DATE
19 July 2024

REFERENCE
0560713

TECHNICAL MEMORANDUM

TO	Josiah Johnson, USEPA Fulton Avenue Remedial Project Manager
FROM	Chris Wenczel, P.G. (NY) and Ernie Rossano, P.G. (NY)
DATE	19 July 2024
REFERENCE	0560713
SUBJECT	OU1 Interim Remedy Effectiveness Evaluation – USEPA 31 May 2024 Letter 150 Fulton Avenue NPL Site - Operable Unit I USEPA Consent Judgment No. CV–09–3917 DOJ Ref. No. 90–11–2–09329 Fulton Avenue Superfund Site, Garden City Park, New York

1. INTRODUCTION

This technical memorandum has been prepared in response to the United States Environmental Protection Agency's (EPA) 31 May 2024 letter, which requested that Genesco Inc. (Settling Defendant)[1] "*assist EPA in summarizing some information regarding the OU1 interim remedy that Genesco is implementing that would be especially helpful as the EPA works toward finalizing the Feasibility Study for OU2 and selecting final remedial approaches for OU1 and OU2.*"

The 31 May 2024 letter reports that "*EPA is preparing a Feasibility Study for Operable Unit Two (OU2) of the Fulton Avenue Superfund Site in Garden City Park, New York (the Site). EPA expects to issue a proposed plan to lay out alternatives to address OU2 that it anticipates would constitute the final groundwater remedial decision for the Site and that would serve as a final decision for the OU1 remedy at the Site and, in turn, the Site as a whole.*"

Specifically, the letter requests a brief summary report that demonstrates the OU1 Interim Remedy is meeting the Remedial Action Objectives (RAOs) established in the 2015 Amended OU1 Record of Decision (2015 ROD), which are:

- Minimize and/or eliminate the potential for future human exposure to Site contaminants via contact with contaminated drinking water[2]; and
- Help reduce migration of contaminated groundwater.[3]

[1] U.S. Environmental Protection Agency (EPA) 30 September 2015 OU1 Record of Decision Amendment (Amended OU1 ROD) for the Site, revised OU1 Consent Judgment No. CV–09–3917 (2016 CJ) and revised OU1 Statement of Work (2016 SOW) approved and entered by the United States District Court for the Eastern District of New York on 15 August 2016.

Genesco conducted the IRM from August 1998 to December 2001 to remove chlorinated VOCs (primarily PCE) from soils within, adjacent to, and beneath a drywell on the Fulton Property in order to address a significant source of contamination that was impacting indoor air at the Fulton Property, and the groundwater beneath and downgradient of the Fulton Property. During the IRM, VOC-impacted soils were excavated, and a soil vapor extraction (SVE)/air sparge (AS) system was installed to address residual soil contamination beneath the drywell and in shallow groundwater in the immediate vicinity. The IRM was completed January 2, 2002, and the SVE was dismantled and removed.

[2] Note that the Performance Standards set forth in Section II of the 2016 Statement of Work (SOW) appended to the 2016 Consent Judgement (CJ) elaborate to state: "*Minimize and/or eliminate potential, current, and future human exposures, including inhalation of vapors and ingestion of groundwater contaminated with volatile organic compounds.*"

[3] Note that the Performance Standards set forth in Section II of the 2016 Statement of Work (SOW) appended to the 2016 Consent Judgement (CJ) elaborate to state: "*Help to reduce further migration of groundwater contaminated with PCE and TCE in the PCE-dominant portion of the groundwater plume.*" & "*Compliance with all applicable or relevant and appropriate requirements (ARARs) as set forth in the Amended OU1 ROD*".

EPA's letter seeks information as to a list of six bullet-point items, which are presented in statement/discussion-format in Section 2 below and are reproduced immediately below:

1. *An explanation/demonstration that the interim OU1 remedy meets the remedial action objectives described in the 2015 OU1 ROD Amendment;*
2. *An explanation as to whether the continued operation of Village of Garden City's wells 13 and 14 has helped prevent or reduce migration of the OU1 portion of the plume toward the Franklin Square Water District wells and provide supporting information that the OU1 portion of the plume is not expected to have a significant impact on these wells;*
3. *A discussion of data trends and how long it is anticipated that it will take to attain MCLs within the OU1 portion of the plume, i.e., provide a rough estimate of the time anticipated for the restoration of the aquifer;*
4. *An explanation/demonstration that Village of Garden City's wells 13 and 14 are effectively capturing the OU1 portion of the plume;*
5. *A "lines of evidence" assessment as to why the investigation identified in the OU1 ROD Amendment is no longer warranted. See page 21 of ROD Amendment: "EPA will continue to investigate additional areas for possible source material that may need to be addressed (by ISCO or another remedial approach), including source(s) of elevated PCE observed in nearby monitoring well GCP-01 located southwest and downgradient of the Fulton Property."; and*
6. *An assessment of the effectiveness of the sub-slab depressurization system installed at 150 Fulton Avenue.*

1.1 OVERVIEW OF OU1 PCE-DOMINANT GROUNDWATER PLUME

An overview of the nature of the OU1 PCE-dominant groundwater plume, Village of Garden City (VGC) Well Nos. 13 (N-07058) and 14 (N-08339) that intercept and capture the OU1 plume, and observed tetrachloroethene (PCE) and trichloroethene (TCE) concentration data trends in both the public supply and groundwater monitoring wells is required to understand the subsequent topical discussions in this technical memorandum and is presented below.

As depicted in **Figure 1** showing all well locations associated with the Site, **Figure 2** showing the hydrogeochemical cross-section along the groundwater flow path between the 150 Fulton Avenue Property from the ERM 2005 Remedial Investigation Report (RI), and confirmed by groundwater monitoring since 2001, the OU1 PCE-dominant plume that emanated from the 150 Fulton Property and other properties within the Garden City Park Industrial Area (GCPIA) is long, narrow and thickens with distance until being intercepted and captured by the pumpage of VGC Wells Nos. 13 and 14 (N-08339) located on the Garden City Country Club golf course.

VGC Well No. 13 is screened 380-440 feet below ground surface (bgs) and VGC Well No. 14 is screened shallower from 308-358 feet bgs, and according to the VGC, the wells pump at 1,200 gallons per minute (gpm) and 1,400 gpm, respectively. Nearby VGC Well No. 9 (N-03881) located to the west of VGC Well Nos. 13 and 14 is screened deeper from 426-469 feet bgs and reportedly pumps at 1,200 gpm.

Since 2017, long-term groundwater monitoring for VOCs in groundwater focused on the OU1 PCE-dominant plume has been performed in accordance with Attachment 1 of the 2016 SOW: Monitoring Well Sampling Program presented in **Table 1** and the EPA-approved 2017 Quality Assurance Project Plan (QAPP) for the Site. Long-term groundwater monitoring well network locations are indicated on the map presented as **Figure 1**. When reviewing **Table 1**, note that the long-term groundwater

monitoring program is in Year 5+ so Group 1 and Groups 2 and 3 wells are sampled every 24 months in alternating years.

Table 2 presents a summary of historical ground water monitoring well analytical results for select predominant compounds (PCE, TCE and cis 1,2-dichloroethene {cis 1,2-DCE}) for all wells associated with the Site.

Attachment A presents updated plots of PCE, TCE and cis 1,2-DCE versus time for each of the 42 groundwater monitoring wells that are part of the OU1 long-term groundwater monitoring program specified in **Table 1** where a green-dotted line for the 5 microgram per liter (µg/l) drinking water Maximum Contaminant Level (MCL) for PCE, TCE and cis 1,2-DCE is shown for context/comparison. Note that the EPA MCL for cis 1,2-DCE is 70 µg/l but the New York State Department of Health (NYSDOH) MCL is 5 µg/l. Monitoring well screen interval depths are indicated in the header for each plot.

The results of the long-term groundwater monitoring and pre-design sampling activities completed in 2011-2012 determined that:

- The Soil IRM (SVE/AS) Interim Remedial Measure (IRM) was effective in significantly reducing VOC concentrations in the shallow groundwater within the IRM area where after 10 years, there was no rebound in VOC concentrations in groundwater within and/or downgradient of the Soil IRM area. In fact, the results of pre-design activities establish that in the vicinity of the former source area, groundwater VOC levels had recovered to below respective MCLs.
- There does not appear to be significant residual PCE in the formation acting as a continuing source of groundwater contamination from original source area at and near the 150 Fulton Avenue property justifying any further remedial action.
- Natural attenuation is occurring where cleaner groundwater appears to be moving from northeast to southwest beneath the Fulton Avenue Property has flushed out residual VOC-impacted groundwater.
- VOC concentrations in groundwater at the Fulton Avenue Property have declined to levels consistent with known/unknown upgradient contributing sources discussed in the 2005 RI Report.
- In comparing the concentrations noted by the various sampling activities, the VOC concentrations in groundwater measured at and immediately downgradient of the Fulton Avenue Property are not indicative of nonaqueous phase liquid (NAPL) concentrations.
- VOC concentrations, where present in the vicinity of the Site, appear as sporadic residual dissolved concentrations generally at the upper water surface within the zone of seasonal groundwater fluctuation.
- VOC concentrations in groundwater monitoring well GCP-01S (screened to straddle the water table surface) continue to fluctuate and the predominant compound has shifted from PCE to 1,2-cis DCE. The source of the VOCs in this well may be either residual VOCs stranded in the vadose zone and only mobilized when groundwater levels rise flooding this zone or from another source associated with immediately adjacent commercial properties (see Figure 3).
- VOC concentrations in groundwater downgradient of the Fulton Avenue Property are the result of residual dissolved solute and sorbed VOCs in the aquifer matrix that are back diffusing and can be expected to continue to decline to levels consistent with upgradient sources over time.

Charts for VGC Well Nos. 13 & 14 showing PCE and TCE concentrations versus time, and historic monthly pumpage versus time (second Y-axis) are presented as **Figures 4** and **5**, respectively.

Historical groundwater sample analytical results from the monitoring wells and VGC Well Nos. 13 and 14 confirm there is little indication of breakdown (reductive dichlorination) due to biodegradation or other natural causes, i.e., PCE remains the dominant compound in groundwater from upgradient to the VGC wells, with the exception of observed VOC concentrations in wells GCP-1S and GCP-18S where cis 1,2-DCE has become the predominant VOC based on concentrations. VOC groundwater plumes of this configuration have steep concentration gradients perpendicular to the direction of groundwater flow where the greater the maximum concentrations observed along the spine (core) of the plume, the greater the concentration range/gradient. Hence, small shifts in groundwater directions due to natural or manmade causes such as changes in pumping scenarios for VGC Well Nos. 9, 13 & 14 can result in large fluctuations in VOC concentrations from one sampling event to the next. An example of this phenomenon is observed at the MW21A – 21D quadruplet well cluster immediately upgradient of VGC Well No. 13 and 14 (see plots for MWs 21B and 21C presented in **Attachment A**).

Due to vertical anisotropy in the Magothy formation, each well sources a greater volume of water horizontally into its well screen but also sources a lesser volume of water from above and below the screen interval. Thus, one can envision that when one well is pumping but the other one is off, contaminated groundwater near the supply wells can be pulled upwards and downwards in the formation toward the pumping well. In addition, pumping and non-pumping of nearby VGC No. 9 located to the west of VGC Well Nos. 13 and 14 can impact groundwater flow directions in the local flow field.

Historical untreated water analytical results provided by VGC show that PCE concentrations in VGC Well Nos. 13 and 14 peaked in June and October 2007 at concentrations of 1,020 µg/l and 769 µg/l, respectively.

Historical pumpage records show that VGC Well No. 13 is used as the primary well to meet demand, i.e., generally pumped year round, whereas VGC Well No. 14 is generally pumped seasonally to supplement and meet demand during the warmer months of the year. i.e., lawn watering/pool season. Thus, VGC Well No. 13 has extracted more water and any dissolved VOCs therein out of the aquifer system since 2007, and while intuitively VGC Well No. 14 has extracted less water and VOCs during the same time period.

Well maintenance/rehabilitation and equipment upgrades completed by the VGC in recent years have resulted in long shutdown (out of service) periods for each of the three VGC wells adding to the dynamic nature of groundwater flow in the aquifer system near these wells:

- VGC Well No. 9 was not used during July 2017 – June 2020;
- VGC Well No. 13 was used minimally during April 2023 – March 2024; and
- VGC Well No. 14 was not used between November 2016 – March 2018, and September 2020 – May 2023.

Examination of the plots of PCE concentrations in VGC Well Nos. 13 and 14 versus pumpage indicates an overall general correlation between temporal increases in PCE concentrations in response to increases in seasonal pumpage followed by the decline and stabilization PCE concentrations during periods of sustained pumpage and/or decreases in pumpage.

PCE concentrations in VGC Well No. 14 were gently declining from the historical high of 769 µg/l observed in 2007 until being put back into service following the November 2016 – March 2018 shutdown period when PCE concentrations increased by a factor of 2X in 2019, and eventually declined and stabilized but at a higher concentration range than was observed before shutdown and then remained at similar concentrations following the second September 2020 – May 2023 shutdown period.

Figure 6 presents average concentrations of PCE and TCE (and the corresponding PCE/TCE ratio) for Well Nos. 9, 13, & 14 by year (2001 – 2023), and plots of average annual PCE and TCE concentrations versus time for each of well for comparison. The data and resultant plots indicate that concentrations of PCE have fluctuated over time since 2007, but there is an overall declining trend in maximum observed and annual average PCE concentrations over time in Well Nos. 13 & 14 notwithstanding the abovementioned recent uptick in PCE concentrations at VGC No. 14. Concentrations of TCE have been declining in Well No. 13 and are beginning to decline in Well No. 14. A brief summary that puts the relative concentrations in perspective is presented in **Table 3** below.

TABLE 3 – HISTORICAL PCE & TCE CONCENTRATION TRENDS VGC Well NOS. 13 & 14

VGC Well	Dominant Compound Historic High	2007 Average (µg/L)	2023 Average (µg/L)	Difference of Averages	% Change of Averages
No. 13 (N-07058)	**6/4/2007**				
PCE	1,020	722.6	345.0	-377.6	-52%
TCE	91.5	90.0	32.1	-57.9	-64%
No. 14 (N-08339)	**10/27/2007**				
PCE	769	370.1	308.8	-61.3	-17%
TCE	69	38.9	28.1	-10.8	-28%

2. SPECIFIC TOPICS

2.1 THE INTERIM OU1 REMEDY MEETS THE REMEDIAL ACTION OBJECTIVES DESCRIBED IN THE 2015 OU1 ROD AMENDMENT [BULLET POINT #1].

EPA's *30 September 2022 Five Year Review Report for the Fulton Avenue Site, Garden City Park, Nassau County New York* presents a technical evaluation of how the OU1 Interim Remedy is performing in terms of the RAOs and concludes as follows:

- The OU1 Interim Remedy is functioning as intended by the decision documents where:
  - Continued operation, maintenance and monitoring of the existing treatment systems on VGC Well Nos. 13 and 14[4], a comprehensive groundwater monitoring plan and institutional controls to restrict future installation of private potable wells or redevelopment of the site into anything other than industrial (the current zoning) ensure that current and future exposure to groundwater contamination is not occurring at the Site.
  - The non-detect analytical results and relatively low detections of PCE, TCE, and cis 1,2-DCE in the multi-level groundwater monitoring wells directly down-gradient of the Village supply

[4] Each well is equipped with its own air stripper to remove VOCs from the pumped groundwater that is then polished with granular activated carbon (GAC) before entering the public supply system. Both raw and treated water are generally sampled on a monthly basis to monitor influent and treated water concentrations and determine when GAC change-outs should occur.

wells show that the pumping of the supply wells is accomplishing the RAO of reducing migration.

- The 2015 ROD also called for an evaluation of structures in the vicinity of 150 Fulton Street (150 Fulton) for soil vapor intrusion (SVI) and, if necessary, the installation of appropriate response actions, such as sub-slab depressurization systems (SSDS). The VI investigation was initiated in 2016 and to date, ERM is unaware that any EPA findings indicated the need for SSDS installations on any other nearby properties.
- Lastly, a Site Management Plan (SMP) required by the 2015 ROD was prepared for OU1 in August 2018 and provides for the proper management of all OU1 remedy components. These components of the interim selected remedy ensure exposure to contaminated sitewide groundwater or vapors is not occurring at the Site.

- The exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection are still valid where:
  - There have been no physical changes to the Site that would adversely affect the protectiveness of the remedy. Land use assumptions, pathways, and cleanup levels considered in the decision document followed the Risk Assessment Guidance for Superfund used by the Agency at that time and remain valid. Although specific parameters may have changed since the time the risk assessment was completed, the process that was used remains valid.
  - In March 2016, EPA initiated an investigation of SVI into structures at commercial properties located immediately downgradient in the vicinity of the 150 Fulton Property on Fulton and Atlantic Avenues that included multiple rounds of SVI sampling consisting of concurrent sub-slab and indoor air samples. ERM is unaware that any EPA findings indicated the need for SSDS installations on any other nearby properties. In addition, during the February 2017 SVI sampling round, sub-slab samples from two residential properties located downgradient from the source area were also collected. Results of the sampling did not find site-related contaminants above levels of concern and further evaluation at these homes was deemed not to be necessary.

    The SSDS installed beneath the 150 Fulton Avenue building following the soil IRM was upgraded to an active system by the installation of a continuously operating electrically powered fan in 2018. The system was last sampled by EPA in 2019 and the results indicated that the indoor air levels of PCE and TCE are below EPA's risk-based Vapor Intrusion Screening Levels (VISLs) set at a cancer risk equal to $1x10^{-6}$ and a noncancer hazard quotient equal to 1.
  - There are no complete exposure pathways to ecological receptors at the Site. Without a complete pathway, there is no exposure and hence, no risk. Based on a review of existing data, there are no potential exposure pathways for ecological receptors at the Site. Given that there are no complete exposure pathways to ecological receptors at the Site, exposure assumptions and RAOs used at the time of the remedy remain valid and are protective of ecological receptors.
- No new/other information has come to light that could call into question the protectiveness of the remedy.

2.2 THE VILLAGE OF GARDEN CITY'S WELLS 13 AND 14 ARE EFFECTIVELY CAPTURING THE OU1 PORTION OF THE PLUME [BULLET POINTS #4 & #2].

This section addresses two very similar and interrelated topics outlined in EPA's 31 May 2024 letter:

- Bullet Point #4: *An explanation/demonstration that Village of Garden City's wells 13 and 14 are effectively capturing the OU1 portion of the plume; and*

- Bullet Point #2: *An explanation as to whether the continued operation of Village of Garden City's VGC Well Nos. 13 and 14 has helped prevent or reduce migration of the OU1 portion of the plume toward the Franklin Square Water District wells and provide supporting information that the OU1 portion of the plume is not expected to have a significant impact on these wells.*

Empirical data presented herein demonstrate that VGC Well Nos. 13 and 14 are indeed effectively capturing the OU1 PCE-dominant portion of the larger OU1/OU2 (TCE-dominant) plume, and as a result, continued operation of VGC Well Nos. 13 and 14 has helped prevent or reduce migration of the OU1 portion of the plume toward the Franklin Square Water District (FSWD) wells, and that the OU1 portion of the plume is not expected to have a significant impact on these wells.

This section presents the results of source water assessments (SWAs) for VGC Well Nos. 9, No. 13 and No. 14, and FSWD Well No. 1 (N-03603) and No. 2 (N-03604) prepared as products of an advanced Long Island-wide groundwater modeling effort performed by a third-party engineering firm under contract with the NYSDOH and published in 2003. Those SWAs for VGC Well Nos. 13 and 14 were validated by empirical pump testing results that were then used to develop and calibrate a local groundwater flow model focused on the Site. The calibrated flow model was in turn used as a predictive tool to assess OU1 plume capture and answer a number of questions regarding the effectiveness/protectiveness of continued pumping of VGC Well Nos. 13 and 14 to capture the OU1 PCE-dominant plume.

Finally, groundwater monitoring well analytical results from multi-level wells located downgradient of VGC Well Nos. 13 and 14 are presented that demonstrate continued non-detect results and relatively low detections of PCE, TCE, and 1,2-DCE, which have generally been decreasing since 2019 (the last 5 years), and should not result in MCL exceedances in the FSWD wells simply due to the effects of dilution along the flow path and at the well heads.

2.2.1 SOURCE WATER ASSESSMENTS

In 2003, the NYSDOH released a report entitled "*Long Island Source Water Assessment Summary Report*" which was prepared by the engineering firm Camp, Dresser & McKee (CDM) in cooperation with the Nassau County Departments of Health and Public Works, and the Suffolk County Department of Health Services.

The Long Island source water assessments (SWAs), were completed by CDM under contract to NYSDOH, utilized computer modeling and geographic information system (GIS) tools to build upon earlier resource management initiatives at the state and county levels. The document is a summary of the results of individual assessments for the 938 community and 418 noncommunity wells serving public water supplies on Long Island.

Existing three-dimensional computer models of the Long Island aquifer system were updated and expanded to predict ground water flow within the entire aquifer system and to each community water supply well. The computer model delineates the area that contributes recharge for each well and approximates the time it takes water to travel from the water table through the aquifer to the well.

A SWA was completed for each well, and the results are summarized in individual well reports, each of which is comprised of a set two figures and accompanying tables that depict/address the following three components:

1. Figures delineating the source water recharge area for the individual supply well showing travel time intervals of 2, 5, 25, 50, 75 and 100 years;
2. Determining the prevalence of contaminants within the source water area; and
3. Analyzing the susceptibility of the well to potential contamination.

This document is still regarded as the best available set of assessments for determining the source water recharge area for each well, i.e., where does the water being pumped by individual wells enter the groundwater system and what is the path it follows to get to that well.

SWA reports for VGC Well Nos. 9, 13 and 14, and FSWD Well Nos. 1 (N-03603) and 2 (N-03604) are presented in **Attachment B** and discussed below.

The SWA report for:

- **VGC Well No. 9** shows that groundwater entering the well originates from recharge areas within the footprint of the OU2 TCE-dominant plume (which also contains PCE) positioned to the west of the OU1 PCE-dominant groundwater plume and the 150 Fulton Avenue Property (**Figure 1**).
- **VGC Well Nos. 13 and 14** show that groundwater entering these wells originates from recharge areas to the north that encompasses the eastern edge of the OU2 TCE-dominant plume, the GCPIA that includes the 150 Fulton Avenue Property and areas further north, and areas further east beneath the recharge basins on the south side of the Long Island Railroad tracks adjacent to Herricks Road. The southern half of this recharge area has been validated by the original OU1 pre-design pump testing of VGC Wells No. 9, No. 13 and No. 14 performed in 2012, the results of which were used to calibrate the groundwater flow model developed and used to support modification of the OU1 remedy further discussed in Section 2.3.2 below.
- **FSWD Well Nos. 1 and 2** show that groundwater entering these wells originates from recharge areas further to the east of the recharge area for VGC Well Nos. 13 and 14, directly north between the Franklin Square wells and VGC Well No. 9, No. 13 and No. 14.

2.3 PUMP TESTING AND GROUNDWATER FLOW MODEL DEVELOPMENT

2.3.1 PUMP TESTING

The capture zones of Village of Garden City (VGC) Public Supply Well Nos. 9, 13 & 14 were estimated as part of the RI/FS. As reported in ERM's August 2016 OU1 Groundwater Flow Model Report, a pre-RD hydraulic evaluation of groundwater flow dynamics within the capture fields of VGC Supply Well Nos. 9, 13 & 14 was subsequently performed to design the groundwater recovery/treatment/recharge component of the OU1 RA.

The pre-RD hydraulic evaluation relied on the coordinated pumping of VGC water supply wells 9, 13 & 14 and continuous data logging of water levels therein and at numerous existing groundwater monitoring wells proximal to the study area.

In anticipation of the pumping response studies, permanent multi-channel data loggers were purchased, installed and tested for proper function on multi-level groundwater monitoring wells MWs 26 & 27 located on the Garden City Country Club golf course. Individual data logging pressure transducers were programmed and deployed in the following conventional groundwater monitoring wells: MWs 15A, 15B, 20A, 20B, 20C, 21A, 21B, 21C, 22A, 22B, 22C, 23A, 23B, 23C, 23D, 24A, 24B, 25A, M5, M6, GCP-14S, GCP-14D, GCP-15S, and VGC Well Nos. 9, 13 & 14. All well locations and associated well screen depths/elevations are shown in **Figure 7**.

These studies were performed during 27 February 2012 - 11 March 2012. The pre-design hydraulic evaluation relied on coordinated pumping of the supply wells and continuous data logging of water levels therein and numerous existing groundwater monitoring wells proximal to the study area. The VGC staff was able to take VGC Supply Well Nos. 9, 13 & 14 off-line, and fully accommodated the requested studies by operating the wells in various combinations as well as simultaneously for specified periods of time followed by shut-down and recovery periods to optimize the quality of the data set obtained from this activity.

The testing was successful and the compilation, reduction, and analysis of the resultant data were completed during 2012 - 2013. **Figure 8** presents a plan view of the study area and depicts the extents of where potentiometric surfaces (water levels) were depressed >0.25 feet as a result of the various pumping scenarios. **Figure 9** shows the >0.25 feet extent of potentiometric depression with just VGC Well Nos. 13 and 14 pumping. These empirical results validate the SWA assessments for VGC Well Nos. 13 and 14 but also explain why pumping of these wells also pull in the OU2 TCE-dominant plume.

Further fine tuning of the model calibration was performed based on data developed during the pre-RD pump testing investigation. The resultant modeled capture fields of VGC water supply wells 9, 13 & 14 closely match the shapes and extents of observed water level responses to the pump testing depicted in **Figures 11 & 12**. The captured fields are depicted in the figures accompanying deliverables discussed below.

2.3.2 MODEL USES

Initially, the calibrated model was used as a basis in the RD to:

- More closely define local groundwater response to pumping of the VGC supply wells (9, 13 and 14) for use in understanding the three-dimensional capture field for each supply well and constructing/calibrating a focused groundwater flow model;
- Identify data gaps and potential new monitoring well locations; and
- Identify the required pumping rates for potential recovery wells to achieve the necessary zone of capture without negatively affecting the supply wells.

The calibrated model was subsequently used to support evaluations requested by USEPA to assist in the decision making process for modifying the 2007 ROD as proposed by the VGC and the Settling Defendant. In particular, a number of scenarios were simulated to evaluate how the operation of VGC Wells No. 9, No. 13 and No. 14 affected the OU1 PCE-dominant plume. These scenarios evaluated:

- The ability of VGC Well Nos. 13 and 14 to capture the OU1 plume;
- How seasonal operation of VGC Well Nos. 13 and 14 for water supply affected OU1 plume capture;
- Whether the installation of recovery wells, contemplated in the OU1 ROD, resulted in a significant reduction in the duration of OU1 plume impact to VGC Well Nos. 13 and 14;
- The minimum annual groundwater withdrawal (pumpage) necessary to ensure that VGC Well Nos. 13 and 14 continue to contain and extract the OU1 plume; and
- How long that VGC Well Nos. 13 and 14 could remain in non-pumping mode (equipment failure/service activities, etc.) before some portion of the OU1 plume might not be recovered upon resumption of pumping.

The results of the evaluations were previously presented to USEPA in two letter reports with graphics showing modeled capture zones, copies of which are presented in **Attachment C**:

1. *24 July 2012 Letter Report: Proposed Remedial Design Modification Analysis, Groundwater Flow Modeling & Forecasting, 150 Fulton Avenue NPL Superfund Site - Operable Unit 1*
2. *29 May 2013 Letter Report: Proposed Remedial Design Modification Analysis, Groundwater Flow Modeling & Pumpage Forecasting, 150 Fulton Avenue NPL Superfund Site - Operable Unit 1*

Salient conclusions presented in the ERM letter reports relative to this topic include:

- Simulations based on empirical data (i.e., pumping rates that are inclusive of seasonal variations) confirm that the current, normal operation of VGC Well No. 13-alone or VGC Well Nos. 13 and 14 as a pair will ensure full capture of the OU1 plume[5].
- VGC Well Nos. 13 and 14 could remain in non-pumping mode (equipment failure/service activities, etc.) for >1 year before some significant portion of the OU1 plume that migrated past the wells might not be recovered upon resumption of pumping.
- VGC Well Nos. 13 and 14 will continue to contain and extract the OU1 plume if there is a minimum combined groundwater withdrawal (pumpage) of 290,000,000 gallons per year from VGC Well Nos. 13 and 14, with at least 139,500,000 gallons per year from VGC No. 13[6].

2.3.3 GROUNDWATER MONITORING WELL VOC ANALYTICAL RESULTS FROM DOWNGRADIENT OF VGC WELL NOS. 13 AND 14

There are three, eight-zone multi-level groundwater monitoring wells (24 sampling intervals) strategically positioned on the Garden City Country Club golf course downgradient of VGC Well Nos. 13 and 14: MW26A-H, MW-27A-H and MW28A-H (see **Figure 1**).

Monitoring wells MW26A-H and MW27A-H have been sampled for VOCs since 2004 (24 sampling events), and MW28A-H has been sampled for VOCs since 2017 (11 sampling events).

Examination of the 24 plots for MW26A-H, MW-27A-H and MW28A-H (**Attachment A**) demonstrate continued non-detect results or relatively low detections of PCE, TCE, and 1,2-DCE that have generally been decreasing since 2019 (the last 5 years). Salient observations are:

- MWs 26A, 26C have never had detections of PCE, TCE, and 1,2-DCE above 1 µg/l in groundwater samples collected from these wells.
- Since 2019, detected concentrations of PCE, TCE, and 1,2-DCE in groundwater samples collected from wells MWs 26B, 26D, 26E, 26F, 26G and 26H have generally been less than 10 µg/l if not below the 5 µg/l MCL.
- Detections of PCE, TCE, and 1,2-DCE in groundwater samples collected from wells MWs 26B, 26D, 26E, 26F, 26G and 26H have generally been TCE-dominant strongly indicating attribution to the OU2 TCE-dominant plume based on the:
    - Location of this multi-level well in comparison to the position of the OU2 TCE-dominant plume; and
    - Consistent historical TCE-dominance in analytical results from groundwater samples collected from the MW23A-D quadruplet well cluster located approximately 700 feet

[5] As defined in the 2005 Remedial Investigation Report.

[6] For reference, this is only 40% of the actual average combined annual groundwater withdrawal for VGC Well Nos. 13 & 14 during the last 5 years (2008 – 2012) which was approximately 730,000,000 gallons per year with approximately 450,000,000 gallons per year coming from VGC No. 13. The minimum withdrawal of 139,500,00 gallons per year from VGC No. 13 is only31% of the actual average annual groundwater withdrawal from this well during the same time period.

immediately upgradient (see **Figure 1** and the PCE, TCE, and 1,2-DCE concentration versus time plots for MWs 23A, 23B, 23C and 23D).

- PCE, TCE, and 1,2-DCE have never been detected in analytical results from the groundwater samples collected from wells MWs 27A, 27B, 27C, 27D, 27E and 27F.
- PCE, TCE, and 1,2-DCE have been detected in analytical results from the groundwater samples collected from wells MWs 27G and 27H.
- PCE, TCE, and 1,2-DCE in analytical results from groundwater samples collected from wells MWs 28A, 28B, 28C, 28D, 28E, 28F, 28G and 28H have never exceeded the 5 µg/l MCL.

The observed detections of PCE, TCE, and 1,2-DCE in wells MW26A-H, MW-27A-H and MW28A- should not result in MCL exceedances in the FSWD wells simply due to the effects of dilution along the groundwater flow path and at the well heads.

Based on the preceding discussion, VGC Well Nos. 13 and 14 are indeed effectively capturing the OU1 PCE-dominant portion of the larger OU1/OU2 (TCE-dominant) plume, and as a result, continued operation of VGC Well Nos. 13 and 14 has helped prevent or reduce migration of the OU1 portion of the plume toward the FSWD wells, and that the OU1 portion of the plume is not expected to have a significant impact on these wells.

2.4 DATA TRENDS AND HOW LONG IT IS ANTICIPATED THAT IT WILL TAKE TO ATTAIN MCLS WITHIN THE OU1 PORTION OF THE PLUME, I.E., PROVIDE A ROUGH ESTIMATE OF THE TIME ANTICIPATED FOR THE RESTORATION OF THE AQUIFER [BULLET POINT #3].

Data trends for PCE, TCE and cis 1,2-DCE in the analytical results from groundwater samples collected from both the monitoring wells and VGC Well Nos. 13 and 14 during 2019 through present were evaluated to consider methods to develop predictive estimates to attain MCLs within the OU1 portion of the plume.

2.4.1 DATA TRENDS – GROUNDWATER MONITORING WELLS VS VGC WELL NOS. 13 AND 14

Examination of the individual plots of PCE, TCE and cis 1,2-DCE for the 42 groundwater monitoring wells that are part of the OU1 long-term groundwater monitoring program (**Attachment A)** indicate that since 2019, VOC concentrations have been above the 5 µg/l MCL for PCE and TCE one or more times in 19 wells (GCP01S, GCP08, GCP15A, GCP15B, MW21B, MW21C, MW21D, MW23A, MW23B, MW23C, MW23D, MW26B, MW26D, MW26E, MW26F, MW26G, MW26H, MW27G & MW27H). However, of the preceding group of 19 wells, VOC concentrations only exceeded 100 µg/l in wells GCP01S and MW21B since 2019.

During the 5-year period of January 2019 – March 2024:

- PCE concentrations in VGC Well No. 13 for the period of January 2019 – March 2024 ranged 230 µg/l to 602 µg/l with an average of 344 µg/l, and TCE concentrations ranged 14.6 µg/l to 63.4 µg/l with an average of 36.7 µg/l.
- PCE concentrations in VGC Well No. 14 ranged 229 µg/l to 617 µg/l with an average of 337 µg/l, and TCE concentrations ranged 18 µg/l to 49.4 µg/l with an average of 31.2 µg/l.

Based on the above concentration ranges in VGC Well Nos. 13 and 14 versus the lower observed concentrations in the groundwater monitoring wells it is obvious that more meaningful predictive

estimates to attain the 5 µg/l MCLs within the OU1 portion of the plume can be made using the Wells No. 13 and No. 14 data sets. Using the lower groundwater monitoring well sample concentration data would undoubtedly underestimate predictions.

2.4.2 PREDICTIVE METHODS

Predictions of when/how long it will take for PCE and TCE concentrations in VGC Well Nos. 13 and 14 to decline to the 5 µg/l MCL were developed using data from the 2007 dates of observed historic high PCE concentrations through March 2024 by two separate methods:

1. A simple regression analysis to extrapolate PCE and TCE concentrations in each well within a 95% confidence interval; and
2. Development of first-order attenuation rate constant calculations used in monitored natural attenuation (MNA) studies using the concentration versus time method set forth in an EPA Ground Water Issue paper entitled "*Calculation and Use of First-Order Rate Constants for Monitored Natural Attenuation Studies*"[7].

2.4.2.1 REGRESSION ANALYSIS TREND LINE EXTRAPOLATIONS

Two versions of the regression analysis with a trend line projected to a 5 µg/l line intercept with a 95% confidence interval were completed with linear and power trend lines, respectively. The linear trend line result predicted 5 µg/l intercepts before 2050 (with the exception of PCE in VGC Well No. 14), and did not project an asymptotic tail in the future as would be anticipated, and so the linear trend line evaluation was rejected. The increased PCE concentration trend (2X+) in VGC Well No. 14 after being put back into service in March 2018 causes the extrapolated concentrations to extend out several hundred years and is a recognized data set issue. The power trend line regression analysis projection results are summarized in **Figure 10** and **Table 4** below. These results are more conservative and generally more consistent with the result of the first-order attenuation rate constant calculations presented in Section 2.3.2.2.

[7] Newell, Charles J., Hanadi S. Rifai, John T. Wilson, John A. Connor, Juhaida Abdul Aziz and Monica P. Suarez. "Calculation and Use of First-Order Rate Constants for Monitored Natural Attenuation Studies." Ground Water Issue. National Risk Management Research Laboratory, Cincinnati, OH, EPA/540/S-02/500 (2002).

FIGURE 10 - POWER TREND LINE REGRESSION ANALYSIS PROJECTION

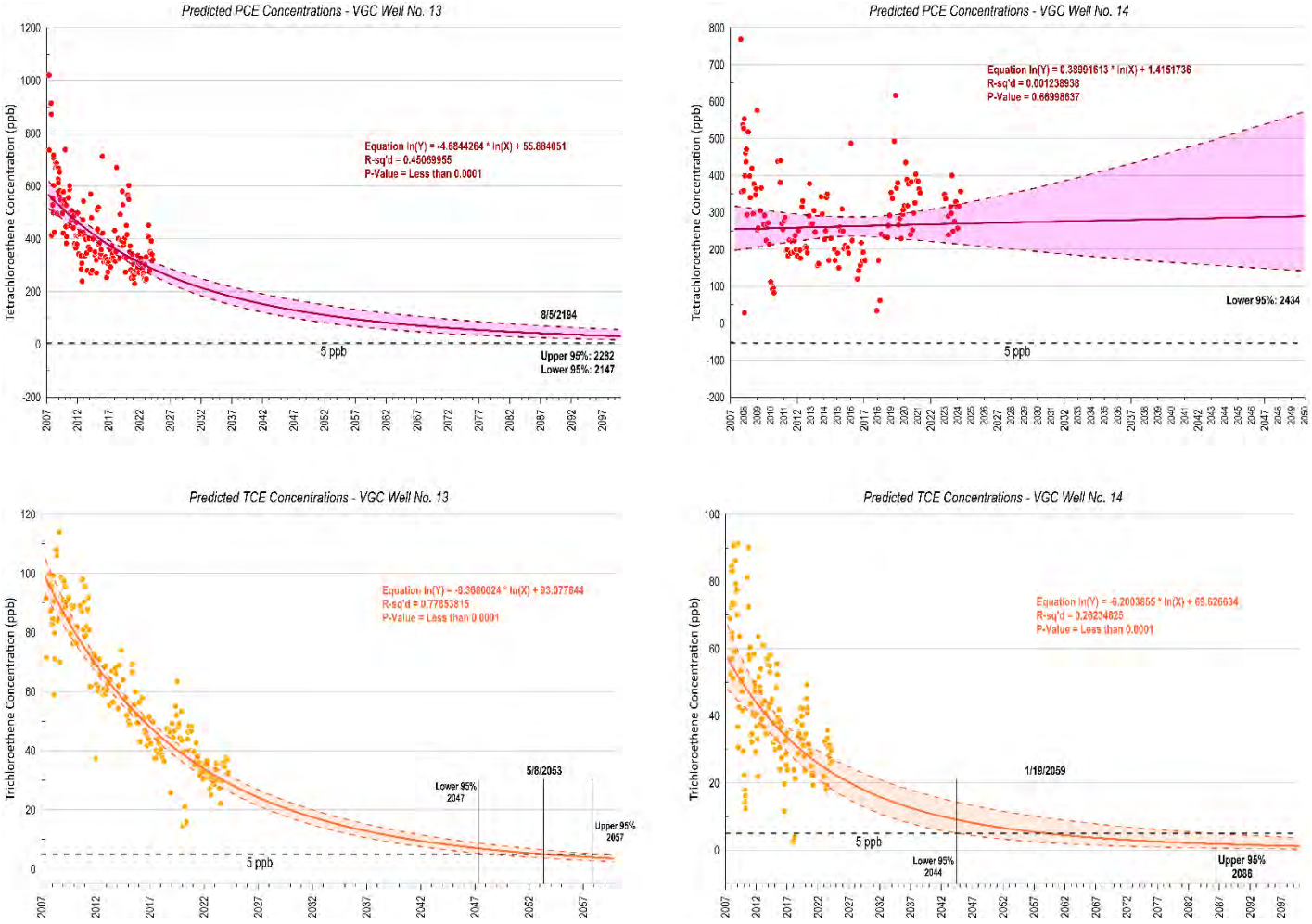


TABLE 4 - POWER TREND LINE REGRESSION ANALYSIS PROJECTION

VGC Well	Lower 95% Confidence (Year)	5 µg/L Intercept (Year)	Upper 95% Confidence (Year)
No. 13 (N-07058)			
PCE	2147 (123 Yrs)	2194 (170 Yrs)	2282 (258 Yrs)
TCE	2047 (23 Yrs)	2053 (29 Yrs)	2057 (33 Yrs)
No. 14 (N-08339)			
PCE	2434 (410 Yrs)	-	-
TCE	2044(20 Yrs)	2059 (35 Yrs)	2086 (62 Yrs)

2.4.2.2 FIRST-ORDER ATTENUATION RATE CONSTANT CALCULATIONS

Reduction of groundwater VOC concentrations in the PCE-dominant OU1 groundwater plume are subject to pumping and treatment VGC Well Nos. 13 and 14, and natural attenuation processes.

Natural attenuation processes include a variety of physical, chemical, and/or biological processes that act without human intervention to reduce the mass or concentration of contaminants in soil and ground water. These in-situ processes include biodegradation, abiotic decay, dispersion, dilution,

sorption, volatilization; radioactive decay; and chemical or biological stabilization, transformation, or destruction of contaminants (U.S. EPA, 1999)[8].

The overall impact of natural attenuation processes at a given site can be assessed by performing first-order attenuation rate constant calculations. This is an important tool for evaluating the rate at which natural attenuation processes are resulting in decreasing contaminant concentrations either spatially or temporally. Specific applications identified in U.S. EPA guidelines (U.S. EPA, 1999) include use in characterization of plume trends (shrinking, expanding, or showing relatively little change), as well as estimation of the time required for achieving concentration goals such as the 5 µg/l MCL for PCE and TCE.

PCE and TCE attenuation times via the first-order attenuation processes were assessed at VGC Well Nos. 13 and 14 to quantify anticipated time required to achieve the 5 µg/l drinking water MCL for PCE, TCE and cis 1,2-DCE as described in EPA 2002 document. Rate calculations were derived at a VGC Well Nos. 13 and 14 using PCE and TCE data from 2007 dates of observed historic high concentrations through March 2024 to quantify a point decay rate (Kpoint), equating to slope estimates derived from the natural log of concentration versus time based on the approach as described in ASTM 1998[9].

The Kpoint values were then used to determine predicted low/high estimated time intervals to reach the 5 µg/l MCL for PCE and TCE in each well. **Figures 11 thru 14** below show regressions for both PCE and TCE concentrations using analytical data starting from historic highs observed in 2007 through March 2024 to obtain Kpoint values.

[8] U.S. Environmental Protection Agency, 1999. Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites, Office of Solid Waste and Emergency Response (OSWER), Directive 9200.4-17P, Final Draft, Washington, D.C., April 21, 1999.

[9] American Society for Testing and Materials, 1998. Standard Guide for Remediation of Ground Water by Natural Attenuation at Petroleum Release Sites. E 1943-98, West Conshohocken, PA. www.astm.org

FIGURE 11 PCE VGC WELL NO. 13 CONCENTRATION VERSUS TIME

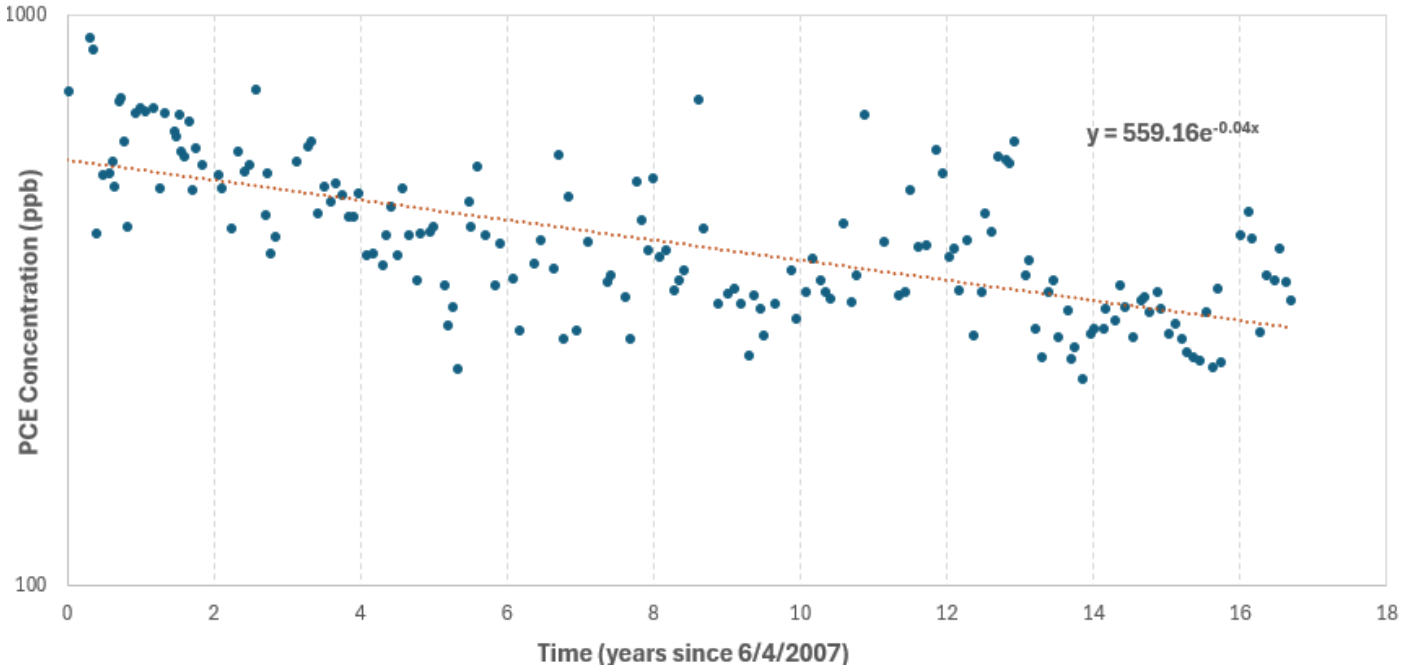


FIGURE 12 TCE VGC WELL NO. 13 CONCENTRATION VERSUS TIME

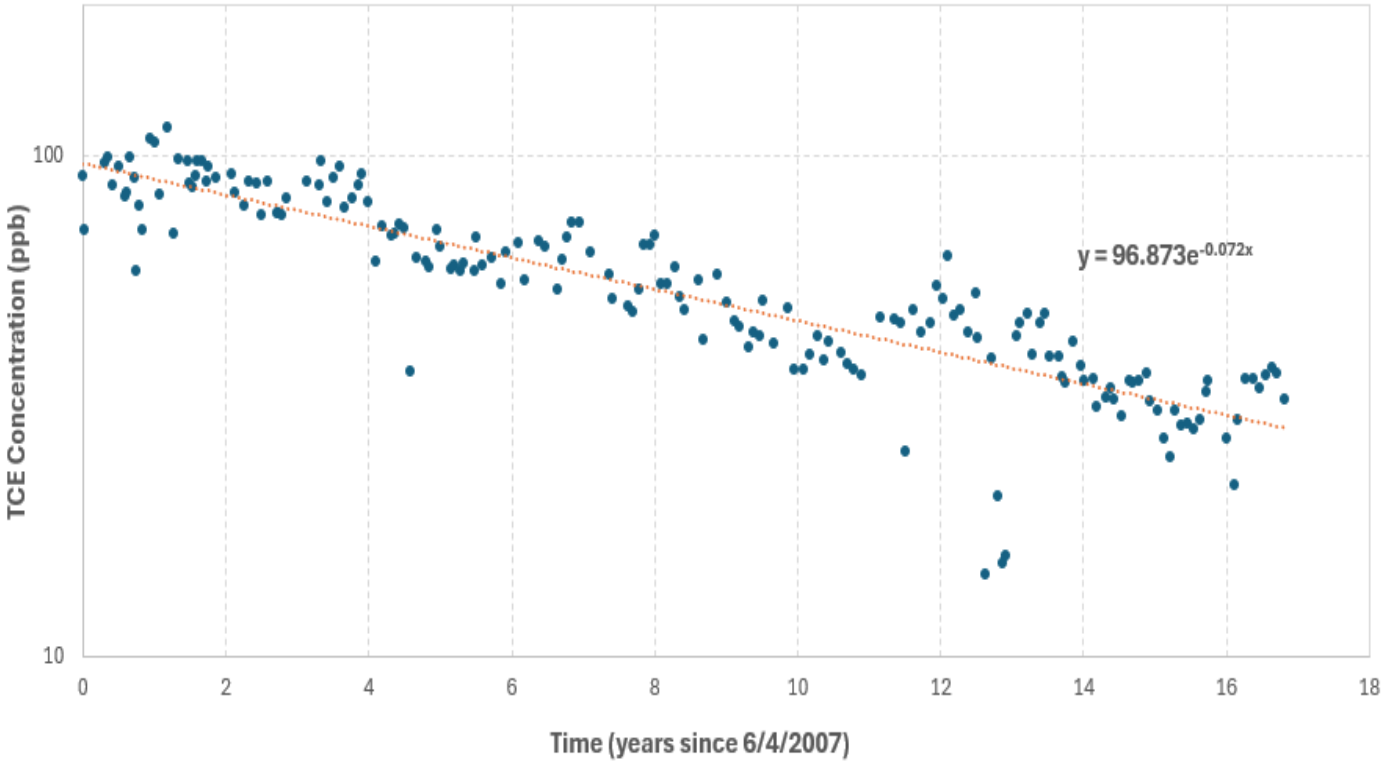


FIGURE 13 PCE VGC WELL NO. 14 CONCENTRATION VERSUS TIME

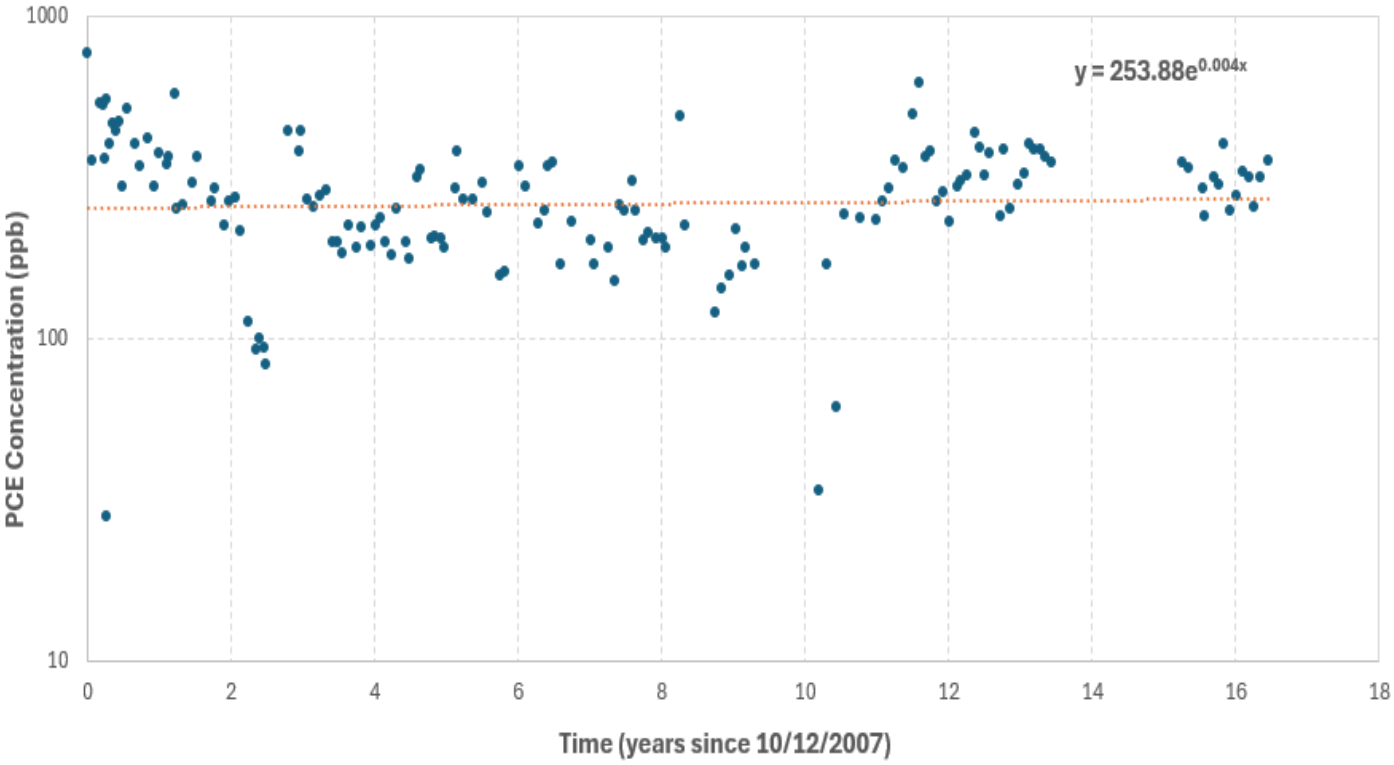
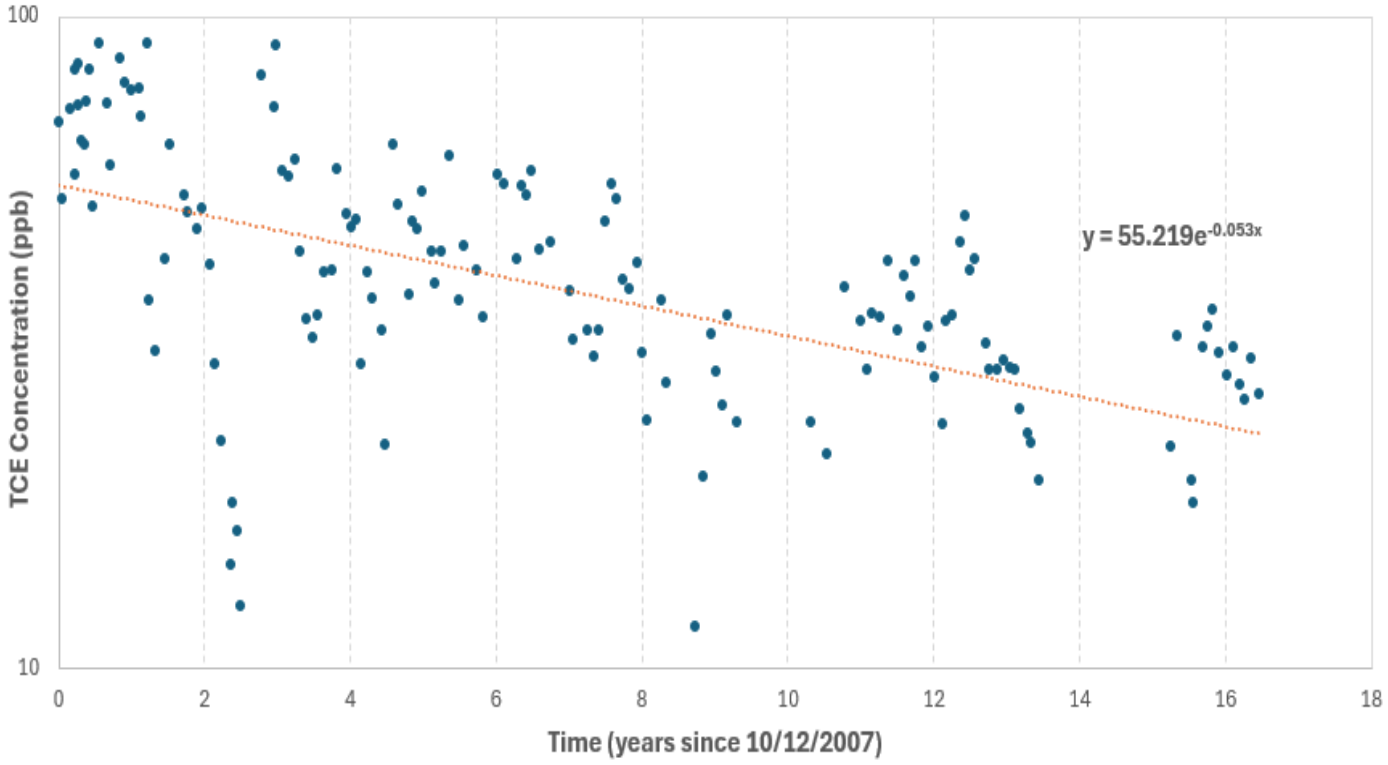


FIGURE 14 TCE VGC WELL NO. 14 CONCENTRATION VERSUS TIME



The second step of the calculation requires use of the derived Kpoint values based on the above regression plots, and minimum and maximum observed PCE and TCE concentration in each well. The

EPA paper does not specify the time interval for min/max value selection, so one-year (2023-2024) and five-year (2019-2024) intervals were used for comparison/time-range sensitivity analysis. The time ranges were calculated using:

$$t = \frac{-ln(Cgoal/Cstart)}{Kpoint}$$

Where:

- t is time in years to reach a remediation goal;
- Cgoal is the remediation goal concentration (5 µg/l MCL);
- Cstart represents starting concentration values; and
- Kpoint values are derived from the above regression analyses.

Table 5 depicts calculated Kpoint values used at each well, starting concentration, and time estimates.

TABLE 5 REMEDIAL TIME ESTIMATIONS

Well No.	COC	Kpoint (per year)	Cstart (µg/l)	Estimated Time (years)	Notes
13	PCE	-0.053	242.0	97	Min concentration 2023 – 2024
			451.0	113	Max concentration 2023 – 2024
			230.0	96	Min concentration 2019 – 2024
			602.0	120	Max concentration 2019 – 2024
13	TCE	-0.072	22.1	21	Min concentration 2023 – 2024
			37.7	28	Max concentration 2023 – 2024
			14.6	15	Min concentration 2019 – 2024
			63.4	35	Max concentration 2019 – 2024
14	PCE	0.004	239.0	967	Min concentration 2023 – 2024
			400.0	1,096	Max concentration 2023 – 2024
			229.0	956	Min concentration 2019 – 2024
			617.0	1,204	Max concentration 2019 – 2024

Well No.	COC	Kpoint (per year)	Cstart (µg/l)	Estimated Time (years)	Notes
14	TCE	-0.04	18.0	24	Min concentration 2023 – 2024
			35.6	37	Max concentration 2023 – 2024
			18.0	24	Min concentration 2019 – 2024
			49.4	43	Max concentration 2019 – 2024

Note: Each analysis is completed respective of a 5 µg/l concentration goal signifying MCL criteria as listed in National Primary Drinking Water Regulations and NYSDOH Public Drinking Water Supply MCLs.

2.4.2.3 CONCLUSIONS

Conservative time range estimates for PCE and TCE to reach the 5 µg/l MCL in VGC Well Nos. 13 and 14 using the two predictive methods are summarized in **Table 6** below.

TABLE 6 – SUMMARY OF TIME RANGE ESTIMATE ANALYSES BY TWO METHODS FOR PCE AND TCE CONCENTRATIONS TO REACH 5 µg/l MCL VGC WELL NOS. 13 AND 14

VGC Well	Power Trend Line Regression Analysis (Years)	First-Order Attenuation Rate Constant Calculations (Years)
No. 13		
PCE	123 – 258	96 - 120
TCE	23 – 33	15 - 35
No. 14		
PCE	410 - ?	967 – 1,204
TCE	20 - 62	24 - 43

Salient observations are:

- There is good agreement between the time range estimates developed by the two methods for PCE and TCE to reach the 5 µg/l MCL in VGC Well Nos. 13 and 14.
- Both methods predict overall shorter duration time range estimates for TCE to reach the 5 µg/l MCL compared to PCE.
- The first-order attenuation rate calculations using the 1-year (2023-2024) versus 5-year time (2019-2024) data sets to evaluate time-sensitivity indicates near agreement with only slightly broader time range estimates predicted using the 5-year data set.
- PCE in VGC Well No. 14 depicts a positive Kpoint value suggesting elongated remedial time estimations, where the increased PCE concentration trend (2X+) in VGC Well No. 14 after being put back into service in March 2018 causes the extrapolated concentrations to extend out hundreds of years and is a recognized data set issue.

2.5 A "LINES OF EVIDENCE" ASSESSMENT AS TO WHY THE INVESTIGATION IDENTIFIED IN THE OU1 ROD AMENDMENT IS NO LONGER WARRANTED. SEE PAGE 21 OF ROD AMENDMENT: "EPA WILL CONTINUE TO INVESTIGATE ADDITIONAL AREAS FOR POSSIBLE SOURCE MATERIAL THAT MAY NEED TO BE ADDRESSED (BY ISCO OR ANOTHER REMEDIAL APPROACH), INCLUDING SOURCE(S) OF ELEVATED PCE OBSERVED IN NEARBY MONITORING WELL GCP-01 LOCATED SOUTHWEST AND DOWNGRADIENT OF THE FULTON PROPERTY." [BULLET POINT #5]

As more fully described in the February 2012 Preliminary (30%) Remedial Design Report, the pre-design activities at the 150 Fulton Property included a high-resolution groundwater investigation that included:

- Membrane interface probe (MIP) borings and the Waterloo Advanced Profiling System borings to collect groundwater samples within the former soil IRM area and along the north, south and west boundaries, and immediately downgradient of the 150 Fulton Property; and
- Collection of groundwater samples from monitoring wells immediately upgradient and within the former soil IRM area, and immediately downgradient of the 150 Fulton Property.

The results of these pre-design sampling activities determined that:

- The Soil IRM (SVE/AS) was effective in significantly reducing VOC concentrations in the shallow groundwater within the IRM area where after 10 years, there was no rebound in VOC concentrations in groundwater within and/or downgradient of the Soil IRM area. In fact, the results of pre-design activities established that in the vicinity of the former source area, groundwater VOC levels had recovered to below respective MCLs.
- There does not appear to be significant residual PCE in the formation acting as a continuing source of groundwater contamination from the original source area at and near the 150 Fulton Avenue property justifying any further remedial action.
- Natural attenuation is occurring where cleaner groundwater appears to be moving from northeast to southwest beneath the Fulton Avenue Property has flushed out residual VOC-impacted groundwater.
- VOC concentrations in groundwater at the Fulton Avenue Property have declined to levels consistent with known/unknown upgradient contributing sources discussed in the 2005 RI Report.
- In comparing the concentrations noted by the various sampling activities, the VOC concentrations in groundwater measured at and immediately downgradient of the Fulton Avenue Property are not indicative of NAPL concentrations.
- VOC concentrations, where present in the vicinity of the Site appear as sporadic residual dissolved concentrations generally at the upper water surface within the zone of seasonal groundwater fluctuation.
- VOC concentrations in groundwater monitoring well GCP-01S (screened to straddle the water table surface) continue to fluctuate and the predominant compound has shifted from PCE to cis 1,2-DCE. The source of the VOCs in this well may be either residual VOCs stranded in the vadose zone and only mobilized when groundwater levels rise flooding this zone or from another source associated with immediately adjacent commercial properties.
- VOC concentrations in groundwater downgradient of the Fulton Avenue Property are the result of residual dissolved solute and sorbed VOCs in the aquifer matrix that are back diffusing and can be expected to continue to decline to levels consistent with upgradient sources over time.

2.6 AN ASSESSMENT OF THE EFFECTIVENESS OF THE SUB-SLAB DEPRESSURIZATION SYSTEM INSTALLED AT 150 FULTON AVENUE [BULLET POINT #6]

The Soil IRM was completed 2 January 2002, and the SVE/AS system was dismantled and removed. The SSDS was subsequently installed beneath the 150 Fulton Avenue building to mitigate the potential for intrusion of soil vapor containing residual PCE into the existing building. This system remains in operation to protect the indoor air quality.

EPA collected sub-slab soil vapor/indoor air quality (IAQ) samples from beneath and within the building at the 150 Fulton Property during February 2017. Analytical results from these samples were provided to the Settling Defendant in June 2017. EPA indicated in the accompanying letter to Gordon Atlantic Corporation (the owner of the property) that the wind-driven SSDS should be upgraded by the addition of a continuously operating, electrically-powered fan. Following discussion with the EPA, the Settling Defendant voluntarily agreed to install a fan. EPA requested submission of a work plan for review and approval prior to any modification of the SSDS.

The Sub Slab Depressurization System Modification Work Plan was submitted to EPA in September 2017 for review and approval. The work plan proposed upgrade of the existing SSDS currently operating at the Fulton Property by the addition of a continuously operating, electrically-powered fan and was approved in November 2017. EPA's approval letter sought a semi-annual sub-slab soil vapor/IAQ sampling and reporting program to be undertaken for a minimum of 2 years (4 events) after which time EPA would decide if further work should be done.

In December 2017, the Settling Defendant offered an alternate scope to include a sub-slab soil vapor/indoor air sampling event such that the next steps would be:

- Installation of the fan (as originally planned);
- Collection of sub-slab vacuum measurements (as originally planned);
- Performance of one (1) sub-slab soil vapor/IAQ sampling event at EPA's February 2017 sampling locations approximately six months after the fan installation (new expanded scope) – seasonality is immaterial as the building HVAC systems are positive pressure and the building is closed all year round;
- Submittal of a letter report that would document the fan installation, vacuum measurements and sub-slab soil vapor/IAQ sampling results (as originally planned but expanded to include those sampling results); and
- Based on those results, a potential scope and frequency of future monitoring would then be considered and discussed with EPA to establish an appropriate monitoring/reporting program.

During January 2018, the SSDS was modified in accordance with the EPA-approved September 2017 Sub-Slab Depressurization System Modification Work Plan and samples were subsequently collected from beneath and within the building at the 150 Fulton Property at the EPA February 2017 sampling locations by:

- EPA during 30-31 January 2018 (approximately 3 weeks after the fan installation); and
- ERM during 28-29 June 2018 (approximately six months after the fan installation).

The validated results of the 2018 samples were presented in the Fourth Quarter 2018 Progress Report where the June 2018 sample results were compared to the January 2018 results and notable observations included:

- Sub-slab vapor PCE and TCE concentrations were significantly lower;
- Indoor air PCE concentrations were slightly lower but similar, (i.e., the same range);
- Indoor air TCE concentrations were higher and exceeded the NYSDOH indoor air guideline of 2 micrograms per cubic meter ($\mu g/m^3$) at all sample locations;
- The number of sampling locations where "mitigation" is indicated using the NYSDOH May 2017 Soil Vapor Intrusion Guidance Matrices reduced from seven to four; and
- The cause of the higher TCE concentrations in the June 2018 sample results is unknown. The precision achieved by the analytical laboratories used by EPA and ERM are assumed similar and the data are comparable.

Based on these findings, an additional sub-slab soil vapor/indoor air sampling event was recommended.

During 7-8 March 2019 (during the heating season and approximately 15 months after the fan installation), ERM collected sub-slab soil vapor/indoor air samples from beneath and within the building at the 150 Fulton Property to confirm the lower PCE/TCE concentrations in sub-slab soil vapor, and determine whether the higher indoor air TCE concentrations are persistent or some transient data anomaly possibly related to operations within the building[10].

The validated results of the March 2019 samples were presented in the EPA-approved November 2019 OU1 Remedial Action Report where the March 2019 sample results are compared to the June 2018 sample results and notable observations included:

- Sub-slab vapor PCE concentrations were lower at four of the seven locations and similar/slightly higher (same magnitude) at the remaining three sample locations with a maximum concentration of 3,200 $\mu g/m^3$ at SS-7;
- Sub-slab vapor TCE concentrations were lower at all seven locations with a maximum concentration of 58 $\mu g/m^3$ at SS-7;
- Indoor air PCE concentrations were slightly lower but similar, (i.e., the same range) with a maximum detected concentration of 3.39 $\mu g/m^3$ at SS-6, which is significantly lower than the NYSDOH indoor air guideline of 30 $\mu g/m^3$;
- Indoor air TCE concentrations were lower at all locations, only slightly exceeding the NYSDOH indoor air guideline of 2 $\mu g/m^3$ at one location (SS-10) at a concentration of 2.88 $\mu g/m^3$;
- The number of sampling locations where "mitigation" is indicated using the NYSDOH May 2017 Soil Vapor Intrusion Guidance Matrices reduced from four to two (SS-05 and SS-07); and
- The generally accepted target range for depressurization is 4 to 10 Pascals or (-0.0161 to -0.04 in. WC) (U.S. EPA 2008)[11] with a nominal continuous operating range of depressurization from -0.025 to -0.035 in. water column (wc) for standard permeability sub-slab material. However, differential pressures as low as -0.002 in. WC are sufficient to effectively depressurize a sub-slab in order to mitigate soil vapor intrusion (U.S. EPA 1994)[12]. The operating fan appears to be maintaining negative pressures at or below the above referenced criteria below most of the building slab.

[10] The tenant operates a business machine/photocopier/electronics supplier/repair facility so there is a potential that the change in TCE concentrations is related to business activities within the building and not vapor intrusion.

[11] USEPA. Indoor Air Vapor Intrusion Mitigation Approaches. EPA/600/R-08-115 October 2008.

[12] USEPA. Radon Prevention in the Design and Construction of Schools and Other Large Buildings. EPA 625-R-92-016. June 1994.

According to the EPA 30 September 2022 Five-Year Review Report, EPA collected sub-slab soil vapor/indoor air samples from beneath and within the building at the 150 Fulton Property in April 2019. These are the most current results and according to the report, elevated sub-slab levels of TCE and PCE still exist where the:

- Maximum sub-slab PCE and TCE concentrations were noted at 120,000 ug/m^3 and 310 ug/m^3, respectively;
- PCE concentrations in indoor air ranged from 4.4 ug/m^3 to 13 ug/m^3, while TCE concentrations ranged from 0.72 ug/m^3 to 3.4 ug/m^3.
- The report states that the indoor air levels of PCE and TCE are below EPA's risk-based VISLs set at a cancer risk equal to $1x10^{-6}$ and a noncancer hazard quotient equal to 1.

Since January 2018, overall concentrations of PCE and TCE in sub-slab soil vapor and indoor air appear to decreasing, and continued operation of SSDS system at the 150 Fulton Property is needed to minimize and/or eliminate potential, current, and future human exposures to VOC from inhalation of vapors, and ensure indoor air levels do not exceed risk-based action levels.

3. SUMMARY AND CONCLUSIONS

Based on the preceding information, the OU1 Interim Remedy is meeting the 2015 OU1 ROD Amendment RAOs of minimizing and/or eliminate the potential for future human exposure to Site contaminants via contact with contaminated drinking water; and helping to reduce migration of contaminated groundwater because:

- The continued operation (pumpage), maintenance and monitoring of the existing treatment systems on VGC Well Nos. 13 and 14, the comprehensive groundwater monitoring plan and the institutional controls that restrict future installation of private potable wells minimize and/or eliminate the potential for future human exposure to Site contaminants via contact with contaminated drinking water.
- VGC Well Nos. 13 and 14 are effectively capturing the OU1 PCE-dominant portion of the plume as evidenced by the continued non-detect results and relatively low detections of PCE, TCE, and 1,2-DCE in multi-level wells MW26A-H, MW-27A-H and MW28A-H strategically located downgradient of VGC Well Nos. 13 and 14.
- The continued operation of VGC Well Nos. 13 and 14 and the demonstrated effective capture of the OU1 portion of the plume has helped prevent or reduce further migration of OU1 PCE-dominant portion of the groundwater plume toward the Franklin Square Water District wells as evidenced by the continued non-detect results and relatively low detections of PCE, TCE, and 1,2-DCE in multi-level wells MW26A-H, MW-27A-H and MW28A-H located downgradient of VGC Well Nos. 13 and 14. The observed detections of PCE, TCE, and 1,2-DCE have generally been decreasing since 2019 (the last 5 years). Accordingly, those detected concentrations should not result in MCL exceedances in the FSWD wells simply due to the effects of dilution along the flow path and at the well heads.
- Based on the observed concentration ranges in VGC Well Nos. 13 and 14 versus the lower observed concentrations in the groundwater monitoring wells since 2007, it is obvious that more meaningful predictive estimates to attain the 5 µg/l MCLs within the OU1 portion of the plume could be made using the Wells No. 13 and No. 14 data sets. Using the lower groundwater monitoring well sample concentration data would undoubtedly underestimate predictions.

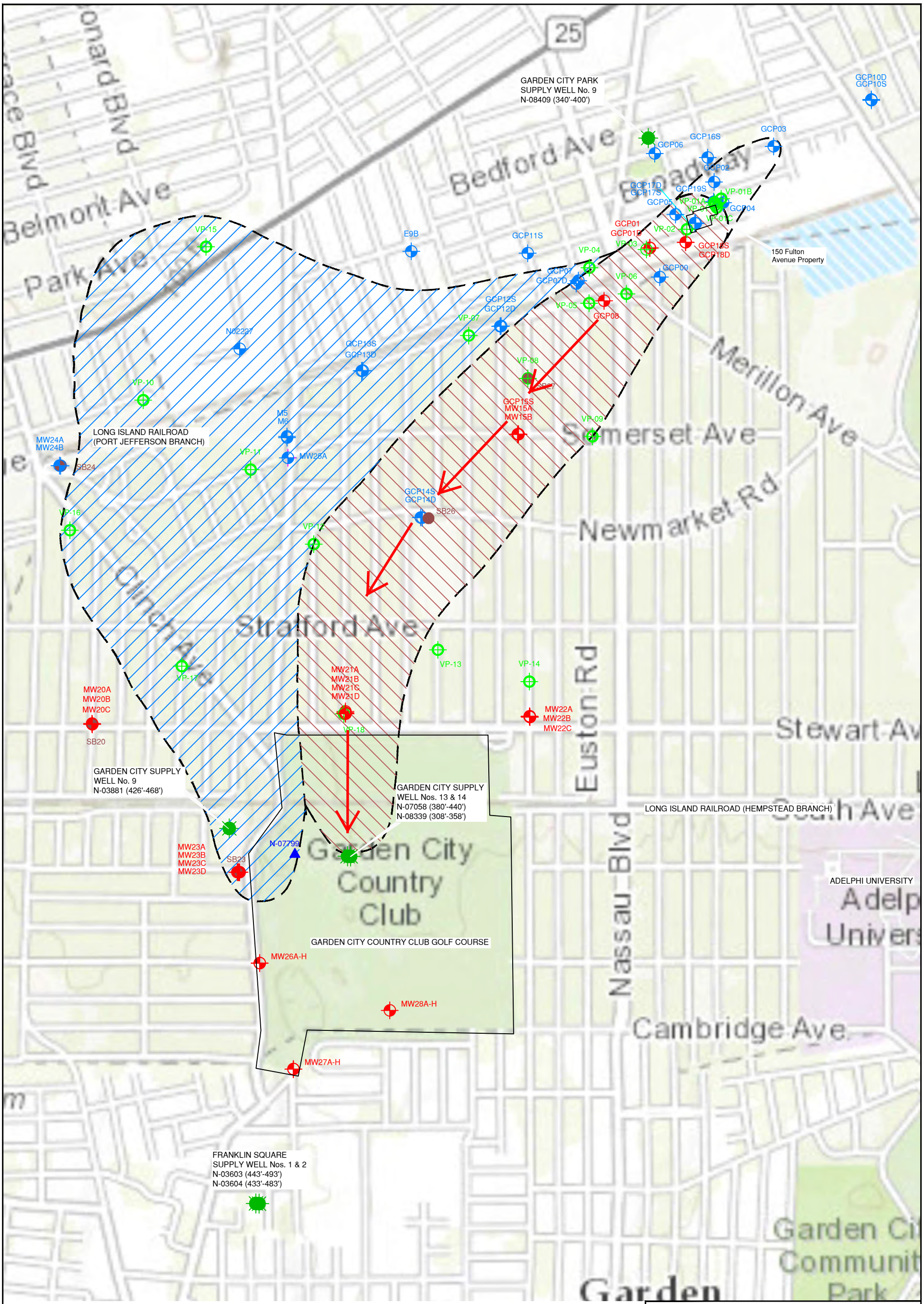
  Predictions of when/how long it will take for PCE and TCE concentrations in VGC Well Nos. 13 and 14 to decline to the 5 µg/l MCL were developed using data from the 2007 dates of observed historic high PCE concentrations through March 2024 by two separate methods. The results of

the analyses indicate there is good agreement between the time range estimates developed by the two methods for PCE and TCE to reach the 5 µg/l MCL in VGC Well Nos. 13 and 14. Both methods predict overall shorter duration time range estimates for TCE to reach the 5 µg/l MCL compared to PCE, which could be in excess of 100 years. Note that the estimates were mathematically developed using the dataset available through March 2024, but may improve in the future as clean water continues to flush through the aquifer system and PCE/TCE concentrations continue to decline in the water being pumped from VGC Well Nos. 13 and 14.

- Continued investigation to identify additional source(s) of elevated PCE observed in monitoring well GCP-01 located southwest and downgradient of the Fulton Property is unnecessary. The Soil IRM (SVE/AS) was effective in significantly reducing VOC concentrations in the shallow groundwater within the IRM area where, after 10 years, there was no rebound in VOC concentrations in groundwater within and/or downgradient of the Soil IRM area. There does not appear to be significant residual PCE in the formation acting as a continuing source of groundwater contamination from the original source area at and near the 150 Fulton Avenue property justifying any further remedial action.

  Natural attenuation is occurring where cleaner groundwater appears to be moving from northeast to southwest beneath the Fulton Avenue Property has flushed out residual VOC-impacted groundwater. VOC concentrations, where present in the vicinity of the Site, appear as sporadic residual dissolved concentrations generally at the upper water surface within the zone of seasonal groundwater fluctuation, indicating that these VOC concentrations in groundwater are the result of residual dissolved solute and sorbed VOCs in the aquifer matrix that are back diffusing and can be expected to continue to decline to levels consistent with upgradient sources over time. In particular, VOC concentrations in groundwater monitoring well GCP-01S (screened to straddle the water table surface) continue to fluctuate and the predominant compound has shifted from PCE to cis 1,2-DCE. The source of the VOCs in this well may be either residual VOCs stranded in the vadose zone and only mobilized when groundwater levels rise, flooding this zone, or from another source associated with immediately adjacent commercial properties.

- Continued operation of the SSDS at the 150 Fulton Property minimizes and/or eliminates potential, current, and future human exposures to VOCs through inhalation of vapors. Since January 2018, overall concentrations of PCE and TCE in sub-slab soil vapor and indoor air appear to be decreasing such that the most recent sampling results (2019) indicate that indoor air PCE and TCE levels are below EPA's risk-based VISLs set at a cancer risk equal to $1x10^{-6}$ and a noncancer hazard quotient equal to 1. Continued operation of the SSDS system at the 150 Fulton Property is warranted to minimize and/or eliminate potential, current, and future human exposures to VOC from inhalation of vapors, and ensure indoor air levels do not exceed risk-based action levels.



TITLE

Long-Term Groundwater Monitoring Well Network Well Locations Fulton Avenue Superfund Site Garden City/Garden City Park, NY

PREPARED FOR

Genesco Inc.

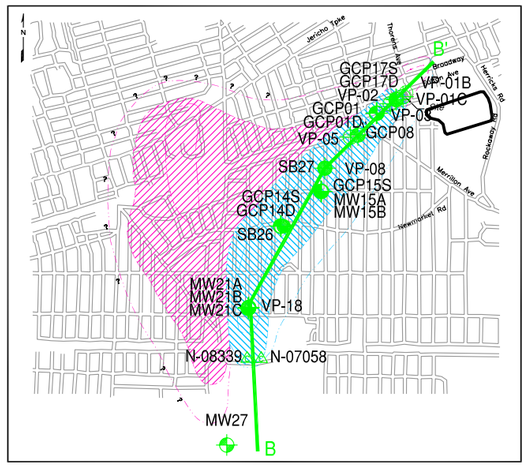
Environmental Resources Management

ERM

FIGURE 1

DRAWN BY	SCALE	DATE	JOB NO.
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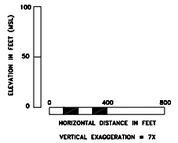
Y:\GENESCO\150 Fulton Ave\NYCAD\2016\2016-12-29 - Fulton Avenue QAPP Wells.dwg (05/10/2017 - 6:10pm Melville)



LOCATION OF CROSS-SECTION LINE

0 1200' 2400'

GRAPHIC SCALE



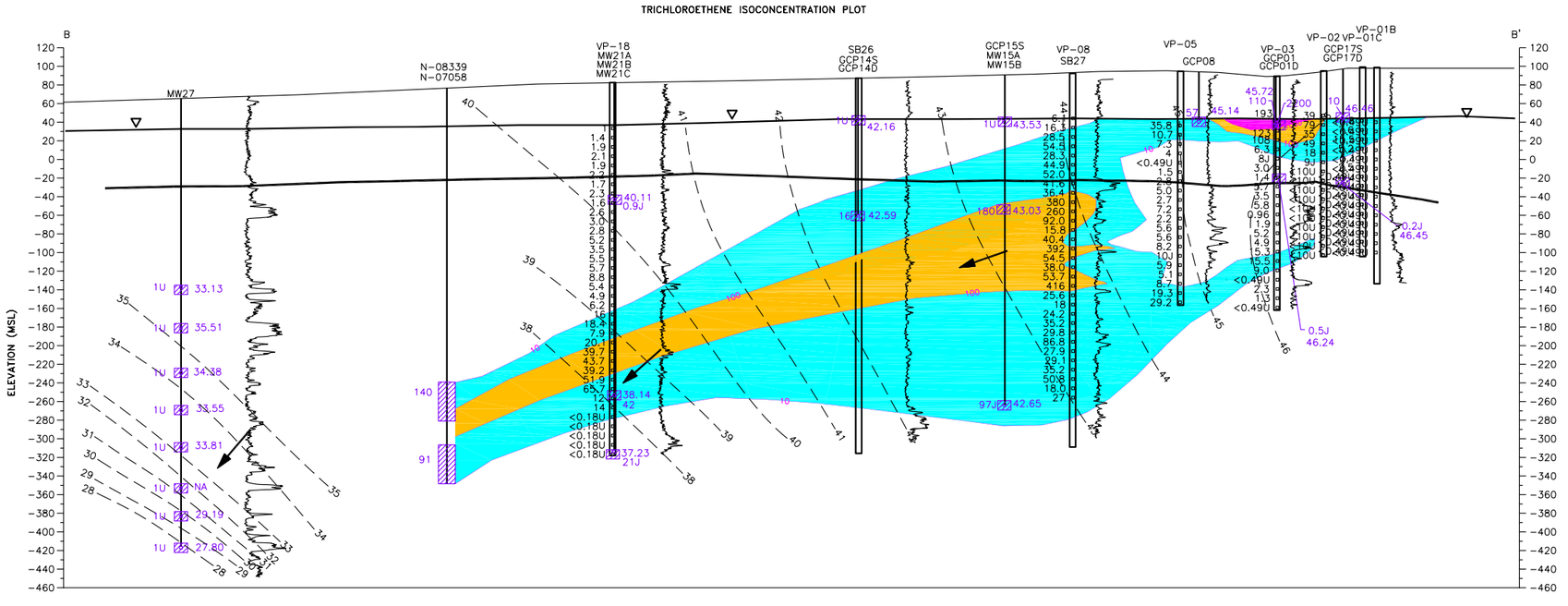
LEGEND

- COMPOUND>1000 μg/L
- COMPOUND>100 μg/L
- COMPOUND>10 μg/L
- CONTACT – UPPER GLACIAL/MAGOTHY AQUIFERS
- WATER TABLE – APRIL 4, 2002 & MAY 3, 2004
- MONITORING WELL SCREEN ZONE
- 0.5J 39.22 – WATER LEVEL ELEVATION (ft MSL)
- COMPOUND CONCENTRATION (μg/L)
- 38 – – – – – 38 EQUIPOTENTIAL LINE
- GENERAL DIRECTION OF GROUND WATER FLOW

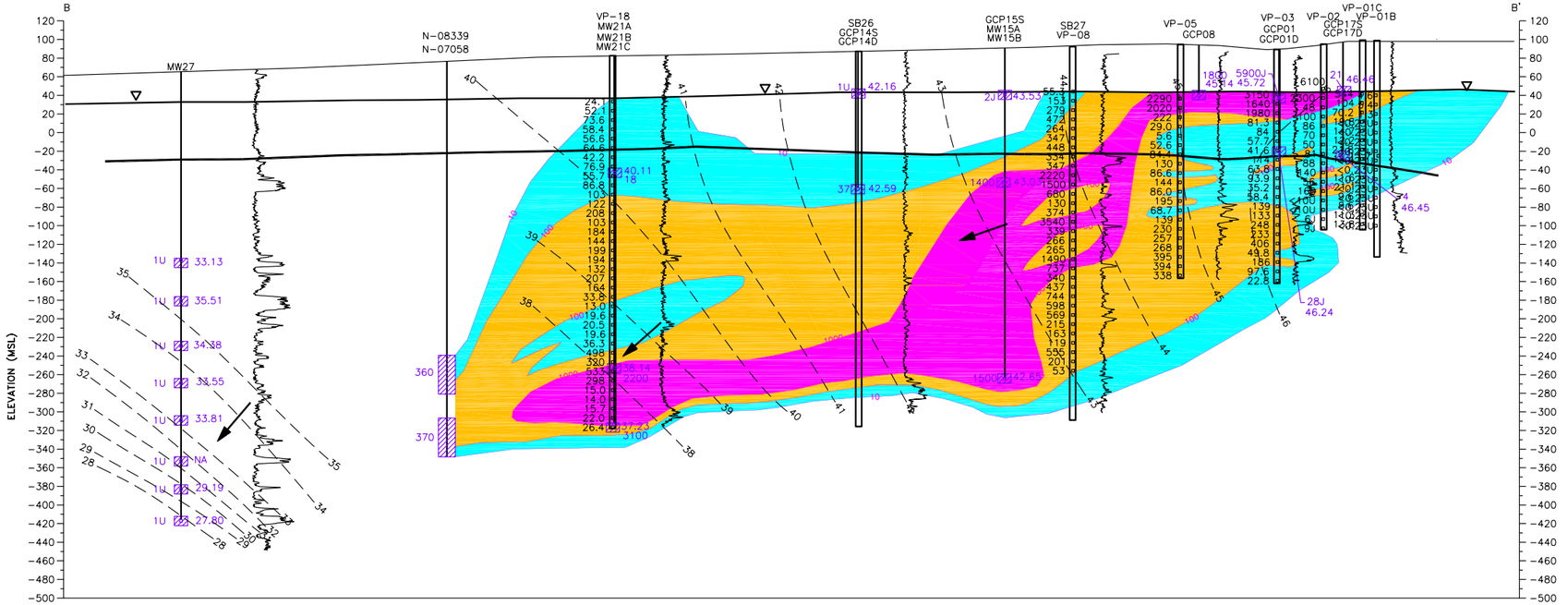
NOTE: ISOCONTOURS ARE BASED ON GROUND WATER QUALITY DATA DERIVED FROM VERTICAL PROFILING AND THE PERMANENT GROUND WATER MONITORING WELLS SAMPLED DURING THE RI. FOR EACH GROUND WATER MONITORING WELL LOCATION, THE MAXIMUM DETECTED CONCENTRATIONS OF PCE AND TCE FROM THE 1999–2005 DATA SET WERE USED IN ORDER TO DEPICT THE CURRENT GENERALIZED DISTRIBUTION OF THESE COMPOUNDS IN GROUND WATER.

ALL CONCENTRATIONS IN μg/L.

TRICHLOROETHENE ISOCONCENTRATION PLOT



TETRACHLOROETHENE ISOCONCENTRATION PLOT



NO.	DATE	APPR.	REVISION	NO.	DATE	APPR.	REVISION

150 FULTON AVENUE

GARDEN CITY PARK, NEW YORK

ERM Environmental Resources Management

CHECKED	DATE
DESIGN ENGINEER	
PROJECT ENGINEER	
PROJECT MANAGER	
APPROVED	
APPROVED	

HYDROGEOCHEMICAL CROSS-SECTION B–B'

DRAWING NO. Figure 2

REV. NO.

DRAWN	DATE	REVISED DATE
MLB/EMF	7/25/05	
SCALE	JOB NO.	FILE NAME
GRAPHIC	0016775.3	0016775-04-018

SHEET OF

Figure 3
Well GCP01
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time Showing Groundwater Elevation
Screen Zone Interval: 49 to 59 Feet Below Ground Surface

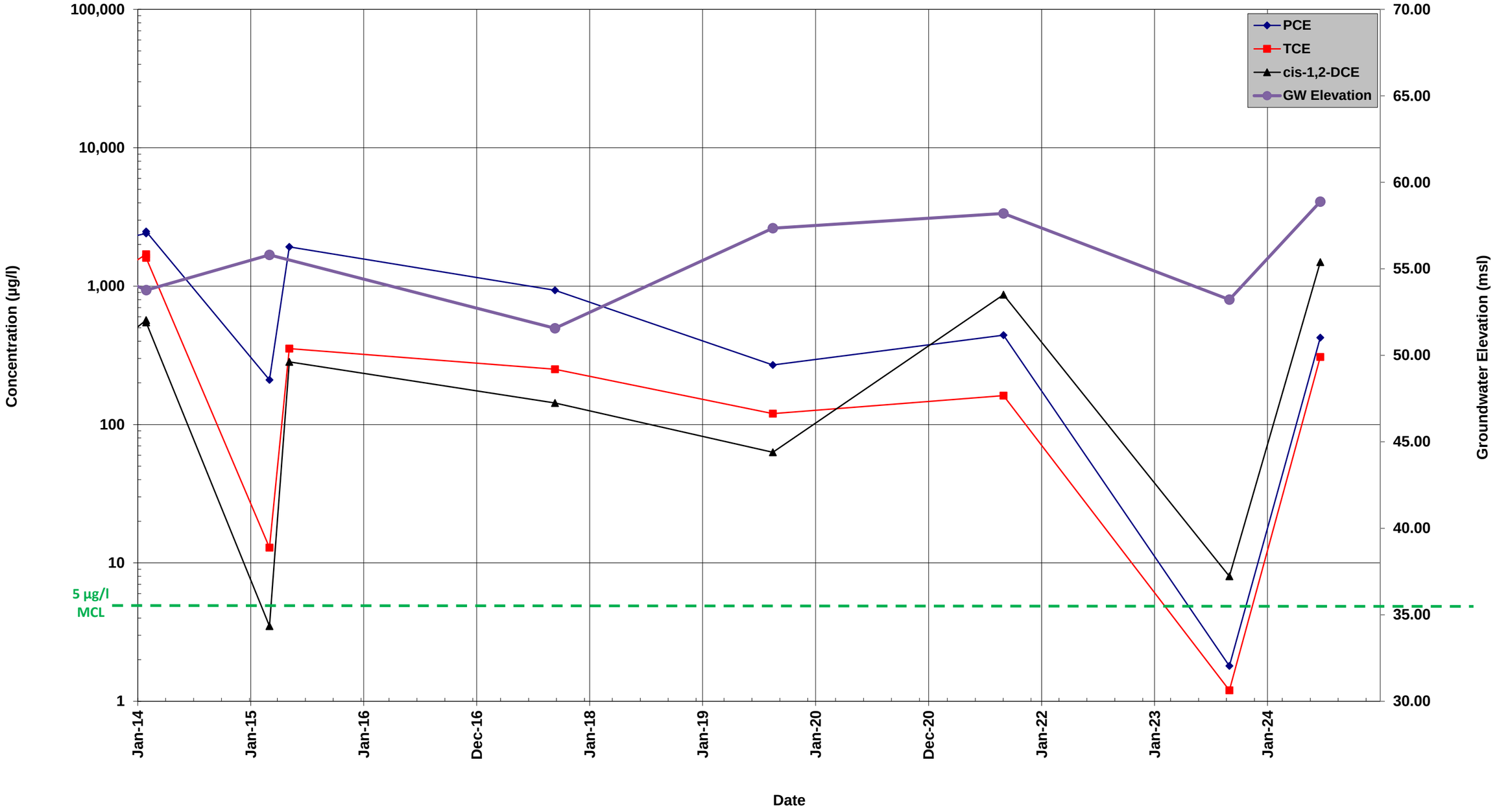
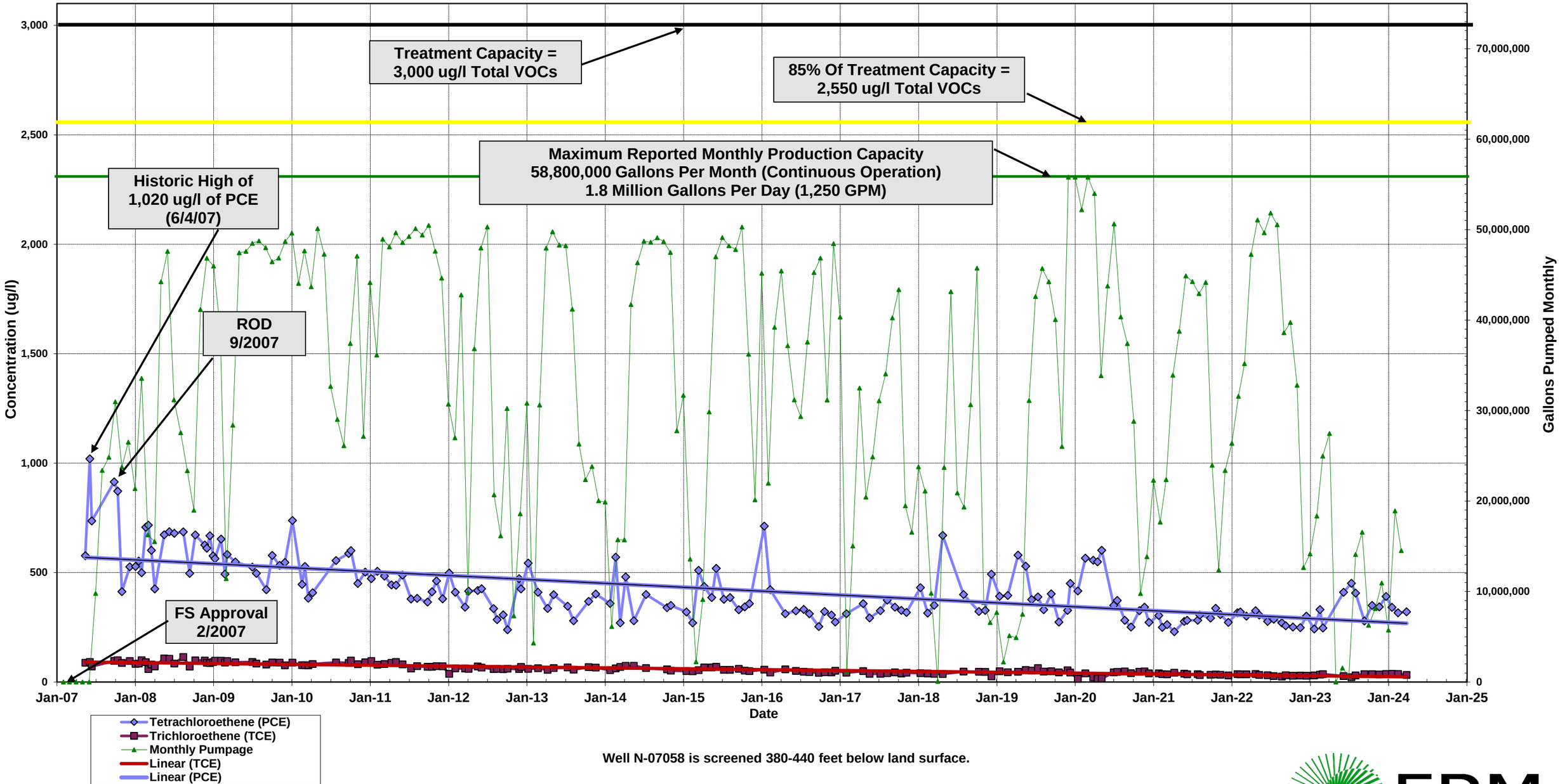


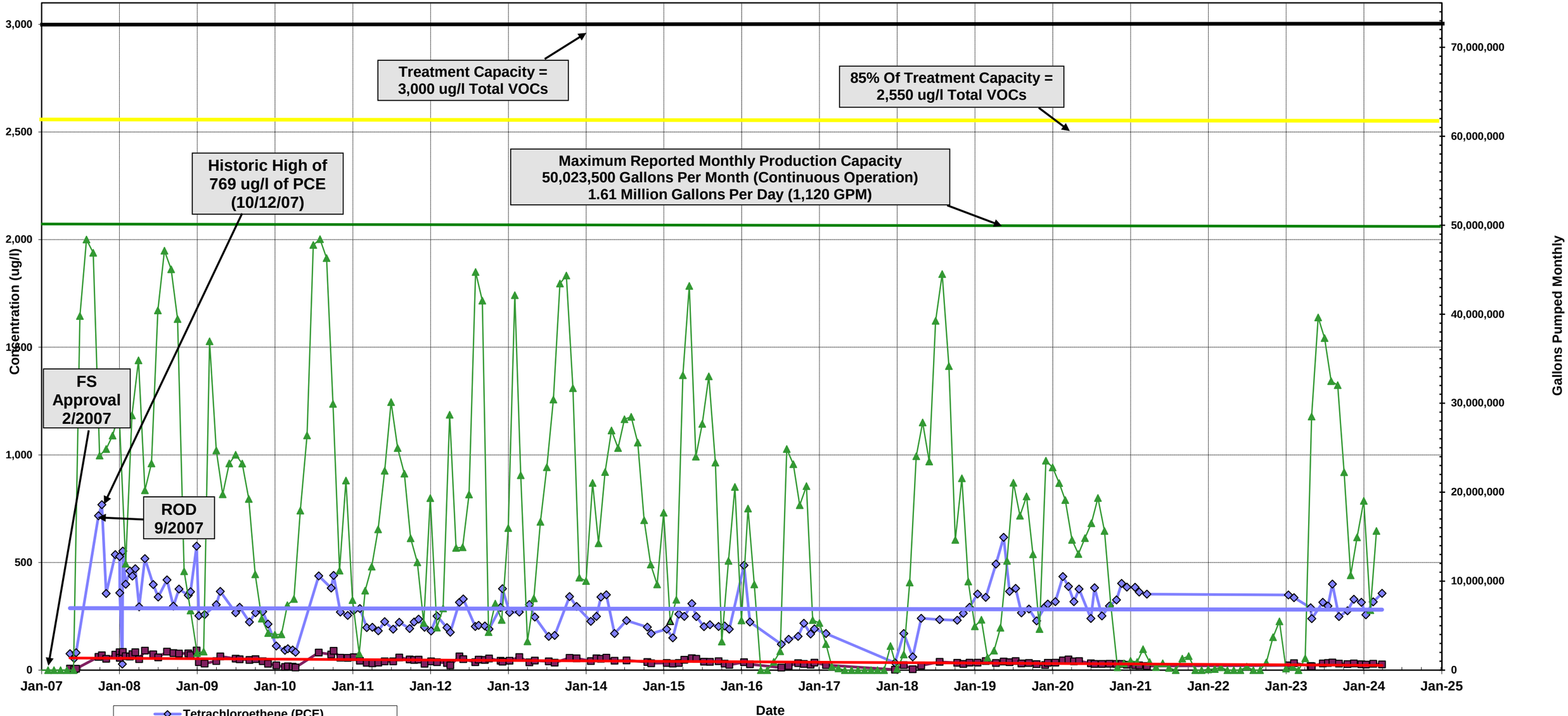
FIGURE 4
HISTORICAL TETRACHLOROETHENE & TRICHLOROETHENE CONCENTRATIONS AND MONTHLY WELL PUMPAGE: JANUARY 2007 - MARCH 2024
PUBLIC WATER SUPPLY WELL # N-07058 (GARDEN CITY WELL NO. 13), GARDEN CITY, NEW YORK



Well N-07058 is screened 380-440 feet below land surface.

ERM

FIGURE 5
HISTORICAL TETRACHLOROETHENE & TRICHLOROETHENE CONCENTRATIONS AND MONTHLY WELL PUMPAGE: JANUARY 2007 - MARCH 2024
PUBLIC WATER SUPPLY WELL # N-08339 (GARDEN CITY WELL NO. 14), GARDEN CITY, NEW YORK



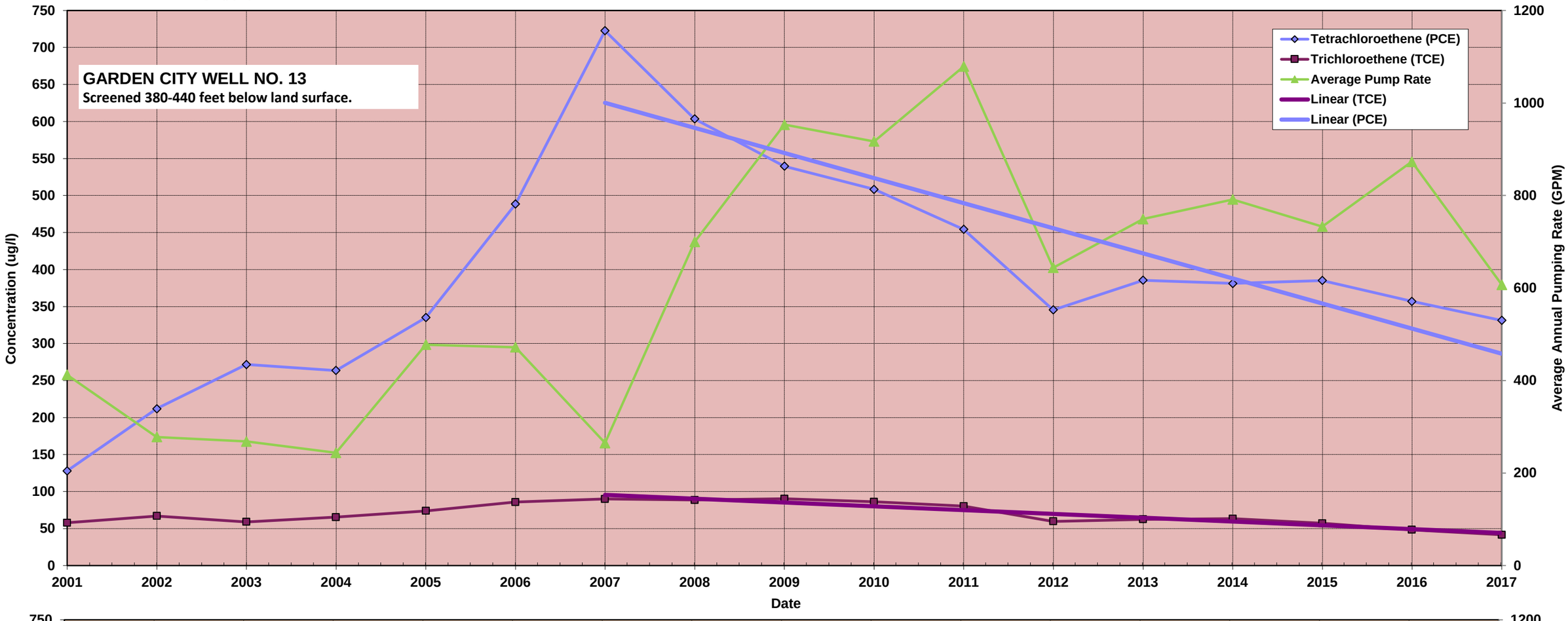
Well N-08339 is screened 308-358 feet below land surface.

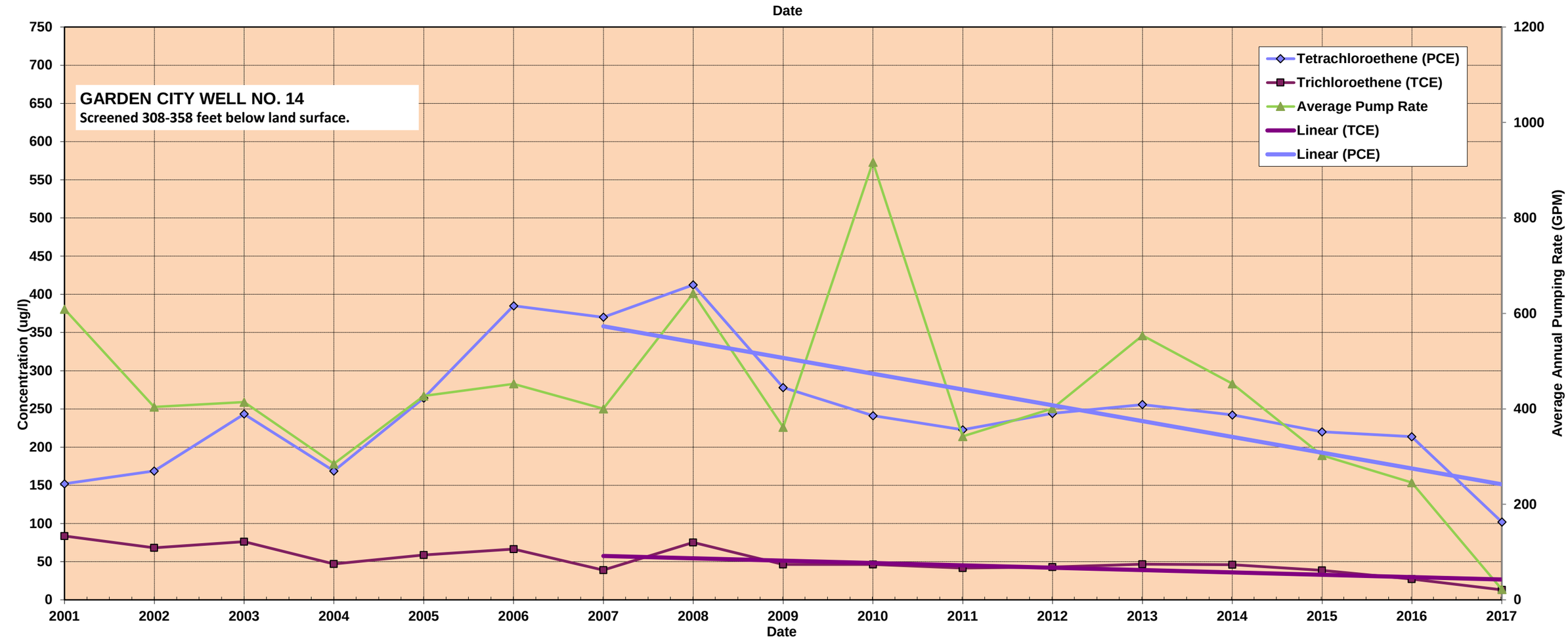
ERM

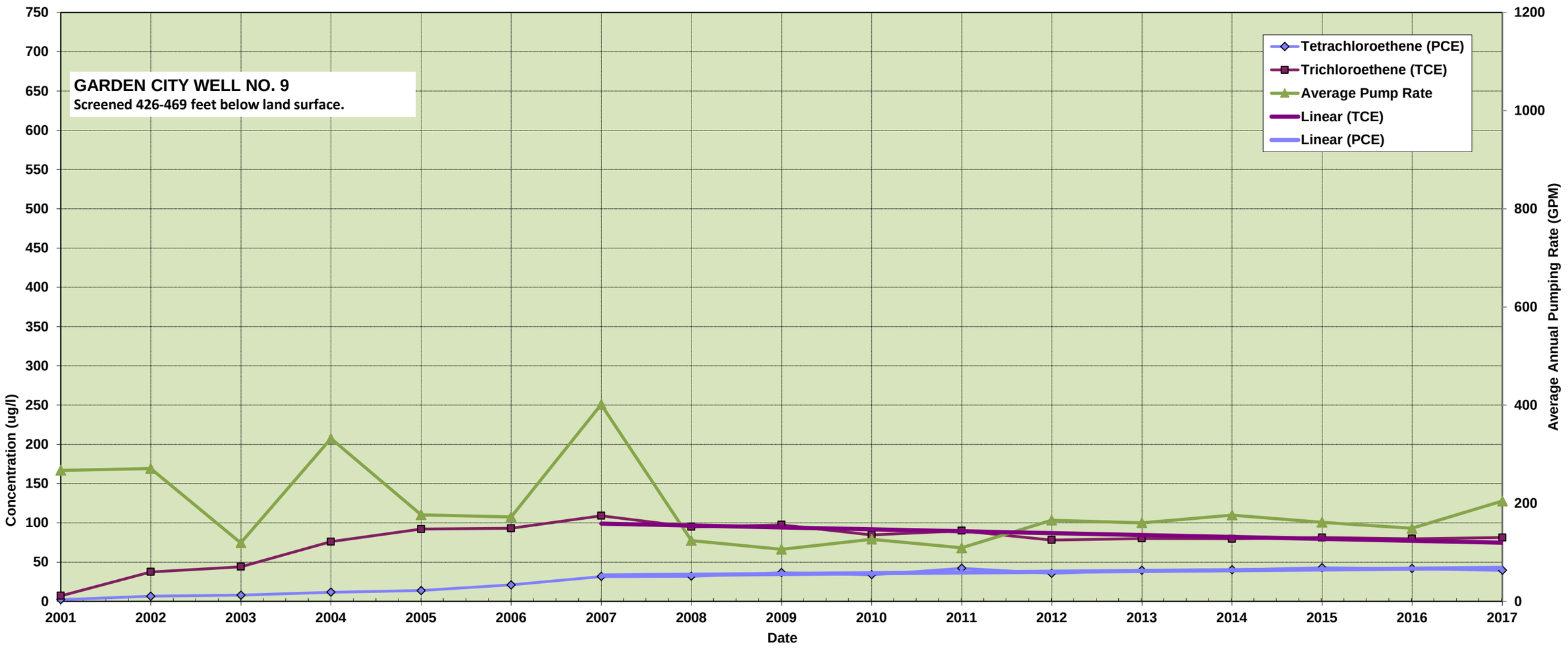
FIGURE 6
HISTORIC AVERAGE TETRACHLOROETHENE AND TRICHLOROETHENE CONCENTRATIONS BY YEAR 2001 - 2015
GARDEN CITY PUBLIC WATER SUPPLY WELL NOS. 9, 13 14, GARDEN CITY, NEW YORK

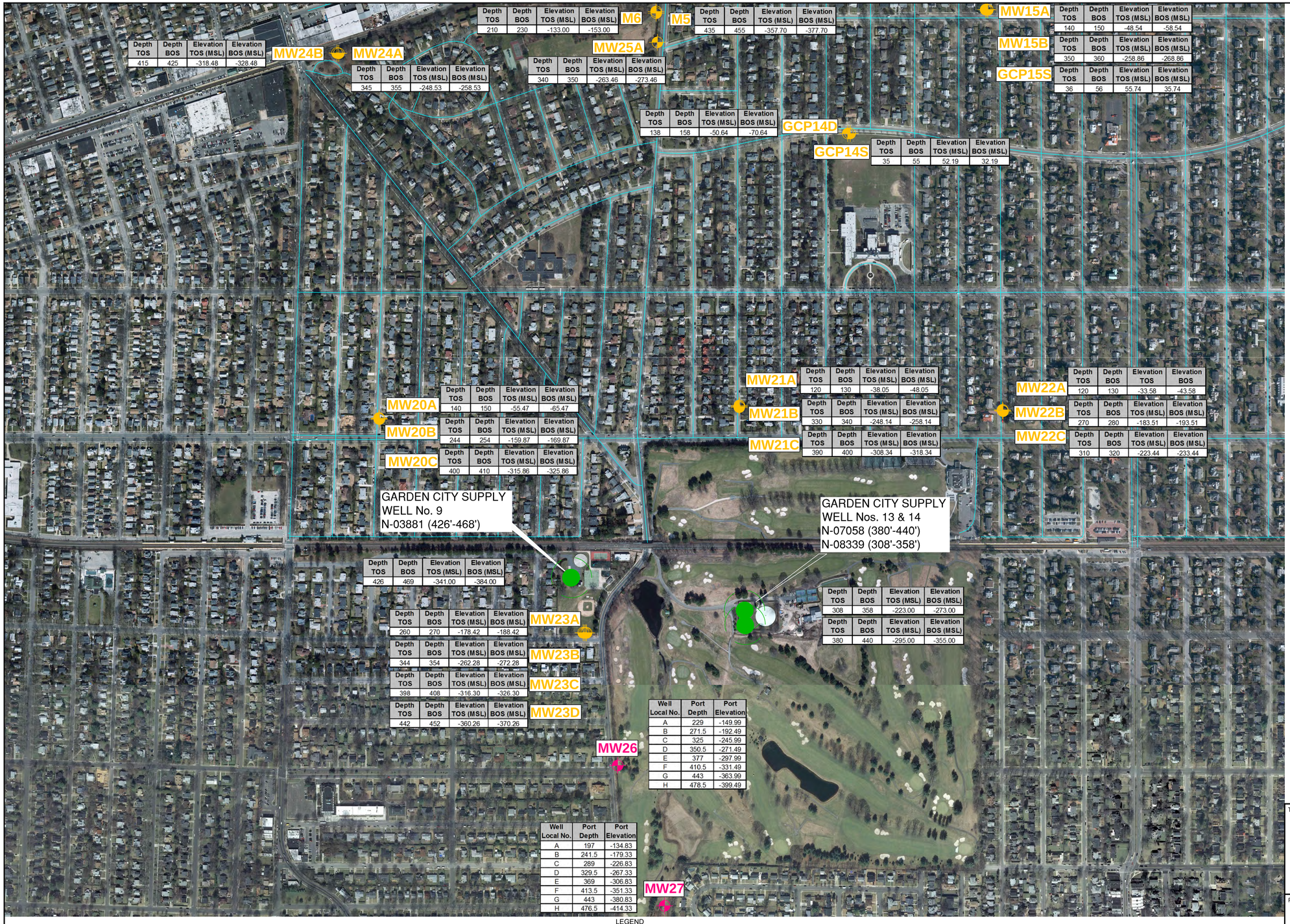
	Year	2001		2002		2003		2004		2005		2006		2007		2008		2009		2010		2011		2012		2013		2014		2015		2016		2017	
	Compound	PCE	TCE	PCE	TCE	PCE	TCE	PCE	TCE	PCE	TCE	PCE	TCE	PCE	TCE	PCE	TCE	PCE	TCE	PCE	TCE	PCE	TCE	PCE	TCE	PCE	TCE	PCE	TCE	PCE	TCE	PCE	TCE
Well No. 13 (N-07058)	Average Concentration	128.0	57.8	211.8	67.0	271.7	59.0	263.6	65.3	335.0	73.9	488.3	85.8	722.6	90.0	603.4	88.5	539.5	90.3	508.3	86.1	454.3	80.2	345.4	59.7	385.5	62.5	381.1	63.4	385.1	57.1	357.0	48.3	331.3	41.6
	Ratio PCE/TCE	2.2		3.2		4.6		4.0		4.5		5.7		8.0		6.8		6.0		5.9		5.7		5.8		6.2		6.0		6.7		7.4		8.0	
	Average Pump Rate	412.1		277.8		268.2		243.8		477.4		472.1		265.0		699.6		953.1		916.8		1078.9		644.0		749.1		791.3		733.0		873.0		607.2	
Well No. 14 (N-08339)	Average Concentration	152.0	83.6	168.7	68.2	243.3	76.2	168.6	46.9	264.2	58.6	385.0	66.5	370.1	38.9	412.4	75.0	278.1	46.3	241.2	46.2	222.8	41.7	244.1	43.1	255.8	46.6	242.1	45.9	219.9	38.8	213.6	27.1	102.0	13.1
	Ratio PCE/TCE	1.8		2.5		3.2		3.6		4.5		5.8		9.5		5.5		6.0		5.2		5.3		5.7		5.5		5.3		5.7		7.9		8.0	
	Average Pump Rate	608.8		271.0		414.2		284.9		427.3		452.6		400.4		642.4		361.9		916.8		342.3		400.9		553.9		453.0		302.7		246.0		22.0	
Well No. 9 (N-03881)	Average Concentration	2.1	7.0	6.6	37.5	7.9	44.0	11.6	76.0	13.7	92.0	21.0	93.0	31.6	109.0	32.0	94.8	36.4	97.5	33.9	84.6	42.0	90.0	35.7	78.1	39.5	80.2	40.1	79.6	42.8	81.2	41.8	79.8	39.4	81.2
	Ratio PCE/TCE	0.3		0.2		0.2		0.2		0.1		0.3		0.3		0.3		0.4		0.4		0.5		0.5		0.5		0.5		0.5		0.5		0.5	
	Average Pump Rate	267.0		271.0		119.2		331.7		176.4		172.3		401.2		123.9		106.1		126.5		109.1		165.4		160.2		175.8		161.0		148.9		204.4	

Concentrations are in ug/l (ppb).









Depth TOS	Depth BOS	Elevation TOS (MSL)	Elevation BOS (MSL)
415	425	-318.48	-328.48

Depth TOS	Depth BOS	Elevation TOS (MSL)	Elevation BOS (MSL)
345	355	-248.53	-258.53

Depth TOS	Depth BOS	Elevation TOS (MSL)	Elevation BOS (MSL)
210	230	-133.00	-153.00

Depth TOS	Depth BOS	Elevation TOS (MSL)	Elevation BOS (MSL)
340	350	-263.46	-273.46

Depth TOS	Depth BOS	Elevation TOS (MSL)	Elevation BOS (MSL)
435	455	-357.70	-377.70

Depth TOS	Depth BOS	Elevation TOS (MSL)	Elevation BOS (MSL)
140	150	-48.54	-58.54

Depth TOS	Depth BOS	Elevation TOS (MSL)	Elevation BOS (MSL)
350	360	-258.86	-268.86

Depth TOS	Depth BOS	Elevation TOS (MSL)	Elevation BOS (MSL)
36	56	55.74	35.74

Depth TOS	Depth BOS	Elevation TOS (MSL)	Elevation BOS (MSL)
138	158	-50.64	-70.64

Depth TOS	Depth BOS	Elevation TOS (MSL)	Elevation BOS (MSL)
35	55	52.19	32.19

Depth TOS	Depth BOS	Elevation TOS (MSL)	Elevation BOS (MSL)
120	130	-38.05	-48.05

Depth TOS	Depth BOS	Elevation TOS (MSL)	Elevation BOS (MSL)
330	340	-248.14	-258.14

Depth TOS	Depth BOS	Elevation TOS (MSL)	Elevation BOS (MSL)
390	400	-308.34	-318.34

Depth TOS	Depth BOS	Elevation TOS	Elevation BOS
120	130	-33.58	-43.58

Depth TOS	Depth BOS	Elevation TOS (MSL)	Elevation BOS (MSL)
270	280	-183.51	-193.51

Depth TOS	Depth BOS	Elevation TOS (MSL)	Elevation BOS (MSL)
310	320	-223.44	-233.44

Depth TOS	Depth BOS	Elevation TOS (MSL)	Elevation BOS (MSL)
140	150	-55.47	-65.47

Depth TOS	Depth BOS	Elevation TOS (MSL)	Elevation BOS (MSL)
244	254	-159.87	-169.87

Depth TOS	Depth BOS	Elevation TOS (MSL)	Elevation BOS (MSL)
400	410	-315.86	-325.86

Depth TOS	Depth BOS	Elevation TOS (MSL)	Elevation BOS (MSL)
426	469	-341.00	-384.00

Depth TOS	Depth BOS	Elevation TOS (MSL)	Elevation BOS (MSL)
260	270	-178.42	-188.42

Depth TOS	Depth BOS	Elevation TOS (MSL)	Elevation BOS (MSL)
344	354	-262.28	-272.28

Depth TOS	Depth BOS	Elevation TOS (MSL)	Elevation BOS (MSL)
398	408	-316.30	-326.30

Depth TOS	Depth BOS	Elevation TOS (MSL)	Elevation BOS (MSL)
442	452	-360.26	-370.26

Depth TOS	Depth BOS	Elevation TOS (MSL)	Elevation BOS (MSL)
308	358	-223.00	-273.00

Depth TOS	Depth BOS	Elevation TOS (MSL)	Elevation BOS (MSL)
380	440	-295.00	-355.00

Well Local No.	Port Depth	Port Elevation
A	229	-149.99
B	271.5	-192.49
C	325	-245.99
D	350.5	-271.49
E	377	-297.99
F	410.5	-331.49
G	443	-363.99
H	478.5	-399.49

Well Local No.	Port Depth	Port Elevation
A	197	-134.83
B	241.5	-179.33
C	289	-226.83
D	329.5	-267.33
E	369	-306.83
F	413.5	-351.33
G	443	-380.83
H	476.5	-414.33

MONITORING/SUPPLY WELLS

Well Local No.	Depth TOS	Depth BOS	Elevation TOS (MSL)	Elevation BOS (MSL)
GCP14D	138	158	-50.64	-70.64
GCP14S	35	55	52.19	32.19
GCP15S	36	56	55.74	35.74
M5	435	455	-357.70	-377.70
M6	210	230	-133.00	-153.00
MW15A	140	150	-48.54	-58.54
MW15B	350	360	-258.86	-268.86
MW20A	140	150	-55.47	-65.47
MW20B	244	254	-159.87	-169.87
MW20C	400	410	-315.86	-325.86
MW21A	120	130	-38.05	-48.05
MW21B	330	340	-248.14	-258.14
MW21C	390	400	-308.34	-318.34
MW22A	120	130	-33.58	-43.58
MW22B	270	280	-183.51	-193.51
MW22C	310	320	-223.44	-233.44
MW23A	260	270	-178.42	-188.42
MW23B	344	354	-262.28	-272.28
MW23C	398	408	-316.30	-326.30
MW24A	345	355	-248.53	-258.53
MW24B	415	425	-318.48	-328.48
MW25A	340	350	-263.46	-273.46
GCWD9	426	469	-341.00	-384.00
GCWD13	380	440	-295.00	-355.00
GCWD14	308	358	-223.00	-273.00

TOS - Top of Screen
BOS -Bottom of Screen

MULTILEVEL WELLS

Well Local No.	Port Depth (msl)	Port Elevation (msl)
MW26A	229.00	-149.99
MW26B	271.50	-192.49
MW26C	325.00	-245.99
MW26D	350.50	-271.49
MW26E	377.00	-297.99
MW26F	410.50	-331.49
MW26G	443.00	-363.99
MW26H	478.50	-399.49
MW27A	197.00	-134.83
MW27B	241.50	-179.33
MW27C	289.00	-226.83
MW27D	329.50	-267.33
MW27E	369.00	-306.83
MW27F*	413.50	-351.33
MW27G	443.00	-380.83
MW26H	476.50	-414.33

* Sensor in port does not function
All measurements in feet
MSL - Mean Sea Level

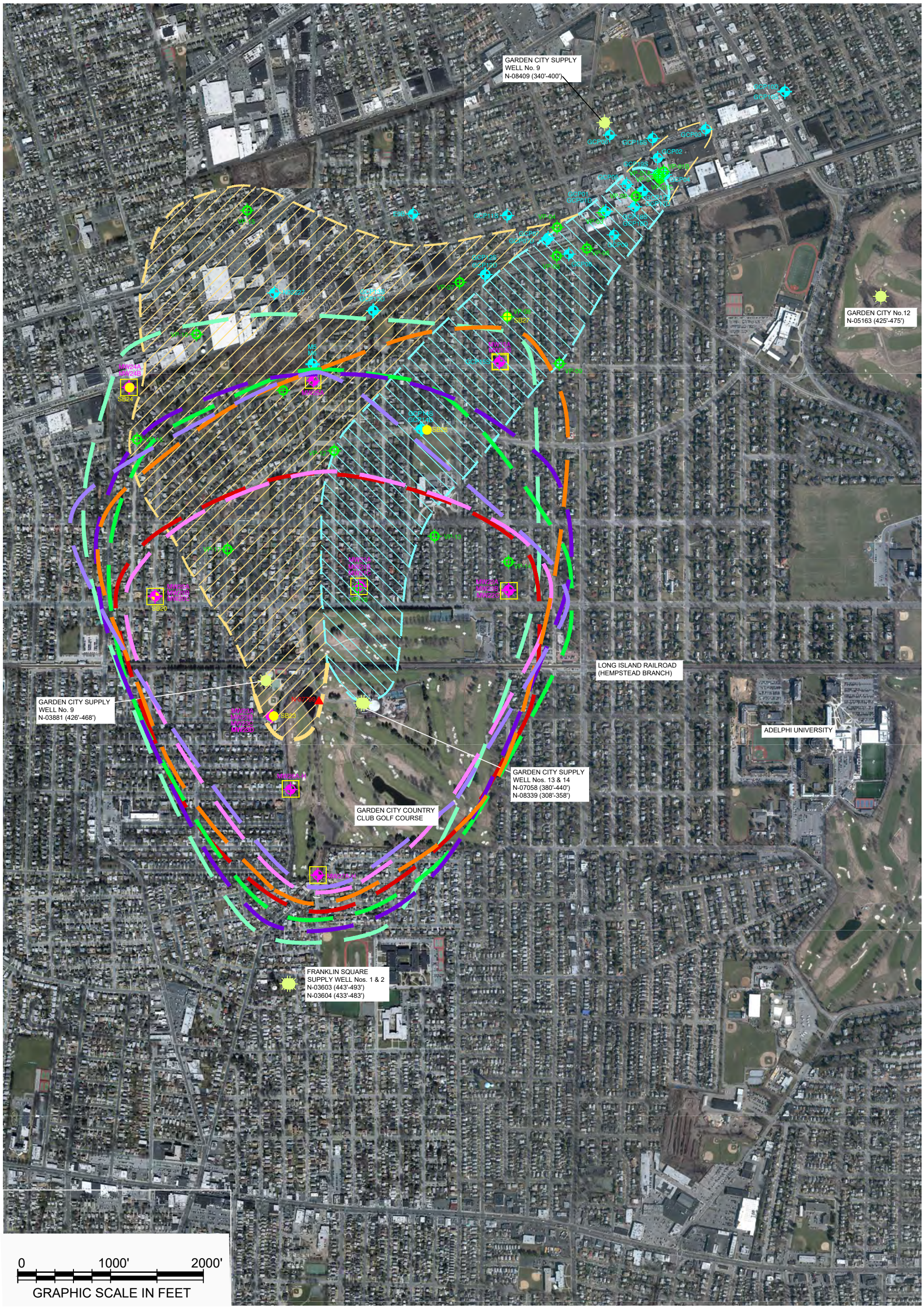
TITLE
Pre-Design Local Hydraulic Evaluation
Wells Outfitted with Data Loggers
150 Fulton Avenue
Garden City Park, NY

PREPARED FOR
Genesco Inc.

