GE
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Pittsfield, MA 01201
USA

Transmitted Via Overnight Courier

January 30, 2007

Mr. Richard Hull
U.S. Environmental Protection Agency
EPA New England
One Congress Street, Suite 1100
Boston, Massachusetts 02114-2023

Re: **GE-Pittsfield/Housatonic River Site**
Groundwater Management Area 2 (GECD320)
Groundwater Quality Monitoring Report for Fall 2006

Dear Mr. Hull:

In accordance with GE's approved *Groundwater Management Area 2 Groundwater Quality Interim Report for Spring 2006* (July 2006), enclosed is the *Groundwater Management Area 2 Supplemental Groundwater Quality Monitoring Report for Fall 2006.* This report summarizes activities performed as part of the Former Oxbows J and K Groundwater Management Area (GMA 2) groundwater quality monitoring program during fall 2006, including the results of the supplemental groundwater sampling and analysis round at GMA 2.

Please call Andrew Silfer or me if you have any questions regarding this report.

Sincerely,

Richard W. Gates

Richard W. Gates
Remediation Project Manager

Enclosure
V:\GE_Pittsfield_CD_GMA_2\Reports and Presentations\GW Qual Rpt Fall 2006\064711324Ltr.DOC

cc: Dean Tagliaferro, EPA
Rose Howell, EPA (CD-ROM)
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Groundwater Management Area 2 Supplemental Groundwater Quality Monitoring Report for Fall 2006

January 2007

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Groundwater Management Area 2 Supplemental Groundwater Quality Monitoring Report for Fall 2006

Fall 2006 GMA 2 Groundwater Quality Report

General Electric Company
Pittsfield, Massachusetts

Prepared for:
General Electric Company

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Our Ref.:
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Date:
January 2007

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Appendices

1. Introduction

1.1 General

On October 27, 2000, a Consent Decree (CD) executed in 1999 by the General Electric Company (GE), the United States Environmental Protection Agency (EPA), the Massachusetts Department of Environmental Protection (MDEP), and several other government agencies was entered by the United States District Court for the District of Massachusetts. The CD governs (among other things) the performance of response actions to address polychlorinated biphenyls (PCBs) and other hazardous constituents in soil, sediment, and groundwater in several Removal Action Areas (RAAs) located in or near Pittsfield, Massachusetts that collectively comprise the GE-Pittsfield/Housatonic River Site (the Site). For groundwater and non-aqueous-phase liquid (NAPL), the RAAs at and near the GE Pittsfield facility have been divided into five separate Groundwater Management Areas (GMAs), which are illustrated on Figure 1. These GMAs are described, together with the Performance Standards established for the response actions at and related to them, in Section 2.7 of the Statement of Work for Removal Actions Outside the River (SOW) (Appendix E to the CD), with further details presented in Attachment H to the SOW (Groundwater/NAPL Monitoring, Assessment, and Response Programs). This report relates to the Former Oxbows J and K Groundwater Management Area, also known as and referred to herein as GMA 2.

In February 2001, GE submitted a Baseline Monitoring Program Proposal for Former Oxbow Areas J and K Groundwater Management Area (GMA 2 Baseline Monitoring Proposal). EPA provided conditional approval of the GMA 2 Baseline Monitoring Proposal by letter of September 6, 2001. Thereafter, certain modifications were made to the GMA 2 baseline monitoring program as a result of EPA approval conditions and/or findings during field reconnaissance of the selected monitoring locations and, subsequently, during implementation of the baseline monitoring program.

The baseline monitoring program, which was initiated in spring 2002, consisted of four semi-annual groundwater quality sampling events (with intervening quarterly groundwater elevation monitoring) followed by preparation and submittal of reports summarizing the groundwater monitoring results and, as appropriate, proposing modifications to the monitoring program. The fourth baseline monitoring report for GMA 2, entitled Groundwater Management Area 2 Baseline Groundwater Quality Interim Report for Fall 2003 (Fall 2003 GMA 2 Groundwater Quality Report), was submitted to EPA on January 30, 2004. Section 6.1.3 of Attachment H to the SOW provides that if the two-year "baseline" period ends prior to the completion of soil-related response actions at all the

RAAs in a GMA, GE may make a proposal to EPA to modify and/or extend the Baseline Monitoring Program based on the results of the initial assessment and the estimated timing of future response actions at the RAAs in the GMA. The approved GMA 2 Baseline Monitoring Proposal also allows GE to propose a modification and/or extension of the baseline monitoring program based on the results of the initial assessment and the estimated timing of future response actions. Therefore, the Fall 2003 GMA 2 Groundwater Quality Report contained a proposal to modify and extend baseline groundwater quality monitoring activities at GMA 2 (under a program referred to as the interim monitoring program) until such time as the soil-related Removal Actions at the GMA 2 RAA are completed and the specific components of a long-term groundwater quality monitoring program are determined. EPA conditionally approved the Fall 2003 GMA 2 Groundwater Quality Report by letter dated May 13, 2004. Under the approved interim monitoring program, annual water quality sampling (alternating between the spring and fall seasons) and semi-annual water level monitoring at selected GMA 2 wells were initiated in spring 2004. In addition to the wells sampled under the approved interim monitoring program, a fourth round of baseline sampling was also performed at two GMA 2 wells at which four complete rounds of sampling had not yet been completed during the two-year baseline monitoring period.

As part of the interim groundwater quality monitoring program, GE is required to submit reports after each groundwater sampling event to summarize the groundwater monitoring results and related activities and, as appropriate, propose modifications to the monitoring program. The results of the previous round of interim groundwater sampling activities, performed at this GMA in spring 2006 were provided in GE's July 2006 Groundwater Management Area 2 Groundwater Quality Interim Report for Spring 2006 (Spring 2006 GMA 2 Groundwater Quality Report), which was conditionally approved by EPA in a letter dated November 16, 2006. That report proposed to perform supplemental sampling activities in fall 2006 at one monitoring well (GMA2-1) where anomalous concentrations of PCBs were detected in spring 2006.

The results of the supplemental groundwater sampling activities conducted in fall 2006 are provided in this Groundwater Management Area 2 Supplemental Groundwater Quality Monitoring Report for Fall 2006 (Fall 2006 GMA 2 Groundwater Quality Report).

1.2 Background Information

GMA 2 encompasses the Former Oxbow Areas J and K RAA, comprised of approximately 8.5 acres adjacent to the Housatonic River, located approximately 2,500 feet upstream of the Newell Street Bridge (Figures 1 and 2. This GMA contains a combination of non-GE-owned commercial areas, residential properties, and recreational areas. Certain portions of this GMA originally consisted of land associated with oxbows or low-lying areas of the Housatonic River. As shown on Figure 1 and 2, the Housatonic River flows through the central portion of this GMA, separating the two Former Oxbow Areas J and K. Rechannelization and straightening of the Housatonic River in the early 1940s by the City of Pittsfield and the United States Army Corps of Engineers (USACE) separated several such oxbows and low-lying areas from the active course of the river. These oxbows and low-lying areas were subsequently filled with various materials from a variety of sources, resulting in the current surface elevations and topography.

Former Oxbow Area J encompasses an area of approximately 6 acres located north of the Housatonic River, south of East Street, and between Fasce Street and Commercial Street. Commercial businesses occupy a portion of this area along East Street. The west side of this portion of GMA 2 consists of a wooded recreational area and footpath, and the rights-of-way for undeveloped Longview Terrace and Zeno Street. The remainder of Former Oxbow Area J contains commercial properties and small, wooded recreational areas.

Former Oxbow Area K encompasses an area of approximately 2.5 acres south of the Housatonic River, across from the eastern portion of Former Oxbow Area J and generally to the northeast of Ventura Avenue. This area consists of a large open field on the south side of the river, and the right-of-way for Longview Terrace. The majority of this generally flat area is undeveloped and covered with grass and low brush. However, residential properties occupy a portion of this area along Ventura Avenue.

Groundwater flow patterns at GMA 2 generally reflect the topography of the site with flow generally towards the Housatonic River. Figure 3 illustrates groundwater elevation contours developed from data collected during the fall 2006 semi-annual monitoring round. The groundwater elevation data utilized to prepare this figure is provided in Table 2 and Appendix A. The groundwater elevations and flow direction depicted on Figure 3 display a pattern consistent with prior monitoring rounds conducted within GMA 2. A relatively steep groundwater gradient is observed at the northeast corner of the Former Oxbow J Area as a result of a change in topography between well OJ-MW-1 and wells GMA2-7 and OJ-MW-2. The hydraulic head gradually decreases toward the Housatonic

River, corresponding to a general decrease in the ground surface topography. As expected, the direction of groundwater flow along the north and south river banks is toward the Housatonic River. However, it should be noted that periodic flow reversals have been observed along the river banks during certain prior monitoring events. These flow reversals are likely short-term in nature due to rapidly rising river conditions and limited to bank areas adjacent to the river, where the direction of groundwater flow may be away from the river across portions of the river banks.

As discussed in Section 1.1 above, the CD and the SOW provide for the performance of groundwater-related Removal Actions at the GMAs, including the implementation of groundwater monitoring, assessment, and recovery programs. In general, these programs consist of a baseline monitoring program conducted over a period of at least two years to establish existing groundwater conditions and a long-term monitoring program performed to assess groundwater conditions over time and to verify the attainment of the Performance Standards for groundwater. As set forth in the GMA 2 Baseline Monitoring Proposal and subsequent addenda, the baseline monitoring program at this GMA involved a total of 12 monitoring wells. Under the baseline monitoring program, groundwater elevations were measured at these wells and a river staff gauge on a quarterly basis, while 11 of the wells were sampled on a semi-annual basis for analysis of PCBs and/or certain non-PCB constituents listed in Appendix IX of 40 CFR Part 264, plus three additional constituents -- benzidine, 2-chloroethylvinyl ether, and 1,2-diphenyhydrazine (Appendix IX+3). The specific groundwater quality parameters for each individual well were selected based on the monitoring objectives of the well. Monitoring for the presence of NAPL is also performed as part of the routine groundwater elevation monitoring activities at this GMA. However, no NAPL has been observed within any of the monitoring wells in GMA 2.

After the fourth baseline sampling event at most of the wells in GMA 2 in fall 2003, GE proposed that an interim groundwater monitoring program be performed until the soil-related Removal Actions at this RAA are complete. As subsequently modified and as approved by EPA, this interim monitoring program for GMA 2 currently consists of annual sampling (beginning in spring 2004 and alternating between the spring and fall seasons) performed at three monitoring wells for select constituents where analytical results from the baseline monitoring rounds did not conclusively indicate whether long-term monitoring would be necessary. Semi-annual groundwater elevation measurement is also performed at each of the original baseline monitoring program wells and at a surface water gauge located on the Housatonic River.

Since the spring 2004 groundwater sampling event, GE has presented the results of each sampling event in interim groundwater quality monitoring reports and, based on those results, has proposed and implemented modifications to the interim program following EPA approval. The most recent interim groundwater sampling event took place in spring 2006 and soil related Removal Actions were completed at the Former Oxbow Areas J and K RAA in summer 2006.

During GE's spring 2006 sampling, however, the level of filtered PCBs in well GMA2-1 showed an anomalous apparent increase over the levels previously detected in that well in recent sampling events. Therefore, in the Spring 2006 GMA 1 Groundwater Quality Report, GE proposed to further assess the concentrations of PCBs observed at that well in spring 2006 by sampling the well again during fall 2006 and analyzing filtered samples for PCBs. EPA approved that supplemental sampling proposal as part of its conditional approval of the Spring 2006 GMA 1 Groundwater Quality Report and also added a requirement that GE conduct an additional supplemental sampling round at well GMA2-1 in spring 2007 prior to preparing a Baseline Assessment Final Report and Long-Term Monitoring Program Proposal for GMA 2. The results of the fall 2006 supplemental sampling are presented in this report.

1.3 Format of Document

The remainder of this report is presented in four sections. Section 2 describes the groundwater quality-related activities performed at GMA 2 in fall 2006. Section 3 presents the analytical results obtained during the supplemental sampling event performed November 7, 2006, and provides an assessment of the results, including a comparison to the applicable groundwater quality Performance Standards identified in the CD and SOW. Finally, Section 4 summarizes the additional supplemental groundwater sampling activities scheduled for spring 2007, and presents the schedule for future field and reporting activities related to groundwater quality at GMA 2.

2. Field and Analytical Procedures

2.1 General

As noted above, during fall 2006, GE conducted supplemental sampling activities involving the collection and analysis of groundwater samples at one monitoring well within GMA 2. The construction details of that well are provided in Table 1 and the fall 2006 field sampling data are presented in Appendix B. This section discusses the field procedures used to collect groundwater samples and the methods used to analyze the samples. All activities were performed in general accordance with GE's approved Field Sampling Plan/Quality Assurance Project Plan (FSP/QAPP).

2.2 Groundwater Elevation Monitoring

Groundwater elevation monitoring for fall 2006 was performed on October 26, 2006, except for two wells (GMA2-5 and GMA2-9) which could not be accessed on that date due to property access limitations. Those two wells were monitored the following day. The fall 2006 groundwater elevation monitoring involved measurement of groundwater levels at each of the 12 wells listed in Table 2 and at the Housatonic River staff gauge. In addition, the groundwater elevation in well GMA2-1 was monitored on the day the well was sampled. River elevations were monitored on a monthly basis. A summary of all groundwater and river elevation monitoring data collected since spring 2006 is provided in Appendix A. In addition, monitoring for the potential presence of NAPL was performed at each well where groundwater elevations were measured. No NAPL was observed during these monitoring events or any of the previous monitoring events at GMA 2.

