

**ANNUAL OPERATION & MAINTENANCE (O&M) AND
MONITORING REPORT
JULY 2012 THROUGH JUNE 2013
SAUNDERS SUPPLY COMPANY SUPERFUND SITE
CHUCKATUCK, VIRGINIA**

July 12, 2013

Prepared for:

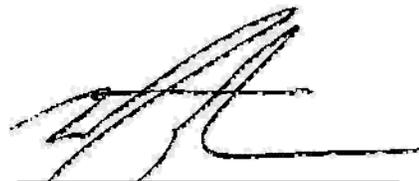
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1.0 INTRODUCTION

Environmental Alliance, Inc. (Alliance) has prepared this Annual Operation and Maintenance (O&M) and Monitoring Report for the groundwater extraction and treatment system at the Saunders Supply Company Superfund Site in Chuckatuck, Virginia (the site). This report has been prepared under a contract with the Virginia Department of Environmental Quality (VADEQ). The purpose of this report is to present groundwater monitoring results from October 2012 and April 2013 as well as system performance monitoring results for the period from July 2012 through June 2013, with historical results for both groundwater and treatment system monitoring.

1.1 Site Location

The site is located at 5969 Godwin Boulevard in the unincorporated community of Chuckatuck, Virginia, within the City of Suffolk. The site encompasses 7.3 acres and consists of the Saunders Supply Company and Kelly Nursery properties. The Saunders Supply Company property is the location of a former wood treatment facility and is currently used as a wholesale lumberyard. The Saunders Supply Company also owns and operates a hardware store located several hundred feet south and upgradient of the former wood treating facility, which is not part of the site. The Kelly Nursery and residence is located immediately to the north, and operates as a year-round nursery that grows and retails various annual and perennial flowers and potted plants. With the exception of recovery well RW-5, which is located on the Saunders property, all the monitoring and recovery wells are located on the Kelly property. The treatment building is located on the Saunders property. A gasoline station and a residential subdivision are located south of the site. Commercial establishments and residences are located east of the site, and a wooded area is located to the west, beyond which agricultural activity exists (CDM, 2009).

The site slopes toward a drainage ditch and Godwin's Mill Pond to the north and an intermittent unnamed stream to the west. The ditch and stream discharge to the Mill Pond. Godwin's Mill Pond is located approximately 500 feet north of the Saunders Supply property, and is used as a municipal drinking water source for the City of Suffolk. The Mill Pond drains to Chuckatuck Creek. Drainage from the east side of the site is received by storm drains (catch basins) along

Godwin Boulevard (State Route 10/32), which discharge to a drainage swale and are ultimately received by Cedar Creek, located approximately 1 mile to the east of the site (CDM, 2009).

1.2 Site History

The site previously hosted a wood preserving facility that used two processes in its wood treating operations. These operations included the use of pentachlorophenol (PCP) and copper, chromium, and arsenic (CCA). The facility ceased all wood treating operations in 1991.

The site was proposed for the National Priorities List (NPL) in January 1987. A Remedial Investigation / Feasibility Study (RI/FS) was conducted from September 1988 until May 1991. A Record of Decision (ROD) was signed by EPA in September 1991, which selected the remedy for the site that included the following components:

- Excavation, dechlorination treatment, and off-site disposal of contaminated sediments from the wastewater pond and former earthen separation pond.
- Excavation, low temperature thermal desorption treatment, and off-site disposal of site soils and sediments from the storm drain.
- Treatment of groundwater during the dewatering process prior to excavating the soil.
- Scarification of the top one inch of the concrete pads and solidification treatment and off-site disposal of the remainder of the pads.
- Cleaning and slip lining the storm drain.
- Groundwater monitoring.
- Institutional controls.

During routine monitoring conducted at the site for the remedial design, the U.S. Environmental Protection Agency (EPA) detected the presence of PCP and traces of metals such as arsenic and chromium in the groundwater downgradient from the Saunders Supply Company property. Since the groundwater discharges to Godwin's Mill Pond, EPA used its emergency removal

authority during the remedial design to design and construct a system to prevent the impacted groundwater from reaching the pond. A 1996 Amendment to the ROD included the operation of the groundwater extraction and treatment system as an emergency measure to prevent the migration of site contaminants of concern (COCs) toward Godwin's Mill Pond.

The groundwater collection and treatment system began operating in April 1998 with four recovery wells (RW-1 through RW-4) that deliver groundwater to a treatment building for processing (CDM, 2009). Recovery well RW-3, which had caved in, was abandoned by EPA in January 2010, and a new recovery well (RW-5) was installed in January 2010. The major treatment process equipment includes a reaction tank, an air compressor, a settling tank, a bag filter system, activated carbon units, and an effluent tank.

The system has been in operation since 1998 with EPA responsible for system operation and site monitoring through July 14, 2009. On July 15, 2009, site responsibility was officially transferred to the VADEQ, who contracted Alliance to perform routine treatment system O&M and site monitoring activities. During the transitional period from July 15 through August 3, 2009, EPA's contractor (CDM) continued O&M with Alliance observing. On August 4, 2009, Alliance took over sole responsibility for the treatment system O&M on VADEQ's behalf.

1.3 Hydrogeology

Four hydrogeologic units have been identified beneath the site. The units (from shallowest to deepest) are the surficial aquifer, the Yorktown confining zone, the Yorktown-Eastover aquifer, the Potomac confining zone, and the Potomac aquifer (McFarland and Bruce, 2006).

The surficial aquifer (formerly referred to as the Columbia Aquifer) occurs at the land surface, is approximately 18 feet thick across most of the site, and consists of a fine to medium-grained sand with isolated silty and/or marshy clay (Ecology and Environment, 1991). Since this unit occurs immediately beneath the land surface, it is referred to as the shallow zone. The water table occurs in the surficial aquifer. Depths to water vary across the site but average approximately 10 feet, with a saturated thickness of approximately 8 feet (CDM, 2009).

Horizontal hydraulic conductivities of the sand range from 0.045 to 6.4 feet/day (ft/d), averaging 1.1 ft/d (Ecology and Environment, 1991; Weston, 1996). An estimated effective porosity value

for material similar to sands encountered in this aquifer is 0.35. Vertical conductivities calculated from material from the fine grained deposits of the surficial aquifer range from 3.0×10^{-5} to 6.0×10^{-3} ft/d (Ecology and Environment, 1991). An estimated effective porosity of similar material is 0.20.

The confining layer immediately underlying the shallow zone has been reported to vary in thickness across the site. The transition zone between the shallow zone and the confining layer contains greenish gray clay lenses and fine silts (Ecology and Environment, 1991). Following multiple investigations after 1991, new data concluded that the clay unit appears to be extensive, but discontinuous, dipping to the west, and thinning from north to south (Weston, 1996). Review of the boring logs for the recovery wells and monitoring wells that were installed in 1998 also suggests that this clay unit is discontinuous, varies in lithology, and is not very thick (OHM Remediation Services, 1998). In December 2004, CDM conducted a direct-push technology (DPT) investigation and logged soil borings at five locations to depths ranging from 20 to 76 feet below ground surface (bgs). During this investigation, the Yorktown confining zone varied in lithology from boring to boring. The unit is predominantly a gray silt with shells, but sandy silt and clay are also found beneath the site (CDM, 2009). Horizontal conductivities for this unit range from 0.0094 ft/d to 3.75 ft/d and average 0.1 ft/d (Ecology and Environment, 1991). An estimated effective porosity for material similar to deposits encountered in the unit is 0.25. None of the borings installing during CDM's investigation encountered the Yorktown-Eastover aquifer (CDM, 2009).

In December 2006, CDM conducted a hydrogeological analysis. CDM concluded that the thin, discontinuous clay and fine silt material identified in earlier investigations as the confining unit (Weston, 1996) is actually the transition zone between the surficial aquifer and the Yorktown confining zone. The shallow zone wells (RW-3, RW-4, MW-7S, MW-20S, MW-22S) are located within the surficial aquifer proper, and the deep zone wells (MW-8D, MW-10D, MW-12D, MW-19D, MW-21D, MW-23D) end in the upper, less permeable reaches of the Yorktown confining zone. Several of the wells (RW-1, RW-2, MW-11S, and MW-9S) are screened in both zones (CDM, 2009).

The Yorktown-Eastover aquifer lies beneath the confining layer, at depths greater than 76 feet bgs. The aquifer has been previously reported to be a sandy unit with locally fossiliferous bands and is believed to be up to 100 feet thick in the site area (Ecology and Environment, 1991).

Average reported transmissivity values from aquifer testing of the Yorktown Formation range from approximately 2,000 to 2,675 square feet/day (ft²/d) (CDM, 2009). The average thickness is 50 feet (estimated from transmissivity tests), and the horizontal hydraulic conductivity ranges from 40 to 54 ft/d.

2.0 GROUNDWATER MONITORING

Site-wide groundwater monitoring is conducted on a semi-annual basis, in April and October. Fall sampling of the 11 groundwater monitoring wells and four active recovery wells (RW-1, RW-2, RW-4, and RW-5) was conducted on October 15 and October 16, 2012. Spring sampling of the 11 groundwater monitoring and three active recovery wells (RW-1, RW-2, RW-4, and RW-5) was conducted from April 17 and April 18, 2013.

2.1 Hydraulic Gradient

A round of synoptic groundwater level data was collected from all active/viable monitoring and recovery wells prior to sampling during the October 2012 and April 2013 sampling events.

Depth to water measurements and calculated groundwater elevations are presented on Table 1.

Groundwater contours for the shallow zone (Figure 1) during October 2012 indicate a regional hydraulic gradient to the north-northwest across the site and cones of depression surrounding recovery wells RW-1, RW-2, and RW-4.

Groundwater contours for the shallow zone (Figure 2) during April 2013 indicate a regional hydraulic gradient to the north-northwest across the site and cones of depression surrounding pumping wells RW-2 and RW-4. Although there are insufficient data points surrounding RW-5, RW-5 also appears to be creating a cone of depression around it on the April 2013 groundwater contour map.

Additionally, the contours indicate that the recovery wells are providing hydraulic control of the PCP, arsenic, and chromium plumes at the site.

Groundwater contours for the deep zone (Figure 3 – October 2012 and Figure 4 – April 2013) indicate a hydraulic gradient to the north-northwest across the site toward Godwin's Mill Pond. This is consistent with historical groundwater contour maps.

2.2 Groundwater Sampling Procedures

Groundwater monitoring wells were sampled using low-flow purging and sampling methods in accordance with the site *Sampling and Analysis Plan* (SAP; Alliance, 2009). Field data sheets

for the semi-annual sampling events in October 2012 and April 2013 are included in Appendix I. The recovery wells were sampled from ports located within the treatment system building. Dissolved metals samples were filtered by the analytical laboratory. Collected samples were containerized into laboratory-supplied and preserved bottleware, stored on ice, and shipped to REI Consultants, Inc. (REIC) of Beaver, West Virginia under standard chain-of-custody protocols. Copies of chains of custody are included in the laboratory analytical reports in Appendix II. All groundwater samples were analyzed for PCP, total and dissolved arsenic, and total and dissolved chromium. Additionally, the samples from MW-8D were analyzed for benzo(a) pyrene, benzo(b) fluoranthene, benzo (g,h,i) perylene, benzo(k) fluoranthene, dibenzo(a,h) anthracene, and indeno(1,2,3-cd) pyrene. Samples from MW-7S were also analyzed for antimony, barium, cobalt, copper, cyanide, lead, manganese, nickel, selenium, and zinc.

2.3 Groundwater Sampling Results

Groundwater monitoring wells and recovery wells were sampled in October 2012 and April 2013. Laboratory analytical data reports are included in Appendix II. Sampling results from the October 2012 event are presented on Table 2, and results from the April 2013 event are presented on Table 3. Historical sampling results, including those from October 2012 and April 2013, are presented on Table 4. Shallow zone groundwater analytical data from the October 2012 and April 2013 sampling events are plotted on Figures 5 and 6, respectively. Deep zone groundwater analytical data from the October 2012 and April 2013 sampling events are plotted on Figures 7 and 8, respectively.

2.3.1 PCP Sampling Results

PCP Concentrations

During the October 2012 sampling event, PCP concentrations ranged from below detection limits at MW-9S, MW-19D, MW-20S, MW-22S, MW-23D, and RW-4 to 375 ug/L at RW-5 (Duplicate Sample). PCP concentrations in seven samples (MW-7S, MW-8D, MW-11S, MW-12D, RW-1, RW-2, and RW-5) exceeded the EPA drinking water Maximum Contaminant Level (MCL) of 1 ug/L for PCP during the October 2012 event. During the April 2013 sampling event,

PCP concentrations ranged from below detection limits at MW-10D, MW-11S, MW-12D, MW-19D, MW-20S, MW-21D, MW-22S, MW-23D, RW-4, and RW-5 to 5.80 ug/L at RW-1. PCP concentrations in five wells (MW-7S, MW-8D, MW-9S, RW-1, and RW-2) exceeded the MCL of 1 ug/L during the April 2013 event.

PCP Trend Analysis

PCP concentration trend graphs for the shallow and deep zones are presented in Appendix IV. PCP concentrations in the recovery wells are similar to concentrations reported in previous years and show significant fluctuations. PCP concentrations in RW-5, MW-10D, MW-12D, and MW-21D show a downward trend. Concentrations of PCP in all other monitoring wells are either below the MCL or show significant fluctuations and/or no discernible trend.

2.3.2 Dissolved Arsenic Sampling Results

Dissolved Arsenic Concentrations

During the October 2012 sampling event, dissolved arsenic concentrations ranged from below detection limits at MW-10D, MW-19D, MW-20S, MW-22S, RW-1, RW-2, RW-4, and RW-5 to 1,760 ug/L at MW-7S. Dissolved arsenic concentrations from three samples (MW-7S, MW-8D, and MW-11S) exceeded the MCL of 10 ug/L during the October 2012 event. During the April 2013 sampling event, dissolved arsenic concentrations ranged from below detection limits at MW-9S, MW-10D, MW-11S, MW-12D, MW-19D, MW-20S, MW-21D, MW-22S, MW-23D, RW-1, RW-2, RW-4, and RW-5 to 1,960 ug/L at MW-8D. Dissolved arsenic concentrations from two samples (MW-7S and MW-8D) exceeded the MCL of 10 ug/L during the April 2013 event.

Dissolved Arsenic Trend Analysis

Dissolved arsenic concentration trend graphs for the shallow and deep zones are presented in Appendix IV. With the exception of monitoring well MW-7S, dissolved arsenic concentrations in the shallow zone monitoring wells and recovery wells generally show fluctuating trends over time, but concentrations remain below the arsenic MCL of 10 ug/L. Shallow zone monitoring well MW-7S does not appear to have a discernible trend and fluctuates significantly, with

concentrations generally orders of magnitude above the MCL.

With the exception of monitoring well MW-8D, dissolved arsenic concentrations in deep zone monitoring wells were similar to previous monitoring events, showing some fluctuation but remaining below the arsenic MCL. Monitoring well MW-8D shows an increasing trend in dissolved arsenic concentrations with concentrations generally orders of magnitude above the arsenic MCL.

2.3.3 Chromium Sampling Results

Dissolved Chromium Concentrations

During the October 2012 sampling event, dissolved chromium ranged from below detection limits at MW-19D, MW-20S, MW-21D, MW-22S, MW-23D, RW-1, W-2, RW-4, and RW-5 to 91.4 ug/L at MW-9S. Dissolved chromium concentrations were all below the MCL of 100 ug/L in all samples from the October 2012 event. During the April 2013 sampling event, dissolved chromium ranged from below detection limits at MW-11S, MW-12D, MW-19D, MW-20S, MW-21D, MW-22S, MW-23D, RW-1, RW-2, RW-4, and RW-5 to 57.5 ug/L at MW-8D. Dissolved chromium concentrations were all below the MCL of 100 ug/L in all samples from the April 2013 event.

Dissolved Chromium Trend Analysis

Dissolved chromium concentrations trend graphs for the shallow and deep zones are attached in Appendix IV. With the exception of monitoring well MW-9S, dissolved chromium concentrations in the shallow zone monitoring wells and recovery wells are generally consistent over time, with concentrations remaining below the chromium MCL of 100 ug/L. Monitoring well MW-9S shows a decrease in chromium concentrations over time, with the concentration remaining below the MCL since October 2009. Dissolved chromium concentrations in the deep zone monitoring wells are consistent with previous monitoring events, fluctuating somewhat but remaining below the chromium MCL.

3.0 GROUNDWATER EXTRACTION SYSTEM OPERATION & MONITORING

The purpose of the groundwater extraction system is to extract contaminated groundwater from the surficial aquifer, thereby preventing the migration of PCP and metals (arsenic and chromium) to Godwin's Mill Pond, a source of drinking water for the City of Suffolk.

3.1 Groundwater Extraction System Operation

The system has been operated for EPA by the following contractors and government organizations since April 1998: Roy F. Weston (Removal Program contractor) from April 1998 to June 1999 (when the project was transferred to the Remedial Program), United States Army Corp of Engineers from July 1999 to October 1999 (when the Remedial Program contractor was secured), Horne Engineering from November 1999 to September 2001, IMS Environmental Services from October 2001 to October 2002, and CDM from November 2002 (CDM, 2009) to August 2009. The system has been operated by Alliance from August 2009 to the present.

3.1.1 Groundwater Extraction System Configuration

The groundwater extraction system consists of four recovery wells (RW-1, RW-2, RW-4, and RW-5) installed along the axis of the groundwater COC plume. A previous recovery well, RW-3, caved in and was abandoned by EPA's contractor in January 2010. Recovery well RW-5 was installed by EPA's contractor in January 2010 in an effort to increase the recovery of PCP near the former wood treating process area on the Saunders Supply property. Each 6-inch diameter recovery well is constructed of Schedule 40 PVC, 0.010-inch slotted well screen, and riser casing. With the exception of RW-5, each well has a solid PVC sump at the bottom. The top of each well is enclosed in a steel vault that is flush with the ground surface.

Each well is equipped with a 4-inch diameter, ½-horsepower submersible pump. Water level transducers are located in each well to allow for cycling of the pumps within a programmed range of water in the well. At high water levels, the pumps start. When drawdown reaches the low water levels, the pumps stop. To prevent overfilling, the pumps also stop if the treatment system's holding tank (T-2) is filled. Individual discharge lines and control and power conduits for each well are located in a trench that runs to the treatment building. Within the building,

each discharge line has a flowmeter that indicates flow rate and records total flow, as well as a valve to control the flow to meet the flow rate settings. Level controllers and pump motor starters are mounted in the treatment building.

A target drawdown for each well was established during system startup in April 1998 based on an evaluation of the groundwater extraction system performance to achieve capture of the contaminant plume. Initially, the target drawdown was set at 5 feet for each well. The minimum drawdown was measured in 2005 and determined to range from 3.3 to 7.1 feet below the non-pumping water level, which fluctuates due to seasonal variations in the water table elevation (CDM, 2009).

3.1.2 Groundwater Treatment System Configuration

The extraction system delivers groundwater to the treatment building to remove contaminants prior to discharge to the storm drain located along Godwin Boulevard (State Route 10/32). The sequence of groundwater treatment is as follows:

- Reaction tank (T-1). Groundwater is mixed with a solution of soda ash (sodium carbonate) and mixed with air from an air compressor to allow for the precipitation of iron and other heavy metals.
- Settling tank (T-2). Water flows from the reaction tank to the settling and holding tank, which also collects precipitated iron and other solids that settle.
- Bag filters. Four bag filters operate in series (first stage with 50-micron filters and second stage with 25-micron filters) and parallel to remove solids. The bag filters were installed in March 2010 to replace the original sand filter system.
- Granular activated carbon (GAC) vessels. To remove PCP, four activated carbon units are arranged in two parallel groups (C1 and C2), which each consist of two drums in series resulting in a two-stage treatment of the effluent.
- Collection (holding) tank (T-3). Effluent from the carbon units is collected in a holding tank prior to discharging to the storm drain.

3.1.3 Treatment System Operation and Maintenance Activities

Treatment system operation and maintenance (O&M) was conducted in general accordance with the *Groundwater Extraction and Treatment System Operations and Maintenance Manual* (CDM, 2003). Routine treatment system O&M is performed on a weekly basis and includes recording totalizer and pH readings with pH adjustment. Adjustments are completed by the addition of soda ash to the soda ash feed tank. In addition, periodic cleaning of system components such as the chemical feed pump is completed. Weekly maintenance checks and a comprehensive monthly inspection are performed.

Pump maintenance is a primary maintenance activity at the site. Iron-scale buildup and fouling of the impellers periodically clog the extraction pumps and reduce the flow rate over time. The reduced flow can be compensated for manually within the treatment system building by opening the flow valve. Once the flow decreases to below the minimum flow rate of approximately 1.5 gallons per minute (gpm) and the valve is fully open (i.e., lowest flow cannot be compensated), the pumps are pulled and the impellers are cleaned, or if necessary, replaced. This activity is performed every other month to every month depending on flow readings.

System monitoring visits were conducted weekly from July 2012 through June 2013. Copies of the weekly system monitoring checklists and monthly critical device checklists from July 2012 through June 2013 are included in Appendix III. The groundwater extraction and treatment system has been operational throughout the reporting period with the exception of the periods as described below. In addition to the routine system monitoring and maintenance, the following maintenance activities were performed during the reporting period:

- On July 3, 2012, the system was shut down upon arrival to the site due to no electrical power at the main control panel. Alliance contacted Dominion Power to troubleshoot electrical service to treatment plant. Dominion Power confirmed that the electrical service to the plant was within normal specifications. Alliance personnel found the issue to be related to a failed breaker in the system main breaker panel. The breaker was replaced, and the system was returned to normal operation.

- On September 12, 2012, Alliance personnel installed a locking hasp on the front doors of the system building.
- On October 9, 2012, Alliance personnel replaced the mixing tank pH probe. The previous probe was malfunctioning.
- On December 5, 2012, the system was shut down upon arrival due to a leaking GAC filter drum. It appeared that the GAC filter drum had developed a leak due to corrosion. On December 10, 2012, Alliance personnel installed a replacement GAC filter drum and filled the replacement drum with water to allow the carbon to off-gas. While attempting to restart the system on December 18, 2012, Alliance personnel found that the GAC filter drum piping needed to be replaced due to corrosion and scaling. Piping repairs were completed on December 19, 2012, and the system was restarted. The GAC filter disposal manifest is attached in Appendix V.
- On January 22, 2013, the system building ventilation fan was found to be disconnected from the motor shaft due to a bird flying into the fan.
- On February 4, 2013, a minor plumbing leak was repaired in the GAC piping.
- On March 4, 2013, a check valve was installed in the RW-5 discharge line to mitigate pump failure issues.
- On May 21, 2013, the RW-5 timer relay was adjusted to mitigate pump failures.
- On June 3, 2013, the system building was found to be flooded on arrival due to a plumbing failure in the sand filter pump piping. Due to the flooding, power was immediately cut to the system to prevent further damage and ensure safety. Alliance returned to the site on June 4, 2013, and pumped the water from the building containment into the settling tank, repaired the sand filter pump piping, and restarted the remediation system. All system components appeared to be operational upon restarting the system.

- On June 24, 2013, Alliance met with an electrical contractor to assess the damaged ventilation fan. Upon inspection, the electrician confirmed that the ventilation fan had sustained damage and new fan components would need to be ordered and installed.

3.1.4 Volume of Groundwater Extracted

During the reporting period, the treatment system recovered groundwater via recovery wells RW-1, RW-2, RW-4, and RW-5.

Table 5 presents a summary of system groundwater recovery data. During the reporting period, a total of 135,224 gallons of groundwater was extracted from beneath the site. Of this total volume, 12% was recovered from RW-1, 13% from RW-2, 26 % from RW-4, and 49 % from RW-5. The total volume extracted during the period from July 2012 through June 2013 is approximately equivalent to 11,269 gallons per month.

3.2 Treatment System Monitoring

The *ROD Amendment* dated September 1996 (EPA, 1996) specifies that the groundwater remedy performance standards are to monitor the site groundwater for PCP, arsenic, and chromium, which were the only contaminants associated with operations at the site detected at elevated levels in the groundwater. In particular, the cleanup level of 1 ug/L for PCP is required to be met in both the surficial aquifer and the Yorktown-Eastover aquifer. In addition, the O&M Manual developed for the system (CDM, 2003) specifies the following discharge limits based on the MCLs:

- PCP = 1 ug/L
- Arsenic = 10 ug/L
- Chromium = 100 ug/L

3.2.1 Monthly Sampling Activities

To monitor the treatment system's effectiveness in removing PCP, arsenic, and chromium from extracted site groundwater, system samples are collected on a monthly basis per the *O&M Manual* (CDM, 2003) and the *SAP* (Alliance, 2010) from after the settling tank (designated "INFLUENT") and after the first set of GAC vessels (designated "C1"). Monthly system samples collected during the reporting period were submitted under standard chain-of-custody protocols to REIC Laboratories of Beaver, West Virginia for analysis of PCP, total and dissolved arsenic, and total and dissolved chromium. Copies of chains of custody forms are included with the laboratory analytical reports in Appendix II.

3.2.2 Treatment System Sampling Results

Table 6 presents a summary of system sampling data from July 2012 through June 2013. The following summarizes the system sampling data collected from the "INFLUENT" during the reporting period:

- PCP ranged from below detection limits to 0.443 ug/L
- Total arsenic ranged from below detection limits to 1.75 ug/L
- Dissolved arsenic was not reported above the detection limits
- Total chromium ranged from below detection limits to 2.25 ug/L
- Dissolved chromium from below the detection limits to 1.42 ug/L

The following summarizes the system sampling data collected from the "C1" location (between upstream and downstream GAC vessels) during the reporting period:

- PCP was not reported above the detection limits
- Total arsenic was not detected above the detection limits
- Dissolved arsenic was not reported above the detection limits

- Total chromium was not reported above the detection limits
- Dissolved chromium was not reported above the detection limits

The discharge limits (MCLs) were not exceeded past the first stage of GAC filtration during the monitoring period.

4.0 SYSTEM PERFORMANCE EVALUATION

4.1 Arsenic and Chromium Mass Removal Efficiency

To estimate the arsenic and chromium removal efficiency of the system, the groundwater analytical data from October 2012 and April 2013 from the active recovery wells (RW-1, RW-2, RW-4, and RW-5) was averaged to estimate the “raw water” concentration entering the system. This was compared to the October 2012 and April 2013 concentrations from the “INFLUENT” (post-settling tank) to calculate the percent removal efficiency across the system. Table 7 presents these calculations. The October 2012 data indicate that the system removed approximately 91% to 100% of arsenic. Chromium removal was calculated at 88% to 100% across the system during the reporting period. The April 2013 data indicate that the system removed approximately 74% to 100% of arsenic. Chromium removal was calculated at 76% to 100% across the system during the reporting period. It should be noted that lower calculated removal efficiencies reflect averaging of low to non-detect arsenic and chromium concentrations rather than a true reduction in treatment efficiency. Removal of the arsenic and chromium is achieved by settling of suspended solids and precipitation of dissolved solids in the settling tank following aeration and treatment with soda ash.

4.2 Mass Recovery Estimate

Table 8 presents a mass recovery estimate for PCP, arsenic, and chromium during the period from July 2012 through June 2013. The mass estimate calculations utilized the groundwater analytical data from October 2012 and April 2013 from the active recovery wells (RW-1, RW-2, RW-4, and RW-5) and the total groundwater volume extracted readings collected during the weekly O&M visits. The mass estimate indicates that during the reporting period, the system recovered approximately:

- 0.1001 pounds of PCP.
- 0.003 pounds of arsenic.
- 0.002 pounds of chromium.

The above estimates are the totals based on groundwater recovery volume totals and

groundwater analytical data from October 2012 and April 2013.

5.0 QUALITY ASSURANCE/QUALITY CONTROL (QA/QC) SAMPLES

The sampling activities performed at the site were conducted in accordance with the *SAP* (Alliance, 2009). Quality control (QC) samples were collected during each sampling event. Monthly and semi-annual QC samples included one duplicate sample per event. In addition, one rinsate blank was collected during the semi-annual groundwater sampling events. One sample was designated as a matrix spike/matrix spike duplicate (MS/MSD) at each event. The QC samples were analyzed with the same methods and detection limits as the other samples collected during the same sampling event.

Duplicate samples were submitted to the laboratory as blind duplicates to mask the identity of the primary sample. A comparison shows that the contaminant concentrations in duplicates were very similar to the primary sample (Table 9). Relative percent differences (RPDs) were calculated for data greater than the detection limit. The RPD value was calculated as the difference between the primary and duplicate sample results, divided by the average of the primary and duplicate sample results. Table 9 lists the primary and duplicate sample results, detection limits, and RPDs for the monthly and quarterly sampling events. Calculated RPD values range from 9.82% to 29.51%. An acceptable range for RPDs in water samples is +/- 20%. The calculated RPDs indicate that there was fair correlation between the primary and duplicate results the samples. Rinsate blanks were generally non-detect for compounds of concern (COCs) during the reporting period (Table 10). No COCs were detected in the rinsate blanks from the October 2012 or April 2013 groundwater sampling events.

6.0 CONCLUSIONS & RECOMMENDATIONS

The groundwater extraction and treatment system at the Saunders Supply Company Superfund Site was operational during the reporting period from July 2012 through June 2013. Based on the groundwater contour maps, the recovery wells continue to provide hydraulic control of the PCP, arsenic, and chromium plumes above the MCLs in the shallow zone groundwater. The GAC units are providing up to 100% removal efficiency of PCP, and the water treatment (aeration and mixing with soda ash) is providing up to 100% removal of arsenic and chromium across the system. However, the system recovered minimal contaminant mass from the subsurface (approximately 0.101 pounds of PCP, 0.003 pounds of arsenic, and 0.002 pounds of chromium) during the reporting period. This mass recovery rate is similar to that of previous years at the site and is reflective of the slow nature of pump-and-treat technology, which only recovers contaminants in the dissolved phase. Evaluation of remedial alternatives to address the remaining PCP, arsenic, and chromium concentrations at the site is recommended.

7.0 REFERENCES

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TABLES

**Table 1
Groundwater Elevation Data
Saunders Supply Company Superfund Site
Chuckatuck, Virginia**

Location ID	TOC Elevation (ft amsl)	Measurement Date	Depth To Water Measurement (ft bgs)	Groundwater Elevation (ft amsl)	Remark
MW-7S	42.67	09/15/09	6.92	35.75	
		10/27/09	7.30	35.37	
		04/22/10	6.81	35.86	
		06/23/10	6.27	36.40	
		10/04/10	6.72	35.95	
		04/19/11	7.58	35.09	
		10/26/11	6.89	35.78	
		04/18/12	8.73	33.94	
		10/16/12	6.61	36.06	
		04/17/13	6.75	35.92	
MW-8D	42.77	09/15/09	12.02	30.75	
		10/27/09	12.27	30.50	
		04/22/10	11.99	30.78	
		06/23/10	12.25	30.52	
		10/04/10	12.24	30.53	
		04/19/11	12.50	30.27	
		10/26/11	11.73	31.04	
		04/18/12	12.62	30.15	
		10/16/12	11.85	30.92	
		04/17/13	11.78	30.99	
MW-9S	37.24	09/15/09	9.36	27.88	
		10/27/09	9.67	27.57	
		04/22/10	9.38	27.86	
		06/23/10	10.14	27.10	
		10/04/10	8.95	28.29	
		04/19/11	10.03	27.21	
		10/26/11	9.28	27.96	
		04/17/12	10.01	27.23	
		10/16/12	6.38	30.86	
		04/17/13	9.12	28.12	

Table 1
Groundwater Elevation Data
Saunders Supply Company Superfund Site
Chuckatuck, Virginia

Location ID	TOC Elevation (ft amsl)	Measurement Date	Depth To Water Measurement (ft bgs)	Groundwater Elevation (ft amsl)	Remark
MW-10D	37.44	09/15/09	9.73	27.71	
		10/27/09	10.02	27.42	
		04/22/10	9.74	26.92	
		06/23/10	10.52	26.92	
		10/04/10	9.33	28.11	
		04/19/11	10.33	27.11	
		10/26/11	9.55	27.89	
		04/17/12	10.34	27.10	
		10/16/12	9.89	27.55	
		04/17/13	9.58	27.86	
MW-11S	35.42	09/15/09	7.27	28.15	
		10/27/09	7.60	27.82	
		04/22/10	7.13	28.29	
		06/23/10	7.93	27.49	
		10/04/10	6.35	29.07	
		04/19/11	7.89	27.53	
		10/26/11	7.10	28.32	
		04/17/12	7.90	27.52	
		10/16/12	7.21	28.21	
		04/17/13	7.30	28.12	
MW-12D	34.56	09/15/09	7.19	27.37	
		10/27/09	7.86	26.70	
		04/22/10	6.19	28.37	
		06/23/10	6.95	27.61	
		10/04/10	6.09	28.47	
		04/19/11	7.00	27.56	
		10/26/11	6.31	28.25	
		04/17/12	7.19	27.37	
		10/16/12	6.38	28.18	
		04/17/13	9.58	24.98	

Table 1
Groundwater Elevation Data
Saunders Supply Company Superfund Site
Chuckatuck, Virginia

Location ID	TOC Elevation (ft amsl)	Measurement Date	Depth To Water Measurement (ft bgs)	Groundwater Elevation (ft amsl)	Remark
MW-19D	21.41	09/15/09	2.46	18.95	
		10/27/09	2.42	18.99	
		04/22/10	2.39	18.94	
		06/23/10	2.47	19.02	
		10/04/10	2.16	19.25	
		04/19/11	2.56	18.85	
		10/26/11	2.38	19.03	
		04/16/12	2.54	18.87	
		10/16/12	2.31	19.10	
		04/17/13	2.42	18.99	
MW-20S	39.99	09/15/09	10.72	29.27	
		10/27/09	11.09	28.90	
		04/22/10	10.44	29.55	
		06/23/10	11.28	28.71	
		10/04/10	10.48	29.51	
		04/19/11	11.40	28.59	
		10/26/11	10.63	29.36	
		04/16/12	11.72	28.27	
		10/16/12	10.96	29.03	
		04/17/13	10.83	29.16	
MW-21D	39.98	09/15/09	10.81	29.17	
		10/27/09	11.13	28.85	
		04/22/10	10.48	29.50	
		06/23/10	11.34	28.64	
		10/04/10	10.52	29.46	
		04/19/11	11.50	28.48	
		10/26/11	10.75	29.23	
		04/16/12	11.42	28.56	
		10/16/12	10.92	29.06	
		04/17/13	10.92	29.06	

**Table 1
Groundwater Elevation Data
Saunders Supply Company Superfund Site
Chuckatuck, Virginia**

Location ID	TOC Elevation (ft amsl)	Measurement Date	Depth To Water Measurement (ft bgs)	Groundwater Elevation (ft amsl)	Remark
MW-22S	35.03	09/15/09	8.19	26.84	
		10/27/09	8.47	26.56	
		04/22/10	8.08	26.95	
		06/23/10	8.74	26.29	
		10/04/10	7.51	27.52	
		04/19/11	8.63	26.40	
		10/26/11	7.94	27.09	
		04/16/12	9.72	25.31	
		10/16/12	8.01	27.02	
		04/17/13	8.13	26.90	
MW-23D	34.90	09/15/09	8.29	26.61	
		10/27/09	5.57	29.33	
		04/22/10	8.21	26.69	
		06/23/10	8.87	26.03	
		10/04/10	7.62	27.28	
		04/19/11	8.76	26.14	
		10/26/11	7.88	27.02	
		04/16/12	8.85	26.05	
		10/16/12	8.90	26.00	
		04/17/13	8.21	26.69	
RW-1	38.83	09/15/09	16.75	22.08	DTW estimated from transducer
		10/27/09	13.65	25.18	
		04/21/10	16.72	22.11	
		06/23/10	13.04	25.79	
		10/04/10	16.84	21.99	
		04/19/11	13.30	25.53	
		10/26/11	13.39	25.44	
		04/18/12	14.35	24.48	
		10/15/12	12.78	26.05	
		04/17/13	13.45	25.38	

**Table 1
Groundwater Elevation Data
Saunders Supply Company Superfund Site
Chuckatuck, Virginia**

Location ID	TOC Elevation (ft amsl)	Measurement Date	Depth To Water Measurement (ft bgs)	Groundwater Elevation (ft amsl)	Remark
RW-2	36.85	09/15/09	14.00	22.85	
		10/27/09	12.73	24.12	
		04/21/10	14.01	22.84	
		06/23/10	12.73	24.12	
		10/04/10	13.90	22.95	
		04/19/11	13.70	23.15	
		10/26/11	12.45	24.40	
		04/18/12	8.92	27.93	
		10/15/12	11.35	25.50	
		04/17/13	13.62	23.23	
RW-3	33.49	10/27/09	NA	--	Not gauged; collapsed Abandoned 01/07/2010
RW-4	32.35	09/15/09	12.42	19.93	
		10/27/09	9.27	23.08	
		04/21/10	12.40	19.95	
		06/23/10	9.15	23.20	
		10/04/10	12.01	20.34	
		04/19/11	11.05	21.30	
		10/26/11	11.26	21.09	
		04/18/12	10.12	22.23	
		10/15/12	8.50	23.85	
		04/17/13	10.96	21.39	
RW-5	40.10	04/21/10	11.16	28.94	
		06/23/10	11.24	28.86	
		10/04/10	12.27	27.83	
		04/19/11	12.91	27.19	
		10/26/11	12.00	28.10	
		04/18/12	13.60	26.50	
		10/15/12	14.58	25.52	
		04/17/13	13.50	26.60	

ft amsl = feet above mean sea level

ft bgs = feet below ground surface

NA = Not available

-- = Not Applicable/ Not Measured

Table 2
October 2012 Groundwater Sampling Data
Saunders Supply Company Superfund Site
Cuckatuck, Virginia

Location ID	EPA-MCLs	MW-7S	MW-8D	MW-9S	MW-10D	MW-11S	MW-12D	MW-19D	MW-20S	MW-21D	MW-22S	MW-23D	RW-1	RW-2	RW-4	RW-5	
Sample Date	MCLs	10/16/12	10/16/12	10/16/12	10/16/12	10/16/12	10/16/12	10/15/12	10/16/13	10/16/13	10/15/12	10/15/12	10/16/12	10/16/12	10/16/12	10/16/12	
Dissolved Metals (µg/L) E200.8																	<i>DUP</i>
ARSENIC	10	1,760	479	1.80 J	< 1.00	10.8	4.69 J	< 1.00	< 1.00	3.60 J	< 1.00	1.14 J	< 1.00	< 1.00	< 1.00	< 1.00	
CHROMIUM	100	57.3	15.8	91.4	8.01	5.04	4.10 J	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	
Total Metals (µg/L) E200.8																	
ANTIMONY	6	29.4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
ARSENIC	10	2,020	520	9.86	< 1.00	16.3	4.64 J	< 1.00	< 1.00	30.3	< 1.00	< 1.00	20.3	< 1.00	< 1.00	< 1.00	
BARIUM	2,000	104	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
CHROMIUM	100	86.0	24.8	147	8.40	6.55	5.88	5.88	3.12 J	4.63 J	6.04	3.42 J	15.3	< 1.00	< 1.00	2.19 J	
COBALT	NG	< 1.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
COPPER	1,300	7.67	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
CYANIDE	0.2	< 5.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
LEAD	15	0.328 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
MANGANESE	NG	8.38 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
NICKEL	NG	8.89 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
SELENIUM	50	< 1.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
ZINC	NG	20.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
SVOCs (µg/L) SW8270D																	
BENZO (A) PYRENE	0.2	--	< 0.103	--	--	--	--	--	--	--	--	--	--	--	--	--	
BENZO (B) FLUORANTHENE	0.2*	--	< 0.103	--	--	--	--	--	--	--	--	--	--	--	--	--	
BENZO (G,H,I) PERYLENE	0.2*	--	< 0.103	--	--	--	--	--	--	--	--	--	--	--	--	--	
BENZO (K) FLUORANTHENE	0.2*	--	< 0.103	--	--	--	--	--	--	--	--	--	--	--	--	--	
DIBENZO (A,H) ANTHRACENE	0.2*	--	< 0.103	--	--	--	--	--	--	--	--	--	--	--	--	--	
INDENO (1,2,3-CD) PYRENE	0.2*	--	< 0.103	--	--	--	--	--	--	--	--	--	--	--	--	--	
PENTACHLOROPHENOL	1	3.51	4.48	0.4	0.474	1.12	2.17	< 0.0788	< 0.0805	0.551	< 0.084	< 0.0799	9.20	3.65	< 0.0793	280	

J = Estimated value less than reporting limit

µg/l = micrograms per liter

SVOCs = Semi-Volatile Organic Compounds

-- = Not Analyzed

< = analyte not detected at or above the specified laboratory detection limit

EPA-MCL = US Environmental Protection Agency Primary Drinking Water Regulations, Maximum Contaminant Level, May 2009.

Results formatted in **bold** are in exceedance of the EPA-MCLs guideline.

NG = No Guidance value for specified analyte

* = MCL value listed is referenced from MCL Regulation for Benzo(a)pyrene / (PAHs)

DUP = Blind field duplicate sample

SVOC non-detect results from REI Consultants, Inc. Labs are not detected at or above the specified Practical Quantitation Limit (PQL).

Table 3
April 2013 Groundwater Sampling Data
Saunders Supply Company Superfund Site
Cuckatuck, Virginia

Location ID	EPA-MCLs	MW-10D	MW-11S	MW-12D	MW-19D	MW-20S	MW-21D	MW-22S	MW-23D	MW-7S	MW-8D	MW-9S	RW-1	RW-2	RW-4	RW-5	
Sample Date		04/17/13	04/17/13	04/17/13	04/18/13	04/18/13	04/18/13	04/17/13	04/17/13	04/18/13	04/18/13	04/17/13	04/18/13	04/18/13	04/18/13	04/18/13	
Dissolved Metals (µg/L) E200.8											<i>Dup</i>						
ARSENIC	10	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	445	1,960	1,740	< 1.00	< 1.00	< 1.00	< 1.00
CHROMIUM	100	14.1	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	14.1	57.5	50.7	4.76	< 1.00	< 1.00	< 1.00
Total Metals (µg/L) E200.8																	
ANTIMONY	6	--	--	--	--	--	--	--	--	--	13.8	--	--	--	--	--	--
ARSENIC	10	1.49 J	< 1.00	2.55 J	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	478	2,050	1,780	< 1.00	6.20	< 1.00	< 1.00
BARIUM	2,000	--	--	--	--	--	--	--	--	--	38.2	--	--	--	--	--	--
CHROMIUM	100	17.5	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	16.4	60.9	55.2	5.12	6.71	< 1.00	< 1.00
COBALT	NG	--	--	--	--	--	--	--	--	--	< 1.00	--	--	--	--	--	--
COPPER	1,300	--	--	--	--	--	--	--	--	--	2.67 J	--	--	--	--	--	--
CYANIDE	0.2	--	--	--	--	--	--	--	--	--	< 5.00	--	--	--	--	--	--
LEAD	15	--	--	--	--	--	--	--	--	--	0.336 J	--	--	--	--	--	--
MANGANESE	NG	--	--	--	--	--	--	--	--	--	29.9	--	--	--	--	--	--
NICKEL	NG	--	--	--	--	--	--	--	--	--	1.29 J	--	--	--	--	--	--
SELENIUM	50	--	--	--	--	--	--	--	--	--	< 1.00	--	--	--	--	--	--
ZINC	NG	--	--	--	--	--	--	--	--	--	8.44 J	--	--	--	--	--	--
SVOCs (µg/L) SW8270D																	
BENZO (A) PYRENE	0.2	--	--	--	--	--	--	--	--	--	< 0.0857	--	--	--	--	--	--
BENZO (B) FLUORANTHENE	0.2*	--	--	--	--	--	--	--	--	--	< 0.0857	--	--	--	--	--	--
BENZO (G,H,I) PERYLENE	0.2*	--	--	--	--	--	--	--	--	--	< 0.0857	--	--	--	--	--	--
BENZO (K) FLUORANTHENE	0.2*	--	--	--	--	--	--	--	--	--	< 0.0857	--	--	--	--	--	--
DIBENZO (A,H) ANTHRACENE	0.2*	--	--	--	--	--	--	--	--	--	< 0.0857	--	--	--	--	--	--
INDENO (1,2,3-CD) PYRENE	0.2*	--	--	--	--	--	--	--	--	--	< 0.0857	--	--	--	--	--	--
PENTACHLOROPHENOL	1	< 0.0820	< 0.0794	0.642	< 0.0815	< 0.0809	< 0.0792	< 0.0756	< 0.0778	1.35	1.30	1.75	1.02	5.80	5.31	< 0.0805	< 0.0795

J = Estimated value less than reporting limit

µg/l = micrograms per liter

SVOCs = Semi-Volatile Organic Compounds

-- = Not Analyzed

< = analyte not detected at or above the specified laboratory detection limit

EPA-MCL = US Environmental Protection Agency Primary Drinking Water Regulations, Maximum Contaminant Level, May 2009.

Results formatted in **bold** are in exceedance of the EPA-MCLs guideline.

NG = No Guidance value for specified analyte

* = MCL value listed is referenced from MCL Regulation for Benzo(a)pyrene / (PAHs)

DUP = Blind field duplicate sample

SVOC non-detect results from REI Consultants, Inc. Labs are not detected at or above the specified Practical Quantitation Limit (PQL).

Pentachlorophenol was analyzed using method SW8151.

Table 4
Historical Groundwater Sampling Data
Saunders Supply Company Superfund Site
Chuckatuck, Virginia

Location ID	Sample Date	Analytes (µg/L)		
		Arsenic (Dissolved)	Chromium (Dissolved)	Pentachlorophenol SVOCs ¹
EPA MCLs		10	100	1
MW-7S	01/01/90	--	--	< 10
	05/01/96	< 140	--	< 8.6
	05/01/00	--	--	< 66.9
	08/01/00	--	--	< 81
	11/01/00	--	--	< 19
	02/01/01	--	--	ND
	05/01/01	--	--	< 1.2
	07/01/01	--	--	< 0.22
	10/01/01	--	--	< 1.7
	01/01/02	--	--	< 6.9
	04/01/02	--	--	< 0.77
	07/01/02	--	--	< 2.6
	10/01/02	--	--	< 0.63
	01/14/03	--	--	< 5 / 1.38
	04/01/03	--	--	< 5 / 0.59
	07/28/03	--	--	2.6 J / 4
	10/21/03	--	--	1.2 J / 2.5
	01/13/04	1,430	37.5	35
	04/13/04	1,960	48.5	95
	07/21/04	2,360 J	62.2	200
	10/05/04	1,470 J	69.3 L	42
	01/18/05	3,470	31.5	430 E
	04/05/05	2990	40	80
	08/16/05	3,130 L	39.9 L	39
	10/20/05	2,810	32.8	79
	01/10/06	1,585	104	< 5.3
	04/04/06	1,440	128	0.89
	07/19/06	< 1.0	< 2.0	< 0.2 E
	10/24/06	2,160	163	6.9 E
	04/10/07	2,500	63.9	110 E
	09/18/07	--	--	1.2 J
	12/14/07	1,390	256	4.8 E
	04/22/08	1,480	159	1.4 E
09/10/08	1,600	149	7 E	
07/22/09	1,620	110	< 10 / < 0.2	
10/22/09	1,490	78.3	1.6	
04/22/10	767	61.7	2.0	
10/06/10	3,280	85.5	3.35	
04/20/11	2,220	91.0	2.54	
10/27/11	1,910	75.7	1.37	
04/18/12	1,910	85.7	2.27	
10/16/12	1,760	57.3	3.51	
04/18/13	445	14.1	1.35	

Table 4
Historical Groundwater Sampling Data
Saunders Supply Company Superfund Site
Chuckatuck, Virginia

Location ID	Sample Date	Analytes (µg/L)		
		Arsenic (Dissolved)	Chromium (Dissolved)	Pentachlorophenol SVOCs ¹
EPA MCLs		10	100	1
MW-8D	01/01/90	--	--	< 160
	05/01/96	ND	--	< 22.2
	07/01/01	--	--	< 0.039
	10/01/01	--	--	< 61
	01/01/02	--	--	< 40.9
	04/01/02	--	--	< 28.3
	07/01/02	--	--	< 94.3
	10/01/02	--	--	< 59.1
	01/14/03	--	--	39
	04/01/03	--	--	73
	07/28/03	--	--	150
	10/21/03	--	--	58
	01/13/04	30.8	1.9 J	32
	04/13/04	38.4	2.2	22
	07/21/04	184 J	4.2	12 J
	10/05/04	163 J	2.9 L	77
	01/18/05	187	6.3	55
	04/05/05	105	4.4	33
	08/16/05	198 L	3 L	81
	10/20/05	318	5.1	99
	01/10/06	278	5.3	15
	04/04/06	128	2.2 B	ND
	07/19/06	< 1	< 2	< 0.2 E
	10/24/06	379	7.4	250 E
	04/10/07	272	1.7 J	190 E
	09/18/07	--	--	130
	12/14/07	158	5.7	350 E
	04/22/08	177	2	44 E
	09/09/08	256	4	380 E
	07/22/09	204	2.5 B	11 / 22 E
	10/22/09	552	17.2	20
	04/22/10	236	9.1	2.9
	10/06/10	1,060	21.5	20.9
04/20/11	393	14.5	3.48	
10/27/11	405	10.7	5.81	
04/18/12	506	23.1	7.28	
10/16/12	479	15.8	4.48	
04/18/13	1,960	57.5	1.30	
DUP	04/18/13	1,740	50.7	1.75

Table 4
Historical Groundwater Sampling Data
Saunders Supply Company Superfund Site
Chuckatuck, Virginia

Location ID	Sample Date	Analytes (µg/L)		
		Arsenic (Dissolved)	Chromium (Dissolved)	Pentachlorophenol SVOCs ¹
EPA MCLs		10	100	1
MW-9S	01/01/90	--	--	ND
	05/01/96	< 14	--	ND
	05/01/98	--	--	< 0.57
	11/01/99	--	--	ND
	03/01/00	--	--	< 0.106
	05/01/00	--	--	ND
	08/01/00	--	--	ND
	11/01/00	--	--	ND
	02/01/01	--	--	ND
	05/01/01	--	--	< 0.11
	07/01/01	--	--	< 0.13
	10/01/01	--	--	< 0.1
	01/01/02	--	--	< 0.066
	04/01/02	--	--	< 0.049
	07/01/02	--	--	< 0.15
	10/01/02	--	--	< 0.87
	01/15/03	--	--	< 5 / < 1
	04/01/03	--	--	< 5 / < 0.32
	07/28/03	--	--	< 5 / 0.3 J
	10/21/03	--	--	< 5 / < 0.32
	01/13/04	< 1	197	< 5 / < 0.32
	04/14/04	< 1 UL	220	< 5 / < 0.32
	07/21/04	3.2 J	197	< 5 / < 0.32 UJ
	10/05/04	0.81 J	204 L	< 5 / < 0.32
	01/18/05	0.72 J	148	< 5.3 / < 0.34
	04/05/05	0.49 J	145	< 5.6 / < 0.36
	08/16/05	0.28 J	247 L	< 5.6 / < 0.36
	10/20/05	0.77 J	251	< 5.3 / < 0.34
	01/03/06	1.5	217	< 5.6
	04/04/06	0.33 J	257	< 0.2
	07/19/06	< 1	< 2	< 0.2
	10/24/06	4.5	267	1.1
	04/10/07	0.79 J	221	0.25
12/13/07	2.5	232	1.5 E	
04/23/08	< 1	150	0.063 J	
09/10/08	0.14 J	250	2.8 E	
07/22/09	0.71 JB	130	< 10 / < 0.2	
10/21/09	1.3	66.6	< 0.10	
04/22/10	4.3	75.3	< 0.10	
10/05/10	13.4	45.4	0.062 J	
04/20/11	< 1.00	54.7	0.0212 J	
10/27/11	3.37 J	54.2	< 0.0759	
04/17/12	< 1.00	49.4	0.261 J	
10/16/12	1.80 J	91.4	0.400	
04/17/13	< 1.00	4.76	1.02	

Table 4
Historical Groundwater Sampling Data
Saunders Supply Company Superfund Site
Chuckatuck, Virginia

Location ID	Sample Date	Analytes (µg/L)		
		Arsenic (Dissolved)	Chromium (Dissolved)	Pentachlorophenol SVOCs ¹
EPA MCLs		10	100	1
MW-10D	01/01/90	--	--	ND
	05/01/96	ND	--	ND
	05/01/98	--	--	< 1.1
	11/01/99	--	--	< 0.303
	03/01/00	--	--	< 0.139
	05/01/00	--	--	ND
	08/01/00	--	--	ND
	11/01/00	--	--	ND
	02/01/01	--	--	ND
	05/01/01	--	--	< 0.099
	07/01/01	--	--	< 0.19
	10/01/01	--	--	< 0.22
	01/01/02	--	--	< 0.19
	04/01/02	--	--	< 0.043
	07/01/02	--	--	< 0.25
	10/01/02	--	--	< 1.5
	01/15/03	--	--	0.59 J / 1.31
	04/01/03	--	--	0.76 J / 0.6
	07/28/03	--	--	< 5 / 0.54
	10/21/03	--	--	< 5 / 0.37
	01/13/04	< 1	0.4 J	< 5 / 0.18 J
	04/14/04	< 1 UL	0.66 B	< 5 / 0.16 J
	07/21/04	0.11 J	2.3	< 5 UJ / 0.33J
	10/05/04	0.07 B	0.05 B	< 5 / < 0.32
	01/18/05	0.18 J	0.56 JB	< 5.3 / 0.21 JB
	04/05/05	0.36 J	4.2	< 5.3 / 1
	08/16/05	0.21 J	5 L	< 6.3 / 0.29J
	10/20/05	0.33 JB	10.1	< 5.6 / 0.24 J
	01/10/06	ND	5.5	2.4 J
	01/10/06	--	--	--
	04/04/06	0.3 J	1.1 JB	< 0.2
	07/19/06	< 1 J	< 2	< 0.2 E
	10/24/06	0.23 J	0.15 J	1
	04/10/07	0.22 J	1.6 J	1.2
	12/13/07	0.16 J	4.9	2.5 E
	04/23/08	0.54 J	7.5	1.6 E
09/10/08	0.22 J	0.62 J	6.8 E	
07/22/09	1 B	1.5 JB	5.9 J / 8.7 E	
10/21/09	--	22.6	2.6	
04/22/10	< 1.0	< 2.0	0.69	
10/05/10	1.3 J	5.6	5.21	
04/20/11	< 1.00	3.44 J	2.44	
10/27/11	< 1.00	2.25 J	1.96	
04/17/12	< 1.00	3.96 J	2.01	
10/16/12	< 1.00	8.01	0.474	
04/17/13	< 1.00	14.1	< 0.0820	

Table 4
Historical Groundwater Sampling Data
Saunders Supply Company Superfund Site
Chuckatuck, Virginia

