



BUILDING A BETTER WORLD

July 25, 2014

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SUBJECT: Wasatch Chemical Site
Progress Report No. 101

Dear Sam and Tony:

This semiannual report was prepared by MWH to summarize environmental remediation activities conducted at the Wasatch Chemical Site (Site) in Salt Lake City, Utah from January through June, 2014. Primary activities conducted during this reporting period include routine semiannual groundwater monitoring and focused deeper groundwater investigation.

A number of remedial actions have been implemented at the Site since 1985, for both soils and groundwater. A brief summary of background information and highlights of groundwater remediation history at the Site are provided; however, for a more thorough presentation of Site history refer to historical documents such as the *Record of Decision* (USEPA, 1991), the *Fourth Five-Year Review Report* (USEPA, 2012), the *Remedial Action Completion Report* (Interstate Land Company, 1998) and the *Draft Wasatch Chemical Site Natural Attenuation Evaluation* (MWH, 2011).

This progress report includes the following sections:

- 1.0 Background
- 2.0 Activities Conducted During Current Reporting Period
- 3.0 Routine Groundwater Monitoring Results
- 4.0 Shallow Groundwater Analytical Data Evaluation
- 5.0 Deeper Groundwater Analytical Data Evaluation
- 6.0 Natural Attenuation Assessment
- 7.0 Recommendations
- 8.0 Deliverables Submitted During Current Reporting Period
- 9.0 Actions to be Completed During Next Reporting Period

The April 2014 groundwater data verification report, historical time series groundwater data, and results of statistical analyses for groundwater data are attached as Appendices A, B, and C, respectively.

1.0 BACKGROUND

1.1 History

Beginning in 1957 the Site was used for producing, packaging, and distributing industrial chemical products such as pesticides, herbicides, fertilizers, industrial chemicals, and cleaners. A remedial investigation was conducted in the late 1980s and a feasibility study for both soil and groundwater remediation alternatives was completed in August 1990 (Harding Lawson, 1990). Selected remedies included in-situ vitrification of soils and sludges, landfarming of hydrocarbon contaminated soils, and extraction and treatment of contaminated groundwater. A Record of Decision (ROD) (USEPA, 1991) and Consent Decree (U.S. District Court, 1991) were signed in 1991. The Site was added to the National Priorities List in 1991 and continues to be federally regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). United States Environmental Protection Agency (USEPA) and Utah Department of Environmental Quality (UDEQ) certified completion of the land farm remedy for soils in January 1994 and the in-situ vitrification remedial action work in May 1996 (Interstate Land, 1991). Groundwater remediation has been ongoing since 1995.

Performance standards for groundwater remediation at the Site are outlined in the Consent Decree (U.S. District Court, 1991) and state that “indicator chemical” concentrations are to be reduced to established drinking water maximum contaminant levels (MCLs), or proposed Alternative Performance Standards. Additionally, concentrations were to be reduced within the first five years of remediation by at least 50 percent of baseline concentrations established at the beginning of the remedial action (March 1995). Groundwater remediation “indicator chemicals” identified in the ROD (USEPA, 1991) as performance monitoring parameters include tetrachloroethene (PCE), trichloroethene (TCE), 1,1-dichloroethene (1,1-DCE), pentachlorophenol (PCP), and 2,4-dichlorophenoxyacetic acid (2,4-D).

1.2 Shallow Groundwater Remediation Progress

Concentrations of indicator chemicals in shallow groundwater (down to 25 feet below ground surface) have decreased by two and three orders of magnitude since 1995 as more than 99 percent of the estimated dissolved contaminant mass in the shallow groundwater was estimated to have been removed by 2011 (*Progress Report No. 95* [MWH, 2011b]). The 50 percent reduction requirement for shallow groundwater has consistently been met for all monitoring locations and indicator chemicals established in the ROD except for TCE in EX-02 which has been below the 50 percent reduction value of 110 µg/l for four of the eight most recent monitoring rounds. TCE concentrations in EX-02 have historically fluctuated both above and below the 50 percent reduction value. However, the TCE baseline concentration for EX-02 (220 µg/l, March 1995) is relatively low compared to concentrations detected at this monitoring location during initial years of monitoring (e.g., 1,000 µg/l of TCE were detected in September 1995).

Groundwater concentrations of 2,4-D reached the performance standard (MCL) across the Site by 1996, and consequently this indicator chemical has not been monitored since 2004. April 2014 statistical analyses indicate concentrations of the remaining groundwater remediation indicator chemicals across the Site are currently either below MCLs, or above MCLs and stable (refer to Section 4.0 of this report).

1.2.1 Best Efforts

As outlined in the Site Consent Decree, “best efforts” to attain MCLs have been made to “maximize the performance of the shallow groundwater Remedial Action to attain the performance standards” (U.S. District Court, 1991). At the Site, “best efforts” have included implementation of three different groundwater remediation technologies:

- Groundwater extraction and treatment (including operation of extraction wells and trenches and modified system operations such as pulse pumping)
- Monitored natural attenuation (MNA)
- Enhanced biodegradation.

1.2.1.1. Groundwater Extraction and Treatment An active pump-and-treat remedy was implemented for eight years until significant mass removal was no longer occurring and a period of MNA was approved by the USEPA. The history and performance of that system are included in progress reports submitted from 1995 to 2003.

1.2.1.2. Monitored Natural Attenuation MNA was implemented beginning in 2003 to assess whether natural biodegradation processes could successfully decrease remaining contaminant mass in the shallow groundwater. Data collected since the groundwater extraction and treatment system was shut down in 2003, and the presence of degradation products that were not released at the Site (e.g., DCE isomers and vinyl chloride [VC]), indicate natural attenuation of chlorinated solvents has occurred and continues to occur at the Site. Since 2003, all indicator chemicals established in the ROD plus VC have been monitored and time series data evaluated. This list of chemicals (PCE, TCE, 1,1-DCE, VC, and PCP) is referred to as the primary constituents of concern (COCs) hereafter in this document.

1.2.1.3. Enhanced Biodegradation. In an effort to accelerate the degradation of chlorinated hydrocarbons at the Site, biodegradation enhancing products were injected near monitoring points across the core of the plume in 2004 and 2006, and monitoring was conducted to assess whether biodegradation was impacted as a result. Results from these pilot tests indicate substantial mass reductions in portions of the aquifer with relatively higher permeability (such as the two gravel-filled extraction trenches), but very limited impact in the prevalent native silts and clays of the Site (*Progress Report No. 89* (MWH, 2008).

1.2.2 Focused Feasibility Study for Shallow Groundwater

Due to the demonstrated limitations of the pump-and-treat remedy at the Site, a *Draft Groundwater Remediation Focused Feasibility Study* (FFS) (MWH, 2010) was prepared and submitted in February 2010 to evaluate alternative groundwater remediation technologies to remediate the remaining contaminants in the shallow groundwater at the Site. MNA along with maintenance of institutional controls as outlined in the Site Environmental Covenant (UDEQ, 2009) is one of the alternatives considered in the draft FFS. The potential to move to a MNA remedy prompted the development of the *Draft Natural Attenuation Evaluation* in October 2011 (MWH, 2011). The USEPA reviewed this report and provided comments to Questar in February 2013, and Questar submitted responses to their comments in May 2013. Finalization of this evaluation report is currently on hold as MNA is reassessed as a potential alternative remedy for shallow groundwater at the Site.

1.3 Summary of Recent Findings and Activities – 2011 to Present

1.3.1 Installation of Deeper Wells

Formal USEPA comments on the draft FFS for shallow groundwater were received in May 2011 and subsequent discussions between Questar and the regulatory agencies spurred additional groundwater investigation. Additional monitoring points were requested to better define the horizontal extent of contamination present on the west side of the Site. During subsequent conversations, USEPA and UDEQ requested installation of additional deeper monitoring wells to determine whether dense non-aqueous phase liquid (DNAPL) was present along or beneath potential preferential flow pathways (inferred subsurface

sand channels), to assess the competency of the underlying clayey confining layer identified during the additional studies conducted in the early 1990s (Harding Lawson, 1993), and to provide deeper groundwater monitoring points at the Site. A shallow groundwater monitoring well was requested in the southwest area of the Site to aid in shallow groundwater plume and potentiometric surface delineation.

In response to these requests, four monitoring wells (MW-30, MW-31D, MW-32D, and MW-33D) were installed in October 2011, at locations requested by the USEPA. Three deeper wells were completed between 45 and 56 feet below ground surface (bgs) and the new shallow well was completed at 24 feet bgs. Well installation details are included in *Progress Report No. 96* (MWH, 2012) and the *Draft Final Groundwater Monitoring Well Installation Documentation* technical memorandum (MWH, 2011b). Well locations are shown in **Figure 1**.

1.3.2 Focused Shallow Soil and Deeper Groundwater Investigation

Data collected from the monitoring points installed in 2011 indicate shallow soil (3.5 feet bgs) and deeper groundwater contamination (35 to 45 feet bgs) at one of the four new well locations (MW-33D). Therefore, additional investigation was warranted in the vicinity of MW-33D located in the southeast area of the Site, northeast of the Peterson Plumbing Supply warehouse as shown in **Figure 1**. Additional investigative steps to delineate the lateral extent of the soil contamination and the extent of deeper groundwater contamination discovered in the southeast area of the Site began in May 2013. The work has been conducted in the area shown in **Figure 1** in general accordance with the *Final Revision 2 Focused Shallow Soil and Deeper Groundwater Investigation and Sentry Well Installation Work Plan* (MWH, 2012a). Once the focused investigation is complete, a shallow soil and deeper groundwater investigation report will be prepared and submitted in draft form to the regulatory agencies for comment. Regulatory agency comments on the draft report will be discussed and conclusions and recommendations will be deliberated at an on-board review meeting between Questar and representatives of the regulatory agencies.

1.3.2.1. Focused Shallow Soil Investigation. The focused shallow soil investigation was conducted in May 2013 to assess the nature and extent of impacted shallow subsurface soils in the vicinity of monitoring well MW-33D (**Figure 1**) where concentrations above EPA industrial screening levels were detected in samples collected during drilling activities at 3.5 feet bgs in October 2011. Direct-push soil borings were completed at a total of 53 locations, beginning adjacent to the MW-33D location and moving outward from locations where sampling results were above screening levels. PCE, TCE, ethylbenzene, xylenes, and/or PCP were detected at concentrations above screening levels in 18 of the 53 boring locations. Soil samples with constituent concentrations above screening levels were collected from borings along the north-south trending corridor east of Peterson Plumbing Supply warehouse and northward along the historical industrial process wastewater pipeline (process drain line) alignment. All shallow soil data will be presented and evaluated in the focused investigation report to be submitted to the regulatory agencies and discussed during a subsequent on-board review meeting between Questar and the regulatory agencies.

1.3.2.2. Focused Deeper Groundwater Investigation. The focused deeper groundwater investigation began in May 2013 with cone penetrometer testing (CPT) and direct-push groundwater sampling and has continued into the current reporting period. The purpose of the focused investigation is to assess the nature and extent of groundwater contamination identified at monitoring well MW-33D where VOCs and PCP were detected above MCLs in a deeper interval (35-45 feet bgs). The general location of the investigation area is shown in **Figure 1**.

CPT has been used to profile subsurface characteristics and to collect direct-push groundwater samples at deeper depths. CPT and direct-push groundwater sampling were conducted on the following dates:

May 20 through 24, 2013 (five locations)
July 23 and 24, 2013 (three locations)
August 19, 2013 (one location)
February 19, 2014 (two locations)
June 30 and July 1, 2014 (one location)

Deeper groundwater samples have been collected from twelve locations at depths up to 160 feet bgs. Direct-push groundwater samples were collected at the more hydraulically conductive intervals (typically interpreted as silts and sands) at two to five different depths at each CPT boring location. Laboratory analytical results for sampling events through February 2014 include detections of some VOCs and/or PCP above MCLs at three locations, between depths of 70 and 106 feet bgs. Data for the June/July 2014 sampling event are not yet available. Once the laboratory analytical data are received for this most recent sampling event, all lithological, groundwater, and pore dissipation test data will be presented and evaluated in the focused investigation report to be submitted to the regulatory agencies and discussed during a subsequent on-board review meeting between Questar and the regulatory agencies to determine next steps.

1.3.3 Indoor Air Sampling

Due to shallow groundwater VOC contamination near occupied buildings, the potential for vapor intrusion and potential risk to workers were evaluated in the spring of 2012. Air samples collected with SUMMA[®] canisters in the three occupied buildings on the Site (**Figure 1**) were analyzed for PCE, TCE, DCE isomers and VC, and results were all below laboratory reporting limits. Therefore, significant risk to worker health was not concluded. A description of the investigation methods, results, and conclusions are presented in the *Final Indoor Air Investigation Summary Report* (MWH, 2013). One additional round of sampling is planned to verify the absence of risk to human health from potential vapor intrusion in the three buildings. Discussions between USEPA, UDEQ, and Questar are currently underway concerning regulatory agency comments on the March 2013 *Draft Indoor Air Sampling Work Plan*.

2.0 ACTIVITIES CONDUCTED DURING CURRENT REPORTING PERIOD

2.1 Shallow Groundwater Treatment System Operation

The groundwater extraction and treatment system was not operated during the reporting period. Operation of the groundwater extraction and treatment system was discontinued in January 2003 in accordance with the USEPA's approval letter dated January 9, 2003.

2.2 Groundwater Monitoring Activities

Overall, the monitoring program is designed to provide data to assess natural attenuation processes of contaminants in the shallow groundwater as described in the *Monitored Natural Attenuation Work Plan* (MWH, 2002) and to assess potential groundwater contaminant migration. Both hydrogeological and constituent concentration data were collected and evaluated. Routine semiannual groundwater monitoring was conducted in April 2014 at 17 monitoring locations for the shallow groundwater (screened down to 25 feet bgs) and three deeper monitoring points (screened down to 56 feet bgs). Additionally, the newest shallow downgradient monitoring well installed in June 2013 (MW-34) was sampled twice during the reporting period, once in February and again in April as part of the initial quarterly monitoring period for this new well. April 2014 groundwater monitoring results are presented in Section 3.0 and time series data are evaluated in Sections 4.0 and 5.0 for shallow and deeper groundwater, respectively.

2.3 Focused Deeper Groundwater Investigation

The focused deeper groundwater investigation continued into the current reporting period with two additional CPT and direct-push sampling efforts, one conducted in February and the other in June/July of 2014. Objectives of the February 19, 2014 sampling effort were to assess the horizontal extent of contamination on the west side of the investigation area and to collect groundwater data deeper than 100 feet bgs. Additional sampling was conducted June 30 and July 1, 2014 to further characterize the vertical extent of contamination in the focused investigation area. Results will be reported and evaluated in the focused investigation report. (Refer to Section 1.3.2 of this report for more information about the focused investigation.)

3.0 ROUTINE GROUNDWATER MONITORING RESULTS

3.1 Shallow Groundwater Level Monitoring Results

Shallow groundwater wells and piezometers at the Site are completed to depths of 25 feet bgs or less. Groundwater elevation contours drawn from shallow groundwater monitoring data collected on April 21, 2014 are illustrated in **Figure 2**. In general, groundwater elevations continue to indicate an overall groundwater flow direction in the shallow aquifer of west to northwest. The average depth to shallow groundwater across the Site was approximately 3.8 feet bgs, approximately 0.4 feet higher than the average measured in November 2013 and 0.6 feet deeper than the average measured in April 2013. Shallower groundwater depths were measured on the upgradient side of the Site (southeast) and greater depths further downgradient, as illustrated in **Figure 2**.

3.2 Deeper Groundwater Level Monitoring Results

Groundwater level data for the deeper wells (MW-31D, MW-32D, and MW-33D completed to depths between 45 and 56 feet bgs) were collected on April 21, 2014. The average depth to water measured in the three deeper wells was approximately 2.7 feet bgs, approximately 0.2 feet higher than the average depth measured in November 2013, and 0.5 feet lower than the average depth to water measured in April 2013. Water-level data from these three points indicate an overall direction of horizontal flow towards the northwest in the deeper zones. Groundwater level elevations for the deeper wells are shown in **Figure 3**.

Each deeper well is located close to a shallow well, providing three well pairs where the vertical component of groundwater flow can be assessed. Vertical hydraulic gradients and resulting directions of the vertical component of groundwater flow are listed in **Table 1**. Water-level data collected in April 2014 indicate an upward vertical component of groundwater flow for all three nested well pairs. Overall, data collected since 2011 indicate that groundwater in the deeper zones is under pressure and induces an upward vertical component of groundwater flow, as shown by the hydraulic gradients presented in **Table 1**.

3.3 Shallow Groundwater Sampling Results

Shallow groundwater samples were collected from 17 monitoring locations from April 21 through 24 for the first semiannual monitoring round of 2014. Samples were analyzed for the COCs PCE, TCE, DCE isomers, VC, PCP, plus geochemical parameters pertinent to the assessment of biotransformation of chlorinated solvents (sulfate, sulfide, nitrate, nitrite, and ferrous iron). Dissolved oxygen (DO), pH, and oxidation-reduction potential (ORP) were measured in the field during sampling activities. Laboratory analytical methods and sampling results for wells completed in the shallow zones for this sampling round are presented in **Table 2**. A detailed data verification report is included in **Appendix A** for all April 2014 laboratory analytical data.

3.3.1 Shallow Groundwater VOC and PCP Results

April 2014 laboratory analytical results for shallow groundwater relative to MCLs and laboratory reporting limits are summarized below. Maximum concentrations detected for each constituent are also enumerated, with the corresponding monitoring point location indicated in parentheses.

**Shallow Groundwater Analytical Data Summary
April 2014**

Constituent	No. of Monitoring Points Sampled	No. of Results Above MCL	Maximum Concentration Detected (µg/l)	No. of Results at or Above Reporting Limit	No. of Results Below Reporting Limit
PCE	18	0	1.1 (ES-01)	1	17
TCE	18	2	87 (EX-02)	5	13
1,1-DCE	18	3	13 (EX-05)	9	9
cis-1,2-DCE	18	3	430 D (EX-11)	12	6
trans-1,2-DCE	18	1	180 D (EX-05)	8	10
VC	18	7	530 D (EX-11)	8	10
PCP	6	1	8.2 D (EX-02)	1	5

D Sample was diluted

April 2014 shallow groundwater results for primary COCs PCE, TCE, 1,1-DCE, VC, and PCP are presented on Site maps shown in **Figures 4 through 8**. Isoconcentration contours in these figures outline areas where concentrations were detected above regulatory drinking water MCLs. In general, the April 2014 data and interpreted contaminant plume areas are similar to those reported for April 2013 (presented in *Progress Report No. 99* [MWH, 2013b]), except in the northern area of the Site where lower VOC concentrations at EX-04 resulted in a smaller plume footprint for TCE.

The DCE isomers cis-1,2-DCE and trans-1,2-DCE are not considered primary COCs and are not presented on Site maps because they are not designated as “indicator chemicals” in the ROD (USEPA, 1991), nor are they included in the analyte list in the *Final Groundwater Monitoring Well Installation and Sampling Plan* (MWH, 2011c). However, the 1,2-DCE isomers have been monitored and reported in Site progress reports since April 2009 to aid in the evaluation of natural attenuation.

Shallow groundwater laboratory analytical results for the primary COCs are discussed below.

Based on historical data, the current PCP monitoring network is limited to the southern area of the Site (**Figure 8**). However, quarterly samples from the newest well installed in June 2013, MW-34, were analyzed for PCP through February 2014 as outlined in the *Focused Shallow Soil and Deeper Groundwater Investigation and Sentry Well Installation Work Plan* (MWH, 2012), and PCP was not detected. Therefore, MW-34 has not been added to the PCP monitoring network.

3.3.2 Geochemical Parameters

Geochemical parameters including pH, ORP, DO, nitrate, nitrite, ferrous iron, sulfate, and sulfide were collected to assess whether conditions in the aquifer are conducive to biotransformation processes. April 2014 results for these parameters for shallow groundwater monitoring points are listed in **Table 2**. Geochemical parameter data for pH, ORP, DO, nitrate, and ferrous iron throughout the Site indicate favorable conditions for anaerobic reductive dechlorination. ORP values measured in the field are consistent with historical results and are within the expected range of values given the measured DO and ferrous iron concentrations.

3.4 Deeper Groundwater Sampling Results

Groundwater samples were collected on April 21 and 23, 2014 from the three wells completed in deeper zones. These deeper groundwater samples were analyzed for VOCs and geochemical parameters pertinent to the assessment of biotransformation of chlorinated solvents (sulfate, sulfide, nitrate, nitrite, and ferrous iron). The three deeper wells, MW-31D, MW-32D, and MW-33D, were installed in 2011 and are screened at 38-48, 46-56, and 35-45 feet bgs, respectively. April 2014 samples were not analyzed for herbicides because herbicide compounds had not been detected over the initial six sampling rounds (refer to the Recommendations section of *Progress Report No. 99* [MWH, 2013b]). DO, pH, and ORP were measured in the field during sampling activities. Results and laboratory analytical methods used are presented in **Table 3** where primary COCs and additional VOCs initially detected in MW-33D groundwater samples (i.e., ethylbenzene, xylenes, toluene) are reported. Time series data for all three wells are presented in Exhibits B-17 through B-19 of **Appendix B**. Additionally, detailed sampling and data validation information is included in **Appendix A** where the complete list of VOC analytes for MW-33D is presented.

Consistent with historical data, VOCs were not detected in wells MW-31D and MW-32D, but were detected at MW-33D. VOC and PCP data for MW-33D are summarized on **Figure 3**. As for the November 2013 monitoring round, April 2014 VOC data for MW-33D are all below MCLs. Hydrocarbon concentrations continued to be detected at MW-33D, though results continue to be orders of magnitude below Utah Leaking Underground Storage Tank Program (LUST) initial screening levels and drinking water MCLs, as listed below:

**April 2014 Hydrocarbon Concentrations Detected in MW-33D Groundwater
Compared to Utah LUST Regulatory Limits and MCLs**

Hydrocarbon	Concentration (µg/l)	Utah LUST Screening Level / Federal and State MCL (µg/l)
Ethylbenzene	12	700
m,p,o-Xylene (sum of isomers)	22.7	10,000
Toluene	0.47 T	1,000

Geochemical parameters measured in April 2014 for all three deeper wells illustrate conditions conducive to natural attenuation with consistently negative ORP readings, low DO concentrations, and neutral pH readings. Laboratory analytical results for nitrate, ferrous iron, and sulfate in MW-33D also fall in the biodegradation indicator ranges presented in USEPA natural attenuation guidance (USEPA, 1998).

4.0 SHALLOW GROUNDWATER ANALYTICAL DATA EVALUATION

Foreseeing potential difficulties in meeting performance standards with pump-and-treat technology, the Site Consent Decree (U.S. District Court, 1991, Section VII, part 17) provides an avenue to “waive or modify” groundwater treatment performance standards (equivalent to MCLs as defined in the ROD) that are demonstrated to be “technically impracticable from an engineering perspective” to achieve, as reflected in “asymptotic conditions” at the Site. To provide justification for a performance standard waiver or modification, the Consent Decree requires a demonstration for each contaminant for which a waiver or modification is sought that illustrates contaminant concentrations remain “at statistically significant asymptotic values above MCLs” for at least the eight most recent data points.

Evaluation of groundwater constituent concentration trends are useful for:

- Assessing overall plume stability
- Evaluating the groundwater monitoring program
- Identifying locations where constituent concentrations have stabilized above MCLs such that petitioning for Alternative Performance Standards may be justified as outlined in the Site Consent Decree (U.S. District Court, 1991).

As substantial contaminant mass reductions in the shallow groundwater have occurred at the Site, statistical methods have been applied to assess whether “asymptotic conditions” exist at shallow groundwater monitoring points where contaminant concentrations remain above MCLs. From 2001 through 2012, linear regression analyses were used to evaluate trends at the Site in accordance with the *Extraction System Performance Standards, Milestones, and Shutdown Procedures* document (Montgomery Watson, 2001). These trends, presented in previous Progress Reports, illustrated groundwater remediation progress and helped guide remediation strategy at the Site.

To look more closely at overall plume stability, beginning in 2013 Mann-Kendall and Theil-Sen statistical tests have been used to evaluate shallow groundwater COC concentrations. The Mann-Kendall method is preferred over linear regression (USEPA, 2009) because the validity of linear regression results is based on a number of underlying assumptions that are not always met consistently for all Site shallow monitoring well data. The primary assumptions for linear regression analyses include: 1) regression residuals are normally distributed, 2) regression residuals are homoscedastic (i.e., variance is homogeneous), 3) there is not significant skewness or any outliers in the data, and 4) there are few if any results below laboratory method detection limits. Results for the combination of Mann-Kendall and Theil-Sen statistical analyses of shallow groundwater data, using a confidence level of 99 percent in accordance with the Consent Decree, are summarized below in Section 4.1.

A summary of analyses and results based on current trends (using the eight most recent data points) at individual wells, as well as historical trends for data extending back to 1995 are presented in the following subsections (4.1 and 4.2). From these results, the overall stability of the shallow plume was assessed. Results characterize areas of the shallow groundwater plume as trending or stable.

4.1 Contaminant Trend Evaluation using Mann-Kendall and Theil-Sen Methods

Shallow groundwater data were evaluated for trends over the past eight monitoring events using Mann-Kendall and Theil-Sen analyses in accordance with EPA Unified Guidance (EPA, 2009). The Mann-Kendall test was used to test for a statistically significant slope (i.e., trend) in constituent concentration

values over time. The Theil-Sen method was used in conjunction with the Mann-Kendall method to determine a slope, or rate of change, of the trending data (Helsel, 2005). In addition to evaluation of trends and rates of change, the eight most recent data points were used to construct confidence intervals for non-trending data and confidence bands for trending data to determine whether current constituent concentrations are statistically above or below MCLs. More in-depth discussion of these methods is included in the statistical analyses technical memorandum included as Appendix C of *Progress Report No. 99* (MWH, 2013b).

A summary of shallow groundwater statistical results including mean, standard deviation, confidence limits, and trends for data sets that represent concentrations that are statistically above the MCLs is presented in **Table 4**. No increasing or decreasing trends were identified for those data sets that are statistically above MCLs. Trend analysis results for monitoring locations where COCs are statistically above MCLs are identified on a Site map on **Figure 9**. Calculated mean concentrations and trends are comparable to those determined for April and November 2013 data presented in the previous two progress reports ([MWH, 2013b] and [MWH, 2014]), with the exception of trend changes from decreasing to stable for VC at EX-05 and TCE at EX-04. Results for all April 2014 analyses, including those that are not statistically above the MCLs, are included in **Appendix C**.

4.2 Shallow Groundwater Plume Stability Evaluation Conclusions

The statistical analyses performed for the eight most recent data points for shallow groundwater across the Site demonstrate that all April 2014 shallow groundwater concentrations currently above MCLs are stable at a 99 percent confidence level. See **Figure 9** and **Table 4** for monitoring locations/COCs that indicate plume stability based on these statistical results. Note that **Figure 9** only shows trend analyses results for wells where a COC is exceeding its MCL.

4.3 Shallow Groundwater Historical Time Series Data

Tables and graphs of all historical data for the current monitoring network are included in **Appendix B** where significant decreases in shallow groundwater concentrations over time are illustrated. Since 1995, contaminant concentrations have decreased two to four orders of magnitude for the original VOC indicator chemicals designated in the ROD (i.e., PCE, TCE, and 1,1-DCE). For example, TCE concentrations have decreased by more than four orders of magnitude in EX-05 and by three orders of magnitude in EX-07, EX-09, and MW-20. Also, concentrations of PCE have decreased by four orders of magnitude in EX-11 and by two orders of magnitude in ES-01, EX-05, EX-07, and MW-20. Concentrations at most wells have decreased exponentially over time, as shown in the B2 Exhibits (**Appendix B**).

5.0 DEEPER GROUNDWATER ANALYTICAL DATA EVALUATION

5.1 Statistical Analyses of Deeper Groundwater Data

Mann-Kendall and Thiel-Sens analyses were conducted for COCs detected at MW-33D, the only deeper monitoring location where COCs have been detected. Confidence limits were also calculated to assess whether the data sets are statistically above their respective MCLs. Results do not identify any statistically significant trends and indicate all COCs are statistically below MCLs. Statistical analysis results for MW-33D are included in **Appendix C**.

5.2 Deeper Groundwater Historical Time Series Data

As shown in Table B-19 in **Appendix B**, PCE and TCE were initially detected above their respective MCLs during the December 2011 and February 2012 sampling rounds. However, concentrations of these COCs have decreased to trace concentrations (below laboratory reporting limits) over the past two monitoring

rounds. VC, though not detected initially, was detected above its MCL three times in the middle of the time series (August 2012, November 2012, and April 2013) and was detected at concentrations below its MCL over the past two monitoring rounds. Ethylbenzene, xylenes and toluene have also been detected in groundwater samples from MW-33D, though at concentrations one to four orders of magnitude below their Utah LUST screening levels and drinking water MCLs.

6.0 NATURAL ATTENUATION ASSESSMENT

6.1 Shallow Groundwater

Geochemical parameters indicative of anaerobic microbial growth and reductive dechlorination of PCE and TCE are presented in **Table 2** as biodegradation indicators. April 2014 data shown in bold indicate conditions conducive to reductive dechlorination. As discussed in the Groundwater Sampling Results section of this report, April 2014 values for ORP, nitrate, and DO are low and ferrous iron elevated in areas of contamination, indicating favorable conditions for reductive dechlorination at the Site.

Though shallow groundwater data indicate that natural attenuation has been occurring at the Site and has contributed to overall shallow groundwater plume stability, MNA as an alternative remedy is currently being reassessed due to the presence of residual contamination in shallow soils at and near the water table northeast of the Peterson Plumbing Supply warehouse. Matrix diffusion of residual contamination can lengthen the remediation time frame for MNA, particularly for contaminated aquifers with inter-bedded low-permeability zones. Therefore, an evaluation of plume stability based on statistical analyses has been conducted, and the practicability of MNA as an alternative remedy is being evaluated.

6.2 Deeper Groundwater

Groundwater data from MW-33D including detections of TCE, cis-1,2-DCE, and VC (MW-33D) indicate the occurrence of reductive dechlorination in deeper groundwater. The generally anoxic environment, negative ORP conditions, nitrate, ferrous iron, and sulfate concentrations, and the presence of daughter products TCE, cis-1,2-DCE, and VC indicate natural attenuation is occurring at the deeper depths of MW-33D (35 to 45 feet bgs).

7.0 RECOMMENDATIONS

1. **Complete Focused Shallow Soil and Deeper Groundwater Investigation.** As outlined in the *Final Revision 2 Focused Shallow Soil and Deeper Groundwater Investigation and Sentry Well Installation Work Plan* (MWH, 2012a), the field investigation will be completed to further characterize the shallow soils and deeper groundwater to determine the lateral extent of shallow soil contamination as well as the vertical and horizontal boundaries of deeper groundwater contamination in the southeast area of the Site. The field activities for this investigation began in May 2013 and are expected to be completed in early July 2014. A focused investigation report will be prepared for regulatory agency review, and an on-board review meeting is planned to discuss next steps.
2. **Conduct Indoor Air Sampling.** To verify the absence of a vapor intrusion risk in occupied Site buildings, an additional round of indoor air sampling is planned. This additional round will include collection of whole indoor air samples in the occupied areas of the KEPCO+ and Intsel office buildings and in the Peterson Plumbing Supply warehouse, both the office area and warehouse sections (see **Figure 1** of this report for building locations). The validated data from these air samples will be used to evaluate human health risks in occupied areas of the on-site buildings due to

vapor intrusion. This recommendation is presented in the *Draft Indoor Air Sampling Work Plan* (MWH, 2013a) and discussed further in responses to USEPA comments on the draft work plan.

3. **Abandon Five Piezometers and One Monitoring Well.** Piezometers PZ-6, PZ-7, PZ-8, PZ-9, and PZ-10 and monitoring well MW-14 are recommended for abandonment. The five piezometers are located north of Peterson Plumbing Supply warehouse, and monitoring well MW-14 is located on the Intsel Steel West Property southeast of the Intsel Steel West warehouse, as shown in **Figure 1**. These monitoring points have been used only for shallow groundwater level monitoring (not groundwater sampling), and water levels collected are redundant of those measured from nearby monitoring points.

The five piezometers proposed for abandonment are located in a paved area where surface water ponding has been observed during wet weather events and potential stormwater infiltration into piezometer casings is a concern. Measurements from a number of shallow groundwater monitoring points (i.e., ES-01, EX-01, MW-09, MW-05, and EX-07) in the vicinity of these five piezometers provide plenty of data to assess the groundwater levels in this area. The five piezometers are closely spaced around extraction trench ES-01, and were installed in 1997 to assess the groundwater table response during initial startup of the extraction trench.

Water-level measurements from monitoring well MW-14 are not necessary because data collected at nearby monitoring well MW-20 are sufficient to assess the shallow groundwater table and shallow groundwater flow direction.

4. **Reduce Frequency of Statistical Analyses and Plume Evaluations.** Because Site groundwater concentration data are generally stable (Section 4.0 of this report), a reduction in the frequency of data evaluations is recommended. While continuing to collect groundwater data and submit progress reports semiannually, statistical analyses and plume evaluations will be reported on an annual basis.

Preparation of a brief progress report following each fall monitoring round is recommended. These reports will include only those progress report elements specified in Section XIII of the Site Consent Decree (U.S. District Court, 1991), including:

- (a) Summary of activities conducted during the reporting period
- (b) Summary of all sampling and testing results
- (c) List of deliverables submitted during the reporting period
- (d) List of activities planned for the next reporting period
- (e) Modifications to any approved work plans or schedules.

Data evaluations will be included in progress reports prepared after each spring monitoring round. These reports will include items (a) through (e) listed above as well as:

- (f) Statistical analyses of groundwater data (i.e., Mann-Kendall and Theil-Sen analyses)
- (g) Groundwater contaminant plume evaluations (i.e., plume contour maps, historical time series data tables and plots, and plume stability evaluations based on statistical results).

8.0 DELIVERABLES SUBMITTED DURING CURRENT REPORTING PERIOD

The following deliverables were submitted to the regulatory agencies during the reporting period.

- *Wasatch Chemical Site Progress Report No. 100* (MWH, 2014) was submitted on January 17, 2014
- Responses to UDEQ comments on the *Draft Indoor Air Sampling Work Plan* (MWH, 2013a) were submitted March 20, 2014.

9.0 ACTIONS TO BE COMPLETED DURING NEXT REPORTING PERIOD

The following project activities are scheduled to be conducted within the next six-month reporting period.

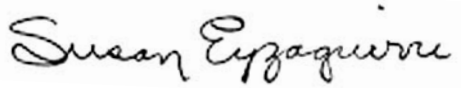
1. **Routine Groundwater Monitoring.** Groundwater contaminant concentrations and water levels will continue to be monitored. Routine monitoring activities will include semiannual groundwater monitoring and sampling of both shallow and deeper compliance monitoring locations in November 2014 in accordance with the *Monitored Natural Attenuation Work Plan* (MWH, 2002) and the *Final Quality Assurance Project Plan Revision 2.0, Wasatch Chemical Site* (MWH, 2012b).
2. **Complete Focused Investigation.** Shallow soil and deeper groundwater investigation field work to define the nature and extent of contamination near MW-33D is expected to be completed in early July 2014. A resulting draft investigation report, to include recommendations for installation of additional deep monitoring wells, will be prepared after the June/July 2014 laboratory analytical data are received. Final new well depths and locations will be selected and agreed upon at an on-board review meeting with the regulatory agencies to be conducted approximately 30 days after the draft submittal, and the investigation report will be finalized accordingly.
3. **New Deeper Well Installation.** New deeper monitoring well(s) will be installed as agreed upon by Questar and the regulatory agencies based on the deeper groundwater investigation results. Locations and depths will be determined during a focused investigation report on-board review meeting with the regulatory agencies, to be conducted approximately 30 days after submittal of the draft focused investigation report.
4. **Indoor Air Monitoring.** Indoor air monitoring at the three occupied buildings on the Site is expected to be conducted during the winter season of 2014/2015. Twenty-four hour time-weighted whole air sample(s) will be collected in each of the occupied buildings located above shallow groundwater contamination, including KEPCO+ office building, Intsel office building, and Peterson Plumbing's office and warehouse building. The *Indoor Air Sampling Work Plan* will be finalized and signed by Questar, MWH, and the regulatory agencies prior to the sampling event.
5. **Progress Reports.** Site Progress reports will continue to be submitted semiannually for 6-month reporting periods of January through June and July through December. The second semiannual progress report for 2014 is scheduled to be submitted in January 2015, and will include only those progress report elements specified in Section XIII of the Site Consent Decree (U.S. District Court, 1991). Refer to Recommendation #4 in Section 7.0 of this report for intended content.
6. **Piezometer and Monitoring Well Abandonment and Routine Well Maintenance.** Abandon six piezometers and one monitoring well that are no longer needed for compliance monitoring and

present unnecessary risk as potential conduits into the shallow aquifer. Conduct maintenance as needed on remaining monitoring wells.

If you have any questions or concerns, please do not hesitate to contact me at (801) 617-3200.

Sincerely,

MWH

A handwritten signature in black ink that reads "Susan Eyzaguirre". The signature is written in a cursive, flowing style.

Susan Eyzaguirre, P.E., P.G.
Project Manager

cc: P. Drake, Questar Corp.
H. Pos, Parsons Behle & Latimer
Utah Dept. of Natural Resources

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- Harding Lawson, 1990. Remedial Investigation Report, Wasatch Chemical Site, Salt Lake City, Utah. March 30, 1990.
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- UDEQ, 2009. Environmental Covenant entered into by Questar InfoComm, Inc., USEPA, and UDEQ pursuant to Utah Code Ann. 57-25-101. Recorded January 14, 2009.
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- USEPA, 1991. Record of Decision, Wasatch Chemical Site, Salt Lake City, Utah. March 29, 1991.
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TABLE 1
APRIL 2014 VERTICAL HYDRAULIC GRADIENT ASSESSMENT
USING DATA FROM NESTED SHALLOW AND DEEPER WELL PAIRS
WASATCH CHEMICAL SITE, SALT LAKE CITY, UTAH

Well Pair Identification	Well	Screened Interval	Groundwater Elevation (ft)	Groundwater Elevation Difference ^(a) (ft)	Vertical Hydraulic Gradient ^(b) (ft/ft)	Vertical Component of Groundwater Flow Direction
Western	MW-06	14 - 24 ft bgs	4225.52	2.24	0.060	Upward
	MW-31D	38 - 48 ft bgs	4227.76			
Northern	PZ-3	5 - 25 ft bgs	4226.34	0.22	0.010	Upward
	MW-32D	46 - 56 ft bgs	4226.56			
Southeastern	EX-01	5 - 15 ft bgs	4227.98	0.44	0.030	Upward
	MW-33D	35 - 45 ft bgs	4228.42			

Water levels measured on April 21, 2014

(a) Calculated by subtracting the water level elevation of the shallow well from that of the deeper well.

(b) Calculated by dividing the difference in water level elevations by the distance between the middle of each screened interval.

Vertical distances between the middle of screened intervals are 35, 24, and 30 ft for the Western, Northern, and Southeastern well pairs, respect

bgs - below ground surface

NA - data not available

ft - feet

TABLE 2
SHALLOW GROUNDWATER SAMPLING RESULTS AND NATURAL ATTENUATION INDICATORS
APRIL 2014
WASATCH CHEMICAL SITE, SALT LAKE CITY, UTAH

		Analytical Results																		Natural Attenuation Assessment		
MCL	Sample Identification Date Collected	ES-01 4/22/14	EX-02 4/22/14	EX-04 4/22/14	EX-05 4/22/14	EX-07 4/22/14	EX-08 4/21/14	EX-09 4/22/14	EX-11 4/22/14	MW-06 4/21/14	MW-20 4/22/14	MW-23 4/21/14	MW-30 4/24/14	MW-34 ^(b) 2/20/14	MW-34 ^(b) 4/24/14	PZ-1 4/23/14	MW-24A 4/23/14	MW-25 4/24/14	PZ-3 ^(c) 4/24/14	Biodegradation Indicator	Purpose and/or Interpretation	
Volatile Organic Compounds (µg/l)		Analytical Method																				
Tetrachloroethene (PCE)	5	SW8260B	1.1	0.33 T	<1	<1	0.61 T	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	Not Applicable	Indicator chemical ^(e)	
Trichloroethene (TCE)	5	SW8260B	59	87	0.84 T	0.38 T	2.4	<1	<1	3.8	0.21 T	1	<1	0.89 T	0.32 T	0.24 T	<1	<1	<1	<1	detection	Indicator chemical ^(e) ; degradation product of PCE
1,1-Dichloroethene (1,1-DCE)	7	SW8260B	1.1	8	2.4	13	0.45 T	<1	2.7	8.8	4.3	1.6	<1	6	<1	<1	<1	<1	<1	<1	detection	Indicator chemical ^(e) ; degradation product of trichloroethene
cis-1,2-Dichloroethene (cis-1,2-DCE)	70	SW8260B	44	240 D	31	180 D	8.4	<1	31	430 D	24	25	<1	37	3	1.6	<1	<1	<1	<1	detection	Degradation product of trichloroethene
trans-1,2-Dichloroethene (trans-1,2-DCE)	100	SW8260B	0.87 T	11	7.8	180 D	1.7	<1	10	88	5.3	15	<1	0.81 T	0.69 T	0.46 T	<1	<1	<1	<1	detection	Degradation product of trichloroethene
Vinyl chloride (VC)	2	SW8260B	39	53	0.89 T	12	6.1	<1	0.24 T	530 D	1.4	2.1	<1	10	<1	<1	<1	<1	<1	<1	detection	Degradation product of dichloroethenes
Pesticides (µg/l)																						
Pentachlorophenol (PCP)	1	SW8151A	<0.5	8.2 D	NA	NA	<0.5	0.48 T	NA	<0.5	NA	NA	NA	NA	<0.5	NA	NA	NA	NA	NA	Not Applicable	Original indicator chemical ^(e)
Geochemical Parameters																						
pH (standard units)	na	field measurement	7.6	6.6	7.3	6.9	7.2	5.9	6.9	7.0	6.0	7.1	6.3	6.8	6.8	6.8	6.9	6.9	7.2	6.7	5 to 9 ^(d)	Optimal range for reductive pathway
Oxidation-reduction Potential (mV)	na	field measurement	-221	-69	-102	-90	-41	-16	-11	-108	-36	-75	-201	-112	-189	-119	-109	-63	-103	-29	<50 ^(d)	Reductive pathway possible
Dissolved Oxygen (mg/l)	na	field measurement	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	<0.5 ^(d)	Reductive pathway possible
Nitrate (mg/l)	10	E300.0	0.0772 T	0.937	0.346	0.11	0.532	7.07 D	0.149	0.122	0.0594 T	0.634	0.413 TD	0.056 T	0.0556 T	0.0681 T	0.0661 T	0.0601 T	0.0505 T	<0.1	<1 ^(d)	Reductive pathway possible
Nitrite (mg/l)	1	E300.0	<0.1	<0.4 D	<0.1	<0.25 D	<0.2 D	<1 D	<0.1 D	<0.4 D	<0.2 D	<0.1	<4D	<0.2 D	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2 D	>1	Evidence of nitrate reduction
Iron II (mg/l) ^(a)	na	Hach 8146	6.39	>9.99	>9.99	>9.99	>9.99	8.79	>9.99	6.66	>9.99	>9.99	>9.99	>9.99	>9.99	>9.99	>9.99	>9.99	>9.99	>9.99	>1 ^(d)	Reductive pathway possible
Sulfate (mg/l)	na	E300.0	67.5 D	1180 D	330 D	1450 D	142 D	487 D	1220 D	897 D	597 D	1030 D	405 D	783 D	1050 D	681 D	485 D	285 D	373 D	2190 D	<20 ^(d)	At higher concentrations may compete with reductive pathway
Sulfide, total (mg/l)	na	E376.2	0.363	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.0312 T	0.0445 T	<0.1	0.0802 T	0.097 T	0.0523 T	0.0707 T	0.0267 T	<0.1	<0.1	<0.1	>1 ^(d)	Evidence of sulfate reduction

^(a)Iron II was measured in the field using Hach kits; a number of samples exceeded the maximum instrument reading of 9.99 mg/l.

^(b)New monitoring well installed in June 2013 was monitored quarterly for one year.

^(c)Replacement monitoring point for MW-26A which was destroyed during construction activities on the SteelCo property in October 2004. Data for piezometer PZ-3, located approximately 100 ft south of the location of former monitoring well MW-26A, is reported in place of data for MW-26A.

^(d)From *Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Groundwater*, USEPA, 1998.

^(e)The "most prevalent, mobile, persistent, and toxic compounds" found at the Site during remedial investigation activities were selected and presented in the Site Record of Decision (USEPA, 1991) as Site indicator chemicals.

	Laboratory results highlighted in yellow are greater than the analyte's MCL.
MCL	Regulatory drinking water maximum contaminant level
mg/l	milligrams per liter
mV	millivolts
µg/l	micrograms per liter
Bold	Values in bold suggest biodegradation is possible
NA	Not analyzed
D	Sample dilution required for analysis; reported values reflect the dilution.
T	Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.

TABLE 3
GROUNDWATER SAMPLING RESULTS FOR DEEPER WELLS INSTALLED IN 2011
APRIL 2014
WASATCH CHEMICAL SITE, SALT LAKE CITY, UTAH

Sample Identification Screened Interval (feet bgs) Date Collected		MCL	Analytical Results			Natural Attenuation Assessment	
			MW-31D	MW-32D	MW-33D	Biodegradation	Purpose and/or Interpretation
			38 - 48 4/21/2014	46 - 56 4/23/2014	35 - 45 4/23/2014	Indicator	
Volatile Organic Compounds (µg/l)							
	Analytical Method						
Tetrachloroethene (PCE)	SW8260B	5	<1	<1	0.98 T	na	Indicator chemical ^(d)
Trichloroethene (TCE)	SW8260B	5	<1	<1	0.42 T	detection	Indicator chemical ^(d) ; degradation product of PCE
1,1-Dichloroethene (1,1-DCE)	SW8260B	7	<1	<1	<1	detection	Indicator chemical ^(d) ; degradation product of TCE
cis-1,2-Dichloroethene (cis-1,2-DCE)	SW8260B	70	<1	<1	3.1	detection	Degradation product of trichloroethene
trans-1,2-Dichloroethene (trans-1,2-DCE)	SW8260B	100	<1	<1	<1	detection	Degradation product of trichloroethene
Vinyl chloride (VC)	SW8260B	2	<1	<1	1.2	detection	Degradation product of dichloroethenes
Ethylbenzene	SW8260B	700	NA	NA	12	na	na
m,p-Xylene (Sum of Isomers)	SW8260B	10,000 ^(b)	NA	NA	15	na	na
o-Xylene	SW8260B	10,000 ^(b)	NA	NA	7.7	na	na
Toluene	SW8260B	1,000	NA	NA	0.47 T	na	na
Geochemical parameters							
pH (standard units)	field measurement	na	6.3	7.7	7.9	5 to 9 ^(c)	Optimal range for reductive pathway.
Oxidation-reduction Potential (mV)	field measurement	na	-138	-172	-122	<50 ^(c)	Reductive pathway possible.
Dissolved Oxygen (mg/l)	field measurement	na	0.02	0.0	0.0	<0.5 ^(c)	Reductive pathway possible.
Nitrate (mg/l)	E300.0	10	0.0607 T	0.0502 T	0.0507 T	<1 ^(c)	Reductive pathway possible.
Nitrite (mg/l)	E300.0	1	< 0.1	< 0.1	< 0.1	>1	Evidence of nitrate reduction.
Iron II (mg/l)	Hach 8146	na	5.25	3.33	4.26	>1 ^(c)	Reductive pathway possible.
Sulfate (mg/l)	E300.0	na	0.581	0.689	2.09	<20 ^(c)	At higher concentrations may compete with reductive pathway.
Sulfide, total (mg/l)	E376.2	na	0.0334 T	0.0356 T	0.0601 T	>1 ^(c)	Evidence of sulfate reduction.

(a) Greater than the maximum reading on the field instrument.

(b) MCL listed is for the sum of o, m, and p xylenes

(c) From *Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Groundwater*, USEPA, 1998.

(d) The "most prevalent, mobile, persistent, and toxic compounds" found at the Site during remedial investigation activities were selected and presented in the Site Record of Decision (USEPA, 1991) as Site indicator chemicals.

µg/l micrograms per liter

bgs below ground surface

D Sample dilution required for analysis; reported values reflect the dilution.

J Data estimated

MCL maximum contaminant level (regulatory limit)

mg/l milligrams per liter

mV millivolts

na Not applicable

NA Not analyzed

T Analyte was positively identified but reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.

TABLE 4
SHALLOW GROUNDWATER STATISTICAL ANALYSIS RESULTS
FOR APRIL 2014 DATA SETS DETERMINED TO BE STATISTICALLY ABOVE MCLs
WASATCH CHEMICAL SITE, SALT LAKE CITY, UTAH

Monitoring Location	Constituent of Concern	Mean (µg/l)	Standard Deviation (µg/l)	Upper Confidence Limit ^(a)	Lower Confidence Limit ^(a)	Exceeds MCL ^(b)	Trend ^(c)	Indication	Recommendation
EX-02	TCE	117.9	63.2	143.0	80.9	Yes	No	Stable	Evaluate Alternate Performance Standard ^(d)
	1,1-DCE	8.7	1.4	9.6	7.7	Yes	No	Stable	Evaluate Alternate Performance Standard ^(d)
	VC	89.1	52.2	210.0	52.5	Yes	No	Stable	Evaluate Alternate Performance Standard ^(d)
	PCP	7.0	3.4	9.3	4.8	Yes	No	Stable	Evaluate Alternate Performance Standard ^(d)
EX-05	1,1-DCE	9.5	1.5	13.0	8.2	Yes	No	Stable	Evaluate Alternate Performance Standard ^(d)
	VC	12.6	2.8	14.5	10.7	Yes	No	Stable	Evaluate Alternate Performance Standard ^(d)
EX-07	VC	4.3	2.3	5.8	2.7	Yes	No	Stable	Evaluate Alternate Performance Standard ^(d)
EX-08	PCP	1.8	1.1	2.5	1.1	Yes	No	Stable	Evaluate Alternate Performance Standard ^(d)
EX-11	VC	434.4	208.9	574.3	294.4	Yes	No	Stable	Evaluate Alternate Performance Standard ^(d)
MW-20	VC	3.4	2.0	4.2	2.3	Yes	No	Stable	Evaluate Alternate Performance Standard ^(d)
MW-30	VC	11.6	7.6	15.8	6.5	Yes	No	Stable	Evaluate Alternate Performance Standard ^(d)

Note: Analyses conducted for the eight most recent data points; refer to Appendix C for more detailed results and plots.

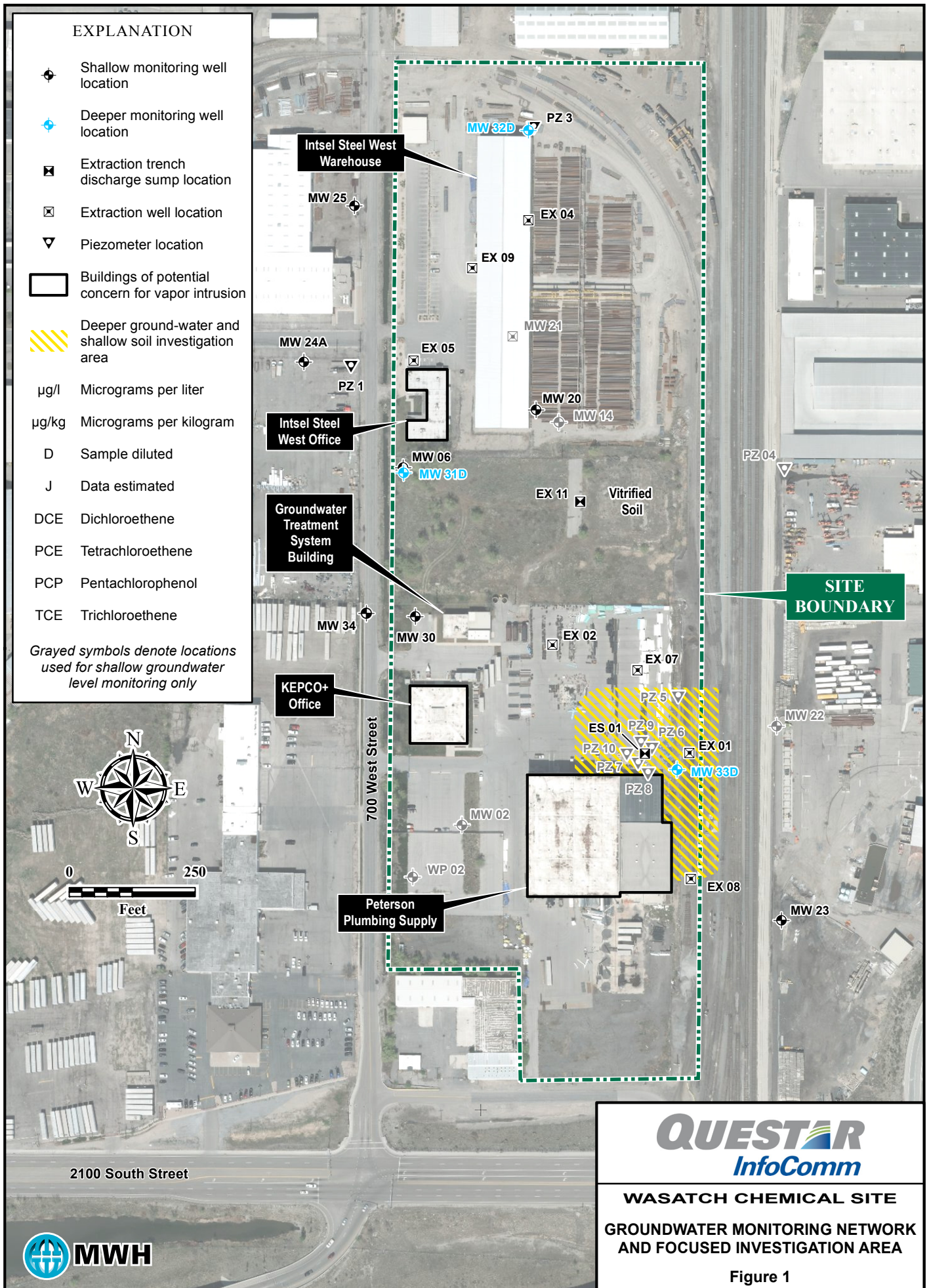
^(a) Confidence limits determined using a 95% confidence level.

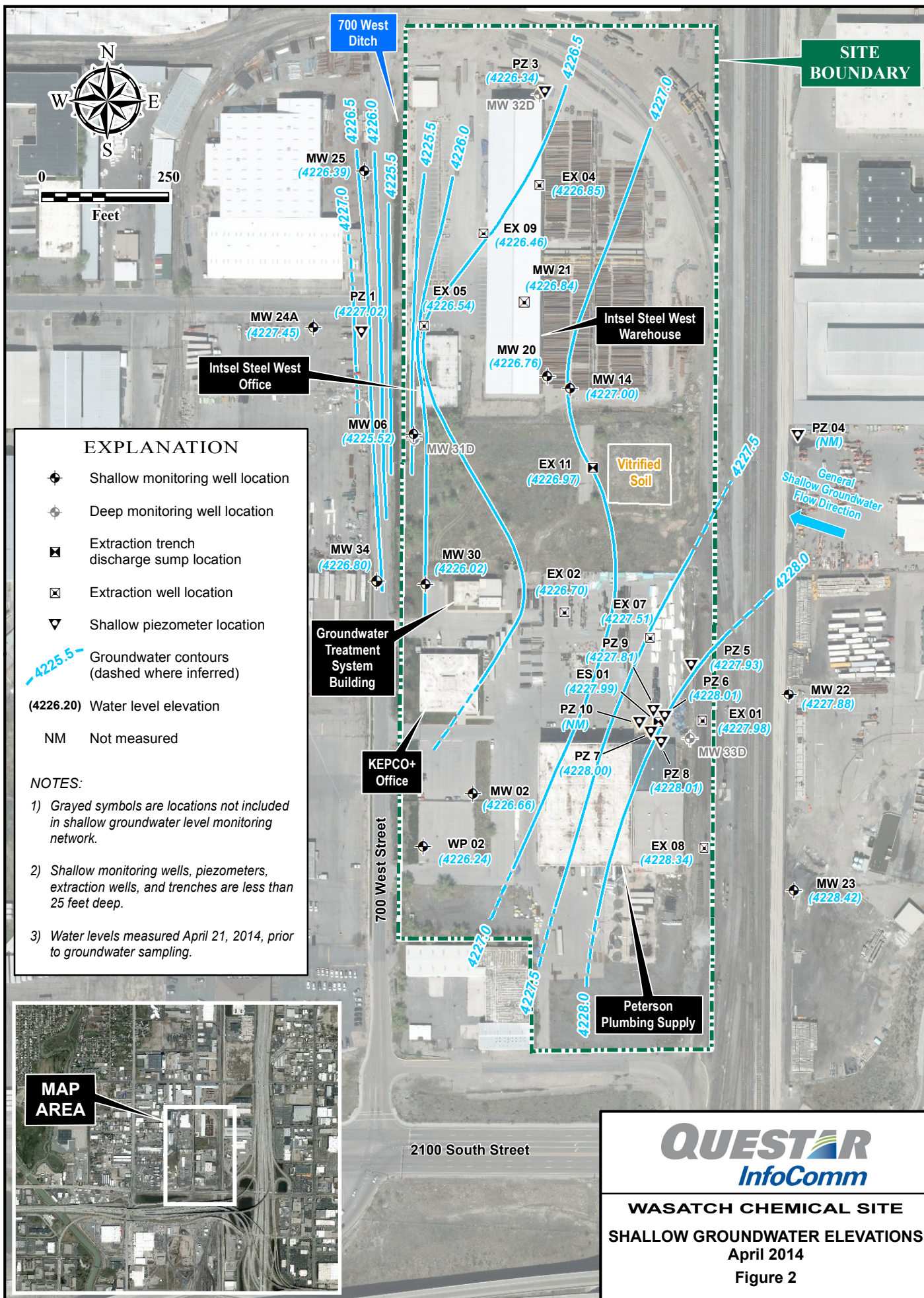
^(b) For nontrending data sets, MCL exceedances were determined by comparing the lower confidence limit to the MCL; for trending data sets, the lower limit of the confidence band was compared to the MCL.

^(c) Presence of significant trend determined using Mann-Kendall method, with 99% confidence level as indicated in the Site Consent Decree (U.S. District Court, 1991).

^(d) Alternate Performance Standards are defined in the Site Consent Decree (U.S. District Court, 1991)

µg/l micrograms per liter
MCL maximum contaminant level
NA not applicable





EXPLANATION

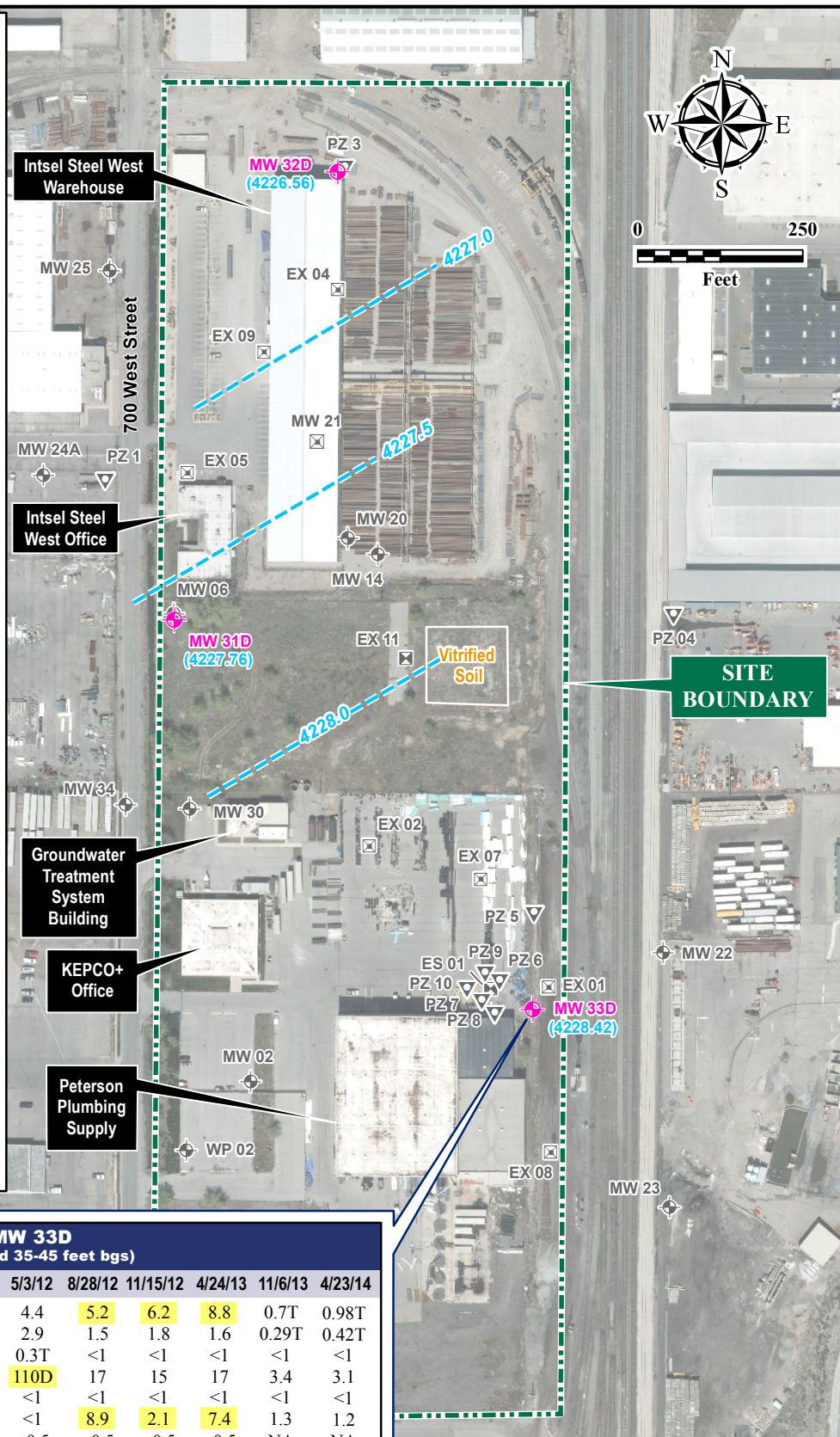
- Deeper monitoring well location
 Monitoring well location
 Extraction trench discharge sump location
 Extraction well location
 Piezometer location
 Deeper groundwater potentiometric surface contour (dashed where inferred)
 (4227.01) Water-level elevation
MCL Maximum contaminant level
PCE Tetrachloroethene
TCE Trichloroethene
DCE Dichloroethene
VC Vinyl chloride
PCP Pentachlorophenol
DO Dissolved oxygen
ORP Oxidation-reduction potential
bgs below ground surface
NA not analyzed
µg/l Micrograms per liter
mg/l Milligrams per liter
mV Millivolts
D Sample diluted for analysis
J Estimated
T Identified below reporting limit

NOTES:

- 1) Water levels measured April 21, 2014
- 2) Contours based on water-level elevations measured in wells MW 31D, MW 32D, and MW 33D screened 38-48, 46-56, and 35-45 feet bgs, respectively.
- 3) Volatile organic and/or herbicide compounds have not been detected in MW 31D or MW 32D; herbicide compounds have not been detected in MW 33D.

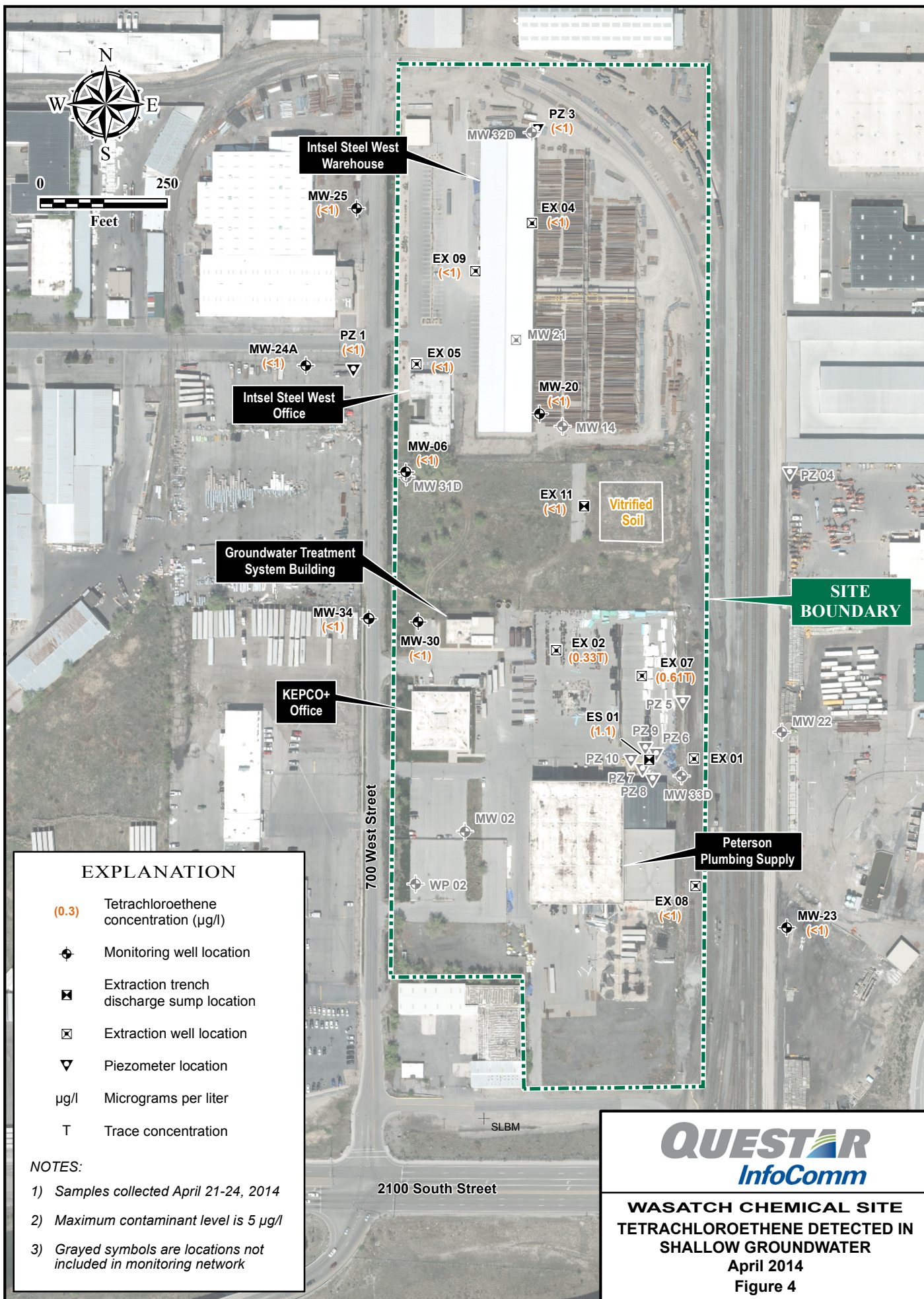
MW 33D (screened 35-45 feet bgs)									
Analyte	MCL	12/28/11	2/7/12	5/3/12	8/28/12	11/15/12	4/24/13	11/6/13	4/23/14
PCE	5	46	19	4.4	5.2	6.2	8.8	0.7T	0.98T
TCE	5	31J	48	2.9	1.5	1.8	1.6	0.29T	0.42T
1,1-DCE	7	<1	0.3T	0.3T	<1	<1	<1	<1	<1
cis-1,2-DCE	70	4.7	140D	110D	17	15	17	3.4	3.1
trans-1,2-DCE	100	<1	<1	<1	<1	<1	<1	<1	<1
VC	2	<1	<1	<1	8.9	2.1	7.4	1.3	1.2
PCP	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	NA	NA
ethylbenzene	700	27J	52	3.6	<1	10	5.1	7	12
m/p-xylenes	10,000 ^(a)	83D	150D	36	7.5	33	39	14	15
o-xylenes	10,000 ^(a)	46	33	9.6	12	13	18	5.6	7.7
toluene	1000	10	5.2	2.8	0.7T	2.8	1.6	1.1	0.47T
ORP (mV)	-	-17	-158	-180	-227	-150	-244	-155	-158
DO (mg/l)	-	0.0	0.0	0.2	0.2	0.1	0.0	0.2	0.0

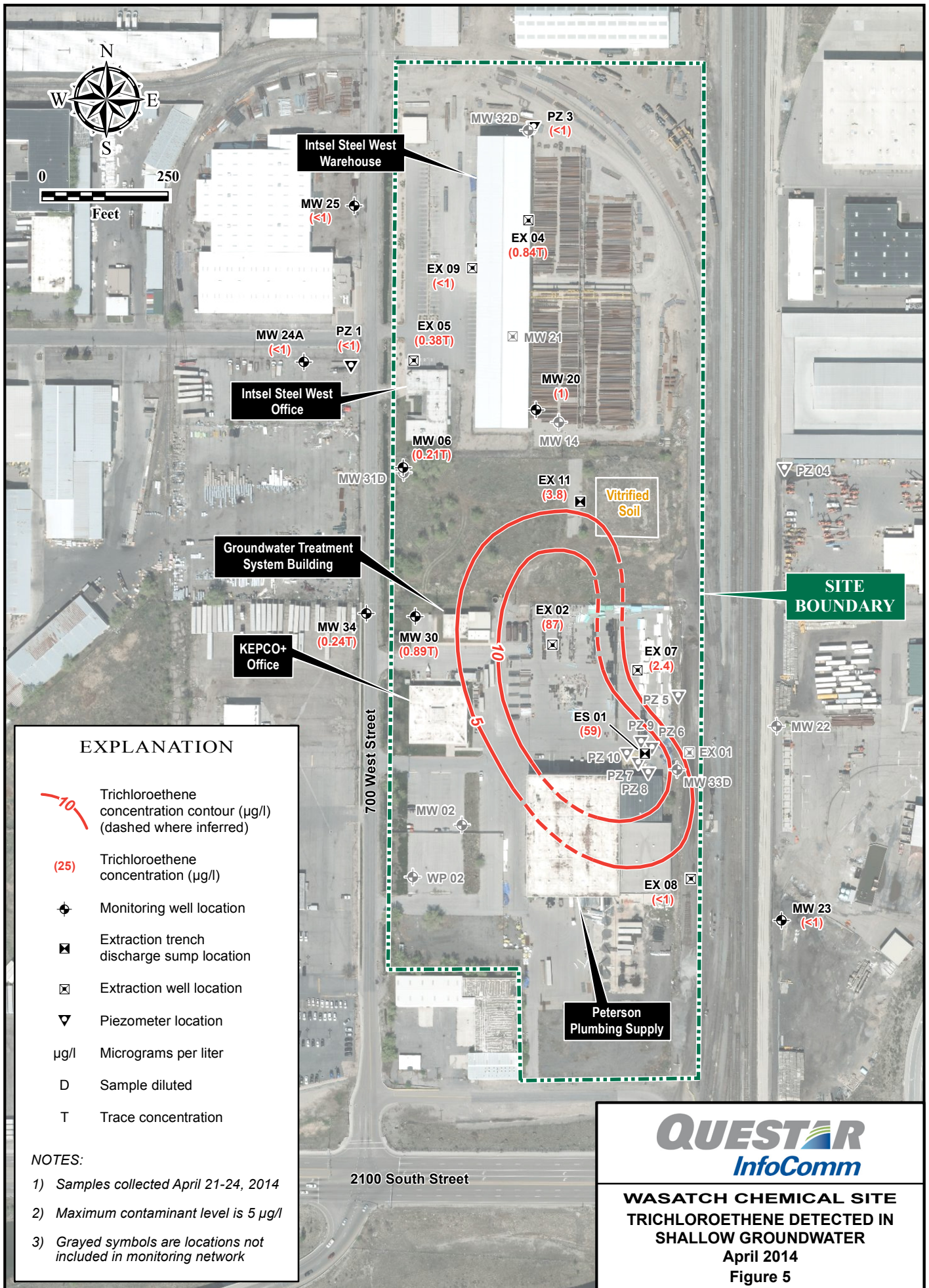
All concentrations reported in µg/l unless noted otherwise
 Yellow highlighting indicates concentration > MCL
 MCL for total xylenes is 10,000 µg/l

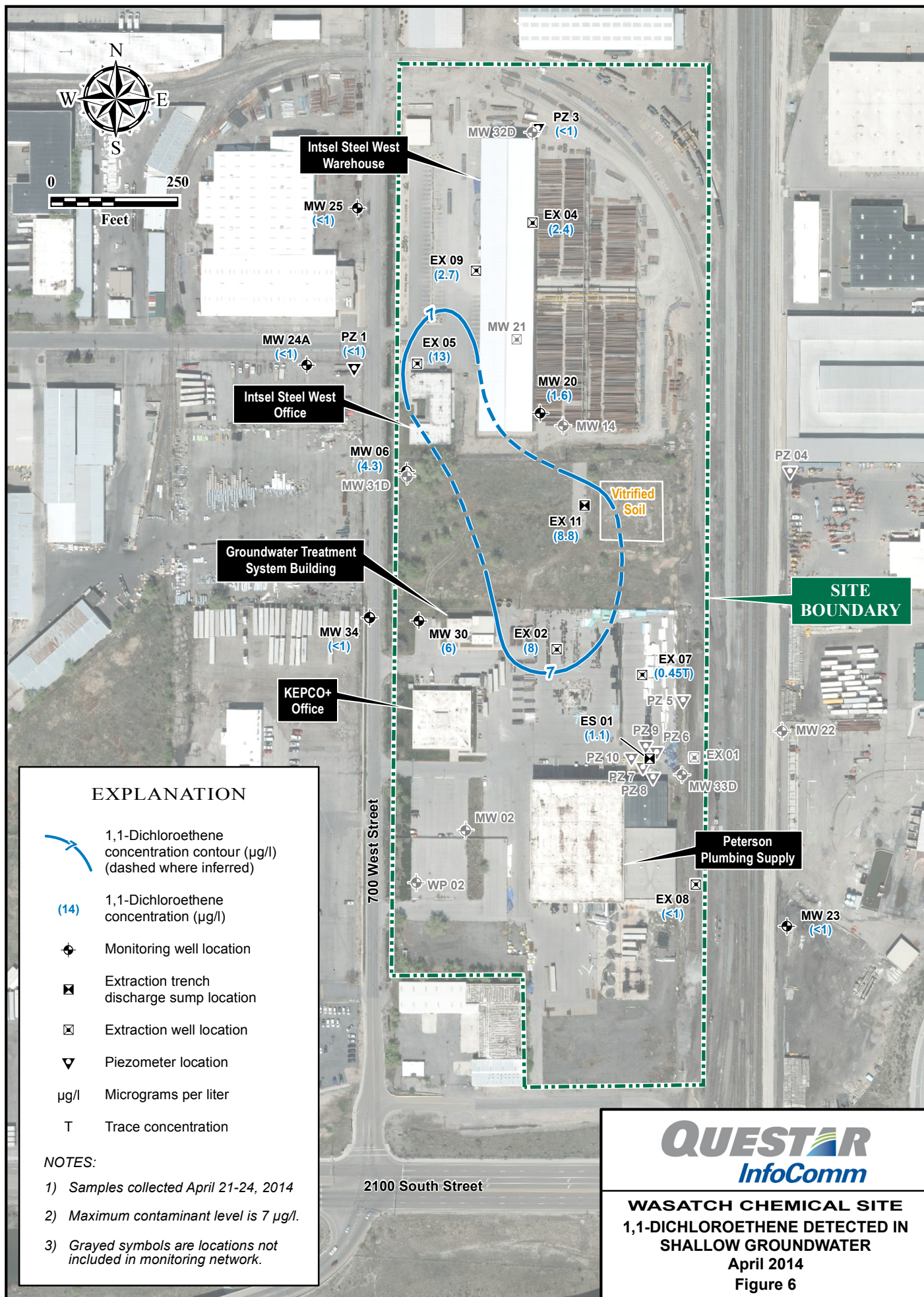


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**WASATCH CHEMICAL SITE
 DEEPER GROUNDWATER ANALYTICAL
 RESULTS AND WATER LEVEL ELEVATIONS
 April 2014
 Figure 3**

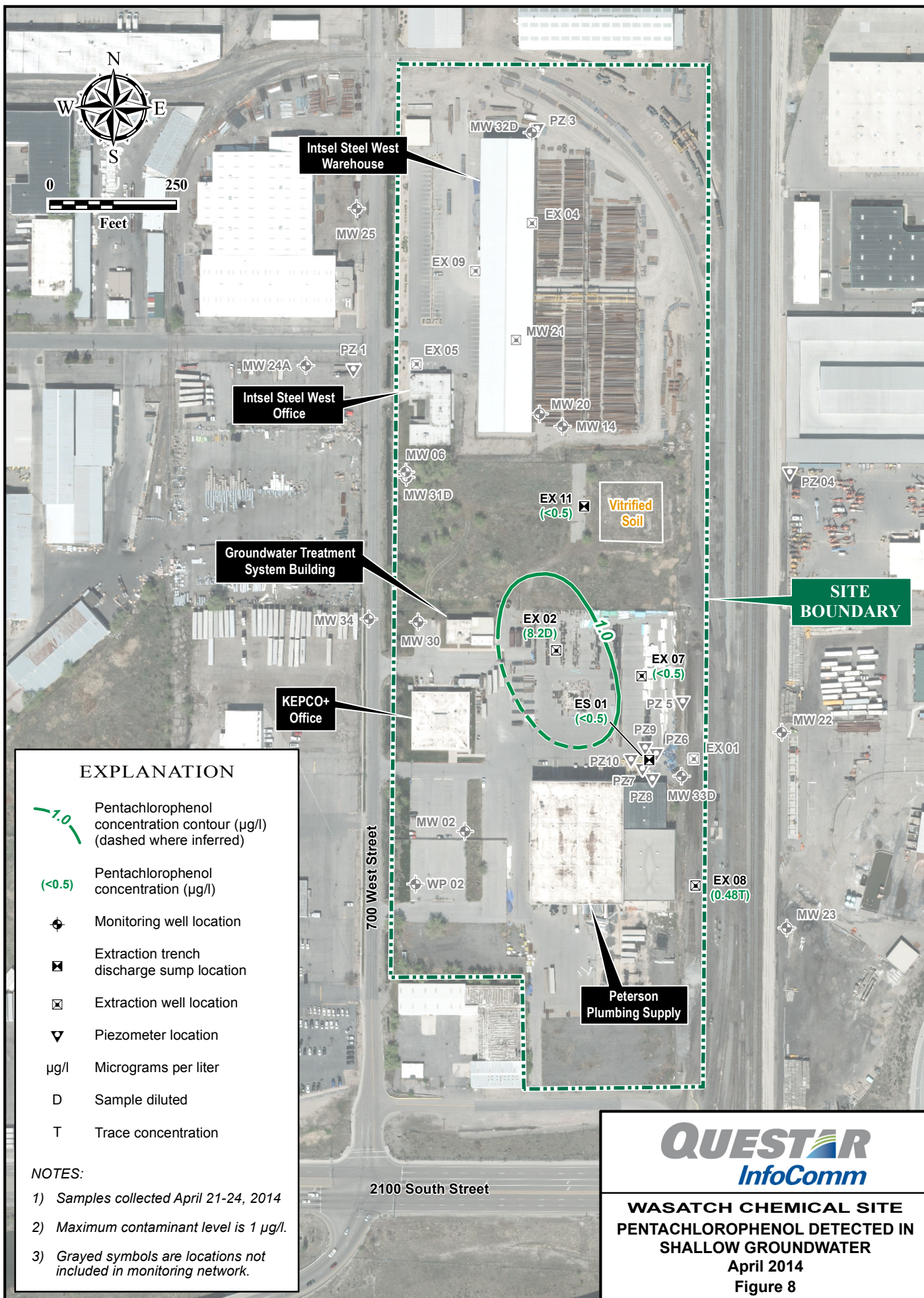






8 Jul 2014





DATE: 8 Jul 2014

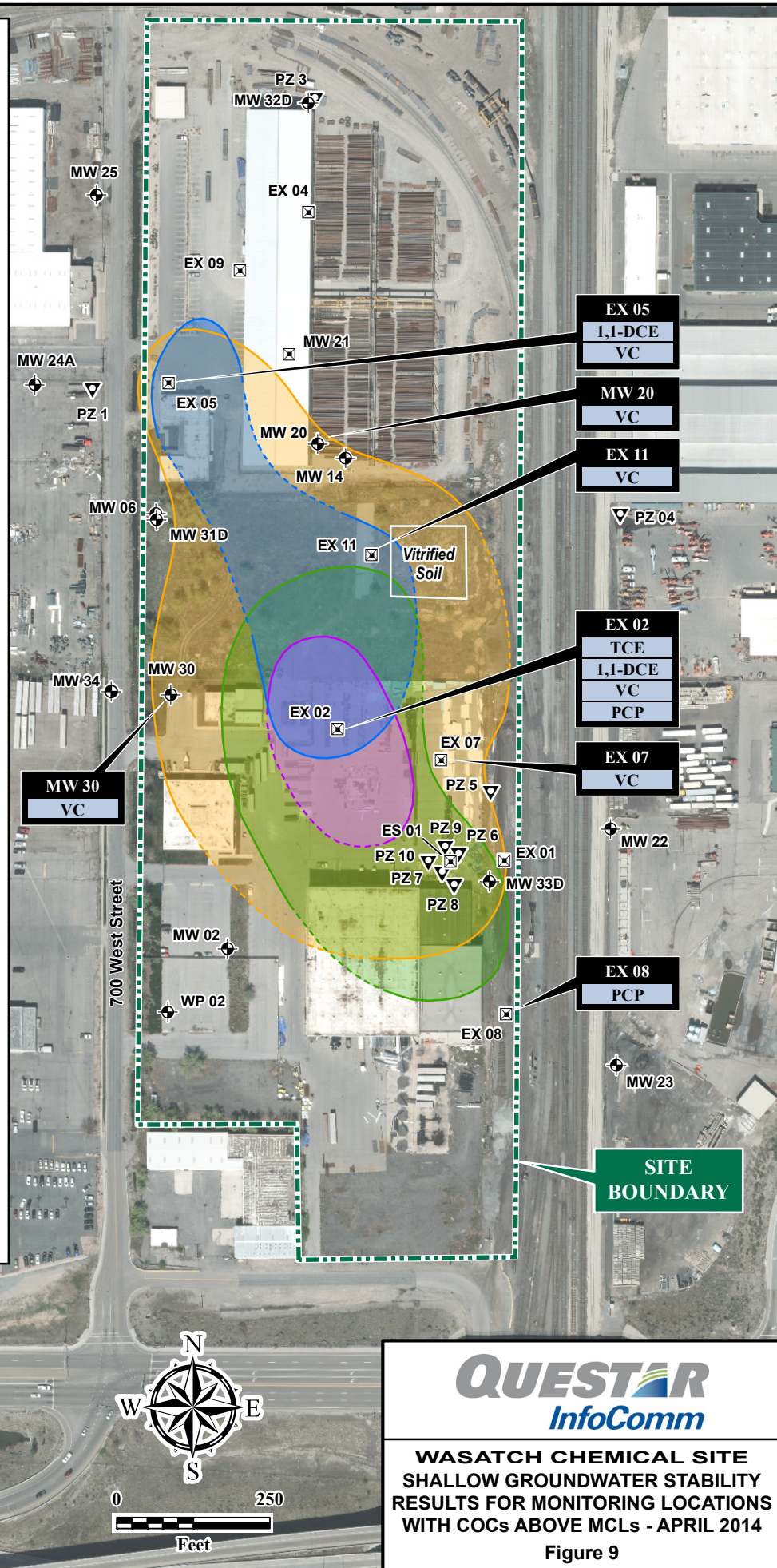
FILE: D:\MWH\Questar\Wasatch Chemical\PROGRESS REPORT_No101\FIGURES\Fig 9_Shallow GW Stability Results for Mon Locs w COCs above MCL_Apr2014.mxd

EXPLANATION

-  Monitoring well location
-  Extraction trench discharge sump location
-  Extraction well location
-  Piezometer location
- COC Constituent of concern
- MCL Maximum contaminant level
- PCE Tetrachloroethene
- TCE Trichloroethene
- 1,1-DCE 1,1-Dichloroethene
- PCP Pentachlorophenol
- VC Vinyl chloride
-  **PLUME ATTENUATION**
Statistically above MCL with decreasing trend
-  **PLUME STABILITY**
Statistically above MCL with no trend
-  TCE shallow groundwater plume MCL (5 µg/l) footprint
-  1,1-DCE shallow groundwater plume MCL (7 µg/l) footprint
-  VC shallow groundwater plume MCL (2 µg/l) footprint
-  PCP shallow groundwater plume MCL (1 µg/l) footprint

NOTES:

- 1) The eight most recent data points were used to evaluate statistically significant COC concentrations.
- 2) Statistical trend analyses did not identify any trends for monitoring locations with COC concentrations statistically above MCLs.
- 3) Plume footprints were drawn from April 2014 data.