The groundwater elevation data were used to prepare a groundwater elevation contour map for fall 2006 (Figure 3). As shown on this figure and described in Section 1.2 above, the fall 2006 groundwater elevations and flow direction are fairly consistent with previous seasons. Specifically, the groundwater flow direction along the areas north and south of the river banks is generally toward the Housatonic River, with slight variations corresponding to surface topography.

2.3 Groundwater Sampling and Analysis

The fall 2006 supplemental sampling event was performed on November 7, 2006. As shown in Table 1, groundwater samples were collected from one groundwater monitoring well. Well construction information for all of the monitoring wells at GMA 2 is also included in Table 1.

Low-flow sampling techniques, using a bladder pump, were utilized for purging the wells and collection of groundwater samples during this sampling event. The monitoring well was purged utilizing low-flow sampling techniques until field parameters (including temperature, pH, specific conductivity, oxidation-reduction potential, dissolved oxygen, and turbidity) stabilized. Field parameters were measured in combination with the sampling activities at the monitoring wells. The field parameter measurements and other field sampling data are provided in Appendix B. A summary of the stabilized field measurement results from well GMA2-1 during the fall 2006 monitoring event is provided below:

Parameter	Units	Stabilized Reading
Turbidity	Nephelometric turbidity units (NTU)	1
pH	pH units	7.40
Specific Conductivity	Millisiemens per centimeter	1.166
Oxidation-Reduction Potential	Millivolts	7.6
Dissolved Oxygen	Milligrams per liter	0.72
Temperature	Degrees Celsius	12.09

As shown above, for this sampling event, the final groundwater turbidity level was well below the target turbidity level of 50 NTU. These results indicate that the sampling and measurement procedures utilized during this sampling event were effective in obtaining groundwater samples with low turbidity.

The collected groundwater samples were submitted to SGS Environmental Services, Inc. of Wilmington, North Carolina (SGS) for laboratory analysis. The groundwater samples were filtered and analyzed for PCBs using EPA Method 8082. In addition, to provide additional data to support a laboratory comparison initiated by GE at GMA 4 (described in a letter to EPA dated November 7, 2006), split samples were also sent to Northeast

Analytical of Schenectady, New York (NEA) for analysis. However, those samples were damaged during shipping and no analyses were performed.

The results of the analyses performed are discussed in Section 3.

Following receipt of the analytical data from the laboratory, the preliminary results were reviewed for completeness and compared to the Massachusetts Contingency Plan (MCP) Method 1 GW-3 standards, and to the MCP Upper Concentration Limits (UCLs) for groundwater. As no GW-2 wells were sampled in fall 2006, no comparison to GW-2 standards was performed. The preliminary analytical results were presented in the next monthly report on overall activities at the GE-Pittsfield/Housatonic River Site.

Finally, the data were validated in accordance with the FSP/QAPP and the validated results were utilized in the preparation of this report. The data validation report is provided in Appendix D. As discussed in the validation report, 100% of the fall 2006 groundwater quality data are considered to be useable. The validated analytical results are summarized and discussed in Section 3 below.

3. Groundwater Analytical Results

3.1 General

A description of the fall 2006 groundwater analytical results is presented in this section. An assessment of these results relative to the applicable GW-3 groundwater quality Performance Standards established in the CD and SOW and the MCP UCL for PCBs in groundwater is also provided.

3.2 Fall 2006 Groundwater Sample Results

Filtered groundwater samples were collected from one monitoring well (GMA2-1) and analyzed for PCBs as part of the fall 2006 supplemental sampling event. The PCB analytical results are provided in Table 3 (that table also provides comparisons to the MCP Method 1 GW-3 standards and with the UCLs for groundwater specified in the MCP (310 CMR 40.0996(7)), as discussed below). No PCBs were detected in the filtered sample or a duplicate sample collected from well GMA2-1. The analytical detection limit was below both the Performance Standard for this well (the MCP Method 1 GW-3 standard of 0.0003 ppm for PCBs) and the UCL for PCBs in groundwater of 0.005 ppm.

3.3 Overall Assessment of Groundwater Analytical Results

The information presented herein is based on the laboratory results obtained during the fall 2006 groundwater sampling event, supplemented with historical groundwater analytical data. A graph illustrating historical total filtered PCB concentrations for the well that was sampled in fall 2006 is presented in Appendix C. A review of the graph contained in Appendix C indicates that the non-detection of filtered PCBs at well GMA2-1, is more consistent with the prior filtered PCB data than the data from the previous sampling event, where elevated concentrations were observed. These results suggest that the spring 2006 results from these wells may have been anomalous (including the duplicate filtered PCB result from that sampling round, which was significantly greater than the original sample result collected at the same time), although lesser exceedances of the Method 1 GW-3 standard for PCBs have been observed at this location during prior monitoring events. To further evaluate PCB concentrations at this location, GE will

conduct an additional supplemental monitoring round at well GMA2-1 in spring 2007, pursuant to EPA's November 16, 2006 conditional approval letter.

4. Schedule of Future Activities

4.1 General

In spring 2004, GE initiated the interim groundwater monitoring program to be conducted until completion of the soil-related Removal Actions at the RAA that comprises GMA 2. Aside from completing baseline sampling events at certain locations that could not be sampled during every round of the initial two-year baseline monitoring program (which was accomplished), the interim monitoring program is designed to obtain additional data from locations where it is not yet clear whether the initial baseline groundwater quality results indicate that the well may require future monitoring in a long-term monitoring program.

The soil-related Removal Actions at the Former Oxbow Areas J & K RAA were completed in summer 2006. As required in EPA's November 16, 2006 conditional approval letter, GE will conduct one additional supplemental sampling event at this GMA prior to preparing a Baseline Assessment Final Report and Long-Term Monitoring Program Proposal for GMA 2.

This section addresses the schedule for future groundwater quality monitoring activities and reporting for GMA 2. Specifically, this section provides a schedule for the supplemental sampling event for spring 2007 and associated reporting activities.

4.2 Field Activities Schedule

As required by EPA, GE will conduct a supplemental sampling event at well GMA2-1 in March 2007. Filtered groundwater samples from this well will be collected and analyzed for PCBs. The groundwater sampling and analysis and methods and procedures will continue to be consistent with those used in the baseline groundwater quality monitoring program and GE's approved Field Sampling Plan/Quality Assurance Project Plan (FSP/QAPP).

In conjunction with that supplemental sampling event, GE will conduct a round of groundwater elevation monitoring at all of the GMA 2 monitoring wells and the surface water staff gauge. Groundwater elevation data will be collected from all locations on a single day, to the extent practical. GE will also continue to monitor river elevations on a monthly basis in spring 2007.

Prior to performance of these field activities, GE will provide EPA with 7 days advance notice to allow the assignment of oversight personnel.

4.3 Reporting Schedule

GE will continue to provide the results of preliminary groundwater analytical data in its monthly reports on overall activities at the GE-Pittsfield/Housatonic River Site.

GE will submit a Baseline Assessment Final Report and Long-Term Monitoring Program Proposal for GMA 2 within 75 days of the receipt of final laboratory data packages from the spring 2007 supplemental sampling event, in accordance with the reporting schedule approved by EPA. That report will present the final, validated spring 2007 supplemental sampling results and a brief discussion of the results. In addition, that report will provide an assessment of the overall baseline monitoring data set, including:

- An update of the current understanding of hydrogeologic conditions and the extent of contamination, including a statistical assessment of the "baseline" data and other historical data, if appropriate, and a comparison to the Performance Standards
- An evaluation of the spatial distribution of constituents within the GMA and the actual migration or potential for migration of such constituents outside the GMA, including an evaluation of groundwater travel time to any receptor (e.g., surface water body/building)
- Identification of the presence or potential presence of previously unidentified sources of groundwater contamination
- An assessment of the adequacy of the selected monitoring locations
- A re-assessment of the constituents, locations, and frequencies to be subject to future monitoring
- Identification of areas where the GW-2 Performance Standards apply in addition to the GW-3 Performance Standards

- Identification of the specific wells to be used to measure compliance with the NAPL, GW-2 and GW-3 Performance Standards

- An evaluation of variations in groundwater quality from event to event to identify and assess sampling data variability and potential causes for the variability, including seasonal influences

- An evaluation of the need for follow-up investigations or assessments, interim response actions, or NAPL recovery modifications/additions

- A statement of the basis for GE's proposal to EPA for approval of a Long-Term Monitoring Program and/or additional actions.

Finally, that report will propose a long-term groundwater quality monitoring program for GMA 2, including:

- The specific areas subject to the monitoring along with the supporting rationale

- The sentinel, natural attenuation, and/or perimeter monitoring locations, along with the supporting rationale

- The schedule for plan implementation, including reporting

- The frequency of future monitoring events

- The constituents to be subject to analysis

- Descriptions of statistical techniques to be employed

- Proposal for any additional investigations or assessments, interim response actions, or NAPL recovery modifications/additions, including any proposal for risk-based alternative GW-2 or GW-3 Performance Standards; and

- An outline of the Monitoring Event Evaluation Report.

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Tables

Table 1
Monitoring Well Construction

Groundwater Management Area 2
Supplemental Groundwater Quality Monitoring Report For Fall 2006
General Electric Company - Pittsfield, Massachusetts

Well Number	Monitoring Well Usage	Survey Coordinates		Well Diameter (inches)	Ground Surface Elevation (feet AMSL)	Measuring Point Elevation (feet AMSL)	Depth to Top of Screen (feet BGS)	Screen Length (feet)	Top of Screen Elevation (feet AMSL)	Base of Screen Elevation (feet AMSL)
		Northing	Easting							
GMA2-1	GW-3 Perimeter	534402.60	135510.20	2.00	988.30	991.36	13.80	10.00	974.50	964.50
GMA2-2	GW-2 Sentinel/GW-3 Perimeter	534264.30	135725.00	2.00	988.10	991.19	12.94	10.00	975.16	965.16
GMA2-3	GW-2 Sentinel	534303.30	135295.50	2.00	991.59	991.48	8.59	10.00	983.00	973.00
GMA2-4	GW-3 Perimeter	534167.60	135730.00	2.00	980.30	983.41	5.20	10.00	975.10	965.10
GMA2-5	GW-2 Sentinel/GW-3 Perimeter	533956.60	135712.80	2.00	986.11	985.85	5.98	10.00	980.13	970.13
GMA2-6	GW-3 Perimeter	534296.40	135526.00	2.00	986.30	989.73	10.13	10.00	976.17	966.17
GMA2-7	GW-3 Perimeter	534452.30	136034.50	2.00	989.84	989.64	8.49	10.00	981.35	971.35
GMA2-8	GW-3 Perimeter	534235.50	135923.10	2.00	978.70	982.30	4.00	10.00	974.70	964.70
GMA2-9	GW-3 Perimeter	534006.00	135431.40	2.00	978.10	981.29	4.00	10.00	974.10	964.10
J-1R	GW-3 Perimeter	534035.60	135266.60	2.00	988.61	988.25	11.55	10.00	977.06	967.06
OJ-MW-1	Groundwater Elevation Monitoring Only	534463.40	136305.70	1.00	994.68	994.47	9.30	10.00	985.38	975.38
OJ-MW-2	GW-2 Sentinel/GW-3 Perimeter	534318.38	136180.30	1.00	991.90	991.64	9.60	10.00	982.30	972.30
Staff Gauge	Surface Water Elevation Monitoring Only	--	--	--	--	989.82	--	--	--	--

Notes:

1. Supplemental samples were collected from well GMA2-1 in fall 2006 and analyzed for PCBs (filtered analysis).

The remaining wells and staff gauge were utilized for groundwater and surface water elevation monitoring only.

2. feet AMSL = feet above mean sea level.

3. feet BGS = feet below ground surface.

4. -- indicates that a value does not apply.

