FINAL SUMMARY REPORT FOR THE 2005 GROUNDWATER MONITORING PROGRAM

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EXECUTIVE SUMMARY

This report provides results of the groundwater monitoring program completed at the Former Carborundum Company's Hyde Park facility in Niagara Falls, New York in the fall of 2005 and summarizes groundwater quality at the site over the 1999 to 2005 monitoring period. The majority of groundwater quality data were collected during the five year semi-annual monitoring program completed from 1999 to 2004.

One round of groundwater monitoring was completed at the site in 2005 from October 31 to November 4. The groundwater monitoring included water level surveys, sampling for volatile organic compounds (VOCs), and sampling to monitor the effectiveness of natural attenuation at the site. An investigation of the Town of Niagara sanitary sewer located south of the site beneath Rhode Island Avenue was also conducted to assess potential impacts to the sewer from contaminated groundwater.

Hydrogeologic conditions at the site in 2005 were consistent with those identified in earlier monitoring rounds. Groundwater flow is approximately west-southwesterly across the site in both the overburden and the bedrock. Lower concentrations of COCs found in the sewer downstream of the site compared to upstream in 2005 continue to show no impact to sewer water from the site.

Historic contaminants of concern (COCs) for the site include vinyl chloride, cis- and trans-1,2-dichloroethene, trichloroethene, benzene and 1,1-dichloroethane. COCs, with the exception of benzene, were detected in most overburden and bedrock wells. Benzene was only detected in two overburden and two bedrock wells in 2005.

COC results in both overburden and bedrock groundwater from the Fall 2005 sampling event were generally consistent with results observed during the five year groundwater monitoring program. Trichloroethene and cis- and trans- 1,2-dichloroethene concentrations were similar to, or showed a slight decrease from, concentrations observed in the five year groundwater monitoring program and vinyl chloride concentrations were similar to, or showed a slight increase from, concentrations observed in the five year groundwater monitoring program.

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1 INTRODUCTION

This report provides results for the groundwater monitoring program completed at the Former Carborundum Company's Hyde Park facility in Niagara Falls, New York in 2005 and also summarizes groundwater quality over the 1999 to 2005 monitoring period. This work was completed in accordance with the NYSDEC-approved, Operable Unit 2 (OU2), groundwater monitoring work plan (DE&S, 2000a) and correspondence from NYSDEC dated September 28, 2005.

This document describes the methodology and results from the groundwater monitoring event completed at the site in the fall of 2005 as a continuation of the OU2 groundwater monitoring program. This report also presents data from the five year monitoring program completed in 2004 and a discussion on groundwater quality over the monitoring period from 1999 to 2005.

The report contains seven sections. Section 1 is an introduction to the site and the study. Section 2 describes the work methodology. Section 3 provides a summary and interpretation of groundwater data from the 2005 groundwater monitoring program. Section 4 is a discussion of groundwater monitoring results observed at the site over the groundwater monitoring period from 1999 to 2005. Conclusions are presented in Section 5. Report references are listed in Section 6 and limitations of the report are provided in Section 7.

This report also contains three appendices. Appendix A contains a copy of the waste water discharge permit for the site. The data usability summary report for the 2005 groundwater data is presented in Appendix B. Original electronic laboratory analytical reports are provided in Appendix C.

The remainder of Section 1 provides a background summary of the site and a description of the purpose and scope of the current monitoring program.

1.1 Background

The Former Carborundum Company's Hyde Park facility (“site” or “facility”) in Niagara Falls is listed on the New York State Department of Environmental Conservation's (NYSDEC) list of Inactive Hazardous Waste Disposal Sites, and is currently classified as a Class 2 site. However, based on the results of the Remedial Investigation and Interim Remedial Measure for Operable Unit #3, the site will be re-classified to a Class 4 site. A Class 4 site by definition is a site which has been properly closed but requires continued management. A site location map is provided in Figure 1-1.

Following the completion of a Preliminary Site Assessment (PSA) by INTERA Inc. (INTERA) in 1993, the following investigation and remediation activities have been completed at the site for BP by INTERA and Duke Engineering & Services (DE&S) (now INTERA):

- Remedial Investigation (RI) (INTERA, 1997) and Phase II RI (DE&S, 1998) - Results of the RI and Phase II RI indicated that soils existed on the property that contained volatile organic compounds (VOCs) and/or polycyclic aromatic hydrocarbons (PAHs) at concentrations that exceeded NYSDEC Soil Cleanup Objectives.

- Interim Remedial Measure (IRM) (DE&S, 1999) - The IRM was executed at the site from September 1998 to August 1999 to delineate the extent of soil contamination and to remove contaminated soil. Excavation during the IRM was conducted up to, but not beyond, property boundaries. Some soils containing VOCs above NYSDEC Soil Cleanup Objectives and the Action Level for vinyl chloride were identified along the eastern property boundary, but were not removed during the IRM because off-site excavation was not within the approved scope of work.
- Feasibility Study (FS) (DE&S, 2000b) - The purpose of the FS was to develop a cleanup program that would allow the removal of the site from NYSDEC's list of hazardous waste disposal sites. Removal of contaminated soils during the IRM addressed on-site soils and removed potential on-site sources of contaminants to groundwater. The FS evaluated the ability of available groundwater remediation technologies to reduce contaminant concentrations below the NYSDEC Groundwater Standards/Criteria. Of the alternatives considered, the preferred remedy was no groundwater remediation combined with groundwater monitoring.

Following completion of the IRM and RI/FS, NYSDEC prepared a Record of Decision (ROD) for the site (NYSDEC, 2000). The ROD divides the site into the following three Operable Units:

- OU1 – On-site soil,
- OU2 – Groundwater beneath the site, and
- OU3 – Off-site soil east of the site.

A work plan for implementing the preferred remedy, no further remedial action with groundwater monitoring, was prepared by DE&S in September 2000 (DE&S, 2000a).

An OU3 investigation conducted in August 2001 identified off-site soil contaminated with VOCs at concentrations that exceeded NYSDEC Soil Cleanup Objectives but below Action Levels. The OU3 Investigation Report (INTERA, 2002a) recommended that the IRM process be continued to allow for removal and off-site disposal of contaminated soil from OU3 as well as the remaining on-site contaminated soil that was identified during the IRM along the east property boundary. An IRM Addendum was executed in December 2002 to excavate and dispose of contaminated soils at an appropriate off-site facility. Details of the IRM Addendum were reported by INTERA in January 2004 (INTERA, 2004a).

Following completion of the investigation and IRM for OU3, NYSDEC prepared a ROD for OU3 (NYSDEC, 2004). The ROD concluded that OU3 does not pose a threat to human health or the environment, therefore No Further Action was selected as the remedy for OU3. In conjunction with the October 2000 Record of Decision addressing OU1 and OU2, the NYSDEC will reclassify the site from a Class 2 to a Class 4 on the New York Registry of Inactive Hazardous Waste Disposal Sites, which means the site is properly closed but requires continued management.

The five year groundwater monitoring program was completed in October 2004. The five year summary report (INTERA, 2005a) indicated that groundwater contamination was still present on site. NYSDEC reviewed the five year summary report and provided comments on May 16, 2005, including a request for continued groundwater monitoring. INTERA provided responses to NYSDEC's comments on behalf of BP America on July 27, 2005 with a recommended groundwater sampling

program. Following review of the response letter, NYSDEC provided correspondence dated September 28, 2005 requesting the five year groundwater monitoring program be continued for another five years on an annual basis. The groundwater monitoring is to be conducted on an alternating spring/fall schedule for VOCs and natural attenuation parameters. If site conditions change significantly, or enhanced natural attenuation is implemented at the site, revisions of the sampling program will be considered as warranted.

1.2 Purpose

The groundwater monitoring event performed in late October/early November 2005 was completed to continue monitoring VOC concentrations and natural attenuation parameters in groundwater at the site.

1.3 Scope of Work

The scope of work for the 2005 groundwater monitoring event included:

- Collection of water level information from all overburden and bedrock monitoring intervals;
- Purging all overburden and bedrock monitoring intervals and collecting field measurements of pH, temperature, conductivity, Eh, DO, and turbidity;
- Collecting groundwater samples from all monitoring intervals for VOC analyses;
- Collecting groundwater samples from selected overburden and bedrock monitoring intervals for analysis of natural attenuation parameters; and
- Conducting sewer water sampling and analysis in the sewer beneath Rhode Island Avenue.

Previous rounds of groundwater sampling indicated that the Contaminants of Concern (COCs), as soluble volatile organic compounds (VOCs), that exceeded NYSDEC Water Quality Regulations/Standards in site groundwater include the following:

- Vinyl Chloride
- Cis- and Trans-1,2-Dichloroethene
- Trichloroethene
- 1,1-Dichloroethane
- Benzene

Semi-volatile organic compounds including PAHs, polychlorinated biphenyls (PCBs) and pesticides were not detected in any of the groundwater samples collected during previous investigations. Metals and inorganic compounds were analyzed during previous investigations and were not found to be contaminants of concern. These compounds were not analyzed as part of the 2005 groundwater monitoring program.

2 GROUNDWATER MONITORING PROGRAM METHODOLOGY: 2005

The groundwater monitoring program included water level monitoring, groundwater sampling in all wells, and submission of groundwater samples for analysis of VOCs. Samples from nine monitoring well couplets were also analyzed for natural attenuation parameters. Sewer water sampling was conducted for analysis of VOCs. Quality assurance/quality control samples including field duplicates and trip blanks were also submitted for analysis of VOCs.

All on-site activities were conducted according to health and safety protocols outlined in the Health and Safety Plan (INTERA, 1995a, rev. 2000) and BP's HSSE requirements. A job safety analysis was completed prior to conducting field work and authorization to work forms were filled out daily prior to work commencing. Approval to sample MW-15 in the right-of-way on Hyde Park Boulevard was obtained from New York State Department of Transportation (NYSDOT). Work was conducted in a safe manner according to NYSDOT procedures.

2.1 Groundwater Level Monitoring

Water level monitoring was conducted in all monitoring wells on October 31, 2005. Water levels were measured relative to the top of the PVC well casing using an electric water level tape accurate to 0.01 ft. The depth to water was measured in each well from a surveyed point on the PVC casing. The water levels were then converted to elevations presented as feet above mean sea level (ft ASL) and used to construct groundwater flow contours, and calculate vertical and horizontal hydraulic gradients.

2.2 Groundwater Sampling and Analysis

Groundwater sampling was conducted in all monitoring wells in the network that was established in October 2000 (MW-1 through MW-8 and MW-10 through MW-19) following the methodology outlined in the groundwater monitoring work plan (DE&S, 2000b). Groundwater samples were collected from all monitoring wells to monitor concentrations of COCs. Monitoring well locations are shown on Figure 1-2.

In addition to monitoring concentrations of COCs, several wells were selected for the monitoring of natural attenuation evaluation parameters. The nine well clusters chosen for these additional analyses are located along the groundwater flow path in upgradient, cross-gradient, and downgradient locations and in source areas, as suggested in the *Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Ground Water* (USEPA, 1998). The well couplets selected for natural attenuation monitoring included MW-1, MW-3, MW-4, MW-7, MW-10, MW-14, MW-16, MW-17, and MW-18.

Each well was purged and sampled using a dedicated inertial sampling pump during the period of November 1 to 4, 2005. Wells were sampled following the purging of three borehole volumes of water from each well. Wells that went dry were purged dry three times and allowed to recover before sampling. The borehole volume was calculated as the volume of the standing water in the well and the water contained within the sand pack. Purge water was collected in covered five-gallon pails and

discharged directly to the Town of Niagara sewer as allowed by the discharge permit from the City of Niagara Falls. A copy of this permit may be found in Appendix A.

During purging, groundwater was monitored for pH, temperature and conductivity. Following purging, groundwater was also monitored for redox potential (Eh), dissolved oxygen (DO) and turbidity. In addition, observations of purge water were made for color, odor and turbidity as well as for the presence of non-aqueous phase liquids. Weather conditions at the time of sampling and all other observations were recorded in a field notebook.

2.2.1 Analysis of VOCs

Groundwater samples were collected unfiltered for analysis of VOCs. Samples were stored in coolers with ice and shipped to Severn Trent Laboratories (STL) of Amherst, New York within 48 hours of sampling. Forty-five water samples were submitted to the laboratory for VOC analysis during the 2005 sampling round including 33 monitoring well samples, three sewer samples, four duplicates and five trip blanks. A summary of groundwater sampling is provided in Table 2-1. A summary of analytical specifications including analytical methods and holding times is provided in Table 2-2.

2.2.2 Analysis of Natural Attenuation Parameters

To evaluate the potential effects of natural attenuation processes on contaminated groundwater at the Former Carborundum Company site, nine well couplets were sampled during the Fall 2005 sampling round. Samples were analyzed for the following parameters as suggested in *Natural Attenuation of Chlorinated Solvents in Groundwater: Principles and Practices* (ITRC, 1999):

- Methane, ethene, ethane, propane, propene
- Total organic carbon (TOC), biochemical oxygen demand (BOD), chemical oxygen demand (COD)
- Dissolved oxygen (DO) and Eh (using an oxidation-reduction potential [ORP] probe) as field measurements
- Total iron
- Nitrate, nitrite, sulfate
- Chloride, sulfide

In addition to the measurement of the field parameters listed above, a field analysis was conducted for ferrous iron (Fe^{+2}) because this parameter is difficult to preserve in oxygen-rich environments and is not suitable for laboratory analysis due to the very short holding time for the analytical method.

Samples were collected unfiltered and were stored in coolers with ice and shipped to STL of Amherst, New York within 48 hours of sampling. Twenty samples were submitted to the laboratory for the analysis of natural attenuation parameters including 18 groundwater samples and two field duplicates. A summary of natural attenuation sampling is provided in Table 2-1. A summary of analytical specifications including analytical methods and holding times is provided in Table 2-2.

