Final Report:
Technical Assistance for the Somersworth Sanitary Landfill Superfund Site
Somersworth, New Hampshire
EPA Region 1

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1.0 INTRODUCTION

The Somersworth Sanitary Landfill Site (Somersworth site) is a former landfill in southern New Hampshire that is on the National Priorities List (NPL). The landfill was closed in 1981 and has had a groundwater monitoring network since the 1980s. Groundwater remedies were installed by 2001, and the site is currently in the long-term monitoring phase of operation and maintenance (O&M).

U.S. EPA Region 1 requested GSI Environmental (GSI), under contract to EMS, Inc., to review the Somersworth site groundwater monitoring plan outlined in the *Annual Monitoring and Demonstration of Compliance Report for 2007* (Annual Report, Geosyntec, 2008) and the *Addendum to the Annual Monitoring and Demonstration of Compliance Report* (Addendum, Geosyntec, 2009). Geosyntec Consultants, Inc. (Geosyntec) reviewed site monitoring data and performed statistical and heuristic evaluations using the Monitoring and Remediation Optimization System software (MAROS) in 2007. GSI was asked to review Geosyntec's inputs, results and recommendations for the groundwater monitoring network, including the results based on the MAROS analysis. The following tasks have been performed:

- Review monitoring objectives in the context of site history and overall remedial goals, and qualitatively evaluate the ability of the monitoring network to achieve the stated goals and objectives.
- Evaluate analytical data sufficiency and data quality; determine if data are adequate in both quality and quantity to conduct the analysis.
- Evaluate input files, input parameters and results from the MAROS software analysis by Geosyntec for consistency with site conditions.
- Determine if recommendations for future monitoring are consistent with the monitoring objectives and results of the statistical and qualitative analyses.
- Review the conceptual site model to determine if any of the recommendations are counter-indicated by site conditions.

2.0 SITE BACKGROUND

The Town of Somersworth operated a waste-burning facility on the current landfill property as early as the 1930s with official waste disposal dating to 1945. By 1958, the property was converted to a landfill for disposal of household trash and business and industrial wastes. Landfill activities pre-dated requirements for liners and leachate recovery systems. Soil excavated from the landfill was used to cover the waste. Disposal operations continued expanding westward until 1981 when the landfill was closed and groundwater monitoring wells installed. The final landfill extends over 26 acres. The landfill was covered with a layer of sand and a thin layer of topsoil, with areas along the northern edge covered with sandy, silt clay. Ten acres in the eastern portion of the site were reclaimed for recreational use in 1981.

The Somersworth site is located in a topographically flat area. Quarrying activities immediately to the north have resulted in a 15 – 20 ft vertical escarpment running parallel to the northern edge of the landfill. The western edge of the site is bounded by Peter's Marsh Brook and associated wetlands. Surface drainage is westerly toward the wetland and brook area. The brook flows northwesterly into Tate's Brook, which flows into the Salmon Falls River, one mile east of the site.

Two water-bearing zones have been identified beneath the site. The overburden aquifer is an unconfined sand and gravel unit ranging from about 15 to 75 feet thick. Groundwater flow in the overburden is northwesterly. Fractured metamorphic bedrock underlies the upper unit. Groundwater flow in the shallow bedrock is largely west/northwest but may be influenced by the size and orientation of fractures locally. Discharge from both the overburden and bedrock zones is thought to impact Peters Marsh Brook and the wetlands to the west/northwest.

3.0 REGULATORY STATUS AND REMEDY

Groundwater sampling conducted after cessation of landfill activities indicated the presence of volatile organic compounds (VOCs) including chlorinated ethenes (CEs) in the subsurface aquifers. The Somersworth site was placed on the NPL in 1983. Remedial investigation activities were conducted between 1985 and 1992, and the Record of Decision (ROD) was signed in 1994. The ROD established interim cleanup levels (ICLs) for eight VOCs in groundwater, including the six priority CEs (trichloroethene (TCE), tetrachloroethene (PCE), 1,1-dichloroethene (11-DCE), *cis*-1,2-dichloroethene (cDCE), trans-1,2-dichloroethene (tDCE) and vinyl chloride (VC)), as well as benzene and dichloromethane (DCM). The ROD also specified the preferred remedial action (PRA) for site groundwater, the goals of which are to 1) provide source control; 2) manage migration of contaminants; 3) establish institutional controls to prevent exposure of potential receptors to affected groundwater and 4) monitor the progress of groundwater toward cleanup goals.

The PRA for source control includes a zero-valent iron (ZVI) permeable reactive barrier, referred to as the chemical treatment wall (CTW) installed at the downgradient edge of the waste management area of the landfill. The source remedy also includes a permeable landfill cover (PLC) over the waste management area. The CTW was installed in 2000 – 2001. The point of compliance for groundwater exiting the landfill area is downgradient of the CTW. Several groundwater monitoring wells in both the overburden and bedrock aquifers have been identified as point of compliance (POC) wells (see Table 1).

The PRA to manage migration of constituents included installation of a groundwater extraction well completed in the bedrock, just south of the waste area (BRW-1). Groundwater from the pumping well is discharged through an infiltration gallery located on top of the landfill. Natural attenuation is also a component of constituent migration management, and monitoring for natural attenuation (NA) parameters is part of the overall groundwater monitoring program.

Institutional controls have been implemented at the site to prevent exposure of potential receptors to affected groundwater and to ensure that the hydrology, protective cap and remaining waste are not disrupted by drilling. Institutional controls consist of fencing and other physical barriers as well as a Groundwater Management Zone (GMZ) established by legislative enactment to control access to site groundwater.

The groundwater monitoring program was established to document the progress of overburden and bedrock aquifers toward achieving ICLs and to evaluate the efficacy of the PRAs. Remedial activities are required until groundwater concentrations meet ICLs at and beyond the POCs designated for the site. The 2007 monitoring program included sampling of wells listed in Table 1 three times annually to evaluate the efficacy of the CTW and pumping remedies to meet remedial objectives. Sampling proposed for 2008 included bi-annual (semi-annual or twice yearly) analytical samples for most wells. Some wells are sampled annually to evaluate NA processes beyond the POC and to evaluate the background conditions at the site. A thorough list of the wells, parameters sampled and sampling frequency is provided in tables in the Annual Report.

4.0 SOMERSWORTH SITE MONITORTING OBJECTIVES

The Somersworth site has a well-developed list of groundwater monitoring objectives that are coordinated with specific wells in the network. Results from each sample fit into a framework for supporting site decision-making. The monitoring objectives are developed in a Site Sampling and Analysis Plan (SAP) and modified based on evolving conditions. Based on the information listed in the Annual Report, the current site monitoring objectives include:

- Objective 1 Evaluate whether the remedy (CTW) is meeting performance standards.
  - Objective 1A: Assess groundwater passing through the CTW to determine if groundwater meets regulatory standards for CEs.
  - Objective 1B: Assess whether substantial amounts of overburden groundwater containing concentrations above regulatory limits of CEs are migrating from the landfill to areas beyond the POC, bypassing the CTW. Evaluate possible flow around or beneath the CTW. (Water level measurements and hydrogeologic evaluations address this objective.)
- Objective 2: Evaluate whether the groundwater migrating from the landfill to areas beyond the POC meets standards for benzene and DCM.
- Objective 3: Evaluate whether there is a need for bedrock groundwater extraction in addition to extraction conducted at well BRW-1.
- Objective 4: Evaluate whether NA processes are continuing to reduce the concentrations of VOCs at the site. (Analyses for NA indicators, such as dissolved oxygen, nitrate, sulfate, and iron address this objective.)
- Objective 5: Evaluate whether the groundwater in the area at and beyond the POC complies with ICLs for a period of three consecutive years.
- Objective 6: Evaluate whether the landfill continues to act as a source of constituents affecting groundwater above standards.

- Objective 7: Evaluate the CTW performance at suspect panels (areas where remedy performance may have been compromised or may be questionable).
- Objective 8: Evaluate the CTW performance at the CTW-20 transect. Some intermittent high concentrations of CEs have been observed downgradient of the CTW at Transect 20. Additional wells were installed in 2005 to monitor this area of the CTW.

5.0 GEOSYNTEC RESULTS AND RECOMMENDATIONS

The Somersworth site groundwater monitoring program was evaluated by Geosyntec in 2007 using the MAROS software. Geosyntec assembled input files from groundwater monitoring data collected between 1985 and 2007 for the CEs PCE, TCE, cDCE, and VC. (Benzene and DCM were not included in the input data as these COCs have fallen below detection limits at most locations of interest (Geosyntec, 2008)). Separate input files for the overburden and bedrock aquifers were developed by Geosyntec. Aquifer input parameters were determined from previous site characterization efforts and are summarized in the Annual Report (Table 2.19) and Addendum Report (Table 1). In the Geosyntec MAROS analysis, the time frame for statistical analysis of groundwater data was between 1989 and 2007 with data consolidation before 1999 and no consolidation of data after 1999. Non-detect results were handled by substitution with half of the associated detection limit. ICLs were used as the regulatory screening levels.

Lines of evidence from the MAROS analysis were used to recommend an updated sampling frequency for wells in the network. The MAROS software was not used to recommend removal of wells or addition of new wells (see discussion below under *Review of Recommendations*). Geosyntec's recommendations for updating the monitoring frequency are presented on Table 2.20 in the Annual Report, and a comprehensive recommendation for groundwater sampling from 2008 to 2010 is presented on replacement Table 1 of the Addendum Report.

Based on the monitoring network analysis using both the MAROS software and qualitative considerations, Geosyntec recommends the following updates to the SAP and monitoring program:

- Annual groundwater sampling is recommended for CTW transect wells (CTW-20; CTW-30; CTW-40; CTW-60). (Semi-annual sampling was recommended for 2008). CTW hydraulic testing is recommended on a biennial (once every two years) basis.
- Annual groundwater analytical sampling is recommended for other wells in the network including overburden monitoring wells at or beyond the POC, bedrock monitoring wells, and the extraction well BRW-1.
- For wells where concentrations have been below ICLs or non-detect for three consecutive years, a biennial sampling frequency is recommended (e.g. FS-4, OB-4U/4R, OB-6R). Background wells (OB-7U and OB-7R) are also recommended for biennial sampling.

6.0 REVIEW OF RECOMMENDATIONS

A review of the Somersworth data input, assumptions, and subsequent MAROS analyses was conducted in order to evaluate the recommendations for the Somersworth site monitoring network. As part of the review, the data input files were reviewed using the MAROS software to determine the sensitivity of the results to input assumptions such as the time interval of the statistical analyses. A summary of steps in the review process is provided below.

6.1 QUALITATIVE REVIEW AND INPUT FILES

In the Annual Monitoring Report and Addendum, the monitoring objectives for the network are well articulated and are connected to observable metrics and specific well locations (see Table 1, this report). The locations, boring logs and screened intervals for all wells are available in the Annual Report. Plumes in both aquifers have been delineated to ICLs.

The input files and parameters used for each groundwater unit were reviewed. The files appeared accurate and complete. Data management is well executed and no problems were encountered recreating outputs generated by Geosyntec. The assembled data were sufficient in quantity and quality for statistical analyses. Some detection limits for analytical data were high (i.e., greater than ICLs), particularly in the bedrock aquifer data. High detection limits may be a result of multiple analyses of dilutions of samples. The high detection limits do not limit the use of the data, and are not considered to change the interpretation of results. Overall, the site information available was complete and of good quality, and the Somersworth site is an appropriate candidate for monitoring optimization.

The monitoring program for the Somersworth site includes measurements for assessing the hydrology, biofouling and NA of constituents of concern (COC) at the site. The MAROS software evaluates only the chemical analytical data, and therefore, the monitoring program recommendations for other parameters were evaluated qualitatively.

6.2 COC PRIORITIZATION

The MAROS COC prioritization module was not reported in the Geosyntec results and recommendations. The COC prioritization module ranks the constituents according to toxicity, prevalence and mobility, and can be very helpful in directing and interpreting the optimization analyses toward the most significant contaminants. MAROS reports from the COC prioritization module for the overburden and bedrock networks (time frame 1989 – 2007) are located in the Appendix to this memorandum.

Based on the evaluation, VC is the priority COC in the overburden aquifer, exceeding regulatory standards by the greatest amount at the most number of monitoring locations. VC is the late-stage degradation product of the other CEs, and it is logical that it would be the priority constituent for a site as old as Somersworth. VC concentrations are very

likely to increase transiently in the near term, as other constituents degrade. Therefore, the overburden monitoring network should focus on characterizing the extent of VC, which, in most cases will encompass the remainder of other constituents. TCE and PCE are of lesser concern, and concentrations of cDCE in the overburden do not exceed regulatory standards on a plume-wide basis (Note: cDCE is of interest at individual locations in the overburden, such as POC wells B-8L and OB-4U).

By contrast, the priority COC in the bedrock aquifer is TCE, followed by VC, cDCE and PCE respectively. A high concentration area of TCE is located just south of the landfill near well B-12R, and tends to dominate the risk profile for this unit. PCE is not-detected at most locations, so it is not a major concern in either the overburden or bedrock aquifers. Based on the results of the COC prioritization, statistical results for VC in the overburden and TCE and VC in the bedrock aquifer should be more heavily weighted in forming the final monitoring recommendations.

6.3 TREND ANALYSIS

The Geosyntec reports did not highlight individual well trend analyses, although the results were presented in Appendix G of the Annual Monitoring Report. In the Geosyntec evaluation, the trend analyses were performed for data collected 1989 through 2007 with some data consolidation for samples prior to 1999.

The CTW remedy was installed in 2001. While there are no specific rules on the appropriate time frame over which to conduct trend analyses, the time frame of the trend should reflect the type of question the analysis is intended to address. For example, if the objective is to determine how the remedy has functioned since installation, the trend should be evaluated using data collected since installation. However, if the goal is to determine how the groundwater concentrations have changed since closure of landfill operations, looking at the full dataset is appropriate.

In the case of the Somersworth site, installation of the remedy created significant changes in the flow regime and fate of site contaminants. In order to ensure comparability in site conditions and to evaluate the impact of the remedy on concentrations, the years 2002 to 2007 were chosen as the most significant time frame over which to evaluate the monitoring network for this memorandum.

Additionally, individual well trends were determined for the 1989 – 2007, 1989 – 2001, and the 2002 – 2007 time frames in order to evaluate the sensitivity of the results to the time interval examined. By comparing results for different time frames, the effects of remedy installation on concentrations trends can be assessed. Individual well trends were also determined for annually consolidated data 2002 to 2007 in order to simulate how annual data might impact the statistical results and interpretation of trends relative to the denser dataset. Trends for the 1989 – 2007 time period are reported in the Geosyntec Report (2009) and are not repeated here. The results of the other Mann-Kendall (MK) trend evaluations are shown in Table 2 with selected summaries in the Appendix. Results for VC in the overburden and TCE in the bedrock are shown. Average concentrations for

the datasets 2002 – 2007 and 1989 – 2001 are shown to illustrate the effect of the remedy on concentrations at various locations. Constituent detection rates are shown for the full dataset 2002 – 2007. Detection rates are significant to trend evaluations because locations with a less than 30% detection frequency may not provide useful trend information.

