Mr. C's Dry Cleaners
2007 Long-Term Groundwater Sampling and Data Summary Report
East Aurora, New York

Site Number: 9-15-157

December 2007

Prepared for:

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
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List of Abbreviations and Acronyms

AMSL	above mean sea level
BGS	below ground surface
cm/s	centimeters per second
COC	chain of custody
cVOC	chlorinated volatile organic compound
DCE	dichloroethene
DNAPL	denser-than-water nonaqueous-phase liquid
DUSR	Data Usability Summary Report
EEEPC	Ecology and Environment Engineering, P.C.
EPA	United States Environmental Protection Agency
FS	feasibility study
IDW	investigation-derived waste
Mr. C's	Mr. C's Dry Cleaners
MS/MSD	matrix spike/matrix spike duplicate
MTBE	methyl tert-butyl ether
µg/kg	micrograms per kilogram
µg/L	micrograms per liter
NTU	nephelometric turbidity unit
NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
PCE	tetrachloroethene
PID	photoionization detector
ppm	parts per million
QA/QC	quality assurance/quality control
RI	Remedial Investigation

List of Abbreviations and Acronyms (Cont.)

ROD	Record of Decision
TCA	trichloroethane
TCE	trichloroethene
TCL	Target Compound List
TOGS	Technical Operational Guidance Series
VOC	volatile organic compound

Executive Summary

Under contract to the New York State Department of Environmental Conservation (NYSDEC) (Work Assignment No. 27.4), Ecology and Environment Engineering, P.C. (EEEPC) was tasked to perform long-term groundwater sampling and analysis and perform minor well maintenance at and around the Mr. C's Dry Cleaners (Mr. C's) site (NYSDEC Site No. 9-15-157), located in the town of East Aurora, Erie County, New York.

The purpose of this investigation was to obtain current groundwater analytical data for use in evaluating the performance of the groundwater treatment system. The groundwater pump and treatment system was installed and became operational on September 21, 2002. Operation and maintenance is currently performed by EEEPC. An average of 1.4 million gallons per month is pumped by the system, with a total of approximately 90 million gallons pumped since September 2002.

Fieldwork was performed by EEEPC personnel between August 6 and August 10, 2007. EEEPC subcontracted Mitkem Corporation, located in Warwick, Rhode Island, to perform laboratory analyses.

Groundwater beneath and around the Mr. C's site contains elevated levels of several chlorinated solvents, their breakdown by-products, and fuel-related compounds. The highest concentrations of tetrachloroethene (PCE) and its breakdown by-products occur in an area approximately 330 feet long by 250 feet wide, west of the site and west of Whaley Avenue and north of Main Street.

Data collected in 2002 through 2004 from several wells were compared to the data from samples collected in 2007. The following is a summary of the findings:

- PCE is the primary chlorinated volatile organic compound (cVOC) detected in the groundwater samples and, in general, distribution of PCE concentrations is similar to the total cVOC concentration distribution.

- Concentrations of PCE in seven pumping wells (RW-1, PW-2 through PW-5, PW-7 and PW-8) increased from startup in 2002 to 2004 and decreased since June 2004 due to initial capture of the plume by the groundwater pumping system and subsequent decrease of mass with time.

- The highest levels of fuel-related VOCs, especially MTBE, occur in the area of the Agway site (MW-4), west of the library (EE-2), and near the First Presbyterian Church (ESI-6 and MPI-12B).

- PCE levels in monitoring well ESI-6 (south of Main Street near the church) have decreased since 2002 (1,180 µg/L in 2002, 514 µg/L in 2004, to 240 µg/L in 2007).

- Wells ESI-5 (Paine Avenue), ESI-1 (upgradient at railroad viaduct), and MPI-13B (Fillmore Avenue) are located on the southern, southeastern, and northwestern boundaries of the PCE plume, respectively. The concentrations of PCE have slightly increased since 2004 (ESI-5 was 0.196 µg/L in 2004 to 4 µg/L in 2007, ESI-1 was 1.47 µg/L in 2004 to 9 µg/L in 2007 and MPI-13B was 0.403 µg/L in 2004 to 5 µg/L in 2007). However, levels remain low and differences in laboratory methodologies and reporting units make assessment of the change difficult. Generally, the high concentration areas of the plume appear to be contained with lower level concentrations in the distal portions of the plume and continue to migrate away before dissipating.

- PCE levels in most wells have decreased since 2004 with aforementioned exceptions and at MW-8, MPI-4I, and MPI-4S.

Based on the observed changes in the distribution of the VOC contamination on-site (i.e., centered around pumping wells) and the general groundwater containment level decrease, the groundwater pumping system appears to continue to be effective in drawing PCE contamination to the pumping wells.

1 Introduction

Ecology and Environment Engineering, P.C. (EEEPC), under contract to the New York State Department of Environmental Conservation (NYSDEC) (Work Assignment No. 27.4), was tasked to: perform groundwater sampling and analysis and perform minor well maintenance at and around the Mr. C's Dry Cleaners (Mr. C's) site (NYSDEC Site No. 9-15-157), located in the village of East Aurora, Erie County, New York (see Figure 1-1).

Field investigations were performed by EEEPC personnel between August 6 through 10, 2007. Laboratory analyses were performed by Mitkem Corporation, which is located in Warwick, Rhode Island. Independent data validation of the analytical results was performed by EEEPC.

This report provides a summary of the groundwater monitoring and sampling activities that took place at the Mr. C's site, as described in the EEEPC work plan (EEEPC 2007). Descriptions of previous investigations are presented in Section 1.3, and work performed under the current work assignment is described in Section 2. Physical characteristics of the study area are presented in Section 3. A discussion of the new analytical data obtained and a comparison to existing data is presented in Section 4.

1.1 Site Location and Description

The Mr. C's site is located at 586 Main Street in the village of East Aurora in Erie County, New York (see Figure 1-1). The site is located on an approximately 0.5-acre parcel in a mixed-use area of residential, municipal, and light commercial properties.

Mr. C's is located in a one-story building on a concrete slab foundation with an adjacent paved parking lot. Mr. C's occupies the front portion of the building along Main Street; the remainder of the building is occupied by other commercial businesses.

Surrounding the Mr. C's site, is the former Agway site to the west and residential homes along Whaley Avenue and Fillmore Avenue. Groundwater pumping wells and groundwater monitoring well form a ring around the entire Mr. C's Site.

The adjacent Agway site was a former gasoline storage spill site that was excavated, but still remains as an active remedial site with an air sparge/soil vapor extraction system in the upper aquifer zone (0 to 12 feet BGS) that is operated and maintained by EEEPC.

Also, nearby the site at two separate locations are active sub-slab depressurization systems: one at the First Presbyterian Church located at the corner of Main Street and Paine Avenue and one at 27 Whaley Avenue. Both systems were installed to mitigate vapor intrusion and are actively monitored and maintained under other tasks of the work assignment.

1.2 Site History

Mr. C's has been in operation as a dry cleaning facility since 1970. Prior to that, the property was used for several other commercial uses, including laundry services and auto repair/painting, and has also served as a hotel. In December 1991, NYSDEC investigated complaints of odors in a neighboring property southwest of the site. Subsequently, NYSDEC collected air samples from basements, as well as soil vapor, groundwater, and sanitary sewer samples on several occasions and detected the presence of tetrachloroethene (PCE). The site was then designated a Class 2 Hazardous Waste Site (Site Number 9-15-157) by NYSDEC, indicating that the site is believed to pose a significant risk to public health and the environment.

1.3 Investigations Prior to 2007

During a remedial investigation (RI) conducted in 1994 and finalized in 1995 by Malcolm Pirnie, Inc. (1995 RI), the highest concentration of PCE was found beneath the Mr. C's building. The RI also determined the horizontal and vertical extents of the contamination and found that other contaminants at the site consisted of petroleum hydrocar-

bons and other volatile organic compounds (VOCs), including compounds resulting from PCE degradation. A feasibility study (FS) completed by Malcolm Pirnie, Inc., in November 1996 recommended remediation of the source plume using in situ air-stripping wells. A remedial action consisting of the installation of eight in situ air-stripping wells was selected, and a Record of Decision (ROD) was signed in March 1997. Additional predesign investigations were conducted by Malcolm Pirnie, Inc., in December 1998 and April 1999 to confirm the limits of the groundwater contamination plume. An Explanation of Significant Differences was issued in April 2000 as justification for the modification of the selected remedy to a conventional groundwater pump-and-treat system. Remedial design, including the preparation of Contract Documents and Drawings, was completed by Malcolm Pirnie, Inc., in October 2000. Remedial construction started in October 2001 under EEEPC's oversight.

Remedial construction included installation of eight pumping wells and 30 observation piezometers, 1,100 linear feet of double-walled groundwater collection piping improvements within the designated groundwater treatment system area inside the Mr. C's building (i.e., demolition and removal of existing utilities and fixtures), a groundwater treatment system, and approximately 1,400 linear feet of 4-inch-inner diameter force main for discharge of treated groundwater to Tannery Brook. The groundwater treatment system consists of a sequestering agent feed system, bag filters, a 3,000-gallon holding tank, a low-profile air stripper, and vapor-phase granular activated carbon (GAC). The groundwater treatment system started operation on September 21, 2002. Operation, maintenance, and monitoring have been performed by EEEPC since September 2003. An average of 1.4 million gallons per month is pumped by the system, with a total of approximately 90 million gallons pumped since September 2002.

In 2004, three overburden monitoring wells (EE-1, EE-2, and ESI-1 [replacement]) were installed at the site by B & S, Inc (Buffalo, New York). Split-spoon samples were collected at each monitoring well location. Each new well was developed, surveyed (by Lu Engineers), purged, and sampled. Also, three borings were drilled (BH-1 through BH-3) and continuous split-spoon samples were collected at each boring. In addition, four monitoring wells (MPI-1I, MPI-4D, MPI-5I, and OW-C) were abandoned by B & S, Inc.