2.3 Sewer Water Sampling and Analysis

Sewer water sampling and analysis was conducted for the Town of Niagara sewer located south of the site beneath Rhode Island Avenue. Sewer water samples were collected from a manhole in Rhode Island Avenue east of Panama Street that is located two blocks east of the eastern site boundary (MH-3). This served as an "upgradient" sampling location. Two sewer water samples were collected from manholes located immediately south of the site in Rhode Island Avenue. One was collected from the manhole located closest to, but not in, Hyde Park Boulevard (MH-1). A second sample was collected from the manhole east of MH-1 (MH-2). These two samples are "site" sampling locations. Sewer sampling locations are indicated on Figure 1-2.

Sewer water grab samples were collected by removing manhole covers and lowering clean, wide-mouth glass jars attached to the end of a telescopic pole, into flowing wastewater in the sewer. Grab samples were then transferred to laboratory-prepared sample containers for analysis.

Sewer water samples were collected during dry conditions and flow rates in all three manholes were observed to be similar to those noted during previous sampling events under similar dry conditions.

Sewer water samples were collected unfiltered for analysis of VOCs. Samples were stored in coolers with ice and shipped to STL of Amherst, New York within 48 hours of sampling. Four sewer samples were submitted to the laboratory, including three manhole samples and one field duplicate. A summary of sewer water samples is included in Table 2-1. A summary of analytical specifications including analytical methods and holding times is provided in Table 2-2.

2.4 Decontamination Procedures

After each water level measurement, the water level tape was decontaminated using the following protocol:

- Methanol spray, and
- De-ionized water rinse.

All other down-hole equipment (i.e., sampling pumps and tubing) was dedicated to individual monitoring wells and therefore decontamination of this equipment was not required.

Other measures used to prevent cross-contamination during sampling included changing latex gloves between sample locations, disposing of purge water to the sanitary sewer (as per City of Niagara Falls Permit), and rinsing the pH, ORP, DO, turbidity, temperature and conductivity probes with distilled water between measurements.

3 RESULTS OF GROUNDWATER MONITORING PROGRAM: 2005

3.1 Hydrogeology

3.1.1 Groundwater Elevations and Flow Directions

A summary of static groundwater elevations for water level measurements taken during groundwater sampling from August 1992 to October 2005 is provided in Table 3-1. Table 3-1 also includes the ground surface and top of PVC monitoring well casing elevations.

Groundwater in overburden monitoring intervals was measured at depths ranging from 3.9 to 8.4 ft below ground surface (BGS) in October 2005. Figure 3-1 depicts potentiometric groundwater contours in the overburden, based on October 2005 groundwater elevations. The general direction of horizontal groundwater flow in the overburden in October 2005 was toward the southwest. The general direction of horizontal groundwater flow in the overburden remained the same in 2005 as determined during the five year groundwater monitoring program.

Groundwater in bedrock monitoring intervals was measured at depths ranging from 3.3 to 9.0 ft BGS in October 2005. Figure 3-2 depicts potentiometric groundwater contours in the Lockport Dolomite bedrock, based on October 2005 groundwater elevations. The general direction of horizontal groundwater flow in the bedrock in October 2005 was toward the west-southwest. The general direction of horizontal groundwater flow in the bedrock remained the same in 2005 as determined during the five year groundwater monitoring program.

3.1.2 Vertical Hydraulic Gradients

Table 3-2 lists vertical hydraulic gradients calculated for October 31, 2005. The vertical hydraulic gradients in Table 3-2 were calculated for each well cluster based on the following equation:

$$i = \frac{\Delta h}{\Delta l} \qquad (1)$$

where: Δh = difference between overburden and bedrock groundwater elevations at a well couplet (ft)

Δl = distance between the midpoint of the overburden well screen and the bedrock well screen (ft)

The vertical hydraulic gradients calculated based on October 2005 data are consistent with conditions observed during the five year groundwater monitoring program. A downward hydraulic gradient, indicating that groundwater is recharging the Lockport Dolomite bedrock through the overburden was observed in most well couplets located in the north and northeast portion of the site. An upward hydraulic gradient, indicating that groundwater is discharging from the bedrock to the overburden was observed in most well couplets located in the south and southwest portion of the site, and beyond the south property boundary.

Figure 3-3 shows the regions of upward and downward vertical hydraulic gradients based on the water levels measured October 31, 2005.

3.1.3 Groundwater Flow Velocity

The estimated velocity of groundwater flow can be calculated using the following equation (Freeze and Cherry, 1979):

$$V = \frac{Ki}{n} \qquad (2)$$

where: V = average linear groundwater velocity (ft/s)
K = hydraulic conductivity (ft/s)
i = hydraulic gradient (ft/ft)
n = effective transport porosity (dimensionless)

The geometric mean hydraulic conductivity for the overburden, calculated during the PSA (INTERA, 1993), was 4.3×10^{-6} ft/s. The horizontal hydraulic gradient in the overburden in October 2005 was approximately 0.01 ft/ft. Using an assumed soil porosity of 0.3, the estimated horizontal velocity of groundwater flow in the overburden was calculated to be 4.5 ft/year in October 2005. The overburden groundwater velocity calculated in 2005 was consistent with groundwater flow velocities calculated during the five year groundwater monitoring program.

The geometric mean hydraulic conductivity for the bedrock, calculated during the RI (INTERA, 1997), was 3.43×10^{-5} ft/s. The horizontal hydraulic gradient in the bedrock in October 2005 was approximately 4.0×10^{-3} ft/ft. Using an assumed bedrock porosity of 0.01, the estimated velocity of groundwater flow in bedrock was calculated to be 433 ft/year in October 2005. The bedrock groundwater velocity calculated in 2005 was slightly higher than velocities calculated during the previous monitoring rounds.

3.2 Data Validation

Validation of the data was completed for both field and laboratory aspects of the sampling program. Data validation consisted of:

- Assessment of the field sampling protocols and Quality Assurance/Quality Control (QA/QC) procedures; and
- Assessment of the laboratory analytical methodology and QA/QC procedures.

3.2.1 Field Sampling QA/QC

To ensure that representative samples were collected in the field and were delivered to the laboratory without degradation or contamination of the sample, the following field QA/QC measures were taken:

- Water level tape was decontaminated after each measurement;

- Field staff used new latex gloves for each sampling location;
- Groundwater monitoring wells were previously fitted with dedicated sampling equipment to prevent cross contamination;
- Sampling for VOCs in water was undertaken using care to avoid agitating the sample and losing VOCs through volatilization; and
- Samples were delivered to the laboratory in sealed, refrigerated coolers under chain-of-custody within 48 hours of sampling.

During sampling, duplicate samples and travel/trip blanks were collected to assess analytical precision and to identify potential sample contamination during sampling or transportation. All QA/QC samples were analyzed for VOCs and selected duplicate samples were also analyzed for natural attenuation parameters. The additional QA/QC samples collected in October 2005 included the following:

- Duplicate sewer water sample collected from MH-1 (sample no. OU2-1005-E01 and OU2-1005-E02);
- Duplicate groundwater sample collected from MW-7A (sample no. OU2-1005-G12 and OU2-1005-G13), the duplicate sample was also analyzed for natural attenuation parameters;
- Duplicate groundwater sample collected from MW-10B (sample no. OU2-1005-G17 and OU2-1005-G18), the duplicate sample was also analyzed for natural attenuation parameters;
- Duplicate groundwater sample collected from MW-17B (sample no. OU2-1005-G31 and OU2-1005-G32); and
- Trip blanks shipped to the laboratory included November 1 (Tripblank-1), November 2 (Tripblank-2, and Tripblank-3), and on November 3, 2005 (Tripblank-4, and Tripblank-5).

The correlation between original and duplicate samples was considered during the review of the laboratory analytical data and is discussed in Section 3.2.2.

3.2.2 Laboratory QA/QC

Severn Trent Laboratories (STL) provided Category B deliverables for all of the samples analyzed. Groundwater samples were analyzed for VOCs using EPA SW-846 Method 8260B. All samples were analyzed within the required holding times. The internal laboratory QA/QC procedures were sufficient to meet the criteria outlined in the methods.

Analytical data was reviewed by INTERA and a Data Usability Summary Report (DUSR) was prepared in accordance with NYSDEC's Guidance for the Development of Data Usability Summary Reports. QA/QC was generally acceptable. No problems were noted with trip blank samples. The majority of the data did not require qualification and can be used to make project decisions. The sewer samples were qualified as estimates for VOCs and six samples were qualified for total iron and chemical oxygen demand because field duplicate samples were outside a 20% control limit for relative percent difference. Some VOC parameters were also qualified for initial and continuing calibrations, however, none of the qualified VOC parameters were COCs for the site. All analytical data was deemed acceptable for the intended use. The DUSR for 2005 data is included in Appendix B.

High concentrations of some analytes found in several groundwater samples necessitated sample dilution. This resulted in high detection limits for other COCs in these samples, however, all laboratory reporting limits met the Contract Required Quantitation Limits (CRQLs).

3.3 Groundwater Sampling Results

Field measured parameters and analytical results for COCs in groundwater samples for the Fall 2005 sampling event are provided in Tables 3-3 to 3-8. Analytical results from sampling during the 1992 PSA, the 1996 RI, the 1997 Phase II RI, and the five year groundwater monitoring program are also included in Tables 3-4 to 3-8, as well as applicable groundwater criteria from NYSDEC (6NYCRR, Part 703 (1991a); TOGS 1.1.1 (1991b)). Laboratory analytical reports for the Fall 2005 sampling round are included in Appendix C (on CDROM).

3.3.1 Physical Parameters in Overburden and Bedrock Groundwater

Table 3-3 provides a summary of field-measured parameters. Parameters included temperature, pH, conductivity, and turbidity. These parameters were used to ensure representative groundwater samples were collected. Dissolved oxygen (DO) and Eh were also measured to assist in evaluating the natural attenuation processes.

The physical parameters measured in November 2005 were generally consistent with previous rounds of monitoring. Groundwater temperatures ranged from 13.3 to 17.6 °C for the shallow overburden wells and from 12.2 to 15.7 °C for the deeper bedrock wells. Groundwater pH values ranged from 6.7 to 7.3. Conductivity measurements ranged from 0.67 to 3.21 mS/cm. Conductivities were higher, on average, in overburden groundwater than the bedrock.

The oxidation-reduction potential and DO measurements collected in the field were also generally consistent with previous rounds of monitoring, not showing any major changes in the potential for natural attenuation to occur at the site. Eh values ranging from -84 to 25.1 mV were measured in overburden groundwater and values ranging from -107 to -22 mV were recorded for bedrock groundwater. As in previous rounds of monitoring, bedrock groundwater indicated more reducing conditions on average than overburden groundwater. DO measurements ranged from 0.5 to 6.5 mg/L.

3.3.2 COCs in Overburden Groundwater

The COCs results for overburden groundwater were consistent with previous rounds of monitoring. COCs were detected in all overburden wells, with the exception of MW-13A. The most commonly detected COCs in the remaining wells in order of decreasing frequency were vinyl chloride, cis- and trans-1,2-dichloroethene, trichloroethene, and 1,1-dichloroethane.

The highest concentrations of COCs were recorded at MW-7A for the Fall 2005 sampling event, which is consistent with previous sampling rounds. The maximum concentrations of COCs, recorded at MW-7A were:

- Vinyl chloride – 205 μg/L;
- Cis- and trans-1,2-dichloroethene – 1950 μg/L;
- Trichloroethene – 475 μg/L; and
- 1,1-dichloroethane – 345 μg/L.

Summaries of COC concentrations for all sampling rounds are provided in Tables 3-4 to 3-8. Overburden COC concentrations from the five year groundwater monitoring program and the Fall 2005 sampling event are shown on Figure 3-4.

Low concentrations of benzene were detected in overburden groundwater at MW-4A and MW-7A during the Fall 2005 sampling event. The benzene detection at MW-4A was qualified as an estimate as it was below laboratory analytical detection limits. Benzene concentrations for all sampling rounds are provided in Table 3-7.

3.3.3 COCs in Bedrock Groundwater

The COCs results for bedrock groundwater were consistent with previous rounds of monitoring. COCs were detected in all bedrock wells. The most commonly detected COCs in order of decreasing frequency were vinyl chloride, cis- and trans-1,2-dichloroethene, 1,1-dichloroethane, and trichloroethene.

The highest concentrations of COCs were recorded at MW-17B for the Fall 2005 sampling event, with the exception of vinyl chloride. The maximum concentration of vinyl chloride was measured at MW18-B, which is consistent with previous sampling rounds. The maximum concentrations of COCs in bedrock were:

- Vinyl chloride – 180 μg/L;
- Cis- and trans-1,2-dichloroethene – 985 μg/L;
- Trichloroethene – 11 μg/L; and
- 1,1-dichloroethane – 25.5 μg/L.

Summaries of COC concentrations for all sampling rounds are provided in Tables 3-4 to 3-8. Bedrock COC concentrations from the five year groundwater monitoring program and the Fall 2005 sampling event are shown on Figure 3-5.

Low concentrations of benzene were detected in bedrock groundwater at MW-16B and MW-17B during the Fall 2005 sampling event. The benzene detection at MW-16B was qualified as an estimate as it was below laboratory analytical detection limits. Benzene concentrations for all sampling rounds are provided in Table 3-7.

3.4 Natural Attenuation Monitoring

Analytical results for natural attenuation evaluation parameters are provided in Table 3-9. The analytical results from the field analyses conducted for ferrous iron are also included in Table 3-9. Results from the field testing of DO and Eh are included in Table 3-3. Laboratory analytical reports for the Fall 2005 sampling event are included in Appendix C (on CD ROM).

