010)	(2.2 - 2.3)/(10 - 7)	-0.0333333
2.5 (10/7/2011)	2.3 (12/22/2010)	(2.5 - 2.3)/(11 - 7)	0.05
2.8 (1/10/2012)	2.3 (12/22/2010)	(2.8 - 2.3)/(12 - 7)	0.1
3.5 (4/5/2012)	2.3 (12/22/2010)	(3.5 - 2.3)/(13 - 7)	0.2
ND<2 (5/10/2011)	ND<2 (2/24/2011)	(2 - 2)/(9 - 8)	0
2.2 (7/28/2011)	ND<2 (2/24/2011)	(2.2 - 2)/(10 - 8)	0.1
2.5 (10/7/2011)	ND<2 (2/24/2011)	(2.5 - 2)/(11 - 8)	0.166667
2.8 (1/10/2012)	ND<2 (2/24/2011)	(2.8 - 2)/(12 - 8)	0.2
3.5 (4/5/2012)	ND<2 (2/24/2011)	(3.5 - 2)/(13 - 8)	0.3
2.2 (7/28/2011)	ND<2 (5/10/2011)	(2.2 - 2)/(10 - 9)	0.2
2.5 (10/7/2011)	ND<2 (5/10/2011)	(2.5 - 2)/(11 - 9)	0.25
2.8 (1/10/2012)	ND<2 (5/10/2011)	(2.8 - 2)/(12 - 9)	0.266667
3.5 (4/5/2012)	ND<2 (5/10/2011)	(3.5 - 2)/(13 - 9)	0.375
2.5 (10/7/2011)	2.2 (7/28/2011)	(2.5 - 2.2)/(11 - 10)	0.3
2.8 (1/10/2012)	2.2 (7/28/2011)	(2.8 - 2.2)/(12 - 10)	0.3
3.5 (4/5/2012)	2.2 (7/28/2011)	(3.5 - 2.2)/(13 - 10)	0.433333
2.8 (1/10/2012)	2.5 (10/7/2011)	(2.8 - 2.5)/(12 - 11)	0.3
3.5 (4/5/2012)	2.5 (10/7/2011)	(3.5 - 2.5)/(13 - 11)	0.5
3.5 (4/5/2012)	2.8 (1/10/2012)	(3.5 - 2.8)/(13 - 12)	0.7

Number of Q values = 78

Ordered Q Values

n	Q
1	-7.3
2	-3.85
3	-2.53333
4	-1.925
5	-1.54
6	-1.33333
7	-1.14286
8	-0.975
9	-0.833333
10	-0.72

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11	-0.590909
12	-0.4
13	-0.3
14	-0.15
15	-0.15
16	-0.15
17	-0.14
18	-0.133333
19	-0.133333
20	-0.116667
21	-0.1
22	-0.1
23	-0.1
24	-0.1
25	-0.075
26	-0.0714286
27	-0.06
28	-0.05
29	-0.04
30	-0.0333333
31	-0.0285714
32	-0.025
33	-0.025
34	-0.025
35	-0.0166667
36	0
37	0
38	0
39	0
40	0
41	0.0111111
42	0.0166667
43	0.0166667
44	0.02
45	0.0285714
46	0.03
47	0.0333333
48	0.04
49	0.05
50	0.05
51	0.0545455
52	0.0571429
53	0.0625
54	0.08
55	0.0833333
56	0.1
57	0.1
58	0.1
59	0.108333
60	0.133333
61	0.1375
62	0.166667
63	0.171429
64	0.2
65	0.2
66	0.2
67	0.25

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68	0.25
69	0.266667
70	0.3
71	0.3
72	0.3
73	0.3
74	0.375
75	0.433333
76	0.5
77	0.7
78	7.8

Sen's Estimator (Median Q) is 0

Tied Group	Value	Members
1	2.2	2
2	2.3	3
3	2	2

Time Period	Observations
3/13/2009	1
4/20/2009	1
12/9/2009	1
3/17/2010	1
5/18/2010	1
9/10/2010	1
12/22/2010	1
2/24/2011	1
5/10/2011	1
7/28/2011	1
10/7/2011	1
1/10/2012	1
4/5/2012	1

There are 0 time periods with multiple data

A = 102
B = 0
C = 6
D = 0
E = 10
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 263
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 26.675
M1 = (78 - 26.675)/2.0 = 25.6625
M2 = (78 + 26.675)/2.0 + 1 = 53.3375
Lower limit is -0.0714286 = Q(26)
Upper limit is 0.0625 = Q(53)
-0.0714286 < 0 < 0.0625 indicating no trend in data.

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Sen's Slope Analysis

Parameter: Trichloroethene

Location: MW-02S

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
130 (4/20/2009)	280 (3/13/2009)	(130 - 280)/(2 - 1)	-150
250 (12/9/2009)	280 (3/13/2009)	(250 - 280)/(3 - 1)	-15
290 (3/17/2010)	280 (3/13/2009)	(290 - 280)/(4 - 1)	3.33333
210 (5/18/2010)	280 (3/13/2009)	(210 - 280)/(5 - 1)	-17.5
220 (9/10/2010)	280 (3/13/2009)	(220 - 280)/(6 - 1)	-12
240 (12/22/2010)	280 (3/13/2009)	(240 - 280)/(7 - 1)	-6.66667
240 (2/24/2011)	280 (3/13/2009)	(240 - 280)/(8 - 1)	-5.71429
250 (5/10/2011)	280 (3/13/2009)	(250 - 280)/(9 - 1)	-3.75
280 (7/28/2011)	280 (3/13/2009)	(280 - 280)/(10 - 1)	0
220 (10/7/2011)	280 (3/13/2009)	(220 - 280)/(11 - 1)	-6
190 (1/10/2012)	280 (3/13/2009)	(190 - 280)/(12 - 1)	-8.18182
210 (4/5/2012)	280 (3/13/2009)	(210 - 280)/(13 - 1)	-5.83333
250 (12/9/2009)	130 (4/20/2009)	(250 - 130)/(3 - 2)	120
290 (3/17/2010)	130 (4/20/2009)	(290 - 130)/(4 - 2)	80
210 (5/18/2010)	130 (4/20/2009)	(210 - 130)/(5 - 2)	26.6667
220 (9/10/2010)	130 (4/20/2009)	(220 - 130)/(6 - 2)	22.5
240 (12/22/2010)	130 (4/20/2009)	(240 - 130)/(7 - 2)	22
240 (2/24/2011)	130 (4/20/2009)	(240 - 130)/(8 - 2)	18.3333
250 (5/10/2011)	130 (4/20/2009)	(250 - 130)/(9 - 2)	17.1429
280 (7/28/2011)	130 (4/20/2009)	(280 - 130)/(10 - 2)	18.75
220 (10/7/2011)	130 (4/20/2009)	(220 - 130)/(11 - 2)	10
190 (1/10/2012)	130 (4/20/2009)	(190 - 130)/(12 - 2)	6
210 (4/5/2012)	130 (4/20/2009)	(210 - 130)/(13 - 2)	7.27273
290 (3/17/2010)	250 (12/9/2009)	(290 - 250)/(4 - 3)	40
210 (5/18/2010)	250 (12/9/2009)	(210 - 250)/(5 - 3)	-20
220 (9/10/2010)	250 (12/9/2009)	(220 - 250)/(6 - 3)	-10
240 (12/22/2010)	250 (12/9/2009)	(240 - 250)/(7 - 3)	-2.5
240 (2/24/2011)	250 (12/9/2009)	(240 - 250)/(8 - 3)	-2
250 (5/10/2011)	250 (12/9/2009)	(250 - 250)/(9 - 3)	0
280 (7/28/2011)	250 (12/9/2009)	(280 - 250)/(10 - 3)	4.28571
220 (10/7/2011)	250 (12/9/2009)	(220 - 250)/(11 - 3)	-3.75
190 (1/10/2012)	250 (12/9/2009)	(190 - 250)/(12 - 3)	-6.66667
210 (4/5/2012)	250 (12/9/2009)	(210 - 250)/(13 - 3)	-4
210 (5/18/2010)	290 (3/17/2010)	(210 - 290)/(5 - 4)	-80
220 (9/10/2010)	290 (3/17/2010)	(220 - 290)/(6 - 4)	-35
240 (12/22/2010)	290 (3/17/2010)	(240 - 290)/(7 - 4)	-16.6667
240 (2/24/2011)	290 (3/17/2010)	(240 - 290)/(8 - 4)	-12.5
250 (5/10/2011)	290 (3/17/2010)	(250 - 290)/(9 - 4)	-8
280 (7/28/2011)	290 (3/17/2010)	(280 - 290)/(10 - 4)	-1.66667
220 (10/7/2011)	290 (3/17/2010)	(220 - 290)/(11 - 4)	-10
190 (1/10/2012)	290 (3/17/2010)	(190 - 290)/(12 - 4)	-12.5
210 (4/5/2012)	290 (3/17/2010)	(210 - 290)/(13 - 4)	-8.88889
220 (9/10/2010)	210 (5/18/2010)	(220 - 210)/(6 - 5)	10
240 (12/22/2010)	210 (5/18/2010)	(240 - 210)/(7 - 5)	15

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240 (2/24/2011)	210 (5/18/2010)	(240 - 210)/(8 - 5)	10
250 (5/10/2011)	210 (5/18/2010)	(250 - 210)/(9 - 5)	10
280 (7/28/2011)	210 (5/18/2010)	(280 - 210)/(10 - 5)	14
220 (10/7/2011)	210 (5/18/2010)	(220 - 210)/(11 - 5)	1.66667
190 (1/10/2012)	210 (5/18/2010)	(190 - 210)/(12 - 5)	-2.85714
210 (4/5/2012)	210 (5/18/2010)	(210 - 210)/(13 - 5)	0
240 (12/22/2010)	220 (9/10/2010)	(240 - 220)/(7 - 6)	20
240 (2/24/2011)	220 (9/10/2010)	(240 - 220)/(8 - 6)	10
250 (5/10/2011)	220 (9/10/2010)	(250 - 220)/(9 - 6)	10
280 (7/28/2011)	220 (9/10/2010)	(280 - 220)/(10 - 6)	15
220 (10/7/2011)	220 (9/10/2010)	(220 - 220)/(11 - 6)	0
190 (1/10/2012)	220 (9/10/2010)	(190 - 220)/(12 - 6)	-5
210 (4/5/2012)	220 (9/10/2010)	(210 - 220)/(13 - 6)	-1.42857
240 (2/24/2011)	240 (12/22/2010)	(240 - 240)/(8 - 7)	0
250 (5/10/2011)	240 (12/22/2010)	(250 - 240)/(9 - 7)	5
280 (7/28/2011)	240 (12/22/2010)	(280 - 240)/(10 - 7)	13.3333
220 (10/7/2011)	240 (12/22/2010)	(220 - 240)/(11 - 7)	-5
190 (1/10/2012)	240 (12/22/2010)	(190 - 240)/(12 - 7)	-10
210 (4/5/2012)	240 (12/22/2010)	(210 - 240)/(13 - 7)	-5
250 (5/10/2011)	240 (2/24/2011)	(250 - 240)/(9 - 8)	10
280 (7/28/2011)	240 (2/24/2011)	(280 - 240)/(10 - 8)	20
220 (10/7/2011)	240 (2/24/2011)	(220 - 240)/(11 - 8)	-6.66667
190 (1/10/2012)	240 (2/24/2011)	(190 - 240)/(12 - 8)	-12.5
210 (4/5/2012)	240 (2/24/2011)	(210 - 240)/(13 - 8)	-6
280 (7/28/2011)	250 (5/10/2011)	(280 - 250)/(10 - 9)	30
220 (10/7/2011)	250 (5/10/2011)	(220 - 250)/(11 - 9)	-15
190 (1/10/2012)	250 (5/10/2011)	(190 - 250)/(12 - 9)	-20
210 (4/5/2012)	250 (5/10/2011)	(210 - 250)/(13 - 9)	-10
220 (10/7/2011)	280 (7/28/2011)	(220 - 280)/(11 - 10)	-60
190 (1/10/2012)	280 (7/28/2011)	(190 - 280)/(12 - 10)	-45
210 (4/5/2012)	280 (7/28/2011)	(210 - 280)/(13 - 10)	-23.3333
190 (1/10/2012)	220 (10/7/2011)	(190 - 220)/(12 - 11)	-30
210 (4/5/2012)	220 (10/7/2011)	(210 - 220)/(13 - 11)	-5
210 (4/5/2012)	190 (1/10/2012)	(210 - 190)/(13 - 12)	20

Number of Q values = 78

Ordered Q Values

n	Q
1	-150
2	-80
3	-60
4	-45
5	-35
6	-30
7	-23.3333
8	-20
9	-20
10	-17.5

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11	-16.6667
12	-15
13	-15
14	-12.5
15	-12.5
16	-12.5
17	-12
18	-10
19	-10
20	-10
21	-10
22	-8.88889
23	-8.18182
24	-8
25	-6.66667
26	-6.66667
27	-6.66667
28	-6
29	-6
30	-5.83333
31	-5.71429
32	-5
33	-5
34	-5
35	-5
36	-4
37	-3.75
38	-3.75
39	-2.85714
40	-2.5
41	-2
42	-1.66667
43	-1.42857
44	0
45	0
46	0
47	0
48	0
49	1.66667
50	3.33333
51	4.28571
52	5
53	6
54	7.27273
55	10
56	10
57	10
58	10
59	10
60	10
61	10
62	13.3333
63	14
64	15
65	15
66	17.1429
67	18.3333

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68	18.75
69	20
70	20
71	20
72	22
73	22.5
74	26.6667
75	30
76	40
77	80
78	120

Sen's Estimator (Median Q) is -2.67857

Tied Group	Value	Members
1	280	2
2	250	2
3	210	2
4	220	2
5	240	2

Time Period	Observations
3/13/2009	1
4/20/2009	1
12/9/2009	1
3/17/2010	1
5/18/2010	1
9/10/2010	1
12/22/2010	1
2/24/2011	1
5/10/2011	1
7/28/2011	1
10/7/2011	1
1/10/2012	1
4/5/2012	1

There are 0 time periods with multiple data

A = 90
B = 0
C = 0
D = 0
E = 10
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 263.667
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 26.7088
M1 = (78 - 26.7088)/2.0 = 25.6456
M2 = (78 + 26.7088)/2.0 + 1 = 53.3544
Lower limit is -6.66667 = Q(26)
Upper limit is 6 = Q(53)
-6.66667 < 0 < 6 indicating no trend in data.

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Sen's Slope Analysis

Parameter: 1,1-Dichloroethane

Location: MW-03S

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
18 (4/20/2009)	9.1 (3/13/2009)	(18 - 9.1)/(2 - 1)	8.9
46 (12/8/2009)	9.1 (3/13/2009)	(46 - 9.1)/(3 - 1)	18.45
11 (3/17/2010)	9.1 (3/13/2009)	(11 - 9.1)/(4 - 1)	0.633333
14 (5/18/2010)	9.1 (3/13/2009)	(14 - 9.1)/(5 - 1)	1.225
29 (9/10/2010)	9.1 (3/13/2009)	(29 - 9.1)/(6 - 1)	3.98
32 (12/22/2010)	9.1 (3/13/2009)	(32 - 9.1)/(7 - 1)	3.81667
33 (2/25/2011)	9.1 (3/13/2009)	(33 - 9.1)/(8 - 1)	3.41429
25 (5/10/2011)	9.1 (3/13/2009)	(25 - 9.1)/(9 - 1)	1.9875
23 (7/28/2011)	9.1 (3/13/2009)	(23 - 9.1)/(10 - 1)	1.54444
24 (10/6/2011)	9.1 (3/13/2009)	(24 - 9.1)/(11 - 1)	1.49
22 (1/10/2012)	9.1 (3/13/2009)	(22 - 9.1)/(12 - 1)	1.17273
ND<20 (4/4/2012)	9.1 (3/13/2009)	(20 - 9.1)/(13 - 1)	0.908333
46 (12/8/2009)	18 (4/20/2009)	(46 - 18)/(3 - 2)	28
11 (3/17/2010)	18 (4/20/2009)	(11 - 18)/(4 - 2)	-3.5
14 (5/18/2010)	18 (4/20/2009)	(14 - 18)/(5 - 2)	-1.33333
29 (9/10/2010)	18 (4/20/2009)	(29 - 18)/(6 - 2)	2.75
32 (12/22/2010)	18 (4/20/2009)	(32 - 18)/(7 - 2)	2.8
33 (2/25/2011)	18 (4/20/2009)	(33 - 18)/(8 - 2)	2.5
25 (5/10/2011)	18 (4/20/2009)	(25 - 18)/(9 - 2)	1
23 (7/28/2011)	18 (4/20/2009)	(23 - 18)/(10 - 2)	0.625
24 (10/6/2011)	18 (4/20/2009)	(24 - 18)/(11 - 2)	0.666667
22 (1/10/2012)	18 (4/20/2009)	(22 - 18)/(12 - 2)	0.4
ND<20 (4/4/2012)	18 (4/20/2009)	(20 - 18)/(13 - 2)	0.181818
11 (3/17/2010)	46 (12/8/2009)	(11 - 46)/(4 - 3)	-35
14 (5/18/2010)	46 (12/8/2009)	(14 - 46)/(5 - 3)	-16
29 (9/10/2010)	46 (12/8/2009)	(29 - 46)/(6 - 3)	-5.66667
32 (12/22/2010)	46 (12/8/2009)	(32 - 46)/(7 - 3)	-3.5
33 (2/25/2011)	46 (12/8/2009)	(33 - 46)/(8 - 3)	-2.6
25 (5/10/2011)	46 (12/8/2009)	(25 - 46)/(9 - 3)	-3.5
23 (7/28/2011)	46 (12/8/2009)	(23 - 46)/(10 - 3)	-3.28571
24 (10/6/2011)	46 (12/8/2009)	(24 - 46)/(11 - 3)	-2.75
22 (1/10/2012)	46 (12/8/2009)	(22 - 46)/(12 - 3)	-2.66667
ND<20 (4/4/2012)	46 (12/8/2009)	(20 - 46)/(13 - 3)	-2.6
14 (5/18/2010)	11 (3/17/2010)	(14 - 11)/(5 - 4)	3
29 (9/10/2010)	11 (3/17/2010)	(29 - 11)/(6 - 4)	9
32 (12/22/2010)	11 (3/17/2010)	(32 - 11)/(7 - 4)	7
33 (2/25/2011)	11 (3/17/2010)	(33 - 11)/(8 - 4)	5.5
25 (5/10/2011)	11 (3/17/2010)	(25 - 11)/(9 - 4)	2.8
23 (7/28/2011)	11 (3/17/2010)	(23 - 11)/(10 - 4)	2
24 (10/6/2011)	11 (3/17/2010)	(24 - 11)/(11 - 4)	1.85714
22 (1/10/2012)	11 (3/17/2010)	(22 - 11)/(12 - 4)	1.375
ND<20 (4/4/2012)	11 (3/17/2010)	(20 - 11)/(13 - 4)	1
29 (9/10/2010)	14 (5/18/2010)	(29 - 14)/(6 - 5)	15
32 (12/22/2010)	14 (5/18/2010)	(32 - 14)/(7 - 5)	9

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33 (2/25/2011)	14 (5/18/2010)	(33 - 14)/(8 - 5)	6.33333
25 (5/10/2011)	14 (5/18/2010)	(25 - 14)/(9 - 5)	2.75
23 (7/28/2011)	14 (5/18/2010)	(23 - 14)/(10 - 5)	1.8
24 (10/6/2011)	14 (5/18/2010)	(24 - 14)/(11 - 5)	1.66667
22 (1/10/2012)	14 (5/18/2010)	(22 - 14)/(12 - 5)	1.14286
ND<20 (4/4/2012)	14 (5/18/2010)	(20 - 14)/(13 - 5)	0.75
32 (12/22/2010)	29 (9/10/2010)	(32 - 29)/(7 - 6)	3
33 (2/25/2011)	29 (9/10/2010)	(33 - 29)/(8 - 6)	2
25 (5/10/2011)	29 (9/10/2010)	(25 - 29)/(9 - 6)	-1.33333
23 (7/28/2011)	29 (9/10/2010)	(23 - 29)/(10 - 6)	-1.5
24 (10/6/2011)	29 (9/10/2010)	(24 - 29)/(11 - 6)	-1
22 (1/10/2012)	29 (9/10/2010)	(22 - 29)/(12 - 6)	-1.16667
ND<20 (4/4/2012)	29 (9/10/2010)	(20 - 29)/(13 - 6)	-1.28571
33 (2/25/2011)	32 (12/22/2010)	(33 - 32)/(8 - 7)	1
25 (5/10/2011)	32 (12/22/2010)	(25 - 32)/(9 - 7)	-3.5
23 (7/28/2011)	32 (12/22/2010)	(23 - 32)/(10 - 7)	-3
24 (10/6/2011)	32 (12/22/2010)	(24 - 32)/(11 - 7)	-2
22 (1/10/2012)	32 (12/22/2010)	(22 - 32)/(12 - 7)	-2
ND<20 (4/4/2012)	32 (12/22/2010)	(20 - 32)/(13 - 7)	-2
25 (5/10/2011)	33 (2/25/2011)	(25 - 33)/(9 - 8)	-8
23 (7/28/2011)	33 (2/25/2011)	(23 - 33)/(10 - 8)	-5
24 (10/6/2011)	33 (2/25/2011)	(24 - 33)/(11 - 8)	-3
22 (1/10/2012)	33 (2/25/2011)	(22 - 33)/(12 - 8)	-2.75
ND<20 (4/4/2012)	33 (2/25/2011)	(20 - 33)/(13 - 8)	-2.6
23 (7/28/2011)	25 (5/10/2011)	(23 - 25)/(10 - 9)	-2
24 (10/6/2011)	25 (5/10/2011)	(24 - 25)/(11 - 9)	-0.5
22 (1/10/2012)	25 (5/10/2011)	(22 - 25)/(12 - 9)	-1
ND<20 (4/4/2012)	25 (5/10/2011)	(20 - 25)/(13 - 9)	-1.25
24 (10/6/2011)	23 (7/28/2011)	(24 - 23)/(11 - 10)	1
22 (1/10/2012)	23 (7/28/2011)	(22 - 23)/(12 - 10)	-0.5
ND<20 (4/4/2012)	23 (7/28/2011)	(20 - 23)/(13 - 10)	-1
22 (1/10/2012)	24 (10/6/2011)	(22 - 24)/(12 - 11)	-2
ND<20 (4/4/2012)	24 (10/6/2011)	(20 - 24)/(13 - 11)	-2
ND<20 (4/4/2012)	22 (1/10/2012)	(20 - 22)/(13 - 12)	-2

Number of Q values = 78

Ordered Q Values

n	Q
1	-35
2	-16
3	-8
4	-5.66667
5	-5
6	-3.5
7	-3.5
8	-3.5
9	-3.5
10	-3.28571

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11	-3
12	-3
13	-2.75
14	-2.75
15	-2.66667
16	-2.6
17	-2.6
18	-2.6
19	-2
20	-2
21	-2
22	-2
23	-2
24	-2
25	-2
26	-1.5
27	-1.33333
28	-1.33333
29	-1.28571
30	-1.25
31	-1.16667
32	-1
33	-1
34	-1
35	-0.5
36	-0.5
37	0.181818
38	0.4
39	0.625
40	0.633333
41	0.666667
42	0.75
43	0.908333
44	1
45	1
46	1
47	1
48	1.14286
49	1.17273
50	1.225
51	1.375
52	1.49
53	1.54444
54	1.66667
55	1.8
56	1.85714
57	1.9875
58	2
59	2
60	2.5
61	2.75
62	2.75
63	2.8
64	2.8
65	3
66	3
67	3.41429

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68	3.81667
69	3.98
70	5.5
71	6.33333
72	7
73	8.9
74	9
75	9
76	15
77	18.45
78	28

Sen's Estimator (Median Q) is 0.629167

Time Period	Observations
3/13/2009	1
4/20/2009	1
12/8/2009	1
3/17/2010	1
5/18/2010	1
9/10/2010	1
12/22/2010	1
2/25/2011	1
5/10/2011	1
7/28/2011	1
10/6/2011	1
1/10/2012	1
4/4/2012	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 268.667
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 26.9609
M1 = (78 - 26.9609)/2.0 = 25.5196
M2 = (78 + 26.9609)/2.0 + 1 = 53.4804
Lower limit is -1.5 = Q(26)
Upper limit is 1.54444 = Q(53)
-1.5 < 0 < 1.54444 indicating no trend in data.

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Sen's Slope Analysis

Parameter: cis-1,2-Dichloroethene
Location: MW-03S

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
490 (4/20/2009)	240 (3/13/2009)	(490 - 240)/(2 - 1)	250
2200 (12/8/2009)	240 (3/13/2009)	(2200 - 240)/(3 - 1)	980
460 (3/17/2010)	240 (3/13/2009)	(460 - 240)/(4 - 1)	73.3333
630 (5/18/2010)	240 (3/13/2009)	(630 - 240)/(5 - 1)	97.5
1600 (9/10/2010)	240 (3/13/2009)	(1600 - 240)/(6 - 1)	272
1800 (12/22/2010)	240 (3/13/2009)	(1800 - 240)/(7 - 1)	260
2200 (2/25/2011)	240 (3/13/2009)	(2200 - 240)/(8 - 1)	280
1600 (5/10/2011)	240 (3/13/2009)	(1600 - 240)/(9 - 1)	170
1700 (7/28/2011)	240 (3/13/2009)	(1700 - 240)/(10 - 1)	162.222
2100 (10/6/2011)	240 (3/13/2009)	(2100 - 240)/(11 - 1)	186
1300 (1/10/2012)	240 (3/13/2009)	(1300 - 240)/(12 - 1)	96.3636
1600 (4/4/2012)	240 (3/13/2009)	(1600 - 240)/(13 - 1)	113.333
2200 (12/8/2009)	490 (4/20/2009)	(2200 - 490)/(3 - 2)	1710
460 (3/17/2010)	490 (4/20/2009)	(460 - 490)/(4 - 2)	-15
630 (5/18/2010)	490 (4/20/2009)	(630 - 490)/(5 - 2)	46.6667
1600 (9/10/2010)	490 (4/20/2009)	(1600 - 490)/(6 - 2)	277.5
1800 (12/22/2010)	490 (4/20/2009)	(1800 - 490)/(7 - 2)	262
2200 (2/25/2011)	490 (4/20/2009)	(2200 - 490)/(8 - 2)	285
1600 (5/10/2011)	490 (4/20/2009)	(1600 - 490)/(9 - 2)	158.571
1700 (7/28/2011)	490 (4/20/2009)	(1700 - 490)/(10 - 2)	151.25
2100 (10/6/2011)	490 (4/20/2009)	(2100 - 490)/(11 - 2)	178.889
1300 (1/10/2012)	490 (4/20/2009)	(1300 - 490)/(12 - 2)	81
1600 (4/4/2012)	490 (4/20/2009)	(1600 - 490)/(13 - 2)	100.909
460 (3/17/2010)	2200 (12/8/2009)	(460 - 2200)/(4 - 3)	-1740
630 (5/18/2010)	2200 (12/8/2009)	(630 - 2200)/(5 - 3)	-785
1600 (9/10/2010)	2200 (12/8/2009)	(1600 - 2200)/(6 - 3)	-200
1800 (12/22/2010)	2200 (12/8/2009)	(1800 - 2200)/(7 - 3)	-100
2200 (2/25/2011)	2200 (12/8/2009)	(2200 - 2200)/(8 - 3)	0
1600 (5/10/2011)	2200 (12/8/2009)	(1600 - 2200)/(9 - 3)	-100
1700 (7/28/2011)	2200 (12/8/2009)	(1700 - 2200)/(10 - 3)	-71.4286
2100 (10/6/2011)	2200 (12/8/2009)	(2100 - 2200)/(11 - 3)	-12.5
1300 (1/10/2012)	2200 (12/8/2009)	(1300 - 2200)/(12 - 3)	-100
1600 (4/4/2012)	2200 (12/8/2009)	(1600 - 2200)/(13 - 3)	-60
630 (5/18/2010)	460 (3/17/2010)	(630 - 460)/(5 - 4)	170
1600 (9/10/2010)	460 (3/17/2010)	(1600 - 460)/(6 - 4)	570
1800 (12/22/2010)	460 (3/17/2010)	(1800 - 460)/(7 - 4)	446.667
2200 (2/25/2011)	460 (3/17/2010)	(2200 - 460)/(8 - 4)	435
1600 (5/10/2011)	460 (3/17/2010)	(1600 - 460)/(9 - 4)	228
1700 (7/28/2011)	460 (3/17/2010)	(1700 - 460)/(10 - 4)	206.667
2100 (10/6/2011)	460 (3/17/2010)	(2100 - 460)/(11 - 4)	234.286
1300 (1/10/2012)	460 (3/17/2010)	(1300 - 460)/(12 - 4)	105
1600 (4/4/2012)	460 (3/17/2010)	(1600 - 460)/(13 - 4)	126.667
1600 (9/10/2010)	630 (5/18/2010)	(1600 - 630)/(6 - 5)	970
1800 (12/22/2010)	630 (5/18/2010)	(1800 - 630)/(7 - 5)	585

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2200 (2/25/2011)	630 (5/18/2010)	(2200 - 630)/(8 - 5)	523.333
1600 (5/10/2011)	630 (5/18/2010)	(1600 - 630)/(9 - 5)	242.5
1700 (7/28/2011)	630 (5/18/2010)	(1700 - 630)/(10 - 5)	214
2100 (10/6/2011)	630 (5/18/2010)	(2100 - 630)/(11 - 5)	245
1300 (1/10/2012)	630 (5/18/2010)	(1300 - 630)/(12 - 5)	95.7143
1600 (4/4/2012)	630 (5/18/2010)	(1600 - 630)/(13 - 5)	121.25
1800 (12/22/2010)	1600 (9/10/2010)	(1800 - 1600)/(7 - 6)	200
2200 (2/25/2011)	1600 (9/10/2010)	(2200 - 1600)/(8 - 6)	300
1600 (5/10/2011)	1600 (9/10/2010)	(1600 - 1600)/(9 - 6)	0
1700 (7/28/2011)	1600 (9/10/2010)	(1700 - 1600)/(10 - 6)	25
2100 (10/6/2011)	1600 (9/10/2010)	(2100 - 1600)/(11 - 6)	100
1300 (1/10/2012)	1600 (9/10/2010)	(1300 - 1600)/(12 - 6)	-50
1600 (4/4/2012)	1600 (9/10/2010)	(1600 - 1600)/(13 - 6)	0
2200 (2/25/2011)	1800 (12/22/2010)	(2200 - 1800)/(8 - 7)	400
1600 (5/10/2011)	1800 (12/22/2010)	(1600 - 1800)/(9 - 7)	-100
1700 (7/28/2011)	1800 (12/22/2010)	(1700 - 1800)/(10 - 7)	-33.3333
2100 (10/6/2011)	1800 (12/22/2010)	(2100 - 1800)/(11 - 7)	75
1300 (1/10/2012)	1800 (12/22/2010)	(1300 - 1800)/(12 - 7)	-100
1600 (4/4/2012)	1800 (12/22/2010)	(1600 - 1800)/(13 - 7)	-33.3333
1600 (5/10/2011)	2200 (2/25/2011)	(1600 - 2200)/(9 - 8)	-600
1700 (7/28/2011)	2200 (2/25/2011)	(1700 - 2200)/(10 - 8)	-250
2100 (10/6/2011)	2200 (2/25/2011)	(2100 - 2200)/(11 - 8)	-33.3333
1300 (1/10/2012)	2200 (2/25/2011)	(1300 - 2200)/(12 - 8)	-225
1600 (4/4/2012)	2200 (2/25/2011)	(1600 - 2200)/(13 - 8)	-120
1700 (7/28/2011)	1600 (5/10/2011)	(1700 - 1600)/(10 - 9)	100
2100 (10/6/2011)	1600 (5/10/2011)	(2100 - 1600)/(11 - 9)	250
1300 (1/10/2012)	1600 (5/10/2011)	(1300 - 1600)/(12 - 9)	-100
1600 (4/4/2012)	1600 (5/10/2011)	(1600 - 1600)/(13 - 9)	0
2100 (10/6/2011)	1700 (7/28/2011)	(2100 - 1700)/(11 - 10)	400
1300 (1/10/2012)	1700 (7/28/2011)	(1300 - 1700)/(12 - 10)	-200
1600 (4/4/2012)	1700 (7/28/2011)	(1600 - 1700)/(13 - 10)	-33.3333
1300 (1/10/2012)	2100 (10/6/2011)	(1300 - 2100)/(12 - 11)	-800
1600 (4/4/2012)	2100 (10/6/2011)	(1600 - 2100)/(13 - 11)	-250
1600 (4/4/2012)	1300 (1/10/2012)	(1600 - 1300)/(13 - 12)	300

Number of Q values = 78

Ordered Q Values

n	Q
1	-1740
2	-800
3	-785
4	-600
5	-250
6	-250
7	-225
8	-200
9	-200
10	-120

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11	-100
12	-100
13	-100
14	-100
15	-100
16	-100
17	-71.4286
18	-60
19	-50
20	-33.3333
21	-33.3333
22	-33.3333
23	-33.3333
24	-15
25	-12.5
26	0
27	0
28	0
29	0
30	25
31	46.6667
32	73.3333
33	75
34	81
35	95.7143
36	96.3636
37	97.5
38	100
39	100
40	100.909
41	105
42	113.333
43	121.25
44	126.667
45	151.25
46	158.571
47	162.222
48	170
49	170
50	178.889
51	186
52	200
53	206.667
54	214
55	228
56	234.286
57	242.5
58	245
59	250
60	250
61	260
62	262
63	272
64	277.5
65	280
66	285
67	300

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68	300
69	400
70	400
71	435
72	446.667
73	523.333
74	570
75	585
76	970
77	980
78	1710

Sen's Estimator (Median Q) is 100.455

Tied Group	Value	Members
1	2200	2
2	1600	3

Time Period	Observations
3/13/2009	1
4/20/2009	1
12/8/2009	1
3/17/2010	1
5/18/2010	1
9/10/2010	1
12/22/2010	1
2/25/2011	1
5/10/2011	1
7/28/2011	1
10/6/2011	1
1/10/2012	1
4/4/2012	1

There are 0 time periods with multiple data

A = 84
B = 0
C = 6
D = 0
E = 8
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 264
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 26.7257
M1 = (78 - 26.7257)/2.0 = 25.6372
M2 = (78 + 26.7257)/2.0 + 1 = 53.3628
Lower limit is 0 = Q(26)
Upper limit is 206.667 = Q(53)
0 < 0 < 206.667 indicating no trend in data.

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Sen's Slope Analysis

Parameter: trans-1,2-Dichloroethene
Location: MW-03S

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
18 (4/20/2009)	9.1 (3/13/2009)	(18 - 9.1)/(2 - 1)	8.9
83 (12/8/2009)	9.1 (3/13/2009)	(83 - 9.1)/(3 - 1)	36.95
17 (3/17/2010)	9.1 (3/13/2009)	(17 - 9.1)/(4 - 1)	2.63333
24 (5/18/2010)	9.1 (3/13/2009)	(24 - 9.1)/(5 - 1)	3.725
63 (9/10/2010)	9.1 (3/13/2009)	(63 - 9.1)/(6 - 1)	10.78
82 (12/22/2010)	9.1 (3/13/2009)	(82 - 9.1)/(7 - 1)	12.15
110 (2/25/2011)	9.1 (3/13/2009)	(110 - 9.1)/(8 - 1)	14.4143
77 (5/10/2011)	9.1 (3/13/2009)	(77 - 9.1)/(9 - 1)	8.4875
78 (7/28/2011)	9.1 (3/13/2009)	(78 - 9.1)/(10 - 1)	7.65556
100 (10/6/2011)	9.1 (3/13/2009)	(100 - 9.1)/(11 - 1)	9.09
81 (1/10/2012)	9.1 (3/13/2009)	(81 - 9.1)/(12 - 1)	6.53636
84 (4/4/2012)	9.1 (3/13/2009)	(84 - 9.1)/(13 - 1)	6.24167
83 (12/8/2009)	18 (4/20/2009)	(83 - 18)/(3 - 2)	65
17 (3/17/2010)	18 (4/20/2009)	(17 - 18)/(4 - 2)	-0.5
24 (5/18/2010)	18 (4/20/2009)	(24 - 18)/(5 - 2)	2
63 (9/10/2010)	18 (4/20/2009)	(63 - 18)/(6 - 2)	11.25
82 (12/22/2010)	18 (4/20/2009)	(82 - 18)/(7 - 2)	12.8
110 (2/25/2011)	18 (4/20/2009)	(110 - 18)/(8 - 2)	15.3333
77 (5/10/2011)	18 (4/20/2009)	(77 - 18)/(9 - 2)	8.42857
78 (7/28/2011)	18 (4/20/2009)	(78 - 18)/(10 - 2)	7.5
100 (10/6/2011)	18 (4/20/2009)	(100 - 18)/(11 - 2)	9.11111
81 (1/10/2012)	18 (4/20/2009)	(81 - 18)/(12 - 2)	6.3
84 (4/4/2012)	18 (4/20/2009)	(84 - 18)/(13 - 2)	6
17 (3/17/2010)	83 (12/8/2009)	(17 - 83)/(4 - 3)	-66
24 (5/18/2010)	83 (12/8/2009)	(24 - 83)/(5 - 3)	-29.5
63 (9/10/2010)	83 (12/8/2009)	(63 - 83)/(6 - 3)	-6.66667
82 (12/22/2010)	83 (12/8/2009)	(82 - 83)/(7 - 3)	-0.25
110 (2/25/2011)	83 (12/8/2009)	(110 - 83)/(8 - 3)	5.4
77 (5/10/2011)	83 (12/8/2009)	(77 - 83)/(9 - 3)	-1
78 (7/28/2011)	83 (12/8/2009)	(78 - 83)/(10 - 3)	-0.714286
100 (10/6/2011)	83 (12/8/2009)	(100 - 83)/(11 - 3)	2.125
81 (1/10/2012)	83 (12/8/2009)	(81 - 83)/(12 - 3)	-0.222222
84 (4/4/2012)	83 (12/8/2009)	(84 - 83)/(13 - 3)	0.1
24 (5/18/2010)	17 (3/17/2010)	(24 - 17)/(5 - 4)	7
63 (9/10/2010)	17 (3/17/2010)	(63 - 17)/(6 - 4)	23
82 (12/22/2010)	17 (3/17/2010)	(82 - 17)/(7 - 4)	21.6667
110 (2/25/2011)	17 (3/17/2010)	(110 - 17)/(8 - 4)	23.25
77 (5/10/2011)	17 (3/17/2010)	(77 - 17)/(9 - 4)	12
78 (7/28/2011)	17 (3/17/2010)	(78 - 17)/(10 - 4)	10.1667
100 (10/6/2011)	17 (3/17/2010)	(100 - 17)/(11 - 4)	11.8571
81 (1/10/2012)	17 (3/17/2010)	(81 - 17)/(12 - 4)	8
84 (4/4/2012)	17 (3/17/2010)	(84 - 17)/(13 - 4)	7.44444
63 (9/10/2010)	24 (5/18/2010)	(63 - 24)/(6 - 5)	39
82 (12/22/2010)	24 (5/18/2010)	(82 - 24)/(7 - 5)	29

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110 (2/25/2011)	24 (5/18/2010)	(110 - 24)/(8 - 5)	28.6667
77 (5/10/2011)	24 (5/18/2010)	(77 - 24)/(9 - 5)	13.25
78 (7/28/2011)	24 (5/18/2010)	(78 - 24)/(10 - 5)	10.8
100 (10/6/2011)	24 (5/18/2010)	(100 - 24)/(11 - 5)	12.6667
81 (1/10/2012)	24 (5/18/2010)	(81 - 24)/(12 - 5)	8.14286
84 (4/4/2012)	24 (5/18/2010)	(84 - 24)/(13 - 5)	7.5
82 (12/22/2010)	63 (9/10/2010)	(82 - 63)/(7 - 6)	19
110 (2/25/2011)	63 (9/10/2010)	(110 - 63)/(8 - 6)	23.5
77 (5/10/2011)	63 (9/10/2010)	(77 - 63)/(9 - 6)	4.66667
78 (7/28/2011)	63 (9/10/2010)	(78 - 63)/(10 - 6)	3.75
100 (10/6/2011)	63 (9/10/2010)	(100 - 63)/(11 - 6)	7.4
81 (1/10/2012)	63 (9/10/2010)	(81 - 63)/(12 - 6)	3
84 (4/4/2012)	63 (9/10/2010)	(84 - 63)/(13 - 6)	3
110 (2/25/2011)	82 (12/22/2010)	(110 - 82)/(8 - 7)	28
77 (5/10/2011)	82 (12/22/2010)	(77 - 82)/(9 - 7)	-2.5
78 (7/28/2011)	82 (12/22/2010)	(78 - 82)/(10 - 7)	-1.33333
100 (10/6/2011)	82 (12/22/2010)	(100 - 82)/(11 - 7)	4.5
81 (1/10/2012)	82 (12/22/2010)	(81 - 82)/(12 - 7)	-0.2
84 (4/4/2012)	82 (12/22/2010)	(84 - 82)/(13 - 7)	0.333333
77 (5/10/2011)	110 (2/25/2011)	(77 - 110)/(9 - 8)	-33
78 (7/28/2011)	110 (2/25/2011)	(78 - 110)/(10 - 8)	-16
100 (10/6/2011)	110 (2/25/2011)	(100 - 110)/(11 - 8)	-3.33333
81 (1/10/2012)	110 (2/25/2011)	(81 - 110)/(12 - 8)	-7.25
84 (4/4/2012)	110 (2/25/2011)	(84 - 110)/(13 - 8)	-5.2
78 (7/28/2011)	77 (5/10/2011)	(78 - 77)/(10 - 9)	1
100 (10/6/2011)	77 (5/10/2011)	(100 - 77)/(11 - 9)	11.5
81 (1/10/2012)	77 (5/10/2011)	(81 - 77)/(12 - 9)	1.33333
84 (4/4/2012)	77 (5/10/2011)	(84 - 77)/(13 - 9)	1.75
100 (10/6/2011)	78 (7/28/2011)	(100 - 78)/(11 - 10)	22
81 (1/10/2012)	78 (7/28/2011)	(81 - 78)/(12 - 10)	1.5
84 (4/4/2012)	78 (7/28/2011)	(84 - 78)/(13 - 10)	2
81 (1/10/2012)	100 (10/6/2011)	(81 - 100)/(12 - 11)	-19
84 (4/4/2012)	100 (10/6/2011)	(84 - 100)/(13 - 11)	-8
84 (4/4/2012)	81 (1/10/2012)	(84 - 81)/(13 - 12)	3

Number of Q values = 78

Ordered Q Values

n	Q
1	-66
2	-33
3	-29.5
4	-19
5	-16
6	-8
7	-7.25
8	-6.66667
9	-5.2
10	-3.33333

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11	-2.5
12	-1.33333
13	-1
14	-0.714286
15	-0.5
16	-0.25
17	-0.222222
18	-0.2
19	0.1
20	0.333333
21	1
22	1.33333
23	1.5
24	1.75
25	2
26	2
27	2.125
28	2.63333
29	3
30	3
31	3
32	3.725
33	3.75
34	4.5
35	4.66667
36	5.4
37	6
38	6.24167
39	6.3
40	6.53636
41	7
42	7.4
43	7.44444
44	7.5
45	7.5
46	7.65556
47	8
48	8.14286
49	8.42857
50	8.4875
51	8.9
52	9.09
53	9.11111
54	10.1667
55	10.78
56	10.8
57	11.25
58	11.5
59	11.8571
60	12
61	12.15
62	12.6667
63	12.8
64	13.25
65	14.4143
66	15.3333
67	19

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68	21.6667
69	22
70	23
71	23.25
72	23.5
73	28
74	28.6667
75	29
76	36.95
77	39
78	65

Sen's Estimator (Median Q) is 6.41818

Time Period	Observations
3/13/2009	1
4/20/2009	1
12/8/2009	1
3/17/2010	1
5/18/2010	1
9/10/2010	1
12/22/2010	1
2/25/2011	1
5/10/2011	1
7/28/2011	1
10/6/2011	1
1/10/2012	1
4/4/2012	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 268.667
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 26.9609
M1 = (78 - 26.9609)/2.0 = 25.5196
M2 = (78 + 26.9609)/2.0 + 1 = 53.4804
Lower limit is 2 = Q(26)
Upper limit is 9.11111 = Q(53)
2 > 0 indicating an upward trend in data.

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Sen's Slope Analysis

Parameter: Vinyl chloride
Location: MW-03S

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
210 (4/20/2009)	140 (3/13/2009)	(210 - 140)/(2 - 1)	70
130 (12/8/2009)	140 (3/13/2009)	(130 - 140)/(3 - 1)	-5
42 (3/17/2010)	140 (3/13/2009)	(42 - 140)/(4 - 1)	-32.6667
34 (5/18/2010)	140 (3/13/2009)	(34 - 140)/(5 - 1)	-26.5
83 (9/10/2010)	140 (3/13/2009)	(83 - 140)/(6 - 1)	-11.4
70 (12/22/2010)	140 (3/13/2009)	(70 - 140)/(7 - 1)	-11.6667
75 (2/25/2011)	140 (3/13/2009)	(75 - 140)/(8 - 1)	-9.28571
52 (5/10/2011)	140 (3/13/2009)	(52 - 140)/(9 - 1)	-11
65 (7/28/2011)	140 (3/13/2009)	(65 - 140)/(10 - 1)	-8.33333
91 (10/6/2011)	140 (3/13/2009)	(91 - 140)/(11 - 1)	-4.9
51 (1/10/2012)	140 (3/13/2009)	(51 - 140)/(12 - 1)	-8.09091
170 (4/4/2012)	140 (3/13/2009)	(170 - 140)/(13 - 1)	2.5
130 (12/8/2009)	210 (4/20/2009)	(130 - 210)/(3 - 2)	-80
42 (3/17/2010)	210 (4/20/2009)	(42 - 210)/(4 - 2)	-84
34 (5/18/2010)	210 (4/20/2009)	(34 - 210)/(5 - 2)	-58.6667
83 (9/10/2010)	210 (4/20/2009)	(83 - 210)/(6 - 2)	-31.75
70 (12/22/2010)	210 (4/20/2009)	(70 - 210)/(7 - 2)	-28
75 (2/25/2011)	210 (4/20/2009)	(75 - 210)/(8 - 2)	-22.5
52 (5/10/2011)	210 (4/20/2009)	(52 - 210)/(9 - 2)	-22.5714
65 (7/28/2011)	210 (4/20/2009)	(65 - 210)/(10 - 2)	-18.125
91 (10/6/2011)	210 (4/20/2009)	(91 - 210)/(11 - 2)	-13.2222
51 (1/10/2012)	210 (4/20/2009)	(51 - 210)/(12 - 2)	-15.9
170 (4/4/2012)	210 (4/20/2009)	(170 - 210)/(13 - 2)	-3.63636
42 (3/17/2010)	130 (12/8/2009)	(42 - 130)/(4 - 3)	-88
34 (5/18/2010)	130 (12/8/2009)	(34 - 130)/(5 - 3)	-48
83 (9/10/2010)	130 (12/8/2009)	(83 - 130)/(6 - 3)	-15.6667
70 (12/22/2010)	130 (12/8/2009)	(70 - 130)/(7 - 3)	-15
75 (2/25/2011)	130 (12/8/2009)	(75 - 130)/(8 - 3)	-11
52 (5/10/2011)	130 (12/8/2009)	(52 - 130)/(9 - 3)	-13
65 (7/28/2011)	130 (12/8/2009)	(65 - 130)/(10 - 3)	-9.28571
91 (10/6/2011)	130 (12/8/2009)	(91 - 130)/(11 - 3)	-4.875
51 (1/10/2012)	130 (12/8/2009)	(51 - 130)/(12 - 3)	-8.77778
170 (4/4/2012)	130 (12/8/2009)	(170 - 130)/(13 - 3)	4
34 (5/18/2010)	42 (3/17/2010)	(34 - 42)/(5 - 4)	-8
83 (9/10/2010)	42 (3/17/2010)	(83 - 42)/(6 - 4)	20.5
70 (12/22/2010)	42 (3/17/2010)	(70 - 42)/(7 - 4)	9.33333
75 (2/25/2011)	42 (3/17/2010)	(75 - 42)/(8 - 4)	8.25
52 (5/10/2011)	42 (3/17/2010)	(52 - 42)/(9 - 4)	2
65 (7/28/2011)	42 (3/17/2010)	(65 - 42)/(10 - 4)	3.83333
91 (10/6/2011)	42 (3/17/2010)	(91 - 42)/(11 - 4)	7
51 (1/10/2012)	42 (3/17/2010)	(51 - 42)/(12 - 4)	1.125
170 (4/4/2012)	42 (3/17/2010)	(170 - 42)/(13 - 4)	14.2222
83 (9/10/2010)	34 (5/18/2010)	(83 - 34)/(6 - 5)	49
70 (12/22/2010)	34 (5/18/2010)	(70 - 34)/(7 - 5)	18

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75 (2/25/2011)	34 (5/18/2010)	(75 - 34)/(8 - 5)	13.6667
52 (5/10/2011)	34 (5/18/2010)	(52 - 34)/(9 - 5)	4.5
65 (7/28/2011)	34 (5/18/2010)	(65 - 34)/(10 - 5)	6.2
91 (10/6/2011)	34 (5/18/2010)	(91 - 34)/(11 - 5)	9.5
51 (1/10/2012)	34 (5/18/2010)	(51 - 34)/(12 - 5)	2.42857
170 (4/4/2012)	34 (5/18/2010)	(170 - 34)/(13 - 5)	17
70 (12/22/2010)	83 (9/10/2010)	(70 - 83)/(7 - 6)	-13
75 (2/25/2011)	83 (9/10/2010)	(75 - 83)/(8 - 6)	-4
52 (5/10/2011)	83 (9/10/2010)	(52 - 83)/(9 - 6)	-10.3333
65 (7/28/2011)	83 (9/10/2010)	(65 - 83)/(10 - 6)	-4.5
91 (10/6/2011)	83 (9/10/2010)	(91 - 83)/(11 - 6)	1.6
51 (1/10/2012)	83 (9/10/2010)	(51 - 83)/(12 - 6)	-5.33333
170 (4/4/2012)	83 (9/10/2010)	(170 - 83)/(13 - 6)	12.4286
75 (2/25/2011)	70 (12/22/2010)	(75 - 70)/(8 - 7)	5
52 (5/10/2011)	70 (12/22/2010)	(52 - 70)/(9 - 7)	-9
65 (7/28/2011)	70 (12/22/2010)	(65 - 70)/(10 - 7)	-1.66667
91 (10/6/2011)	70 (12/22/2010)	(91 - 70)/(11 - 7)	5.25
51 (1/10/2012)	70 (12/22/2010)	(51 - 70)/(12 - 7)	-3.8
170 (4/4/2012)	70 (12/22/2010)	(170 - 70)/(13 - 7)	16.6667
52 (5/10/2011)	75 (2/25/2011)	(52 - 75)/(9 - 8)	-23
65 (7/28/2011)	75 (2/25/2011)	(65 - 75)/(10 - 8)	-5
91 (10/6/2011)	75 (2/25/2011)	(91 - 75)/(11 - 8)	5.33333
51 (1/10/2012)	75 (2/25/2011)	(51 - 75)/(12 - 8)	-6
170 (4/4/2012)	75 (2/25/2011)	(170 - 75)/(13 - 8)	19
65 (7/28/2011)	52 (5/10/2011)	(65 - 52)/(10 - 9)	13
91 (10/6/2011)	52 (5/10/2011)	(91 - 52)/(11 - 9)	19.5
51 (1/10/2012)	52 (5/10/2011)	(51 - 52)/(12 - 9)	-0.333333
170 (4/4/2012)	52 (5/10/2011)	(170 - 52)/(13 - 9)	29.5
91 (10/6/2011)	65 (7/28/2011)	(91 - 65)/(11 - 10)	26
51 (1/10/2012)	65 (7/28/2011)	(51 - 65)/(12 - 10)	-7
170 (4/4/2012)	65 (7/28/2011)	(170 - 65)/(13 - 10)	35
51 (1/10/2012)	91 (10/6/2011)	(51 - 91)/(12 - 11)	-40
170 (4/4/2012)	91 (10/6/2011)	(170 - 91)/(13 - 11)	39.5
170 (4/4/2012)	51 (1/10/2012)	(170 - 51)/(13 - 12)	119

Number of Q values = 78

Ordered Q Values

n	Q
1	-88
2	-84
3	-80
4	-58.6667
5	-48
6	-40
7	-32.6667
8	-31.75
9	-28
10	-26.5

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11	-23
12	-22.5714
13	-22.5
14	-18.125
15	-15.9
16	-15.6667
17	-15
18	-13.2222
19	-13
20	-13
21	-11.6667
22	-11.4
23	-11
24	-11
25	-10.3333
26	-9.28571
27	-9.28571
28	-9
29	-8.77778
30	-8.33333
31	-8.09091
32	-8
33	-7
34	-6
35	-5.33333
36	-5
37	-5
38	-4.9
39	-4.875
40	-4.5
41	-4
42	-3.8
43	-3.63636
44	-1.66667
45	-0.333333
46	1.125
47	1.6
48	2
49	2.42857
50	2.5
51	3.83333
52	4
53	4.5
54	5
55	5.25
56	5.33333
57	6.2
58	7
59	8.25
60	9.33333
61	9.5
62	12.4286
63	13
64	13.6667
65	14.2222
66	16.6667
67	17

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68	18
69	19
70	19.5
71	20.5
72	26
73	29.5
74	35
75	39.5
76	49
77	70
78	119

Sen's Estimator (Median Q) is -4.6875

Time Period	Observations
3/13/2009	1
4/20/2009	1
12/8/2009	1
3/17/2010	1
5/18/2010	1
9/10/2010	1
12/22/2010	1
2/25/2011	1
5/10/2011	1
7/28/2011	1
10/6/2011	1
1/10/2012	1
4/4/2012	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 268.667
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 26.9609
M1 = (78 - 26.9609)/2.0 = 25.5196
M2 = (78 + 26.9609)/2.0 + 1 = 53.4804
Lower limit is -9.28571 = Q(26)
Upper limit is 4.5 = Q(53)
-9.28571 < 0 < 4.5 indicating no trend in data.

