DRAFT SITE MANAGEMENT PLAN

STANTON CLEANERS AREA SUPERFUND SITE

GREAT NECK, NASSAU COUNTY, NEW YORK

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ACRONYMS AND ABBREVIATIONS

µg/L	micrograms per liter
µg/m^3	micrograms per cubic meter
amsl	above mean sea level
bmsl	below mean sea level
CAG	Community Action Group
CERCLA	Comprehensive Environmental Response, Compensation, and Liabilities Act
CFM	cubic feet per minute
DCE	1,2-dichloroethene
GAC	granular activated carbon
gpm	gallons per minute
GWPT	groundwater pump and treat
GWT	groundwater treatment
IAQ	Indoor Air Quality
mA	milliampere
mg/kg	milligrams per kilogram
NCDH	Nassau County Department of Health
NPL	National Priorities List
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
O&M	operation and maintenance
OU-1	Operable Unit One
P&ID	Process and Instrumentation Diagram
PCE	perchloroethylene, tetrachloroethene
PLC	programmable logic control
ppm	parts per million
ROD	Record of Decision
RI	Remedial Investigation
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
SCADA	Supervisory Control and Data Acquisition
SMP	Site Management Plan
SVE	soil vapor extraction
TCE	trichloroethene
TCL	Target Compound List
UFP-QAPP	Uniform Federal Policy – Quality Assurance Work Plan
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
UST	underground storage tank
VAC	volts alternating current
VDC	volts direct current
VOC	volatile organic compound
WAGNN	Water Authority of Great Neck North

1.0 INTRODUCTION

This Site Management Plan (SMP) is required as an element of the remedial program at the Stanton Cleaners Area Superfund Site to transfer administration from the United States Environmental Protection Agency (USEPA) to the New York State Department of Environmental Conservation (NYSDEC). The objective of the SMP is to set guidelines for the management of any future activities which are related primarily to groundwater and soil vapor remediation for volatile organic compounds (VOCs). This SMP provides a description of procedures required to manage remaining contamination at the site and operation and maintenance of the treatment systems.

The guidelines and procedures described in this SMP are the result of over 12 years of site-specific operation and maintenance (O&M) experience and lessons learned. Many of the guidelines and procedures described are based on USEPA and United States Army Corps of Engineers (USACE) policies, which should be reviewed for applicability and relevance to the objectives of the NYSDEC.

Electronic copies of site documents (Project Plans, reports, data and figures) supplement this SMP and are available from a secure download "ftp" site. Login credentials and download instructions will be provided to individuals at the NYSDEC, and will also be available on request. Other documents, such as the original O&M Manual, early reports, plans are available in hardcopy at the site.

1.1 Site Background

Stanton Cleaners is an active dry cleaning facility located at 110 Cutter Mill Road in Great Neck, Nassau County, New York (Figure 1). A dry cleaner has operated at the site since the 1950s. The property had several different owners in subsequent years and the business may have had several names, most recently Stanton Cleaners. Between about 1958 and 1983, waste liquids from the on-site dry cleaning processes were discharged, spilled, or leaked onto the ground behind the facility. (U.S. Department of Health, 2004) The site is located approximately 1,000 feet north of an active public water supply well field owned and operated by the Water Authority of Great Neck North (WAGNN). The Stanton Cleaners Property (Site) is approximately ¼ acre and includes a two-story building in which the dry-cleaning business operates and an adjacent one-story boiler/storage building (Figure 2). The site is bordered to the west by Cutter Mill Road, to the north and east by a former indoor tennis court, and to the south by a gasoline station. Adjacent areas that have been affected by the contamination include, but are not limited to, the neighboring Plaza Tennis Center, the Century Condominium Complex, the North Shore Sephardic Synagogue, and the Long Island Hebrew Academy.

In June of 1983, the Nassau County Department of Health (NCDH) inspected the Stanton Cleaners facility. According to NCDH files, the inspection revealed a pipe protruding from the rear side of the building. It was noted that the pipe was connected to the dry cleaning fluid/water separator that discharged onto the ground in the rear yard sloping away from the building. To determine the impacts of

the separator discharge, soil samples were collected by NCDH in the rear of the building. The results of the analysis indicated the soil was contaminated with tetrachloroethene (also known as perchloroethylene or PCE) at levels of 8,000 parts per million (ppm). Groundwater sampling conducted in January 1998 by a contractor for the NYSDEC showed PCE; 1,2-dichloroethene (DCE); and trichloroethene (TCE) contamination at, and downgradient of Stanton Cleaners.

On June 8, 1998, the NYSDEC requested that USEPA perform a Comprehensive Environmental Response, Compensation, and Liabilities Act (CERCLA) authorized emergency response action at the site to address contaminated groundwater impacting the nearby public water supply. The Stanton Cleaners site was added to the National Priorities List (NPL) on May 17, 1999.

Site cleanup was addressed in two steps: an immediate action consisting of a soil vapor extraction (SVE) system to remediate contaminated soils, thus reducing indoor air contamination in adjacent buildings; and a long-term remedial phase focusing on the cleanup of contaminated soils, indoor air, and groundwater. In March of 1999, USEPA issued the Record of Decision (ROD) identifying a selected remedy for Operable Unit One (OU-1). This remedy included the following elements:

1) upgrade of the existing air stripper at the site,
2) construction of a groundwater extraction and treatment system,
3) continued operation of the SVE system,
4) indoor air monitoring of the affected buildings adjacent to the property,
5) long-term groundwater monitoring, and
6) groundwater use restrictions.

A groundwater pump and treat system is currently operating. The system extracts groundwater from one extraction well at a rate of approximately 70 gallons per minute (gpm). The water is treated with granular activated carbon (GAC) before being discharged to surface water through a storm drain. An SVE system is also in place and operating. The SVE system extracts air laden with VOCs from three well clusters and several sub-slab systems. The vapors are treated with a GAC system and released to the atmosphere. An air sparge system was installed for enhancing treatment near the source of the contamination plume.

1.2 Geologic Conditions

Long Island's geology is composed of a sequence of unconsolidated glacial, lacustrine, deltaic, and marine deposits of clay, silt, and gravel that range in age from Upper Cretaceous to Pleistocene. These deposits overlay a Precambrian to Paleozoic crystalline bedrock. In the region of Nassau County where the Site is located, the thickness of the unconsolidated deposits is approximately 500 feet.

The Raritan Formation overlies the crystalline bedrock surface and includes the Lloyd Sand Member and the Unnamed Clay Member. The Lloyd Sand Member has a maximum thickness of 500 feet and consists

of fine to coarse sand and gravel, commonly with a clayey matrix. Some lenses and layers of solid and silty clay are included. The Lloyd locally has a gradational contact with the overlying Unnamed clay unit (Raritan clay). The Unnamed Clay Member known as the Raritan Confining Unit has a maximum thickness of 200 feet and consists of clay, solid and silty, with few lenses or layers of sand and gravel. An unconformity separates the Unnamed Clay Unit from the Magothy Formation above. The Magothy Formation has a maximum thickness of 1100 feet and consists of fine to medium sand, clayey in parts inter-bedded with lenses and layers of coarse sand and sandy clay. Gravel is common in the basal zone. An unconformity separates the Magothy from the Pleistocene glacial deposits (Upper Glacial Formation). The Upper Glacial Formation has a maximum thickness of 340 feet and consists of glacial till, unsorted clay, sand, gravel and boulders. Outwash deposits of stratified brown sand and gravel are also present in the Upper Glacial Formation.

The aquifers underlying the Site are comprised of coastal-plain deposits of continental and marine origin of Late Cretaceous age overlain by unconsolidated glacial deposits of Pleistocene age. These deposits are underlain by bedrock of Lower Paleozoic and/or Precambrian age. The elevation of the top of bedrock is at 419 feet below mean sea level (bmsl), which is approximately 500 feet beneath the Site, is virtually impermeable, and forms the base of the aquifer. The Lloyd Aquifer overlays the crystalline bedrock and is poorly to moderately permeable. The Lloyd is located at about 273 feet bmsl (approximately 350 feet below the Site) and is the major regional drinking water aquifer with well yields of 1,600 gpm. The Lloyd aquifer has been intruded by salty groundwater from over pumping, locally in necks near the north shore, where the aquifer is shallow and overlying clays are discontinuous.

The Raritan Clay located at 223 feet bmsl (approximately 300 feet beneath the Site) constitutes a confining unit for the Lloyd Aquifer preventing the impact by contaminants from the overlying Upper Glacial formation. The deep Upper Glacial Aquifer constitutes the principal aquifer for public-supply in eastern Queens, most of Nassau, and western/central Suffolk counties. Wells screened in the basal zone of the aquifer yield as much as 1,400 gpm. The deep Upper Glacial Aquifer has also been invaded by salt water from over pumping locally in southwestern Nassau and southern Queens County and in small areas along the north shore.

The Upper Glacial Aquifer constitutes the surface aquifer and is composed of glacial till and outwash deposits. The till is relatively impermeable and may cause local perched aquifers and impede downward movement of precipitation. However, the outwash deposits of sand and gravel are highly permeable and wells screened in these deposits can yield as much as 1,400 gpm. The Upper Glacial Aquifer has been impacted by industrial and municipal activities and is vulnerable to impacts by contaminants.

The shallow, intermediate, and deep portions of the Upper Glacial Aquifer were evaluated during this investigation. These zones correspond to the saturated portions of the shallow, intermediate and deep Upper Glacial Formation. The shallow Upper Glacial Aquifer is defined as the first groundwater

encountered within the Upper Glacial Aquifer and generally occurs between 15 feet above mean sea level (amsl) and 20 feet bmsl. The intermediate Upper Glacial Aquifer is the zone directly above the North Shore Confining Unit and generally occurs between 20 and 70 feet bmsl. The North Shore Confining unit may be discontinuous across the Site and separates the shallow/intermediate Upper Glacial Aquifer from the deep Upper Glacial Aquifer. The North Shore Confining unit generally occurs between 70 and 100 feet bmsl. The deep Upper Glacial Aquifer is the zone below the North Shore Confining Unit and generally occurs below 100 feet bmsl.

WAGNN operates three pumping wells in the vicinity of the Site. Public supply wells PW-2A and PW-9 are screened in the deep Upper Glacial Aquifer. Public supply well PW-11 is screened in the Lloyd Aquifer (Earth Tech, 2004). The well locations are shown on Figure 3.

1.3 Summary of Remedial Investigation Findings

The following is a summary of the historical results of sampling data collected from soil, sediment, groundwater and vapor monitoring, both on-site and off-site. Remedial Investigation (RI) activities included private water well survey; public water supply well survey; soil gas survey, soil sampling; groundwater sampling, indoor and outdoor air sampling. Detailed findings of the Remedial Investigation/Feasibility Study (RI/FS) is presented in the 1998 report by Dvirka and Bartilucci.

Subsurface Soil

Analytical data from historic sampling and from sampling during the Remedial Investigation indicate that subsurface soil behind the Stanton Cleaners building, beneath the Stanton Cleaners boiler room contained PCE up to 50,000 milligrams per kilogram (mg/kg). The soil column to the water table (about 60 feet below ground surface) contained significantly elevated concentrations of PCE (U.S. Department of Health, 2004).

Surface Soil

Few surface soil samples have been collected at the site. This is because most of the area around the facility is paved. There is one unpaved strip of property on the slope between the Stanton Cleaners parking lot and Plaza Tennis. Analytical results from two soil samples collected from this strip of exposed soil were found in the record. The samples were collected in 1983 and 1985 to evaluate PCE in soil at spillage areas behind Stanton Cleaners and are, therefore, presumed to be near-surface (i.e., probably less than six inches deep). Surface soil samples, collected prior to removal of visibly contaminated soil, contained PCE at a concentration of 8,000 mg/kg. Contaminated soil was removed and the area backfilled with clean soil. Late in 1998, US EPA had the entire surface area between Stanton Cleaners and Plaza Tennis paved with concrete while installing the SVE system.

Groundwater

Historical groundwater analytical results showed that the upper glacial groundwater contained PCE concentrations up to 26,000 micrograms per liter (µg/L). TCE concentrations were present up to 750 µg/L; 1,2-DCE concentrations up to 1,200 µg/L; and vinyl chloride concentrations were detected as high as 840 µg/L.

Groundwater samples from the Magothy Aquifer near the Site are generally less contaminated than those in the upper glacial aquifer. PCE was detected in groundwater samples collected during well-drilling activities at concentrations ranging from 160 to 2,900 µg/L. However, detections in permanent groundwater monitoring wells within the Magothy Aquifer were all less than 3 µg/L.

The Lloyd Aquifer does not appear to have been significantly affected by PCE to date.

Surface Water

There were no known discharges of dry cleaning fluids directly to surface water from the cleaning operation at the site. Treated groundwater from behind Stanton Cleaners is discharged to a storm drain. The drain empties directly into Little Neck Bay.

Sediments

Sediment samples were collected during the RI from two storm drain catch basins near Plaza Tennis. Neither of these contained PCE above cleanup criteria concentrations.

Air

A few hundred indoor and outdoor air samples have been collected to determine if PCE from the soil beneath the Site was affecting the air in nearby buildings. During the RI and subsequent air investigations, PCE concentrations from indoor locations were compared to State and Federal guidance values. The New York State Department of Health (NYSDOH) guideline value for PCE in indoor air is 100 micrograms of PCE per cubic meter of air (µg/m^3). Analytical results from the earliest rounds of air sampling revealed the highest PCE levels encountered were collected from Plaza Tennis, with concentrations ranging from 120 µg/m^3 to 190,000 µg/m^3.

Samples collected between 1997 and 1999 from the nearby North Shore Sephardic Synagogue contained PCE at concentrations ranging from 2.7 to 210 µg/m^3. Only one sampling location, a classroom on the lower level of the synagogue, had concentrations in excess of the NYSDOH guideline of 100 µg/m^3. Two basement-parking garages in a nearby condominium, owned by Century Apartments, were sampled for PCE during an early round of sampling. While neither sample contained PCE above the NYSDOH guideline of 100 µg/m^3, the results suggested subsurface migration of PCE into the building and the need for additional testing.

1.4 Summary of Remedial Actions

In April 1985, the owner of Stanton Cleaners entered into a Consent Order with NYSDEC. As part of the agreement, an air-stripping tower and groundwater extraction and treatment system were installed in 1989. Contaminated groundwater was pumped through the air stripper. The treated water was discharged to the local public storm drain system.

Between 1992 and 1996, NYSDEC requested that the Site owner remediate the contamination at and around the property. After several years of unsuccessful negotiations, the owner had failed to implement a RI/FS.

The USEPA assumed the role of lead agency at the request of NYSDEC in April of 1998. Since that time, several removal/remedial actions have been implemented at the site in order to address the contaminated soil and groundwater and to prevent the associated contaminant migration into the adjacent building structures. The actions implemented to date include the following:

- Installation of a sub-slab ventilation system at the Tennis Club facility in September 1998.
- Installation and operation of a SVE system to reduce soil VOC concentrations in source areas in February 1999.
- Construction and installation of a groundwater recovery and treatment system in September 2001.
- Removal of two 500-gallon PCE underground storage tanks (USTs) and one 1,000-gallon fuel oil UST in 2002.
- Installation of sub-slab ventilation system at the Long Island Hebrew Academy in 2003.
- Installation of air sparge system to enhance treatment of the contamination source area in June, 2010.

A Process and Instrumentation Diagram is presented in Figure 4 showing the updated treatment systems in place at the Site.

1.4.1 Removal of Contaminated Material from the Site

Soil

During the removal of underground storage tanks in January 2002, approximately 20 tons of contaminated soil were excavated and disposed. A comprehensive summary report of this UST Removal Action is provided in the *Underground Storage Tank Closure Report - Final Draft* (Earth Tech, July 10, 2002).

Groundwater

Between October 2003 and June 2012, during the operation of the groundwater pump and treat system approximately 275 million gallons of water were pumped and about 200 pounds of PCE were removed. Figure 5 shows the PCE concentrations detected in the groundwater treatment system influent over time, as well as the cumulative mass recovery of PCE.

Soil Vapor

Based on PID readings, approximately 1,600 pounds of PCE were removed by the SVE system between 2003 to April 2012. Figure 6 shows the PCE concentrations detected in the SVE treatment system influent water over time, as well as the cumulative mass recovery of PCE.

1.4.2 Site Related Treatment Systems

The following three engineering controls were installed for the treatment of the contaminated vapors and groundwater: SVE, air sparge, and groundwater pump and treat (GWPT). The SVE system addresses surface and subsurface soil contamination through a series of SVE wells where significant concentrations of PCE have been detected. Soil vapors containing VOCs are being extracted from the soils by an above ground vacuum system. The contaminated vapors are being treated by a vapor-phase GAC system. The GWPT system includes groundwater extraction wells and a treatment system for the contaminated groundwater. Initially, the contaminated groundwater from the extraction wells was conveyed to a shallow-tray air stripper, which uses forced air to remove the VOCs. The treated groundwater was then further polished by a liquid-phase GAC system. The final treated groundwater is then discharged into a local storm sewer system. The air released from the air stripper was also treated via the same vapor-phase GAC vessel used by the SVE system. The subsequent treated air is discharged to the atmosphere. In 2008, the air stripper was eliminated from the system and removed from the site because the influent VOC concentrations had decreased to a level where the liquid-phase GAC could effectively treat the impacted groundwater instead of the air stripper. This and other optimization changes are discussed in further detail below, in Section 1.4.3

1.4.3 System Optimization

Based on routine evaluation of the system data, several activities were implemented for optimization of the treatment system, sampling and reporting tasks. Optimization included elimination of the air stripper in 2008, as described above. Additionally, another water pump was eliminated from the system when the influent groundwater flow was diverted to by-pass an unnecessary equalization tank, directly to the LPGAC. This resulted in a groundwater extraction system that uses only the extraction well pump to remove the groundwater from the aquifer, conveyed through piping to the treatment plant and LPGAC, then out to the discharge location. Elimination of this equipment reduced electrical consumption, O&M monitoring, and preventive maintenance of the eliminated equipment. The air stripper was removed from the site and reused at another USEPA CERCLA site.

The long term monitoring program for groundwater and indoor air quality was also optimized by ramp-down of the sampling locations and frequency. In the first several years after system startup, approximately 30 monitoring wells were sampled every quarter. Based on stable trends of groundwater concentrations, the frequency was reduced to semi-annual, then finally to annual sampling only, and the number of wells sampled was reduced to less than 10, as currently monitored.

Similarly, the frequency of IAQ sampling was reduced from quarterly to annual events.

Frequency of monthly O&M Activity Reports was reduced to Quarterly O&M Activity Reports in 2007.

The last significant treatment system optimization was the addition of two sparge wells to promote subsurface mobilization of VOC contaminants and enhance the recovery of contaminant mass from the groundwater.

2.0 ENGINEERING AND INSTITUTIONAL CONTROL PLAN

Engineering Controls and Institutional Controls are required to protect human health and the environment. This Engineering and Institutional Control Plan describes the procedures for the implementation and management for the site. This plan is subject to revision by NYSDEC.

The engineering controls at the Site include a groundwater treatment (GWT) system and the SVE system. These systems are designed to contain the off-site migration of VOC-contaminated vapors and groundwater. The GWT system's primary responsibilities include the pumping and treatment of groundwater. The SVE system's responsibilities include the treatment of high VOC source areas, the containment of off-site migration of contaminated soil vapors, and the extraction and treatment of the contaminants of concern contained in the soil vapors.

2.1 Engineering Controls

2.1.1 Engineering Control Systems

A detailed description of all the engineering controls systems is provided in the Operations and Maintenance Manual. A list of the remediation equipment is included in Appendix A. A Process and Instrumentation Diagram (P&ID) is provided as Figure 4. A summary of the components is provided in the following sections.

The remediation equipment at the facility is located in a building approximately 32 feet long by 36 feet wide and is maintained at ambient temperature with a forced air heater and two exhaust fans. The programmable logic control (PLC) and its associated electronics are located in the treatment building's second floor control room. The expected life of the entire treatment system and its control components is 20 years.

All system components are to be integrated through the PLC system for system automation, control, and off-site monitoring. The treatment system components are operated by the PLC, but some specific components (treatment room heater, exhaust fans, HVAC, and ceiling fans) are operated via their own controls. The equipment motors are powered by 240 volts alternating current (VAC), 3-phase electrical service. The treatment system monitoring instrumentation devices (i.e., level switches, probes, sensors, and transmitters) have a 24 volts direct current (VDC) input; the transmitters have a 4-20 milliampere (mA) output.

The system P&ID (Figure 4) shows all system components and utilizes the naming conventions, which are incorporated in the labeled PLC control panel and associated electrical drawings.

2.1.2 Groundwater Treatment

The Groundwater Treatment System consists of a groundwater extraction system, probes, sensors, a

liquid-phase and vapor-phase carbon, and a PLC for complete integration and automation of system components. The system is capable of both manual and automatic operation. Although the system has been designed to run in a continuous mode, it also has the capability of batch treatment. System monitoring and automated control is available from both local and remote locations.

This system can be monitored from a remote location for a majority of its operational life. Additionally, treated water is discharged directly into a local storm sewer in accordance with the requirements of NYSDEC discharge equivalency permit.

The design of the complete groundwater recovery and treatment system includes the following items:

- Three (3) extraction/interceptor wells (only one well, EPA-EXT-02) has been in operation since prior to 2007);
- Three (3) submersible well pumps (only one well and pump has been in operation since prior to 2007);
- Chemical addition system (included in the original design, but not required);
- 400 gpm, low-profile air stripper; (eliminated from system);
- One (1), 2,000-pound liquid-phase GAC vessel;
- One (1) 3,000-pound vapor-phase GAC recovery system for off-gas treatment from the air stripper and SVE system;
- All pumps as required to transfer water within the treatment component and ultimately deliver treated water to the discharge point (at present, only the extraction well pump is required to operate the groundwater pump and treatment system);
- Master Control Center PLC;
- Electronically actuated flow control valves;
- Probes and sensors, level indicators, differential pressure gauges and other probes and sensors as required for complete automation of the system;
- Piping between system components and to final discharge point;
- Wiring from the PLC to the components, probes and sensors; and
- A building to house the treatment system components.

The groundwater treatment system sequence of operations is as follows. Water is pumped from up to three extraction wells to the treatment building. The water then flows through a flow meter/totalizer. The flow from each well can be controlled through individual electronic flow control valves regulated by the PLC. The water then meets at the piping manifold and flows to the liquid-phase GAC.

The treated effluent water is monitored for conductivity, pH, and temperature. It then flows to a three-way valve where it can either be re-circulated into the system or discharged through a flow totalizer to the storm sewer. All system components are integrated through the PLC for system automation, data recording/retrieval, control, security, and off-site monitoring.

2.1.3 Soil Vapor Extraction

The SVE System is integrated into the groundwater pump and treatment system which includes the following:

- PLC based control panel (also controls the groundwater pump and treatment system);
- Six (6) SVE extraction wells (i.e., includes UST removal manifold system);
- A skid-mounted, 250 cubic feet per minute (CFM) SVE unit with knockout tank and pump;
- 1,000-gallon holding tank and pump; and
- One (1) 3,000-pound vapor-phase GAC recovery system for off-gas treatment from the SVE system.

2.1.4 Air Sparge

Two sparge systems were added to the system to promote subsurface mobilization of VOC contaminants and to enhance the recovery of contaminant mass from the groundwater. One sparge system was installed in well EPA-AS-01 (directly in front of the Stanton Cleaners Building) in June 2010. This system uses air from the treatment system's air compressor to sparge within the screened interval. The sparge system uses a well packer to seal the well from atmospheric pressure, so the sparge air exits the well screen and enters the aquifer.

The second sparge system was installed in well MW-24 (in "Triangle" at Cutter Mill/Bayview Ave. Intersection) in April 2012. This system also uses air from the treatment system's air compressor, but has no well packer installed.

2.2 Institutional Controls

Institutional Controls are required to implement, maintain and monitor the Engineering Control systems and prevent future exposure. All Engineering Controls must be operated, inspected and maintained as specified in this SMP. Groundwater and other environmental or public health monitoring must be performed as defined in this SMP. Data and information pertinent to Site Management of the Controlled Property must be reported at the frequency and in a manner defined in this SMP.

A Record of Decision (ROD) for OU-1 was issued by USEPA on March 31, 1999. This ROD called for continued SVE at the Site and installation of a groundwater extraction treatment system. The SVE system has been running at the Site since February 1999.

2.3 Discharge Requirements

Effluent discharge limits from the groundwater extraction system treatment plant are provided in Table 2. The New York State Air Discharge Limits for the Site are shown in the Table 3.

Other institutional controls include Public Health Advisories, which consist of periodic local public meetings attended by the EPA and local residents to notify the public of the progress of the site investigation and remediation.

Table 1. Effluent Discharge Limits Stanton Cleaners Area Groundwater Contamination Site Great Neck, NY				
Outfall Number and Parameter	Daily Average	Daily Maximum	Minimum Monitoring Requirements	
			Frequency	Sample Type
Flow	Monitor	115,000 GPD	Continuous	Meter
pH (range)	6.5 - 8.5 SU		Monthly	Grab
Total Suspended Solids (TSS)	Monitor	20 mg/l	Monthly	Grab
Methylene Chloride	Monitor	5 ppb	Monthly	Grab
Acetone	Monitor	5 ppb	Monthly	Grab
1,1-Dichloroethene	Monitor	5 ppb	Monthly	Grab
Tetrachloroethene (PCE)	Monitor	5 ppb	Monthly	Grab
Benzene	Monitor	5 ppb	Monthly	Grab
1,2-Dichloroethene (Total)	Monitor	5 ppb	Monthly	Grab
Chloroform	Monitor	5 ppb	Monthly	Grab
Trichloroethylene	Monitor	5 ppb	Monthly	Grab
Toluene	Monitor	5 ppb	Monthly	Grab

GPD = gallons per day
mg/l = milligrams per liter
ppb = parts per billion
SU = Standard Units

Table 2. New York State Air Discharge Limits Stanton Cleaners Area Groundwater Contamination Site Great Neck, NY	
Contaminant	*Concentration*
Total VOCs	0.5 pounds per hour

VOCs = volatile organic compounds

2.4 Inspections and Notifications

2.4.1 Inspections

Site inspections will be conducted on a monthly and annual basis. The Operation and Inspection Logs forms are provided in the in Operation and Maintenance Manual; Volume I – Appendix 5.1

2.4.2 Notifications

The local Community Action Group (CAG) has been inactive for several years. Notifications are made to the Stanton Cleaners Dry Cleaners, WAGGN, Long Island Hebrew Academy, and Silverstein Academy prior to sampling events, rooftop carbon filter changes and other activities that may affect these entities.