Analytical and field-measured parameters were evaluated to determine the potential for natural attenuation processes to operate at the site using the methodology suggested by USEPA (1998) for preliminary screening of anaerobic degradation processes for chlorinated COCs. This approach was designed by the USEPA to evaluate geochemical environments where reductive dechlorination of chlorinated hydrocarbons is likely to occur. Reductive dechlorination is the initial biotransformation process of most chlorinated hydrocarbons in the environment.

This screening methodology was applied to both overburden and bedrock groundwater at the site for the Fall 2005 data. An abbreviated version of the USEPA preliminary screening criteria, and the resultant scoring for site groundwater, is provided in Table 3-10.

Based on comparison of groundwater data to the input fields in Table 3-10, preliminary screening results indicate that there is limited evidence for anaerobic degradation in shallow overburden and deeper bedrock groundwater. The decreasing trend of trichloroethene and the detection of degradation compounds, as cis- and trans-1,2-dichloroethene and vinyl chloride, indicates that reductive dechlorination is occurring.

3.5 Sewer Water Sampling Results

Analytical results for sewer water samples are included in Tables 3-4 to 3-8. Laboratory analytical reports for the Fall 2005 sampling event are included in Appendix C (on CD ROM).

Concentrations of cis- and trans-1,2-dichloroethene and trichloroethene were detected in each of the sewer samples collected October 31, 2005. No other COCs were detected above analytical detection limits in any of the sewer water samples. The highest concentrations of cis- and trans-1,2-dichloroethene and trichloroethene were recorded at the upstream location, MH-3. MH-3 is representative of background sanitary sewer water quality. Lower levels of COCs detected in the sewer water downstream of the site compared to upstream indicate that no significant impacts to the sewer water are occurring from the site.

The elevation of the sewer bottom was measured at each sewer sampling location. The elevation of the sewer bottom is lower than the water table at the site and therefore may influence local groundwater flow directions.

4 DISCUSSION OF RESULTS

The estimated horizontal velocity of groundwater flow in the overburden has ranged from as low as 1.8 ft/year in October 2002 to 4.5 ft/year in October 2005. The estimated horizontal velocity of groundwater flow in the bedrock has ranged from 107 ft/year in October 2002 to 433 ft/year in October 2005.

4.1 COCs in Overburden Groundwater

Overburden groundwater COC concentrations from the five year monitoring program and the Fall 2005 sampling event are shown on Figure 3-4. The 2005 COC results were generally consistent with the five year monitoring program results. Trichloroethene and cis- and trans-1,2-dichloroethene concentrations, at most intervals, were either similar or somewhat less than those from previous sampling rounds conducted in the fall. Vinyl chloride concentrations, at most intervals, were either similar or slightly greater than those from previous fall sampling rounds.

4.2 COCs in Bedrock Groundwater

Bedrock groundwater COC concentrations from the five year monitoring program and the Fall 2005 sampling event are shown on Figure 3-5. The 2005 COC results were generally consistent with the five year monitoring program results. Trichloroethene and cis- and trans-1,2-dichloroethene concentrations, at most intervals, were either similar or somewhat less than those from previous sampling rounds conducted in the fall. Vinyl Chloride concentrations, at most intervals, were either similar or slightly greater than those from previous fall sampling rounds.

4.3 Natural Attenuation Monitoring

Groundwater samples for natural attenuation monitoring have been collected on ten separate occasions since the October 2000 sampling round. The analytical results indicate that concentrations of natural attenuation parameters are relatively consistent at the site.

4.4 Sewer Water Quality

Sewer water samples have also been collected on ten separate occasions since October 2000. COC concentrations are relatively similar between sampling rounds. The only consistently detected parameters are cis- and trans-1,2-dichloroethene and trichloroethene with the highest concentrations generally detected in the upstream sewer sampling location, MH-3, that is representative of background sewer water quality.

5 CONCLUSIONS

1. Groundwater flow directions and velocities calculated from the Fall 2005 data were consistent with former groundwater monitoring results. Groundwater flow is approximately west-southwesterly across the site in both the overburden and the bedrock. The calculated average linear groundwater flow velocity in the overburden was 4.5 ft/year and the average site-wide linear groundwater flow velocity in the upper portion of the bedrock was calculated as 433 ft/year. The linear groundwater flow velocities calculated in 2005 were slightly higher than the five year averages of 3.5 ft/year for overburden and 210 ft/year for bedrock.

2. Lower concentrations of COCs found in the sewer downstream of the site compared to upstream in 2005, continue to show no impact to sewer water from the site.

3. Overburden well MW-7A, which is located along the north property boundary, near the former solvent storage area, consistently shows the highest level of contamination.

4. COC results in both overburden and bedrock groundwater from the Fall 2005 sampling event were generally consistent with results observed during the five year groundwater monitoring program. Trichloroethene and cis- and trans- 1,2-dichloroethene concentrations were similar to, or showed a slight decrease from, concentrations observed in the five year groundwater monitoring program and vinyl chloride concentrations were similar to, or showed a slight increase from, concentrations observed in the five year groundwater monitoring program.

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7 REPORT LIMITATIONS

This report has been prepared for the exclusive use of BP using a methodology for conducting an environmental site assessment that is acceptable within the profession. Data obtained from borehole and/or monitoring well investigations represent the conditions about a limited area surrounding the sampling location and as such can be expected to be variable with respect to location and time. It should be noted that results of an investigation of this type should in no way be construed as a warranty that the site is free from any and all contamination from past or current practices.

INTERA Inc. (INTERA) has exercised professional judgment in collecting and analyzing the information and in formulating recommendations based on the results of the study. The evaluation and conclusions contained in the report have been prepared on the basis of conditions in evidence at the time of the site investigation and on the basis of information provided to INTERA. Accordingly, INTERA cannot accept responsibility for any deficiency, misstatement or inaccuracy contained in this report as a result of misstatements, omissions, misrepresentations, or fraudulent acts of persons providing information.

The mandate of INTERA Inc. is to perform the given tasks within the guidelines prescribed by the client and with the quality and due diligence expected within the profession. No other warranty or representation, expressed or implied, as to the accuracy of the information or recommendations is included or intended in this report.

INTERA hereby disclaims any liability or responsibility to any person or party, other than the party to whom this report is addressed, for any loss, damage, expense, fines or penalties which may arise or result from the use of any information or recommendations contained in this report by any other party. Any use of this report constitutes acceptance of the limits of INTERA's liability. INTERA's liability extends only to its client and only for the total amount of fees received from the client for this specific project and not to other parties who may obtain this report.

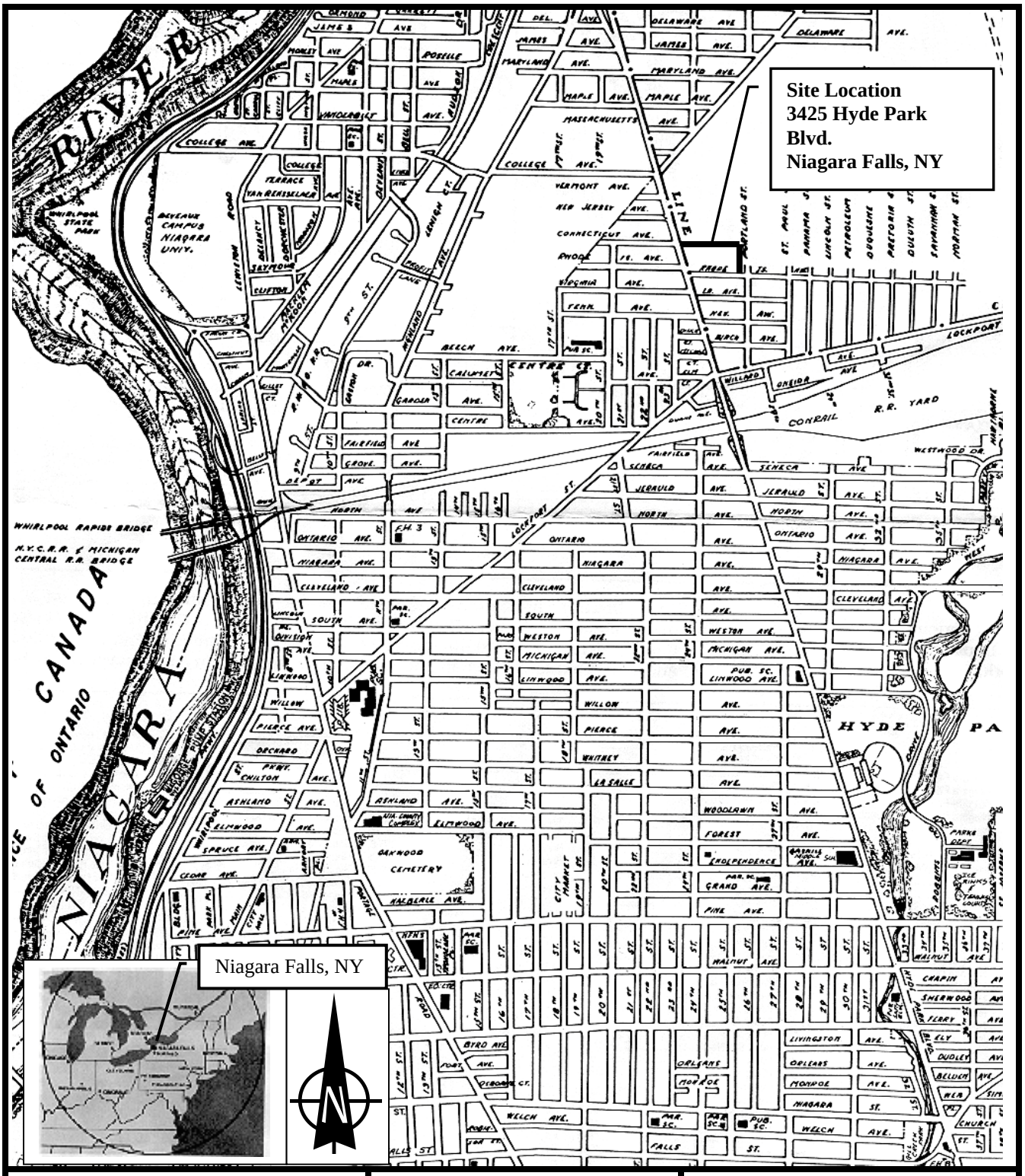
Respectfully submitted,

INTERA INC.

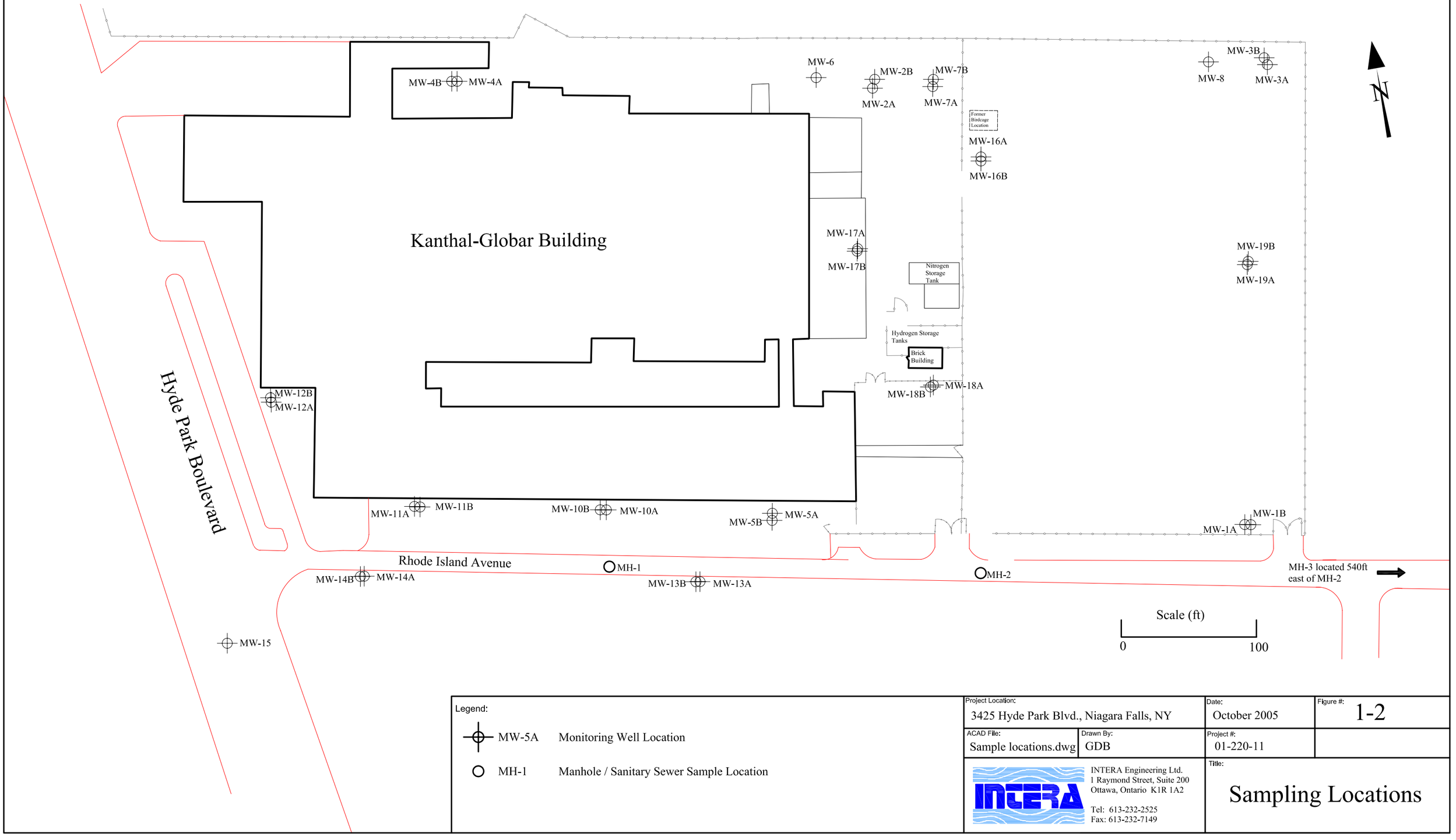
Glen D. Briscoe, P.Eng.
Environmental Engineer