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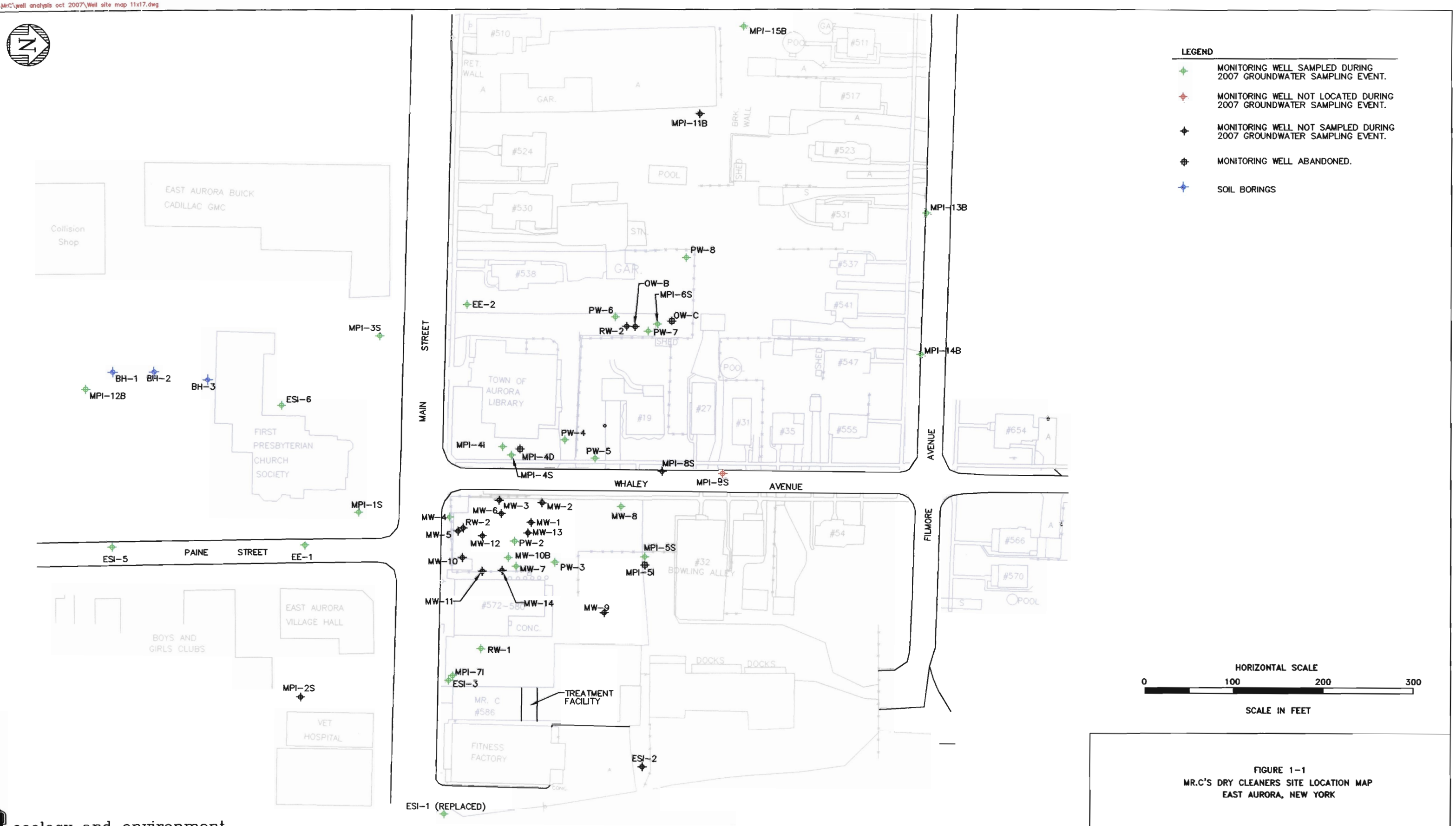

HORIZONTAL SCALE

0 100 200 300

SCALE IN FEET

FIGURE 1-1
MR.C'S DRY CLEANERS SITE LOCATION MAP
EAST AURORA, NEW YORK

2 Mr. C's Dry Cleaners 2007 Field Activities

This section discusses the 2007 field activities performed at the Mr. C's site in August 2007. All field activities were conducted according to the April 2007 NYSDEC-approved work plan (EEEPC 2007). Sample locations are indicated on Figure 1-1. In addition to the 2007 work plan, an addendum to the existing site-specific health and safety plan was prepared.

2.1 2007 Investigations

2.1.1 Monitoring Well Sampling

Groundwater samples were collected from 29 wells at the Mr. C's site (see Table 2-1). All monitoring wells sampled were purged prior to sampling. Eight pumping wells (RW-1, PW-2, PW-3, PW-4, PW-5, PW-6, PW-7, and PW-8) did not require purging because they are consistently pumped as part of the groundwater treatment system. If the pump was not turned on prior to sampling, it was manually activated, and the well was evacuated and allowed to recharge prior to sample collection.

Monitoring well purging was accomplished using a submersible pump with new polyethylene tubing or using disposable polyethylene bailers on new polypropylene line. All the wells with the exception of the pumping wells were sampled using disposable polyethylene bailers on new polypropylene line. The pumping wells were sampled using a check valve and new polyethylene tubing because the pumping hardware obstructed access with a bailer. Prior to purging, static water levels were measured to within ±0.01

Table 2-1 2007 Long-Term Monitoring Well Construction Summary, Mr. C's Dry Cleaners, East Aurora, New York

Well ID	Well Casing/ Screen Inner Diameter	Total Casing Depth (ft TOIC)	TOIC Casing Elevation (ft AMSL)	Ground Elevation (ft AMSL)	Screen Interval (ft BGS)	Sand Pack Interval (ft BGS)	Top of Seal (ft BGS)	Unit Screened	Northing[a]	Easting[a]
EE-1	2	26.37	913.46	913.63	23 - 28	21 - 28.5	15	OA	1008334.03	491787.2
EE-2	2	31.34	916.3	916.51	22 - 32	20 - 32	15	OA	1008521.26	491514.8
ESI-1 Replacement	2	19.74	916.99	917.35	10.5 - 20.5	8 - 21	4	OA	1008488.4	492086.2
ESI-2	2	NA	NA	NA	9 - 19	8 - 20	6	OA	NA	NA
ESI-3	2	15.42	915.85	916.41	7 - 17	6 - 18	4.1	OA	1008493.49	491938.8
ESI-4	2	26.37	NA	NA	5 - 15	4 - 16	2	OA	NA	NA
ESI-5	2	12.32	912.64	912.9	5 - 15	4 - 16	2	OA	1008120	491788.5
ESI-6	2	15.93	914.48	914.92	7 - 17	6 - 18	3.8	OA	1008309.02	491630.2
MW-1	2	NA	NA	NA	12 - 22	10.6 - 22	9	OA	NA	NA
MW-2	2	NA	NA	NA	10 - 15	NA	NA	OA	NA	NA
MW-3	4	NA	NA	NA	7 - 17	6.1 - 18	3.7	OA	NA	NA
MW-4	4	16.67	914.02	914.47	7.3 - 17.3	6.6 - 18	4.7	OA	1008495.05	491755.9
MW-5	2	NA	NA	NA	10 - 15	NA	NA	OA	NA	NA
MW-6	2	NA	NA	NA	5 - 14.5	NA - 15	3	OA	NA	NA
MW-7	2	13.97	915.96	916.34	5 - 14.5	NA - 15	3	OA	1008569.02	491811.2
MW-8	2	13.57	915.62	915.97	5 - 14.5	NA - 15	3	OA	1008685.39	491744.6
MW-9	2	NA	NA	NA	5 - 14.5	NA - 15	3	OA	NA	NA
MW-10	2	NA	NA	NA	4 - 13.5	NA - 14	2	OA	NA	NA
MW-11	NA	NA	NA	NA	NA	NA	NA	--	NA	NA
MW-14	2	NA	NA	NA	NA - 18.16 (TOIC)	NA	NA	OA	1008530.72	491815.9
MPI-1S	2	18.64	915.08	915.38	9 - 19	7.2 - 19.5	5.3	OA	1008394.23	491750.1
MPI-1D	NA	NA	NA	NA	NA	NA	NA	--	NA	NA
MPI-2S	2	9.52	NA	NA	8 - 18	6 - 18.5	3.8	OA	NA	NA
MPI-3S	2	17.41	914.4	914.79	8 - 18	5.7 - 18.5	3.7	OA	1008418.03	491553.2
MPI-4S	2	20.24	914.82	915.12	11 - 21	8.8 - 21.5	6.8	OA	1008564.07	491686.7
MPI-4I	2	41.5	915.66	916.12	32 - 42	29.8 - 42.5	4	LA	1008554.34	491677.3

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Well ID	Well Casing/ Screen Inner Diameter	Total Casing Depth (ft TOIC)	TOIC Casing Elevation (ft AMSL)	Ground Elevation (ft AMSL)	Screen Interval (ft BGS)	Sand Pack Interval (ft BGS)	Top of Seal (ft BGS)	Unit Screened	Northing[a]	Easting[a]
MPI-5S	2	17.34	916.45	916.78	8 - 18	5.9 - 18.4	3.9	OA	1008711.63	491800.8
MPI-5D	NA	NA	NA	NA	NA	NA	NA	--	NA	NA
MPI-6S	2	21.65	915.03	915.35	12.3 - 22.3	10 - 23	7.9	OA	1008725.14	491535.1
MPI-7I	2	13.37	916.14	916.42	29.5 - 39.5	27.1 - 40	5.3	LA	1008497.89	491933.5
MPI-7D	NA	NA	NA	NA	NA	NA	NA	--	NA	NA
MPI-8S	2	6.54	NA	NA	8 - 18	6 - 18.5	4	OA	NA	NA
MPI-9S	2	NA	NA	NA	8 - 18	6.5 - 18.5	4.5	OA	NA	NA
MPI-10B	2	31.11	915.68	916.07	16.5 - 31.5	13 - 32	11	OA	1008560.4	491801.5
MPI-11B	2	NA	NA	NA	15 - 30	13 - 30.5	8.5	OA	NA	NA
MPI-12B	2	34.62	911.19	911.44	20 - 35	15 - 35	11.5	OA	1008091.58	491611.5
MPI-13B	2	31.43	913.25	913.49	17 - 32	15 - 32	10	OA	1009024.45	491416.5
MPI-14B	2	27.54	913.18	913.68	15 - 30	11 - 30	8.5	OA	1009018.11	491574.9
MPI-15B	2	28.15	NA	NA	NA	NA	NA	OA	1008822.54	491205.5
RW-1	6	24.48	NA	NA	17.9 - 27.9	10 - 30	7	OA	1008529.43	491903.3
RW-2	4	NA	NA	NA	18 - 28	10 - 28	8	OA	NA	NA
PW-2	4	29.02	NA	NA	NA - 32	NA	NA	OA	1008567.08	491783.3
PW-3	4	28.67	NA	NA	NA - 32	NA	NA	OA	1008612.06	491806.6
PW-4	4	29.04	NA	NA	NA - 32	NA	NA	OA	1008623.23	491669.6
PW-5	4	28.47	NA	NA	NA - 32	NA	NA	OA	1008656.69	491690.3
PW-6	4	28.3	NA	NA	NA - 32	NA	NA	OA	1008679.07	491531.6
PW-7	4	26.49	NA	NA	NA - 32	NA	NA	OA	1008715.29	491547.6

Table 2-1 2007 Long-Term Monitoring Well Construction Summary, Mr. C's Dry Cleaners, East Aurora, New York

Well ID	Well Casing/ Screen Inner Diameter	Total Casing Depth (ft TOIC)	TOIC Casing Elevation (ft AMSL)	Ground Elevation (ft AMSL)	Screen Interval (ft BGS)	Sand Pack Interval (ft BGS)	Top of Seal (ft BGS)	Unit Screened	Northing[a]	Easting[a]
PW-8	4	26.82	NA	NA	NA - 32	NA	NA	OA	1008757.77	491465.1
OW-B	2	26.41	NA	NA	22.5 - 27.5	10.5 - 27.5	8	OA	NA	NA

Note:
[a] Coordinates system is New York State Plane West Zone (feet)

Key:
AMSL = Above mean sea level.
BGS = Below ground surface.
ft = Feet.
LA = Lacustrine aquifer.
NA = Information not available.
OA = Outwash aquifer.
TOIC = Top of inner casing.

foot in each well using a Solinst water level meter. All wells were purged of approximately three to five times the volume (or greater) of water standing in the well. Purged water from the monitoring well was handled in accordance with Section 2.2. Temperature, pH, specific conductance, and turbidity were measured and recorded, at a minimum, initially, after each well volume, and just prior to sampling using a LaMotte 2020 Turbidity meter and a Myron 6P Ultrameter II. A Thermo Environmental Instruments TVA 1000B meter was also used to measure organic vapor concentrations in the head-space of each well that was sampled. Purging was performed until pH, specific conductance, and temperature had stabilized and turbidity was 50 NTUs or less. The desired turbidity of 50 nephelometric turbidity units (NTUs) was not achieved during purging of wells ESI-3, MW-7, and MW-8. Well ESI-3 was sampled after approximately 27 gallons were purged (one well volume was approximately 0.45 gallons). Wells MW-7 and MW-8 were pumped dry during purging and were sampled after the wells recharged. The water quality parameters measured at the time of sampling are presented in Table 2-2. All groundwater samples were submitted for analysis of VOCs by United States Environmental Protection Agency (EPA) Method 8260B. However, due to laboratory error, the samples were analyzed by Contact Laboratory Program (CLP) Method OLM 4.2.