Table 2
Groundwater Elevation Data - Fall 2006

Groundwater Management Area 2
Supplemental Groundwater Quality Monitoring Report For Fall 2006
General Electric Company - Pittsfield, Massachusetts

Well Number	Location	Fall 2006 [1] Groundwater Elevation
GMA2-1	Oxbow Area J	976.01
GMA2-2	Oxbow Area J	974.02
GMA2-3	Oxbow Area J	977.00
GMA2-4	Oxbow Area K	974.65
GMA2-5	Oxbow Area K	976.35
GMA2-6	Oxbow Area J	974.85
GMA2-7	Oxbow Area J	975.17
GMA2-8	Oxbow Area K	974.22
GMA2-9	Oxbow Area K	973.86
J-1R	Oxbow Area J	973.66
OJ-MW-1	Oxbow Area J	982.32
OJ-MW-2	Oxbow Area J	978.60
Staff Gauge [2]	Housatonic River	970.26

Notes:

1. Fall 2006 Groundwater elevation data collected on 10/26-27/2006.

2. River elevation was measured on 10/26/2006.

Table 3
Fall 2006 Groundwater Analytical Results

Groundwater Management Area 2
Supplemental Groundwater Quality Monitoring Report For Fall 2006
General Electric Company - Pittsfield, Massachusetts
(Results are presented in parts per million, ppm)

Parameter / Sample ID: / Date Collected:	Method 1 GW-3 Standards	MCP UCL for GroundWater	GMA2-1 11/07/06
PCBs-Filtered			
Aroclor-1016	Not Listed	Not Listed	ND(0.00011) J [ND(0.00011) J]
Aroclor-1221	Not Listed	Not Listed	ND(0.00011) J [ND(0.00011) J]
Aroclor-1232	Not Listed	Not Listed	ND(0.00011) J [ND(0.00011) J]
Aroclor-1242	Not Listed	Not Listed	ND(0.00011) J [ND(0.00011) J]
Aroclor-1248	Not Listed	Not Listed	ND(0.00011) J [ND(0.00011) J]
Aroclor-1254	Not Listed	Not Listed	ND(0.00011) J [ND(0.00011) J]
Aroclor-1260	Not Listed	Not Listed	ND(0.00011) J [ND(0.00011) J]
Total PCBs	0.0003	0.005	ND(0.00011) J [ND(0.00011) J]

Notes:
1. Samples were collected by by ARCADIS BBL, and submitted to SGS Environmental Services, Inc. for analysis of PCBs (filtered).
2. Samples have been validated as per Field Sampling Plan/Quality Assurance Project Plan (FSP/QAPP), General Electric Company, Pittsfield, Massachusetts, Blasland Bouck & Lee, Inc. (approved May 29, 2004 and resubmitted June 19, 2004).
3. ND - Analyte was not detected. The number in parenthesis is the associated detection limit.
4. Field duplicate sample results are presented in brackets.

Data Qualifiers:

J - Indicates that the associated numerical value is an estimated concentration.

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Figures

LEGEND:

GMA1	GMA 1–PLANT SITE 1
GMA2	GMA 2–FORMER OXBOWS J&K
GMA3	GMA 3–PLANT SITE 2
GMA4	GMA 4–PLANT SITE 3
GMA5	GMA 5–FORMER OXBOWS A&C

NOTES:

1. MAPPING IS BASED ON AERIAL PHOTOGRAPHS AND PHOTOGRAMMETRIC MAPPING BY LOCKWOOD MAPPING, INC. – FLOWN IN APRIL 1990; DATA PROVIDED BY GENERAL ELECTRIC COMPANY; AND BLASLAND & BOUCK ENGINEERS, P.C. CONSTRUCTION PLANS.
2. NOT ALL PHYSICAL FEATURES SHOWN.
3. SITE BOUNDARIES/LIMITS ARE APPROXIMATE.

0 500' 1000'
APPROXIMATE SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

GMA 2 INTERIM MONITORING PROGRAM

GROUNDWATER MANAGEMENT AREAS

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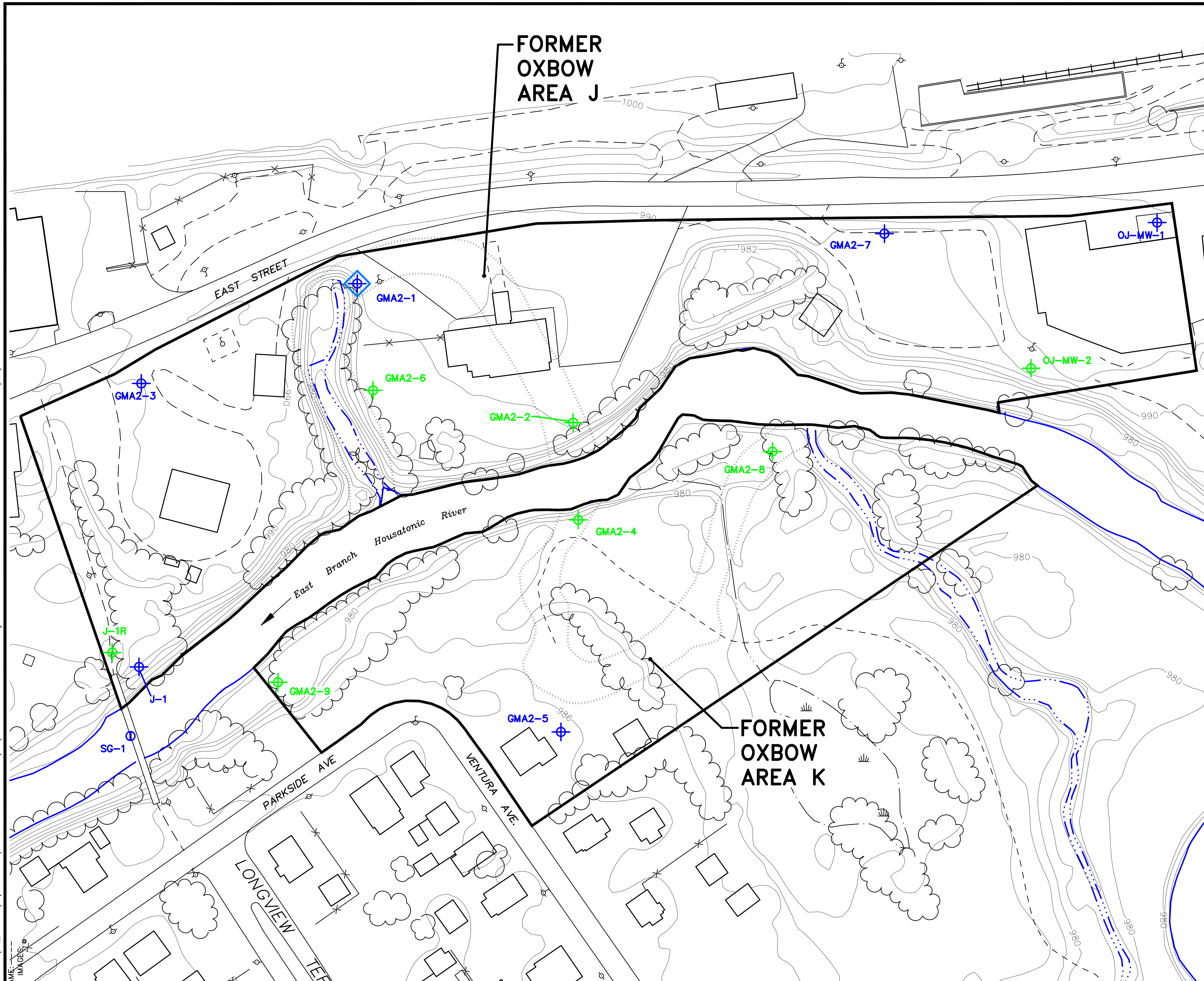
infrastructure, environment, facilities

FIGURE
1

SYR-85-NES PGL RGB LAYERS: ON=*, OFF=*REF*, GW-GEN
G:\CAD\GE-CAD\GE_ACTIVE\WA\30154004\30154B10.DWG SAVED:1/29/2007 4:28 PM LAYOUT:Layout1 PAGESETUP:---- PENTABLE:PLTFULL.CTB PRINTED:1/29/2007 4:32 PM BY:RBASSETT
PROJECTNAME:----
XREFS: IMAGES:



LEGEND:

- GMA 2 BOUNDARY
- FORMER OXBOW/LOW-LYING AREA
- FENCE
- OR MONITORING WELL
- STAFF GAUGE
- GW-3 PERIMETER WELLS SAMPLED FALL 2006
- GW-3 COMPLIANCE POINT

NOTES:

1. MAPPING IS BASED ON AERIAL PHOTOGRAPHS AND PHOTOGRAMMETRIC MAPPING BY LOCKWOOD MAPPING, INC. FLOWN IN APRIL 1990; DATA PROVIDED BY GENERAL ELECTRIC COMPANY AND BLASLAND AND BOUCK ENGINEERS, P.C. CONSTRUCTION PLANS.
2. FORMER RIVER CHANNEL AND LOWLAND AREAS DELINEATED USING THE CITY OF PITTSFIELD'S RECHANNELIZATION MAPPING, 1940.
3. NOT ALL PHYSICAL FEATURES SHOWN.
4. SITE PROPERTY BOUNDARIES ARE APPROXIMATE.
5. ALL MONITORING WELL LOCATIONS ARE APPROXIMATE.

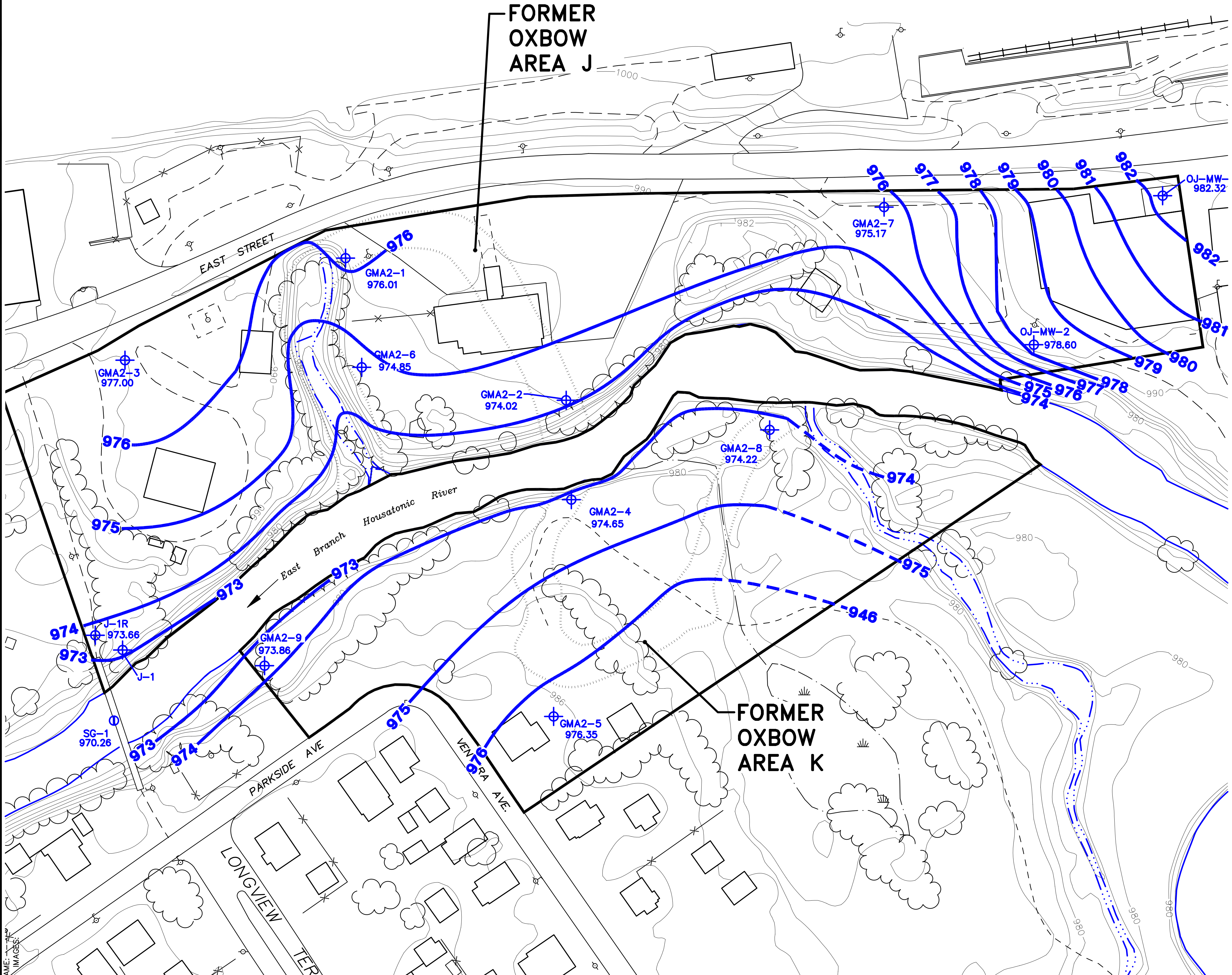
0 100' 200'
GRAPHIC SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD MASSACHUSETTS
GMA 2 INTERIM MONITORING PROGRAM

MONITORING WELL LOCATIONS

ARCADIS BBL
Infrastructure, environment, facilities

FIGURE
2



LEGEND:

- GMA 2 BOUNDARY
- FORMER OXBOW/LOWLAND AREAS
- FENCE
- MONITORING WELL
- STAFF GAUGE
- 975.17 GROUNDWATER ELEVATION (FT AMSL)
- 976 GROUNDWATER ELEVATION CONTOUR (FT AMSL), DASHED WHERE INFERRED

NOTES:

1. MAPPING IS BASED ON AERIAL PHOTOGRAPHS AND PHOTOGRAMMETRIC MAPPING BY LOCKWOOD MAPPING, INC. FLOWN IN APRIL 1990; DATA PROVIDED BY GENERAL ELECTRIC COMPANY AND BLASLAND AND BOUCK ENGINEERS, P.C. CONSTRUCTION PLANS.
2. FORMER RIVER CHANNEL AND LOWLAND AREAS DELINEATED USING THE CITY OF PITTSFIELD'S RECHANNELIZATION MAPPING, 1940.
3. NOT ALL PHYSICAL FEATURES SHOWN.
4. SITE PROPERTY BOUNDARIES ARE APPROXIMATE.
5. ALL MONITORING WELL LOCATIONS ARE APPROXIMATE.
6. GROUNDWATER AND RIVER LEVEL MEASUREMENTS OBTAINED OCTOBER 26–27, 2006.