Steven T. Wegner, P. Eng.
Senior Project Manager

FIGURES



INTERA	**Figure 1-1**	**Site Location Map**



Legend:

MW-5A	Monitoring Well Location
MH-1	Manhole / Sanitary Sewer Sample Location

Project Location: 3425 Hyde Park Blvd., Niagara Falls, NY		Date: October 2005	Figure #: 1-2
ACAD File: Sample locations.dwg	Drawn By: GDB	Project #: 01-220-11	

INTERA Engineering Ltd.
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Ottawa, Ontario K1R 1A2

Tel: 613-232-2525
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Title: Sampling Locations

N

MW-4A
587.73

MW-2A
589.75

MW-7A
589.59

Former Birdcage Location

MW-16A
587.72

593.95
MW-3A

593

592

591

590

589

588

587

Kanthal-Globar Building

MW-17A
588.80

Nitrogen Storage Tank

Hydrogen Storage Tanks

Brick Building

MW-18A
588.69

MW-19A
589.68

Hyde Park Boulevard

586.48
MW-12A

MW-11A
587.18

MW-10A
587.67

MW-5A
587.76

MW-1A
588.85

Rhode Island Avenue

MH-1

MH-2

MH-3 located 540ft east of MH-2

MW-14A
586.12

MW-13A
587.52

Scale (ft)

0 100

Legend:

MW-5A	Monitoring Well Location	588.32	Groundwater Elevation (ft.amsl)
MH-1	Manhole / Sewer Sample Location		
587	Contour Elevation (ft above mean sea level)		

Note: Contour Interval = 1ft

Project Location: 3425 Hyde Park Blvd., Niagara Falls, NY		Date: October 2005	Figure #: 3-1
ACAD File: GW Elev 2005.dwg	Drawn By: GDB	Project #: 01-220-11	

INTERA Engineering Ltd.
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Tel: 613-232-2525
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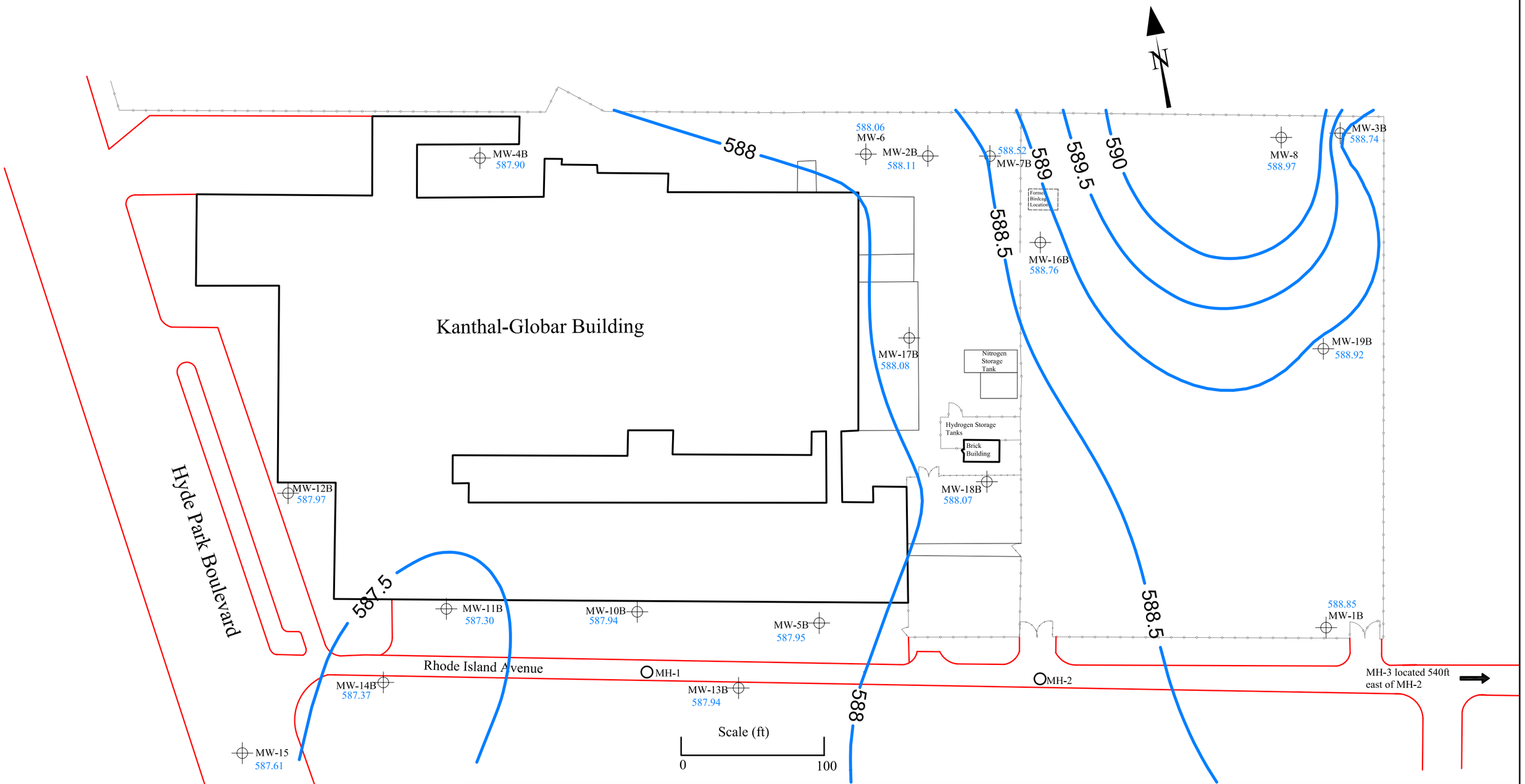
Title: Overburden Groundwater Elevations - Oct 31/05



Legend:

MW-5A	Monitoring Well Location	588.32	Groundwater Elevation (ft.amsl)
MH-1	Manhole / Sewer Sample Location		
587	Contour Elevation (ft above mean sea level)		

Note: Contour Interval = 0.2ft

Project Location: 3425 Hyde Park Blvd., Niagara Falls, NY		Date: October 2005	Figure #: 3-2
ACAD File: GW Elev 2005.dwg	Drawn By: GDB	Project #: 01-220-11	

INTERA Engineering Ltd.
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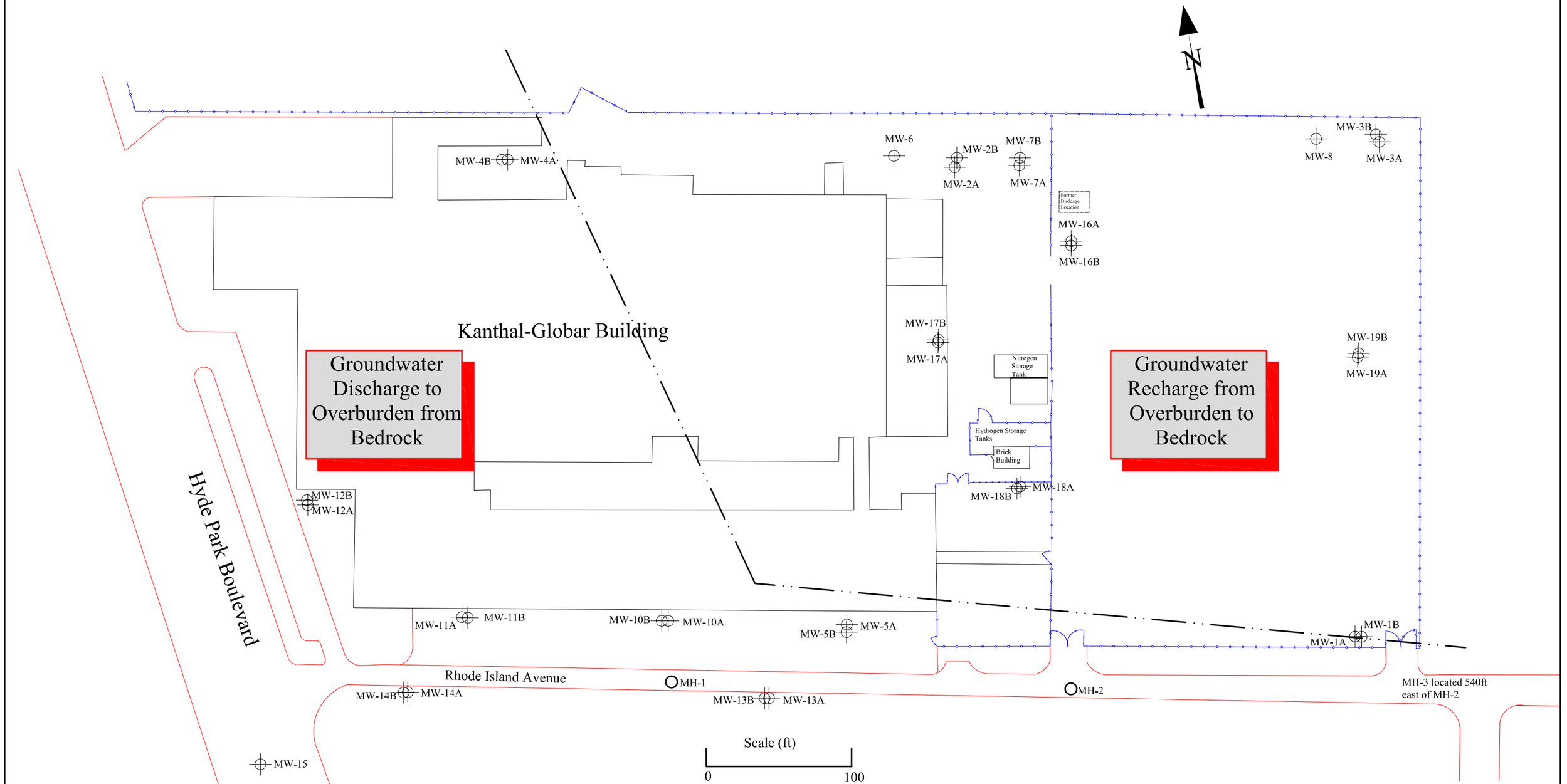
Tel: 613-232-2525
Fax: 613-232-7149

Title: Bedrock Groundwater Elevations - Oct 31/05



Legend:

- MW-5A — Monitoring Well Location
- MH-1 — Manhole / Sanitary Sewer Location
- Vertical Groundwater Boundary

Project Location: 3425 Hyde Park Blvd., Niagara Falls, NY		Date: October 2005	Figure #: 3-3
ACAD File: Vert Grad-2005.dwg	Drawn By: GDB	Project #: 01-220-11	

Intera Engineering Ltd.
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Tel: 613-232-2525
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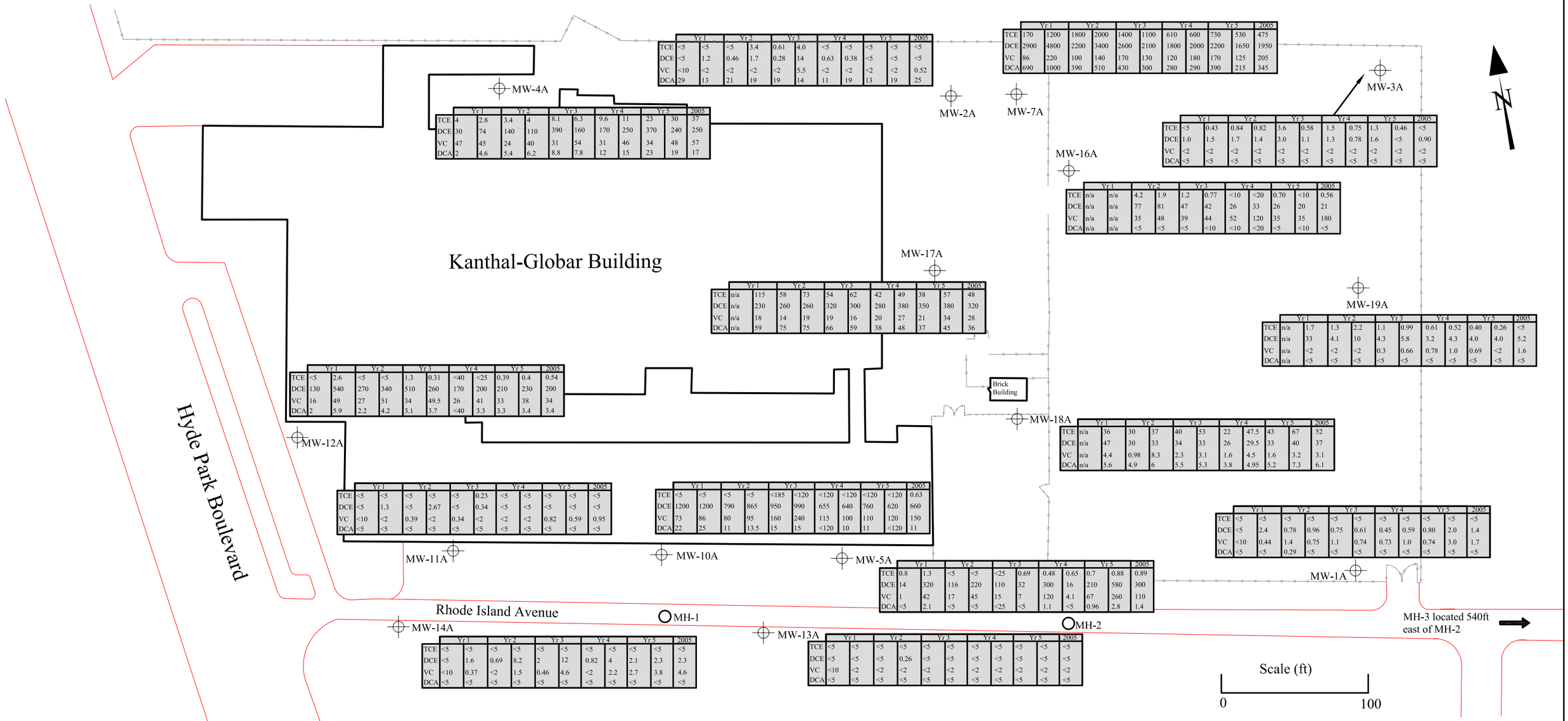
Title: Vertical Groundwater Gradients - Oct. 2005