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**WASATCH CHEMICAL SITE
SHALLOW GROUNDWATER STABILITY
RESULTS FOR MONITORING LOCATIONS
WITH COCs ABOVE MCLs - APRIL 2014**

Figure 9



APPENDIX A
DATA VERIFICATION

APPENDIX A

DATA VERIFICATION WINTER AND SPRING 2014 GROUNDWATER SAMPLING

Introduction. Groundwater samples were collected as listed in Table A-1 at the Wasatch Chemical Site on February 20 and April 21 - 24, 2014. A summary of the analytical data is presented in Table A-2. The following paragraphs summarize the results of the data validation.

Sampling Procedures. All groundwater samples were collected as scheduled and in accordance with the Quality Assurance Project Plan (QAPP) Revision 2 (MWH, 2012), the *Monitored Natural Attenuation Work Plan* (MWH, 2002), and the *Focused Shallow Soil and Deeper Groundwater Investigation and Sentry Well Installation Work Plan* (MWH, 2012a).

Analytical Procedures and Detection Limits. All samples were analyzed in accordance with the methodology, detection limits, and quality control (QC) criteria specified in the project QAPP (MWH, 2012). EMAX Laboratories Inc. provided analytical services.

Holding times were evaluated and are presented in Table A-3. All holding times met method criteria.

Two field duplicate (FD) samples were collected. A summary of the field duplicate results as compared with the normal sample results for these locations is presented in Table A-4. Requested matrix spike (MS) and/or matrix spike duplicate (MSD) analyses were performed on groundwater samples collected from MW-34 and MW-20.

The following occurred during sample analysis resulting in flagged or qualified data; however, there was no impact to data usability:

- Dilutions were required during VOC analysis due to the high concentrations of analyte(s). The affected sample results are flagged with a “D” to indicate sample dilution in Table A-2.

The following occurred during sample analysis but did not result in flagged or qualified data; however, there was no impact to data usability:

- The ambient blank and equipment blank collected in April 2014 both contained sulfate. Associated sample concentrations were greater than 50 times the blank concentration. Data were not qualified.

Data Verification Process. The data were validated based on the criteria specified in the project QAPP (MWH, 2012). The results of the data verification are summarized in the following tables:

- Table A-1, Summary of Groundwater and Soil Samples
- Table A-2, Sample Data Summary
- Table A-3, Holding Time Summary
- Table A-4, Field Duplicate Data Summary

All holding times, reporting limits, accuracy, precision, and representativeness criteria, as specified in the QAPP (MWH, 2012), were met.

Conclusions. Based on the results of the data verification, the data are considered precise, accurate, and representative, as qualified. Sampling completeness for this project is 100 percent, and analytical completeness for this sampling round is 100 percent, which meets the completeness goal of 85 percent.

References.

- MWH, 1996. Final Ground-water Monitoring Plan, Wasatch Chemical Site. August 1996.
- MWH, 2002. Monitored Natural Attenuation Work Plan, Wasatch Chemical Site Addendum to the Final Extraction and Treatment System Performance Standards, Milestones, and Shutdown Procedures document. November 14, 2002.
- MWH, 2011. Final Groundwater Monitoring Well Installation and Sampling Plan, Wasatch Chemical Site. October 2011.
- MWH, 2012. Quality Assurance Project Plan, Revision 2, Wasatch Chemical Site. March 2012.
- MWH, 2012a. Final Focused Shallow Soil and Deeper Groundwater Investigation and Sentry Well Installation Work Plan, Revision 2.0. November 2012.

TABLE A-1

SUMMARY OF GROUNDWATER SAMPLES
Q-76 AND Q-77, FEBRUARY AND APRIL 2014
WASATCH CHEMICAL SITE, SALT LAKE CITY, UTAH
 (Page 1 of 1)

Location Identification	Field Sample Identification	Date Collected	Sample Matrix	Sampling Technique	Sample Type	VOCs SW-846 8260B	PCP SW-846 8151A	Anions E300	Sulfide E376.2
ES-01	ES-01-77	22-Apr-14	WG	G	N	X	X	X	X
EX-02	EX-02-77	22-Apr-14	WG	G	N	X	X	X	X
EX-04	EX-04-77	22-Apr-14	WG	G	N	X	NS	X	X
EX-05	EX-05-77	22-Apr-14	WG	G	N	X	NS	X	X
EX-07	EX-07-77	22-Apr-14	WG	G	N	X	X	X	X
EX-08	EX-08-77	21-Apr-14	WG	G	N	X	X	X	X
EX-09	EX-09-77	22-Apr-14	WG	G	N	X	NS	X	X
EX-09	SX-909-77	22-Apr-14	WG	G	FD	X	NS	X	X
EX-11	EX-11-77	22-Apr-14	WG	G	N	X	X	X	X
MW-06	MW-06-77	21-Apr-14	WG	G	N	X	NS	X	X
MW-20	MW-20-77	22-Apr-14	WG	G	N	X	NS	X	X
MW-20	SW-920-77	22-Apr-14	WG	G	FD	X	NS	X	X
MW-20	MW-20-77	22-Apr-14	WG	G	LR	NS	NS	X	X
					MS	X	NS	X	X
					SD	X	NS	X	NS
MW-23	MW-23-77	21-Apr-14	WG	G	N	X	NS	X	X
MW-24A	MW-24A-77	23-Apr-14	WG	G	N	X	NS	X	X
MW-25	MW-25-77	24-Apr-14	WG	G	N	X	NS	X	X
MW-30	MW-30-77	24-Apr-14	WG	G	N	X	NS	X	X
					LR	NS	NS	NS	X
					MS	NS	NS	NS	X
MW-31D	MW-31D-77	21-Apr-14	WG	G	N	X	NS	X	X
MW-32D	MW-32D-77	23-Apr-14	WG	G	N	X	NS	X	X
MW-33D	MW-33D-77	23-Apr-14	WG	G	N	X	NS	X	X
MW-34	MW-34-76	20-Feb-14	WG	SP	N	X	X	X	X
					LR	NS	NS	X	X
					MS	X	X	X	X
					SD	X	X	X	X
MW-34	MW-34-77	24-Apr-14	WG	G	N	X	NS	X	X
PZ-1	PZ-1-77	23-Apr-14	WG	G	N	X	NS	X	X
					LR	NS	NS	X	NS
					MS	NS	NS	X	NS
					SD	NS	NS	X	NS
PZ-3	PZ-3-77	23-Apr-14	WG	G	N	X	NS	X	X
FIELDQC	TRIP BLANK20021401	20-Feb-14	WQ	NA	TB	X	NS	NS	NS
	TB-4-21-14	21-Apr-14	WQ	NA	TB	X	NS	NS	NS
	EB-4-22-14	22-Apr-14	WQ	G	EB	X	NS	X	X
	TB-4-22-14	22-Apr-14	WQ	NA	TB	X	NS	NS	NS
	TB-4-23-14	23-Apr-14	WQ	NA	TB	X	NS	NS	NS
	EQ-4-24-14	24-Apr-14	WQ	NA	AB	X	NS	X	X
	TB-4-24-14	24-Apr-14	WQ	NA	TB	X	NS	NS	NS

AB	Ambient blank	N	Compliance sample	TB	Trip blank
EB	Equipment rinseate blank	NA	Not applicable	VOCs	Volatile organic compounds
FD	Field Duplicate	NS	Not sampled	WG	Groundwater
G	Grab sample	PCP	Pentachlorophenol	WQ	Reagent Grade water or distilled water
LR	Laboratory replicate	SD	Matrix spike duplicate	X	Sampled
MS	Matrix spike				

TABLE A-2

GROUNDWATER SAMPLE DATA SUMMARY
Q-76 AND Q-77, FEBRUARY AND APRIL 2014
WASATCH CHEMICAL COMPANY, SALT LAKE CITY, UTAH
 (Page 1 of 4)

Location Identification		ES-01	EX-02	EX-04	EX-05	EX-07	EX-08	EX-09
Field Sample Identification		ES-01-77	EX-02-77	EX-04-77	EX-05-77	EX-07-77	EX-08-77	EX-09-77
Date Collected		4/22/2014	4/22/2014	4/22/2014	4/22/2014	4/22/2014	4/21/2014	4/22/2014
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Analyte/Methods (Units)								
Herbicides (µg/l)								
Pentachlorophenol		<0.5	8.2 D	--	--	<0.5	0.48 T	--
Chemistry Parameters (mg/l)								
Nitrogen, Nitrate (as N)		0.0772 T	0.937	0.346	<0.1	0.532	5.73 D	0.165
Nitrogen, Nitrite		<0.1	<0.4 D	<0.1	<0.25 D	<0.2 D	<1 D	<0.1
Sulfate (as SO ₄)		67.5 D	1180 D	330 D	1450 D	142 D	487 D	1220 D
Sulfide		0.363	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Volatile Organic Compounds (µg/l)								
1,1-Dichloroethene		1.1	8	2.4	13	0.45 T	<1	2.7
Benzene		--	--	--	--	--	--	--
cis-1,2-Dichloroethene		44	240 D	31	180 D	8.4	<1	31
Ethylbenzene		--	--	--	--	--	--	--
m,p-Xylene (Sum of isomers)		--	--	--	--	--	--	--
Naphthalene		--	--	--	--	--	--	--
o-Xylene (1,2-Dimethylbenzene)		--	--	--	--	--	--	--
Tetrachloroethene (PCE)		1.1	0.33 T	<1	<1	0.61 T	<1	<1
Toluene		--	--	--	--	--	--	--
trans-1,2-Dichloroethene		0.87 T	11	7.8	180 D	1.7	<1	10
Trichloroethene (TCE)		59	87	0.84 T	0.38 T	2.4	<1	<1
Vinyl chloride		39	53	0.89 T	12	6.1	<1	0.24 T

µg/l micrograms per liter.

mg/l milligrams per liter.

Bold Bolded result indicates positively identified compound.

-- Not scheduled.

D Sample dilution required for analysis; reported values reflect the dilution.

T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.

TABLE A-2

GROUNDWATER SAMPLE DATA SUMMARY
Q-76 AND Q-77, FEBRUARY AND APRIL 2014
WASATCH CHEMICAL COMPANY, SALT LAKE CITY, UTAH
 (Page 2 of 4)

	Location Identification	EX-09 Dup	EX-11	MW-06	MW-20	MW-20 Dup	MW-23	MW-24A
	Field Sample Identification	SX-909-77	EX-11-77	MW-06-77	MW-20-77	SW-920-77	MW-23-77	MW-24A-77
	Date Collected	4/22/2014	4/22/2014	4/21/2014	4/22/2014	4/22/2014	4/21/2014	4/23/2014
	Matrix	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Analyte/Methods (Units)								
Herbicides (µg/l)								
Pentachlorophenol		--	<0.5	--	--	--	--	--
Chemistry Parameters (mg/l)								
Nitrogen, Nitrate (as N)		0.164	0.058 T	0.0594 T	0.634	0.69	0.413 TD	0.0601 T
Nitrogen, Nitrite		<0.1	<0.4 D	<0.2 D	<0.1	<0.4 D	<4 D	<0.1
Sulfate (as SO ₄)		1190 D	897 D	597 D	1030 D	1020 D	405 D	285 D
Sulfide		<0.1	0.0312 T	0.0445 T	<0.1	<0.1	0.0802 T	<0.1
Volatile Organic Compounds (µg/l)								
1,1-Dichloroethene		2.8	8.8	4.3	1.6	1.6	<1	<1
Benzene		--	--	--	--	--	--	--
cis-1,2-Dichloroethene		32	430 D	24	25	24	<1	<1
Ethylbenzene		--	--	--	--	--	--	--
m,p-Xylene (Sum of isomers)		--	--	--	--	--	--	--
Naphthalene		--	--	--	--	--	--	--
o-Xylene (1,2-Dimethylbenzene)		--	--	--	--	--	--	--
Tetrachloroethene (PCE)		<1	<1	<1	<1	<1	<1	<1
Toluene		--	--	--	--	--	--	--
trans-1,2-Dichloroethene		10	88	5.3	15	15	<1	<1
Trichloroethene (TCE)		<1	3.8	0.21 T	1	1	<1	<1
Vinyl chloride		0.27 T	530 D	1.4	2.1	1.9	<1	<1

µg/l micrograms per liter.

mg/l milligrams per liter.

Bold Bolded result indicates positively identified compound.

-- Not scheduled.

D Sample dilution required for analysis; reported values reflect the dilution.

T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.

TABLE A-2

GROUNDWATER SAMPLE DATA SUMMARY
Q-76 AND Q-77, FEBRUARY AND APRIL 2014
WASATCH CHEMICAL COMPANY, SALT LAKE CITY, UTAH
 (Page 3 of 4)

Location Identification		MW-25	MW-30	MW-31D	MW-32D	MW-33D	MW-34	MW-34
Field Sample Identification		MW-25-77	MW-30-77	MW-31D-77	MW-32D-77	MW-33D-77	MW-34-76	MW-34-77
Date Collected		4/24/2014	4/24/2014	4/21/2014	4/23/2014	4/23/2014	2/20/2014	4/24/2014
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Analyte/Methods (Units)								
Herbicides (µg/l)								
Pentachlorophenol		--	--	--	--	--	<0.5	--
Chemistry Parameters (mg/l)								
Nitrogen, Nitrate (as N)		0.0505 T	0.056 T	0.0607 T	0.0502 T	0.0507 T	0.0556 T	0.0681 T
Nitrogen, Nitrite		<0.1	<0.2 D	<0.1	<0.1	<0.1	<0.2 D	<0.1
Sulfate (as SO ₄)		373 D	783 D	0.581	0.689	2.09	1050 D	681 D
Sulfide		<0.1	0.097 T	0.0334 T	0.0356 T	0.0601 T	0.0523 T	0.0707 T
Volatile Organic Compounds (µg/l)								
1,1-Dichloroethene		<1	6	<1	<1	<1	<1	<1
Benzene		--	--	--	--	<0.5	--	--
cis-1,2-Dichloroethene		<1	37	<1	<1	3.1	3	1.6
Ethylbenzene		--	--	--	--	12	--	--
m,p-Xylene (Sum of isomers)		--	--	--	--	15	--	--
Naphthalene		--	--	--	--	<1	--	--
o-Xylene (1,2-Dimethylbenzene)		--	--	--	--	7.7	--	--
Tetrachloroethene (PCE)		<1	<1	<1	<1	0.98 T	<1	<1
Toluene		--	--	--	--	0.47 T	--	--
trans-1,2-Dichloroethene		<1	0.81 T	<1	<1	<1	0.69 T	0.46 T
Trichloroethene (TCE)		<1	0.89 T	<1	<1	0.42 T	0.32 T	0.24 T
Vinyl chloride		<1	10	<1	<1	1.2	<1	<1

µg/l micrograms per liter.

mg/l milligrams per liter.

Bold Bolded result indicates positively identified compound.

-- Not scheduled.

D Sample dilution required for analysis; reported values reflect the dilution.

T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.

TABLE A-2

GROUNDWATER SAMPLE DATA SUMMARY
Q-76 AND Q-77, FEBRUARY AND APRIL 2014
WASATCH CHEMICAL COMPANY, SALT LAKE CITY, UTAH
 (Page 4 of 4)

Location Identification		PZ-1	PZ-3
Field Sample Identification		PZ-1-77	PZ-3-77
Date Collected		4/23/2014	4/23/2014
Matrix		Groundwater	Groundwater
Analyte/Methods (Units)			
Herbicides (µg/l)			
Pentachlorophenol		--	--
Chemistry Parameters (mg/l)			
Nitrogen, Nitrate (as N)		0.0661 T	<0.1
Nitrogen, Nitrite		<0.1	<0.2 D
Sulfate (as SO ₄)		485 D	2190 D
Sulfide		0.0267 T	<0.1
Volatile Organic Compounds (µg/l)			
1,1-Dichloroethene		<1	<1
Benzene		--	--
cis-1,2-Dichloroethene		<1	<1
Ethylbenzene		--	--
m,p-Xylene (Sum of isomers)		--	--
Naphthalene		--	--
o-Xylene (1,2-Dimethylbenzene)		--	--
Tetrachloroethene (PCE)		<1	<1
Toluene		--	--
trans-1,2-Dichloroethene		<1	<1
Trichloroethene (TCE)		<1	<1
Vinyl chloride		<1	<1

µg/l micrograms per liter.

mg/l milligrams per liter.

Bold Bolded result indicates positively identified compound.

-- Not scheduled.

D Sample dilution required for analysis; reported values reflect the dilution.

T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.

TABLE A-3

HOLDING TIME SUMMARY
Q-76 AND Q-77, FEBRUARY AND APRIL 2014
WASATCH CHEMICAL COMPANY, SALT LAKE CITY, UTAH
 (Page 1 of 6)

Location Identification	Field Identification	Sample Date	Sample Time	Analysis Code	Preparation Date	Preparation Holding Time (Days)	Method Holding Time (Days)	Analysis Date	Analysis Time	Analysis Holding Time (Days)	Method Holding Time (Days)
ES-01	ES-01-77	22-Apr-14	920	E300	N/A	N/A	N/A	23-Apr-14	1205	1	28
					N/A	N/A	N/A	23-Apr-14	2056	1	28
				E376.2	N/A	N/A	N/A	25-Apr-14	1238	3	7
				SW8151A	28-Apr-14	6		2-May-14	1547	10	14
				SW8260B	25-Apr-14	3	7	25-Apr-14	1539	3	7
EX-02	EX-02-77	22-Apr-14	1005	E300	N/A	N/A	N/A	23-Apr-14	1220	1	28
					N/A	N/A	N/A	23-Apr-14	1336	1	28
					N/A	N/A	N/A	23-Apr-14	2111	1	28
				E376.2	N/A	N/A	N/A	25-Apr-14	1238	3	7
				SW8151A	28-Apr-14	6		2-May-14	1614	10	14
				SW8260B	25-Apr-14	3	7	25-Apr-14	1741	3	7
					28-Apr-14	6	7	28-Apr-14	1153	6	7
EX-04	EX-04-77	22-Apr-14	1055	E300	N/A	N/A	N/A	23-Apr-14	1235	1	28
					N/A	N/A	N/A	23-Apr-14	2126	1	28
				E376.2	N/A	N/A	N/A	25-Apr-14	1239	3	7
				SW8260B	25-Apr-14	3	7	25-Apr-14	1640	3	7
EX-05	EX-05-77	22-Apr-14	1200	E300	N/A	N/A	N/A	23-Apr-14	1250	1	28
					N/A	N/A	N/A	23-Apr-14	1321	1	28
					N/A	N/A	N/A	23-Apr-14	2141	1	28
				E376.2	N/A	N/A	N/A	25-Apr-14	1240	3	7
				SW8260B	25-Apr-14	3	7	25-Apr-14	1609	3	7
					28-Apr-14	6	7	28-Apr-14	1224	6	7
EX-07	EX-07-77	22-Apr-14	1415	E300	N/A	N/A	N/A	23-Apr-14	1305	1	28
					N/A	N/A	N/A	23-Apr-14	1638	1	28
					N/A	N/A	N/A	23-Apr-14	2156	1	28
				E376.2	N/A	N/A	N/A	25-Apr-14	1240	3	7
				SW8151A	28-Apr-14	6		2-May-14	1641	10	14

TABLE A-3

HOLDING TIME SUMMARY
Q-76 AND Q-77, FEBRUARY AND APRIL 2014
WASATCH CHEMICAL COMPANY, SALT LAKE CITY, UTAH
 (Page 2 of 6)

Location Identification	Field Identification	Sample Date	Sample Time	Analysis Code	Preparation Date	Preparation Holding Time (Days)	Method Holding Time (Days)	Analysis Date	Analysis Time	Analysis Holding Time (Days)	Method Holding Time (Days)
EX-07	EX-07-77	22-Apr-14	1415	SW8260B	25-Apr-14	3	7	25-Apr-14	1709	3	7
EX-08	EX-08-77	21-Apr-14	1620	E300	N/A	N/A	N/A	22-Apr-14	1147	1	28
					N/A	N/A	N/A	22-Apr-14	1217	1	28
					N/A	N/A	N/A	22-Apr-14	1821	1	28
				E376.2	N/A	N/A	N/A	25-Apr-14	1237	4	7
				SW8151A	22-Apr-14	1		22-Apr-14	1922	1	14
				SW8260B	24-Apr-14	3	7	24-Apr-14	1722	3	7
EX-09	EX-09-77	22-Apr-14	1505	E300	N/A	N/A	N/A	23-Apr-14	1436	1	28
					N/A	N/A	N/A	23-Apr-14	2211	1	28
				E376.2	N/A	N/A	N/A	25-Apr-14	1241	3	7
				SW8260B	25-Apr-14	3	7	25-Apr-14	1437	3	7
EX-09	SX-909-77	22-Apr-14	1505	E300	N/A	N/A	N/A	23-Apr-14	1452	1	28
					N/A	N/A	N/A	23-Apr-14	2227	1	28
				E376.2	N/A	N/A	N/A	25-Apr-14	1241	3	7
				SW8260B	25-Apr-14	3	7	25-Apr-14	1508	3	7
EX-11	EX-11-77	22-Apr-14	1605	E300	N/A	N/A	N/A	23-Apr-14	1507	1	28
					N/A	N/A	N/A	23-Apr-14	1754	1	28
					N/A	N/A	N/A	23-Apr-14	2312	1	28
				E376.2	N/A	N/A	N/A	25-Apr-14	1242	3	7
				SW8151A	28-Apr-14	6		2-May-14	1709	10	14
				SW8260B	25-Apr-14	3	7	25-Apr-14	1811	3	7
					28-Apr-14	6	7	28-Apr-14	1255	6	7
MW-06	MW-06-77	21-Apr-14	1505	E300	N/A	N/A	N/A	22-Apr-14	1116	1	28
					N/A	N/A	N/A	22-Apr-14	1202	1	28
					N/A	N/A	N/A	22-Apr-14	1806	1	28
				E376.2	N/A	N/A	N/A	25-Apr-14	1236	4	7
				SW8260B	24-Apr-14	3	7	24-Apr-14	1621	3	7

TABLE A-3

HOLDING TIME SUMMARY
Q-76 AND Q-77, FEBRUARY AND APRIL 2014
WASATCH CHEMICAL COMPANY, SALT LAKE CITY, UTAH
 (Page 3 of 6)

Location Identification	Field Identification	Sample Date	Sample Time	Analysis Code	Preparation Date	Preparation Holding Time (Days)	Method Holding Time (Days)	Analysis Date	Analysis Time	Analysis Holding Time (Days)	Method Holding Time (Days)
MW-20	MW-20-77	22-Apr-14	1605	E300	N/A	N/A	N/A	23-Apr-14	1537	1	28
					N/A	N/A	N/A	23-Apr-14	1552	1	28
					N/A	N/A	N/A	23-Apr-14	1607	1	28
					N/A	N/A	N/A	23-Apr-14	1623	1	28
					N/A	N/A	N/A	23-Apr-14	2327	1	28
					N/A	N/A	N/A	23-Apr-14	2343	1	28
					N/A	N/A	N/A	23-Apr-14	2358	1	28
					N/A	N/A	N/A	24-Apr-14	13	2	28
				E376.2	N/A	N/A	N/A	25-Apr-14	1242	3	7
					N/A	N/A	N/A	25-Apr-14	1243	3	7
					N/A	N/A	N/A	25-Apr-14	1244	3	7
				SW8260B	28-Apr-14	6	7	28-Apr-14	1359	6	7
					28-Apr-14	6	7	28-Apr-14	1429	6	7
					28-Apr-14	6	7	28-Apr-14	1500	6	7
MW-20	SW-920-77	22-Apr-14	1605	E300	N/A	N/A	N/A	23-Apr-14	1522	1	28
					N/A	N/A	N/A	23-Apr-14	1909	1	28
					N/A	N/A	N/A	24-Apr-14	28	2	28
				E376.2	N/A	N/A	N/A	25-Apr-14	1244	3	7
				SW8260B	28-Apr-14	6	7	28-Apr-14	1052	6	7
MW-23	MW-23-77	21-Apr-14	1300	E300	N/A	N/A	N/A	22-Apr-14	1101	1	28
					N/A	N/A	N/A	22-Apr-14	1232	1	28
				E376.2	N/A	N/A	N/A	25-Apr-14	1236	4	7
				SW8260B	24-Apr-14	3	7	24-Apr-14	1550	3	7
MW-24A	MW-24A-77	23-Apr-14	1120	E300	N/A	N/A	N/A	24-Apr-14	1213	1	28
					N/A	N/A	N/A	24-Apr-14	1445	1	28
				E376.2	N/A	N/A	N/A	25-Apr-14	1246	2	7
				SW8260B	28-Apr-14	5	7	28-Apr-14	1630	5	7

TABLE A-3

HOLDING TIME SUMMARY
Q-76 AND Q-77, FEBRUARY AND APRIL 2014
WASATCH CHEMICAL COMPANY, SALT LAKE CITY, UTAH
 (Page 4 of 6)

Location Identification	Field Identification	Sample Date	Sample Time	Analysis Code	Preparation Date	Preparation Holding Time (Days)	Method Holding Time (Days)	Analysis Date	Analysis Time	Analysis Holding Time (Days)	Method Holding Time (Days)				
MW-25	MW-25-77	24-Apr-14	910	E300	N/A	N/A	N/A	25-Apr-14	1414	1	28				
					N/A	N/A	N/A	25-Apr-14	1545	1	28				
								E376.2	N/A	N/A	N/A	30-Apr-14	1342	6	7
								SW8260B	30-Apr-14	6	7	30-Apr-14	1337	6	7
MW-30	MW-30-77	24-Apr-14	805	E300	N/A	N/A	N/A	25-Apr-14	1359	1	28				
					N/A	N/A	N/A	25-Apr-14	1445	1	28				
					N/A	N/A	N/A	25-Apr-14	1500	1	28				
								E376.2	N/A	N/A	N/A	30-Apr-14	1341	6	7
					N/A	N/A	N/A	30-Apr-14	1342	6	7				
								SW8260B	30-Apr-14	6	7	30-Apr-14	1258	6	7
				MW-31D	MW-31D-77	21-Apr-14	1520	E300	N/A	N/A	N/A	22-Apr-14	1132	1	28
									E376.2	N/A	N/A	N/A	25-Apr-14	1237	4
	SW8260B	24-Apr-14	3					7	24-Apr-14	1651	3	7			
MW-32D	MW-32D-77	23-Apr-14	1020					E300	N/A	N/A	N/A	24-Apr-14	1158	1	28
					E376.2	N/A	N/A	N/A	25-Apr-14	1246	2	7			
					SW8260B	28-Apr-14	5	7	28-Apr-14	1700	5	7			
				MW-33D	MW-33D-77	23-Apr-14	1310	E300	N/A	N/A	N/A	24-Apr-14	1228	1	28
	E376.2	N/A	N/A					N/A	25-Apr-14	1247	2	7			
	SW8260B	28-Apr-14	5					7	28-Apr-14	1600	5	7			
MW-34	MW-34-76	20-Feb-14	1045					E300	N/A	N/A	N/A	21-Feb-14	1323	1	28
					N/A	N/A	N/A	21-Feb-14	1351	1	28				
					N/A	N/A	N/A	21-Feb-14	1419	1	28				
					N/A	N/A	N/A	21-Feb-14	1447	1	28				
					N/A	N/A	N/A	21-Feb-14	1610	1	28				
					N/A	N/A	N/A	21-Feb-14	1638	1	28				
					N/A	N/A	N/A	21-Feb-14	1706	1	28				
					N/A	N/A	N/A	21-Feb-14	1858	1	28				

TABLE A-3

HOLDING TIME SUMMARY
Q-76 AND Q-77, FEBRUARY AND APRIL 2014
WASATCH CHEMICAL COMPANY, SALT LAKE CITY, UTAH
 (Page 5 of 6)

Location Identification	Field Identification	Sample Date	Sample Time	Analysis Code	Preparation Date	Preparation Holding Time (Days)	Method Holding Time (Days)	Analysis Date	Analysis Time	Analysis Holding Time (Days)	Method Holding Time (Days)
MW-34	MW-34-76	20-Feb-14	1045	E300	N/A	N/A	N/A	21-Feb-14	1926	1	28
					N/A	N/A	N/A	21-Feb-14	1954	1	28
					N/A	N/A	N/A	21-Feb-14	2022	1	28
					N/A	N/A	N/A	21-Feb-14	2050	1	28
				E376.2	N/A	N/A	N/A	21-Feb-14	1501	1	7
					N/A	N/A	N/A	21-Feb-14	1502	1	7
				SW8151A	25-Feb-14	5		26-Feb-14	1509	6	14
					25-Feb-14	5		26-Feb-14	1536	6	14
					25-Feb-14	5		26-Feb-14	1604	6	14
				SW8260B	21-Feb-14	1	7	21-Feb-14	1532	1	7
					21-Feb-14	1	7	21-Feb-14	1611	1	7
					21-Feb-14	1	7	21-Feb-14	1649	1	7
MW-34	MW-34-77	24-Apr-14	1020	E300	N/A	N/A	N/A	25-Apr-14	1430	1	28
					N/A	N/A	N/A	25-Apr-14	1530	1	28
				E376.2	N/A	N/A	N/A	30-Apr-14	1343	6	7
				SW8260B	30-Apr-14	6	7	30-Apr-14	1416	6	7
PZ-1	PZ-1-77	23-Apr-14	1400	E300	N/A	N/A	N/A	24-Apr-14	1258	1	28
					N/A	N/A	N/A	24-Apr-14	1314	1	28
					N/A	N/A	N/A	24-Apr-14	1359	1	28
					N/A	N/A	N/A	24-Apr-14	1414	1	28
					N/A	N/A	N/A	24-Apr-14	1500	1	28
					N/A	N/A	N/A	24-Apr-14	1515	1	28
					N/A	N/A	N/A	24-Apr-14	1530	1	28
					N/A	N/A	N/A	24-Apr-14	1545	1	28
				E376.2	N/A	N/A	N/A	25-Apr-14	1247	2	7
				SW8260B	28-Apr-14	5	7	28-Apr-14	1530	5	7

TABLE A-3

HOLDING TIME SUMMARY
Q-76 AND Q-77, FEBRUARY AND APRIL 2014
WASATCH CHEMICAL COMPANY, SALT LAKE CITY, UTAH
 (Page 6 of 6)

Location Identification	Field Identification	Sample Date	Sample Time	Analysis Code	Preparation Date	Preparation Holding Time (Days)	Method Holding Time (Days)	Analysis Date	Analysis Time	Analysis Holding Time (Days)	Method Holding Time (Days)
PZ-3	PZ-3-77	23-Apr-14	1000	E300	N/A	N/A	N/A	24-Apr-14	1143	1	28
					N/A	N/A	N/A	24-Apr-14	1243	1	28
					N/A	N/A	N/A	24-Apr-14	1429	1	28
				E376.2	N/A	N/A	N/A	25-Apr-14	1245	2	7
				SW8260B	28-Apr-14	5	7	28-Apr-14	1730	5	7

N/A Not applicable

TABLE A-4

FIELD DUPLICATE DATA SUMMARY
Q-76 AND Q-77, FEBRUARY AND APRIL 2014
WASATCH CHEMICAL COMPANY, SALT LAKE CITY, UTAH
 (Page 1 of 1)

Location Identification	EX-09-77	EX-09-77 Dup		MW-20-77	MW-20-77 Dup	
Field Sample Identification	EX-09-77	SX-909-77		MW-20-77	SW-920-77	
Sample Type	Normal	Field Duplicate		Normal	Field Duplicate	
Date Collected	4/22/2014	4/22/2014		4/22/2014	4/22/2014	
Matrix	WG	WG		WG	WG	
Analyte/Methods (Units)			RPD			RPD
Chemistry Parameters (mg/l)						
Nitrogen, Nitrate (as N)	0.165	0.164	0.61	0.634	0.69	8.46
Nitrogen, Nitrite	<0.1	<0.1	NC	<0.1	<0.4 D	NC
Sulfate (as SO ₄)	1220 D	1190 D	2.49	1030 D	1020 D	0.98
Sulfide	<0.1	<0.1	NC	<0.1	<0.1	NC
Volatile Organic Compounds (µg/l)						
1,1-Dichloroethene	2.7	2.8	3.64	1.6	1.6	0
cis-1,2-Dichloroethene	31	32	3.17	25	24	4.08
Tetrachloroethene (PCE)	<1	<1	NC	<1	<1	NC
trans-1,2-Dichloroethene	10	10	0	15	15	0
Trichloroethene (TCE)	<1	<1	NC	1	1	0
Vinyl chloride	0.24 T	0.27 T	11.8	2.1	1.9	10

µg/l micrograms per liter.

mg/l milligrams per liter.

Bold Bolded result indicates positively identified compound.

NC Not calculated.

D Sample dilution required for analysis; reported values reflect the dilution.

T Analyte was positively identified but the reported concentration is estimated; reported concentration is less than the reporting limit, but greater than the method detection limit.

APPENDIX B

HISTORICAL TIME SERIES
GROUNDWATER MONITORING DATA

APPENDIX B
GROUNDWATER ANALYTICAL DATA
HISTORICAL TIME SERIES TABLES AND PLOTS

WASATCH CHEMICAL SITE

List of Exhibits

Exhibit B-1	Historical Time Series Data Extraction Trench ES-01
Exhibit B-2	Historical Time Series Data Extraction Well EX-02
Exhibit B-3	Historical Time Series Data Extraction Well EX-04
Exhibit B-4	Historical Time Series Data Extraction Well EX-05
Exhibit B-5	Historical Time Series Data Extraction Well EX-07
Exhibit B-6	Historical Time Series Data Extraction Well EX-08
Exhibit B-7	Historical Time Series Data Extraction Well EX-09
Exhibit B-8	Historical Time Series Data Extraction Well EX-11
Exhibit B-9	Historical Time Series Data Monitoring Well MW-06
Exhibit B-10	Historical Time Series Data Monitoring Well MW-20
Exhibit B-11	Historical Time Series Data Monitoring Well MW-23
Exhibit B-12	Historical Time Series Data Monitoring Well MW-24A
Exhibit B-13	Historical Time Series Data Monitoring Well MW-25
Exhibit B-14	Historical Time Series Data Monitoring Well MW-30
Exhibit B-15	Historical Time Series Data Piezometer PZ-1
Exhibit B-16	Historical Time Series Data Piezometer PZ-3
Exhibit B-17	Historical Time Series Data Monitoring Well MW-31D
Exhibit B-18	Historical Time Series Data Monitoring Well MW-32D
Exhibit B-19	Historical Time Series Data Monitoring Well MW-33D
Exhibit B-20	Historical Time Series Data Monitoring Well MW-34

APPENDIX B
LIST OF ACRONYMS AND DATA QUALIFIERS

µg/l	micrograms per liter
2,4-D	2,4-dichlorophenoxyacetic acid
B	Analyte was detected in associated blank sample
BZ	benzene
BZME	toluene
D	Sample dilution was conducted
DCE	dichloroethene
EBZ	ethylbenzene
G	Data qualifier definition is unknown
J	Value was estimated
J+	Value was estimated, biased high
J-	Value was estimated, biased low
PCE	tetrachloroethene
PCP	pentachlorophenol
TCE	trichloroethene
U	Analyte not detected above the method detection limit
UB	Analyte deemed not detected due to detection in associated blank sample

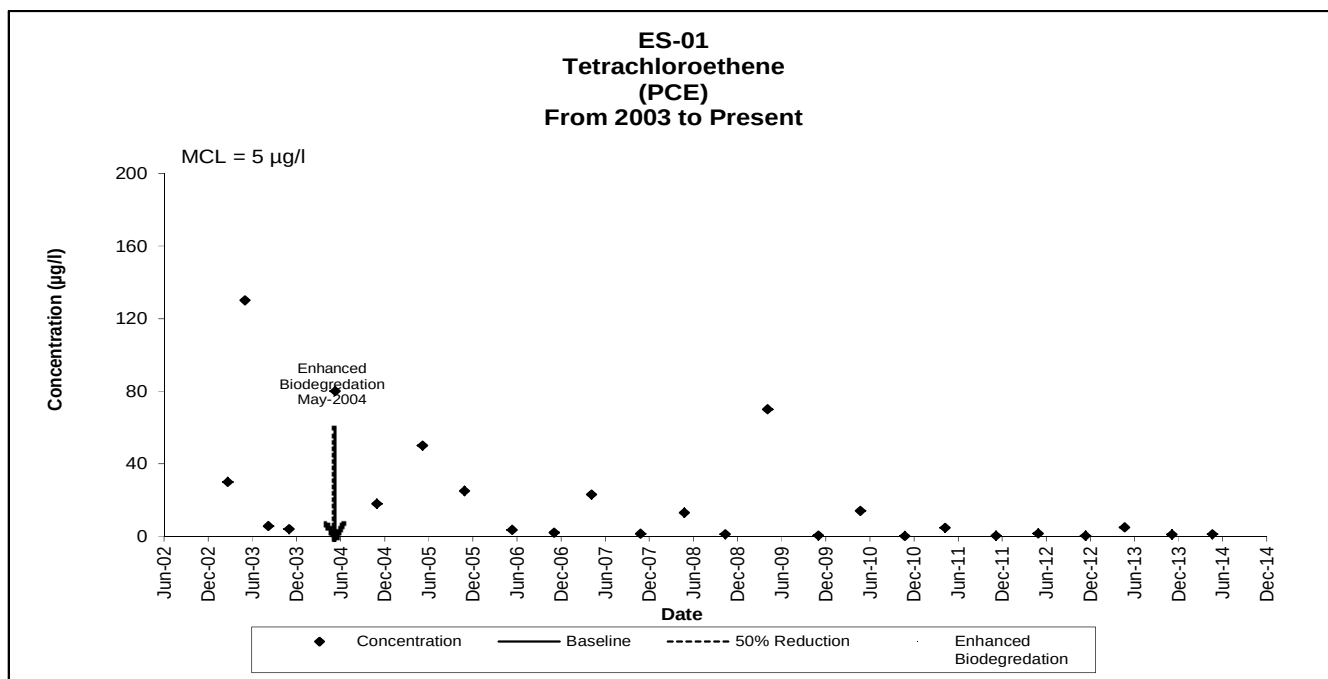
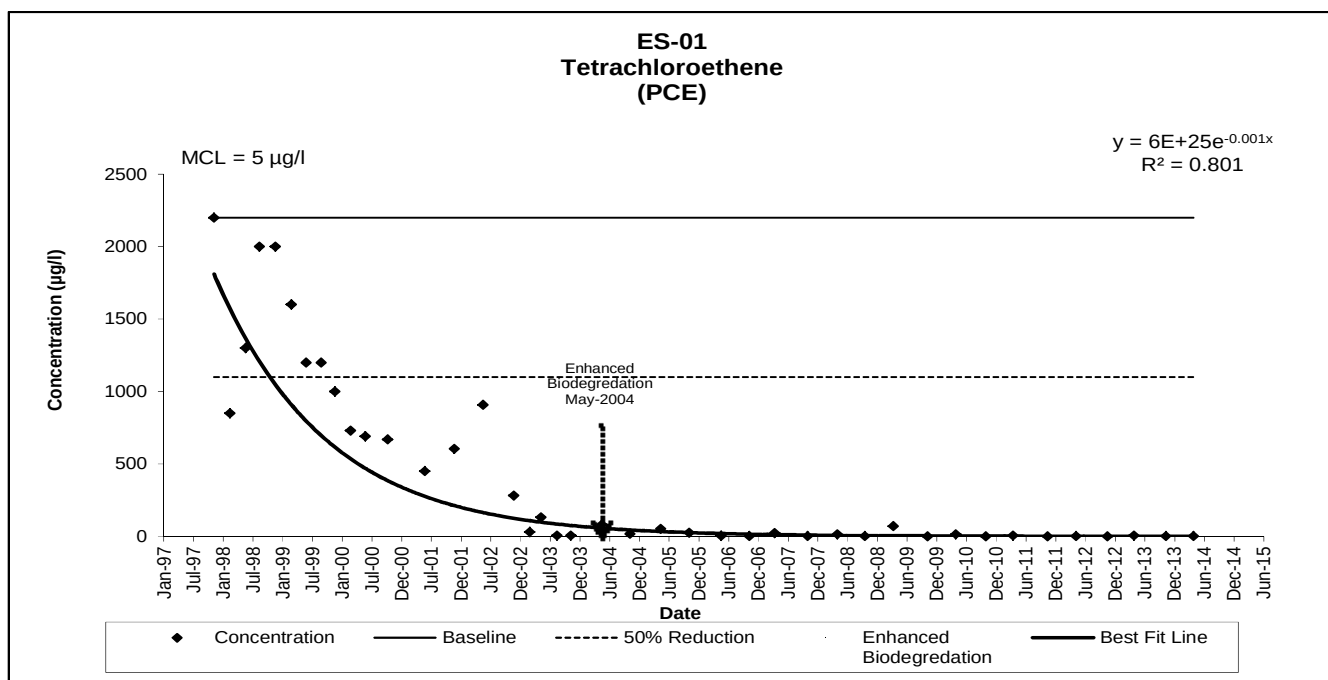
EXHIBIT B-1
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION TRENCH ES-01

LABORATORY PARAMETERS								
Sample Date	PCE (µg/l)	TCE (µg/l)	1,1-DCE (µg/l)	cis-1,2-DCE (µg/l)	trans-1,2-DCE (µg/l)	VC (µg/l)	2,4-D (µg/l)	PCP (µg/l)
6-Nov-97	2200	890	270	--	--	--	260	4700
12-Feb-98	850 B	310 B	53	--	--	--	33	870 JG
19-May-98	1300	620	140	--	--	--	38	1100
12-Aug-98	2000	770	100	--	--	--	65	980
17-Nov-98	2000	690	87	--	--	--	48	1000
23-Feb-99	1600 J	750 J	82 J	--	--	--	30	670
26-May-99	1200	660	< 500 G	--	--	--	55	640
25-Aug-99	1200	410	33 T	--	--	--	35	240
17-Nov-99	1000	590	36 T	--	--	--	16	380
22-Feb-00	730	270	18 T	--	--	--	11.4	79
23-May-00	690	570	28 T	--	--	--	14.2	210
6-Oct-00	670 D	460 D	36 D	--	--	--	25 J	120 D
23-May-01	450 D	410 D	30 D	--	--	--	13	360 D
19-Nov-01	603 D	555 D	33 D	--	--	--	10	130
15-May-02	907 D	524 D	33 D	--	--	--	7.9	100
20-Nov-02	280 D	100 D	< 50 D	--	--	--	8.6	43 T
25-Feb-03	30	59	3.5	--	--	64	1.6	8 T
6-May-03	130 D	100 D	3 TD	--	--	31 D	1.7	1.3
12-Aug-03	5.7	14	2.2	--	--	505 D	< 0.5	0.3 TJ
5-Nov-03	4 TD	6 TD	< 10 D	--	--	51 D	< 2.4	0.07 TJ
14-May-04	80 DJ	106 D	9.7	--	--	80 D	--	21 D
3-Nov-04	18	19	0.7 T	--	--	6.1	--	3.2
10-May-05	< 50 D	35 TD	< 50 D	--	--	70 D	--	5.1 J
31-Oct-05	< 25 D	< 25 D	< 25 D	--	--	< 25 D	--	< 0.5
16-May-06	3.6	24	5.7	--	--	60 D	--	8 D
6-Nov-06	2	4.5	0.55 T	--	--	10 J-	--	< 0.5
9-Apr-07	23	39	1.9	--	--	11	--	1.5
29-Oct-07	1.4	2	< 1	--	--	2.4	--	0.11 T
28-Apr-08	13	62 D	6.1	--	--	85 D	--	16 D
14-Oct-08	1.2	2.4	< 1	--	--	1.6	--	< 0.5
7-Apr-09	70 D	150 D	10 J	210 D	1.8 J	75 D	--	42 TDJ
3-Nov-09	0.37 T	1.7	< 1	0.81 T	0.5 T	0.73 T	--	< 0.5
26-Apr-10	14	47	6.7	78	0.77 T	30 J	--	26 D
26-Oct-10	0.21 T	0.44 T	< 1	0.45 T	< 1	0.35 T	--	< 0.5
11-Apr-11	4.7	19	2.6	48	0.64 T	18	--	8.6 D
9-Nov-11	0.29 T	2.3	< 1	1.4	0.39 T	1.2	--	< 0.5
1-May-12	1.6	10	1.5	64	0.8 T	60 D	--	10 D
12-Nov-12	0.31 T	1.4	< 1	0.6 T	< 1	0.44 T	--	< 0.5
23-Apr-13	5	29	2.9	26	0.42 T	13	--	4 D
5-Nov-13	< 1	0.76 T	0.27 T	0.74 T	0.37 T	0.83 T	--	< 0.5
22-Apr-14	1.1	59	1.1	44	0.87 T	39	--	< 0.5

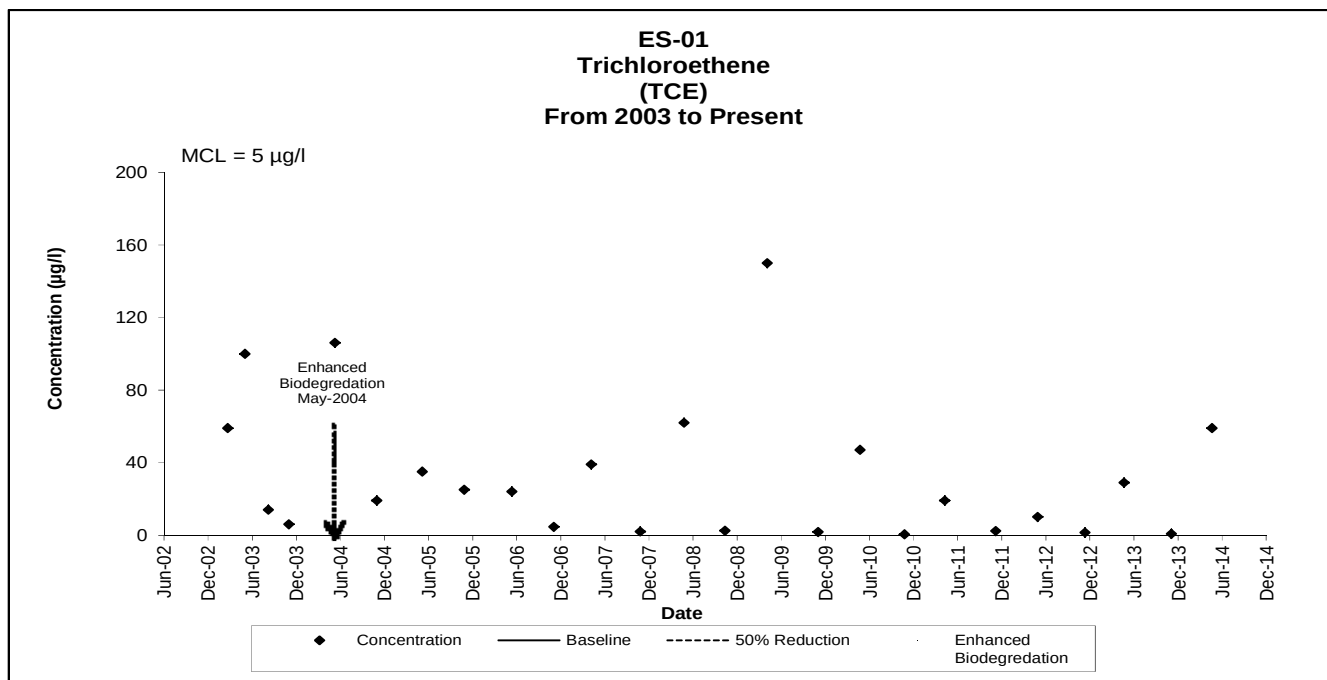
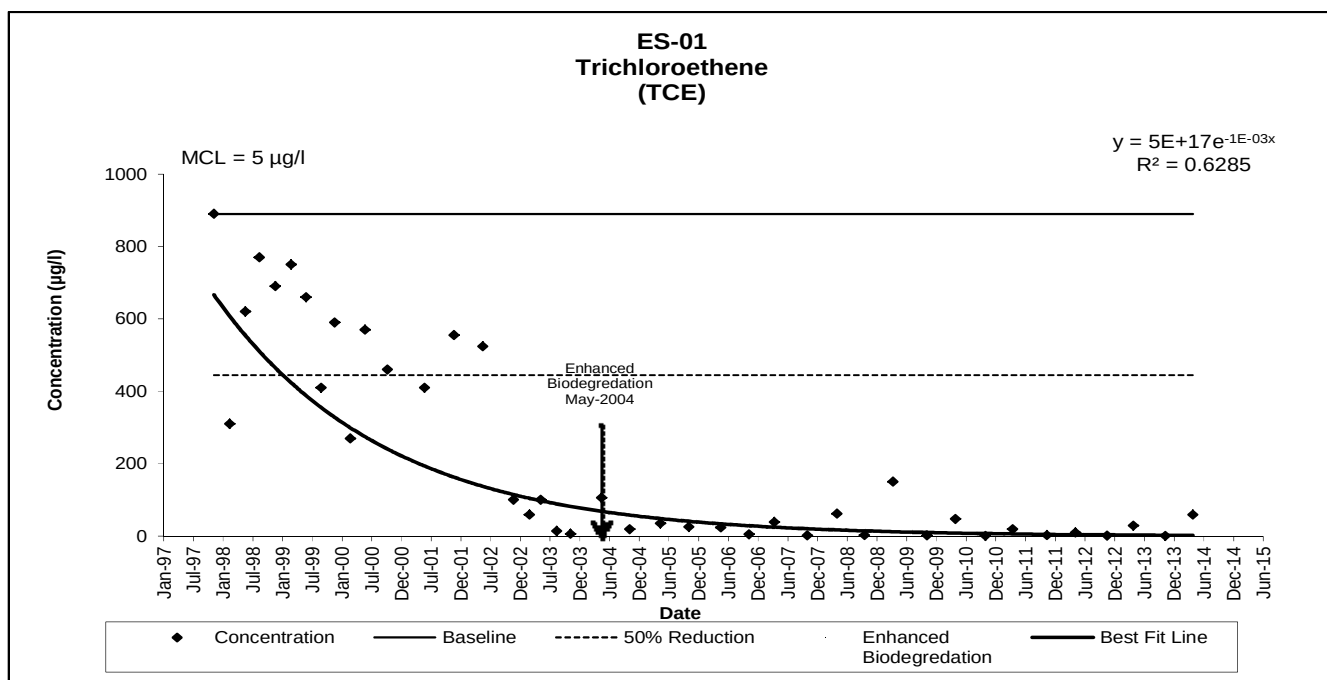
Data qualifiers are defined in laboratory reports. For data collected since 2001, a list of data qualifier definitions is included at the front of this appendix.

-- Not analyzed

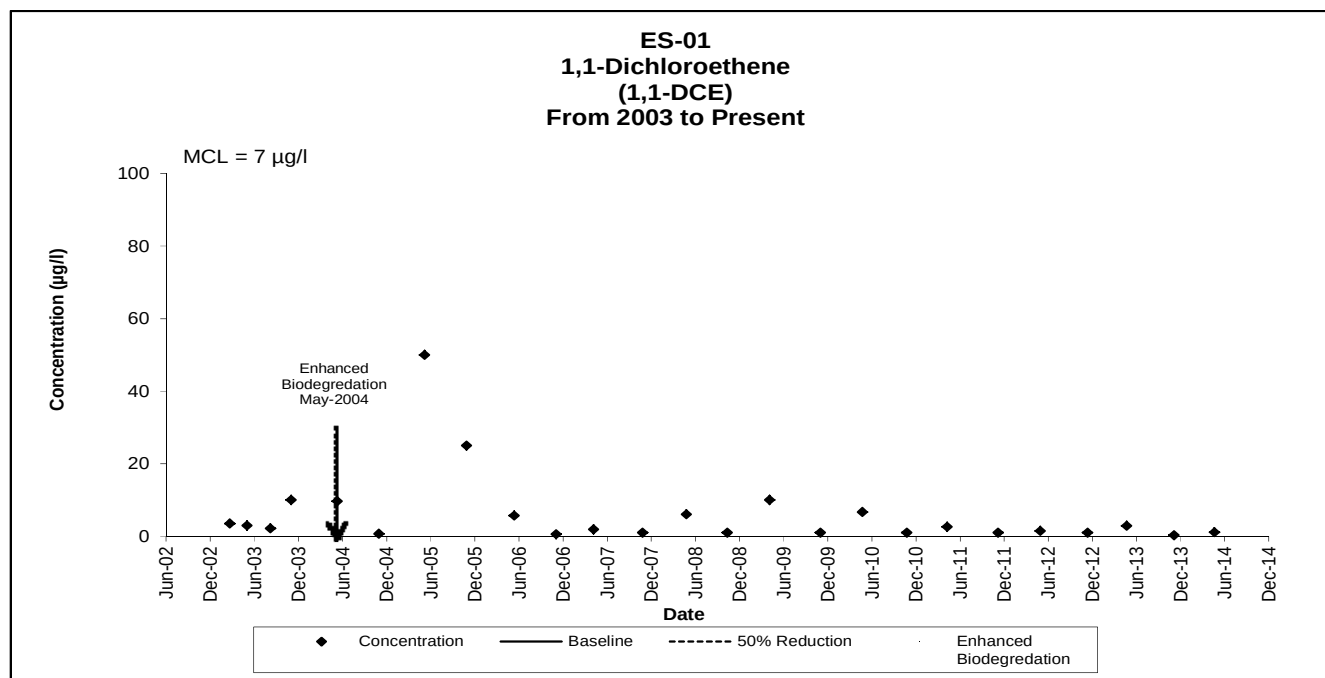
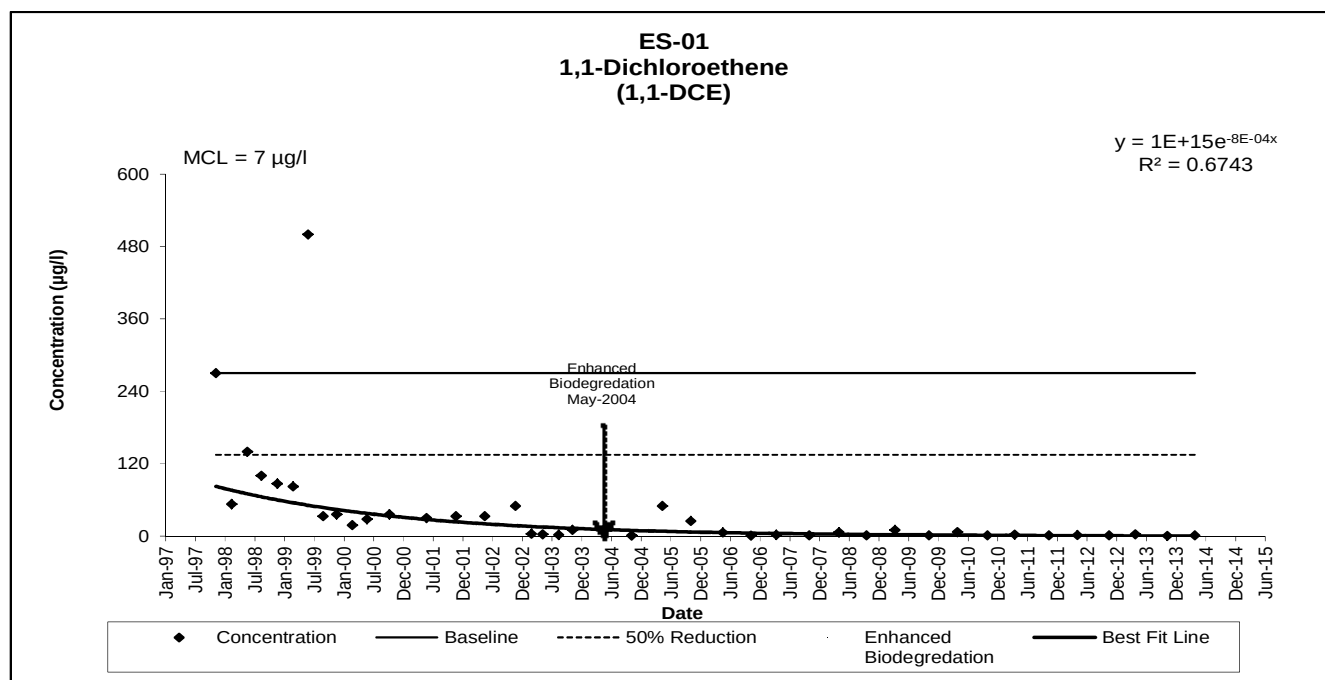
**EXHIBIT B-1
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION TRENCH ES-01**



**EXHIBIT B-1
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION TRENCH ES-01**



**EXHIBIT B-1
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION TRENCH ES-01**



**EXHIBIT B-1
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION TRENCH ES-01**

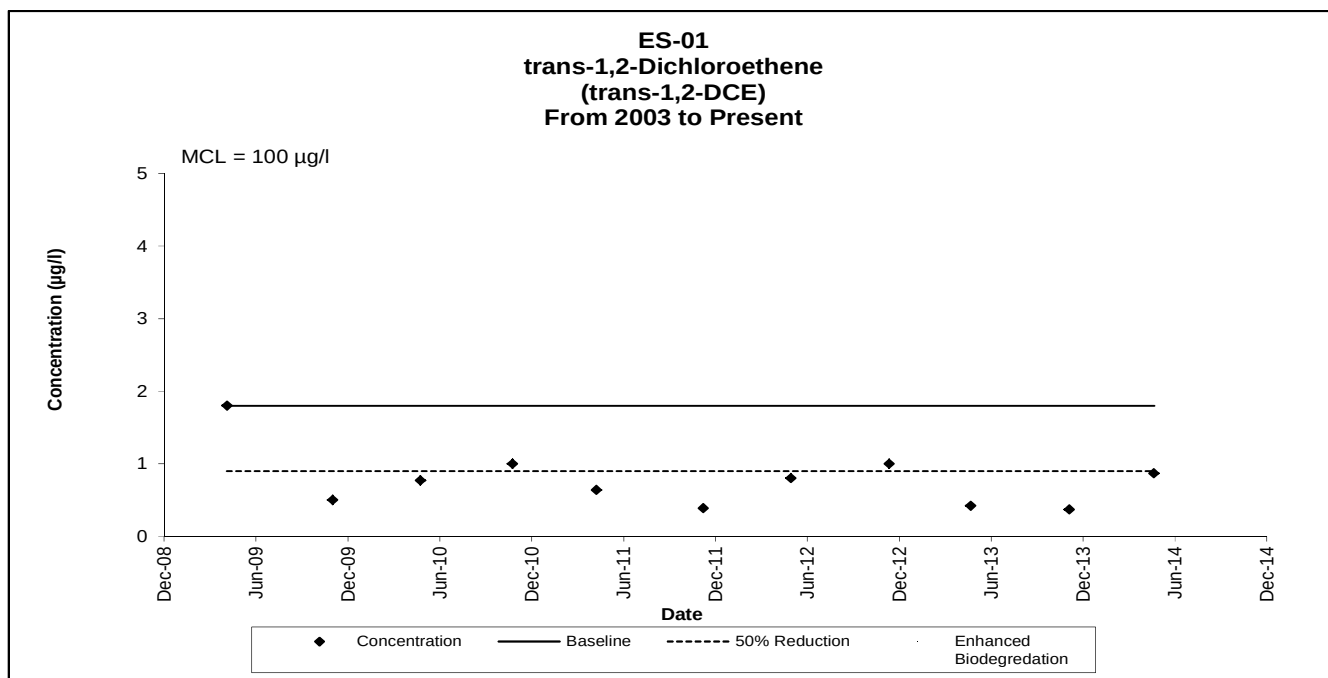
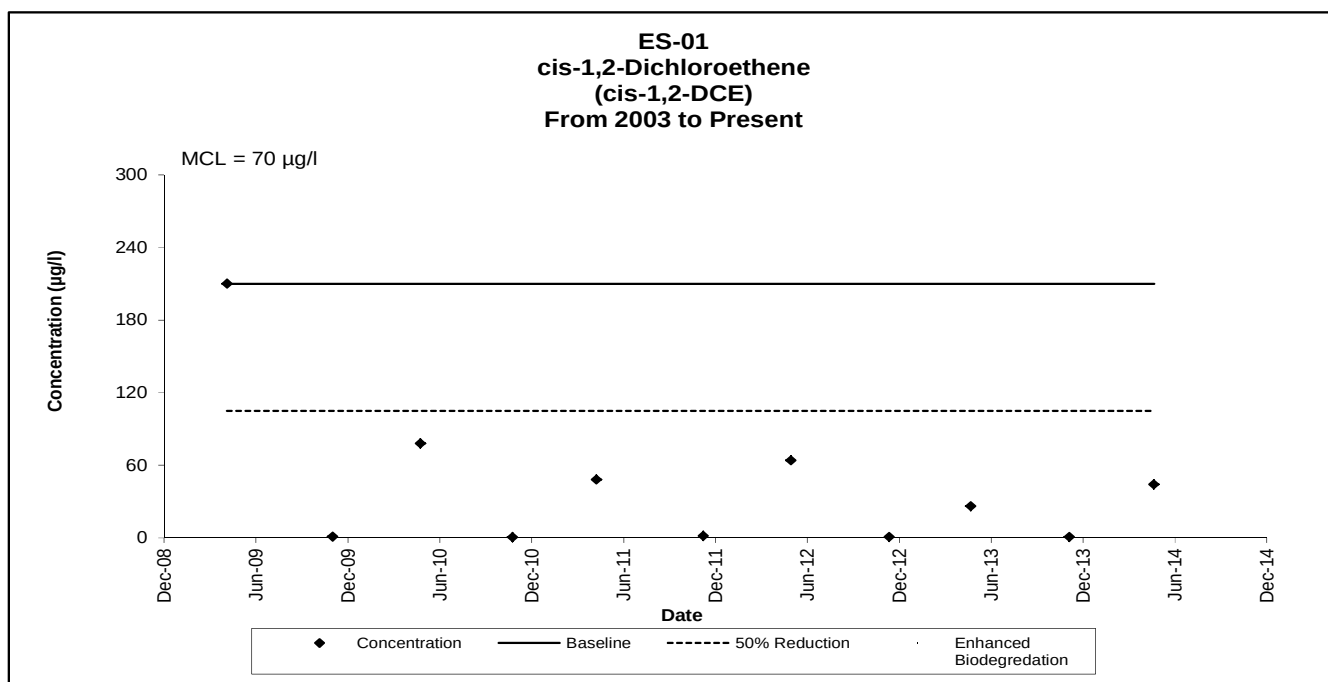
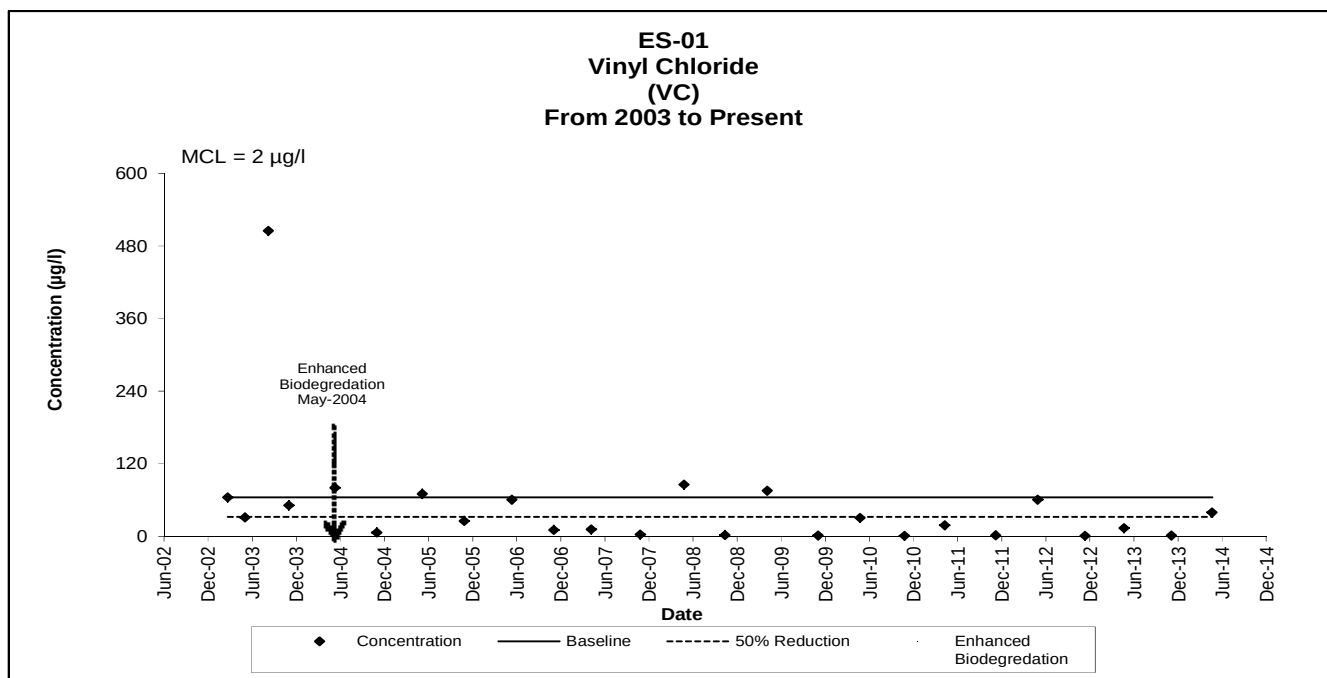
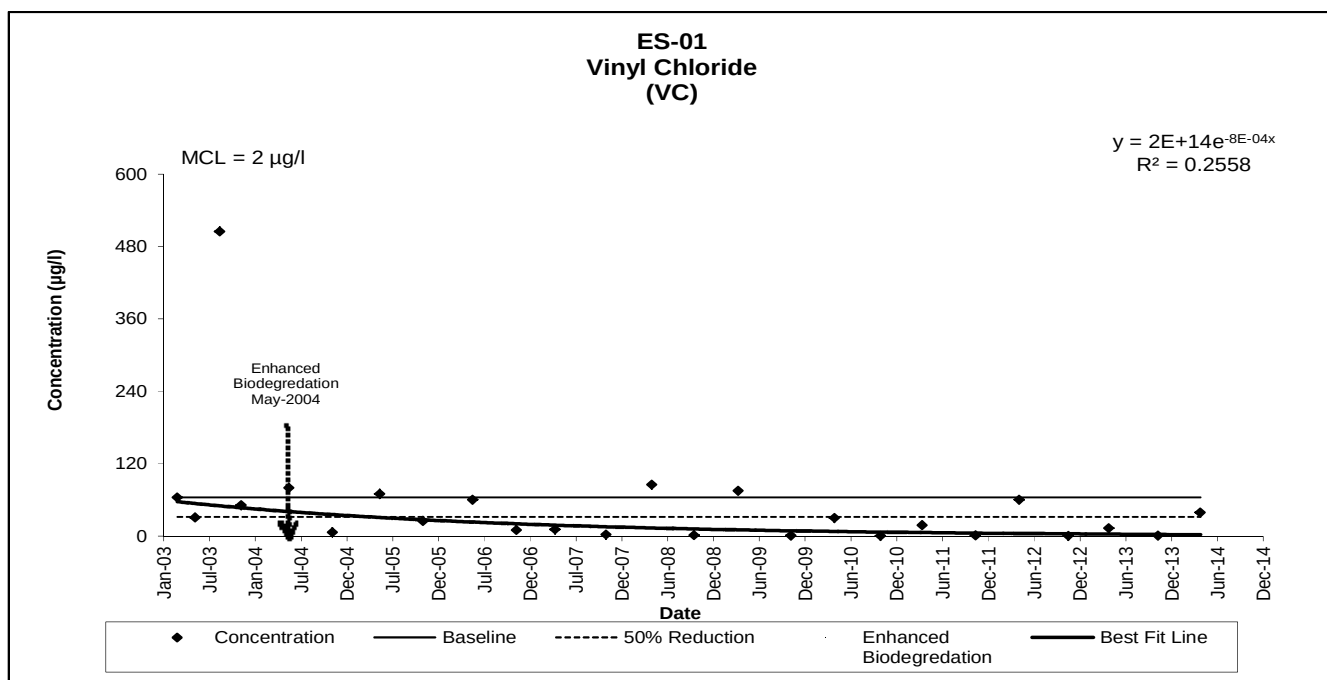


EXHIBIT B-1
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION TRENCH ES-01



**EXHIBIT B-1
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION TRENCH ES-01**

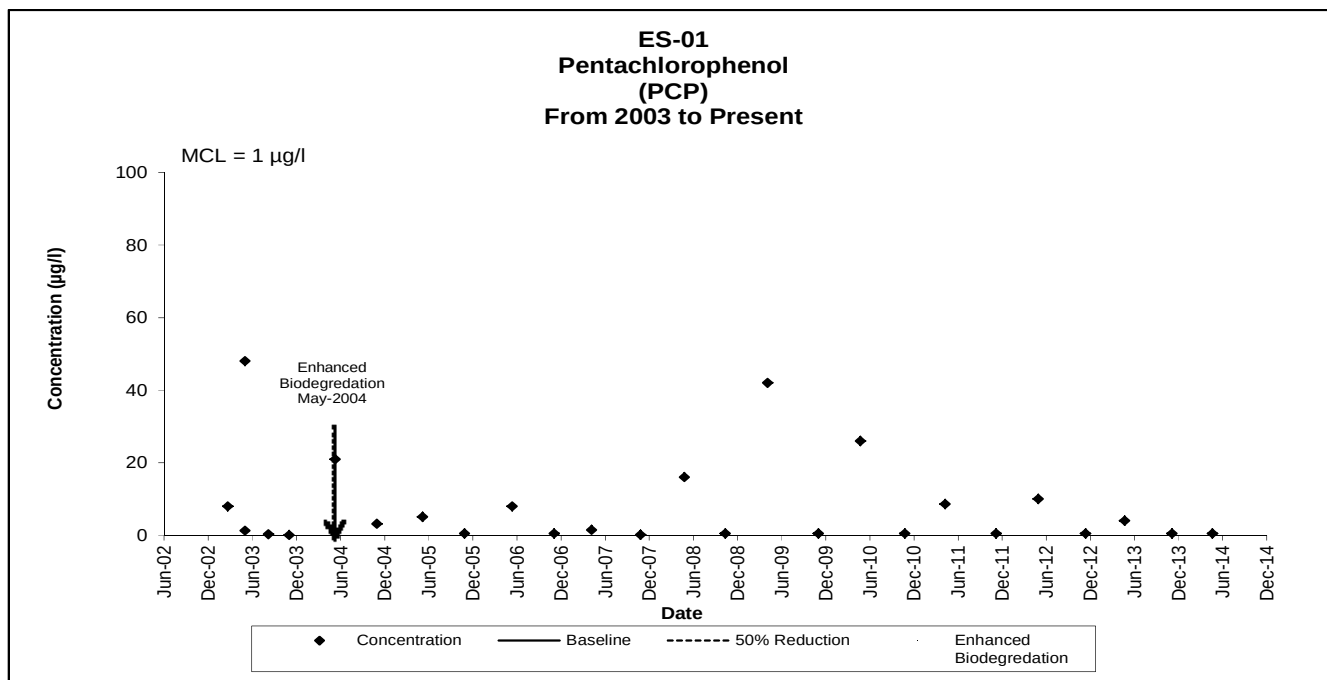
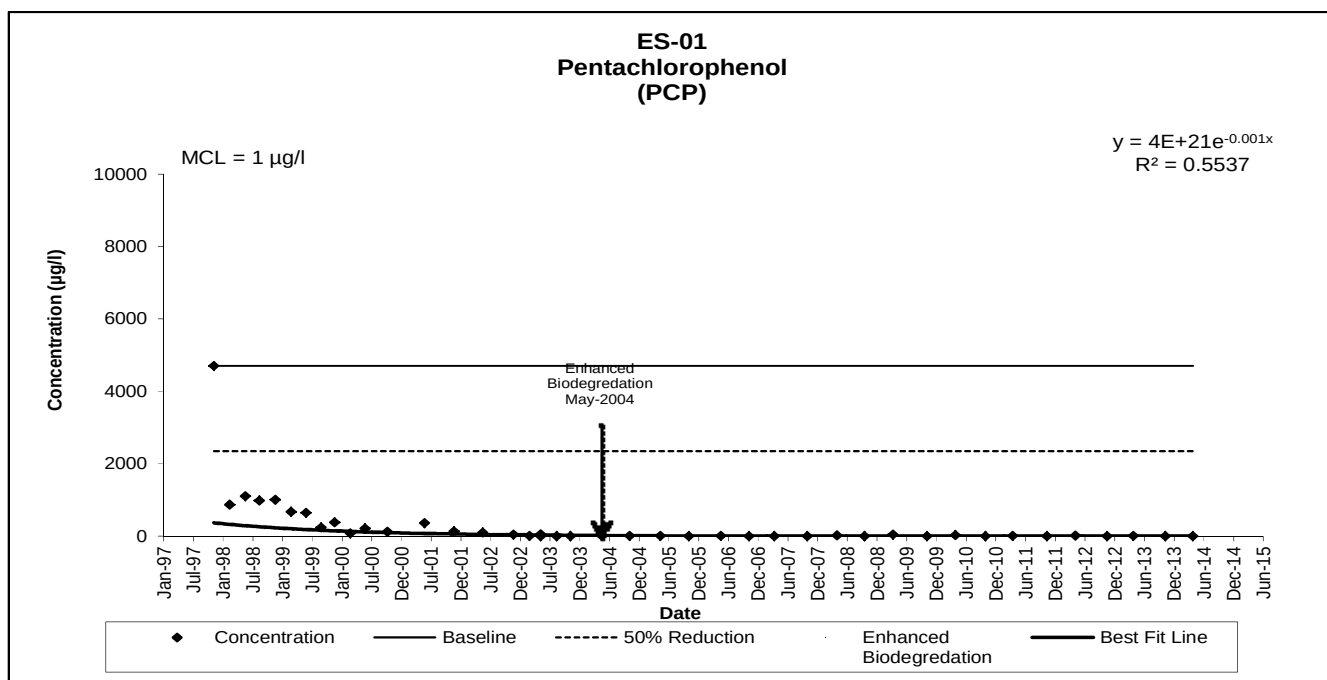