0 100' 200'

GRAPHIC SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD MASSACHUSETTS

GMA 2 INTERIM MONITORING PROGRAM

WATER-TABLE CONTOUR MAP - FALL 2006

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Infrastructure, environment, facilities

FIGURE **3**

SYR-85-NES PGL RCB LAYERS: ON=*, OFF=*REF*, |BLD-SH, |FLOOD, |FORMER-HATCH, |FORMERCHANNEL, |FORMERCHANNEL-SHADE
G:\CAD\GE-CAD\GE_ACTIVE\N\30154004\30154W14.DWG SAVED:1/29/2007 5:11 PM LAYOUT: Layout1 PAGESETUP: ---- PENTABLE: PLTFULL.CTB PRINTED:1/29/2007 5:11 PM BY: RBASSETT
PROJECTNAME: ---- IMAGES: XREFS: 30154X01

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Appendices

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Appendix A

Groundwater Elevation
Monitoring Data

Appendix A
Groundwater Elevation Monitoring Data

Groundwater Management Area 2
Supplemental Groundwater Quality Monitoring Report For Fall 2006
General Electric Company - Pittsfield, Massachusetts

Well Name	Measuring Point Elev (Ft.)	Date	Depth to Water (feet BMP)	Corrected Water Elev. (feet)
Former Oxbow Area J				
GMA 2-1	991.36	10/26/2006	15.35	976.01
GMA 2-1	991.36	11/7/2006	15.36	976.00
GMA 2-2	991.19	10/26/2006	17.17	974.02
GMA 2-3	991.48	10/26/2006	14.48	977.00
GMA 2-6	989.73	10/26/2006	14.88	974.85
GMA 2-7	989.64	10/26/2006	14.47	975.17
J-1R	988.25	10/26/2006	14.59	973.66
MW-1	994.47	10/26/2006	12.15	982.32
MW-2	991.64	10/26/2006	13.04	978.60
Former Oxbow Area K				
GMA 2-4	983.41	10/26/2006	8.76	974.65
GMA 2-5	985.85	10/27/2006	9.50	976.35
GMA 2-8	982.30	10/26/2006	8.08	974.22
GMA 2-9	981.29	10/27/2006	7.43	973.86
Housatonic River (Foot Bridge)				
GMA2-SG-1	989.82	7/18/2006	17.06	972.76
GMA2-SG-1	989.82	8/30/06	17.08	972.74
GMA2-SG-1	989.82	9/19/2006	17.15	972.67
GMA2-SG-1	989.82	10/26/2006	19.56	970.26
GMA2-SG-1	989.82	11/28/2006	16.94	972.88
GMA2-SG-1	989.82	12/20/2006	16.97	972.85

Notes:
1. ft BMP - feet Below Measuring Point.
2. NA indicates 3.
3. A survey reference point was established on the Oxbow J & K foot bridge for staff gauge GMA2-SG-1. The "Depth to Water" value(s) provided in the above table refer to the vertical distance from the surveyed reference point to the water surface.

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Appendix B

Field Sampling Data

GROUNDWATER SAMPLING LOG

Well No. GMA2-1
Key No. FX-37
PID Background (ppm) 0.0
Well Headspace (ppm) 0.0

Site/GMA Name GE/GMA2
Sampling Personnel SWO/MM
Date 11/7/2006
Weather Cool, Hazy

WELL INFORMATION

Reference Point Marked? (Y) N
Height of Reference Point 2.35' Meas. From Grade
Well Diameter 2"
Screen Interval Depth 3.8-23.8' Meas. From BGS
Water Table Depth 15.36' Meas. From TIC
Well Depth 26.97' Meas. From TIC
Length of Water Column 11.61'
Volume of Water in Well 1.90 gallon
Intake Depth of Pump/Tubing 20.15' Meas. From TIC

Reference Point Identification:
TIC: Top of Inner (PVC) Casing
TOC: Top of Outer (Protective) Casing
Grade/BGS: Ground Surface

Redevelop? Y (N)

Sample Time 1100
Sample ID GMA2-1
Duplicate ID GMA2-BlindDup
MS/MSD GMA2-1-MS/MSD
Split Sample ID —

Required	Analytical Parameters:	Collected
( )	VOCs (Std. list)	( )
( )	VOCs (Exp. list)	( )
( )	SVOCs	( )
(X)	PCBs (Total)	(X)
( )	PCBs (Dissolved)	( )
( )	Metals/Inorganics (Total)	( )
( )	Metals/Inorganics (Dissolved)	( )
( )	EPA Cyanide (Dissolved)	( )
( )	PAC Cyanide (Dissolved)	( )
( )	PCDDs/PCDFs	( )
( )	Pesticides/Herbicides	( )
( )	Natural Attenuation	( )
( )	Other (Specify)	( )

EVACUATION INFORMATION

Pump Start Time 940
Pump Stop Time ~~1058~~ 11:25
Minutes of Pumping ~~28~~ 105
Volume of Water Removed ~~[illegible]~~ 5.5 gallons
Did Well Go Dry? Y (N)

Evacuation Method: Bailer ( ) Bladder Pump (X)
Peristaltic Pump ( ) Submersible Pump ( ) Other/Specify ( )
Pump Type: Marschalk-System One
Samples collected by same method as evacuation? (Y) N (specify)

Water Quality Meter Type(s) / Serial Numbers: YSI-556 MPS, Hach 2100P Turbidimeter

Time	Pump Rate (L/min.)	Total Gallons Removed	Water Level (ft TIC)	Temp. (Celsius) [3%]*	pH [0.1 units]*	Sp. Cond. (mS/cm) [3%]*	Turbidity (NTU) [10% or 1 NTU]*	DO (mg/l) [10% or 0.1 mg/l]*	ORP (mV) [10 mV]*
1000	200	1.06	15.55	12.00	6.91	1.149	18	5.02	165.6
1005		1.32	15.58	12.16	7.10	1.154	9	2.95	147.3
1010		1.59	15.58	12.06	7.20	1.158	6	2.69	122.9
1013		1.74	15.60	12.12	7.23	1.159	5	2.15	107.9
1016		1.90	15.60	12.08	7.28	1.163	4	2.30	87.6
1019		2.06	15.60	12.03	7.28	1.164	3	2.55	76.9
1022		2.21	15.60	12.03	7.30	1.164	3	1.80	68.4
1025		2.38	15.60	12.12	7.32	1.164	2	1.70	56.3

* The stabilization criteria for each field parameter (three consecutive readings collected at 3- to 5-minute intervals) is listed in each column heading.

OBSERVATIONS/SAMPLING METHOD DEVIATIONS No apparent odor, rust suspended in water

SAMPLE DESTINATION

Laboratory: SGS/NEA
Delivered Via: UPS
Airbill #: —

Field Sampling Coordinator: [signature]

GROUNDWATER SAMPLING LOG

Well No. GMA2-1

Site/GMA Name GE/GMA2
Sampling Personnel SWO/MM
Date 11/7/2006
Weather Cool, Hazy

WELL INFORMATION - See Page 1

Time	Pump Rate (L/min.)	Total Gallons Removed	Water Level (ft TIC)	Temp. (Celsius) [3%]*	pH [0.1 units]*	Sp. Cond. (mS/cm) [3%]*	Turbidity (NTU) [10% or 1 NTU]*	DO (mg/l) [10% or 0.1 mg/l]*	ORP (mV) [10 mV]*
1028	200	2.54	15.60	12.06	7.35	1.166	2	2.15	43.0
1031		2.70	15.60	12.05	7.37	1.166	1	1.96	36.1
1034		2.86	15.60	12.07	7.38	1.166	1	1.46	30.4
1037		3.02	15.60	12.06	7.40	1.167	1	1.25	23.8
1040		3.18	15.60	11.99	7.40	1.168	1	1.09	20.8
1043		3.34	15.60	11.98	7.38	1.167	1	0.96	17.0
1046		3.50	15.60	12.05	7.38	1.166	1	0.86	14.2
1049		3.66	15.60	12.02	7.39	1.168	1	0.71	11.6
1052		3.82	15.60	12.04	7.40	1.167	1	0.80	8.9
1055		3.98	15.60	12.09	7.40	1.166	1	0.72	7.6

* The stabilization criteria for each field parameter (three consecutive readings collected at 3- to 5-minute intervals) is listed in each column heading.

OBSERVATIONS/SAMPLING METHOD DEVIATIONS

C:\WORK\GE\Groundwater\554198\Attachment\D-2

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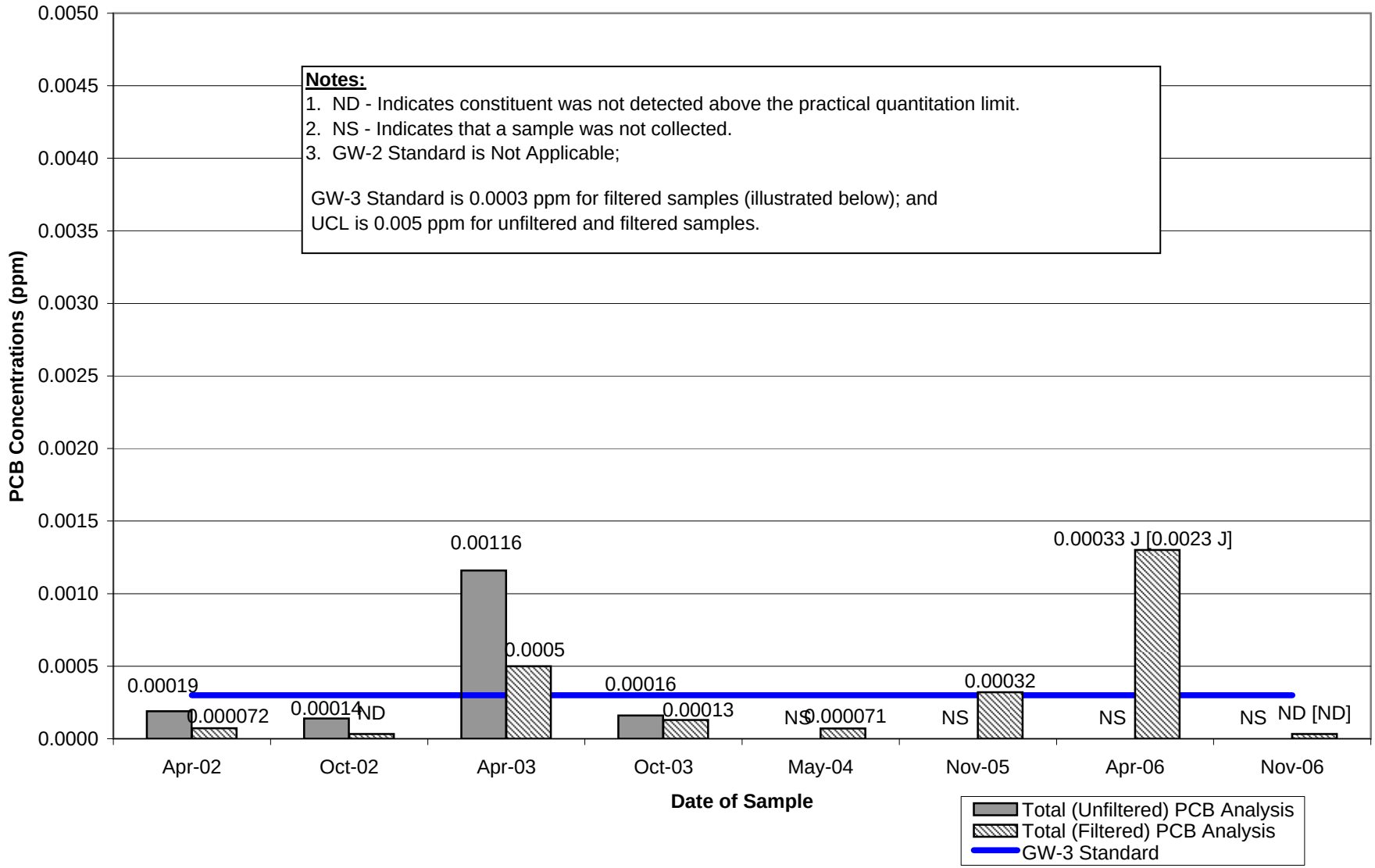
Appendix C