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Sen's Slope Analysis

Parameter: cis-1,2-Dichloroethene
Location: MW-04S

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
1700 (4/20/2009)	2100 (3/13/2009)	(1700 - 2100)/(2 - 1)	-400
2500 (12/9/2009)	2100 (3/13/2009)	(2500 - 2100)/(3 - 1)	200
2900 (3/17/2010)	2100 (3/13/2009)	(2900 - 2100)/(4 - 1)	266.667
2100 (5/18/2010)	2100 (3/13/2009)	(2100 - 2100)/(5 - 1)	0
2400 (9/17/2010)	2100 (3/13/2009)	(2400 - 2100)/(6 - 1)	60
2700 (12/22/2010)	2100 (3/13/2009)	(2700 - 2100)/(7 - 1)	100
2500 (2/25/2011)	2100 (3/13/2009)	(2500 - 2100)/(8 - 1)	57.1429
1900 (5/11/2011)	2100 (3/13/2009)	(1900 - 2100)/(9 - 1)	-25
1700 (7/28/2011)	2100 (3/13/2009)	(1700 - 2100)/(10 - 1)	-44.4444
2000 (10/6/2011)	2100 (3/13/2009)	(2000 - 2100)/(11 - 1)	-10
1800 (1/10/2012)	2100 (3/13/2009)	(1800 - 2100)/(12 - 1)	-27.2727
1600 (4/4/2012)	2100 (3/13/2009)	(1600 - 2100)/(13 - 1)	-41.6667
2500 (12/9/2009)	1700 (4/20/2009)	(2500 - 1700)/(3 - 2)	800
2900 (3/17/2010)	1700 (4/20/2009)	(2900 - 1700)/(4 - 2)	600
2100 (5/18/2010)	1700 (4/20/2009)	(2100 - 1700)/(5 - 2)	133.333
2400 (9/17/2010)	1700 (4/20/2009)	(2400 - 1700)/(6 - 2)	175
2700 (12/22/2010)	1700 (4/20/2009)	(2700 - 1700)/(7 - 2)	200
2500 (2/25/2011)	1700 (4/20/2009)	(2500 - 1700)/(8 - 2)	133.333
1900 (5/11/2011)	1700 (4/20/2009)	(1900 - 1700)/(9 - 2)	28.5714
1700 (7/28/2011)	1700 (4/20/2009)	(1700 - 1700)/(10 - 2)	0
2000 (10/6/2011)	1700 (4/20/2009)	(2000 - 1700)/(11 - 2)	33.3333
1800 (1/10/2012)	1700 (4/20/2009)	(1800 - 1700)/(12 - 2)	10
1600 (4/4/2012)	1700 (4/20/2009)	(1600 - 1700)/(13 - 2)	-9.09091
2900 (3/17/2010)	2500 (12/9/2009)	(2900 - 2500)/(4 - 3)	400
2100 (5/18/2010)	2500 (12/9/2009)	(2100 - 2500)/(5 - 3)	-200
2400 (9/17/2010)	2500 (12/9/2009)	(2400 - 2500)/(6 - 3)	-33.3333
2700 (12/22/2010)	2500 (12/9/2009)	(2700 - 2500)/(7 - 3)	50
2500 (2/25/2011)	2500 (12/9/2009)	(2500 - 2500)/(8 - 3)	0
1900 (5/11/2011)	2500 (12/9/2009)	(1900 - 2500)/(9 - 3)	-100
1700 (7/28/2011)	2500 (12/9/2009)	(1700 - 2500)/(10 - 3)	-114.286
2000 (10/6/2011)	2500 (12/9/2009)	(2000 - 2500)/(11 - 3)	-62.5
1800 (1/10/2012)	2500 (12/9/2009)	(1800 - 2500)/(12 - 3)	-77.7778
1600 (4/4/2012)	2500 (12/9/2009)	(1600 - 2500)/(13 - 3)	-90
2100 (5/18/2010)	2900 (3/17/2010)	(2100 - 2900)/(5 - 4)	-800
2400 (9/17/2010)	2900 (3/17/2010)	(2400 - 2900)/(6 - 4)	-250
2700 (12/22/2010)	2900 (3/17/2010)	(2700 - 2900)/(7 - 4)	-66.6667
2500 (2/25/2011)	2900 (3/17/2010)	(2500 - 2900)/(8 - 4)	-100
1900 (5/11/2011)	2900 (3/17/2010)	(1900 - 2900)/(9 - 4)	-200
1700 (7/28/2011)	2900 (3/17/2010)	(1700 - 2900)/(10 - 4)	-200
2000 (10/6/2011)	2900 (3/17/2010)	(2000 - 2900)/(11 - 4)	-128.571
1800 (1/10/2012)	2900 (3/17/2010)	(1800 - 2900)/(12 - 4)	-137.5
1600 (4/4/2012)	2900 (3/17/2010)	(1600 - 2900)/(13 - 4)	-144.444
2400 (9/17/2010)	2100 (5/18/2010)	(2400 - 2100)/(6 - 5)	300
2700 (12/22/2010)	2100 (5/18/2010)	(2700 - 2100)/(7 - 5)	300

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2500	(2/25/2011)	2100	(5/18/2010)	(2500 - 2100)/(8 - 5)	133.333
1900	(5/11/2011)	2100	(5/18/2010)	(1900 - 2100)/(9 - 5)	-50
1700	(7/28/2011)	2100	(5/18/2010)	(1700 - 2100)/(10 - 5)	-80
2000	(10/6/2011)	2100	(5/18/2010)	(2000 - 2100)/(11 - 5)	-16.6667
1800	(1/10/2012)	2100	(5/18/2010)	(1800 - 2100)/(12 - 5)	-42.8571
1600	(4/4/2012)	2100	(5/18/2010)	(1600 - 2100)/(13 - 5)	-62.5
2700	(12/22/2010)	2400	(9/17/2010)	(2700 - 2400)/(7 - 6)	300
2500	(2/25/2011)	2400	(9/17/2010)	(2500 - 2400)/(8 - 6)	50
1900	(5/11/2011)	2400	(9/17/2010)	(1900 - 2400)/(9 - 6)	-166.667
1700	(7/28/2011)	2400	(9/17/2010)	(1700 - 2400)/(10 - 6)	-175
2000	(10/6/2011)	2400	(9/17/2010)	(2000 - 2400)/(11 - 6)	-80
1800	(1/10/2012)	2400	(9/17/2010)	(1800 - 2400)/(12 - 6)	-100
1600	(4/4/2012)	2400	(9/17/2010)	(1600 - 2400)/(13 - 6)	-114.286
2500	(2/25/2011)	2700	(12/22/2010)	(2500 - 2700)/(8 - 7)	-200
1900	(5/11/2011)	2700	(12/22/2010)	(1900 - 2700)/(9 - 7)	-400
1700	(7/28/2011)	2700	(12/22/2010)	(1700 - 2700)/(10 - 7)	-333.333
2000	(10/6/2011)	2700	(12/22/2010)	(2000 - 2700)/(11 - 7)	-175
1800	(1/10/2012)	2700	(12/22/2010)	(1800 - 2700)/(12 - 7)	-180
1600	(4/4/2012)	2700	(12/22/2010)	(1600 - 2700)/(13 - 7)	-183.333
1900	(5/11/2011)	2500	(2/25/2011)	(1900 - 2500)/(9 - 8)	-600
1700	(7/28/2011)	2500	(2/25/2011)	(1700 - 2500)/(10 - 8)	-400
2000	(10/6/2011)	2500	(2/25/2011)	(2000 - 2500)/(11 - 8)	-166.667
1800	(1/10/2012)	2500	(2/25/2011)	(1800 - 2500)/(12 - 8)	-175
1600	(4/4/2012)	2500	(2/25/2011)	(1600 - 2500)/(13 - 8)	-180
1700	(7/28/2011)	1900	(5/11/2011)	(1700 - 1900)/(10 - 9)	-200
2000	(10/6/2011)	1900	(5/11/2011)	(2000 - 1900)/(11 - 9)	50
1800	(1/10/2012)	1900	(5/11/2011)	(1800 - 1900)/(12 - 9)	-33.3333
1600	(4/4/2012)	1900	(5/11/2011)	(1600 - 1900)/(13 - 9)	-75
2000	(10/6/2011)	1700	(7/28/2011)	(2000 - 1700)/(11 - 10)	300
1800	(1/10/2012)	1700	(7/28/2011)	(1800 - 1700)/(12 - 10)	50
1600	(4/4/2012)	1700	(7/28/2011)	(1600 - 1700)/(13 - 10)	-33.3333
1800	(1/10/2012)	2000	(10/6/2011)	(1800 - 2000)/(12 - 11)	-200
1600	(4/4/2012)	2000	(10/6/2011)	(1600 - 2000)/(13 - 11)	-200
1600	(4/4/2012)	1800	(1/10/2012)	(1600 - 1800)/(13 - 12)	-200

Number of Q values = 78

Ordered Q Values

n	Q
1	-800
2	-600
3	-400
4	-400
5	-400
6	-333.333
7	-250
8	-200
9	-200
10	-200

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11	-200
12	-200
13	-200
14	-200
15	-200
16	-183.333
17	-180
18	-180
19	-175
20	-175
21	-175
22	-166.667
23	-166.667
24	-144.444
25	-137.5
26	-128.571
27	-114.286
28	-114.286
29	-100
30	-100
31	-100
32	-90
33	-80
34	-80
35	-77.7778
36	-75
37	-66.6667
38	-62.5
39	-62.5
40	-50
41	-44.4444
42	-42.8571
43	-41.6667
44	-33.3333
45	-33.3333
46	-33.3333
47	-27.2727
48	-25
49	-16.6667
50	-10
51	-9.09091
52	0
53	0
54	0
55	10
56	28.5714
57	33.3333
58	50
59	50
60	50
61	50
62	57.1429
63	60
64	100
65	133.333
66	133.333
67	133.333

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68	175
69	200
70	200
71	266.667
72	300
73	300
74	300
75	300
76	400
77	600
78	800

Sen's Estimator (Median Q) is -56.25

Tied Group	Value	Members
1	2100	2
2	1700	2
3	2500	2

Time Period	Observations
3/13/2009	1
4/20/2009	1
12/9/2009	1
3/17/2010	1
5/18/2010	1
9/17/2010	1
12/22/2010	1
2/25/2011	1
5/11/2011	1
7/28/2011	1
10/6/2011	1
1/10/2012	1
4/4/2012	1

There are 0 time periods with multiple data

A = 54
B = 0
C = 0
D = 0
E = 6
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 265.667
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 26.8099
M1 = (78 - 26.8099)/2.0 = 25.595
M2 = (78 + 26.8099)/2.0 + 1 = 53.405
Lower limit is -128.571 = Q(26)
Upper limit is 0 = Q(53)
-128.571 < 0 < 0 indicating no trend in data.

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Sen's Slope Analysis

Parameter: trans-1,2-Dichloroethene
Location: MW-04S
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
ND<100 (4/20/2009)	70 (3/13/2009)	(100 - 70)/(2 - 1)	30
90 (12/9/2009)	70 (3/13/2009)	(90 - 70)/(3 - 1)	10
82 (3/17/2010)	70 (3/13/2009)	(82 - 70)/(4 - 1)	4
58 (5/18/2010)	70 (3/13/2009)	(58 - 70)/(5 - 1)	-3
70 (9/17/2010)	70 (3/13/2009)	(70 - 70)/(6 - 1)	0
91 (12/22/2010)	70 (3/13/2009)	(91 - 70)/(7 - 1)	3.5
82 (2/25/2011)	70 (3/13/2009)	(82 - 70)/(8 - 1)	1.71429
58 (5/11/2011)	70 (3/13/2009)	(58 - 70)/(9 - 1)	-1.5
50 (7/28/2011)	70 (3/13/2009)	(50 - 70)/(10 - 1)	-2.22222
58 (10/6/2011)	70 (3/13/2009)	(58 - 70)/(11 - 1)	-1.2
72 (1/10/2012)	70 (3/13/2009)	(72 - 70)/(12 - 1)	0.181818
54 (4/4/2012)	70 (3/13/2009)	(54 - 70)/(13 - 1)	-1.33333
90 (12/9/2009)	ND<100 (4/20/2009)	(90 - 100)/(3 - 2)	-10
82 (3/17/2010)	ND<100 (4/20/2009)	(82 - 100)/(4 - 2)	-9
58 (5/18/2010)	ND<100 (4/20/2009)	(58 - 100)/(5 - 2)	-14
70 (9/17/2010)	ND<100 (4/20/2009)	(70 - 100)/(6 - 2)	-7.5
91 (12/22/2010)	ND<100 (4/20/2009)	(91 - 100)/(7 - 2)	-1.8
82 (2/25/2011)	ND<100 (4/20/2009)	(82 - 100)/(8 - 2)	-3
58 (5/11/2011)	ND<100 (4/20/2009)	(58 - 100)/(9 - 2)	-6
50 (7/28/2011)	ND<100 (4/20/2009)	(50 - 100)/(10 - 2)	-6.25
58 (10/6/2011)	ND<100 (4/20/2009)	(58 - 100)/(11 - 2)	-4.66667
72 (1/10/2012)	ND<100 (4/20/2009)	(72 - 100)/(12 - 2)	-2.8
54 (4/4/2012)	ND<100 (4/20/2009)	(54 - 100)/(13 - 2)	-4.18182
82 (3/17/2010)	90 (12/9/2009)	(82 - 90)/(4 - 3)	-8
58 (5/18/2010)	90 (12/9/2009)	(58 - 90)/(5 - 3)	-16
70 (9/17/2010)	90 (12/9/2009)	(70 - 90)/(6 - 3)	-6.66667
91 (12/22/2010)	90 (12/9/2009)	(91 - 90)/(7 - 3)	0.25
82 (2/25/2011)	90 (12/9/2009)	(82 - 90)/(8 - 3)	-1.6
58 (5/11/2011)	90 (12/9/2009)	(58 - 90)/(9 - 3)	-5.33333
50 (7/28/2011)	90 (12/9/2009)	(50 - 90)/(10 - 3)	-5.71429
58 (10/6/2011)	90 (12/9/2009)	(58 - 90)/(11 - 3)	-4
72 (1/10/2012)	90 (12/9/2009)	(72 - 90)/(12 - 3)	-2
54 (4/4/2012)	90 (12/9/2009)	(54 - 90)/(13 - 3)	-3.6
58 (5/18/2010)	82 (3/17/2010)	(58 - 82)/(5 - 4)	-24
70 (9/17/2010)	82 (3/17/2010)	(70 - 82)/(6 - 4)	-6
91 (12/22/2010)	82 (3/17/2010)	(91 - 82)/(7 - 4)	3
82 (2/25/2011)	82 (3/17/2010)	(82 - 82)/(8 - 4)	0
58 (5/11/2011)	82 (3/17/2010)	(58 - 82)/(9 - 4)	-4.8
50 (7/28/2011)	82 (3/17/2010)	(50 - 82)/(10 - 4)	-5.33333
58 (10/6/2011)	82 (3/17/2010)	(58 - 82)/(11 - 4)	-3.42857
72 (1/10/2012)	82 (3/17/2010)	(72 - 82)/(12 - 4)	-1.25
54 (4/4/2012)	82 (3/17/2010)	(54 - 82)/(13 - 4)	-3.11111
70 (9/17/2010)	58 (5/18/2010)	(70 - 58)/(6 - 5)	12
91 (12/22/2010)	58 (5/18/2010)	(91 - 58)/(7 - 5)	16.5

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82 (2/25/2011)	58 (5/18/2010)	(82 - 58)/(8 - 5)	8
58 (5/11/2011)	58 (5/18/2010)	(58 - 58)/(9 - 5)	0
50 (7/28/2011)	58 (5/18/2010)	(50 - 58)/(10 - 5)	-1.6
58 (10/6/2011)	58 (5/18/2010)	(58 - 58)/(11 - 5)	0
72 (1/10/2012)	58 (5/18/2010)	(72 - 58)/(12 - 5)	2
54 (4/4/2012)	58 (5/18/2010)	(54 - 58)/(13 - 5)	-0.5
91 (12/22/2010)	70 (9/17/2010)	(91 - 70)/(7 - 6)	21
82 (2/25/2011)	70 (9/17/2010)	(82 - 70)/(8 - 6)	6
58 (5/11/2011)	70 (9/17/2010)	(58 - 70)/(9 - 6)	-4
50 (7/28/2011)	70 (9/17/2010)	(50 - 70)/(10 - 6)	-5
58 (10/6/2011)	70 (9/17/2010)	(58 - 70)/(11 - 6)	-2.4
72 (1/10/2012)	70 (9/17/2010)	(72 - 70)/(12 - 6)	0.333333
54 (4/4/2012)	70 (9/17/2010)	(54 - 70)/(13 - 6)	-2.28571
82 (2/25/2011)	91 (12/22/2010)	(82 - 91)/(8 - 7)	-9
58 (5/11/2011)	91 (12/22/2010)	(58 - 91)/(9 - 7)	-16.5
50 (7/28/2011)	91 (12/22/2010)	(50 - 91)/(10 - 7)	-13.6667
58 (10/6/2011)	91 (12/22/2010)	(58 - 91)/(11 - 7)	-8.25
72 (1/10/2012)	91 (12/22/2010)	(72 - 91)/(12 - 7)	-3.8
54 (4/4/2012)	91 (12/22/2010)	(54 - 91)/(13 - 7)	-6.16667
58 (5/11/2011)	82 (2/25/2011)	(58 - 82)/(9 - 8)	-24
50 (7/28/2011)	82 (2/25/2011)	(50 - 82)/(10 - 8)	-16
58 (10/6/2011)	82 (2/25/2011)	(58 - 82)/(11 - 8)	-8
72 (1/10/2012)	82 (2/25/2011)	(72 - 82)/(12 - 8)	-2.5
54 (4/4/2012)	82 (2/25/2011)	(54 - 82)/(13 - 8)	-5.6
50 (7/28/2011)	58 (5/11/2011)	(50 - 58)/(10 - 9)	-8
58 (10/6/2011)	58 (5/11/2011)	(58 - 58)/(11 - 9)	0
72 (1/10/2012)	58 (5/11/2011)	(72 - 58)/(12 - 9)	4.66667
54 (4/4/2012)	58 (5/11/2011)	(54 - 58)/(13 - 9)	-1
58 (10/6/2011)	50 (7/28/2011)	(58 - 50)/(11 - 10)	8
72 (1/10/2012)	50 (7/28/2011)	(72 - 50)/(12 - 10)	11
54 (4/4/2012)	50 (7/28/2011)	(54 - 50)/(13 - 10)	1.33333
72 (1/10/2012)	58 (10/6/2011)	(72 - 58)/(12 - 11)	14
54 (4/4/2012)	58 (10/6/2011)	(54 - 58)/(13 - 11)	-2
54 (4/4/2012)	72 (1/10/2012)	(54 - 72)/(13 - 12)	-18

Number of Q values = 78

Ordered Q Values

n	Q
1	-24
2	-24
3	-18
4	-16.5
5	-16
6	-16
7	-14
8	-13.6667
9	-10
10	-9

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11	-9
12	-8.25
13	-8
14	-8
15	-8
16	-7.5
17	-6.66667
18	-6.25
19	-6.16667
20	-6
21	-6
22	-5.71429
23	-5.6
24	-5.33333
25	-5.33333
26	-5
27	-4.8
28	-4.66667
29	-4.18182
30	-4
31	-4
32	-3.8
33	-3.6
34	-3.42857
35	-3.11111
36	-3
37	-3
38	-2.8
39	-2.5
40	-2.4
41	-2.28571
42	-2.22222
43	-2
44	-2
45	-1.8
46	-1.6
47	-1.6
48	-1.5
49	-1.33333
50	-1.25
51	-1.2
52	-1
53	-0.5
54	0
55	0
56	0
57	0
58	0
59	0.181818
60	0.25
61	0.333333
62	1.33333
63	1.71429
64	2
65	3
66	3.5
67	4

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68	4.66667
69	6
70	8
71	8
72	10
73	11
74	12
75	14
76	16.5
77	21
78	30

Sen's Estimator (Median Q) is -2.45

Tied Group	Value	Members
1	70	2
2	82	2
3	58	3

Time Period	Observations
3/13/2009	1
4/20/2009	1
12/9/2009	1
3/17/2010	1
5/18/2010	1
9/17/2010	1
12/22/2010	1
2/25/2011	1
5/11/2011	1
7/28/2011	1
10/6/2011	1
1/10/2012	1
4/4/2012	1

There are 0 time periods with multiple data

A = 102
B = 0
C = 6
D = 0
E = 10
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 263
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 26.675
M1 = (78 - 26.675)/2.0 = 25.6625
M2 = (78 + 26.675)/2.0 + 1 = 53.3375
Lower limit is -5 = Q(26)
Upper limit is -0.5 = Q(53)
-0.5 < 0 indicating a downward trend in data.

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Sen's Slope Analysis
Parameter: Trichloroethene
Location: MW-04S
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
4000 (4/20/2009)	5000 (3/13/2009)	(4000 - 5000)/(2 - 1)	-1000
7100 (12/9/2009)	5000 (3/13/2009)	(7100 - 5000)/(3 - 1)	1050
7500 (3/17/2010)	5000 (3/13/2009)	(7500 - 5000)/(4 - 1)	833.333
4700 (5/18/2010)	5000 (3/13/2009)	(4700 - 5000)/(5 - 1)	-75
5200 (9/17/2010)	5000 (3/13/2009)	(5200 - 5000)/(6 - 1)	40
6700 (12/22/2010)	5000 (3/13/2009)	(6700 - 5000)/(7 - 1)	283.333
5900 (2/25/2011)	5000 (3/13/2009)	(5900 - 5000)/(8 - 1)	128.571
4600 (5/11/2011)	5000 (3/13/2009)	(4600 - 5000)/(9 - 1)	-50
4600 (7/28/2011)	5000 (3/13/2009)	(4600 - 5000)/(10 - 1)	-44.4444
4600 (10/6/2011)	5000 (3/13/2009)	(4600 - 5000)/(11 - 1)	-40
4800 (1/10/2012)	5000 (3/13/2009)	(4800 - 5000)/(12 - 1)	-18.1818
4300 (4/4/2012)	5000 (3/13/2009)	(4300 - 5000)/(13 - 1)	-58.3333
7100 (12/9/2009)	4000 (4/20/2009)	(7100 - 4000)/(3 - 2)	3100
7500 (3/17/2010)	4000 (4/20/2009)	(7500 - 4000)/(4 - 2)	1750
4700 (5/18/2010)	4000 (4/20/2009)	(4700 - 4000)/(5 - 2)	233.333
5200 (9/17/2010)	4000 (4/20/2009)	(5200 - 4000)/(6 - 2)	300
6700 (12/22/2010)	4000 (4/20/2009)	(6700 - 4000)/(7 - 2)	540
5900 (2/25/2011)	4000 (4/20/2009)	(5900 - 4000)/(8 - 2)	316.667
4600 (5/11/2011)	4000 (4/20/2009)	(4600 - 4000)/(9 - 2)	85.7143
4600 (7/28/2011)	4000 (4/20/2009)	(4600 - 4000)/(10 - 2)	75
4600 (10/6/2011)	4000 (4/20/2009)	(4600 - 4000)/(11 - 2)	66.6667
4800 (1/10/2012)	4000 (4/20/2009)	(4800 - 4000)/(12 - 2)	80
4300 (4/4/2012)	4000 (4/20/2009)	(4300 - 4000)/(13 - 2)	27.2727
7500 (3/17/2010)	7100 (12/9/2009)	(7500 - 7100)/(4 - 3)	400
4700 (5/18/2010)	7100 (12/9/2009)	(4700 - 7100)/(5 - 3)	-1200
5200 (9/17/2010)	7100 (12/9/2009)	(5200 - 7100)/(6 - 3)	-633.333
6700 (12/22/2010)	7100 (12/9/2009)	(6700 - 7100)/(7 - 3)	-100
5900 (2/25/2011)	7100 (12/9/2009)	(5900 - 7100)/(8 - 3)	-240
4600 (5/11/2011)	7100 (12/9/2009)	(4600 - 7100)/(9 - 3)	-416.667
4600 (7/28/2011)	7100 (12/9/2009)	(4600 - 7100)/(10 - 3)	-357.143
4600 (10/6/2011)	7100 (12/9/2009)	(4600 - 7100)/(11 - 3)	-312.5
4800 (1/10/2012)	7100 (12/9/2009)	(4800 - 7100)/(12 - 3)	-255.556
4300 (4/4/2012)	7100 (12/9/2009)	(4300 - 7100)/(13 - 3)	-280
4700 (5/18/2010)	7500 (3/17/2010)	(4700 - 7500)/(5 - 4)	-2800
5200 (9/17/2010)	7500 (3/17/2010)	(5200 - 7500)/(6 - 4)	-1150
6700 (12/22/2010)	7500 (3/17/2010)	(6700 - 7500)/(7 - 4)	-266.667
5900 (2/25/2011)	7500 (3/17/2010)	(5900 - 7500)/(8 - 4)	-400
4600 (5/11/2011)	7500 (3/17/2010)	(4600 - 7500)/(9 - 4)	-580
4600 (7/28/2011)	7500 (3/17/2010)	(4600 - 7500)/(10 - 4)	-483.333
4600 (10/6/2011)	7500 (3/17/2010)	(4600 - 7500)/(11 - 4)	-414.286
4800 (1/10/2012)	7500 (3/17/2010)	(4800 - 7500)/(12 - 4)	-337.5
4300 (4/4/2012)	7500 (3/17/2010)	(4300 - 7500)/(13 - 4)	-355.556
5200 (9/17/2010)	4700 (5/18/2010)	(5200 - 4700)/(6 - 5)	500
6700 (12/22/2010)	4700 (5/18/2010)	(6700 - 4700)/(7 - 5)	1000

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5900	(2/25/2011)	4700	(5/18/2010)	(5900 - 4700)/(8 - 5)	400
4600	(5/11/2011)	4700	(5/18/2010)	(4600 - 4700)/(9 - 5)	-25
4600	(7/28/2011)	4700	(5/18/2010)	(4600 - 4700)/(10 - 5)	-20
4600	(10/6/2011)	4700	(5/18/2010)	(4600 - 4700)/(11 - 5)	-16.6667
4800	(1/10/2012)	4700	(5/18/2010)	(4800 - 4700)/(12 - 5)	14.2857
4300	(4/4/2012)	4700	(5/18/2010)	(4300 - 4700)/(13 - 5)	-50
6700	(12/22/2010)	5200	(9/17/2010)	(6700 - 5200)/(7 - 6)	1500
5900	(2/25/2011)	5200	(9/17/2010)	(5900 - 5200)/(8 - 6)	350
4600	(5/11/2011)	5200	(9/17/2010)	(4600 - 5200)/(9 - 6)	-200
4600	(7/28/2011)	5200	(9/17/2010)	(4600 - 5200)/(10 - 6)	-150
4600	(10/6/2011)	5200	(9/17/2010)	(4600 - 5200)/(11 - 6)	-120
4800	(1/10/2012)	5200	(9/17/2010)	(4800 - 5200)/(12 - 6)	-66.6667
4300	(4/4/2012)	5200	(9/17/2010)	(4300 - 5200)/(13 - 6)	-128.571
5900	(2/25/2011)	6700	(12/22/2010)	(5900 - 6700)/(8 - 7)	-800
4600	(5/11/2011)	6700	(12/22/2010)	(4600 - 6700)/(9 - 7)	-1050
4600	(7/28/2011)	6700	(12/22/2010)	(4600 - 6700)/(10 - 7)	-700
4600	(10/6/2011)	6700	(12/22/2010)	(4600 - 6700)/(11 - 7)	-525
4800	(1/10/2012)	6700	(12/22/2010)	(4800 - 6700)/(12 - 7)	-380
4300	(4/4/2012)	6700	(12/22/2010)	(4300 - 6700)/(13 - 7)	-400
4600	(5/11/2011)	5900	(2/25/2011)	(4600 - 5900)/(9 - 8)	-1300
4600	(7/28/2011)	5900	(2/25/2011)	(4600 - 5900)/(10 - 8)	-650
4600	(10/6/2011)	5900	(2/25/2011)	(4600 - 5900)/(11 - 8)	-433.333
4800	(1/10/2012)	5900	(2/25/2011)	(4800 - 5900)/(12 - 8)	-275
4300	(4/4/2012)	5900	(2/25/2011)	(4300 - 5900)/(13 - 8)	-320
4600	(7/28/2011)	4600	(5/11/2011)	(4600 - 4600)/(10 - 9)	0
4600	(10/6/2011)	4600	(5/11/2011)	(4600 - 4600)/(11 - 9)	0
4800	(1/10/2012)	4600	(5/11/2011)	(4800 - 4600)/(12 - 9)	66.6667
4300	(4/4/2012)	4600	(5/11/2011)	(4300 - 4600)/(13 - 9)	-75
4600	(10/6/2011)	4600	(7/28/2011)	(4600 - 4600)/(11 - 10)	0
4800	(1/10/2012)	4600	(7/28/2011)	(4800 - 4600)/(12 - 10)	100
4300	(4/4/2012)	4600	(7/28/2011)	(4300 - 4600)/(13 - 10)	-100
4800	(1/10/2012)	4600	(10/6/2011)	(4800 - 4600)/(12 - 11)	200
4300	(4/4/2012)	4600	(10/6/2011)	(4300 - 4600)/(13 - 11)	-150
4300	(4/4/2012)	4800	(1/10/2012)	(4300 - 4800)/(13 - 12)	-500

Number of Q values = 78

Ordered Q Values

n	Q
1	-2800
2	-1300
3	-1200
4	-1150
5	-1050
6	-1000
7	-800
8	-700
9	-650
10	-633.333

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11	-580
12	-525
13	-500
14	-483.333
15	-433.333
16	-416.667
17	-414.286
18	-400
19	-400
20	-380
21	-357.143
22	-355.556
23	-337.5
24	-320
25	-312.5
26	-280
27	-275
28	-266.667
29	-255.556
30	-240
31	-200
32	-150
33	-150
34	-128.571
35	-120
36	-100
37	-100
38	-75
39	-75
40	-66.6667
41	-58.3333
42	-50
43	-50
44	-44.4444
45	-40
46	-25
47	-20
48	-18.1818
49	-16.6667
50	0
51	0
52	0
53	14.2857
54	27.2727
55	40
56	66.6667
57	66.6667
58	75
59	80
60	85.7143
61	100
62	128.571
63	200
64	233.333
65	283.333
66	300
67	316.667

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68	350
69	400
70	400
71	500
72	540
73	833.333
74	1000
75	1050
76	1500
77	1750
78	3100

Sen's Estimator (Median Q) is -70.8333

Tied Group	Value	Members
1	4600	3

Time Period	Observations
3/13/2009	1
4/20/2009	1
12/9/2009	1
3/17/2010	1
5/18/2010	1
9/17/2010	1
12/22/2010	1
2/25/2011	1
5/11/2011	1
7/28/2011	1
10/6/2011	1
1/10/2012	1
4/4/2012	1

There are 0 time periods with multiple data

A = 66
B = 0
C = 6
D = 0
E = 6
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 265
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 26.7763
M1 = (78 - 26.7763)/2.0 = 25.6119
M2 = (78 + 26.7763)/2.0 + 1 = 53.3881
Lower limit is -280 = Q(26)
Upper limit is 14.2857 = Q(53)
-280 < 0 < 14.2857 indicating no trend in data.

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Sen's Slope Analysis
Parameter: Vinyl chloride
Location: MW-04S
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
520 (4/20/2009)	460 (3/13/2009)	(520 - 460)/(2 - 1)	60
270 (12/9/2009)	460 (3/13/2009)	(270 - 460)/(3 - 1)	-95
520 (3/17/2010)	460 (3/13/2009)	(520 - 460)/(4 - 1)	20
280 (5/18/2010)	460 (3/13/2009)	(280 - 460)/(5 - 1)	-45
200 (9/17/2010)	460 (3/13/2009)	(200 - 460)/(6 - 1)	-52
270 (12/22/2010)	460 (3/13/2009)	(270 - 460)/(7 - 1)	-31.6667
280 (2/25/2011)	460 (3/13/2009)	(280 - 460)/(8 - 1)	-25.7143
270 (5/11/2011)	460 (3/13/2009)	(270 - 460)/(9 - 1)	-23.75
190 (7/28/2011)	460 (3/13/2009)	(190 - 460)/(10 - 1)	-30
190 (10/6/2011)	460 (3/13/2009)	(190 - 460)/(11 - 1)	-27
190 (1/10/2012)	460 (3/13/2009)	(190 - 460)/(12 - 1)	-24.5455
170 (4/4/2012)	460 (3/13/2009)	(170 - 460)/(13 - 1)	-24.1667
270 (12/9/2009)	520 (4/20/2009)	(270 - 520)/(3 - 2)	-250
520 (3/17/2010)	520 (4/20/2009)	(520 - 520)/(4 - 2)	0
280 (5/18/2010)	520 (4/20/2009)	(280 - 520)/(5 - 2)	-80
200 (9/17/2010)	520 (4/20/2009)	(200 - 520)/(6 - 2)	-80
270 (12/22/2010)	520 (4/20/2009)	(270 - 520)/(7 - 2)	-50
280 (2/25/2011)	520 (4/20/2009)	(280 - 520)/(8 - 2)	-40
270 (5/11/2011)	520 (4/20/2009)	(270 - 520)/(9 - 2)	-35.7143
190 (7/28/2011)	520 (4/20/2009)	(190 - 520)/(10 - 2)	-41.25
190 (10/6/2011)	520 (4/20/2009)	(190 - 520)/(11 - 2)	-36.6667
190 (1/10/2012)	520 (4/20/2009)	(190 - 520)/(12 - 2)	-33
170 (4/4/2012)	520 (4/20/2009)	(170 - 520)/(13 - 2)	-31.8182
520 (3/17/2010)	270 (12/9/2009)	(520 - 270)/(4 - 3)	250
280 (5/18/2010)	270 (12/9/2009)	(280 - 270)/(5 - 3)	5
200 (9/17/2010)	270 (12/9/2009)	(200 - 270)/(6 - 3)	-23.3333
270 (12/22/2010)	270 (12/9/2009)	(270 - 270)/(7 - 3)	0
280 (2/25/2011)	270 (12/9/2009)	(280 - 270)/(8 - 3)	2
270 (5/11/2011)	270 (12/9/2009)	(270 - 270)/(9 - 3)	0
190 (7/28/2011)	270 (12/9/2009)	(190 - 270)/(10 - 3)	-11.4286
190 (10/6/2011)	270 (12/9/2009)	(190 - 270)/(11 - 3)	-10
190 (1/10/2012)	270 (12/9/2009)	(190 - 270)/(12 - 3)	-8.88889
170 (4/4/2012)	270 (12/9/2009)	(170 - 270)/(13 - 3)	-10
280 (5/18/2010)	520 (3/17/2010)	(280 - 520)/(5 - 4)	-240
200 (9/17/2010)	520 (3/17/2010)	(200 - 520)/(6 - 4)	-160
270 (12/22/2010)	520 (3/17/2010)	(270 - 520)/(7 - 4)	-83.3333
280 (2/25/2011)	520 (3/17/2010)	(280 - 520)/(8 - 4)	-60
270 (5/11/2011)	520 (3/17/2010)	(270 - 520)/(9 - 4)	-50
190 (7/28/2011)	520 (3/17/2010)	(190 - 520)/(10 - 4)	-55
190 (10/6/2011)	520 (3/17/2010)	(190 - 520)/(11 - 4)	-47.1429
190 (1/10/2012)	520 (3/17/2010)	(190 - 520)/(12 - 4)	-41.25
170 (4/4/2012)	520 (3/17/2010)	(170 - 520)/(13 - 4)	-38.8889
200 (9/17/2010)	280 (5/18/2010)	(200 - 280)/(6 - 5)	-80
270 (12/22/2010)	280 (5/18/2010)	(270 - 280)/(7 - 5)	-5

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280 (2/25/2011)	280 (5/18/2010)	(280 - 280)/(8 - 5)	0
270 (5/11/2011)	280 (5/18/2010)	(270 - 280)/(9 - 5)	-2.5
190 (7/28/2011)	280 (5/18/2010)	(190 - 280)/(10 - 5)	-18
190 (10/6/2011)	280 (5/18/2010)	(190 - 280)/(11 - 5)	-15
190 (1/10/2012)	280 (5/18/2010)	(190 - 280)/(12 - 5)	-12.8571
170 (4/4/2012)	280 (5/18/2010)	(170 - 280)/(13 - 5)	-13.75
270 (12/22/2010)	200 (9/17/2010)	(270 - 200)/(7 - 6)	70
280 (2/25/2011)	200 (9/17/2010)	(280 - 200)/(8 - 6)	40
270 (5/11/2011)	200 (9/17/2010)	(270 - 200)/(9 - 6)	23.3333
190 (7/28/2011)	200 (9/17/2010)	(190 - 200)/(10 - 6)	-2.5
190 (10/6/2011)	200 (9/17/2010)	(190 - 200)/(11 - 6)	-2
190 (1/10/2012)	200 (9/17/2010)	(190 - 200)/(12 - 6)	-1.66667
170 (4/4/2012)	200 (9/17/2010)	(170 - 200)/(13 - 6)	-4.28571
280 (2/25/2011)	270 (12/22/2010)	(280 - 270)/(8 - 7)	10
270 (5/11/2011)	270 (12/22/2010)	(270 - 270)/(9 - 7)	0
190 (7/28/2011)	270 (12/22/2010)	(190 - 270)/(10 - 7)	-26.6667
190 (10/6/2011)	270 (12/22/2010)	(190 - 270)/(11 - 7)	-20
190 (1/10/2012)	270 (12/22/2010)	(190 - 270)/(12 - 7)	-16
170 (4/4/2012)	270 (12/22/2010)	(170 - 270)/(13 - 7)	-16.6667
270 (5/11/2011)	280 (2/25/2011)	(270 - 280)/(9 - 8)	-10
190 (7/28/2011)	280 (2/25/2011)	(190 - 280)/(10 - 8)	-45
190 (10/6/2011)	280 (2/25/2011)	(190 - 280)/(11 - 8)	-30
190 (1/10/2012)	280 (2/25/2011)	(190 - 280)/(12 - 8)	-22.5
170 (4/4/2012)	280 (2/25/2011)	(170 - 280)/(13 - 8)	-22
190 (7/28/2011)	270 (5/11/2011)	(190 - 270)/(10 - 9)	-80
190 (10/6/2011)	270 (5/11/2011)	(190 - 270)/(11 - 9)	-40
190 (1/10/2012)	270 (5/11/2011)	(190 - 270)/(12 - 9)	-26.6667
170 (4/4/2012)	270 (5/11/2011)	(170 - 270)/(13 - 9)	-25
190 (10/6/2011)	190 (7/28/2011)	(190 - 190)/(11 - 10)	0
190 (1/10/2012)	190 (7/28/2011)	(190 - 190)/(12 - 10)	0
170 (4/4/2012)	190 (7/28/2011)	(170 - 190)/(13 - 10)	-6.66667
190 (1/10/2012)	190 (10/6/2011)	(190 - 190)/(12 - 11)	0
170 (4/4/2012)	190 (10/6/2011)	(170 - 190)/(13 - 11)	-10
170 (4/4/2012)	190 (1/10/2012)	(170 - 190)/(13 - 12)	-20

Number of Q values = 78

Ordered Q Values

n	Q
1	-250
2	-240
3	-160
4	-95
5	-83.3333
6	-80
7	-80
8	-80
9	-80
10	-60

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11	-55
12	-52
13	-50
14	-50
15	-47.1429
16	-45
17	-45
18	-41.25
19	-41.25
20	-40
21	-40
22	-38.8889
23	-36.6667
24	-35.7143
25	-33
26	-31.8182
27	-31.6667
28	-30
29	-30
30	-27
31	-26.6667
32	-26.6667
33	-25.7143
34	-25
35	-24.5455
36	-24.1667
37	-23.75
38	-23.3333
39	-22.5
40	-22
41	-20
42	-20
43	-18
44	-16.6667
45	-16
46	-15
47	-13.75
48	-12.8571
49	-11.4286
50	-10
51	-10
52	-10
53	-10
54	-8.88889
55	-6.66667
56	-5
57	-4.28571
58	-2.5
59	-2.5
60	-2
61	-1.66667
62	0
63	0
64	0
65	0
66	0
67	0

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68	0
69	0
70	2
71	5
72	10
73	20
74	23.3333
75	40
76	60
77	70
78	250

Sen's Estimator (Median Q) is -22.25

Tied Group	Value	Members
1	520	2
2	270	3
3	280	2
4	190	3

Time Period	Observations
3/13/2009	1
4/20/2009	1
12/9/2009	1
3/17/2010	1
5/18/2010	1
9/17/2010	1
12/22/2010	1
2/25/2011	1
5/11/2011	1
7/28/2011	1
10/6/2011	1
1/10/2012	1
4/4/2012	1

There are 0 time periods with multiple data

A = 168
B = 0
C = 12
D = 0
E = 16
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 259.333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 26.4884
M1 = (78 - 26.4884)/2.0 = 25.7558
M2 = (78 + 26.4884)/2.0 + 1 = 53.2442
Lower limit is -31.8182 = Q(26)
Upper limit is -10 = Q(53)
-10 < 0 indicating a downward trend in data.

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Sen's Slope Analysis

Parameter: Tetrachloroethene
Location: MW-05S

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
ND<5 (4/20/2009)	3.5 (3/13/2009)	(5 - 3.5)/(2 - 1)	1.5
5.3 (12/10/2009)	3.5 (3/13/2009)	(5.3 - 3.5)/(3 - 1)	0.9
6.3 (3/17/2010)	3.5 (3/13/2009)	(6.3 - 3.5)/(4 - 1)	0.933333
4.6 (5/17/2010)	3.5 (3/13/2009)	(4.6 - 3.5)/(5 - 1)	0.275
4.6 (9/9/2010)	3.5 (3/13/2009)	(4.6 - 3.5)/(6 - 1)	0.22
4.9 (12/21/2010)	3.5 (3/13/2009)	(4.9 - 3.5)/(7 - 1)	0.233333
4.4 (2/24/2011)	3.5 (3/13/2009)	(4.4 - 3.5)/(8 - 1)	0.128571
4.9 (5/13/2011)	3.5 (3/13/2009)	(4.9 - 3.5)/(9 - 1)	0.175
4.8 (7/27/2011)	3.5 (3/13/2009)	(4.8 - 3.5)/(10 - 1)	0.144444
5.1 (10/10/2011)	3.5 (3/13/2009)	(5.1 - 3.5)/(11 - 1)	0.16
5.8 (1/9/2012)	3.5 (3/13/2009)	(5.8 - 3.5)/(12 - 1)	0.209091
5.7 (4/9/2012)	3.5 (3/13/2009)	(5.7 - 3.5)/(13 - 1)	0.183333
5.3 (12/10/2009)	ND<5 (4/20/2009)	(5.3 - 5)/(3 - 2)	0.3
6.3 (3/17/2010)	ND<5 (4/20/2009)	(6.3 - 5)/(4 - 2)	0.65
4.6 (5/17/2010)	ND<5 (4/20/2009)	(4.6 - 5)/(5 - 2)	-0.133333
4.6 (9/9/2010)	ND<5 (4/20/2009)	(4.6 - 5)/(6 - 2)	-0.1
4.9 (12/21/2010)	ND<5 (4/20/2009)	(4.9 - 5)/(7 - 2)	-0.02
4.4 (2/24/2011)	ND<5 (4/20/2009)	(4.4 - 5)/(8 - 2)	-0.1
4.9 (5/13/2011)	ND<5 (4/20/2009)	(4.9 - 5)/(9 - 2)	-0.0142857
4.8 (7/27/2011)	ND<5 (4/20/2009)	(4.8 - 5)/(10 - 2)	-0.025
5.1 (10/10/2011)	ND<5 (4/20/2009)	(5.1 - 5)/(11 - 2)	0.0111111
5.8 (1/9/2012)	ND<5 (4/20/2009)	(5.8 - 5)/(12 - 2)	0.08
5.7 (4/9/2012)	ND<5 (4/20/2009)	(5.7 - 5)/(13 - 2)	0.0636364
6.3 (3/17/2010)	5.3 (12/10/2009)	(6.3 - 5.3)/(4 - 3)	1
4.6 (5/17/2010)	5.3 (12/10/2009)	(4.6 - 5.3)/(5 - 3)	-0.35
4.6 (9/9/2010)	5.3 (12/10/2009)	(4.6 - 5.3)/(6 - 3)	-0.233333
4.9 (12/21/2010)	5.3 (12/10/2009)	(4.9 - 5.3)/(7 - 3)	-0.1
4.4 (2/24/2011)	5.3 (12/10/2009)	(4.4 - 5.3)/(8 - 3)	-0.18
4.9 (5/13/2011)	5.3 (12/10/2009)	(4.9 - 5.3)/(9 - 3)	-0.0666667
4.8 (7/27/2011)	5.3 (12/10/2009)	(4.8 - 5.3)/(10 - 3)	-0.0714286
5.1 (10/10/2011)	5.3 (12/10/2009)	(5.1 - 5.3)/(11 - 3)	-0.025
5.8 (1/9/2012)	5.3 (12/10/2009)	(5.8 - 5.3)/(12 - 3)	0.0555556
5.7 (4/9/2012)	5.3 (12/10/2009)	(5.7 - 5.3)/(13 - 3)	0.04
4.6 (5/17/2010)	6.3 (3/17/2010)	(4.6 - 6.3)/(5 - 4)	-1.7
4.6 (9/9/2010)	6.3 (3/17/2010)	(4.6 - 6.3)/(6 - 4)	-0.85
4.9 (12/21/2010)	6.3 (3/17/2010)	(4.9 - 6.3)/(7 - 4)	-0.466667
4.4 (2/24/2011)	6.3 (3/17/2010)	(4.4 - 6.3)/(8 - 4)	-0.475
4.9 (5/13/2011)	6.3 (3/17/2010)	(4.9 - 6.3)/(9 - 4)	-0.28
4.8 (7/27/2011)	6.3 (3/17/2010)	(4.8 - 6.3)/(10 - 4)	-0.25
5.1 (10/10/2011)	6.3 (3/17/2010)	(5.1 - 6.3)/(11 - 4)	-0.171429
5.8 (1/9/2012)	6.3 (3/17/2010)	(5.8 - 6.3)/(12 - 4)	-0.0625
5.7 (4/9/2012)	6.3 (3/17/2010)	(5.7 - 6.3)/(13 - 4)	-0.0666667
4.6 (9/9/2010)	4.6 (5/17/2010)	(4.6 - 4.6)/(6 - 5)	0
4.9 (12/21/2010)	4.6 (5/17/2010)	(4.9 - 4.6)/(7 - 5)	0.15

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4.4 (2/24/2011)	4.6 (5/17/2010)	(4.4 - 4.6)/(8 - 5)	-0.0666667
4.9 (5/13/2011)	4.6 (5/17/2010)	(4.9 - 4.6)/(9 - 5)	0.075
4.8 (7/27/2011)	4.6 (5/17/2010)	(4.8 - 4.6)/(10 - 5)	0.04
5.1 (10/10/2011)	4.6 (5/17/2010)	(5.1 - 4.6)/(11 - 5)	0.0833333
5.8 (1/9/2012)	4.6 (5/17/2010)	(5.8 - 4.6)/(12 - 5)	0.171429
5.7 (4/9/2012)	4.6 (5/17/2010)	(5.7 - 4.6)/(13 - 5)	0.1375
4.9 (12/21/2010)	4.6 (9/9/2010)	(4.9 - 4.6)/(7 - 6)	0.3
4.4 (2/24/2011)	4.6 (9/9/2010)	(4.4 - 4.6)/(8 - 6)	-0.1
4.9 (5/13/2011)	4.6 (9/9/2010)	(4.9 - 4.6)/(9 - 6)	0.1
4.8 (7/27/2011)	4.6 (9/9/2010)	(4.8 - 4.6)/(10 - 6)	0.05
5.1 (10/10/2011)	4.6 (9/9/2010)	(5.1 - 4.6)/(11 - 6)	0.1
5.8 (1/9/2012)	4.6 (9/9/2010)	(5.8 - 4.6)/(12 - 6)	0.2
5.7 (4/9/2012)	4.6 (9/9/2010)	(5.7 - 4.6)/(13 - 6)	0.157143
4.4 (2/24/2011)	4.9 (12/21/2010)	(4.4 - 4.9)/(8 - 7)	-0.5
4.9 (5/13/2011)	4.9 (12/21/2010)	(4.9 - 4.9)/(9 - 7)	0
4.8 (7/27/2011)	4.9 (12/21/2010)	(4.8 - 4.9)/(10 - 7)	-0.0333333
5.1 (10/10/2011)	4.9 (12/21/2010)	(5.1 - 4.9)/(11 - 7)	0.05
5.8 (1/9/2012)	4.9 (12/21/2010)	(5.8 - 4.9)/(12 - 7)	0.18
5.7 (4/9/2012)	4.9 (12/21/2010)	(5.7 - 4.9)/(13 - 7)	0.133333
4.9 (5/13/2011)	4.4 (2/24/2011)	(4.9 - 4.4)/(9 - 8)	0.5
4.8 (7/27/2011)	4.4 (2/24/2011)	(4.8 - 4.4)/(10 - 8)	0.2
5.1 (10/10/2011)	4.4 (2/24/2011)	(5.1 - 4.4)/(11 - 8)	0.233333
5.8 (1/9/2012)	4.4 (2/24/2011)	(5.8 - 4.4)/(12 - 8)	0.35
5.7 (4/9/2012)	4.4 (2/24/2011)	(5.7 - 4.4)/(13 - 8)	0.26
4.8 (7/27/2011)	4.9 (5/13/2011)	(4.8 - 4.9)/(10 - 9)	-0.1
5.1 (10/10/2011)	4.9 (5/13/2011)	(5.1 - 4.9)/(11 - 9)	0.1
5.8 (1/9/2012)	4.9 (5/13/2011)	(5.8 - 4.9)/(12 - 9)	0.3
5.7 (4/9/2012)	4.9 (5/13/2011)	(5.7 - 4.9)/(13 - 9)	0.2
5.1 (10/10/2011)	4.8 (7/27/2011)	(5.1 - 4.8)/(11 - 10)	0.3
5.8 (1/9/2012)	4.8 (7/27/2011)	(5.8 - 4.8)/(12 - 10)	0.5
5.7 (4/9/2012)	4.8 (7/27/2011)	(5.7 - 4.8)/(13 - 10)	0.3
5.8 (1/9/2012)	5.1 (10/10/2011)	(5.8 - 5.1)/(12 - 11)	0.7
5.7 (4/9/2012)	5.1 (10/10/2011)	(5.7 - 5.1)/(13 - 11)	0.3
5.7 (4/9/2012)	5.8 (1/9/2012)	(5.7 - 5.8)/(13 - 12)	-0.1

Number of Q values = 78

Ordered Q Values

n	Q
1	-1.7
2	-0.85
3	-0.5
4	-0.475
5	-0.466667
6	-0.35
7	-0.28
8	-0.25
9	-0.233333
10	-0.18

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11	-0.171429
12	-0.133333
13	-0.1
14	-0.1
15	-0.1
16	-0.1
17	-0.1
18	-0.1
19	-0.0714286
20	-0.0666667
21	-0.0666667
22	-0.0666667
23	-0.0625
24	-0.0333333
25	-0.025
26	-0.025
27	-0.02
28	-0.0142857
29	0
30	0
31	0.0111111
32	0.04
33	0.04
34	0.05
35	0.05
36	0.0555556
37	0.0636364
38	0.075
39	0.08
40	0.0833333
41	0.1
42	0.1
43	0.1
44	0.128571
45	0.133333
46	0.1375
47	0.144444
48	0.15
49	0.157143
50	0.16
51	0.171429
52	0.175
53	0.18
54	0.183333
55	0.2
56	0.2
57	0.2
58	0.209091
59	0.22
60	0.233333
61	0.233333
62	0.26
63	0.275
64	0.3
65	0.3
66	0.3
67	0.3

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68	0.3
69	0.3
70	0.35
71	0.5
72	0.5
73	0.65
74	0.7
75	0.9
76	0.933333
77	1
78	1.5

Sen's Estimator (Median Q) is 0.0816667

Tied Group	Value	Members
1	4.6	2
2	4.9	2

Time Period	Observations
3/13/2009	1
4/20/2009	1
12/10/2009	1
3/17/2010	1
5/17/2010	1
9/9/2010	1
12/21/2010	1
2/24/2011	1
5/13/2011	1
7/27/2011	1
10/10/2011	1
1/9/2012	1
4/9/2012	1

There are 0 time periods with multiple data

A = 36
B = 0
C = 0
D = 0
E = 4
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 266.667
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 26.8603
M1 = (78 - 26.8603)/2.0 = 25.5698
M2 = (78 + 26.8603)/2.0 + 1 = 53.4302
Lower limit is -0.025 = Q(26)
Upper limit is 0.18 = Q(53)
-0.025 < 0 < 0.18 indicating no trend in data.

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Sen's Slope Analysis

Parameter: Trichloroethene

Location: MW-05S

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
140 (4/20/2009)	120 (3/13/2009)	(140 - 120)/(2 - 1)	20
190 (12/10/2009)	120 (3/13/2009)	(190 - 120)/(3 - 1)	35
160 (3/17/2010)	120 (3/13/2009)	(160 - 120)/(4 - 1)	13.3333
160 (5/17/2010)	120 (3/13/2009)	(160 - 120)/(5 - 1)	10
140 (9/9/2010)	120 (3/13/2009)	(140 - 120)/(6 - 1)	4
160 (12/21/2010)	120 (3/13/2009)	(160 - 120)/(7 - 1)	6.66667
130 (2/24/2011)	120 (3/13/2009)	(130 - 120)/(8 - 1)	1.42857
160 (5/13/2011)	120 (3/13/2009)	(160 - 120)/(9 - 1)	5
150 (7/27/2011)	120 (3/13/2009)	(150 - 120)/(10 - 1)	3.33333
150 (10/10/2011)	120 (3/13/2009)	(150 - 120)/(11 - 1)	3
150 (1/9/2012)	120 (3/13/2009)	(150 - 120)/(12 - 1)	2.72727
160 (4/9/2012)	120 (3/13/2009)	(160 - 120)/(13 - 1)	3.33333
190 (12/10/2009)	140 (4/20/2009)	(190 - 140)/(3 - 2)	50
160 (3/17/2010)	140 (4/20/2009)	(160 - 140)/(4 - 2)	10
160 (5/17/2010)	140 (4/20/2009)	(160 - 140)/(5 - 2)	6.66667
140 (9/9/2010)	140 (4/20/2009)	(140 - 140)/(6 - 2)	0
160 (12/21/2010)	140 (4/20/2009)	(160 - 140)/(7 - 2)	4
130 (2/24/2011)	140 (4/20/2009)	(130 - 140)/(8 - 2)	-1.66667
160 (5/13/2011)	140 (4/20/2009)	(160 - 140)/(9 - 2)	2.85714
150 (7/27/2011)	140 (4/20/2009)	(150 - 140)/(10 - 2)	1.25
150 (10/10/2011)	140 (4/20/2009)	(150 - 140)/(11 - 2)	1.11111
150 (1/9/2012)	140 (4/20/2009)	(150 - 140)/(12 - 2)	1
160 (4/9/2012)	140 (4/20/2009)	(160 - 140)/(13 - 2)	1.81818
160 (3/17/2010)	190 (12/10/2009)	(160 - 190)/(4 - 3)	-30
160 (5/17/2010)	190 (12/10/2009)	(160 - 190)/(5 - 3)	-15
140 (9/9/2010)	190 (12/10/2009)	(140 - 190)/(6 - 3)	-16.6667
160 (12/21/2010)	190 (12/10/2009)	(160 - 190)/(7 - 3)	-7.5
130 (2/24/2011)	190 (12/10/2009)	(130 - 190)/(8 - 3)	-12
160 (5/13/2011)	190 (12/10/2009)	(160 - 190)/(9 - 3)	-5
150 (7/27/2011)	190 (12/10/2009)	(150 - 190)/(10 - 3)	-5.71429
150 (10/10/2011)	190 (12/10/2009)	(150 - 190)/(11 - 3)	-5
150 (1/9/2012)	190 (12/10/2009)	(150 - 190)/(12 - 3)	-4.44444
160 (4/9/2012)	190 (12/10/2009)	(160 - 190)/(13 - 3)	-3
160 (5/17/2010)	160 (3/17/2010)	(160 - 160)/(5 - 4)	0
140 (9/9/2010)	160 (3/17/2010)	(140 - 160)/(6 - 4)	-10
160 (12/21/2010)	160 (3/17/2010)	(160 - 160)/(7 - 4)	0
130 (2/24/2011)	160 (3/17/2010)	(130 - 160)/(8 - 4)	-7.5
160 (5/13/2011)	160 (3/17/2010)	(160 - 160)/(9 - 4)	0
150 (7/27/2011)	160 (3/17/2010)	(150 - 160)/(10 - 4)	-1.66667
150 (10/10/2011)	160 (3/17/2010)	(150 - 160)/(11 - 4)	-1.42857
150 (1/9/2012)	160 (3/17/2010)	(150 - 160)/(12 - 4)	-1.25
160 (4/9/2012)	160 (3/17/2010)	(160 - 160)/(13 - 4)	0
140 (9/9/2010)	160 (5/17/2010)	(140 - 160)/(6 - 5)	-20
160 (12/21/2010)	160 (5/17/2010)	(160 - 160)/(7 - 5)	0

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130 (2/24/2011)	160 (5/17/2010)	(130 - 160)/(8 - 5)	-10
160 (5/13/2011)	160 (5/17/2010)	(160 - 160)/(9 - 5)	0
150 (7/27/2011)	160 (5/17/2010)	(150 - 160)/(10 - 5)	-2
150 (10/10/2011)	160 (5/17/2010)	(150 - 160)/(11 - 5)	-1.66667
150 (1/9/2012)	160 (5/17/2010)	(150 - 160)/(12 - 5)	-1.42857
160 (4/9/2012)	160 (5/17/2010)	(160 - 160)/(13 - 5)	0
160 (12/21/2010)	140 (9/9/2010)	(160 - 140)/(7 - 6)	20
130 (2/24/2011)	140 (9/9/2010)	(130 - 140)/(8 - 6)	-5
160 (5/13/2011)	140 (9/9/2010)	(160 - 140)/(9 - 6)	6.66667
150 (7/27/2011)	140 (9/9/2010)	(150 - 140)/(10 - 6)	2.5
150 (10/10/2011)	140 (9/9/2010)	(150 - 140)/(11 - 6)	2
150 (1/9/2012)	140 (9/9/2010)	(150 - 140)/(12 - 6)	1.66667
160 (4/9/2012)	140 (9/9/2010)	(160 - 140)/(13 - 6)	2.85714
130 (2/24/2011)	160 (12/21/2010)	(130 - 160)/(8 - 7)	-30
160 (5/13/2011)	160 (12/21/2010)	(160 - 160)/(9 - 7)	0
150 (7/27/2011)	160 (12/21/2010)	(150 - 160)/(10 - 7)	-3.33333
150 (10/10/2011)	160 (12/21/2010)	(150 - 160)/(11 - 7)	-2.5
150 (1/9/2012)	160 (12/21/2010)	(150 - 160)/(12 - 7)	-2
160 (4/9/2012)	160 (12/21/2010)	(160 - 160)/(13 - 7)	0
160 (5/13/2011)	130 (2/24/2011)	(160 - 130)/(9 - 8)	30
150 (7/27/2011)	130 (2/24/2011)	(150 - 130)/(10 - 8)	10
150 (10/10/2011)	130 (2/24/2011)	(150 - 130)/(11 - 8)	6.66667
150 (1/9/2012)	130 (2/24/2011)	(150 - 130)/(12 - 8)	5
160 (4/9/2012)	130 (2/24/2011)	(160 - 130)/(13 - 8)	6
150 (7/27/2011)	160 (5/13/2011)	(150 - 160)/(10 - 9)	-10
150 (10/10/2011)	160 (5/13/2011)	(150 - 160)/(11 - 9)	-5
150 (1/9/2012)	160 (5/13/2011)	(150 - 160)/(12 - 9)	-3.33333
160 (4/9/2012)	160 (5/13/2011)	(160 - 160)/(13 - 9)	0
150 (10/10/2011)	150 (7/27/2011)	(150 - 150)/(11 - 10)	0
150 (1/9/2012)	150 (7/27/2011)	(150 - 150)/(12 - 10)	0
160 (4/9/2012)	150 (7/27/2011)	(160 - 150)/(13 - 10)	3.33333
150 (1/9/2012)	150 (10/10/2011)	(150 - 150)/(12 - 11)	0
160 (4/9/2012)	150 (10/10/2011)	(160 - 150)/(13 - 11)	5
160 (4/9/2012)	150 (1/9/2012)	(160 - 150)/(13 - 12)	10

Number of Q values = 78

Ordered Q Values

n	Q
1	-30
2	-30
3	-20
4	-16.6667
5	-15
6	-12
7	-10
8	-10
9	-10
10	-7.5

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11	-7.5
12	-5.71429
13	-5
14	-5
15	-5
16	-5
17	-4.44444
18	-3.33333
19	-3.33333
20	-3
21	-2.5
22	-2
23	-2
24	-1.66667
25	-1.66667
26	-1.66667
27	-1.42857
28	-1.42857
29	-1.25
30	0
31	0
32	0
33	0
34	0
35	0
36	0
37	0
38	0
39	0
40	0
41	0
42	0
43	0
44	1
45	1.11111
46	1.25
47	1.42857
48	1.66667
49	1.81818
50	2
51	2.5
52	2.72727
53	2.85714
54	2.85714
55	3
56	3.33333
57	3.33333
58	3.33333
59	4
60	4
61	5
62	5
63	5
64	6
65	6.66667
66	6.66667
67	6.66667

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68	6.66667
69	10
70	10
71	10
72	10
73	13.3333
74	20
75	20
76	30
77	35
78	50

Sen's Estimator (Median Q) is 0

Tied Group	Value	Members
1	140	2
2	160	5
3	150	3

Time Period	Observations
3/13/2009	1
4/20/2009	1
12/10/2009	1
3/17/2010	1
5/17/2010	1
9/9/2010	1
12/21/2010	1
2/24/2011	1
5/13/2011	1
7/27/2011	1
10/10/2011	1
1/9/2012	1
4/9/2012	1

There are 0 time periods with multiple data

A = 384
B = 0
C = 66
D = 0
E = 28
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 247.333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 25.8683
M1 = (78 - 25.8683)/2.0 = 26.0658
M2 = (78 + 25.8683)/2.0 + 1 = 52.9342
Lower limit is -1.66667 = Q(26)
Upper limit is 2.85714 = Q(53)
-1.66667 < 0 < 2.85714 indicating no trend in data.