In addition to the environmental samples, quality assurance/quality control (QA/QC) samples were collected. Trip blanks accompanied every shipment for VOC analysis to check for the possible introduction of VOCs from the time the samples are collected to the time they are analyzed. A total of five trip blanks (MRC-TB01 through MRC-TB05) were submitted for analysis. All sample portions for VOCs collected on a single day were transported in the same cooler. To check consistency in both sample collection and sample analysis, duplicate samples were collected. Duplicate samples were collected at a rate of approximately one per 20 field samples. The two duplicate samples (MRC-PW02/D and MRC-MPI-1S/D) consisted of aliquots of sample media placed in separate sample containers and labeled as separate samples. Additionally, matrix spike/matrix spike duplicates (MS/MSD) samples were collected to simulate the background effect and interferences found in the actual samples. The calculated percent recovery of the spike is used as a measure of the accuracy of the total analytical method. MS/MSD samples were collected at a rate of one per 20 field samples. A total of two MS/MSD samples were collected (MRC-PW04 and MRC-MPI-5S).

Per the procedures outlined in the 2007 work plan, volatile organic analysis vials were filled leaving no headspace. Upon collection, all samples were labeled and immediately placed in a cooler maintained with ice at 4°C. The samples were then packaged and the cooler was shipped to the laboratory with chain of custody (COC) documents prepared in accordance with the 2007 work plan (EEEPC 2007).

2.1.2 Monitoring Well Inspections

During groundwater sampling, EEEPC conducted a brief inspection of all existing groundwater monitoring, pumping, and recovery wells proposed for sampling. The purpose of these inspections was to determine and document the physical condition of the wells and to identify maintenance actions required to keep the wells operational. The results of the inspections are documented on Table 2-3.

Based on the inspections, well maintenance issues identified included replacing missing bolts or stripped bolts, new asphalt/concrete pads, a new well cover, a new watertight wellcap, and removal of a portion of a cracked casing (see Table 2-3). These discrepancies will be addressed by the operations and maintenance subcontractor when practicable.

2.2 Investigation-Derived Waste Management

All investigation-derived waste (IDW) generated during the groundwater sampling activities was handled according to procedures outlined in the work plan. Decontamination water and purged groundwater were the only IDW generated during the fieldwork. Decontamination water and purged groundwater were pumped into the equalization holding tank at the on-site groundwater treatment system for subsequent treatment and disposal.

Table 2-2 2007 Summary of Groundwater Quality Field Measurements, Mr. C's Dry Cleaners, East Aurora, New York

Sample Identification	Sample Date	pH (s.u.)	Temperature (°C)	Conductivity (µS/cm)	Unfiltered Turbidity (NTUs)
MRC-RW01	8/7/07	NP	NP	NP	NP
MRC-PW02	8/7/07	NP	NP	NP	NP
MRC-PW03	8/7/07	NP	NP	NP	NP
MRC-PW04	8/7/07	NP	NP	NP	NP
MRC-PW05	8/7/07	NP	NP	NP	NP

Table 2-2 2007 Summary of Groundwater Quality Field Measurements, Mr. C's Dry Cleaners, East Aurora, New York

Sample Identification	Sample Date	pH (s.u.)	Temperature (°C)	Conductivity (µS/cm)	Unfiltered Turbidity (NTUs)
MRC-PW06	8/7/07	NP	NP	NP	NP
MRC-PW07	8/7/07	NP	NP	NP	NP
MRC-PW08	8/7/07	NP	NP	NP	NP
MRC-ESI-5	8/7/07	7.35	16.4	2454	21.2
MRC-MPI-7I	8/7/07	7.45	14.0	3460	37.4
MRC-ESI-3	8/7/07	7.34	15.0	1761	209
MRC-ESI-6	8/8/07	7.21	16.3	3946	12.1
MRC-MPI-3S	8/8/07	7.15	14.6	2952	4.97
MRC-MW04	8/8/07	7.19	15.3	3554	3.06
MRC-MW07	8/8/07	7.41	14.2	1112	169
MRC-MPI-5S	8/8/07	7.03	15.4	1613	10.37
MRC-MPI-1S	8/8/07	7.30	15.1	2770	2.24
MRC-EE1	8/8/07	7.28	16.8	2021	10.03
MRC-EE2	8/9/07	7.23	14.4	1953	16.1
MRC-MW08	8/8/07	7.32	17.8	2037	>1000
MRC-MPI-6S	8/9/07	7.18	12.3	1241	1.36
MRC-MPI-4I	8/9/07	7.21	13.4	2354	14.1
MRC-MPI-4S	8/9/07	7.24	13.3	4244	2.31
MRC-ESI-1 (Replacement)	8/9/07	7.12	15.4	3053	22.5
MRC-MPI-14B	8/9/07	7.43	12.2	1216	10.3
MRC-MPI-13B	8/9/07	7.13	12.3	1983	8.07
MRC-MPI-10B	8/9/07	7.18	13.5	3317	10.9
MRC-MPI-12B	8/10/07	7.24	13.6	2944	14.2
MRC-MPI-15B	8/10/07	7.18	11.6	1396	14.2

Key:
°C = Degrees Celsius.
µS/cm = MicroSiemens per centimeter.
NTU = Nephelometric turbidity unit.
NP = Pumping well was not purged; therefore, no water quality monitoring was performed during sampling.
s.u. = Standard units.

Table 2-3 2007 Well Inspection Summary Results, Mr. C's Dry Cleaners, East Aurora, New York

Well/Borehole No.	Date Inspected	Inspection Observations Maintenance Required
EE-1	08/08/07	Replace concrete pad, possibly with asphalt
EE-2	08/09/07	None
ESI-1 Replacement	08/09/07	None
ESI-3	08/07/07	Asphalt needs to be removed near well cover
ESI-5	08/07/07	Inner PVC casing cracked, pieces missing
ESI-6	08/08/07	None
MW-4	08/08/07	None
MW-7	08/08/07	None
MW-8	08/08/07	One bolt missing, needs new J-plug
MPI-1S	08/08/07	None
MPI-3S	08/08/07	None

Table 2-3 2007 Well Inspection Summary Results, Mr. C's Dry Cleaners, East Aurora, New York

Well/Borehole No.	Date Inspected	Inspection Observations Maintenance Required
MPI-4S	08/09/07	None
MPI-4I	08/09/07	None
MPI-5S	08/08/07	None
MPI-6S	08/09/07	None
MPI-7I	08/07/07	Bolts stripped
MPI-10B	08/09/07	None
MPI-12B	08/10/07	None
MPI-13B	08/06/07	Covered with asphalt during road resurfacing – needs new pad
MPI-14B	08/06/07	Missing cover (has temporary cover); cover was removed during road resurfacing; also needs new curb box
MPI-15B	08/10/07	Replace pad
RW-1	08/07/07	Bolts stripped
PW-2	08/07/07	One bolt missing
PW-3	08/07/07	None
PW-4	08/07/07	One bolt missing
PW-5	08/07/07	One bolt missing
PW-6	08/07/07	None
PW-7	08/07/07	None
PW-8	08/07/07	None

Key:
MW = Monitoring well.
PVC = Polyvinyl chloride.
PW = Pumping well.

3 Physical Characteristics of the Study Area

3.1 Physiography and Topography

East Aurora lies at the edge of the Allegheny Plateau. Topography is truncated to the south and east of the village where Cazenovia Creek exits the Allegheny Plateau and enters the Lake Erie/Ontario lowland. The Erie/Ontario lowland slopes gently north and west toward Lake Erie (Malcolm Pirnie 1995). The topography of the area surrounding the site is relatively flat with some low areas at the rear of properties along Main Street. A railroad viaduct is present just east of the site and Main Street approximately 15 feet below the surrounding grade beneath the viaduct. Tannery Brook and Cazenovia Creek run approximately 0.25 mile north and one mile south of the site, respectively. The two surface waterbodies flow into Buffalo River and into Lake Erie (approximately 12.5 miles west of the site).

3.2 Geology

The site is located in a residential/commercial area with both paved and unpaved (lawns and soil fill) sections. The site is situated on fill overlying glacial deposits deposited during the last ice age.

3.2.1 Bedrock

The site is situated on top of the buried bedrock valley of Cazenovia Creek. The Rhinestreet Shale member of the West Falls Formation is the uppermost bedrock unit beneath the site and surrounding area. The Rhinestreet Shale consists of slightly petrolifer-

ous, fissile-to-massive, black shale interbedded with medium and dark gray shales in the upper third of the Rhinestreet member. Bedrock underneath the site is estimated at 150 to 200 feet below ground surface (BGS) (Malcolm Pirnie 1995). East and west of the buried valley, bedrock is found at 20 to 30 feet BGS.

3.2.2 Overburden

Unconsolidated sediments at the site consist primarily of fill, glacial outwash, lacustrine deposits, and glacial till. During the 1994 RI, fill was found to approximately 11 feet BGS. Fill underneath the Mr. C's site was described as clayey silt with gravel overlying gravel with clayey silt and trace of brick fragments. The fill is underlain by 4 to 7 feet of glacial till composed of brown clayey silt with varying amounts of shale fragments. The RI identified three stratigraphic units below the fill and till. These stratigraphic units are described below.

Gravel and Sand Outwash

Glacial outwash, encountered in each RI borehole, grades from sandy gravel near the top of the unit to very fine sand at the base. The outwash is approximately 27 feet thick, consisting of 2 to 26 feet of gravel followed by 1.5 to 12 feet of medium-to-coarse sand with varying amounts of fine sand. Fine and very fine sands were encountered at the base of the outwash unit in most of the RI borings (Malcolm Pirnie 1995).

Lacustrine Deposits

The glacial outwash is underlain by lacustrine sandy silt. The lacustrine deposits were encountered at an approximate elevation of 888 feet above mean sea level (AMSL) and ranged in thickness between 11.5 and 14.5 feet. These deposits may liquify when disturbed, are uniform, and are characterized by mostly silt and fine to very fine sand (Malcolm Pirnie 1995).