Historical Groundwater Data

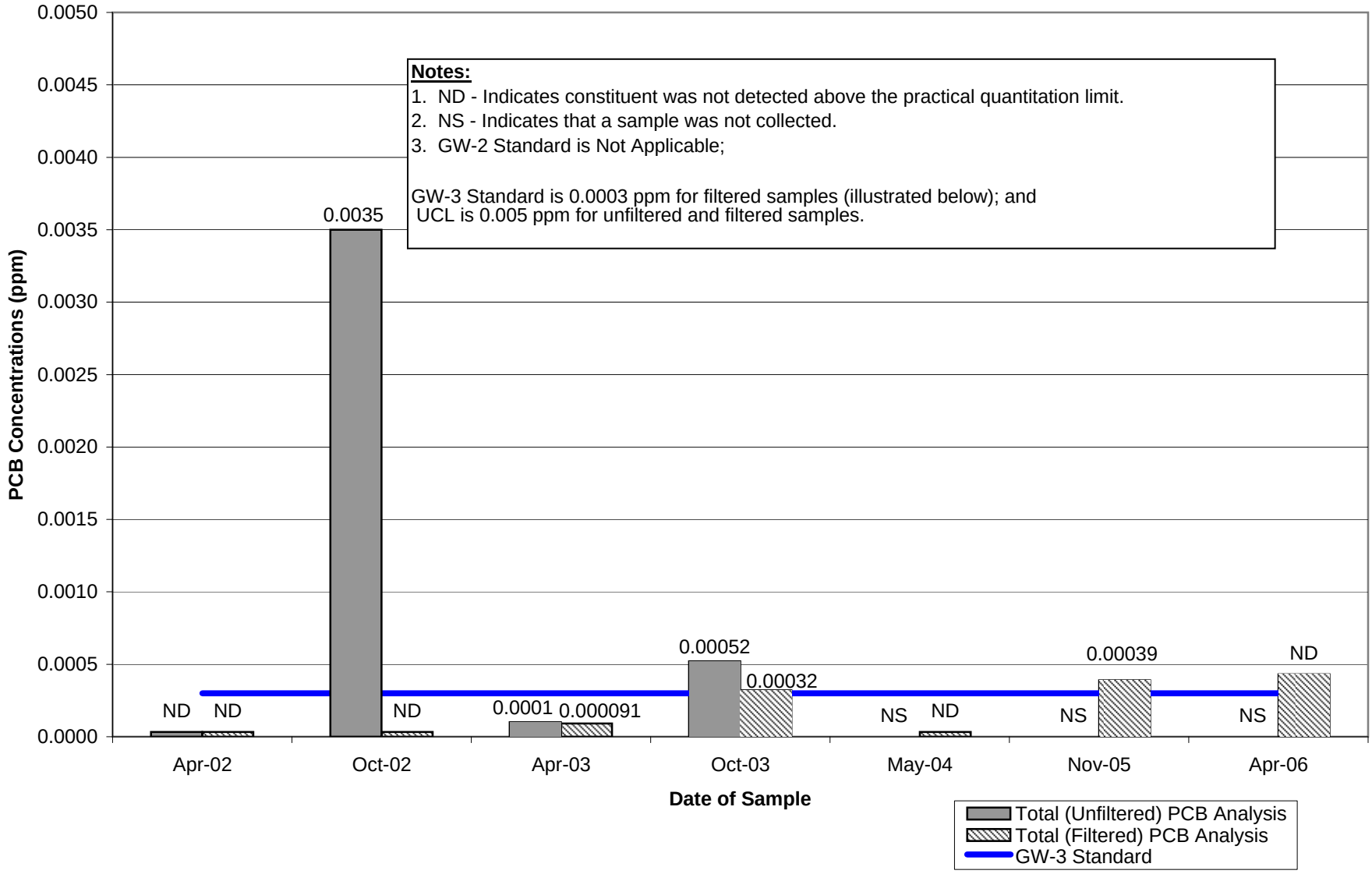
Appendix C

Groundwater Management Area 2
General Electric Company
Pittsfield, Massachusetts
Well GMA2-1 Historical PCB Concentrations



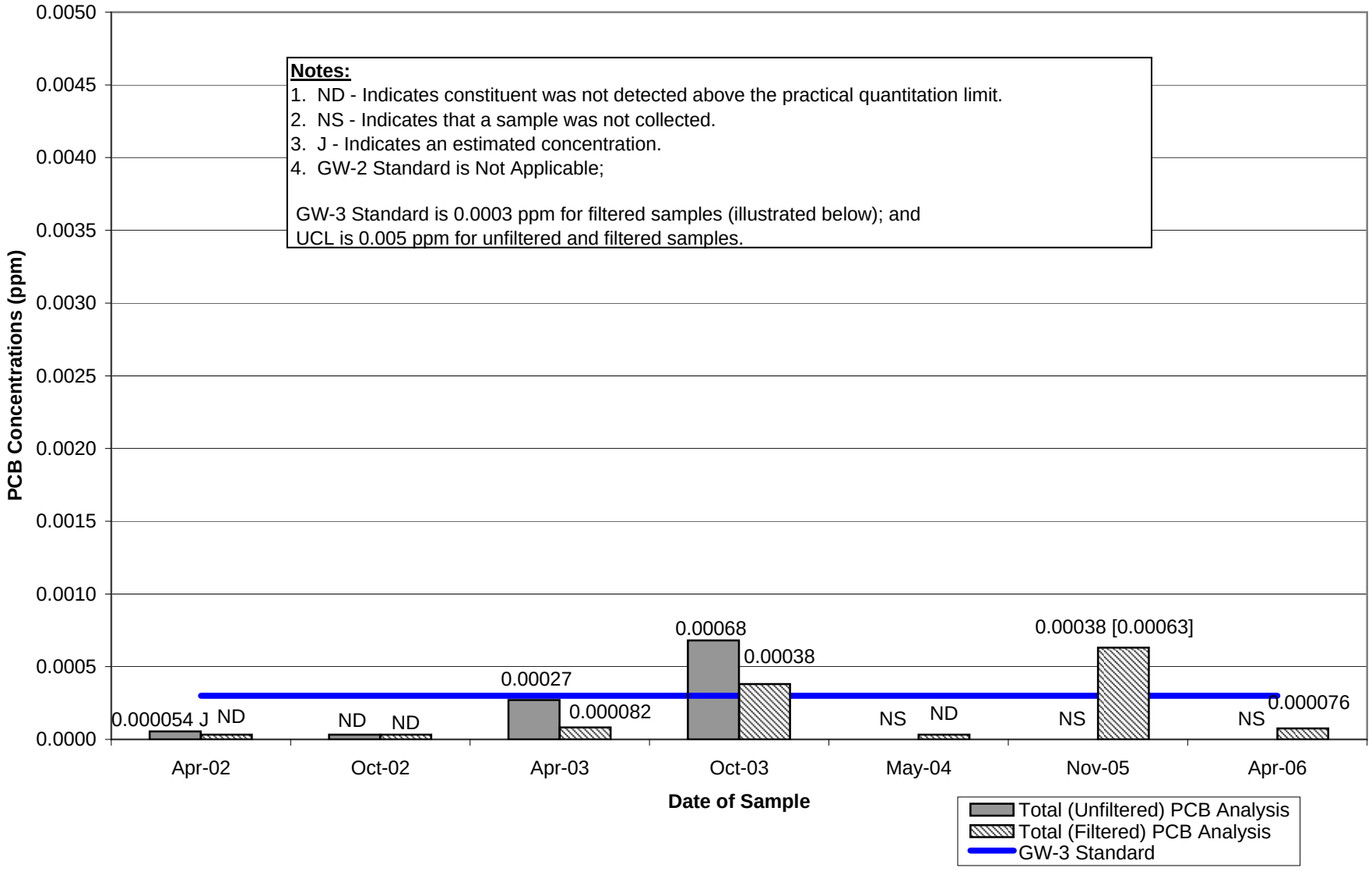
Appendix C

Groundwater Management Area 2
General Electric Company
Pittsfield, Massachusetts
Well GMA2-4 Historical PCB Concentrations



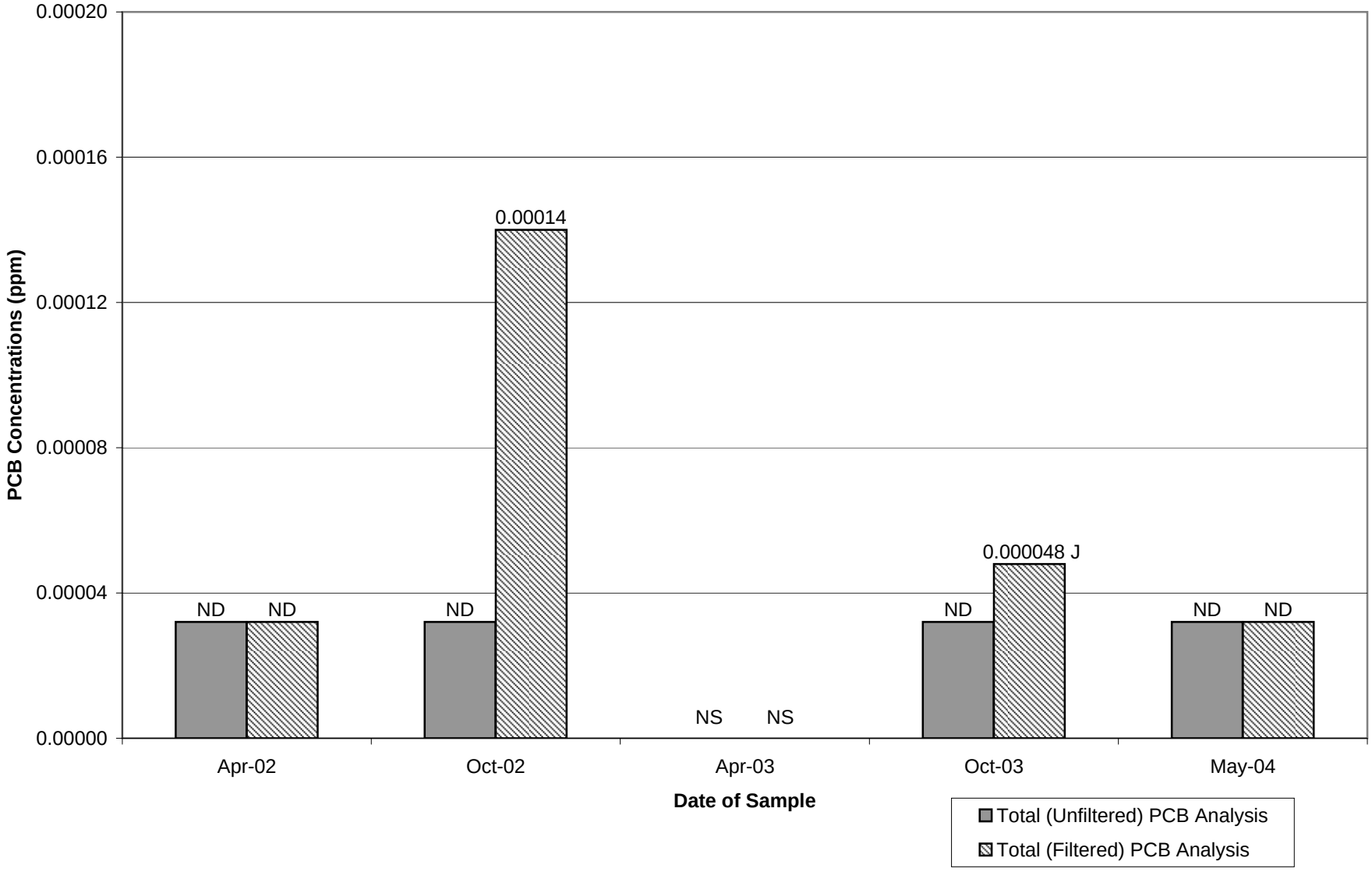
Appendix C

Groundwater Management Area 2
General Electric Company
Pittsfield, Massachusetts
Well GMA2-9 Historical PCB Concentrations



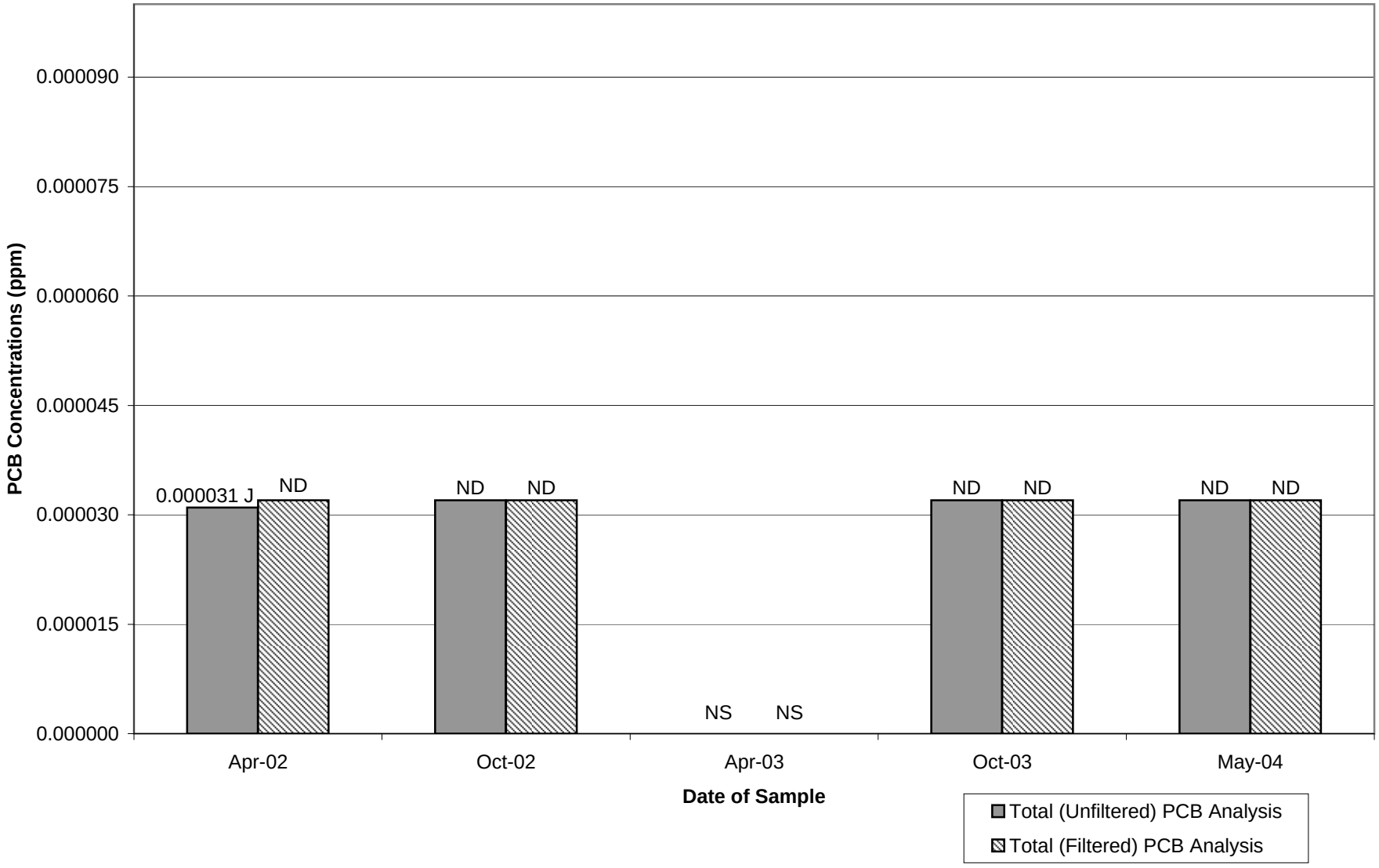
Appendix C

Groundwater Management Area 2
General Electric Company
Pittsfield, Massachusetts
Well GMA2-7 Historical PCB Concentrations