2.5 Contingency Plan

In the event of any emergency or unplanned occurrence requiring assistance, the Site representative should contact the appropriate party from the contact list in Table 4. The emergency contact list below must be periodically updated and maintained in an easily accessible location at the site.

Table 3. Fire, Police and Emergency Response

Emergency Service	Company	Phone
Police Department	Nassau County Police (Sixth District)	911
Fire Department	Vigilant Hook & Ladder	911

3.0 SITE MONITORING PLAN

3.1 General Purpose and Schedule

This Site Monitoring Plan describes the measures in place for evaluating the performance and effectiveness of the remediation systems. The site monitoring plan currently includes annual sampling of groundwater and indoor air quality, while O&M performance assessment sampling is done on a monthly Basis. The groundwater and Indoor Air Quality (IAQ) results data are both reported annually, while the monthly performance data is reported quarterly in the Quarterly O&M Activity Report. Examples of the various project reports have been archived on an ftp website to facilitate document transfer. The website will be available for downloading documents until April 10, 2013, and all files posted on the website will be distributed to the NYSDEC on CD.

This Site Monitoring Plan briefly describes the program, while the detailed methods for sampling, sample locations, frequency of sampling, analytical methods, etc are described in the Uniform Federal Policy – Quality Assurance Work Plan (UFP-QAPP). The UFP-QAPP has been uploaded to an "ftp site and will be distributed to the NYSDEC on CD. The UFP-QAPP describes;

- Sampling and analysis of all media (groundwater and indoor air, and soil vapor);
- Assessing compliance with applicable USEPA and NYSDEC standards, criteria and guidance,
- Assessing achievement of the remedial performance criteria.
- Preparing the necessary reports for the various monitoring activities.
- Evaluating site information periodically to confirm that the remedy continues to be effective in protecting public health and the environment;

To adequately address these issues, the UFP-QAPP provides information on:

- Sampling locations, protocol, and frequency;
- Analytical sampling program requirements;
- Reporting requirements;
- Quality Assurance/Quality Control (QA/QC) requirements;
- Inspection and periodic Reports.

Routine monitoring of the performance of the remedy and overall reduction in contamination on-site has been conducted since system startup. As data trends were established, the monitoring program has been optimized to collect only relevant data to achieve the objectives of the monitoring plan. Initial monitoring of the system was performed on a quarterly basis, and was later reduced to a semi-annual frequency, and finally, to an annual frequency. The number of groundwater monitoring wells has also been reduced throughout the life of the remedial systems since startup, due to established and/or unchanging concentration trends. The frequency of monitoring in the future will be determined by NYSDEC. Trends in contaminant levels in air and groundwater in the affected areas are routinely evaluated to determine if the remedy continues to be effective in achieving remedial goals.

3.2 Indoor Air Quality Monitoring

Indoor air samples will be collected from buildings adjacent to the Stanton Cleaners site to evaluate indoor air quality. Samples will be collected annually during the groundwater monitoring well sampling event and sent to a lab for definitive analysis. Samples will be collected using passive air samplers (Summa canisters) equipped with a 24 hour control valve. Details of the sampling procedures are prescribed in the UFP-QAPP, while each sampling event completed is documented in a Trip Report and included with the analytical results of the sampling in the IAQ Reports. The IAQ Reports describe sampling locations, procedures and results.

3.3 Groundwater Monitoring

Monthly and annual monitoring of the performance of the remedy and overall reduction in contamination will be conducted. O&M performance sampling Water samples will be collected monthly. Water samples will be collected annually from groundwater monitoring wells to monitor the PCE contaminant plume. The samples will be analyzed for VOCs and natural attenuation parameters (methane, ethane, ethane, alkalinity, sulfide, total organic carbon, chloride, nitrate, and sulfate). Natural attenuation parameters will provide information on the natural degradation of VOCs at the Stanton Cleaners site. In the early 2000s, approximately 30 groundwater monitoring wells were sampled on a quarterly basis. As trends were established in the site-wide monitoring network, the groundwater monitoring program was optimized to focus on wells that showed impact from the site contamination, and/or exhibited concentrations that haven't stabilized. As of fall 2012, the groundwater monitoring program includes the sampling, analysis and reporting for 8 monitoring wells. Electronic copies of the Groundwater Data Summaries are available for download from the "ftp" site.

3.4 Operation and Maintenance Performance Assessment Monitoring

O&M performance assessment monitoring is completed monthly to assess the effectiveness of the groundwater treatment system (discharge compliance sampling) and the SVE system. Monitoring wells EPA-MW-21R and ST-MW-19 are sampled monthly to monitor concentrations near the two air sparge wells (EPA-AS-01 and MW-24, respectively). The influent and the effluent samples are collected monthly from sample ports inside the treatment building to assess the effectiveness of groundwater treatment and discharge compliance. Monthly samples are analyzed for VOCs.

Contaminant level trends in groundwater will be evaluated to determine if the remedy continues to be effective in achieving remedial goals. The sampling frequency may be modified, as appropriate.

3.4.1 Sampling Protocol

Sampling protocol for groundwater and indoor air follow USEPA procedures, and is detailed in the UFP-QAPP.

3.4.2 Monitoring Well Repairs and Decommissioning

Based on a review of the historical well data (Appendix B), including concentration trends, water levels, and the potential for future monitoring needs, six USEPA-installed wells were abandoned (or were confirmed destroyed) in September 2012, as follows;

- EPA-MW-22 (shallow well) – abandoned 9/11/12.
- EPA-MW-31 (shallow well) – abandoned 9/11/12.
- EPA-MW-33(shallow well) – abandoned 9/11/12.
- EPA-MW-25 (intermediate well) – well not found in former tennis court area that has been bulldozed and graded. Assumed to have been destroyed.
- EPA-MW-30 (intermediate well) – Well appeared to have been paved over in street.
- EPA-MW-32 (intermediate well) – abandoned 9/11/12.

Wells abandoned on 9/11/12 were done so in accordance with NYSDEC's "CP-43: Groundwater Monitoring Well Decommissioning Policy".

3.5 Site-Wide Inspection

Site-wide inspections will be performed on a regular schedule at a minimum of once per year. Site-wide inspections will also be performed after all severe weather conditions that may affect Engineering Controls or monitoring devices. During these inspections, the following will be assessed and documented:

- An evaluation of the condition and continued effectiveness of the remediation systems
- General site conditions at the time of the inspection;
- Compliance with schedules included in the Operation and Maintenance Plan; and
- Confirm that site records are up to date.
- The site management activities being conducted including, where appropriate, confirmation sampling and a health and safety inspection;

3.6 Monitoring Quality Assurance/Quality Control

A UFP-QAPP for the site has been prepared for the site. A copy is provided on the "ftp" site, and on CD.

3.7 Monitoring Reporting Requirements

Quarterly O&M Activity Reports will contain a compilation of data collected during that quarter including: sampling trip reports from groundwater system sampling, air sparge system sampling, SVE air monitoring , water level measurement tables, daily quality control reports of site activities, groundwater treatment system operational data, analytical data, and any other relevant treatment system operational information. Annual indoor air sampling trip reports and groundwater sampling trip reports will be appended to the quarterly O&M report in which they occurred.

4.0 OPERATION AND MAINTENANCE PLAN

4.1 Introduction

An O&M Manual, which describes the measures necessary to operate and maintain all the mechanical components at the Site, was prepared and has been submitted under separate cover. A copy of the detailed O&M Manual will be maintained at the site for the plant operators' reference.

4.2 Engineering Control System Operation and Maintenance

The O&M Manual specifies detailed operator instructions regarding the maintenance, monitoring, testing and record keeping of the groundwater treatment system, SVE system and PLC system.

4.2.1 System Operation: Routine Operation Procedures

The procedures to startup and shut down the facility treatment systems are provided in the O&M Manual. The Operator will conduct formal periodic inspections of conditions at the Stanton Cleaners Site, and will make a record of these inspections. An Operation and Maintenance Inspection Form is provided in the O&M Manual and provides a "to-do list" of maintenance, operation, and monitoring activities, as well as creating a record that the activities were successfully completed. Equipment manufacturers' operation and maintenance information is included in Volume III of the O&M Manual. The inspection and maintenance schedules presented in Tab B were developed from the manufacturers' information. When in doubt the Operator should refer back to the manufacturer's information in the Volume III of the O&M Manual.

4.2.2 System Operation: Routine Equipment Maintenance

The Maintenance Requirements and Records templates are included in the O&M Manual. All process equipment, including tanks shall be maintained in accordance with manufacturer's instructions (in the Volume III of the O&M Manual). In general, the Operator will follow the following general procedures when performing maintenance of any piece of process equipment:

- Make sure that the equipment is turned off and that the Lockout/Tagout procedures are followed;
- Pressure (hydraulic and pneumatic) must be released before opening a valve or fitting; and
- All staff must be fully trained and wear appropriate personal protective equipment when working on equipment containing hazardous chemicals.

4.2.2.1 Rotating and Reciprocating Equipment

Rotating equipment in the treatment building includes centrifugal pumps, and compressors. All of these pieces of equipment should be:

- Observed during the regular operator visits (weekly/bi-weekly or monthly depending on manufacturer) for leaks, noise, misalignment and vibration; and
- Maintained in accordance with schedule based on supplier's recommendations (O&M Manual Volume III).

The observation and maintenance results (including date, time, person, and any adjustments) will be noted by the Operator in the Operations log. In addition, all motors will be maintained according to the motor manufacturer in the Volume III of the O&M Manual.

4.2.2.2 Tanks

Tanks will be visually inspected for physical damage monthly. All connections to the tank (i.e. valves, hoses and other fittings) will also be inspected monthly for signs of wear and tear.

4.2.2.3 SVE Heat Exchanger

The heat exchanger will be visually inspected for structural stability and air leaks weekly. The manufacturer's operation and maintenance manual is located in the Volume III of the O&M Manual.

4.2.2.4 SVE Blowers

The SVE blowers will be greased once a week. For more details on the type of grease and location of the grease fittings refer to the manufacturer's operation and maintenance manual located in the Volume III of the O&M Manual.

4.2.2.5 Carbon Vessels and Carbon

Minimal maintenance is anticipated on the carbon vessels as they contain no moving parts or wearing surfaces. The piping layout connecting the SVE unit to the carbon vessels and also the connecting the carbon vessels to each other and to the exhaust stack will be inspected once a month for air leaks and deformations due to high temperatures. The coatings and paint on the vessels will be maintained and refinished if significant rusting occurs. The carbon media contained within the vessel will be replaced as necessary. The replacement frequency will be determined by identification of breakthrough times. Based on operational history, the VPGAC will typically last more than one year. "Spent" carbon will be handled according to local, state and federal regulations; typically removed and regenerated for use elsewhere by the carbon vendor.

The liquid-phase GAC unit contains 3,000 pounds of activated carbon. The liquid-phase GAC units are not equipped with piping and valves to allow carbon backwash if required. This quantity of carbon fills each vessel to within 15 inches or less of the vessel top which does not provide sufficient headspace for adequate bed expansion to clean the filters during a backwash. In addition, operation experience has demonstrated the solids loading to the carbon is sufficiently low and does not cause head loss across the units that would inhibit flow. For these two reasons, it is not recommended that the liquid-phase GAC units be backwashed.

The following procedures will be used when changing out the liquid-phase and vapor-phase carbon units:

Liquid-phase carbon

The following steps describe the liquid phase carbon change out procedure:

- Shut down the groundwater extraction and treatment system.
- Remove the vessel's lid.
- Open the valve that is piped to the bottom of the vessel, to drain the water. Allow to drain.
- Replace carbon according to manufacturer's recommendations.
- Fill the liquid carbon unit with potable water and allow it to sit for 24 hours. (i.e., do not restart system for 24 hours).
- Manage spent carbon.

Vapor-phase carbon

The following steps describe the vapor phase carbon change out procedure:

- Shut down the soil vapor extraction system.
- Remove the vessel lids.
- Replace carbon in the original primary unit in accordance with manufacturer's recommendations.
- Manage spent carbon.

4.2.2.6 Piping and Valves

All above grade piping will be visually inspected weekly for leaks, cracks or other evidence of failure. The inspection will focus on areas of concern including joints, seals and connections. All valves will be opened and closed once a year to prevent rigidity from occurring.

4.2.2.7 Gauges

Temperature and pressure gauges require minimal maintenance. Two types of pressure gauges are present: pressure gauges and differential pressure Magnehelic gauges. The Magnehelic gauge pressure lines should be occasionally disconnected to vent both sides and re-zero the gauges.

The system also includes pH meters, flow meters, pressure and water level transducers, tank depth gauges, and float switches that do not have a scheduled maintenance interval, but should be serviced and/or calibrated, as needed, to ensure accurate data collection. For example, there will be historical data in the Supervisory Control and Data Acquisition (SCADA) system to compare against; therefore, a radical change in readings could indicate that gauges and instruments are in need of maintenance.

4.2.2.8 Supervisory Control and Data Acquisition (SCADA) System

The groundwater extraction and soil vapor extraction systems are controlled and operated by the SCADA. The treatment system will be monitored remotely periodically via a cable connection. A data logger incorporated with the SCADA system is used to store and extract data, such as flow, water levels etc. The extracted data will help to monitor the treatment system performance. In addition to remote monitoring, site visits will be conducted by a technician on a weekly/bi-weekly basis. On each site visit, an O&M checklist will be filled out and stored on-site.

Minimal maintenance is expected for the SCADA system. The data will be copied and backed up on a monthly basis. A professional in SCADA programming will perform diagnostics in the event of a malfunction. The O&M documentation is kept on the hard drive (i.e. desktop) of the control room computer and is in Volume III of the O&M Manual.

4.3 Engineering Control System Performance Monitoring

4.3.1 Monitoring Schedule

The schedule for system monitoring (sampling) activities is presented in the June 2010 UFP QAPP for the Stanton Cleaners Site.

4.3.2 Sampling Quality Assurance Project Plan

The sampling activities are performed in accordance with the June 2010 UFP QAPP for the Stanton Cleaners Site. The UFP-QAPP is included in the O&M Manual as an attachment. The UFP QAPP addresses the following:

- Data use objectives
- Quality assurance objectives
- Sampling program
- Sample designation
- Analytical program
- Evaluation of monitoring results
- Records
- Quality Assurance Project Plan
- Monitoring well sampling
- Indoor air sampling

4.3.3 Monitoring Tasks

4.3.3.1 Groundwater Samples

Groundwater monitoring wells are sampled quarterly for Target Compound List (TCL) VOCs, nitrate, sulfate, sulfide, methane, ethane, ethene, alkalinity, chloride, and total organic carbon. This quarterly sampling event will to be conducted in accordance with the USEPA approved low-flow groundwater sampling procedures, which are available on-line at www.epa.gov/ahaazvuc/download/issue/lwflw2a.pdf. Prior to collecting the samples, water levels in all the monitoring wells must be measured and the level

data recorded on the appropriate Field Sampling Forms and in the Field Logbook.

4.3.3.2 Groundwater Treatment System Samples

Sampling for system performance monitoring, and operation and maintenance monitoring will be performed once every month as per the permit equivalency requirements. The samples will be collected from the combined water influent line to the GWT system and the treated water effluent line from the GWT system. Additional samples (i.e. individual extraction wells) may be collected at the discretion of the Project Manager. The influent and effluent samples will be sent to the contracted analytical laboratory for analysis of Target Compound List VOCs.

4.3.3.3 Soil Vapor Extraction and Treatment System Samples

The SVE system will be monitored at individual SVE wells, sub-slab system sampling ports, and key SVE system process ports (see Figure 5-2, SVE System Monitoring Ports, in the UFP-QAPP). These sample locations were chosen to monitor the concentration of the COCs present in the system and to aid in the operation and maintenance of the SVE system. Monitoring will follow the details outlined in the "Soil Vapor Extraction and Groundwater Extraction Treatment System Operations and Maintenance (O&M) Manual". Equipment used for screening analyses will include a PID and a hand held hotwire anemometer.

4.3.3.4 Indoor Air Quality Samples

The Indoor Air Quality Samples are collected once every year at the following locations:

- USEPA Groundwater Treatment Building (1st floor office and 2nd floor control panel room);
- Long Island Hebrew Academy (ground-floor, roof, and 1st floor lobby);
- Century Condominium Complex (lowest parking garage level); and
- Ambient sample.

These indoor air samples are sent to the contracted analytical laboratory for analysis of TCL VOCs.

4.4 Maintenance and Performance Monitoring Reporting Requirements

Quarterly O&M Activity Reports will contain a compilation of data collected during that quarter including: sampling trip reports from groundwater system sampling; air sparge system sampling; SVE air monitoring; water level measurement tables; daily quality control reports of site activities; groundwater treatment system operational data; analytical data; and any other relevant treatment system operational information.

Duties for the operator include:

- System monitoring and associated reports;
- Instrumentation calibration and maintenance;
- Pump and site equipment maintenance; and
- Sample collection for laboratory analysis.

5.0 INSPECTIONS, REPORTING AND CERTIFICATIONS

5.1 Site Inspections

Periodic inspections are recommended to ensure the plant is running properly, and the required health and safety and quality control measures are in place and functioning. Throughout the transition and when first learning how to operate the plant, a minimum of weekly visits and daily remote inspections via online software is recommended. Monthly or quarterly compliance checks for health and safety and quality control are recommended.

5.1.1 Inspection Frequency

Routine O&M inspections are recommended to take place on at least a monthly basis.

5.1.2 Inspection Forms, Sampling Data, and Maintenance Reports

Inspection forms for routine O&M monitoring are provided in the O&M Manual. Sampling data is available in the various reports archived on the "ftp" site. Maintenance Reports are documented in the quarterly O&M Activity Reports and in Monthly Progress Meeting minutes.

5.1.3 Evaluation of Records and Reporting

Analytical results from the monthly O&M performance sampling will be reviewed upon receipt from the laboratory to ensure discharge compliance and to evaluate treatment efficiency.

Analytical results from the groundwater and IAQ sampling will be evaluated at the same frequency as samples collected to evaluate overall progress of the remediation system and to re-assess the extent on the impacted groundwater plume, and to monitor indoor air quality at the locations sampled.

5.2 Periodic Review Report

A CERCLA 121.C 5-year Review was completed in October 2011, and is available from the USEPA Remedial Project Manager (RPM) or the Information Repository.

6.0 REFERENCES

Dvirka and Bartilucci Consulting Engineers, November 1998. *Remedial Investigation and Feasibility Report, Stanton Cleaners Site, Great Neck, Nassau County, New York.* Woodbury, New York.

Dvirka and Bartilucci Consulting Engineers, January 1999. *Focused Feasibility Study and Interim Remedial Measure/Presumptive Remedy Selection, Stanton Cleaners Area Groundwater Contamination Site, Operable Unit* 1.

Earth Tech, Inc., July 10, 2002. *U.S. EPA Region II Removal Action: Underground Storage Tank Closure Report – Final, Stanton Cleaners Area Groundwater Contamination Site.*

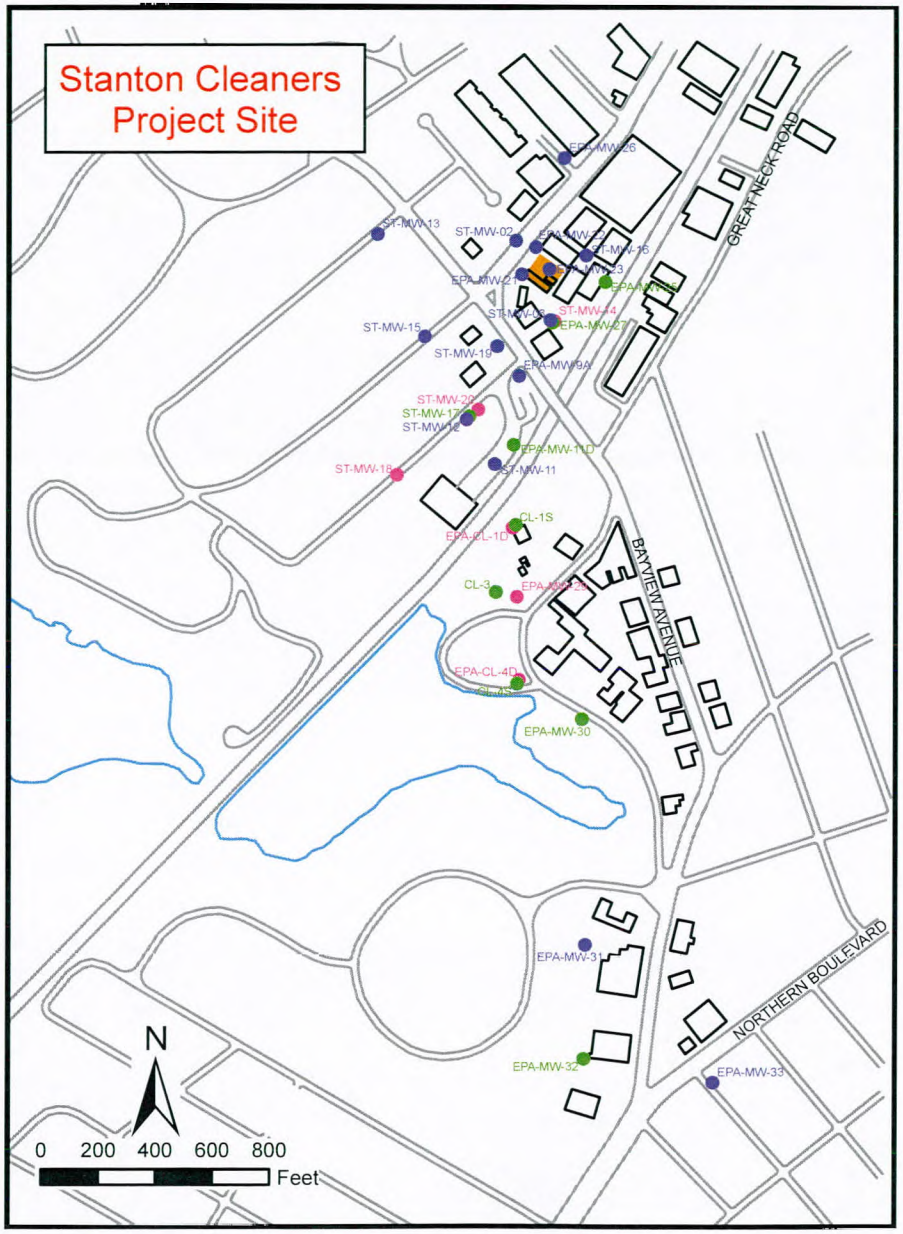
Earth Tech, Inc., July 23, 2002. *U.S. EPA Region II Removal & Remedial Action: Indoor Air Quality Summary Report – Final Draft, Stanton Cleaners Area Groundwater Contamination Site.*

Earth Tech, Inc., August 2002. *Soil Vapor Extraction System Pre-Closure Report, Stanton Cleaners Site.*

Earth Tech, Inc., February 2003. *Draft Operable Unit-2 Summary Report, Stanton Cleaners Area Groundwater Contamination Site.* (Currently in review – final expected June 2003).

U. S. EPA Region II. March 31, 1999. *Record of Decision (ROD) for Stanton Cleaners Area Groundwater Contamination.* EPA/541/R-99/124.