A comparison of trends for various time frames does not indicate any results outside of those expected from the current conceptual model. Based on the comparison of trends for each time interval, an annual sampling frequency will capture trends for wells with high detection frequencies. Consequently, the recommended annual sampling frequency will most likely be adequate to reveal trends in contaminant concentrations. Sample trend reports for wells using various time frames are located in the Appendix to this memorandum.

For both the overburden and bedrock aquifers, the majority of concentration trends are stable to decreasing. Non-detect results for PCE are increasingly common for recent samples, and TCE concentrations are decreasing across the plumes. The few increasing concentration trends are found for the degradation products VC and DCE indicating the success of NA processes. Overall, trend results are supportive of a decrease in monitoring effort at the site.

6.4 MOMENT ANALYSIS

Results of the MAROS moment analysis module can be used to evaluate plume stability. A reduction in monitoring effort is reasonable under stable plume conditions. In the Geosyntec report, moment results were reported for all data collected 1989 through 2007. The moment analysis is fairly sensitive to the number and identity of wells sampled during each event. For this review, the moment analyses were re-run with annually consolidated (averaged) data limited to 2002 – 2007, in order to have a more consistent number of wells per sampling event.

Results of the zeroth moment analyses (estimate of total dissolved mass in the plume) for the overburden indicate stable to slightly decreasing trends for the four major constituents. Stable to decreasing trends for total dissolved mass indicate a slowly changing plume where the remedies are controlling or reducing mass. Decreasing total mass trends are consistent with reduced monitoring effort. Geosyntec's results show more increasing trends for the total dissolved mass, but this is most likely due to the statistical artifact of additional wells installed after 1989.

First moments are estimates of the distance of the center of mass from the source area. Because the Somersworth site monitoring network and landfill monitoring networks, in general, do not have many wells in the center of the plume, first moments calculated for these sites may not provide a precise picture of distribution of constituents in the plumes. For this reason, the Mann-Kendall trend of the first moment is reported, giving a relative metric of the change in center of mass over time.

For the overburden aquifer, the 'source' was estimated to be near well OB-7U/R, a point just east of the landfill area. Overall, first moments are increasing in the overburden as concentrations decrease within the upgradient section of the landfill and are stable to increasing in the downgradient section (notably, degradation products VC and cDCE concentrations are increasing at some downgradient locations). Bedrock results also show increasing first moments. In this case, results most likely indicate reduced source strength, which is consistent with both the age of the plumes and the goals of the PRA. Increasing first moments are not inconsistent with reduced sampling frequency and can be consistent with reduced sampling effort in the source zone.

6.5 WELL SUFFICIENCY/REDUNDANCY

The redundancy and sufficiency spatial location analysis tools in MAROS are best applied at sites where subsurface conditions are fairly homogeneous. Flow in fractured bedrock, in particular, is dominated by the largest fractures and is difficult to model with geostatistical methods. Landfills present special challenges for spatial analysis as drilling through historic waste areas can be hazardous and monitoring wells are restricted to the fringe of the waste areas. Additionally, CE compounds, with their cascade of degradation products, present challenges for the well redundancy evaluation. Frequently, high-priority locations for monitoring parent compounds are not important for monitoring daughter products and vice versa. Results of the Geosyntec evaluation recognize and account for these issues. While several wells were identified as being redundant for individual COCs, no one well was identified as redundant for all COCs.

A brief review of the well sufficiency module indicates some spatial uncertainty in the center of the former landfill for the overburden and bedrock aquifers, as anticipated. Waste is most likely distributed unevenly within the landfill, but installation of wells through the buried waste is problematic. No new wells were recommended for this plume based on the MAROS spatial analysis.

Due to the complications applying MAROS' spatial analysis, the number and location of wells in the Somersworth monitoring program are best evaluated qualitatively. Geosyntec provides a very good qualitative evaluation of the position of monitoring locations in their discussion of how the results of the monitoring program address each monitoring objective in Section 2 of the Annual Monitoring Report. Each of the monitoring objectives appears to have the appropriate number and distribution of monitoring locations to satisfy the management questions the objectives address.

POC wells at Somersworth generally define the edges of the plume above ICLs, effectively delineating the area of affected groundwater. Recently, wells OB-101U/R have been installed at the northern extent of the GMZ to monitor the northernmost boundary of the institutional control. One area that is not clearly bounded by identified POC wells is south of the groundwater extraction well BRW-1. The purpose of groundwater extraction from BRW-1 is to hydraulically contain an area of high TCE concentrations centered around B-12R and OB-24R in the fractured bedrock aquifer. B-12R and OB-24 R averaged 3010 and 688 µg/L respectively for samples collected 2002 –

2007. The extraction well appears to be operating to control the spread of constituents in this area, with concentrations at nearby well OB-23R dropping below detection limits in recent years.

Groundwater flow in the bedrock aquifer is roughly west/northwest. Downgradient from the landfill, wells OB-4R and OB-6R are currently below all ICLs, and location B-13R is below all ICLs, except for vinyl chloride. However, there are no POC wells present between the area of high TCE concentrations at B-12R and the southern extent of the GMZ. Recently, wells OB-101U/R have been installed at the northern extent of the GMZ to monitor the boundary of the institutional control to the north.

Locations OB-23R and OB-9R are south and southeast of BRW-1 and recent samples indicate that concentrations in these areas are below detection limits. Wells OB-23R and OB-9 are recommended as POC wells, defining the southern boundary of the affected bedrock aquifer, to be used as surrogates to monitor the GMZ boundary south of the landfill. Alternately, a new POC well may be installed south of OB-23R to confirm containment of VOCs by the extraction well, in case there is concern that OB-23R is too close to the extraction well and may rebound if changes occur in the extraction system. OB-23R and OB-9R are recommended for annual sampling provided that BRW-1 continues to function at the current level of efficiency.

No other new wells are recommended based on the data reviewed.

6.6 SAMPLING FREQUENCY

The results of the MAROS sampling frequency module indicate that the majority of wells can be sampled annually without loss of significant information. Wells with a limited number of sampling results are assigned more frequent sampling recommendations by default in the software. Wells such as OB-101, with limited sampling results, were recommended by the software for more frequent sampling, but based on a qualitative review of monitoring objectives, quarterly sampling frequency is not required at these locations.

The sampling frequency module does indicate that more frequent sampling may be appropriate for locations where concentrations of VC are increasing, such as B-8L, B-6R and FS-7. The software algorithm recommends more frequent sampling for wells with increasing trends. However, the rate of increase in concentrations at these wells is relatively slow, the wells are within the GMZ, and production of VC is an indication of successful degradation of parent CEs. For these reasons, annual sampling frequency is still appropriate for wells in the network. More frequent sampling would be appropriate only if VC concentrations are approaching a limit that would require installation of a contingent remedy (such as one that would address a vapor/inhalation exposure pathway, which does not appear to be the case).

Overall, Geosyntec's recommendation for reduced sampling frequency appears to be supported by the data and site monitoring objectives. Geosyntec's logic for interpreting the results of the MAROS analysis is appropriate.

7.0 CONCLUSIONS

Based on a review of the data inputs, MAROS results and interpretation, the Geosyntec recommendations for the Somersworth site are appropriate. The recommended updates to the SAP are consistent with long-term monitoring optimization (LTMO) data analysis practices, the conceptual site model and the stated monitoring objectives. The proposed monitoring plan updates should provide data to achieve the stated goals and objectives and support site management decisions.

The following conclusions were made based on the review:

- Groundwater monitoring objectives are clearly articulated and linked to specific data collected from the network.
- The analytical data were sufficient in both quality and quantity to perform the analyses, and are adequate to support the derived conclusions.
- The input files and input parameters for the MAROS software are complete and consistent with the conceptual site model. Results from the MAROS software and interpretation of results are consistent with LTMO practice.
- Groundwater monitoring recommendations are consistent with site monitoring objectives and results of the statistical and qualitative analyses. The recommendations for monitoring potentiometric surfaces, hydraulic characteristics and NA parameters are also consistent with the site data, conditions and monitoring objectives.
- None of the recommendations are counter-indicated by other site conditions.

8.0 OBSERVATIONS AND RECOMMENDATIONS

While Geosyntec's recommended modifications to the SAP are reasonable, the following observations and recommendations are provided to streamline future data analyses and prevent minor complications that may arise after making the proposed changes to the monitoring network.

- In the recent program, wells are sampled three times per year, and the averaged results are compared with ICLs. By moving to an annual sampling frequency, individual results will be compared with ICLs, which increases the impact of individual outlying or anomalous results. The move to a lower sampling frequency should be accompanied by higher data quality standards, as site management decisions are based on a smaller dataset. Contingency or confirmatory sampling should be performed when analytical results are outside of the 95% upper confidence level (UCL) based on the historic concentrations for that location. Preliminary analytical results should be screened for outliers and

confirmatory sampling should be scheduled as soon after discovery of the outlier as possible, preferably within three months. Several software packages including the EPA supported ProUCL software package (Singh, Maichle et al. 2007) can be used to identify outlier data points and 95% UCLs.

- Contingency sampling may also be necessary after extreme weather events, visible damage to the remedy or other conditions where increased density of sampling data is necessary to support site decision making. Contingency sampling should be considered if the extraction well, BRW-1, declines in pumping efficiency or needs to be shut down for maintenance. Increased sampling frequency of bedrock wells OB-23R, OB-9R, B-12R, OB-22R, and OB24R is recommended if changes are made to the groundwater extraction remedy.

- Confirm data quality objectives for analytical detection limits. Laboratory detection limits should be set below regulatory screening levels for samples, unless dilution is necessary for accurate quantitation.

- Concentration trends for VC, and to a lesser extent cDCE, may demonstrate statistically significant increasing trends in the near-term as a result of the success of parent compound degradation processes. While groundwater passing through the CTW may meet ICLs, residual sorbed parent compounds outside the CTW may still be generating daughter products. Because the VC ICL and detection limits are very low, small variations in sampling and analysis results can have greater impact on the interpretation of VC concentration trends. Consider including flexibility to handle transient increasing concentrations of daughter products at downgradient locations into the language of compliance metrics to account for variable concentrations or increasing trends in CE daughter products.

- Data collected prior to the scheduled five-year reviews (2010, 2015) will be used to make a determination of the protectiveness of the remedy and progress toward remedial goals. An appropriate time frame over which to evaluate efficacy of the remedy is from the time of remedy installation (late 2001) to the present. Concentration trends should be determined for the time frame after installation of the remedy to the most current sampling event (roughly from 2002). Average concentrations and trends for priority COCs for the time from 1985 – 2001 are summarize in Table 2 and listed in detail in the Appendix as a baseline for future reference and comparison. Future concentrations and trends can be compared to the baseline, pre-remedy data to evaluate changes over time.

  With annual sampling, a sufficient number of data points will be available for evaluation of a recent, five-year concentration trend for each five-year review. (The minimum number of data points to evaluate a trend is 4.) Results of trend analysis since the last five-year review can be used to detect recent changes in direction and magnitude of concentration changes.

9.0 REFERENCES

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GROUNDWATER MONITORING NETWORK OPTIMIZATION REVIEW
SOMERSWORTH LANDFILL SITE

Somersworth, New Hampshire

TABLES

Table 1 Somersworth Landfill Monitoring Well Network Summary

Table 2 Well Trend Summary Results and Average Concentrations

TABLE 1
SOMERSWORTH LANDFILL MONITORING WELL NETWORK SUMMARY

LONG-TERM MONITORING OPTIMIZATION REVIEW
Somersworth Landfill Superfund Site, Somerworth, New Hampshire

Well Name	Minimum Sample Date	Maximum Sample Date	Number of Samples in Dataset	Monitoring Rationale
Overburden				
B-13WT	4/8/1996	10/24/2007	18	Objective 5, POC
B-2L	3/3/1998	10/24/2007	26	Objective 5, Objective 2, Objective 1B, , POC
B-8L	11/16/1989	10/24/2007	27	Objective 5, POC
CTW-10U	1/29/2001	10/26/2007	24	Objective 5, Objective 2, Objective 1B, POC
CTW-1DU	11/13/2001	10/18/2004	5	Evaluate GW flow near CTW, not sampled currently
CTW-21U	2/15/2001	10/23/2007	26	Objective 2, Objective 1A
CTW-22L	10/20/2004	5/17/2005	2	Not sampled currently
CTW-22U	4/20/2004	10/23/2007	7	Objective 1A
CTW-23L	3/28/2001	10/23/2007	22	Objective 5, Objective 2, Objective 1A, POC
CTW-23U	3/28/2001	10/23/2007	24	Objective 5, Objective 2, Objective 1A, POC
CTW-24U	8/22/2005	10/23/2007	8	Objective 2, Objective 1A
CTW-2DU	11/14/2001	10/18/2004	5	Evaluate GW flow near CTW, not sampled currently
CTW-31U	2/15/2001	10/23/2007	23	Objective 1A
CTW-32U	4/20/2004	10/23/2007	6	Objective 1A
CTW-33L	3/28/2001	10/23/2007	23	Objective 5, Objective 2, Objective 1A, POC
CTW-33U	3/28/2001	10/23/2007	24	Objective 5, Objective 2, Objective 1A, POC
CTW-41U	2/15/2001	10/25/2007	24	Objective 1A
CTW-42U	4/20/2004	10/25/2007	5	Objective 1A
CTW-43L	3/28/2001	10/25/2007	26	Objective 5, Objective 2, Objective 1A, POC
CTW-43U	3/28/2001	10/25/2007	23	Objective 5, Objective 2, Objective 1A, POC
CTW-50U	1/29/2001	10/24/2007	24	Objective 5, Objective 2, Objective 1B, POC
CTW-61U	8/22/2005	10/25/2007	9	Objective 1A*
CTW-63U	8/22/2005	10/25/2007	9	Objective 1A
FS-1	5/2/1996	10/24/2007	30	Up and cross-gradient
FS-11	4/6/1996	10/18/2004	5	Upgradient of CTW, not sampled currently
FS-12	4/6/1996	10/18/2004	6	Upgradient of CTW, not sampled currently
FS-4	4/30/1996	10/24/2007	29	Objective 5, Objective 1B, POC
FS-7	4/5/1996	10/24/2007	38	Objective 5, Objective 1B, POC
FS-9	4/6/1996	12/8/1999	5	Objective 1B, Not sampled currently
FS-9A	6/6/2001	10/24/2007	21	Objective 5, Objective 2, POC
OB-101U	4/26/2007	10/24/2007	5	Delineation - farthest downgradient monitoring locations
OB-16U	1/24/1992	10/22/2007	22	Objective 6
OB-17U	1/24/1992	10/22/2007	26	Objective 6, Objective 2
OB-4U	11/13/1989	10/24/2007	20	Objective 5
OB-5U	11/13/1989	10/24/2007	30	Objective 5, POC
OB-6U	11/16/1989	10/24/2007	34	Objective 5, POC
OB-7U	11/13/1989	10/24/2007	21	Objective 5, Background POC