Environmental Resources Management

DRAWN BY	SCALE	DATE	JOB NO.	FIGURE
EMF	AS SHOWN	6/29/16	0997881	7

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LEGEND

- HISTORICAL EXTENT OF TRICHLOROETHENE (TCE) - DOMINANT PLUME WHERE THE TOTAL VOLATILE ORGANIC CONCENTRATION WAS GREATER THAN 100 ug/l*
- HISTORICAL TETRACHLOROETHENE (PCE) - DOMINANT PLUME WHERE THE TOTAL VOLATILE ORGANIC CONCENTRATION WAS GREATER THAN 100 ug/l*
- HISTORICAL CIS 1,2 DICHLOROETHENE - DOMINANT PLUME WHERE THERE TOTAL VOLATILE ORGANIC CONCENTRATION WAS GREATER THAN 100 ug/l*

*NOTE:
THE AREAL EXTENT OF CHLORINATED VOLATILE ORGANIC COMPOUNDS DEPICTED IN THIS FIGURE IS BASED ON THE MAXIMUM CONCENTRATIONS DETECTED IN GROUND WATER SAMPLES OBTAINED FROM VERTICAL PROFILE TEMPORARY WELLS INSTALLED DURING 1999 - 2000, AND PERMANENT WELLS DURING SEPTEMBER 2001 - MAY 2005.

- SB23 — SOIL BORING LOCATION
- SUPPLY WELL
- (426'-468') — SCREEN INTERVAL
- N-07799 — IRRIGATION WELL
- GCP08 — EXISTING MONITORING WELL LOCATION
- MW27A-H — NEW MONITORING WELL LOCATION (INSTALLED DURING RI)
- VP-04 — VERTICAL PROFILE LOCATION

- PUMPING WELL GCWD-9 AREA OF RESPONSE > 0.25 FEET
- PUMPING WELL GCWD-13 AREA OF RESPONSE > 0.25 FEET
- PUMPING WELL GCWD-14 AREA OF RESPONSE > 0.25 FEET
- PUMPING WELLS GCWD-9 & 13 AREA OF RESPONSE > 0.25 FEET
- PUMPING WELLS GCWD-9 & 14 AREA OF RESPONSE > 0.25 FEET
- PUMPING WELLS GCWD-13 & 14 AREA OF RESPONSE > 0.25 FEET
- PUMPING WELLS GCWD-9, 13 & 14 AREA OF RESPONSE > 0.25 FEET

TITLE

OBSERVED DRAWDOWN RESPONSE > 0.25 FEET
ALL PUMPING SCENARIOS
150 FULTON AVENUE
GARDEN CITY PARK, NEW YORK

PREPARED FOR

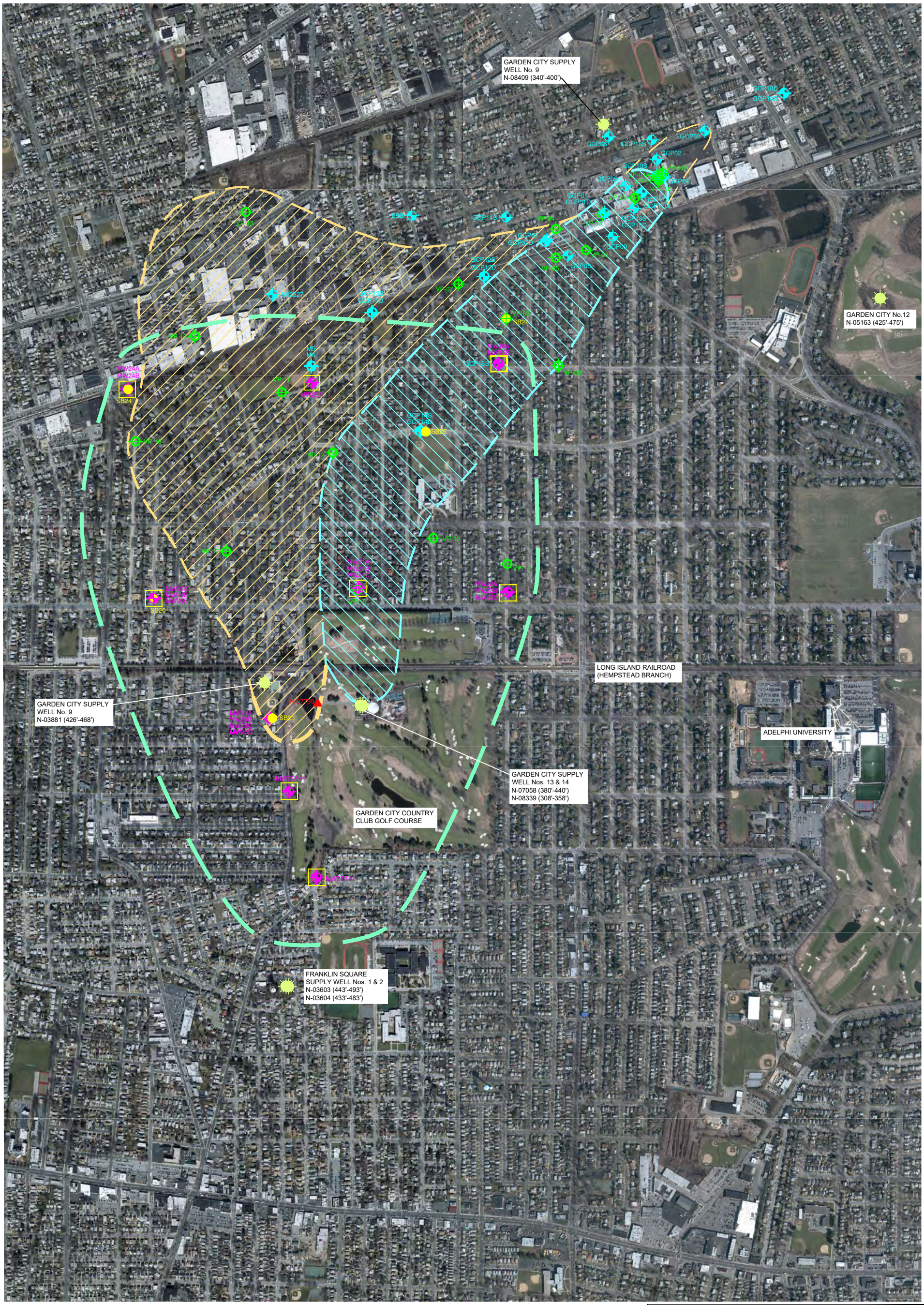
GENESCO INC.

Environmental Resources Management

FIGURE 8

DRAWN BY	SCALE	DATE	JOB NO.
EMF	GRAPHIC	6/29/16	097881

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LEGEND

- HISTORICAL EXTENT OF TRICHLOROETHENE (TCE) - DOMINANT PLUME WHERE THE TOTAL VOLATILE ORGANIC CONCENTRATION WAS GREATER THAN 100 ug/l*
- HISTORICAL TETRACHLOROETHENE (PCE) - DOMINANT PLUME WHERE THE TOTAL VOLATILE ORGANIC CONCENTRATION WAS GREATER THAN 100 ug/l*
- HISTORICAL CIS 1,2 DICHLOROETHENE - DOMINANT PLUME WHERE THERE TOTAL VOLATILE ORGANIC CONCENTRATION WAS GREATER THAN 100 ug/l*

NOTE:
THE AREAL EXTENT OF CHLORINATED VOLATILE ORGANIC COMPOUNDS DEPICTED IN THIS FIGURE IS BASED ON THE MAXIMUM CONCENTRATIONS DETECTED IN GROUND WATER SAMPLES OBTAINED FROM VERTICAL PROFILE TEMPORARY WELLS INSTALLED DURING 1999 - 2000, AND PERMANENT WELLS DURING SEPTEMBER 2001 - MAY 2005.

- SB23 — SOIL BORING LOCATION
- SUPPLY WELL
- (426'-468') — SCREEN INTERVAL
- N-07799 — IRRIGATION WELL
- GCP08 — EXISTING MONITORING WELL LOCATION
- MW27A-H — NEW MONITORING WELL LOCATION (INSTALLED DURING RI)
- VP-04 — VERTICAL PROFILE LOCATION
- PUMPING WELLS GCWD-13 & 14 AREA OF RESPONSE > 0.25 FEET

0 1000' 2000'
GRAPHIC SCALE IN FEET

N

TITLE
OBSERVED DRAWDOWN RESPONSE > 0.25 FEET
PUMPING WELLS GCWD-13 & 14
150 FULTON AVENUE
GARDEN CITY PARK, NEW YORK

PREPARED FOR
GENESCO INC.

Environmental Resources Management

FIGURE 9

DRAWN BY	SCALE	DATE	JOB NO.
EMF	GRAPHIC	6/29/16	0097881

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Table 1
OU1 Long-Term Monitoring Well Sampling Program
Fulton Avenue Superfund Site
Garden City Park, New York

Per 2016 SOW Attachment 1: Monitoring Well Sampling Program

Group 1 Wells are as follows:

GCP-01 S/D
GCP 08
GCP-18 S/D
GCP-15S
MW15 A-B
MW20 A-C
MW22 A-C
MW23 A-D

Group 1 Wells shall be sampled and analyzed at the following frequency:

The first sampling round shall commence within 20 days of EPA approval of the RD Work Plan, and sampling shall be performed every 24 months thereafter.

Group 2 Wells are as follows:

MW21 A-D

Group 2 Wells shall be sampled and analyzed at the following frequency:

Year 1 – quarterly, to commence approximately 30 days after completion of construction of MW21 D and MW28 A-H
Year 2 – semi-annually (every six months)
Year 3 – semi-annually (every six months)
Year 4 – no sampling and analysis
Year 5 (and beyond) – once in year 5 and every 24 months thereafter.

Group 3 Wells are as follows:

MW26 A-H
MW27 A-H
MW28 A-H

Group 3 Wells shall be sampled and analyzed at the following frequency:

Year 1 – quarterly, to commence approximately 30 days after completion of construction of MW21 D and MW28 A-H
Year 2 –9 of 24 zones with EPA approval of the specific zones, semi-annually (every six months)
Year 3 – 9 of 24 zones with EPA approval of the specific zones, semi-annually (every six months)
Year 4 – no sampling and analysis
Year 5 (and beyond) – once in year 5 and every 24 months thereafter.

Table 2
Summary of Historic Ground Water Monitoring Well Sample Results for Select Predominant Compounds
Fulton Avenue Superfund Site, Garden City Park, New York

ERM

GCP01			
Date	PCE	TCE	cis-1,2-DCE
12/06/84	3,700.0	3.0	0.0
03/27/85	3,400.0	4.0	0.0
12/18/85	36,000.0	350.0	1,400.0
01/17/86	50,000.0	350.0	780.0
04/19/89	3,700.0	160.0	190.0
11/09/90	360.0	3.0	0.0
01/17/92	1,400.0	11.0	1.0
06/18/92	13,000.0	75.0	49.0
08/27/93	20,000.0	3,100.0	650.0
04/21/94	7,900.0	530.0	0.0
05/10/95	3,600.0	150.0	0.0
08/16/95	3,200.0	110.0	0.0
09/09/98	1,200.0	21.0	5.0
10/02/01	2,600.0	2,200.0	360.0
08/13/03	5,900.0	110.0	100.0
12/17/03	440.0	180.0	750.0
05/10/04	220.0	28.0	39.0
12/08/04	3,300.0	160.0	9.0
05/20/05	610.0	16.0	3.0
11/03/05	580.0	120.0	0.0
06/07/06	325.0	10.3	0.0
12/22/06	1,940.0	63.0	0.0
12/18/08	1,420.0	1,350.0	24.5
11/14/11	198.0	24.7	24.0
12/16/11	984.0	129.0	22.9
01/28/14	2,400.0	1,700.0	569.0
01/28/14	2,480.0	1,600.0	547.0
03/03/15	210.0	12.9	3.5
05/06/15	1,920.0	354.0	284.0
09/11/17	933.0	251.0	143.0
08/16/19	269.0	120.0	63.0
08/31/21	442.0	162.0	866.0
08/31/23	1.8	1.2	8.0
06/20/24	425.0	308.0	1,490.0
Min	1.8	1.2	0.0
Max	50,000.0	3,100.0	1,490.0
Average	5,148.8	404.9	246.5

GCP01D			
Date	PCE	TCE	cis-1,2-DCE
08/16/95	145.0	2.9	5.0
09/09/98	0.0	0.0	0.0
10/02/01	16.0	0.3	0.2
07/14/03	15.0	0.3	0.0
08/13/03	28.0	0.5	0.0
12/19/03	3.0	0.0	0.0
05/10/04	4.0	0.0	0.0
12/08/04	5.0	0.0	0.0
05/20/05	4.0	0.0	0.0
11/03/05	16.0	0.0	0.0
06/07/06	2.8	0.0	0.0
12/22/06	9.3	0.0	0.0
12/18/08	42.8	0.6	0.5
11/14/11	13.8	0.7	2.5
03/02/15	2.0	0.0	0.0
09/11/17	3.6	0.0	0.0
08/16/19	0.0	0.0	0.0
08/31/21	2.5	0.0	0.0
08/31/23	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	145.0	2.9	5.0
Average	16.5	0.3	0.4

GCP02			
Date	PCE	TCE	cis-1,2-DCE
12/06/84	150.0	440.0	0.0
03/27/85	17.0	54.0	0.0
12/18/85	200.0	96.0	14.0
04/26/89	170.0	52.0	5.0
11/09/90	48.0	7.0	5.0
01/08/91	230.0	8.0	12.0
01/17/92	43.0	18.0	6.0
06/18/92	44.0	48.0	23.0
08/23/93	16.0	30.0	34.0
04/21/94	15.0	25.0	17.0
05/09/95	2.4	11.0	0.0
06/18/96	4.0	6.0	3.0
09/10/01	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	230.0	440.0	34.0
Average	72.3	61.2	9.2

GCP03			
Date	PCE	TCE	cis-1,2-DCE
11/29/85	0.0	0.0	0.0
12/20/85	240.0	82.0	16.0
04/27/89	6.0	220.0	87.0
10/12/90	4.0	23.0	10.0
03/25/91	2.0	25.0	12.0
07/09/91	2.0	17.0	6.0
01/13/92	4.0	12.0	4.0
06/16/92	12.0	89.0	50.0
08/20/93	8.0	31.0	25.0
04/21/94	6.8	42.0	24.0
05/10/95	2.4	38.0	0.0
09/21/01	2.0	22.0	10.0
06/20/24	0.6	0.0	0.0
Min	0.0	0.0	0.0
Max	240.0	220.0	87.0
Average	22.3	46.2	18.8

GCP04			
Date	PCE	TCE	cis-1,2-DCE
11/27/85	300.0	40.0	0.0
12/19/85	120.0	28.0	14.0
10/12/90	9.0	3.0	1.0
07/09/91	120.0	10.0	14.0
01/17/92	28.0	120.0	2.0
06/18/92	92.0	620.0	6.0
08/23/93	64.0	300.0	13.0
04/21/94	88.0	55.0	0.0
05/10/95	810.0	41.0	0.0
06/07/00	19.4	11.5	1.6
09/10/01	10.0	20.0	3.0
11/15/11	1.9	0.0	0.0
03/04/15	1.0	0.0	0.0
Min	1.0	0.0	0.0
Max	810.0	620.0	14.0
Average	127.9	96.0	4.2

GCP05			
Date	PCE	TCE	cis-1,2-DCE
11/27/85	450.0	830.0	0.0
12/19/85	310.0	210.0	0.0
10/12/90	300.0	71.0	5.0
07/09/91	96.0	40.0	5.0
01/15/92	87.0	24.0	5.0
06/17/92	55.0	21.0	3.0
08/26/93	47.0	19.0	4.0
04/21/94	110.0	26.0	0.0
05/09/95	27.0	4.2	0.0
09/28/01	0.9	3.0	1.0
Min	0.9	3.0	0.0
Max	450.0	830.0	5.0
Average	148.3	124.8	2.3

GCP06			
Date	PCE	TCE	cis-1,2-DCE
11/27/85	0.0	0.0	0.0
12/20/85	0.0	0.0	0.0
04/26/89	0.0	1.0	0.0
11/09/90	3.0	0.0	0.0
01/08/91	5.0	0.0	0.0
01/13/92	11.0	23.0	0.0
06/17/92	11.0	23.0	0.0
08/23/93	9.0	14.0	0.0
04/25/94	0.0	0.0	0.0
09/12/01	8.0	4.0	0.1
06/20/24	4.0	0.0	0.0
Min	0.0	0.0	0.0
Max	11.0	23.0	0.1
Average	4.6	5.9	0.0

GCP07S			
Date	PCE	TCE	cis-1,2-DCE
11/01/85	1,700.0	60.0	28.0
12/19/85	2,300.0	100.0	52.0
04/19/89	50.0	29.0	3.0
09/21/90	29,000.0	830.0	520.0
10/02/90	10,000.0	470.0	380.0
01/02/91	3,900.0	190.0	76.0
01/22/92	430.0	18.0	0.0
06/18/92	280.0	0.0	0.0
08/27/93	84.0	11.0	1.0
04/22/94	30.0	8.7	2.3
08/18/95	0.0	1.2	0.0
09/07/01	1.0	0.0	0.0
03/06/15	3.8	0.0	0.0
Min	0.0	0.0	0.0
Max	29,000.0	830.0	520.0
Average	3,675.3	132.1	81.7

GCP07D			
Date	PCE	TCE	cis-1,2-DCE
01/22/92	343.0	10.2	7.6
06/16/92	170.0	15.0	9.0
08/20/93	190.0	9.0	21.0
04/21/94	44.0	0.0	0.0
08/18/95	220.0	11.0	13.0
09/02/99	0.0	0.0	0.0
09/07/01	8.0	0.6	0.0
03/06/15	6.5	0.2	0.0
Min	0.0	0.0	0.0
Max	343.0	15.0	21.0
Average	122.7	5.7	6.3

GCP08			
Date	PCE	TCE	cis-1,2-DCE
01/01/85	67.0	0.0	0.0
12/19/85	250.0	1.0	0.0
04/26/89	320.0	3.0	0.0
09/21/90	87.0	1.0	0.0
12/31/90	28.0	0.0	0.0
01/13/92	72.0	1.0	0.0
06/16/92	1,600.0	87.0	490.0
08/26/93	470.0	54.0	570.0
04/25/94	650.0	110.0	530.0
09/28/01	1,800.0	12.0	2.0
08/18/03	940.0	27.0	43.0
12/17/03	350.0	17.0	12.0
05/10/04	200.0	40.0	66.0
12/08/04	710.0	16.0	150.0
05/19/05	520.0	56.0	140.0
11/04/05	280.0	26.0	67.0
06/07/06	120.0	8.8	16.2
12/22/06	27.5	2.8	1.0
12/18/08	32.5	4.0	107.0
11/14/11	4.6	0.6	8.4
01/28/14	1.6	0.0	0.9
03/03/15	1.9	0.0	0.6
05/07/15	1.1	0.0	1.0
09/12/17	305.0	168.0	837.0
08/14/19	6.9	2.1	0.0
08/31/21	2.2	0.0	0.0
08/31/23	19.5	9.9	38.2
Min	1.1	0.0	0.0
Max	1,800.0	168.0	837.0
Average	328.4	24.0	114.1

GCP09			
Date	PCE	TCE	cis-1,2-DCE
11/01/85	16.0	0.0	0.0
12/19/85	36.0	0.0	0.0
09/21/90	17.0	0.0	0.0
12/31/90	4.0	0.0	0.0
01/08/91	14.0	0.0	0.0
01/13/92	4.0	0.0	0.0
06/16/92	11.0	0.0	0.0
08/26/93	9.0	0.0	0.0
04/25/94	24.0	0.0	0.0
09/22/95	110.0	0.0	14.0
10/01/01	47.0	4.0	2.0
11/14/11	0.0	0.0	0.0
03/06/15	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	110.0	4.0	14.0
Average	22.5	0.3	1.2

GCP10S			
Date	PCE	TCE	cis-1,2-DCE
01/09/92	6.8	0.0	0.0
06/10/92	0.0	0.0	0.0
08/16/93	0.0	0.0	0.0
04/26/94	6.8	42.0	24.0
01/28/99	0.0	0.0	0.0
09/05/01	0.0	0.0	0.0
06/21/24	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	6.8	42.0	24.0
Average	1.9	6.0	3.4

GCP10D			
Date	PCE	TCE	cis-1,2-DCE
01/09/92	6.2	0.0	0.0
06/10/92	0.0	0.0	0.0
08/16/93	0.0	0.0	0.0
04/26/94	0.0	0.0	0.0
01/28/99	2.9	0.0	0.0
09/07/01	6.0	0.8	0.0
06/21/24	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	6.2	0.8	0.0
Average	2.2	0.1	0.0

GCP11S			
Date	PCE	TCE	cis-1,2-DCE
01/08/92	26.6	0.6	0.0
06/04/98	0.0	0.0	0.0
09/07/01	0.0	3.0	0.0
Min	0.0	0.0	0.0
Max	26.6	3.0	0.0
Average	8.9	1.2	0.0

All values are in micrograms per liter (µg/l).
0.0 = Not detected at or above the method detection limit.
NA = Not analyzed.

Table 2
Summary of Historic Ground Water Monitoring Well Sample Results for Select Predominant Compounds
Fulton Avenue Superfund Site, Garden City Park, New York

ERM

GCP12S			
Date	PCE	TCE	cis-1,2-DCE
01/08/92	62.0	0.8	0.0
06/04/98	0.0	0.0	0.0
09/17/01	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	62.0	0.8	0.0
Average	20.7	0.3	0.0

GCP12D			
Date	PCE	TCE	cis-1,2-DCE
01/08/92	144.0	55.7	9.0
06/10/98	71.6	51.7	0.0
05/11/00	59.4	60.6	0.0
09/17/01	10.0	11.0	0.0
Min	10.0	11.0	0.0
Max	144.0	60.6	9.0
Average	71.3	44.8	2.3

GCP13S			
Date	PCE	TCE	cis-1,2-DCE
01/07/92	10.0	1.9	1.0
11/16/95	1.4	4.0	0.0
08/18/97	1.3	3.0	0.0
07/09/98	1.2	2.4	0.0
09/10/01	0.6	1.0	0.0
Min	0.6	1.0	0.0
Max	10.0	4.0	1.0
Average	2.9	2.5	0.2

GCP13D			
Date	PCE	TCE	cis-1,2-DCE
01/07/92	56.8	105.0	1.7
06/10/98	24.3	42.6	0.0
05/11/00	13.0	0.0	0.0
09/10/01	10.0	17.0	0.4
Min	10.0	0.0	0.0
Max	56.8	105.0	1.7
Average	26.0	41.2	0.5

GCP14S			
Date	PCE	TCE	cis-1,2-DCE
01/07/92	23.9	0.0	0.0
12/09/98	0.0	0.0	0.0
09/28/01	0.0	0.0	0.0
03/04/15	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	23.9	0.0	0.0
Average	6.0	0.0	0.0

GCP14D			
Date	PCE	TCE	cis-1,2-DCE
01/07/92	152.0	4.7	1.7
12/23/98	0.0	0.0	0.0
09/28/01	37.0	16.0	1.0
03/04/15	8.9	0.4	0.0
Min	0.0	0.0	0.0
Max	152.0	16.0	1.7
Average	49.5	5.3	0.7

GCP15S			
Date	PCE	TCE	cis-1,2-DCE
01/08/92	18.5	0.2	0.0
12/23/98	0.0	0.0	0.0
09/26/01	0.0	0.0	0.0
05/21/03	0.0	0.0	0.0
05/21/03	0.1	0.0	0.0
08/13/03	1.0	0.0	0.0
12/16/03	0.3	0.0	0.0
05/07/04	0.0	0.0	0.0
12/09/04	0.4	0.0	0.0
05/17/05	2.0	0.0	0.0
11/03/05	2.0	0.2	0.0
05/31/06	0.0	0.0	0.0
12/21/06	0.0	0.0	0.0
12/19/08	0.0	0.0	0.0
11/11/11	0.0	0.0	0.0
03/03/15	0.0	0.0	0.0
05/05/15	0.0	0.0	0.0
09/07/17	0.0	0.0	0.0
08/13/19	0.0	0.0	0.0
08/30/21	0.0	0.0	0.0
08/30/23	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	18.5	0.2	0.0
Average	1.2	0.0	0.0

MW15A			
Date	PCE	TCE	cis-1,2-DCE
07/20/01	12.0	2.0	8.0
09/26/01	5.0	0.6	0.4
10/03/01	22.0	2.0	4.0
05/21/03	72.0	9.0	4.0
08/11/03	400.0	57.0	18.0
12/16/03	2.0	0.0	0.2
05/07/04	220.0	23.0	7.0
12/09/04	1,100.0	120.0	33.0
05/17/05	1,400.0	180.0	54.0
11/02/05	2,000.0	240.0	69.0
05/31/06	1,880.0	173.0	56.2
12/21/06	2,390.0	182.0	78.8
12/19/08	1,440.0	95.2	76.0
11/11/11	1,120.0	51.9	50.3
03/04/15	243.0	16.2	13.8
05/05/15	399.0	21.8	21.9
09/11/17	7.2	0.8	0.9
08/13/19	27.7	3.3	3.8
08/30/21	20.5	6.7	8.7
08/28/23	0.6	0.0	0.6
06/19/24	63.6	63.7	91.2
Min	0.6	0.0	0.2
Max	2,390.0	240.0	91.2
Average	610.7	59.4	28.6

MW15B			
Date	PCE	TCE	cis-1,2-DCE
07/20/01	1,500.0	97.0	9.0
09/26/01	88.0	9.0	0.8
10/03/01	1,200.0	95.0	9.0
05/21/03	680.0	68.0	50.0
08/11/03	560.0	50.0	5.0
12/16/03	440.0	54.0	4.0
05/07/04	470.0	56.0	4.0
12/09/04	150.0	40.0	4.0
05/17/05	310.0	54.0	5.0
11/02/05	250.0	39.0	3.0
05/31/06	251.0	37.4	3.1
12/21/06	293.0	37.7	3.1
12/19/08	174.0	23.7	1.9
11/11/11	185.0	15.0	2.0
03/03/15	0.6	0.0	0.0
05/05/15	67.4	4.6	0.5
09/12/17	48.2	3.6	0.0
08/13/19	0.0	0.0	0.0
08/31/21	10.2	1.0	0.0
08/30/23	2.2	0.0	0.0
Min	0.0	0.0	0.0
Max	1,500.0	97.0	50.0
Average	334.0	34.2	5.2

GCP16S			
Date	PCE	TCE	cis-1,2-DCE
01/13/92	9.2	25.3	0.7
04/26/94	0.0	0.0	0.0
11/26/96	0.7	0.8	0.0
09/06/01	1.0	10.0	8.0
Min	0.0	0.0	0.0
Max	9.2	25.3	8.0
Average	2.7	9.0	2.2

GCP17S			
Date	PCE	TCE	cis-1,2-DCE
08/22/95	5,600.0	0.0	0.0
06/18/96	2,000.0	34.0	0.0
09/09/98	29,000.0	600.0	58.0
10/04/01	21.0	10.0	12.0
12/16/11	1.4	0.0	0.0
Min	1.4	0.0	0.0
Max	29,000.0	600.0	58.0
Average	7,324.5	128.8	14.0

GCP17D			
Date	PCE	TCE	cis-1,2-DCE
08/22/95	7,100.0	0.0	0.0
09/09/98	53.0	1.0	0.0
10/01/01	4.0	0.2	0.3
12/16/11	0.4	0.0	0.0
Min	0.4	0.0	0.0
Max	7,100.0	1.0	0.3
Average	1,789.4	0.3	0.1

GCP18S			
Date	PCE	TCE	cis-1,2-DCE
08/17/95	780.0	330.0	3700.0
06/18/96	850.0	260.0	2000.0
09/09/98	1100.0	280.0	6300.0
09/19/01	220.0	66.0	781.0
08/14/03	52.0	28.0	3200.0
12/18/03	42.0	0.0	2300.0
05/10/04	22.0	0.0	3100.0
12/08/04	18.0	1.0	40.0
05/19/05	0.0	0.0	2800.0
11/03/05	120.0	76.0	550.0
06/07/06	2.8	0.0	1.1
12/22/06	69.8	4.5	178.0
12/18/08	53.6	13.4	292.0
11/14/11	2.0	0.0	0.8
12/16/11	2.5	0.0	0.9
05/07/15	1.5	0.6	6.1
09/08/17	4.5	0.6	17.2
08/16/19	1.5	0.8	2.6
08/31/21	0.0	0.0	2.6
08/31/23	0.0	0.0	2.3
Min	0.0	0.0	0.8
Max	1100.0	330.0	6300.0
Average	167.1	53.0	1263.7

GCP18D			
Date	PCE	TCE	cis-1,2-DCE
08/17/95	4.2	0.0	4.2
09/09/98	0.0	0.0	0.0
09/19/01	2.0	0.5	0.4
08/14/03	7.0	0.0	0.0
12/18/03	5.0	0.0	0.0
05/10/04	1.0	0.0	0.0
12/08/04	0.3	0.0	0.0
05/19/05	1.0	0.0	0.0
11/03/05	0.4	0.0	0.0
06/07/06	2.3	0.0	0.0
12/22/06	0.0	0.0	0.0
12/18/08	0.7	0.0	0.0
11/14/11	0.0	0.0	0.4
05/07/15	0.0	0.0	0.0
09/08/17	0.0	0.0	0.0
08/16/19	0.0	0.0	0.0
08/31/21	0.0	0.0	0.0
08/31/23	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	7.0	0.5	4.2
Average	1.3	0.0	0.3

All values are in micrograms per liter (µg/l).
0.0 = Not detected at or above the method detection limit.
NA = Not analyzed.

Table 2
Summary of Historic Ground Water Monitoring Well Sample Results for Select Predominant Compounds
Fulton Avenue Superfund Site, Garden City Park, New York

ERM

GCP19S			
Date	PCE	TCE	cis-1,2-DCE
08/17/95	7,900.0	0.0	0.0
06/18/96	2,100.0	23.0	0.0
01/12/99	233.0	28.1	3.9
06/07/00	17.6	2.6	0.3
09/19/01	6.0	41.0	1.0
11/16/11	1.1	0.0	0.3
Min	1.1	0.0	0.0
Max	7,900.0	41.0	3.9
Average	1,709.6	15.8	0.9

MW20A			
Date	PCE	TCE	cis-1,2-DCE
04/24/01	0.0	0.0	0.0
09/18/01	0.0	0.0	0.0
04/30/15	0.0	0.0	0.0
09/07/17	0.0	0.0	0.0
08/15/19	0.0	0.0	0.0
09/01/21	0.0	0.0	0.0
08/30/23	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	0.0	0.0	0.0
Average	0.0	0.0	0.0

MW20B			
Date	PCE	TCE	cis-1,2-DCE
05/15/01	0.0	34.0	0.3
09/18/01	0.0	12.0	0.0
04/30/15	0.0	0.0	0.0
09/07/17	0.0	0.0	0.0
08/15/19	0.0	0.0	0.0
09/01/21	0.0	0.0	0.0
08/29/23	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	0.0	34.0	0.3
Average	0.0	6.6	0.0

MW20C			
Date	PCE	TCE	cis-1,2-DCE
05/14/01	0.0	0.0	0.0
09/18/01	0.0	0.0	0.0
04/30/15	0.5	1.1	0.0
09/06/17	3.9	5.3	0.0
08/15/19	0.0	0.0	0.0
09/01/21	0.0	2.1	0.0
08/29/23	0.9	5.1	0.0
Min	0.0	0.0	0.0
Max	3.9	5.3	0.0
Average	0.8	1.9	0.0

MW21A			
Date	PCE	TCE	cis-1,2-DCE
05/29/01	4.0	0.9	0.0
09/24/01	9.0	0.2	0.0
05/22/03	14.0	0.0	0.0
08/14/03	16.0	0.0	0.0
12/15/03	18.0	0.3	0.0
12/19/03	14.0	0.0	0.0
05/06/04	8.0	0.0	0.0
12/07/04	15.0	0.0	0.0
05/13/05	12.0	0.0	0.0
11/01/05	4.0	0.0	0.0
06/01/06	10.3	0.0	0.0
12/20/06	5.7	0.0	0.0
08/21/07	9.3	0.0	0.0
12/15/08	3.8	0.0	0.0
09/02/09	1.9	0.0	0.0
01/05/10	1.3	0.0	0.0
05/12/10	0.8	0.0	0.0
10/29/10	0.9	0.0	0.0
11/09/11	0.8	0.0	0.0
03/05/15	0.0	0.0	0.0
05/01/15	0.5	0.0	0.0
09/12/17	0.0	0.0	0.0
12/19/17	0.0	0.0	0.0
03/12/18	0.0	0.0	0.0
06/14/18	0.0	0.0	0.0
09/13/18	0.0	0.0	0.0
03/04/19	0.0	0.0	0.0
08/14/19	0.0	0.0	0.0
02/28/20	0.0	0.0	0.0
09/03/20	0.0	0.0	0.0
10/06/22	0.0	0.0	0.0
06/19/24	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	18.0	0.9	0.0
Average	4.7	0.0	0.0

MW21B			
Date	PCE	TCE	cis-1,2-DCE
05/29/01	200.0	42.0	0.3
09/24/01	16.0	4.0	0.0
05/22/03	490.0	32.0	0.0
08/12/03	490.0	29.0	0.0
12/15/03	860.0	25.0	0.0
05/06/04	2,200.0	21.0	0.0
12/07/04	1,500.0	37.0	0.0
05/13/05	1,000.0	36.0	0.0
11/01/05	1,000.0	43.0	4.0
06/01/06	1,130.0	63.5	2.7
12/20/06	1,640.0	100.0	6.8
08/21/07	2,310.0	97.7	1.9
12/15/08	2,370.0	164.0	9.0
09/02/09	2,560.0	208.0	14.1
01/05/10	1,670.0	193.0	21.1
05/12/10	2,570.0	217.0	22.8
10/29/10	2,380.0	208.0	24.8
11/09/11	1,230.0	80.7	21.5
03/05/15	1.5	1.1	0.5
05/01/15	1,470.0	154.0	14.5
09/12/17	975.0	158.0	10.1
12/19/17	1,120.0	203.0	8.8
03/09/18	3.9	0.8	0.0
06/14/18	417.0	84.9	3.6
09/14/18	118.0	41.4	2.5
03/05/19	21.1	8.6	0.5
08/14/19	4.1	0.8	0.0
02/28/20	249.0	109.0	0.0
09/03/20	314.0	68.4	6.3
10/06/22	47.6	33.3	4.4
06/19/24	159.0	26.4	4.3
Min	1.5	0.8	0.0
Max	2,570.0	217.0	24.8
Average	984.4	80.3	6.0

MW21C			
Date	PCE	TCE	cis-1,2-DCE
07/19/01	290.0	1.0	0.0
09/24/01	27.0	1.0	0.0
05/22/03	1,800.0	0.0	0.0
08/12/03	1,600.0	8.0	0.0
12/15/03	350.0	4.0	0.0
05/06/04	1,000.0	5.0	8.0
12/07/04	1,200.0	9.0	0.0
05/13/05	3,100.0	21.0	0.0
11/01/05	260.0	9.0	9.0
06/01/06	3,330.0	28.7	7.4
12/20/06	2,410.0	32.4	18.0
08/21/07	9.6	0.2	1.0
12/15/08	2,820.0	53.1	9.4
09/02/09	2,620.0	84.6	10.9
01/05/10	422.0	25.5	12.3
05/12/10	2,230.0	78.9	8.5
10/29/10	454.0	12.4	4.0
11/09/11	850.0	48.4	7.3
03/05/15	1.3	0.0	0.0
05/01/15	318.0	18.8	2.3
09/12/17	181.0	14.3	2.3
12/19/17	267.0	22.5	2.4
03/09/18	202.0	19.4	2.5
06/14/18	146.0	10.5	1.4
09/14/18	23.5	4.2	1.5
03/07/19	16.7	4.1	3.1
08/14/19	14.2	4.5	26.8
02/28/20	20.4	6.5	31.8
09/02/20	48.3	10.3	18.2
10/06/22	3.1	1.6	5.4
06/19/24	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	3,330.0	84.6	31.8
Average	839.2	17.4	6.2

MW21D			
Date	PCE	TCE	cis-1,2-DCE
11/05/17	115.0	2.8	0.0
12/15/17	188.0	7.7	0.6
03/09/18	11.4	0.0	0.0
06/15/18	304.0	14.4	1.0
09/13/18	37.5	6.8	0.8
03/07/19	28.4	2.8	0.0
08/14/19	6.9	0.8	0.0
02/28/20	15.0	1.6	0.0
09/02/20	3.2	0.0	0.6
10/06/22	17.4	4.1	0.9
06/19/24	1.4	0.0	0.0
Min	1.4	0.0	0.0
Max	304.0	14.4	1.0
Average	66.2	3.7	0.4

MW22A			
Date	PCE	TCE	cis-1,2-DCE
05/15/01	1.0	0.0	0.0
09/21/01	3.0	0.0	0.0
05/08/15	0.7	0.0	0.0
09/06/17	0.0	0.0	0.0
08/13/19	0.0	0.0	0.0
09/01/21	0.0	0.0	0.0
08/29/23	0.0	0.0	0.0
06/20/24	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	3.0	0.0	0.0
Average	0.6	0.0	0.0

MW22B			
Date	PCE	TCE	cis-1,2-DCE
05/16/01	1.0	0.0	0.0
09/21/01	0.6	0.0	0.0
10/04/01	0.9	0.0	0.0
05/04/15	0.0	0.0	0.0
09/06/17	0.0	0.0	0.0
08/13/19	0.0	0.0	0.0
09/02/21	0.0	0.0	0.0
08/29/23	0.0	0.0	0.0
06/20/24	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	1.0	0.0	0.0
Average	0.3	0.0	0.0

MW22C			
Date	PCE	TCE	cis-1,2-DCE
05/16/01	0.4	0.0	0.0
09/21/01	0.5	0.4	0.0
05/04/15	0.2	0.0	0.0
09/06/17	0.0	0.0	0.0
08/13/19	0.0	0.0	0.0
09/02/21	0.0	0.0	0.0
08/29/23	0.0	0.0	0.0
06/20/24	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	0.5	0.4	0.0
Average	0.1	0.1	0.0

MW23A			
Date	PCE	TCE	cis-1,2-DCE
04/24/01	0.4	2.0	0.0
09/20/01	0.7	0.0	0.0
05/05/04	0.0	6.0	0.0
12/06/04	0.0	0.0	0.0
05/18/05	2.0	9.0	0.0
10/31/05	0.0	4.0	0.0
06/06/06	0.0	5.5	0.0
12/20/06	0.0	4.0	0.0
08/22/07	0.0	5.7	0.0
12/22/08	0.0	0.5	0.0
11/10/11	0.0	0.0	0.0
04/30/15	0.0	0.3	0.0
09/08/17	0.0	3.0	0.0
08/19/19	0.0	1.5	0.0
09/02/21	0.0	6.6	0.0
08/30/23	0.0	1.9	0.0
Min	0.0	0.0	0.0
Max	2.0	9.0	0.0
Average	0.2	3.1	0.0

MW23B			
Date	PCE	TCE	cis-1,2-DCE
04/24/01	23.0	210.0	0.0
09/20/01	3.0	21.0	0.2
12/13/04	8.0	79.0	0.0
05/18/05	2.0	11.0	2.0
11/02/05	12.0	170.0	0.0
06/06/06	12.3	191.0	0.4
12/20/06	12.3	179.0	0.4
08/22/07	11.3	102.0	0.0
12/22/08	8.4	137.0	0.3
11/10/11	6.0	96.9	0.5
05/04/15	3.5	37.2	0.3
09/08/17	3.0	30.8	0.0
08/22/19	4.5	30.3	0.0
09/02/21	0.0	0.6	0.0
09/01/23	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	23.0	210.0	2.0
Average	7.3	86.4	0.3

MW23C			
Date	PCE	TCE	cis-1,2-DCE
07/23/01	15.0	35.0	0.5
09/20/01	3.0	4.0	0.0
05/05/04	38.0	240.0	4.0
12/06/04	30.0	160.0	1.0
05/18/05	39.0	290.0	2.0
10/31/05	28.0	130.0	1.0
06/06/06	21.1	120.0	1.0
12/19/06	37.3	183.0	1.3
08/22/07	49.3	204.0	1.1
12/22/08	20.7	150.0	0.8
11/10/11	6.2	89.3	0.8
04/30/15	4.8	39.6	0.5
09/08/17	0.7	5.9	0.0
08/22/19	0.0	2.3	0.0
09/02/21	9.0	34.5	0.7
08/30/23	0.0	0.0	0.00
Min	0.0	0.0	0.0
Max	49.3	290.0	4.0
Average	18.9	105.5	0.9

All values are in micrograms per liter (µg/l).
0.0 = Not detected at or above the method detection limit.
NA = Not analyzed.

Table 2
Summary of Historic Ground Water Monitoring Well Sample Results for Select Predominant Compounds
Fulton Avenue Superfund Site, Garden City Park, New York

ERM

MW23D			
Date	PCE	TCE	cis-1,2-DCE
07/23/01	0.5	10.0	0.0
09/20/01	0.0	0.4	0.0
05/05/04	2.0	8.0	0.0
12/06/04	0.4	3.0	0.0
05/18/05	2.0	8.0	0.0
11/02/05	0.0	0.0	0.0
06/06/06	10.5	62.9	0.0
12/19/06	9.9	51.1	0.4
08/22/07	1.5	10.5	0.0
12/22/08	6.8	73.2	0.4
11/10/11	9.7	92.0	0.8
05/04/15	9.4	84.1	0.5
09/08/17	5.2	93.9	0.0
08/22/19	9.3	36.1	0.0
09/02/21	8.9	62.8	0.0
08/30/23	0.0	0.6	0.0
Min	0.0	0.0	0.0
Max	10.5	93.9	0.8
Average	4.8	37.3	0.1

MW24A			
Date	PCE	TCE	cis-1,2-DCE
08/13/01	24.0	39.0	0.6
09/25/01	0.5	0.2	0.0
05/01/15	12.1	81.2	1.3
Min	0.5	0.2	0.0
Max	24.0	81.2	1.3
Average	12.2	40.1	0.6

MW24B			
Date	PCE	TCE	cis-1,2-DCE
08/14/01	5.0	6.0	0.0
09/25/01	21.0	39.0	0.6
05/01/15	4.8	5.8	0.2
Min	4.8	5.8	0.0
Max	21.0	39.0	0.6
Average	10.3	16.9	0.3

MW25A			
Date	PCE	TCE	cis-1,2-DCE
07/19/01	77.0	96.0	2.0
09/27/01	62.0	82.0	2.0
05/06/15	13.9	19.3	1.5
Min	13.9	19.3	1.5
Max	77.0	96.0	2.0
Average	51.0	65.8	1.8

M5			
Date	PCE	TCE	cis-1,2-DCE
05/22/89	0.0	0.0	0.0
06/16/89	0.0	0.7	0.0
07/11/90	0.0	0.0	0.0
08/20/90	0.0	0.0	0.0
04/18/91	0.0	0.0	0.0
05/20/92	0.0	0.0	0.0
07/06/93	0.0	0.0	0.0
08/12/94	0.0	0.0	0.0
02/06/97	0.0	0.0	0.0
06/03/98	0.0	0.0	0.0
09/27/01	0.0	0.0	0.0
05/05/15	0.3	0.0	0.0
Min	0.0	0.0	0.0
Max	0.3	0.7	0.0
Average	0.0	0.1	0.0

M6			
Date	PCE	TCE	cis-1,2-DCE
05/22/89	24.4	89.4	0.0
06/16/89	33.2	88.3	0.0
07/11/90	41.4	99.0	0.6
08/20/90	70.6	119.0	1.9
04/18/91	37.7	93.7	0.0
01/15/92	23.0	67.6	0.8
05/20/92	42.2	261.0	1.2
07/06/93	32.2	103.0	1.3
11/02/94	55.4	92.7	1.0
02/06/97	0.0	0.0	0.0
06/03/98	1.5	2.5	0.0
09/27/01	10.0	14.0	0.2
05/15/15	1.3	1.1	0.0
Min	0.0	0.0	0.0
Max	70.6	261.0	1.9
Average	28.7	79.3	0.5

MW26A			
Date	PCE	TCE	cis-1,2-DCE
05/04/04	0.0	0.0	0.0
12/03/04	0.0	0.0	0.0
05/16/05	0.0	0.0	0.0
10/31/05	0.0	0.0	0.0
06/05/06	0.0	0.0	0.0
12/18/06	0.0	0.0	0.0
08/20/07	0.0	0.0	0.0
12/17/08	0.0	0.0	0.0
08/31/09	0.0	0.0	0.0
01/07/10	0.0	0.0	0.0
05/10/10	0.0	0.0	0.0
11/07/11	0.0	0.0	0.0
10/03/17	0.0	0.0	0.0
12/18/17	0.0	0.0	0.0
03/08/18	0.0	0.0	0.0
06/13/18	0.0	0.0	0.0
09/11/18	0.0	0.0	0.0
03/14/19	0.0	0.0	0.0
08/19/19	0.0	0.0	0.0
02/27/20	0.0	0.0	0.0
09/02/20	0.0	0.0	0.0
06/18/24	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	0.0	0.0	0.0
Average	0.0	0.0	0.0

MW26B			
Date	PCE	TCE	cis-1,2-DCE
05/04/04	0.0	0.0	0.0
12/03/04	0.0	0.0	0.0
05/16/05	0.0	0.0	0.0
10/31/05	0.0	0.0	0.0
06/05/06	0.0	0.0	0.0
12/18/06	0.0	0.0	0.0
08/20/07	0.0	0.0	0.0
12/17/08	0.0	0.0	0.0
08/31/09	0.0	0.0	0.0
01/07/10	0.0	0.0	0.0
05/10/10	0.0	0.0	0.0
11/07/11	0.0	0.0	0.0
05/06/15	0.4	0.0	0.0
10/03/17	0.8	0.0	0.0
12/18/17	0.8	0.0	0.0
03/08/18	0.9	0.0	0.0
06/13/18	0.9	0.0	0.0
09/11/18	0.0	0.0	0.0
03/06/19	1.1	0.0	0.0
08/19/19	0.0	0.0	0.0
02/27/20	1.1	0.0	0.0
09/01/20	1.0	0.0	0.0
10/03/22	0.8	0.0	0.0
06/18/24	1.1	0.0	0.0
Min	0.0	0.0	0.0
Max	1.1	0.0	0.0
Average	0.4	0.0	0.0

MW26C			
Date	PCE	TCE	cis-1,2-DCE
05/04/04	0.0	0.0	0.0
12/03/04	0.0	0.0	0.0
05/16/05	0.0	0.0	0.0
10/31/05	0.0	0.0	0.0
06/05/06	0.0	0.0	0.0
12/18/06	0.0	0.0	0.0
08/20/07	0.0	0.0	0.0
12/17/08	0.0	0.0	0.0
08/31/09	0.0	0.0	0.0
01/07/10	0.0	0.0	0.0
05/10/10	0.0	0.0	0.0
11/07/11	0.0	0.0	0.0
05/06/15	0.4	0.0	0.0
10/02/17	0.0	0.0	0.0
12/18/17	0.7	0.0	0.0
03/08/18	0.6	0.0	0.0
06/13/18	0.0	0.0	0.0
09/11/18	0.0	0.0	0.0
03/06/19	0.0	0.0	0.0
08/19/19	0.0	0.0	0.0
02/27/20	0.0	0.0	0.0
09/01/20	0.0	0.0	0.0
06/18/24	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	0.7	0.0	0.0
Average	0.1	0.0	0.0

MW26D			
Date	PCE	TCE	cis-1,2-DCE
05/04/04	0.0	0.0	0.0
12/03/04	0.0	0.0	0.0
05/16/05	0.0	0.0	0.0
10/31/05	0.0	0.0	0.0
06/05/06	0.0	0.0	0.0
12/18/06	0.0	0.0	0.0
08/20/07	0.0	0.0	0.0
12/17/08	1.0	0.0	0.0
08/31/09	0.5	0.0	0.0
01/07/10	0.0	0.6	0.0
05/10/10	0.0	1.6	0.0
11/07/11	0.5	0.3	0.0
03/09/15	3.5	0.7	0.2
05/06/15	2.3	0.6	0.5
10/02/17	6.3	1.3	0.0
12/18/17	7.5	1.1	0.0
03/08/18	9.1	1.2	0.0
06/13/18	6.5	1.4	0.0
09/11/18	18.7	2.9	0.0
03/06/19	28.8	3.8	0.8
08/19/19	24.9	4.2	2.1
02/27/20	20.1	4.5	5.7
09/01/20	18.6	4.7	8.9
10/03/22	3.2	11.6	7.4
06/18/24	1.9	14.9	3.6
Min	0.0	0.0	0.0
Max	28.8	14.9	8.9
Average	6.1	2.2	1.2

MW26E			
Date	PCE	TCE	cis-1,2-DCE
05/03/04	0.0	0.0	0.0
12/03/04	0.0	0.0	0.0
05/16/05	0.0	0.0	0.0
10/31/05	0.0	0.0	0.0
06/05/06	0.0	0.9	0.0
12/18/06	0.0	0.0	0.0
08/20/07	0.0	0.9	0.0
12/17/08	0.0	0.9	0.0
08/31/09	0.6	2.2	0.0
01/07/10	2.0	4.4	0.0
05/10/10	3.8	7.7	0.0
11/07/11	12.5	7.0	2.2
03/09/15	24.1	8.3	1.8
05/06/15	15.1	7.4	2.1
10/02/17	10.5	12.2	2.6
12/18/17	4.2	11.9	2.7
03/08/18	1.1	9.2	2.3
06/13/18	0.6	2.1	1.0
09/11/18	0.9	9.4	1.8
03/06/19	1.1	11.6	2.9
08/19/19	0.0	11.1	4.0
02/27/20	0.0	9.4	3.6
09/01/20	0.0	8.3	3.6
10/03/22	0.0	7.7	2.4
06/18/24	0.0	11.9	7.4
Min	0.0	0.0	0.0
Max	24.1	12.2	7.4
Average	3.1	5.8	1.6

MW26F			
Date	PCE	TCE	cis-1,2-DCE
05/03/04	0.0	0.0	0.0
12/03/04	0.4	4.0	0.6
05/16/05	0.9	10.0	1.0
10/31/05	1.0	10.0	0.8
06/05/06	4.3	32.8	2.4
12/18/06	3.5	23.5	1.4
08/20/07	0.4	0.0	1.1
12/17/08	0.6	4.6	0.9
08/31/09	0.6	3.4	0.7
01/07/10	0.0	2.5	1.5
05/10/10	0.4	3.0	0.0
11/07/11	4.7	3.9	3.1
03/09/15	42.0	16.3	6.0
05/06/15	30.9	12.5	7.6
10/02/17	27.7	12.6	5.2
12/18/17	26.2	13.5	7.2
03/08/18	25.2	12.9	5.3
06/13/18	25.3	13.9	4.9
09/11/18	19.8	15.5	7.4
03/06/19	7.6	11.4	8.3
08/19/19	10.9	16.1	4.8
02/27/20	10.2	17.7	3.5
09/01/20	3.1	8.5	3.0
06/18/24	1.3	8.2	2.9
Min	0.0	0.0	0.0
Max	42.0	32.8	8.3
Average	10.3	10.7	3.3

MW26G			
Date	PCE	TCE	cis-1,2-DCE
05/03/04	5.0	30.0	0.0
12/03/04	5.0	35.0	0.4
05/16/05	9.0	72.0	0.8
10/31/05	6.0	42.0	0.4
06/05/06	8.4	53.2	0.6
12/18/06	4.9	31.7	0.0
08/20/07	0.5	4.2	0.0
12/17/08	2.2	15.1	0.3
08/31/09	5.1	21.2	0.9
01/07/10	6.1	21.6	1.4
05/10/10	7.0	19.9	1.9
11/07/11	11.7	24.3	3.8
03/09/15	13.1	34.9	1.2
05/06/15	8.4	37.7	1.2
10/02/17	10.7	37.2	0.6
12/18/17	9.0	34.1	0.0
03/08/18	8.6	24.8	0.0
06/13/18	7.1	27.0	0.0
09/11/18	5.8	25.5	0.0
03/06/19	6.2	30.3	0.0
08/19/19	5.1	26.9	0.0
02/27/20	5.0	26.5	0.0
09/01/20	8.7	17.3	0.0
10/03/22	5.0	4.6	0.7
06/18/24	2.8	10.4	0.0
Min	0.5	4.2	0.0
Max	13.1	72.0	3.8
Average	6.7	28.3	0.6

MW26H			
Date	PCE	TCE	cis-1,2-DCE
05/03/04	0.0	0.0	0.0
12/03/04	0.0	0.0	0.0
05/16/05	0.0	0.0	0.0
10/31/05	0.0	0.0	0.0
06/05/06	0.0	0.0	0.0
12/18/06	0.0	0.0	0.0
08/20/07	0.0	0.0	0.0
12/17/08	0.0	0.0	0.0
08/31/09	0.0	0.0	0.0
01/07/10	0.0	0.6	0.0
05/10/10	0.0	1.7	0.0
11/07/11	0.5	9.9	0.5
03/09/15	1.9	22.7	0.2
05/06/15	1.5	18.2	0.3
10/02/17	1.9	25.5	0.0
12/18/17	1.7	24.9	0.0
03/08/18	1.7	22.1	0.0
06/13/18	1.7	22.1	0.0
09/11/18	1.7	20.6	0.0
03/06/19	1.6	15.8	0.0
08/19/19	1.1	13.2	0.0
02/27/20	5.0	26.5	0.0
09/01/20	1.4	12.8	0.0
10/03/22	0.8	11.9	0.0
06/18/24	0.9	11.4	0.0
Min	0.0	0.0	0.0
Max	5.0	26.5	0.5
Average	0.9	10.4	0.0

All values are in micrograms per liter (µg/l).
0.0 = Not detected at or above the method detection limit.
NA = Not analyzed.

Table 2
Summary of Historic Ground Water Monitoring Well Sample Results for Select Predominant Compounds
Fulton Avenue Superfund Site, Garden City Park, New York

ERM

MW27A			
Date	PCE	TCE	cis-1,2-DCE
05/03/04	0.0	0.0	0.0
12/02/04	0.0	0.0	0.0
05/12/05	0.0	0.0	0.0
11/01/05	0.0	0.0	0.0
06/02/06	0.0	0.0	0.0
12/15/06	0.0	0.0	0.0
08/23/07	0.0	0.0	0.0
12/16/08	0.0	0.0	0.0
09/01/09	0.0	0.0	0.0
01/06/10	0.0	0.0	0.0
05/11/10	0.0	0.0	0.0
11/07/11	0.0	0.0	0.0
05/07/15	0.0	0.0	0.0
09/13/17	0.0	0.0	0.0
12/20/17	0.0	0.0	0.0
03/05/18	0.0	0.0	0.0
06/11/18	0.0	0.0	0.0
09/11/18	0.0	0.0	0.0
03/05/19	0.0	0.0	0.0
08/21/19	0.0	0.0	0.0
02/26/20	0.0	0.0	0.0
09/01/20	0.0	0.0	0.0
10/04/22	0.0	0.0	0.0
06/18/24	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	0.0	0.0	0.0
Average	0.0	0.0	0.0

MW27B			
Date	PCE	TCE	cis-1,2-DCE
05/03/04	0.0	0.0	0.0
12/02/04	0.0	0.0	0.0
05/12/05	0.0	0.0	0.0
11/1/2005	0.0	0.0	0.0
06/02/06	0.0	0.0	0.0
12/15/06	0.0	0.0	0.0
08/23/07	0.0	0.0	0.0
12/16/08	0.0	0.0	0.0
09/01/09	0.0	0.0	0.0
01/06/10	0.0	0.0	0.0
05/11/10	0.0	0.0	0.0
12/20/11	0.0	0.0	0.0
05/07/15	0.0	0.0	0.0
09/13/17	0.0	0.0	0.0
12/20/17	0.0	0.0	0.0
03/05/18	0.0	0.0	0.0
06/11/18	0.0	0.0	0.0
09/11/18	0.0	0.0	0.0
03/05/19	0.0	0.0	0.0
08/21/19	0.0	0.0	0.0
02/26/20	0.0	0.0	0.0
09/01/20	0.0	0.0	0.0
10/04/22	0.0	0.0	0.0
06/18/24	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	0.0	0.0	0.0
Average	0.0	0.0	0.0

MW27C			
Date	PCE	TCE	cis-1,2-DCE
05/03/04	0.0	0.0	0.0
12/02/04	0.0	0.0	0.0
05/12/05	0.0	0.0	0.0
11/1/2005	0.0	0.0	0.0
06/02/06	0.0	0.0	0.0
12/15/06	0.0	0.0	0.0
08/23/07	0.0	0.0	0.0
12/16/08	0.0	0.0	0.0
09/01/09	0.0	0.0	0.0
01/06/10	0.0	0.0	0.0
05/11/10	0.0	0.0	0.0
12/20/11	0.0	0.0	0.0
05/07/15	0.0	0.0	0.0
10/03/17	0.0	0.0	0.0
12/20/17	0.0	0.0	0.0
03/05/18	0.0	0.0	0.0
06/11/18	0.0	0.0	0.0
09/11/18	0.0	0.0	0.0
03/05/19	0.0	0.0	0.0
08/21/19	0.0	0.0	0.0
02/26/20	0.0	0.0	0.0
09/01/20	0.0	0.0	0.0
10/04/22	0.0	0.0	0.0
06/18/24	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	0.0	0.0	0.0
Average	0.0	0.0	0.0

MW27D			
Date	PCE	TCE	cis-1,2-DCE
05/03/04	0.0	0.0	0.0
12/02/04	0.0	0.0	0.0
05/12/05	0.0	0.0	0.0
11/1/2005	0.0	0.0	0.0
06/02/06	0.0	0.0	0.0
12/15/06	0.0	0.0	0.0
08/23/07	0.0	0.0	0.0
12/16/08	0.0	0.0	0.0
09/01/09	0.0	0.0	0.0
01/06/10	0.0	0.0	0.0
05/11/10	0.0	0.0	0.0
11/08/11	0.0	0.0	0.0
05/07/15	0.0	0.0	0.0
09/13/17	0.0	0.0	0.0
12/20/17	0.0	0.0	0.0
03/05/18	0.0	0.0	0.0
06/11/18	0.0	0.0	0.0
09/11/18	0.0	0.0	0.0
03/05/19	0.0	0.0	0.0
08/21/19	0.0	0.0	0.0
02/26/20	0.0	0.0	0.0
09/01/20	0.0	0.0	0.0
10/04/22	0.0	0.0	0.0
06/18/24	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	0.0	0.0	0.0
Average	0.0	0.0	0.0

MW27E			
Date	PCE	TCE	cis-1,2-DCE
05/03/04	0.0	0.0	0.0
12/02/04	0.0	0.0	0.0
05/12/05	0.0	0.0	0.0
11/1/2005	0.0	0.0	0.0
06/02/06	0.0	0.0	0.0
12/15/06	0.0	0.0	0.0
08/23/07	0.0	0.0	0.0
12/16/08	0.0	0.0	0.0
09/01/09	0.0	0.0	0.0
01/06/10	0.0	0.0	0.0
05/11/10	0.0	0.0	0.0
11/08/11	0.0	0.0	0.0
05/07/15	0.0	0.0	0.0
10/03/17	0.0	0.0	0.0
12/20/17	0.0	0.0	0.0
03/05/18	0.0	0.0	0.0
06/11/18	0.0	0.0	0.0
09/11/18	0.0	0.0	0.0
03/05/19	0.0	0.0	0.0
08/21/19	0.0	0.0	0.0
02/26/20	0.0	0.0	0.0
09/01/20	0.0	0.0	0.0
10/04/22	0.0	0.0	0.0
06/18/24	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	0.0	0.0	0.0
Average	0.0	0.0	0.0

MW27F			
Date	PCE	TCE	cis-1,2-DCE
05/03/04	0.0	0.0	0.0
12/02/04	0.0	0.0	0.0
05/12/05	0.0	0.0	0.0
11/1/2005	0.0	0.0	0.0
06/02/06	0.0	0.0	0.0
12/15/06	0.0	0.0	0.0
08/23/07	0.0	0.0	0.0
12/16/08	0.0	0.0	0.0
09/01/09	0.0	0.0	0.0
01/06/10	0.0	0.0	0.0
05/11/10	0.0	0.0	0.0
11/08/11	0.0	0.0	0.0
05/07/15	0.0	0.0	0.0
09/13/17	0.0	0.0	0.0
12/20/17	0.0	0.0	0.0
03/05/18	0.0	0.0	0.0
06/11/18	0.0	0.0	0.0
09/10/18	0.0	0.0	0.0
03/05/19	0.0	0.0	0.0
08/21/19	0.0	0.0	0.0
02/26/20	0.0	0.0	0.0
09/01/20	0.0	0.0	0.0
10/04/22	0.0	0.0	0.0
06/18/24	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	0.0	0.0	0.0
Average	0.0	0.0	0.0

MW27G			
Date	PCE	TCE	cis-1,2-DCE
05/03/04	0.0	0.0	0.0
12/02/04	0.0	0.0	0.0
05/12/05	0.0	0.0	0.0
11/1/2005	0.0	0.4	0.0
06/02/06	0.0	0.0	0.0
12/15/06	0.0	1.8	0.0
08/23/07	0.0	0.0	0.0
12/16/08	0.4	4.2	0.0
09/01/09	1.0	8.4	0.0
01/06/10	0.0	4.1	0.0
05/11/10	0.0	1.9	0.0
11/08/11	0.3	2.5	0.0
03/09/15	1.5	2.5	0.0
05/07/15	1.0	1.1	0.0
09/13/17	3.5	1.7	0.0
12/20/17	3.8	2.0	0.0
03/05/18	2.8	1.4	0.0
06/11/18	1.9	0.9	0.0
09/10/18	7.2	3.1	0.6
03/05/19	2.9	0.9	0.0
08/21/19	8.2	2.3	0.5
02/26/20	5.3	1.2	0.0
09/01/20	21.2	3.8	1.2
10/04/22	26.1	3.9	1.2
06/18/24	14.1	2.5	0.7
Min	0.0	0.0	0.0
Max	26.1	8.4	1.2
Average	4.0	2.0	0.2

MW27H			
Date	PCE	TCE	cis-1,2-DCE
05/03/04	0.0	0.0	0.0
12/02/04	0.0	0.0	0.0
05/12/05	0.0	0.0	0.0
11/1/2005	0.0	0.0	0.0
06/02/06	0.0	0.0	0.0
12/15/06	0.0	0.0	0.0
08/23/07	0.0	0.0	0.0
12/16/08	0.0	0.0	0.0
09/01/09	0.0	0.0	0.0
01/06/10	0.0	0.0	0.0
05/11/10	0.0	0.0	0.0
11/08/11	0.0	1.0	0.0
03/09/15	0.3	1.5	0.7
05/07/15	0.0	0.6	1.6
09/13/17	0.0	1.8	6.8
12/20/17	0.0	0.0	6.5
03/05/18	0.0	0.3	6.5
06/11/18	0.0	0.5	6.2
09/10/18	0.0	1.1	7.7
03/05/19	0.0	0.0	7.2
08/21/19	0.0	0.0	5.8
02/26/20	0.0	0.7	6.4
09/01/20	0.0	0.0	1.0
10/04/22	0.0	0.0	2.3
06/18/24	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	0.3	1.8	7.7
Average	0.0	0.3	2.3

MW28A			
Date	PCE	TCE	cis-1,2-DCE
09/14/17	0.0	0.0	0.0
12/21/17	0.0	0.0	0.0
03/06/18	0.0	0.0	0.0
06/12/18	0.0	0.0	0.0
09/17/18	0.0	0.0	0.0
03/14/19	0.0	0.0	0.0
08/19/19	0.0	0.0	0.0
02/25/20	0.0	0.0	0.0
08/31/20	0.0	0.0	0.0
10/05/22	0.0	0.0	0.0
06/17/24	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	0.0	0.0	0.0
Average	0.0	0.0	0.0

MW28B			
Date	PCE	TCE	cis-1,2-DCE
09/14/17	0.0	0.0	0.0
12/21/17	0.0	0.0	0.0
03/06/18	0.0	0.0	0.0
06/12/18	0.0	0.0	0.0
09/17/18	0.0	0.0	0.0
03/14/19	0.0	0.0	0.0
08/19/19	0.0	0.0	0.0
02/25/20	0.0	0.0	0.0
08/31/20	0.0	0.0	0.0
10/05/22	0.0	0.0	0.0
06/17/24	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	0.0	0.0	0.0
Average	0.0	0.0	0.0

MW28C			
Date	PCE	TCE	cis-1,2-DCE
09/14/17	0.0	0.0	0.0
12/21/17	0.0	0.0	0.0
03/06/18	0.0	0.0	0.0
06/12/18	0.0	0.0	0.0
09/17/18	0.0	0.0	0.0
03/14/19	0.0	0.0	0.0
08/19/19	0.0	0.0	0.0
02/25/20	0.0	0.0	0.0
08/31/20	0.0	0.0	0.0
10/05/22	0.0	0.0	0.0
06/17/24	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	0.0	0.0	0.0
Average	0.0	0.0	0.0

MW28D			
Date	PCE	TCE	cis-1,2-DCE
09/14/17	0.5	0.0	0.0
12/21/17	1.1	0.0	0.0
03/06/18	0.9	0.0	0.0
06/12/18	0.8	0.0	0.0
09/17/18	0.0	0.0	0.0
03/14/19	0.0	0.0	0.0
08/19/19	0.0	0.0	0.0
02/25/20	0.0	0.0	0.0
08/31/20	0.0	0.0	0.0
10/05/22	0.0	0.0	0.0
06/17/24	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	1.1	0.0	0.0
Average	0.3	0.0	0.0

MW28E			
Date	PCE	TCE	cis-1,2-DCE
09/14/17	0.0	0.0	0.0
12/21/17	1.2	0.0	0.0
03/06/18	0.8	0.0	0.0
06/12/18	0.0	0.0	0.0
09/17/18	0.0	0.0	0.0
03/14/19	0.0	0.0	0.0
08/19/19	0.0	0.0	0.0
02/25/20	0.0	0.0	0.0
08/31/20	0.0	0.0	0.0
10/05/22	0.9	0.0	0.0
06/17/24	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	1.2	0.0	0.0
Average	0.3	0.0	0.0

MW28F			
Date	PCE	TCE	cis-1,2-DCE
09/14/17	0.0	0.0	0.0
12/21/17	1.0	0.0	0.0
03/06/18	1.3	0.0	0.0
06/12/18	0.0	0.0	0.0
09/17/18	1.0	0.0	0.0
03/14/19	1.5	0.0	0.0
08/19/19	1.0	0.0	0.0
02/25/20	0.0	0.0	0.0
08/31/20	0.0	0.0	0.0
10/05/22	0.8	0.0	0.0
06/17/24	0.8	0.0	0.0
Min	0.0	0.0	0.0
Max	1.5	0.0	0.0
Average	0.7	0.0	0.0

All values are in micrograms per liter (µg/l).
0.0 = Not detected at or above the method detection limit.
NA = Not analyzed.

Table 2
Summary of Historic Ground Water Monitoring Well Sample Results for Select Predominant Compounds
Fulton Avenue Superfund Site, Garden City Park, New York

ERM

MW28G

Date	PCE	TCE	cis-1,2-DCE
09/14/17	0.0	0.0	0.0
12/21/17	0.8	0.0	0.0
03/06/18	0.6	0.0	0.0
06/12/18	1.2	0.0	0.0
09/17/18	0.0	0.0	0.0
03/14/19	0.0	0.0	0.0
08/19/19	0.0	0.0	0.0
02/25/20	0.0	0.0	0.0
08/31/20	0.0	0.0	0.0
10/05/22	0.0	0.0	0.0
06/17/24	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	1.2	0.0	0.0
Average	0.2	0.0	0.0

MW28H

Date	PCE	TCE	cis-1,2-DCE
09/14/17	0.0	0.0	0.0
12/21/17	0.5	0.0	0.0
03/06/18	0.7	0.0	0.0
06/12/18	0.9	0.0	0.0
09/17/18	0.0	0.0	0.0
03/14/19	0.0	0.0	0.0
08/19/19	0.0	0.0	0.0
02/25/20	0.0	0.0	0.0
08/31/20	0.0	0.0	0.0
10/05/22	0.0	0.0	0.0
06/17/24	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	0.9	0.0	e
Average	0.2	0.0	0.0

E9B

Date	PCE	TCE	cis-1,2-DCE
07/17/86	20.4	36.3	0.0
02/04/87	15.3	18.1	0.0
07/29/88	0.0	0.0	0.0
07/21/89	8.0	0.0	0.0
10/13/89	1.8	0.4	0.0
06/21/90	3.1	1.5	0.0
06/24/91	0.0	0.0	0.0
01/09/92	14.4	1.1	0.0
01/08/93	2.9	1.3	0.0
07/28/94	1.8	0.4	0.0
02/26/97	3.2	0.0	0.0
09/12/01	2.0	0.4	0.4
Min	0.0	0.0	0.0
Max	20.4	36.3	0.4
Average	6.1	5.0	0.0

M51

Date	PCE	TCE	cis-1,2-DCE
10/22/93	0.0	4.6	0.0
08/15/94	0.2	12.2	0.5
03/03/99	0.0	7.5	0.0
09/25/01	0.0	6.0	0.0
Min	0.0	4.6	0.0
Max	0.2	12.2	0.5
Average	0.1	7.6	0.1

M52

Date	PCE	TCE	cis-1,2-DCE
10/22/93	0.0	0.0	0.0
08/15/94	2.9	0.0	1.1
02/26/97	1.9	0.0	0.0
09/25/01	0.7	0.3	0.0
Min	0.0	0.0	0.0
Max	2.9	0.3	1.1
Average	1.4	0.1	0.3

N-02227

Date	PCE	TCE	cis-1,2-DCE
09/17/01	10.0	4.0	0.1
Min	10.0	4.0	0.1
Max	10.0	4.0	0.1
Average	10.0	4.0	0.1

VOW1D

Date	PCE	TCE	cis-1,2-DCE
4/26/99	111.0	7.0	0.0
7/14/99	47.6	8.1	0.0
10/26/99	0.5	0.0	0.0
6/7/00	0.7	0.0	0.0
3/19/01	0.0	0.0	0.0
6/14/01	0.0	0.0	0.0
11/15/11	1.6	0.0	0.0
Min	0.0	0.0	0.0
Max	111.0	8.1	0.0
Average	23.1	2.2	0.0

VOW3D

Date	PCE	TCE	cis-1,2-DCE
4/26/99	22,200.0	224.0	1.6
7/14/99	11,700.0	2,410.0	0.0
10/26/99	705.0	745.0	50.1
6/7/00	99.1	87.7	12.7
9/29/00	27.8	26.7	1.0
3/19/01	64.2	18.9	28.8
6/14/01	4.9	3.3	0.0
11/15/11	1.6	0.0	0.0
12/16/11	1.2	0.0	0.0
Min	1.2	0.0	0.0
Max	22,200.0	2,410.0	50.1
Average	3,867.1	390.6	10.5

VOW4D

Date	PCE	TCE	cis-1,2-DCE
4/26/99	53,700.0	0.0	0.0
7/14/99	36,700.0	1,040.0	0.0
10/26/99	6,800.0	2,600.0	401.0
1/24/00	2,140.0	4,380.0	1,290.0
6/7/00	897.0	3,540.0	2,373.7
9/29/00	134.0	928.0	1,562.0
1/3/01	55.8	929.0	1,569.8
3/19/01	0.0	117.0	13,243.7
6/14/01	1.6	2.5	19.4
9/6/01	6.3	10.0	5.0
11/15/11	2.9	0.4	0.0
12/16/11	1.8	0.4	0.0
12/16/11	1.9	0.4	0.0
Min	0.0	0.0	0.0
Max	53,700.0	4,380.0	13,243.7
Average	7,726.3	1,042.1	1,574.2

VEW1

Date	PCE	TCE	cis-1,2-DCE
11/15/11	2.5	0.3	0.0
12/16/11	3.1	0.5	0.0
Min	2.5	0.3	0.0
Max	3.1	0.5	0.0
Average	2.8	0.4	0.0

All values are in micrograms per liter (µg/l).
0.0 = Not detected at or above the method detection limit.
NA = Not analyzed.

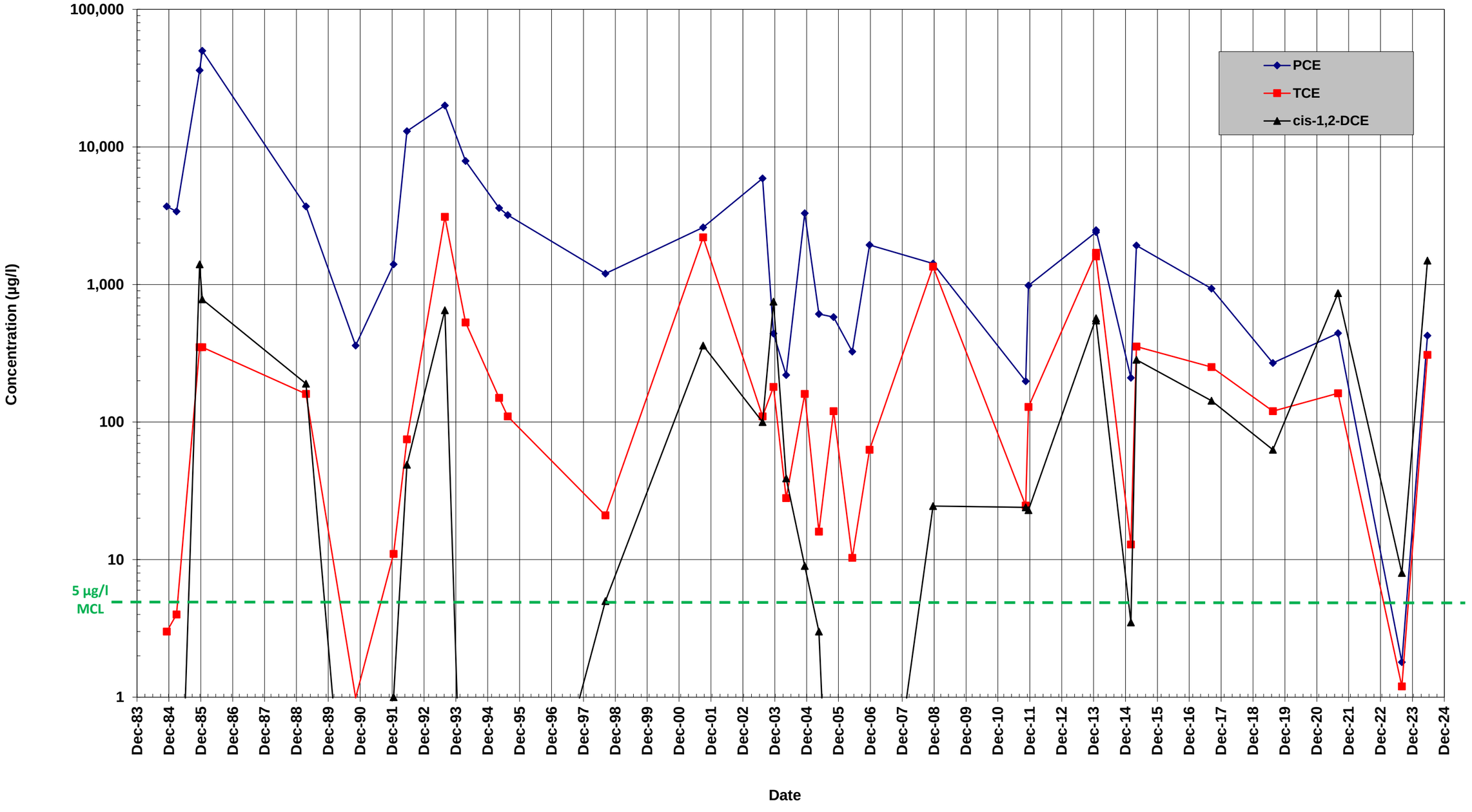
ATTACHMENT A

PLOTS OF PCE, TCE AND CIS 1,2-DCE VERSUS TIME FOR EACH OF THE 42 GROUNDWATER MONITORING WELLS THAT ARE PART OF THE OU1 LONG-TERM GROUNDWATER MONITORING PROGRAM

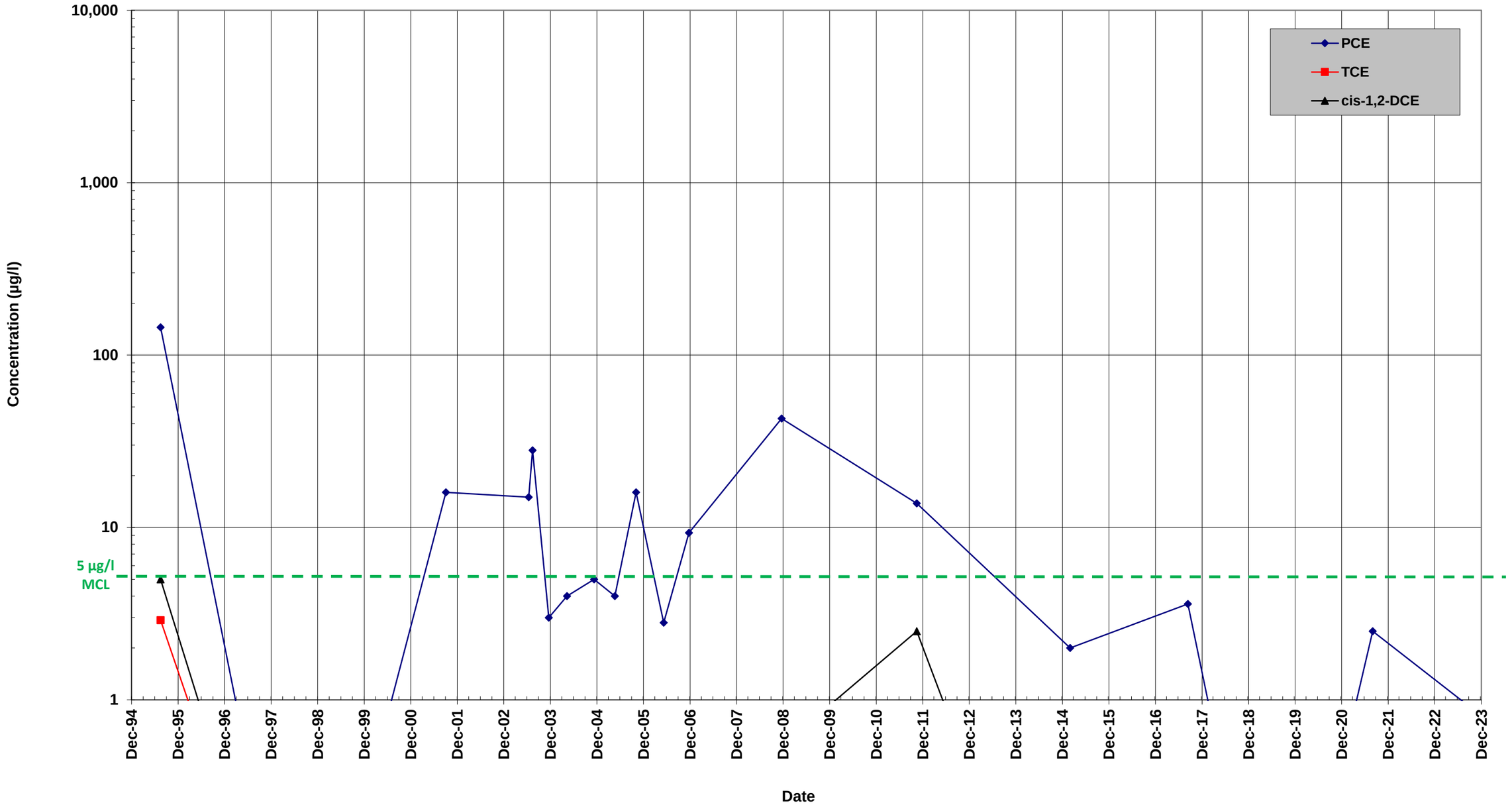
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Well GCP01
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 49 to 59 Feet Below Ground Surface

ERM

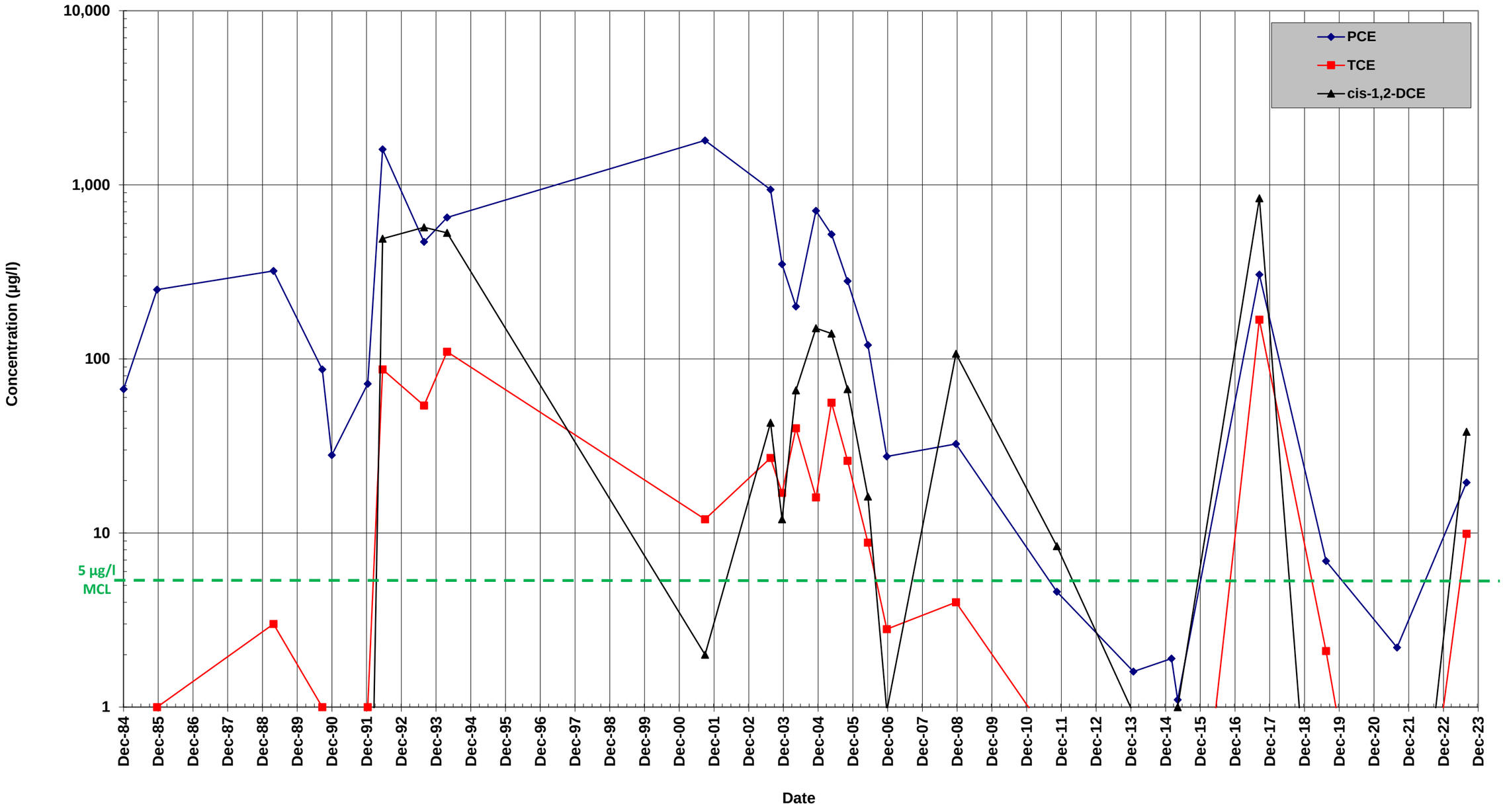


Well GCP01D
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 105 to 115 Feet Below Ground Surface

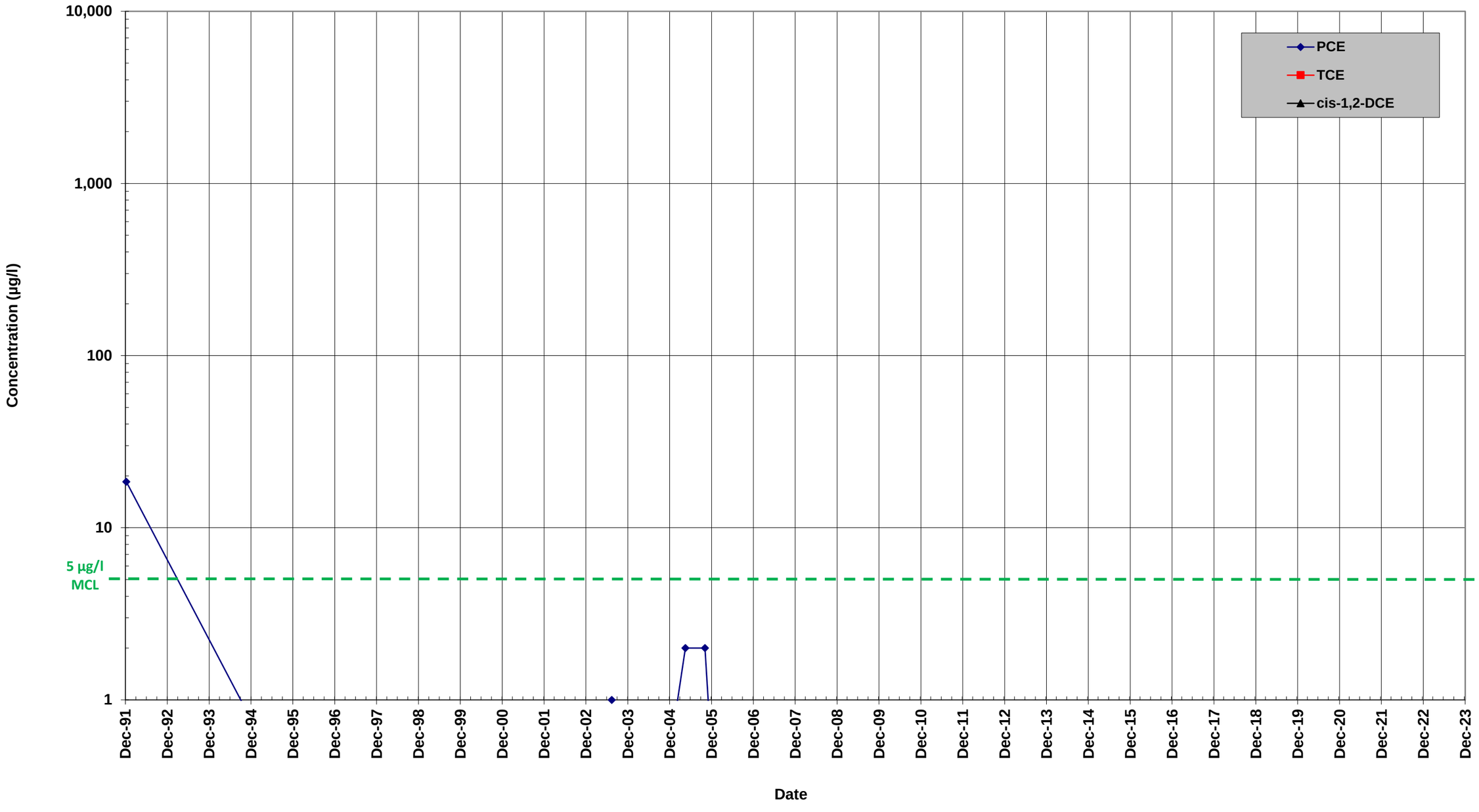


Well GCP08
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 50 to 60 Feet Below Ground Surface

ERM

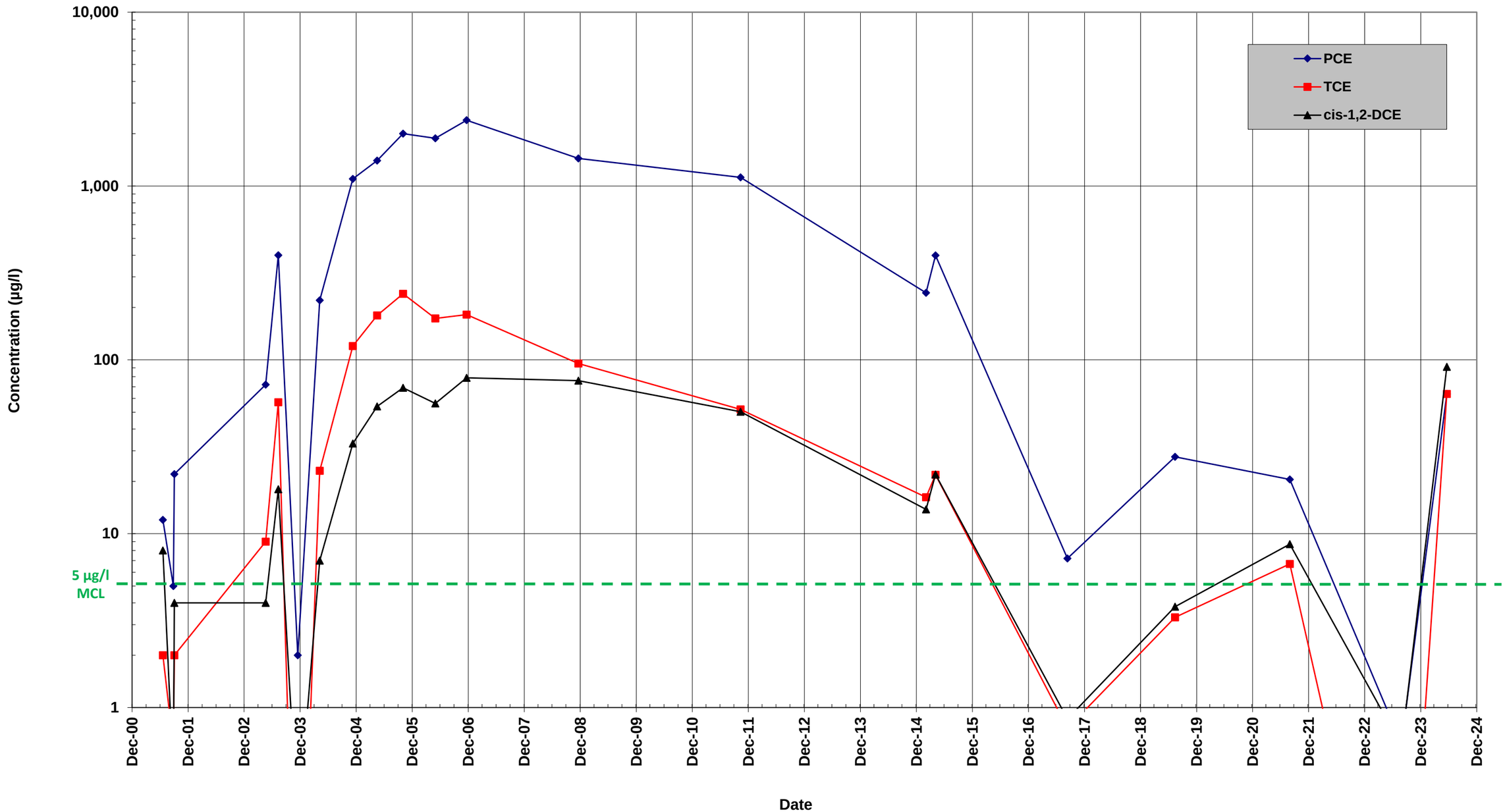


Well GCP15S
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 36 to 56 Feet Below Ground Surface



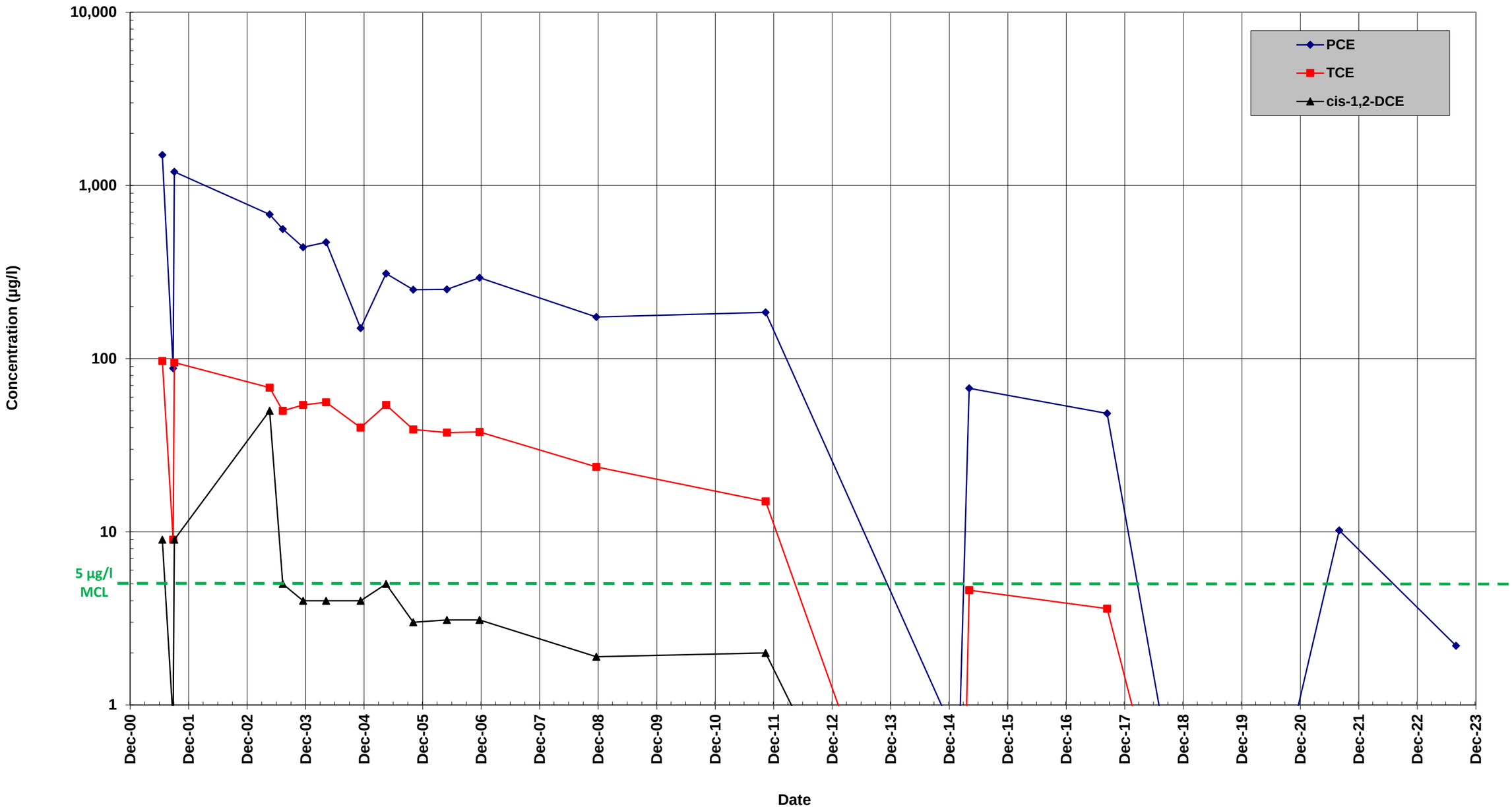
Well MW15A
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 140 to 150 Feet Below Ground Surface

ERM



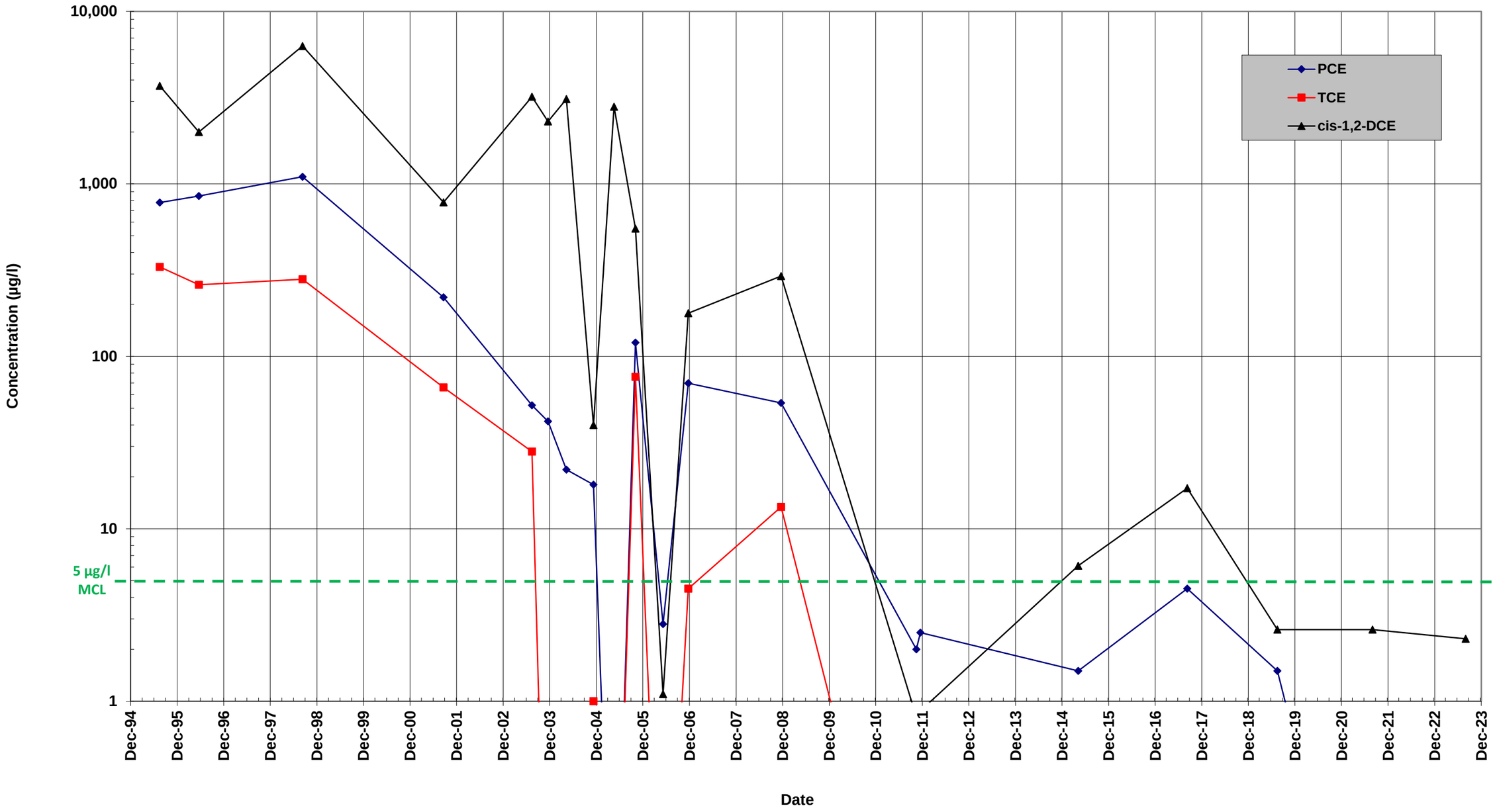
Well MW15B
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 350 to 360 Feet Below Ground Surface

ERM



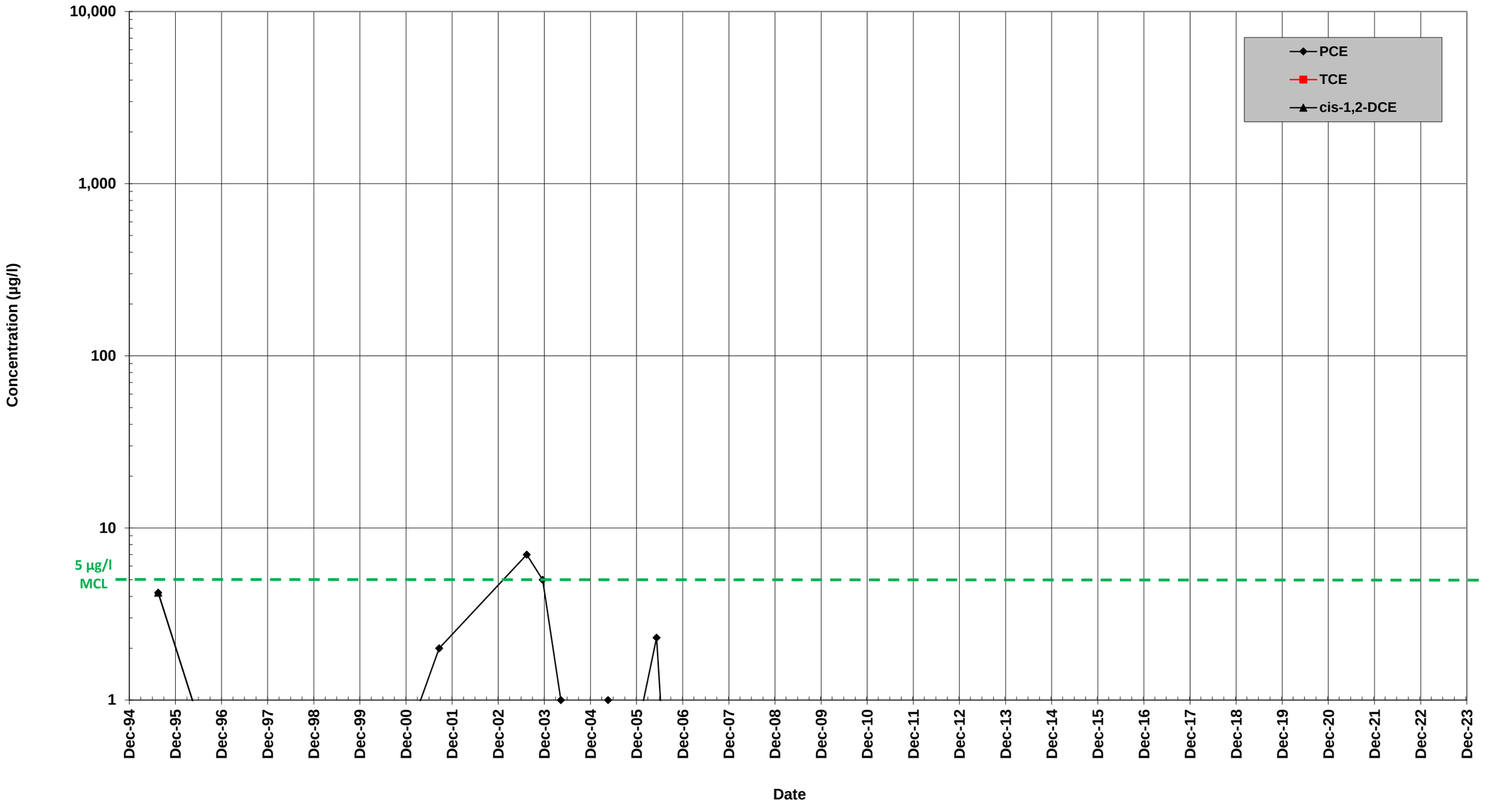
Well GCP18S
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 39 to 54 Feet Below Ground Surface

ERM

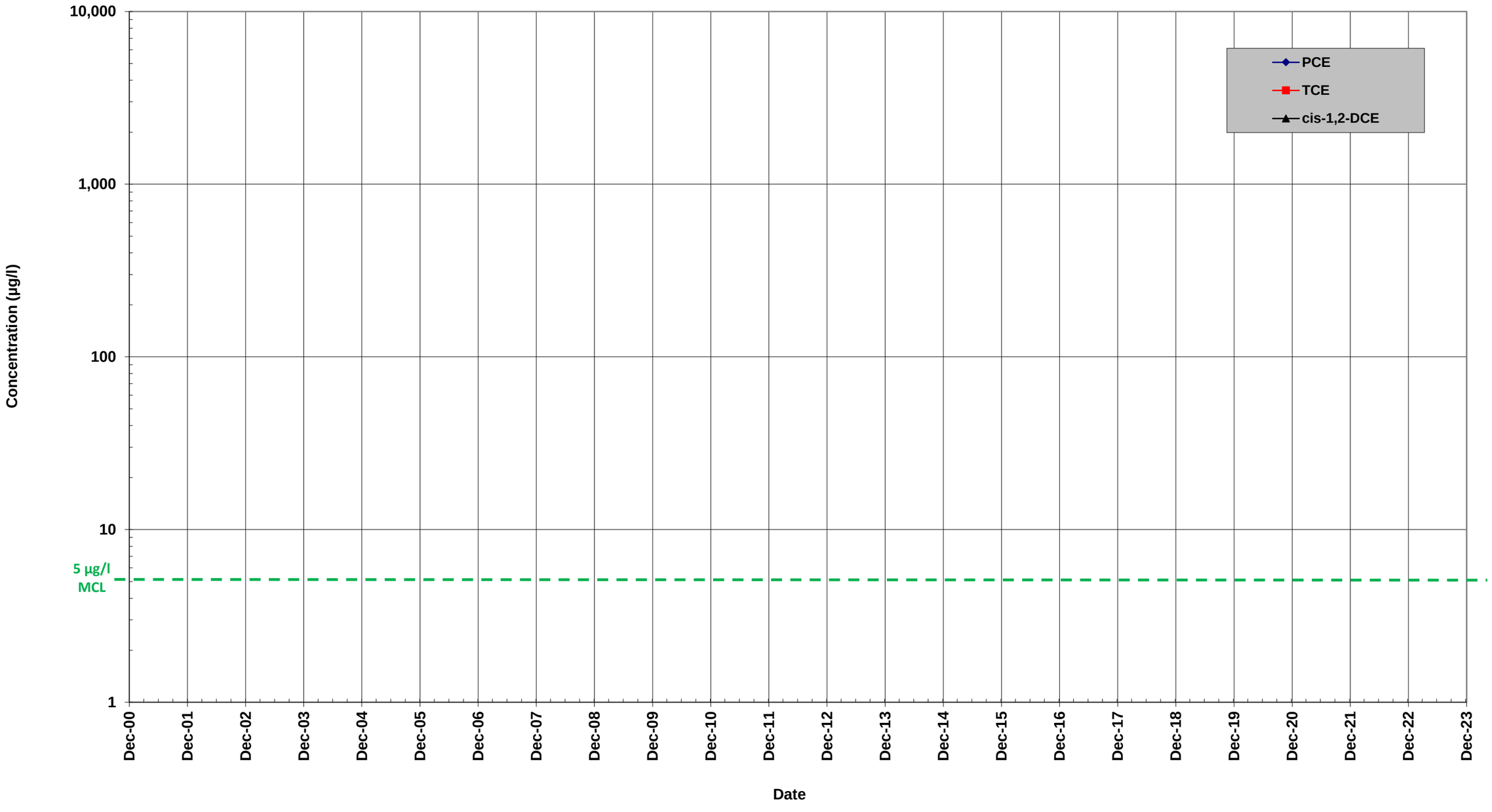


Well GCP18D
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 113 to 123 Feet Below Ground Surface

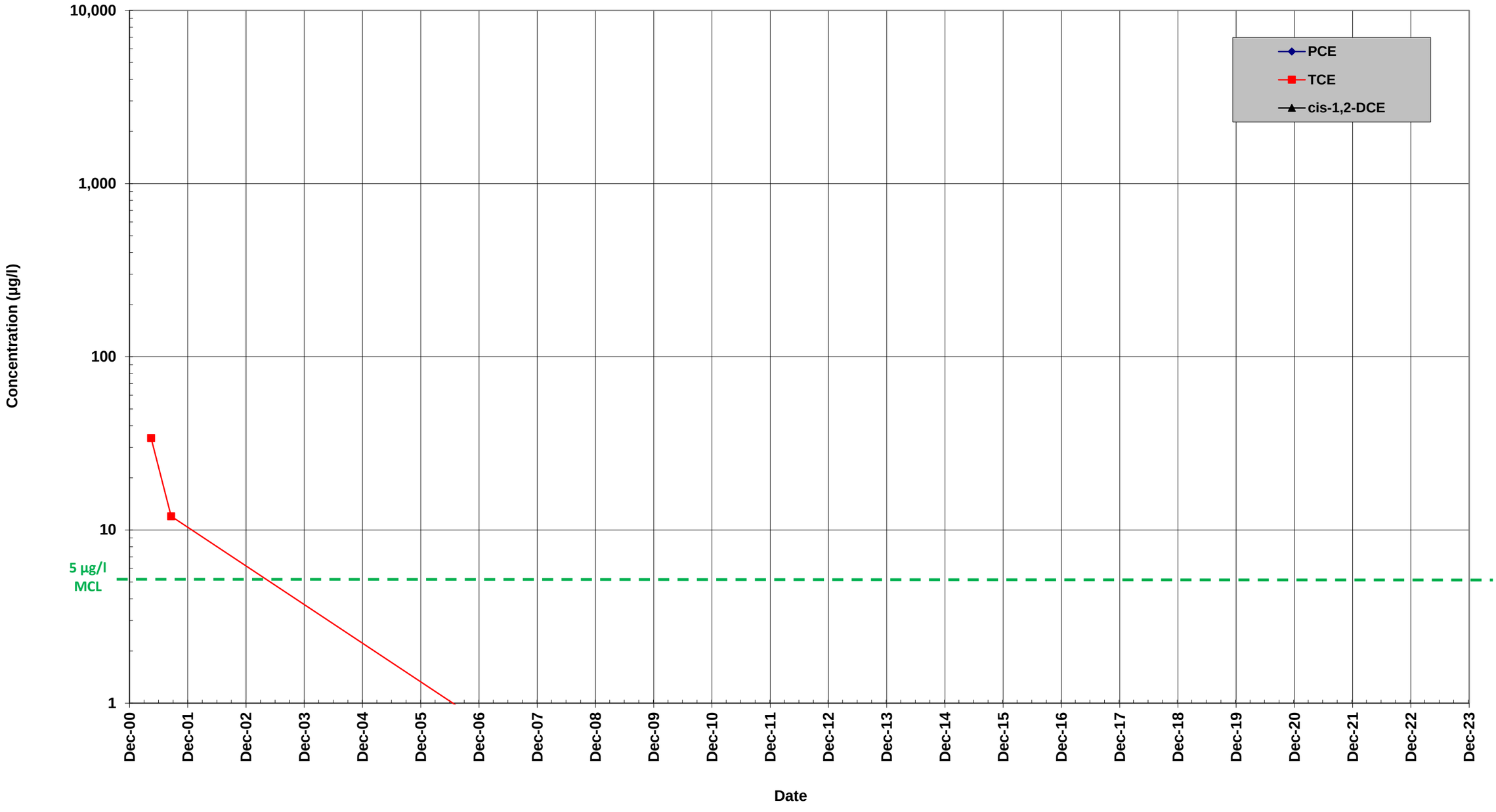
ERM



Well MW20A
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 140 to 150 Feet Below Ground Surface

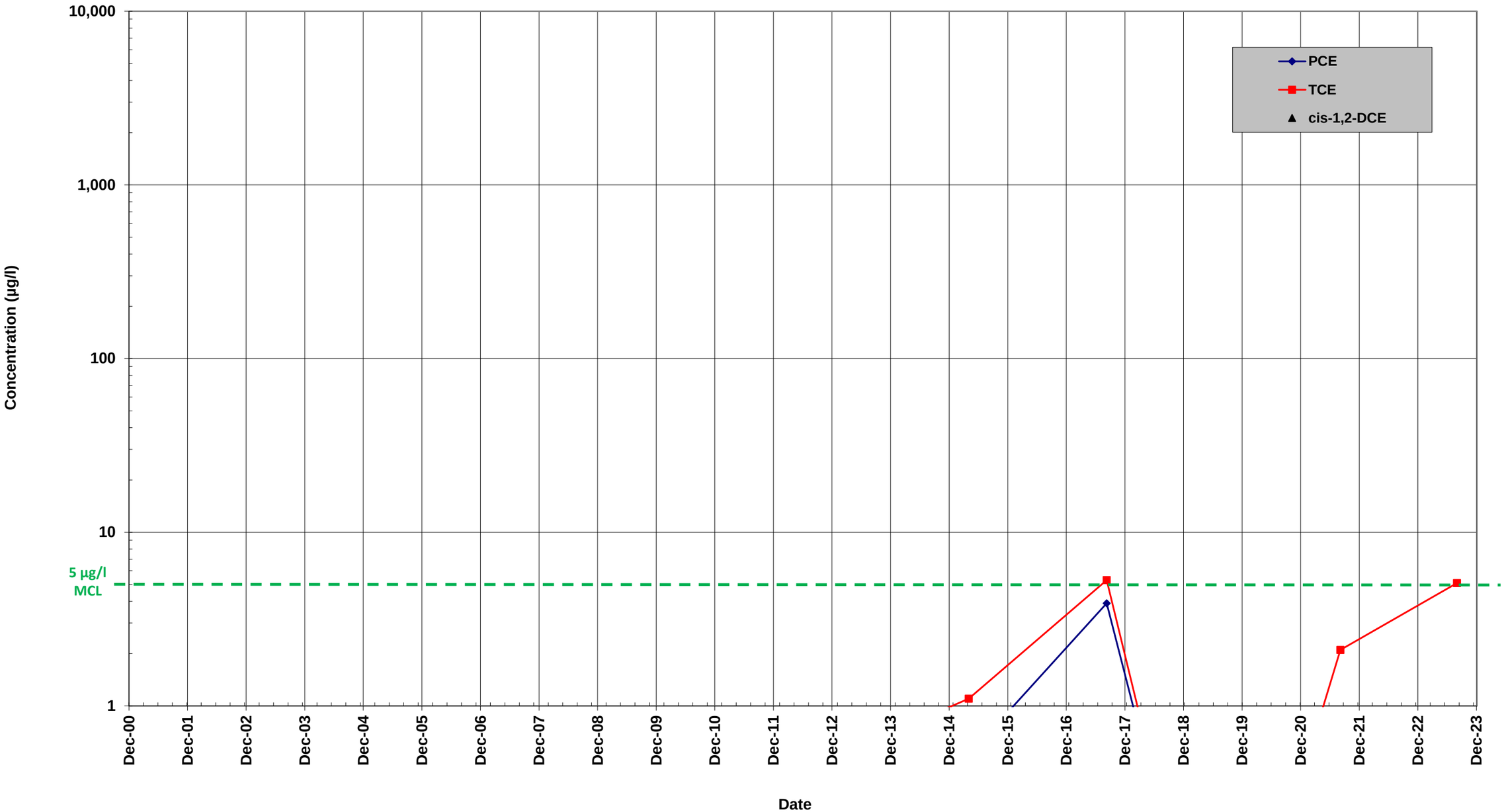


Well MW20B
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 244 to 254 Feet Below Ground Surface

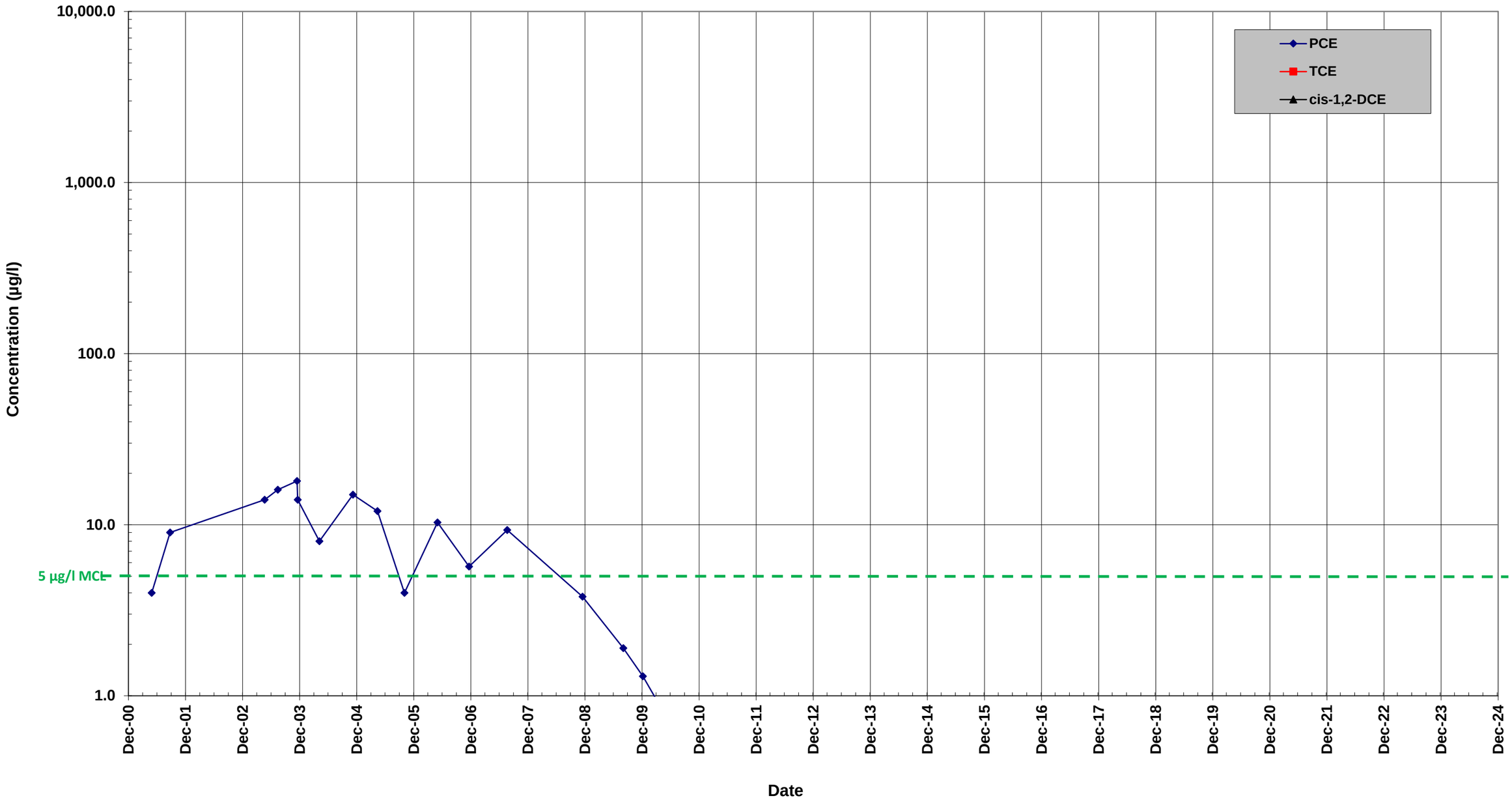


Well MW20C
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 400 to 410 Feet Below Ground Surface

ERM

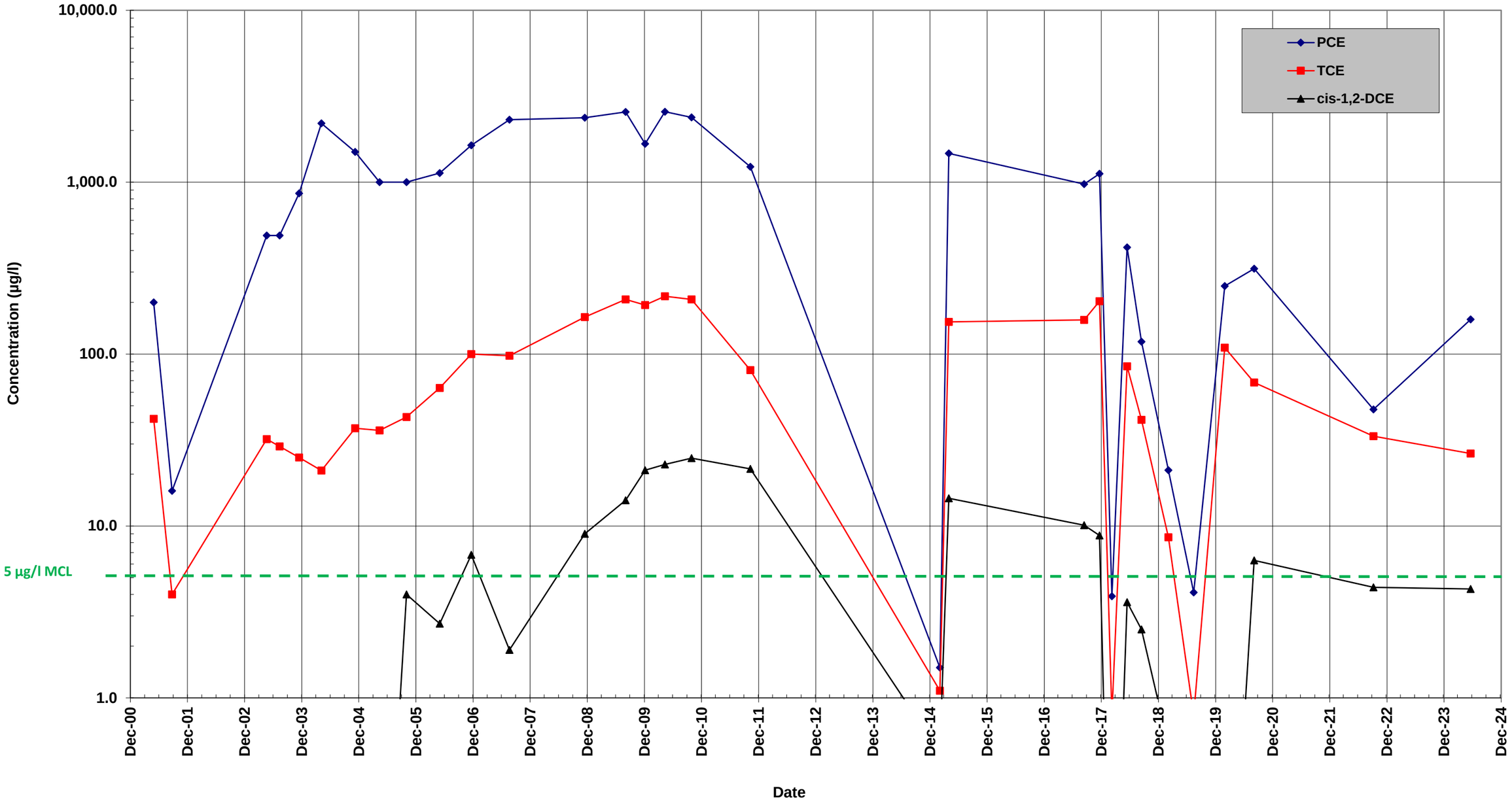


Well MW21A
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 120 to 130 Feet Below Ground Surface