FIGURES



Legend

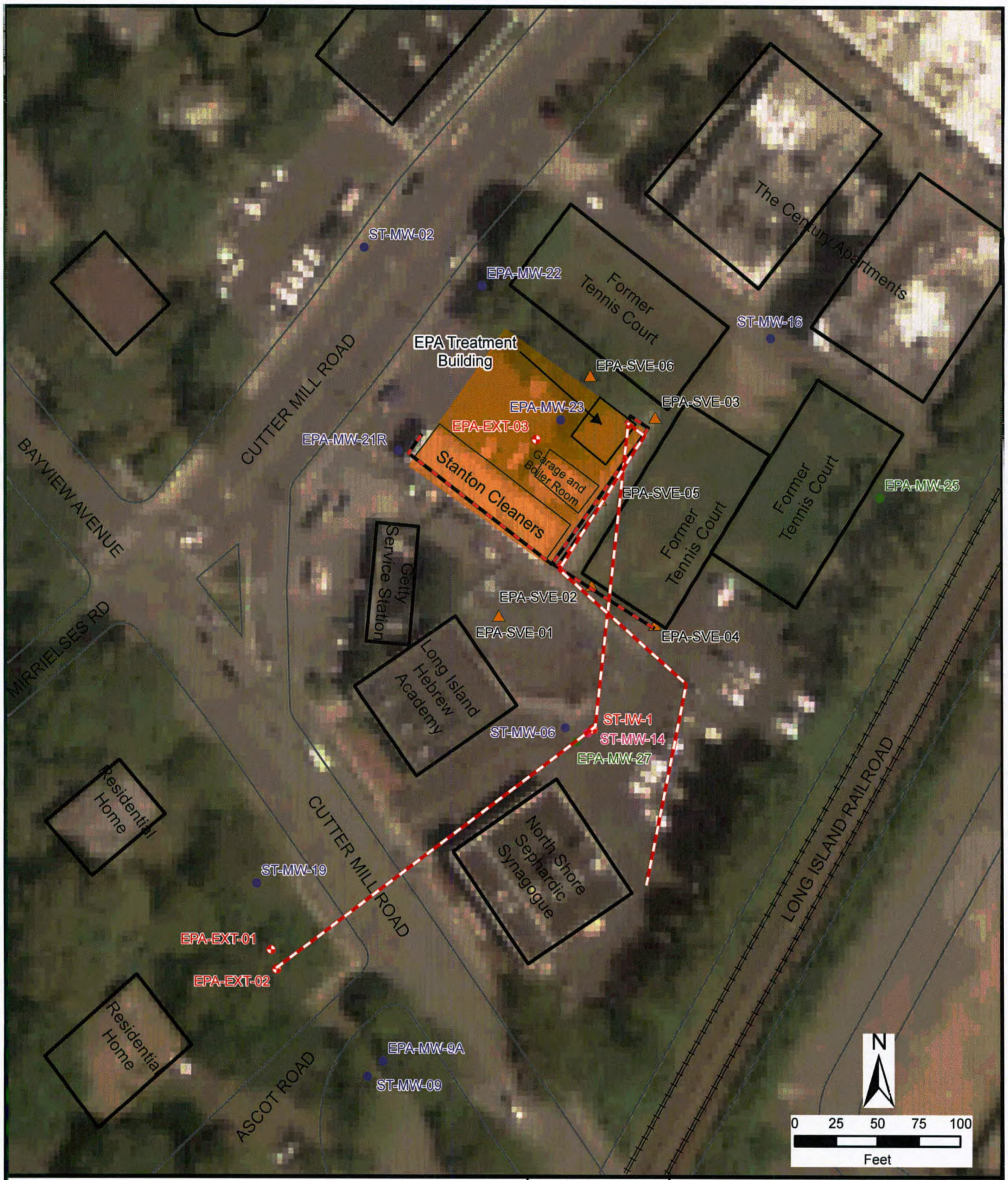
- Shallow Monitoring Well
- Intermediate Monitoring Well
- Deep Monitoring Well
- Water
- Roads
- Buildings
- Stanton Cleaners Property

ECC
1125 Route 22 West
Bridgewater, NJ 08807

STANTON CLEANERS, GREAT NECK, NEW YORK

FIGURE 1
SITE LOCATION MAP

Drawn by: M Johanson	Reviewed by:	Projection: North American Datum 1983 State Plane New York Long Island, FIPS 3104 Units: Feet
Date: 8/30/2012	Date:	
Version:	Revision Date / Initials:	



Legend

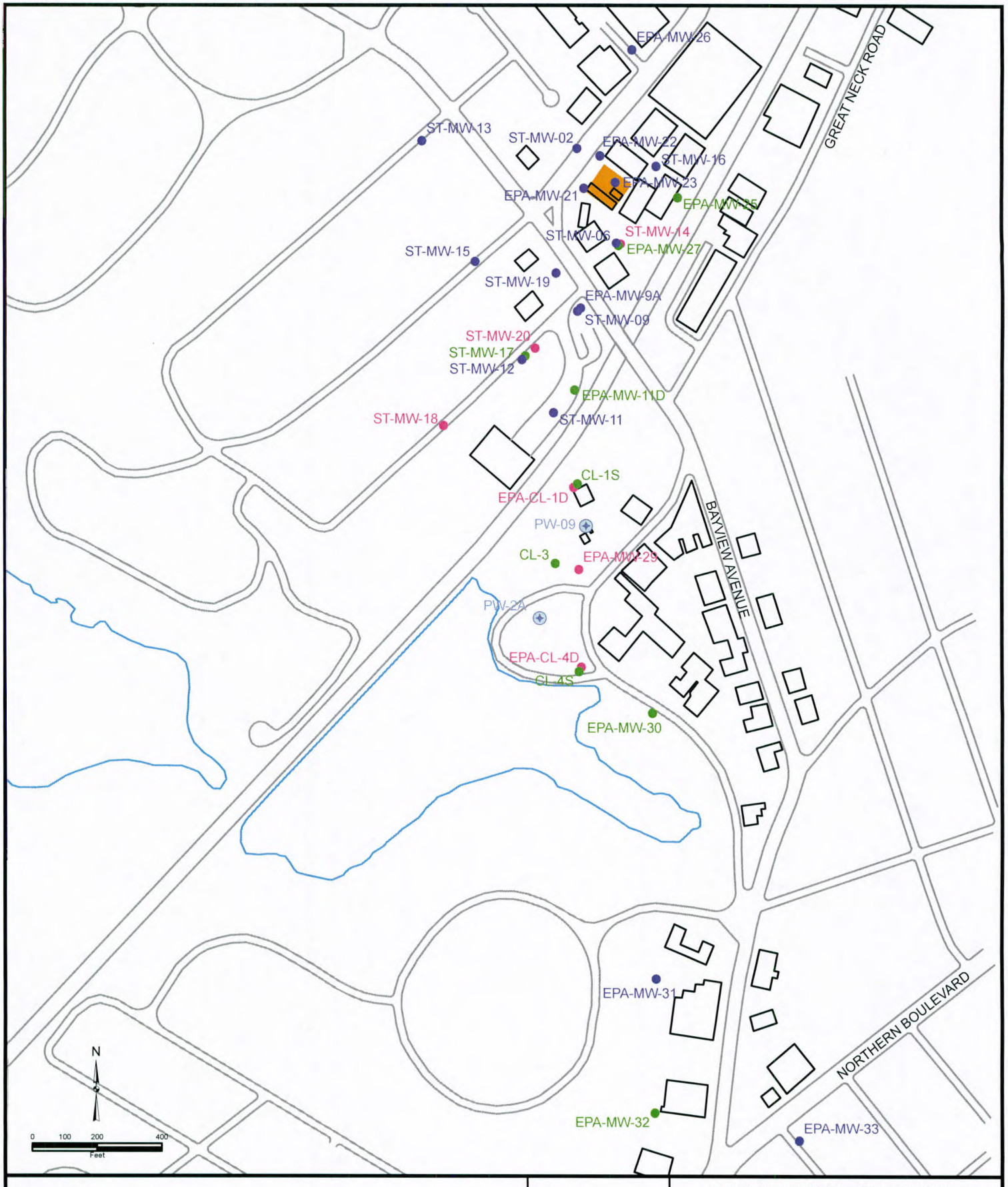
- Buildings
- Stanton Cleaners Property
- Shallow Monitoring Well
- Intermediate Monitoring Well
- Deep Monitoring Well
- SVE Extraction Wells
- EPA Extraction Wells
- SVE System Suction Line
- Groundwater Treatment System Influent Line

ECC
1125 Route 22 West
Bridgewater, NJ 08807

STANTON CLEANERS, GREAT NECK, NEW YORK

FIGURE 2
SITE LAYOUT

Drawn by: M Johanson	Reviewed by: D Miller	Projection: North American Datum 1983 State Plane New York Long Island, FIPS 3104 Units: Feet
Date: 9/3/2012	Date: 9/18/2012	
Version:	Revision Date / Initials: 9/19/2012 MGJ	



Legend

- Shallow Monitoring Well
- Intermediate Monitoring Well
- Deep Monitoring Well
- Public Supply Well
- Water
- Roads
- Buildings
- Stanton Cleaners Property

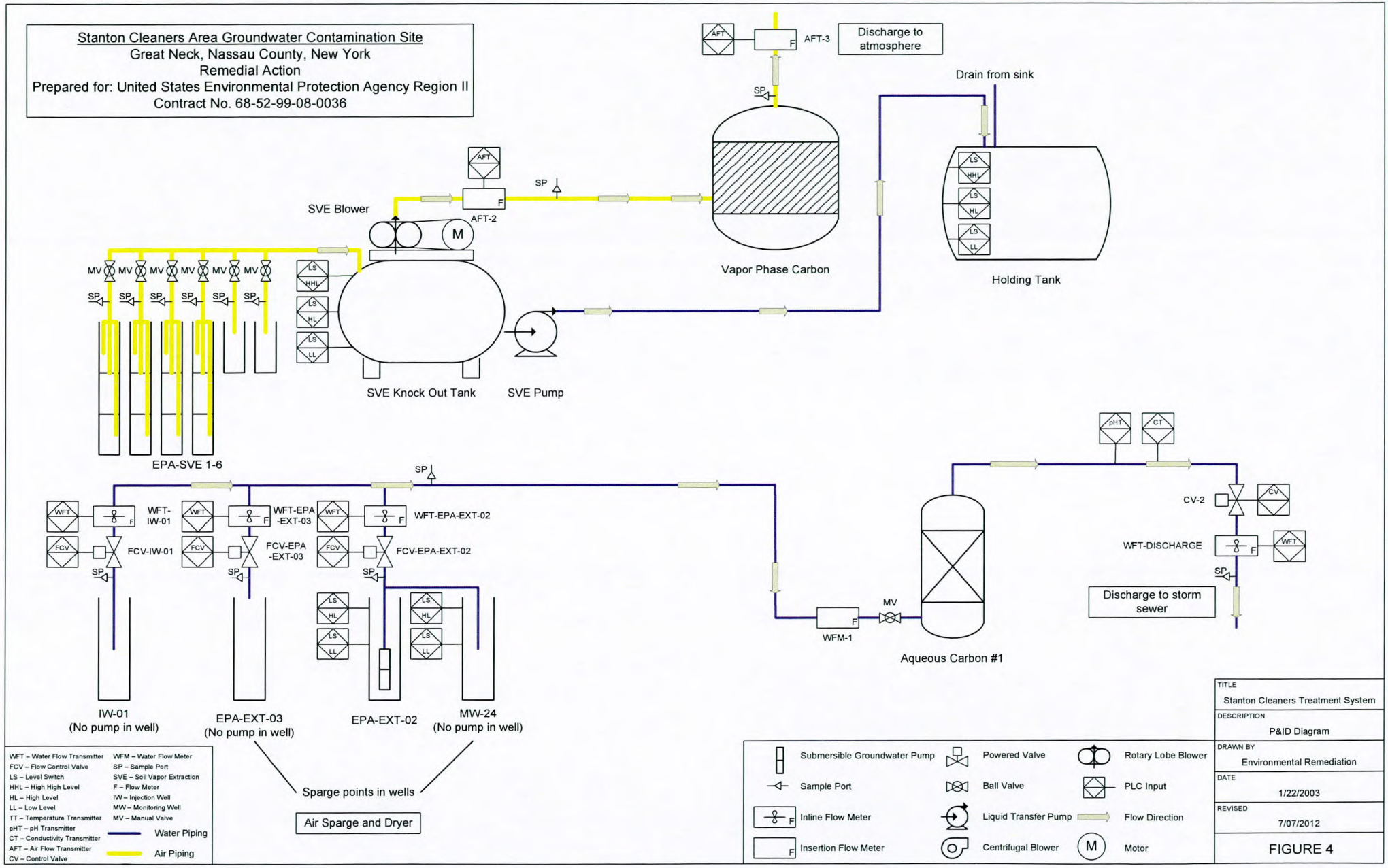
ECC
1125 Route 22 West
Bridgewater, NJ 08807

STANTON CLEANERS, GREAT NECK, NEW YORK

FIGURE 3
SITE LAYOUT WITH MONITORING WELL NETWORK

Drawn by: M Johanson	Reviewed by:	Projection: North American Datum 1983 State Plane New York Long Island, FIPS 3104 Units: Feet
Date: 7/28/2011	Date:	
Version:	Revision Date / Initials:	

Stanton Cleaners Area Groundwater Contamination Site
Great Neck, Nassau County, New York
Remedial Action
Prepared for: United States Environmental Protection Agency Region II
Contract No. 68-52-99-08-0036



WFT – Water Flow Transmitter
FCV – Flow Control Valve
LS – Level Switch
HHL – High High Level
HL – High Level
LL – Low Level
TT – Temperature Transmitter
pHT – pH Transmitter
CT – Conductivity Transmitter
AFT – Air Flow Transmitter
CV – Control Valve
WFM – Water Flow Meter
SP – Sample Port
SVE – Soil Vapor Extraction
F – Flow Meter
IW – Injection Well
MW – Monitoring Well
MV – Manual Valve
Water Piping
Air Piping

Submersible Groundwater Pump
Sample Port
Inline Flow Meter
Insertion Flow Meter
Powered Valve
Ball Valve
Liquid Transfer Pump
Centrifugal Blower
Rotary Lobe Blower
PLC Input
Flow Direction
Motor

TITLE	Stanton Cleaners Treatment System
DESCRIPTION	P&ID Diagram
DRAWN BY	Environmental Remediation
DATE	1/22/2003
REVISED	7/07/2012

FIGURE 4

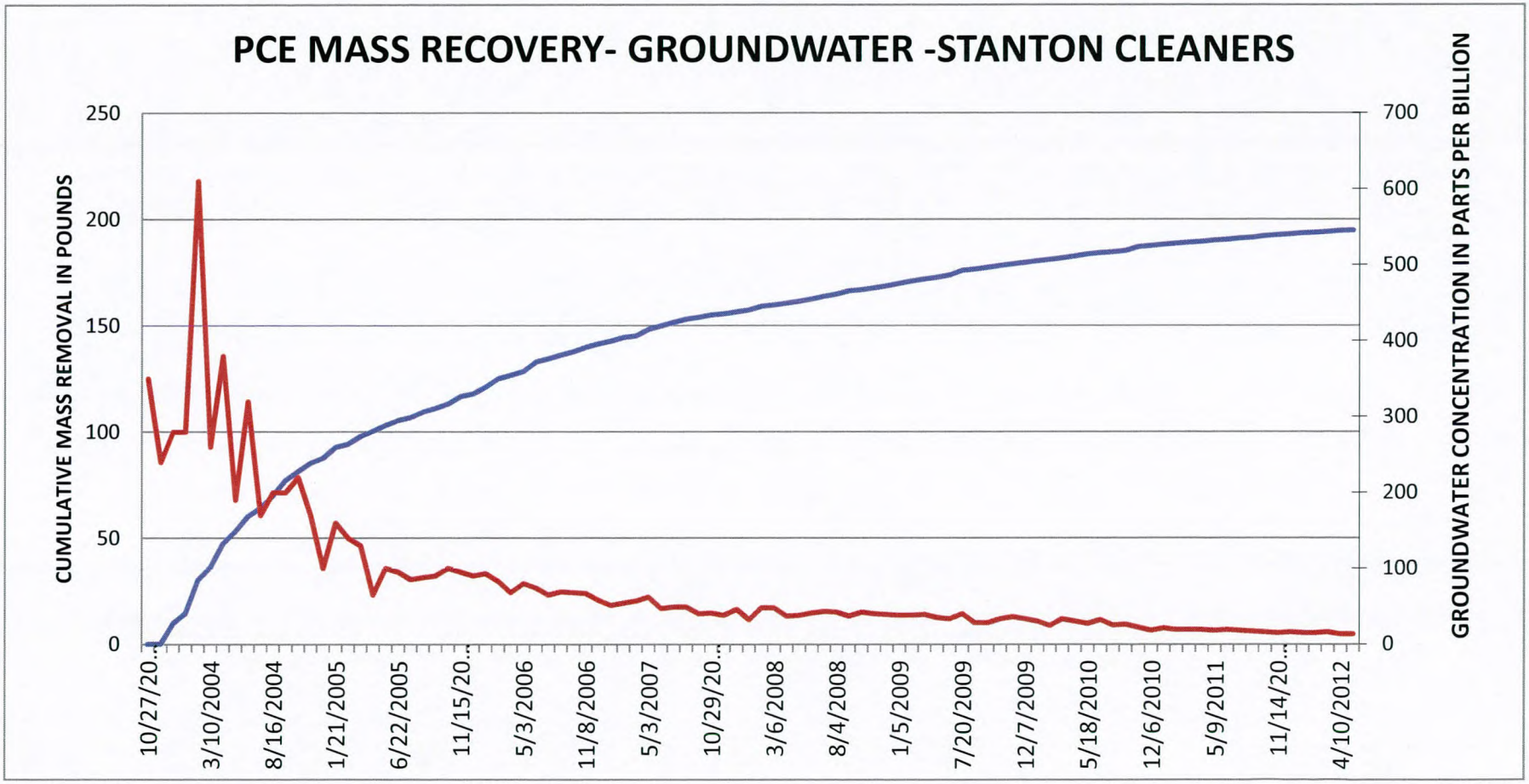


FIGURE 5 Mass Removal by Groundwater Pumping and Treatment

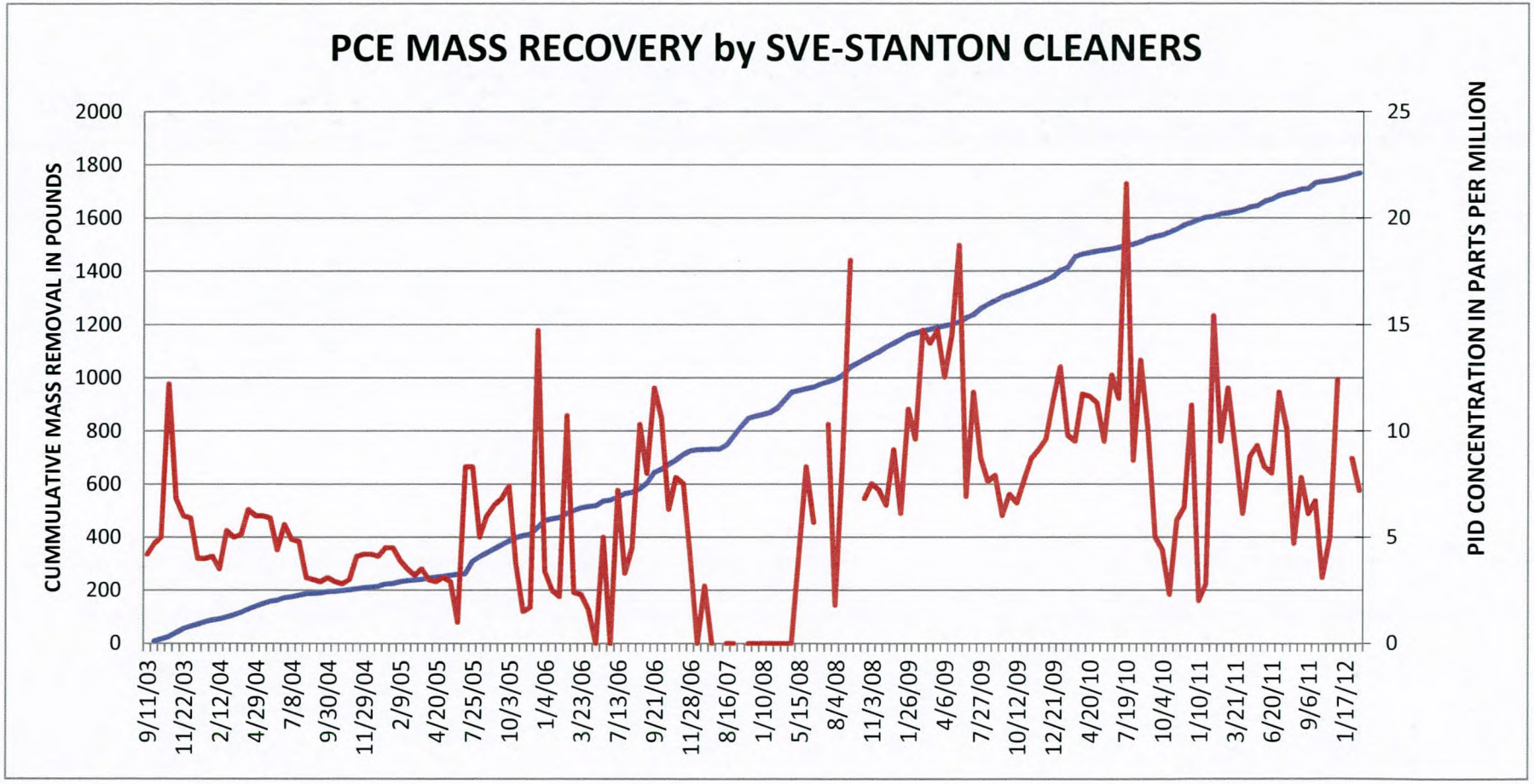


FIGURE 6 Mass Removal by SVE

APPENDICES

Appendix A

Equipment List

EQUIPMENT LIST,
GOVERNMENT PROPERTY TRACKING NUMBERS
AND MAINTENANCE REQUIREMENTS
Stanton Cleaners Area Groundwater Contamination Site

EQUIPMENT DESCRIPTION	EQUIPMENT LABEL	MANUFACTURER	GOVERNMENT TRACKING NUMBER	MAINTENANCE REQUIREMENTS	MAINTENANCE FREQUENCY
Recovery Well Pump Motors		Franklin	001365, 001366, 001367	Appendix C	As needed to maintain proper operation.
Recovery Well Pumps	RWPMP	Teel	001365, 001366, 001367	Appendix C	As needed to maintain proper operation.
Recovery Well Motor Start Boxes		Franklin	001365, 001366, 001367	Appendix C	As needed to maintain proper operation.
Recovery Well Liquid Level Switches	RWHL, RWLL	McMaster-Carr	No tracking number assigned	Appendix C	As needed to maintain proper operation.
Recovery Well Sediment Strainers		Asahi-America	No tracking number assigned	Appendix D	As needed to maintain proper operation.
Flow Control Valve - Actuators	FCV	Asahi-America	001140	Appendix D	As needed to maintain proper operation.
Flow Control Valve - Valves		Asahi-America	001141	Appendix D	As needed to maintain proper operation.
Water Flow Meters	WFT	Niagara	001193, 001207, 001208	Appendix E	As needed to maintain proper operation.
Water Flow Meter Infrared Sensors		Niagara	Recycled from other system, no tracking assigned	Appendix E	As needed to maintain proper operation.
Water Flow Meter Pulse to DC Converters		Niagara	Recycled from other system, no tracking assigned	Appendix E	As needed to maintain proper operation.
Influent pH Sensors	INFPH	ABB	001139	Appendix F Section 2	As needed to maintain proper operation.
Influent pH Transmitters	INFPH	TBI Bailey - ABB	001137	Appendix F Section 1	As needed to maintain proper operation.
Influent Conductivity Sensors	INFCOND	ABB	001181	Appendix F Section 2	As needed to maintain proper operation.
Influent Conductivity Transmitters	INFCOND	TBI Bailey - ABB	001138	Appendix F Section 1	As needed to maintain proper operation.
Air Stripper pH Sensor	ASPH	ABB	001223	Appendix F Section 2	As needed to maintain proper operation.
Air Stripper pH Transmitter	ASPH	TBI Bailey - ABB	001137	Appendix F Section 1	As needed to maintain proper operation.
~~Air Stripper~~	~~AIRSTRIPPER~~	~~NEEP/ShallowTray~~	~~Recycled from other system, no tracking assigned~~	~~Appendix G Section 1~~	~~As needed to maintain proper operation.~~
~~Temperature Transmitter~~	~~ASTEMP~~	~~Telmar~~	~~Recycled from other system, no tracking assigned~~	~~Appendix G Section 4~~	~~As needed to maintain proper operation.~~
~~Liquid Level Switches~~	~~ASHHL, ASHL, ASLL~~	~~McMaster-Carr~~	~~No tracking number assigned~~	~~Appendix C~~	~~As needed to maintain proper operation.~~
~~Air Stripper Pump Motor~~		~~US Motors~~	~~001363~~	~~Appendix G Section 3~~	~~As needed to maintain proper operation.~~
~~Air Stripper Pump~~	~~ASPMP~~	~~Flowserve~~	~~Recycled from other system, no tracking assigned~~	~~Appendix G Section 2~~	~~As needed to maintain proper operation.~~
~~Air Stripper Pump Ball Valve~~		~~Watts Regulator~~	~~Recycled from other system, no tracking assigned~~	~~Appendix G Section 5~~	~~As needed to maintain proper operation.~~
~~Air Stripper Pump Flow Meter~~		~~Erdco~~	~~001191~~	~~Appendix G Section 6~~	~~As needed to maintain proper operation.~~
~~Air Stripper Blower Motor~~		~~Baldor~~	~~001129~~	~~Appendix G Section 3~~	~~As needed to maintain proper operation.~~
~~Air Stripper Blower~~	~~ASBLR~~	~~New York Blower~~	~~001129~~	~~Appendix G Section 2~~	~~As needed to maintain proper operation.~~
~~Butterfly Valve~~		~~Mastergear/Spears~~	~~No tracking number assigned~~	~~Appendix G Section 5~~	~~As needed to maintain proper operation.~~
~~Air Flow Transducer~~	~~ASBLRFLOW~~	~~Dwyer~~	~~001179~~	~~Appendix G Section 4~~	~~As indicated by visual inspection.~~
~~Pressure Transducer~~	~~ASBLRPRESS~~	~~Dwyer~~	~~001142~~	~~Appendix G Section 4~~	~~As needed to maintain proper operation.~~
Vapor Phase Carbon Adsorber Vessel		Envirotrol	001135	Appendix H Section 1	Interior visual inspection every 6 months
Vapor Phase Carbon		Envirotrol	item is spent egurlarly and has no assigned #	Appendix H Section 1	Replace once every 6 months
Aqueous Phase Carbon Adsorber Vessel		Structural	Recycled from other system, no tracking assigned	Appendix H Section 2	Interior visual inspection every 6 months
Aqueous Phase Carbon		General Carbon	item is spent egurlarly and has no assigned #	Appendix H Section 2	Replace once every 6 months
Discharge Valve - Actuator	DISCHVALVE	Asahi-America	Recycled from other system, no tracking assigned	Appendix D	As needed to maintain proper operation.
Discharge Valve - Valve		Asahi-America	Recycled from other system, no tracking assigned	Appendix D	As needed to maintain proper operation.
Recirculation Valve - Actuator	RECIRCVALVE	Asahi-America	Recycled from other system, no tracking assigned	Appendix D	As needed to maintain proper operation.
Recirculation Valve - Valve		Asahi-America	Recycled from other system, no tracking assigned	Appendix D	As needed to maintain proper operation.
Discharge Water Flow Meter	DISCHFLOW	Niagara	001144	Appendix E	As needed to maintain proper operation.
Discharge Flow Meter Infrared Sensor		Niagara	Recycled from other system, no tracking assigned	Appendix E	As needed to maintain proper operation.
Dishcharge Flow Meter Pulse to DC Converter		Niagara	Recycled from other system, no tracking assigned	Appendix E	As needed to maintain proper operation.