Location ID	Sample Date	Analytes (µg/L)		
		Arsenic (Dissolved)	Chromium (Dissolved)	Pentachlorophenol SVOCs ¹
EPA MCLs		10	100	1
MW-11S	01/01/90	--	--	ND
	05/01/96	ND	--	< 41.6
	05/01/98	--	--	< 0.68
	11/01/99	--	--	< 0.215
	03/01/00	--	--	ND
	05/01/00	--	--	< 1.59
	08/01/00	--	--	ND
	11/01/00	--	--	< 3
	02/01/01	--	--	< 69.3
	05/01/01	--	--	< 1.2
	07/01/01	--	--	< 0.071
	10/01/01	--	--	< 2.7
	01/01/02	--	--	< 0.059
	04/01/02	--	--	< 0.071
	07/01/02	--	--	< 0.076
	10/01/02	--	--	< 0.21
	01/15/03	--	--	19 J
	04/02/03	--	--	5.8
	07/29/03	--	--	1.1 J / 2.4
	10/21/03	--	--	< 5 / 0.58
	01/13/04	0.7 J	< 2	< 5 / 0.33 J
	04/14/04	0.83 J	0.21 B	2.3 J / 2.4
	07/21/04	2.5 J	0.25 B	< 5 UJ / 4.4 J
	10/05/04	2.6 J	0.09 B	48
	01/18/05	2.8	0.8 JB	7.3
	04/05/05	1.3	0.74 J	26
	08/16/05	1 L	0.43 JB	3.8 J / 7.4
	10/20/05	1.4	1.7 JB	< 5.6 / 0.18 J
	01/10/06	ND	ND	< 5.1
	04/04/06	--	--	1
	07/19/06	< 1 J	< 2 J	< 0.2
	10/24/06	2.9	0.31 J	0.47
	04/10/07	2.1	0.52 J	1.3
12/13/07	1.5	3.1	68 E	
04/23/08	1.8	< 2	2.2 E	
09/11/08	1.4	0.26 J	53 E	
07/21/09	2.4	< 2	--	
07/21/09	2.2 B	< 2	10 / 23 E	
07/21/09	--	--	14 / 28 E	
10/22/09	9.6	6.3	0.17	
04/22/10	4.6	< 2.0	1.3	
10/06/10	4.2 J	< 1.00	10.5	
<i>DUP</i> 10/06/10	4.0 J	< 1.00	12.3	
04/20/11	2.93 J	1.91 J	2.09	
10/27/11	6.59	1.78 J	0.583	
04/17/12	1.76 J	1.67 J	2.85	
10/16/12	10.8	5.04	1.12	
04/17/13	< 1.00	< 1.00	< 0.0794	

Table 4
Historical Groundwater Sampling Data
Saunders Supply Company Superfund Site
Chuckatuck, Virginia

Location ID	Sample Date	Analytes (µg/L)		
		Arsenic (Dissolved)	Chromium (Dissolved)	Pentachlorophenol SVOCs ¹
EPA MCLs		10	100	1
MW-12D	01/01/90	--	--	ND
	05/01/96	ND	--	ND
	05/01/98	--	--	< 3.6
	11/01/99	--	--	ND
	03/01/00	--	--	ND
	05/01/00	--	--	ND
	08/01/00	--	--	ND
	11/01/00	--	--	ND
	02/01/01	--	--	< 4.7
	05/01/01	--	--	< 0.27
	07/01/01	--	--	< 0.025
	10/01/01	--	--	< 0.022
	01/01/02	--	--	< 0.074
	04/01/02	--	--	< 0.023
	07/01/02	--	--	ND
	10/01/02	--	--	< 0.032
	01/15/03	--	--	< 5 / < 1
	04/02/03	--	--	< 5 / 0.17 J
	07/29/03	--	--	< 5 / < 0.32
	10/21/03	--	--	< 5 / < 0.32
	01/13/04	1.2	< 2	< 5 / < 0.32
	04/14/04	0.67 J	0.19 B	< 5 / < 0.32
	07/21/04	1.2 J	0.19 B	< 5 / < 0.32
	10/05/04	0.68 J	0.06 B	< 5 / < 0.32
	01/18/05	0.69 J	0.53 JB	< 5.3 / 6.6 B
	04/05/05	0.86 J	0.67 JB	< 5.4 / < 0.35
	08/16/05	1.2 L	0.27 JB	< 5 / < 0.32
	10/20/05	2.3	0.54 JB	< 5.3 / < 0.32
	01/10/06	ND	ND	0.74 J
	04/04/06	0.84 J	0.45 JB	< 0.2
	07/19/06	< 1 J	< 2 J	< 0.2
	10/24/06	0.97 J	0.16 J	0.5
	04/10/07	1.1	< 2	0.43
	12/13/07	1.5	1 J	10 E
04/23/08	0.55 J	< 2	2.1 E	
09/11/08	0.69 J	0.056 J	26 E	
07/21/09	0.93 JB	< 2	< 10 / 2.9 E	
10/22/09	< 1.0	4.3	14	
04/22/10	< 1.0	< 2.0	1.3	
10/06/10	1.5 J	< 1.00	2.05	
04/20/11	1.37 J	< 1.00	3.91	
10/27/11	1.00 J	< 1.00	4.47	
04/17/12	< 1.00	< 1.00	4.74	
10/16/12	4.69 J	4.10 J	2.17	
04/17/13	< 1.00	< 1.00	0.642	

Table 4
Historical Groundwater Sampling Data
Saunders Supply Company Superfund Site
Chuckatuck, Virginia

Location ID	Sample Date	Analytes (µg/L)		
		Arsenic (Dissolved)	Chromium (Dissolved)	Pentachlorophenol SVOCs ¹
EPA MCLs		10	100	1
MW-19D	01/01/90	--	--	ND
	05/01/96	ND	--	ND
	11/01/99	--	--	ND
	03/01/00	--	--	ND
	05/01/00	--	--	ND
	08/01/00	--	--	ND
	11/01/00	--	--	ND
	02/01/01	--	--	ND
	05/01/01	--	--	< 0.089
	07/01/01	--	--	ND
	10/01/01	--	--	< 0.025
	01/01/02	--	--	ND
	04/01/02	--	--	ND
	07/01/02	--	--	ND
	10/01/02	--	--	ND
	01/14/03	--	--	< 5 / < 1
	04/02/03	--	--	< 5 / < 0.32
	07/28/03	--	--	< 5 / < 0.32
	10/21/03	--	--	< 5 / < 0.32
	01/13/04	< 1	< 2	< 5 / < 0.32
	04/14/04	< 1 UL	0.17 B	< 5 / < 0.32
	07/21/04	0.23 J	0.16 B	< 5 / < 0.32
	10/05/04	< 1 UL	< 2 UL	< 5 / < 0.32
	01/19/05	0.23 J	0.6 JB	< 5.4 / 5.4 B
	04/05/05	0.23 J	0.76 JB	< 5.6 / < 0.36
	08/16/05	0.26 JB	0.38 JB	< 5.9 / < 0.38
	10/20/05	0.25 J	0.75 JB	< 5.6 / < 0.36
	01/09/06	ND	ND	0.18 J
	04/04/06	0.23 J	0.55 JB	< 0.2
	07/20/06	< 1 J	< 2 J	< 0.2
	10/24/06	0.26 J	0.21 J	< 0.2
	04/09/07	0.19 J	< 2	< 0.2
	04/10/07	0.14 J	< 2	< 0.2
	12/13/07	0.56 J	13.5	< 0.2
	04/23/08	< 1	< 2	< 0.2
	09/10/08	0.15 J	0.17 J	0.2
07/21/09	--	--	--	
10/20/09	< 1.0	2.9	< 0.10	
04/22/10	< 1.0	< 2.0	< 0.10	
10/04/10	1.6 J	< 1.00	< 0.103	
04/19/11	< 1.00	1.54 J	< 0.101	
10/26/11	< 1.00	< 1.00	< 0.073	
04/16/12	< 1.00	< 1.00	< 0.0707	
10/15/12	< 1.00	< 1.00	< 0.0788	
04/18/13	< 1.00	< 1.00	< 0.0815	

Table 4
Historical Groundwater Sampling Data
Saunders Supply Company Superfund Site
Chuckatuck, Virginia

Location ID	Sample Date	Analytes (µg/L)		
		Arsenic (Dissolved)	Chromium (Dissolved)	Pentachlorophenol SVOCs ¹
EPA MCLs		10	100	1
MW-20S	05/01/98	--	--	< 6.1
	11/01/99	--	--	< 0.272
	03/01/00	--	--	< 2.35
	05/01/00	--	--	ND
	08/01/00	--	--	ND
	11/01/00	--	--	< 2
	02/01/01	--	--	< 2.2
	05/01/01	--	--	< 4.5
	07/01/01	--	--	< 0.14
	10/01/01	--	--	< 11.3
	01/01/02	--	--	< 9.4
	04/01/02	--	--	< 10.5
	07/01/02	--	--	< 0.036
	10/01/02	--	--	< 0.13
	01/16/03	--	--	< 5 / 0.32 J
	04/02/03	--	--	< 5 / 0.16 J
	07/29/03	--	--	< 5 / 0.88
	10/21/03	--	--	2.3 J / 2.8
	01/13/04	< 1	< 2	< 5 / 1.6 J
	04/14/04	< 1 UL	0.18 B	0.75 J / 1.2
	07/21/04	0.059 J	0.14 B	< 5 / 0.26 J
	10/05/04	< 1 UL	< 2 UL	< 5 / < 0.32
	01/19/05	< 1	0.54 JB	< 5.3 / 9.5 B
	04/05/05	< 1	0.8 JB	2.9 J / 3.7
	08/16/05	< 1	0.45 JB	< 5 / 2.7
	10/20/05	0.12 JB	0.76 JB	< 5.3 / 2.9
	01/10/06	ND	ND	0.38 J
	04/04/06	< 1	0.56 JB	6.1
	07/19/06	< 1 J	< 2 J	< 0.2 E
	10/24/06	0.07 J	0.2 J	4.4 E
	04/10/07	0.14 J	0.32 J	1.6
	09/18/07	--	--	< 12
	12/14/07	0.44 J	2.1	5.2 E
	04/23/08	< 1	0.41 J	< 0.2
	09/10/08	0.17 J	7.9	1.3 E
07/21/09	< 1	< 2	< 10 / < 0.2	
10/21/09	< 1.0	3.3	< 0.10	
04/22/10	< 1.0	< 2.0	< 0.10	
10/05/10	1.4 J	< 1.00	0.238	
04/19/11	< 1.00	< 1.00	< 0.104	
10/26/11	< 1.00	< 1.00	< 0.0739	
04/16/12	< 1.00	1.12 J	< 0.0806	
10/16/12	< 1.00	< 1.00	< 0.0805	
04/18/13	< 1.00	< 1.00	< 0.0809	

Table 4
Historical Groundwater Sampling Data
Saunders Supply Company Superfund Site
Chuckatuck, Virginia

Location ID	Sample Date	Analytes (µg/L)		
		Arsenic (Dissolved)	Chromium (Dissolved)	Pentachlorophenol SVOCs ¹
EPA MCLs		10	100	1
MW-21D	05/01/98	--	--	< 1,500
	11/01/99	--	--	< 0.159
	03/01/00	--	--	< 998
	05/01/00	--	--	< 712
	08/01/00	--	--	< 110
	11/01/00	--	--	< 97
	02/01/01	--	--	< 1,060
	05/01/01	--	--	< 52.9
	07/01/01	--	--	< 1,130
	10/01/01	--	--	< 514
	01/01/02	--	--	< 353
	04/01/02	--	--	< 212
	07/01/02	--	--	< 215
	10/01/02	--	--	< 145
	01/16/03	--	--	550
	04/02/03	--	--	410
	07/29/03	--	--	400
	10/21/03	--	--	510
	01/13/04	5.6	0.51 J	210
	04/14/04	4.1	0.18 B	360
	07/21/04	2.4 J	0.17 B	210
	10/05/04	3.9 J	0.09 B	350
	01/12/05	3.8	0.66 JB	150 J
	04/05/05	2	0.68 JB	150
	08/16/05	10.7 L	0.28 JB	130
	10/20/05	15	0.56 JB	23
	01/10/06	11	ND	27
	04/04/06	3.5	0.5 JB	ND
	07/19/06	< 1	< 2 J	< 0.2 E
	10/24/06	9.2	0.21 J	49 E
	04/10/07	9.5	< 2	230 E
	09/18/07	--	--	37
	12/14/07	10.6	9.6	86 E
	04/23/08	2.6	< 2	< 0.2
	09/10/08	8.2	0.6 J	93 E
07/22/09	12.9	< 2	11 / 17 E	
10/21/09	1.9	3.5	0.83	
04/22/10	< 1.0	< 2.0	0.52	
10/05/10	1.6 J	< 1.00	4.58	
04/19/11	< 1.00	4.96 J	1.71	
10/26/11	6.42	< 1.00	0.556	
04/16/12	< 1.00	< 1.00	< 0.0744	
10/16/12	3.60 J	< 1.00	0.551	
04/18/13	< 1.00	< 1.00	< 0.0792	

Table 4
Historical Groundwater Sampling Data
Saunders Supply Company Superfund Site
Chuckatuck, Virginia

Location ID	Sample Date	Analytes (µg/L)		
		Arsenic (Dissolved)	Chromium (Dissolved)	Pentachlorophenol SVOCs ¹
EPA MCLs		10	100	1
MW-22S	05/01/98	--	--	< 0.52
	11/01/99	--	--	ND
	03/01/00	--	--	ND
	05/01/00	--	--	ND
	08/01/00	--	--	ND
	11/01/00	--	--	ND
	02/01/01	--	--	ND
	05/01/01	--	--	< 0.18
	07/01/01	--	--	< 0.047
	10/01/01	--	--	< 0.045
	01/01/02	--	--	< 0.026
	04/01/02	--	--	ND
	07/01/02	--	--	ND
	10/01/02	--	--	ND
	01/15/03	--	--	< 5 / < 1
	04/02/03	--	--	< 5 / 0.44
	07/29/03	--	--	< 5 / < 0.32
	10/21/03	--	--	< 5 / < 0.32
	01/13/04	< 1	0.4 J	< 5 / < 0.32
	04/14/04	< 1 UL	0.42 B	1 J / < 0.32
	07/21/04	0.27 J	0.42 B	< 5 / < 0.32
	10/05/04	0.05 B	0.24 B	< 5 / 0.25 J
	01/18/05	0.22 J	0.77 JB	< 5.6 / 8.8 B
	04/05/05	0.34 J	0.89 JB	< 5 / < 0.32
	08/16/05	0.29 JB	0.66 JB	< 5.9 / < 0.38
	10/20/05	0.24 J	0.69 JB	< 5.6 / < 0.32
	01/10/06	ND	ND	< 1
	04/04/06	0.24 J	0.61 JB	< 0.2
	07/20/06	< 1 J	< 2 J	< 0.2
	10/24/06	0.43 J	0.45 J	< 0.2
	04/10/07	0.23 J	0.33 J	0.21
	12/13/07	1.4	29.4	< 0.2
	04/23/08	< 1	1.1 J	< 0.2
09/11/08	0.23 J	0.33 J	0.27	
07/21/09	0.75 JB	< 2	< 10 / < 0.2	
10/21/09	< 1.0	3.9	< 0.10	
04/22/10	< 1.0	< 2.0	< 0.10	
10/05/10	1.9 J	< 1.00	< 0.104	
04/19/11	< 1.00	< 1.00	< 0.104	
10/26/11	< 1.00	< 1.00	< 0.0738	
04/16/12	< 1.00	< 1.00	< 0.0765	
10/15/12	< 1.00	< 1.00	< 0.0840	
04/17/13	< 1.00	< 1.00	< 0.0756	

Table 4
Historical Groundwater Sampling Data
Saunders Supply Company Superfund Site
Chuckatuck, Virginia

Location ID	Sample Date	Analytes (µg/L)		
		Arsenic (Dissolved)	Chromium (Dissolved)	Pentachlorophenol SVOCs ¹
EPA MCLs		10	100	1
MW-23D	5/1/1998	--	--	< 0.57
	11/01/99	--	--	ND
	03/01/00	--	--	ND
	05/01/00	--	--	ND
	08/01/00	--	--	ND
	11/01/00	--	--	ND
	02/01/01	--	--	ND
	05/01/01	--	--	< 0.084
	07/01/01	--	--	ND
	10/01/01	--	--	< 0.021
	01/01/02	--	--	ND
	04/01/02	--	--	ND
	07/01/02	--	--	ND
	10/01/02	--	--	ND
	01/15/03	--	--	< 5 / < 1
	04/02/03	--	--	< 5 / < 0.32
	07/29/03	--	--	< 5 / < 0.32
	10/21/03	--	--	< 5 / < 0.32
	01/13/04	< 1	0.33 J	< 5 / < 0.32
	04/14/04	< 1 UL	0.21 B	< 5 / < 0.32
	07/21/04	0.26 J	0.15 B	< 5 / < 0.32
	10/05/04	< 1 UL	< 2 UL	< 5 / < 0.32
	01/18/05	0.2 J	0.52 JB	< 5.6 / < 0.36
	04/05/05	0.24 J	0.77 JB	< 5.6 / < 0.36
	08/16/05	0.14 JB	0.22 JB	< 5.9 / < 0.38
	10/20/05	0.19 J	1.1 JB	< 5.3 / < 0.32
	01/10/06	ND	ND	0.22 J
	04/04/06	< 1	0.48 JB	< 0.2
	07/20/06	< 1 J	< 2 J	< 0.2
	10/24/06	0.25 J	0.41 J	< 0.2
	04/10/07	< 1	0.11 J	< 0.2
	12/13/07	0.2 J	3.8	0.069 J
	04/23/08	< 1	1 J	< 0.2
09/11/08	0.28 J	< 2	< 0.2	
07/21/09	0.72 JB	< 2	< 10 / 0.69	
10/21/09	< 1.0	3.1	< 0.10	
04/22/10	< 1.0	< 2.0	< 0.10	
10/05/10	1.4 J	< 1.00	< 0.102	
04/19/11	< 1.00	< 1.00	< 0.108	
10/26/11	< 1.00	< 1.00	< 0.0748	
04/16/12	< 1.00	< 1.00	< 0.0765	
10/15/12	1.14 J	< 1.00	< 0.0799	
04/17/13	< 1.00	< 1.00	< 0.0778	

Table 4
Historical Groundwater Sampling Data
Saunders Supply Company Superfund Site
Chuckatuck, Virginia

Location ID	Sample Date	Analytes (µg/L)		
		Arsenic (Dissolved)	Chromium (Dissolved)	Pentachlorophenol SVOCs ¹
EPA MCLs		10	100	1
RW-1	05/01/98	--	--	< 3.8
	11/01/99	--	--	< 3.39
	03/01/00	--	--	< 6.77
	05/01/00	--	--	< 5.34
	08/01/00	--	--	< 3.4
	11/01/00	--	--	< 2.6
	02/01/01	--	--	< 0.72
	07/01/01	--	--	< 2.7
	10/01/01	--	--	< 1
	01/01/02	--	--	< 2.3
	07/01/02	--	--	< 2.7
	10/01/02	--	--	< 2.5
	01/14/03	--	--	5 J / 7.79
	04/01/03	--	--	3.1 J / 3.8
	07/28/03	--	--	< 5 / 1.7
	10/21/03	--	--	4.4 J / 5
	01/13/04	< 1	0.41 J	5.1 J / 8.4
	04/13/04	< 1 UL	0.18 B	0.83 J / 1.1
	07/21/04	0.16 J	1.8 J	34
	10/05/04	0.14 B	0.03 B	< 5 / 0.92
	01/17/05	< 1	2.4 B	< 5.6 / 0.86 B
	04/04/05	0.16 J	0.78 JB	< 5 / 0.2 J
	08/17/05	0.17 JB	0.49 JB	5.5
	10/20/05	0.13 J	0.54 JB	< 5.6 / 2.1
	01/09/06	ND	ND	< 5
	04/03/06	--	--	0.79
	07/18/06	< 1	< 2 J	< 0.2
	10/23/06	0.12 J	0.14 J	37 E
	04/09/07	< 1	< 2	24 E
	09/18/07	--	--	2.3 J
	12/12/07	16.3	93.3	0.078 J
	04/22/08	0.12 J	3.5	--
	11/12/08	0.95 JB	2.3	0.94
07/21/09	0.53 JB	0.81 J	< 10 / < 0.2	
10/21/09	< 1.0	4.2	0.16	
04/21/10	< 1.0	< 2.0	< 0.10	
10/04/10	1.5 J	< 1.00	17.0	
04/20/11	< 1.00	1.62 J	3.76	
10/26/11	< 1.00	4.42 J	6.18	
04/16/12	< 1.00	< 1.00	4.95	
10/16/12	< 1.00	< 1.00	9.20	
04/18/13	< 1.00	< 1.00	5.80	

Table 4
Historical Groundwater Sampling Data
Saunders Supply Company Superfund Site
Chuckatuck, Virginia

Location ID	Sample Date	Analytes (µg/L)		
		Arsenic (Dissolved)	Chromium (Dissolved)	Pentachlorophenol SVOCs ¹
EPA MCLs		10	100	1
RW-2	05/01/98	--	--	< 75
	11/01/99	--	--	< 32.6
	03/01/00	--	--	< 3.34
	05/01/00	--	--	< 25.6
	08/01/00	--	--	< 20
	02/01/01	--	--	ND
	05/01/01	--	--	< 0.11
	07/01/01	--	--	< 0.97
	10/01/01	--	--	< 4.4
	01/01/02	--	--	< 24
	04/01/02	--	--	< 27.1
	07/01/02	--	--	< 4.1
	10/01/02	--	--	< 0.61
	01/14/03	--	--	< 5 / 0.4 J
	04/01/03	--	--	16 J
	07/28/03	--	--	0.88 J / 2.6
	10/21/03	--	--	< 5 / < 0.32
	01/13/04	< 1	0.89 J	30
	04/13/04	< 1 UL	0.52 B	49
	07/21/04	0.18 J	0.33 B	150
	10/05/04	0.19 B	2 L	< 5 / < 0.32
	01/17/05	0.26 J	1.1 JB	55
	04/04/05	0.22 J	1.2 JB	7.8
	08/17/05	0.17 JB	0.37 JB	25
	10/20/05	0.14 J	0.43 JB	5.6
	01/09/06	ND	ND	< 5
	04/03/06	--	--	ND
	07/20/06	< 1 J	< 2 J	< 0.2 E
	10/23/06	0.25 J	0.88 J	71 E
	04/09/07	0.4 J	< 2	89 E
	09/18/07	--	--	1.3 J
	12/12/07	0.15 J	0.51 J	41 E
	11/12/08	1.1 B	< 2	1.8
07/21/09	0.5 JB	< 2	25 / 56 E	
10/21/09	< 1.0	4.9	0.16	
04/21/10	< 1.0	< 2.0	0.24 PG	
10/04/10	1.8 J	< 1.00	43.6	
04/20/11	< 1.00	< 1.00	17.1	
10/26/11	< 1.00	< 1.00	2.70	
04/16/12	--	--	--	
10/16/12	< 1.00	< 1.00	3.65	
04/18/13	< 1.00	< 1.00	5.31	

Table 4
Historical Groundwater Sampling Data
Saunders Supply Company Superfund Site
Chuckatuck, Virginia

Location ID	Sample Date	Analytes (µg/L)		
		Arsenic (Dissolved)	Chromium (Dissolved)	Pentachlorophenol SVOCs ¹
EPA MCLs		10	100	1
RW-3	05/01/98	--	--	< 340
	11/01/99	--	--	< 4.39
	03/01/00	--	--	< 54.2
	05/01/00	--	--	< 52
	08/01/00	--	--	< 59
	11/01/00	--	--	< 9.6
	02/01/01	--	--	< 41.2
	05/01/01	--	--	< 25.5
	07/01/01	--	--	< 2.2
	10/01/01	--	--	< 22.9
	01/01/02	--	--	< 10.7
	04/01/02	--	--	< 12.3
	07/01/02	--	--	< 37.4
	10/01/02	--	--	< 14.3
	01/14/03	--	--	100 J
	04/01/03	--	--	< 5 / 0.23 J
	07/28/03	--	--	5.2
	10/21/03	--	--	< 5 / 0.19 J
	01/13/04	< 1	< 2	< 5 / 0.24 J
	04/13/04	< 1 UL	0.21 B	0.68 J / 1.3
	07/21/04	0.13 J	0.17 B	20
	10/05/04	0.39 B	0.15 B	< 5 / < 0.32
	01/17/05	0.45 J	0.79 JB	< 5.6 / 2.7 B
	04/04/05	0.39 J	1.2 JB	< 5.6 / 0.66 B
	08/17/05	1.7 L	0.41 JB	< 5.3 / 0.39
	01/02/06	ND	ND	13
	04/03/06	--	--	ND
07/18/06	< 1 J	< 2	< 0.2	
10/25/06	0.21 J	0.98 J	0.11 J	
04/09/07	0.37 J	< 2	25 E	
09/18/07	--	--	< 11	
12/12/07	0.57 J	1.5 J	0.056 J	
04/22/08	0.55 J	< 2.0	97 E	
1/7/2010	ABANDONED			

Table 4
Historical Groundwater Sampling Data
Saunders Supply Company Superfund Site
Chuckatuck, Virginia

Location ID	Sample Date	Analytes (µg/L)		
		Arsenic (Dissolved)	Chromium (Dissolved)	Pentachlorophenol SVOCs ¹
EPA MCLs		10	100	1
RW-4	05/01/98	--	--	< 0.57
	11/01/99	--	--	< 49
	03/01/00	--	--	ND
	05/01/00	--	--	ND
	11/01/00	--	--	ND
	02/01/01	--	--	< 1.9
	05/01/01	--	--	ND
	07/01/01	--	--	< 0.025
	10/01/01	--	--	< 22.6
	01/01/02	--	--	ND
	04/01/02	--	--	ND
	07/01/02	--	--	ND
	10/01/02	--	--	ND
	01/14/03	--	--	< 5 / < 1
	04/01/03	--	--	< 5 / < 0.32
	07/28/03	--	--	< 5 / < 0.32
	10/21/03	--	--	23
	01/14/04	< 1	0.55 J	16
	04/13/04	< 1	0.26 B	< 5 / < 0.32
	07/21/04	0.2 J	0.22 B	< 5 / < 0.32
	10/05/04	< 1 UL	0.07 B	< 5 / < 0.32
	01/17/05	< 1	0.6 JB	< 5.6 / 5.8 B
	04/04/05	< 1	0.86 JB	< 5.6 / 0.39 B
	08/17/05	0.081 JB	0.25 JB	< 5.3 / < 0.34
	10/20/05	0.44 J	0.5 JB	< 5.6 / < 0.32
	01/09/06	ND	ND	1 J
	07/20/06	< 1 J	< 2 J	< 0.2
	10/25/06	0.55 J	0.2 J	< 0.2
	04/09/07	0.31 J	< 2	< 0.2
	09/18/07	--	--	1.2 J
	12/12/07	0.13 J	0.49 J	0.04 J
	11/12/08	1.1 B	< 2	< 0.2
	07/21/09	0.55 JB	< 2	< 10 / < 0.2
10/21/09	4.1†	2.9†	39	
04/21/10	< 1.0	< 2	< 0.10	
<i>DUP</i> 04/21/10	< 1.0	< 2.0	< 0.10	
10/04/10	3.1 J	< 1.00	0.010 J	
04/20/11	< 1.00	< 1.00	< 0.103	
10/26/11	< 1.00	< 1.00	< 0.0723	
04/16/12	< 1.00	< 1.00	< 0.0780	
10/16/12	< 1.00	< 1.00	< 0.0793	
04/18/13	< 1.00	< 1.00	< 0.0805	

Table 4
Historical Groundwater Sampling Data
Saunders Supply Company Superfund Site
Chuckatuck, Virginia

Location ID	Sample Date	Analytes (µg/L)		
		Arsenic (Dissolved)	Chromium (Dissolved)	Pentachlorophenol SVOCs ¹
EPA MCLs		10	100	1
RW-5	04/21/10	< 1.0	< 2.0	240
	10/04/10	1.7 J	< 1.00	442
	04/20/11	< 1.00	4.24 J	337
	<i>DUP</i> 04/20/11	< 1.00	< 1.00	337
	<i>DUP</i> 10/26/11	< 1.00	< 1.00	193
	<i>DUP</i> 10/26/11	< 1.00	< 1.00	375
	04/16/12	< 1.00	< 1.00	108
	10/16/12	< 1.00	< 1.00	280
	<i>DUP</i> 10/16/12	< 1.00	< 1.00	226
	04/18/13	< 1.00	< 1.00	< 0.0795

Qualifiers:

J = estimated value

B = analyte found in blank

NJ = Qualitative identification questionable due to poor resolution. Presumptively present at approximate quantity

L = Analyte present. Reporting value may be biased low. Actual value is expected to be higher

K = Analyte present. Reported value may be biased high. Actual value is expected to be lower

E = Exceeds calibration limit

PG = The percent difference between the original and confirmation analyses is greater than 40%.

Notes:

µg/L = micrograms per liter

-- = Not Analyzed

ND = Not Detected, laboratory detection limit not available

< = indicates analyte not detected at or above specified laboratory detection limit

DUP = Blind field duplicate sample

SVOC = Semivolatile Organic Compound

EPA-MCL = US Environmental Protection Agency Primary Drinking Water Regulations, Maximum Contaminant Level, May 2009.

Results formatted in **bold** are in exceedance of the EPA-MCLs guideline.

† = Suspected labeling error for filtered (dissolved metals) and unfiltered (total metals) samples, results are expected to be, and historically have been, the reverse trend.

Note: All data collected prior to October 2009 were provided by CDM and have not been verified by laboratory analysis reports for accuracy.

Dissolved Metals samples were lab filtered by REI Consultants, Inc. Labs

Pentachlorophenol non-detect results from REI Consultants, Inc. Labs are not detected at or above the specified Practical Quantitation Limit (PQL).

¹ = Where two results are presented, the second value is from an analytical method capable of lower detection limits.

Table 5
Groundwater Recovery Data
Saunders Supply Company Superfund Site
Chuckatuck, Virginia

O&M Event Date	System On and Off		GWR Totalizer (Gallons)	Recovery Well Totalizers Running Totals (Gallons)			
	Arrival	Departure	Running Total	RW-1	RW-2	RW-3/ RW-5**	RW-4
8/3/09	No	No	NA	NA	NA	NA	NA
8/11/09	No	Yes	1818771	579425	2023089	15070	2008457
8/18/09	No	Yes	1819946	579985	2023089	15070	2009740
8/24/09	Yes	Yes	Inop	580492	2023089	15105*	2011381
9/1/09	Yes	Yes	Inop	580342	2022997	15105	2012316
9/10/09	Yes	Yes	Inop	581284	2023948	15105	2015535
9/15/09	Yes	Yes	Inop	582322	2025326	15105	2016913
9/21/09	Yes	Yes	Inop	582536	2027331	15105	2018939
9/29/09	Yes	Yes	Inop	583259	2028799	15105	2020946
10/8/09	Yes	Yes	Inop	584262	2031037	15105	2023361
10/12/09	Yes	Yes	Inop	584674	2031965	15105	2024384
10/20/09	No	No	Inop	NA	NA	15105	NA
10/27/09	Yes	Yes	Inop	586323	2033726	15105	2022767
11/3/09	Yes	Yes	Inop	586346	2034926	15105	2028855
11/11/09	Yes	No	Inop	586937	2036439	15105	2030684
11/18/09	No	Yes	Inop	587516	2036738	15105	2031019
11/24/09	Yes	Yes	Inop	587884	2037130	15105	2031470
12/1/09	Yes	Yes	Inop	588700	2039228	15105	2034134
12/9/09	Yes	Yes	Inop	590719	2041803	15105	2037362
12/15/09	Yes	Yes	Inop	591996	2042743	15105	2040010
12/21/09	Yes	Yes	Inop	592684	2044892	15105	2040092
12/28/09	Yes	Yes	Inop	594111	2047319	15105	2043152
1/5/10	No	No	Inop	594223	2047714	15105	2043377
1/12/10	No	Yes	Inop	594456	2047960	15198	2043837
1/19/10	Yes	Yes	Inop	594778	2048494	15415	2045243
1/26/10	Yes	Yes	Inop	595610	2049209	21872	2047272
2/2/10	Yes	Yes	Inop	596562	2051330	27487	2049349
2/9/10	Yes	Yes	Inop	604110	2053626	33422	2051643
2/17/10	Yes	Yes	Inop	606004	2055640	34313	2054539
2/23/10	Yes	Yes	Inop	607184	2057571	34740	2056471
3/1/10	Yes	No	Inop	607976	2058641	39878	2058133
3/9/10	No	No	Inop	607976	2058641	40123	2058133
3/25/10	No	No	Inop	608081	2059390	40441	2058222
3/30/10	No	No	Inop	608181	2059450	41176	2058386
4/6/10	No	No	Inop	608181	2059450	41176	2058386
4/12/10	No	No	Inop	608181	2059450	41176	2058386
4/20/10	No	No	Inop	608197	2059492	41224	2058461
4/28/10	No	No	Inop	608197	2059492	41224	2058461
5/3/10	No	Yes	Inop	608384	2059680	41345	2058618
5/11/10	Yes	Yes	Inop	609437	2061812	42551	2060529
5/17/10	Yes	Yes	Inop	609926	2062704	43986	2061674
5/24/10	Yes	Yes	Inop	610486	2063752	45695	2062306
6/1/10	Yes	Yes	Inop	612007	2066130	48771	2064538
6/9/10	Yes	Yes	Inop	612651	2067628	50993	2065837
6/14/10	Yes	Yes	Inop	613111	2068678	51216	2066667
6/23/10	Yes	Yes	Inop	613299	2070337	53787	2067002
7/1/10	Yes	Yes	Inop	613930	2070358	56064	2068263
7/6/10	Yes	Yes	Inop	614835	2070648	57412	2068960
7/12/10	Yes	Yes	Inop	614650	2071396	58979	2069976
7/20/10	Yes	Yes	Inop	615095	2071817	60968	2070601
7/26/10	Yes	Yes	Inop	615419	2072735	62382	2071238

**Table 5
Groundwater Recovery Data
Saunders Supply Company Superfund Site
Chuckatuck, Virginia**

O&M Event Date	System On and Off		GWR Totalizer (Gallons)	Recovery Well Totalizers Running Totals (Gallons)			
	Arrival	Departure	Running Total	RW-1	RW-2	RW-3/ RW-5**	RW-4
8/3/10	Yes	Yes	Inop	615838	2073942	63536	2072141
8/11/10	Yes	Yes	Inop	616186	2073956	65223	2072974
8/17/10	Yes	Yes	Inop	616510	2074902	66826	2073735
8/24/10	Yes	Yes	Inop	616852	2075900	68474	2074547
9/1/10	Yes	Yes	Inop	617208	2076977	70196	2075316
9/7/10	Yes	Yes	Inop	617466	2077758	71433	2075867
9/15/10	Yes	Yes	Inop	617793	2078738	72915	2076541
9/22/10	Yes	Yes	Inop	618068	2079564	74099	2077101
10/1/10	Yes	Yes	Inop	618922	2080978	78712	2080451
10/4/10	Yes	Yes	Inop	618975	2083195	82564	2083267
10/13/10	Yes	Yes	Inop	619743	2082077	80011	2081449
10/20/10	Yes	Yes	Inop	620276	2083195	82564	2083267
10/25/10	Yes	Yes	Inop	621179	2084176	84275	2084475
11/1/10	Yes	Yes	Inop	621104	2084947	86618	2080186
11/12/10	Yes	Yes	Inop	621829	2086430	90091	2088849
11/17/10	Yes	Yes	Inop	622153	2087024	91503	2089934
11/24/10	Yes	Yes	Inop	622680	2087839	93382	2091505
12/1/10	Yes	Yes	Inop	623291	2088509	95387	2093244
12/9/10	Yes	Yes	Inop	623751	2089004	96874	2094632
12/15/10	Yes	Yes	Inop	623751	2089004	96874	2094632
12/21/10	Yes	Yes	Inop	624718	2090444	99731	2097972
12/29/10	Yes	Yes	Inop	625302	2091215	101452	2099150
1/5/11	Yes	Yes	Inop	625788	2091857	102900	2100594
1/13/11	Yes	Yes	Inop	626418	2092706	104817	2102436
1/20/11	Yes	Yes	Inop	627002	2092723	106718	2104081
1/25/11	Yes	Yes	Inop	627437	209358	108035	2105280
2/4/11	Yes	Yes	Inop	628455	2094803	108319	2107908
2/8/11	Yes	Yes	Inop	628869	2095415	109824	2108993
2/16/11	Yes	Yes	Inop	629210	2096196	111261	2109014
2/23/11	Yes	Yes	Inop	629582	2097145	113079	2109060
3/2/11	Yes	Yes	Inop	630132	2097622	113741	2109645
3/8/11	Yes	Yes	Inop	630194	2098066	114210	2108774
3/17/11	Yes	Yes	Inop	630222	2098519	114759	2110083
3/22/11	Yes	Yes	Inop	630410	2098879	114987	2110481
3/31/11	Yes	Yes	Inop	630667	2099513	115039	2111196
4/7/11	Yes	Yes	Inop	630882	2100021	116647	2111761
4/13/11	Yes	Yes	Inop	631002	2100521	118022	2112087
4/19/11	Yes	Yes	Inop	631265	2100917	119357	2112732
4/28/11	Yes	Yes	Inop	631527	2101551	121192	2113393
5/4/11	Yes	Yes	Inop	631691	2101962	122327	2113814
5/11/11	Yes	Yes	Inop	631875	2102422	123589	2114280
5/16/11	Yes	Yes	Inop	631998	2102730	124451	2114596
5/25/11	No	Yes	Inop	632198	2103227	125812	2115103
6/2/11	Yes	Yes	Inop	632382	2103687	127092	2115570
6/8/11	Yes	Yes	Inop	632519	2104036	128066	2115910
6/14/11	Yes	Yes	Inop	632654	2104382	129010	2116235
6/22/11	Yes	Yes	Inop	632820	2104838	130221	2116644
6/28/11	Yes	Yes	Inop	632956	2104899	131102	2116931
7/5/11	Yes	Yes	Inop	633100	2105286	132113	2117257
7/11/11	No	No	Inop	633105	2105298	132144	2117266
7/22/11	No	No	Inop	633105	2105298	132144	2117266
7/25/11	No	No	Inop	633105	2105298	132144	2117266

Table 5
Groundwater Recovery Data
Saunders Supply Company Superfund Site
Chuckatuck, Virginia

O&M Event Date	System On and Off		GWR Totalizer (Gallons)	Recovery Well Totalizers Running Totals (Gallons)			
	Arrival	Departure	Running Total	RW-1	RW-2	RW-3/ RW-5**	RW-4
8/3/11	No	Yes	Inop	633105	2105298	132144	2117266
8/8/11	Yes	Yes	Inop	633159	2105563	133254	2117514
8/15/11	Yes	Yes	Inop	633277	2105829	134055	2117801
8/25/11	Yes	Yes	Inop	633575	2106190	135481	2118219
8/31/11	Yes	Yes	Inop	633723	2106424	135882	2118655
9/6/11	Yes	Yes	Inop	633951	2106789	137219	2119266
9/16/11	Yes	Yes	Inop	634343	2107390	139492	2120285
9/22/11	Yes	Yes	Inop	634606	2107769	140947	2120922
9/30/11	Yes	Yes	Inop	635529	2108510	142861	2122074
10/3/11	Yes	Yes	Inop	635689	2108709	143641	2122442
10/13/11	Yes	Yes	Inop	635686	2109146	146154	2123371
10/20/11	Yes	Yes	Inop	636581	2109812	147830	2124459
10/27/11	Yes	Yes	Inop	636827	2109956	149173	2124884
11/3/11	No	No	Inop	636374	2110017	150487	2125538
11/14/11	No	No	Inop	636374	2110017	150487	2125538
11/29/11	No	Yes	Inop	636376	2110022	150490	2125544
12/8/11	No	Yes	Inop	637030	2110378	151049	2126084
12/12/11	No	Yes	Inop	637055	2110410	151163	2126145
12/19/11	Yes	Yes	Inop	637323	2110773	152681	2126899
12/29/11	Yes	Yes	Inop	637663	2111300	154786	2127888
1/4/12	--	--	Inop	--	--	--	--
1/9/12	No	Yes	Inop	637866	2111618	156081	2128487
1/19/12	Yes	Yes	Inop	637611	2111904	158029	2129109
1/23/12	Yes	Yes	Inop	637725	2112124	158802	2129384
1/30/12	Yes	Yes	Inop	637918	2112513	160162	2129869
2/8/12	Yes	Yes	Inop	638166	2113004	161922	2130475
2/15/12	Yes	Yes	Inop	638226	2113390	163275	2131043
2/22/12	Yes	No	Inop	638253	2113788	164654	2131625
2/29/12	No	Yes	Inop	638253	2113788	164654	2131625
3/7/12	Yes	Yes	Inop	--	--	--	--
3/14/12	Yes	Yes	Inop	638774	2114321	167764	2133055
3/22/12	Yes	Yes	Inop	639076	2114929	169537	2133836
3/30/12	Yes	Yes	Inop	639355	2115514	171381	2134586
4/4/12	Yes	Yes	Inop	639509	2115630	172449	2135032
4/11/12	No	Yes	Inop	639519	2115646	172486	2135052
4/17/12	No	Yes	Inop	639584	2115641	172940	2135238
4/26/12	Yes	Yes	Inop	639842	2115641	174829	2136051
5/2/12	Yes	Yes	Inop	640019	2115641	176088	2136587
5/11/12	Yes	Yes	Inop	640257	2115646	177936	2137315
5/14/12	Yes	Yes	Inop	640336	2115680	178545	2137559
5/24/12	Yes	Yes	Inop	640608	2115691	180632	2138402
5/30/12	Yes	Yes	Inop	640791	2115704	181970	2139040
6/4/12	Yes	Yes	Inop	641536	2115956	183235	2139969
6/12/12	Yes	Yes	Inop	641407	2115745	185339	2140788
6/19/12	Yes	Yes	Inop	641793	2115929	187248	2141618
6/25/12	Yes	Yes	Inop	642098	2116425	188886	2142335
7/3/12	No	Yes	Inop	642374	2116537	190423	2142984
7/9/12	Yes	Yes	Inop	642677	2116193	191987	2143669
7/17/12	Yes	Yes	Inop	643126	2116640	194162	2144788
7/23/12	Yes	Yes	Inop	643478	2117074	196224	2145574
7/30/12	Yes	Yes	Inop	643862	2117091	198590	2146396
8/7/12	Yes	Yes	Inop	644241	2117190	201229	2147238

**Table 5
Groundwater Recovery Data
Saunders Supply Company Superfund Site
Chuckatuck, Virginia**

O&M Event Date	System On and Off		GWR Totalizer (Gallons)	Recovery Well Totalizers Running Totals (Gallons)			
	Arrival	Departure	Running Total	RW-1	RW-2	RW-3/ RW-5**	RW-4
8/15/12	Yes	Yes	Inop	645118	2117679	203747	2147975
8/21/12	Yes	Yes	Inop	644802	2118027	205551	2148496
8/29/12	Yes	Yes	Inop	645104	2118229	207982	2149272
9/4/12	Yes	Yes	Inop	645412	2118646	209962	2150099
9/12/12	Yes	Yes	Inop	645956	2119464	212585	2151111
9/17/12	Yes	Yes	Inop	646314	2119826	214208	2152002
9/25/12	Yes	Yes	Inop	646808	2120126	216571	2152613
10/1/12	Yes	Yes	Inop	647139	2120508	218273	2153243
10/9/12	Yes	Yes	Inop	647548	2121002	220408	2154075
10/15/12	Yes	Yes	Inop	648397	2121586	221940	2154705
10/24/12	Yes	Yes	Inop	648160	2129694	223394	2155370
10/30/12	Yes	Yes	Inop	648426	2122027	224807	2156086
11/5/12	Yes	Yes	Inop	648881	2122463	225611	2157293
11/15/12	Yes	Yes	Inop	649579	2123144	227523	2158259
11/19/12	Yes	Yes	Inop	649817	2123394	228655	2158717
11/25/12	Yes	Yes	Inop	650194	2123815	230501	2159496
12/5/12	Yes	No	Inop	650634	2124342	231249	2160459
12/10/12	No	No	Inop	650634	2124342	231249	2160459
12/19/12	No	Yes	Inop	650641	2124348	231262	2160468
12/27/12	Yes	Yes	Inop	650903	2124780	232138	2161310
1/2/13	Yes	Yes	Inop	651121	2124829	232527	2162004
1/8/13	Yes	Yes	Inop	651300	2124921	234147	2162654
1/15/13	Yes	Yes	Inop	651520	2124998	234715	2163397
1/22/13	Yes	Yes	Inop	651787	2125433	236696	2164256
1/28/13	Yes	Yes	Inop	652079	2125821	237928	2164977
2/4/13	Yes	Yes	Inop	652009	2125846	238032	2165022
2/12/13	Yes	Yes	Inop	652537	2126378	238478	2165992
2/22/13	Yes	Yes	Inop	653072	2127051	240941	2167209
2/28/13	Yes	Yes	Inop	653383	2127455	242970	2167932
3/4/13	Yes	Yes	Inop	653598	2127722	244282	2168410
3/11/13	Yes	Yes	Inop	653986	2128191	246118	2169226
3/18/13	Yes	Yes	Inop	654181	2128678	246387	2170033
3/25/13	Yes	Yes	Inop	654798	2129149	248291	2170801
4/1/13	Yes	Yes	Inop	655167	2129617	248873	2171552
4/8/13	Yes	Yes	Inop	655230	2129688	248909	2171660
4/17/13	Yes	Yes	Inop	655351	2129838	249263	2171887
4/22/13	Yes	Yes	Inop	655537	2129851	250373	2172297
4/29/13	Yes	Yes	Inop	655859	2130328	250434	2172991
5/6/13	Yes	Yes	Inop	656154	2130789	250461	2173677
5/15/13	Yes	Yes	Inop	656513	2131436	250583	2174635
5/21/13	Yes	Yes	Inop	656811	2131891	251067	2175112
5/28/13	Yes	Yes	Inop	657011	2132231	251824	2175871
6/4/13	No	Yes	Inop	657171	2132381	252018	2176188
6/10/13	Yes	Yes	Inop	657409	2132776	252775	2176791
6/17/13	Yes	Yes	Inop	657747	2133157	253862	2177812
6/24/13	Yes	Yes	Inop	658061	2133712	254951	2178244
TOTALS:*			Inop	78636	110623	239881	169787

*Note: Running Total for System is sum of totals for all Recovery wells

** Note: RW-3 was abandoned and replaced with RW-5 which was brought online 1/12/2010

-- = No Data Available

Table 6
Monthly System Sampling Data
Saunders Supply Company Superfund Site
Chuckatuck, Virginia

Location ID	Sample Date	Analytes (µg/L)					
		Arsenic (Total)	Arsenic (Dissolved)	Chromium (Total)	Chromium (Dissolved)	Pentachlorophenol	
MCLs		10	10	100	100	1	
INF		< 1.0	< 1.0	< 2.0	< 2.0	< 0.10	
	<i>DUP</i>	< 1.0	< 1.0	< 2.0	< 2.0	< 0.10	
		< 1.0	--	< 2.0	--	0.4	
		< 1.0	< 1.0	3.8	3.3	0.14	
		< 1.0	< 1.0	2.3	< 2.0	< 0.10	
		< 1.0	< 1.0	< 2.0	< 2.0	0.69	
		4.0	< 1.0	< 2.0	< 2.0	84	
		< 1.0	< 1.0	3.9	3.5	12	
		2.9	< 1.0	< 10.0 G	< 2.0	< 0.10	
		< 1.0	< 1.0	< 2.0	< 2.0	< 0.10	
		5.7	3.3	2.6	< 2.0	69	
		< 1.0	< 1.0	< 2.0	< 2.0	< 0.10	
		< 1.00	< 1.00	< 1.00	< 1.00	0.308	
		< 1.00	< 1.00	< 1.00	< 1.00	0.126	
		1.00 J	< 1.00	< 1.00	< 1.00	0.112	
		2.8 J	1.7 J	4.3 J	< 1.00	0.133	
		1.18 J	1.04 J	< 1.00	< 1.00	0.215	
		< 1.00	< 1.00	< 1.00	< 1.00	3.93	
		< 1.00	< 1.00	< 1.00	< 1.00	0.141	
		< 1.00	< 1.00	1.43 J	< 1.00	102	
		< 1.00	< 1.00	1.20 J	< 1.00	0.348	
		< 1.00	< 1.00	< 1.00	< 1.00	0.320	
		< 1.00	< 1.00	< 1.00	< 1.00	< 0.0774 ²	
		< 1.00	< 1.00	< 1.00	< 1.00	< 0.374 ²	
		< 1.00	< 1.00	< 1.00	< 1.00	< 0.0841 ²	
		< 1.00	< 1.00	2.02 J	< 1.00	42.3	
		1.94 J	< 1.00	2.16 J	< 1.00	< 0.0670 ²	
	<i>DUP</i>	09/16/11	1.60 J	< 1.00	1.64 J	< 1.00	< 0.0677 ²
		10/26/11	< 1.00	< 1.00	< 1.00	< 1.00	< 0.0752
	<i>DUP</i>	10/26/11	< 1.00	< 1.00	< 1.00	< 1.00	< 0.0751
		11/29/11	1.42 J	1.46 J	1.40 J	< 1.00	< 0.0744
	<i>DUP</i>	11/29/11	1.38 J	1.35 J	7.97	< 1.00	< 0.075
		12/12/11	1.24 J	1.10 J	< 1.00	< 1.00	< 0.0750
	<i>DUP</i>	12/12/11	1.26 J	1.03 J	< 1.00	< 1.00	< 0.0746
		01/30/12	< 1.00	< 1.00	< 1.00	< 1.00	71.9
		02/15/12	< 1.00	< 1.00	< 1.00	< 1.00	0.31
		03/14/12	< 1.00	< 1.00	< 1.00	< 1.00	16.2
		04/17/12	< 1.00	< 1.00	< 1.00	< 1.00	< 0.0806
		05/14/12	< 1.00	< 1.00	< 1.00	< 1.00	< 0.0793
		06/19/12	< 1.00	< 1.00	< 1.00	< 1.00	< 0.0849
		07/09/12	< 1.00	< 1.00	< 1.00	< 1.00	< 0.0766
	<i>DUP</i>	07/09/12	< 1.00	< 1.00	< 1.00	< 1.00	< 0.0781
		08/07/12	< 1.00	< 1.00	< 1.00	< 1.00	0.362
		09/12/12	1.07 J	< 1.00	1.26 J	< 1.00	< 0.0818
	10/16/12	< 1.00	< 1.00	< 1.00	< 1.00	0.443	
	11/05/12	1.11 J	< 1.00	2.25 J	< 1.00	0.0917 J	
	12/19/12	1.62 J	< 1.00	1.15 J	< 1.00	< 0.0799	
	01/15/13	< 1.00	< 1.00	< 1.00	< 1.00	< 0.0781	
	02/22/13	< 1.00	< 1.00	< 1.00	< 1.00	< 0.0809	
	03/18/13	< 1.00	< 1.00	1.15 J	< 1.00	< 0.0797	
	04/08/13	< 1.00	< 1.00	< 1.00	< 1.00	< 0.0787	
	05/16/13	1.75 J	< 1.00	1.77 J	< 1.00	< 0.0797	
	06/10/13	1.57 J	< 1.00	1.21 J	1.42 J	< 0.0823	

Table 6
Monthly System Sampling Data
Saunders Supply Company Superfund Site
Chuckatuck, Virginia

Location ID	Sample Date	Analytes (µg/L)				
		Arsenic (Total)	Arsenic (Dissolved)	Chromium (Total)	Chromium (Dissolved)	Pentachlorophenol
MCLs		10	10	100	100	1
C1	08/18/09	9.0	7.8	<2.0	<2.0	<0.10
	09/29/09	1.8	--	<2.0	--	<0.10
DUP	09/29/09	1.7	--	<2.0	--	<0.10
	10/29/09	3.9	4.4	3.3	3.0	<0.10
DUP	10/29/09	3.7	3.9	3.9	2.7	<0.10
	11/24/09	1.6	1.8	2.1	<2.0	<0.10
DUP	11/24/09	1.5	1.6	<2.0	<2.0	<0.10
	12/15/09	1.2	1.0	<2.0	<2.0	<0.10
DUP	12/15/09	1.1	1.1	<2.0	<2.0	<0.10
	01/26/10	1.0	1.1	<2.0	<2.0	<0.10
DUP	01/26/10	1.1	1.0	<2.0	<2.0	0.12 ⁽¹⁾
	02/23/10	2.9	2.6	2.0	<2.0	<0.10
DUP	02/23/10	2.9	2.7	2.0	<2.0	<0.10
	03/30/10	3.4	2.9	<2.0	<2.0	<0.10
DUP	03/30/10	1.0	2.9	<2.0	<2.0	<0.10
	04/21/10	3.0	2.7	<2.0	<2.0	<0.10
DUP	04/21/10	2.9	2.8	<2.0	<2.0	<0.10
	05/24/10	6.3	6.8	<2.0	4.0	0.23
DUP	05/24/10	7.7	6.3	<2.0	<2.0	<0.10
	06/14/10	1.9	1.9	<2.0	<2.0	<0.10
DUP	06/14/10	1.7	1.7	<2.0	<2.0	<0.10
	07/20/10	1.77 J	1.84 J	<1.00	<1.00	0.103
DUP	07/20/10	1.84 J	1.90 J	<1.00	<1.00	<0.102
	08/17/10	1.54 J	1.48 J	<1.00	<1.00	<0.104
DUP	08/17/10	1.47 J	1.58 J	<1.00	<1.00	<0.102
	09/22/10	2.31 J	1.35 J	2.20 J	<1.00	<0.103
DUP	09/22/10	1.44 J	1.49 J	<1.00	<1.00	<0.103
	10/04/10	3.3 J	2.9 J	<1.00	<1.00	<0.104
DUP	10/04/10	2.9 J	2.9 J	<1.00	<1.00	<0.103
	11/01/10	1.58 J	1.75 J	<1.00	<1.00	<0.103
DUP	11/01/10	1.83 J	1.61 J	<1.00	<1.00	<0.102
	12/10/10	1.30 J	1.29 J	<1.00	<1.00	0.121
DUP	12/10/10	1.28 J	1.35 J	<1.00	<1.00	<0.102
	01/20/11	1.34 J	1.25 J	<1.00	<1.00	<0.103
DUP	01/20/11	1.38 J	1.11 J	<1.00	<1.00	<0.106
	02/16/11	1.61 J	1.30 J	2.48 J	<1.00	0.127
DUP	02/16/11	1.75 J	1.54 J	1.25 J	1.08 J	0.114
	03/17/11	1.77 J	1.67 J	<1.00	<1.00	<0.103
DUP	03/17/11	1.58 J	1.61 J	<1.00	1.50 J	<0.105
	04/20/11	<1.00	<1.00	<1.00	<1.00	<0.116
DUP	04/20/11	<1.00	<1.00	<1.00	<1.00	<0.106
	05/16/11	1.02 J	<1.00	<1.00	<1.00	<0.0774 ²
DUP	05/16/11	<1.00	<1.00	<1.00	<1.00	<0.0792 ²
	06/14/11	1.19 J	1.02 J	<1.00	<1.00	0.226 ²
DUP	06/14/11	1.11 J	<1.00	<1.00	<1.00	<0.0798 ²
	07/11/11	1.93 J	1.54 J	<1.00	<1.00	<0.0790 ²
DUP	07/11/11	7.77	1.14 J	9.92	<1.00	0.102 J ²
	08/08/11	1.96 J	1.49 J	1.00 J	1.22 J	<0.0818 ²
DUP	08/08/11	2.00 J	1.37 J	2.84 J	1.29 J	0.204
	09/16/11	1.11 J	1.16 J	<1.00	<1.00	<0.0673 ²
	10/26/11	1.37 J	1.02 J	<1.00	<1.00	<0.0754
	11/29/11	1.86 J	1.46 J	<1.00	<1.00	<0.0763
	12/12/11	10.7	1.36 J	5.17	<1.00	<0.0750

Table 6
Monthly System Sampling Data
Saunders Supply Company Superfund Site
Chuckatuck, Virginia

Location ID	Sample Date	Analytes (µg/L)				
		Arsenic (Total)	Arsenic (Dissolved)	Chromium (Total)	Chromium (Dissolved)	Pentachlorophenol
MCLs		10	10	100	100	1
C1 cont'd	01/30/12	< 1.00	< 1.00	< 1.00	< 1.00	83.4
DUP	01/30/12	< 1.00	< 1.00	< 1.00	< 1.00	82.8
	02/15/12	1.81 J	< 1.00	< 1.00	< 1.00	< 0.0710
DUP	02/15/12	1.24 J	< 1.00	< 1.00	< 1.00	< 0.0729
	03/14/12	< 1.00	< 1.00	< 1.00	< 1.00	< 0.0769
DUP	03/14/12	< 1.00	< 1.00	< 1.00	< 1.00	< 0.0765
	04/17/12	< 1.00	< 1.00	< 1.00	< 1.00	< 0.0741
DUP	04/17/12	< 1.00	< 1.00	< 1.00	< 1.00	< 0.0750
	05/14/12	< 1.00	< 1.00	< 1.00	< 1.00	0.0821
DUP	05/14/12	< 1.00	< 1.00	< 1.00	< 1.00	0.082
	06/19/12	< 1.00	< 1.00	< 1.00	< 1.00	< 0.0817
DUP	06/19/12	< 1.00	< 1.00	< 1.00	< 1.00	< 0.0825
	07/09/12	< 1.00	< 1.00	< 1.00	< 1.00	< 0.0833
	08/07/12	< 1.00	< 1.00	< 1.00	< 1.00	< 0.0939
DUP	08/07/12	< 1.00	< 1.00	< 1.00	< 1.00	< 0.0792
	09/12/12	< 1.00	< 1.00	< 1.00	< 1.00	< 0.0833
DUP	09/12/12	< 1.00	< 1.00	< 1.00	< 1.00	< 0.0819
	10/16/12	< 1.00	< 1.00	< 1.00	< 1.00	< 0.0796
	11/05/12	< 1.00	< 1.00	< 1.00	< 1.00	< 0.0767
DUP	11/05/12	< 1.00	< 1.00	< 1.00	< 1.00	< 0.0766
	12/19/12	< 1.00	< 1.00	< 1.00	< 1.00	< 0.0752
DUP	12/19/12	< 1.00	< 1.00	< 1.00	< 1.00	< 0.0768
	01/15/13	< 1.00	< 1.00	< 1.00	< 1.00	< 0.0776
DUP	01/15/13	< 1.00	< 1.00	< 1.00	< 1.00	< 0.0630
	02/22/13	< 1.00	< 1.00	< 1.00	< 1.00	< 0.0793
DUP	02/22/13	< 1.00	< 1.00	< 1.00	< 1.00	< 0.0773
	03/18/13	< 1.00	< 1.00	< 1.00	< 1.00	< 0.0751
DUP	03/18/13	< 1.00	< 1.00	< 1.00	< 1.00	< 0.0793
	04/08/13	< 1.00	< 1.00	< 1.00	< 1.00	< 0.0774
DUP	04/08/13	< 1.00	< 1.00	< 1.00	< 1.00	< 0.0766
	05/16/13	< 1.00	< 1.00	< 1.00	< 1.00	< 0.0813
DUP	05/16/13	< 1.00	< 1.00	< 1.00	< 1.00	< 0.0780
	06/10/13	< 1.00	< 1.00	< 1.00	< 1.00	< 0.0789
DUP	06/10/13	< 1.00	< 1.00	< 1.00	< 1.00	< 0.0789

Notes:

µg/L = micrograms per liter

09/29/09 samples not analyzed for dissolved metals due to laboratory bottleware error.