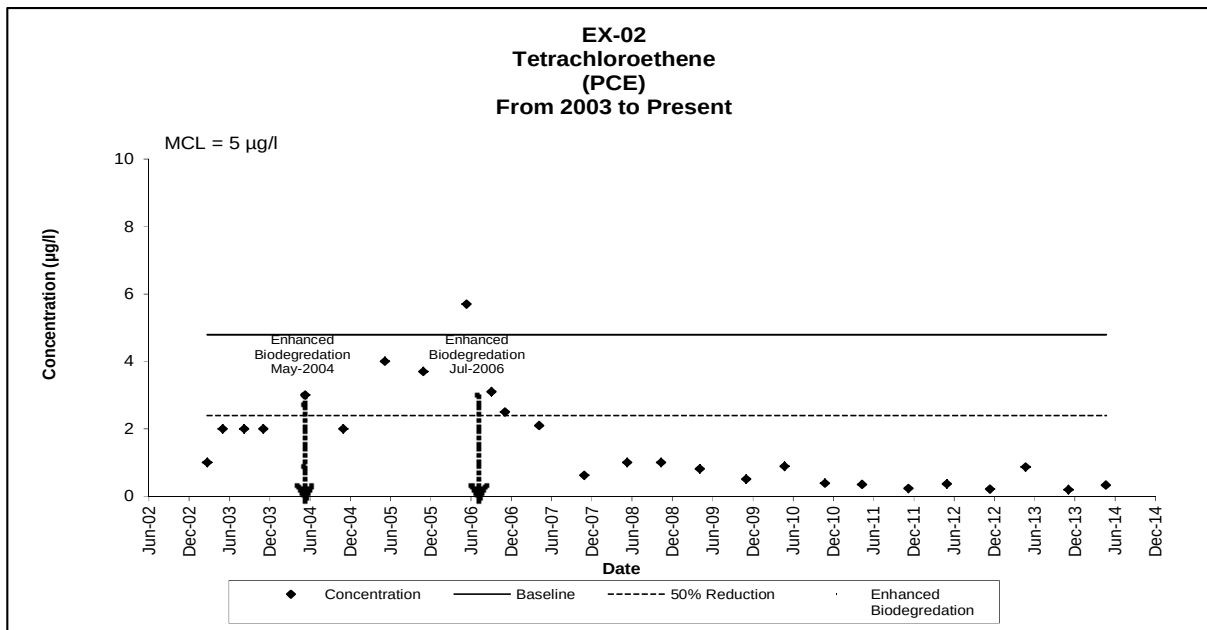
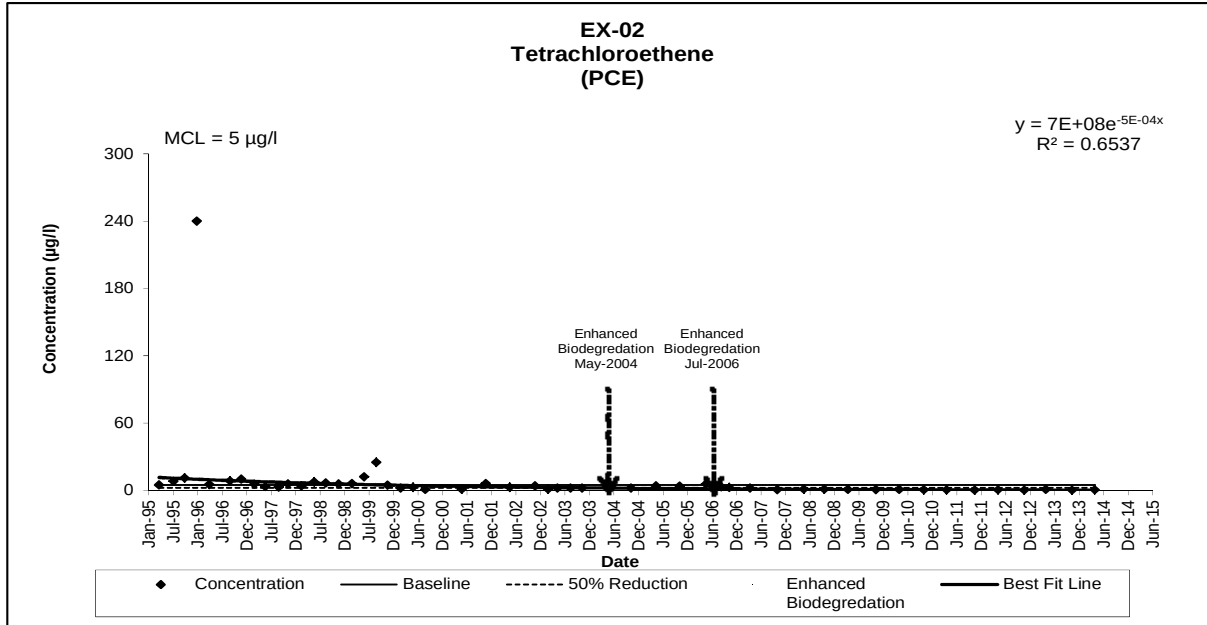
EXHIBIT B-2
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-02

LABORATORY PARAMETERS								
Sample Date	PCE (µg/l)	TCE (µg/l)	1,1-DCE (µg/l)	cis-1,2-DCE (µg/l)	trans-1,2-DCE (µg/l)	VC (µg/l)	2,4-D (µg/l)	PCP (µg/l)
20-Mar-95	4.8	220	27	--	--	--	3.73	139 J
6-Jul-95	8	360	35	--	--	--	< 2 J	< 400 J
27-Sep-95	11	1000	140	--	--	--	< 2	< 20
27-Dec-95	240 J	22 J	7.8 J	--	--	--	< 2	32
28-Mar-96	5.2	170	8.7	--	--	--	< 2	2.5
28-Aug-96	8.4	530	43	--	--	--	< 10	3.6 J
21-Nov-96	9.9 T	420	25	--	--	34	3.1 J	7 J
26-Feb-97	5.5	290	14	--	--	--	3.2	5.1
21-May-97	3.4 T	200	11	--	--	--	< 2.5 G	4.5
26-Aug-97	3	130	7.7	--	--	--	< 2.5 G	3.8 B
6-Nov-97	5.7 B	260	15	--	--	--	< 2.5 G	9.4 J
12-Feb-98	4 B	150 B	8.2	--	--	--	0.77 J	3.2
19-May-98	7.5	300	21	--	--	--	< 1.5 G	3.8
12-Aug-98	6.5	350	23	--	--	--	2.9 J	4.3 J
17-Nov-98	5.7	330	26 J	--	--	--	< 2.5 G	4.3
24-Feb-99	6.2 JB	260 J	15 J	--	--	--	3.9	6.1
26-May-99	< 12 G	190	12	--	--	--	< 4 UJ	9.2
25-Aug-99	< 25 G	440	14 T	--	--	--	1.94	12.1
17-Nov-99	4.6 T	130	8.1	--	--	--	< 0.2	9.48 J
22-Feb-00	2.1 T	89	5.2	--	--	--	1.01	10.1
24-May-00	2.8 T	54	3.1 T	--	--	--	1.36 J	5.08 J
23-Aug-00	0.83 D	0.34 D	0.58 D	--	--	--	--	--
7-Oct-00	--	--	--	--	--	--	< 0.5	8.59 J
23-May-01	1	61	4.2	--	--	--	< 0.5	3.3
19-Nov-01	6.2 D	99 D	11 D	--	--	--	< 0.5	0.8
15-May-02	2.6	114 D	11	--	--	--	< 0.5	2.1
20-Nov-02	3.9	83 D	8.2	--	--	--	< 0.48	0.4 T
25-Feb-03	1	127	12	--	--	74	< 0.48	1.1
6-May-03	2 TD	145 D	12 D	--	--	78 D	< 0.5	1.1
12-Aug-03	2	136 D	10	--	--	48	< 0.5	1.8
6-Nov-03	2	197 D	16	--	--	74 D	< 2.4	1.1
14-May-04	3	390 D	32	--	--	201 D	--	0.7 B
3-Nov-04	2 TD	181 D	14 D	--	--	80 D	--	2.0 J
10-May-05	4 TD	251 D	20 D	--	--	110 D	--	< 0.5 UJ
31-Oct-05	3.7	201 D	15	--	--	87 D	--	1.1 J
16-May-06	5.7	200 D	14	--	--	65 D	--	2.4 D
6-Sep-06	3.1	170 D	14	--	--	82 D	--	--
6-Nov-06	2.5	190 D	14	--	--	95 D	--	0.39 T
10-Apr-07	2.1	130 D	14	--	--	120 D	--	3 D
30-Oct-07	0.62 T	120 D	11	--	--	170 DJ	--	1.5
30-Apr-08	--	--	--	--	--	--	--	1
13-May-08	1	200 D	12	--	--	180 D	--	2
14-Oct-08	1	140 D	12	--	--	180 D	--	--
7-Apr-09	0.81 T	140 D	13	96 D	11	220 D	--	8.3 D
3-Nov-09	0.51 T	99 D	7.9	73 D	7.6	140 D	--	7.9 D
26-Apr-10	0.89 T	130 D	9.6	94	11	210 D	--	6.7 D
26-Oct-10	0.39 T	110 D	9	100 D	11	110 D	--	7.9 D
13-Apr-11	0.35 T	120 D	8.6	84	11	210 D	--	3.5 D
9-Nov-11	0.23 T	74	7.2	110 D	8.8	68	--	7.7 D
1-May-12	0.37 T	130 D	10	170 D	8.6	82 D	--	13 D
12-Nov-12	0.21 T	85	10	220 D	11	70	--	7.8 D
23-Apr-13	0.87 T	300 D	10	320 D	8.3	55 D	--	6.3 D
4-Nov-13	0.2 T	72	6.4	200 D	9.9	67	--	1.8 D
22-Apr-14	0.33 T	87	8	240 D	11	53	--	8.2 D

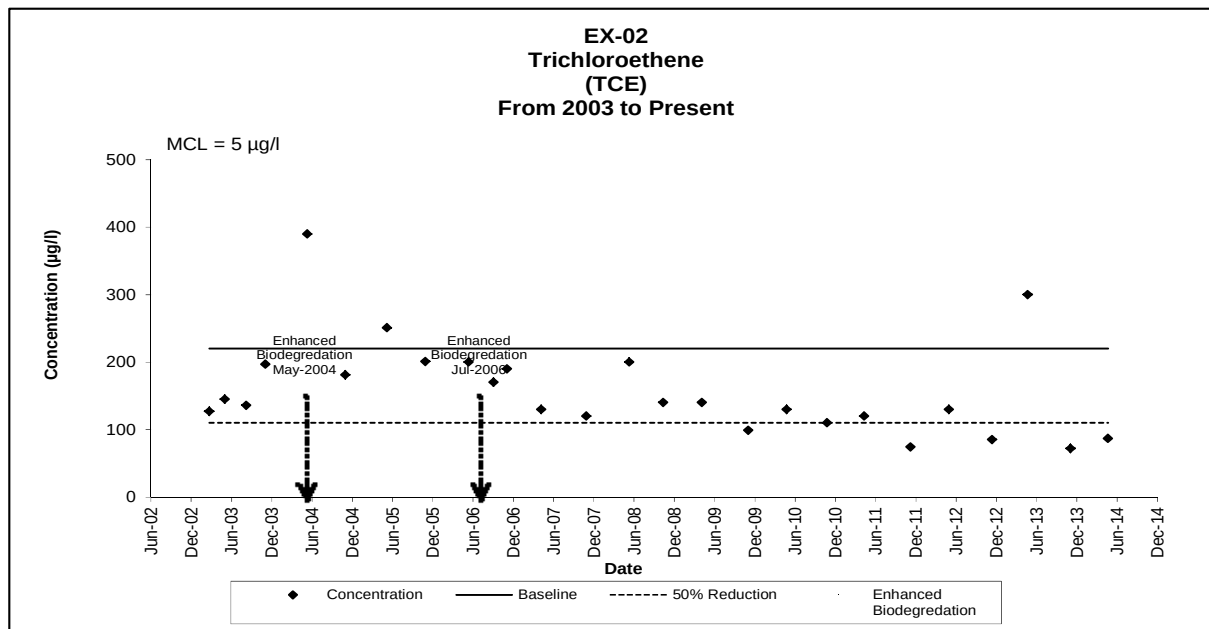
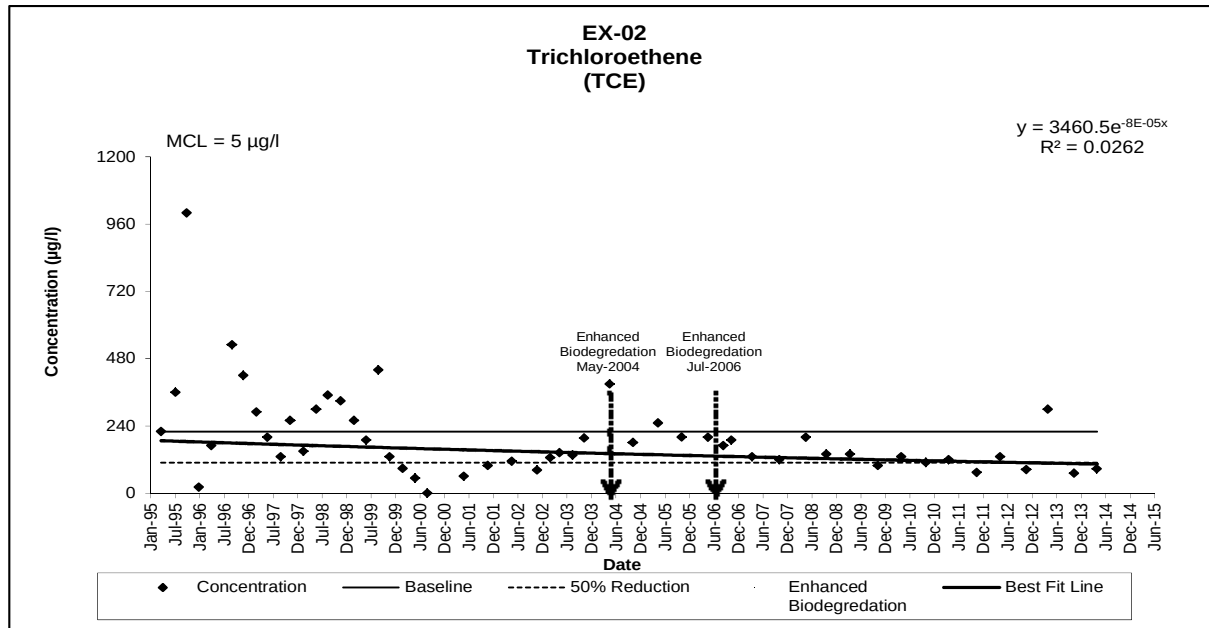
Data qualifiers are defined in laboratory reports. For data collected since 2001, a list of data qualifier definitions is included at the front of this appendix.

-- Not analyzed

**EXHIBIT B-2
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-02**



**EXHIBIT B-2
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-02**



**EXHIBIT B-2
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-02**

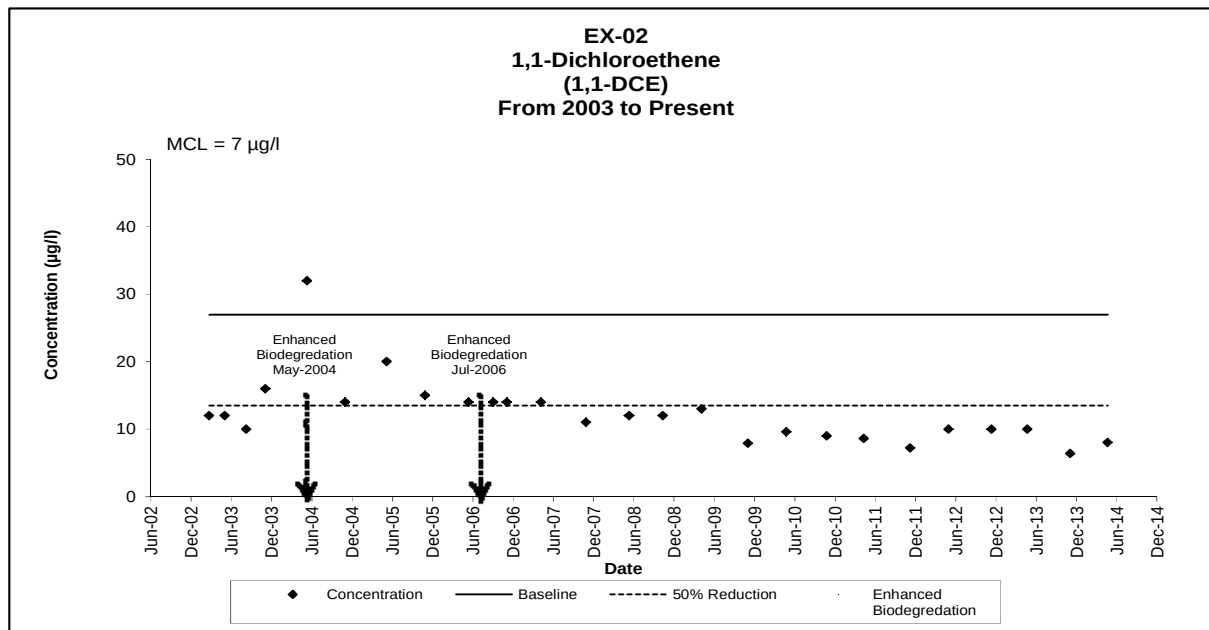
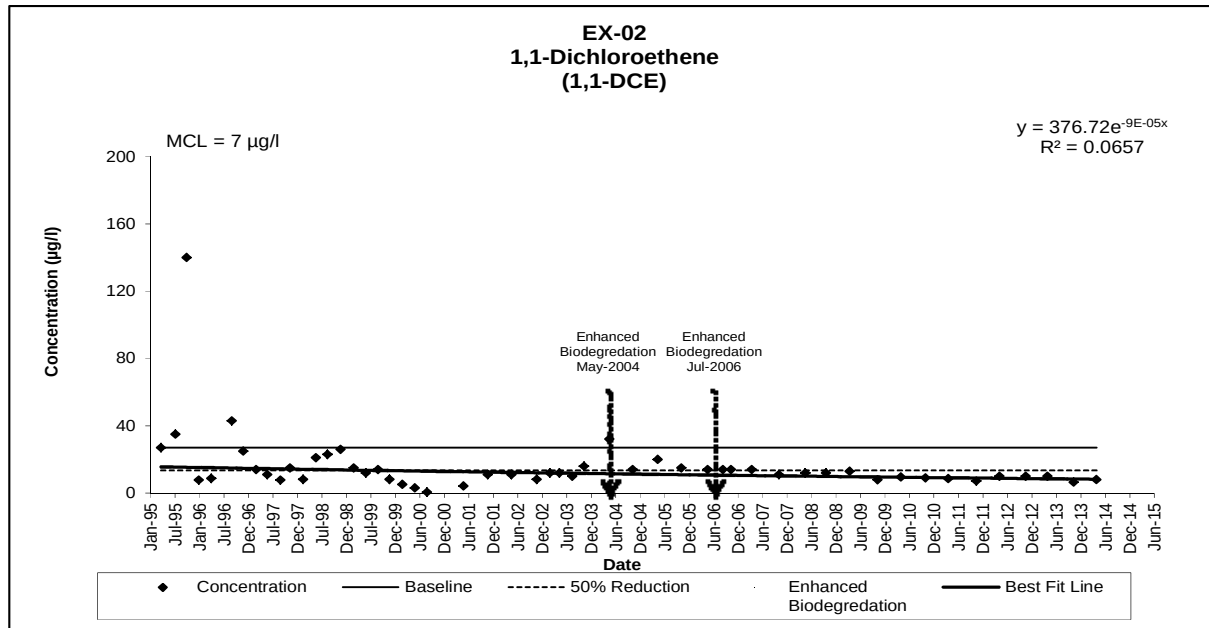
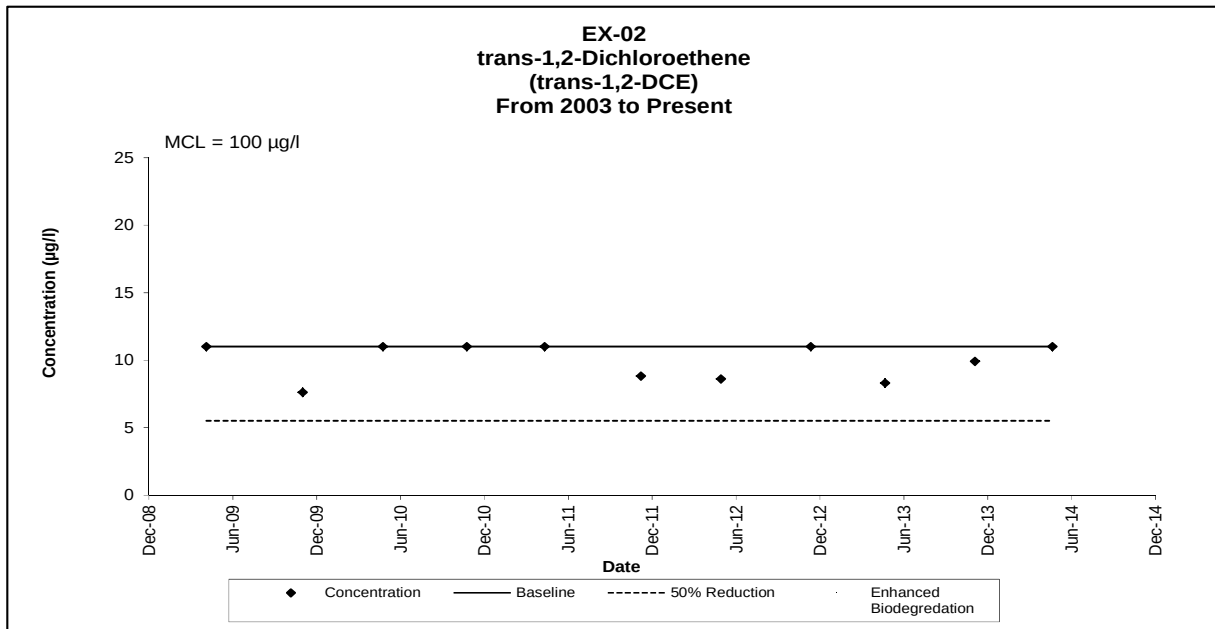
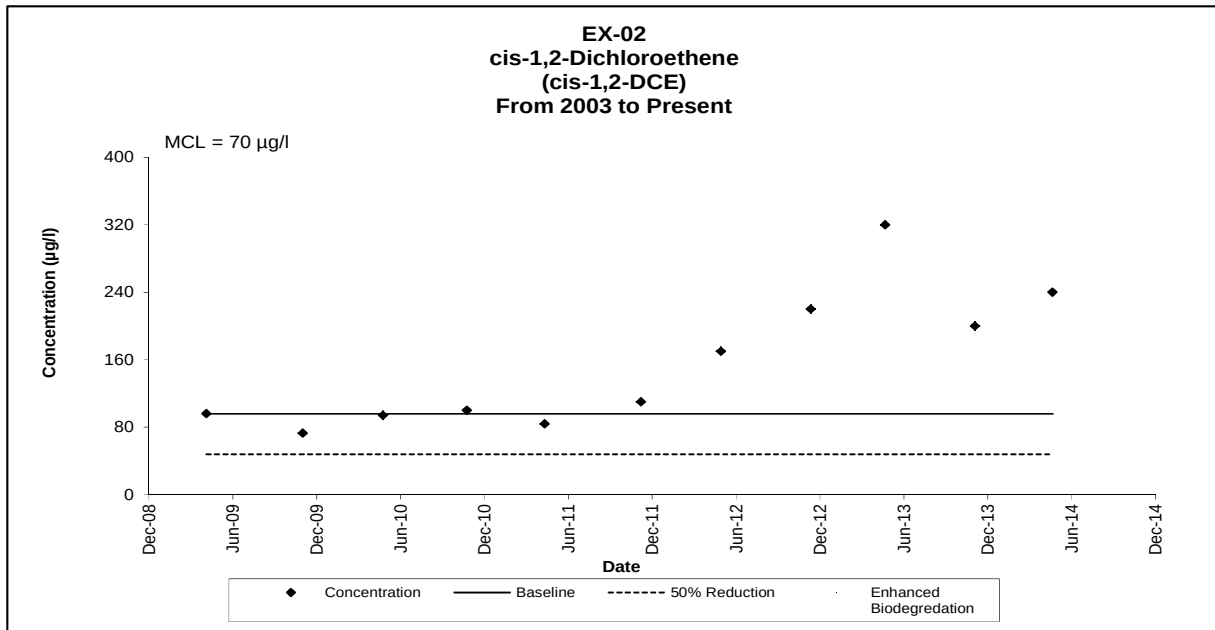
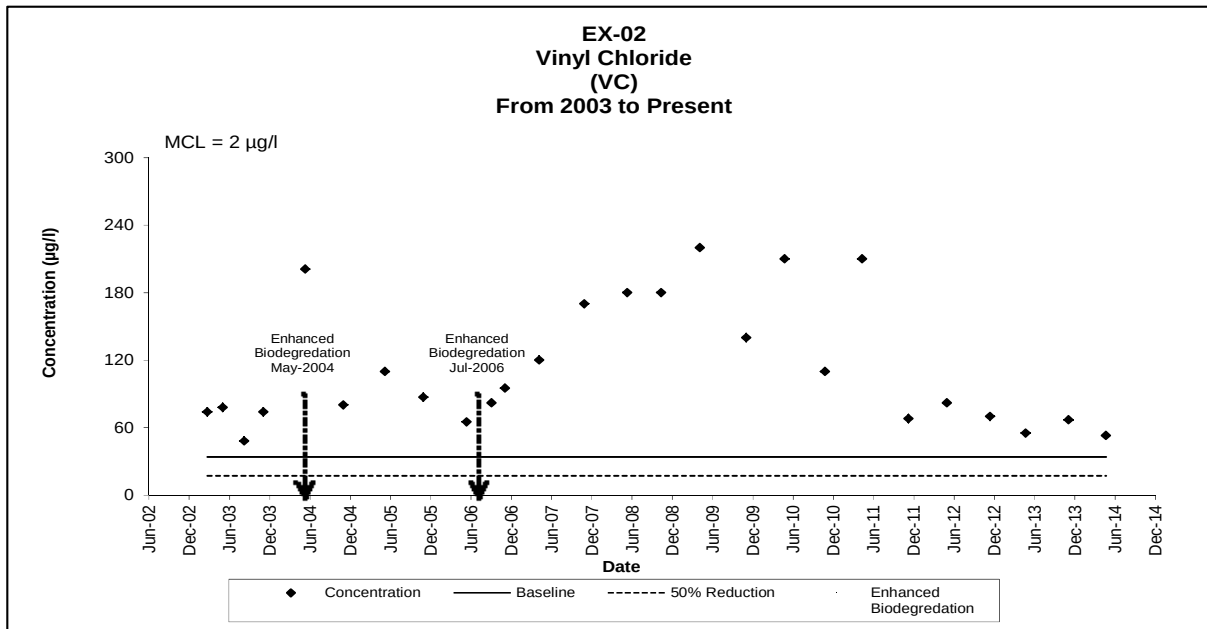
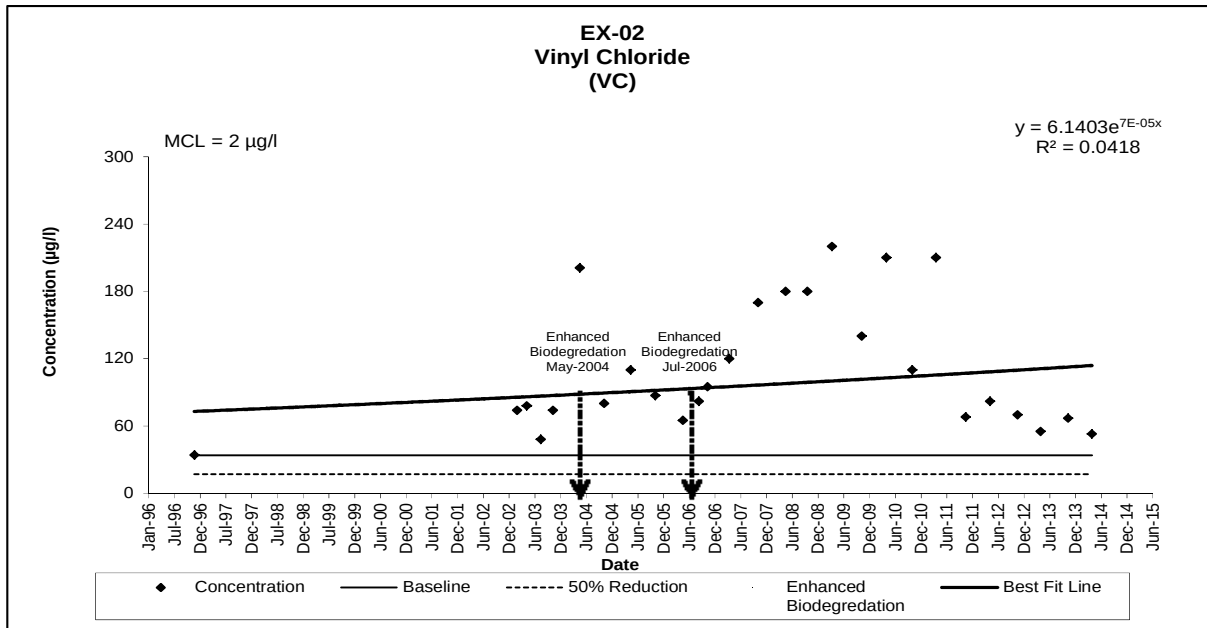


EXHIBIT B-2
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-02



**EXHIBIT B-2
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-02**



**EXHIBIT B-2
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-02**

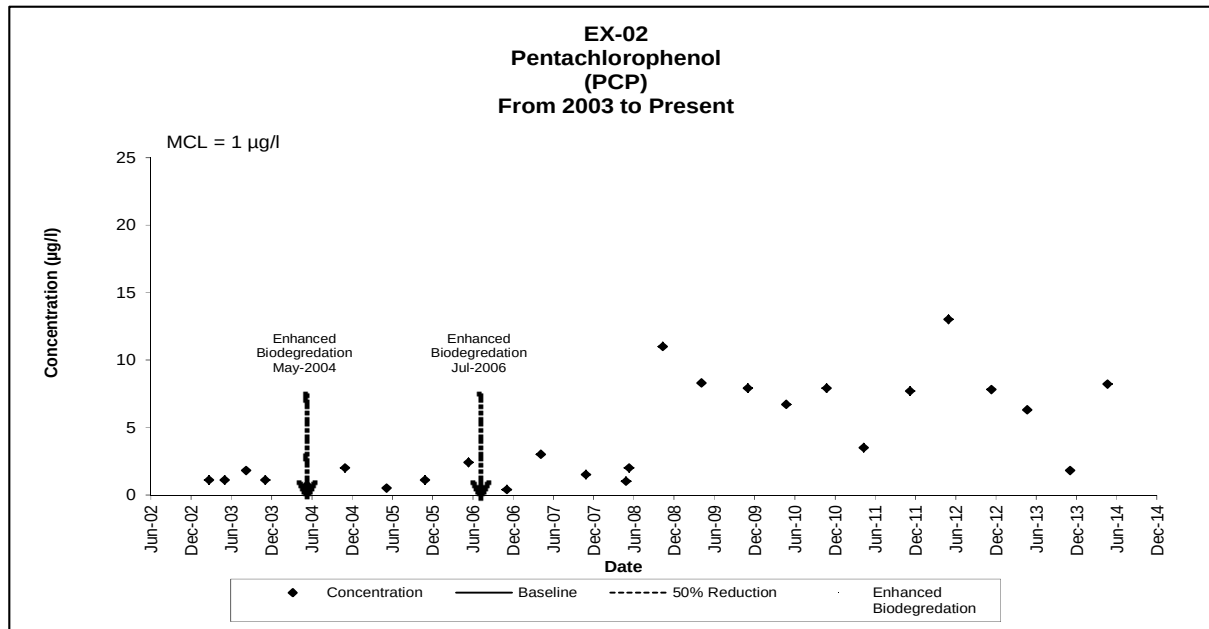
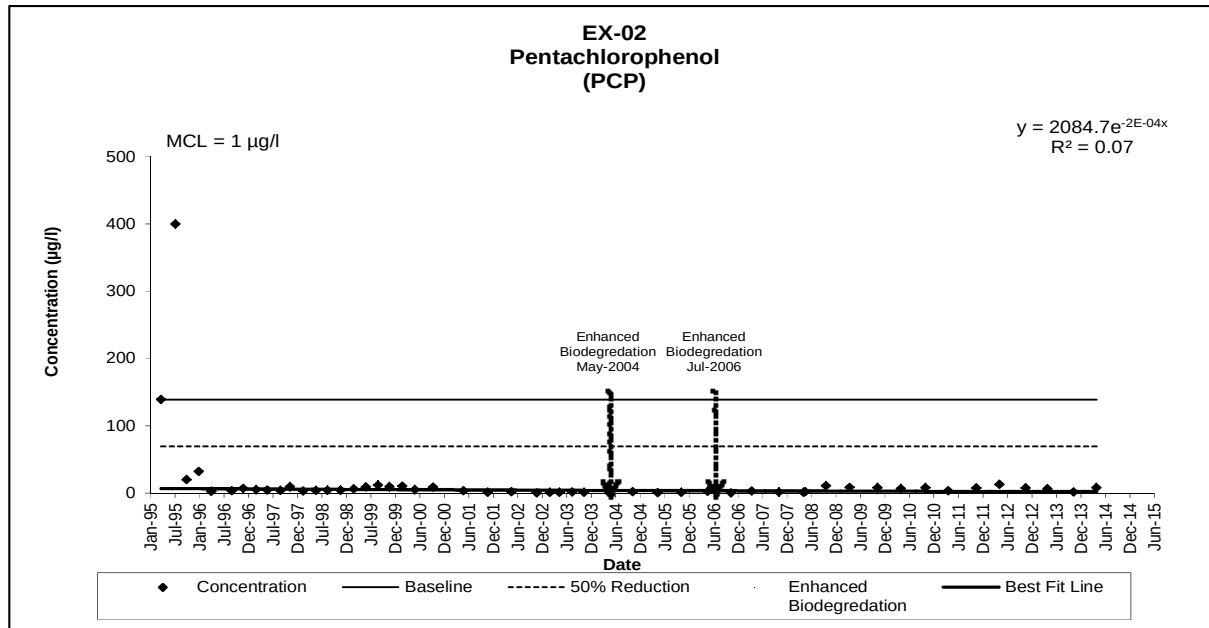


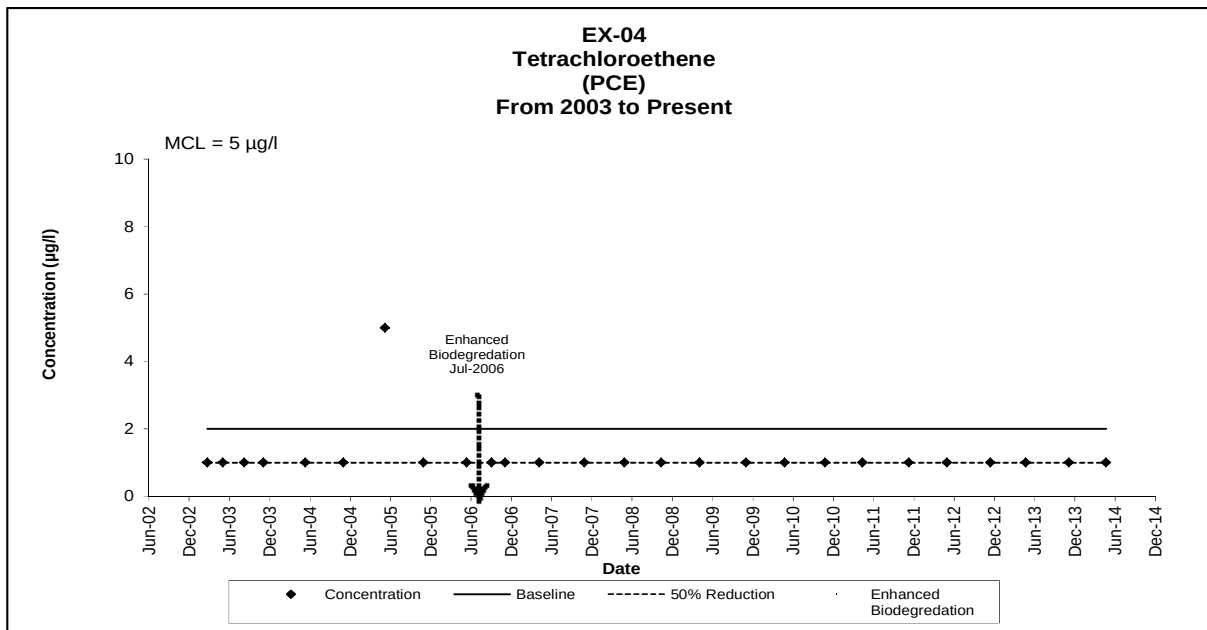
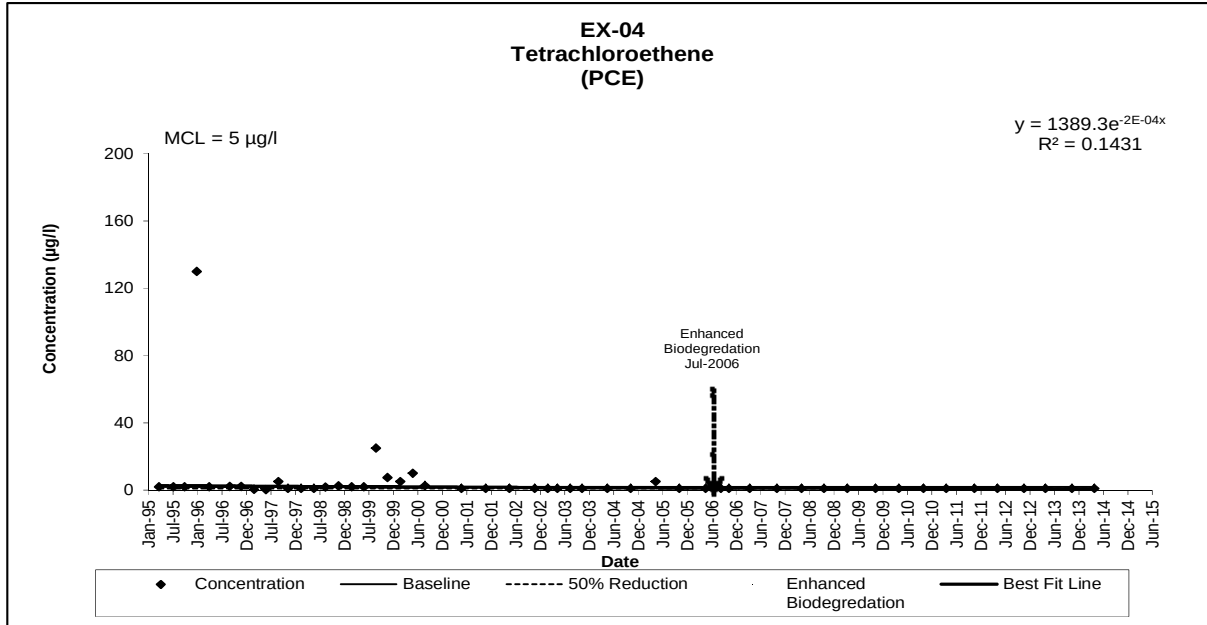
EXHIBIT B-3
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-04

LABORATORY PARAMETERS								
Sample Date	PCE (µg/l)	TCE (µg/l)	1,1-DCE (µg/l)	cis-1,2-DCE (µg/l)	trans-1,2-DCE (µg/l)	VC (µg/l)	2,4-D (µg/l)	PCP (µg/l)
20-Mar-95	< 2 J	680	130	--	--	--	< 2	< 0.2 J
6-Jul-95	< 2	180	21	--	--	--	< 2 J	< 0.2 J
27-Sep-95	< 2	190	48	--	--	--	< 2	< 0.2
27-Dec-95	130	390	49	--	--	--	2.1	8.4
28-Mar-96	< 2	360	23	--	--	--	< 2	< 0.2
28-Aug-96	2.2	330	38	--	--	--	1.2 T	0.063 TJ
21-Nov-96	< 2.2 T	290	21	--	--	--	< 0.25	< 1 UJ
26-Feb-97	0.33 T	54	3.2	--	--	--	< 0.25	< 1
27-May-97	0.31 T	91	6.1	--	--	--	< 0.25	< 1
26-Aug-97	< 5	280	17	--	--	--	< 0.25	< 1
6-Nov-97	0.99	140	9	--	--	--	< 0.25	< 1
12-Feb-98	< 1	51	4	--	--	--	< 0.25	< 1
19-May-98	< 1	75	4.8	--	--	--	0.03 J	< 1
12-Aug-98	1.8 J	190	11	--	--	--	< 0.25	< 1
17-Nov-98	< 2.5	170	14	--	--	--	< 0.25	< 0.5
24-Feb-99	< 2	140	8.5	--	--	--	< 0.25	< 0.5
26-May-99	< 2	110	5.5 Q	--	--	--	< 4	< 0.5
25-Aug-99	< 25 G	120	7.6 T	--	--	--	< 0.2	< 0.1
17-Nov-99	7.5	200	11	--	--	--	< 0.2	0.5
22-Feb-00	< 5	110	8.8	--	--	--	< 0.2	< 0.1
24-May-00	< 10	96	5.4	--	--	--	< 0.2	< 0.1
23-Aug-00	2.7 D	150 D	13 D	--	--	--	--	--
7-Oct-00	--	--	--	--	--	--	0.63 J	< 0.5 UJ
23-May-01	< 1	59	8.4	--	--	--	< 0.5	0.4 T
19-Nov-01	< 1	35	9	--	--	--	< 0.5	< 0.5
15-May-02	< 1	76	10	--	--	--	< 0.5	0.09 T
20-Nov-02	< 1	50	12	--	--	--	< 0.48	< 0.48
25-Feb-03	< 1	59	9.9	--	--	< 1	< 0.48	< 0.48
6-May-03	< 1	61	8.2	--	--	< 1	< 0.5	< 0.5
12-Aug-03	< 1	56	8.8	--	--	2	< 0.5	< 0.5
6-Nov-03	< 1	74 D	10	--	--	< 1	< 2.4	< 0.48
14-May-04	< 1	88 D	15	--	--	< 1	--	< 0.48 UB
3-Nov-04	< 1	55	8.3	--	--	< 1	--	< 0.48
10-May-05	< 5 D	81 D	10 D	--	--	< 5 D	--	< 0.5
1-Nov-05	< 1	118 D	13	--	--	0.4 T	--	< 0.5
16-May-06	< 1	81 D	9.8	--	--	0.31 T	--	0.26 T
6-Sep-06	< 1	130 D	18	--	--	0.75 T	--	--
6-Nov-06	< 1	180 D	20	--	--	0.7 T	--	< 0.5 UJ
10-Apr-07	< 1	110 D	16	--	--	1	--	< 0.5
30-Oct-07	< 1	52 D	14	--	--	0.71 T	--	< 0.5
30-Apr-08	< 1	85 D	14	--	--	0.92 T	--	< 0.5
14-Oct-08	< 1	83 D	13	--	--	0.91 T	--	< 0.5
6-Apr-09	< 1	54 D	11	110 D	16	1.6	--	< 0.5
2-Nov-09	< 1	58 D	12	110 D	20	1.9	--	< 0.5
26-Apr-10	< 1	48	12	150 D	20	1.9	--	< 0.5
26-Oct-10	< 1	55	17	180 D	29	2.9	--	< 0.5
14-Apr-11	< 1	29	12	180 D	20	2.3	--	< 0.5
10-Nov-11	< 1	15	6.6	84	9.8	0.74 T	--	< 0.5
21-Dec-11	--	--	--	--	--	--	--	< 0.5
1-May-12	< 1	21	9.4	130 D	16	1.4	--	--
13-Nov-12	< 1	20	8.7	140 D	18	1.3	--	--
23-Apr-13	< 1	7.1	4.9	66	12	0.84 T	--	--
5-Nov-13	< 1	2.9	3	57 D	28	5.2	--	--
22-Apr-14	< 1	0.84 T	2.4	31	7.8	0.89 T	--	--

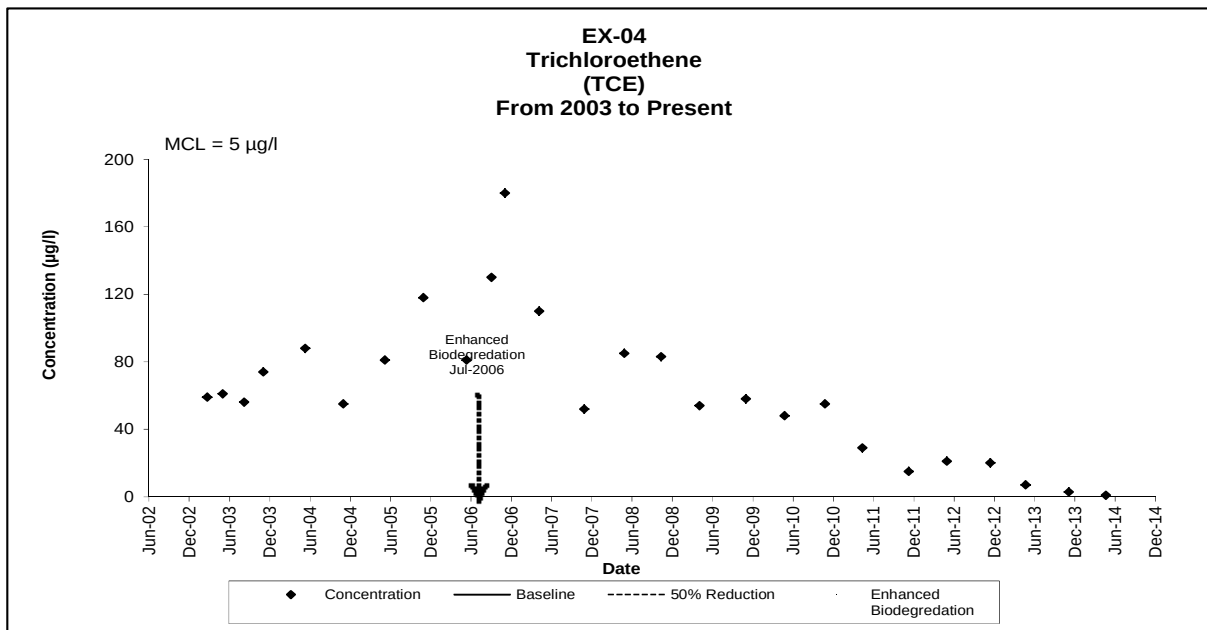
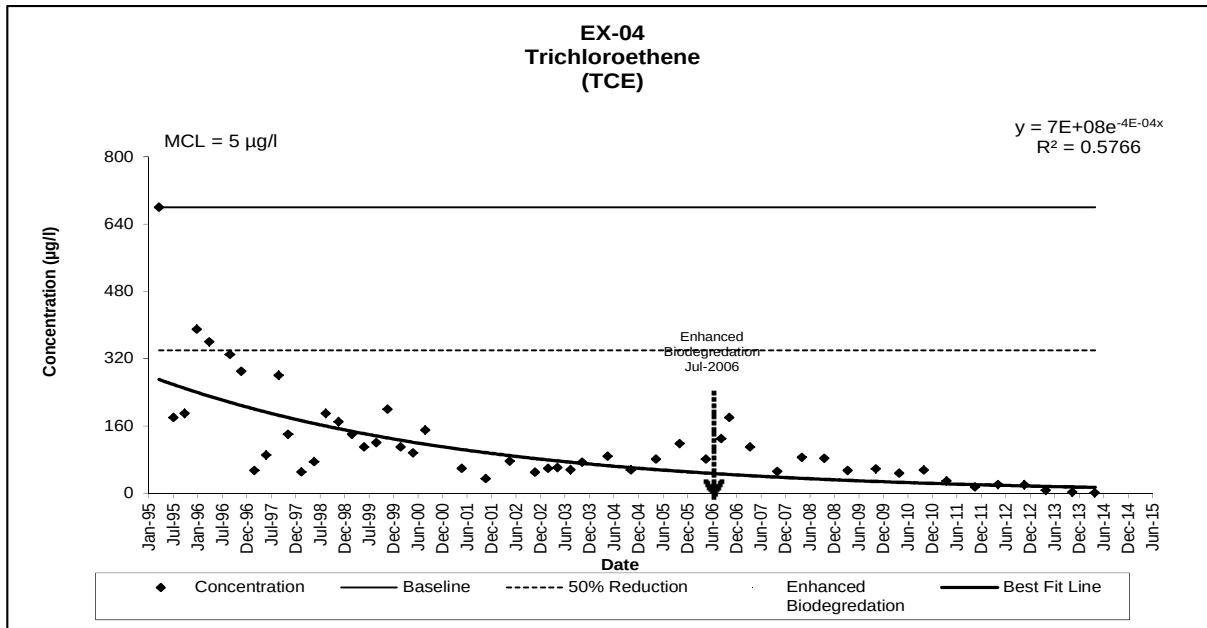
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-- Not analyzed

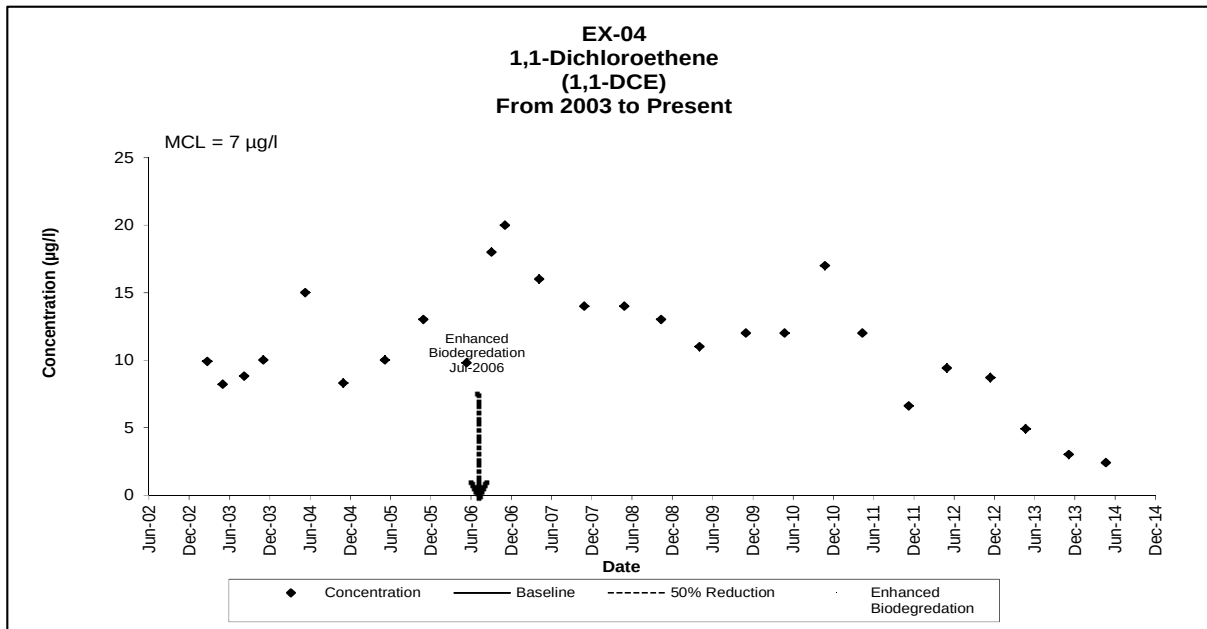
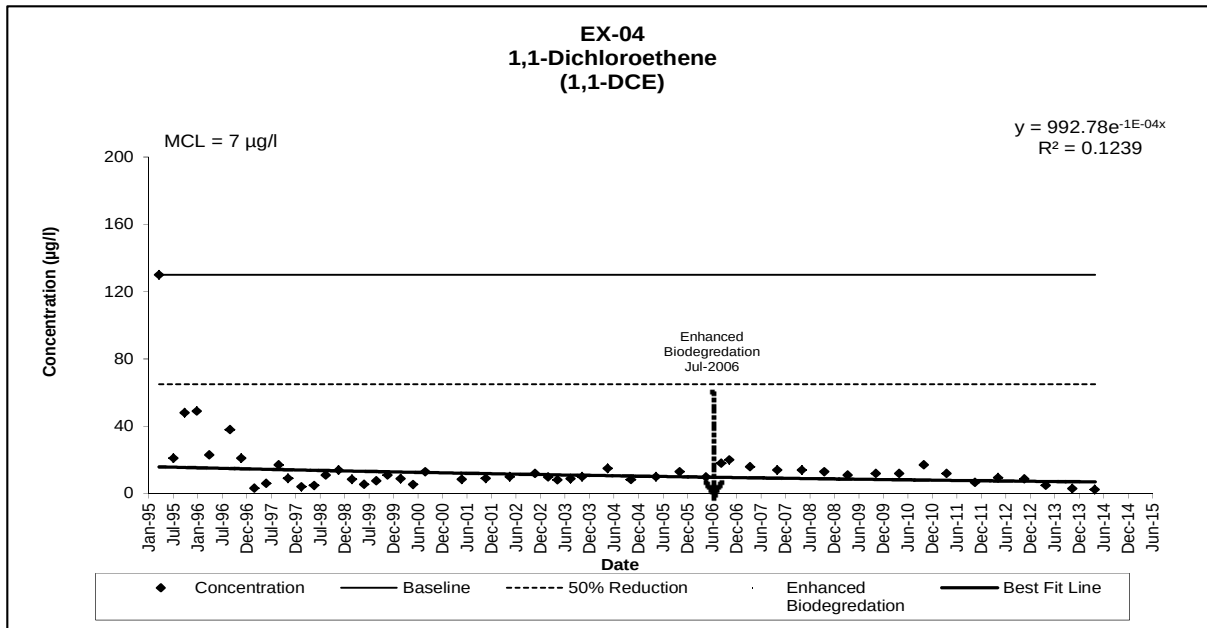
**EXHIBIT B-3
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-04**



**EXHIBIT B-3
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-04**



**EXHIBIT B-3
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-04**



**EXHIBIT B-3
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-04**

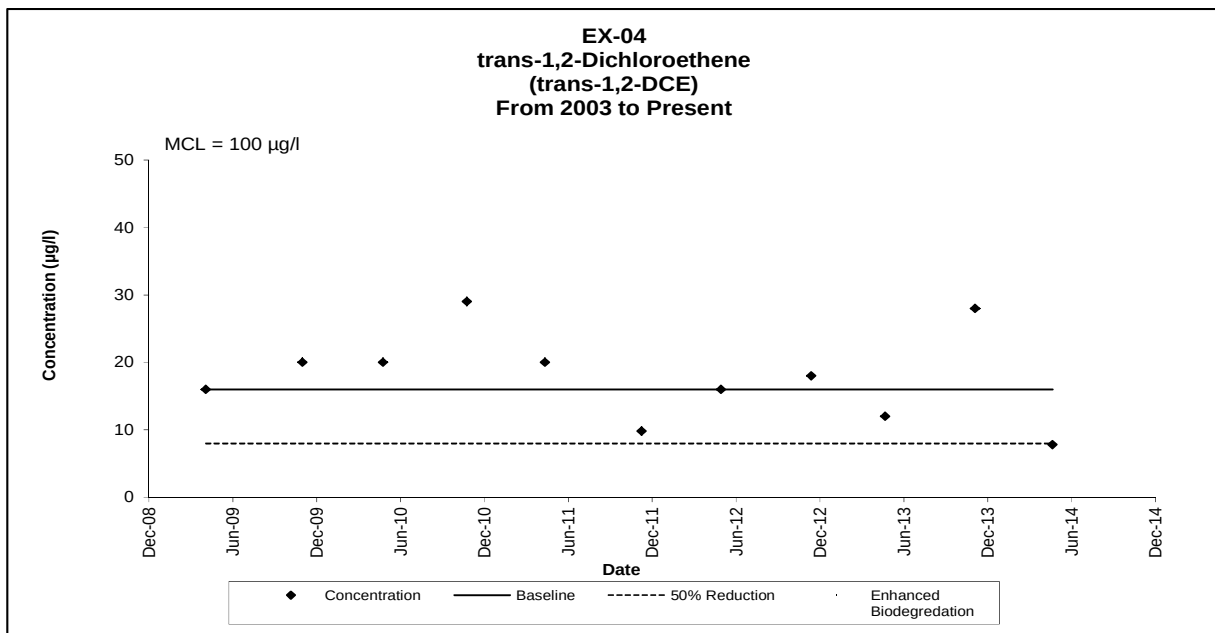
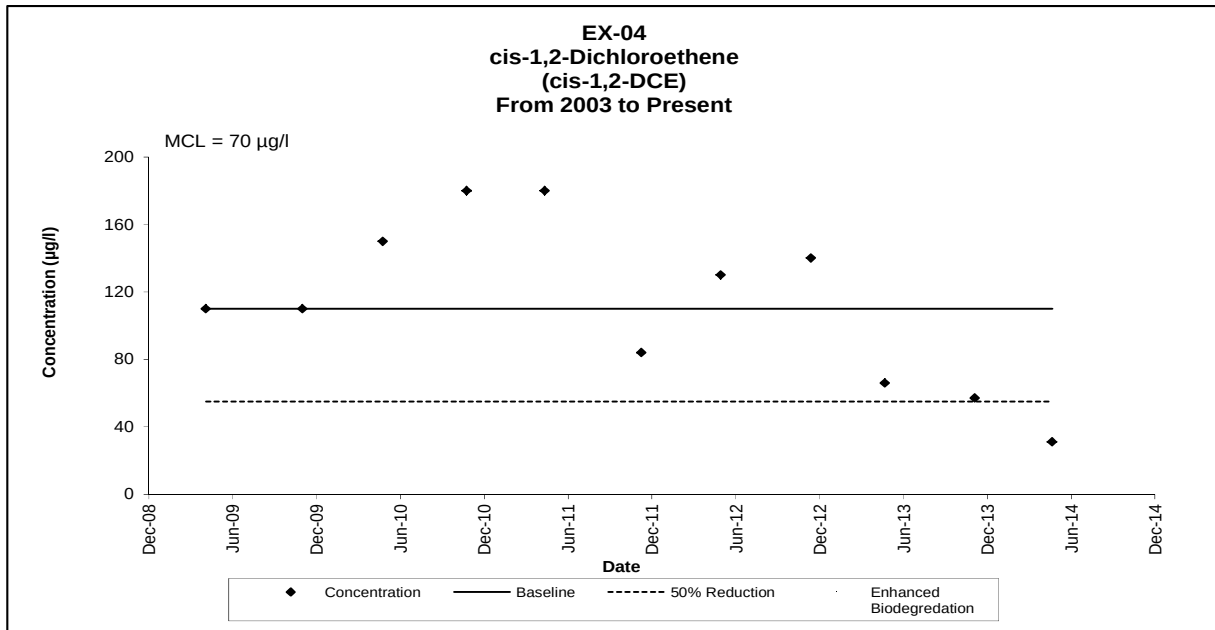


EXHIBIT B-3
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-04

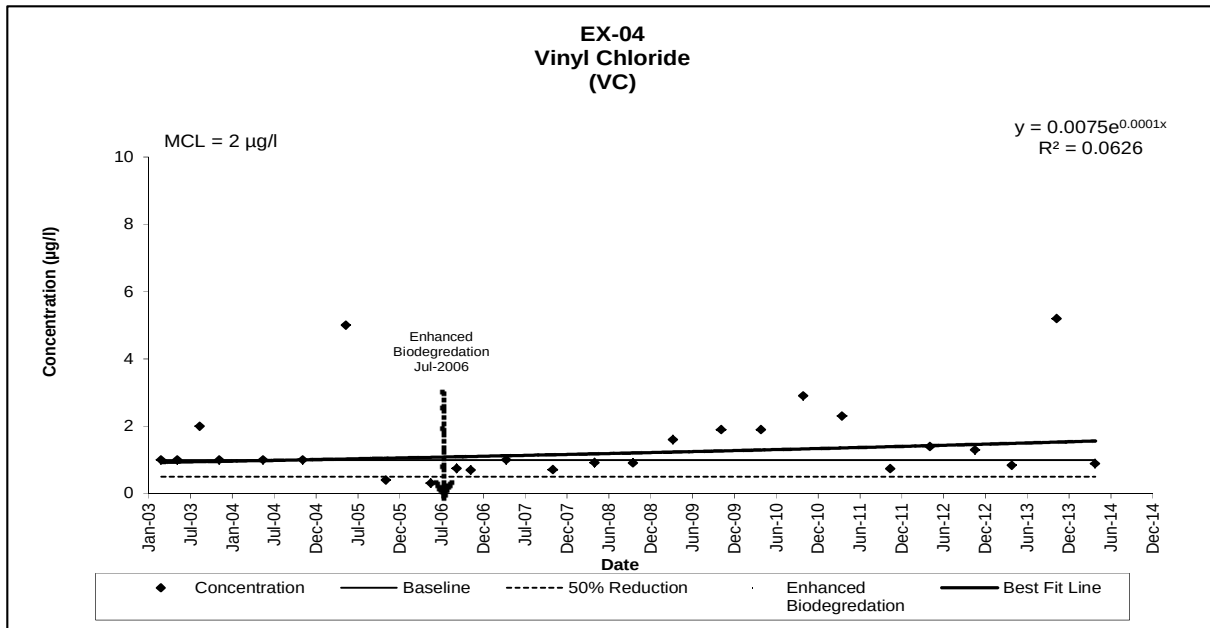


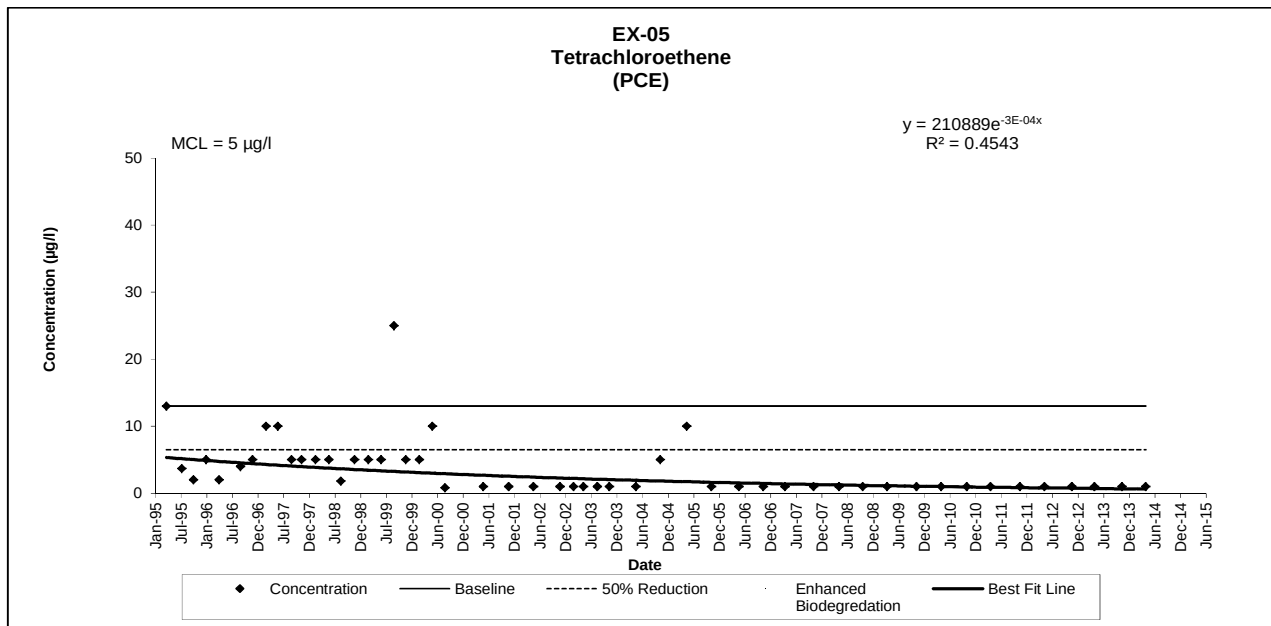
EXHIBIT B-4
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-05

LABORATORY PARAMETERS								
Sample Date	PCE (µg/l)	TCE (µg/l)	1,1-DCE (µg/l)	cis-1,2-DCE (µg/l)	trans-1,2-DCE (µg/l)	VC (µg/l)	2,4-D (µg/l)	PCP (µg/l)
20-Mar-95	13	5500	450	--	--	--	< 20	< 2 J
6-Jul-95	3.7	1900	110	--	--	--	< 2	< 0.2
27-Sep-95	< 2	1900	320	--	--	--	< 2	< 0.2
27-Dec-95	< 5	1000	62	--	--	--	< 2	< 0.2
28-Mar-96	< 2	1100	55	--	--	--	< 2	< 0.2
28-Aug-96	< 4	180	9.5	--	--	--	< 10	< 0.2
21-Nov-96	< 5	200	10	--	--	1 T	< 0.25	< 1 UJ
26-Feb-97	< 10	520	23	--	--	--	< 0.25	< 1
21-May-97	< 10	850	43	--	--	--	< 0.25	1
26-Aug-97	< 5	250	13	--	--	--	< 0.25	1
6-Nov-97	< 5	260	11	--	--	--	< 0.25	< 1
12-Feb-98	< 5	430 B	27	--	--	--	< 0.25	< 1
19-May-98	< 5	280	16	--	--	--	< 0.25	< 1
12-Aug-98	1.8 J	190	11	--	--	--	< 0.25	< 1
17-Nov-98	< 5	360	20 J	--	--	--	< 0.25	< 0.5
24-Feb-99	< 5	330 JB	14 J	--	--	--	< 0.25	< 0.5
26-May-99	< 5 G	220 J	9.6	--	--	--	< 4 UJ	< 0.5
25-Aug-99	< 25 G	140	6.8 T	--	--	--	1.04	< 0.1
17-Nov-99	< 5	130	6.4	--	--	--	< 0.2	< 0.1
22-Feb-00	< 5	130	6.3	--	--	--	< 0.2	< 0.1
24-May-00	< 10	98	4	--	--	--	0.431	< 0.1
23-Aug-00	< 0.83 D	77 D	4.7 D	--	--	--	--	--
7-Oct-00	--	--	--	--	--	--	1.34 J	< 0.5 UJ
23-May-01	< 1	58	3	--	--	--	< 0.5	0.5
19-Nov-01	< 1	26	2	--	--	--	< 0.5	< 0.5
15-May-02	< 1	74 D	5	--	--	--	< 0.5	0.04 T
20-Nov-02	< 1	2	1	--	--	--	< 0.48	< 0.48
25-Feb-03	< 1	0.9 T	1	--	--	< 1	< 0.48	0.1 T
6-May-03	< 1	31	4.1	--	--	0.4 T	< 0.5	0.7
12-Aug-03	< 1	53	7.5	--	--	2.1	< 0.5	< 0.5
6-Nov-03	< 1	20	8.7	--	--	0.7 T	< 2.4	< 0.48
13-May-04	< 1	140 D	23	--	--	2.6	--	< 0.48
3-Nov-04	< 5 D	20 D	11 D	--	--	3 TD	--	< 0.48
10-May-05	< 10 D	34 D	10 D	--	--	< 10 D	--	< 0.5
1-Nov-05	< 1	2	13	--	--	0.9 T	--	< 0.5
16-May-06	< 1	6	12	--	--	0.68 T	--	< 0.5
7-Nov-06	< 1	0.6 T	19	--	--	1.1	--	< 0.5
9-Apr-07	< 1	0.76 T	20	--	--	2	--	< 0.5
30-Oct-07	< 1	0.5 T	17	--	--	9.3 J	--	< 0.5
29-Apr-08	< 1	0.37 T	10	--	--	44 D	--	< 0.5
14-Oct-08	< 1	0.45 T	13	--	--	40	--	< 0.5
7-Apr-09	< 1	0.44 T	12	180 D	210 D	47	--	< 0.5
2-Nov-09	< 1	0.43 T	8.5	150 D	170 D	27	--	< 0.5
26-Apr-10	< 1	0.44 T	5.8	140 D	130 D	20	--	< 0.5
26-Oct-10	< 1	0.5 T	9.9	170 D	170 D	16	--	< 0.5
13-Apr-11	< 1	0.37 T	9	140 D	150 D	17	--	< 0.5
9-Nov-11	< 1	0.36 T	8.6	140 D	150 D	12	--	< 0.5
1-May-12	< 1	0.47 T	8.3	150 D	140 D	13	--	--
13-Nov-12	< 1	0.53 T	9.1	150 D	150 D	11	--	--
23-Apr-13	< 1	0.51 T	9.3	150 D	160 D	11	--	--
4-Nov-13	< 1	0.32 T	8.2	130 D	120 D	8.2	--	--
22-Apr-14	< 1	0.38 T	13	180 D	180 D	12	--	--

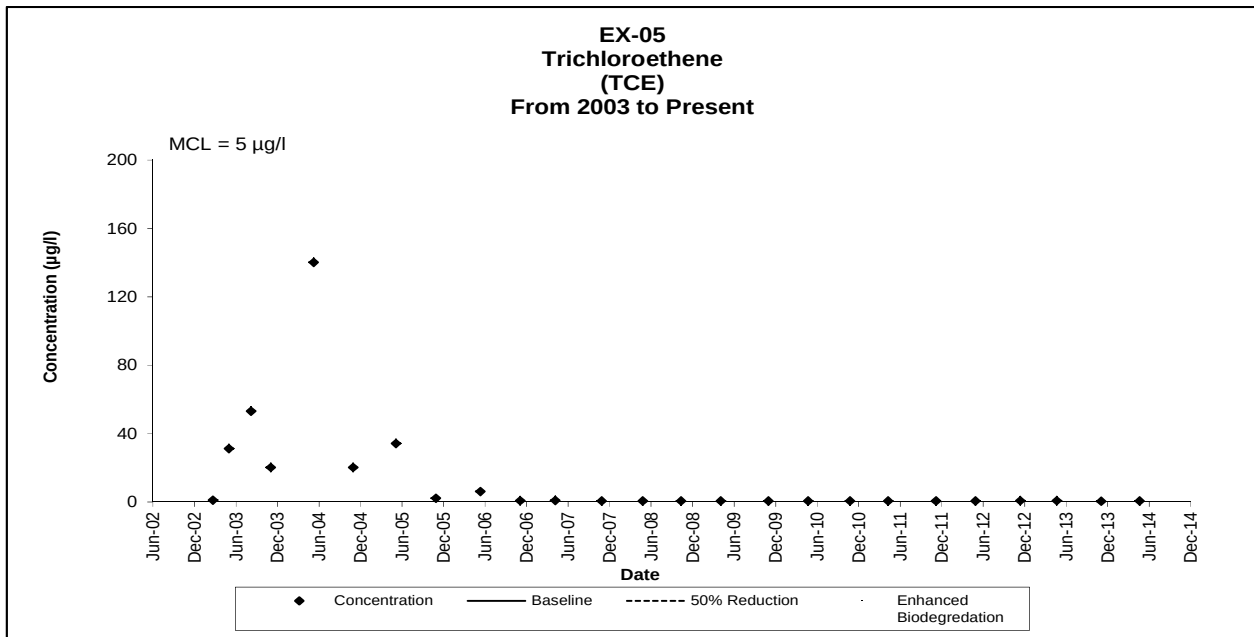
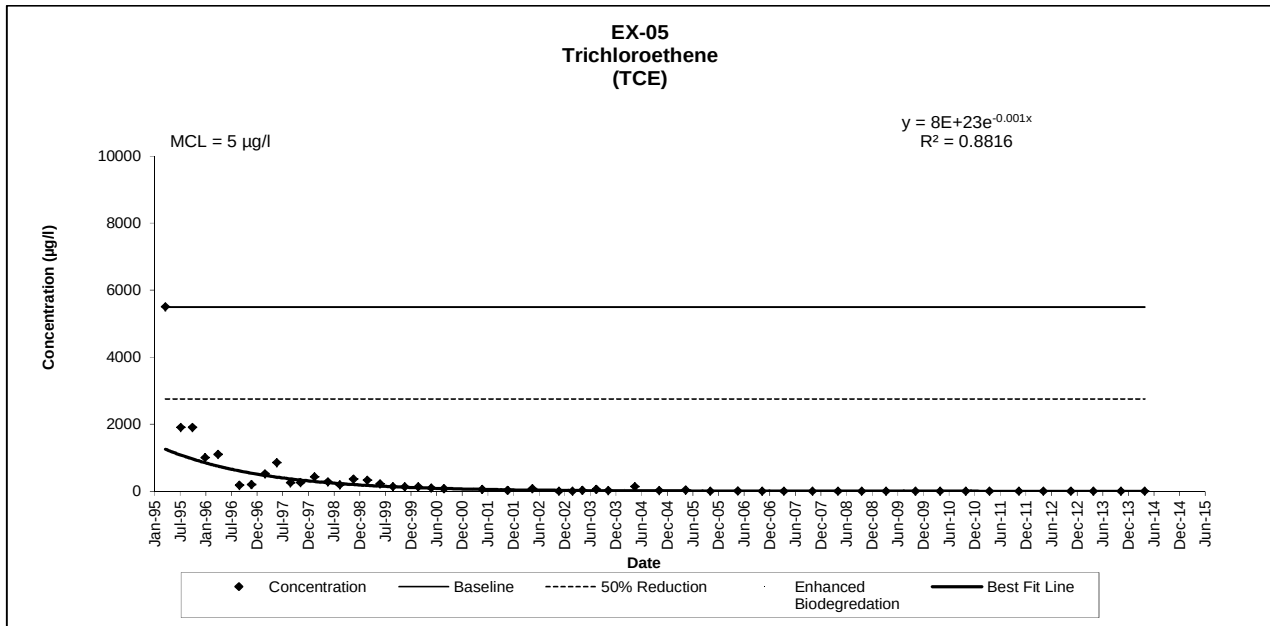
Data qualifiers are defined in laboratory reports. For data collected since 2001, a list of data qualifier definitions is included at the front of this appendix.