EARTH TECH
A Tyco Infrastructure Services Company

EQUIPMENT LIST,
GOVERNMENT PROPERTY TRACKING NUMBERS
AND MAINTENANCE REQUIREMENTS
Stanton Cleaners Area Groundwater Contamination Site

EQUIPMENT DESCRIPTION	EQUIPMENT LABEL	MANUFACTURER	GOVERNMENT TRACKING NUMBER	MAINTENANCE REQUIREMENTS	MAINTENANCE FREQUENCY
Holding Tank	HOLDTANK	Chem-tainer	001209	Appendix J Section 1	As needed to maintain proper operation.
Holding Tank Liquid Level Switches	HOLDHHL, HOLDHL, HOLDLL	McMaster-Carr	Recycled from other system, no tracking assigned	Appendix C	As needed to maintain proper operation.
Holding Tank Transfer Pump Motor			Recycled from other system, no tracking assigned	Appendx J Section 2	As needed to maintain proper operation.
Holding Tank Transfer Pump	HOLDPMP		Recycled from other system, no tracking assigned	Appendx J Section 2	As needed to maintain proper operation.
SVE Knockout Tank		Air Components	Recycled from other system, no tracking assigned	Appendix I Section 1	As needed to maintain proper operation.
SVE Blower Motor			Recycled from other system, no tracking assigned	Appendix I Section 2	As needed to maintain proper operation.
SVE Blower	SVBLR	Sutorbilt	001226	Appendix I Section 2	As needed to maintain proper operation.
Silencer			001224	Appendix I Section 1	As needed to maintain proper operation.
Filter			Recycled from other system, no tracking assigned	Appendix I Section 1	As needed based on visual observations.
Liquid Level Switches	SVHHL, SVHL, SVLL	McMaster-Carr/	No tracking number assigned	Appendix C	As needed to maintain proper operation.
SVE Transfer Pump Motor			Recycled from other system, no tracking assigned	Appendix I Section 2	As needed to maintain proper operation.
SVE Transfer Pump	SVPMP		Recycled from other system, no tracking assigned	Appendix I Section 2	As needed to maintain proper operation.
Vacuum Transducer	SVVAC	Dwyer	001195	Appendix I Section 3	As needed to maintain proper operation.
Butterfly Valve		Spears	No tracking number assigned	Appendix G Section 5	As needed to maintain proper operation.
Air Flow Transducer	SVBLRFLOW	Dwyer	Recycled from other system, no tracking assigned	Appendix I Section 3	As needed to maintain proper operation.
Control Panel Enclosure		Hoffman	No tracking number assigned	Appendix K Section 1	Not required
Three Phase Disconnect		Sprecher&Schuh	No tracking number assigned	Appendix K Section 2	As needed to maintain proper operation.
Three Phase Disconnect Handle		Sprecher&Schuh	No tracking number assigned	Appendix K Section 2	As needed to maintain proper operation.
Transformer		Cutler-Hammer	No tracking number assigned	Appendix K Section 3	As needed to maintain proper operation.
Fuse Blocks		Automationdirect	No tracking number assigned	Appendix K Section 1	As needed to maintain proper operation.
Fuses			No tracking number assigned	Appendix K Section 1	As needed to maintain proper operation.
Manual Motor Starters		Sprecher&Schuh	No tracking number assigned	Appendix K Section 7	As needed to maintain proper operation.
Motor Contactors		Sprecher&Schuh	No tracking number assigned	Appendix K Section 6	As needed to maintain proper operation.
Terminals		Automationdirect	No tracking number assigned	Appendix K Section 1	As needed to maintain proper operation.
Ground Terminals		Automationdirect	No tracking number assigned	Appendix K Section 1	As needed to maintain proper operation.
Din Rail		Automationdirect	No tracking number assigned	Appendix K Section 1	Not required
PLC Rack		Automationdirect	No tracking number assigned	No routine maintenance requirements.	As needed to maintain proper operation.
PLC Processor		Automationdirect	No tracking number assigned	Appendix K Section 4	As needed to maintain proper operation.
PLC Analog Input Card		Automationdirect	No tracking number assigned	Appendix K Section 4	As needed to maintain proper operation.
PLC Analog Output Card		Automationdirect	No tracking number assigned	Appendix K Section 4	As needed to maintain proper operation.
PLC Low Voltage Input Card		Automationdirect	No tracking number assigned	Appendix K Section 4	As needed to maintain proper operation.
PLC High Voltage Input Card		Automationdirect	No tracking number assigned	Appendix K Section 4	As needed to maintain proper operation.
PLC Relay Output Card		Automationdirect	No tracking number assigned	Appendix K Section 4	As needed to maintain proper operation.
PLC Remote I/O Card		Automationdirect	No tracking number assigned	Appendix K Section 5	As needed to maintain proper operation.
Intrinsic Barriers		Pepperl&Fuchs	No tracking number assigned	No routine maintenance requirements.	As needed to maintain proper operation.
24VDC Power Supplies		Automationdirect	No tracking number assigned	Appendix K Section 8	As needed to maintain proper operation.
Panel Mount PC		Automationdirect	No tracking number assigned	Appendix K Section 11	As needed to maintain proper operation.
Panel Mount PC Monitor		Automationdirect	No tracking number assigned	Appendix K Section 9	As needed to maintain proper operation.
Three Position Selector Switch		Sprecher&Schuh	No tracking number assigned	No routine maintenance requirements.	As needed to maintain proper operation.
Push Button Switch		Sprecher&Schuh	No tracking number assigned	No routine maintenance requirements.	As needed to maintain proper operation.
Indicator Light		Sprecher&Schuh	No tracking number assigned	No routine maintenance requirements.	Replace light bulb as needed

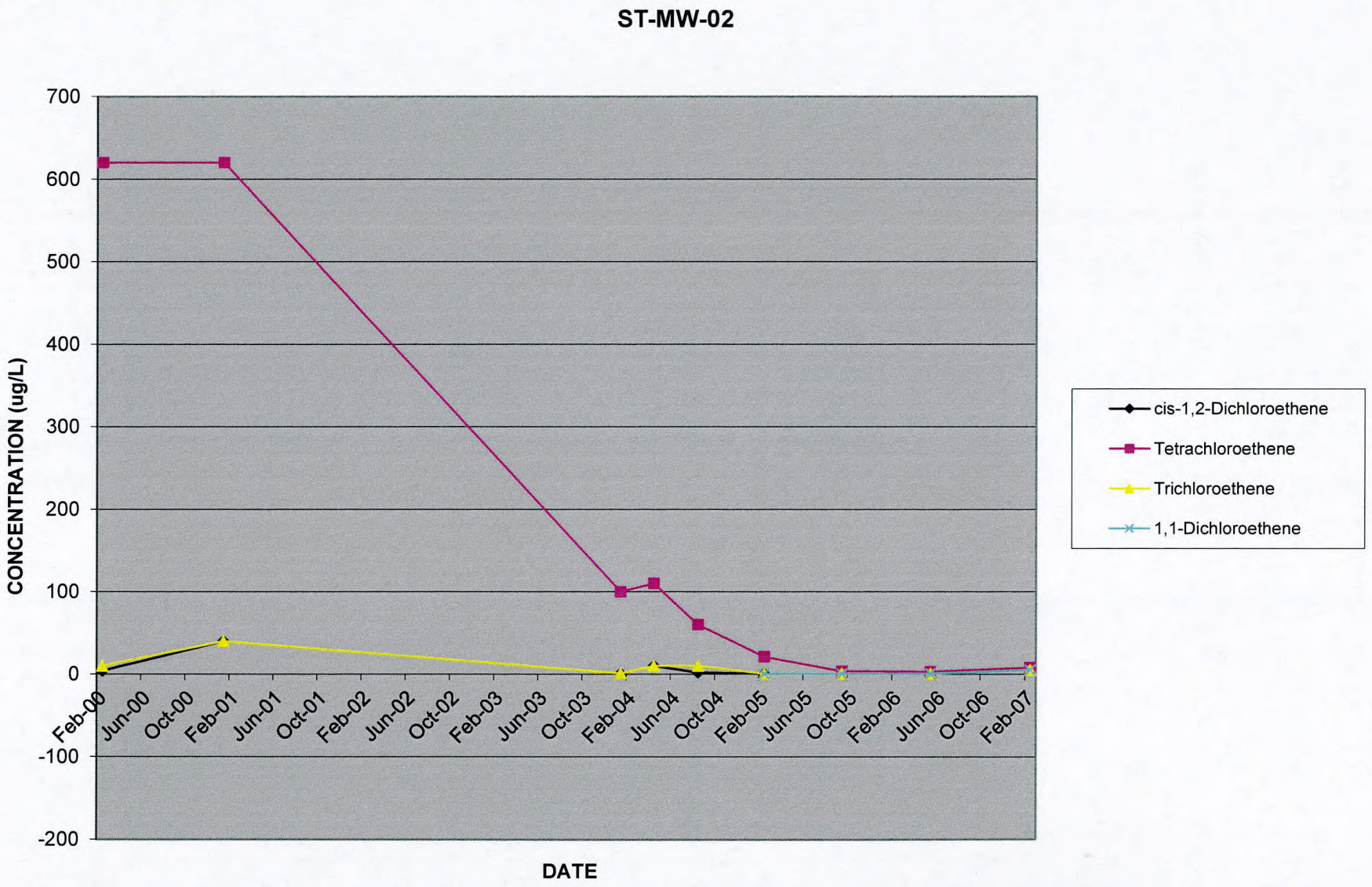
EARTH TECH
A Tyco Infrastructure Services Company

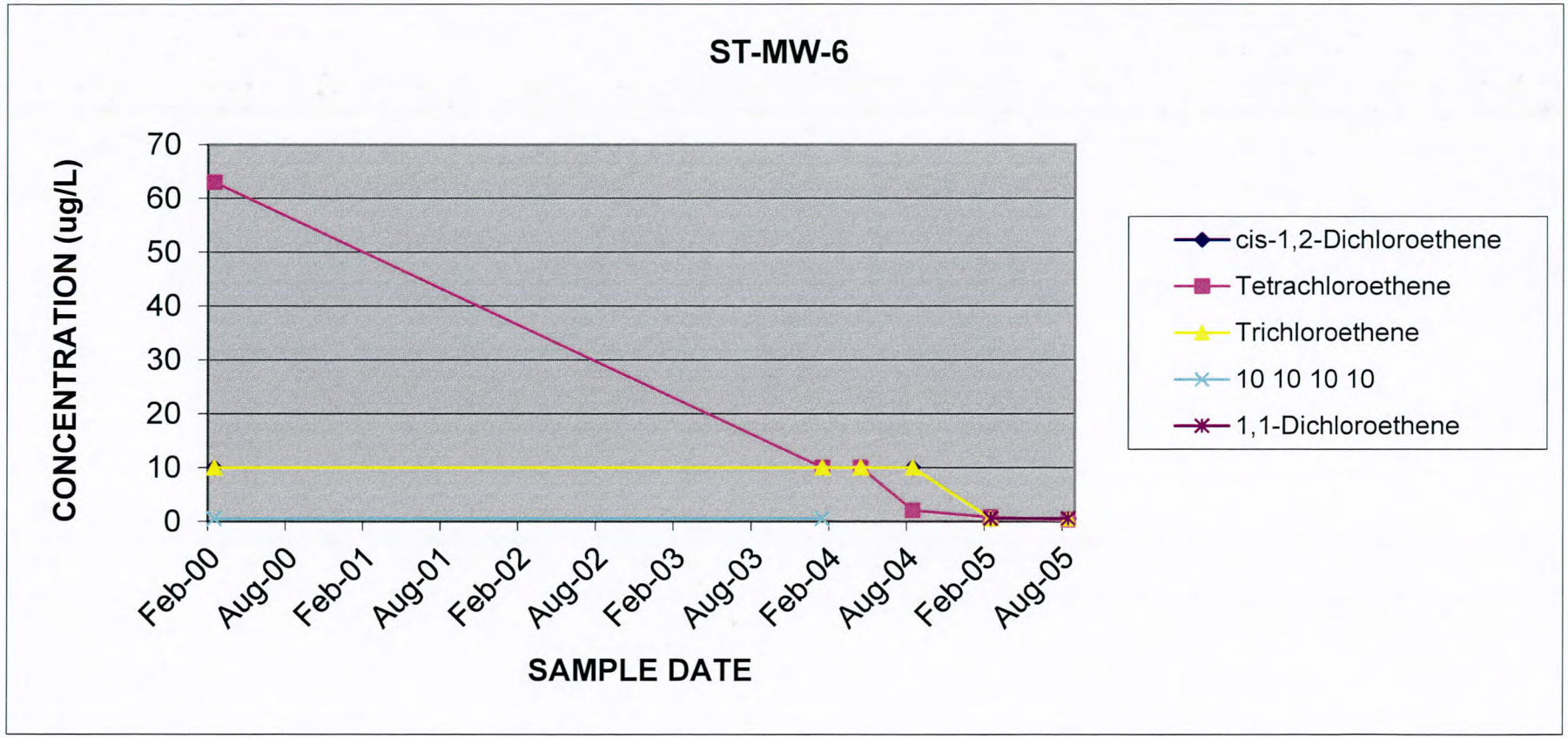
EQUIPMENT LIST,
GOVERNMENT PROPERTY TRACKING NUMBERS
AND MAINTENANCE REQUIREMENTS
Stanton Cleaners Area Groundwater Contamination Site

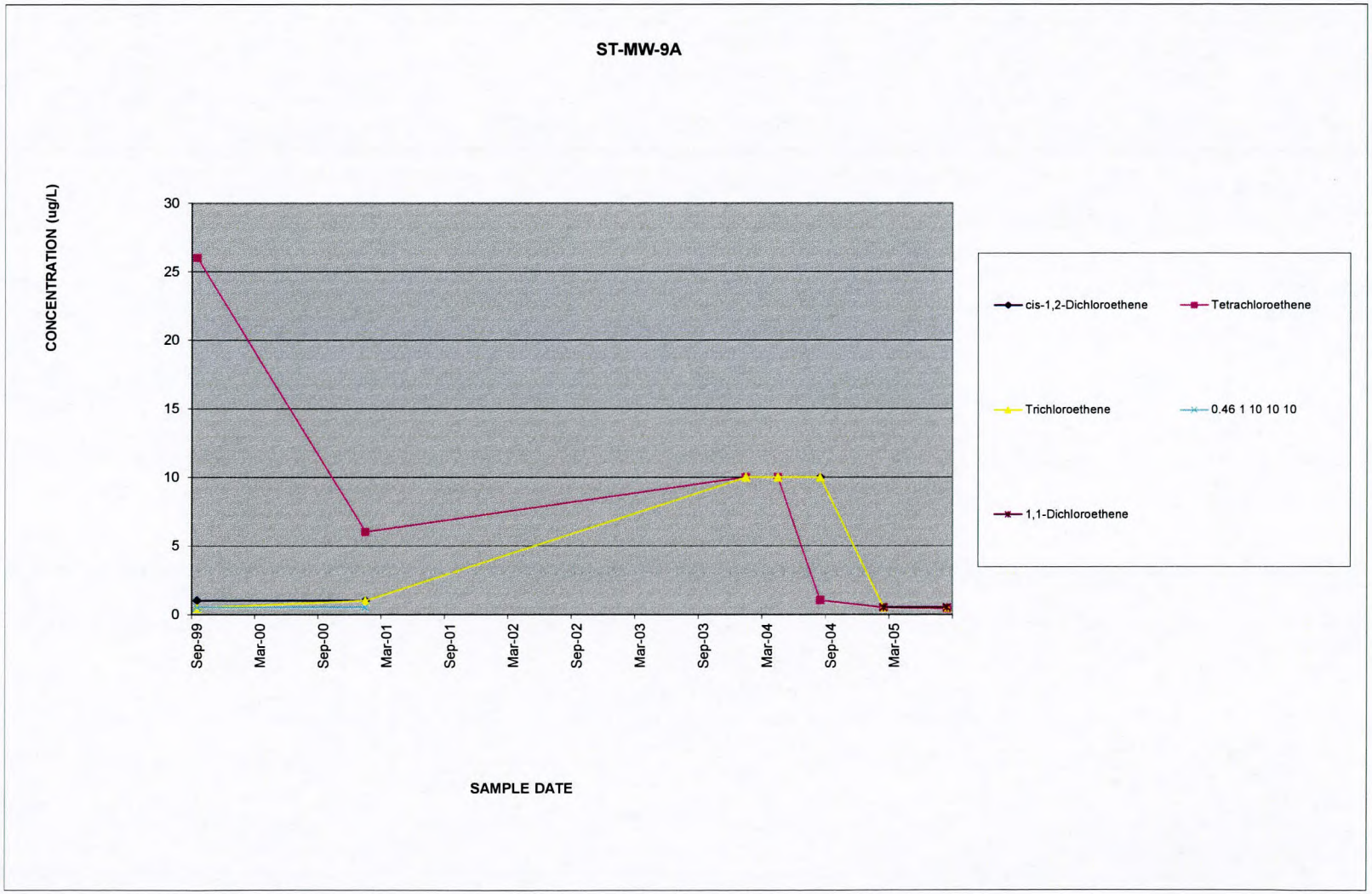
EQUIPMENT DESCRIPTION	EQUIPMENT LABEL	MANUFACTURER	GOVERNMENT TRACKING NUMBER	MAINTENANCE REQUIREMENTS	MAINTENANCE FREQUENCY
Motor Disconnect		Cutler-Hammer	No tracking number assigned	No routine maintenance requirements.	As needed to maintain proper operation.
Floor Wet Switches		McMaster-Carr	No tracking number assigned	No routine maintenance requirements.	As needed to maintain proper operation.
Ceiling Fans		DAYTON	001122	Appendix L Section 1	Visual inspection once a month
Exhuast Fan Motors		DAYTON	No tracking number assigned	No routine maintenance requirements.	As needed to maintain proper operation.
Exhaust Fans		DAYTON	001177	No routine maintenance requirements.	As needed to maintain proper operation.
Garage Door		Chamberlain Group	001113	Appendix L Section 2	Every 3, 6, and 12 months
Garage Door Opener		Chamberlain Group	001113	Appendix L Section 2	Every 3, 6, and 12 months
Garage Door Opener Switch		Chamberlain Group	001113	Appendix L Section 2	Every 3, 6, and 12 months
Treatment Room Heater		DAYTON	001118	No routine maintenance requirements.	As needed to maintain proper operation.
Air Handler		Luxair	001115	Appendix L Section 5	Check filters once a month, change when needed
Treatment Room Light Fixtures		Hubbel	001132	No routine maintenance requirements.	Replace lgh bulbs as needed
Office Light Fixtures		Hubbel	No tracking number assigned	Appendix L Section 6	As needed to maintain proper operation.
Office Baseboard Heaters		DAYTON	No tracking number assigned	Appendix L Section 6	As needed to maintain proper operation.
Office Phone/Fax		Vtech	No tracking number assigned	Appendix L Section 4	As needed to maintain proper operation.
Air Conditioner		Luxair	No tracking number assigned	No routine maintenance requirements.	As needed to maintain proper operation.
Emergency Lights		LITHONIA LIGHTING	001359, 001360, 001361, 001362	Appendix L Section 3	Replacement battries as needed.
Fire Sprinklers		MacMaster-Carr	No tracking number assigned	Appendix L Section 3	Yearly inspection
Attic Fan		Automationdirect	No tracking number assigned	No routine maintenance requirements.	As needed to maintain proper operation.
Three Phase Disconnect Panel		Automationdirect	No tracking number assigned	No routine maintenance requirements.	As needed to maintain proper operation.
Electrical Distribution Panels		Automationdirect	No tracking number assigned	No routine maintenance requirements.	As needed to maintain proper operation.

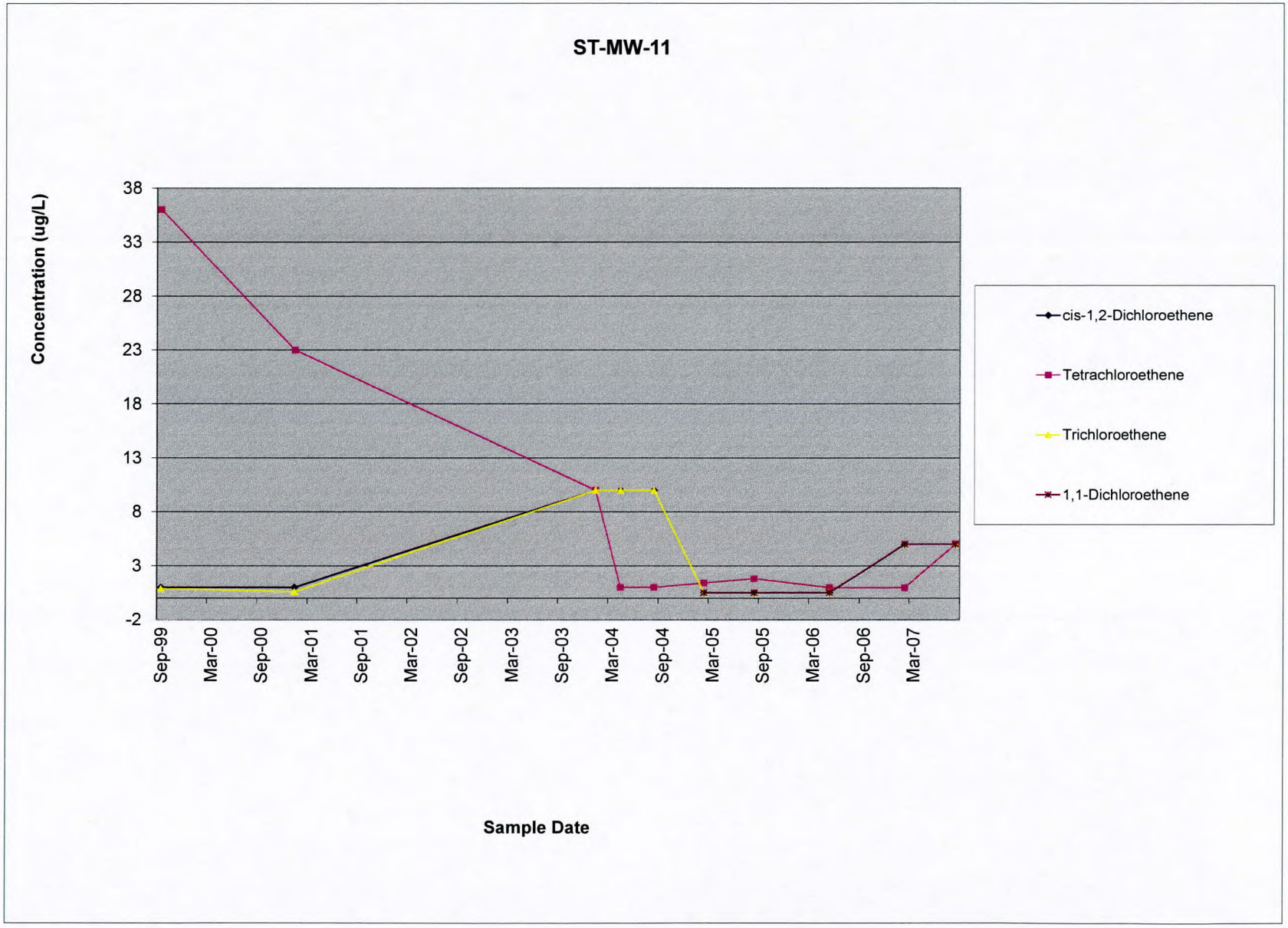
Appendix B

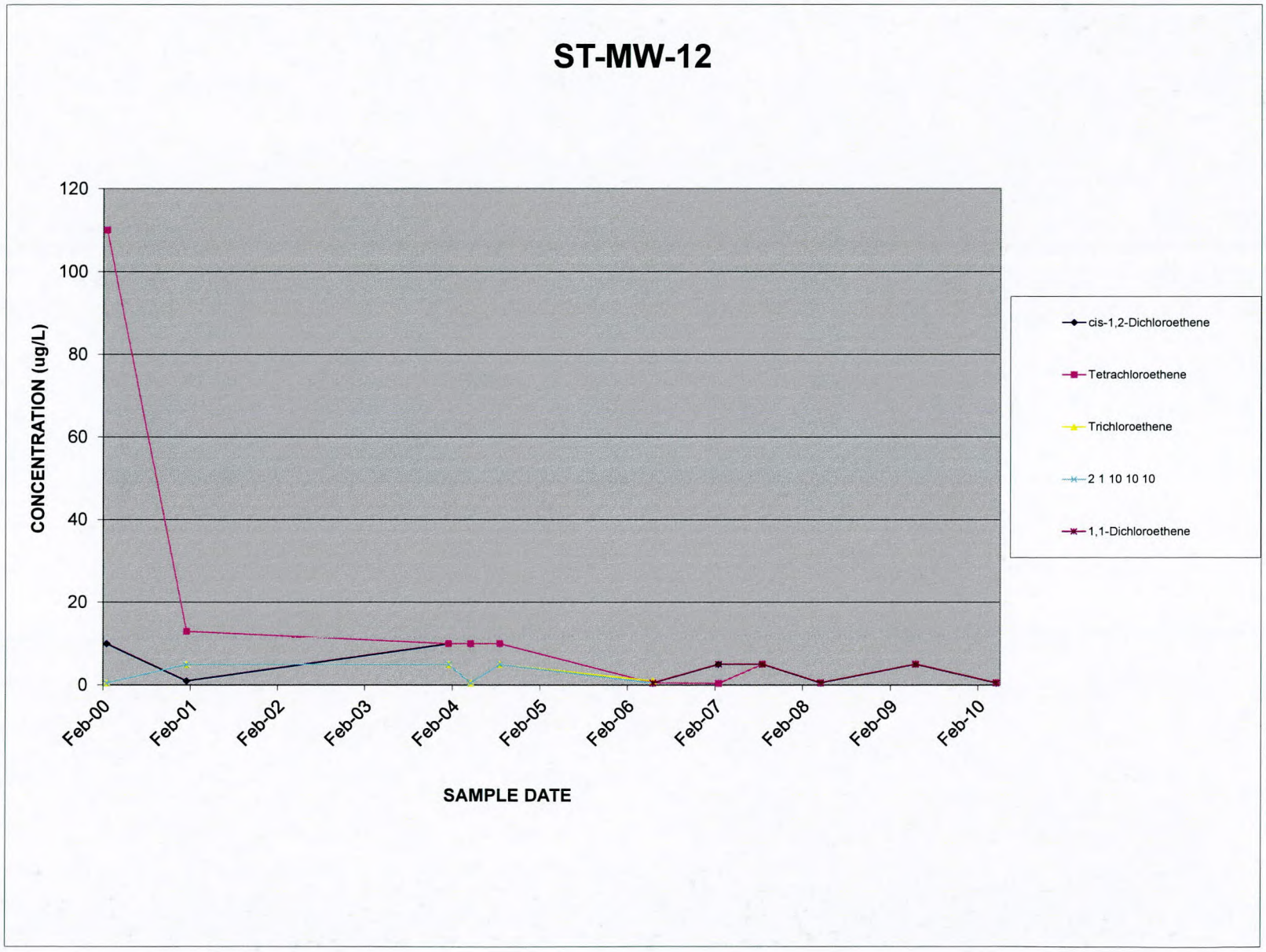
Historical Groundwater Contamination Trends in Monitoring Wells