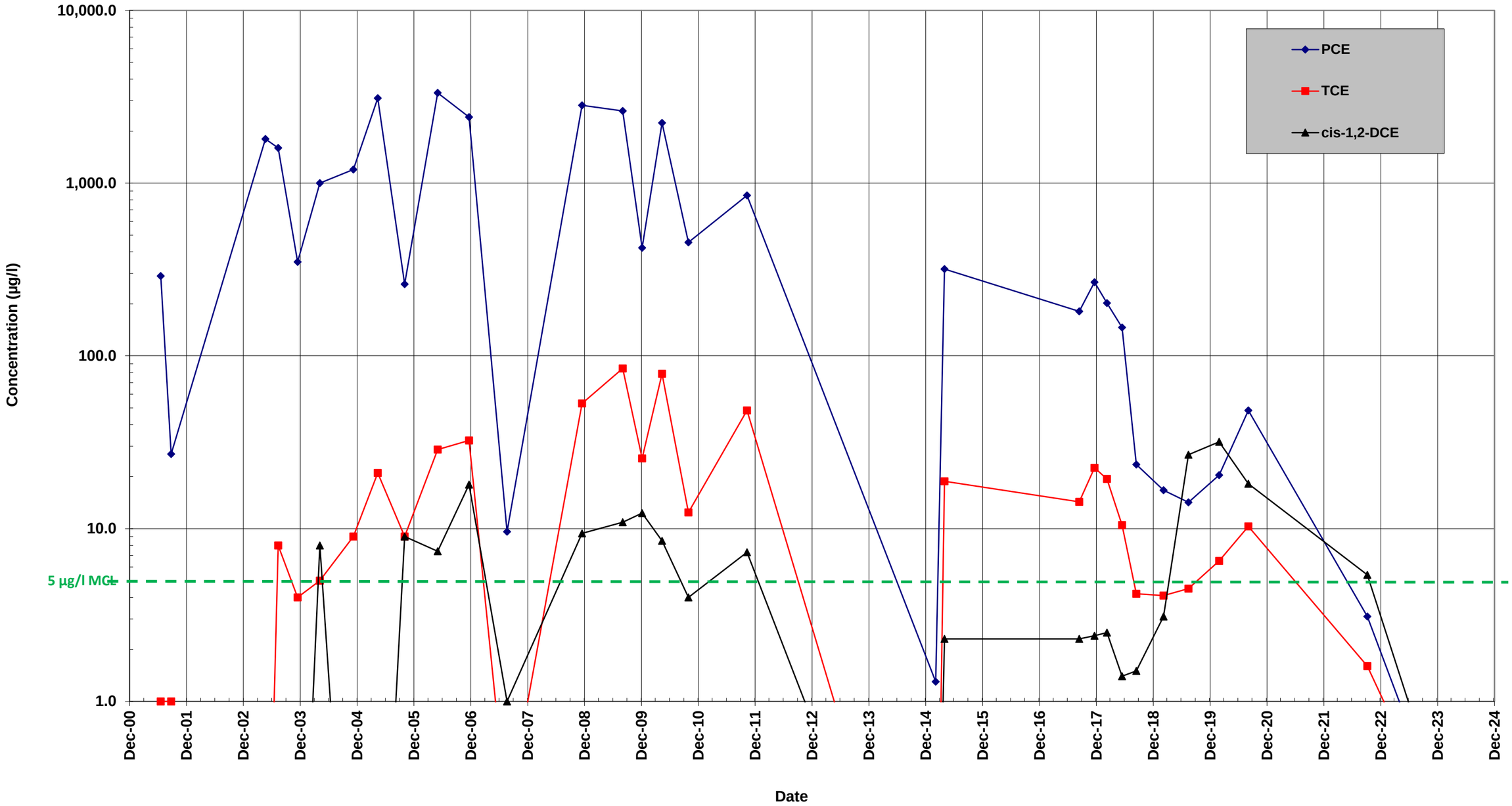
Well MW21B
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 330 to 340 Feet Below Ground Surface

ERM

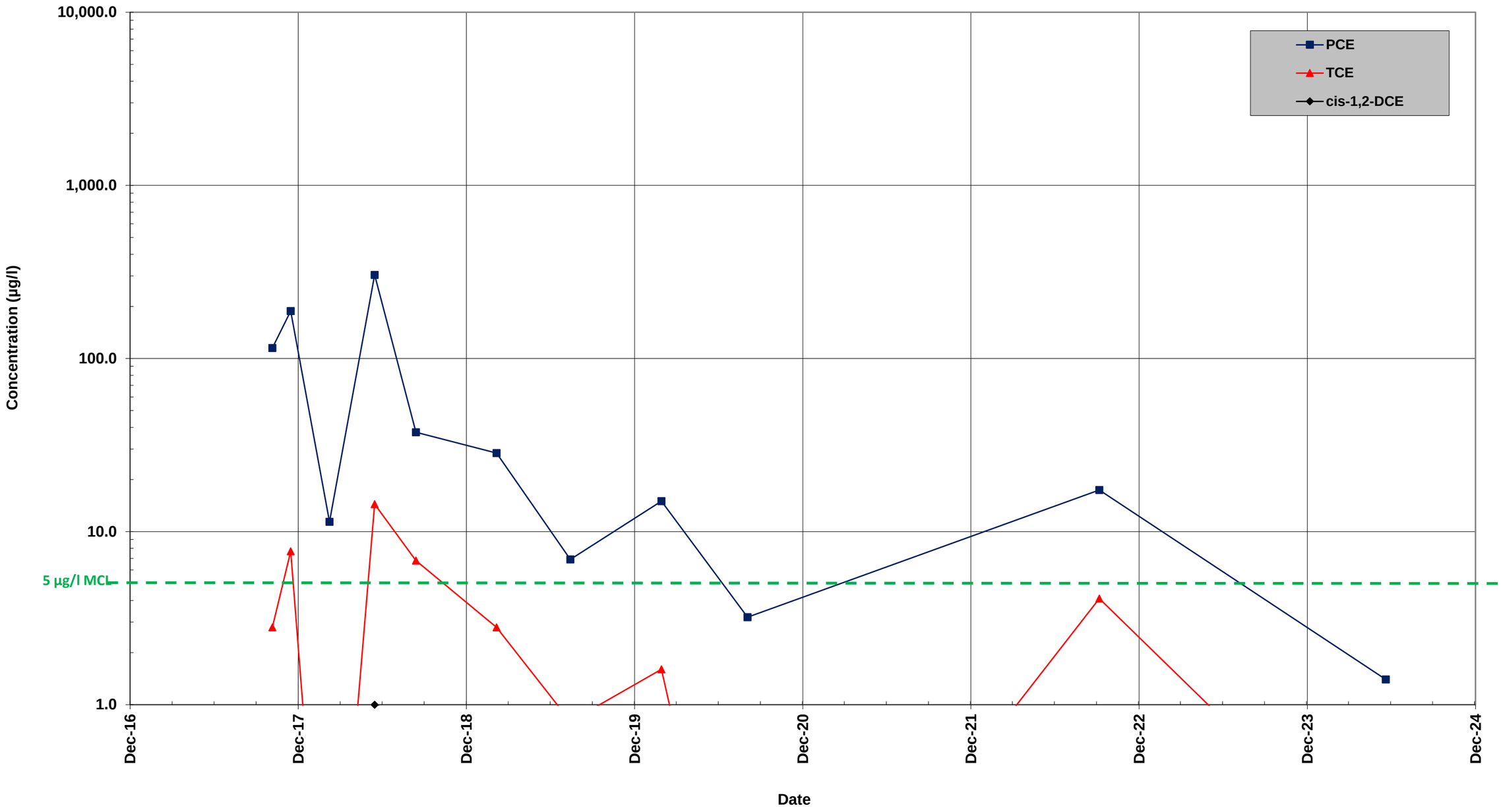


Well MW21C
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 390 to 400 Feet Below Ground Surface

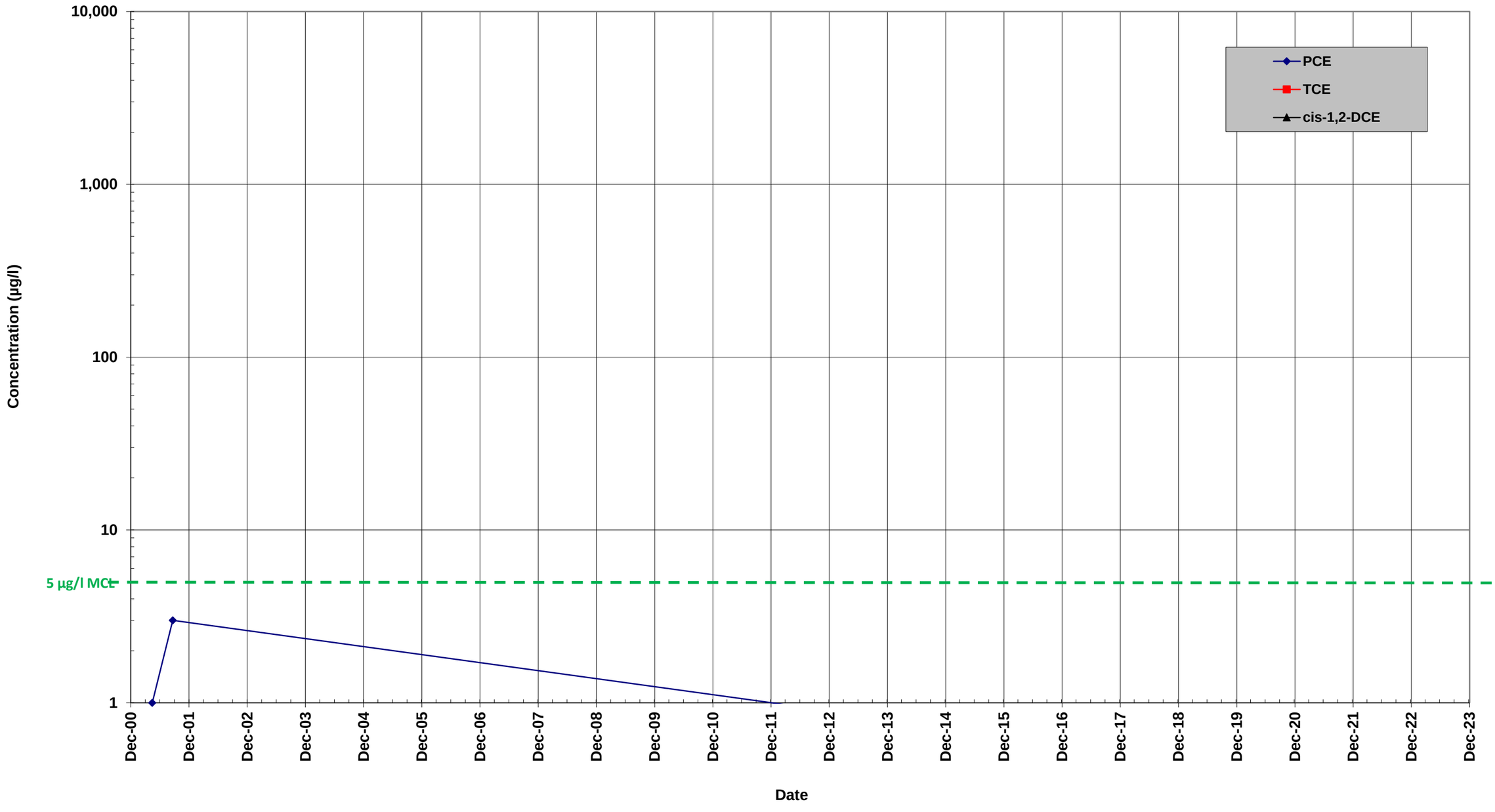
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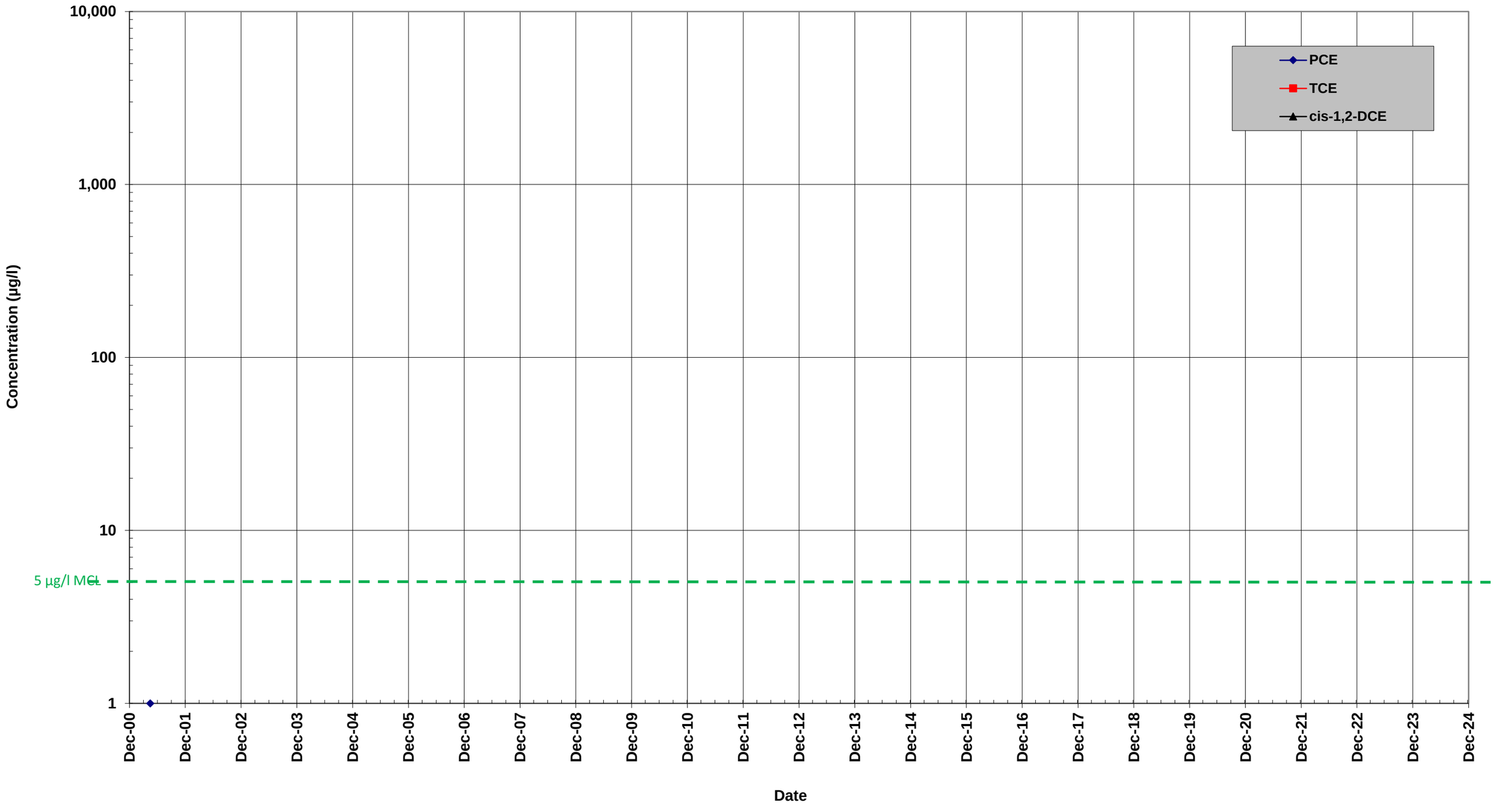
Well MW21D
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 447 to 457 Feet Below Ground Surface



Well MW22A
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 120 to 130 Feet Below Ground Surface

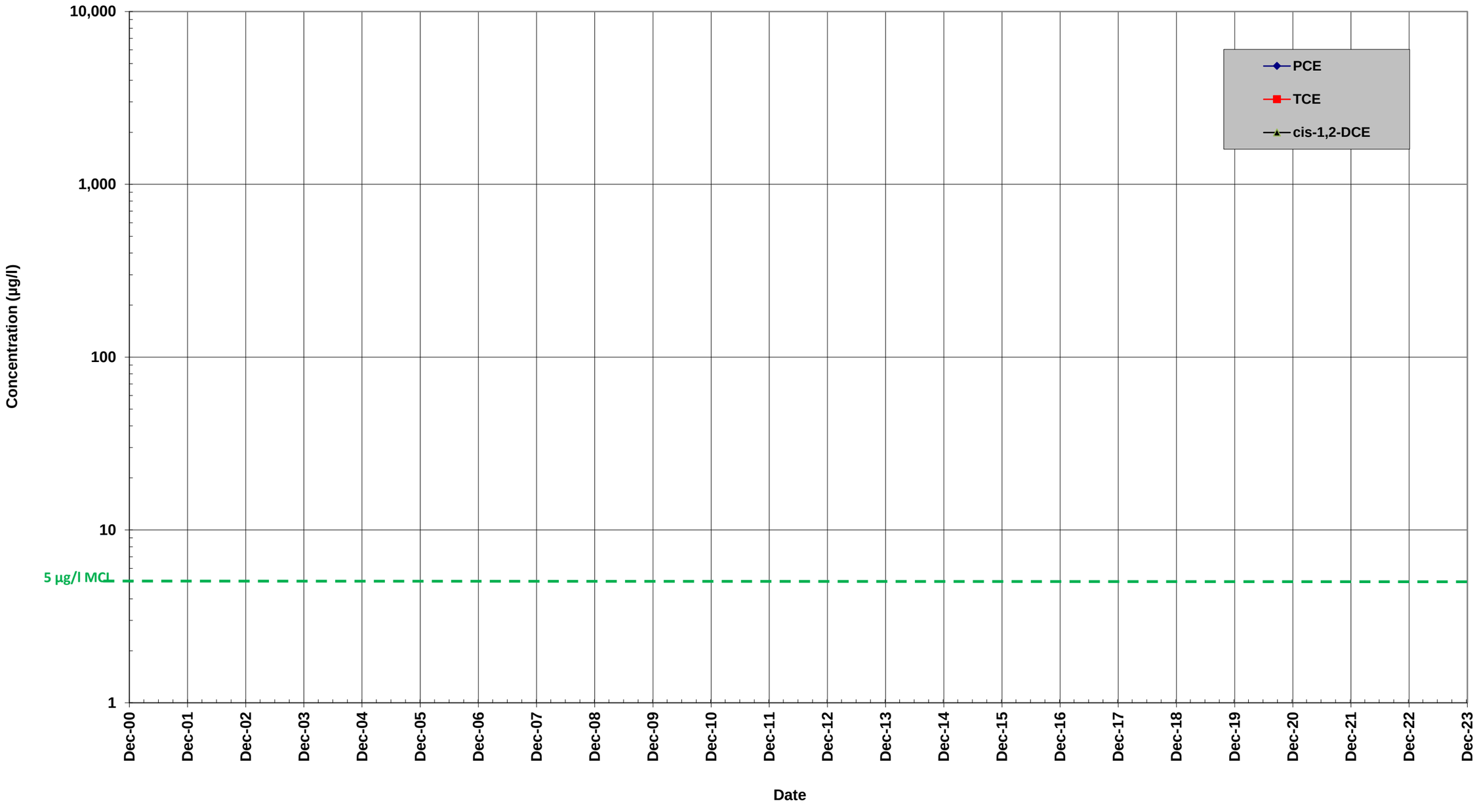


Well MW22B
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 270 to 280 Feet Below Ground Surface

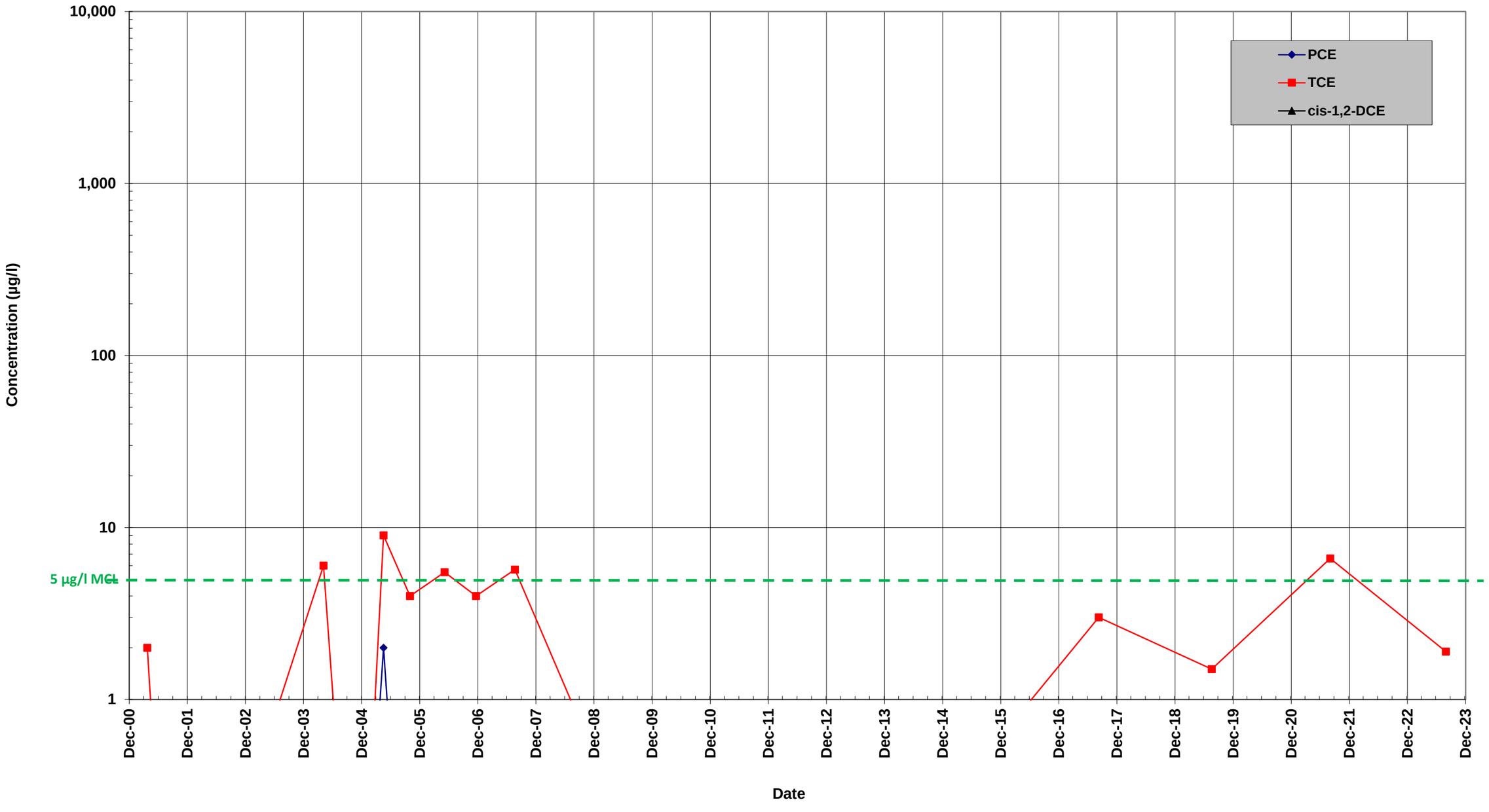


Well MW22C
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 310 to 320 Feet Below Ground Surface

ERM

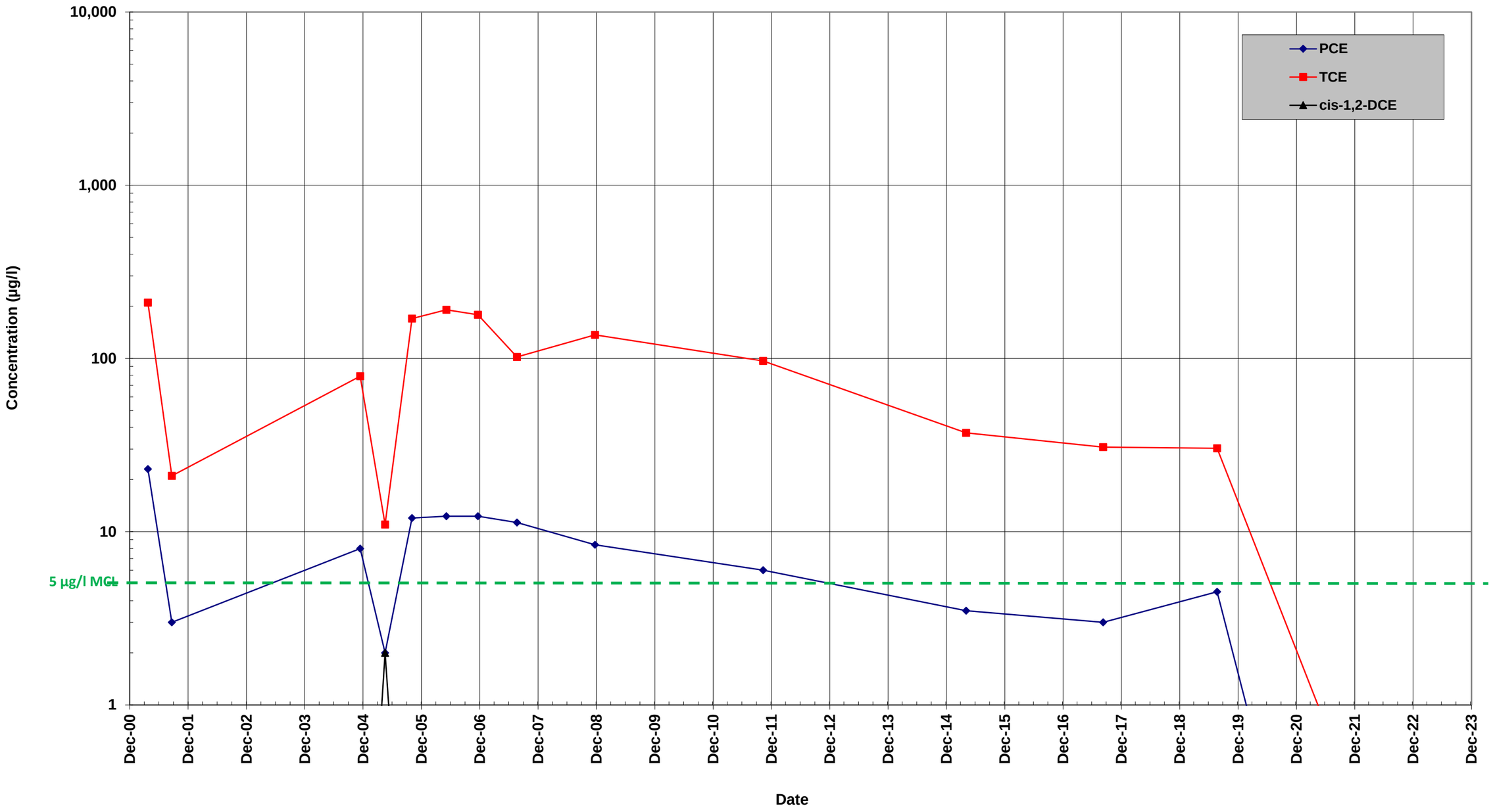


Well MW23A
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 260 to 270 Feet Below Ground Surface

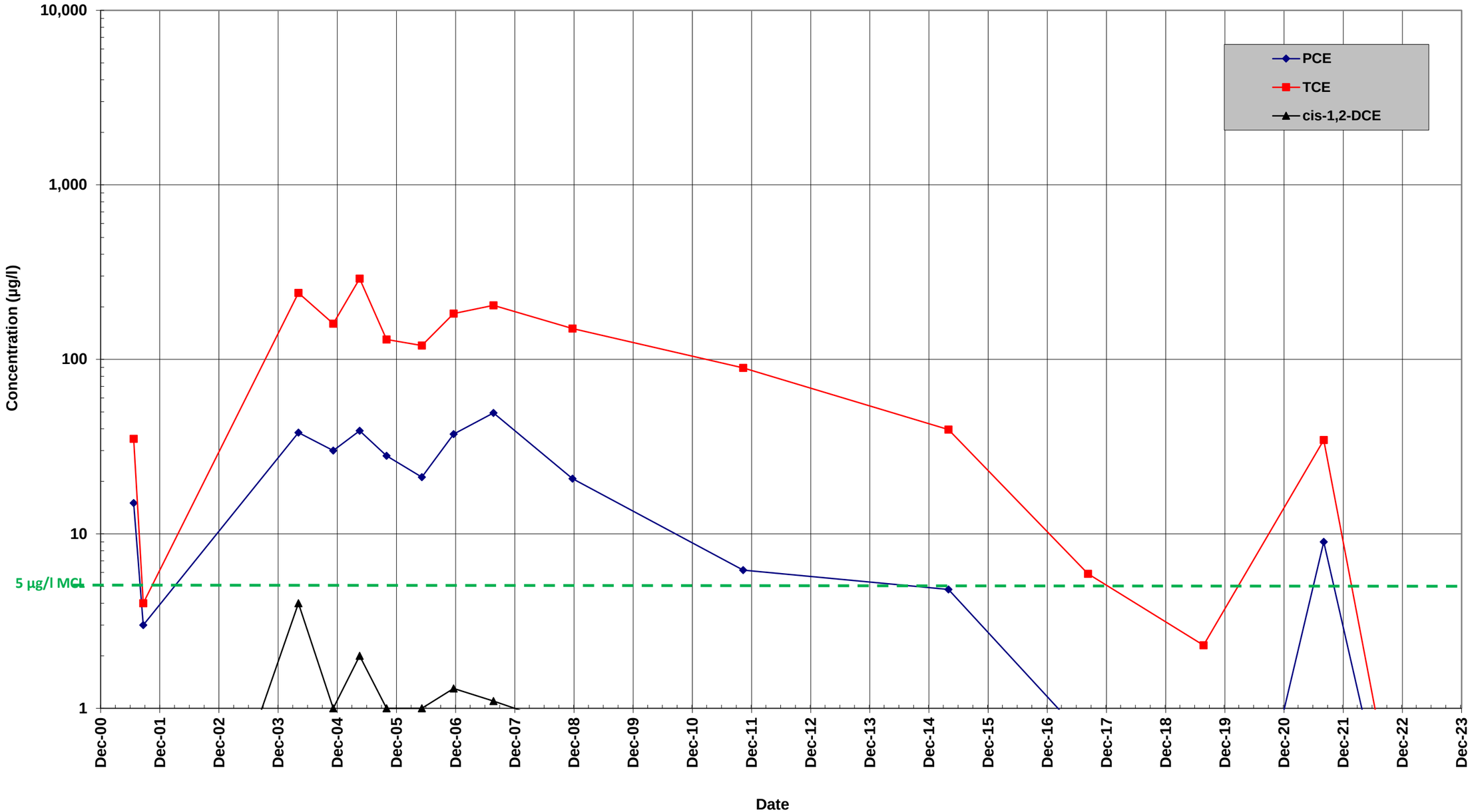


Well MW23B
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 345 to 355 Feet Below Ground Surface

ERM

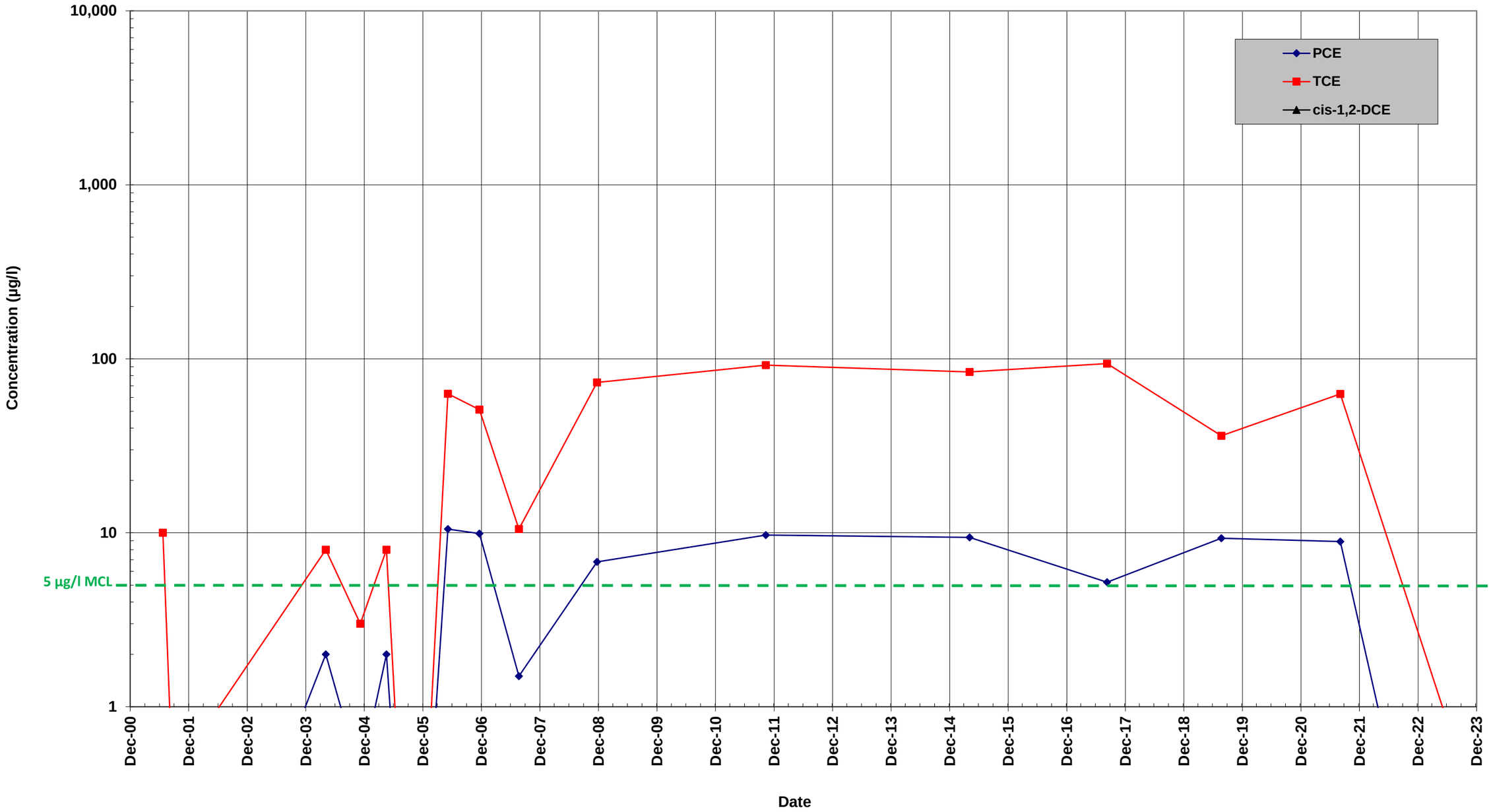


Well MW23C
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 398 to 408 Feet Below Ground Surface

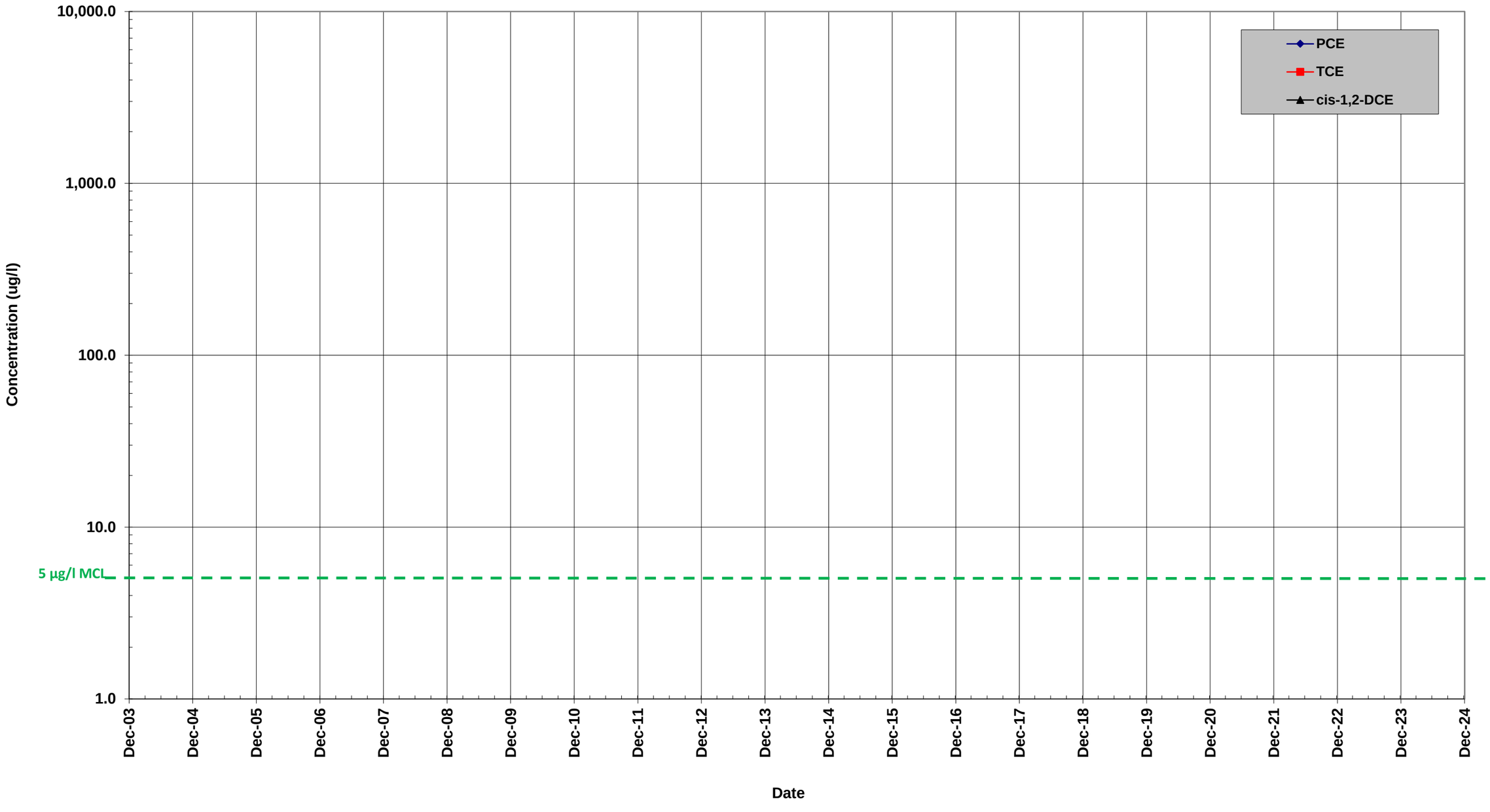


Well MW23D
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 442 to 452 Feet Below Ground Surface

ERM

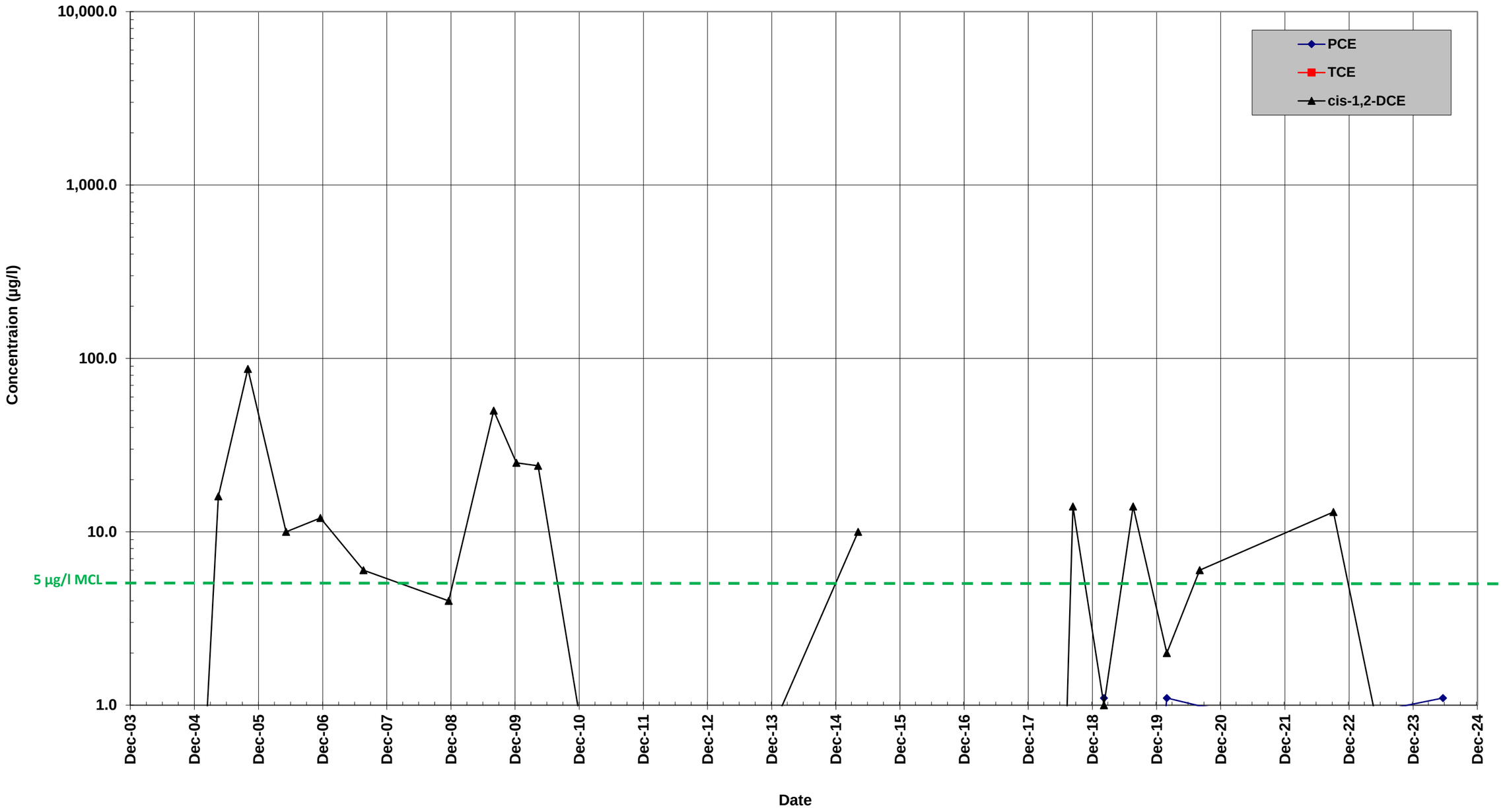


Well MW26A
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 224 to 234 Feet Below Ground Surface

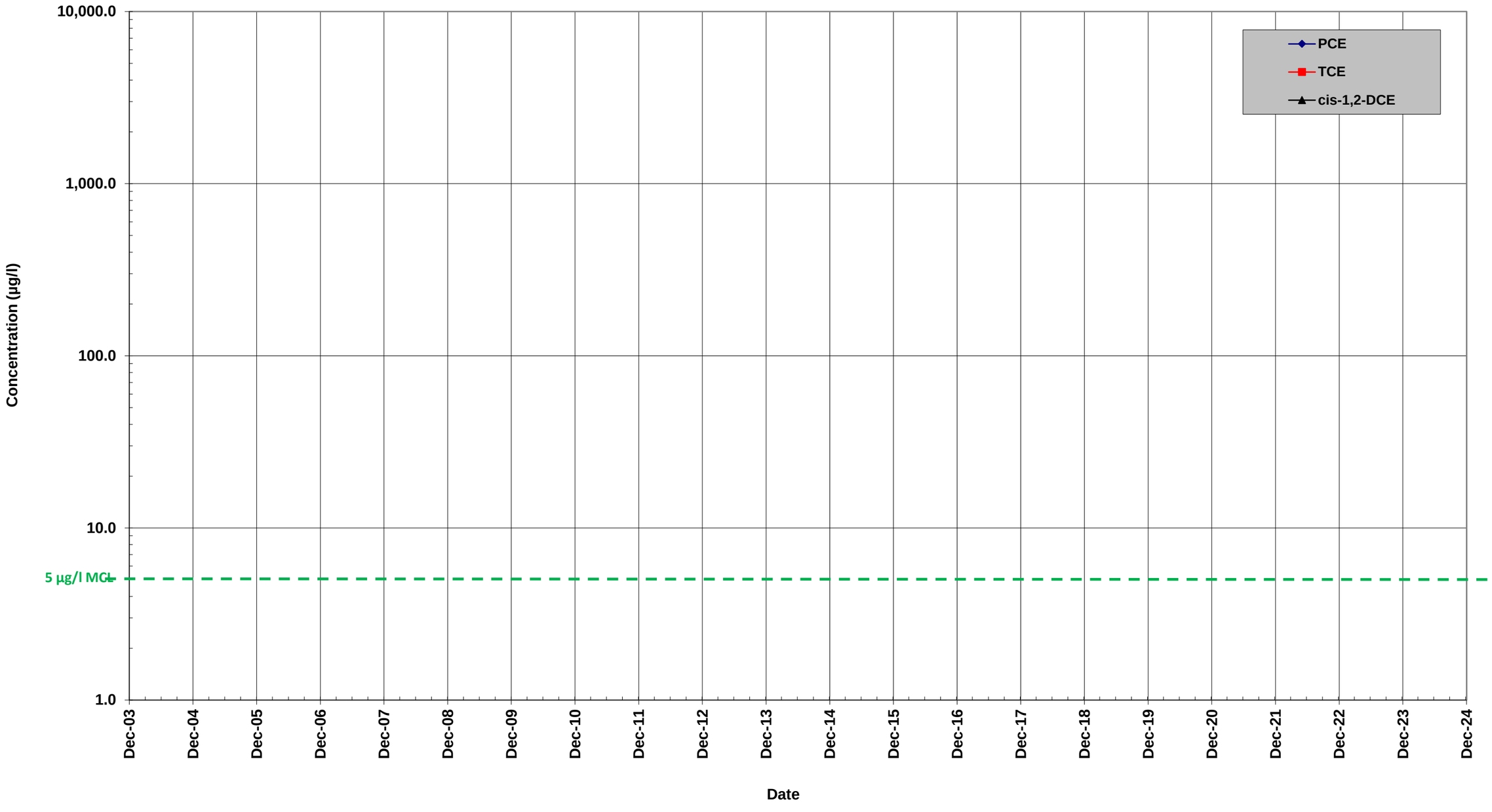


Well MW26B
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 266 to 276 Feet Below Ground Surface

ERM

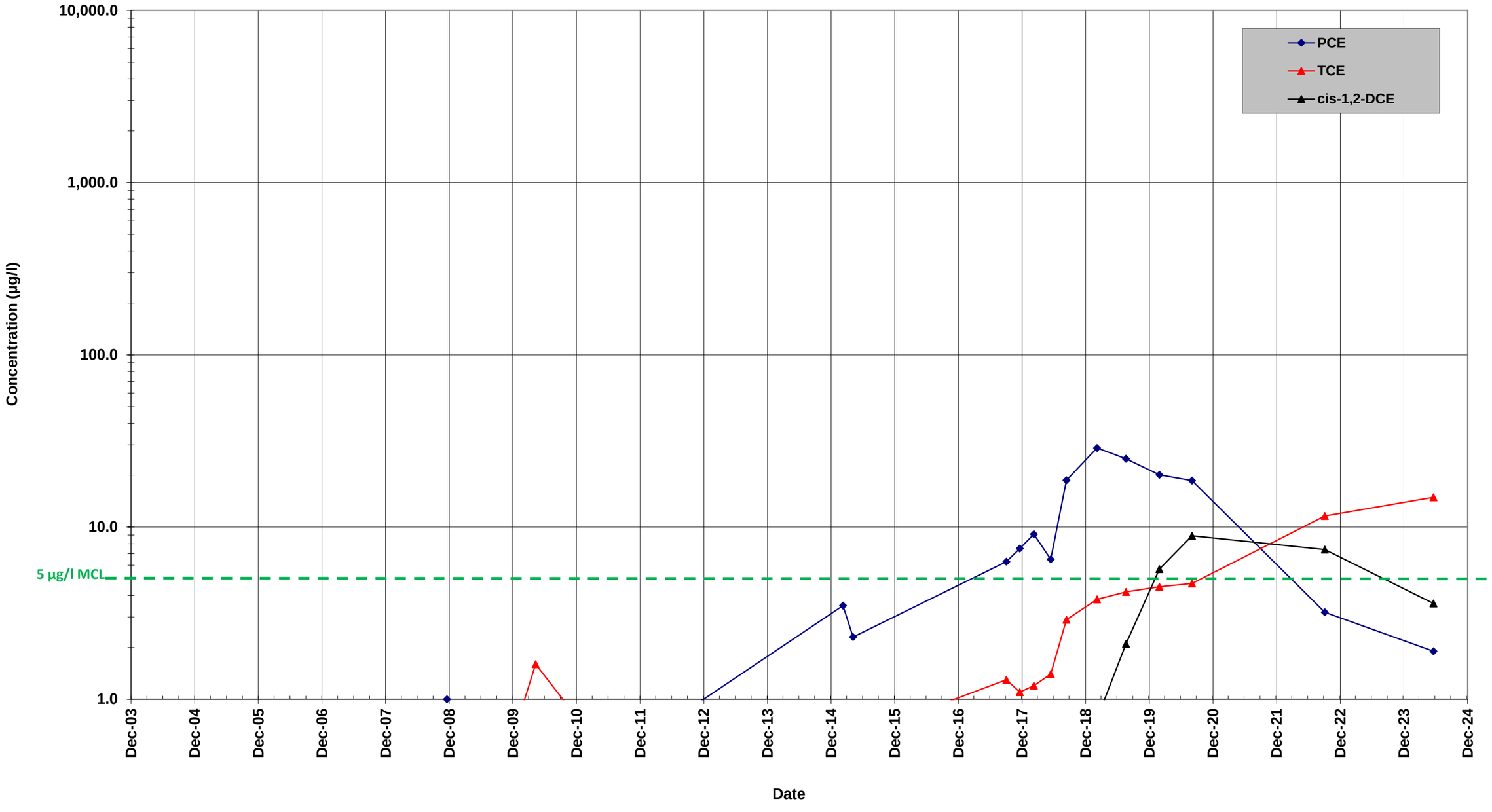


Well MW26C
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 320 to 330 Feet Below Ground Surface



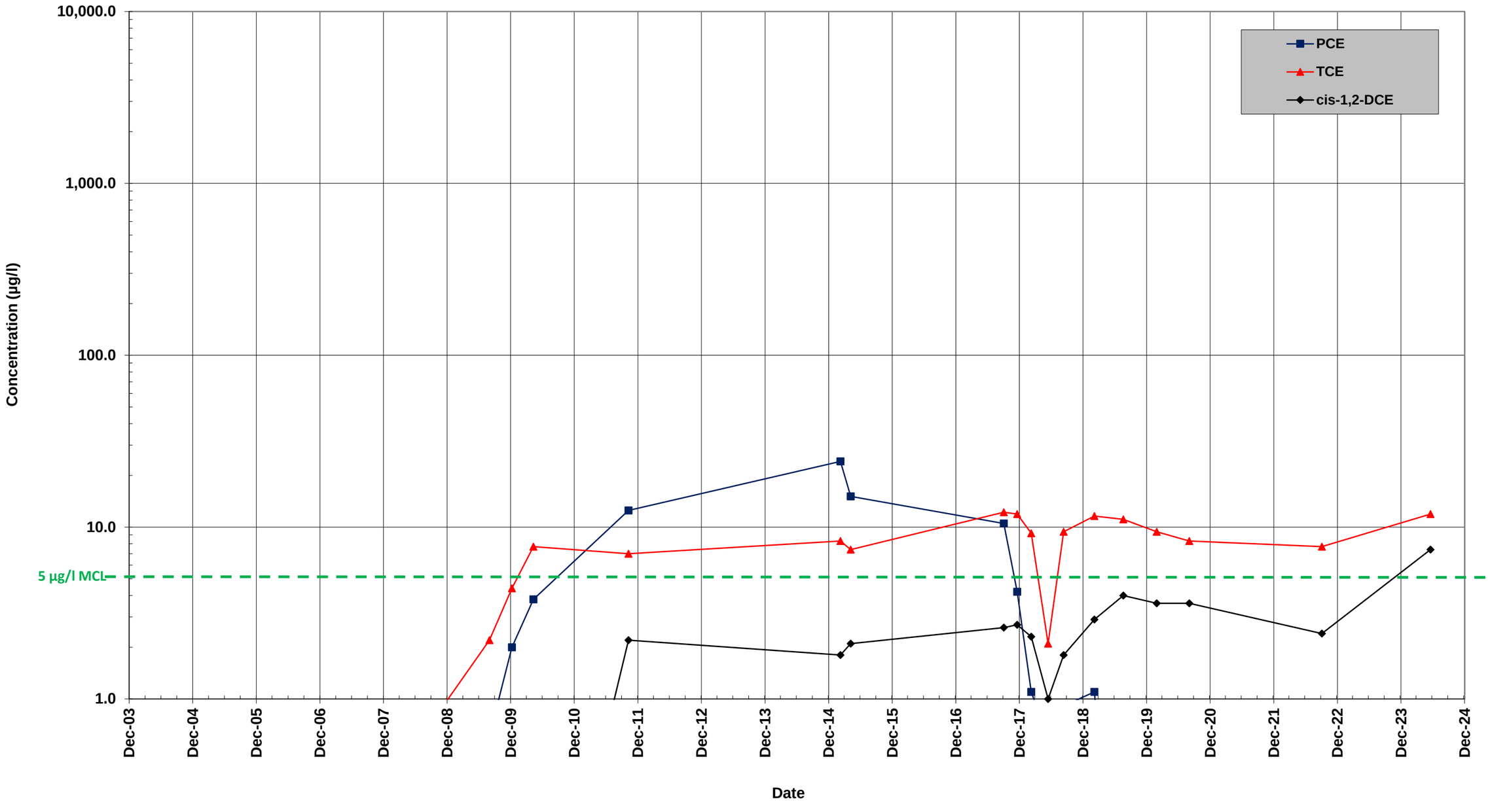
Well MW26D
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 345 to 355 Feet Below Ground Surface

ERM

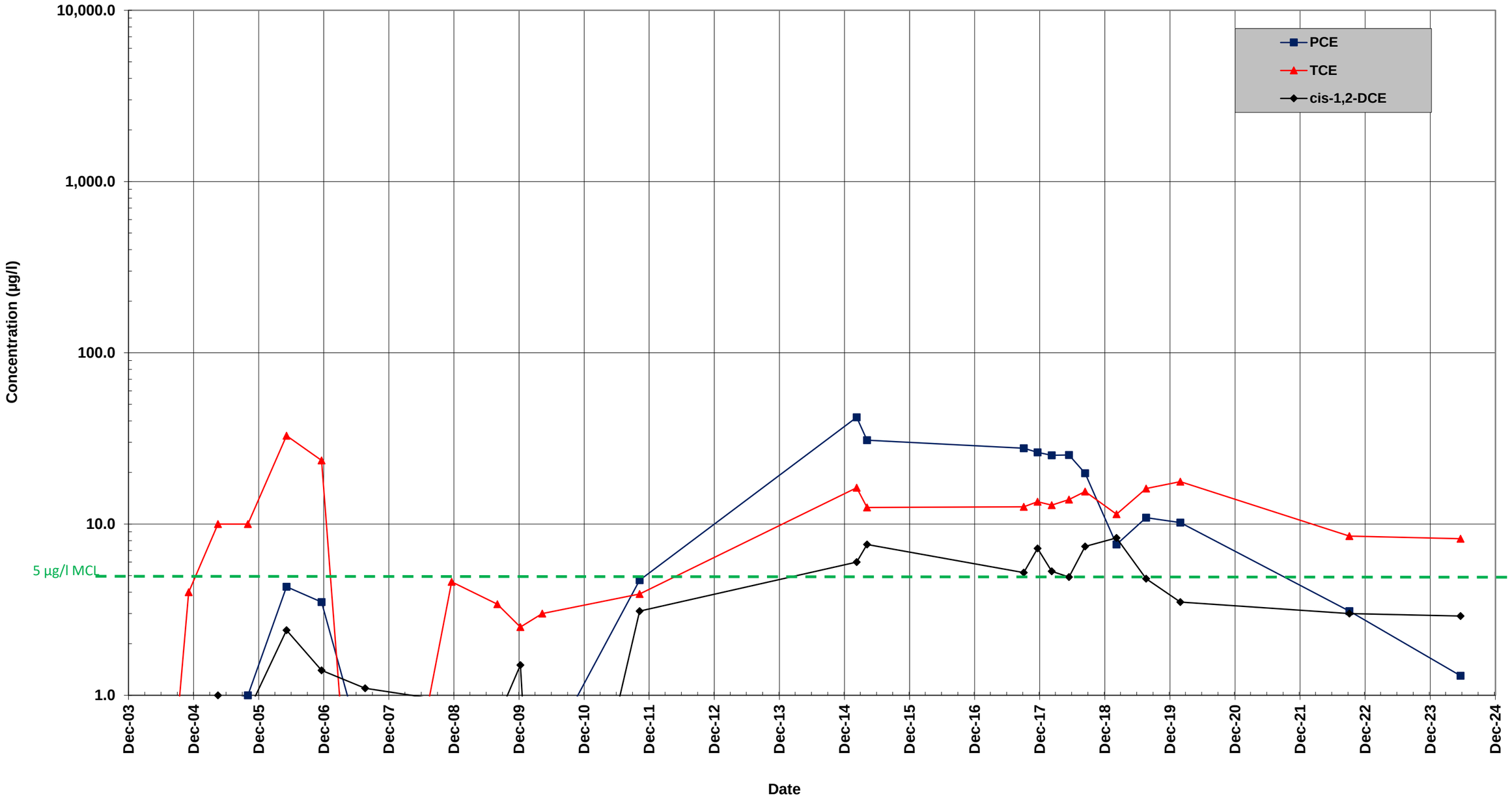


Well MW26E
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 372 to 382 Feet Below Ground Surface

ERM

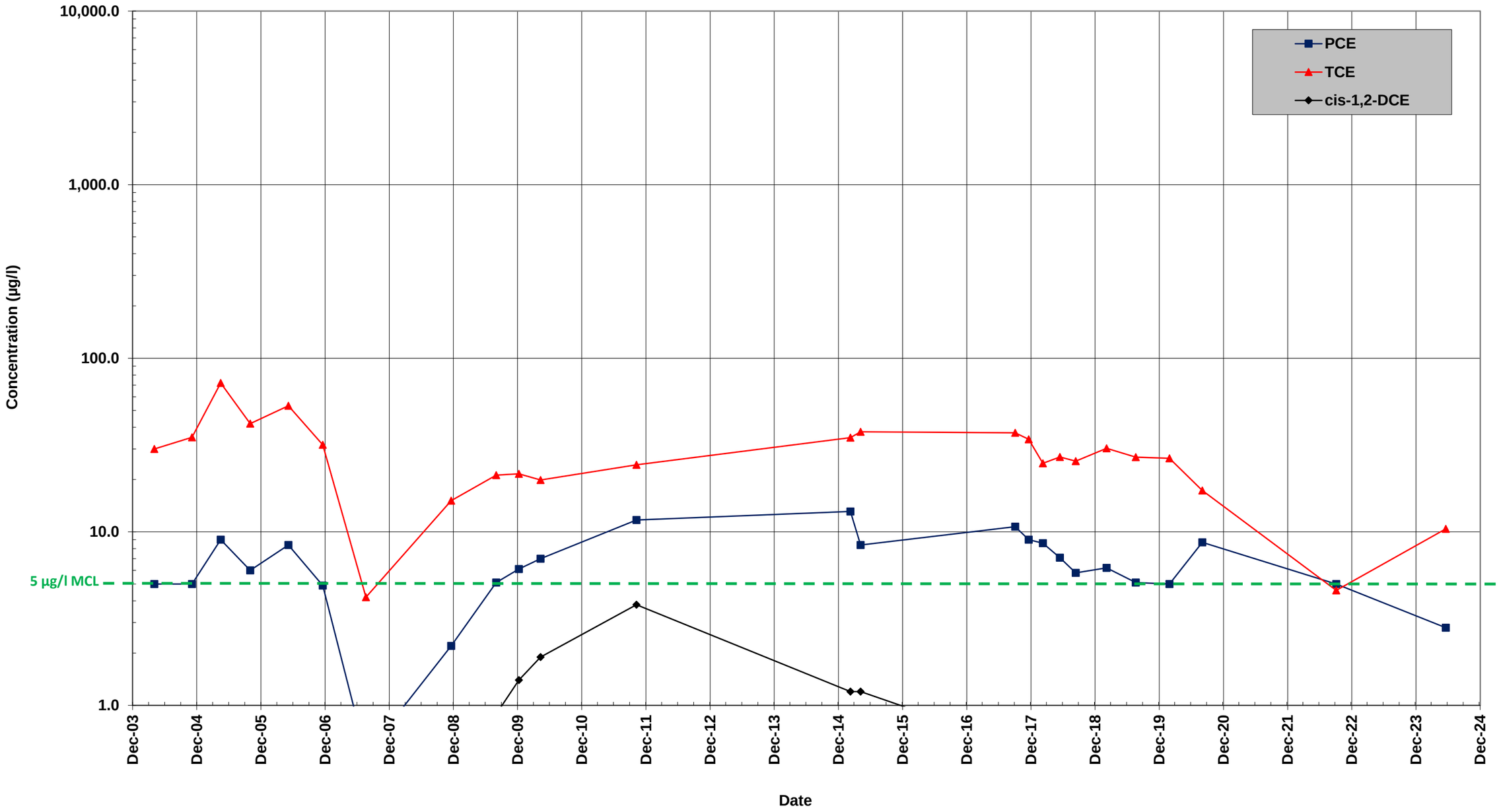


Well MW26F
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 405 to 415 Feet Below Ground Surface



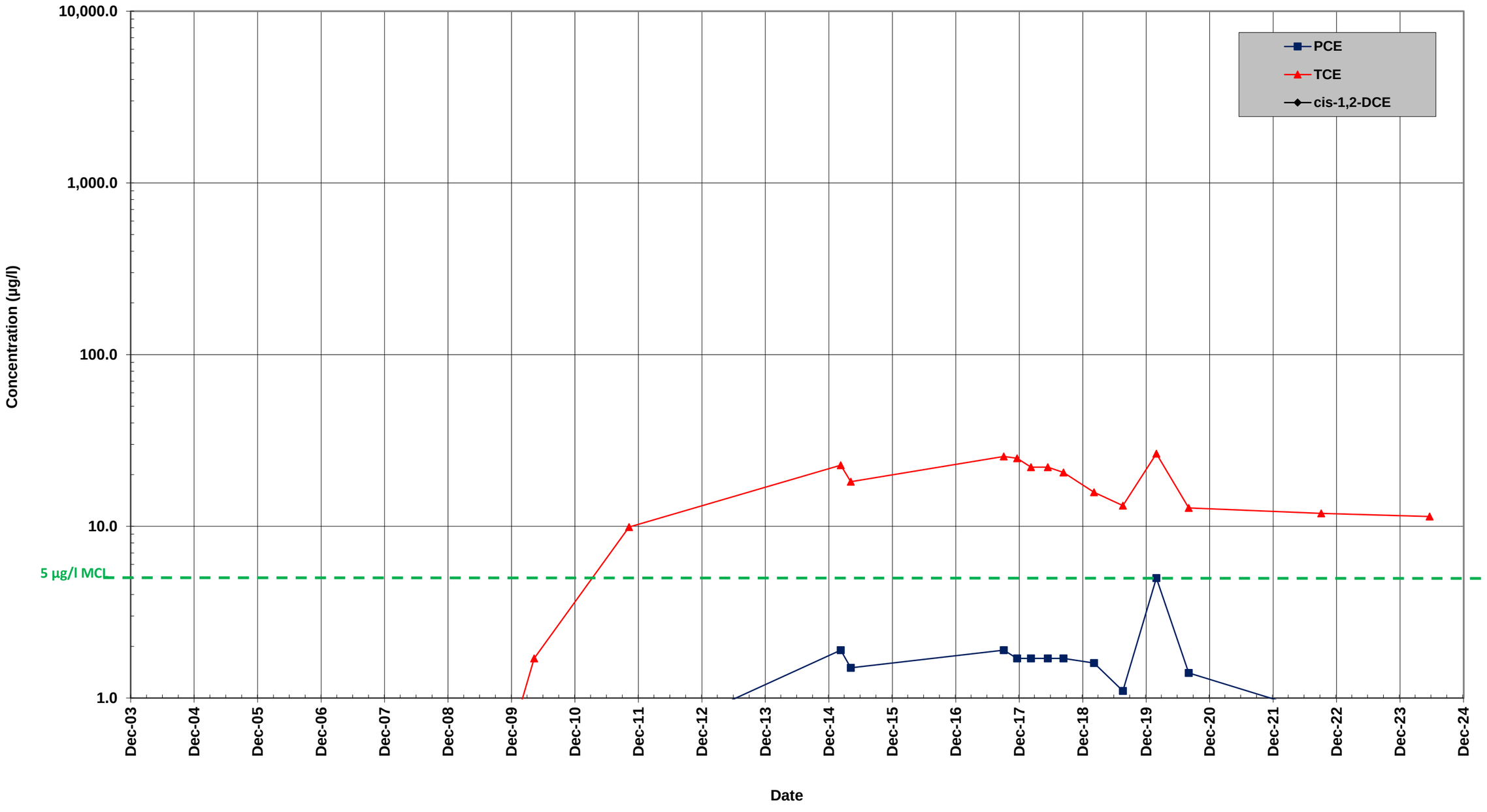
Well MW26G
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 438 to 448 Feet Below Ground Surface

ERM



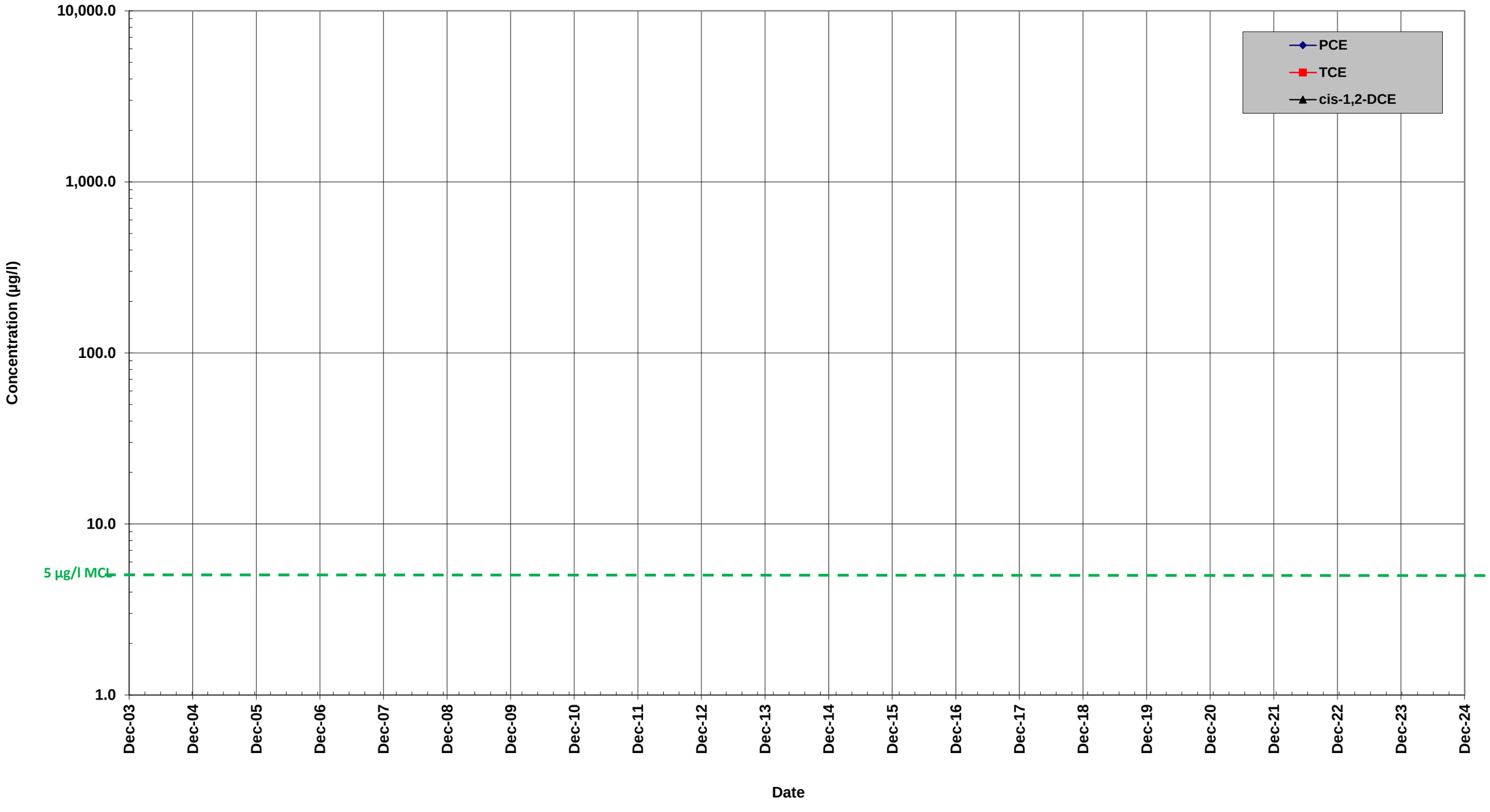
Well MW26H
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 474 to 484 Feet Below Ground Surface

ERM

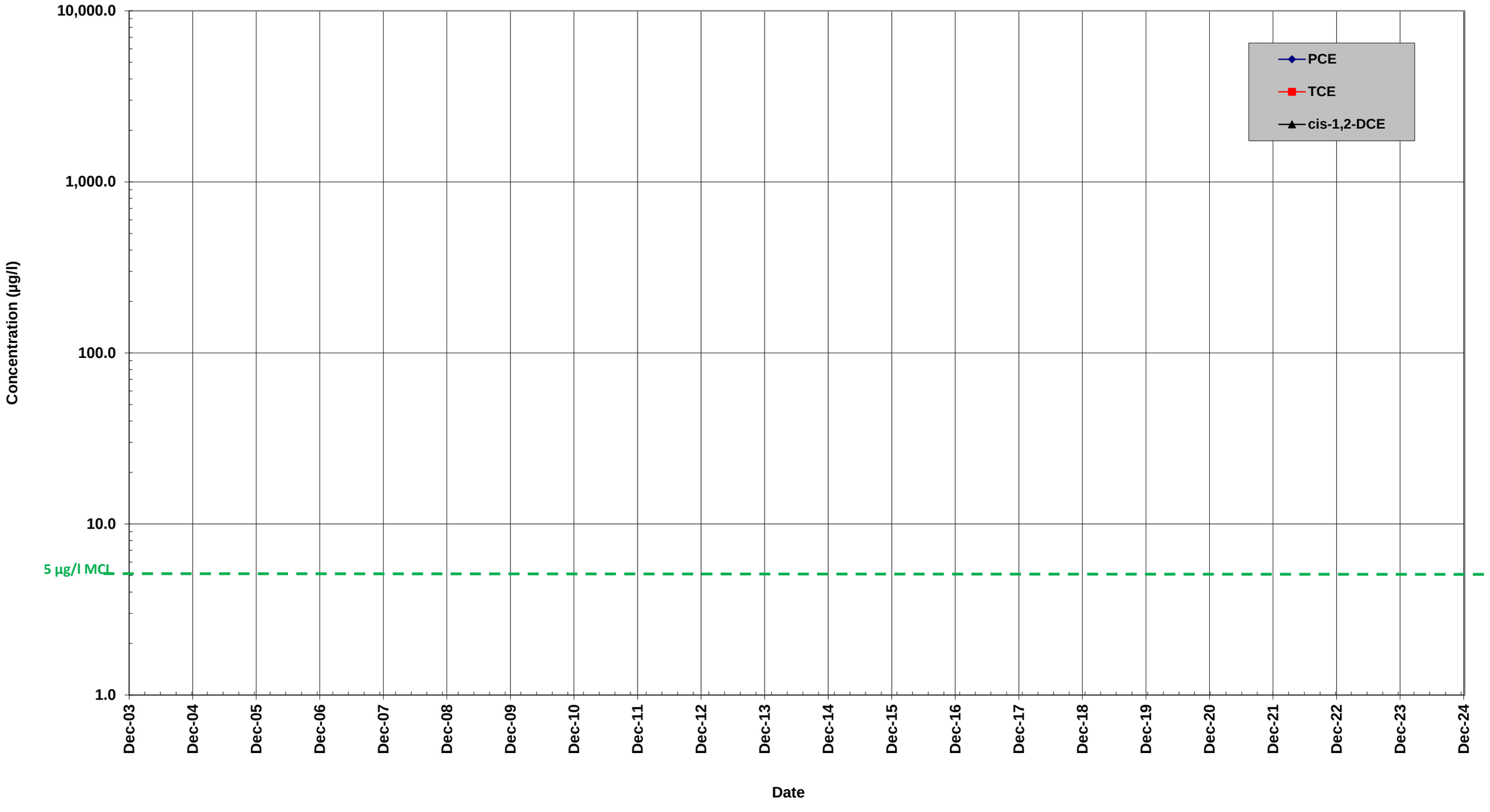


Well MW27A
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 192 to 202 Feet Below Ground Surface

ERM

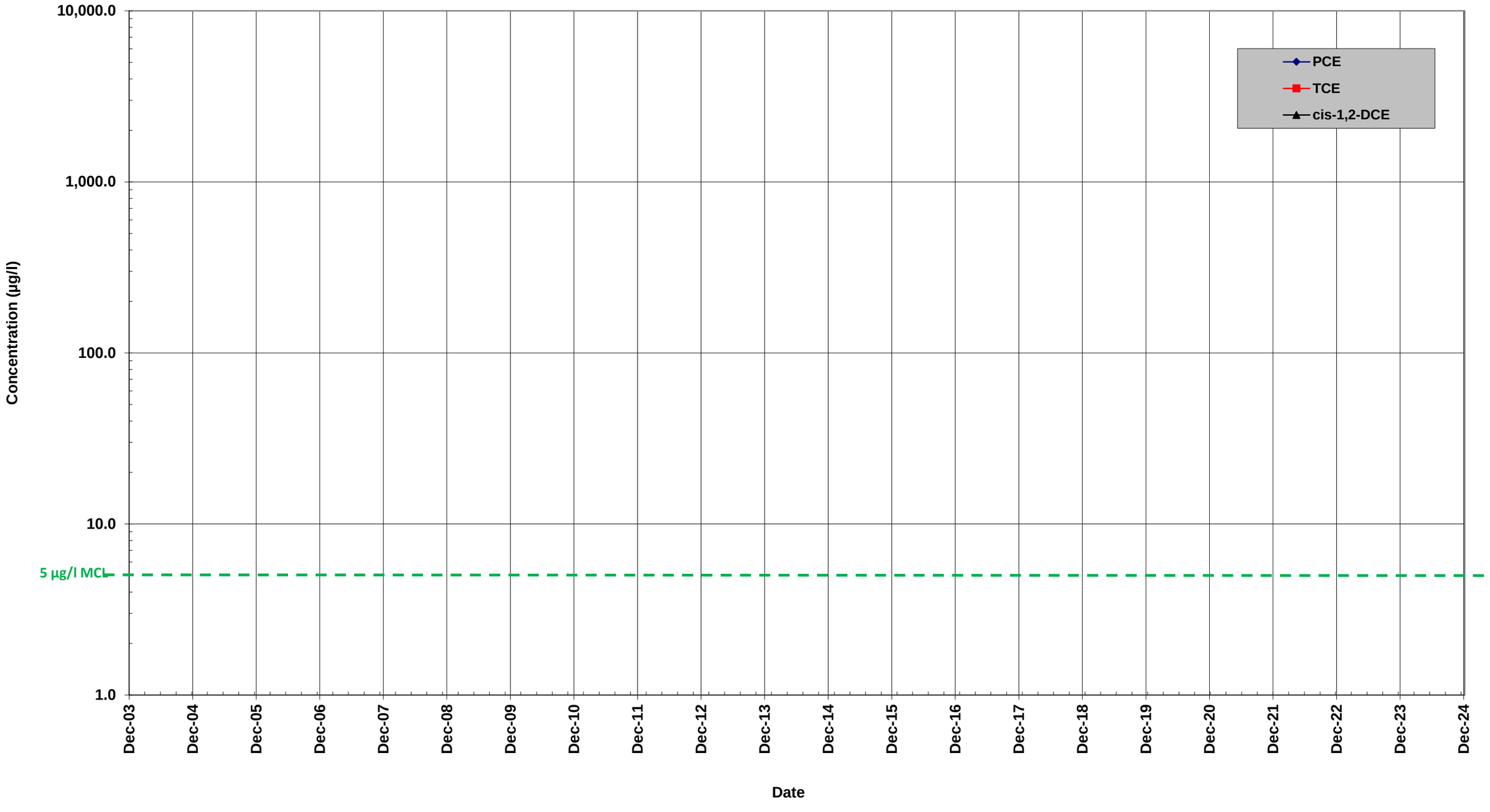


Well MW27B
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 236 to 246 Feet Below Ground Surface

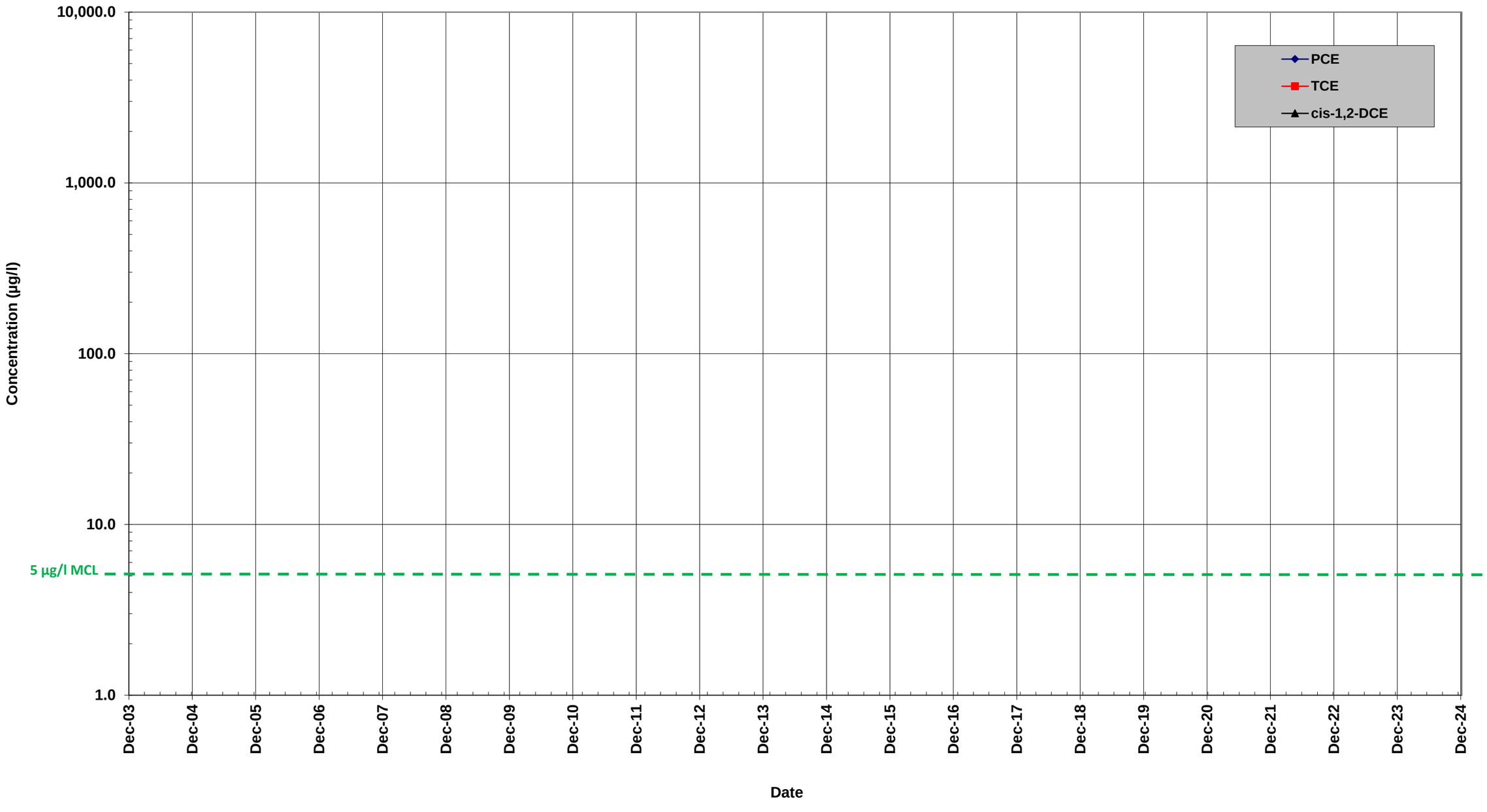


Well MW27C
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 284 to 294 Feet Below Ground Surface

ERM

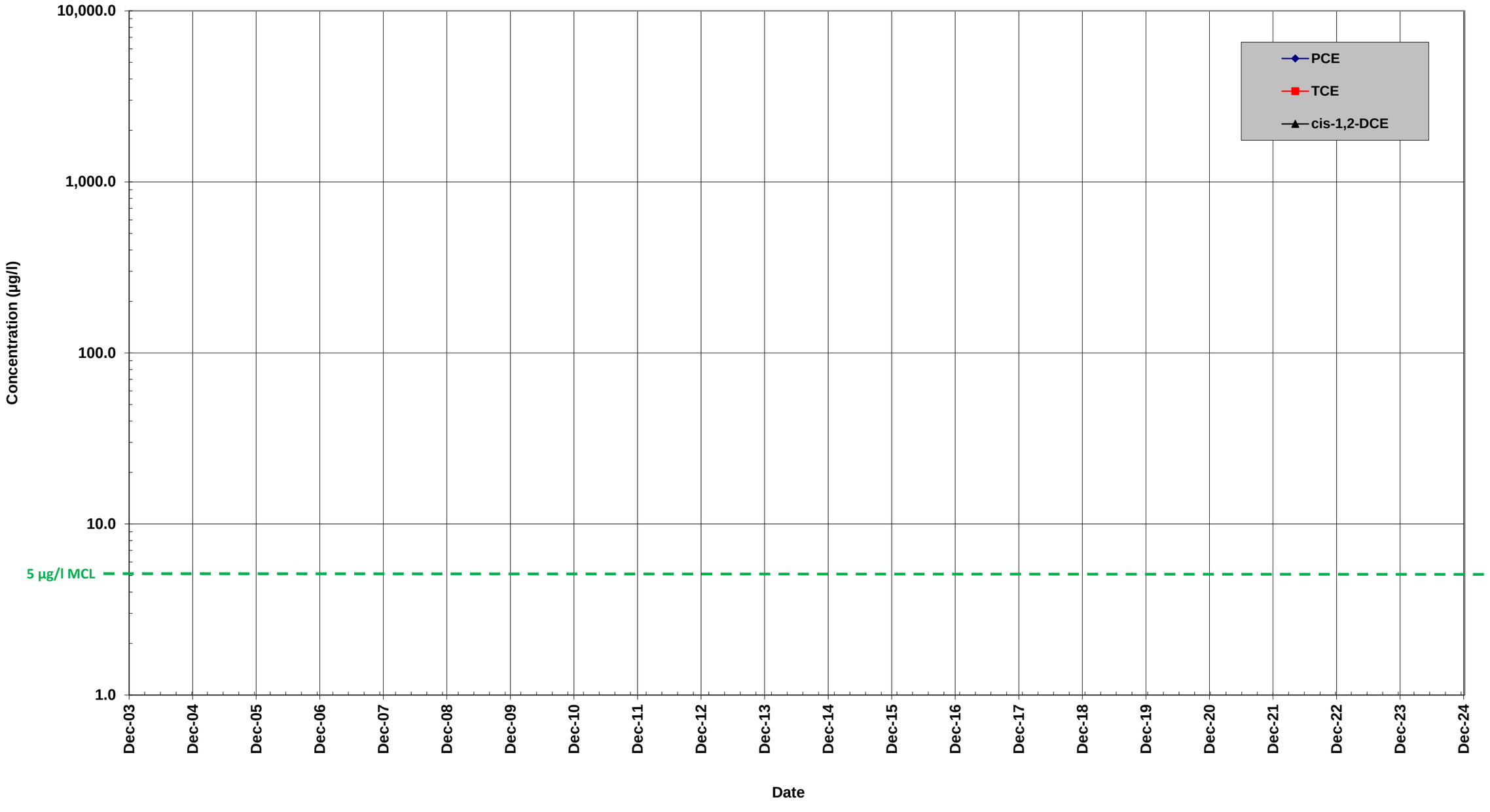


Well MW27D
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 324 to 334 Feet Below Ground Surface



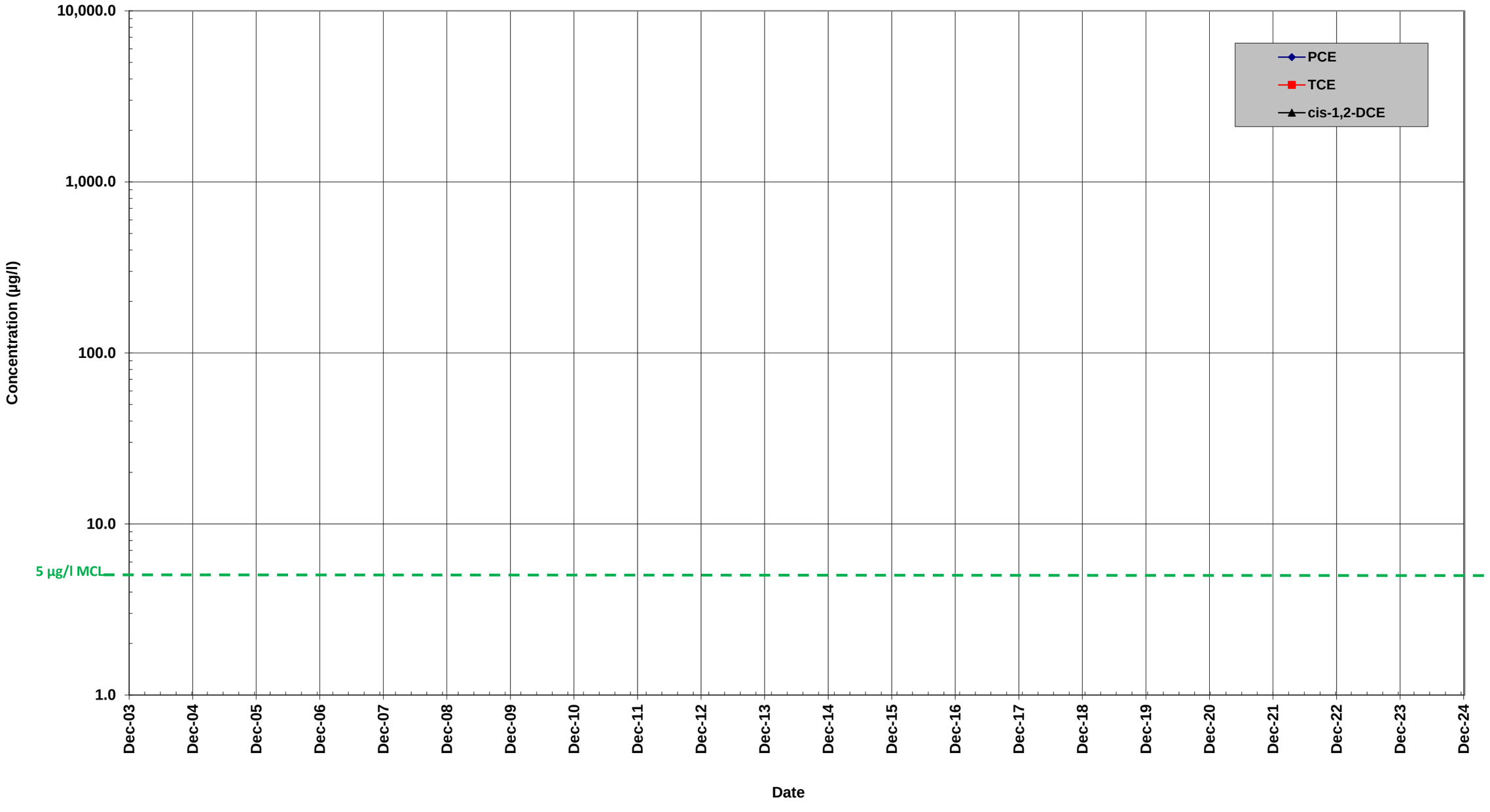
Well MW27E
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 364 to 374 Feet Below Ground Surface

ERM



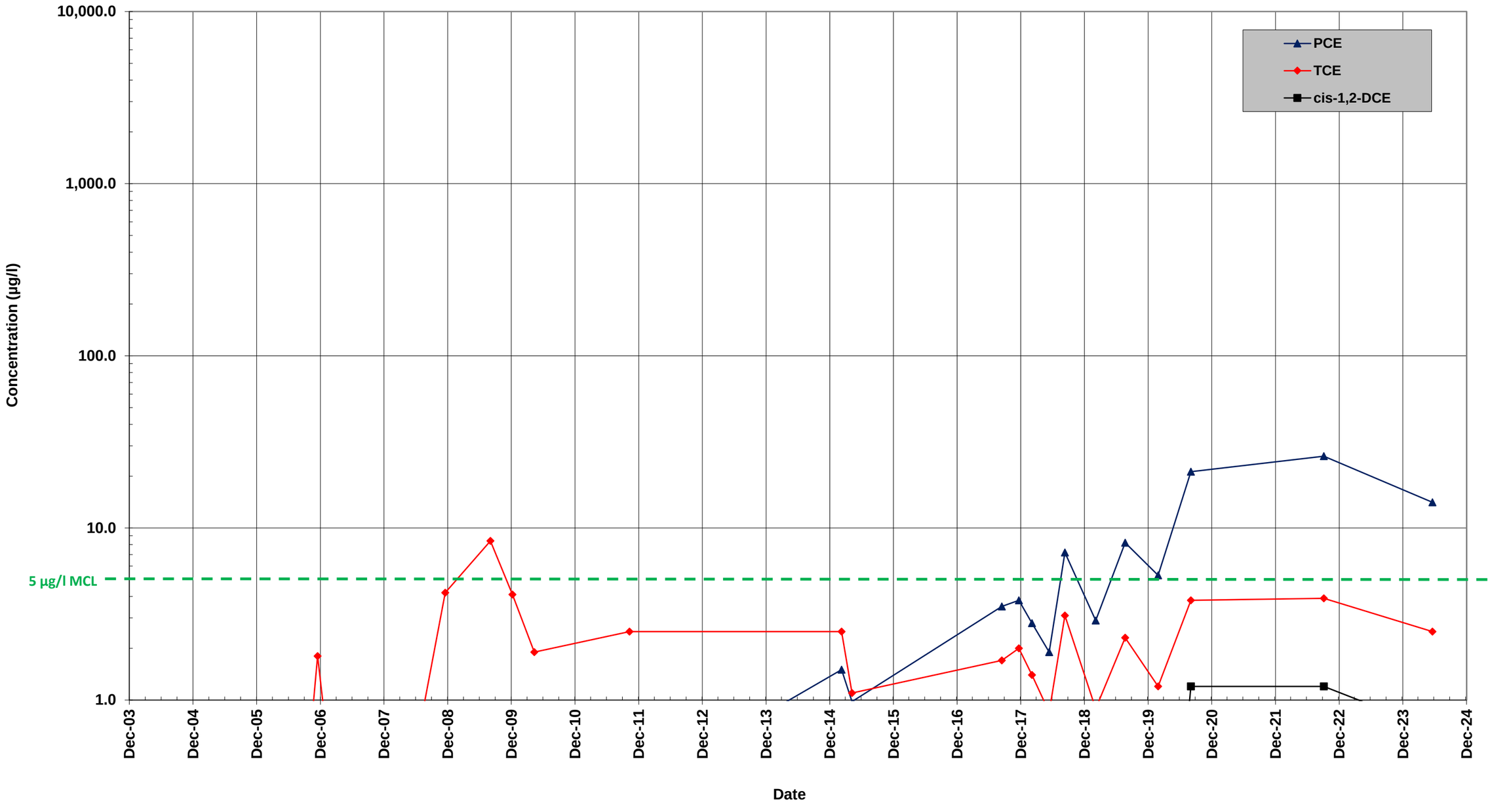
Well MW27F
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 408 to 418 Feet Below Ground Surface

ERM

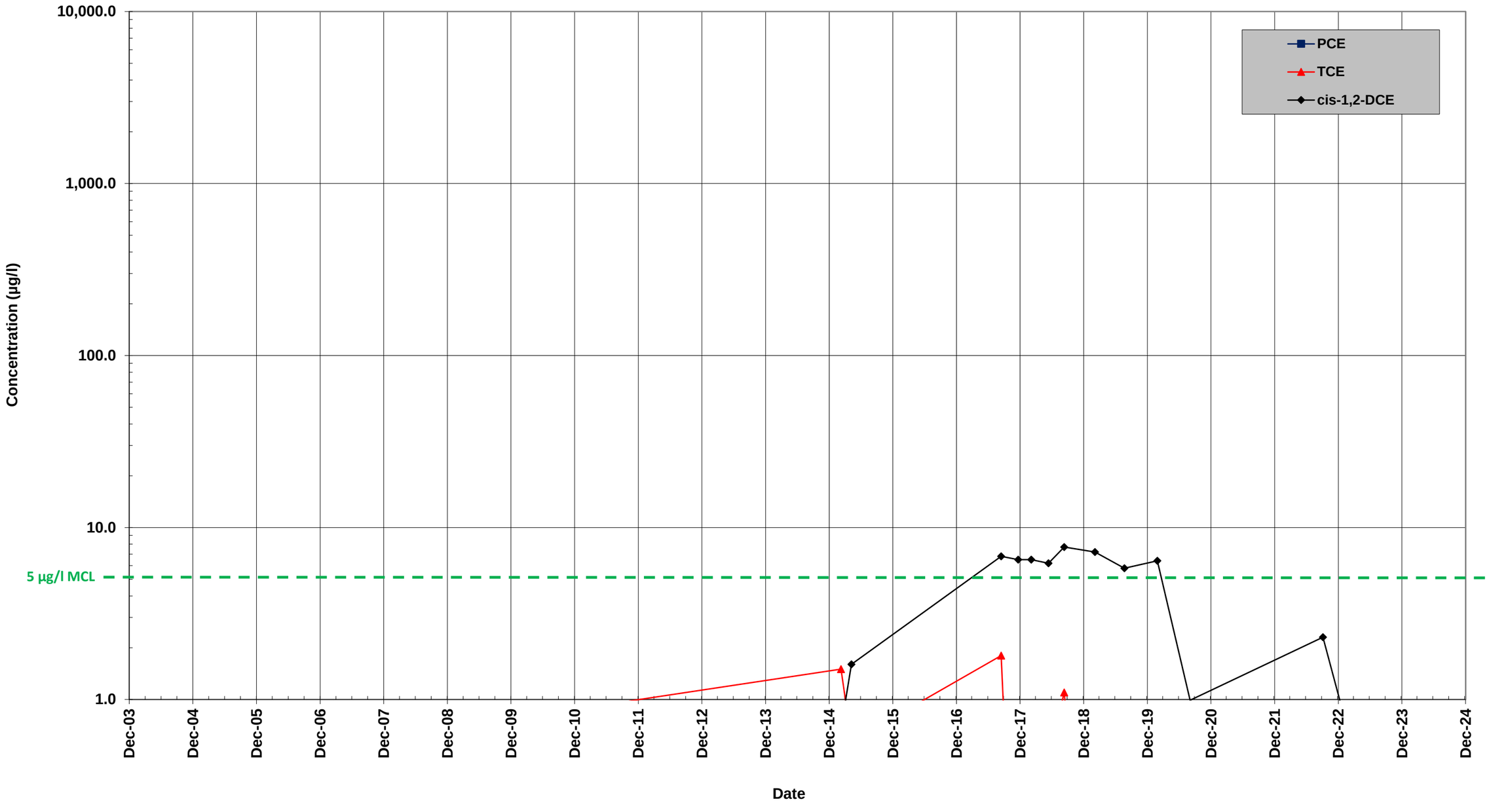


Well MW27G
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 438 to 448 Feet Below Ground Surface

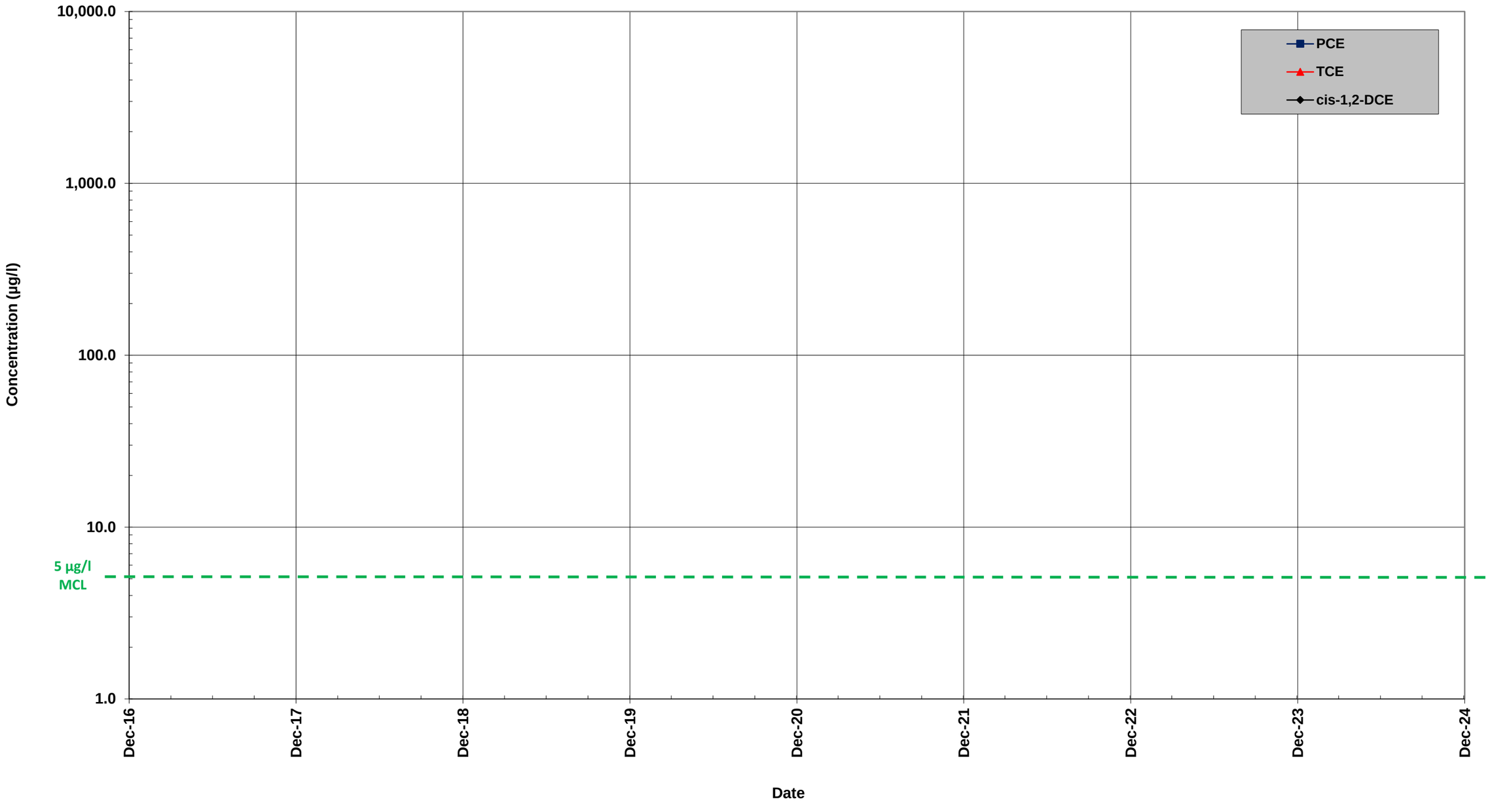
ERM



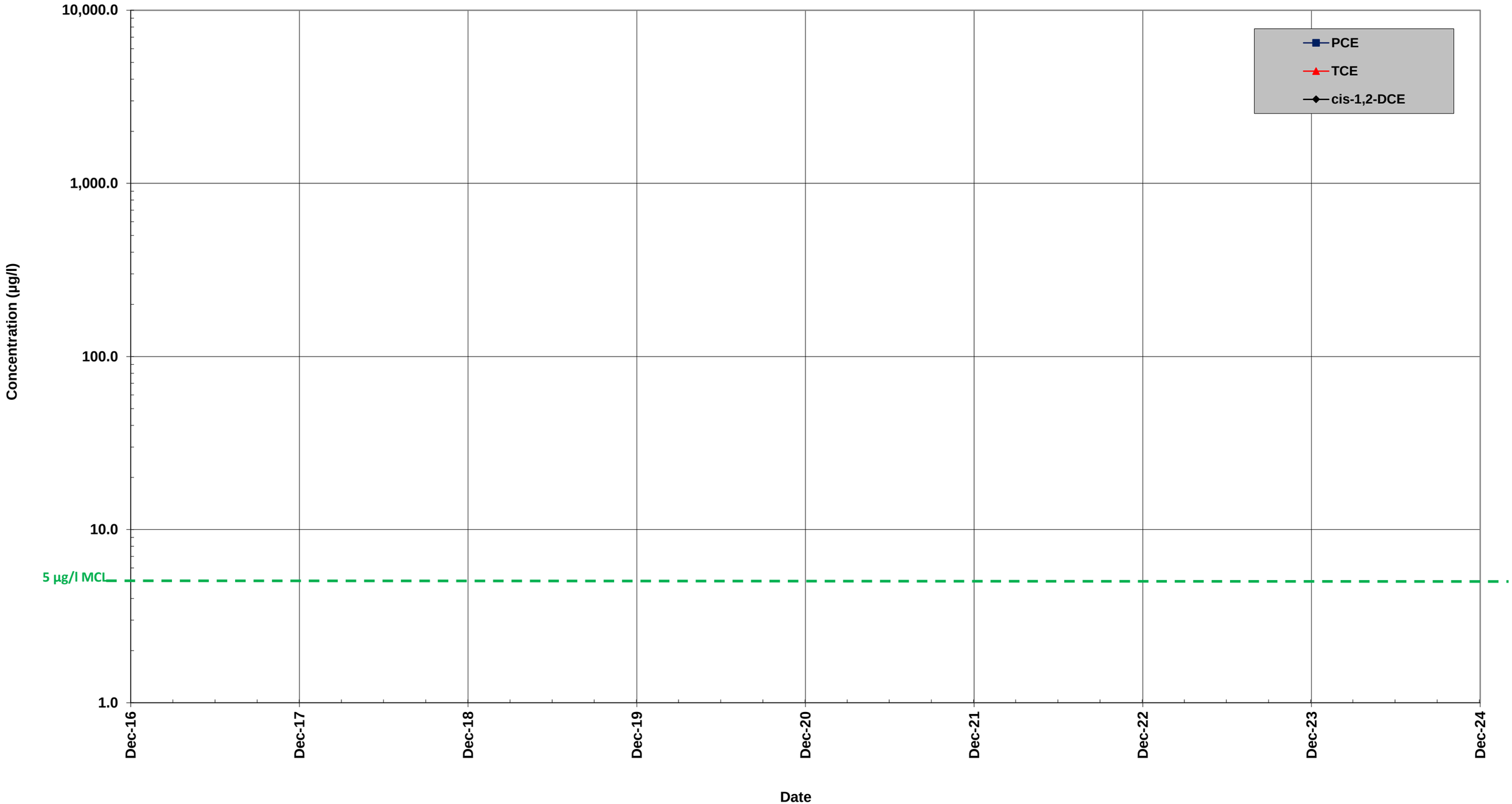
Well MW27H
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 472 to 482 Feet Below Ground Surface



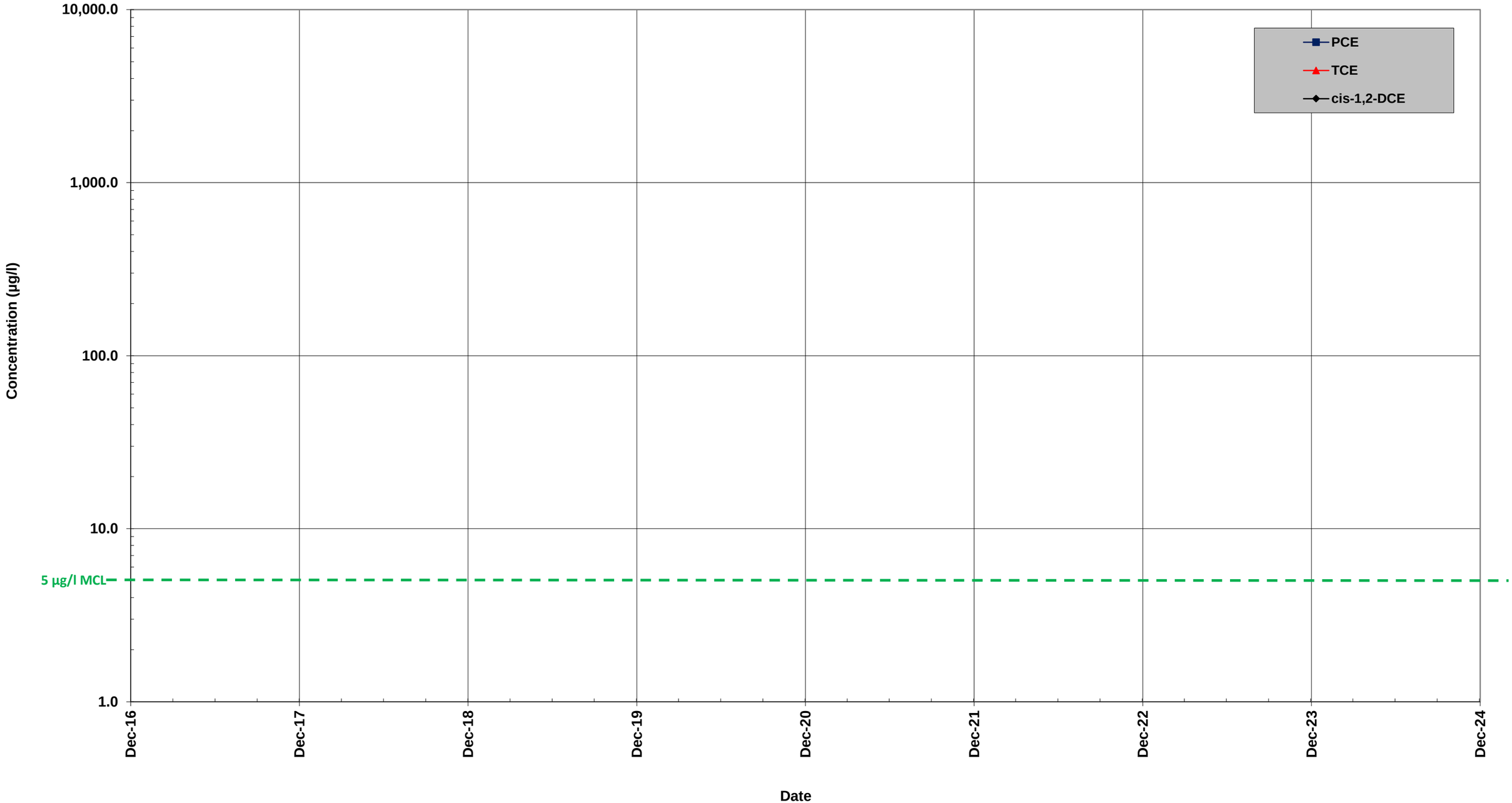
Well MW28A
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 92 to 102 Feet Below Ground Surface



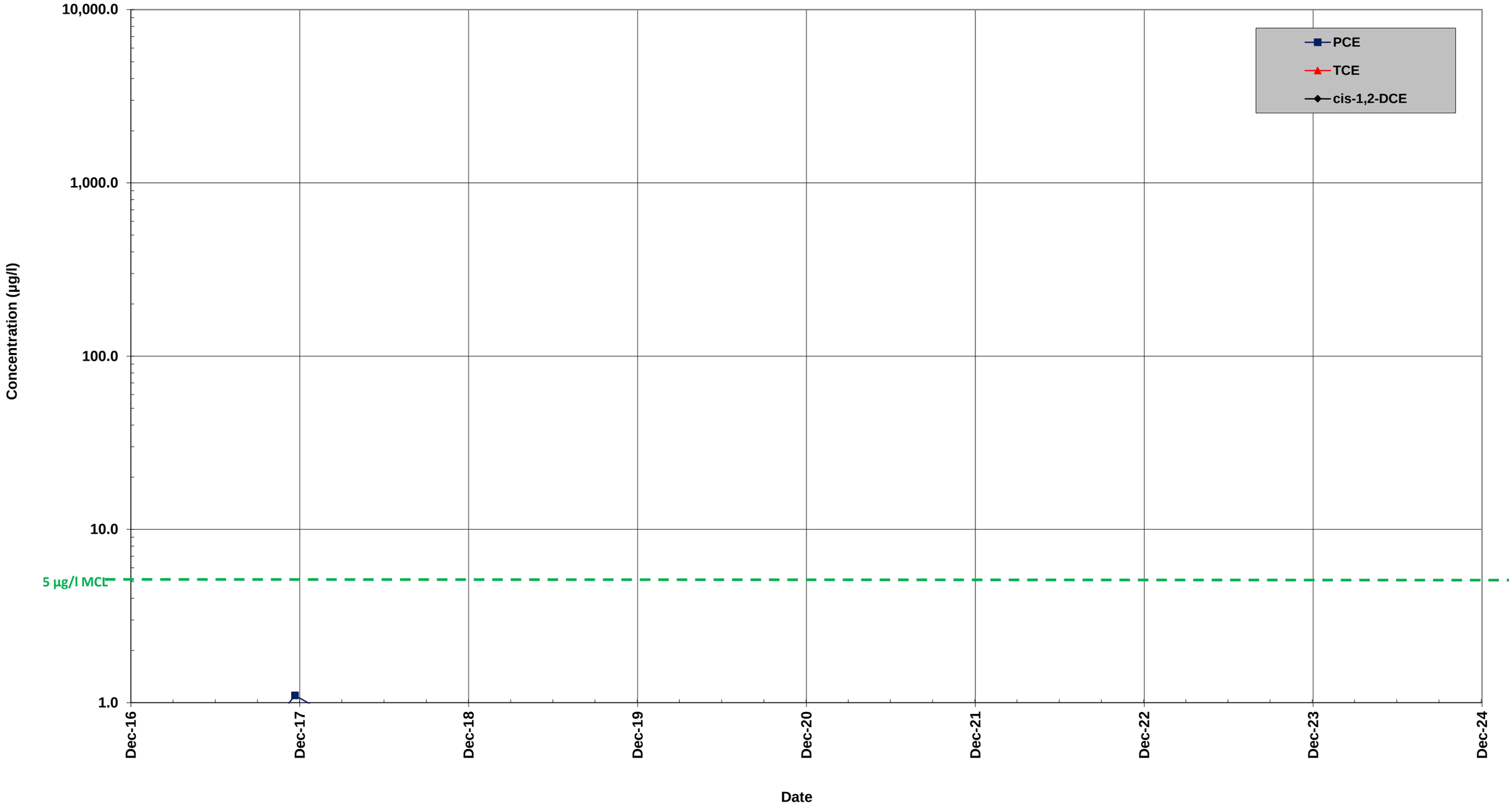
Well MW28B
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 214 to 224 Feet Below Ground Surface



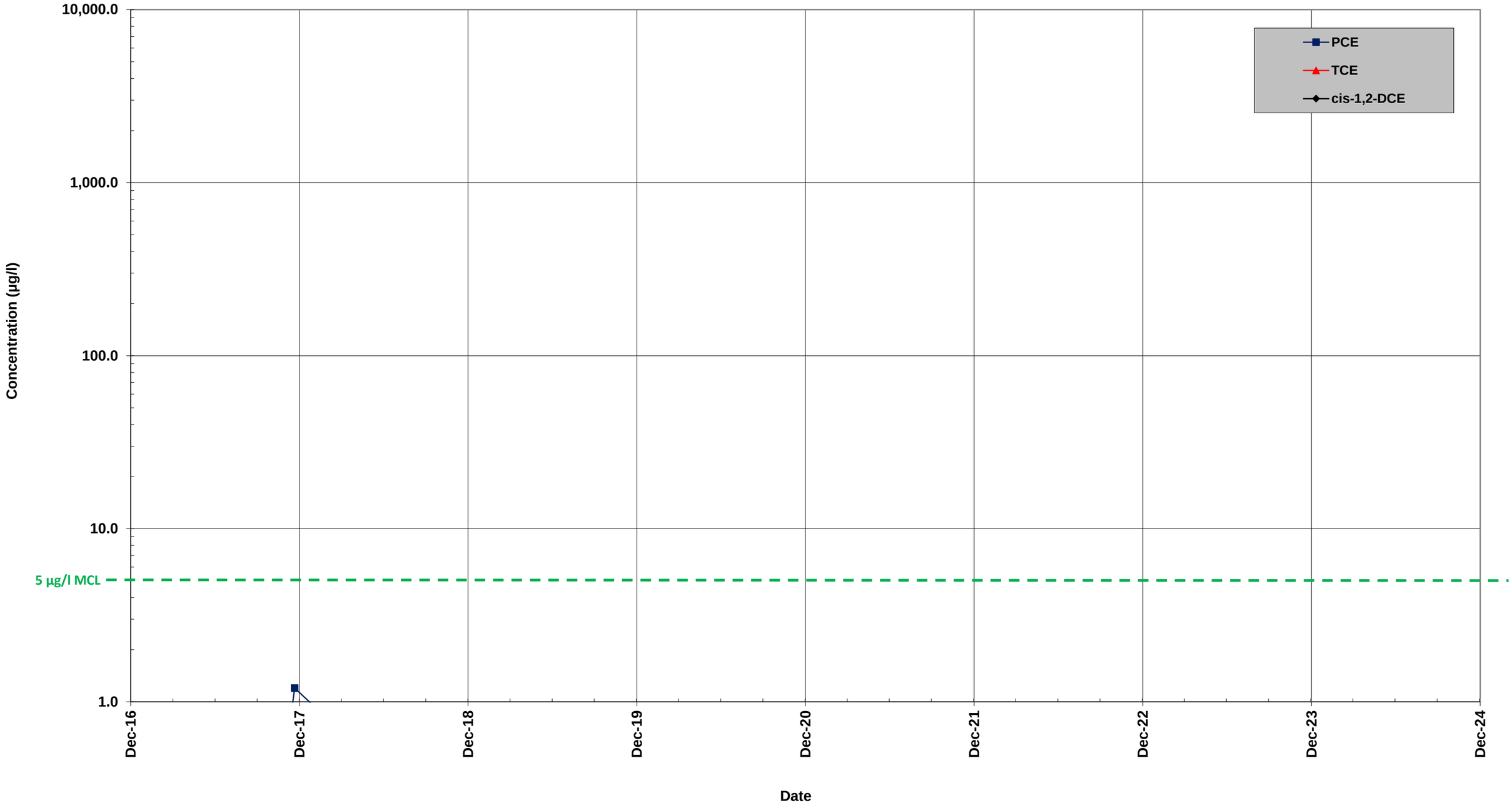
Well MW28C
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 312 to 322 Feet Below Ground Surface



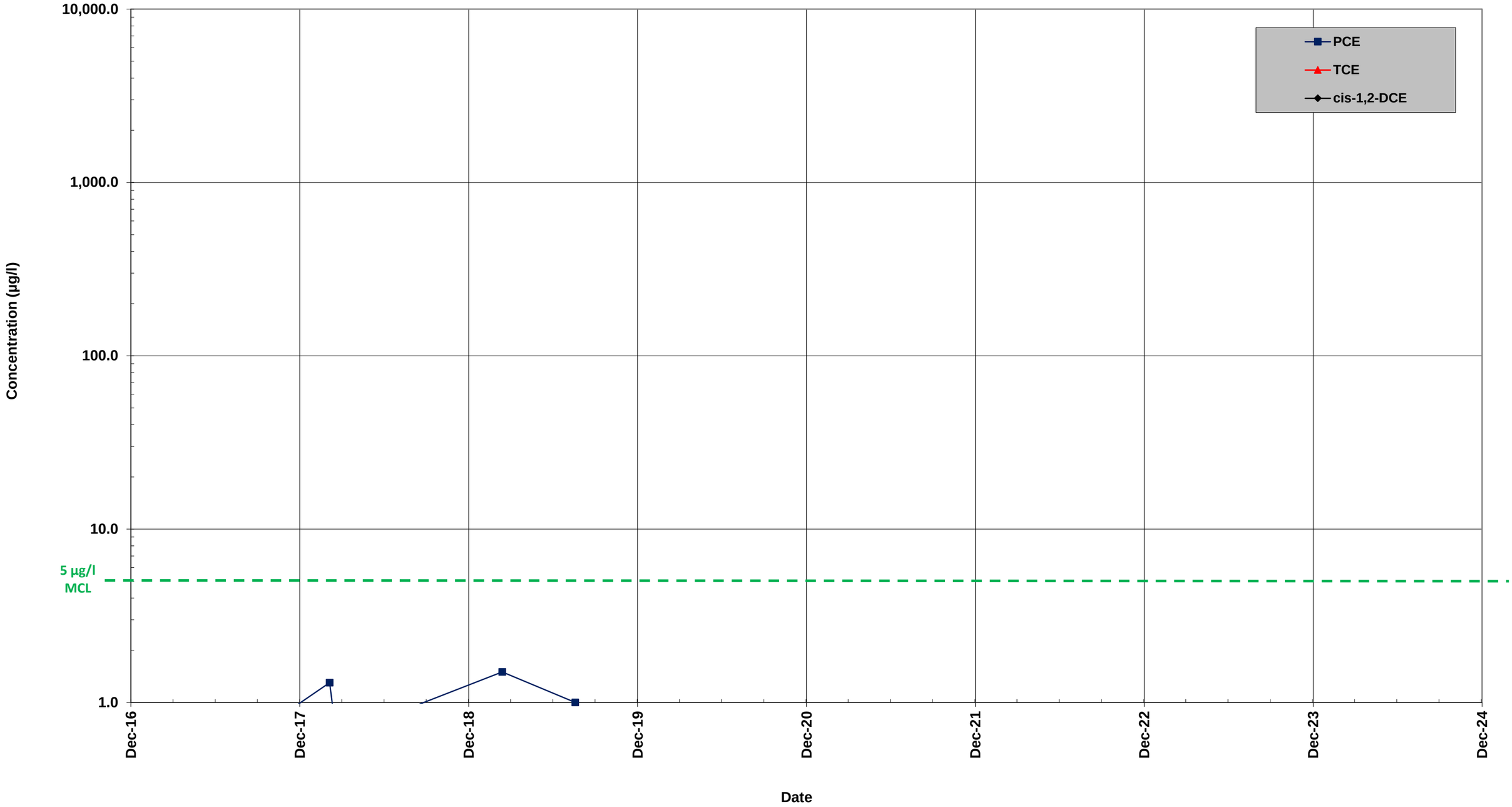
Well MW28D
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 340 to 350 Feet Below Ground Surface



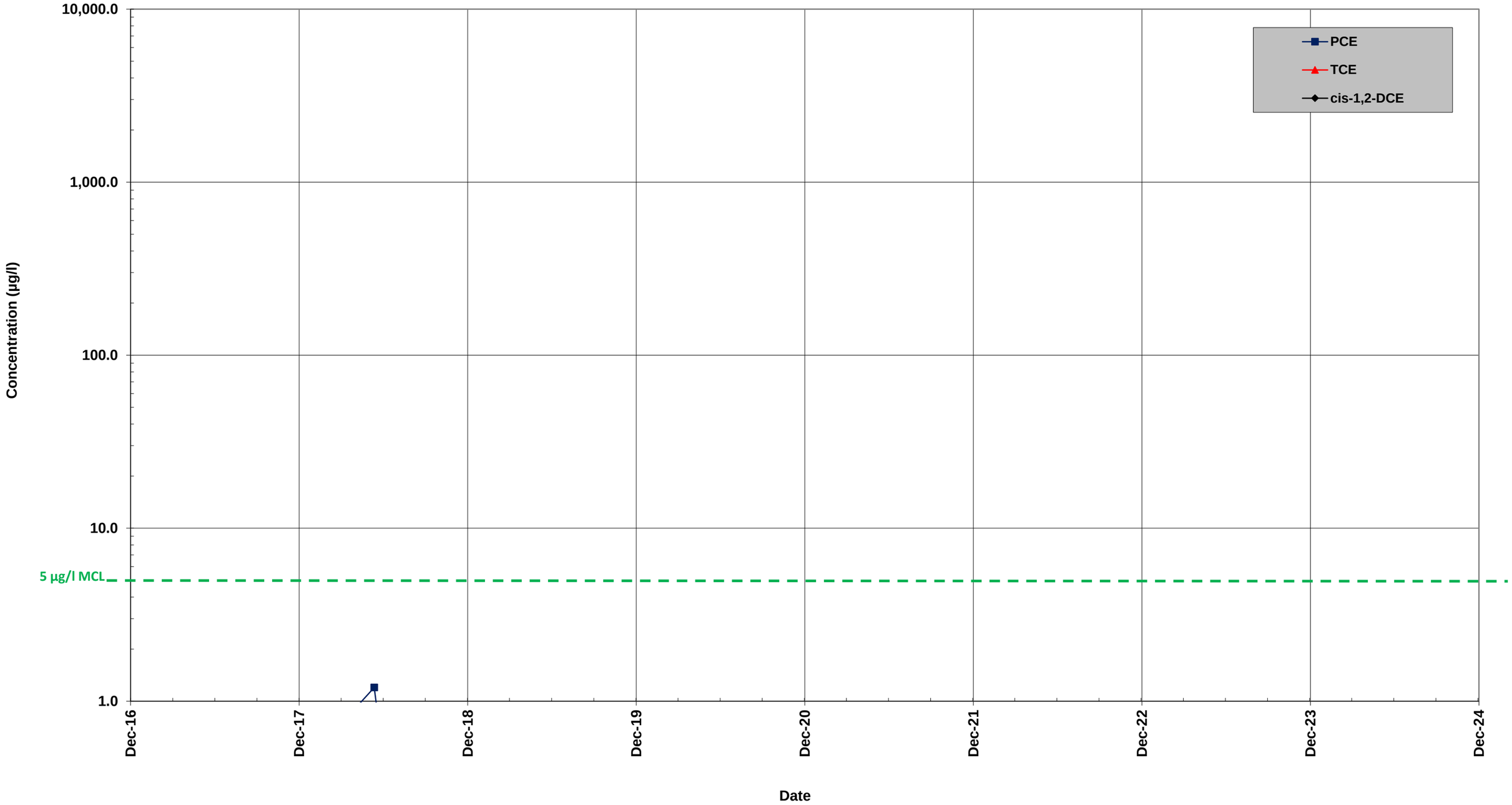
Well MW28E
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 362 to 372 Feet Below Ground Surface



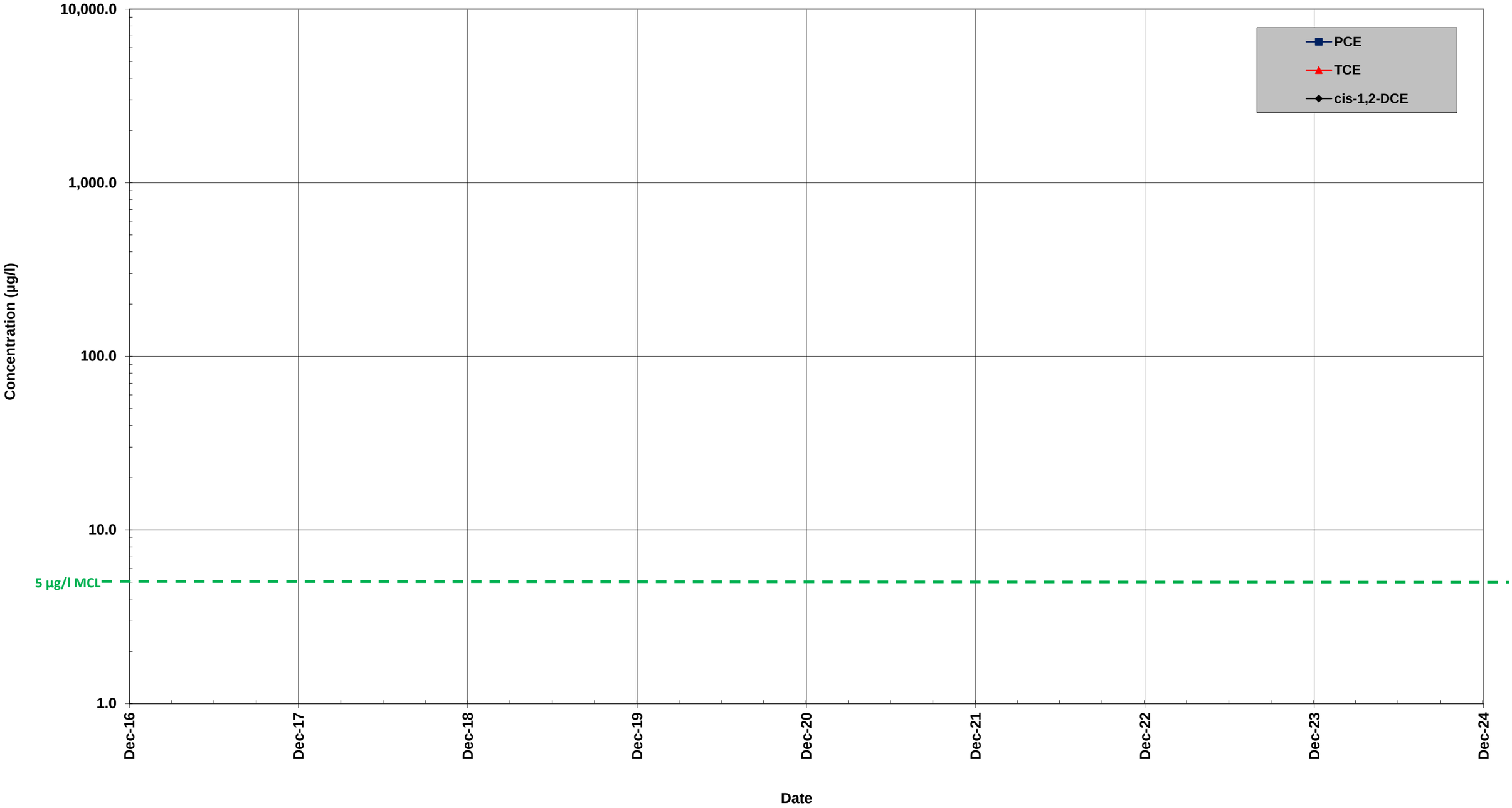
Well MW28F
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 398 to 408 Feet Below Ground Surface



Well MW28G
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 434 to 444 Feet Below Ground Surface



Well MW28H
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 485 to 495 Feet Below Ground Surface



ATTACHMENT B

SWA REPORTS FOR VGC WELL NOS. 9, 13 AND 14, AND FSWD WELL NOS. 1 AND 2

Owner (Purveyor): Garden City Village
Owner's Well Designation (Local #): 9
Location (Site Name): Garden City Village
Town: Hempstead
Screened Interval (MSL): -341 To -381
Aquifer: Magothy
Well Depth: 470
Simulated Pumping Rate (cfd): 51428.8
Minimum Time of Travel (Yrs): 15.0
Subgrids used in Model: cz_sg01e

Table N-03881-1: Land Use Summary

Land Use Type	Land Use Area (Acres) in Time Of Travel							
	2	5	25	50	75	100	Total	%
Commercial Sewered				0.13		2.67	2.80	1.3
High Density Residential Sewered			60.65	25.60	8.13	8.43	102.81	48.2
Industrial Sewered			0.61	25.94	17.88	8.86	53.28	25.0
Institutional Sewered			6.88	0.90	0.10	0.05	7.93	3.7
Low Density Residential Sewered			0.04	0.05			0.09	0.0
Open Space			4.37	2.29			6.66	3.1
Surface Waters			3.50	0.90			4.40	2.1
Transportation			15.16	6.84	2.83	7.25	32.07	15.0
Vacant			1.23	1.41	0.30	0.17	3.10	1.5
Totals			**92.42**	**64.05**	**29.24**	**27.43**	**213.15**	

Table N-03881-1A: Contaminant Prevalence Summary By Land Use

Contaminant Category	By Land Use				
	2	5	25	75	100
Microbials			L		
Nitrates					M
Pesticides			L	L	L
VOCs					L



Travel Time (Years)

- Two
- Five
- Twenty Five
- Fifty
- Seventy Five
- One Hundred

Land Use Classifications

- Low Density Residential
- Medium Density Residential
- High Density Residential
- Commercial
- Industrial
- Institutional
- Open Space
- Agricultural
- Vacant
- Transportation
- Utilities
- Waste Handling Mant.
- Surface Waters

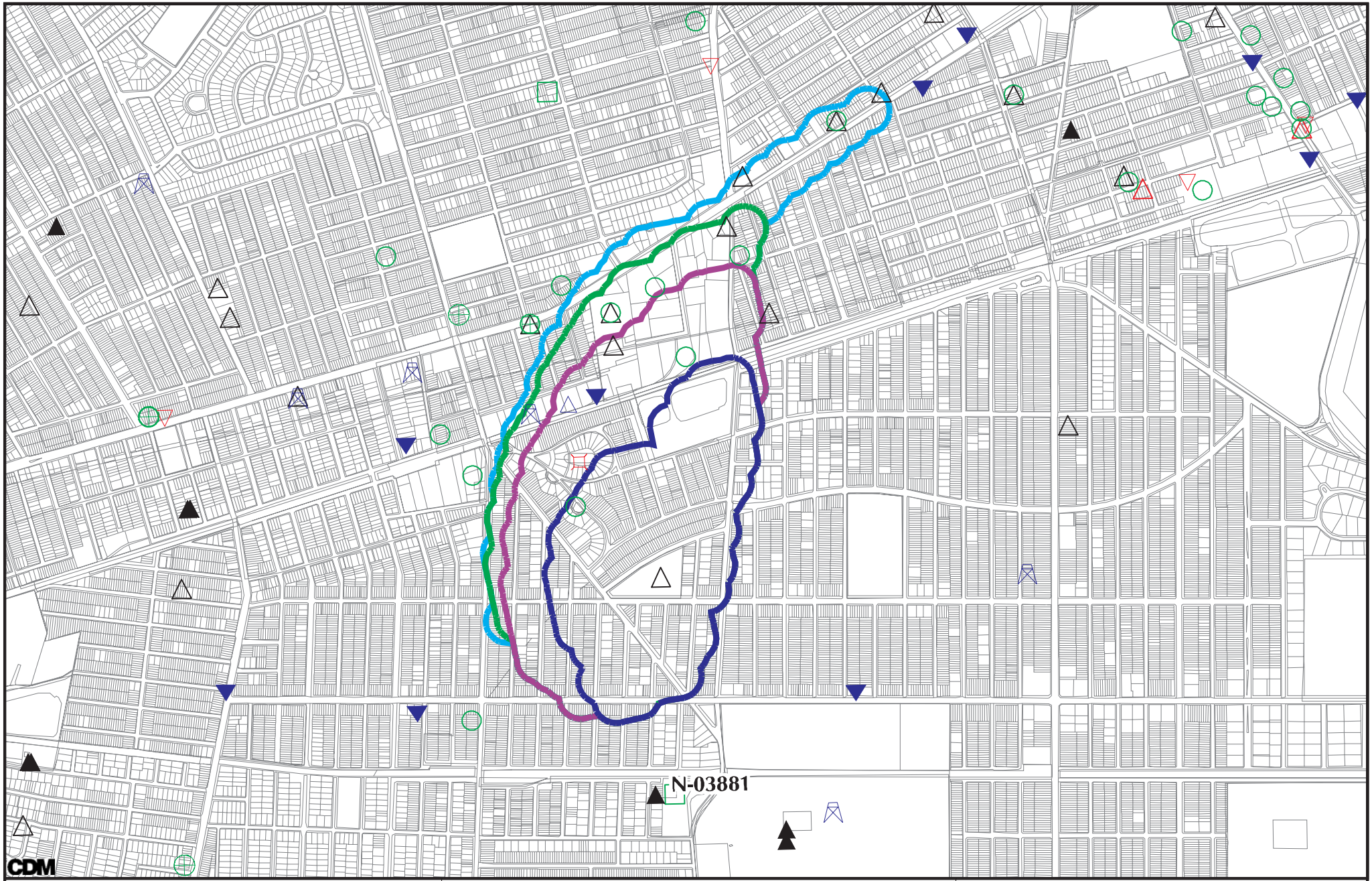
Contributing area to well number N-03881

- Lot Lines
- Public Supply Wells

600 0 600 Feet

N
W E
S

Map Date March 25, 2003



Travel Time (Years)

- Two
- Five
- Twenty Five
- Fifty
- Seventy Five
- One Hundred

Potential Point Sources

- Chemical Bulk Storage Facility
- CERCLA Facility
- Drycleaning Facility
- Hazardous Waste Site
- Landfill
- MOSF
- Other Type of Facility
- PCS Facility
- RCRA Facility
- SPDES / Denit Facility
- Spill Site
- Gas Station

Contributing area to well number N-03881

- Lot Lines
- Public Supply Wells

N
W E
S

600 0 600 Feet

Map Date April 11, 2003

Table N-03881-2: Potential Point Sources of Contamination

Source Type	# of Sources in Time Of Travel						
	2	5	25	50	75	100	Total
Chemical Bulk Storage Facility (County)			1	1	2	2	6
Gas Stations					1		1
Major Oil Storage Facility				1			1
PCS Facility				1			1
RCRA Facility			1	1	3	1	6
Spill Site				1			1
Totals			**2**	**5**	**6**	**3**	**16**

Table N-03881-2: Potential Point Sources of Contamination (Contd.)