See notes end of table

TABLE 1
SOMERSWORTH LANDFILL MONITORING WELL NETWORK SUMMARY

LONG-TERM MONITORING OPTIMIZATION REVIEW
Somersworth Landfill Superfund Site, Somerworth, New Hampshire

Well Name	Minimum Sample Date	Maximum Sample Date	Number of Samples in Dataset	Monitoring Rationale
Bedrock				
B-12R	11/14/1989	10/24/2007	37	Objective 3
B-13R	11/14/1989	10/24/2007	30	Objective 5, POC
B-6R	11/17/1989	10/22/2007	32	Objective 5, Objective 3, POC
B-8R	11/16/1989	10/24/2007	33	Objective 5, Objective 3, POC
B-9R	11/15/1989	10/24/2007	32	Objective 5, Objective 3, POC
BRW-1	3/18/1997	10/25/2007	21	Objective 3; Extraction Well
CTW-1DR	4/26/2002	10/14/2002	3	Evaluate GW flow near CTW, not sampled currently
CTW-2DR	4/26/2002	10/14/2002	3	Evaluate GW flow near CTW, not sampled currently
OB-101R	4/26/2007	10/24/2007	3	Delineation - farthest downgradient monitoring locations
OB-15R	1/24/1992	10/24/2007	32	Upgradient of CTW
OB-16R	1/24/1992	10/24/2007	30	Objective 6*
OB-21RA	8/7/2001	10/24/2007	20	Upgradient of CTW
OB-22R	2/2/2001	10/24/2007	23	Objective 3
OB-23R	1/29/2001	10/24/2007	26	Objective 3
OB-24R	1/29/2001	10/22/2007	25	Objective 3
OB-4R	11/13/1989	10/24/2007	21	Objective 5, POC
OB-5R	11/11/1989	10/24/2007	31	Objective 5, POC
OB-6R	11/16/1989	10/24/2007	26	Objective 5, POC
OB-7R	11/7/1990	10/24/2007	20	Objective 5, Background, POC
OB-9R	11/8/1990	10/24/2007	23	Objective 3
PS-1R	5/2/1996	10/24/2007	28	Objective 5, Objective 3, Objective 2, POC

Notes:

1. Wells listed were in MAROS input files. Data from Geosyntec, 2009.
2. Monitoring objectives for each well are from Annual Report (Geosyntec, 2008).
   * = indicates objective not listed in Annual Report, but assumed based on location of the well.
3. POC = Point of Compliance
4. Number of Samples = total number of analytical sample events from Geosyntec input files.
   Does not include hydrologic or natural attenuation parameter sampling.
5. Minimum sample date is the earliest record in the MAROS input file for the specified well. Maximum sample date is the most recent date for an analytical result in the input file.

TABLE 2
WELL TREND SUMMARY RESULTS AND AVERAGE CONCENTRATIONS

LONG-TERM MONITORING OPTIMIZATION REVIEW
Somersworth Sanitary Landfill, New Hampshire

Well Name	2002 - 2007 Number of Samples	2002 - 2007 Number of Detects	2002 - 2007 Percent Detection	Average Concentration 1985 - 2000 [ug/L]	Average Concentration 2002 - 2007 [ug/L]	MK Result 1985 - 2001	MK Result 2002 - 2007	MK Result Annually Consolidated 2002 - 2007
Overburden Vinyl Chloride								
B-13WT	9	0	0%	1.8	<1	S	ND	ND
B-2L	18	11	61%	6.3	3.1	N/A	S	S
B-8L	18	18	100%	380.0	363.0	S	I	I
CTW-10U	18	2	11%	<1	2.7	N/A	NT	S
CTW-1DU	4	4	100%	--	99.8	--	S	N/A
CTW-21U	18	14	78%	3.0	21.1	N/A	NT	NT
CTW-22L	2	0	0%	--	<1	--	N/A	N/A
CTW-22U	7	4	57%	--	22.1	--	NT	NT
CTW-23L	18	1	6%	<1	1.8	N/A	NT	S
CTW-23U	18	6	33%	<1	7.2	N/A	NT	NT
CTW-24U	8	5	63%	--	2.3	--	D	N/A
CTW-2DU	4	0	0%	--	<1	--	ND	N/A
CTW-31U	17	12	71%	21.0	8.3	N/A	D	D
CTW-32U	5	0	0%	--	<1	--	ND	ND
CTW-33L	18	2	11%	8.5	1.2	N/A	S	S
CTW-33U	18	0	0%	<1	<1	N/A	ND	ND
CTW-41U	18	1	6%	<1	1.1	N/A	S	S
CTW-42U	5	1	20%	--	1.6	--	S	S
CTW-43L	18	1	6%	<1	1.3	N/A	NT	S
CTW-43U	18	0	0%	<1	<1	N/A	ND	ND
CTW-50U	17	8	47%	<1	2.2	N/A	D	S
CTW-61U	8	8	100%	--	148.0	--	D	N/A
CTW-63U	8	3	38%	--	3.4	--	NT	N/A
FS-1	18	17	94%	8.3	4.5	S	D	PD
FS-11	1	1	100%	25.2	40.0	N/A	N/A	N/A
FS-12	1	1	100%	1.7	66.0	N/A	N/A	N/A
FS-4	18	12	67%	6.4	4.4	I	D	D
FS-7	18	18	100%	16.1	10.4	NT	I	PI
FS-9A	18	17	94%	--	168.0	NT	S	S
OB-101U	3	0	0%	--	<1	--	N/A	N/A
OB-16U	11	8	73%	65.8	9.6	NT	D	D
OB-17U	11	11	100%	283.0	129.0	NT	D	D
OB-4U	10	0	0%	<1	<1	ND	ND	ND
OB-5U	18	17	94%	15.2	11.4	S	I	NT
OB-6U	18	18	100%	34.8	24.2	S	S	NT
OB-7U	10	0	0%	<1	<1	ND	ND	ND

See notes end of table

TABLE 2
WELL TREND SUMMARY RESULTS AND AVERAGE CONCENTRATIONS

LONG-TERM MONITORING OPTIMIZATION REVIEW
Somersworth Sanitary Landfill, New Hampshire

Well Name	2002 - 2007			Average Concentration 1985 - 2000 [ug/L]	Average Concentration 2002 - 2007 [ug/L]	MK Result 1985 - 2001	MK Result 2002 - 2007	MK Result Annually Consolidated 2002 - 2007
	Number of Samples	Number of Detects	Percent Detection					
Bedrock TCE								
B-12R	18	18	100%	3110	3010	S	D	D
B-13R	18	3	17%	9.97	2.75	D	S	S
B-6R	18	3	17%	110	4.45	D	S	S
B-8R	18	12	67%	27.6	10.3	NT	D	D
B-9R	18	1	6%	17.7	2.38	NT	S	S
BRW-1	16	16	100%	61	33.1	N/A	S	S
CTW-1DR	3	3	100%	--	70	--	N/A	N/A
CTW-2DR	3	3	100%	--	45.3	--	N/A	N/A
OB-101R	3	0	0%	--	<2.5	--	N/A	N/A
OB-15R	18	0	0%	6.38	<2.5	D	ND	ND
OB-16R	18	0	0%	14.9	<2.5	NT	ND	ND
OB-21RA	17	17	100%	--	11.7	--	NT	S
OB-22R	18	0	0%	< 2	<2.5	N/A	ND	ND
OB-23R	18	9	50%	95	114	N/A	D	D
OB-24R	17	17	100%	1500	688	N/A	D	D
OB-4R	10	1	10%	3.58	2.29	PD	S	S
OB-5R	18	4	22%	34.5	9.62	D	PD	S
OB-6R	11	0	0%	3.64	<2.5	D	ND	ND
OB-7R	10	0	0%	<1	<2.5	ND	ND	ND
OB-9R	18	0	0%	<1	<2.5	N/A	ND	ND
PS-1R	18	6	33%	34.4	3.04	PD	PI	NT

Notes

1. Trends were evaluated for data collected during intervals indicated.
2. Number of Samples is the number of samples for the compound at this location 2002 - 2007.
   Number of Detects is the number of times the compound has been detected at this location.
3. D = Decreasing; PD = Probably Decreasing; S = Stable; PI = Probably Increasing;
   I = Increasing; N/A = Insufficient Data to determine trend (<4 sample events);
   NT = No Trend; ND = well has all non-detect results for COC.
4. < = Not detected; -- = No data collected during the indicated time frame.

GROUNDWATER MONITORING NETWORK OPTIMIZATION REVIEW
SOMERSWORTH LANDFILL SITE

Somersworth, New Hampshire

MAROS Reports

COC Assessment Overburden

COC Assessment Bedrock

Example Trend Summary Reports

MAROS COC Assessment

Project: Somersworth **User Name:** MV

Location: Overburden **State:** New Hampshire

Toxicity:

Contaminant of Concern	Representative Concentration (mg/L)	PRG (mg/L)	Percent Above PRG
Vinyl chloride	3.3E-02	2.0E-03	1531.3%
Trichloroethylene (TCE)	1.5E-02	5.0E-03	195.4%
Tetrachloroethylene(PCE)	1.0E-02	5.0E-03	108.7%

Note: Top COCs by toxicity were determined by examining a representative concentration for each compound over the entire site. The compound representative concentrations are then compared with the chosen PRG for that compound, with the percentage exceedance from the PRG determining the compound's toxicity. All compounds above exceed the PRG.

Prevalence:

Contaminant of Concern	Class	Total Wells	Total Exceedances	Percent Exceedances	Total detects
Vinyl chloride	ORG	37	24	64.9%	30
Trichloroethylene (TCE)	ORG	37	8	21.6%	17
Tetrachloroethylene(PCE)	ORG	37	7	18.9%	9

Note: Top COCs by prevalence were determined by examining a representative concentration for each well location at the site. The total exceedances (values above the chosen PRGs) are compared to the total number of wells to determine the prevalence of the compound.

Mobility:

Contaminant of Concern	Kd
Vinyl chloride	0.042
Trichloroethylene (TCE)	0.297
Tetrachloroethylene(PCE)	0.923

Note: Top COCs by mobility were determined by examining each detected compound in the dataset and comparing their mobilities (Koc's for organics, assume foc = 0.001, and Kd's for metals).

Contaminants of Concern (COC's)

Vinyl chloride

Trichloroethylene (TCE)

Tetrachloroethylene(PCE)

cis-1,2-Dichloroethylene

MAROS COC Assessment

Project: Somersworth **User Name:** MV

Location: Bedrock **State:** New Hampshire

Toxicity:

Contaminant of Concern	Representative Concentration (mg/L)	PRG (mg/L)	Percent Above PRG
trichloroethylene (TCE)	2.0E-01	5.0E-03	3878.8%
Vinyl chloride	2.5E-02	2.0E-03	1161.0%
cis-1,2-Dichloroethylene	1.3E-01	7.0E-02	92.0%
tetrachloroethylene(PCE)	8.8E-03	5.0E-03	77.0%

Note: Top COCs by toxicity were determined by examining a representative concentration for each compound over the entire site. The compound representative concentrations are then compared with the chosen PRG for that compound, with the percentage exceedance from the PRG determining the compound's toxicity. All compounds above exceed the PRG.

Prevalence:

Contaminant of Concern	Class	Total Wells	Total Exceedances	Percent Exceedances	Total detects
trichloroethylene (TCE)	ORG	21	14	66.7%	17
Vinyl chloride	ORG	21	13	61.9%	18
cis-1,2-Dichloroethylene	ORG	21	8	38.1%	17
tetrachloroethylene(PCE)	ORG	21	6	28.6%	11

Note: Top COCs by prevalence were determined by examining a representative concentration for each well location at the site. The total exceedances (values above the chosen PRGs) are compared to the total number of wells to determine the prevalence of the compound.

Mobility:

Contaminant of Concern	Kd
Vinyl chloride	0.042
cis-1,2-Dichloroethylene	0.0724
trichloroethylene (TCE)	0.297
tetrachloroethylene(PCE)	0.923

Note: Top COCs by mobility were determined by examining each detected compound in the dataset and comparing their mobilities (Koc's for organics, assume foc = 0.001, and Kd's for metals).