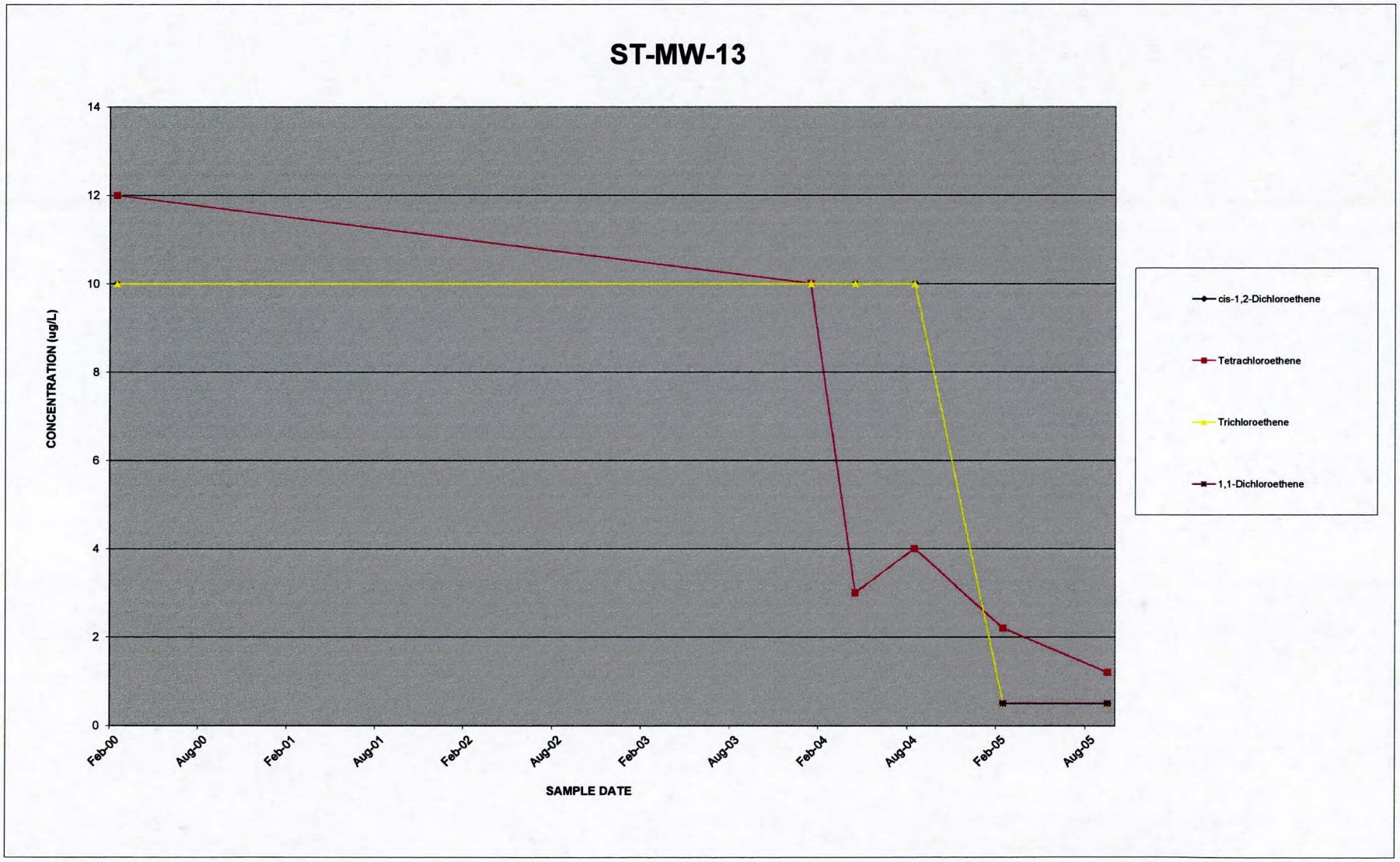

ST-MW-02
CONCENTRATION (ug/L)
700
600
500
400
300
200
100
0
-100
-200
Feb-00
Jun-00
Oct-00
Feb-01
Jun-01
Oct-01
Feb-02
Jun-02
Oct-02
Feb-03
Jun-03
Oct-03
Feb-04
Jun-04
Oct-04
Feb-05
Jun-05
Oct-05
Feb-06
Jun-06
Oct-06
Feb-07
DATE
cis-1,2-Dichloroethene
Tetrachloroethene
Trichloroethene
1,1-Dichloroethene

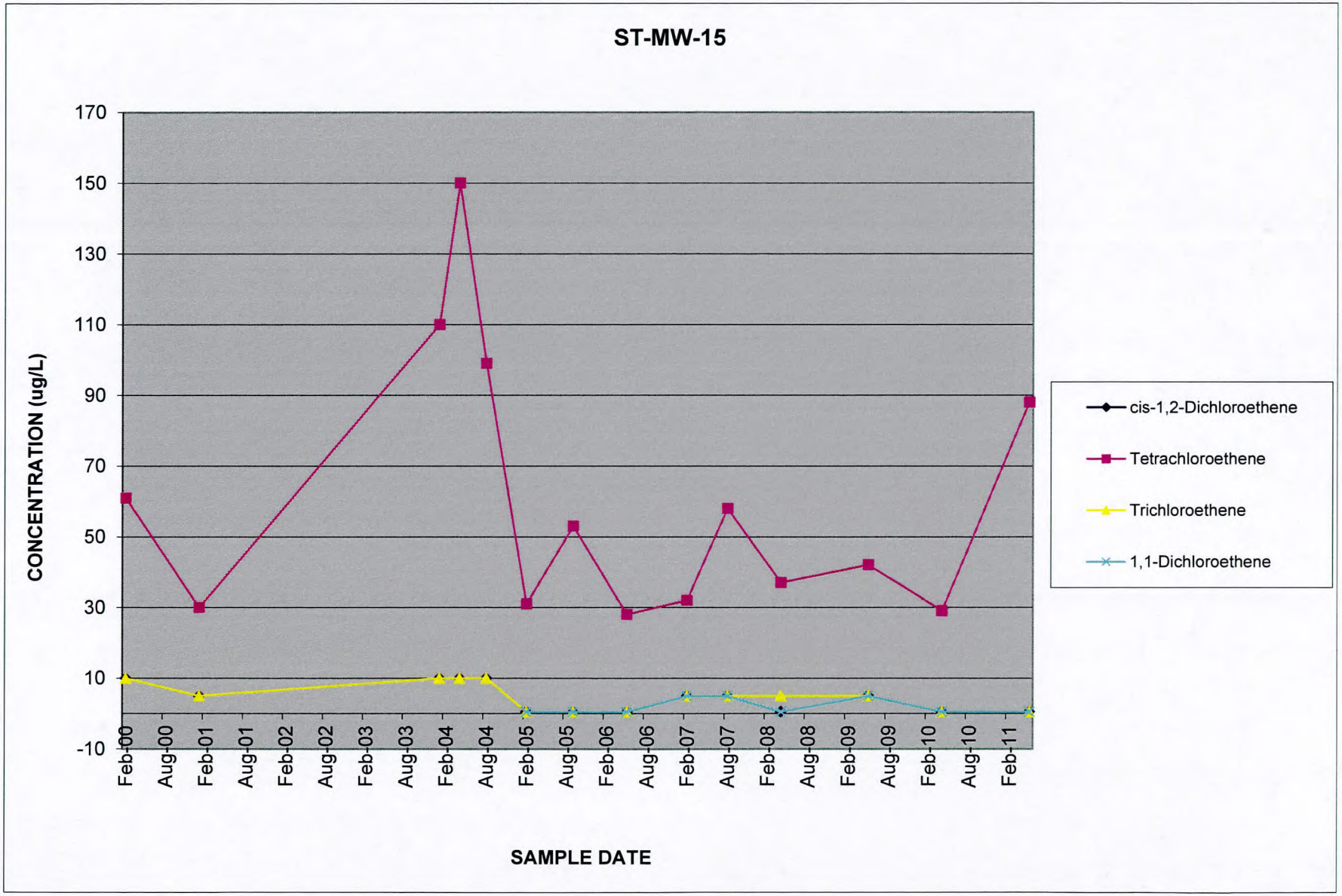

ST-MW-6
CONCENTRATION (ug/L)
70
60
50
40
30
20
10
0
Feb-00
Aug-00
Feb-01
Aug-01
Feb-02
Aug-02
Feb-03
Aug-03
Feb-04
Aug-04
Feb-05
Aug-05
SAMPLE DATE
cis-1,2-Dichloroethene
Tetrachloroethene
Trichloroethene
10 10 10 10
1,1-Dichloroethene

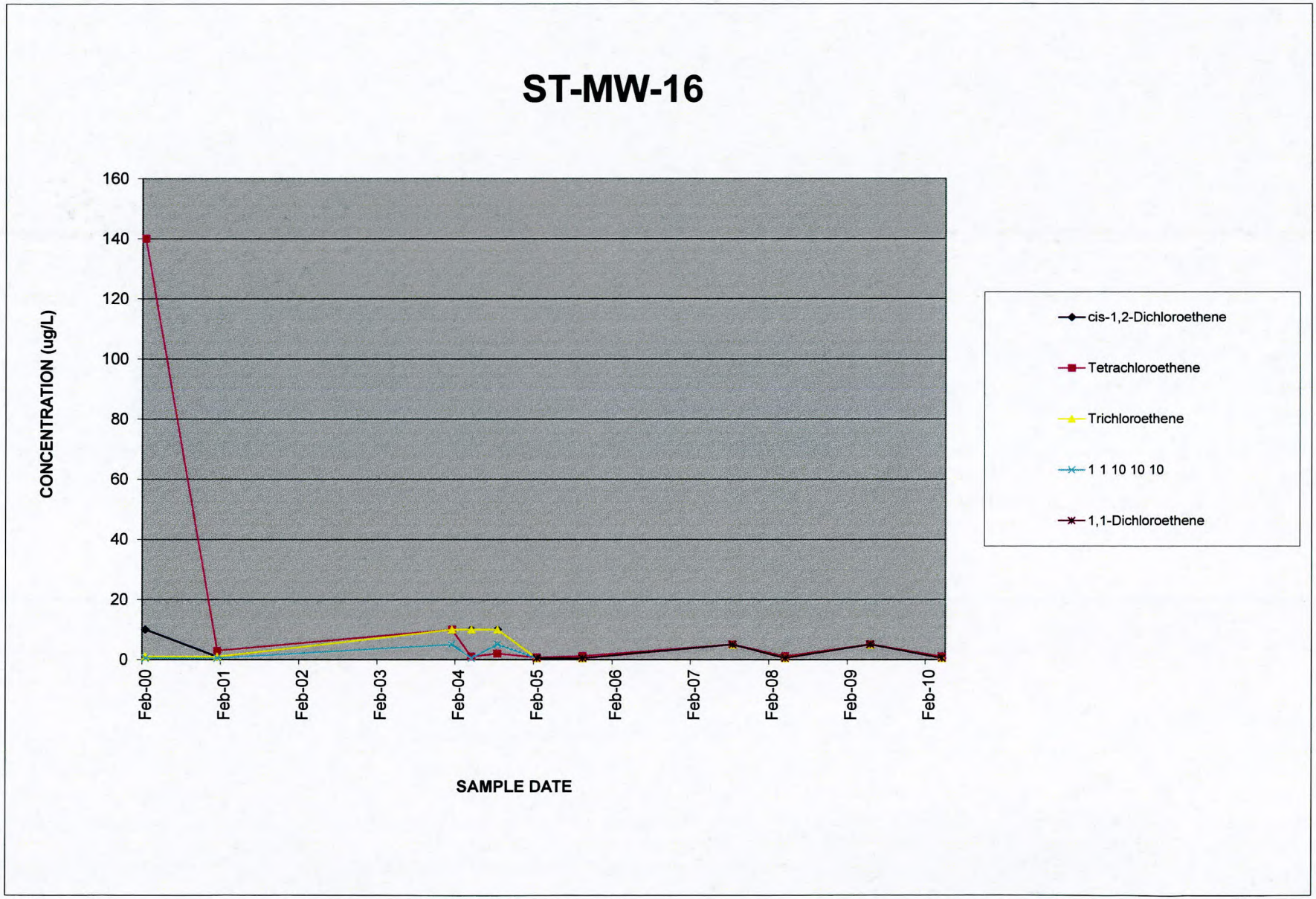

ST-MW-9A
CONCENTRATION (ug/L)
30
25
20
15
10
5
0
Sep-99
Mar-00
Sep-00
Mar-01
Sep-01
Mar-02
Sep-02
Mar-03
Sep-03
Mar-04
Sep-04
Mar-05
SAMPLE DATE
cis-1,2-Dichloroethene
Tetrachloroethene
Trichloroethene
0.46 1 10 10 10
1,1-Dichloroethene

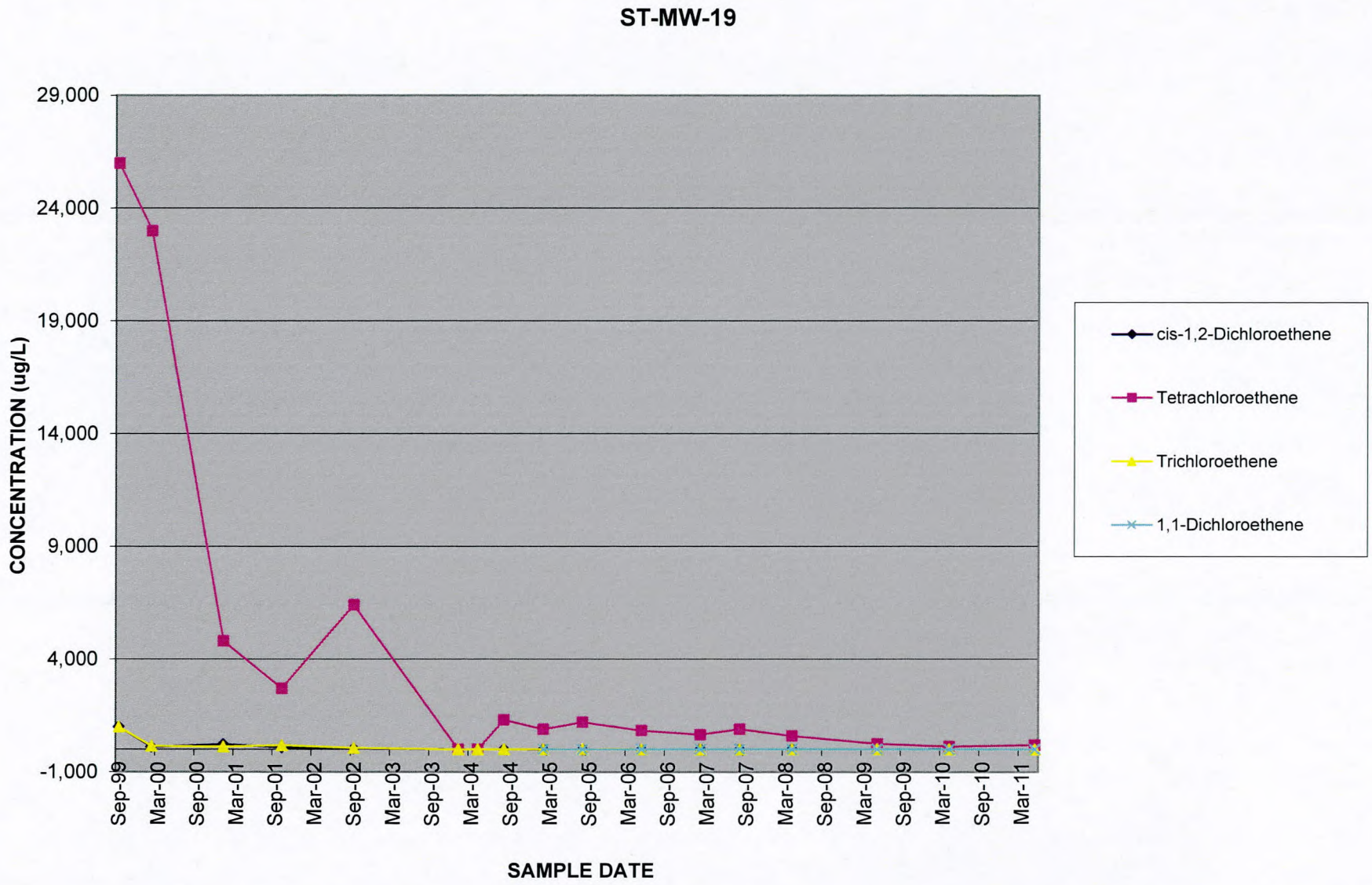

ST-MW-11
Concentration (ug/L)
38
33
28
23
18
13
8
3
-2
Sep-99
Mar-00
Sep-00
Mar-01
Sep-01
Mar-02
Sep-02
Mar-03
Sep-03
Mar-04
Sep-04
Mar-05
Sep-05
Mar-06
Sep-06
Mar-07
Sample Date
cis-1,2-Dichloroethene
Tetrachloroethene
Trichloroethene
1,1-Dichloroethene


ST-MW-12
120
100
80
60
40
20
0
CONCENTRATION (ug/L)
Feb-00
Feb-01
Feb-02
Feb-03
Feb-04
Feb-05
Feb-06
Feb-07
Feb-08
Feb-09
Feb-10
SAMPLE DATE
cis-1,2-Dichloroethene
Tetrachloroethene
Trichloroethene
2 1 10 10 10
1,1-Dichloroethene

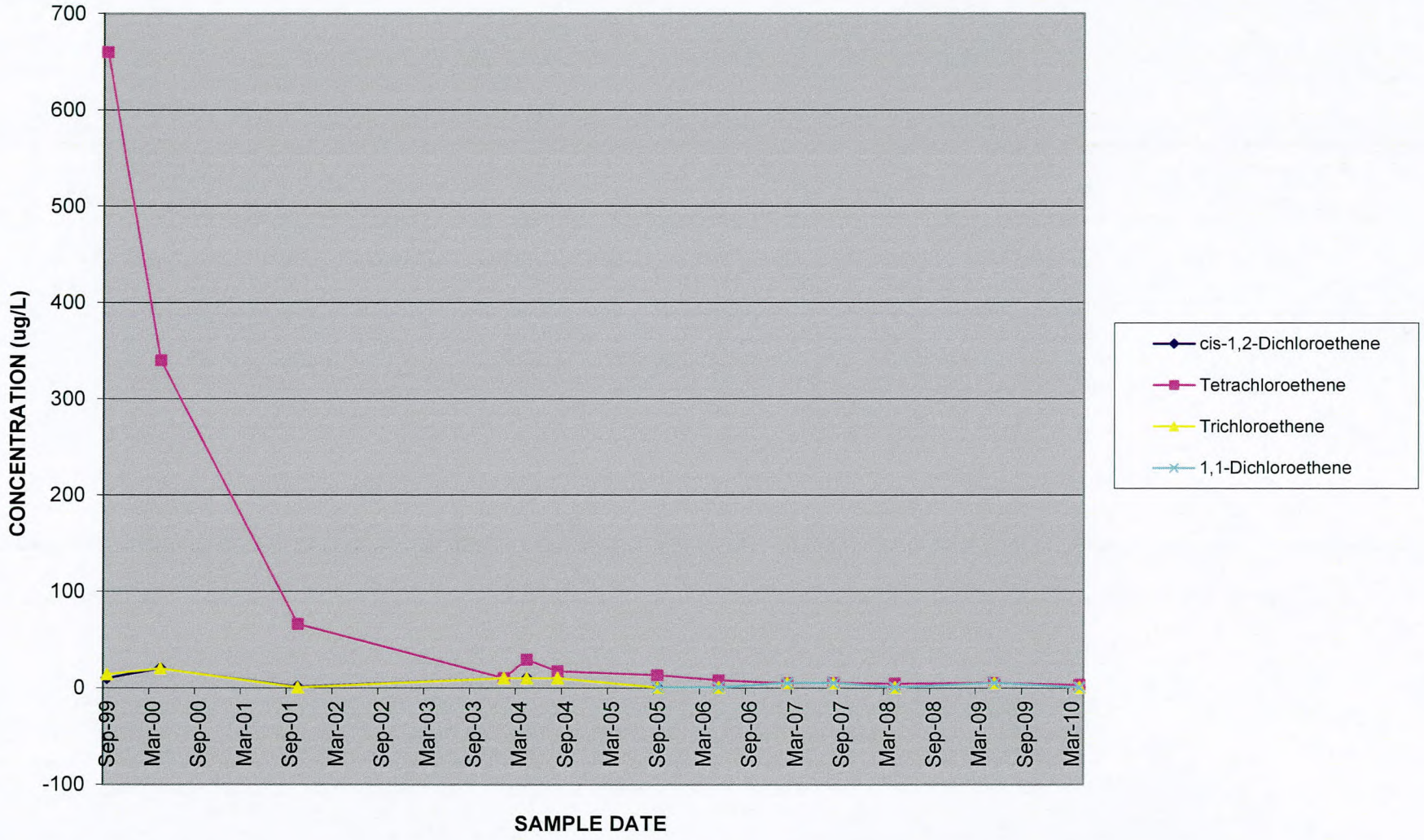

ST-MW-13
CONCENTRATION (ug/L)
0
2
4
6
8
10
12
14
Feb-00
Aug-00
Feb-01
Aug-01
Feb-02
Aug-02
Feb-03
Aug-03
Feb-04
Aug-04
Feb-05
Aug-05
SAMPLE DATE
cis-1,2-Dichloroethene
Tetrachloroethene
Trichloroethene
1,1-Dichloroethene

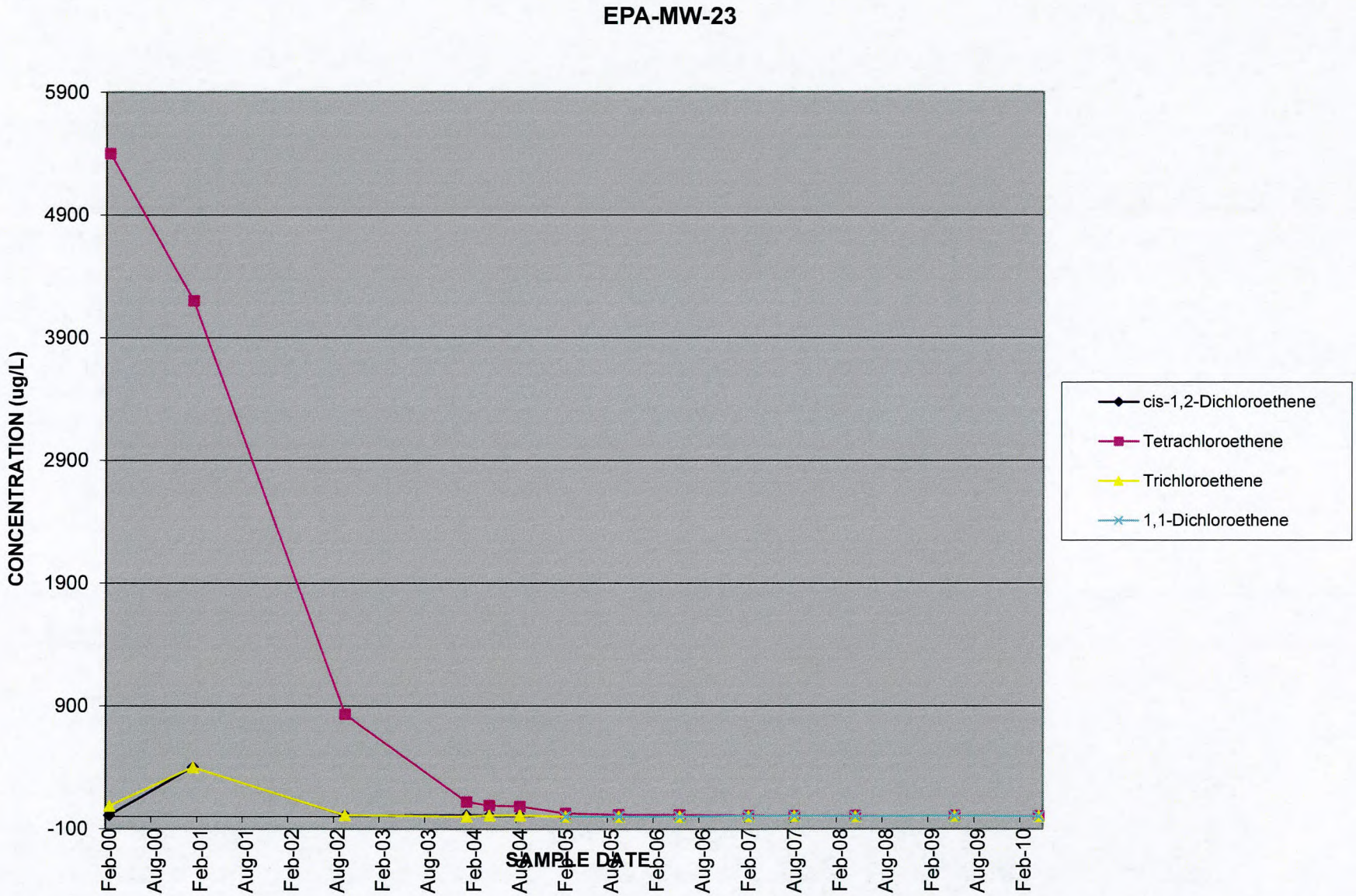

ST-MW-15
CONCENTRATION (ug/L)
170
150
130
110
90
70
50
30
10
-10
Feb-00
Aug-00
Feb-01
Aug-01
Feb-02
Aug-02
Feb-03
Aug-03
Feb-04
Aug-04
Feb-05
Aug-05
Feb-06
Aug-06
Feb-07
Aug-07
Feb-08
Aug-08
Feb-09
Aug-09
Feb-10
Aug-10
Feb-11
SAMPLE DATE
cis-1,2-Dichloroethene
Tetrachloroethene
Trichloroethene
1,1-Dichloroethene