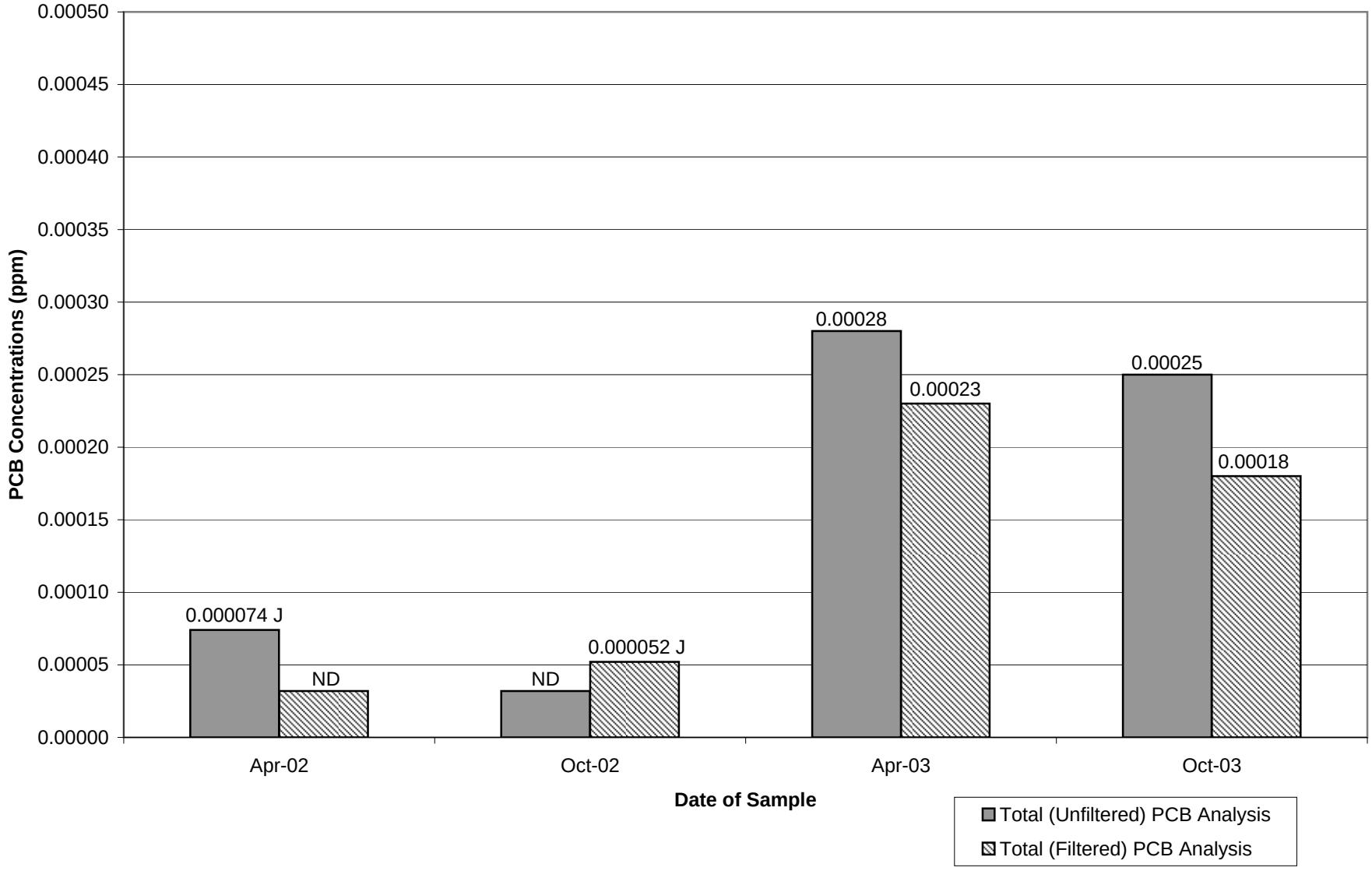
Appendix C

Groundwater Management Area 2
General Electric Company
Pittsfield, Massachusetts
Well OJ-MW-2 Historical PCB Concentrations



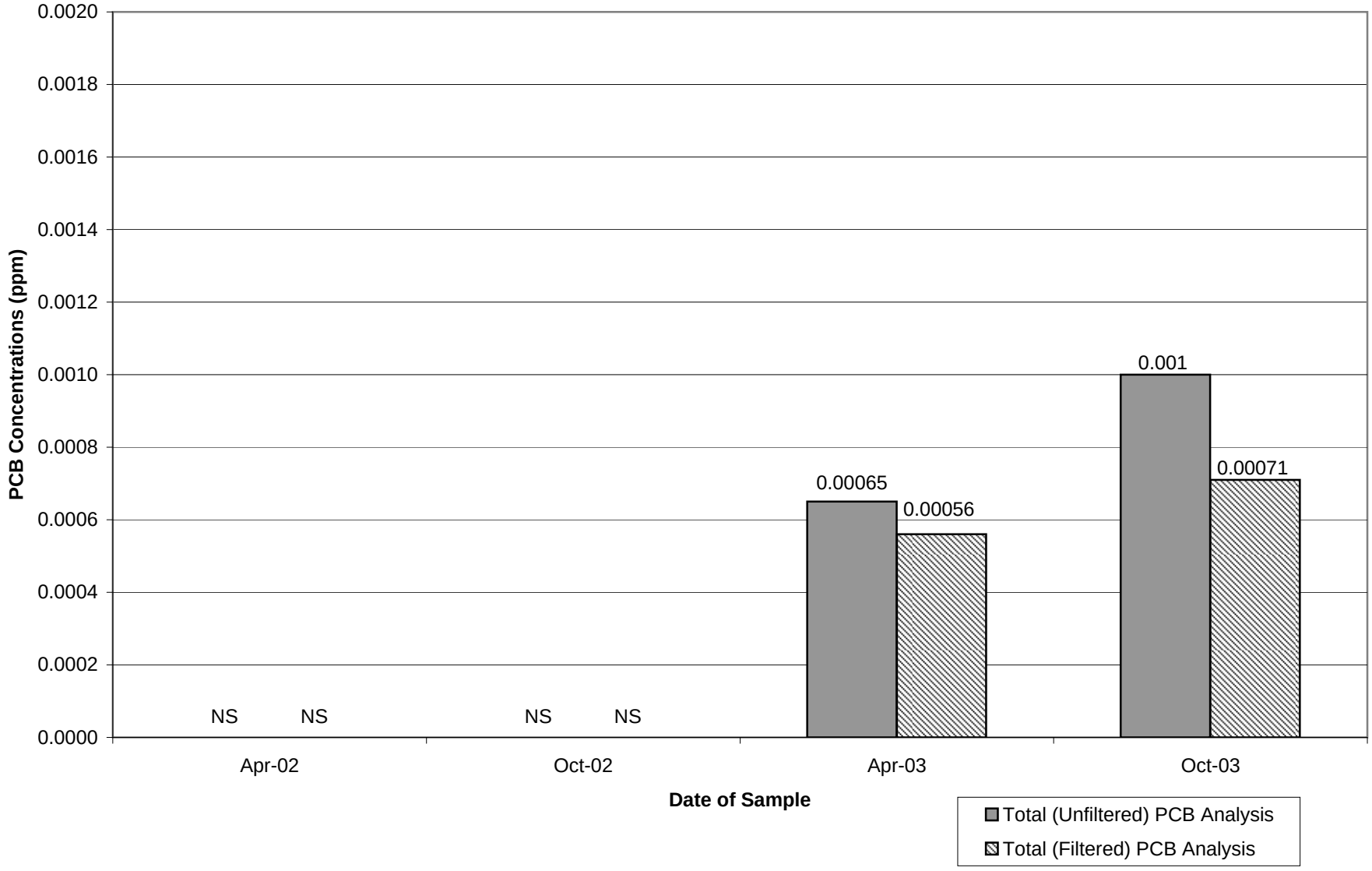
Appendix C

Groundwater Management Area 2
General Electric Company
Pittsfield, Massachusetts
Well GMA2-2 Historical PCB Concentrations



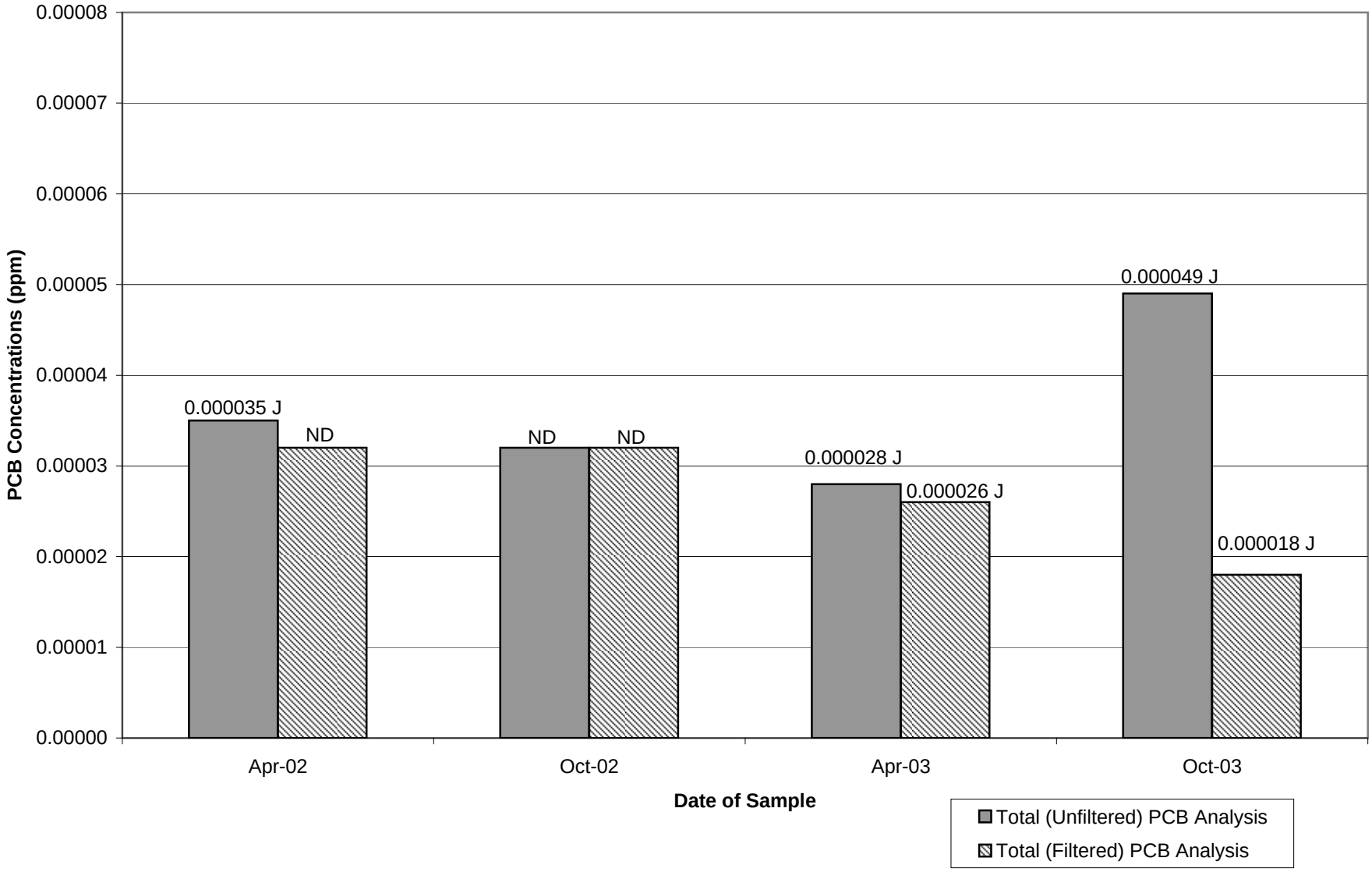
Appendix C

Groundwater Management Area 2
General Electric Company
Pittsfield, Massachusetts
Well GMA2-3 Historical PCB Concentrations