Contaminants of Concern (COC's)

cis-1,2-Dichloroethylene

tetrachloroethylene(PCE)

trichloroethylene (TCE)

Vinyl chloride

MAROS Statistical Trend Analysis Summary

Project: Overburden

Location: Somersworth

User Name: MV

State: New Hampshire

Time Period: 7/1/1985 **to** 1/1/2001

Consolidation Period: No Time Consolidation

Consolidation Type: Median

Duplicate Consolidation: Average

ND Values: Specified Detection Limit

J Flag Values : Actual Value

Well	Source/ Tail	Number of Samples	Number of Detects	Average Conc. (mg/L)	Median Conc. (mg/L)	All Samples "ND" ?	Mann-Kendall Trend	Linear Regression Trend
cis-1,2-Dichloroethylene								
B-13WT	T	5	0	1.0E-03	1.0E-03	Yes	ND	ND
B-2L	T	5	5	1.1E-02	8.0E-03	No	S	S
B-8L	S	6	6	5.1E-01	4.8E-01	No	S	S
CTW-10U	T	1	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-21U	T	1	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-23L	T	1	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-23U	T	1	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-31U	T	1	1	4.3E-02	4.3E-02	No	N/A	N/A
CTW-33L	T	1	1	9.0E-03	9.0E-03	No	N/A	N/A
CTW-33U	T	1	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-41U	T	1	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-43L	T	1	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-43U	T	1	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-50U	T	1	0	1.0E-03	1.0E-03	Yes	ND	ND
FS-1	T	6	5	1.6E-02	6.9E-03	No	NT	NT
FS-11	T	3	3	1.9E-01	2.0E-01	No	N/A	N/A
FS-12	T	3	2	3.7E-03	2.0E-03	No	N/A	N/A
FS-4	T	4	4	2.3E-02	2.3E-02	No	I	I
FS-7	T	8	8	3.7E-02	2.1E-02	No	NT	S
FS-9	T	4	3	1.8E-02	4.0E-03	No	I	I
OB-16U	S	7	6	2.6E-01	2.1E-01	No	NT	I
OB-17U	S	7	7	2.1E-01	1.3E-02	No	NT	D
OB-4U	T	6	0	1.0E-03	1.0E-03	Yes	ND	ND
OB-5U	T	6	6	2.2E-02	2.4E-02	No	S	PD
OB-6U	S	10	10	2.2E-01	1.9E-01	No	S	S
OB-7U	T	7	0	1.0E-03	1.0E-03	Yes	ND	ND
Tetrachloroethylene(PCE)								
B-13WT	T	4	0	1.0E-03	1.0E-03	Yes	ND	ND
B-2L	T	5	5	2.1E-02	1.6E-02	No	NT	NT
B-8L	S	6	2	7.5E-03	1.0E-03	No	NT	PD
CTW-10U	T	1	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-21U	T	1	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-23L	T	1	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-23U	T	1	0	1.0E-03	1.0E-03	Yes	ND	ND

MAROS Statistical Trend Analysis Summary

Well	Source/ Tail	Number of Samples	Number of Detects	Average Conc. (mg/L)	Median Conc. (mg/L)	All Samples "ND" ?	Mann-Kendall Trend	Linear Regression Trend
Tetrachloroethylene(PCE)								
CTW-31U	T	1	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-33L	T	1	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-33U	T	1	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-41U	T	1	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-43L	T	1	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-43U	T	1	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-50U	T	1	0	1.0E-03	1.0E-03	Yes	ND	ND
FS-1	T	6	3	1.0E-03	1.0E-03	No	NT	I
FS-11	T	3	3	2.2E-01	2.2E-01	No	N/A	N/A
FS-12	T	2	1	2.5E-03	2.5E-03	No	N/A	N/A
FS-4	T	4	0	1.0E-03	1.0E-03	Yes	ND	ND
FS-7	T	8	0	1.0E-03	1.0E-03	Yes	ND	ND
FS-9	T	4	0	1.0E-03	1.0E-03	Yes	ND	ND
OB-16U	S	7	1	1.1E-03	1.0E-03	No	NT	NT
OB-17U	S	6	0	1.0E-03	1.0E-03	Yes	ND	ND
OB-4U	T	6	0	1.0E-03	1.0E-03	Yes	ND	ND
OB-5U	T	6	0	1.0E-03	1.0E-03	Yes	ND	ND
OB-6U	S	10	9	4.7E-02	3.1E-02	No	D	PD
OB-7U	T	7	0	1.0E-03	1.0E-03	Yes	ND	ND
Trichloroethylene (TCE)								
B-13WT	T	4	0	1.0E-03	1.0E-03	Yes	ND	ND
B-2L	T	5	5	1.8E-02	1.6E-02	No	NT	S
B-8L	S	6	4	7.9E-02	3.2E-02	No	D	D
CTW-10U	T	1	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-21U	T	1	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-23L	T	1	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-23U	T	1	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-31U	T	1	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-33L	T	1	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-33U	T	1	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-41U	T	1	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-43L	T	1	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-43U	T	1	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-50U	T	1	0	1.0E-03	1.0E-03	Yes	ND	ND
FS-1	T	6	4	6.9E-03	7.1E-03	No	S	D
FS-11	T	3	3	1.7E-01	1.7E-01	No	N/A	N/A
FS-12	T	3	2	3.0E-03	3.0E-03	No	N/A	N/A
FS-4	T	4	3	8.5E-03	7.5E-03	No	S	NT
FS-7	T	8	7	5.9E-02	1.2E-02	No	D	D
FS-9	T	4	2	1.0E-03	1.0E-03	No	S	I
OB-16U	S	7	6	5.6E-03	4.0E-03	No	S	PI
OB-17U	S	6	2	3.3E-03	1.0E-03	No	NT	D
OB-4U	T	6	1	1.2E-03	1.0E-03	No	NT	NT
OB-5U	T	6	4	1.7E-03	1.5E-03	No	S	D
OB-6U	S	10	9	1.7E-01	1.4E-01	No	S	S

MAROS Statistical Trend Analysis Summary

Well	Source/ Tail	Number of Samples	Number of Detects	Average Conc. (mg/L)	Median Conc. (mg/L)	All Samples "ND" ?	Mann-Kendall Trend	Linear Regression Trend
Trichloroethylene (TCE)								
OB-7U	T	7	0	1.0E-03	1.0E-03	Yes	ND	ND
Vinyl chloride								
B-13WT	T	4	2	1.8E-03	1.5E-03	No	S	S
B-2L	T	3	3	6.3E-03	6.0E-03	No	N/A	N/A
B-8L	S	5	5	3.8E-01	3.6E-01	No	S	I
CTW-10U	T	1	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-21U	T	1	1	3.0E-03	3.0E-03	No	N/A	N/A
CTW-23L	T	1	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-23U	T	1	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-31U	T	1	1	2.1E-02	2.1E-02	No	N/A	N/A
CTW-33L	T	1	1	8.5E-03	8.5E-03	No	N/A	N/A
CTW-33U	T	1	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-41U	T	1	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-43L	T	1	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-43U	T	1	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-50U	T	1	0	1.0E-03	1.0E-03	Yes	ND	ND
FS-1	T	6	6	8.3E-03	7.3E-03	No	S	PD
FS-11	T	3	3	2.5E-02	2.8E-02	No	N/A	N/A
FS-12	T	3	2	1.7E-03	1.0E-03	No	N/A	N/A
FS-4	T	4	4	6.4E-03	7.0E-03	No	I	I
FS-7	T	8	8	1.6E-02	9.2E-03	No	NT	NT
FS-9	T	4	3	1.1E-02	3.0E-03	No	NT	I
OB-16U	S	7	7	6.6E-02	6.4E-02	No	NT	I
OB-17U	S	7	7	2.8E-01	1.0E-02	No	NT	D
OB-4U	T	6	0	1.0E-03	1.0E-03	Yes	ND	ND
OB-5U	T	6	6	1.5E-02	1.6E-02	No	S	S
OB-6U	S	10	10	3.5E-02	2.8E-02	No	S	PD
OB-7U	T	7	0	1.0E-03	1.0E-03	Yes	ND	ND

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); No Detectable Concentration (NDC)

The Number of Samples and Number of Detects shown above are post-consolidation values.

MAROS Statistical Trend Analysis Summary

Project: Somersworth

Location: Overburden

User Name: MV

State: New Hampshire

Time Period: 1/1/2002 **to** 10/1/2007

Consolidation Period: No Time Consolidation

Consolidation Type: Median

Duplicate Consolidation: Average

ND Values: Specified Detection Limit

J Flag Values : Actual Value

Well	Source/ Tail	Number of Samples	Number of Detects	Average Conc. (mg/L)	Median Conc. (mg/L)	All Samples "ND" ?	Mann-Kendall Trend	Linear Regression Trend
cis-1,2-Dichloroethylene								
B-13WT	T	10	0	1.0E-03	1.0E-03	Yes	ND	ND
B-2L	T	18	12	9.0E-03	8.0E-03	No	NT	NT
B-8L	S	18	18	1.2E-01	1.1E-01	No	D	D
CTW-10U	T	18	2	2.1E-03	1.0E-03	No	NT	PI
CTW-1DU	T	4	4	3.0E-01	3.0E-01	No	S	PI
CTW-21U	T	18	7	2.3E-02	1.0E-03	No	NT	NT
CTW-22L	T	2	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-22U	T	7	2	2.4E-02	1.0E-03	No	NT	PD
CTW-23L	T	18	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-23U	T	18	3	8.0E-03	1.0E-03	No	NT	NT
CTW-24U	T	8	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-2DU	T	4	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-31U	T	17	12	1.3E-02	1.2E-02	No	D	D
CTW-32U	T	5	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-33L	T	18	1	1.2E-03	1.0E-03	No	S	S
CTW-33U	T	18	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-41U	T	18	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-42U	T	5	1	2.0E-03	1.0E-03	No	NT	NT
CTW-43L	T	18	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-43U	T	18	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-50U	T	17	2	2.1E-03	1.0E-03	No	NT	NT
CTW-61U	S	8	7	2.8E-01	1.2E-01	No	D	D
CTW-63U	T	8	2	2.6E-03	1.0E-03	No	NT	NT
FS-1	T	18	5	1.7E-03	1.0E-03	No	D	D
FS-11	T	1	1	7.4E-02	7.4E-02	No	N/A	N/A
FS-12	T	1	1	1.6E-01	1.6E-01	No	N/A	N/A
FS-4	T	18	11	1.3E-02	1.4E-02	No	D	D
FS-7	T	18	18	2.9E-02	1.7E-02	No	I	I
FS-9A	S	18	17	2.0E-01	1.1E-01	No	NT	NT
OB-101U	T	3	0	1.0E-03	1.0E-03	Yes	ND	ND
OB-16U	S	11	8	5.0E-02	1.6E-02	No	D	D
OB-17U	S	11	11	8.8E-01	9.6E-01	No	D	D
OB-4U	T	10	0	1.0E-03	1.0E-03	Yes	ND	ND
OB-5U	T	18	13	4.8E-03	5.0E-03	No	NT	S
OB-6U	S	18	18	1.1E-01	1.1E-01	No	S	I

MAROS Statistical Trend Analysis Summary

Well	Source/ Tail	Number of Samples	Number of Detects	Average Conc. (mg/L)	Median Conc. (mg/L)	All Samples "ND" ?	Mann-Kendall Trend	Linear Regression Trend
cis-1,2-Dichloroethylene								
OB-7U	T	10	0	1.0E-03	1.0E-03	Yes	ND	ND
Tetrachloroethylene(PCE)								
B-13WT	T	10	0	1.0E-03	1.0E-03	Yes	ND	ND
B-2L	T	18	4	3.6E-03	1.0E-03	No	PD	D
B-8L	S	18	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-10U	T	18	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-1DU	T	4	4	7.3E-02	5.9E-02	No	NT	NT
CTW-21U	T	18	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-22L	T	2	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-22U	T	7	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-23L	T	18	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-23U	T	18	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-24U	T	8	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-2DU	T	4	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-31U	T	17	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-32U	T	5	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-33L	T	18	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-33U	T	18	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-41U	T	18	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-42U	T	5	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-43L	T	18	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-43U	T	18	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-50U	T	18	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-61U	S	8	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-63U	T	8	0	1.0E-03	1.0E-03	Yes	ND	ND
FS-1	T	18	0	1.0E-03	1.0E-03	Yes	ND	ND
FS-11	T	1	1	4.2E-02	4.2E-02	No	N/A	N/A
FS-12	T	1	0	1.0E-03	1.0E-03	Yes	ND	ND
FS-4	T	18	0	1.0E-03	1.0E-03	Yes	ND	ND
FS-7	T	18	0	1.0E-03	1.0E-03	Yes	ND	ND
FS-9A	S	18	0	1.0E-03	1.0E-03	Yes	ND	ND
OB-101U	T	3	0	1.0E-03	1.0E-03	Yes	ND	ND
OB-16U	S	11	3	1.9E-03	1.0E-03	No	PD	PD
OB-17U	S	11	3	2.5E-03	1.0E-03	No	PD	PD
OB-4U	T	10	0	1.0E-03	1.0E-03	Yes	ND	ND
OB-5U	T	18	0	1.0E-03	1.0E-03	Yes	ND	ND
OB-6U	S	18	18	1.3E-02	1.3E-02	No	D	S
OB-7U	T	10	0	1.0E-03	1.0E-03	Yes	ND	ND
Trichloroethylene (TCE)								
B-13WT	T	10	0	1.0E-03	1.0E-03	Yes	ND	ND
B-2L	T	18	7	6.9E-03	1.0E-03	No	PD	D
B-8L	S	18	3	1.3E-03	1.0E-03	No	S	S
CTW-10U	T	18	1	1.1E-03	1.0E-03	No	S	PD
CTW-1DU	T	4	4	1.5E-01	1.4E-01	No	NT	NT

MAROS Statistical Trend Analysis Summary

Well	Source/ Tail	Number of Samples	Number of Detects	Average Conc. (mg/L)	Median Conc. (mg/L)	All Samples "ND" ?	Mann-Kendall Trend	Linear Regression Trend
Trichloroethylene (TCE)								
CTW-21U	T	18	1	1.3E-03	1.0E-03	No	S	S
CTW-22L	T	2	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-22U	T	7	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-23L	T	18	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-23U	T	18	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-24U	T	8	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-2DU	T	4	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-31U	T	17	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-32U	T	5	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-33L	T	18	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-33U	T	18	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-41U	T	18	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-42U	T	5	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-43L	T	18	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-43U	T	18	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-50U	T	18	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-61U	S	8	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-63U	T	8	0	1.0E-03	1.0E-03	Yes	ND	ND
FS-1	T	18	3	1.1E-03	1.0E-03	No	NT	NT
FS-11	T	1	1	4.5E-02	4.5E-02	No	N/A	N/A
FS-12	T	1	0	1.0E-03	1.0E-03	Yes	ND	ND
FS-4	T	18	4	1.5E-03	1.0E-03	No	PD	D
FS-7	T	18	9	5.4E-03	1.0E-03	No	I	I
FS-9A	S	18	1	1.1E-03	1.0E-03	No	NT	NT
OB-101U	T	3	0	1.0E-03	1.0E-03	Yes	ND	ND
OB-16U	S	11	5	5.5E-03	1.0E-03	No	PD	D
OB-17U	S	11	3	4.0E-03	1.0E-03	No	PD	PD
OB-4U	T	10	0	1.0E-03	1.0E-03	Yes	ND	ND
OB-5U	T	17	0	1.0E-03	1.0E-03	Yes	ND	ND
OB-6U	S	18	18	8.4E-02	8.9E-02	No	S	NT
OB-7U	T	10	0	1.0E-03	1.0E-03	Yes	ND	ND
Vinyl chloride								
B-13WT	T	9	0	1.0E-03	1.0E-03	Yes	ND	ND
B-2L	T	18	11	3.1E-03	3.0E-03	No	S	I
B-8L	S	18	18	3.6E-01	3.7E-01	No	I	I
CTW-10U	T	18	2	2.7E-03	1.0E-03	No	NT	PI
CTW-1DU	T	4	4	1.0E-01	1.0E-01	No	S	S
CTW-21U	T	18	14	2.1E-02	5.0E-03	No	NT	NT
CTW-22L	T	2	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-22U	T	7	4	2.2E-02	4.0E-03	No	NT	PD
CTW-23L	T	18	1	1.8E-03	1.0E-03	No	NT	NT
CTW-23U	T	18	6	7.2E-03	1.0E-03	No	NT	NT
CTW-24U	T	8	5	2.3E-03	2.0E-03	No	D	D
CTW-2DU	T	4	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-31U	T	17	12	8.3E-03	8.5E-03	No	D	D

MAROS Statistical Trend Analysis Summary

Well	Source/ Tail	Number of Samples	Number of Detects	Average Conc. (mg/L)	Median Conc. (mg/L)	All Samples "ND" ?	Mann-Kendall Trend	Linear Regression Trend
Vinyl chloride								
CTW-32U	T	5	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-33L	T	18	2	1.2E-03	1.0E-03	No	S	S
CTW-33U	T	18	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-41U	T	18	1	1.1E-03	1.0E-03	No	S	D
CTW-42U	T	5	1	1.6E-03	1.0E-03	No	S	S
CTW-43L	T	18	1	1.3E-03	1.0E-03	No	NT	PD
CTW-43U	T	18	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-50U	T	17	8	2.2E-03	1.0E-03	No	D	D
CTW-61U	S	8	8	1.5E-01	9.7E-02	No	D	D
CTW-63U	T	8	3	3.4E-03	1.0E-03	No	NT	NT
FS-1	T	18	17	4.5E-03	4.0E-03	No	D	PD
FS-11	T	1	1	4.0E-02	4.0E-02	No	N/A	N/A
FS-12	T	1	1	6.6E-02	6.6E-02	No	N/A	N/A
FS-4	T	18	12	4.4E-03	5.0E-03	No	D	D
FS-7	T	18	18	1.0E-02	9.5E-03	No	I	I
FS-9A	S	18	17	1.7E-01	1.3E-01	No	S	PD
OB-101U	T	3	0	1.0E-03	1.0E-03	Yes	ND	ND
OB-16U	S	11	8	9.5E-03	3.0E-03	No	D	D
OB-17U	S	11	11	1.3E-01	6.0E-02	No	D	D
OB-4U	T	10	0	1.0E-03	1.0E-03	Yes	ND	ND
OB-5U	T	18	17	1.1E-02	1.0E-02	No	I	I
OB-6U	S	18	18	2.4E-02	2.5E-02	No	S	S
OB-7U	T	10	0	1.0E-03	1.0E-03	Yes	ND	ND

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); No Detectable Concentration (NDC)

The Number of Samples and Number of Detects shown above are post-consolidation values.