-- Not analyzed

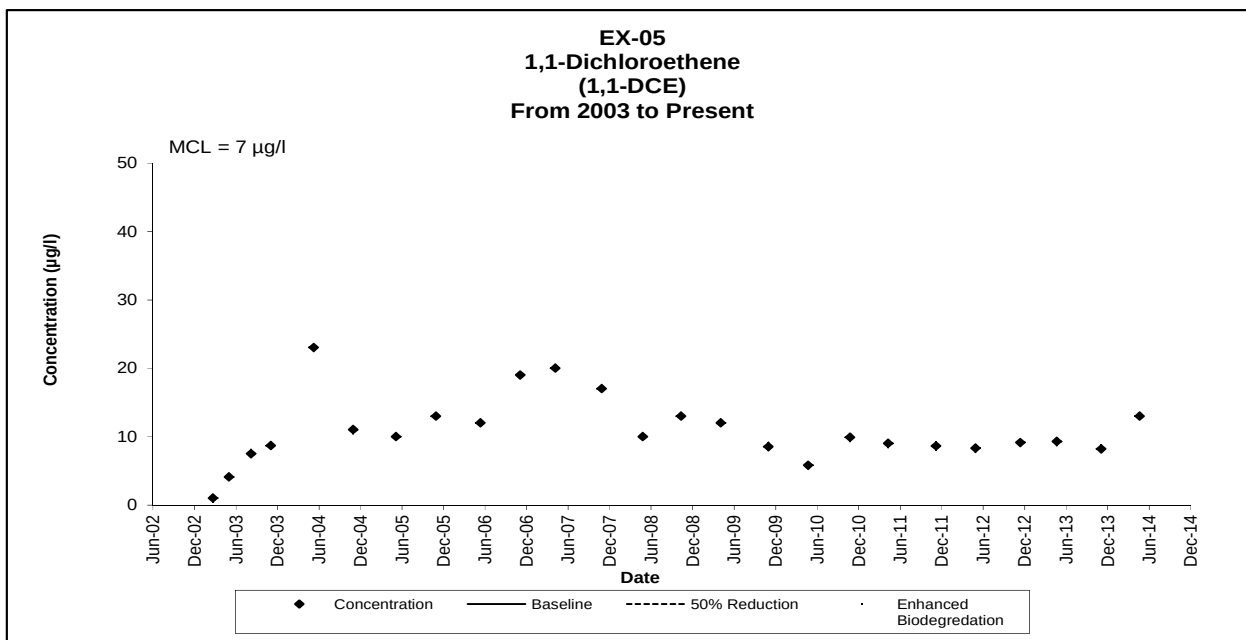
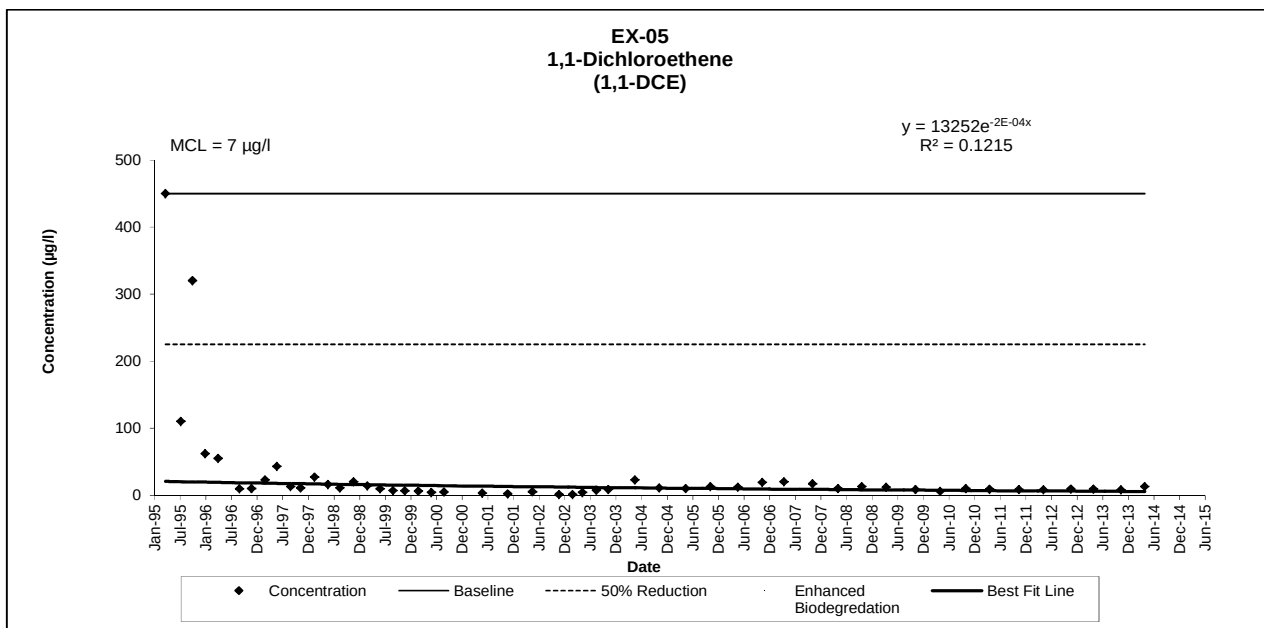
**EXHIBIT B-4
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-05**



**EXHIBIT B-4
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-05**



**EXHIBIT B-4
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-05**



**EXHIBIT B-4
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-05**

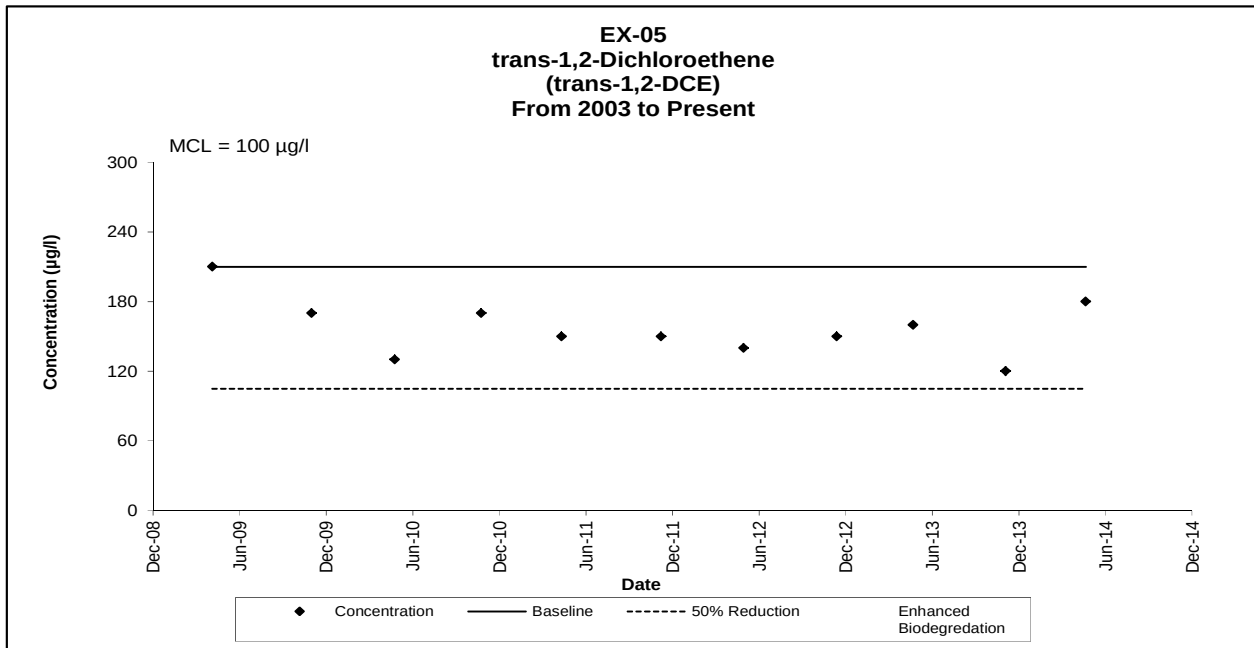
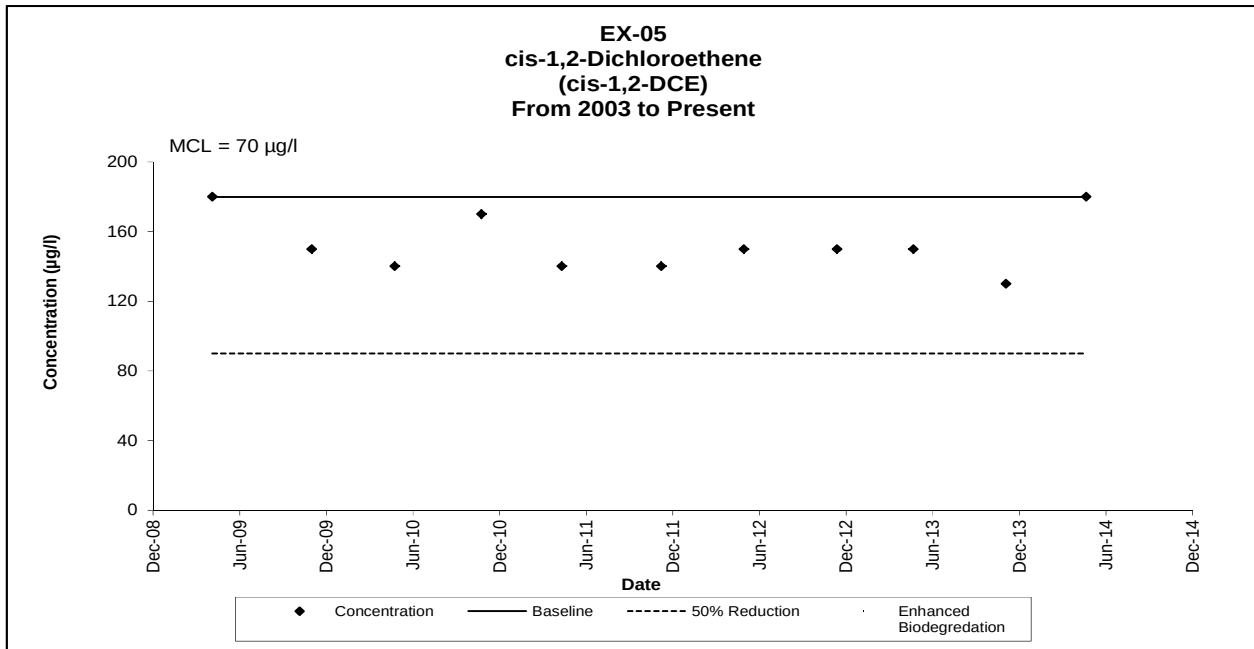


EXHIBIT B-4
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-05

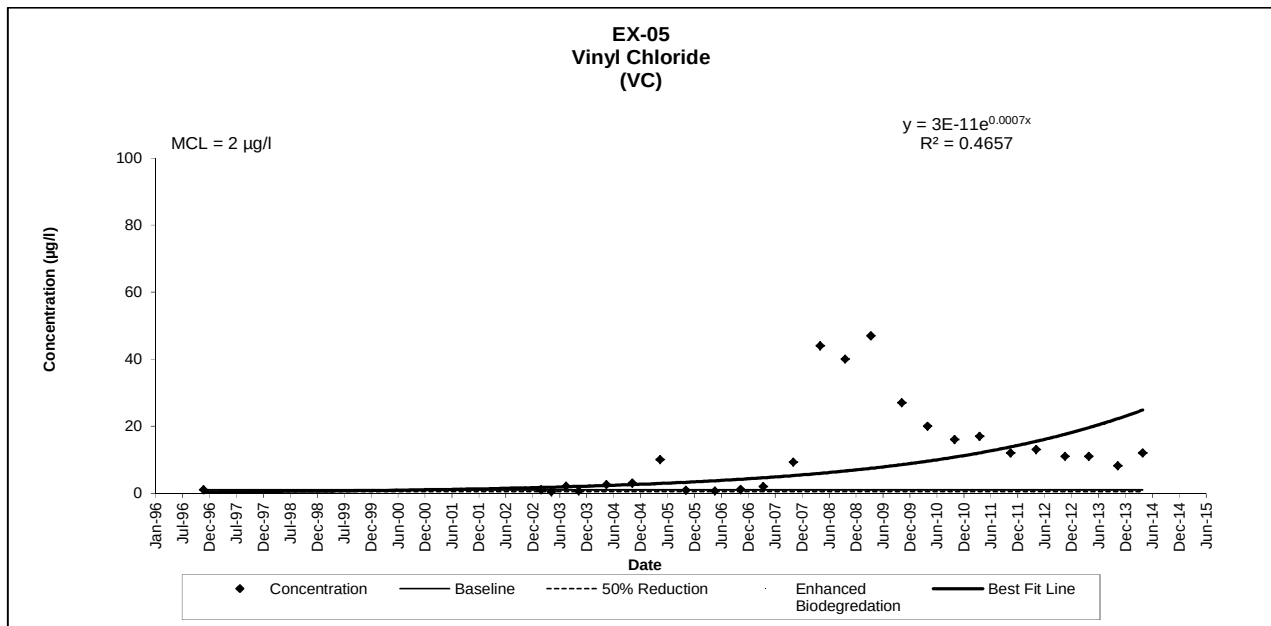


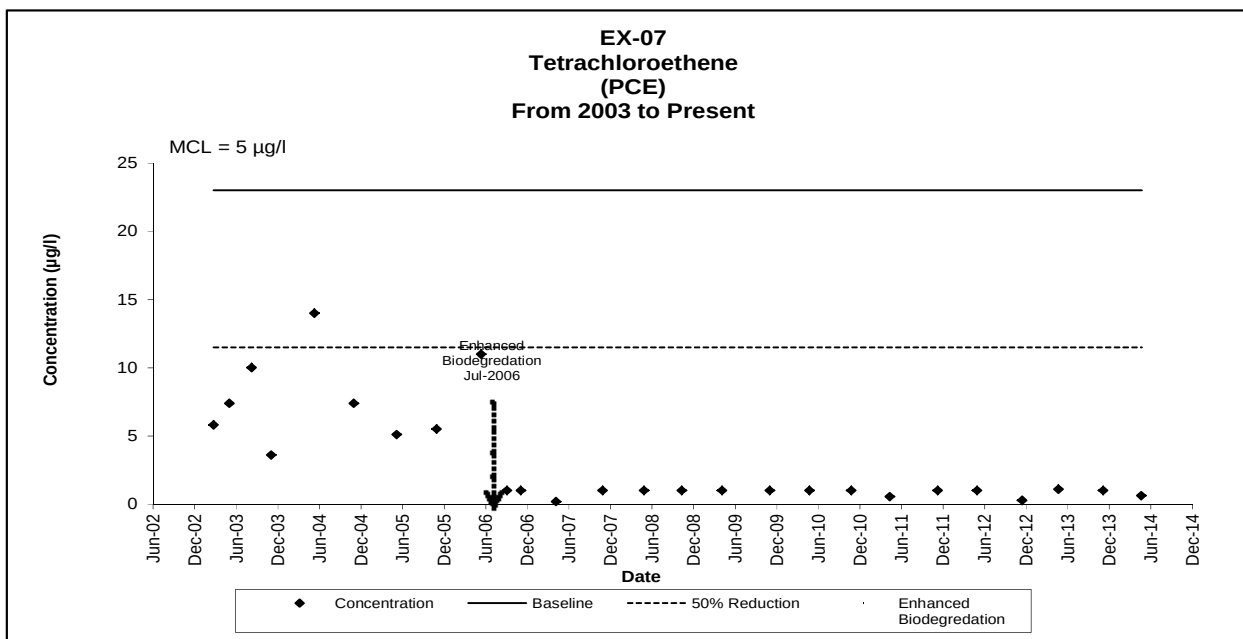
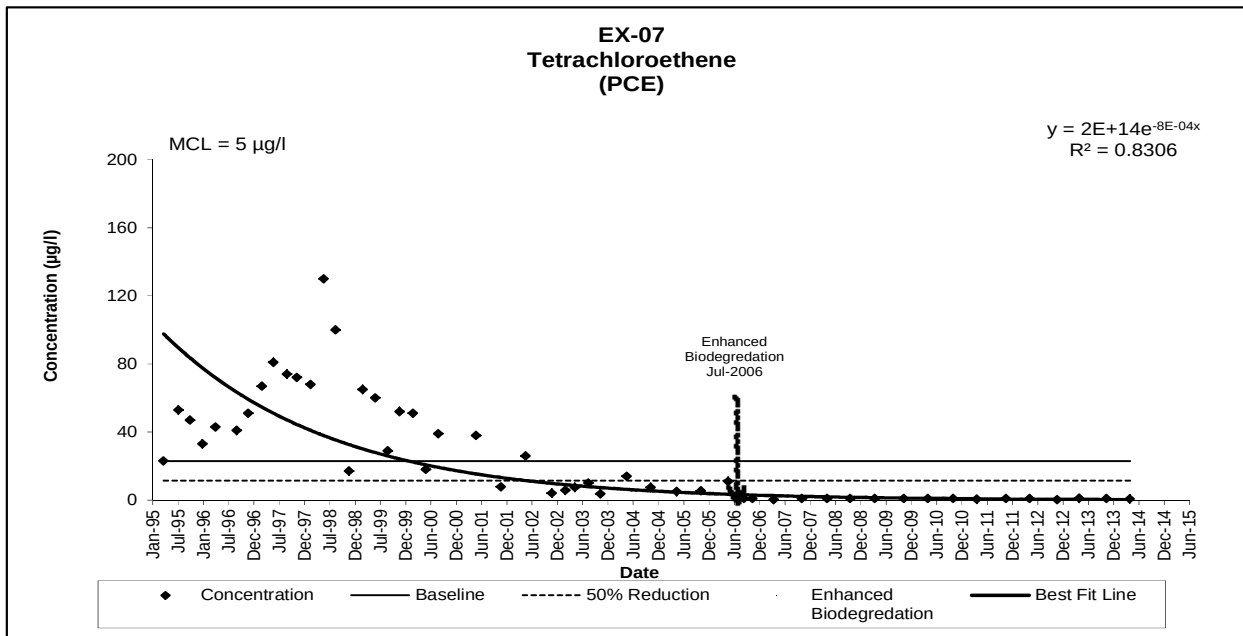
EXHIBIT B-5
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-07

LABORATORY PARAMETERS								
Sample Date	PCE (µg/l)	TCE (µg/l)	1,1-DCE (µg/l)	cis-1,2-DCE (µg/l)	trans-1,2-DCE (µg/l)	VC (µg/l)	2,4-D (µg/l)	PCP (µg/l)
20-Mar-95	23	210	86	--	--	--	150	0.671 J
6-Jul-95	53	160	21	--	--	--	< 20	< 40
27-Sep-95	47	150	71	--	--	--	< 2	< 20
27-Dec-95	33	140	28	--	--	--	< 2	< 0.2
28-Mar-96	43	170	21	--	--	--	240	< 20
28-Aug-96	41	360	24	--	--	--	< 10	38 J
20-Nov-96	51	420	23	--	--	53	< 2.5	19 J
26-Feb-97	67	490	19	--	--	--	< 2.5	46
21-May-97	81	850	21	--	--	--	< 2.5	37 J
26-Aug-97	74	460	16	--	--	--	1.7 J	40 B
6-Nov-97	72	490	16	--	--	--	< 2.5	--
12-Feb-98	68 B	460 B	19	--	--	--	3.6	--
19-May-98	130	680	15	--	--	--	4.5	--
12-Aug-98	100	650	21	--	--	--	< 5.5	--
17-Nov-98	17	58	1.4 J	--	--	--	< 0.3 G	5.1
24-Feb-99	65 JB	190 J	4.2 J	--	--	--	< 2.5 G	7
26-May-99	60	160	< 5 G	--	--	--	< 4 UJ	16
25-Aug-99	29	210	10 T	--	--	--	1.53	4.78
17-Nov-99	52	210	9.4 T	--	--	--	< 0.2 J	28.8 J
22-Feb-00	51	110	2.9 J	--	--	--	0.13 J	16.7
24-May-00	18	71	2.6 T	--	--	--	< 0.2	4.92 J
23-Aug-00	39 D	96	5.5 D	--	--	--	--	--
7-Oct-00	--	--	--	--	--	--	< 0.5	0.77
23-May-01	38 D	141 D	7 D	--	--	--	< 0.5	5.4 D
19-Nov-01	7.8	59	3.9	--	--	--	< 0.5	2.4
15-May-02	26	96 D	4.1	--	--	--	< 0.5	8.4 D
20-Nov-02	4.1	46	3.7	--	--	--	< 0.48	2
26-Feb-03	5.8	36	2.1	--	--	17	0.1 TJ	3.2 J
6-May-03	7.4	24	< 1	--	--	1	< 0.5	1.4
12-Aug-03	10	65 D	4.8	--	--	32	< 0.5	2.4
6-Nov-03	3.6	21	2	--	--	10	< 2.4	1.3
14-May-04	14	42	< 1	--	--	3.1	--	0.4 TB
3-Nov-04	7.4	19	< 1	--	--	1	--	0.6
10-May-05	5.1	11	< 1	--	--	0.5 T	--	< 0.5
1-Nov-05	5.5	30	2.4	--	--	18	--	0.9
16-May-06	11	22	0.47 T	--	--	2.1	--	1.2
6-Sep-06	< 1	5.4	2.2	--	--	16 J+	--	--
6-Nov-06	< 1	7.9	2.2	--	--	17	--	0.27 T
10-Apr-07	0.2036 T	7.1	0.71 T	--	--	6.9	--	0.31 T
30-Oct-07	< 1	2.1	0.43 T	--	--	4.2	--	0.13 T
30-Apr-08	< 1	5	0.82 T	--	--	8.9	--	0.16 T
13-Oct-08	< 1	5	1.6	--	--	29	--	< 0.5
7-Apr-09	< 1	3	0.79 T	16	2.3	10	--	0.13 T
3-Nov-09	< 1	1.2	0.33 T	6	1.4	3.6	--	< 0.5
26-Apr-10	< 1	2	< 1	3.6	0.62 T	1.4	--	< 0.5
26-Oct-10	< 1	1.5	0.34 T	8.3	4	4.1	--	< 0.5
14-Apr-11	0.54 T	2.4	0.25 T	4	0.51 T	1.4	--	< 0.5
10-Nov-11	< 1	1.1	0.45 T	10	5	5.3	--	< 0.5
1-May-12	< 1	0.93 T	0.42 T	8.3	3.7	6.5	--	< 0.5
14-Nov-12	0.28 T	1.6	0.24 T	4.7	1.8	2.3	--	< 0.5
23-Apr-13	1.1	3.1	< 1	3.9	0.73 T	1.4	--	< 0.5
5-Nov-13	< 1	1.5	0.46 T	9.7	3	7.1	--	< 0.5
22-Apr-14	0.61 T	2.4	0.45 T	8.4	1.7	6.1	--	< 0.5

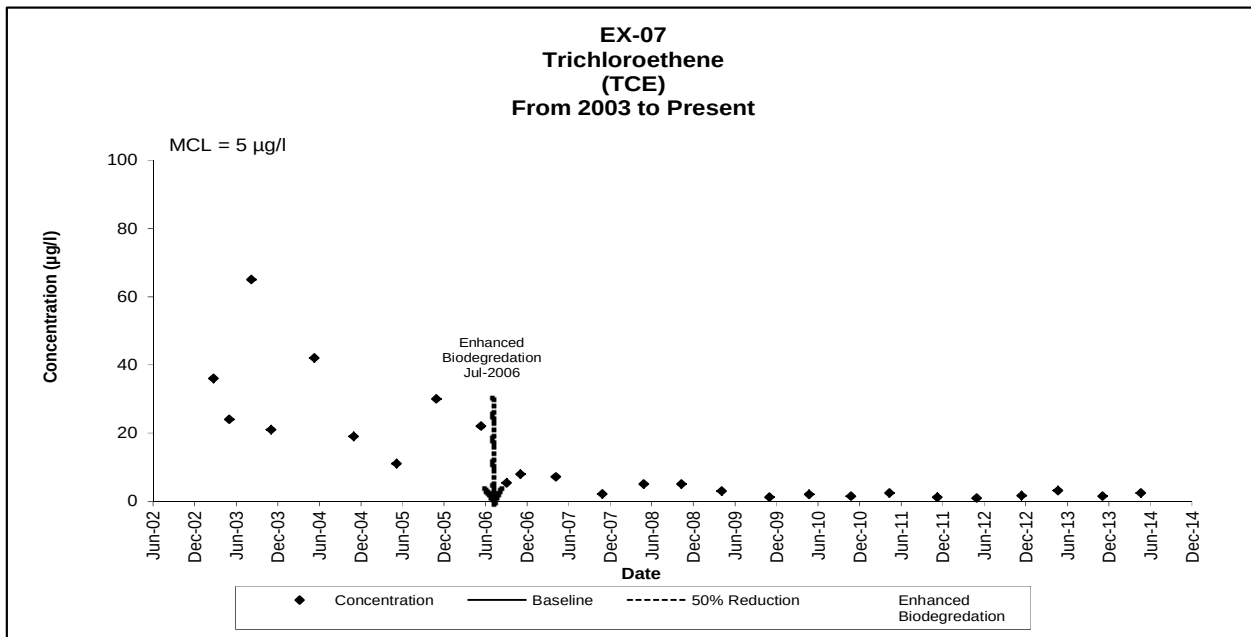
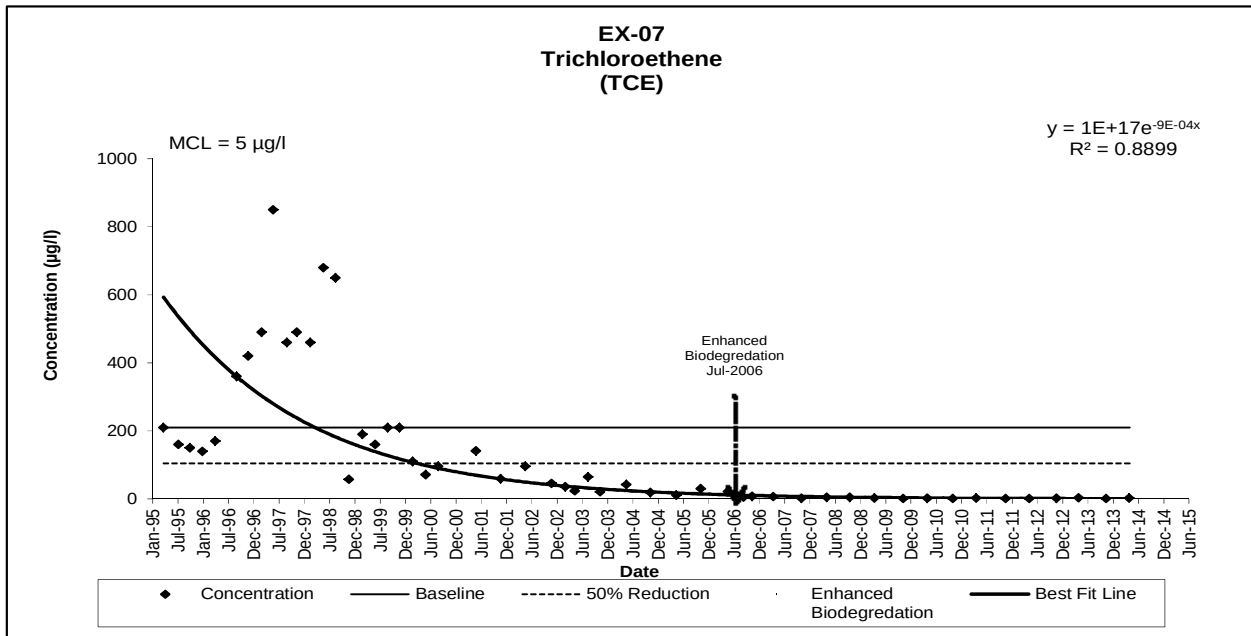
Data qualifiers are defined in laboratory reports. For data collected since 2001, a list of data qualifier definitions is included at the front of this appendix.

-- Not analyzed

**EXHIBIT B-5
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-07**



**EXHIBIT B-5
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-07**



**EXHIBIT B-5
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-07**

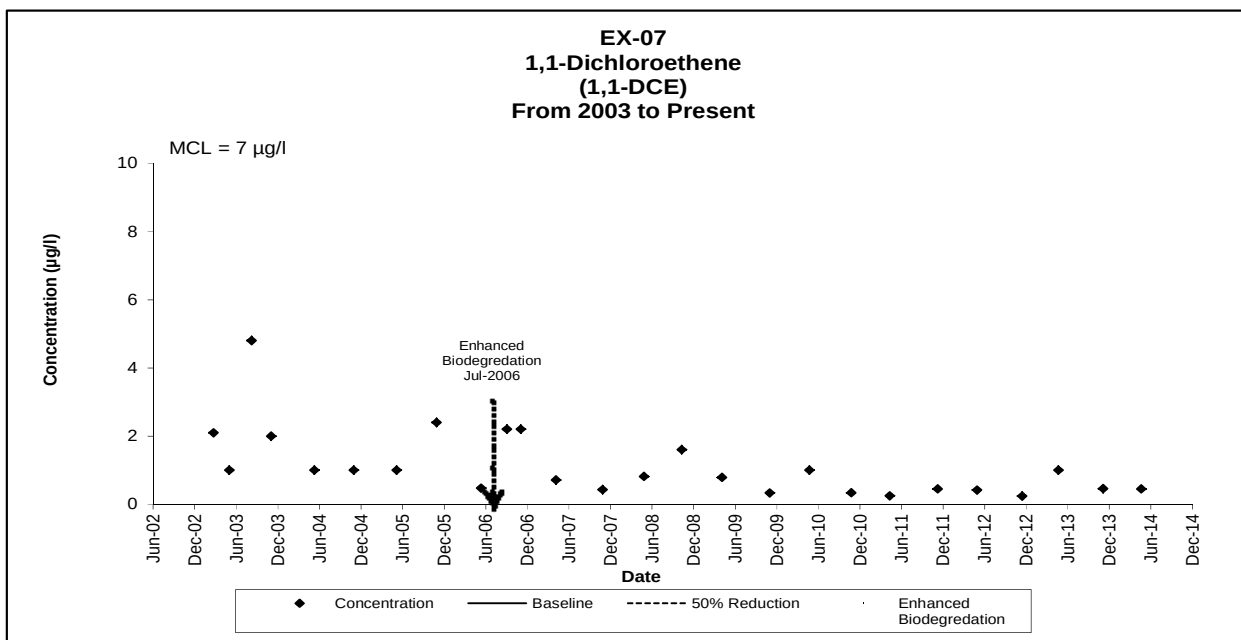
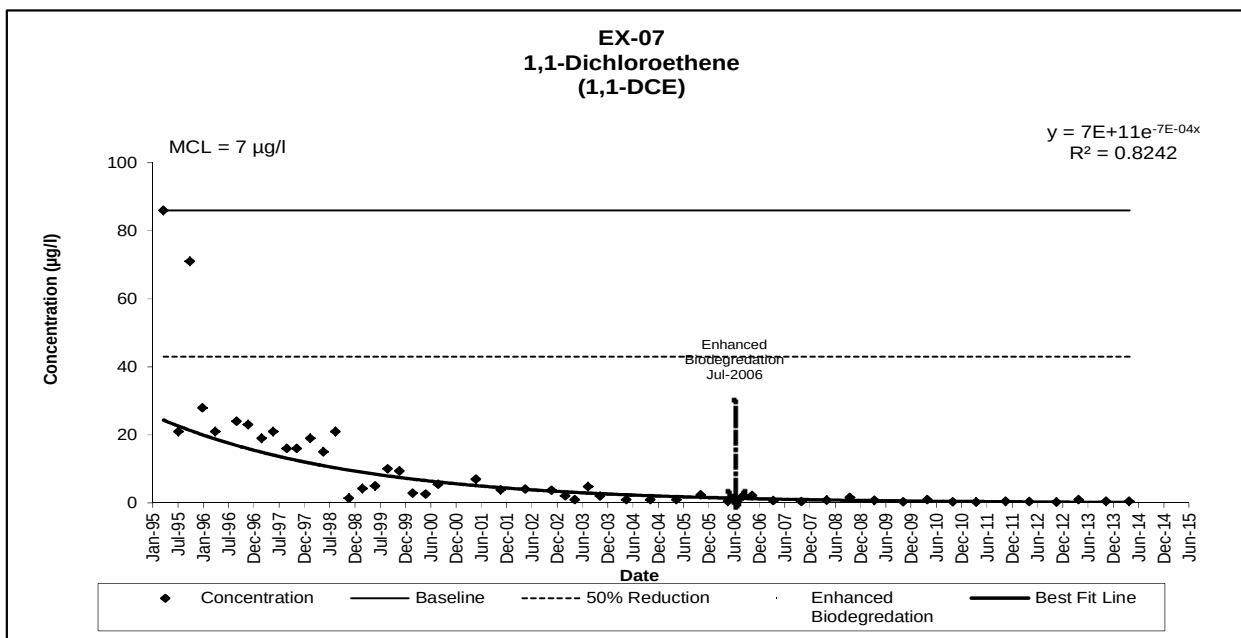
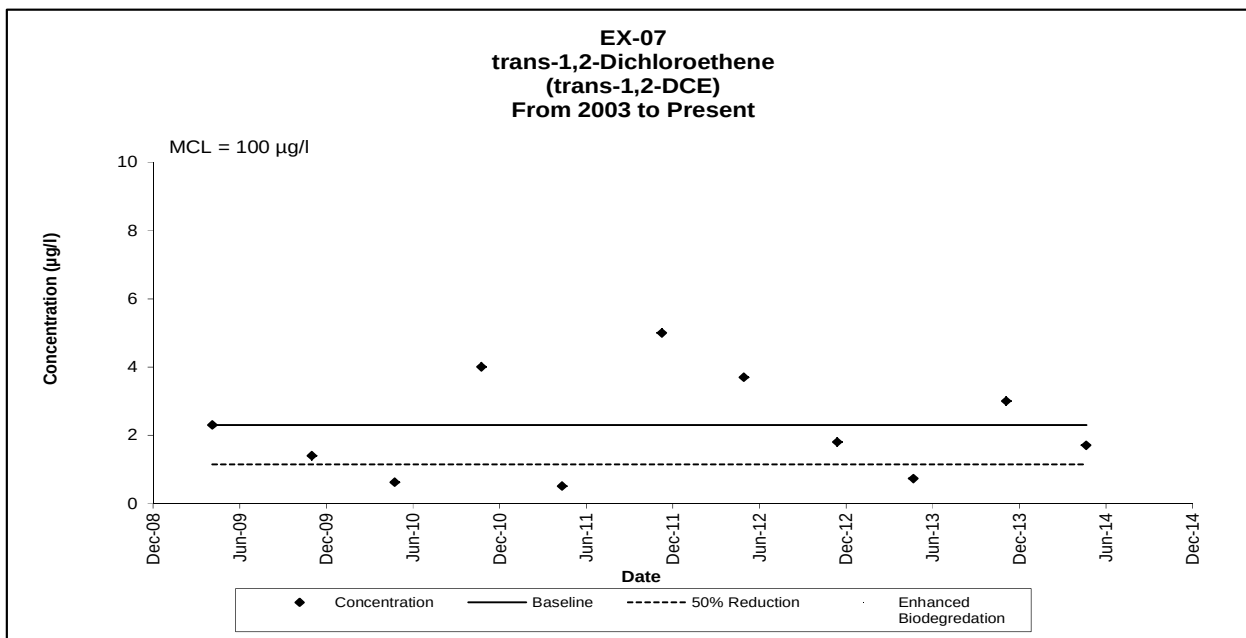
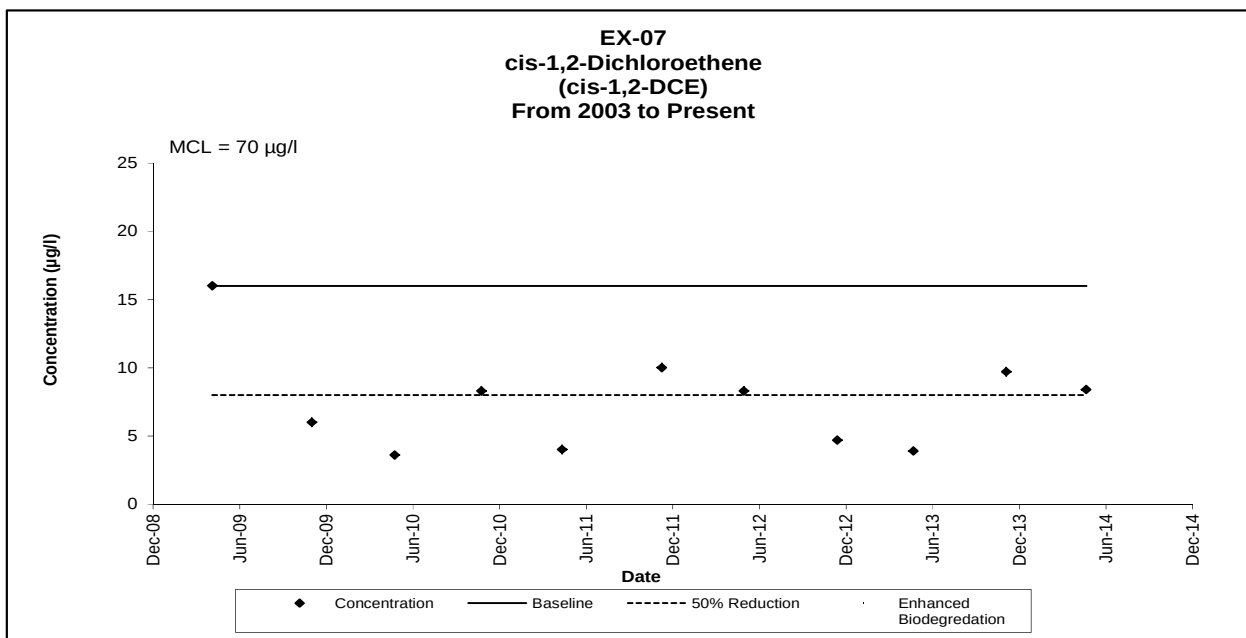
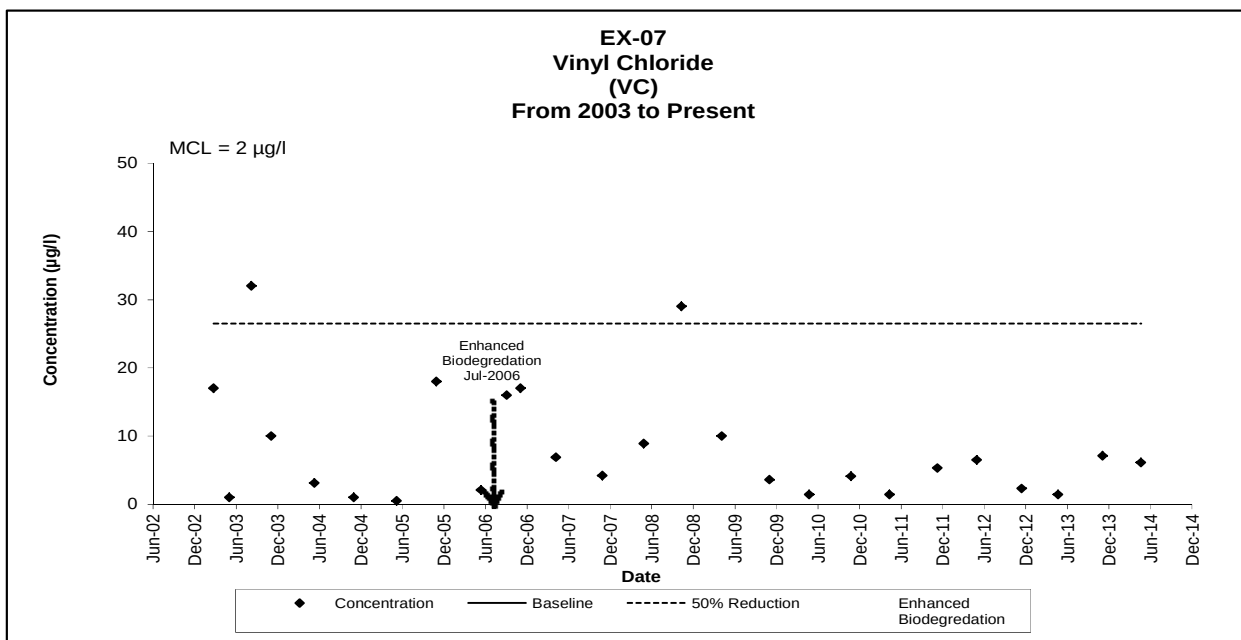
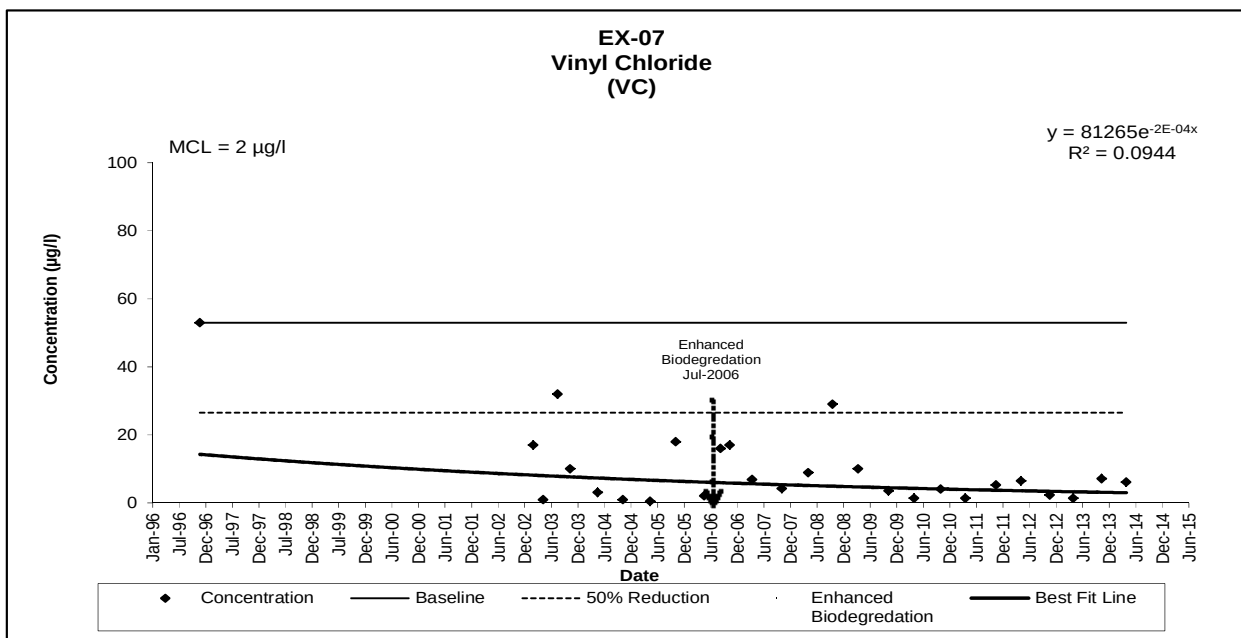


EXHIBIT B-5
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-07



**EXHIBIT B-5
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-07**



**EXHIBIT B-5
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-07**

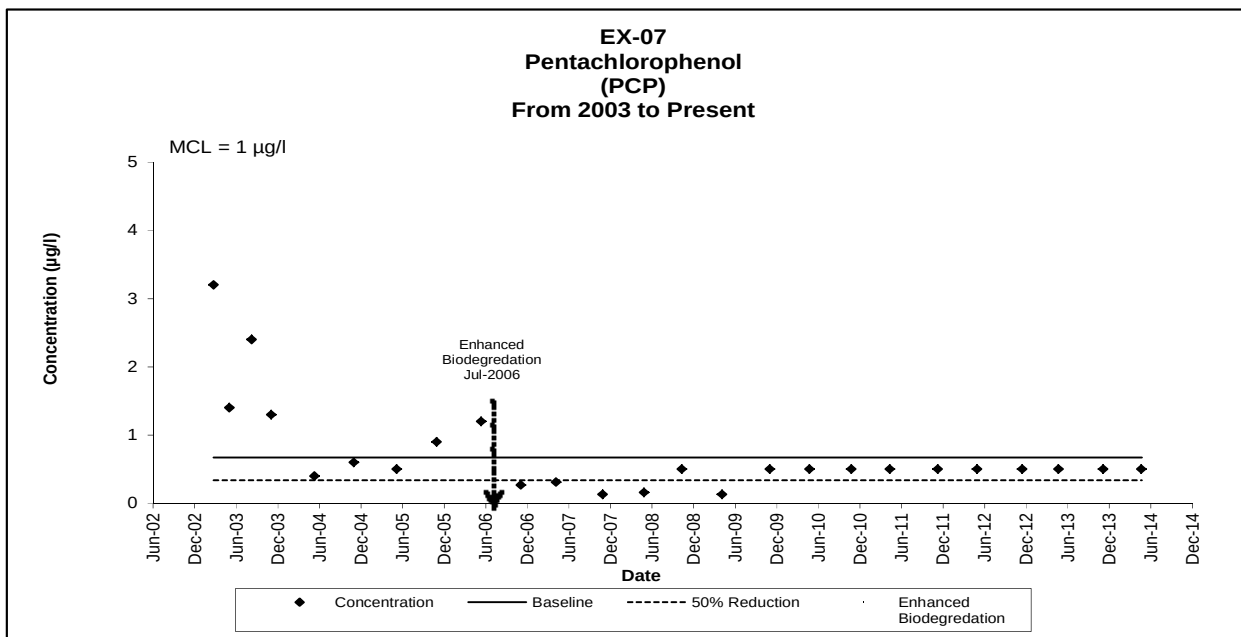
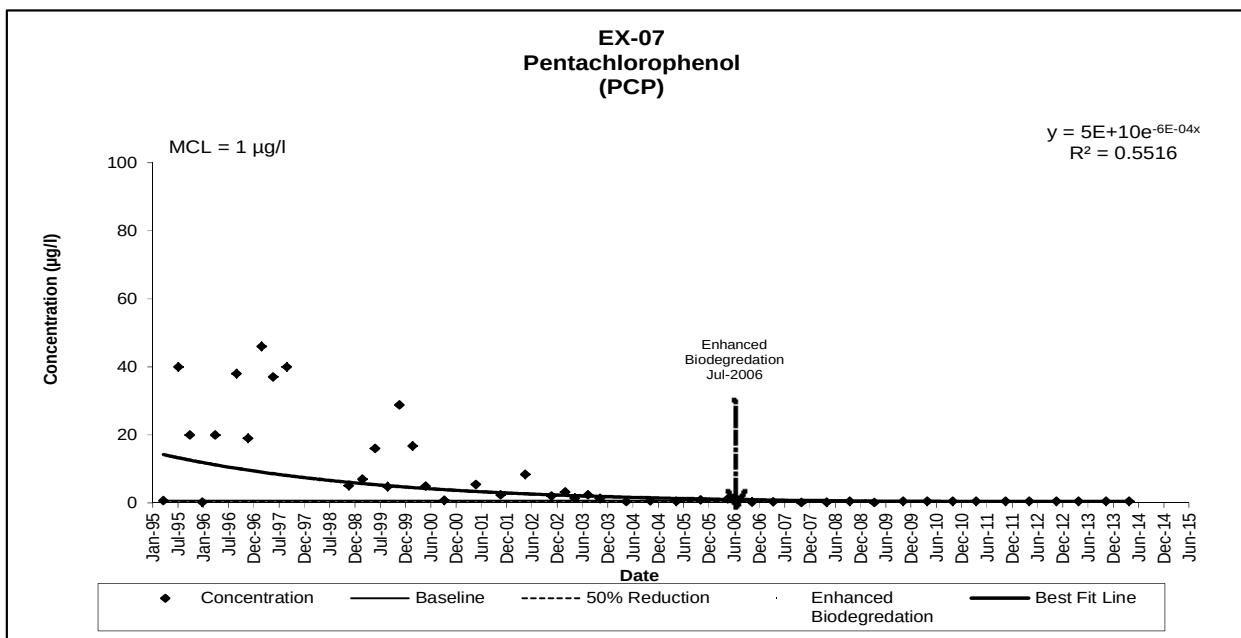


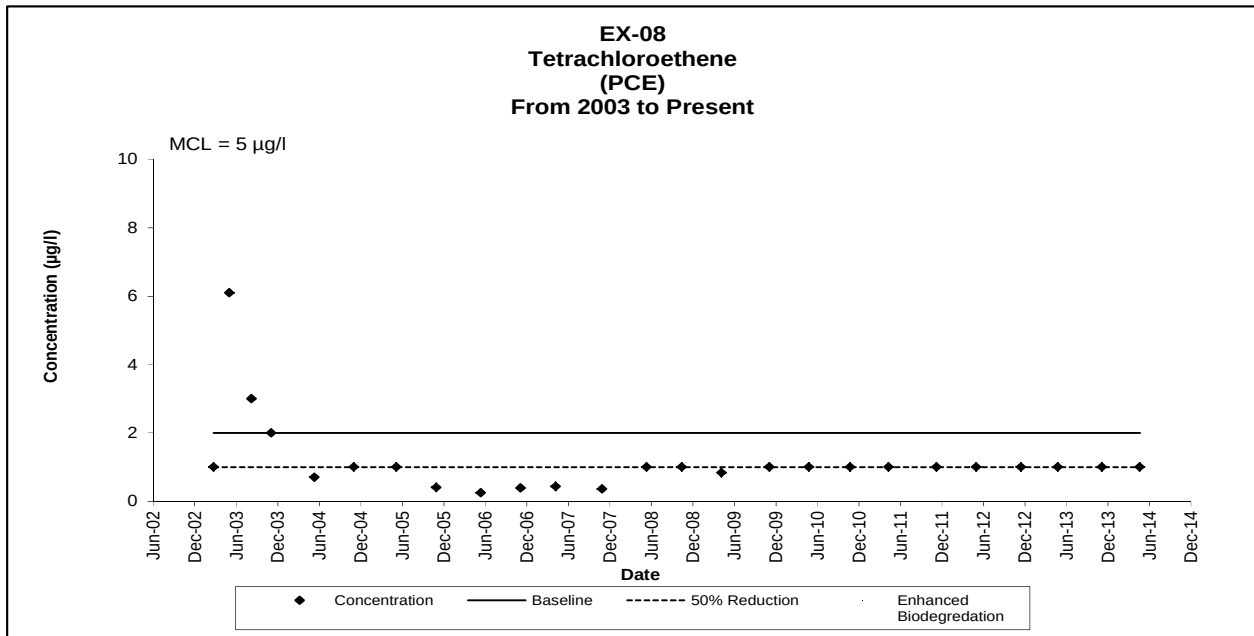
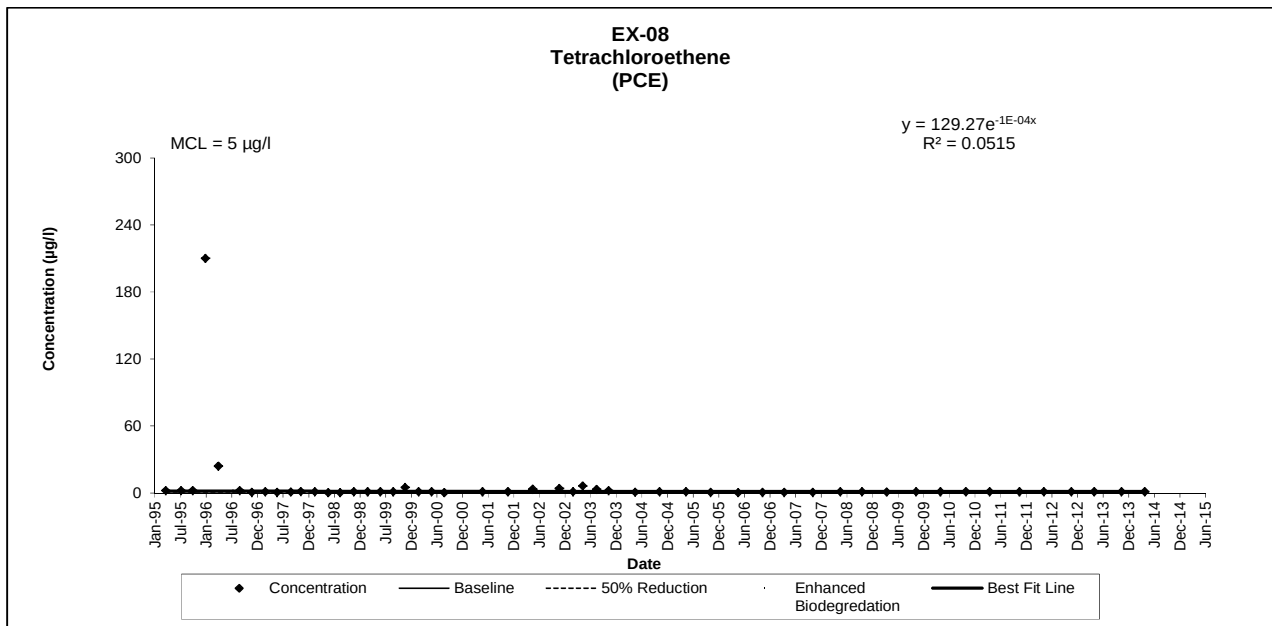
EXHIBIT B-6
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-08

LABORATORY PARAMETERS								
Sample Date	PCE (µg/l)	TCE (µg/l)	1,1-DCE (µg/l)	cis-1,2-DCE (µg/l)	trans-1,2-DCE (µg/l)	VC (µg/l)	2,4-D (µg/l)	PCP (µg/l)
20-Mar-95	< 2	< 2	< 2	--	--	--	< 10	18.5 J
6-Jul-95	< 2	< 2	< 2	--	--	--	< 20	< 40
27-Sep-95	< 2	< 2	< 2	--	--	--	< 2	30
27-Dec-95	210	420	22	--	--	--	980	29
28-Mar-96	24	23	< 2	--	--	--	< 2	22
28-Aug-96	< 2	< 2	< 2	--	--	--	< 10	20 J
21-Nov-96	0.33 T	3.9	0.88 T	--	--	0.55	< 0.25 UJ	14
26-Feb-97	< 1	0.94 T	0.15 T	--	--	--	< 0.25	8.3
21-May-97	0.32 T	1.2	0.42 T	--	--	--	< 0.25	10 J
26-Aug-97	0.82 T	2	0.45 T	--	--	--	< 0.25	11 B
6-Nov-97	1.3 B	1.4	0.34	--	--	--	< 0.25	11 J
12-Feb-98	< 1	0.39 JB	< 1	--	--	--	< 0.25	3
19-May-98	0.21 J	0.34 J	< 1	--	--	--	< 0.25	2.8
12-Aug-98	0.2 J	0.59 J	< 1	--	--	--	< 0.25	3.5
17-Nov-98	< 1	0.48 J	< 1	--	--	--	< 0.25	3.4
24-Feb-99	< 1 UJ	< 1 UJ	< 1	--	--	--	< 0.25	2.8
26-May-99	< 1	< 1	< 1	--	--	--	< 5 UJ	3
25-Aug-99	< 1	0.49 T	< 1	--	--	--	< 0.2	2.71
17-Nov-99	< 5	0.53 T	< 5	--	--	--	< 0.2	3.08
22-Feb-00	< 1	< 1	< 1	--	--	--	< 0.2	1.85
24-May-00	< 1	0.31 T	< 1	--	--	--	< 0.2	2.77 J
23-Aug-00	< 0.166	0.45	< 0.116	--	--	--	--	--
7-Oct-00	--	--	--	--	--	--	2.28 J	0.28 J
23-May-01	< 1	0.5 T	< 1	--	--	--	< 0.5	0.6
19-Nov-01	< 1	0.7 T	< 1	--	--	--	< 0.5	0.2 T
15-May-02	3.3	16	0.7 T	--	--	--	< 0.5	0.4 T
20-Nov-02	3.8	20	< 1	--	--	--	< 0.48	0.3 T
26-Feb-03	1	2.8	< 1	--	--	< 1	0.2 T	0.3 T
6-May-03	6.1	25	0.4 T	--	--	6.5	< 0.5	0.2 T
12-Aug-03	3	9.5	< 1	--	--	3.6	< 0.5	0.2 TJ
6-Nov-03	2	4.2	< 1	--	--	0.8 T	< 2.4	0.5 T
14-May-04	0.7 T	2	< 1	--	--	< 1	--	0.2 TUB
4-Nov-04	< 1	1	< 1	--	--	< 1	--	0.4 T
10-May-05	< 1	0.5 T	< 1	--	--	< 1	--	< 0.5
1-Nov-05	0.4 T	1	< 1	--	--	< 1	--	< 0.5
16-May-06	0.25 T	0.49 T	< 1	--	--	< 1	--	0.74
7-Nov-06	0.39 T	1.5	< 1	--	--	0.54 T	--	0.92
10-Apr-07	0.43 T	1.3	< 1	--	--	0.54 T	--	0.82
30-Oct-07	0.36 T	1.6	< 1	--	--	1.9	--	1.1
13-May-08	< 1	0.22 T	< 1	--	--	< 1	--	1.2
15-Oct-08	< 1	0.22 T	< 1	--	--	< 1	--	1.4
8-Apr-09	0.83 T	4.7	0.92 T	16	1.5	11	--	1
4-Nov-09	< 1	0.4 T	< 1	0.94 T	< 1	0.35 T	--	2.7 D
27-Apr-10	< 1	0.27 T	< 1	< 1	< 1	< 1	--	1.8
25-Oct-10	< 1	0.44 T	< 1	< 1	< 1	< 1	--	3.4 D
12-Apr-11	< 1	0.28 T	< 1	< 1	< 1	< 1	--	1.2
10-Nov-11	< 1	0.28 T	< 1	0.83 T	< 1	0.88 T	--	2.9 D
2-May-12	< 1	< 1	< 1	0.23 T	< 1	< 1	--	2
15-Nov-12	< 1	0.29 T	< 1	< 1	< 1	< 1	--	2.4 D
25-Apr-13	< 1	< 1	< 1	< 1	< 1	< 1	--	0.87
6-Nov-13	< 1	< 1	< 1	< 1	< 1	< 1	--	0.89
21-Apr-14	< 1	< 1	< 1	< 1	< 1	< 1	--	0.48 T

Data qualifiers are defined in laboratory reports. For data collected since 2001, a list of data qualifier definitions is included at the front of this appendix.

-- Not analyzed

**EXHIBIT B-6
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-08**



**EXHIBIT B-6
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-08**

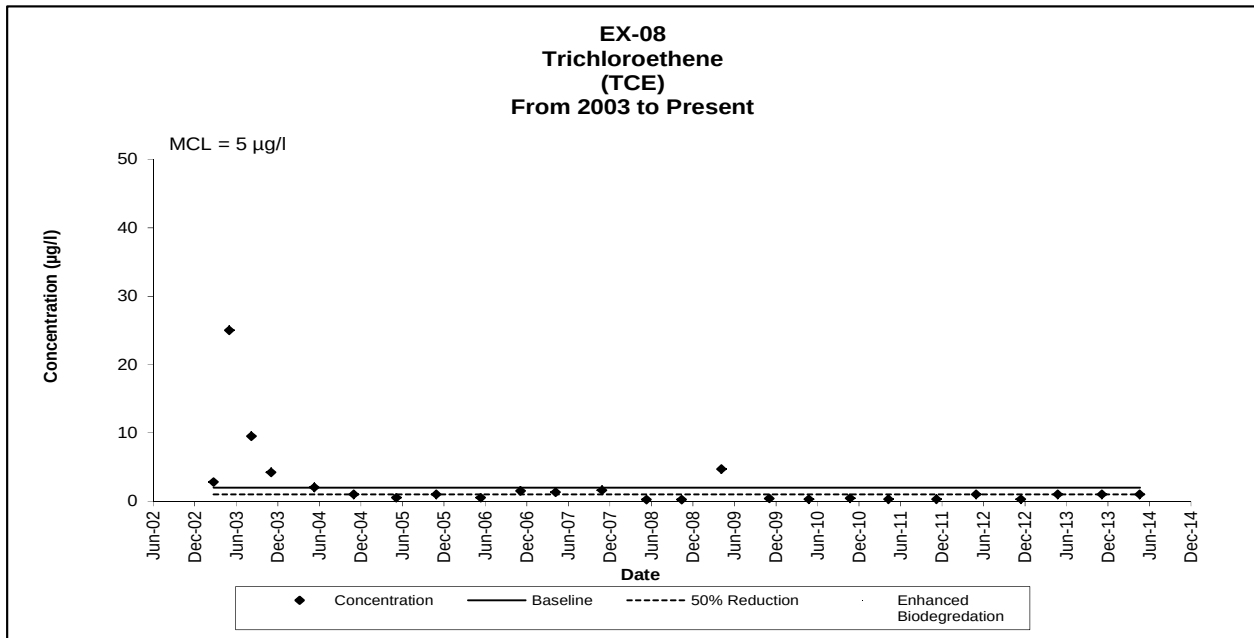
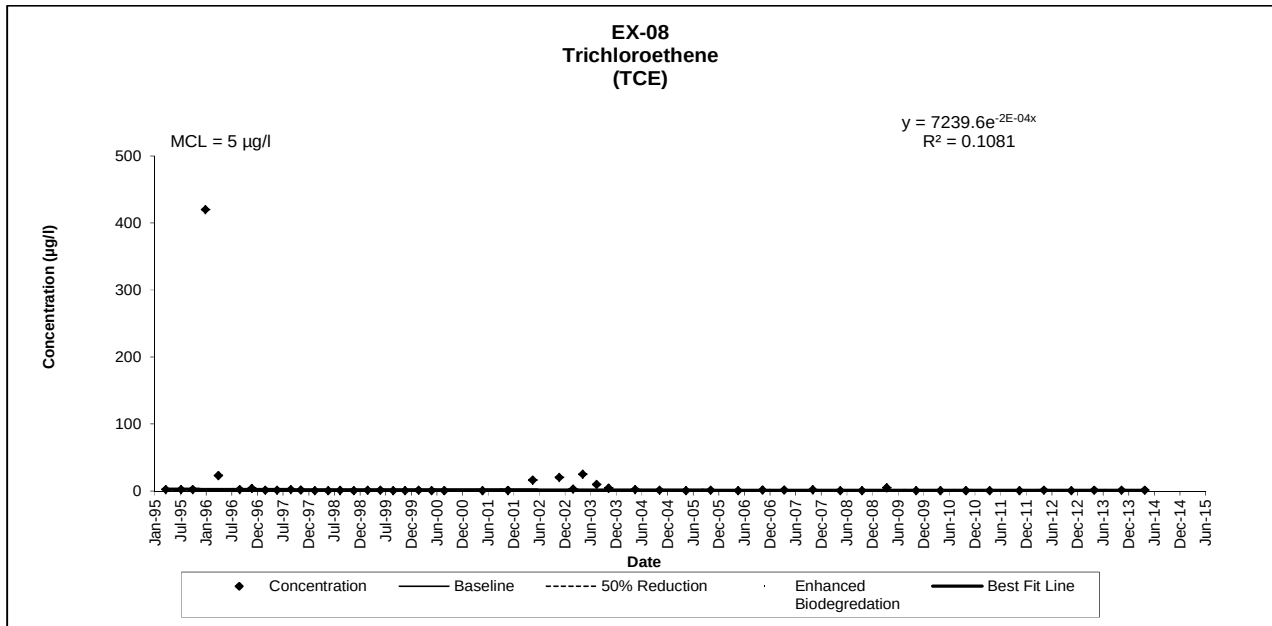


EXHIBIT B-6
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-08

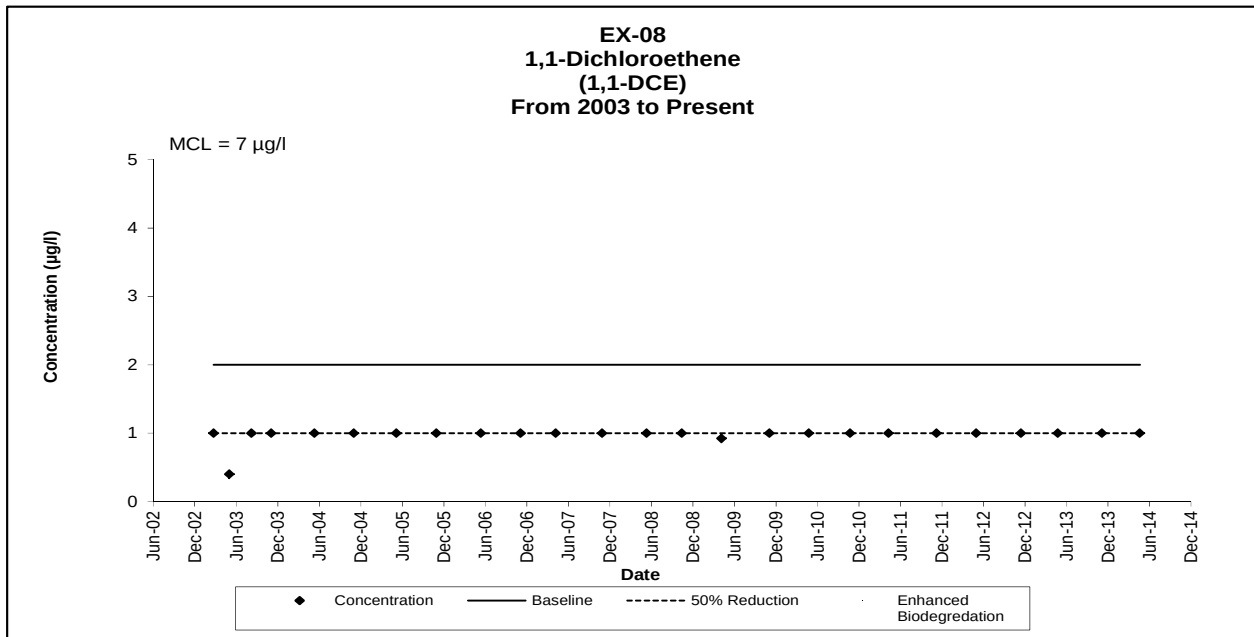
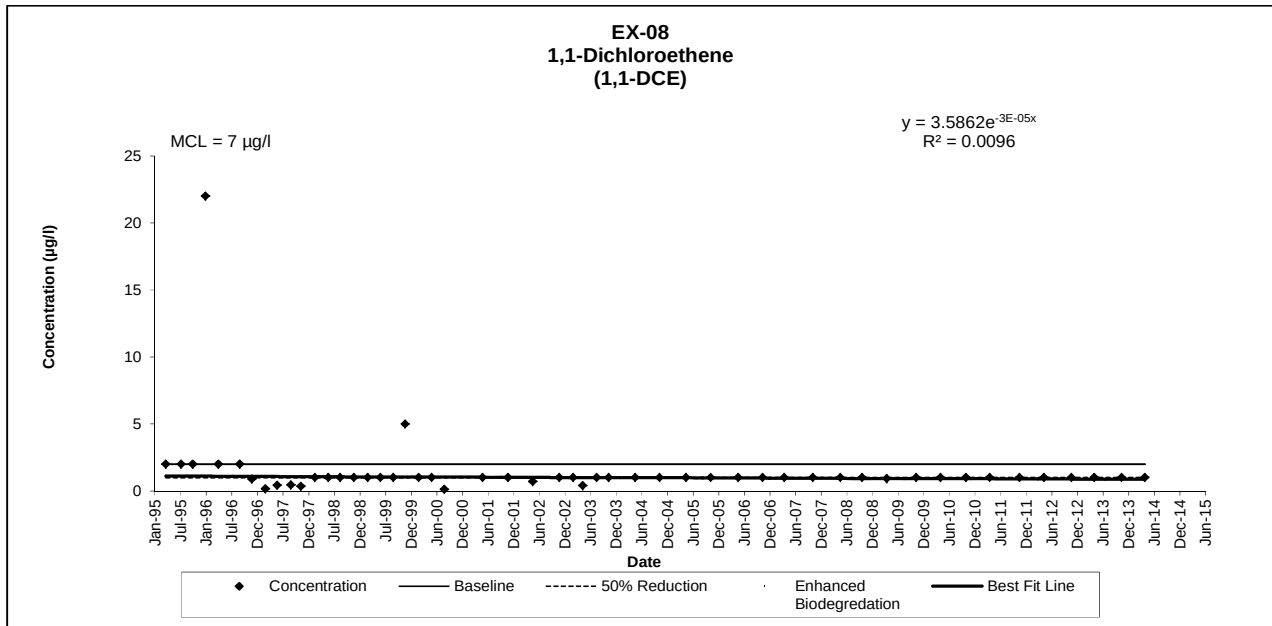


EXHIBIT B-6
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-08

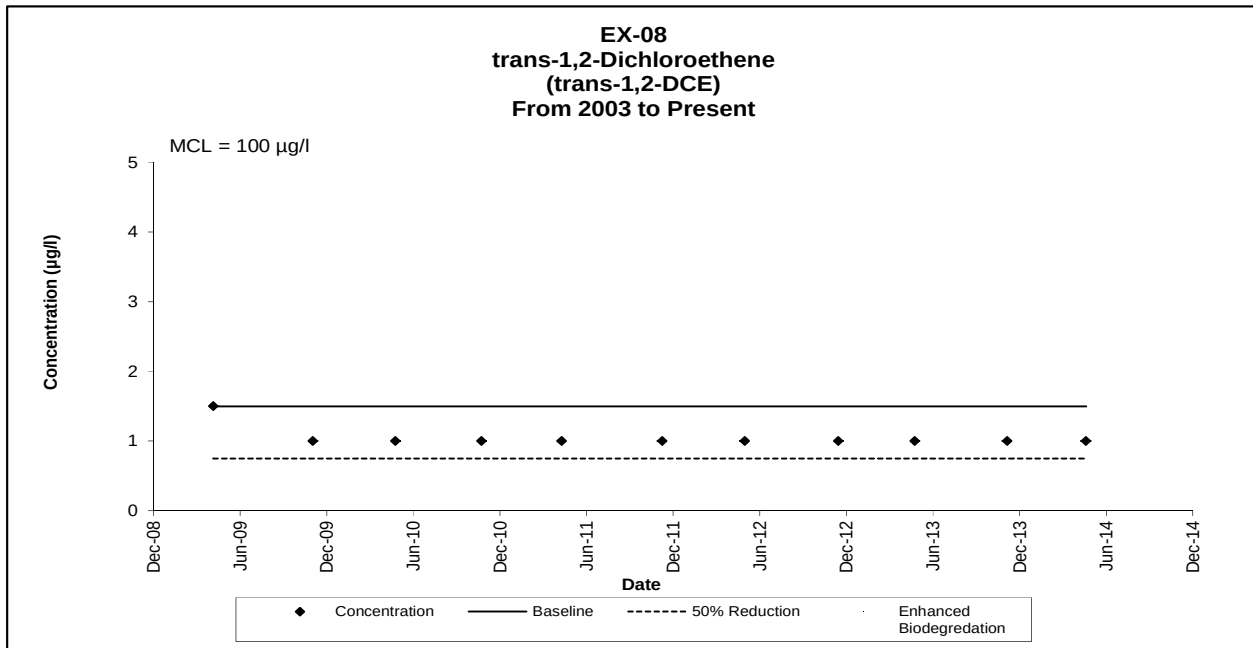
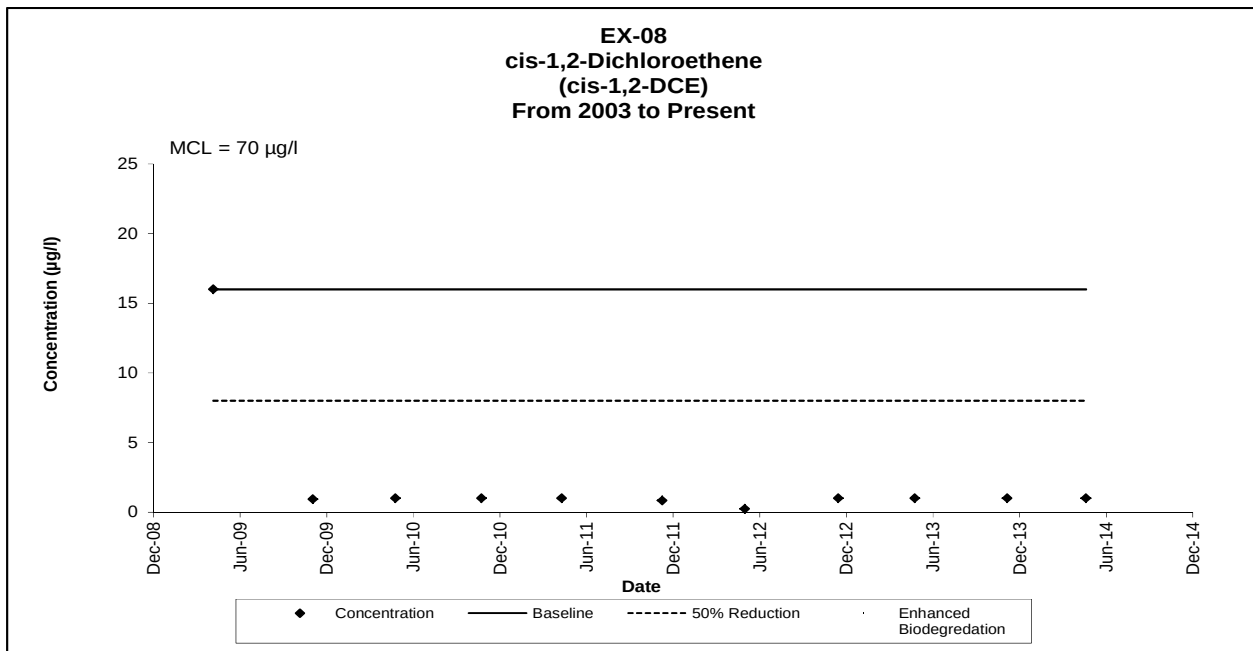
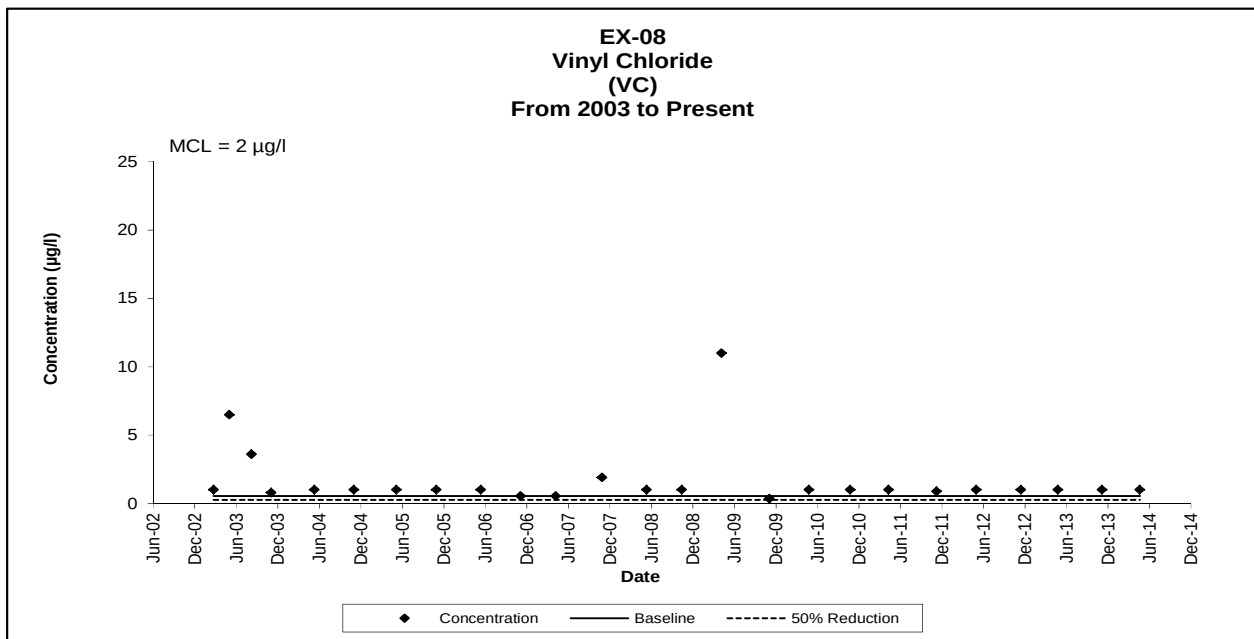
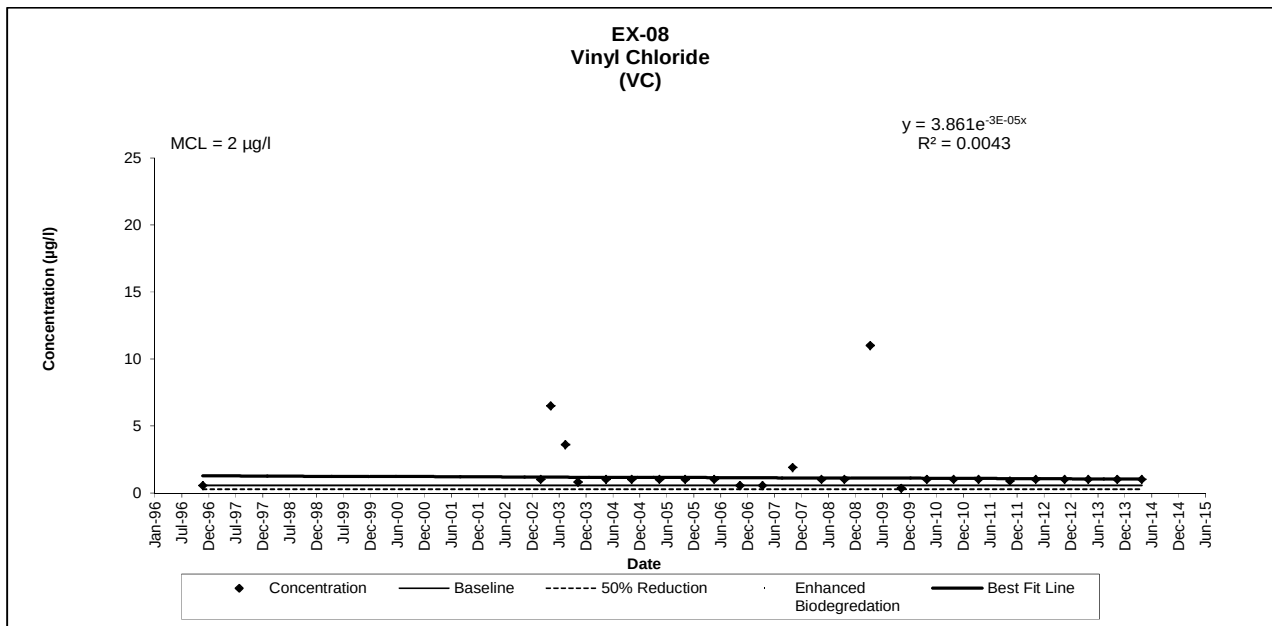