	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	2005
TCE	<5	<5	<5	3.4	0.61	4.0
DCE	<5	1.2	0.46	1.7	0.28	14
VC	<10	<2	<2	<2	<2	5.5
DCA	29	13	21	19	19	14

	Yr 4		Yr 5		2005
TCE	<5	<5	<5	<5	<5
DCE	0.63	0.38	<5	<5	<5
VC	<2	<2	<2	<2	0.52
DCA	11	19	13	19	25

	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	2005
TCE	170	1200	1800	2000	1400	1100
DCE	2900	4800	2200	3400	2600	2100
VC	86	220	100	140	170	130
DCA	690	1000	390	510	430	300

	Yr 4		Yr 5		2005
TCE	610	600	730	530	475
DCE	1800	2000	2200	1650	1950
VC	120	180	170	125	205
DCA	280	290	390	215	345

	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	2005
TCE	4	2.8	3.4	4	8.1	6.3
DCE	30	74	140	110	390	160
VC	47	45	24	40	31	54
DCA	2	4.6	5.4	6.2	8.8	7.8

	Yr 4		Yr 5		2005
TCE	9.6	11	23	30	37
DCE	170	250	370	240	250
VC	31	46	34	48	57
DCA	12	15	23	19	17

	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	2005
TCE	<5	0.43	0.84	0.82	3.6	0.58
DCE	1.0	1.5	1.7	1.4	3.0	1.1
VC	<2	<2	<2	<2	<2	<2
DCA	<5	<5	<5	<5	<5	<5

	Yr 4		Yr 5		2005
TCE	1.5	0.75	1.3	0.46	<5
DCE	1.3	0.78	1.6	<5	0.90
VC	<2	<2	<2	<2	<2
DCA	<5	<5	<5	<5	<5

	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	2005
TCE	n/a	n/a	4.2	1.9	1.2	0.77
DCE	n/a	n/a	77	81	47	42
VC	n/a	n/a	35	48	39	44
DCA	n/a	n/a	<5	<5	<5	<10

	Yr 4		Yr 5		2005
TCE	<10	<20	0.70	<10	0.56
DCE	26	33	26	20	21
VC	52	120	35	35	180
DCA	<10	<20	<5	<10	<5

	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	2005
TCE	n/a	115	58	73	54	62
DCE	n/a	230	260	260	320	300
VC	n/a	18	14	19	19	16
DCA	n/a	59	75	75	66	59

	Yr 4		Yr 5		2005
TCE	42	49	38	57	48
DCE	280	380	350	380	320
VC	20	27	21	34	28
DCA	38	48	37	45	36

	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	2005
TCE	n/a	1.7	1.3	2.2	1.1	0.99
DCE	n/a	33	4.1	10	4.3	5.8
VC	n/a	<2	<2	<2	0.3	0.66
DCA	n/a	<5	<5	<5	<5	<5

	Yr 4		Yr 5		2005
TCE	0.61	0.52	0.40	0.26	<5
DCE	3.2	4.3	4.0	4.0	5.2
VC	0.78	1.0	0.69	<2	1.6
DCA	<5	<5	<5	<5	<5

	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	2005
TCE	<5	2.6	<5	<5	1.3	0.31
DCE	130	540	270	340	510	260
VC	16	49	27	51	34	49.5
DCA	2	5.9	2.2	4.2	3.1	3.7

	Yr 4		Yr 5		2005
TCE	<40	<25	0.39	0.4	0.54
DCE	170	200	210	230	200
VC	26	41	33	38	34
DCA	<40	3.3	3.3	3.4	3.4

	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	2005
TCE	n/a	36	30	37	40	53
DCE	n/a	47	30	33	34	33
VC	n/a	4.4	0.98	8.3	2.3	3.1
DCA	n/a	5.6	4.9	6	5.5	5.3

	Yr 4		Yr 5		2005
TCE	22	47.5	43	67	52
DCE	26	29.5	33	40	37
VC	1.6	4.5	1.6	3.2	3.1
DCA	3.8	4.95	5.2	7.3	6.1

	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	2005
TCE	<5	<5	<5	<5	<5	<5
DCE	<5	1.3	<5	2.67	<5	0.34
VC	<10	<2	0.39	<2	0.34	<2
DCA	<5	<5	<5	<5	<5	<5

	Yr 4		Yr 5		2005
TCE	<5	0.23	<5	<5	<5	<5
DCE	<5	0.34	<5	<5	<5	<5
VC	<2	<2	<2	<2	0.82	0.59
DCA	<5	<5	<5	<5	<5	<5

	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	2005
TCE	<5	<5	<5	<5	<185	<120
DCE	1200	1200	790	865	950	990
VC	73	86	80	95	160	240
DCA	22	25	11	13.5	15	15

	Yr 4		Yr 5		2005
TCE	<120	<120	<120	<120	0.63
DCE	655	640	760	620	660
VC	115	100	110	120	150
DCA	<120	10	11	<120	11

	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	2005
TCE	0.8	1.3	<5	<5	<25	0.69
DCE	14	320	116	220	110	32
VC	1	42	17	45	15	7
DCA	<5	2.1	<5	<5	<25	<5

	Yr 4		Yr 5		2005
TCE	0.48	0.65	0.7	0.88	0.89
DCE	300	16	210	580	300
VC	120	4.1	67	260	110
DCA	1.1	<5	0.96	2.8	1.4

	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	2005
TCE	<5	<5	<5	<5	<5	<5
DCE	<5	2.4	0.78	0.96	0.75	0.61
VC	<10	0.44	1.4	0.75	1.1	0.74
DCA	<5	<5	0.29	<5	<5	<5

	Yr 4		Yr 5		2005
TCE	<5	<5	<5	<5	<5
DCE	0.45	0.59	0.80	2.0	1.4
VC	0.73	1.0	0.74	3.0	1.7
DCA	<5	<5	<5	<5	<5

	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	2005
TCE	<5	<5	<5	<5	<5	<5
DCE	<5	1.6	0.69	8.2	2	12
VC	<10	0.37	<2	1.5	0.46	4.6
DCA	<5	<5	<5	<5	<5	<5

	Yr 4		Yr 5		2005
TCE	<5	<5	<5	<5	<5
DCE	0.82	4	2.1	2.3	2.3
VC	<2	2.2	2.7	3.8	4.6
DCA	<5	<5	<5	<5	<5

	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	2005
TCE	<5	<5	<5	<5	<5	<5
DCE	<5	<5	<5	0.26	<5	<5
VC	<10	<2	<2	<2	<2	<2
DCA	<5	<5	<5	<5	<5	<5

	Yr 4		Yr 5		2005
TCE	<5	<5	<5	<5	<5
DCE	<5	<5	<5	<5	<5
VC	<2	<2	<2	<2	<2
DCA	<5	<5	<5	<5	<5

Legend:

MW-5A — Monitoring Well Location

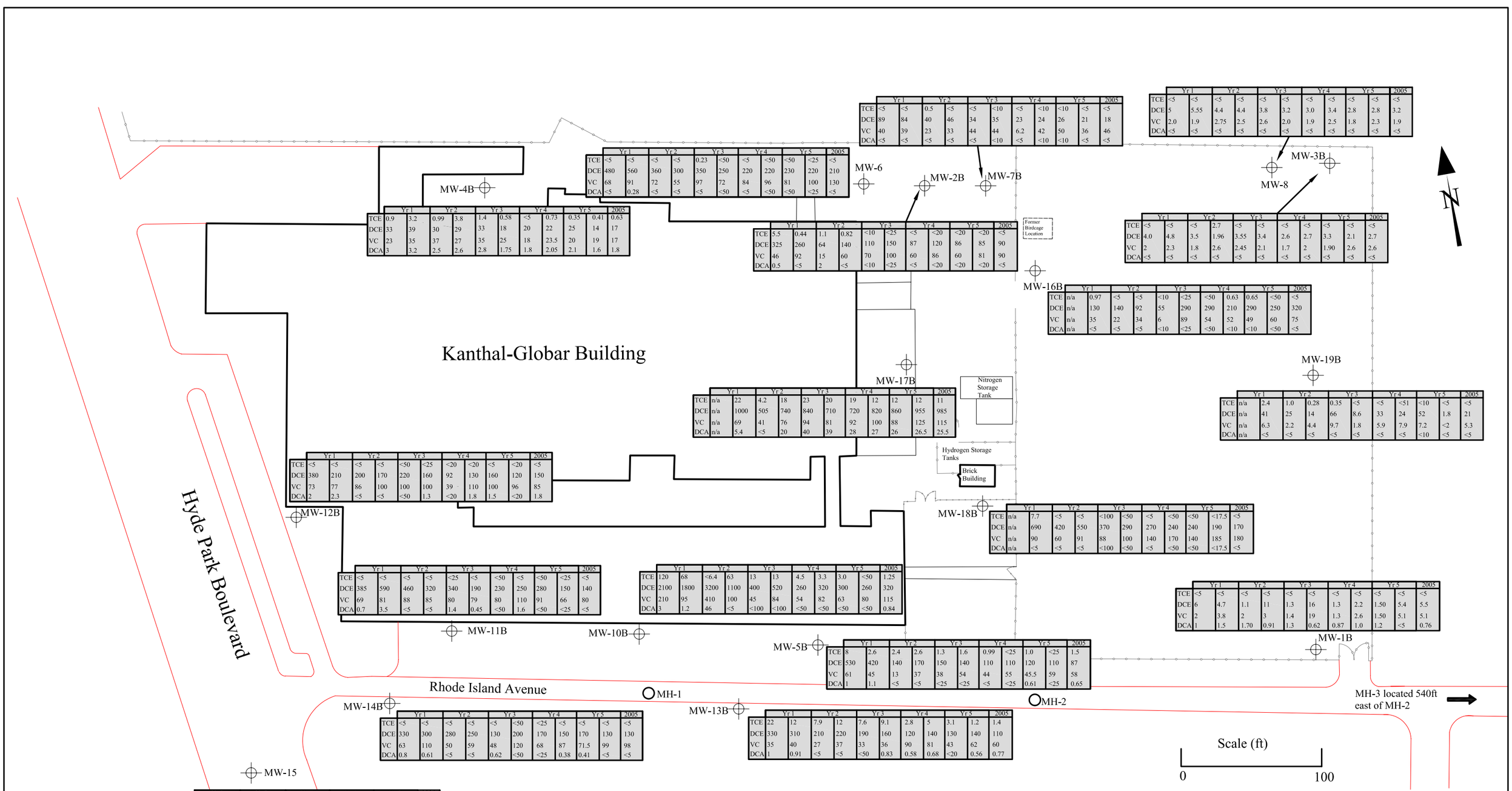
MH-1 — Manhole / Sanitary Sewer Sample Location

Project Location: 3425 Hyde Park Blvd., Niagara Falls, NY		Date: October 2005	Figure #: 3-4
ACAD File: Sample locations.dwg	Drawn By: GDB	Project #: 01-220-11	

INTERA Engineering Ltd.
1 Raymond Street, Suite 200
Ottawa, Ontario K1R 1A2

Tel: 613-232-2525
Fax: 613-232-7149

Title: COC Concentrations in Overburden Groundwater (1999-2005)



	Yr 1		Yr 2		Yr 3		Yr 4		Yr 5		2005
TCE	0.9	3.2	0.99	3.8	1.4	0.58	<5	0.73	0.35	0.41	0.63
DCE	33	39	30	29	33	18	20	22	25	14	17
VC	23	35	37	27	35	25	18	23.5	20	19	17
DCA	3	3.2	2.5	2.6	2.8	1.75	1.8	2.05	2.1	1.6	1.8

	Yr 1		Yr 2		Yr 3		Yr 4		Yr 5		2005
TCE	<5	<5	<5	<5	0.23	<50	<5	<50	<50	<25	<5
DCE	480	560	360	300	350	250	220	220	230	220	210
VC	68	91	72	55	97	72	84	96	81	100	130
DCA	<5	0.28	<5	<5	<5	<50	<5	<50	<50	<25	<5

	Yr 1		Yr 2		Yr 3		Yr 4		Yr 5		2005
TCE	5.5	0.44	1.1	0.82	<10	<25	<5	<20	<20	<20	<5
DCE	325	260	64	140	110	150	87	120	86	85	90
VC	46	92	15	60	70	100	60	86	60	81	90
DCA	0.5	<5	2	<5	<10	<25	<5	<20	<20	<20	<5