MAROS Statistical Trend Analysis Summary

Project: Somersworth

Location: Bedrock

User Name: MV

State: New Hampshire

Time Period: 1/1/1985 **to** 1/1/2001

Consolidation Period: No Time Consolidation

Consolidation Type: Median

Duplicate Consolidation: Average

ND Values: Specified Detection Limit

J Flag Values : Actual Value

Well	Source/ Tail	Number of Samples	Number of Detects	Average Conc. (mg/L)	Median Conc. (mg/L)	All Samples "ND" ?	Mann-Kendall Trend	Linear Regression Trend
cis-1,2-Dichloroethylene								
B-12R	S	11	9	5.0E-02	3.4E-02	No	D	D
B-13R	T	10	10	4.6E-02	5.2E-02	No	S	PI
B-6R	S	10	10	8.6E-01	4.2E-01	No	PD	D
B-8R	T	10	10	2.5E-01	3.0E-01	No	I	I
B-9R	T	9	8	4.4E-02	3.0E-02	No	NT	NT
BRW-1	T	1	0	1.0E-03	1.0E-03	Yes	ND	ND
OB-15R	T	8	3	1.0E-03	1.0E-03	No	NT	I
OB-16R	T	9	9	3.1E-01	2.7E-01	No	NT	PI
OB-22R	T	1	0	1.0E-03	1.0E-03	Yes	ND	ND
OB-23R	S	1	0	1.0E-03	1.0E-03	Yes	ND	ND
OB-24R	S	1	1	5.9E-01	5.9E-01	No	N/A	N/A
OB-4R	T	8	6	8.4E-03	4.3E-03	No	D	D
OB-5R	T	8	8	1.8E-01	1.0E-01	No	NT	S
OB-6R	T	10	7	4.5E-03	3.3E-03	No	D	D
OB-7R	T	6	0	1.0E-03	1.0E-03	Yes	ND	ND
OB-9R	T	2	0	1.0E-03	1.0E-03	Yes	ND	ND
PS-1R	T	5	5	4.7E-02	2.0E-02	No	NT	NT
tetrachloroethylene(PCE)								
B-12R	S	10	3	1.5E-03	1.0E-03	No	D	D
B-13R	T	9	0	1.0E-03	1.0E-03	Yes	ND	ND
B-6R	S	10	4	1.8E-02	1.0E-03	No	D	D
B-8R	T	9	0	1.0E-03	1.0E-03	Yes	ND	ND
B-9R	T	8	1	5.1E-03	1.0E-03	No	NT	NT
BRW-1	T	1	1	1.5E-03	1.5E-03	No	N/A	N/A
OB-15R	T	8	0	1.0E-03	1.0E-03	Yes	ND	ND
OB-16R	T	9	2	1.5E-03	1.0E-03	No	S	S
OB-22R	T	1	0	1.0E-03	1.0E-03	Yes	ND	ND
OB-23R	S	1	0	1.0E-03	1.0E-03	Yes	ND	ND
OB-24R	S	1	0	1.0E-03	1.0E-03	Yes	ND	ND
OB-4R	T	8	1	1.0E-03	1.0E-03	No	NT	I
OB-5R	T	8	2	1.6E-03	1.0E-03	No	PD	D
OB-6R	T	10	2	1.5E-03	1.0E-03	No	S	D
OB-7R	T	6	0	1.0E-03	1.0E-03	Yes	ND	ND
OB-9R	T	2	0	1.0E-03	1.0E-03	Yes	ND	ND

MAROS Statistical Trend Analysis Summary

Well	Source/ Tail	Number of Samples	Number of Detects	Average Conc. (mg/L)	Median Conc. (mg/L)	All Samples "ND" ?	Mann-Kendall Trend	Linear Regression Trend
tetrachloroethylene(PCE)								
PS-1R	T	5	0	1.0E-03	1.0E-03	Yes	ND	ND
trichloroethylene (TCE)								
B-12R	S	11	11	3.1E+00	2.0E+00	No	S	D
B-13R	T	10	9	1.0E-02	7.7E-03	No	D	D
B-6R	S	10	9	1.1E-01	4.3E-02	No	D	D
B-8R	T	10	10	2.8E-02	2.6E-02	No	NT	NT
B-9R	T	9	5	1.8E-02	2.3E-03	No	NT	NT
BRW-1	T	1	1	6.1E-02	6.1E-02	No	N/A	N/A
OB-15R	T	8	6	6.4E-03	5.1E-03	No	D	D
OB-16R	T	9	9	1.5E-02	1.3E-02	No	NT	NT
OB-22R	T	1	0	1.0E-03	1.0E-03	Yes	ND	ND
OB-23R	S	1	1	9.5E-02	9.5E-02	No	N/A	N/A
OB-24R	S	1	1	1.5E+00	1.5E+00	No	N/A	N/A
OB-4R	T	8	4	3.6E-03	1.0E-03	No	PD	D
OB-5R	T	8	7	3.4E-02	5.1E-03	No	D	D
OB-6R	T	10	8	3.6E-03	1.9E-03	No	D	D
OB-7R	T	6	0	1.0E-03	1.0E-03	Yes	ND	ND
OB-9R	T	2	0	1.0E-03	1.0E-03	Yes	ND	ND
PS-1R	T	5	2	3.4E-02	1.0E-03	No	PD	PD
Vinyl chloride								
B-12R	S	10	4	6.0E-03	2.0E-03	No	D	D
B-13R	T	9	8	1.1E-02	1.2E-02	No	S	NT
B-6R	S	8	8	9.9E-02	1.0E-01	No	I	I
B-8R	T	9	9	1.9E-02	2.2E-02	No	I	I
B-9R	T	8	7	1.1E-02	9.0E-03	No	PI	I
BRW-1	T	1	0	2.0E-03	2.0E-03	Yes	ND	ND
OB-15R	T	8	2	1.7E-03	2.0E-03	No	NT	NT
OB-16R	T	9	9	6.5E-02	5.7E-02	No	S	NT
OB-22R	T	1	0	2.0E-03	2.0E-03	Yes	ND	ND
OB-23R	S	1	0	2.0E-03	2.0E-03	Yes	ND	ND
OB-24R	S	1	0	2.0E-03	2.0E-03	Yes	ND	ND
OB-4R	T	8	2	2.5E-03	2.0E-03	No	S	PD
OB-5R	T	8	7	2.0E-02	1.4E-02	No	PI	NT
OB-6R	T	10	4	1.7E-03	2.0E-03	No	PI	NT
OB-7R	T	6	0	2.0E-03	2.0E-03	Yes	ND	ND
OB-9R	T	2	0	2.0E-03	2.0E-03	Yes	ND	ND
PS-1R	T	5	5	2.5E-02	1.7E-02	No	NT	NT

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); No Detectable Concentration (NDC)

The Number of Samples and Number of Detects shown above are post-consolidation values.

MAROS Statistical Trend Analysis Summary

Project: Somersworth

Location: Bedrock

User Name: MV

State: New Hampshire

Time Period: 1/1/2002 **to** 10/1/2007

Consolidation Period: No Time Consolidation

Consolidation Type: Median

Duplicate Consolidation: Average

ND Values: Specified Detection Limit

J Flag Values : Actual Value

Well	Source/ Tail	Number of Samples	Number of Detects	Average Conc. (mg/L)	Median Conc. (mg/L)	All Samples "ND" ?	Mann-Kendall Trend	Linear Regression Trend
cis-1,2-Dichloroethylene								
B-12R	S	18	4	1.7E-02	1.0E-03	No	NT	I
B-13R	T	18	18	2.9E-02	3.0E-02	No	D	D
B-6R	S	18	18	2.5E-01	2.6E-01	No	PI	I
B-8R	T	18	18	2.7E-01	2.7E-01	No	D	D
B-9R	T	18	18	6.3E-02	6.2E-02	No	I	I
BRW-1	T	16	3	2.0E-03	1.0E-03	No	NT	PD
CTW-1DR	T	3	3	6.0E-01	6.9E-01	No	N/A	N/A
CTW-2DR	T	3	3	3.7E-01	3.5E-01	No	N/A	N/A
OB-101R	T	3	0	1.0E-03	1.0E-03	Yes	ND	ND
OB-15R	T	18	0	1.0E-03	1.0E-03	Yes	ND	ND
OB-16R	T	18	5	1.3E-02	1.0E-03	No	D	D
OB-21RA	T	17	17	1.1E-02	1.1E-02	No	S	S
OB-22R	T	18	0	1.0E-03	1.0E-03	Yes	ND	ND
OB-23R	S	18	6	9.3E-03	1.0E-03	No	D	D
OB-24R	S	17	17	3.0E-01	2.9E-01	No	D	D
OB-4R	T	10	3	1.3E-03	1.0E-03	No	S	S
OB-5R	T	18	18	5.0E-01	5.2E-01	No	NT	S
OB-6R	T	11	3	9.7E-04	1.0E-03	No	S	S
OB-7R	T	10	0	1.0E-03	1.0E-03	Yes	ND	ND
OB-9R	T	18	0	1.0E-03	1.0E-03	Yes	ND	ND
PS-1R	T	18	16	2.5E-02	2.0E-02	No	I	I
tetrachloroethylene(PCE)								
B-12R	S	18	0	1.0E-03	1.0E-03	Yes	ND	ND
B-13R	T	18	0	1.0E-03	1.0E-03	Yes	ND	ND
B-6R	S	18	0	1.0E-03	1.0E-03	Yes	ND	ND
B-8R	T	18	0	1.0E-03	1.0E-03	Yes	ND	ND
B-9R	T	18	0	1.0E-03	1.0E-03	Yes	ND	ND
BRW-1	T	16	0	1.0E-03	1.0E-03	Yes	ND	ND
CTW-1DR	T	3	1	1.2E-02	1.0E-03	No	N/A	N/A
CTW-2DR	T	3	2	1.2E-02	1.2E-02	No	N/A	N/A
OB-101R	T	3	0	1.0E-03	1.0E-03	Yes	ND	ND
OB-15R	T	18	0	1.0E-03	1.0E-03	Yes	ND	ND
OB-16R	T	18	0	1.0E-03	1.0E-03	Yes	ND	ND
OB-21RA	T	17	2	1.9E-03	1.0E-03	No	NT	NT

MAROS Statistical Trend Analysis Summary

Well	Source/ Tail	Number of Samples	Number of Detects	Average Conc. (mg/L)	Median Conc. (mg/L)	All Samples "ND" ?	Mann-Kendall Trend	Linear Regression Trend
tetrachloroethylene(PCE)								
OB-22R	T	18	0	1.0E-03	1.0E-03	Yes	ND	ND
OB-23R	S	18	0	1.0E-03	1.0E-03	Yes	ND	ND
OB-24R	S	17	0	1.0E-03	1.0E-03	Yes	ND	ND
OB-4R	T	10	0	1.0E-03	1.0E-03	Yes	ND	ND
OB-5R	T	18	0	1.0E-03	1.0E-03	Yes	ND	ND
OB-6R	T	11	0	1.0E-03	1.0E-03	Yes	ND	ND
OB-7R	T	10	0	1.0E-03	1.0E-03	Yes	ND	ND
OB-9R	T	18	0	1.0E-03	1.0E-03	Yes	ND	ND
PS-1R	T	18	0	1.0E-03	1.0E-03	Yes	ND	ND
trichloroethylene (TCE)								
B-12R	S	18	18	3.0E+00	2.6E+00	No	D	D
B-13R	T	18	3	1.5E-03	1.0E-03	No	S	PD
B-6R	S	18	3	1.0E-03	1.0E-03	No	S	D
B-8R	T	18	12	8.9E-03	9.4E-03	No	D	D
B-9R	T	18	1	9.7E-04	1.0E-03	No	S	S
BRW-1	T	16	16	3.3E-02	3.2E-02	No	S	PD
CTW-1DR	T	3	3	7.0E-02	8.4E-02	No	N/A	N/A
CTW-2DR	T	3	3	4.5E-02	4.7E-02	No	N/A	N/A
OB-101R	T	3	0	1.0E-03	1.0E-03	Yes	ND	ND
OB-15R	T	18	0	1.0E-03	1.0E-03	Yes	ND	ND
OB-16R	T	18	0	1.0E-03	1.0E-03	Yes	ND	ND
OB-21RA	T	17	17	1.2E-02	1.1E-02	No	NT	NT
OB-22R	T	18	0	1.0E-03	1.0E-03	Yes	ND	ND
OB-23R	S	18	9	1.1E-01	3.8E-03	No	D	D
OB-24R	S	17	17	6.9E-01	6.7E-01	No	D	D
OB-4R	T	10	1	9.4E-04	1.0E-03	No	S	S
OB-5R	T	18	4	2.6E-03	1.0E-03	No	NT	NT
OB-6R	T	11	0	1.0E-03	1.0E-03	Yes	ND	ND
OB-7R	T	10	0	1.0E-03	1.0E-03	Yes	ND	ND
OB-9R	T	18	0	1.0E-03	1.0E-03	Yes	ND	ND
PS-1R	T	18	6	2.0E-03	1.0E-03	No	I	I
Vinyl chloride								
B-12R	S	18	0	2.0E-03	2.0E-03	Yes	ND	ND
B-13R	T	18	17	1.1E-02	1.2E-02	No	S	NT
B-6R	S	18	17	1.5E-01	1.7E-01	No	PI	NT
B-8R	T	18	18	3.6E-02	3.6E-02	No	NT	PI
B-9R	T	18	18	8.4E-03	8.5E-03	No	S	S
BRW-1	T	16	4	2.5E-03	2.0E-03	No	S	PD
CTW-1DR	T	3	3	7.2E-02	8.3E-02	No	N/A	N/A
CTW-2DR	T	3	3	6.7E-02	6.8E-02	No	N/A	N/A
OB-101R	T	3	0	2.0E-03	2.0E-03	Yes	ND	ND
OB-15R	T	18	0	2.0E-03	2.0E-03	Yes	ND	ND
OB-16R	T	18	5	4.4E-03	2.0E-03	No	D	D
OB-21RA	T	17	17	6.7E-03	6.7E-03	No	S	S