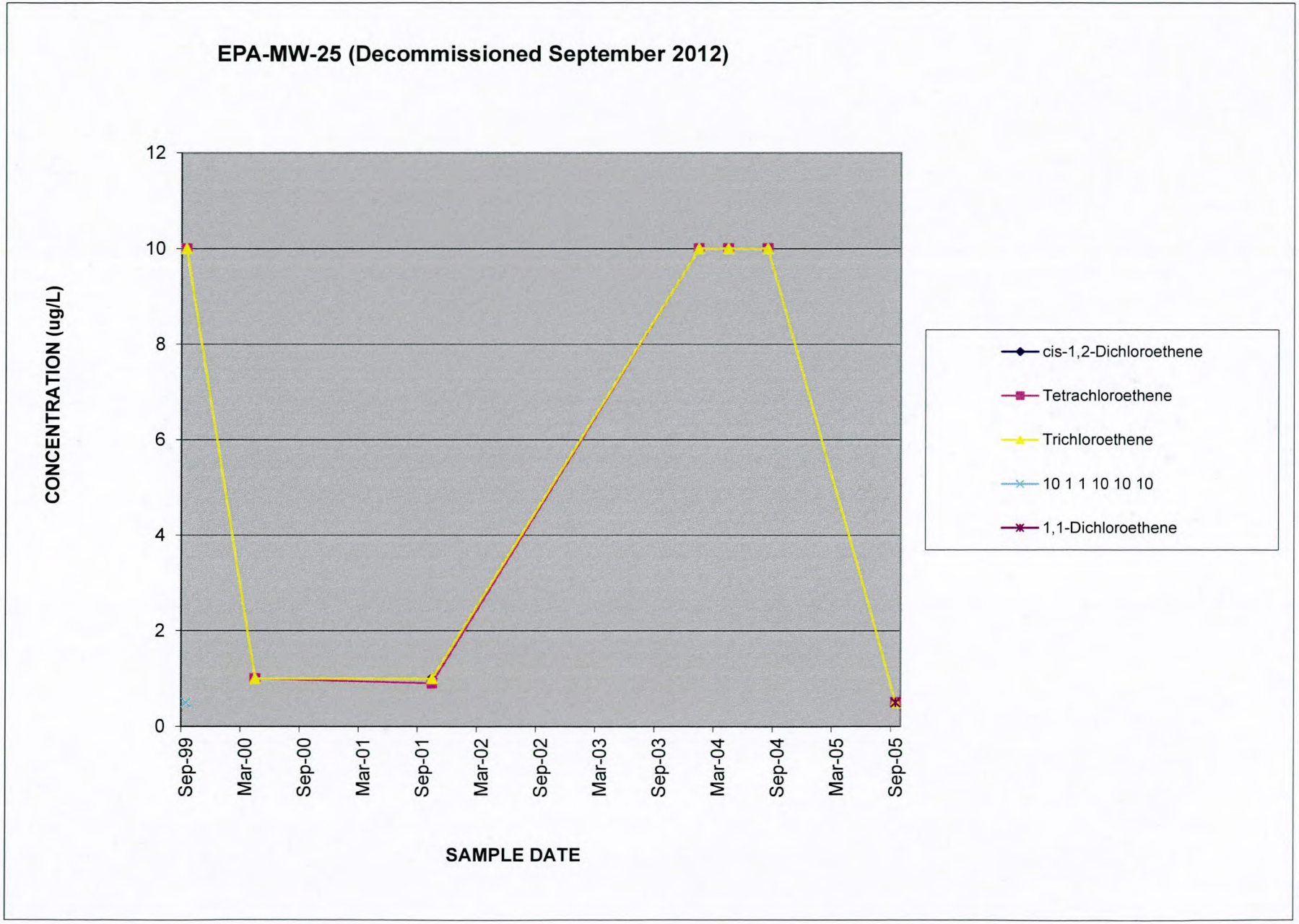

ST-MW-16
CONCENTRATION (ug/L)
160
140
120
100
80
60
40
20
0
Feb-00
Feb-01
Feb-02
Feb-03
Feb-04
Feb-05
Feb-06
Feb-07
Feb-08
Feb-09
Feb-10
SAMPLE DATE
cis-1,2-Dichloroethene
Tetrachloroethene
Trichloroethene
1 1 10 10 10
1,1-Dichloroethene

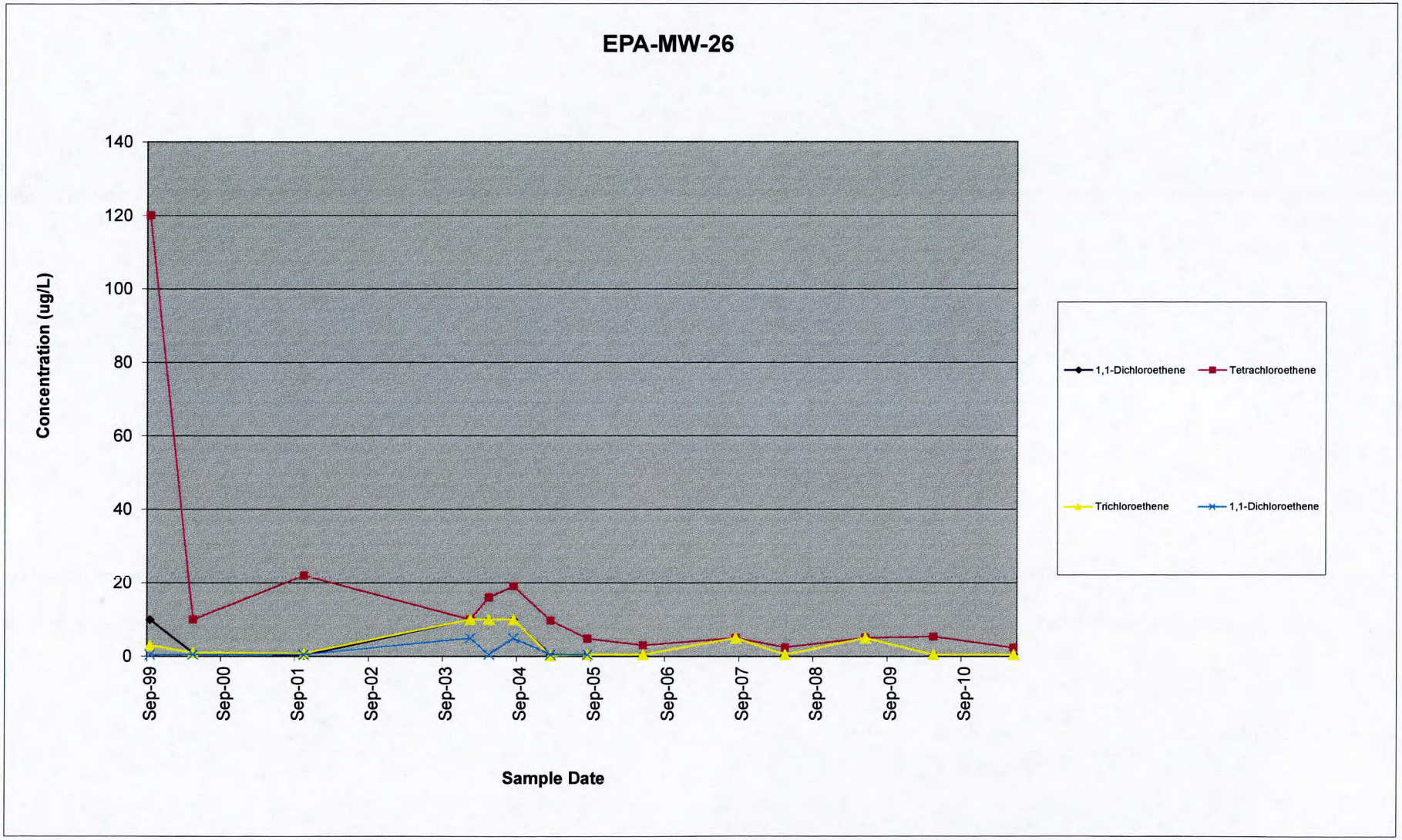

ST-MW-19
CONCENTRATION (ug/L)
29,000
24,000
19,000
14,000
9,000
4,000
-1,000
Sep-99
Mar-00
Sep-00
Mar-01
Sep-01
Mar-02
Sep-02
Mar-03
Sep-03
Mar-04
Sep-04
Mar-05
Sep-05
Mar-06
Sep-06
Mar-07
Sep-07
Mar-08
Sep-08
Mar-09
Sep-09
Mar-10
Sep-10
Mar-11
SAMPLE DATE
cis-1,2-Dichloroethene
Tetrachloroethene
Trichloroethene
1,1-Dichloroethene

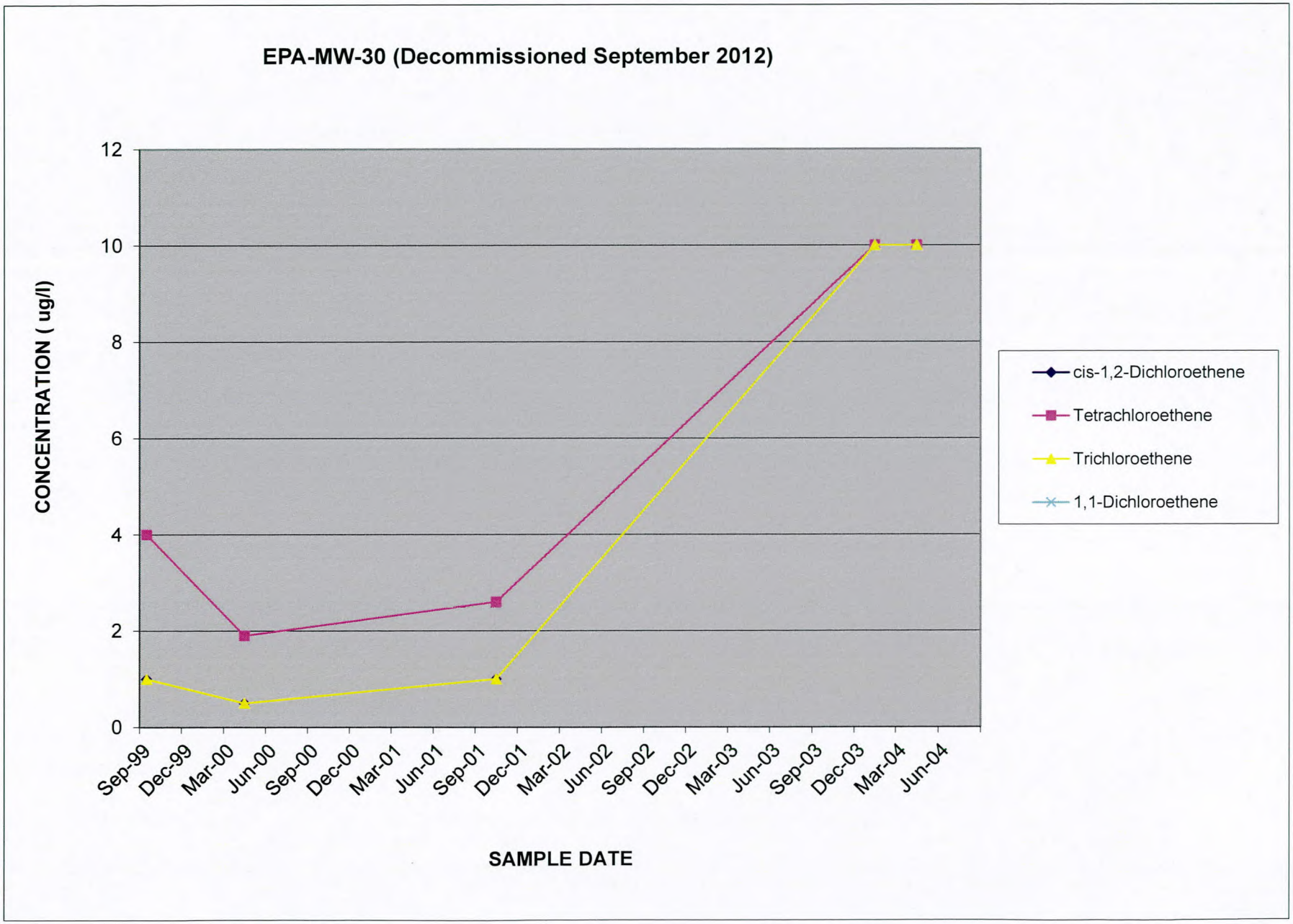
EPA-MW-22 (Decommissioned September 2012)

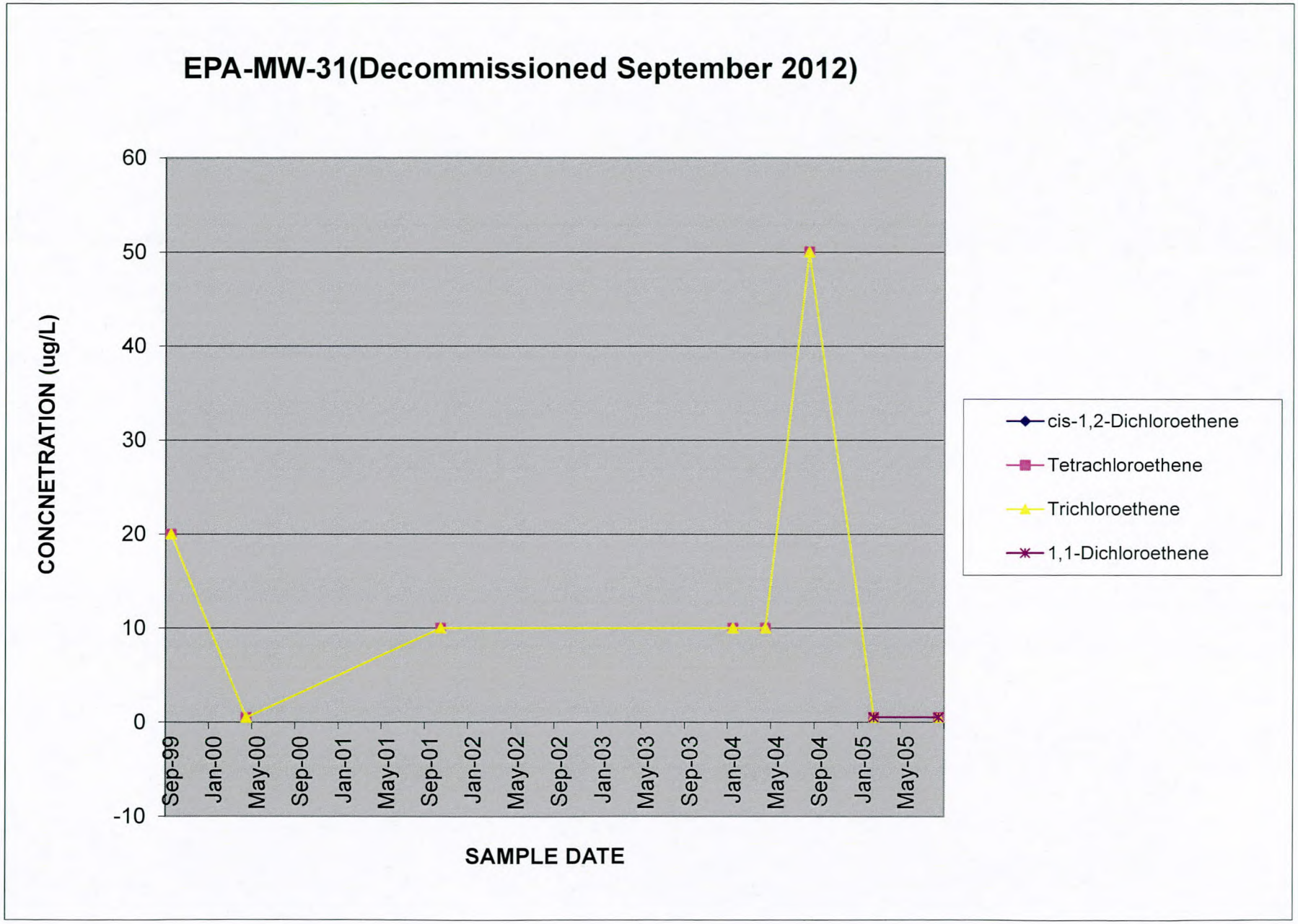


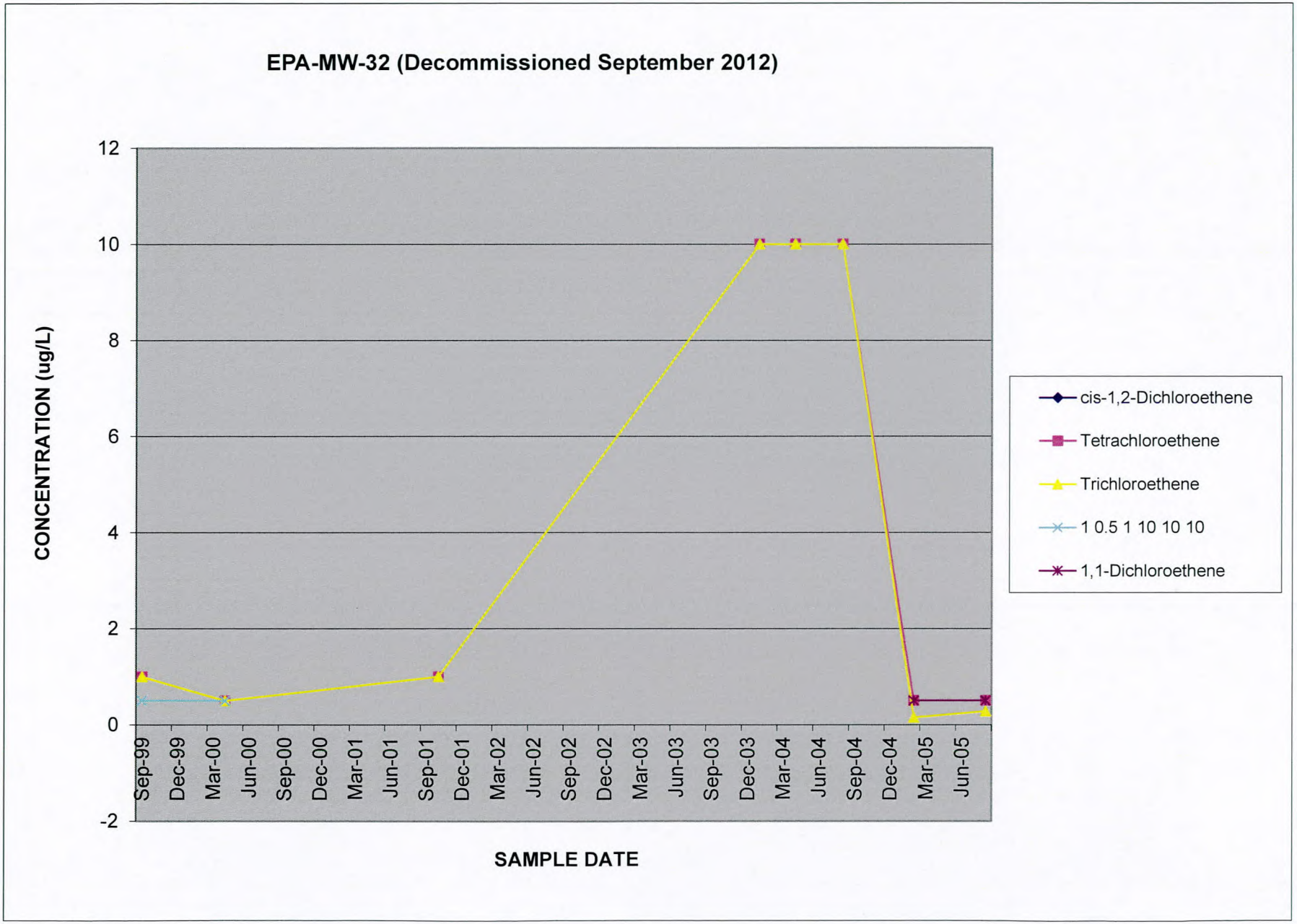

EPA-MW-23
CONCENTRATION (ug/L)
5900
4900
3900
2900
1900
900
-100
Feb-00
Aug-00
Feb-01
Aug-01
Feb-02
Aug-02
Feb-03
Aug-03
Feb-04
Aug-04
Feb-05
Aug-05
Feb-06
Aug-06
Feb-07
Aug-07
Feb-08
Aug-08
Feb-09
Aug-09
Feb-10
SAMPLE DATE
cis-1,2-Dichloroethene
Tetrachloroethene
Trichloroethene
1,1-Dichloroethene

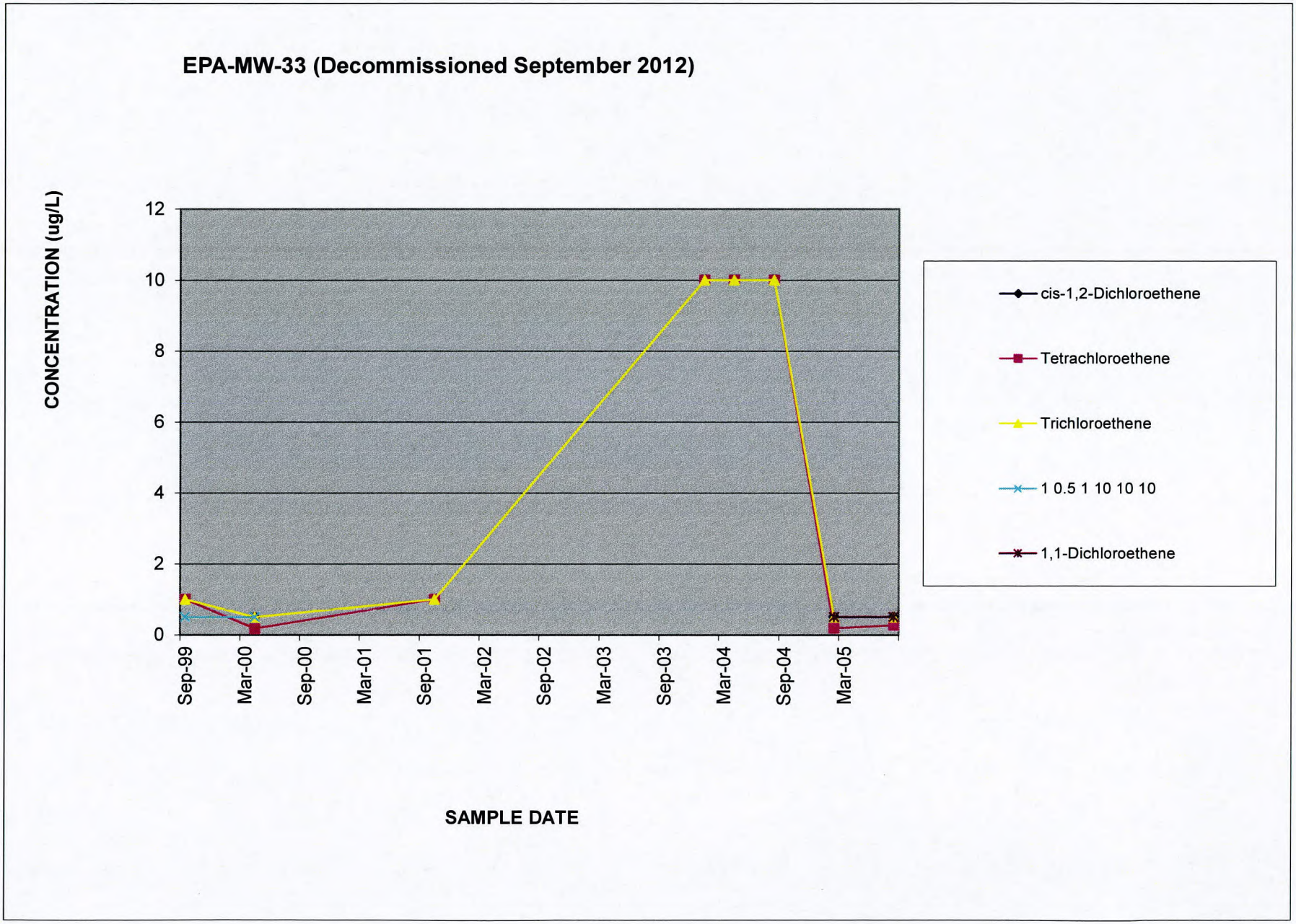

EPA-MW-25 (Decommissioned September 2012)
CONCENTRATION (ug/L)
12
10
8
6
4
2
0
Sep-99
Mar-00
Sep-00
Mar-01
Sep-01
Mar-02
Sep-02
Mar-03
Sep-03
Mar-04
Sep-04
Mar-05
Sep-05
SAMPLE DATE
cis-1,2-Dichloroethene
Tetrachloroethene
Trichloroethene
10 1 1 10 10 10
1,1-Dichloroethene