Stratified Till and Sand

A sequence of stratified interbedded fine-grained till and sand underlies the lacustrine deposits. It was encountered at 90 feet BGS in the deepest exploratory RI boring. This layer was found to be approximately 49.5 feet thick.

This sequence contains lenses of stratified medium and fine sand interbedded with clayey silt and silty clay till layers. The two lithologies are separated by a sharp contact with the sand layers varying in thickness from thin laminae to 3 feet and the till ranging in thickness from thin laminae to layers 5 to 11 feet thick (Malcolm Pirnie 1995).

3.3 Hydrostratigraphic Units

The 1994 RI identified three major hydrostratigraphic units at the site including an unconfined aquifer of saturated outwash deposits (outwash aquifer); the underlying lacustrine aquifer; and a confining layer consisting of the stratified till deposits (Malcolm Pirnie 1995). The outwash and lacustrine aquifers are hydraulically connected, with nearly the same hydraulic heads. However, they are characterized by different hydraulic conductivities and porosities.

Outwash Aquifer

The outwash aquifer is an unconfined aquifer with a saturated thickness of approximately 18 feet. Wells screened across the entire outwash aquifer exhibited a geometric mean hydraulic conductivity of 0.004 centimeter per second (cm/s). Precipitation and infiltration are the main recharge sources for this aquifer with possible exfiltration from sewers located above the water table.

Lacustrine Aquifer

The lacustrine aquifer is a rather uniform aquifer with a saturated thickness of approximately 13 feet. Wells screened across the lacustrine aquifer exhibited hydraulic conductivities that ranged from 1.5×10^{-4} to 4.9×10^{-4} cm/s. During the RI, groundwater flow appeared very similar to the outwash aquifer groundwater flow.

Stratified Till Unit

The confining stratified till unit consists of interbedded layers of clayey till and sand with average permeabilities measured for the clayey unit of 4.8 cm/s. Clay content in the unit ranged between 23.3 and 39.9%. The average hydraulic conductivity for the unit was estimated at 8.8×10^{-6} cm/s (Malcolm Pirnie 1995). An upward vertical hydraulic gradient for this unit was calculated on January 1995 indicating that the water table

aquifer beneath the site is not the source of recharge to the stratified till unit (Malcolm Pirnie 1995).

3.4 Hydrogeology

A groundwater contour map of the site (see Figure 3-1) indicates the groundwater flow direction is radial, with a groundwater mound generally centered near the intersection of Main and Paine streets. A smaller mound also appears to exist west of Whaley Avenue. Groundwater sinks appear to exist in the immediate vicinity of Mr. C's and wells PW-6, PW-7, and PW-8. This results in groundwater flow divides where groundflow direction changes. Divides exist at the two aforementioned mounds as well as east of Whaley Avenue and south of Fillmore Avenue. The two groundwater sink locations are consistent with groundwater capture at the pumping well locations. The depth of groundwater beneath the site ranged from approximately 8 to 26 feet BGS at the time of measurement in August 2007.

Based on 2007 groundwater level measurements (see Table 3-1), the groundwater gradients are variable. Hydraulic gradients measured during the RI ranged from 0.002 to 0.004 ft/ft (with essentially no vertical flow) for the outwash aquifer and ranged between 0.002 to 0.003 ft/ft for the lacustrine aquifer (Malcolm Pirnie 1995).

Table 3-1 2007 Groundwater Elevations, Mr. C's Dry Cleaners Site, East Aurora, New York

Well ID	Water Level Measurement Date	Total Casing Depth (feet TOIC)	TOIC Casing Elevation (feet AMSL)	Water Level (feet TOIC)	Water Elevation (feet AMSL)	Unit Screened
EE-1	8/6/2007	27.03	913.46	9.15	904.31	OA
EE-2	8/6/2007	30.98	916.3	12.18	904.12	OA
ESI-1 Replacement	8/6/2007	20.3	916.99	13.25	903.74	OA
ESI-3	8/6/2007	15.98	915.85	12.63	903.22	OA
ESI-5	8/6/2007	13.58	912.64	9.21	903.43	OA
ESI-6	8/6/2007	16.49	914.48	11.50	902.98	OA
MW-4	8/6/2007	16.37	914.02	10.45	903.57	OA
MW-7	8/6/2007	14.14	915.96	12.45	903.51	OA
MW-8	8/6/2007	14.03	915.62	12.37	903.25	OA
MW-14	NA	18.16	NA	NA	NA	OA
MPI-1S	8/6/2007	19.1	915.08	11.55	903.53	OA
MPI-3S	8/6/2007	17.94	914.4	11.22	903.18	OA

Table 3-1 2007 Groundwater Elevations, Mr. C's Dry Cleaners Site, East Aurora, New York

Well ID	Water Level Measurement Date	Total Casing Depth (feet TOIC)	TOIC Casing Elevation (feet AMSL)	Water Level (feet TOIC)	Water Elevation (feet AMSL)	Unit Screened
MPI-4S	8/6/2007	20.54	914.82	11.42	903.4	OA
MPI-4I	8/6/2007	42.06	915.66	12.40	903.26	LA
MPI-5S	8/6/2007	17.9	916.45	12.97	903.48	OA
MPI-6S	8/6/2007	22.17	915.03	12.15	902.88	OA
MPI-7I	8/6/2007	39.26	916.14	12.25	903.89	LA
MPI-10B	8/6/2007	31.7	915.68	12.12	903.56	OA
MPI-12B	8/9/2007	35.19	911.19	7.92	903.27	OA
MPI-13B	8/6/2007	32.12	913.25	10.30	902.95	OA
MPI-14B	8/6/2007	30.19	913.18	10.14	903.04	OA
MPI-15B	8/10/2007	25.77	NA	10.06	NA	OA
RW-1	8/6/2007	24.48	NA	23.40	NA	OA
PW-2	8/6/2007	NA	NA	22.75	NA	OA
PW-3	8/6/2007	NA	NA	21.15	NA	OA
PW-4	8/6/2007	NA	NA	22.50	NA	OA
PW-5	8/6/2007	NA	NA	25.82	NA	OA
PW-6	8/6/2007	28.3	NA	20.31	NA	OA
PW-7	8/6/2007	NA	NA	15.90	NA	OA
PW-8	8/6/2007	NA	NA	19.45	NA	OA

Key:

AMSL = Above mean sea level.
LA = Lacustrine aquifer.
MW = Monitoring well.
NA = Not available.
OA = Outwash aquifer.
PW = Pumping well.
TOIC = Top of inner casing.

F:\MrC\well analysis nov 2007\groundwater contour map.dwg

N

LEGEND

- MONITORING WELL SAMPLED DURING 2007 GROUNDWATER SAMPLING EVENT.
- MONITORING WELL NOT LOCATED DURING 2007 GROUNDWATER SAMPLING EVENT.
- MONITORING WELL NOT SAMPLED DURING 2007 GROUNDWATER SAMPLING EVENT.
- MONITORING WELL ABANDONED.
- GROUNDWATER CONTOUR LINE, DASHED WHERE INFERRED (CONTOUR INTERVAL=1.0)
- DIRECTION OF GROUNDWATER FLOW

MPI-15B
MPI-11B
MPI-13B (902.95)
MPI-14B (903.04)
MPI-12B (903.27)
MPI-3S (903.18)
EE-2 (904.12)
PW-8
OW-B
MPI-6S (902.88)
OW-C
PW-6
RW-2
PW-7
ESI-6 (902.98)
MPI-4I
PW-4
PW-5
MPI-4D
MPI-4S (903.40)
MPI-8S
MPI-9S
MPI-1S (903.53)
MW-3
MW-2
MW-6
MW-8 (903.25)
MW-4 (903.57)
RW-2
MW-1
MW-13
MW-5
MW-12
PW-2
MPI-5S (903.48)
ESI-5 (903.43)
EE-1 (904.31)
MW-10
MW-10B (903.56)
MW-7 (903.51)
PW-3
MPI-5I
MW-14
MW-11
MW-9
RW-1
MPI-7I
ESI-3 (903.22)
MPI-2S
ESI-2
ESI-1 (REPLACED) (903.74)
903.0
903.5
904.0

EAST AURORA BUICK CADILLAC GMC
FIRST PRESBYTERIAN CHURCH SOCIETY
TOWN OF AURORA LIBRARY
EAST AURORA VILLAGE HALL
BOYS AND GIRLS CLUBS
VET HOSPITAL
BOWLING ALLEY
TREATMENT FACILITY
MAIN STREET
PAINE STREET
WHALEY AVENUE
FILMORE AVENUE

HORIZONTAL SCALE
0 100 200 300
SCALE IN FEET

FIGURE 3-1
GROUNDWATER ELEVATION ISOPLETHS
FOR THE OUTWASH AQUIFER
AUGUST 2007
MR. C'S DRY CLEANERS SITE
EAST AURORA, NEW YORK

4 Nature and Extent of Contamination

The analytical results for the year 2007 samples for the Mr. C's Dry Cleaners site and the comparison of the results of the 2004 sampling conducted by EEEPC are discussed in this section. A short summary of the results of previous investigations (including the 1994 RI) is also provided in Section 4.1.

The 2007 laboratory results are presented on Figure 4-1 and in Table 4-1. The complete laboratory data packs for the 2007 samples will be provided under separate cover. Historical results are also provided on Figure 4-1.

Independent data validation of the analytical results was performed by EEEPC. The data usability summary report (DUSR) is provided as Appendix A.

During the 2007 field activities, groundwater samples were collected from 29 wells. The groundwater samples were screened against the NYSDEC Technical and Operational Guidance Series (TOGS) 1.1.1, Class GA Drinking Water Standards and Guidance Values (NYSDEC 1998).