Bolded values indicate detection above MCL

< = not detected at or above specified laboratory detection limit.

DUP = Blind Duplicate taken in field.

-- = Not analyzed

⁽¹⁾ - Sample was reanalyzed due to laboratory cross-contamination, second analysis results are presented

Arsenic and Chromium analyzed via method SW846 6020 by Test America, North Canton, Ohio. (08/09-06/10)

Pentachlorophenol analyzed via method SW846 8151A by Test America, North Canton, Ohio. (08/09-06/10)

Arsenic and Chromium analyzed via method E200.8 by REIC Labs, Beaver, West Virginia. (beginning 07/10)

Pentachlorophenol analyzed via method SW8270D by REIC Labs, Beaver, West Virginia. (07/10-04/11)

Pentachlorophenol non-detect results from REIC Labs are not detected at or above the specified Practical Quantitation Limit (PQL). (07/10-04/11)

MCLs = EPA National Primary Drinking Water Regulations Maximum Contaminant Levels

G = Elevated reporting limit. The reporting limit is elevated due to matrix interference.

J = Analyte detected below quantitation limits

² = Pentachlorophenol analyzed via method SW8151 by REIC Labs. Non-detect results are not detected at or above the Method Detection Limit (MDL).

Table 7
Arsenic and Chromium Mass Removal Calculations
Groundwater Extraction Treatment System
Saunders Supply Company Superfund Site

GROUNDWATER ANALYTICAL DATA - OCTOBER 2012

Analyte Name Total/Dissolved Unit	Sample Date	Sample Type Code	ARSENIC T ug/l	ARSENIC D ug/l	CHROMIUM T ug/l	CHROMIUM D ug/l	PCP N ug/l
IN	10/16/2012	N	< 1.00	< 1.00	< 1.00	< 1.00	0.443
RW-1	10/16/2012	N	20.3	< 1.00	15.3	< 1.00	6.18
RW-2	10/16/2012	N	< 1.00	< 1.00	< 1.00	< 1.00	2.7
RW-4	10/16/2012	N	< 1.00	< 1.00	< 1.00	< 1.00	< 0.0723
RW-5	10/19/2012	N	< 1.00	< 1.00	< 1.00	< 1.00	284

PCP = Pentachlorophenol; N = normal sample; T = total (unfiltered) sample; D = dissolved (filtered) sample; NS = not sampled due to pump failure

Mass Removal Calculation Assuming Samples, When Reported Below Detection Limits, at Half the Dection Limit

Average** Total Arsenic, Raw Water 5.45 ug/L	Total Arsenic, Post-Settling Tank (IN sample)* 0.5 ug/L	Difference (Removed) 4.95 ug/L	% Removal 91%
---	--	-----------------------------------	--------------------------------

Average** Total Chromium, Raw Water 4.2 ug/L	Total Chromium, Post-Settling Tank (IN sample)* 0.5 ug/L	Difference (Removed) 3.70 ug/L	% Removal 88%
---	---	-----------------------------------	--------------------------------

*< values converted to half the quantitation/detection limit for calculation purposes

**Raw water concentrations the average of RW-1, RW-2, RW-4, and RW-5 concentrations

Mass Removal Calculation Assuming, When Reported Below Detection Limits, as 0 ug/L

Average** Total Arsenic, Raw Water 5.45 ug/L	Total Arsenic, Post-Settling Tank (IN sample)*** 0 ug/L	Difference (Removed) 5.45 ug/L	% Removal 100%
---	--	-----------------------------------	---------------------------------

Average** Total Chromium, Raw Water 4.2 ug/L	Total Chromium, Post-Settling Tank (In sample)*** 0 ug/L	Difference (Removed) 4.20 ug/L	% Removal 100%
---	---	-----------------------------------	---------------------------------

***< values converted to 0 ug/L for calculation purposes

**Raw water concentrations the average of RW-1, RW-2, RW-4, and RW-5 concentrations

Table 7
Arsenic and Chromium Mass Removal Calculations
Groundwater Extraction Treatment System
Saunders Supply Company Superfund Site

GROUNDWATER ANALYTICAL DATA - APRIL 2013

Analyte Name Total/Dissolved Unit	Sample Date	Sample Type Code	ARSENIC T ug/l	ARSENIC D ug/l	CHROMIUM T ug/l	CHROMIUM D ug/l	PCP N ug/l
IN	4/8/2013	N	< 1.00	< 1.00	< 1.00	< 1.00	< 0.0787
RW-1	4/18/2013	N	6.20	< 1.00	6.71	< 1.00	5.80
RW-2	4/18/2013	N	< 1.00	< 1.00	< 1.00	< 1.00	5.31
RW-4	4/18/2013	N	< 1.00	< 1.00	< 1.00	< 1.00	< 0.0805
RW-5	4/18/2013	N	< 1.00	< 1.00	< 1.00	< 1.00	< 0.0795

PCP = Pentachlorophenol; N = normal sample; T = total (unfiltered) sample; D = dissolved (filtered) sample; NS = not sampled due to pump failure

Mass Removal Calculation Assuming Samples, When Reported Below Detection Limits, at Half the Dection Limit

Average** Total Arsenic, Raw Water 1.92 ug/L	Total Arsenic, Post-Settling Tank (IN sample)* 0.5 ug/L	Difference (Removed) 1.42 ug/L	% Removal 74%
---	--	-----------------------------------	--------------------------------

Average** Total Chromium, Raw Water 2.05 ug/L	Total Chromium, Post-Settling Tank (IN sample)* 0.5 ug/L	Difference (Removed) 1.55 ug/L	% Removal 76%
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*< values converted to half the quantitation/detection limit for calculation purposes

**Raw water concentrations the average of RW-1, RW-2, RW-4, and RW-5 concentrations

Mass Removal Calculation Assuming, When Reported Below Detection Limits, as 0 ug/L

Average** Total Arsenic, Raw Water 1.55 ug/L	Total Arsenic, Post-Settling Tank (IN sample)*** 0 ug/L	Difference (Removed) 1.55 ug/L	% Removal 100%
---	--	-----------------------------------	---------------------------------

Average** Total Chromium, Raw Water 1.67 ug/L	Total Chromium, Post-Settling Tank (In sample)*** 0 ug/L	Difference (Removed) 1.67 ug/L	% Removal 100%
--	---	-----------------------------------	---------------------------------

***< values converted to 0 ug/L for calculation purposes

**Raw water concentrations the average of RW-1, RW-2, RW-4, and RW-5 concentrations

Table 8
Mass Recovery Estimate Calculations
Groundwater Extraction Treatment System
Saunders Supply Company Superfund Site

GROUNDWATER ANALYTICAL DATA - OCTOBER 2012

Analyte Name Total/Dissolved Unit	Sample Date	Sample Type Code	ARSENIC	ARSENIC	CHROMIUM	CHROMIUM	PCP
			T ug/l	D ug/l	T ug/l	D ug/l	N ug/l
RW-1	10/16/2012	N	20.3	< 1.00	15.3	< 1.00	9.20
RW-2	10/16/2012	N	< 1.00	< 1.00	< 1.00	< 1.00	3.65
RW-4	10/16/2012	N	< 1.00	< 1.00	< 1.00	< 1.00	< 0.0793
RW-5	10/16/2012	N	< 1.00	< 1.00	< 1.00	< 1.00	280

PCP = Pentachlorophenol; N = normal sample; T = total (unfiltered) sample; D = dissolved (filtered) sample; NS = not sampled due to pump failure

Monitoring Period 6/25/2012 through 12/27/2012 = 185 days

Volume of Groundwater Processed during this period:		
RW-1	8,805	gallons
RW-2	8,355	gallons
RW-4	18,975	gallons
RW-5	43,252	gallons
TOTAL	79,387	gallons

TOTAL MASS RECOVERED DURING MONITORING PERIOD		
PCP	0.10	lbs
Arsenic	0.002	lbs
Chromium	0.002	lbs

RW-1 Mass Recovery Estimate:

Mass (PCP)=	9.20	ug	8805	gal	1000	mg	1000	g	454	g	3,785	L	=	6.75E-04	lbs
		L				ug		mg			gal				
Mass (Arsenic)=	20.8	ug	8805	gal	1000	mg	1000	g	454	g	3,785	L	=	1.53E-03	lbs
		L				ug		mg			gal				
Mass (Chromium)=	15.8	ug	8805	gal	1000	mg	1000	g	454	g	3,785	L	=	1.16E-03	lbs
		L				ug		mg			gal				

RW-2 Mass Recovery Estimate:

Mass (PCP)=	3.65	ug	8355	gal	1000	mg	1000	g	454	g	3,785	L	=	2.54E-04	lbs
		L				ug		mg			gal				
Mass (Arsenic)*=	1	ug	8355	gal	1000	mg	1000	g	454	g	3,785	L	=	6.97E-05	lbs
		L				ug		mg			gal				
Mass (Chromium)*=	1	ug	8355	gal	1000	mg	1000	g	454	g	3,785	L	=	6.97E-05	lbs
		L				ug		mg			gal				

RW-4 Mass Recovery Estimate:

Mass (PCP)*=	0.03965	ug	18975	gal	1000	mg	1000	g	454	g	3,785	L	=	6.27E-06	lbs
		L				ug		mg			gal				
Mass (Arsenic)*=	1.62	ug	18975	gal	1000	mg	1000	g	454	g	3,785	L	=	2.56E-04	lbs
		L				ug		mg			gal				
Mass (Chromium)*=	1	ug	18975	gal	1000	mg	1000	g	454	g	3,785	L	=	1.58E-04	lbs
		L				ug		mg			gal				

RW-5 Mass Recovery Estimate:

Mass (PCP)=	280	ug	43252	gal	1000	mg	1000	g	454	g	3,785	L	=	1.01E-01	lbs
		L				ug		mg			gal				
Mass (Arsenic)*=	1	ug	43252	gal	1000	mg	1000	g	454	g	3,785	L	=	3.61E-04	lbs
		L				ug		mg			gal				
Mass (Chromium)*=	1	ug	43252	gal	1000	mg	1000	g	454	g	3,785	L	=	3.61E-04	lbs
		L				ug		mg			gal				

*for calculation purposes, values converted to half the quantitation/detection limit for results below detection limits

Table 8
Mass Recovery Estimate Calculations
Groundwater Extraction Treatment System
Saunders Supply Company Superfund Site

GROUNDWATER ANALYTICAL DATA - APRIL 2013

Analyte Name Total/Dissolved Unit	Sample Date	Sample Type Code	ARSENIC	ARSENIC	CHROMIUM	CHROMIUM	PCP
			T ug/l	D ug/l	T ug/l	D ug/l	N ug/l
RW-1	4/18/2013	N	6.20	< 1.00	6.71	< 1.00	5.80
RW-2	4/18/2013	N	< 1.00	< 1.00	< 1.00	< 1.00	5.31
RW-4	4/18/2013	N	< 1.00	< 1.00	< 1.00	< 1.00	< 0.0805
RW-5	4/18/2013	N	< 1.00	< 1.00	< 1.00	< 1.00	< 0.0795

PCP = Pentachlorophenol; N = normal sample; T = total (unfiltered) sample; D = dissolved (filtered) sample

Monitoring Period 12/28/2012 through 6/24/2013 = 178 days

Volume of Groundwater Processed during this period:		
RW-1	7158	gallons
RW-2	8932	gallons
RW-4	22813	gallons
RW-5	16934	gallons
TOTAL	55837	gallons

TOTAL MASS RECOVERED DURING MONITORING PERIOD		
PCP	0.001	lbs
Arsenic	0.001	lbs
Chromium	0.0005	lbs

RW-1 Mass Recovery Estimate:

Mass (PCP)=	5.80	ug	7158	gal	1000	mg	1000	mg	454	lbs	3.785	L	=	3.46E-04	lbs
		L				ug				g		gal			
Mass (Arsenic)*=	6.70	ug	7158	gal	1000	mg	1000	mg	454	lbs	3.785	L	=	4.00E-04	lbs
		L				ug				g		gal			
Mass (Chromium)=	1	ug	7158	gal	1000	mg	1000	mg	454	lbs	3.785	L	=	5.97E-05	lbs
		L				ug				g		gal			

RW-2 Mass Recovery Estimate:

Mass (PCP)=	5.31	ug	8932	gal	1000	mg	1000	mg	454	lbs	3.785	L	=	3.95E-04	lbs
		L				ug				g		gal			
Mass (Arsenic)*=	1	ug	8932	gal	1000	mg	1000	mg	454	lbs	3.785	L	=	7.45E-05	lbs
		L				ug				g		gal			
Mass (Chromium)*=	1	ug	8932	gal	1000	mg	1000	mg	454	lbs	3.785	L	=	7.45E-05	lbs
		L				ug				g		gal			

RW-4 Mass Recovery Estimate:

Mass (PCP)*=	0.040	ug	22813	gal	1000	mg	1000	mg	454	lbs	3.785	L	=	7.61E-06	lbs
		L				ug				g		gal			
Mass (Arsenic)*=	1	ug	22813	gal	1000	mg	1000	mg	454	lbs	3.785	L	=	1.90E-04	lbs
		L				ug				g		gal			
Mass (Chromium)*=	1	ug	22813	gal	1000	mg	1000	mg	454	lbs	3.785	L	=	1.90E-04	lbs
		L				ug				g		gal			

RW-5 Mass Recovery Estimate:

Mass (PCP)=	0.040	ug	16934	gal	1000	mg	1000	mg	454	lbs	3.785	L	=	5.65E-06	lbs
		L				ug				g		gal			
Mass (Arsenic)=	1	ug	16934	gal	1000	mg	1000	mg	454	lbs	3.785	L	=	1.41E-04	lbs
		L				ug				g		gal			
Mass (Chromium)*=	1	ug	16934	gal	1000	mg	1000	mg	454	lbs	3.785	L	=	1.41E-04	lbs
		L				ug				g		gal			

*for calculation purposes, values converted to half the quantitation/detection limit for results below detection limits

Table 9
Primary and Duplicate Sample Results
Saunders Supply Company
Chuckatuck, Virginia

Location ID Sample Date Sample Type Code Analyte Name	Unit	Analytical Method	MCL	INF 07/09/12 P	INF 07/09/12 FD	RPD ¹	C1 08/07/12 P	C1 08/07/12 FD	RPD ¹	C1 9/12/2012 P	C1 9/12/2012 FD	RPD ¹	RW-5 10/16/2012 P	RW-5 10/16/2012 FD	RPD ¹
Arsenic (Total)	µg/L	E200.8	10	<1.00	<1.00	--	<1.00	<1.00	--	<1.00	<1.00	--	<1.00	<1.00	--
Arsenic (Dissolved)	µg/L	E200.8	10	<1.00	<1.00	--	<1.00	<1.00	--	<1.00	<1.00	--	<1.00	<1.00	--
Chromium (Total)	µg/L	E200.8	100	<1.00	<1.00	--	<1.00	<1.00	--	<1.00	<1.00	--	<1.00	2.19 J	--
Chromium (Dissolved)	µg/L	E200.8	100	<1.00	<1.00	--	<1.00	<1.00	--	<1.00	<1.00	--	<1.00	<1.00	--
Pentachlorophenol ²	µg/L	SW8151	1	<0.0766 ²	<0.0781 ²	--	<0.0939 ²	<0.0792 ²	--	<0.0833 ²	<0.0819 ²	--	280	226	21.34

Location ID Sample Date Sample Type Code Analyte Name	Unit	Analytical Method	MCL	C1 11/5/2012 P	C1 11/5/2012 FD	RPD ¹	C1 12/19/2012 P	C1 12/19/2012 FD	RPD ¹	C1 1/15/2013 P	C1 1/15/2013 FD	RPD ¹	C1 2/22/2013 P	C1 2/22/2013 FD	RPD ¹
Arsenic (Total)	µg/L	E200.8	10	<1.00	<1.00	--	<1.00	<1.00	--	<1.00	<1.00	--	<1.00	<1.00	--
Arsenic (Dissolved)	µg/L	E200.8	10	<1.00	<1.00	--	<1.00	<1.00	--	<1.00	<1.00	--	<1.00	<1.00	--
Chromium (Total)	µg/L	E200.8	100	<1.00	<1.00	--	<1.00	<1.00	--	<1.00	<1.00	--	<1.00	<1.00	--
Chromium (Dissolved)	µg/L	E200.8	100	<1.00	<1.00	--	<1.00	<1.00	--	<1.00	<1.00	--	<1.00	<1.00	--
Pentachlorophenol ²	µg/L	SW8151	1	<0.0767 ²	<0.0766 ²	--	<0.0752 ²	<0.0768 ²	--	<0.0776 ²	<0.0630 ²	--	<0.0793 ²	<0.0773 ²	--

Location ID Sample Date Sample Type Code Analyte Name	Unit	Analytical Method	MCL	C1 3/18/2013 P	C1 3/18/2013 FD	RPD ¹	C1 4/8/2013 P	C1 4/8/2013 FD	RPD ¹	MW-8D 4/18/2013 P	MW-8D 4/18/2013 FD	RPD ¹	C1 5/16/2013 P	C1 5/16/2013 FD	RPD ¹
Arsenic (Total)	µg/L	E200.8	10	<1.00	<1.00	--	<1.00	<1.00	--	2050	1780	14.10	<1.00	<1.00	--
Arsenic (Dissolved)	µg/L	E200.8	10	<1.00	<1.00	--	<1.00	<1.00	--	1960	1740	11.89	<1.00	<1.00	--
Chromium (Total)	µg/L	E200.8	100	<1.00	<1.00	--	<1.00	<1.00	--	60.9	55.2	9.82	<1.00	<1.00	--
Chromium (Dissolved)	µg/L	E200.8	100	<1.00	<1.00	--	<1.00	<1.00	--	57.5	50.7	12.57	<1.00	<1.00	--
Pentachlorophenol ²	µg/L	SW8151	1	<0.0751 ²	<0.0793 ²	--	<0.0774 ²	<0.0766 ²	--	1.30	1.75	29.51	<0.08130 ²	<0.0780 ²	--

Location ID Sample Date Sample Type Code Analyte Name	Unit	Analytical Method	MCL	C1 6/10/2013 P	C1 6/10/2013 FD	RPD ¹
Arsenic (Total)	µg/L	E200.8	10	<1.00	<1.00	--
Arsenic (Dissolved)	µg/L	E200.8	10	<1.00	<1.00	--
Chromium (Total)	µg/L	E200.8	100	<1.00	<1.00	--
Chromium (Dissolved)	µg/L	E200.8	100	<1.00	<1.00	--
Pentachlorophenol ²	µg/L	SW8151	1	<0.0789 ²	<0.0789 ²	--

< = not detected at or above specified laboratory detection limit.

P = Primary or Parent Sample

FD = Field Duplicate Sample

RPD = Relative Percent Difference

MCLs = EPA National Primary Drinking Water Regulations Maximum Contaminant Levels

J = Analyte detected below quantitation limits

µg/L = micrograms per liter

¹ = Difference of the primary and duplicate sample results divided by the average of the parent and duplicate sample results, then multiplied by 100

-- = Cannot compute

Arsenic and Chromium analyzed via method E200.8 by REIC Labs, Beaver, West Virginia.

² = Pentachlorophenol analyzed via method SW8151 by REIC Labs. Non-detect results are not detected at or above the Method Detection Limit (MDL).

The following detection limits were attained:

Arsenic: 1.00 µg/l

Chromium: 1.00 µg/l

Pentachlorophenol: 0.0670 - 0.0825 µg/l

See lab reports for specific MDL and PQL limits reached for each Pentachlorophenol analysis.

Table 10
Rinsate Blank Sample Results
Saunders Supply Company Superfund Site
Chuckatuck, Virginia

Location ID	Sample Date	Analytes (µg/L)				
		Arsenic (Total) <i>E200.8</i>	Arsenic (Dissolved) <i>E200.8</i>	Chromium (Total) <i>E200.8</i>	Chromium (Dissolved) <i>E200.8</i>	Pentachlorophenol <i>SW8270 SIMS</i>
MCLs		10	10	100	100	1
RB	10/22/2009	1.4	1.0	4.0	4.5	< 0.10
RB	4/22/2010	< 1.0	< 1.0	< 2.0	< 2.0	< 0.10
RB	10/6/2010	3.2 J	1.9 J	< 1.00	< 1.00	<0.103
RB	4/20/2011	< 1.00	< 1.00	< 1.00	< 1.00	< 0.110
RB	10/27/2011	< 1.00	< 1.00	< 1.00	< 1.00	< 0.0760
RB	4/18/2012	< 1.00	< 1.00	< 1.00	< 1.00	< 0.0772
RB	10/15/2012	< 1.00	< 1.00	< 1.00	< 1.00	< 0.0835
RB	4/18/2013	< 1.00	< 1.00	< 1.00	< 1.00	< 0.0777

µg/L = micrograms per liter

< = analyte not detected at or above the specified laboratory detection limit

RB = Rinsate Blank

MCLs = EPA National Primary Drinking Water Regulations Maximum Contaminant Levels

Pentachlorophenol non-detect results from REI Consultants, Inc. Labs are not detected at or above the specified Practical Quantitation Limit (PQL).

FIGURES

Godwin's Millpond

Godwin Blvd (Route 10/32)



Approximate Center Line of Ditch

Well ID	TOC (ft)	DTW (ft)	GW Elev (ft)
MW-7S	42.67	7.58	36.06
MW-9S	37.24	10.03	30.86
MW-11S	35.42	7.89	28.21
MW-20S	39.99	11.40	29.03
MW-22S	35.03	8.63	27.02
RW-1	38.83	13.30	26.05
RW-2	36.85	13.70	25.50
RW-4	32.35	11.05	23.85
RW-5	40.10	12.91	25.52

Propane Tanks

Kelly Nursery

Former Wastewater Pond

Former Earthen Separation Pond

Groundwater Treatment Building

Former Wood Treating Process Area

Former Storage Tanks

Legend	
	Monitoring Well
	Recovery Well
	Abandoned Well
	Groundwater Contour (ft)
	Former Use Area
	Former Tank
	Propane Tank
	Building
	Concrete Pad
	Road
	Ditch
	Fence/Property Line
	Creek
	Pond



Source: Base map provided by CDM



Environmental Alliance, Inc.
8215 Hermitage Road - Henrico, Virginia 23228
Phone: (877) 234-1141 - Fax: (302) 234-1535

Saunders Supply Company
Superfund Site
Chuckatuck, Virginia

Groundwater Elevation Contour Map -
Shallow Zone - October 2012

DESIGNED BY: JSE	DRAWN BY: SKJ	UPDATED BY: --	FIGURE NO.:
APPROVED BY: MRR	PROJECT NO.:2832	DATE: 01/22/13	1

Godwin's Millpond

Godwin Blvd (Route 10/32)



Approximate Center Line of Ditch

MW-19D

Well ID	TOC (ft)	DTW (ft)	GW Elev (ft)
MW-7S	42.67	7.58	35.92
MW-9S	37.24	10.03	28.12
MW-11S	35.42	7.89	28.12
MW-20S	39.99	11.40	29.16
MW-22S	35.03	8.63	26.90
RW-1	38.83	13.30	25.38
RW-2	36.85	13.70	23.23
RW-4	32.35	11.05	21.39
RW-5	40.10	12.91	26.60

Propane Tanks

Kelly Nursery

MW-10D
MW-9S

Groundwater Treatment Building

Former Wastewater Pond

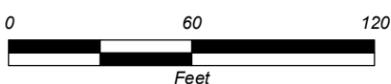
Former Earthen Separation Pond

Former Wood Treating Process Area

Former Storage Tanks

Legend

- Monitoring Well
- Recovery Well
- Abandoned Well
- Groundwater Contour (ft)
- Road
- Ditch
- Fence/Property Line
- Creek
- Former Use Area
- Former Tank
- Propane Tank
- Building
- Concrete Pad
- Pond



Source: Base map provided by CDM



Environmental Alliance, Inc.
8215 Hermitage Road - Henrico, Virginia 23228
Phone: (877) 234-1141 - Fax: (302) 234-1535

Saunders Supply Company
Superfund Site
Chuckatuck, Virginia

Groundwater Elevation Contour Map -
Shallow Zone - April 2013

DESIGNED BY: JSE	DRAWN BY: SKJ	UPDATED BY: --	FIGURE NO.:
APPROVED BY: MR.R	PROJECT NO.:2832	DATE: 05/14/13	2

05/14/13 1:17:13 PM - G:\EAI\Projects\Non-PCG\Projects\2832-Saunders\MKD\2013-04\2832-SGW-Grad04-13.mxd

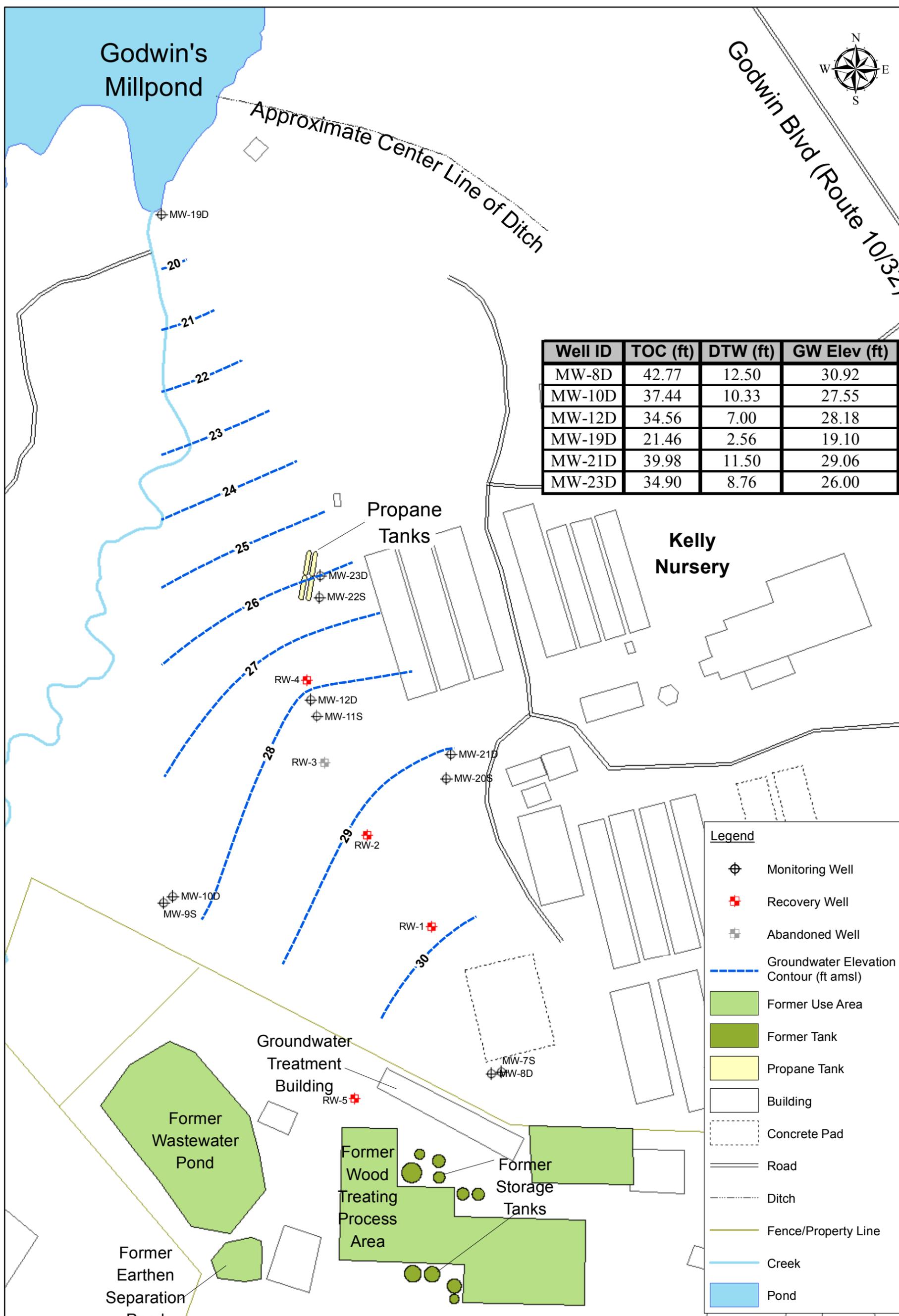
Godwin's Millpond

Godwin Blvd (Route 10/32)



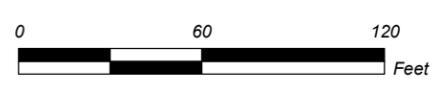
Approximate Center Line of Ditch

Well ID	TOC (ft)	DTW (ft)	GW Elev (ft)
MW-8D	42.77	12.50	30.92
MW-10D	37.44	10.33	27.55
MW-12D	34.56	7.00	28.18
MW-19D	21.46	2.56	19.10
MW-21D	39.98	11.50	29.06
MW-23D	34.90	8.76	26.00



Legend

- Monitoring Well
- Recovery Well
- Abandoned Well
- Groundwater Elevation Contour (ft amsl)
- Former Use Area
- Former Tank
- Propane Tank
- Building
- Concrete Pad
- Road
- Ditch
- Fence/Property Line
- Creek
- Pond



Source: Base map provided by CDM

Environmental Alliance, Inc.
 8215 Hermitage Road - Henrico, Virginia 23228
 Phone: (877) 234-1141 - Fax: (302) 234-1535

Saunders Supply Company Superfund Site
 Chuckatuck, Virginia

Groundwater Elevation Contour Map - Deep Zone - October 2012

DESIGNED BY: JSE	DRAWN BY: SKJ	UPDATED BY: --	FIGURE NO.:
APPROVED BY: MRR	PROJECT NO.:	DATE:	3
	2832	01/22/13	

Godwin's Millpond

Godwin Blvd (Route 10/32)



Approximate Center Line of Ditch

Well ID	TOC (ft)	DTW (ft)	GW Elev (ft)
MW-8D	42.77	12.50	30.99
MW-10D	37.44	10.33	27.86
MW-12D	34.56	7.00	24.98
MW-19D	21.46	2.56	18.99
MW-21D	39.98	11.50	29.06
MW-23D	34.90	8.76	26.69

Propane Tanks

Kelly Nursery

Groundwater Treatment Building

Former Wastewater Pond

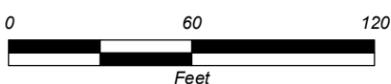
Former Earthen Separation Pond

Former Wood Treating Process Area

Former Storage Tanks

Legend

- Monitoring Well
- Recovery Well
- Abandoned Well
- Groundwater Elevation Contour (ft amsl)
- Road
- Ditch
- Fence/Property Line
- Creek
- Former Use Area
- Former Tank
- Propane Tank
- Building
- Concrete Pad
- Pond



Source: Base map provided by CDM



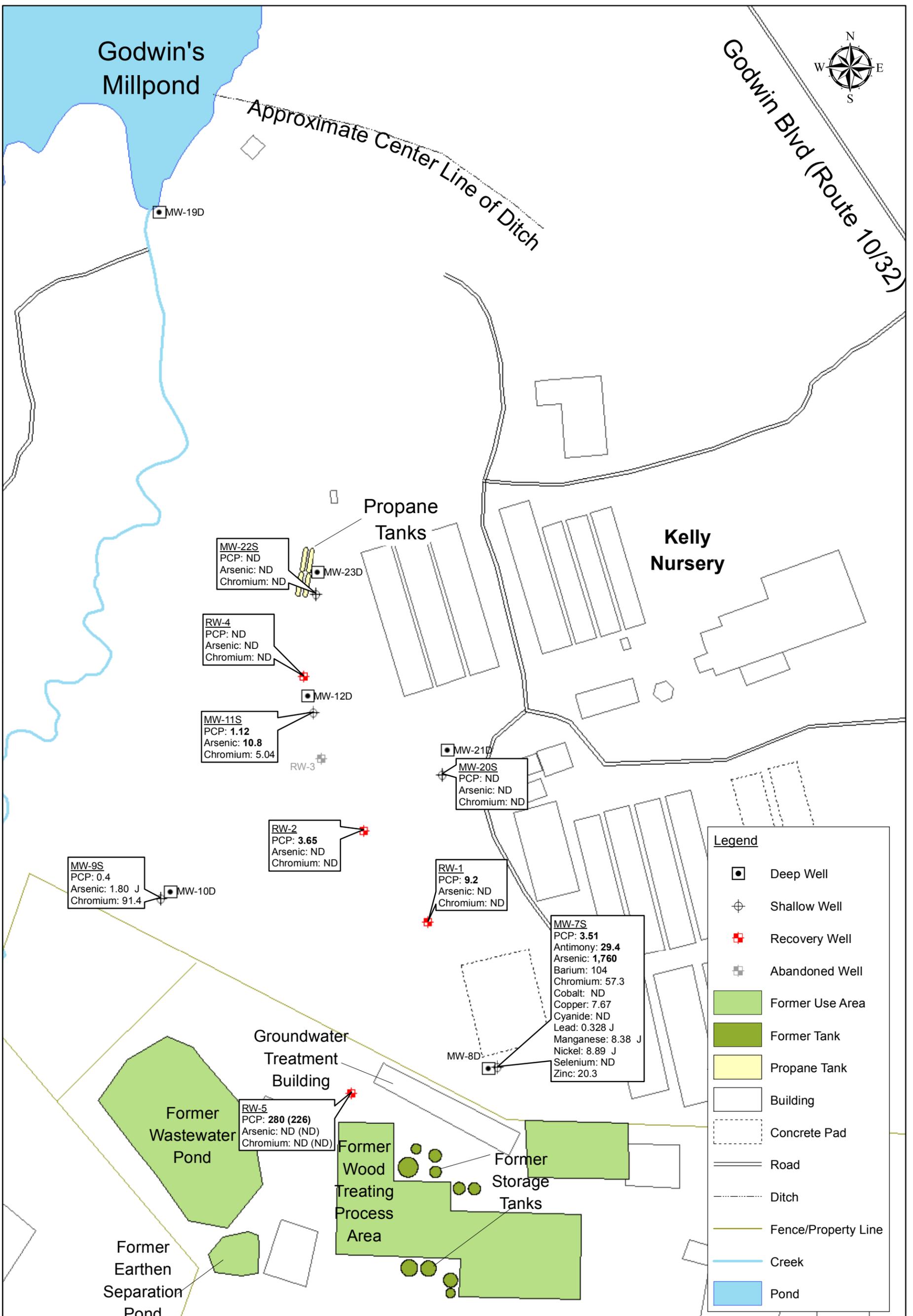
Environmental Alliance, Inc.
8215 Hermitage Road - Henrico, Virginia 23228
Phone: (877) 234-1141 - Fax: (302) 234-1535

Saunders Supply Company Superfund Site
Chuckatuck, Virginia

Groundwater Elevation Contour Map - Deep Zone - April 2013

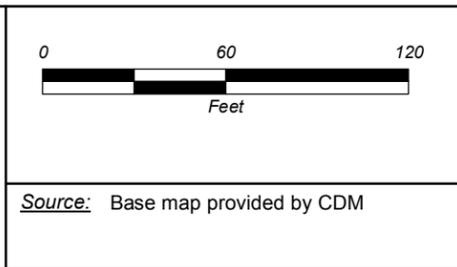
DESIGNED BY: JSE	DRAWN BY: SKJ	UPDATED BY: --	FIGURE NO.:
APPROVED BY: MRR	PROJECT NO.:2832	DATE: 05/14/13	4

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Notes:

- All concentrations reported in micrograms per liter (µg/L).
- J = Estimated Value
- ND = Non-Detect
- Duplicate samples shown in parenthesis.
- **Bolded** values are greater than or equal to the MCL
- Only dissolved concentrations shown for Arsenic and Chromium

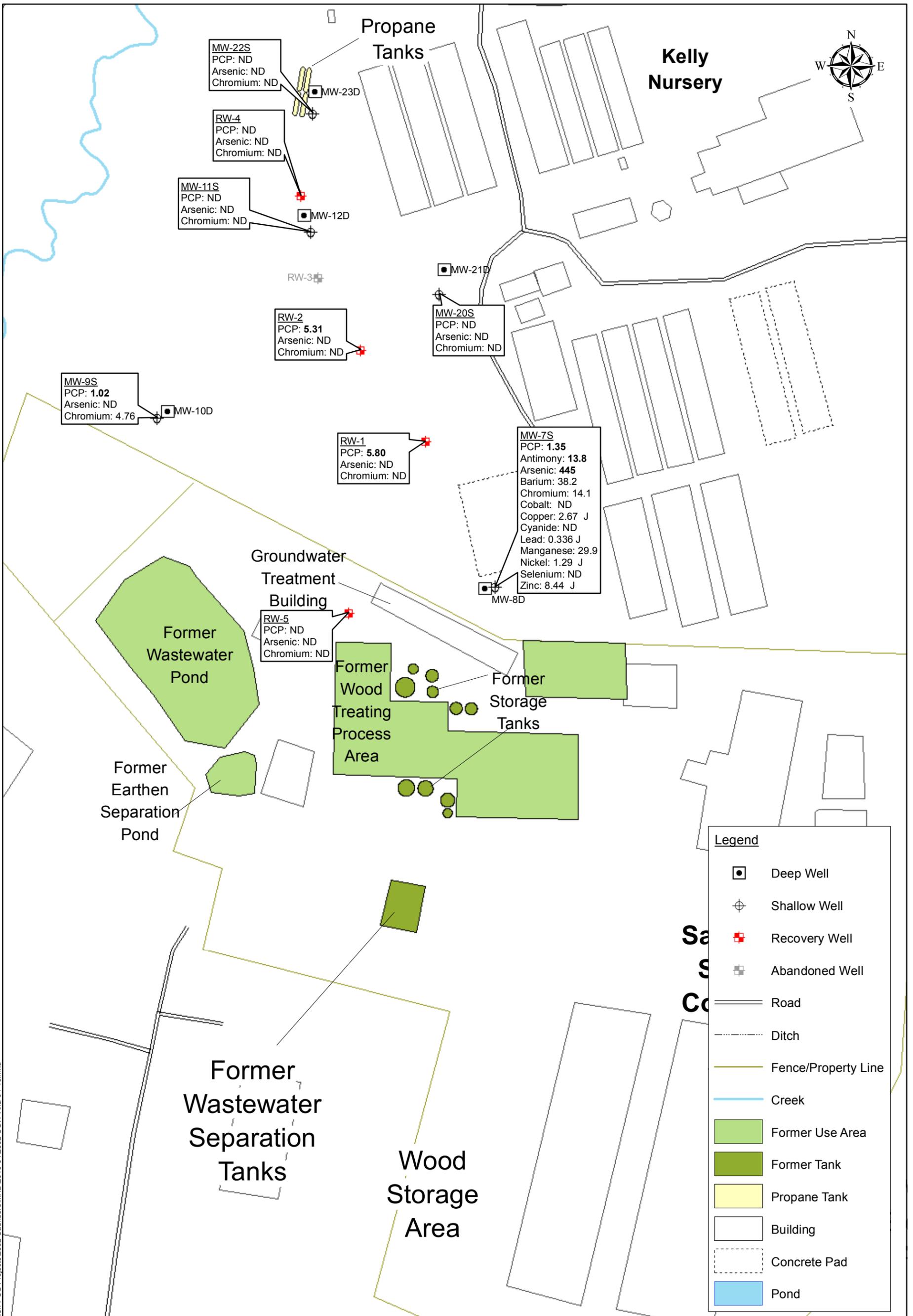


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Saunders Supply Company Superfund Site
Chuckatuck, Virginia

Groundwater COC Concentrations in Shallow Zone Groundwater - October 2012

DESIGNED BY: JSE	DRAWN BY: SKJ	UPDATED BY: --	FIGURE NO.:
APPROVED BY: MRR	PROJECT NO.:2832	DATE: 01/23/13	5



MW-22S
PCP: ND
Arsenic: ND
Chromium: ND

RW-4
PCP: ND
Arsenic: ND
Chromium: ND

MW-11S
PCP: ND
Arsenic: ND
Chromium: ND

RW-2
PCP: **5.31**
Arsenic: ND
Chromium: ND

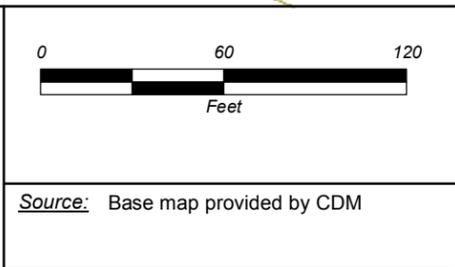
MW-9S
PCP: **1.02**
Arsenic: ND
Chromium: 4.76

RW-1
PCP: **5.80**
Arsenic: ND
Chromium: ND

MW-7S
PCP: **1.35**
Antimony: **13.8**
Arsenic: **445**
Barium: 38.2
Chromium: 14.1
Cobalt: ND
Copper: 2.67 J
Cyanide: ND
Lead: 0.336 J
Manganese: 29.9
Nickel: 1.29 J
Selenium: ND
Zinc: 8.44 J

RW-5
PCP: ND
Arsenic: ND
Chromium: ND

Notes:
 - All concentrations reported in micrograms per liter (µg/L).
 - J = Estimated Value
 - ND = Non-Detect
 - Duplicate samples shown in parenthesis.
 - **Bolded** values are greater than or equal to the MCL
 - Only dissolved concentrations shown for Arsenic and Chromium

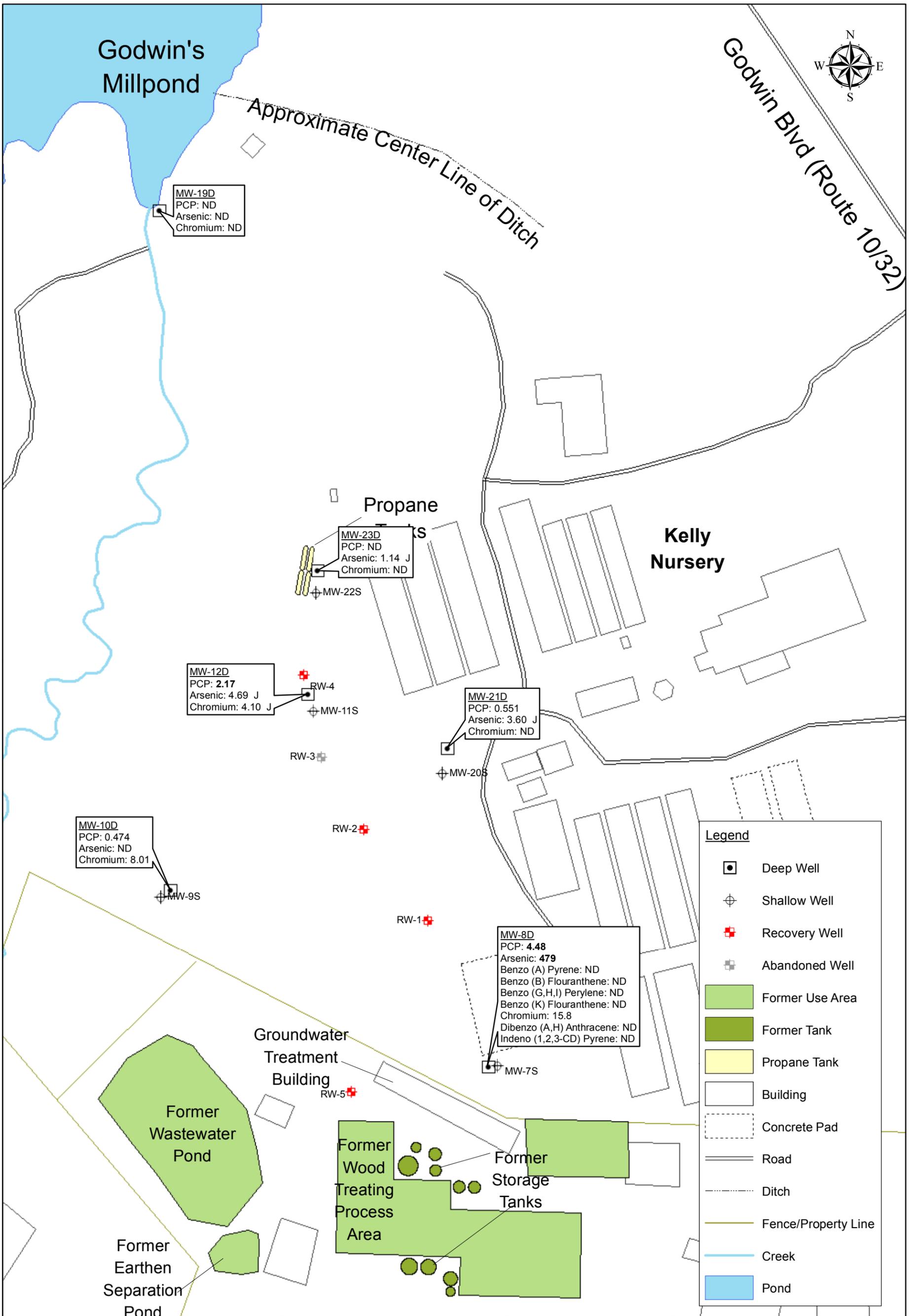


Saunders Supply Company Superfund Site Chuckatuck, Virginia

Groundwater COC Concentrations in Shallow Zone Groundwater - April 2013

DESIGNED BY: JSE	DRAWN BY: SKJ	UPDATED BY: LAV	FIGURE NO.:
APPROVED BY: MRR	PROJECT NO.:	DATE:	↑
	2832	07/09/13	

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MW-19D
PCP: ND
Arsenic: ND
Chromium: ND

MW-23D
PCP: ND
Arsenic: 1.14 J
Chromium: ND

MW-12D
PCP: 2.17
Arsenic: 4.69 J
Chromium: 4.10 J

MW-10D
PCP: 0.474
Arsenic: ND
Chromium: 8.01

MW-21D
PCP: 0.551
Arsenic: 3.60 J
Chromium: ND

MW-8D
PCP: 4.48
Arsenic: 479
Benzo (A) Pyrene: ND
Benzo (B) Flouranthene: ND
Benzo (G,H,I) Perylene: ND
Benzo (K) Flouranthene: ND
Chromium: 15.8
Dibenzo (A,H) Anthracene: ND
Indeno (1,2,3-CD) Pyrene: ND

Legend

- Deep Well
- Shallow Well
- Recovery Well
- Abandoned Well
- Former Use Area
- Former Tank
- Propane Tank
- Building
- Concrete Pad
- Road
- Ditch
- Fence/Property Line
- Creek
- Pond

Notes:

- All concentrations reported in micrograms per liter (µg/L).
- J = Estimated Value
- ND = Non-Detect
- Bolded values are greater than or equal to the MCL
- Only Dissolved concentrations shown for Arsenic and Chromium unless otherwise noted

0 60 120
Feet

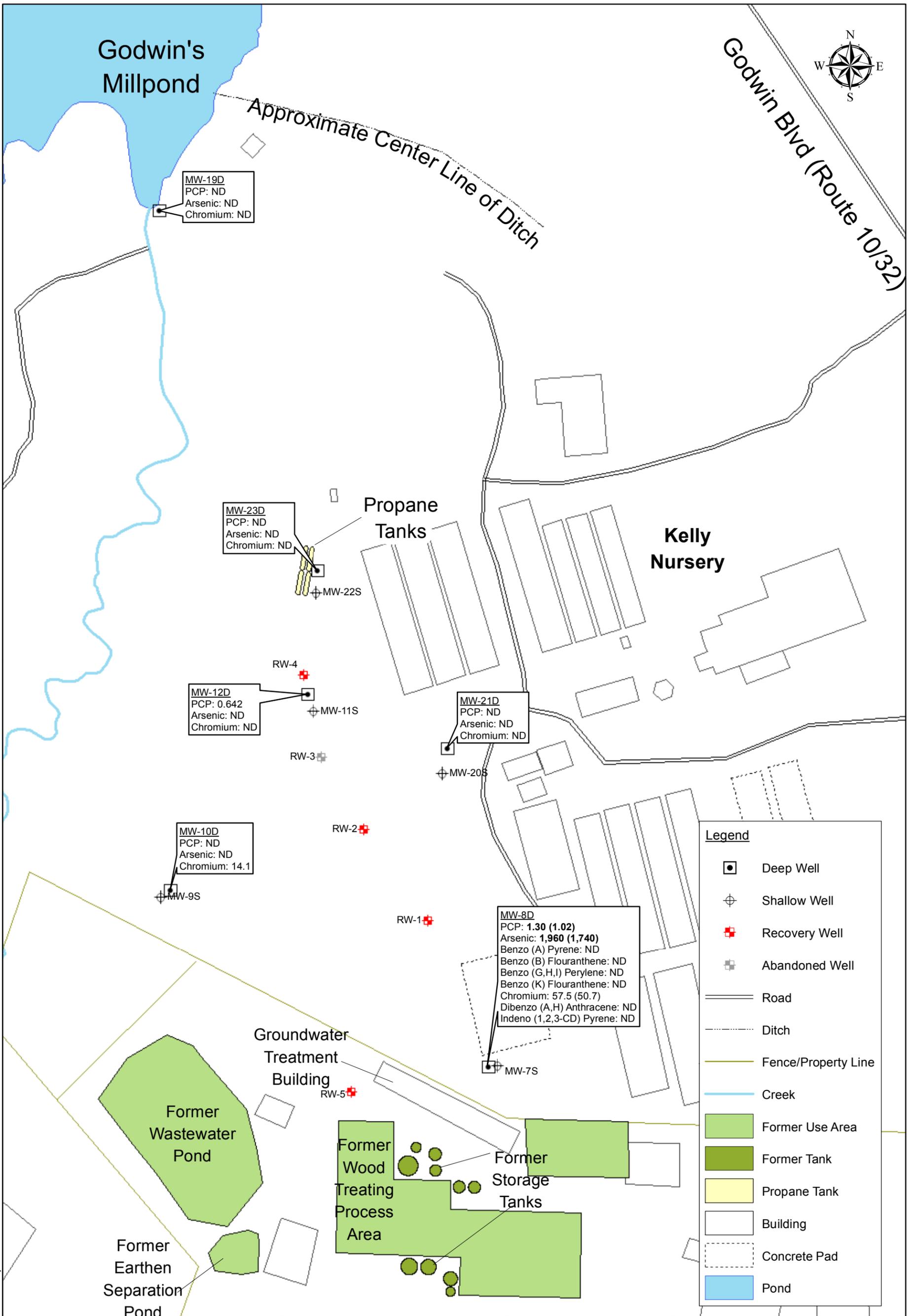
Source: Base map provided by CDM

Environmental Alliance, Inc.
8215 Hermitage Road - Henrico, Virginia 23228
Phone: (877) 234-1141 - Fax: (302) 234-1535