	Yr 1		Yr 2		Yr 3		Yr 4		Yr 5		2005
TCE	<5	<5	0.5	<5	<5	<10	<5	<10	<10	<5	<5
DCE	89	84	40	46	34	35	23	24	26	21	18
VC	40	39	23	33	44	44	6.2	42	50	36	46
DCA	<5	<5	<5	<5	<5	<10	<5	<10	<10	<5	<5

	Yr 1		Yr 2		Yr 3		Yr 4		Yr 5		2005
TCE	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
DCE	5	5.55	4.4	4.4	3.8	3.2	3.0	3.4	2.8	2.8	3.2
VC	2.0	1.9	2.75	2.5	2.6	2.0	1.9	2.5	1.8	2.3	1.9
DCA	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5

	Yr 1		Yr 2		Yr 3		Yr 4		Yr 5		2005
TCE	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
DCE	4.0	4.8	3.5	1.96	3.55	3.4	2.6	2.7	3.3	2.1	2.7
VC	2	2.3	1.8	2.6	2.45	2.1	1.7	2	1.90	2.6	2.6
DCA	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5

	Yr 1		Yr 2		Yr 3		Yr 4		Yr 5		2005
TCE	n/a	0.97	<5	<5	<10	<25	<50	0.63	0.65	<50	<5
DCE	n/a	130	140	92	55	290	290	210	290	250	320
VC	n/a	35	22	34	6	89	54	52	49	60	75
DCA	n/a	<5	<5	<5	<10	<25	<50	<10	<10	<50	<5

	Yr 1		Yr 2		Yr 3		Yr 4		Yr 5		2005
TCE	n/a	2.4	1.0	0.28	0.35	<5	<5	<51	<10	<5	<5
DCE	n/a	41	25	14	66	8.6	33	24	52	1.8	21
VC	n/a	6.3	2.2	4.4	9.7	1.8	5.9	7.9	7.2	<2	5.3
DCA	n/a	<5	<5	<5	<5	<5	<5	<5	<10	<5	<5

	Yr 1		Yr 2		Yr 3		Yr 4		Yr 5		2005
TCE	n/a	22	4.2	18	23	20	19	12	12	12	11
DCE	n/a	1000	505	740	840	710	720	820	860	955	985
VC	n/a	69	41	76	94	81	92	100	88	125	115
DCA	n/a	5.4	<5	20	40	39	28	27	26	26.5	25.5

	Yr 1		Yr 2		Yr 3		Yr 4		Yr 5		2005
TCE	<5	<5	<5	<5	<50	<25	<20	<20	<5	<20	<5
DCE	380	210	200	170	220	160	92	130	160	120	150
VC	73	77	86	100	100	100	39	110	100	96	85
DCA	2	2.3	<5	<5	<50	1.3	<20	1.8	1.5	<20	1.8

	Yr 1		Yr 2		Yr 3		Yr 4		Yr 5		2005
TCE	n/a	7.7	<5	<5	<100	<50	<5	<50	<50	<17.5	<5
DCE	n/a	690	420	550	370	290	270	240	240	190	170
VC	n/a	90	60	91	88	100	140	170	140	185	180
DCA	n/a	<5	<5	<5	<100	<50	<5	<50	<50	<17.5	<5

	Yr 1		Yr 2		Yr 3		Yr 4		Yr 5		2005
TCE	<5	<5	<5	<5	<25	<5	<50	<5	<50	<25	<5
DCE	385	590	460	320	340	190	230	250	280	150	140
VC	69	81	88	85	80	79	80	110	91	66	80
DCA	0.7	3.5	<5	<5	1.4	0.45	<50	1.6	<50	<25	<5

	Yr 1		Yr 2		Yr 3		Yr 4		Yr 5		2005
TCE	120	68	<6.4	63	13	13	4.5	3.3	3.0	<50	1.25
DCE	2100	1800	3200	1100	400	520	260	320	300	260	320
VC	210	95	410	100	45	84	54	82	63	80	115
DCA	3	1.2	46	<5	<100	<100	<50	<50	<50	<50	0.84

	Yr 1		Yr 2		Yr 3		Yr 4		Yr 5		2005
TCE	8	2.6	2.4	2.6	1.3	1.6	0.99	<25	1.0	<25	1.5
DCE	530	420	140	170	150	140	110	110	120	110	87
VC	61	45	13	37	38	54	44	55	45.5	59	58
DCA	1	1.1	<5	<5	<25	<25	<5	<25	0.61	<25	0.65

	Yr 1		Yr 2		Yr 3		Yr 4		Yr 5		2005
TCE	<5	<5	<5	<5	<5	<50	<25	<5	<5	<5	<5
DCE	330	300	280	250	130	200	170	150	170	130	130
VC	63	110	50	59	48	120	68	87	71.5	99	98
DCA	0.8	0.61	<5	<5	0.62	<50	<25	0.38	0.41	<5	<5

	Yr 1		Yr 2		Yr 3		Yr 4		Yr 5		2005
TCE	22	12	7.9	12	7.6	9.1	2.8	5	3.1	1.2	1.4
DCE	330	310	210	220	190	160	120	140	130	140	110
VC	35	40	27	37	33	36	90	81	43	62	60
DCA	1	0.91	<5	<5	<50	0.83	0.58	0.68	<20	0.56	0.77

	Yr 1		Yr 2		Yr 3		Yr 4		Yr 5		2005
TCE	<5	<5	<5	<5	<25	<5	<100	<25	<25	<50	<5
DCE	460	400	410	390	440	340	440	330	310	400	340
VC	79	120	58	93	98	100	110	100	65	130	120
DCA	1	0.95	<5	<5	1.7	1.1	<100	<25	<25	<50	2

Legend:

- MW-5A — Monitoring Well Location
- MH-1 — Manhole / Sanitary Sewer Sample Location

Project Location: 3425 Hyde Park Blvd., Niagara Falls, NY		Date: October 2005	Figure #: 3-5
ACAD File: Sample locations.dwg	Drawn By: GDB	Project #: 01-220-11	

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Title: COC Concentrations in Bedrock Groundwater (1999-2005)

TABLES

Table 2-1: Summary of Groundwater Sampling

Well ID	Date Sampled	Sample ID	Weather Conditions	Volume Purged (gallons)
MW-1A	3-Nov-05	OU2-1005-G01	clear, 9°C	5.9 (dry)
MW-1B	3-Nov-05	OU2-1005-G02	clear, 9°C	31.7
MW-2A	1-Nov-05	OU2-1005-G03	overcast, 7°C	8.5 (dry)
MW-2B	1-Nov-05	OU2-1005-G04	overcast, 7°C	31.7
MW-3A	3-Nov-05	OU2-1005-G05	sunny, windy, 8°C	8.7 (dry)
MW-3B	3-Nov-05	OU2-1005-G06	sunny, windy, 8°C	31.7
MW-4A	2-Nov-05	OU2-1005-G07	couldy, 8°C	11.9
MW-4B	2-Nov-05	OU2-1005-G08	cloudy, 8°C	31.7
MW-5A	3-Nov-05	OU2-1005-G09	sunny, windy, 8°C	15.9
MW-5B	3-Nov-05	OU2-1005-G10	sunny, windy, 8°C	31.7
MW-6	1-Nov-05	OU2-1005-G11	overcast, 10°C	31.7
MW-7A	1-Nov-05	OU2-1005-G12 OU2-1005-G13	overcast, 7°C	11.9
MW-7B	1-Nov-05	OU2-1005-G14	overcast, 7°C	31.7
MW-8	3-Nov-05	OU2-1005-G15	sunny, windy, 8°C	31.7
MW-10A	1-Nov-05	OU2-1005-G16	overcast, light rain, 9°C	15.9
MW-10B	1-Nov-05	OU2-1005-G17 OU2-1005-G18	overcast, light rain 8°C	63.4
MW-11A	3-Nov-05	OU2-1005-G19	clear, windy, 8°C	6.3 (dry)
MW-11B	3-Nov-05	OU2-1005-G20	clear, windy, 8°C	63.4
MW-12A	2-Nov-05	OU2-1005-G21	clear, 5°C	15.9
MW-12B	2-Nov-05	OU2-1005-G22	clear, 5°C	63.4
MW-13A	2-Nov-05	OU2-1005-G23	clear, 10°C	15.9
MW-13B	2-Nov-05	OU2-1005-G24	clear, 10°C	31.7
MW-14A	2-Nov-05	OU2-1005-G25	clear, 10°C	3.4 (dry)
MW-14B	2-Nov-05	OU2-1005-G26	clear, 10°C	31.7
MW-15	2-Nov-05	OU2-1005-G27	clear, 7°C	21.1
MW-16A	4-Nov-05	OU2-1005-G28	sun & cloud, 6°C	2.9 (dry)
MW-16B	3-Nov-05	OU2-1005-G29	sunny, windy, 8°C	31.7
MW-17A	2-Nov-05	OU2-1005-G30	sunny, cloudy, 10°C	13.2
MW-17B	2-Nov-05	OU2-1005-G31 OU2-1005-G32	sun & cloud, 10°C	23.8
MW-18A	2-Nov-05	OU2-1005-G33	sun & cloud, 7°C	15.9
MW-18B	2-Nov-05	OU2-1005-G34	sun & cloud, 7°C	31.7
MW-19A	3-Nov-05	OU2-1005-G35	sun & cloud, windy, 10°C	8.2 (dry)
MW-19B	3-Nov-05	OU2-1005-G36	sun & cloud, windy, 10°C	31.7
MH-1	31-Oct-05	OU2-1005-E01 OU2-1005-E02	overcast, 7°C	na
MH-2	31-Oct-05	OU2-1005-E03	overcast, 7°C	na
MH-3	31-Oct-05	OU2-1005-E04	overcast, 7°C	na

Table 2-2: Summary of Analytical Specifications

Sample Type	Container Type	Sample Volume	Preservation Method	Max. Holding Time	Analytical Method
Contaminants of Concern (COCs)					
VOCs	40mL glass vial with septum top	4x40 mL	Hydrochloric acid, Cool 4oC	7days	SW846 Method 8260B
Natural Attenuation Parameters					
Methane, Ethene, Ethane, Propane, Propene	40mL glass vial with septum top	2x40 mL	Hydrochloric acid, Cool 4oC	7 days	USEPA RSK175
TOC	40mL glass vial with septum top	2x40 mL	Hydrochloric acid, Cool 4oC	7 days	USEPA 415.1
BOD	1L plastic	1L	None	48 hrs	USEPA 405.1
COD	250 mL plastic	250 mL	Sulfuric acid	28 days	USEPA 410.4
Total Iron	250 mL plastic	250 mL	Nitric acid	6 months	USEPA 6010B
Chloride	500 mL plastic	500 mL	None	28 days	Standard Method 325.2
Nitrate	-	-	-	48 hours	USEPA 353.2
Nitrite	-	-	-	28 days	USEPA 353.2
Sulfate	-	-	-	28 days	USEPA 375.4
Sulfide	250 mL plastic	250 mL	Sodium hydroxide and zinc acetate	7 days	USEPA 376.2