Time Of Travel (Years): **25**

State ID #	Type	City	Zip
NC-052041	CBSFC	GARDEN CITY	
NYD982716391	RCRA	GARDEN CITY	11530

Time Of Travel (Years): **50**

State ID #	Type	City	Zip
NC-058059	CBSFC	GARDEN CITY	
1-2300	MOSF	NEW HYDE PARK	11040
8904105	Spill	HEMPSTEAD	11040
NYD987024189	RCRA	NEW HYDE PARK	11040
NY0109398	PCS	NEW HYDE PARK	11040

Time Of Travel (Years): **75**

State ID #	Type	City	Zip
NC-GS125	Gas Stations	NEW HYDE PARK	
NYD002044535	RCRA	NEW HYDE PARK	11040
NC-056957	CBSFC	NEW HYDE PARK	
SC-4154	CBSFC	NEW HYDE PARK	
NYD002040459	RCRA	NEW HYDE PARK	11040
NYR000022038	RCRA	GARDEN CITY PARK	11040

Time Of Travel (Years): **100**

State ID #	Type	City	Zip
NYD981183254	RCRA	GARDEN CITY PARK	11040
NC-057588	CBSFC	NEW HYDE PARK	
NC-057406	CBSFC	NEW HYDE PARK	

Table N-03881-3: Contaminant Prevalence Summary

Contaminant Category	By Land Use					By Point Source					Combined				
	2	5	25	75	100	2	5	25	75	100	2	5	25	75	100
Microbials			L					L					L		
Nitrates					M					M					M
Pesticides			L	L	L			L	L	L			L	L	L
VOCs					L					H					H

Table N-03881-4: Well Sensitivity

Contaminant Category	Sensitivity				
	2	5	25	75	100
Microbials	H	M	L		
Nitrates					H
Pesticides			H	M	L
VOCs					H

Table N-03881-5A: Well Susceptibility Determination

Contaminant Category	Susceptibility				
	2	5	25	75	100
Microbials			L		
Nitrates					H
Pesticides			M	L	L
VOCs					VH

Table N-03881-5B: Well Susceptibility Summary

	Contaminant Category			
	Microbials	Nitrates	Pesticides	VOCs
Susceptibility	L	H	M	VH

Notes:

1. Values shown in the Time Of Travel 100 column for VOCs and Nitrates are aggregates for the entire area

2. For microbials, Contaminant Prevalence assessments do not include any land use or point sources in contributing areas greater than 25-years Time of Travel.

3. For pesticides, all sources in times of travel below 25 years have been aggregated into the 25 column and sources in times of travel between 25 and 75 years have been aggregated into the 75 column

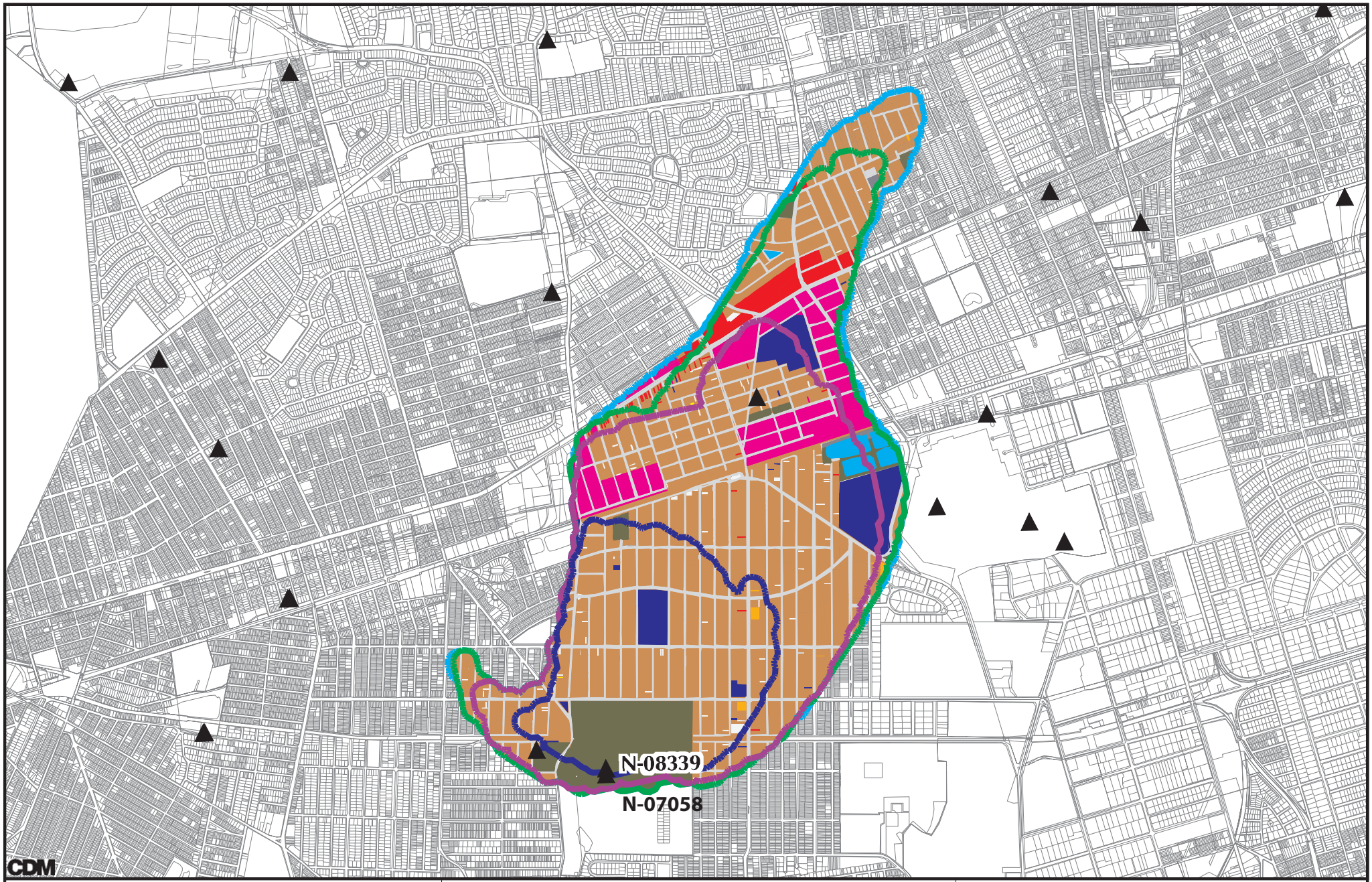
Owner (Purveyor): Garden City Village
Owner's Well Designation (Local #): 13
Location (Site Name): Garden City Village
Town: Hempstead
Screened Interval (MSL): -300 To -360
Aquifer: Magothy
Well Depth: 445
Simulated Pumping Rate (cfd): 93586.6
Minimum Time of Travel (Yrs): 12.0
Subgrids used in Model: cz_sg01e

Table N-07058-1: Land Use Summary

Land Use Type	Land Use Area (Acres) in Time Of Travel							
	2	5	25	50	75	100	Total	%
Commercial Sewered			0.07	0.39	22.13	4.29	26.87	2.6
High Density Residential Sewered			186.07	269.04	84.64	42.56	582.31	56.7
Industrial Sewered				50.65	29.72	6.56	86.94	8.5
Institutional Sewered			12.91	27.42	15.16	0.05	55.53	5.4
Low Density Residential Sewered			0.04	0.01	0.11		0.17	0.0
Medium Density Residential Sewered			1.32	0.12	0.44	0.10	1.98	0.2
Open Space			56.93	22.83	7.06	2.18	89.00	8.7
Surface Waters				6.05	6.63	0.67	13.35	1.3
Transportation			42.89	72.67	33.90	12.69	162.16	15.8
Utilities				0.71	1.46	0.27	2.44	0.2
Vacant			2.30	3.11	1.03	0.18	6.63	0.6
Totals			**302.53**	**453.00**	**202.30**	**69.55**	**1,027.38**	

Table N-07058-1A: Contaminant Prevalence Summary By Land Use

Contaminant Category	By Land Use				
	2	5	25	75	100
Microbials			L		
Nitrates					M
Pesticides			L	L	L
VOCs					L



Travel Time (Years)

- Two
- Five
- Twenty Five
- Fifty
- Seventy Five
- One Hundred

Land Use Classifications

- Low Density Residential
- Medium Density Residential
- High Density Residential
- Commercial
- Industrial
- Institutional
- Open Space
- Agricultural
- Vacant
- Transportation
- Utilities
- Waste Handling Mant.
- Surface Waters

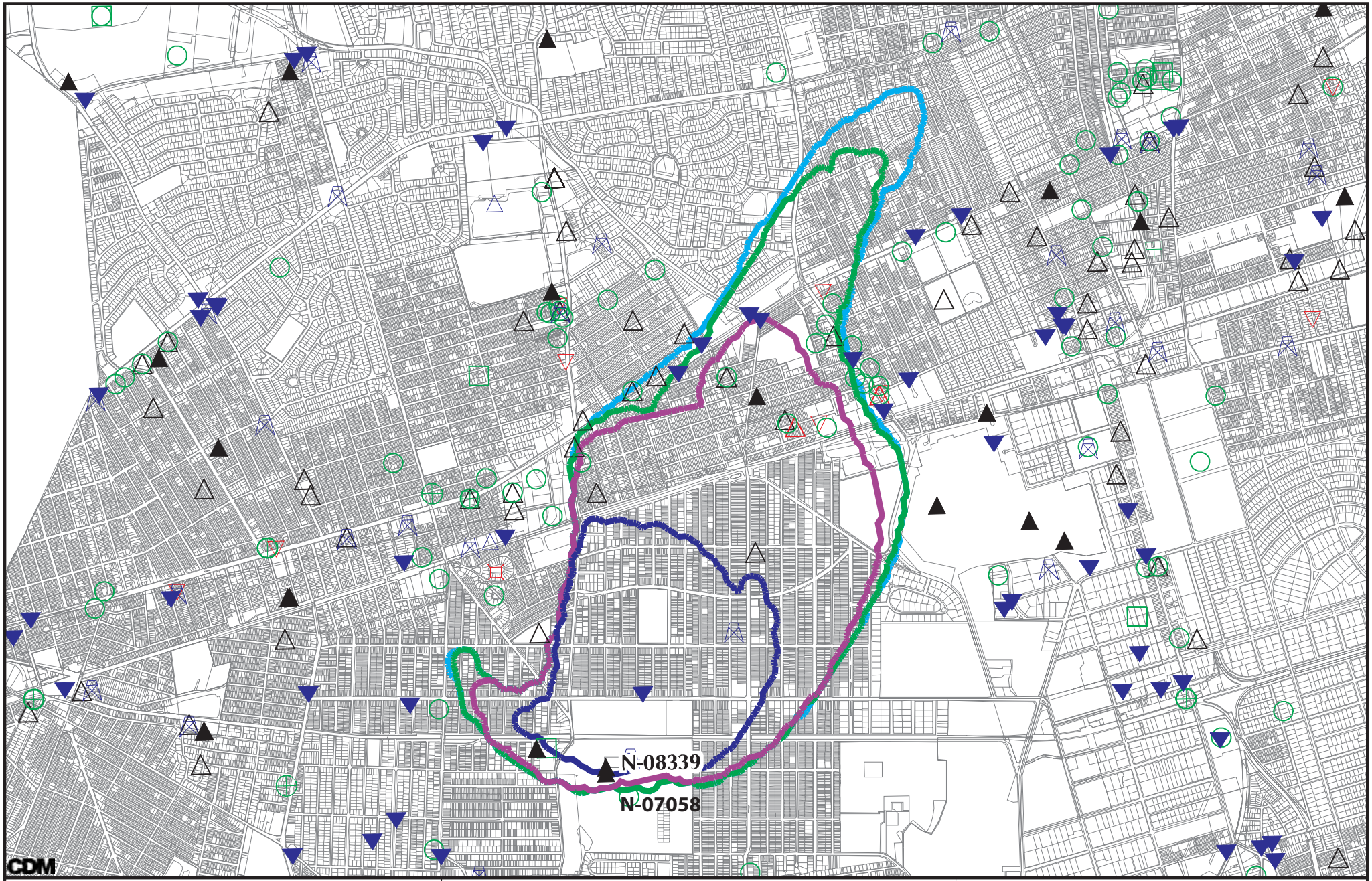
Contributing area to well number N-08339 N-07058

- Lot Lines
- Public Supply Wells

1000 0 1000 Feet

N
W E
S

Map Date March 25, 2003



Travel Time (Years)

- Two
- Five
- Twenty Five
- Fifty
- Seventy Five
- One Hundred

Potential Point Sources

- Chemical Bulk Storage Facility
- CERCLA Facility
- Drycleaning Facility
- Hazardous Waste Site
- Landfill
- MOSF
- Other Type of Facility
- PCS Facility
- RCRA Facility
- SPDES / Denit Facility
- Spill Site
- Gas Station

Contributing area to well number

N-08339
N-07058

- Lot Lines
- Public Supply Wells

1000 0 1000 Feet

N
W E
S

Map Date April 11, 2003

Table N-07058-2: Potential Point Sources of Contamination

Source Type	# of Sources in Time Of Travel						
	2	5	25	50	75	100	Total
CERCLA Facility				1			1
Chemical Bulk Storage Facility (County)				4	1	2	7
Gas Stations			2				2
Hazardous Waste Site				1	1		2
RCRA Facility				4	3	1	8
SPDES Denitrification Facilities In Sewered Areas				1			1
Spill Site			1	1	3		5
Totals			**3**	**12**	**8**	**3**	**26**

Table N-07058-2: Potential Point Sources of Contamination (Contd.)

Time Of Travel (Years): **25**

State ID #	Type	City	Zip
NC-GS149	Gas Stations	GARDEN CITY	
NC-GS164	Gas Stations	GARDEN CITY SOUTH	
9712758	Spill	HEMPSTEAD	11530

Time Of Travel (Years): **50**

State ID #	Type	City	Zip
9315515	Spill	HEMPSTEAD	11530
NY0000110247	CERCLA	NORTH HEMPSTEAD	11040
130073	HWS		
NC-055425	CBSFC	GARDEN CITY	
NYD986949154	RCRA	GARDEN CITY	11530
NC-056856	CBSFC	GARDEN CTY S.	
NC-055005	CBSFC	GARDEN CTY PK	
NC-055006	CBSFC	NEW HYDE PARK	
NY0000644245	RCRA	GARDEN CITY PARK	11040
NY0109398	SPDES/Denit	NEW HYDE PARK	11040
NYR000022038	RCRA	GARDEN CITY PARK	11040
NYD064720121	RCRA	NEW HYDE PARK	11040

Time Of Travel (Years): **75**

State ID #	Type	City	Zip
NYD986937530	RCRA	NEW HYDE PARK	11040
8909282	Spill	HEMPSTEAD	11530
202687	HWS	NEW HYDE PARK	11040
8708299	Spill	NORTH HEMPSTEAD	11040
8300216	Spill	HEMPSTEAD	11530
NYD982743015	RCRA	SYOSSET	11791
NYD986900603	RCRA	NEW HYDE PARK	11040
NC-058087	CBSFC	GARDEN CTY PK	

Time Of Travel (Years): **100**

State ID #	Type	City	Zip
NYD981183254	RCRA	GARDEN CITY PARK	11040
NC-057588	CBSFC	NEW HYDE PARK	
NC-055144	CBSFC	GARDEN CTY PK	

Table N-07058-3: Contaminant Prevalence Summary

Contaminant Category	By Land Use					By Point Source					Combined				
	2	5	25	75	100	2	5	25	75	100	2	5	25	75	100
Microbials			L					N					L		
Nitrates					M					M					M

Pesticides			L	L	L			L	L	L			L	L	L	
VOCs					L					H					H	

Table N-07058-4: Well Sensitivity

Contaminant Category	Sensitivity				
	2	5	25	75	100
Microbials	H	M	L		
Nitrates					H
Pesticides			H	M	L
VOCs					H

Table N-07058-5A: Well Susceptibility Determination

Contaminant Category	Susceptibility				
	2	5	25	75	100
Microbials			L		
Nitrates					H
Pesticides			M	L	L
VOCs					VH

Table N-07058-5B: Well Susceptibility Summary

	Contaminant Category			
	Microbials	Nitrates	Pesticides	VOCs
Susceptibility	L	H	M	VH

Notes:

1. Values shown in the Time Of Travel 100 column for VOCs and Nitrates are aggregates for the entire area

2. For microbials, Contaminant Prevalence assessments do not include any land use or point sources in contributing areas greater than 25-years Time of Travel.

3. For pesticides, all sources in times of travel below 25 years have been aggregated into the 25 column and sources in times of travel between 25 and 75 years have been aggregated into the 75 column

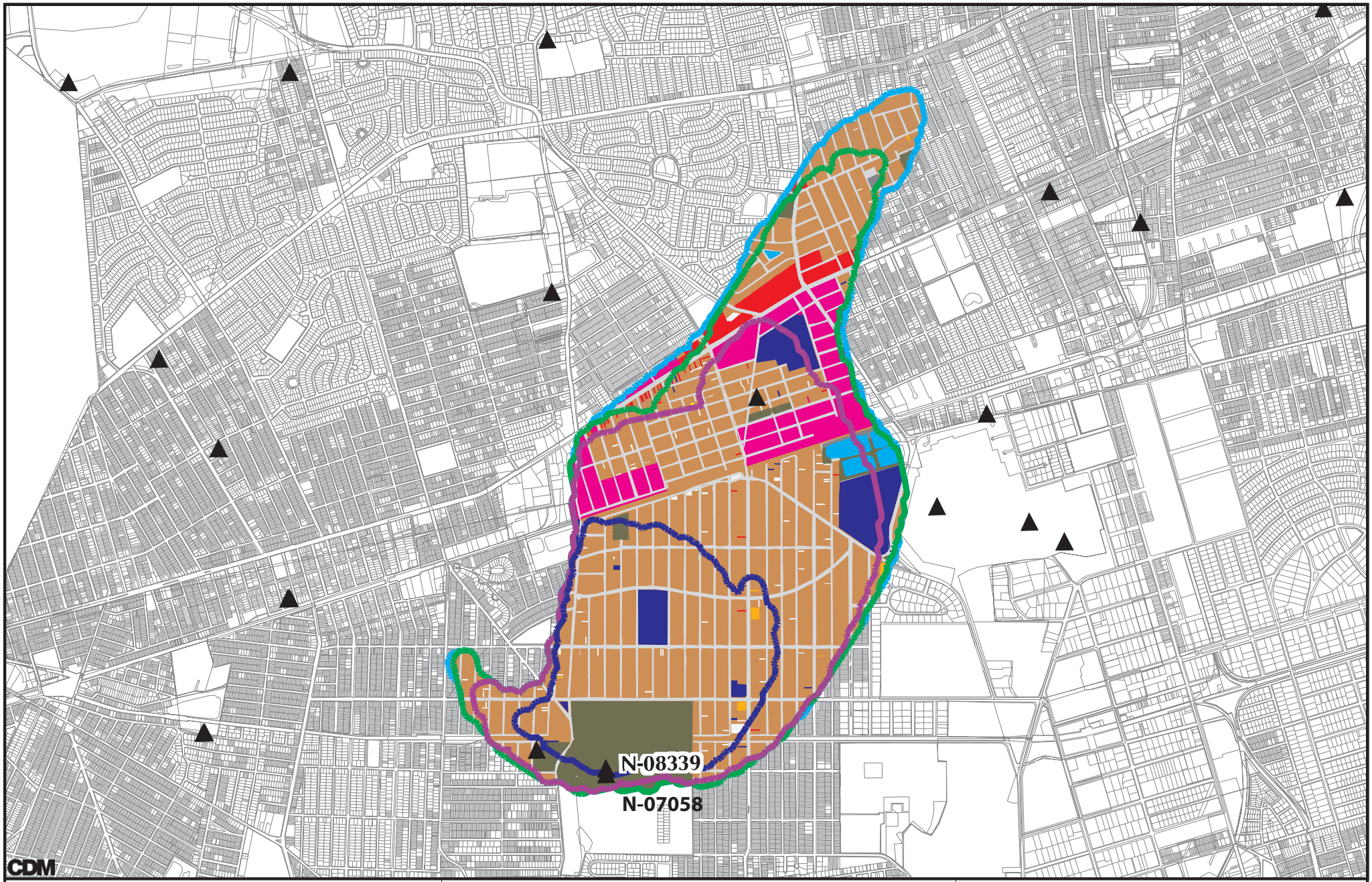
Owner (Purveyor): Garden City Village
Owner's Well Designation (Local #): 14
Location (Site Name): Garden City Village
Town: Hempstead
Screened Interval (MSL): -228 To -278
Aquifer: Magothy
Well Depth: 363
Simulated Pumping Rate (cfd): 148714.4
Minimum Time of Travel (Yrs): 12.0
Subgrids used in Model: cz_sg01e

Table N-08339-1: Land Use Summary

Land Use Type	Land Use Area (Acres) in Time Of Travel							
	2	5	25	50	75	100	Total	%
Commercial Sewered			0.07	0.39	22.13	4.29	26.87	2.6
High Density Residential Sewered			186.07	269.04	84.64	42.56	582.31	56.7
Industrial Sewered				50.65	29.72	6.56	86.94	8.5
Institutional Sewered			12.91	27.42	15.16	0.05	55.53	5.4
Low Density Residential Sewered			0.04	0.01	0.11		0.17	0.0
Medium Density Residential Sewered			1.32	0.12	0.44	0.10	1.98	0.2
Open Space			56.93	22.83	7.06	2.18	89.00	8.7
Surface Waters				6.05	6.63	0.67	13.35	1.3
Transportation			42.89	72.67	33.90	12.69	162.16	15.8
Utilities				0.71	1.46	0.27	2.44	0.2
Vacant			2.30	3.11	1.03	0.18	6.63	0.6
Totals			**302.53**	**453.00**	**202.30**	**69.55**	**1,027.38**	

Table N-08339-1A: Contaminant Prevalence Summary By Land Use

Contaminant Category	By Land Use				
	2	5	25	75	100
Microbials			L		
Nitrates					M
Pesticides			L	L	L
VOCs					L



Travel Time (Years)

- Two
- Five
- Twenty Five
- Fifty
- Seventy Five
- One Hundred

Land Use Classifications

- Low Density Residential
- Medium Density Residential
- High Density Residential
- Commercial
- Industrial
- Institutional
- Open Space
- Agricultural
- Vacant
- Transportation
- Utilities
- Waste Handling Mant.
- Surface Waters

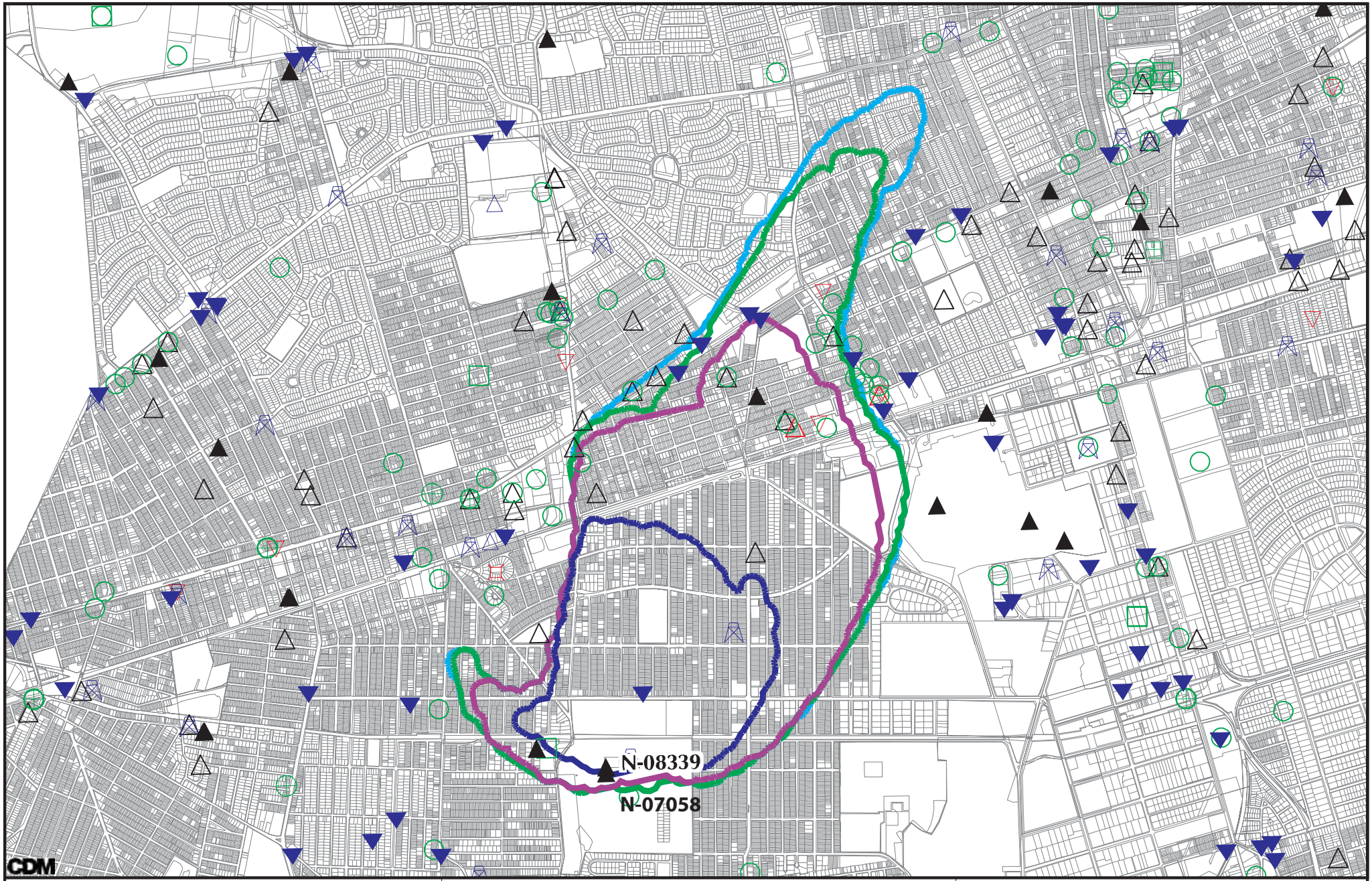
Contributing area to well number N-08339 N-07058

- Lot Lines
- Public Supply Wells

1000 0 1000 Feet

N
W E
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Map Date March 25, 2003



Travel Time (Years)

- Two
- Five
- Twenty Five
- Fifty
- Seventy Five
- One Hundred

Potential Point Sources

- Chemical Bulk Storage Facility
- CERCLA Facility
- Drycleaning Facility
- Hazardous Waste Site
- Landfill
- MOSF
- Other Type of Facility
- PCS Facility
- RCRA Facility
- SPDES / Denit Facility
- Spill Site
- Gas Station

Contributing area to well number

N-08339
N-07058

- Lot Lines
- Public Supply Wells

1000 0 1000 Feet

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Map Date April 11, 2003

Table N-08339-2: Potential Point Sources of Contamination

Source Type	# of Sources in Time Of Travel						
	2	5	25	50	75	100	Total
CERCLA Facility				1			1
Chemical Bulk Storage Facility (County)				4	1	2	7
Gas Stations			2				2
Hazardous Waste Site				1	1		2
RCRA Facility				4	3	1	8
SPDES Denitrification Facilities In Sewered Areas				1			1
Spill Site			1	1	3		5
Totals			**3**	**12**	**8**	**3**	**26**

Table N-08339-2: Potential Point Sources of Contamination (Contd.)

Time Of Travel (Years): **25**

State ID #	Type	City	Zip
NC-GS149	Gas Stations	GARDEN CITY	
NC-GS164	Gas Stations	GARDEN CITY SOUTH	
9712758	Spill	HEMPSTEAD	11530

Time Of Travel (Years): **50**

State ID #	Type	City	Zip
9315515	Spill	HEMPSTEAD	11530
NY0000110247	CERCLA	NORTH HEMPSTEAD	11040
130073	HWS		
NC-055425	CBSFC	GARDEN CITY	
NYD986949154	RCRA	GARDEN CITY	11530
NC-056856	CBSFC	GARDEN CTY S.	
NC-055005	CBSFC	GARDEN CTY PK	
NC-055006	CBSFC	NEW HYDE PARK	
NY0000644245	RCRA	GARDEN CITY PARK	11040
NY0109398	SPDES/Denit	NEW HYDE PARK	11040
NYR000022038	RCRA	GARDEN CITY PARK	11040
NYD064720121	RCRA	NEW HYDE PARK	11040

Time Of Travel (Years): **75**

State ID #	Type	City	Zip
NYD986937530	RCRA	NEW HYDE PARK	11040
8909282	Spill	HEMPSTEAD	11530
202687	HWS	NEW HYDE PARK	11040
8708299	Spill	NORTH HEMPSTEAD	11040
8300216	Spill	HEMPSTEAD	11530
NYD982743015	RCRA	SYOSSET	11791
NYD986900603	RCRA	NEW HYDE PARK	11040
NC-058087	CBSFC	GARDEN CTY PK	

Time Of Travel (Years): **100**

State ID #	Type	City	Zip
NYD981183254	RCRA	GARDEN CITY PARK	11040
NC-057588	CBSFC	NEW HYDE PARK	
NC-055144	CBSFC	GARDEN CTY PK	

Table N-08339-3: Contaminant Prevalence Summary

Contaminant Category	By Land Use					By Point Source					Combined				
	2	5	25	75	100	2	5	25	75	100	2	5	25	75	100
Microbials			L					N					L		
Nitrates					M					M					M

Pesticides			L	L	L			L	L	L			L	L	L	
VOCs					L					H					H	

Table N-08339-4: Well Sensitivity

Contaminant Category	Sensitivity				
	2	5	25	75	100
Microbials	H	M	L		
Nitrates					H
Pesticides			H	M	L
VOCs					H

Table N-08339-5A: Well Susceptibility Determination

Contaminant Category	Susceptibility				
	2	5	25	75	100
Microbials			L		
Nitrates					H
Pesticides			M	L	L
VOCs					VH

Table N-08339-5B: Well Susceptibility Summary

	Contaminant Category			
	Microbials	Nitrates	Pesticides	VOCs
Susceptibility	L	H	M	VH

Notes:

1. Values shown in the Time Of Travel 100 column for VOCs and Nitrates are aggregates for the entire area

2. For microbials, Contaminant Prevalence assessments do not include any land use or point sources in contributing areas greater than 25-years Time of Travel.

3. For pesticides, all sources in times of travel below 25 years have been aggregated into the 25 column and sources in times of travel between 25 and 75 years have been aggregated into the 75 column

Well Number: **N-03603**

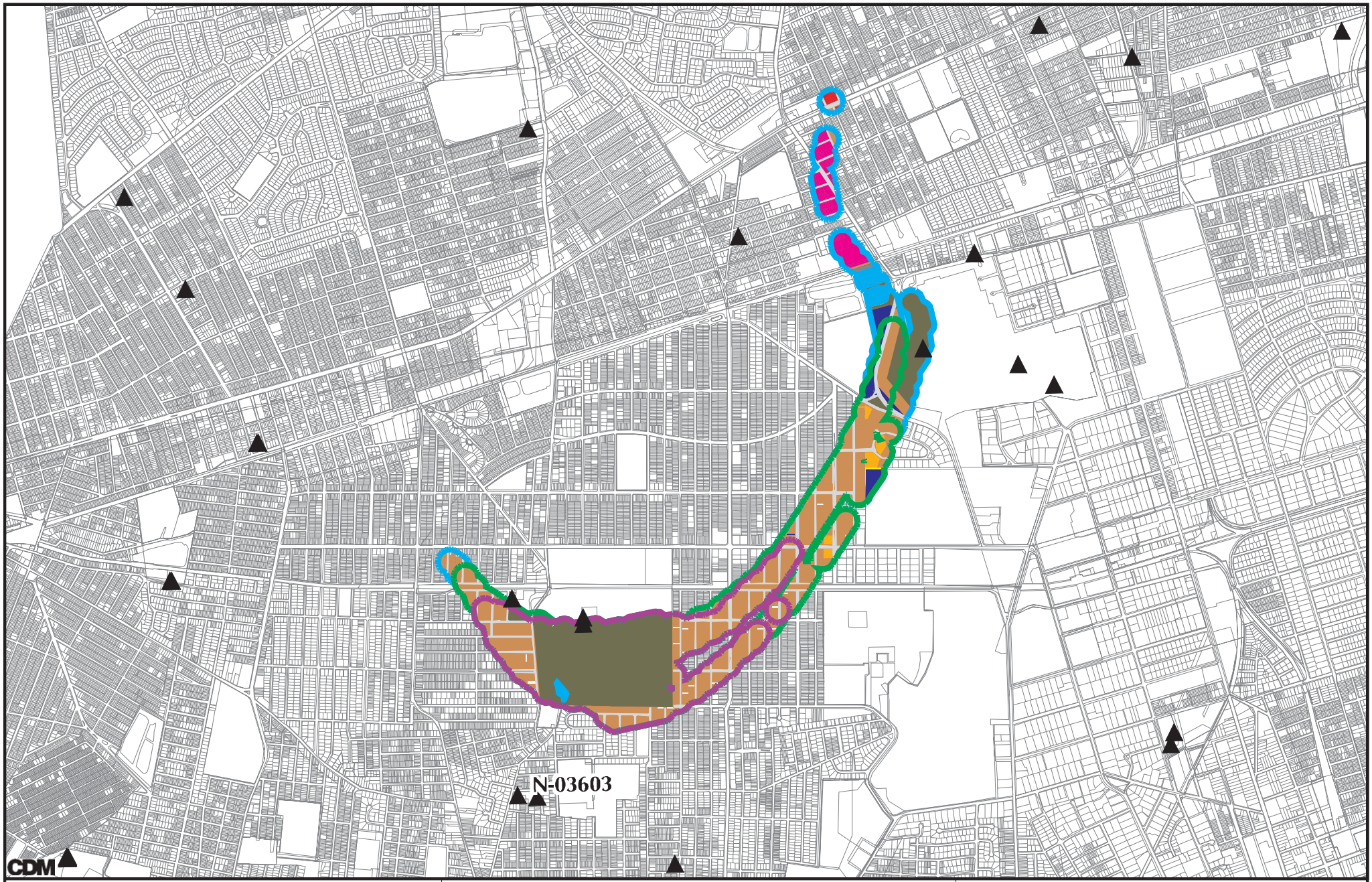
Owner (Purveyor): Franklin Square Water District
Owner's Well Designation (Local #): 1
Location (Site Name): Franklin Square Water District
Town: Hempstead
Screened Interval (MSL): -378 To -428
Aquifer: Magothy
Well Depth: 493
Simulated Pumping Rate (cfd): 31906.8
Minimum Time of Travel (Yrs): 32.3
Subgrids used in Model: cz_sg01e

Table N-03603-1: Land Use Summary

Land Use Type	Land Use Area (Acres) in Time Of Travel							
	2	5	25	50	75	100	Total	%
Commercial Sewered						1.60	1.60	0.5
High Density Residential Sewered				68.57	58.49	7.49	134.56	44.3
Industrial Sewered						15.36	15.36	5.1
Institutional Sewered					5.51	3.65	9.16	3.0
Low Density Residential Sewered					0.32		0.32	0.1
Medium Density Residential Sewered					3.69		3.69	1.2
Open Space				73.64	6.12	16.88	96.63	31.8
Surface Waters				1.30		5.37	6.68	2.2
Transportation				14.40	14.77	5.08	34.24	11.3
Utilities						0.62	0.62	0.2
Vacant				0.82	0.27	0.12	1.22	0.4
Totals				**158.73**	**89.17**	**56.16**	**304.06**	

Table N-03603-1A: Contaminant Prevalence Summary By Land Use

Contaminant Category	By Land Use				
	2	5	25	75	100
Nitrates					M
Pesticides				L	L
VOCs					L



Travel Time (Years)

- Two
- Five
- Twenty Five
- Fifty
- Seventy Five
- One Hundred

Land Use Classifications

- Low Density Residential
- Medium Density Residential
- High Density Residential
- Commercial
- Industrial
- Institutional
- Open Space
- Agricultural
- Vacant
- Transportation
- Utilities
- Waste Handling Mant.
- Surface Waters

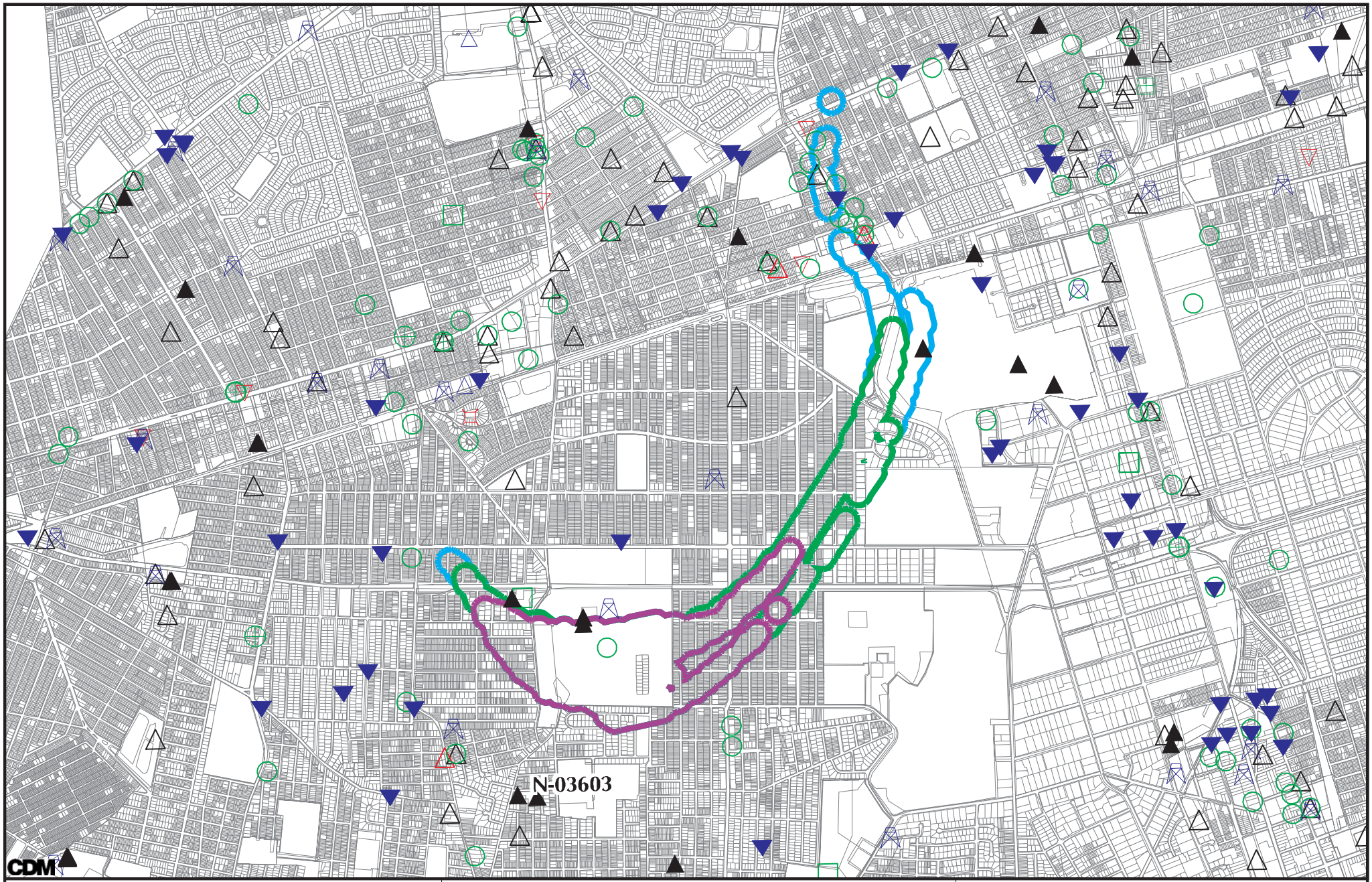
Contributing area to well number N-03603

- Lot Lines
- Public Supply Wells

1000 0 1000 Feet

N
W E
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Map Date April 14, 2003



Travel Time (Years)

- Two
- Five
- Twenty Five
- Fifty
- Seventy Five
- One Hundred

Potential Point Sources

- Chemical Bulk Storage Facility
- CERCLA Facility
- Drycleaning Facility
- Hazardous Waste Site
- Landfill
- MOSF
- Other Type of Facility
- PCS Facility
- RCRA Facility
- SPDES / Denit Facility
- Spill Site
- Gas Station

Contributing area to well number N-03603

- Lot Lines
- Public Supply Wells

1000 0 1000 Feet

N
W E
S

Map Date April 14, 2003

Table N-03603-2: Potential Point Sources of Contamination

Source Type	# of Sources in Time Of Travel						
	2	5	25	50	75	100	Total
Chemical Bulk Storage Facility (County)						1	1
RCRA Facility				1		1	2
Spill Site						1	1
Totals				**1**		**3**	**4**

Table N-03603-2: Potential Point Sources of Contamination (Contd.)

Time Of Travel (Years): **50**

State ID #	Type	City	Zip
NYD093307809	RCRA	GARDEN CITY	11530

Time Of Travel (Years): **100**

State ID #	Type	City	Zip
8100782	Spill	HEMPSTEAD	11040
NYD982743015	RCRA	SYOSSET	11791
NC-058087	CBSFC	GARDEN CTY PK	

Table N-03603-3: Contaminant Prevalence Summary

Contaminant Category	By Land Use					By Point Source					Combined				
	2	5	25	75	100	2	5	25	75	100	2	5	25	75	100
Nitrates					M					M					M
Pesticides				L	L				L	L				L	L
VOCs					L					H					H

Table N-03603-4: Well Sensitivity

Contaminant Category	Sensitivity				
	2	5	25	75	100
Microbials	H	M	L		
Nitrates					H
Pesticides			H	M	L
VOCs					H

Table N-03603-5A: Well Susceptibility Determination

Contaminant Category	Susceptibility				
	2	5	25	75	100
Microbials			L		
Nitrates					H
Pesticides				L	L
VOCs					VH

Table N-03603-5B: Well Susceptibility Summary

	Contaminant Category			
	Microbials	Nitrates	Pesticides	VOCs
Susceptibility	L	H	L	VH

Notes:

1. Values shown in the Time Of Travel 100 column for VOCs and Nitrates are aggregates for the entire area

2. For microbials, Contaminant Prevalence assessments do not include any land use or point sources in contributing areas greater than 25-years Time of Travel.

3. For pesticides, all sources in times of travel below 25 years have been aggregated into the 25 column and sources in times of travel between 25 and 75 years have been aggregated into the 75 column

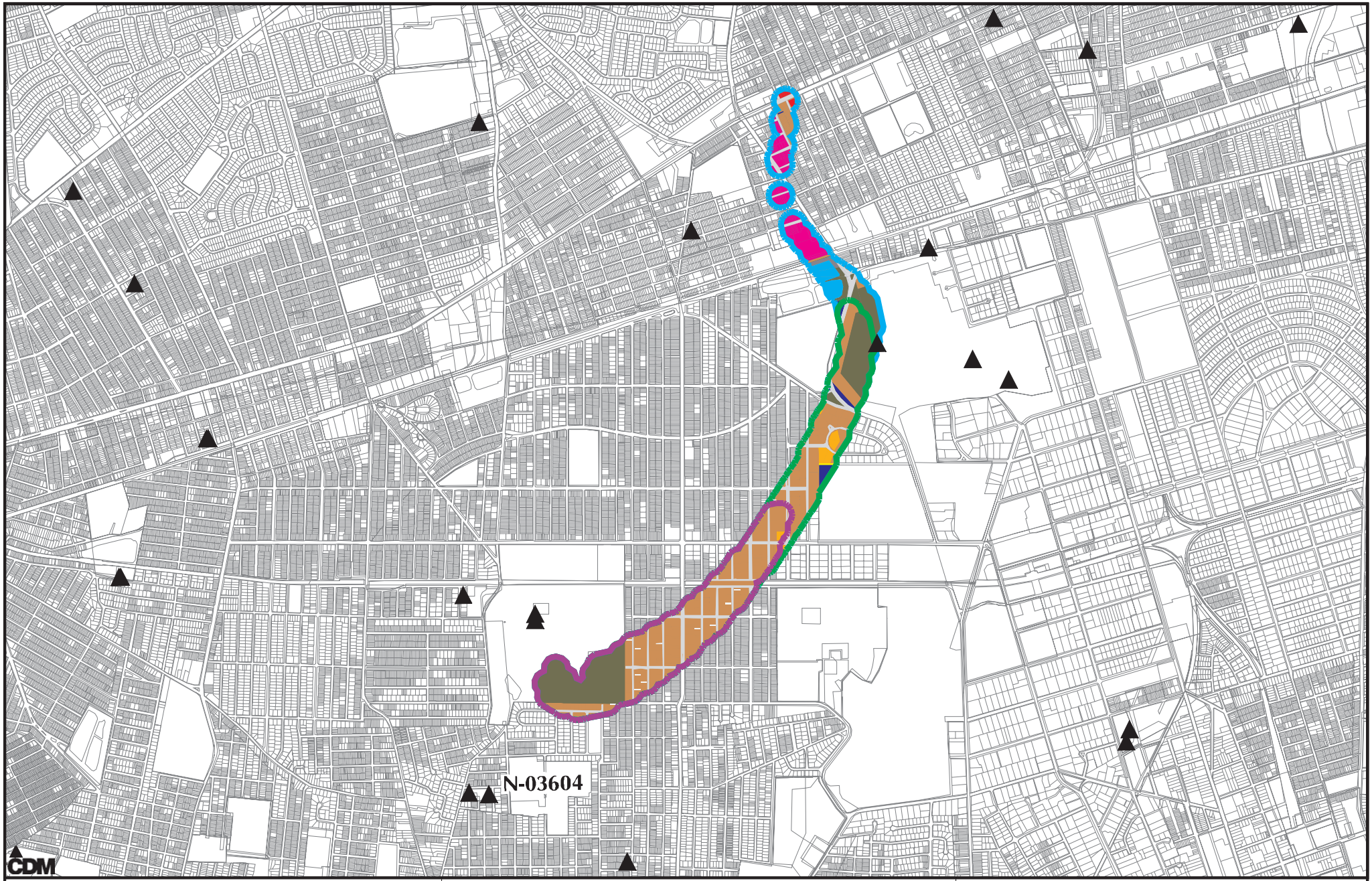
Owner (Purveyor): Franklin Square Water District
Owner's Well Designation (Local #): 2
Location (Site Name): Franklin Square Water District
Town: Hempstead
Screened Interval (MSL): -373 To -433
Aquifer: Magothy
Well Depth: 498
Simulated Pumping Rate (cfd): 28514.4
Minimum Time of Travel (Yrs): 31.1
Subgrids used in Model: cz_sg01e

Table N-03604-1: Land Use Summary

Land Use Type	Land Use Area (Acres) in Time Of Travel							
	2	5	25	50	75	100	Total	%
Commercial Sewered						1.11	1.11	0.6
High Density Residential Sewered				55.97	28.33	4.25	88.55	48.1
Industrial Sewered						14.70	14.70	8.0
Institutional Sewered					2.76	0.31	3.07	1.7
Low Density Residential Sewered					0.30		0.30	0.2
Medium Density Residential Sewered				0.66	2.77		3.44	1.9
Open Space				23.96	12.55	7.24	43.75	23.8
Surface Waters						4.18	4.18	2.3
Transportation				11.85	6.31	5.29	23.45	12.7
Utilities						0.81	0.81	0.4
Vacant				0.57	0.10	0.00	0.67	0.4
Totals				**93.01**	**53.13**	**37.90**	**184.04**	

Table N-03604-1A: Contaminant Prevalence Summary By Land Use

Contaminant Category	By Land Use				
	2	5	25	75	100
Nitrates					M
Pesticides				L	L
VOCs					L



Travel Time (Years)

- Two
- Five
- Twenty Five
- Fifty
- Seventy Five
- One Hundred

Land Use Classifications

- Low Density Residential
- Medium Density Residential
- High Density Residential
- Commercial
- Industrial
- Institutional
- Open Space
- Agricultural
- Vacant
- Transportation
- Utilities
- Waste Handling Mant.
- Surface Waters

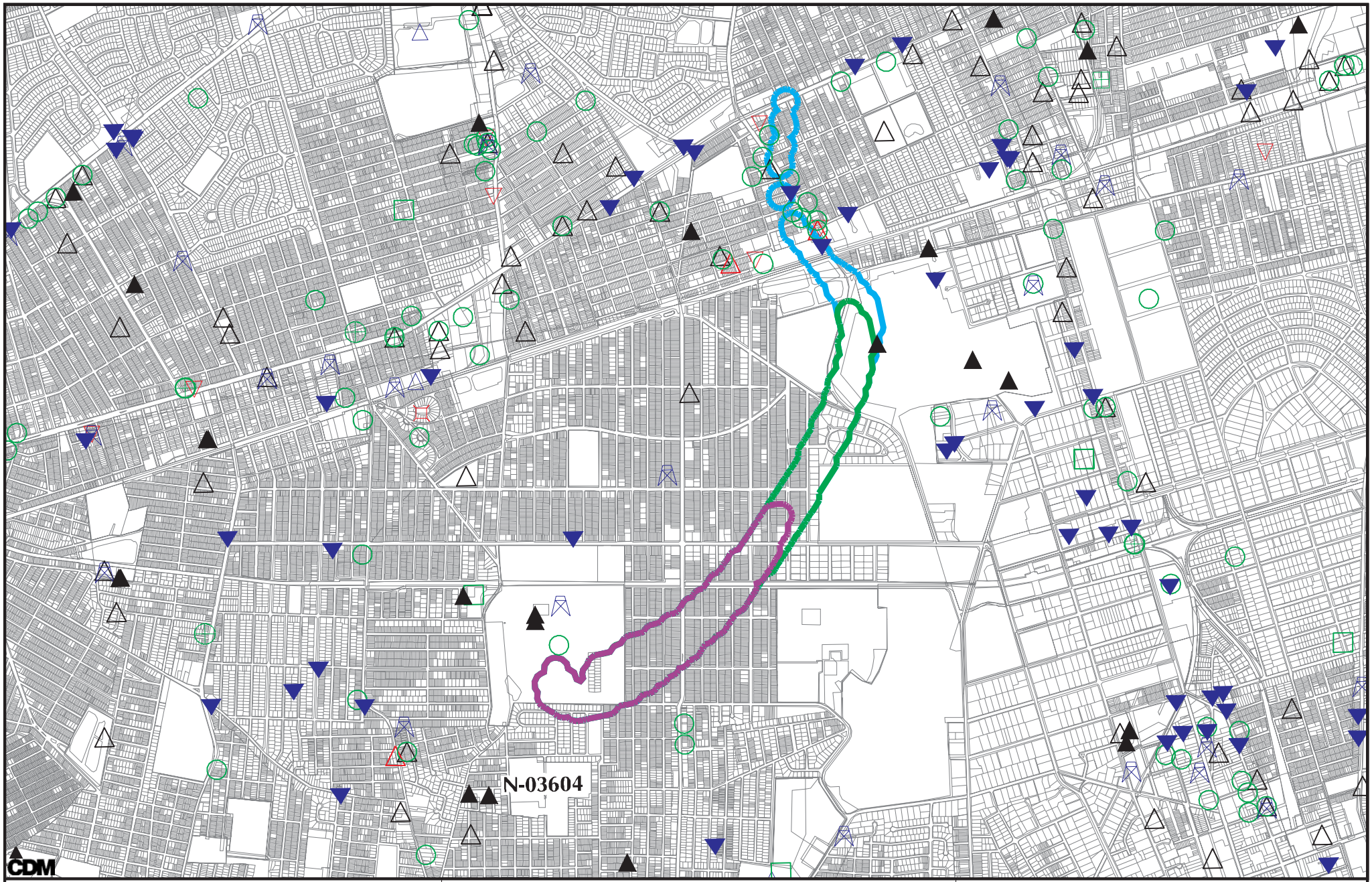
Contributing area to well number N-03604

- Lot Lines
- Public Supply Wells

1000 0 1000 Feet

N
W E
S

Map Date March 25, 2003



Travel Time (Years)

- Two
- Five
- Twenty Five
- Fifty
- Seventy Five
- One Hundred

Potential Point Sources

- Chemical Bulk Storage Facility
- CERCLA Facility
- Drycleaning Facility
- Hazardous Waste Site
- Landfill
- MOSF
- Other Type of Facility
- PCS Facility
- RCRA Facility
- SPDES / Denit Facility
- Spill Site
- Gas Station

Contributing area to well number N-03604

- Lot Lines
- Public Supply Wells

1000 0 1000 Feet

N
W E
S

Map Date April 11, 2003

Table N-03604-2: Potential Point Sources of Contamination

Source Type	# of Sources in Time Of Travel						
	2	5	25	50	75	100	Total
Chemical Bulk Storage Facility (County)						1	1
RCRA Facility						1	1
Spill Site						2	2
Totals						**4**	**4**

Table N-03604-2: Potential Point Sources of Contamination (Contd.)

Time Of Travel (Years): **100**

State ID #	Type	City	Zip
NYD982718827	RCRA	GARDEN CITY PARK	11040
8605497	Spill	HEMPSTEAD	11040
8100782	Spill	HEMPSTEAD	11040
NC-058087	CBSFC	GARDEN CTY PK	

Table N-03604-3: Contaminant Prevalence Summary

Contaminant Category	By Land Use					By Point Source					Combined				
	2	5	25	75	100	2	5	25	75	100	2	5	25	75	100
Nitrates					M					M					M
Pesticides				L	L				N	L				L	L
VOCs					L					H					H

Table N-03604-4: Well Sensitivity

Contaminant Category	Sensitivity				
	2	5	25	75	100
Microbials	H	M	L		
Nitrates					H
Pesticides			H	M	L
VOCs					H

Table N-03604-5A: Well Susceptibility Determination

Contaminant Category	Susceptibility				
	2	5	25	75	100
Microbials			L		
Nitrates					H
Pesticides				L	L
VOCs					VH

Table N-03604-5B: Well Susceptibility Summary

	Contaminant Category			
	Microbials	Nitrates	Pesticides	VOCs
Susceptibility	L	H	L	VH

Notes:

1. Values shown in the Time Of Travel 100 column for VOCs and Nitrates are aggregates for the entire area

2. For microbials, Contaminant Prevalence assessments do not include any land use or point sources in contributing areas greater than 25-years Time of Travel.

3. For pesticides, all sources in times of travel below 25 years have been aggregated into the 25 column and sources in times of travel between 25 and 75 years have been aggregated into the 75 column

ATTACHMENT C

24 JULY 2012 LETTER REPORT: PROPOSED REMEDIAL DESIGN MODIFICATION ANALYSIS, GROUNDWATER FLOW MODELING & FORECASTING, 150 FULTON AVENUE NPL SUPERFUND SITE - OPERABLE UNIT 1

29 MAY 2013 LETTER REPORT: PROPOSED REMEDIAL DESIGN MODIFICATION ANALYSIS, GROUNDWATER FLOW MODELING & PUMPAGE FORECASTING, 150 FULTON AVENUE NPL SUPERFUND SITE - OPERABLE UNIT 1

Environmental Resources Management

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Melville, NY 11747
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http://www.erm.com

24 July 2012
ERM Project No. 0097881

Mr. Kevin Willis
Remedial Project Manager – Fulton Avenue Superfund Site
New York Remediation Branch
United States Environmental Protection Agency, Region II
290 Broadway, 20th Floor
New York, NY 10007-1866

Re: Proposed Remedial Design Modification Analysis
Groundwater Flow Modeling & Forecasting
150 Fulton Avenue NPL Superfund Site - Operable Unit 1
USEPA Consent Judgment No. CV–09–3917
DOJ Ref. No. 90–11–2–09329
Garden City Park Industrial Site NYSDEC#130073

Dear Mr. Willis:

The purpose of this letter is to summarize the results of some additional evaluations that have been conducted as part of the ongoing Remedial Design (RD) for the selected remedy in EPA's Operable Unit 1 (OU1) Record of Decision (ROD) for the above-referenced site. These additional evaluations were completed in response to your request for an estimate of the expected duration of the selected remedy versus a modified remedial alternative in which the Incorporated Village of Garden City (VGC) public supply wells Nos. 13 and 14 are relied upon to contain and extract the Tetrachloroethene (PCE) - dominant portion (associated with 150 Fulton Avenue) of the larger regional plume.

As part of the RD, hydraulic testing was performed. This testing involved a shutdown of VGC Wells Nos. 9, 13 and 14 to establish baseline groundwater elevations in monitoring wells throughout the Upper Glacial and Magothy Aquifers. Once baseline conditions were achieved, the testing progressed to pumping of VGC Wells Nos. 9, 13 and 14 in various combinations for specified periods of time while simultaneously recording the response to groundwater elevations in the monitoring well network.

The results from the hydraulic testing were used to construct and calibrate a three-dimensional regional computer groundwater flow model. The model uses the United States Geological Survey's MODFLOW NWT code. MODFLOW is a three-dimensional finite-difference model that can account for heterogeneity, anisotropy and varying boundary conditions. MODFLOW NWT is a publicly available code, well documented and widely used in the private and public sectors. Aquaveo's Groundwater Modeling System (GMS) software was utilized for pre- and post-processing of model input and output. This software allowed ERM to utilize publically available GIS coverage's for a significant portion of the model inputs including, geologic data, hydrology, topography and cultural features.

Once calibration was complete, a number of scenarios were simulated to evaluate how the operation of VGC Wells Nos. 9, 13 and 14 affected the PCE-dominant portion of the plume. The purpose of the scenarios was to evaluate:

1) the ability of VGC Wells Nos. 13 and 14 to capture the PCE-dominant portion of the plume;
2) how seasonal operation of VGC Wells Nos. 13 and 14 for water supply affected plume capture; and,
3) whether the installation of recovery wells, contemplated in the OU1 ROD, resulted in a significant reduction in the duration of PCE-dominant impact to VGC Wells Nos. 13 and 14.

As indicated above, this letter is intended to summarize the results of the additional evaluations to further inform EPA's decision on whether to modify the selected remedy in the OU1 ROD. As more fully described below the results of the additional evaluations find:

- Groundwater flow modeling confirms that the current, seasonal operation of VGC Well Nos. 13 and 14, as a pair or VGC Well Nos. 9, 13 and 14 together, will capture of the PCE-dominant portion of the plume.
- Groundwater flow modeling estimates that VGC Well Nos. 13 and 14 could remain in non-pumping mode for >1,000 days (>3 years) before some portion of the plume might not be recovered by resumption of pumping.
- Current PCE concentration trends in VGC Nos. 13 and 14 could be expected to return PCE concentrations to pre-1997 levels in 4 to 17 years. Supplementing the ongoing operation of VCG Wells Nos. 13 and 14 with the installation and operation of two recovery wells could be expected accelerate the return to PCE concentrations to pre-1997 levels at the supply wells in 3 to 12 years.

A more detailed description of the methodology and supporting backup information used in development and calibration of the flow model would be included in the RD submission.

VCG Wells Influence on the PCE-dominant Portion of the Plume

The model was used to generate capture fields for all operating public supply wells in the study area using reverse particle tracks. Then particles of water, analogous to molecules of PCE moving through the aquifer system un-retarded, were tracked from within the three-dimensional footprint of the defined PCE-dominant portion of the plume from the 150 Fulton Property. These forward particle tracks illustrate the pathways that individual particles follow from a given location within the PCE-dominant portion of the plume to VGC Wells Nos. 13 and 14. These simulations were run for VGC Well Nos. 13 and 14 operating as a pair (VGC No. 9 off), and all three VGC Well Nos. 9, 13 and 14 operating together as they have been operated in recent years. In these simulations, all other supply wells within the study area, e.g., the Franklin Square and other VGC supply wells were operating based on historic operational records obtained from the Nassau County Department of Health (NCDOH).

The model output for the simulation run of VGC Well Nos. 13 and 14 operating together is graphically presented in Figure 1 and shows full capture of the PCE-dominant plume. As would be expected, the simulation run for VGC Well Nos. 9, 13

and 14 operating together also shows full capture of the PCE-dominant plume (Figure 2). These findings are consistent with the historic groundwater monitoring data set which confirms that the operation of VGC Well Nos. 13 and 14 effects full capture of the PCE-dominant portion of the plume.

VCG Wells No. 13 and 14 Seasonal Operation Influence on the PCE-dominant Portion of Plume

The primary objective of VGC Wells Nos. 13 and 14 normal operations are to supply potable water to the community. Hence, seasonal water demand influences the operational frequency of these wells. In the course of operation, VGC Wells Nos. 13 and 14 also capture the PCE-dominant plume, as well as a portion of the regional Trichloroethene (TCE)-dominant plume. However, if VGC Wells Nos. 13 and 14 are to be relied upon as the primary mechanism for capture of the PCE-dominant portion of the plume, an analysis of how the frequency of seasonal operations might influence plume capture is required.

To evaluate how seasonal operations of VGC Wells Nos. 13 and 14 might influence capture of the PCE-dominant plume, the model was used to simulate the time it would take for a particle of water within the plume to move past VGC Wells Nos. 13 and 14 under non-pumping conditions and be unable to be recovered during a resumption of pumping. Based on the forward particle track simulations, it is estimated that VGC Well Nos. 13 and 14 could be off for >1,000 days before some portion of the plume would be unable to be recovered by resumption of pumping[1].

Operational records for VGC Well Nos. 9, 13, and 14 for the last 5 years (i.e., 2007 – 2011) indicate all three wells are operated year-round. However, it is clear that Well No. 13 is pumped most heavily year-round to meet demand while Well Nos. 9 and 14 are pumped to supplement demand as needed and especially during the warmer months of the year. As discussed above, the capture field/particle track simulations clearly indicate that operating VGC Well Nos. 13 and 14 or VGC Well Nos. 9, 13, and 14 together enable full capture of the PCE-dominant portion of the plume. Hence, it can be concluded that even during the seasonal minimum in pumping (i.e., when VGC Well Nos. 9 and 14 are pumped less), full capture of the PCE-dominant portion of the plume can be expected when these wells are operated as they have been in the recent past.

PCE-dominant Plume Impact: VCG Wells Nos. 13 and 14 Only vs. VGC Wells Nos. 13 and 14 with New Recovery Wells

The duration of PCE-dominant portion of the plume impacts to VGC Wells Nos. 13 and 14 under a scenario with and without additional recovery wells was evaluated in two steps.

The first step considered the trend in PCE concentration at VGC Wells Nos. 13 and 14 since the recorded peak value in 2007. The observed trend in PCE concentration in these two supply wells has been downward since that time. Hence, it was subject to a

[1] Historic pumping records for VGC Well Nos. 13 & 14 indicate that since 1988, the longest time period that Wells 13 & 14 were not operated was six months (~180 days) in 2007 during construction of a second air stripper and installation of the granular activated carbon(GAC) treatment equipment. Since 1968, the only other significant non-operational periods were all of 1988 (~365 days) for Well No. 14 and a four-month period in early 1989 (~120 days) for Well No. 13.

statistical evaluation to predict the potential time frame before the PCE concentration would return to pre-1997 levels.[2] The analysis found that the downward trend in VCG Wells Nos. 13 and 14 were significant (see discussion around Table 2 below). It also assumes that the observed downward trend in PCE concentration in VGC Wells Nos. 13 and 14 over the last five years will continue into the future.

Evaluation of Current PCE Concentration Trend

The statistical evaluation of the PCE concentration trend in VGC Wells Nos. 13 and 14 was comprised of three components: 1) characterize pre-1997 PCE concentrations; 2) characterize post-July 2007 PCE concentrations; and, 3) forecast the time expected for PCE concentrations to return to pre-1997 levels. These three components were all based on the reported concentrations of PCE measured at VGC Wells Nos. 13 and 14 from 1977 to January 2012 and are shown in Figures 3 and 4, respectively.

Pre-1997 PCE Concentration

PCE concentrations measured prior to January 1997 at VGC Wells Nos. 13 and 14 were comparable to PCE concentrations measured in supply wells in other areas of the regional aquifer unaffected by 150 Fulton Avenue.[3] Figures 5 and 6 show pre-1997 PCE concentrations vs. time for VGC Wells Nos. 13 and 14, respectively.

Descriptive statistics for PCE concentrations measured at VGC Wells Nos. 13 and 14 prior to January 1997 were calculated using USEPA's ProUCL v. 4.01.00 (statistical software) and are shown in Table 1. Mean pre-1997 PCE concentrations[4] are 1.43 µg/L and 6.01 µg/L for VGC Wells Nos. 13 and 14, respectively. These mean concentrations were used to characterize pre-1997 baseline concentrations for PCE.

An upper bound (95 percent {%} upper confidence limit or 95 UCL) was also calculated as an alternative value (to the mean) to represent baseline concentrations.[5] Given the relatively small difference between the mean and 95 UCL as compared to the variability observed in the predictive trend models, the mean was selected to represent baseline concentrations as it is a readily understandable and widely recognized metric.

Post-July 2007 PCE Concentration

PCE concentrations measured after to 2007 July included the highest PCE concentrations measured at VGC Wells Nos. 13 and 14. Plots of post-2007 PCE concentrations as a function of time (date) for VGC Wells Nos. 13 and 14 are shown in Figures 7 and 8, respectively.

---

[2] The FS (July 2006) suggested that the trend in PCE concentration in VGC Wells Nos. 13 and 14 indicated an arrival of the PCE dominant plume around 2000. However, subsequent evaluation of PCE concentrations in regional supply wells unaffected by 150 Fulton Avenue would suggest a slightly earlier arrival time of 1997.

[3] Based on historic PCE concentrations in: a) New Hyde Park Well No. 57 (N-07649); b) Mineola Well No. 4 (N-03185); and Garden City Well No. 12 (N-05163), located west, northeast and east-northeast of 150 Fulton Avenue, respectively.

[4] USEPA strongly recommends avoiding the use of the ½-detection limit (DL/2) method for estimation and hypothesis testing approaches used in environmental applications. Hence, estimates of mean PCE concentrations were calculated using the Kaplan-Meier method that adjusts for non-detected (left-censored) data.

[5] If the future observation is a member (with a probability of 0.95) of the existing pre-1997 baseline dataset, then it should have a value less than or equal to the 95UCL.

Simple linear regression (SLR) analyses for post- July 2007 concentrations (PCE concentrations vs. time) were used to characterize current trends in PCE concentrations at VGC Wells Nos. 13 and 14. SLR analyses found that decreasing trends in PCE concentrations observed for each well were statistically significant (see Signif < 0.05 in Table 2).

The coefficient of determination (r^2) is a measure (proportion) of the variability in PCE concentrations that is explained by the model. As seen in Figures 7 and 8, the regression model explains 31% and 42% of the variation observed in PCE concentrations at VGC Wells Nos. 13 and 14, respectively. These r^2 suggest that a large percentage of the variability observed in PCE concentrations are not explained using these models. To visualize the predictive uncertainty of these models, lower and upper 95% confidence limits on predicted PCE concentrations are also shown in these figures.

Time Forecast to Return to Pre-1997 PCE Concentrations

Post- July 2007 trends were used to determine whether/when PCE concentrations would return to pre-1997 baseline concentrations. Post- July 2007 linear regression models were used to extrapolate/predict PCE concentrations at future dates. The results are shown in Figures 9 and 10 for VGC Wells Nos. 13 and 14, respectively (extrapolations are indicated as dashed lines).

Based on the linear regression graphs shown in Figures 9 and 10, continued operation of the supply wells in a manner similar to the last five years would be predicted to return to pre-1997 baseline PCE concentrations between:

- 2020 (Q3) and 2029 (Q3) for VGC Well No. 13 (A total of 17 years); and
- 2013 (Q4) and 2016 (Q16) for VGC Well No. 14 (A total of 4 years).

It is important to note that though linear regression models are commonly relied upon, straight-forward to understand, and generally provide comparable coefficient of determination (r^2) values as non-linear model alternatives, attenuation of concentrations is frequently observed to move toward an asymptote with time. Hence, predicted returns to baseline concentrations should be used with care and re-evaluated as new data become available. Nevertheless, this linear regression analysis is useful to evaluate whether the installation of recovery wells would result in a significant reduction in the duration of PCE-dominant impact to VGC Well Nos. 13 and 14. This is because: 1) non-linear regression analysis did not provide a better explanation of OCE variability; and, 2) any asymptotic effect in concentrations would be similarly observed in recovery well operations.

Particle Simulation of PCE VGC Supply Wells with and without New Recovery Wells Evaluation of Current PCE Concentration Trend

The second step in evaluating whether the installation of recovery wells would result in a significant reduction in the duration of PCE-dominant impact to VGC Wells Nos. 13 and 14 uses the groundwater flow model to estimate the: 1) time for a particle of water to move from the 150 Fulton Avenue property to VGC Wells Nos. 13 and 14; and 2) time required for particles of water within the PCE-dominant portion of the plume present in both the Upper Glacial and Magothy aquifers, as depicted in the RI/FS, to

be recovered by VGC Wells Nos. 13 and 14 alone or in combination with new recovery wells. Since particles of water are not correlated to PCE concentrations, the objective of this evaluation was simply to determine a ratio of particles of water being removed with both the supply and recovery wells than with the supply wells alone. This ratio was then used to forecast the proportional change in the time frame required to reduce the of PCE-dominant impact to VGC Wells Nos. 13 and 14.

Scenario No. 1 is shown in Figure 1 and depicts a backward particle flow from VGC Wells Nos. 13 and 14 toward 150 Fulton Avenue to depict the capture zone of these wells. Forward particle tracks are overlain on the defined PCE-dominant portion of the plume to illustrate the pathways that individual particles follow from a given location within the PCE-dominant portion of the plume to VGC Wells Nos. 13 and 14.

Scenario No. 2 is shown in Figure 2 and represents capture of the particles of water within the defined, vertical and horizontal portions of the PCE-dominant plume with VGC Well Nos. 9, 13 & 14 operating together, as they have been operated in recent years. Additionally, this scenario assumes supply wells in Garden City Park and Franklin Square are also operating.

Scenario No. 3 is shown in Figure 11 and is the same as Scenario No. 2 except that two recovery wells are also removing particles from the effected aquifer. These two recovery wells operate at 250 gallons per minute (gpm) each (a combined recovery of 500 gpm).

Duration Estimate

The above evaluation indicates that based on a linear regression analysis using actual PCE influent data to VGC Wells Nos. 13 and 14 over the last five years, the residual PCE concentrations would be expected to return to pre-1997 levels between 2016 and 2029. This represents the projected duration of 4 to 17 years under a remedial scenario without recovery wells.

The installation and operation of two recovery wells, in addition to continued operation of VGC Wells Nos. 13 and 14 could be expected to accelerate the return to pre-1997 levels by 28% resulting in a projected duration of 3 to 12 years under a remedial scenario with recovery wells (i.e., multiplying the time frames derived from the linear regression analysis by 72%).[6]

[6] The 28% acceleration of removal of the PCE-dominant impacts when using recovery wells in conjunction with VGC Wells Nos. 13 and 14 was based on a modeled flow (i.e., not concentration) evaluation that evaluated the relative efficiency of extracting particles of water under the operational scenario of VGC Wells Nos. 13 and 14 only, as well as in conjunction with two new recovery wells. Since the particles of water are not directly correlated with concentration, the percent acceleration was used to calculate a "best case" improvement in the forecasted time frame of PCE reduction based on the linear regression analysis in Step 1.

Summary

In summary, the evaluations presented herein yield several key findings:

- Groundwater modeling simulations based on empirical data (i.e., pumping rates that are inclusive of seasonal variations) will enable full capture of the PCE-dominant portion of the plume when VGC Wells Nos. 13 and 14 operate normally.
- Based on the forward particle track simulations, it is estimated that VGC Well Nos. 13 and 14 could remain in a non-pumping condition for >1,000 days before some portion of the plume would be unable to be recovered by resumption of pumping.
- A linear regression of the current PCE concentration suggests that under current operating conditions, VGC Well Nos. 13 & 14 could be expected to return PCE concentrations to pre-1997 levels in 4 to 17 years.
- Installation and operation of two recovery wells can be expected to accelerate the removal of PCE dominant impacts by approximately 28%, thereby reducing the expected duration of a remedial scenario in which only VGC Wells Nos. 13 and 14 to return PCE concentrations to pre-1997 levels from 4 to 17 years to 3 to 12 years.

We look forward to your review of the enclosed information and a subsequent meeting to discuss next steps. If you should you have any questions or wish to discuss the content of the documents, please do not hesitate to call us at (631) 756-8900.

Sincerely,

Chris W. Wenczel
Principal Consultant

James A. Perazzo
Principal

cc: Douglas Fischer, USEPA
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Roger Sisson, Esq., Genesco Inc.
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Richard Humann, P.E., H2M
Robert J. Mangan, Incorporated Village of Garden City
Frank Koch, Incorporated Village of Garden City

TABLES

Table 1. Pre-1997 PCE Concentrations: Descriptive Statistics for Wells D-13 and D-14

Well	N	#NDs	%NDs	Detected Concentrations						Distrib	KM Mean	95UCL KM Mean
				Min	Max	Median	Mean	std dev	CV			
DW-13	103	25	24%	0.50	6.7	1.45	1.72	1.11	65%	nonparam	1.43	1.63
DW-14	107	11	10%	0.50	22	6.65	6.64	3.73	56%	nonparam	6.01	6.68

USEPA ProUCL v. 4.01.00 was used to calculate descriptive statistics

Notes:

KM mean = mean using Kaplan-Meier method to account for non-detected values

95UCL = 95 upper confidence limit on the mean using Kaplan-Meier method to account for non-detected values

Table 2. Results of Simple Linear Regression Analysis

(a) VGC Well No. 13

	df	*SS*	*MS*	*F*	*Signif*
Model	1	189464	189464	21	0.000042
Residual	45	414128	9203		
Total	46	603592			

(b) VGC Well No. 14

	df	*SS*	*MS*	*F*	*Signif*
Model	1	401659	401659	31	0.0000018
Residual	42	548361	13056		
Total	43	950020			

Notes:

df = *degrees of freedom*
SS = *sums of squares*
MS = *mean sums of squares*
F = *F statistic*
Signif = *significance or p-value*

FIGURES



LEGEND

- TRICHLOROETHENE (TCE)– DOMINANT PLUME TOTAL VOLATILE ORGANIC CONCENTRATION GREATER THAN 100 ug/l
- TETRACHLOROETHENE (PCE)– DOMINANT PLUME TOTAL VOLATILE ORGANIC CONCENTRATION GREATER THAN 100 ug/l
- CIS 1, 2 DICHLOROETHENE– DOMINANT PLUME TOTAL VOLATILE ORGANIC CONCENTRATION GREATER THAN 100 ug/l
- 10 ug/l CONTOUR LINE
- 100 ug/l CONTOUR LINE
- 1,000 ug/l CONTOUR LINE
- VGC WELL 13 CAPTURE ZONE
- VGC WELL 14 CAPTURE ZONE
- PCE–DOMINANT PLUME PARTICLES CAPTURED BY VGC WELL NOS. 13 & 14

NOTE: THE AREAL EXTENT OF CHLORINATED VOLATILE ORGANIC COMPOUNDS DEPICTED IN THIS FIGURE IS BASED ON THE MAXIMUM CONCENTRATIONS DETECTED IN GROUND WATER SAMPLES OBTAINED FROM VERTICAL PROFILE TEMPORARY WELLS INSTALLED DURING 1999 – 2000, AND PERMANENT WELLS DURING SEPTEMBER 2001 – MAY 2005.

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GRAPHIC SCALE IN FEET

TITLE

GROUNDWATER FLOW MODEL OUTPUT VGC SUPPLY WELL NOS. 13 & 14 26-YEAR CAPTURE ZONES & PCE-DOMINANT PLUME PARTICLE TRACKS

PREPARED FOR

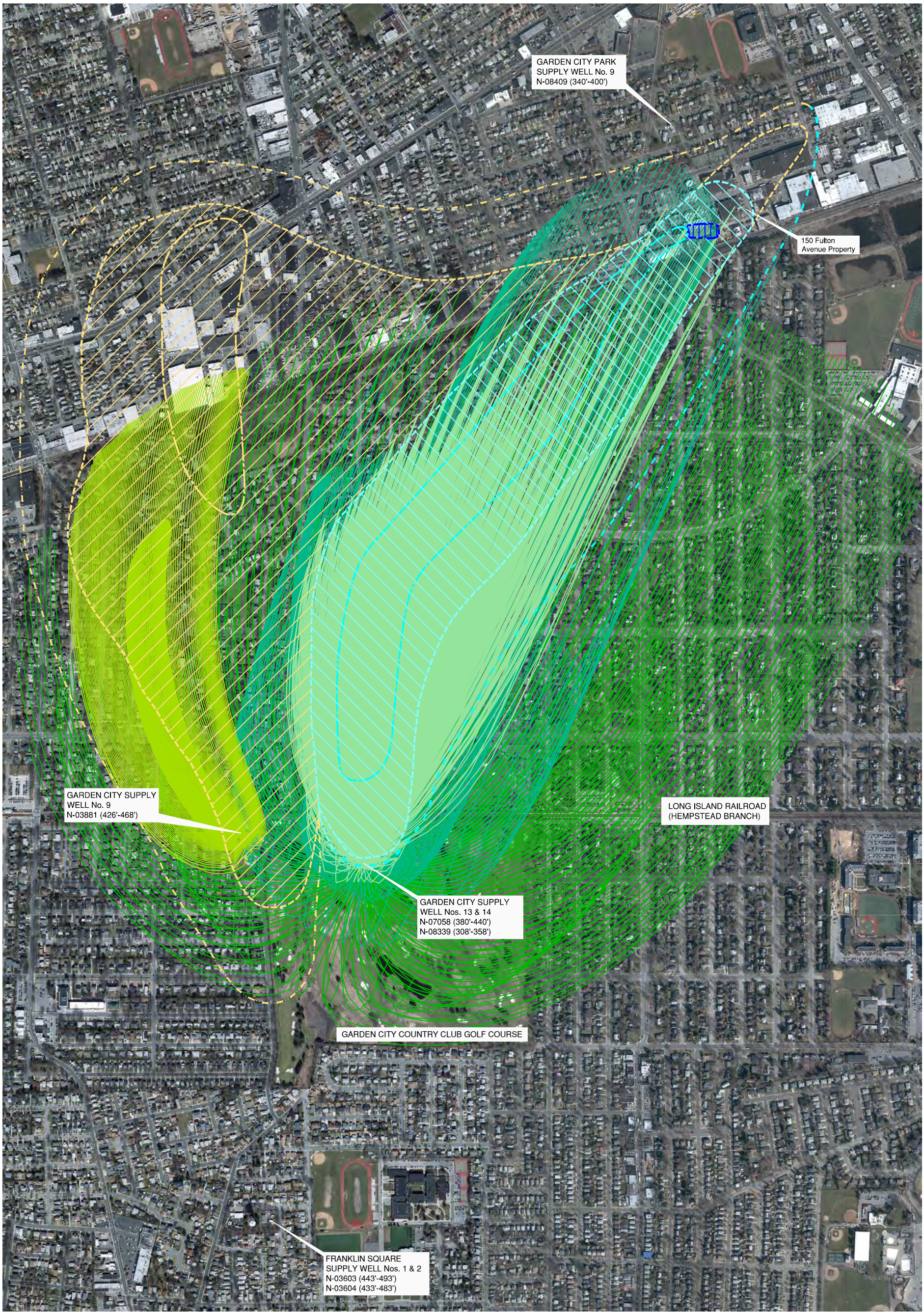
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FIGURE 1

DRAWN BY	SCALE	DATE	JOB NO.
MAW/CWW	AS SHOWN	07/23/2012	0097881.0008

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LEGEND

- TRICHLOROETHENE (TCE)– DOMINANT PLUME TOTAL VOLATILE ORGANIC CONCENTRATION GREATER THAN 100 ug/l
- TETRACHLOROETHENE (PCE)– DOMINANT PLUME TOTAL VOLATILE ORGANIC CONCENTRATION GREATER THAN 100 ug/l
- CIS 1, 2 DICHLOROETHENE– DOMINANT PLUME TOTAL VOLATILE ORGANIC CONCENTRATION GREATER THAN 100 ug/l
- 10 ug/l CONTOUR LINE
- 100 ug/l CONTOUR LINE
- 1,000 ug/l CONTOUR LINE
- VGC WELL 09 CAPTURE ZONE
- VGC WELL 13 CAPTURE ZONE
- VGC WELL 14 CAPTURE ZONE
- PCE–DOMINANT PLUME PARTICLES CAPTURED BY VGC WELL NOS. 13 & 14

NOTE: THE AREAL EXTENT OF CHLORINATED VOLATILE ORGANIC COMPOUNDS DEPICTED IN THIS FIGURE IS BASED ON THE MAXIMUM CONCENTRATIONS DETECTED IN GROUND WATER SAMPLES OBTAINED FROM VERTICAL PROFILE TEMPORARY WELLS INSTALLED DURING 1999 – 2000, AND PERMANENT WELLS DURING SEPTEMBER 2001 – MAY 2005.

0 800 1600

GRAPHIC SCALE IN FEET

TITLE

GROUNDWATER FLOW MODEL OUTPUT VGC SUPPLY WELL NOS. 9, 13 & 14 26-YEAR CAPTURE ZONES & PCE-DOMINANT PLUME PARTICLE TRACKS

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FIGURE 2

DRAWN BY	SCALE	DATE	JOB NO.
MAW/CWW	AS SHOWN	07/23/2012	0097881.0008

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Figure 3: VGC Well No. 13 - PCE Concentrations from 1977 to 2012

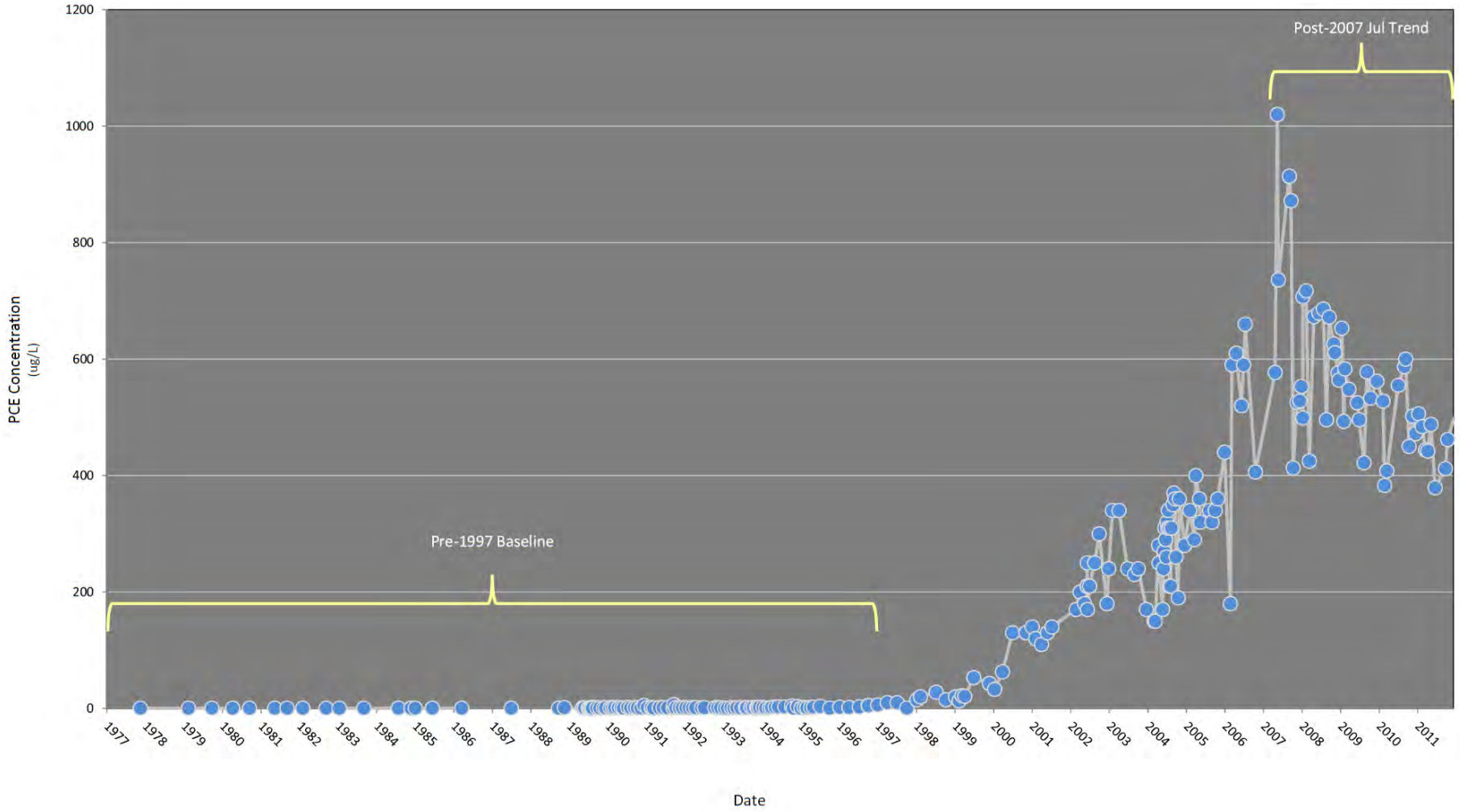


Figure 4: VGC Well No. 14 - PCE Concentrations from 1977 to 2012

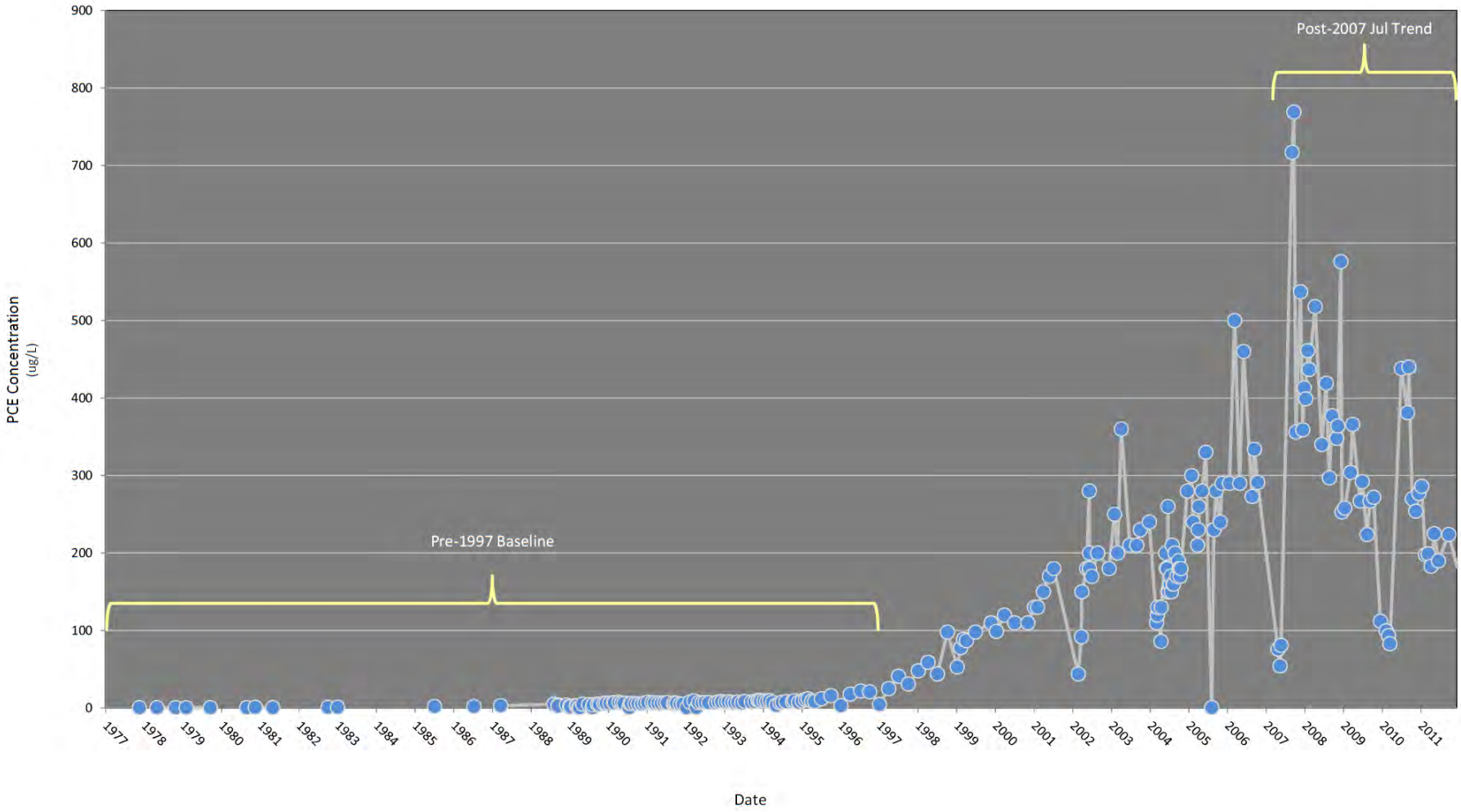


Figure 5: VGC Well No. 13 - Pre-1997 PCE Concentrations

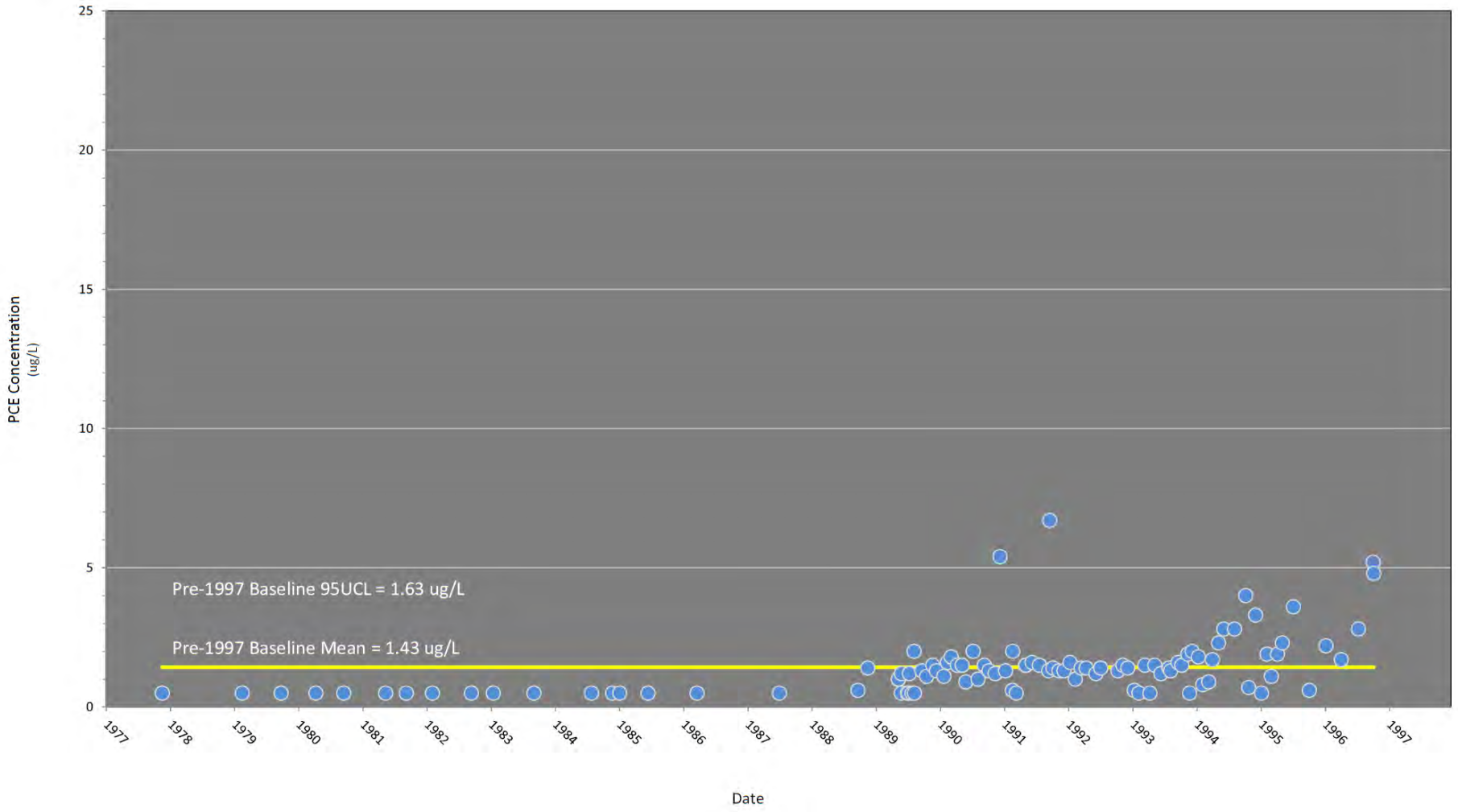


Figure 6: VGC Well No. 14 - Pre-1997 PCE Concentrations

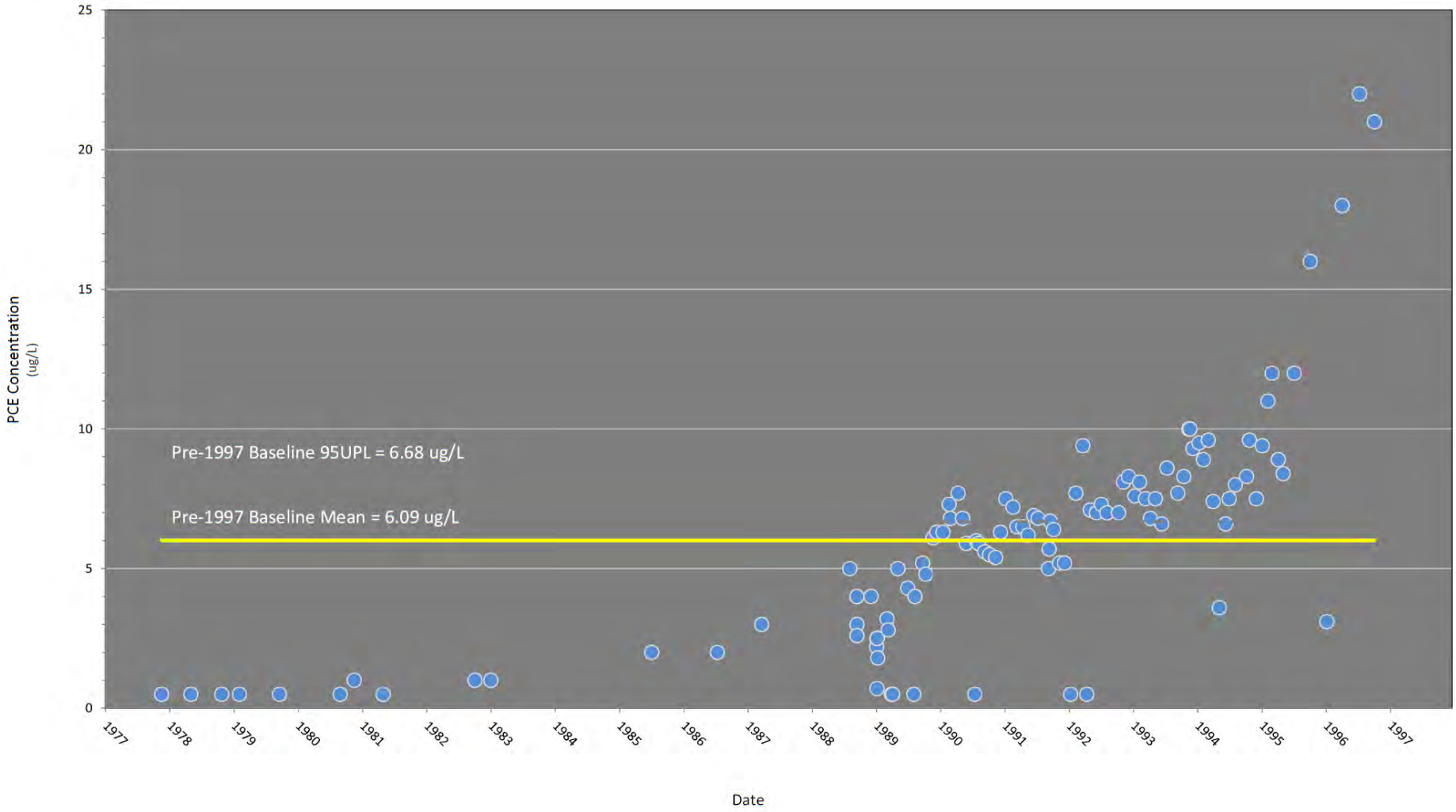


Figure 7: VGC Well No. 13 - Post-2007 July PCE Concentrations

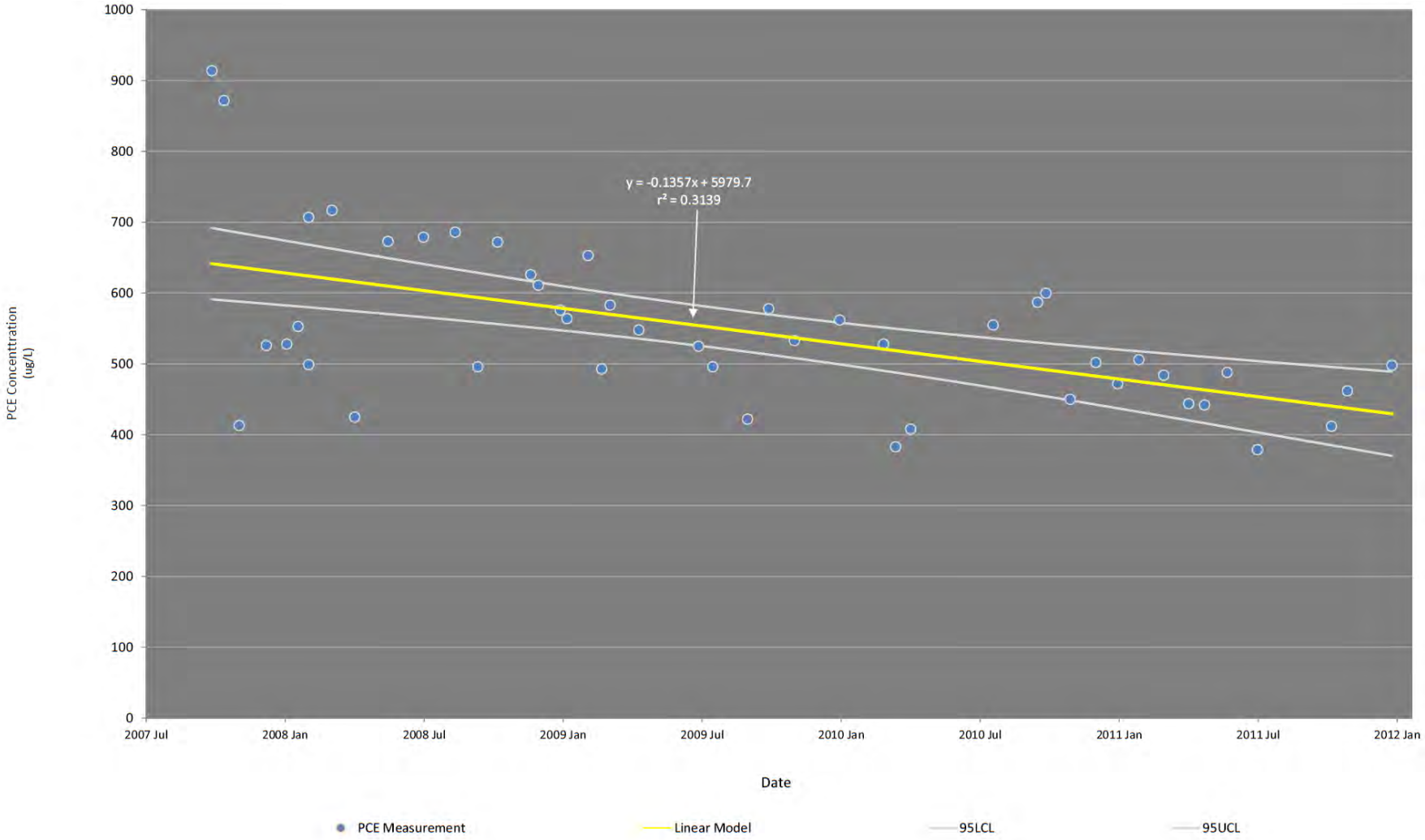


Figure 8: VGC Well No. 14 - Post-2007 July PCE Concentrations

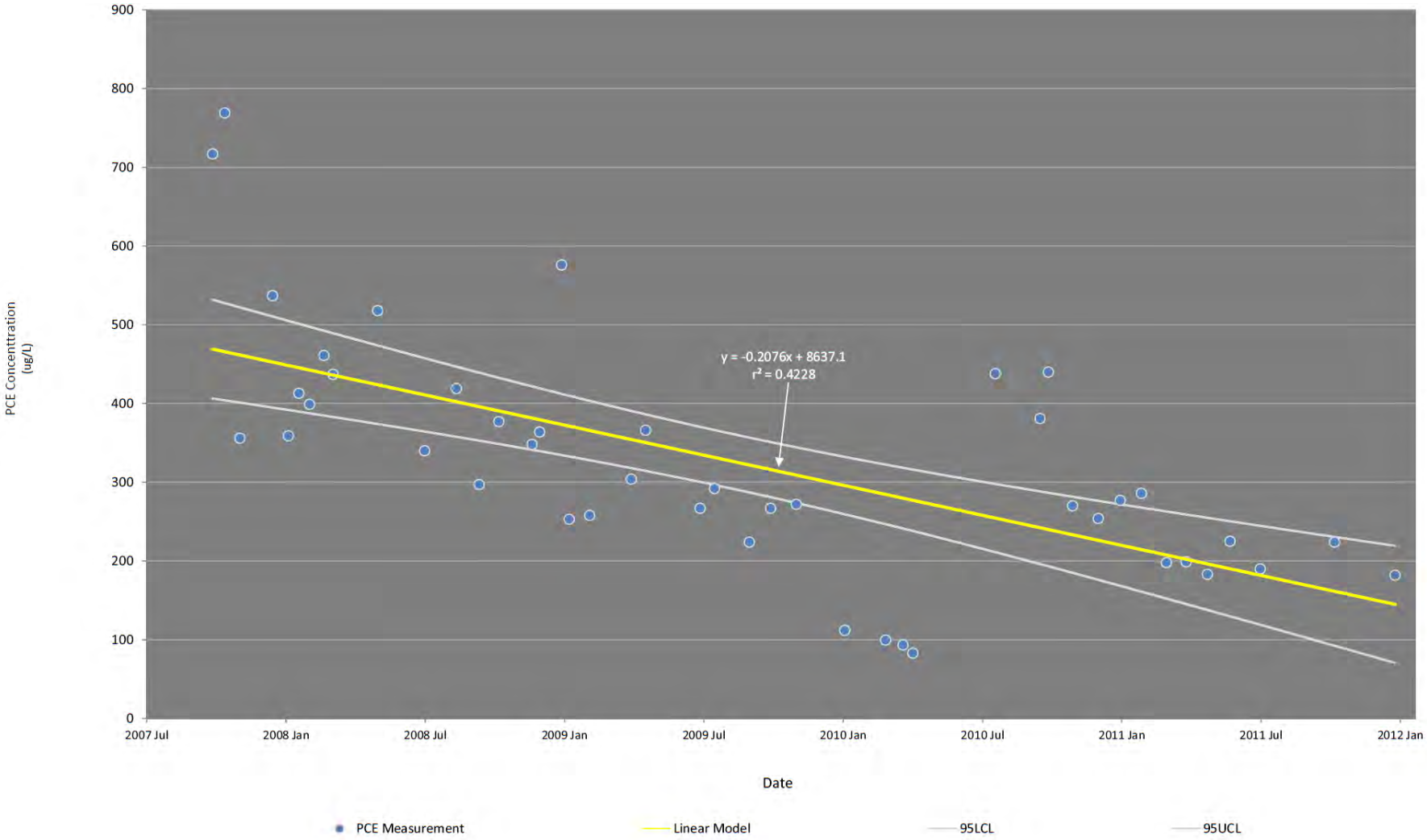


Figure 9: VGC Well No. 13 - Predicted PCE Concentrations
(extrapolations are indicated by dashed lines)

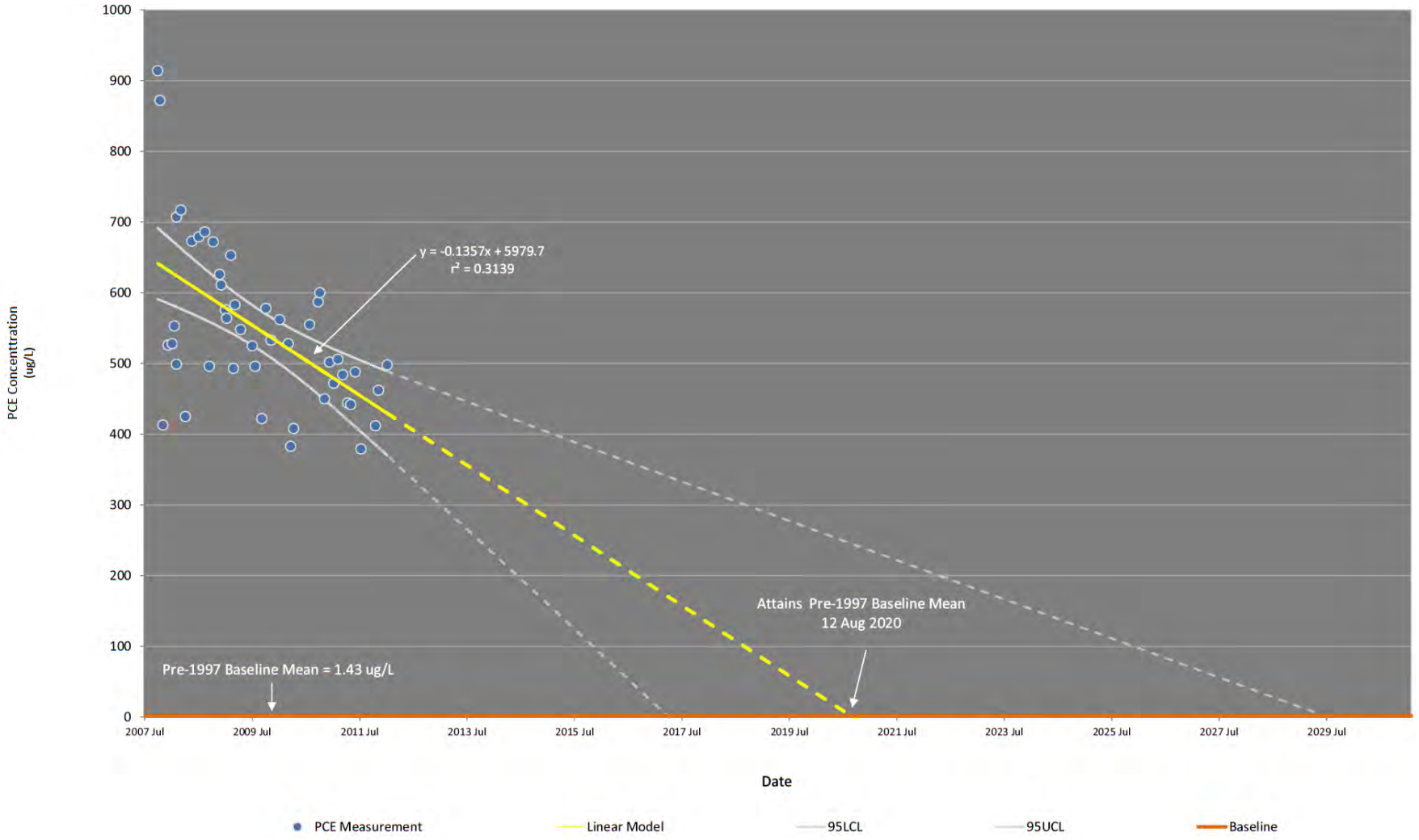
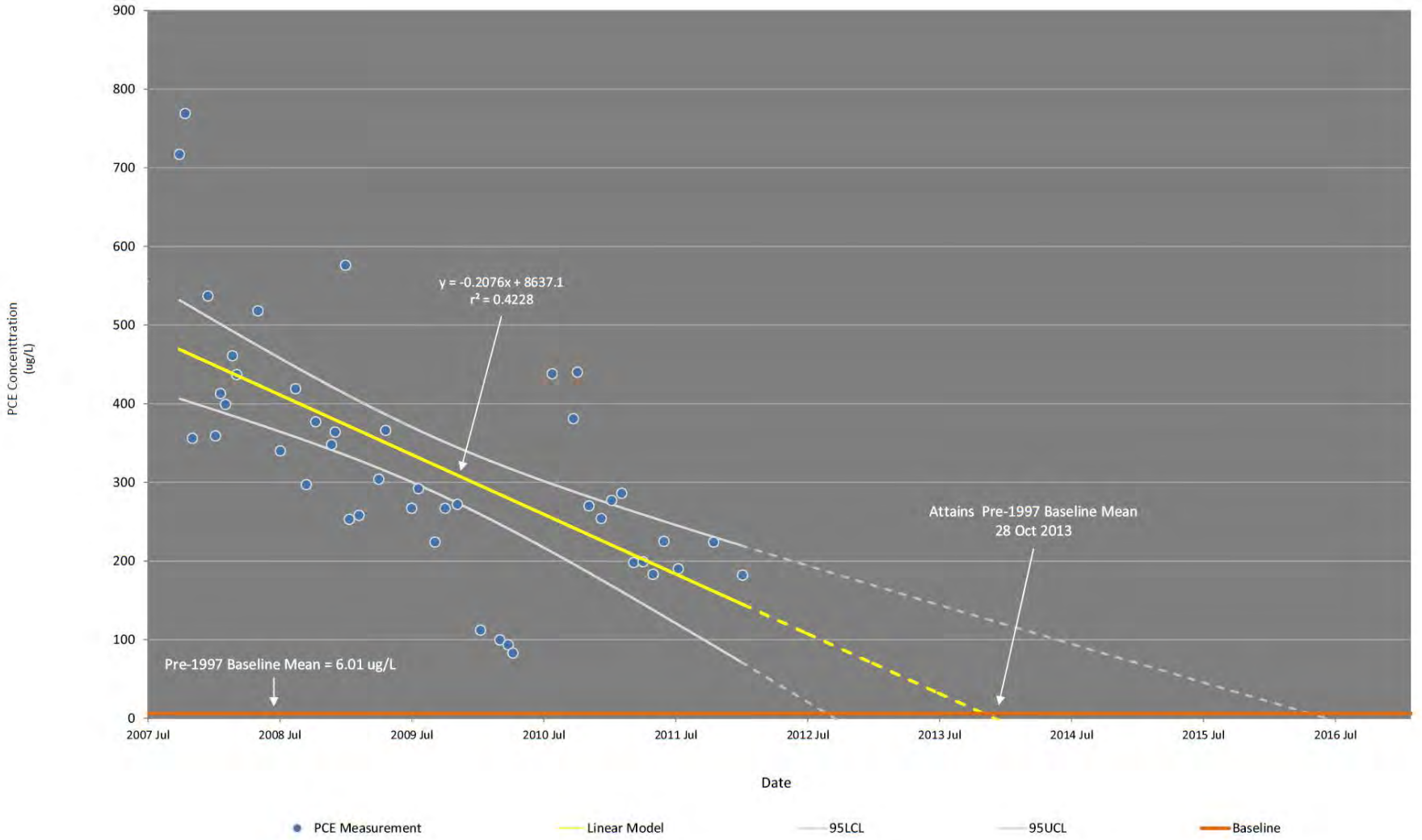
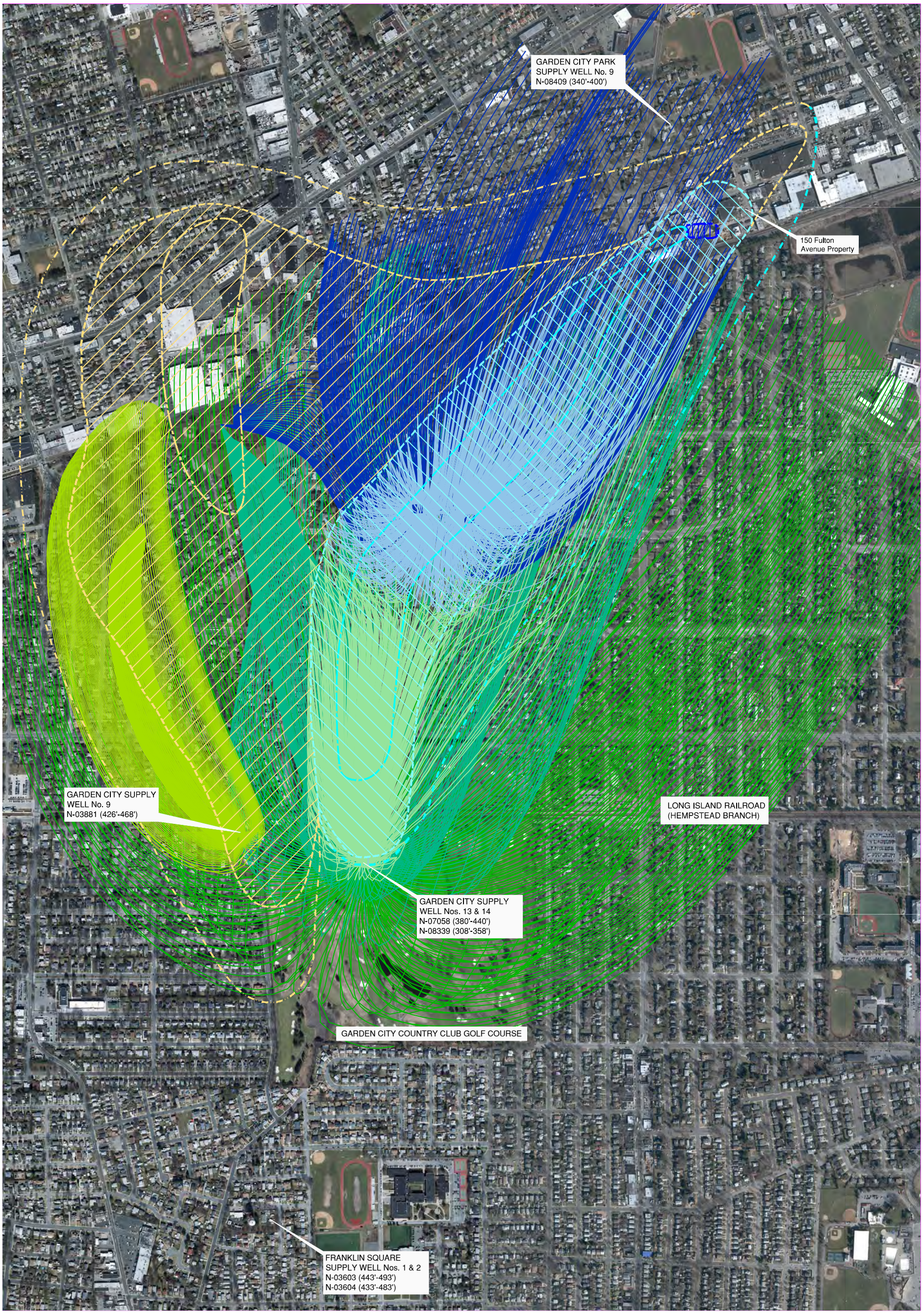


Figure 10: VGC Well No. 14 - Predicted PCE Concentrations

(extrapolations are indicated by dashed lines)





LEGEND

- TRICHLOROETHENE (TCE)– DOMINANT PLUME TOTAL VOLATILE ORGANIC CONCENTRATION GREATER THAN 100 ug/l
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- VGC WELL 13 CAPTURE ZONE
- VGC WELL 14 CAPTURE ZONE
- PROPOSED RW–01 CAPTURE ZONE
- PROPOSED RW–02 CAPTURE ZONE
- PCE–DOMINANT PLUME PARTICLES CAPTURED BY RECOVERY WELLS
- PCE–DOMINANT PLUME PARTICLES CAPTURED BY VGC WELL NOS. 13 &14

NOTE: THE AREAL EXTENT OF CHLORINATED VOLATILE ORGANIC COMPOUNDS DEPICTED IN THIS FIGURE IS BASED ON THE MAXIMUM CONCENTRATIONS DETECTED IN GROUND WATER SAMPLES OBTAINED FROM VERTICAL PROFILE TEMPORARY WELLS INSTALLED DURING 1999 – 2000, AND PERMANENT WELLS DURING SEPTEMBER 2001 – MAY 2005.