EXHIBIT B-6
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-08



**EXHIBIT B-6
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-08**

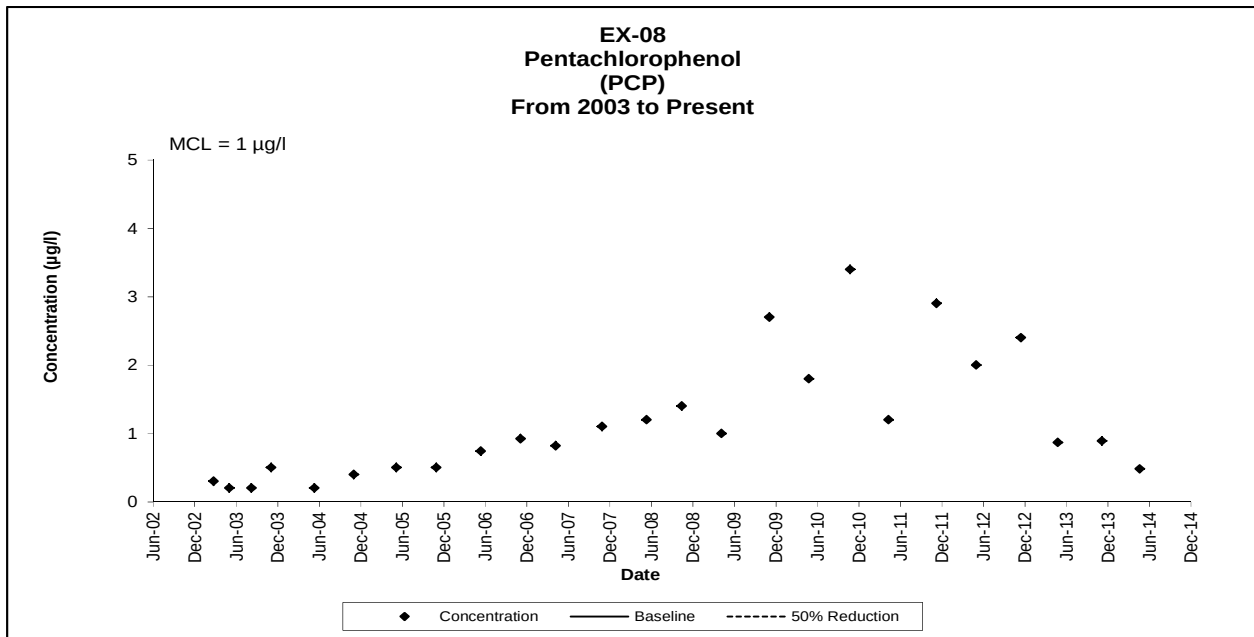
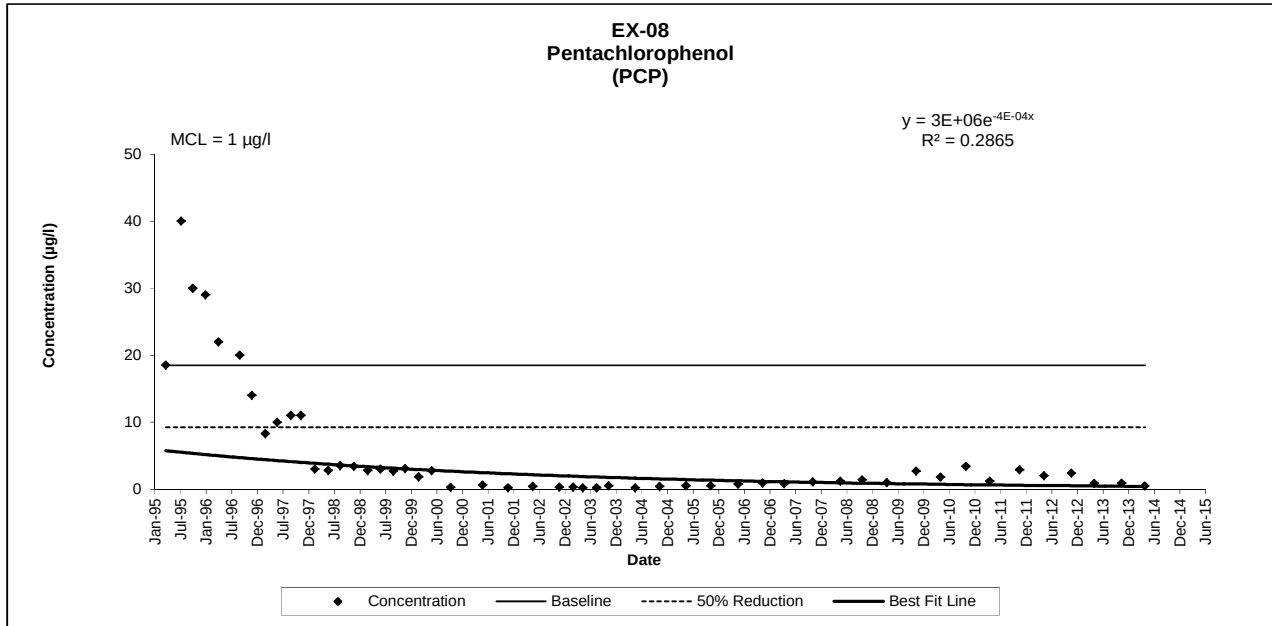


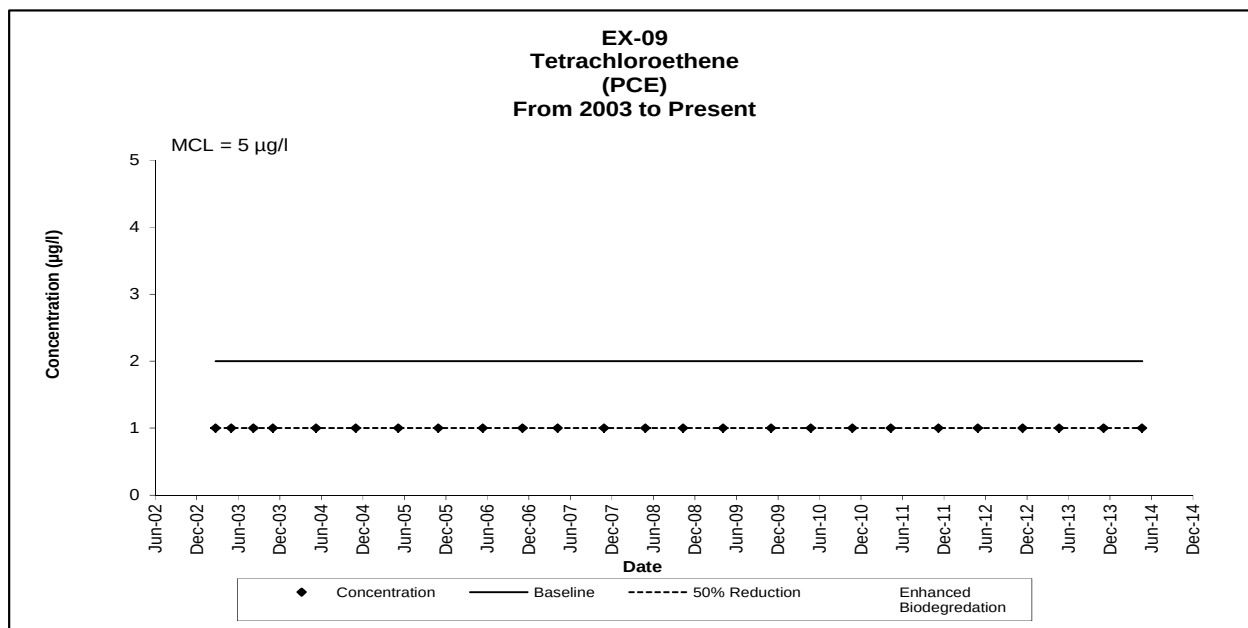
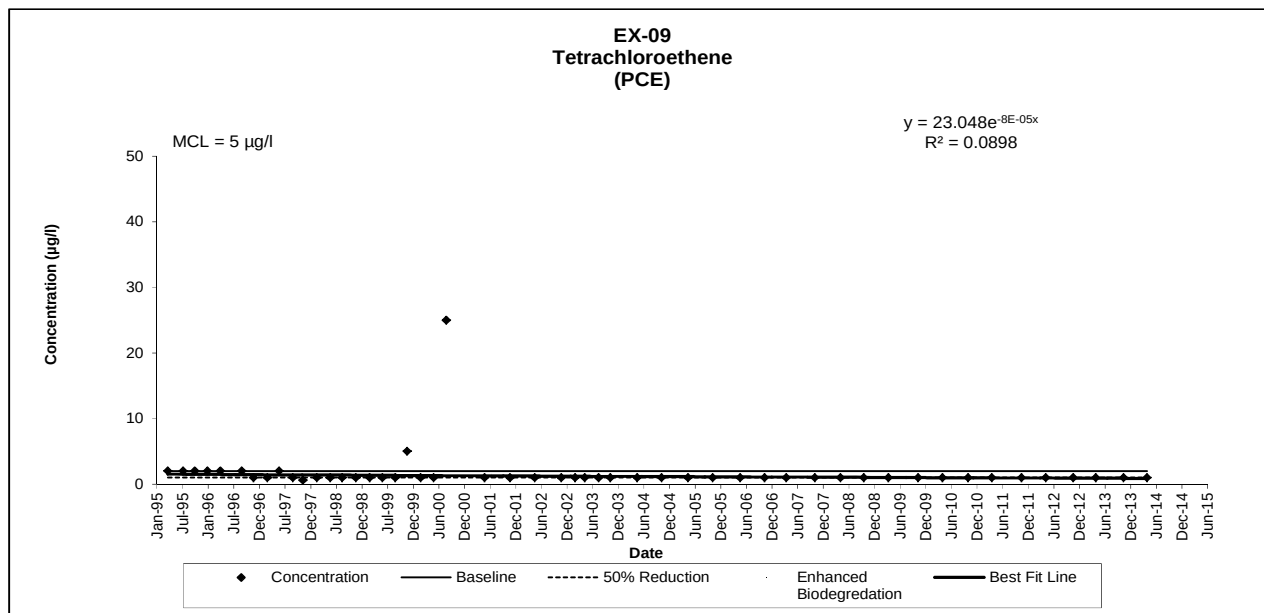
EXHIBIT B-7
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-09

LABORATORY PARAMETERS								
Sample Date	PCE (µg/l)	TCE (µg/l)	1,1-DCE (µg/l)	cis-1,2-DCE (µg/l)	trans-1,2-DCE (µg/l)	VC (µg/l)	2,4-D (µg/l)	PCP (µg/l)
20-Mar-95	< 2	190	25	--	--	--	< 2	< 0.2 J
6-Jul-95	< 2	120	6.7	--	--	--	< 2 J	< 0.2 J
27-Sep-95	< 2	200	35	--	--	--	< 2	< 0.2
27-Dec-95	< 2	190	17	--	--	--	< 2	< 0.2
28-Mar-96	< 2	170	9.1	--	--	--	< 2	< 0.2
28-Aug-96	< 2	90	6.7	--	--	--	< 10	< 0.2
20-Nov-96	< 1	84	6.5	--	--	0.23	< 0.25	< 1
26-Feb-97	< 1	72	4.3	--	--	--	< 0.25	< 1
21-May-97	2	130	8	--	--	--	< 0.25	1
26-Aug-97	< 1	85	5.7	--	--	--	< 0.25	1
6-Nov-97	0.58 JB	60	4.1	--	--	--	< 0.25	< 1
12-Feb-98	< 1	19 B	1.9	--	--	--	< 0.25	< 1
19-May-98	< 1	38	3.5	--	--	--	< 0.25	< 1
12-Aug-98	< 1	73	5	--	--	--	< 0.25	< 1
17-Nov-98	< 1	29	2.8 J	--	--	--	< 0.25	< 0.5
24-Feb-99	< 1	30 J	2.3 J	--	--	--	< 0.25	< 0.5
26-May-99	< 1	12	1.1	--	--	--	< 4 UJ	< 0.5
25-Aug-99	< 1	35	2.7	--	--	--	< 0.2	< 0.1
17-Nov-99	< 5	21	1.9 T	--	--	--	< 0.2	< 0.1
22-Feb-00	< 1	9.2	1.4	--	--	--	< 0.2	< 0.1
24-May-00	< 1	17	1.7	--	--	--	< 0.2	< 0.1
23-Aug-00	25 D	310 D	19 D	--	--	--	--	--
7-Oct-00	--	--	--	--	--	--	0.43 J	< 0.5 UJ
23-May-01	< 1	5.9	0.8 T	--	--	--	< 0.5	< 0.5
19-Nov-01	< 1	4.6	1 T	--	--	--	< 0.5	< 0.5
15-May-02	< 1	2	< 1	--	--	--	< 0.5	< 0.5
20-Nov-02	< 1	2.9	1	--	--	--	< 0.48	< 0.48
26-Feb-03	< 1	2	0.8 T	--	--	< 1	< 0.48 UJ	< 0.48 UJ
6-May-03	< 1	1	1	--	--	< 1	< 0.5	< 0.5
12-Aug-03	< 1	0.8 T	1	--	--	< 1	< 0.5	< 0.5
5-Nov-03	< 1	1	2.4	--	--	< 1	< 2.4	< 0.48
13-May-04	< 1	0.5 T	< 1	--	--	< 1	--	0.1 T
4-Nov-04	< 1	0.7 T	0.7 T	--	--	< 1	--	< 0.48
10-May-05	< 1	0.5 T	< 1	--	--	< 1	--	< 0.5
1-Nov-05	< 1	0.4 T	0.6 T	--	--	< 1	--	< 0.5
16-May-06	< 1	0.42 T	0.32 T	--	--	< 1	--	< 0.5
7-Nov-06	< 1	0.7 T	1.3	--	--	< 1	--	< 0.5
10-Apr-07	< 1	0.27 T	1.7	--	--	0.22 T	--	< 0.5
30-Oct-07	< 1	0.6 T	1.8	--	--	1.2	--	< 0.5
30-Apr-08	< 1	< 1	0.61 T	--	--	< 1	--	< 0.5
13-Oct-08	< 1	0.36 T	1.8	--	--	< 1	--	< 0.5
7-Apr-09	< 1	0.29 T	2	24	6	< 1	--	< 0.5
3-Nov-09	< 1	0.33 T	1.6	19	5.8	< 1	--	< 0.5
27-Apr-10	< 1	0.28 T	2.8	35	10	< 1	--	< 0.5
27-Oct-10	< 1	0.25 T	1.7	26	8.2	< 1	--	< 0.5
14-Apr-11	< 1	0.21 T	1.2	17	5.6	< 1	--	< 0.5
10-Nov-11	< 1	0.24 T	1.2	15	5.3	< 1	--	< 0.5
21-Dec-11	--	--	--	--	--	--	--	< 0.5
1-May-12	< 1	0.21 T	2.1	25	7	0.22 T	--	--
13-Nov-12	< 1	0.29 T	2.5	35	9	0.22 T	--	--
23-Apr-13	< 1	0.23 T	2	25	7.5	< 1	--	--
5-Nov-13	< 1	0.26 T	2.2	28	8.8	< 1	--	--
22-Apr-14	< 1	< 1	2.7	31	10	0.24 T	--	--

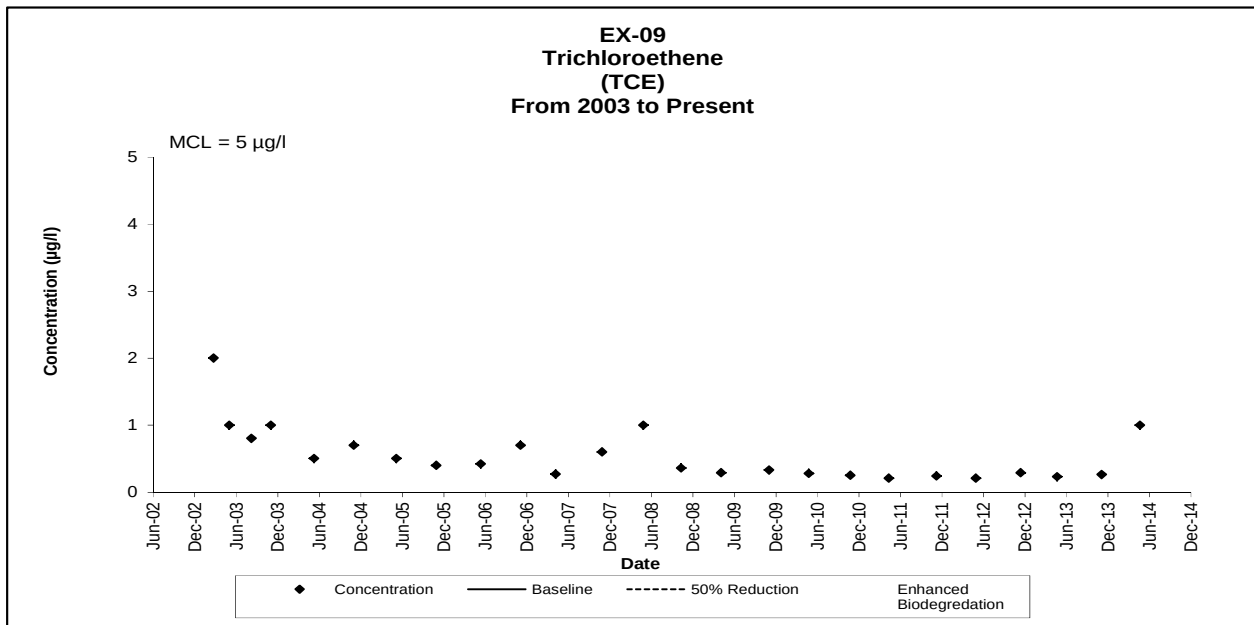
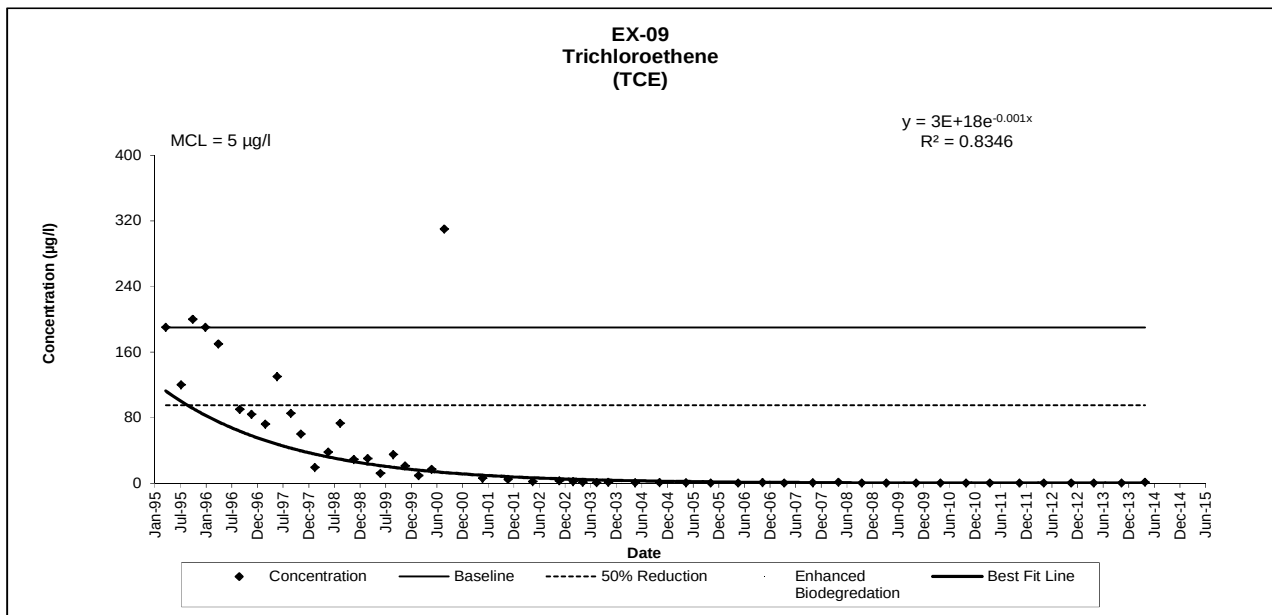
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-- Not analyzed

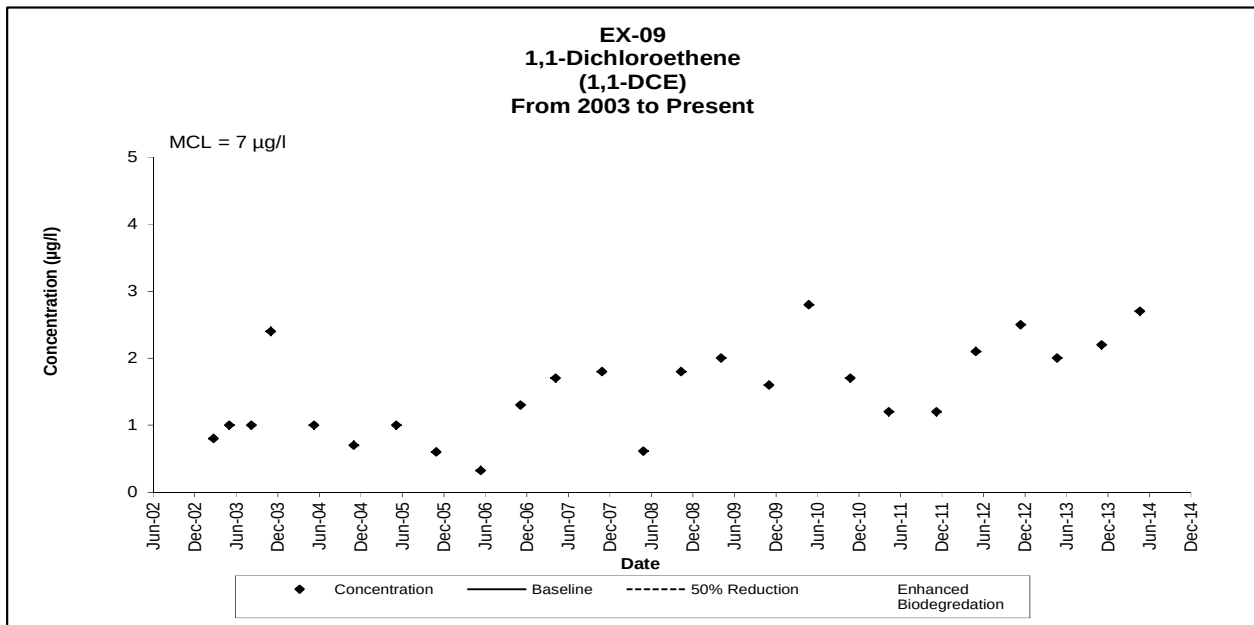
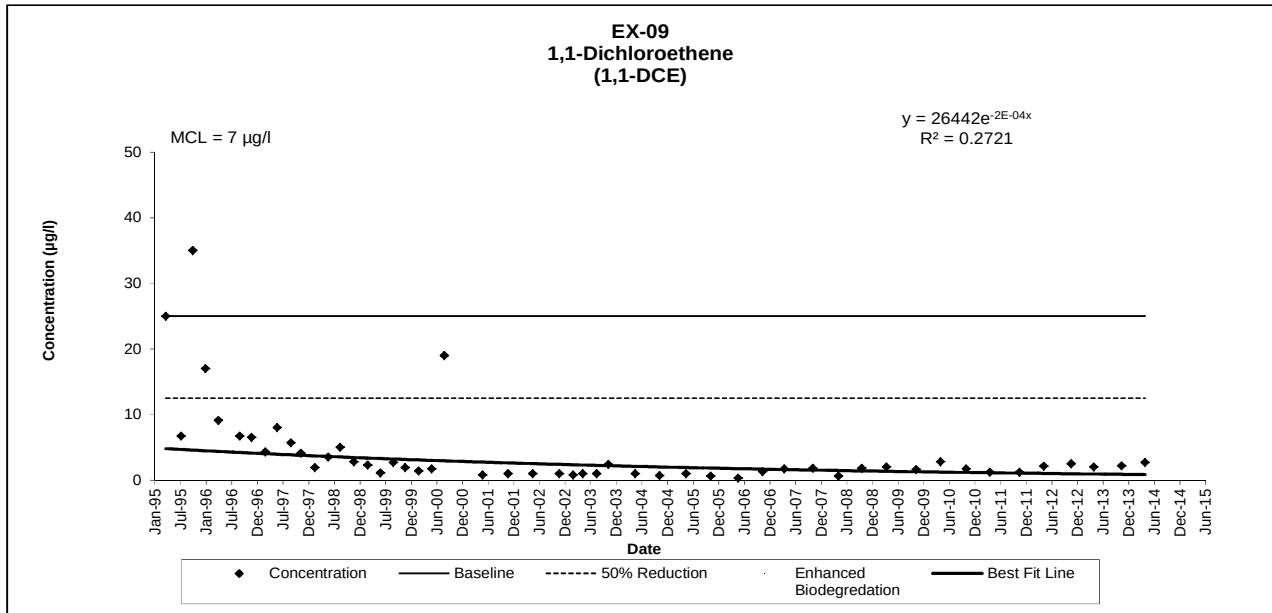
**EXHIBIT B-7
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-09**



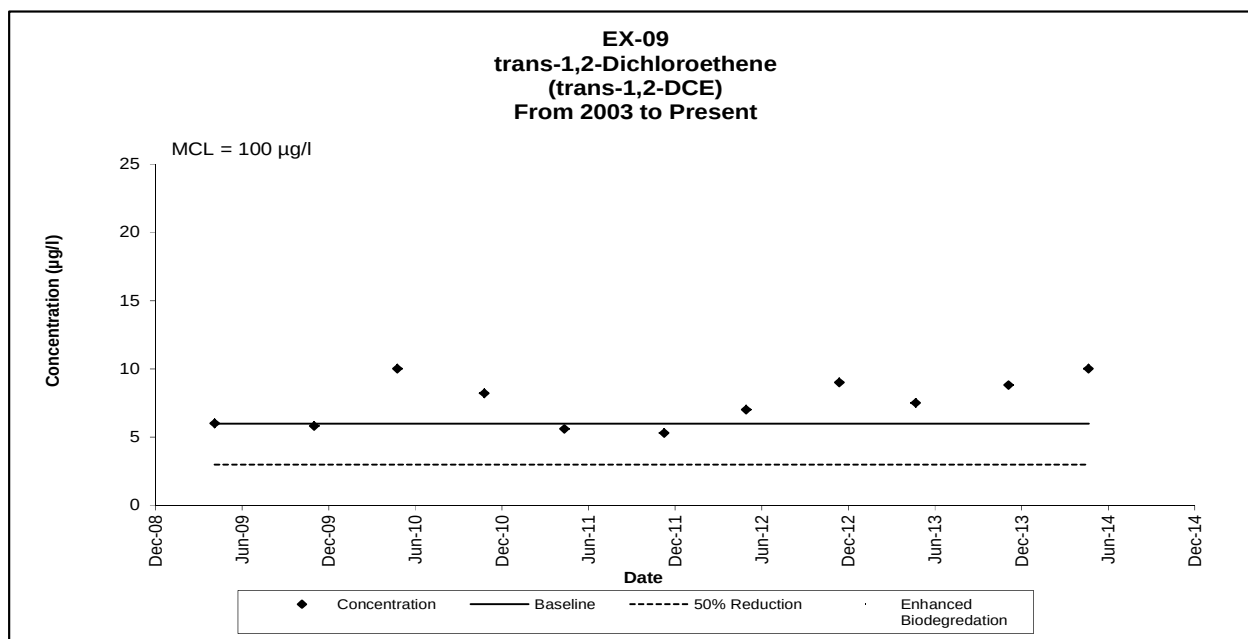
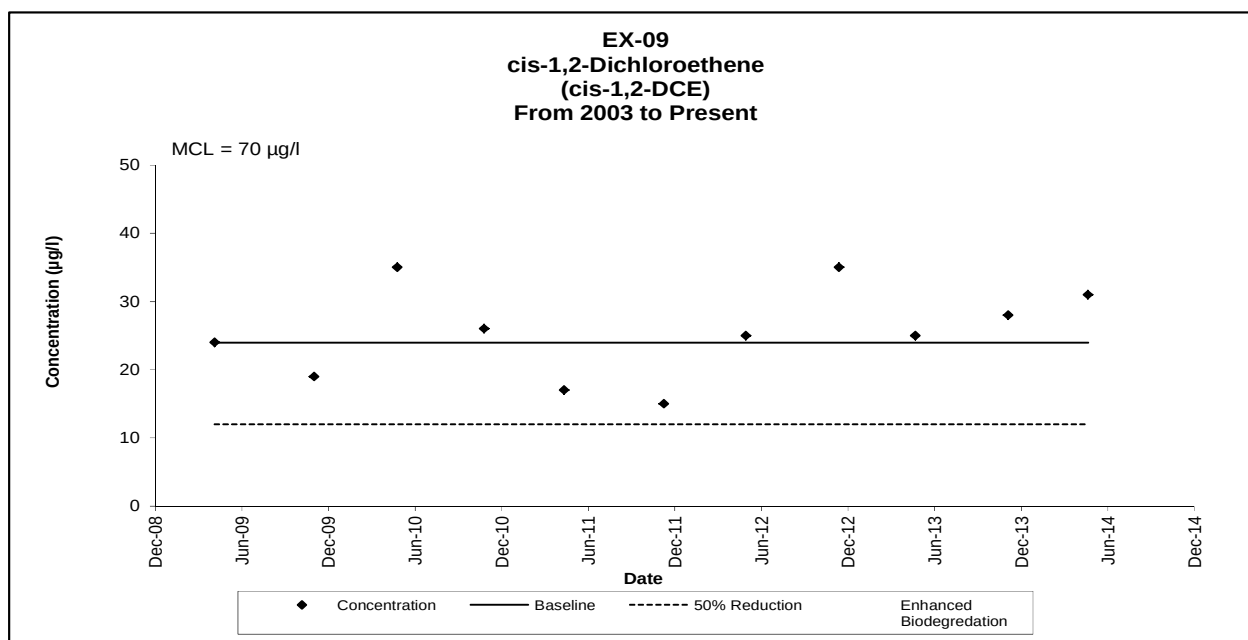
**EXHIBIT B-7
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-09**



**EXHIBIT B-7
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-09**



**EXHIBIT B-7
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-09**



**EXHIBIT B-7
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION WELL EX-09**

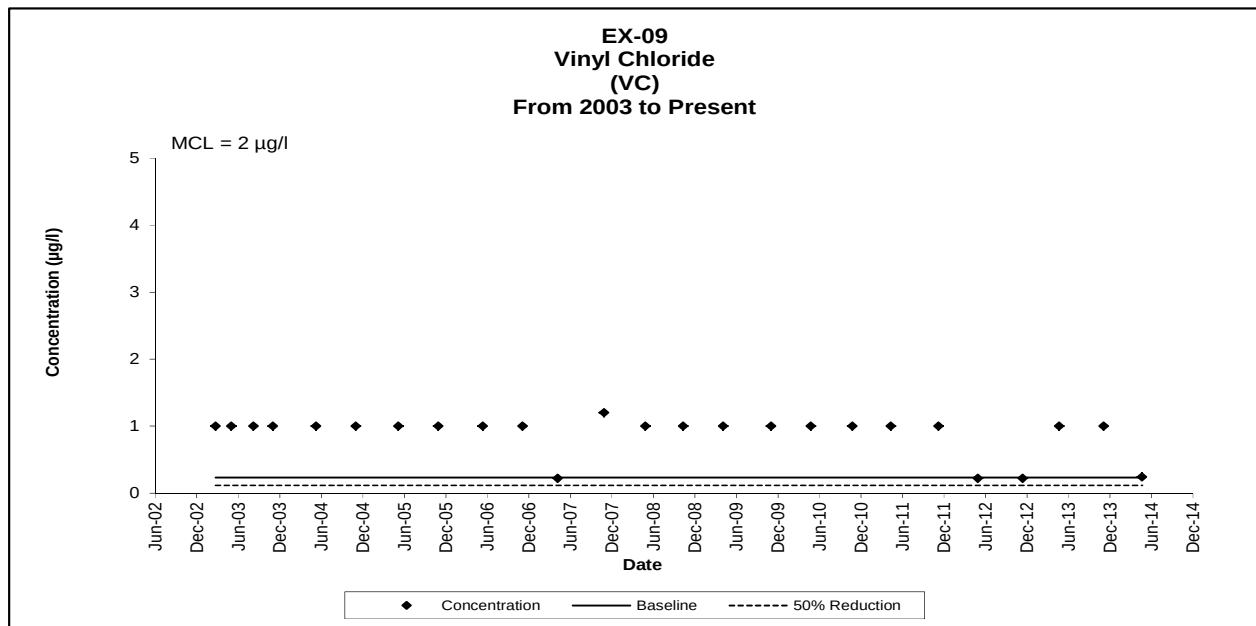
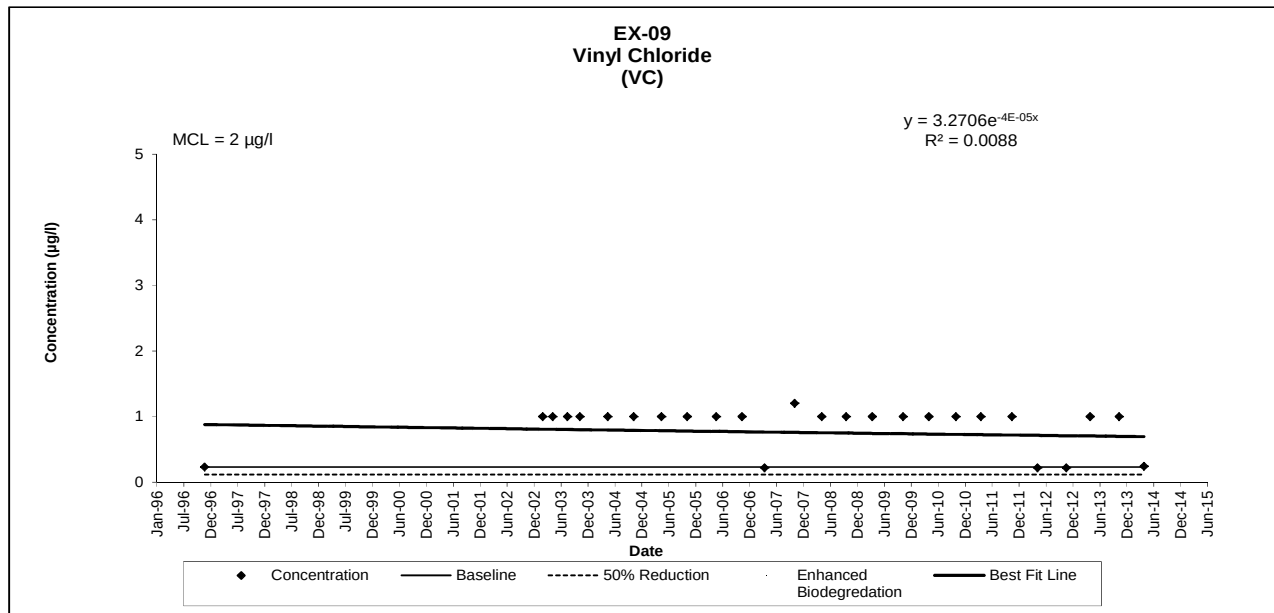


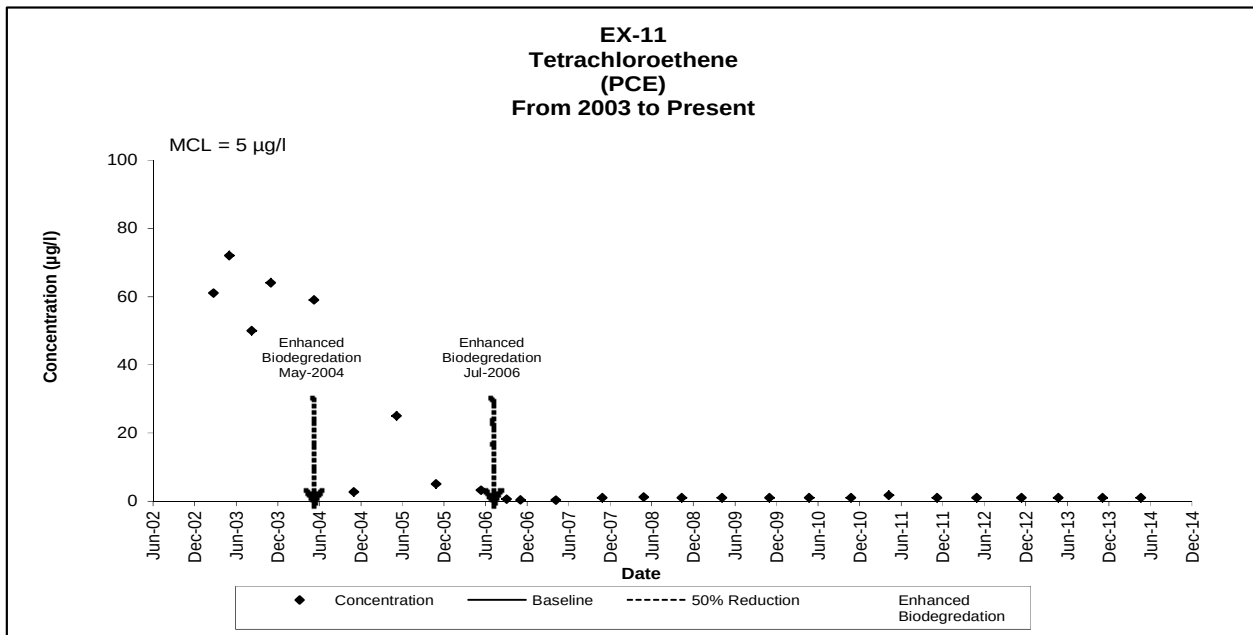
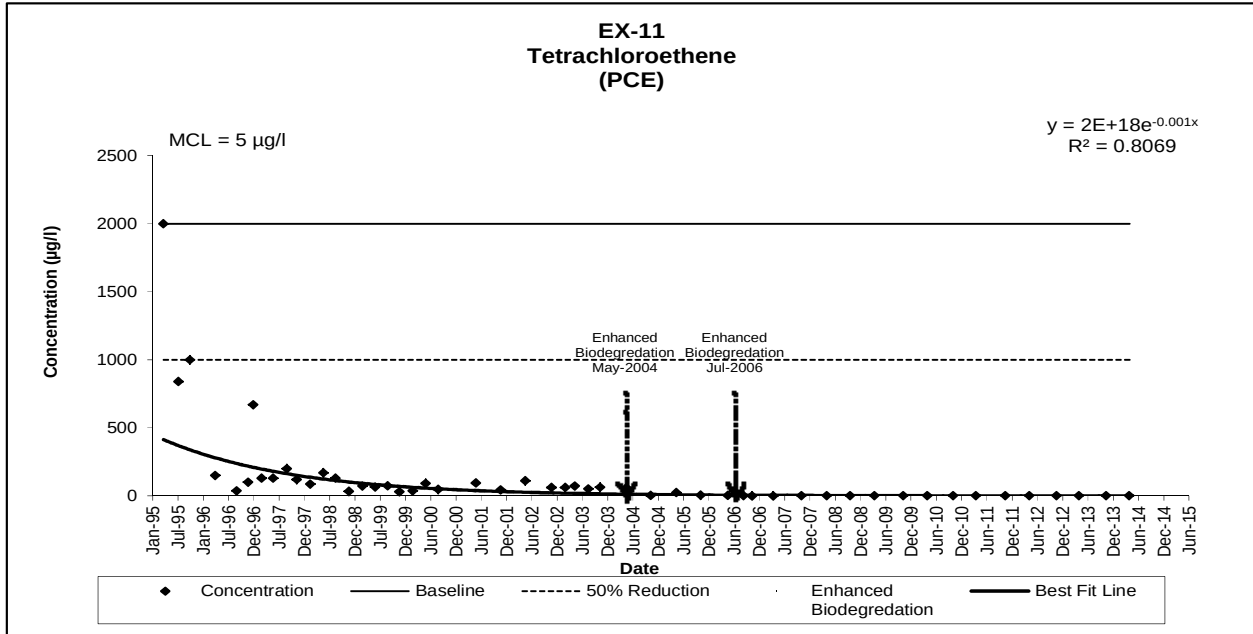
EXHIBIT B-8
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION TRENCH EX-11

LABORATORY PARAMETERS								
Sample Date	PCE (µg/l)	TCE (µg/l)	1,1-DCE (µg/l)	cis-1,2-DCE (µg/l)	trans-1,2-DCE (µg/l)	VC (µg/l)	2,4-D (µg/l)	PCP (µg/l)
20-Mar-95	2000	5900	380	--	--	--	3.89 J	< 2 J
6-Jul-95	840	3200	< 200	--	--	--	< 20 J	< 0.2 J
27-Sep-95	1000	1600	210	--	--	--	< 2	< 0.2
28-Mar-96	150	380	28	--	--	--	< 2	< 0.2
28-Aug-96	36	390	36	--	--	--	< 10	< 0.2
20-Nov-96	100	560	34	--	--	130	< 0.6 UJ	< 1
27-Dec-96	670	920	63	--	--	--	< 2	< 0.2
26-Feb-97	130	470	25	--	--	--	< 0.25	< 1
21-May-97	130	300	33	--	--	--	< 0.25	1
26-Aug-97	200	560	39	--	--	--	< 2.5	1
6-Nov-97	120	560	33	--	--	--	< 2.5	< 1
12-Feb-98	86 B	330 B	26	--	--	--	< 0.25	< 1
19-May-98	170	420	34	--	--	--	< 0.25	< 1
12-Aug-98	130	420	35	--	--	--	< 0.55	< 1
17-Nov-98	34	400	31 J	--	--	--	< 2.5 G	< 0.6 G
24-Feb-99	72 J	530 J	30 J	--	--	--	< 2.5 G	< 0.5
26-May-99	65	250 J	15	--	--	--	< 4 UJ	< 0.5
25-Aug-99	74	420	23	--	--	--	5.68	0.631
17-Nov-99	29 T	480	26 T	--	--	--	< 0.2	< 0.1
22-Feb-00	37	400	24	--	--	--	< 0.2	< 0.1
24-May-00	91	480 J	22	--	--	--	< 0.2	< 0.1
23-Aug-00	47 D	420 D	21 D	--	--	--	--	--
7-Oct-00	--	--	--	--	--	--	4.66	0.45
23-May-01	95 D	382 D	27 D	--	--	--	< 0.5	0.1 T
19-Nov-01	43 D	392 D	29 D	--	--	--	< 0.5	< 0.5
15-May-02	110 D	402 D	27 D	--	--	--	< 0.48	< 0.48
20-Nov-02	62 DJ	347 D	31 DJ	--	--	--	< 0.48	< 0.48 UJ
26-Feb-03	61	339	24	--	--	170	< 0.48 UJ	< 0.48 UJ
6-May-03	72 D	420 D	24	--	--	247 D	< 0.5	< 0.5 UJ
13-Aug-03	50	374 D	35	--	--	271 D	< 0.5	< 0.5 J
5-Nov-03	64 D	362 D	35 D	--	--	394 D	< 2.4	< 0.48 UJ
13-May-04	59 J	460 D	51 J	--	--	658 D	--	0.1 TJ
4-Nov-04	2.7	120 D	12	--	--	617 DJ	--	< 0.48 UJ
10-May-05	< 25 D	120 D	19 TD	--	--	500 D	--	< 0.5 UJ
31-Oct-05	< 5 D	82 D	15 D	--	--	580 D	--	< 0.5 UJ
16-May-06	3.2	210 DJ	20	--	--	380 DJ	--	< 0.5
6-Sep-06	0.56 T	23	0.99 T	--	--	310 D	--	--
6-Nov-06	0.36 TJ+	13 J+	1.2 J+	--	--	160 D	--	< 0.5
10-Apr-07	0.29 T	15	3.6	--	--	300 D	--	< 0.5
30-Oct-07	< 1	4.3	0.74 T	--	--	480 DJ	--	< 0.5
30-Apr-08	1.2	64 D	18	--	--	920 D	--	< 0.5
14-Oct-08	< 1	3.8	1.1	--	--	520 D	--	< 0.5
8-Apr-09	< 1	83 D	23	1200 D	120 D	560 D	--	< 0.5
3-Nov-09	< 1	2.5	3.4	300 D	78 D	840 D	--	< 0.5
26-Apr-10	< 1	35	20	1300 D	100	550 D	--	< 0.5
27-Oct-10	< 1	2.3	4.1	420 D	87	790 DJ-	--	< 0.5
11-Apr-11	1.7	26	15	740 D	81	230 D	--	< 0.5
9-Nov-11	< 1	2	1.2	97	54	240 D	--	< 0.5
1-May-12	< 1	14	6.1	360 D	73	590 D	--	< 0.5
13-Nov-12	< 1	3	1.3	140 D	65	470 D	--	< 0.5
24-Apr-13	< 1	69	15	670 D	84	460 D	--	< 0.5
5-Nov-13	< 1	2.3	0.43 T	34	54 D	180 D	--	< 0.5
22-Apr-14	< 1	3.8	8.8	430 D	88	530 D	--	< 0.5

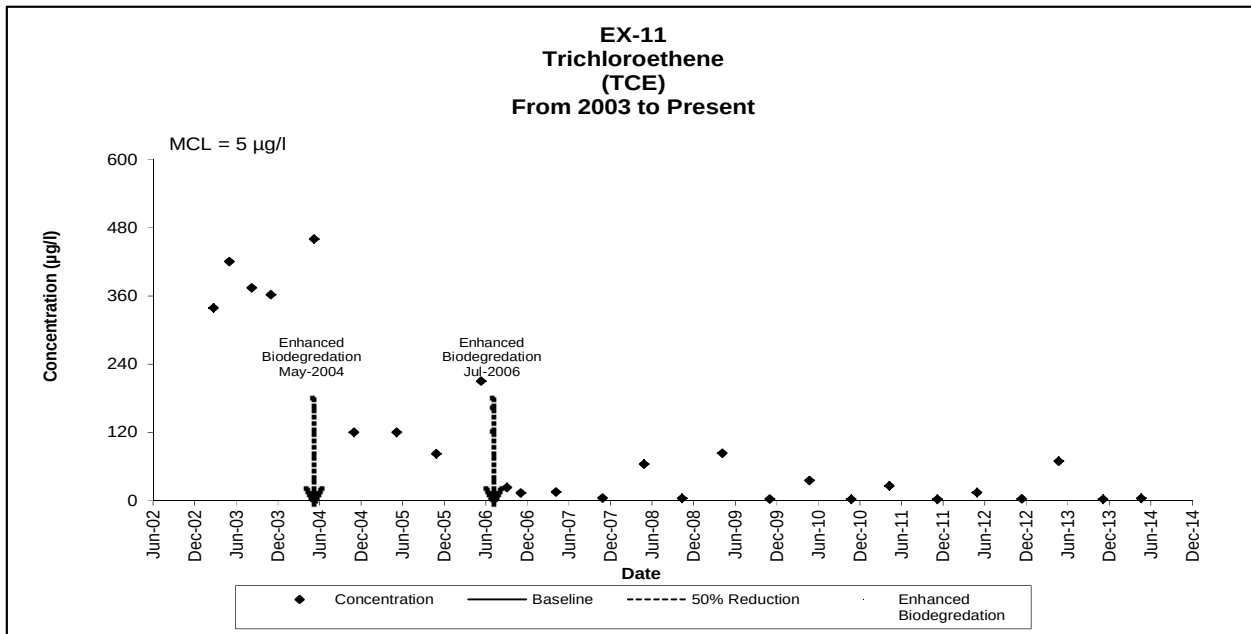
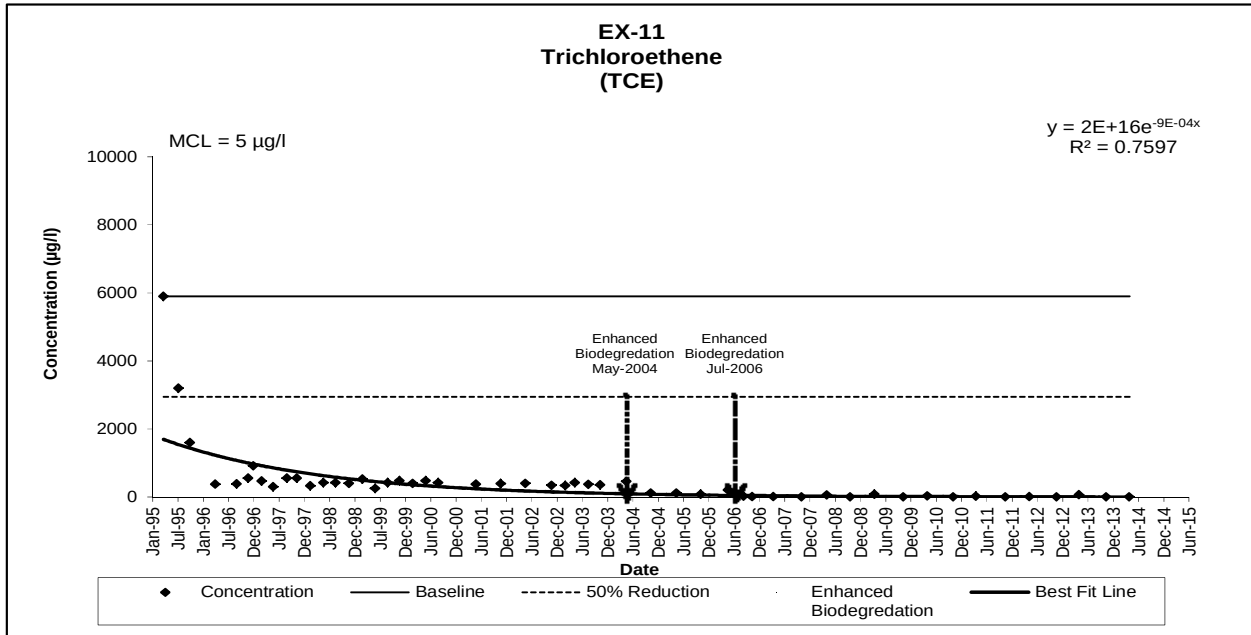
Data qualifiers are defined in laboratory reports. For data collected since 2001, a list of data qualifier definitions is included at the front of this appendix.

-- Not analyzed

**EXHIBIT B-8
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION TRENCH EX-11**



**EXHIBIT B-8
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION TRENCH EX-11**



**EXHIBIT B-8
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION TRENCH EX-11**

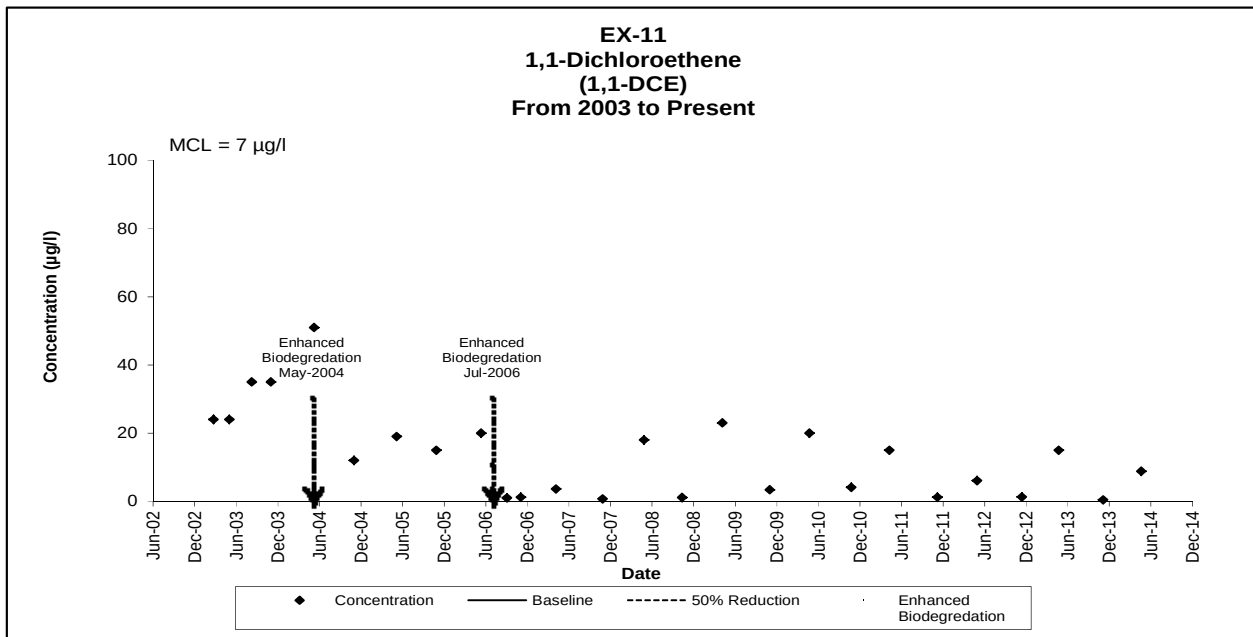
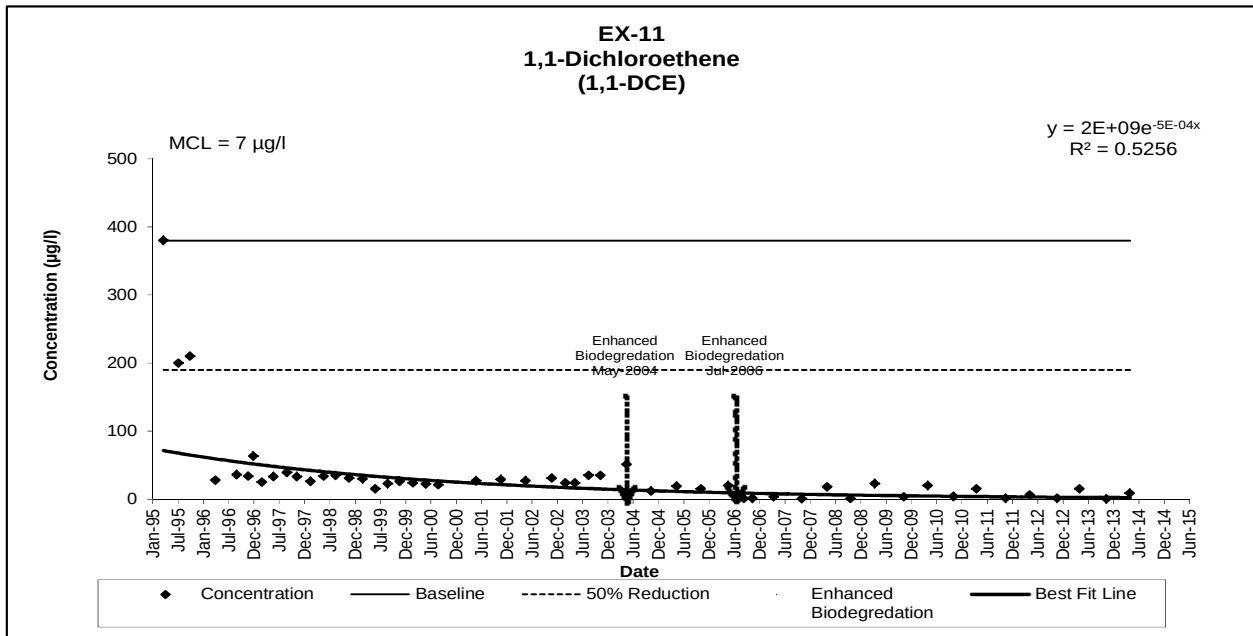
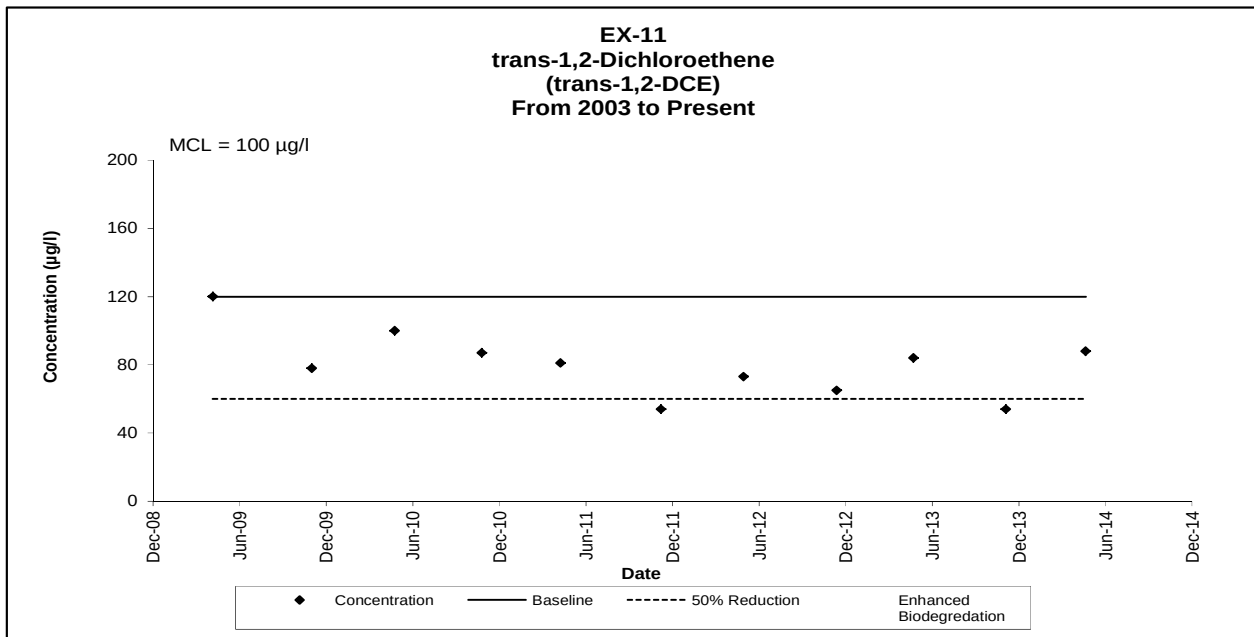
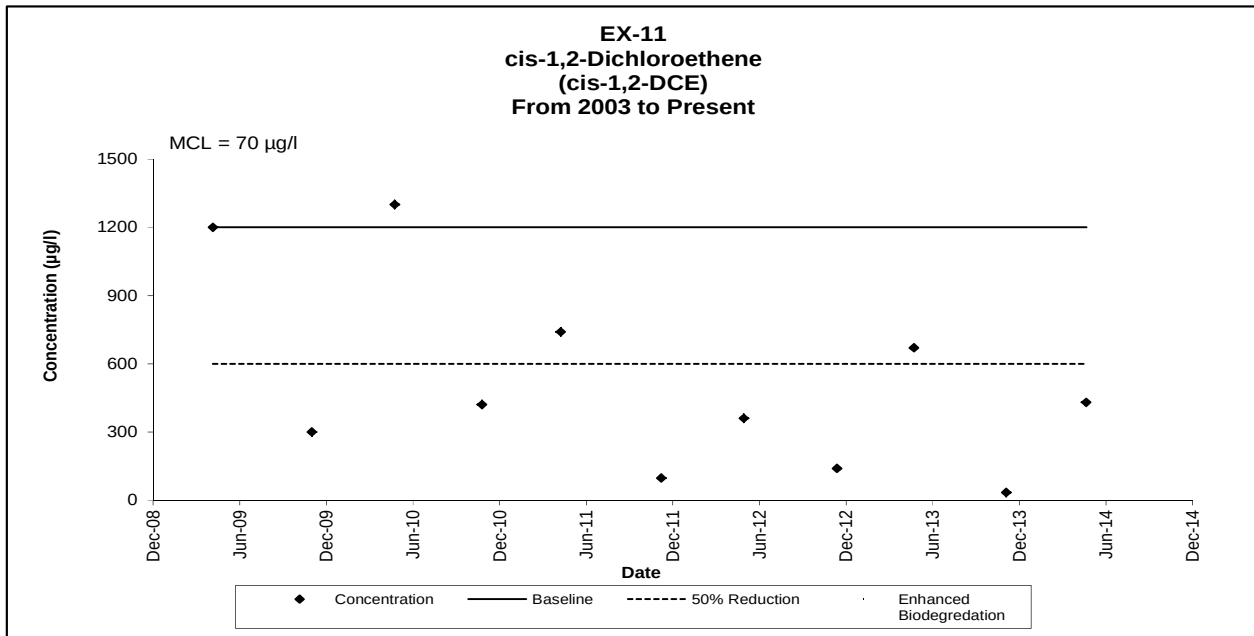


EXHIBIT B-8
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION TRENCH EX-11



**EXHIBIT B-8
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
EXTRACTION TRENCH EX-11**

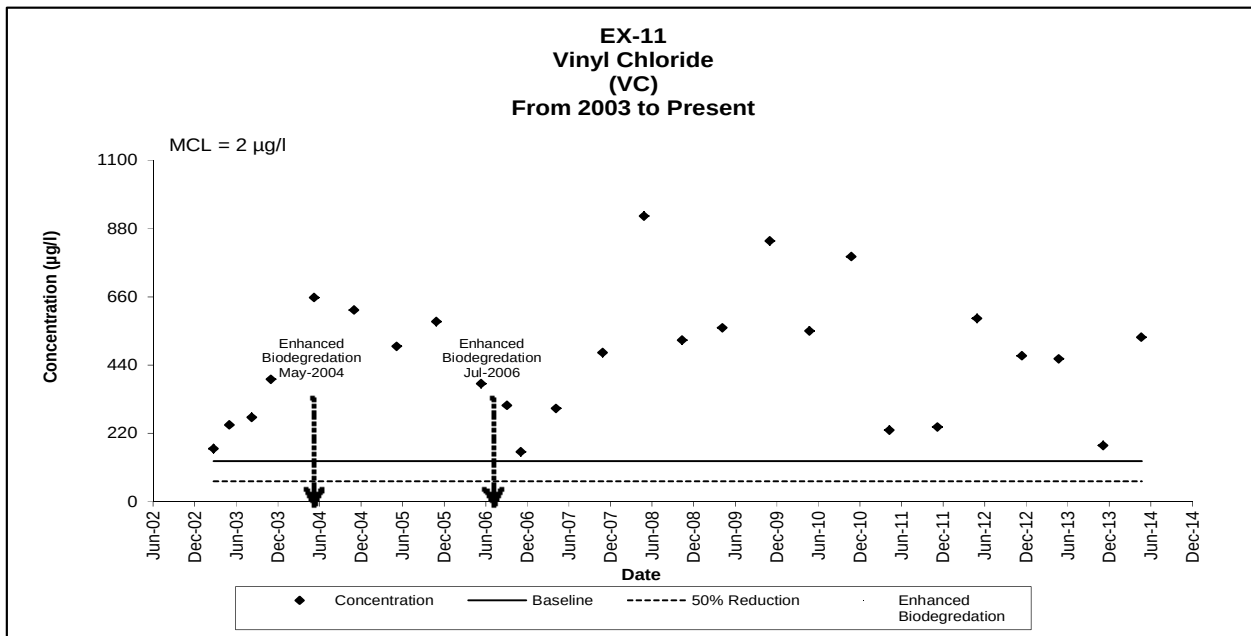
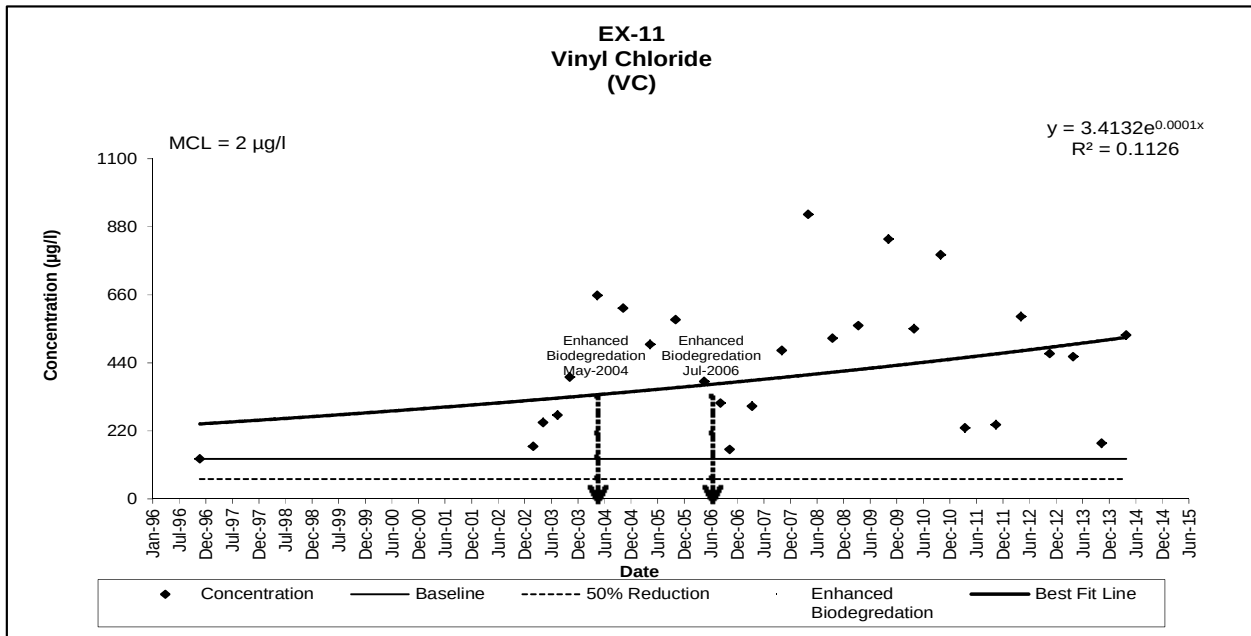


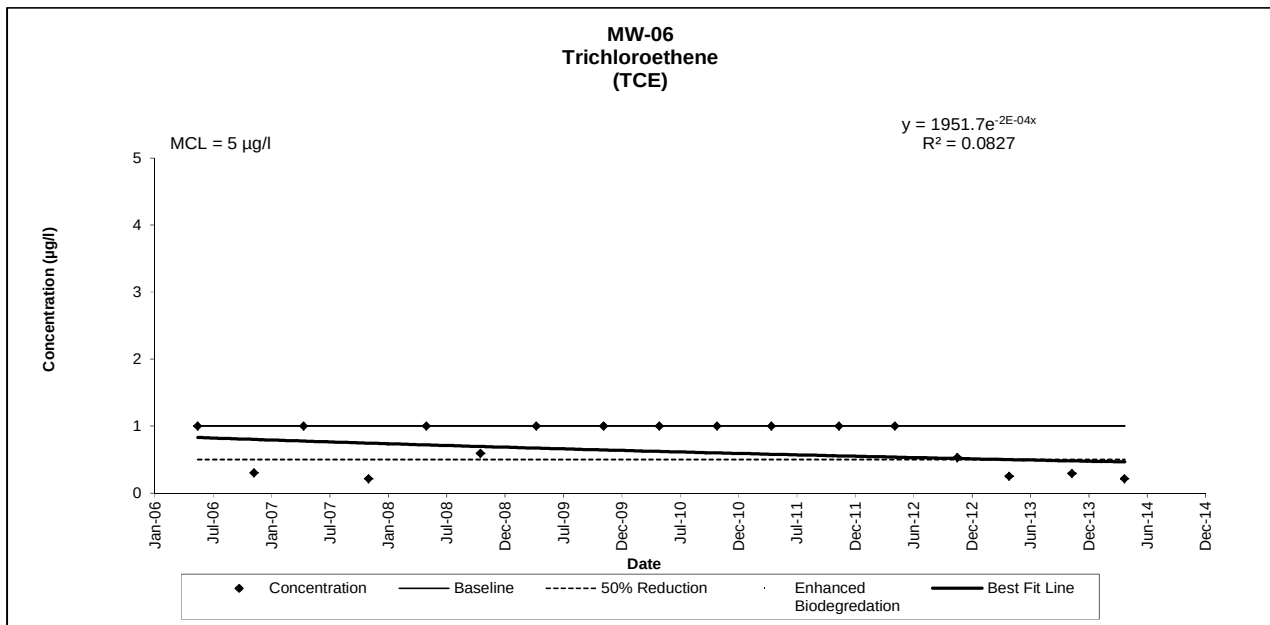
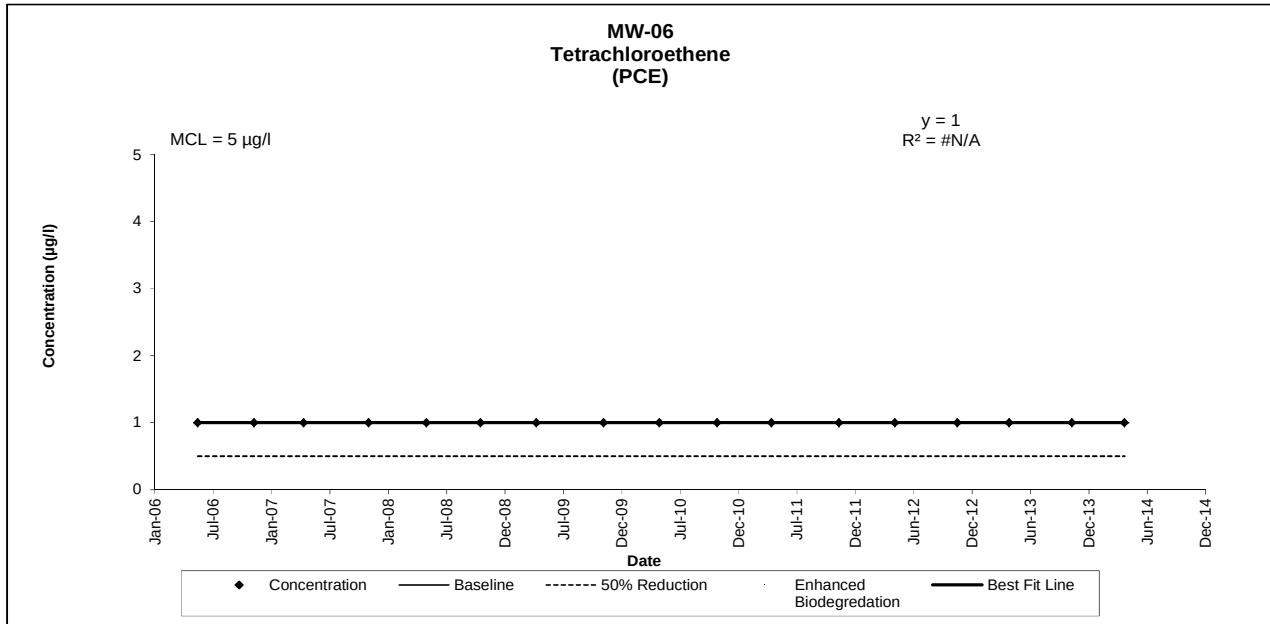
EXHIBIT B-9
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
MONITORING WELL MW-06

LABORATORY PARAMETERS								
Sample Date	PCE (µg/l)	TCE (µg/l)	1,1-DCE (µg/l)	cis-1,2-DCE (µg/l)	trans-1,2-DCE (µg/l)	VC (µg/l)	2,4-D (µg/l)	PCP (µg/l)
15-May-06	< 1	< 1	< 1	--	--	< 1	--	--
7-Nov-06	< 1	0.3 T	< 1	--	--	< 1	--	--
11-Apr-07	< 1	< 1	< 1	--	--	< 1	--	--
31-Oct-07	< 1	0.21 T	< 1	--	--	< 1	--	--
29-Apr-08	< 1	< 1	< 1	--	--	< 1	--	--
15-Oct-08	< 1	0.59 T	< 1	--	--	< 1	--	--
8-Apr-09	< 1	< 1	0.37 T	1.9	0.31 T	0.24 T	--	--
4-Nov-09	< 1	< 1	< 1	0.86 T	< 1	< 1	--	--
27-Apr-10	< 1	< 1	0.87 T	5.3	0.65 T	< 1	--	--
25-Oct-10	< 1	< 1	0.66 T	4.5	0.61 T	0.3 T	--	--
13-Apr-11	< 1	< 1	3.5	21	3.2	1.5	--	--
10-Nov-11	< 1	< 1	3	18	2.8	0.98 T	--	--
3-May-12	< 1	< 1	3.4	19	3.1	1.5	--	--
14-Nov-12	< 1	0.53 T	3.1	23	4.3	1.2	--	--
25-Apr-13	< 1	0.25 T	5.7	28	5.1	1.9	--	--
7-Nov-13	< 1	0.29 T	3.4	25	4.8	1.4	--	--
21-Apr-14	< 1	0.21 T	4.3	24	5.3	1.4	--	--

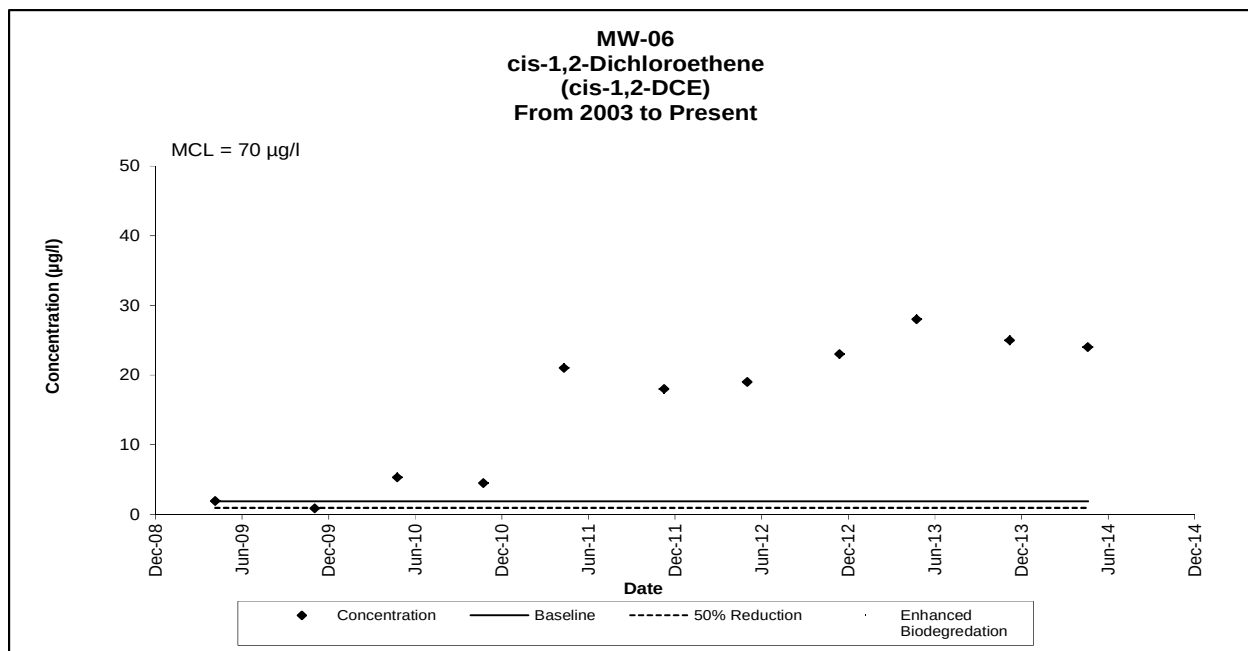
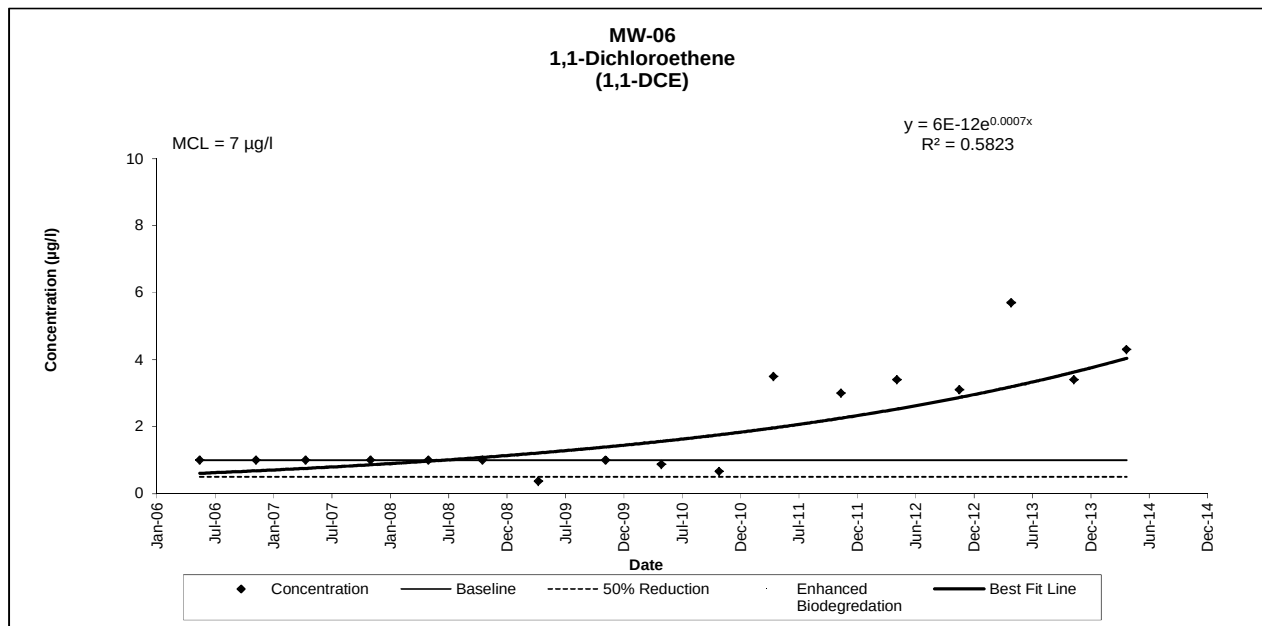
Data qualifiers are defined in laboratory reports. For data collected since 2001, a list of data qualifier definitions is included at the front of this appendix.