4.1 Summary of Results from Previous Investigations

Investigations conducted prior to the 1994 RI detected PCE and other chlorinated solvents in the groundwater, soil gas, and sewers in the vicinity of the Mr. C's site. The highest concentrations of PCE in soil gas and groundwater were found near the Mr. C's sanitary sewer lateral. These investigations indicated the Mr. C's site as the possible

Table 4-1 Summary of Positive Analytical Results for Groundwater Samples, August 2007, Mr. C's Dry Cleaners Site, East Aurora, New York

Analyte	Screening Criteria [1]	Sample ID: / Date:	MRC-EE-1 08/08/07	MRC-EE2 08/09/07	MRC-ESI-1 08/09/07	MRC-ESI-3 08/07/07	MRC-ESI-5 08/07/07	MRC-ESI-6 08/08/07
Volatile Organic Compounds by OLM4.2 (µg/L)								
1,1,1-Trichloroethane	5		**9.6 J**	10 U	10 U	**2.0 J**	10 U	10 U
Acetone	50g		10 U	10 U	10 U	10 U	10 U	10 U
Benzene	1		10 U	10 U	10 U	10 U	10 U	10 U
Carbon disulfide	60g		10 U	10 U	10 U	10 U	10 U	10 U
Chloroform	7		10 U	10 U	10 U	**2.4 J**	10 U	10 U
cis-1,2-Dichloroethene	5		10 U	10 U	10 U	**2.8 J**	10 U	**20**
Cyclohexane	NA		10 U	10 U	10 U	10 U	10 U	10 U
Isopropylbenzene	NA		10 U	10 U	10 U	10 U	10 U	10 U
Methyl tert-butyl ether	10		**4.2 J**	**670**	10 U	10 U	10 U	**7.5 J**
Methylcyclohexane	NA		10 U	10 U	10 U	10 U	10 U	10 U
Tetrachloroethene	5		**3.1 J**	10 U	**9.3 J**	**250**	**4.6 J**	**240**
trans-1,2-Dichloroethene	5		10 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene	5		10 U	10 U	10 U	10 U	10 U	**14**
Vinyl chloride	2		10 U	10 U	10 U	10 U	10 U	10 U

Source: Ecology and Environment Engineering, P.C, 2007

Table 4-1 Summary of Positive Analytical Results for Groundwater Samples, August 2007, Mr. C's Dry Cleaners Site, East Aurora, New York

Analyte	Screening Criteria [1]	MRC-MPI-1S 08/08/07	MRC-MPI-1S/D* 08/08/07	MRC-MPI-3S 08/08/07	MRC-MPI-4I 08/08/07	MRC-MPI-4S 08/09/07
Volatile Organic Compounds by OLM4.2 (µg/L)						
1,1,1-Trichloroethane	5	10 U	10 U	10 U	10 U	10 U
Acetone	50g	10 U	10 U	10 U	10 U	10 U
Benzene	1	10 U	10 U	10 U	10 U	10 U
Carbon disulfide	60g	10 U	10 U	10 U	10 U	10 U
Chloroform	7	10 U	10 U	10 U	10 U	10 U
cis-1,2-Dichloroethene	5	10 U	10 U	10 U	**160**	**140**
Cyclohexane	NA	10 U	10 U	10 U	10 U	10 U
Isopropylbenzene	NA	10 U	10 U	10 U	10 U	10 U
Methyl tert-butyl ether	10	10 U	10 U	**240**	**23**	10 U
Methylcyclohexane	NA	10 U	10 U	10 U	10 U	10 U
Tetrachloroethene	5	**85**	**97**	10 U	**1300**	**5.0 J**
trans-1,2-Dichloroethene	5	10 U	10 U	10 U	**21**	10 U
Trichloroethene	5	**5.8 J**	**6.5 J**	10 U	**580**	**2.4 J**
Vinyl chloride	2	10 U	10 U	10 U	10 U	**20**

Table 4-1 Summary of Positive Analytical Results for Groundwater Samples, August 2007, Mr. C's Dry Cleaners Site, East Aurora, New York

Analyte	Screening Criteria [1]	MRC-MPI-5S 08/08/07	MRC-MPI-6S 08/09/07	MRC-MPI-7I 08/07/07	MRC-MPI-10B 08/09/07	MRC-MPI-12B 08/10/07
Volatile Organic Compounds by OLM4.2 (µg/L)						
1,1,1-Trichloroethane	5	10 U	10 U	10 U	80 U	10 U
Acetone	50g	10 U	10 U	10 U	80 U	10 U
Benzene	1	10 U	10 U	10 U	80 U	10 U
Carbon disulfide	60g	10 U	10 U	10 U	80 U	10 U
Chloroform	7	10 U	10 U	10 U	80 U	10 U
cis-1,2-Dichloroethene	5	**8.4 J**	**3.8 J**	**12**	80 U	**9.4 J**
Cyclohexane	NA	10 U	10 U	10 U	80 U	10 U
Isopropylbenzene	NA	10 U	10 U	10 U	80 U	10 U
Methyl tert-butyl ether	10	10 U	10 U	10 U	80 U	**170**
Methylcyclohexane	NA	10 U	10 U	10 U	80 U	10 U
Tetrachloroethene	5	**4.9 J**	**4900**	**2.9 J**	**790**	10 U
trans-1,2-Dichloroethene	5	**6.0 J**	10 U	10 U	80 U	10 U
Trichloroethene	5	**2.7 J**	**58**	10 U	80 U	10 U
Vinyl chloride	2	**15**	10 U	10 U	80 U	10 U

Table 4-1 Summary of Positive Analytical Results for Groundwater Samples, August 2007, Mr. C's Dry Cleaners Site, East Aurora, New York

Analyte	Screening Criteria [1]	MRC-MPI-13B 08/09/07	MRC-MPI-14B 08/09/07	MRC-MPI-15B 08/10/07	MRC-MW04 08/08/07	MRC-MW07 08/08/07
Volatile Organic Compounds by OLM4.2 (µg/L)						
1,1,1-Trichloroethane	5	10 U	10 U	10 U	10 U	10 U
Acetone	50g	10 U	**9.6 J**	10 U	10 U	10 U
Benzene	1	10 U	10 U	10 U	**5.4 J**	10 U
Carbon disulfide	60g	10 U	10 U	10 U	10 U	10 U
Chloroform	7	10 U	10 U	10 U	10 U	10 U
cis-1,2-Dichloroethene	5	10 U	**2.8 J**	10 U	**2.5 J**	10 U
Cyclohexane	NA	10 U	10 U	10 U	**110**	10 U
Isopropylbenzene	NA	10 U	10 U	10 U	**4.2 J**	10 U
Methyl tert-butyl ether	10	10 U	10 U	**6.3 J**	10 U	10 U
Methylcyclohexane	NA	10 U	10 U	10 U	**22**	10 U
Tetrachloroethene	5	**5.0 J**	10 U	10 U	10 U	**830**
trans-1,2-Dichloroethene	5	10 U	10 U	10 U	10 U	10 U
Trichloroethene	5	10 U	10 U	10 U	10 U	10 U
Vinyl chloride	2	10 U	10 U	10 U	10 U	10 U

Table 4-1 Summary of Positive Analytical Results for Groundwater Samples, August 2007, Mr. C's Dry Cleaners Site, East Aurora, New York

Analyte	Screening Criteria [1]	MRC-MW08 08/09/07	MRC-PW02 08/07/07	MRC-PW02/D** 08/07/07	MRC-PW03 08/07/07	MRC-PW04 08/07/07	MRC-PW05 08/07/07
Volatile Organic Compounds by OLM4.2 (µg/L)							
1,1,1-Trichloroethane	5	10 U	10 U	10 U	10 U	10 U	10 U
Acetone	50g	10 U	10 U	10 U	10 U	10 U	10 U
Benzene	1	10 U	10 U	10 U	10 U	10 U	10 U
Carbon disulfide	60g	10 U	10 U	10 U	10 U	10 U	10 U
Chloroform	7	10 U	10 U	10 U	10 U	10 U	10 U
cis-1,2-Dichloroethene	5	**390**	10 U	10 U	**2.8 J**	**19**	**21**
Cyclohexane	NA	10 U	10 U	10 U	10 U	10 U	10 U
Isopropylbenzene	NA	10 U	10 U	10 U	10 U	10 U	10 U
Methyl tert-butyl ether	10	10 U	10 U	10 U	10 U	**23**	**3.7 J**
Methylcyclohexane	NA	**2.5 J**	10 U	10 U	10 U	10 U	10 U
Tetrachloroethene	5	**960**	**1300**	**880**	**290**	**1600**	**2000**
trans-1,2-Dichloroethene	5	**24**	10 U	10 U	**5.0 J**	10 U	**6.5 J**
Trichloroethene	5	**590**	**9.3 J**	**8.7 J**	**7.2 J**	**74 J**	**95**
Vinyl chloride	2	**35**	10 U	10 U	10 U	**3.3 J**	10 U

Table 4-1 Summary of Positive Analytical Results for Groundwater Samples, August 2007, Mr. C's Dry Cleaners Site, East Aurora, New York

Analyte	Screening Criteria (1)	MRC-PW06 08/07/07	MRC-PW07 08/07/07	MRC-PW08 08/07/07	MRC-RW01 08/07/07
Volatile Organic Compounds by OLM4.2 (µg/L)					
1,1,1-Trichloroethane	5	10 U	10 U	10 U	10 U
Acetone	50g	10 U	10 U	10 U	10 U
Benzene	1	10 U	10 U	10 U	10 U
Carbon disulfide	60g	10 U	10 U	**7.2 J**	10 U
Chloroform	7	10 U	10 U	10 U	10 U
cis-1,2-Dichloroethene	5	**50**	**25**	**13**	10 U
Cyclohexane	NA	10 U	10 U	10 U	10 U
Isopropylbenzene	NA	10 U	10 U	10 U	10 U
Methyl tert-butyl ether	10	**18**	**5.2 J**	**3.5 J**	10 U
Methylcyclohexane	NA	10 U	10 U	10 U	10 U
Tetrachloroethene	5	**1100**	**2400**	**150**	**140**
trans-1,2-Dichloroethene	5	10 U	10 U	10 U	10 U
Trichloroethene	5	**100**	**94**	**15**	10 U
Vinyl chloride	2	10 U	10 U	10 U	10 U

Key:

g = Guidance value (no promulgated standard).

J = Estimated value.

U = Not detected at the reported value.

µg/L = Micrograms per liter

(1) Class GA standards and guidance values (NYSDEC 1998).

Note: Shaded cells exceed the screening value.

*Sample is field duplicate of MRC-MPI-1S

** Sample is field duplicate of MRC-PW02

source of PCE in the groundwater and soil gas. It was determined that the PCE levels found in the sewers were consistent with a source located at the Mr. C's site (migration possibly occurring along sanitary sewers). It was also concluded that groundwater is an important migration pathway.

The 1995, RI found the highest concentration of PCE beneath the Mr. C's building. The RI also determined the horizontal and vertical extents of the contamination and found that other contaminants at the site consisted of petroleum hydrocarbons and VOCs, including compounds resulting from PCE degradation. The RI concluded that substantial VOC contamination is present in the outwash aquifer (upper unconfined aquifer in saturated glacial outwash sand and gravel). It was determined that PCE distribution in the lacustrine aquifer (saturated sand and silt lacustrine deposits) is more localized and at lower levels. The RI also concluded that the Agway property's existing well network adequately defined the limits of the petroleum hydrocarbon groundwater plume. The RI did not define the extent of the petroleum hydrocarbon plume west/southwest of the First Presbyterian Church. The RI identified the leading edges of the chlorinated organics groundwater plume. The RI identified leakage from the Mr. C's sanitary sewer lateral as the suspected original mechanism of PCE release to groundwater. The RI suggested that the presence of PCE and PCE degradation by-products south of Main Street are either the result of migration from the Mr. C's site or PCE originating from a different source. The RI found no evidence of migration of denser-than-water nonaqueous-phase liquid (DNAPL) PCE to the lacustrine sandy silt or substantial accumulation of DNAPL. RI analytical data indicated an increase of chlorinated VOCs with depth in the outwash aquifer, with the highest concentrations occurring near the base of the outwash aquifer in a narrow elongated plume extending northwest from the Mr. C's building.

4.2 Summary of Previous Subsurface Soil Results

Subsurface soil samples were previously collected immediately above the water table from each of the three boreholes located in the parking lot on the south side of the First Presbyterian Church, 9 Paine Street, which were installed in May 2004 (see Figure 1-1). A second shallower sample was also collected from borehole BH-2. These subsurface soil samples were analyzed for Target Compound List (TCL) VOCs. Soil cores were scanned for VOCs by the EEEPC team using a photoionization detector (PID). PID read-

ings above background were obtained in borehole BH-1 (0.5 part per million [ppm]) in the 6-to-8-foot soil core (sample collected) and in borehole BH-2 in the 0.5-to-2-foot (100.2 ppm [sample collected]) and 2-to-4-foot (2.4 ppm) soil cores. Orange stains were observed in the 4-to-6-foot soil core from BH-2 and the 2-to-4-foot soil core from BH-3.