Saunders Supply Company Superfund Site
Chuckatuck, Virginia

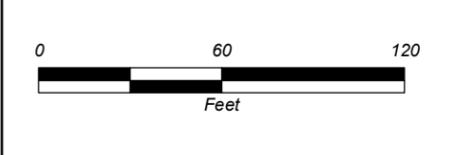
Groundwater COC Concentrations in Deep Zone Groundwater - October 2012

DESIGNED BY: JSE	DRAWN BY: SKJ	UPDATED BY: --	FIGURE NO.:
APPROVED BY: MRR	PROJECT NO.:	DATE:	7
	2832	01/23/13	



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Notes:
 - All concentrations reported in micrograms per liter (µg/L).
 - J = Estimated Value
 - ND = Non-Detect
 - Bolded values are greater than or equal to the MCL
 - Only Dissolved concentrations shown for Arsenic and Chromium unless otherwise noted



Source: Base map provided by CDM



Environmental Alliance, Inc.
 8215 Hermitage Road - Henrico, Virginia 23228
 Phone: (877) 234-1141 - Fax: (302) 234-1535

**Saunders Supply Company
 Superfund Site
 Chuckatuck, Virginia**

**Groundwater COC Concentrations in
 Deep Zone Groundwater - April 2013**

DESIGNED BY: JSE	DRAWN BY: SKJ	UPDATED BY: --	FIGURE NO.:
APPROVED BY: MRR	PROJECT NO.:	DATE:	8
	2632	05/14/13	

APPENDIX I

FIELD DATA SHEETS

GROUNDWATER SAMPLING FIELD DATA SHEET

DATE: 10/15-16/12

SITE/PROJECT: 2832A Saunders

SAMPLING TEAM: Matt Scott

WELL INFORMATION						PURGE INFORMATION			PARAMETERS GROUP 1				PARAMETERS GROUP 2		SAMPLING	
SAMPLE LOCATION	DTW (REF.)	WELL DEPTH	WELL DIAM.	WATER COLUMN	VOLUME TO PURGE	VOLUME PURGED	RATE (gpm)	METHOD	TIME	pH	TEMP	COND	DO	Turbidity	TIME	METHOD
MW-19D	2.31							Low Flow	11:44	7.56	20.38	0.421	4.89	68.5	10/15/2012	
									11:47	7.50	20.45	0.421	4.55	53.3		
									11:50	7.46	20.62	0.409	5.47	49.6		
									11:54	7.45	20.79	0.408	5.48	48.6		
									11:58	7.47	21.09	0.406	5.22	44.2		
									12:02	7.46	21.22	0.406	4.31	42.9		
									12:06	7.44	21.20	0.405	3.64	43.6		
MW-23D	8.90							Low Flow	14:30	7.39	21.40	0.397	0.50	10/15/2012		
									14:34	7.37	22.24	0.401	0.27			
									14:37	7.37	22.43	0.402	0.27			
									14:40	7.36	22.62	0.403	0.24			
									14:44	7.37	22.86	0.404	0.22			
									14:47	7.36	23.00	0.405	0.20			
									14:50	7.36	23.10	0.405	0.20			
MW-22S	8.01							Low Flow	15:10	6.41	23.59	0.373	4.31	10/15/2012		
									15:14	6.36	23.95	0.373	4.15			
									15:18	6.32	24.52	0.374	3.94			
									15:21	6.31	24.91	0.374	3.71			
									15:24	6.31	24.97	0.374	3.75			
MW-21D	10.92							Low Flow	15:27	6.31	25.01	0.374	3.61	10/16/2012		
									9:17	6.94	19.35		2.87			
									9:20	6.75	20.46		2.03			
									9:23	6.68	20.76		1.65			
									9:26	6.64	21.11					
									9:28	6.62	21.19					
									9:30	6.60	21.32					
MW-20S	10.96							Low Flow	9:33	6.60	21.33			10/16/2012		
									9:35	6.59	21.36					
									9:47	6.39	19.91					
									9:50	6.26	20.23					
									9:53	6.11	21.30					
									9:55	6.06	21.91					
									9:58	6.03	22.09					
MW-11S	7.21							Low Flow	10:00	6.02	22.15			10/16/2012		
									10:03	6.01	22.19					
									10:05	6.00	22.23					
									10:22	6.64	20.02					
									10:26	6.74	21.07					
									10:28	6.75	21.34					
									10:31	6.75	21.66					
10:34	6.73	22.06														
10:36	6.71	22.38														
10:39	6.69	22.59														
10:42	6.67	22.60														
10:45	6.66	22.60														

2" Well - 0.163
 4" Well - 0.653
 6" Well - 1.470

COMMENTS:

GROUNDWATER SAMPLING FIELD DATA SHEET

DATE: 4/17-18/2013

SITE/PROJECT: 2832A Saunder Supplu

SAMPLING TEAM: Matt Scott

WELL INFORMATION						PURGE INFORMATION			PARAMETERS GROUP 1				PARAMETERS GROUP 2		SAMPLING	
SAMPLE LOCATION	DTW (REF.)	WELL DEPTH	WELL DIAM.	WATER COLUMN	VOLUME TO PURGE	VOLUME PURGED	RATE (gpm)	METHOD	TIME	pH	TEMP	COND	DO	Turbidity	TIME	METHOD
MW-22S	8.13							Low Flow	12:00	6.38	22.58		7.94	4/17/2013 12:20		
									12:03	6.38	22.60		7.39			
									12:06	6.38	23.02		6.93			
									12:09	6.37	23.04		6.83			
									12:12	6.37	22.96		6.65			
MW-23D	8.21							Low Flow	12:45	7.02	25.35		0.00	4/17/2013 13:00		
									12:48	7.35	24.91		0.00			
									12:51	7.43	24.72		0.11			
									12:54	7.43	24.70		0.09			
									12:57	7.45	24.65		0.02			
MW-11S	7.30							Low Flow	13:29	6.48	22.62		0.00	4/17/2013 13:45		
									13:32	6.20	22.70		0.00			
									13:35	6.12	22.62		0.00			
									13:38	6.07	22.47		0.00			
									13:41	6.03	22.63		0.00			
MW-10D	9.58							Low Flow	14:57	6.49	22.28		0.00	4/17/2013 14:10		
									15:00	6.22	19.78		0.00			
									15:03	6.18	19.59		0.00			
									15:06	6.14	19.39		0.00			
MW-12D	9.58							Low Flow	14:15	6.74	23.85		0.00	4/17/2013 14:45		
									14:18	6.83	21.98		0.00			
									14:21	6.87	22.32		3.77			
									14:24	6.87	22.22		3.66			
									14:27	6.87	22.26		3.56			
MW-9S	9.12							Low Flow	14:30	6.88	22.16		3.49	4/17/2013 15:15		
									13:52	5.25	24.48		1.39			
									13:55	5.06	24.67		0.00			
									13:58	4.97	23.58		0.00			
MW-8D	11.78							Low Flow	14:01	4.95	23.47		0.00	4/18/2013 12:50		
									12:25	6.47	18.42		9.63			
									12:28	6.24	17.34		2.07			
									12:31	6.17	17.36		0.95			
									12:34	6.12	17.74		0.35			
									12:37	6.16	18.78		0.37			
									12:41	6.18	19.07		0.17			
MW-7S	6.75							Low Flow	12:44	6.25	18.72		0.00	4/18/2013 13:25		
									13:10	6.41	23.15		1.13			
									13:13	6.40	24.09		0.00			
									13:16	6.32	23.51		0.00			
									13:19	6.31	23.43		0.00			
MW-19D	2.42							Low Flow	13:22	6.30	23.44		0.00	4/18/2013 14:00		
									13:40	6.15	18.54		0.29			
									13:43	6.01	17.92		0.00			
									13:46	6.03	17.99		0.00			
									13:49	6.04	18.21		0.00			
									13:52	6.04	18.20		0.00			
MW-20S	10.83							Low Flow	13:55	6.05	18.25		0.00	4/18/2013 14:50		
									14:35	6.24	20.21		0.51			
									14:39	6.05	20.01		0.21			
									14:42	6.09	20.12		0.00			
									14:45	6.10	20.30		0.00			
MW-21D	10.92							Low Flow	14:48	6.12	20.34		0.00	4/18/2013 15:40		
									15:22	6.19	20.02		0.2			
									15:25	6.12	19.58		0.00			
									15:28	6.13	19.67		0.00			
									15:32	6.13	19.66		0.00			
									15:35	6.14	19.72		0.00			

2" Well - 0.163
 4" Well - 0.653
 6" Well - 1.470

COMMENTS: _____

APPENDIX II

LABORATORY ANALYTICAL REPORTS

(ON DATA COMPACT DISC)

APPENDIX III

SYSTEM MONITORING CHECKLISTS

Saunders Supply Superfund Site - Groundwater Treatment System Weekly System Monitoring Checklist

Date: 7/3/2012

Time onsite: 8:00

Personnel Onsite: M. Scott

Time offsite: 10:20

Note: For all readings, if equipment is not operating, turn the equipment on and take readings. Ensure conditions are safe to operate equipment (i.e. sufficient water supply exists for pump suction).

RECOVERY WELL	TIME	PUMP RUNNING?	FLOW TRANSMITTER				AMETEK METER	
			TOTAL FLOW TO DATE (gallons)	FLOW RATE (gpm)	FLOW RATE ADJUSTED (if below 2.5 adjust to 2.5 - 2.75)	FINAL FLOW RATE*	WELL WATER LEVEL	PROGRAMMED WATER LEVEL RANGE
RW-1		Y	642374	1.55	N	1.55	5.7	7.3-5.3
RW-2		Y	2116537	1.62	N	1.62	2.4	3.6-1.6
RW-5		Y	190423	2.7	N	2.7	8.8	9.5-7.5
RW-4		Y	2142984	1.37	Y	1.53	5.0	6.7-4.7

*Note if flow adjustment value is full open, write "Full Open" in the Final Flow Rate box.

Yellow Lights: T-2-Hi-Hi **OFF / ON** Well Pump 1 **OFF / ON** Well Pump 5 **OFF / ON**
 (On Alarm Panel) T-3-Hi-Hi **OFF / ON** Well Pump 2 **OFF / ON** Well Pump 4 **OFF / ON**

Chemical Feed Tank CF-1: Full ¾ ½ ¼ Empty Feed Tank pH: 10+
 Filled Tank? **Y**

Chemical Blending Tank T-1: Air Compressor Operating? **Y/N** pH Strips: 9.70
 Ph Meter: 9.51

Bag Filters: In Operation **Y / N** Pump Pressure (psi): 24 Flow (gpm): 9
 Bag Filters Changed: **N**

Carbon Filters: Pre-carbon Filtration Pressure (psi) 3.4

Effluent Pump: In Operation' **Y** 4.6

Building: Heaters effective? **Y / N / N.A.** Vent fan operating? **Y / N**

Critical Device Check Performed this visit? **Y**

Notes:

No power to control panel upon arrival - Dominion power called to site to check power service - Power service normal

Power outage found to be a breaker in electrical panel stuck between the on and off positions - Reason for tripped breaker unknown

RW-2 pumping upon restart but roto flowmeter inoperational - Removed flow meter and cleaned - Reinstalled flow meter and

RW-2 was returned to normal operation.

Saunders Supply Superfund Site - Groundwater Treatment System Weekly System Monitoring Checklist

Date: 7/9/2012

Time onsite: 12:00

Personnel Onsite: M. Scott

Time offsite: 14:00

Note: For all readings, if equipment is not operating, turn the equipment on and take readings. Ensure conditions are safe to operate equipment (i.e. sufficient water supply exists for pump suction).

RECOVERY WELL	TIME	PUMP RUNNING?	FLOW TRANSMITTER				AMETEK METER	
			TOTAL FLOW TO DATE (gallons)	FLOW RATE (gpm)	FLOW RATE ADJUSTED (if below 2.5 adjust to 2.5 - 2.75)	FINAL FLOW RATE*	WELL WATER LEVEL	PROGRAMMED WATER LEVEL RANGE
RW-1		Y	642677	2.20	Y	1.70	7.2	7.3-5.3
RW-2		Y	2116193	2.07	Y	1.61	2.7	3.6-1.6
RW-5		Y	191987	2.7	N	2.7	8.5	9.5-7.5
RW-4		Y	2143669	2.14	Y	1.83	5.5	6.7-4.7

*Note if flow adjustment value is full open, write "Full Open" in the Final Flow Rate box.

Yellow Lights: T-2-Hi-Hi **OFF** / ON Well Pump 1 **OFF** / ON Well Pump 5 **OFF** / ON
 (On Alarm Panel) T-3-Hi-Hi **OFF** / ON Well Pump 2 **OFF** / ON Well Pump 4 **OFF** / ON

Chemical Feed Tank CF-1: Full ¾ ½ ¼ Empty Feed Tank pH: 10+
 Filled Tank? **Y**

Chemical Blending Tank T-1: Air Compressor Operating? **Y/N** pH Strips: 7.82
 Ph Meter: 8.05

Bag Filters: In Operation **Y / N** Pump Pressure (psi): 24 Flow (gpm): 9
 Bag Filters Changed: **N**

Carbon Filters: Pre-carbon Filtration Pressure (psi) 2.9

Effluent Pump: In Operation' **Y** 4.6

Building: Heaters effective? **Y / N / N.A.** Vent fan operating? **Y / N**

Critical Device Check Performed this visit? **N**

Notes:

System Samples Collected

Saunders Supply Superfund Site - Groundwater Treatment System Weekly System Monitoring Checklist

Date: 7/17/2012

Time onsite: _____

Personnel Onsite: M. Scott & M. Richardson

Time offsite: _____

Note: For all readings, if equipment is not operating, turn the equipment on and take readings. Ensure conditions are safe to operate equipment (i.e. sufficient water supply exists for pump suction).

RECOVERY WELL	TIME	PUMP RUNNING?	FLOW TRANSMITTER				AMETEK METER	
			TOTAL FLOW TO DATE (gallons)	FLOW RATE (gpm)	FLOW RATE ADJUSTED (if below 2.5 adjust to 2.5 - 2.75)	FINAL FLOW RATE*	WELL WATER LEVEL	PROGRAMMED WATER LEVEL RANGE
RW-1		Y	643126	1.43	Y	1.65	5.6	7.3-5.3
RW-2		N	2116640	--	Y	2.02	1.9	3.6-1.6
RW-5		Y	194162	2.5	N	2.5	7.0	8.5-6.5
RW-4		Y	2144788	1.47	Y	1.61	6.4	6.7-4.7

*Note if flow adjustment value is full open, write "Full Open" in the Final Flow Rate box.

Yellow Lights: T-2-Hi-Hi **OFF / ON** Well Pump 1 **OFF / ON** Well Pump 5 **OFF / ON**
 (On Alarm Panel) T-3-Hi-Hi **OFF / ON** Well Pump 2 **OFF / ON** Well Pump 4 **OFF / ON**

Chemical Feed Tank CF-1: Full ¾ ½ ¼ Empty Feed Tank pH: 10.88
 Filled Tank? **Y**

Chemical Blending Tank T-1: Air Compressor Operating? **Y/N** pH Strips: 7.67
 Ph Meter: 7.80

Bag Filters: In Operation **Y / N** Pump Pressure (psi): 25 Flow (gpm): 9
 Bag Filters Changed: **N**

Carbon Filters: Pre-carbon Filtration Pressure (psi) 3.4

Effluent Pump: In Operation' **Y** 3.8

Building: Heaters effective? **Y / N / N.A.** Vent fan operating? **Y / N**

Critical Device Check Performed this visit? **N**

Notes:

Changed programming in RW-5 to water level of 8.5-6.5 feet in an effort to pump more PCP

Calibrated pH probe

RW-2 down upon arrival- cleaned roto meter and reinstalled then restarted

Cleaned RW-4 and RW-5 pumps- Mr. Kelly has plantings over RW-1 and RW-2 that will need to moved

Saunders Supply Superfund Site - Groundwater Treatment System Weekly System Monitoring Checklist

Date: 7/23/2012

Time onsite: 12:05

Personnel Onsite: M. Scott

Time offsite: 14:10

Note: For all readings, if equipment is not operating, turn the equipment on and take readings. Ensure conditions are safe to operate equipment (i.e. sufficient water supply exists for pump suction).

RECOVERY WELL	TIME	PUMP RUNNING?	FLOW TRANSMITTER				AMETEK METER	
			TOTAL FLOW TO DATE (gallons)	FLOW RATE (gpm)	FLOW RATE ADJUSTED (if below 2.5 adjust to 2.5 - 2.75)	FINAL FLOW RATE*	WELL WATER LEVEL	PROGRAMMED WATER LEVEL RANGE
RW-1		Y	643478	1.41	Y	1.60	6.8	7.3-5.3
RW-2		Y	2117074	1.70	N	1.70	1.8	3.6-1.6
RW-5		Y	196224	2.7	N	2.7	8.4	8.5-6.5
RW-4		Y	2145574	1.35	Y	1.75	6.4	6.7-4.7

*Note if flow adjustment value is full open, write "Full Open" in the Final Flow Rate box.

Yellow Lights: T-2-Hi-Hi **OFF** / ON
(On Alarm Panel) T-3-Hi-Hi **OFF** / ON

Well Pump 1 **OFF** / ON
Well Pump 2 **OFF** / ON

Well Pump 5 **OFF** / ON
Well Pump 4 **OFF** / ON

Chemical Feed Tank CF-1: Full ¾ ½ ¼ Empty
Filled Tank? **Y**

Feed Tank pH: 10+

Chemical Blending Tank T-1: Air Compressor Operating? **Y/N**

pH Strips: 7.04
Ph Meter: 7.12

Bag Filters: In Operation **Y / N**
Bag Filters Changed: **Y**

Pump Pressure (psi): 24

Flow (gpm): 9

Carbon Filters: Pre-carbon Filtration Pressure (psi) 3.2

Effluent Pump: In Operation' **Y**

4.6

Building: Heaters effective? **Y / N / N.A.**

Vent fan operating? **Y / N**

Critical Device Check Performed this visit? **Y**

Notes:

Met with Mr. Kelly to clean pumps in RW-1 and RW-2; was instructed to call Mr. Kelly and he would move plants to gain access

Replaced bag filters

Completed Monthly Critical Checklist

Saunders Supply Superfund Site - Groundwater Treatment System Weekly System Monitoring Checklist

Date: 7/30/2012

Time onsite: 11:20

Personnel Onsite: M. Scott

Time offsite: 13:20

Note: For all readings, if equipment is not operating, turn the equipment on and take readings. Ensure conditions are safe to operate equipment (i.e. sufficient water supply exists for pump suction).

RECOVERY WELL	TIME	PUMP RUNNING?	FLOW TRANSMITTER				AMETEK METER	
			TOTAL FLOW TO DATE (gallons)	FLOW RATE (gpm)	FLOW RATE ADJUSTED (if below 2.5 adjust to 2.5 - 2.75)	FINAL FLOW RATE*	WELL WATER LEVEL	PROGRAMMED WATER LEVEL RANGE
RW-1		Y	643862	1.53	N	1.53	6.6	7.3-5.3
RW-2		N	2117091	1.62	N	1.62	3.2	3.6-1.6
RW-5		Y	198590	2.7	N	2.7	7.4	8.5-6.5
RW-4		Y	2146396	1.63	N	1.63	6.1	6.7-4.7

*Note if flow adjustment value is full open, write "Full Open" in the Final Flow Rate box.

Yellow Lights: T-2-Hi-Hi **OFF / ON** Well Pump 1 **OFF / ON** Well Pump 5 **OFF / ON**
 (On Alarm Panel) T-3-Hi-Hi **OFF / ON** Well Pump 2 **OFF / ON** Well Pump 4 **OFF / ON**

Chemical Feed Tank CF-1: Full ¾ ½ ¼ Empty Feed Tank pH: 10+
 Filled Tank? **Y**

Chemical Blending Tank T-1: Air Compressor Operating? **Y/N** pH Strips: 7.39
 Ph Meter: 7.55

Bag Filters: In Operation **Y / N** Pump Pressure (psi): 24 Flow (gpm): 9
 Bag Filters Changed: **N**

Carbon Filters: Pre-carbon Filtration Pressure (psi) 3.4

Effluent Pump: In Operation' **Y** 4.6

Building: Heaters effective? **Y / N / N.A.** Vent fan operating? **Y / N**

Critical Device Check Performed this visit? **Y**

Notes:

RW-2 down upon arrival- switched roto-flow meters in RW-2 and RW-5 in an effort to determine if roto-flow meter is malfunctioning

Critical Device Checklist
Saunders Supply, Chuckatuck, Virginia

Year: 2012 Quarter: 3rd

Month: July	Month: August	Month: September	
MS			Inspector's Initials
7/23/2012			Date of Inspection
<u>CRITICAL DEVICE</u>			
Recovery Pumps			
X			Well Pump Low Flow Alarm
X			Pull and wash recovery well pumps, clean pump suction
X			Check level probes, clean
Chemical Feed Package			
X			Clean and calibrate pH probe
X			Field test for iron
X			Check Settling Tank HiHi Level alarm and pump control
X			Check Settling Tank level controls for Sand Filter Pump
X			Check Blending Tank, T-1 for sludge buildup
X			Clean blower fan, blower tray, and suction inlet
X			Measure and record sludge depth in settling tank, T-2
Bag Filter Pump and Bag Filter Assembly			
X			Clean bag filter pump flow meter
X			Clean bag filter pump impeller
X			Check bag filter housing O-rings for damage
Effluent Tank			
X			Lubricate Pump
X			Check Effluent Tank HiHi Level alarm and pump control
X			Check Effluent Tank level controls for Effluent Pump
X			Inspect Effluent Tank for scaling, build-up
Signage			
X			Identification at front door
X			Caution: Caustic Solution
X			Blending Tank Mixing Instructions
X			Caution: More than one voltage source (Alarm Panel)
X			Equipment Labels: Tanks, Piping, Motor Controller, C/B
Electrical			
X			Ground connection for Circuit Breaker Panel
X			Ground connection for Sand Filter Platform
X			Circuit Breaker Panel
Misc.			
X			Piping (Leaks, Supports)
X			Pressure and Seal Fire Extinguisher
X			Inspect First Aid Kid
X			Inspect Eyewash Station
X			Change Eyewash Solution

Notes: Cleaned effluent tank with weak bleach solution to kill algae.

Saunders Supply Superfund Site - Groundwater Treatment System Weekly System Monitoring Checklist

Date: 8/7/2012

Time onsite: 1100

Personnel Onsite: M. Scott

Time offsite: 1220

Note: For all readings, if equipment is not operating, turn the equipment on and take readings. Ensure conditions are safe to operate equipment (i.e. sufficient water supply exists for pump suction).

RECOVERY WELL	TIME	PUMP RUNNING?	FLOW TRANSMITTER				AMETEK METER	
			TOTAL FLOW TO DATE (gallons)	FLOW RATE (gpm)	FLOW RATE ADJUSTED (if below 2.5 adjust to 2.5 - 2.75)	FINAL FLOW RATE*	WELL WATER LEVEL	PROGRAMMED WATER LEVEL RANGE
RW-1		Y	644241	1.74	N	1.74	7.2	7.3-5.3
RW-2		N	2117190	1.62	N	1.62	7.3	3.6-1.6
RW-5		Y	201229	2.7	N	2.7	8.4	8.5-6.5
RW-4		Y	2147238	1.35	Y	1.56	6.4	6.7-4.7

*Note if flow adjustment value is full open, write "Full Open" in the Final Flow Rate box.

Yellow Lights: T-2-Hi-Hi **OFF / ON** Well Pump 1 **OFF / ON** Well Pump 5 **OFF / ON**
 (On Alarm Panel) T-3-Hi-Hi **OFF / ON** Well Pump 2 **OFF / ON** Well Pump 4 **OFF / ON**

Chemical Feed Tank CF-1: Full ¾ ½ ¼ Empty Feed Tank pH: 10+
 Filled Tank? **Y**

Chemical Blending Tank T-1: Air Compressor Operating? **Y/N** pH Strips: 7.32
 Ph Meter: 7.22

Bag Filters: In Operation **Y / N** Pump Pressure (psi): 24 Flow (gpm): 9
 Bag Filters Changed: **N**

Carbon Filters: Pre-carbon Filtration Pressure (psi) 3.4

Effluent Pump: In Operation' **Y** 4.6

Building: Heaters effective? **Y / N / N.A.** Vent fan operating? **Y / N**

Critical Device Check Performed this visit? **N**

Notes:

RW-2 down upon arrival, reset and restarted RW-2 pump

Collected system samples- Dup sample from C1 sample port

Saunders Supply Superfund Site - Groundwater Treatment System Weekly System Monitoring Checklist

Date: 8/15/2012

Time onsite: 1025

Personnel Onsite: J. Early

Time offsite: 1130

Note: For all readings, if equipment is not operating, turn the equipment on and take readings. Ensure conditions are safe to operate equipment (i.e. sufficient water supply exists for pump suction).

RECOVERY WELL	TIME	PUMP RUNNING?	FLOW TRANSMITTER				AMETEK METER	
			TOTAL FLOW TO DATE (gallons)	FLOW RATE (gpm)	FLOW RATE ADJUSTED (if below 2.5 adjust to 2.5 - 2.75)	FINAL FLOW RATE*	WELL WATER LEVEL	PROGRAMMED WATER LEVEL RANGE
RW-1		Y	645118	2.05	N	2.05		7.3-5.3
RW-2		N	2117679	2.10	N	2.10		3.6-1.6
RW-5		Y	203747	2.5	N	2.5		8.5-6.5
RW-4		Y	2147975	1.70	Y	2.09		6.7-4.7

*Note if flow adjustment value is full open, write "Full Open" in the Final Flow Rate box.

Yellow Lights: T-2-Hi-Hi **OFF** / ON Well Pump 1 **OFF** / ON Well Pump 5 **OFF** / ON
(On Alarm Panel) T-3-Hi-Hi **OFF** / ON Well Pump 2 **OFF** / ON Well Pump 4 **OFF** / ON

Chemical Feed Tank CF-1: Full ¾ ½ ¼ Empty Feed Tank pH: 10+
Filled Tank? **Y**

Chemical Blending Tank T-1: Air Compressor Operating? **Y/N** pH Strips: ~8
Ph Meter: 7.46

Bag Filters: In Operation **Y / N** Pump Pressure (psi): 25 Flow (gpm): 9
Bag Filters Changed: **N**

Carbon Filters: Pre-carbon Filtration Pressure (psi) 4.0

Effluent Pump: In Operation' **Y** 4.8

Building: Heaters effective? **Y / N / N.A.** Vent fan operating? **Y / N**

Critical Device Check Performed this visit? **N**

Notes:

Air compressor off upon arrival - restarted air compressor - drained air compressor

pH meter may need to be recalibrated

Blending tank needs to be cleaned

Saunders Supply Superfund Site - Groundwater Treatment System Weekly System Monitoring Checklist

Date: 8/21/2012

Time onsite: 1030

Personnel Onsite: M. Scott

Time offsite: 1230

Note: For all readings, if equipment is not operating, turn the equipment on and take readings. Ensure conditions are safe to operate equipment (i.e. sufficient water supply exists for pump suction).

RECOVERY WELL	TIME	PUMP RUNNING?	FLOW TRANSMITTER				AMETEK METER	
			TOTAL FLOW TO DATE (gallons)	FLOW RATE (gpm)	FLOW RATE ADJUSTED (if below 2.5 adjust to 2.5 - 2.75)	FINAL FLOW RATE*	WELL WATER LEVEL	PROGRAMMED WATER LEVEL RANGE
RW-1		Y	644802	1.62	N	1.62	6.8	7.3-5.3
RW-2		Y	2118027	1.58	N	1.58	2.5	3.6-1.6
RW-5		Y	205551	2.7	N	2.7	7.7	8.5-6.5
RW-4		Y	2148496	1.33	Y	1.61	6.6	6.7-4.7

*Note if flow adjustment value is full open, write "Full Open" in the Final Flow Rate box.

Yellow Lights: T-2-Hi-Hi **OFF / ON** Well Pump 1 **OFF / ON** Well Pump 5 **OFF / ON**
 (On Alarm Panel) T-3-Hi-Hi **OFF / ON** Well Pump 2 **OFF / ON** Well Pump 4 **OFF / ON**

Chemical Feed Tank CF-1: Full ¾ ½ ¼ Empty Feed Tank pH: 10+
 Filled Tank? **Y**

Chemical Blending Tank T-1: Air Compressor Operating? **Y/N** pH Strips: 6.70
 Ph Meter: 6.75

Bag Filters: In Operation **Y / N** Pump Pressure (psi): 25 Flow (gpm): 9
 Bag Filters Changed: **N**

Carbon Filters: Pre-carbon Filtration Pressure (psi) 3.6

Effluent Pump: In Operation' **Y** 4.6

Building: Heaters effective? **Y / N / N.A.** Vent fan operating? **Y / N**

Critical Device Check Performed this visit? **N**

Notes:

Upon arrival soda ash supply line to blending tank was clogged- Repaired line

Cleaned recovery pumps

Cleaned roto-flow sensors and pH probe

Saunders Supply Superfund Site - Groundwater Treatment System Weekly System Monitoring Checklist

Date: 8/29/2012

Time onsite: 1050

Personnel Onsite: M. Scott

Time offsite: 1340

Note: For all readings, if equipment is not operating, turn the equipment on and take readings. Ensure conditions are safe to operate equipment (i.e. sufficient water supply exists for pump suction).

RECOVERY WELL	TIME	PUMP RUNNING?	FLOW TRANSMITTER				AMETEK METER	
			TOTAL FLOW TO DATE (gallons)	FLOW RATE (gpm)	FLOW RATE ADJUSTED (if below 2.5 adjust to 2.5 - 2.75)	FINAL FLOW RATE*	WELL WATER LEVEL	PROGRAMMED WATER LEVEL RANGE
RW-1		Y	645104	1.67	N	1.67	6.8	7.3-5.3
RW-2		Y	2118229	2.01	N	2.01	1.9	3.6-1.6
RW-5		Y	207982	2.8	N	2.8	7.5	8.5-6.5
RW-4		Y	2149272	1.67	N	1.67	6.3	6.7-4.7

*Note if flow adjustment value is full open, write "Full Open" in the Final Flow Rate box.

Yellow Lights: T-2-Hi-Hi **OFF / ON** Well Pump 1 **OFF / ON** Well Pump 5 **OFF / ON**
 (On Alarm Panel) T-3-Hi-Hi **OFF / ON** Well Pump 2 **OFF / ON** Well Pump 4 **OFF / ON**

Chemical Feed Tank CF-1: Full ¾ ½ ¼ Empty Feed Tank pH: 10+
 Filled Tank? **Y**

Chemical Blending Tank T-1: Air Compressor Operating? **Y/N** pH Strips: 7.29
 Ph Meter: 7.35

Bag Filters: In Operation **Y / N** Pump Pressure (psi): 24 Flow (gpm): 9
 Bag Filters Changed: **Y**

Carbon Filters: Pre-carbon Filtration Pressure (psi) 3.6

Effluent Pump: In Operation' **Y** 4.6

Building: Heaters effective? **Y / N / N.A.** Vent fan operating? **Y / N**

Critical Device Check Performed this visit? **Y**

Notes:

Cleaned pH probe, roto-flow sensors, and sandfilter pump

Recalibrated pH probe

Critical Device Checklist
Saunders Supply, Chuckatuck, Virginia

Year: 2012 Quarter: 3rd

Month: July	Month: August	Month: September	
MS	MS		Inspector's Initials
7/23/2012	8/29/2012		Date of Inspection
<u>CRITICAL DEVICE</u>			
Recovery Pumps			
X	X		Well Pump Low Flow Alarm
X	X		Pull and wash recovery well pumps, clean pump suction
X	X		Check level probes, clean
Chemical Feed Package			
X	X		Clean and calibrate pH probe
X	X		Field test for iron
X	X		Check Settling Tank HiHi Level alarm and pump control
X	X		Check Settling Tank level controls for Sand Filter Pump
X			Check Blending Tank, T-1 for sludge buildup
X			Clean blower fan, blower tray, and suction inlet
X			Measure and record sludge depth in settling tank, T-2
Bag Filter Pump and Bag Filter Assembly			
X	X		Clean bag filter pump flow meter
X			Clean bag filter pump impeller
X		X	Check bag filter housing O-rings for damage
Effluent Tank			
X	X		Lubricate Pump
X	X		Check Effluent Tank HiHi Level alarm and pump control
X	X		Check Effluent Tank level controls for Effluent Pump
X	X		Inspect Effluent Tank for scaling, build-up
Signage			
X	X		Identification at front door
X	X		Caution: Caustic Solution
X	X		Blending Tank Mixing Instructions
X	X		Caution: More than one voltage source (Alarm Panel)
X	X		Equipment Labels: Tanks, Piping, Motor Controller, C/B
Electrical			
X	X		Ground connection for Circuit Breaker Panel
X	X		Ground connection for Sand Filter Platform
X	X		Circuit Breaker Panel
Misc.			
X	X		Piping (Leaks, Supports)
X	X		Pressure and Seal Fire Extinguisher
X	X		Inspect First Aid Kid
X	X		Inspect Eyewash Station
X			Change Eyewash Solution

Notes:

Saunders Supply Superfund Site - Groundwater Treatment System Weekly System Monitoring Checklist

Date: 9/12/2012

Time onsite: _____

Personnel Onsite: M. Richardson

Time offsite: _____

Note: For all readings, if equipment is not operating, turn the equipment on and take readings. Ensure conditions are safe to operate equipment (i.e. sufficient water supply exists for pump suction).

RECOVERY WELL	TIME	PUMP RUNNING?	FLOW TRANSMITTER				AMETEK METER	
			TOTAL FLOW TO DATE (gallons)	FLOW RATE (gpm)	FLOW RATE ADJUSTED (if below 2.5 adjust to 2.5 - 2.75)	FINAL FLOW RATE*	WELL WATER LEVEL	PROGRAMMED WATER LEVEL RANGE
RW-1		Y	645956	1.48	Y	1.62	6.4	7.3-5.3
RW-2		Y	2119464	2.01	N	2.01	2.2	3.6-1.6
RW-5		Y	212585	2.8	N	2.8	8.3	8.5-6.5
RW-4		Y	2151111	1.37	Y	1.58	5.1	6.7-4.7

*Note if flow adjustment value is full open, write "Full Open" in the Final Flow Rate box.

Yellow Lights: T-2-Hi-Hi **OFF** / ON Well Pump 1 **OFF** / ON Well Pump 5 **OFF** / ON
(On Alarm Panel) T-3-Hi-Hi **OFF** / ON Well Pump 2 **OFF** / ON Well Pump 4 **OFF** / ON

Chemical Feed Tank CF-1: Full ¾ ½ ¼ Empty Feed Tank pH: 10+
Filled Tank? **Y**

Chemical Blending Tank T-1: Air Compressor Operating? **Y/N** pH Strips: 6.45 * Corrected to 7.85
Ph Meter: 6.43 during site visit

Bag Filters: In Operation **Y / N** Pump Pressure (psi): 25 Flow (gpm): 9
Bag Filters Changed: **Y**

Carbon Filters: Pre-carbon Filtration Pressure (psi) 3.8

Effluent Pump: In Operation' **Y** 4.6

Building: Heaters effective? **Y / N / N.A.** Vent fan operating? **Y / N**

Critical Device Check Performed this visit? **N**

Notes:

pH meter reading low upon arrival. Found that metering pump tubing clogged with soda ash. Unclogged tubing.

Collected monthly system samples

Cleaned roto-flow sensors and pH probe

Attempted to clean blending tank - could not move tank due to weight (~14 inches of solidified precipitation in tank)

Saunders Supply Superfund Site - Groundwater Treatment System Weekly System Monitoring Checklist

Date: 9/17/2012

Time onsite: 1400

Personnel Onsite: M. Scott

Time offsite: 1550

Note: For all readings, if equipment is not operating, turn the equipment on and take readings. Ensure conditions are safe to operate equipment (i.e. sufficient water supply exists for pump suction).

RECOVERY WELL	TIME	PUMP RUNNING?	FLOW TRANSMITTER				AMETEK METER	
			TOTAL FLOW TO DATE (gallons)	FLOW RATE (gpm)	FLOW RATE ADJUSTED (if below 2.5 adjust to 2.5 - 2.75)	FINAL FLOW RATE*	WELL WATER LEVEL	PROGRAMMED WATER LEVEL RANGE
RW-1		Y	646314	1.61	N	1.61	6.8	7.3-5.3
RW-2		Y	2119826	1.52	N	1.52	3.5	3.6-1.6
RW-5		Y	214208	2.7	N	2.7	8.1	8.5-6.5
RW-4		Y	2152002	1.65	N	1.65	6.2	6.7-4.7

*Note if flow adjustment value is full open, write "Full Open" in the Final Flow Rate box.

Yellow Lights: T-2-Hi-Hi **OFF / ON** Well Pump 1 **OFF / ON** Well Pump 5 **OFF / ON**
 (On Alarm Panel) T-3-Hi-Hi **OFF / ON** Well Pump 2 **OFF / ON** Well Pump 4 **OFF / ON**

Chemical Feed Tank CF-1: Full ¾ ½ ¼ Empty Feed Tank pH: 10+
 Filled Tank? **Y**

Chemical Blending Tank T-1: Air Compressor Operating? **Y/N** pH Strips: 7.01
 Ph Meter: 7.08

Bag Filters: In Operation **Y / N** Pump Pressure (psi): 24 Flow (gpm): 9
 Bag Filters Changed: **N**

Carbon Filters: Pre-carbon Filtration Pressure (psi) 3.6

Effluent Pump: In Operation' **Y** 4.7

Building: Heaters effective? **Y / N / N.A.** Vent fan operating? **Y / N**

Critical Device Check Performed this visit? **Y**

Notes:

Monthly Critical Device Check performed

Saunders Supply Superfund Site - Groundwater Treatment System Weekly System Monitoring Checklist

Date: 9/25/2012

Time onsite: 935

Personnel Onsite: M. Richardson & J. Early

Time offsite: 1215

Note: For all readings, if equipment is not operating, turn the equipment on and take readings. Ensure conditions are safe to operate equipment (i.e. sufficient water supply exists for pump suction).

RECOVERY WELL	TIME	PUMP RUNNING?	FLOW TRANSMITTER				AMETEK METER	
			TOTAL FLOW TO DATE (gallons)	FLOW RATE (gpm)	FLOW RATE ADJUSTED (if below 2.5 adjust to 2.5 - 2.75)	FINAL FLOW RATE*	WELL WATER LEVEL	PROGRAMMED WATER LEVEL RANGE
RW-1		Y	646808	1.93	Y	1.63	6.8	7.3-5.3
RW-2		Y	2120126	1.75	N	1.75	3.3	3.6-1.6
RW-5		Y	216571	2.6	N	2.6	6.5	8.5-6.5
RW-4		Y	2152613	0.83	Y	1.64	6.3	6.7-4.7

*Note if flow adjustment value is full open, write "Full Open" in the Final Flow Rate box.

Yellow Lights: T-2-Hi-Hi **OFF** / ON Well Pump 1 **OFF** / ON Well Pump 5 **OFF** / ON
(On Alarm Panel) T-3-Hi-Hi **OFF** / ON Well Pump 2 **OFF** / ON Well Pump 4 **OFF** / ON

Chemical Feed Tank CF-1: Full ¾ ½ ¼ Empty Feed Tank pH: 10.63
Filled Tank? **Y**

Chemical Blending Tank T-1: Air Compressor Operating? **Y/N** pH Strips: 7.24
Ph Meter: 7.26

Bag Filters: In Operation **Y / N** Pump Pressure (psi): 24 Flow (gpm): 9
Bag Filters Changed: **N**

Carbon Filters: Pre-carbon Filtration Pressure (psi) 4.5

Effluent Pump: In Operation' **Y** 4.0

Building: Heaters effective? **Y / N / N.A.** Vent fan operating? **Y / N**

Critical Device Check Performed this visit? **N**

Notes:

Cleaned roto-flow sensors, cleaned and recalibrated pH probe

Met with VDEQ after O&M visit to discuss future investigation/ system operations

Critical Device Checklist
Saunders Supply, Chuckatuck, Virginia

Year: 2012 Quarter: 3rd

Month: July	Month: August	Month: September	
MS	MS	MS	Inspector's Initials
7/23/2012	8/29/2012	9/17/2012	Date of Inspection
<u>CRITICAL DEVICE</u>			
Recovery Pumps			
X	X	X	Well Pump Low Flow Alarm
X	X	X	Pull and wash recovery well pumps, clean pump suction
X	X	X	Check level probes, clean
Chemical Feed Package			
X	X	X	Clean and calibrate pH probe
X	X	X	Field test for iron
X	X	X	Check Settling Tank HiHi Level alarm and pump control
X	X	X	Check Settling Tank level controls for Sand Filter Pump
X	/	/	Check Blending Tank, T-1 for sludge buildup
X			Clean blower fan, blower tray, and suction inlet
X			Measure and record sludge depth in settling tank, T-2
Bag Filter Pump and Bag Filter Assembly			
X	X	X	Clean bag filter pump flow meter
X	/	/	Clean bag filter pump impeller
X	X	X	Check bag filter housing O-rings for damage
Effluent Tank			
X	X	X	Lubricate Pump
X	X	X	Check Effluent Tank HiHi Level alarm and pump control
X	X	X	Check Effluent Tank level controls for Effluent Pump
X	X	X	Inspect Effluent Tank for scaling, build-up
Signage			
X	X	X	Identification at front door
X	X	X	Caution: Caustic Solution
X	X	X	Blending Tank Mixing Instructions
X	X	X	Caution: More than one voltage source (Alarm Panel)
X	X	X	Equipment Labels: Tanks, Piping, Motor Controller, C/B
Electrical			
X	X	X	Ground connection for Circuit Breaker Panel
X	X	X	Ground connection for Sand Filter Platform
X	X	X	Circuit Breaker Panel
Misc.			
X	X	X	Piping (Leaks, Supports)
X	X	X	Pressure and Seal Fire Extinguisher
X	X	X	Inspect First Aid Kid
X	X	X	Inspect Eyewash Station
X	/	/	Change Eyewash Solution

Notes:

Saunders Supply Superfund Site - Groundwater Treatment System Weekly System Monitoring Checklist

Date: 10/24/2012

Time onsite: 1230

Personnel Onsite: M. Scott

Time offsite: 1425

Note: For all readings, if equipment is not operating, turn the equipment on and take readings. Ensure conditions are safe to operate equipment (i.e. sufficient water supply exists for pump suction).

RECOVERY WELL	TIME	PUMP RUNNING?	FLOW TRANSMITTER				AMETEK METER	
			TOTAL FLOW TO DATE (gallons)	FLOW RATE (gpm)	FLOW RATE ADJUSTED (if below 2.5 adjust to 2.5 - 2.75)	FINAL FLOW RATE*	WELL WATER LEVEL	PROGRAMMED WATER LEVEL RANGE
RW-1		Y	648160	1.65	N	1.65	6.4	7.3-5.3
RW-2		N	2129694	1.74	N	1.74	6.3	3.6-1.6
RW-5		N	223394	2.7	N	2.7	11.2	8.5-6.5
RW-4		Y	2155370	1.82	N	1.82	5.9	6.7-4.7

*Note if flow adjustment value is full open, write "Full Open" in the Final Flow Rate box.

Yellow Lights: T-2-Hi-Hi **OFF / ON** Well Pump 1 **OFF / ON** Well Pump 5 **OFF / ON**
 (On Alarm Panel) T-3-Hi-Hi **OFF / ON** Well Pump 2 **OFF / ON** Well Pump 4 **OFF / ON**

Chemical Feed Tank CF-1: Full ¾ ½ ¼ Empty Feed Tank pH: 10+
 Filled Tank? **Y**

Chemical Blending Tank T-1: Air Compressor Operating? **Y/N** pH Strips: 9.08 Corrected to 9.11
 Ph Meter: 6.36 after cleaning pH probe

Bag Filters: In Operation **Y / N** Pump Pressure (psi): 24 Flow (gpm): ~9
 Bag Filters Changed: **Y**

Carbon Filters: Pre-carbon Filtration Pressure (psi) 5.2

Effluent Pump: In Operation' **Y** Effluent Pump Pressure (psi):

Building: Heaters effective? **Y / N / N.A.** Vent fan operating? **Y / N**

Critical Device Check Performed this visit? **Y**

Notes:

RW-2 & RW-5 down upon arrival - reset pumps, cleaned roto-flow meters, and restarted

Completed monthly Critical Device Check

Recalibrated pH probe

Replaced bag filters

Saunders Supply Superfund Site - Groundwater Treatment System Weekly System Monitoring Checklist

Date: 10/30/2012

Time onsite: _____

Personnel Onsite: M. Scott

Time offsite: _____

Note: For all readings, if equipment is not operating, turn the equipment on and take readings. Ensure conditions are safe to operate equipment (i.e. sufficient water supply exists for pump suction).

RECOVERY WELL	TIME	PUMP RUNNING?	FLOW TRANSMITTER				AMETEK METER	
			TOTAL FLOW TO DATE (gallons)	FLOW RATE (gpm)	FLOW RATE ADJUSTED (if below 2.5 adjust to 2.5 - 2.75)	FINAL FLOW RATE*	WELL WATER LEVEL	PROGRAMMED WATER LEVEL RANGE
RW-1		Y	648426	1.29	Y	1.66	6.6	7.3-5.3
RW-2		Y	2122027	1.89	N	1.89	2.0	3.6-1.6
RW-5		N	224807	2.7	N	2.7	11.6	8.5-6.5
RW-4		Y	2156086	1.88	N	1.88	4.9	6.7-4.7

*Note if flow adjustment value is full open, write "Full Open" in the Final Flow Rate box.

Yellow Lights: T-2-Hi-Hi **OFF** / ON Well Pump 1 **OFF** / ON Well Pump 5 **OFF** / ON
(On Alarm Panel) T-3-Hi-Hi **OFF** / ON Well Pump 2 **OFF** / ON Well Pump 4 **OFF** / ON

Chemical Feed Tank CF-1: Full ¾ ½ ¼ Empty Feed Tank pH: 10+
Filled Tank? **Y**

Chemical Blending Tank T-1: Air Compressor Operating? **Y/N** pH Strips: 6.27 Corrected to 7.12
Ph Meter: 6.24 after repriming
metering pump

Bag Filters: In Operation **Y / N** Pump Pressure (psi): 24 Flow (gpm): ~9
Bag Filters Changed: **N**

Carbon Filters: Pre-carbon Filtration Pressure (psi) 4.8

Effluent Pump: In Operation' **Y** Effluent Pump Pressure (psi):

Building: Heaters effective? **Y / N / N.A.** Vent fan operating? **Y / N**

Critical Device Check Performed this visit? **N**

Notes:

RW-5 down upon arrival - reset pump, cleaned roto-flow meter, and restarted

Metering pump lost prime - reprimed and restarted pump

Set thermostats on heaters - plugged in heat trace tape on manifold

Critical Device Checklist
Saunders Supply, Chuckatuck, Virginia

Year: 2012 Quarter: 4th

Month: July	Month: August	Month: September	
MS			Inspector's Initials
10/24/2012			Date of Inspection
<u>CRITICAL DEVICE</u>			
Recovery Pumps			
X			Well Pump Low Flow Alarm
X			Pull and wash recovery well pumps, clean pump suction
X			Check level probes, clean
Chemical Feed Package			
X			Clean and calibrate pH probe
X			Field test for iron
X			Check Settling Tank HiHi Level alarm and pump control
X			Check Settling Tank level controls for Sand Filter Pump
X			Check Blending Tank, T-1 for sludge buildup
X			Clean blower fan, blower tray, and suction inlet
X			Measure and record sludge depth in settling tank, T-2
Bag Filter Pump and Bag Filter Assembly			
X			Clean bag filter pump flow meter
X			Clean bag filter pump impeller
X			Check bag filter housing O-rings for damage
Effluent Tank			
X			Lubricate Pump
X			Check Effluent Tank HiHi Level alarm and pump control
X			Check Effluent Tank level controls for Effluent Pump
X			Inspect Effluent Tank for scaling, build-up
Signage			
X			Identification at front door
X			Caution: Caustic Solution
X			Blending Tank Mixing Instructions
X			Caution: More than one voltage source (Alarm Panel)
X			Equipment Labels: Tanks, Piping, Motor Controller, C/B
Electrical			
X			Ground connection for Circuit Breaker Panel
X			Ground connection for Sand Filter Platform
X			Circuit Breaker Panel
Misc.			
X			Piping (Leaks, Supports)
X			Pressure and Seal Fire Extinguisher
X			Inspect First Aid Kid
X			Inspect Eyewash Station
X			Change Eyewash Solution

Notes: Recalibrated pH probe & replaced eyewash solution

Saunders Supply Superfund Site - Groundwater Treatment System Weekly System Monitoring Checklist

Date: 11/15/2012

Time onsite: _____

Personnel Onsite: M. Scott

Time offsite: _____

Note: For all readings, if equipment is not operating, turn the equipment on and take readings. Ensure conditions are safe to operate equipment (i.e. sufficient water supply exists for pump suction).

RECOVERY WELL	TIME	PUMP RUNNING?	FLOW TRANSMITTER				AMETEK METER	
			TOTAL FLOW TO DATE (gallons)	FLOW RATE (gpm)	FLOW RATE ADJUSTED (if below 2.5 adjust to 2.5 - 2.75)	FINAL FLOW RATE*	WELL WATER LEVEL	PROGRAMMED WATER LEVEL RANGE
RW-1		Y	649579				7.2	7.3-5.3
RW-2		Y	2123144				3.2	3.6-1.6
RW-5		N	227523	2.5	N	2.5	11.2	8.5-6.5
RW-4		Y	2158259				5.6	6.7-4.7

*Note if flow adjustment value is full open, write "Full Open" in the Final Flow Rate box.

Yellow Lights: T-2-Hi-Hi **OFF / ON** Well Pump 1 **OFF / ON** Well Pump 5 **OFF / ON**
 (On Alarm Panel) T-3-Hi-Hi **OFF / ON** Well Pump 2 **OFF / ON** Well Pump 4 **OFF / ON**

Chemical Feed Tank CF-1: Full ¼ ½ ¼ **Empty** Feed Tank pH: 10+
 Filled Tank? **Y**

Chemical Blending Tank T-1: Air Compressor Operating? **Y/N** pH Strips: 6.20
 Ph Meter: 6.29 Corrected to 9.41

Bag Filters: In Operation **Y / N** Pump Pressure (psi): 24 Flow (gpm): ~9
 Bag Filters Changed: **N**

Carbon Filters: Pre-carbon Filtration Pressure (psi) 5.0

Effluent Pump: In Operation' **Y** Effluent Pump Pressure (psi):

Building: Heaters effective? **Y / N / N.A.** Vent fan operating? **Y / N**

Critical Device Check Performed this visit? **N**

Notes:

RW-5 recovery pump not operational upon arrival - Reset and restarted

Saunders Supply Superfund Site - Groundwater Treatment System Weekly System Monitoring Checklist

Date: 11/25/2012

Time onsite: _____

Personnel Onsite: M. Scott

Time offsite: _____

Note: For all readings, if equipment is not operating, turn the equipment on and take readings. Ensure conditions are safe to operate equipment (i.e. sufficient water supply exists for pump suction).

RECOVERY WELL	TIME	PUMP RUNNING?	FLOW TRANSMITTER				AMETEK METER	
			TOTAL FLOW TO DATE (gallons)	FLOW RATE (gpm)	FLOW RATE ADJUSTED (if below 2.5 adjust to 2.5 - 2.75)	FINAL FLOW RATE*	WELL WATER LEVEL	PROGRAMMED WATER LEVEL RANGE
RW-1		Y	650194				5.9	7.3-5.3
RW-2		Y	2123815	1.76	N	1.76	2.6	3.6-1.6
RW-5		Y	230501	2.7	N	2.7	7.7	8.5-6.5
RW-4		Y	2159496	1.64	N	1.64	6.2	6.7-4.7

*Note if flow adjustment value is full open, write "Full Open" in the Final Flow Rate box.

Yellow Lights: T-2-Hi-Hi **OFF** / ON Well Pump 1 **OFF** / ON Well Pump 5 **OFF** / ON
 (On Alarm Panel) T-3-Hi-Hi **OFF** / ON Well Pump 2 **OFF** / ON Well Pump 4 **OFF** / ON

Chemical Feed Tank CF-1: Full ¾ ½ ¼ **Empty** Feed Tank pH: 10+
 Filled Tank? **Y**

Chemical Blending Tank T-1: Air Compressor Operating? **Y/N** pH Strips:
 Ph Meter: 7.02

Bag Filters: In Operation **Y / N** Pump Pressure (psi): 24 Flow (gpm): ~9
 Bag Filters Changed: **N**

Carbon Filters: Pre-carbon Filtration Pressure (psi) 6.4

Effluent Pump: In Operation' **Y** Effluent Pump Pressure (psi):

Building: Heaters effective? **Y / N / N.A.** Vent fan operating? **Y / N**

Critical Device Check Performed this visit? **Y**

Notes:

Caustic tank mixer inoperable

Critical Device Checklist
Saunders Supply, Chuckatuck, Virginia

Year: 2012 Quarter: 4th

Month: October	Month: November	Month: December	
MS	MS		Inspector's Initials
10/24/2012	11/25/2012		Date of Inspection
<u>CRITICAL DEVICE</u>			
Recovery Pumps			
X	X		Well Pump Low Flow Alarm
X	X		Pull and wash recovery well pumps, clean pump suction
X	X		Check level probes, clean
Chemical Feed Package			
X	X		Clean and calibrate pH probe
X	X		Field test for iron
X	X		Check Settling Tank HiHi Level alarm and pump control
X	X		Check Settling Tank level controls for Sand Filter Pump
X			Check Blending Tank, T-1 for sludge buildup
X			Clean blower fan, blower tray, and suction inlet
X			Measure and record sludge depth in settling tank, T-2
Bag Filter Pump and Bag Filter Assembly			
X	X		Clean bag filter pump flow meter
X			Clean bag filter pump impeller
X		X	Check bag filter housing O-rings for damage
Effluent Tank			
X	X		Lubricate Pump
X	X		Check Effluent Tank HiHi Level alarm and pump control
X	X		Check Effluent Tank level controls for Effluent Pump
X	X		Inspect Effluent Tank for scaling, build-up
Signage			
X	X		Identification at front door
X	X		Caution: Caustic Solution
X	X		Blending Tank Mixing Instructions
X	X		Caution: More than one voltage source (Alarm Panel)
X	X		Equipment Labels: Tanks, Piping, Motor Controller, C/B
Electrical			
X	X		Ground connection for Circuit Breaker Panel
X	X		Ground connection for Sand Filter Platform
X	X		Circuit Breaker Panel
Misc.			
X	X		Piping (Leaks, Supports)
X	X		Pressure and Seal Fire Extinguisher
X	X		Inspect First Aid Kit
X	X		Inspect Eyewash Station
X			Change Eyewash Solution

Notes:

Saunders Supply Superfund Site - Groundwater Treatment System Weekly System Monitoring Checklist

Date: 12/5/2012
Personnel Onsite: M. Scott

Time onsite: 1300
Time offsite: 1430

Note: For all readings, if equipment is not operating, turn the equipment on and take readings. Ensure conditions are safe to operate equipment (i.e sufficient water supply exists for pump suction).