0 800 1600

GRAPHIC SCALE IN FEET

TITLE

GROUNDWATER FLOW MODEL OUTPUT VGC SUPPLY WELL NOS. 9, 13 & 14 AND RECOVERY WELL NOS. 1 & 2 26-YEAR CAPTURE ZONES & PCE-DOMINANT PLUME PARTICLE TRACKS

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FIGURE 11

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29 May 2013
ERM Project No. 0097881

Mr. Kevin Willis
Remedial Project Manager – Fulton Avenue Superfund Site
New York Remediation Branch
United States Environmental Protection Agency, Region II
290 Broadway, 20th Floor
New York, NY 10007-1866

Re: Proposed Remedial Design Modification Analysis
Groundwater Flow Modeling & Pumpage Forecasting
150 Fulton Avenue NPL Superfund Site - Operable Unit 1
USEPA Consent Judgment No. CV–09–3917
DOJ Ref. No. 90–11–2–09329
Garden City Park Industrial Site NYSDEC#130073

Dear Mr. Willis:

This letter is a follow-up to the 8 May 2013 meeting and is intended to summarize the results of the groundwater flow modeling and evaluations to further inform EPA's decision on whether to modify the selected remedy in EPA's Operable Unit 1 (OU1) Record of Decision (ROD) for the above-referenced site.

These evaluations were completed in response to EPA's requests for additional information regarding the proposed Modified Remedial Alternative, some of which were previously summarized in our letter of 24 July 2012, and most recently pertaining to certain operational conditions necessary to ensure that the Incorporated Village of Garden City (VGC) public supply wells Nos. 13 and 14 continue to contain and extract the OU1 plume (Tetrachloroethene {PCE} dominant) associated with 150 Fulton Avenue[1].

Details of the groundwater flow modeling simulations and evaluations are presented in Attachment A. In summary, the groundwater flow modeling simulations and evaluations thereof discussed herein yield several key findings:

- Simulations based on empirical data (i.e., pumping rates that are inclusive of seasonal variations) confirm that the current, normal operation of VGC Well No. 13-alone or VGC Well Nos. 13 and 14 as a pair will ensure full capture of the OU1 plume.
- VGC Wells Nos. 13 and 14 will continue to contain and extract the OU1 plume if there is a minimum combined groundwater withdrawal (pumpage) of 290,000,000 gallons per year from VGC Well Nos. 13 and 14, with at least 139,500,000 gallons per year from VGC No. 13[2].

1 As defined in the 2005 Remedial Investigation Report.

2 For reference, this is only 40% of the actual average combined annual groundwater withdrawal for VGC Well Nos. 13 & 14 during the last 5 years (2008 – 2012) which was approximately 730,000,000 gallons per year with approximately 450,000,0`00 gallons per year coming from VGC No. 13. The minimum withdrawal of 139,500,00 gallons per year from VGC No. 13 is only 31% of the actual average annual groundwater withdrawal from this well during the same time period.

- VGC Well Nos. 13 and 14 could remain in non-pumping mode (equipment failure/service activities, etc.) for >1 year before some portion of the OU1 plume that migrated past the wells might not be recovered upon resumption of pumping[3].

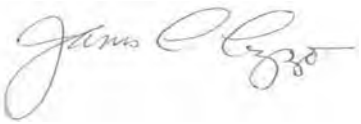
Therefore, a performance standard which requires a minimum combined annual groundwater withdrawal (pumpage) of 290,000,000 gallons per year combined from VGC Well Nos. 13 and 14, with a minimum pumpage of at least 139,500,000 gallons per year from VGC No. 13 will ensure that VGC Wells Nos. 13 and 14 continue to contain and extract the OU1 plume. Furthermore, VGC Well Nos. 13 and 14 could be shut down due to equipment failure and/or required service activities for >1year before some portion of the OU1 plume that migrated past the wells might not be recovered upon resumption of pumping.

We look forward to your review of the enclosed information and a subsequent meeting to discuss next steps. If you should you have any questions or wish to discuss the content of the documents, please do not hesitate to call us at (631) 756-8900.

Sincerely,



Chris W. Wenczel
Principal Consultant



James A. Perazzo
Principal

cc: Douglas Fischer, USEPA
Sal Badalamenti, USEPA
Robert Kambic, USDOJ
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John Swartwout, NYSDEC
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James Periconi, Esq., Periconi, LLC
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David Yudelson, Esq., Sive, Paget & Riesel P.C.
Richard Humann, P.E., H2M
Robert J. Mangan, Incorporated Village of Garden City
Frank Koch, Incorporated Village of Garden City

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[3] Historic pumping records for VGC Well Nos. 13 & 14 indicate that since 1988, the longest time period that Wells 13 & 14 were not operated was six months (~180 days) in 2007 during construction of a second air stripper and installation of the granular activated carbon(GAC) treatment equipment. Since 1968, the only other significant non-operational periods were all of 1988 (~365 days) for Well No. 14 and a four-month period in early 1989 (~120 days) for Well No. 13. Based on the forward particle track simulations discussed in Attachement 1, it is estimated that VGC Well Nos. 13 and 14 could be off for >1,000 days (2.7 years) before some portion of the plume would be unable to be recovered by resumption of pumping.that demonstrated.

ATTACHMENT 1

Environmental Resources Management

Details Of Groundwater Flow Modeling & Forecasting For Proposed Remedial Design Modification Analysis
150 Fulton Avenue NPL Superfund Site - Operable Unit 1

Background

As part of the OU1 Remedial Design (RD), hydraulic testing was performed in early 2012. This testing involved a shutdown of VGC Wells Nos. 9, 13 and 14 to establish baseline groundwater elevations in monitoring wells throughout the Upper Glacial and Magothy Aquifers. Once baseline conditions were achieved, the testing progressed to pumping of VGC Wells Nos. 9, 13 and 14 in various combinations for specified periods of time while simultaneously recording groundwater elevation response in the monitoring well network to the pumping.

The results from the hydraulic testing were used in conjunction with regional groundwater elevation data obtained from United States Geological Survey (USGS) to construct and calibrate a three-dimensional regional computer groundwater flow model. The model uses the USGS' MODFLOW-NWT code. MODFLOW is a three-dimensional finite-difference model that can account for heterogeneity, anisotropy and varying boundary conditions. MODFLOW NWT is publicly available, well documented and widely used in both the private and public sectors. Aquaveo's Groundwater Modeling System (GMS) software was utilized for pre- and post-processing of model input and output. This software allowed ERM to utilize publically available GIS coverage's for a significant portion of the model inputs including, geologic data, hydrology, topography and cultural features.

Once calibration was complete, a number of scenarios were simulated to evaluate how the operation of VGC Wells Nos. 9, 13 and 14 affected the OU1 plume. More fully explained below, these scenarios were intended to:

1) Evaluate the ability of VGC Wells Nos. 13 and 14 to capture the OU1 plume;
2) Consider how seasonal variations in operation of VGC Wells Nos. 13 and 14 for water supply may affect plume capture;
3) Estimate the minimum annual groundwater withdrawal (pumpage) necessary to ensure that VGC Wells Nos. 13 and 14 continue to contain and extract the OU1 plume; and
4) Estimate how long that VGC Well Nos. 13 and 14 could remain in non-pumping mode (equipment failure/service activities, etc.) before some portion of the OU1 plume might not be recovered upon resumption of pumping.

VGC Wells Influence on the OU1 Plume

The model was used to generate capture fields for all operating public supply wells in the study area using reverse particle tracks. Groundwater withdrawals assigned to each public supply well in the model were based on historic operational records obtained from the Nassau County Department of Health (NCDOH). Then particles of water, analogous to molecules of PCE moving through the aquifer system un-retarded, were tracked from within the three-dimensional footprint of the defined OU1 plume from the 150 Fulton Property. These forward particle tracks illustrate the pathways that individual particles follow from a given location within the OU1 plume to VGC Wells Nos. 13 and 14.

ATTACHMENT 1

Details Of Groundwater Flow Modeling & Forecasting For Proposed Remedial Design Modification Analysis
150 Fulton Avenue NPL Superfund Site - Operable Unit 1

These simulations were run for VGC Well No. 13 operating alone (VGC Nos. 9 and 14 off), VGC Well Nos. 13 and 14 operating as a pair (VGC No. 9 off), and all three VGC Well Nos. 9, 13 and 14 operating together as they have been operated in recent years which included seasonal. In these simulations, all other supply wells within the study area, e.g., the Franklin Square and other VGC supply wells were operating based on historic operational records obtained from the Nassau County Department of Health (NCDOH).

The model output for the simulation run of VGC Well No. 13 operating alone is graphically presented in Figure 1 and shows full capture of the PCE-dominant plume. As would be expected, the simulation runs for VGC Well Nos. 13 and 14 operating together, as well as VGC Well Nos. 9, 13 and 14 operating together also show full capture of the PCE-dominant plume, shown in Figures 2 and 3, respectively. These findings are consistent with the historic groundwater monitoring data set which confirms that the operation of VGC Well Nos. 13 and 14 effects full capture of the OU1 plume.

VGC Wells No. 13 and 14 Seasonal Operation Influence on the PCE-dominant Portion of Plume

The primary objective of VGC Wells Nos. 13 and 14 normal operations are to supply potable water to the community. Hence, seasonal water demand influences the operational frequency of these wells. In the course of operation, VGC Wells Nos. 13 and 14 also capture the PCE-dominant plume, as well as a portion of the regional Trichloroethene (TCE)-dominant plume. Because a modified remedy would rely on VGC Wells Nos. 13 and 14 as the primary mechanism for capture of the OU1 plume, we also considered how the frequency of seasonal operations might influence plume capture.

Operational records for VGC Well Nos. 9, 13, and 14 for the last 5 years (i.e., 2007 – 2011) indicate all three wells are operated year-round. However, it is clear that Well No. 13 is pumped most heavily year-round to meet demand while Well Nos. 9 and 14 are pumped to supplement demand as needed and especially during the warmer months of the year.

As discussed above, the capture field/particle track simulations clearly indicate that operating VGC Well No. 13-alone, VGC Well Nos. 13 and 14 or VGC Well Nos. 9, 13, and 14 together enable full capture of the OU1 plume. In developing those simulations, groundwater withdrawals were assigned to each public supply well in the model based on historic operational records which inherently included seasonality in the records, and the simulation run of VGC Well No. 13 operating alone shows full capture of the PCE-dominant plume. Hence, it can be concluded that even during the seasonal minimum in pumping (i.e., when VGC Well Nos. 9 and 14 are pumped less), full capture of the OU1 plume can be expected when these wells are operated as they have been in the recent past.

ATTACHMENT 1

Details Of Groundwater Flow Modeling & Forecasting For Proposed Remedial Design Modification Analysis
150 Fulton Avenue NPL Superfund Site - Operable Unit 1

Revised Modeling Scenario: Operational Conditions Required To Ensure Capture of the PCE-dominant Portion of Plume by VGC Wells No. 13 and 14

A revised modeling scenario was constructed in order to more directly evaluate the operational conditions necessary to ensure complete capture of the PCE –dominant portion of the plume by the VGC Wells Nos. 13 and 14. This scenario was specifically designed to:

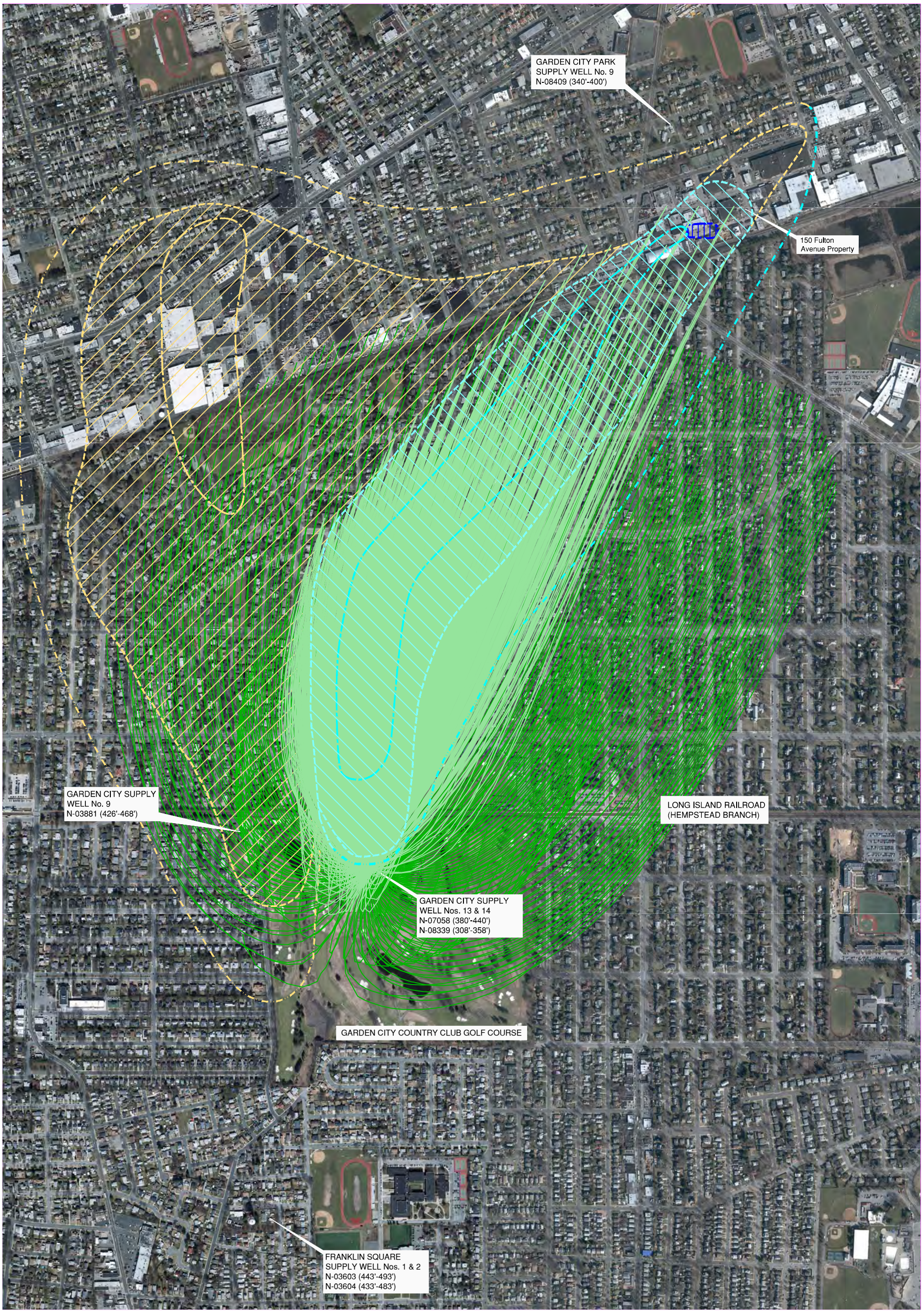
- Estimate the minimum annual groundwater withdrawal (pumpage) necessary to ensure that VGC Wells Nos. 13 and 14 continue to contain and extract the PCE - dominant portion of the plume; and
- Estimate how long VGC Well Nos. 13 and 14 could remain in non-pumping mode (equipment failure/service activities, etc.) before some portion of the OU1 plume might not be recovered upon resumption of pumping[4].

The updated model was run under transient pumping conditions where VGC Wells Nos. 13 and 14 were simulated to be out of service for 1,000 days before beginning to pump. The model then continued to run for an additional 25 years. The withdrawal rates for all of the local supply wells were chosen in order to approximate a reasonable worst-case scenario and are summarized below:

Well		Groundwater Withdrawal Rate (gal/year)		
NC Name	Local Name	0 To 1,000 Days	1,000 Days To 25 Years	Description/Information Source
N-03881	VGC-9	0	0	Worst Case - Completely Shutdown
N-07058	VGC-13	0	-139,292,399	Recent Historical Minimum - 2007
N-08339	VGC-14	0	-149,732,501	Recent Historical Minimum - 2004
N-05163	VGC-12	-3,058,999	-3,058,999	Recent Historical Maximum - 2009
N-08409	GCP-9	-13,058,999	-13,058,999	Recent Historical Maximum - 2009
N-03603	FS-1	-189,279,999	-189,279,999	Recent Historical Maximum - 2002
N-03604	FS-2	-146,027,700	-146,027,700	Recent Historical Maximum - 2002

During the simulation, hypothetical particles of water were tracked from within the three-dimensional footprint of the OU1 plume in order to approximate un-retarded molecules of PCE moving through the aquifer system. These particle tracks are graphically presented in Figure 4 and show full capture of the PCE-dominant plume. Based on the forward particle track simulations, it is estimated that VGC Well Nos. 13 and 14 could be off for >1,000 days before some portion of the plume would be unable to be recovered by resumption of pumping.

[4] Historic pumping records for VGC Well Nos. 13 & 14 indicate that since 1988, the longest time period that Wells 13 & 14 were not operated was six months (~180 days) in 2007 during construction of a second air stripper and installation of the granular activated carbon(GAC) treatment equipment. Since 1968, the only other significant non-operational periods were all of 1988 (~365 days) for Well No. 14 and a four-month period in early 1989 (~120 days) for Well No. 13.



LEGEND

- TRICHLOROETHENE (TCE)– DOMINANT PLUME TOTAL VOLATILE ORGANIC CONCENTRATION GREATER THAN 100 ug/l
- TETRACHLOROETHENE (PCE)– DOMINANT PLUME TOTAL VOLATILE ORGANIC CONCENTRATION GREATER THAN 100 ug/l
- CIS 1, 2 DICHLOROETHENE– DOMINANT PLUME TOTAL VOLATILE ORGANIC CONCENTRATION GREATER THAN 100 ug/l
- 10 ug/l CONTOUR LINE
- 100 ug/l CONTOUR LINE
- 1,000 ug/l CONTOUR LINE
- VGC WELL 13 CAPTURE ZONE
- PCE–DOMINANT PLUME PARTICLES CAPTURED BY VGC WELL NO. 13

NOTE: THE AREAL EXTENT OF CHLORINATED VOLATILE ORGANIC COMPOUNDS DEPICTED IN THIS FIGURE IS BASED ON THE MAXIMUM CONCENTRATIONS DETECTED IN GROUND WATER SAMPLES OBTAINED FROM VERTICAL PROFILE TEMPORARY WELLS INSTALLED DURING 1999 – 2000, AND PERMANENT WELLS DURING SEPTEMBER 2001 – MAY 2005.

0 800 1600

GRAPHIC SCALE IN FEET

TITLE

GROUNDWATER FLOW MODEL OUTPUT VGC SUPPLY WELL NO. 13-ONLY 26-YEAR CAPTURE ZONE & PCE-DOMINANT PLUME PARTICLE TRACK

PREPARED FOR

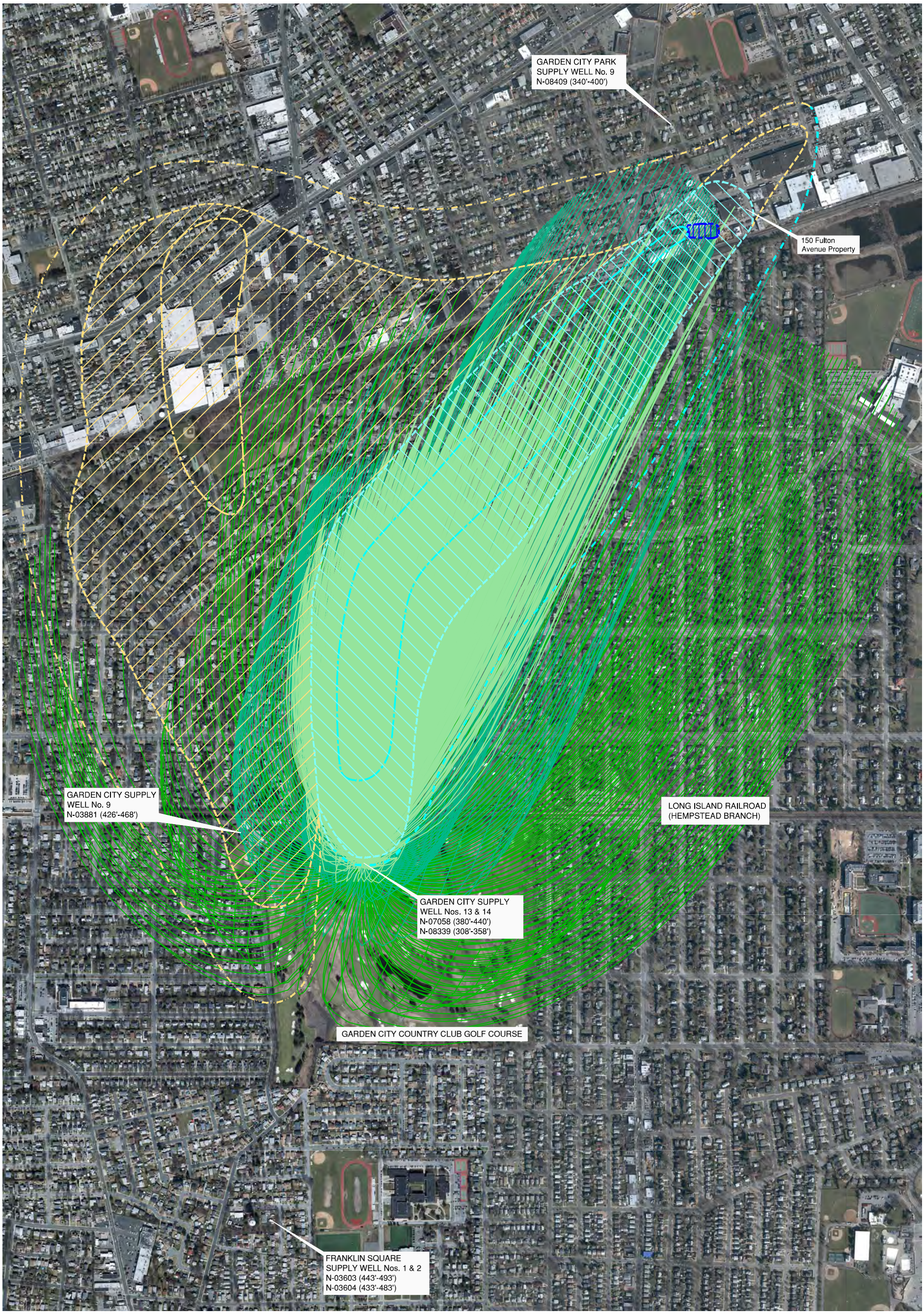
GENESCO INC.

Environmental Resources Management

FIGURE 1

DRAWN BY	SCALE	DATE	JOB NO.
MAW/CWW	AS SHOWN	05/15/2013	0097881.0008

R:\Scout\Projects\GENESCO\150 Fulton Avenue, NY\CAD\2012 Groundwater Modeling\2012 Model\2012-07 Memo - Figures\Draft\2013-05 Memo - Figure 1 - v01 (26YR-13 Only).dwg (05/29/2013 - 12:46pm Melville)



LEGEND

- TRICHLOROETHENE (TCE)– DOMINANT PLUME TOTAL VOLATILE ORGANIC CONCENTRATION GREATER THAN 100 ug/l
- TETRACHLOROETHENE (PCE)– DOMINANT PLUME TOTAL VOLATILE ORGANIC CONCENTRATION GREATER THAN 100 ug/l
- CIS 1, 2 DICHLOROETHENE– DOMINANT PLUME TOTAL VOLATILE ORGANIC CONCENTRATION GREATER THAN 100 ug/l
- 10 ug/l CONTOUR LINE
- 100 ug/l CONTOUR LINE
- 1,000 ug/l CONTOUR LINE
- VGC WELL 13 CAPTURE ZONE
- VGC WELL 14 CAPTURE ZONE
- PCE–DOMINANT PLUME PARTICLES CAPTURED BY VGC WELL NOS. 13 & 14

NOTE: THE AREAL EXTENT OF CHLORINATED VOLATILE ORGANIC COMPOUNDS DEPICTED IN THIS FIGURE IS BASED ON THE MAXIMUM CONCENTRATIONS DETECTED IN GROUND WATER SAMPLES OBTAINED FROM VERTICAL PROFILE TEMPORARY WELLS INSTALLED DURING 1999 – 2000, AND PERMANENT WELLS DURING SEPTEMBER 2001 – MAY 2005.

0 800 1600

GRAPHIC SCALE IN FEET

TITLE

GROUNDWATER FLOW MODEL OUTPUT VGC SUPPLY WELL NOS. 13 & 14 26-YEAR CAPTURE ZONES & PCE-DOMINANT PLUME PARTICLE TRACKS

PREPARED FOR

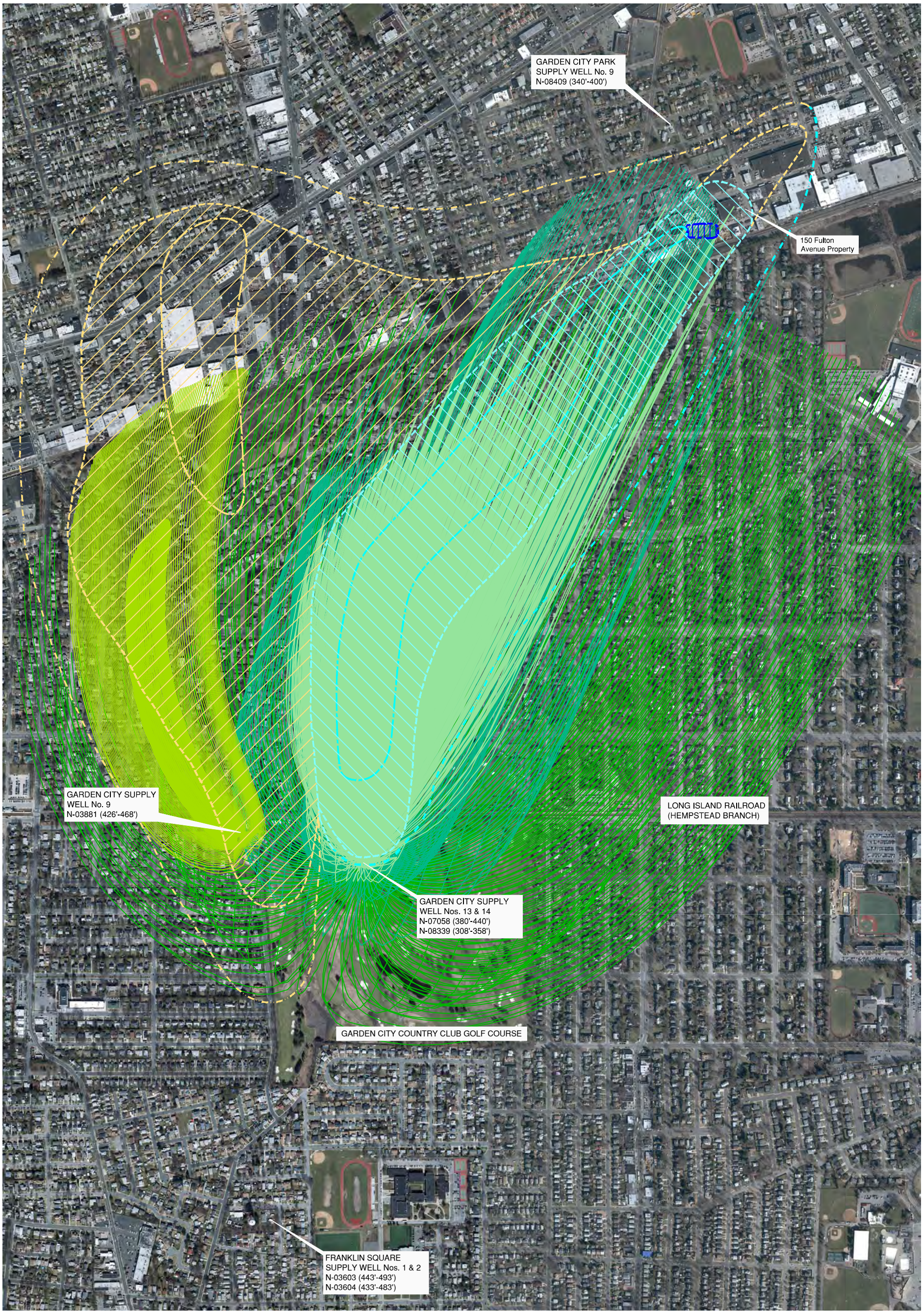
GENESCO INC.

Environmental Resources Management

FIGURE 2

DRAWN BY	SCALE	DATE	JOB NO.
MAW/CWW	AS SHOWN	05/15/2013	0097881.0008

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LEGEND

- TRICHLOROETHENE (TCE)– DOMINANT PLUME TOTAL VOLATILE ORGANIC CONCENTRATION GREATER THAN 100 ug/l
- TETRACHLOROETHENE (PCE)– DOMINANT PLUME TOTAL VOLATILE ORGANIC CONCENTRATION GREATER THAN 100 ug/l
- CIS 1, 2 DICHLOROETHENE– DOMINANT PLUME TOTAL VOLATILE ORGANIC CONCENTRATION GREATER THAN 100 ug/l
- 10 ug/l CONTOUR LINE
- 100 ug/l CONTOUR LINE
- 1,000 ug/l CONTOUR LINE
- VGC WELL 09 CAPTURE ZONE
- VGC WELL 13 CAPTURE ZONE
- VGC WELL 14 CAPTURE ZONE
- PCE–DOMINANT PLUME PARTICLES CAPTURED BY VGC WELL NOS. 13 & 14

NOTE: THE AREAL EXTENT OF CHLORINATED VOLATILE ORGANIC COMPOUNDS DEPICTED IN THIS FIGURE IS BASED ON THE MAXIMUM CONCENTRATIONS DETECTED IN GROUND WATER SAMPLES OBTAINED FROM VERTICAL PROFILE TEMPORARY WELLS INSTALLED DURING 1999 – 2000, AND PERMANENT WELLS DURING SEPTEMBER 2001 – MAY 2005.

0 800 1600

GRAPHIC SCALE IN FEET

TITLE

GROUNDWATER FLOW MODEL OUTPUT VGC SUPPLY WELL NOS. 9, 13 & 14 26-YEAR CAPTURE ZONES & PCE-DOMINANT PLUME PARTICLE TRACKS

PREPARED FOR

GENESCO INC.

Environmental Resources Management

FIGURE 3

DRAWN BY	SCALE	DATE	JOB NO.
MAW/CWW	AS SHOWN	05/15/2013	0097881.0008

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GARDEN CITY PARK
SUPPLY WELL No. 9
N-08409 (340'-400')

150 Fulton
Avenue Property

GARDEN CITY SUPPLY
WELL No. 9
N-03881 (426'-468')

GARDEN CITY SUPPLY
WELL Nos. 13 & 14
N-07058 (380'-440')
N-08339 (308'-358')

LONG ISLAND RAILROAD
(HEMPSTEAD BRANCH)

GARDEN CITY COUNTRY CLUB GOLF COURSE

FRANKLIN SQUARE
SUPPLY WELL Nos. 1 & 2
N-03603 (443'-493')
N-03604 (433'-483')

LEGEND

- TRICHLOROETHENE (TCE)– DOMINANT PLUME TOTAL VOLATILE ORGANIC CONCENTRATION GREATER THAN 100 ug/l
- TETRACHLOROETHENE (PCE)– DOMINANT PLUME TOTAL VOLATILE ORGANIC CONCENTRATION GREATER THAN 100 ug/l
- CIS 1, 2 DICHLOROETHENE– DOMINANT PLUME TOTAL VOLATILE ORGANIC CONCENTRATION GREATER THAN 100 ug/l
- 10 ug/l CONTOUR LINE
- 100 ug/l CONTOUR LINE
- 1,000 ug/l CONTOUR LINE
- VGC WELL 13 CAPTURE ZONE
- VGC WELL 14 CAPTURE ZONE
- PCE–DOMINANT PLUME PARTICLES CAPTURED BY VGC WELL NOS. 13 & 14

NOTE: THE AREAL EXTENT OF CHLORINATED VOLATILE ORGANIC COMPOUNDS DEPICTED IN THIS FIGURE IS BASED ON THE MAXIMUM CONCENTRATIONS DETECTED IN GROUND WATER SAMPLES OBTAINED FROM VERTICAL PROFILE TEMPORARY WELLS INSTALLED DURING 1999 – 2000, AND PERMANENT WELLS DURING SEPTEMBER 2001 – MAY 2005.

0 800 1600
GRAPHIC SCALE IN FEET

TITLE
GROUNDWATER FLOW MODEL OUTPUT
VGC SUPPLY WELL NOS. 13 & 14
TRANSIENT FLOW - 1,000 DAY DELAY
PCE-DOMINANT PLUME PARTICLE TRACKS

PREPARED FOR
GENESCO INC.

Environmental Resources Management

FIGURE 4

DRAWN BY	SCALE	DATE	JOB NO.
MCW	AS SHOWN	05/29/2013	0097881.0008

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Table 1
OU1 Long-Term Monitoring Well Sampling Program
Fulton Avenue Superfund Site
Garden City Park, New York

Per 2016 SOW Attachment 1: Monitoring Well Sampling Program

Group 1 Wells are as follows:

GCP-01 S/D
GCP 08
GCP-18 S/D
GCP-15S
MW15 A-B
MW20 A-C
MW22 A-C
MW23 A-D

Group 1 Wells shall be sampled and analyzed at the following frequency:

The first sampling round shall commence within 20 days of EPA approval of the RD Work Plan, and sampling shall be performed every 24 months thereafter.

Group 2 Wells are as follows:

MW21 A-D

Group 2 Wells shall be sampled and analyzed at the following frequency:

Year 1 – quarterly, to commence approximately 30 days after completion of construction of MW21 D and MW28 A-H
Year 2 – semi-annually (every six months)
Year 3 – semi-annually (every six months)
Year 4 – no sampling and analysis
Year 5 (and beyond) – once in year 5 and every 24 months thereafter.

Group 3 Wells are as follows:

MW26 A-H
MW27 A-H
MW28 A-H

Group 3 Wells shall be sampled and analyzed at the following frequency:

Year 1 – quarterly, to commence approximately 30 days after completion of construction of MW21 D and MW28 A-H
Year 2 –9 of 24 zones with EPA approval of the specific zones, semi-annually (every six months)
Year 3 – 9 of 24 zones with EPA approval of the specific zones, semi-annually (every six months)
Year 4 – no sampling and analysis
Year 5 (and beyond) – once in year 5 and every 24 months thereafter.

Table 2
Summary of Historic Ground Water Monitoring Well Sample Results for Select Predominant Compounds
Fulton Avenue Superfund Site, Garden City Park, New York

ERM

GCP01			
Date	PCE	TCE	cis-1,2-DCE
12/06/84	3,700.0	3.0	0.0
03/27/85	3,400.0	4.0	0.0
12/18/85	36,000.0	350.0	1,400.0
01/17/86	50,000.0	350.0	780.0
04/19/89	3,700.0	160.0	190.0
11/09/90	360.0	3.0	0.0
01/17/92	1,400.0	11.0	1.0
06/18/92	13,000.0	75.0	49.0
08/27/93	20,000.0	3,100.0	650.0
04/21/94	7,900.0	530.0	0.0
05/10/95	3,600.0	150.0	0.0
08/16/95	3,200.0	110.0	0.0
09/09/98	1,200.0	21.0	5.0
10/02/01	2,600.0	2,200.0	360.0
08/13/03	5,900.0	110.0	100.0
12/17/03	440.0	180.0	750.0
05/10/04	220.0	28.0	39.0
12/08/04	3,300.0	160.0	9.0
05/20/05	610.0	16.0	3.0
11/03/05	580.0	120.0	0.0
06/07/06	325.0	10.3	0.0
12/22/06	1,940.0	63.0	0.0
12/18/08	1,420.0	1,350.0	24.5
11/14/11	198.0	24.7	24.0
12/16/11	984.0	129.0	22.9
01/28/14	2,400.0	1,700.0	569.0
01/28/14	2,480.0	1,600.0	547.0
03/03/15	210.0	12.9	3.5
05/06/15	1,920.0	354.0	284.0
09/11/17	933.0	251.0	143.0
08/16/19	269.0	120.0	63.0
08/31/21	442.0	162.0	866.0
08/31/23	1.8	1.2	8.0
06/20/24	425.0	308.0	1,490.0
Min	1.8	1.2	0.0
Max	50,000.0	3,100.0	1,490.0
Average	5,148.8	404.9	246.5

GCP01D			
Date	PCE	TCE	cis-1,2-DCE
08/16/95	145.0	2.9	5.0
09/09/98	0.0	0.0	0.0
10/02/01	16.0	0.3	0.2
07/14/03	15.0	0.3	0.0
08/13/03	28.0	0.5	0.0
12/19/03	3.0	0.0	0.0
05/10/04	4.0	0.0	0.0
12/08/04	5.0	0.0	0.0
05/20/05	4.0	0.0	0.0
11/03/05	16.0	0.0	0.0
06/07/06	2.8	0.0	0.0
12/22/06	9.3	0.0	0.0
12/18/08	42.8	0.6	0.5
11/14/11	13.8	0.7	2.5
03/02/15	2.0	0.0	0.0
09/11/17	3.6	0.0	0.0
08/16/19	0.0	0.0	0.0
08/31/21	2.5	0.0	0.0
08/31/23	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	145.0	2.9	5.0
Average	16.5	0.3	0.4

GCP02			
Date	PCE	TCE	cis-1,2-DCE
12/06/84	150.0	440.0	0.0
03/27/85	17.0	54.0	0.0
12/18/85	200.0	96.0	14.0
04/26/89	170.0	52.0	5.0
11/09/90	48.0	7.0	5.0
01/08/91	230.0	8.0	12.0
01/17/92	43.0	18.0	6.0
06/18/92	44.0	48.0	23.0
08/23/93	16.0	30.0	34.0
04/21/94	15.0	25.0	17.0
05/09/95	2.4	11.0	0.0
06/18/96	4.0	6.0	3.0
09/10/01	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	230.0	440.0	34.0
Average	72.3	61.2	9.2

GCP03			
Date	PCE	TCE	cis-1,2-DCE
11/29/85	0.0	0.0	0.0
12/20/85	240.0	82.0	16.0
04/27/89	6.0	220.0	87.0
10/12/90	4.0	23.0	10.0
03/25/91	2.0	25.0	12.0
07/09/91	2.0	17.0	6.0
01/13/92	4.0	12.0	4.0
06/16/92	12.0	89.0	50.0
08/20/93	8.0	31.0	25.0
04/21/94	6.8	42.0	24.0
05/10/95	2.4	38.0	0.0
09/21/01	2.0	22.0	10.0
06/20/24	0.6	0.0	0.0
Min	0.0	0.0	0.0
Max	240.0	220.0	87.0
Average	22.3	46.2	18.8

GCP04			
Date	PCE	TCE	cis-1,2-DCE
11/27/85	300.0	40.0	0.0
12/19/85	120.0	28.0	14.0
10/12/90	9.0	3.0	1.0
07/09/91	120.0	10.0	14.0
01/17/92	28.0	120.0	2.0
06/18/92	92.0	620.0	6.0
08/23/93	64.0	300.0	13.0
04/21/94	88.0	55.0	0.0
05/10/95	810.0	41.0	0.0
06/07/00	19.4	11.5	1.6
09/10/01	10.0	20.0	3.0
11/15/11	1.9	0.0	0.0
03/04/15	1.0	0.0	0.0
Min	1.0	0.0	0.0
Max	810.0	620.0	14.0
Average	127.9	96.0	4.2

GCP05			
Date	PCE	TCE	cis-1,2-DCE
11/27/85	450.0	830.0	0.0
12/19/85	310.0	210.0	0.0
10/12/90	300.0	71.0	5.0
07/09/91	96.0	40.0	5.0
01/15/92	87.0	24.0	5.0
06/17/92	55.0	21.0	3.0
08/26/93	47.0	19.0	4.0
04/21/94	110.0	26.0	0.0
05/09/95	27.0	4.2	0.0
09/28/01	0.9	3.0	1.0
Min	0.9	3.0	0.0
Max	450.0	830.0	5.0
Average	148.3	124.8	2.3

GCP06			
Date	PCE	TCE	cis-1,2-DCE
11/27/85	0.0	0.0	0.0
12/20/85	0.0	0.0	0.0
04/26/89	0.0	1.0	0.0
11/09/90	3.0	0.0	0.0
01/08/91	5.0	0.0	0.0
01/13/92	11.0	23.0	0.0
06/17/92	11.0	23.0	0.0
08/23/93	9.0	14.0	0.0
04/25/94	0.0	0.0	0.0
09/12/01	8.0	4.0	0.1
06/20/24	4.0	0.0	0.0
Min	0.0	0.0	0.0
Max	11.0	23.0	0.1
Average	4.6	5.9	0.0

GCP07S			
Date	PCE	TCE	cis-1,2-DCE
11/01/85	1,700.0	60.0	28.0
12/19/85	2,300.0	100.0	52.0
04/19/89	50.0	29.0	3.0
09/21/90	29,000.0	830.0	520.0
10/02/90	10,000.0	470.0	380.0
01/02/91	3,900.0	190.0	76.0
01/22/92	430.0	18.0	0.0
06/18/92	280.0	0.0	0.0
08/27/93	84.0	11.0	1.0
04/22/94	30.0	8.7	2.3
08/18/95	0.0	1.2	0.0
09/07/01	1.0	0.0	0.0
03/06/15	3.8	0.0	0.0
Min	0.0	0.0	0.0
Max	29,000.0	830.0	520.0
Average	3,675.3	132.1	81.7

GCP07D			
Date	PCE	TCE	cis-1,2-DCE
01/22/92	343.0	10.2	7.6
06/16/92	170.0	15.0	9.0
08/20/93	190.0	9.0	21.0
04/21/94	44.0	0.0	0.0
08/18/95	220.0	11.0	13.0
09/02/99	0.0	0.0	0.0
09/07/01	8.0	0.6	0.0
03/06/15	6.5	0.2	0.0
Min	0.0	0.0	0.0
Max	343.0	15.0	21.0
Average	122.7	5.7	6.3

GCP08			
Date	PCE	TCE	cis-1,2-DCE
01/01/85	67.0	0.0	0.0
12/19/85	250.0	1.0	0.0
04/26/89	320.0	3.0	0.0
09/21/90	87.0	1.0	0.0
12/31/90	28.0	0.0	0.0
01/13/92	72.0	1.0	0.0
06/16/92	1,600.0	87.0	490.0
08/26/93	470.0	54.0	570.0
04/25/94	650.0	110.0	530.0
09/28/01	1,800.0	12.0	2.0
08/18/03	940.0	27.0	43.0
12/17/03	350.0	17.0	12.0
05/10/04	200.0	40.0	66.0
12/08/04	710.0	16.0	150.0
05/19/05	520.0	56.0	140.0
11/04/05	280.0	26.0	67.0
06/07/06	120.0	8.8	16.2
12/22/06	27.5	2.8	1.0
12/18/08	32.5	4.0	107.0
11/14/11	4.6	0.6	8.4
01/28/14	1.6	0.0	0.9
03/03/15	1.9	0.0	0.6
05/07/15	1.1	0.0	1.0
09/12/17	305.0	168.0	837.0
08/14/19	6.9	2.1	0.0
08/31/21	2.2	0.0	0.0
08/31/23	19.5	9.9	38.2
Min	1.1	0.0	0.0
Max	1,800.0	168.0	837.0
Average	328.4	24.0	114.1

GCP09			
Date	PCE	TCE	cis-1,2-DCE
11/01/85	16.0	0.0	0.0
12/19/85	36.0	0.0	0.0
09/21/90	17.0	0.0	0.0
12/31/90	4.0	0.0	0.0
01/08/91	14.0	0.0	0.0
01/13/92	4.0	0.0	0.0
06/16/92	11.0	0.0	0.0
08/26/93	9.0	0.0	0.0
04/25/94	24.0	0.0	0.0
09/22/95	110.0	0.0	14.0
10/01/01	47.0	4.0	2.0
11/14/11	0.0	0.0	0.0
03/06/15	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	110.0	4.0	14.0
Average	22.5	0.3	1.2

GCP10S			
Date	PCE	TCE	cis-1,2-DCE
01/09/92	6.8	0.0	0.0
06/10/92	0.0	0.0	0.0
08/16/93	0.0	0.0	0.0
04/26/94	6.8	42.0	24.0
01/28/99	0.0	0.0	0.0
09/05/01	0.0	0.0	0.0
06/21/24	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	6.8	42.0	24.0
Average	1.9	6.0	3.4

GCP10D			
Date	PCE	TCE	cis-1,2-DCE
01/09/92	6.2	0.0	0.0
06/10/92	0.0	0.0	0.0
08/16/93	0.0	0.0	0.0
04/26/94	0.0	0.0	0.0
01/28/99	2.9	0.0	0.0
09/07/01	6.0	0.8	0.0
06/21/24	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	6.2	0.8	0.0
Average	2.2	0.1	0.0

GCP11S			
Date	PCE	TCE	cis-1,2-DCE
01/08/92	26.6	0.6	0.0
06/04/98	0.0	0.0	0.0
09/07/01	0.0	3.0	0.0
Min	0.0	0.0	0.0
Max	26.6	3.0	0.0
Average	8.9	1.2	0.0

All values are in micrograms per liter (µg/l).
0.0 = Not detected at or above the method detection limit.
NA = Not analyzed.

Table 2
Summary of Historic Ground Water Monitoring Well Sample Results for Select Predominant Compounds
Fulton Avenue Superfund Site, Garden City Park, New York

ERM

GCP12S			
Date	PCE	TCE	cis-1,2-DCE
01/08/92	62.0	0.8	0.0
06/04/98	0.0	0.0	0.0
09/17/01	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	62.0	0.8	0.0
Average	20.7	0.3	0.0

GCP12D			
Date	PCE	TCE	cis-1,2-DCE
01/08/92	144.0	55.7	9.0
06/10/98	71.6	51.7	0.0
05/11/00	59.4	60.6	0.0
09/17/01	10.0	11.0	0.0
Min	10.0	11.0	0.0
Max	144.0	60.6	9.0
Average	71.3	44.8	2.3

GCP13S			
Date	PCE	TCE	cis-1,2-DCE
01/07/92	10.0	1.9	1.0
11/16/95	1.4	4.0	0.0
08/18/97	1.3	3.0	0.0
07/09/98	1.2	2.4	0.0
09/10/01	0.6	1.0	0.0
Min	0.6	1.0	0.0
Max	10.0	4.0	1.0
Average	2.9	2.5	0.2

GCP13D			
Date	PCE	TCE	cis-1,2-DCE
01/07/92	56.8	105.0	1.7
06/10/98	24.3	42.6	0.0
05/11/00	13.0	0.0	0.0
09/10/01	10.0	17.0	0.4
Min	10.0	0.0	0.0
Max	56.8	105.0	1.7
Average	26.0	41.2	0.5

GCP14S			
Date	PCE	TCE	cis-1,2-DCE
01/07/92	23.9	0.0	0.0
12/09/98	0.0	0.0	0.0
09/28/01	0.0	0.0	0.0
03/04/15	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	23.9	0.0	0.0
Average	6.0	0.0	0.0

GCP14D			
Date	PCE	TCE	cis-1,2-DCE
01/07/92	152.0	4.7	1.7
12/23/98	0.0	0.0	0.0
09/28/01	37.0	16.0	1.0
03/04/15	8.9	0.4	0.0
Min	0.0	0.0	0.0
Max	152.0	16.0	1.7
Average	49.5	5.3	0.7

GCP15S			
Date	PCE	TCE	cis-1,2-DCE
01/08/92	18.5	0.2	0.0
12/23/98	0.0	0.0	0.0
09/26/01	0.0	0.0	0.0
05/21/03	0.0	0.0	0.0
05/21/03	0.1	0.0	0.0
08/13/03	1.0	0.0	0.0
12/16/03	0.3	0.0	0.0
05/07/04	0.0	0.0	0.0
12/09/04	0.4	0.0	0.0
05/17/05	2.0	0.0	0.0
11/03/05	2.0	0.2	0.0
05/31/06	0.0	0.0	0.0
12/21/06	0.0	0.0	0.0
12/19/08	0.0	0.0	0.0
11/11/11	0.0	0.0	0.0
03/03/15	0.0	0.0	0.0
05/05/15	0.0	0.0	0.0
09/07/17	0.0	0.0	0.0
08/13/19	0.0	0.0	0.0
08/30/21	0.0	0.0	0.0
08/30/23	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	18.5	0.2	0.0
Average	1.2	0.0	0.0

MW15A			
Date	PCE	TCE	cis-1,2-DCE
07/20/01	12.0	2.0	8.0
09/26/01	5.0	0.6	0.4
10/03/01	22.0	2.0	4.0
05/21/03	72.0	9.0	4.0
08/11/03	400.0	57.0	18.0
12/16/03	2.0	0.0	0.2
05/07/04	220.0	23.0	7.0
12/09/04	1,100.0	120.0	33.0
05/17/05	1,400.0	180.0	54.0
11/02/05	2,000.0	240.0	69.0
05/31/06	1,880.0	173.0	56.2
12/21/06	2,390.0	182.0	78.8
12/19/08	1,440.0	95.2	76.0
11/11/11	1,120.0	51.9	50.3
03/04/15	243.0	16.2	13.8
05/05/15	399.0	21.8	21.9
09/11/17	7.2	0.8	0.9
08/13/19	27.7	3.3	3.8
08/30/21	20.5	6.7	8.7
08/28/23	0.6	0.0	0.6
06/19/24	63.6	63.7	91.2
Min	0.6	0.0	0.2
Max	2,390.0	240.0	91.2
Average	610.7	59.4	28.6

MW15B			
Date	PCE	TCE	cis-1,2-DCE
07/20/01	1,500.0	97.0	9.0
09/26/01	88.0	9.0	0.8
10/03/01	1,200.0	95.0	9.0
05/21/03	680.0	68.0	50.0
08/11/03	560.0	50.0	5.0
12/16/03	440.0	54.0	4.0
05/07/04	470.0	56.0	4.0
12/09/04	150.0	40.0	4.0
05/17/05	310.0	54.0	5.0
11/02/05	250.0	39.0	3.0
05/31/06	251.0	37.4	3.1
12/21/06	293.0	37.7	3.1
12/19/08	174.0	23.7	1.9
11/11/11	185.0	15.0	2.0
03/03/15	0.6	0.0	0.0
05/05/15	67.4	4.6	0.5
09/12/17	48.2	3.6	0.0
08/13/19	0.0	0.0	0.0
08/31/21	10.2	1.0	0.0
08/30/23	2.2	0.0	0.0
Min	0.0	0.0	0.0
Max	1,500.0	97.0	50.0
Average	334.0	34.2	5.2

GCP16S			
Date	PCE	TCE	cis-1,2-DCE
01/13/92	9.2	25.3	0.7
04/26/94	0.0	0.0	0.0
11/26/96	0.7	0.8	0.0
09/06/01	1.0	10.0	8.0
Min	0.0	0.0	0.0
Max	9.2	25.3	8.0
Average	2.7	9.0	2.2

GCP17S			
Date	PCE	TCE	cis-1,2-DCE
08/22/95	5,600.0	0.0	0.0
06/18/96	2,000.0	34.0	0.0
09/09/98	29,000.0	600.0	58.0
10/04/01	21.0	10.0	12.0
12/16/11	1.4	0.0	0.0
Min	1.4	0.0	0.0
Max	29,000.0	600.0	58.0
Average	7,324.5	128.8	14.0

GCP17D			
Date	PCE	TCE	cis-1,2-DCE
08/22/95	7,100.0	0.0	0.0
09/09/98	53.0	1.0	0.0
10/01/01	4.0	0.2	0.3
12/16/11	0.4	0.0	0.0
Min	0.4	0.0	0.0
Max	7,100.0	1.0	0.3
Average	1,789.4	0.3	0.1

GCP18S			
Date	PCE	TCE	cis-1,2-DCE
08/17/95	780.0	330.0	3700.0
06/18/96	850.0	260.0	2000.0
09/09/98	1100.0	280.0	6300.0
09/19/01	220.0	66.0	781.0
08/14/03	52.0	28.0	3200.0
12/18/03	42.0	0.0	2300.0
05/10/04	22.0	0.0	3100.0
12/08/04	18.0	1.0	40.0
05/19/05	0.0	0.0	2800.0
11/03/05	120.0	76.0	550.0
06/07/06	2.8	0.0	1.1
12/22/06	69.8	4.5	178.0
12/18/08	53.6	13.4	292.0
11/14/11	2.0	0.0	0.8
12/16/11	2.5	0.0	0.9
05/07/15	1.5	0.6	6.1
09/08/17	4.5	0.6	17.2
08/16/19	1.5	0.8	2.6
08/31/21	0.0	0.0	2.6
08/31/23	0.0	0.0	2.3
Min	0.0	0.0	0.8
Max	1100.0	330.0	6300.0
Average	167.1	53.0	1263.7

GCP18D			
Date	PCE	TCE	cis-1,2-DCE
08/17/95	4.2	0.0	4.2
09/09/98	0.0	0.0	0.0
09/19/01	2.0	0.5	0.4
08/14/03	7.0	0.0	0.0
12/18/03	5.0	0.0	0.0
05/10/04	1.0	0.0	0.0
12/08/04	0.3	0.0	0.0
05/19/05	1.0	0.0	0.0
11/03/05	0.4	0.0	0.0
06/07/06	2.3	0.0	0.0
12/22/06	0.0	0.0	0.0
12/18/08	0.7	0.0	0.0
11/14/11	0.0	0.0	0.4
05/07/15	0.0	0.0	0.0
09/08/17	0.0	0.0	0.0
08/16/19	0.0	0.0	0.0
08/31/21	0.0	0.0	0.0
08/31/23	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	7.0	0.5	4.2
Average	1.3	0.0	0.3

All values are in micrograms per liter (µg/l).
0.0 = Not detected at or above the method detection limit.
NA = Not analyzed.

Table 2
Summary of Historic Ground Water Monitoring Well Sample Results for Select Predominant Compounds
Fulton Avenue Superfund Site, Garden City Park, New York

ERM

GCP19S			
Date	PCE	TCE	cis-1,2-DCE
08/17/95	7,900.0	0.0	0.0
06/18/96	2,100.0	23.0	0.0
01/12/99	233.0	28.1	3.9
06/07/00	17.6	2.6	0.3
09/19/01	6.0	41.0	1.0
11/16/11	1.1	0.0	0.3
Min	1.1	0.0	0.0
Max	7,900.0	41.0	3.9
Average	1,709.6	15.8	0.9

MW20A			
Date	PCE	TCE	cis-1,2-DCE
04/24/01	0.0	0.0	0.0
09/18/01	0.0	0.0	0.0
04/30/15	0.0	0.0	0.0
09/07/17	0.0	0.0	0.0
08/15/19	0.0	0.0	0.0
09/01/21	0.0	0.0	0.0
08/30/23	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	0.0	0.0	0.0
Average	0.0	0.0	0.0

MW20B			
Date	PCE	TCE	cis-1,2-DCE
05/15/01	0.0	34.0	0.3
09/18/01	0.0	12.0	0.0
04/30/15	0.0	0.0	0.0
09/07/17	0.0	0.0	0.0
08/15/19	0.0	0.0	0.0
09/01/21	0.0	0.0	0.0
08/29/23	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	0.0	34.0	0.3
Average	0.0	6.6	0.0

MW20C			
Date	PCE	TCE	cis-1,2-DCE
05/14/01	0.0	0.0	0.0
09/18/01	0.0	0.0	0.0
04/30/15	0.5	1.1	0.0
09/06/17	3.9	5.3	0.0
08/15/19	0.0	0.0	0.0
09/01/21	0.0	2.1	0.0
08/29/23	0.9	5.1	0.0
Min	0.0	0.0	0.0
Max	3.9	5.3	0.0
Average	0.8	1.9	0.0

MW21A			
Date	PCE	TCE	cis-1,2-DCE
05/29/01	4.0	0.9	0.0
09/24/01	9.0	0.2	0.0
05/22/03	14.0	0.0	0.0
08/14/03	16.0	0.0	0.0
12/15/03	18.0	0.3	0.0
12/19/03	14.0	0.0	0.0
05/06/04	8.0	0.0	0.0
12/07/04	15.0	0.0	0.0
05/13/05	12.0	0.0	0.0
11/01/05	4.0	0.0	0.0
06/01/06	10.3	0.0	0.0
12/20/06	5.7	0.0	0.0
08/21/07	9.3	0.0	0.0
12/15/08	3.8	0.0	0.0
09/02/09	1.9	0.0	0.0
01/05/10	1.3	0.0	0.0
05/12/10	0.8	0.0	0.0
10/29/10	0.9	0.0	0.0
11/09/11	0.8	0.0	0.0
03/05/15	0.0	0.0	0.0
05/01/15	0.5	0.0	0.0
09/12/17	0.0	0.0	0.0
12/19/17	0.0	0.0	0.0
03/12/18	0.0	0.0	0.0
06/14/18	0.0	0.0	0.0
09/13/18	0.0	0.0	0.0
03/04/19	0.0	0.0	0.0
08/14/19	0.0	0.0	0.0
02/28/20	0.0	0.0	0.0
09/03/20	0.0	0.0	0.0
10/06/22	0.0	0.0	0.0
06/19/24	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	18.0	0.9	0.0
Average	4.7	0.0	0.0

MW21B			
Date	PCE	TCE	cis-1,2-DCE
05/29/01	200.0	42.0	0.3
09/24/01	16.0	4.0	0.0
05/22/03	490.0	32.0	0.0
08/12/03	490.0	29.0	0.0
12/15/03	860.0	25.0	0.0
05/06/04	2,200.0	21.0	0.0
12/07/04	1,500.0	37.0	0.0
05/13/05	1,000.0	36.0	0.0
11/01/05	1,000.0	43.0	4.0
06/01/06	1,130.0	63.5	2.7
12/20/06	1,640.0	100.0	6.8
08/21/07	2,310.0	97.7	1.9
12/15/08	2,370.0	164.0	9.0
09/02/09	2,560.0	208.0	14.1
01/05/10	1,670.0	193.0	21.1
05/12/10	2,570.0	217.0	22.8
10/29/10	2,380.0	208.0	24.8
11/09/11	1,230.0	80.7	21.5
03/05/15	1.5	1.1	0.5
05/01/15	1,470.0	154.0	14.5
09/12/17	975.0	158.0	10.1
12/19/17	1,120.0	203.0	8.8
03/09/18	3.9	0.8	0.0
06/14/18	417.0	84.9	3.6
09/14/18	118.0	41.4	2.5
03/05/19	21.1	8.6	0.5
08/14/19	4.1	0.8	0.0
02/28/20	249.0	109.0	0.0
09/03/20	314.0	68.4	6.3
10/06/22	47.6	33.3	4.4
06/19/24	159.0	26.4	4.3
Min	1.5	0.8	0.0
Max	2,570.0	217.0	24.8
Average	984.4	80.3	6.0

MW21C			
Date	PCE	TCE	cis-1,2-DCE
07/19/01	290.0	1.0	0.0
09/24/01	27.0	1.0	0.0
05/22/03	1,800.0	0.0	0.0
08/12/03	1,600.0	8.0	0.0
12/15/03	350.0	4.0	0.0
05/06/04	1,000.0	5.0	8.0
12/07/04	1,200.0	9.0	0.0
05/13/05	3,100.0	21.0	0.0
11/01/05	260.0	9.0	9.0
06/01/06	3,330.0	28.7	7.4
12/20/06	2,410.0	32.4	18.0
08/21/07	9.6	0.2	1.0
12/15/08	2,820.0	53.1	9.4
09/02/09	2,620.0	84.6	10.9
01/05/10	422.0	25.5	12.3
05/12/10	2,230.0	78.9	8.5
10/29/10	454.0	12.4	4.0
11/09/11	850.0	48.4	7.3
03/05/15	1.3	0.0	0.0
05/01/15	318.0	18.8	2.3
09/12/17	181.0	14.3	2.3
12/19/17	267.0	22.5	2.4
03/09/18	202.0	19.4	2.5
06/14/18	146.0	10.5	1.4
09/14/18	23.5	4.2	1.5
03/07/19	16.7	4.1	3.1
08/14/19	14.2	4.5	26.8
02/28/20	20.4	6.5	31.8
09/02/20	48.3	10.3	18.2
10/06/22	3.1	1.6	5.4
06/19/24	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	3,330.0	84.6	31.8
Average	839.2	17.4	6.2

MW21D			
Date	PCE	TCE	cis-1,2-DCE
11/05/17	115.0	2.8	0.0
12/15/17	188.0	7.7	0.6
03/09/18	11.4	0.0	0.0
06/15/18	304.0	14.4	1.0
09/13/18	37.5	6.8	0.8
03/07/19	28.4	2.8	0.0
08/14/19	6.9	0.8	0.0
02/28/20	15.0	1.6	0.0
09/02/20	3.2	0.0	0.6
10/06/22	17.4	4.1	0.9
06/19/24	1.4	0.0	0.0
Min	1.4	0.0	0.0
Max	304.0	14.4	1.0
Average	66.2	3.7	0.4

MW22A			
Date	PCE	TCE	cis-1,2-DCE
05/15/01	1.0	0.0	0.0
09/21/01	3.0	0.0	0.0
05/08/15	0.7	0.0	0.0
09/06/17	0.0	0.0	0.0
08/13/19	0.0	0.0	0.0
09/01/21	0.0	0.0	0.0
08/29/23	0.0	0.0	0.0
06/20/24	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	3.0	0.0	0.0
Average	0.6	0.0	0.0

MW22B			
Date	PCE	TCE	cis-1,2-DCE
05/16/01	1.0	0.0	0.0
09/21/01	0.6	0.0	0.0
10/04/01	0.9	0.0	0.0
05/04/15	0.0	0.0	0.0
09/06/17	0.0	0.0	0.0
08/13/19	0.0	0.0	0.0
09/02/21	0.0	0.0	0.0
08/29/23	0.0	0.0	0.0
06/20/24	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	1.0	0.0	0.0
Average	0.3	0.0	0.0

MW22C			
Date	PCE	TCE	cis-1,2-DCE
05/16/01	0.4	0.0	0.0
09/21/01	0.5	0.4	0.0
05/04/15	0.2	0.0	0.0
09/06/17	0.0	0.0	0.0
08/13/19	0.0	0.0	0.0
09/02/21	0.0	0.0	0.0
08/29/23	0.0	0.0	0.0
06/20/24	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	0.5	0.4	0.0
Average	0.1	0.1	0.0

MW23A			
Date	PCE	TCE	cis-1,2-DCE
04/24/01	0.4	2.0	0.0
09/20/01	0.7	0.0	0.0
05/05/04	0.0	6.0	0.0
12/06/04	0.0	0.0	0.0
05/18/05	2.0	9.0	0.0
10/31/05	0.0	4.0	0.0
06/06/06	0.0	5.5	0.0
12/20/06	0.0	4.0	0.0
08/22/07	0.0	5.7	0.0
12/22/08	0.0	0.5	0.0
11/10/11	0.0	0.0	0.0
04/30/15	0.0	0.3	0.0
09/08/17	0.0	3.0	0.0
08/19/19	0.0	1.5	0.0
09/02/21	0.0	6.6	0.0
08/30/23	0.0	1.9	0.0
Min	0.0	0.0	0.0
Max	2.0	9.0	0.0
Average	0.2	3.1	0.0

MW23B			
Date	PCE	TCE	cis-1,2-DCE
04/24/01	23.0	210.0	0.0
09/20/01	3.0	21.0	0.2
12/13/04	8.0	79.0	0.0
05/18/05	2.0	11.0	2.0
11/02/05	12.0	170.0	0.0
06/06/06	12.3	191.0	0.4
12/20/06	12.3	179.0	0.4
08/22/07	11.3	102.0	0.0
12/22/08	8.4	137.0	0.3
11/10/11	6.0	96.9	0.5
05/04/15	3.5	37.2	0.3
09/08/17	3.0	30.8	0.0
08/22/19	4.5	30.3	0.0
09/02/21	0.0	0.6	0.0
09/01/23	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	23.0	210.0	2.0
Average	7.3	86.4	0.3

MW23C			
Date	PCE	TCE	cis-1,2-DCE
07/23/01	15.0	35.0	0.5
09/20/01	3.0	4.0	0.0
05/05/04	38.0	240.0	4.0
12/06/04	30.0	160.0	1.0
05/18/05	39.0	290.0	2.0
10/31/05	28.0	130.0	1.0
06/06/06	21.1	120.0	1.0
12/19/06	37.3	183.0	1.3
08/22/07	49.3	204.0	1.1
12/22/08	20.7	150.0	0.8
11/10/11	6.2	89.3	0.8
04/30/15	4.8	39.6	0.5
09/08/17	0.7	5.9	0.0
08/22/19	0.0	2.3	0.0
09/02/21	9.0	34.5	0.7
08/30/23	0.0	0.0	0.00
Min	0.0	0.0	0.0
Max	49.3	290.0	4.0
Average	18.9	105.5	0.9

All values are in micrograms per liter (µg/l).
0.0 = Not detected at or above the method detection limit.
NA = Not analyzed.

Table 2
Summary of Historic Ground Water Monitoring Well Sample Results for Select Predominant Compounds
Fulton Avenue Superfund Site, Garden City Park, New York

ERM

MW23D			
Date	PCE	TCE	cis-1,2-DCE
07/23/01	0.5	10.0	0.0
09/20/01	0.0	0.4	0.0
05/05/04	2.0	8.0	0.0
12/06/04	0.4	3.0	0.0
05/18/05	2.0	8.0	0.0
11/02/05	0.0	0.0	0.0
06/06/06	10.5	62.9	0.0
12/19/06	9.9	51.1	0.4
08/22/07	1.5	10.5	0.0
12/22/08	6.8	73.2	0.4
11/10/11	9.7	92.0	0.8
05/04/15	9.4	84.1	0.5
09/08/17	5.2	93.9	0.0
08/22/19	9.3	36.1	0.0
09/02/21	8.9	62.8	0.0
08/30/23	0.0	0.6	0.0
Min	0.0	0.0	0.0
Max	10.5	93.9	0.8
Average	4.8	37.3	0.1

MW24A			
Date	PCE	TCE	cis-1,2-DCE
08/13/01	24.0	39.0	0.6
09/25/01	0.5	0.2	0.0
05/01/15	12.1	81.2	1.3
Min	0.5	0.2	0.0
Max	24.0	81.2	1.3
Average	12.2	40.1	0.6

MW24B			
Date	PCE	TCE	cis-1,2-DCE
08/14/01	5.0	6.0	0.0
09/25/01	21.0	39.0	0.6
05/01/15	4.8	5.8	0.2
Min	4.8	5.8	0.0
Max	21.0	39.0	0.6
Average	10.3	16.9	0.3

MW25A			
Date	PCE	TCE	cis-1,2-DCE
07/19/01	77.0	96.0	2.0
09/27/01	62.0	82.0	2.0
05/06/15	13.9	19.3	1.5
Min	13.9	19.3	1.5
Max	77.0	96.0	2.0
Average	51.0	65.8	1.8

M5			
Date	PCE	TCE	cis-1,2-DCE
05/22/89	0.0	0.0	0.0
06/16/89	0.0	0.7	0.0
07/11/90	0.0	0.0	0.0
08/20/90	0.0	0.0	0.0
04/18/91	0.0	0.0	0.0
05/20/92	0.0	0.0	0.0
07/06/93	0.0	0.0	0.0
08/12/94	0.0	0.0	0.0
02/06/97	0.0	0.0	0.0
06/03/98	0.0	0.0	0.0
09/27/01	0.0	0.0	0.0
05/05/15	0.3	0.0	0.0
Min	0.0	0.0	0.0
Max	0.3	0.7	0.0
Average	0.0	0.1	0.0

M6			
Date	PCE	TCE	cis-1,2-DCE
05/22/89	24.4	89.4	0.0
06/16/89	33.2	88.3	0.0
07/11/90	41.4	99.0	0.6
08/20/90	70.6	119.0	1.9
04/18/91	37.7	93.7	0.0
01/15/92	23.0	67.6	0.8
05/20/92	42.2	261.0	1.2
07/06/93	32.2	103.0	1.3
11/02/94	55.4	92.7	1.0
02/06/97	0.0	0.0	0.0
06/03/98	1.5	2.5	0.0
09/27/01	10.0	14.0	0.2
05/15/15	1.3	1.1	0.0
Min	0.0	0.0	0.0
Max	70.6	261.0	1.9
Average	28.7	79.3	0.5

MW26A			
Date	PCE	TCE	cis-1,2-DCE
05/04/04	0.0	0.0	0.0
12/03/04	0.0	0.0	0.0
05/16/05	0.0	0.0	0.0
10/31/05	0.0	0.0	0.0
06/05/06	0.0	0.0	0.0
12/18/06	0.0	0.0	0.0
08/20/07	0.0	0.0	0.0
12/17/08	0.0	0.0	0.0
08/31/09	0.0	0.0	0.0
01/07/10	0.0	0.0	0.0
05/10/10	0.0	0.0	0.0
11/07/11	0.0	0.0	0.0
10/03/17	0.0	0.0	0.0
12/18/17	0.0	0.0	0.0
03/08/18	0.0	0.0	0.0
06/13/18	0.0	0.0	0.0
09/11/18	0.0	0.0	0.0
03/14/19	0.0	0.0	0.0
08/19/19	0.0	0.0	0.0
02/27/20	0.0	0.0	0.0
09/02/20	0.0	0.0	0.0
06/18/24	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	0.0	0.0	0.0
Average	0.0	0.0	0.0

MW26B			
Date	PCE	TCE	cis-1,2-DCE
05/04/04	0.0	0.0	0.0
12/03/04	0.0	0.0	0.0
05/16/05	0.0	0.0	0.0
10/31/05	0.0	0.0	0.0
06/05/06	0.0	0.0	0.0
12/18/06	0.0	0.0	0.0
08/20/07	0.0	0.0	0.0
12/17/08	0.0	0.0	0.0
08/31/09	0.0	0.0	0.0
01/07/10	0.0	0.0	0.0
05/10/10	0.0	0.0	0.0
11/07/11	0.0	0.0	0.0
05/06/15	0.4	0.0	0.0
10/03/17	0.8	0.0	0.0
12/18/17	0.8	0.0	0.0
03/08/18	0.9	0.0	0.0
06/13/18	0.9	0.0	0.0
09/11/18	0.0	0.0	0.0
03/06/19	1.1	0.0	0.0
08/19/19	0.0	0.0	0.0
02/27/20	1.1	0.0	0.0
09/01/20	1.0	0.0	0.0
10/03/22	0.8	0.0	0.0
06/18/24	1.1	0.0	0.0
Min	0.0	0.0	0.0
Max	1.1	0.0	0.0
Average	0.4	0.0	0.0

MW26C			
Date	PCE	TCE	cis-1,2-DCE
05/04/04	0.0	0.0	0.0
12/03/04	0.0	0.0	0.0
05/16/05	0.0	0.0	0.0
10/31/05	0.0	0.0	0.0
06/05/06	0.0	0.0	0.0
12/18/06	0.0	0.0	0.0
08/20/07	0.0	0.0	0.0
12/17/08	0.0	0.0	0.0
08/31/09	0.0	0.0	0.0
01/07/10	0.0	0.0	0.0
05/10/10	0.0	0.0	0.0
11/07/11	0.0	0.0	0.0
05/06/15	0.4	0.0	0.0
10/02/17	0.0	0.0	0.0
12/18/17	0.7	0.0	0.0
03/08/18	0.6	0.0	0.0
06/13/18	0.0	0.0	0.0
09/11/18	0.0	0.0	0.0
03/06/19	0.0	0.0	0.0
08/19/19	0.0	0.0	0.0
02/27/20	0.0	0.0	0.0
09/01/20	0.0	0.0	0.0
06/18/24	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	0.7	0.0	0.0
Average	0.1	0.0	0.0

MW26D			
Date	PCE	TCE	cis-1,2-DCE
05/04/04	0.0	0.0	0.0
12/03/04	0.0	0.0	0.0
05/16/05	0.0	0.0	0.0
10/31/05	0.0	0.0	0.0
06/05/06	0.0	0.0	0.0
12/18/06	0.0	0.0	0.0
08/20/07	0.0	0.0	0.0
12/17/08	1.0	0.0	0.0
08/31/09	0.5	0.0	0.0
01/07/10	0.0	0.6	0.0
05/10/10	0.0	1.6	0.0
11/07/11	0.5	0.3	0.0
03/09/15	3.5	0.7	0.2
05/06/15	2.3	0.6	0.5
10/02/17	6.3	1.3	0.0
12/18/17	7.5	1.1	0.0
03/08/18	9.1	1.2	0.0
06/13/18	6.5	1.4	0.0
09/11/18	18.7	2.9	0.0
03/06/19	28.8	3.8	0.8
08/19/19	24.9	4.2	2.1
02/27/20	20.1	4.5	5.7
09/01/20	18.6	4.7	8.9
10/03/22	3.2	11.6	7.4
06/18/24	1.9	14.9	3.6
Min	0.0	0.0	0.0
Max	28.8	14.9	8.9
Average	6.1	2.2	1.2

MW26E			
Date	PCE	TCE	cis-1,2-DCE
05/03/04	0.0	0.0	0.0
12/03/04	0.0	0.0	0.0
05/16/05	0.0	0.0	0.0
10/31/05	0.0	0.0	0.0
06/05/06	0.0	0.9	0.0
12/18/06	0.0	0.0	0.0
08/20/07	0.0	0.9	0.0
12/17/08	0.0	0.9	0.0
08/31/09	0.6	2.2	0.0
01/07/10	2.0	4.4	0.0
05/10/10	3.8	7.7	0.0
11/07/11	12.5	7.0	2.2
03/09/15	24.1	8.3	1.8
05/06/15	15.1	7.4	2.1
10/02/17	10.5	12.2	2.6
12/18/17	4.2	11.9	2.7
03/08/18	1.1	9.2	2.3
06/13/18	0.6	2.1	1.0
09/11/18	0.9	9.4	1.8
03/06/19	1.1	11.6	2.9
08/19/19	0.0	11.1	4.0
02/27/20	0.0	9.4	3.6
09/01/20	0.0	8.3	3.6
10/03/22	0.0	7.7	2.4
06/18/24	0.0	11.9	7.4
Min	0.0	0.0	0.0
Max	24.1	12.2	7.4
Average	3.1	5.8	1.6

MW26F			
Date	PCE	TCE	cis-1,2-DCE
05/03/04	0.0	0.0	0.0
12/03/04	0.4	4.0	0.6
05/16/05	0.9	10.0	1.0
10/31/05	1.0	10.0	0.8
06/05/06	4.3	32.8	2.4
12/18/06	3.5	23.5	1.4
08/20/07	0.4	0.0	1.1
12/17/08	0.6	4.6	0.9
08/31/09	0.6	3.4	0.7
01/07/10	0.0	2.5	1.5
05/10/10	0.4	3.0	0.0
11/07/11	4.7	3.9	3.1
03/09/15	42.0	16.3	6.0
05/06/15	30.9	12.5	7.6
10/02/17	27.7	12.6	5.2
12/18/17	26.2	13.5	7.2
03/08/18	25.2	12.9	5.3
06/13/18	25.3	13.9	4.9
09/11/18	19.8	15.5	7.4
03/06/19	7.6	11.4	8.3
08/19/19	10.9	16.1	4.8
02/27/20	10.2	17.7	3.5
09/01/20	3.1	8.5	3.0
06/18/24	1.3	8.2	2.9
Min	0.0	0.0	0.0
Max	42.0	32.8	8.3
Average	10.3	10.7	3.3

MW26G			
Date	PCE	TCE	cis-1,2-DCE
05/03/04	5.0	30.0	0.0
12/03/04	5.0	35.0	0.4
05/16/05	9.0	72.0	0.8
10/31/05	6.0	42.0	0.4
06/05/06	8.4	53.2	0.6
12/18/06	4.9	31.7	0.0
08/20/07	0.5	4.2	0.0
12/17/08	2.2	15.1	0.3
08/31/09	5.1	21.2	0.9
01/07/10	6.1	21.6	1.4
05/10/10	7.0	19.9	1.9
11/07/11	11.7	24.3	3.8
03/09/15	13.1	34.9	1.2
05/06/15	8.4	37.7	1.2
10/02/17	10.7	37.2	0.6
12/18/17	9.0	34.1	0.0
03/08/18	8.6	24.8	0.0
06/13/18	7.1	27.0	0.0
09/11/18	5.8	25.5	0.0
03/06/19	6.2	30.3	0.0
08/19/19	5.1	26.9	0.0
02/27/20	5.0	26.5	0.0
09/01/20	8.7	17.3	0.0
10/03/22	5.0	4.6	0.7
06/18/24	2.8	10.4	0.0
Min	0.5	4.2	0.0
Max	13.1	72.0	3.8
Average	6.7	28.3	0.6

MW26H			
Date	PCE	TCE	cis-1,2-DCE
05/03/04	0.0	0.0	0.0
12/03/04	0.0	0.0	0.0
05/16/05	0.0	0.0	0.0
10/31/05	0.0	0.0	0.0
06/05/06	0.0	0.0	0.0
12/18/06	0.0	0.0	0.0
08/20/07	0.0	0.0	0.0
12/17/08	0.0	0.0	0.0
08/31/09	0.0	0.0	0.0
01/07/10	0.0	0.6	0.0
05/10/10	0.0	1.7	0.0
11/07/11	0.5	9.9	0.5
03/09/15	1.9	22.7	0.2
05/06/15	1.5	18.2	0.3
10/02/17	1.9	25.5	0.0
12/18/17	1.7	24.9	0.0
03/08/18	1.7	22.1	0.0
06/13/18	1.7	22.1	0.0
09/11/18	1.7	20.6	0.0
03/06/19	1.6	15.8	0.0
08/19/19	1.1	13.2	0.0
02/27/20	5.0	26.5	0.0
09/01/20	1.4	12.8	0.0
10/03/22	0.8	11.9	0.0
06/18/24	0.9	11.4	0.0
Min	0.0	0.0	0.0
Max	5.0	26.5	0.5
Average	0.9	10.4	0.0

All values are in micrograms per liter (µg/l).
0.0 = Not detected at or above the method detection limit.
NA = Not analyzed.

Table 2
Summary of Historic Ground Water Monitoring Well Sample Results for Select Predominant Compounds
Fulton Avenue Superfund Site, Garden City Park, New York

ERM

MW27A			
Date	PCE	TCE	cis-1,2-DCE
05/03/04	0.0	0.0	0.0
12/02/04	0.0	0.0	0.0
05/12/05	0.0	0.0	0.0
11/01/05	0.0	0.0	0.0
06/02/06	0.0	0.0	0.0
12/15/06	0.0	0.0	0.0
08/23/07	0.0	0.0	0.0
12/16/08	0.0	0.0	0.0
09/01/09	0.0	0.0	0.0
01/06/10	0.0	0.0	0.0
05/11/10	0.0	0.0	0.0
11/07/11	0.0	0.0	0.0
05/07/15	0.0	0.0	0.0
09/13/17	0.0	0.0	0.0
12/20/17	0.0	0.0	0.0
03/05/18	0.0	0.0	0.0
06/11/18	0.0	0.0	0.0
09/11/18	0.0	0.0	0.0
03/05/19	0.0	0.0	0.0
08/21/19	0.0	0.0	0.0
02/26/20	0.0	0.0	0.0
09/01/20	0.0	0.0	0.0
10/04/22	0.0	0.0	0.0
06/18/24	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	0.0	0.0	0.0
Average	0.0	0.0	0.0

MW27B			
Date	PCE	TCE	cis-1,2-DCE
05/03/04	0.0	0.0	0.0
12/02/04	0.0	0.0	0.0
05/12/05	0.0	0.0	0.0
11/1/2005	0.0	0.0	0.0
06/02/06	0.0	0.0	0.0
12/15/06	0.0	0.0	0.0
08/23/07	0.0	0.0	0.0
12/16/08	0.0	0.0	0.0
09/01/09	0.0	0.0	0.0
01/06/10	0.0	0.0	0.0
05/11/10	0.0	0.0	0.0
12/20/11	0.0	0.0	0.0
05/07/15	0.0	0.0	0.0
09/13/17	0.0	0.0	0.0
12/20/17	0.0	0.0	0.0
03/05/18	0.0	0.0	0.0
06/11/18	0.0	0.0	0.0
09/11/18	0.0	0.0	0.0
03/05/19	0.0	0.0	0.0
08/21/19	0.0	0.0	0.0
02/26/20	0.0	0.0	0.0
09/01/20	0.0	0.0	0.0
10/04/22	0.0	0.0	0.0
06/18/24	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	0.0	0.0	0.0
Average	0.0	0.0	0.0

MW27C			
Date	PCE	TCE	cis-1,2-DCE
05/03/04	0.0	0.0	0.0
12/02/04	0.0	0.0	0.0
05/12/05	0.0	0.0	0.0
11/1/2005	0.0	0.0	0.0
06/02/06	0.0	0.0	0.0
12/15/06	0.0	0.0	0.0
08/23/07	0.0	0.0	0.0
12/16/08	0.0	0.0	0.0
09/01/09	0.0	0.0	0.0
01/06/10	0.0	0.0	0.0
05/11/10	0.0	0.0	0.0
12/20/11	0.0	0.0	0.0
05/07/15	0.0	0.0	0.0
10/03/17	0.0	0.0	0.0
12/20/17	0.0	0.0	0.0
03/05/18	0.0	0.0	0.0
06/11/18	0.0	0.0	0.0
09/11/18	0.0	0.0	0.0
03/05/19	0.0	0.0	0.0
08/21/19	0.0	0.0	0.0
02/26/20	0.0	0.0	0.0
09/01/20	0.0	0.0	0.0
10/04/22	0.0	0.0	0.0
06/18/24	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	0.0	0.0	0.0
Average	0.0	0.0	0.0

MW27D			
Date	PCE	TCE	cis-1,2-DCE
05/03/04	0.0	0.0	0.0
12/02/04	0.0	0.0	0.0
05/12/05	0.0	0.0	0.0
11/1/2005	0.0	0.0	0.0
06/02/06	0.0	0.0	0.0
12/15/06	0.0	0.0	0.0
08/23/07	0.0	0.0	0.0
12/16/08	0.0	0.0	0.0
09/01/09	0.0	0.0	0.0
01/06/10	0.0	0.0	0.0
05/11/10	0.0	0.0	0.0
11/08/11	0.0	0.0	0.0
05/07/15	0.0	0.0	0.0
09/13/17	0.0	0.0	0.0
12/20/17	0.0	0.0	0.0
03/05/18	0.0	0.0	0.0
06/11/18	0.0	0.0	0.0
09/11/18	0.0	0.0	0.0
03/05/19	0.0	0.0	0.0
08/21/19	0.0	0.0	0.0
02/26/20	0.0	0.0	0.0
09/01/20	0.0	0.0	0.0
10/04/22	0.0	0.0	0.0
06/18/24	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	0.0	0.0	0.0
Average	0.0	0.0	0.0

MW27E			
Date	PCE	TCE	cis-1,2-DCE
05/03/04	0.0	0.0	0.0
12/02/04	0.0	0.0	0.0
05/12/05	0.0	0.0	0.0
11/1/2005	0.0	0.0	0.0
06/02/06	0.0	0.0	0.0
12/15/06	0.0	0.0	0.0
08/23/07	0.0	0.0	0.0
12/16/08	0.0	0.0	0.0
09/01/09	0.0	0.0	0.0
01/06/10	0.0	0.0	0.0
05/11/10	0.0	0.0	0.0
11/08/11	0.0	0.0	0.0
05/07/15	0.0	0.0	0.0
10/03/17	0.0	0.0	0.0
12/20/17	0.0	0.0	0.0
03/05/18	0.0	0.0	0.0
06/11/18	0.0	0.0	0.0
09/11/18	0.0	0.0	0.0
03/05/19	0.0	0.0	0.0
08/21/19	0.0	0.0	0.0
02/26/20	0.0	0.0	0.0
09/01/20	0.0	0.0	0.0
10/04/22	0.0	0.0	0.0
06/18/24	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	0.0	0.0	0.0
Average	0.0	0.0	0.0

MW27F			
Date	PCE	TCE	cis-1,2-DCE
05/03/04	0.0	0.0	0.0
12/02/04	0.0	0.0	0.0
05/12/05	0.0	0.0	0.0
11/1/2005	0.0	0.0	0.0
06/02/06	0.0	0.0	0.0
12/15/06	0.0	0.0	0.0
08/23/07	0.0	0.0	0.0
12/16/08	0.0	0.0	0.0
09/01/09	0.0	0.0	0.0
01/06/10	0.0	0.0	0.0
05/11/10	0.0	0.0	0.0
11/08/11	0.0	0.0	0.0
05/07/15	0.0	0.0	0.0
09/13/17	0.0	0.0	0.0
12/20/17	0.0	0.0	0.0
03/05/18	0.0	0.0	0.0
06/11/18	0.0	0.0	0.0
09/10/18	0.0	0.0	0.0
03/05/19	0.0	0.0	0.0
08/21/19	0.0	0.0	0.0
02/26/20	0.0	0.0	0.0
09/01/20	0.0	0.0	0.0
10/04/22	0.0	0.0	0.0
06/18/24	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	0.0	0.0	0.0
Average	0.0	0.0	0.0

MW27G			
Date	PCE	TCE	cis-1,2-DCE
05/03/04	0.0	0.0	0.0
12/02/04	0.0	0.0	0.0
05/12/05	0.0	0.0	0.0
11/1/2005	0.0	0.4	0.0
06/02/06	0.0	0.0	0.0
12/15/06	0.0	1.8	0.0
08/23/07	0.0	0.0	0.0
12/16/08	0.4	4.2	0.0
09/01/09	1.0	8.4	0.0
01/06/10	0.0	4.1	0.0
05/11/10	0.0	1.9	0.0
11/08/11	0.3	2.5	0.0
03/09/15	1.5	2.5	0.0
05/07/15	1.0	1.1	0.0
09/13/17	3.5	1.7	0.0
12/20/17	3.8	2.0	0.0
03/05/18	2.8	1.4	0.0
06/11/18	1.9	0.9	0.0
09/10/18	7.2	3.1	0.6
03/05/19	2.9	0.9	0.0
08/21/19	8.2	2.3	0.5
02/26/20	5.3	1.2	0.0
09/01/20	21.2	3.8	1.2
10/04/22	26.1	3.9	1.2
06/18/24	14.1	2.5	0.7
Min	0.0	0.0	0.0
Max	26.1	8.4	1.2
Average	4.0	2.0	0.2

MW27H			
Date	PCE	TCE	cis-1,2-DCE
05/03/04	0.0	0.0	0.0
12/02/04	0.0	0.0	0.0
05/12/05	0.0	0.0	0.0
11/1/2005	0.0	0.0	0.0
06/02/06	0.0	0.0	0.0
12/15/06	0.0	0.0	0.0
08/23/07	0.0	0.0	0.0
12/16/08	0.0	0.0	0.0
09/01/09	0.0	0.0	0.0
01/06/10	0.0	0.0	0.0
05/11/10	0.0	0.0	0.0
11/08/11	0.0	1.0	0.0
03/09/15	0.3	1.5	0.7
05/07/15	0.0	0.6	1.6
09/13/17	0.0	1.8	6.8
12/20/17	0.0	0.0	6.5
03/05/18	0.0	0.3	6.5
06/11/18	0.0	0.5	6.2
09/10/18	0.0	1.1	7.7
03/05/19	0.0	0.0	7.2
08/21/19	0.0	0.0	5.8
02/26/20	0.0	0.7	6.4
09/01/20	0.0	0.0	1.0
10/04/22	0.0	0.0	2.3
06/18/24	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	0.3	1.8	7.7
Average	0.0	0.3	2.3

MW28A			
Date	PCE	TCE	cis-1,2-DCE
09/14/17	0.0	0.0	0.0
12/21/17	0.0	0.0	0.0
03/06/18	0.0	0.0	0.0
06/12/18	0.0	0.0	0.0
09/17/18	0.0	0.0	0.0
03/14/19	0.0	0.0	0.0
08/19/19	0.0	0.0	0.0
02/25/20	0.0	0.0	0.0
08/31/20	0.0	0.0	0.0
10/05/22	0.0	0.0	0.0
06/17/24	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	0.0	0.0	0.0
Average	0.0	0.0	0.0

MW28B			
Date	PCE	TCE	cis-1,2-DCE
09/14/17	0.0	0.0	0.0
12/21/17	0.0	0.0	0.0
03/06/18	0.0	0.0	0.0
06/12/18	0.0	0.0	0.0
09/17/18	0.0	0.0	0.0
03/14/19	0.0	0.0	0.0
08/19/19	0.0	0.0	0.0
02/25/20	0.0	0.0	0.0
08/31/20	0.0	0.0	0.0
10/05/22	0.0	0.0	0.0
06/17/24	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	0.0	0.0	0.0
Average	0.0	0.0	0.0

MW28C			
Date	PCE	TCE	cis-1,2-DCE
09/14/17	0.0	0.0	0.0
12/21/17	0.0	0.0	0.0
03/06/18	0.0	0.0	0.0
06/12/18	0.0	0.0	0.0
09/17/18	0.0	0.0	0.0
03/14/19	0.0	0.0	0.0
08/19/19	0.0	0.0	0.0
02/25/20	0.0	0.0	0.0
08/31/20	0.0	0.0	0.0
10/05/22	0.0	0.0	0.0
06/17/24	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	0.0	0.0	0.0
Average	0.0	0.0	0.0

MW28D			
Date	PCE	TCE	cis-1,2-DCE
09/14/17	0.5	0.0	0.0
12/21/17	1.1	0.0	0.0
03/06/18	0.9	0.0	0.0
06/12/18	0.8	0.0	0.0
09/17/18	0.0	0.0	0.0
03/14/19	0.0	0.0	0.0
08/19/19	0.0	0.0	0.0
02/25/20	0.0	0.0	0.0
08/31/20	0.0	0.0	0.0
10/05/22	0.0	0.0	0.0
06/17/24	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	1.1	0.0	0.0
Average	0.3	0.0	0.0

MW28E			
Date	PCE	TCE	cis-1,2-DCE
09/14/17	0.0	0.0	0.0
12/21/17	1.2	0.0	0.0
03/06/18	0.8	0.0	0.0
06/12/18	0.0	0.0	0.0
09/17/18	0.0	0.0	0.0
03/14/19	0.0	0.0	0.0
08/19/19	0.0	0.0	0.0
02/25/20	0.0	0.0	0.0
08/31/20	0.0	0.0	0.0
10/05/22	0.9	0.0	0.0
06/17/24	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	1.2	0.0	0.0
Average	0.3	0.0	0.0

MW28F			
Date	PCE	TCE	cis-1,2-DCE
09/14/17	0.0	0.0	0.0
12/21/17	1.0	0.0	0.0
03/06/18	1.3	0.0	0.0
06/12/18	0.0	0.0	0.0
09/17/18	1.0	0.0	0.0
03/14/19	1.5	0.0	0.0
08/19/19	1.0	0.0	0.0
02/25/20	0.0	0.0	0.0
08/31/20	0.0	0.0	0.0
10/05/22	0.8	0.0	0.0
06/17/24	0.8	0.0	0.0
Min	0.0	0.0	0.0
Max	1.5	0.0	0.0
Average	0.7	0.0	0.0

All values are in micrograms per liter (µg/l).
0.0 = Not detected at or above the method detection limit.
NA = Not analyzed.

Table 2
Summary of Historic Ground Water Monitoring Well Sample Results for Select Predominant Compounds
Fulton Avenue Superfund Site, Garden City Park, New York

ERM

MW28G

Date	PCE	TCE	cis-1,2-DCE
09/14/17	0.0	0.0	0.0
12/21/17	0.8	0.0	0.0
03/06/18	0.6	0.0	0.0
06/12/18	1.2	0.0	0.0
09/17/18	0.0	0.0	0.0
03/14/19	0.0	0.0	0.0
08/19/19	0.0	0.0	0.0
02/25/20	0.0	0.0	0.0
08/31/20	0.0	0.0	0.0
10/05/22	0.0	0.0	0.0
06/17/24	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	1.2	0.0	0.0
Average	0.2	0.0	0.0

MW28H

Date	PCE	TCE	cis-1,2-DCE
09/14/17	0.0	0.0	0.0
12/21/17	0.5	0.0	0.0
03/06/18	0.7	0.0	0.0
06/12/18	0.9	0.0	0.0
09/17/18	0.0	0.0	0.0
03/14/19	0.0	0.0	0.0
08/19/19	0.0	0.0	0.0
02/25/20	0.0	0.0	0.0
08/31/20	0.0	0.0	0.0
10/05/22	0.0	0.0	0.0
06/17/24	0.0	0.0	0.0
Min	0.0	0.0	0.0
Max	0.9	0.0	e
Average	0.2	0.0	0.0

E9B

Date	PCE	TCE	cis-1,2-DCE
07/17/86	20.4	36.3	0.0
02/04/87	15.3	18.1	0.0
07/29/88	0.0	0.0	0.0
07/21/89	8.0	0.0	0.0
10/13/89	1.8	0.4	0.0
06/21/90	3.1	1.5	0.0
06/24/91	0.0	0.0	0.0
01/09/92	14.4	1.1	0.0
01/08/93	2.9	1.3	0.0
07/28/94	1.8	0.4	0.0
02/26/97	3.2	0.0	0.0
09/12/01	2.0	0.4	0.4
Min	0.0	0.0	0.0
Max	20.4	36.3	0.4
Average	6.1	5.0	0.0

M51

Date	PCE	TCE	cis-1,2-DCE
10/22/93	0.0	4.6	0.0
08/15/94	0.2	12.2	0.5
03/03/99	0.0	7.5	0.0
09/25/01	0.0	6.0	0.0
Min	0.0	4.6	0.0
Max	0.2	12.2	0.5
Average	0.1	7.6	0.1

M52

Date	PCE	TCE	cis-1,2-DCE
10/22/93	0.0	0.0	0.0
08/15/94	2.9	0.0	1.1
02/26/97	1.9	0.0	0.0
09/25/01	0.7	0.3	0.0
Min	0.0	0.0	0.0
Max	2.9	0.3	1.1
Average	1.4	0.1	0.3

N-02227

Date	PCE	TCE	cis-1,2-DCE
09/17/01	10.0	4.0	0.1
Min	10.0	4.0	0.1
Max	10.0	4.0	0.1
Average	10.0	4.0	0.1

VOW1D

Date	PCE	TCE	cis-1,2-DCE
4/26/99	111.0	7.0	0.0
7/14/99	47.6	8.1	0.0
10/26/99	0.5	0.0	0.0
6/7/00	0.7	0.0	0.0
3/19/01	0.0	0.0	0.0
6/14/01	0.0	0.0	0.0
11/15/11	1.6	0.0	0.0
Min	0.0	0.0	0.0
Max	111.0	8.1	0.0
Average	23.1	2.2	0.0

VOW3D

Date	PCE	TCE	cis-1,2-DCE
4/26/99	22,200.0	224.0	1.6
7/14/99	11,700.0	2,410.0	0.0
10/26/99	705.0	745.0	50.1
6/7/00	99.1	87.7	12.7
9/29/00	27.8	26.7	1.0
3/19/01	64.2	18.9	28.8
6/14/01	4.9	3.3	0.0
11/15/11	1.6	0.0	0.0
12/16/11	1.2	0.0	0.0
Min	1.2	0.0	0.0
Max	22,200.0	2,410.0	50.1
Average	3,867.1	390.6	10.5

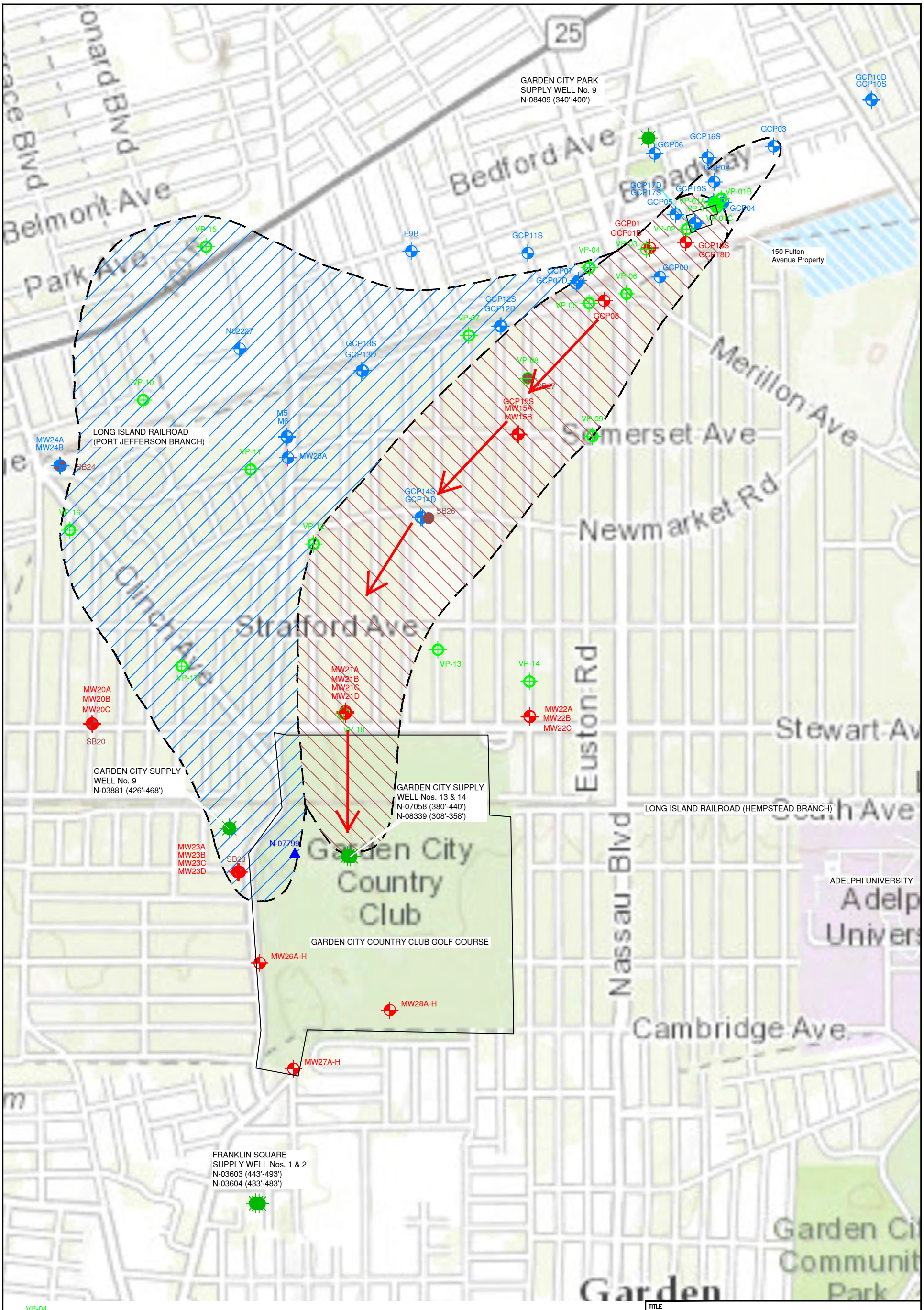
VOW4D

Date	PCE	TCE	cis-1,2-DCE
4/26/99	53,700.0	0.0	0.0
7/14/99	36,700.0	1,040.0	0.0
10/26/99	6,800.0	2,600.0	401.0
1/24/00	2,140.0	4,380.0	1,290.0
6/7/00	897.0	3,540.0	2,373.7
9/29/00	134.0	928.0	1,562.0
1/3/01	55.8	929.0	1,569.8
3/19/01	0.0	117.0	13,243.7
6/14/01	1.6	2.5	19.4
9/6/01	6.3	10.0	5.0
11/15/11	2.9	0.4	0.0
12/16/11	1.8	0.4	0.0
12/16/11	1.9	0.4	0.0
Min	0.0	0.0	0.0
Max	53,700.0	4,380.0	13,243.7
Average	7,726.3	1,042.1	1,574.2

VEW1

Date	PCE	TCE	cis-1,2-DCE
11/15/11	2.5	0.3	0.0
12/16/11	3.1	0.5	0.0
Min	2.5	0.3	0.0
Max	3.1	0.5	0.0
Average	2.8	0.4	0.0

All values are in micrograms per liter (µg/l).
0.0 = Not detected at or above the method detection limit.
NA = Not analyzed.



TITLE

Long-Term Groundwater Monitoring Well Network Well Locations Fulton Avenue Superfund Site Garden City/Garden City Park, NY

PREPARED FOR

Genesco Inc.

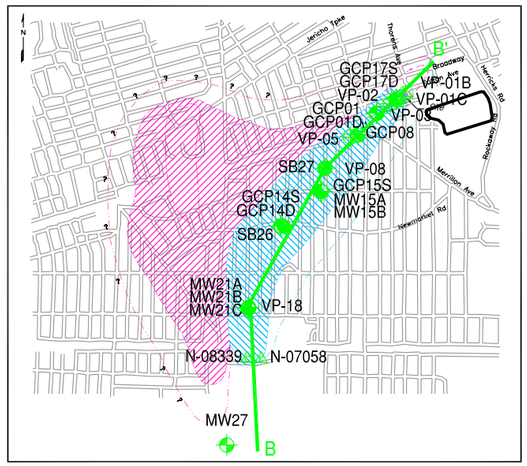
Environmental Resources Management

ERM

FIGURE 1

DRAWN BY	SCALE	DATE	JOB NO.
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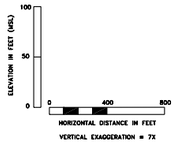
Y:\GENESCO\150 Fulton Ave\NYCAD\2016\2016-12-29 - Fulton Avenue QAPP Wells.dwg (05/10/2017 - 6:10pm Melville)



LOCATION OF CROSS-SECTION LINE

0 1200' 2400'

GRAPHIC SCALE



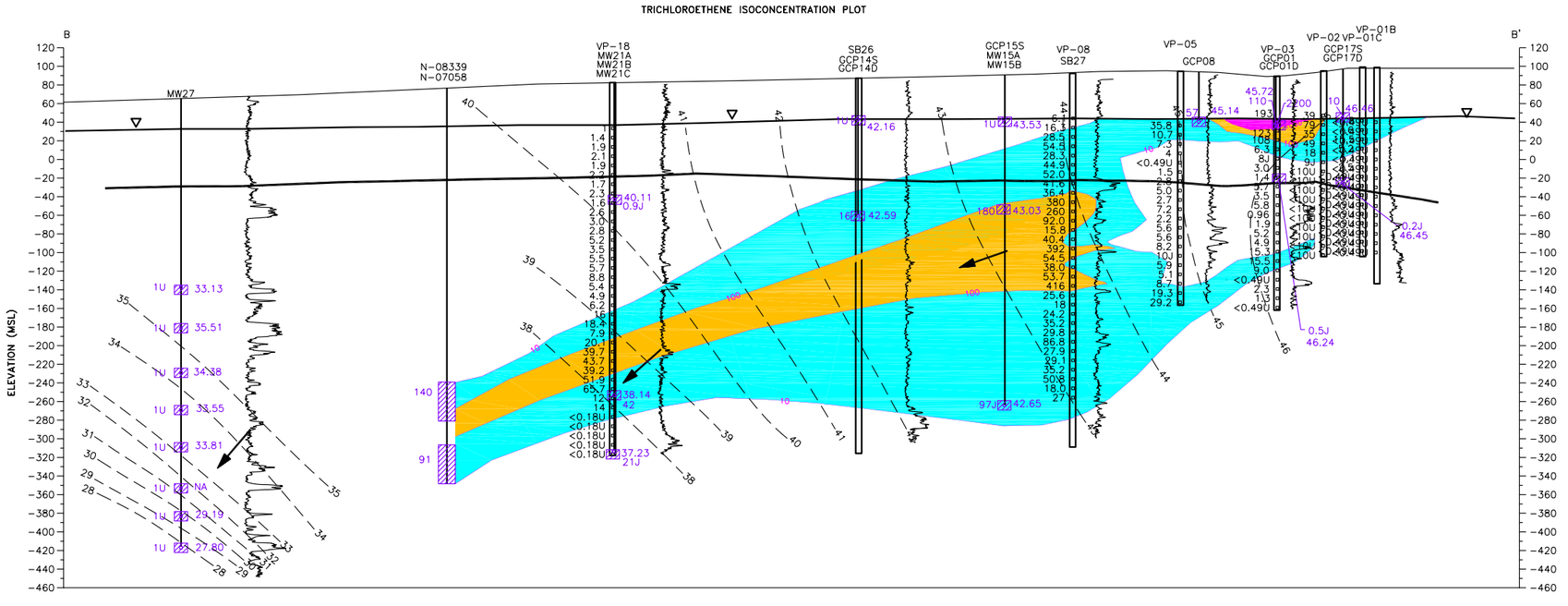
LEGEND

- COMPOUND>1000 μg/L
- COMPOUND>100 μg/L
- COMPOUND>10 μg/L
- CONTACT – UPPER GLACIAL/MAGOTHY AQUIFERS
- WATER TABLE – APRIL 4, 2002 & MAY 3, 2004
- MONITORING WELL SCREEN ZONE
- 0.5J 39.22 – WATER LEVEL ELEVATION (ft MSL)
- COMPOUND CONCENTRATION (μg/L)
- 38 – – – – – 38 EQUIPOTENTIAL LINE
- GENERAL DIRECTION OF GROUND WATER FLOW

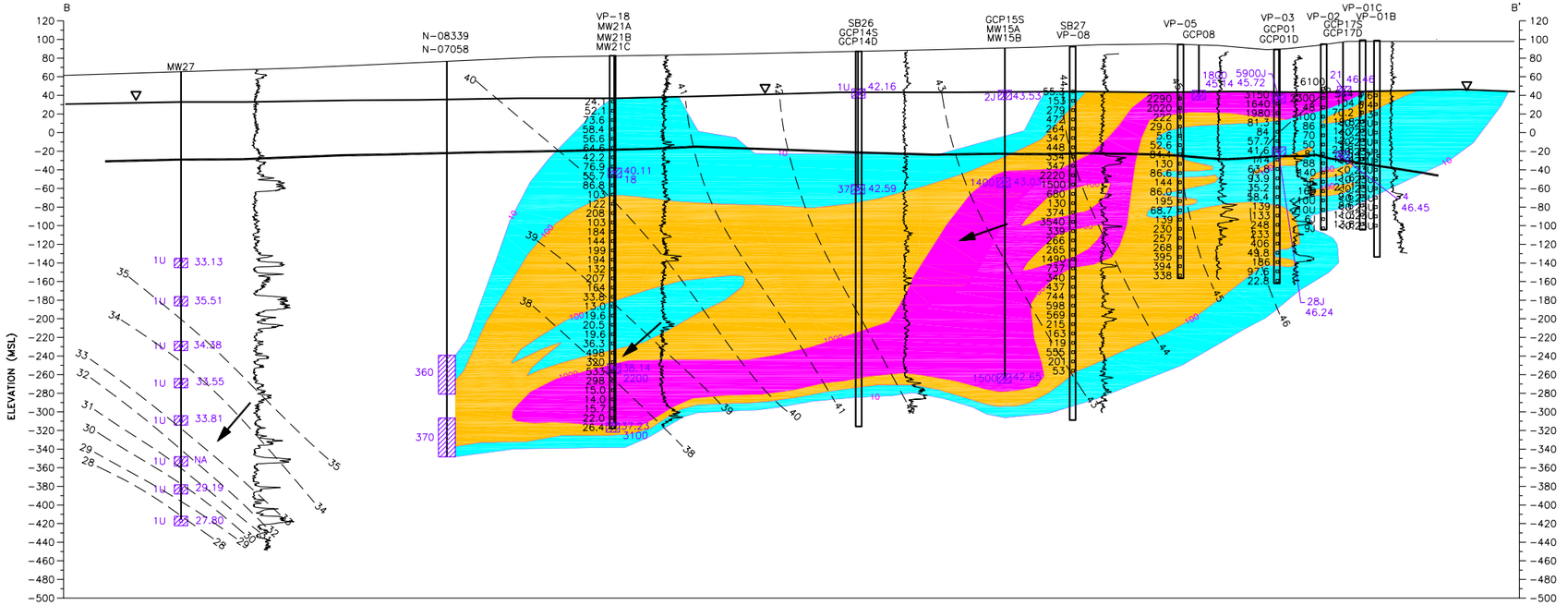
NOTE: ISOCONTOURS ARE BASED ON GROUND WATER QUALITY DATA DERIVED FROM VERTICAL PROFILING AND THE PERMANENT GROUND WATER MONITORING WELLS SAMPLED DURING THE RI. FOR EACH GROUND WATER MONITORING WELL LOCATION, THE MAXIMUM DETECTED CONCENTRATIONS OF PCE AND TCE FROM THE 1999–2005 DATA SET WERE USED IN ORDER TO DEPICT THE CURRENT GENERALIZED DISTRIBUTION OF THESE COMPOUNDS IN GROUND WATER.

ALL CONCENTRATIONS IN μg/L.

TRICHLOROETHENE ISOCONCENTRATION PLOT



TETRACHLOROETHENE ISOCONCENTRATION PLOT



NO.	DATE	APPR.	REVISION	NO.	DATE	APPR.	REVISION

150 FULTON AVENUE

GARDEN CITY PARK, NEW YORK

ERM Environmental Resources Management

CHECKED	DATE
DESIGN ENGINEER	
PROJECT ENGINEER	
PROJECT MANAGER	
APPROVED	
APPROVED	

HYDROGEOCHEMICAL CROSS-SECTION B–B'

DRAWING NO. Figure 2

REV. NO.

DRAWN	DATE	REVISED DATE
MLB/EMF	7/25/05	
SCALE	JOB NO.	FILE NAME
GRAPHIC	0016775.3	0016775-04-018

SHEET OF

Figure 3
Well GCP01
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time Showing Groundwater Elevation
Screen Zone Interval: 49 to 59 Feet Below Ground Surface

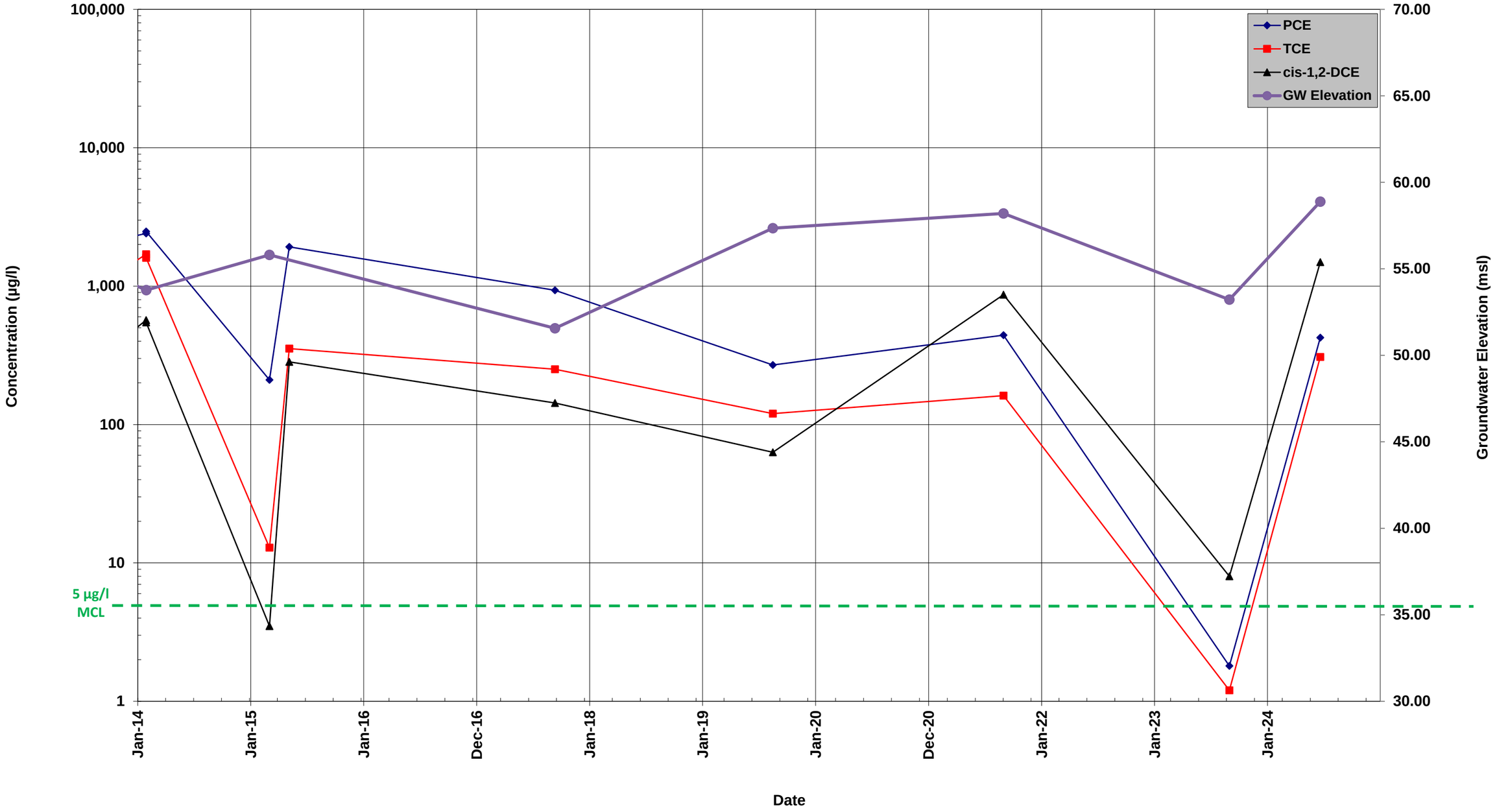
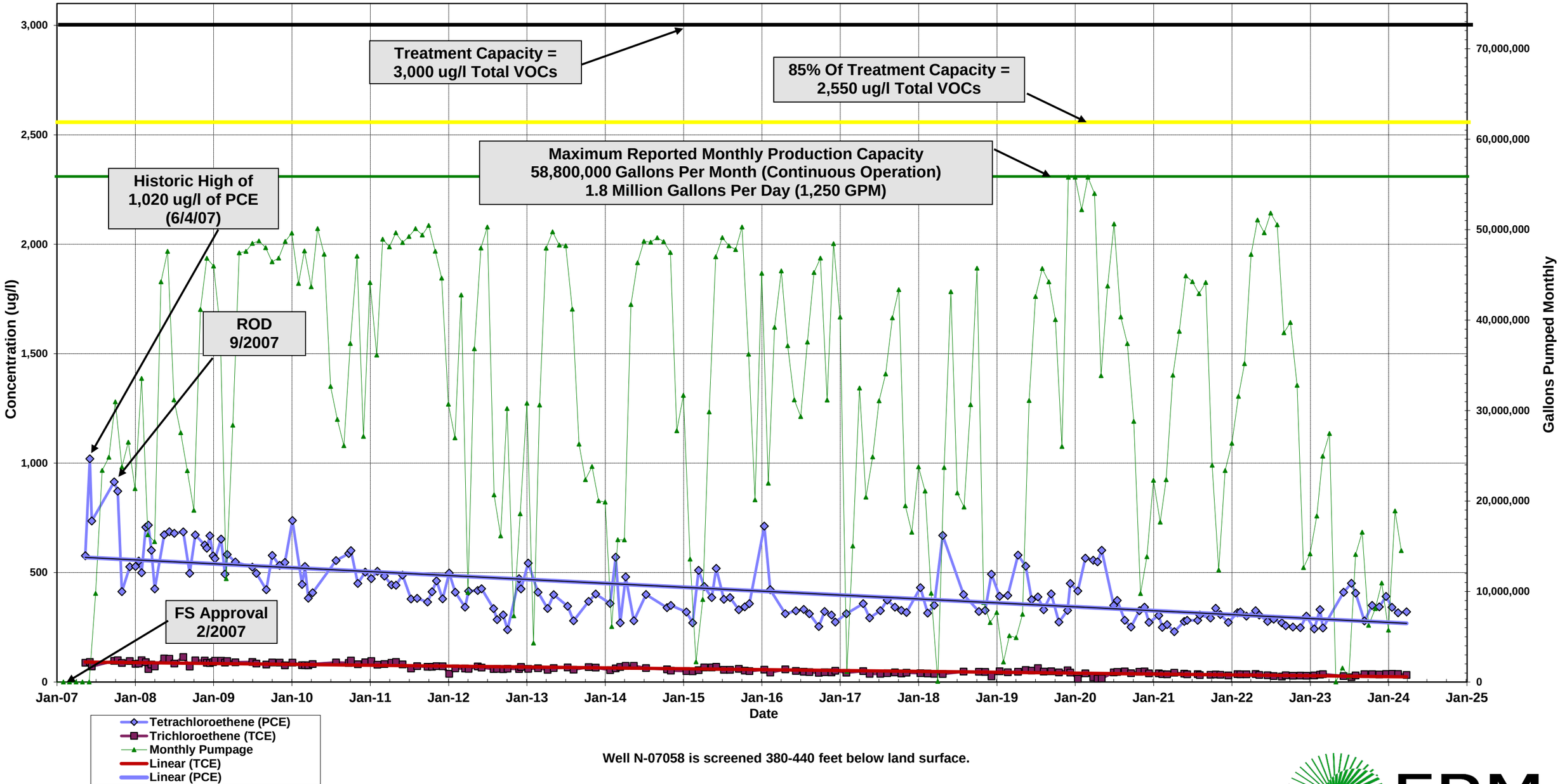


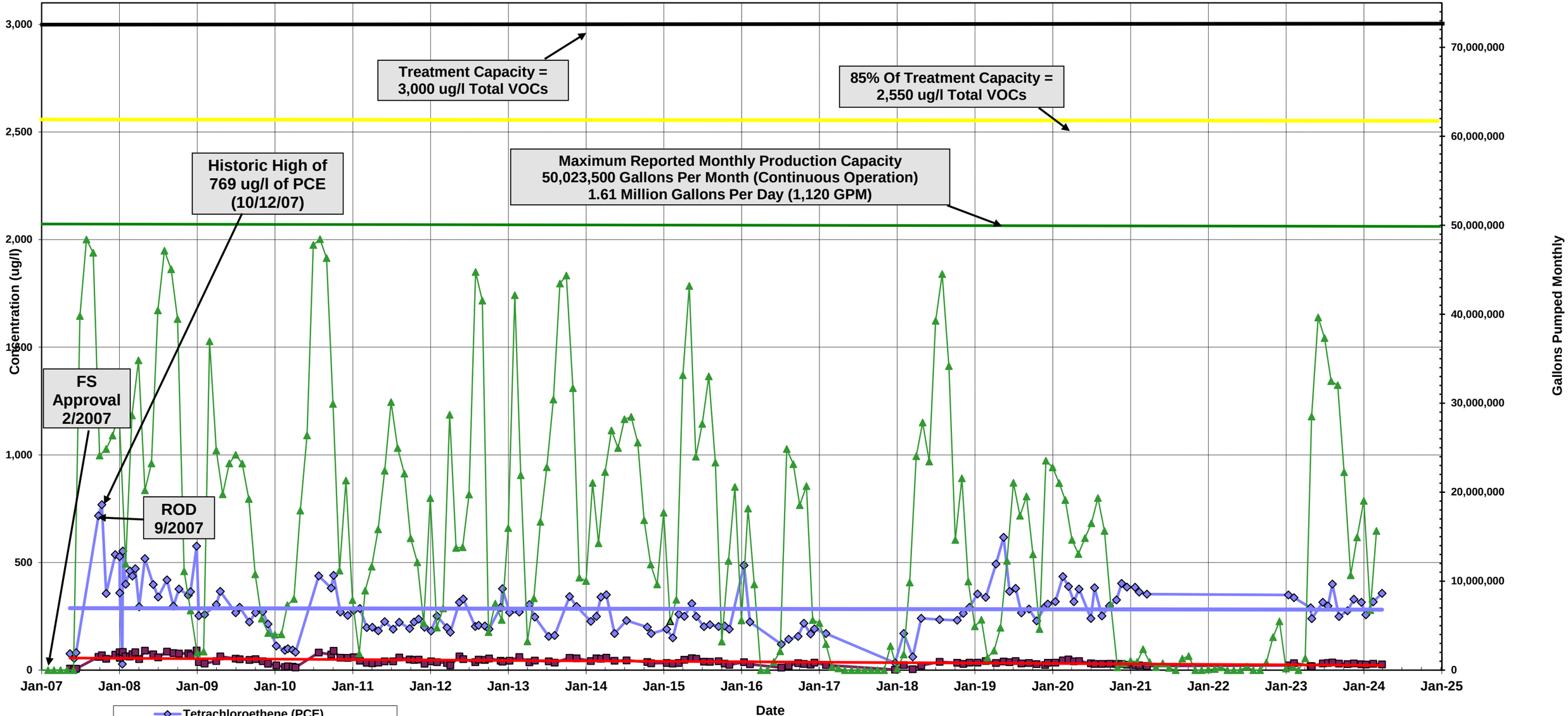
FIGURE 4
HISTORICAL TETRACHLOROETHENE & TRICHLOROETHENE CONCENTRATIONS AND MONTHLY WELL PUMPAGE: JANUARY 2007 - MARCH 2024
PUBLIC WATER SUPPLY WELL # N-07058 (GARDEN CITY WELL NO. 13), GARDEN CITY, NEW YORK



Well N-07058 is screened 380-440 feet below land surface.