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Sen's Slope Analysis

Parameter: Trichloroethene

Location: MW-06S

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
23 (4/20/2009)	21 (3/16/2009)	(23 - 21)/(2 - 1)	2
37 (12/9/2009)	21 (3/16/2009)	(37 - 21)/(3 - 1)	8
31 (3/18/2010)	21 (3/16/2009)	(31 - 21)/(4 - 1)	3.33333
33 (5/17/2010)	21 (3/16/2009)	(33 - 21)/(5 - 1)	3
29 (9/10/2010)	21 (3/16/2009)	(29 - 21)/(6 - 1)	1.6
34 (12/21/2010)	21 (3/16/2009)	(34 - 21)/(7 - 1)	2.16667
35 (2/18/2011)	21 (3/16/2009)	(35 - 21)/(8 - 1)	2
27 (5/10/2011)	21 (3/16/2009)	(27 - 21)/(9 - 1)	0.75
27 (7/27/2011)	21 (3/16/2009)	(27 - 21)/(10 - 1)	0.666667
30 (10/5/2011)	21 (3/16/2009)	(30 - 21)/(11 - 1)	0.9
31 (1/9/2012)	21 (3/16/2009)	(31 - 21)/(12 - 1)	0.909091
32 (4/3/2012)	21 (3/16/2009)	(32 - 21)/(13 - 1)	0.916667
37 (12/9/2009)	23 (4/20/2009)	(37 - 23)/(3 - 2)	14
31 (3/18/2010)	23 (4/20/2009)	(31 - 23)/(4 - 2)	4
33 (5/17/2010)	23 (4/20/2009)	(33 - 23)/(5 - 2)	3.33333
29 (9/10/2010)	23 (4/20/2009)	(29 - 23)/(6 - 2)	1.5
34 (12/21/2010)	23 (4/20/2009)	(34 - 23)/(7 - 2)	2.2
35 (2/18/2011)	23 (4/20/2009)	(35 - 23)/(8 - 2)	2
27 (5/10/2011)	23 (4/20/2009)	(27 - 23)/(9 - 2)	0.571429
27 (7/27/2011)	23 (4/20/2009)	(27 - 23)/(10 - 2)	0.5
30 (10/5/2011)	23 (4/20/2009)	(30 - 23)/(11 - 2)	0.777778
31 (1/9/2012)	23 (4/20/2009)	(31 - 23)/(12 - 2)	0.8
32 (4/3/2012)	23 (4/20/2009)	(32 - 23)/(13 - 2)	0.818182
31 (3/18/2010)	37 (12/9/2009)	(31 - 37)/(4 - 3)	-6
33 (5/17/2010)	37 (12/9/2009)	(33 - 37)/(5 - 3)	-2
29 (9/10/2010)	37 (12/9/2009)	(29 - 37)/(6 - 3)	-2.66667
34 (12/21/2010)	37 (12/9/2009)	(34 - 37)/(7 - 3)	-0.75
35 (2/18/2011)	37 (12/9/2009)	(35 - 37)/(8 - 3)	-0.4
27 (5/10/2011)	37 (12/9/2009)	(27 - 37)/(9 - 3)	-1.66667
27 (7/27/2011)	37 (12/9/2009)	(27 - 37)/(10 - 3)	-1.42857
30 (10/5/2011)	37 (12/9/2009)	(30 - 37)/(11 - 3)	-0.875
31 (1/9/2012)	37 (12/9/2009)	(31 - 37)/(12 - 3)	-0.666667
32 (4/3/2012)	37 (12/9/2009)	(32 - 37)/(13 - 3)	-0.5
33 (5/17/2010)	31 (3/18/2010)	(33 - 31)/(5 - 4)	2
29 (9/10/2010)	31 (3/18/2010)	(29 - 31)/(6 - 4)	-1
34 (12/21/2010)	31 (3/18/2010)	(34 - 31)/(7 - 4)	1
35 (2/18/2011)	31 (3/18/2010)	(35 - 31)/(8 - 4)	1
27 (5/10/2011)	31 (3/18/2010)	(27 - 31)/(9 - 4)	-0.8
27 (7/27/2011)	31 (3/18/2010)	(27 - 31)/(10 - 4)	-0.666667
30 (10/5/2011)	31 (3/18/2010)	(30 - 31)/(11 - 4)	-0.142857
31 (1/9/2012)	31 (3/18/2010)	(31 - 31)/(12 - 4)	0
32 (4/3/2012)	31 (3/18/2010)	(32 - 31)/(13 - 4)	0.111111
29 (9/10/2010)	33 (5/17/2010)	(29 - 33)/(6 - 5)	-4
34 (12/21/2010)	33 (5/17/2010)	(34 - 33)/(7 - 5)	0.5

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35 (2/18/2011)	33 (5/17/2010)	(35 - 33)/(8 - 5)	0.666667
27 (5/10/2011)	33 (5/17/2010)	(27 - 33)/(9 - 5)	-1.5
27 (7/27/2011)	33 (5/17/2010)	(27 - 33)/(10 - 5)	-1.2
30 (10/5/2011)	33 (5/17/2010)	(30 - 33)/(11 - 5)	-0.5
31 (1/9/2012)	33 (5/17/2010)	(31 - 33)/(12 - 5)	-0.285714
32 (4/3/2012)	33 (5/17/2010)	(32 - 33)/(13 - 5)	-0.125
34 (12/21/2010)	29 (9/10/2010)	(34 - 29)/(7 - 6)	5
35 (2/18/2011)	29 (9/10/2010)	(35 - 29)/(8 - 6)	3
27 (5/10/2011)	29 (9/10/2010)	(27 - 29)/(9 - 6)	-0.666667
27 (7/27/2011)	29 (9/10/2010)	(27 - 29)/(10 - 6)	-0.5
30 (10/5/2011)	29 (9/10/2010)	(30 - 29)/(11 - 6)	0.2
31 (1/9/2012)	29 (9/10/2010)	(31 - 29)/(12 - 6)	0.333333
32 (4/3/2012)	29 (9/10/2010)	(32 - 29)/(13 - 6)	0.428571
35 (2/18/2011)	34 (12/21/2010)	(35 - 34)/(8 - 7)	1
27 (5/10/2011)	34 (12/21/2010)	(27 - 34)/(9 - 7)	-3.5
27 (7/27/2011)	34 (12/21/2010)	(27 - 34)/(10 - 7)	-2.33333
30 (10/5/2011)	34 (12/21/2010)	(30 - 34)/(11 - 7)	-1
31 (1/9/2012)	34 (12/21/2010)	(31 - 34)/(12 - 7)	-0.6
32 (4/3/2012)	34 (12/21/2010)	(32 - 34)/(13 - 7)	-0.333333
27 (5/10/2011)	35 (2/18/2011)	(27 - 35)/(9 - 8)	-8
27 (7/27/2011)	35 (2/18/2011)	(27 - 35)/(10 - 8)	-4
30 (10/5/2011)	35 (2/18/2011)	(30 - 35)/(11 - 8)	-1.66667
31 (1/9/2012)	35 (2/18/2011)	(31 - 35)/(12 - 8)	-1
32 (4/3/2012)	35 (2/18/2011)	(32 - 35)/(13 - 8)	-0.6
27 (7/27/2011)	27 (5/10/2011)	(27 - 27)/(10 - 9)	0
30 (10/5/2011)	27 (5/10/2011)	(30 - 27)/(11 - 9)	1.5
31 (1/9/2012)	27 (5/10/2011)	(31 - 27)/(12 - 9)	1.33333
32 (4/3/2012)	27 (5/10/2011)	(32 - 27)/(13 - 9)	1.25
30 (10/5/2011)	27 (7/27/2011)	(30 - 27)/(11 - 10)	3
31 (1/9/2012)	27 (7/27/2011)	(31 - 27)/(12 - 10)	2
32 (4/3/2012)	27 (7/27/2011)	(32 - 27)/(13 - 10)	1.66667
31 (1/9/2012)	30 (10/5/2011)	(31 - 30)/(12 - 11)	1
32 (4/3/2012)	30 (10/5/2011)	(32 - 30)/(13 - 11)	1
32 (4/3/2012)	31 (1/9/2012)	(32 - 31)/(13 - 12)	1

Number of Q values = 78

Ordered Q Values

n	Q
1	-8
2	-6
3	-4
4	-4
5	-3.5
6	-2.66667
7	-2.33333
8	-2
9	-1.66667
10	-1.66667

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11	-1.5
12	-1.42857
13	-1.2
14	-1
15	-1
16	-1
17	-0.875
18	-0.8
19	-0.75
20	-0.666667
21	-0.666667
22	-0.666667
23	-0.6
24	-0.6
25	-0.5
26	-0.5
27	-0.5
28	-0.4
29	-0.333333
30	-0.285714
31	-0.142857
32	-0.125
33	0
34	0
35	0.111111
36	0.2
37	0.333333
38	0.428571
39	0.5
40	0.5
41	0.571429
42	0.666667
43	0.666667
44	0.75
45	0.777778
46	0.8
47	0.818182
48	0.9
49	0.909091
50	0.916667
51	1
52	1
53	1
54	1
55	1
56	1
57	1.25
58	1.33333
59	1.5
60	1.5
61	1.6
62	1.66667
63	2
64	2
65	2
66	2
67	2

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68	2.16667
69	2.2
70	3
71	3
72	3
73	3.33333
74	3.33333
75	4
76	5
77	8
78	14

Sen's Estimator (Median Q) is 0.5

Tied Group	Value	Members
1	31	2
2	27	2

Time Period	Observations
3/16/2009	1
4/20/2009	1
12/9/2009	1
3/18/2010	1
5/17/2010	1
9/10/2010	1
12/21/2010	1
2/18/2011	1
5/10/2011	1
7/27/2011	1
10/5/2011	1
1/9/2012	1
4/3/2012	1

There are 0 time periods with multiple data

A = 36
B = 0
C = 0
D = 0
E = 4
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 266.667
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 26.8603
M1 = (78 - 26.8603)/2.0 = 25.5698
M2 = (78 + 26.8603)/2.0 + 1 = 53.4302
Lower limit is -0.5 = Q(26)
Upper limit is 1 = Q(53)
-0.5 < 0 < 1 indicating no trend in data.

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Sen's Slope Analysis

Parameter: 1,1,1-Trichloroethane

Location: MW-07S

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
1.6 (4/20/2009)	2.1 (3/16/2009)	(1.6 - 2.1)/(2 - 1)	-0.5
1.8 (12/10/2009)	2.1 (3/16/2009)	(1.8 - 2.1)/(3 - 1)	-0.15
1.9 (3/17/2010)	2.1 (3/16/2009)	(1.9 - 2.1)/(4 - 1)	-0.0666667
1.9 (5/17/2010)	2.1 (3/16/2009)	(1.9 - 2.1)/(5 - 1)	-0.05
1.4 (9/10/2010)	2.1 (3/16/2009)	(1.4 - 2.1)/(6 - 1)	-0.14
2.1 (12/21/2010)	2.1 (3/16/2009)	(2.1 - 2.1)/(7 - 1)	0
1.6 (2/24/2011)	2.1 (3/16/2009)	(1.6 - 2.1)/(8 - 1)	-0.0714286
1.5 (5/13/2011)	2.1 (3/16/2009)	(1.5 - 2.1)/(9 - 1)	-0.075
1.2 (7/27/2011)	2.1 (3/16/2009)	(1.2 - 2.1)/(10 - 1)	-0.1
1.4 (10/10/2011)	2.1 (3/16/2009)	(1.4 - 2.1)/(11 - 1)	-0.07
1.6 (1/9/2012)	2.1 (3/16/2009)	(1.6 - 2.1)/(12 - 1)	-0.0454545
1.3 (4/9/2012)	2.1 (3/16/2009)	(1.3 - 2.1)/(13 - 1)	-0.0666667
1.8 (12/10/2009)	1.6 (4/20/2009)	(1.8 - 1.6)/(3 - 2)	0.2
1.9 (3/17/2010)	1.6 (4/20/2009)	(1.9 - 1.6)/(4 - 2)	0.15
1.9 (5/17/2010)	1.6 (4/20/2009)	(1.9 - 1.6)/(5 - 2)	0.1
1.4 (9/10/2010)	1.6 (4/20/2009)	(1.4 - 1.6)/(6 - 2)	-0.05
2.1 (12/21/2010)	1.6 (4/20/2009)	(2.1 - 1.6)/(7 - 2)	0.1
1.6 (2/24/2011)	1.6 (4/20/2009)	(1.6 - 1.6)/(8 - 2)	0
1.5 (5/13/2011)	1.6 (4/20/2009)	(1.5 - 1.6)/(9 - 2)	-0.0142857
1.2 (7/27/2011)	1.6 (4/20/2009)	(1.2 - 1.6)/(10 - 2)	-0.05
1.4 (10/10/2011)	1.6 (4/20/2009)	(1.4 - 1.6)/(11 - 2)	-0.0222222
1.6 (1/9/2012)	1.6 (4/20/2009)	(1.6 - 1.6)/(12 - 2)	0
1.3 (4/9/2012)	1.6 (4/20/2009)	(1.3 - 1.6)/(13 - 2)	-0.0272727
1.9 (3/17/2010)	1.8 (12/10/2009)	(1.9 - 1.8)/(4 - 3)	0.1
1.9 (5/17/2010)	1.8 (12/10/2009)	(1.9 - 1.8)/(5 - 3)	0.05
1.4 (9/10/2010)	1.8 (12/10/2009)	(1.4 - 1.8)/(6 - 3)	-0.133333
2.1 (12/21/2010)	1.8 (12/10/2009)	(2.1 - 1.8)/(7 - 3)	0.075
1.6 (2/24/2011)	1.8 (12/10/2009)	(1.6 - 1.8)/(8 - 3)	-0.04
1.5 (5/13/2011)	1.8 (12/10/2009)	(1.5 - 1.8)/(9 - 3)	-0.05
1.2 (7/27/2011)	1.8 (12/10/2009)	(1.2 - 1.8)/(10 - 3)	-0.0857143
1.4 (10/10/2011)	1.8 (12/10/2009)	(1.4 - 1.8)/(11 - 3)	-0.05
1.6 (1/9/2012)	1.8 (12/10/2009)	(1.6 - 1.8)/(12 - 3)	-0.0222222
1.3 (4/9/2012)	1.8 (12/10/2009)	(1.3 - 1.8)/(13 - 3)	-0.05
1.9 (5/17/2010)	1.9 (3/17/2010)	(1.9 - 1.9)/(5 - 4)	0
1.4 (9/10/2010)	1.9 (3/17/2010)	(1.4 - 1.9)/(6 - 4)	-0.25
2.1 (12/21/2010)	1.9 (3/17/2010)	(2.1 - 1.9)/(7 - 4)	0.0666667
1.6 (2/24/2011)	1.9 (3/17/2010)	(1.6 - 1.9)/(8 - 4)	-0.075
1.5 (5/13/2011)	1.9 (3/17/2010)	(1.5 - 1.9)/(9 - 4)	-0.08
1.2 (7/27/2011)	1.9 (3/17/2010)	(1.2 - 1.9)/(10 - 4)	-0.116667
1.4 (10/10/2011)	1.9 (3/17/2010)	(1.4 - 1.9)/(11 - 4)	-0.0714286
1.6 (1/9/2012)	1.9 (3/17/2010)	(1.6 - 1.9)/(12 - 4)	-0.0375
1.3 (4/9/2012)	1.9 (3/17/2010)	(1.3 - 1.9)/(13 - 4)	-0.0666667
1.4 (9/10/2010)	1.9 (5/17/2010)	(1.4 - 1.9)/(6 - 5)	-0.5
2.1 (12/21/2010)	1.9 (5/17/2010)	(2.1 - 1.9)/(7 - 5)	0.1

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1.6 (2/24/2011)	1.9 (5/17/2010)	(1.6 - 1.9)/(8 - 5)	-0.1
1.5 (5/13/2011)	1.9 (5/17/2010)	(1.5 - 1.9)/(9 - 5)	-0.1
1.2 (7/27/2011)	1.9 (5/17/2010)	(1.2 - 1.9)/(10 - 5)	-0.14
1.4 (10/10/2011)	1.9 (5/17/2010)	(1.4 - 1.9)/(11 - 5)	-0.0833333
1.6 (1/9/2012)	1.9 (5/17/2010)	(1.6 - 1.9)/(12 - 5)	-0.0428571
1.3 (4/9/2012)	1.9 (5/17/2010)	(1.3 - 1.9)/(13 - 5)	-0.075
2.1 (12/21/2010)	1.4 (9/10/2010)	(2.1 - 1.4)/(7 - 6)	0.7
1.6 (2/24/2011)	1.4 (9/10/2010)	(1.6 - 1.4)/(8 - 6)	0.1
1.5 (5/13/2011)	1.4 (9/10/2010)	(1.5 - 1.4)/(9 - 6)	0.0333333
1.2 (7/27/2011)	1.4 (9/10/2010)	(1.2 - 1.4)/(10 - 6)	-0.05
1.4 (10/10/2011)	1.4 (9/10/2010)	(1.4 - 1.4)/(11 - 6)	0
1.6 (1/9/2012)	1.4 (9/10/2010)	(1.6 - 1.4)/(12 - 6)	0.0333333
1.3 (4/9/2012)	1.4 (9/10/2010)	(1.3 - 1.4)/(13 - 6)	-0.0142857
1.6 (2/24/2011)	2.1 (12/21/2010)	(1.6 - 2.1)/(8 - 7)	-0.5
1.5 (5/13/2011)	2.1 (12/21/2010)	(1.5 - 2.1)/(9 - 7)	-0.3
1.2 (7/27/2011)	2.1 (12/21/2010)	(1.2 - 2.1)/(10 - 7)	-0.3
1.4 (10/10/2011)	2.1 (12/21/2010)	(1.4 - 2.1)/(11 - 7)	-0.175
1.6 (1/9/2012)	2.1 (12/21/2010)	(1.6 - 2.1)/(12 - 7)	-0.1
1.3 (4/9/2012)	2.1 (12/21/2010)	(1.3 - 2.1)/(13 - 7)	-0.133333
1.5 (5/13/2011)	1.6 (2/24/2011)	(1.5 - 1.6)/(9 - 8)	-0.1
1.2 (7/27/2011)	1.6 (2/24/2011)	(1.2 - 1.6)/(10 - 8)	-0.2
1.4 (10/10/2011)	1.6 (2/24/2011)	(1.4 - 1.6)/(11 - 8)	-0.0666667
1.6 (1/9/2012)	1.6 (2/24/2011)	(1.6 - 1.6)/(12 - 8)	0
1.3 (4/9/2012)	1.6 (2/24/2011)	(1.3 - 1.6)/(13 - 8)	-0.06
1.2 (7/27/2011)	1.5 (5/13/2011)	(1.2 - 1.5)/(10 - 9)	-0.3
1.4 (10/10/2011)	1.5 (5/13/2011)	(1.4 - 1.5)/(11 - 9)	-0.05
1.6 (1/9/2012)	1.5 (5/13/2011)	(1.6 - 1.5)/(12 - 9)	0.0333333
1.3 (4/9/2012)	1.5 (5/13/2011)	(1.3 - 1.5)/(13 - 9)	-0.05
1.4 (10/10/2011)	1.2 (7/27/2011)	(1.4 - 1.2)/(11 - 10)	0.2
1.6 (1/9/2012)	1.2 (7/27/2011)	(1.6 - 1.2)/(12 - 10)	0.2
1.3 (4/9/2012)	1.2 (7/27/2011)	(1.3 - 1.2)/(13 - 10)	0.0333333
1.6 (1/9/2012)	1.4 (10/10/2011)	(1.6 - 1.4)/(12 - 11)	0.2
1.3 (4/9/2012)	1.4 (10/10/2011)	(1.3 - 1.4)/(13 - 11)	-0.05
1.3 (4/9/2012)	1.6 (1/9/2012)	(1.3 - 1.6)/(13 - 12)	-0.3

Number of Q values = 78

Ordered Q Values

n	Q
1	-0.5
2	-0.5
3	-0.5
4	-0.3
5	-0.3
6	-0.3
7	-0.3
8	-0.25
9	-0.2
10	-0.175

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11	-0.15
12	-0.14
13	-0.14
14	-0.133333
15	-0.133333
16	-0.116667
17	-0.1
18	-0.1
19	-0.1
20	-0.1
21	-0.1
22	-0.0857143
23	-0.0833333
24	-0.08
25	-0.075
26	-0.075
27	-0.075
28	-0.0714286
29	-0.0714286
30	-0.07
31	-0.0666667
32	-0.0666667
33	-0.0666667
34	-0.0666667
35	-0.06
36	-0.05
37	-0.05
38	-0.05
39	-0.05
40	-0.05
41	-0.05
42	-0.05
43	-0.05
44	-0.05
45	-0.05
46	-0.0454545
47	-0.0428571
48	-0.04
49	-0.0375
50	-0.0272727
51	-0.0222222
52	-0.0222222
53	-0.0142857
54	-0.0142857
55	0
56	0
57	0
58	0
59	0
60	0
61	0.0333333
62	0.0333333
63	0.0333333
64	0.0333333
65	0.05
66	0.0666667
67	0.075

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68	0.1
69	0.1
70	0.1
71	0.1
72	0.1
73	0.15
74	0.2
75	0.2
76	0.2
77	0.2
78	0.7

Sen's Estimator (Median Q) is -0.05

Tied Group	Value	Members
1	2.1	2
2	1.6	3
3	1.9	2
4	1.4	2

Time Period	Observations
3/16/2009	1
4/20/2009	1
12/10/2009	1
3/17/2010	1
5/17/2010	1
9/10/2010	1
12/21/2010	1
2/24/2011	1
5/13/2011	1
7/27/2011	1
10/10/2011	1
1/9/2012	1
4/9/2012	1

There are 0 time periods with multiple data

A = 120
B = 0
C = 6
D = 0
E = 12
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 262
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 26.6243
M1 = (78 - 26.6243)/2.0 = 25.6879
M2 = (78 + 26.6243)/2.0 + 1 = 53.3121
Lower limit is -0.075 = Q(26)
Upper limit is -0.0142857 = Q(53)
-0.0142857 < 0 indicating a downward trend in data.

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Sen's Slope Analysis

Parameter: Trichloroethene

Location: MW-07S

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
11 (4/20/2009)	10 (3/16/2009)	(11 - 10)/(2 - 1)	1
14 (12/10/2009)	10 (3/16/2009)	(14 - 10)/(3 - 1)	2
13 (3/17/2010)	10 (3/16/2009)	(13 - 10)/(4 - 1)	1
13 (5/17/2010)	10 (3/16/2009)	(13 - 10)/(5 - 1)	0.75
12 (9/10/2010)	10 (3/16/2009)	(12 - 10)/(6 - 1)	0.4
16 (12/21/2010)	10 (3/16/2009)	(16 - 10)/(7 - 1)	1
12 (2/24/2011)	10 (3/16/2009)	(12 - 10)/(8 - 1)	0.285714
12 (5/13/2011)	10 (3/16/2009)	(12 - 10)/(9 - 1)	0.25
11 (7/27/2011)	10 (3/16/2009)	(11 - 10)/(10 - 1)	0.111111
13 (10/10/2011)	10 (3/16/2009)	(13 - 10)/(11 - 1)	0.3
14 (1/9/2012)	10 (3/16/2009)	(14 - 10)/(12 - 1)	0.363636
12 (4/9/2012)	10 (3/16/2009)	(12 - 10)/(13 - 1)	0.166667
14 (12/10/2009)	11 (4/20/2009)	(14 - 11)/(3 - 2)	3
13 (3/17/2010)	11 (4/20/2009)	(13 - 11)/(4 - 2)	1
13 (5/17/2010)	11 (4/20/2009)	(13 - 11)/(5 - 2)	0.666667
12 (9/10/2010)	11 (4/20/2009)	(12 - 11)/(6 - 2)	0.25
16 (12/21/2010)	11 (4/20/2009)	(16 - 11)/(7 - 2)	1
12 (2/24/2011)	11 (4/20/2009)	(12 - 11)/(8 - 2)	0.166667
12 (5/13/2011)	11 (4/20/2009)	(12 - 11)/(9 - 2)	0.142857
11 (7/27/2011)	11 (4/20/2009)	(11 - 11)/(10 - 2)	0
13 (10/10/2011)	11 (4/20/2009)	(13 - 11)/(11 - 2)	0.222222
14 (1/9/2012)	11 (4/20/2009)	(14 - 11)/(12 - 2)	0.3
12 (4/9/2012)	11 (4/20/2009)	(12 - 11)/(13 - 2)	0.0909091
13 (3/17/2010)	14 (12/10/2009)	(13 - 14)/(4 - 3)	-1
13 (5/17/2010)	14 (12/10/2009)	(13 - 14)/(5 - 3)	-0.5
12 (9/10/2010)	14 (12/10/2009)	(12 - 14)/(6 - 3)	-0.666667
16 (12/21/2010)	14 (12/10/2009)	(16 - 14)/(7 - 3)	0.5
12 (2/24/2011)	14 (12/10/2009)	(12 - 14)/(8 - 3)	-0.4
12 (5/13/2011)	14 (12/10/2009)	(12 - 14)/(9 - 3)	-0.333333
11 (7/27/2011)	14 (12/10/2009)	(11 - 14)/(10 - 3)	-0.428571
13 (10/10/2011)	14 (12/10/2009)	(13 - 14)/(11 - 3)	-0.125
14 (1/9/2012)	14 (12/10/2009)	(14 - 14)/(12 - 3)	0
12 (4/9/2012)	14 (12/10/2009)	(12 - 14)/(13 - 3)	-0.2
13 (5/17/2010)	13 (3/17/2010)	(13 - 13)/(5 - 4)	0
12 (9/10/2010)	13 (3/17/2010)	(12 - 13)/(6 - 4)	-0.5
16 (12/21/2010)	13 (3/17/2010)	(16 - 13)/(7 - 4)	1
12 (2/24/2011)	13 (3/17/2010)	(12 - 13)/(8 - 4)	-0.25
12 (5/13/2011)	13 (3/17/2010)	(12 - 13)/(9 - 4)	-0.2
11 (7/27/2011)	13 (3/17/2010)	(11 - 13)/(10 - 4)	-0.333333
13 (10/10/2011)	13 (3/17/2010)	(13 - 13)/(11 - 4)	0
14 (1/9/2012)	13 (3/17/2010)	(14 - 13)/(12 - 4)	0.125
12 (4/9/2012)	13 (3/17/2010)	(12 - 13)/(13 - 4)	-0.111111
12 (9/10/2010)	13 (5/17/2010)	(12 - 13)/(6 - 5)	-1
16 (12/21/2010)	13 (5/17/2010)	(16 - 13)/(7 - 5)	1.5

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12 (2/24/2011)	13 (5/17/2010)	(12 - 13)/(8 - 5)	-0.333333
12 (5/13/2011)	13 (5/17/2010)	(12 - 13)/(9 - 5)	-0.25
11 (7/27/2011)	13 (5/17/2010)	(11 - 13)/(10 - 5)	-0.4
13 (10/10/2011)	13 (5/17/2010)	(13 - 13)/(11 - 5)	0
14 (1/9/2012)	13 (5/17/2010)	(14 - 13)/(12 - 5)	0.142857
12 (4/9/2012)	13 (5/17/2010)	(12 - 13)/(13 - 5)	-0.125
16 (12/21/2010)	12 (9/10/2010)	(16 - 12)/(7 - 6)	4
12 (2/24/2011)	12 (9/10/2010)	(12 - 12)/(8 - 6)	0
12 (5/13/2011)	12 (9/10/2010)	(12 - 12)/(9 - 6)	0
11 (7/27/2011)	12 (9/10/2010)	(11 - 12)/(10 - 6)	-0.25
13 (10/10/2011)	12 (9/10/2010)	(13 - 12)/(11 - 6)	0.2
14 (1/9/2012)	12 (9/10/2010)	(14 - 12)/(12 - 6)	0.333333
12 (4/9/2012)	12 (9/10/2010)	(12 - 12)/(13 - 6)	0
12 (2/24/2011)	16 (12/21/2010)	(12 - 16)/(8 - 7)	-4
12 (5/13/2011)	16 (12/21/2010)	(12 - 16)/(9 - 7)	-2
11 (7/27/2011)	16 (12/21/2010)	(11 - 16)/(10 - 7)	-1.66667
13 (10/10/2011)	16 (12/21/2010)	(13 - 16)/(11 - 7)	-0.75
14 (1/9/2012)	16 (12/21/2010)	(14 - 16)/(12 - 7)	-0.4
12 (4/9/2012)	16 (12/21/2010)	(12 - 16)/(13 - 7)	-0.666667
12 (5/13/2011)	12 (2/24/2011)	(12 - 12)/(9 - 8)	0
11 (7/27/2011)	12 (2/24/2011)	(11 - 12)/(10 - 8)	-0.5
13 (10/10/2011)	12 (2/24/2011)	(13 - 12)/(11 - 8)	0.333333
14 (1/9/2012)	12 (2/24/2011)	(14 - 12)/(12 - 8)	0.5
12 (4/9/2012)	12 (2/24/2011)	(12 - 12)/(13 - 8)	0
11 (7/27/2011)	12 (5/13/2011)	(11 - 12)/(10 - 9)	-1
13 (10/10/2011)	12 (5/13/2011)	(13 - 12)/(11 - 9)	0.5
14 (1/9/2012)	12 (5/13/2011)	(14 - 12)/(12 - 9)	0.666667
12 (4/9/2012)	12 (5/13/2011)	(12 - 12)/(13 - 9)	0
13 (10/10/2011)	11 (7/27/2011)	(13 - 11)/(11 - 10)	2
14 (1/9/2012)	11 (7/27/2011)	(14 - 11)/(12 - 10)	1.5
12 (4/9/2012)	11 (7/27/2011)	(12 - 11)/(13 - 10)	0.333333
14 (1/9/2012)	13 (10/10/2011)	(14 - 13)/(12 - 11)	1
12 (4/9/2012)	13 (10/10/2011)	(12 - 13)/(13 - 11)	-0.5
12 (4/9/2012)	14 (1/9/2012)	(12 - 14)/(13 - 12)	-2

Number of Q values = 78

Ordered Q Values

n	Q
1	-4
2	-2
3	-2
4	-1.66667
5	-1
6	-1
7	-1
8	-0.75
9	-0.666667
10	-0.666667

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11	-0.5
12	-0.5
13	-0.5
14	-0.5
15	-0.428571
16	-0.4
17	-0.4
18	-0.4
19	-0.333333
20	-0.333333
21	-0.333333
22	-0.25
23	-0.25
24	-0.25
25	-0.2
26	-0.2
27	-0.125
28	-0.125
29	-0.111111
30	0
31	0
32	0
33	0
34	0
35	0
36	0
37	0
38	0
39	0
40	0
41	0.0909091
42	0.111111
43	0.125
44	0.142857
45	0.142857
46	0.166667
47	0.166667
48	0.2
49	0.222222
50	0.25
51	0.25
52	0.285714
53	0.3
54	0.3
55	0.333333
56	0.333333
57	0.333333
58	0.363636
59	0.4
60	0.5
61	0.5
62	0.5
63	0.666667
64	0.666667
65	0.75
66	1
67	1

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68	1
69	1
70	1
71	1
72	1
73	1.5
74	1.5
75	2
76	2
77	3
78	4

Sen's Estimator (Median Q) is 0

Tied Group	Value	Members
1	11	2
2	14	2
3	13	3
4	12	4

Time Period	Observations
3/16/2009	1
4/20/2009	1
12/10/2009	1
3/17/2010	1
5/17/2010	1
9/10/2010	1
12/21/2010	1
2/24/2011	1
5/13/2011	1
7/27/2011	1
10/10/2011	1
1/9/2012	1
4/9/2012	1

There are 0 time periods with multiple data

A = 258
B = 0
C = 30
D = 0
E = 22
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 254.333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 26.2318
M1 = (78 - 26.2318)/2.0 = 25.8841
M2 = (78 + 26.2318)/2.0 + 1 = 53.1159
Lower limit is -0.2 = Q(26)
Upper limit is 0.3 = Q(53)
-0.2 < 0 < 0.3 indicating no trend in data.

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Sen's Slope Analysis

Parameter: 1,1,1-Trichloroethane

Location: MW-09S

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
220 (4/20/2009)	160 (3/16/2009)	(220 - 160)/(2 - 1)	60
150 (12/9/2009)	160 (3/16/2009)	(150 - 160)/(3 - 1)	-5
120 (3/18/2010)	160 (3/16/2009)	(120 - 160)/(4 - 1)	-13.3333
120 (5/18/2010)	160 (3/16/2009)	(120 - 160)/(5 - 1)	-10
120 (9/17/2010)	160 (3/16/2009)	(120 - 160)/(6 - 1)	-8
84 (2/25/2011)	160 (3/16/2009)	(84 - 160)/(7 - 1)	-12.6667
83 (5/11/2011)	160 (3/16/2009)	(83 - 160)/(8 - 1)	-11
150 (12/9/2009)	220 (4/20/2009)	(150 - 220)/(3 - 2)	-70
120 (3/18/2010)	220 (4/20/2009)	(120 - 220)/(4 - 2)	-50
120 (5/18/2010)	220 (4/20/2009)	(120 - 220)/(5 - 2)	-33.3333
120 (9/17/2010)	220 (4/20/2009)	(120 - 220)/(6 - 2)	-25
84 (2/25/2011)	220 (4/20/2009)	(84 - 220)/(7 - 2)	-27.2
83 (5/11/2011)	220 (4/20/2009)	(83 - 220)/(8 - 2)	-22.8333
120 (3/18/2010)	150 (12/9/2009)	(120 - 150)/(4 - 3)	-30
120 (5/18/2010)	150 (12/9/2009)	(120 - 150)/(5 - 3)	-15
120 (9/17/2010)	150 (12/9/2009)	(120 - 150)/(6 - 3)	-10
84 (2/25/2011)	150 (12/9/2009)	(84 - 150)/(7 - 3)	-16.5
83 (5/11/2011)	150 (12/9/2009)	(83 - 150)/(8 - 3)	-13.4
120 (5/18/2010)	120 (3/18/2010)	(120 - 120)/(5 - 4)	0
120 (9/17/2010)	120 (3/18/2010)	(120 - 120)/(6 - 4)	0
84 (2/25/2011)	120 (3/18/2010)	(84 - 120)/(7 - 4)	-12
83 (5/11/2011)	120 (3/18/2010)	(83 - 120)/(8 - 4)	-9.25
120 (9/17/2010)	120 (5/18/2010)	(120 - 120)/(6 - 5)	0
84 (2/25/2011)	120 (5/18/2010)	(84 - 120)/(7 - 5)	-18
83 (5/11/2011)	120 (5/18/2010)	(83 - 120)/(8 - 5)	-12.3333
84 (2/25/2011)	120 (9/17/2010)	(84 - 120)/(7 - 6)	-36
83 (5/11/2011)	120 (9/17/2010)	(83 - 120)/(8 - 6)	-18.5
83 (5/11/2011)	84 (2/25/2011)	(83 - 84)/(8 - 7)	-1

Number of Q values = 28

Ordered Q Values

n	Q
1	-70
2	-50
3	-36
4	-33.3333
5	-30
6	-27.2
7	-25

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8	-22.8333
9	-18.5
10	-18
11	-16.5
12	-15
13	-13.4
14	-13.3333
15	-12.6667
16	-12.3333
17	-12
18	-11
19	-10
20	-10
21	-9.25
22	-8
23	-5
24	-1
25	0
26	0
27	0
28	60

Sen's Estimator (Median Q) is -13

Tied Group	Value	Members
1	120	3

Time Period	Observations
3/16/2009	1
4/20/2009	1
12/9/2009	1
3/18/2010	1
5/18/2010	1
9/17/2010	1
2/25/2011	1
5/11/2011	1

There are 0 time periods with multiple data

A = 66
B = 0
C = 6
D = 0
E = 6
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 61.6667
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 12.9167
M1 = (28 - 12.9167)/2.0 = 7.54164
M2 = (28 + 12.9167)/2.0 + 1 = 21.4584
Lower limit is -22.8333 = Q(8)
Upper limit is -9.25 = Q(21)
-9.25 < 0 indicating a downward trend in data.

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Sen's Slope Analysis

Parameter: Trichloroethene
Location: MW-09S

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
2100 (4/20/2009)	1700 (3/16/2009)	(2100 - 1700)/(2 - 1)	400
2400 (12/9/2009)	1700 (3/16/2009)	(2400 - 1700)/(3 - 1)	350
1500 (3/18/2010)	1700 (3/16/2009)	(1500 - 1700)/(4 - 1)	-66.6667
1700 (5/18/2010)	1700 (3/16/2009)	(1700 - 1700)/(5 - 1)	0
1700 (9/17/2010)	1700 (3/16/2009)	(1700 - 1700)/(6 - 1)	0
1100 (2/25/2011)	1700 (3/16/2009)	(1100 - 1700)/(7 - 1)	-100
1200 (5/11/2011)	1700 (3/16/2009)	(1200 - 1700)/(8 - 1)	-71.4286
2400 (12/9/2009)	2100 (4/20/2009)	(2400 - 2100)/(3 - 2)	300
1500 (3/18/2010)	2100 (4/20/2009)	(1500 - 2100)/(4 - 2)	-300
1700 (5/18/2010)	2100 (4/20/2009)	(1700 - 2100)/(5 - 2)	-133.333
1700 (9/17/2010)	2100 (4/20/2009)	(1700 - 2100)/(6 - 2)	-100
1100 (2/25/2011)	2100 (4/20/2009)	(1100 - 2100)/(7 - 2)	-200
1200 (5/11/2011)	2100 (4/20/2009)	(1200 - 2100)/(8 - 2)	-150
1500 (3/18/2010)	2400 (12/9/2009)	(1500 - 2400)/(4 - 3)	-900
1700 (5/18/2010)	2400 (12/9/2009)	(1700 - 2400)/(5 - 3)	-350
1700 (9/17/2010)	2400 (12/9/2009)	(1700 - 2400)/(6 - 3)	-233.333
1100 (2/25/2011)	2400 (12/9/2009)	(1100 - 2400)/(7 - 3)	-325
1200 (5/11/2011)	2400 (12/9/2009)	(1200 - 2400)/(8 - 3)	-240
1700 (5/18/2010)	1500 (3/18/2010)	(1700 - 1500)/(5 - 4)	200
1700 (9/17/2010)	1500 (3/18/2010)	(1700 - 1500)/(6 - 4)	100
1100 (2/25/2011)	1500 (3/18/2010)	(1100 - 1500)/(7 - 4)	-133.333
1200 (5/11/2011)	1500 (3/18/2010)	(1200 - 1500)/(8 - 4)	-75
1700 (9/17/2010)	1700 (5/18/2010)	(1700 - 1700)/(6 - 5)	0
1100 (2/25/2011)	1700 (5/18/2010)	(1100 - 1700)/(7 - 5)	-300
1200 (5/11/2011)	1700 (5/18/2010)	(1200 - 1700)/(8 - 5)	-166.667
1100 (2/25/2011)	1700 (9/17/2010)	(1100 - 1700)/(7 - 6)	-600
1200 (5/11/2011)	1700 (9/17/2010)	(1200 - 1700)/(8 - 6)	-250
1200 (5/11/2011)	1100 (2/25/2011)	(1200 - 1100)/(8 - 7)	100

Number of Q values = 28

Ordered Q Values

n	Q
1	-900
2	-600
3	-350
4	-325
5	-300
6	-300
7	-250

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8	-240
9	-233.333
10	-200
11	-166.667
12	-150
13	-133.333
14	-133.333
15	-100
16	-100
17	-75
18	-71.4286
19	-66.6667
20	0
21	0
22	0
23	100
24	100
25	200
26	300
27	350
28	400

Sen's Estimator (Median Q) is -116.667

Tied Group	Value	Members
1	1700	3

Time Period	Observations
3/16/2009	1
4/20/2009	1
12/9/2009	1
3/18/2010	1
5/18/2010	1
9/17/2010	1
2/25/2011	1
5/11/2011	1

There are 0 time periods with multiple data

A = 66
B = 0
C = 6
D = 0
E = 6
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 61.6667
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 12.9167
M1 = (28 - 12.9167)/2.0 = 7.54164
M2 = (28 + 12.9167)/2.0 + 1 = 21.4584
Lower limit is -240 = Q(8)
Upper limit is 0 = Q(21)
-240 < 0 < 0 indicating no trend in data.

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Sen's Slope Analysis

Parameter: Tetrachloroethene
Location: MW-12S

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
1.4 (12/30/2009)	1.4 (5/15/2009)	(1.4 - 1.4)/(2 - 1)	0
ND<1 (3/15/2010)	1.4 (5/15/2009)	(1 - 1.4)/(3 - 1)	-0.2
1 (5/14/2010)	1.4 (5/15/2009)	(1 - 1.4)/(4 - 1)	-0.133333
1.6 (9/3/2010)	1.4 (5/15/2009)	(1.6 - 1.4)/(5 - 1)	0.05
ND<1 (12/14/2010)	1.4 (5/15/2009)	(1 - 1.4)/(6 - 1)	-0.08
ND<1 (2/14/2011)	1.4 (5/15/2009)	(1 - 1.4)/(7 - 1)	-0.0666667
1.6 (5/12/2011)	1.4 (5/15/2009)	(1.6 - 1.4)/(8 - 1)	0.0285714
1.4 (7/20/2011)	1.4 (5/15/2009)	(1.4 - 1.4)/(9 - 1)	0
1.9 (10/7/2011)	1.4 (5/15/2009)	(1.9 - 1.4)/(10 - 1)	0.0555556
2.2 (1/4/2012)	1.4 (5/15/2009)	(2.2 - 1.4)/(11 - 1)	0.08
1.2 (4/5/2012)	1.4 (5/15/2009)	(1.2 - 1.4)/(12 - 1)	-0.0181818
ND<1 (3/15/2010)	1.4 (12/30/2009)	(1 - 1.4)/(3 - 2)	-0.4
1 (5/14/2010)	1.4 (12/30/2009)	(1 - 1.4)/(4 - 2)	-0.2
1.6 (9/3/2010)	1.4 (12/30/2009)	(1.6 - 1.4)/(5 - 2)	0.0666667
ND<1 (12/14/2010)	1.4 (12/30/2009)	(1 - 1.4)/(6 - 2)	-0.1
ND<1 (2/14/2011)	1.4 (12/30/2009)	(1 - 1.4)/(7 - 2)	-0.08
1.6 (5/12/2011)	1.4 (12/30/2009)	(1.6 - 1.4)/(8 - 2)	0.0333333
1.4 (7/20/2011)	1.4 (12/30/2009)	(1.4 - 1.4)/(9 - 2)	0
1.9 (10/7/2011)	1.4 (12/30/2009)	(1.9 - 1.4)/(10 - 2)	0.0625
2.2 (1/4/2012)	1.4 (12/30/2009)	(2.2 - 1.4)/(11 - 2)	0.0888889
1.2 (4/5/2012)	1.4 (12/30/2009)	(1.2 - 1.4)/(12 - 2)	-0.02
1 (5/14/2010)	ND<1 (3/15/2010)	(1 - 1)/(4 - 3)	0
1.6 (9/3/2010)	ND<1 (3/15/2010)	(1.6 - 1)/(5 - 3)	0.3
ND<1 (12/14/2010)	ND<1 (3/15/2010)	(1 - 1)/(6 - 3)	0
ND<1 (2/14/2011)	ND<1 (3/15/2010)	(1 - 1)/(7 - 3)	0
1.6 (5/12/2011)	ND<1 (3/15/2010)	(1.6 - 1)/(8 - 3)	0.12
1.4 (7/20/2011)	ND<1 (3/15/2010)	(1.4 - 1)/(9 - 3)	0.0666667
1.9 (10/7/2011)	ND<1 (3/15/2010)	(1.9 - 1)/(10 - 3)	0.128571
2.2 (1/4/2012)	ND<1 (3/15/2010)	(2.2 - 1)/(11 - 3)	0.15
1.2 (4/5/2012)	ND<1 (3/15/2010)	(1.2 - 1)/(12 - 3)	0.0222222
1.6 (9/3/2010)	1 (5/14/2010)	(1.6 - 1)/(5 - 4)	0.6
ND<1 (12/14/2010)	1 (5/14/2010)	(1 - 1)/(6 - 4)	0
ND<1 (2/14/2011)	1 (5/14/2010)	(1 - 1)/(7 - 4)	0
1.6 (5/12/2011)	1 (5/14/2010)	(1.6 - 1)/(8 - 4)	0.15
1.4 (7/20/2011)	1 (5/14/2010)	(1.4 - 1)/(9 - 4)	0.08
1.9 (10/7/2011)	1 (5/14/2010)	(1.9 - 1)/(10 - 4)	0.15
2.2 (1/4/2012)	1 (5/14/2010)	(2.2 - 1)/(11 - 4)	0.171429
1.2 (4/5/2012)	1 (5/14/2010)	(1.2 - 1)/(12 - 4)	0.025
ND<1 (12/14/2010)	1.6 (9/3/2010)	(1 - 1.6)/(6 - 5)	-0.6
ND<1 (2/14/2011)	1.6 (9/3/2010)	(1 - 1.6)/(7 - 5)	-0.3
1.6 (5/12/2011)	1.6 (9/3/2010)	(1.6 - 1.6)/(8 - 5)	0
1.4 (7/20/2011)	1.6 (9/3/2010)	(1.4 - 1.6)/(9 - 5)	-0.05
1.9 (10/7/2011)	1.6 (9/3/2010)	(1.9 - 1.6)/(10 - 5)	0.06
2.2 (1/4/2012)	1.6 (9/3/2010)	(2.2 - 1.6)/(11 - 5)	0.1

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1.2 (4/5/2012)	1.6 (9/3/2010)	(1.2 - 1.6)/(12 - 5)	-0.0571429
ND<1 (2/14/2011)	ND<1 (12/14/2010)	(1 - 1)/(7 - 6)	0
1.6 (5/12/2011)	ND<1 (12/14/2010)	(1.6 - 1)/(8 - 6)	0.3
1.4 (7/20/2011)	ND<1 (12/14/2010)	(1.4 - 1)/(9 - 6)	0.133333
1.9 (10/7/2011)	ND<1 (12/14/2010)	(1.9 - 1)/(10 - 6)	0.225
2.2 (1/4/2012)	ND<1 (12/14/2010)	(2.2 - 1)/(11 - 6)	0.24
1.2 (4/5/2012)	ND<1 (12/14/2010)	(1.2 - 1)/(12 - 6)	0.0333333
1.6 (5/12/2011)	ND<1 (2/14/2011)	(1.6 - 1)/(8 - 7)	0.6
1.4 (7/20/2011)	ND<1 (2/14/2011)	(1.4 - 1)/(9 - 7)	0.2
1.9 (10/7/2011)	ND<1 (2/14/2011)	(1.9 - 1)/(10 - 7)	0.3
2.2 (1/4/2012)	ND<1 (2/14/2011)	(2.2 - 1)/(11 - 7)	0.3
1.2 (4/5/2012)	ND<1 (2/14/2011)	(1.2 - 1)/(12 - 7)	0.04
1.4 (7/20/2011)	1.6 (5/12/2011)	(1.4 - 1.6)/(9 - 8)	-0.2
1.9 (10/7/2011)	1.6 (5/12/2011)	(1.9 - 1.6)/(10 - 8)	0.15
2.2 (1/4/2012)	1.6 (5/12/2011)	(2.2 - 1.6)/(11 - 8)	0.2
1.2 (4/5/2012)	1.6 (5/12/2011)	(1.2 - 1.6)/(12 - 8)	-0.1
1.9 (10/7/2011)	1.4 (7/20/2011)	(1.9 - 1.4)/(10 - 9)	0.5
2.2 (1/4/2012)	1.4 (7/20/2011)	(2.2 - 1.4)/(11 - 9)	0.4
1.2 (4/5/2012)	1.4 (7/20/2011)	(1.2 - 1.4)/(12 - 9)	-0.0666667
2.2 (1/4/2012)	1.9 (10/7/2011)	(2.2 - 1.9)/(11 - 10)	0.3
1.2 (4/5/2012)	1.9 (10/7/2011)	(1.2 - 1.9)/(12 - 10)	-0.35
1.2 (4/5/2012)	2.2 (1/4/2012)	(1.2 - 2.2)/(12 - 11)	-1

Number of Q values = 66

Ordered Q Values

n	Q
1	-1
2	-0.6
3	-0.4
4	-0.35
5	-0.3
6	-0.2
7	-0.2
8	-0.2
9	-0.133333
10	-0.1
11	-0.1
12	-0.08
13	-0.08
14	-0.0666667
15	-0.0666667
16	-0.0571429
17	-0.05
18	-0.02
19	-0.0181818
20	0
21	0
22	0
23	0

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24	0
25	0
26	0
27	0
28	0
29	0
30	0.0222222
31	0.025
32	0.0285714
33	0.0333333
34	0.0333333
35	0.04
36	0.05
37	0.0555556
38	0.06
39	0.0625
40	0.0666667
41	0.0666667
42	0.08
43	0.08
44	0.0888889
45	0.1
46	0.12
47	0.128571
48	0.133333
49	0.15
50	0.15
51	0.15
52	0.15
53	0.171429
54	0.2
55	0.2
56	0.225
57	0.24
58	0.3
59	0.3
60	0.3
61	0.3
62	0.3
63	0.4
64	0.5
65	0.6
66	0.6

Sen's Estimator (Median Q) is 0.0333333

Tied Group	Value	Members
1	1.4	3
2	1	4
3	1.6	2

Time Period	Observations
5/15/2009	1
12/30/2009	1
3/15/2010	1
5/14/2010	1
9/3/2010	1
12/14/2010	1

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2/14/2011	1
5/12/2011	1
7/20/2011	1
10/7/2011	1
1/4/2012	1
4/5/2012	1

There are 0 time periods with multiple data

A = 240
B = 0
C = 30
D = 0
E = 20
F = 0
a = 3828
b = 11880
c = 264
Group Variance = 199.333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 23.2229
M1 = (66 - 23.2229)/2.0 = 21.3885
M2 = (66 + 23.2229)/2.0 + 1 = 45.6115
Lower limit is 0 = Q(21)
Upper limit is 0.12 = Q(46)
0 < 0 < 0.12 indicating no trend in data.

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Sen's Slope Analysis

Parameter: 1,1,1-Trichloroethane
Location: MW-19S

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
2.3 (1/13/2010)	1.8 (12/8/2009)	(2.3 - 1.8)/(2 - 1)	0.5
1.7 (3/16/2010)	1.8 (12/8/2009)	(1.7 - 1.8)/(3 - 1)	-0.05
1.6 (5/18/2010)	1.8 (12/8/2009)	(1.6 - 1.8)/(4 - 1)	-0.0666667
1.8 (9/10/2010)	1.8 (12/8/2009)	(1.8 - 1.8)/(5 - 1)	0
1.8 (12/20/2010)	1.8 (12/8/2009)	(1.8 - 1.8)/(6 - 1)	0
1.8 (2/18/2011)	1.8 (12/8/2009)	(1.8 - 1.8)/(7 - 1)	0
1.5 (5/10/2011)	1.8 (12/8/2009)	(1.5 - 1.8)/(8 - 1)	-0.0428571
1.4 (7/25/2011)	1.8 (12/8/2009)	(1.4 - 1.8)/(9 - 1)	-0.05
1.7 (10/5/2011)	1.8 (12/8/2009)	(1.7 - 1.8)/(10 - 1)	-0.0111111
1.9 (1/9/2012)	1.8 (12/8/2009)	(1.9 - 1.8)/(11 - 1)	0.01
1.5 (4/3/2012)	1.8 (12/8/2009)	(1.5 - 1.8)/(12 - 1)	-0.0272727
1.7 (3/16/2010)	2.3 (1/13/2010)	(1.7 - 2.3)/(3 - 2)	-0.6
1.6 (5/18/2010)	2.3 (1/13/2010)	(1.6 - 2.3)/(4 - 2)	-0.35
1.8 (9/10/2010)	2.3 (1/13/2010)	(1.8 - 2.3)/(5 - 2)	-0.166667
1.8 (12/20/2010)	2.3 (1/13/2010)	(1.8 - 2.3)/(6 - 2)	-0.125
1.8 (2/18/2011)	2.3 (1/13/2010)	(1.8 - 2.3)/(7 - 2)	-0.1
1.5 (5/10/2011)	2.3 (1/13/2010)	(1.5 - 2.3)/(8 - 2)	-0.133333
1.4 (7/25/2011)	2.3 (1/13/2010)	(1.4 - 2.3)/(9 - 2)	-0.128571
1.7 (10/5/2011)	2.3 (1/13/2010)	(1.7 - 2.3)/(10 - 2)	-0.075
1.9 (1/9/2012)	2.3 (1/13/2010)	(1.9 - 2.3)/(11 - 2)	-0.0444444
1.5 (4/3/2012)	2.3 (1/13/2010)	(1.5 - 2.3)/(12 - 2)	-0.08
1.6 (5/18/2010)	1.7 (3/16/2010)	(1.6 - 1.7)/(4 - 3)	-0.1
1.8 (9/10/2010)	1.7 (3/16/2010)	(1.8 - 1.7)/(5 - 3)	0.05
1.8 (12/20/2010)	1.7 (3/16/2010)	(1.8 - 1.7)/(6 - 3)	0.0333333
1.8 (2/18/2011)	1.7 (3/16/2010)	(1.8 - 1.7)/(7 - 3)	0.025
1.5 (5/10/2011)	1.7 (3/16/2010)	(1.5 - 1.7)/(8 - 3)	-0.04
1.4 (7/25/2011)	1.7 (3/16/2010)	(1.4 - 1.7)/(9 - 3)	-0.05
1.7 (10/5/2011)	1.7 (3/16/2010)	(1.7 - 1.7)/(10 - 3)	0
1.9 (1/9/2012)	1.7 (3/16/2010)	(1.9 - 1.7)/(11 - 3)	0.025
1.5 (4/3/2012)	1.7 (3/16/2010)	(1.5 - 1.7)/(12 - 3)	-0.0222222
1.8 (9/10/2010)	1.6 (5/18/2010)	(1.8 - 1.6)/(5 - 4)	0.2
1.8 (12/20/2010)	1.6 (5/18/2010)	(1.8 - 1.6)/(6 - 4)	0.1
1.8 (2/18/2011)	1.6 (5/18/2010)	(1.8 - 1.6)/(7 - 4)	0.0666667
1.5 (5/10/2011)	1.6 (5/18/2010)	(1.5 - 1.6)/(8 - 4)	-0.025
1.4 (7/25/2011)	1.6 (5/18/2010)	(1.4 - 1.6)/(9 - 4)	-0.04
1.7 (10/5/2011)	1.6 (5/18/2010)	(1.7 - 1.6)/(10 - 4)	0.0166667
1.9 (1/9/2012)	1.6 (5/18/2010)	(1.9 - 1.6)/(11 - 4)	0.0428571
1.5 (4/3/2012)	1.6 (5/18/2010)	(1.5 - 1.6)/(12 - 4)	-0.0125
1.8 (12/20/2010)	1.8 (9/10/2010)	(1.8 - 1.8)/(6 - 5)	0
1.8 (2/18/2011)	1.8 (9/10/2010)	(1.8 - 1.8)/(7 - 5)	0
1.5 (5/10/2011)	1.8 (9/10/2010)	(1.5 - 1.8)/(8 - 5)	-0.1
1.4 (7/25/2011)	1.8 (9/10/2010)	(1.4 - 1.8)/(9 - 5)	-0.1
1.7 (10/5/2011)	1.8 (9/10/2010)	(1.7 - 1.8)/(10 - 5)	-0.02
1.9 (1/9/2012)	1.8 (9/10/2010)	(1.9 - 1.8)/(11 - 5)	0.0166667

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1.5 (4/3/2012)	1.8 (9/10/2010)	(1.5 - 1.8)/(12 - 5)	-0.0428571
1.8 (2/18/2011)	1.8 (12/20/2010)	(1.8 - 1.8)/(7 - 6)	0
1.5 (5/10/2011)	1.8 (12/20/2010)	(1.5 - 1.8)/(8 - 6)	-0.15
1.4 (7/25/2011)	1.8 (12/20/2010)	(1.4 - 1.8)/(9 - 6)	-0.133333
1.7 (10/5/2011)	1.8 (12/20/2010)	(1.7 - 1.8)/(10 - 6)	-0.025
1.9 (1/9/2012)	1.8 (12/20/2010)	(1.9 - 1.8)/(11 - 6)	0.02
1.5 (4/3/2012)	1.8 (12/20/2010)	(1.5 - 1.8)/(12 - 6)	-0.05
1.5 (5/10/2011)	1.8 (2/18/2011)	(1.5 - 1.8)/(8 - 7)	-0.3
1.4 (7/25/2011)	1.8 (2/18/2011)	(1.4 - 1.8)/(9 - 7)	-0.2
1.7 (10/5/2011)	1.8 (2/18/2011)	(1.7 - 1.8)/(10 - 7)	-0.0333333
1.9 (1/9/2012)	1.8 (2/18/2011)	(1.9 - 1.8)/(11 - 7)	0.025
1.5 (4/3/2012)	1.8 (2/18/2011)	(1.5 - 1.8)/(12 - 7)	-0.06
1.4 (7/25/2011)	1.5 (5/10/2011)	(1.4 - 1.5)/(9 - 8)	-0.1
1.7 (10/5/2011)	1.5 (5/10/2011)	(1.7 - 1.5)/(10 - 8)	0.1
1.9 (1/9/2012)	1.5 (5/10/2011)	(1.9 - 1.5)/(11 - 8)	0.133333
1.5 (4/3/2012)	1.5 (5/10/2011)	(1.5 - 1.5)/(12 - 8)	0
1.7 (10/5/2011)	1.4 (7/25/2011)	(1.7 - 1.4)/(10 - 9)	0.3
1.9 (1/9/2012)	1.4 (7/25/2011)	(1.9 - 1.4)/(11 - 9)	0.25
1.5 (4/3/2012)	1.4 (7/25/2011)	(1.5 - 1.4)/(12 - 9)	0.0333333
1.9 (1/9/2012)	1.7 (10/5/2011)	(1.9 - 1.7)/(11 - 10)	0.2
1.5 (4/3/2012)	1.7 (10/5/2011)	(1.5 - 1.7)/(12 - 10)	-0.1
1.5 (4/3/2012)	1.9 (1/9/2012)	(1.5 - 1.9)/(12 - 11)	-0.4

Number of Q values = 66

Ordered Q Values

n	Q
1	-0.6
2	-0.4
3	-0.35
4	-0.3
5	-0.2
6	-0.166667
7	-0.15
8	-0.133333
9	-0.133333
10	-0.128571
11	-0.125
12	-0.1
13	-0.1
14	-0.1
15	-0.1
16	-0.1
17	-0.1
18	-0.08
19	-0.075
20	-0.0666667
21	-0.06
22	-0.05
23	-0.05

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24	-0.05
25	-0.05
26	-0.0444444
27	-0.0428571
28	-0.0428571
29	-0.04
30	-0.04
31	-0.0333333
32	-0.0272727
33	-0.025
34	-0.025
35	-0.0222222
36	-0.02
37	-0.0125
38	-0.0111111
39	0
40	0
41	0
42	0
43	0
44	0
45	0
46	0
47	0.01
48	0.0166667
49	0.0166667
50	0.02
51	0.025
52	0.025
53	0.025
54	0.0333333
55	0.0333333
56	0.0428571
57	0.05
58	0.0666667
59	0.1
60	0.1
61	0.133333
62	0.2
63	0.2
64	0.25
65	0.3
66	0.5

Sen's Estimator (Median Q) is -0.025

Tied Group	Value	Members
1	1.8	4
2	1.7	2
3	1.5	2

Time Period	Observations
12/8/2009	1
1/13/2010	1
3/16/2010	1
5/18/2010	1
9/10/2010	1
12/20/2010	1

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2/18/2011	1
5/10/2011	1
7/25/2011	1
10/5/2011	1
1/9/2012	1
4/3/2012	1

There are 0 time periods with multiple data

A = 192
B = 0
C = 24
D = 0
E = 16
F = 0
a = 3828
b = 11880
c = 264
Group Variance = 202
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 23.3778
M1 = (66 - 23.3778)/2.0 = 21.3111
M2 = (66 + 23.3778)/2.0 + 1 = 45.6889
Lower limit is -0.06 = Q(21)
Upper limit is 0 = Q(46)
-0.06 < 0 < 0 indicating no trend in data.