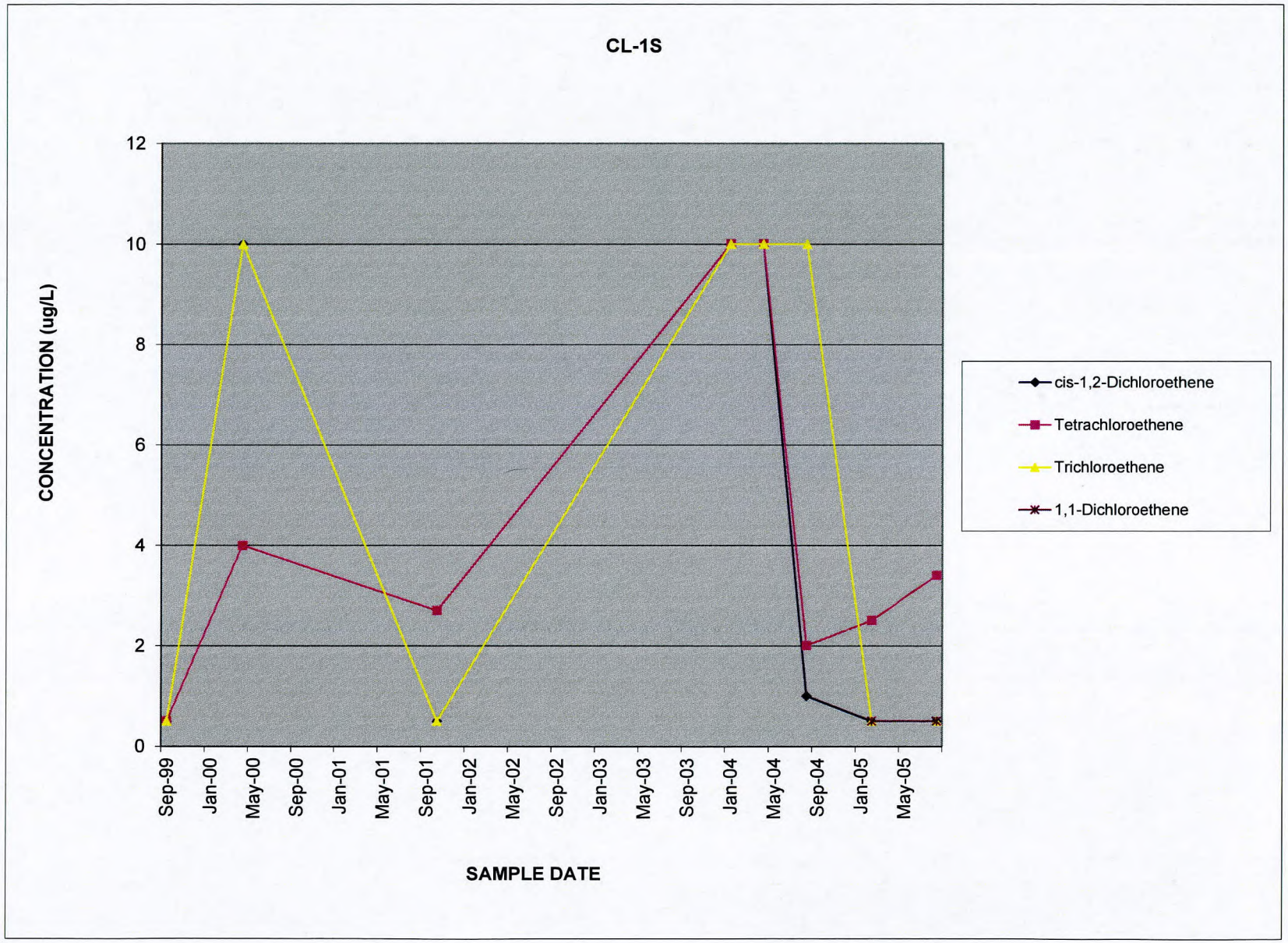

EPA-MW-26
Concentration (ug/L)
140
120
100
80
60
40
20
0
Sep-99
Sep-00
Sep-01
Sep-02
Sep-03
Sep-04
Sep-05
Sep-06
Sep-07
Sep-08
Sep-09
Sep-10
Sample Date
1,1-Dichloroethene
Tetrachloroethene
Trichloroethene
1,1-Dichloroethene


EPA-MW-30 (Decommissioned September 2012)
CONCENTRATION (ug/l)
12
10
8
6
4
2
0
Sep-99
Dec-99
Mar-00
Jun-00
Sep-00
Dec-00
Mar-01
Jun-01
Sep-01
Dec-01
Mar-02
Jun-02
Sep-02
Dec-02
Mar-03
Jun-03
Sep-03
Dec-03
Mar-04
Jun-04
SAMPLE DATE
cis-1,2-Dichloroethene
Tetrachloroethene
Trichloroethene
1,1-Dichloroethene

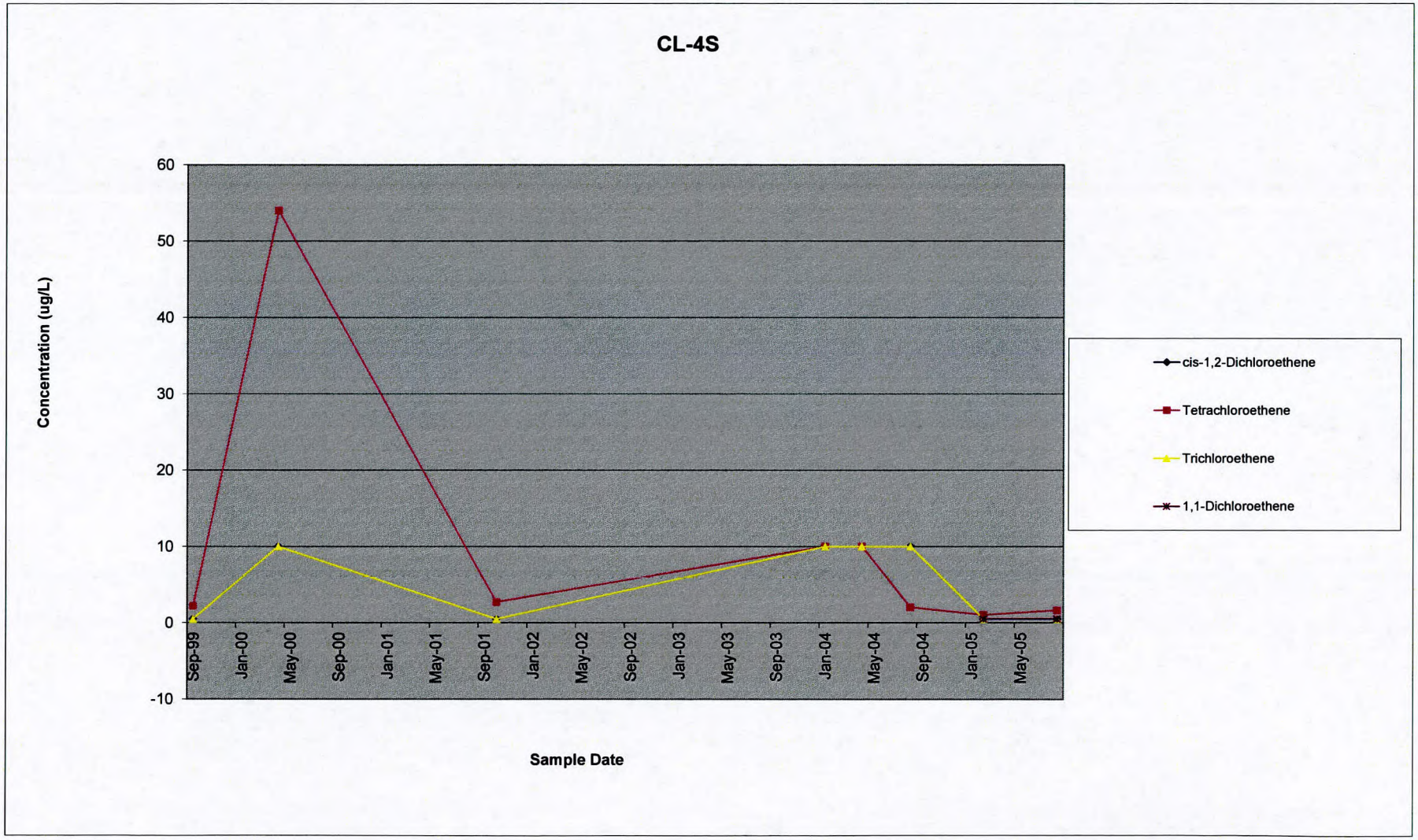

EPA-MW-31(Decommissioned September 2012)
CONCNETRATION (ug/L)
60
50
40
30
20
10
0
-10
Sep-99
Jan-00
May-00
Sep-00
Jan-01
May-01
Sep-01
Jan-02
May-02
Sep-02
Jan-03
May-03
Sep-03
Jan-04
May-04
Sep-04
Jan-05
May-05
SAMPLE DATE
cis-1,2-Dichloroethene
Tetrachloroethene
Trichloroethene
1,1-Dichloroethene

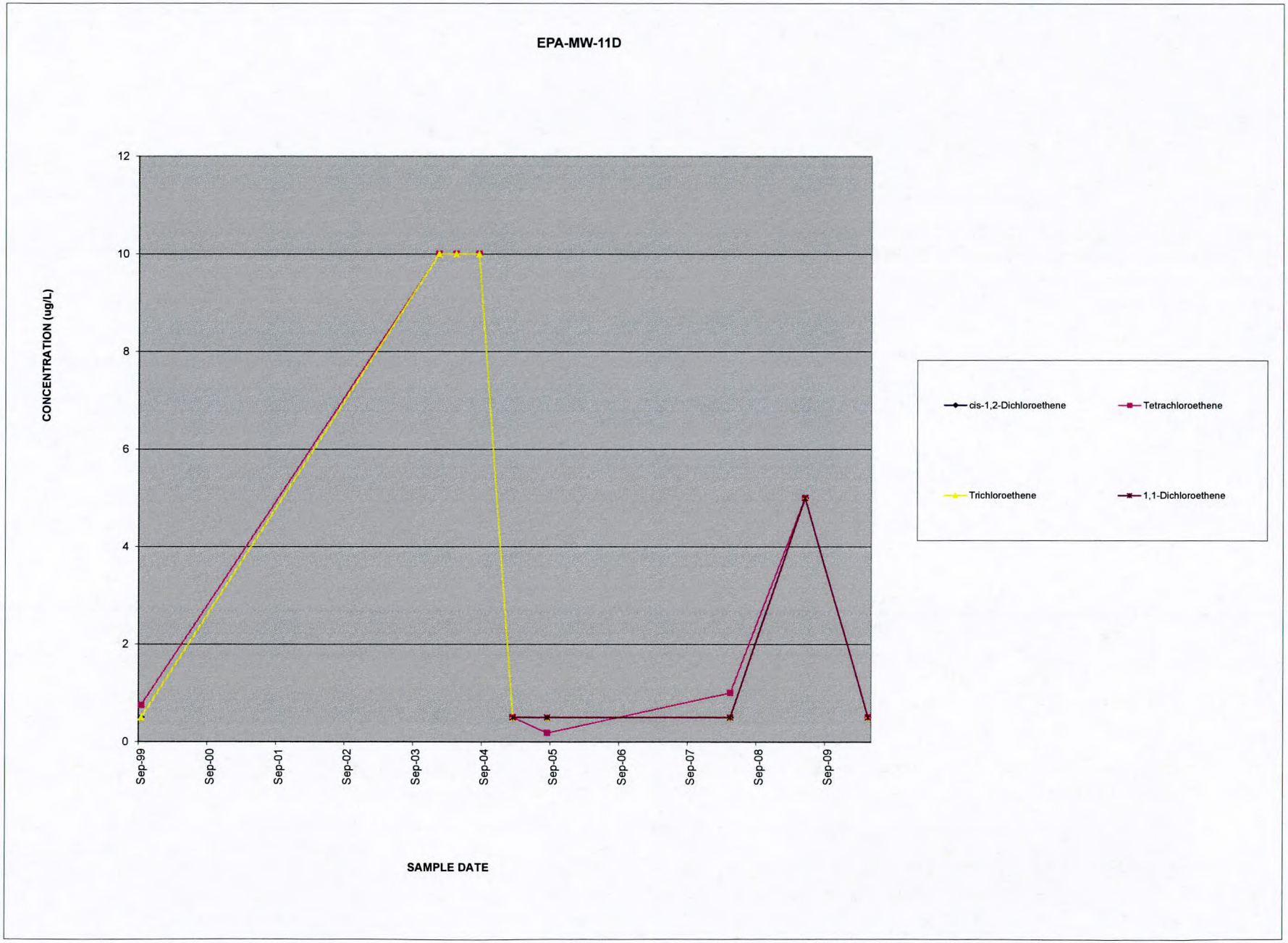

EPA-MW-32 (Decommissioned September 2012)
CONCENTRATION (ug/L)
12
10
8
6
4
2
0
-2
Sep-99
Dec-99
Mar-00
Jun-00
Sep-00
Dec-00
Mar-01
Jun-01
Sep-01
Dec-01
Mar-02
Jun-02
Sep-02
Dec-02
Mar-03
Jun-03
Sep-03
Dec-03
Mar-04
Jun-04
Sep-04
Dec-04
Mar-05
Jun-05
SAMPLE DATE
cis-1,2-Dichloroethene
Tetrachloroethene
Trichloroethene
1 0.5 1 10 10 10
1,1-Dichloroethene

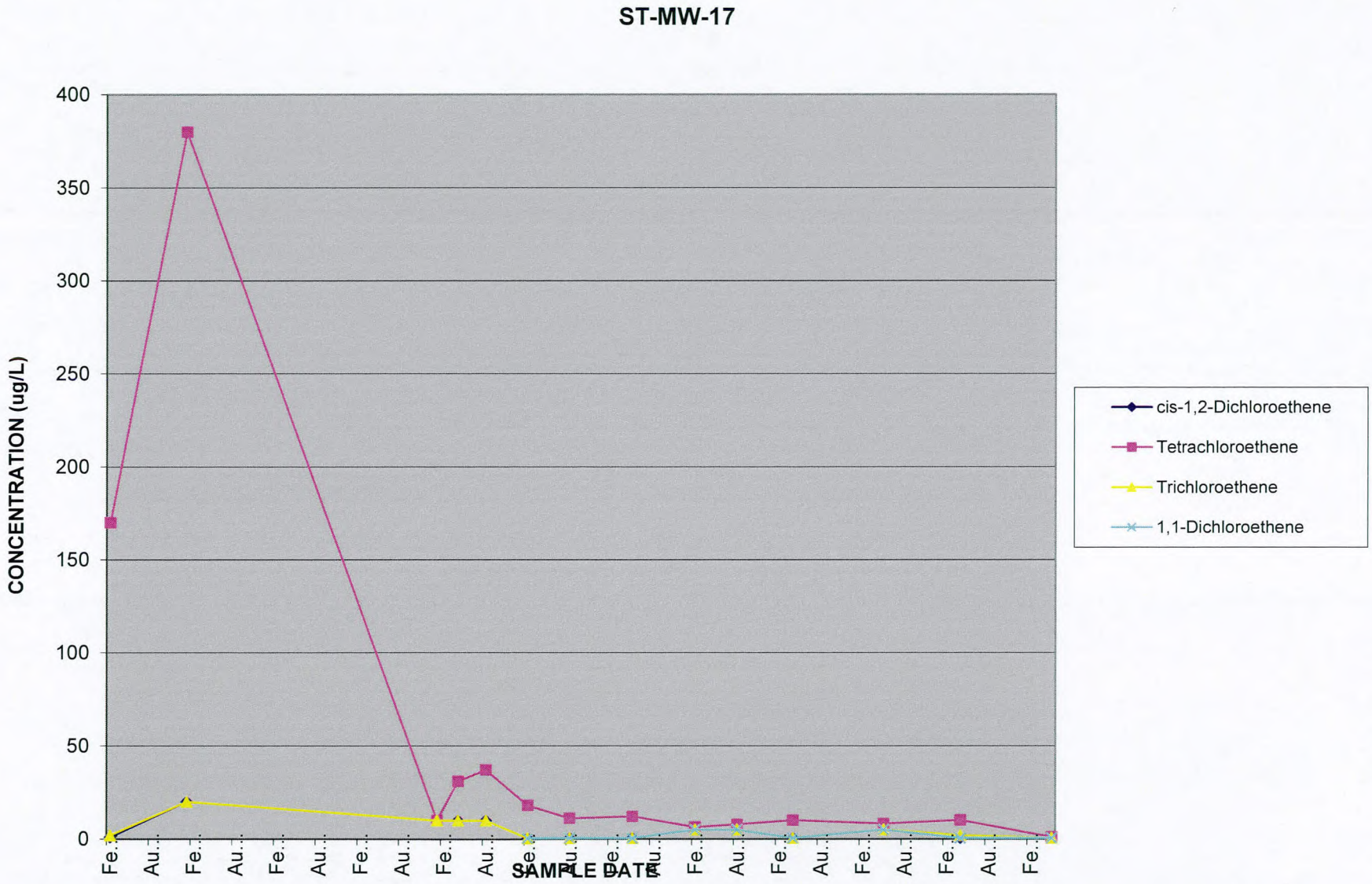

EPA-MW-33 (Decommissioned September 2012)
CONCENTRATION (ug/L)
12
10
8
6
4
2
0
Sep-99
Mar-00
Sep-00
Mar-01
Sep-01
Mar-02
Sep-02
Mar-03
Sep-03
Mar-04
Sep-04
Mar-05
SAMPLE DATE
cis-1,2-Dichloroethene
Tetrachloroethene
Trichloroethene
1 0.5 1 10 10 10
1,1-Dichloroethene

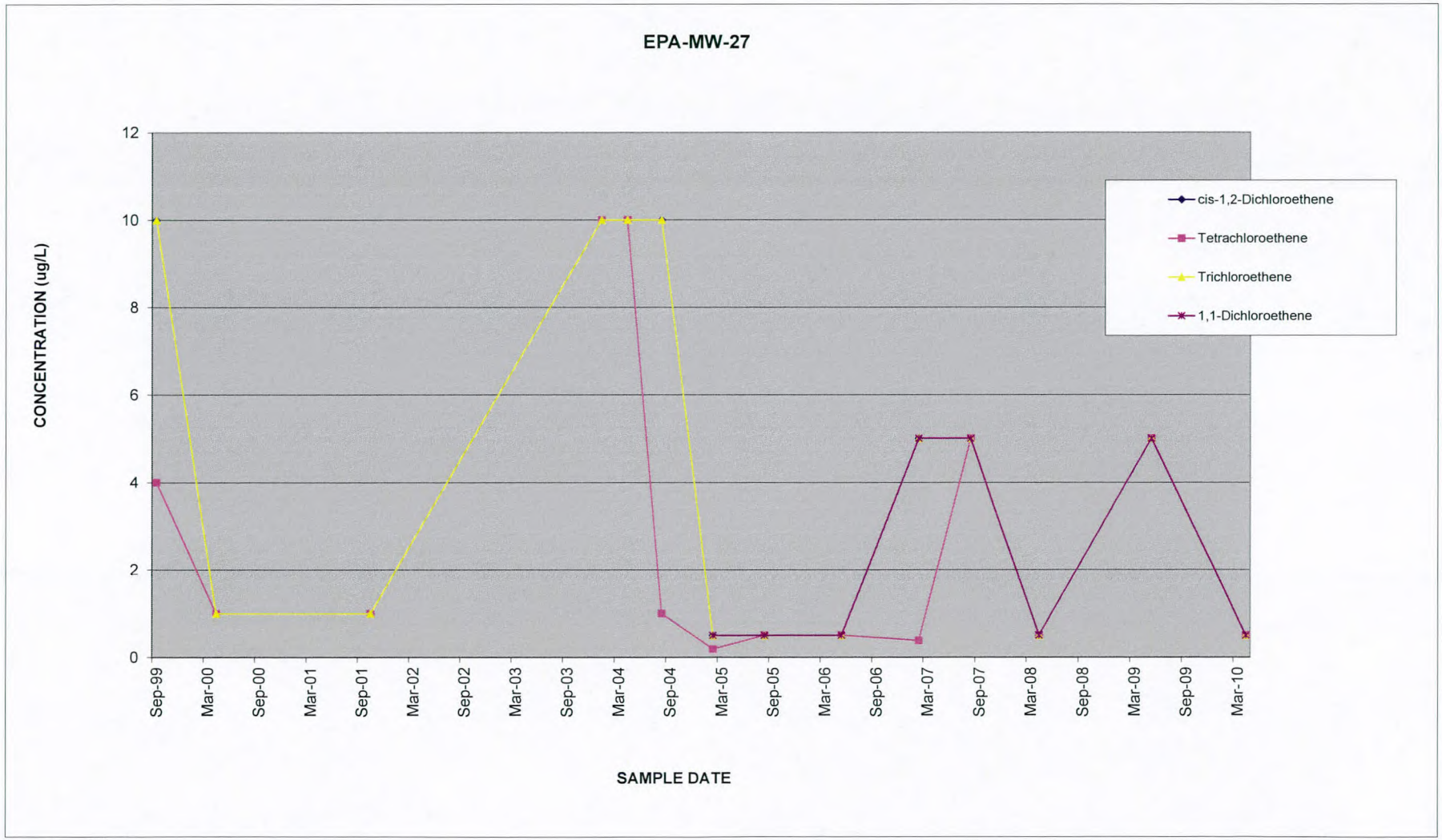

CL-1S
CONCENTRATION (ug/L)
0
2
4
6
8
10
12
Sep-99
Jan-00
May-00
Sep-00
Jan-01
May-01
Sep-01
Jan-02
May-02
Sep-02
Jan-03
May-03
Sep-03
Jan-04
May-04
Sep-04
Jan-05
May-05
SAMPLE DATE
cis-1,2-Dichloroethene
Tetrachloroethene
Trichloroethene
1,1-Dichloroethene


CL-3
Concentration (ug/L)
100
90
80
70
60
50
40
30
20
10
0
Sep-99
Jan-00
May-00
Sep-00
Jan-01
May-01
Sep-01
Jan-02
May-02
Sep-02
Jan-03
May-03
Sep-03
Jan-04
May-04
Sep-04
Jan-05
May-05
Sample Date
cis-1,2-Dichloroethene
Tetrachloroethene
Trichloroethene
0.5 2 0.5 10 10 10
1,1-Dichloroethene

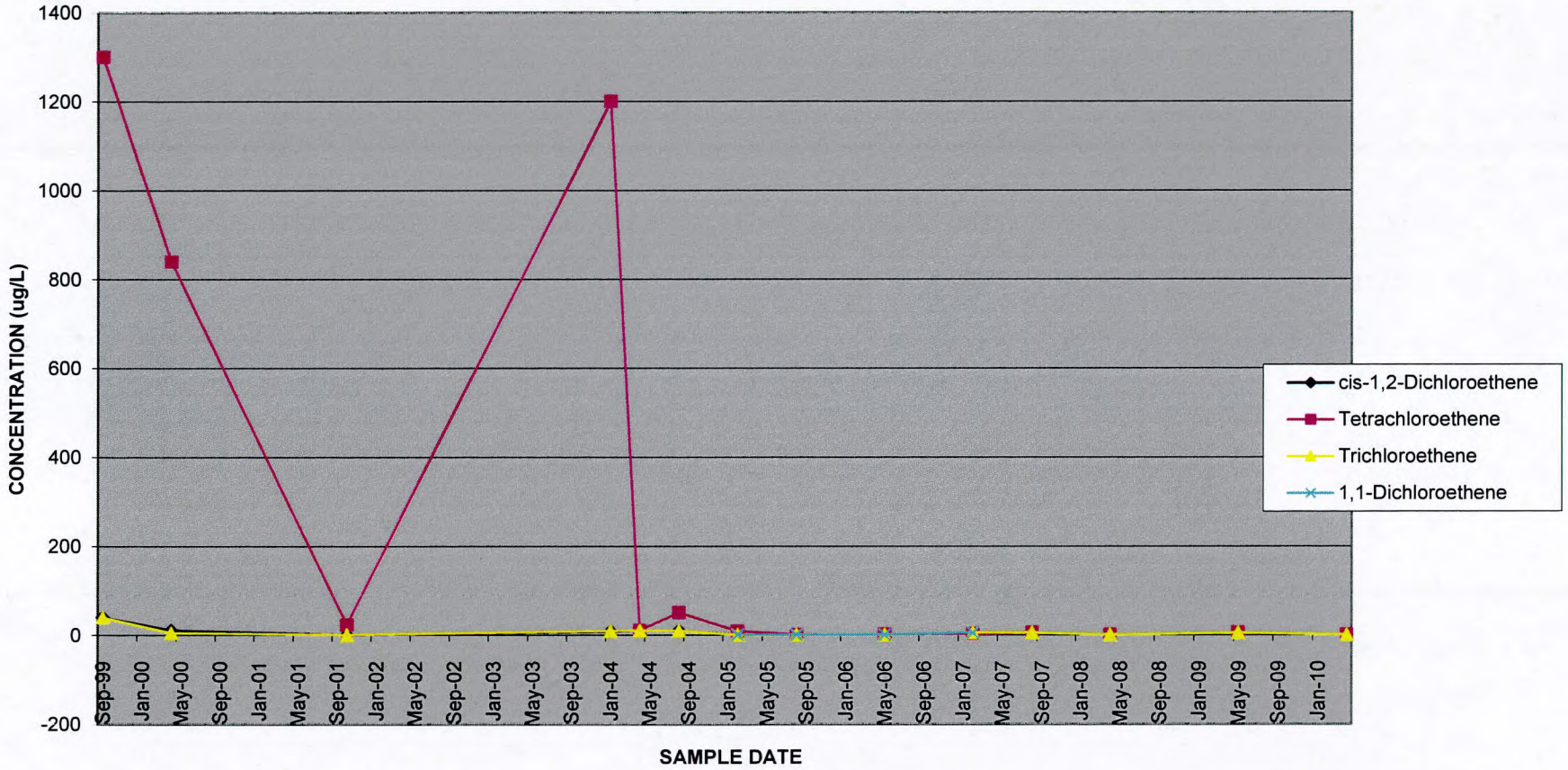

CL-4S
Concentration (ug/L)
60
50
40
30
20
10
0
-10
Sep-99
Jan-00
May-00
Sep-00
Jan-01
May-01
Sep-01
Jan-02
May-02
Sep-02
Jan-03
May-03
Sep-03
Jan-04
May-04
Sep-04
Jan-05
May-05
Sample Date
cis-1,2-Dichloroethene
Tetrachloroethene
Trichloroethene
1,1-Dichloroethene


EPA-MW-11D
CONCENTRATION (ug/L)
12
10
8
6
4
2
0
Sep-99
Sep-00
Sep-01
Sep-02
Sep-03
Sep-04
Sep-05
Sep-06
Sep-07
Sep-08
Sep-09
SAMPLE DATE
cis-1,2-Dichloroethene
Tetrachloroethene
Trichloroethene
1,1-Dichloroethene


ST-MW-17
CONCENTRATION (ug/L)
400
350
300
250
200
150
100
50
0
SAMPLE DATE
cis-1,2-Dichloroethene
Tetrachloroethene
Trichloroethene
1,1-Dichloroethene