ERM

FIGURE 5
HISTORICAL TETRACHLOROETHENE & TRICHLOROETHENE CONCENTRATIONS AND MONTHLY WELL PUMPAGE: JANUARY 2007 - MARCH 2024
PUBLIC WATER SUPPLY WELL # N-08339 (GARDEN CITY WELL NO. 14), GARDEN CITY, NEW YORK



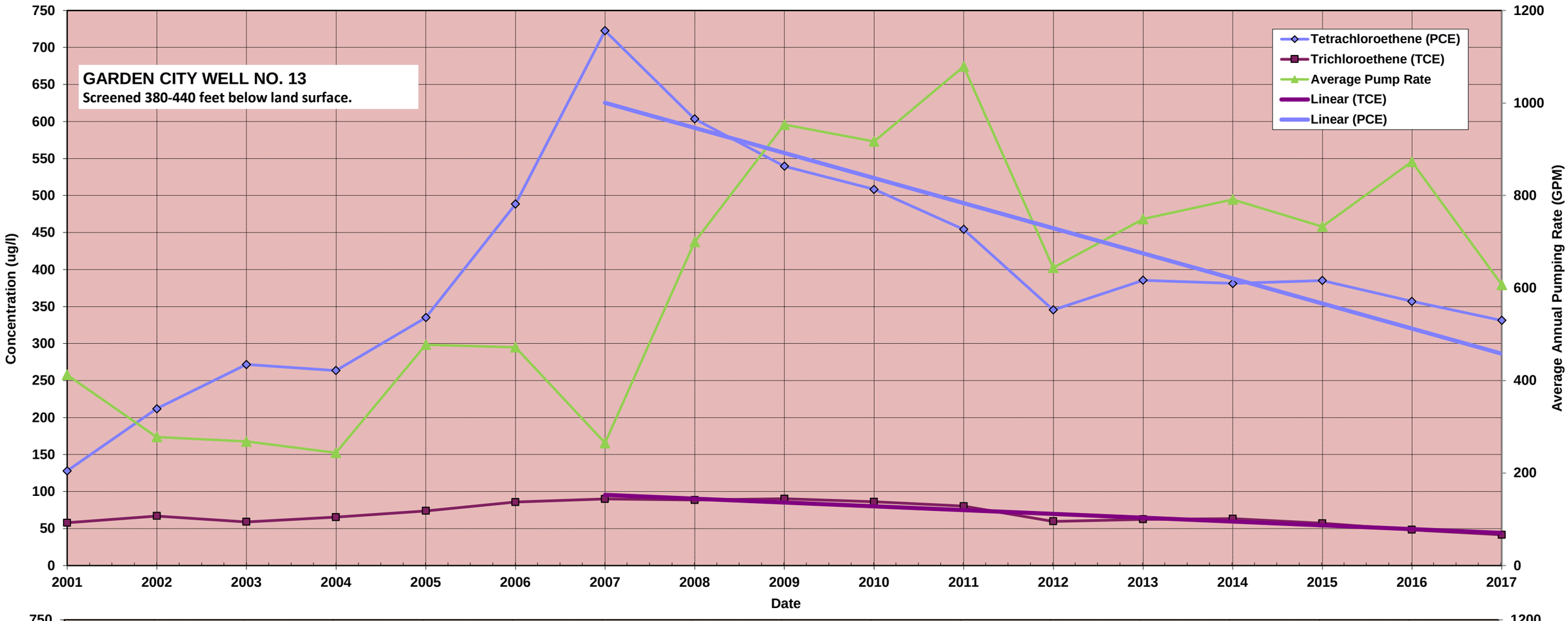
Well N-08339 is screened 308-358 feet below land surface.

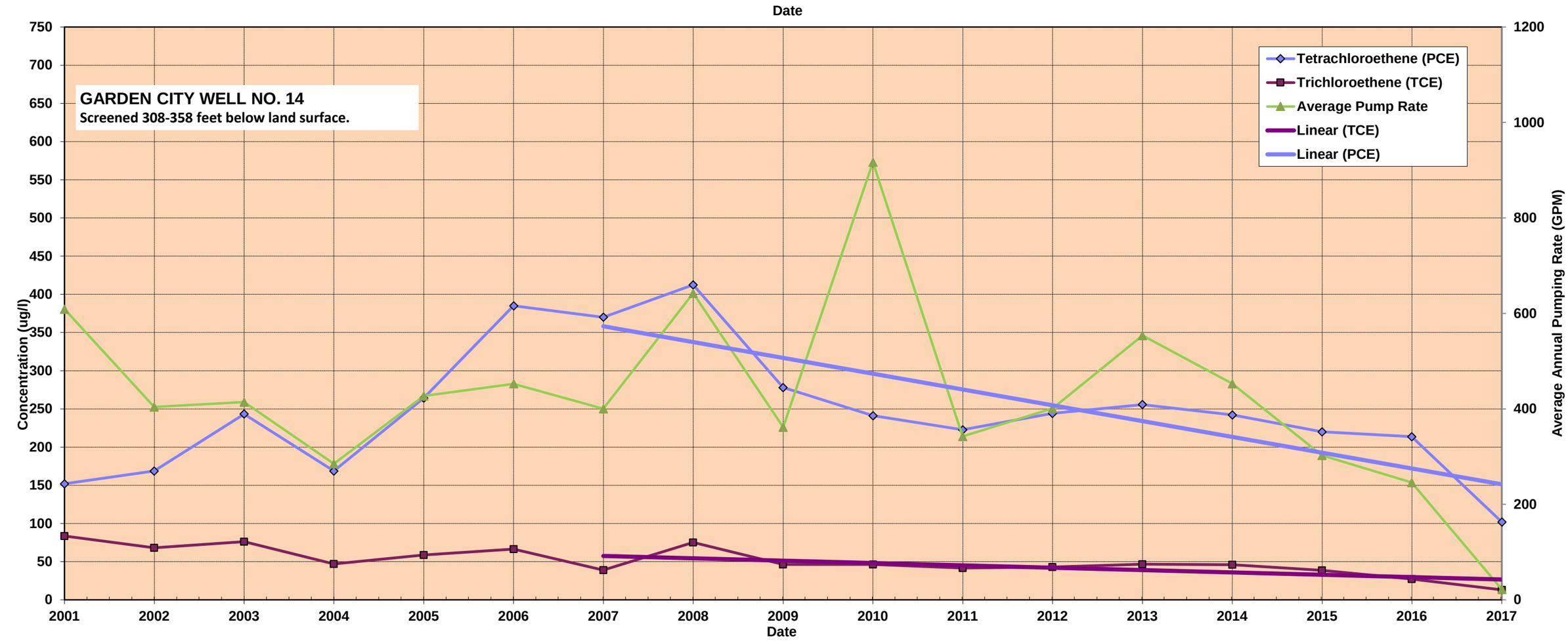
ERM

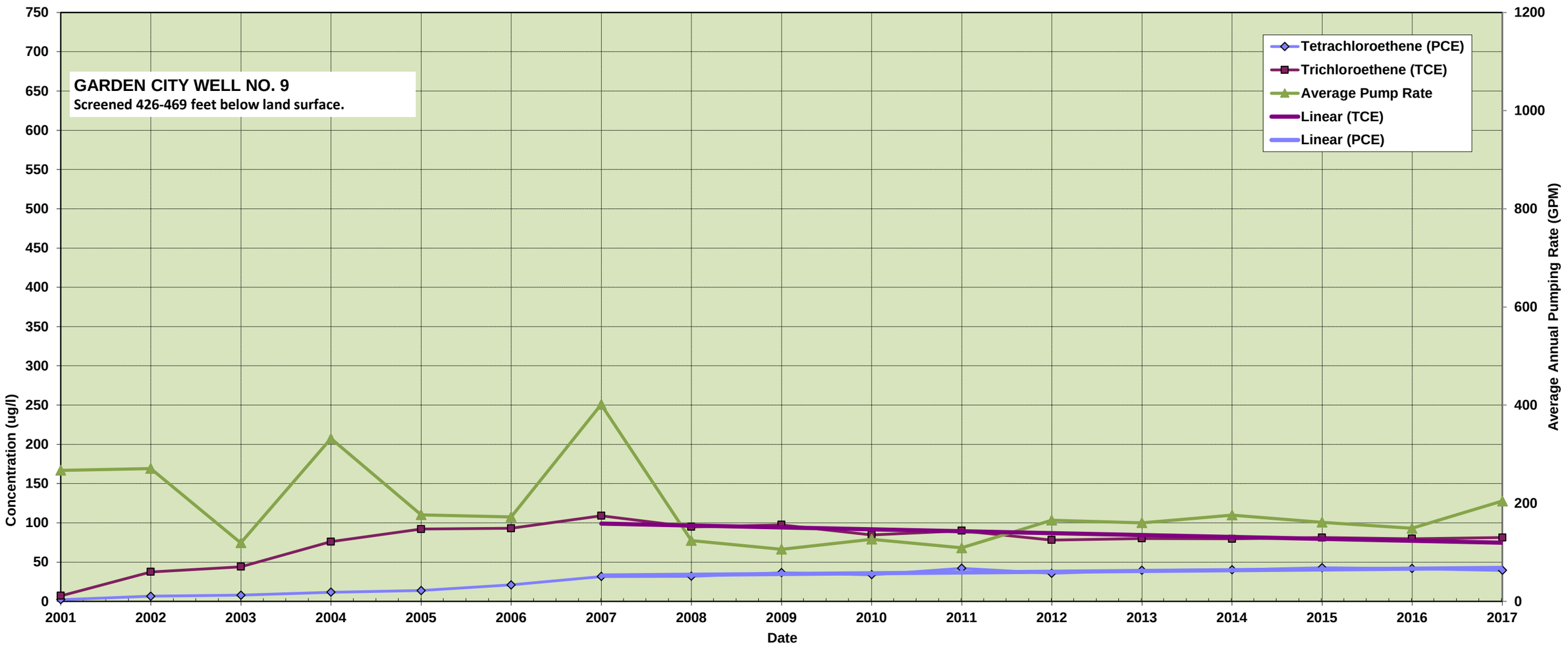
FIGURE 6
HISTORIC AVERAGE TETRACHLOROETHENE AND TRICHLOROETHENE CONCENTRATIONS BY YEAR 2001 - 2015
GARDEN CITY PUBLIC WATER SUPPLY WELL NOS. 9, 13 14, GARDEN CITY, NEW YORK

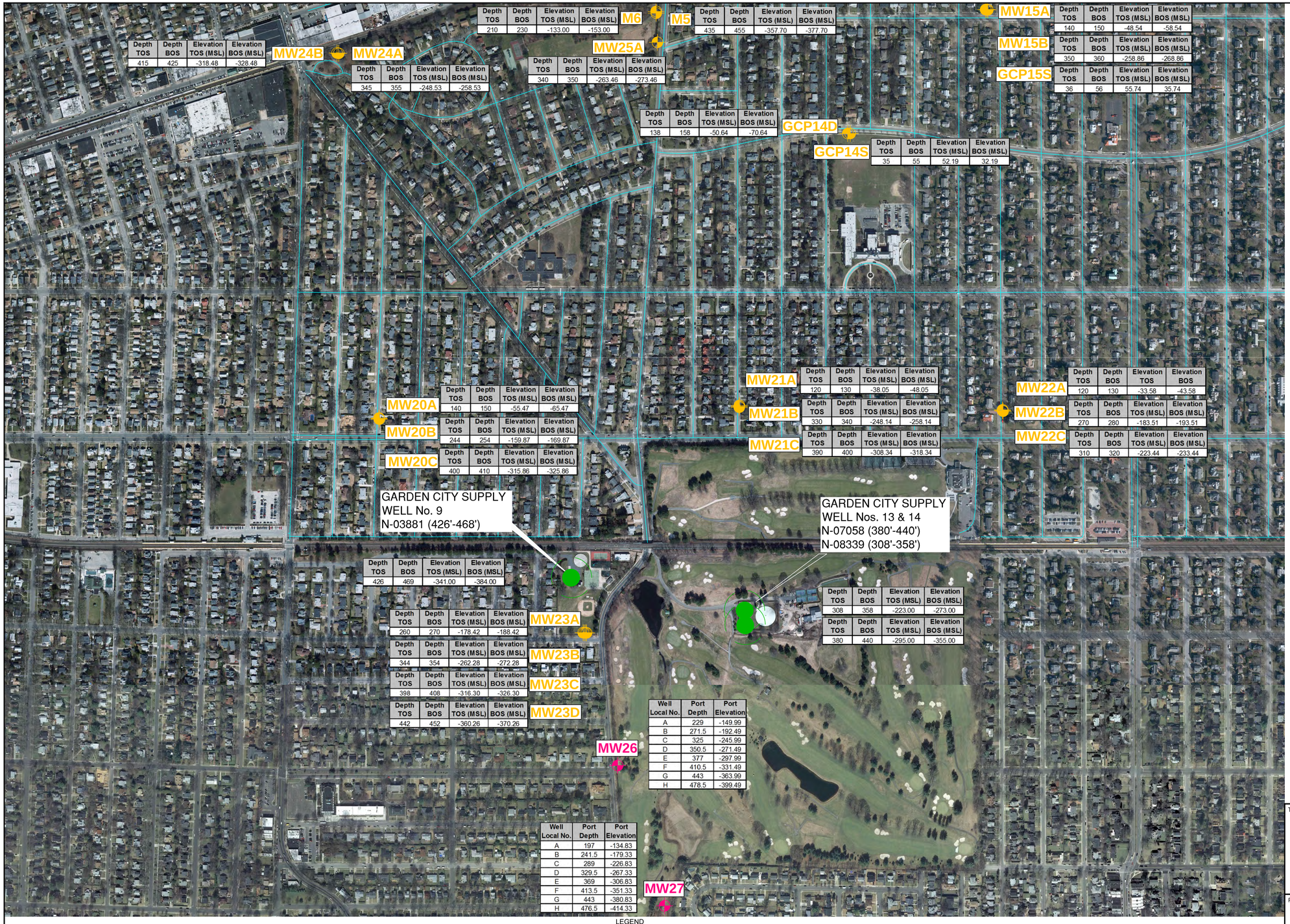
	Year	2001		2002		2003		2004		2005		2006		2007		2008		2009		2010		2011		2012		2013		2014		2015		2016		2017	
	Compound	PCE	TCE	PCE	TCE	PCE	TCE	PCE	TCE	PCE	TCE	PCE	TCE	PCE	TCE	PCE	TCE	PCE	TCE	PCE	TCE	PCE	TCE	PCE	TCE	PCE	TCE	PCE	TCE	PCE	TCE	PCE	TCE
Well No. 13 (N-07058)	Average Concentration	128.0	57.8	211.8	67.0	271.7	59.0	263.6	65.3	335.0	73.9	488.3	85.8	722.6	90.0	603.4	88.5	539.5	90.3	508.3	86.1	454.3	80.2	345.4	59.7	385.5	62.5	381.1	63.4	385.1	57.1	357.0	48.3	331.3	41.6
	Ratio PCE/TCE	2.2		3.2		4.6		4.0		4.5		5.7		8.0		6.8		6.0		5.9		5.7		5.8		6.2		6.0		6.7		7.4		8.0	
	Average Pump Rate	412.1		277.8		268.2		243.8		477.4		472.1		265.0		699.6		953.1		916.8		1078.9		644.0		749.1		791.3		733.0		873.0		607.2	
Well No. 14 (N-08339)	Average Concentration	152.0	83.6	168.7	68.2	243.3	76.2	168.6	46.9	264.2	58.6	385.0	66.5	370.1	38.9	412.4	75.0	278.1	46.3	241.2	46.2	222.8	41.7	244.1	43.1	255.8	46.6	242.1	45.9	219.9	38.8	213.6	27.1	102.0	13.1
	Ratio PCE/TCE	1.8		2.5		3.2		3.6		4.5		5.8		9.5		5.5		6.0		5.2		5.3		5.7		5.5		5.3		5.7		7.9		8.0	
	Average Pump Rate	608.8		271.0		414.2		284.9		427.3		452.6		400.4		642.4		361.9		916.8		342.3		400.9		553.9		453.0		302.7		246.0		22.0	
Well No. 9 (N-03881)	Average Concentration	2.1	7.0	6.6	37.5	7.9	44.0	11.6	76.0	13.7	92.0	21.0	93.0	31.6	109.0	32.0	94.8	36.4	97.5	33.9	84.6	42.0	90.0	35.7	78.1	39.5	80.2	40.1	79.6	42.8	81.2	41.8	79.8	39.4	81.2
	Ratio PCE/TCE	0.3		0.2		0.2		0.2		0.1		0.3		0.3		0.3		0.4		0.4		0.5		0.5		0.5		0.5		0.5		0.5		0.5	
	Average Pump Rate	267.0		271.0		119.2		331.7		176.4		172.3		401.2		123.9		106.1		126.5		109.1		165.4		160.2		175.8		161.0		148.9		204.4	

Concentrations are in ug/l (ppb).









Depth TOS	Depth BOS	Elevation TOS (MSL)	Elevation BOS (MSL)
415	425	-318.48	-328.48

Depth TOS	Depth BOS	Elevation TOS (MSL)	Elevation BOS (MSL)
345	355	-248.53	-258.53

Depth TOS	Depth BOS	Elevation TOS (MSL)	Elevation BOS (MSL)
210	230	-133.00	-153.00

Depth TOS	Depth BOS	Elevation TOS (MSL)	Elevation BOS (MSL)
340	350	-263.46	-273.46

Depth TOS	Depth BOS	Elevation TOS (MSL)	Elevation BOS (MSL)
435	455	-357.70	-377.70

Depth TOS	Depth BOS	Elevation TOS (MSL)	Elevation BOS (MSL)
140	150	-48.54	-58.54

Depth TOS	Depth BOS	Elevation TOS (MSL)	Elevation BOS (MSL)
350	360	-258.86	-268.86

Depth TOS	Depth BOS	Elevation TOS (MSL)	Elevation BOS (MSL)
36	56	55.74	35.74

Depth TOS	Depth BOS	Elevation TOS (MSL)	Elevation BOS (MSL)
138	158	-50.64	-70.64

Depth TOS	Depth BOS	Elevation TOS (MSL)	Elevation BOS (MSL)
35	55	52.19	32.19

Depth TOS	Depth BOS	Elevation TOS (MSL)	Elevation BOS (MSL)
120	130	-38.05	-48.05

Depth TOS	Depth BOS	Elevation TOS (MSL)	Elevation BOS (MSL)
330	340	-248.14	-258.14

Depth TOS	Depth BOS	Elevation TOS (MSL)	Elevation BOS (MSL)
390	400	-308.34	-318.34

Depth TOS	Depth BOS	Elevation TOS	Elevation BOS
120	130	-33.58	-43.58

Depth TOS	Depth BOS	Elevation TOS (MSL)	Elevation BOS (MSL)
270	280	-183.51	-193.51

Depth TOS	Depth BOS	Elevation TOS (MSL)	Elevation BOS (MSL)
310	320	-223.44	-233.44

Depth TOS	Depth BOS	Elevation TOS (MSL)	Elevation BOS (MSL)
140	150	-55.47	-65.47

Depth TOS	Depth BOS	Elevation TOS (MSL)	Elevation BOS (MSL)
244	254	-159.87	-169.87

Depth TOS	Depth BOS	Elevation TOS (MSL)	Elevation BOS (MSL)
400	410	-315.86	-325.86

Depth TOS	Depth BOS	Elevation TOS (MSL)	Elevation BOS (MSL)
426	469	-341.00	-384.00

Depth TOS	Depth BOS	Elevation TOS (MSL)	Elevation BOS (MSL)
260	270	-178.42	-188.42

Depth TOS	Depth BOS	Elevation TOS (MSL)	Elevation BOS (MSL)
344	354	-262.28	-272.28

Depth TOS	Depth BOS	Elevation TOS (MSL)	Elevation BOS (MSL)
398	408	-316.30	-326.30

Depth TOS	Depth BOS	Elevation TOS (MSL)	Elevation BOS (MSL)
442	452	-360.26	-370.26

Depth TOS	Depth BOS	Elevation TOS (MSL)	Elevation BOS (MSL)
308	358	-223.00	-273.00

Depth TOS	Depth BOS	Elevation TOS (MSL)	Elevation BOS (MSL)
380	440	-295.00	-355.00

Well Local No.	Port Depth	Port Elevation
A	229	-149.99
B	271.5	-192.49
C	325	-245.99
D	350.5	-271.49
E	377	-297.99
F	410.5	-331.49
G	443	-363.99
H	478.5	-399.49

Well Local No.	Port Depth	Port Elevation
A	197	-134.83
B	241.5	-179.33
C	289	-226.83
D	329.5	-267.33
E	369	-306.83
F	413.5	-351.33
G	443	-380.83
H	476.5	-414.33

MONITORING/SUPPLY WELLS

Well Local No.	Depth TOS	Depth BOS	Elevation TOS (MSL)	Elevation BOS (MSL)
GCP14D	138	158	-50.64	-70.64
GCP14S	35	55	52.19	32.19
GCP15S	36	56	55.74	35.74
M5	435	455	-357.70	-377.70
M6	210	230	-133.00	-153.00
MW15A	140	150	-48.54	-58.54
MW15B	350	360	-258.86	-268.86
MW20A	140	150	-55.47	-65.47
MW20B	244	254	-159.87	-169.87
MW20C	400	410	-315.86	-325.86
MW21A	120	130	-38.05	-48.05
MW21B	330	340	-248.14	-258.14
MW21C	390	400	-308.34	-318.34
MW22A	120	130	-33.58	-43.58
MW22B	270	280	-183.51	-193.51
MW22C	310	320	-223.44	-233.44
MW23A	260	270	-178.42	-188.42
MW23B	344	354	-262.28	-272.28
MW23C	398	408	-316.30	-326.30
MW24A	345	355	-248.53	-258.53
MW24B	415	425	-318.48	-328.48
MW25A	340	350	-263.46	-273.46
GCWD9	426	469	-341.00	-384.00
GCWD13	380	440	-295.00	-355.00
GCWD14	308	358	-223.00	-273.00

TOS - Top of Screen
BOS -Bottom of Screen

MULTILEVEL WELLS

Well Local No.	Port Depth (msl)	Port Elevation (msl)
MW26A	229.00	-149.99
MW26B	271.50	-192.49
MW26C	325.00	-245.99
MW26D	350.50	-271.49
MW26E	377.00	-297.99
MW26F	410.50	-331.49
MW26G	443.00	-363.99
MW26H	478.50	-399.49
MW27A	197.00	-134.83
MW27B	241.50	-179.33
MW27C	289.00	-226.83
MW27D	329.50	-267.33
MW27E	369.00	-306.83
MW27F*	413.50	-351.33
MW27G	443.00	-380.83
MW26H	476.50	-414.33

* Sensor in port does not function
All measurements in feet
MSL - Mean Sea Level

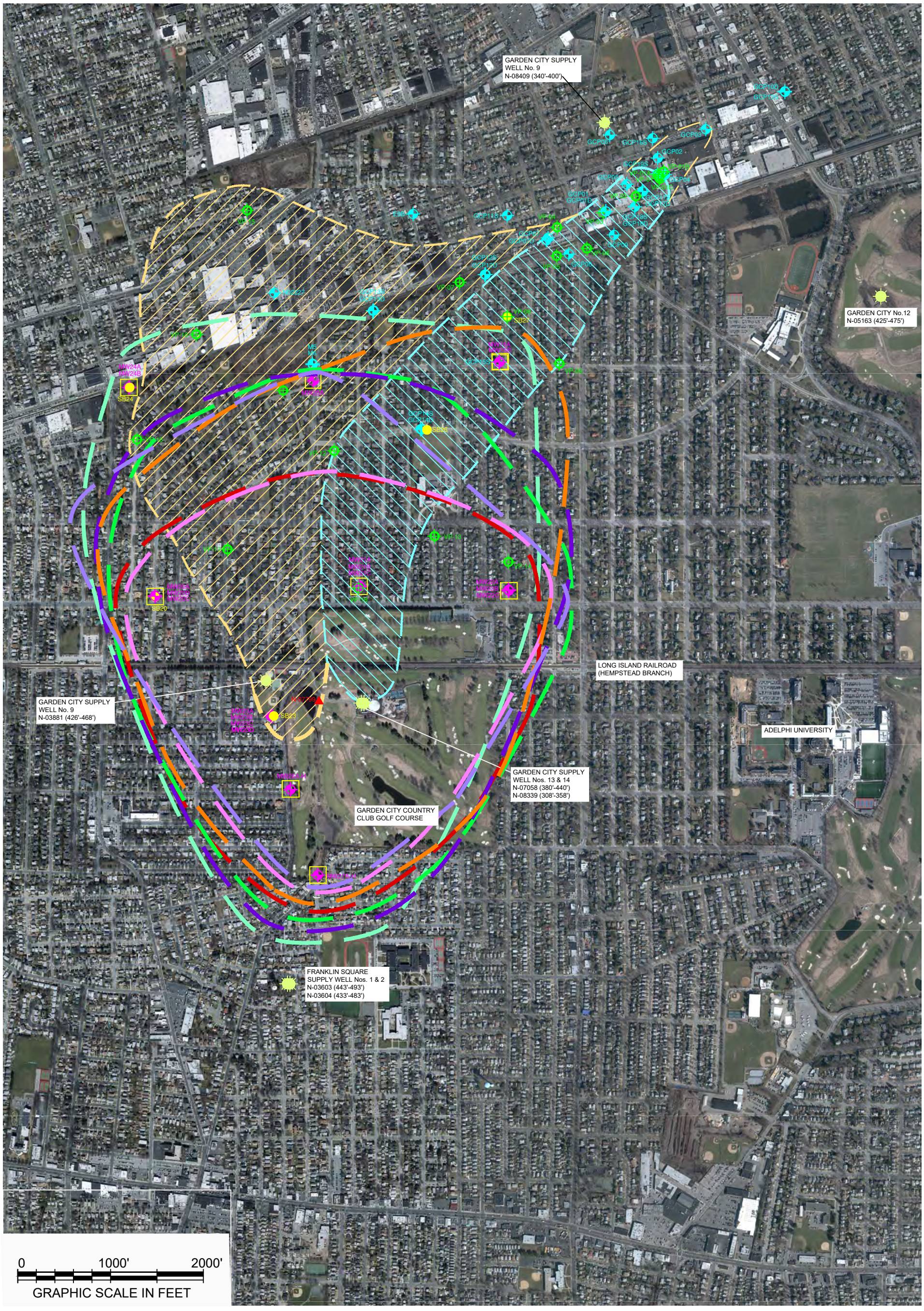
TITLE
Pre-Design Local Hydraulic Evaluation
Wells Outfitted with Data Loggers
150 Fulton Avenue
Garden City Park, NY

PREPARED FOR
Genesco Inc.

Environmental Resources Management

DRAWN BY	SCALE	DATE	JOB NO.	FIGURE
EMF	AS SHOWN	6/29/16	0997881	7

R:\Scout\Projects\GENESCO\150 Fulton Avenue, NY\CAD\2016\Model Report\2016-07-15 - 150 Fulton Avenue - Pre-Design Local Hydraulic Evaluation - Figure 10.dwg (07/15/2016 - 7:44am Melville)



LEGEND

- HISTORICAL EXTENT OF TRICHLOROETHENE (TCE) - DOMINANT PLUME WHERE THE TOTAL VOLATILE ORGANIC CONCENTRATION WAS GREATER THAN 100 ug/l*
- HISTORICAL TETRACHLOROETHENE (PCE) - DOMINANT PLUME WHERE THE TOTAL VOLATILE ORGANIC CONCENTRATION WAS GREATER THAN 100 ug/l*
- HISTORICAL CIS 1,2 DICHLOROETHENE - DOMINANT PLUME WHERE THERE TOTAL VOLATILE ORGANIC CONCENTRATION WAS GREATER THAN 100 ug/l*

*NOTE:
THE AREAL EXTENT OF CHLORINATED VOLATILE ORGANIC COMPOUNDS DEPICTED IN THIS FIGURE IS BASED ON THE MAXIMUM CONCENTRATIONS DETECTED IN GROUND WATER SAMPLES OBTAINED FROM VERTICAL PROFILE TEMPORARY WELLS INSTALLED DURING 1999 - 2000, AND PERMANENT WELLS DURING SEPTEMBER 2001 - MAY 2005.

- SB23 — SOIL BORING LOCATION
- SUPPLY WELL
- (426'-468') — SCREEN INTERVAL
- N-07799 — IRRIGATION WELL
- GCP08 — EXISTING MONITORING WELL LOCATION
- MW27A-H — NEW MONITORING WELL LOCATION (INSTALLED DURING RI)
- VP-04 — VERTICAL PROFILE LOCATION

- PUMPING WELL GCWD-9 AREA OF RESPONSE > 0.25 FEET
- PUMPING WELL GCWD-13 AREA OF RESPONSE > 0.25 FEET
- PUMPING WELL GCWD-14 AREA OF RESPONSE > 0.25 FEET
- PUMPING WELLS GCWD-9 & 13 AREA OF RESPONSE > 0.25 FEET
- PUMPING WELLS GCWD-9 & 14 AREA OF RESPONSE > 0.25 FEET
- PUMPING WELLS GCWD-13 & 14 AREA OF RESPONSE > 0.25 FEET
- PUMPING WELLS GCWD-9, 13 & 14 AREA OF RESPONSE > 0.25 FEET

TITLE

OBSERVED DRAWDOWN RESPONSE > 0.25 FEET
ALL PUMPING SCENARIOS
150 FULTON AVENUE
GARDEN CITY PARK, NEW YORK

PREPARED FOR

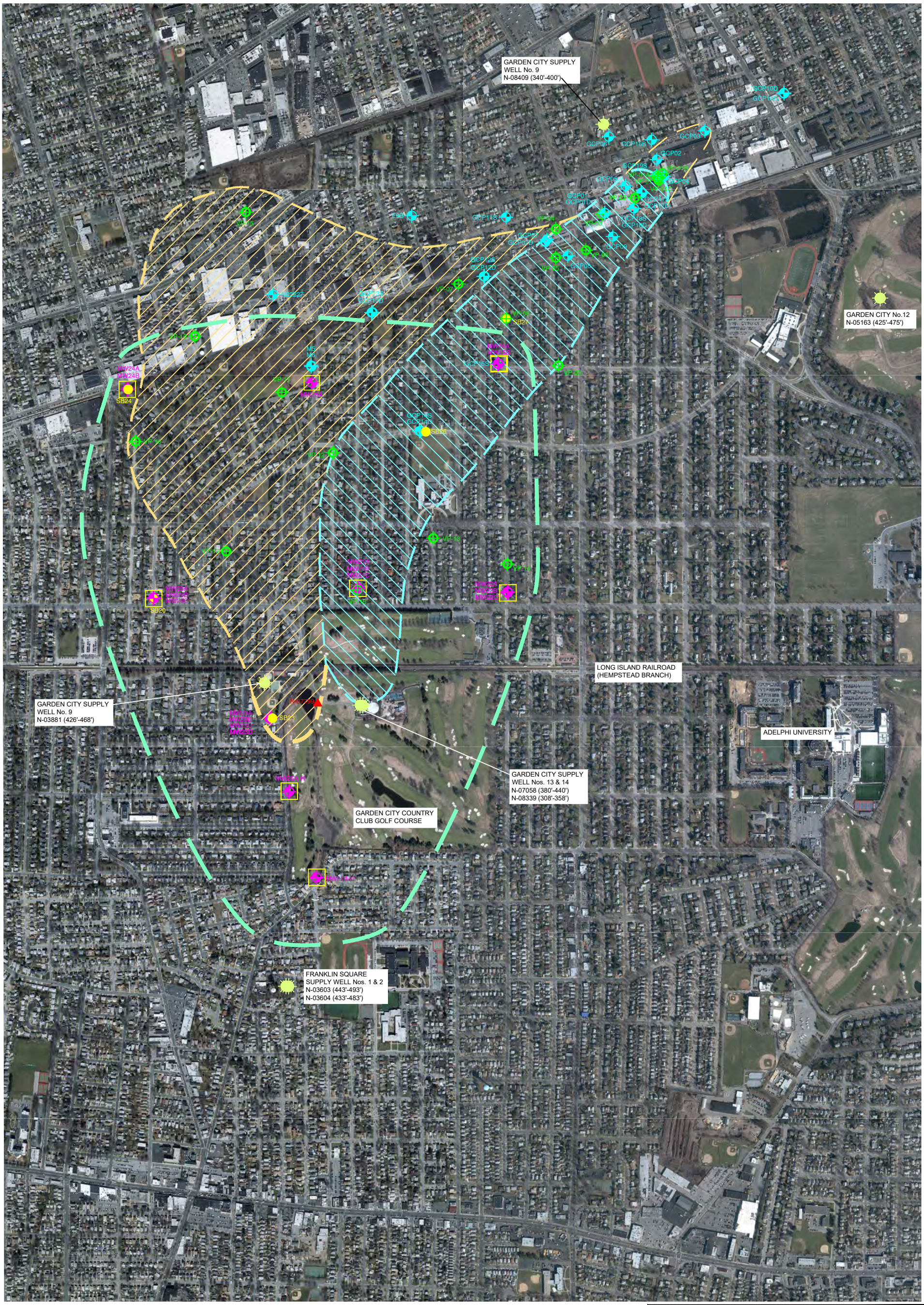
GENESCO INC.

Environmental Resources Management

FIGURE 8

DRAWN BY	SCALE	DATE	JOB NO.
EMF	GRAPHIC	6/29/16	097881

R:\Scout\Projects\GENESCO\150 Fulton Avenue, NY\CAD\2016\Model Report\2016-07-15 - 150 Fulton Avenue - Hydraulic Evaluation - Pumping Figures 11 & 12.dwg (08/09/2016 - 5:35pm Melville)



LEGEND

- HISTORICAL EXTENT OF TRICHLOROETHENE (TCE) - DOMINANT PLUME WHERE THE TOTAL VOLATILE ORGANIC CONCENTRATION WAS GREATER THAN 100 ug/l*
- HISTORICAL TETRACHLOROETHENE (PCE) - DOMINANT PLUME WHERE THE TOTAL VOLATILE ORGANIC CONCENTRATION WAS GREATER THAN 100 ug/l*
- HISTORICAL CIS 1,2 DICHLOROETHENE - DOMINANT PLUME WHERE THERE TOTAL VOLATILE ORGANIC CONCENTRATION WAS GREATER THAN 100 ug/l*

NOTE:
THE AREAL EXTENT OF CHLORINATED VOLATILE ORGANIC COMPOUNDS DEPICTED IN THIS FIGURE IS BASED ON THE MAXIMUM CONCENTRATIONS DETECTED IN GROUND WATER SAMPLES OBTAINED FROM VERTICAL PROFILE TEMPORARY WELLS INSTALLED DURING 1999 - 2000, AND PERMANENT WELLS DURING SEPTEMBER 2001 - MAY 2005.

- SB23 — SOIL BORING LOCATION
- SUPPLY WELL
- (426'-468') — SCREEN INTERVAL
- N-07799 — IRRIGATION WELL
- GCP08 — EXISTING MONITORING WELL LOCATION
- MW27A-H — NEW MONITORING WELL LOCATION (INSTALLED DURING RI)
- VP-04 — VERTICAL PROFILE LOCATION
- PUMPING WELLS GCWD-13 & 14 AREA OF RESPONSE > 0.25 FEET

0 1000' 2000'
GRAPHIC SCALE IN FEET

N

TITLE
OBSERVED DRAWDOWN RESPONSE > 0.25 FEET
PUMPING WELLS GCWD-13 & 14
150 FULTON AVENUE
GARDEN CITY PARK, NEW YORK

PREPARED FOR
GENESCO INC.

Environmental Resources Management

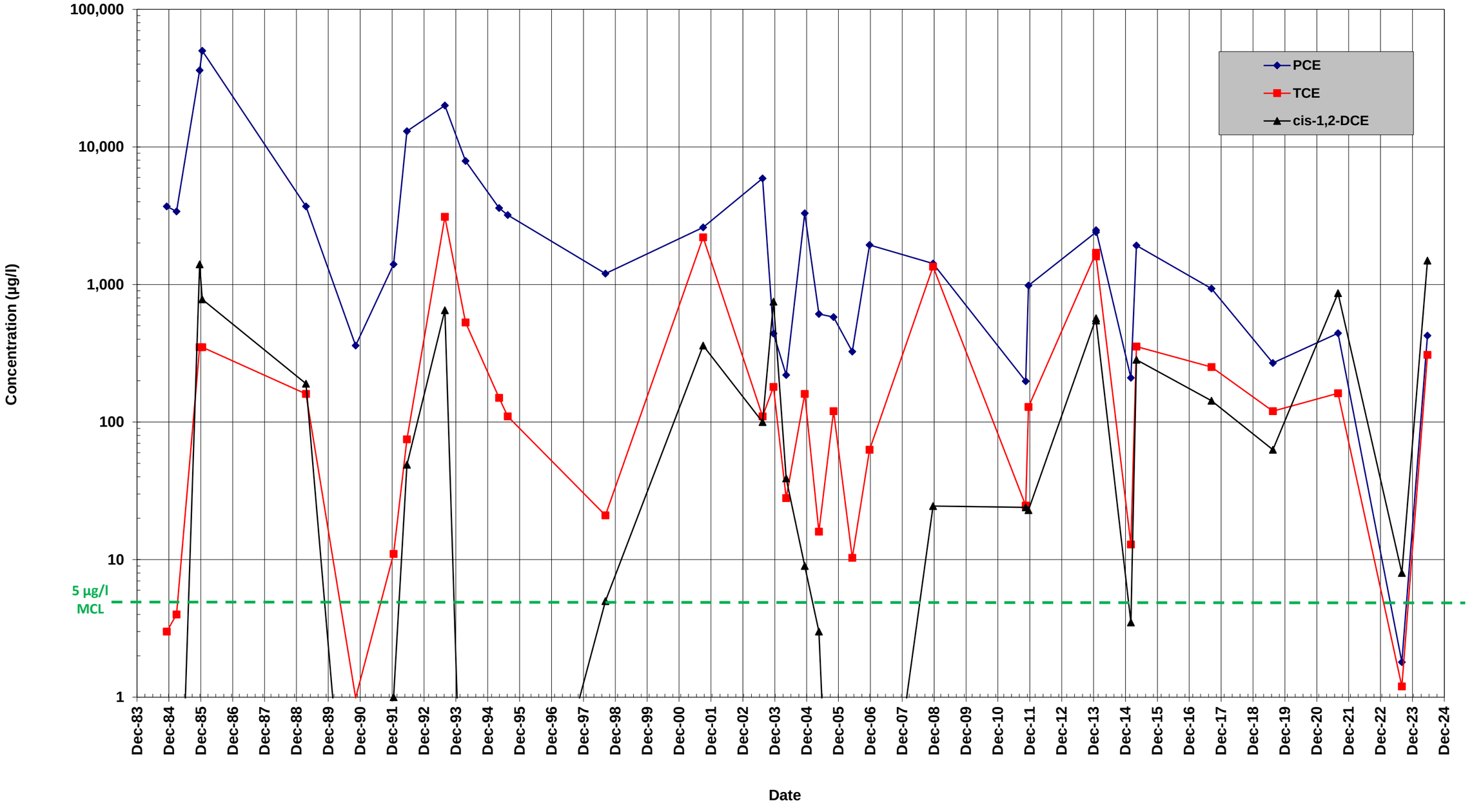
FIGURE 9

DRAWN BY	SCALE	DATE	JOB NO.
EMF	GRAPHIC	6/29/16	0097881

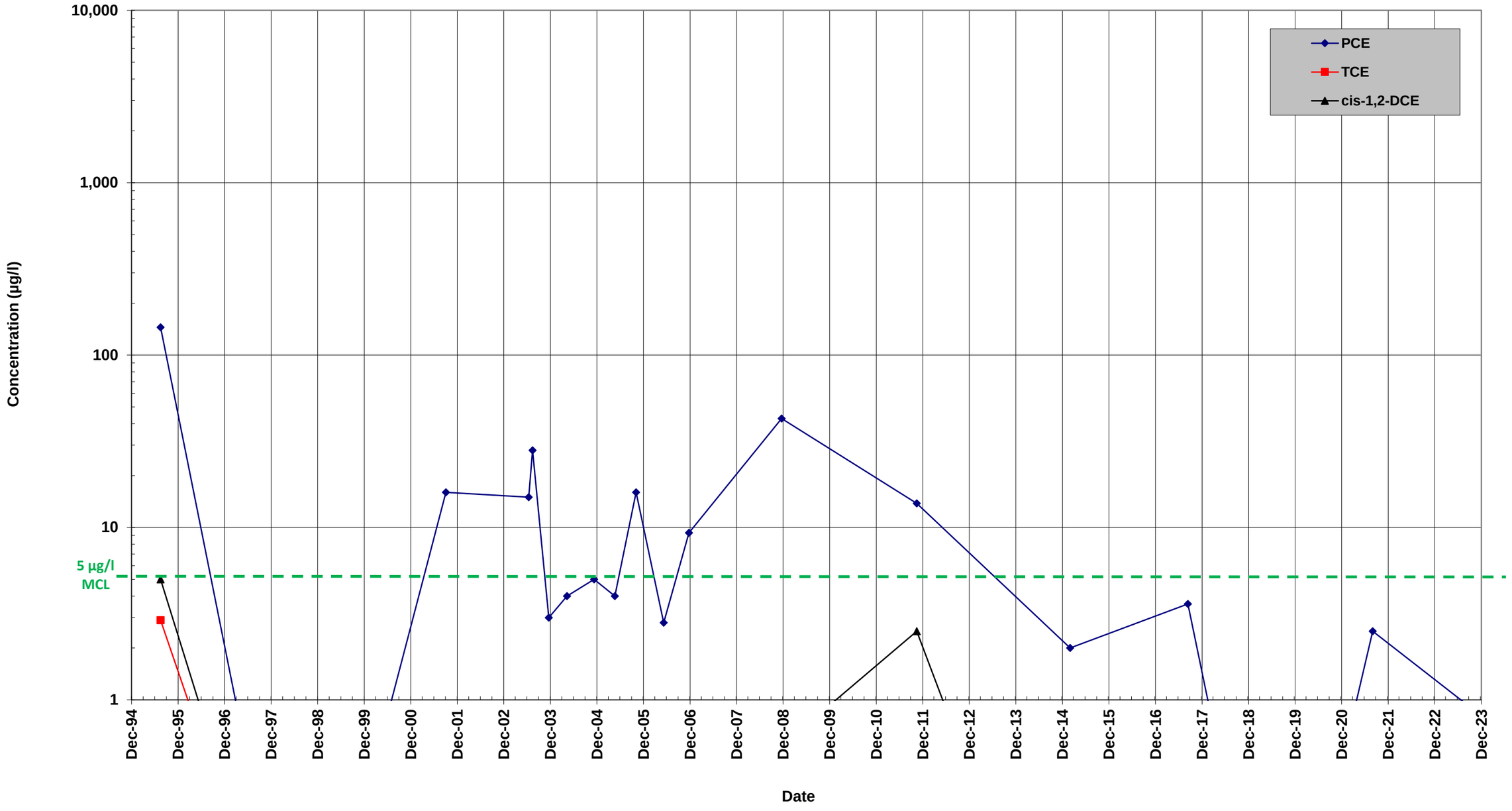
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Well GCP01
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 49 to 59 Feet Below Ground Surface

ERM

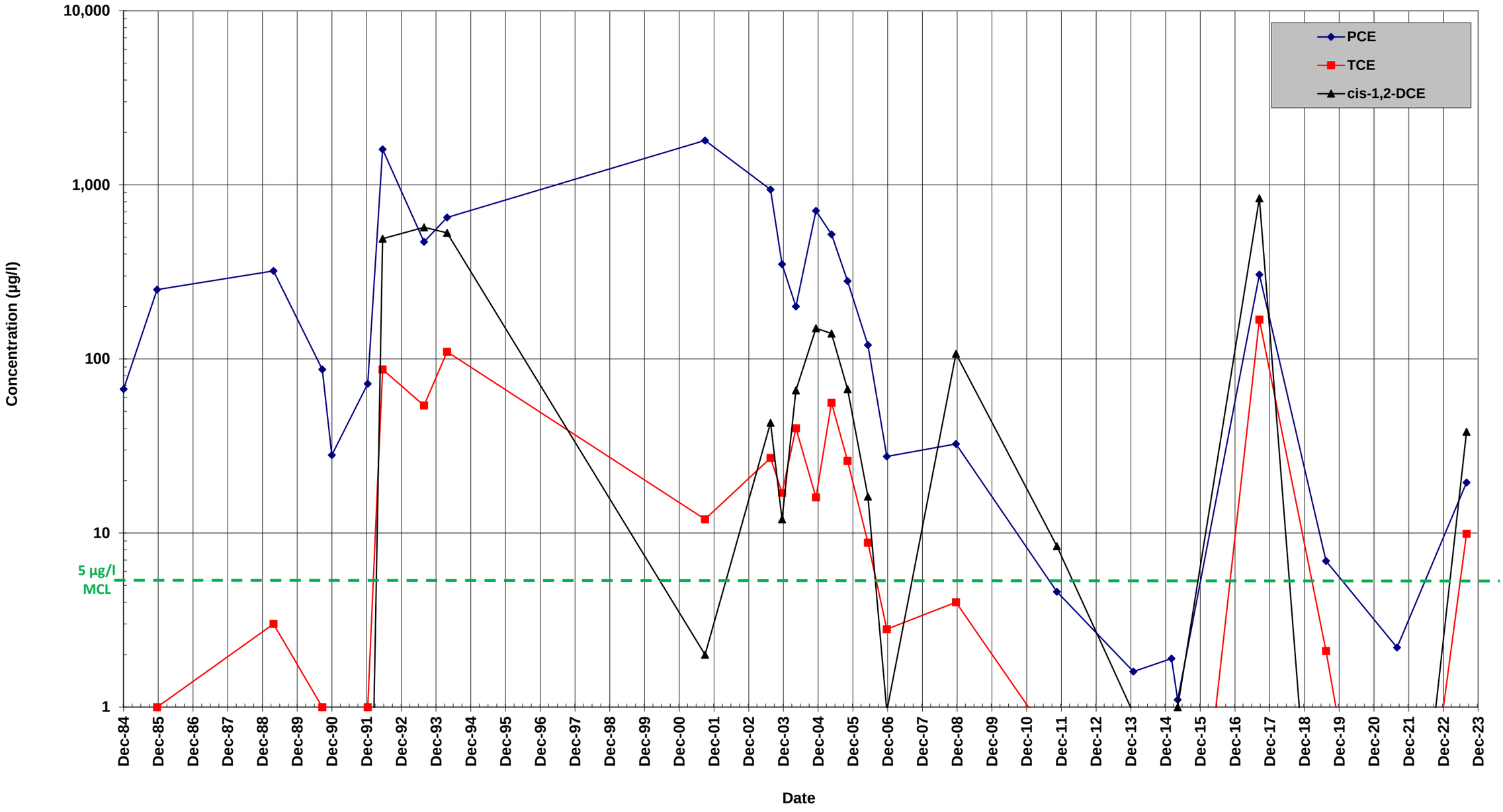


Well GCP01D
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 105 to 115 Feet Below Ground Surface

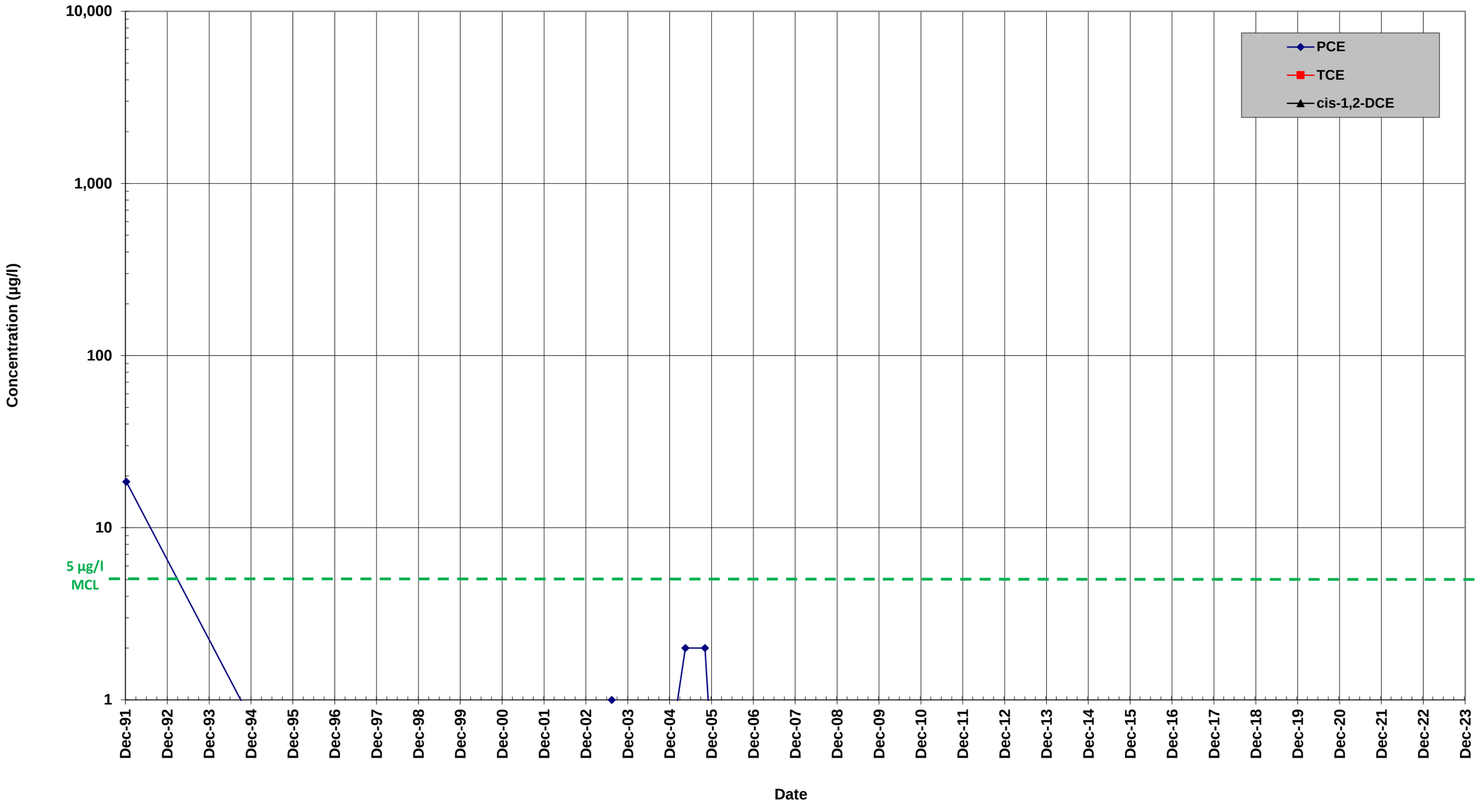


Well GCP08
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 50 to 60 Feet Below Ground Surface

ERM

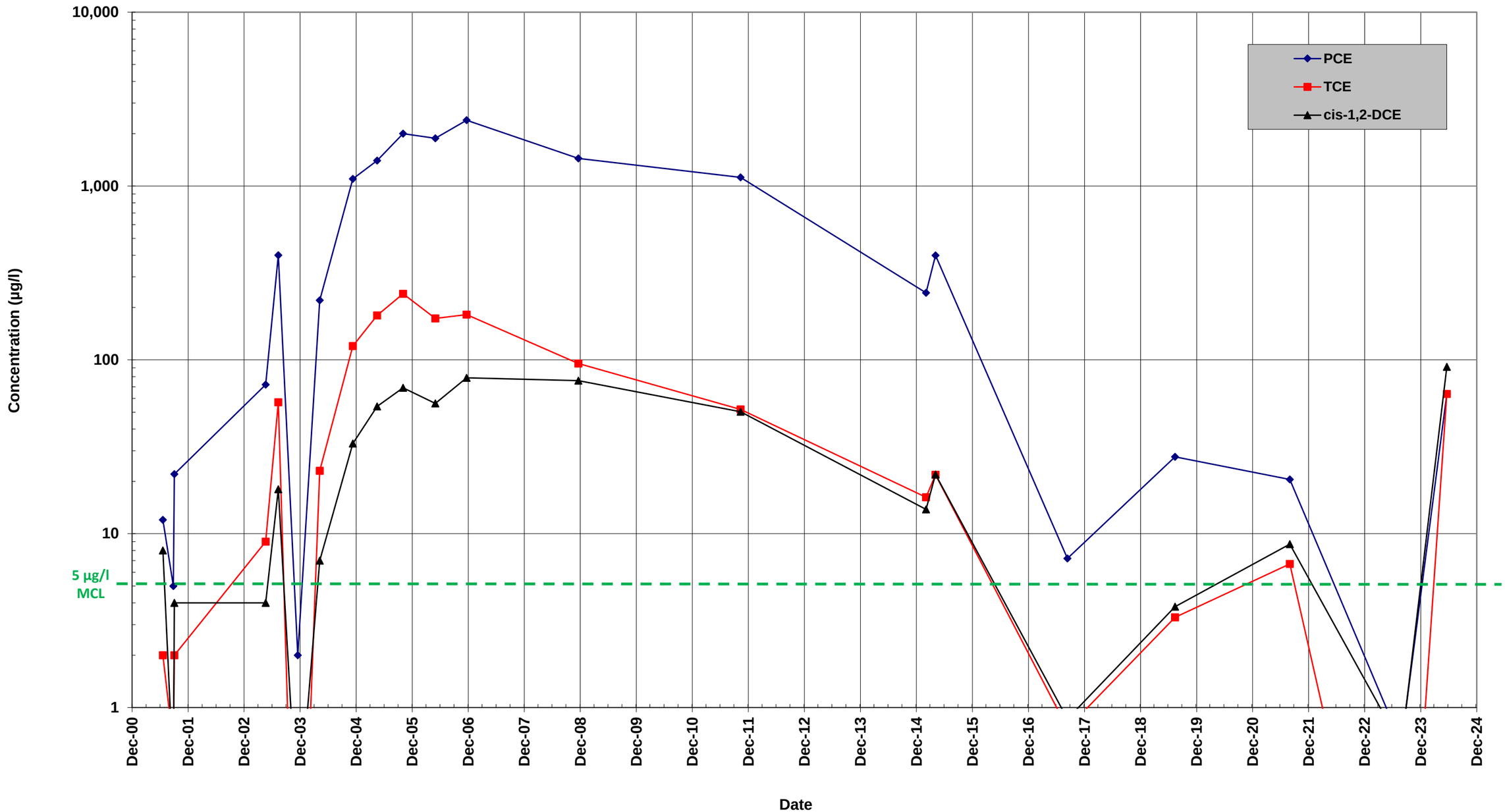


Well GCP15S
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 36 to 56 Feet Below Ground Surface



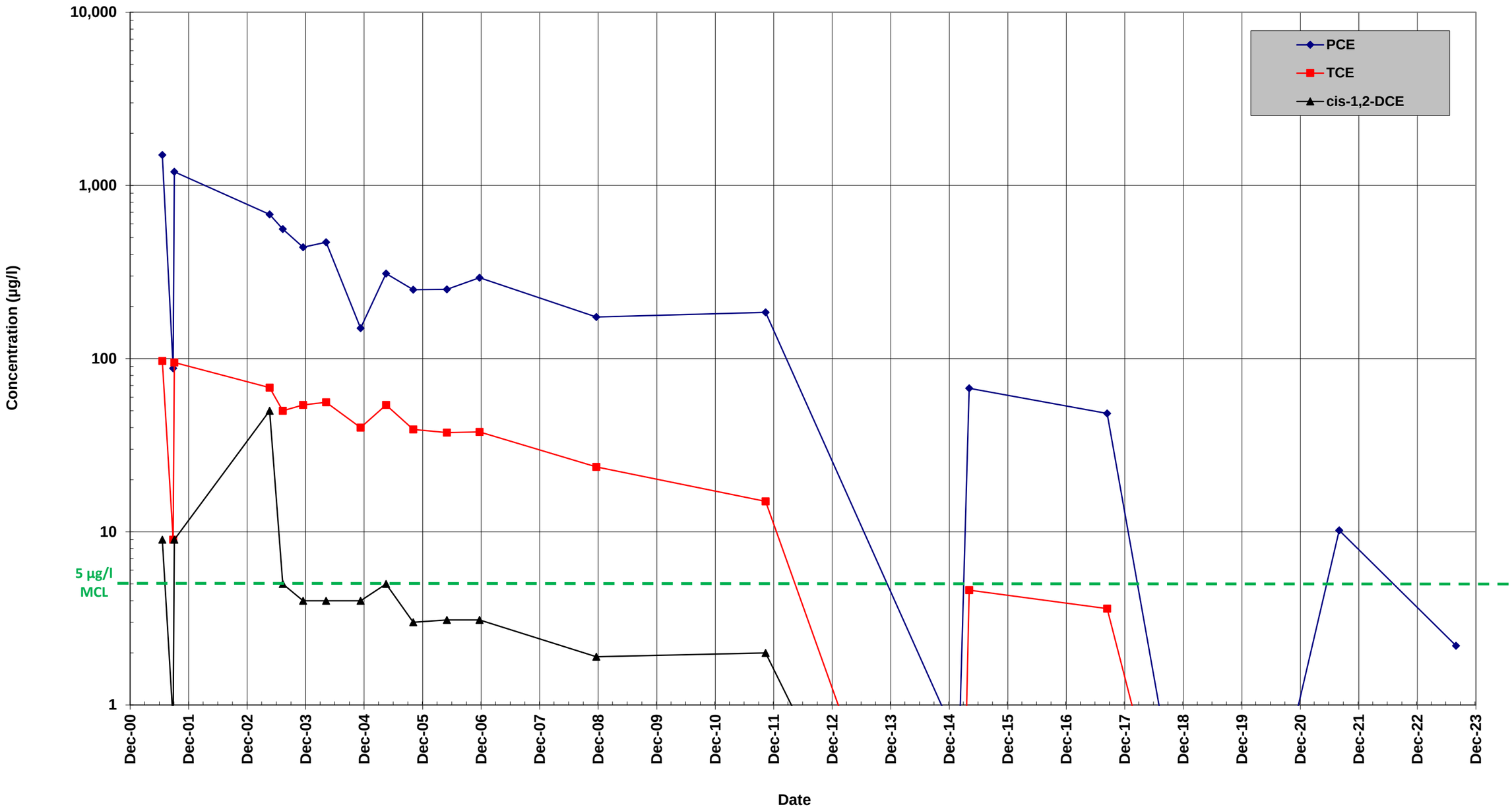
Well MW15A
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 140 to 150 Feet Below Ground Surface

ERM



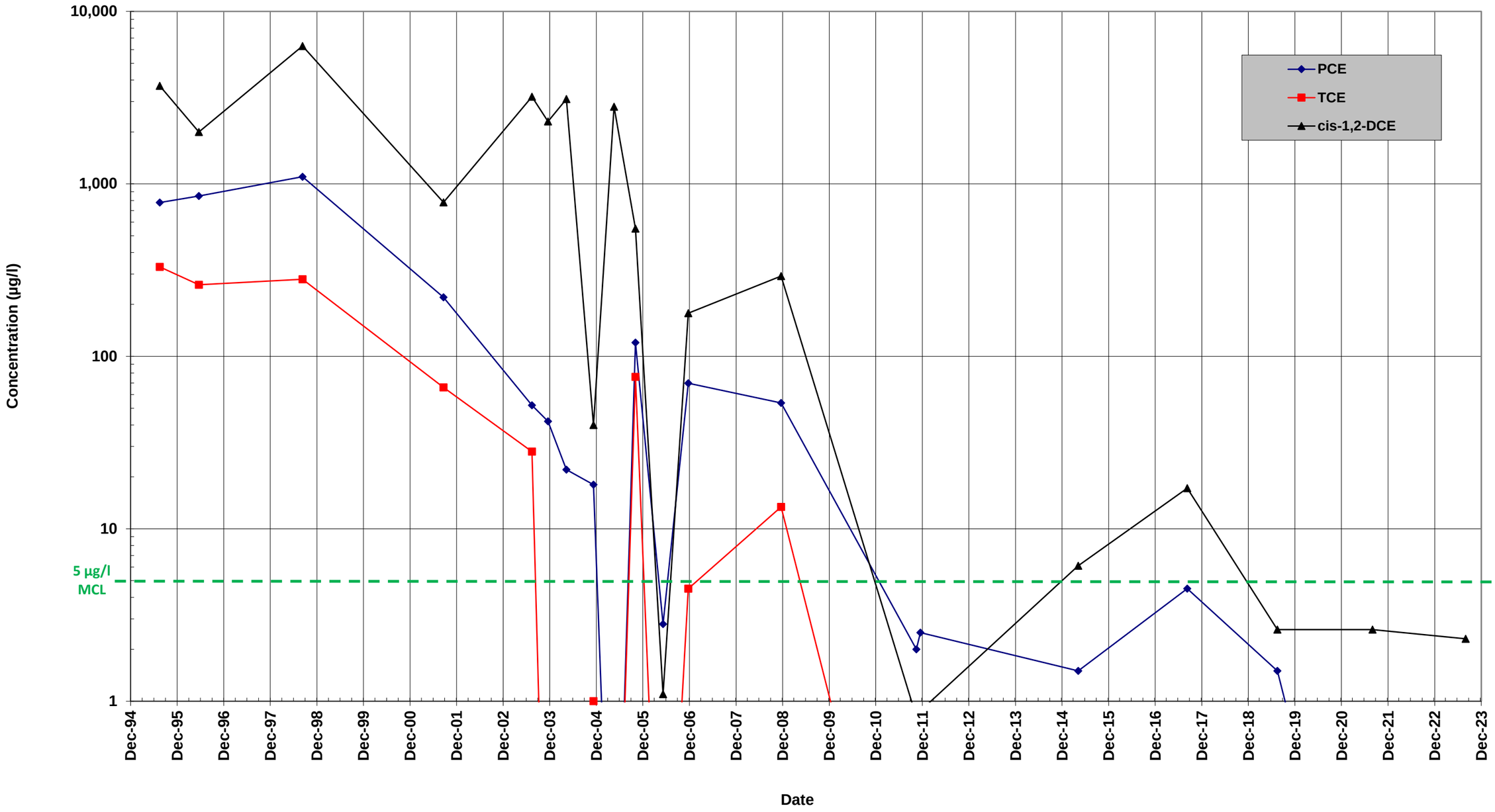
Well MW15B
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 350 to 360 Feet Below Ground Surface

ERM



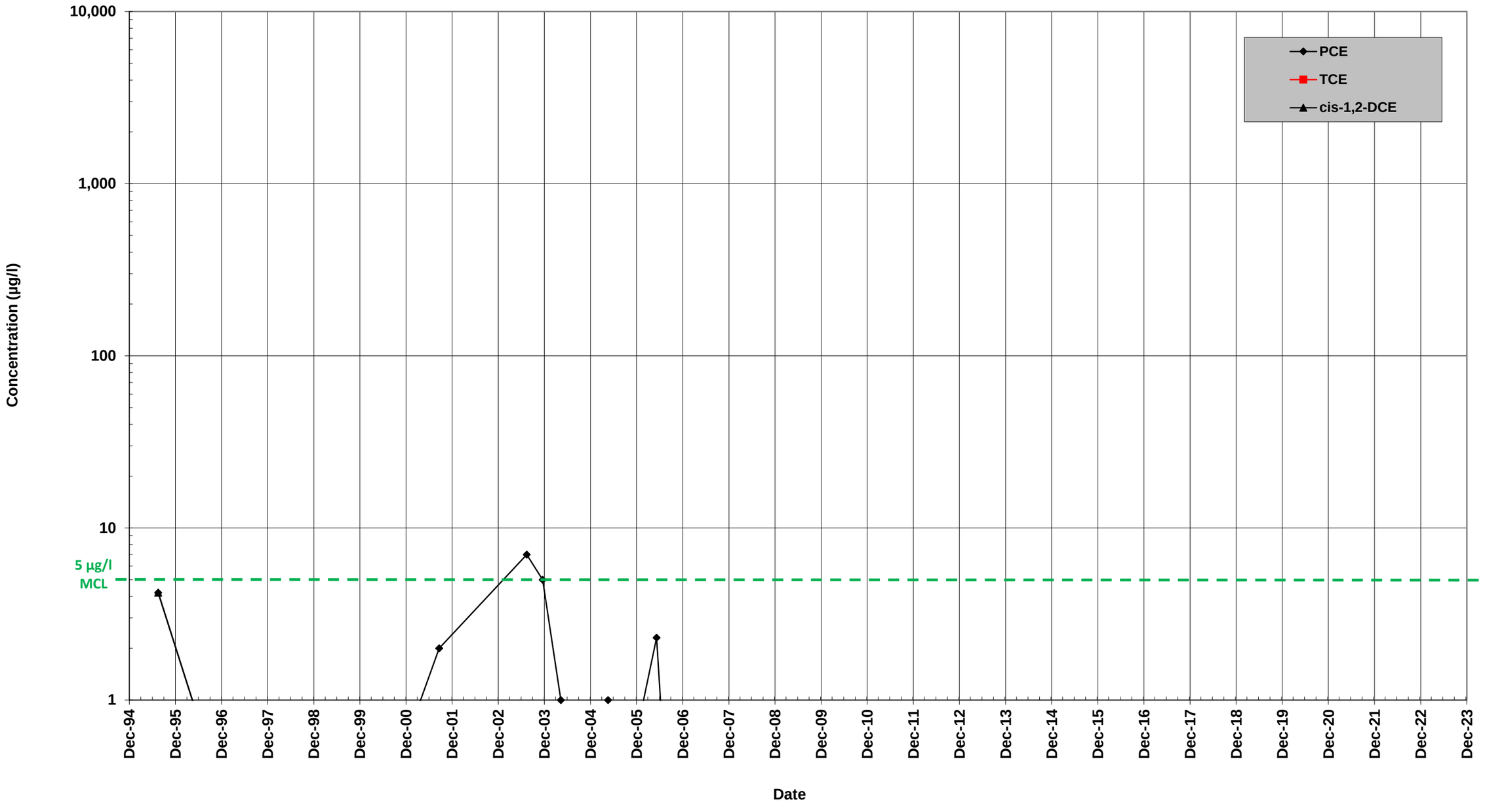
Well GCP18S
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 39 to 54 Feet Below Ground Surface

ERM

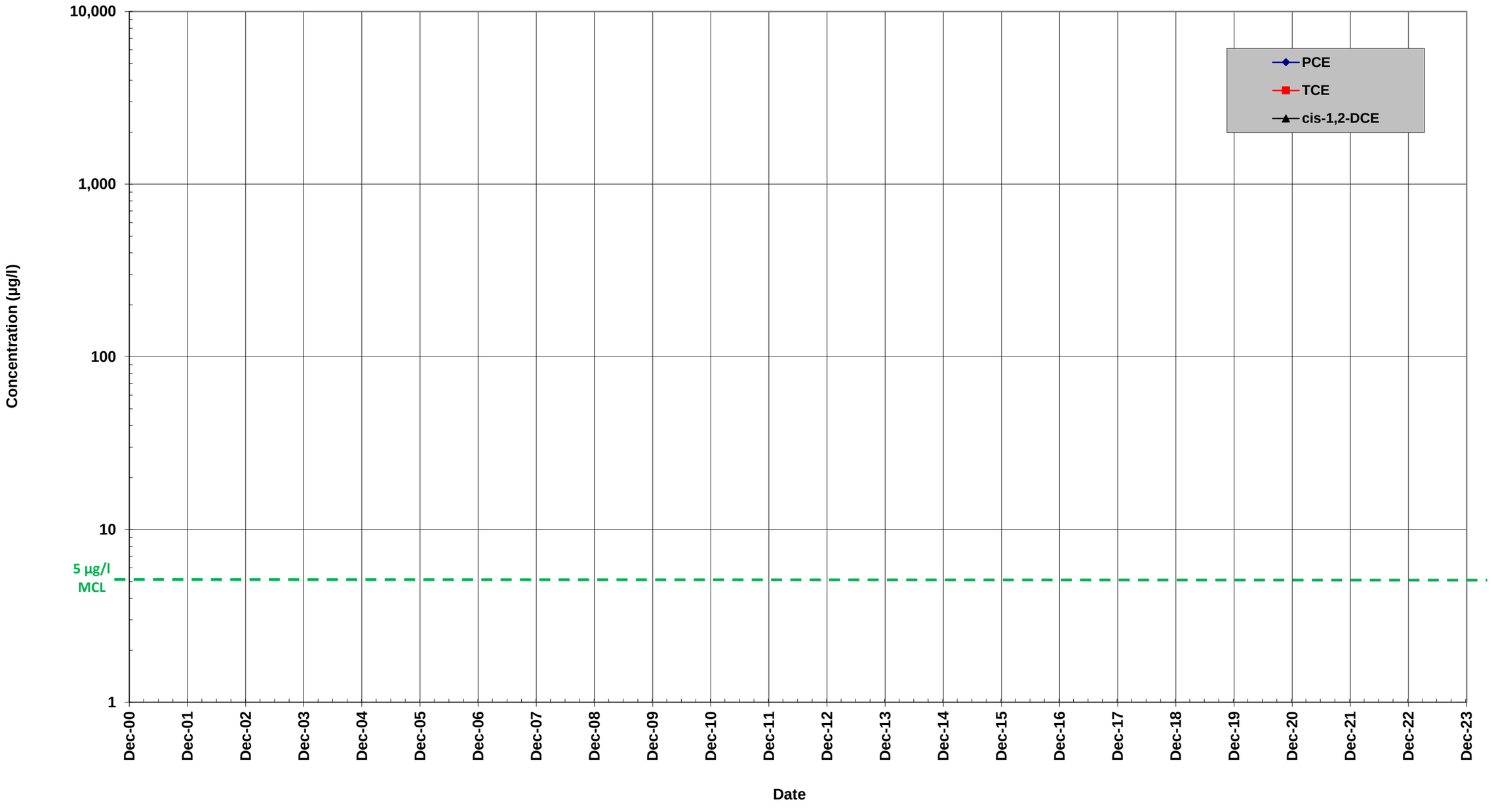


Well GCP18D
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 113 to 123 Feet Below Ground Surface

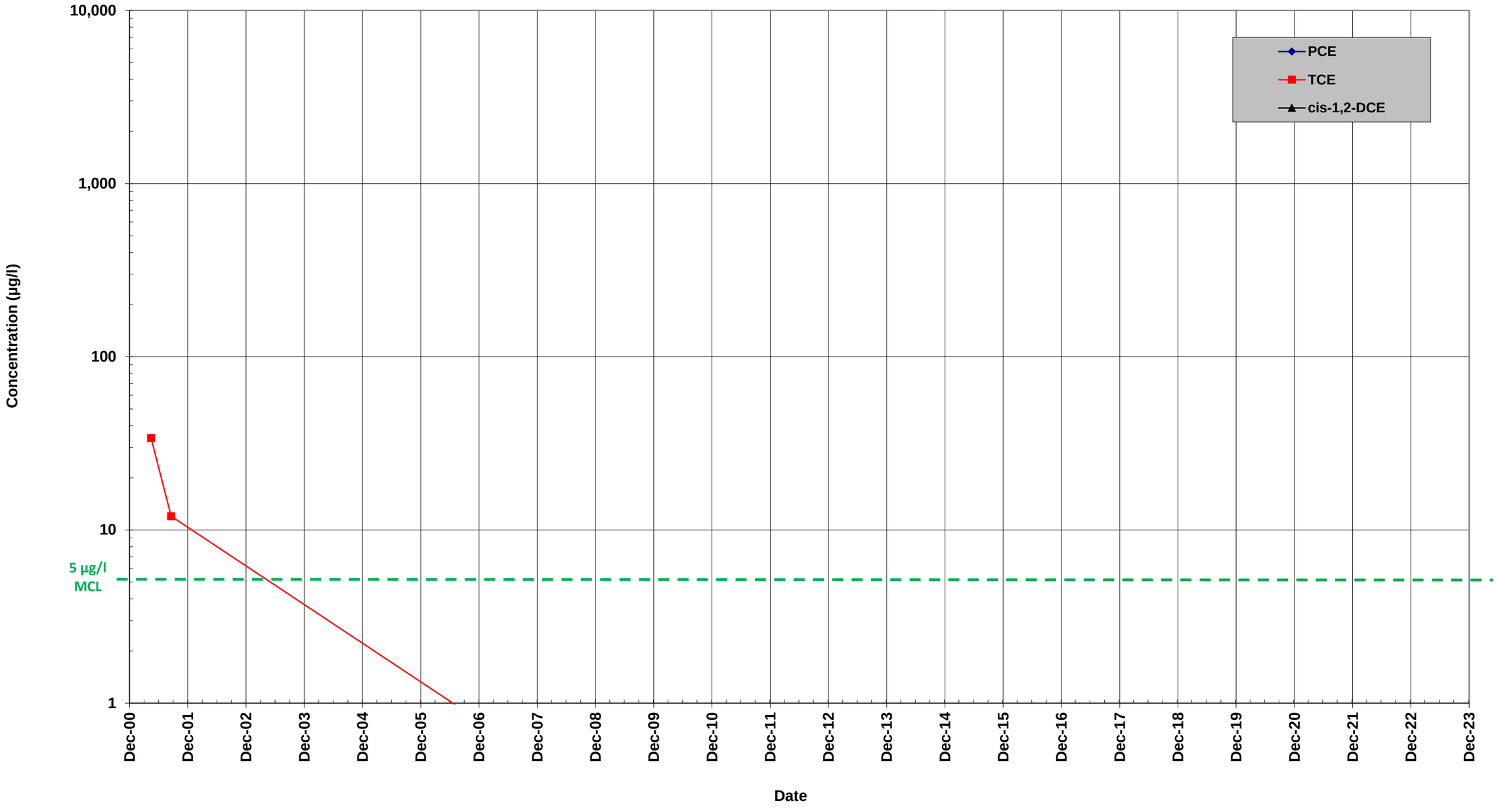
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Well MW20A
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 140 to 150 Feet Below Ground Surface

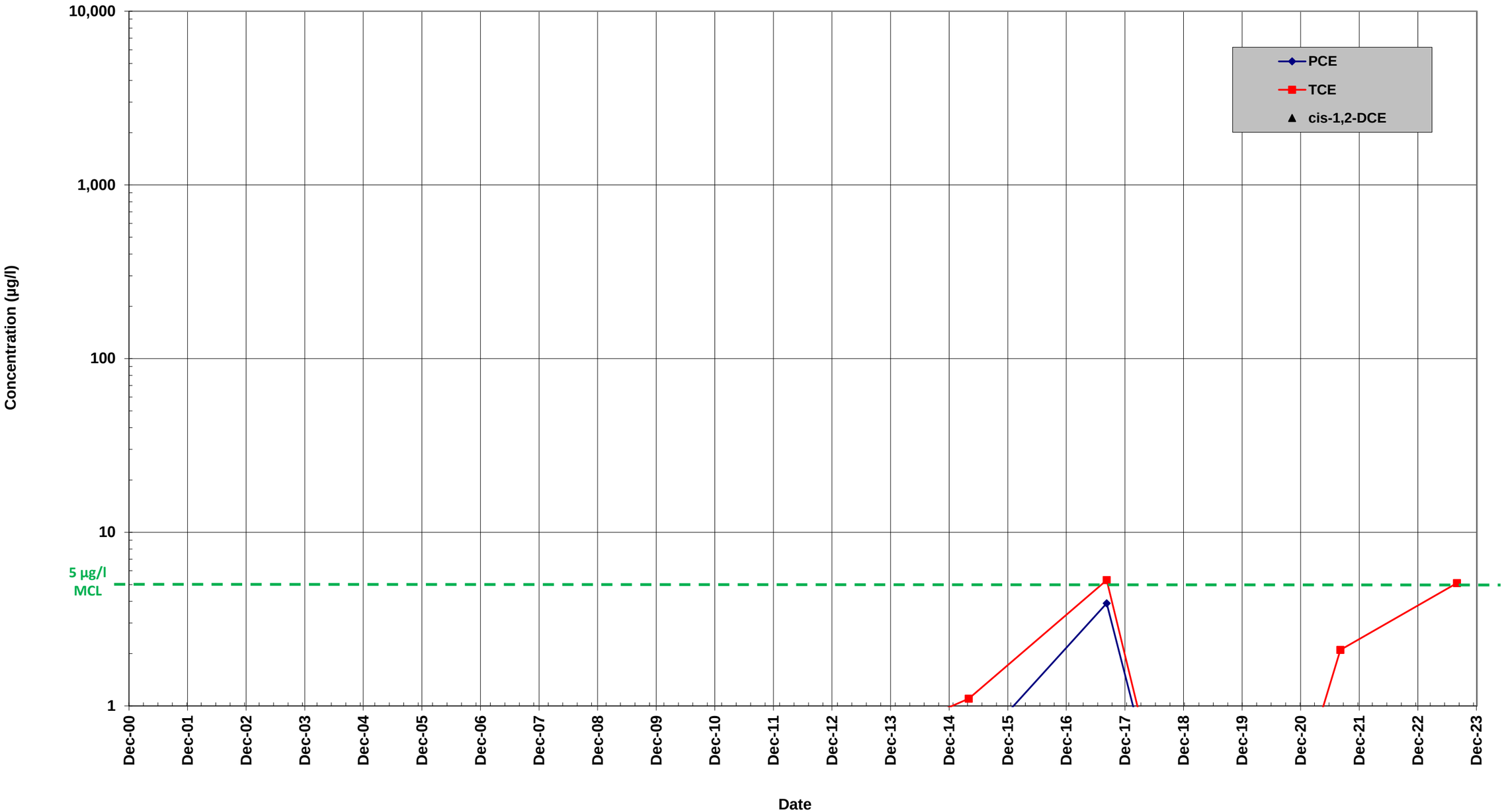


Well MW20B
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 244 to 254 Feet Below Ground Surface

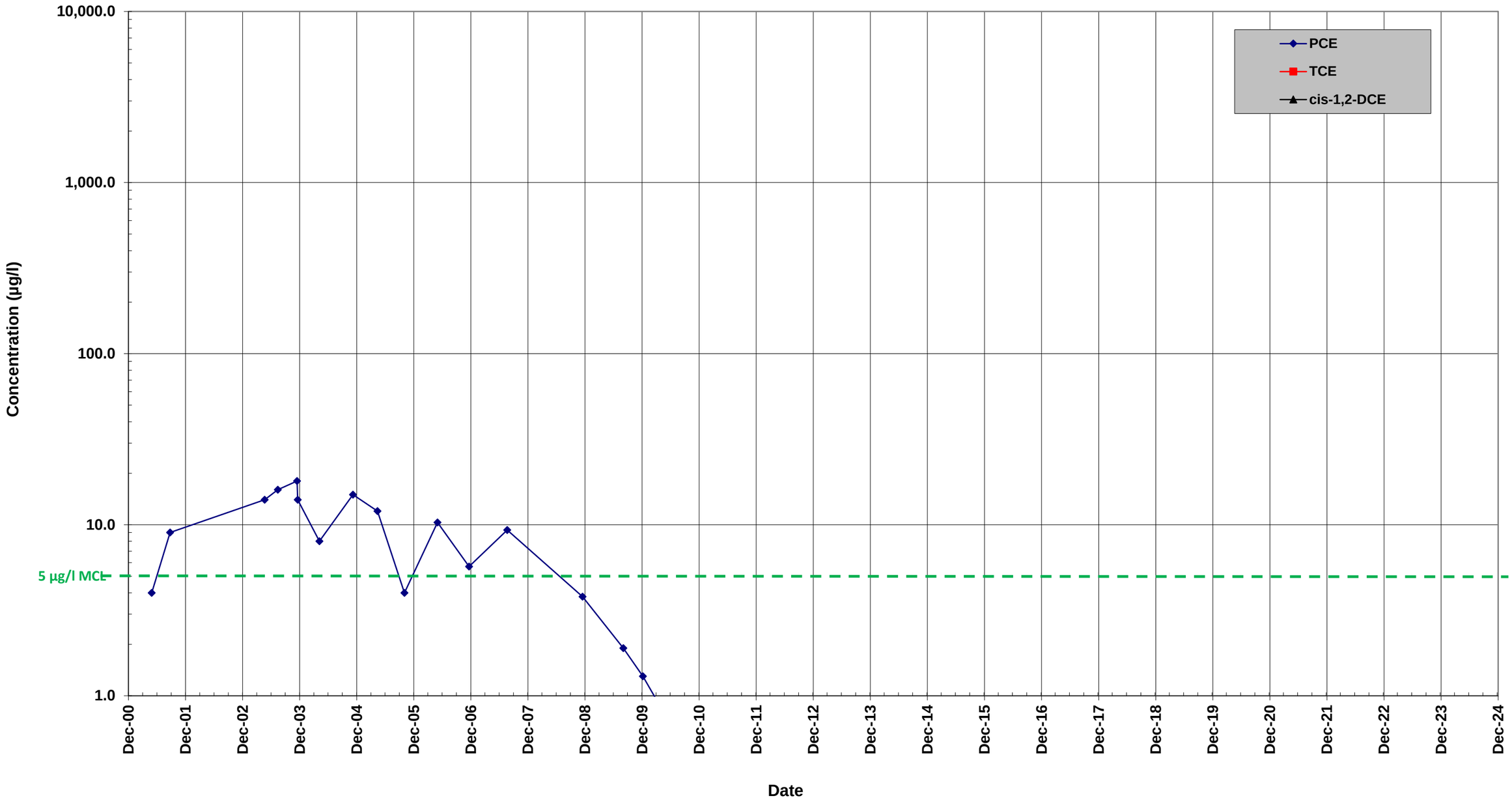


Well MW20C
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 400 to 410 Feet Below Ground Surface

ERM

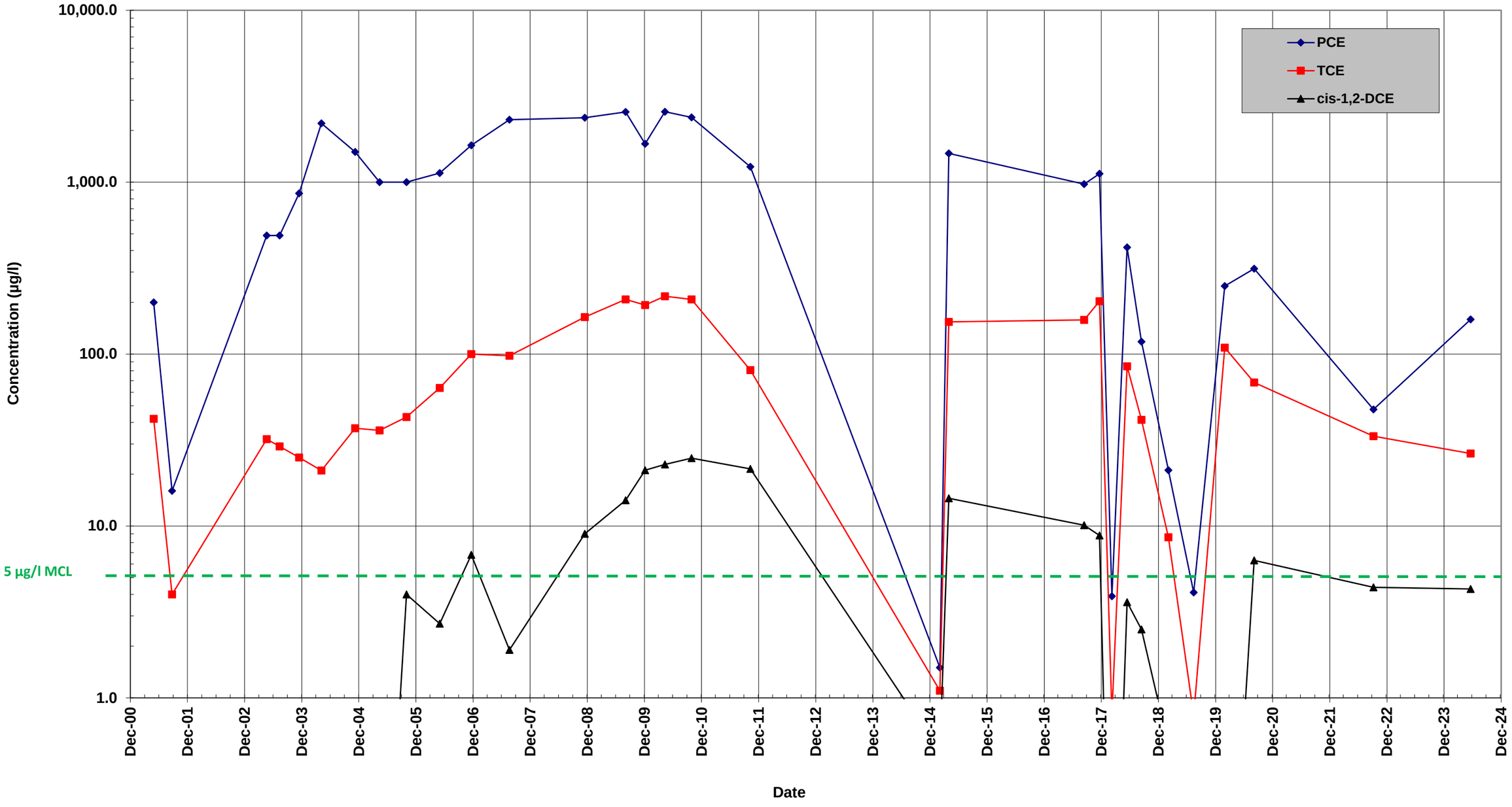


Well MW21A
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 120 to 130 Feet Below Ground Surface



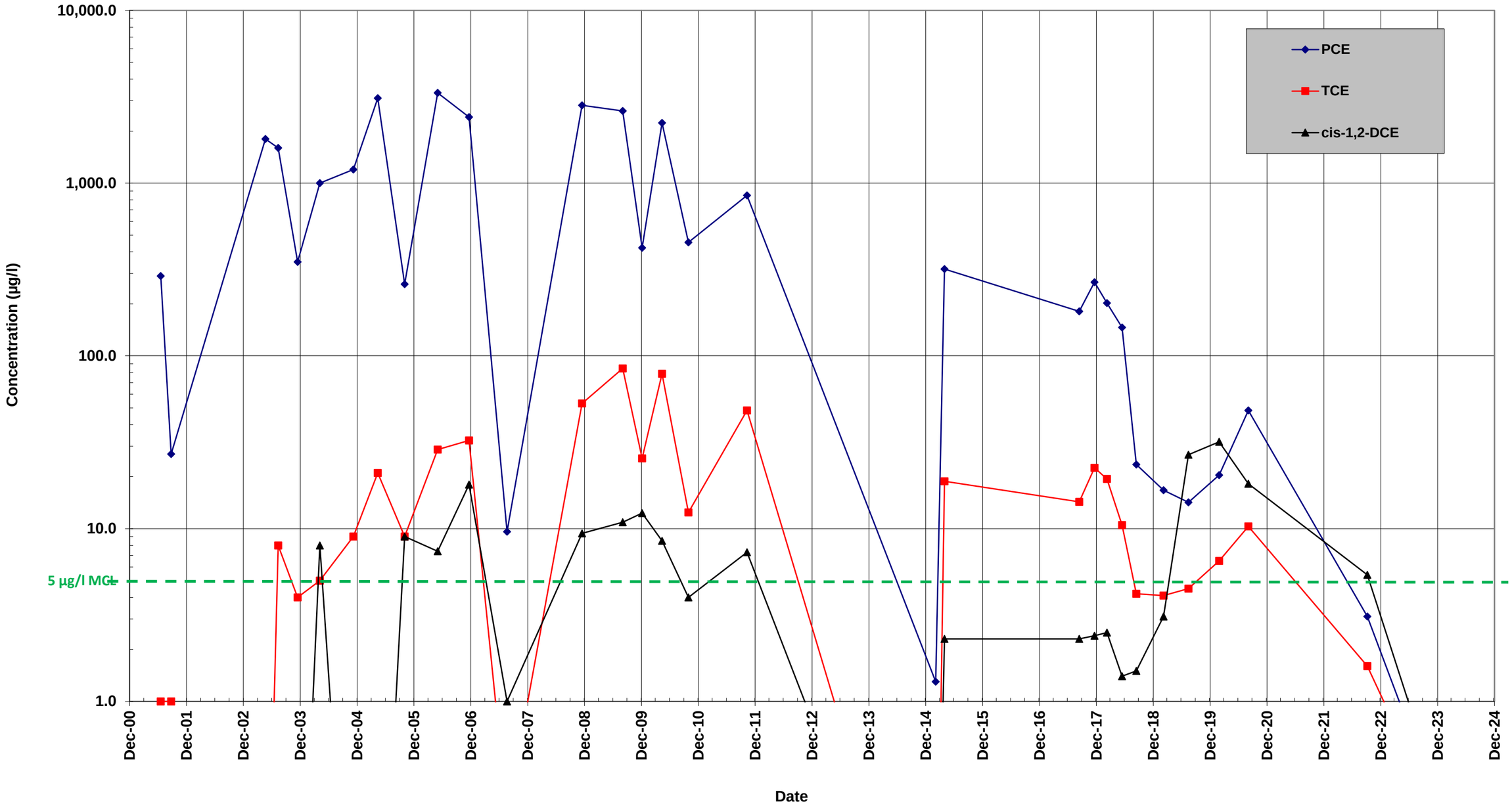
Well MW21B
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 330 to 340 Feet Below Ground Surface

ERM

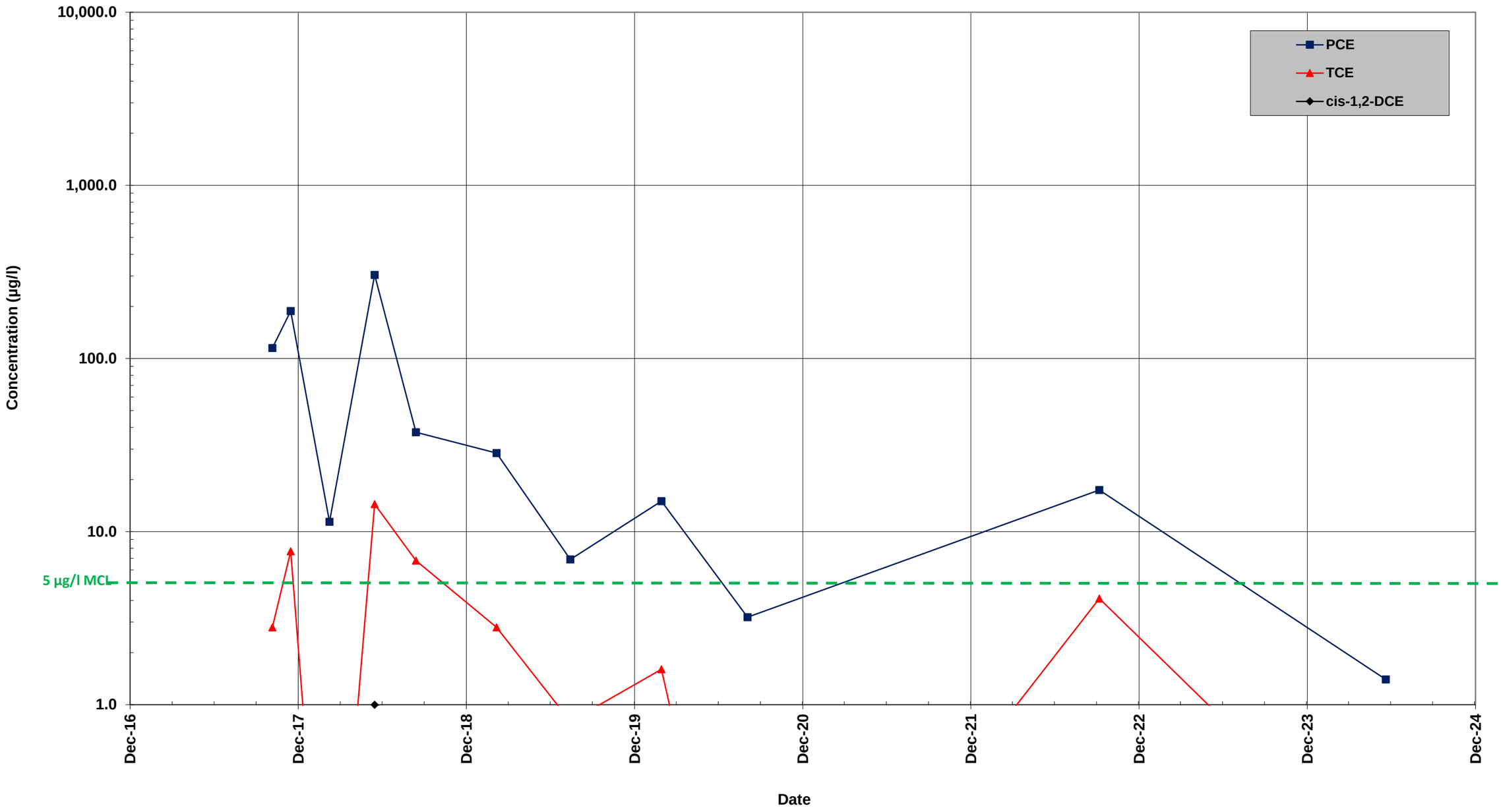


Well MW21C
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 390 to 400 Feet Below Ground Surface

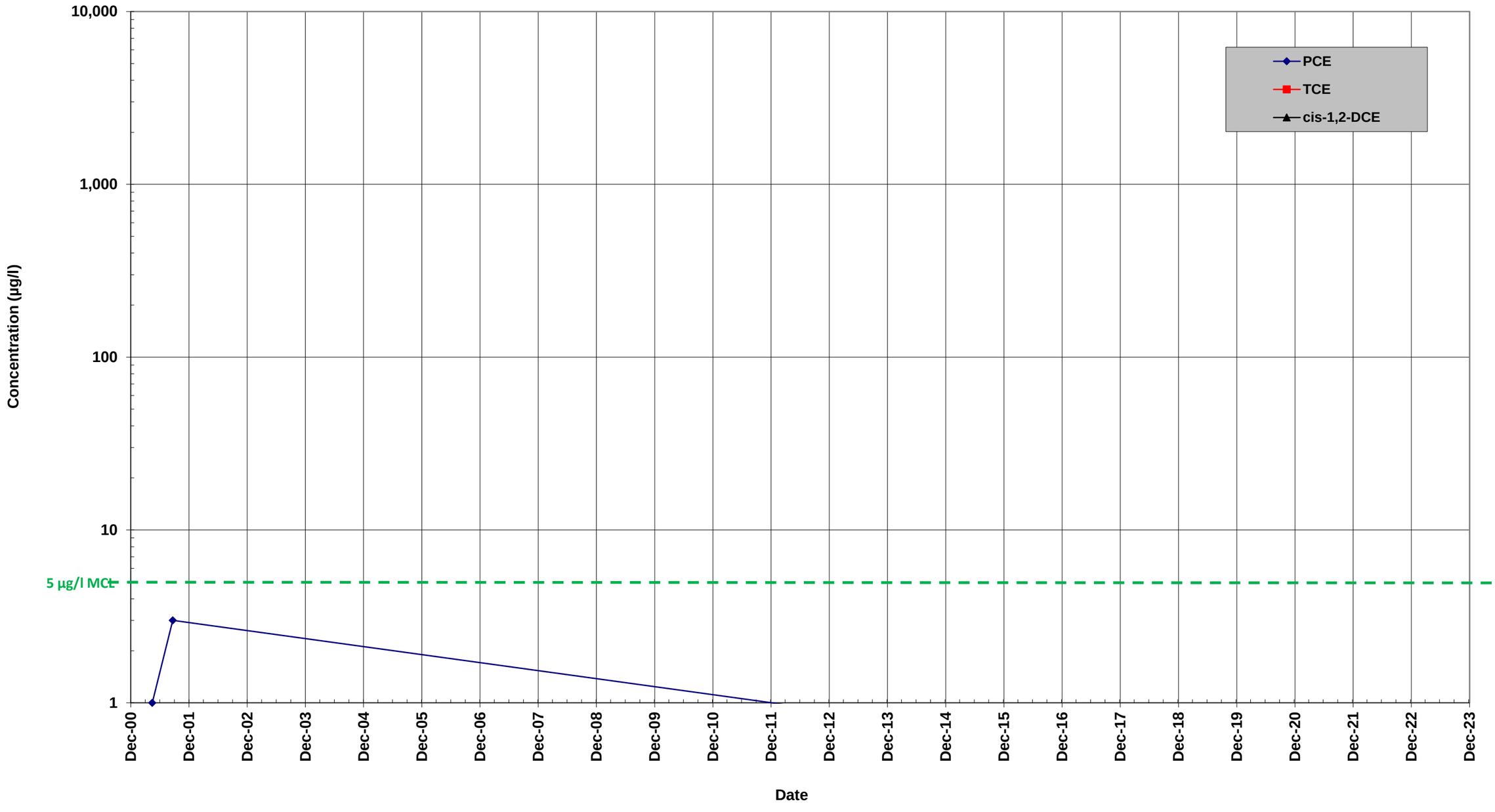
ERM



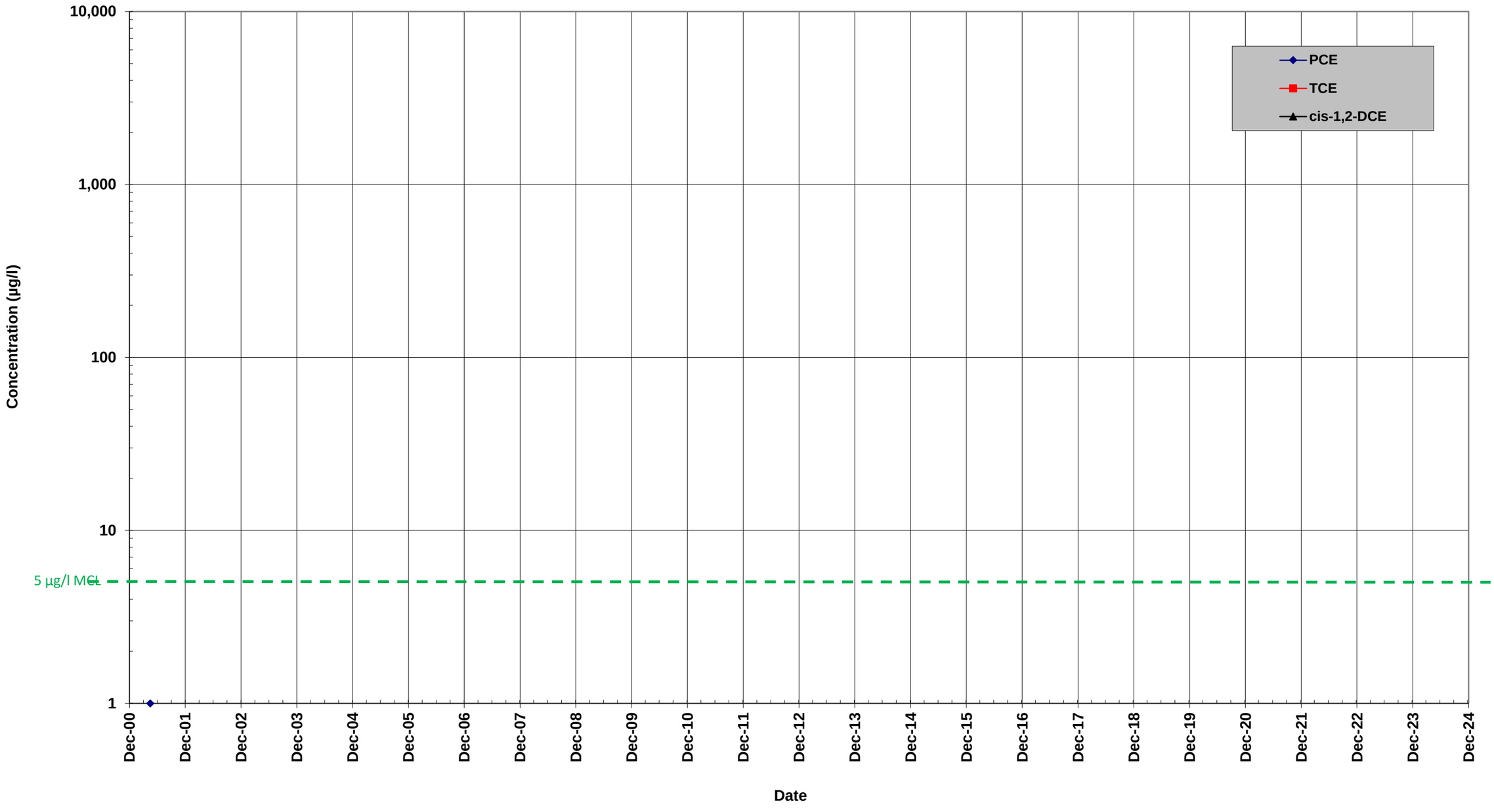
Well MW21D
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 447 to 457 Feet Below Ground Surface



Well MW22A
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 120 to 130 Feet Below Ground Surface

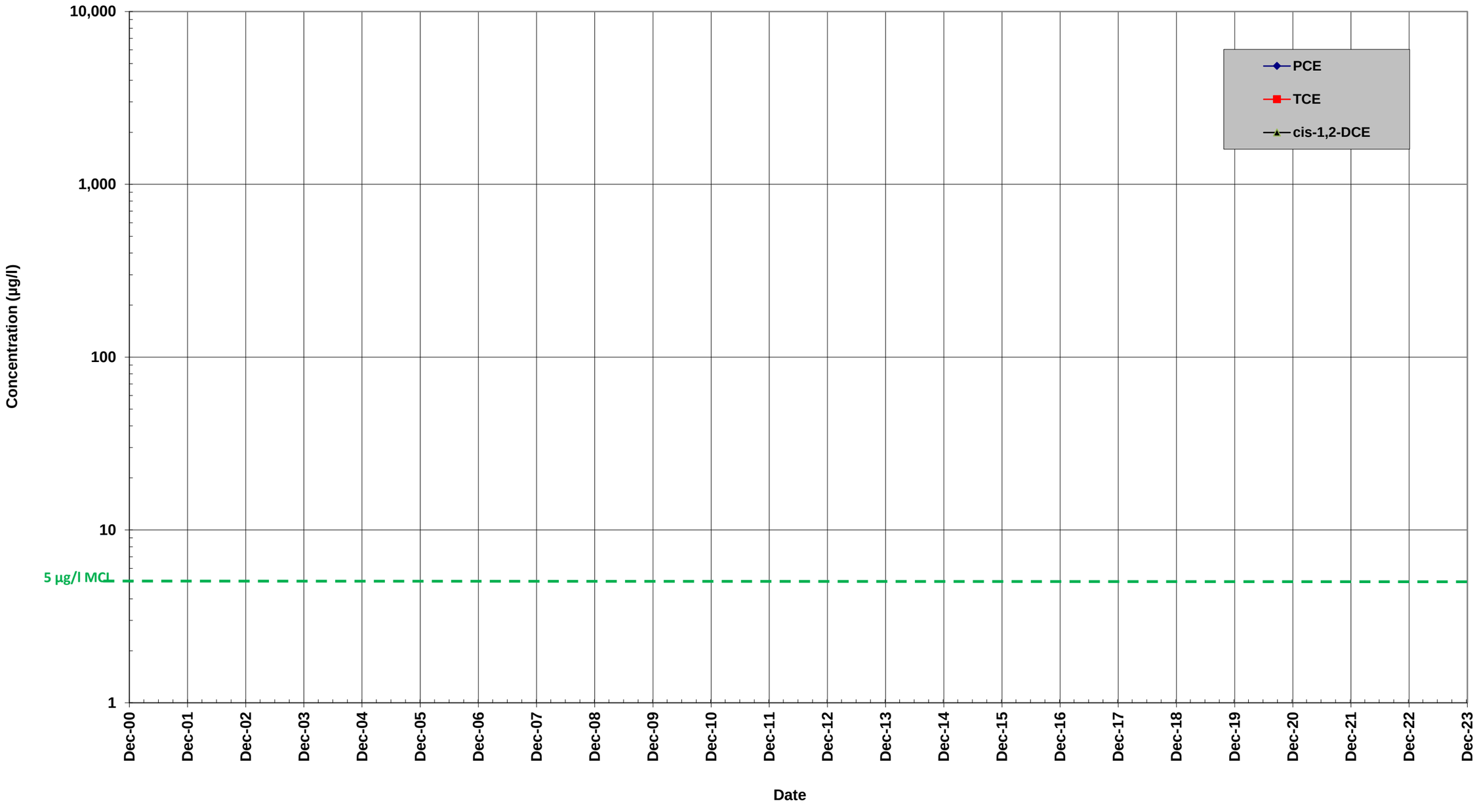


Well MW22B
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 270 to 280 Feet Below Ground Surface

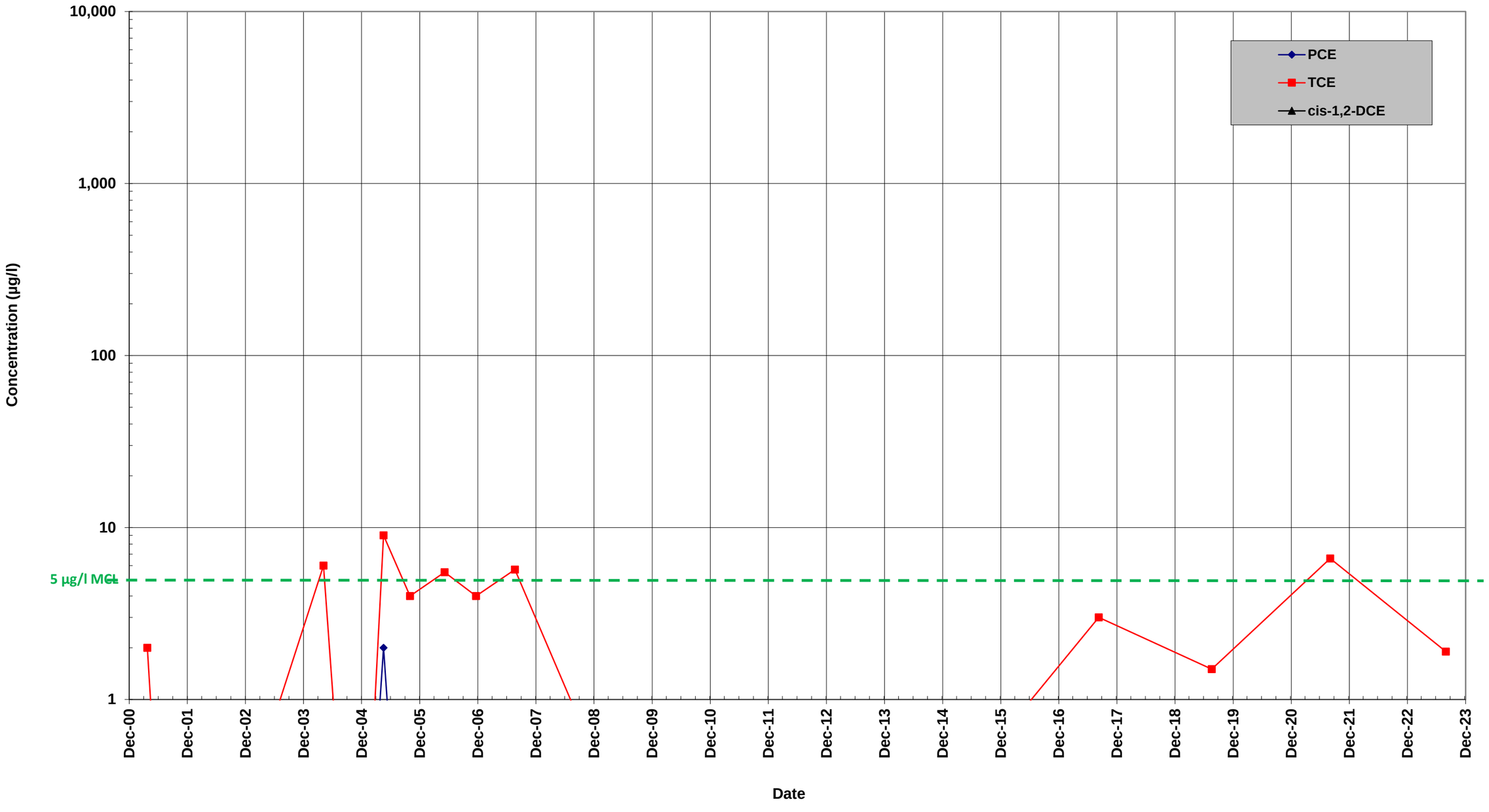


Well MW22C
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 310 to 320 Feet Below Ground Surface

ERM

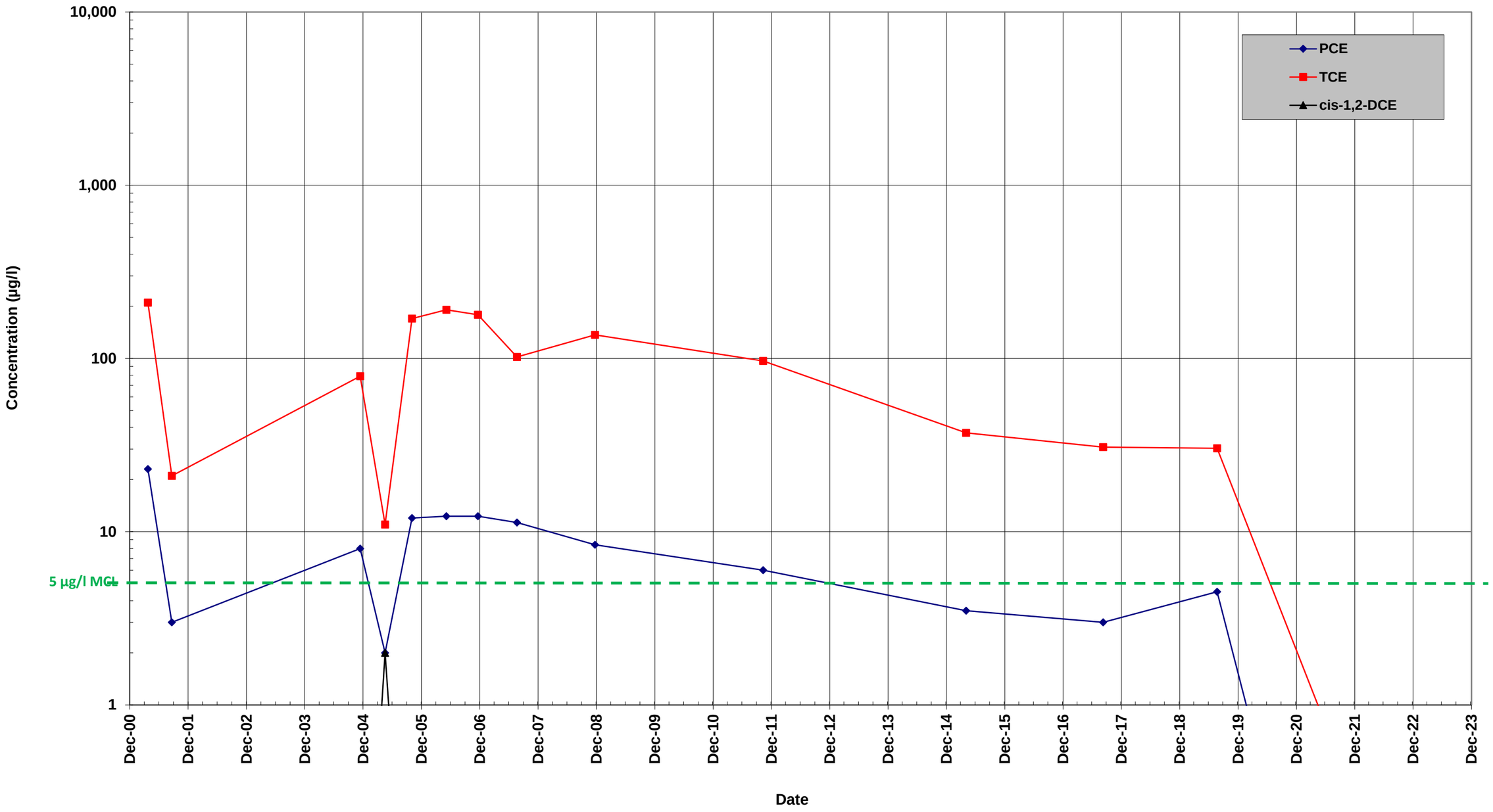


Well MW23A
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 260 to 270 Feet Below Ground Surface

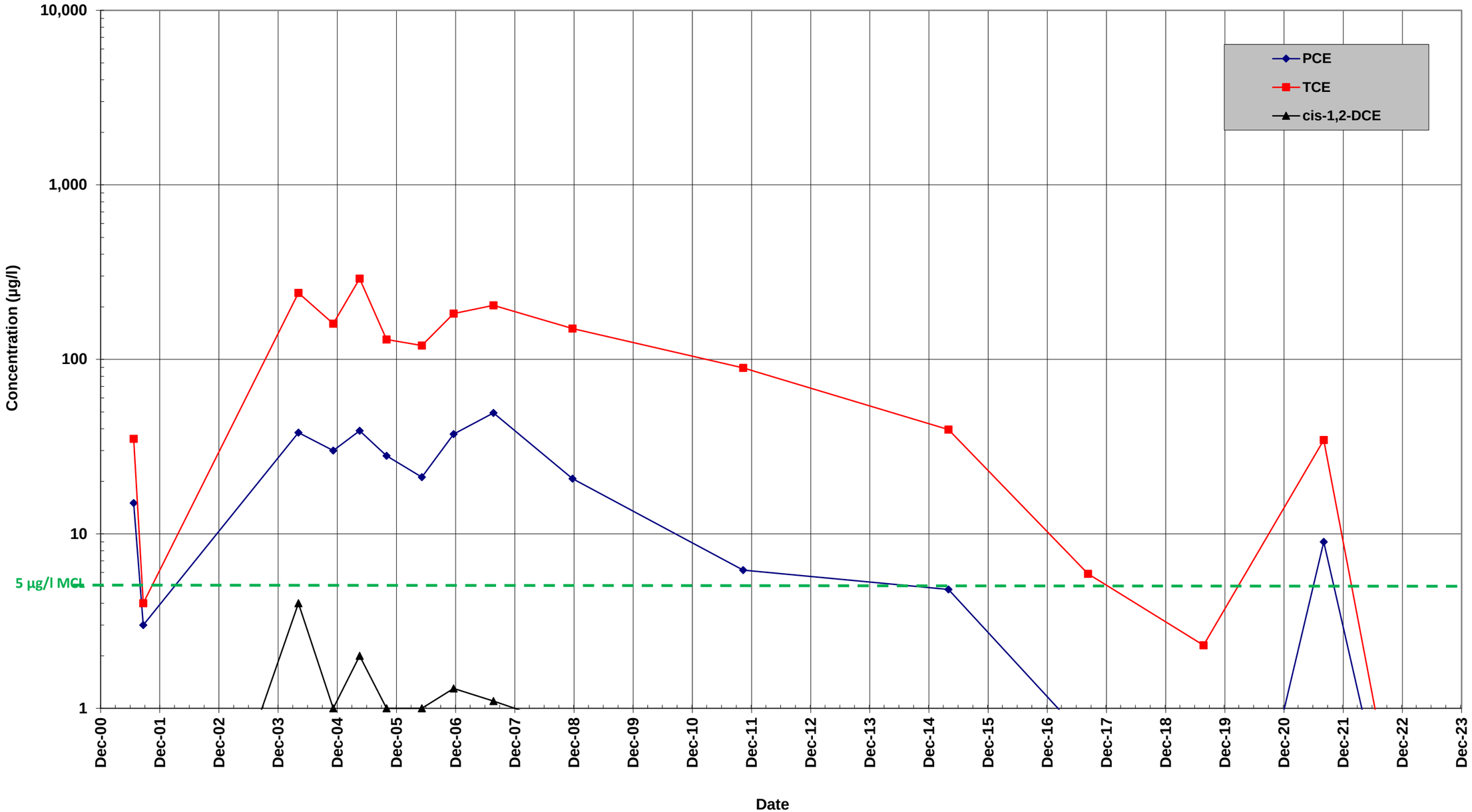


Well MW23B
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 345 to 355 Feet Below Ground Surface

ERM

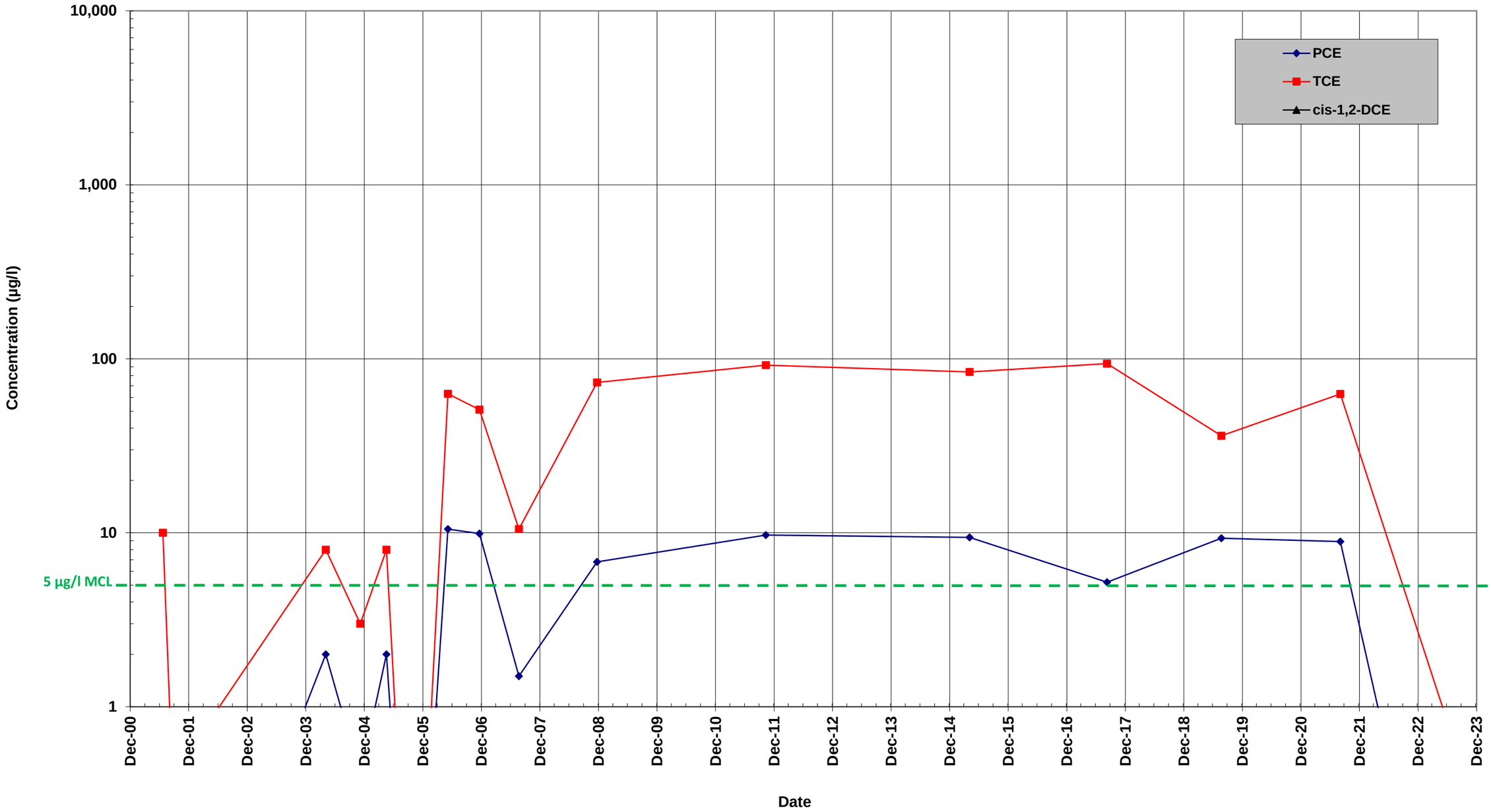


Well MW23C
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 398 to 408 Feet Below Ground Surface

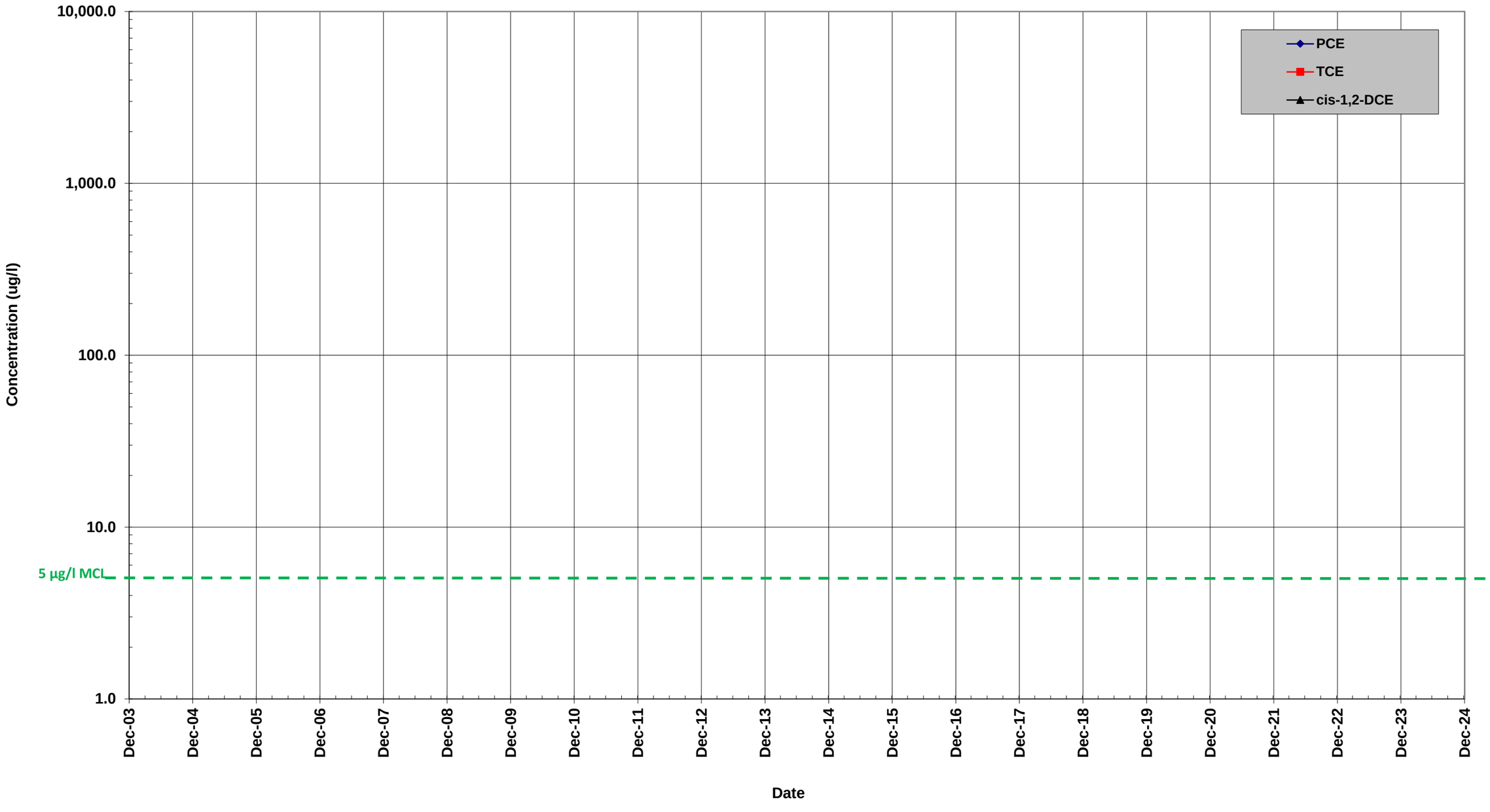


Well MW23D
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 442 to 452 Feet Below Ground Surface