MAROS Statistical Trend Analysis Summary

Well	Source/ Tail	Number of Samples	Number of Detects	Average Conc. (mg/L)	Median Conc. (mg/L)	All Samples "ND" ?	Mann-Kendall Trend	Linear Regression Trend
Vinyl chloride								
OB-22R	T	18	8	2.3E-03	2.0E-03	No	S	PD
OB-23R	S	18	7	5.0E-03	2.0E-03	No	D	D
OB-24R	S	17	13	3.8E-02	2.6E-02	No	I	I
OB-4R	T	10	0	2.0E-03	2.0E-03	Yes	ND	ND
OB-5R	T	18	18	9.7E-02	1.0E-01	No	I	I
OB-6R	T	11	6	2.3E-03	2.1E-03	No	NT	I
OB-7R	T	10	0	2.0E-03	2.0E-03	Yes	ND	ND
OB-9R	T	18	0	2.0E-03	2.0E-03	Yes	ND	ND
PS-1R	T	18	18	2.3E-02	2.0E-02	No	I	I

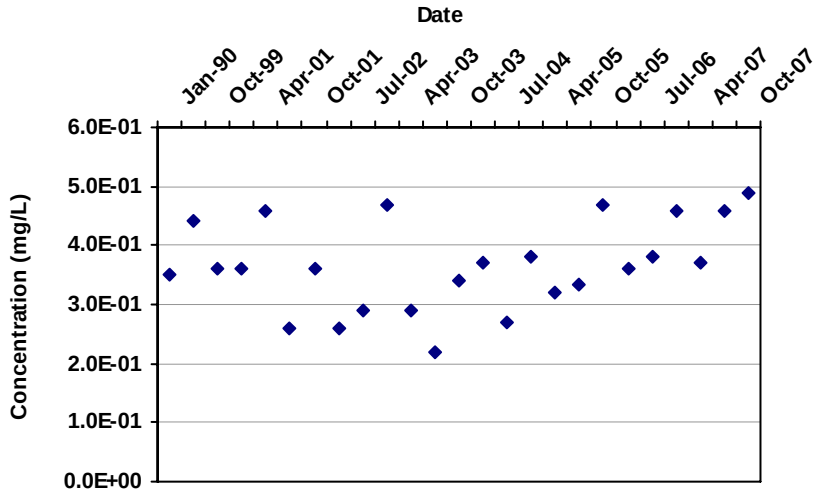
Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); No Detectable Concentration (NDC)

The Number of Samples and Number of Detects shown above are post-consolidation values.

MAROS Mann-Kendall Statistics Summary

Well: B-8L
Well Type: T
COC: Vinyl chloride

Time Period: 11/16/1989 **to** 10/15/2007
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: 78

Confidence in Trend: 96.4%

Coefficient of Variation: 0.21

Mann Kendall Concentration Trend: (See Note) I

Data Table:

Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
B-8L	T	1/1/1990	Vinyl chloride	3.5E-01		1	1
B-8L	T	7/1/1997	Vinyl chloride	4.4E-01		1	1
B-8L	T	10/1/1999	Vinyl chloride	3.6E-01		1	1
B-8L	T	1/1/2001	Vinyl chloride	3.6E-01		1	1
B-8L	T	4/1/2001	Vinyl chloride	4.6E-01		1	1
B-8L	T	7/1/2001	Vinyl chloride	2.6E-01		1	1
B-8L	T	10/1/2001	Vinyl chloride	3.6E-01		1	1
B-8L	T	4/1/2002	Vinyl chloride	2.6E-01		1	1
B-8L	T	7/1/2002	Vinyl chloride	2.9E-01		1	1
B-8L	T	10/1/2002	Vinyl chloride	4.7E-01		1	1
B-8L	T	4/1/2003	Vinyl chloride	2.9E-01		1	1
B-8L	T	7/1/2003	Vinyl chloride	2.2E-01		1	1
B-8L	T	10/1/2003	Vinyl chloride	3.4E-01		1	1
B-8L	T	4/1/2004	Vinyl chloride	3.7E-01		1	1
B-8L	T	7/1/2004	Vinyl chloride	2.7E-01		1	1
B-8L	T	10/1/2004	Vinyl chloride	3.8E-01		1	1
B-8L	T	4/1/2005	Vinyl chloride	3.2E-01		1	1
B-8L	T	7/1/2005	Vinyl chloride	3.4E-01		2	2
B-8L	T	10/1/2005	Vinyl chloride	4.7E-01		1	1
B-8L	T	4/1/2006	Vinyl chloride	3.6E-01		1	1
B-8L	T	7/1/2006	Vinyl chloride	3.8E-01		1	1
B-8L	T	10/1/2006	Vinyl chloride	4.6E-01		1	1

MAROS Mann-Kendall Statistics Summary

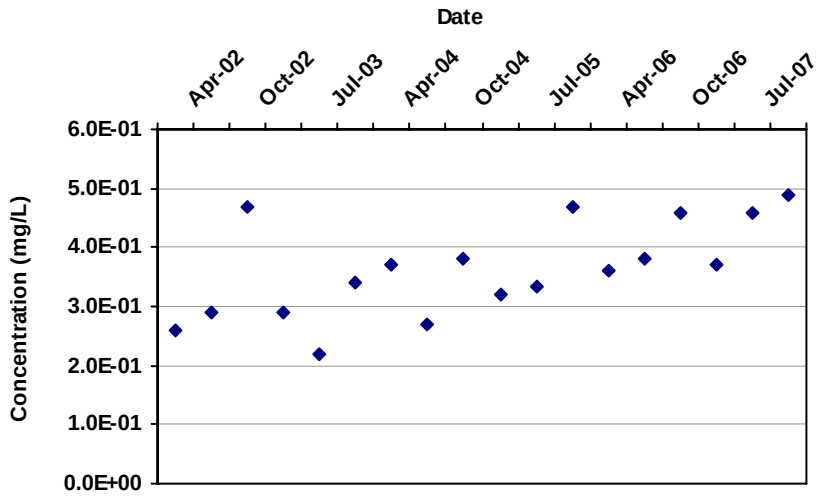
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
B-8L	T	4/1/2007	Vinyl chloride	3.7E-01		1	1
B-8L	T	7/1/2007	Vinyl chloride	4.6E-01		1	1
B-8L	T	10/1/2007	Vinyl chloride	4.9E-01		1	1

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: B-8L
Well Type: S
COC: Vinyl chloride

Time Period: 1/1/2002 **to** 10/1/2007
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: 76

Confidence in Trend: 99.9%

Coefficient of Variation: 0.22

Mann Kendall Concentration Trend: (See Note) I

Data Table:

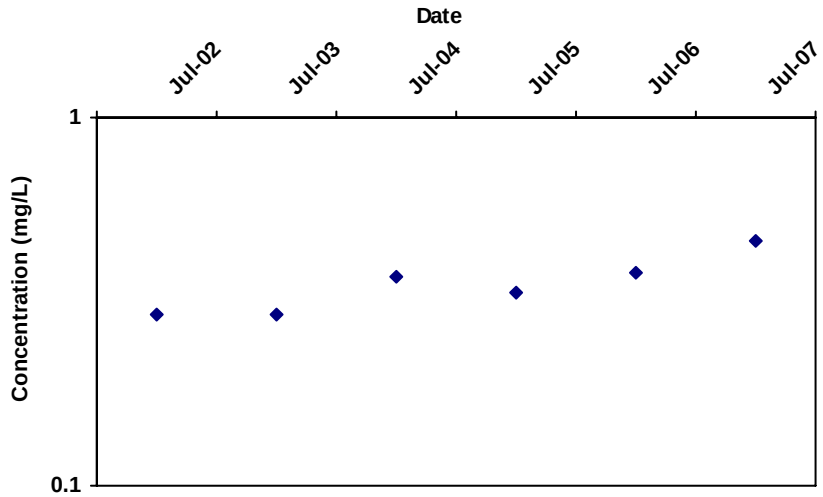
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
B-8L	S	4/1/2002	Vinyl chloride	2.6E-01		1	1
B-8L	S	7/1/2002	Vinyl chloride	2.9E-01		1	1
B-8L	S	10/1/2002	Vinyl chloride	4.7E-01		1	1
B-8L	S	4/1/2003	Vinyl chloride	2.9E-01		1	1
B-8L	S	7/1/2003	Vinyl chloride	2.2E-01		1	1
B-8L	S	10/1/2003	Vinyl chloride	3.4E-01		1	1
B-8L	S	4/1/2004	Vinyl chloride	3.7E-01		1	1
B-8L	S	7/1/2004	Vinyl chloride	2.7E-01		1	1
B-8L	S	10/1/2004	Vinyl chloride	3.8E-01		1	1
B-8L	S	4/1/2005	Vinyl chloride	3.2E-01		1	1
B-8L	S	7/1/2005	Vinyl chloride	3.4E-01		2	2
B-8L	S	10/1/2005	Vinyl chloride	4.7E-01		1	1
B-8L	S	4/1/2006	Vinyl chloride	3.6E-01		1	1
B-8L	S	7/1/2006	Vinyl chloride	3.8E-01		1	1
B-8L	S	10/1/2006	Vinyl chloride	4.6E-01		1	1
B-8L	S	4/1/2007	Vinyl chloride	3.7E-01		1	1
B-8L	S	7/1/2007	Vinyl chloride	4.6E-01		1	1
B-8L	S	10/1/2007	Vinyl chloride	4.9E-01		1	1

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: B-8L
Well Type: S
COC: Vinyl chloride

Time Period: 1/1/2002 **to** 10/1/2007
Consolidation Period: Yearly
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: 12

Confidence in Trend: 98.2%

Coefficient of Variation: 0.18

Mann Kendall Concentration Trend: (See Note) I

Data Table:

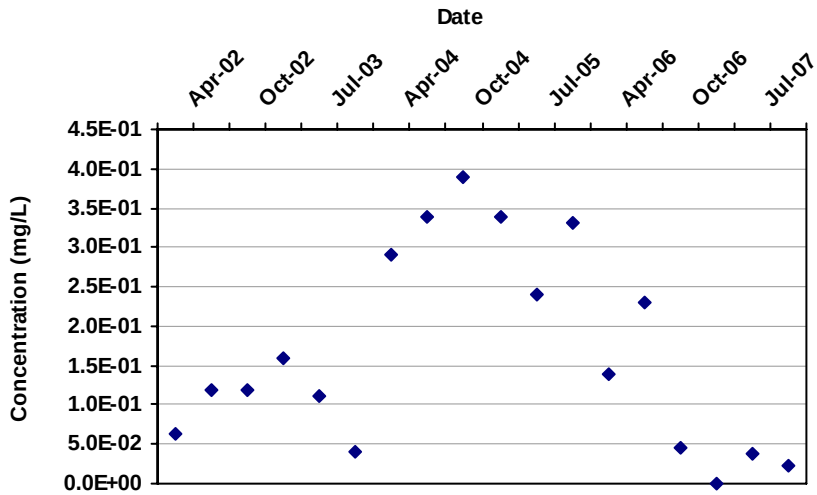
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
B-8L	S	7/1/2002	Vinyl chloride	2.9E-01		3	3
B-8L	S	7/1/2003	Vinyl chloride	2.9E-01		3	3
B-8L	S	7/1/2004	Vinyl chloride	3.7E-01		3	3
B-8L	S	7/1/2005	Vinyl chloride	3.4E-01		3	3
B-8L	S	7/1/2006	Vinyl chloride	3.8E-01		3	3
B-8L	S	7/1/2007	Vinyl chloride	4.6E-01		3	3

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: FS-9A
Well Type: S
COC: Vinyl chloride

Time Period: 1/1/2002 **to** 10/1/2007
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: -25

Confidence in Trend: 81.6%

Coefficient of Variation: 0.76

Mann Kendall Concentration Trend: (See Note) S

Data Table:

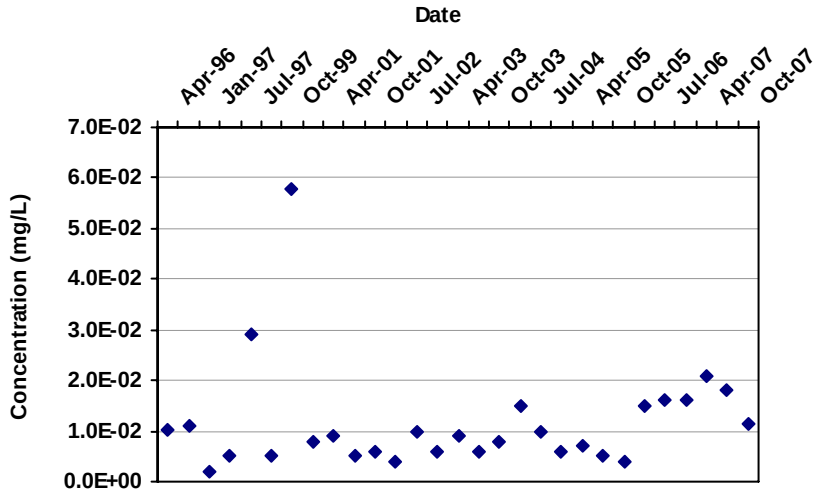
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
FS-9A	S	4/1/2002	Vinyl chloride	6.2E-02		1	1
FS-9A	S	7/1/2002	Vinyl chloride	1.2E-01		1	1
FS-9A	S	10/1/2002	Vinyl chloride	1.2E-01		1	1
FS-9A	S	4/1/2003	Vinyl chloride	1.6E-01		1	1
FS-9A	S	7/1/2003	Vinyl chloride	1.1E-01		1	1
FS-9A	S	10/1/2003	Vinyl chloride	4.0E-02		1	1
FS-9A	S	4/1/2004	Vinyl chloride	2.9E-01		1	1
FS-9A	S	7/1/2004	Vinyl chloride	3.4E-01		1	1
FS-9A	S	10/1/2004	Vinyl chloride	3.9E-01		1	1
FS-9A	S	4/1/2005	Vinyl chloride	3.4E-01		1	1
FS-9A	S	7/1/2005	Vinyl chloride	2.4E-01		1	1
FS-9A	S	10/1/2005	Vinyl chloride	3.3E-01		1	1
FS-9A	S	4/1/2006	Vinyl chloride	1.4E-01		1	1
FS-9A	S	7/1/2006	Vinyl chloride	2.3E-01		1	1
FS-9A	S	10/1/2006	Vinyl chloride	4.6E-02		1	1
FS-9A	S	4/1/2007	Vinyl chloride	1.0E-03	ND	1	0
FS-9A	S	7/1/2007	Vinyl chloride	3.7E-02		1	1
FS-9A	S	10/1/2007	Vinyl chloride	2.2E-02		1	1

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: FS-7
Well Type: T
COC: Vinyl chloride

Time Period: 11/16/1989 **to** 10/15/2007
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: 84

Confidence in Trend: 94.0%

Coefficient of Variation: 0.93

Mann Kendall Concentration Trend: (See Note) PI

Data Table:

Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
FS-7	T	4/1/1996	Vinyl chloride	1.0E-02		3	3
FS-7	T	7/1/1996	Vinyl chloride	1.1E-02		5	5
FS-7	T	1/1/1997	Vinyl chloride	2.0E-03		1	1
FS-7	T	4/1/1997	Vinyl chloride	5.0E-03		2	2
FS-7	T	7/1/1997	Vinyl chloride	2.9E-02		1	1
FS-7	T	1/1/1998	Vinyl chloride	5.0E-03		1	1
FS-7	T	10/1/1999	Vinyl chloride	5.8E-02		1	1
FS-7	T	1/1/2001	Vinyl chloride	8.0E-03		1	1
FS-7	T	4/1/2001	Vinyl chloride	9.0E-03		2	2
FS-7	T	7/1/2001	Vinyl chloride	5.0E-03		1	1
FS-7	T	10/1/2001	Vinyl chloride	6.0E-03		1	1
FS-7	T	4/1/2002	Vinyl chloride	4.0E-03		1	1
FS-7	T	7/1/2002	Vinyl chloride	1.0E-02		1	1
FS-7	T	10/1/2002	Vinyl chloride	6.0E-03		1	1
FS-7	T	4/1/2003	Vinyl chloride	9.0E-03		1	1
FS-7	T	7/1/2003	Vinyl chloride	6.0E-03		1	1
FS-7	T	10/1/2003	Vinyl chloride	8.0E-03		1	1
FS-7	T	4/1/2004	Vinyl chloride	1.5E-02		1	1
FS-7	T	7/1/2004	Vinyl chloride	1.0E-02		1	1
FS-7	T	10/1/2004	Vinyl chloride	6.0E-03		1	1
FS-7	T	4/1/2005	Vinyl chloride	7.0E-03		1	1
FS-7	T	7/1/2005	Vinyl chloride	5.0E-03		1	1

MAROS Mann-Kendall Statistics Summary

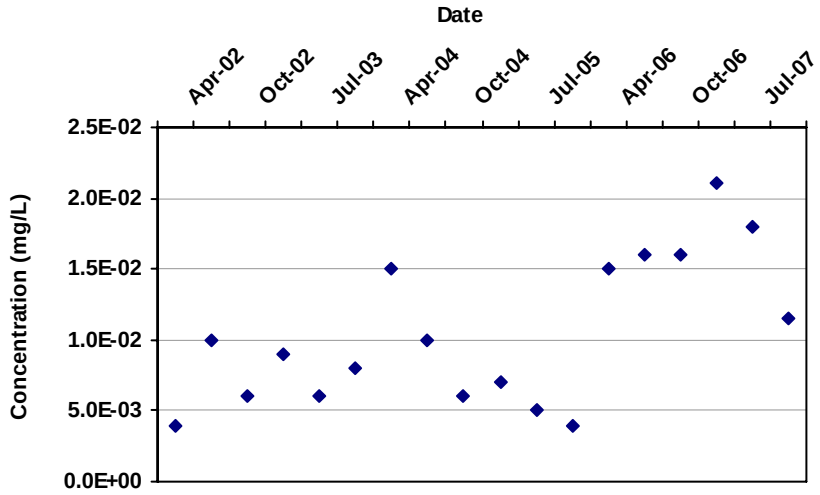
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
FS-7	T	10/1/2005	Vinyl chloride	4.0E-03		1	1
FS-7	T	4/1/2006	Vinyl chloride	1.5E-02		1	1
FS-7	T	7/1/2006	Vinyl chloride	1.6E-02		1	1
FS-7	T	10/1/2006	Vinyl chloride	1.6E-02		1	1
FS-7	T	4/1/2007	Vinyl chloride	2.1E-02		1	1
FS-7	T	7/1/2007	Vinyl chloride	1.8E-02		1	1
FS-7	T	10/1/2007	Vinyl chloride	1.2E-02		2	2

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: FS-7
Well Type: T
COC: Vinyl chloride

Time Period: 1/1/2002 **to** 10/1/2007
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: 60

Confidence in Trend: 98.8%

Coefficient of Variation: 0.50

Mann Kendall Concentration Trend: (See Note) I

Data Table:

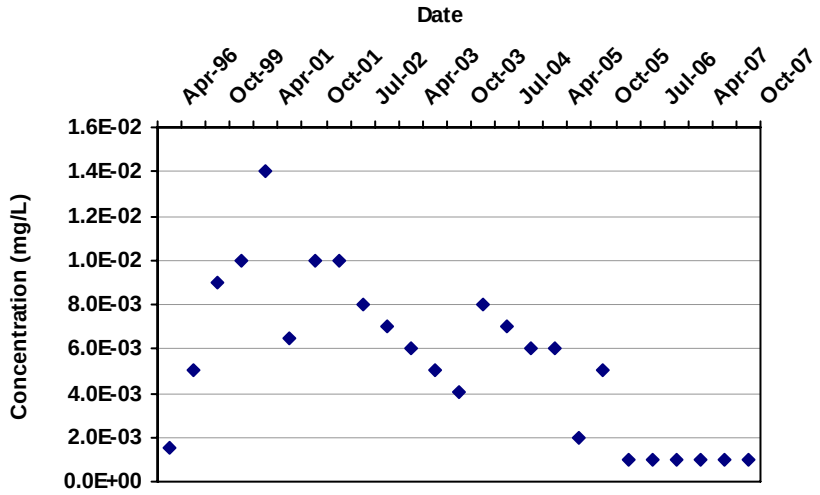
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
FS-7	T	4/1/2002	Vinyl chloride	4.0E-03		1	1
FS-7	T	7/1/2002	Vinyl chloride	1.0E-02		1	1
FS-7	T	10/1/2002	Vinyl chloride	6.0E-03		1	1
FS-7	T	4/1/2003	Vinyl chloride	9.0E-03		1	1
FS-7	T	7/1/2003	Vinyl chloride	6.0E-03		1	1
FS-7	T	10/1/2003	Vinyl chloride	8.0E-03		1	1
FS-7	T	4/1/2004	Vinyl chloride	1.5E-02		1	1
FS-7	T	7/1/2004	Vinyl chloride	1.0E-02		1	1
FS-7	T	10/1/2004	Vinyl chloride	6.0E-03		1	1
FS-7	T	4/1/2005	Vinyl chloride	7.0E-03		1	1
FS-7	T	7/1/2005	Vinyl chloride	5.0E-03		1	1
FS-7	T	10/1/2005	Vinyl chloride	4.0E-03		1	1
FS-7	T	4/1/2006	Vinyl chloride	1.5E-02		1	1
FS-7	T	7/1/2006	Vinyl chloride	1.6E-02		1	1
FS-7	T	10/1/2006	Vinyl chloride	1.6E-02		1	1
FS-7	T	4/1/2007	Vinyl chloride	2.1E-02		1	1
FS-7	T	7/1/2007	Vinyl chloride	1.8E-02		1	1
FS-7	T	10/1/2007	Vinyl chloride	1.2E-02		2	2

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: FS-4
Well Type: T
COC: Vinyl chloride

Time Period: 11/16/1989 **to** 10/15/2007
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: -164

Confidence in Trend: 100.0%

Coefficient of Variation: 0.67

Mann Kendall Concentration Trend: (See Note) D

Data Table:

Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
FS-4	T	4/1/1996	Vinyl chloride	1.5E-03		4	1
FS-4	T	7/1/1997	Vinyl chloride	5.0E-03		1	1
FS-4	T	10/1/1999	Vinyl chloride	9.0E-03		1	1
FS-4	T	1/1/2001	Vinyl chloride	1.0E-02		1	1
FS-4	T	4/1/2001	Vinyl chloride	1.4E-02		1	1
FS-4	T	7/1/2001	Vinyl chloride	6.5E-03		2	2
FS-4	T	10/1/2001	Vinyl chloride	1.0E-02		1	1
FS-4	T	4/1/2002	Vinyl chloride	1.0E-02		1	1
FS-4	T	7/1/2002	Vinyl chloride	8.0E-03		1	1
FS-4	T	10/1/2002	Vinyl chloride	7.0E-03		1	1
FS-4	T	4/1/2003	Vinyl chloride	6.0E-03		1	1
FS-4	T	7/1/2003	Vinyl chloride	5.0E-03		1	1
FS-4	T	10/1/2003	Vinyl chloride	4.0E-03		1	1
FS-4	T	4/1/2004	Vinyl chloride	8.0E-03		1	1
FS-4	T	7/1/2004	Vinyl chloride	7.0E-03		1	1
FS-4	T	10/1/2004	Vinyl chloride	6.0E-03		1	1
FS-4	T	4/1/2005	Vinyl chloride	6.0E-03		1	1
FS-4	T	7/1/2005	Vinyl chloride	2.0E-03		1	1
FS-4	T	10/1/2005	Vinyl chloride	5.0E-03		1	1
FS-4	T	4/1/2006	Vinyl chloride	1.0E-03	ND	1	0
FS-4	T	7/1/2006	Vinyl chloride	1.0E-03	ND	1	0
FS-4	T	10/1/2006	Vinyl chloride	1.0E-03	ND	1	0

MAROS Mann-Kendall Statistics Summary

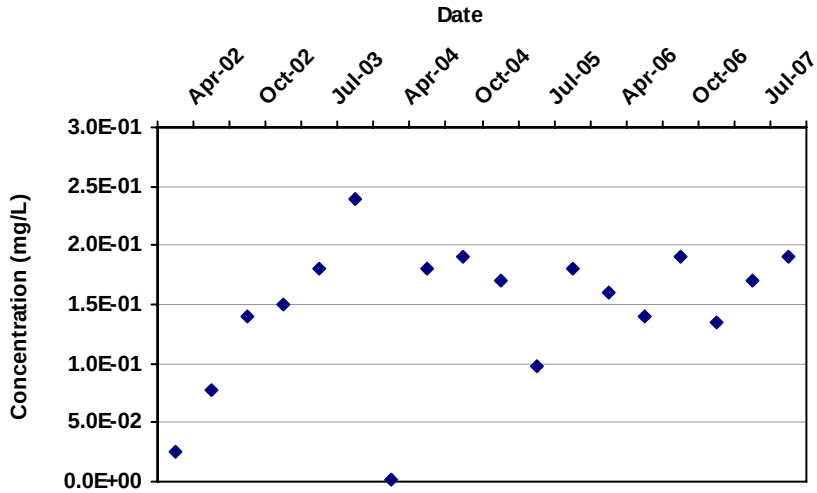
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
FS-4	T	4/1/2007	Vinyl chloride	1.0E-03	ND	1	0
FS-4	T	7/1/2007	Vinyl chloride	1.0E-03	ND	1	0
FS-4	T	10/1/2007	Vinyl chloride	1.0E-03	ND	1	0

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: B-6R
Well Type: S
COC: Vinyl chloride

Time Period: 1/1/2002 **to** 10/1/2007
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: 37

Confidence in Trend: 91.2%

Coefficient of Variation: 0.41

Mann Kendall Concentration Trend: (See Note) PI

Data Table:

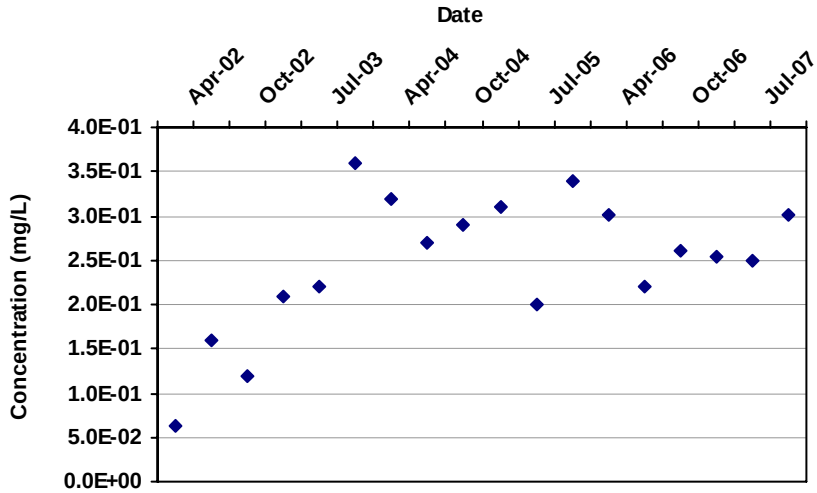
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
B-6R	S	4/1/2002	Vinyl chloride	2.6E-02		1	1
B-6R	S	7/1/2002	Vinyl chloride	7.7E-02		1	1
B-6R	S	10/1/2002	Vinyl chloride	1.4E-01		1	1
B-6R	S	4/1/2003	Vinyl chloride	1.5E-01		1	1
B-6R	S	7/1/2003	Vinyl chloride	1.8E-01		1	1
B-6R	S	10/1/2003	Vinyl chloride	2.4E-01		1	1
B-6R	S	4/1/2004	Vinyl chloride	2.5E-03	ND	1	0
B-6R	S	7/1/2004	Vinyl chloride	1.8E-01		1	1
B-6R	S	10/1/2004	Vinyl chloride	1.9E-01		1	1
B-6R	S	4/1/2005	Vinyl chloride	1.7E-01		1	1
B-6R	S	7/1/2005	Vinyl chloride	9.7E-02		1	1
B-6R	S	10/1/2005	Vinyl chloride	1.8E-01		1	1
B-6R	S	4/1/2006	Vinyl chloride	1.6E-01		1	1
B-6R	S	7/1/2006	Vinyl chloride	1.4E-01		2	2
B-6R	S	10/1/2006	Vinyl chloride	1.9E-01		1	1
B-6R	S	4/1/2007	Vinyl chloride	1.4E-01		2	2
B-6R	S	7/1/2007	Vinyl chloride	1.7E-01		1	1
B-6R	S	10/1/2007	Vinyl chloride	1.9E-01		1	1