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Sen's Slope Analysis

Parameter: Tetrachloroethene

Location: MW-19S

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
1.2 (1/13/2010)	ND<1 (12/8/2009)	(1.2 - 1)/(2 - 1)	0.2
1.1 (3/16/2010)	ND<1 (12/8/2009)	(1.1 - 1)/(3 - 1)	0.05
ND<1 (5/18/2010)	ND<1 (12/8/2009)	(1 - 1)/(4 - 1)	0
1.2 (9/10/2010)	ND<1 (12/8/2009)	(1.2 - 1)/(5 - 1)	0.05
ND<1 (12/20/2010)	ND<1 (12/8/2009)	(1 - 1)/(6 - 1)	0
1.1 (2/18/2011)	ND<1 (12/8/2009)	(1.1 - 1)/(7 - 1)	0.0166667
ND<1 (5/10/2011)	ND<1 (12/8/2009)	(1 - 1)/(8 - 1)	0
1 (7/25/2011)	ND<1 (12/8/2009)	(1 - 1)/(9 - 1)	0
1.1 (10/5/2011)	ND<1 (12/8/2009)	(1.1 - 1)/(10 - 1)	0.0111111
1.2 (1/9/2012)	ND<1 (12/8/2009)	(1.2 - 1)/(11 - 1)	0.02
1.1 (4/3/2012)	ND<1 (12/8/2009)	(1.1 - 1)/(12 - 1)	0.00909091
1.1 (3/16/2010)	1.2 (1/13/2010)	(1.1 - 1.2)/(3 - 2)	-0.1
ND<1 (5/18/2010)	1.2 (1/13/2010)	(1 - 1.2)/(4 - 2)	-0.1
1.2 (9/10/2010)	1.2 (1/13/2010)	(1.2 - 1.2)/(5 - 2)	0
ND<1 (12/20/2010)	1.2 (1/13/2010)	(1 - 1.2)/(6 - 2)	-0.05
1.1 (2/18/2011)	1.2 (1/13/2010)	(1.1 - 1.2)/(7 - 2)	-0.02
ND<1 (5/10/2011)	1.2 (1/13/2010)	(1 - 1.2)/(8 - 2)	-0.0333333
1 (7/25/2011)	1.2 (1/13/2010)	(1 - 1.2)/(9 - 2)	-0.0285714
1.1 (10/5/2011)	1.2 (1/13/2010)	(1.1 - 1.2)/(10 - 2)	-0.0125
1.2 (1/9/2012)	1.2 (1/13/2010)	(1.2 - 1.2)/(11 - 2)	0
1.1 (4/3/2012)	1.2 (1/13/2010)	(1.1 - 1.2)/(12 - 2)	-0.01
ND<1 (5/18/2010)	1.1 (3/16/2010)	(1 - 1.1)/(4 - 3)	-0.1
1.2 (9/10/2010)	1.1 (3/16/2010)	(1.2 - 1.1)/(5 - 3)	0.05
ND<1 (12/20/2010)	1.1 (3/16/2010)	(1 - 1.1)/(6 - 3)	-0.0333333
1.1 (2/18/2011)	1.1 (3/16/2010)	(1.1 - 1.1)/(7 - 3)	0
ND<1 (5/10/2011)	1.1 (3/16/2010)	(1 - 1.1)/(8 - 3)	-0.02
1 (7/25/2011)	1.1 (3/16/2010)	(1 - 1.1)/(9 - 3)	-0.0166667
1.1 (10/5/2011)	1.1 (3/16/2010)	(1.1 - 1.1)/(10 - 3)	0
1.2 (1/9/2012)	1.1 (3/16/2010)	(1.2 - 1.1)/(11 - 3)	0.0125
1.1 (4/3/2012)	1.1 (3/16/2010)	(1.1 - 1.1)/(12 - 3)	0
1.2 (9/10/2010)	ND<1 (5/18/2010)	(1.2 - 1)/(5 - 4)	0.2
ND<1 (12/20/2010)	ND<1 (5/18/2010)	(1 - 1)/(6 - 4)	0
1.1 (2/18/2011)	ND<1 (5/18/2010)	(1.1 - 1)/(7 - 4)	0.0333333
ND<1 (5/10/2011)	ND<1 (5/18/2010)	(1 - 1)/(8 - 4)	0
1 (7/25/2011)	ND<1 (5/18/2010)	(1 - 1)/(9 - 4)	0
1.1 (10/5/2011)	ND<1 (5/18/2010)	(1.1 - 1)/(10 - 4)	0.0166667
1.2 (1/9/2012)	ND<1 (5/18/2010)	(1.2 - 1)/(11 - 4)	0.0285714
1.1 (4/3/2012)	ND<1 (5/18/2010)	(1.1 - 1)/(12 - 4)	0.0125
ND<1 (12/20/2010)	1.2 (9/10/2010)	(1 - 1.2)/(6 - 5)	-0.2
1.1 (2/18/2011)	1.2 (9/10/2010)	(1.1 - 1.2)/(7 - 5)	-0.05
ND<1 (5/10/2011)	1.2 (9/10/2010)	(1 - 1.2)/(8 - 5)	-0.0666667
1 (7/25/2011)	1.2 (9/10/2010)	(1 - 1.2)/(9 - 5)	-0.05
1.1 (10/5/2011)	1.2 (9/10/2010)	(1.1 - 1.2)/(10 - 5)	-0.02
1.2 (1/9/2012)	1.2 (9/10/2010)	(1.2 - 1.2)/(11 - 5)	0

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1.1 (4/3/2012)	1.2 (9/10/2010)	(1.1 - 1.2)/(12 - 5)	-0.0142857
1.1 (2/18/2011)	ND<1 (12/20/2010)	(1.1 - 1)/(7 - 6)	0.1
ND<1 (5/10/2011)	ND<1 (12/20/2010)	(1 - 1)/(8 - 6)	0
1 (7/25/2011)	ND<1 (12/20/2010)	(1 - 1)/(9 - 6)	0
1.1 (10/5/2011)	ND<1 (12/20/2010)	(1.1 - 1)/(10 - 6)	0.025
1.2 (1/9/2012)	ND<1 (12/20/2010)	(1.2 - 1)/(11 - 6)	0.04
1.1 (4/3/2012)	ND<1 (12/20/2010)	(1.1 - 1)/(12 - 6)	0.0166667
ND<1 (5/10/2011)	1.1 (2/18/2011)	(1 - 1.1)/(8 - 7)	-0.1
1 (7/25/2011)	1.1 (2/18/2011)	(1 - 1.1)/(9 - 7)	-0.05
1.1 (10/5/2011)	1.1 (2/18/2011)	(1.1 - 1.1)/(10 - 7)	0
1.2 (1/9/2012)	1.1 (2/18/2011)	(1.2 - 1.1)/(11 - 7)	0.025
1.1 (4/3/2012)	1.1 (2/18/2011)	(1.1 - 1.1)/(12 - 7)	0
1 (7/25/2011)	ND<1 (5/10/2011)	(1 - 1)/(9 - 8)	0
1.1 (10/5/2011)	ND<1 (5/10/2011)	(1.1 - 1)/(10 - 8)	0.05
1.2 (1/9/2012)	ND<1 (5/10/2011)	(1.2 - 1)/(11 - 8)	0.0666667
1.1 (4/3/2012)	ND<1 (5/10/2011)	(1.1 - 1)/(12 - 8)	0.025
1.1 (10/5/2011)	1 (7/25/2011)	(1.1 - 1)/(10 - 9)	0.1
1.2 (1/9/2012)	1 (7/25/2011)	(1.2 - 1)/(11 - 9)	0.1
1.1 (4/3/2012)	1 (7/25/2011)	(1.1 - 1)/(12 - 9)	0.0333333
1.2 (1/9/2012)	1.1 (10/5/2011)	(1.2 - 1.1)/(11 - 10)	0.1
1.1 (4/3/2012)	1.1 (10/5/2011)	(1.1 - 1.1)/(12 - 10)	0
1.1 (4/3/2012)	1.2 (1/9/2012)	(1.1 - 1.2)/(12 - 11)	-0.1

Number of Q values = 66

Ordered Q Values

n	Q
1	-0.2
2	-0.1
3	-0.1
4	-0.1
5	-0.1
6	-0.1
7	-0.0666667
8	-0.05
9	-0.05
10	-0.05
11	-0.05
12	-0.0333333
13	-0.0333333
14	-0.0285714
15	-0.02
16	-0.02
17	-0.02
18	-0.0166667
19	-0.0142857
20	-0.0125
21	-0.01
22	0
23	0

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24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0
33	0
34	0
35	0
36	0
37	0
38	0
39	0
40	0
41	0.00909091
42	0.0111111
43	0.0125
44	0.0125
45	0.0166667
46	0.0166667
47	0.0166667
48	0.02
49	0.025
50	0.025
51	0.025
52	0.0285714
53	0.0333333
54	0.0333333
55	0.04
56	0.05
57	0.05
58	0.05
59	0.05
60	0.0666667
61	0.1
62	0.1
63	0.1
64	0.1
65	0.2
66	0.2

Sen's Estimator (Median Q) is 0

Tied Group	Value	Members
1	1	5
2	1.2	3
3	1.1	4

Time Period	Observations
12/8/2009	1
1/13/2010	1
3/16/2010	1
5/18/2010	1
9/10/2010	1
12/20/2010	1

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2/18/2011	1
5/10/2011	1
7/25/2011	1
10/5/2011	1
1/9/2012	1
4/3/2012	1

There are 0 time periods with multiple data

A = 522
B = 0
C = 90
D = 0
E = 38
F = 0
a = 3828
b = 11880
c = 264
Group Variance = 183.667
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 22.2917
M1 = (66 - 22.2917)/2.0 = 21.8542
M2 = (66 + 22.2917)/2.0 + 1 = 45.1458
Lower limit is 0 = Q(22)
Upper limit is 0.0166667 = Q(45)
0 < 0 < 0.0166667 indicating no trend in data.

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Sen's Slope Analysis

Parameter: Trichloroethene
Location: MW-19S

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
36 (1/13/2010)	31 (12/8/2009)	(36 - 31)/(2 - 1)	5
36 (3/16/2010)	31 (12/8/2009)	(36 - 31)/(3 - 1)	2.5
32 (5/18/2010)	31 (12/8/2009)	(32 - 31)/(4 - 1)	0.333333
33 (9/10/2010)	31 (12/8/2009)	(33 - 31)/(5 - 1)	0.5
37 (12/20/2010)	31 (12/8/2009)	(37 - 31)/(6 - 1)	1.2
41 (2/18/2011)	31 (12/8/2009)	(41 - 31)/(7 - 1)	1.66667
28 (5/10/2011)	31 (12/8/2009)	(28 - 31)/(8 - 1)	-0.428571
27 (7/25/2011)	31 (12/8/2009)	(27 - 31)/(9 - 1)	-0.5
28 (10/5/2011)	31 (12/8/2009)	(28 - 31)/(10 - 1)	-0.333333
34 (1/9/2012)	31 (12/8/2009)	(34 - 31)/(11 - 1)	0.3
32 (4/3/2012)	31 (12/8/2009)	(32 - 31)/(12 - 1)	0.0909091
36 (3/16/2010)	36 (1/13/2010)	(36 - 36)/(3 - 2)	0
32 (5/18/2010)	36 (1/13/2010)	(32 - 36)/(4 - 2)	-2
33 (9/10/2010)	36 (1/13/2010)	(33 - 36)/(5 - 2)	-1
37 (12/20/2010)	36 (1/13/2010)	(37 - 36)/(6 - 2)	0.25
41 (2/18/2011)	36 (1/13/2010)	(41 - 36)/(7 - 2)	1
28 (5/10/2011)	36 (1/13/2010)	(28 - 36)/(8 - 2)	-1.33333
27 (7/25/2011)	36 (1/13/2010)	(27 - 36)/(9 - 2)	-1.28571
28 (10/5/2011)	36 (1/13/2010)	(28 - 36)/(10 - 2)	-1
34 (1/9/2012)	36 (1/13/2010)	(34 - 36)/(11 - 2)	-0.222222
32 (4/3/2012)	36 (1/13/2010)	(32 - 36)/(12 - 2)	-0.4
32 (5/18/2010)	36 (3/16/2010)	(32 - 36)/(4 - 3)	-4
33 (9/10/2010)	36 (3/16/2010)	(33 - 36)/(5 - 3)	-1.5
37 (12/20/2010)	36 (3/16/2010)	(37 - 36)/(6 - 3)	0.333333
41 (2/18/2011)	36 (3/16/2010)	(41 - 36)/(7 - 3)	1.25
28 (5/10/2011)	36 (3/16/2010)	(28 - 36)/(8 - 3)	-1.6
27 (7/25/2011)	36 (3/16/2010)	(27 - 36)/(9 - 3)	-1.5
28 (10/5/2011)	36 (3/16/2010)	(28 - 36)/(10 - 3)	-1.14286
34 (1/9/2012)	36 (3/16/2010)	(34 - 36)/(11 - 3)	-0.25
32 (4/3/2012)	36 (3/16/2010)	(32 - 36)/(12 - 3)	-0.444444
33 (9/10/2010)	32 (5/18/2010)	(33 - 32)/(5 - 4)	1
37 (12/20/2010)	32 (5/18/2010)	(37 - 32)/(6 - 4)	2.5
41 (2/18/2011)	32 (5/18/2010)	(41 - 32)/(7 - 4)	3
28 (5/10/2011)	32 (5/18/2010)	(28 - 32)/(8 - 4)	-1
27 (7/25/2011)	32 (5/18/2010)	(27 - 32)/(9 - 4)	-1
28 (10/5/2011)	32 (5/18/2010)	(28 - 32)/(10 - 4)	-0.666667
34 (1/9/2012)	32 (5/18/2010)	(34 - 32)/(11 - 4)	0.285714
32 (4/3/2012)	32 (5/18/2010)	(32 - 32)/(12 - 4)	0
37 (12/20/2010)	33 (9/10/2010)	(37 - 33)/(6 - 5)	4
41 (2/18/2011)	33 (9/10/2010)	(41 - 33)/(7 - 5)	4
28 (5/10/2011)	33 (9/10/2010)	(28 - 33)/(8 - 5)	-1.66667
27 (7/25/2011)	33 (9/10/2010)	(27 - 33)/(9 - 5)	-1.5
28 (10/5/2011)	33 (9/10/2010)	(28 - 33)/(10 - 5)	-1
34 (1/9/2012)	33 (9/10/2010)	(34 - 33)/(11 - 5)	0.166667

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32 (4/3/2012)	33 (9/10/2010)	(32 - 33)/(12 - 5)	-0.142857
41 (2/18/2011)	37 (12/20/2010)	(41 - 37)/(7 - 6)	4
28 (5/10/2011)	37 (12/20/2010)	(28 - 37)/(8 - 6)	-4.5
27 (7/25/2011)	37 (12/20/2010)	(27 - 37)/(9 - 6)	-3.33333
28 (10/5/2011)	37 (12/20/2010)	(28 - 37)/(10 - 6)	-2.25
34 (1/9/2012)	37 (12/20/2010)	(34 - 37)/(11 - 6)	-0.6
32 (4/3/2012)	37 (12/20/2010)	(32 - 37)/(12 - 6)	-0.833333
28 (5/10/2011)	41 (2/18/2011)	(28 - 41)/(8 - 7)	-13
27 (7/25/2011)	41 (2/18/2011)	(27 - 41)/(9 - 7)	-7
28 (10/5/2011)	41 (2/18/2011)	(28 - 41)/(10 - 7)	-4.33333
34 (1/9/2012)	41 (2/18/2011)	(34 - 41)/(11 - 7)	-1.75
32 (4/3/2012)	41 (2/18/2011)	(32 - 41)/(12 - 7)	-1.8
27 (7/25/2011)	28 (5/10/2011)	(27 - 28)/(9 - 8)	-1
28 (10/5/2011)	28 (5/10/2011)	(28 - 28)/(10 - 8)	0
34 (1/9/2012)	28 (5/10/2011)	(34 - 28)/(11 - 8)	2
32 (4/3/2012)	28 (5/10/2011)	(32 - 28)/(12 - 8)	1
28 (10/5/2011)	27 (7/25/2011)	(28 - 27)/(10 - 9)	1
34 (1/9/2012)	27 (7/25/2011)	(34 - 27)/(11 - 9)	3.5
32 (4/3/2012)	27 (7/25/2011)	(32 - 27)/(12 - 9)	1.66667
34 (1/9/2012)	28 (10/5/2011)	(34 - 28)/(11 - 10)	6
32 (4/3/2012)	28 (10/5/2011)	(32 - 28)/(12 - 10)	2
32 (4/3/2012)	34 (1/9/2012)	(32 - 34)/(12 - 11)	-2

Number of Q values = 66

Ordered Q Values

n	Q
1	-13
2	-7
3	-4.5
4	-4.33333
5	-4
6	-3.33333
7	-2.25
8	-2
9	-2
10	-1.8
11	-1.75
12	-1.66667
13	-1.6
14	-1.5
15	-1.5
16	-1.5
17	-1.33333
18	-1.28571
19	-1.14286
20	-1
21	-1
22	-1
23	-1

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24	-1
25	-1
26	-0.833333
27	-0.666667
28	-0.6
29	-0.5
30	-0.444444
31	-0.428571
32	-0.4
33	-0.333333
34	-0.25
35	-0.222222
36	-0.142857
37	0
38	0
39	0
40	0.0909091
41	0.166667
42	0.25
43	0.285714
44	0.3
45	0.333333
46	0.333333
47	0.5
48	1
49	1
50	1
51	1
52	1.2
53	1.25
54	1.66667
55	1.66667
56	2
57	2
58	2.5
59	2.5
60	3
61	3.5
62	4
63	4
64	4
65	5
66	6

Sen's Estimator (Median Q) is -0.291667

Tied Group	Value	Members
1	36	2
2	32	2
3	28	2

Time Period	Observations
12/8/2009	1
1/13/2010	1
3/16/2010	1
5/18/2010	1
9/10/2010	1
12/20/2010	1

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2/18/2011	1
5/10/2011	1
7/25/2011	1
10/5/2011	1
1/9/2012	1
4/3/2012	1

There are 0 time periods with multiple data

A = 54
B = 0
C = 0
D = 0
E = 6
F = 0
a = 3828
b = 11880
c = 264
Group Variance = 209.667
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 23.8173
M1 = (66 - 23.8173)/2.0 = 21.0914
M2 = (66 + 23.8173)/2.0 + 1 = 45.9086
Lower limit is -1 = Q(21)
Upper limit is 0.333333 = Q(46)
-1 < 0 < 0.333333 indicating no trend in data.

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Sen's Slope Analysis

Parameter: cis-1,2-Dichloroethene

Location: MW-20D

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
94 (1/13/2010)	86 (12/30/2009)	(94 - 86)/(2 - 1)	8
85 (3/17/2010)	86 (12/30/2009)	(85 - 86)/(3 - 1)	-0.5
120 (5/18/2010)	86 (12/30/2009)	(120 - 86)/(4 - 1)	11.3333
95 (9/10/2010)	86 (12/30/2009)	(95 - 86)/(5 - 1)	2.25
200 (12/21/2010)	86 (12/30/2009)	(200 - 86)/(6 - 1)	22.8
190 (2/18/2011)	86 (12/30/2009)	(190 - 86)/(7 - 1)	17.3333
170 (5/13/2011)	86 (12/30/2009)	(170 - 86)/(8 - 1)	12
170 (7/25/2011)	86 (12/30/2009)	(170 - 86)/(9 - 1)	10.5
200 (10/10/2011)	86 (12/30/2009)	(200 - 86)/(10 - 1)	12.6667
140 (1/9/2012)	86 (12/30/2009)	(140 - 86)/(11 - 1)	5.4
190 (4/9/2012)	86 (12/30/2009)	(190 - 86)/(12 - 1)	9.45455
85 (3/17/2010)	94 (1/13/2010)	(85 - 94)/(3 - 2)	-9
120 (5/18/2010)	94 (1/13/2010)	(120 - 94)/(4 - 2)	13
95 (9/10/2010)	94 (1/13/2010)	(95 - 94)/(5 - 2)	0.333333
200 (12/21/2010)	94 (1/13/2010)	(200 - 94)/(6 - 2)	26.5
190 (2/18/2011)	94 (1/13/2010)	(190 - 94)/(7 - 2)	19.2
170 (5/13/2011)	94 (1/13/2010)	(170 - 94)/(8 - 2)	12.6667
170 (7/25/2011)	94 (1/13/2010)	(170 - 94)/(9 - 2)	10.8571
200 (10/10/2011)	94 (1/13/2010)	(200 - 94)/(10 - 2)	13.25
140 (1/9/2012)	94 (1/13/2010)	(140 - 94)/(11 - 2)	5.11111
190 (4/9/2012)	94 (1/13/2010)	(190 - 94)/(12 - 2)	9.6
120 (5/18/2010)	85 (3/17/2010)	(120 - 85)/(4 - 3)	35
95 (9/10/2010)	85 (3/17/2010)	(95 - 85)/(5 - 3)	5
200 (12/21/2010)	85 (3/17/2010)	(200 - 85)/(6 - 3)	38.3333
190 (2/18/2011)	85 (3/17/2010)	(190 - 85)/(7 - 3)	26.25
170 (5/13/2011)	85 (3/17/2010)	(170 - 85)/(8 - 3)	17
170 (7/25/2011)	85 (3/17/2010)	(170 - 85)/(9 - 3)	14.1667
200 (10/10/2011)	85 (3/17/2010)	(200 - 85)/(10 - 3)	16.4286
140 (1/9/2012)	85 (3/17/2010)	(140 - 85)/(11 - 3)	6.875
190 (4/9/2012)	85 (3/17/2010)	(190 - 85)/(12 - 3)	11.6667
95 (9/10/2010)	120 (5/18/2010)	(95 - 120)/(5 - 4)	-25
200 (12/21/2010)	120 (5/18/2010)	(200 - 120)/(6 - 4)	40
190 (2/18/2011)	120 (5/18/2010)	(190 - 120)/(7 - 4)	23.3333
170 (5/13/2011)	120 (5/18/2010)	(170 - 120)/(8 - 4)	12.5
170 (7/25/2011)	120 (5/18/2010)	(170 - 120)/(9 - 4)	10
200 (10/10/2011)	120 (5/18/2010)	(200 - 120)/(10 - 4)	13.3333
140 (1/9/2012)	120 (5/18/2010)	(140 - 120)/(11 - 4)	2.85714
190 (4/9/2012)	120 (5/18/2010)	(190 - 120)/(12 - 4)	8.75
200 (12/21/2010)	95 (9/10/2010)	(200 - 95)/(6 - 5)	105
190 (2/18/2011)	95 (9/10/2010)	(190 - 95)/(7 - 5)	47.5
170 (5/13/2011)	95 (9/10/2010)	(170 - 95)/(8 - 5)	25
170 (7/25/2011)	95 (9/10/2010)	(170 - 95)/(9 - 5)	18.75
200 (10/10/2011)	95 (9/10/2010)	(200 - 95)/(10 - 5)	21
140 (1/9/2012)	95 (9/10/2010)	(140 - 95)/(11 - 5)	7.5

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190 (4/9/2012)	95 (9/10/2010)	(190 - 95)/(12 - 5)	13.5714
190 (2/18/2011)	200 (12/21/2010)	(190 - 200)/(7 - 6)	-10
170 (5/13/2011)	200 (12/21/2010)	(170 - 200)/(8 - 6)	-15
170 (7/25/2011)	200 (12/21/2010)	(170 - 200)/(9 - 6)	-10
200 (10/10/2011)	200 (12/21/2010)	(200 - 200)/(10 - 6)	0
140 (1/9/2012)	200 (12/21/2010)	(140 - 200)/(11 - 6)	-12
190 (4/9/2012)	200 (12/21/2010)	(190 - 200)/(12 - 6)	-1.66667
170 (5/13/2011)	190 (2/18/2011)	(170 - 190)/(8 - 7)	-20
170 (7/25/2011)	190 (2/18/2011)	(170 - 190)/(9 - 7)	-10
200 (10/10/2011)	190 (2/18/2011)	(200 - 190)/(10 - 7)	3.33333
140 (1/9/2012)	190 (2/18/2011)	(140 - 190)/(11 - 7)	-12.5
190 (4/9/2012)	190 (2/18/2011)	(190 - 190)/(12 - 7)	0
170 (7/25/2011)	170 (5/13/2011)	(170 - 170)/(9 - 8)	0
200 (10/10/2011)	170 (5/13/2011)	(200 - 170)/(10 - 8)	15
140 (1/9/2012)	170 (5/13/2011)	(140 - 170)/(11 - 8)	-10
190 (4/9/2012)	170 (5/13/2011)	(190 - 170)/(12 - 8)	5
200 (10/10/2011)	170 (7/25/2011)	(200 - 170)/(10 - 9)	30
140 (1/9/2012)	170 (7/25/2011)	(140 - 170)/(11 - 9)	-15
190 (4/9/2012)	170 (7/25/2011)	(190 - 170)/(12 - 9)	6.66667
140 (1/9/2012)	200 (10/10/2011)	(140 - 200)/(11 - 10)	-60
190 (4/9/2012)	200 (10/10/2011)	(190 - 200)/(12 - 10)	-5
190 (4/9/2012)	140 (1/9/2012)	(190 - 140)/(12 - 11)	50

Number of Q values = 66

Ordered Q Values

n	Q
1	-60
2	-25
3	-20
4	-15
5	-15
6	-12.5
7	-12
8	-10
9	-10
10	-10
11	-10
12	-9
13	-5
14	-1.66667
15	-0.5
16	0
17	0
18	0
19	0.333333
20	2.25
21	2.85714
22	3.33333
23	5

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24	5
25	5.11111
26	5.4
27	6.66667
28	6.875
29	7.5
30	8
31	8.75
32	9.45455
33	9.6
34	10
35	10.5
36	10.8571
37	11.3333
38	11.6667
39	12
40	12.5
41	12.6667
42	12.6667
43	13
44	13.25
45	13.3333
46	13.5714
47	14.1667
48	15
49	16.4286
50	17
51	17.3333
52	18.75
53	19.2
54	21
55	22.8
56	23.3333
57	25
58	26.25
59	26.5
60	30
61	35
62	38.3333
63	40
64	47.5
65	50
66	105

Sen's Estimator (Median Q) is 9.8

Tied Group	Value	Members
1	200	2
2	190	2
3	170	2

Time Period	Observations
12/30/2009	1
1/13/2010	1
3/17/2010	1
5/18/2010	1
9/10/2010	1
12/21/2010	1

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2/18/2011	1
5/13/2011	1
7/25/2011	1
10/10/2011	1
1/9/2012	1
4/9/2012	1

There are 0 time periods with multiple data

A = 54
B = 0
C = 0
D = 0
E = 6
F = 0
a = 3828
b = 11880
c = 264
Group Variance = 209.667
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 23.8173
M1 = (66 - 23.8173)/2.0 = 21.0914
M2 = (66 + 23.8173)/2.0 + 1 = 45.9086
Lower limit is 2.85714 = Q(21)
Upper limit is 13.5714 = Q(46)
2.85714 > 0 indicating an upward trend in data.

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Sen's Slope Analysis

Parameter: Vinyl chloride
Location: MW-20D

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
3.7 (1/13/2010)	3.5 (12/30/2009)	(3.7 - 3.5)/(2 - 1)	0.2
4.4 (3/17/2010)	3.5 (12/30/2009)	(4.4 - 3.5)/(3 - 1)	0.45
3.7 (5/18/2010)	3.5 (12/30/2009)	(3.7 - 3.5)/(4 - 1)	0.0666667
ND<1 (9/10/2010)	3.5 (12/30/2009)	(1 - 3.5)/(5 - 1)	-0.625
3.5 (12/21/2010)	3.5 (12/30/2009)	(3.5 - 3.5)/(6 - 1)	0
3.2 (2/18/2011)	3.5 (12/30/2009)	(3.2 - 3.5)/(7 - 1)	-0.05
2.6 (5/13/2011)	3.5 (12/30/2009)	(2.6 - 3.5)/(8 - 1)	-0.128571
2.6 (7/25/2011)	3.5 (12/30/2009)	(2.6 - 3.5)/(9 - 1)	-0.1125
2.5 (10/10/2011)	3.5 (12/30/2009)	(2.5 - 3.5)/(10 - 1)	-0.111111
6 (1/9/2012)	3.5 (12/30/2009)	(6 - 3.5)/(11 - 1)	0.25
10 (4/9/2012)	3.5 (12/30/2009)	(10 - 3.5)/(12 - 1)	0.590909
4.4 (3/17/2010)	3.7 (1/13/2010)	(4.4 - 3.7)/(3 - 2)	0.7
3.7 (5/18/2010)	3.7 (1/13/2010)	(3.7 - 3.7)/(4 - 2)	0
ND<1 (9/10/2010)	3.7 (1/13/2010)	(1 - 3.7)/(5 - 2)	-0.9
3.5 (12/21/2010)	3.7 (1/13/2010)	(3.5 - 3.7)/(6 - 2)	-0.05
3.2 (2/18/2011)	3.7 (1/13/2010)	(3.2 - 3.7)/(7 - 2)	-0.1
2.6 (5/13/2011)	3.7 (1/13/2010)	(2.6 - 3.7)/(8 - 2)	-0.183333
2.6 (7/25/2011)	3.7 (1/13/2010)	(2.6 - 3.7)/(9 - 2)	-0.157143
2.5 (10/10/2011)	3.7 (1/13/2010)	(2.5 - 3.7)/(10 - 2)	-0.15
6 (1/9/2012)	3.7 (1/13/2010)	(6 - 3.7)/(11 - 2)	0.255556
10 (4/9/2012)	3.7 (1/13/2010)	(10 - 3.7)/(12 - 2)	0.63
3.7 (5/18/2010)	4.4 (3/17/2010)	(3.7 - 4.4)/(4 - 3)	-0.7
ND<1 (9/10/2010)	4.4 (3/17/2010)	(1 - 4.4)/(5 - 3)	-1.7
3.5 (12/21/2010)	4.4 (3/17/2010)	(3.5 - 4.4)/(6 - 3)	-0.3
3.2 (2/18/2011)	4.4 (3/17/2010)	(3.2 - 4.4)/(7 - 3)	-0.3
2.6 (5/13/2011)	4.4 (3/17/2010)	(2.6 - 4.4)/(8 - 3)	-0.36
2.6 (7/25/2011)	4.4 (3/17/2010)	(2.6 - 4.4)/(9 - 3)	-0.3
2.5 (10/10/2011)	4.4 (3/17/2010)	(2.5 - 4.4)/(10 - 3)	-0.271429
6 (1/9/2012)	4.4 (3/17/2010)	(6 - 4.4)/(11 - 3)	0.2
10 (4/9/2012)	4.4 (3/17/2010)	(10 - 4.4)/(12 - 3)	0.622222
ND<1 (9/10/2010)	3.7 (5/18/2010)	(1 - 3.7)/(5 - 4)	-2.7
3.5 (12/21/2010)	3.7 (5/18/2010)	(3.5 - 3.7)/(6 - 4)	-0.1
3.2 (2/18/2011)	3.7 (5/18/2010)	(3.2 - 3.7)/(7 - 4)	-0.166667
2.6 (5/13/2011)	3.7 (5/18/2010)	(2.6 - 3.7)/(8 - 4)	-0.275
2.6 (7/25/2011)	3.7 (5/18/2010)	(2.6 - 3.7)/(9 - 4)	-0.22
2.5 (10/10/2011)	3.7 (5/18/2010)	(2.5 - 3.7)/(10 - 4)	-0.2
6 (1/9/2012)	3.7 (5/18/2010)	(6 - 3.7)/(11 - 4)	0.328571
10 (4/9/2012)	3.7 (5/18/2010)	(10 - 3.7)/(12 - 4)	0.7875
3.5 (12/21/2010)	ND<1 (9/10/2010)	(3.5 - 1)/(6 - 5)	2.5
3.2 (2/18/2011)	ND<1 (9/10/2010)	(3.2 - 1)/(7 - 5)	1.1
2.6 (5/13/2011)	ND<1 (9/10/2010)	(2.6 - 1)/(8 - 5)	0.533333
2.6 (7/25/2011)	ND<1 (9/10/2010)	(2.6 - 1)/(9 - 5)	0.4
2.5 (10/10/2011)	ND<1 (9/10/2010)	(2.5 - 1)/(10 - 5)	0.3
6 (1/9/2012)	ND<1 (9/10/2010)	(6 - 1)/(11 - 5)	0.833333

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10 (4/9/2012)	ND<1 (9/10/2010)	(10 - 1)/(12 - 5)	1.28571
3.2 (2/18/2011)	3.5 (12/21/2010)	(3.2 - 3.5)/(7 - 6)	-0.3
2.6 (5/13/2011)	3.5 (12/21/2010)	(2.6 - 3.5)/(8 - 6)	-0.45
2.6 (7/25/2011)	3.5 (12/21/2010)	(2.6 - 3.5)/(9 - 6)	-0.3
2.5 (10/10/2011)	3.5 (12/21/2010)	(2.5 - 3.5)/(10 - 6)	-0.25
6 (1/9/2012)	3.5 (12/21/2010)	(6 - 3.5)/(11 - 6)	0.5
10 (4/9/2012)	3.5 (12/21/2010)	(10 - 3.5)/(12 - 6)	1.08333
2.6 (5/13/2011)	3.2 (2/18/2011)	(2.6 - 3.2)/(8 - 7)	-0.6
2.6 (7/25/2011)	3.2 (2/18/2011)	(2.6 - 3.2)/(9 - 7)	-0.3
2.5 (10/10/2011)	3.2 (2/18/2011)	(2.5 - 3.2)/(10 - 7)	-0.233333
6 (1/9/2012)	3.2 (2/18/2011)	(6 - 3.2)/(11 - 7)	0.7
10 (4/9/2012)	3.2 (2/18/2011)	(10 - 3.2)/(12 - 7)	1.36
2.6 (7/25/2011)	2.6 (5/13/2011)	(2.6 - 2.6)/(9 - 8)	0
2.5 (10/10/2011)	2.6 (5/13/2011)	(2.5 - 2.6)/(10 - 8)	-0.05
6 (1/9/2012)	2.6 (5/13/2011)	(6 - 2.6)/(11 - 8)	1.13333
10 (4/9/2012)	2.6 (5/13/2011)	(10 - 2.6)/(12 - 8)	1.85
2.5 (10/10/2011)	2.6 (7/25/2011)	(2.5 - 2.6)/(10 - 9)	-0.1
6 (1/9/2012)	2.6 (7/25/2011)	(6 - 2.6)/(11 - 9)	1.7
10 (4/9/2012)	2.6 (7/25/2011)	(10 - 2.6)/(12 - 9)	2.46667
6 (1/9/2012)	2.5 (10/10/2011)	(6 - 2.5)/(11 - 10)	3.5
10 (4/9/2012)	2.5 (10/10/2011)	(10 - 2.5)/(12 - 10)	3.75
10 (4/9/2012)	6 (1/9/2012)	(10 - 6)/(12 - 11)	4

Number of Q values = 66

Ordered Q Values

n	Q
1	-2.7
2	-1.7
3	-0.9
4	-0.7
5	-0.625
6	-0.6
7	-0.45
8	-0.36
9	-0.3
10	-0.3
11	-0.3
12	-0.3
13	-0.3
14	-0.3
15	-0.275
16	-0.271429
17	-0.25
18	-0.233333
19	-0.22
20	-0.2
21	-0.183333
22	-0.166667
23	-0.157143

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24	-0.15
25	-0.128571
26	-0.1125
27	-0.111111
28	-0.1
29	-0.1
30	-0.1
31	-0.05
32	-0.05
33	-0.05
34	0
35	0
36	0
37	0.0666667
38	0.2
39	0.2
40	0.25
41	0.255556
42	0.3
43	0.328571
44	0.4
45	0.45
46	0.5
47	0.533333
48	0.590909
49	0.622222
50	0.63
51	0.7
52	0.7
53	0.7875
54	0.833333
55	1.08333
56	1.1
57	1.13333
58	1.28571
59	1.36
60	1.7
61	1.85
62	2.46667
63	2.5
64	3.5
65	3.75
66	4

Sen's Estimator (Median Q) is -0.025

Tied Group	Value	Members
1	3.5	2
2	3.7	2
3	2.6	2

Time Period	Observations
12/30/2009	1
1/13/2010	1
3/17/2010	1
5/18/2010	1
9/10/2010	1
12/21/2010	1

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2/18/2011	1
5/13/2011	1
7/25/2011	1
10/10/2011	1
1/9/2012	1
4/9/2012	1

There are 0 time periods with multiple data

A = 54
B = 0
C = 0
D = 0
E = 6
F = 0
a = 3828
b = 11880
c = 264
Group Variance = 209.667
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 23.8173
M1 = (66 - 23.8173)/2.0 = 21.0914
M2 = (66 + 23.8173)/2.0 + 1 = 45.9086
Lower limit is -0.183333 = Q(21)
Upper limit is 0.5 = Q(46)
-0.183333 < 0 < 0.5 indicating no trend in data.

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Sen's Slope Analysis

Parameter: 1,1,1-Trichloroethane

Location: MW-20S

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
170 (1/13/2010)	150 (12/30/2009)	(170 - 150)/(2 - 1)	20
160 (3/17/2010)	150 (12/30/2009)	(160 - 150)/(3 - 1)	5
210 (5/18/2010)	150 (12/30/2009)	(210 - 150)/(4 - 1)	20
230 (9/10/2010)	150 (12/30/2009)	(230 - 150)/(5 - 1)	20
200 (12/21/2010)	150 (12/30/2009)	(200 - 150)/(6 - 1)	10
190 (2/18/2011)	150 (12/30/2009)	(190 - 150)/(7 - 1)	6.66667
190 (5/13/2011)	150 (12/30/2009)	(190 - 150)/(8 - 1)	5.71429
190 (7/25/2011)	150 (12/30/2009)	(190 - 150)/(9 - 1)	5
190 (10/10/2011)	150 (12/30/2009)	(190 - 150)/(10 - 1)	4.44444
190 (1/9/2012)	150 (12/30/2009)	(190 - 150)/(11 - 1)	4
180 (4/9/2012)	150 (12/30/2009)	(180 - 150)/(12 - 1)	2.72727
160 (3/17/2010)	170 (1/13/2010)	(160 - 170)/(3 - 2)	-10
210 (5/18/2010)	170 (1/13/2010)	(210 - 170)/(4 - 2)	20
230 (9/10/2010)	170 (1/13/2010)	(230 - 170)/(5 - 2)	20
200 (12/21/2010)	170 (1/13/2010)	(200 - 170)/(6 - 2)	7.5
190 (2/18/2011)	170 (1/13/2010)	(190 - 170)/(7 - 2)	4
190 (5/13/2011)	170 (1/13/2010)	(190 - 170)/(8 - 2)	3.33333
190 (7/25/2011)	170 (1/13/2010)	(190 - 170)/(9 - 2)	2.85714
190 (10/10/2011)	170 (1/13/2010)	(190 - 170)/(10 - 2)	2.5
190 (1/9/2012)	170 (1/13/2010)	(190 - 170)/(11 - 2)	2.22222
180 (4/9/2012)	170 (1/13/2010)	(180 - 170)/(12 - 2)	1
210 (5/18/2010)	160 (3/17/2010)	(210 - 160)/(4 - 3)	50
230 (9/10/2010)	160 (3/17/2010)	(230 - 160)/(5 - 3)	35
200 (12/21/2010)	160 (3/17/2010)	(200 - 160)/(6 - 3)	13.3333
190 (2/18/2011)	160 (3/17/2010)	(190 - 160)/(7 - 3)	7.5
190 (5/13/2011)	160 (3/17/2010)	(190 - 160)/(8 - 3)	6
190 (7/25/2011)	160 (3/17/2010)	(190 - 160)/(9 - 3)	5
190 (10/10/2011)	160 (3/17/2010)	(190 - 160)/(10 - 3)	4.28571
190 (1/9/2012)	160 (3/17/2010)	(190 - 160)/(11 - 3)	3.75
180 (4/9/2012)	160 (3/17/2010)	(180 - 160)/(12 - 3)	2.22222
230 (9/10/2010)	210 (5/18/2010)	(230 - 210)/(5 - 4)	20
200 (12/21/2010)	210 (5/18/2010)	(200 - 210)/(6 - 4)	-5
190 (2/18/2011)	210 (5/18/2010)	(190 - 210)/(7 - 4)	-6.66667
190 (5/13/2011)	210 (5/18/2010)	(190 - 210)/(8 - 4)	-5
190 (7/25/2011)	210 (5/18/2010)	(190 - 210)/(9 - 4)	-4
190 (10/10/2011)	210 (5/18/2010)	(190 - 210)/(10 - 4)	-3.33333
190 (1/9/2012)	210 (5/18/2010)	(190 - 210)/(11 - 4)	-2.85714
180 (4/9/2012)	210 (5/18/2010)	(180 - 210)/(12 - 4)	-3.75
200 (12/21/2010)	230 (9/10/2010)	(200 - 230)/(6 - 5)	-30
190 (2/18/2011)	230 (9/10/2010)	(190 - 230)/(7 - 5)	-20
190 (5/13/2011)	230 (9/10/2010)	(190 - 230)/(8 - 5)	-13.3333
190 (7/25/2011)	230 (9/10/2010)	(190 - 230)/(9 - 5)	-10
190 (10/10/2011)	230 (9/10/2010)	(190 - 230)/(10 - 5)	-8
190 (1/9/2012)	230 (9/10/2010)	(190 - 230)/(11 - 5)	-6.66667

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180 (4/9/2012)	230 (9/10/2010)	(180 - 230)/(12 - 5)	-7.14286
190 (2/18/2011)	200 (12/21/2010)	(190 - 200)/(7 - 6)	-10
190 (5/13/2011)	200 (12/21/2010)	(190 - 200)/(8 - 6)	-5
190 (7/25/2011)	200 (12/21/2010)	(190 - 200)/(9 - 6)	-3.33333
190 (10/10/2011)	200 (12/21/2010)	(190 - 200)/(10 - 6)	-2.5
190 (1/9/2012)	200 (12/21/2010)	(190 - 200)/(11 - 6)	-2
180 (4/9/2012)	200 (12/21/2010)	(180 - 200)/(12 - 6)	-3.33333
190 (5/13/2011)	190 (2/18/2011)	(190 - 190)/(8 - 7)	0
190 (7/25/2011)	190 (2/18/2011)	(190 - 190)/(9 - 7)	0
190 (10/10/2011)	190 (2/18/2011)	(190 - 190)/(10 - 7)	0
190 (1/9/2012)	190 (2/18/2011)	(190 - 190)/(11 - 7)	0
180 (4/9/2012)	190 (2/18/2011)	(180 - 190)/(12 - 7)	-2
190 (7/25/2011)	190 (5/13/2011)	(190 - 190)/(9 - 8)	0
190 (10/10/2011)	190 (5/13/2011)	(190 - 190)/(10 - 8)	0
190 (1/9/2012)	190 (5/13/2011)	(190 - 190)/(11 - 8)	0
180 (4/9/2012)	190 (5/13/2011)	(180 - 190)/(12 - 8)	-2.5
190 (10/10/2011)	190 (7/25/2011)	(190 - 190)/(10 - 9)	0
190 (1/9/2012)	190 (7/25/2011)	(190 - 190)/(11 - 9)	0
180 (4/9/2012)	190 (7/25/2011)	(180 - 190)/(12 - 9)	-3.33333
190 (1/9/2012)	190 (10/10/2011)	(190 - 190)/(11 - 10)	0
180 (4/9/2012)	190 (10/10/2011)	(180 - 190)/(12 - 10)	-5
180 (4/9/2012)	190 (1/9/2012)	(180 - 190)/(12 - 11)	-10

Number of Q values = 66

Ordered Q Values

n	Q
1	-30
2	-20
3	-13.3333
4	-10
5	-10
6	-10
7	-10
8	-8
9	-7.14286
10	-6.66667
11	-6.66667
12	-5
13	-5
14	-5
15	-5
16	-4
17	-3.75
18	-3.33333
19	-3.33333
20	-3.33333
21	-3.33333
22	-2.85714
23	-2.5

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24	-2.5
25	-2
26	-2
27	0
28	0
29	0
30	0
31	0
32	0
33	0
34	0
35	0
36	0
37	1
38	2.22222
39	2.22222
40	2.5
41	2.72727
42	2.85714
43	3.33333
44	3.75
45	4
46	4
47	4.28571
48	4.44444
49	5
50	5
51	5
52	5.71429
53	6
54	6.66667
55	7.5
56	7.5
57	10
58	13.3333
59	20
60	20
61	20
62	20
63	20
64	20
65	35
66	50

Sen's Estimator (Median Q) is 0

Tied Group	Value	Members
1	190	5

Time Period	Observations
12/30/2009	1
1/13/2010	1
3/17/2010	1
5/18/2010	1
9/10/2010	1
12/21/2010	1
2/18/2011	1
5/13/2011	1

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7/25/2011	1
10/10/2011	1
1/9/2012	1
4/9/2012	1

There are 0 time periods with multiple data

A = 300
B = 0
C = 60
D = 0
E = 20
F = 0
a = 3828
b = 11880
c = 264
Group Variance = 196
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 23.0279
M1 = (66 - 23.0279)/2.0 = 21.486
M2 = (66 + 23.0279)/2.0 + 1 = 45.514
Lower limit is -3.33333 = Q(21)
Upper limit is 4 = Q(46)
-3.33333 < 0 < 4 indicating no trend in data.

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Sen's Slope Analysis

Parameter: 1,1-Dichloroethane

Location: MW-20S

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
50 (1/13/2010)	48 (12/30/2009)	(50 - 48)/(2 - 1)	2
51 (3/17/2010)	48 (12/30/2009)	(51 - 48)/(3 - 1)	1.5
58 (5/18/2010)	48 (12/30/2009)	(58 - 48)/(4 - 1)	3.33333
34 (9/10/2010)	48 (12/30/2009)	(34 - 48)/(5 - 1)	-3.5
24 (12/21/2010)	48 (12/30/2009)	(24 - 48)/(6 - 1)	-4.8
19 (2/18/2011)	48 (12/30/2009)	(19 - 48)/(7 - 1)	-4.83333
14 (5/13/2011)	48 (12/30/2009)	(14 - 48)/(8 - 1)	-4.85714
6.5 (7/25/2011)	48 (12/30/2009)	(6.5 - 48)/(9 - 1)	-5.1875
5.8 (10/10/2011)	48 (12/30/2009)	(5.8 - 48)/(10 - 1)	-4.68889
6 (1/9/2012)	48 (12/30/2009)	(6 - 48)/(11 - 1)	-4.2
11 (4/9/2012)	48 (12/30/2009)	(11 - 48)/(12 - 1)	-3.36364
51 (3/17/2010)	50 (1/13/2010)	(51 - 50)/(3 - 2)	1
58 (5/18/2010)	50 (1/13/2010)	(58 - 50)/(4 - 2)	4
34 (9/10/2010)	50 (1/13/2010)	(34 - 50)/(5 - 2)	-5.33333
24 (12/21/2010)	50 (1/13/2010)	(24 - 50)/(6 - 2)	-6.5
19 (2/18/2011)	50 (1/13/2010)	(19 - 50)/(7 - 2)	-6.2
14 (5/13/2011)	50 (1/13/2010)	(14 - 50)/(8 - 2)	-6
6.5 (7/25/2011)	50 (1/13/2010)	(6.5 - 50)/(9 - 2)	-6.21429
5.8 (10/10/2011)	50 (1/13/2010)	(5.8 - 50)/(10 - 2)	-5.525
6 (1/9/2012)	50 (1/13/2010)	(6 - 50)/(11 - 2)	-4.88889
11 (4/9/2012)	50 (1/13/2010)	(11 - 50)/(12 - 2)	-3.9
58 (5/18/2010)	51 (3/17/2010)	(58 - 51)/(4 - 3)	7
34 (9/10/2010)	51 (3/17/2010)	(34 - 51)/(5 - 3)	-8.5
24 (12/21/2010)	51 (3/17/2010)	(24 - 51)/(6 - 3)	-9
19 (2/18/2011)	51 (3/17/2010)	(19 - 51)/(7 - 3)	-8
14 (5/13/2011)	51 (3/17/2010)	(14 - 51)/(8 - 3)	-7.4
6.5 (7/25/2011)	51 (3/17/2010)	(6.5 - 51)/(9 - 3)	-7.41667
5.8 (10/10/2011)	51 (3/17/2010)	(5.8 - 51)/(10 - 3)	-6.45714
6 (1/9/2012)	51 (3/17/2010)	(6 - 51)/(11 - 3)	-5.625
11 (4/9/2012)	51 (3/17/2010)	(11 - 51)/(12 - 3)	-4.44444
34 (9/10/2010)	58 (5/18/2010)	(34 - 58)/(5 - 4)	-24
24 (12/21/2010)	58 (5/18/2010)	(24 - 58)/(6 - 4)	-17
19 (2/18/2011)	58 (5/18/2010)	(19 - 58)/(7 - 4)	-13
14 (5/13/2011)	58 (5/18/2010)	(14 - 58)/(8 - 4)	-11
6.5 (7/25/2011)	58 (5/18/2010)	(6.5 - 58)/(9 - 4)	-10.3
5.8 (10/10/2011)	58 (5/18/2010)	(5.8 - 58)/(10 - 4)	-8.7
6 (1/9/2012)	58 (5/18/2010)	(6 - 58)/(11 - 4)	-7.42857
11 (4/9/2012)	58 (5/18/2010)	(11 - 58)/(12 - 4)	-5.875
24 (12/21/2010)	34 (9/10/2010)	(24 - 34)/(6 - 5)	-10
19 (2/18/2011)	34 (9/10/2010)	(19 - 34)/(7 - 5)	-7.5
14 (5/13/2011)	34 (9/10/2010)	(14 - 34)/(8 - 5)	-6.66667
6.5 (7/25/2011)	34 (9/10/2010)	(6.5 - 34)/(9 - 5)	-6.875
5.8 (10/10/2011)	34 (9/10/2010)	(5.8 - 34)/(10 - 5)	-5.64
6 (1/9/2012)	34 (9/10/2010)	(6 - 34)/(11 - 5)	-4.66667

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11 (4/9/2012)	34 (9/10/2010)	(11 - 34)/(12 - 5)	-3.28571
19 (2/18/2011)	24 (12/21/2010)	(19 - 24)/(7 - 6)	-5
14 (5/13/2011)	24 (12/21/2010)	(14 - 24)/(8 - 6)	-5
6.5 (7/25/2011)	24 (12/21/2010)	(6.5 - 24)/(9 - 6)	-5.83333
5.8 (10/10/2011)	24 (12/21/2010)	(5.8 - 24)/(10 - 6)	-4.55
6 (1/9/2012)	24 (12/21/2010)	(6 - 24)/(11 - 6)	-3.6
11 (4/9/2012)	24 (12/21/2010)	(11 - 24)/(12 - 6)	-2.16667
14 (5/13/2011)	19 (2/18/2011)	(14 - 19)/(8 - 7)	-5
6.5 (7/25/2011)	19 (2/18/2011)	(6.5 - 19)/(9 - 7)	-6.25
5.8 (10/10/2011)	19 (2/18/2011)	(5.8 - 19)/(10 - 7)	-4.4
6 (1/9/2012)	19 (2/18/2011)	(6 - 19)/(11 - 7)	-3.25
11 (4/9/2012)	19 (2/18/2011)	(11 - 19)/(12 - 7)	-1.6
6.5 (7/25/2011)	14 (5/13/2011)	(6.5 - 14)/(9 - 8)	-7.5
5.8 (10/10/2011)	14 (5/13/2011)	(5.8 - 14)/(10 - 8)	-4.1
6 (1/9/2012)	14 (5/13/2011)	(6 - 14)/(11 - 8)	-2.66667
11 (4/9/2012)	14 (5/13/2011)	(11 - 14)/(12 - 8)	-0.75
5.8 (10/10/2011)	6.5 (7/25/2011)	(5.8 - 6.5)/(10 - 9)	-0.7
6 (1/9/2012)	6.5 (7/25/2011)	(6 - 6.5)/(11 - 9)	-0.25
11 (4/9/2012)	6.5 (7/25/2011)	(11 - 6.5)/(12 - 9)	1.5
6 (1/9/2012)	5.8 (10/10/2011)	(6 - 5.8)/(11 - 10)	0.2
11 (4/9/2012)	5.8 (10/10/2011)	(11 - 5.8)/(12 - 10)	2.6
11 (4/9/2012)	6 (1/9/2012)	(11 - 6)/(12 - 11)	5

Number of Q values = 66

Ordered Q Values

n	Q
1	-24
2	-17
3	-13
4	-11
5	-10.3
6	-10
7	-9
8	-8.7
9	-8.5
10	-8
11	-7.5
12	-7.5
13	-7.42857
14	-7.41667
15	-7.4
16	-6.875
17	-6.66667
18	-6.5
19	-6.45714
20	-6.25
21	-6.21429
22	-6.2
23	-6

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24	-5.875
25	-5.83333
26	-5.64
27	-5.625
28	-5.525
29	-5.33333
30	-5.1875
31	-5
32	-5
33	-5
34	-4.88889
35	-4.85714
36	-4.83333
37	-4.8
38	-4.68889
39	-4.66667
40	-4.55
41	-4.44444
42	-4.4
43	-4.2
44	-4.1
45	-3.9
46	-3.6
47	-3.5
48	-3.36364
49	-3.28571
50	-3.25
51	-2.66667
52	-2.16667
53	-1.6
54	-0.75
55	-0.7
56	-0.25
57	0.2
58	1
59	1.5
60	1.5
61	2
62	2.6
63	3.33333
64	4
65	5
66	7

Sen's Estimator (Median Q) is -4.94444

Time Period	Observations
12/30/2009	1
1/13/2010	1
3/17/2010	1
5/18/2010	1
9/10/2010	1
12/21/2010	1
2/18/2011	1
5/13/2011	1
7/25/2011	1
10/10/2011	1
1/9/2012	1

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4/9/2012 1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 3828
b = 11880
c = 264
Group Variance = 212.667
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 23.987
M1 = (66 - 23.987)/2.0 = 21.0065
M2 = (66 + 23.987)/2.0 + 1 = 45.9935
Lower limit is -6.21429 = Q(21)
Upper limit is -3.6 = Q(46)
-3.6 < 0 indicating a downward trend in data.