RECOVERY WELL	TIME	PUMP RUNNING?	FLOW TRANSMITTER				AMETEK METER	
			TOTAL FLOW TO DATE (gallons)	FLOW RATE (gpm)	FLOW RATE ADJUSTED (if below 2.5 adjust to 2.5 - 2.75)	FINAL FLOW RATE*	WELL WATER LEVEL	PROGRAMMED WATER LEVEL RANGE
RW-1		Y	650634	1.69	N	1.69	6.9	7.3-5.3
RW-2		Y	2124342	1.72	N	1.72	2.9	3.6-1.6
RW-5		Y	231249	2.7	N	2.7	6.9	8.5-6.5
RW-4		Y	2160459	1.53	N	1.53	5.2	6.7-4.7

*Note if flow adjustment value is full open, write "Full Open" in the Final Flow Rate box.

Yellow Lights: T-2-Hi-Hi **OFF** / ON Well Pump 1 **OFF** / ON Well Pump 5 **OFF** / ON
(On Alarm Panel) T-3-Hi-Hi **OFF** / ON Well Pump 2 **OFF** / ON Well Pump 4 **OFF** / ON

Chemical Feed Tank CF-1: Full ¾ ½ ¼ Empty Feed Tank pH: 10+
Filled Tank? **Y**

Chemical Blending Tank T-1: Air Compressor Operating? **Y/N** pH Strips: 6.29
Ph Meter: 6.24 Corrected to 8.29

Bag Filters: In Operation **Y** / N Pump Pressure (psi): 24 Flow (gpm): ~9
Bag Filters Changed: **N**

Carbon Filters: Pre-carbon Filtration Pressure (psi):

Effluent Pump: In Operation **Y** Effluent Pump Pressure (psi): 4.9

Building: Heaters effective? **Y** / N / N.A. Vent fan operating? **Y** / N

Critical Device Check Performed this visit? **N**

Notes:

Performed scheduled recovery well pump maintenance

Upon arrival LGAC filter found to be leaking due to hole (corrosion) - System shutdown until replacement LGAC could be installed

Critical Device Checklist
Saunders Supply, Chuckatuck, Virginia

Year: 2012

Quarter: 4th

Month: October	Month: November	Month: December	
MS	MS	MS	Inspector's Initials
10/24/2012	11/25/2012	12/27/2012	Date of Inspection
<u>CRITICAL DEVICE</u>			
Recovery Pumps			
X	X	X	Well Pump Low Flow Alarm
X	X	X	Pull and wash recovery well pumps, clean pump suction
X	X	X	Check level probes, clean
Chemical Feed Package			
X	X	X	Clean and calibrate pH probe
X	X	X	Field test for iron
X	X	X	Check Settling Tank HiHi Level alarm and pump control
X	X	X	Check Settling Tank level controls for Sand Filter Pump
X	/		Check Blending Tank, T-1 for sludge buildup
X			Clean blower fan, blower tray, and suction inlet
X			Measure and record sludge depth in settling tank, T-2
Bag Filter Pump and Bag Filter Assembly			
X	X	X	Clean bag filter pump flow meter
X	/	/	Clean bag filter pump impeller
X	X	X	Check bag filter housing O-rings for damage
Effluent Tank			
X	X	X	Lubricate Pump
X	X	X	Check Effluent Tank HiHi Level alarm and pump control
X	X	X	Check Effluent Tank level controls for Effluent Pump
X	X	X	Inspect Effluent Tank for scaling, build-up
Signage			
X	X	X	Identification at front door
X	X	X	Caution: Caustic Solution
X	X	X	Blending Tank Mixing Instructions
X	X	X	Caution: More than one voltage source (Alarm Panel)
X	X	X	Equipment Labels: Tanks, Piping, Motor Controller, C/B
Electrical			
X	X	X	Ground connection for Circuit Breaker Panel
X	X	X	Ground connection for Sand Filter Platform
X	X	X	Circuit Breaker Panel
Misc.			
X	X	X	Piping (Leaks, Supports)
X	X	X	Pressure and Seal Fire Extinguisher
X	X	X	Inspect First Aid Kid
X	X	X	Inspect Eyewash Station
X	/	/	Change Eyewash Solution

Notes:

Saunders Supply Superfund Site - Groundwater Treatment System Weekly System Monitoring Checklist

Date: 1/2/2013
 Personnel Onsite: M. Scott

Time onsite: 1050
 Time offsite: 1200

Note: For all readings, if equipment is not operating, turn the equipment on and take readings. Ensure conditions are safe to operate equipment (i.e sufficient water supply exists for pump suction).

RECOVERY WELL	TIME	PUMP RUNNING?	FLOW TRANSMITTER				AMETEK METER	
			TOTAL FLOW TO DATE (gallons)	FLOW RATE (gpm)	FLOW RATE ADJUSTED (if below 2.5 adjust to 2.5 - 2.75)	FINAL FLOW RATE*	WELL WATER LEVEL	PROGRAMMED WATER LEVEL RANGE
RW-1		Y	651121	1.39	Y	1.52	6.2	7.3-5.3
RW-2		Y	2124829	1.42	Y	1.67	6.9	3.6-1.6
RW-5		N	232527	2.3	N	2.3	11.8	8.5-6.5
RW-4		Y	2162004	1.63	N	1.63	5.9	6.7-4.7

*Note if flow adjustment value is full open, write "Full Open" in the Final Flow Rate box.

Yellow Lights: T-2-Hi-Hi **OFF** / ON Well Pump 1 **OFF** / ON Well Pump 5 **OFF** / **ON**
 (On Alarm Panel) T-3-Hi-Hi **OFF** / ON Well Pump 2 **OFF** / ON Well Pump 4 **OFF** / ON

Chemical Feed Tank CF-1: Full ¾ ½ ¼ **Empty** Feed Tank pH: 10+
 Filled Tank Y

Chemical Blending Tank T-1: Air Compressor Operating? **Y/N** pH Strips: 6.31
 Ph Meter: 6.36 Corrected to 8.92

Bag Filters: In Operation **Y** / N Pump Pressure (psi): 24 Flow (gpm): ~9
 Bag Filters Changed: **N**

Carbon Filters: Pre-carbon Filtration Pressure (psi) 3.5

Effluent Pump: In Operation **Y** Effluent Pump Pressure (psi): 4.5

Building: Heaters effective? **Y** / N / N.A. Vent fan operating? **Y** / N

Critical Device Check Performed this visit? **N**

Notes:

RW-5 down upon arrival- reset and restarted pump.

Saunders Supply Superfund Site - Groundwater Treatment System Weekly System Monitoring Checklist

Date: 1/15/2013
 Personnel Onsite: M. Scott

Time onsite: 1255
 Time offsite: 1400

Note: For all readings, if equipment is not operating, turn the equipment on and take readings. Ensure conditions are safe to operate equipment (i.e sufficient water supply exists for pump suction).

RECOVERY WELL	TIME	PUMP RUNNING?	FLOW TRANSMITTER				AMETEK METER	
			TOTAL FLOW TO DATE (gallons)	FLOW RATE (gpm)	FLOW RATE ADJUSTED (if below 2.5 adjust to 2.5 - 2.75)	FINAL FLOW RATE*	WELL WATER LEVEL	PROGRAMMED WATER LEVEL RANGE
RW-1		Y	651520	1.75	N	1.75	6.5	7.3-5.3
RW-2		N	2124998	1.72	N	1.72	6.9	3.6-1.6
RW-5		N	234715	2.4	N	2.4	12.1	8.5-6.5
RW-4		Y	2163397	1.90	N	1.90	5.8	6.7-4.7

*Note if flow adjustment value is full open, write "Full Open" in the Final Flow Rate box.

Yellow Lights: T-2-Hi-Hi **OFF / ON** Well Pump 1 **OFF / ON** Well Pump 5 **OFF / ON**
 (On Alarm Panel) T-3-Hi-Hi **OFF / ON** Well Pump 2 **OFF / ON** Well Pump 4 **OFF / ON**

Chemical Feed Tank CF-1: Full ¾ ½ ¼ Empty Feed Tank pH: 10+
 Filled Tank Y

Chemical Blending Tank T-1: Air Compressor Operating? **Y/N** pH Strips: 8.10
 Ph Meter: 8.01

Bag Filters: In Operation **Y / N** Pump Pressure (psi): 24 Flow (gpm): ~9
 Bag Filters Changed: **N**

Carbon Filters: Pre-carbon Filtration Pressure (psi) 3.8

Effluent Pump: In Operation **Y** Effluent Pump Pressure (psi): 4.6

Building: Heaters effective? **Y / N / N.A.** Vent fan operating? **Y / N**

Critical Device Check Performed this visit? **N**

Notes:

RW-2 and RW-5 down upon arrival- cleaned roto-flow sensors and restarted pumps.

Saunders Supply Superfund Site - Groundwater Treatment System Weekly System Monitoring Checklist

Date: 1/22/2013

Time onsite: 1300

Personnel Onsite: M. Scott

Time offsite: 1420

Note: For all readings, if equipment is not operating, turn the equipment on and take readings. Ensure conditions are safe to operate equipment (i.e sufficient water supply exists for pump suction).

RECOVERY WELL	TIME	PUMP RUNNING?	FLOW TRANSMITTER				AMETEK METER	
			TOTAL FLOW TO DATE (gallons)	FLOW RATE (gpm)	FLOW RATE ADJUSTED (if below 2.5 adjust to 2.5 - 2.75)	FINAL FLOW RATE*	WELL WATER LEVEL	PROGRAMMED WATER LEVEL RANGE
RW-1		Y	651787	1.71	N	1.71	6.0	7.3-5.3
RW-2		Y	2125433	1.68	N	1.68	2.0	3.6-1.6
RW-5		N	236696	2.4	N	2.4	12.2	8.5-6.5
RW-4		Y	2164256	2.03	Y	1.83	6.4	6.7-4.7

*Note if flow adjustment value is full open, write "Full Open" in the Final Flow Rate box.

Yellow Lights: T-2-Hi-Hi **OFF** / ON Well Pump 1 **OFF** / ON Well Pump 5 **OFF** / **ON**
 (On Alarm Panel) T-3-Hi-Hi **OFF** / ON Well Pump 2 **OFF** / ON Well Pump 4 **OFF** / ON

Chemical Feed Tank CF-1: Full ¾ ½ ¼ **Empty** Feed Tank pH: 10+
 Filled Tank Y

Chemical Blending Tank T-1: Air Compressor Operating? Y/N pH Strips: 6.26
 Ph Meter: 6.21 Corrected to 7.68

Bag Filters: In Operation Y / N Pump Pressure (psi): 24 Flow (gpm): ~9
 Bag Filters Changed: N

Carbon Filters: Pre-carbon Filtration Pressure (psi) 3.9

Effluent Pump: In Operation Y Effluent Pump Pressure (psi): 4.6

Building: Heaters effective? Y / N / N.A. Vent fan operating? Y / N

Critical Device Check Performed this visit? N

Notes:

Ventilation fan blades found to be disconnected from motor shaft.

RW-5 down upon arrival. Reset and restarted pump.

Saunders Supply Superfund Site - Groundwater Treatment System Weekly System Monitoring Checklist

Date: 1/28/2013
 Personnel Onsite: M. Scott

Time onsite: 1120
 Time offsite: 1240

Note: For all readings, if equipment is not operating, turn the equipment on and take readings. Ensure conditions are safe to operate equipment (i.e. sufficient water supply exists for pump suction).

RECOVERY WELL	TIME	PUMP RUNNING?	FLOW TRANSMITTER				AMETEK METER	
			TOTAL FLOW TO DATE (gallons)	FLOW RATE (gpm)	FLOW RATE ADJUSTED (if below 2.5 adjust to 2.5 - 2.75)	FINAL FLOW RATE*	WELL WATER LEVEL	PROGRAMMED WATER LEVEL RANGE
RW-1		Y	652079	1.26	Y	1.59	6.5	7.3-5.3
RW-2		Y	2125821	1.75	N	1.75	3.5	3.6-1.6
RW-5		N	237928	2.4	N	2.4	12.5	8.5-6.5
RW-4		Y	2164977	1.88	N	1.88	6.1	6.7-4.7

*Note if flow adjustment value is full open, write "Full Open" in the Final Flow Rate box.

Yellow Lights: T-2-Hi-Hi **OFF** / ON Well Pump 1 **OFF** / ON Well Pump 5 **OFF** / **ON**
 (On Alarm Panel) T-3-Hi-Hi **OFF** / ON Well Pump 2 **OFF** / ON Well Pump 4 **OFF** / ON

Chemical Feed Tank CF-1: Full ¾ ½ ¼ **Empty** Feed Tank pH: 10+
 Filled Tank Y

Chemical Blending Tank T-1: Air Compressor Operating? **Y/N** pH Strips: 6.31
 Ph Meter: 6.36 Corrected to 9.20

Bag Filters: In Operation **Y** / N Pump Pressure (psi): 24 Flow (gpm): ~9
 Bag Filters Changed: **Y**

Carbon Filters: Pre-carbon Filtration Pressure (psi) 3.1

Effluent Pump: In Operation **Y** Effluent Pump Pressure (psi): 4.5

Building: Heaters effective? **Y** / N / N.A. Vent fan operating? **Y** / N

Critical Device Check Performed this visit? **Y**

Notes:

Changed bag filters

Ventilation fan remains inoperational

Critical Device Checklist
Saunders Supply, Chuckatuck, Virginia

Year: 2013

Quarter: 1st

Month: October	Month: November	Month: December	
MS			Inspector's Initials
1/28/2013			Date of Inspection
CRITICAL DEVICE			
Recovery Pumps			
X			Well Pump Low Flow Alarm
X			Pull and wash recovery well pumps, clean pump suction
X			Check level probes, clean
Chemical Feed Package			
X			Clean and calibrate pH probe
X			Field test for iron
X			Check Settling Tank HiHi Level alarm and pump control
X			Check Settling Tank level controls for Sand Filter Pump
X			Check Blending Tank, T-1 for sludge buildup
X			Clean blower fan, blower tray, and suction inlet
X			Measure and record sludge depth in settling tank, T-2
Bag Filter Pump and Bag Filter Assembly			
X			Clean bag filter pump flow meter
X			Clean bag filter pump impeller
X			Check bag filter housing O-rings for damage
Effluent Tank			
X			Lubricate Pump
X			Check Effluent Tank HiHi Level alarm and pump control
X			Check Effluent Tank level controls for Effluent Pump
X			Inspect Effluent Tank for scaling, build-up
Signage			
X			Identification at front door
X			Caution: Caustic Solution
X			Blending Tank Mixing Instructions
X			Caution: More than one voltage source (Alarm Panel)
X			Equipment Labels: Tanks, Piping, Motor Controller, C/B
Electrical			
X			Ground connection for Circuit Breaker Panel
X			Ground connection for Sand Filter Platform
X			Circuit Breaker Panel
Misc.			
X			Piping (Leaks, Supports)
X			Pressure and Seal Fire Extinguisher
X			Inspect First Aid Kit
X			Inspect Eyewash Station
X			Change Eyewash Solution

Notes:

Critical Device Checklist
Saunders Supply, Chuckatuck, Virginia

Year: 2012

Quarter: 1st

Month: Jan	Month: February	Month: March	
MS	MS		Inspector's Initials
1/28/2013	2/28/2013		Date of Inspection
<u>CRITICAL DEVICE</u>			
Recovery Pumps			
X	X		Well Pump Low Flow Alarm
X	X		Pull and wash recovery well pumps, clean pump suction
X	X		Check level probes, clean
Chemical Feed Package			
X	X		Clean and calibrate pH probe
X	X		Field test for iron
X	X		Check Settling Tank HiHi Level alarm and pump control
X	X		Check Settling Tank level controls for Sand Filter Pump
X			Check Blending Tank, T-1 for sludge buildup
X			Clean blower fan, blower tray, and suction inlet
X			Measure and record sludge depth in settling tank, T-2
Bag Filter Pump and Bag Filter Assembly			
X	X		Clean bag filter pump flow meter
X			Clean bag filter pump impeller
X		X	Check bag filter housing O-rings for damage
Effluent Tank			
X	X		Lubricate Pump
X	X		Check Effluent Tank HiHi Level alarm and pump control
X	X		Check Effluent Tank level controls for Effluent Pump
X	X		Inspect Effluent Tank for scaling, build-up
Signage			
X	X		Identification at front door
X	X		Caution: Caustic Solution
X	X		Blending Tank Mixing Instructions
X	X		Caution: More than one voltage source (Alarm Panel)
X	X		Equipment Labels: Tanks, Piping, Motor Controller, C/B
Electrical			
X	X		Ground connection for Circuit Breaker Panel
X	X		Ground connection for Sand Filter Platform
X	X		Circuit Breaker Panel
Misc.			
X	X		Piping (Leaks, Supports)
X	X		Pressure and Seal Fire Extinguisher
X	X		Inspect First Aid Kid
X	X		Inspect Eyewash Station
X			Change Eyewash Solution

Notes:

Saunders Supply Superfund Site - Groundwater Treatment System Weekly System Monitoring Checklist

Date: 3/18/2013

Time onsite: 1200

Personnel Onsite: M. Scott

Time offsite: _____

Note: For all readings, if equipment is not operating, turn the equipment on and take readings. Ensure conditions are safe to operate equipment (i.e. sufficient water supply exists for pump suction).

RECOVERY WELL	TIME	PUMP RUNNING?	FLOW TRANSMITTER				AMETEK METER	
			TOTAL FLOW TO DATE (gallons)	FLOW RATE (gpm)	FLOW RATE ADJUSTED (if below 2.5 adjust to 2.5 - 2.75)	FINAL FLOW RATE*	WELL WATER LEVEL	PROGRAMMED WATER LEVEL RANGE
RW-1		Y	6541815	1.93	N	1.93	7.1	7.3-5.3
RW-2		Y	2128678	2.03	Y	1.76	2.1	3.6-1.6
RW-5		N	246387	2.4	N	2.4	11.8	8.5-6.5
RW-4		Y	2170033	1.92	N	1.92	5.5	6.7-4.7

*Note if flow adjustment value is full open, write "Full Open" in the Final Flow Rate box.

Yellow Lights: T-2-Hi-Hi **OFF** / ON Well Pump 1 **OFF** / ON Well Pump 5 **OFF** / ON
 (On Alarm Panel) T-3-Hi-Hi **OFF** / ON Well Pump 2 **OFF** / ON Well Pump 4 **OFF** / ON

Chemical Feed Tank CF-1: Full ¾ ½ ¼ Empty Feed Tank pH: 10+
 Filled Tank Y

Chemical Blending Tank T-1: Air Compressor Operating? Y/N pH Strips:
 Ph Meter: 7.89 Corrected to 9.20

Bag Filters: In Operation Y / N Pump Pressure (psi): 24 Flow (gpm): 9
 Bag Filters Changed: N

Carbon Filters: Pre-carbon Filtration Pressure (psi) 4.9

Effluent Pump: In Operation Y Effluent Pump Pressure (psi): 4.5

Building: Heaters effective? Y / N / N.A. Vent fan operating? Y / N

Critical Device Check Performed this visit? N

Notes:

Collected monthly system samples

Reset and restarted RW-5 pump

Saunders Supply Superfund Site - Groundwater Treatment System Weekly System Monitoring Checklist

Date: 3/25/2013

Time onsite: 1145

Personnel Onsite: M. Scott

Time offsite: 1315

Note: For all readings, if equipment is not operating, turn the equipment on and take readings. Ensure conditions are safe to operate equipment (i.e. sufficient water supply exists for pump suction).

RECOVERY WELL	TIME	PUMP RUNNING?	FLOW TRANSMITTER				AMETEK METER	
			TOTAL FLOW TO DATE (gallons)	FLOW RATE (gpm)	FLOW RATE ADJUSTED (if below 2.5 adjust to 2.5 - 2.75)	FINAL FLOW RATE*	WELL WATER LEVEL	PROGRAMMED WATER LEVEL RANGE
RW-1		Y	654798	1.85	N	1.85	5.9	7.3-5.3
RW-2		Y	2129149	1.74	N	1.74	2.6	3.6-1.6
RW-5		Y	248291	2.3	N	2.3	7.7	8.5-6.5
RW-4		Y	2170801	1.70	N	1.70	6.2	6.7-4.7

*Note if flow adjustment value is full open, write "Full Open" in the Final Flow Rate box.

Yellow Lights: T-2-Hi-Hi **OFF** / ON Well Pump 1 **OFF** / ON Well Pump 5 **OFF** / ON
(On Alarm Panel) T-3-Hi-Hi **OFF** / ON Well Pump 2 **OFF** / ON Well Pump 4 **OFF** / ON

Chemical Feed Tank CF-1: Full ¾ ½ ¼ Empty Feed Tank pH: 10+
Filled Tank Y

Chemical Blending Tank T-1: Air Compressor Operating? Y/N pH Strips: 6.70
Ph Meter: 6.79 Corrected to 8.38

Bag Filters: In Operation Y / N Pump Pressure (psi): 24 Flow (gpm): 9
Bag Filters Changed: Y

Carbon Filters: Pre-carbon Filtration Pressure (psi) 3.8

Effluent Pump: In Operation Y Effluent Pump Pressure (psi): 4.8

Building: Heaters effective? Y / N / N.A. Vent fan operating? Y / N

Critical Device Check Performed this visit? Y

Notes:

Performed monthly critical device checklist

Cleaned roto-flow sensors in influent manifold

Cleaned impeller on sand filter pump

Changed bag filters

Critical Device Checklist
Saunders Supply, Chuckatuck, Virginia

Year: 2012

Quarter: 1st

Month: Jan	Month: February	Month: March	
MS	MS	MS	Inspector's Initials
1/28/2013	2/28/2013	3/25/2013	Date of Inspection
<u>CRITICAL DEVICE</u>			
Recovery Pumps			
X	X	X	Well Pump Low Flow Alarm
X	X	X	Pull and wash recovery well pumps, clean pump suction
X	X	X	Check level probes, clean
Chemical Feed Package			
X	X	X	Clean and calibrate pH probe
X	X	X	Field test for iron
X	X	X	Check Settling Tank HiHi Level alarm and pump control
X	X	X	Check Settling Tank level controls for Sand Filter Pump
X	/	/	Check Blending Tank, T-1 for sludge buildup
X			Clean blower fan, blower tray, and suction inlet
X			Measure and record sludge depth in settling tank, T-2
Bag Filter Pump and Bag Filter Assembly			
X	X	X	Clean bag filter pump flow meter
X	/	/	Clean bag filter pump impeller
X	X	X	Check bag filter housing O-rings for damage
Effluent Tank			
X	X	X	Lubricate Pump
X	X	X	Check Effluent Tank HiHi Level alarm and pump control
X	X	X	Check Effluent Tank level controls for Effluent Pump
X	X	X	Inspect Effluent Tank for scaling, build-up
Signage			
X	X	X	Identification at front door
X	X	X	Caution: Caustic Solution
X	X	X	Blending Tank Mixing Instructions
X	X	X	Caution: More than one voltage source (Alarm Panel)
X	X	X	Equipment Labels: Tanks, Piping, Motor Controller, C/B
Electrical			
X	X	X	Ground connection for Circuit Breaker Panel
X	X	X	Ground connection for Sand Filter Platform
X	X	X	Circuit Breaker Panel
Misc.			
X	X	X	Piping (Leaks, Supports)
X	X	X	Pressure and Seal Fire Extinguisher
X	X	X	Inspect First Aid Kid
X	X	X	Inspect Eyewash Station
X	/	/	Change Eyewash Solution

Notes:

Saunders Supply Superfund Site - Groundwater Treatment System Weekly System Monitoring Checklist

Date: 4/29/2013

Time onsite: 1200

Personnel Onsite: M. Scott

Time offsite: 1430

Note: For all readings, if equipment is not operating, turn the equipment on and take readings. Ensure conditions are safe to operate equipment (i.e. sufficient water supply exists for pump suction).

RECOVERY WELL	TIME	PUMP RUNNING?	FLOW TRANSMITTER				AMETEK METER	
			TOTAL FLOW TO DATE (gallons)	FLOW RATE (gpm)	FLOW RATE ADJUSTED (if below 2.5 adjust to 2.5 - 2.75)	FINAL FLOW RATE*	WELL WATER LEVEL	PROGRAMMED WATER LEVEL RANGE
RW-1		Y	655859	1.63	N	1.63	6.2	7.3-5.3
RW-2		Y	2130328	1.72	N	1.72	2.8	3.6-1.6
RW-5		N	250434	2.1	N	2.1	11.9	8.5-6.5
RW-4		Y	2172991	1.84	N	1.84	5.8	6.7-4.7

*Note if flow adjustment value is full open, write "Full Open" in the Final Flow Rate box.

Yellow Lights: T-2-Hi-Hi **OFF** / ON Well Pump 1 **OFF** / ON Well Pump 5 **OFF** / **ON**
 (On Alarm Panel) T-3-Hi-Hi **OFF** / ON Well Pump 2 **OFF** / **ON** Well Pump 4 **OFF** / **ON**

Chemical Feed Tank CF-1: Full ¾ ½ ¼ Empty Feed Tank pH: 10+
 Filled Tank Y

Chemical Blending Tank T-1: Air Compressor Operating? Y/N pH Strips: 7.69
 Ph Meter: 7.75

Bag Filters: In Operation Y / N Pump Pressure (psi): 24 Flow (gpm): 9
 Bag Filters Changed: Y

Carbon Filters: Pre-carbon Filtration Pressure (psi) 3.0

Effluent Pump: In Operation Y Effluent Pump Pressure (psi): 4.9

Building: Heaters effective? Y / N / N.A. Vent fan operating? Y / N

Critical Device Check Performed this visit? Y

Notes:

Met with electrical motor contractor to get quote for exhaust fan repair

Raise RW-5 pump by 1.5 ft to mitigate pump malfunctions

Perform monthly critical device checklist

Critical Device Checklist
Saunders Supply, Chuckatuck, Virginia

Year: 2013

Quarter: 2nd

Month: Apr	Month: May	Month: June	
MS	MS		Inspector's Initials
4/29/2013	5/28/2013		Date of Inspection
<u>CRITICAL DEVICE</u>			
Recovery Pumps			
X	X		Well Pump Low Flow Alarm
X	X		Pull and wash recovery well pumps, clean pump suction
X	X		Check level probes, clean
Chemical Feed Package			
X	X		Clean and calibrate pH probe
X	X		Field test for iron
X	X		Check Settling Tank HiHi Level alarm and pump control
X	X		Check Settling Tank level controls for Sand Filter Pump
X			Check Blending Tank, T-1 for sludge buildup
X			Clean blower fan, blower tray, and suction inlet
X			Measure and record sludge depth in settling tank, T-2
Bag Filter Pump and Bag Filter Assembly			
X	X		Clean bag filter pump flow meter
X			Clean bag filter pump impeller
X		X	Check bag filter housing O-rings for damage
Effluent Tank			
X	X		Lubricate Pump
X	X		Check Effluent Tank HiHi Level alarm and pump control
X	X		Check Effluent Tank level controls for Effluent Pump
X	X		Inspect Effluent Tank for scaling, build-up
Signage			
X	X		Identification at front door
X	X		Caution: Caustic Solution
X	X		Blending Tank Mixing Instructions
X	X		Caution: More than one voltage source (Alarm Panel)
X	X		Equipment Labels: Tanks, Piping, Motor Controller, C/B
Electrical			
X	X		Ground connection for Circuit Breaker Panel
X	X		Ground connection for Sand Filter Platform
X	X		Circuit Breaker Panel
Misc.			
X	X		Piping (Leaks, Supports)
X	X		Pressure and Seal Fire Extinguisher
X	X		Inspect First Aid Kid
X	X		Inspect Eyewash Station
X			Change Eyewash Solution

Notes:

Saunders Supply Superfund Site - Groundwater Treatment System Weekly System Monitoring Checklist

Date: 6/3/2013
 Personnel Onsite: M. Scott

Time onsite: 1130
 Time offsite: 1200

Note: For all readings, if equipment is not operating, turn the equipment on and take readings. Ensure conditions are safe to operate equipment (i.e. sufficient water supply exists for pump suction).

RECOVERY WELL	TIME	PUMP RUNNING?	FLOW TRANSMITTER				AMETEK METER	
			TOTAL FLOW TO DATE (gallons)	FLOW RATE (gpm)	FLOW RATE ADJUSTED (if below 2.5 adjust to 2.5 - 2.75)	FINAL FLOW RATE*	WELL WATER LEVEL	PROGRAMMED WATER LEVEL RANGE
RW-1		N						7.3-5.3
RW-2		N						3.6-1.6
RW-5		N						8.5-6.5
RW-4		N						6.7-4.7

*Note if flow adjustment value is full open, write "Full Open" in the Final Flow Rate box.

Yellow Lights: T-2-Hi-Hi OFF / ON Well Pump 1 OFF / ON Well Pump 5 OFF / ON
 (On Alarm Panel) T-3-Hi-Hi OFF / ON Well Pump 2 OFF / ON Well Pump 4 OFF / ON

Chemical Feed Tank CF-1: Full ¾ ½ ¼ Empty Feed Tank pH: 10+
 Filled Tank Y

Chemical Blending Tank T-1: Air Compressor Operating? Y/N pH Strips:
 Ph Meter:

Bag Filters: In Operation Y / N Pump Pressure (psi): Flow (gpm):
 Bag Filters Changed: Y

Carbon Filters: Pre-carbon Filtration Pressure (psi):

Effluent Pump: In Operation? Effluent Pump Pressure (psi):

Building: Heaters effective? Y / N / N.A. Vent fan operating? Y / N

Critical Device Check Performed this visit? Y

Notes:

Building found to be flooded upon arrival. Flooding apparently due to piping failure at sand filter pump.
Power was cut to system building to prevent damage/ safety

Saunders Supply Superfund Site - Groundwater Treatment System Weekly System Monitoring Checklist

Date: 6/4/2013

Time onsite: _____

Personnel Onsite: M. Richardson

Time offsite: _____

Note: For all readings, if equipment is not operating, turn the equipment on and take readings. Ensure conditions are safe to operate equipment (i.e. sufficient water supply exists for pump suction).

RECOVERY WELL	TIME	PUMP RUNNING?	FLOW TRANSMITTER				AMETEK METER	
			TOTAL FLOW TO DATE (gallons)	FLOW RATE (gpm)	FLOW RATE ADJUSTED (if below 2.5 adjust to 2.5 - 2.75)	FINAL FLOW RATE*	WELL WATER LEVEL	PROGRAMMED WATER LEVEL RANGE
RW-1		Y	657171	--	Y	1.61	6.2	7.3-5.3
RW-2		Y	2132381	--	Y	1.64	2.8	3.6-1.6
RW-5		Y	252018	--	Y	2.4	7.1	8.5-6.5
RW-4		Y	2176188	--	Y	1.58	5.6	6.7-4.7

*Note if flow adjustment value is full open, write "Full Open" in the Final Flow Rate box.

Yellow Lights: T-2-Hi-Hi OFF / ON Well Pump 1 OFF / ON Well Pump 5 OFF / ON
(On Alarm Panel) T-3-Hi-Hi OFF / ON Well Pump 2 OFF / ON Well Pump 4 OFF / ON

Chemical Feed Tank CF-1: Full ¾ ½ ¼ Empty Feed Tank pH: 10+
Filled Tank Y

Chemical Blending Tank T-1: Air Compressor Operating? Y/N pH Strips:
Ph Meter: 8.21

Bag Filters: In Operation Y / N Pump Pressure (psi): 24 Flow (gpm): ~9
Bag Filters Changed: N

Carbon Filters: Pre-carbon Filtration Pressure (psi) 24.0

Effluent Pump: In Operation Y Effluent Pump Pressure (psi): 3.6

Building: Heaters effective? Y / N / N.A. Vent fan operating? Y / N

Critical Device Check Performed this visit? N

Notes:

Building flooded upon arrival. Used utility pump to pump water in containment into settling tank.

Repaired damaged piping at sand filter pump. Restarted system and all components appeared to be undamaged and operational

Saunders Supply Superfund Site - Groundwater Treatment System Weekly System Monitoring Checklist

Date: 6/24/2013
 Personnel Onsite: M. Scott

Time onsite: 955
 Time offsite: 1220

Note: For all readings, if equipment is not operating, turn the equipment on and take readings. Ensure conditions are safe to operate equipment (i.e sufficient water supply exists for pump suction).

RECOVERY WELL	TIME	PUMP RUNNING?	FLOW TRANSMITTER				AMETEK METER	
			TOTAL FLOW TO DATE (gallons)	FLOW RATE (gpm)	FLOW RATE ADJUSTED (if below 2.5 adjust to 2.5 - 2.75)	FINAL FLOW RATE*	WELL WATER LEVEL	PROGRAMMED WATER LEVEL RANGE
RW-1		Y	658061	1.69	N	1.69	6.8	7.3-5.3
RW-2		Y	2133712	1.82	N	1.82	1.8	3.6-1.6
RW-5		Y	254951	2.1	N	2.1	7.9	8.5-6.5
RW-4		Y	2178244	1.93	N	1.93	6.6	6.7-4.7

*Note if flow adjustment value is full open, write "Full Open" in the Final Flow Rate box.

Yellow Lights: T-2-Hi-Hi **OFF** / ON Well Pump 1 **OFF** / ON Well Pump 5 **OFF** / ON
 (On Alarm Panel) T-3-Hi-Hi **OFF** / ON Well Pump 2 **OFF** / ON Well Pump 4 **OFF** / ON

Chemical Feed Tank CF-1: Full ¾ ½ ¼ Empty Feed Tank pH: 10+
 Filled Tank Y

Chemical Blending Tank T-1: Air Compressor Operating? Y/N pH Strips: 7.06
 Ph Meter: 6.98 Corrected to 8.69

Bag Filters: In Operation Y / N Pump Pressure (psi): 24 Flow (gpm): ~9
 Bag Filters Changed: Y

Carbon Filters: Pre-carbon Filtration Pressure (psi) 5.5

Effluent Pump: In Operation Y Effluent Pump Pressure (psi): 4.8

Building: Heaters effective? Y / N / N.A. Vent fan operating? Y / N

Critical Device Check Performed this visit? Y

Notes:

Met with electrical contactor to assess exhaust fan - Fan and fan shaft found to be damaged and to be replaced

Performed monthly critical safety device checklist

Critical Device Checklist
Saunders Supply, Chuckatuck, Virginia

Year: 2013

Quarter: 2nd

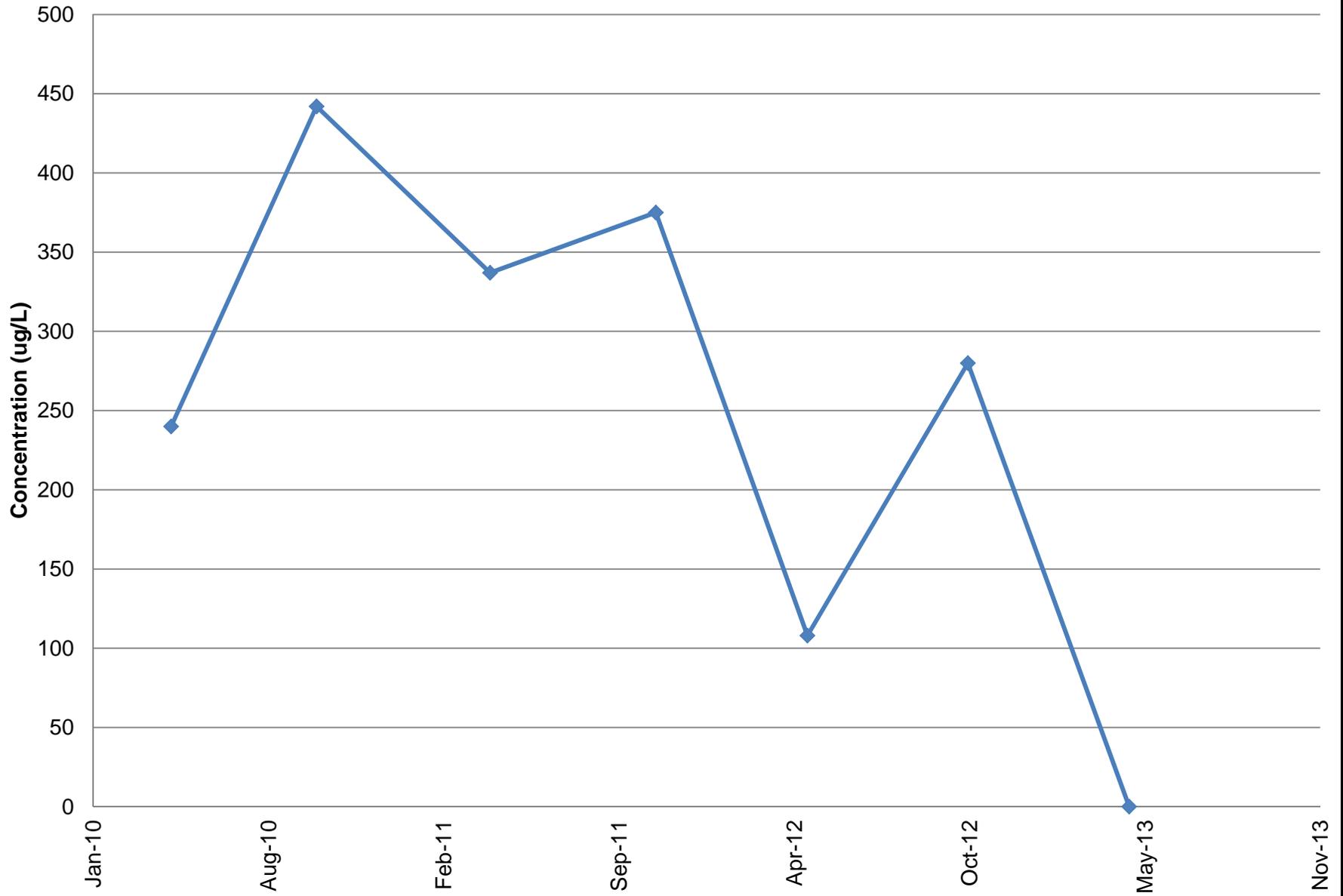
Month: Apr	Month: May	Month: June	
MS	MS	MS	Inspector's Initials
4/29/2013	5/28/2013	6/24/2013	Date of Inspection
<u>CRITICAL DEVICE</u>			
Recovery Pumps			
X	X	X	Well Pump Low Flow Alarm
X	X	X	Pull and wash recovery well pumps, clean pump suction
X	X	X	Check level probes, clean
Chemical Feed Package			
X	X	X	Clean and calibrate pH probe
X	X	X	Field test for iron
X	X	X	Check Settling Tank HiHi Level alarm and pump control
X	X	X	Check Settling Tank level controls for Sand Filter Pump
X			Check Blending Tank, T-1 for sludge buildup
X			Clean blower fan, blower tray, and suction inlet
X			Measure and record sludge depth in settling tank, T-2
Bag Filter Pump and Bag Filter Assembly			
X	X	X	Clean bag filter pump flow meter
X			Clean bag filter pump impeller
X	X	X	Check bag filter housing O-rings for damage
Effluent Tank			
X	X	X	Lubricate Pump
X	X	X	Check Effluent Tank HiHi Level alarm and pump control
X	X	X	Check Effluent Tank level controls for Effluent Pump
X	X	X	Inspect Effluent Tank for scaling, build-up
Signage			
X	X	X	Identification at front door
X	X	X	Caution: Caustic Solution
X	X	X	Blending Tank Mixing Instructions
X	X	X	Caution: More than one voltage source (Alarm Panel)
X	X	X	Equipment Labels: Tanks, Piping, Motor Controller, C/B
Electrical			
X	X	X	Ground connection for Circuit Breaker Panel
X	X	X	Ground connection for Sand Filter Platform
X	X	X	Circuit Breaker Panel
Misc.			
X	X	X	Piping (Leaks, Supports)
X	X	X	Pressure and Seal Fire Extinguisher
X	X	X	Inspect First Aid Kid
X	X	X	Inspect Eyewash Station
X			Change Eyewash Solution

Notes:

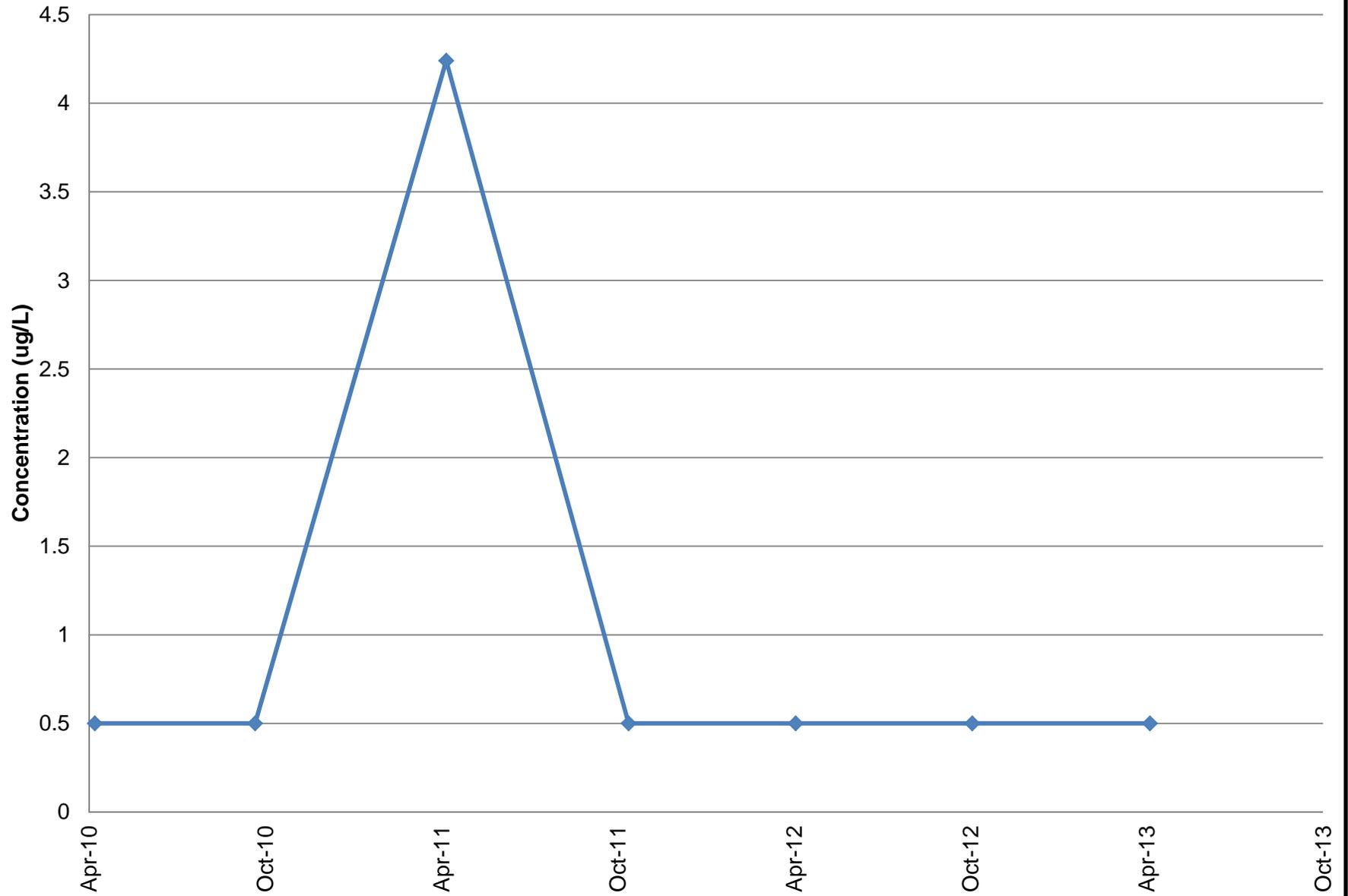
APPENDIX IV

CONTAMINANT TREND GRAPHS

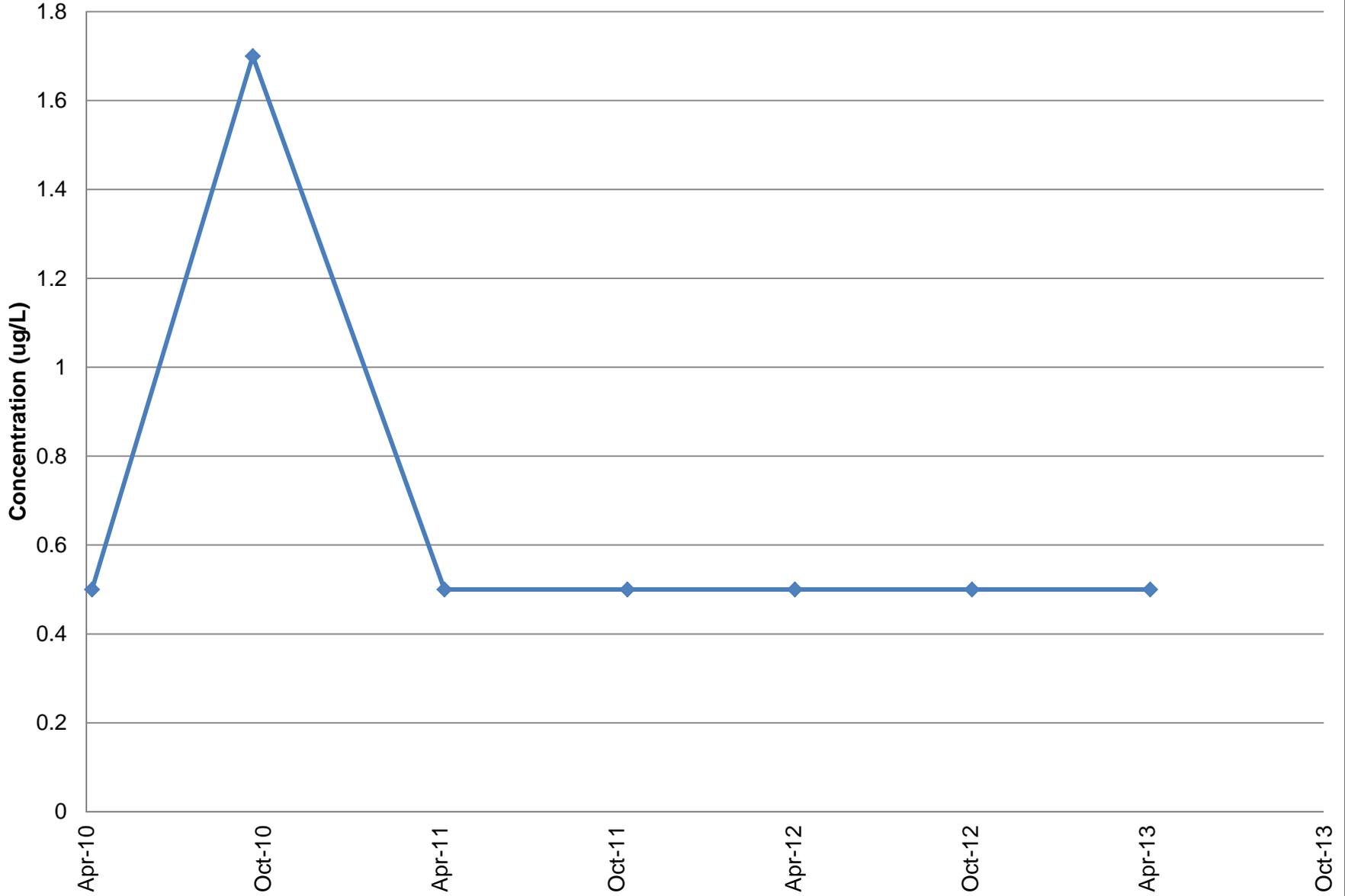
Pentachlorophenol in RW-5



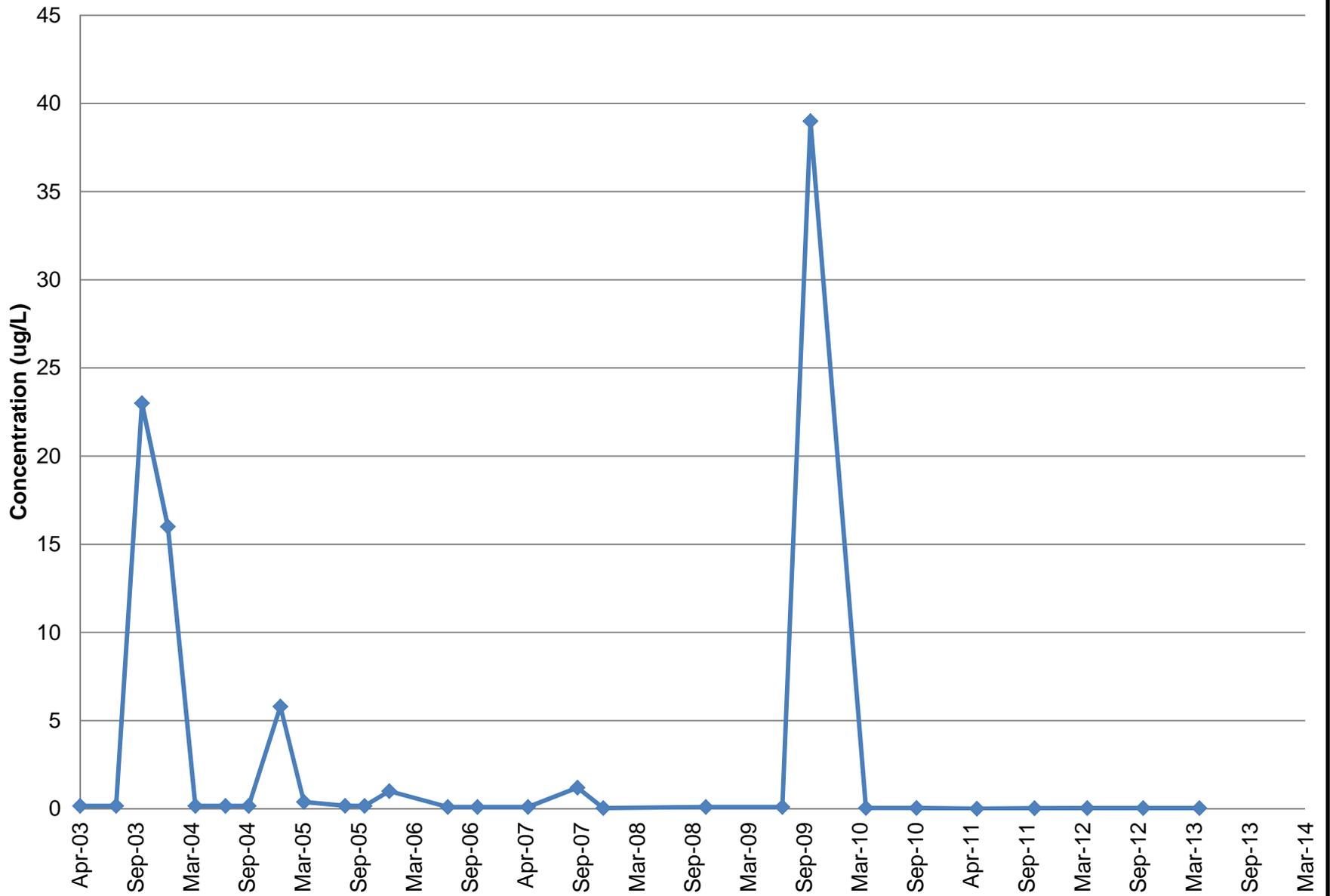
Dissolved Chromium in RW-5



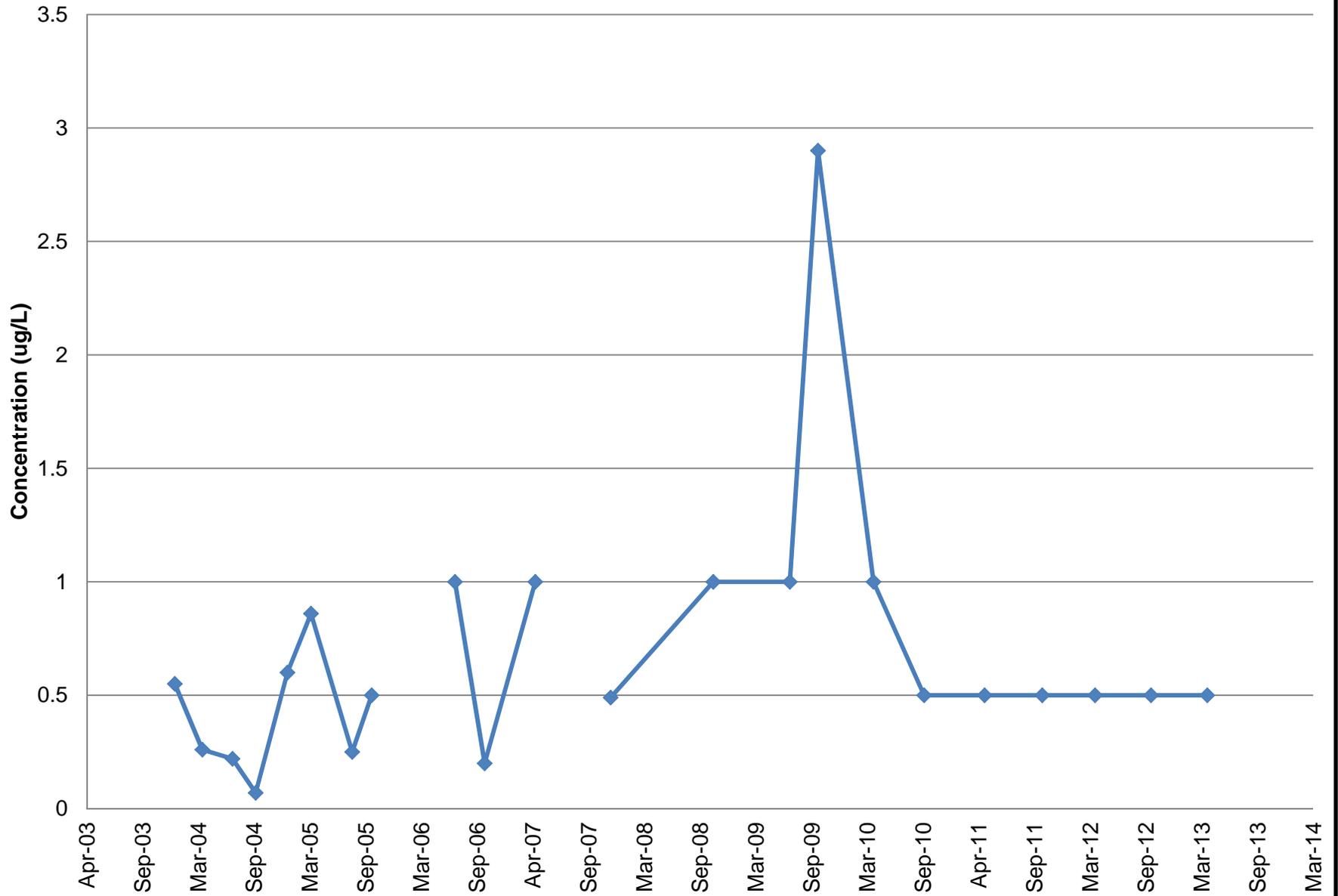
Dissolved Arsenic in RW-5



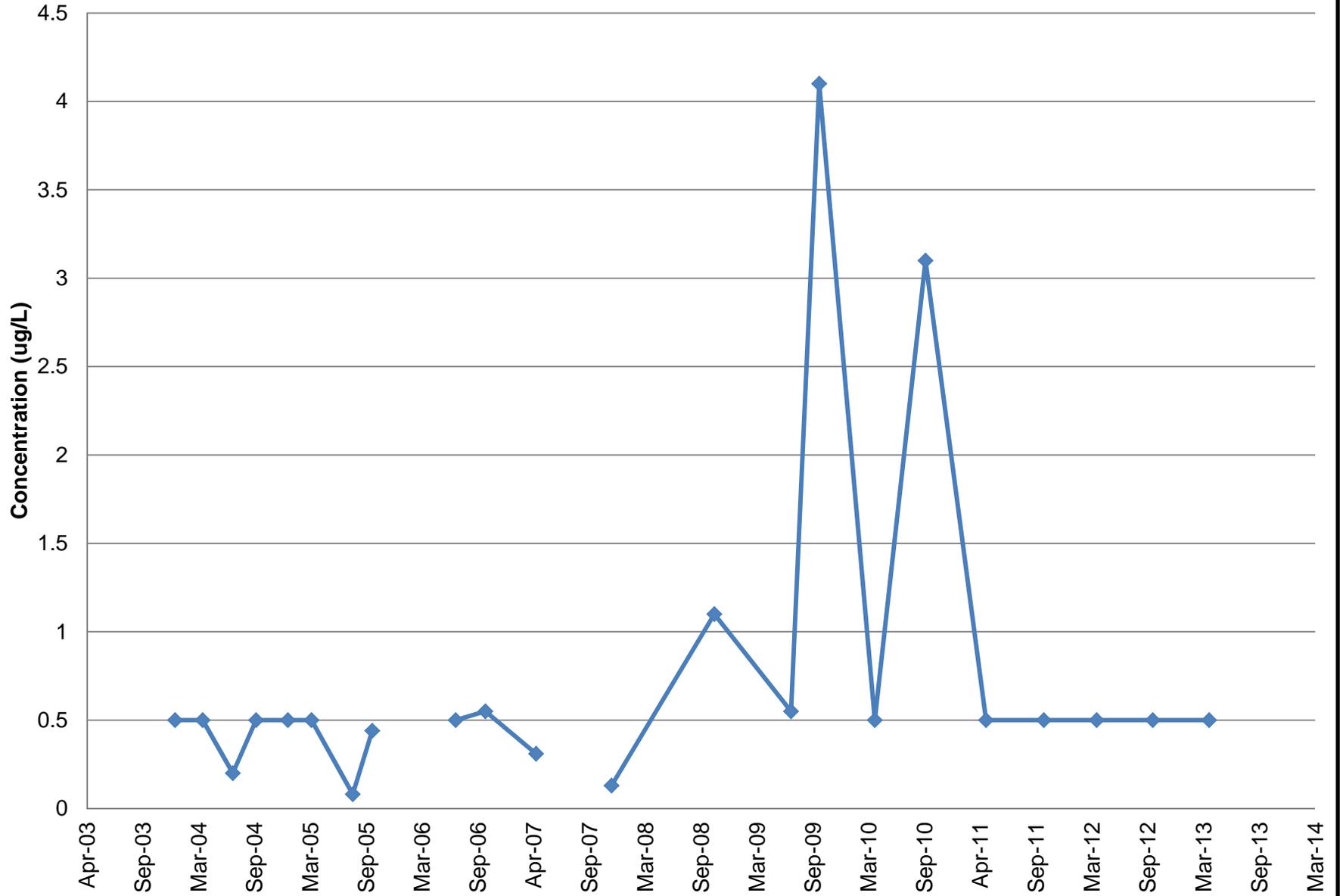
Pentachlorophenol in RW-4



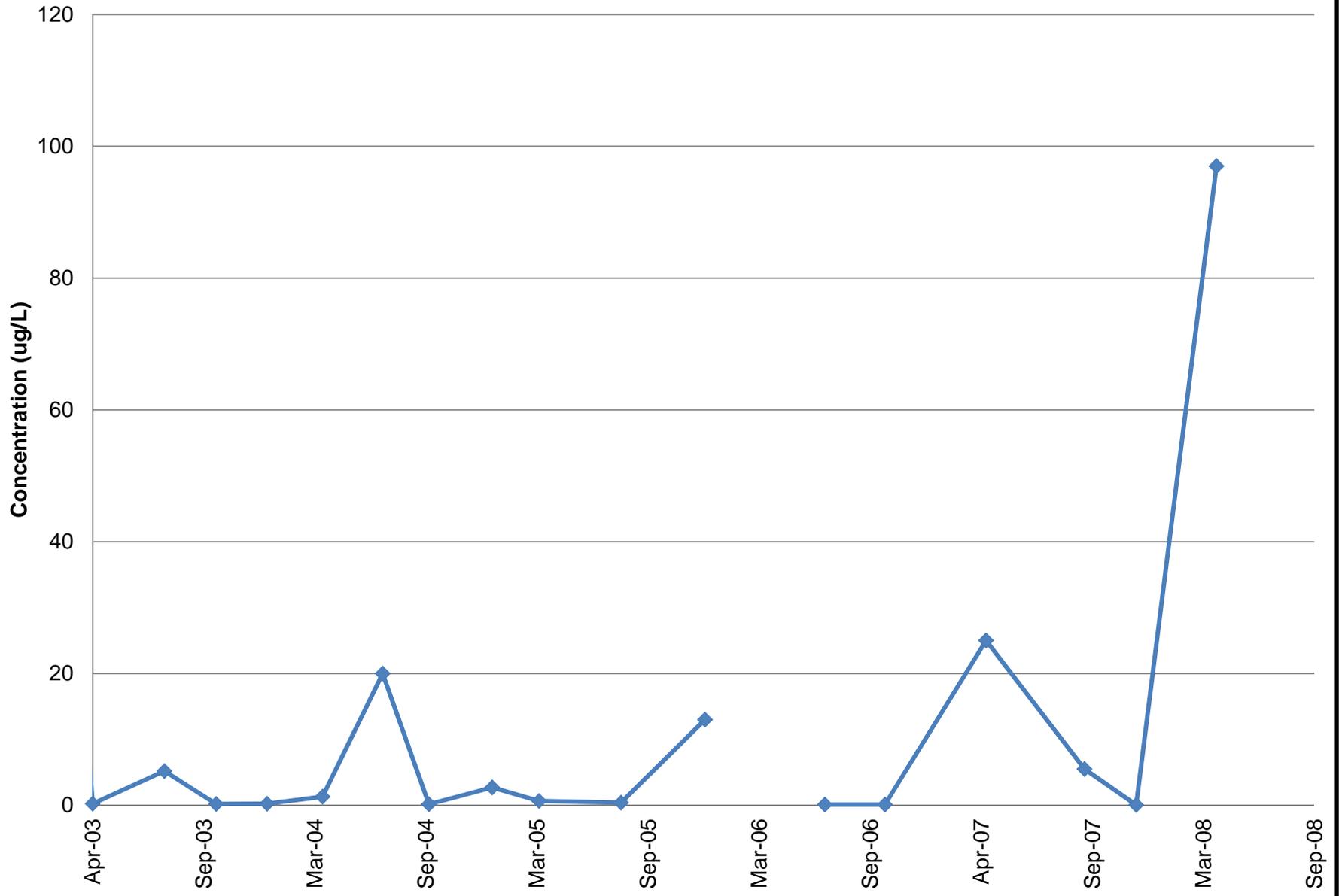
Dissolved Chromium in RW-4



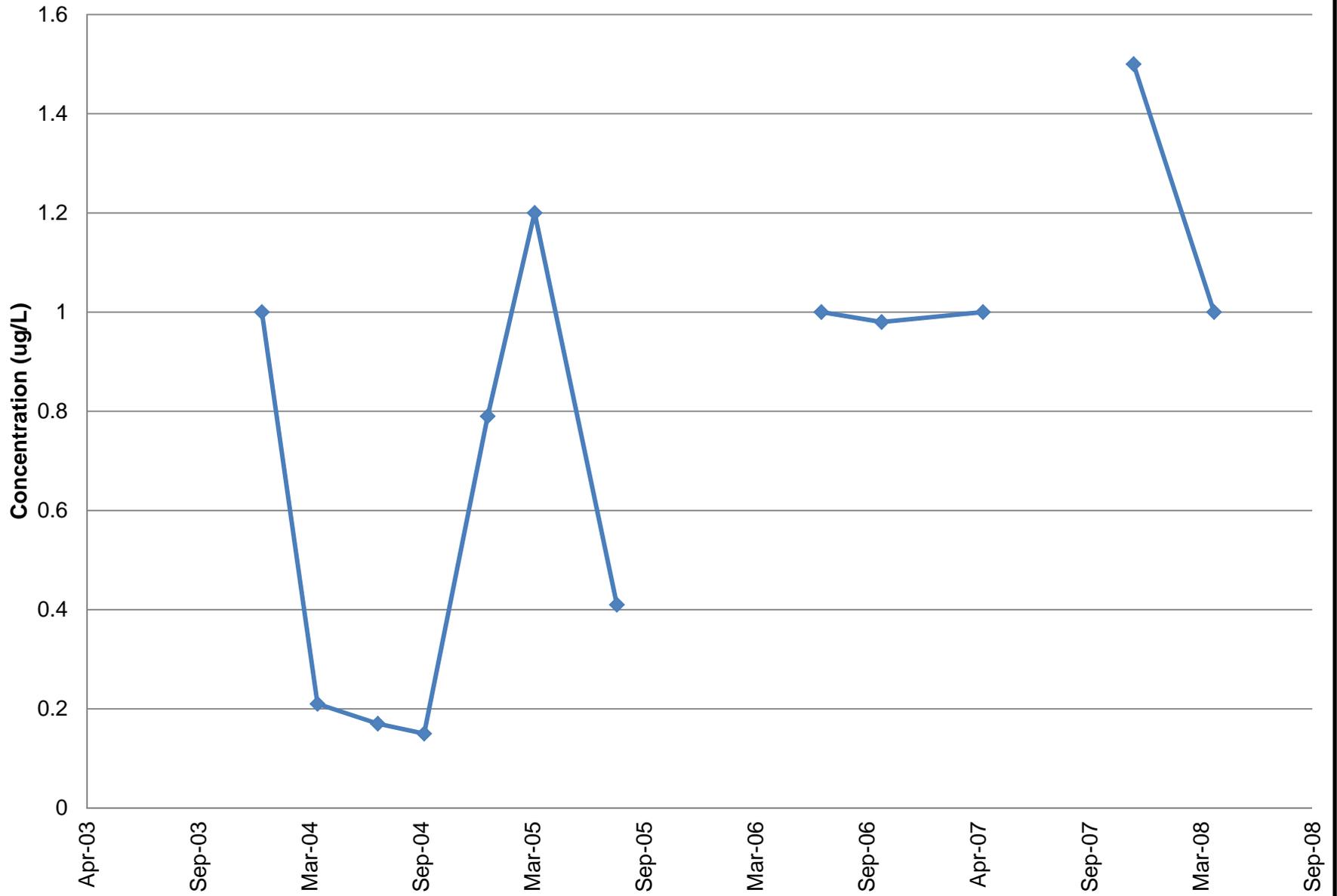
Dissolved Arsenic in RW-4



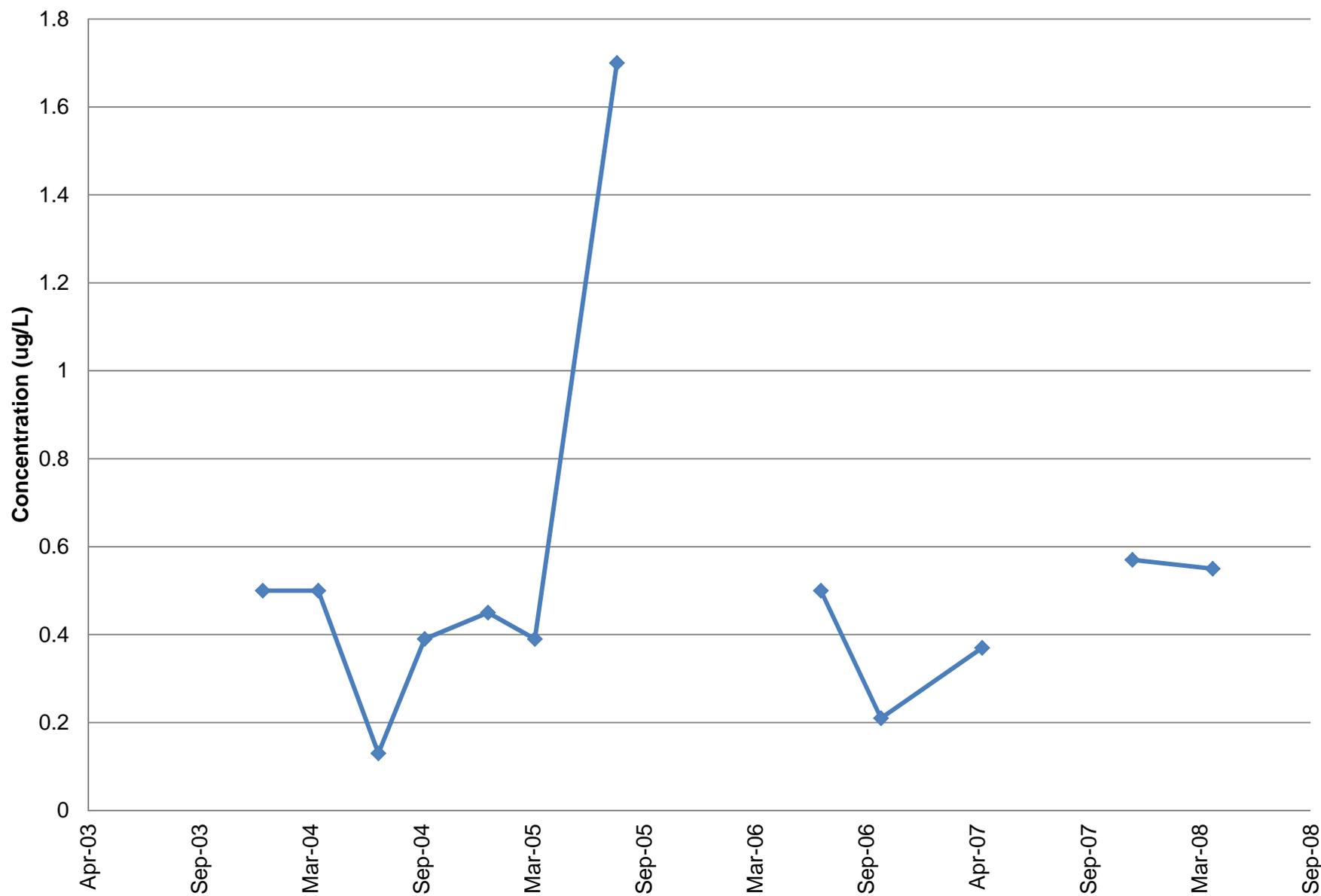
Pentachlorophenol in RW-3



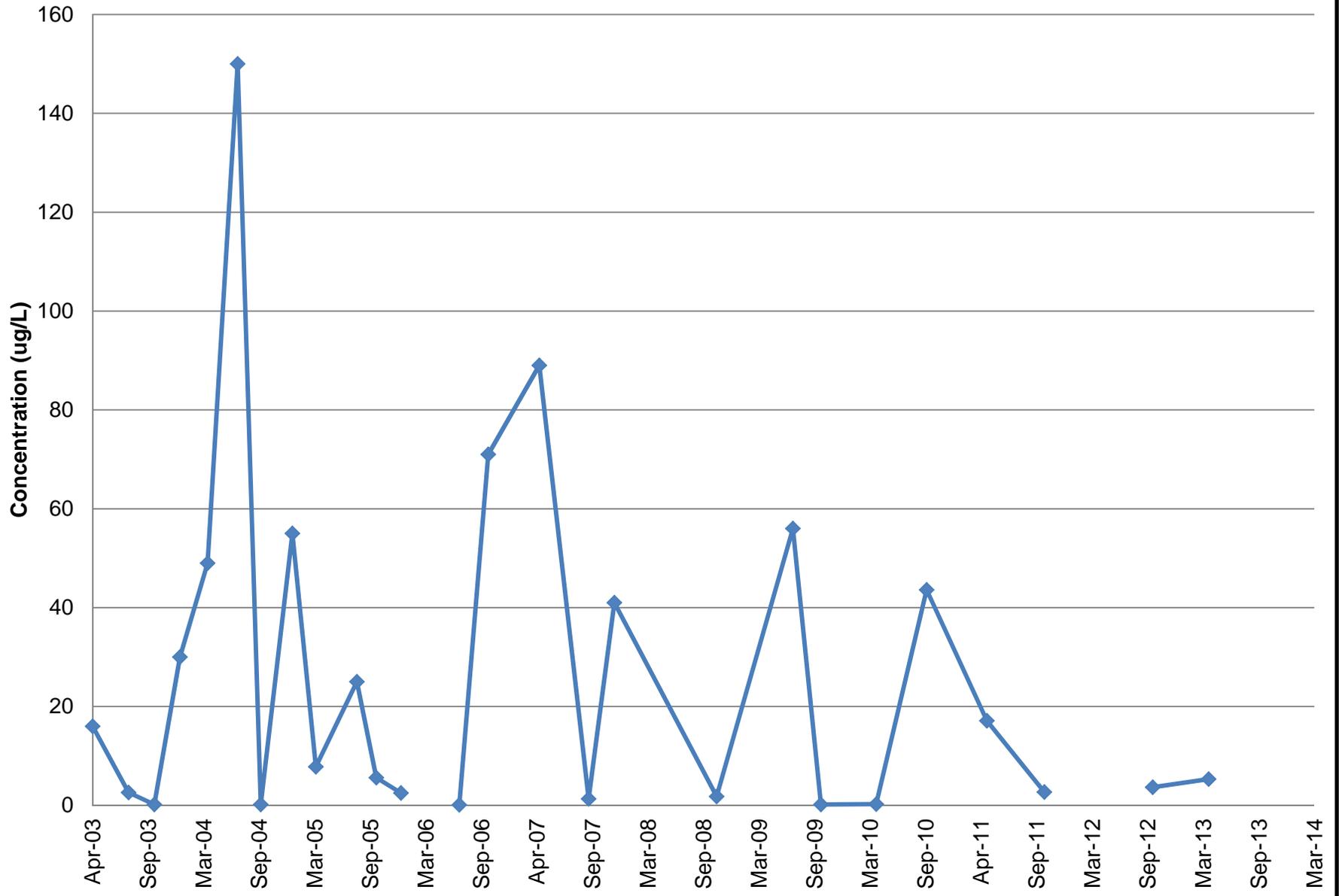
Dissolved Chromium in RW-3



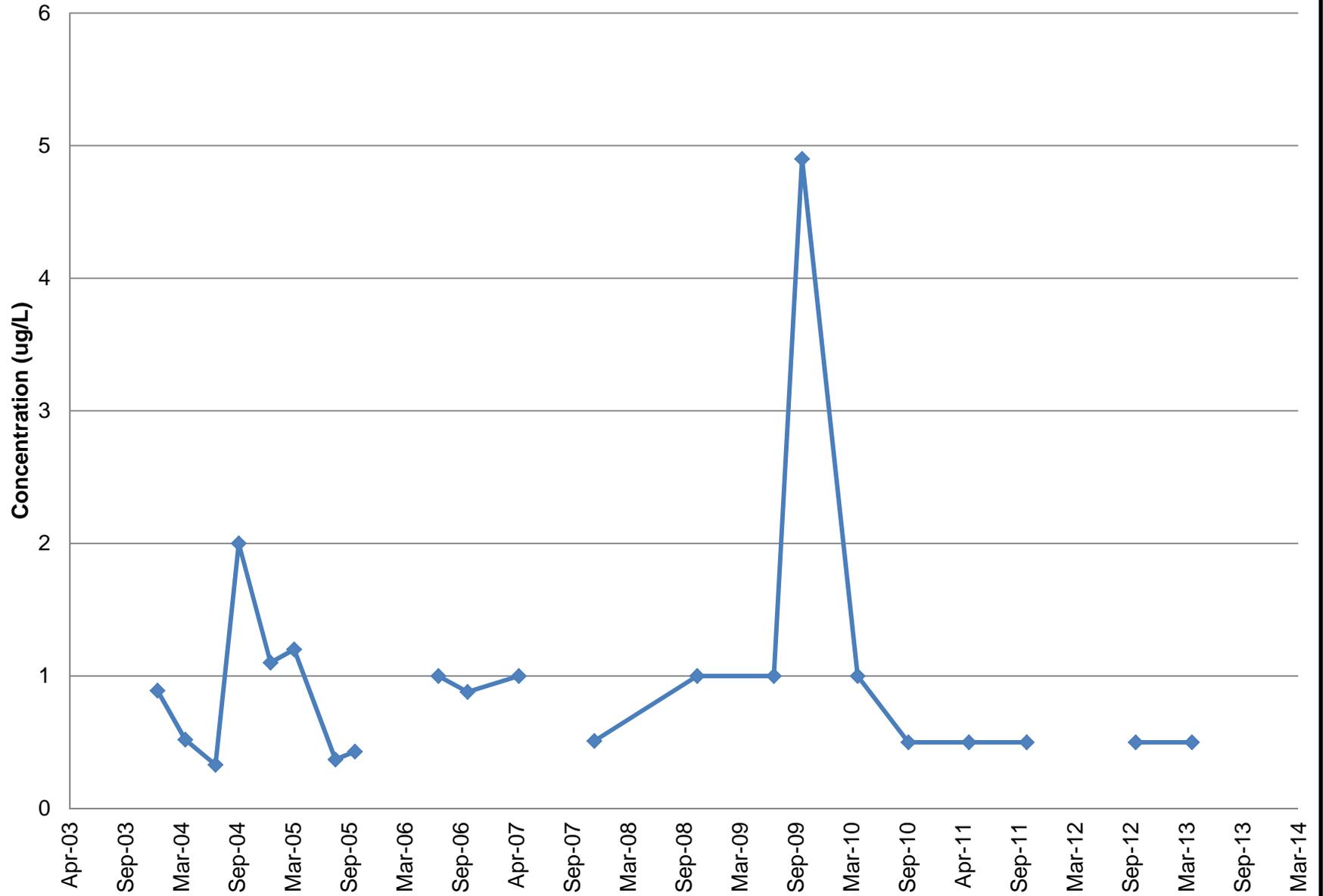
Dissolved Arsenic in RW-3



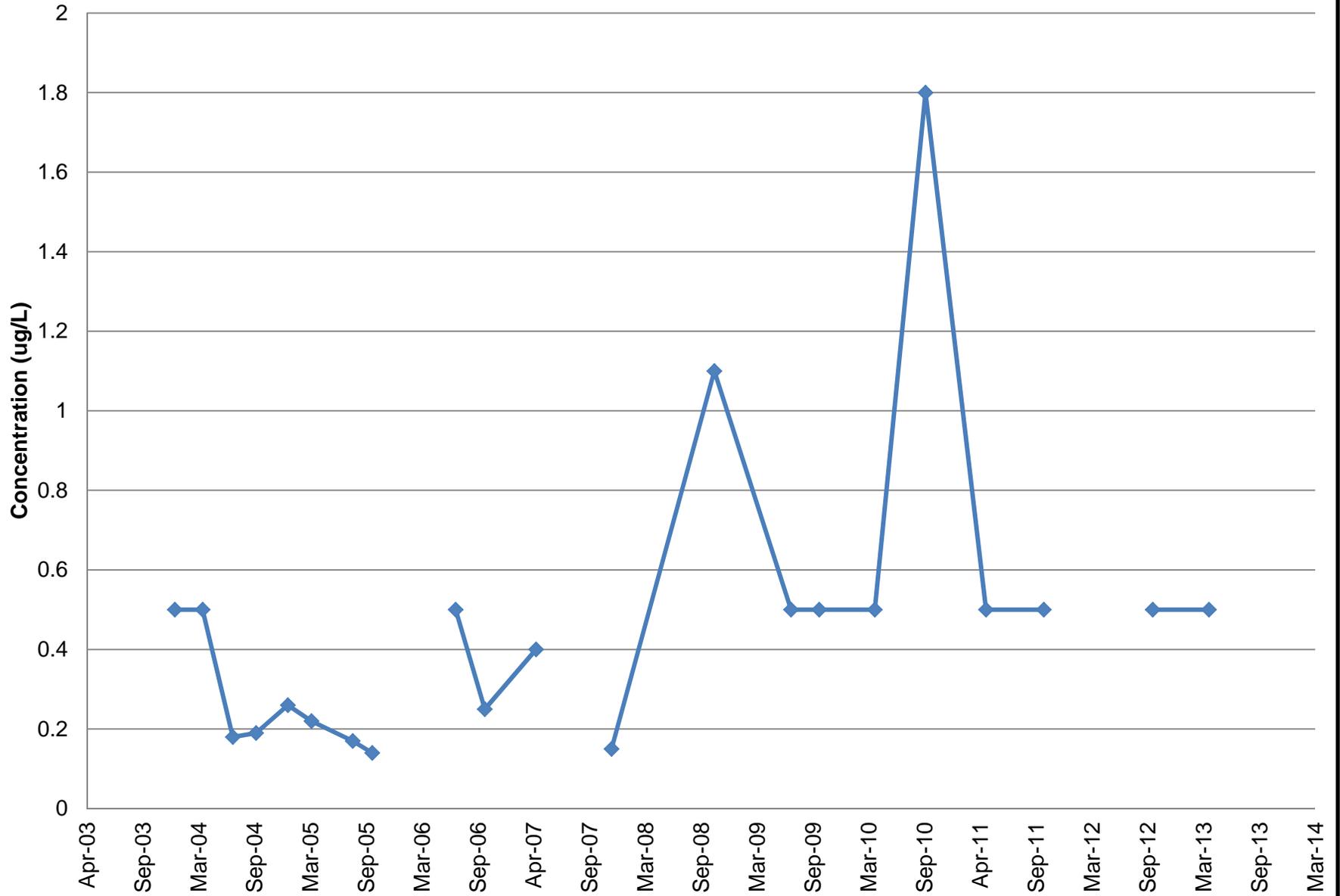
Pentachlorophenol in RW-2



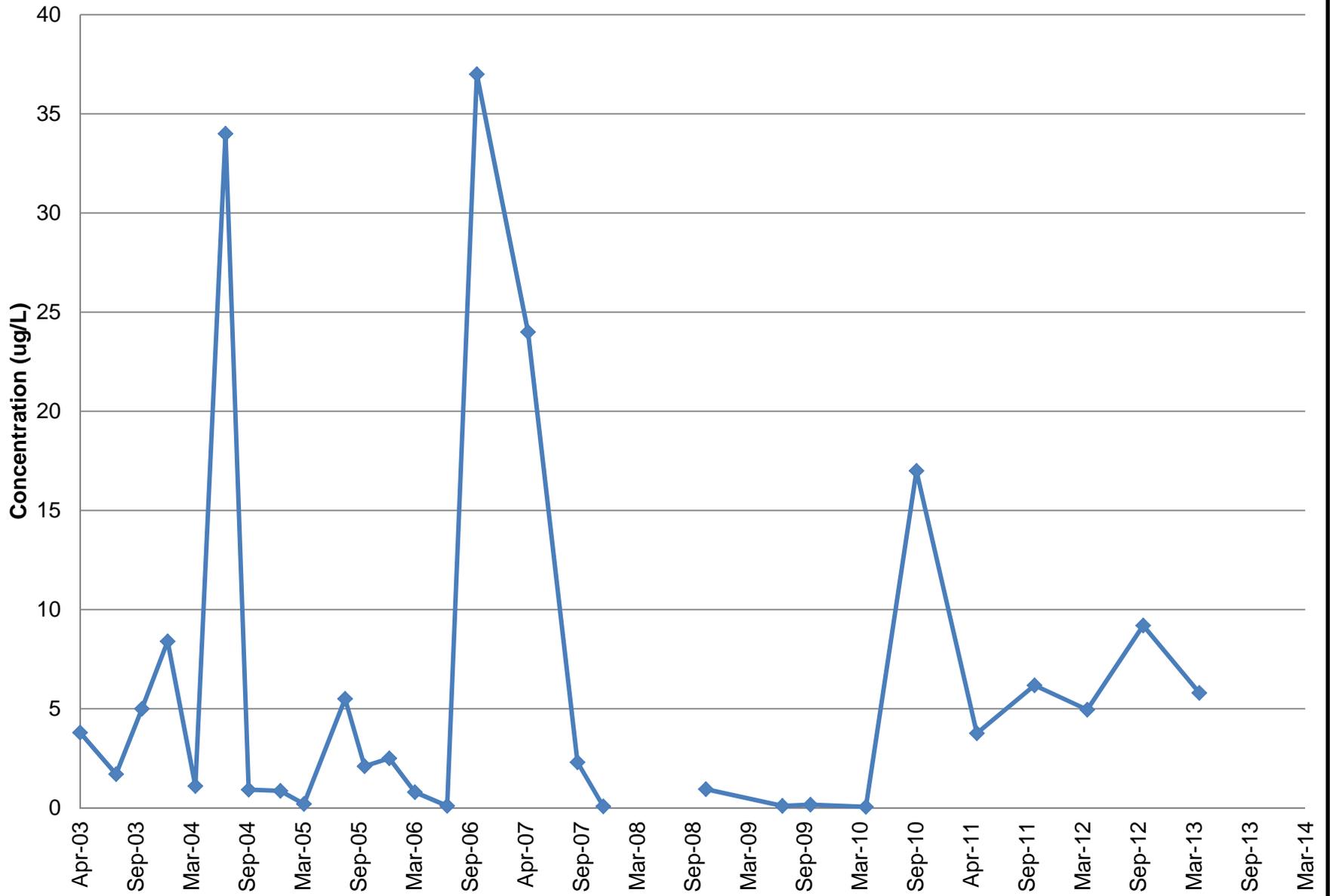
Dissolved Chromium in RW-2



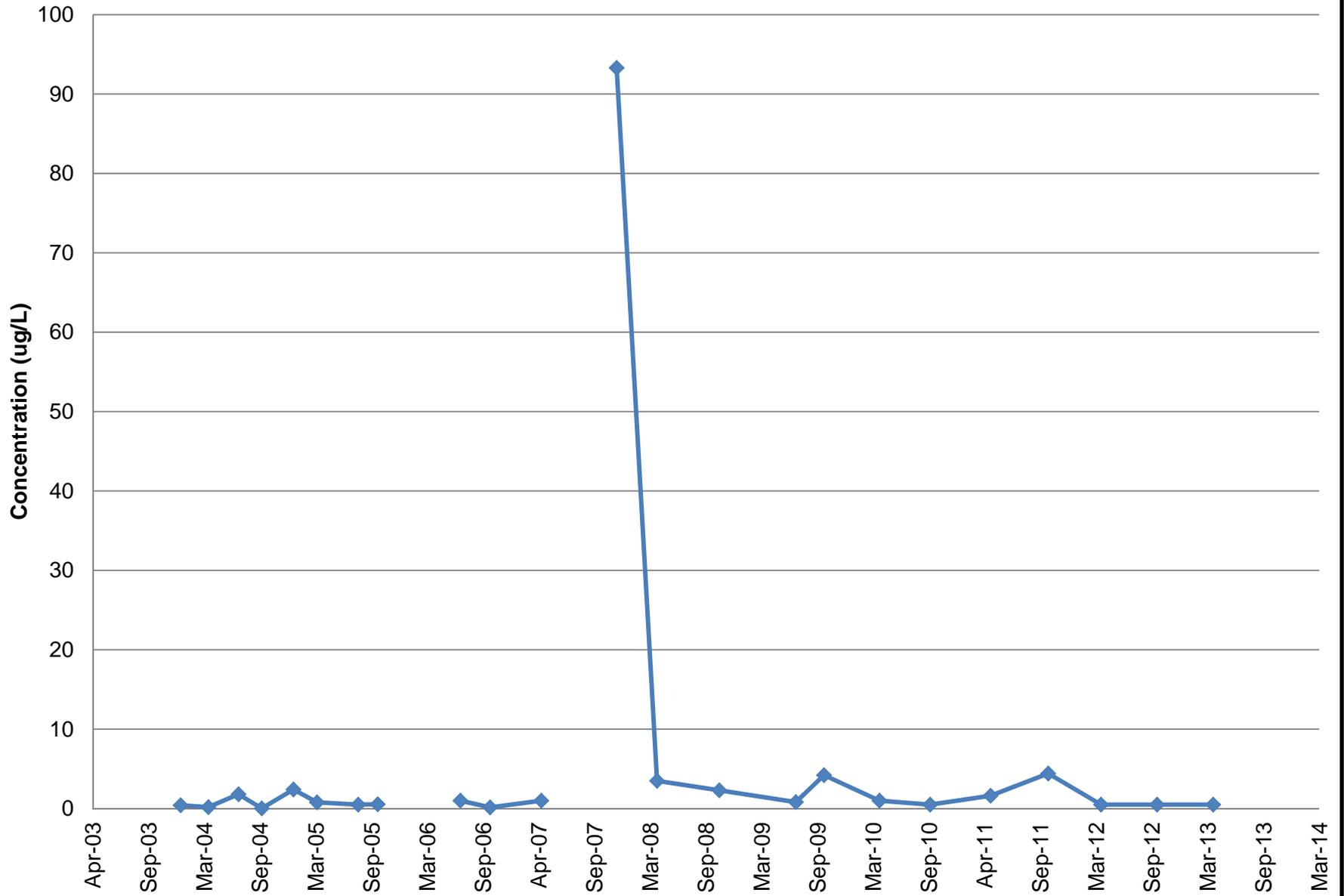
Dissolved Arsenic in RW-2



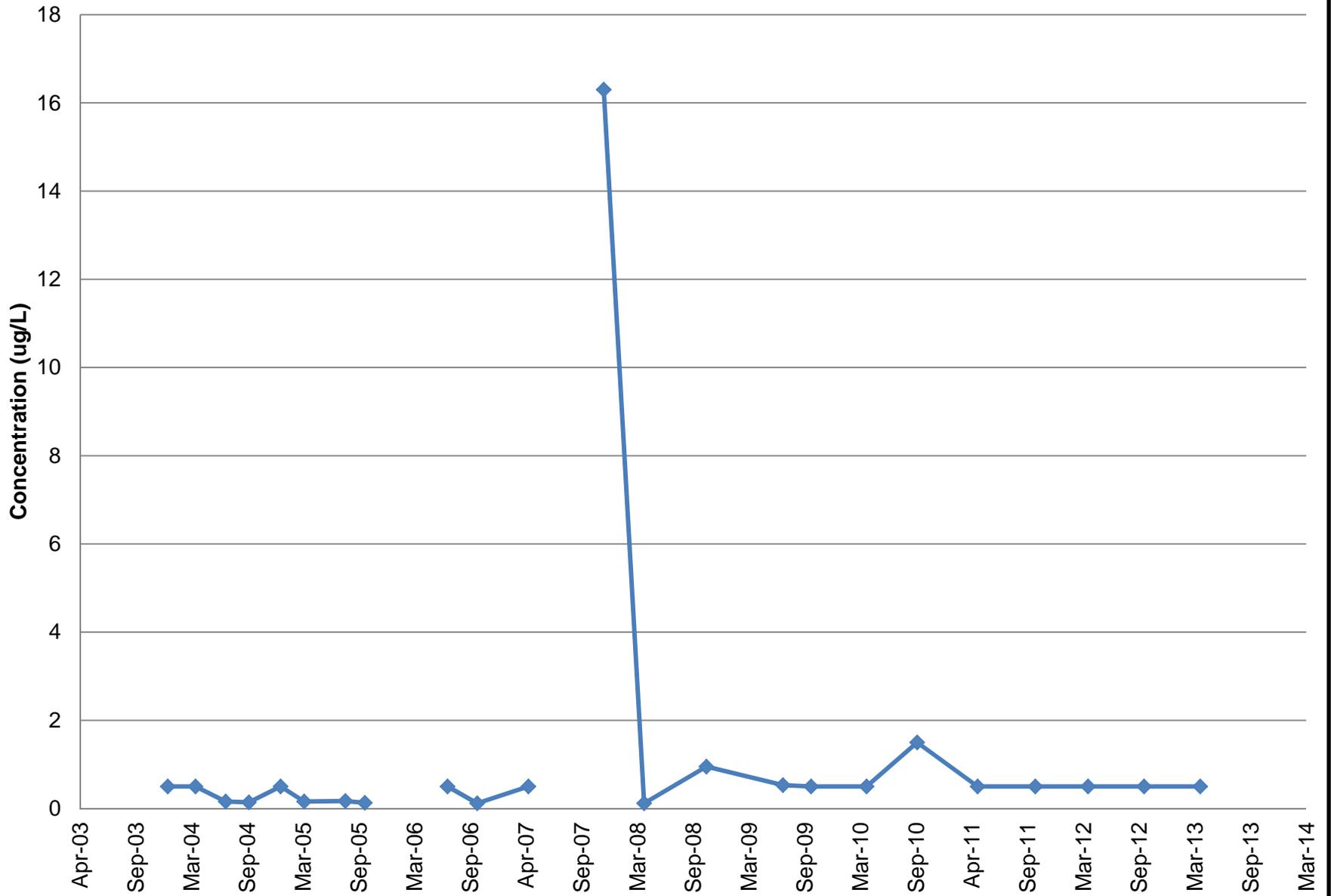
Pentachlorophenol in RW-1



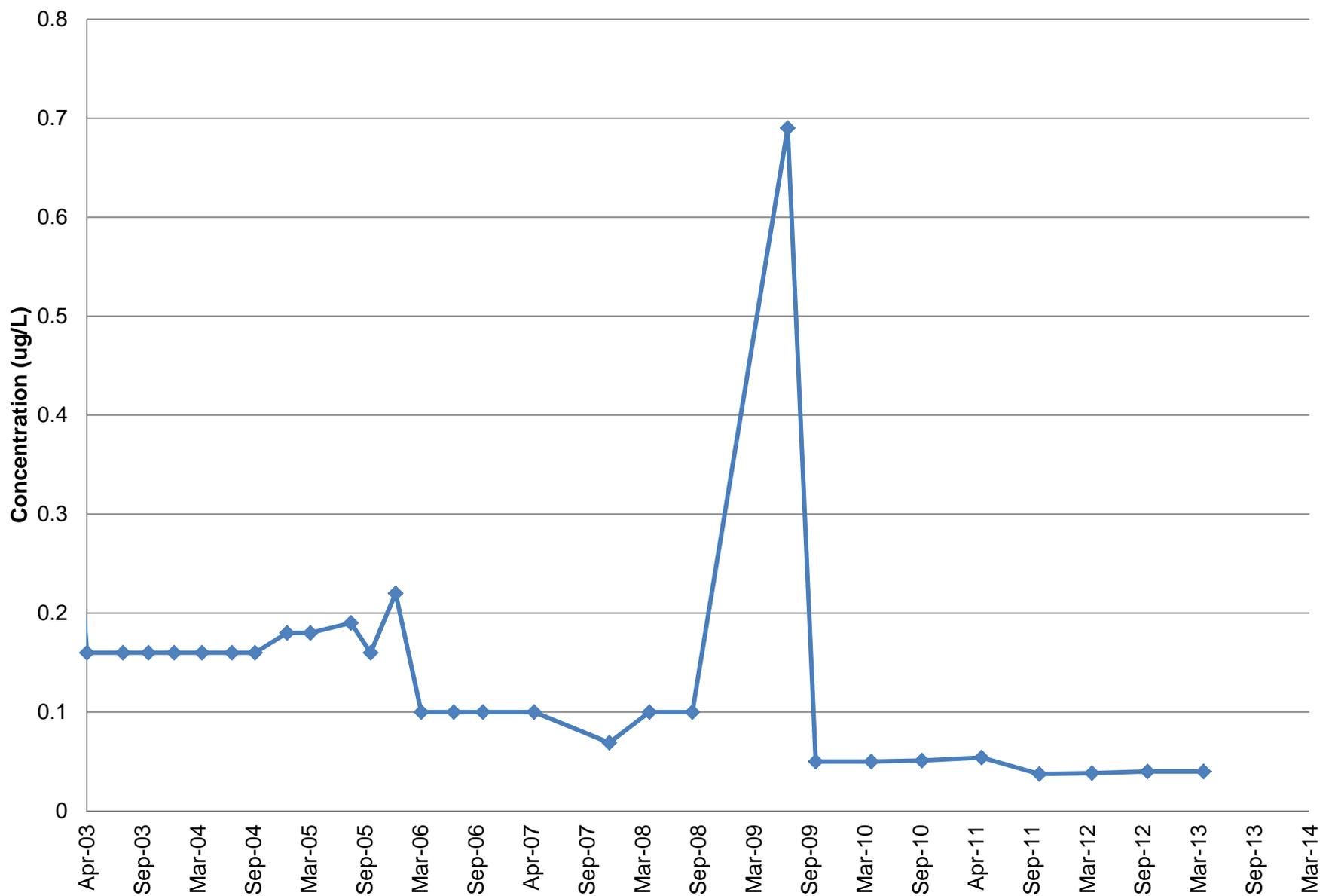
Dissolved Chromium in RW-1



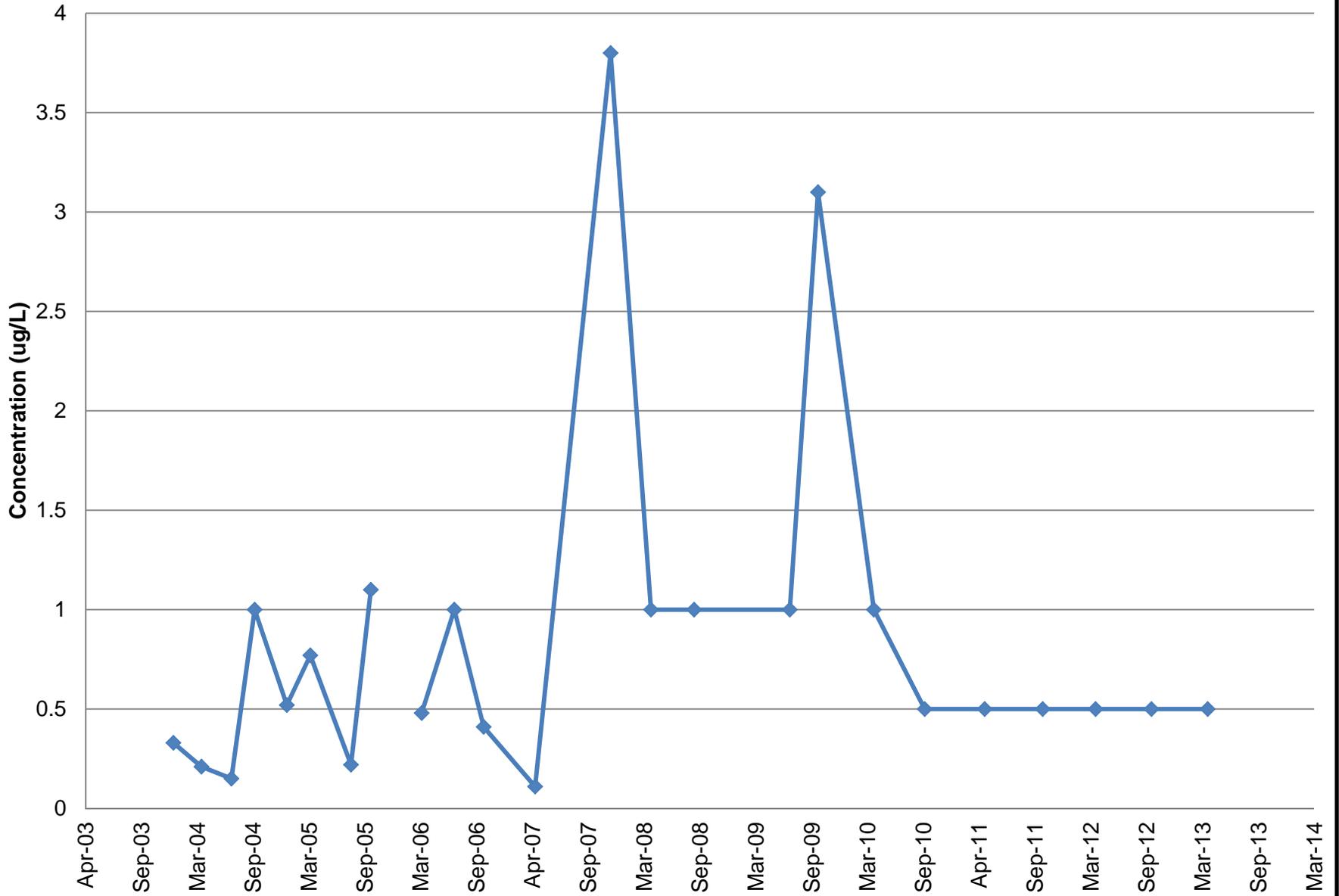
Dissolved Arsenic in RW-1



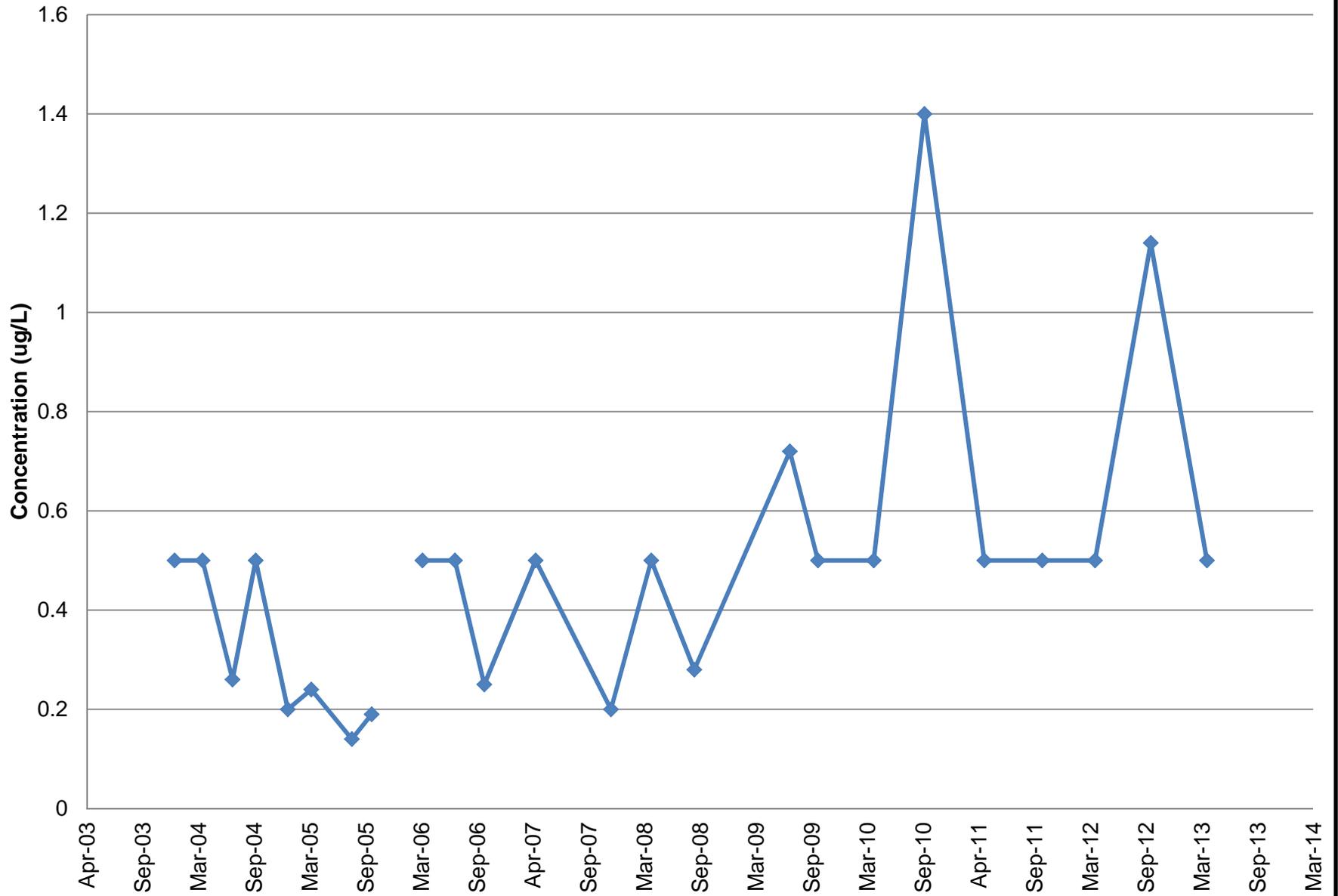
Pentachlorophenol in MW-23D



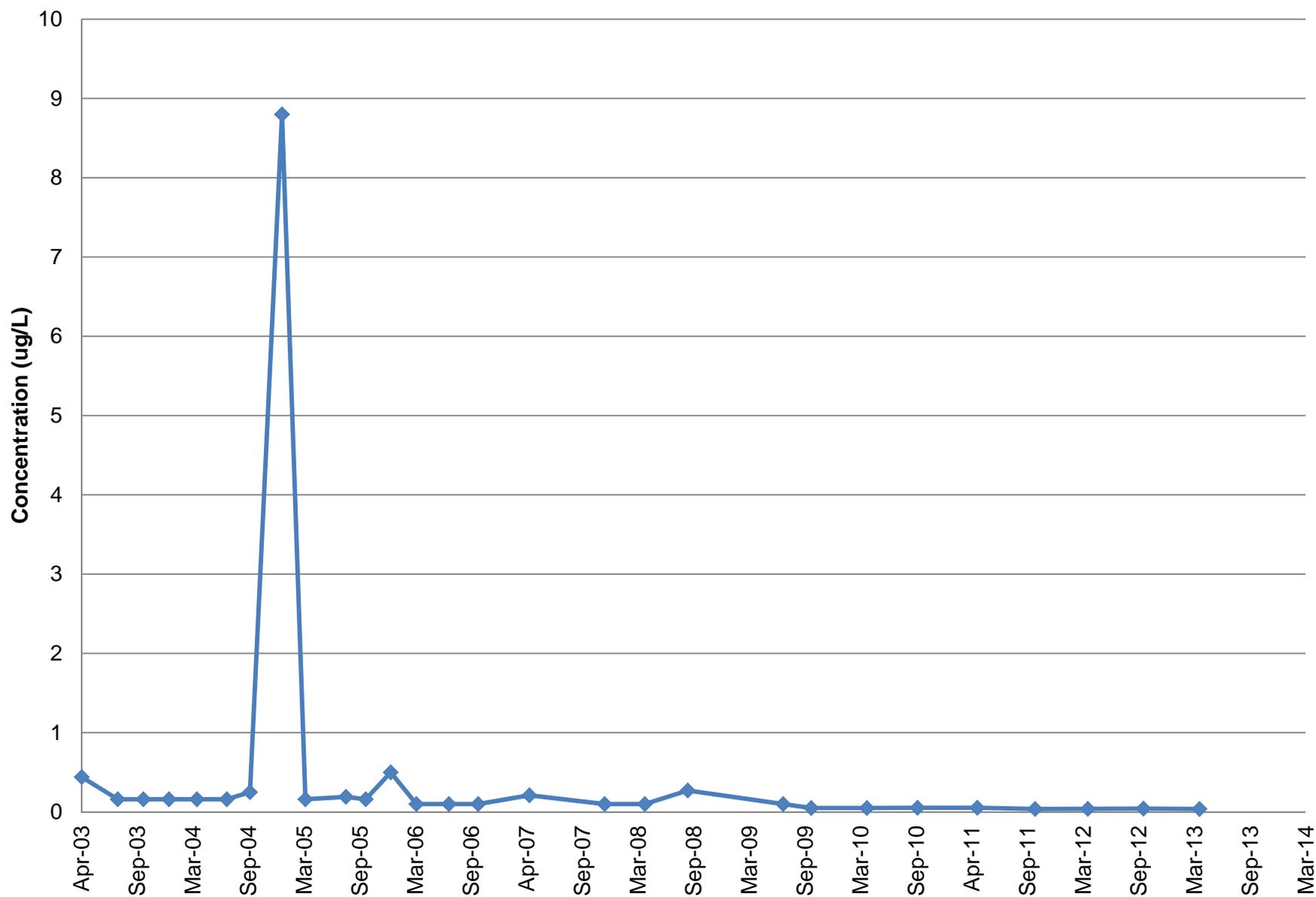
Dissolved Chromium in MW-23D



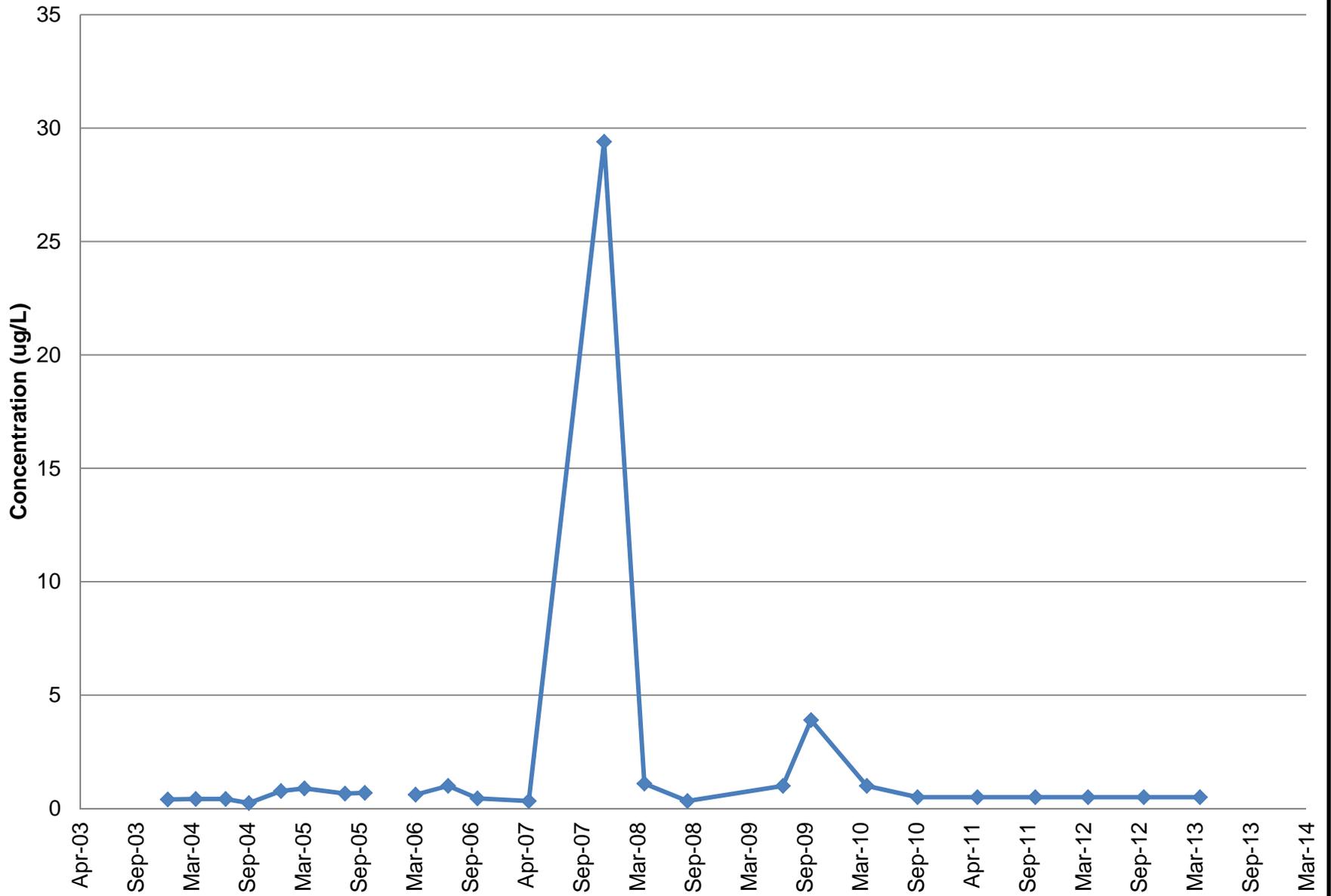
Dissolved Arsenic in MW-23D



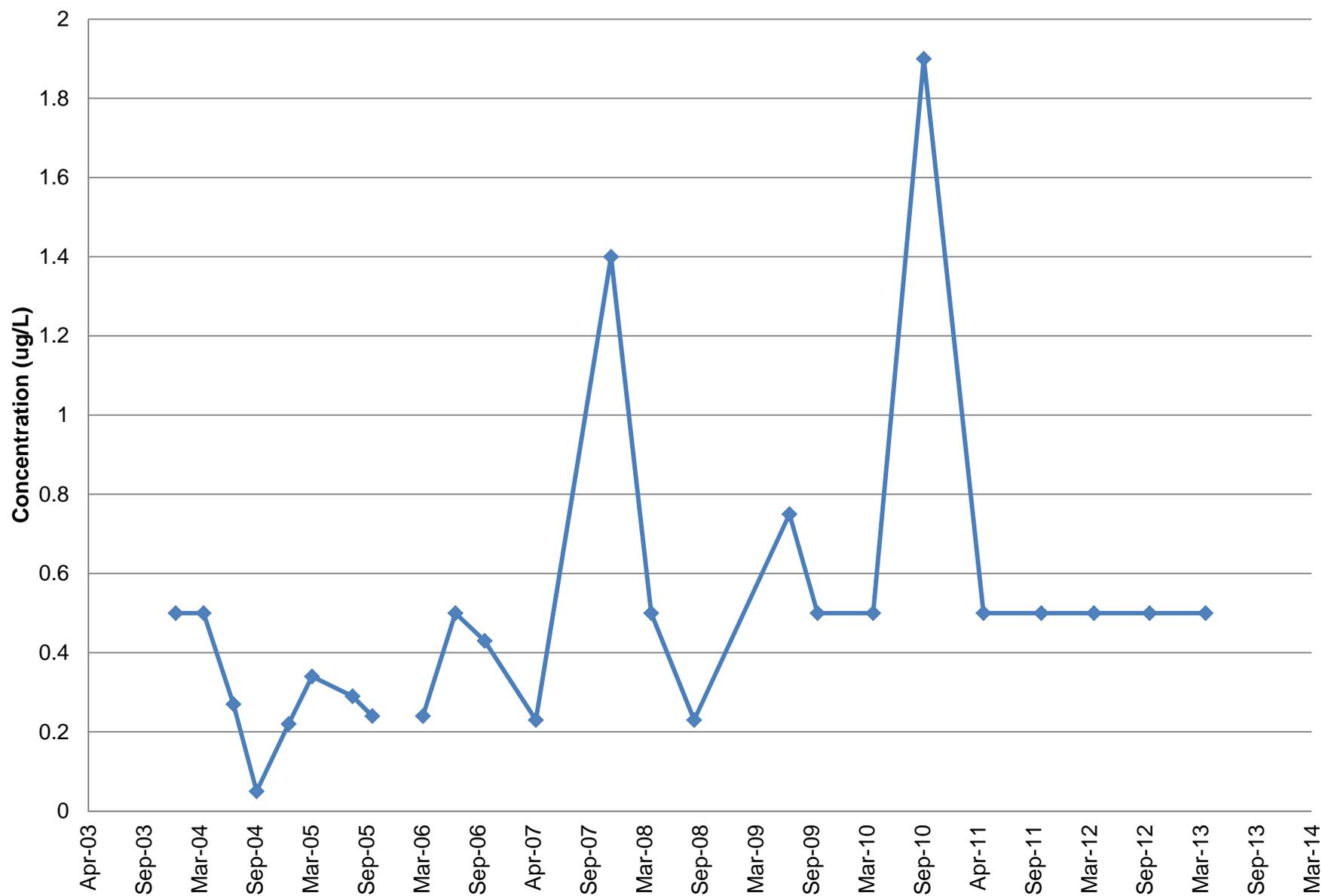
Pentachlorophenol in MW-22S



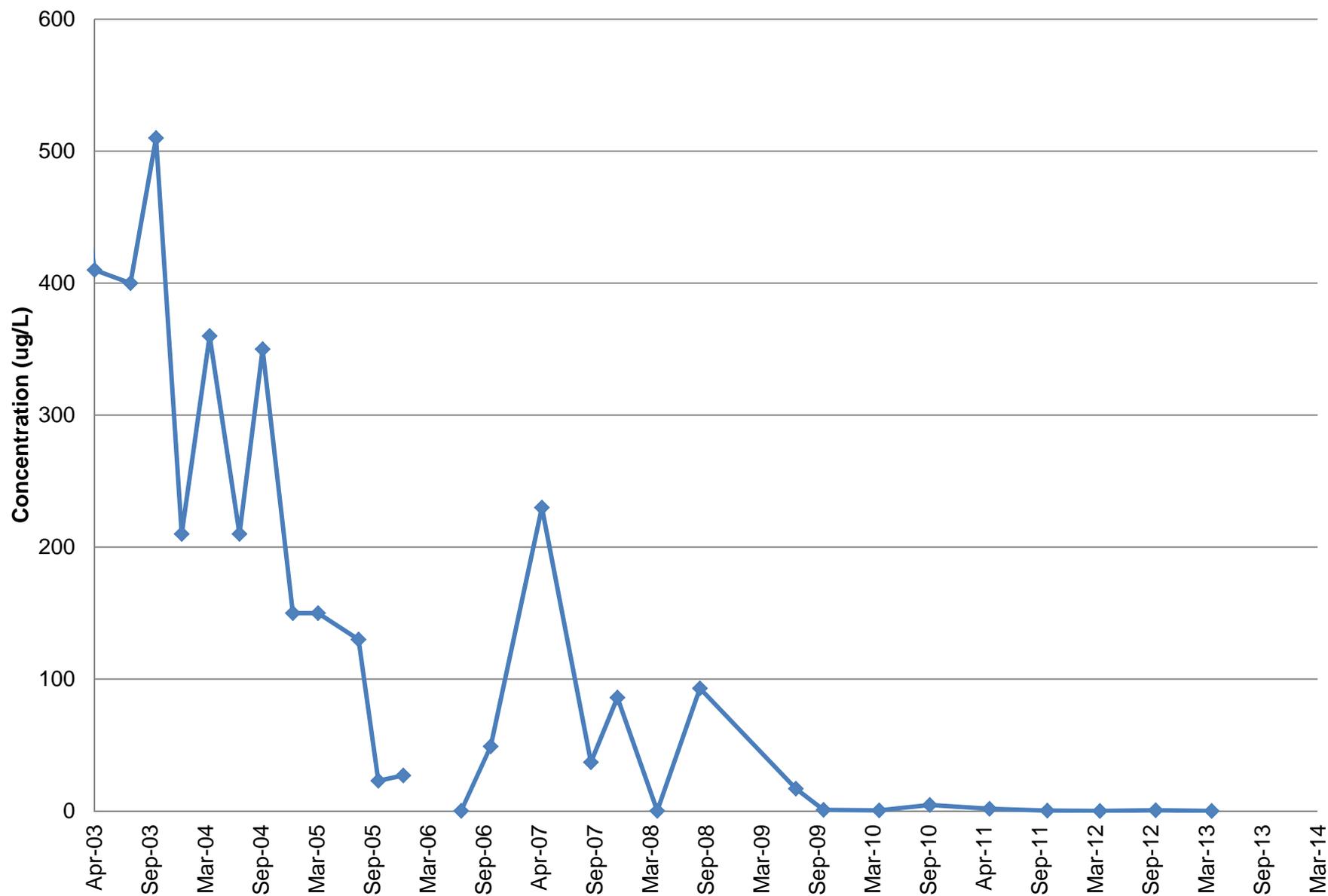
Dissolved Chromium in MW-22S



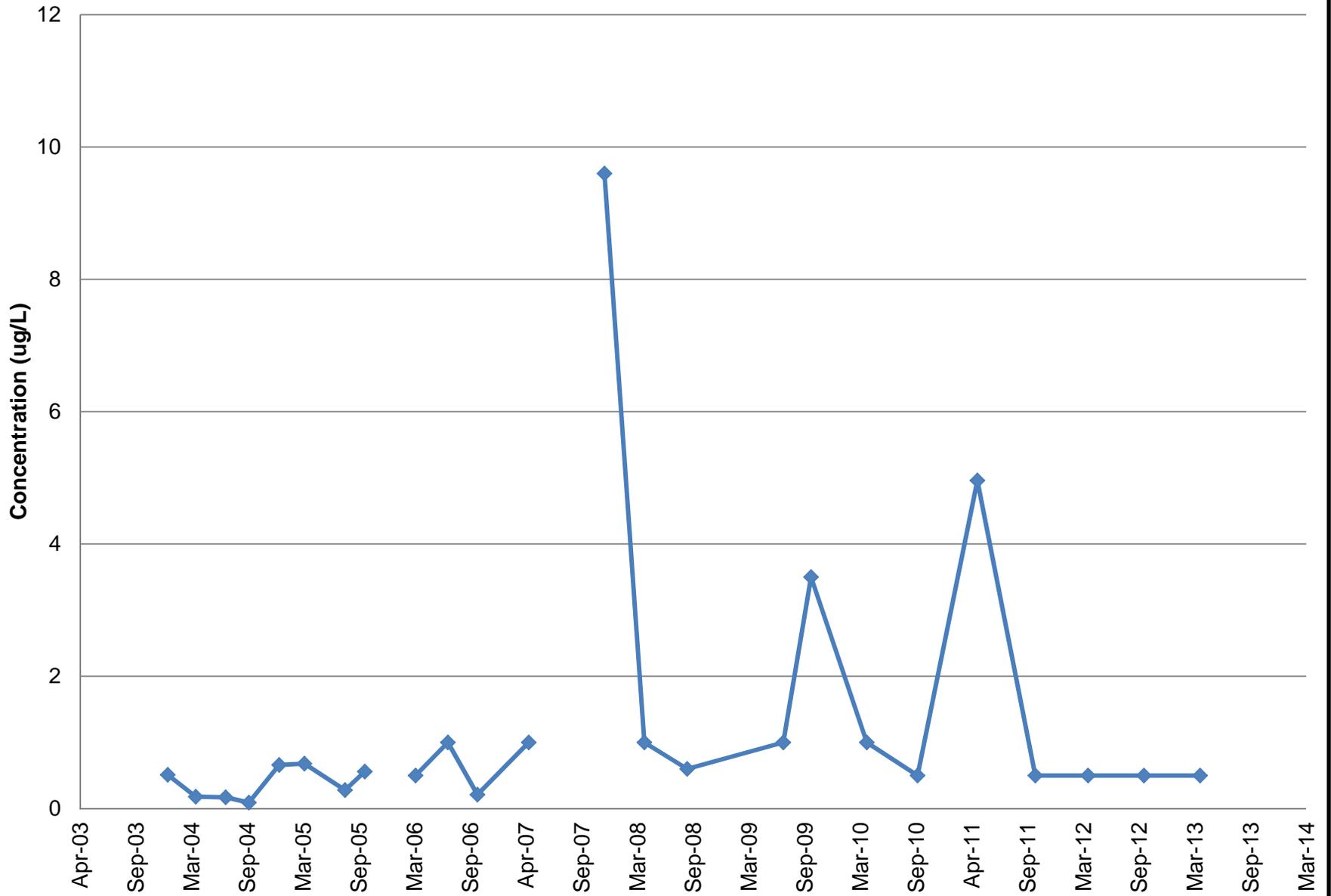
Dissolved Arsenic in MW-22S



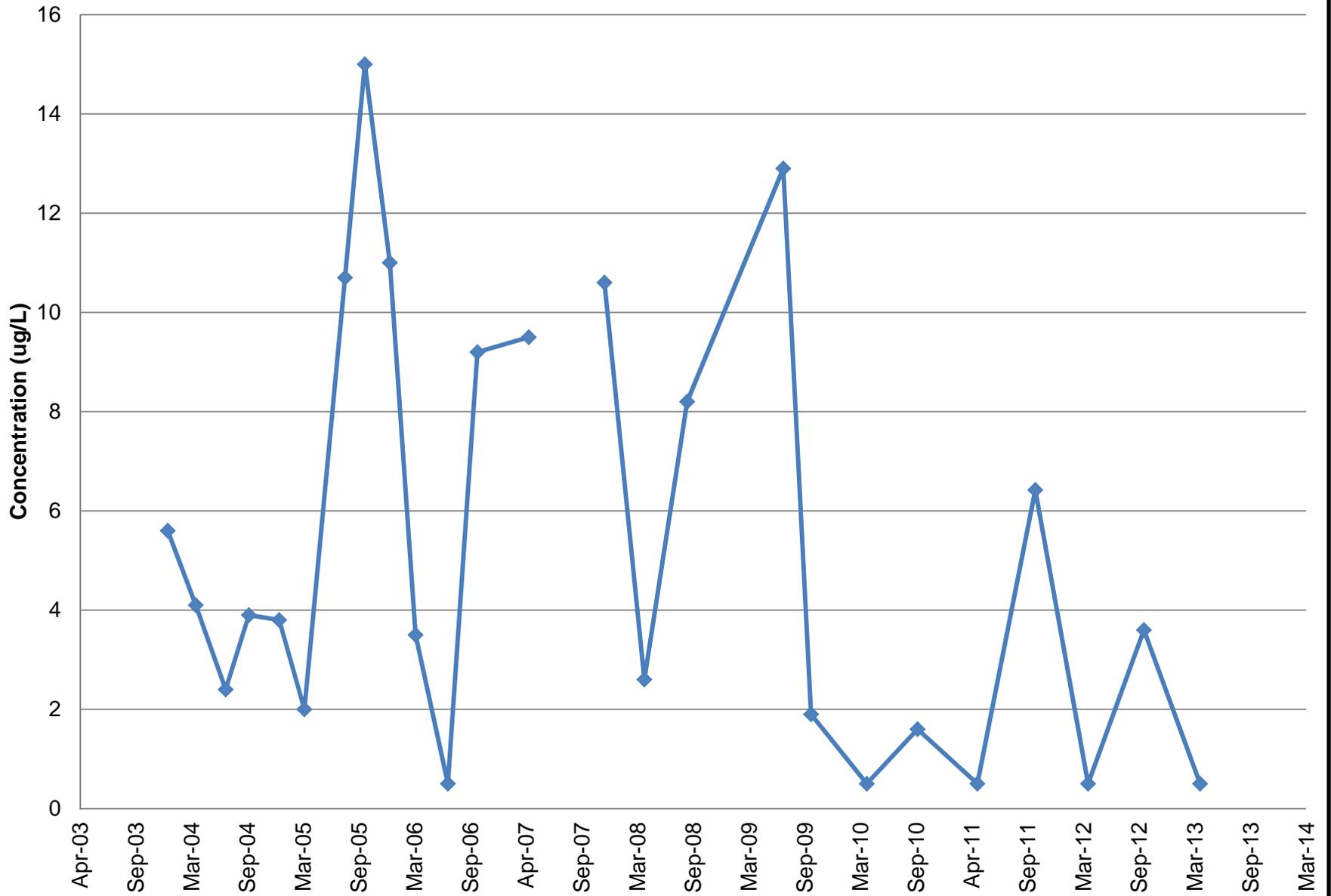
Pentachlorophenol in MW-21D



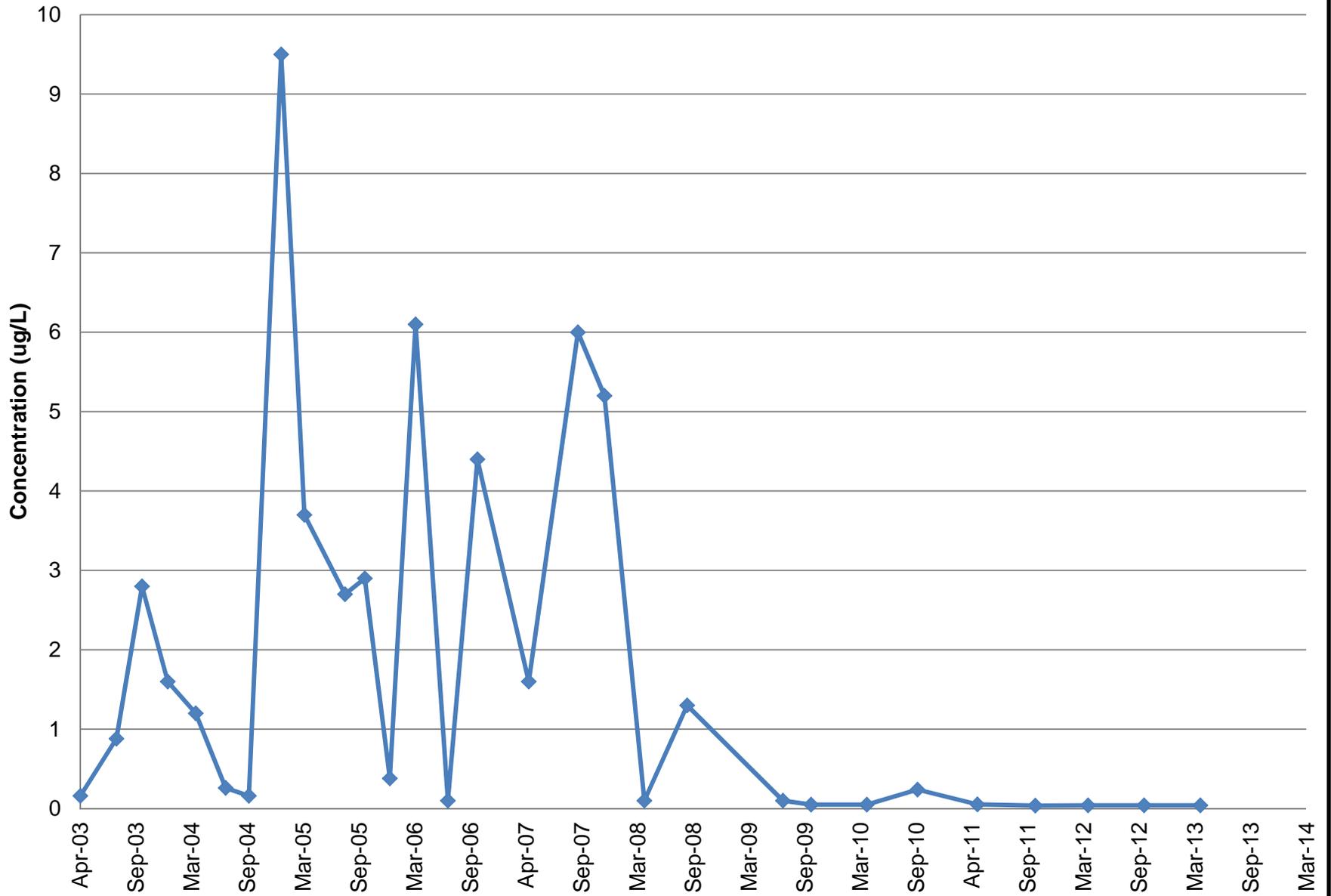
Dissolved Chromium in MW-21D