Notes:
- = This parameter was analyzed from the above sample container

Table 3-1: Summary of Groundwater Elevations

Well No.	Easting Coordinates (ft)	Northing Coordinates (ft)	Elevation (ft. amsl)		Static Water Level Elevation (ft. amsl)													
								Year 1		Year 2		Year 3		Year 4		Year 5		Fall 2005
			Ground Surface	Top of Monitor Well Casing	24-Aug-92	24-May-96	17-Nov-97	18-Oct-99	8-Nov-00	11-May-01	5-Nov-01	13-May-02	28-Oct-02	20-May-03	4-Nov-03	10-May-04	25-Oct-04	31-Oct-05
MW-1A	2955.6087	5008.2713	595.48	597.56	592.62	590.48	587.89	586.26	585.95	588.35	586.70	589.42	585.81	589.57	587.62	589.92	587.52	588.85
MW-1B	2960.1041	5008.1236	595.44	597.64	592.64	590.45	587.73	586.52	585.87	588.34	586.76	589.50	585.80	589.59	587.63	589.96	587.53	588.85
MW-2A	2680.1182	5331.3852	593.70	595.73	593.25	591.13	588.96	587.37	586.45	589.43	587.87	590.55	586.58	590.43	588.91	590.84	588.25	589.75
MW-2B	2681.7002	5337.9356	593.60	595.80	591.92	589.72	586.89	586.03	585.48	587.72	586.38	588.75	585.43	588.80	586.94	588.99	586.94	588.11
MW-3A	2969.9762	5353.9117	597.90	599.94	597.37	595.49	594.30	592.20	592.09	594.48	589.75	595.81	587.54	595.48	593.41	596.20	592.62	593.95
MW-3B	2972.3807	5348.8355	597.70	599.70	592.63	590.47	587.77	586.64	585.80	588.18	586.69	589.30	585.69	589.33	587.40	589.73	587.46	588.74
MW-4A	2372.5988	5336.5134	591.93	591.60	nm	nm	586.79	585.98	585.24	587.52	586.32	588.55	585.10	588.65	586.48	588.84	586.83	587.73
MW-4B	2368.6508	5336.5000	591.90	591.49	nm	nm	586.80	585.95	585.23	587.55	586.29	588.54	585.35	588.64	586.83	588.85	586.81	587.90
MW-5A	2605.9294	5016.5936	596.14	597.91	591.18	589.11	586.60	585.79	585.20	587.31	586.00	588.35	585.21	588.38	586.82	588.66	586.49	587.76
MW-5B	2605.7558	5011.3162	596.03	597.79	591.48	589.55	586.81	585.93	585.25	587.54	586.24	588.57	585.32	588.64	586.83	588.85	586.77	587.95
MW-6	2638.3679	5339.2224	593.10	595.51	592.26	589.67	586.85	586.03	585.44	587.67	586.36	588.69	585.40	588.75	586.91	588.95	586.90	588.06
MW-7A	2724.6499	5332.6172	593.90	596.59	593.62	590.94	588.68	587.33	586.45	589.21	587.72	590.27	586.35	590.24	588.62	590.59	588.17	589.59
MW-7B	2725.0999	5337.8887	593.90	596.66	592.59	589.93	587.26	586.40	585.63	587.93	586.59	589.11	585.64	589.13	587.24	589.41	587.29	588.52
MW-8	2928.7692	5350.8907	597.50	599.63	592.51	590.38	587.77	586.65	585.94	588.36	586.90	589.52	585.92	589.62	587.69	589.93	587.69	588.97
MW-10A	2483.0258	5019.0908	594.75	596.87	591.17	588.90	586.51	585.71	585.15	587.20	585.93	588.22	585.16	588.26	586.80	588.52	586.47	587.67
MW-10B	2478.5765	5019.1388	594.67	596.71	591.71	589.50	586.79	585.93	585.19	587.49	586.21	588.54	585.29	588.61	586.83	588.82	586.74	587.94
MW-11A	2341.0812	5021.6589	593.53	595.48	589.97	587.85	585.98	585.32	584.85	586.62	585.51	587.61	584.88	587.67	586.33	587.87	586.06	587.18
MW-11B	2345.1520	5021.2462	593.56	595.57	591.53	589.36	586.41	585.55	585.06	587.03	585.73	587.83	584.91	587.83	586.42	588.01	586.15	587.30
MW-12A	2235.0446	5098.8980	591.30	590.79	586.33	586.84	585.35	584.82	584.38	585.77	584.90	586.59	584.39	586.79	585.64	586.87	585.51	586.48
MW-12B	2234.5233	5102.1429	591.30	590.89	588.85	589.25	586.65	585.93	585.21	587.53	586.21	588.56	585.35	588.64	586.82	588.82	586.76	587.97
MW-13A	2552.3923	4965.9516	595.60	595.18	588.56	589.04	586.51	585.70	585.16	587.30	585.25	588.16	585.17	588.32	586.91	588.62	586.65	587.52
MW-13B	2549.3819	4965.8826	595.40	594.73	588.62	589.50	586.78	585.90	585.22	587.50	586.22	588.56	585.28	588.63	586.99	588.82	586.72	587.94
MW-14A	2303.8879	4969.9839	593.42	592.97	585.55	585.87	585.60	585.30	582.91	585.95	585.47	587.56	584.83	587.43	586.28	586.19	585.29	586.12
MW-14B	2301.0559	4969.7638	593.30	592.85	588.35	589.30	586.72	585.83	585.04	587.08	585.83	587.96	584.94	587.91	586.48	588.13	586.19	587.37
MW-15	2202.4948	4920.3288	592.01	591.44	nm	nm	586.22	585.57	585.02	587.13	585.86	588.13	585.04	588.18	586.68	588.44	586.35	587.61
MW-16A	2760.3762	5280.4861	592.60	591.64	nm	nm	nm	nm	nm	587.40	586.11	587.80	586.23	587.60	587.28	588.26	588.13	587.72
MW-16B	2760.3365	5277.4639	592.60	592.38	nm	nm	nm	nm	585.70	nm	586.70	nm	585.82	589.36	587.43	589.64	587.49	588.76
MW-17A	2669.1049	5212.5469	593.45	593.11	nm	nm	nm	nm	586.26	588.27	586.81	589.29	586.02	589.32	587.76	589.60	587.47	588.80
MW-17B	2668.7040	5210.7102	593.44	592.90	nm	nm	nm	nm	585.58	587.63	586.29	588.65	585.39	588.70	586.90	588.93	586.83	588.08
MW-18A	2725.1577	5111.5508	594.00	593.78	nm	nm	nm	nm	585.76	587.91	586.94	589.25	586.17	589.07	587.94	589.58	587.69	588.69
MW-18B	2722.9546	5110.1467	594.00	593.43	nm	nm	nm	nm	585.39	587.67	586.34	588.71	585.42	588.77	587.00	588.97	586.90	588.07
MW-19A	2957.4556	5200.7298	595.44	594.95	nm	nm	nm	nm	586.38	589.16	582.97	590.36	586.09	589.96	588.58	590.16	589.86	589.68
MW-19B	2958.1664	5203.1593	595.43	594.65	nm	nm	nm	nm	585.91	588.33	586.87	589.50	585.89	589.60	587.63	589.89	587.63	588.92
MH-1	2485.3313	4977.0431	na	595.29	nm	nm	nm	nm	583.31	583.35	582.86	nm	583.31	583.35	583.35	583.45	583.64	583.58
MH-2	2760.1474	4972.2985	na	596.51	nm	nm	nm	nm	583.88	583.91	583.85	nm	583.71	583.98	583.98	584.04	584.14	584.21
MH-3	3300.8154	4964.0866	na	596.79	nm	nm	nm	nm	585.61	585.73	nm	nm	583.99	584.09	584.09	584.16	584.26	584.72

Notes: ft amsl - feet above mean sea level
nm - water level not measured

Table 3-2: Vertical Hydraulic Gradients - October 31, 2005

Well Cluster	Overburden Well "A" Interval Static Water Elevation (ft. amsl)	Bedrock Well "B" Interval Static Water Elevation (ft. amsl)	Overburden Well Screen Midpoint Elevation (ft. amsl)	Bedrock Well Screen Midpoint Elevation (ft. amsl)	Vertical Gradient (ft/ft)
1	588.85	588.85	577.41	565.11	0.0000
2	589.75	588.11	578.60	560.40	0.0901
3	593.95	588.74	580.80	557.30	0.2217
4	587.73	587.90	575.42	562.38	-0.0130
5	587.76	587.95	578.36	563.58	-0.0129
7	589.59	588.52	577.40	558.00	0.0552
10	587.67	587.94	578.12	562.52	-0.0173
11	587.18	587.30	582.40	563.92	-0.0065
12	586.48	587.97	579.05	565.80	-0.1125
13	587.52	587.94	579.43	564.11	-0.0274
14	586.12	587.37	581.30	567.30	-0.0893
16	587.72	588.76	574.51	557.43	-0.0609
17	588.80	588.08	577.94	563.45	0.0497
18	588.69	588.07	578.50	560.00	0.0335
19	589.68	588.92	577.45	562.10	0.0495

Notes:
Positive vertical gradient indicates groundwater is moving downward
Negative vertical gradient indicates groundwater is moving upward

Table 3-3: Field Measured Parameters

Well ID	Sample Date	pH (pH Units)	Conductivity (mS/cm)	Temperature (^{o}C)	Eh (mV)	DO (mg/L)	Turbidity (NTU)
MW-1A	3-Nov-05	7.24	0.67	14.1	-53.3	1.1	72.3
MW-1B	3-Nov-05	6.93	0.89	13.0	-74.1	0.5	6.6
MW-2A	1-Nov-05	7.08	0.98	14.7	-84.2	2.1	34.0
MW-2B	1-Nov-05	7.01	0.99	12.8	-106.6	0.5	5.2
MW-3A	3-Nov-05	6.84	1.32	13.3	-27.8	6.5	325.2
MW-3B	3-Nov-05	6.85	1.12	12.2	-104	1.2	1.7
MW-4A	2-Nov-05	7.06	1.01	14.7	-35.6	0.9	309.0
MW-4B	2-Nov-05	7.14	1.04	13.8	-45.1	0.5	54.2
MW-5A	3-Nov-05	7.07	3.21	17.6	11.3	1.0	148.0
MW-5B	3-Nov-05	6.90	1.02	15.7	-52.2	1.8	48.1
MW-6	1-Nov-05	7.07	0.96	12.7	-95.6	2.5	54.0
MW-7A	1-Nov-05	7.02	0.91	14.0	-67.2	2.7	451.3
MW-7B	1-Nov-05	7.05	1.03	12.6	-73.7	0.7	0.5
MW-8	3-Nov-05	6.93	1.12	12.3	-101.5	0.9	2.6
MW-10A	1-Nov-05	6.74	2.94	16.2	-48.7	2.2	222.7
MW-10B	1-Nov-05	6.92	1.00	14.6	-53.5	5.9	10.2
MW-11A	3-Nov-05	6.92	2.05	16.5	-53.6	3.3	217.2
MW-11B	3-Nov-05	7.06	1.03	14.7	-55.8	0.6	1.9
MW-12A	2-Nov-05	6.91	0.98	15.3	-51.2	0.6	375.4
MW-12B	2-Nov-05	7.11	1.10	15.0	-51.8	1.1	0.2
MW-13A	2-Nov-05	6.71	1.36	15.0	4.1	1.0	705.0
MW-13B	2-Nov-05	6.83	0.96	12.9	-22.2	0.9	24.2
MW-14A	2-Nov-05	6.99	0.95	15.6	-66.6	0.9	385.0
MW-14B	2-Nov-05	7.03	1.00	13.3	-65.7	0.5	5.3
MW-15	2-Nov-05	7.08	1.01	14.0	-53.2	0.7	9.4
MW-16A	4-Nov-05	7.28	2.33	14.9	25.1	4.2	21.0
MW-16B	3-Nov-05	6.93	0.97	13.6	-82.2	0.6	13.5
MW-17A	2-Nov-05	6.84	3.13	16.6	-55.8	1.2	561.3
MW-17B	2-Nov-05	6.87	1.56	14.5	-61.6	0.7	77.3
MW-18A	2-Nov-05	7.14	0.75	15.9	-67.9	0.7	145.0
MW-18B	2-Nov-05	6.90	0.98	13.7	-46.1	0.5	5.6
MW-19A	3-Nov-05	6.69	1.57	15.7	-19.4	2.0	54.4
MW-19B	3-Nov-05	6.90	0.97	14.2	-98.9	0.6	6.5

Table 3-4: Laboratory Analytical Results for Vinyl Chloride (ug/L)

Monitoring Well	Sample Date													
				Round 1		Round 2		Round 3		Round 4		Round 5		Fall 2005
	Aug-92	May-96	Nov-97	Oct-99	Oct-00	May-01	Nov-01	May-02	Oct-02	May-03	Nov-03	May-04	Oct-04	Nov-05
MW-1A	2J	--	<2	<10	0.44 J	1.4J	0.75J	1.1J	0.74J	0.73J	1.0J	0.74 J	3.0	1.7 J
MW-1B	<10	--	<2	2J	3.8	2	3	1.4J	19	1.3J	2.6	1.50 J	5.1	5.1
MW-2A	<10	--	<2	<10	<2	<2	<2	<2	5.5	<2	<2	<2	<2	0.52 J
MW-2B	66	--	59	46	92	15	60D	70D	100	60D	86	60	81	90
MW-3A	<10	--	<2	<10	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
MW-3B	5	--	<2	2J	2.3	1.8J	2.6*	2.45	2.1	1.7J	2	1.90 J	2.6	2.6
MW-4A	13	--	32	47	45	24	40D	31	54	31*	46	34	48	57
MW-4B	26	--	22	23	35	37	27	35	25*	18	23.5 *	20	19	17
MW-5A	1300	--	14	1J	42	17DJ*	45D	15	7	120D	4.1	67 D	260 D	110 D
MW-5B	75	--	33	61	45	13J	37D	38	54	44D	55	45.5*	59	58
MW-6	--	<100	68	68	91	72	55D	97D	72	84D	96	81	100	130 D
MW-7A	--	<1000	11	86	220	100	140D	170J	130J	120DJ	180	170 J	125*	205 D*
MW-7B	--	<100	23	40	39	23	33D	44D	44	6.2D	42	50	36	46
MW-8	--	<10	<2	2J	1.9 J	2.75*	2.5	2.6	2.0	1.9J	2.5	1.8 J	2.3	1.9 J
MW-10A	--	38	65	73	86	80DJ	95D*	160	240	115*	100	110	120	150 D
MW-10B	--	120	52	210J	95	410J	100D	45	84	54*	82	63	80	115 D*
MW-11A	--	<10	<2	<10	<2	0.39J	<2*	0.34J*	<2	<2	<2 *	0.82 J	0.59 J	0.95 J
MW-11B	--	<50	56	69	81	88J	85D	80	79D	80	110D	91	66	80
MW-12A	--	13	14	16	49	27J	51	34	49.5D*	26	41	33	38 D	34
MW-12B	--	16	53	73	77	86J	100D	100	100	39	110	100 D	96	85
MW-13A	--	<10	<2	<10	<2	<2J	<2	<2	<2	<2	<2	<2	<2	<2
MW-13B	--	<100	31	35	40	27D	37D	33	36D	90D	81D	43	62 D	60
MW-14A	--	<10	<2	<10	0.37 J	<2J	59D	0.46J	4.6	<2	2.2	2.7	3.8	4.6
MW-14B	--	<50	65	63	110	50DJ	1.5J	48D	120	68	87D	71.5*	99 D	98 D
MW-15	--	--	68	79	120	58DJ	93D	98	100D	110	100	65	130	120 D
MW-16A	--	--	--	--	NS	35DJ	48D	39	44	52	120	35	35	180 D
MW-16B	--	--	--	--	35	22	34D	6	89	54	52	49	60	75
MW-17A	--	--	--	--	18	14	19D	19J	16J	20	27	21*	34	28
MW-17B	--	--	--	--	69	41D*	76D	94	81	92	100	88	125*	115 D*
MW-18A	--	--	--	--	4.4	0.98J	8.3	2.3	3.1J*	1.6J	4.5 *	1.6 J	3.2 J	3.1
MW-18B	--	--	--	--	90	60	91D	88	100	140D	170	140	185 D*	180 D
MW-19A	--	--	--	--	<2	<2	<2	0.3J	0.66J	0.78J	1.0J	0.69 J	<2	1.6 J
MW-19B	--	--	--	--	6.3	2.2D	4.4	9.7	1.8J	5.9	7.9	7.2	<2	5.3
MH-1	--	--	--	--	<2	<2	<2	<2	<10*	<2	<2	<2	<2*	<20*
MH-2	--	--	--	--	<2	<2	<2 J	<2	<10	<2	<2*	<2	<20	<8
MH-3	--	--	--	--	<2	<2*	<2*	<2*	1.2J	<2*	<2	<2*	<20	<8