Four VOCs were detected in the soil samples, including acetone (a common laboratory contaminant), cis-1, PCE, trichloroethene (TCE), and 2-dichloroethene (DCE). All VOCs were detected at concentrations below NYSDEC soil cleanup objectives (6NYCRR 375-6). Acetone was detected only in the samples from borehole BH-2 at estimated concentrations ranging between 4.57 and 4.92 micrograms per kilogram (µg/kg). Acetone was the only VOC detected in the shallow soil sample collected from the 0.5-to-1.5-foot interval from borehole BH-2. The deeper sample from the same borehole collected from the 6-to-7-foot interval contained acetone, cis-1,2-DCE, and PCE.

PCE concentrations ranged between 29.7 micrograms per kilogram (µg/kg) (in the deeper sample from borehole BH-2) and 77.4 µ/kg (in the 6-to-8-foot depth interval sample from borehole BH-1). TCE was only detected in boreholes BH-1 and BH-3 at concentrations ranging between 2.3 µg/kg (in the 7-to-8-foot depth interval sample from BH-3) and 4.52 µg/kg (in the BH-1 sample). Concentrations of cis-1,2-DCE ranged between 0.894 µ/kg (in the deeper sample from BH-2) and 4.54 µ/kg (in the sample from BH-1).

4.3 2007 Groundwater Results

A total of 29 groundwater samples were collected from 29 locations (see Figure 1-1) and analyzed for VOCs in August 2007. A summary of positive results is presented in Table 4-1.

Eight VOCs (1,1,1-trichloroethane [TCA], benzene, cis-1,2-DCE, methyl tert-butyl ether [MTBE], PCE, trans-1,2-DCE, TCE and vinyl chloride) were detected in the groundwater samples at levels that exceeded NYSDEC Class GA groundwater standards (NYSDEC 1998) used to screen the groundwater data. The locations with the highest levels of concentrations of the contaminants of concern include: TCA (up to 9 micrograms per liter [µg/L]) in MRC-EE-1; benzene (up to 5 µg/L) in MRC-MW04; cis-1,2-DCE (up to 390 µg/L) in MRC-MW08; MTBE (up to 670 µg/L) in MRC-EE-2; PCE (up to 4900 µg/L) in MRC-MPI-6S; trans-1,2-DCE (up to 24 µg/L) in MRC-MW08;

TCE (up to 590 µg/L) in MRC-MW08; and vinyl chloride (up to 35 µg/L) in MRC-MW08. These wells are located within the contaminant plume (north side of Main Street, west and east of Whaley Avenue and south side of Main Street west of Paine Street). Well MPI-6S, located northwest of the town of Aurora library contained the highest cVOC (PCE) concentration. The 2007 concentration isopleths for PCE (the highest concentration contaminant) and total cVOCs are presented in Figures 4-2 and 4-3, respectively.

Total cVOCs include PCE and breakdown products such as TCE, cis- and trans-1,2-DCE, and vinyl chloride as well as TCA and chloroform. PCE concentrations dominate the total cVOC concentrations; thus, the distributions are very similar. Figures 4-2 and 4-3 were prepared using Surfer Version 8 by Golden Software. Concentrations were gridded using the Kriging method of data interpolation and concentration contours were generated at various levels to depict the extent of the contaminant plume.

Laboratory data review identified two potential impacts on data usability (see DUSR, Appendix A). The laboratory analyzed for volatile organic compounds following CLP Method OLM04.2 instead of the requested SW8260B method. Target compound identification was not affected; however, the resulting reporting limits were 10 µg/L rather than the requested 1.0 µg/L. Plume limit delineation was not affected because PCE concentrations in most wells are significantly greater than the reporting limits. Also, the matrix spike recovery and RPD criteria were not met for trichloroethene in MS/MSD analysis of MRC-PW04 and results were qualified with a "J" as estimated (see Table 4-1).

Summary of 2007 Analytical Results

Groundwater beneath the Mr. C's site contains elevated levels of several chlorinated solvents, their breakdown products, and aromatic hydrocarbons. The highest concentrations of PCE greater than 1,000 µ/L exists in an area approximately 330 feet long by 250 feet wide, and encompasses wells PW-2, PW-4, PW-5, PW-6, PW-7, and MPI-65, mostly on the west side of Whaley Avenue.

Miscellaneous elevated, although significantly lower levels, of cVOCs from 2004 also occur northwest of the First Presbyterian Church (ESI-6) and immediately west of the Mr. C's site (ESI-3 and RW-1). The distribution of the total cVOCs contaminant

plume and the PCE contaminant plume is relatively the same (i.e., composed of three lobes). The primary lobe containing the highest levels of contamination is centered under the private residence located at 19 and 27 Whaley Avenue, the secondary lobe is centered under and slightly south and west of the Mr. C's building, and the third lobe is centered under the First Presbyterian Church. Degradation of PCE is evident by the presence of elevated levels of its daughter products (TCE and cis-1,2-DCE). The highest levels of fuel-related contamination, especially MTBE, exists in the area of the former Agway facility (MW-4), west of the library (EE-2), and near the church (ESI-6 and MPI-12B). The presence of elevated MTBE levels is not believed to be related to the PCE contamination.

Comparison of Previous and Current Data

The 2004 and 2002 concentration isopleths of PCE (the contaminant of primary concern) are presented in the 2004 data summary report (EEEPC 2004a). Figure 4-1 presents a summary of all previous groundwater data. The following is a summary of the findings:

- The installation of wells and sample collection from additional wells in 2004 assisted in defining the lateral extent of the VOC contamination, which gives the false impression that the contaminant plume is significantly larger than previously identified.

- PCE is the primary cVOC detected in the groundwater samples and in general, distribution of PCE concentrations is similar to the total cVOC concentration distribution. Previously, cis-1,2-DCE levels in MW-4 were consistently higher (approximately two times) than the PCE level in the well; however, in 2007 PCE was not detected in MW-4 and cis-1, 2-DCE was present below groundwater standard.

- Concentrations of PCE in the eight pumping wells (RW-1 and PW2- through PW-8) generally increased from 2002 to 2004. The groundwater treatment system appeared to be drawing the contamination toward the pumping wells causing an increase in PCE concentrations in the pumping wells since inception of the groundwater treatment system. In general, PCE concentrations in these wells decreased or were similar from 2004 to 2007 indicating that capture has reached its limit and contaminant levels may continue to decrease.

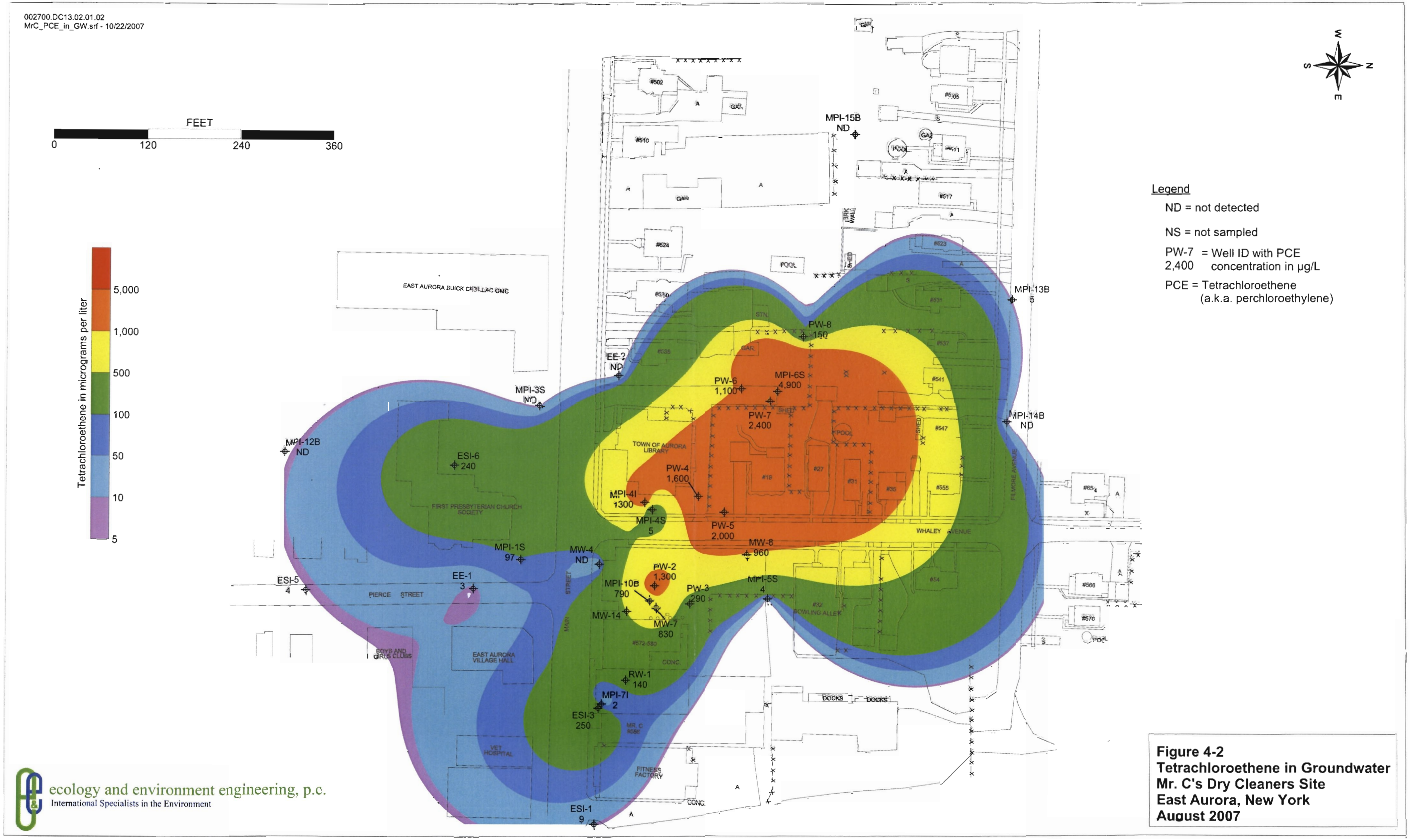
- PCE levels in MW-7 initially increased (240 µg/L in 2002 and 3,300 in 2003) and then decreased (1,170 µg/L in 2004 and 830 µ/L in 2007); however, they remain elevated. Increases in the PCE levels in MW-7 and other wells in the center of the plume are likely due to their proximity to the operational pumping wells.

- PCE levels in MPI-6S increased from non-detect to 1,200 µg/L in 2003 to 3,480 µg/L in 2004 and to 4,900 µ/L in 2007. This well contained the highest PCE concentration in 2007.

- PCE levels in ESI-6 (south of Main Street) have decreased since 2002 (1,180 µg/L in 2002 to 240 µg/L in 2007) but are still elevated.

- Due to the lower method detection limits achieved for the analysis of the 2004 samples, some wells in which PCE had not been previously detected now appear to have small amounts of PCE. Similarly, the higher reporting limits in 2007 cause some of the low-level concentrations to be reported as non-detect.