ERM

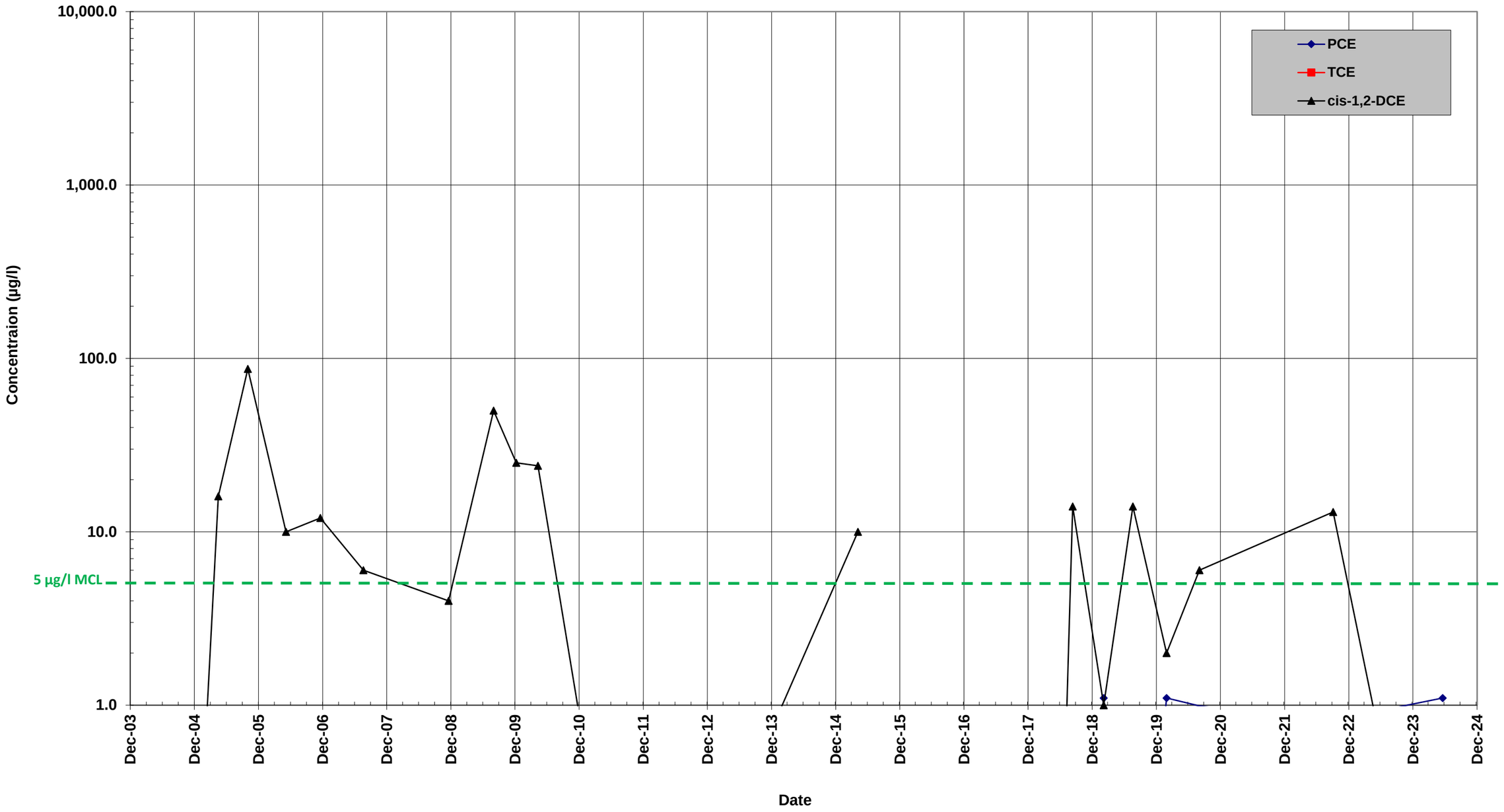


Well MW26A
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 224 to 234 Feet Below Ground Surface

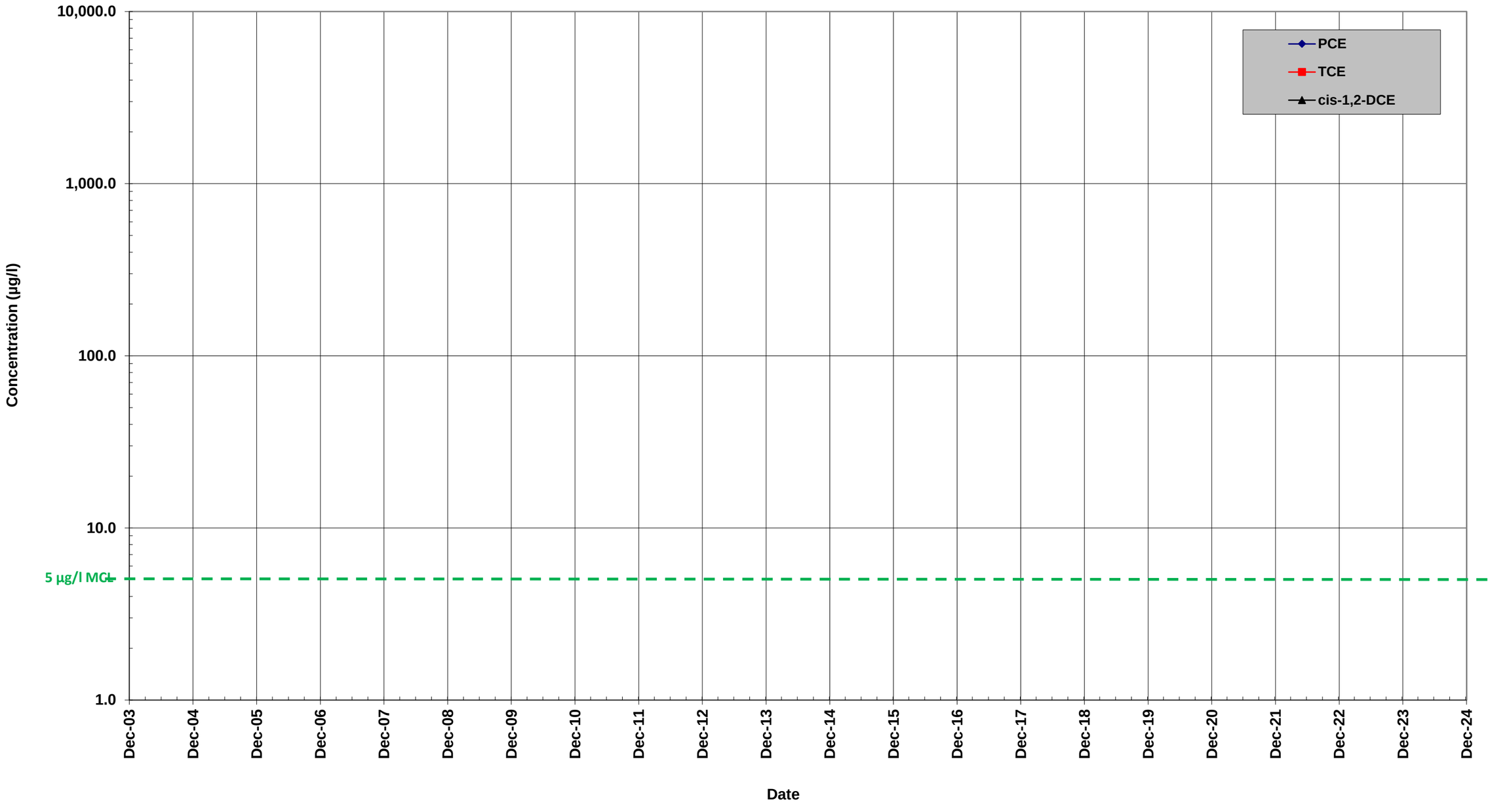


Well MW26B
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 266 to 276 Feet Below Ground Surface

ERM

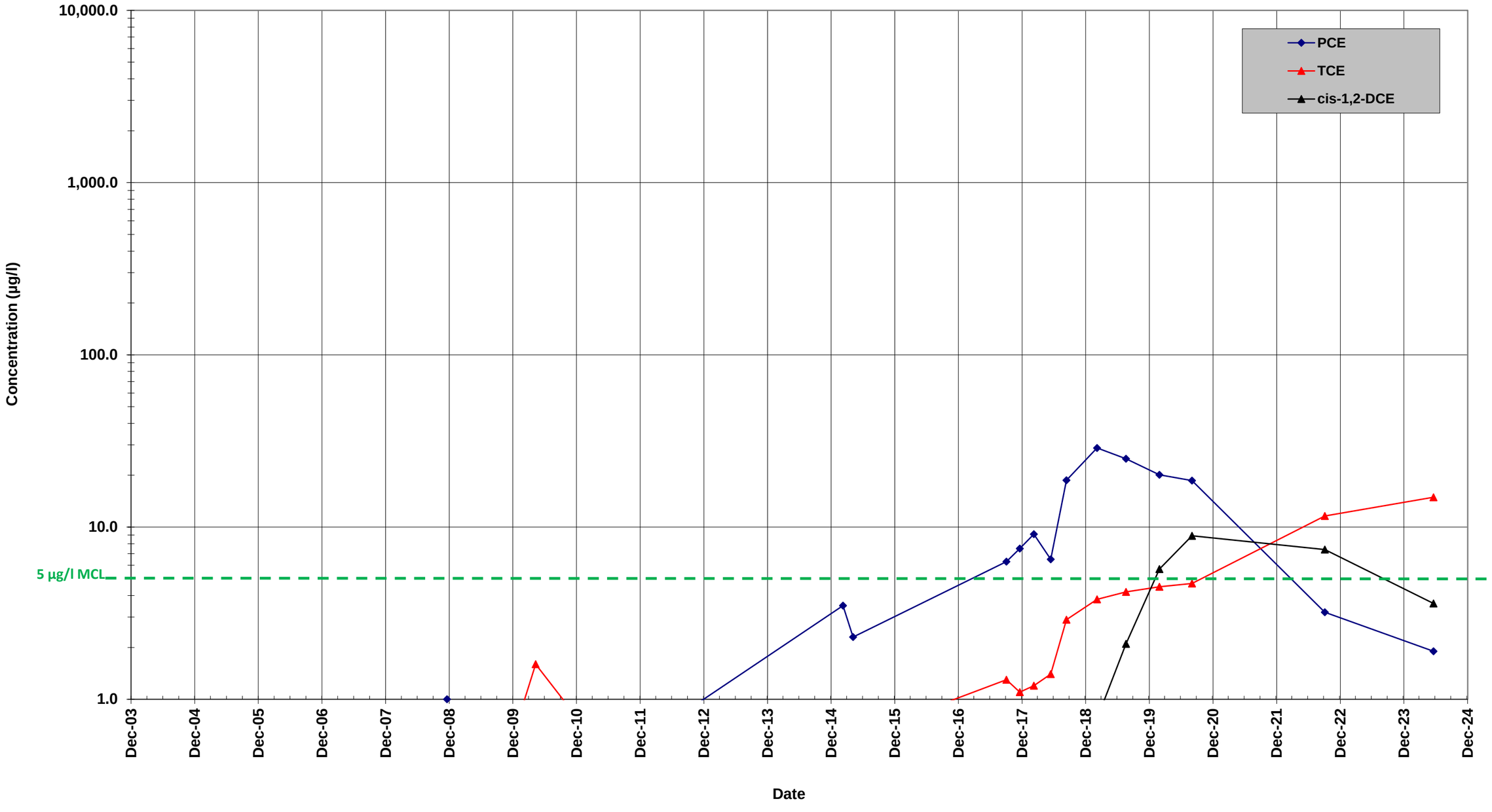


Well MW26C
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 320 to 330 Feet Below Ground Surface



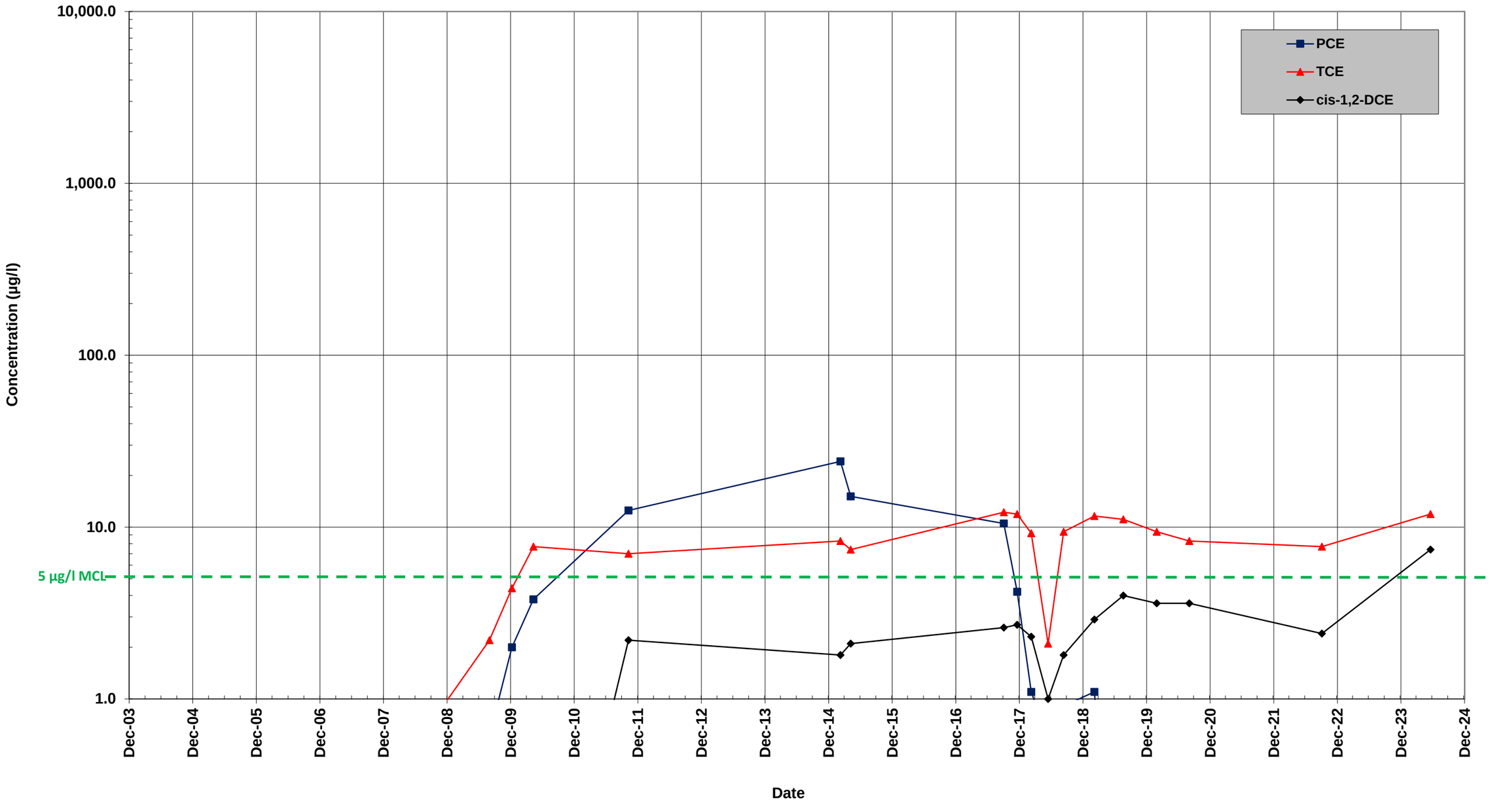
Well MW26D
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 345 to 355 Feet Below Ground Surface

ERM

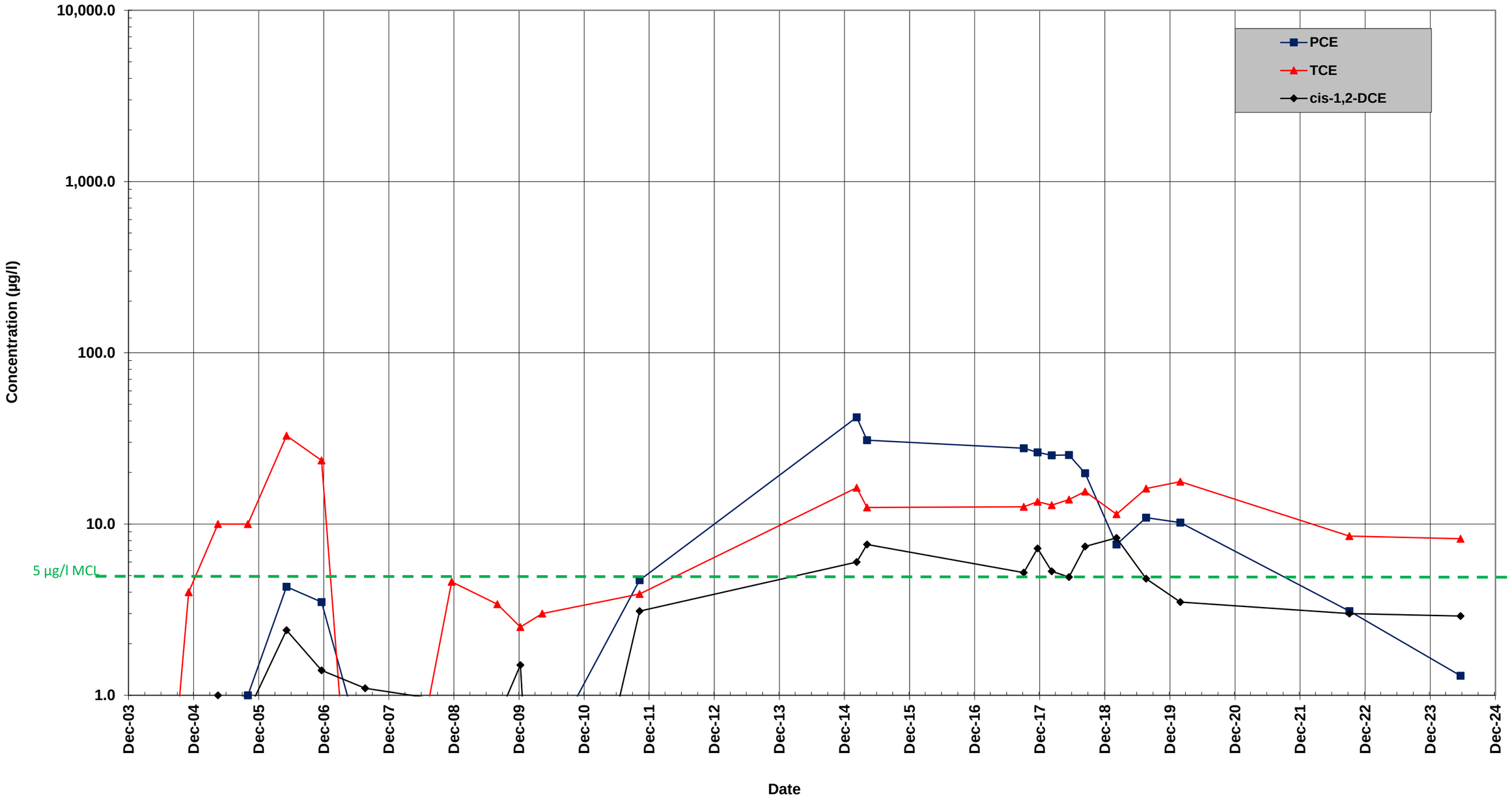


Well MW26E
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 372 to 382 Feet Below Ground Surface

ERM

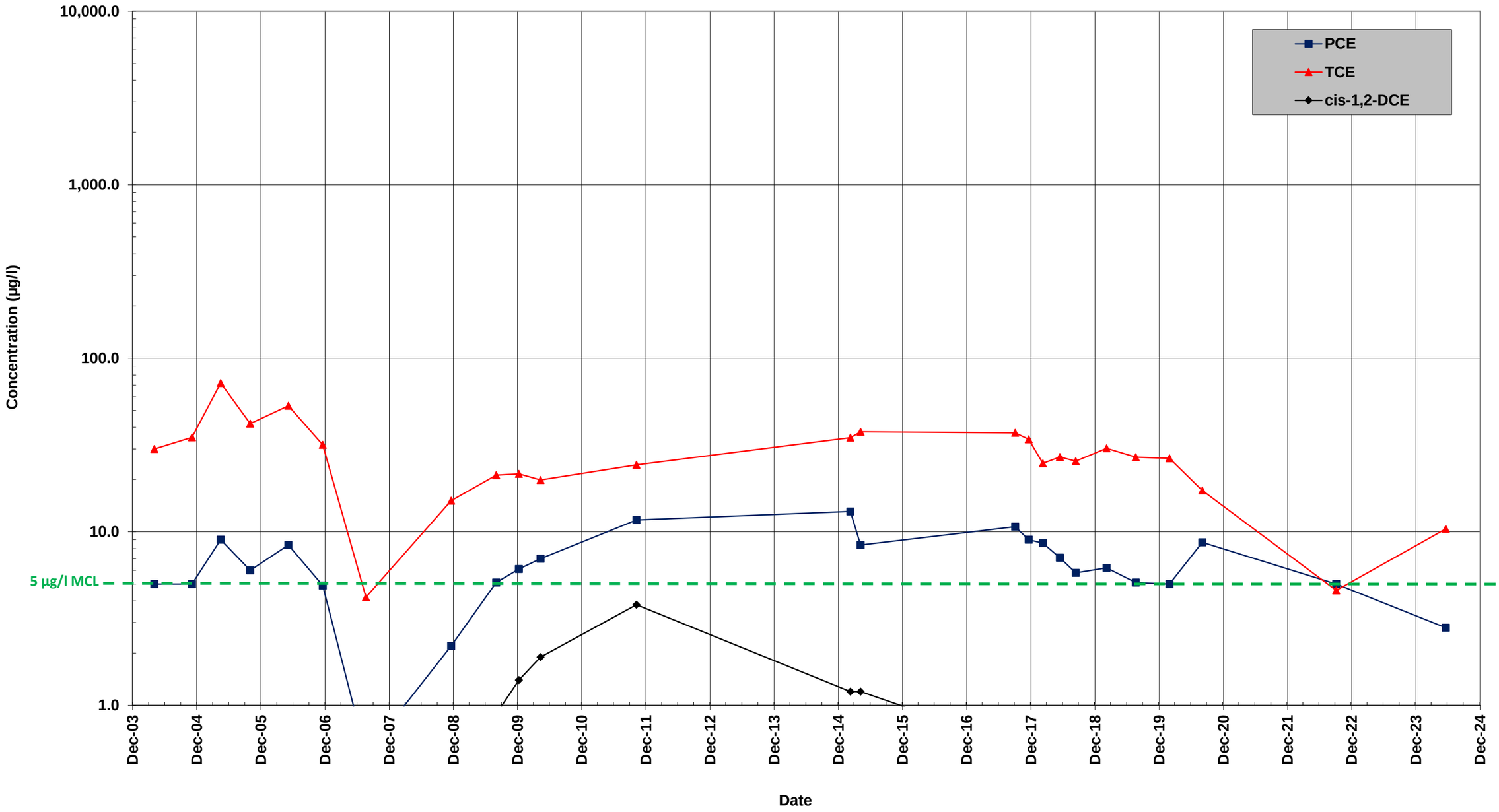


Well MW26F
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 405 to 415 Feet Below Ground Surface



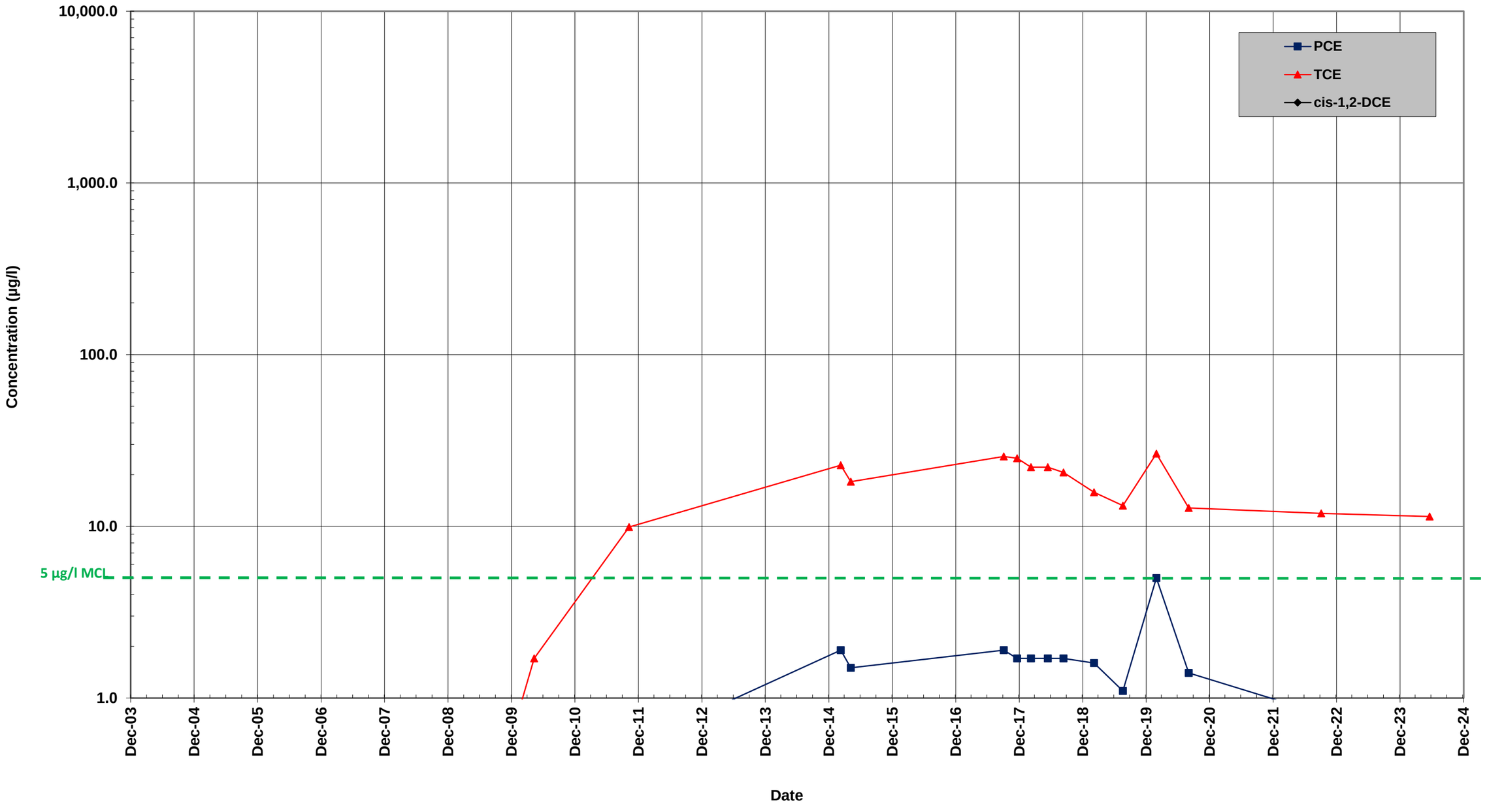
Well MW26G
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 438 to 448 Feet Below Ground Surface

ERM



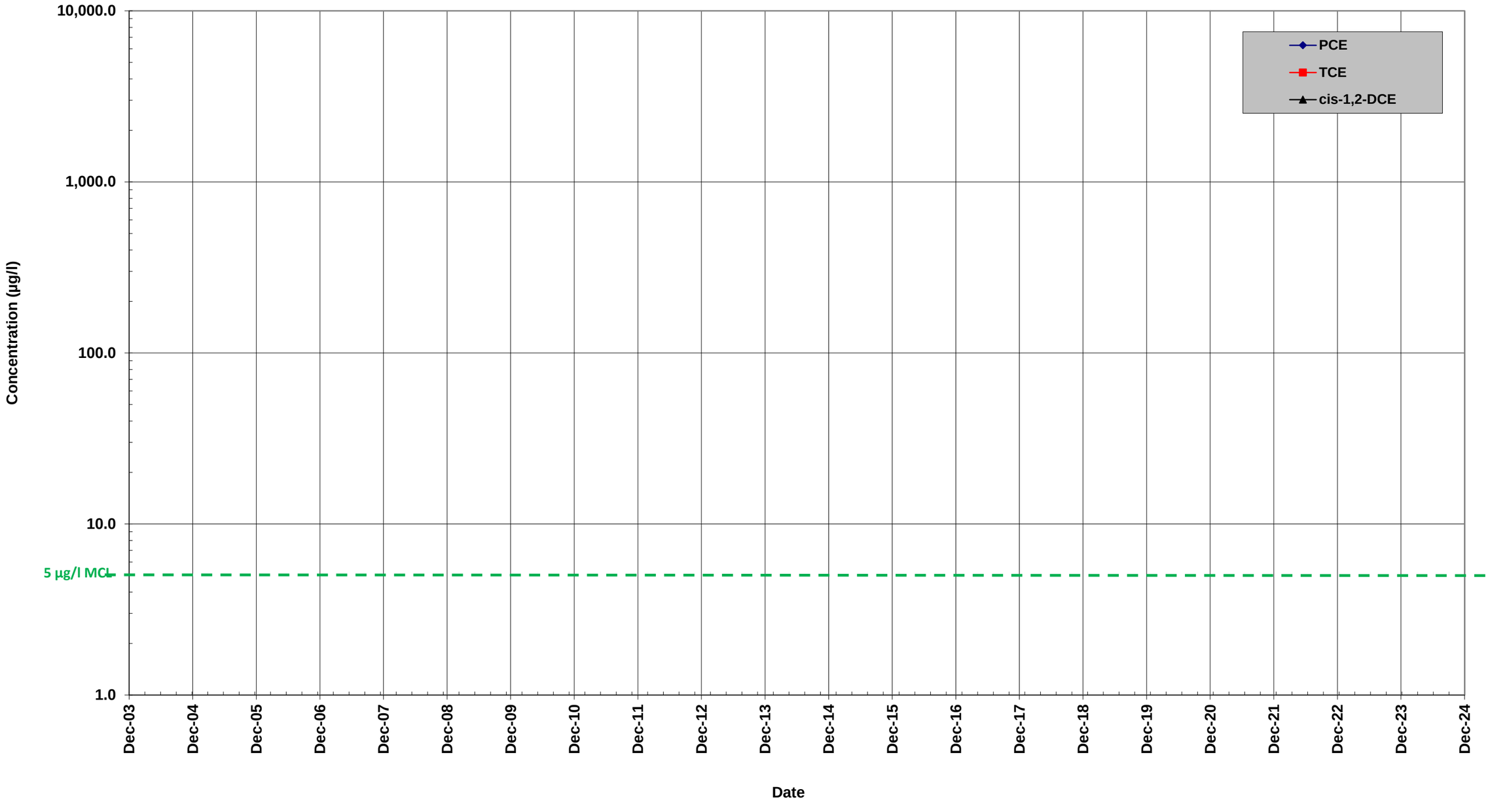
Well MW26H
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 474 to 484 Feet Below Ground Surface

ERM

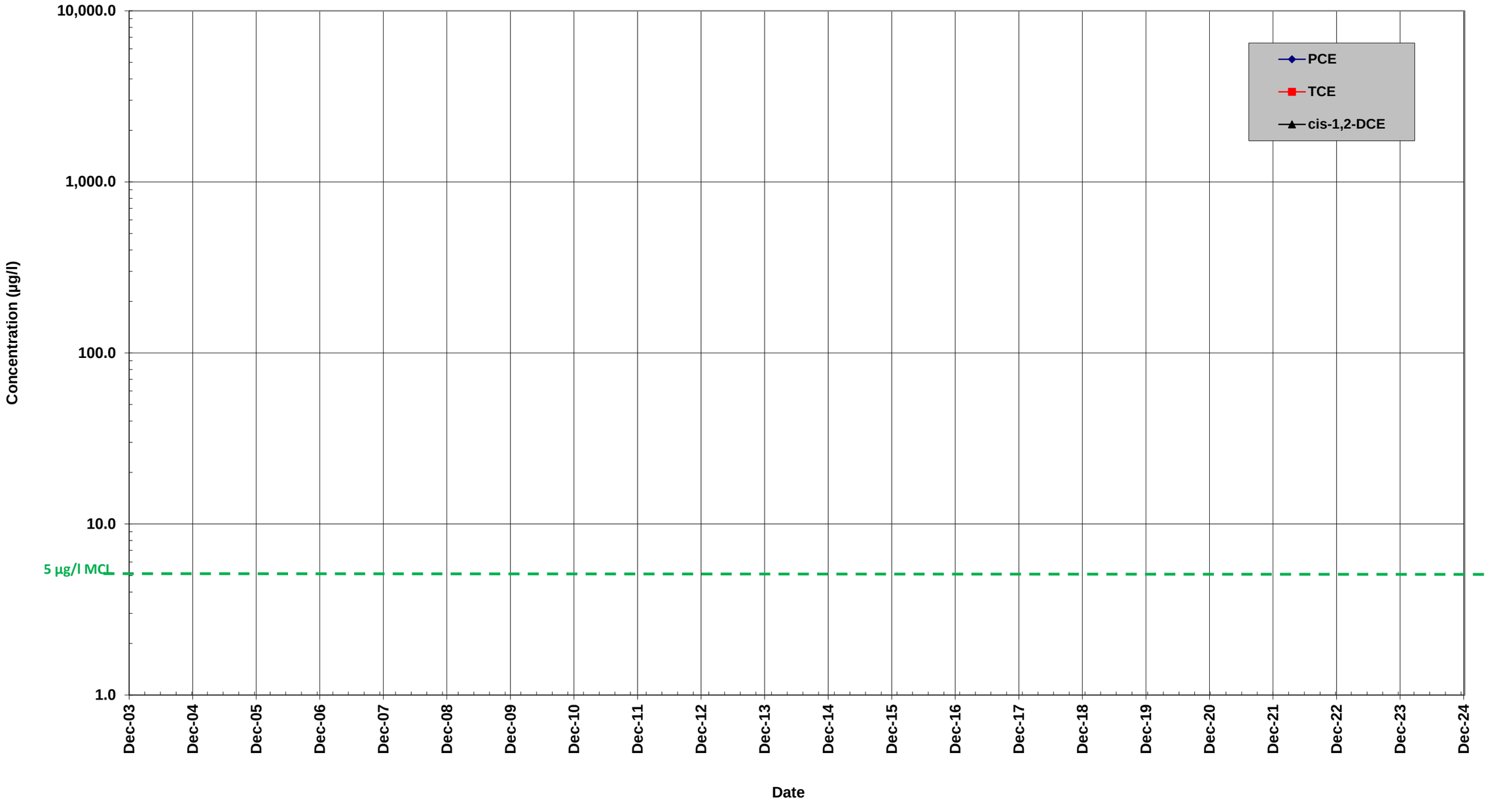


Well MW27A
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 192 to 202 Feet Below Ground Surface

ERM

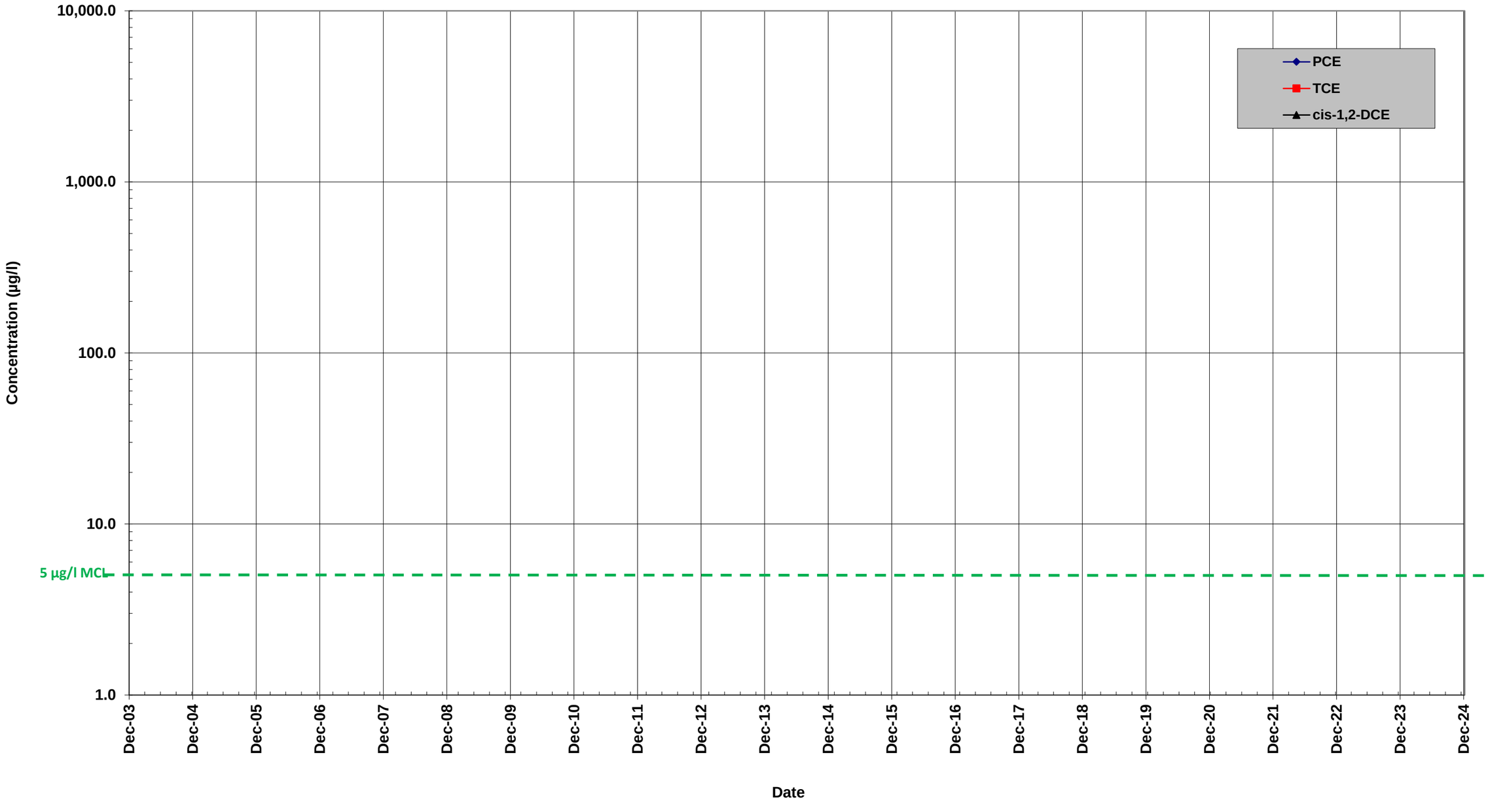


Well MW27B
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 236 to 246 Feet Below Ground Surface

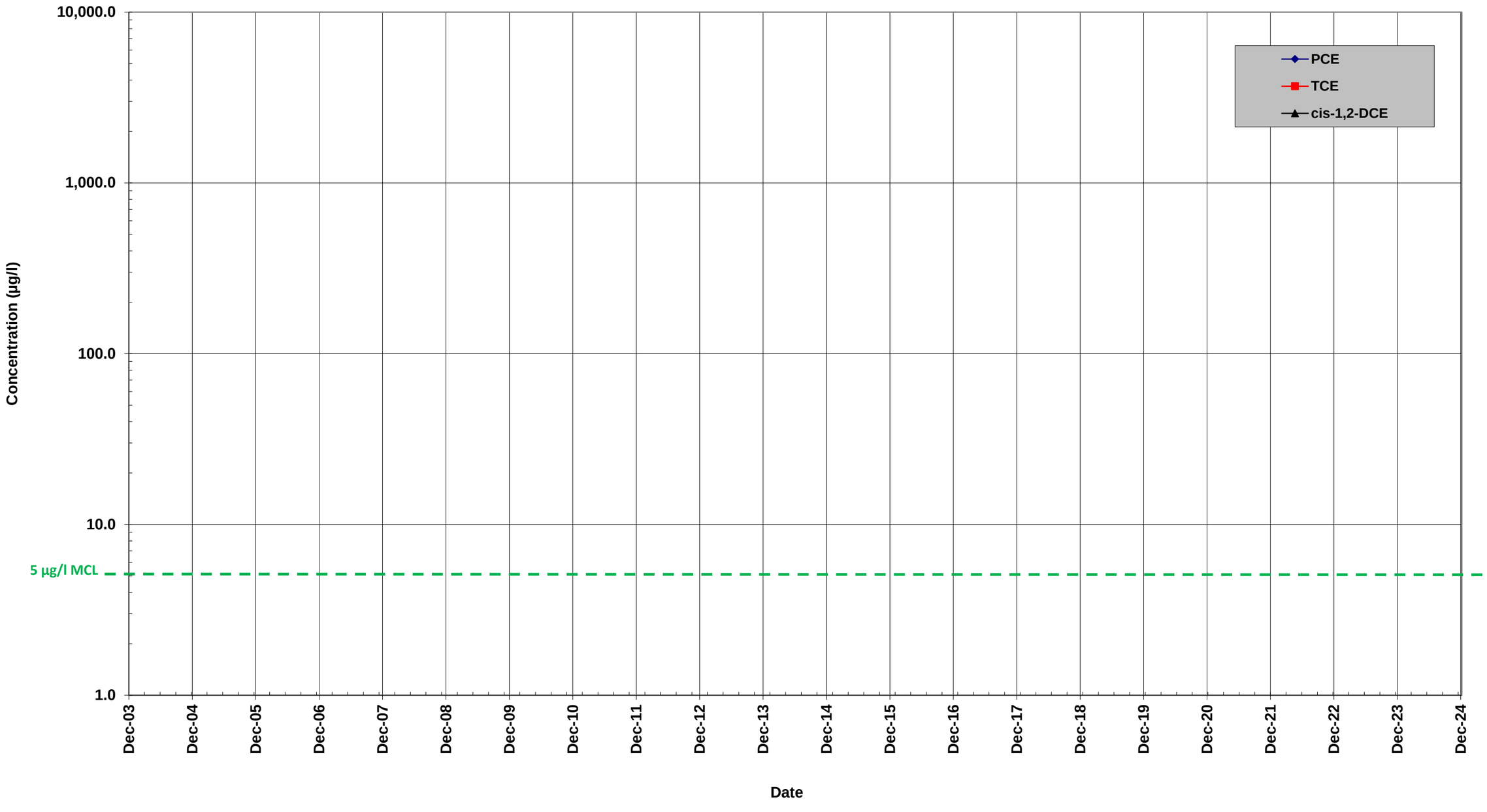


Well MW27C
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 284 to 294 Feet Below Ground Surface

ERM

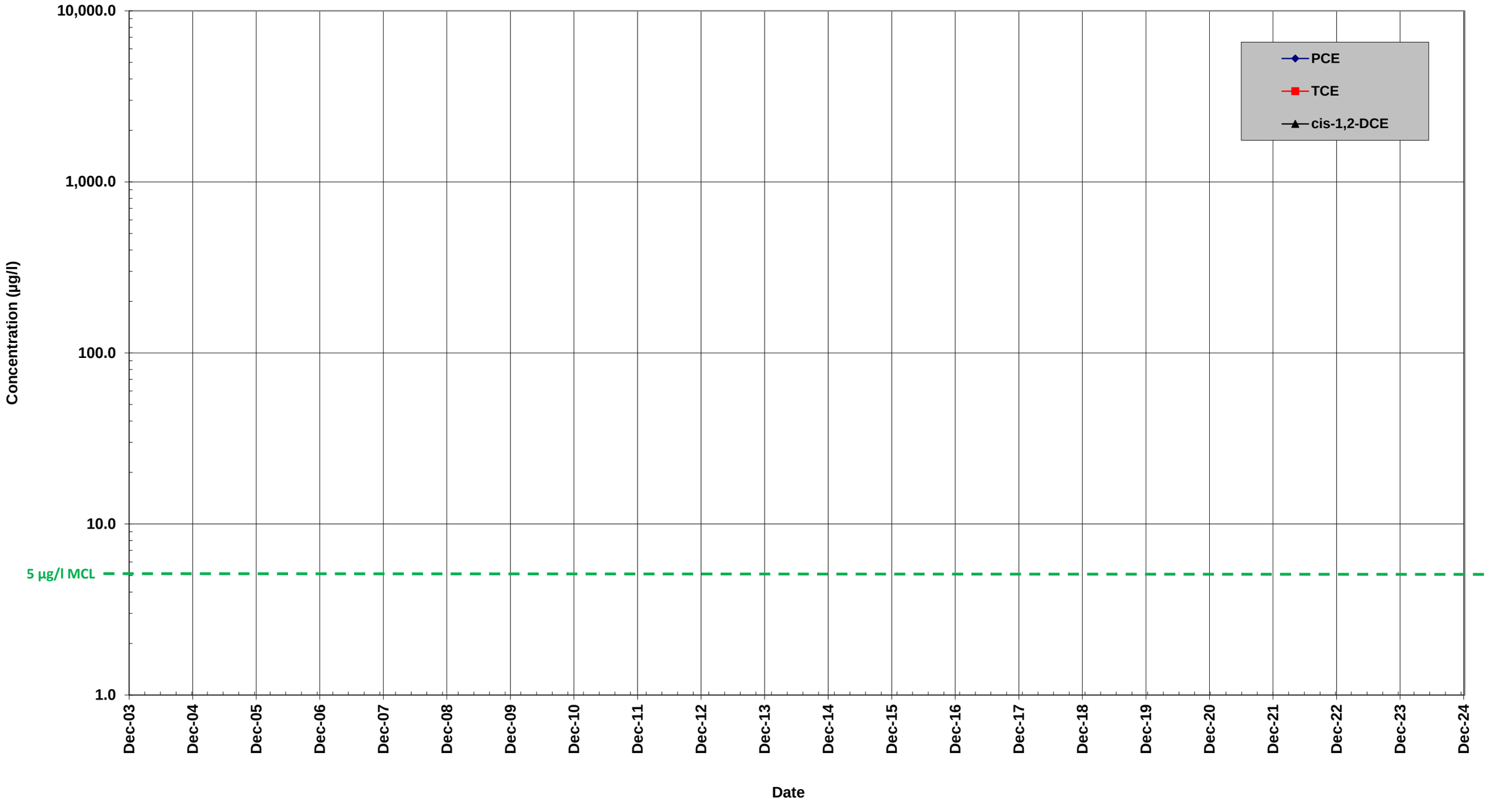


Well MW27D
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 324 to 334 Feet Below Ground Surface



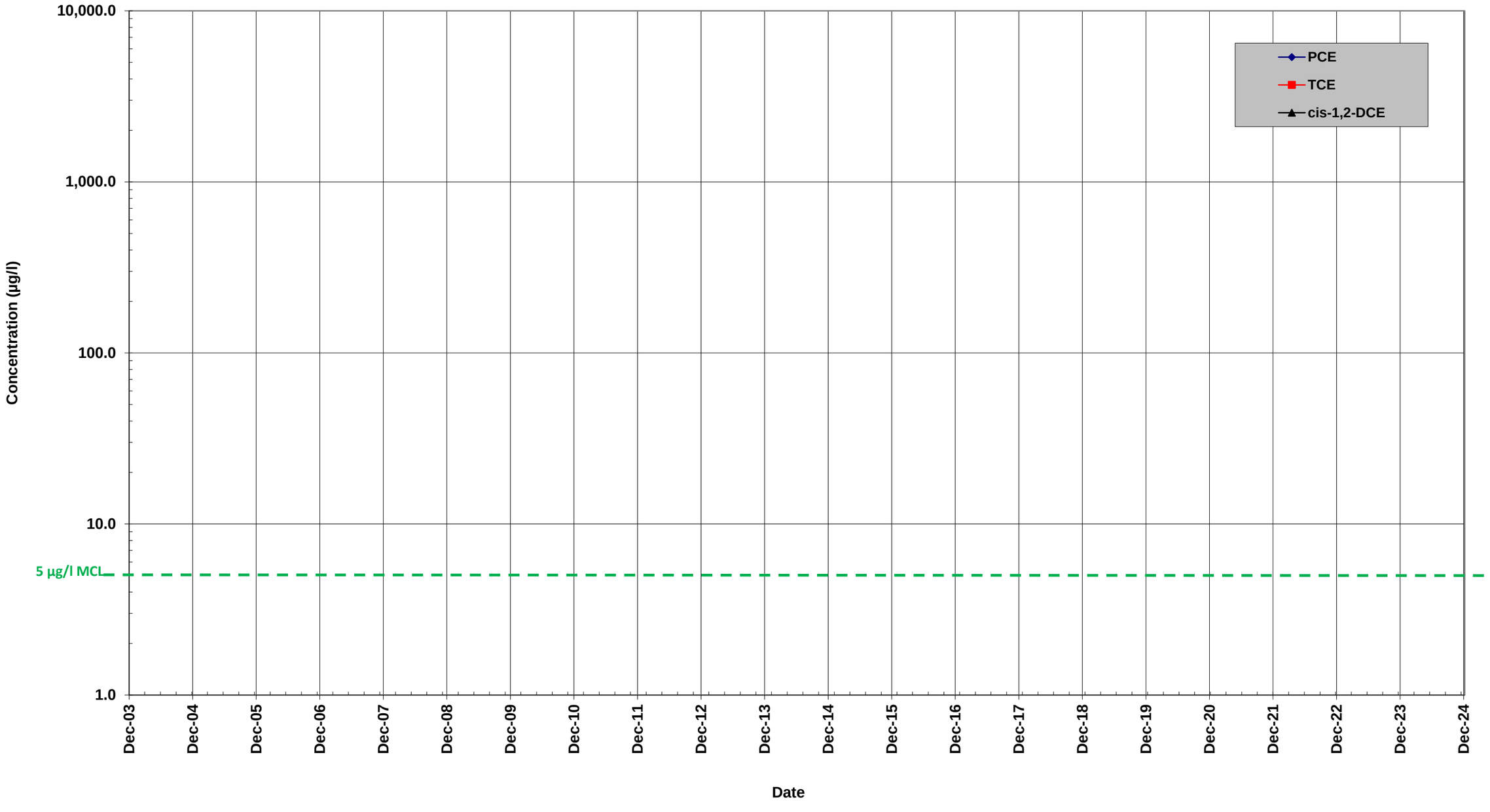
Well MW27E
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 364 to 374 Feet Below Ground Surface

ERM



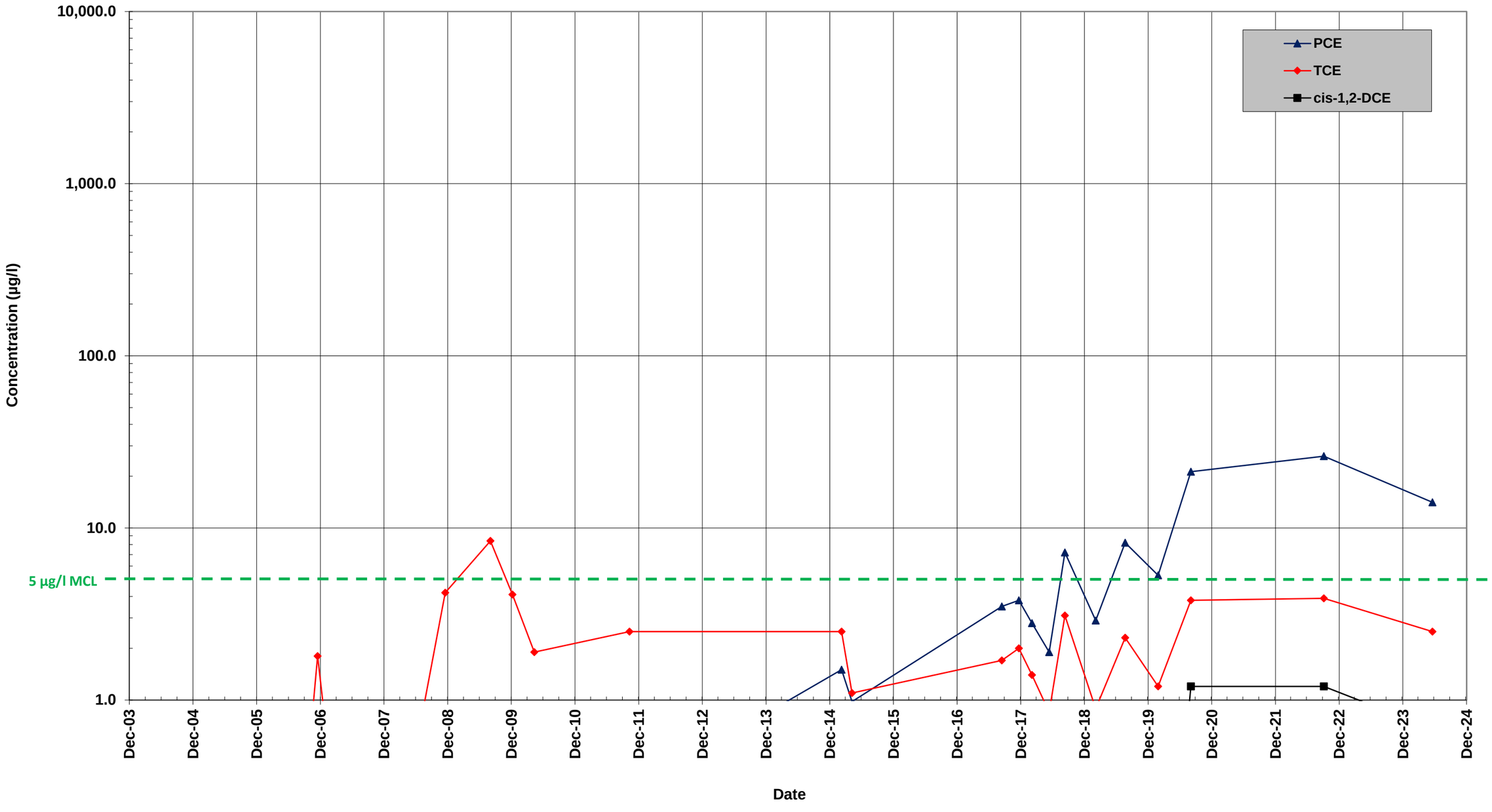
Well MW27F
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 408 to 418 Feet Below Ground Surface

ERM

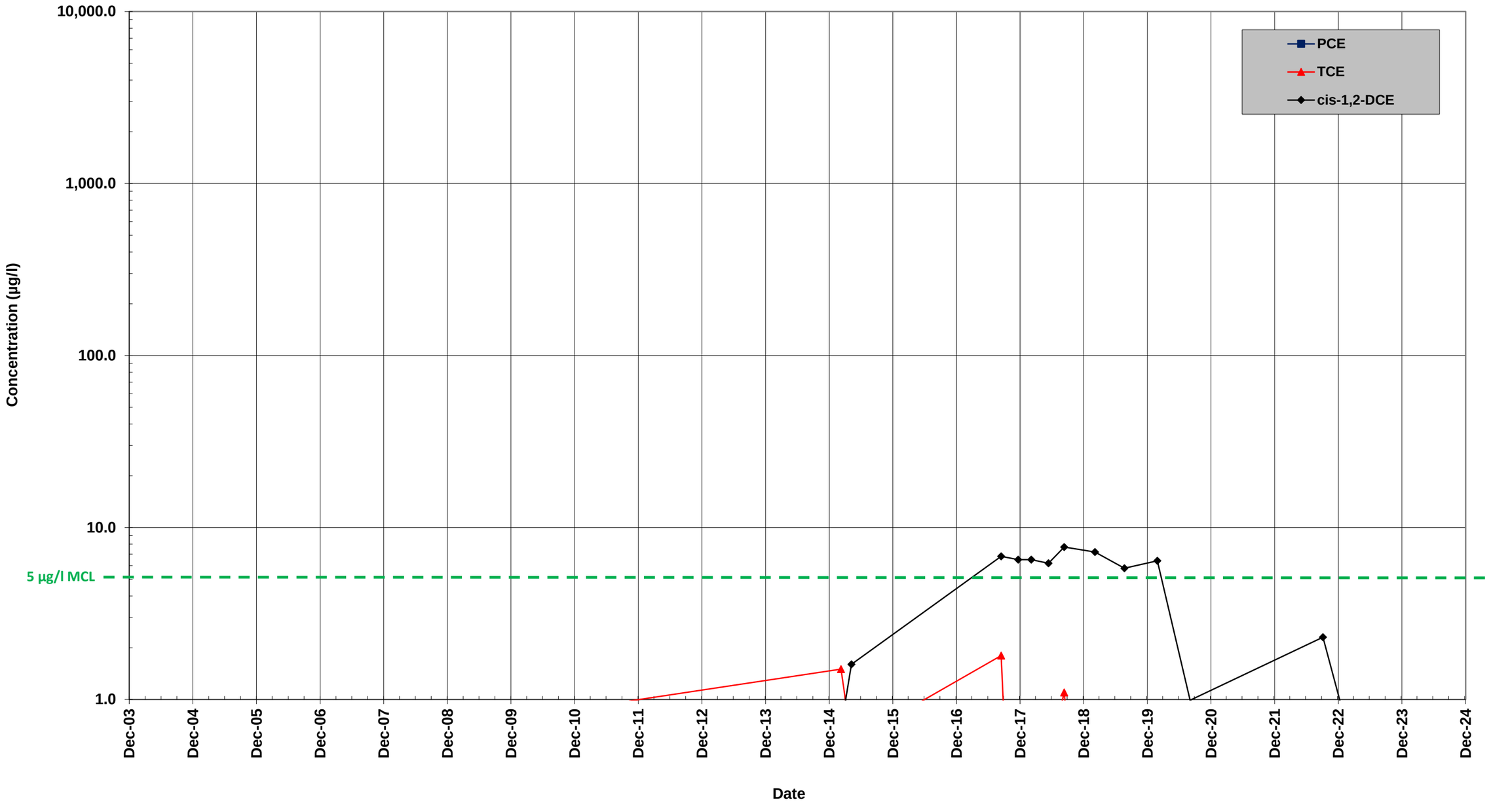


Well MW27G
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 438 to 448 Feet Below Ground Surface

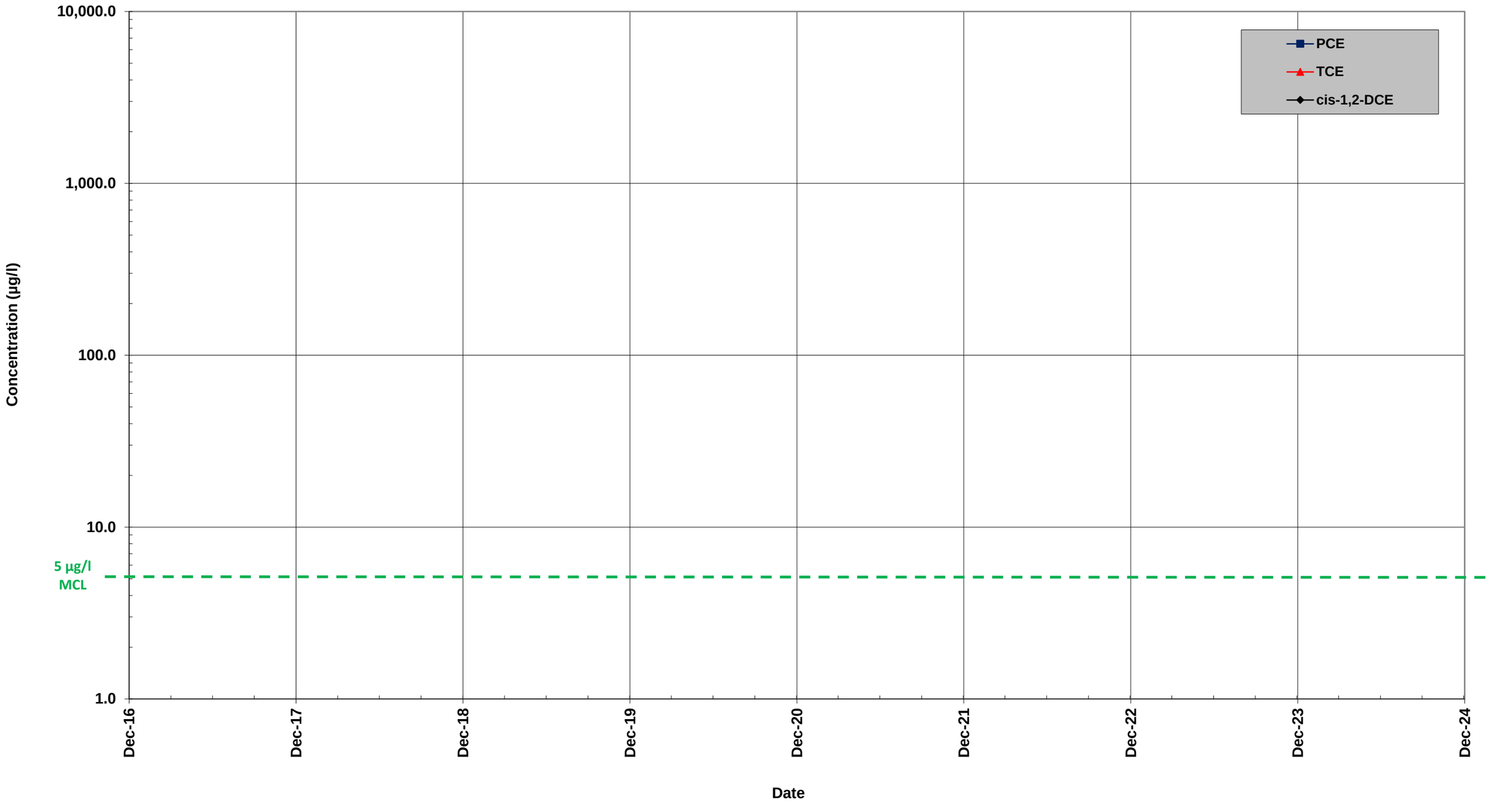
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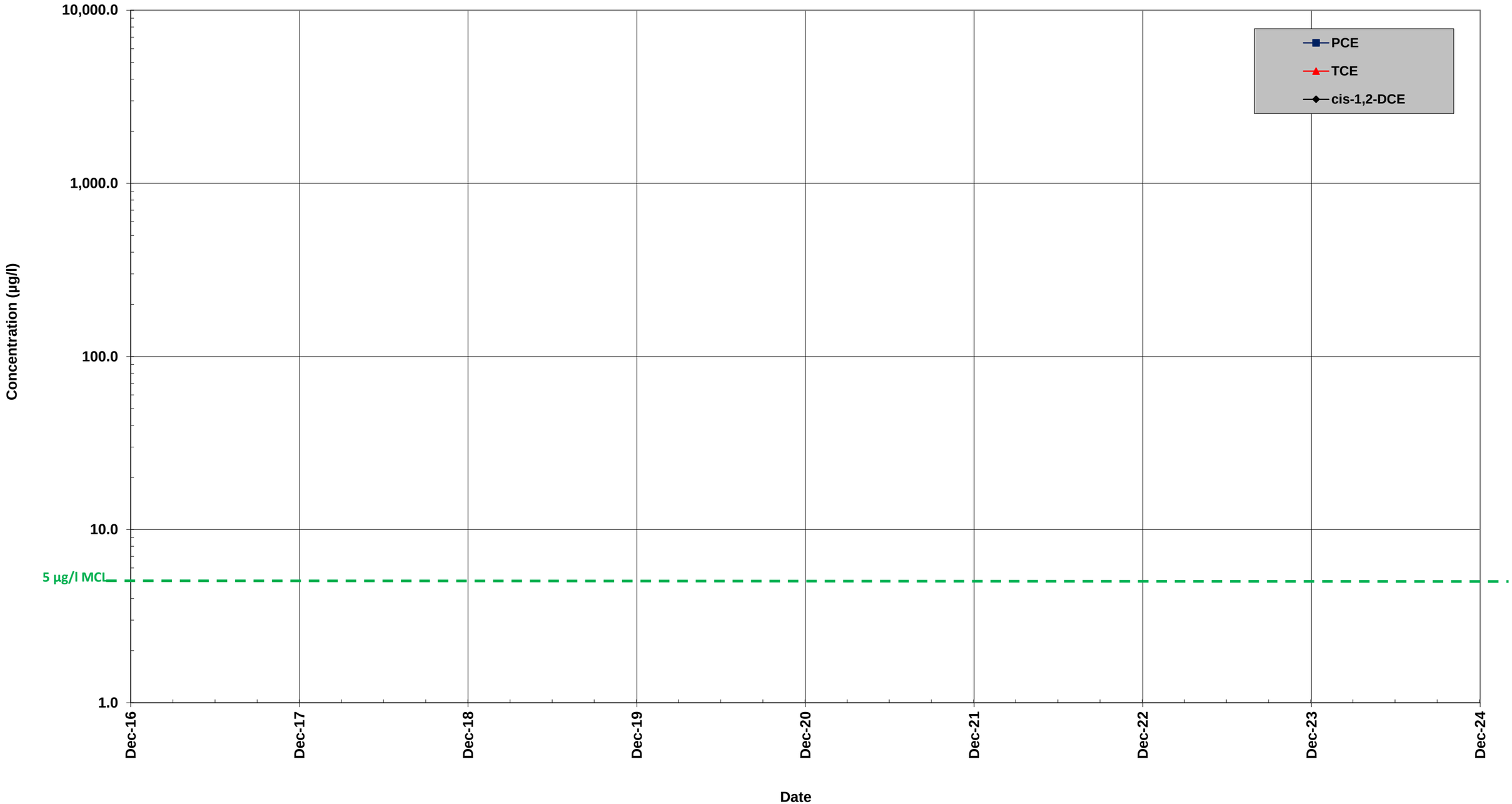
Well MW27H
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 472 to 482 Feet Below Ground Surface



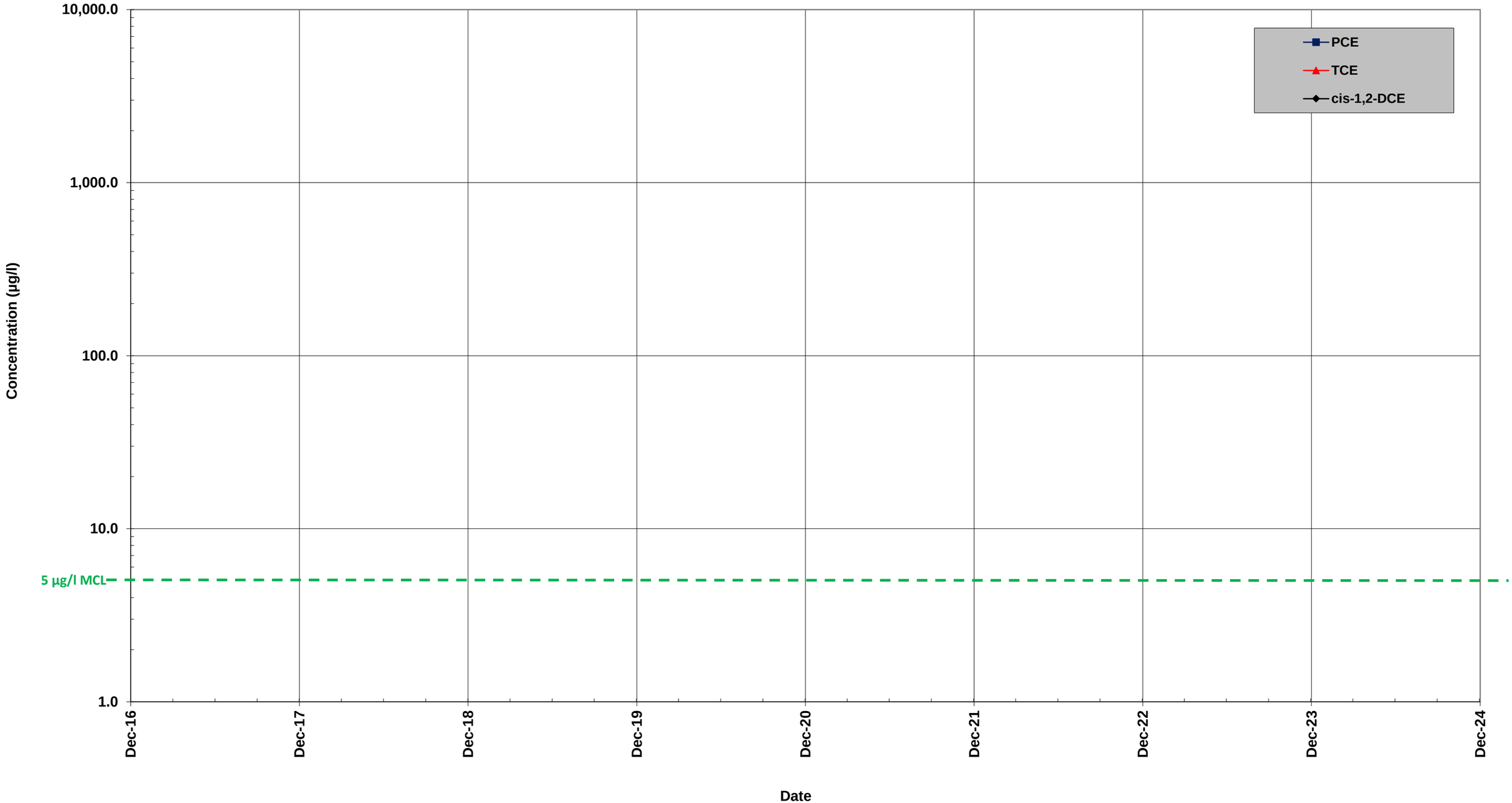
Well MW28A
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 92 to 102 Feet Below Ground Surface



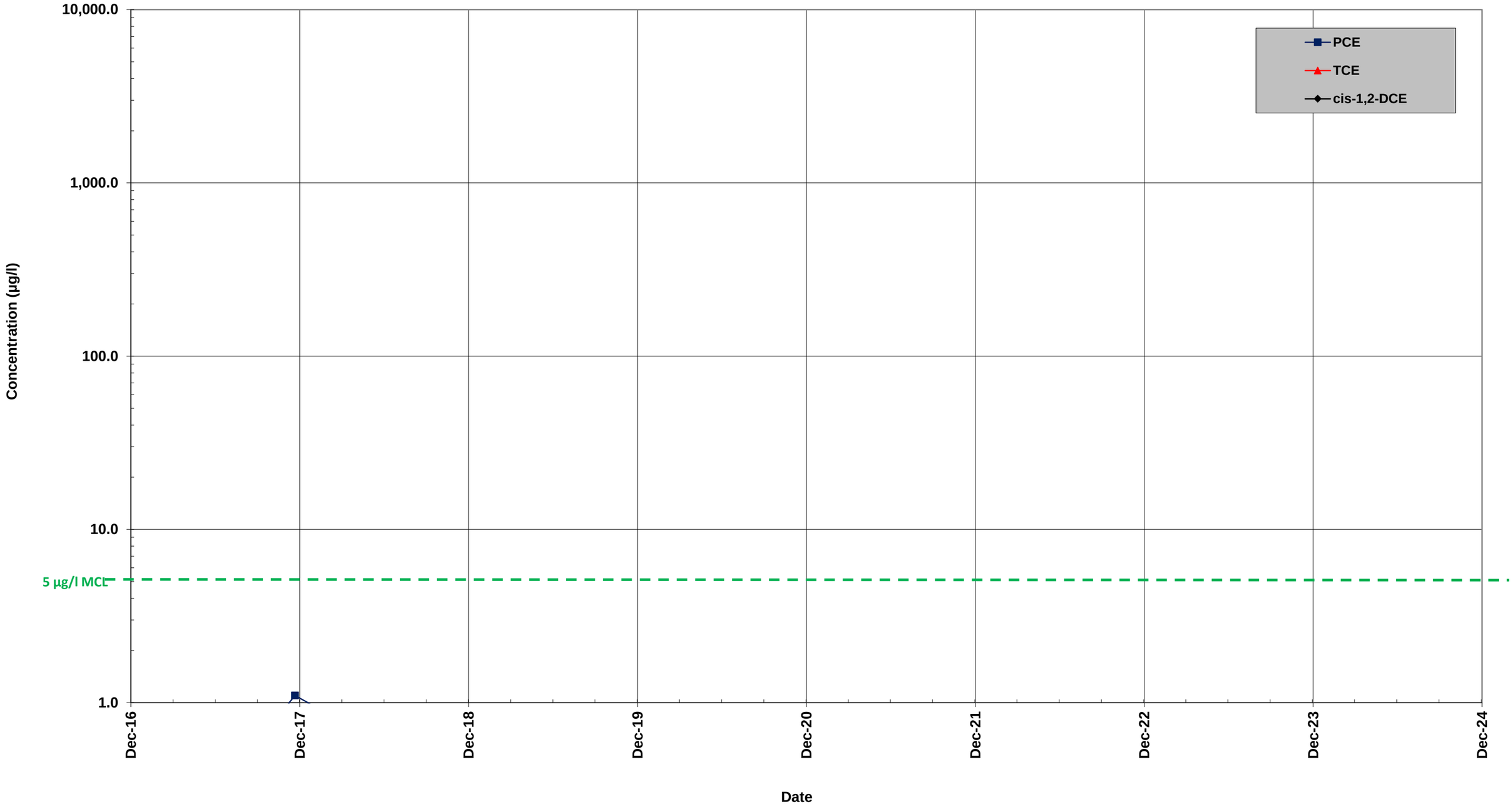
Well MW28B
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 214 to 224 Feet Below Ground Surface



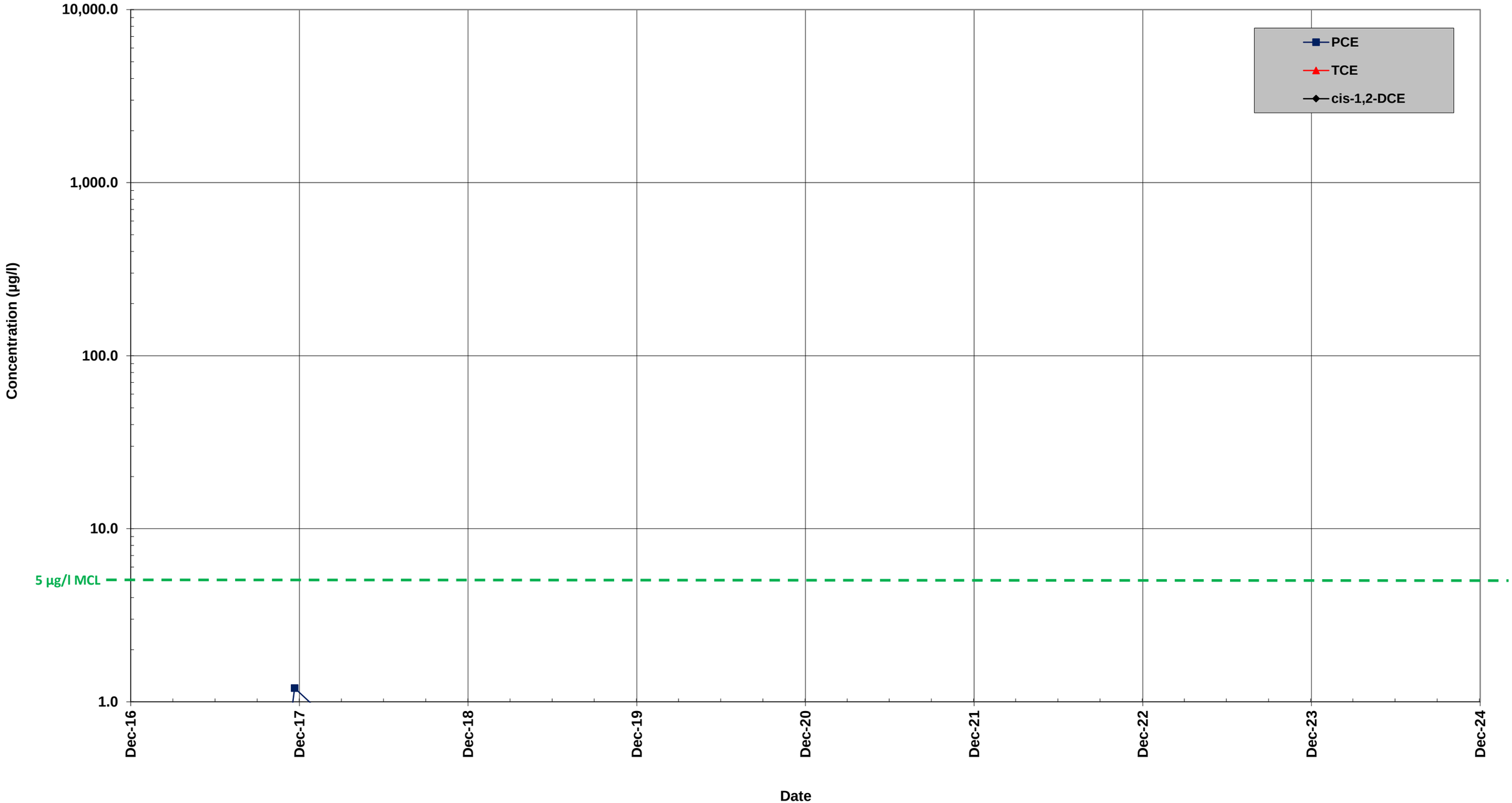
Well MW28C
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 312 to 322 Feet Below Ground Surface



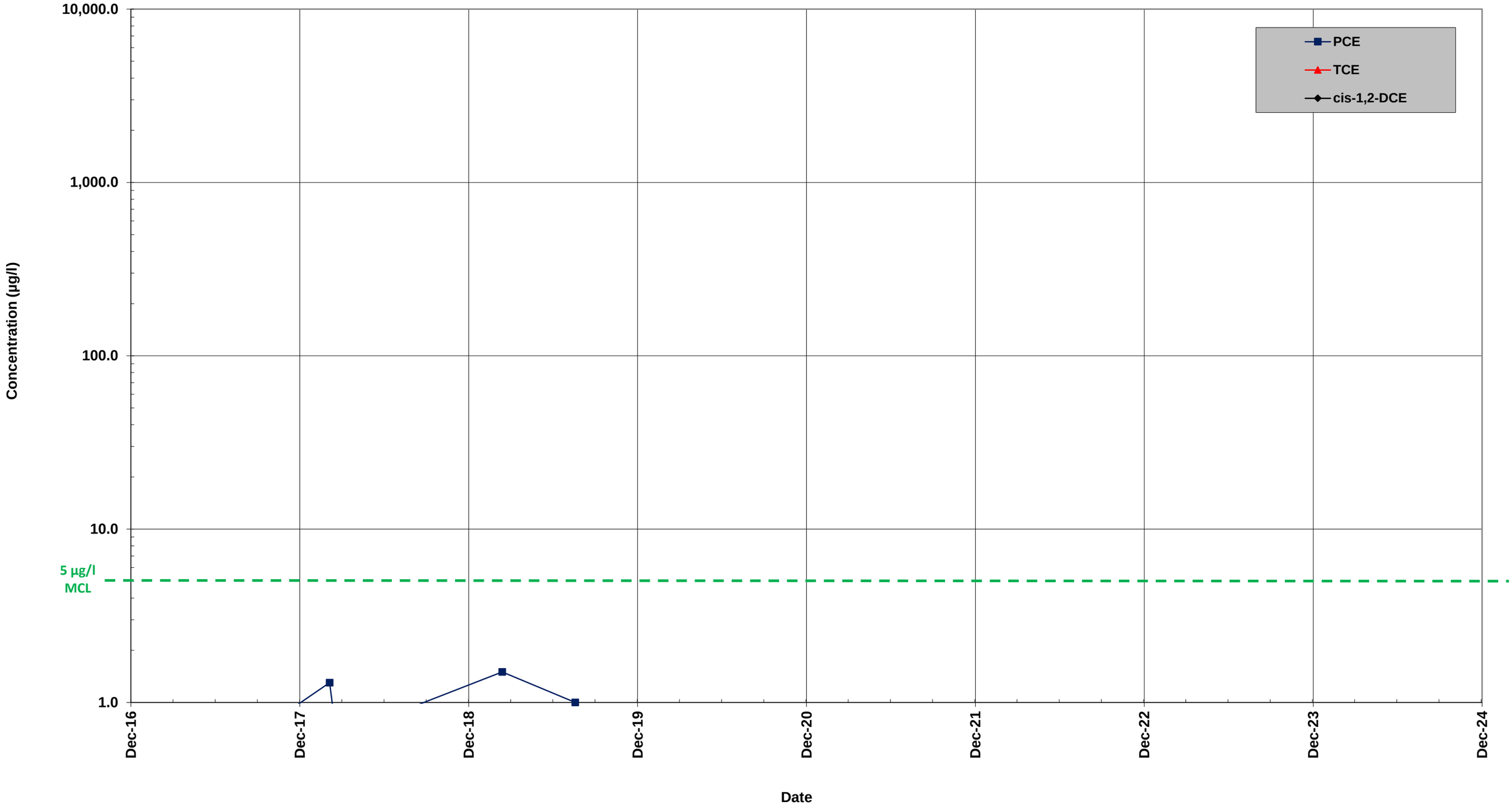
Well MW28D
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 340 to 350 Feet Below Ground Surface



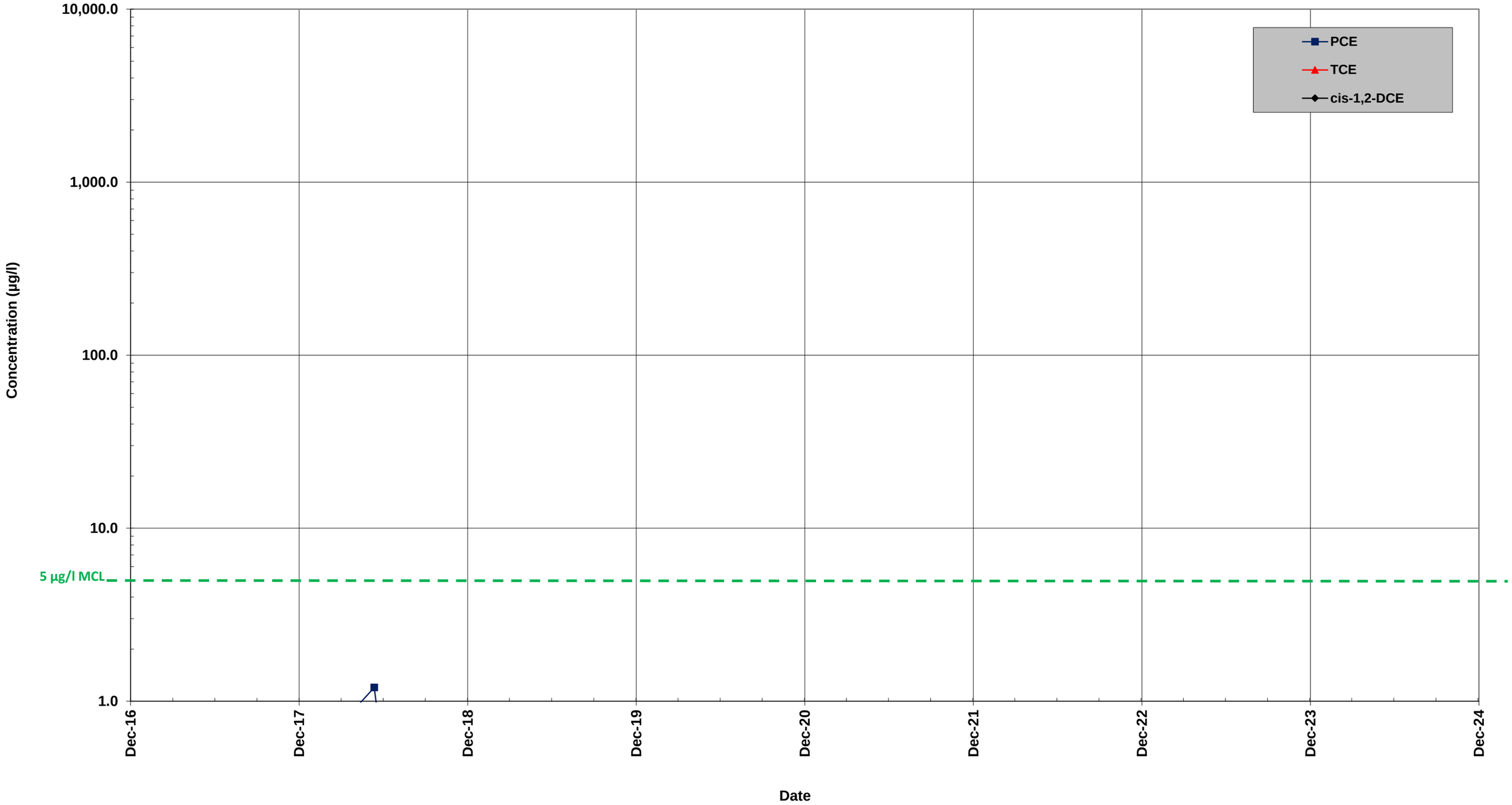
Well MW28E
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 362 to 372 Feet Below Ground Surface



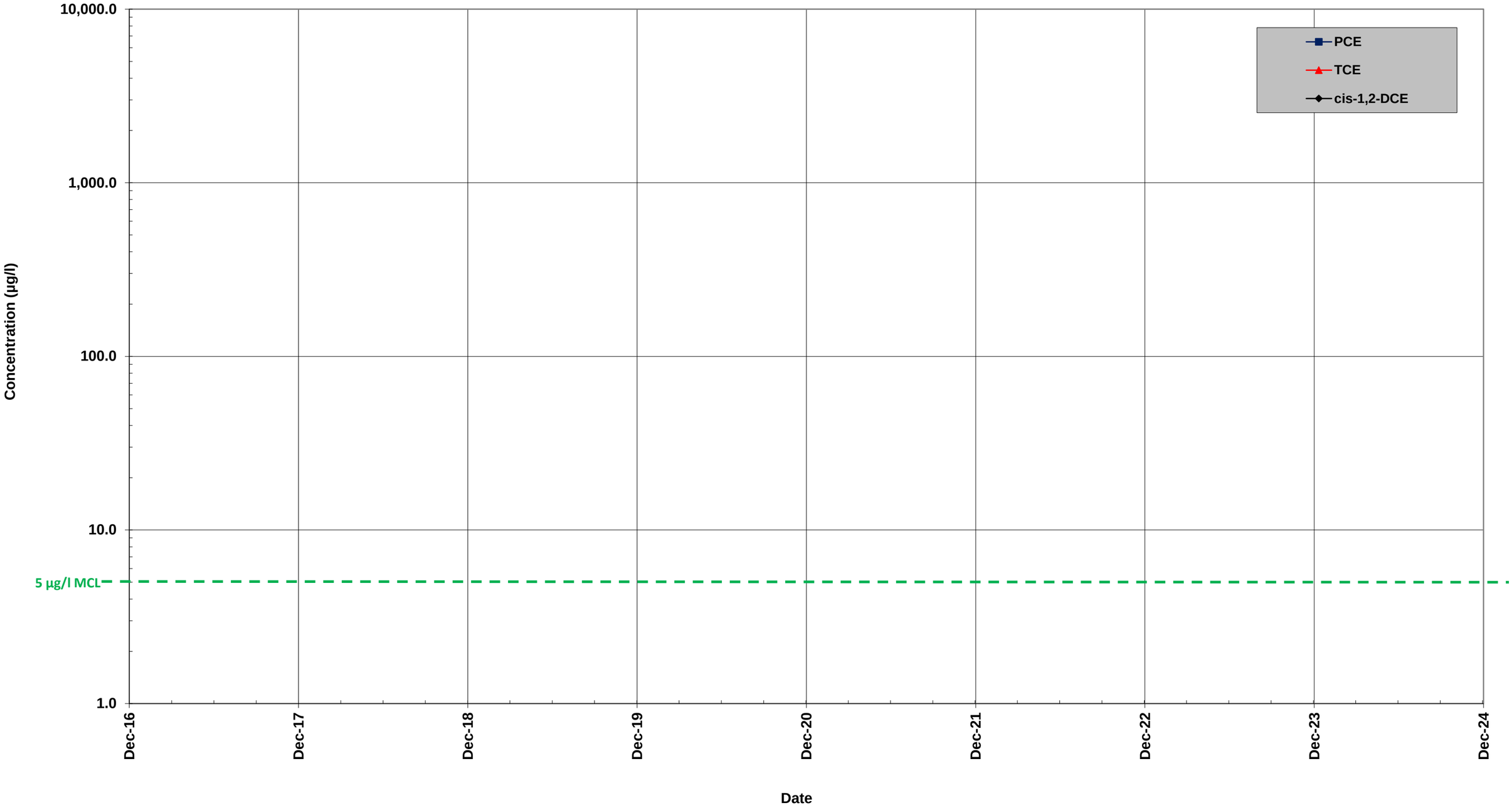
Well MW28F
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 398 to 408 Feet Below Ground Surface



Well MW28G
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 434 to 444 Feet Below Ground Surface



Well MW28H
Summary of Historic Groundwater Sampling Results
PCE, TCE and cis-1,2-DCE Concentrations Vs. Time
Screen Zone Interval: 485 to 495 Feet Below Ground Surface



Owner (Purveyor): Garden City Village
Owner's Well Designation (Local #): 9
Location (Site Name): Garden City Village
Town: Hempstead
Screened Interval (MSL): -341 To -381
Aquifer: Magothy
Well Depth: 470
Simulated Pumping Rate (cfd): 51428.8
Minimum Time of Travel (Yrs): 15.0
Subgrids used in Model: cz_sg01e

Table N-03881-1: Land Use Summary

Land Use Type	Land Use Area (Acres) in Time Of Travel							
	2	5	25	50	75	100	Total	%
Commercial Sewered				0.13		2.67	2.80	1.3
High Density Residential Sewered			60.65	25.60	8.13	8.43	102.81	48.2
Industrial Sewered			0.61	25.94	17.88	8.86	53.28	25.0
Institutional Sewered			6.88	0.90	0.10	0.05	7.93	3.7
Low Density Residential Sewered			0.04	0.05			0.09	0.0
Open Space			4.37	2.29			6.66	3.1
Surface Waters			3.50	0.90			4.40	2.1
Transportation			15.16	6.84	2.83	7.25	32.07	15.0
Vacant			1.23	1.41	0.30	0.17	3.10	1.5
Totals			**92.42**	**64.05**	**29.24**	**27.43**	**213.15**	

Table N-03881-1A: Contaminant Prevalence Summary By Land Use

Contaminant Category	By Land Use				
	2	5	25	75	100
Microbials			L		
Nitrates					M
Pesticides			L	L	L
VOCs					L



Travel Time (Years)

- Two
- Five
- Twenty Five
- Fifty
- Seventy Five
- One Hundred

Land Use Classifications

- Low Density Residential
- Medium Density Residential
- High Density Residential
- Commercial
- Industrial
- Institutional
- Open Space
- Agricultural
- Vacant
- Transportation
- Utilities
- Waste Handling Mant.
- Surface Waters

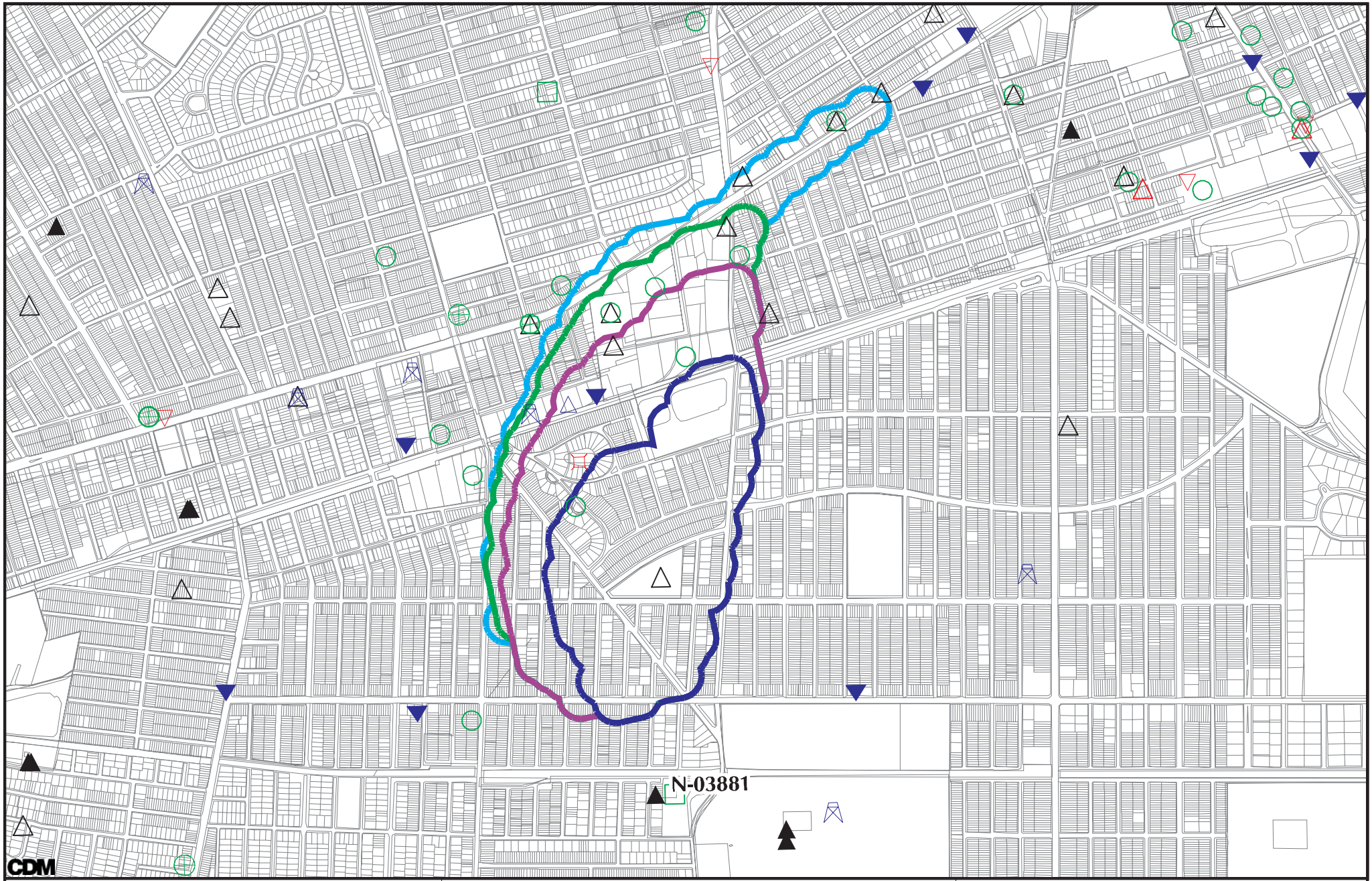
Contributing area to well number N-03881

- Lot Lines
- Public Supply Wells

600 0 600 Feet

N
W E
S

Map Date March 25, 2003



Travel Time (Years)

- Two
- Five
- Twenty Five
- Fifty
- Seventy Five
- One Hundred

Potential Point Sources

- Chemical Bulk Storage Facility
- CERCLA Facility
- Drycleaning Facility
- Hazardous Waste Site
- Landfill
- MOSF
- Other Type of Facility
- PCS Facility
- RCRA Facility
- SPDES / Denit Facility
- Spill Site
- Gas Station

Contributing area to well number N-03881

- Lot Lines
- Public Supply Wells

N
W E
S

600 0 600 Feet

Map Date April 11, 2003

Table N-03881-2: Potential Point Sources of Contamination

Source Type	# of Sources in Time Of Travel						
	2	5	25	50	75	100	Total
Chemical Bulk Storage Facility (County)			1	1	2	2	6
Gas Stations					1		1
Major Oil Storage Facility				1			1
PCS Facility				1			1
RCRA Facility			1	1	3	1	6
Spill Site				1			1
Totals			**2**	**5**	**6**	**3**	**16**

Table N-03881-2: Potential Point Sources of Contamination (Contd.)

Time Of Travel (Years): **25**

State ID #	Type	City	Zip
NC-052041	CBSFC	GARDEN CITY	
NYD982716391	RCRA	GARDEN CITY	11530

Time Of Travel (Years): **50**

State ID #	Type	City	Zip
NC-058059	CBSFC	GARDEN CITY	
1-2300	MOSF	NEW HYDE PARK	11040
8904105	Spill	HEMPSTEAD	11040
NYD987024189	RCRA	NEW HYDE PARK	11040
NY0109398	PCS	NEW HYDE PARK	11040

Time Of Travel (Years): **75**

State ID #	Type	City	Zip
NC-GS125	Gas Stations	NEW HYDE PARK	
NYD002044535	RCRA	NEW HYDE PARK	11040
NC-056957	CBSFC	NEW HYDE PARK	
SC-4154	CBSFC	NEW HYDE PARK	
NYD002040459	RCRA	NEW HYDE PARK	11040
NYR000022038	RCRA	GARDEN CITY PARK	11040

Time Of Travel (Years): **100**

State ID #	Type	City	Zip
NYD981183254	RCRA	GARDEN CITY PARK	11040
NC-057588	CBSFC	NEW HYDE PARK	
NC-057406	CBSFC	NEW HYDE PARK	

Table N-03881-3: Contaminant Prevalence Summary

Contaminant Category	By Land Use					By Point Source					Combined				
	2	5	25	75	100	2	5	25	75	100	2	5	25	75	100
Microbials			L					L					L		
Nitrates					M					M					M
Pesticides			L	L	L			L	L	L			L	L	L
VOCs					L					H					H

Table N-03881-4: Well Sensitivity

Contaminant Category	Sensitivity				
	2	5	25	75	100
Microbials	H	M	L		
Nitrates					H
Pesticides			H	M	L
VOCs					H

Table N-03881-5A: Well Susceptibility Determination

Contaminant Category	Susceptibility				
	2	5	25	75	100
Microbials			L		
Nitrates					H
Pesticides			M	L	L
VOCs					VH

Table N-03881-5B: Well Susceptibility Summary

	Contaminant Category			
	Microbials	Nitrates	Pesticides	VOCs
Susceptibility	L	H	M	VH

Notes:

1. Values shown in the Time Of Travel 100 column for VOCs and Nitrates are aggregates for the entire area

2. For microbials, Contaminant Prevalence assessments do not include any land use or point sources in contributing areas greater than 25-years Time of Travel.

3. For pesticides, all sources in times of travel below 25 years have been aggregated into the 25 column and sources in times of travel between 25 and 75 years have been aggregated into the 75 column

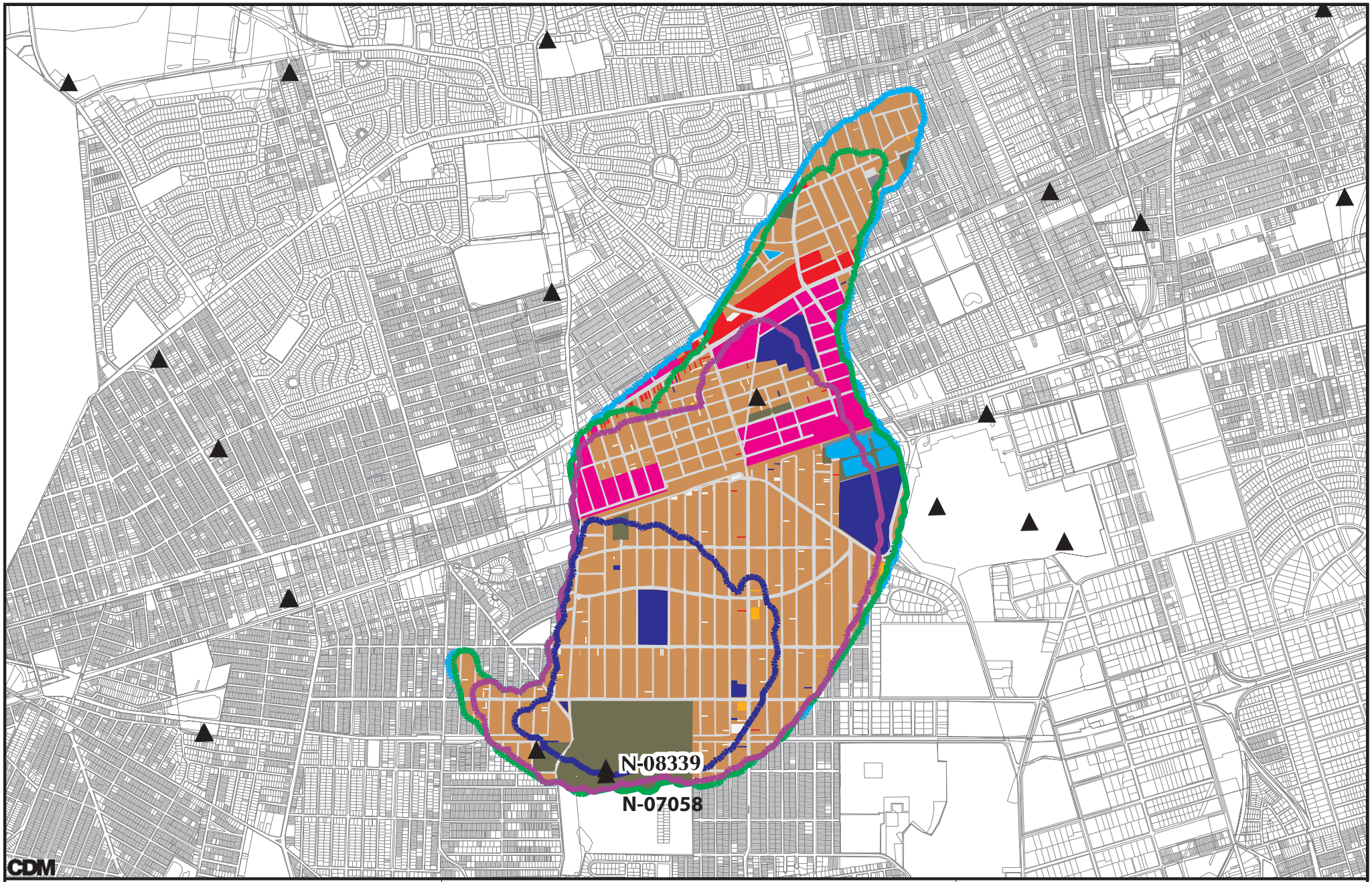
Owner (Purveyor): Garden City Village
Owner's Well Designation (Local #): 13
Location (Site Name): Garden City Village
Town: Hempstead
Screened Interval (MSL): -300 To -360
Aquifer: Magothy
Well Depth: 445
Simulated Pumping Rate (cfd): 93586.6
Minimum Time of Travel (Yrs): 12.0
Subgrids used in Model: cz_sg01e

Table N-07058-1: Land Use Summary

Land Use Type	Land Use Area (Acres) in Time Of Travel							
	2	5	25	50	75	100	Total	%
Commercial Sewered			0.07	0.39	22.13	4.29	26.87	2.6
High Density Residential Sewered			186.07	269.04	84.64	42.56	582.31	56.7
Industrial Sewered				50.65	29.72	6.56	86.94	8.5
Institutional Sewered			12.91	27.42	15.16	0.05	55.53	5.4
Low Density Residential Sewered			0.04	0.01	0.11		0.17	0.0
Medium Density Residential Sewered			1.32	0.12	0.44	0.10	1.98	0.2
Open Space			56.93	22.83	7.06	2.18	89.00	8.7
Surface Waters				6.05	6.63	0.67	13.35	1.3
Transportation			42.89	72.67	33.90	12.69	162.16	15.8
Utilities				0.71	1.46	0.27	2.44	0.2
Vacant			2.30	3.11	1.03	0.18	6.63	0.6
Totals			**302.53**	**453.00**	**202.30**	**69.55**	**1,027.38**	

Table N-07058-1A: Contaminant Prevalence Summary By Land Use

Contaminant Category	By Land Use				
	2	5	25	75	100
Microbials			L		
Nitrates					M
Pesticides			L	L	L
VOCs					L



Travel Time (Years)

- Two
- Five
- Twenty Five
- Fifty
- Seventy Five
- One Hundred

Land Use Classifications

- Low Density Residential
- Medium Density Residential
- High Density Residential
- Commercial
- Industrial
- Institutional
- Open Space
- Agricultural
- Vacant
- Transportation
- Utilities
- Waste Handling Mant.
- Surface Waters

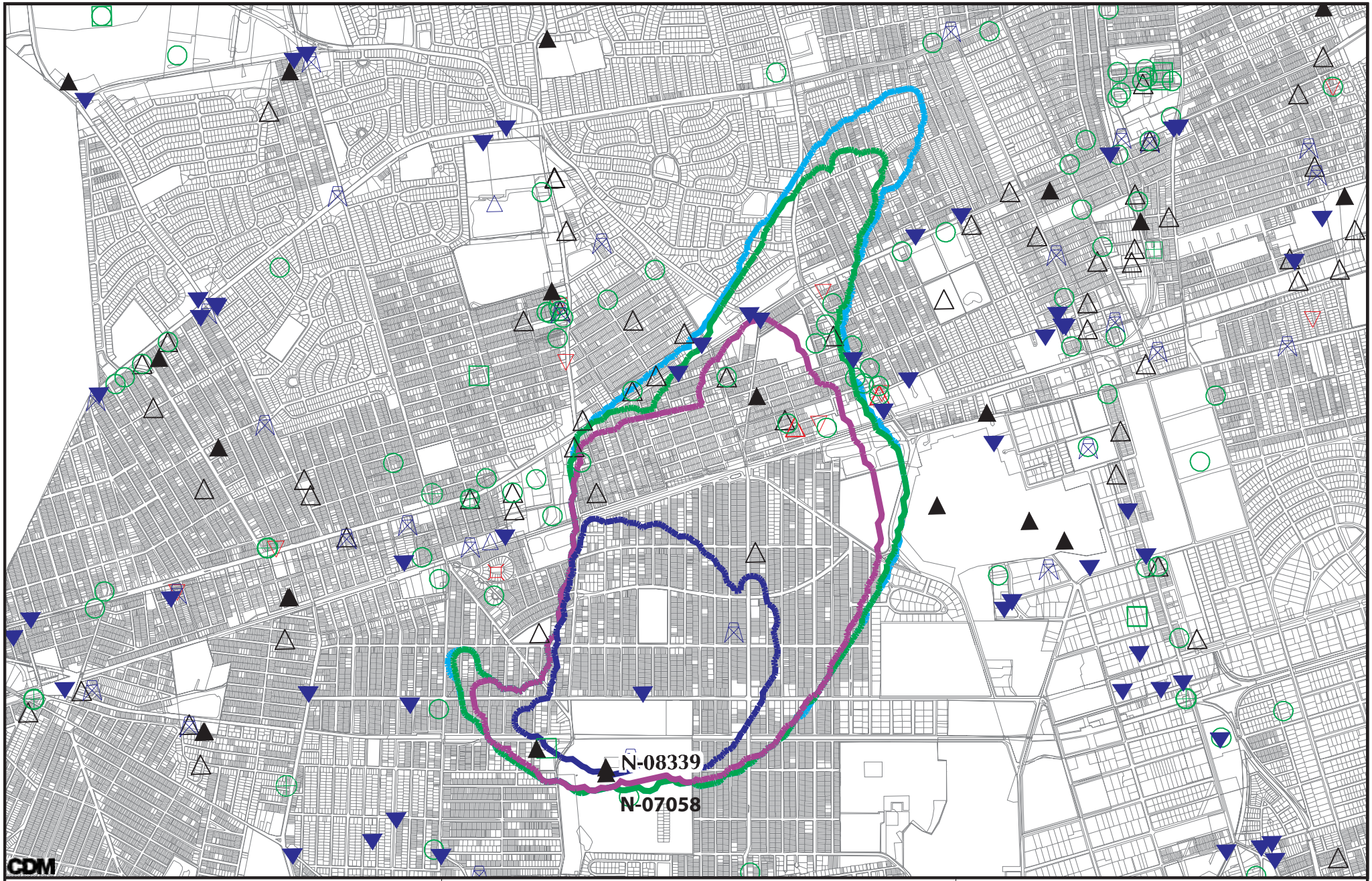
Contributing area to well number N-08339 N-07058

- Lot Lines
- Public Supply Wells

1000 0 1000 Feet

N
W E
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Map Date March 25, 2003



Travel Time (Years)

- Two
- Five
- Twenty Five
- Fifty
- Seventy Five
- One Hundred

Potential Point Sources

- Chemical Bulk Storage Facility
- CERCLA Facility
- Drycleaning Facility
- Hazardous Waste Site
- Landfill
- MOSF
- Other Type of Facility
- PCS Facility
- RCRA Facility
- SPDES / Denit Facility
- Spill Site
- Gas Station

Contributing area to well number

N-08339
N-07058

- Lot Lines
- Public Supply Wells

1000 0 1000 Feet

N
W E
S

Map Date April 11, 2003

Table N-07058-2: Potential Point Sources of Contamination

Source Type	# of Sources in Time Of Travel						
	2	5	25	50	75	100	Total
CERCLA Facility				1			1
Chemical Bulk Storage Facility (County)				4	1	2	7
Gas Stations			2				2
Hazardous Waste Site				1	1		2
RCRA Facility				4	3	1	8
SPDES Denitrification Facilities In Sewered Areas				1			1
Spill Site			1	1	3		5
Totals			**3**	**12**	**8**	**3**	**26**

Table N-07058-2: Potential Point Sources of Contamination (Contd.)

Time Of Travel (Years): **25**

State ID #	Type	City	Zip
NC-GS149	Gas Stations	GARDEN CITY	
NC-GS164	Gas Stations	GARDEN CITY SOUTH	
9712758	Spill	HEMPSTEAD	11530

Time Of Travel (Years): **50**

State ID #	Type	City	Zip
9315515	Spill	HEMPSTEAD	11530
NY0000110247	CERCLA	NORTH HEMPSTEAD	11040
130073	HWS		
NC-055425	CBSFC	GARDEN CITY	
NYD986949154	RCRA	GARDEN CITY	11530
NC-056856	CBSFC	GARDEN CTY S.	
NC-055005	CBSFC	GARDEN CTY PK	
NC-055006	CBSFC	NEW HYDE PARK	
NY0000644245	RCRA	GARDEN CITY PARK	11040
NY0109398	SPDES/Denit	NEW HYDE PARK	11040
NYR000022038	RCRA	GARDEN CITY PARK	11040
NYD064720121	RCRA	NEW HYDE PARK	11040

Time Of Travel (Years): **75**

State ID #	Type	City	Zip
NYD986937530	RCRA	NEW HYDE PARK	11040
8909282	Spill	HEMPSTEAD	11530
202687	HWS	NEW HYDE PARK	11040
8708299	Spill	NORTH HEMPSTEAD	11040
8300216	Spill	HEMPSTEAD	11530
NYD982743015	RCRA	SYOSSET	11791
NYD986900603	RCRA	NEW HYDE PARK	11040
NC-058087	CBSFC	GARDEN CTY PK	

Time Of Travel (Years): **100**

State ID #	Type	City	Zip
NYD981183254	RCRA	GARDEN CITY PARK	11040
NC-057588	CBSFC	NEW HYDE PARK	
NC-055144	CBSFC	GARDEN CTY PK	

Table N-07058-3: Contaminant Prevalence Summary

Contaminant Category	By Land Use					By Point Source					Combined				
	2	5	25	75	100	2	5	25	75	100	2	5	25	75	100
Microbials			L					N					L		
Nitrates					M					M					M

Pesticides			L	L	L			L	L	L			L	L	L	
VOCs					L					H					H	

Table N-07058-4: Well Sensitivity

Contaminant Category	Sensitivity				
	2	5	25	75	100
Microbials	H	M	L		
Nitrates					H
Pesticides			H	M	L
VOCs					H

Table N-07058-5A: Well Susceptibility Determination

Contaminant Category	Susceptibility				
	2	5	25	75	100
Microbials			L		
Nitrates					H
Pesticides			M	L	L
VOCs					VH

Table N-07058-5B: Well Susceptibility Summary

	Contaminant Category			
	Microbials	Nitrates	Pesticides	VOCs
Susceptibility	L	H	M	VH

Notes:

1. Values shown in the Time Of Travel 100 column for VOCs and Nitrates are aggregates for the entire area

2. For microbials, Contaminant Prevalence assessments do not include any land use or point sources in contributing areas greater than 25-years Time of Travel.

3. For pesticides, all sources in times of travel below 25 years have been aggregated into the 25 column and sources in times of travel between 25 and 75 years have been aggregated into the 75 column

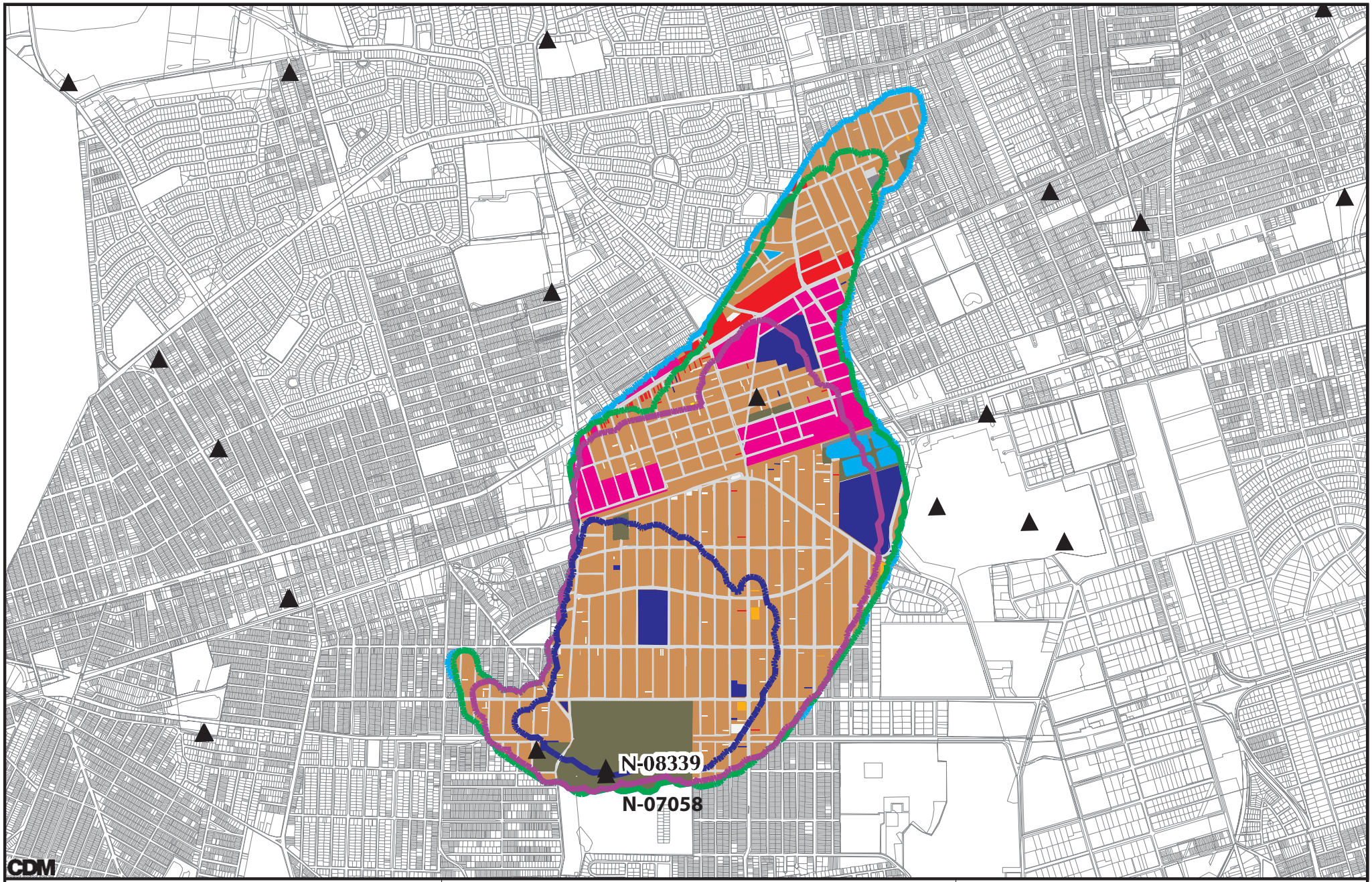
Owner (Purveyor): Garden City Village
Owner's Well Designation (Local #): 14
Location (Site Name): Garden City Village
Town: Hempstead
Screened Interval (MSL): -228 To -278
Aquifer: Magothy
Well Depth: 363
Simulated Pumping Rate (cfd): 148714.4
Minimum Time of Travel (Yrs): 12.0
Subgrids used in Model: cz_sg01e

Table N-08339-1: Land Use Summary

Land Use Type	Land Use Area (Acres) in Time Of Travel							
	2	5	25	50	75	100	Total	%
Commercial Sewered			0.07	0.39	22.13	4.29	26.87	2.6
High Density Residential Sewered			186.07	269.04	84.64	42.56	582.31	56.7
Industrial Sewered				50.65	29.72	6.56	86.94	8.5
Institutional Sewered			12.91	27.42	15.16	0.05	55.53	5.4
Low Density Residential Sewered			0.04	0.01	0.11		0.17	0.0
Medium Density Residential Sewered			1.32	0.12	0.44	0.10	1.98	0.2
Open Space			56.93	22.83	7.06	2.18	89.00	8.7
Surface Waters				6.05	6.63	0.67	13.35	1.3
Transportation			42.89	72.67	33.90	12.69	162.16	15.8
Utilities				0.71	1.46	0.27	2.44	0.2
Vacant			2.30	3.11	1.03	0.18	6.63	0.6
Totals			**302.53**	**453.00**	**202.30**	**69.55**	**1,027.38**	

Table N-08339-1A: Contaminant Prevalence Summary By Land Use

Contaminant Category	By Land Use				
	2	5	25	75	100
Microbials			L		
Nitrates					M
Pesticides			L	L	L
VOCs					L



Travel Time (Years)

- Two
- Five
- Twenty Five
- Fifty
- Seventy Five
- One Hundred

Land Use Classifications

- Low Density Residential
- Medium Density Residential
- High Density Residential
- Commercial
- Industrial
- Institutional
- Open Space
- Agricultural
- Vacant
- Transportation
- Utilities
- Waste Handling Mant.
- Surface Waters

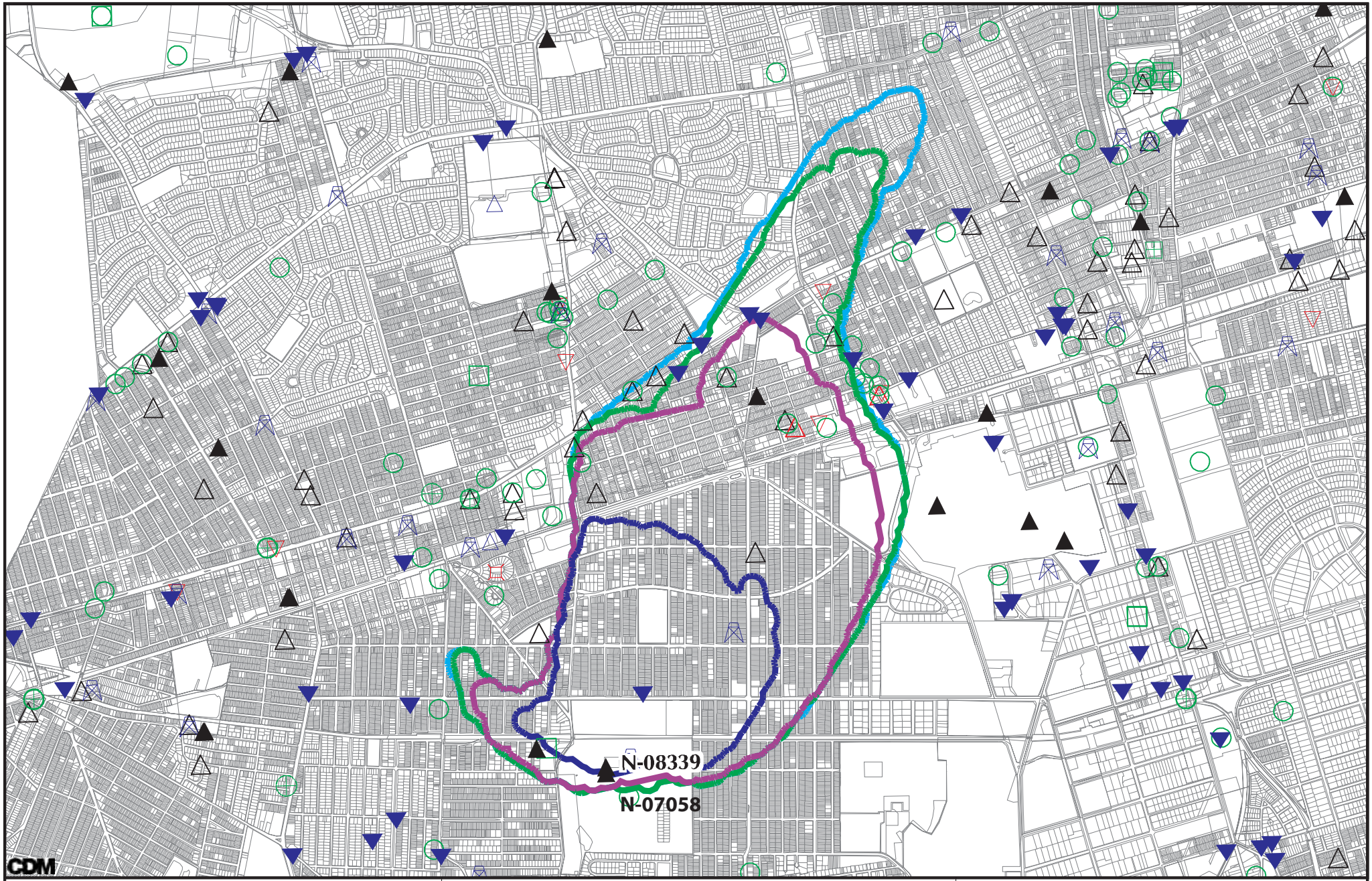
Contributing area to well number N-08339 N-07058

- Lot Lines
- Public Supply Wells

1000 0 1000 Feet

N
W E
S

Map Date March 25, 2003



Travel Time (Years)

- Two
- Five
- Twenty Five
- Fifty
- Seventy Five
- One Hundred

Potential Point Sources

- Chemical Bulk Storage Facility
- CERCLA Facility
- Drycleaning Facility
- Hazardous Waste Site
- Landfill
- MOSF
- Other Type of Facility
- PCS Facility
- RCRA Facility
- SPDES / Denit Facility
- Spill Site
- Gas Station

Contributing area to well number

N-08339
N-07058

- Lot Lines
- Public Supply Wells

1000 0 1000 Feet

N
W E
S

Map Date April 11, 2003

Table N-08339-2: Potential Point Sources of Contamination

Source Type	# of Sources in Time Of Travel						
	2	5	25	50	75	100	Total
CERCLA Facility				1			1
Chemical Bulk Storage Facility (County)				4	1	2	7
Gas Stations			2				2
Hazardous Waste Site				1	1		2
RCRA Facility				4	3	1	8
SPDES Denitrification Facilities In Sewered Areas				1			1
Spill Site			1	1	3		5
Totals			**3**	**12**	**8**	**3**	**26**

Table N-08339-2: Potential Point Sources of Contamination (Contd.)