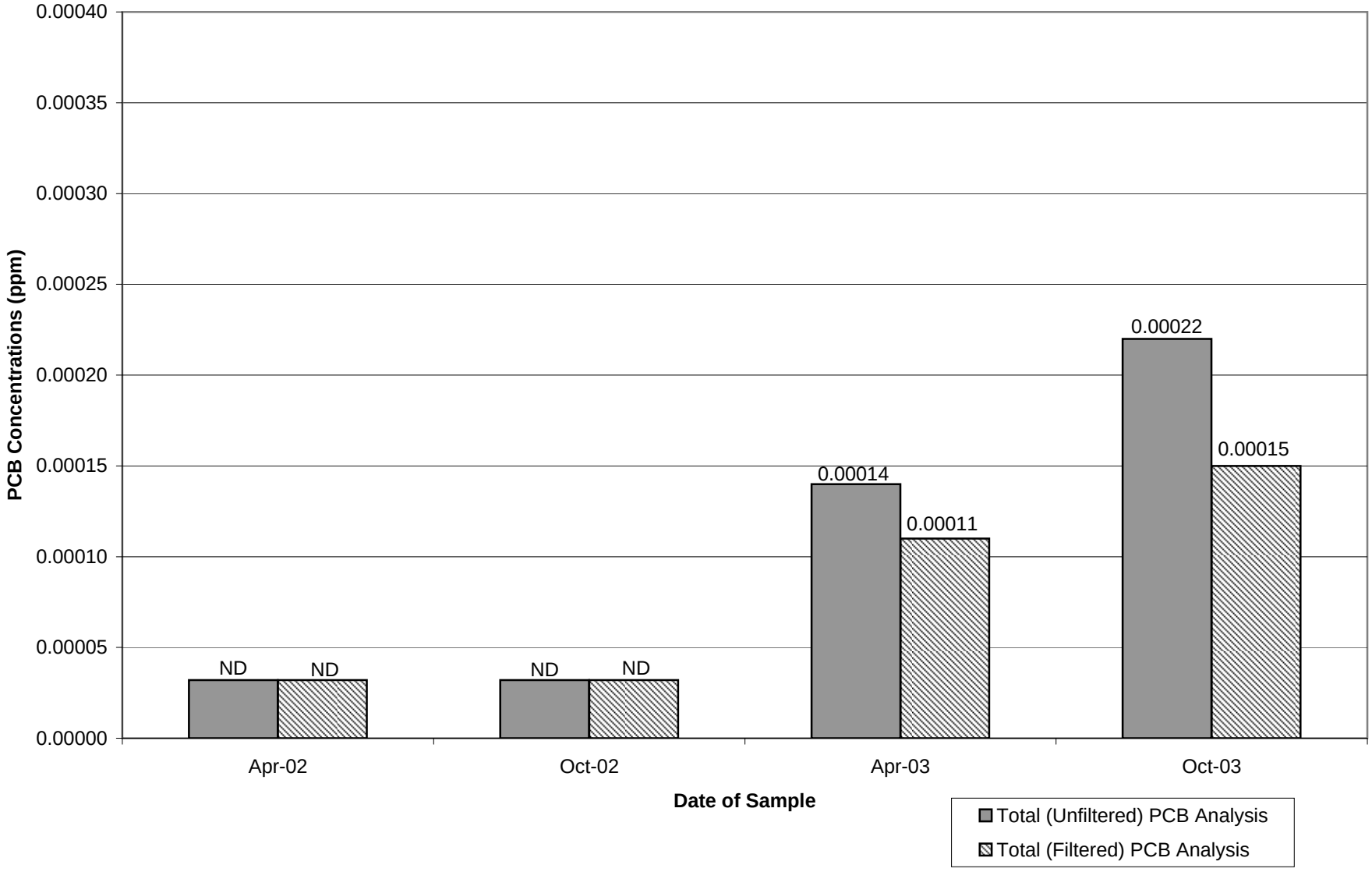
Appendix C

Groundwater Management Area 2
General Electric Company
Pittsfield, Massachusetts
Well GMA2-5 Historical PCB Concentrations



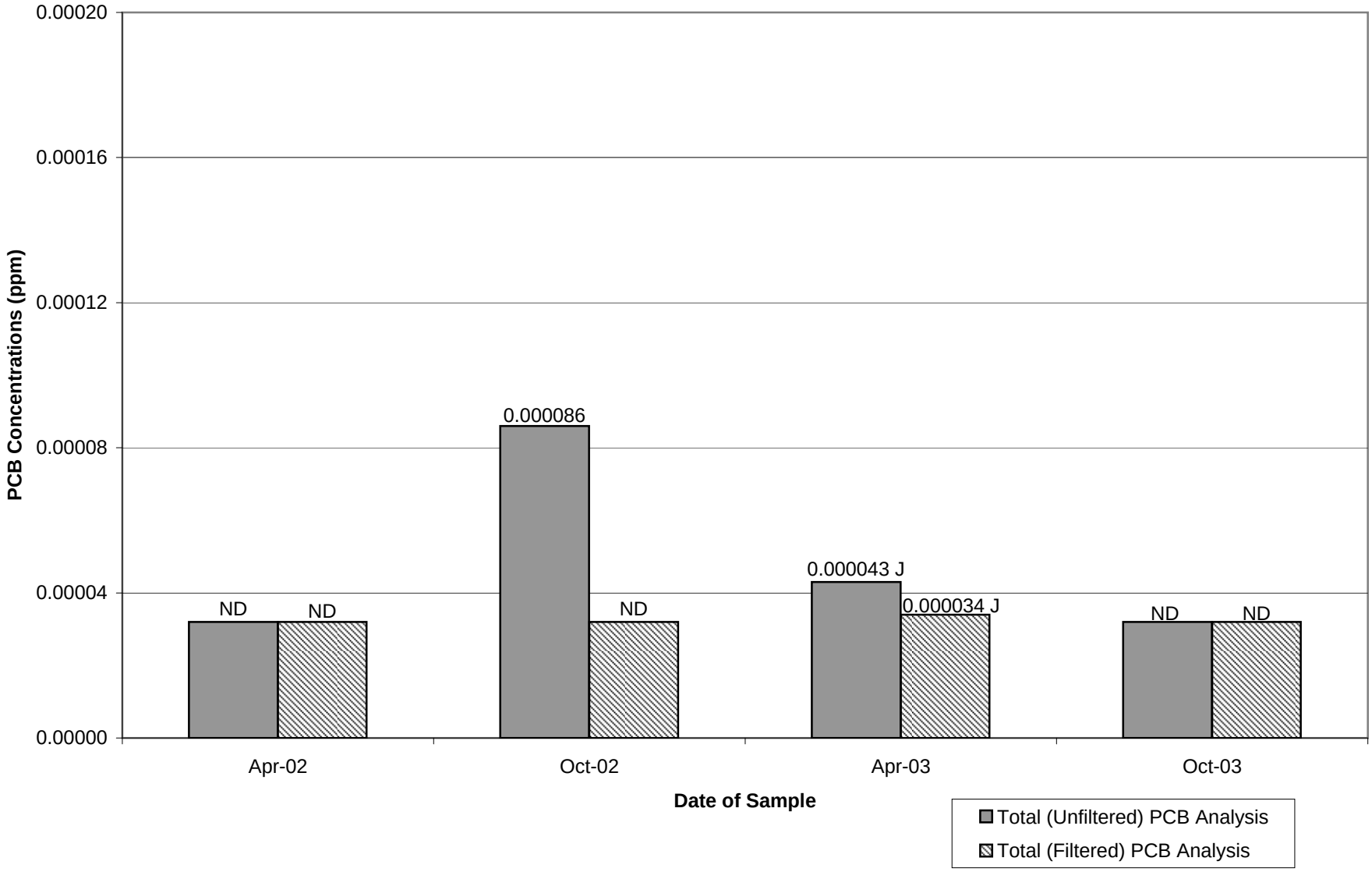
Appendix C

Groundwater Management Area 2
General Electric Company
Pittsfield, Massachusetts
Well GMA2-6 Historical PCB Concentrations



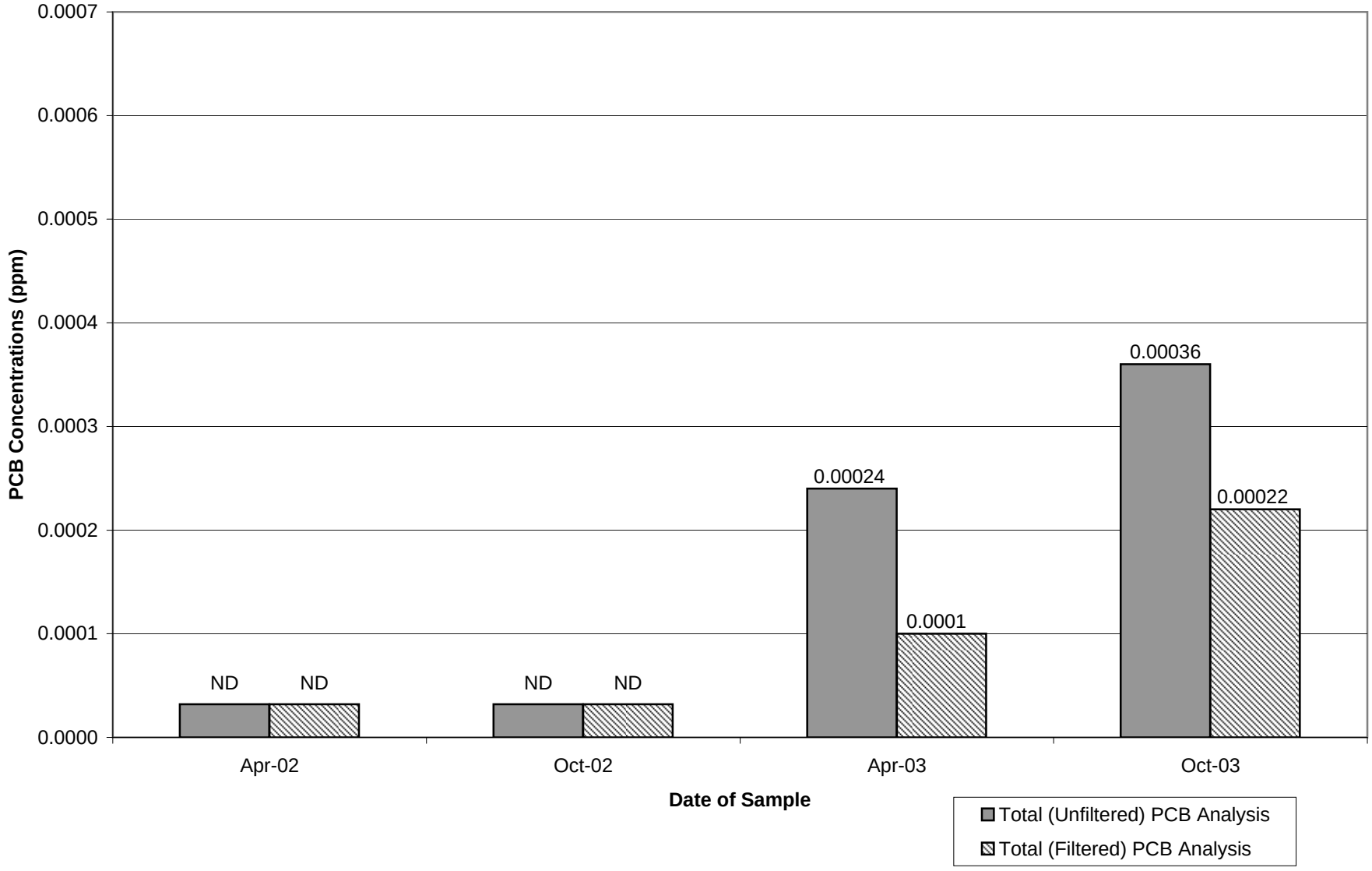
Appendix C

Groundwater Management Area 2
General Electric Company
Pittsfield, Massachusetts
Well GMA2-8 Historical PCB Concentrations



Appendix C

Groundwater Management Area 2
General Electric Company
Pittsfield, Massachusetts
Well J-1R Historical PCB Concentrations



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Appendix D

Data Validation Report

APPENDIX D
GROUNDWATER SAMPLING DATA VALIDATION REPORT
GROUNDWATER MANAGEMENT AREA 2 – FALL 2006

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

1.0 General

This appendix summarizes the Tier I and Tier II data reviews performed for groundwater samples collected during Remedial Investigation activities at Groundwater Management Area 2 (GMA 2) located at the General Electric Company/Housatonic River Site in Pittsfield, Massachusetts. The samples were analyzed for polychlorinated biphenyls (PCBs) by SGS Environmental Services, Inc. (formerly Paradigm Analytical Labs, Inc.) of Wilmington, North Carolina. Data validation was performed for two polychlorinated biphenyl (PCB) samples.