-- Not analyzed

**EXHIBIT B-9
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
MONITORING WELL MW-06**



**EXHIBIT B-9
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
MONITORING WELL MW-06**



**EXHIBIT B-9
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
MONITORING WELL MW-06**

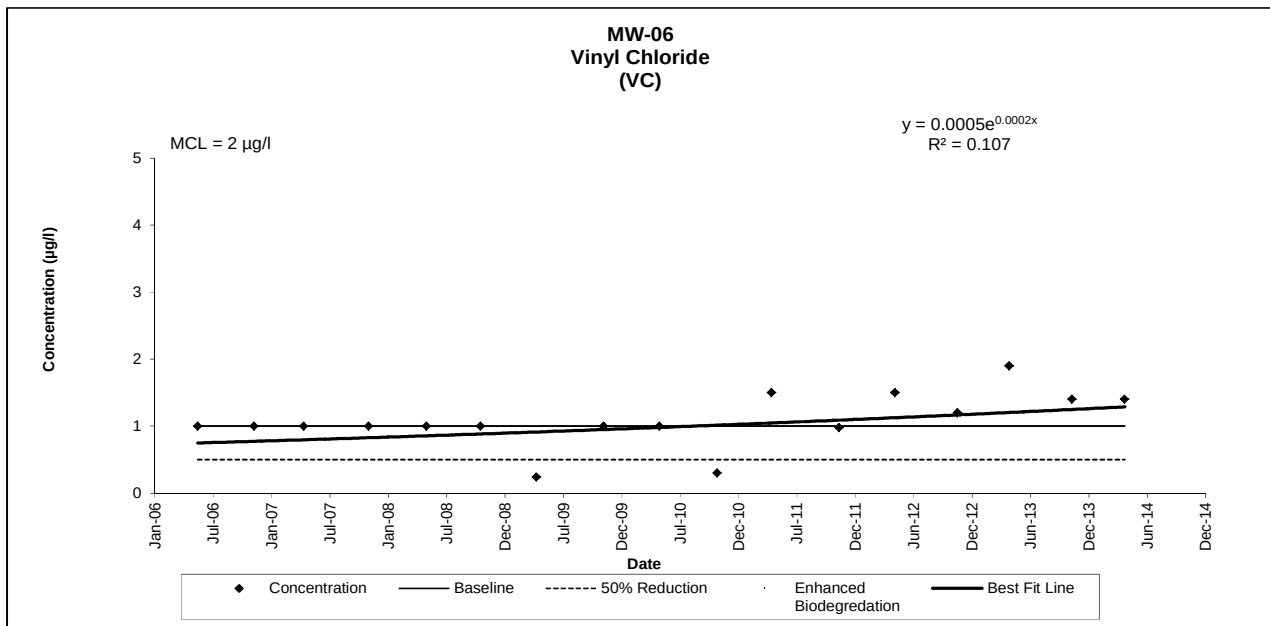
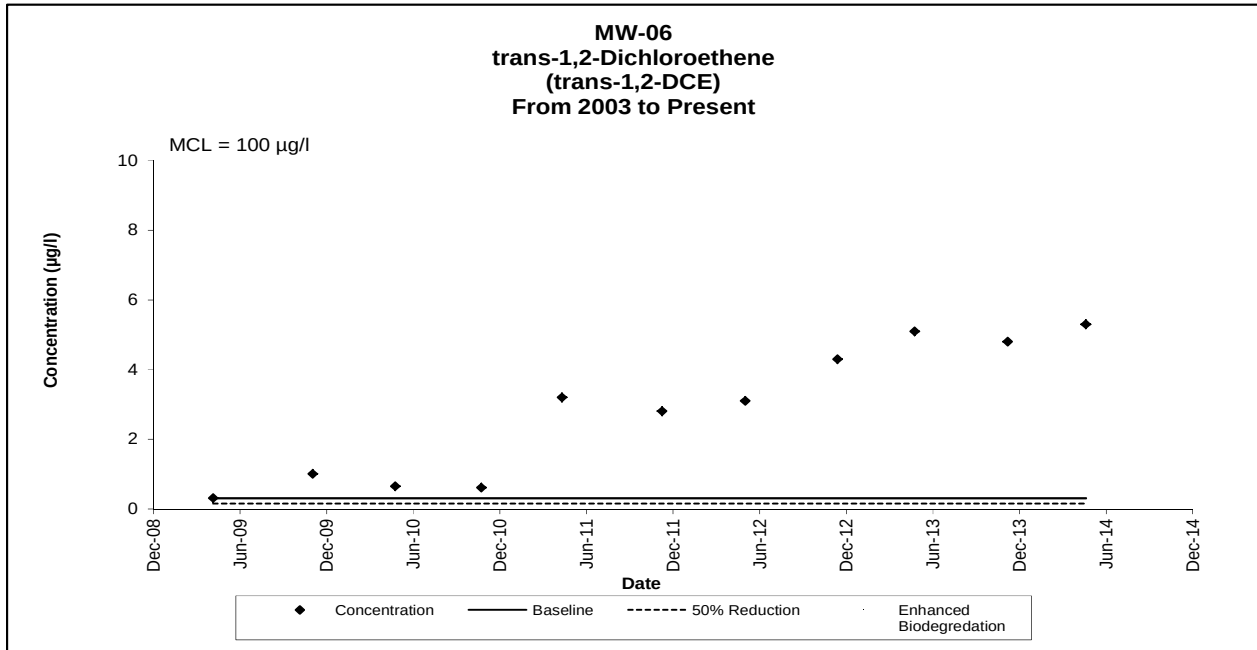


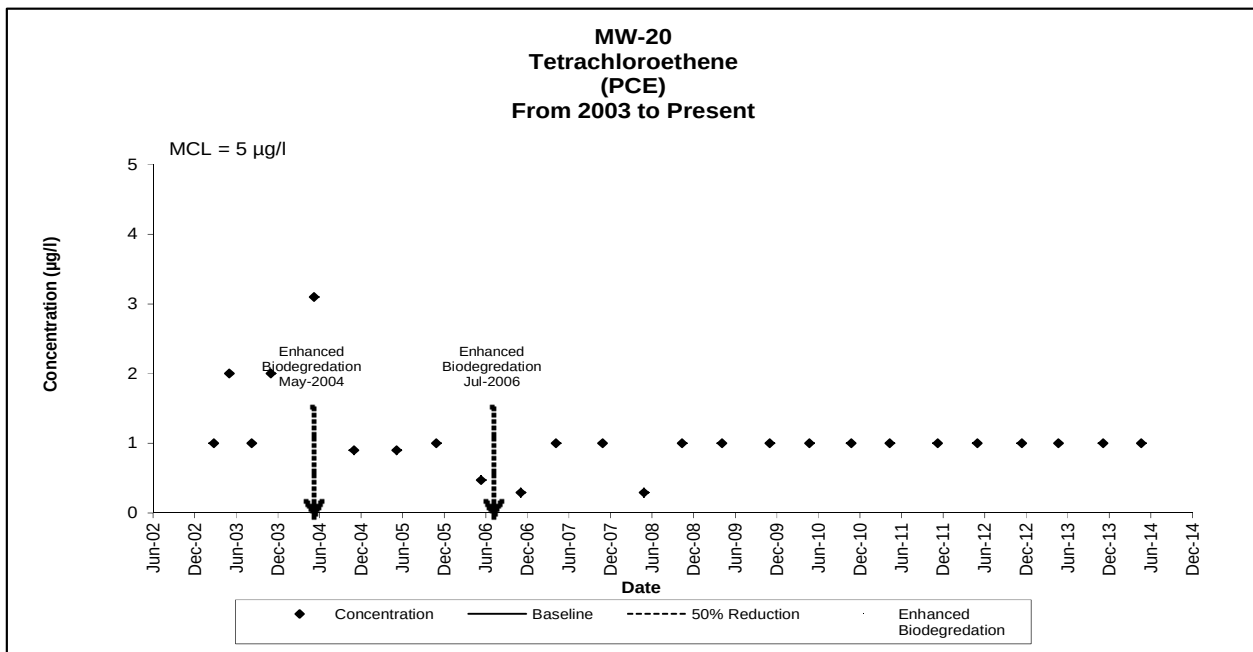
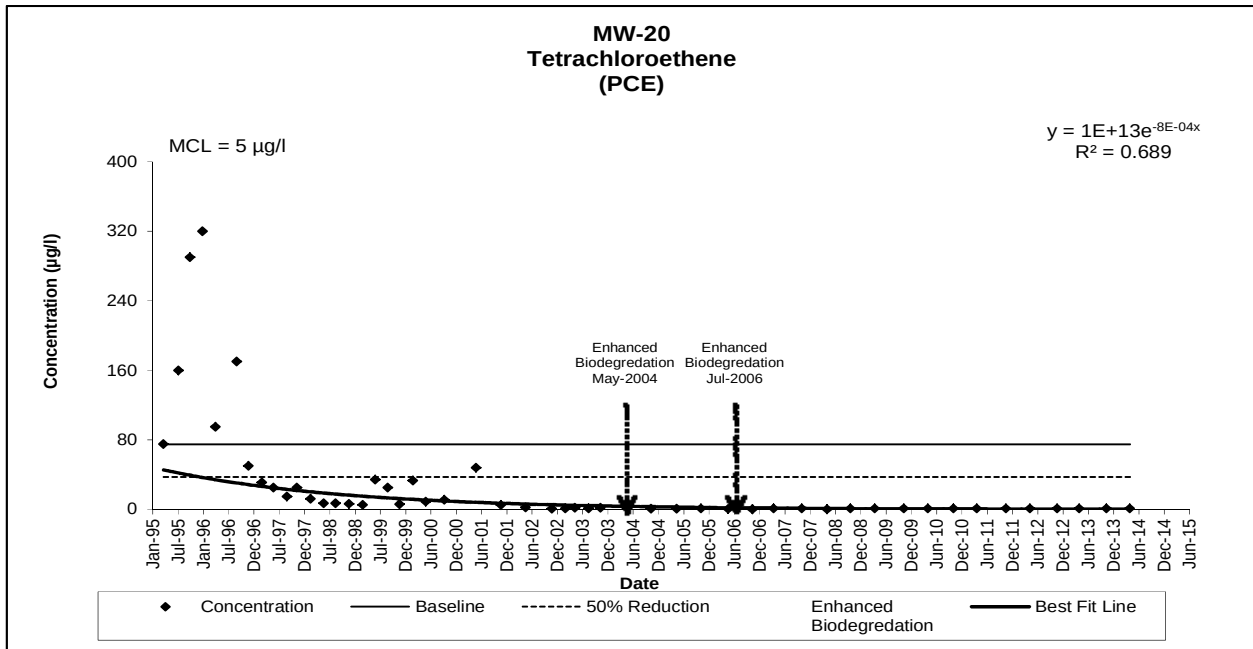
EXHIBIT B-10
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
MONITORING WELL MW-20

LABORATORY PARAMETERS								
Sample Date	PCE (µg/l)	TCE (µg/l)	1,1-DCE (µg/l)	cis-1,2-DCE (µg/l)	trans-1,2-DCE (µg/l)	VC (µg/l)	2,4-D (µg/l)	PCP (µg/l)
20-Mar-95	75 J	3600 J	350 J	--	--	--	< 2	< 0.2 J
6-Jul-95	160	3600	150	--	--	--	< 2	< 0.2
27-Sep-95	290	5500	580	--	--	--	< 2	< 0.2
27-Dec-95	320	3400	87	--	--	--	< 2	< 0.2
28-Mar-96	95	1700	45	--	--	--	< 2	< 0.2
28-Aug-96	170	2600	97	--	--	--	2.6 T	< 0.2
21-Nov-96	< 50	2700	100	--	--	50	< 1.5	< 1
26-Feb-97	31	1400	49	--	--	--	< 0.25	< 1
21-May-97	25	1000	40	--	--	--	< 0.25	< 1
26-Aug-97	15 T	1500	61	--	--	--	< 2.5	< 1
6-Nov-97	< 25	1400	50	--	--	--	< 0.25	< 1
12-Feb-98	< 12	630 B	35	--	--	--	< 0.25	< 1
19-May-98	7 J	830	35	--	--	--	< 0.25	< 1
12-Aug-98	7.1 J	810	36	--	--	--	< 0.25	< 1
17-Nov-98	6.4 J	510	25 J	--	--	--	< 0.25	< 0.5
24-Feb-99	5.3 JB	460 J	25 J	--	--	--	< 0.25	< 0.5
26-May-99	34	190	10	--	--	--	< 4 UJ	< 0.5
25-Aug-99	< 25 G	220	15 T	--	--	--	1.41	< 0.1
17-Nov-99	5.8 T	340	20 T	--	--	--	< 0.2 J	< 0.1 J
22-Feb-00	33	400	24	--	--	--	< 0.2	< 0.1
24-May-00	8.9 T	180	13	--	--	--	< 0.2	< 0.1
6-Oct-00	11 D	250 D	16 D	--	--	--	--	--
23-May-01	48 D	316 D	20 D	--	--	--	< 0.5	< 0.5
19-Nov-01	5 D	230 D	25 D	--	--	--	< 0.5	0.2 T
15-May-02	2.3	205 D	15	--	--	--	< 0.5	< 0.5
20-Nov-02	0.7 T	166 D	17	--	--	--	< 0.48	< 0.48
27-Feb-03	1	142	10	--	--	0.4 T	--	--
6-May-03	2	119 D	12	--	--	--	--	--
13-Aug-03	1	113 D	20	--	--	0.7 T	--	--
5-Nov-03	2	149 D	24	--	--	< 5 D	--	--
13-May-04	3.1	87 D	21	--	--	0.9 T	--	--
4-Nov-04	0.9 T	22	5.8	--	--	4.7	--	< 0.48
10-May-05	0.9 T	10	3.1	--	--	7.4	--	< 0.5
31-Oct-05	< 1	2.4	0.8 T	--	--	7.6	--	< 0.5
16-May-06	0.47 T	6.5	1	--	--	5.4	--	< 0.5
6-Nov-06	0.29 T	5.7	0.62 T	--	--	3.6	--	--
10-Apr-07	< 1	2.9	0.76 T	--	--	1.1	--	--
30-Oct-07	< 1	1.4	0.56 T	--	--	0.7 T	--	< 0.5
30-Apr-08	0.29 T	4.9	3.4	--	--	3.3	--	< 0.5
14-Oct-08	< 1	2.6	2	--	--	3.1	--	--
7-Apr-09	< 1	5.5	3.3	24	22	3	--	0.11 T
3-Nov-09	< 1	1.2	1.5	20	10	3.3	--	< 0.5
26-Apr-10	< 1	2.3	2.3	34	17	3.8	--	< 0.5
27-Oct-10	< 1	1	0.81 T	14	10	3.2	--	--
14-Apr-11	< 1	3.4	2	26	21	8.1	--	--
10-Nov-11	< 1	0.97 T	0.95 T	15	13	2.4	--	--
2-May-12	< 1	1.4	1.8	28	12	3	--	--
13-Nov-12	< 1	1.2	0.64 T	12	13	1.9	--	--
23-Apr-13	< 1	1.4	1.3	20	18	2.7	--	--
5-Nov-13	< 1	0.91 T	1.1	20	11	4	--	--
22-Apr-14	< 1	1	1.6	25	15	2.1	--	--

Data qualifiers are defined in laboratory reports. For data collected since 2001, a list of data qualifier definitions is included at the front of this appendix.

-- Not analyzed

**EXHIBIT B-10
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
MONITORING WELL MW-20**



**EXHIBIT B-10
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
MONITORING WELL MW-20**

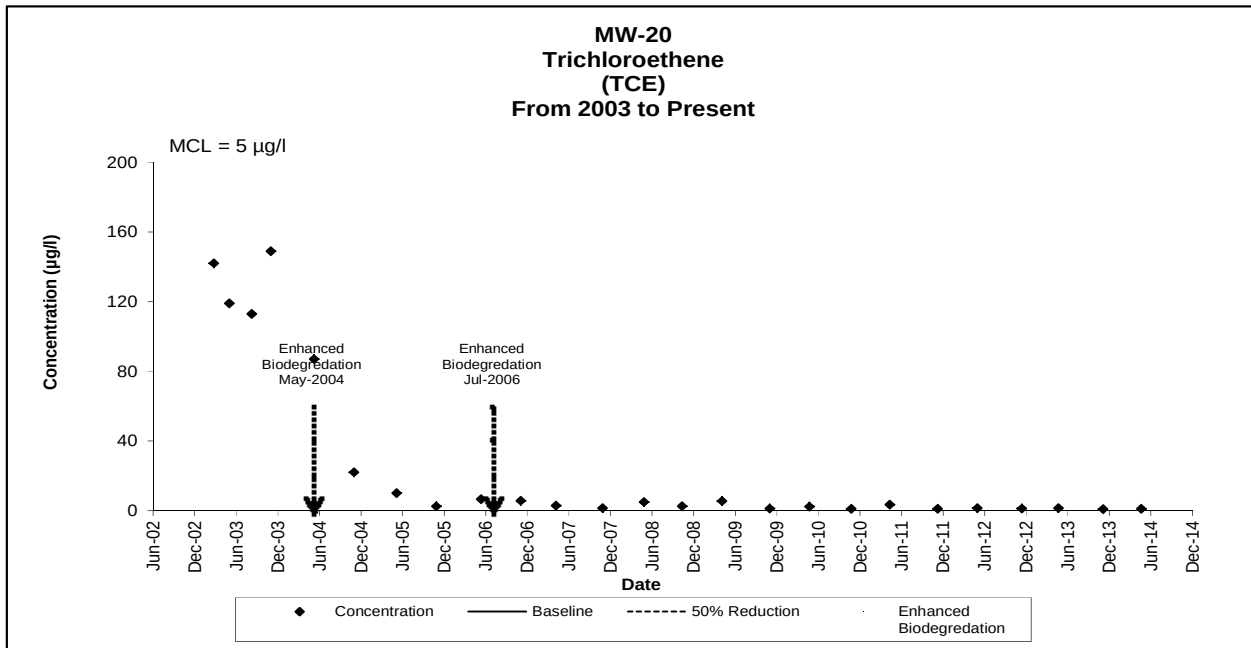
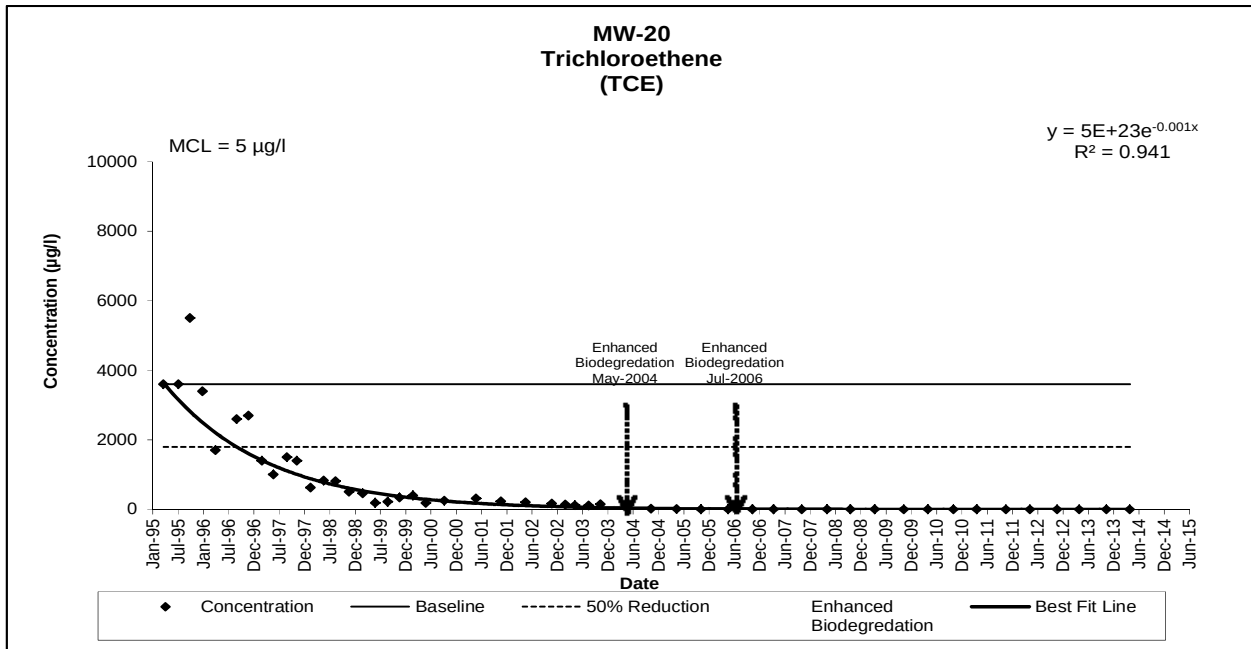
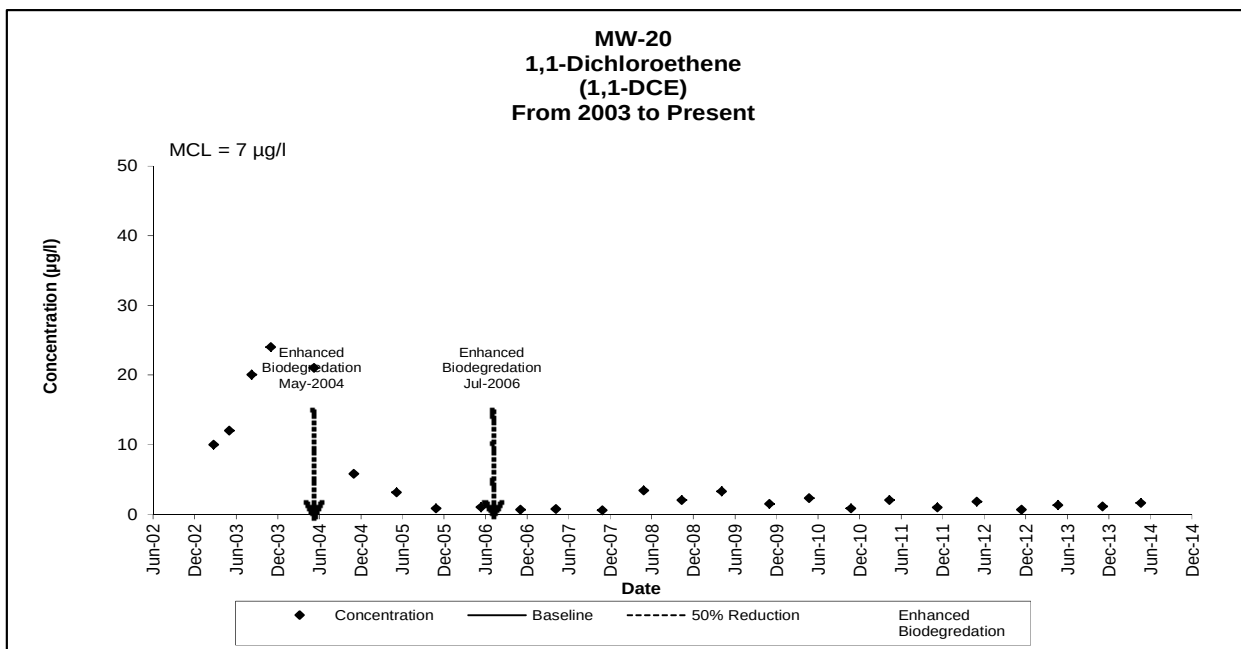
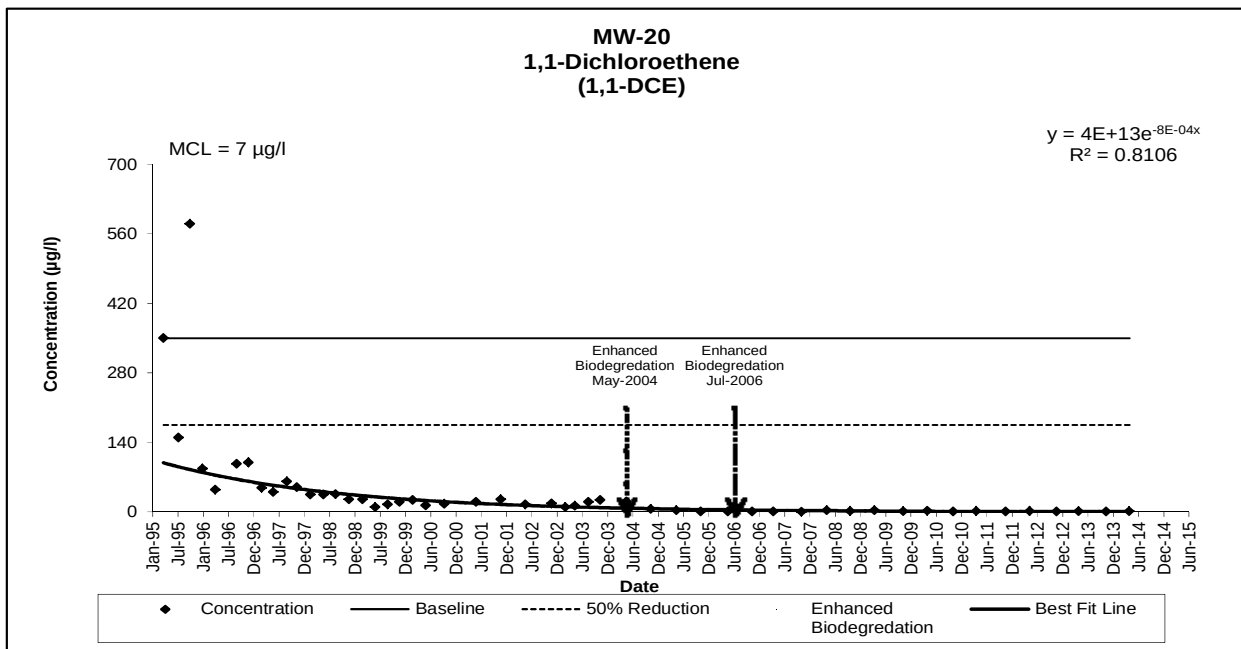
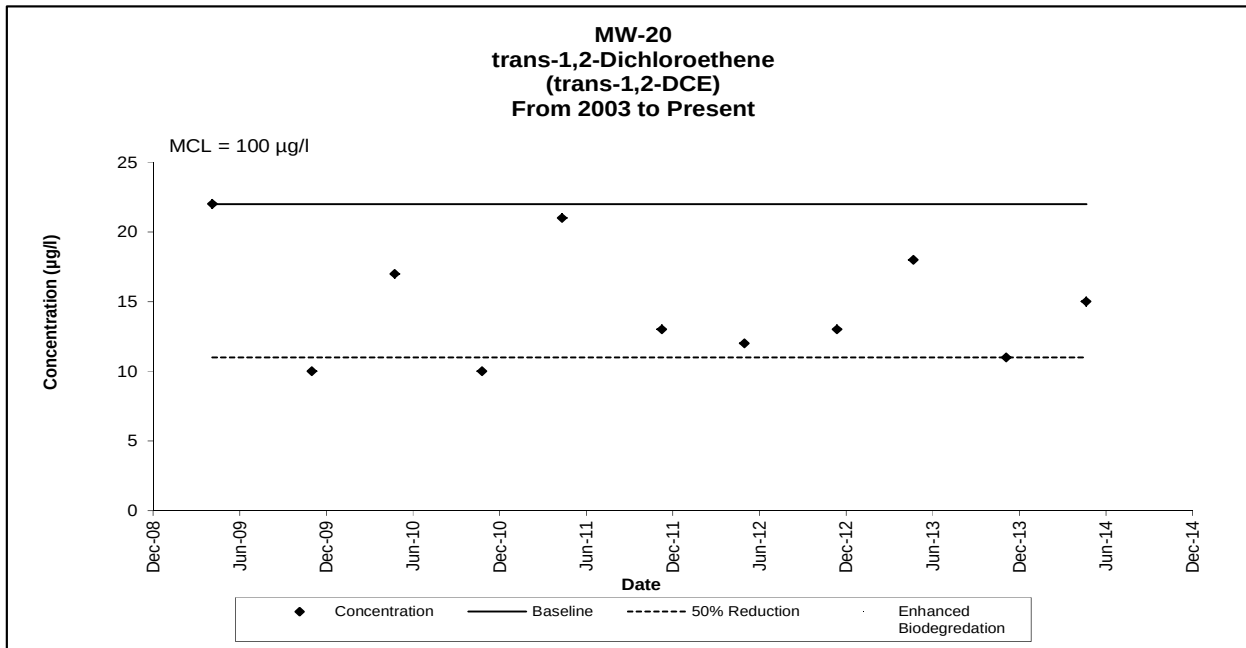
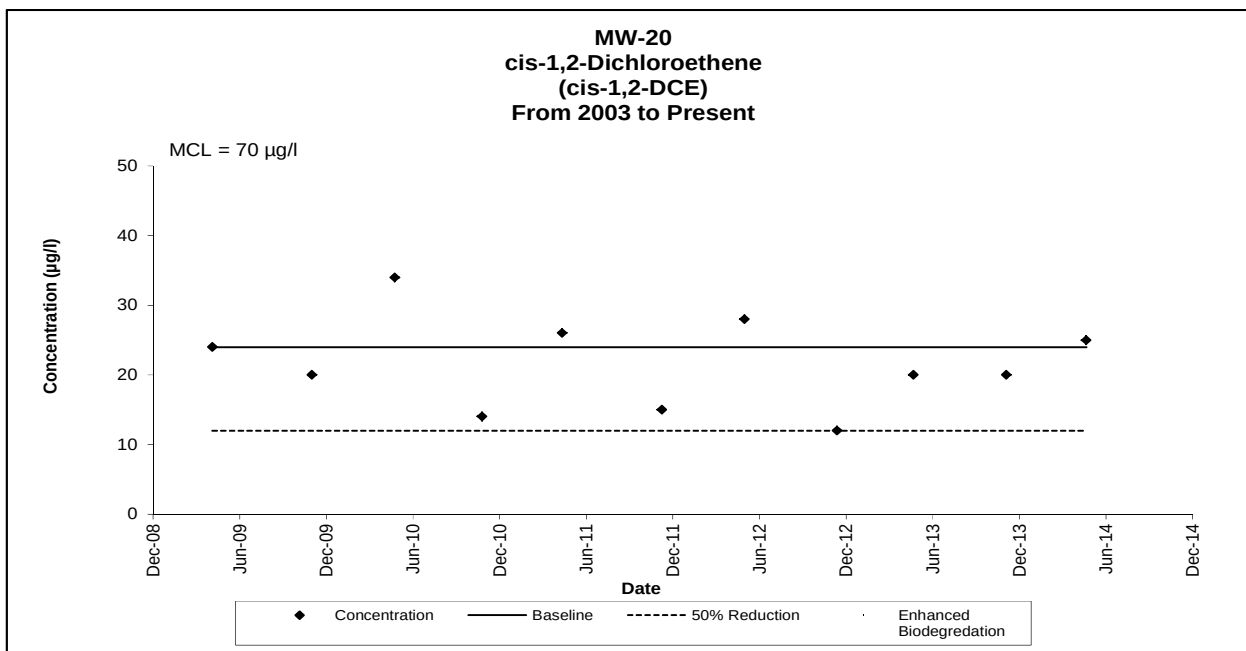


EXHIBIT B-10
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
MONITORING WELL MW-20



**EXHIBIT B-10
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
MONITORING WELL MW-20**



**EXHIBIT B-10
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
MONITORING WELL MW-20**

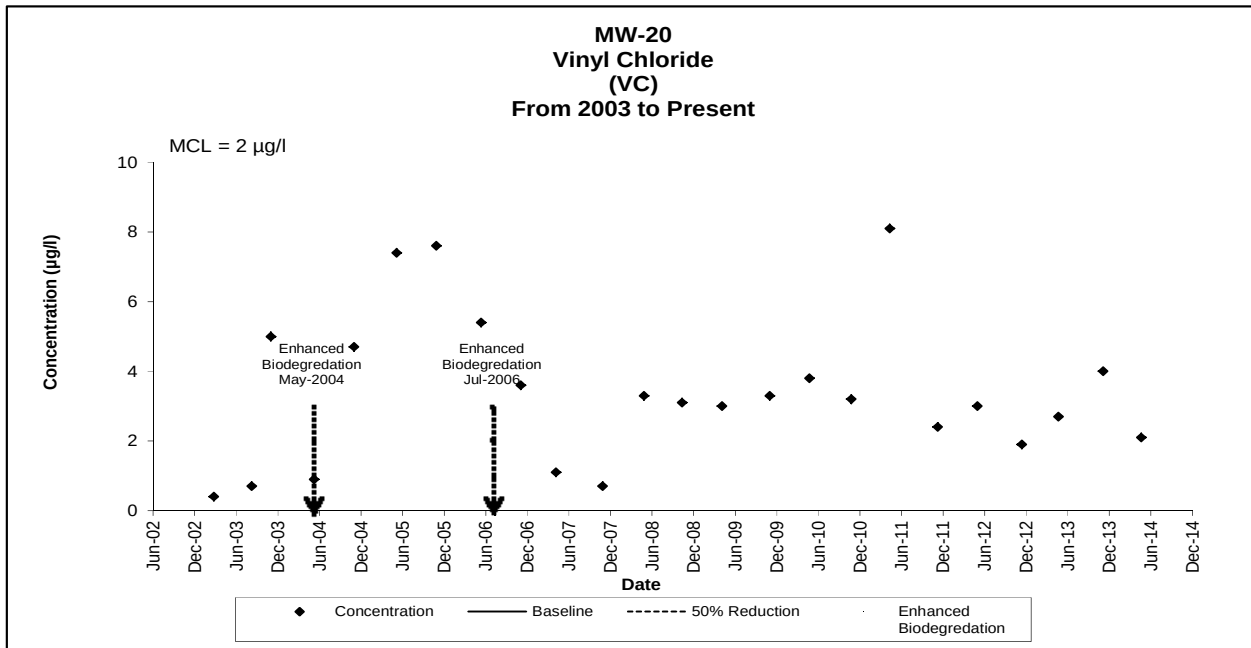
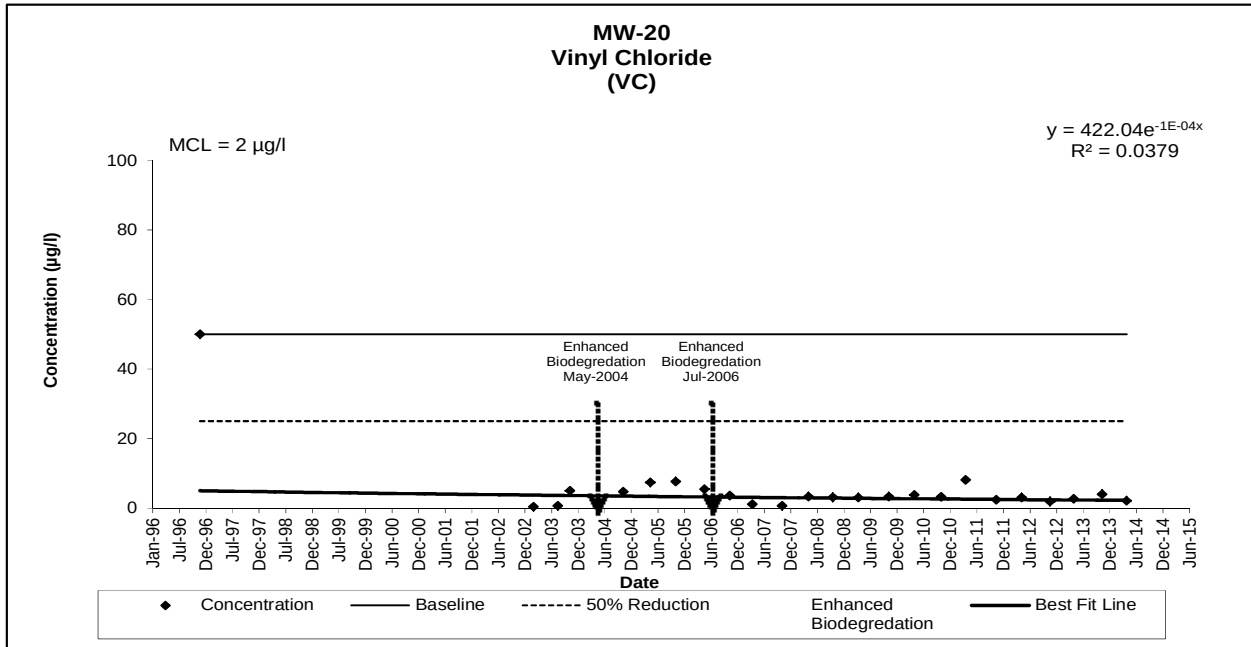


EXHIBIT B-11
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
MONITORING WELL MW-23

LABORATORY PARAMETERS								
Sample Date	PCE (µg/l)	TCE (µg/l)	1,1-DCE (µg/l)	cis-1,2-DCE (µg/l)	trans-1,2-DCE (µg/l)	VC (µg/l)	2,4-D (µg/l)	PCP (µg/l)
9-Mar-95	< 2	< 2	< 2	--	--	--	< 10 J	< 1 J
6-Jul-95	< 2	< 2	< 2	--	--	--	< 2	< 0.2
29-Sep-95	< 2	< 2	< 2	--	--	--	< 2	< 0.2
27-Dec-95	< 2	< 2	< 2	--	--	--	< 2	< 0.2
28-Mar-96	< 2	< 2	< 2	--	--	--	< 2	< 0.2
27-Aug-96	< 2	< 2	< 2	--	--	--	< 10	< 0.2
21-Nov-96	< 1	< 1	< 1	--	--	1.4	< 0.25 UJ	< 1
25-Feb-97	< 1	< 1	< 1	--	--	--	< 0.25	< 1
20-May-97	< 1	< 1	< 1	--	--	--	< 0.25	< 1
25-Aug-97	< 1	0.14 T	< 1	--	--	--	< 0.25	< 1
5-Nov-97	< 1	< 1	< 1	--	--	--	< 0.25	< 1
12-Feb-98	< 1	< 1	< 1	--	--	--	< 0.25 J	< 1
18-May-98	< 1	< 1	< 1	--	--	--	< 0.25	< 1
11-Aug-98	< 1	< 1	< 1	--	--	--	< 0.25	< 1
16-Nov-98	< 1	< 1	< 1	--	--	--	0.9	< 0.5
23-Feb-99	< 1	< 1	< 1	--	--	--	0.57 J	< 0.5
25-May-99	< 1	< 1	< 1	--	--	--	< 4 UJ	< 0.5
26-Aug-99	< 1	< 1	< 1	--	--	--	5	< 0.1
18-Nov-99	< 5	< 5	< 5	--	--	--	< 0.2 J	< 0.1 J
23-Feb-00	< 1	< 1	< 1	--	--	--	< 0.2	< 0.1
23-May-00	< 1	< 1	< 1	--	--	--	0.741	< 0.1
23-Aug-00	< 0.166	< 0.0672	< 0.116	--	--	--	--	--
7-Oct-00	--	--	--	--	--	--	0.07	< 0.5
24-May-01	< 1	< 1	< 1	--	--	--	< 0.5	< 0.5
14-May-02	< 1	< 1	< 1	--	--	--	< 0.5	< 0.5
27-Feb-03	< 1	< 2	< 1	--	--	< 1	--	--
5-May-03	< 1	< 1	< 1	--	--	< 1	--	--
13-Aug-03	< 1	< 1	< 1	--	--	< 1	--	--
6-Nov-03	< 1	< 1	< 1	--	--	< 1	--	--
13-May-04	< 1	< 1	< 1	--	--	< 1	--	--
4-Nov-04	< 1	< 1	< 1	--	--	< 1	--	--
9-May-05	< 1	< 1	< 1	--	--	< 1	--	--
2-Nov-05	< 1	< 1	< 1	--	--	< 1	--	--
15-May-06	< 1	< 1	< 1	--	--	< 1	--	--
7-Nov-06	< 1	< 1	< 1	--	--	< 1	--	--
11-Apr-07	< 1	< 1	< 1	--	--	< 1	--	--
31-Oct-07	< 1	< 1	< 1	--	--	< 1	--	--
29-Apr-08	< 1	< 1	< 1	--	--	< 1	--	--
15-Oct-08	< 1	< 1	< 1	--	--	< 1	--	--
8-Apr-09	< 1	< 1	< 1	< 1	< 1	< 1	--	--
4-Nov-09	< 1	< 1	< 1	< 1	< 1	< 1	--	--
27-Apr-10	< 1	< 1	< 1	< 1	< 1	< 1	--	--
26-Oct-10	< 1	< 1	< 1	< 1	< 1	< 1	--	--
13-Apr-11	< 1	< 1	< 1	< 1	< 1	< 1	--	--
10-Nov-11	< 1	< 1	< 1	< 1	< 1	< 1	--	--
2-May-12	< 1	< 1	< 1	< 1	< 1	< 1	--	--
15-Nov-12	< 1	< 1	< 1	< 1	< 1	< 1	--	--
25-Apr-13	< 1	< 1	< 1	< 1	< 1	< 1	--	--
7-Nov-13	< 1	< 1	< 1	< 1	< 1	< 1	--	--
21-Apr-14	< 1	< 1	< 1	< 1	< 1	< 1	--	--

Data qualifiers are defined in laboratory reports. For data collected since 2001, a list of data qualifier definitions is included at the front of this appendix.

-- Not analyzed

EXHIBIT B-12
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
MONITORING WELL MW-24A

LABORATORY PARAMETERS								
Sample Date	PCE (µg/l)	TCE (µg/l)	1,1-DCE (µg/l)	cis-1,2-DCE (µg/l)	trans-1,2-DCE (µg/l)	VC (µg/l)	2,4-D (µg/l)	PCP (µg/l)
9-Mar-95	< 2	< 2	< 2	--	--	--	< 10 J	< 1 J
6-Jul-95	< 2	< 2	< 2	--	--	--	< 2	< 0.2
27-Sep-95	< 2	< 2	< 2	--	--	--	< 2	< 0.2
28-Dec-95	< 2	< 2	< 2	--	--	--	< 2	0.2
29-Mar-96	< 2	< 2	< 2	--	--	--	< 2	< 0.2
27-Aug-96	< 2	< 2	< 2	--	--	--	< 10	< 0.2
21-Nov-96	< 1	< 1	< 1	--	--	1	< 0.25	< 1 UJ
25-Feb-97	< 1	< 1	< 1	--	--	--	< 0.25	< 1
20-May-97	< 1	< 1	< 1	--	--	--	< 0.25	< 1
25-Aug-97	< 1	< 1	< 1	--	--	--	< 0.25	< 1
5-Nov-97	0.32 J	< 1	< 1	--	--	--	< 0.25	< 1
12-Feb-98	< 1	< 1	< 1	--	--	--	< 0.25	< 1
18-May-98	< 1	< 1	< 1	--	--	--	< 0.25	< 1
11-Aug-98	< 1	< 1	< 1	--	--	--	< 0.25	< 1
16-Nov-98	< 1	< 1	< 1	--	--	--	< 0.25	< 0.5
23-Feb-99	< 1	< 1	< 1	--	--	--	< 0.25	< 0.5
25-May-99	< 1	< 1	< 1	--	--	--	< 4 UJ	< 0.5
26-Aug-99	< 1	< 1	< 1	--	--	--	< 0.2	< 0.1
18-Nov-99	< 5	< 5	< 5	--	--	--	< 0.2 J	< 0.1 J
23-Feb-00	< 1	< 1	< 1	--	--	--	< 0.2	< 0.1
23-May-00	< 1	< 1	< 1	--	--	--	< 0.2	< 0.1
23-Aug-00	< 0.166	< 0.0672	< 0.116	--	--	--	--	--
7-Oct-00	--	--	--	--	--	--	< 0.5	< 0.5
24-May-01	< 1	0.3 T	< 1	--	--	--	< 0.5	< 0.5
14-May-02	< 1	< 1	< 1	--	--	--	< 0.5	< 0.5
27-Feb-03	< 1	< 2	< 1	--	--	< 1	--	--
5-May-03	< 1	< 1	< 1	--	--	< 1	--	--
13-Aug-03	< 1	< 1	< 1	--	--	< 1	--	--
6-Nov-03	< 1	< 1	< 1	--	--	< 1	--	--
13-May-04	< 1	< 1	< 1	--	--	< 1	--	--
4-Nov-04	< 1	< 1	< 1	--	--	< 1	--	--
9-May-05	< 1	< 1	< 1	--	--	< 1	--	--
2-Nov-05	< 1	< 1	< 1	--	--	< 1	--	--
15-May-06	< 1	< 1	< 1	--	--	< 1	--	--
7-Nov-06	< 1	< 1	< 1	--	--	< 1	--	--
11-Apr-07	< 1	< 1	< 1	--	--	< 1	--	--
31-Oct-07	< 1	< 1	< 1	--	--	< 1	--	--
29-Apr-08	< 1	< 1	< 1	--	--	< 1	--	--
15-Oct-08	< 1	< 1	< 1	--	--	< 1	--	--
8-Apr-09	< 1	< 1	< 1	< 1	< 1	< 1	--	--
4-Nov-09	< 1	< 1	< 1	< 1	< 1	< 1	--	--
28-Apr-10	< 1	< 1	< 1	< 1	< 1	< 1	--	--
25-Oct-10	< 1	< 1	< 1	< 1	< 1	< 1	--	--
13-Apr-11	< 1	< 1	< 1	< 1	< 1	< 1	--	--
11-Nov-11	< 1	< 1	< 1	< 1	< 1	< 1	--	--
2-May-12	< 1	< 1	< 1	< 1	< 1	< 1	--	--
14-Nov-12	< 1	< 1	< 1	< 1	< 1	< 1	--	--
24-Apr-13	< 1	< 1	< 1	< 1	< 1	< 1	--	--
6-Nov-13	< 1	< 1	< 1	< 1	< 1	< 1	--	--
23-Apr-14	< 1	< 1	< 1	< 1	< 1	< 1	--	--

Data qualifiers are defined in laboratory reports. For data collected since 2001, a list of data qualifier definitions is included at the front of this appendix.

-- Not analyzed

EXHIBIT B-13
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
MONITORING WELL MW-25

LABORATORY PARAMETERS								
Sample Date	PCE (µg/l)	TCE (µg/l)	1,1-DCE (µg/l)	cis-1,2-DCE (µg/l)	trans-1,2-DCE (µg/l)	VC (µg/l)	2,4-D (µg/l)	PCP (µg/l)
9-Mar-95	< 2	< 2	< 2	--	--	--	< 10 J	< 1
6-Jul-95	< 2	< 2	< 2	--	--	--	< 2	< 0.2
29-Sep-95	< 2	< 2	< 2	--	--	--	< 2	< 0.2
28-Dec-95	< 2	< 2	< 2	--	--	--	< 2	< 0.2
29-Mar-96	< 2	< 2	< 2	--	--	--	< 2	< 2.2
27-Aug-96	< 2	< 2	< 2	--	--	--	< 10	< 0.2
21-Nov-96	< 1	< 1	< 1	--	--	1	< 0.25	< 1 UJ
26-Feb-97	< 1	< 1	< 1	--	--	--	< 0.25	< 1
20-May-97	< 1	< 1	< 1	--	--	--	< 0.25	< 1
26-Aug-97	< 1	< 1	< 1	--	--	--	< 0.25	< 1
6-Nov-97	0.48 JB	< 1	< 1	--	--	--	< 0.25	< 10
12-Feb-98	< 1	< 1	< 1	--	--	--	< 0.25	< 1
18-May-98	< 1	< 1	< 1	--	--	--	< 0.25	< 1
11-Aug-98	< 1	< 1	< 1	--	--	--	< 0.25	< 1
16-Nov-98	< 1	< 1	< 1	--	--	--	< 0.25	< 0.5
23-Feb-99	< 1	< 1	< 1	--	--	--	< 0.25	< 0.5
25-May-99	< 1	< 1	< 1	--	--	--	< 4 UJ	< 0.5
26-Aug-99	< 1	< 1	< 1	--	--	--	1.74	< 0.1
18-Nov-99	< 5	< 5	< 5	--	--	--	< 0.2	< 0.1
23-Feb-00	< 1	< 1	< 1	--	--	--	< 0.2	< 0.1
23-May-00	< 1	< 1	< 1	--	--	--	< 0.2	< 0.1
23-Aug-00	< 0.166	< 0.0672	< 0.116	--	--	--	5.85 J	< 0.5 UJ
24-May-01	< 1	< 1	< 1	--	--	--	< 0.5	< 0.5
14-May-02	< 1	< 1	< 1	--	--	--	< 0.5	0.03 T
27-Feb-03	< 1	< 2	< 1	--	--	< 1	--	--
5-May-03	< 1	< 1	< 1	--	--	< 1	--	--
13-Aug-03	< 1	< 1	< 1	--	--	< 1	--	--
6-Nov-03	< 1	< 1	< 1	--	--	< 1	--	--
14-May-04	< 1	< 1	< 1	--	--	< 1	--	--
4-Nov-04	< 1	< 1	< 1	--	--	< 1	--	--
9-May-05	< 1	< 1	< 1	--	--	< 1	--	--
2-Nov-05	< 1	< 1	< 1	--	--	< 1	--	--
15-May-06	< 1	< 1	< 1	--	--	< 1	--	--
7-Nov-06	< 1	< 1	< 1	--	--	< 1	--	--
11-Apr-07	< 1	< 1	< 1	--	--	< 1	--	--
31-Oct-07	< 1	< 1	< 1	--	--	< 1	--	--
29-Apr-08	< 1	< 1	< 1	--	--	< 1	--	--
15-Oct-08	< 1	< 1	< 1	--	--	< 1	--	--
8-Apr-09	< 1	< 1	< 1	< 1	< 1	< 1	--	--
4-Nov-09	< 1	< 1	< 1	< 1	< 1	< 1	--	--
28-Apr-10	< 1	< 1	< 1	< 1	< 1	< 1	--	--
25-Oct-10	< 1	< 1	< 1	< 1	< 1	< 1	--	--
12-Apr-11	< 1	< 1	< 1	< 1	< 1	< 1	--	--
11-Nov-11	< 1	< 1	< 1	< 1	< 1	< 1	--	--
2-May-12	< 1	< 1	< 1	< 1	< 1	< 1	--	--
15-Nov-12	< 1	< 1	< 1	< 1	< 1	< 1	--	--
25-Apr-13	< 1	< 1	< 1	< 1	< 1	< 1	--	< 0.5
6-Nov-13	< 1	< 1	< 1	< 1	< 1	< 1	--	--
24-Apr-14	< 1	< 1	< 1	< 1	< 1	< 1	--	--

Data qualifiers are defined in laboratory reports. For data collected since 2001, a list of data qualifier definitions is included at the front of this appendix.

-- Not analyzed

EXHIBIT B-14
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
MONITORING WELL MW-30

LABORATORY PARAMETERS								
Sample Date	PCE (µg/l)	TCE (µg/l)	1,1-DCE (µg/l)	cis-1,2-DCE (µg/l)	trans-1,2-DCE (µg/l)	VC (µg/l)	2,4-D (µg/l)	PCP (µg/l)
10-Nov-11	< 1	0.59 T	5.8	64	1.6	14	--	< 0.5
21-Dec-11	< 1	0.7 T	9	75	1.9	25	--	< 0.5
8-Feb-12	< 1	0.66 T	7.3	71	1.5	15	--	< 0.5
30-Apr-12	< 1	0.65 T	7.6	75	1.7	20	--	< 0.5
28-Aug-12	< 1	0.77 T	4.3	31	0.96 T	5.9	--	< 0.5
13-Nov-12	< 1	1.1	4.8	30	1	5.5	--	< 0.5
25-Apr-13	< 1	0.63 T	5.6	30	0.93 T	6.5	--	< 0.5
7-Nov-13	< 1	0.8 T	4.1	23	0.77 T	5.1	--	--
24-Apr-14	< 1	0.89 T	6	37	0.81 T	10	--	--

Data qualifiers are defined in laboratory reports. For data collected since 2001, a list of data qualifier definitions is included at the front of this appendix.

-- Not analyzed

**EXHIBIT B-14
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
MONITORING WELL MW-30**

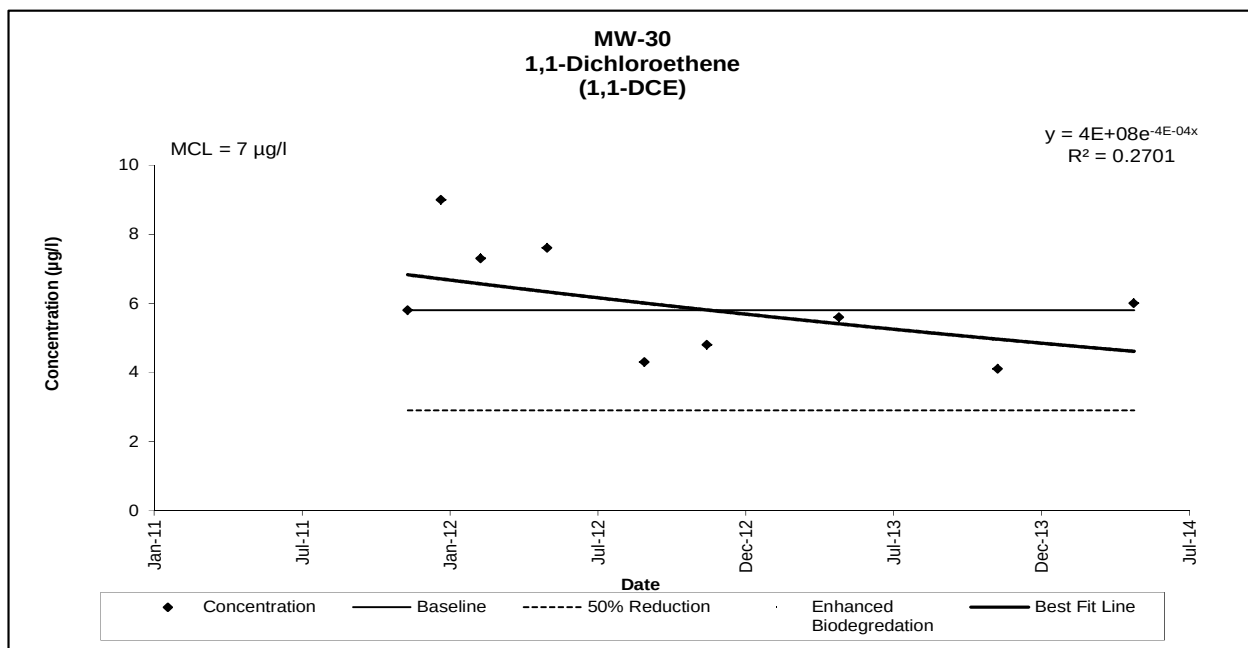
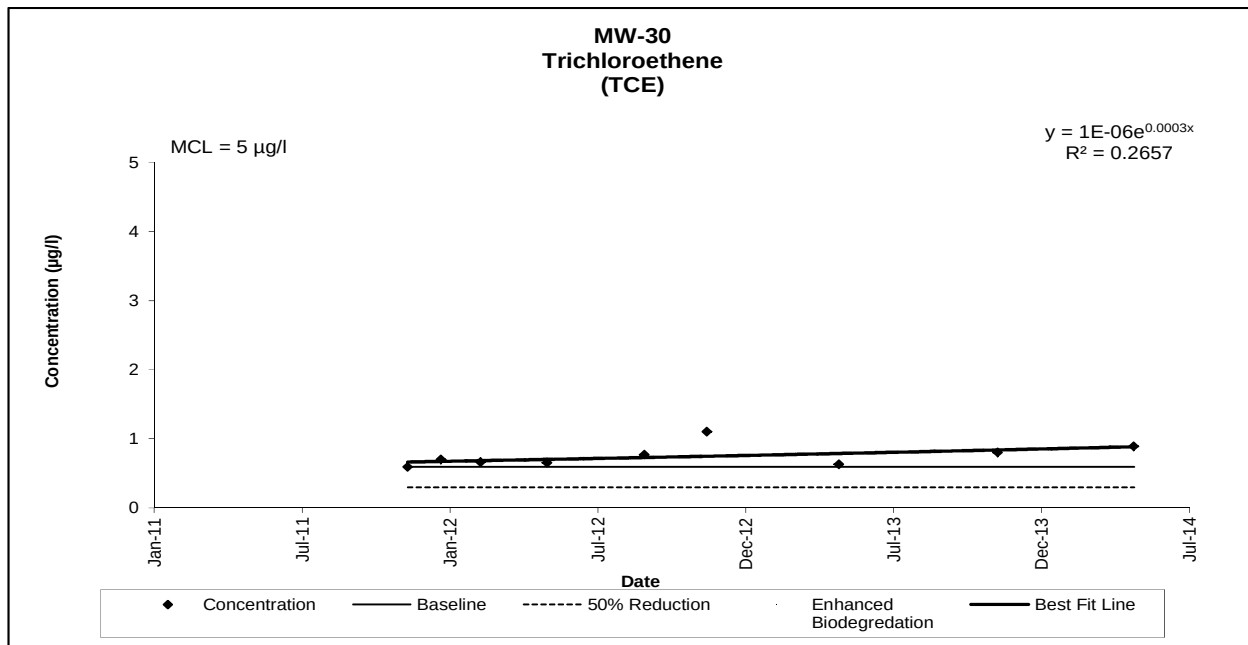


EXHIBIT B-14
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
MONITORING WELL MW-30

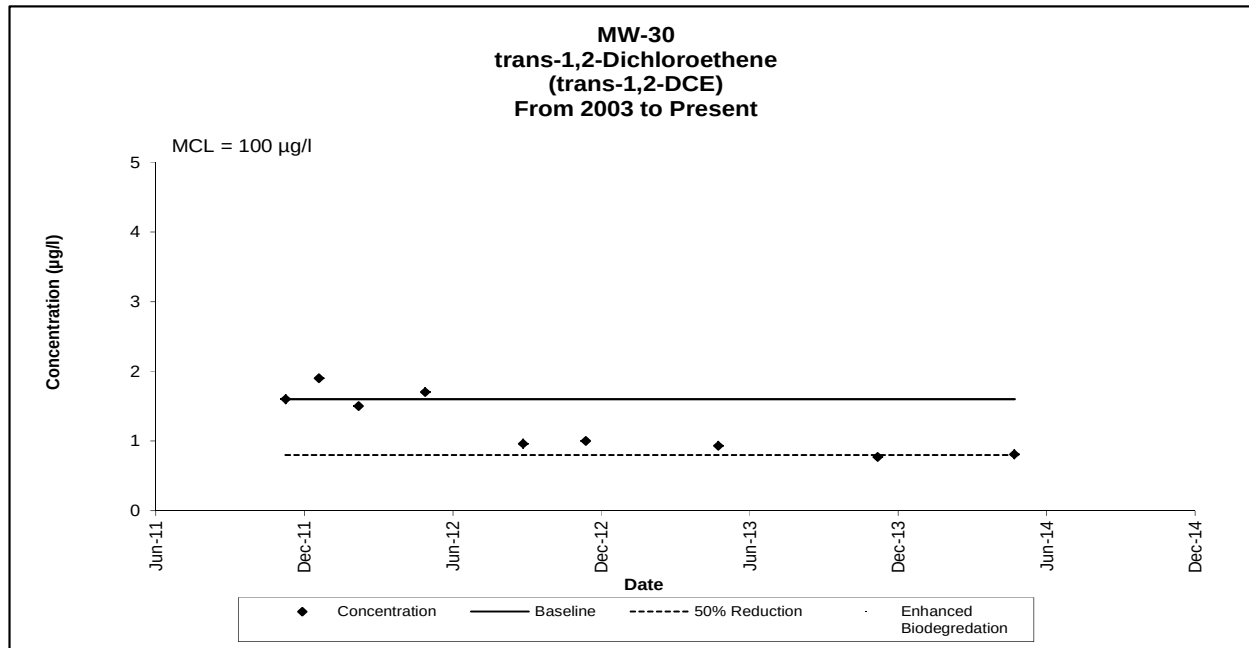
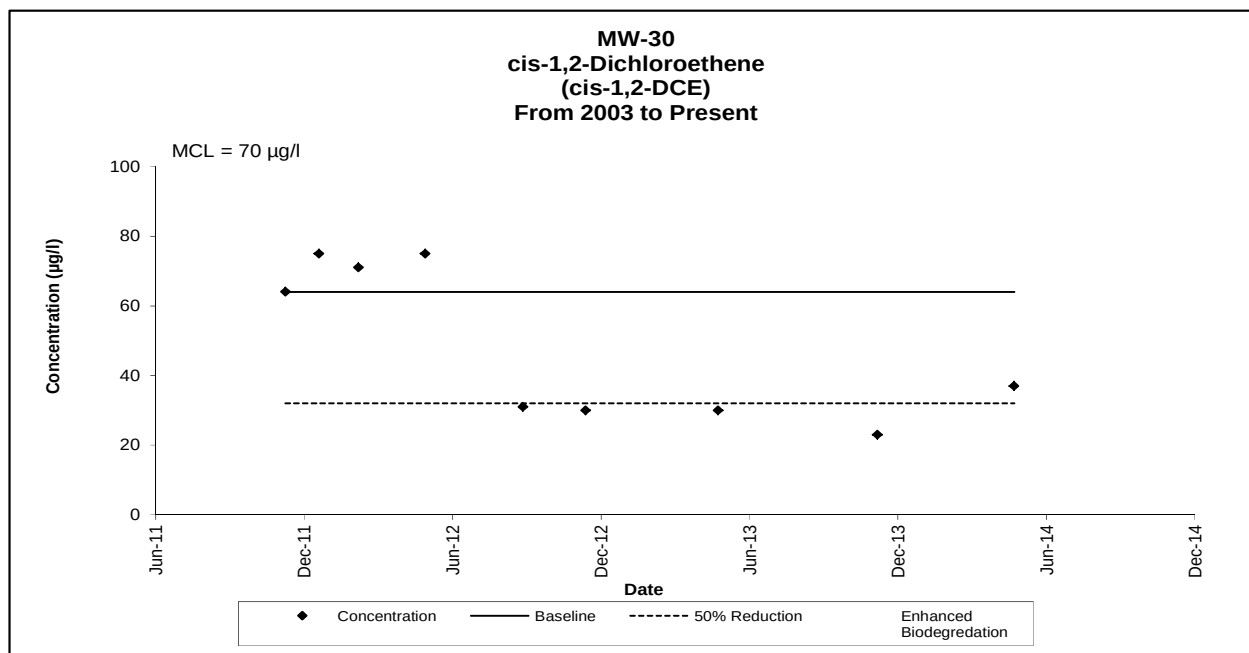


EXHIBIT B-14
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
MONITORING WELL MW-30

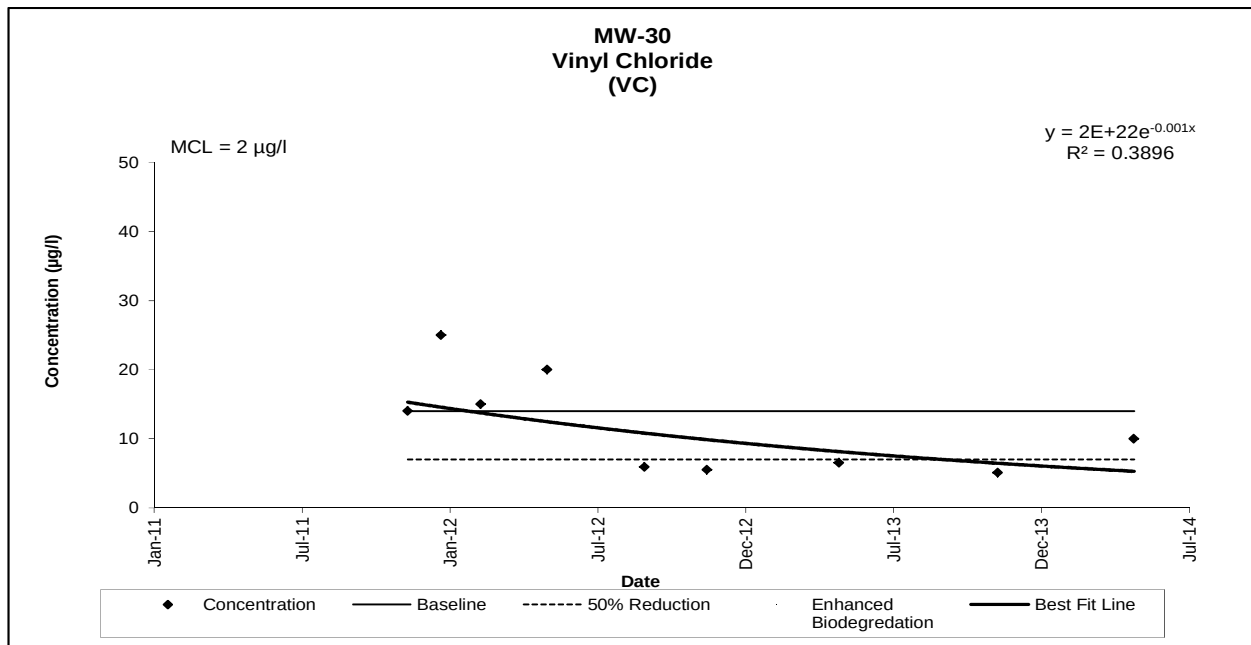


EXHIBIT B-15
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
PIEZOMETER PZ-1

LABORATORY PARAMETERS								
Sample Date	PCE (µg/l)	TCE (µg/l)	1,1-DCE (µg/l)	cis-1,2-DCE (µg/l)	trans-1,2-DCE (µg/l)	VC (µg/l)	2,4-D (µg/l)	PCP (µg/l)
13-Aug-03	< 1	< 1	< 1	--	--	< 1	--	--
6-Nov-03	< 1	< 1	< 1	--	--	< 1	--	--
14-May-04	< 1	< 1	< 1	--	--	< 1	--	--
4-Nov-04	< 1	< 1	< 1	--	--	< 1	--	--
9-May-05	< 1	< 1	< 1	--	--	< 1	--	--
2-Nov-05	< 1	< 1	< 1	--	--	< 1	--	--
15-May-06	< 1	< 1	< 1	--	--	< 1	--	--
7-Nov-06	< 1	< 1	< 1	--	--	< 1	--	--
11-Apr-07	< 1	< 1	< 1	--	--	< 1	--	--
31-Oct-07	< 1	< 1	< 1	--	--	< 1	--	--
29-Apr-08	< 1	< 1	< 1	--	--	< 1	--	--
15-Oct-08	< 1	< 1	< 1	--	--	< 1	--	--
8-Apr-09	< 1	< 1	< 1	< 1	< 1	< 1	--	--
4-Nov-09	< 1	< 1	< 1	< 1	< 1	< 1	--	--
28-Apr-10	< 1	< 1	< 1	< 1	< 1	< 1	--	--
25-Oct-10	< 1	< 1	< 1	< 1	< 1	< 1	--	--
13-Apr-11	< 1	< 1	< 1	< 1	< 1	< 1	--	--
10-Nov-11	< 1	< 1	< 1	< 1	< 1	< 1	--	--
2-May-12	< 1	< 1	< 1	< 1	< 1	< 1	--	--
15-Nov-12	< 1	< 1	< 1	< 1	< 1	< 1	--	--
24-Apr-13	< 1	< 1	< 1	< 1	< 1	< 1	--	--
6-Nov-13	< 1	< 1	< 1	< 1	< 1	< 1	--	--
23-Apr-14	< 1	< 1	< 1	< 1	< 1	< 1	--	--

Data qualifiers are defined in laboratory reports. For data collected since 2001, a list of data qualifier definitions is included at the front of this appendix.

-- Not analyzed

EXHIBIT B-16
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
PIEZOMETER PZ-3

LABORATORY PARAMETERS								
Sample Date	PCE (µg/l)	TCE (µg/l)	1,1-DCE (µg/l)	cis-1,2-DCE (µg/l)	trans-1,2-DCE (µg/l)	VC (µg/l)	2,4-D (µg/l)	PCP (µg/l)
14-May-04	< 1	< 1	< 1	--	--	< 1	--	--
4-Nov-04	< 1	< 1	< 1	--	--	< 1	--	--
9-May-05	< 1	< 1	< 1	--	--	< 1	--	--
2-Nov-05	< 1	< 1	< 1	--	--	< 1	--	--
15-May-06	< 1	< 1	< 1	--	--	< 1	--	--
7-Nov-06	< 1	< 1	< 1	--	--	< 1	--	--
11-Apr-07	< 1	< 1	< 1	--	--	< 1	--	--
31-Oct-07	< 1	< 1	< 1	--	--	< 1	--	--
29-Apr-08	< 1	< 1	< 1	--	--	< 1	--	--
15-Oct-08	< 1	< 1	< 1	--	--	< 1	--	--
8-Apr-09	< 1	< 1	< 1	< 1	< 1	< 1	--	--
4-Nov-09	< 1	< 1	< 1	< 1	< 1	< 1	--	--
28-Apr-10	< 1	< 1	< 1	< 1	< 1	< 1	--	--
25-Oct-10	< 1	< 1	< 1	< 1	< 1	< 1	--	--
12-Apr-11	< 1	< 1	< 1	< 1	< 1	< 1	--	--
11-Nov-11	< 1	< 1	< 1	< 1	< 1	< 1	--	--
3-May-12	< 1	< 1	< 1	< 1	< 1	< 1	--	--
14-Nov-12	< 1	< 1	< 1	< 1	< 1	< 1	--	--
24-Apr-13	< 1	< 1	< 1	< 1	< 1	< 1	--	--
6-Nov-13	< 1	< 1	< 1	< 1	< 1	< 1	--	--
23-Apr-14	< 1	< 1	< 1	< 1	< 1	< 1	--	--

Data qualifiers are defined in laboratory reports. For data collected since 2001, a list of data qualifier definitions is included at the front of this appendix.

-- Not analyzed

EXHIBIT B-17
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
MONITORING WELL MW-31D

LABORATORY PARAMETERS								
Sample Date	PCE (µg/l)	TCE (µg/l)	1,1-DCE (µg/l)	cis-1,2-DCE (µg/l)	trans-1,2-DCE (µg/l)	VC (µg/l)	2,4-D (µg/l)	PCP (µg/l)
20-Dec-11	< 1	< 1	< 1	< 1	< 1	< 1	--	< 0.5
7-Feb-12	< 1	< 1	< 1	< 1	< 1	< 1	--	< 0.5
3-May-12	< 1	< 1	< 1	< 1	< 1	< 1	--	< 0.5
29-Aug-12	< 1	< 1	< 1	< 1	< 1	< 1	--	< 0.5
14-Nov-12	< 1	< 1	< 1	< 1	< 1	< 1	--	< 0.5
25-Apr-13	< 1	< 1	< 1	< 1	< 1	< 1	--	< 0.5
7-Nov-13	< 1	< 1	< 1	< 1	< 1	< 1	--	--
21-Apr-14	< 1	< 1	< 1	< 1	< 1	< 1	--	--

Data qualifiers are defined in laboratory reports. For data collected since 2001, a list of data qualifier definitions is included at the front of this appendix.

-- Not analyzed

EXHIBIT B-18
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
MONITORING WELL MW-32D

LABORATORY PARAMETERS								
Sample Date	PCE (µg/l)	TCE (µg/l)	1,1-DCE (µg/l)	cis-1,2-DCE (µg/l)	trans-1,2-DCE (µg/l)	VC (µg/l)	2,4-D (µg/l)	PCP (µg/l)
20-Dec-11	< 1	< 1	< 1	< 1	< 1	< 1	--	< 0.5
7-Feb-12	< 1	< 1	< 1	< 1	< 1	< 1	--	< 0.5
3-May-12	< 1	< 1	< 1	< 1	< 1	< 1	--	< 0.5
29-Aug-12	< 1	< 1	< 1	< 1	< 1	< 1	--	< 0.5
14-Nov-12	< 1	< 1	< 1	< 1	< 1	< 1	--	< 0.5
24-Apr-13	< 1	< 1	< 1	< 1	< 1	< 1	--	< 0.5
6-Nov-13	< 1	< 1	< 1	< 1	< 1	< 1	--	--
23-Apr-14	< 1	< 1	< 1	< 1	< 1	< 1	--	--

Data qualifiers are defined in laboratory reports. For data collected since 2001, a list of data qualifier definitions is included at the front of this appendix.

-- Not analyzed

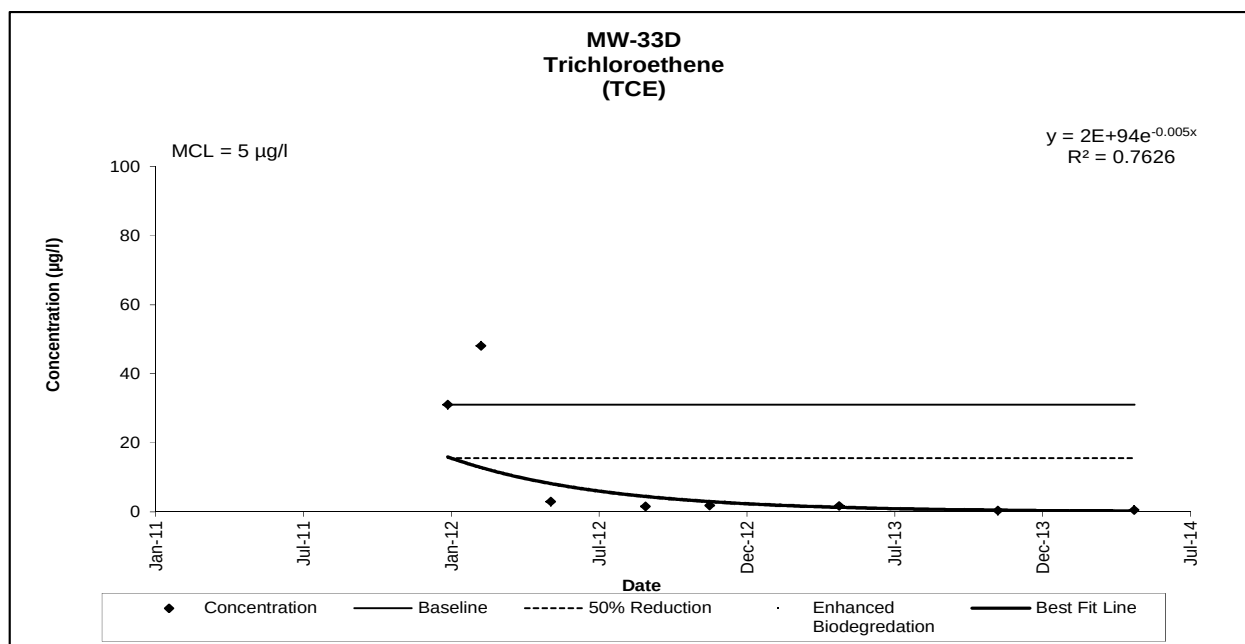
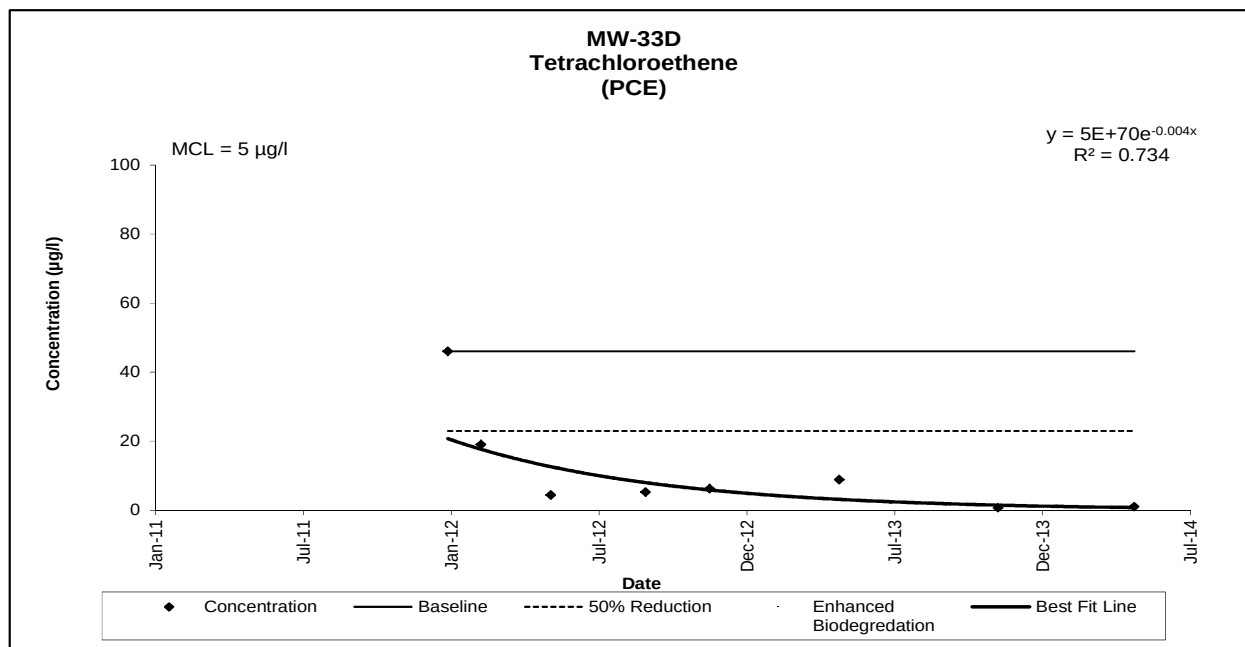
**EXHIBIT B-19
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
MONITORING WELL MW-33D**

LABORATORY PARAMETERS								
Sample Date	PCE (µg/l)	TCE (µg/l)	1,1-DCE (µg/l)	cis-1,2-DCE (µg/l)	trans-1,2-DCE (µg/l)	VC (µg/l)	2,4-D (µg/l)	PCP (µg/l)
28-Dec-11	46	31	< 1	4.7	< 1	< 1	--	< 0.5
7-Feb-12	19	48	0.3 T	140 D	< 1	< 1	--	< 0.5
3-May-12	4.4	2.9	0.26 T	110 D	< 1	< 1	--	< 0.5
28-Aug-12	5.2	1.5	< 1	17	< 1	8.9	--	< 0.5
15-Nov-12	6.2	1.8	< 1	15	< 1	2.1	--	< 0.5
24-Apr-13	8.8	1.6	< 1	17	< 1	7.4	--	< 0.5
6-Nov-13	0.7 T	0.29 T	< 1	3.4	< 1	1.3	--	--
23-Apr-14	0.98 T	0.42 T	< 1	3.1	< 1	1.2	--	--

Data qualifiers are defined in laboratory reports. For data collected since 2001, a list of data qualifier definitions is included at the front of this appendix.