EPA-MW-27
CONCENTRATION (ug/L)
12
10
8
6
4
2
0
Sep-99
Mar-00
Sep-00
Mar-01
Sep-01
Mar-02
Sep-02
Mar-03
Sep-03
Mar-04
Sep-04
Mar-05
Sep-05
Mar-06
Sep-06
Mar-07
Sep-07
Mar-08
Sep-08
Mar-09
Sep-09
Mar-10
SAMPLE DATE
cis-1,2-Dichloroethene
Tetrachloroethene
Trichloroethene
1,1-Dichloroethene

CL-1D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1200
1000
800
600
400
200
0
-200
CONCENTRATION (ug/L)
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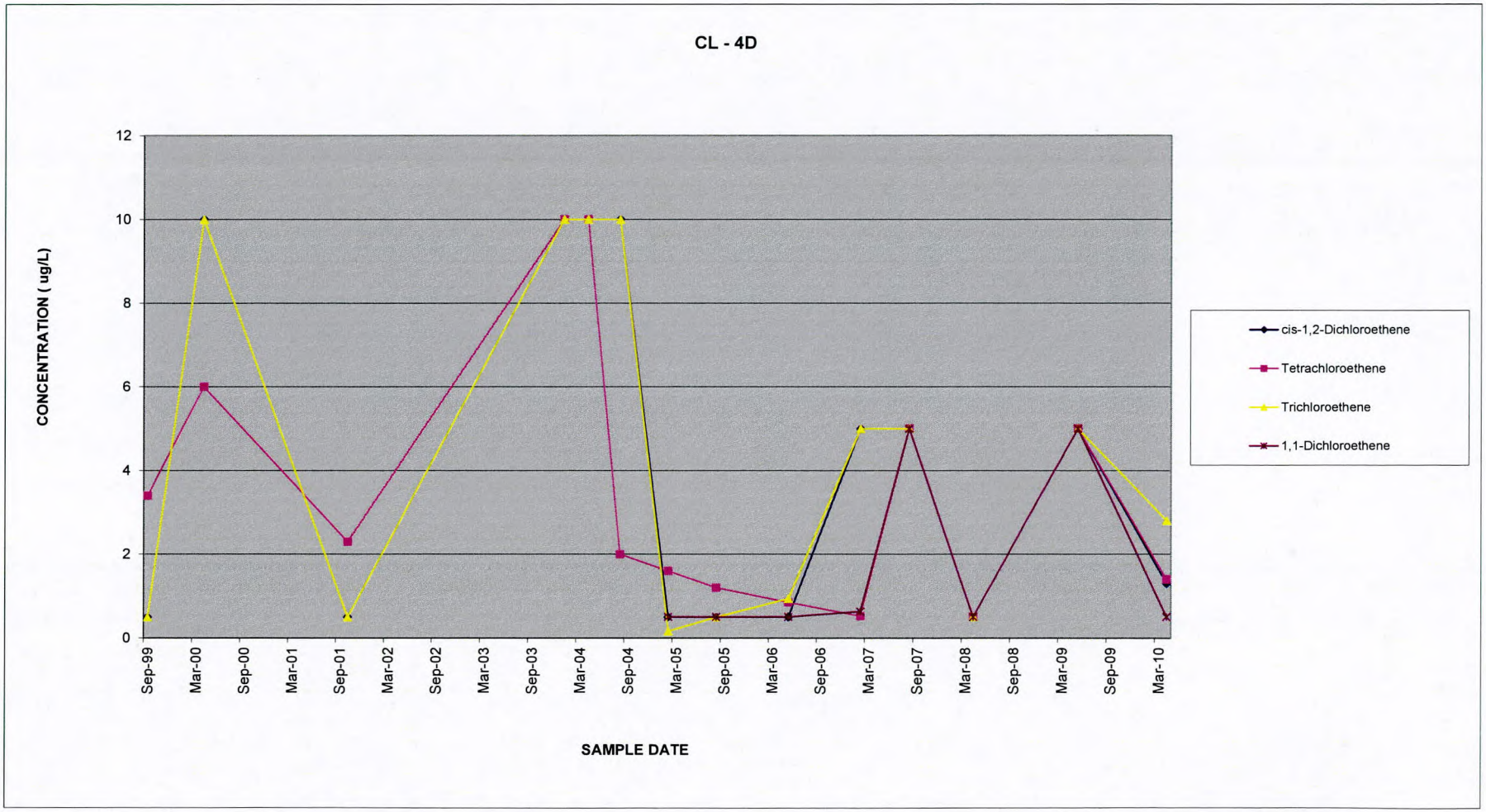
Jan-00
May-00
Sep-00
Jan-01
May-01
Sep-01
Jan-02
May-02
Sep-02
Jan-03
May-03
Sep-03
Jan-04
May-04
Sep-04
Jan-05
May-05
Sep-05
Jan-06
May-06
Sep-06
Jan-07
May-07
Sep-07
Jan-08
May-08
Sep-08
Jan-09
May-09
Sep-09
Jan-10
SAMPLE DATE
cis-1,2-Dichloroethene
Tetrachloroethene
Trichloroethene
1,1-Dichloroethene


CL - 4D
CONCENTRATION (ug/L)
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10
8
6
4
2
0
Sep-99
Mar-00
Sep-00
Mar-01
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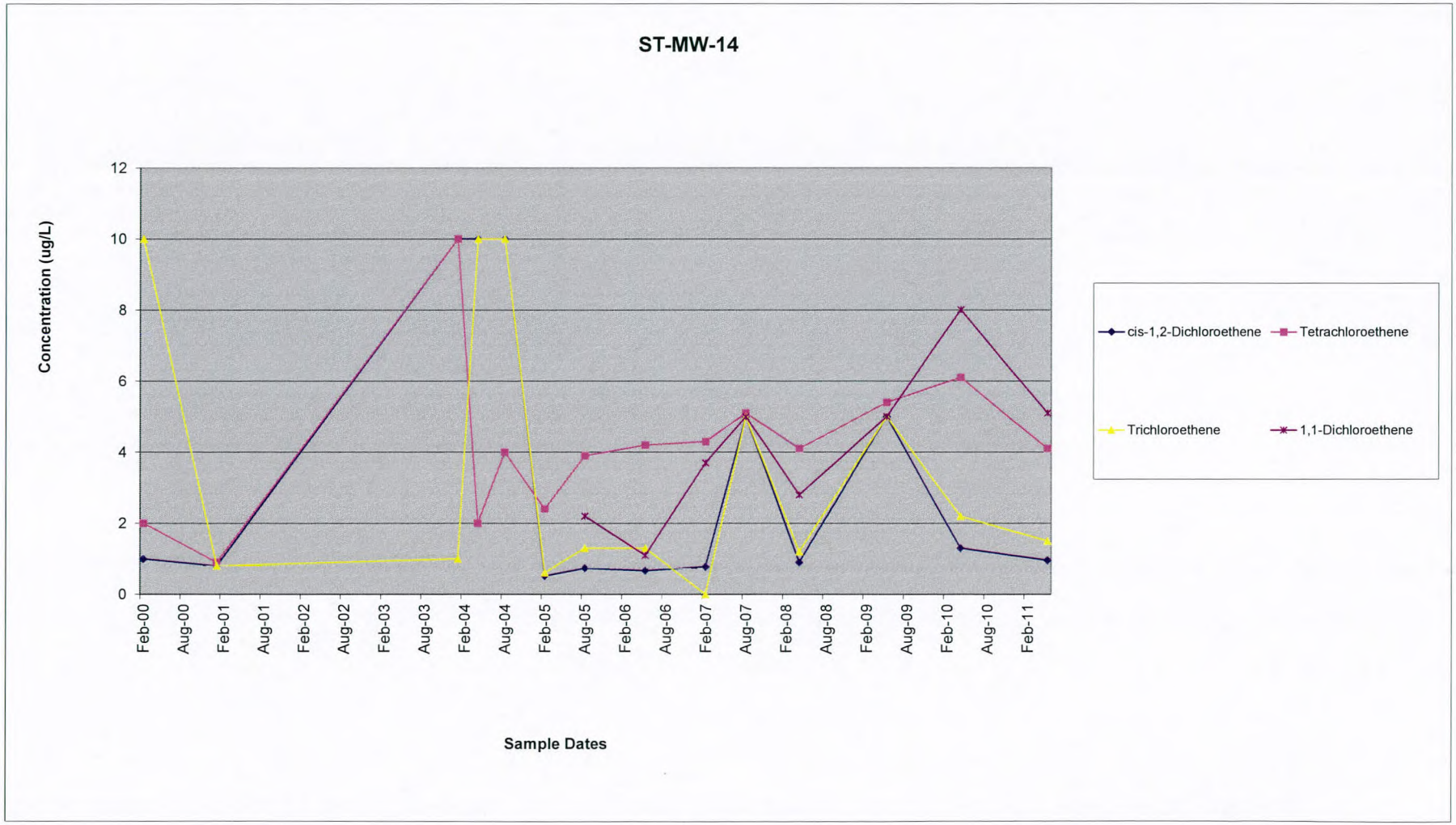
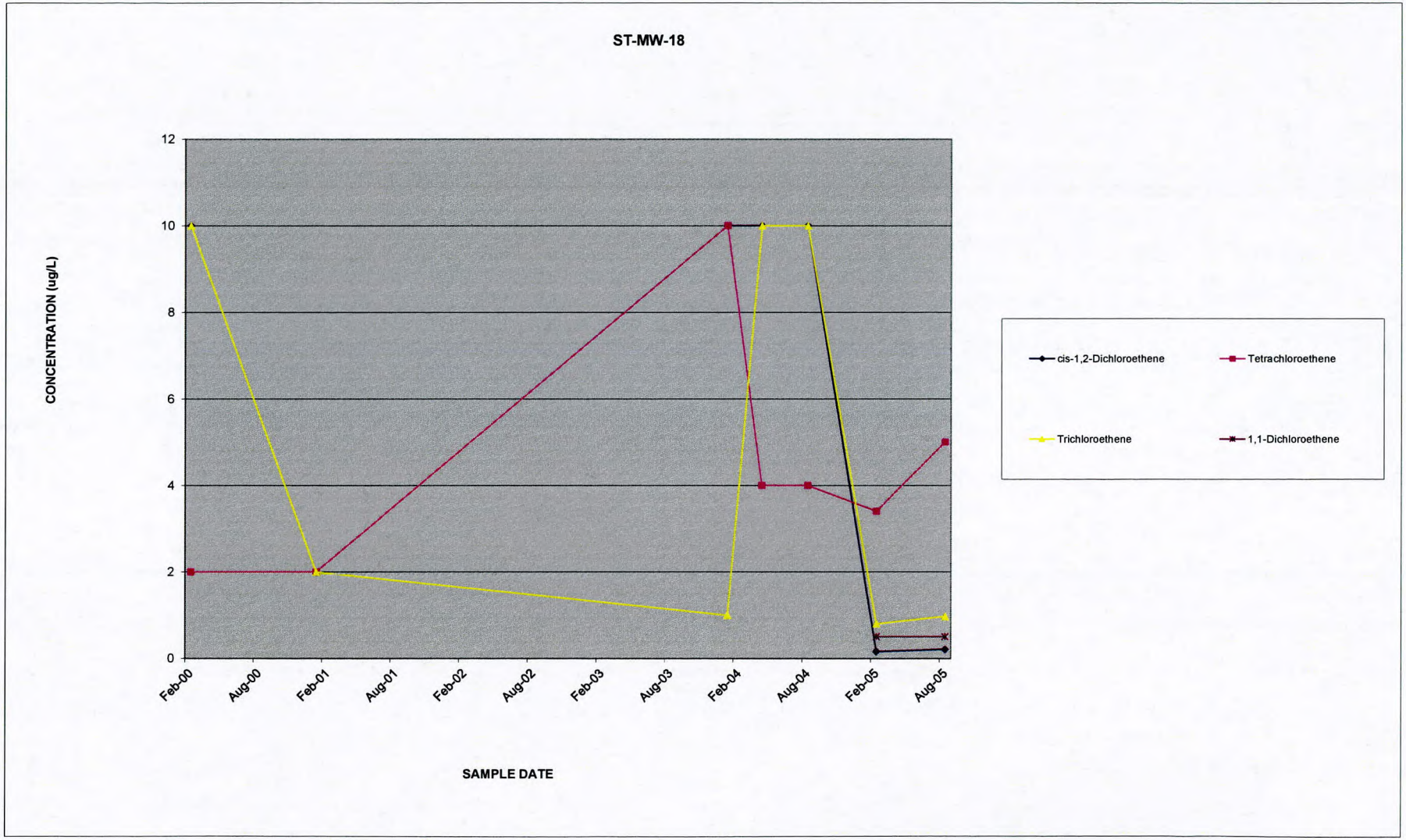
Mar-02
Sep-02
Mar-03
Sep-03
Mar-04
Sep-04
Mar-05
Sep-05
Mar-06
Sep-06
Mar-07
Sep-07
Mar-08
Sep-08
Mar-09
Sep-09
Mar-10
SAMPLE DATE
cis-1,2-Dichloroethene
Tetrachloroethene
Trichloroethene
1,1-Dichloroethene


ST-MW-14
Concentration (ug/L)
12
10
8
6
4
2
0
Feb-00
Aug-00
Feb-01
Aug-01
Feb-02
Aug-02
Feb-03
Aug-03
Feb-04
Aug-04
Feb-05
Aug-05
Feb-06
Aug-06
Feb-07
Aug-07
Feb-08
Aug-08
Feb-09
Aug-09
Feb-10
Aug-10
Feb-11
Sample Dates
cis-1,2-Dichloroethene
Tetrachloroethene
Trichloroethene
1,1-Dichloroethene


ST-MW-18
CONCENTRATION (ug/L)
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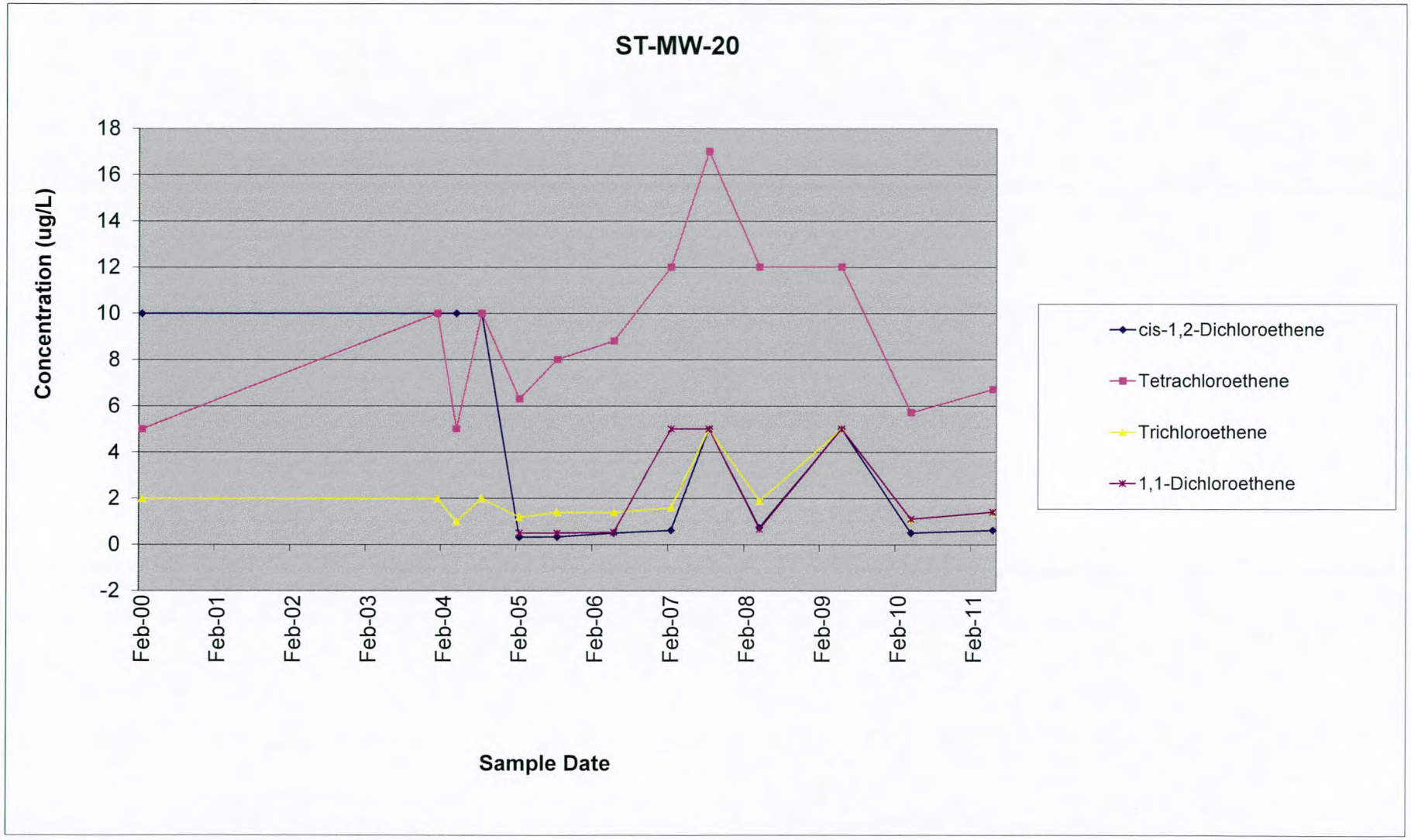
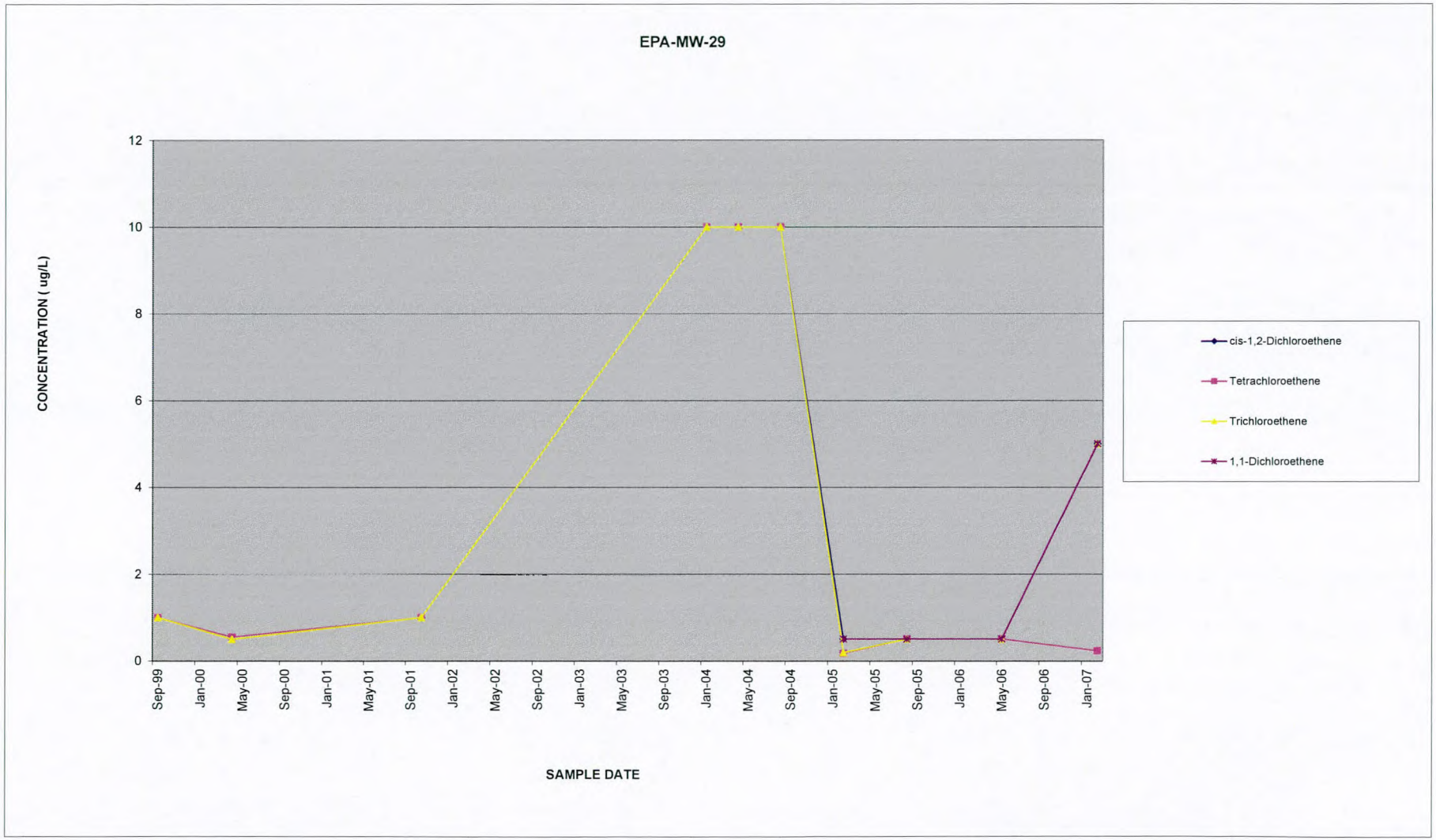
10
8
6
4
2
0
Feb-00
Aug-00
Feb-01
Aug-01
Feb-02
Aug-02
Feb-03
Aug-03
Feb-04
Aug-04
Feb-05
Aug-05
SAMPLE DATE
cis-1,2-Dichloroethene
Tetrachloroethene
Trichloroethene
1,1-Dichloroethene


ST-MW-20
Concentration (ug/L)
18
16
14
12
10
8
6
4
2
0
-2
Feb-00
Feb-01
Feb-02
Feb-03
Feb-04
Feb-05
Feb-06
Feb-07
Feb-08
Feb-09
Feb-10
Feb-11
Sample Date
cis-1,2-Dichloroethene
Tetrachloroethene
Trichloroethene
1,1-Dichloroethene


EPA-MW-29
CONCENTRATION (ug/L)
12
10
8
6
4
2
0
Sep-99
Jan-00
May-00
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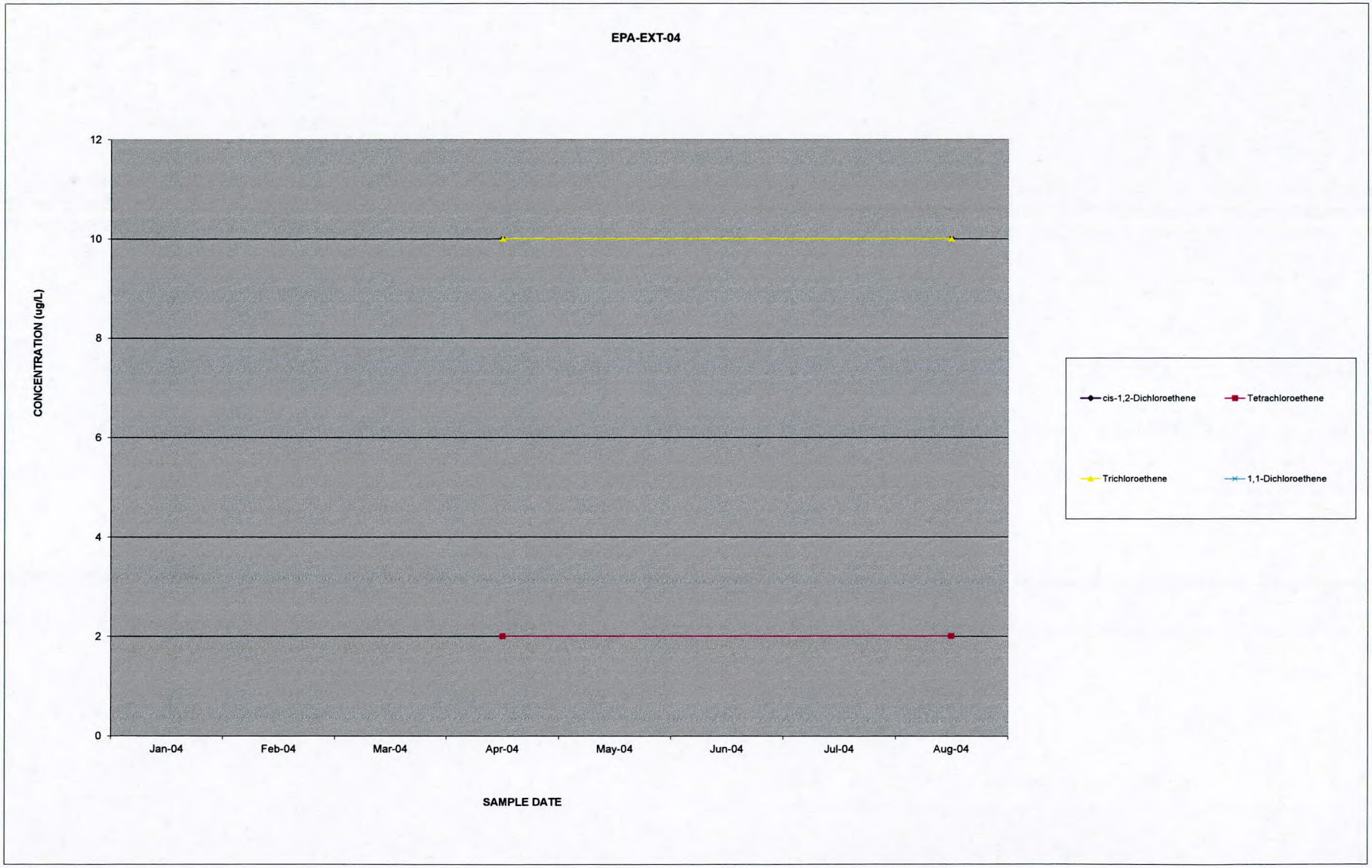
Jan-01
May-01
Sep-01
Jan-02
May-02
Sep-02
Jan-03
May-03
Sep-03
Jan-04
May-04
Sep-04
Jan-05
May-05
Sep-05
Jan-06
May-06
Sep-06
Jan-07
SAMPLE DATE
cis-1,2-Dichloroethene
Tetrachloroethene
Trichloroethene
1,1-Dichloroethene


EPA-EXT-04
CONCENTRATION (ug/L)
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10
8
6
4
2
0
Jan-04
Feb-04
Mar-04
Apr-04
May-04
Jun-04
Jul-04
Aug-04
SAMPLE DATE
cis-1,2-Dichloroethene
Tetrachloroethene
Trichloroethene
1,1-Dichloroethene