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: B-6R
Well Type: S
COC: cis-1,2-Dichloroethylene

Time Period: 1/1/2002 **to** 10/1/2007
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: 41

Confidence in Trend: 93.4%

Coefficient of Variation: 0.31

Mann Kendall Concentration Trend: (See Note) PI

Data Table:

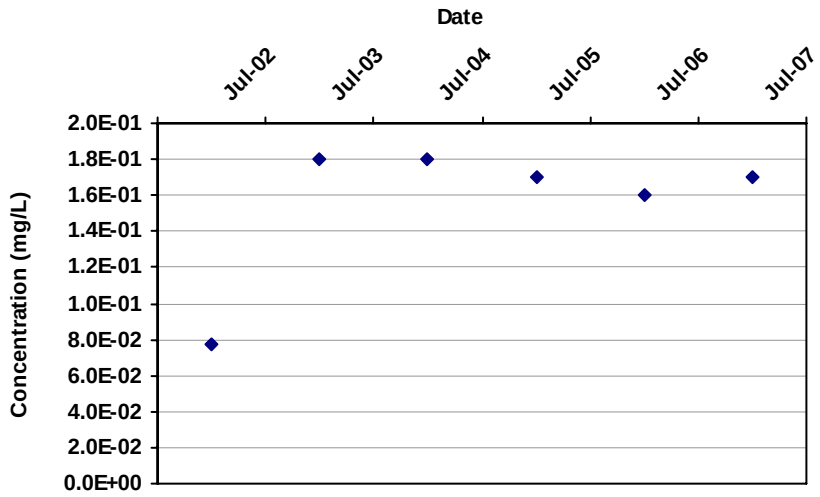
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
B-6R	S	4/1/2002	cis-1,2-Dichloroethylene	6.4E-02		1	1
B-6R	S	7/1/2002	cis-1,2-Dichloroethylene	1.6E-01		1	1
B-6R	S	10/1/2002	cis-1,2-Dichloroethylene	1.2E-01		1	1
B-6R	S	4/1/2003	cis-1,2-Dichloroethylene	2.1E-01		1	1
B-6R	S	7/1/2003	cis-1,2-Dichloroethylene	2.2E-01		1	1
B-6R	S	10/1/2003	cis-1,2-Dichloroethylene	3.6E-01		1	1
B-6R	S	4/1/2004	cis-1,2-Dichloroethylene	3.2E-01		1	1
B-6R	S	7/1/2004	cis-1,2-Dichloroethylene	2.7E-01		1	1
B-6R	S	10/1/2004	cis-1,2-Dichloroethylene	2.9E-01		1	1
B-6R	S	4/1/2005	cis-1,2-Dichloroethylene	3.1E-01		1	1
B-6R	S	7/1/2005	cis-1,2-Dichloroethylene	2.0E-01		1	1
B-6R	S	10/1/2005	cis-1,2-Dichloroethylene	3.4E-01		1	1
B-6R	S	4/1/2006	cis-1,2-Dichloroethylene	3.0E-01		1	1
B-6R	S	7/1/2006	cis-1,2-Dichloroethylene	2.2E-01		2	2
B-6R	S	10/1/2006	cis-1,2-Dichloroethylene	2.6E-01		1	1
B-6R	S	4/1/2007	cis-1,2-Dichloroethylene	2.6E-01		2	2
B-6R	S	7/1/2007	cis-1,2-Dichloroethylene	2.5E-01		1	1
B-6R	S	10/1/2007	cis-1,2-Dichloroethylene	3.0E-01		1	1

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: B-6R
Well Type: S
COC: Vinyl chloride

Time Period: 1/1/2002 **to** 10/1/2007
Consolidation Period: Yearly
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: -1

Confidence in Trend: 50.0%

Coefficient of Variation: 0.25

Mann Kendall Concentration Trend: (See Note) S

Data Table:

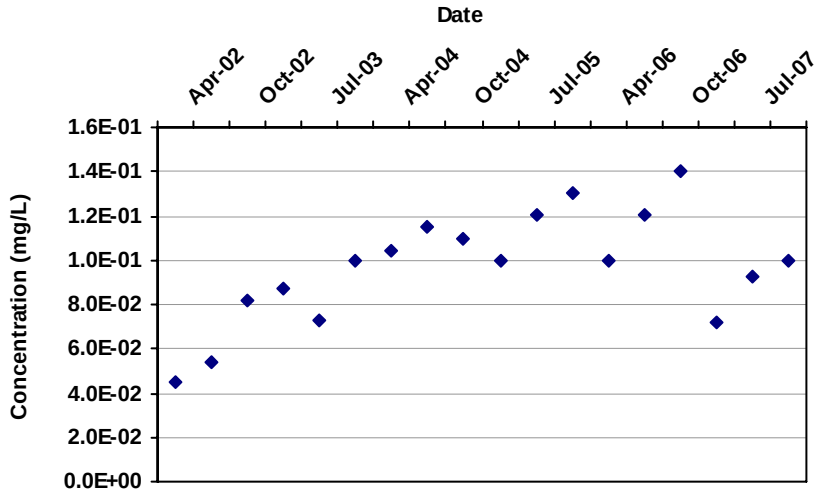
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
B-6R	S	7/1/2002	Vinyl chloride	7.7E-02		3	3
B-6R	S	7/1/2003	Vinyl chloride	1.8E-01		3	3
B-6R	S	7/1/2004	Vinyl chloride	1.8E-01		3	2
B-6R	S	7/1/2005	Vinyl chloride	1.7E-01		3	3
B-6R	S	7/1/2006	Vinyl chloride	1.6E-01		3	3
B-6R	S	7/1/2007	Vinyl chloride	1.7E-01		3	3

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: OB-5R
Well Type: S
COC: Vinyl chloride

Time Period: 1/1/2002 **to** 10/1/2007
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: 62

Confidence in Trend: 99.0%

Coefficient of Variation: 0.26

Mann Kendall Concentration Trend: (See Note) I

Data Table:

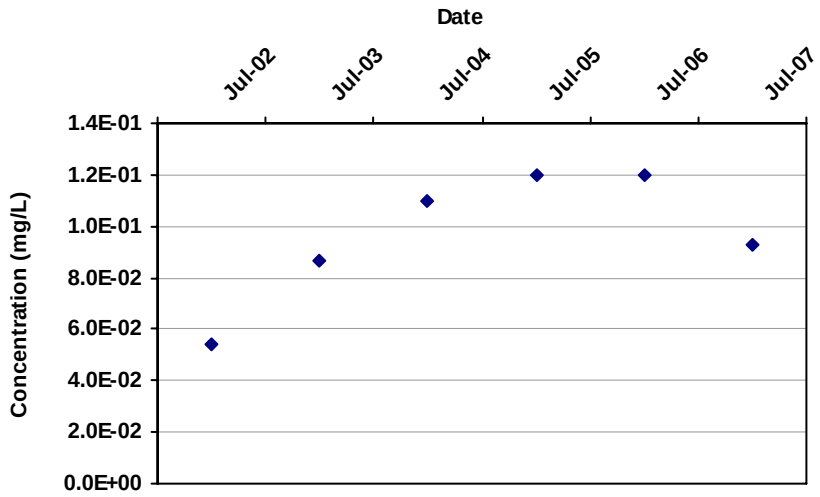
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
OB-5R	S	4/1/2002	Vinyl chloride	4.5E-02		1	1
OB-5R	S	7/1/2002	Vinyl chloride	5.4E-02		1	1
OB-5R	S	10/1/2002	Vinyl chloride	8.2E-02		1	1
OB-5R	S	4/1/2003	Vinyl chloride	8.7E-02		1	1
OB-5R	S	7/1/2003	Vinyl chloride	7.3E-02		1	1
OB-5R	S	10/1/2003	Vinyl chloride	1.0E-01		1	1
OB-5R	S	4/1/2004	Vinyl chloride	1.0E-01		2	2
OB-5R	S	7/1/2004	Vinyl chloride	1.2E-01		2	2
OB-5R	S	10/1/2004	Vinyl chloride	1.1E-01		1	1
OB-5R	S	4/1/2005	Vinyl chloride	1.0E-01		1	1
OB-5R	S	7/1/2005	Vinyl chloride	1.2E-01		1	1
OB-5R	S	10/1/2005	Vinyl chloride	1.3E-01		1	1
OB-5R	S	4/1/2006	Vinyl chloride	1.0E-01		1	1
OB-5R	S	7/1/2006	Vinyl chloride	1.2E-01		1	1
OB-5R	S	10/1/2006	Vinyl chloride	1.4E-01		1	1
OB-5R	S	4/1/2007	Vinyl chloride	7.2E-02		1	1
OB-5R	S	7/1/2007	Vinyl chloride	9.3E-02		1	1
OB-5R	S	10/1/2007	Vinyl chloride	1.0E-01		1	1

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: OB-5R
Well Type: S
COC: Vinyl chloride

Time Period: 1/1/2002 **to** 10/1/2007
Consolidation Period: Yearly
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: 8

Confidence in Trend: 89.8%

Coefficient of Variation: 0.26

Mann Kendall Concentration Trend: (See Note) NT

Data Table:

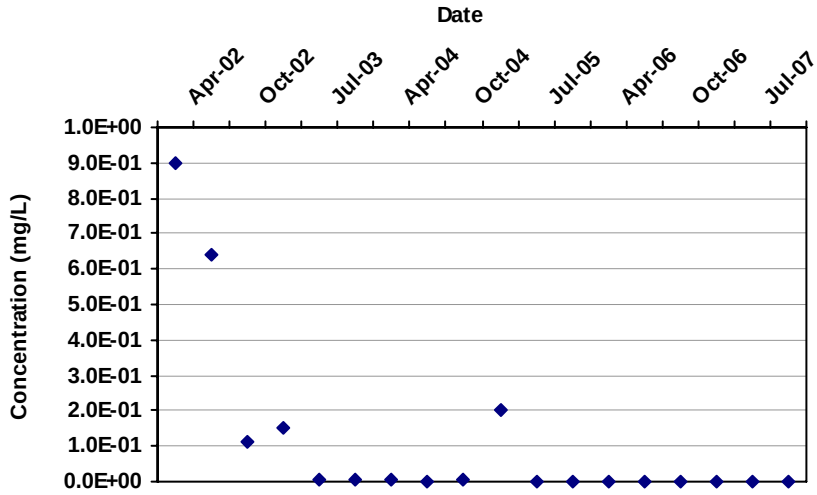
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
OB-5R	S	7/1/2002	Vinyl chloride	5.4E-02		3	3
OB-5R	S	7/1/2003	Vinyl chloride	8.7E-02		3	3
OB-5R	S	7/1/2004	Vinyl chloride	1.1E-01		3	3
OB-5R	S	7/1/2005	Vinyl chloride	1.2E-01		3	3
OB-5R	S	7/1/2006	Vinyl chloride	1.2E-01		3	3
OB-5R	S	7/1/2007	Vinyl chloride	9.3E-02		3	3

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: OB-23R
Well Type: S
COC: trichloroethylene (TCE)

Time Period: 1/1/2002 **to** 10/1/2007
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: Specified Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: -93

Confidence in Trend: 100.0%

Coefficient of Variation: 2.21

Mann Kendall Concentration Trend: (See Note) D

Data Table:

Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
OB-23R	S	4/1/2002	trichloroethylene (TCE)	9.0E-01		1	1
OB-23R	S	7/1/2002	trichloroethylene (TCE)	6.4E-01		2	2
OB-23R	S	10/1/2002	trichloroethylene (TCE)	1.1E-01		1	1
OB-23R	S	4/1/2003	trichloroethylene (TCE)	1.5E-01		1	1
OB-23R	S	7/1/2003	trichloroethylene (TCE)	7.7E-03		1	1
OB-23R	S	10/1/2003	trichloroethylene (TCE)	6.6E-03		1	1
OB-23R	S	4/1/2004	trichloroethylene (TCE)	6.8E-03		1	1
OB-23R	S	7/1/2004	trichloroethylene (TCE)	1.0E-03	ND	1	0
OB-23R	S	10/1/2004	trichloroethylene (TCE)	7.6E-03		1	1
OB-23R	S	4/1/2005	trichloroethylene (TCE)	2.1E-01		2	2
OB-23R	S	7/1/2005	trichloroethylene (TCE)	1.0E-03	ND	1	0
OB-23R	S	10/1/2005	trichloroethylene (TCE)	1.0E-03	ND	1	0
OB-23R	S	4/1/2006	trichloroethylene (TCE)	1.0E-03	ND	1	0
OB-23R	S	7/1/2006	trichloroethylene (TCE)	1.0E-03	ND	1	0
OB-23R	S	10/1/2006	trichloroethylene (TCE)	1.0E-03	ND	1	0
OB-23R	S	4/1/2007	trichloroethylene (TCE)	1.0E-03	ND	1	0
OB-23R	S	7/1/2007	trichloroethylene (TCE)	1.0E-03	ND	1	0
OB-23R	S	10/1/2007	trichloroethylene (TCE)	1.0E-03	ND	2	0

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

Acronyms

ACRONYMS

CE	chlorinated ethene
cDCE	*cis*–1,2–dichloroethene
CTW	chemical treatment wall
DCE	1,1–dichloroethene
DCM	dichloromethane
EMS	EMS Environmental Management Support, Inc.
GMZ	groundwater management zone
ICL	interim cleanup level
LTMO	long-term monitoring optimization
MAROS	Monitoring and Remediation Optimization Software
NA	natural attenuation
PCE	tetrachloroethene
PLC	permeable landfill cover
POC	point of compliance
PRA	preferred remedial action
ROD	record of decision
SAP	site sampling and analysis plan
TCE	trichloroethene
tDCE	*trans*–1,2–dichloroethene
UCL	Upper Confidence Level
U.S. EPA	United States Environmental Protection Agency
VC	vinyl chloride

VOC	volatile organic compound
ZVI	zero-valent iron