2.0 Data Evaluation Procedures

This appendix outlines the applicable quality control criteria utilized during the data review process and any deviations from those criteria. The data review was conducted in accordance with the following documents:

- Field Sampling Plan/Quality Assurance Project Plan, General Electric Company, Pittsfield, Massachusetts, Blasland, Bouck & Lee, Inc. (BBL; FSP/QAPP, approved May 25, 2004 and resubmitted June 15, 2004);

- Region I Tiered Organic and Inorganic Data Validation Guidelines, USEPA Region I (July 1, 1993);

- Region I Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses, USEPA Region I (February 1, 1988) (Modified November 1, 1988); and

- Region I Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses, USEPA Region I (Draft, December 1996).

A tabulated summary of the Tier I and Tier II data evaluations is presented in Table D-1. Each sample subjected to evaluation is listed in Table D-1 to document that data review was performed, as well as present the highest level of data validation (Tier I or Tier II) that was applied. Samples that required data qualification are listed separately for each parameter (compound or analyte) that required qualification.

The following data qualifiers were used in this data evaluation.

J The compound was positively identified, but the associated numerical value is an estimated concentration. This qualifier is used when the data evaluation procedure identifies a deficiency in the data generation process. This qualifier is also used when a compound is detected at an estimated concentration less than the corresponding practical quantitation limit (PQL).

U The compound was analyzed for, but was not detected. The sample quantitation limit is presented and adjusted for dilution and (for solid samples only) percent moisture. Non-detect sample results are presented as ND(PQL) within this report and in Table D-1 for consistency with documents previously prepared for this investigation.

UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is estimated and may or may not represent the actual level of quantitation. Non-detect sample results that required qualification are presented as ND(PQL) J within this report and in Table D-1 for consistency with documents previously prepared for this investigation.

R Indicates that the previously reported detection limit or sample result has been rejected due to a major deficiency in the data generation procedure. The data should not be used for any qualitative or quantitative purpose.

3.0 Data Validation Procedures

The FSP/QAPP provides (in Section 7.5) that all analytical data will be validated to a Tier I level following the procedures presented in the Region I Tiered Organic and Inorganic Data Validation Guidelines (USEPA guidelines). Accordingly, 100% of the analytical data for these investigations were subjected to Tier I review. The Tier I review consisted of a completeness evidence audit, as outlined in the USEPA Region I CSF Completeness Evidence Audit Program (USEPA Region I, 7/31/91), to ensure that all laboratory data and documentation were present. In the event data packages were determined to be incomplete, the missing information was requested from the laboratory. Upon completion of the Tier I review, the data packages complied with the USEPA Region I Tier I data completeness requirements.

As specified in the FSP/QAPP, approximately 25% of the laboratory sample delivery group packages are to be randomly chosen to be subjected to Tier II review. A Tier II review is also performed to resolve data usability limitations identified from laboratory qualification of the data during the Tier I data review. Since only one sample and a duplicate were analyzed for this round, a Tier II evaluation was performed on all data. The Tier II data review consisted of a review of all data package summary forms for identification of quality assurance/quality control (QA/QC) deviations and qualification of the data according to the Region I Data Validation Functional Guidelines. The Tier II review resulted in the qualification of data for several samples due to minor QA/QC deficiencies. Additionally, all field duplicates were examined for relative percent difference (RPD) compliance with the criteria specified in the FSP/QAPP. A tabulated summary of the samples subjected to Tier I and Tier II data evaluations is presented in the following table.

Summary of Samples Subjected to Tier I and Tier II Data Validation

Parameter	Tier I Only			Tier I &Tier II			Total
	Samples	Duplicates	Blanks	Samples	Duplicates	Blanks	
PCBs	0	0	0	1	1	0	2
Total	**0**	**0**	**0**	**1**	**1**	**0**	**2**

When qualification of the sample data was required, the sample results associated with a QA/QC parameter deviation were qualified in accordance with the procedures outlined in USEPA Region I data validation guidance documents. When the data validation process identified several quality control deficiencies, the cumulative effect of the various deficiencies was employed in assigning the final data qualifier. A summary of the QA/QC parameter deviations that resulted in data qualification is presented below for each analytical method.

4.0 Data Review

The continuing calibration criterion requires that the percent difference (%D) between the initial calibration RRF and the continuing calibration RRF for PCBs be less than 15%. Sample data for detect and non-detect compounds with %D values that exceeded the continuing calibration criteria were qualified as estimated (J). A summary of the compounds that exceeded the continuing calibration criterion and the number of samples qualified due to those deviations are presented in the following table.

Compounds Qualified Due to Continuing Calibration of %D Values

Analysis	Compound	Number of Affected Samples	Qualification
PCBs	Aroclor-1016	2	J
	Aroclor-1221	2	J
	Aroclor-1232	2	J
	Aroclor-1242	2	J
	Aroclor-1248	2	J
	Aroclor-1254	2	J
	Aroclor-1260	2	J
	Total PCBs	2	J

Matrix spike/matrix spike duplicate (MS/MSD) sample analysis recovery criteria for organics require that the RPD between the MS and MSD be less than the laboratory-generated QC acceptance limits specified on the MS/MSD reporting form. The compounds that exceeded RPD limits and the number of samples qualified due to deviations are presented in the following table.

Compounds Qualified Due to MS/MSD RPD Deviations

Analysis	Compound	Number of Affected Samples	Qualification
PCBs	Aroclor-1016	1	J
	Aroclor-1221	1	J
	Aroclor-1232	1	J
	Aroclor-1242	1	J
	Aroclor-1248	1	J
	Aroclor-1254	1	J
	Aroclor-1260	1	J
	Total PCBs	1	J

5.0 Overall Data Usability

This section summarizes the analytical data in terms of its completeness and usability for site characterization purposes. Data completeness is defined as the percentage of sample results that have been determined to be usable during the data validation process. The percent usability calculation included analyses evaluated under both the Tier I and Tier II data validation reviews. Data completeness with respect to usability was calculated separately for inorganic and each of the organic analysis. The percent usability calculation also includes quality control samples collected to aid in the evaluation of data usability. Therefore, field/equipment blank, trip blank, and field duplicate data determined to be unusable as a result of the validation process are represented in the percent usability value tabulated in the following table.

Data Usability

Parameter	Percent Usability	Rejected Data
PCBs	100	None

The data package completeness, as determined from the Tier I data review, was used in combination with the data quality deviations identified during the Tier II data review to determine overall data quality. As specified in the FSP/QAPP, the overall precision, accuracy, representativeness, comparability, and completeness (PARCC) parameters determined from the Tier I and Tier II data reviews were used as indicators of overall data quality. These parameters were assessed through an evaluation of the results of the field and laboratory QA/QC sample analyses to provide a measure of compliance of the analytical data with the Data Quality Objectives (DQOs) specified in the FSP/QAPP. Therefore, the following sections present summaries of the PARCC parameters assessment with regard to the DQOs specified in the FSP/QAPP.

5.1 Precision

Precision measures the reproducibility of measurements under a given set of conditions. Specifically, it is a quantitative measure of the variability of a group of measurements compared to their average value. For this investigation, precision was defined as the RPD between duplicate sample results. The duplicate samples used to evaluate precision included field duplicates and MS/MSD samples. For this analytical program, 50.0% of the data required qualification due to MS/MSD RPD deviations. None of the data required qualification due to field duplicate RPD deviations.

5.2 Accuracy

Accuracy measures the bias in an analytical system or the degree of agreement of a measurement with a known reference value. For this investigation, accuracy was defined as the percent recovery of QA/QC samples that were spiked with a known concentration of an analyte or compound of interest. The QA/QC samples used to evaluate analytical accuracy included instrument calibration, Laboratory Control Standards (LCSs), MS/MSD samples, and surrogate compound recoveries. For this analytical program, 100% of the data required qualification due to instrument calibration deviations. None of the data required qualification due to LCS recovery deviations, MS/MSD recovery deviations, or surrogate compound recovery deviations.

5.3 Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents a characteristic of a population, parameter variations at a sampling point, or an environmental condition. Representativeness is a qualitative parameter, which is most concerned with the proper design of the sampling program. The representativeness criterion is best satisfied by making certain that sampling locations are selected properly and a sufficient number of samples are collected. This parameter has been addressed by collecting samples at locations specified in MDEP-approved work plans, and by following the procedures for sample collection/analyses that were described in the FSP/QAPP. Additionally, the analytical program used procedures consistent with USEPA-approved analytical methodology. A QA/QC parameter that is an indicator of the representativeness of a sample is holding time. Holding time criteria are established to maintain the samples in a state that is representative of the in-situ field conditions before analysis. For this analytical program, none of the data required qualification for exceeding holding time requirements.

5.4 Comparability

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared with another. This goal was achieved through the use of the standardized techniques for sample collection and analysis presented in the FSP/QAPP. The USEPA SW-846[1] analytical methods presented in the FSP/QAPP are updated on occasion by the USEPA to benefit from recent technological advancements in analytical chemistry and instrumentation. In most cases, the method upgrades include the incorporation of new technology that improves the sensitivity and stability of the instrumentation or allows the laboratory to increase throughput without hindering accuracy and precision. Overall, the

[1] Test Methods for evaluating Solid Waste, SW-846, USEPA, Final Update III, December 1996.

analytical methods for this investigation have remained consistent in their general approach through continued use of the basic analytical techniques (e.g., sample extraction/preparation, instrument calibration, QA/QC procedures). Through this use of consistent base analytical procedures and by requiring that updated procedures meet the QA/QC criteria specified in the FSP/QAPP, the analytical data from past, present, and future sampling events will be comparable to allow for qualitative and quantitative assessment of site conditions. Through this use of consistent base analytical procedures and by requiring that updated procedures meet the QA/QC criteria specified in the FSP/QAPP, the analytical data from past, present, and future sampling events will be comparable to allow for qualitative and quantitative assessment of site conditions.

5.5 Completeness

Completeness is defined as the percentage of measurements that are judged to be valid or usable to meet the prescribed DQOs. The completeness criterion is essentially the same for all data uses -- the generation of a sufficient amount of valid data. This analytical data set had an overall usability of 100%.

Table D-1
Analytical Data Validation Summary
Groundwater Management Area 2 - Fall 2006

General Electric Company - Pittsfield, Massachusetts
(Results are presented in parts per million, ppm)

Sample Delivery Group No.	Sample ID	Date Collected	Matrix	Validation Level	Qualification	Compound	QA/QC Parameter	Value	Control Limits	Qualified Result	Notes
PCBs											
G135-221	GMA2-1 (Filtered)	11/7/2006	Water	Tier II	Yes	Aroclor-1016	CCAL %D (Aroclor-1016, 1260)	44.7%, 36.0%	<15%	ND(0.00011) J	
						Aroclor-1016	MS/MSD RPD	13.4%	<12%	ND(0.00011) J	
						Aroclor-1221	CCAL %D (Aroclor-1016, 1260)	44.7%, 36.0%	<15%	ND(0.00011) J	
						Aroclor-1221	MS/MSD RPD	13.4%	<12%	ND(0.00011) J	
						Aroclor-1232	CCAL %D (Aroclor-1016, 1260)	44.7%, 36.0%	<15%	ND(0.00011) J	
						Aroclor-1232	MS/MSD RPD	13.4%	<12%	ND(0.00011) J	
						Aroclor-1242	CCAL %D (Aroclor-1016, 1260)	44.7%, 36.0%	<15%	ND(0.00011) J	
						Aroclor-1242	MS/MSD RPD	13.4%	<12%	ND(0.00011) J	
						Aroclor-1248	CCAL %D (Aroclor-1016, 1260)	44.7%, 36.0%	<15%	ND(0.00011) J	
						Aroclor-1248	MS/MSD RPD	13.4%	<12%	ND(0.00011) J	
						Aroclor-1254	CCAL %D (Aroclor-1016, 1260)	44.7%, 36.0%	<15%	ND(0.00011) J	
						Aroclor-1254	MS/MSD RPD	13.4%	<12%	ND(0.00011) J	
						Aroclor-1260	CCAL %D (Aroclor-1016, 1260)	44.7%, 36.0%	<15%	ND(0.00011) J	
						Aroclor-1260	MS/MSD RPD	13.4%	<12%	ND(0.00011) J	
						Total PCBs	CCAL %D (Aroclor-1016, 1260)	44.7%, 36.0%	<15%	ND(0.00011) J	
						Total PCBs	MS/MSD RPD	13.4%	<12%	ND(0.00011) J	
G135-221	GMA2-BlindDup (Filtered)	11/7/2006	Water	Tier II	Yes	Aroclor-1016	CCAL %D (Aroclor-1016, 1260)	44.7%, 36.0%	<15%	ND(0.00011) J	GMA2-1 (Filtered)
						Aroclor-1221	CCAL %D (Aroclor-1016, 1260)	44.7%, 36.0%	<15%	ND(0.00011) J	
						Aroclor-1232	CCAL %D (Aroclor-1016, 1260)	44.7%, 36.0%	<15%	ND(0.00011) J	
						Aroclor-1242	CCAL %D (Aroclor-1016, 1260)	44.7%, 36.0%	<15%	ND(0.00011) J	
						Aroclor-1248	CCAL %D (Aroclor-1016, 1260)	44.7%, 36.0%	<15%	ND(0.00011) J	
						Aroclor-1254	CCAL %D (Aroclor-1016, 1260)	44.7%, 36.0%	<15%	ND(0.00011) J	
						Aroclor-1260	CCAL %D (Aroclor-1016, 1260)	44.7%, 36.0%	<15%	ND(0.00011) J	
						Total PCBs	CCAL %D (Aroclor-1016, 1260)	44.7%, 36.0%	<15%	ND(0.00011) J	