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Sen's Slope Analysis

Parameter: 1,1-Dichloroethene
Location: MW-20S

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
3.5 (1/13/2010)	4 (12/30/2009)	(3.5 - 4)/(2 - 1)	-0.5
3.8 (3/17/2010)	4 (12/30/2009)	(3.8 - 4)/(3 - 1)	-0.1
5.1 (5/18/2010)	4 (12/30/2009)	(5.1 - 4)/(4 - 1)	0.366667
4.2 (9/10/2010)	4 (12/30/2009)	(4.2 - 4)/(5 - 1)	0.05
3.6 (12/21/2010)	4 (12/30/2009)	(3.6 - 4)/(6 - 1)	-0.08
3.3 (2/18/2011)	4 (12/30/2009)	(3.3 - 4)/(7 - 1)	-0.116667
2.8 (5/13/2011)	4 (12/30/2009)	(2.8 - 4)/(8 - 1)	-0.171429
ND<2 (7/25/2011)	4 (12/30/2009)	(2 - 4)/(9 - 1)	-0.25
ND<2 (10/10/2011)	4 (12/30/2009)	(2 - 4)/(10 - 1)	-0.222222
1.4 (1/9/2012)	4 (12/30/2009)	(1.4 - 4)/(11 - 1)	-0.26
1.1 (4/9/2012)	4 (12/30/2009)	(1.1 - 4)/(12 - 1)	-0.263636
3.8 (3/17/2010)	3.5 (1/13/2010)	(3.8 - 3.5)/(3 - 2)	0.3
5.1 (5/18/2010)	3.5 (1/13/2010)	(5.1 - 3.5)/(4 - 2)	0.8
4.2 (9/10/2010)	3.5 (1/13/2010)	(4.2 - 3.5)/(5 - 2)	0.233333
3.6 (12/21/2010)	3.5 (1/13/2010)	(3.6 - 3.5)/(6 - 2)	0.025
3.3 (2/18/2011)	3.5 (1/13/2010)	(3.3 - 3.5)/(7 - 2)	-0.04
2.8 (5/13/2011)	3.5 (1/13/2010)	(2.8 - 3.5)/(8 - 2)	-0.116667
ND<2 (7/25/2011)	3.5 (1/13/2010)	(2 - 3.5)/(9 - 2)	-0.214286
ND<2 (10/10/2011)	3.5 (1/13/2010)	(2 - 3.5)/(10 - 2)	-0.1875
1.4 (1/9/2012)	3.5 (1/13/2010)	(1.4 - 3.5)/(11 - 2)	-0.233333
1.1 (4/9/2012)	3.5 (1/13/2010)	(1.1 - 3.5)/(12 - 2)	-0.24
5.1 (5/18/2010)	3.8 (3/17/2010)	(5.1 - 3.8)/(4 - 3)	1.3
4.2 (9/10/2010)	3.8 (3/17/2010)	(4.2 - 3.8)/(5 - 3)	0.2
3.6 (12/21/2010)	3.8 (3/17/2010)	(3.6 - 3.8)/(6 - 3)	-0.0666667
3.3 (2/18/2011)	3.8 (3/17/2010)	(3.3 - 3.8)/(7 - 3)	-0.125
2.8 (5/13/2011)	3.8 (3/17/2010)	(2.8 - 3.8)/(8 - 3)	-0.2
ND<2 (7/25/2011)	3.8 (3/17/2010)	(2 - 3.8)/(9 - 3)	-0.3
ND<2 (10/10/2011)	3.8 (3/17/2010)	(2 - 3.8)/(10 - 3)	-0.257143
1.4 (1/9/2012)	3.8 (3/17/2010)	(1.4 - 3.8)/(11 - 3)	-0.3
1.1 (4/9/2012)	3.8 (3/17/2010)	(1.1 - 3.8)/(12 - 3)	-0.3
4.2 (9/10/2010)	5.1 (5/18/2010)	(4.2 - 5.1)/(5 - 4)	-0.9
3.6 (12/21/2010)	5.1 (5/18/2010)	(3.6 - 5.1)/(6 - 4)	-0.75
3.3 (2/18/2011)	5.1 (5/18/2010)	(3.3 - 5.1)/(7 - 4)	-0.6
2.8 (5/13/2011)	5.1 (5/18/2010)	(2.8 - 5.1)/(8 - 4)	-0.575
ND<2 (7/25/2011)	5.1 (5/18/2010)	(2 - 5.1)/(9 - 4)	-0.62
ND<2 (10/10/2011)	5.1 (5/18/2010)	(2 - 5.1)/(10 - 4)	-0.516667
1.4 (1/9/2012)	5.1 (5/18/2010)	(1.4 - 5.1)/(11 - 4)	-0.528571
1.1 (4/9/2012)	5.1 (5/18/2010)	(1.1 - 5.1)/(12 - 4)	-0.5
3.6 (12/21/2010)	4.2 (9/10/2010)	(3.6 - 4.2)/(6 - 5)	-0.6
3.3 (2/18/2011)	4.2 (9/10/2010)	(3.3 - 4.2)/(7 - 5)	-0.45
2.8 (5/13/2011)	4.2 (9/10/2010)	(2.8 - 4.2)/(8 - 5)	-0.466667
ND<2 (7/25/2011)	4.2 (9/10/2010)	(2 - 4.2)/(9 - 5)	-0.55
ND<2 (10/10/2011)	4.2 (9/10/2010)	(2 - 4.2)/(10 - 5)	-0.44
1.4 (1/9/2012)	4.2 (9/10/2010)	(1.4 - 4.2)/(11 - 5)	-0.466667

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1.1 (4/9/2012)	4.2 (9/10/2010)	(1.1 - 4.2)/(12 - 5)	-0.442857
3.3 (2/18/2011)	3.6 (12/21/2010)	(3.3 - 3.6)/(7 - 6)	-0.3
2.8 (5/13/2011)	3.6 (12/21/2010)	(2.8 - 3.6)/(8 - 6)	-0.4
ND<2 (7/25/2011)	3.6 (12/21/2010)	(2 - 3.6)/(9 - 6)	-0.533333
ND<2 (10/10/2011)	3.6 (12/21/2010)	(2 - 3.6)/(10 - 6)	-0.4
1.4 (1/9/2012)	3.6 (12/21/2010)	(1.4 - 3.6)/(11 - 6)	-0.44
1.1 (4/9/2012)	3.6 (12/21/2010)	(1.1 - 3.6)/(12 - 6)	-0.416667
2.8 (5/13/2011)	3.3 (2/18/2011)	(2.8 - 3.3)/(8 - 7)	-0.5
ND<2 (7/25/2011)	3.3 (2/18/2011)	(2 - 3.3)/(9 - 7)	-0.65
ND<2 (10/10/2011)	3.3 (2/18/2011)	(2 - 3.3)/(10 - 7)	-0.433333
1.4 (1/9/2012)	3.3 (2/18/2011)	(1.4 - 3.3)/(11 - 7)	-0.475
1.1 (4/9/2012)	3.3 (2/18/2011)	(1.1 - 3.3)/(12 - 7)	-0.44
ND<2 (7/25/2011)	2.8 (5/13/2011)	(2 - 2.8)/(9 - 8)	-0.8
ND<2 (10/10/2011)	2.8 (5/13/2011)	(2 - 2.8)/(10 - 8)	-0.4
1.4 (1/9/2012)	2.8 (5/13/2011)	(1.4 - 2.8)/(11 - 8)	-0.466667
1.1 (4/9/2012)	2.8 (5/13/2011)	(1.1 - 2.8)/(12 - 8)	-0.425
ND<2 (10/10/2011)	ND<2 (7/25/2011)	(2 - 2)/(10 - 9)	0
1.4 (1/9/2012)	ND<2 (7/25/2011)	(1.4 - 2)/(11 - 9)	-0.3
1.1 (4/9/2012)	ND<2 (7/25/2011)	(1.1 - 2)/(12 - 9)	-0.3
1.4 (1/9/2012)	ND<2 (10/10/2011)	(1.4 - 2)/(11 - 10)	-0.6
1.1 (4/9/2012)	ND<2 (10/10/2011)	(1.1 - 2)/(12 - 10)	-0.45
1.1 (4/9/2012)	1.4 (1/9/2012)	(1.1 - 1.4)/(12 - 11)	-0.3

Number of Q values = 66

Ordered Q Values

n	Q
1	-0.9
2	-0.8
3	-0.75
4	-0.65
5	-0.62
6	-0.6
7	-0.6
8	-0.6
9	-0.575
10	-0.55
11	-0.533333
12	-0.528571
13	-0.516667
14	-0.5
15	-0.5
16	-0.5
17	-0.475
18	-0.466667
19	-0.466667
20	-0.466667
21	-0.45
22	-0.45
23	-0.442857

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24	-0.44
25	-0.44
26	-0.44
27	-0.433333
28	-0.425
29	-0.416667
30	-0.4
31	-0.4
32	-0.4
33	-0.3
34	-0.3
35	-0.3
36	-0.3
37	-0.3
38	-0.3
39	-0.3
40	-0.263636
41	-0.26
42	-0.257143
43	-0.25
44	-0.24
45	-0.233333
46	-0.222222
47	-0.214286
48	-0.2
49	-0.1875
50	-0.171429
51	-0.125
52	-0.116667
53	-0.116667
54	-0.1
55	-0.08
56	-0.0666667
57	-0.04
58	0
59	0.025
60	0.05
61	0.2
62	0.233333
63	0.3
64	0.366667
65	0.8
66	1.3

Sen's Estimator (Median Q) is -0.3

Tied Group	Value	Members
1	2	2

Time Period	Observations
12/30/2009	1
1/13/2010	1
3/17/2010	1
5/18/2010	1
9/10/2010	1
12/21/2010	1
2/18/2011	1
5/13/2011	1

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7/25/2011	1
10/10/2011	1
1/9/2012	1
4/9/2012	1

There are 0 time periods with multiple data

A = 18
B = 0
C = 0
D = 0
E = 2
F = 0
a = 3828
b = 11880
c = 264
Group Variance = 211.667
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 23.9306
M1 = (66 - 23.9306)/2.0 = 21.0347
M2 = (66 + 23.9306)/2.0 + 1 = 45.9653
Lower limit is -0.45 = Q(21)
Upper limit is -0.222222 = Q(46)
-0.222222 < 0 indicating a downward trend in data.

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Sen's Slope Analysis

Parameter: cis-1,2-Dichloroethene
Location: MW-20S

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
9 (1/13/2010)	9.6 (12/30/2009)	(9 - 9.6)/(2 - 1)	-0.6
9.4 (3/17/2010)	9.6 (12/30/2009)	(9.4 - 9.6)/(3 - 1)	-0.1
12 (5/18/2010)	9.6 (12/30/2009)	(12 - 9.6)/(4 - 1)	0.8
9.7 (9/10/2010)	9.6 (12/30/2009)	(9.7 - 9.6)/(5 - 1)	0.025
6.1 (12/21/2010)	9.6 (12/30/2009)	(6.1 - 9.6)/(6 - 1)	-0.7
5.5 (2/18/2011)	9.6 (12/30/2009)	(5.5 - 9.6)/(7 - 1)	-0.683333
4.1 (5/13/2011)	9.6 (12/30/2009)	(4.1 - 9.6)/(8 - 1)	-0.785714
2.4 (7/25/2011)	9.6 (12/30/2009)	(2.4 - 9.6)/(9 - 1)	-0.9
ND<2 (10/10/2011)	9.6 (12/30/2009)	(2 - 9.6)/(10 - 1)	-0.844444
1.9 (1/9/2012)	9.6 (12/30/2009)	(1.9 - 9.6)/(11 - 1)	-0.77
2 (4/9/2012)	9.6 (12/30/2009)	(2 - 9.6)/(12 - 1)	-0.690909
9.4 (3/17/2010)	9 (1/13/2010)	(9.4 - 9)/(3 - 2)	0.4
12 (5/18/2010)	9 (1/13/2010)	(12 - 9)/(4 - 2)	1.5
9.7 (9/10/2010)	9 (1/13/2010)	(9.7 - 9)/(5 - 2)	0.233333
6.1 (12/21/2010)	9 (1/13/2010)	(6.1 - 9)/(6 - 2)	-0.725
5.5 (2/18/2011)	9 (1/13/2010)	(5.5 - 9)/(7 - 2)	-0.7
4.1 (5/13/2011)	9 (1/13/2010)	(4.1 - 9)/(8 - 2)	-0.816667
2.4 (7/25/2011)	9 (1/13/2010)	(2.4 - 9)/(9 - 2)	-0.942857
ND<2 (10/10/2011)	9 (1/13/2010)	(2 - 9)/(10 - 2)	-0.875
1.9 (1/9/2012)	9 (1/13/2010)	(1.9 - 9)/(11 - 2)	-0.788889
2 (4/9/2012)	9 (1/13/2010)	(2 - 9)/(12 - 2)	-0.7
12 (5/18/2010)	9.4 (3/17/2010)	(12 - 9.4)/(4 - 3)	2.6
9.7 (9/10/2010)	9.4 (3/17/2010)	(9.7 - 9.4)/(5 - 3)	0.15
6.1 (12/21/2010)	9.4 (3/17/2010)	(6.1 - 9.4)/(6 - 3)	-1.1
5.5 (2/18/2011)	9.4 (3/17/2010)	(5.5 - 9.4)/(7 - 3)	-0.975
4.1 (5/13/2011)	9.4 (3/17/2010)	(4.1 - 9.4)/(8 - 3)	-1.06
2.4 (7/25/2011)	9.4 (3/17/2010)	(2.4 - 9.4)/(9 - 3)	-1.16667
ND<2 (10/10/2011)	9.4 (3/17/2010)	(2 - 9.4)/(10 - 3)	-1.05714
1.9 (1/9/2012)	9.4 (3/17/2010)	(1.9 - 9.4)/(11 - 3)	-0.9375
2 (4/9/2012)	9.4 (3/17/2010)	(2 - 9.4)/(12 - 3)	-0.822222
9.7 (9/10/2010)	12 (5/18/2010)	(9.7 - 12)/(5 - 4)	-2.3
6.1 (12/21/2010)	12 (5/18/2010)	(6.1 - 12)/(6 - 4)	-2.95
5.5 (2/18/2011)	12 (5/18/2010)	(5.5 - 12)/(7 - 4)	-2.16667
4.1 (5/13/2011)	12 (5/18/2010)	(4.1 - 12)/(8 - 4)	-1.975
2.4 (7/25/2011)	12 (5/18/2010)	(2.4 - 12)/(9 - 4)	-1.92
ND<2 (10/10/2011)	12 (5/18/2010)	(2 - 12)/(10 - 4)	-1.66667
1.9 (1/9/2012)	12 (5/18/2010)	(1.9 - 12)/(11 - 4)	-1.44286
2 (4/9/2012)	12 (5/18/2010)	(2 - 12)/(12 - 4)	-1.25
6.1 (12/21/2010)	9.7 (9/10/2010)	(6.1 - 9.7)/(6 - 5)	-3.6
5.5 (2/18/2011)	9.7 (9/10/2010)	(5.5 - 9.7)/(7 - 5)	-2.1
4.1 (5/13/2011)	9.7 (9/10/2010)	(4.1 - 9.7)/(8 - 5)	-1.86667
2.4 (7/25/2011)	9.7 (9/10/2010)	(2.4 - 9.7)/(9 - 5)	-1.825
ND<2 (10/10/2011)	9.7 (9/10/2010)	(2 - 9.7)/(10 - 5)	-1.54
1.9 (1/9/2012)	9.7 (9/10/2010)	(1.9 - 9.7)/(11 - 5)	-1.3

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2 (4/9/2012)	9.7 (9/10/2010)	(2 - 9.7)/(12 - 5)	-1.1
5.5 (2/18/2011)	6.1 (12/21/2010)	(5.5 - 6.1)/(7 - 6)	-0.6
4.1 (5/13/2011)	6.1 (12/21/2010)	(4.1 - 6.1)/(8 - 6)	-1
2.4 (7/25/2011)	6.1 (12/21/2010)	(2.4 - 6.1)/(9 - 6)	-1.23333
ND<2 (10/10/2011)	6.1 (12/21/2010)	(2 - 6.1)/(10 - 6)	-1.025
1.9 (1/9/2012)	6.1 (12/21/2010)	(1.9 - 6.1)/(11 - 6)	-0.84
2 (4/9/2012)	6.1 (12/21/2010)	(2 - 6.1)/(12 - 6)	-0.683333
4.1 (5/13/2011)	5.5 (2/18/2011)	(4.1 - 5.5)/(8 - 7)	-1.4
2.4 (7/25/2011)	5.5 (2/18/2011)	(2.4 - 5.5)/(9 - 7)	-1.55
ND<2 (10/10/2011)	5.5 (2/18/2011)	(2 - 5.5)/(10 - 7)	-1.16667
1.9 (1/9/2012)	5.5 (2/18/2011)	(1.9 - 5.5)/(11 - 7)	-0.9
2 (4/9/2012)	5.5 (2/18/2011)	(2 - 5.5)/(12 - 7)	-0.7
2.4 (7/25/2011)	4.1 (5/13/2011)	(2.4 - 4.1)/(9 - 8)	-1.7
ND<2 (10/10/2011)	4.1 (5/13/2011)	(2 - 4.1)/(10 - 8)	-1.05
1.9 (1/9/2012)	4.1 (5/13/2011)	(1.9 - 4.1)/(11 - 8)	-0.733333
2 (4/9/2012)	4.1 (5/13/2011)	(2 - 4.1)/(12 - 8)	-0.525
ND<2 (10/10/2011)	2.4 (7/25/2011)	(2 - 2.4)/(10 - 9)	-0.4
1.9 (1/9/2012)	2.4 (7/25/2011)	(1.9 - 2.4)/(11 - 9)	-0.25
2 (4/9/2012)	2.4 (7/25/2011)	(2 - 2.4)/(12 - 9)	-0.133333
1.9 (1/9/2012)	ND<2 (10/10/2011)	(1.9 - 2)/(11 - 10)	-0.1
2 (4/9/2012)	ND<2 (10/10/2011)	(2 - 2)/(12 - 10)	0
2 (4/9/2012)	1.9 (1/9/2012)	(2 - 1.9)/(12 - 11)	0.1

Number of Q values = 66

Ordered Q Values

n	Q
1	-3.6
2	-2.95
3	-2.3
4	-2.16667
5	-2.1
6	-1.975
7	-1.92
8	-1.86667
9	-1.825
10	-1.7
11	-1.66667
12	-1.55
13	-1.54
14	-1.44286
15	-1.4
16	-1.3
17	-1.25
18	-1.23333
19	-1.16667
20	-1.16667
21	-1.1
22	-1.1
23	-1.06

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24	-1.05714
25	-1.05
26	-1.025
27	-1
28	-0.975
29	-0.942857
30	-0.9375
31	-0.9
32	-0.9
33	-0.875
34	-0.844444
35	-0.84
36	-0.822222
37	-0.816667
38	-0.788889
39	-0.785714
40	-0.77
41	-0.733333
42	-0.725
43	-0.7
44	-0.7
45	-0.7
46	-0.7
47	-0.690909
48	-0.683333
49	-0.683333
50	-0.6
51	-0.6
52	-0.525
53	-0.4
54	-0.25
55	-0.133333
56	-0.1
57	-0.1
58	0
59	0.025
60	0.1
61	0.15
62	0.233333
63	0.4
64	0.8
65	1.5
66	2.6

Sen's Estimator (Median Q) is -0.859722

Tied Group	Value	Members
1	2	2

Time Period	Observations
12/30/2009	1
1/13/2010	1
3/17/2010	1
5/18/2010	1
9/10/2010	1
12/21/2010	1
2/18/2011	1
5/13/2011	1

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7/25/2011	1
10/10/2011	1
1/9/2012	1
4/9/2012	1

There are 0 time periods with multiple data

A = 18
B = 0
C = 0
D = 0
E = 2
F = 0
a = 3828
b = 11880
c = 264
Group Variance = 211.667
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 23.9306
M1 = (66 - 23.9306)/2.0 = 21.0347
M2 = (66 + 23.9306)/2.0 + 1 = 45.9653
Lower limit is -1.1 = Q(21)
Upper limit is -0.7 = Q(46)
-0.7 < 0 indicating a downward trend in data.

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Sen's Slope Analysis

Parameter: Trichloroethene

Location: MW-20S

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
70 (1/13/2010)	71 (12/30/2009)	(70 - 71)/(2 - 1)	-1
64 (3/17/2010)	71 (12/30/2009)	(64 - 71)/(3 - 1)	-3.5
94 (5/18/2010)	71 (12/30/2009)	(94 - 71)/(4 - 1)	7.66667
110 (9/10/2010)	71 (12/30/2009)	(110 - 71)/(5 - 1)	9.75
89 (12/21/2010)	71 (12/30/2009)	(89 - 71)/(6 - 1)	3.6
93 (2/18/2011)	71 (12/30/2009)	(93 - 71)/(7 - 1)	3.66667
91 (5/13/2011)	71 (12/30/2009)	(91 - 71)/(8 - 1)	2.85714
100 (7/25/2011)	71 (12/30/2009)	(100 - 71)/(9 - 1)	3.625
110 (10/10/2011)	71 (12/30/2009)	(110 - 71)/(10 - 1)	4.33333
100 (1/9/2012)	71 (12/30/2009)	(100 - 71)/(11 - 1)	2.9
100 (4/9/2012)	71 (12/30/2009)	(100 - 71)/(12 - 1)	2.63636
64 (3/17/2010)	70 (1/13/2010)	(64 - 70)/(3 - 2)	-6
94 (5/18/2010)	70 (1/13/2010)	(94 - 70)/(4 - 2)	12
110 (9/10/2010)	70 (1/13/2010)	(110 - 70)/(5 - 2)	13.3333
89 (12/21/2010)	70 (1/13/2010)	(89 - 70)/(6 - 2)	4.75
93 (2/18/2011)	70 (1/13/2010)	(93 - 70)/(7 - 2)	4.6
91 (5/13/2011)	70 (1/13/2010)	(91 - 70)/(8 - 2)	3.5
100 (7/25/2011)	70 (1/13/2010)	(100 - 70)/(9 - 2)	4.28571
110 (10/10/2011)	70 (1/13/2010)	(110 - 70)/(10 - 2)	5
100 (1/9/2012)	70 (1/13/2010)	(100 - 70)/(11 - 2)	3.33333
100 (4/9/2012)	70 (1/13/2010)	(100 - 70)/(12 - 2)	3
94 (5/18/2010)	64 (3/17/2010)	(94 - 64)/(4 - 3)	30
110 (9/10/2010)	64 (3/17/2010)	(110 - 64)/(5 - 3)	23
89 (12/21/2010)	64 (3/17/2010)	(89 - 64)/(6 - 3)	8.33333
93 (2/18/2011)	64 (3/17/2010)	(93 - 64)/(7 - 3)	7.25
91 (5/13/2011)	64 (3/17/2010)	(91 - 64)/(8 - 3)	5.4
100 (7/25/2011)	64 (3/17/2010)	(100 - 64)/(9 - 3)	6
110 (10/10/2011)	64 (3/17/2010)	(110 - 64)/(10 - 3)	6.57143
100 (1/9/2012)	64 (3/17/2010)	(100 - 64)/(11 - 3)	4.5
100 (4/9/2012)	64 (3/17/2010)	(100 - 64)/(12 - 3)	4
110 (9/10/2010)	94 (5/18/2010)	(110 - 94)/(5 - 4)	16
89 (12/21/2010)	94 (5/18/2010)	(89 - 94)/(6 - 4)	-2.5
93 (2/18/2011)	94 (5/18/2010)	(93 - 94)/(7 - 4)	-0.333333
91 (5/13/2011)	94 (5/18/2010)	(91 - 94)/(8 - 4)	-0.75
100 (7/25/2011)	94 (5/18/2010)	(100 - 94)/(9 - 4)	1.2
110 (10/10/2011)	94 (5/18/2010)	(110 - 94)/(10 - 4)	2.66667
100 (1/9/2012)	94 (5/18/2010)	(100 - 94)/(11 - 4)	0.857143
100 (4/9/2012)	94 (5/18/2010)	(100 - 94)/(12 - 4)	0.75
89 (12/21/2010)	110 (9/10/2010)	(89 - 110)/(6 - 5)	-21
93 (2/18/2011)	110 (9/10/2010)	(93 - 110)/(7 - 5)	-8.5
91 (5/13/2011)	110 (9/10/2010)	(91 - 110)/(8 - 5)	-6.33333
100 (7/25/2011)	110 (9/10/2010)	(100 - 110)/(9 - 5)	-2.5
110 (10/10/2011)	110 (9/10/2010)	(110 - 110)/(10 - 5)	0
100 (1/9/2012)	110 (9/10/2010)	(100 - 110)/(11 - 5)	-1.66667

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100 (4/9/2012)	110 (9/10/2010)	(100 - 110)/(12 - 5)	-1.42857
93 (2/18/2011)	89 (12/21/2010)	(93 - 89)/(7 - 6)	4
91 (5/13/2011)	89 (12/21/2010)	(91 - 89)/(8 - 6)	1
100 (7/25/2011)	89 (12/21/2010)	(100 - 89)/(9 - 6)	3.66667
110 (10/10/2011)	89 (12/21/2010)	(110 - 89)/(10 - 6)	5.25
100 (1/9/2012)	89 (12/21/2010)	(100 - 89)/(11 - 6)	2.2
100 (4/9/2012)	89 (12/21/2010)	(100 - 89)/(12 - 6)	1.83333
91 (5/13/2011)	93 (2/18/2011)	(91 - 93)/(8 - 7)	-2
100 (7/25/2011)	93 (2/18/2011)	(100 - 93)/(9 - 7)	3.5
110 (10/10/2011)	93 (2/18/2011)	(110 - 93)/(10 - 7)	5.66667
100 (1/9/2012)	93 (2/18/2011)	(100 - 93)/(11 - 7)	1.75
100 (4/9/2012)	93 (2/18/2011)	(100 - 93)/(12 - 7)	1.4
100 (7/25/2011)	91 (5/13/2011)	(100 - 91)/(9 - 8)	9
110 (10/10/2011)	91 (5/13/2011)	(110 - 91)/(10 - 8)	9.5
100 (1/9/2012)	91 (5/13/2011)	(100 - 91)/(11 - 8)	3
100 (4/9/2012)	91 (5/13/2011)	(100 - 91)/(12 - 8)	2.25
110 (10/10/2011)	100 (7/25/2011)	(110 - 100)/(10 - 9)	10
100 (1/9/2012)	100 (7/25/2011)	(100 - 100)/(11 - 9)	0
100 (4/9/2012)	100 (7/25/2011)	(100 - 100)/(12 - 9)	0
100 (1/9/2012)	110 (10/10/2011)	(100 - 110)/(11 - 10)	-10
100 (4/9/2012)	110 (10/10/2011)	(100 - 110)/(12 - 10)	-5
100 (4/9/2012)	100 (1/9/2012)	(100 - 100)/(12 - 11)	0

Number of Q values = 66

Ordered Q Values

n	Q
1	-21
2	-10
3	-8.5
4	-6.33333
5	-6
6	-5
7	-3.5
8	-2.5
9	-2.5
10	-2
11	-1.66667
12	-1.42857
13	-1
14	-0.75
15	-0.333333
16	0
17	0
18	0
19	0
20	0.75
21	0.857143
22	1
23	1.2

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24	1.4
25	1.75
26	1.83333
27	2.2
28	2.25
29	2.63636
30	2.66667
31	2.85714
32	2.9
33	3
34	3
35	3.33333
36	3.5
37	3.5
38	3.6
39	3.625
40	3.66667
41	3.66667
42	4
43	4
44	4.28571
45	4.33333
46	4.5
47	4.6
48	4.75
49	5
50	5.25
51	5.4
52	5.66667
53	6
54	6.57143
55	7.25
56	7.66667
57	8.33333
58	9
59	9.5
60	9.75
61	10
62	12
63	13.3333
64	16
65	23
66	30

Sen's Estimator (Median Q) is 3

Tied Group	Value	Members
1	110	2
2	100	3

Time Period	Observations
12/30/2009	1
1/13/2010	1
3/17/2010	1
5/18/2010	1
9/10/2010	1
12/21/2010	1
2/18/2011	1

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5/13/2011	1
7/25/2011	1
10/10/2011	1
1/9/2012	1
4/9/2012	1

There are 0 time periods with multiple data

A = 84
B = 0
C = 6
D = 0
E = 8
F = 0
a = 3828
b = 11880
c = 264
Group Variance = 208
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 23.7224
M1 = (66 - 23.7224)/2.0 = 21.1388
M2 = (66 + 23.7224)/2.0 + 1 = 45.8612
Lower limit is 0.857143 = Q(21)
Upper limit is 4.5 = Q(46)
0.857143 > 0 indicating an upward trend in data.

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Sen's Slope Analysis

Parameter: 1,1,1-Trichloroethane

Location: MW-21

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
56 (1/13/2010)	54 (12/8/2009)	(56 - 54)/(2 - 1)	2
62 (3/23/2010)	54 (12/8/2009)	(62 - 54)/(3 - 1)	4
63 (5/18/2010)	54 (12/8/2009)	(63 - 54)/(4 - 1)	3
59 (10/15/2010)	54 (12/8/2009)	(59 - 54)/(5 - 1)	1.25
55 (12/22/2010)	54 (12/8/2009)	(55 - 54)/(6 - 1)	0.2
52 (2/24/2011)	54 (12/8/2009)	(52 - 54)/(7 - 1)	-0.333333
49 (5/11/2011)	54 (12/8/2009)	(49 - 54)/(8 - 1)	-0.714286
54 (7/28/2011)	54 (12/8/2009)	(54 - 54)/(9 - 1)	0
55 (10/6/2011)	54 (12/8/2009)	(55 - 54)/(10 - 1)	0.111111
64 (1/10/2012)	54 (12/8/2009)	(64 - 54)/(11 - 1)	1
55 (4/4/2012)	54 (12/8/2009)	(55 - 54)/(12 - 1)	0.0909091
62 (3/23/2010)	56 (1/13/2010)	(62 - 56)/(3 - 2)	6
63 (5/18/2010)	56 (1/13/2010)	(63 - 56)/(4 - 2)	3.5
59 (10/15/2010)	56 (1/13/2010)	(59 - 56)/(5 - 2)	1
55 (12/22/2010)	56 (1/13/2010)	(55 - 56)/(6 - 2)	-0.25
52 (2/24/2011)	56 (1/13/2010)	(52 - 56)/(7 - 2)	-0.8
49 (5/11/2011)	56 (1/13/2010)	(49 - 56)/(8 - 2)	-1.16667
54 (7/28/2011)	56 (1/13/2010)	(54 - 56)/(9 - 2)	-0.285714
55 (10/6/2011)	56 (1/13/2010)	(55 - 56)/(10 - 2)	-0.125
64 (1/10/2012)	56 (1/13/2010)	(64 - 56)/(11 - 2)	0.888889
55 (4/4/2012)	56 (1/13/2010)	(55 - 56)/(12 - 2)	-0.1
63 (5/18/2010)	62 (3/23/2010)	(63 - 62)/(4 - 3)	1
59 (10/15/2010)	62 (3/23/2010)	(59 - 62)/(5 - 3)	-1.5
55 (12/22/2010)	62 (3/23/2010)	(55 - 62)/(6 - 3)	-2.33333
52 (2/24/2011)	62 (3/23/2010)	(52 - 62)/(7 - 3)	-2.5
49 (5/11/2011)	62 (3/23/2010)	(49 - 62)/(8 - 3)	-2.6
54 (7/28/2011)	62 (3/23/2010)	(54 - 62)/(9 - 3)	-1.33333
55 (10/6/2011)	62 (3/23/2010)	(55 - 62)/(10 - 3)	-1
64 (1/10/2012)	62 (3/23/2010)	(64 - 62)/(11 - 3)	0.25
55 (4/4/2012)	62 (3/23/2010)	(55 - 62)/(12 - 3)	-0.777778
59 (10/15/2010)	63 (5/18/2010)	(59 - 63)/(5 - 4)	-4
55 (12/22/2010)	63 (5/18/2010)	(55 - 63)/(6 - 4)	-4
52 (2/24/2011)	63 (5/18/2010)	(52 - 63)/(7 - 4)	-3.66667
49 (5/11/2011)	63 (5/18/2010)	(49 - 63)/(8 - 4)	-3.5
54 (7/28/2011)	63 (5/18/2010)	(54 - 63)/(9 - 4)	-1.8
55 (10/6/2011)	63 (5/18/2010)	(55 - 63)/(10 - 4)	-1.33333
64 (1/10/2012)	63 (5/18/2010)	(64 - 63)/(11 - 4)	0.142857
55 (4/4/2012)	63 (5/18/2010)	(55 - 63)/(12 - 4)	-1
55 (12/22/2010)	59 (10/15/2010)	(55 - 59)/(6 - 5)	-4
52 (2/24/2011)	59 (10/15/2010)	(52 - 59)/(7 - 5)	-3.5
49 (5/11/2011)	59 (10/15/2010)	(49 - 59)/(8 - 5)	-3.33333
54 (7/28/2011)	59 (10/15/2010)	(54 - 59)/(9 - 5)	-1.25
55 (10/6/2011)	59 (10/15/2010)	(55 - 59)/(10 - 5)	-0.8
64 (1/10/2012)	59 (10/15/2010)	(64 - 59)/(11 - 5)	0.833333

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55 (4/4/2012)	59 (10/15/2010)	(55 - 59)/(12 - 5)	-0.571429
52 (2/24/2011)	55 (12/22/2010)	(52 - 55)/(7 - 6)	-3
49 (5/11/2011)	55 (12/22/2010)	(49 - 55)/(8 - 6)	-3
54 (7/28/2011)	55 (12/22/2010)	(54 - 55)/(9 - 6)	-0.333333
55 (10/6/2011)	55 (12/22/2010)	(55 - 55)/(10 - 6)	0
64 (1/10/2012)	55 (12/22/2010)	(64 - 55)/(11 - 6)	1.8
55 (4/4/2012)	55 (12/22/2010)	(55 - 55)/(12 - 6)	0
49 (5/11/2011)	52 (2/24/2011)	(49 - 52)/(8 - 7)	-3
54 (7/28/2011)	52 (2/24/2011)	(54 - 52)/(9 - 7)	1
55 (10/6/2011)	52 (2/24/2011)	(55 - 52)/(10 - 7)	1
64 (1/10/2012)	52 (2/24/2011)	(64 - 52)/(11 - 7)	3
55 (4/4/2012)	52 (2/24/2011)	(55 - 52)/(12 - 7)	0.6
54 (7/28/2011)	49 (5/11/2011)	(54 - 49)/(9 - 8)	5
55 (10/6/2011)	49 (5/11/2011)	(55 - 49)/(10 - 8)	3
64 (1/10/2012)	49 (5/11/2011)	(64 - 49)/(11 - 8)	5
55 (4/4/2012)	49 (5/11/2011)	(55 - 49)/(12 - 8)	1.5
55 (10/6/2011)	54 (7/28/2011)	(55 - 54)/(10 - 9)	1
64 (1/10/2012)	54 (7/28/2011)	(64 - 54)/(11 - 9)	5
55 (4/4/2012)	54 (7/28/2011)	(55 - 54)/(12 - 9)	0.333333
64 (1/10/2012)	55 (10/6/2011)	(64 - 55)/(11 - 10)	9
55 (4/4/2012)	55 (10/6/2011)	(55 - 55)/(12 - 10)	0
55 (4/4/2012)	64 (1/10/2012)	(55 - 64)/(12 - 11)	-9

Number of Q values = 66

Ordered Q Values

n	Q
1	-9
2	-4
3	-4
4	-4
5	-3.66667
6	-3.5
7	-3.5
8	-3.33333
9	-3
10	-3
11	-3
12	-2.6
13	-2.5
14	-2.33333
15	-1.8
16	-1.5
17	-1.33333
18	-1.33333
19	-1.25
20	-1.16667
21	-1
22	-1
23	-0.8

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24	-0.8
25	-0.777778
26	-0.714286
27	-0.571429
28	-0.333333
29	-0.333333
30	-0.285714
31	-0.25
32	-0.125
33	-0.1
34	0
35	0
36	0
37	0
38	0.0909091
39	0.111111
40	0.142857
41	0.2
42	0.25
43	0.333333
44	0.6
45	0.833333
46	0.888889
47	1
48	1
49	1
50	1
51	1
52	1
53	1.25
54	1.5
55	1.8
56	2
57	3
58	3
59	3
60	3.5
61	4
62	5
63	5
64	5
65	6
66	9

Sen's Estimator (Median Q) is -0.05

Tied Group	Value	Members
1	54	2
2	55	3

Time Period	Observations
12/8/2009	1
1/13/2010	1
3/23/2010	1
5/18/2010	1
10/15/2010	1
12/22/2010	1
2/24/2011	1

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5/11/2011	1
7/28/2011	1
10/6/2011	1
1/10/2012	1
4/4/2012	1

There are 0 time periods with multiple data

A = 84
B = 0
C = 6
D = 0
E = 8
F = 0
a = 3828
b = 11880
c = 264
Group Variance = 208
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 23.7224
M1 = (66 - 23.7224)/2.0 = 21.1388
M2 = (66 + 23.7224)/2.0 + 1 = 45.8612
Lower limit is -1 = Q(21)
Upper limit is 0.888889 = Q(46)
-1 < 0 < 0.888889 indicating no trend in data.

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Sen's Slope Analysis

Parameter: 1,1-Dichloroethane

Location: MW-21

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
28 (1/13/2010)	31 (12/8/2009)	(28 - 31)/(2 - 1)	-3
33 (3/23/2010)	31 (12/8/2009)	(33 - 31)/(3 - 1)	1
35 (5/18/2010)	31 (12/8/2009)	(35 - 31)/(4 - 1)	1.33333
26 (10/15/2010)	31 (12/8/2009)	(26 - 31)/(5 - 1)	-1.25
25 (12/22/2010)	31 (12/8/2009)	(25 - 31)/(6 - 1)	-1.2
25 (2/24/2011)	31 (12/8/2009)	(25 - 31)/(7 - 1)	-1
24 (5/11/2011)	31 (12/8/2009)	(24 - 31)/(8 - 1)	-1
22 (7/28/2011)	31 (12/8/2009)	(22 - 31)/(9 - 1)	-1.125
22 (10/6/2011)	31 (12/8/2009)	(22 - 31)/(10 - 1)	-1
27 (1/10/2012)	31 (12/8/2009)	(27 - 31)/(11 - 1)	-0.4
25 (4/4/2012)	31 (12/8/2009)	(25 - 31)/(12 - 1)	-0.545455
33 (3/23/2010)	28 (1/13/2010)	(33 - 28)/(3 - 2)	5
35 (5/18/2010)	28 (1/13/2010)	(35 - 28)/(4 - 2)	3.5
26 (10/15/2010)	28 (1/13/2010)	(26 - 28)/(5 - 2)	-0.666667
25 (12/22/2010)	28 (1/13/2010)	(25 - 28)/(6 - 2)	-0.75
25 (2/24/2011)	28 (1/13/2010)	(25 - 28)/(7 - 2)	-0.6
24 (5/11/2011)	28 (1/13/2010)	(24 - 28)/(8 - 2)	-0.666667
22 (7/28/2011)	28 (1/13/2010)	(22 - 28)/(9 - 2)	-0.857143
22 (10/6/2011)	28 (1/13/2010)	(22 - 28)/(10 - 2)	-0.75
27 (1/10/2012)	28 (1/13/2010)	(27 - 28)/(11 - 2)	-0.111111
25 (4/4/2012)	28 (1/13/2010)	(25 - 28)/(12 - 2)	-0.3
35 (5/18/2010)	33 (3/23/2010)	(35 - 33)/(4 - 3)	2
26 (10/15/2010)	33 (3/23/2010)	(26 - 33)/(5 - 3)	-3.5
25 (12/22/2010)	33 (3/23/2010)	(25 - 33)/(6 - 3)	-2.66667
25 (2/24/2011)	33 (3/23/2010)	(25 - 33)/(7 - 3)	-2
24 (5/11/2011)	33 (3/23/2010)	(24 - 33)/(8 - 3)	-1.8
22 (7/28/2011)	33 (3/23/2010)	(22 - 33)/(9 - 3)	-1.83333
22 (10/6/2011)	33 (3/23/2010)	(22 - 33)/(10 - 3)	-1.57143
27 (1/10/2012)	33 (3/23/2010)	(27 - 33)/(11 - 3)	-0.75
25 (4/4/2012)	33 (3/23/2010)	(25 - 33)/(12 - 3)	-0.888889
26 (10/15/2010)	35 (5/18/2010)	(26 - 35)/(5 - 4)	-9
25 (12/22/2010)	35 (5/18/2010)	(25 - 35)/(6 - 4)	-5
25 (2/24/2011)	35 (5/18/2010)	(25 - 35)/(7 - 4)	-3.33333
24 (5/11/2011)	35 (5/18/2010)	(24 - 35)/(8 - 4)	-2.75
22 (7/28/2011)	35 (5/18/2010)	(22 - 35)/(9 - 4)	-2.6
22 (10/6/2011)	35 (5/18/2010)	(22 - 35)/(10 - 4)	-2.16667
27 (1/10/2012)	35 (5/18/2010)	(27 - 35)/(11 - 4)	-1.14286
25 (4/4/2012)	35 (5/18/2010)	(25 - 35)/(12 - 4)	-1.25
25 (12/22/2010)	26 (10/15/2010)	(25 - 26)/(6 - 5)	-1
25 (2/24/2011)	26 (10/15/2010)	(25 - 26)/(7 - 5)	-0.5
24 (5/11/2011)	26 (10/15/2010)	(24 - 26)/(8 - 5)	-0.666667
22 (7/28/2011)	26 (10/15/2010)	(22 - 26)/(9 - 5)	-1
22 (10/6/2011)	26 (10/15/2010)	(22 - 26)/(10 - 5)	-0.8
27 (1/10/2012)	26 (10/15/2010)	(27 - 26)/(11 - 5)	0.166667

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25 (4/4/2012)	26 (10/15/2010)	(25 - 26)/(12 - 5)	-0.142857
25 (2/24/2011)	25 (12/22/2010)	(25 - 25)/(7 - 6)	0
24 (5/11/2011)	25 (12/22/2010)	(24 - 25)/(8 - 6)	-0.5
22 (7/28/2011)	25 (12/22/2010)	(22 - 25)/(9 - 6)	-1
22 (10/6/2011)	25 (12/22/2010)	(22 - 25)/(10 - 6)	-0.75
27 (1/10/2012)	25 (12/22/2010)	(27 - 25)/(11 - 6)	0.4
25 (4/4/2012)	25 (12/22/2010)	(25 - 25)/(12 - 6)	0
24 (5/11/2011)	25 (2/24/2011)	(24 - 25)/(8 - 7)	-1
22 (7/28/2011)	25 (2/24/2011)	(22 - 25)/(9 - 7)	-1.5
22 (10/6/2011)	25 (2/24/2011)	(22 - 25)/(10 - 7)	-1
27 (1/10/2012)	25 (2/24/2011)	(27 - 25)/(11 - 7)	0.5
25 (4/4/2012)	25 (2/24/2011)	(25 - 25)/(12 - 7)	0
22 (7/28/2011)	24 (5/11/2011)	(22 - 24)/(9 - 8)	-2
22 (10/6/2011)	24 (5/11/2011)	(22 - 24)/(10 - 8)	-1
27 (1/10/2012)	24 (5/11/2011)	(27 - 24)/(11 - 8)	1
25 (4/4/2012)	24 (5/11/2011)	(25 - 24)/(12 - 8)	0.25
22 (10/6/2011)	22 (7/28/2011)	(22 - 22)/(10 - 9)	0
27 (1/10/2012)	22 (7/28/2011)	(27 - 22)/(11 - 9)	2.5
25 (4/4/2012)	22 (7/28/2011)	(25 - 22)/(12 - 9)	1
27 (1/10/2012)	22 (10/6/2011)	(27 - 22)/(11 - 10)	5
25 (4/4/2012)	22 (10/6/2011)	(25 - 22)/(12 - 10)	1.5
25 (4/4/2012)	27 (1/10/2012)	(25 - 27)/(12 - 11)	-2

Number of Q values = 66

Ordered Q Values

n	Q
1	-9
2	-5
3	-3.5
4	-3.33333
5	-3
6	-2.75
7	-2.66667
8	-2.6
9	-2.16667
10	-2
11	-2
12	-2
13	-1.83333
14	-1.8
15	-1.57143
16	-1.5
17	-1.25
18	-1.25
19	-1.2
20	-1.14286
21	-1.125
22	-1
23	-1

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24	-1
25	-1
26	-1
27	-1
28	-1
29	-1
30	-1
31	-0.888889
32	-0.857143
33	-0.8
34	-0.75
35	-0.75
36	-0.75
37	-0.75
38	-0.666667
39	-0.666667
40	-0.666667
41	-0.6
42	-0.545455
43	-0.5
44	-0.5
45	-0.4
46	-0.3
47	-0.142857
48	-0.111111
49	0
50	0
51	0
52	0
53	0.166667
54	0.25
55	0.4
56	0.5
57	1
58	1
59	1
60	1.33333
61	1.5
62	2
63	2.5
64	3.5
65	5
66	5

Sen's Estimator (Median Q) is -0.775

Tied Group	Value	Members
1	25	3
2	22	2

Time Period	Observations
12/8/2009	1
1/13/2010	1
3/23/2010	1
5/18/2010	1
10/15/2010	1
12/22/2010	1
2/24/2011	1

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5/11/2011	1
7/28/2011	1
10/6/2011	1
1/10/2012	1
4/4/2012	1

There are 0 time periods with multiple data

A = 84
B = 0
C = 6
D = 0
E = 8
F = 0
a = 3828
b = 11880
c = 264
Group Variance = 208
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 23.7224
M1 = (66 - 23.7224)/2.0 = 21.1388
M2 = (66 + 23.7224)/2.0 + 1 = 45.8612
Lower limit is -1.125 = Q(21)
Upper limit is -0.3 = Q(46)
-0.3 < 0 indicating a downward trend in data.

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Sen's Slope Analysis

Parameter: cis-1,2-Dichloroethene

Location: MW-21

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
62 (1/13/2010)	59 (12/8/2009)	(62 - 59)/(2 - 1)	3
81 (3/23/2010)	59 (12/8/2009)	(81 - 59)/(3 - 1)	11
89 (5/18/2010)	59 (12/8/2009)	(89 - 59)/(4 - 1)	10
80 (10/15/2010)	59 (12/8/2009)	(80 - 59)/(5 - 1)	5.25
69 (12/22/2010)	59 (12/8/2009)	(69 - 59)/(6 - 1)	2
66 (2/24/2011)	59 (12/8/2009)	(66 - 59)/(7 - 1)	1.16667
65 (5/11/2011)	59 (12/8/2009)	(65 - 59)/(8 - 1)	0.857143
77 (7/28/2011)	59 (12/8/2009)	(77 - 59)/(9 - 1)	2.25
74 (10/6/2011)	59 (12/8/2009)	(74 - 59)/(10 - 1)	1.66667
79 (1/10/2012)	59 (12/8/2009)	(79 - 59)/(11 - 1)	2
81 (4/4/2012)	59 (12/8/2009)	(81 - 59)/(12 - 1)	2
81 (3/23/2010)	62 (1/13/2010)	(81 - 62)/(3 - 2)	19
89 (5/18/2010)	62 (1/13/2010)	(89 - 62)/(4 - 2)	13.5
80 (10/15/2010)	62 (1/13/2010)	(80 - 62)/(5 - 2)	6
69 (12/22/2010)	62 (1/13/2010)	(69 - 62)/(6 - 2)	1.75
66 (2/24/2011)	62 (1/13/2010)	(66 - 62)/(7 - 2)	0.8
65 (5/11/2011)	62 (1/13/2010)	(65 - 62)/(8 - 2)	0.5
77 (7/28/2011)	62 (1/13/2010)	(77 - 62)/(9 - 2)	2.14286
74 (10/6/2011)	62 (1/13/2010)	(74 - 62)/(10 - 2)	1.5
79 (1/10/2012)	62 (1/13/2010)	(79 - 62)/(11 - 2)	1.88889
81 (4/4/2012)	62 (1/13/2010)	(81 - 62)/(12 - 2)	1.9
89 (5/18/2010)	81 (3/23/2010)	(89 - 81)/(4 - 3)	8
80 (10/15/2010)	81 (3/23/2010)	(80 - 81)/(5 - 3)	-0.5
69 (12/22/2010)	81 (3/23/2010)	(69 - 81)/(6 - 3)	-4
66 (2/24/2011)	81 (3/23/2010)	(66 - 81)/(7 - 3)	-3.75
65 (5/11/2011)	81 (3/23/2010)	(65 - 81)/(8 - 3)	-3.2
77 (7/28/2011)	81 (3/23/2010)	(77 - 81)/(9 - 3)	-0.666667
74 (10/6/2011)	81 (3/23/2010)	(74 - 81)/(10 - 3)	-1
79 (1/10/2012)	81 (3/23/2010)	(79 - 81)/(11 - 3)	-0.25
81 (4/4/2012)	81 (3/23/2010)	(81 - 81)/(12 - 3)	0
80 (10/15/2010)	89 (5/18/2010)	(80 - 89)/(5 - 4)	-9
69 (12/22/2010)	89 (5/18/2010)	(69 - 89)/(6 - 4)	-10
66 (2/24/2011)	89 (5/18/2010)	(66 - 89)/(7 - 4)	-7.66667
65 (5/11/2011)	89 (5/18/2010)	(65 - 89)/(8 - 4)	-6
77 (7/28/2011)	89 (5/18/2010)	(77 - 89)/(9 - 4)	-2.4
74 (10/6/2011)	89 (5/18/2010)	(74 - 89)/(10 - 4)	-2.5
79 (1/10/2012)	89 (5/18/2010)	(79 - 89)/(11 - 4)	-1.42857
81 (4/4/2012)	89 (5/18/2010)	(81 - 89)/(12 - 4)	-1
69 (12/22/2010)	80 (10/15/2010)	(69 - 80)/(6 - 5)	-11
66 (2/24/2011)	80 (10/15/2010)	(66 - 80)/(7 - 5)	-7
65 (5/11/2011)	80 (10/15/2010)	(65 - 80)/(8 - 5)	-5
77 (7/28/2011)	80 (10/15/2010)	(77 - 80)/(9 - 5)	-0.75
74 (10/6/2011)	80 (10/15/2010)	(74 - 80)/(10 - 5)	-1.2
79 (1/10/2012)	80 (10/15/2010)	(79 - 80)/(11 - 5)	-0.166667

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81 (4/4/2012)	80 (10/15/2010)	(81 - 80)/(12 - 5)	0.142857
66 (2/24/2011)	69 (12/22/2010)	(66 - 69)/(7 - 6)	-3
65 (5/11/2011)	69 (12/22/2010)	(65 - 69)/(8 - 6)	-2
77 (7/28/2011)	69 (12/22/2010)	(77 - 69)/(9 - 6)	2.66667
74 (10/6/2011)	69 (12/22/2010)	(74 - 69)/(10 - 6)	1.25
79 (1/10/2012)	69 (12/22/2010)	(79 - 69)/(11 - 6)	2
81 (4/4/2012)	69 (12/22/2010)	(81 - 69)/(12 - 6)	2
65 (5/11/2011)	66 (2/24/2011)	(65 - 66)/(8 - 7)	-1
77 (7/28/2011)	66 (2/24/2011)	(77 - 66)/(9 - 7)	5.5
74 (10/6/2011)	66 (2/24/2011)	(74 - 66)/(10 - 7)	2.66667
79 (1/10/2012)	66 (2/24/2011)	(79 - 66)/(11 - 7)	3.25
81 (4/4/2012)	66 (2/24/2011)	(81 - 66)/(12 - 7)	3
77 (7/28/2011)	65 (5/11/2011)	(77 - 65)/(9 - 8)	12
74 (10/6/2011)	65 (5/11/2011)	(74 - 65)/(10 - 8)	4.5
79 (1/10/2012)	65 (5/11/2011)	(79 - 65)/(11 - 8)	4.66667
81 (4/4/2012)	65 (5/11/2011)	(81 - 65)/(12 - 8)	4
74 (10/6/2011)	77 (7/28/2011)	(74 - 77)/(10 - 9)	-3
79 (1/10/2012)	77 (7/28/2011)	(79 - 77)/(11 - 9)	1
81 (4/4/2012)	77 (7/28/2011)	(81 - 77)/(12 - 9)	1.33333
79 (1/10/2012)	74 (10/6/2011)	(79 - 74)/(11 - 10)	5
81 (4/4/2012)	74 (10/6/2011)	(81 - 74)/(12 - 10)	3.5
81 (4/4/2012)	79 (1/10/2012)	(81 - 79)/(12 - 11)	2

Number of Q values = 66

Ordered Q Values

n	Q
1	-11
2	-10
3	-9
4	-7.66667
5	-7
6	-6
7	-5
8	-4
9	-3.75
10	-3.2
11	-3
12	-3
13	-2.5
14	-2.4
15	-2
16	-1.42857
17	-1.2
18	-1
19	-1
20	-1
21	-0.75
22	-0.666667
23	-0.5

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24	-0.25
25	-0.166667
26	0
27	0.142857
28	0.5
29	0.8
30	0.857143
31	1
32	1.16667
33	1.25
34	1.33333
35	1.5
36	1.66667
37	1.75
38	1.88889
39	1.9
40	2
41	2
42	2
43	2
44	2
45	2
46	2.14286
47	2.25
48	2.66667
49	2.66667
50	3
51	3
52	3.25
53	3.5
54	4
55	4.5
56	4.66667
57	5
58	5.25
59	5.5
60	6
61	8
62	10
63	11
64	12
65	13.5
66	19

Sen's Estimator (Median Q) is 1.29167

Tied Group	Value	Members
1	81	2

Time Period	Observations
12/8/2009	1
1/13/2010	1
3/23/2010	1
5/18/2010	1
10/15/2010	1
12/22/2010	1
2/24/2011	1
5/11/2011	1

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7/28/2011	1
10/6/2011	1
1/10/2012	1
4/4/2012	1

There are 0 time periods with multiple data

A = 18
B = 0
C = 0
D = 0
E = 2
F = 0
a = 3828
b = 11880
c = 264
Group Variance = 211.667
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 23.9306
M1 = (66 - 23.9306)/2.0 = 21.0347
M2 = (66 + 23.9306)/2.0 + 1 = 45.9653
Lower limit is -0.75 = Q(21)
Upper limit is 2.14286 = Q(46)
-0.75 < 0 < 2.14286 indicating no trend in data.