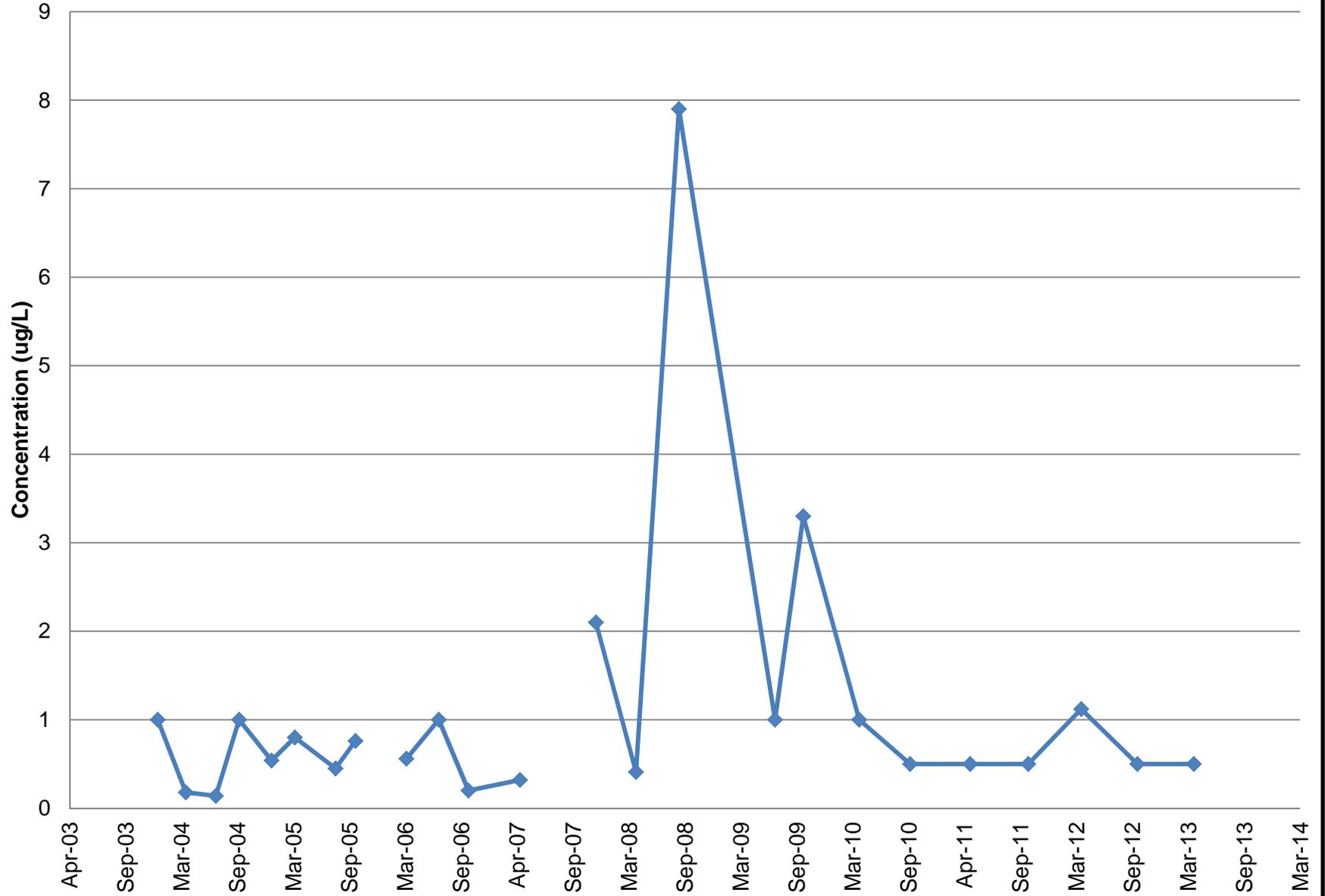
Dissolved Arsenic in MW-21D



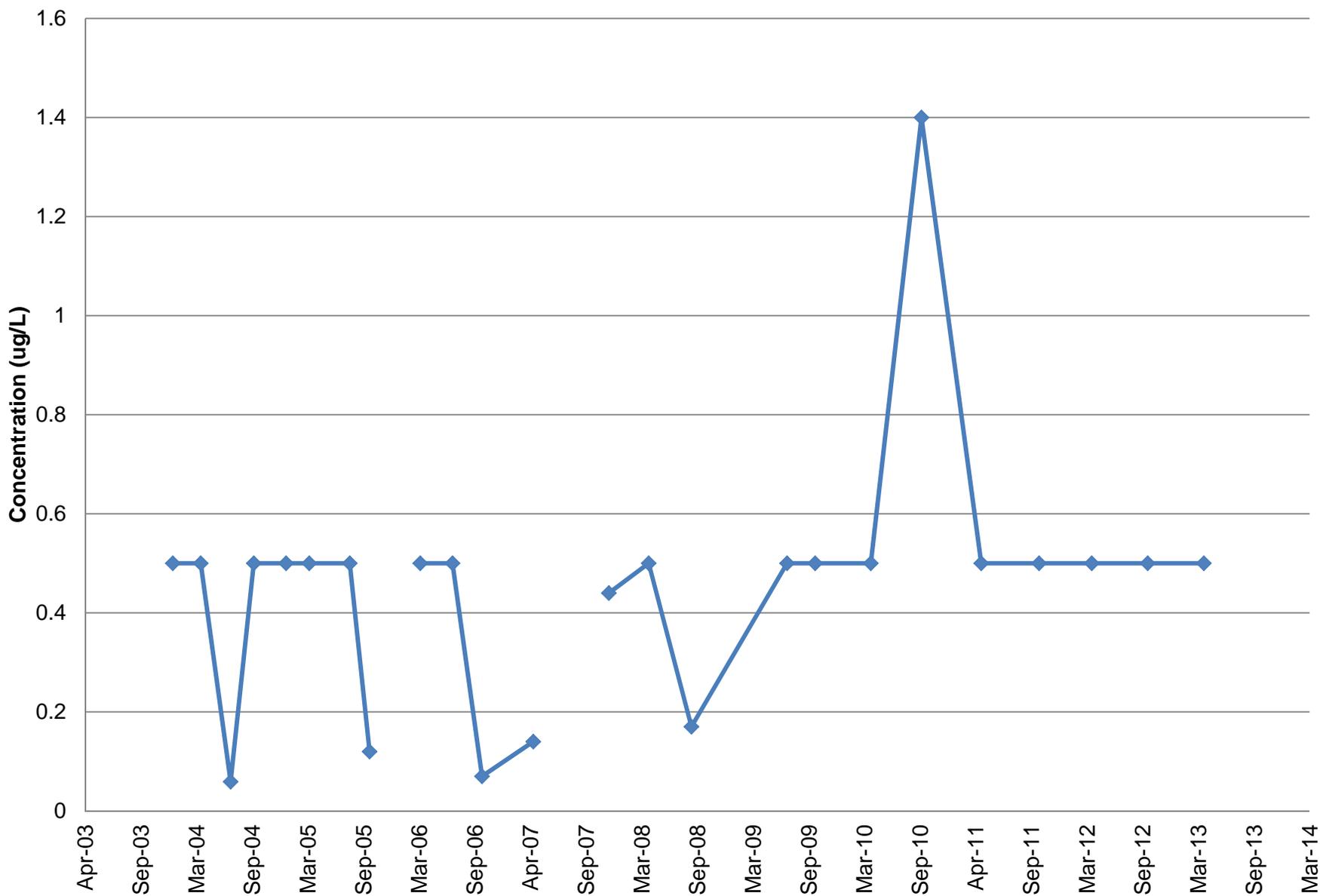
Pentachlorophenol in MW-20S



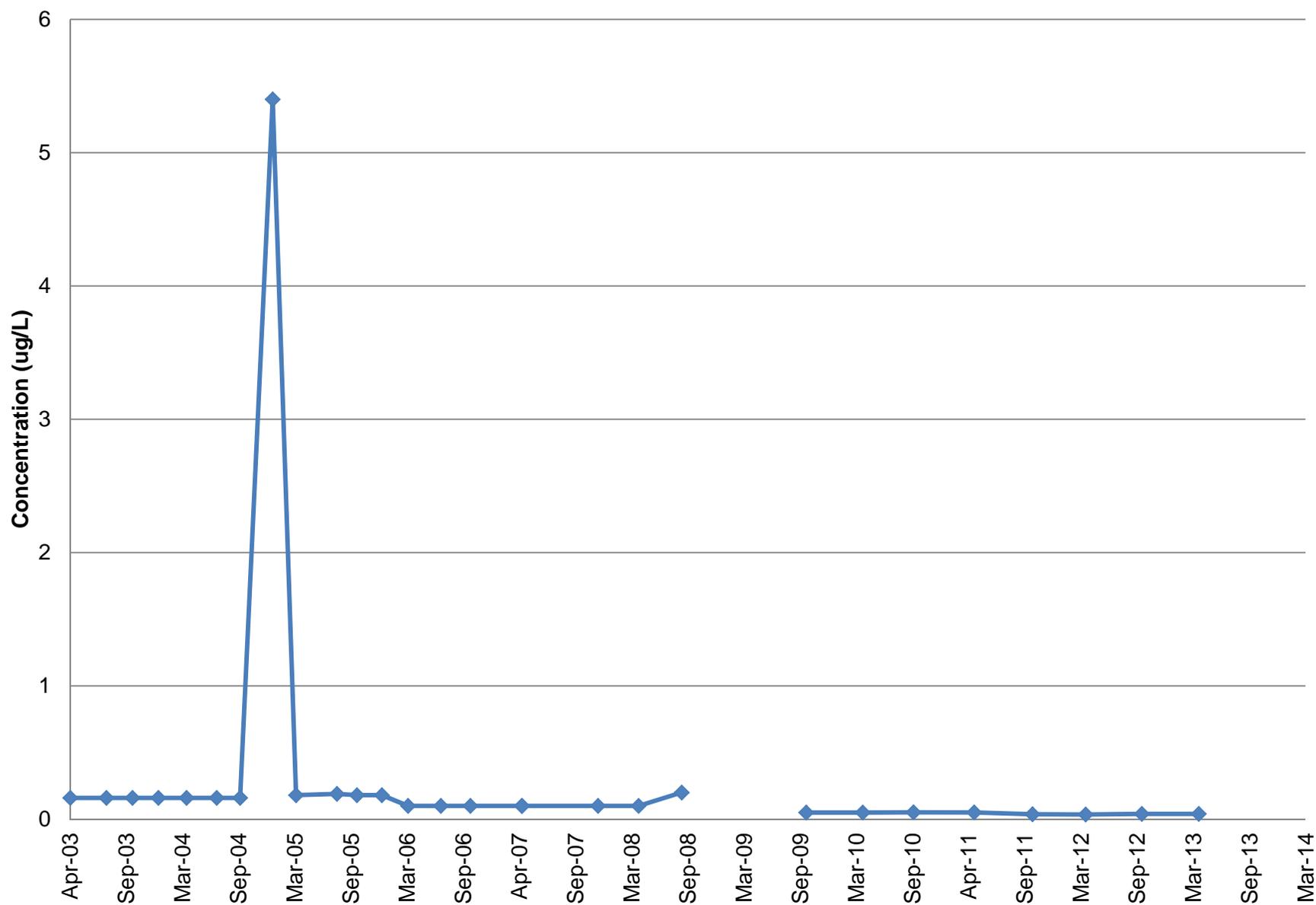
Dissolved Chromium in MW-20S



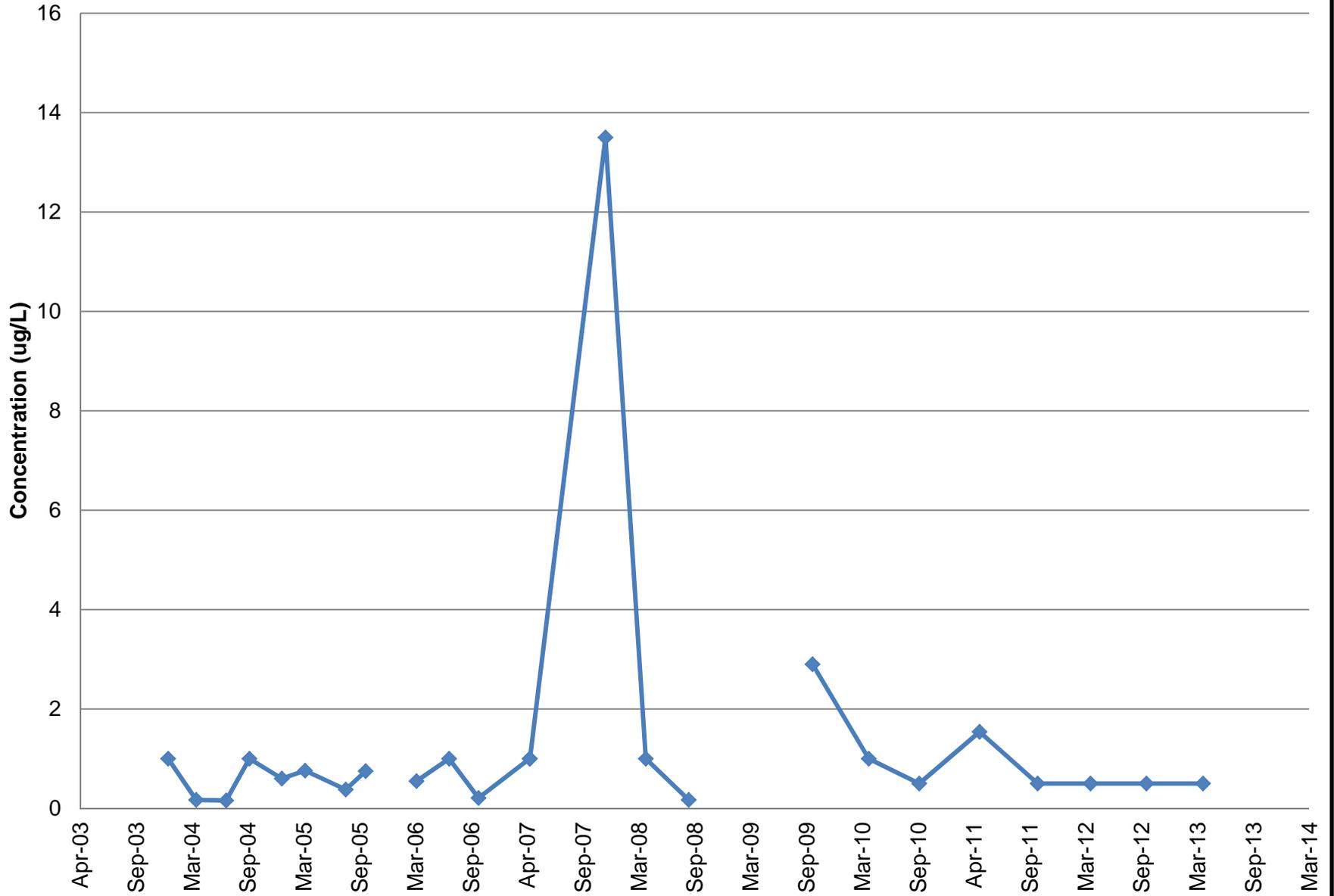
Dissolved Arsenic in MW-20S



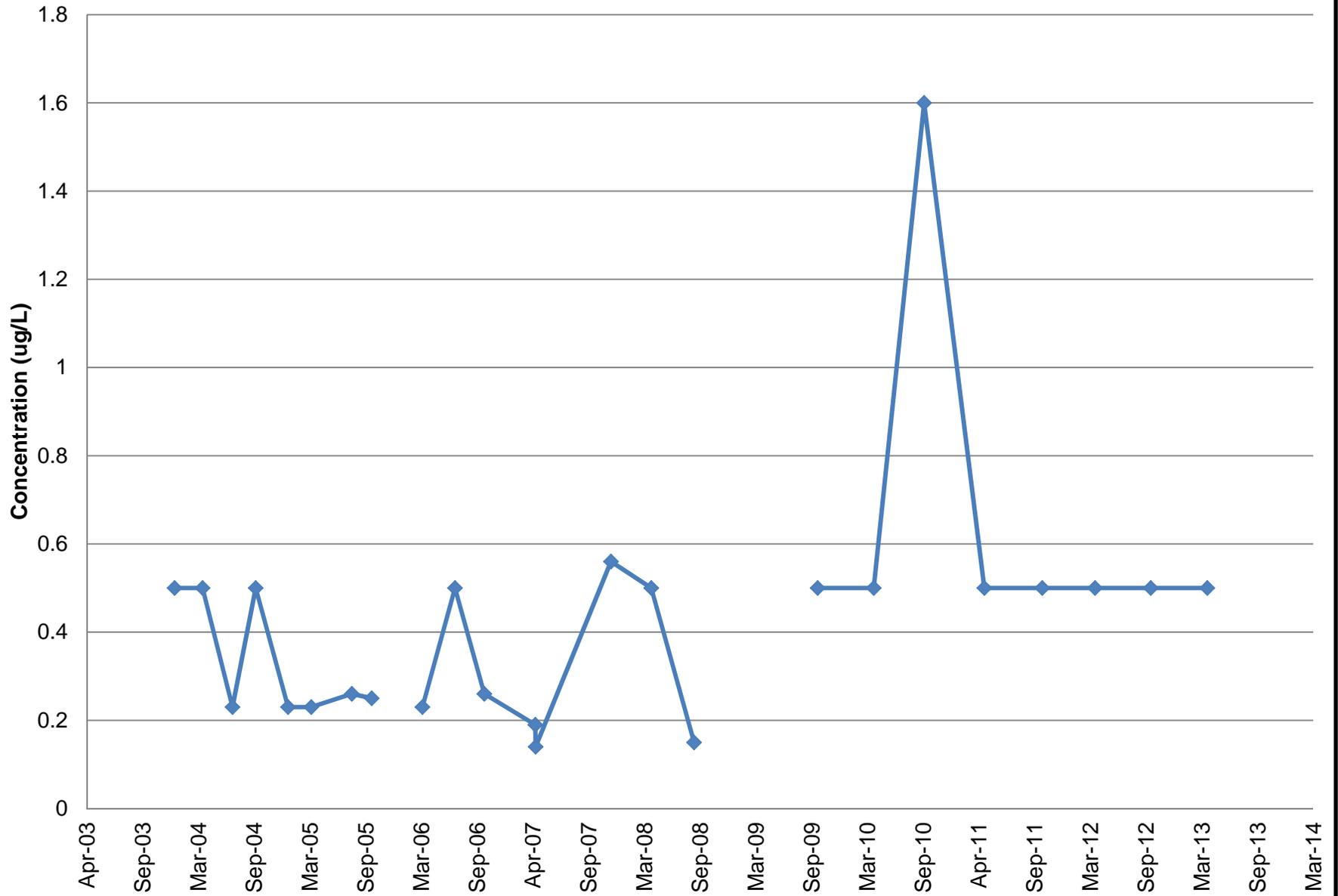
Pentachlorophenol in MW-19D



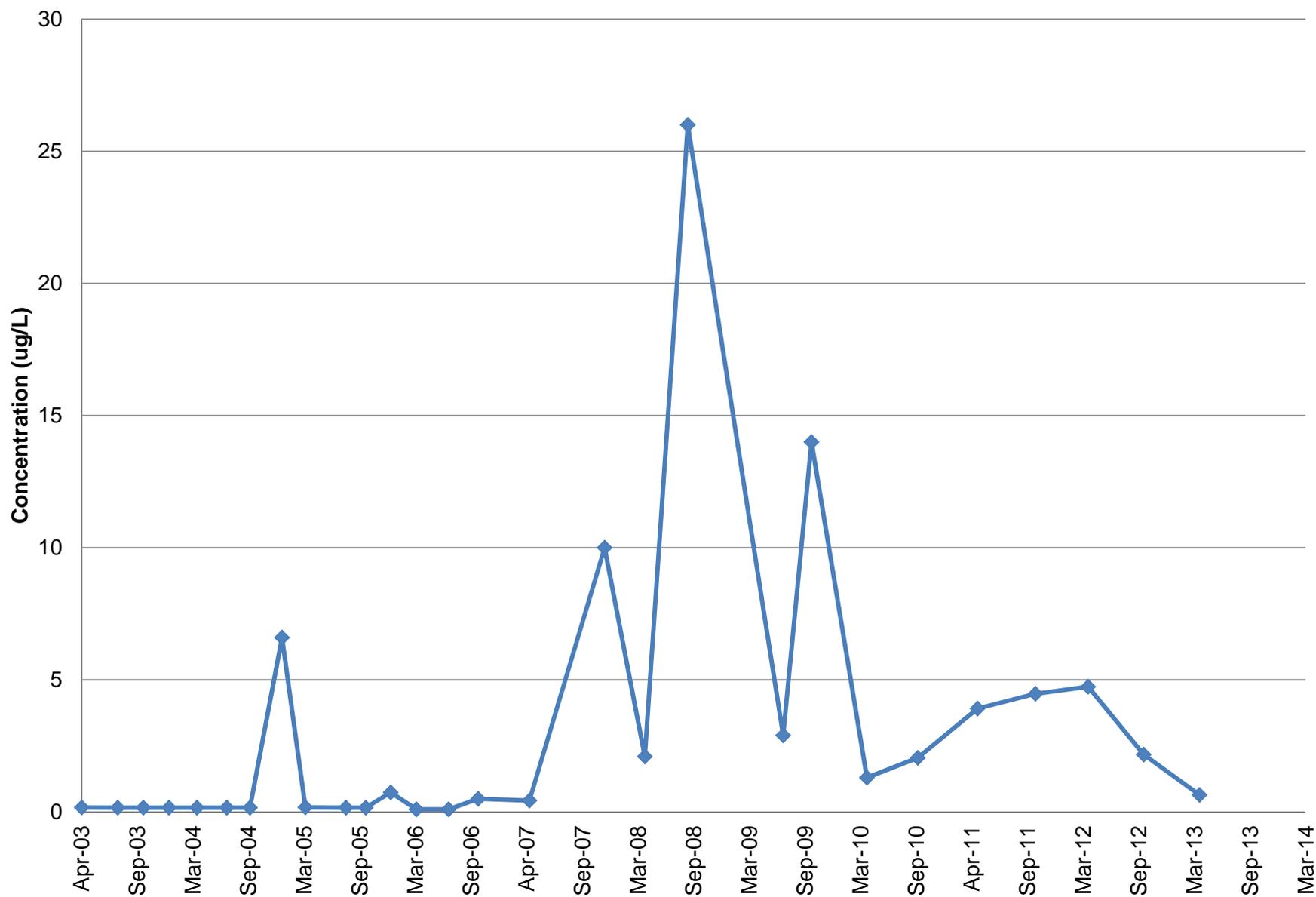
Chromium in MW-19D



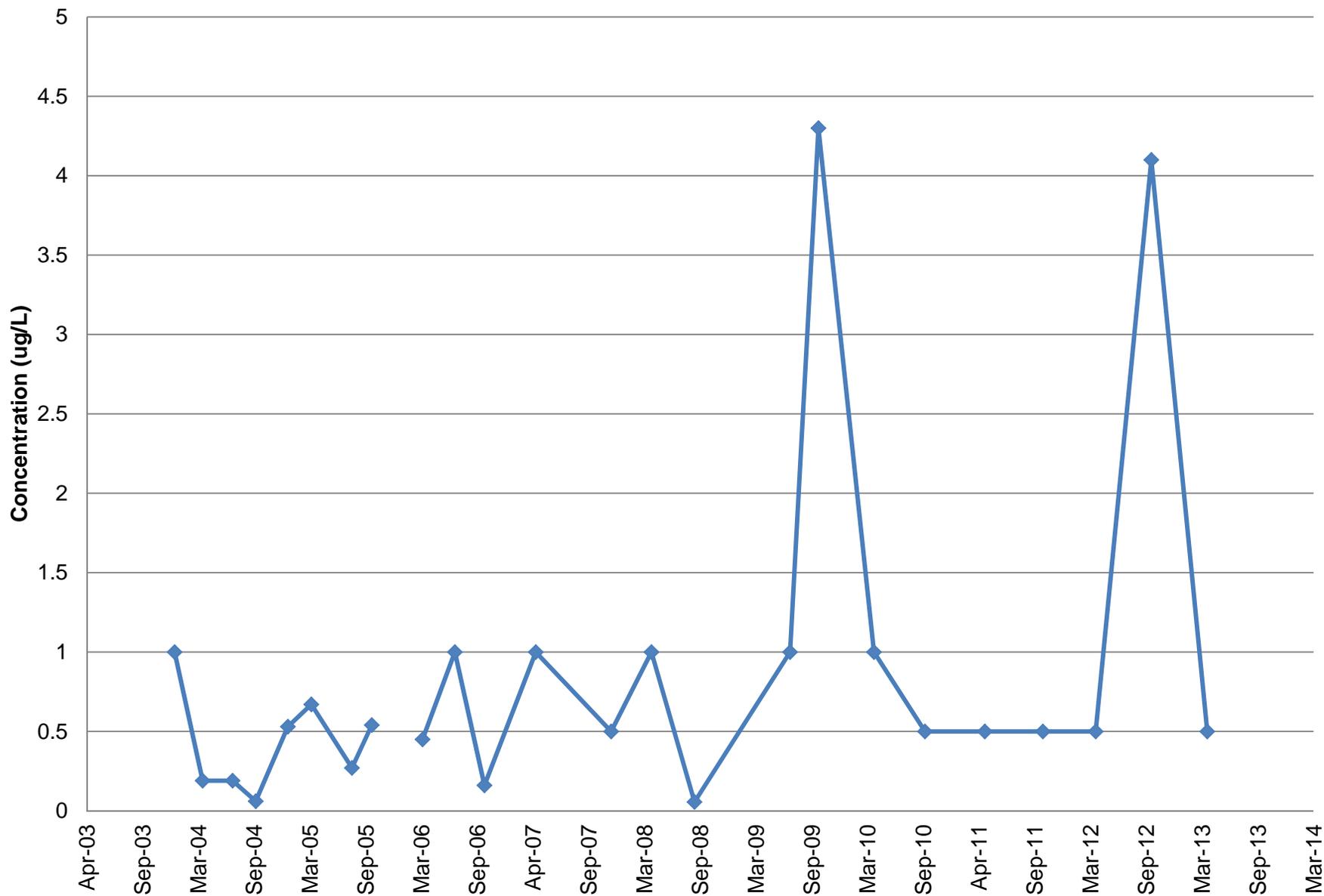
Dissolved Arsenic in MW-19D



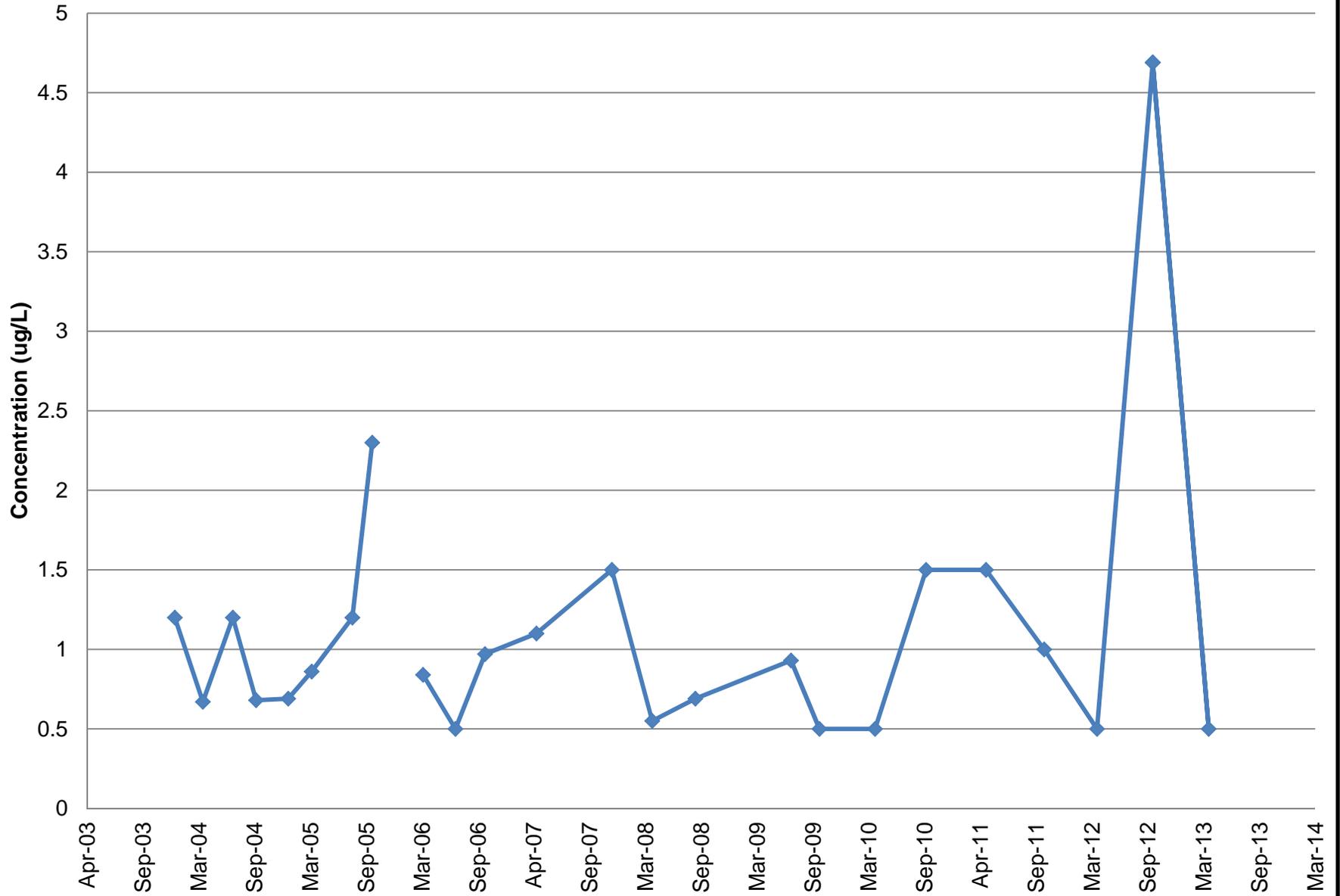
Pentachlorophenol in MW-12D



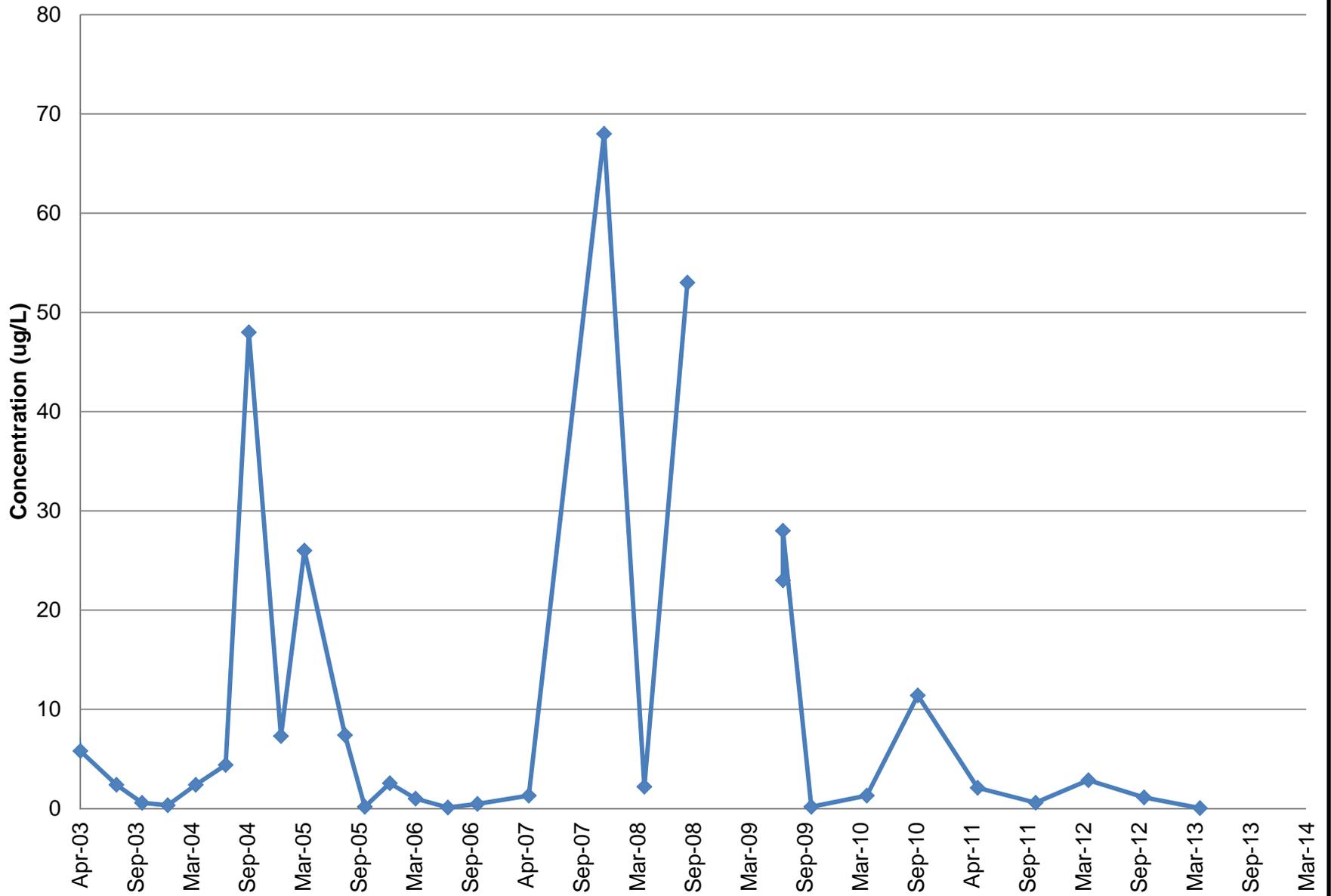
Dissolved Chromium in MW-12D



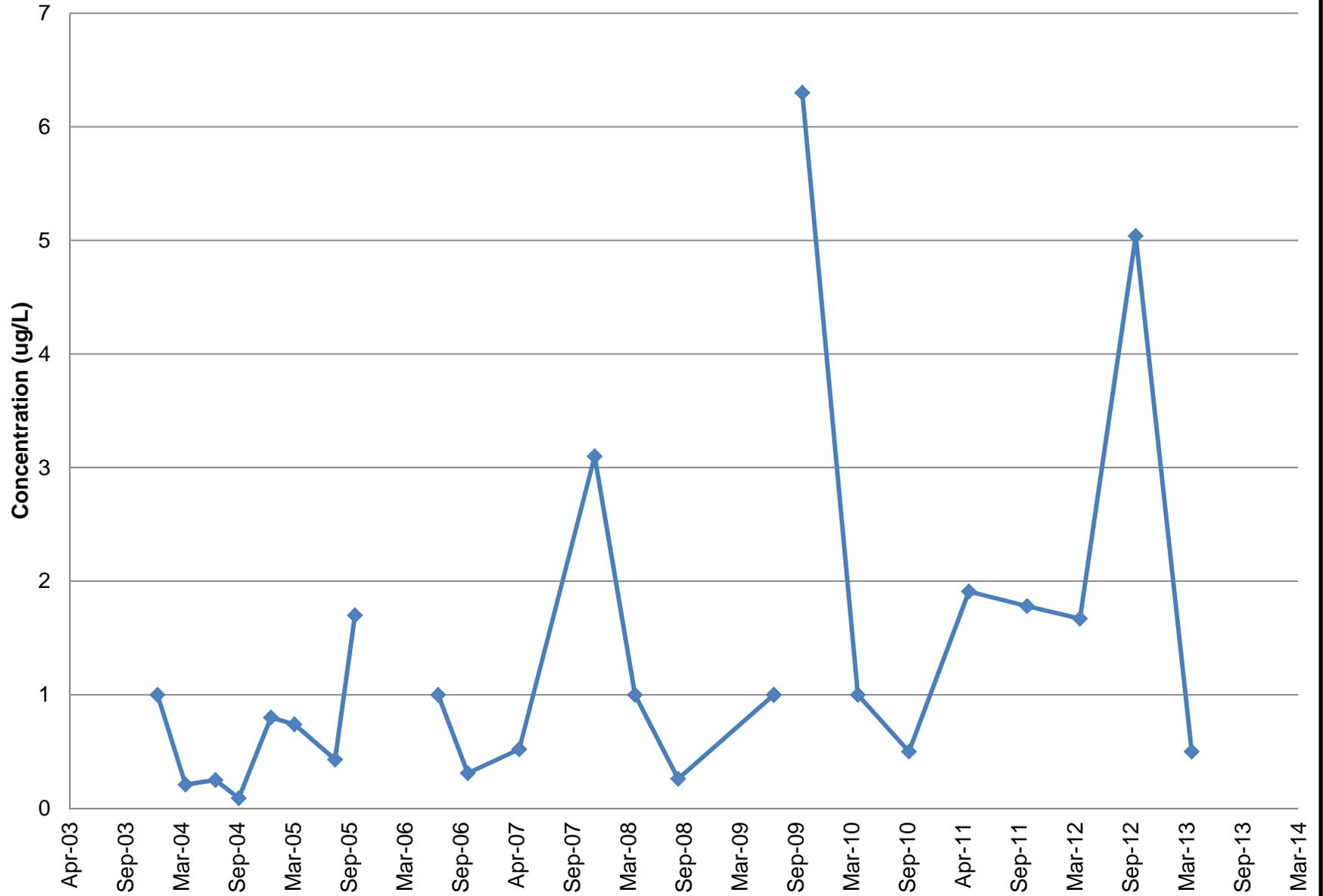
Dissolved Arsenic in MW-12D



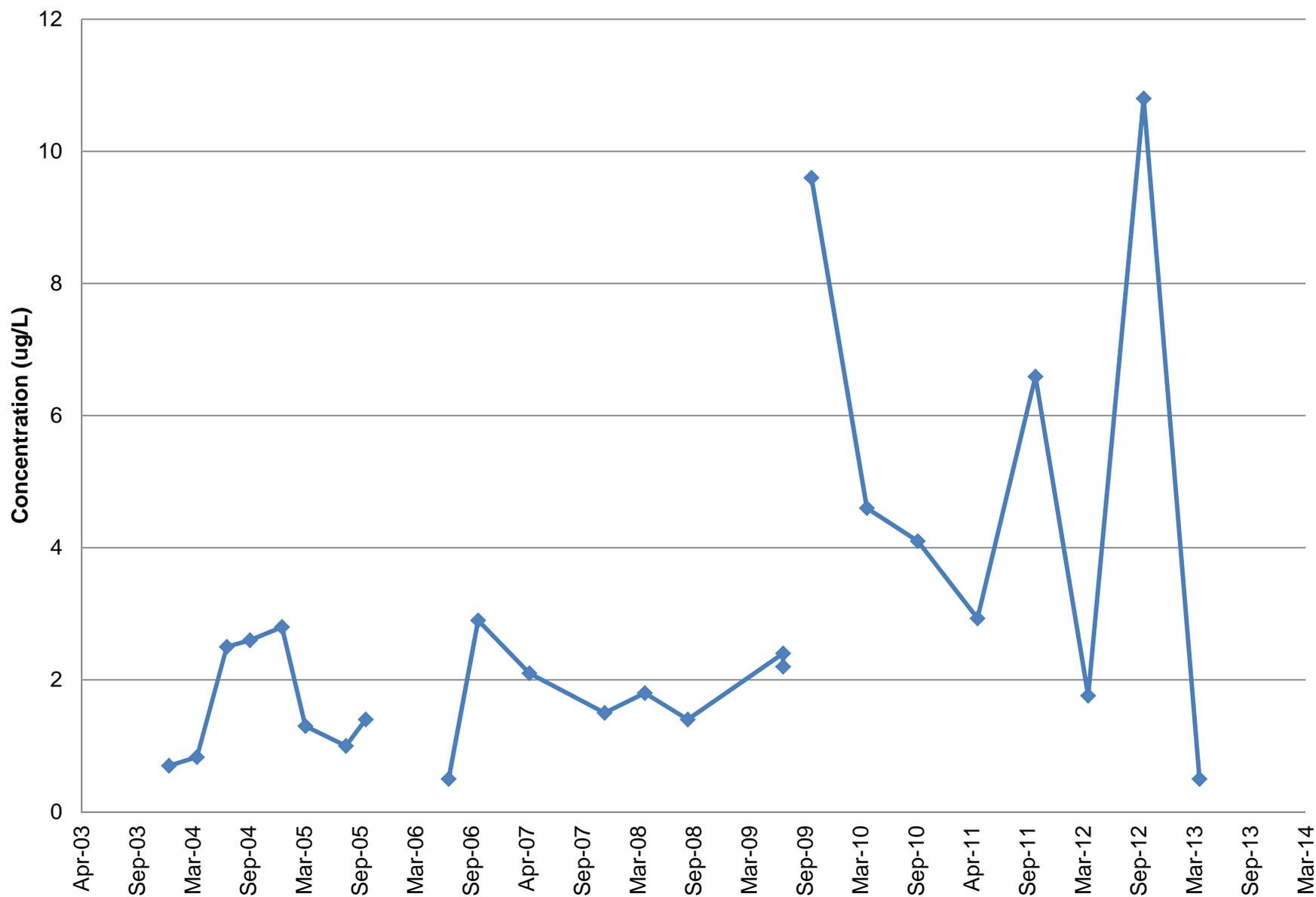
Pentachlorophenol in MW-11S



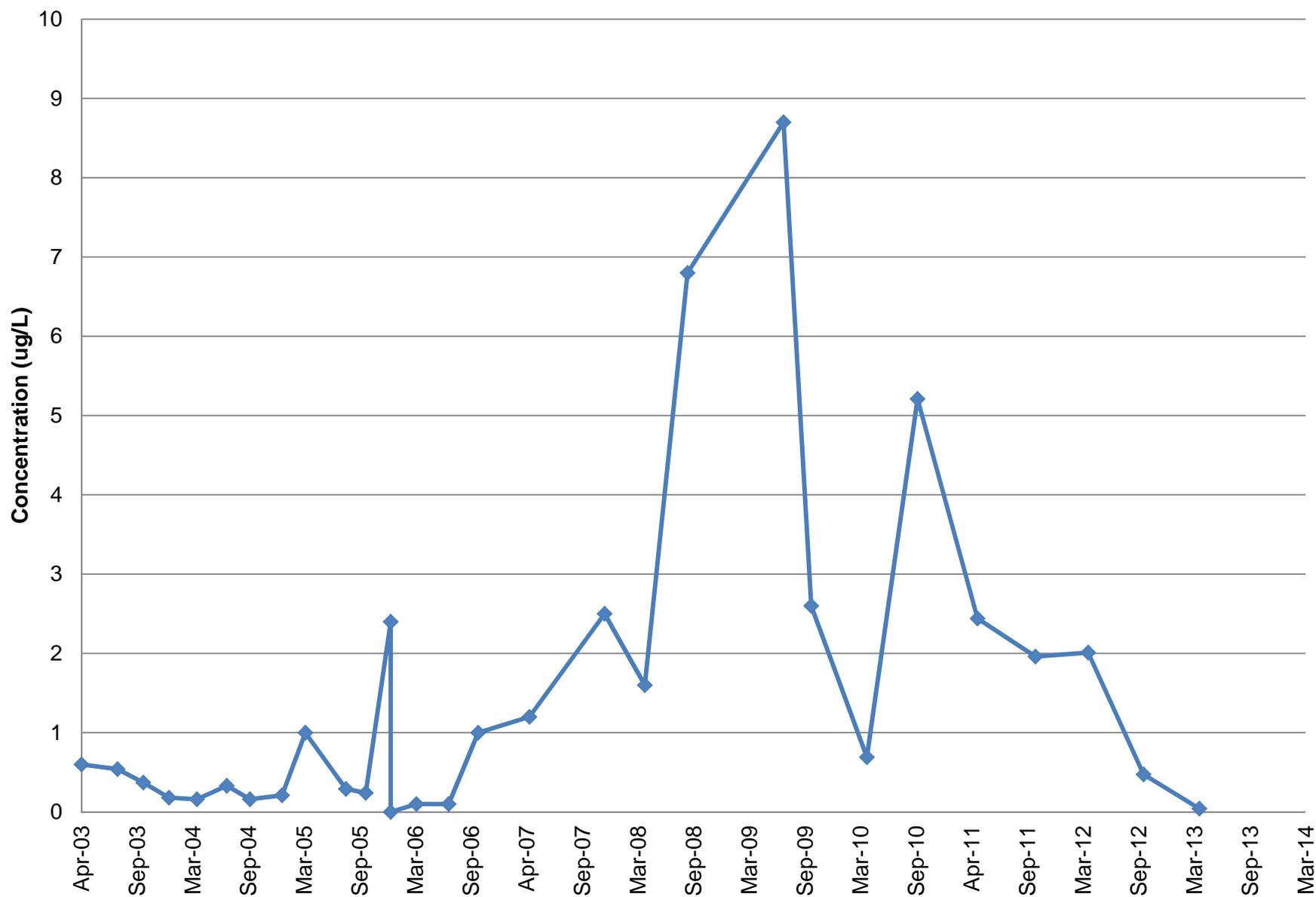
Dissolved Chromium in MW-11S



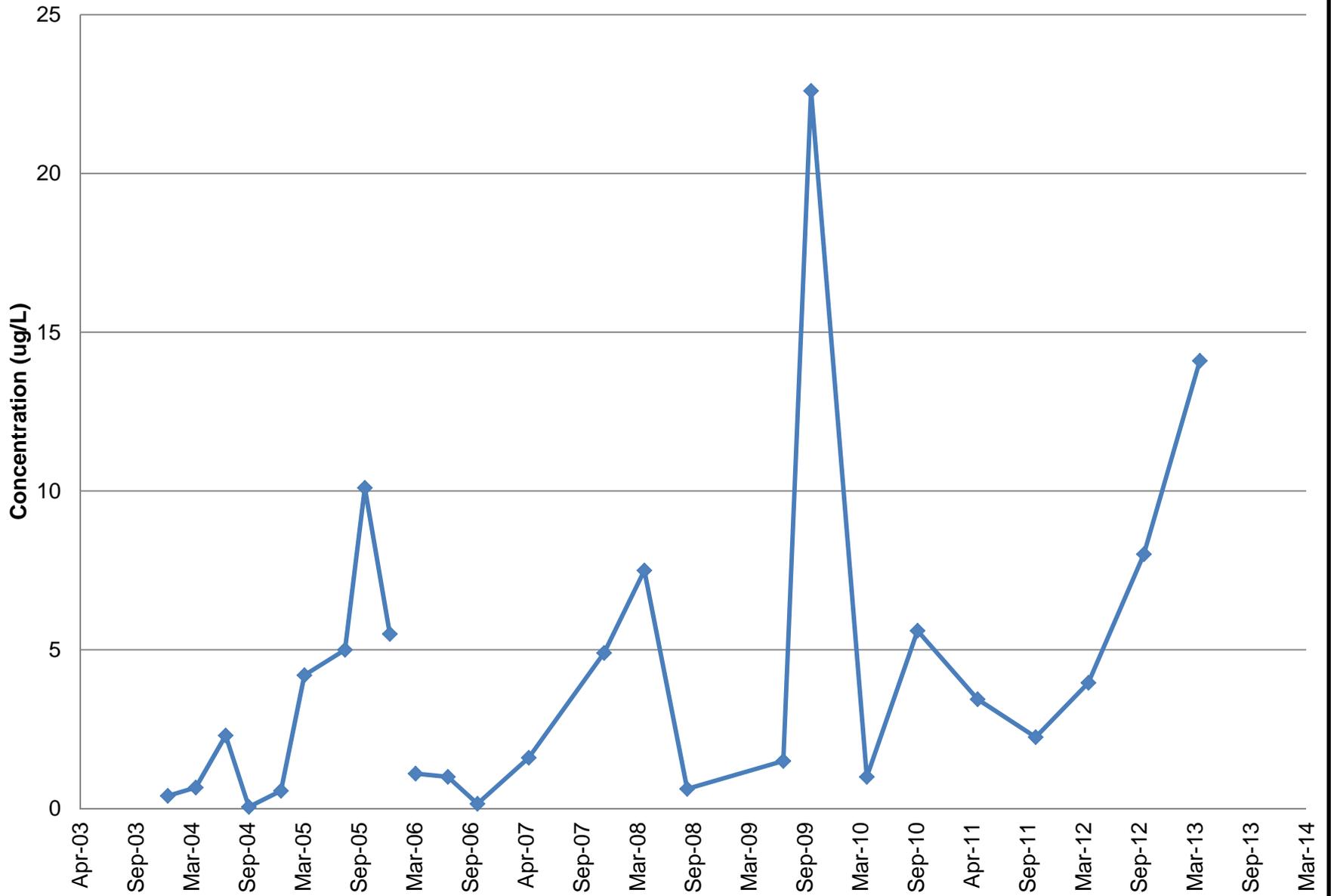
Dissolved Arsenic in MW-11S



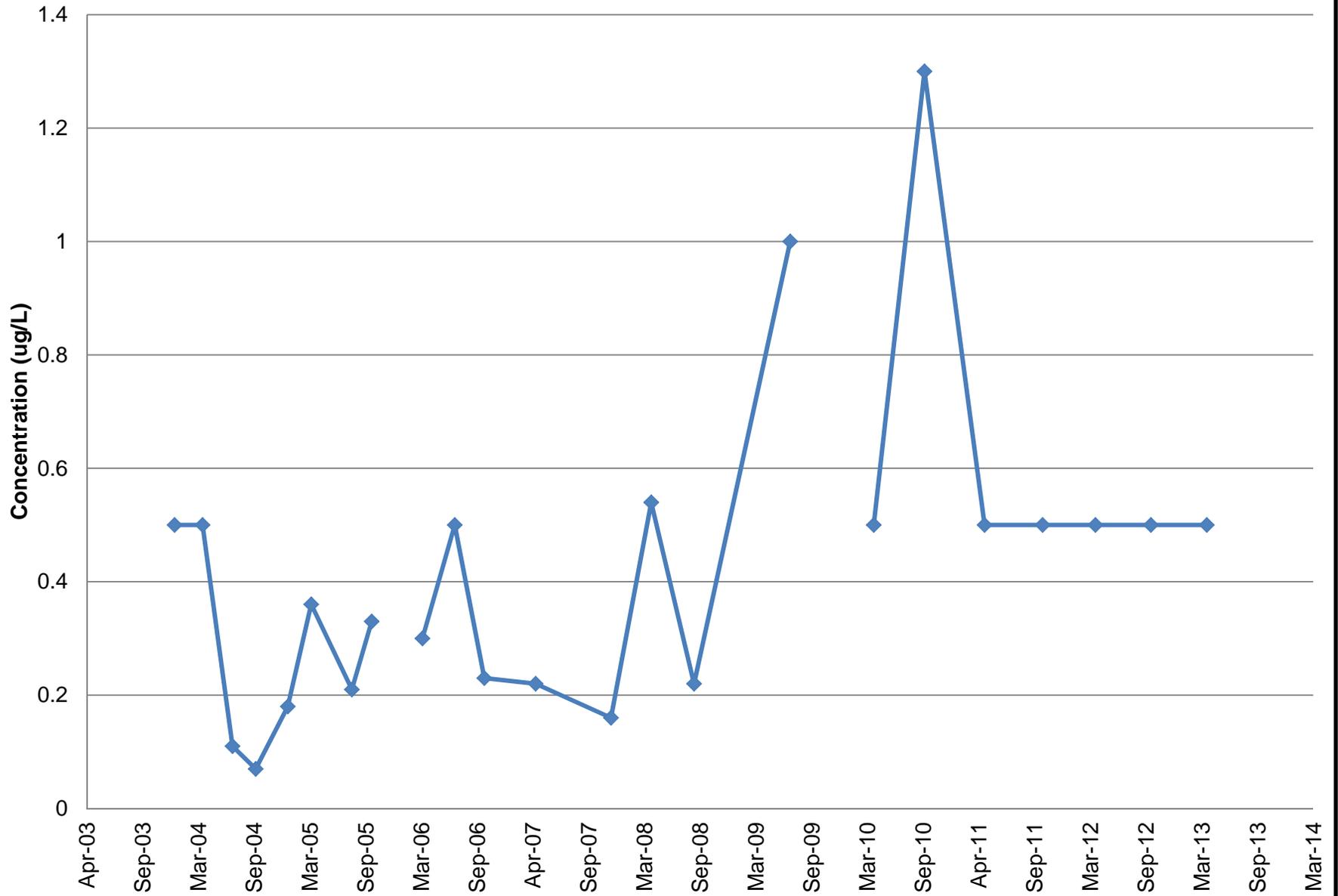
Pentachlorophenol in MW-10D



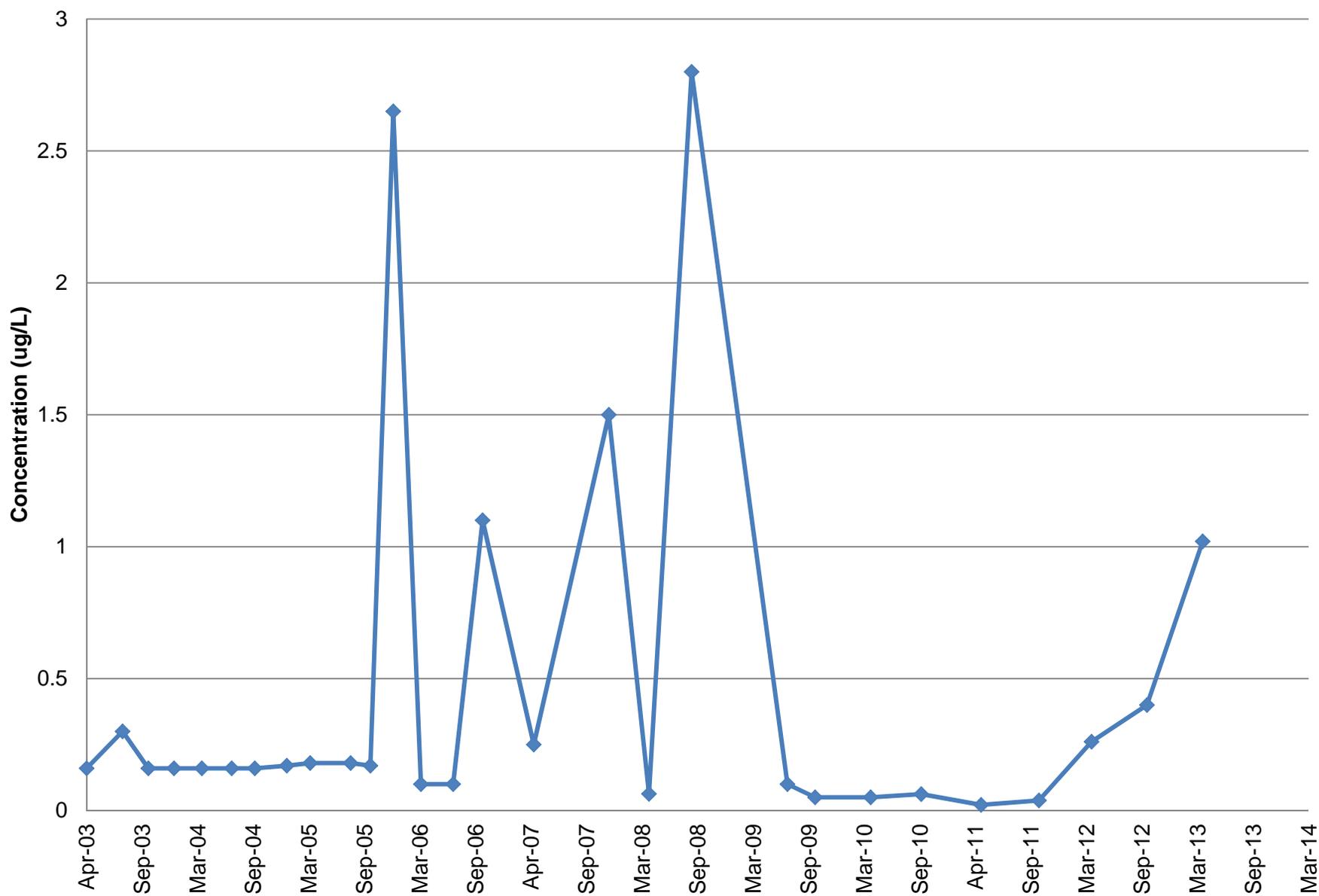
Dissolved Chromium in MW-10D



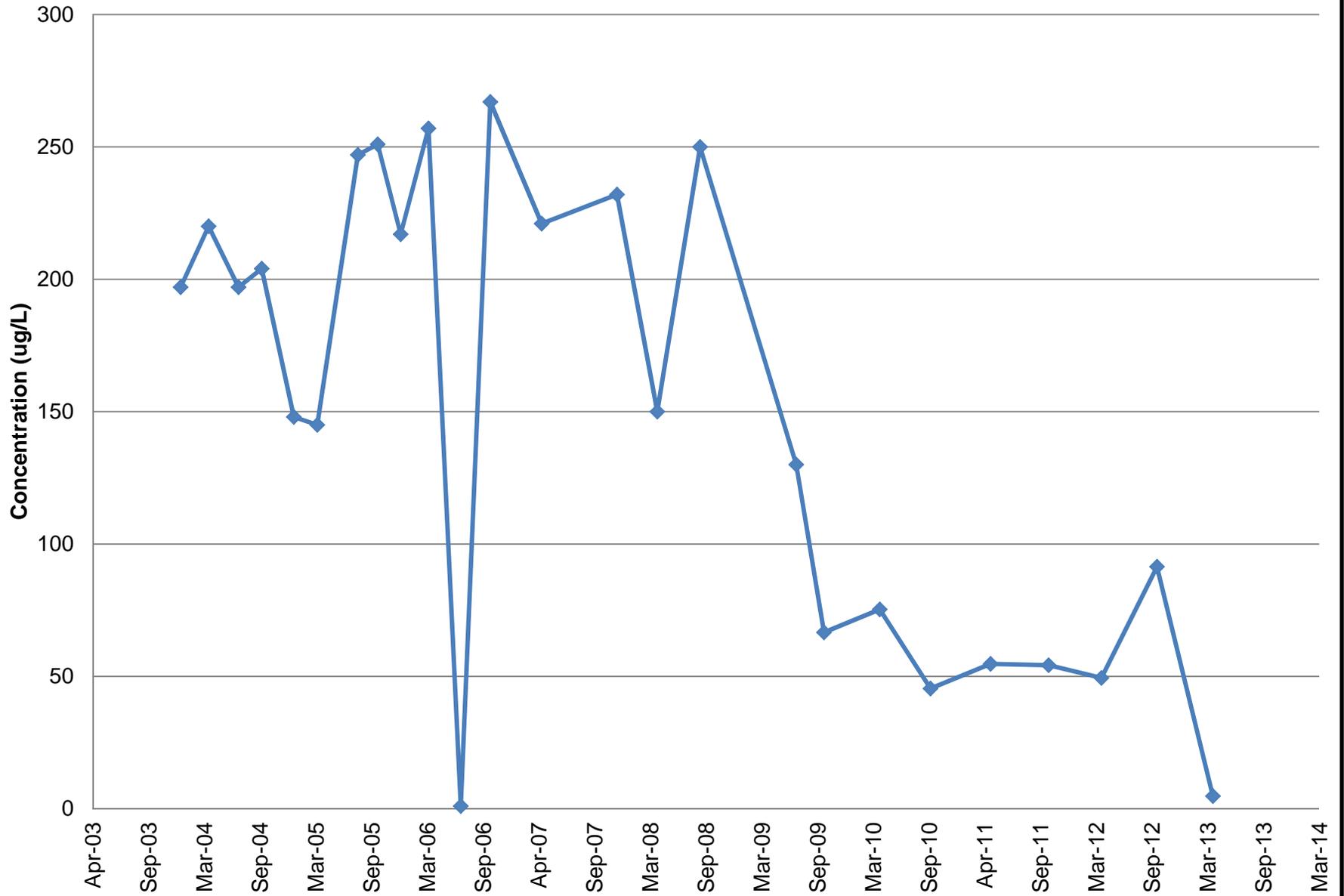
Dissolved Arsenic in MW-10D



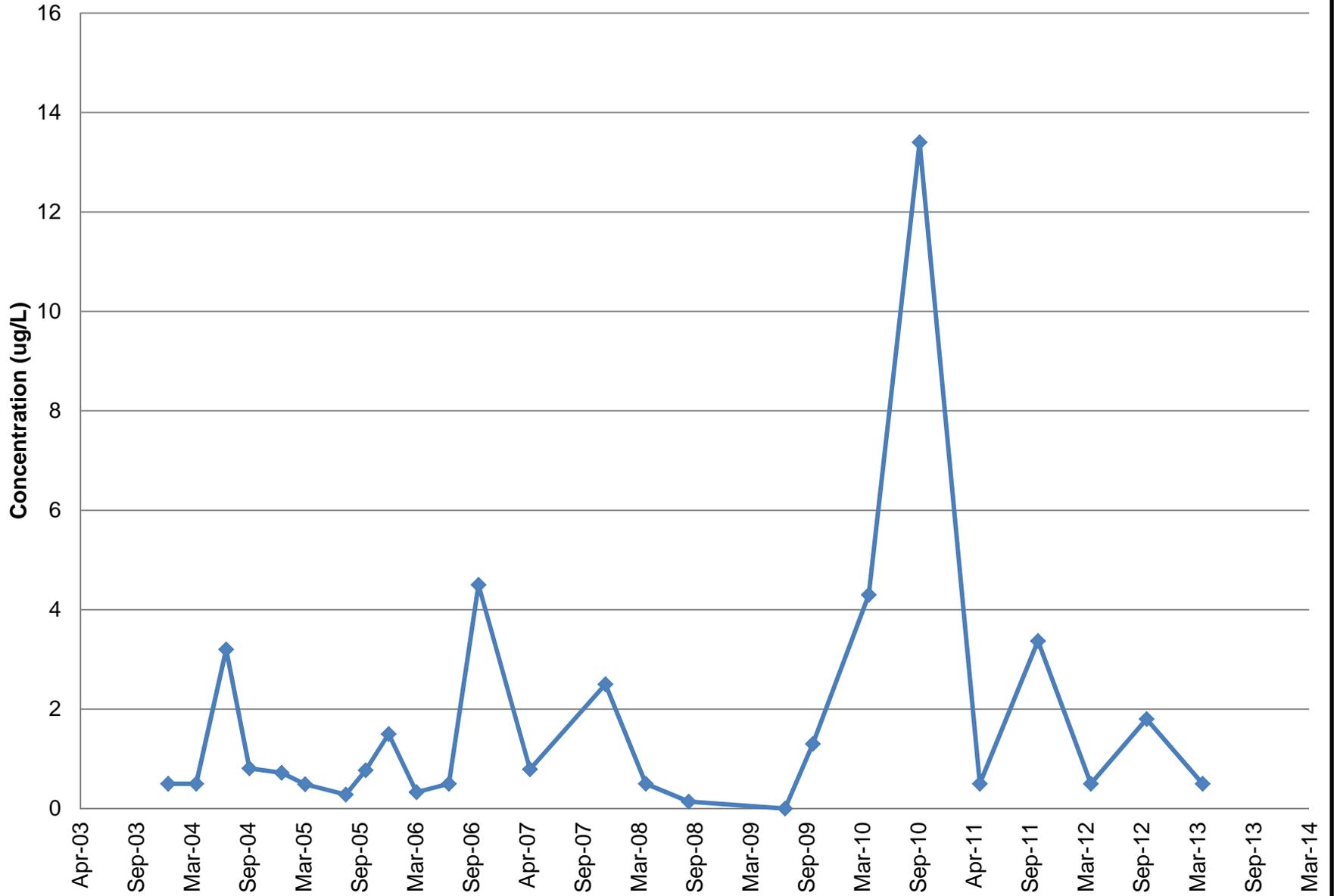
Pentachlorophenol in MW-9S



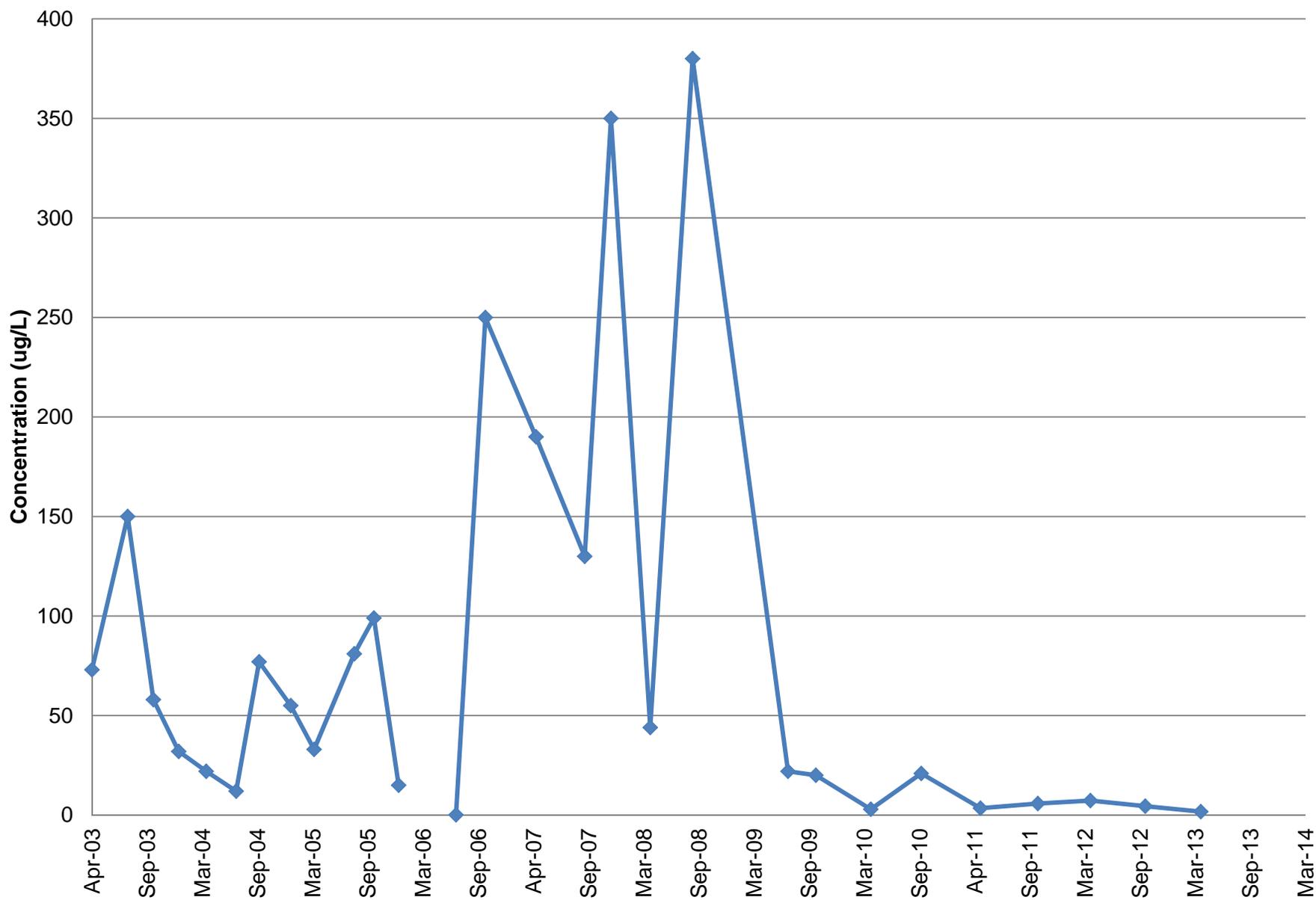
Dissolved Chromium in MW-9S



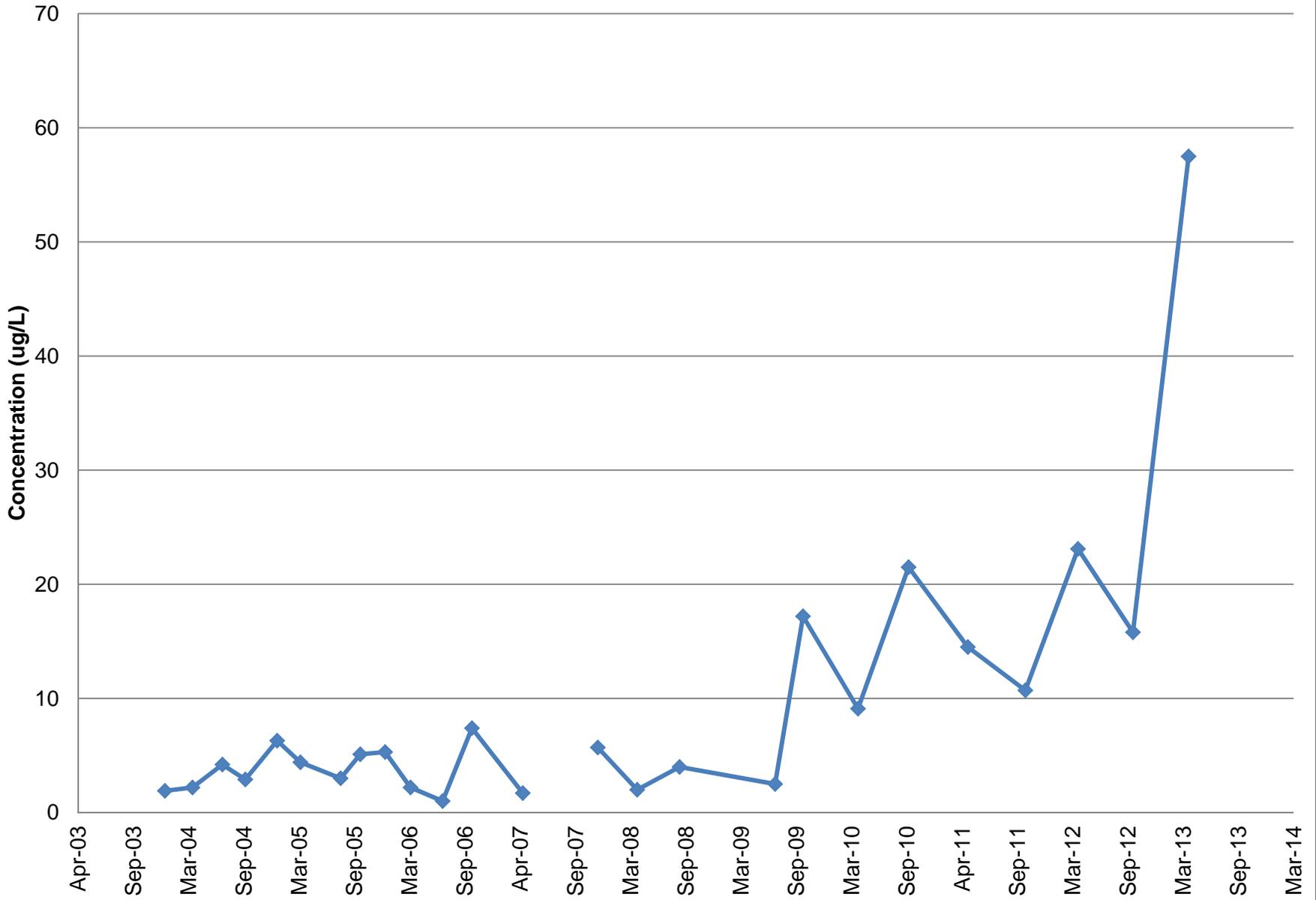
Dissolved Arsenic in MW-9S



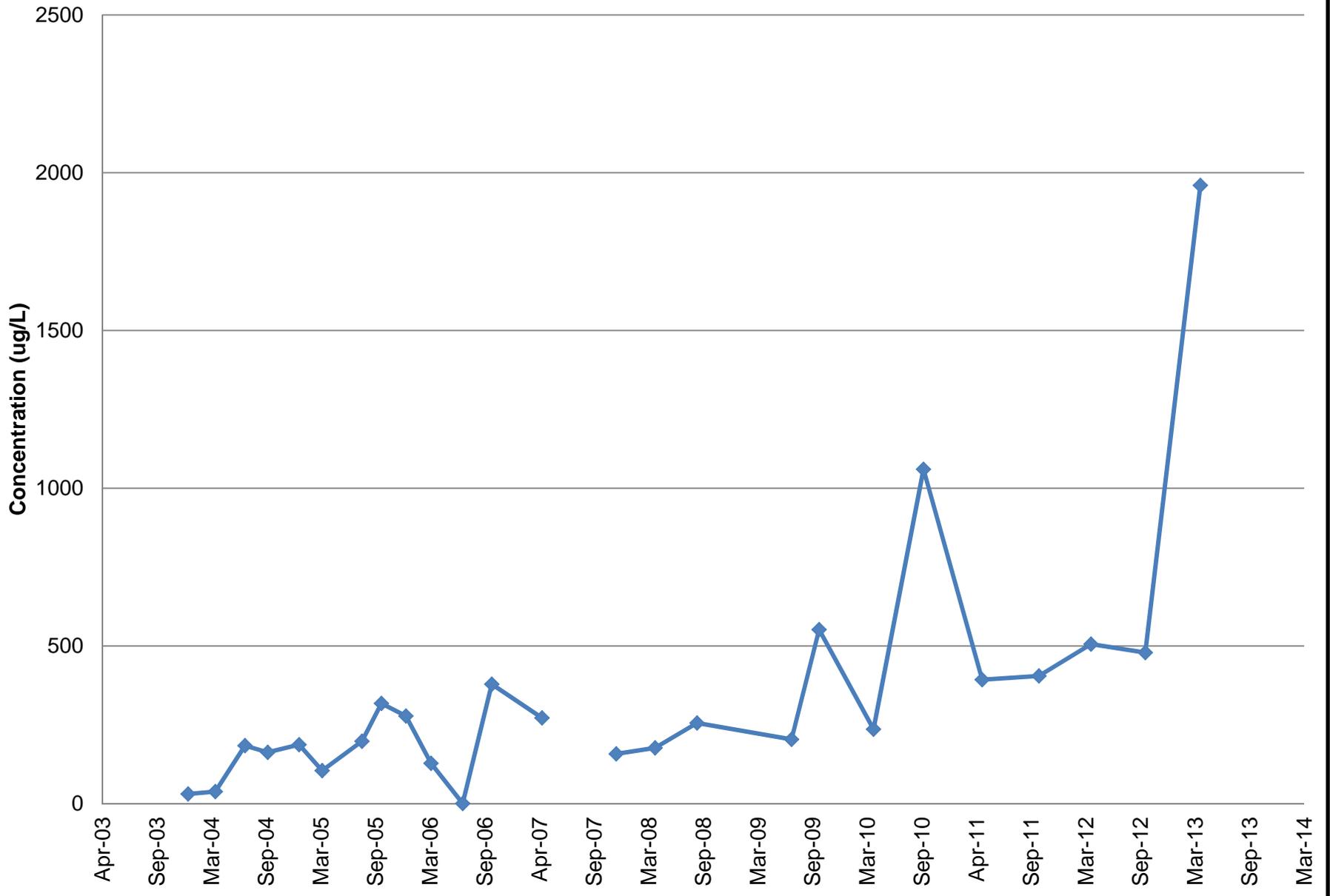
Pentachlorophenol in MW-8D



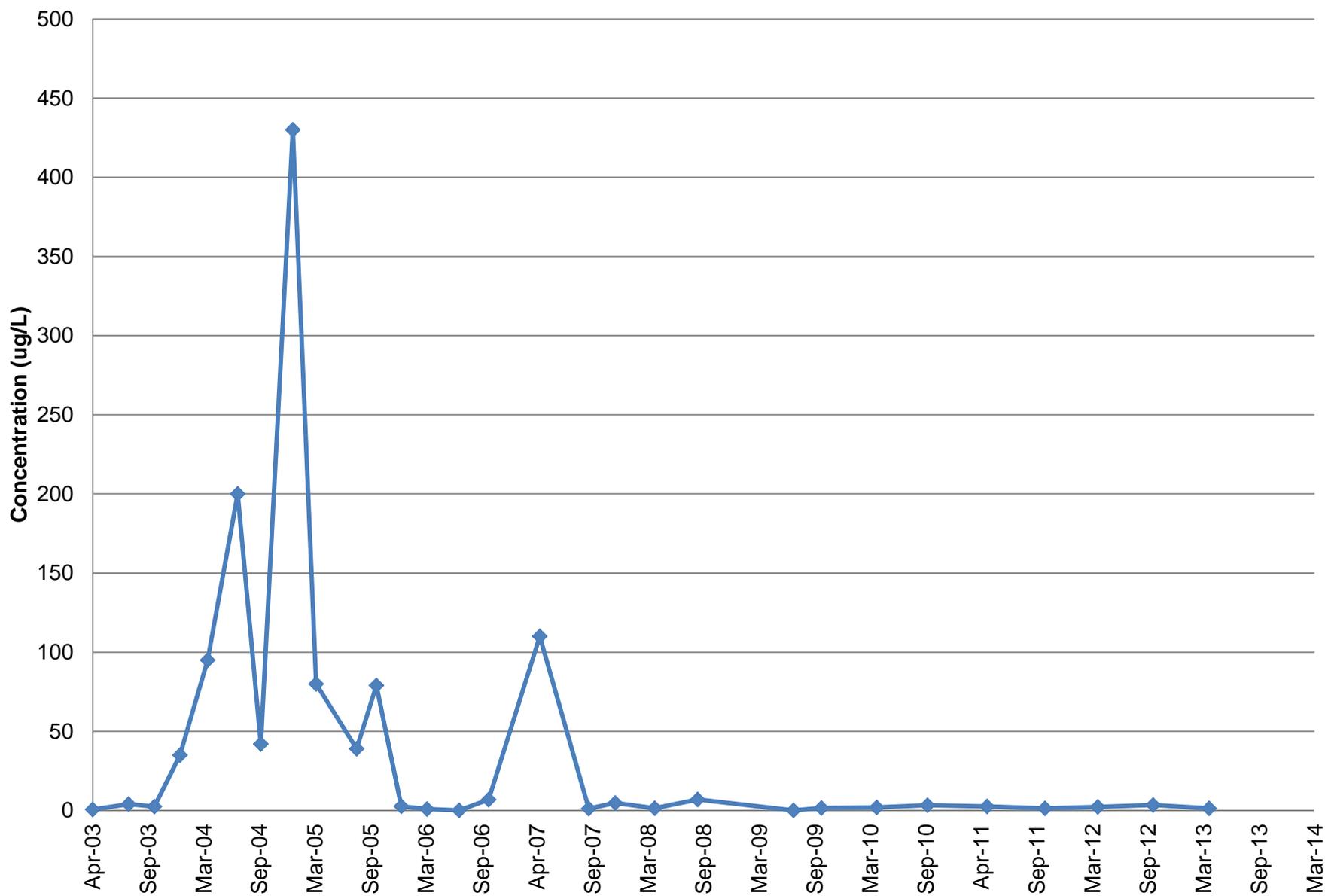
Dissolved Chromium in MW-8D



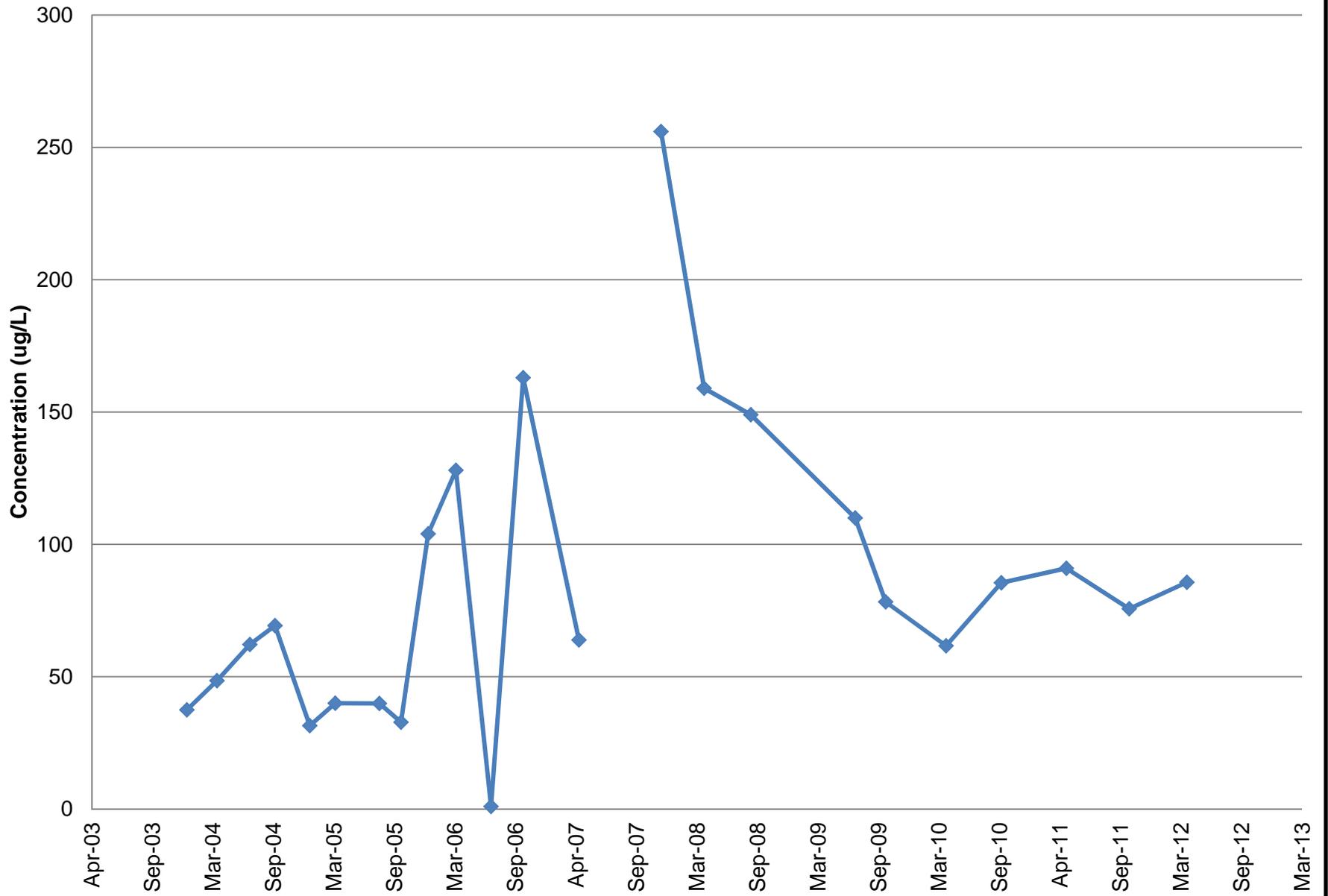
Dissolved Arsenic in MW-8D



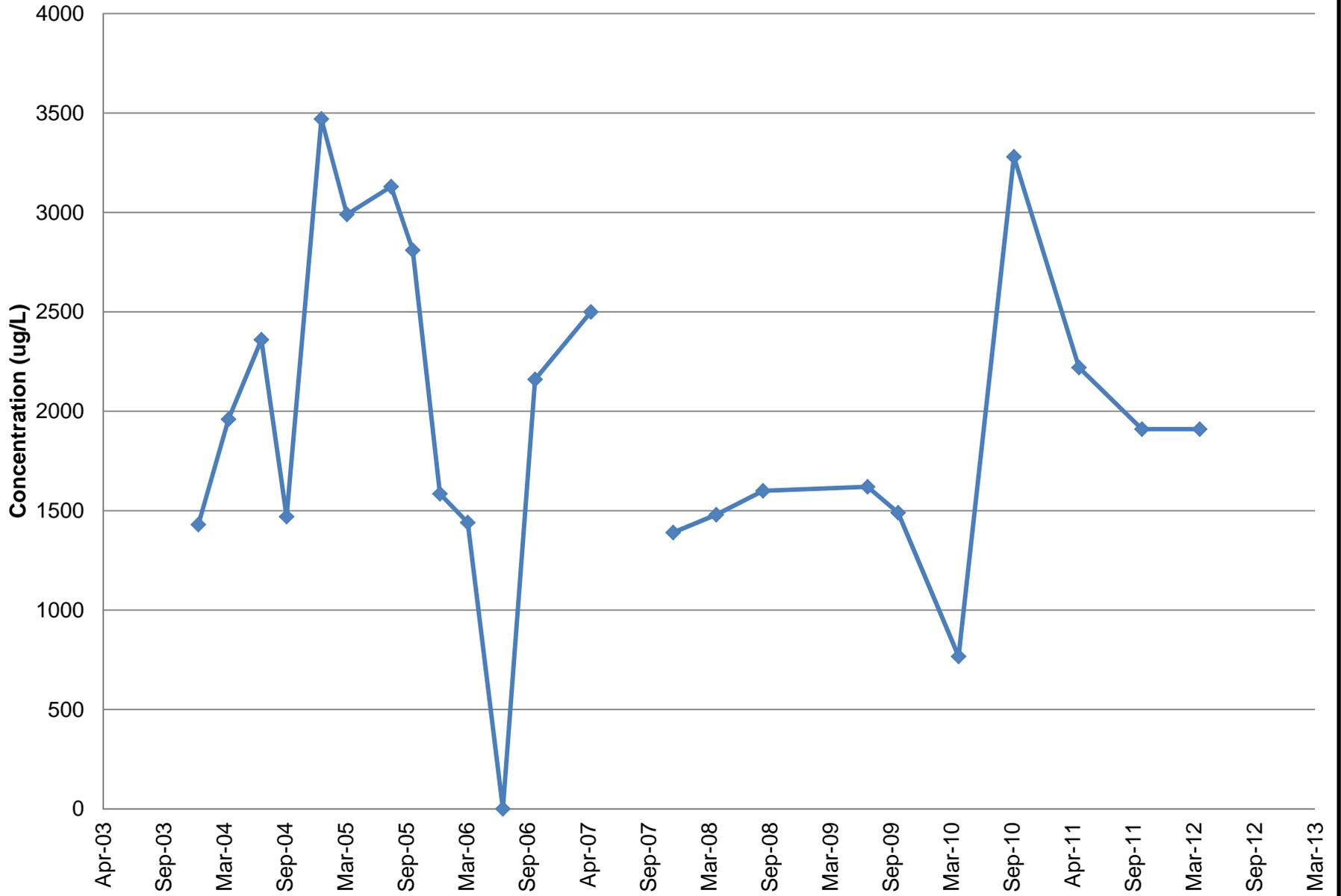
Pentachlorophenol in MW-7S



Dissolved Chromium in MW-7S



Dissolved Arsenic in MW-7S



APPENDIX V

WASTE DISPOSAL MANIFEST