Time Of Travel (Years): **25**

State ID #	Type	City	Zip
NC-GS149	Gas Stations	GARDEN CITY	
NC-GS164	Gas Stations	GARDEN CITY SOUTH	
9712758	Spill	HEMPSTEAD	11530

Time Of Travel (Years): **50**

State ID #	Type	City	Zip
9315515	Spill	HEMPSTEAD	11530
NY0000110247	CERCLA	NORTH HEMPSTEAD	11040
130073	HWS		
NC-055425	CBSFC	GARDEN CITY	
NYD986949154	RCRA	GARDEN CITY	11530
NC-056856	CBSFC	GARDEN CTY S.	
NC-055005	CBSFC	GARDEN CTY PK	
NC-055006	CBSFC	NEW HYDE PARK	
NY0000644245	RCRA	GARDEN CITY PARK	11040
NY0109398	SPDES/Denit	NEW HYDE PARK	11040
NYR000022038	RCRA	GARDEN CITY PARK	11040
NYD064720121	RCRA	NEW HYDE PARK	11040

Time Of Travel (Years): **75**

State ID #	Type	City	Zip
NYD986937530	RCRA	NEW HYDE PARK	11040
8909282	Spill	HEMPSTEAD	11530
202687	HWS	NEW HYDE PARK	11040
8708299	Spill	NORTH HEMPSTEAD	11040
8300216	Spill	HEMPSTEAD	11530
NYD982743015	RCRA	SYOSSET	11791
NYD986900603	RCRA	NEW HYDE PARK	11040
NC-058087	CBSFC	GARDEN CTY PK	

Time Of Travel (Years): **100**

State ID #	Type	City	Zip
NYD981183254	RCRA	GARDEN CITY PARK	11040
NC-057588	CBSFC	NEW HYDE PARK	
NC-055144	CBSFC	GARDEN CTY PK	

Table N-08339-3: Contaminant Prevalence Summary

Contaminant Category	By Land Use					By Point Source					Combined				
	2	5	25	75	100	2	5	25	75	100	2	5	25	75	100
Microbials			L					N					L		
Nitrates					M					M					M

Pesticides			L	L	L			L	L	L			L	L	L	
VOCs					L					H					H	

Table N-08339-4: Well Sensitivity

Contaminant Category	Sensitivity				
	2	5	25	75	100
Microbials	H	M	L		
Nitrates					H
Pesticides			H	M	L
VOCs					H

Table N-08339-5A: Well Susceptibility Determination

Contaminant Category	Susceptibility				
	2	5	25	75	100
Microbials			L		
Nitrates					H
Pesticides			M	L	L
VOCs					VH

Table N-08339-5B: Well Susceptibility Summary

	Contaminant Category			
	Microbials	Nitrates	Pesticides	VOCs
Susceptibility	L	H	M	VH

Notes:

1. Values shown in the Time Of Travel 100 column for VOCs and Nitrates are aggregates for the entire area

2. For microbials, Contaminant Prevalence assessments do not include any land use or point sources in contributing areas greater than 25-years Time of Travel.

3. For pesticides, all sources in times of travel below 25 years have been aggregated into the 25 column and sources in times of travel between 25 and 75 years have been aggregated into the 75 column

Well Number: **N-03603**

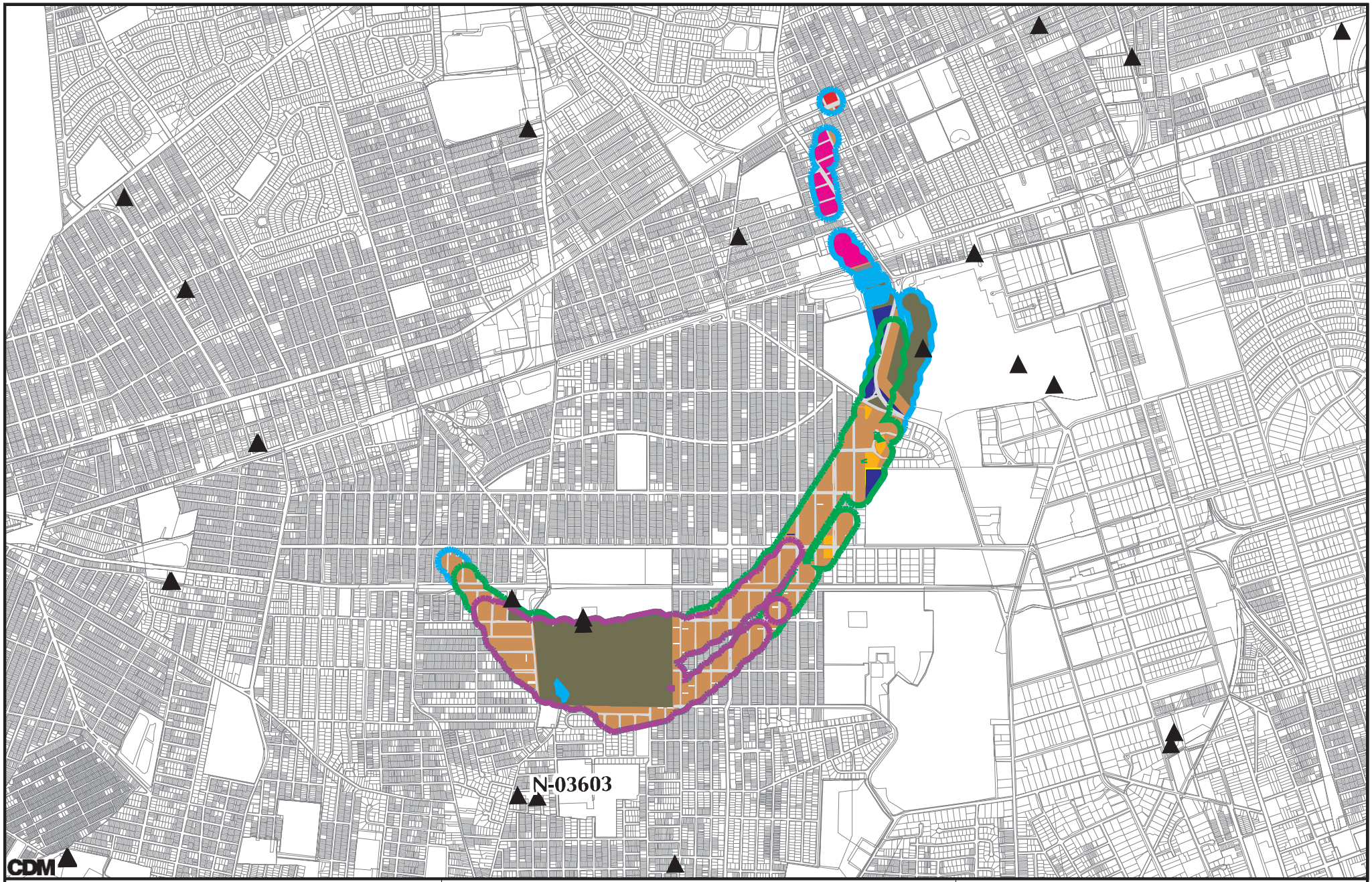
Owner (Purveyor): Franklin Square Water District
Owner's Well Designation (Local #): 1
Location (Site Name): Franklin Square Water District
Town: Hempstead
Screened Interval (MSL): -378 To -428
Aquifer: Magothy
Well Depth: 493
Simulated Pumping Rate (cfd): 31906.8
Minimum Time of Travel (Yrs): 32.3
Subgrids used in Model: cz_sg01e

Table N-03603-1: Land Use Summary

Land Use Type	Land Use Area (Acres) in Time Of Travel							
	2	5	25	50	75	100	Total	%
Commercial Sewered						1.60	1.60	0.5
High Density Residential Sewered				68.57	58.49	7.49	134.56	44.3
Industrial Sewered						15.36	15.36	5.1
Institutional Sewered					5.51	3.65	9.16	3.0
Low Density Residential Sewered					0.32		0.32	0.1
Medium Density Residential Sewered					3.69		3.69	1.2
Open Space				73.64	6.12	16.88	96.63	31.8
Surface Waters				1.30		5.37	6.68	2.2
Transportation				14.40	14.77	5.08	34.24	11.3
Utilities						0.62	0.62	0.2
Vacant				0.82	0.27	0.12	1.22	0.4
Totals				**158.73**	**89.17**	**56.16**	**304.06**	

Table N-03603-1A: Contaminant Prevalence Summary By Land Use

Contaminant Category	By Land Use				
	2	5	25	75	100
Nitrates					M
Pesticides				L	L
VOCs					L



Travel Time (Years)

- Two
- Five
- Twenty Five
- Fifty
- Seventy Five
- One Hundred

Land Use Classifications

- Low Density Residential
- Medium Density Residential
- High Density Residential
- Commercial
- Industrial
- Institutional
- Open Space
- Agricultural
- Vacant
- Transportation
- Utilities
- Waste Handling Mant.
- Surface Waters

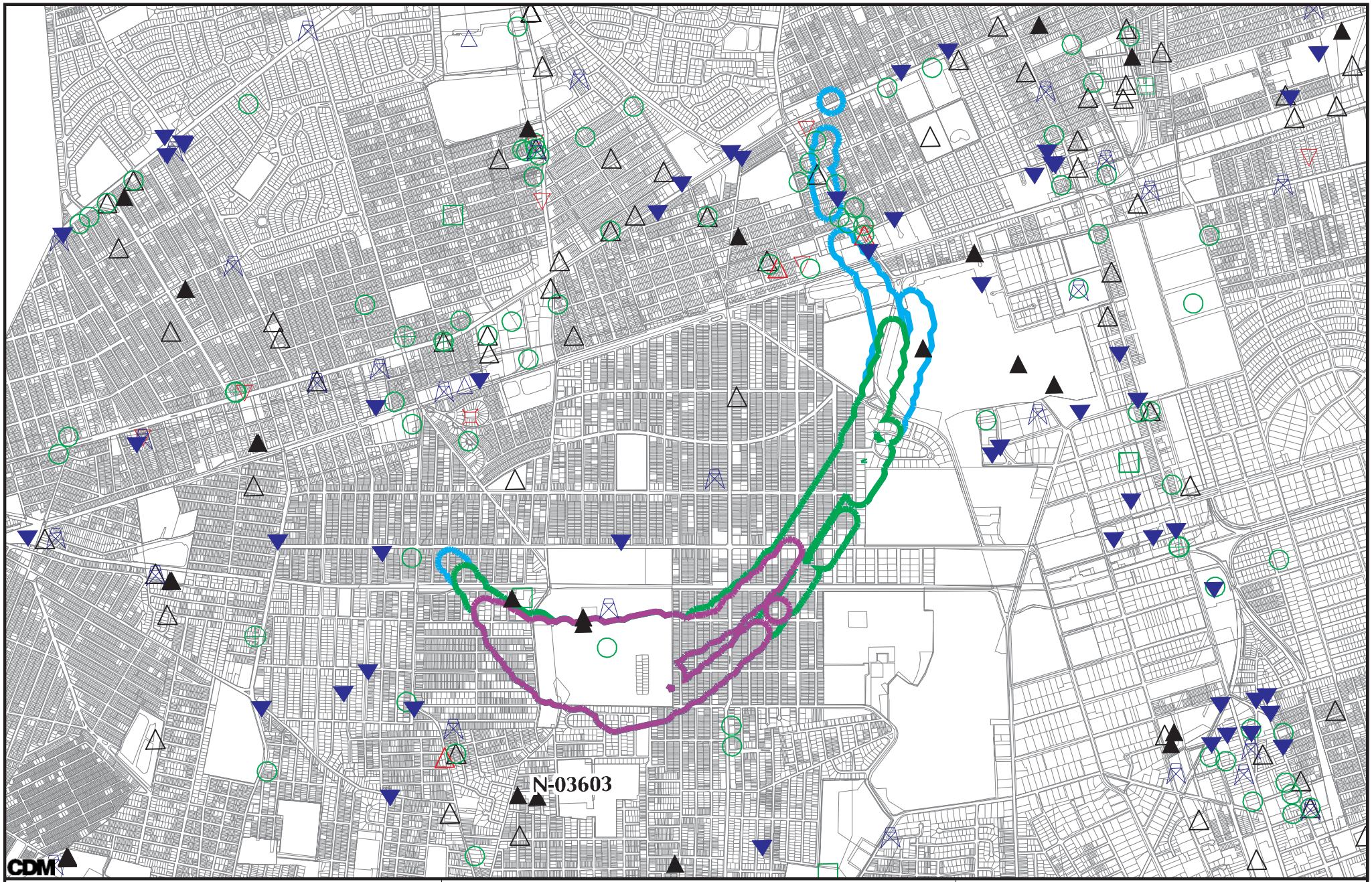
Contributing area to well number N-03603

- Lot Lines
- Public Supply Wells

1000 0 1000 Feet

N
W E
S

Map Date April 14, 2003



Travel Time (Years)

- Two
- Five
- Twenty Five
- Fifty
- Seventy Five
- One Hundred

Potential Point Sources

- Chemical Bulk Storage Facility
- CERCLA Facility
- Drycleaning Facility
- Hazardous Waste Site
- Landfill
- MOSF
- Other Type of Facility
- PCS Facility
- RCRA Facility
- SPDES / Denit Facility
- Spill Site
- Gas Station

Contributing area to well number N-03603

- Lot Lines
- Public Supply Wells

1000 0 1000 Feet

N
W E
S

Map Date April 14, 2003

Table N-03603-2: Potential Point Sources of Contamination

Source Type	# of Sources in Time Of Travel						
	2	5	25	50	75	100	Total
Chemical Bulk Storage Facility (County)						1	1
RCRA Facility				1		1	2
Spill Site						1	1
Totals				**1**		**3**	**4**

Table N-03603-2: Potential Point Sources of Contamination (Contd.)

Time Of Travel (Years): **50**

State ID #	Type	City	Zip
NYD093307809	RCRA	GARDEN CITY	11530

Time Of Travel (Years): **100**

State ID #	Type	City	Zip
8100782	Spill	HEMPSTEAD	11040
NYD982743015	RCRA	SYOSSET	11791
NC-058087	CBSFC	GARDEN CTY PK	

Table N-03603-3: Contaminant Prevalence Summary

Contaminant Category	By Land Use					By Point Source					Combined				
	2	5	25	75	100	2	5	25	75	100	2	5	25	75	100
Nitrates					M					M					M
Pesticides				L	L				L	L				L	L
VOCs					L					H					H

Table N-03603-4: Well Sensitivity

Contaminant Category	Sensitivity				
	2	5	25	75	100
Microbials	H	M	L		
Nitrates					H
Pesticides			H	M	L
VOCs					H

Table N-03603-5A: Well Susceptibility Determination

Contaminant Category	Susceptibility				
	2	5	25	75	100
Microbials			L		
Nitrates					H
Pesticides				L	L
VOCs					VH

Table N-03603-5B: Well Susceptibility Summary

	Contaminant Category			
	Microbials	Nitrates	Pesticides	VOCs
Susceptibility	L	H	L	VH

Notes:

1. Values shown in the Time Of Travel 100 column for VOCs and Nitrates are aggregates for the entire area

2. For microbials, Contaminant Prevalence assessments do not include any land use or point sources in contributing areas greater than 25-years Time of Travel.

3. For pesticides, all sources in times of travel below 25 years have been aggregated into the 25 column and sources in times of travel between 25 and 75 years have been aggregated into the 75 column

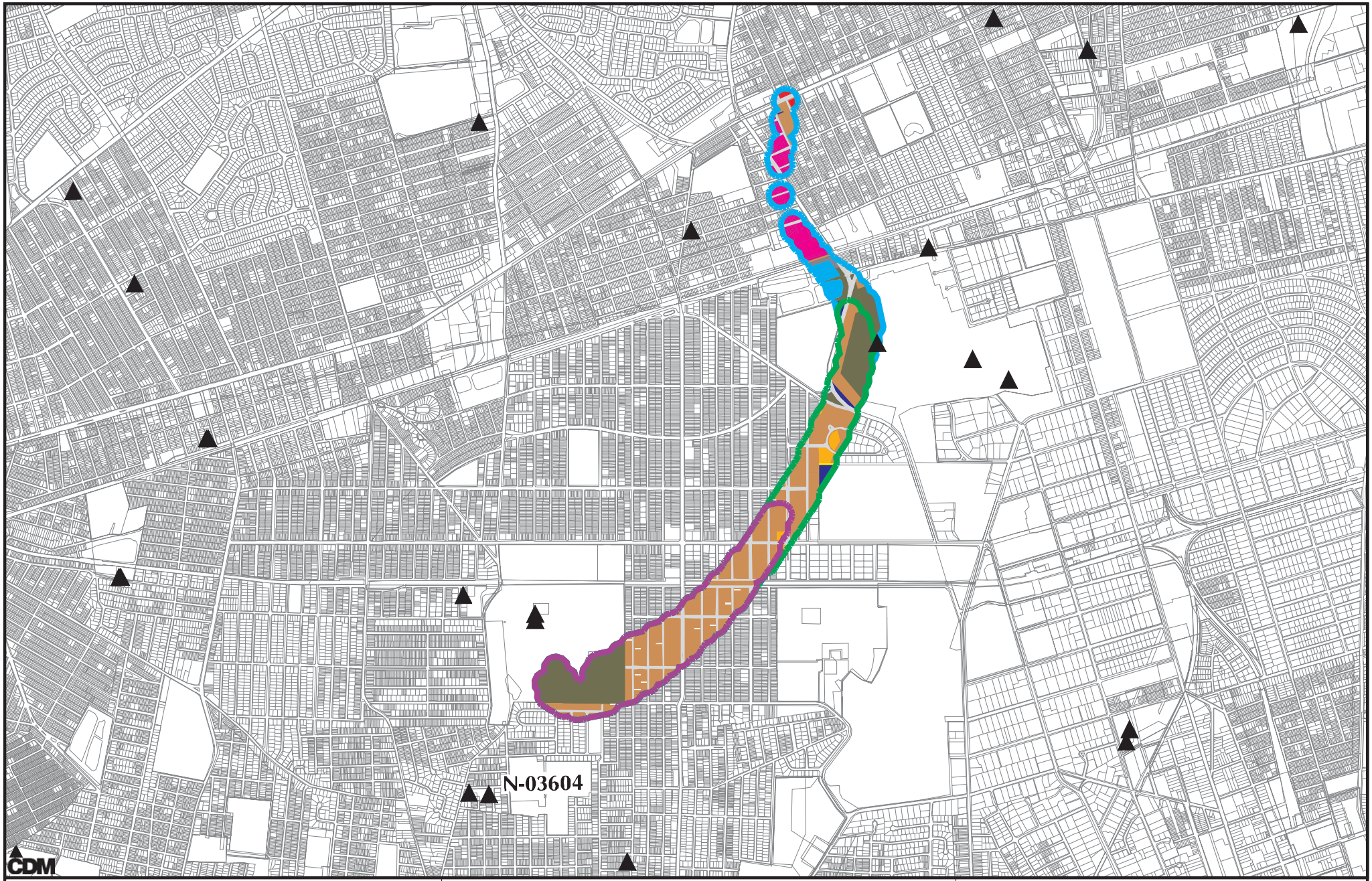
Owner (Purveyor): Franklin Square Water District
Owner's Well Designation (Local #): 2
Location (Site Name): Franklin Square Water District
Town: Hempstead
Screened Interval (MSL): -373 To -433
Aquifer: Magothy
Well Depth: 498
Simulated Pumping Rate (cfd): 28514.4
Minimum Time of Travel (Yrs): 31.1
Subgrids used in Model: cz_sg01e

Table N-03604-1: Land Use Summary

Land Use Type	Land Use Area (Acres) in Time Of Travel							
	2	5	25	50	75	100	Total	%
Commercial Sewered						1.11	1.11	0.6
High Density Residential Sewered				55.97	28.33	4.25	88.55	48.1
Industrial Sewered						14.70	14.70	8.0
Institutional Sewered					2.76	0.31	3.07	1.7
Low Density Residential Sewered					0.30		0.30	0.2
Medium Density Residential Sewered				0.66	2.77		3.44	1.9
Open Space				23.96	12.55	7.24	43.75	23.8
Surface Waters						4.18	4.18	2.3
Transportation				11.85	6.31	5.29	23.45	12.7
Utilities						0.81	0.81	0.4
Vacant				0.57	0.10	0.00	0.67	0.4
Totals				**93.01**	**53.13**	**37.90**	**184.04**	

Table N-03604-1A: Contaminant Prevalence Summary By Land Use

Contaminant Category	By Land Use				
	2	5	25	75	100
Nitrates					M
Pesticides				L	L
VOCs					L



Travel Time (Years)

- Two
- Five
- Twenty Five
- Fifty
- Seventy Five
- One Hundred

Land Use Classifications

- Low Density Residential
- Medium Density Residential
- High Density Residential
- Commercial
- Industrial
- Institutional
- Open Space
- Agricultural
- Vacant
- Transportation
- Utilities
- Waste Handling Mant.
- Surface Waters

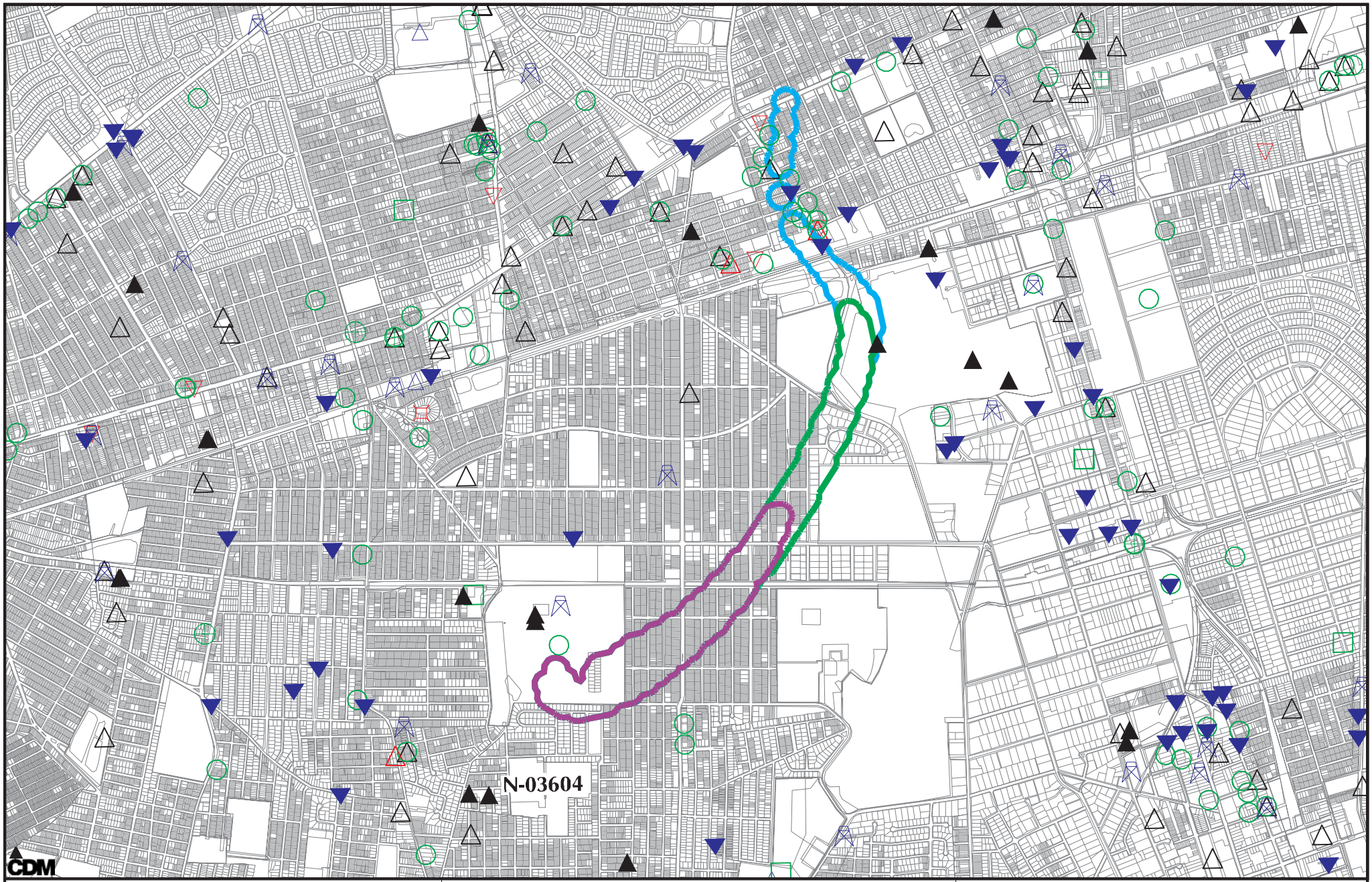
Contributing area to well number N-03604

- Lot Lines
- Public Supply Wells

1000 0 1000 Feet

N
W E
S

Map Date March 25, 2003



Travel Time (Years)

- Two
- Five
- Twenty Five
- Fifty
- Seventy Five
- One Hundred

Potential Point Sources

- Chemical Bulk Storage Facility
- CERCLA Facility
- Drycleaning Facility
- Hazardous Waste Site
- Landfill
- MOSF
- Other Type of Facility
- PCS Facility
- RCRA Facility
- SPDES / Denit Facility
- Spill Site
- Gas Station

Contributing area to well number N-03604

- Lot Lines
- Public Supply Wells

1000 0 1000 Feet

N
W E
S

Map Date April 11, 2003

Table N-03604-2: Potential Point Sources of Contamination

Source Type	# of Sources in Time Of Travel						
	2	5	25	50	75	100	Total
Chemical Bulk Storage Facility (County)						1	1
RCRA Facility						1	1
Spill Site						2	2
Totals						**4**	**4**

Table N-03604-2: Potential Point Sources of Contamination (Contd.)

Time Of Travel (Years): **100**

State ID #	Type	City	Zip
NYD982718827	RCRA	GARDEN CITY PARK	11040
8605497	Spill	HEMPSTEAD	11040
8100782	Spill	HEMPSTEAD	11040
NC-058087	CBSFC	GARDEN CTY PK	

Table N-03604-3: Contaminant Prevalence Summary

Contaminant Category	By Land Use					By Point Source					Combined				
	2	5	25	75	100	2	5	25	75	100	2	5	25	75	100
Nitrates					M					M					M
Pesticides				L	L				N	L				L	L
VOCs					L					H					H

Table N-03604-4: Well Sensitivity

Contaminant Category	Sensitivity				
	2	5	25	75	100
Microbials	H	M	L		
Nitrates					H
Pesticides			H	M	L
VOCs					H

Table N-03604-5A: Well Susceptibility Determination

Contaminant Category	Susceptibility				
	2	5	25	75	100
Microbials			L		
Nitrates					H
Pesticides				L	L
VOCs					VH

Table N-03604-5B: Well Susceptibility Summary

	Contaminant Category			
	Microbials	Nitrates	Pesticides	VOCs
Susceptibility	L	H	L	VH

Notes:

1. Values shown in the Time Of Travel 100 column for VOCs and Nitrates are aggregates for the entire area

2. For microbials, Contaminant Prevalence assessments do not include any land use or point sources in contributing areas greater than 25-years Time of Travel.

3. For pesticides, all sources in times of travel below 25 years have been aggregated into the 25 column and sources in times of travel between 25 and 75 years have been aggregated into the 75 column

Environmental Resources Management

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24 July 2012
ERM Project No. 0097881

Mr. Kevin Willis
Remedial Project Manager – Fulton Avenue Superfund Site
New York Remediation Branch
United States Environmental Protection Agency, Region II
290 Broadway, 20th Floor
New York, NY 10007-1866

Re: Proposed Remedial Design Modification Analysis
Groundwater Flow Modeling & Forecasting
150 Fulton Avenue NPL Superfund Site - Operable Unit 1
USEPA Consent Judgment No. CV–09–3917
DOJ Ref. No. 90–11–2–09329
Garden City Park Industrial Site NYSDEC#130073

Dear Mr. Willis:

The purpose of this letter is to summarize the results of some additional evaluations that have been conducted as part of the ongoing Remedial Design (RD) for the selected remedy in EPA's Operable Unit 1 (OU1) Record of Decision (ROD) for the above-referenced site. These additional evaluations were completed in response to your request for an estimate of the expected duration of the selected remedy versus a modified remedial alternative in which the Incorporated Village of Garden City (VGC) public supply wells Nos. 13 and 14 are relied upon to contain and extract the Tetrachloroethene (PCE) - dominant portion (associated with 150 Fulton Avenue) of the larger regional plume.

As part of the RD, hydraulic testing was performed. This testing involved a shutdown of VGC Wells Nos. 9, 13 and 14 to establish baseline groundwater elevations in monitoring wells throughout the Upper Glacial and Magothy Aquifers. Once baseline conditions were achieved, the testing progressed to pumping of VGC Wells Nos. 9, 13 and 14 in various combinations for specified periods of time while simultaneously recording the response to groundwater elevations in the monitoring well network.

The results from the hydraulic testing were used to construct and calibrate a three-dimensional regional computer groundwater flow model. The model uses the United States Geological Survey's MODFLOW NWT code. MODFLOW is a three-dimensional finite-difference model that can account for heterogeneity, anisotropy and varying boundary conditions. MODFLOW NWT is a publicly available code, well documented and widely used in the private and public sectors. Aquaveo's Groundwater Modeling System (GMS) software was utilized for pre- and post-processing of model input and output. This software allowed ERM to utilize publically available GIS coverage's for a significant portion of the model inputs including, geologic data, hydrology, topography and cultural features.

Once calibration was complete, a number of scenarios were simulated to evaluate how the operation of VGC Wells Nos. 9, 13 and 14 affected the PCE-dominant portion of the plume. The purpose of the scenarios was to evaluate:

1) the ability of VGC Wells Nos. 13 and 14 to capture the PCE-dominant portion of the plume;
2) how seasonal operation of VGC Wells Nos. 13 and 14 for water supply affected plume capture; and,
3) whether the installation of recovery wells, contemplated in the OU1 ROD, resulted in a significant reduction in the duration of PCE-dominant impact to VGC Wells Nos. 13 and 14.

As indicated above, this letter is intended to summarize the results of the additional evaluations to further inform EPA's decision on whether to modify the selected remedy in the OU1 ROD. As more fully described below the results of the additional evaluations find:

- Groundwater flow modeling confirms that the current, seasonal operation of VGC Well Nos. 13 and 14, as a pair or VGC Well Nos. 9, 13 and 14 together, will capture of the PCE-dominant portion of the plume.
- Groundwater flow modeling estimates that VGC Well Nos. 13 and 14 could remain in non-pumping mode for >1,000 days (>3 years) before some portion of the plume might not be recovered by resumption of pumping.
- Current PCE concentration trends in VGC Nos. 13 and 14 could be expected to return PCE concentrations to pre-1997 levels in 4 to 17 years. Supplementing the ongoing operation of VCG Wells Nos. 13 and 14 with the installation and operation of two recovery wells could be expected accelerate the return to PCE concentrations to pre-1997 levels at the supply wells in 3 to 12 years.

A more detailed description of the methodology and supporting backup information used in development and calibration of the flow model would be included in the RD submission.

VCG Wells Influence on the PCE-dominant Portion of the Plume

The model was used to generate capture fields for all operating public supply wells in the study area using reverse particle tracks. Then particles of water, analogous to molecules of PCE moving through the aquifer system un-retarded, were tracked from within the three-dimensional footprint of the defined PCE-dominant portion of the plume from the 150 Fulton Property. These forward particle tracks illustrate the pathways that individual particles follow from a given location within the PCE-dominant portion of the plume to VGC Wells Nos. 13 and 14. These simulations were run for VGC Well Nos. 13 and 14 operating as a pair (VGC No. 9 off), and all three VGC Well Nos. 9, 13 and 14 operating together as they have been operated in recent years. In these simulations, all other supply wells within the study area, e.g., the Franklin Square and other VGC supply wells were operating based on historic operational records obtained from the Nassau County Department of Health (NCDOH).

The model output for the simulation run of VGC Well Nos. 13 and 14 operating together is graphically presented in Figure 1 and shows full capture of the PCE-dominant plume. As would be expected, the simulation run for VGC Well Nos. 9, 13

and 14 operating together also shows full capture of the PCE-dominant plume (Figure 2). These findings are consistent with the historic groundwater monitoring data set which confirms that the operation of VGC Well Nos. 13 and 14 effects full capture of the PCE-dominant portion of the plume.

VCG Wells No. 13 and 14 Seasonal Operation Influence on the PCE-dominant Portion of Plume

The primary objective of VGC Wells Nos. 13 and 14 normal operations are to supply potable water to the community. Hence, seasonal water demand influences the operational frequency of these wells. In the course of operation, VGC Wells Nos. 13 and 14 also capture the PCE-dominant plume, as well as a portion of the regional Trichloroethene (TCE)-dominant plume. However, if VGC Wells Nos. 13 and 14 are to be relied upon as the primary mechanism for capture of the PCE-dominant portion of the plume, an analysis of how the frequency of seasonal operations might influence plume capture is required.

To evaluate how seasonal operations of VGC Wells Nos. 13 and 14 might influence capture of the PCE-dominant plume, the model was used to simulate the time it would take for a particle of water within the plume to move past VGC Wells Nos. 13 and 14 under non-pumping conditions and be unable to be recovered during a resumption of pumping. Based on the forward particle track simulations, it is estimated that VGC Well Nos. 13 and 14 could be off for >1,000 days before some portion of the plume would be unable to be recovered by resumption of pumping[1].

Operational records for VGC Well Nos. 9, 13, and 14 for the last 5 years (i.e., 2007 – 2011) indicate all three wells are operated year-round. However, it is clear that Well No. 13 is pumped most heavily year-round to meet demand while Well Nos. 9 and 14 are pumped to supplement demand as needed and especially during the warmer months of the year. As discussed above, the capture field/particle track simulations clearly indicate that operating VGC Well Nos. 13 and 14 or VGC Well Nos. 9, 13, and 14 together enable full capture of the PCE-dominant portion of the plume. Hence, it can be concluded that even during the seasonal minimum in pumping (i.e., when VGC Well Nos. 9 and 14 are pumped less), full capture of the PCE-dominant portion of the plume can be expected when these wells are operated as they have been in the recent past.

PCE-dominant Plume Impact: VCG Wells Nos. 13 and 14 Only vs. VGC Wells Nos. 13 and 14 with New Recovery Wells

The duration of PCE-dominant portion of the plume impacts to VGC Wells Nos. 13 and 14 under a scenario with and without additional recovery wells was evaluated in two steps.

The first step considered the trend in PCE concentration at VGC Wells Nos. 13 and 14 since the recorded peak value in 2007. The observed trend in PCE concentration in these two supply wells has been downward since that time. Hence, it was subject to a

[1] Historic pumping records for VGC Well Nos. 13 & 14 indicate that since 1988, the longest time period that Wells 13 & 14 were not operated was six months (~180 days) in 2007 during construction of a second air stripper and installation of the granular activated carbon(GAC) treatment equipment. Since 1968, the only other significant non-operational periods were all of 1988 (~365 days) for Well No. 14 and a four-month period in early 1989 (~120 days) for Well No. 13.

statistical evaluation to predict the potential time frame before the PCE concentration would return to pre-1997 levels.[2] The analysis found that the downward trend in VCG Wells Nos. 13 and 14 were significant (see discussion around Table 2 below). It also assumes that the observed downward trend in PCE concentration in VGC Wells Nos. 13 and 14 over the last five years will continue into the future.

Evaluation of Current PCE Concentration Trend

The statistical evaluation of the PCE concentration trend in VGC Wells Nos. 13 and 14 was comprised of three components: 1) characterize pre-1997 PCE concentrations; 2) characterize post-July 2007 PCE concentrations; and, 3) forecast the time expected for PCE concentrations to return to pre-1997 levels. These three components were all based on the reported concentrations of PCE measured at VGC Wells Nos. 13 and 14 from 1977 to January 2012 and are shown in Figures 3 and 4, respectively.

Pre-1997 PCE Concentration

PCE concentrations measured prior to January 1997 at VGC Wells Nos. 13 and 14 were comparable to PCE concentrations measured in supply wells in other areas of the regional aquifer unaffected by 150 Fulton Avenue.[3] Figures 5 and 6 show pre-1997 PCE concentrations vs. time for VGC Wells Nos. 13 and 14, respectively.

Descriptive statistics for PCE concentrations measured at VGC Wells Nos. 13 and 14 prior to January 1997 were calculated using USEPA's ProUCL v. 4.01.00 (statistical software) and are shown in Table 1. Mean pre-1997 PCE concentrations[4] are 1.43 µg/L and 6.01 µg/L for VGC Wells Nos. 13 and 14, respectively. These mean concentrations were used to characterize pre-1997 baseline concentrations for PCE.

An upper bound (95 percent {%} upper confidence limit or 95 UCL) was also calculated as an alternative value (to the mean) to represent baseline concentrations.[5] Given the relatively small difference between the mean and 95 UCL as compared to the variability observed in the predictive trend models, the mean was selected to represent baseline concentrations as it is a readily understandable and widely recognized metric.

Post-July 2007 PCE Concentration

PCE concentrations measured after to 2007 July included the highest PCE concentrations measured at VGC Wells Nos. 13 and 14. Plots of post-2007 PCE concentrations as a function of time (date) for VGC Wells Nos. 13 and 14 are shown in Figures 7 and 8, respectively.

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[2] The FS (July 2006) suggested that the trend in PCE concentration in VGC Wells Nos. 13 and 14 indicated an arrival of the PCE dominant plume around 2000. However, subsequent evaluation of PCE concentrations in regional supply wells unaffected by 150 Fulton Avenue would suggest a slightly earlier arrival time of 1997.

[3] Based on historic PCE concentrations in: a) New Hyde Park Well No. 57 (N-07649); b) Mineola Well No. 4 (N-03185); and Garden City Well No. 12 (N-05163), located west, northeast and east-northeast of 150 Fulton Avenue, respectively.

[4] USEPA strongly recommends avoiding the use of the ½-detection limit (DL/2) method for estimation and hypothesis testing approaches used in environmental applications. Hence, estimates of mean PCE concentrations were calculated using the Kaplan-Meier method that adjusts for non-detected (left-censored) data.

[5] If the future observation is a member (with a probability of 0.95) of the existing pre-1997 baseline dataset, then it should have a value less than or equal to the 95UCL.

Simple linear regression (SLR) analyses for post- July 2007 concentrations (PCE concentrations vs. time) were used to characterize current trends in PCE concentrations at VGC Wells Nos. 13 and 14. SLR analyses found that decreasing trends in PCE concentrations observed for each well were statistically significant (see Signif < 0.05 in Table 2).

The coefficient of determination (r^2) is a measure (proportion) of the variability in PCE concentrations that is explained by the model. As seen in Figures 7 and 8, the regression model explains 31% and 42% of the variation observed in PCE concentrations at VGC Wells Nos. 13 and 14, respectively. These r^2 suggest that a large percentage of the variability observed in PCE concentrations are not explained using these models. To visualize the predictive uncertainty of these models, lower and upper 95% confidence limits on predicted PCE concentrations are also shown in these figures.

Time Forecast to Return to Pre-1997 PCE Concentrations

Post- July 2007 trends were used to determine whether/when PCE concentrations would return to pre-1997 baseline concentrations. Post- July 2007 linear regression models were used to extrapolate/predict PCE concentrations at future dates. The results are shown in Figures 9 and 10 for VGC Wells Nos. 13 and 14, respectively (extrapolations are indicated as dashed lines).

Based on the linear regression graphs shown in Figures 9 and 10, continued operation of the supply wells in a manner similar to the last five years would be predicted to return to pre-1997 baseline PCE concentrations between:

- 2020 (Q3) and 2029 (Q3) for VGC Well No. 13 (A total of 17 years); and
- 2013 (Q4) and 2016 (Q16) for VGC Well No. 14 (A total of 4 years).

It is important to note that though linear regression models are commonly relied upon, straight-forward to understand, and generally provide comparable coefficient of determination (r^2) values as non-linear model alternatives, attenuation of concentrations is frequently observed to move toward an asymptote with time. Hence, predicted returns to baseline concentrations should be used with care and re-evaluated as new data become available. Nevertheless, this linear regression analysis is useful to evaluate whether the installation of recovery wells would result in a significant reduction in the duration of PCE-dominant impact to VGC Well Nos. 13 and 14. This is because: 1) non-linear regression analysis did not provide a better explanation of OCE variability; and, 2) any asymptotic effect in concentrations would be similarly observed in recovery well operations.

Particle Simulation of PCE VGC Supply Wells with and without New Recovery Wells Evaluation of Current PCE Concentration Trend

The second step in evaluating whether the installation of recovery wells would result in a significant reduction in the duration of PCE-dominant impact to VGC Wells Nos. 13 and 14 uses the groundwater flow model to estimate the: 1) time for a particle of water to move from the 150 Fulton Avenue property to VGC Wells Nos. 13 and 14; and 2) time required for particles of water within the PCE-dominant portion of the plume present in both the Upper Glacial and Magothy aquifers, as depicted in the RI/FS, to

be recovered by VGC Wells Nos. 13 and 14 alone or in combination with new recovery wells. Since particles of water are not correlated to PCE concentrations, the objective of this evaluation was simply to determine a ratio of particles of water being removed with both the supply and recovery wells than with the supply wells alone. This ratio was then used to forecast the proportional change in the time frame required to reduce the of PCE-dominant impact to VGC Wells Nos. 13 and 14.

Scenario No. 1 is shown in Figure 1 and depicts a backward particle flow from VGC Wells Nos. 13 and 14 toward 150 Fulton Avenue to depict the capture zone of these wells. Forward particle tracks are overlain on the defined PCE-dominant portion of the plume to illustrate the pathways that individual particles follow from a given location within the PCE-dominant portion of the plume to VGC Wells Nos. 13 and 14.

Scenario No. 2 is shown in Figure 2 and represents capture of the particles of water within the defined, vertical and horizontal portions of the PCE-dominant plume with VGC Well Nos. 9, 13 & 14 operating together, as they have been operated in recent years. Additionally, this scenario assumes supply wells in Garden City Park and Franklin Square are also operating.

Scenario No. 3 is shown in Figure 11 and is the same as Scenario No. 2 except that two recovery wells are also removing particles from the effected aquifer. These two recovery wells operate at 250 gallons per minute (gpm) each (a combined recovery of 500 gpm).

Duration Estimate

The above evaluation indicates that based on a linear regression analysis using actual PCE influent data to VGC Wells Nos. 13 and 14 over the last five years, the residual PCE concentrations would be expected to return to pre-1997 levels between 2016 and 2029. This represents the projected duration of 4 to 17 years under a remedial scenario without recovery wells.

The installation and operation of two recovery wells, in addition to continued operation of VGC Wells Nos. 13 and 14 could be expected to accelerate the return to pre-1997 levels by 28% resulting in a projected duration of 3 to 12 years under a remedial scenario with recovery wells (i.e., multiplying the time frames derived from the linear regression analysis by 72%).[6]

[6] The 28% acceleration of removal of the PCE-dominant impacts when using recovery wells in conjunction with VGC Wells Nos. 13 and 14 was based on a modeled flow (i.e., not concentration) evaluation that evaluated the relative efficiency of extracting particles of water under the operational scenario of VGC Wells Nos. 13 and 14 only, as well as in conjunction with two new recovery wells. Since the particles of water are not directly correlated with concentration, the percent acceleration was used to calculate a "best case" improvement in the forecasted time frame of PCE reduction based on the linear regression analysis in Step 1.

Summary

In summary, the evaluations presented herein yield several key findings:

- Groundwater modeling simulations based on empirical data (i.e., pumping rates that are inclusive of seasonal variations) will enable full capture of the PCE-dominant portion of the plume when VGC Wells Nos. 13 and 14 operate normally.
- Based on the forward particle track simulations, it is estimated that VGC Well Nos. 13 and 14 could remain in a non-pumping condition for >1,000 days before some portion of the plume would be unable to be recovered by resumption of pumping.
- A linear regression of the current PCE concentration suggests that under current operating conditions, VGC Well Nos. 13 & 14 could be expected to return PCE concentrations to pre-1997 levels in 4 to 17 years.
- Installation and operation of two recovery wells can be expected to accelerate the removal of PCE dominant impacts by approximately 28%, thereby reducing the expected duration of a remedial scenario in which only VGC Wells Nos. 13 and 14 to return PCE concentrations to pre-1997 levels from 4 to 17 years to 3 to 12 years.

We look forward to your review of the enclosed information and a subsequent meeting to discuss next steps. If you should you have any questions or wish to discuss the content of the documents, please do not hesitate to call us at (631) 756-8900.

Sincerely,

Chris W. Wenczel
Principal Consultant

James A. Perazzo
Principal

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Robert J. Mangan, Incorporated Village of Garden City
Frank Koch, Incorporated Village of Garden City

TABLES

Table 1. Pre-1997 PCE Concentrations: Descriptive Statistics for Wells D-13 and D-14

Well	N	#NDs	%NDs	Detected Concentrations						Distrib	KM Mean	95UCL KM Mean
				Min	Max	Median	Mean	std dev	CV			
DW-13	103	25	24%	0.50	6.7	1.45	1.72	1.11	65%	nonparam	1.43	1.63
DW-14	107	11	10%	0.50	22	6.65	6.64	3.73	56%	nonparam	6.01	6.68

USEPA ProUCL v. 4.01.00 was used to calculate descriptive statistics

Notes:

KM mean = mean using Kaplan-Meier method to account for non-detected values

95UCL = 95 upper confidence limit on the mean using Kaplan-Meier method to account for non-detected values

Table 2. Results of Simple Linear Regression Analysis

(a) VGC Well No. 13

	df	*SS*	*MS*	*F*	*Signif*
Model	1	189464	189464	21	0.000042
Residual	45	414128	9203		
Total	46	603592			

(b) VGC Well No. 14

	df	*SS*	*MS*	*F*	*Signif*
Model	1	401659	401659	31	0.0000018
Residual	42	548361	13056		
Total	43	950020			

Notes:

df = *degrees of freedom*
SS = *sums of squares*
MS = *mean sums of squares*
F = *F statistic*
Signif = *significance or p-value*

FIGURES



LEGEND

- TRICHLOROETHENE (TCE)– DOMINANT PLUME TOTAL VOLATILE ORGANIC CONCENTRATION GREATER THAN 100 ug/l
- TETRACHLOROETHENE (PCE)– DOMINANT PLUME TOTAL VOLATILE ORGANIC CONCENTRATION GREATER THAN 100 ug/l
- CIS 1, 2 DICHLOROETHENE– DOMINANT PLUME TOTAL VOLATILE ORGANIC CONCENTRATION GREATER THAN 100 ug/l
- 10 ug/l CONTOUR LINE
- 100 ug/l CONTOUR LINE
- 1,000 ug/l CONTOUR LINE
- VGC WELL 13 CAPTURE ZONE
- VGC WELL 14 CAPTURE ZONE
- PCE–DOMINANT PLUME PARTICLES CAPTURED BY VGC WELL NOS. 13 & 14

NOTE: THE AREAL EXTENT OF CHLORINATED VOLATILE ORGANIC COMPOUNDS DEPICTED IN THIS FIGURE IS BASED ON THE MAXIMUM CONCENTRATIONS DETECTED IN GROUND WATER SAMPLES OBTAINED FROM VERTICAL PROFILE TEMPORARY WELLS INSTALLED DURING 1999 – 2000, AND PERMANENT WELLS DURING SEPTEMBER 2001 – MAY 2005.

0 800 1600

GRAPHIC SCALE IN FEET

TITLE

GROUNDWATER FLOW MODEL OUTPUT VGC SUPPLY WELL NOS. 13 & 14 26-YEAR CAPTURE ZONES & PCE-DOMINANT PLUME PARTICLE TRACKS

PREPARED FOR

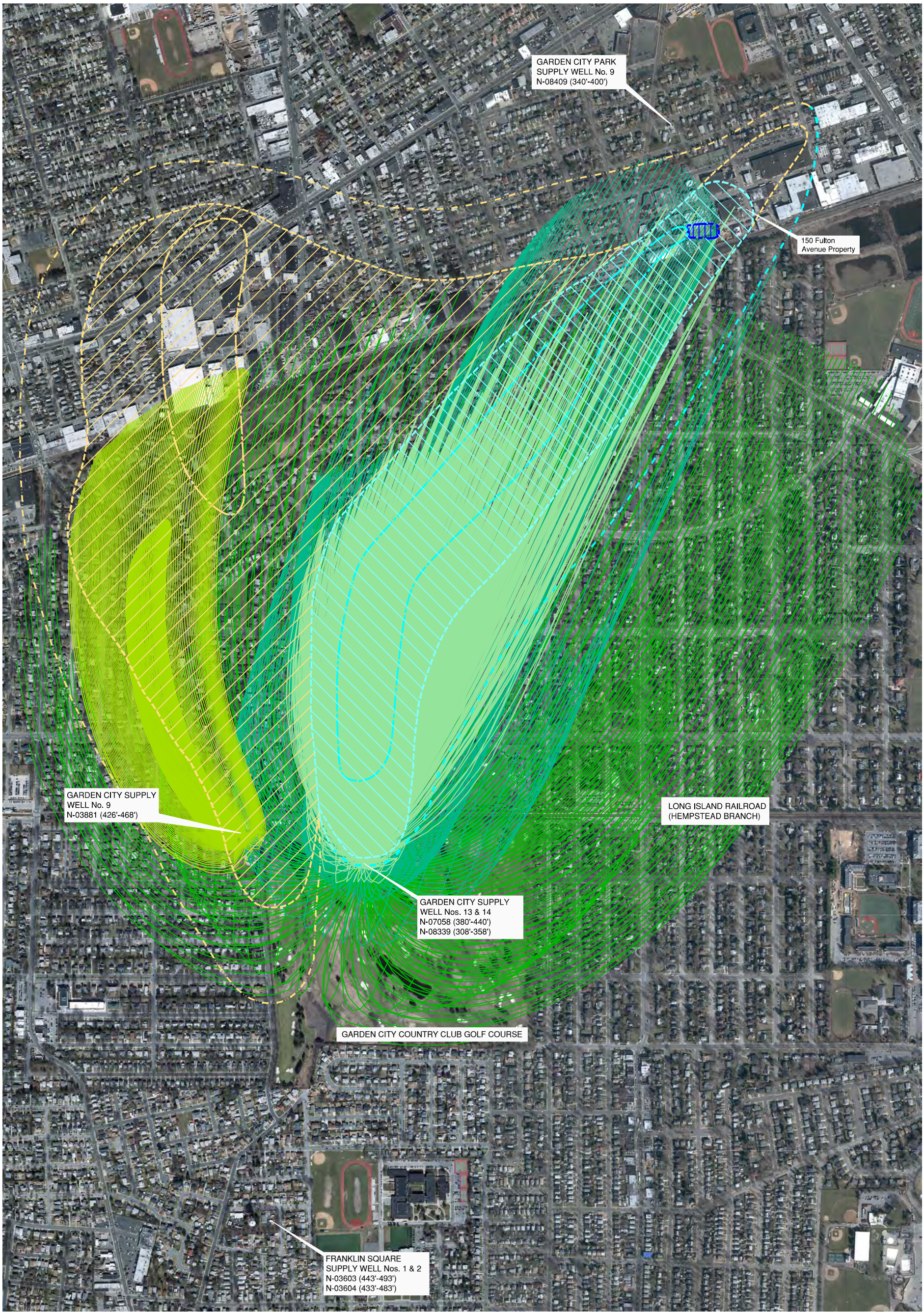
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FIGURE 1

DRAWN BY	SCALE	DATE	JOB NO.
MAW/CWW	AS SHOWN	07/23/2012	0097881.0008

\\ndmeldc01\cad-gis\Scout\Projects\GENESCO\150 Fulton Avenue, NY\CAD Dwgs\2012 Groundwater Modeling\2012 Model\2012-07 Memo - Figur2012-07 Memo - Figure 1 - v01.dwg (07/23/2012 - 12:15pm Melville)



LEGEND

- TRICHLOROETHENE (TCE)– DOMINANT PLUME TOTAL VOLATILE ORGANIC CONCENTRATION GREATER THAN 100 ug/l
- TETRACHLOROETHENE (PCE)– DOMINANT PLUME TOTAL VOLATILE ORGANIC CONCENTRATION GREATER THAN 100 ug/l
- CIS 1, 2 DICHLOROETHENE– DOMINANT PLUME TOTAL VOLATILE ORGANIC CONCENTRATION GREATER THAN 100 ug/l
- 10 ug/l CONTOUR LINE
- 100 ug/l CONTOUR LINE
- 1,000 ug/l CONTOUR LINE
- VGC WELL 09 CAPTURE ZONE
- VGC WELL 13 CAPTURE ZONE
- VGC WELL 14 CAPTURE ZONE
- PCE–DOMINANT PLUME PARTICLES CAPTURED BY VGC WELL NOS. 13 & 14

NOTE: THE AREAL EXTENT OF CHLORINATED VOLATILE ORGANIC COMPOUNDS DEPICTED IN THIS FIGURE IS BASED ON THE MAXIMUM CONCENTRATIONS DETECTED IN GROUND WATER SAMPLES OBTAINED FROM VERTICAL PROFILE TEMPORARY WELLS INSTALLED DURING 1999 – 2000, AND PERMANENT WELLS DURING SEPTEMBER 2001 – MAY 2005.

0 800 1600

GRAPHIC SCALE IN FEET

TITLE

GROUNDWATER FLOW MODEL OUTPUT VGC SUPPLY WELL NOS. 9, 13 & 14 26-YEAR CAPTURE ZONES & PCE-DOMINANT PLUME PARTICLE TRACKS

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FIGURE 2

DRAWN BY	SCALE	DATE	JOB NO.
MAW/CWW	AS SHOWN	07/23/2012	0097881.0008

\\ndmeldc01\cad-gis\Scout\Projects\GENESCO\150 Fulton Avenue, NY\CAD Dwgs\2012 Groundwater Modeling\2012 Model\2012-07 Memo - Figur2012-07 Memo - Figure 2 - v01.dwg (07/23/2012 - 12:20pm Melville)

Figure 3: VGC Well No. 13 - PCE Concentrations from 1977 to 2012

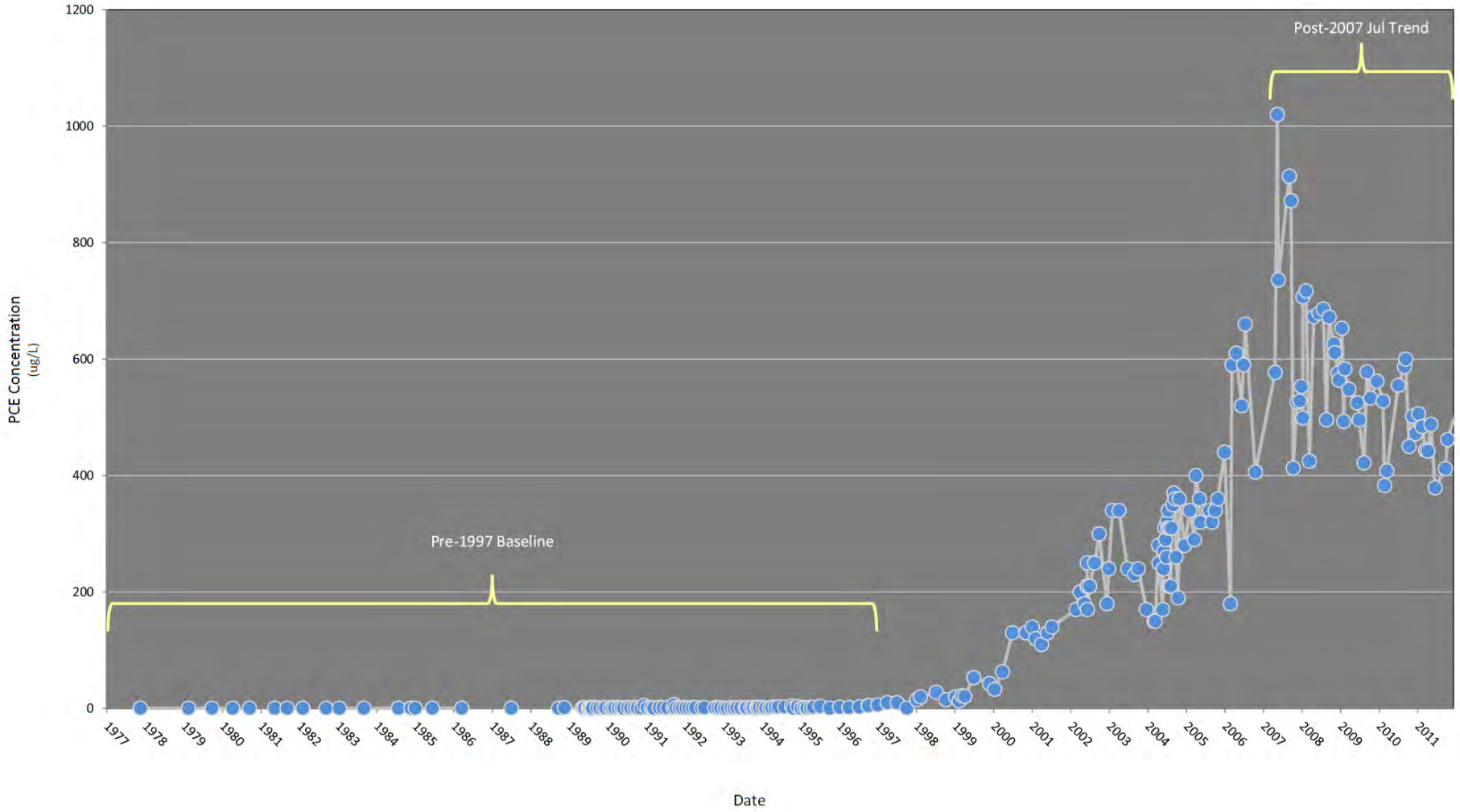


Figure 4: VGC Well No. 14 - PCE Concentrations from 1977 to 2012

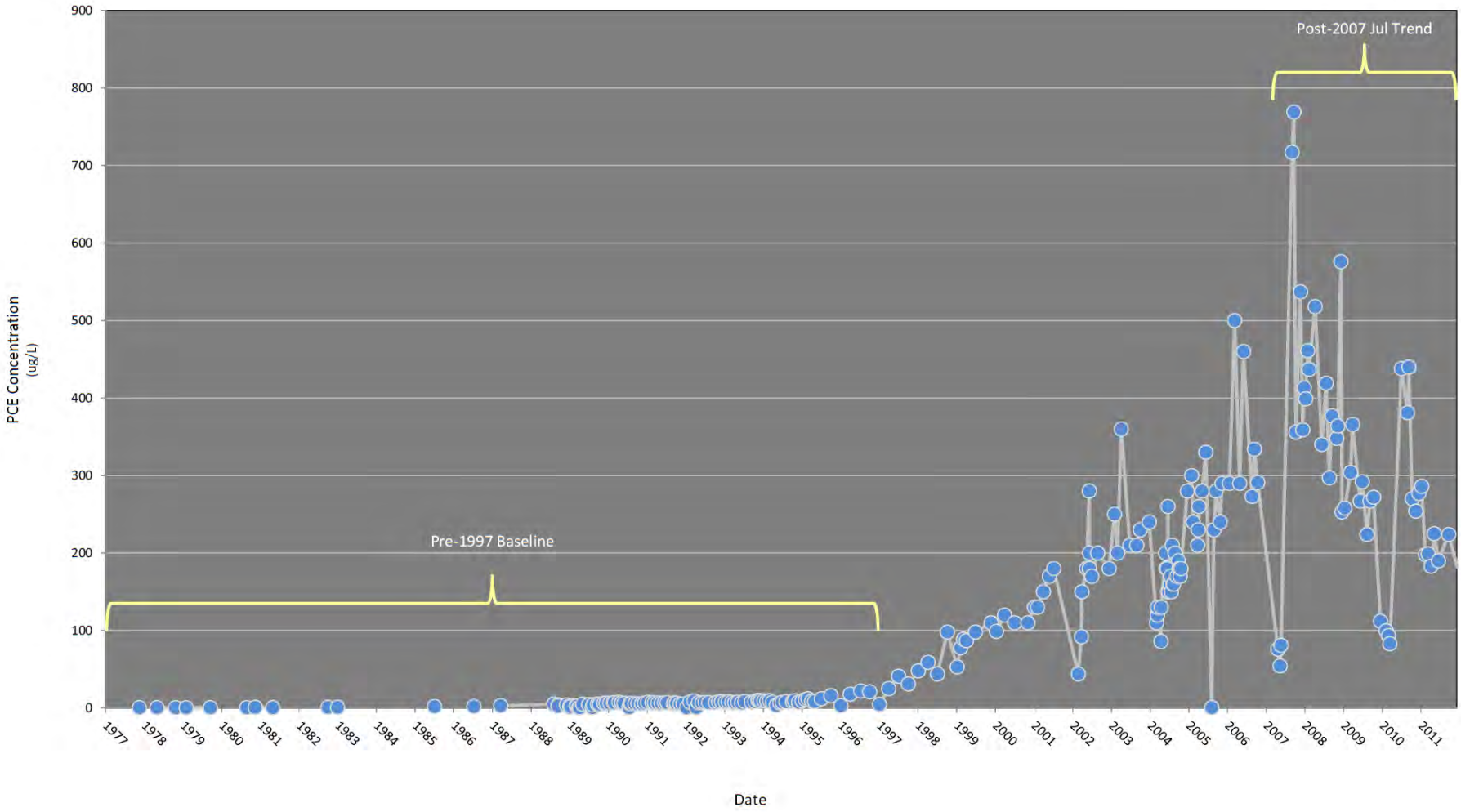


Figure 5: VGC Well No. 13 - Pre-1997 PCE Concentrations

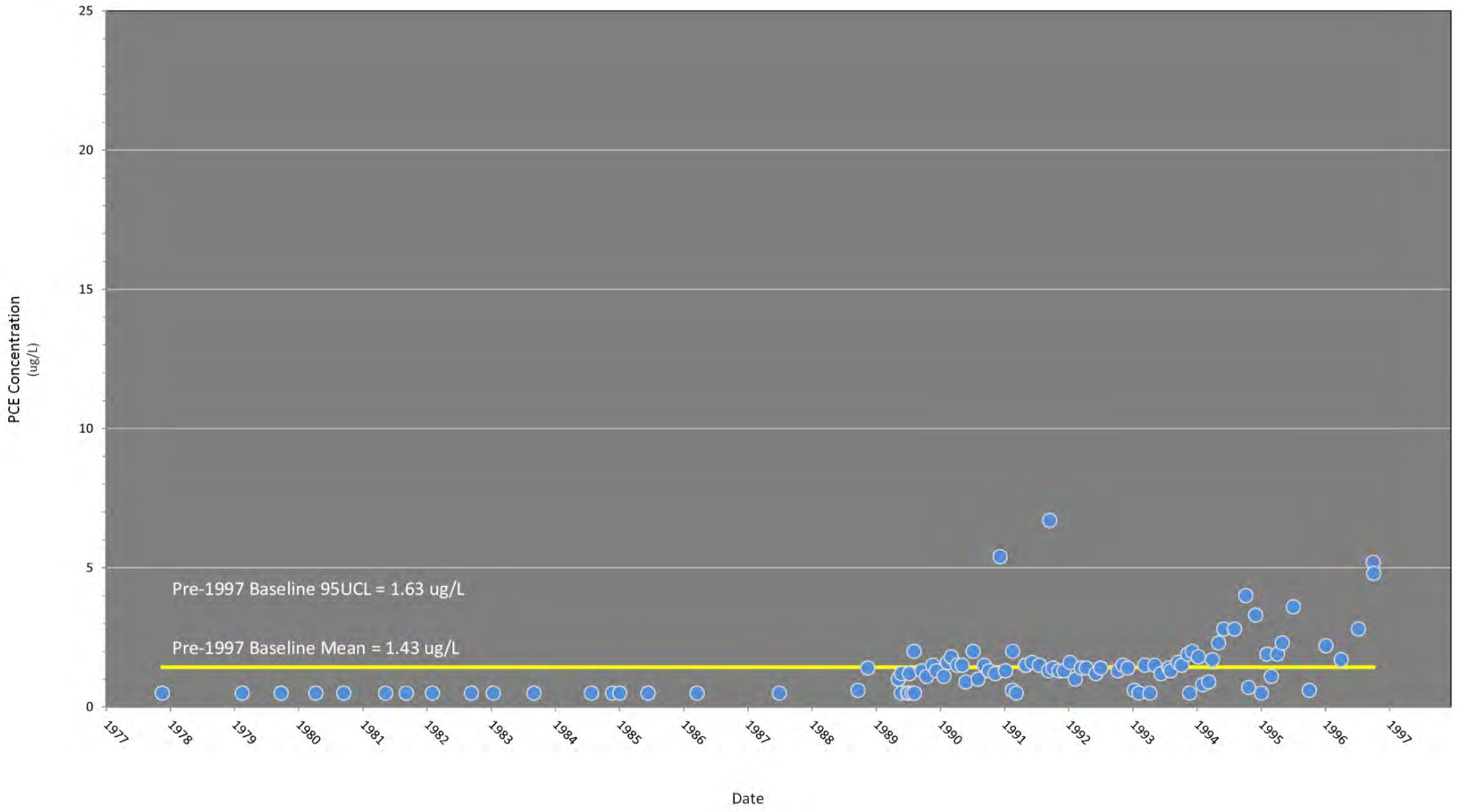


Figure 6: VGC Well No. 14 - Pre-1997 PCE Concentrations

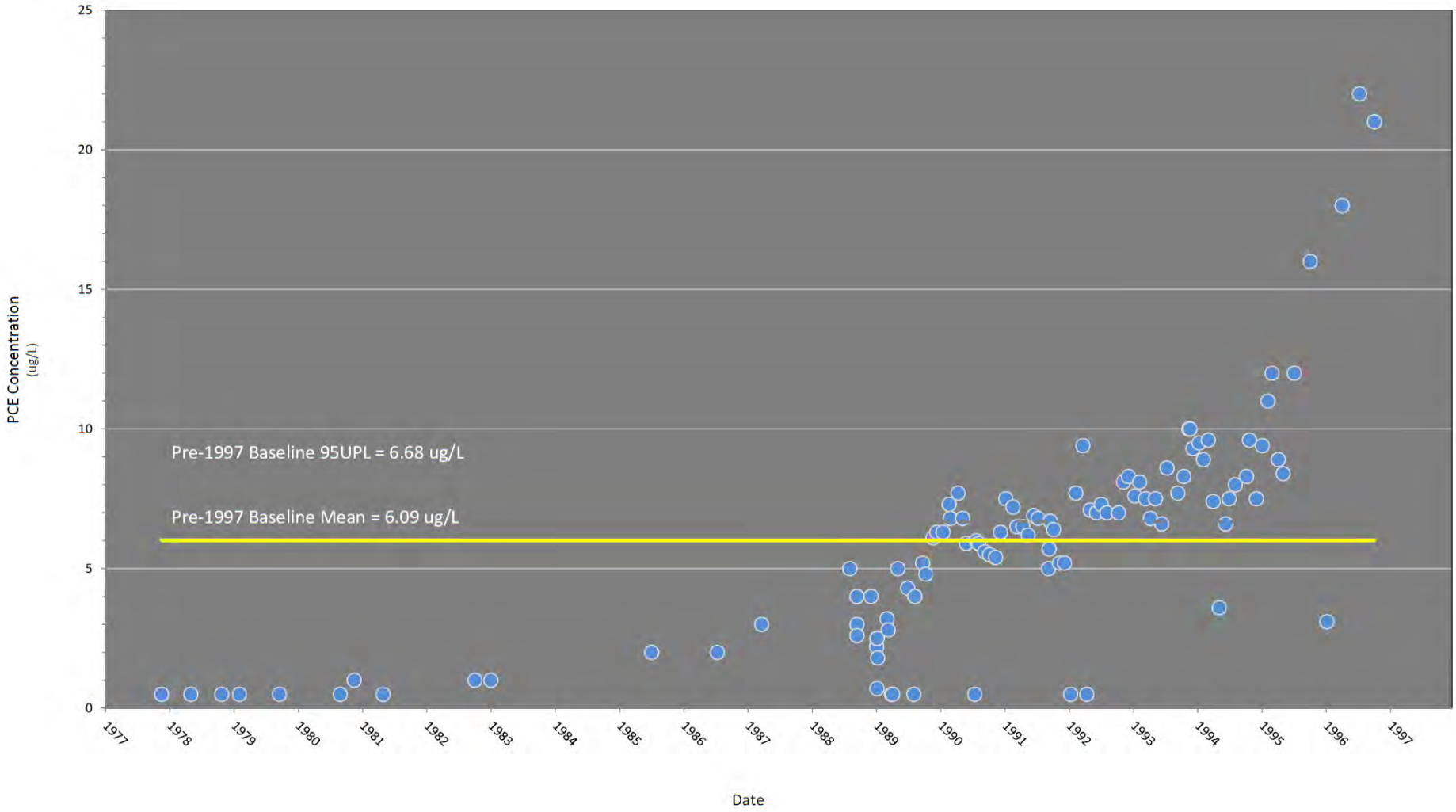


Figure 7: VGC Well No. 13 - Post-2007 July PCE Concentrations

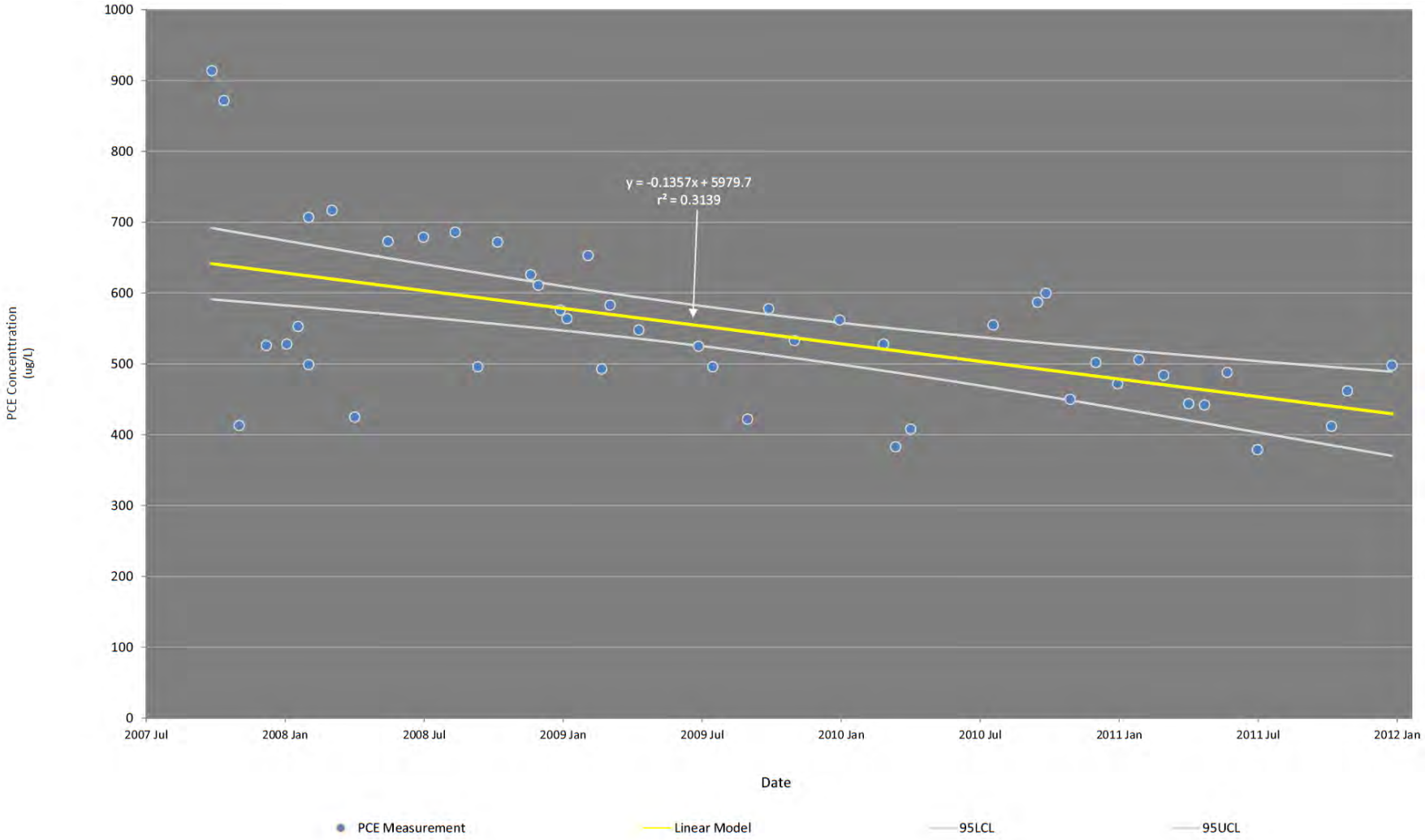


Figure 8: VGC Well No. 14 - Post-2007 July PCE Concentrations

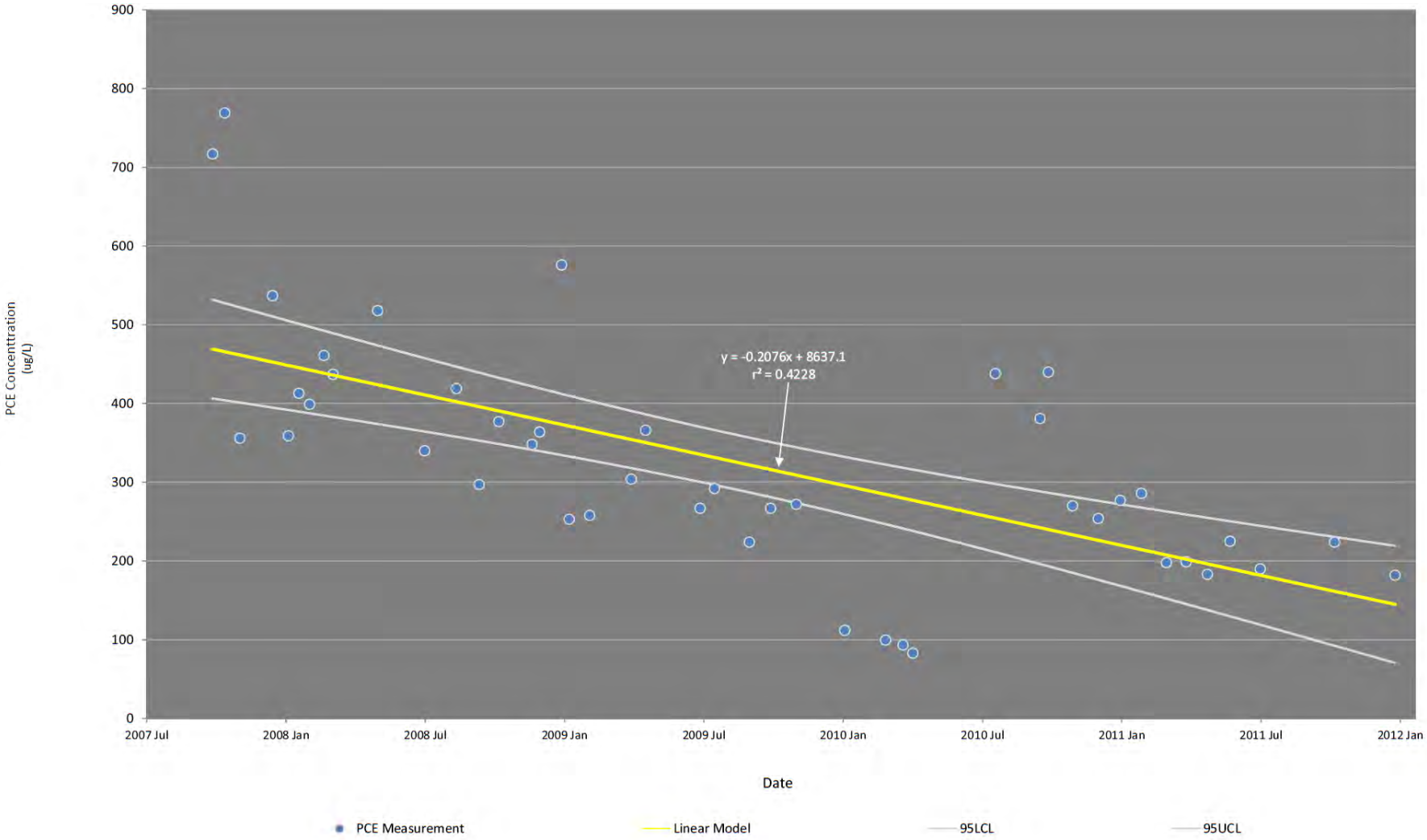


Figure 9: VGC Well No. 13 - Predicted PCE Concentrations
(extrapolations are indicated by dashed lines)

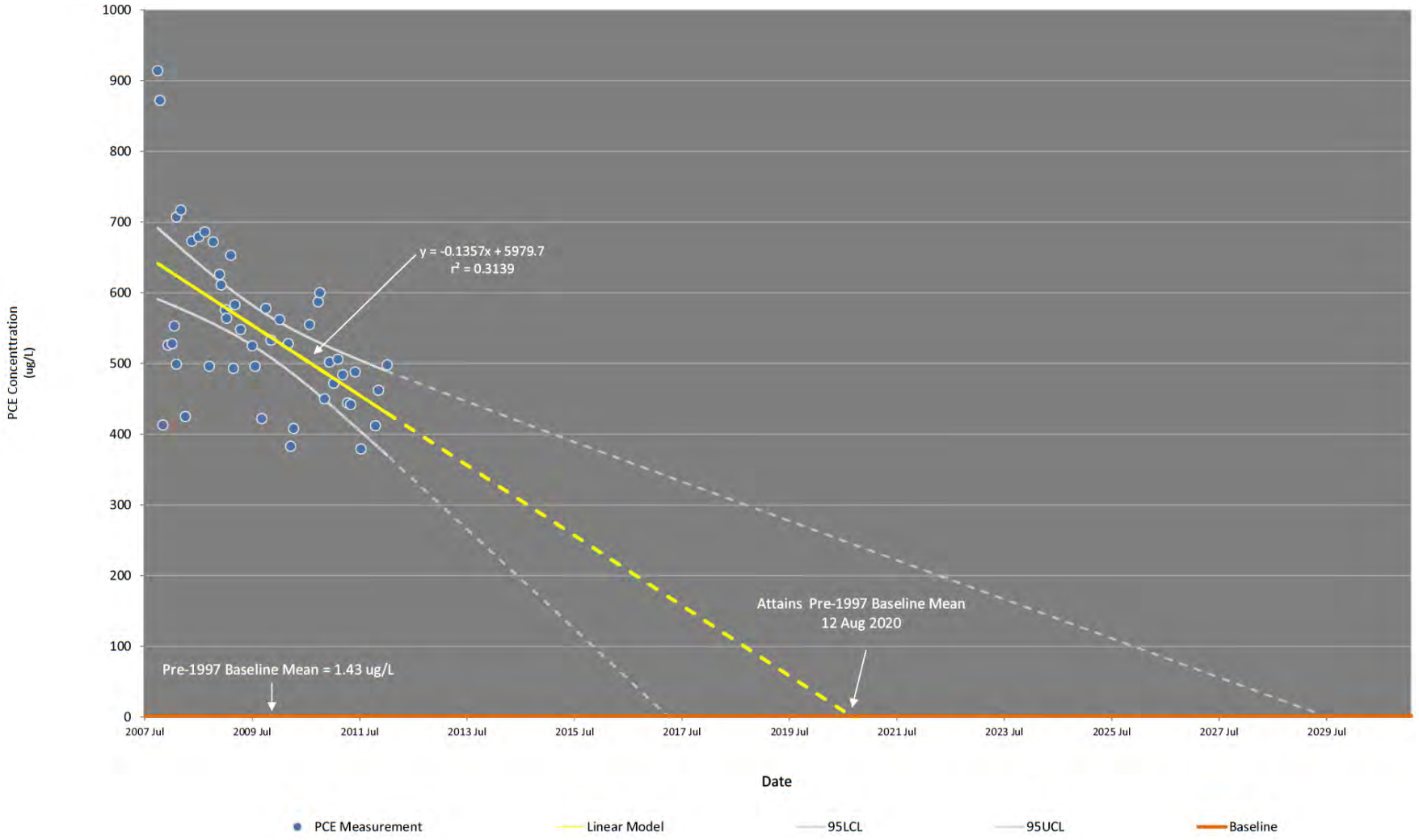
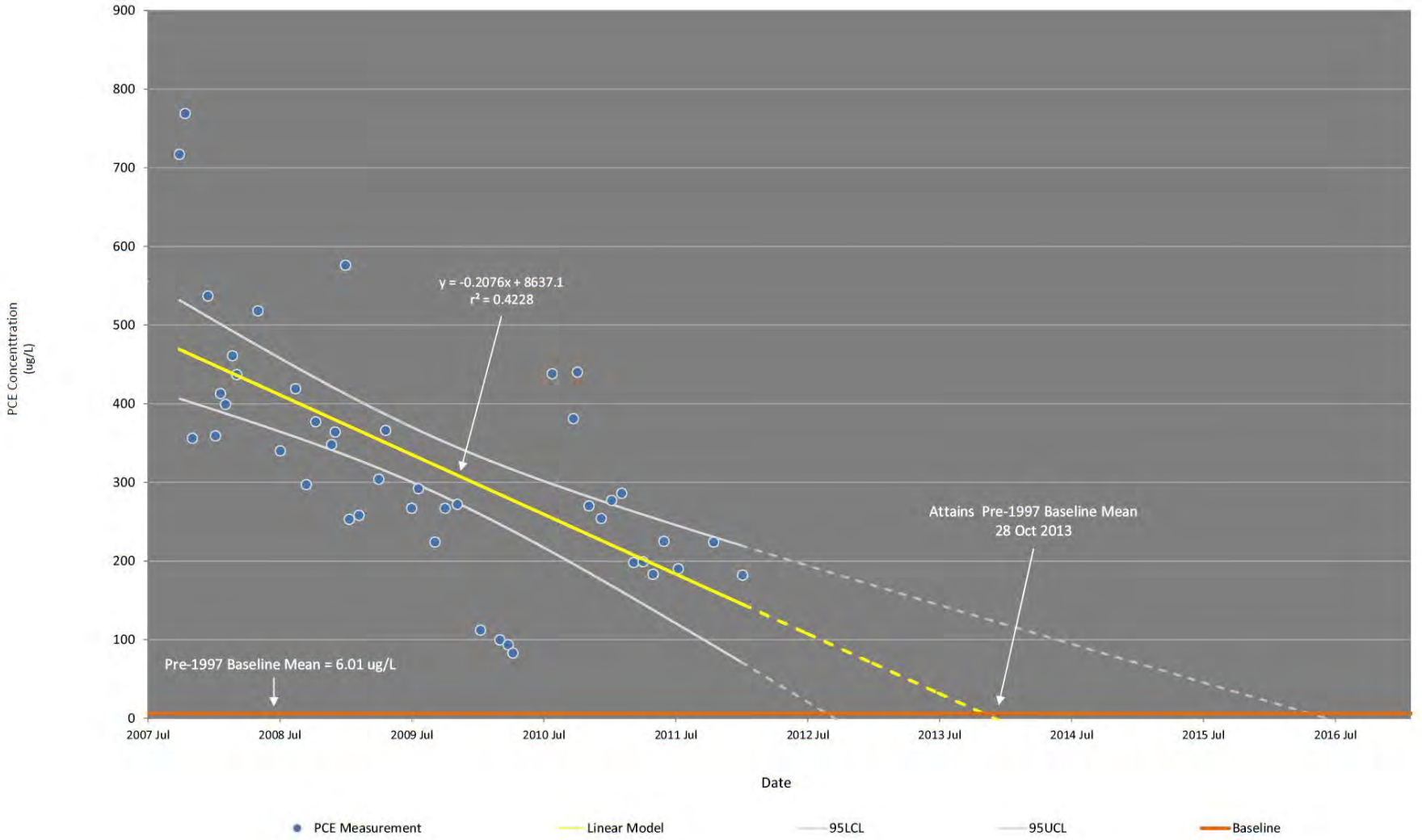
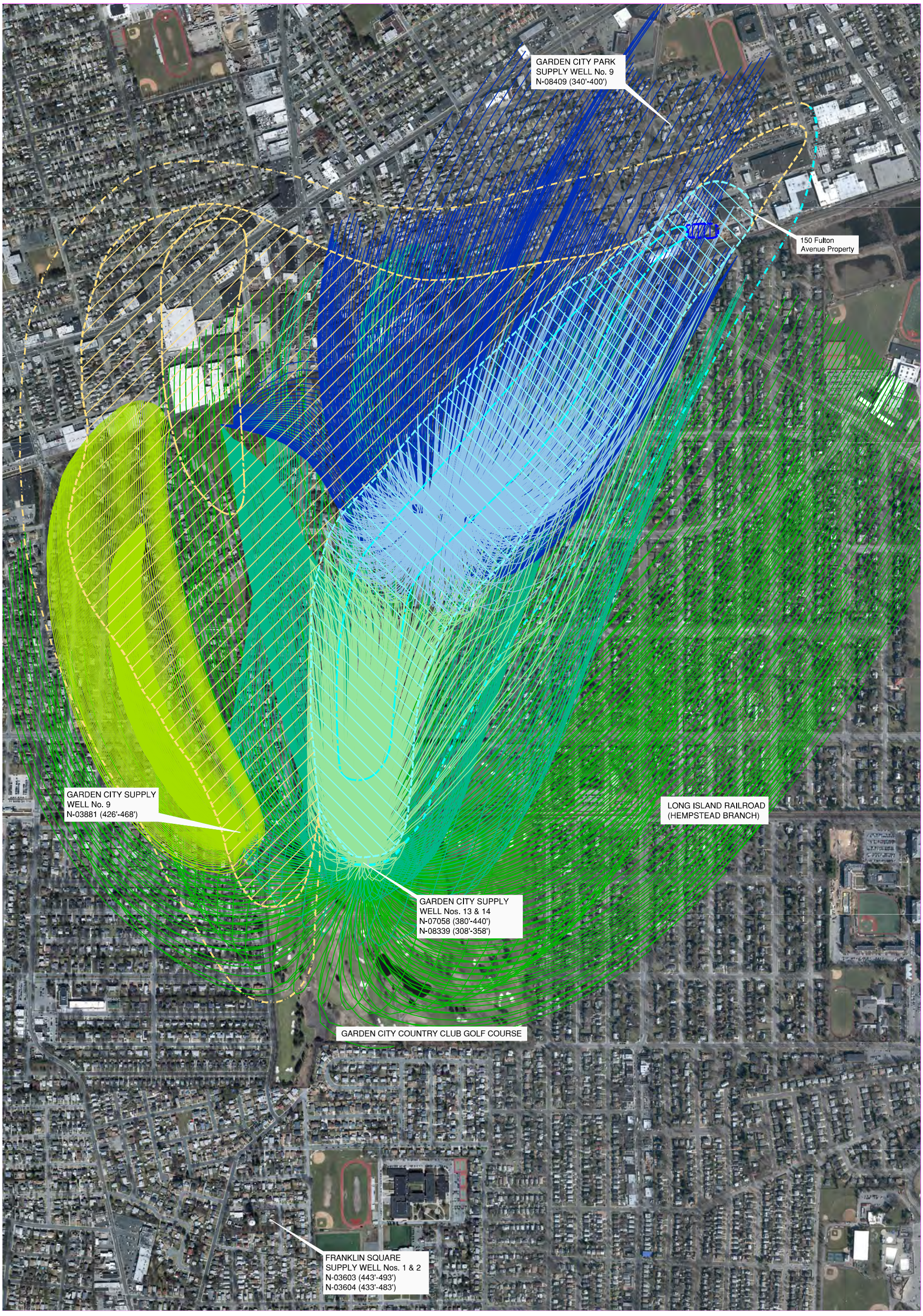


Figure 10: VGC Well No. 14 - Predicted PCE Concentrations

(extrapolations are indicated by dashed lines)





LEGEND

- TRICHLOROETHENE (TCE)– DOMINANT PLUME TOTAL VOLATILE ORGANIC CONCENTRATION GREATER THAN 100 ug/l
- TETRACHLOROETHENE (PCE)– DOMINANT PLUME TOTAL VOLATILE ORGANIC CONCENTRATION GREATER THAN 100 ug/l
- CIS 1, 2 DICHLOROETHENE– DOMINANT PLUME TOTAL VOLATILE ORGANIC CONCENTRATION GREATER THAN 100 ug/l
- 10 ug/l CONTOUR LINE
- 100 ug/l CONTOUR LINE
- 1,000 ug/l CONTOUR LINE
- VGC WELL 09 CAPTURE ZONE
- VGC WELL 13 CAPTURE ZONE
- VGC WELL 14 CAPTURE ZONE
- PROPOSED RW–01 CAPTURE ZONE
- PROPOSED RW–02 CAPTURE ZONE
- PCE–DOMINANT PLUME PARTICLES CAPTURED BY RECOVERY WELLS
- PCE–DOMINANT PLUME PARTICLES CAPTURED BY VGC WELL NOS. 13 &14

NOTE: THE AREAL EXTENT OF CHLORINATED VOLATILE ORGANIC COMPOUNDS DEPICTED IN THIS FIGURE IS BASED ON THE MAXIMUM CONCENTRATIONS DETECTED IN GROUND WATER SAMPLES OBTAINED FROM VERTICAL PROFILE TEMPORARY WELLS INSTALLED DURING 1999 – 2000, AND PERMANENT WELLS DURING SEPTEMBER 2001 – MAY 2005.

0 800 1600

GRAPHIC SCALE IN FEET

TITLE

GROUNDWATER FLOW MODEL OUTPUT VGC SUPPLY WELL NOS. 9, 13 & 14 AND RECOVERY WELL NOS. 1 & 2 26-YEAR CAPTURE ZONES & PCE-DOMINANT PLUME PARTICLE TRACKS

PREPARED FOR

GENESCO INC.

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FIGURE 11

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Environmental Resources Management

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29 May 2013
ERM Project No. 0097881

Mr. Kevin Willis
Remedial Project Manager – Fulton Avenue Superfund Site
New York Remediation Branch
United States Environmental Protection Agency, Region II
290 Broadway, 20th Floor
New York, NY 10007-1866

Re: Proposed Remedial Design Modification Analysis
Groundwater Flow Modeling & Pumpage Forecasting
150 Fulton Avenue NPL Superfund Site - Operable Unit 1
USEPA Consent Judgment No. CV–09–3917
DOJ Ref. No. 90–11–2–09329
Garden City Park Industrial Site NYSDEC#130073

Dear Mr. Willis:

This letter is a follow-up to the 8 May 2013 meeting and is intended to summarize the results of the groundwater flow modeling and evaluations to further inform EPA's decision on whether to modify the selected remedy in EPA's Operable Unit 1 (OU1) Record of Decision (ROD) for the above-referenced site.

These evaluations were completed in response to EPA's requests for additional information regarding the proposed Modified Remedial Alternative, some of which were previously summarized in our letter of 24 July 2012, and most recently pertaining to certain operational conditions necessary to ensure that the Incorporated Village of Garden City (VGC) public supply wells Nos. 13 and 14 continue to contain and extract the OU1 plume (Tetrachloroethene {PCE} dominant) associated with 150 Fulton Avenue[1].

Details of the groundwater flow modeling simulations and evaluations are presented in Attachment A. In summary, the groundwater flow modeling simulations and evaluations thereof discussed herein yield several key findings:

- Simulations based on empirical data (i.e., pumping rates that are inclusive of seasonal variations) confirm that the current, normal operation of VGC Well No. 13-alone or VGC Well Nos. 13 and 14 as a pair will ensure full capture of the OU1 plume.
- VGC Wells Nos. 13 and 14 will continue to contain and extract the OU1 plume if there is a minimum combined groundwater withdrawal (pumpage) of 290,000,000 gallons per year from VGC Well Nos. 13 and 14, with at least 139,500,000 gallons per year from VGC No. 13[2].

1 As defined in the 2005 Remedial Investigation Report.

2 For reference, this is only 40% of the actual average combined annual groundwater withdrawal for VGC Well Nos. 13 & 14 during the last 5 years (2008 – 2012) which was approximately 730,000,000 gallons per year with approximately 450,000,0`00 gallons per year coming from VGC No. 13. The minimum withdrawal of 139,500,00 gallons per year from VGC No. 13 is only 31% of the actual average annual groundwater withdrawal from this well during the same time period.

- VGC Well Nos. 13 and 14 could remain in non-pumping mode (equipment failure/service activities, etc.) for >1 year before some portion of the OU1 plume that migrated past the wells might not be recovered upon resumption of pumping[3].

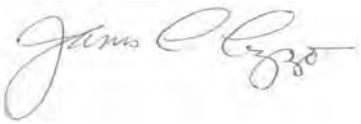
Therefore, a performance standard which requires a minimum combined annual groundwater withdrawal (pumpage) of 290,000,000 gallons per year combined from VGC Well Nos. 13 and 14, with a minimum pumpage of at least 139,500,000 gallons per year from VGC No. 13 will ensure that VGC Wells Nos. 13 and 14 continue to contain and extract the OU1 plume. Furthermore, VGC Well Nos. 13 and 14 could be shut down due to equipment failure and/or required service activities for >1year before some portion of the OU1 plume that migrated past the wells might not be recovered upon resumption of pumping.

We look forward to your review of the enclosed information and a subsequent meeting to discuss next steps. If you should you have any questions or wish to discuss the content of the documents, please do not hesitate to call us at (631) 756-8900.

Sincerely,



Chris W. Wenczel
Principal Consultant



James A. Perazzo
Principal

cc: Douglas Fischer, USEPA
Sal Badalamenti, USEPA
Robert Kambic, USDOJ
Steven M. Scharf, P.E., NYSDEC
John Swartwout, NYSDEC
Paul Alexis, Esq., Bradley Arant Boult Cummings LLP
Melissa Ballengee Alexander, Esq., Bradley Arant Boult Cummings LLP
James Periconi, Esq., Periconi, LLC
Roger Sisson, Esq., Genesco Inc.
David Yudelson, Esq., Sive, Paget & Riesel P.C.
Richard Humann, P.E., H2M
Robert J. Mangan, Incorporated Village of Garden City
Frank Koch, Incorporated Village of Garden City

---

[3] Historic pumping records for VGC Well Nos. 13 & 14 indicate that since 1988, the longest time period that Wells 13 & 14 were not operated was six months (~180 days) in 2007 during construction of a second air stripper and installation of the granular activated carbon(GAC) treatment equipment. Since 1968, the only other significant non-operational periods were all of 1988 (~365 days) for Well No. 14 and a four-month period in early 1989 (~120 days) for Well No. 13. Based on the forward particle track simulations discussed in Attachement 1, it is estimated that VGC Well Nos. 13 and 14 could be off for >1,000 days (2.7 years) before some portion of the plume would be unable to be recovered by resumption of pumping.that demonstrated.

ATTACHMENT 1

Environmental Resources Management

Details Of Groundwater Flow Modeling & Forecasting For Proposed Remedial Design Modification Analysis
150 Fulton Avenue NPL Superfund Site - Operable Unit 1

Background

As part of the OU1 Remedial Design (RD), hydraulic testing was performed in early 2012. This testing involved a shutdown of VGC Wells Nos. 9, 13 and 14 to establish baseline groundwater elevations in monitoring wells throughout the Upper Glacial and Magothy Aquifers. Once baseline conditions were achieved, the testing progressed to pumping of VGC Wells Nos. 9, 13 and 14 in various combinations for specified periods of time while simultaneously recording groundwater elevation response in the monitoring well network to the pumping.

The results from the hydraulic testing were used in conjunction with regional groundwater elevation data obtained from United States Geological Survey (USGS) to construct and calibrate a three-dimensional regional computer groundwater flow model. The model uses the USGS' MODFLOW-NWT code. MODFLOW is a three-dimensional finite-difference model that can account for heterogeneity, anisotropy and varying boundary conditions. MODFLOW NWT is publicly available, well documented and widely used in both the private and public sectors. Aquaveo's Groundwater Modeling System (GMS) software was utilized for pre- and post-processing of model input and output. This software allowed ERM to utilize publically available GIS coverage's for a significant portion of the model inputs including, geologic data, hydrology, topography and cultural features.

Once calibration was complete, a number of scenarios were simulated to evaluate how the operation of VGC Wells Nos. 9, 13 and 14 affected the OU1 plume. More fully explained below, these scenarios were intended to:

1) Evaluate the ability of VGC Wells Nos. 13 and 14 to capture the OU1 plume;
2) Consider how seasonal variations in operation of VGC Wells Nos. 13 and 14 for water supply may affect plume capture;
3) Estimate the minimum annual groundwater withdrawal (pumpage) necessary to ensure that VGC Wells Nos. 13 and 14 continue to contain and extract the OU1 plume; and
4) Estimate how long that VGC Well Nos. 13 and 14 could remain in non-pumping mode (equipment failure/service activities, etc.) before some portion of the OU1 plume might not be recovered upon resumption of pumping.

VGC Wells Influence on the OU1 Plume

The model was used to generate capture fields for all operating public supply wells in the study area using reverse particle tracks. Groundwater withdrawals assigned to each public supply well in the model were based on historic operational records obtained from the Nassau County Department of Health (NCDOH). Then particles of water, analogous to molecules of PCE moving through the aquifer system un-retarded, were tracked from within the three-dimensional footprint of the defined OU1 plume from the 150 Fulton Property. These forward particle tracks illustrate the pathways that individual particles follow from a given location within the OU1 plume to VGC Wells Nos. 13 and 14.

ATTACHMENT 1

Details Of Groundwater Flow Modeling & Forecasting For Proposed Remedial Design Modification Analysis
150 Fulton Avenue NPL Superfund Site - Operable Unit 1

These simulations were run for VGC Well No. 13 operating alone (VGC Nos. 9 and 14 off), VGC Well Nos. 13 and 14 operating as a pair (VGC No. 9 off), and all three VGC Well Nos. 9, 13 and 14 operating together as they have been operated in recent years which included seasonal. In these simulations, all other supply wells within the study area, e.g., the Franklin Square and other VGC supply wells were operating based on historic operational records obtained from the Nassau County Department of Health (NCDOH).

The model output for the simulation run of VGC Well No. 13 operating alone is graphically presented in Figure 1 and shows full capture of the PCE-dominant plume. As would be expected, the simulation runs for VGC Well Nos. 13 and 14 operating together, as well as VGC Well Nos. 9, 13 and 14 operating together also show full capture of the PCE-dominant plume, shown in Figures 2 and 3, respectively. These findings are consistent with the historic groundwater monitoring data set which confirms that the operation of VGC Well Nos. 13 and 14 effects full capture of the OU1 plume.

VGC Wells No. 13 and 14 Seasonal Operation Influence on the PCE-dominant Portion of Plume

The primary objective of VGC Wells Nos. 13 and 14 normal operations are to supply potable water to the community. Hence, seasonal water demand influences the operational frequency of these wells. In the course of operation, VGC Wells Nos. 13 and 14 also capture the PCE-dominant plume, as well as a portion of the regional Trichloroethene (TCE)-dominant plume. Because a modified remedy would rely on VGC Wells Nos. 13 and 14 as the primary mechanism for capture of the OU1 plume, we also considered how the frequency of seasonal operations might influence plume capture.

Operational records for VGC Well Nos. 9, 13, and 14 for the last 5 years (i.e., 2007 – 2011) indicate all three wells are operated year-round. However, it is clear that Well No. 13 is pumped most heavily year-round to meet demand while Well Nos. 9 and 14 are pumped to supplement demand as needed and especially during the warmer months of the year.

As discussed above, the capture field/particle track simulations clearly indicate that operating VGC Well No. 13-alone, VGC Well Nos. 13 and 14 or VGC Well Nos. 9, 13, and 14 together enable full capture of the OU1 plume. In developing those simulations, groundwater withdrawals were assigned to each public supply well in the model based on historic operational records which inherently included seasonality in the records, and the simulation run of VGC Well No. 13 operating alone shows full capture of the PCE-dominant plume. Hence, it can be concluded that even during the seasonal minimum in pumping (i.e., when VGC Well Nos. 9 and 14 are pumped less), full capture of the OU1 plume can be expected when these wells are operated as they have been in the recent past.

ATTACHMENT 1

Details Of Groundwater Flow Modeling & Forecasting For Proposed Remedial Design Modification Analysis
150 Fulton Avenue NPL Superfund Site - Operable Unit 1

Revised Modeling Scenario: Operational Conditions Required To Ensure Capture of the PCE-dominant Portion of Plume by VGC Wells No. 13 and 14

A revised modeling scenario was constructed in order to more directly evaluate the operational conditions necessary to ensure complete capture of the PCE –dominant portion of the plume by the VGC Wells Nos. 13 and 14. This scenario was specifically designed to:

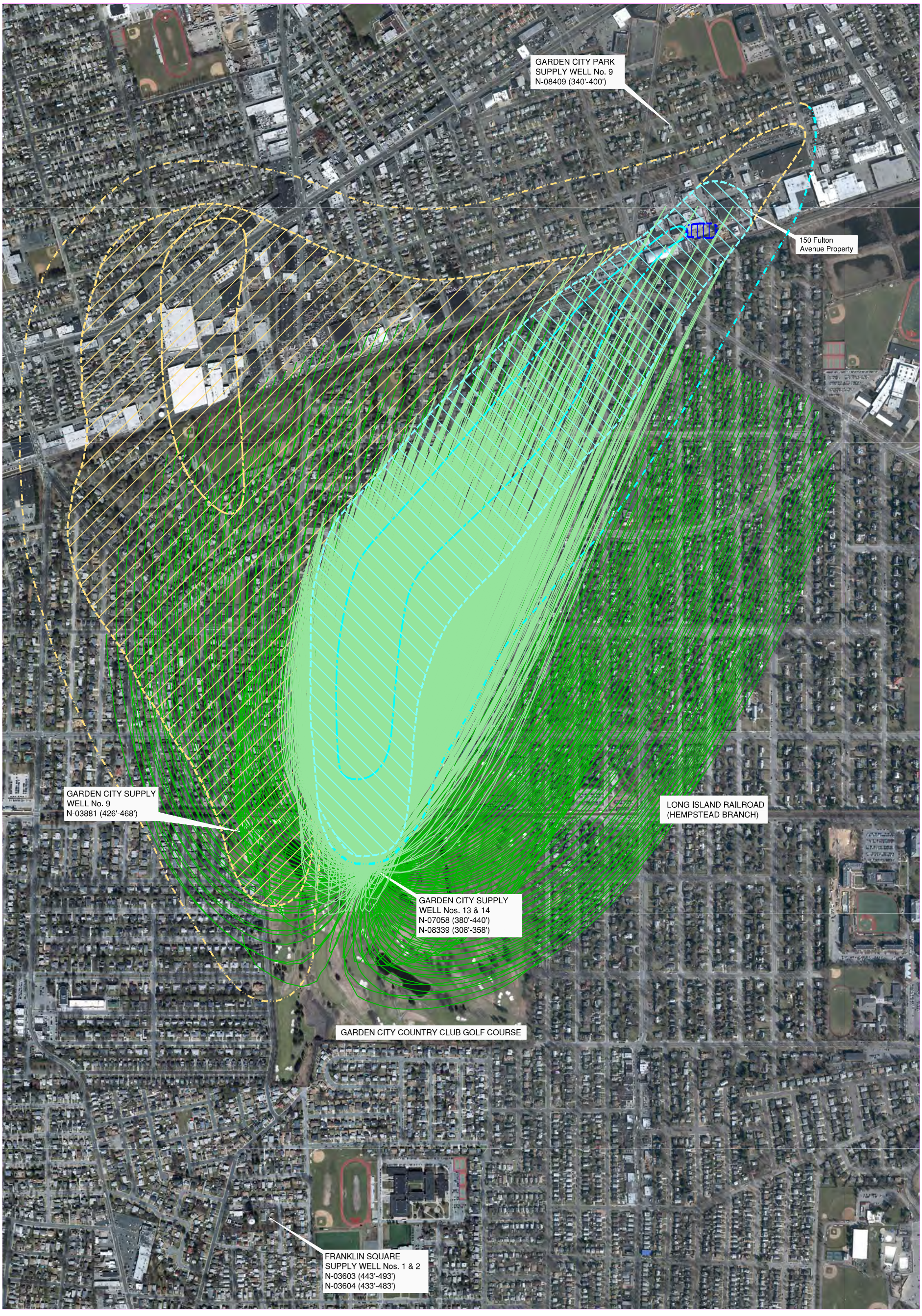
- Estimate the minimum annual groundwater withdrawal (pumpage) necessary to ensure that VGC Wells Nos. 13 and 14 continue to contain and extract the PCE - dominant portion of the plume; and
- Estimate how long VGC Well Nos. 13 and 14 could remain in non-pumping mode (equipment failure/service activities, etc.) before some portion of the OU1 plume might not be recovered upon resumption of pumping[4].

The updated model was run under transient pumping conditions where VGC Wells Nos. 13 and 14 were simulated to be out of service for 1,000 days before beginning to pump. The model then continued to run for an additional 25 years. The withdrawal rates for all of the local supply wells were chosen in order to approximate a reasonable worst-case scenario and are summarized below:

Well		Groundwater Withdrawal Rate (gal/year)		
NC Name	Local Name	0 To 1,000 Days	1,000 Days To 25 Years	Description/Information Source
N-03881	VGC-9	0	0	Worst Case - Completely Shutdown
N-07058	VGC-13	0	-139,292,399	Recent Historical Minimum - 2007
N-08339	VGC-14	0	-149,732,501	Recent Historical Minimum - 2004
N-05163	VGC-12	-3,058,999	-3,058,999	Recent Historical Maximum - 2009
N-08409	GCP-9	-13,058,999	-13,058,999	Recent Historical Maximum - 2009
N-03603	FS-1	-189,279,999	-189,279,999	Recent Historical Maximum - 2002
N-03604	FS-2	-146,027,700	-146,027,700	Recent Historical Maximum - 2002

During the simulation, hypothetical particles of water were tracked from within the three-dimensional footprint of the OU1 plume in order to approximate un-retarded molecules of PCE moving through the aquifer system. These particle tracks are graphically presented in Figure 4 and show full capture of the PCE-dominant plume. Based on the forward particle track simulations, it is estimated that VGC Well Nos. 13 and 14 could be off for >1,000 days before some portion of the plume would be unable to be recovered by resumption of pumping.

[4] Historic pumping records for VGC Well Nos. 13 & 14 indicate that since 1988, the longest time period that Wells 13 & 14 were not operated was six months (~180 days) in 2007 during construction of a second air stripper and installation of the granular activated carbon(GAC) treatment equipment. Since 1968, the only other significant non-operational periods were all of 1988 (~365 days) for Well No. 14 and a four-month period in early 1989 (~120 days) for Well No. 13.



LEGEND

- TRICHLOROETHENE (TCE)– DOMINANT PLUME TOTAL VOLATILE ORGANIC CONCENTRATION GREATER THAN 100 ug/l
- TETRACHLOROETHENE (PCE)– DOMINANT PLUME TOTAL VOLATILE ORGANIC CONCENTRATION GREATER THAN 100 ug/l
- CIS 1, 2 DICHLOROETHENE– DOMINANT PLUME TOTAL VOLATILE ORGANIC CONCENTRATION GREATER THAN 100 ug/l
- 10 ug/l CONTOUR LINE
- 100 ug/l CONTOUR LINE
- 1,000 ug/l CONTOUR LINE
- VGC WELL 13 CAPTURE ZONE
- PCE–DOMINANT PLUME PARTICLES CAPTURED BY VGC WELL NO. 13

NOTE: THE AREAL EXTENT OF CHLORINATED VOLATILE ORGANIC COMPOUNDS DEPICTED IN THIS FIGURE IS BASED ON THE MAXIMUM CONCENTRATIONS DETECTED IN GROUND WATER SAMPLES OBTAINED FROM VERTICAL PROFILE TEMPORARY WELLS INSTALLED DURING 1999 – 2000, AND PERMANENT WELLS DURING SEPTEMBER 2001 – MAY 2005.

0 800 1600

GRAPHIC SCALE IN FEET

TITLE

GROUNDWATER FLOW MODEL OUTPUT VGC SUPPLY WELL NO. 13-ONLY 26-YEAR CAPTURE ZONE & PCE-DOMINANT PLUME PARTICLE TRACK

PREPARED FOR

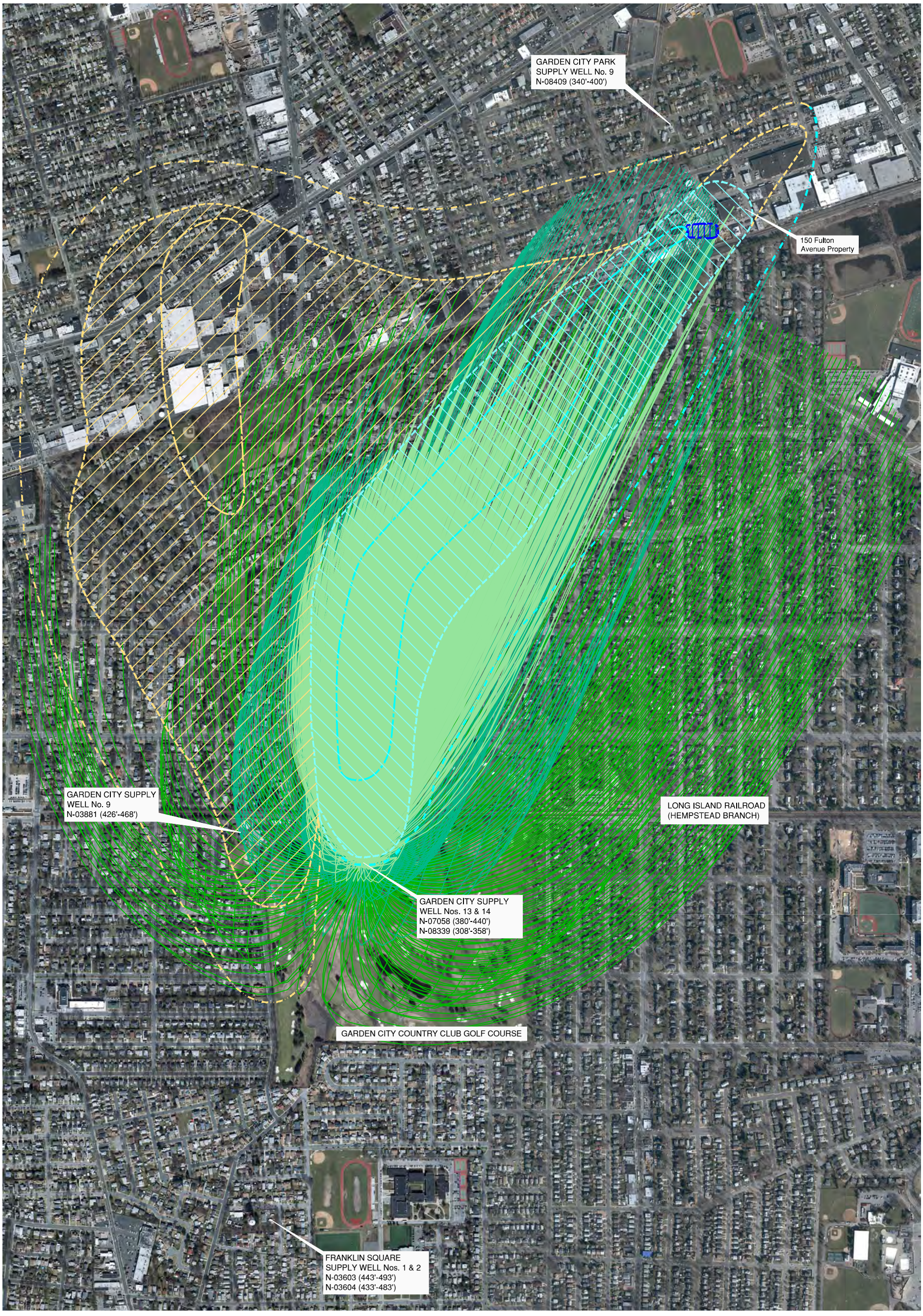
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FIGURE 1

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LEGEND

- TRICHLOROETHENE (TCE)– DOMINANT PLUME TOTAL VOLATILE ORGANIC CONCENTRATION GREATER THAN 100 ug/l
- TETRACHLOROETHENE (PCE)– DOMINANT PLUME TOTAL VOLATILE ORGANIC CONCENTRATION GREATER THAN 100 ug/l
- CIS 1, 2 DICHLOROETHENE– DOMINANT PLUME TOTAL VOLATILE ORGANIC CONCENTRATION GREATER THAN 100 ug/l
- 10 ug/l CONTOUR LINE
- 100 ug/l CONTOUR LINE
- 1,000 ug/l CONTOUR LINE
- VGC WELL 13 CAPTURE ZONE
- VGC WELL 14 CAPTURE ZONE
- PCE–DOMINANT PLUME PARTICLES CAPTURED BY VGC WELL NOS. 13 & 14

NOTE: THE AREAL EXTENT OF CHLORINATED VOLATILE ORGANIC COMPOUNDS DEPICTED IN THIS FIGURE IS BASED ON THE MAXIMUM CONCENTRATIONS DETECTED IN GROUND WATER SAMPLES OBTAINED FROM VERTICAL PROFILE TEMPORARY WELLS INSTALLED DURING 1999 – 2000, AND PERMANENT WELLS DURING SEPTEMBER 2001 – MAY 2005.

0 800 1600

GRAPHIC SCALE IN FEET

TITLE

GROUNDWATER FLOW MODEL OUTPUT VGC SUPPLY WELL NOS. 13 & 14 26-YEAR CAPTURE ZONES & PCE-DOMINANT PLUME PARTICLE TRACKS

PREPARED FOR

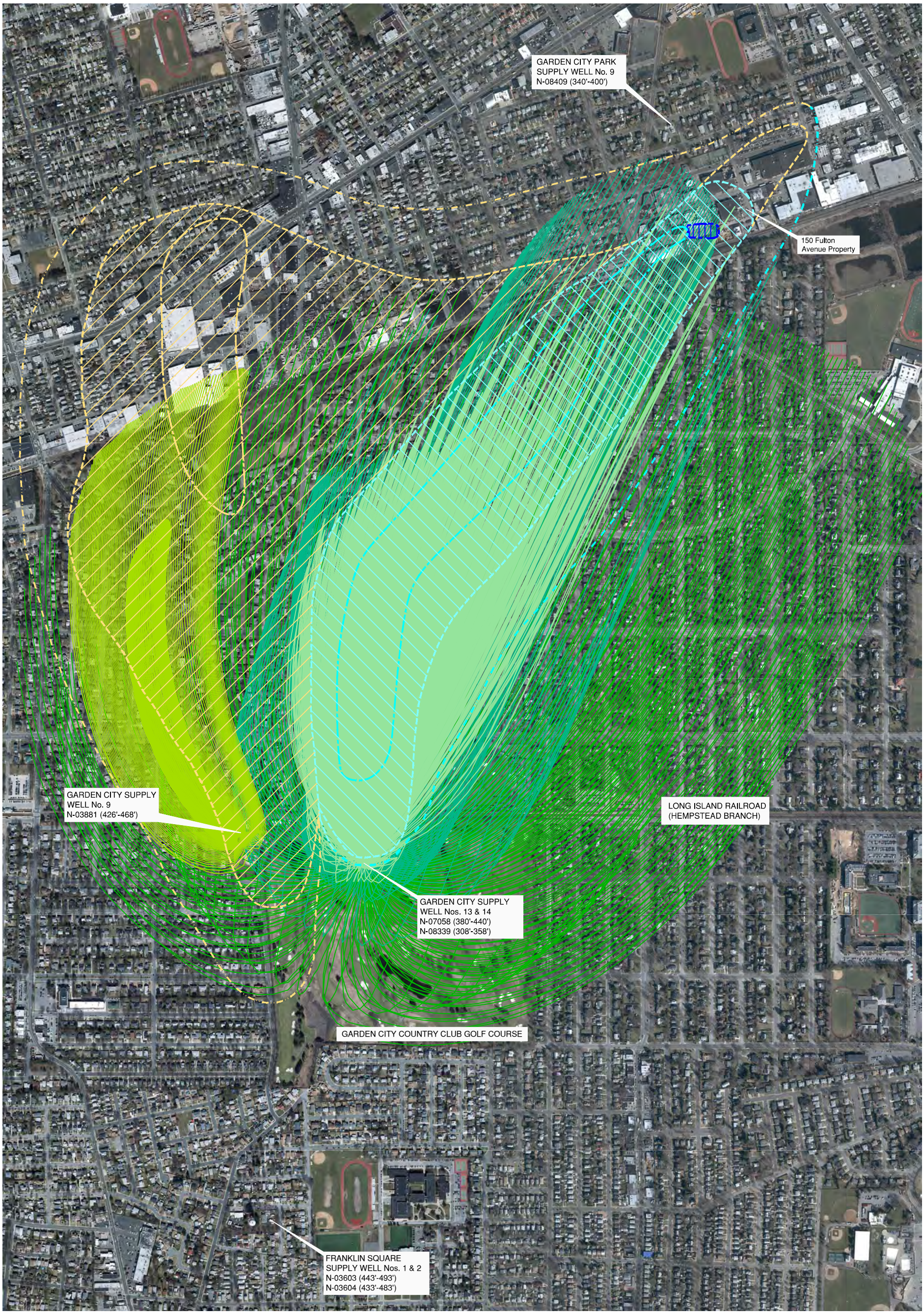
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FIGURE 2

DRAWN BY	SCALE	DATE	JOB NO.
MAW/CWW	AS SHOWN	05/15/2013	0097881.0008

R:\Scout\Projects\GENESCO\150 Fulton Avenue, NY\CAD\2012 Groundwater Modeling\2012 Model\2012-07 Memo - Figures\Draft\2013-05 Memo - Figure 2 - v01 (26YR-13&14 Only).dwg (05/15/2013 - 2:52pm Melville)



LEGEND

- TRICHLOROETHENE (TCE)– DOMINANT PLUME TOTAL VOLATILE ORGANIC CONCENTRATION GREATER THAN 100 ug/l
- TETRACHLOROETHENE (PCE)– DOMINANT PLUME TOTAL VOLATILE ORGANIC CONCENTRATION GREATER THAN 100 ug/l
- CIS 1, 2 DICHLOROETHENE– DOMINANT PLUME TOTAL VOLATILE ORGANIC CONCENTRATION GREATER THAN 100 ug/l
- 10 ug/l CONTOUR LINE
- 100 ug/l CONTOUR LINE
- 1,000 ug/l CONTOUR LINE
- VGC WELL 09 CAPTURE ZONE
- VGC WELL 13 CAPTURE ZONE
- VGC WELL 14 CAPTURE ZONE
- PCE–DOMINANT PLUME PARTICLES CAPTURED BY VGC WELL NOS. 13 & 14

NOTE: THE AREAL EXTENT OF CHLORINATED VOLATILE ORGANIC COMPOUNDS DEPICTED IN THIS FIGURE IS BASED ON THE MAXIMUM CONCENTRATIONS DETECTED IN GROUND WATER SAMPLES OBTAINED FROM VERTICAL PROFILE TEMPORARY WELLS INSTALLED DURING 1999 – 2000, AND PERMANENT WELLS DURING SEPTEMBER 2001 – MAY 2005.

0 800 1600

GRAPHIC SCALE IN FEET

TITLE

GROUNDWATER FLOW MODEL OUTPUT VGC SUPPLY WELL NOS. 9, 13 & 14 26-YEAR CAPTURE ZONES & PCE-DOMINANT PLUME PARTICLE TRACKS

PREPARED FOR

GENESCO INC.

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FIGURE 3

DRAWN BY	SCALE	DATE	JOB NO.
MAW/CWW	AS SHOWN	05/15/2013	0097881.0008

R:\Scout\Projects\GENESCO\150 Fulton Avenue, NY\CAD\2012 Groundwater Modeling\2012 Model\2012-07 Memo - Figures\Draft\2013-05 Memo - Figure 3 - v01 (26YR-9, 13&14).dwg (05/15/2013 - 2:21pm Melville)

GARDEN CITY PARK
SUPPLY WELL No. 9
N-08409 (340'-400')

150 Fulton
Avenue Property

GARDEN CITY SUPPLY
WELL No. 9
N-03881 (426'-468')

LONG ISLAND RAILROAD
(HEMPSTEAD BRANCH)

GARDEN CITY SUPPLY
WELL Nos. 13 & 14
N-07058 (380'-440')
N-08339 (308'-358')

GARDEN CITY COUNTRY CLUB GOLF COURSE

FRANKLIN SQUARE
SUPPLY WELL Nos. 1 & 2
N-03603 (443'-493')
N-03604 (433'-483')

LEGEND

- TRICHLOROETHENE (TCE)– DOMINANT PLUME TOTAL VOLATILE ORGANIC CONCENTRATION GREATER THAN 100 ug/l
- TETRACHLOROETHENE (PCE)– DOMINANT PLUME TOTAL VOLATILE ORGANIC CONCENTRATION GREATER THAN 100 ug/l
- CIS 1, 2 DICHLOROETHENE– DOMINANT PLUME TOTAL VOLATILE ORGANIC CONCENTRATION GREATER THAN 100 ug/l
- 10 ug/l CONTOUR LINE
- 100 ug/l CONTOUR LINE
- 1,000 ug/l CONTOUR LINE
- VGC WELL 13 CAPTURE ZONE
- VGC WELL 14 CAPTURE ZONE
- PCE–DOMINANT PLUME PARTICLES CAPTURED BY VGC WELL NOS. 13 & 14

NOTE: THE AREAL EXTENT OF CHLORINATED VOLATILE ORGANIC COMPOUNDS DEPICTED IN THIS FIGURE IS BASED ON THE MAXIMUM CONCENTRATIONS DETECTED IN GROUND WATER SAMPLES OBTAINED FROM VERTICAL PROFILE TEMPORARY WELLS INSTALLED DURING 1999 – 2000, AND PERMANENT WELLS DURING SEPTEMBER 2001 – MAY 2005.

0 800 1600

GRAPHIC SCALE IN FEET

TITLE

GROUNDWATER FLOW MODEL OUTPUT
VGC SUPPLY WELL NOS. 13 & 14
TRANSIENT FLOW - 1,000 DAY DELAY
PCE-DOMINANT PLUME PARTICLE TRACKS

PREPARED FOR

GENESCO INC.

Environmental Resources Management

FIGURE 4

DRAWN BY	SCALE	DATE	JOB NO.
MCW	AS SHOWN	05/29/2013	0097881.0008

C:\temp\Z - To Be Sorted - 2013-02-19\Z - To Be Sorted OLD\GENESCO\2013-05 Memo - Figure 4 - v02 (1000 day delay, 13&14 Min Rate).dwg (05/29/2013 - 11:35am Melville)