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Sen's Slope Analysis
Parameter: Trichloroethene
Location: MW-21
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
730 (1/13/2010)	840 (12/8/2009)	(730 - 840)/(2 - 1)	-110
850 (3/23/2010)	840 (12/8/2009)	(850 - 840)/(3 - 1)	5
830 (5/18/2010)	840 (12/8/2009)	(830 - 840)/(4 - 1)	-3.33333
810 (10/15/2010)	840 (12/8/2009)	(810 - 840)/(5 - 1)	-7.5
730 (12/22/2010)	840 (12/8/2009)	(730 - 840)/(6 - 1)	-22
730 (2/24/2011)	840 (12/8/2009)	(730 - 840)/(7 - 1)	-18.3333
740 (5/11/2011)	840 (12/8/2009)	(740 - 840)/(8 - 1)	-14.2857
1000 (7/28/2011)	840 (12/8/2009)	(1000 - 840)/(9 - 1)	20
960 (10/6/2011)	840 (12/8/2009)	(960 - 840)/(10 - 1)	13.3333
990 (1/10/2012)	840 (12/8/2009)	(990 - 840)/(11 - 1)	15
980 (4/4/2012)	840 (12/8/2009)	(980 - 840)/(12 - 1)	12.7273
850 (3/23/2010)	730 (1/13/2010)	(850 - 730)/(3 - 2)	120
830 (5/18/2010)	730 (1/13/2010)	(830 - 730)/(4 - 2)	50
810 (10/15/2010)	730 (1/13/2010)	(810 - 730)/(5 - 2)	26.6667
730 (12/22/2010)	730 (1/13/2010)	(730 - 730)/(6 - 2)	0
730 (2/24/2011)	730 (1/13/2010)	(730 - 730)/(7 - 2)	0
740 (5/11/2011)	730 (1/13/2010)	(740 - 730)/(8 - 2)	1.66667
1000 (7/28/2011)	730 (1/13/2010)	(1000 - 730)/(9 - 2)	38.5714
960 (10/6/2011)	730 (1/13/2010)	(960 - 730)/(10 - 2)	28.75
990 (1/10/2012)	730 (1/13/2010)	(990 - 730)/(11 - 2)	28.8889
980 (4/4/2012)	730 (1/13/2010)	(980 - 730)/(12 - 2)	25
830 (5/18/2010)	850 (3/23/2010)	(830 - 850)/(4 - 3)	-20
810 (10/15/2010)	850 (3/23/2010)	(810 - 850)/(5 - 3)	-20
730 (12/22/2010)	850 (3/23/2010)	(730 - 850)/(6 - 3)	-40
730 (2/24/2011)	850 (3/23/2010)	(730 - 850)/(7 - 3)	-30
740 (5/11/2011)	850 (3/23/2010)	(740 - 850)/(8 - 3)	-22
1000 (7/28/2011)	850 (3/23/2010)	(1000 - 850)/(9 - 3)	25
960 (10/6/2011)	850 (3/23/2010)	(960 - 850)/(10 - 3)	15.7143
990 (1/10/2012)	850 (3/23/2010)	(990 - 850)/(11 - 3)	17.5
980 (4/4/2012)	850 (3/23/2010)	(980 - 850)/(12 - 3)	14.4444
810 (10/15/2010)	830 (5/18/2010)	(810 - 830)/(5 - 4)	-20
730 (12/22/2010)	830 (5/18/2010)	(730 - 830)/(6 - 4)	-50
730 (2/24/2011)	830 (5/18/2010)	(730 - 830)/(7 - 4)	-33.3333
740 (5/11/2011)	830 (5/18/2010)	(740 - 830)/(8 - 4)	-22.5
1000 (7/28/2011)	830 (5/18/2010)	(1000 - 830)/(9 - 4)	34
960 (10/6/2011)	830 (5/18/2010)	(960 - 830)/(10 - 4)	21.6667
990 (1/10/2012)	830 (5/18/2010)	(990 - 830)/(11 - 4)	22.8571
980 (4/4/2012)	830 (5/18/2010)	(980 - 830)/(12 - 4)	18.75
730 (12/22/2010)	810 (10/15/2010)	(730 - 810)/(6 - 5)	-80
730 (2/24/2011)	810 (10/15/2010)	(730 - 810)/(7 - 5)	-40
740 (5/11/2011)	810 (10/15/2010)	(740 - 810)/(8 - 5)	-23.3333
1000 (7/28/2011)	810 (10/15/2010)	(1000 - 810)/(9 - 5)	47.5
960 (10/6/2011)	810 (10/15/2010)	(960 - 810)/(10 - 5)	30
990 (1/10/2012)	810 (10/15/2010)	(990 - 810)/(11 - 5)	30

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980 (4/4/2012)	810 (10/15/2010)	(980 - 810)/(12 - 5)	24.2857
730 (2/24/2011)	730 (12/22/2010)	(730 - 730)/(7 - 6)	0
740 (5/11/2011)	730 (12/22/2010)	(740 - 730)/(8 - 6)	5
1000 (7/28/2011)	730 (12/22/2010)	(1000 - 730)/(9 - 6)	90
960 (10/6/2011)	730 (12/22/2010)	(960 - 730)/(10 - 6)	57.5
990 (1/10/2012)	730 (12/22/2010)	(990 - 730)/(11 - 6)	52
980 (4/4/2012)	730 (12/22/2010)	(980 - 730)/(12 - 6)	41.6667
740 (5/11/2011)	730 (2/24/2011)	(740 - 730)/(8 - 7)	10
1000 (7/28/2011)	730 (2/24/2011)	(1000 - 730)/(9 - 7)	135
960 (10/6/2011)	730 (2/24/2011)	(960 - 730)/(10 - 7)	76.6667
990 (1/10/2012)	730 (2/24/2011)	(990 - 730)/(11 - 7)	65
980 (4/4/2012)	730 (2/24/2011)	(980 - 730)/(12 - 7)	50
1000 (7/28/2011)	740 (5/11/2011)	(1000 - 740)/(9 - 8)	260
960 (10/6/2011)	740 (5/11/2011)	(960 - 740)/(10 - 8)	110
990 (1/10/2012)	740 (5/11/2011)	(990 - 740)/(11 - 8)	83.3333
980 (4/4/2012)	740 (5/11/2011)	(980 - 740)/(12 - 8)	60
960 (10/6/2011)	1000 (7/28/2011)	(960 - 1000)/(10 - 9)	-40
990 (1/10/2012)	1000 (7/28/2011)	(990 - 1000)/(11 - 9)	-5
980 (4/4/2012)	1000 (7/28/2011)	(980 - 1000)/(12 - 9)	-6.66667
990 (1/10/2012)	960 (10/6/2011)	(990 - 960)/(11 - 10)	30
980 (4/4/2012)	960 (10/6/2011)	(980 - 960)/(12 - 10)	10
980 (4/4/2012)	990 (1/10/2012)	(980 - 990)/(12 - 11)	-10

Number of Q values = 66

Ordered Q Values

n	Q
1	-110
2	-80
3	-50
4	-40
5	-40
6	-40
7	-33.3333
8	-30
9	-23.3333
10	-22.5
11	-22
12	-22
13	-20
14	-20
15	-20
16	-18.3333
17	-14.2857
18	-10
19	-7.5
20	-6.66667
21	-5
22	-3.33333
23	0

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24	0
25	0
26	1.66667
27	5
28	5
29	10
30	10
31	12.7273
32	13.3333
33	14.4444
34	15
35	15.7143
36	17.5
37	18.75
38	20
39	21.6667
40	22.8571
41	24.2857
42	25
43	25
44	26.6667
45	28.75
46	28.8889
47	30
48	30
49	30
50	34
51	38.5714
52	41.6667
53	47.5
54	50
55	50
56	52
57	57.5
58	60
59	65
60	76.6667
61	83.3333
62	90
63	110
64	120
65	135
66	260

Sen's Estimator (Median Q) is 14.7222

Tied Group	Value	Members
1	730	3

Time Period	Observations
12/8/2009	1
1/13/2010	1
3/23/2010	1
5/18/2010	1
10/15/2010	1
12/22/2010	1
2/24/2011	1
5/11/2011	1

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7/28/2011	1
10/6/2011	1
1/10/2012	1
4/4/2012	1

There are 0 time periods with multiple data

A = 66
B = 0
C = 6
D = 0
E = 6
F = 0
a = 3828
b = 11880
c = 264
Group Variance = 209
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 23.7794
M1 = (66 - 23.7794)/2.0 = 21.1103
M2 = (66 + 23.7794)/2.0 + 1 = 45.8897
Lower limit is -5 = Q(21)
Upper limit is 28.8889 = Q(46)
-5 < 0 < 28.8889 indicating no trend in data.

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Sen's Slope Analysis
Parameter: Vinyl chloride
Location: MW-22
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
8.5 (3/18/2010)	10 (12/7/2009)	(8.5 - 10)/(2 - 1)	-1.5
2 (5/18/2010)	10 (12/7/2009)	(2 - 10)/(3 - 1)	-4
4.3 (9/10/2010)	10 (12/7/2009)	(4.3 - 10)/(4 - 1)	-1.9
3 (12/22/2010)	10 (12/7/2009)	(3 - 10)/(5 - 1)	-1.75
2.3 (2/24/2011)	10 (12/7/2009)	(2.3 - 10)/(6 - 1)	-1.54
1.4 (5/11/2011)	10 (12/7/2009)	(1.4 - 10)/(7 - 1)	-1.43333
2.8 (7/21/2011)	10 (12/7/2009)	(2.8 - 10)/(8 - 1)	-1.02857
6.2 (10/4/2011)	10 (12/7/2009)	(6.2 - 10)/(9 - 1)	-0.475
8.4 (1/9/2012)	10 (12/7/2009)	(8.4 - 10)/(10 - 1)	-0.177778
12 (4/5/2012)	10 (12/7/2009)	(12 - 10)/(11 - 1)	0.2
2 (5/18/2010)	8.5 (3/18/2010)	(2 - 8.5)/(3 - 2)	-6.5
4.3 (9/10/2010)	8.5 (3/18/2010)	(4.3 - 8.5)/(4 - 2)	-2.1
3 (12/22/2010)	8.5 (3/18/2010)	(3 - 8.5)/(5 - 2)	-1.83333
2.3 (2/24/2011)	8.5 (3/18/2010)	(2.3 - 8.5)/(6 - 2)	-1.55
1.4 (5/11/2011)	8.5 (3/18/2010)	(1.4 - 8.5)/(7 - 2)	-1.42
2.8 (7/21/2011)	8.5 (3/18/2010)	(2.8 - 8.5)/(8 - 2)	-0.95
6.2 (10/4/2011)	8.5 (3/18/2010)	(6.2 - 8.5)/(9 - 2)	-0.328571
8.4 (1/9/2012)	8.5 (3/18/2010)	(8.4 - 8.5)/(10 - 2)	-0.0125
12 (4/5/2012)	8.5 (3/18/2010)	(12 - 8.5)/(11 - 2)	0.388889
4.3 (9/10/2010)	2 (5/18/2010)	(4.3 - 2)/(4 - 3)	2.3
3 (12/22/2010)	2 (5/18/2010)	(3 - 2)/(5 - 3)	0.5
2.3 (2/24/2011)	2 (5/18/2010)	(2.3 - 2)/(6 - 3)	0.1
1.4 (5/11/2011)	2 (5/18/2010)	(1.4 - 2)/(7 - 3)	-0.15
2.8 (7/21/2011)	2 (5/18/2010)	(2.8 - 2)/(8 - 3)	0.16
6.2 (10/4/2011)	2 (5/18/2010)	(6.2 - 2)/(9 - 3)	0.7
8.4 (1/9/2012)	2 (5/18/2010)	(8.4 - 2)/(10 - 3)	0.914286
12 (4/5/2012)	2 (5/18/2010)	(12 - 2)/(11 - 3)	1.25
3 (12/22/2010)	4.3 (9/10/2010)	(3 - 4.3)/(5 - 4)	-1.3
2.3 (2/24/2011)	4.3 (9/10/2010)	(2.3 - 4.3)/(6 - 4)	-1
1.4 (5/11/2011)	4.3 (9/10/2010)	(1.4 - 4.3)/(7 - 4)	-0.966667
2.8 (7/21/2011)	4.3 (9/10/2010)	(2.8 - 4.3)/(8 - 4)	-0.375
6.2 (10/4/2011)	4.3 (9/10/2010)	(6.2 - 4.3)/(9 - 4)	0.38
8.4 (1/9/2012)	4.3 (9/10/2010)	(8.4 - 4.3)/(10 - 4)	0.683333
12 (4/5/2012)	4.3 (9/10/2010)	(12 - 4.3)/(11 - 4)	1.1
2.3 (2/24/2011)	3 (12/22/2010)	(2.3 - 3)/(6 - 5)	-0.7
1.4 (5/11/2011)	3 (12/22/2010)	(1.4 - 3)/(7 - 5)	-0.8
2.8 (7/21/2011)	3 (12/22/2010)	(2.8 - 3)/(8 - 5)	-0.0666667
6.2 (10/4/2011)	3 (12/22/2010)	(6.2 - 3)/(9 - 5)	0.8
8.4 (1/9/2012)	3 (12/22/2010)	(8.4 - 3)/(10 - 5)	1.08
12 (4/5/2012)	3 (12/22/2010)	(12 - 3)/(11 - 5)	1.5
1.4 (5/11/2011)	2.3 (2/24/2011)	(1.4 - 2.3)/(7 - 6)	-0.9
2.8 (7/21/2011)	2.3 (2/24/2011)	(2.8 - 2.3)/(8 - 6)	0.25
6.2 (10/4/2011)	2.3 (2/24/2011)	(6.2 - 2.3)/(9 - 6)	1.3

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8.4 (1/9/2012)	2.3 (2/24/2011)	(8.4 - 2.3)/(10 - 6)	1.525
12 (4/5/2012)	2.3 (2/24/2011)	(12 - 2.3)/(11 - 6)	1.94
2.8 (7/21/2011)	1.4 (5/11/2011)	(2.8 - 1.4)/(8 - 7)	1.4
6.2 (10/4/2011)	1.4 (5/11/2011)	(6.2 - 1.4)/(9 - 7)	2.4
8.4 (1/9/2012)	1.4 (5/11/2011)	(8.4 - 1.4)/(10 - 7)	2.33333
12 (4/5/2012)	1.4 (5/11/2011)	(12 - 1.4)/(11 - 7)	2.65
6.2 (10/4/2011)	2.8 (7/21/2011)	(6.2 - 2.8)/(9 - 8)	3.4
8.4 (1/9/2012)	2.8 (7/21/2011)	(8.4 - 2.8)/(10 - 8)	2.8
12 (4/5/2012)	2.8 (7/21/2011)	(12 - 2.8)/(11 - 8)	3.06667
8.4 (1/9/2012)	6.2 (10/4/2011)	(8.4 - 6.2)/(10 - 9)	2.2
12 (4/5/2012)	6.2 (10/4/2011)	(12 - 6.2)/(11 - 9)	2.9
12 (4/5/2012)	8.4 (1/9/2012)	(12 - 8.4)/(11 - 10)	3.6

Number of Q values = 55

Ordered Q Values

n	Q
1	-6.5
2	-4
3	-2.1
4	-1.9
5	-1.83333
6	-1.75
7	-1.55
8	-1.54
9	-1.5
10	-1.43333
11	-1.42
12	-1.3
13	-1.02857
14	-1
15	-0.966667
16	-0.95
17	-0.9
18	-0.8
19	-0.7
20	-0.475
21	-0.375
22	-0.328571
23	-0.177778
24	-0.15
25	-0.0666667
26	-0.0125
27	0.1
28	0.16
29	0.2
30	0.25
31	0.38
32	0.388889
33	0.5
34	0.683333
35	0.7

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36	0.8
37	0.914286
38	1.08
39	1.1
40	1.25
41	1.3
42	1.4
43	1.5
44	1.525
45	1.94
46	2.2
47	2.3
48	2.33333
49	2.4
50	2.65
51	2.8
52	2.9
53	3.06667
54	3.4
55	3.6

Sen's Estimator (Median Q) is 0.16

Time Period	Observations
12/7/2009	1
3/18/2010	1
5/18/2010	1
9/10/2010	1
12/22/2010	1
2/24/2011	1
5/11/2011	1
7/21/2011	1
10/4/2011	1
1/9/2012	1
4/5/2012	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 2970
b = 8910
c = 220
Group Variance = 165
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 21.1285
M1 = (55 - 21.1285)/2.0 = 16.9357
M2 = (55 + 21.1285)/2.0 + 1 = 39.0643
Lower limit is -0.9 = Q(17)
Upper limit is 1.1 = Q(39)
-0.9 < 0 < 1.1 indicating no trend in data.

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Sen's Slope Analysis
Parameter: Vinyl chloride
Location: MW-23
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
7.6 (1/13/2010)	3.2 (12/8/2009)	(7.6 - 3.2)/(2 - 1)	4.4
4 (3/16/2010)	3.2 (12/8/2009)	(4 - 3.2)/(3 - 1)	0.4
6.1 (5/18/2010)	3.2 (12/8/2009)	(6.1 - 3.2)/(4 - 1)	0.966667
9 (9/10/2010)	3.2 (12/8/2009)	(9 - 3.2)/(5 - 1)	1.45
17 (12/21/2010)	3.2 (12/8/2009)	(17 - 3.2)/(6 - 1)	2.76
18 (2/18/2011)	3.2 (12/8/2009)	(18 - 3.2)/(7 - 1)	2.46667
25 (5/10/2011)	3.2 (12/8/2009)	(25 - 3.2)/(8 - 1)	3.11429
23 (7/25/2011)	3.2 (12/8/2009)	(23 - 3.2)/(9 - 1)	2.475
56 (10/5/2011)	3.2 (12/8/2009)	(56 - 3.2)/(10 - 1)	5.86667
11 (11/4/2011)	3.2 (12/8/2009)	(11 - 3.2)/(11 - 1)	0.78
48 (1/9/2012)	3.2 (12/8/2009)	(48 - 3.2)/(12 - 1)	4.07273
85 (4/3/2012)	3.2 (12/8/2009)	(85 - 3.2)/(13 - 1)	6.81667
4 (3/16/2010)	7.6 (1/13/2010)	(4 - 7.6)/(3 - 2)	-3.6
6.1 (5/18/2010)	7.6 (1/13/2010)	(6.1 - 7.6)/(4 - 2)	-0.75
9 (9/10/2010)	7.6 (1/13/2010)	(9 - 7.6)/(5 - 2)	0.466667
17 (12/21/2010)	7.6 (1/13/2010)	(17 - 7.6)/(6 - 2)	2.35
18 (2/18/2011)	7.6 (1/13/2010)	(18 - 7.6)/(7 - 2)	2.08
25 (5/10/2011)	7.6 (1/13/2010)	(25 - 7.6)/(8 - 2)	2.9
23 (7/25/2011)	7.6 (1/13/2010)	(23 - 7.6)/(9 - 2)	2.2
56 (10/5/2011)	7.6 (1/13/2010)	(56 - 7.6)/(10 - 2)	6.05
11 (11/4/2011)	7.6 (1/13/2010)	(11 - 7.6)/(11 - 2)	0.377778
48 (1/9/2012)	7.6 (1/13/2010)	(48 - 7.6)/(12 - 2)	4.04
85 (4/3/2012)	7.6 (1/13/2010)	(85 - 7.6)/(13 - 2)	7.03636
6.1 (5/18/2010)	4 (3/16/2010)	(6.1 - 4)/(4 - 3)	2.1
9 (9/10/2010)	4 (3/16/2010)	(9 - 4)/(5 - 3)	2.5
17 (12/21/2010)	4 (3/16/2010)	(17 - 4)/(6 - 3)	4.33333
18 (2/18/2011)	4 (3/16/2010)	(18 - 4)/(7 - 3)	3.5
25 (5/10/2011)	4 (3/16/2010)	(25 - 4)/(8 - 3)	4.2
23 (7/25/2011)	4 (3/16/2010)	(23 - 4)/(9 - 3)	3.16667
56 (10/5/2011)	4 (3/16/2010)	(56 - 4)/(10 - 3)	7.42857
11 (11/4/2011)	4 (3/16/2010)	(11 - 4)/(11 - 3)	0.875
48 (1/9/2012)	4 (3/16/2010)	(48 - 4)/(12 - 3)	4.88889
85 (4/3/2012)	4 (3/16/2010)	(85 - 4)/(13 - 3)	8.1
9 (9/10/2010)	6.1 (5/18/2010)	(9 - 6.1)/(5 - 4)	2.9
17 (12/21/2010)	6.1 (5/18/2010)	(17 - 6.1)/(6 - 4)	5.45
18 (2/18/2011)	6.1 (5/18/2010)	(18 - 6.1)/(7 - 4)	3.96667
25 (5/10/2011)	6.1 (5/18/2010)	(25 - 6.1)/(8 - 4)	4.725
23 (7/25/2011)	6.1 (5/18/2010)	(23 - 6.1)/(9 - 4)	3.38
56 (10/5/2011)	6.1 (5/18/2010)	(56 - 6.1)/(10 - 4)	8.31667
11 (11/4/2011)	6.1 (5/18/2010)	(11 - 6.1)/(11 - 4)	0.7
48 (1/9/2012)	6.1 (5/18/2010)	(48 - 6.1)/(12 - 4)	5.2375
85 (4/3/2012)	6.1 (5/18/2010)	(85 - 6.1)/(13 - 4)	8.76667
17 (12/21/2010)	9 (9/10/2010)	(17 - 9)/(6 - 5)	8
18 (2/18/2011)	9 (9/10/2010)	(18 - 9)/(7 - 5)	4.5

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25 (5/10/2011)	9 (9/10/2010)	(25 - 9)/(8 - 5)	5.33333
23 (7/25/2011)	9 (9/10/2010)	(23 - 9)/(9 - 5)	3.5
56 (10/5/2011)	9 (9/10/2010)	(56 - 9)/(10 - 5)	9.4
11 (11/4/2011)	9 (9/10/2010)	(11 - 9)/(11 - 5)	0.333333
48 (1/9/2012)	9 (9/10/2010)	(48 - 9)/(12 - 5)	5.57143
85 (4/3/2012)	9 (9/10/2010)	(85 - 9)/(13 - 5)	9.5
18 (2/18/2011)	17 (12/21/2010)	(18 - 17)/(7 - 6)	1
25 (5/10/2011)	17 (12/21/2010)	(25 - 17)/(8 - 6)	4
23 (7/25/2011)	17 (12/21/2010)	(23 - 17)/(9 - 6)	2
56 (10/5/2011)	17 (12/21/2010)	(56 - 17)/(10 - 6)	9.75
11 (11/4/2011)	17 (12/21/2010)	(11 - 17)/(11 - 6)	-1.2
48 (1/9/2012)	17 (12/21/2010)	(48 - 17)/(12 - 6)	5.16667
85 (4/3/2012)	17 (12/21/2010)	(85 - 17)/(13 - 6)	9.71429
25 (5/10/2011)	18 (2/18/2011)	(25 - 18)/(8 - 7)	7
23 (7/25/2011)	18 (2/18/2011)	(23 - 18)/(9 - 7)	2.5
56 (10/5/2011)	18 (2/18/2011)	(56 - 18)/(10 - 7)	12.6667
11 (11/4/2011)	18 (2/18/2011)	(11 - 18)/(11 - 7)	-1.75
48 (1/9/2012)	18 (2/18/2011)	(48 - 18)/(12 - 7)	6
85 (4/3/2012)	18 (2/18/2011)	(85 - 18)/(13 - 7)	11.1667
23 (7/25/2011)	25 (5/10/2011)	(23 - 25)/(9 - 8)	-2
56 (10/5/2011)	25 (5/10/2011)	(56 - 25)/(10 - 8)	15.5
11 (11/4/2011)	25 (5/10/2011)	(11 - 25)/(11 - 8)	-4.66667
48 (1/9/2012)	25 (5/10/2011)	(48 - 25)/(12 - 8)	5.75
85 (4/3/2012)	25 (5/10/2011)	(85 - 25)/(13 - 8)	12
56 (10/5/2011)	23 (7/25/2011)	(56 - 23)/(10 - 9)	33
11 (11/4/2011)	23 (7/25/2011)	(11 - 23)/(11 - 9)	-6
48 (1/9/2012)	23 (7/25/2011)	(48 - 23)/(12 - 9)	8.33333
85 (4/3/2012)	23 (7/25/2011)	(85 - 23)/(13 - 9)	15.5
11 (11/4/2011)	56 (10/5/2011)	(11 - 56)/(11 - 10)	-45
48 (1/9/2012)	56 (10/5/2011)	(48 - 56)/(12 - 10)	-4
85 (4/3/2012)	56 (10/5/2011)	(85 - 56)/(13 - 10)	9.66667
48 (1/9/2012)	11 (11/4/2011)	(48 - 11)/(12 - 11)	37
85 (4/3/2012)	11 (11/4/2011)	(85 - 11)/(13 - 11)	37
85 (4/3/2012)	48 (1/9/2012)	(85 - 48)/(13 - 12)	37

Number of Q values = 78

Ordered Q Values

n	Q
1	-45
2	-6
3	-4.66667
4	-4
5	-3.6
6	-2
7	-1.75
8	-1.2
9	-0.75
10	0.333333

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11	0.377778
12	0.4
13	0.466667
14	0.7
15	0.78
16	0.875
17	0.966667
18	1
19	1.45
20	2
21	2.08
22	2.1
23	2.2
24	2.35
25	2.46667
26	2.475
27	2.5
28	2.5
29	2.76
30	2.9
31	2.9
32	3.11429
33	3.16667
34	3.38
35	3.5
36	3.5
37	3.96667
38	4
39	4.04
40	4.07273
41	4.2
42	4.33333
43	4.4
44	4.5
45	4.725
46	4.88889
47	5.16667
48	5.2375
49	5.33333
50	5.45
51	5.57143
52	5.75
53	5.86667
54	6
55	6.05
56	6.81667
57	7
58	7.03636
59	7.42857
60	8
61	8.1
62	8.31667
63	8.33333
64	8.76667
65	9.4
66	9.5
67	9.66667

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68	9.71429
69	9.75
70	11.1667
71	12
72	12.6667
73	15.5
74	15.5
75	33
76	37
77	37
78	37

Sen's Estimator (Median Q) is 4.05636

Time Period	Observations
12/8/2009	1
1/13/2010	1
3/16/2010	1
5/18/2010	1
9/10/2010	1
12/21/2010	1
2/18/2011	1
5/10/2011	1
7/25/2011	1
10/5/2011	1
11/4/2011	1
1/9/2012	1
4/3/2012	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 268.667
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 26.9609
M1 = (78 - 26.9609)/2.0 = 25.5196
M2 = (78 + 26.9609)/2.0 + 1 = 53.4804
Lower limit is 2.475 = Q(26)
Upper limit is 5.86667 = Q(53)
2.475 > 0 indicating an upward trend in data.

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Sen's Slope Analysis

Parameter: 1,1,1-Trichloroethane

Location: MW-25S

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
17 (3/16/2010)	4.8 (12/10/2009)	(17 - 4.8)/(2 - 1)	12.2
18 (5/14/2010)	4.8 (12/10/2009)	(18 - 4.8)/(3 - 1)	6.6
19 (9/8/2010)	4.8 (12/10/2009)	(19 - 4.8)/(4 - 1)	4.73333
26 (12/22/2010)	4.8 (12/10/2009)	(26 - 4.8)/(5 - 1)	5.3
19 (2/24/2011)	4.8 (12/10/2009)	(19 - 4.8)/(6 - 1)	2.84
21 (5/13/2011)	4.8 (12/10/2009)	(21 - 4.8)/(7 - 1)	2.7
19 (7/28/2011)	4.8 (12/10/2009)	(19 - 4.8)/(8 - 1)	2.02857
20 (10/10/2011)	4.8 (12/10/2009)	(20 - 4.8)/(9 - 1)	1.9
20 (1/5/2012)	4.8 (12/10/2009)	(20 - 4.8)/(10 - 1)	1.68889
20 (4/9/2012)	4.8 (12/10/2009)	(20 - 4.8)/(11 - 1)	1.52
18 (5/14/2010)	17 (3/16/2010)	(18 - 17)/(3 - 2)	1
19 (9/8/2010)	17 (3/16/2010)	(19 - 17)/(4 - 2)	1
26 (12/22/2010)	17 (3/16/2010)	(26 - 17)/(5 - 2)	3
19 (2/24/2011)	17 (3/16/2010)	(19 - 17)/(6 - 2)	0.5
21 (5/13/2011)	17 (3/16/2010)	(21 - 17)/(7 - 2)	0.8
19 (7/28/2011)	17 (3/16/2010)	(19 - 17)/(8 - 2)	0.333333
20 (10/10/2011)	17 (3/16/2010)	(20 - 17)/(9 - 2)	0.428571
20 (1/5/2012)	17 (3/16/2010)	(20 - 17)/(10 - 2)	0.375
20 (4/9/2012)	17 (3/16/2010)	(20 - 17)/(11 - 2)	0.333333
19 (9/8/2010)	18 (5/14/2010)	(19 - 18)/(4 - 3)	1
26 (12/22/2010)	18 (5/14/2010)	(26 - 18)/(5 - 3)	4
19 (2/24/2011)	18 (5/14/2010)	(19 - 18)/(6 - 3)	0.333333
21 (5/13/2011)	18 (5/14/2010)	(21 - 18)/(7 - 3)	0.75
19 (7/28/2011)	18 (5/14/2010)	(19 - 18)/(8 - 3)	0.2
20 (10/10/2011)	18 (5/14/2010)	(20 - 18)/(9 - 3)	0.333333
20 (1/5/2012)	18 (5/14/2010)	(20 - 18)/(10 - 3)	0.285714
20 (4/9/2012)	18 (5/14/2010)	(20 - 18)/(11 - 3)	0.25
26 (12/22/2010)	19 (9/8/2010)	(26 - 19)/(5 - 4)	7
19 (2/24/2011)	19 (9/8/2010)	(19 - 19)/(6 - 4)	0
21 (5/13/2011)	19 (9/8/2010)	(21 - 19)/(7 - 4)	0.666667
19 (7/28/2011)	19 (9/8/2010)	(19 - 19)/(8 - 4)	0
20 (10/10/2011)	19 (9/8/2010)	(20 - 19)/(9 - 4)	0.2
20 (1/5/2012)	19 (9/8/2010)	(20 - 19)/(10 - 4)	0.166667
20 (4/9/2012)	19 (9/8/2010)	(20 - 19)/(11 - 4)	0.142857
19 (2/24/2011)	26 (12/22/2010)	(19 - 26)/(6 - 5)	-7
21 (5/13/2011)	26 (12/22/2010)	(21 - 26)/(7 - 5)	-2.5
19 (7/28/2011)	26 (12/22/2010)	(19 - 26)/(8 - 5)	-2.33333
20 (10/10/2011)	26 (12/22/2010)	(20 - 26)/(9 - 5)	-1.5
20 (1/5/2012)	26 (12/22/2010)	(20 - 26)/(10 - 5)	-1.2
20 (4/9/2012)	26 (12/22/2010)	(20 - 26)/(11 - 5)	-1
21 (5/13/2011)	19 (2/24/2011)	(21 - 19)/(7 - 6)	2
19 (7/28/2011)	19 (2/24/2011)	(19 - 19)/(8 - 6)	0
20 (10/10/2011)	19 (2/24/2011)	(20 - 19)/(9 - 6)	0.333333

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20 (1/5/2012)	19 (2/24/2011)	(20 - 19)/(10 - 6)	0.25
20 (4/9/2012)	19 (2/24/2011)	(20 - 19)/(11 - 6)	0.2
19 (7/28/2011)	21 (5/13/2011)	(19 - 21)/(8 - 7)	-2
20 (10/10/2011)	21 (5/13/2011)	(20 - 21)/(9 - 7)	-0.5
20 (1/5/2012)	21 (5/13/2011)	(20 - 21)/(10 - 7)	-0.333333
20 (4/9/2012)	21 (5/13/2011)	(20 - 21)/(11 - 7)	-0.25
20 (10/10/2011)	19 (7/28/2011)	(20 - 19)/(9 - 8)	1
20 (1/5/2012)	19 (7/28/2011)	(20 - 19)/(10 - 8)	0.5
20 (4/9/2012)	19 (7/28/2011)	(20 - 19)/(11 - 8)	0.333333
20 (1/5/2012)	20 (10/10/2011)	(20 - 20)/(10 - 9)	0
20 (4/9/2012)	20 (10/10/2011)	(20 - 20)/(11 - 9)	0
20 (4/9/2012)	20 (1/5/2012)	(20 - 20)/(11 - 10)	0

Number of Q values = 55

Ordered Q Values

n	Q
1	-7
2	-2.5
3	-2.33333
4	-2
5	-1.5
6	-1.2
7	-1
8	-0.5
9	-0.333333
10	-0.25
11	0
12	0
13	0
14	0
15	0
16	0
17	0.142857
18	0.166667
19	0.2
20	0.2
21	0.2
22	0.25
23	0.25
24	0.285714
25	0.333333
26	0.333333
27	0.333333
28	0.333333
29	0.333333
30	0.333333
31	0.375
32	0.428571
33	0.5
34	0.5
35	0.666667

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36	0.75
37	0.8
38	1
39	1
40	1
41	1
42	1.52
43	1.68889
44	1.9
45	2
46	2.02857
47	2.7
48	2.84
49	3
50	4
51	4.73333
52	5.3
53	6.6
54	7
55	12.2

Sen's Estimator (Median Q) is 0.333333

Tied Group	Value	Members
1	19	3
2	20	3

Time Period	Observations
12/10/2009	1
3/16/2010	1
5/14/2010	1
9/8/2010	1
12/22/2010	1
2/24/2011	1
5/13/2011	1
7/28/2011	1
10/10/2011	1
1/5/2012	1
4/9/2012	1

There are 0 time periods with multiple data

A = 132
B = 0
C = 12
D = 0
E = 12
F = 0
a = 2970
b = 8910
c = 220
Group Variance = 157.667
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 20.6537
M1 = (55 - 20.6537)/2.0 = 17.1732
M2 = (55 + 20.6537)/2.0 + 1 = 38.8268
Lower limit is 0.142857 = Q(17)
Upper limit is 1 = Q(39)
0.142857 > 0 indicating an upward trend in data.

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Sen's Slope Analysis

Parameter: 1,1-Dichloroethane

Location: MW-25S

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
1.2 (3/16/2010)	1.7 (12/10/2009)	(1.2 - 1.7)/(2 - 1)	-0.5
1.2 (5/14/2010)	1.7 (12/10/2009)	(1.2 - 1.7)/(3 - 1)	-0.25
1 (9/8/2010)	1.7 (12/10/2009)	(1 - 1.7)/(4 - 1)	-0.233333
1.2 (12/22/2010)	1.7 (12/10/2009)	(1.2 - 1.7)/(5 - 1)	-0.125
ND<1 (2/24/2011)	1.7 (12/10/2009)	(1 - 1.7)/(6 - 1)	-0.14
ND<1 (5/13/2011)	1.7 (12/10/2009)	(1 - 1.7)/(7 - 1)	-0.116667
ND<1 (7/28/2011)	1.7 (12/10/2009)	(1 - 1.7)/(8 - 1)	-0.1
ND<1 (10/10/2011)	1.7 (12/10/2009)	(1 - 1.7)/(9 - 1)	-0.0875
ND<1 (1/5/2012)	1.7 (12/10/2009)	(1 - 1.7)/(10 - 1)	-0.0777778
ND<1 (4/9/2012)	1.7 (12/10/2009)	(1 - 1.7)/(11 - 1)	-0.07
1.2 (5/14/2010)	1.2 (3/16/2010)	(1.2 - 1.2)/(3 - 2)	0
1 (9/8/2010)	1.2 (3/16/2010)	(1 - 1.2)/(4 - 2)	-0.1
1.2 (12/22/2010)	1.2 (3/16/2010)	(1.2 - 1.2)/(5 - 2)	0
ND<1 (2/24/2011)	1.2 (3/16/2010)	(1 - 1.2)/(6 - 2)	-0.05
ND<1 (5/13/2011)	1.2 (3/16/2010)	(1 - 1.2)/(7 - 2)	-0.04
ND<1 (7/28/2011)	1.2 (3/16/2010)	(1 - 1.2)/(8 - 2)	-0.0333333
ND<1 (10/10/2011)	1.2 (3/16/2010)	(1 - 1.2)/(9 - 2)	-0.0285714
ND<1 (1/5/2012)	1.2 (3/16/2010)	(1 - 1.2)/(10 - 2)	-0.025
ND<1 (4/9/2012)	1.2 (3/16/2010)	(1 - 1.2)/(11 - 2)	-0.0222222
1 (9/8/2010)	1.2 (5/14/2010)	(1 - 1.2)/(4 - 3)	-0.2
1.2 (12/22/2010)	1.2 (5/14/2010)	(1.2 - 1.2)/(5 - 3)	0
ND<1 (2/24/2011)	1.2 (5/14/2010)	(1 - 1.2)/(6 - 3)	-0.0666667
ND<1 (5/13/2011)	1.2 (5/14/2010)	(1 - 1.2)/(7 - 3)	-0.05
ND<1 (7/28/2011)	1.2 (5/14/2010)	(1 - 1.2)/(8 - 3)	-0.04
ND<1 (10/10/2011)	1.2 (5/14/2010)	(1 - 1.2)/(9 - 3)	-0.0333333
ND<1 (1/5/2012)	1.2 (5/14/2010)	(1 - 1.2)/(10 - 3)	-0.0285714
ND<1 (4/9/2012)	1.2 (5/14/2010)	(1 - 1.2)/(11 - 3)	-0.025
1.2 (12/22/2010)	1 (9/8/2010)	(1.2 - 1)/(5 - 4)	0.2
ND<1 (2/24/2011)	1 (9/8/2010)	(1 - 1)/(6 - 4)	0
ND<1 (5/13/2011)	1 (9/8/2010)	(1 - 1)/(7 - 4)	0
ND<1 (7/28/2011)	1 (9/8/2010)	(1 - 1)/(8 - 4)	0
ND<1 (10/10/2011)	1 (9/8/2010)	(1 - 1)/(9 - 4)	0
ND<1 (1/5/2012)	1 (9/8/2010)	(1 - 1)/(10 - 4)	0
ND<1 (4/9/2012)	1 (9/8/2010)	(1 - 1)/(11 - 4)	0
ND<1 (2/24/2011)	1.2 (12/22/2010)	(1 - 1.2)/(6 - 5)	-0.2
ND<1 (5/13/2011)	1.2 (12/22/2010)	(1 - 1.2)/(7 - 5)	-0.1
ND<1 (7/28/2011)	1.2 (12/22/2010)	(1 - 1.2)/(8 - 5)	-0.0666667
ND<1 (10/10/2011)	1.2 (12/22/2010)	(1 - 1.2)/(9 - 5)	-0.05
ND<1 (1/5/2012)	1.2 (12/22/2010)	(1 - 1.2)/(10 - 5)	-0.04
ND<1 (4/9/2012)	1.2 (12/22/2010)	(1 - 1.2)/(11 - 5)	-0.0333333
ND<1 (5/13/2011)	ND<1 (2/24/2011)	(1 - 1)/(7 - 6)	0
ND<1 (7/28/2011)	ND<1 (2/24/2011)	(1 - 1)/(8 - 6)	0
ND<1 (10/10/2011)	ND<1 (2/24/2011)	(1 - 1)/(9 - 6)	0

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ND<1 (1/5/2012)	ND<1 (2/24/2011)	(1 - 1)/(10 - 6)	0
ND<1 (4/9/2012)	ND<1 (2/24/2011)	(1 - 1)/(11 - 6)	0
ND<1 (7/28/2011)	ND<1 (5/13/2011)	(1 - 1)/(8 - 7)	0
ND<1 (10/10/2011)	ND<1 (5/13/2011)	(1 - 1)/(9 - 7)	0
ND<1 (1/5/2012)	ND<1 (5/13/2011)	(1 - 1)/(10 - 7)	0
ND<1 (4/9/2012)	ND<1 (5/13/2011)	(1 - 1)/(11 - 7)	0
ND<1 (10/10/2011)	ND<1 (7/28/2011)	(1 - 1)/(9 - 8)	0
ND<1 (1/5/2012)	ND<1 (7/28/2011)	(1 - 1)/(10 - 8)	0
ND<1 (4/9/2012)	ND<1 (7/28/2011)	(1 - 1)/(11 - 8)	0
ND<1 (1/5/2012)	ND<1 (10/10/2011)	(1 - 1)/(10 - 9)	0
ND<1 (4/9/2012)	ND<1 (10/10/2011)	(1 - 1)/(11 - 9)	0
ND<1 (4/9/2012)	ND<1 (1/5/2012)	(1 - 1)/(11 - 10)	0

Number of Q values = 55

Ordered Q Values

n	Q
1	-0.5
2	-0.25
3	-0.233333
4	-0.2
5	-0.2
6	-0.14
7	-0.125
8	-0.116667
9	-0.1
10	-0.1
11	-0.1
12	-0.0875
13	-0.0777778
14	-0.07
15	-0.0666667
16	-0.0666667
17	-0.05
18	-0.05
19	-0.05
20	-0.04
21	-0.04
22	-0.04
23	-0.0333333
24	-0.0333333
25	-0.0333333
26	-0.0285714
27	-0.0285714
28	-0.025
29	-0.025
30	-0.0222222
31	0
32	0
33	0
34	0
35	0

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36	0
37	0
38	0
39	0
40	0
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
55	0.2

Sen's Estimator (Median Q) is -0.025

Tied Group	Value	Members
1	1.2	3
2	1	7

Time Period	Observations
12/10/2009	1
3/16/2010	1
5/14/2010	1
9/8/2010	1
12/22/2010	1
2/24/2011	1
5/13/2011	1
7/28/2011	1
10/10/2011	1
1/5/2012	1
4/9/2012	1

There are 0 time periods with multiple data

A = 864
B = 0
C = 216
D = 0
E = 48
F = 0
a = 2970
b = 8910
c = 220
Group Variance = 117
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 17.7918
M1 = (55 - 17.7918)/2.0 = 18.6041
M2 = (55 + 17.7918)/2.0 + 1 = 37.3959
Lower limit is -0.05 = Q(19)
Upper limit is 0 = Q(37)
-0.05 < 0 < 0 indicating no trend in data.

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Sen's Slope Analysis

Parameter: Trichloroethene
Location: MW-25S

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
1.1 (3/16/2010)	ND<1 (12/10/2009)	(1.1 - 1)/(2 - 1)	0.1
1 (5/14/2010)	ND<1 (12/10/2009)	(1 - 1)/(3 - 1)	0
1.4 (9/8/2010)	ND<1 (12/10/2009)	(1.4 - 1)/(4 - 1)	0.133333
2.4 (12/22/2010)	ND<1 (12/10/2009)	(2.4 - 1)/(5 - 1)	0.35
2.2 (2/24/2011)	ND<1 (12/10/2009)	(2.2 - 1)/(6 - 1)	0.24
2.2 (5/13/2011)	ND<1 (12/10/2009)	(2.2 - 1)/(7 - 1)	0.2
2.5 (7/28/2011)	ND<1 (12/10/2009)	(2.5 - 1)/(8 - 1)	0.214286
2.8 (10/10/2011)	ND<1 (12/10/2009)	(2.8 - 1)/(9 - 1)	0.225
3 (1/5/2012)	ND<1 (12/10/2009)	(3 - 1)/(10 - 1)	0.222222
3.6 (4/9/2012)	ND<1 (12/10/2009)	(3.6 - 1)/(11 - 1)	0.26
1 (5/14/2010)	1.1 (3/16/2010)	(1 - 1.1)/(3 - 2)	-0.1
1.4 (9/8/2010)	1.1 (3/16/2010)	(1.4 - 1.1)/(4 - 2)	0.15
2.4 (12/22/2010)	1.1 (3/16/2010)	(2.4 - 1.1)/(5 - 2)	0.433333
2.2 (2/24/2011)	1.1 (3/16/2010)	(2.2 - 1.1)/(6 - 2)	0.275
2.2 (5/13/2011)	1.1 (3/16/2010)	(2.2 - 1.1)/(7 - 2)	0.22
2.5 (7/28/2011)	1.1 (3/16/2010)	(2.5 - 1.1)/(8 - 2)	0.233333
2.8 (10/10/2011)	1.1 (3/16/2010)	(2.8 - 1.1)/(9 - 2)	0.242857
3 (1/5/2012)	1.1 (3/16/2010)	(3 - 1.1)/(10 - 2)	0.2375
3.6 (4/9/2012)	1.1 (3/16/2010)	(3.6 - 1.1)/(11 - 2)	0.277778
1.4 (9/8/2010)	1 (5/14/2010)	(1.4 - 1)/(4 - 3)	0.4
2.4 (12/22/2010)	1 (5/14/2010)	(2.4 - 1)/(5 - 3)	0.7
2.2 (2/24/2011)	1 (5/14/2010)	(2.2 - 1)/(6 - 3)	0.4
2.2 (5/13/2011)	1 (5/14/2010)	(2.2 - 1)/(7 - 3)	0.3
2.5 (7/28/2011)	1 (5/14/2010)	(2.5 - 1)/(8 - 3)	0.3
2.8 (10/10/2011)	1 (5/14/2010)	(2.8 - 1)/(9 - 3)	0.3
3 (1/5/2012)	1 (5/14/2010)	(3 - 1)/(10 - 3)	0.285714
3.6 (4/9/2012)	1 (5/14/2010)	(3.6 - 1)/(11 - 3)	0.325
2.4 (12/22/2010)	1.4 (9/8/2010)	(2.4 - 1.4)/(5 - 4)	1
2.2 (2/24/2011)	1.4 (9/8/2010)	(2.2 - 1.4)/(6 - 4)	0.4
2.2 (5/13/2011)	1.4 (9/8/2010)	(2.2 - 1.4)/(7 - 4)	0.266667
2.5 (7/28/2011)	1.4 (9/8/2010)	(2.5 - 1.4)/(8 - 4)	0.275
2.8 (10/10/2011)	1.4 (9/8/2010)	(2.8 - 1.4)/(9 - 4)	0.28
3 (1/5/2012)	1.4 (9/8/2010)	(3 - 1.4)/(10 - 4)	0.266667
3.6 (4/9/2012)	1.4 (9/8/2010)	(3.6 - 1.4)/(11 - 4)	0.314286
2.2 (2/24/2011)	2.4 (12/22/2010)	(2.2 - 2.4)/(6 - 5)	-0.2
2.2 (5/13/2011)	2.4 (12/22/2010)	(2.2 - 2.4)/(7 - 5)	-0.1
2.5 (7/28/2011)	2.4 (12/22/2010)	(2.5 - 2.4)/(8 - 5)	0.0333333
2.8 (10/10/2011)	2.4 (12/22/2010)	(2.8 - 2.4)/(9 - 5)	0.1
3 (1/5/2012)	2.4 (12/22/2010)	(3 - 2.4)/(10 - 5)	0.12
3.6 (4/9/2012)	2.4 (12/22/2010)	(3.6 - 2.4)/(11 - 5)	0.2
2.2 (5/13/2011)	2.2 (2/24/2011)	(2.2 - 2.2)/(7 - 6)	0
2.5 (7/28/2011)	2.2 (2/24/2011)	(2.5 - 2.2)/(8 - 6)	0.15
2.8 (10/10/2011)	2.2 (2/24/2011)	(2.8 - 2.2)/(9 - 6)	0.2

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3 (1/5/2012)	2.2 (2/24/2011)	(3 - 2.2)/(10 - 6)	0.2
3.6 (4/9/2012)	2.2 (2/24/2011)	(3.6 - 2.2)/(11 - 6)	0.28
2.5 (7/28/2011)	2.2 (5/13/2011)	(2.5 - 2.2)/(8 - 7)	0.3
2.8 (10/10/2011)	2.2 (5/13/2011)	(2.8 - 2.2)/(9 - 7)	0.3
3 (1/5/2012)	2.2 (5/13/2011)	(3 - 2.2)/(10 - 7)	0.266667
3.6 (4/9/2012)	2.2 (5/13/2011)	(3.6 - 2.2)/(11 - 7)	0.35
2.8 (10/10/2011)	2.5 (7/28/2011)	(2.8 - 2.5)/(9 - 8)	0.3
3 (1/5/2012)	2.5 (7/28/2011)	(3 - 2.5)/(10 - 8)	0.25
3.6 (4/9/2012)	2.5 (7/28/2011)	(3.6 - 2.5)/(11 - 8)	0.366667
3 (1/5/2012)	2.8 (10/10/2011)	(3 - 2.8)/(10 - 9)	0.2
3.6 (4/9/2012)	2.8 (10/10/2011)	(3.6 - 2.8)/(11 - 9)	0.4
3.6 (4/9/2012)	3 (1/5/2012)	(3.6 - 3)/(11 - 10)	0.6

Number of Q values = 55

Ordered Q Values

n	Q
1	-0.2
2	-0.1
3	-0.1
4	0
5	0
6	0.0333333
7	0.1
8	0.1
9	0.12
10	0.133333
11	0.15
12	0.15
13	0.2
14	0.2
15	0.2
16	0.2
17	0.2
18	0.214286
19	0.22
20	0.222222
21	0.225
22	0.233333
23	0.2375
24	0.24
25	0.242857
26	0.25
27	0.26
28	0.266667
29	0.266667
30	0.266667
31	0.275
32	0.275
33	0.277778
34	0.28
35	0.28

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36	0.285714
37	0.3
38	0.3
39	0.3
40	0.3
41	0.3
42	0.3
43	0.314286
44	0.325
45	0.35
46	0.35
47	0.366667
48	0.4
49	0.4
50	0.4
51	0.4
52	0.433333
53	0.6
54	0.7
55	1

Sen's Estimator (Median Q) is 0.266667

Tied Group	Value	Members
1	1	2
2	2.2	2

Time Period	Observations
12/10/2009	1
3/16/2010	1
5/14/2010	1
9/8/2010	1
12/22/2010	1
2/24/2011	1
5/13/2011	1
7/28/2011	1
10/10/2011	1
1/5/2012	1
4/9/2012	1

There are 0 time periods with multiple data

A = 36
B = 0
C = 0
D = 0
E = 4
F = 0
a = 2970
b = 8910
c = 220
Group Variance = 163
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 21.0001
M1 = (55 - 21.0001)/2.0 = 17
M2 = (55 + 21.0001)/2.0 + 1 = 39
Lower limit is 0.2 = Q(17)
Upper limit is 0.3 = Q(39)
0.2 > 0 indicating an upward trend in data.

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Sen's Slope Analysis

Parameter: cis-1,2-Dichloroethene
Location: MW-29s

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
1.2 (5/17/2010)	1.3 (3/18/2010)	(1.2 - 1.3)/(2 - 1)	-0.1
1.4 (9/9/2010)	1.3 (3/18/2010)	(1.4 - 1.3)/(3 - 1)	0.05
1.5 (12/15/2010)	1.3 (3/18/2010)	(1.5 - 1.3)/(4 - 1)	0.0666667
1.7 (2/15/2011)	1.3 (3/18/2010)	(1.7 - 1.3)/(5 - 1)	0.1
ND<1 (5/12/2011)	1.3 (3/18/2010)	(1 - 1.3)/(6 - 1)	-0.06
1.1 (7/20/2011)	1.3 (3/18/2010)	(1.1 - 1.3)/(7 - 1)	-0.0333333
1.3 (10/10/2011)	1.3 (3/18/2010)	(1.3 - 1.3)/(8 - 1)	0
1.2 (1/6/2012)	1.3 (3/18/2010)	(1.2 - 1.3)/(9 - 1)	-0.0125
1.1 (4/5/2012)	1.3 (3/18/2010)	(1.1 - 1.3)/(10 - 1)	-0.0222222
1.4 (9/9/2010)	1.2 (5/17/2010)	(1.4 - 1.2)/(3 - 2)	0.2
1.5 (12/15/2010)	1.2 (5/17/2010)	(1.5 - 1.2)/(4 - 2)	0.15
1.7 (2/15/2011)	1.2 (5/17/2010)	(1.7 - 1.2)/(5 - 2)	0.166667
ND<1 (5/12/2011)	1.2 (5/17/2010)	(1 - 1.2)/(6 - 2)	-0.05
1.1 (7/20/2011)	1.2 (5/17/2010)	(1.1 - 1.2)/(7 - 2)	-0.02
1.3 (10/10/2011)	1.2 (5/17/2010)	(1.3 - 1.2)/(8 - 2)	0.0166667
1.2 (1/6/2012)	1.2 (5/17/2010)	(1.2 - 1.2)/(9 - 2)	0
1.1 (4/5/2012)	1.2 (5/17/2010)	(1.1 - 1.2)/(10 - 2)	-0.0125
1.5 (12/15/2010)	1.4 (9/9/2010)	(1.5 - 1.4)/(4 - 3)	0.1
1.7 (2/15/2011)	1.4 (9/9/2010)	(1.7 - 1.4)/(5 - 3)	0.15
ND<1 (5/12/2011)	1.4 (9/9/2010)	(1 - 1.4)/(6 - 3)	-0.133333
1.1 (7/20/2011)	1.4 (9/9/2010)	(1.1 - 1.4)/(7 - 3)	-0.075
1.3 (10/10/2011)	1.4 (9/9/2010)	(1.3 - 1.4)/(8 - 3)	-0.02
1.2 (1/6/2012)	1.4 (9/9/2010)	(1.2 - 1.4)/(9 - 3)	-0.0333333
1.1 (4/5/2012)	1.4 (9/9/2010)	(1.1 - 1.4)/(10 - 3)	-0.0428571
1.7 (2/15/2011)	1.5 (12/15/2010)	(1.7 - 1.5)/(5 - 4)	0.2
ND<1 (5/12/2011)	1.5 (12/15/2010)	(1 - 1.5)/(6 - 4)	-0.25
1.1 (7/20/2011)	1.5 (12/15/2010)	(1.1 - 1.5)/(7 - 4)	-0.133333
1.3 (10/10/2011)	1.5 (12/15/2010)	(1.3 - 1.5)/(8 - 4)	-0.05
1.2 (1/6/2012)	1.5 (12/15/2010)	(1.2 - 1.5)/(9 - 4)	-0.06
1.1 (4/5/2012)	1.5 (12/15/2010)	(1.1 - 1.5)/(10 - 4)	-0.0666667
ND<1 (5/12/2011)	1.7 (2/15/2011)	(1 - 1.7)/(6 - 5)	-0.7
1.1 (7/20/2011)	1.7 (2/15/2011)	(1.1 - 1.7)/(7 - 5)	-0.3
1.3 (10/10/2011)	1.7 (2/15/2011)	(1.3 - 1.7)/(8 - 5)	-0.133333
1.2 (1/6/2012)	1.7 (2/15/2011)	(1.2 - 1.7)/(9 - 5)	-0.125
1.1 (4/5/2012)	1.7 (2/15/2011)	(1.1 - 1.7)/(10 - 5)	-0.12
1.1 (7/20/2011)	ND<1 (5/12/2011)	(1.1 - 1)/(7 - 6)	0.1
1.3 (10/10/2011)	ND<1 (5/12/2011)	(1.3 - 1)/(8 - 6)	0.15
1.2 (1/6/2012)	ND<1 (5/12/2011)	(1.2 - 1)/(9 - 6)	0.0666667
1.1 (4/5/2012)	ND<1 (5/12/2011)	(1.1 - 1)/(10 - 6)	0.025
1.3 (10/10/2011)	1.1 (7/20/2011)	(1.3 - 1.1)/(8 - 7)	0.2
1.2 (1/6/2012)	1.1 (7/20/2011)	(1.2 - 1.1)/(9 - 7)	0.05
1.1 (4/5/2012)	1.1 (7/20/2011)	(1.1 - 1.1)/(10 - 7)	0

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1.2 (1/6/2012)	1.3 (10/10/2011)	(1.2 - 1.3)/(9 - 8)	-0.1
1.1 (4/5/2012)	1.3 (10/10/2011)	(1.1 - 1.3)/(10 - 8)	-0.1
1.1 (4/5/2012)	1.2 (1/6/2012)	(1.1 - 1.2)/(10 - 9)	-0.1

Number of Q values = 45

Ordered Q Values

n	Q
1	-0.7
2	-0.3
3	-0.25
4	-0.133333
5	-0.133333
6	-0.133333
7	-0.125
8	-0.12
9	-0.1
10	-0.1
11	-0.1
12	-0.1
13	-0.075
14	-0.0666667
15	-0.06
16	-0.06
17	-0.05
18	-0.05
19	-0.0428571
20	-0.0333333
21	-0.0333333
22	-0.0222222
23	-0.02
24	-0.02
25	-0.0125
26	-0.0125
27	0
28	0
29	0
30	0.0166667
31	0.025
32	0.05
33	0.05
34	0.0666667
35	0.0666667
36	0.1
37	0.1
38	0.1
39	0.15
40	0.15
41	0.15
42	0.166667
43	0.2
44	0.2
45	0.2

Sen's Estimator (Median Q) is -0.02

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Tied Group	Value	Members
1	1.3	2
2	1.2	2
3	1.1	2

Time Period	Observations
3/18/2010	1
5/17/2010	1
9/9/2010	1
12/15/2010	1
2/15/2011	1
5/12/2011	1
7/20/2011	1
10/10/2011	1
1/6/2012	1
4/5/2012	1

There are 0 time periods with multiple data

A = 54
B = 0
C = 0
D = 0
E = 6
F = 0
a = 2250
b = 6480
c = 180
Group Variance = 122
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 18.168
M1 = (45 - 18.168)/2.0 = 13.416
M2 = (45 + 18.168)/2.0 + 1 = 32.584
Lower limit is -0.075 = Q(13)
Upper limit is 0.05 = Q(33)
-0.075 < 0 < 0.05 indicating no trend in data.

US EPA ARCHIVE DOCUMENT

Sen's Slope Analysis

Parameter: 1,1,1-Trichloroethane

Location: MW-31

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
48 (9/17/2010)	20 (6/18/2010)	(48 - 20)/(2 - 1)	28
27 (12/22/2010)	20 (6/18/2010)	(27 - 20)/(3 - 1)	3.5
26 (2/24/2011)	20 (6/18/2010)	(26 - 20)/(4 - 1)	2
22 (5/11/2011)	20 (6/18/2010)	(22 - 20)/(5 - 1)	0.5
11 (7/21/2011)	20 (6/18/2010)	(11 - 20)/(6 - 1)	-1.8
28 (10/4/2011)	20 (6/18/2010)	(28 - 20)/(7 - 1)	1.33333
24 (1/10/2012)	20 (6/18/2010)	(24 - 20)/(8 - 1)	0.571429
24 (4/5/2012)	20 (6/18/2010)	(24 - 20)/(9 - 1)	0.5
27 (12/22/2010)	48 (9/17/2010)	(27 - 48)/(3 - 2)	-21
26 (2/24/2011)	48 (9/17/2010)	(26 - 48)/(4 - 2)	-11
22 (5/11/2011)	48 (9/17/2010)	(22 - 48)/(5 - 2)	-8.66667
11 (7/21/2011)	48 (9/17/2010)	(11 - 48)/(6 - 2)	-9.25
28 (10/4/2011)	48 (9/17/2010)	(28 - 48)/(7 - 2)	-4
24 (1/10/2012)	48 (9/17/2010)	(24 - 48)/(8 - 2)	-4
24 (4/5/2012)	48 (9/17/2010)	(24 - 48)/(9 - 2)	-3.42857
26 (2/24/2011)	27 (12/22/2010)	(26 - 27)/(4 - 3)	-1
22 (5/11/2011)	27 (12/22/2010)	(22 - 27)/(5 - 3)	-2.5
11 (7/21/2011)	27 (12/22/2010)	(11 - 27)/(6 - 3)	-5.33333
28 (10/4/2011)	27 (12/22/2010)	(28 - 27)/(7 - 3)	0.25
24 (1/10/2012)	27 (12/22/2010)	(24 - 27)/(8 - 3)	-0.6
24 (4/5/2012)	27 (12/22/2010)	(24 - 27)/(9 - 3)	-0.5
22 (5/11/2011)	26 (2/24/2011)	(22 - 26)/(5 - 4)	-4
11 (7/21/2011)	26 (2/24/2011)	(11 - 26)/(6 - 4)	-7.5
28 (10/4/2011)	26 (2/24/2011)	(28 - 26)/(7 - 4)	0.666667
24 (1/10/2012)	26 (2/24/2011)	(24 - 26)/(8 - 4)	-0.5
24 (4/5/2012)	26 (2/24/2011)	(24 - 26)/(9 - 4)	-0.4
11 (7/21/2011)	22 (5/11/2011)	(11 - 22)/(6 - 5)	-11
28 (10/4/2011)	22 (5/11/2011)	(28 - 22)/(7 - 5)	3
24 (1/10/2012)	22 (5/11/2011)	(24 - 22)/(8 - 5)	0.666667
24 (4/5/2012)	22 (5/11/2011)	(24 - 22)/(9 - 5)	0.5
28 (10/4/2011)	11 (7/21/2011)	(28 - 11)/(7 - 6)	17
24 (1/10/2012)	11 (7/21/2011)	(24 - 11)/(8 - 6)	6.5
24 (4/5/2012)	11 (7/21/2011)	(24 - 11)/(9 - 6)	4.33333
24 (1/10/2012)	28 (10/4/2011)	(24 - 28)/(8 - 7)	-4
24 (4/5/2012)	28 (10/4/2011)	(24 - 28)/(9 - 7)	-2
24 (4/5/2012)	24 (1/10/2012)	(24 - 24)/(9 - 8)	0

Number of Q values = 36

Ordered Q Values

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n	Q
1	-21
2	-11
3	-11
4	-9.25
5	-8.66667
6	-7.5
7	-5.33333
8	-4
9	-4
10	-4
11	-4
12	-3.42857
13	-2.5
14	-2
15	-1.8
16	-1
17	-0.6
18	-0.5
19	-0.5
20	-0.4
21	0
22	0.25
23	0.5
24	0.5
25	0.5
26	0.571429
27	0.666667
28	0.666667
29	1.33333
30	2
31	3
32	3.5
33	4.33333
34	6.5
35	17
36	28

Sen's Estimator (Median Q) is -0.5

Tied Group	Value	Members
1	24	2

Time Period	Observations
6/18/2010	1
9/17/2010	1
12/22/2010	1
2/24/2011	1
5/11/2011	1
7/21/2011	1
10/4/2011	1
1/10/2012	1
4/5/2012	1

There are 0 time periods with multiple data

A = 18
B = 0
C = 0

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D = 0
E = 2
F = 0
a = 1656
b = 4536
c = 144
Group Variance = 91
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 15.6909
M1 = (36 - 15.6909)/2.0 = 10.1546
M2 = (36 + 15.6909)/2.0 + 1 = 26.8454
Lower limit is -4 = Q(10)
Upper limit is 0.666667 = Q(27)
-4 < 0 < 0.666667 indicating no trend in data.