-- Not analyzed

**EXHIBIT B-19
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
MONITORING WELL MW-33D**



**EXHIBIT B-19
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
MONITORING WELL MW-33D**

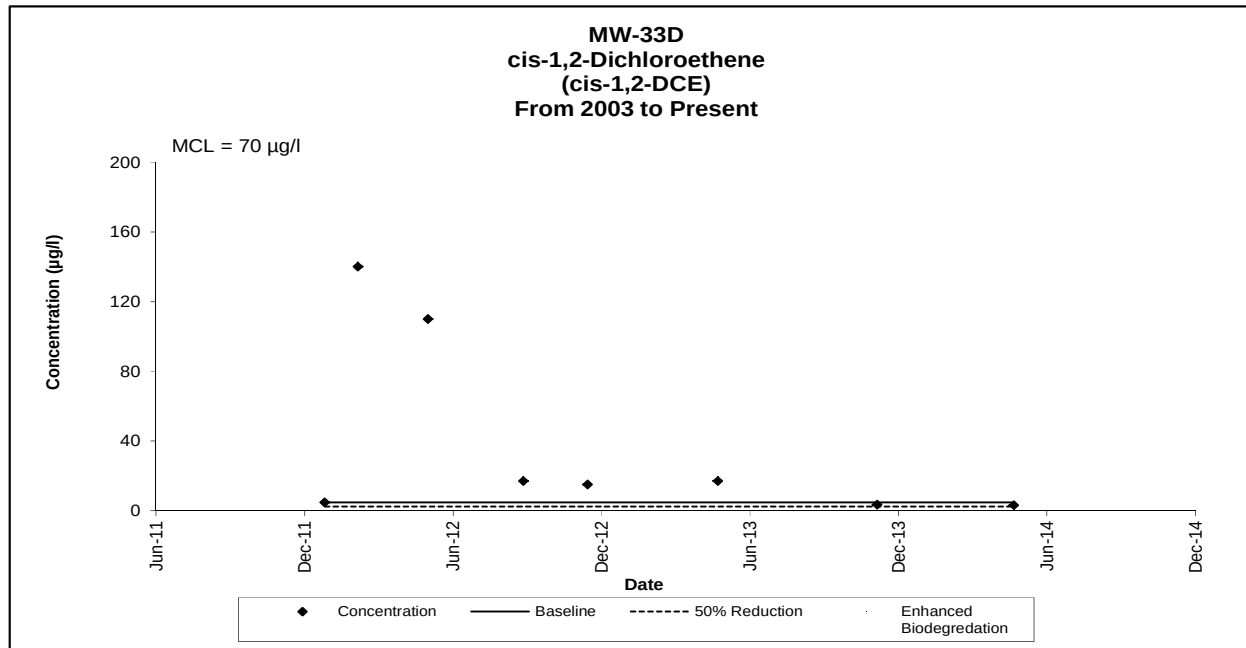
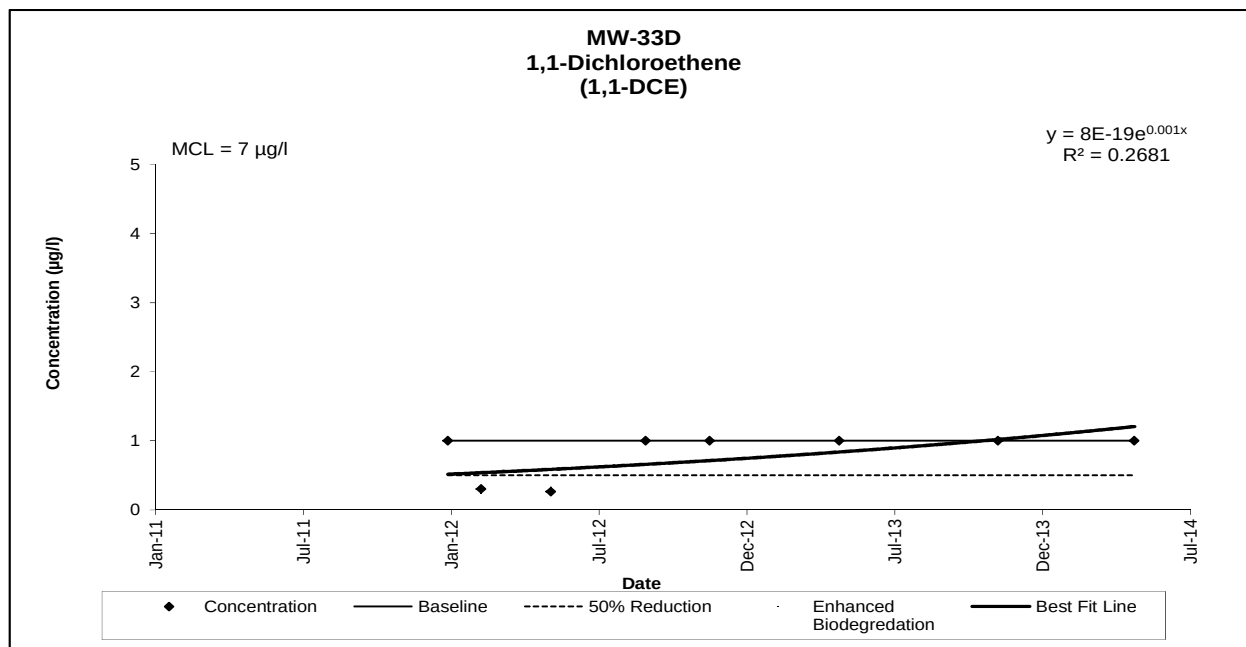


EXHIBIT B-19
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
MONITORING WELL MW-33D

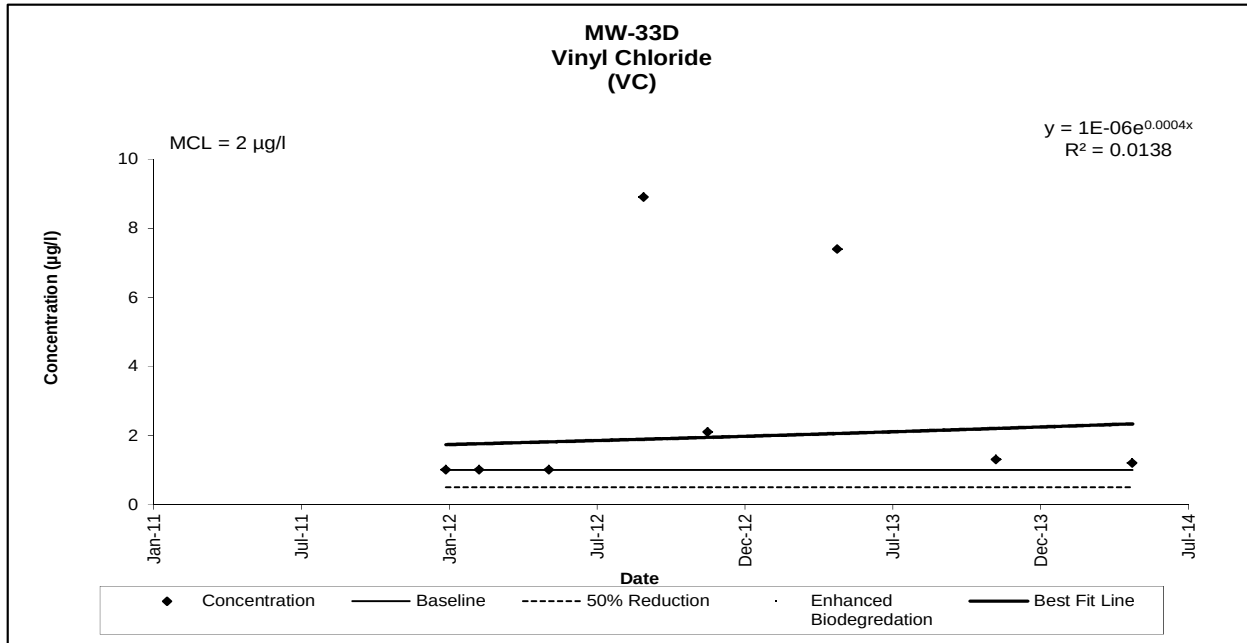


EXHIBIT B-20
WASATCH CHEMICAL SITE
HISTORICAL DATA TRENDS
MONITORING WELL MW-34

LABORATORY PARAMETERS								
Sample Date	PCE (µg/l)	TCE (µg/l)	1,1-DCE (µg/l)	cis-1,2-DCE (µg/l)	trans-1,2-DCE (µg/l)	VC (µg/l)	2,4-D (µg/l)	PCP (µg/l)
13-Jun-13	< 1	0.24 T	< 1	1.7	0.48 T	< 1	--	< 0.5
28-Aug-13	< 1	0.31 T	< 1	1.6	0.5 T	< 1 UJ	--	< 0.5
7-Nov-13	< 1	0.33 T	< 1	2.2	0.58 T	< 1	--	< 0.5
20-Feb-14	< 1	0.32 T	< 1	3	0.69 T	< 1	--	< 0.5
24-Apr-14	< 1	0.24 T	< 1	1.6	0.46 T	< 1	--	--

Data qualifiers are defined in laboratory reports. For data collected since 2001, a list of data qualifier definitions is included at the front of this appendix.

-- Not analyzed

APPENDIX C

STATISTICAL EVALUATION RESULTS

APPENDIX C
STATISTICAL EVALUATION RESULTS

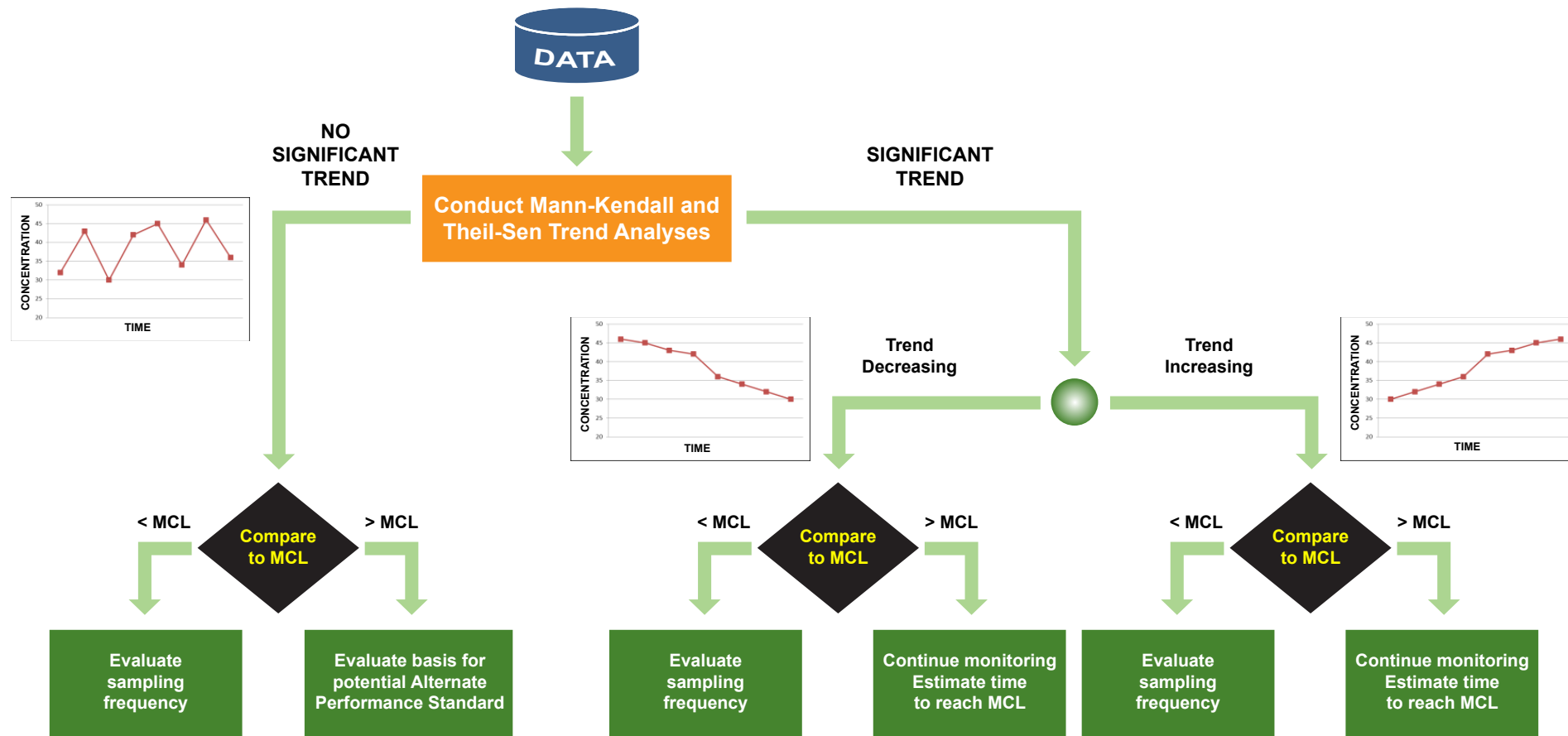
WASATCH CHEMICAL SITE

Figure C-1 Plume Stability Evaluation Flow Chart

Section C1: Statistical Analysis Results

Section C2: Trend Analysis Plots

Section C3: Confidence Interval Plots



MCL - Maximum Contaminant Level

Section C1

Statistical Analysis Results

TABLE C1-1
SHALLOW GROUNDWATER STATISTICAL RESULTS SUMMARY - APRIL 2014
USING THE EIGHT MOST RECENT DATA POINTS FOR CONSTITUENTS OF CONCERN
WASATCH CHEMICAL SITE, SALT LAKE CITY, UTAH
(Page 1 of 2)

Monitoring Location	COC	MCL (µg/l)	N	Mean (µg/l)	Standard Deviation (µg/l)	Data Distribution	% Non-detects	Trend at α 0.01 ^(a)	Slope at α 0.01 ^(b) (µg/l/year)	UCL (95% CL)	LCL (95% CL)	Exceeds MCL	MCL Exceedance Determination Method	Indication	Recommendation
ES-01	PCE	5	8	1.664	2.034	ln(x)	12.5	No	NA	2.322	0.3032	No	Confidence interval	Performance Standard met	B
	TCE	5	8	15.24	20.47	ln(x)	0	No	NA	23.03	1.979	No	Confidence interval	Performance Standard met	B
	1,1-DCE	7	8	1.084	1.155	unknown	37.5	No	NA	2.9	0.1	No	Confidence interval	Performance Standard met	B
	VC	2	8	16.6	22.08	ln(x)	0	No	NA	24.99	1.628	No	Confidence interval	Performance Standard met	B
	PCP	1	8	2.881	4.202	unknown	62.5	No	NA	10	0.05	No	Confidence interval	Performance Standard met	B
EX-02	PCE	5	8	0.3769	0.2377	normal	0	No	NA	0.4636	0.2389	No	Confidence interval	Performance Standard met	B
	TCE	5	8	117.9	63.16	normal	0	No	NA	143	80.93	Yes	Confidence interval	Stability	C
	1,1-DCE	7	8	8.65	1.372	normal	0	No	NA	9.569	7.731	Yes	Confidence interval	Stability	C
	VC	2	8	89.06	52.16	normal	0	No	NA	210	52.5	Yes	Confidence interval	Stability	C
	PCP	1	8	7.025	3.363	normal	0	No	NA	9.277	4.773	Yes	Confidence interval	Stability	C
EX-04	PCE	5	8	0.1	0	unknown	100	No	NA	0.1	0.1	No	Confidence interval	Performance Standard met	B
	TCE	5	8	18.86	17.52	normal	0	Yes	-10.5	NA	NA	No	Confidence band	Performance Standard met	B
	1,1-DCE	7	8	8	4.89	normal	0	Yes	-3.541	NA	NA	No	Confidence band	Performance Standard met	B
	VC	2	8	1.946	1.518	ln(x)	0	No	NA	2.708	0.9807	No	Confidence interval	Performance Standard met	B
EX-05	PCE	5	8	0.15	0.1414	unknown	100	No	NA	0.5	0.1	No	Confidence interval	Performance Standard met	B
	TCE	5	8	0.4294	0.08038	normal	0	No	NA	0.4832	0.3755	No	Confidence interval	Performance Standard met	B
	1,1-DCE	7	8	9.469	1.548	normal	0	No	NA	13	8.2	Yes	Confidence interval	Stability	C
	VC	2	8	12.59	2.801	normal	0	No	NA	14.46	10.71	Yes	Confidence interval	Stability	C
EX-07	PCE	5	8	0.3663	0.3623	unknown	50	No	NA	1.1	0.1	No	Confidence interval	Performance Standard met	B
	TCE	5	8	1.816	0.744	normal	0	No	NA	2.315	1.318	No	Confidence interval	Performance Standard met	B
	1,1-DCE	7	8	0.3388	0.1313	unknown	12.5	No	NA	0.4267	0.2508	No	Confidence interval	Performance Standard met	B
	VC	2	8	4.275	2.323	normal	0	No	NA	5.831	2.719	Yes	Confidence interval	Stability	C
	PCP	1	8	0.09375	0.01768	unknown	100	No	NA	0.1	0.05	No	Confidence interval	Performance Standard met	B
EX-08	PCE	5	8	0.1	0	unknown	100	No	NA	0.1	0.1	No	Confidence interval	Performance Standard met	B
	TCE	5	8	0.2113	0.1296	unknown	50	No	NA	0.44	0.1	No	Confidence interval	Performance Standard met	B
	1,1-DCE	7	8	0.1	0	unknown	100	No	NA	0.1	0.1	No	Confidence interval	Performance Standard met	B
	VC	2	8	0.1975	0.2758	unknown	87.5	No	NA	0.88	0.1	No	Confidence interval	Performance Standard met	B
	PCP	1	8	1.768	1.066	normal	0	No	NA	2.482	1.053	Yes	Confidence interval	Stability	C
EX-09	PCE	5	8	0.1	0	unknown	100	No	NA	0.1	0.1	No	Confidence interval	Performance Standard met	B
	TCE	5	8	0.2238	0.05655	normal	12.5	No	NA	0.2616	0.1859	No	Confidence interval	Performance Standard met	B
	1,1-DCE	7	8	1.95	0.5529	normal	0	No	NA	2.32	1.58	No	Confidence interval	Performance Standard met	B
	VC	2	8	0.1475	0.06585	unknown	62.5	No	NA	0.24	0.1	No	Confidence interval	Performance Standard met	B

TABLE C1-1
SHALLOW GROUNDWATER STATISTICAL RESULTS SUMMARY - APRIL 2014
USING THE EIGHT MOST RECENT DATA POINTS FOR CONSTITUENTS OF CONCERN
WASATCH CHEMICAL SITE, SALT LAKE CITY, UTAH
(Page 2 of 2)

Monitoring Location	COC	MCL (µg/l)	N	Mean (µg/l)	Standard Deviation (µg/l)	Data Distribution	% Non-detects	Trend at α 0.01 ^(a)	Slope at α 0.01 ^(b) (µg/l/year)	UCL (95% CL)	LCL (95% CL)	Exceeds MCL	MCL Exceedance Determination Method	Indication	Recommendation
EX-11	PCE	5	8	0.6	0.9502	unknown	87.5	No	NA	2.5	0.1	No	Confidence interval	Performance Standard met	B
	TCE	5	8	15.05	22.64	unknown	0	No	NA	67	2	No	Confidence interval	Performance Standard met	B
	1,1-DCE	7	8	6.429	5.848	normal	0	No	NA	10.35	2.512	No	Confidence interval	Performance Standard met	B
	VC	2	8	434.4	208.9	normal	0	No	NA	574.3	294.4	Yes	Confidence interval	Stability	C
	PCP	1	8	0.09375	0.01768	unknown	100	No	NA	0.1	0.05	No	Confidence interval	Performance Standard met	B
MW-06	PCE	5	8	0.1	0	unknown	100	No	NA	0.1	0.1	No	Confidence interval	Performance Standard met	B
	TCE	5	8	0.21	0.1506	unknown	50	No	NA	0.53	0.1	No	Confidence interval	Performance Standard met	B
	1,1-DCE	7	8	3.383	1.407	normal	0	No	NA	4.325	2.44	No	Confidence interval	Performance Standard met	B
	VC	2	8	1.273	0.473	normal	0	No	NA	1.589	0.9556	No	Confidence interval	Performance Standard met	B
MW-20	PCE	5	8	0.1	0	unknown	100	No	NA	0.1	0.1	No	Confidence interval	Performance Standard met	B
	TCE	5	8	1.41	0.8267	ln(x)	0	No	NA	3.4	0.91	No	Confidence interval	Performance Standard met	B
	1,1-DCE	7	8	1.275	0.4874	normal	0	No	NA	1.602	0.9485	No	Confidence interval	Performance Standard met	B
	VC	2	8	3.425	2.003	normal	0	No	NA	4.181	2.265	Yes	Confidence interval	Stability	C
MW-30	PCE	5	8	0.1	0	unknown	100	No	NA	0.1	0.1	No	Confidence interval	Performance Standard met	B
	TCE	5	8	0.775	0.1581	normal	0	No	NA	0.8809	0.6691	No	Confidence interval	Performance Standard met	B
	1,1-DCE	7	8	6.088	1.744	normal	0	No	NA	7.256	4.919	No	Confidence interval	Performance Standard met	B
	VC	2	8	11.63	7.58	ln(x)	0	No	NA	15.79	6.496	Yes	Confidence interval	Stability	C
	PCP	1	6	0.1	0	unknown	100	No	NA	0.1	0.1	No	Confidence interval	Performance Standard met	B

- (a) Mann-Kendall method used to test for a statistically significant slope trend.
(b) Thiel-Sen method used to estimate the rate of change of the median concentration over time (slope).
(c) The mean of the eight-point data set is considered statistically above the MCL if lower confidence band is greater than the MCL for trending data sets, or if the lower confidence interval is above the MCL for nontrending data sets.

CL	confidence level	A	Continue monitoring
COC	constituent of concern; includes PCE, TCE, 1,1-DCE, VC, and PCP	B	Evaluate sampling frequency
LCL	lower confidence limit	C	Evaluate basis for potential Alternative Performance Standard
ln(x)	logrithmic distribution		
MCL	maximum contaminant level		
N	number of data points used		
NA	not applicable		
PCE	tetrachloroethene		
PCP	pentachlorophenol		
TCE	trichloroethene		
UCL	upper confidence limit		
VC	vinyl chloride		
1,1-DCE	1,1-dichloroethene		
α	Defined as 1-confidence level; represents the percentage of cases for which a false conclusion is reached.		
µg/l	micrograms per liter		

TABLE C1-2
DEEP GROUNDWATER STATISTICAL RESULTS SUMMARY - APRIL 2014
USING THE SEVEN MOST RECENT DATA POINTS FOR CONSTITUENTS OF CONCERN
WASATCH CHEMICAL SITE, SALT LAKE CITY, UTAH
(Page 1 of 1)

Monitoring Location	COC	MCL (µg/l)	N	Mean (µg/l)	Standard Deviation (µg/l)	Data Distribution	% Non-detects	Trend at α 0.01 ^(a)	Slope at α 0.01 ^(b) (µg/l/year)	UCL (95% CL)	LCL (95% CL)	Exceeds MCL	MCL Exceedance Determination Method	Indication	Recommendation
MW-33D	PCE	5	8	11.41	15.11	ln(x)	0	No	NA	17.21	2.409	No	Confidence interval	Performance Standard met	B
	TCE	5	8	10.94	18.22	ln(x)	0	No	NA	8.956	0.7708	No	Confidence interval	Performance Standard met	B
	1,1-DCE	7	8	0.145	0.08401	unknown	75	No	NA	0.3	0.1	No	Confidence interval	Performance Standard met	B
	VC	2	8	2.65	3.492	unknown	37.5	No	NA	8.9	0.1	No	Confidence interval	Performance Standard met	B
	PCP	1	6	0.1	0	unknown	100	No	NA	0.1	0.1	No	Confidence interval	Performance Standard met	B

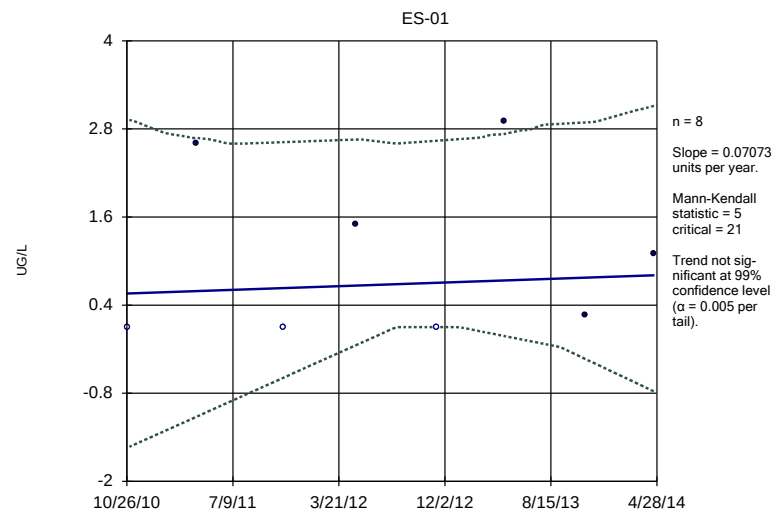
- (a) Mann-Kendall method used to test for a statistically significant slope trend.
(b) Thiel-Sen method used to estimate the rate of change of the median concentration over time (slope).
(c) The mean of the eight-point data set is considered statistically above the MCL if lower confidence band is greater than the MCL for trending data sets, or if the lower confidence interval is above the MCL for nontrending data sets.

CL	confidence level	A	Continue monitoring
COC	constituent of concern; includes PCE, TCE, 1,1-DCE, VC, and PCP	B	Evaluate sampling frequency
LCL	lower confidence limit	C	Evaluate basis for potential Alternative Performance Standard
ln(x)	logrithmic distribution		
MCL	maximum contaminant level		
N	number of data points used		
NA	not applicable		
PCE	tetrachloroethene		
PCP	pentachlorophenol		
TCE	trichloroethene		
UCL	upper confidence limit		
VC	vinyl chloride		
1,1-DCE	1,1-dichloroethene		
α	Defined as 1-confidence level; represents the percentage of cases for which a false conclusion is reached.		
µg/l	micrograms per liter		

Section C2

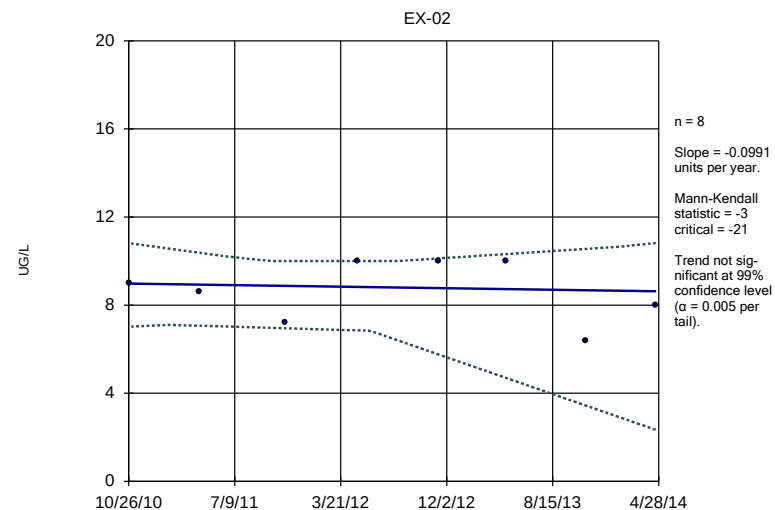
Trend Analysis Plots

Sen's Slope and 99% Confidence Band



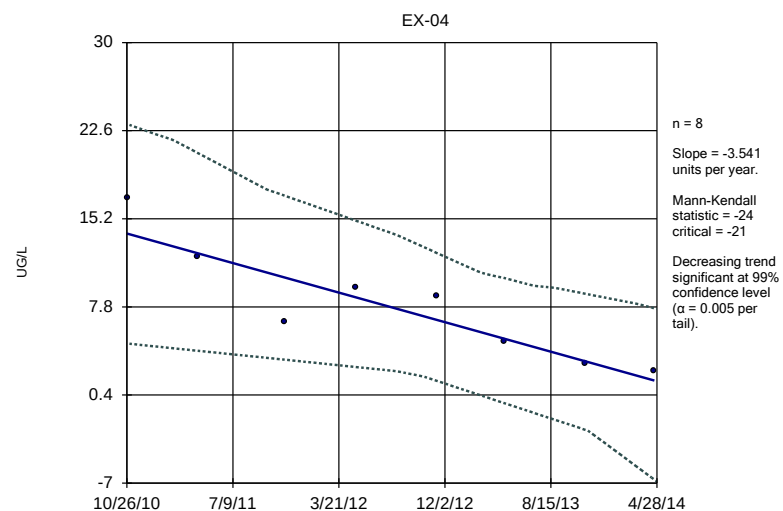
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Sen's Slope and 99% Confidence Band



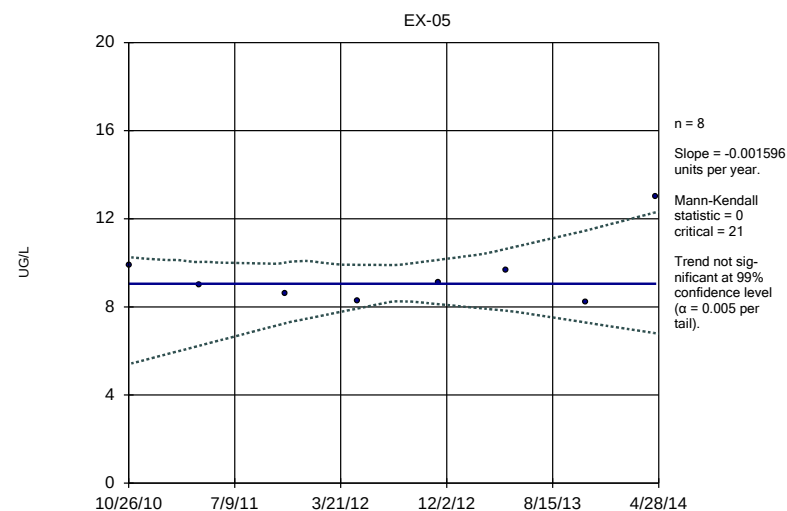
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Sen's Slope and 99% Confidence Band

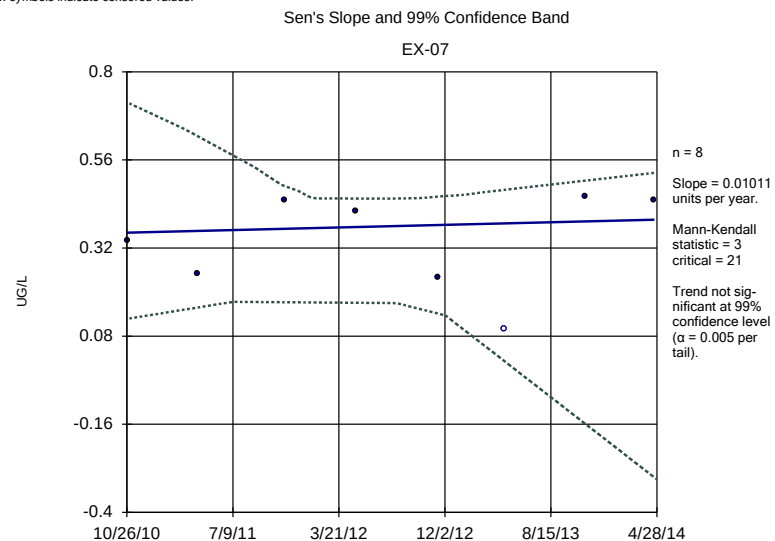


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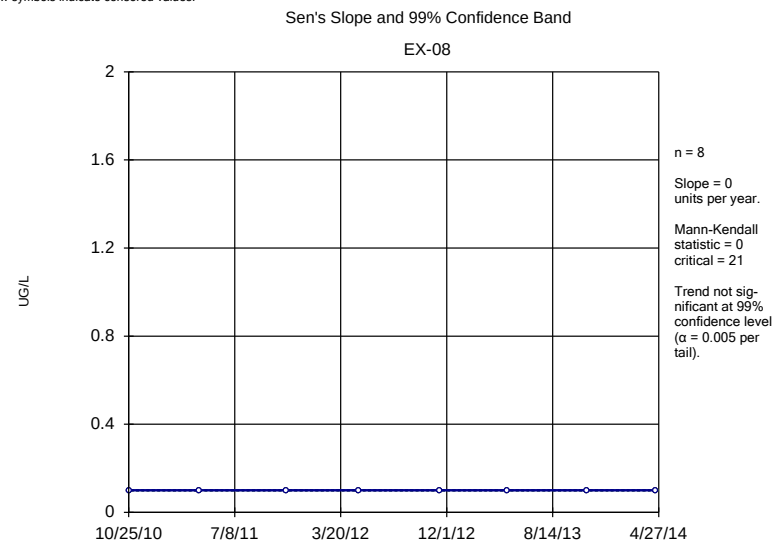
Sen's Slope and 99% Confidence Band



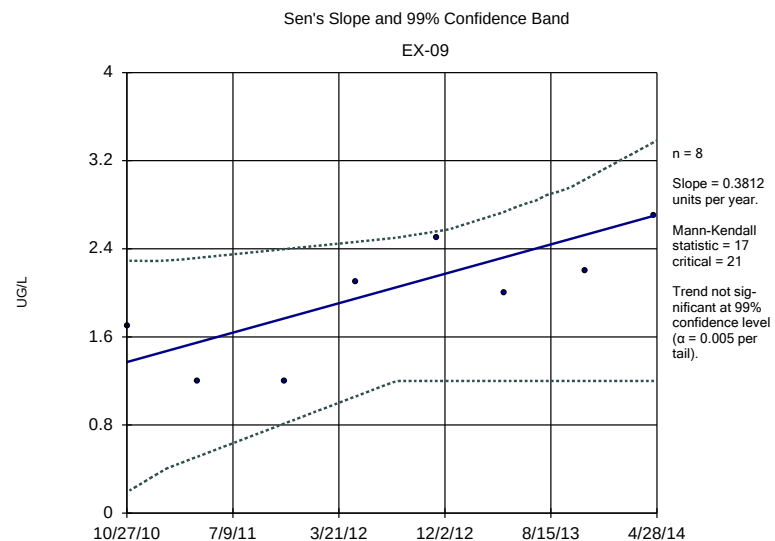
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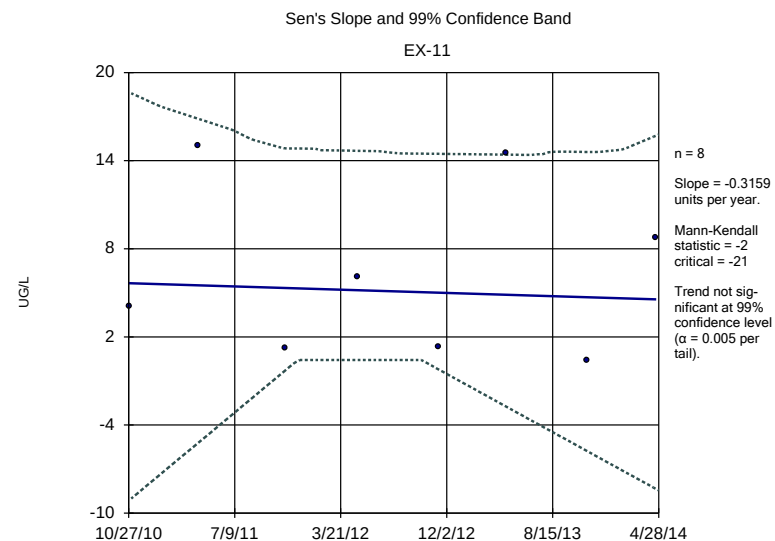
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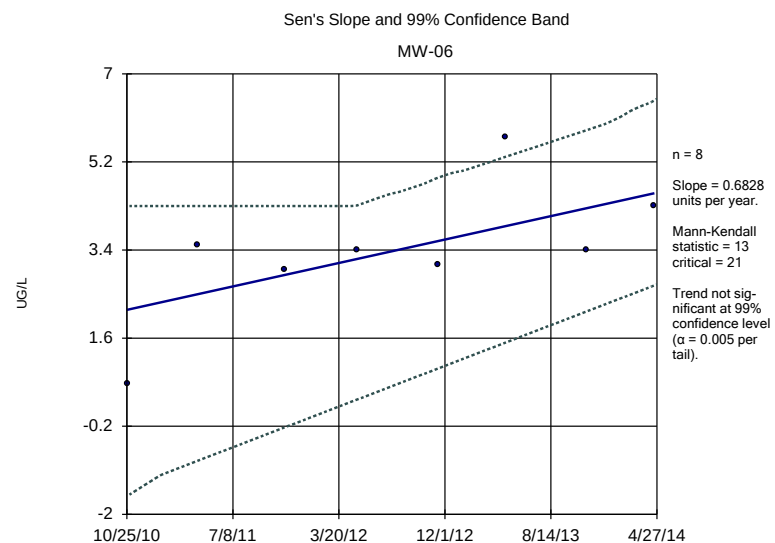
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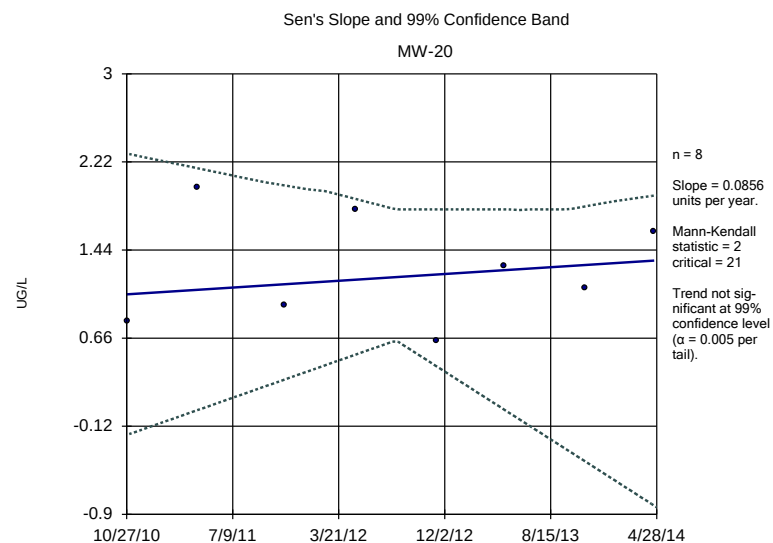
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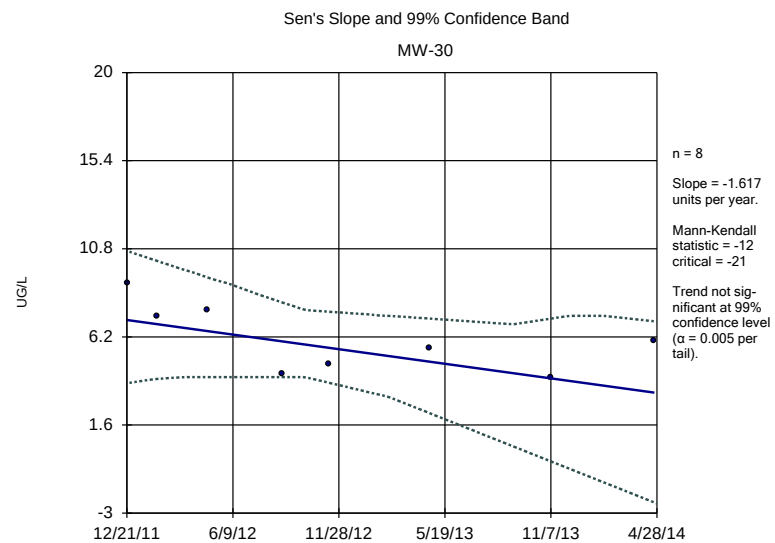
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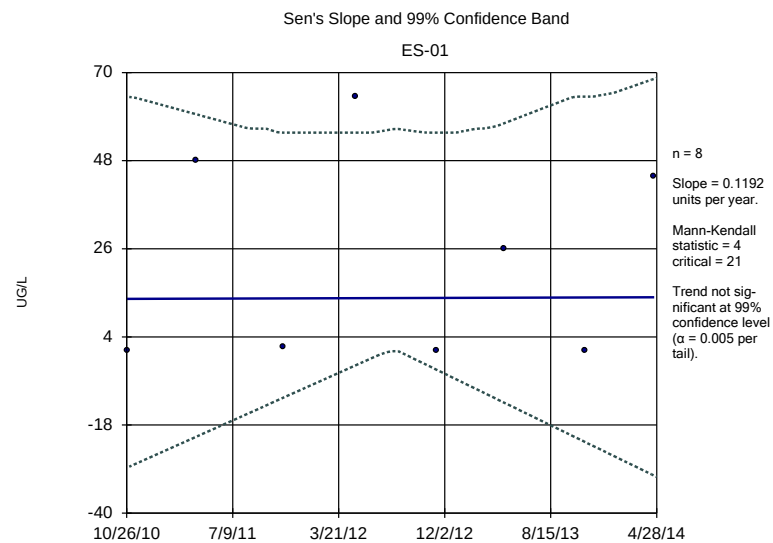
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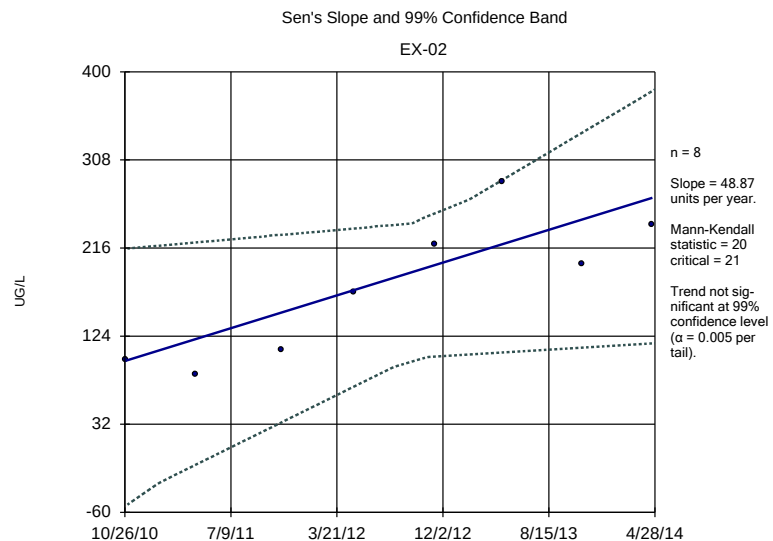
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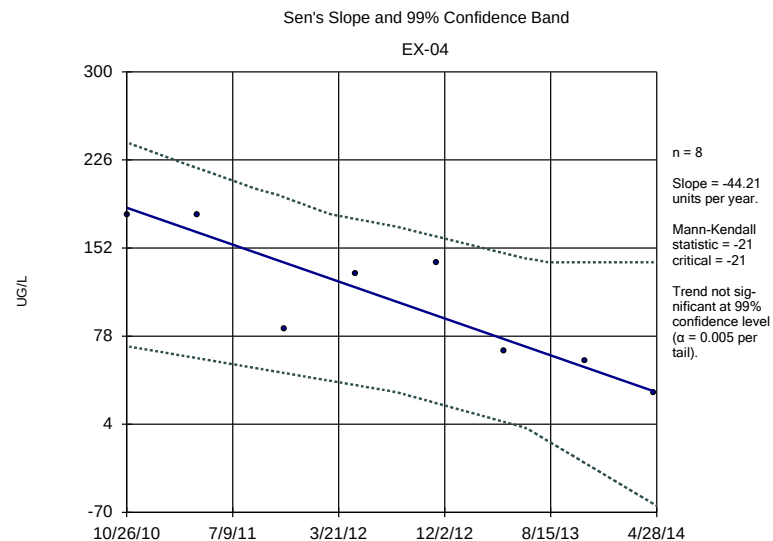
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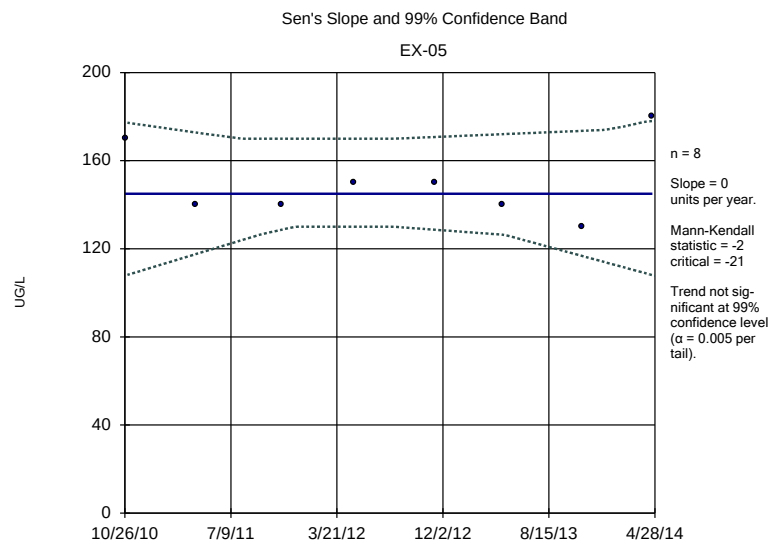
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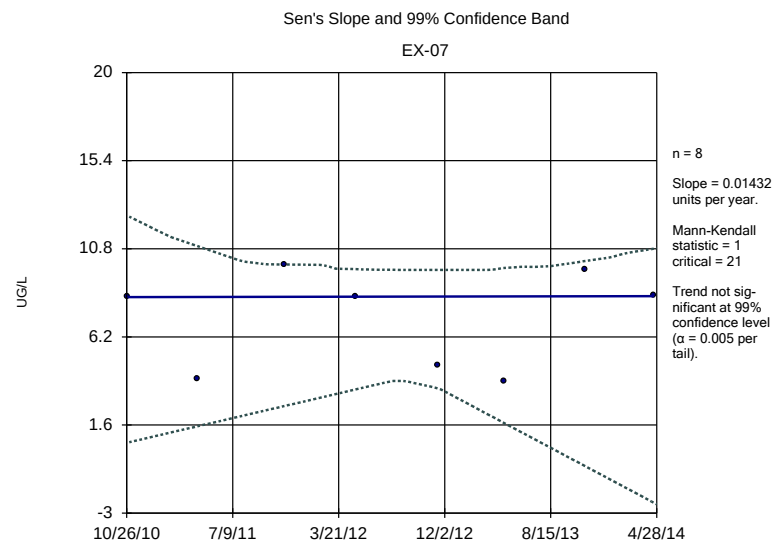
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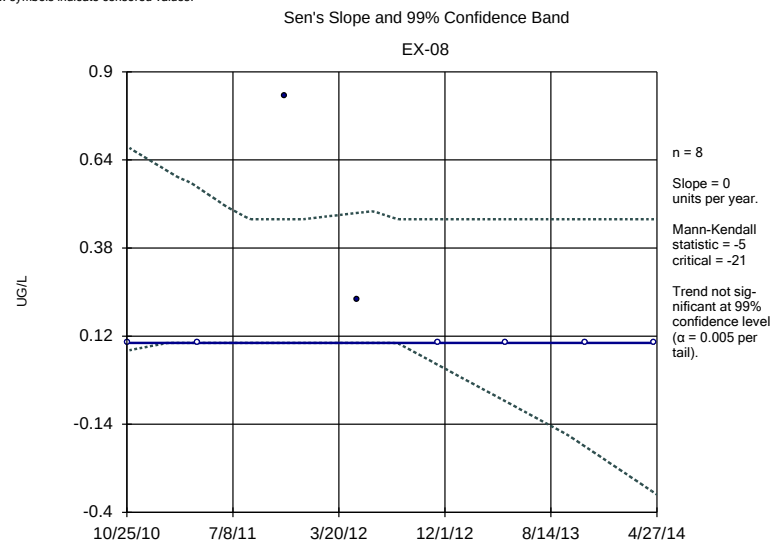
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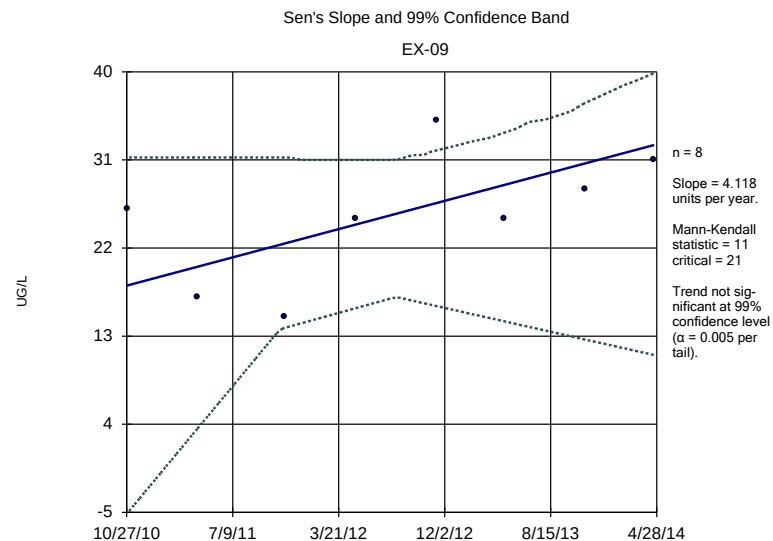
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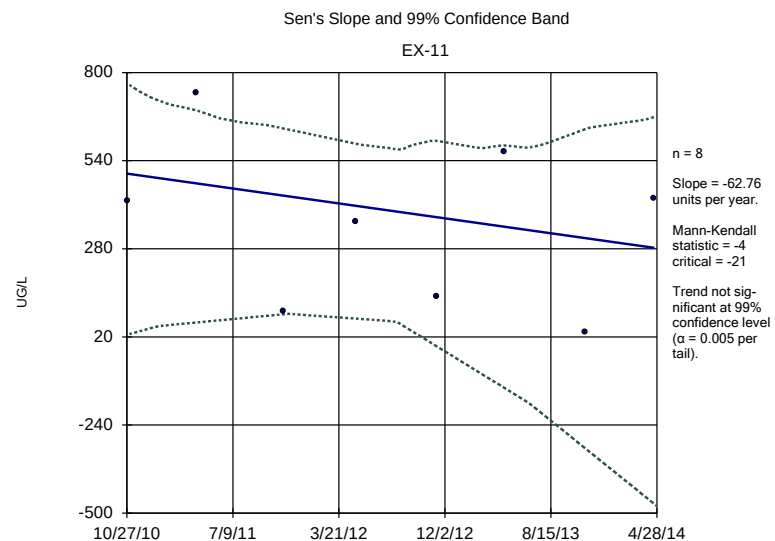
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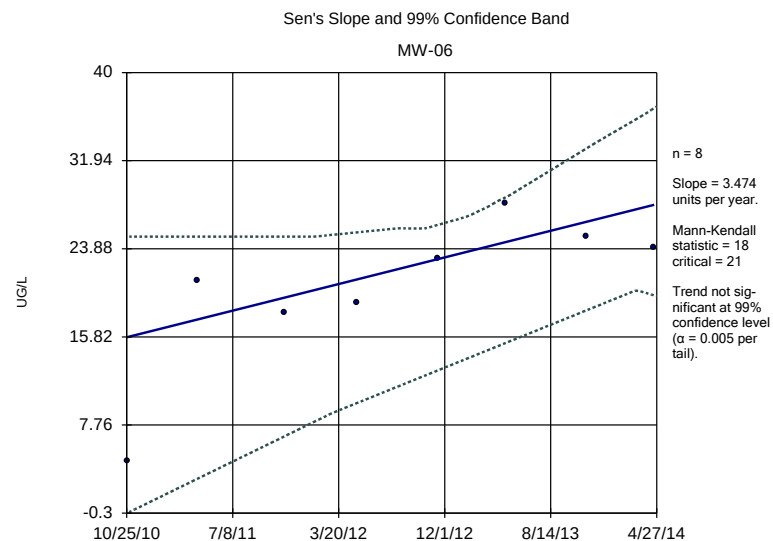
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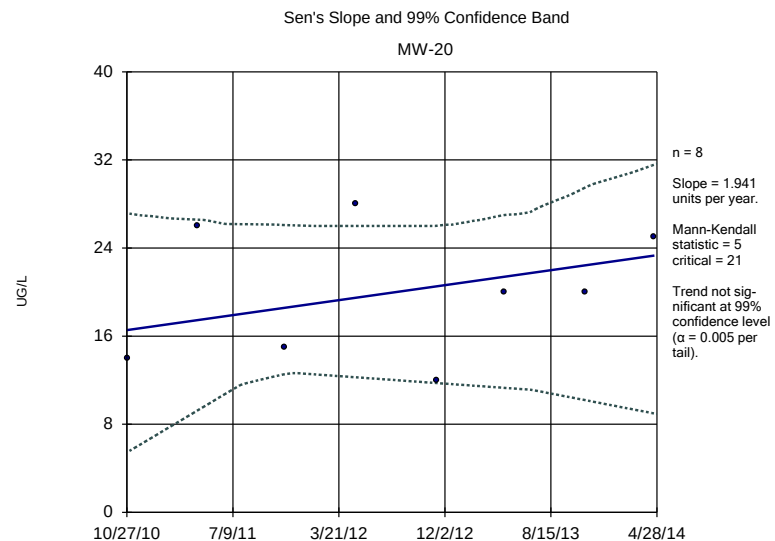
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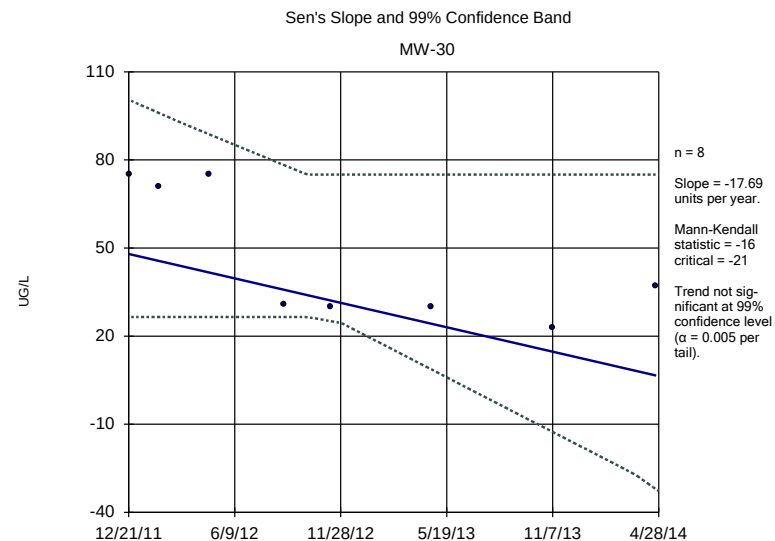
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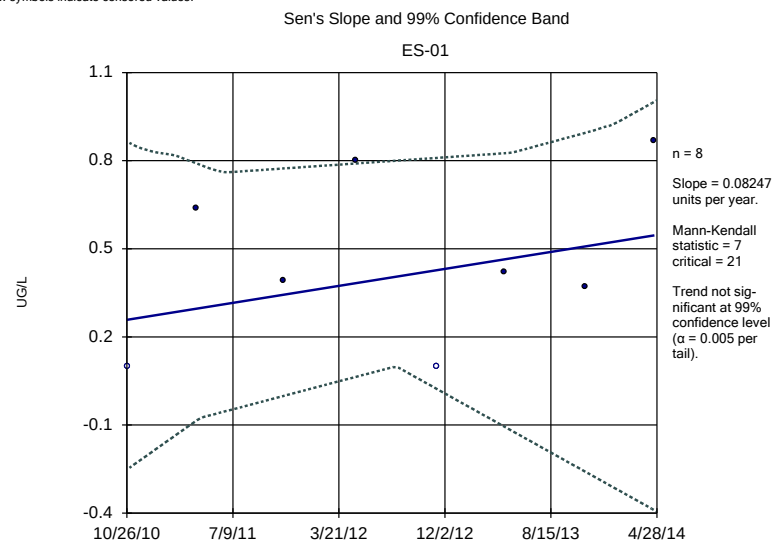
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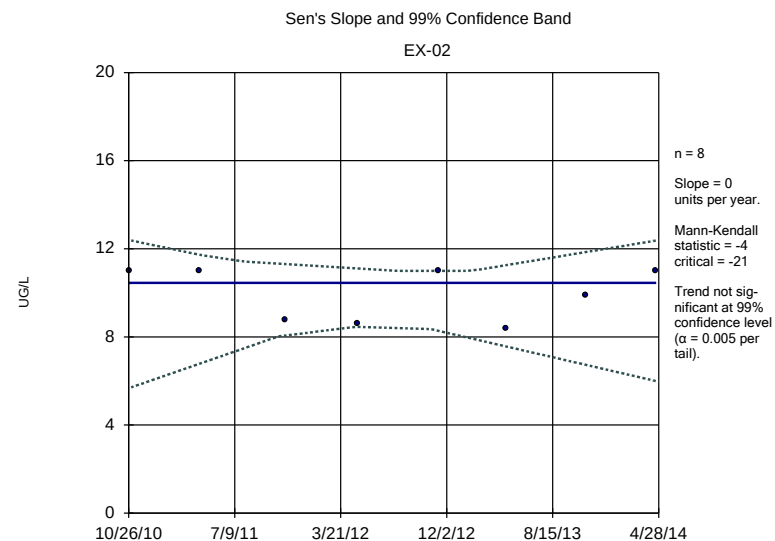
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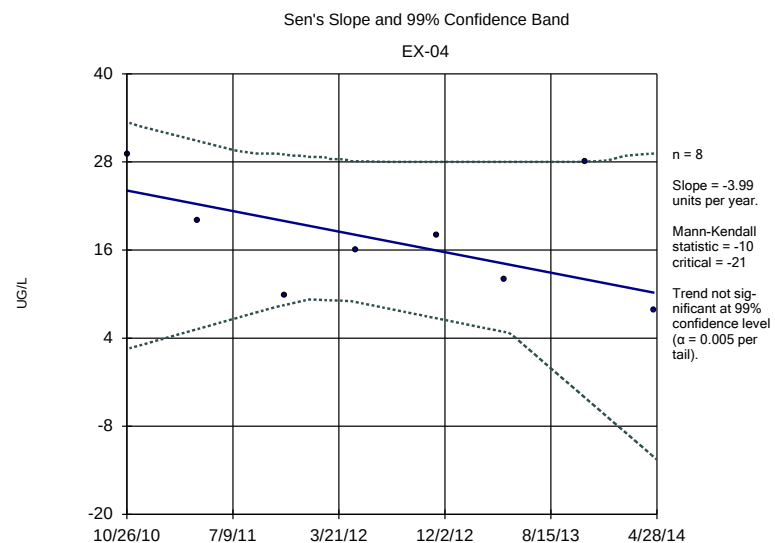
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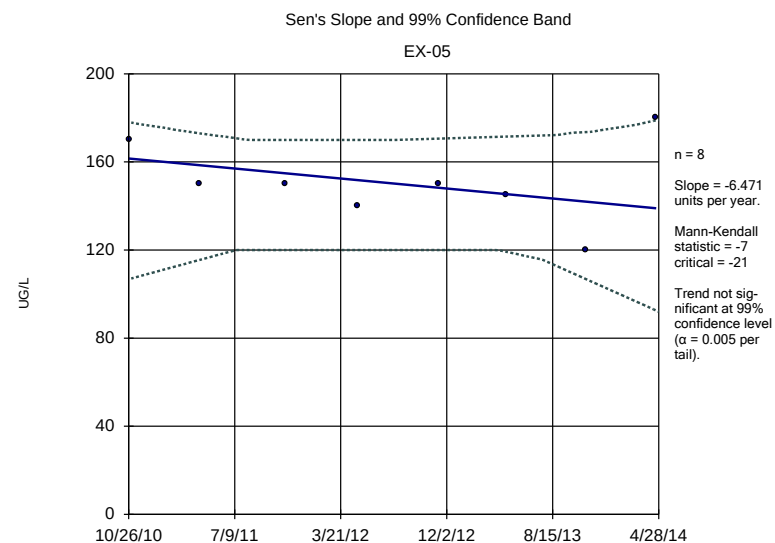
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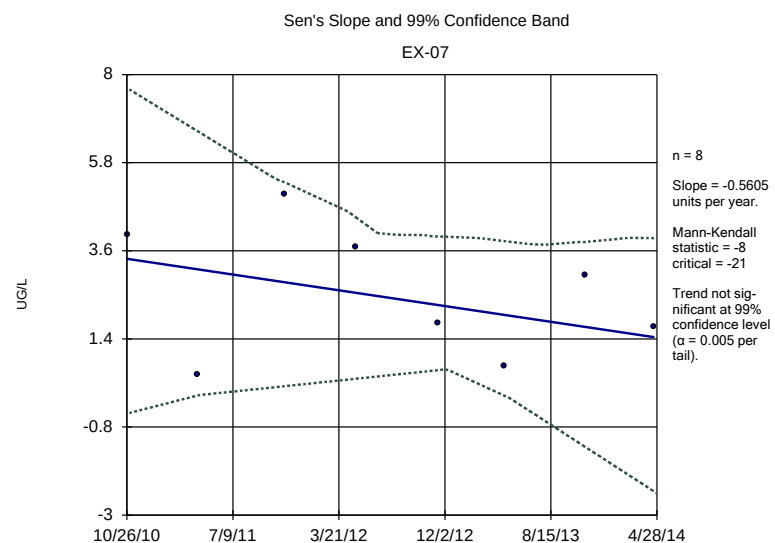
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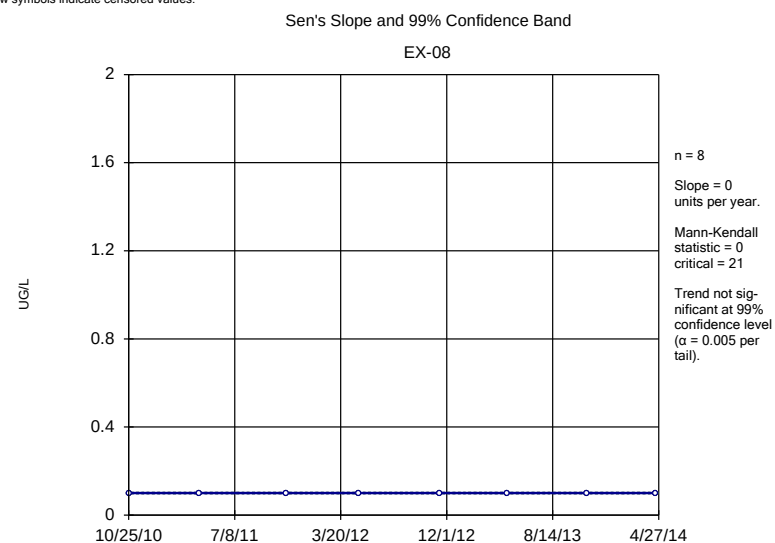
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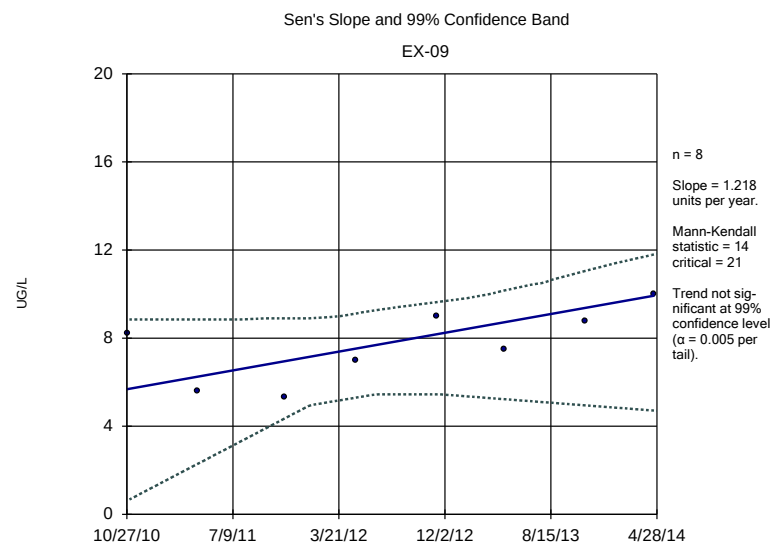
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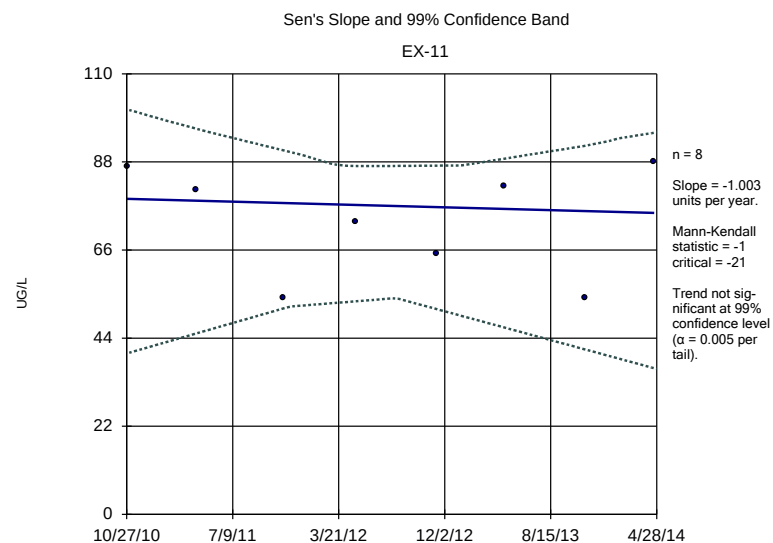
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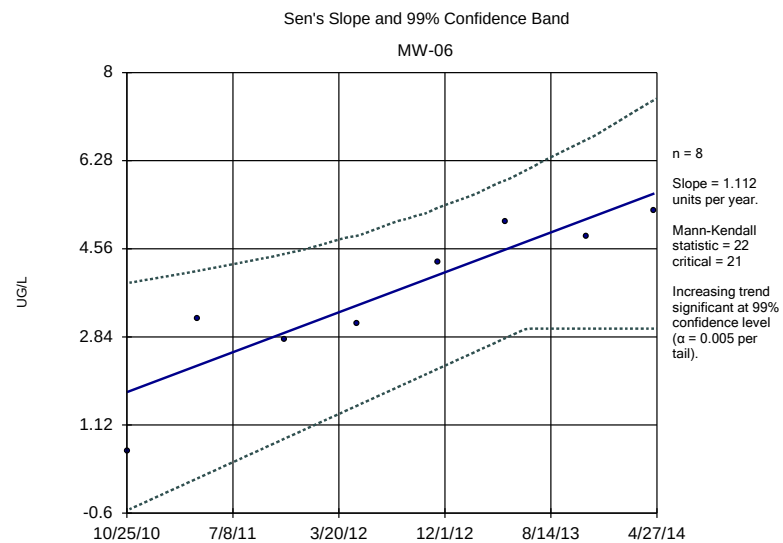
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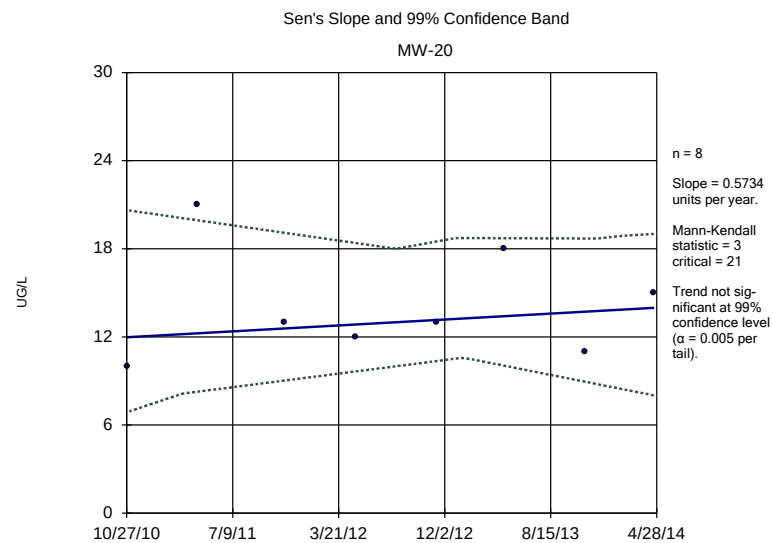
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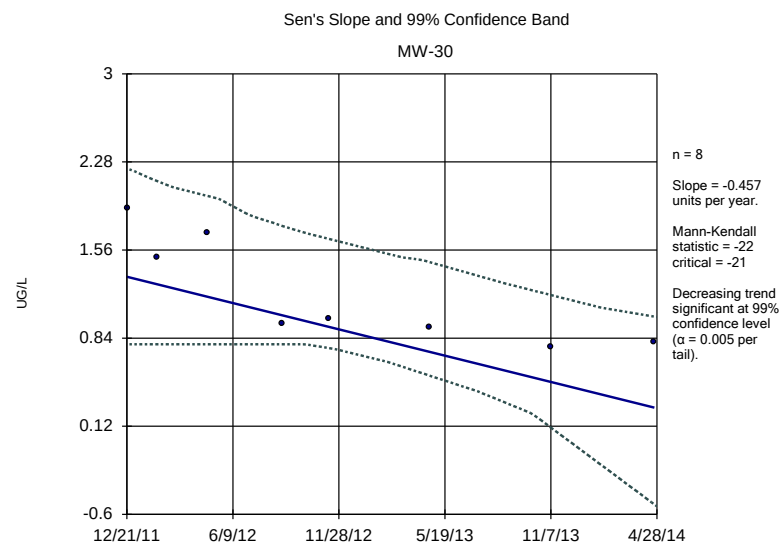
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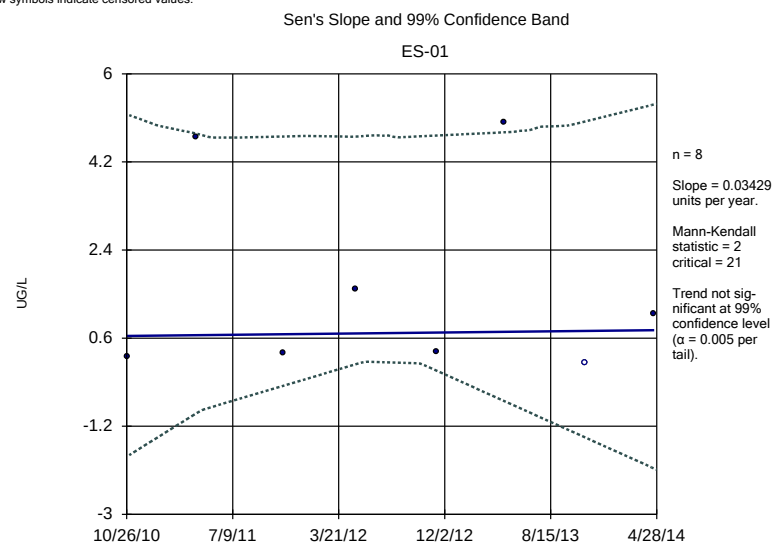
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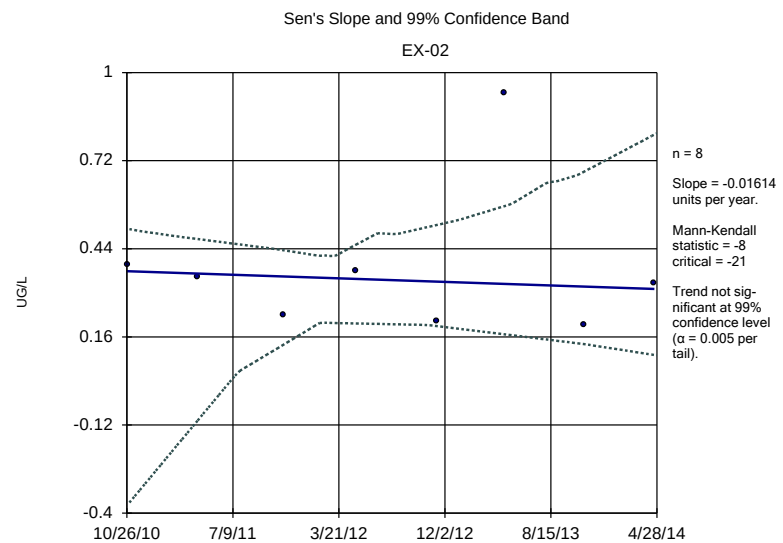
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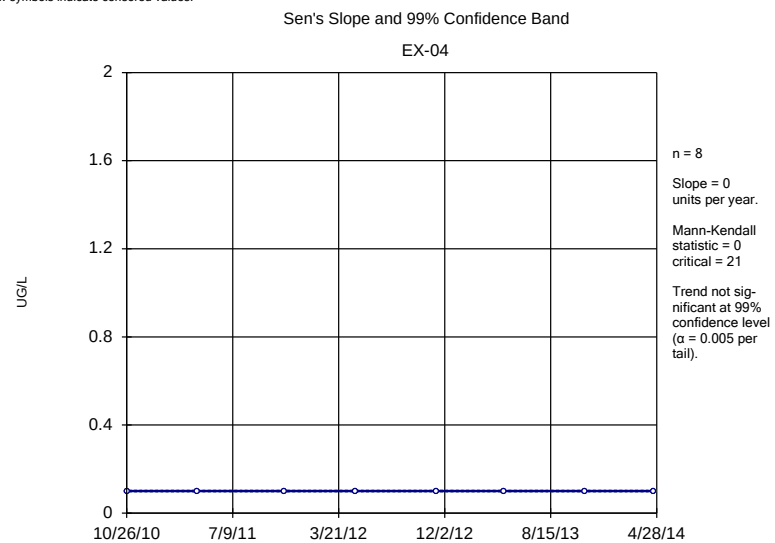
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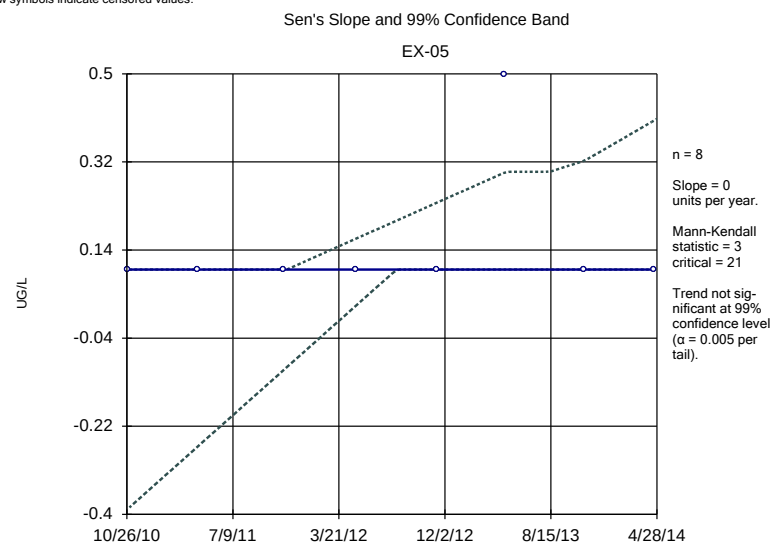
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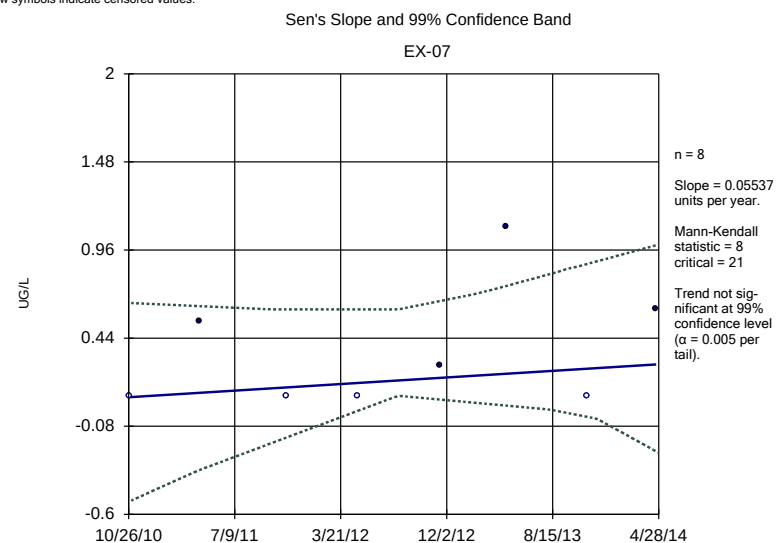
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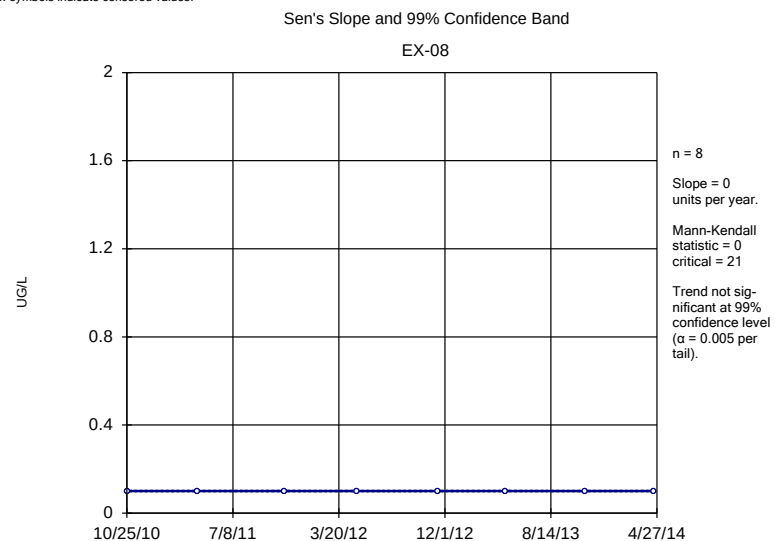
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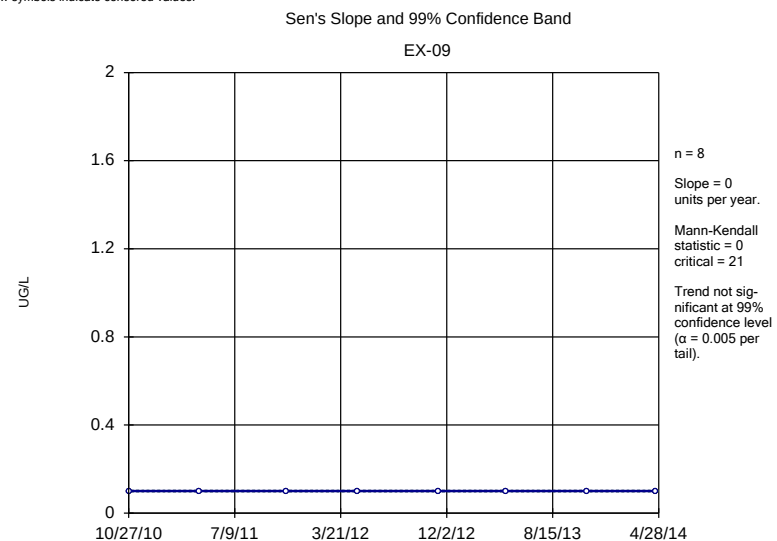
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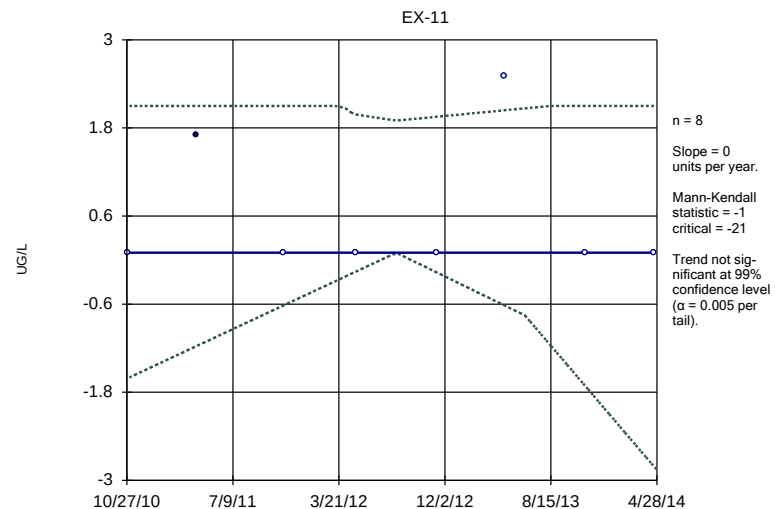


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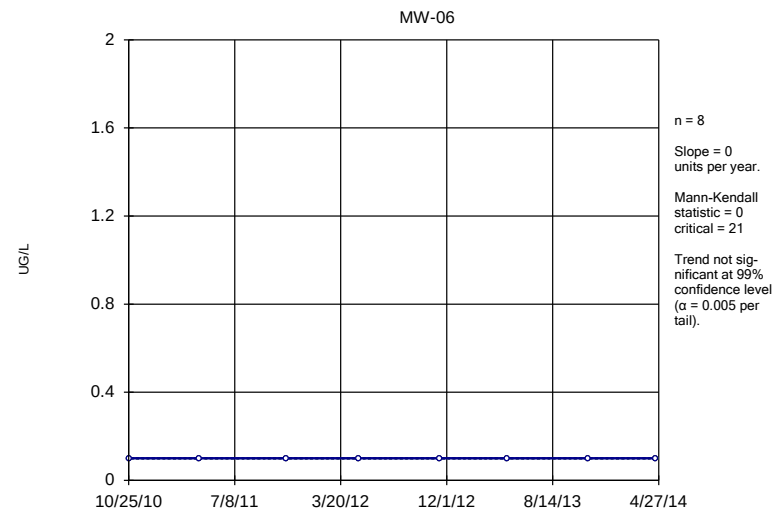
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Sen's Slope and 99% Confidence Band