Clearfield MMG

Post Office Box 1444
Chesapeake, VA 23327
(757) 549-8448
FAX: (757) 549-6668

NON-HAZARDOUS SHIPPING MANIFEST

MANIFEST NO. _____

GENERATOR

NAME **Va. Department of Environmental Quality** TELEPHONE **804-698-4183**

ADDRESS **P.O. Box 1105** CITY **Richmond** STATE **VA**

SHIPMENT ORIGIN **Saunders Supply, 5969 Godwin Blvd.** CITY **Suffolk** STATE **VA**

AUTHORIZED AGENT **c/o Environmental Alliance** FIRM _____

ADDRESS _____ OTHER _____

MATERIAL CHARACTERIZATION

ACTIVITY GENERATING THIS MATERIAL: UST/AST REMOVAL _____ OTHER Groundwater Treatment

PETROLEUM TYPE (S): N/A VIRGIN PRODUCT _____ NON-VIRGIN PRODUCT _____

PHYSICAL STATE: STOCKPILED _____ EXCAVATING _____ DRUMS 1 OTHER _____
(Granular Carbon)

HANDLING INSTRUCTIONS: **Transport To Facility Designated Below**

FIRE OR SPILL INSTRUCTIONS: **Non-Flammable / Non-Hazardous**

DESTINATION: **Chesapeake Facility**

I hereby certify, to the best of my knowledge, the material characterized above is non-hazardous as defined by the Virginia Hazardous Waste Management Regulations, Federal Regulations under Subtitle C - RCRA, U.S. Department of Transportation, or local / state of origin regulations.

Signature of Generator / Agent

Printed Name / Date

TRANSPORTER

TRANSPORTER NAME Clearfield MMG, Inc. TELEPHONE 549-8448 TRUCK NO. 14

I certify that the materials described above were received by me for shipment and delivered to the designated facility.

Elmer Phillips 2/12/13
Transporter Signature / Date

FACILITY

I certify that the materials described above were delivered to the facility and received by me.

ACCEPTED BY [Signature] DATE 2/12/13
REASONS FOR REJECTION _____

Gross Weight	
Tare Weight	
Net Weight	
Tons	

GENERATOR