002700.DC13.02.01.02
MrC_PCE_in_GW.srf - 10/22/2007



Legend

ND = not detected

NS = not sampled

PW-7 = Well ID with PCE
2,400 concentration in µg/L

PCE = Tetrachloroethene
(a.k.a. perchloroethylene)

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Figure 4-2
Tetrachloroethene in Groundwater
Mr. C's Dry Cleaners Site
East Aurora, New York
August 2007

002700.DC13.02.01.02
MrC_cVOC_in_GW.srf - 10/22/2007

FEET
0 120 240 360

Total chlorinated VOCs in micrograms per liter
5,000
1,000
500
100
50
10
5

N
W
E
S

Legend

ND = not detected

NS = not sampled

PW-7 = Well ID with PCE
2,520 concentration in µg/L

cVOC = Sum of chlorinated volatile organic compound concentrations

MPI-15B ND
MPI-13B 5
MPI-14B 2
EE-2 ND
PW-8 178
PW-6 1,250
MPI-6S 4,960
PW-7 2,520
MPI-3S ND
MPI-12B 9
ESI-6 274
PW-4 1,700
MPI-4I 2,060
MPI-4S 167
PW-5 2,120
MW-8 2,000
MPI-1S 103
MW-4 2
PW-2 1,310
MPI-10B 790
PW-3 304
MPI-5S 35
ESI-5 4
EE-1 12
MW-14
MW-7 830
RW-1 140
MPI-7I 14
ESI-3 254
ESI-1 9

EAST AURORA BUICK CADILLAC GMC
TOWN OF AURORA LIBRARY
FIRST PRESBYTERIAN CHURCH SOCIETY
PIERCE STREET
MAIN STREET
WHALEY AVENUE
FILLMORE AVENUE
BOYS AND GIRLS CLUBS
EAST AURORA VILLAGE HALL
VET HOSPITAL
FITNESS FACTORY
BOWLING ALLEY
POOL
DOCKS

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Figure 4-3
Total Chlorinated VOCs in Groundwater
Mr. C's Dry Cleaners Site
East Aurora, New York
August 2007

4.4 Summary and Conclusions

Groundwater samples were collected from 29 monitoring and pumping well locations. All groundwater samples were analyzed for VOCs.

Groundwater in the vicinity of Mr. C's contains elevated levels of several chlorinated solvents, their breakdown products, and aromatic hydrocarbons. Fourteen VOCs were detected in the groundwater samples including, seven cVOCs, fuel-related compounds (benzene, cyclohexane, isopropylbenzene, and methylcyclohexane), acetone, and carbon disulfide. Eight of these VOCs were detected at levels that exceed the NYSDEC Class GA groundwater standards used to screen the groundwater data (NYSDEC 1998).

The highest concentrations of PCE (greater than 1,000 µ/L) and its breakdown byproducts occur in an area approximately 330 feet long by 250 feet wide, on the west side of Whaley Avenue and north of Main Street. Miscellaneous elevated, although significantly lower levels of cVOCs also occur northwest of the First Presbyterian Church (ESI-6), and immediately west of the Mr. C's site (ESI-3 and RW-1). The distributions of total cVOCs and PCE in the contaminant plume are similar (see Figures 4-2 and 4-3). Based on the interpreted distribution of concentrations, the primary lobe containing the highest levels of contamination is centered under the private residences located at 19 and 27 Whaley Avenue, the secondary lobe is slightly south and west of the Mr. C's building, and the third lobe is centered under the First Presbyterian Church. The highest concentrations of fuel-related VOCs, especially MTBE, occur in the area of the former Agway facility (MW-4), west of the library (EE-2), and near the First Presbyterian Church (ESI-6 and MPI-12B).

In general, concentrations of PCE in six pumping wells (RW-1, PW-3 through PW-5, PW-7 and PW-8) initially increased from 2002 to 2004 and have decreased since June 2004 due to capture by the groundwater treatment system. However, the PCE concentration in PW-2 increased from 2004 to 2007. The groundwater pumping system appears to have captured peak concentrations and continues to draw contaminated groundwater into the treatment system.

PCE is the primary cVOC detected in the groundwater samples and, in general, distribution of PCE concentrations is similar to the total cVOC concentration distribution. Wells ESI-5, ESI-1 and MPI-13B are located on the southern boundary, eastern boundary,

and northwestern boundary of the PCE plume. The concentrations of PCE in ESI-5, ESI-1 and MPI-13B have slightly increased from 2004 to 2007. PCE levels in ESI-6 have decreased from 2002 to 2007 indicating that a portion of the plume continues to migrate away from the site but at very low concentrations. Natural attenuation should continue to limit plume size. PCE levels in ESI-6 near the church have also decreased from 2002 to 2007.

Based on the observed changes in the distribution of the VOC contamination on-site (i.e., centered around pumping wells) and the general contaminant level decrease in the pumping wells, the groundwater pumping system appears to be effective in drawing the vast majority of PCE contamination to the pumping wells.

5 References

Blackman, P., 1956, "Glacial Geology of the East Aurora, New York Quadrangle," unpublished MA Thesis, State University of New York at Buffalo, 100 p.

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_____, 1998, Division of Water Technical and Operational Guidance Series (1.1.1): *Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations,* Division of Water, Albany, New York.

A Data Usability Summary Report

Data Usability Summary Report	Project: Mr. C's
Date Completed: September 21, 2007	Completed by: B. Krajewski

The analytical data provided by the laboratory were reviewed for precision, accuracy, and completeness per NYSDEC Division of Environmental Remediation Guidance for the Development of DUSRs (June 1999). Specific criteria for QC limits were obtained from the project QAPP. Compliance with the project QA program is indicated on the in the checklist and tables. Any major or minor concerns affected data usability are summarized listed below. The checklist and tables also indicate whether data qualification is required and/or the type of qualifier assigned.

Reference:

ProjectID	Lab Work Order
MR. C'S DRY CLEANERS O&M 002700.DC13.02.01.02	F1090
MR. C'S DRY CLEANERS O&M 002700.DC13.02.01.02	F1096

Table 1 Sample Summary Tables from Electronic Data Deliverable

Work Order	Matrix	Sample ID	Lab ID	Sample Date	Lab QC	MS/ MSD	ID Corrections
F1090	Aqueous	MRC-TB01	F1090-01A	08/07/2007 0810			None
F1090	Aqueous	MRC-RW01	F1090-02A	08/07/2007 0828			None
F1090	Aqueous	MRC-PW02	F1090-03A	08/07/2007 0917			None
F1090	Aqueous	MRC-PW02	F1090-03AD	08/07/2007 0917			None
F1090	Aqueous	MRC-PW03	F1090-04A	08/07/2007 0932			None
F1090	Aqueous	MRC-PW03	F1090-04AD	08/07/2007 0932			None
F1090	Aqueous	MRC-PW04	F1090-05A	08/07/2007 0955	MS/MSD	*	None
F1090	Aqueous	MRC-PW04	F1090-05AD	08/07/2007 0955			None
F1090	Aqueous	MRC-PW05	F1090-06A	08/07/2007 1012			None
F1090	Aqueous	MRC-PW05	F1090-06AD	08/07/2007 1012			None
F1090	Aqueous	MRC-PW06	F1090-07A	08/07/2007 1031			None
F1090	Aqueous	MRC-PW06	F1090-07AD	08/07/2007 1031			None
F1090	Aqueous	MRC-PW07	F1090-08A	08/07/2007 1040			None
F1090	Aqueous	MRC-PW07	F1090-08AD	08/07/2007 1040			None
F1090	Aqueous	MRC-PW08	F1090-09A	08/07/2007 1054			None
F1090	Aqueous	MRC-PW02/D	F1090-10A	08/07/2007 0917			None
F1090	Aqueous	MRC-PW02/D	F1090-10AD	08/07/2007 0917			None
F1090	Aqueous	MRC-ESI-5	F1090-11A	08/07/2007 1417			None
F1090	Aqueous	MRC-MPI-7I	F1090-12A	08/07/2007 1510			None
F1090	Aqueous	MRC-ESI-3	F1090-13A	08/07/2007 1717			None
F1090	Aqueous	MRC-ESI-3	F1090-13AD	08/07/2007 1717			None
F1090	Aqueous	MRC-TB03	F1090-14A	08/08/2007 1435			None
F1090	Aqueous	MRC-ESI-6	F1090-15A	08/08/2007 1512			None
F1090	Aqueous	MRC-ESI-6	F1090-15AD	08/08/2007 1512			None
F1090	Aqueous	MRC-MPI-3S	F1090-16A	08/08/2007 1553			None
F1090	Aqueous	MRC-MPI-3S	F1090-16AD	08/08/2007 1553			None

F1090	Aqueous	MRC-MW04	F1090-17A	08/08/2007 1744			None
F1090	Aqueous	MRC-TB02	F1090-18A	08/08/2007 0745			None
F1090	Aqueous	MRC-MW07	F1090-19A	08/08/2007 0855			None
F1090	Aqueous	MRC-MW07	F1090-19AD	08/08/2007 0855			None
F1090	Aqueous	MRC-MPI-1S	F1090-20A	08/08/2007 1301			None
F1096	Aqueous	MRC-MPI-5S	F1096-01A	08/08/2007 1000	MS/MSD	*	None
F1096	Aqueous	MRC-MPI-1S/D	F1096-02A	08/08/2007 1301			None
F1096	Aqueous	MRC-EE-1	F1096-03A	08/08/2007 1424			None
F1096	Aqueous	MRC-TB04	F1096-04A	08/09/2007 0730			None
F1096	Aqueous	MRC-EE2	F1096-05A	08/09/2007 0939			None
F1096	Aqueous	MRC-EE2	F1096-05AD	08/09/2007 0939			None
F1096	Aqueous	MRC-MW08	F1096-06A	08/09/2007 0850			None
F1096	Aqueous	MRC-MW08	F1096-06AD	08/09/2007 0850			None
F1096	Aqueous	MRC-MPI-6S	F1096-07A	08/09/2007 1027			None
F1096	Aqueous	MRC-MPI-6S	F1096-07AD	08/09/2007 1027			None
F1096	Aqueous	MRC-MPI-4I	F1096-08A	08/08/2007 1147			None
F1096	Aqueous	MRC-MPI-4I	F1096-08AD	08/08/2007 1147			None
F1096	Aqueous	MRC-MPI-4S	F1096-09A	08/09/2007 1237			None
F1096	Aqueous	MRC-ESI-1	F1096-10A	08/09/2007 1321			None
F1096	Aqueous	MRC-MPI-14B	F1096-11A	08/09/2007 1409			None
F1096	Aqueous	MRC-MPI-13B	F1096-12A	08/09/2007 1452			None
F1096	Aqueous	MRC-MPI-10B	F1096-13A	08/09/2007 1632			None
F1096	Aqueous	MRC-TB05	F1096-14A	08/10/2007 0745			None
F1096	Aqueous	MRC-MPI-12B	F1096-15A	08/10/2007 0900			None
F1096	Aqueous	MRC-MPI-15B	F1096-16A	08/10/2007 0952			None
F1096	Aqueous	AS INFLUENT	F1096-17A	08/14/2007 1250			None
F1096	Aqueous	AS INFLUENT	F1096-17AD	08/14/2007 1250			None
F1096	Aqueous	AS INFLUENT	F1096-17B	08/14/2007 1250			None
F1096	Aqueous	AS EFFLUENT	F1096-18A	08/14/2007 1250			None
F1096	Aqueous	AS EFFLUENT	F1096-18B	08/14/2007 1250			None
F1096	Aqueous	TRIPBLANK	F1096-19A	08/14/2007 0000			None