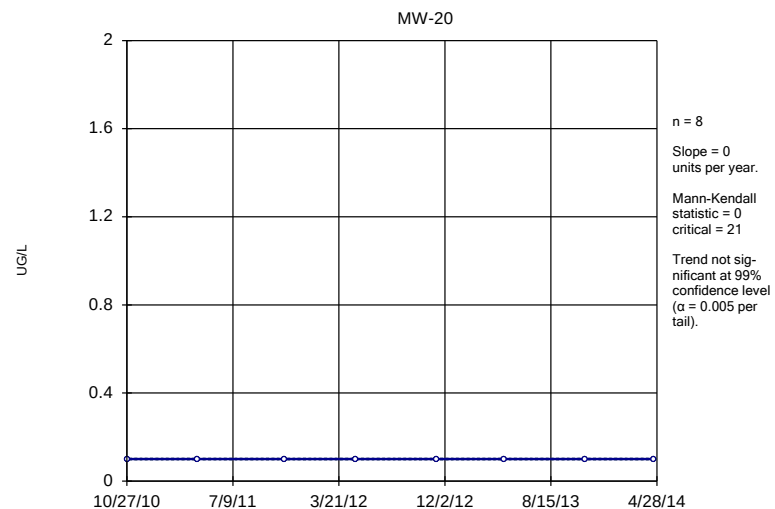
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Sen's Slope and 99% Confidence Band



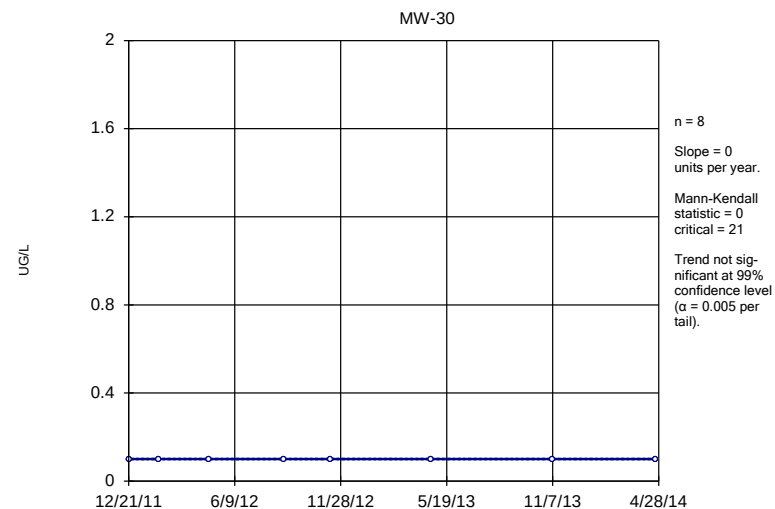
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Sen's Slope and 99% Confidence Band



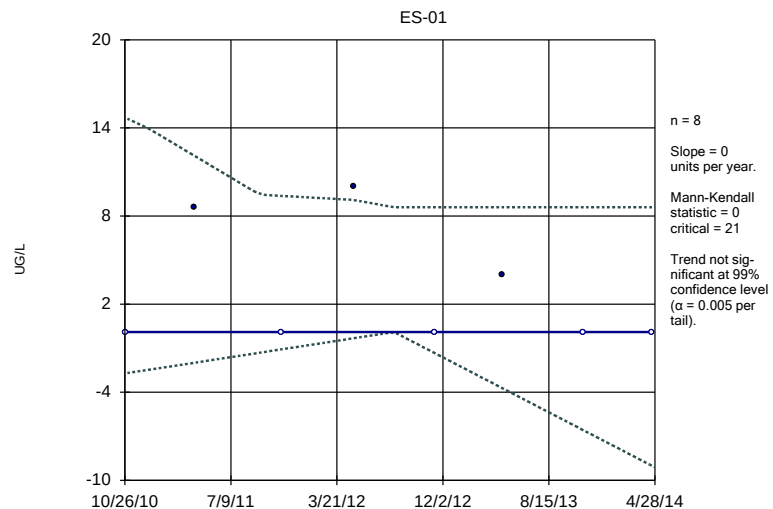
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Sen's Slope and 99% Confidence Band



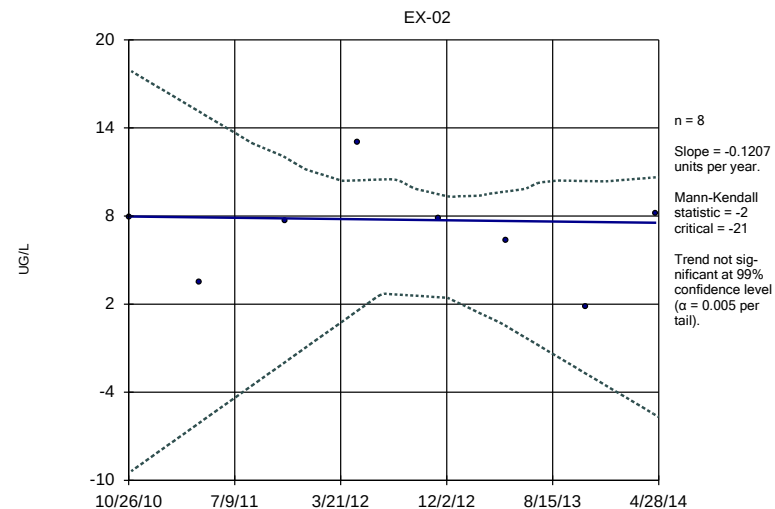
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Sen's Slope and 99% Confidence Band



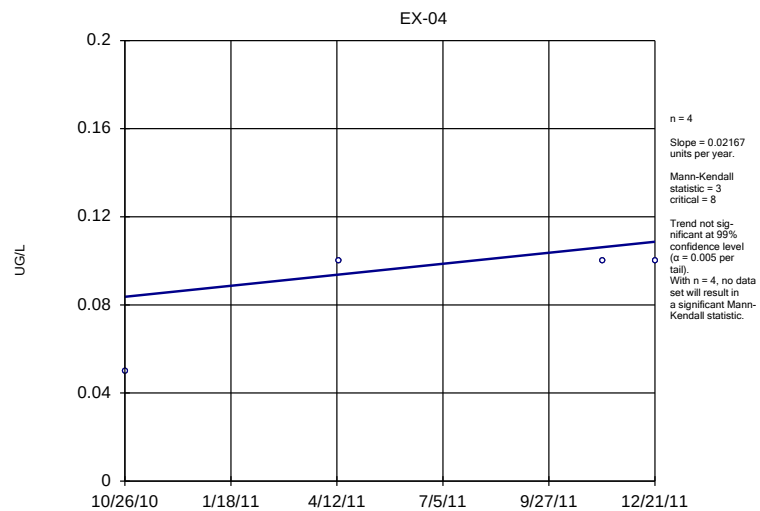
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Sen's Slope and 99% Confidence Band



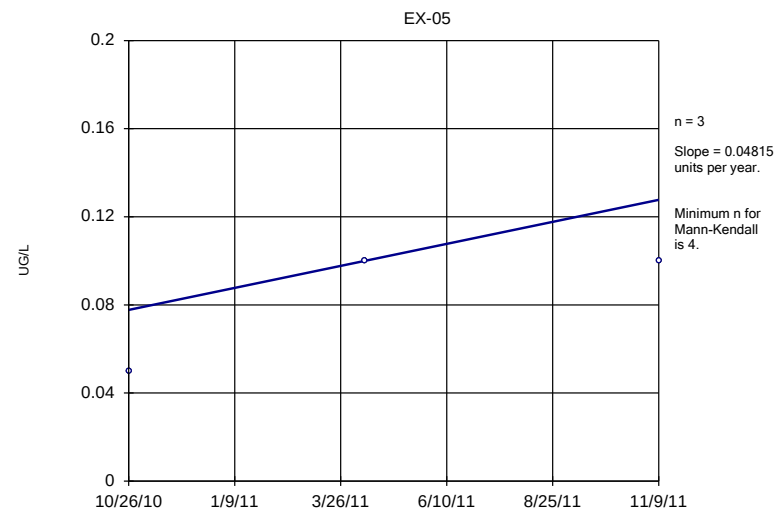
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Sen's Slope Estimator



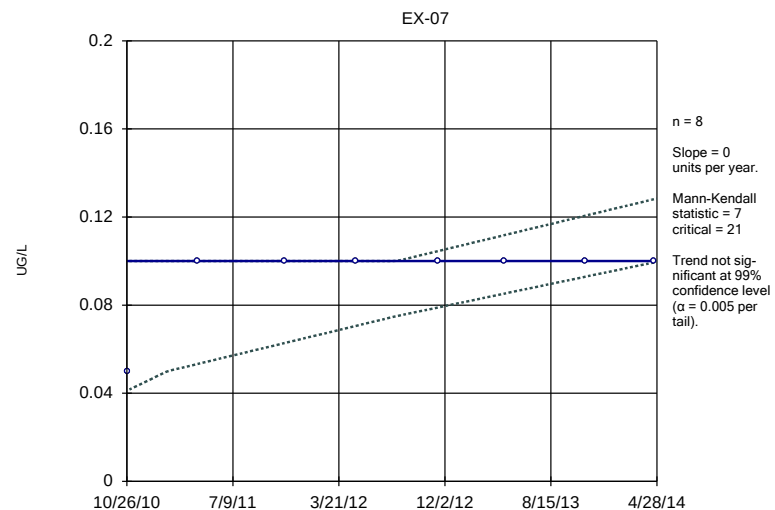
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Sen's Slope Estimator



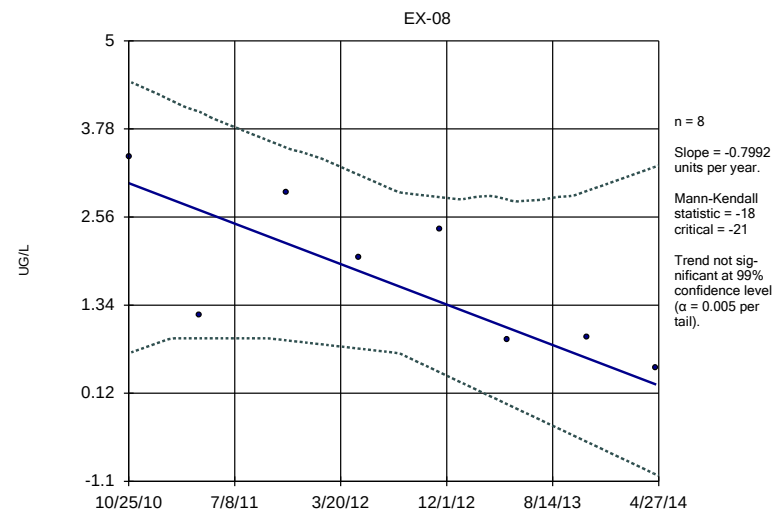
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Sen's Slope and 99% Confidence Band



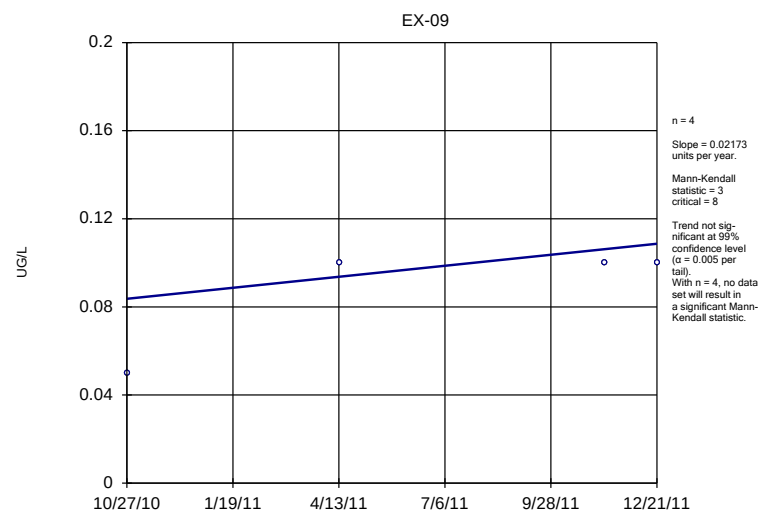
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Sen's Slope and 99% Confidence Band



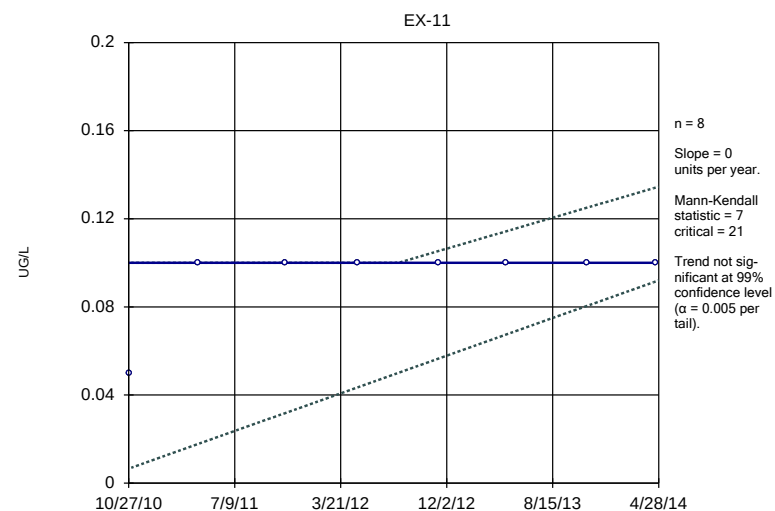
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Sen's Slope Estimator



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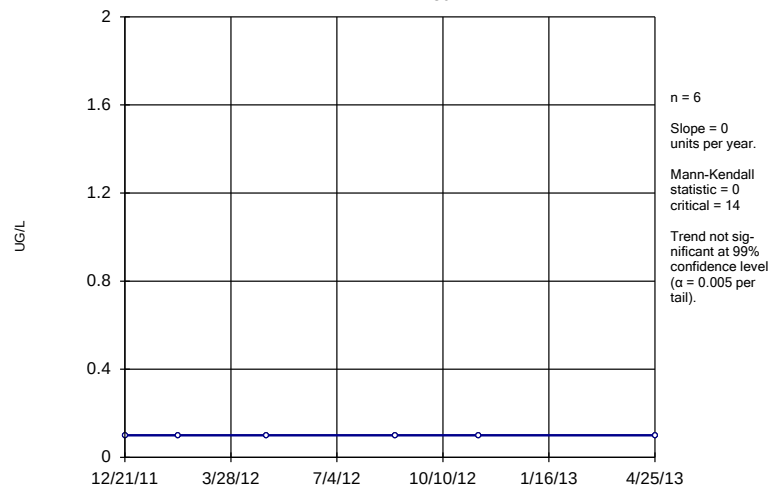
Sen's Slope and 99% Confidence Band



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Sen's Slope Estimator

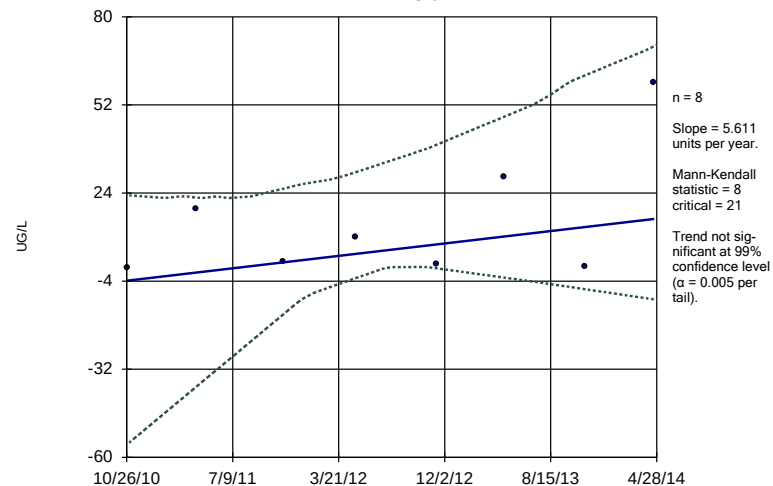
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Sen's Slope and 99% Confidence Band

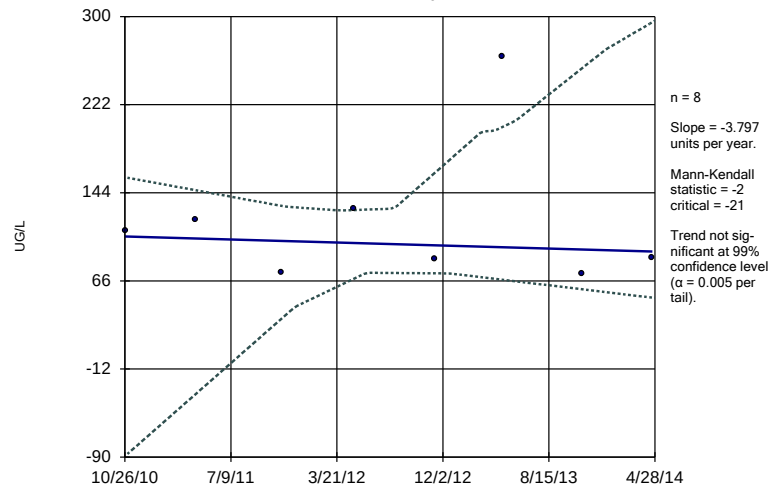
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Sen's Slope and 99% Confidence Band

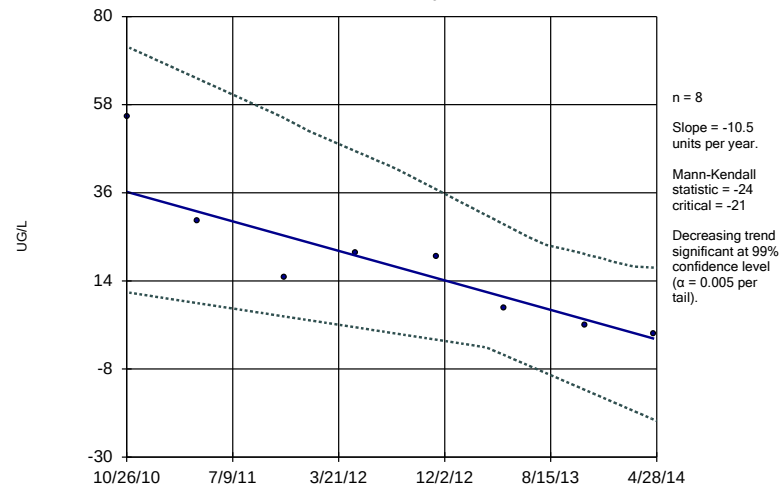
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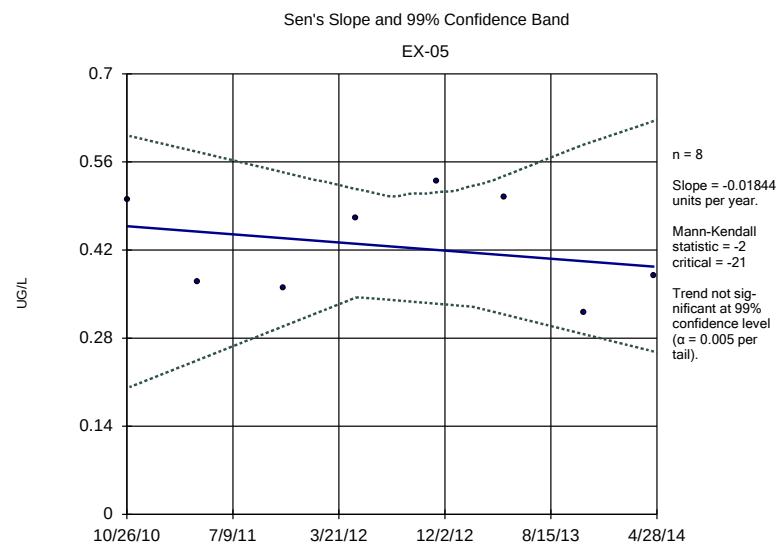
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Sen's Slope and 99% Confidence Band

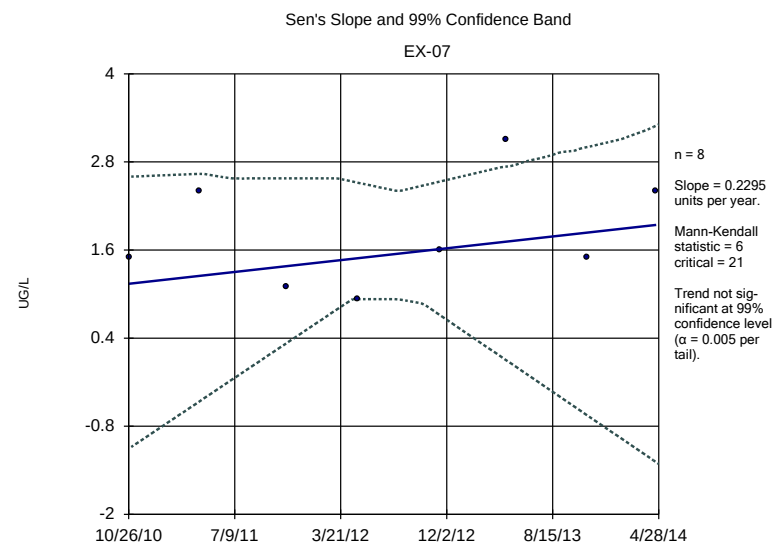
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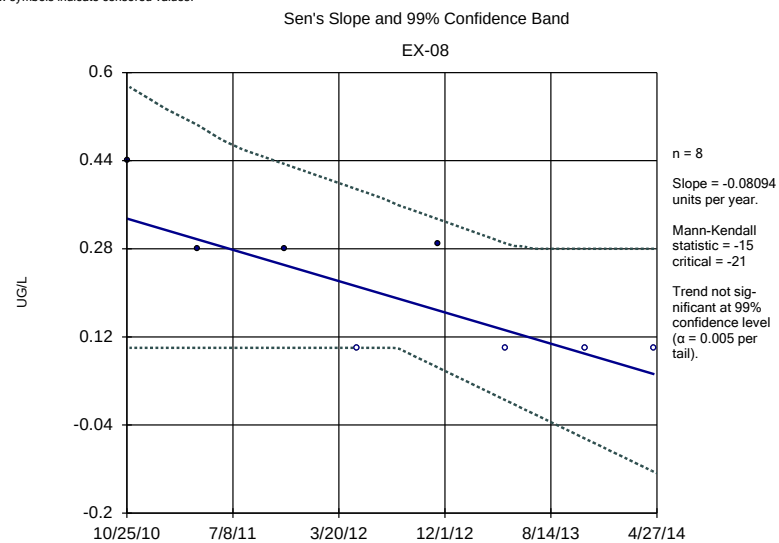
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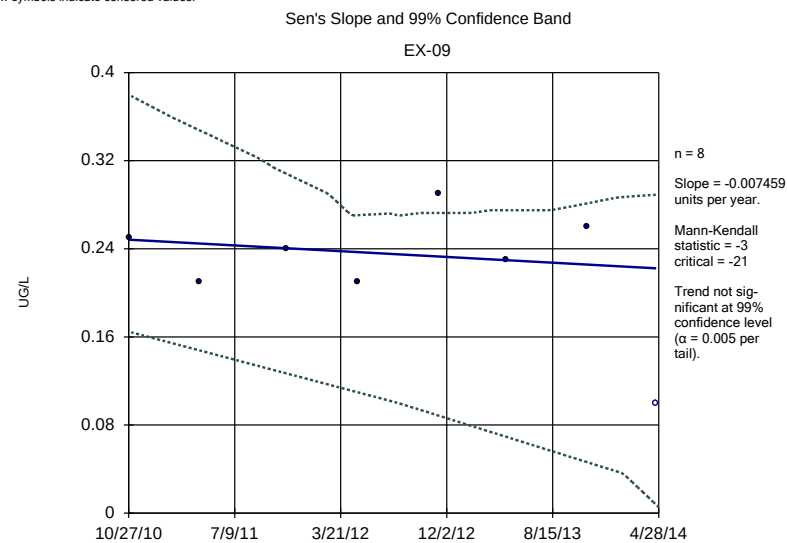
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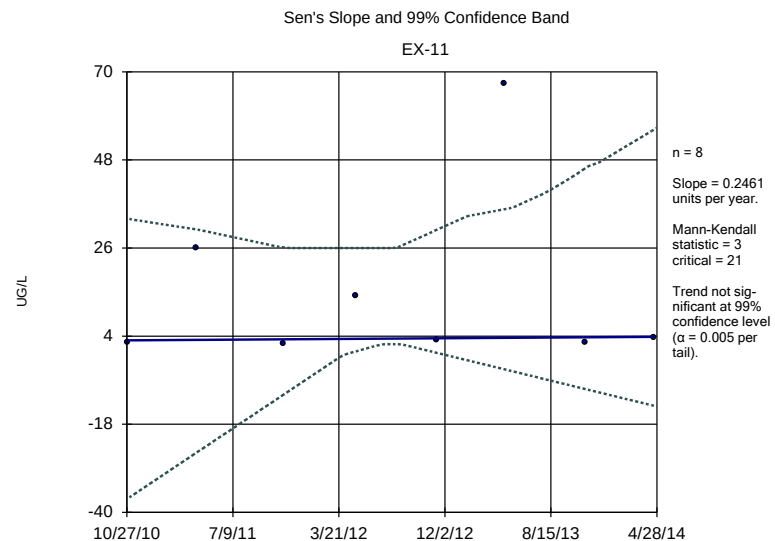
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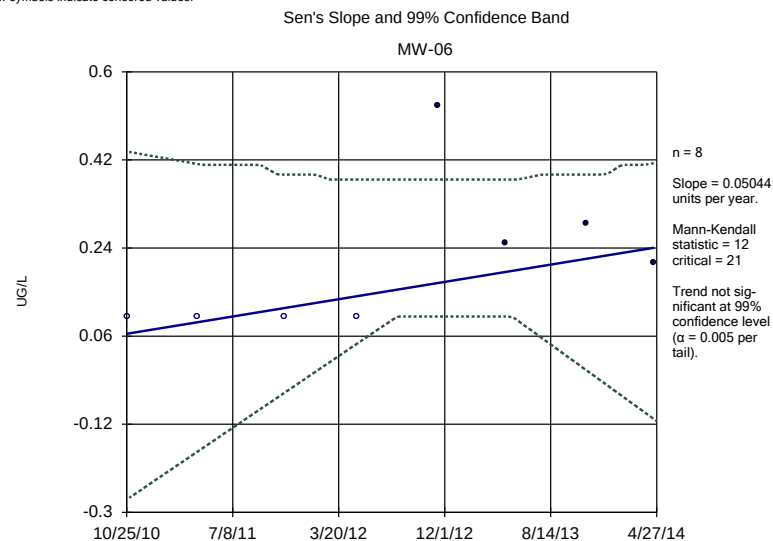
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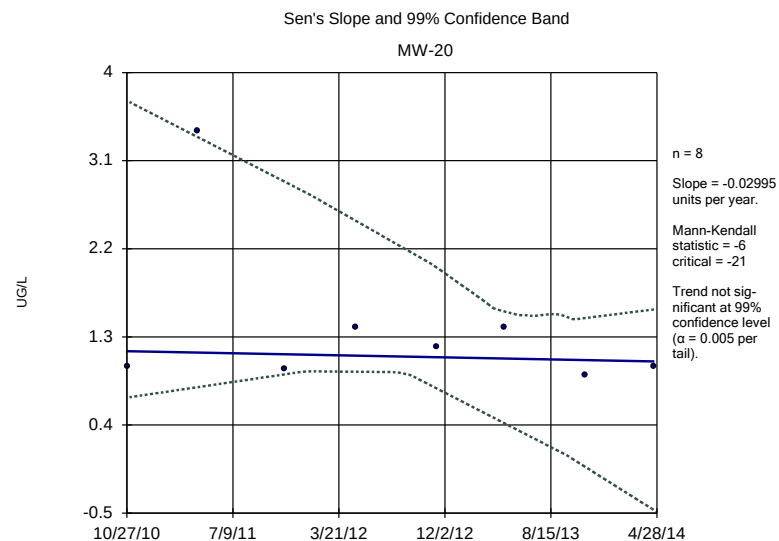
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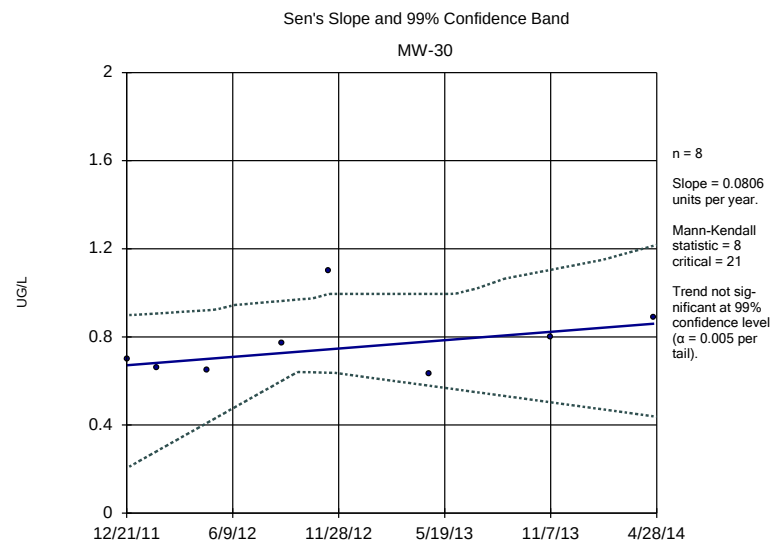
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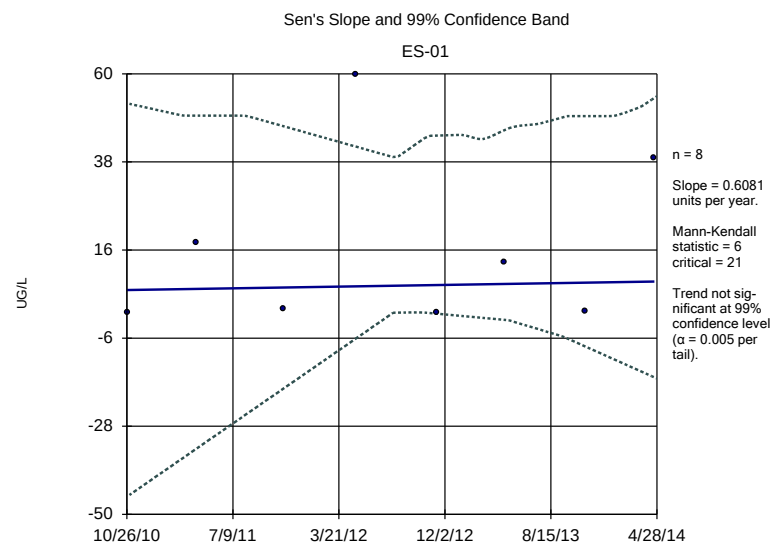
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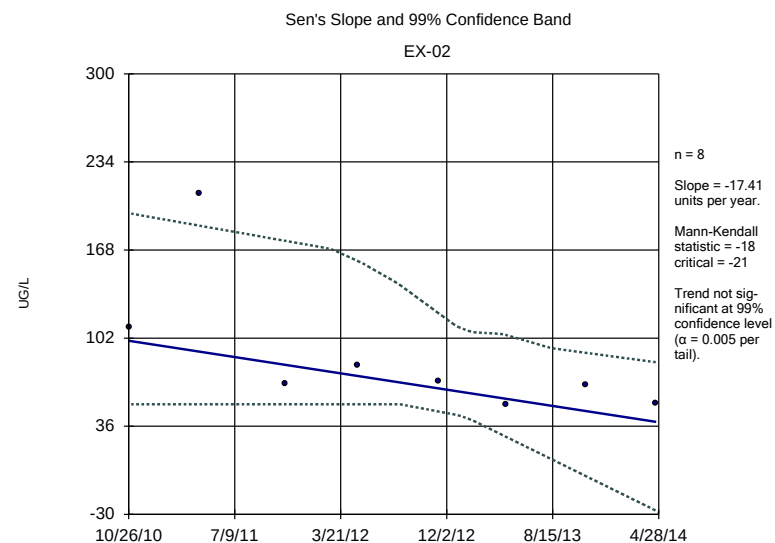
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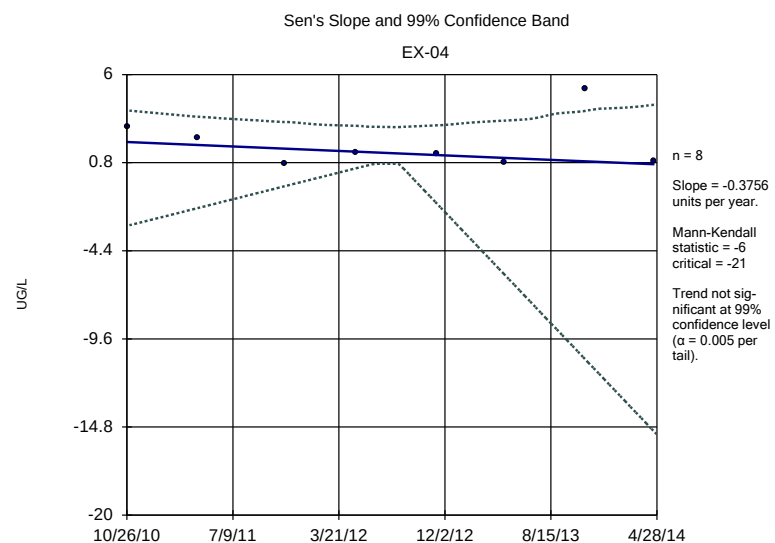
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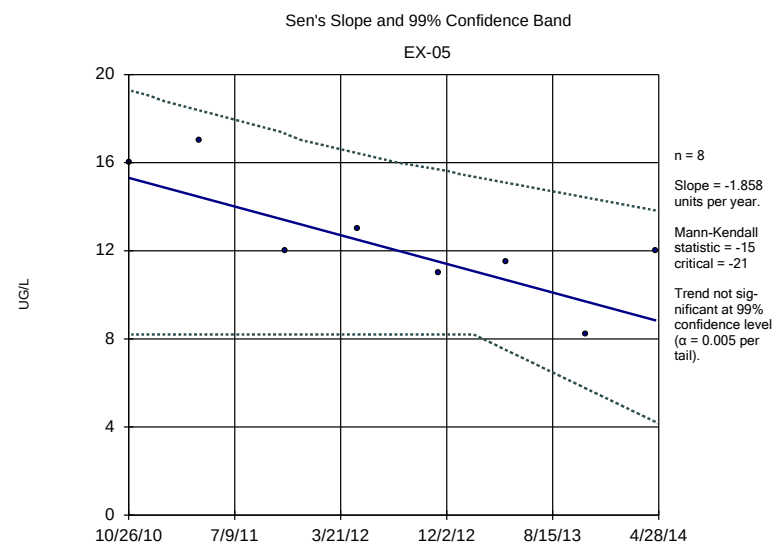
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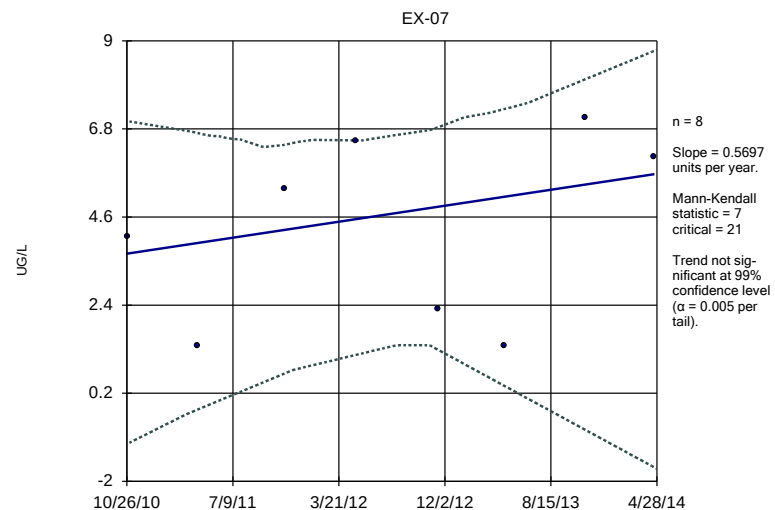


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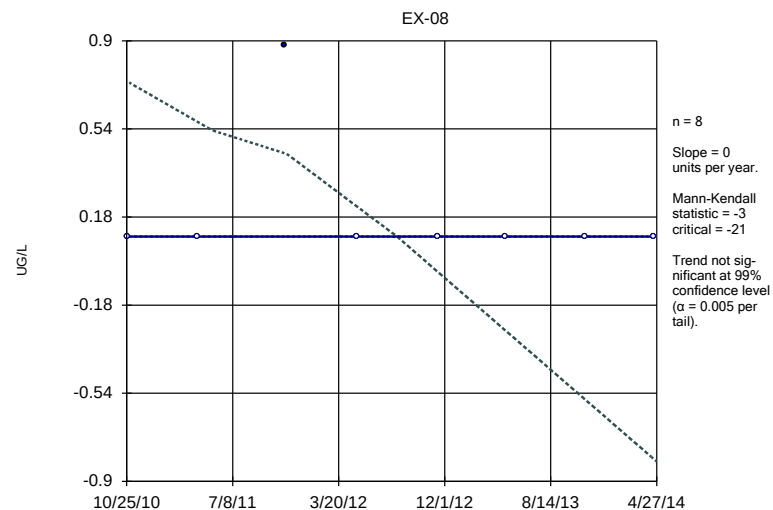
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Sen's Slope and 99% Confidence Band



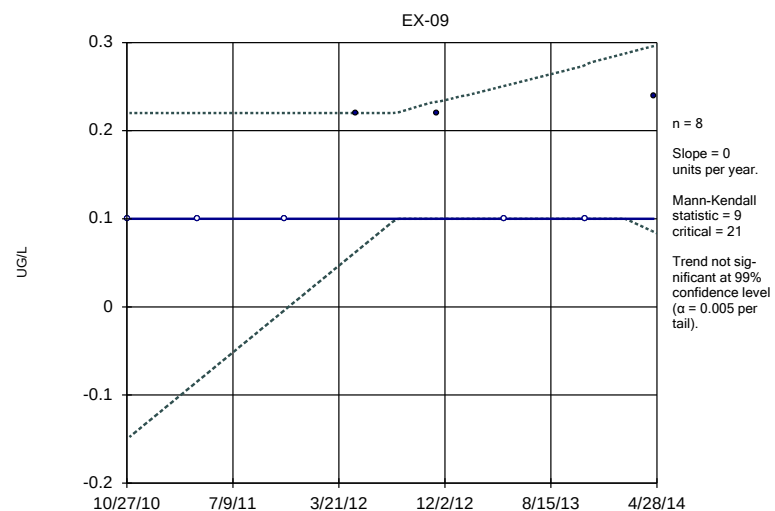
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Sen's Slope and 99% Confidence Band



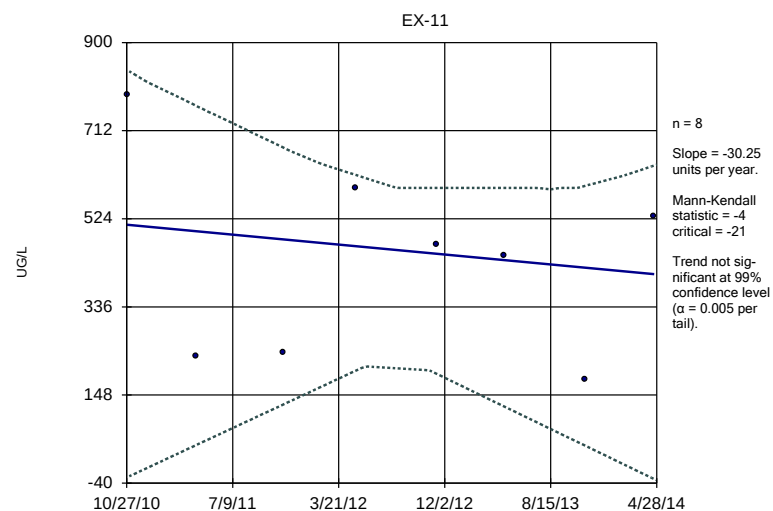
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Sen's Slope and 99% Confidence Band



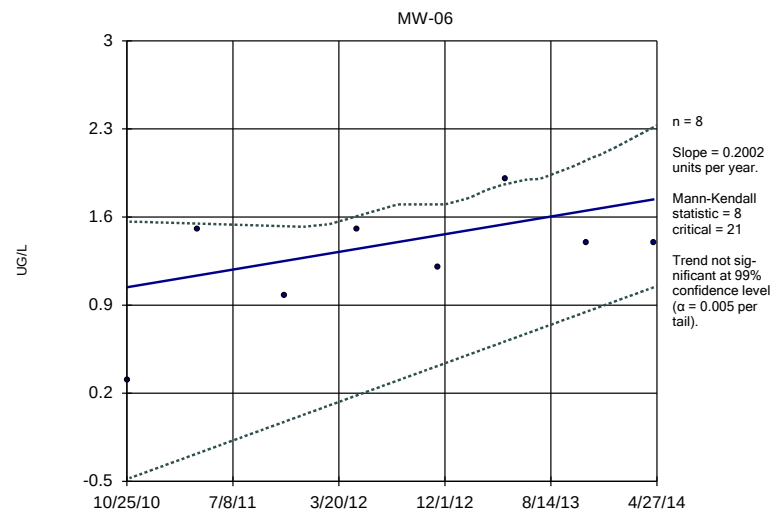
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Sen's Slope and 99% Confidence Band



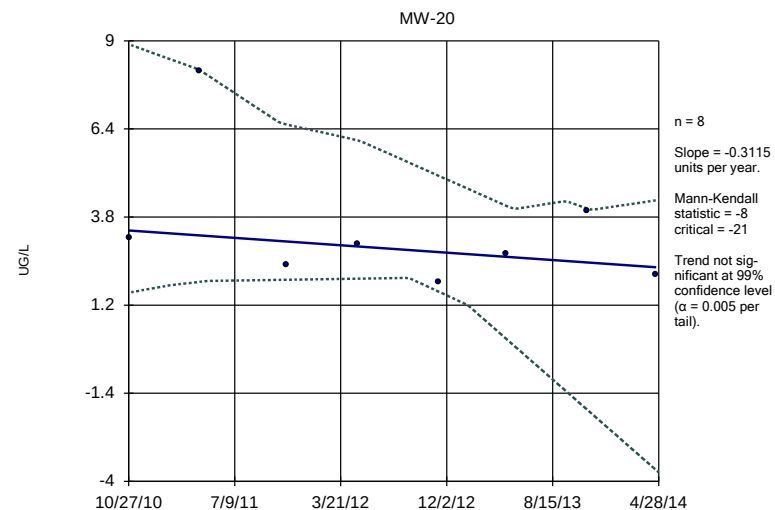
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Sen's Slope and 99% Confidence Band



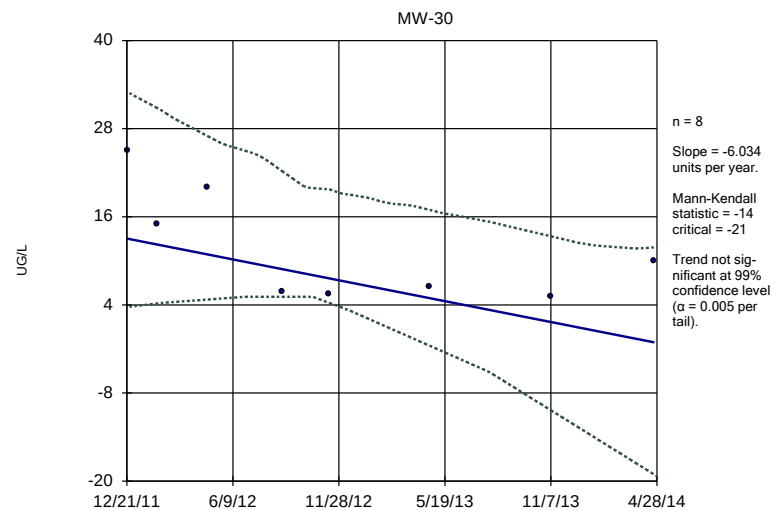
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Sen's Slope and 99% Confidence Band

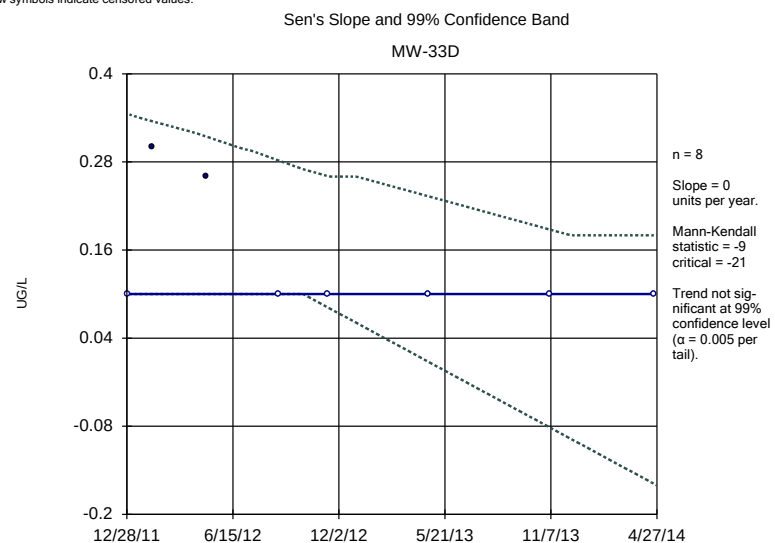


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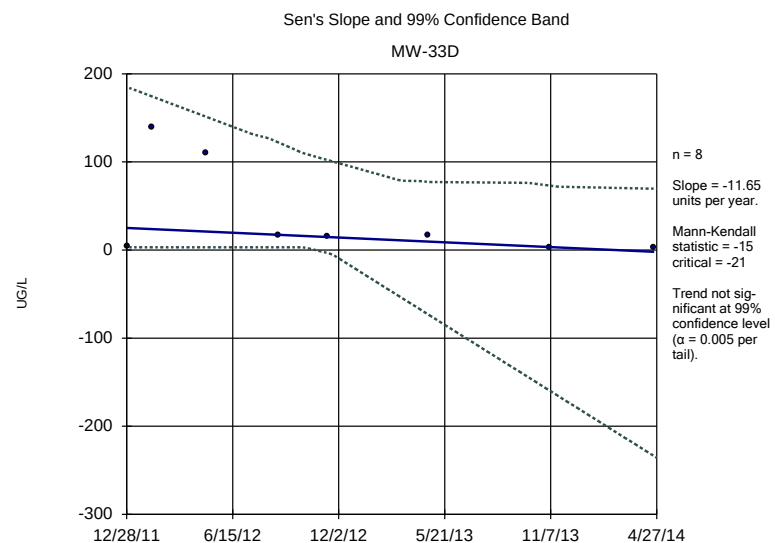
Sen's Slope and 99% Confidence Band



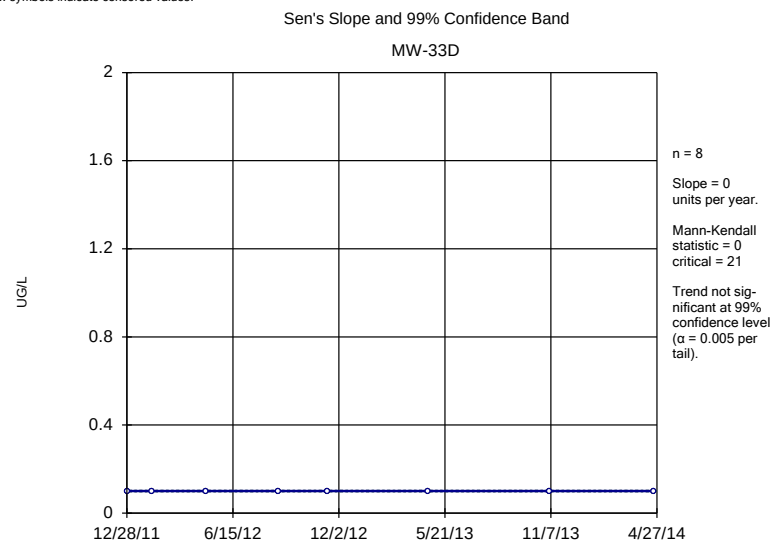
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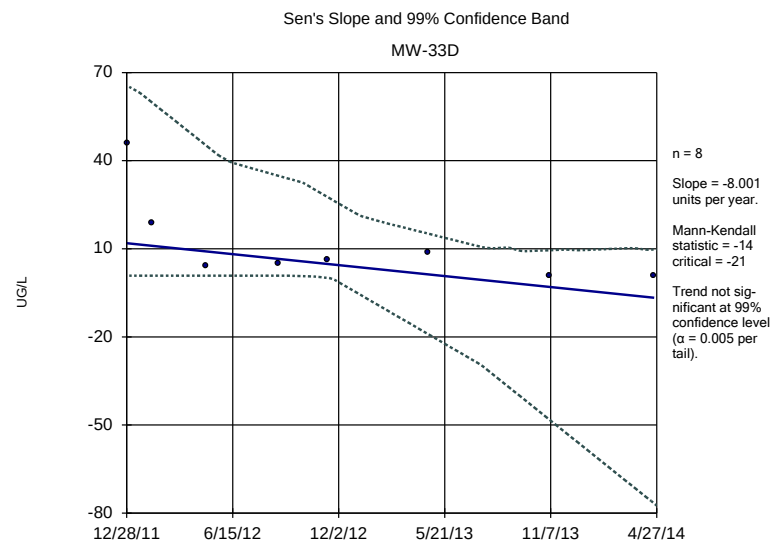
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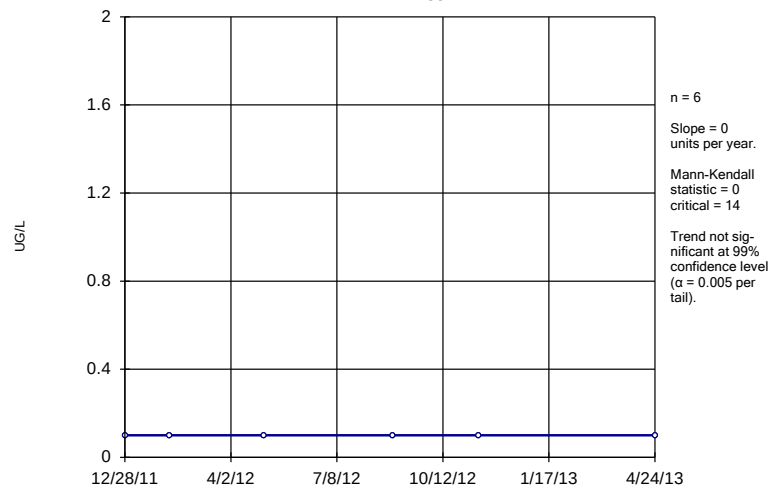
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Sen's Slope Estimator

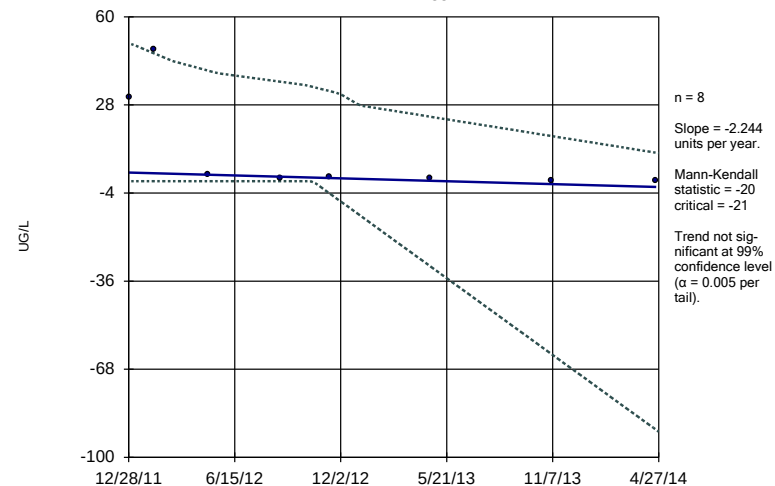
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Sen's Slope and 99% Confidence Band

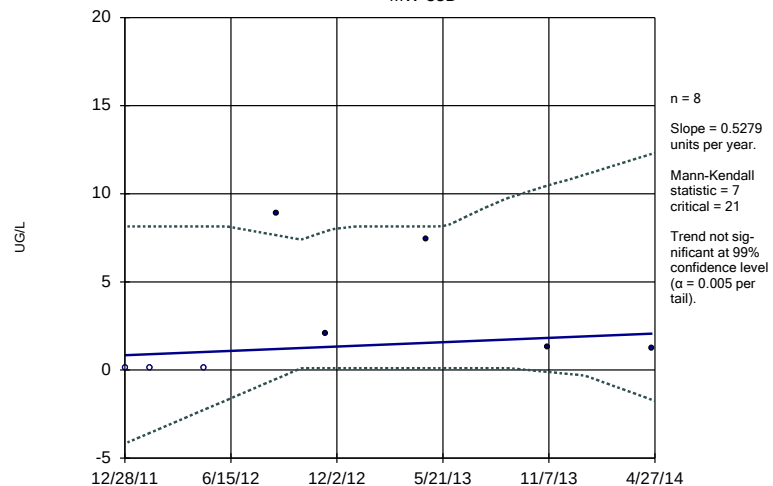
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Sen's Slope and 99% Confidence Band

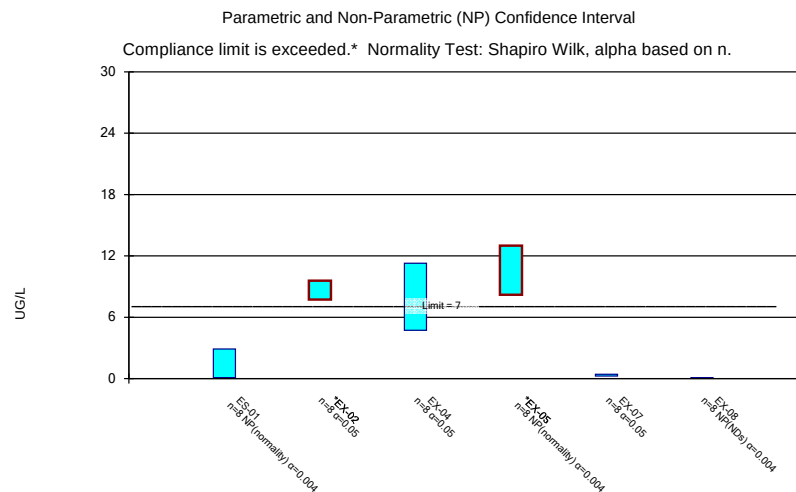
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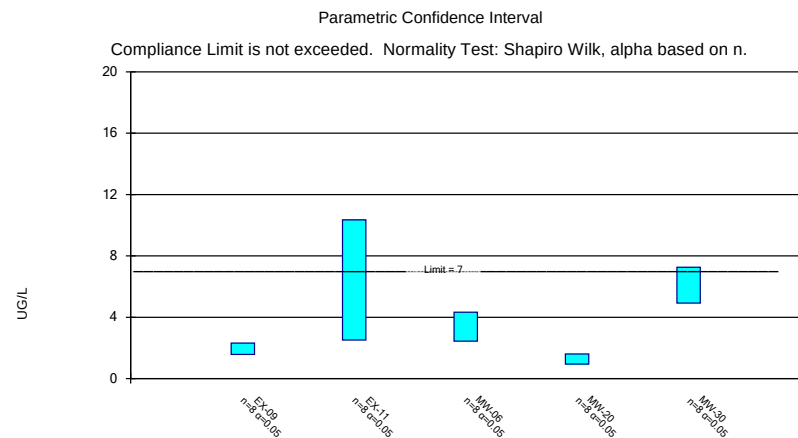
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Section C3

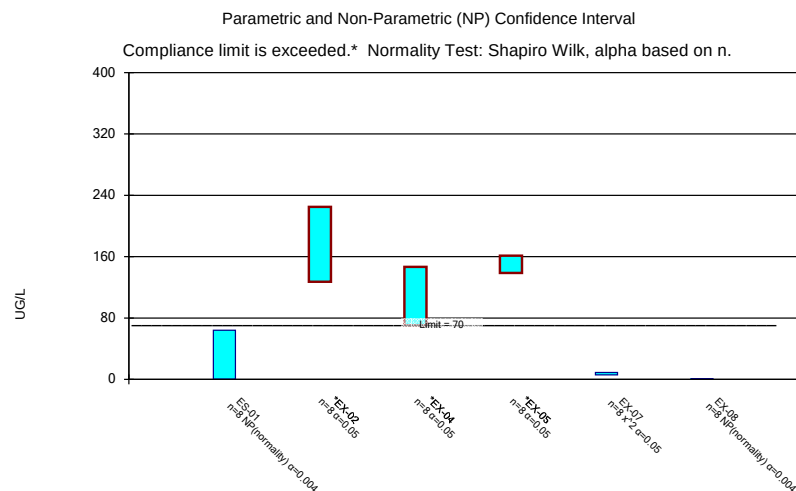
Confidence Interval Plots



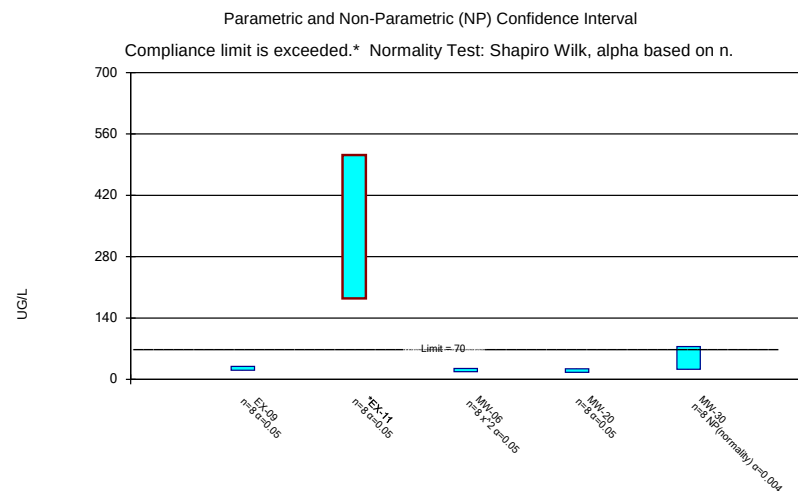
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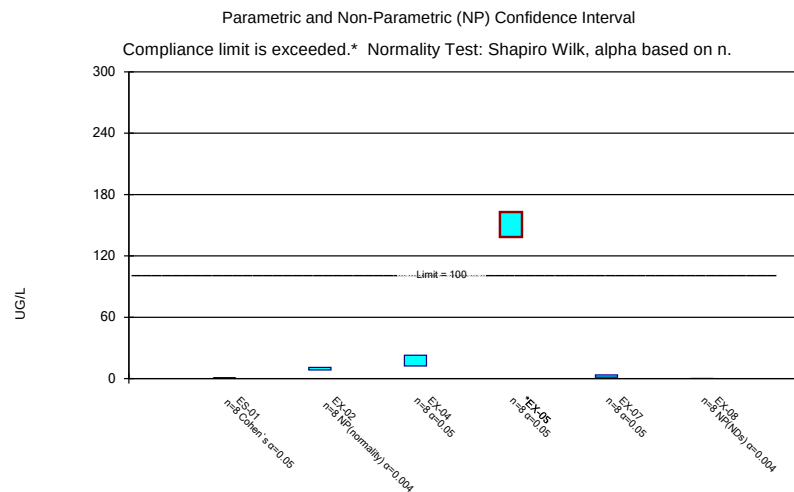
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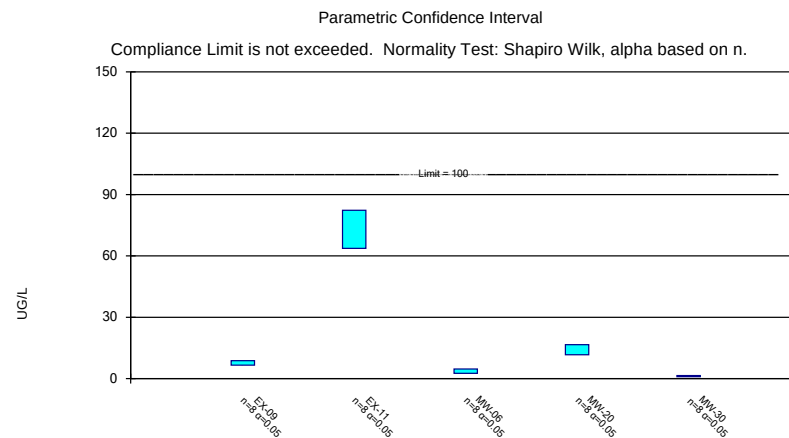
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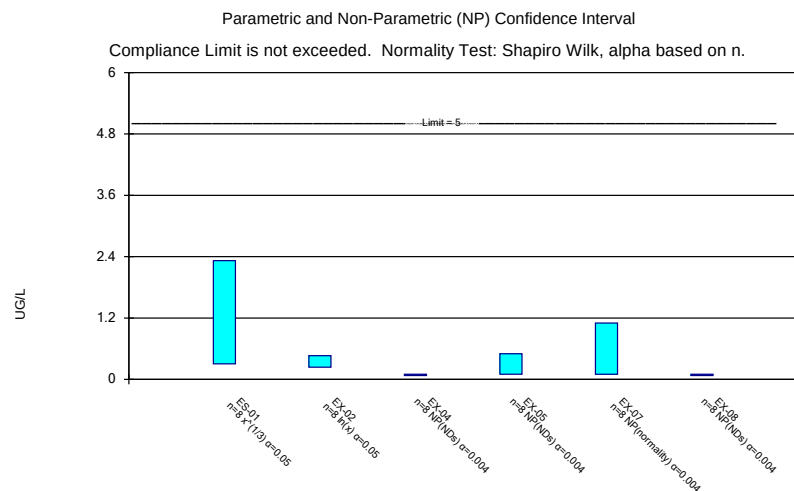
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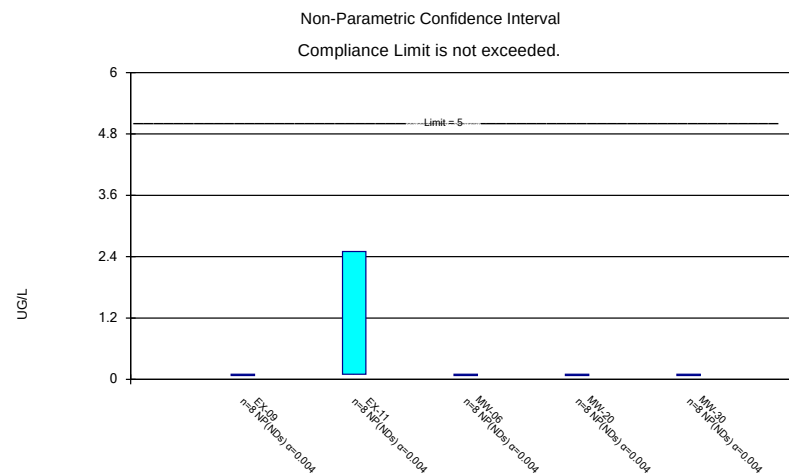
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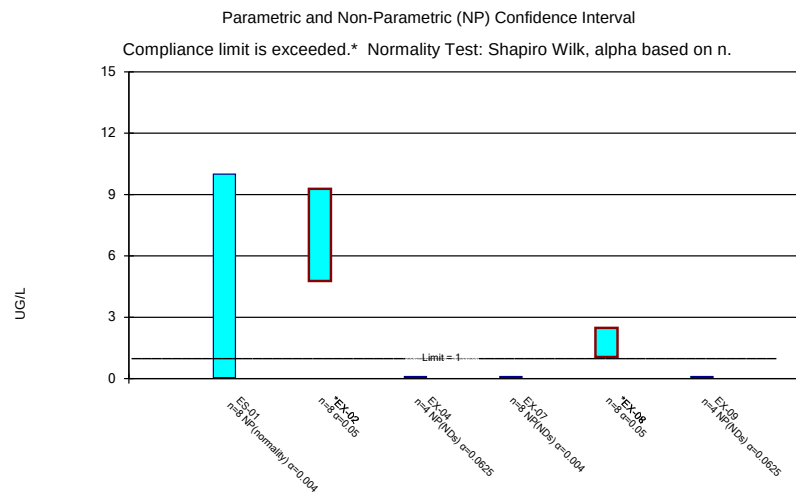
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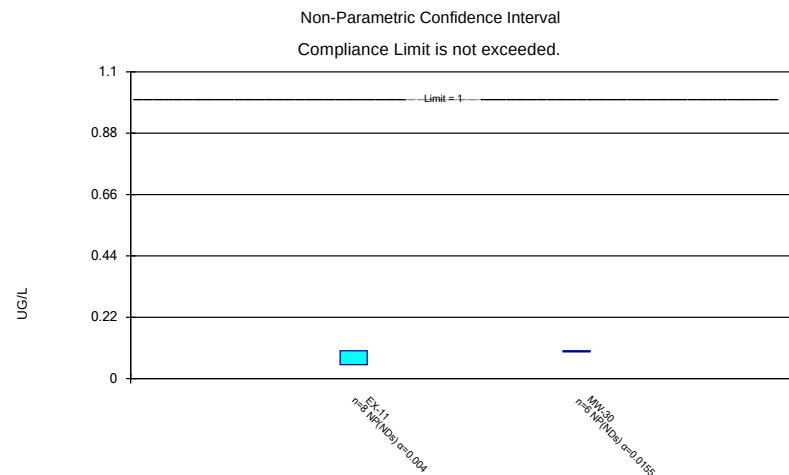
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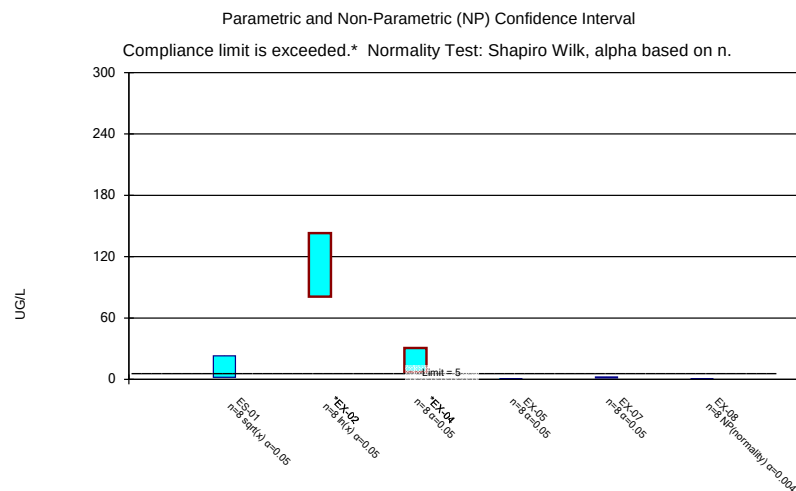
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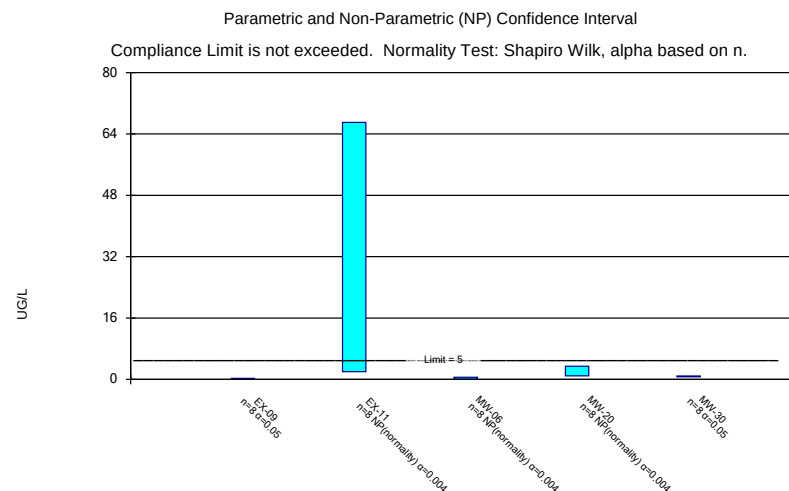
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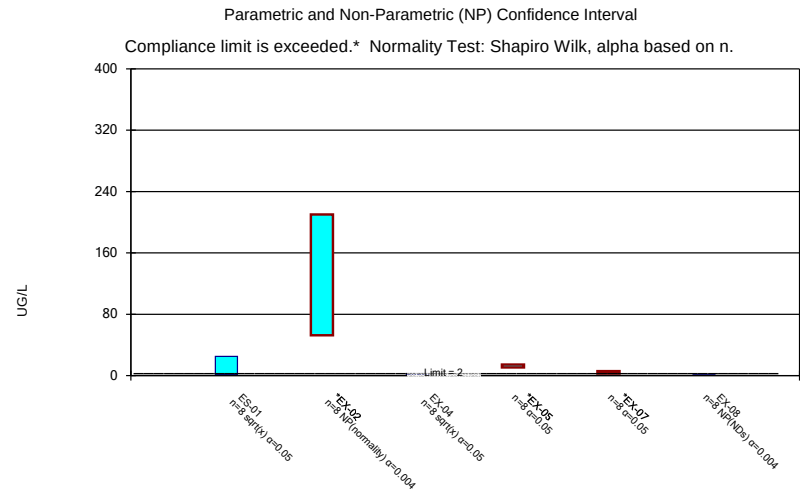
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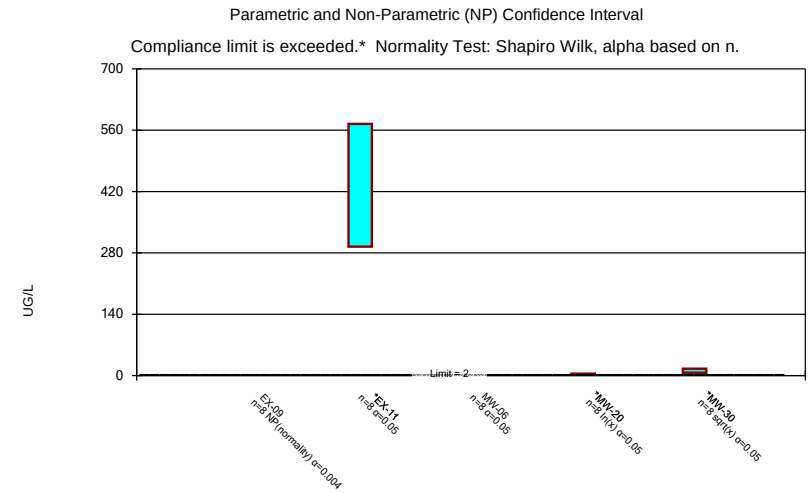
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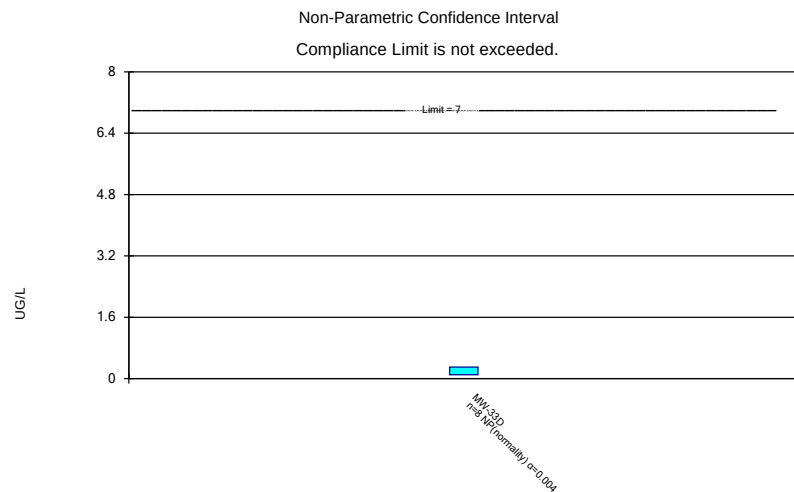
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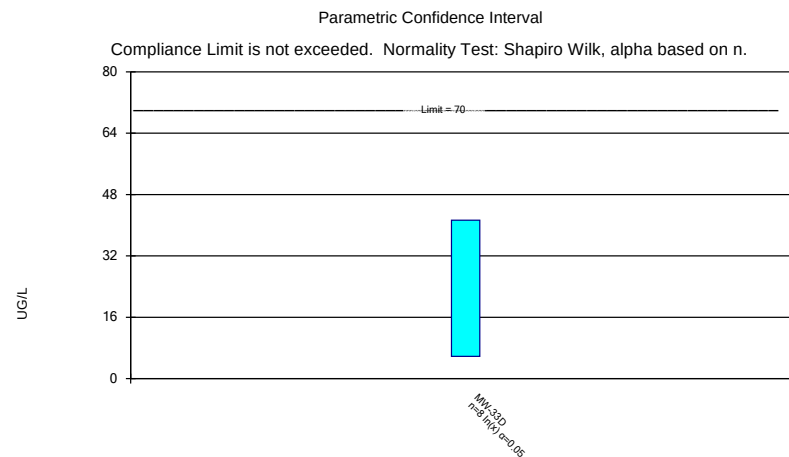
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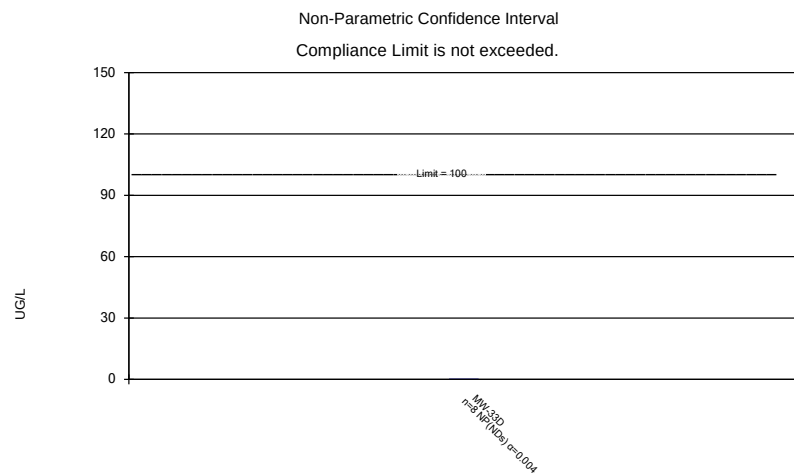
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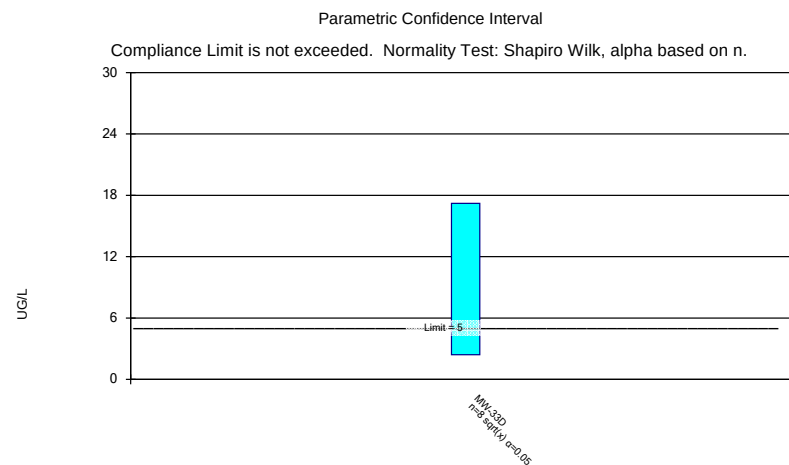
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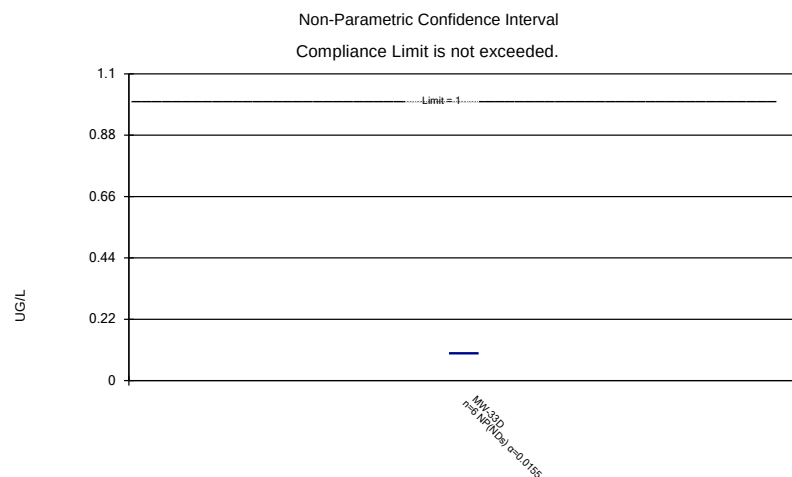
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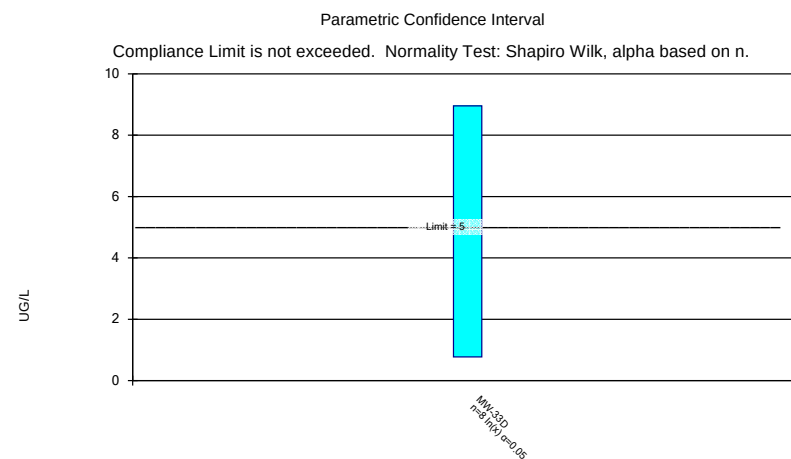
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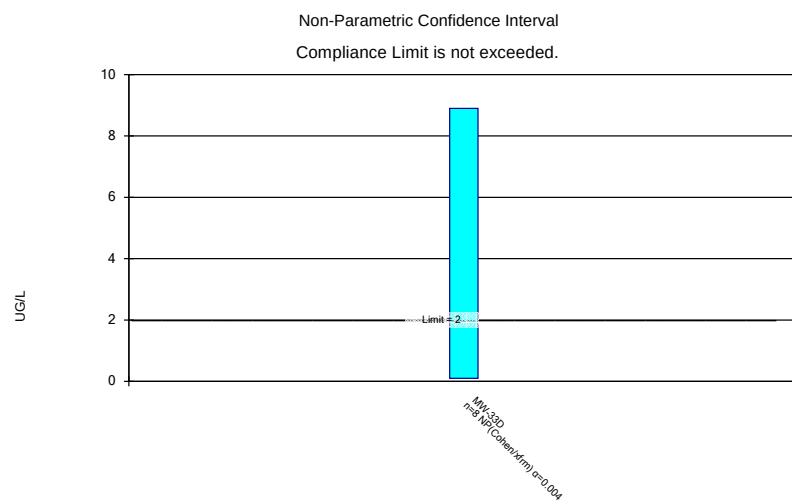
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