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Sen's Slope Analysis

Parameter: 1,1-Dichloroethane

Location: MW-31

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
ND<2 (9/17/2010)	14 (6/18/2010)	(2 - 14)/(2 - 1)	-12
16 (12/22/2010)	14 (6/18/2010)	(16 - 14)/(3 - 1)	1
16 (2/24/2011)	14 (6/18/2010)	(16 - 14)/(4 - 1)	0.666667
15 (5/11/2011)	14 (6/18/2010)	(15 - 14)/(5 - 1)	0.25
7.4 (7/21/2011)	14 (6/18/2010)	(7.4 - 14)/(6 - 1)	-1.32
18 (10/4/2011)	14 (6/18/2010)	(18 - 14)/(7 - 1)	0.666667
17 (1/10/2012)	14 (6/18/2010)	(17 - 14)/(8 - 1)	0.428571
16 (4/5/2012)	14 (6/18/2010)	(16 - 14)/(9 - 1)	0.25
16 (12/22/2010)	ND<2 (9/17/2010)	(16 - 2)/(3 - 2)	14
16 (2/24/2011)	ND<2 (9/17/2010)	(16 - 2)/(4 - 2)	7
15 (5/11/2011)	ND<2 (9/17/2010)	(15 - 2)/(5 - 2)	4.33333
7.4 (7/21/2011)	ND<2 (9/17/2010)	(7.4 - 2)/(6 - 2)	1.35
18 (10/4/2011)	ND<2 (9/17/2010)	(18 - 2)/(7 - 2)	3.2
17 (1/10/2012)	ND<2 (9/17/2010)	(17 - 2)/(8 - 2)	2.5
16 (4/5/2012)	ND<2 (9/17/2010)	(16 - 2)/(9 - 2)	2
16 (2/24/2011)	16 (12/22/2010)	(16 - 16)/(4 - 3)	0
15 (5/11/2011)	16 (12/22/2010)	(15 - 16)/(5 - 3)	-0.5
7.4 (7/21/2011)	16 (12/22/2010)	(7.4 - 16)/(6 - 3)	-2.86667
18 (10/4/2011)	16 (12/22/2010)	(18 - 16)/(7 - 3)	0.5
17 (1/10/2012)	16 (12/22/2010)	(17 - 16)/(8 - 3)	0.2
16 (4/5/2012)	16 (12/22/2010)	(16 - 16)/(9 - 3)	0
15 (5/11/2011)	16 (2/24/2011)	(15 - 16)/(5 - 4)	-1
7.4 (7/21/2011)	16 (2/24/2011)	(7.4 - 16)/(6 - 4)	-4.3
18 (10/4/2011)	16 (2/24/2011)	(18 - 16)/(7 - 4)	0.666667
17 (1/10/2012)	16 (2/24/2011)	(17 - 16)/(8 - 4)	0.25
16 (4/5/2012)	16 (2/24/2011)	(16 - 16)/(9 - 4)	0
7.4 (7/21/2011)	15 (5/11/2011)	(7.4 - 15)/(6 - 5)	-7.6
18 (10/4/2011)	15 (5/11/2011)	(18 - 15)/(7 - 5)	1.5
17 (1/10/2012)	15 (5/11/2011)	(17 - 15)/(8 - 5)	0.666667
16 (4/5/2012)	15 (5/11/2011)	(16 - 15)/(9 - 5)	0.25
18 (10/4/2011)	7.4 (7/21/2011)	(18 - 7.4)/(7 - 6)	10.6
17 (1/10/2012)	7.4 (7/21/2011)	(17 - 7.4)/(8 - 6)	4.8
16 (4/5/2012)	7.4 (7/21/2011)	(16 - 7.4)/(9 - 6)	2.86667
17 (1/10/2012)	18 (10/4/2011)	(17 - 18)/(8 - 7)	-1
16 (4/5/2012)	18 (10/4/2011)	(16 - 18)/(9 - 7)	-1
16 (4/5/2012)	17 (1/10/2012)	(16 - 17)/(9 - 8)	-1

Number of Q values = 36

Ordered Q Values

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n	Q
1	-12
2	-7.6
3	-4.3
4	-2.86667
5	-1.32
6	-1
7	-1
8	-1
9	-1
10	-0.5
11	0
12	0
13	0
14	0.2
15	0.25
16	0.25
17	0.25
18	0.25
19	0.428571
20	0.5
21	0.666667
22	0.666667
23	0.666667
24	0.666667
25	1
26	1.35
27	1.5
28	2
29	2.5
30	2.86667
31	3.2
32	4.33333
33	4.8
34	7
35	10.6
36	14

Sen's Estimator (Median Q) is 0.339286

Tied Group	Value	Members
1	16	3

Time Period	Observations
6/18/2010	1
9/17/2010	1
12/22/2010	1
2/24/2011	1
5/11/2011	1
7/21/2011	1
10/4/2011	1
1/10/2012	1
4/5/2012	1

There are 0 time periods with multiple data

A = 66
B = 0
C = 6

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D = 0
E = 6
F = 0
a = 1656
b = 4536
c = 144
Group Variance = 88.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 15.4593
M1 = (36 - 15.4593)/2.0 = 10.2704
M2 = (36 + 15.4593)/2.0 + 1 = 26.7296
Lower limit is -0.5 = Q(10)
Upper limit is 1.5 = Q(27)
-0.5 < 0 < 1.5 indicating no trend in data.

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Sen's Slope Analysis

Parameter: cis-1,2-Dichloroethene
Location: MW-31

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
15 (9/17/2010)	19 (6/18/2010)	(15 - 19)/(2 - 1)	-4
29 (12/22/2010)	19 (6/18/2010)	(29 - 19)/(3 - 1)	5
31 (2/24/2011)	19 (6/18/2010)	(31 - 19)/(4 - 1)	4
24 (5/11/2011)	19 (6/18/2010)	(24 - 19)/(5 - 1)	1.25
14 (7/21/2011)	19 (6/18/2010)	(14 - 19)/(6 - 1)	-1
40 (10/4/2011)	19 (6/18/2010)	(40 - 19)/(7 - 1)	3.5
35 (1/10/2012)	19 (6/18/2010)	(35 - 19)/(8 - 1)	2.28571
36 (4/5/2012)	19 (6/18/2010)	(36 - 19)/(9 - 1)	2.125
29 (12/22/2010)	15 (9/17/2010)	(29 - 15)/(3 - 2)	14
31 (2/24/2011)	15 (9/17/2010)	(31 - 15)/(4 - 2)	8
24 (5/11/2011)	15 (9/17/2010)	(24 - 15)/(5 - 2)	3
14 (7/21/2011)	15 (9/17/2010)	(14 - 15)/(6 - 2)	-0.25
40 (10/4/2011)	15 (9/17/2010)	(40 - 15)/(7 - 2)	5
35 (1/10/2012)	15 (9/17/2010)	(35 - 15)/(8 - 2)	3.33333
36 (4/5/2012)	15 (9/17/2010)	(36 - 15)/(9 - 2)	3
31 (2/24/2011)	29 (12/22/2010)	(31 - 29)/(4 - 3)	2
24 (5/11/2011)	29 (12/22/2010)	(24 - 29)/(5 - 3)	-2.5
14 (7/21/2011)	29 (12/22/2010)	(14 - 29)/(6 - 3)	-5
40 (10/4/2011)	29 (12/22/2010)	(40 - 29)/(7 - 3)	2.75
35 (1/10/2012)	29 (12/22/2010)	(35 - 29)/(8 - 3)	1.2
36 (4/5/2012)	29 (12/22/2010)	(36 - 29)/(9 - 3)	1.16667
24 (5/11/2011)	31 (2/24/2011)	(24 - 31)/(5 - 4)	-7
14 (7/21/2011)	31 (2/24/2011)	(14 - 31)/(6 - 4)	-8.5
40 (10/4/2011)	31 (2/24/2011)	(40 - 31)/(7 - 4)	3
35 (1/10/2012)	31 (2/24/2011)	(35 - 31)/(8 - 4)	1
36 (4/5/2012)	31 (2/24/2011)	(36 - 31)/(9 - 4)	1
14 (7/21/2011)	24 (5/11/2011)	(14 - 24)/(6 - 5)	-10
40 (10/4/2011)	24 (5/11/2011)	(40 - 24)/(7 - 5)	8
35 (1/10/2012)	24 (5/11/2011)	(35 - 24)/(8 - 5)	3.66667
36 (4/5/2012)	24 (5/11/2011)	(36 - 24)/(9 - 5)	3
40 (10/4/2011)	14 (7/21/2011)	(40 - 14)/(7 - 6)	26
35 (1/10/2012)	14 (7/21/2011)	(35 - 14)/(8 - 6)	10.5
36 (4/5/2012)	14 (7/21/2011)	(36 - 14)/(9 - 6)	7.33333
35 (1/10/2012)	40 (10/4/2011)	(35 - 40)/(8 - 7)	-5
36 (4/5/2012)	40 (10/4/2011)	(36 - 40)/(9 - 7)	-2
36 (4/5/2012)	35 (1/10/2012)	(36 - 35)/(9 - 8)	1

Number of Q values = 36

Ordered Q Values

US EPA ARCHIVE DOCUMENT

n	Q
1	-10
2	-8.5
3	-7
4	-5
5	-5
6	-4
7	-2.5
8	-2
9	-1
10	-0.25
11	1
12	1
13	1
14	1.16667
15	1.2
16	1.25
17	2
18	2.125
19	2.28571
20	2.75
21	3
22	3
23	3
24	3
25	3.33333
26	3.5
27	3.66667
28	4
29	5
30	5
31	7.33333
32	8
33	8
34	10.5
35	14
36	26

Sen's Estimator (Median Q) is 2.20536

Time Period	Observations
6/18/2010	1
9/17/2010	1
12/22/2010	1
2/24/2011	1
5/11/2011	1
7/21/2011	1
10/4/2011	1
1/10/2012	1
4/5/2012	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0

US EPA ARCHIVE DOCUMENT

a = 1656
b = 4536
c = 144
Group Variance = 92
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 15.7769
M1 = (36 - 15.7769)/2.0 = 10.1116
M2 = (36 + 15.7769)/2.0 + 1 = 26.8884
Lower limit is -0.25 = Q(10)
Upper limit is 3.66667 = Q(27)
-0.25 < 0 < 3.66667 indicating no trend in data.

US EPA ARCHIVE DOCUMENT

Sen's Slope Analysis

Parameter: trans-1,2-Dichloroethene
Location: MW-31

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
ND<2 (9/17/2010)	2.2 (6/18/2010)	(2 - 2.2)/(2 - 1)	-0.2
2.9 (12/22/2010)	2.2 (6/18/2010)	(2.9 - 2.2)/(3 - 1)	0.35
3.1 (2/24/2011)	2.2 (6/18/2010)	(3.1 - 2.2)/(4 - 1)	0.3
3 (5/11/2011)	2.2 (6/18/2010)	(3 - 2.2)/(5 - 1)	0.2
1.2 (7/21/2011)	2.2 (6/18/2010)	(1.2 - 2.2)/(6 - 1)	-0.2
3.4 (10/4/2011)	2.2 (6/18/2010)	(3.4 - 2.2)/(7 - 1)	0.2
3.1 (1/10/2012)	2.2 (6/18/2010)	(3.1 - 2.2)/(8 - 1)	0.128571
3.1 (4/5/2012)	2.2 (6/18/2010)	(3.1 - 2.2)/(9 - 1)	0.1125
2.9 (12/22/2010)	ND<2 (9/17/2010)	(2.9 - 2)/(3 - 2)	0.9
3.1 (2/24/2011)	ND<2 (9/17/2010)	(3.1 - 2)/(4 - 2)	0.55
3 (5/11/2011)	ND<2 (9/17/2010)	(3 - 2)/(5 - 2)	0.333333
1.2 (7/21/2011)	ND<2 (9/17/2010)	(1.2 - 2)/(6 - 2)	-0.2
3.4 (10/4/2011)	ND<2 (9/17/2010)	(3.4 - 2)/(7 - 2)	0.28
3.1 (1/10/2012)	ND<2 (9/17/2010)	(3.1 - 2)/(8 - 2)	0.183333
3.1 (4/5/2012)	ND<2 (9/17/2010)	(3.1 - 2)/(9 - 2)	0.157143
3.1 (2/24/2011)	2.9 (12/22/2010)	(3.1 - 2.9)/(4 - 3)	0.2
3 (5/11/2011)	2.9 (12/22/2010)	(3 - 2.9)/(5 - 3)	0.05
1.2 (7/21/2011)	2.9 (12/22/2010)	(1.2 - 2.9)/(6 - 3)	-0.566667
3.4 (10/4/2011)	2.9 (12/22/2010)	(3.4 - 2.9)/(7 - 3)	0.125
3.1 (1/10/2012)	2.9 (12/22/2010)	(3.1 - 2.9)/(8 - 3)	0.04
3.1 (4/5/2012)	2.9 (12/22/2010)	(3.1 - 2.9)/(9 - 3)	0.0333333
3 (5/11/2011)	3.1 (2/24/2011)	(3 - 3.1)/(5 - 4)	-0.1
1.2 (7/21/2011)	3.1 (2/24/2011)	(1.2 - 3.1)/(6 - 4)	-0.95
3.4 (10/4/2011)	3.1 (2/24/2011)	(3.4 - 3.1)/(7 - 4)	0.1
3.1 (1/10/2012)	3.1 (2/24/2011)	(3.1 - 3.1)/(8 - 4)	0
3.1 (4/5/2012)	3.1 (2/24/2011)	(3.1 - 3.1)/(9 - 4)	0
1.2 (7/21/2011)	3 (5/11/2011)	(1.2 - 3)/(6 - 5)	-1.8
3.4 (10/4/2011)	3 (5/11/2011)	(3.4 - 3)/(7 - 5)	0.2
3.1 (1/10/2012)	3 (5/11/2011)	(3.1 - 3)/(8 - 5)	0.0333333
3.1 (4/5/2012)	3 (5/11/2011)	(3.1 - 3)/(9 - 5)	0.025
3.4 (10/4/2011)	1.2 (7/21/2011)	(3.4 - 1.2)/(7 - 6)	2.2
3.1 (1/10/2012)	1.2 (7/21/2011)	(3.1 - 1.2)/(8 - 6)	0.95
3.1 (4/5/2012)	1.2 (7/21/2011)	(3.1 - 1.2)/(9 - 6)	0.633333
3.1 (1/10/2012)	3.4 (10/4/2011)	(3.1 - 3.4)/(8 - 7)	-0.3
3.1 (4/5/2012)	3.4 (10/4/2011)	(3.1 - 3.4)/(9 - 7)	-0.15
3.1 (4/5/2012)	3.1 (1/10/2012)	(3.1 - 3.1)/(9 - 8)	0

Number of Q values = 36

Ordered Q Values

US EPA ARCHIVE DOCUMENT

n	Q
1	-1.8
2	-0.95
3	-0.566667
4	-0.3
5	-0.2
6	-0.2
7	-0.2
8	-0.15
9	-0.1
10	0
11	0
12	0
13	0.025
14	0.0333333
15	0.0333333
16	0.04
17	0.05
18	0.1
19	0.1125
20	0.125
21	0.128571
22	0.157143
23	0.183333
24	0.2
25	0.2
26	0.2
27	0.2
28	0.28
29	0.3
30	0.333333
31	0.35
32	0.55
33	0.633333
34	0.9
35	0.95
36	2.2

Sen's Estimator (Median Q) is 0.10625

Tied Group	Value	Members
1	3.1	3

Time Period	Observations
6/18/2010	1
9/17/2010	1
12/22/2010	1
2/24/2011	1
5/11/2011	1
7/21/2011	1
10/4/2011	1
1/10/2012	1
4/5/2012	1

There are 0 time periods with multiple data

A = 66
B = 0
C = 6

US EPA ARCHIVE DOCUMENT

D = 0
E = 6
F = 0
a = 1656
b = 4536
c = 144
Group Variance = 88.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 15.4593
M1 = (36 - 15.4593)/2.0 = 10.2704
M2 = (36 + 15.4593)/2.0 + 1 = 26.7296
Lower limit is 0 = Q(10)
Upper limit is 0.2 = Q(27)
0 < 0 < 0.2 indicating no trend in data.

US EPA ARCHIVE DOCUMENT

Sen's Slope Analysis

Parameter: Trichloroethene
Location: MW-31

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
220 (9/17/2010)	180 (6/18/2010)	(220 - 180)/(2 - 1)	40
260 (12/22/2010)	180 (6/18/2010)	(260 - 180)/(3 - 1)	40
300 (2/24/2011)	180 (6/18/2010)	(300 - 180)/(4 - 1)	40
250 (5/11/2011)	180 (6/18/2010)	(250 - 180)/(5 - 1)	17.5
130 (7/21/2011)	180 (6/18/2010)	(130 - 180)/(6 - 1)	-10
340 (10/4/2011)	180 (6/18/2010)	(340 - 180)/(7 - 1)	26.6667
290 (1/10/2012)	180 (6/18/2010)	(290 - 180)/(8 - 1)	15.7143
290 (4/5/2012)	180 (6/18/2010)	(290 - 180)/(9 - 1)	13.75
260 (12/22/2010)	220 (9/17/2010)	(260 - 220)/(3 - 2)	40
300 (2/24/2011)	220 (9/17/2010)	(300 - 220)/(4 - 2)	40
250 (5/11/2011)	220 (9/17/2010)	(250 - 220)/(5 - 2)	10
130 (7/21/2011)	220 (9/17/2010)	(130 - 220)/(6 - 2)	-22.5
340 (10/4/2011)	220 (9/17/2010)	(340 - 220)/(7 - 2)	24
290 (1/10/2012)	220 (9/17/2010)	(290 - 220)/(8 - 2)	11.6667
290 (4/5/2012)	220 (9/17/2010)	(290 - 220)/(9 - 2)	10
300 (2/24/2011)	260 (12/22/2010)	(300 - 260)/(4 - 3)	40
250 (5/11/2011)	260 (12/22/2010)	(250 - 260)/(5 - 3)	-5
130 (7/21/2011)	260 (12/22/2010)	(130 - 260)/(6 - 3)	-43.3333
340 (10/4/2011)	260 (12/22/2010)	(340 - 260)/(7 - 3)	20
290 (1/10/2012)	260 (12/22/2010)	(290 - 260)/(8 - 3)	6
290 (4/5/2012)	260 (12/22/2010)	(290 - 260)/(9 - 3)	5
250 (5/11/2011)	300 (2/24/2011)	(250 - 300)/(5 - 4)	-50
130 (7/21/2011)	300 (2/24/2011)	(130 - 300)/(6 - 4)	-85
340 (10/4/2011)	300 (2/24/2011)	(340 - 300)/(7 - 4)	13.3333
290 (1/10/2012)	300 (2/24/2011)	(290 - 300)/(8 - 4)	-2.5
290 (4/5/2012)	300 (2/24/2011)	(290 - 300)/(9 - 4)	-2
130 (7/21/2011)	250 (5/11/2011)	(130 - 250)/(6 - 5)	-120
340 (10/4/2011)	250 (5/11/2011)	(340 - 250)/(7 - 5)	45
290 (1/10/2012)	250 (5/11/2011)	(290 - 250)/(8 - 5)	13.3333
290 (4/5/2012)	250 (5/11/2011)	(290 - 250)/(9 - 5)	10
340 (10/4/2011)	130 (7/21/2011)	(340 - 130)/(7 - 6)	210
290 (1/10/2012)	130 (7/21/2011)	(290 - 130)/(8 - 6)	80
290 (4/5/2012)	130 (7/21/2011)	(290 - 130)/(9 - 6)	53.3333
290 (1/10/2012)	340 (10/4/2011)	(290 - 340)/(8 - 7)	-50
290 (4/5/2012)	340 (10/4/2011)	(290 - 340)/(9 - 7)	-25
290 (4/5/2012)	290 (1/10/2012)	(290 - 290)/(9 - 8)	0

Number of Q values = 36

Ordered Q Values

US EPA ARCHIVE DOCUMENT

n	Q
1	-120
2	-85
3	-50
4	-50
5	-43.3333
6	-25
7	-22.5
8	-10
9	-5
10	-2.5
11	-2
12	0
13	5
14	6
15	10
16	10
17	10
18	11.6667
19	13.3333
20	13.3333
21	13.75
22	15.7143
23	17.5
24	20
25	24
26	26.6667
27	40
28	40
29	40
30	40
31	40
32	40
33	45
34	53.3333
35	80
36	210

Sen's Estimator (Median Q) is 12.5

Tied Group	Value	Members
1	290	2

Time Period	Observations
6/18/2010	1
9/17/2010	1
12/22/2010	1
2/24/2011	1
5/11/2011	1
7/21/2011	1
10/4/2011	1
1/10/2012	1
4/5/2012	1

There are 0 time periods with multiple data

A = 18
B = 0
C = 0

US EPA ARCHIVE DOCUMENT

D = 0
E = 2
F = 0
a = 1656
b = 4536
c = 144
Group Variance = 91
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 15.6909
M1 = (36 - 15.6909)/2.0 = 10.1546
M2 = (36 + 15.6909)/2.0 + 1 = 26.8454
Lower limit is -2.5 = Q(10)
Upper limit is 40 = Q(27)
-2.5 < 0 < 40 indicating no trend in data.

US EPA ARCHIVE DOCUMENT

Sen's Slope Analysis

Parameter: 1,1,1-Trichloroethane

Location: MW-32s

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
560 (11/18/2010)	220 (9/17/2010)	(560 - 220)/(2 - 1)	340
510 (12/28/2010)	220 (9/17/2010)	(510 - 220)/(3 - 1)	145
420 (2/25/2011)	220 (9/17/2010)	(420 - 220)/(4 - 1)	66.6667
380 (5/10/2011)	220 (9/17/2010)	(380 - 220)/(5 - 1)	40
380 (7/28/2011)	220 (9/17/2010)	(380 - 220)/(6 - 1)	32
350 (10/6/2011)	220 (9/17/2010)	(350 - 220)/(7 - 1)	21.6667
400 (1/10/2012)	220 (9/17/2010)	(400 - 220)/(8 - 1)	25.7143
340 (4/4/2012)	220 (9/17/2010)	(340 - 220)/(9 - 1)	15
510 (12/28/2010)	560 (11/18/2010)	(510 - 560)/(3 - 2)	-50
420 (2/25/2011)	560 (11/18/2010)	(420 - 560)/(4 - 2)	-70
380 (5/10/2011)	560 (11/18/2010)	(380 - 560)/(5 - 2)	-60
380 (7/28/2011)	560 (11/18/2010)	(380 - 560)/(6 - 2)	-45
350 (10/6/2011)	560 (11/18/2010)	(350 - 560)/(7 - 2)	-42
400 (1/10/2012)	560 (11/18/2010)	(400 - 560)/(8 - 2)	-26.6667
340 (4/4/2012)	560 (11/18/2010)	(340 - 560)/(9 - 2)	-31.4286
420 (2/25/2011)	510 (12/28/2010)	(420 - 510)/(4 - 3)	-90
380 (5/10/2011)	510 (12/28/2010)	(380 - 510)/(5 - 3)	-65
380 (7/28/2011)	510 (12/28/2010)	(380 - 510)/(6 - 3)	-43.3333
350 (10/6/2011)	510 (12/28/2010)	(350 - 510)/(7 - 3)	-40
400 (1/10/2012)	510 (12/28/2010)	(400 - 510)/(8 - 3)	-22
340 (4/4/2012)	510 (12/28/2010)	(340 - 510)/(9 - 3)	-28.3333
380 (5/10/2011)	420 (2/25/2011)	(380 - 420)/(5 - 4)	-40
380 (7/28/2011)	420 (2/25/2011)	(380 - 420)/(6 - 4)	-20
350 (10/6/2011)	420 (2/25/2011)	(350 - 420)/(7 - 4)	-23.3333
400 (1/10/2012)	420 (2/25/2011)	(400 - 420)/(8 - 4)	-5
340 (4/4/2012)	420 (2/25/2011)	(340 - 420)/(9 - 4)	-16
380 (7/28/2011)	380 (5/10/2011)	(380 - 380)/(6 - 5)	0
350 (10/6/2011)	380 (5/10/2011)	(350 - 380)/(7 - 5)	-15
400 (1/10/2012)	380 (5/10/2011)	(400 - 380)/(8 - 5)	6.66667
340 (4/4/2012)	380 (5/10/2011)	(340 - 380)/(9 - 5)	-10
350 (10/6/2011)	380 (7/28/2011)	(350 - 380)/(7 - 6)	-30
400 (1/10/2012)	380 (7/28/2011)	(400 - 380)/(8 - 6)	10
340 (4/4/2012)	380 (7/28/2011)	(340 - 380)/(9 - 6)	-13.3333
400 (1/10/2012)	350 (10/6/2011)	(400 - 350)/(8 - 7)	50
340 (4/4/2012)	350 (10/6/2011)	(340 - 350)/(9 - 7)	-5
340 (4/4/2012)	400 (1/10/2012)	(340 - 400)/(9 - 8)	-60

Number of Q values = 36

Ordered Q Values

US EPA ARCHIVE DOCUMENT

n	Q
1	-90
2	-70
3	-65
4	-60
5	-60
6	-50
7	-45
8	-43.3333
9	-42
10	-40
11	-40
12	-31.4286
13	-30
14	-28.3333
15	-26.6667
16	-23.3333
17	-22
18	-20
19	-16
20	-15
21	-13.3333
22	-10
23	-5
24	-5
25	0
26	6.66667
27	10
28	15
29	21.6667
30	25.7143
31	32
32	40
33	50
34	66.6667
35	145
36	340

Sen's Estimator (Median Q) is -18

Tied Group	Value	Members
1	380	2

Time Period	Observations
9/17/2010	1
11/18/2010	1
12/28/2010	1
2/25/2011	1
5/10/2011	1
7/28/2011	1
10/6/2011	1
1/10/2012	1
4/4/2012	1

There are 0 time periods with multiple data

A = 18
B = 0
C = 0

US EPA ARCHIVE DOCUMENT

D = 0
E = 2
F = 0
a = 1656
b = 4536
c = 144
Group Variance = 91
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 15.6909
M1 = (36 - 15.6909)/2.0 = 10.1546
M2 = (36 + 15.6909)/2.0 + 1 = 26.8454
Lower limit is -40 = Q(10)
Upper limit is 10 = Q(27)
-40 < 0 < 10 indicating no trend in data.

US EPA ARCHIVE DOCUMENT

Sen's Slope Analysis

Parameter: cis-1,2-Dichloroethene
Location: MW-32s

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
190 (11/18/2010)	270 (9/17/2010)	(190 - 270)/(2 - 1)	-80
200 (12/28/2010)	270 (9/17/2010)	(200 - 270)/(3 - 1)	-35
190 (2/25/2011)	270 (9/17/2010)	(190 - 270)/(4 - 1)	-26.6667
170 (5/10/2011)	270 (9/17/2010)	(170 - 270)/(5 - 1)	-25
140 (7/28/2011)	270 (9/17/2010)	(140 - 270)/(6 - 1)	-26
160 (10/6/2011)	270 (9/17/2010)	(160 - 270)/(7 - 1)	-18.3333
170 (1/10/2012)	270 (9/17/2010)	(170 - 270)/(8 - 1)	-14.2857
130 (4/4/2012)	270 (9/17/2010)	(130 - 270)/(9 - 1)	-17.5
200 (12/28/2010)	190 (11/18/2010)	(200 - 190)/(3 - 2)	10
190 (2/25/2011)	190 (11/18/2010)	(190 - 190)/(4 - 2)	0
170 (5/10/2011)	190 (11/18/2010)	(170 - 190)/(5 - 2)	-6.66667
140 (7/28/2011)	190 (11/18/2010)	(140 - 190)/(6 - 2)	-12.5
160 (10/6/2011)	190 (11/18/2010)	(160 - 190)/(7 - 2)	-6
170 (1/10/2012)	190 (11/18/2010)	(170 - 190)/(8 - 2)	-3.33333
130 (4/4/2012)	190 (11/18/2010)	(130 - 190)/(9 - 2)	-8.57143
190 (2/25/2011)	200 (12/28/2010)	(190 - 200)/(4 - 3)	-10
170 (5/10/2011)	200 (12/28/2010)	(170 - 200)/(5 - 3)	-15
140 (7/28/2011)	200 (12/28/2010)	(140 - 200)/(6 - 3)	-20
160 (10/6/2011)	200 (12/28/2010)	(160 - 200)/(7 - 3)	-10
170 (1/10/2012)	200 (12/28/2010)	(170 - 200)/(8 - 3)	-6
130 (4/4/2012)	200 (12/28/2010)	(130 - 200)/(9 - 3)	-11.6667
170 (5/10/2011)	190 (2/25/2011)	(170 - 190)/(5 - 4)	-20
140 (7/28/2011)	190 (2/25/2011)	(140 - 190)/(6 - 4)	-25
160 (10/6/2011)	190 (2/25/2011)	(160 - 190)/(7 - 4)	-10
170 (1/10/2012)	190 (2/25/2011)	(170 - 190)/(8 - 4)	-5
130 (4/4/2012)	190 (2/25/2011)	(130 - 190)/(9 - 4)	-12
140 (7/28/2011)	170 (5/10/2011)	(140 - 170)/(6 - 5)	-30
160 (10/6/2011)	170 (5/10/2011)	(160 - 170)/(7 - 5)	-5
170 (1/10/2012)	170 (5/10/2011)	(170 - 170)/(8 - 5)	0
130 (4/4/2012)	170 (5/10/2011)	(130 - 170)/(9 - 5)	-10
160 (10/6/2011)	140 (7/28/2011)	(160 - 140)/(7 - 6)	20
170 (1/10/2012)	140 (7/28/2011)	(170 - 140)/(8 - 6)	15
130 (4/4/2012)	140 (7/28/2011)	(130 - 140)/(9 - 6)	-3.33333
170 (1/10/2012)	160 (10/6/2011)	(170 - 160)/(8 - 7)	10
130 (4/4/2012)	160 (10/6/2011)	(130 - 160)/(9 - 7)	-15
130 (4/4/2012)	170 (1/10/2012)	(130 - 170)/(9 - 8)	-40

Number of Q values = 36

Ordered Q Values

US EPA ARCHIVE DOCUMENT

n	Q
1	-80
2	-40
3	-35
4	-30
5	-26.6667
6	-26
7	-25
8	-25
9	-20
10	-20
11	-18.3333
12	-17.5
13	-15
14	-15
15	-14.2857
16	-12.5
17	-12
18	-11.6667
19	-10
20	-10
21	-10
22	-10
23	-8.57143
24	-6.66667
25	-6
26	-6
27	-5
28	-5
29	-3.33333
30	-3.33333
31	0
32	0
33	10
34	10
35	15
36	20

Sen's Estimator (Median Q) is -10.8333

Tied Group	Value	Members
1	190	2
2	170	2

Time Period	Observations
9/17/2010	1
11/18/2010	1
12/28/2010	1
2/25/2011	1
5/10/2011	1
7/28/2011	1
10/6/2011	1
1/10/2012	1
4/4/2012	1

There are 0 time periods with multiple data

A = 36
B = 0

US EPA ARCHIVE DOCUMENT

C = 0
D = 0
E = 4
F = 0
a = 1656
b = 4536
c = 144
Group Variance = 90
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 15.6044
M1 = (36 - 15.6044)/2.0 = 10.1978
M2 = (36 + 15.6044)/2.0 + 1 = 26.8022
Lower limit is -20 = Q(10)
Upper limit is -5 = Q(27)
-5 < 0 indicating a downward trend in data.

US EPA ARCHIVE DOCUMENT

Sen's Slope Analysis

Parameter: Trichloroethene
Location: MW-32s

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
2800 (11/18/2010)	2400 (9/17/2010)	(2800 - 2400)/(2 - 1)	400
2300 (12/28/2010)	2400 (9/17/2010)	(2300 - 2400)/(3 - 1)	-50
2300 (2/25/2011)	2400 (9/17/2010)	(2300 - 2400)/(4 - 1)	-33.3333
2300 (5/10/2011)	2400 (9/17/2010)	(2300 - 2400)/(5 - 1)	-25
2400 (7/28/2011)	2400 (9/17/2010)	(2400 - 2400)/(6 - 1)	0
2200 (10/6/2011)	2400 (9/17/2010)	(2200 - 2400)/(7 - 1)	-33.3333
2300 (1/10/2012)	2400 (9/17/2010)	(2300 - 2400)/(8 - 1)	-14.2857
2200 (4/4/2012)	2400 (9/17/2010)	(2200 - 2400)/(9 - 1)	-25
2300 (12/28/2010)	2800 (11/18/2010)	(2300 - 2800)/(3 - 2)	-500
2300 (2/25/2011)	2800 (11/18/2010)	(2300 - 2800)/(4 - 2)	-250
2300 (5/10/2011)	2800 (11/18/2010)	(2300 - 2800)/(5 - 2)	-166.667
2400 (7/28/2011)	2800 (11/18/2010)	(2400 - 2800)/(6 - 2)	-100
2200 (10/6/2011)	2800 (11/18/2010)	(2200 - 2800)/(7 - 2)	-120
2300 (1/10/2012)	2800 (11/18/2010)	(2300 - 2800)/(8 - 2)	-83.3333
2200 (4/4/2012)	2800 (11/18/2010)	(2200 - 2800)/(9 - 2)	-85.7143
2300 (2/25/2011)	2300 (12/28/2010)	(2300 - 2300)/(4 - 3)	0
2300 (5/10/2011)	2300 (12/28/2010)	(2300 - 2300)/(5 - 3)	0
2400 (7/28/2011)	2300 (12/28/2010)	(2400 - 2300)/(6 - 3)	33.3333
2200 (10/6/2011)	2300 (12/28/2010)	(2200 - 2300)/(7 - 3)	-25
2300 (1/10/2012)	2300 (12/28/2010)	(2300 - 2300)/(8 - 3)	0
2200 (4/4/2012)	2300 (12/28/2010)	(2200 - 2300)/(9 - 3)	-16.6667
2300 (5/10/2011)	2300 (2/25/2011)	(2300 - 2300)/(5 - 4)	0
2400 (7/28/2011)	2300 (2/25/2011)	(2400 - 2300)/(6 - 4)	50
2200 (10/6/2011)	2300 (2/25/2011)	(2200 - 2300)/(7 - 4)	-33.3333
2300 (1/10/2012)	2300 (2/25/2011)	(2300 - 2300)/(8 - 4)	0
2200 (4/4/2012)	2300 (2/25/2011)	(2200 - 2300)/(9 - 4)	-20
2400 (7/28/2011)	2300 (5/10/2011)	(2400 - 2300)/(6 - 5)	100
2200 (10/6/2011)	2300 (5/10/2011)	(2200 - 2300)/(7 - 5)	-50
2300 (1/10/2012)	2300 (5/10/2011)	(2300 - 2300)/(8 - 5)	0
2200 (4/4/2012)	2300 (5/10/2011)	(2200 - 2300)/(9 - 5)	-25
2200 (10/6/2011)	2400 (7/28/2011)	(2200 - 2400)/(7 - 6)	-200
2300 (1/10/2012)	2400 (7/28/2011)	(2300 - 2400)/(8 - 6)	-50
2200 (4/4/2012)	2400 (7/28/2011)	(2200 - 2400)/(9 - 6)	-66.6667
2300 (1/10/2012)	2200 (10/6/2011)	(2300 - 2200)/(8 - 7)	100
2200 (4/4/2012)	2200 (10/6/2011)	(2200 - 2200)/(9 - 7)	0
2200 (4/4/2012)	2300 (1/10/2012)	(2200 - 2300)/(9 - 8)	-100

Number of Q values = 36

Ordered Q Values

US EPA ARCHIVE DOCUMENT

n	Q
1	-500
2	-250
3	-200
4	-166.667
5	-120
6	-100
7	-100
8	-85.7143
9	-83.3333
10	-66.6667
11	-50
12	-50
13	-50
14	-33.3333
15	-33.3333
16	-33.3333
17	-25
18	-25
19	-25
20	-25
21	-20
22	-16.6667
23	-14.2857
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	33.3333
33	50
34	100
35	100
36	400

Sen's Estimator (Median Q) is -25

Tied Group	Value	Members
1	2400	2
2	2300	4
3	2200	2

Time Period	Observations
9/17/2010	1
11/18/2010	1
12/28/2010	1
2/25/2011	1
5/10/2011	1
7/28/2011	1
10/6/2011	1
1/10/2012	1
4/4/2012	1

There are 0 time periods with multiple data

A = 192

US EPA ARCHIVE DOCUMENT

B = 0
C = 24
D = 0
E = 16
F = 0
a = 1656
b = 4536
c = 144
Group Variance = 81.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 14.8341
M1 = (36 - 14.8341)/2.0 = 10.5829
M2 = (36 + 14.8341)/2.0 + 1 = 26.4171
Lower limit is -50 = Q(11)
Upper limit is 0 = Q(26)
-50 < 0 < 0 indicating no trend in data.

US EPA ARCHIVE DOCUMENT

Sen's Slope Analysis

Parameter: 1,1,1-Trichloroethane

Location: MW-33s

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
1.1 (11/18/2010)	ND<1 (9/17/2010)	(1.1 - 1)/(2 - 1)	0.1
1 (12/22/2010)	ND<1 (9/17/2010)	(1 - 1)/(3 - 1)	0
ND<1 (2/24/2011)	ND<1 (9/17/2010)	(1 - 1)/(4 - 1)	0
ND<2 (5/10/2011)	ND<1 (9/17/2010)	(2 - 1)/(5 - 1)	0.25
ND<2 (7/28/2011)	ND<1 (9/17/2010)	(2 - 1)/(6 - 1)	0.2
ND<2 (10/6/2011)	ND<1 (9/17/2010)	(2 - 1)/(7 - 1)	0.166667
1.3 (1/9/2012)	ND<1 (9/17/2010)	(1.3 - 1)/(8 - 1)	0.0428571
1.2 (4/4/2012)	ND<1 (9/17/2010)	(1.2 - 1)/(9 - 1)	0.025
1 (12/22/2010)	1.1 (11/18/2010)	(1 - 1.1)/(3 - 2)	-0.1
ND<1 (2/24/2011)	1.1 (11/18/2010)	(1 - 1.1)/(4 - 2)	-0.05
ND<2 (5/10/2011)	1.1 (11/18/2010)	(2 - 1.1)/(5 - 2)	0.3
ND<2 (7/28/2011)	1.1 (11/18/2010)	(2 - 1.1)/(6 - 2)	0.225
ND<2 (10/6/2011)	1.1 (11/18/2010)	(2 - 1.1)/(7 - 2)	0.18
1.3 (1/9/2012)	1.1 (11/18/2010)	(1.3 - 1.1)/(8 - 2)	0.0333333
1.2 (4/4/2012)	1.1 (11/18/2010)	(1.2 - 1.1)/(9 - 2)	0.0142857
ND<1 (2/24/2011)	1 (12/22/2010)	(1 - 1)/(4 - 3)	0
ND<2 (5/10/2011)	1 (12/22/2010)	(2 - 1)/(5 - 3)	0.5
ND<2 (7/28/2011)	1 (12/22/2010)	(2 - 1)/(6 - 3)	0.333333
ND<2 (10/6/2011)	1 (12/22/2010)	(2 - 1)/(7 - 3)	0.25
1.3 (1/9/2012)	1 (12/22/2010)	(1.3 - 1)/(8 - 3)	0.06
1.2 (4/4/2012)	1 (12/22/2010)	(1.2 - 1)/(9 - 3)	0.0333333
ND<2 (5/10/2011)	ND<1 (2/24/2011)	(2 - 1)/(5 - 4)	1
ND<2 (7/28/2011)	ND<1 (2/24/2011)	(2 - 1)/(6 - 4)	0.5
ND<2 (10/6/2011)	ND<1 (2/24/2011)	(2 - 1)/(7 - 4)	0.333333
1.3 (1/9/2012)	ND<1 (2/24/2011)	(1.3 - 1)/(8 - 4)	0.075
1.2 (4/4/2012)	ND<1 (2/24/2011)	(1.2 - 1)/(9 - 4)	0.04
ND<2 (7/28/2011)	ND<2 (5/10/2011)	(2 - 2)/(6 - 5)	0
ND<2 (10/6/2011)	ND<2 (5/10/2011)	(2 - 2)/(7 - 5)	0
1.3 (1/9/2012)	ND<2 (5/10/2011)	(1.3 - 2)/(8 - 5)	-0.233333
1.2 (4/4/2012)	ND<2 (5/10/2011)	(1.2 - 2)/(9 - 5)	-0.2
ND<2 (10/6/2011)	ND<2 (7/28/2011)	(2 - 2)/(7 - 6)	0
1.3 (1/9/2012)	ND<2 (7/28/2011)	(1.3 - 2)/(8 - 6)	-0.35
1.2 (4/4/2012)	ND<2 (7/28/2011)	(1.2 - 2)/(9 - 6)	-0.266667
1.3 (1/9/2012)	ND<2 (10/6/2011)	(1.3 - 2)/(8 - 7)	-0.7
1.2 (4/4/2012)	ND<2 (10/6/2011)	(1.2 - 2)/(9 - 7)	-0.4
1.2 (4/4/2012)	1.3 (1/9/2012)	(1.2 - 1.3)/(9 - 8)	-0.1

Number of Q values = 36

Ordered Q Values

US EPA ARCHIVE DOCUMENT

n	Q
1	-0.7
2	-0.4
3	-0.35
4	-0.266667
5	-0.233333
6	-0.2
7	-0.1
8	-0.1
9	-0.05
10	0
11	0
12	0
13	0
14	0
15	0
16	0.0142857
17	0.025
18	0.0333333
19	0.0333333
20	0.04
21	0.0428571
22	0.06
23	0.075
24	0.1
25	0.166667
26	0.18
27	0.2
28	0.225
29	0.25
30	0.25
31	0.3
32	0.333333
33	0.333333
34	0.5
35	0.5
36	1

Sen's Estimator (Median Q) is 0.0333333

Tied Group	Value	Members
1	1	3
2	2	3

Time Period	Observations
9/17/2010	1
11/18/2010	1
12/22/2010	1
2/24/2011	1
5/10/2011	1
7/28/2011	1
10/6/2011	1
1/9/2012	1
4/4/2012	1

There are 0 time periods with multiple data

A = 132
B = 0

US EPA ARCHIVE DOCUMENT

C = 12
D = 0
E = 12
F = 0
a = 1656
b = 4536
c = 144
Group Variance = 84.6667
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 15.135
M1 = (36 - 15.135)/2.0 = 10.4325
M2 = (36 + 15.135)/2.0 + 1 = 26.5675
Lower limit is 0 = Q(10)
Upper limit is 0.2 = Q(27)
0 < 0 < 0.2 indicating no trend in data.

US EPA ARCHIVE DOCUMENT

Sen's Slope Analysis

Parameter: 1,1-Dichloroethane

Location: MW-33s

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
14 (11/18/2010)	12 (9/17/2010)	(14 - 12)/(2 - 1)	2
14 (12/22/2010)	12 (9/17/2010)	(14 - 12)/(3 - 1)	1
12 (2/24/2011)	12 (9/17/2010)	(12 - 12)/(4 - 1)	0
11 (5/10/2011)	12 (9/17/2010)	(11 - 12)/(5 - 1)	-0.25
8.9 (7/28/2011)	12 (9/17/2010)	(8.9 - 12)/(6 - 1)	-0.62
11 (10/6/2011)	12 (9/17/2010)	(11 - 12)/(7 - 1)	-0.166667
15 (1/9/2012)	12 (9/17/2010)	(15 - 12)/(8 - 1)	0.428571
17 (4/4/2012)	12 (9/17/2010)	(17 - 12)/(9 - 1)	0.625
14 (12/22/2010)	14 (11/18/2010)	(14 - 14)/(3 - 2)	0
12 (2/24/2011)	14 (11/18/2010)	(12 - 14)/(4 - 2)	-1
11 (5/10/2011)	14 (11/18/2010)	(11 - 14)/(5 - 2)	-1
8.9 (7/28/2011)	14 (11/18/2010)	(8.9 - 14)/(6 - 2)	-1.275
11 (10/6/2011)	14 (11/18/2010)	(11 - 14)/(7 - 2)	-0.6
15 (1/9/2012)	14 (11/18/2010)	(15 - 14)/(8 - 2)	0.166667
17 (4/4/2012)	14 (11/18/2010)	(17 - 14)/(9 - 2)	0.428571
12 (2/24/2011)	14 (12/22/2010)	(12 - 14)/(4 - 3)	-2
11 (5/10/2011)	14 (12/22/2010)	(11 - 14)/(5 - 3)	-1.5
8.9 (7/28/2011)	14 (12/22/2010)	(8.9 - 14)/(6 - 3)	-1.7
11 (10/6/2011)	14 (12/22/2010)	(11 - 14)/(7 - 3)	-0.75
15 (1/9/2012)	14 (12/22/2010)	(15 - 14)/(8 - 3)	0.2
17 (4/4/2012)	14 (12/22/2010)	(17 - 14)/(9 - 3)	0.5
11 (5/10/2011)	12 (2/24/2011)	(11 - 12)/(5 - 4)	-1
8.9 (7/28/2011)	12 (2/24/2011)	(8.9 - 12)/(6 - 4)	-1.55
11 (10/6/2011)	12 (2/24/2011)	(11 - 12)/(7 - 4)	-0.333333
15 (1/9/2012)	12 (2/24/2011)	(15 - 12)/(8 - 4)	0.75
17 (4/4/2012)	12 (2/24/2011)	(17 - 12)/(9 - 4)	1
8.9 (7/28/2011)	11 (5/10/2011)	(8.9 - 11)/(6 - 5)	-2.1
11 (10/6/2011)	11 (5/10/2011)	(11 - 11)/(7 - 5)	0
15 (1/9/2012)	11 (5/10/2011)	(15 - 11)/(8 - 5)	1.33333
17 (4/4/2012)	11 (5/10/2011)	(17 - 11)/(9 - 5)	1.5
11 (10/6/2011)	8.9 (7/28/2011)	(11 - 8.9)/(7 - 6)	2.1
15 (1/9/2012)	8.9 (7/28/2011)	(15 - 8.9)/(8 - 6)	3.05
17 (4/4/2012)	8.9 (7/28/2011)	(17 - 8.9)/(9 - 6)	2.7
15 (1/9/2012)	11 (10/6/2011)	(15 - 11)/(8 - 7)	4
17 (4/4/2012)	11 (10/6/2011)	(17 - 11)/(9 - 7)	3
17 (4/4/2012)	15 (1/9/2012)	(17 - 15)/(9 - 8)	2

Number of Q values = 36

Ordered Q Values

US EPA ARCHIVE DOCUMENT

n	Q
1	-2.1
2	-2
3	-1.7
4	-1.55
5	-1.5
6	-1.275
7	-1
8	-1
9	-1
10	-0.75
11	-0.62
12	-0.6
13	-0.333333
14	-0.25
15	-0.166667
16	0
17	0
18	0
19	0.166667
20	0.2
21	0.428571
22	0.428571
23	0.5
24	0.625
25	0.75
26	1
27	1
28	1.33333
29	1.5
30	2
31	2
32	2.1
33	2.7
34	3
35	3.05
36	4

Sen's Estimator (Median Q) is 0.0833333

Tied Group	Value	Members
1	12	2
2	14	2
3	11	2

Time Period	Observations
9/17/2010	1
11/18/2010	1
12/22/2010	1
2/24/2011	1
5/10/2011	1
7/28/2011	1
10/6/2011	1
1/9/2012	1
4/4/2012	1

There are 0 time periods with multiple data

A = 54

US EPA ARCHIVE DOCUMENT

B = 0
C = 0
D = 0
E = 6
F = 0
a = 1656
b = 4536
c = 144
Group Variance = 89
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 15.5175
M1 = (36 - 15.5175)/2.0 = 10.2412
M2 = (36 + 15.5175)/2.0 + 1 = 26.7588
Lower limit is -0.75 = Q(10)
Upper limit is 1 = Q(27)
-0.75 < 0 < 1 indicating no trend in data.

US EPA ARCHIVE DOCUMENT

Sen's Slope Analysis

Parameter: cis-1,2-Dichloroethene
Location: MW-33s

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
22 (11/18/2010)	13 (9/17/2010)	(22 - 13)/(2 - 1)	9
22 (12/22/2010)	13 (9/17/2010)	(22 - 13)/(3 - 1)	4.5
20 (2/24/2011)	13 (9/17/2010)	(20 - 13)/(4 - 1)	2.33333
21 (5/10/2011)	13 (9/17/2010)	(21 - 13)/(5 - 1)	2
18 (7/28/2011)	13 (9/17/2010)	(18 - 13)/(6 - 1)	1
19 (10/6/2011)	13 (9/17/2010)	(19 - 13)/(7 - 1)	1
20 (1/9/2012)	13 (9/17/2010)	(20 - 13)/(8 - 1)	1
21 (4/4/2012)	13 (9/17/2010)	(21 - 13)/(9 - 1)	1
22 (12/22/2010)	22 (11/18/2010)	(22 - 22)/(3 - 2)	0
20 (2/24/2011)	22 (11/18/2010)	(20 - 22)/(4 - 2)	-1
21 (5/10/2011)	22 (11/18/2010)	(21 - 22)/(5 - 2)	-0.333333
18 (7/28/2011)	22 (11/18/2010)	(18 - 22)/(6 - 2)	-1
19 (10/6/2011)	22 (11/18/2010)	(19 - 22)/(7 - 2)	-0.6
20 (1/9/2012)	22 (11/18/2010)	(20 - 22)/(8 - 2)	-0.333333
21 (4/4/2012)	22 (11/18/2010)	(21 - 22)/(9 - 2)	-0.142857
20 (2/24/2011)	22 (12/22/2010)	(20 - 22)/(4 - 3)	-2
21 (5/10/2011)	22 (12/22/2010)	(21 - 22)/(5 - 3)	-0.5
18 (7/28/2011)	22 (12/22/2010)	(18 - 22)/(6 - 3)	-1.33333
19 (10/6/2011)	22 (12/22/2010)	(19 - 22)/(7 - 3)	-0.75
20 (1/9/2012)	22 (12/22/2010)	(20 - 22)/(8 - 3)	-0.4
21 (4/4/2012)	22 (12/22/2010)	(21 - 22)/(9 - 3)	-0.166667
21 (5/10/2011)	20 (2/24/2011)	(21 - 20)/(5 - 4)	1
18 (7/28/2011)	20 (2/24/2011)	(18 - 20)/(6 - 4)	-1
19 (10/6/2011)	20 (2/24/2011)	(19 - 20)/(7 - 4)	-0.333333
20 (1/9/2012)	20 (2/24/2011)	(20 - 20)/(8 - 4)	0
21 (4/4/2012)	20 (2/24/2011)	(21 - 20)/(9 - 4)	0.2
18 (7/28/2011)	21 (5/10/2011)	(18 - 21)/(6 - 5)	-3
19 (10/6/2011)	21 (5/10/2011)	(19 - 21)/(7 - 5)	-1
20 (1/9/2012)	21 (5/10/2011)	(20 - 21)/(8 - 5)	-0.333333
21 (4/4/2012)	21 (5/10/2011)	(21 - 21)/(9 - 5)	0
19 (10/6/2011)	18 (7/28/2011)	(19 - 18)/(7 - 6)	1
20 (1/9/2012)	18 (7/28/2011)	(20 - 18)/(8 - 6)	1
21 (4/4/2012)	18 (7/28/2011)	(21 - 18)/(9 - 6)	1
20 (1/9/2012)	19 (10/6/2011)	(20 - 19)/(8 - 7)	1
21 (4/4/2012)	19 (10/6/2011)	(21 - 19)/(9 - 7)	1
21 (4/4/2012)	20 (1/9/2012)	(21 - 20)/(9 - 8)	1

Number of Q values = 36

Ordered Q Values

US EPA ARCHIVE DOCUMENT

n	Q
1	-3
2	-2
3	-1.33333
4	-1
5	-1
6	-1
7	-1
8	-0.75
9	-0.6
10	-0.5
11	-0.4
12	-0.333333
13	-0.333333
14	-0.333333
15	-0.333333
16	-0.166667
17	-0.142857
18	0
19	0
20	0
21	0.2
22	1
23	1
24	1
25	1
26	1
27	1
28	1
29	1
30	1
31	1
32	1
33	2
34	2.33333
35	4.5
36	9

Sen's Estimator (Median Q) is 0

Tied Group	Value	Members
1	22	2
2	20	2
3	21	2

Time Period	Observations
9/17/2010	1
11/18/2010	1
12/22/2010	1
2/24/2011	1
5/10/2011	1
7/28/2011	1
10/6/2011	1
1/9/2012	1
4/4/2012	1

There are 0 time periods with multiple data

A = 54

US EPA ARCHIVE DOCUMENT

B = 0
C = 0
D = 0
E = 6
F = 0
a = 1656
b = 4536
c = 144
Group Variance = 89
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 15.5175
M1 = (36 - 15.5175)/2.0 = 10.2412
M2 = (36 + 15.5175)/2.0 + 1 = 26.7588
Lower limit is -0.5 = Q(10)
Upper limit is 1 = Q(27)
-0.5 < 0 < 1 indicating no trend in data.

US EPA ARCHIVE DOCUMENT

Sen's Slope Analysis

Parameter: Trichloroethene
Location: MW-33s

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
150 (11/18/2010)	76 (9/17/2010)	(150 - 76)/(2 - 1)	74
130 (12/22/2010)	76 (9/17/2010)	(130 - 76)/(3 - 1)	27
110 (2/24/2011)	76 (9/17/2010)	(110 - 76)/(4 - 1)	11.3333
220 (5/10/2011)	76 (9/17/2010)	(220 - 76)/(5 - 1)	36
260 (7/28/2011)	76 (9/17/2010)	(260 - 76)/(6 - 1)	36.8
220 (10/6/2011)	76 (9/17/2010)	(220 - 76)/(7 - 1)	24
170 (1/9/2012)	76 (9/17/2010)	(170 - 76)/(8 - 1)	13.4286
170 (4/4/2012)	76 (9/17/2010)	(170 - 76)/(9 - 1)	11.75
130 (12/22/2010)	150 (11/18/2010)	(130 - 150)/(3 - 2)	-20
110 (2/24/2011)	150 (11/18/2010)	(110 - 150)/(4 - 2)	-20
220 (5/10/2011)	150 (11/18/2010)	(220 - 150)/(5 - 2)	23.3333
260 (7/28/2011)	150 (11/18/2010)	(260 - 150)/(6 - 2)	27.5
220 (10/6/2011)	150 (11/18/2010)	(220 - 150)/(7 - 2)	14
170 (1/9/2012)	150 (11/18/2010)	(170 - 150)/(8 - 2)	3.33333
170 (4/4/2012)	150 (11/18/2010)	(170 - 150)/(9 - 2)	2.85714
110 (2/24/2011)	130 (12/22/2010)	(110 - 130)/(4 - 3)	-20
220 (5/10/2011)	130 (12/22/2010)	(220 - 130)/(5 - 3)	45
260 (7/28/2011)	130 (12/22/2010)	(260 - 130)/(6 - 3)	43.3333
220 (10/6/2011)	130 (12/22/2010)	(220 - 130)/(7 - 3)	22.5
170 (1/9/2012)	130 (12/22/2010)	(170 - 130)/(8 - 3)	8
170 (4/4/2012)	130 (12/22/2010)	(170 - 130)/(9 - 3)	6.66667
220 (5/10/2011)	110 (2/24/2011)	(220 - 110)/(5 - 4)	110
260 (7/28/2011)	110 (2/24/2011)	(260 - 110)/(6 - 4)	75
220 (10/6/2011)	110 (2/24/2011)	(220 - 110)/(7 - 4)	36.6667
170 (1/9/2012)	110 (2/24/2011)	(170 - 110)/(8 - 4)	15
170 (4/4/2012)	110 (2/24/2011)	(170 - 110)/(9 - 4)	12
260 (7/28/2011)	220 (5/10/2011)	(260 - 220)/(6 - 5)	40
220 (10/6/2011)	220 (5/10/2011)	(220 - 220)/(7 - 5)	0
170 (1/9/2012)	220 (5/10/2011)	(170 - 220)/(8 - 5)	-16.6667
170 (4/4/2012)	220 (5/10/2011)	(170 - 220)/(9 - 5)	-12.5
220 (10/6/2011)	260 (7/28/2011)	(220 - 260)/(7 - 6)	-40
170 (1/9/2012)	260 (7/28/2011)	(170 - 260)/(8 - 6)	-45
170 (4/4/2012)	260 (7/28/2011)	(170 - 260)/(9 - 6)	-30
170 (1/9/2012)	220 (10/6/2011)	(170 - 220)/(8 - 7)	-50
170 (4/4/2012)	220 (10/6/2011)	(170 - 220)/(9 - 7)	-25
170 (4/4/2012)	170 (1/9/2012)	(170 - 170)/(9 - 8)	0

Number of Q values = 36

Ordered Q Values

US EPA ARCHIVE DOCUMENT

n	Q
1	-50
2	-45
3	-40
4	-30
5	-25
6	-20
7	-20
8	-20
9	-16.6667
10	-12.5
11	0
12	0
13	2.85714
14	3.33333
15	6.66667
16	8
17	11.3333
18	11.75
19	12
20	13.4286
21	14
22	15
23	22.5
24	23.3333
25	24
26	27
27	27.5
28	36
29	36.6667
30	36.8
31	40
32	43.3333
33	45
34	74
35	75
36	110

Sen's Estimator (Median Q) is 11.875

Tied Group	Value	Members
1	220	2
2	170	2

Time Period	Observations
9/17/2010	1
11/18/2010	1
12/22/2010	1
2/24/2011	1
5/10/2011	1
7/28/2011	1
10/6/2011	1
1/9/2012	1
4/4/2012	1

There are 0 time periods with multiple data

A = 36
B = 0

US EPA ARCHIVE DOCUMENT

C = 0
D = 0
E = 4
F = 0
a = 1656
b = 4536
c = 144
Group Variance = 90
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 15.6044
M1 = (36 - 15.6044)/2.0 = 10.1978
M2 = (36 + 15.6044)/2.0 + 1 = 26.8022
Lower limit is -12.5 = Q(10)
Upper limit is 27.5 = Q(27)
-12.5 < 0 < 27.5 indicating no trend in data.