Work Orders, Tests and Number of Samples included in this DUSR

Work Orders	Matrix	Test Method	Method Name	Number of Samples	Sample Type
F1090	Aqueous	OLM4.2_VOA_W	OLM 4.2 VOA by GC-MS	11	DL
F1090	Aqueous	OLM4.2_VOA_W	OLM 4.2 VOA by GC-MS	20	SAMP
F1096	Aqueous	OLM4.2_VOA_W	OLM 4.2 VOA by GC-MS	5	DL
F1096	Aqueous	OLM4.2_VOA_W	OLM 4.2 VOA by GC-MS	19	SAMP

F1096	Aqueous	SM2320_W	ALKALINITY (Total)	2	SAMP
F1096	Aqueous	SM4500_H+	pH VALUE	2	SAMP

General Sample Information	
Do Samples and Analyses on COC check against Lab Sample Tracking Form?	No – Lab performed analysis as per OLM04.2 procedure. SOW and COC list SW8260B as required method. No qualifiers applied based on this discrepancy.
Did coolers arrive at lab between 2 and 6°C and in good condition as indicated on COC and Cooler Receipt Form?	Yes
Frequency of Field QC Samples Correct? Field Duplicate - 1/20 samples Trip Blank - Every cooler with VOCs waters only Equipment Blank - 1/ set of samples per day?	Yes
All ASP Forms complete?	Yes Incorrect BFB summary forms used for some tune clocks. No impact on data quality.
Case narrative present and complete?	Yes
Any holding time violations (See table below)?	No - All samples were prepared and analyzed within holding times.

Insert Holding time table below.

The following tables are presented at the end of this DUSR and provided summaries of results outside QC criteria.

- Method Blanks Results (Table 2)
- Surrogates Outside Limits (Table 3)
- MS/MSD Outside Limits (Table 4)
- LCS Outside Limits (Table 5)
- Re-analysis Results (Table 6)
- Field Duplicate Results (Table 7)

Go to Tables List

Volatile Organics and Semi-volatile Organics by GCMS	
Description	**Notes and Qualifiers**
Any compounds present in method, trip and field blanks (see Table 2)?	No
For samples, if results are <5 times the blank or < 10 times blank for common laboratory contaminants then "U" flag data. Qualification also applies to TICs.	Samples are flagged U as noted on Table 2a for method blanks and Table 2b for field blanks.
Surrogate for method blanks and LCS within limits?	Yes

Data Usability Summary Report	Project: Mr. C's
Date Completed: September 21, 2007	Completed by: B. Krajewski

Volatile Organics and Semi-volatile Organics by GCMS	
Description	**Notes and Qualifiers**
Surrogate for samples and MS/MSD within limits? (See Table 3). All samples should be re-analyzed for VOCs? Samples should re-analyzed if >1 BN and/or > AP for BNAs is out. Matrix effects should be established.	Yes
Laboratory QC frequency one blank and LCS with each batch and one set of MS/MSD per 20 samples?	Yes
MS/MSD within QC criteria (see Table 4)? If out and LCS is compliant, then J flag positive data in original sample due to matrix?	No – Trichloroethene recovery and RPD outside of QC limits for MRC-PW04. Results qualified "J"
LCS within QC criteria (see Table 5)? If out, and the recovery high with no positive values, then no data qualification is required.	Yes
Do internal standards areas and retention time meet criteria? If not was sample re-analyzed to establish matrix (see Table 6)?	Yes
Is initial calibration for target compounds <15 %RSD or curve fit?	Lab analyzed as per OLM04.2. ICAL criteria met.
Is continuing calibration for target compounds < 20.5%D.	OLM04.2 criteria met.
Were any samples re-analyzed or diluted (see Table 6)? For any sample re-analysis and dilutions is only one reportable result by flagged?	Yes – Several samples required reanalysis at dilutions based on levels of target compounds present.
For TICs are there any system related compounds that should not be reported?	No
Do field duplicate results show good precision for all compounds except TICs (see Table 7)?	Yes

General Analytical Methods	
Description	**Notes and Qualifiers**
Any compounds present in method and field blanks as noted on Table 2?	No.
For samples, if results are <5 times the blank then "U" flag data.	Samples are flagged U as noted on Table 2a for method blanks and Table 2b for field blanks.
Laboratory QC frequency one blank and LCS with each batch and one set of MS/MSD per 20 samples?	Yes – (Not applicable for pH)
MS/MSD within QC criteria (see Table 4)? QC limits are not applicable to sample results greater than 4 times spike amount.	NA
LCS within QC criteria (see Table 5)? If out, and the recovery high with no positive values, then no data qualification is required.	Yes
Do field duplicate results show good precision for all compounds (see Table 7)?	NA

Summary of Potential Impacts on Data Usability
Major Concerns
Lab analyzed for volatile samples following CLP OLM04.2 instead of the requested SW8260B with reporting limit of 1.0 ug/L.
Minor Concerns
Matrix spike recovery and RPD criteria not met for trichloroethene in MS/MSD analysis of MRC-PW04. Qualified as estimated "J".

Data Usability Summary Report	Project: Mr. C's
Date Completed: September 21, 2007	Completed by: B. Krajewski

Table 2 - List of Positive Results for Blank Samples
None

Table 2A - List of Samples Qualified for Method Blank Contamination
None

Table 2B - List of Samples Qualified for Field Blank Contamination
None

Table 3 - List of Samples with Surrogates outside Control Limits
None

Table 4 - List MS/MSD Recoveries and RPDs outside Control Limits

Method	Sample ID	Sample Type	Analyte	Orig. Result	Spike Amount	Rec.	Dil Fac	Low Limit	High Limit	Sample Qual.	REPORTABLE
OLM4.2_VOA_W	MRC-PW04	MSD	Trichloroethene	<0.1	50	179	1	71	120	ND	Yes

Method	Sample ID	Sample Type	Analyte	RPD	RPD Limit	Sample Qual.
OLM4.2_VOA_W	MRC-PW04	MSD	Trichloroethene	56	14	None

Table 5 - List LCS Recoveries outside Control Limits
None

Table 6 –Samples that were Reanalyzed

Sample ID	Lab ID	Method	Sample Type	Action
MRC-PW02	F1090-03A	OLM4.2_VOA_W	SAMP	Report, add J and UJ flags
MRC-PW02	F1090-03AD	OLM4.2_VOA_W	DL	Report for E flag data only
MRC-PW03	F1090-04A	OLM4.2_VOA_W	SAMP	Report, add J and UJ flags
MRC-PW03	F1090-04AD	OLM4.2_VOA_W	DL	Report for E flag data only
MRC-PW04	F1090-05A	OLM4.2_VOA_W	SAMP	Report, add J and UJ flags
MRC-PW04	F1090-05AD	OLM4.2_VOA_W	DL	Report for E flag data only
MRC-PW05	F1090-06A	OLM4.2_VOA_W	SAMP	Report, add J and UJ flags
MRC-PW05	F1090-06AD	OLM4.2_VOA_W	DL	Report for E flag data only
MRC-PW06	F1090-07A	OLM4.2_VOA_W	SAMP	Report, add J and UJ flags
MRC-PW06	F1090-07AD	OLM4.2_VOA_W	DL	Report for E flag data only

Data Usability Summary Report	Project: Mr. C's
Date Completed: September 21, 2007	Completed by: B. Krajewski

Sample ID	Lab ID	Method	Sample Type	Action
MRC-PW07	F1090-08A	OLM4.2_VOA_W	SAMP	Report, add J and UJ flags
MRC-PW07	F1090-08AD	OLM4.2_VOA_W	DL	Report for E flag data only
MRC-PW02/D	F1090-10A	OLM4.2_VOA_W	SAMP	Report, add J and UJ flags
MRC-PW02/D	F1090-10AD	OLM4.2_VOA_W	DL	Report for E flag data only
MRC-ESI-3	F1090-13A	OLM4.2_VOA_W	SAMP	Report, add J and UJ flags
MRC-ESI-3	F1090-13AD	OLM4.2_VOA_W	DL	Report for E flag data only
MRC-ESI-6	F1090-15A	OLM4.2_VOA_W	SAMP	Report, add J and UJ flags
MRC-ESI-6	F1090-15AD	OLM4.2_VOA_W	DL	Report for E flag data only
MRC-MPI-3S	F1090-16A	OLM4.2_VOA_W	SAMP	Report, add J and UJ flags
MRC-MPI-3S	F1090-16AD	OLM4.2_VOA_W	DL	Report for E flag data only
MRC-MW07	F1090-19A	OLM4.2_VOA_W	SAMP	Report, add J and UJ flags
MRC-MW07	F1090-19AD	OLM4.2_VOA_W	DL	Report for E flag data only
MRC-EE2	F1096-05A	OLM4.2_VOA_W	SAMP	Report, add J and UJ flags
MRC-EE2	F1096-05AD	OLM4.2_VOA_W	DL	Report for E flag data only
MRC-MW08	F1096-06A	OLM4.2_VOA_W	SAMP	Report, add J and UJ flags
MRC-MW08	F1096-06AD	OLM4.2_VOA_W	DL	Report for E flag data only
MRC-MPI-6S	F1096-07A	OLM4.2_VOA_W	SAMP	Report, add J and UJ flags
MRC-MPI-6S	F1096-07AD	OLM4.2_VOA_W	DL	Report for E flag data only
MRC-MPI-4I	F1096-08A	OLM4.2_VOA_W	SAMP	Report, add J and UJ flags
MRC-MPI-4I	F1096-08AD	OLM4.2_VOA_W	DL	Report for E flag data only
AS INFLUENT	F1096-17A	OLM4.2_VOA_W	SAMP	Report, add J and UJ flags
AS INFLUENT	F1096-17AD	OLM4.2_VOA_W	DL	Report for E flag data only

Table 7 – Summary of Field Duplicate Results

Method	Analyte	Unit	PQL	MRC-PW02/D	MRC-PW02	RPD	RPD Rating	Samp Qual
OLM4.2_VOA_W	Tetrachloroethene	µg/L	80	880	1300	38.5%	Good	None
OLM4.2_VOA_W	Trichloroethene	µg/L	80	8	9	11.8%	Good	None

Data Usability Summary Report	Project: Mr. C's
Date Completed: September 21, 2007	Completed by: B. Krajewski

Method	Analyte	Unit	PQL	MRC-MPI-1S/D	MRC-MPI-1S	RPD	RPD Rating	Samp Qual
OLM4.2_VOA_W	Tetrachloroethene	µg/L	80	97	85	13.2%	Good	None
OLM4.2_VOA_W	Trichloroethene	µg/L	80	6	5	18.2%	Good	None

Key:
A = Analyte
NC = Not Calculated
ND = Not Detected
PQL = Practical Quantitation Limit
RPD = Relative Percent Difference
T = Tentatively Identified Compound