US EPA ARCHIVE DOCUMENT

Sen's Slope Analysis

Parameter: Vinyl chloride
Location: MW-33s

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
56 (11/18/2010)	64 (9/17/2010)	(56 - 64)/(2 - 1)	-8
57 (12/22/2010)	64 (9/17/2010)	(57 - 64)/(3 - 1)	-3.5
60 (2/24/2011)	64 (9/17/2010)	(60 - 64)/(4 - 1)	-1.33333
55 (5/10/2011)	64 (9/17/2010)	(55 - 64)/(5 - 1)	-2.25
22 (7/28/2011)	64 (9/17/2010)	(22 - 64)/(6 - 1)	-8.4
48 (10/6/2011)	64 (9/17/2010)	(48 - 64)/(7 - 1)	-2.66667
51 (1/9/2012)	64 (9/17/2010)	(51 - 64)/(8 - 1)	-1.85714
48 (4/4/2012)	64 (9/17/2010)	(48 - 64)/(9 - 1)	-2
57 (12/22/2010)	56 (11/18/2010)	(57 - 56)/(3 - 2)	1
60 (2/24/2011)	56 (11/18/2010)	(60 - 56)/(4 - 2)	2
55 (5/10/2011)	56 (11/18/2010)	(55 - 56)/(5 - 2)	-0.333333
22 (7/28/2011)	56 (11/18/2010)	(22 - 56)/(6 - 2)	-8.5
48 (10/6/2011)	56 (11/18/2010)	(48 - 56)/(7 - 2)	-1.6
51 (1/9/2012)	56 (11/18/2010)	(51 - 56)/(8 - 2)	-0.833333
48 (4/4/2012)	56 (11/18/2010)	(48 - 56)/(9 - 2)	-1.14286
60 (2/24/2011)	57 (12/22/2010)	(60 - 57)/(4 - 3)	3
55 (5/10/2011)	57 (12/22/2010)	(55 - 57)/(5 - 3)	-1
22 (7/28/2011)	57 (12/22/2010)	(22 - 57)/(6 - 3)	-11.6667
48 (10/6/2011)	57 (12/22/2010)	(48 - 57)/(7 - 3)	-2.25
51 (1/9/2012)	57 (12/22/2010)	(51 - 57)/(8 - 3)	-1.2
48 (4/4/2012)	57 (12/22/2010)	(48 - 57)/(9 - 3)	-1.5
55 (5/10/2011)	60 (2/24/2011)	(55 - 60)/(5 - 4)	-5
22 (7/28/2011)	60 (2/24/2011)	(22 - 60)/(6 - 4)	-19
48 (10/6/2011)	60 (2/24/2011)	(48 - 60)/(7 - 4)	-4
51 (1/9/2012)	60 (2/24/2011)	(51 - 60)/(8 - 4)	-2.25
48 (4/4/2012)	60 (2/24/2011)	(48 - 60)/(9 - 4)	-2.4
22 (7/28/2011)	55 (5/10/2011)	(22 - 55)/(6 - 5)	-33
48 (10/6/2011)	55 (5/10/2011)	(48 - 55)/(7 - 5)	-3.5
51 (1/9/2012)	55 (5/10/2011)	(51 - 55)/(8 - 5)	-1.33333
48 (4/4/2012)	55 (5/10/2011)	(48 - 55)/(9 - 5)	-1.75
48 (10/6/2011)	22 (7/28/2011)	(48 - 22)/(7 - 6)	26
51 (1/9/2012)	22 (7/28/2011)	(51 - 22)/(8 - 6)	14.5
48 (4/4/2012)	22 (7/28/2011)	(48 - 22)/(9 - 6)	8.66667
51 (1/9/2012)	48 (10/6/2011)	(51 - 48)/(8 - 7)	3
48 (4/4/2012)	48 (10/6/2011)	(48 - 48)/(9 - 7)	0
48 (4/4/2012)	51 (1/9/2012)	(48 - 51)/(9 - 8)	-3

Number of Q values = 36

Ordered Q Values

US EPA ARCHIVE DOCUMENT

n	Q
1	-33
2	-19
3	-11.6667
4	-8.5
5	-8.4
6	-8
7	-5
8	-4
9	-3.5
10	-3.5
11	-3
12	-2.66667
13	-2.4
14	-2.25
15	-2.25
16	-2.25
17	-2
18	-1.85714
19	-1.75
20	-1.6
21	-1.5
22	-1.33333
23	-1.33333
24	-1.2
25	-1.14286
26	-1
27	-0.833333
28	-0.333333
29	0
30	1
31	2
32	3
33	3
34	8.66667
35	14.5
36	26

Sen's Estimator (Median Q) is -1.80357

Tied Group	Value	Members
1	48	2

Time Period	Observations
9/17/2010	1
11/18/2010	1
12/22/2010	1
2/24/2011	1
5/10/2011	1
7/28/2011	1
10/6/2011	1
1/9/2012	1
4/4/2012	1

There are 0 time periods with multiple data

A = 18
B = 0
C = 0

US EPA ARCHIVE DOCUMENT

D = 0
E = 2
F = 0
a = 1656
b = 4536
c = 144
Group Variance = 91
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 15.6909
M1 = (36 - 15.6909)/2.0 = 10.1546
M2 = (36 + 15.6909)/2.0 + 1 = 26.8454
Lower limit is -3.5 = Q(10)
Upper limit is -0.833333 = Q(27)
-0.833333 < 0 indicating a downward trend in data.

US EPA ARCHIVE DOCUMENT

Sen's Slope Analysis

Parameter: 1,1,1-Trichloroethane

Location: MW-34s

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
1600 (11/18/2010)	1600 (9/17/2010)	(1600 - 1600)/(2 - 1)	0
1400 (12/28/2010)	1600 (9/17/2010)	(1400 - 1600)/(3 - 1)	-100
1100 (2/25/2011)	1600 (9/17/2010)	(1100 - 1600)/(4 - 1)	-166.667
1200 (5/10/2011)	1600 (9/17/2010)	(1200 - 1600)/(5 - 1)	-100
1300 (7/28/2011)	1600 (9/17/2010)	(1300 - 1600)/(6 - 1)	-60
1200 (10/6/2011)	1600 (9/17/2010)	(1200 - 1600)/(7 - 1)	-66.6667
1500 (1/10/2012)	1600 (9/17/2010)	(1500 - 1600)/(8 - 1)	-14.2857
1400 (4/4/2012)	1600 (9/17/2010)	(1400 - 1600)/(9 - 1)	-25
1400 (12/28/2010)	1600 (11/18/2010)	(1400 - 1600)/(3 - 2)	-200
1100 (2/25/2011)	1600 (11/18/2010)	(1100 - 1600)/(4 - 2)	-250
1200 (5/10/2011)	1600 (11/18/2010)	(1200 - 1600)/(5 - 2)	-133.333
1300 (7/28/2011)	1600 (11/18/2010)	(1300 - 1600)/(6 - 2)	-75
1200 (10/6/2011)	1600 (11/18/2010)	(1200 - 1600)/(7 - 2)	-80
1500 (1/10/2012)	1600 (11/18/2010)	(1500 - 1600)/(8 - 2)	-16.6667
1400 (4/4/2012)	1600 (11/18/2010)	(1400 - 1600)/(9 - 2)	-28.5714
1100 (2/25/2011)	1400 (12/28/2010)	(1100 - 1400)/(4 - 3)	-300
1200 (5/10/2011)	1400 (12/28/2010)	(1200 - 1400)/(5 - 3)	-100
1300 (7/28/2011)	1400 (12/28/2010)	(1300 - 1400)/(6 - 3)	-33.3333
1200 (10/6/2011)	1400 (12/28/2010)	(1200 - 1400)/(7 - 3)	-50
1500 (1/10/2012)	1400 (12/28/2010)	(1500 - 1400)/(8 - 3)	20
1400 (4/4/2012)	1400 (12/28/2010)	(1400 - 1400)/(9 - 3)	0
1200 (5/10/2011)	1100 (2/25/2011)	(1200 - 1100)/(5 - 4)	100
1300 (7/28/2011)	1100 (2/25/2011)	(1300 - 1100)/(6 - 4)	100
1200 (10/6/2011)	1100 (2/25/2011)	(1200 - 1100)/(7 - 4)	33.3333
1500 (1/10/2012)	1100 (2/25/2011)	(1500 - 1100)/(8 - 4)	100
1400 (4/4/2012)	1100 (2/25/2011)	(1400 - 1100)/(9 - 4)	60
1300 (7/28/2011)	1200 (5/10/2011)	(1300 - 1200)/(6 - 5)	100
1200 (10/6/2011)	1200 (5/10/2011)	(1200 - 1200)/(7 - 5)	0
1500 (1/10/2012)	1200 (5/10/2011)	(1500 - 1200)/(8 - 5)	100
1400 (4/4/2012)	1200 (5/10/2011)	(1400 - 1200)/(9 - 5)	50
1200 (10/6/2011)	1300 (7/28/2011)	(1200 - 1300)/(7 - 6)	-100
1500 (1/10/2012)	1300 (7/28/2011)	(1500 - 1300)/(8 - 6)	100
1400 (4/4/2012)	1300 (7/28/2011)	(1400 - 1300)/(9 - 6)	33.3333
1500 (1/10/2012)	1200 (10/6/2011)	(1500 - 1200)/(8 - 7)	300
1400 (4/4/2012)	1200 (10/6/2011)	(1400 - 1200)/(9 - 7)	100
1400 (4/4/2012)	1500 (1/10/2012)	(1400 - 1500)/(9 - 8)	-100

Number of Q values = 36

Ordered Q Values

US EPA ARCHIVE DOCUMENT

n	Q
1	-300
2	-250
3	-200
4	-166.667
5	-133.333
6	-100
7	-100
8	-100
9	-100
10	-100
11	-80
12	-75
13	-66.6667
14	-60
15	-50
16	-33.3333
17	-28.5714
18	-25
19	-16.6667
20	-14.2857
21	0
22	0
23	0
24	20
25	33.3333
26	33.3333
27	50
28	60
29	100
30	100
31	100
32	100
33	100
34	100
35	100
36	300

Sen's Estimator (Median Q) is -20.8333

Tied Group	Value	Members
1	1600	2
2	1400	2
3	1200	2

Time Period	Observations
9/17/2010	1
11/18/2010	1
12/28/2010	1
2/25/2011	1
5/10/2011	1
7/28/2011	1
10/6/2011	1
1/10/2012	1
4/4/2012	1

There are 0 time periods with multiple data

A = 54

US EPA ARCHIVE DOCUMENT

B = 0
C = 0
D = 0
E = 6
F = 0
a = 1656
b = 4536
c = 144
Group Variance = 89
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 15.5175
M1 = (36 - 15.5175)/2.0 = 10.2412
M2 = (36 + 15.5175)/2.0 + 1 = 26.7588
Lower limit is -100 = Q(10)
Upper limit is 50 = Q(27)
-100 < 0 < 50 indicating no trend in data.

US EPA ARCHIVE DOCUMENT

Sen's Slope Analysis

Parameter: Trichloroethene
Location: MW-34s

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
1200 (11/18/2010)	1100 (9/17/2010)	(1200 - 1100)/(2 - 1)	100
1000 (12/28/2010)	1100 (9/17/2010)	(1000 - 1100)/(3 - 1)	-50
900 (2/25/2011)	1100 (9/17/2010)	(900 - 1100)/(4 - 1)	-66.6667
970 (5/10/2011)	1100 (9/17/2010)	(970 - 1100)/(5 - 1)	-32.5
1100 (7/28/2011)	1100 (9/17/2010)	(1100 - 1100)/(6 - 1)	0
1000 (10/6/2011)	1100 (9/17/2010)	(1000 - 1100)/(7 - 1)	-16.6667
1100 (1/10/2012)	1100 (9/17/2010)	(1100 - 1100)/(8 - 1)	0
1200 (4/4/2012)	1100 (9/17/2010)	(1200 - 1100)/(9 - 1)	12.5
1000 (12/28/2010)	1200 (11/18/2010)	(1000 - 1200)/(3 - 2)	-200
900 (2/25/2011)	1200 (11/18/2010)	(900 - 1200)/(4 - 2)	-150
970 (5/10/2011)	1200 (11/18/2010)	(970 - 1200)/(5 - 2)	-76.6667
1100 (7/28/2011)	1200 (11/18/2010)	(1100 - 1200)/(6 - 2)	-25
1000 (10/6/2011)	1200 (11/18/2010)	(1000 - 1200)/(7 - 2)	-40
1100 (1/10/2012)	1200 (11/18/2010)	(1100 - 1200)/(8 - 2)	-16.6667
1200 (4/4/2012)	1200 (11/18/2010)	(1200 - 1200)/(9 - 2)	0
900 (2/25/2011)	1000 (12/28/2010)	(900 - 1000)/(4 - 3)	-100
970 (5/10/2011)	1000 (12/28/2010)	(970 - 1000)/(5 - 3)	-15
1100 (7/28/2011)	1000 (12/28/2010)	(1100 - 1000)/(6 - 3)	33.3333
1000 (10/6/2011)	1000 (12/28/2010)	(1000 - 1000)/(7 - 3)	0
1100 (1/10/2012)	1000 (12/28/2010)	(1100 - 1000)/(8 - 3)	20
1200 (4/4/2012)	1000 (12/28/2010)	(1200 - 1000)/(9 - 3)	33.3333
970 (5/10/2011)	900 (2/25/2011)	(970 - 900)/(5 - 4)	70
1100 (7/28/2011)	900 (2/25/2011)	(1100 - 900)/(6 - 4)	100
1000 (10/6/2011)	900 (2/25/2011)	(1000 - 900)/(7 - 4)	33.3333
1100 (1/10/2012)	900 (2/25/2011)	(1100 - 900)/(8 - 4)	50
1200 (4/4/2012)	900 (2/25/2011)	(1200 - 900)/(9 - 4)	60
1100 (7/28/2011)	970 (5/10/2011)	(1100 - 970)/(6 - 5)	130
1000 (10/6/2011)	970 (5/10/2011)	(1000 - 970)/(7 - 5)	15
1100 (1/10/2012)	970 (5/10/2011)	(1100 - 970)/(8 - 5)	43.3333
1200 (4/4/2012)	970 (5/10/2011)	(1200 - 970)/(9 - 5)	57.5
1000 (10/6/2011)	1100 (7/28/2011)	(1000 - 1100)/(7 - 6)	-100
1100 (1/10/2012)	1100 (7/28/2011)	(1100 - 1100)/(8 - 6)	0
1200 (4/4/2012)	1100 (7/28/2011)	(1200 - 1100)/(9 - 6)	33.3333
1100 (1/10/2012)	1000 (10/6/2011)	(1100 - 1000)/(8 - 7)	100
1200 (4/4/2012)	1000 (10/6/2011)	(1200 - 1000)/(9 - 7)	100
1200 (4/4/2012)	1100 (1/10/2012)	(1200 - 1100)/(9 - 8)	100

Number of Q values = 36

Ordered Q Values

US EPA ARCHIVE DOCUMENT

n	Q
1	-200
2	-150
3	-100
4	-100
5	-76.6667
6	-66.6667
7	-50
8	-40
9	-32.5
10	-25
11	-16.6667
12	-16.6667
13	-15
14	0
15	0
16	0
17	0
18	0
19	12.5
20	15
21	20
22	33.3333
23	33.3333
24	33.3333
25	33.3333
26	43.3333
27	50
28	57.5
29	60
30	70
31	100
32	100
33	100
34	100
35	100
36	130

Sen's Estimator (Median Q) is 6.25

Tied Group	Value	Members
1	1100	3
2	1200	2
3	1000	2

Time Period	Observations
9/17/2010	1
11/18/2010	1
12/28/2010	1
2/25/2011	1
5/10/2011	1
7/28/2011	1
10/6/2011	1
1/10/2012	1
4/4/2012	1

There are 0 time periods with multiple data

A = 102

US EPA ARCHIVE DOCUMENT

B = 0
C = 6
D = 0
E = 10
F = 0
a = 1656
b = 4536
c = 144
Group Variance = 86.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 15.2833
M1 = (36 - 15.2833)/2.0 = 10.3584
M2 = (36 + 15.2833)/2.0 + 1 = 26.6416
Lower limit is -25 = Q(10)
Upper limit is 50 = Q(27)
-25 < 0 < 50 indicating no trend in data.

US EPA ARCHIVE DOCUMENT

Appendix G
Basic Statistics – Model Output

US EPA ARCHIVE DOCUMENT

Table G1

Calculated Coefficient of Varience for "No Trend" Parameter-Well Combinations

Former Tecumseh Products Company Site

Tecumseh, Michigan

Monitoring Location	Parmeter	Standard Deviation	Mean	Coeficient of Variance
MW-02s	Tetrachloroethene	2.13575	3.01538	0.708286
	Trichloroethene	42.9818	231.538	0.185636
	1,1,1-Trichloroethane	2.05776	3.24615	0.633908
MW-03s	cis-1,2-Dichloroethene	694.872	1378.46	0.504093
	Vinyl Chloride	53.5901	93.3077	0.574337
	1,1-Dichloroethane	10.0014	23.5462	0.424756
MW-04s	Trichloroethene	1128.02	5307.69	0.212526
	cis-1,2-Dichloroethene	417.563	2146.15	0.194564
MW-05s	Tetrachloroethene	0.701738	4.99231	0.140564
	Trichloroethene	17.2463	151.538	0.113808
MW-06s	Trichloroethene	4.60072	30	0.153357
MW-07s	Trichloroethene	1.56074	12.5385	0.124476
MW-09s	Trichloroethene	430.116	1675	0.256786
MW-12s	Tetrachloroethene	0.387201	1.39167	0.278228
MW-19s	Tetrachloroethene	0.0834847	1.08333	0.077063
	Trichloroethene	4.16606	32.9167	0.126564
	1,1,1-Trichloroethane	0.234844	1.73333	0.135487
MW-20d	Vinyl Chloride	2.26654	3.89167	0.582408
MW-20s	1,1,1-Trichloroethane	21.3733	187.5	0.113991
MW-21	Trichloroethene	108.079	849.167	0.127276
	cis-1,2-Dichloroethene	9.18992	73.5	0.125033
	1,1,1-Trichloroethane	4.58258	56.5	0.081108
MW-22	Vinyl Chloride	3.66968	5.53636	0.662833
MW-29s	cis-1,2-Dichloroethene	0.209762	1.28	0.163877
MW-31	Trichloroethene	65.2772	251.111	0.259954
	cis-1,2-Dichloroethene	9.48683	27	0.351364
	trans-1,2-Dichloroethene	0.714143	2.66667	0.267803
	1,1,1-Trichloroethane	9.82486	25.5556	0.384450
	1,1-Dichloroethane	5.28215	13.4889	0.391592
MW-32s	1,1,1-Trichloroethane	98.2486	395.556	0.248381
MW-33s	Trichloroethene	58.6003	167.333	0.350202
	cis-1,2-Dichloroethene	2.78887	19.5556	0.142612
	1,1,1-Trichloroethane	0.460977	1.4	0.329269
	1,1-Dichloroethane	2.45764	12.7667	0.192504
MW-34s	Trichloroethene	102.956	1063.33	0.096824
	1,1,1-Trichloroethane	180.278	1366.67	0.131910

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Basic Statistics

Parameter: 1,1,1-Trichloroethane

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements	456
Total Non-Detects	331 (72.5877%)
Pooled Mean	70.4072
Pooled Std Dev	241.686
Compliance Meas.	456
Compliance Mean	70.4072
Compliance Std Dev	241.686
Background Meas.	0
Background Mean	0
Background Std Dev	0

Background Locations

There are 0 background location

Compliance Locations

There are 41 compliance location

Location	Obs.	Non-Detects	% ND	Total
MW-01S	13	0	0	10570
MW-02S	13	1	7.69231	42.2
MW-03S	13	13	100	177
MW-04S	13	13	100	675
MW-05S	13	13	100	17
MW-06S	13	13	100	13
MW-07S	13	0	0	21.4
MW-09S	8	0	0	1057
MW-10S	12	12	100	12
MW-11S	12	12	100	12
MW-12d	10	10	100	10
MW-12S	12	12	100	12
MW-13S	12	12	100	12
MW-14d	10	10	100	10
MW-14S	12	12	100	12
MW-15S	12	12	100	12
MW-17S	12	12	100	12
MW-18S	11	11	100	11
MW-19D	11	11	100	11
MW-19S	12	0	0	20.8
MW-20D	12	11	91.6667	15.9
MW-20S	12	0	0	2250
MW-21	12	0	0	678
MW-22	11	11	100	11
MW-23	13	13	100	13
MW-24D	11	11	100	11
MW-24S	11	11	100	11
MW-25S	11	0	0	203.8
MW-26S	10	10	100	10
MW-27d	10	10	100	10
MW-27s	10	10	100	10
MW-28d	10	10	100	10

MW-28s	10	10	100	10
MW-29d	10	10	100	10
MW-29s	10	10	100	10
MW-30d	10	10	100	10
MW-30s	10	10	100	10
MW-31	9	0	0	230
MW-32s	9	0	0	3560
MW-33s	9	5	55.5556	12.6
MW-34s	9	0	0	12300

Location	Mean	Std Dev	Dif From Bkg	Std Err	Rank Sum	Rank Mean
MW-01S	813.077	291.101	813.077	0	5730	440.769
MW-02S	3.24615	2.05776	3.24615	0	4574	351.846
MW-03S	13.6154	7.46702	13.6154	0	2158	166
MW-04S	51.9231	16.0128	51.9231	0	2158	166
MW-05S	1.30769	1.1094	1.30769	0	2158	166
MW-06S	1	0	1	0	2158	166
MW-07S	1.64615	0.293301	1.64615	0	4503	346.385
MW-09S	132.125	44.7036	132.125	0	3288	411
MW-10S	1	0	1	0	1992	166
MW-11S	1	0	1	0	1992	166
MW-12d	1	0	1	0	1660	166
MW-12S	1	0	1	0	1992	166
MW-13S	1	0	1	0	1992	166
MW-14d	1	0	1	0	1660	166
MW-14S	1	0	1	0	1992	166
MW-15S	1	0	1	0	1992	166
MW-17S	1	0	1	0	1992	166
MW-18S	1	0	1	0	1826	166
MW-19D	1	0	1	0	1826	166
MW-19S	1.73333	0.234844	1.73333	0	4199	349.917
MW-20D	1.325	0.480766	1.325	0	2184	182
MW-20S	187.5	21.3733	187.5	0	5023	418.583
MW-21	56.5	4.58258	56.5	0	4794	399.5
MW-22	1	0	1	0	1826	166
MW-23	1	0	1	0	2158	166
MW-24D	1	0	1	0	1826	166
MW-24S	1	0	1	0	1826	166
MW-25S	18.5273	5.1008	18.5273	0	4184	380.364
MW-26S	1	0	1	0	1660	166
MW-27d	1	0	1	0	1660	166
MW-27s	1	0	1	0	1660	166
MW-28d	1	0	1	0	1660	166
MW-28s	1	0	1	0	1660	166
MW-29d	1	0	1	0	1660	166
MW-29s	1	0	1	0	1660	166
MW-30d	1	0	1	0	1660	166
MW-30s	1	0	1	0	1660	166
MW-31	25.5556	9.82486	25.5556	0	3486	387.333
MW-32s	395.556	98.2486	395.556	0	3876	430.667
MW-33s	1.4	0.460977	1.4	0	2167	240.778
MW-34s	1366.67	180.278	1366.67	0	4064	451.556

Analysis of Variance Statistics

SS Wells	2.51994e+007
SS Total	2.65776e+007

US EPA ARCHIVE DOCUMENT

Kruskal-Wallis Statistics

Non-Detect Rank	166
Background Rank Sum	0
Background Rank Mean	0
H Statistic	273.077
H Adjusted for Ties	442.203

US EPA ARCHIVE DOCUMENT

Basic Statistics

Parameter: 1,1-Dichloroethane

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements	456
Total Non-Detects	396 (86.8421%)
Pooled Mean	7.03114
Pooled Std Dev	15.0939
Compliance Meas.	456
Compliance Mean	7.03114
Compliance Std Dev	15.0939
Background Meas.	0
Background Mean	0
Background Std Dev	0

Background Locations

There are 0 background location

Compliance Locations

There are 41 compliance location

Location	Obs.	Non-Detects	% ND	Total
MW-01S	13	13	100	320
MW-02S	13	13	100	34
MW-03S	13	1	7.69231	306.1
MW-04S	13	13	100	675
MW-05S	13	13	100	17
MW-06S	13	13	100	13
MW-07S	13	13	100	13
MW-09S	8	8	100	220
MW-10S	12	12	100	12
MW-11S	12	12	100	12
MW-12d	10	10	100	10
MW-12S	12	12	100	12
MW-13S	12	12	100	12
MW-14d	10	10	100	10
MW-14S	12	12	100	12
MW-15S	12	12	100	12
MW-17S	12	12	100	12
MW-18S	11	11	100	11
MW-19D	11	11	100	11
MW-19S	12	12	100	12
MW-20D	12	11	91.6667	15.2
MW-20S	12	0	0	327.3
MW-21	12	0	0	323
MW-22	11	11	100	11
MW-23	13	13	100	13
MW-24D	11	11	100	11
MW-24S	11	11	100	11
MW-25S	11	6	54.5455	12.3
MW-26S	10	10	100	10
MW-27d	10	10	100	10
MW-27s	10	10	100	10
MW-28d	10	10	100	10

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MW-28s	10	10	100	10
MW-29d	10	10	100	10
MW-29s	10	10	100	10
MW-30d	10	10	100	10
MW-30s	10	10	100	10
MW-31	9	1	11.1111	121.4
MW-32s	9	8	88.8889	310
MW-33s	9	0	0	114.9
MW-34s	9	9	100	110

Location	Mean	Std Dev	Dif From Bkg	Std Err	Rank Sum	Rank Mean
MW-01S	24.6154	22.9548	24.6154	0	2580.5	198.5
MW-02S	2.61538	2.2188	2.61538	0	2580.5	198.5
MW-03S	23.5462	10.0014	23.5462	0	5379.5	413.808
MW-04S	51.9231	16.0128	51.9231	0	2580.5	198.5
MW-05S	1.30769	1.1094	1.30769	0	2580.5	198.5
MW-06S	1	0	1	0	2580.5	198.5
MW-07S	1	0	1	0	2580.5	198.5
MW-09S	27.5	29.6407	27.5	0	1588	198.5
MW-10S	1	0	1	0	2382	198.5
MW-11S	1	0	1	0	2382	198.5
MW-12d	1	0	1	0	1985	198.5
MW-12S	1	0	1	0	2382	198.5
MW-13S	1	0	1	0	2382	198.5
MW-14d	1	0	1	0	1985	198.5
MW-14S	1	0	1	0	2382	198.5
MW-15S	1	0	1	0	2382	198.5
MW-17S	1	0	1	0	2382	198.5
MW-18S	1	0	1	0	2183.5	198.5
MW-19D	1	0	1	0	2183.5	198.5
MW-19S	1	0	1	0	2382	198.5
MW-20D	1.26667	0.445856	1.26667	0	2581.5	215.125
MW-20S	27.275	19.9175	27.275	0	5165	430.417
MW-21	26.9167	4.14418	26.9167	0	5285	440.417
MW-22	1	0	1	0	2183.5	198.5
MW-23	1	0	1	0	2580.5	198.5
MW-24D	1	0	1	0	2183.5	198.5
MW-24S	1	0	1	0	2183.5	198.5
MW-25S	1.11818	0.213627	1.11818	0	3190	290
MW-26S	1	0	1	0	1985	198.5
MW-27d	1	0	1	0	1985	198.5
MW-27s	1	0	1	0	1985	198.5
MW-28d	1	0	1	0	1985	198.5
MW-28s	1	0	1	0	1985	198.5
MW-29d	1	0	1	0	1985	198.5
MW-29s	1	0	1	0	1985	198.5
MW-30d	1	0	1	0	1985	198.5
MW-30s	1	0	1	0	1985	198.5
MW-31	13.4889	5.28215	13.4889	0	3563.5	395.944
MW-32s	34.4444	43.3333	34.4444	0	2044	227.111
MW-33s	12.7667	2.45764	12.7667	0	3741	415.667
MW-34s	12.2222	4.40959	12.2222	0	1786.5	198.5

Analysis of Variance Statistics

SS Wells	66831.3
SS Total	103660

US EPA ARCHIVE DOCUMENT

Kruskal-Wallis Statistics

Non-Detect Rank	198.5
Background Rank Sum	0
Background Rank Mean	0
H Statistic	139.24
H Adjusted for Ties	403.505

US EPA ARCHIVE DOCUMENT

Basic Statistics

Parameter: 1,1-Dichloroethene

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements	456
Total Non-Detects	443 (97.1491%)
Pooled Mean	4.91667
Pooled Std Dev	11.8268
Compliance Meas.	456
Compliance Mean	4.91667
Compliance Std Dev	11.8268
Background Meas.	0
Background Mean	0
Background Std Dev	0

Background Locations

There are 0 background location

Compliance Locations

There are 41 compliance location

Location	Obs.	Non-Detects	% ND	Total
MW-01S	13	13	100	320
MW-02S	13	13	100	34
MW-03S	13	13	100	177
MW-04S	13	13	100	675
MW-05S	13	13	100	17
MW-06S	13	13	100	13
MW-07S	13	13	100	13
MW-09S	8	8	100	220
MW-10S	12	12	100	12
MW-11S	12	12	100	12
MW-12d	10	10	100	10
MW-12S	12	12	100	12
MW-13S	12	12	100	12
MW-14d	10	10	100	10
MW-14S	12	12	100	12
MW-15S	12	12	100	12
MW-17S	12	12	100	12
MW-18S	11	11	100	11
MW-19D	11	11	100	11
MW-19S	12	12	100	12
MW-20D	12	12	100	15
MW-20S	12	2	16.6667	36.8
MW-21	12	11	91.6667	112.2
MW-22	11	11	100	11
MW-23	13	13	100	13
MW-24D	11	11	100	11
MW-24S	11	11	100	11
MW-25S	11	11	100	11
MW-26S	10	10	100	10
MW-27d	10	10	100	10
MW-27s	10	10	100	10
MW-28d	10	10	100	10

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MW-28s	10	10	100	10
MW-29d	10	10	100	10
MW-29s	10	10	100	10
MW-30d	10	10	100	10
MW-30s	10	10	100	10
MW-31	9	9	100	15
MW-32s	9	9	100	180
MW-33s	9	9	100	12
MW-34s	9	7	77.7778	117

Location	Mean	Std Dev	Dif From Bkg	Std Err	Rank Sum	Rank Mean
MW-01S	24.6154	22.9548	24.6154	0	2886	222
MW-02S	2.61538	2.2188	2.61538	0	2886	222
MW-03S	13.6154	7.46702	13.6154	0	2886	222
MW-04S	51.9231	16.0128	51.9231	0	2886	222
MW-05S	1.30769	1.1094	1.30769	0	2886	222
MW-06S	1	0	1	0	2886	222
MW-07S	1	0	1	0	2886	222
MW-09S	27.5	29.6407	27.5	0	1776	222
MW-10S	1	0	1	0	2664	222
MW-11S	1	0	1	0	2664	222
MW-12d	1	0	1	0	2220	222
MW-12S	1	0	1	0	2664	222
MW-13S	1	0	1	0	2664	222
MW-14d	1	0	1	0	2220	222
MW-14S	1	0	1	0	2664	222
MW-15S	1	0	1	0	2664	222
MW-17S	1	0	1	0	2664	222
MW-18S	1	0	1	0	2442	222
MW-19D	1	0	1	0	2442	222
MW-19S	1	0	1	0	2664	222
MW-20D	1.25	0.452267	1.25	0	2664	222
MW-20S	3.06667	1.21904	3.06667	0	4937	411.417
MW-21	9.35	2.25167	9.35	0	2888	240.667
MW-22	1	0	1	0	2442	222
MW-23	1	0	1	0	2886	222
MW-24D	1	0	1	0	2442	222
MW-24S	1	0	1	0	2442	222
MW-25S	1	0	1	0	2442	222
MW-26S	1	0	1	0	2220	222
MW-27d	1	0	1	0	2220	222
MW-27s	1	0	1	0	2220	222
MW-28d	1	0	1	0	2220	222
MW-28s	1	0	1	0	2220	222
MW-29d	1	0	1	0	2220	222
MW-29s	1	0	1	0	2220	222
MW-30d	1	0	1	0	2220	222
MW-30s	1	0	1	0	2220	222
MW-31	1.66667	0.5	1.66667	0	1998	222
MW-32s	20	0	20	0	1998	222
MW-33s	1.33333	0.5	1.33333	0	1998	222
MW-34s	13	4.24264	13	0	2465	273.889

Analysis of Variance Statistics

SS Wells	47126.6
SS Total	63641.9

US EPA ARCHIVE DOCUMENT

Kruskal-Wallis Statistics

Non-Detect Rank	222
Background Rank Sum	0
Background Rank Mean	0
H Statistic	25.3191
H Adjusted for Ties	304.64

US EPA ARCHIVE DOCUMENT

Basic Statistics

Parameter: cis-1,2-Dichloroethene

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements	456
Total Non-Detects	347 (76.0965%)
Pooled Mean	113.185
Pooled Std Dev	438.061
Compliance Meas.	456
Compliance Mean	113.185
Compliance Std Dev	438.061
Background Meas.	0
Background Mean	0
Background Std Dev	0

Background Locations

There are 0 background location

Compliance Locations

There are 41 compliance location

Location	Obs.	Non-Detects	% ND	Total
MW-01S	13	11	84.6154	349
MW-02S	13	4	30.7692	39.9
MW-03S	13	0	0	17920
MW-04S	13	0	0	27900
MW-05S	13	13	100	17
MW-06S	13	13	100	13
MW-07S	13	13	100	13
MW-09S	8	8	100	220
MW-10S	12	12	100	12
MW-11S	12	12	100	12
MW-12d	10	10	100	10
MW-12S	12	12	100	12
MW-13S	12	12	100	12
MW-14d	10	10	100	10
MW-14S	12	12	100	12
MW-15S	12	12	100	12
MW-17S	12	12	100	12
MW-18S	11	11	100	11
MW-19D	11	11	100	11
MW-19S	12	12	100	12
MW-20D	12	0	0	1740
MW-20S	12	1	8.33333	73.7
MW-21	12	0	0	882
MW-22	11	11	100	11
MW-23	13	13	100	13
MW-24D	11	11	100	11
MW-24S	11	11	100	11
MW-25S	11	10	90.9091	18.8
MW-26S	10	10	100	10
MW-27d	10	10	100	10
MW-27s	10	10	100	10
MW-28d	10	10	100	10

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MW-28s	10	10	100	10
MW-29d	10	10	100	10
MW-29s	10	1	10	12.8
MW-30d	10	10	100	10
MW-30s	10	10	100	10
MW-31	9	0	0	243
MW-32s	9	0	0	1620
MW-33s	9	0	0	176
MW-34s	9	9	100	110

Location	Mean	Std Dev	Dif From Bkg	Std Err	Rank Sum	Rank Mean
MW-01S	26.8462	23.1583	26.8462	0	2702	207.846
MW-02S	3.06923	2.18761	3.06923	0	3964	304.923
MW-03S	1378.46	694.872	1378.46	0	5706	438.923
MW-04S	2146.15	417.563	2146.15	0	5824	448
MW-05S	1.30769	1.1094	1.30769	0	2262	174
MW-06S	1	0	1	0	2262	174
MW-07S	1	0	1	0	2262	174
MW-09S	27.5	29.6407	27.5	0	1392	174
MW-10S	1	0	1	0	2088	174
MW-11S	1	0	1	0	2088	174
MW-12d	1	0	1	0	1740	174
MW-12S	1	0	1	0	2088	174
MW-13S	1	0	1	0	2088	174
MW-14d	1	0	1	0	1740	174
MW-14S	1	0	1	0	2088	174
MW-15S	1	0	1	0	2088	174
MW-17S	1	0	1	0	2088	174
MW-18S	1	0	1	0	1914	174
MW-19D	1	0	1	0	1914	174
MW-19S	1	0	1	0	2088	174
MW-20D	145	46.8867	145	0	5015	417.917
MW-20S	6.14167	3.67558	6.14167	0	4241	353.417
MW-21	73.5	9.18992	73.5	0	4844	403.667
MW-22	1	0	1	0	1914	174
MW-23	1	0	1	0	2262	174
MW-24D	1	0	1	0	1914	174
MW-24S	1	0	1	0	1914	174
MW-25S	1.70909	2.35179	1.70909	0	2112	192
MW-26S	1	0	1	0	1740	174
MW-27d	1	0	1	0	1740	174
MW-27s	1	0	1	0	1740	174
MW-28d	1	0	1	0	1740	174
MW-28s	1	0	1	0	1740	174
MW-29d	1	0	1	0	1740	174
MW-29s	1.28	0.209762	1.28	0	3342	334.2
MW-30d	1	0	1	0	1740	174
MW-30s	1	0	1	0	1740	174
MW-31	27	9.48683	27	0	3501	389
MW-32s	180	40.9268	180	0	3804	422.667
MW-33s	19.5556	2.78887	19.5556	0	3461	384.556
MW-34s	12.2222	4.40959	12.2222	0	1566	174

Analysis of Variance Statistics

SS Wells	7.93744e+007
SS Total	8.73132e+007

US EPA ARCHIVE DOCUMENT

Kruskal-Wallis Statistics

Non-Detect Rank	174
Background Rank Sum	0
Background Rank Mean	0
H Statistic	238.202
H Adjusted for Ties	425.853

US EPA ARCHIVE DOCUMENT

Basic Statistics

Parameter: Tetrachloroethene

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements	456
Total Non-Detects	417 (91.4474%)
Pooled Mean	4.9886
Pooled Std Dev	11.8029
Compliance Meas.	456
Compliance Mean	4.9886
Compliance Std Dev	11.8029
Background Meas.	0
Background Mean	0
Background Std Dev	0

Background Locations

There are 0 background location

Compliance Locations

There are 41 compliance location

Location	Obs.	Non-Detects	% ND	Total
MW-01S	13	13	100	320
MW-02S	13	3	23.0769	39.2
MW-03S	13	13	100	177
MW-04S	13	13	100	675
MW-05S	13	1	7.69231	64.9
MW-06S	13	13	100	13
MW-07S	13	13	100	13
MW-09S	8	8	100	220
MW-10S	12	12	100	12
MW-11S	12	12	100	12
MW-12d	10	10	100	10
MW-12S	12	3	25	16.7
MW-13S	12	12	100	12
MW-14d	10	10	100	10
MW-14S	12	12	100	12
MW-15S	12	12	100	12
MW-17S	12	12	100	12
MW-18S	11	11	100	11
MW-19D	11	11	100	11
MW-19S	12	4	33.3333	13
MW-20D	12	12	100	15
MW-20S	12	12	100	19
MW-21	12	12	100	111
MW-22	11	11	100	11
MW-23	13	13	100	13
MW-24D	11	11	100	11
MW-24S	11	11	100	11
MW-25S	11	11	100	11
MW-26S	10	10	100	10
MW-27d	10	10	100	10
MW-27s	10	10	100	10
MW-28d	10	10	100	10

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MW-28s	10	10	100	10
MW-29d	10	10	100	10
MW-29s	10	10	100	10
MW-30d	10	10	100	10
MW-30s	10	10	100	10
MW-31	9	9	100	15
MW-32s	9	9	100	180
MW-33s	9	9	100	12
MW-34s	9	9	100	110

Location	Mean	Std Dev	Dif From Bkg	Std Err	Rank Sum	Rank Mean
MW-01S	24.6154	22.9548	24.6154	0	2717	209
MW-02S	3.01538	2.13575	3.01538	0	5020	386.154
MW-03S	13.6154	7.46702	13.6154	0	2717	209
MW-04S	51.9231	16.0128	51.9231	0	2717	209
MW-05S	4.99231	0.701738	4.99231	0	5615	431.923
MW-06S	1	0	1	0	2717	209
MW-07S	1	0	1	0	2717	209
MW-09S	27.5	29.6407	27.5	0	1672	209
MW-10S	1	0	1	0	2508	209
MW-11S	1	0	1	0	2508	209
MW-12d	1	0	1	0	2090	209
MW-12S	1.39167	0.387201	1.39167	0	4488	374
MW-13S	1	0	1	0	2508	209
MW-14d	1	0	1	0	2090	209
MW-14S	1	0	1	0	2508	209
MW-15S	1	0	1	0	2508	209
MW-17S	1	0	1	0	2508	209
MW-18S	1	0	1	0	2299	209
MW-19D	1	0	1	0	2299	209
MW-19S	1.08333	0.0834847	1.08333	0	4219	351.583
MW-20D	1.25	0.452267	1.25	0	2508	209
MW-20S	1.58333	0.514929	1.58333	0	2508	209
MW-21	9.25	2.59808	9.25	0	2508	209
MW-22	1	0	1	0	2299	209
MW-23	1	0	1	0	2717	209
MW-24D	1	0	1	0	2299	209
MW-24S	1	0	1	0	2299	209
MW-25S	1	0	1	0	2299	209
MW-26S	1	0	1	0	2090	209
MW-27d	1	0	1	0	2090	209
MW-27s	1	0	1	0	2090	209
MW-28d	1	0	1	0	2090	209
MW-28s	1	0	1	0	2090	209
MW-29d	1	0	1	0	2090	209
MW-29s	1	0	1	0	2090	209
MW-30d	1	0	1	0	2090	209
MW-30s	1	0	1	0	2090	209
MW-31	1.66667	0.5	1.66667	0	1881	209
MW-32s	20	0	20	0	1881	209
MW-33s	1.33333	0.5	1.33333	0	1881	209
MW-34s	12.2222	4.40959	12.2222	0	1881	209

Analysis of Variance Statistics

SS Wells	46864.4
SS Total	63384.8

US EPA ARCHIVE DOCUMENT

Kruskal-Wallis Statistics

Non-Detect Rank	209
Background Rank Sum	0
Background Rank Mean	0
H Statistic	83.5703
H Adjusted for Ties	355.224

US EPA ARCHIVE DOCUMENT

Basic Statistics

Parameter: trans-1,2-Dichloroethene

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements	456
Total Non-Detects	417 (91.4474%)
Pooled Mean	6.90307
Pooled Std Dev	18.0808
Compliance Meas.	456
Compliance Mean	6.90307
Compliance Std Dev	18.0808
Background Meas.	0
Background Mean	0
Background Std Dev	0

Background Locations

There are 0 background location

Compliance Locations

There are 41 compliance location

Location	Obs.	Non-Detects	% ND	Total
MW-01S	13	13	100	320
MW-02S	13	13	100	34
MW-03S	13	0	0	826.1
MW-04S	13	1	7.69231	935
MW-05S	13	13	100	17
MW-06S	13	13	100	13
MW-07S	13	13	100	13
MW-09S	8	8	100	220
MW-10S	12	12	100	12
MW-11S	12	12	100	12
MW-12d	10	10	100	10
MW-12S	12	12	100	12
MW-13S	12	12	100	12
MW-14d	10	10	100	10
MW-14S	12	12	100	12
MW-15S	12	12	100	12
MW-17S	12	12	100	12
MW-18S	11	11	100	11
MW-19D	11	11	100	11
MW-19S	12	12	100	12
MW-20D	12	11	91.6667	16
MW-20S	12	12	100	19
MW-21	12	11	91.6667	117.5
MW-22	11	11	100	11
MW-23	13	13	100	13
MW-24D	11	11	100	11
MW-24S	11	11	100	11
MW-25S	11	11	100	11
MW-26S	10	10	100	10
MW-27d	10	10	100	10
MW-27s	10	10	100	10
MW-28d	10	10	100	10

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MW-28s	10	10	100	10
MW-29d	10	10	100	10
MW-29s	10	10	100	10
MW-30d	10	10	100	10
MW-30s	10	10	100	10
MW-31	9	1	11.1111	24
MW-32s	9	8	88.8889	186
MW-33s	9	6	66.6667	12.2
MW-34s	9	9	100	110

Location	Mean	Std Dev	Dif From Bkg	Std Err	Rank Sum	Rank Mean
MW-01S	24.6154	22.9548	24.6154	0	2717	209
MW-02S	2.61538	2.2188	2.61538	0	2717	209
MW-03S	63.5462	34.2641	63.5462	0	5771	443.923
MW-04S	71.9231	16.0024	71.9231	0	5534	425.692
MW-05S	1.30769	1.1094	1.30769	0	2717	209
MW-06S	1	0	1	0	2717	209
MW-07S	1	0	1	0	2717	209
MW-09S	27.5	29.6407	27.5	0	1672	209
MW-10S	1	0	1	0	2508	209
MW-11S	1	0	1	0	2508	209
MW-12d	1	0	1	0	2090	209
MW-12S	1	0	1	0	2508	209
MW-13S	1	0	1	0	2508	209
MW-14d	1	0	1	0	2090	209
MW-14S	1	0	1	0	2508	209
MW-15S	1	0	1	0	2508	209
MW-17S	1	0	1	0	2508	209
MW-18S	1	0	1	0	2299	209
MW-19D	1	0	1	0	2299	209
MW-19S	1	0	1	0	2508	209
MW-20D	1.33333	0.492366	1.33333	0	2721	226.75
MW-20S	1.58333	0.514929	1.58333	0	2508	209
MW-21	9.79167	0.721688	9.79167	0	2729	227.417
MW-22	1	0	1	0	2299	209
MW-23	1	0	1	0	2717	209
MW-24D	1	0	1	0	2299	209
MW-24S	1	0	1	0	2299	209
MW-25S	1	0	1	0	2299	209
MW-26S	1	0	1	0	2090	209
MW-27d	1	0	1	0	2090	209
MW-27s	1	0	1	0	2090	209
MW-28d	1	0	1	0	2090	209
MW-28s	1	0	1	0	2090	209
MW-29d	1	0	1	0	2090	209
MW-29s	1	0	1	0	2090	209
MW-30d	1	0	1	0	2090	209
MW-30s	1	0	1	0	2090	209
MW-31	2.66667	0.714143	2.66667	0	3611	401.222
MW-32s	20.6667	2	20.6667	0	2107	234.111
MW-33s	1.35556	0.487625	1.35556	0	2512	279.111
MW-34s	12.2222	4.40959	12.2222	0	1881	209

Analysis of Variance Statistics

SS Wells	118834
SS Total	148747

US EPA ARCHIVE DOCUMENT

Kruskal-Wallis Statistics

Non-Detect Rank	209
Background Rank Sum	0
Background Rank Mean	0
H Statistic	88.9551
H Adjusted for Ties	378.112

US EPA ARCHIVE DOCUMENT

Basic Statistics

Parameter: Trichloroethene

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements	456
Total Non-Detects	282 (61.8421%)
Pooled Mean	359.706
Pooled Std Dev	1034.86
Compliance Meas.	456
Compliance Mean	359.706
Compliance Std Dev	1034.86
Background Meas.	0
Background Mean	0
Background Std Dev	0

Background Locations

There are 0 background location

Compliance Locations

There are 41 compliance location

Location	Obs.	Non-Detects	% ND	Total
MW-01S	13	0	0	29400
MW-02S	13	0	0	3010
MW-03S	13	12	92.3077	177
MW-04S	13	0	0	69000
MW-05S	13	0	0	1970
MW-06S	13	0	0	390
MW-07S	13	0	0	163
MW-09S	8	0	0	13400
MW-10S	12	12	100	12
MW-11S	12	12	100	12
MW-12d	10	10	100	10
MW-12S	12	12	100	12
MW-13S	12	12	100	12
MW-14d	10	10	100	10
MW-14S	12	12	100	12
MW-15S	12	12	100	12
MW-17S	12	12	100	12
MW-18S	11	11	100	11
MW-19D	11	11	100	11
MW-19S	12	0	0	395
MW-20D	12	11	91.6667	15
MW-20S	12	0	0	1092
MW-21	12	0	0	10190
MW-22	11	11	100	11
MW-23	13	13	100	13
MW-24D	11	11	100	11
MW-24S	11	11	100	11
MW-25S	11	1	9.09091	23.2
MW-26S	10	10	100	10
MW-27d	10	10	100	10
MW-27s	10	7	70	12.5
MW-28d	10	10	100	10

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MW-28s	10	9	90	10.1
MW-29d	10	10	100	10
MW-29s	10	10	100	10
MW-30d	10	10	100	10
MW-30s	10	10	100	10
MW-31	9	0	0	2260
MW-32s	9	0	0	21200
MW-33s	9	0	0	1506
MW-34s	9	0	0	9570

Location	Mean	Std Dev	Dif From Bkg	Std Err	Rank Sum	Rank Mean
MW-01S	2261.54	522.077	2261.54	0	5593	430.231
MW-02S	231.538	42.9818	231.538	0	4899	376.846
MW-03S	13.6154	7.46702	13.6154	0	2009	154.538
MW-04S	5307.69	1128.02	5307.69	0	5850	450
MW-05S	151.538	17.2463	151.538	0	4685	360.385
MW-06S	30	4.60072	30	0	4181	321.615
MW-07S	12.5385	1.56074	12.5385	0	3952	304
MW-09S	1675	430.116	1675	0	3357	419.625
MW-10S	1	0	1	0	1698	141.5
MW-11S	1	0	1	0	1698	141.5
MW-12d	1	0	1	0	1415	141.5
MW-12S	1	0	1	0	1698	141.5
MW-13S	1	0	1	0	1698	141.5
MW-14d	1	0	1	0	1415	141.5
MW-14S	1	0	1	0	1698	141.5
MW-15S	1	0	1	0	1698	141.5
MW-17S	1	0	1	0	1698	141.5
MW-18S	1	0	1	0	1556.5	141.5
MW-19D	1	0	1	0	1556.5	141.5
MW-19S	32.9167	4.16606	32.9167	0	3919	326.583
MW-20D	1.25	0.452267	1.25	0	1839.5	153.292
MW-20S	91	15.2315	91	0	4119	343.25
MW-21	849.167	108.079	849.167	0	4789	399.083
MW-22	1	0	1	0	1556.5	141.5
MW-23	1	0	1	0	1839.5	141.5
MW-24D	1	0	1	0	1556.5	141.5
MW-24S	1	0	1	0	1556.5	141.5
MW-25S	2.10909	0.879152	2.10909	0	3050.5	277.318
MW-26S	1	0	1	0	1415	141.5
MW-27d	1	0	1	0	1415	141.5
MW-27s	1.25	0.627606	1.25	0	1861.5	186.15
MW-28d	1	0	1	0	1415	141.5
MW-28s	1.01	0.0316228	1.01	0	1560.5	156.05
MW-29d	1	0	1	0	1415	141.5
MW-29s	1	0	1	0	1415	141.5
MW-30d	1	0	1	0	1415	141.5
MW-30s	1	0	1	0	1415	141.5
MW-31	251.111	65.2772	251.111	0	3428	380.889
MW-32s	2355.56	181.046	2355.56	0	3898	433.111
MW-33s	167.333	58.6003	167.333	0	3281	364.556
MW-34s	1063.33	102.956	1063.33	0	3681	409

Analysis of Variance Statistics

SS Wells	4.66875e+008
SS Total	4.87276e+008

US EPA ARCHIVE DOCUMENT

Kruskal-Wallis Statistics

Non-Detect Rank	141.5
Background Rank Sum	0
Background Rank Mean	0
H Statistic	339.38
H Adjusted for Ties	444.512

US EPA ARCHIVE DOCUMENT

Basic Statistics

Parameter: Vinyl chloride

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements	456
Total Non-Detects	384 (84.2105%)
Pooled Mean	15.8531
Pooled Std Dev	55.7093
Compliance Meas.	456
Compliance Mean	15.8531
Compliance Std Dev	55.7093
Background Meas.	0
Background Mean	0
Background Std Dev	0

Background Locations

There are 0 background location

Compliance Locations

There are 41 compliance location

Location	Obs.	Non-Detects	% ND	Total
MW-01S	13	13	100	320
MW-02S	13	13	100	34
MW-03S	13	0	0	1213
MW-04S	13	0	0	3810
MW-05S	13	13	100	17
MW-06S	13	13	100	13
MW-07S	13	13	100	13
MW-09S	8	8	100	220
MW-10S	12	12	100	12
MW-11S	12	12	100	12
MW-12d	10	10	100	10
MW-12S	12	12	100	12
MW-13S	12	12	100	12
MW-14d	10	10	100	10
MW-14S	12	12	100	12
MW-15S	12	12	100	12
MW-17S	12	12	100	12
MW-18S	11	11	100	11
MW-19D	11	11	100	11
MW-19S	12	12	100	12
MW-20D	12	1	8.33333	46.7
MW-20S	12	12	100	19
MW-21	12	12	100	111
MW-22	11	0	0	60.9
MW-23	13	0	0	312.9
MW-24D	11	11	100	11
MW-24S	11	11	100	11
MW-25S	11	11	100	11
MW-26S	10	10	100	10
MW-27d	10	10	100	10
MW-27s	10	10	100	10
MW-28d	10	10	100	10

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MW-28s	10	10	100	10
MW-29d	10	10	100	10
MW-29s	10	10	100	10
MW-30d	10	10	100	10
MW-30s	10	10	100	10
MW-31	9	8	88.8889	15.5
MW-32s	9	8	88.8889	191
MW-33s	9	0	0	461
MW-34s	9	9	100	110

Location	Mean	Std Dev	Dif From Bkg	Std Err	Rank Sum	Rank Mean
MW-01S	24.6154	22.9548	24.6154	0	2502.5	192.5
MW-02S	2.61538	2.2188	2.61538	0	2502.5	192.5
MW-03S	93.3077	53.5901	93.3077	0	5645	434.231
MW-04S	293.077	125.325	293.077	0	5845	449.615
MW-05S	1.30769	1.1094	1.30769	0	2502.5	192.5
MW-06S	1	0	1	0	2502.5	192.5
MW-07S	1	0	1	0	2502.5	192.5
MW-09S	27.5	29.6407	27.5	0	1540	192.5
MW-10S	1	0	1	0	2310	192.5
MW-11S	1	0	1	0	2310	192.5
MW-12d	1	0	1	0	1925	192.5
MW-12S	1	0	1	0	2310	192.5
MW-13S	1	0	1	0	2310	192.5
MW-14d	1	0	1	0	1925	192.5
MW-14S	1	0	1	0	2310	192.5
MW-15S	1	0	1	0	2310	192.5
MW-17S	1	0	1	0	2310	192.5
MW-18S	1	0	1	0	2117.5	192.5
MW-19D	1	0	1	0	2117.5	192.5
MW-19S	1	0	1	0	2310	192.5
MW-20D	3.89167	2.26654	3.89167	0	4560.5	380.042
MW-20S	1.58333	0.514929	1.58333	0	2310	192.5
MW-21	9.25	2.59808	9.25	0	2310	192.5
MW-22	5.53636	3.66968	5.53636	0	4388	398.909
MW-23	24.0692	24.5356	24.0692	0	5379	413.769
MW-24D	1	0	1	0	2117.5	192.5
MW-24S	1	0	1	0	2117.5	192.5
MW-25S	1	0	1	0	2117.5	192.5
MW-26S	1	0	1	0	1925	192.5
MW-27d	1	0	1	0	1925	192.5
MW-27s	1	0	1	0	1925	192.5
MW-28d	1	0	1	0	1925	192.5
MW-28s	1	0	1	0	1925	192.5
MW-29d	1	0	1	0	1925	192.5
MW-29s	1	0	1	0	1925	192.5
MW-30d	1	0	1	0	1925	192.5
MW-30s	1	0	1	0	1925	192.5
MW-31	1.72222	0.565194	1.72222	0	1929	214.333
MW-32s	21.2222	3.66667	21.2222	0	1959	217.667
MW-33s	51.2222	12.1735	51.2222	0	3843	427
MW-34s	12.2222	4.40959	12.2222	0	1732.5	192.5

Analysis of Variance Statistics

SS Wells	1.16767e+006
SS Total	1.4121e+006

US EPA ARCHIVE DOCUMENT

Kruskal-Wallis Statistics

Non-Detect Rank	192.5
Background Rank Sum	0
Background Rank Mean	0
H Statistic	176.216
H Adjusted for Ties	437.446

US EPA ARCHIVE DOCUMENT