Units: ug/L

J indicates an estimated value

D indicates sample was diluted

NS indicates that MW-16B could not be sampled due to insufficient water volume in the well

NYSDEC (1991) (6NYCRR Part 703) Standard for Vinyl Chloride is 2ug/L

* indicates reported concentration is average value of sample and duplicate sample concentrations

Table 3-5: Laboratory Analytical Results for Cis- & Trans-1,2-Dichloroethene (ug/L)

Monitoring Well	Sample Date													
				Round 1		Round 2		Round 3		Round 4		Round 5		Fall 2005
	Aug-92	May-96	Nov-97	Oct-99	Oct-00	May-01	Nov-01	May-02	Oct-02	May-03	Nov-03	May-04	Oct-04	Nov-05
MW-1A	14	--	<5	<5	2.4 J	0.78J	0.96J	0.75J	0.61J	0.45J	0.59J	0.80 J	2.0 J	1.4 J
MW-1B	10	--	<5	6	4.7 J	1.1J	11	1.3	16	1.3J	2.2J	1.50 J	5.4	5.5
MW-2A	<10	--	<5	<5	1.2 J	0.46J	1.7J	0.28J	14	0.63J	0.38J	<5	<5	<5
MW-2B	2300	--	450	325	260	64	140D	110	150	87D	120J	86	85	90
MW-3A	<10	--	<5	1J	1.5 J	1.7J	1.4J	3J	1.1J	1.3J	0.78J	1.6 J	<5	0.90 J
MW-3B	18	--	5	4J	4.8 J	3.5J	1.96J*	3.55J*	3.4J	2.6J	2.7J	3.3 J	2.1 J	2.7 J
MW-4A	230	--	49	30	74	140	110D	390D	160	170D*	250J	370	240	250 D
MW-4B	130	--	45	33	39	30	29	33	18*	20	22J *	25	14	17
MW-5A	1900	--	110	14	320	116DJ*	220D	110	32	300D	16J	210 D	580 D	300 D
MW-5B	520	--	270	530	420	140J	170D	150	140	110D	110J	120*	110	87
MW-6	--	1000	595	480	560	360	300D	350D	250	220D	220J	230	220 D	210 D
MW-7A	--	1200	5206	2900	4800	2200	3400D	2600	2100	1800D	2000DJ	2200	1650 D*	1950 D*
MW-7B	--	370	110	89	84	40	46D	34	35	23	24J	26	21	18
MW-8	--	<10	6	5	5.55	4.4J*	4.4J	3.8J	3.2J	3.0J	3.4J	2.8 J	2.8 J	3.2 J
MW-10A	--	690	1212	1200	1200	790DJ	865D*	950*	990	655*	640J	760	620	660 D
MW-10B	--	1900	921	2100	1800	3200J	1100D	400	520	260*	320J	300	260	320 D*
MW-11A	--	<10	<5	<5	1.3 J	<5J	2.67J*	<5*	0.34J	<5	<5J *	<5	<5	<5
MW-11B	--	390	705	385	590	460J	320D	340D	190D	230	250DJ	280	150	140 D
MW-12A	--	430	120	130	540	270J	340	510D	260D*	170	200DJ	210 D	230 D	200 D
MW-12B	--	250	250	380	210	200J	170D	220	160	92	130J	160 D	120	150 D
MW-13A	--	<10	<5	<5	<5	<5J	0.26J	<5	<5	<5	<5J	<5	<5	<5
MW-13B	--	810	410	330	310	210DJ	220D	190	160D	120D	140DJ	130	140 D	110 D
MW-14A	--	<10	<5	<5	1.6 J	0.69J	250D	2J	12	0.82J	4.0J	2.1 J	2.3 J	2.3 J
MW-14B	--	310	765	330	300	280DJ	8.2	130D	200	170	150DJ	170*	130 D	130
MW-15	--	--	640	460	400	410DJ	390D	440D	340D	440	330DJ	310 D	400 D	340 D
MW-16A	--	--	--	--	NS	77D	81D	47D	42	26	33J	26	20	21
MW-16B	--	--	--	--	130	140	92D	55	290D	290	210DJ	290 D	250	320 D
MW-17A	--	--	--	--	230	260	260D	320	300	280	380DJ	350*	380 D	320 D
MW-17B	--	--	--	--	1000	505D*	740D	840	710	720	820	860	955*	985 D*
MW-18A	--	--	--	--	47	30	33	34	33*	26	29.5J *	33	40	37
MW-18B	--	--	--	--	690	420	550D	370	290	270D	240J	240	190 D*	170
MW-19A	--	--	--	--	33	4.1J	10	4.3J	5.8	3.2J	4.3J	4.0 J	4.0 J	5.2
MW-19B	--	--	--	--	41	25D	14	66D	8.6	33	24 J	52	1.8 J	21
MH-1	--	--	--	--	4.7 J	6.6	4.4J	<5	4.7J*	5.6	5.8J	2.5 J	3.2 J*	11.1 J*
MH-2	--	--	--	--	<5	5.9	7.8 J	<5	4.4J	5.1	5.15J*	2.8 J	<50	8.8 J
MH-3	--	--	--	--	2 J	9.4*	5.8*	<5*	7.8J	7.5*	6.9J	4.0* J	<50	18 J

Units: ug/L

J indicates an estimated value

D indicates sample was diluted

NS indicates that MW-16B could not be sampled due to insufficient water volume in the well

NYSDEC (1991) (TOGS 1.1.1) Standard for DCE is 5ug/L

* indicates reported concentration is average value of sample and duplicate sample concentrations

Table 3-6: Laboratory Analytical Results for Trichloroethene (ug/L)

Monitoring Well	Sample Date													
				Round 1		Round 2		Round 3		Round 4		Round 5		Fall 2005
	Aug-92	May-96	Nov-97	Oct-99	Oct-00	May-01	Nov-01	May-02	Oct-02	May-03	Nov-03	May-04	Oct-04	Nov-05
MW-1A	<10	--	<5	<5	<5	<5	<5	<5	<5	<5	<5J	<5	<5	<5
MW-1B	<10	--	<5	<5	<5	<5	<5	<5	<5	<5	<5J	<5	<5	<5
MW-2A	<10	--	<5	<5	<5	<5	3.4J	0.61J	4.0J	<5	<5J	<5	<5	<5
MW-2B	670	--	6	5.5	0.44 J	1.1BJ	0.82DJ	<10	<25	<5	<20J	<20	<20	<5
MW-3A	4	--	<5	<5	0.43 J	0.84BJ	0.82J	3.6J	0.58J	1.5J	0.75J	1.3 J	0.46 J	<5
MW-3B	<10	--	<5	<5	<5	<5	2.7J*	<5*	<5	<5	<5J	<5	<5	<5
MW-4A	3	--	<5	4J	2.8 J	3.4BJ	4DJ	8.1J	6.3J	9.55*	11J	23 J	30 J	37
MW-4B	5	--	<5	0.9J	3.2 J	0.99BJ	3.8J	1.4J	0.585J*	<5	0.73J *	0.35 J	0.41 J	0.63 J
MW-5A	<200	--	<5	0.8J	1.3 J	<5*	<5D	<25	0.69J	0.48J	0.65J	0.7 J	0.88 J	0.89 J
MW-5B	71	--	5	8	2.6 J	2.4BJ	2.6DJ	1.3J	1.6J	0.99J	<25J	1.0* J	<25	1.5 J
MW-6	--	<100	<5	<5	<5	<5	<5D	0.23J	<50	<5	<50J	<50	<25	<5
MW-7A	--	8700	1400	170 J	1200	1800	2000D	1400	1100	610D	600J	730	530*	475 D*
MW-7B	--	<100	<5	<5	<5	0.5J	<5D	<5	<10	<5	<10J	<10	<5	<5
MW-8	--	<10	<5	<5	<5	<5*	<5	<5	<5	<5	<5J	<5	<5	<5
MW-10A	--	<250	<5	<5	<5	<5	<5*	<185*	<120	<120*	<120J	<120	<120	0.63 J
MW-10B	--	90	28	120	68	<6.4	63D	13J	13J	4.5J*	3.3J	3.0 J	<50	1.25 J*
MW-11A	--	<10	<5	<5	<5	<5	<5*	<5*	0.23J	<5	<5J *	<5	<5	<5
MW-11B	--	<50	<5	<5	<5	<5	<5	<25	<5	<50	<5	<50	<25	<5
MW-12A	--	<50	<5	<5	2.6 J	<5	<5	1.3J	0.31J*	<40	<25J	0.39 J	0.40 J	0.54 J
MW-12B	--	18	<5	<5	<5	<5	<5	<50	<25	<20	<20J	<5	<20	<5
MW-13A	--	<10	<5	<5	<5	<5	<5	<5	<5	<5	<5J	<5	<5	<5
MW-13B	--	48	36	22	12	7.9D	12D	7.6J	9.1	2.8J	5J	3.1 J	1.2 J	1.4 J
MW-14A	--	<10	<5	<5	<5	<5	<5D	<5	<5	<5	<5J	<5	<5	<5
MW-14B	--	<50	<5	<5	<5	<5	<5	<5	<50	<25	<5J	<5*	<5	<5
MW-15	--	--	<10	<5	<5	<5	<5D	<25	<5	<100	<25J	<25	<50	<5
MW-16A	--	--	--	--	NS	4.2DJ	1.9DJ	1.2J	0.77J	<10	<20J	0.70 J	<10	0.56 J
MW-16B	--	--	--	--	0.97 J	<5	<5D	<10	<25	<50	0.63J	0.65 J	<50	<5
MW-17A	--	--	--	--	115	58	73D	54	62	42J	49J	38* J	57	48
MW-17B	--	--	--	--	22	4.2DJ*	18D	23J	20J	19J	12J	12 J	12 J**	11*
MW-18A	--	--	--	--	36	30	37	40	53*	22D	47.5DJ *	43	67	52
MW-18B	--	--	--	--	7.7	<5	<5D	<100	<50	<5	<50J	<50	<17.5*	<5
MW-19A	--	--	--	--	1.7 J	1.3J	2.2J	1.1J	0.99J	0.61J	0.52J	0.40 J	0.26 J	<5
MW-19B	--	--	--	--	2.4 J	1.0DJ	0.28J	0.35J	<5	<5	<5J	<10	<5	<5
MH-1	--	--	--	--	<5	3.6BJ	0.59J	<5	<25*	5.0	4.5J	3.5 J	1.5 J*	5.3 J*
MH-2	--	--	--	--	<5	3.3BJ	0.82J	<5	<25	5.1	4.2J *	4.3 J	<50	3.1 J
MH-3	--	--	--	--	<5	5.8B*	0.74J*	<5*	1.4J	7.65*	5.7J	5.8*	2.6 J	8.1 J

Units: ug/L

J indicates an estimated value

B indicates the analyte was found in an associated blank.

D indicates sample was diluted

NS indicates that MW-16B could not be sampled due to insufficient water volume in the well

NYSDEC (1991) (TOGS 1.1.1) Standard for TCE is 5ug/L

* indicates reported concentration is average value of sample and duplicate sample concentrations

** indicates reported concentration of duplicate, sample is non-detect with an MDL of 200 ug/L

Table 3-7: Laboratory Analytical Results for Benzene (ug/L)

Monitoring Well	Sample Date													
				Round 1		Round 2		Round 3		Round 4		Round 5		Fall 2005
	Aug-92	May-96	Nov-97	Oct-99	Oct-00	May-01	Nov-01	May-02	Oct-02	May-03	Nov-03	May-04	Oct-04	Nov-05
MW-1A	<10	--	<0.7	<5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-1B	<10	--	<0.7	<5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-2A	<10	--	<0.7	<5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-2B	1J	--	<0.7	<5	0.32 J	<1	<1D	<2	<5	<1	<4	<4	<4	<1
MW-3A	<10	--	<5	<5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-3B	0.6	--	<5	<5	<1	<1	<1*	<1*	<1	<1	<1	<1	<1	<1
MW-4A	<10	--	<5	<5	<1	<1	<1D	<4	<5	<1*	<10	<10	<10	0.6 J
MW-4B	<10	--	<0.7	<5	0.23 J	0.24BJ	<1	<1	<1*	<1	<1 *	<1	<1	<1
MW-5A	<200	--	<0.7	<5	0.24 J	<1*	<1D	<5	<1	<1	<1	<1	0.47 J	<1
MW-5B	<10	--	<0.7	<5	<1	<1	<1D	<5	<5	<1	<5	<1*	<5	<1
MW-6	--	<100	<0.7	<5	0.39 J	<1.2	<1D	0.27 J	<10	<1	<10	<10	<5	<1
MW-7A	--	<1000	4	2J	2.9	<12	<16D	<100	<100	1	<50	<100	<45*	1.4*
MW-7B	--	<100	<0.7	<5	0.21 J	<1	<1D	<1	<2	<1	<2	<2	<1	<1
MW-8	--	<10	<0.7	<5	<1	<1*	<1	<1	<1	<1	<1	<1	<1	<1
MW-10A	--	<250	<0.7	0.6J	0.52 J	<3.2	<4D*	<37.5*	<25	<25*	<25	<25	<25	<1
MW-10B	--	<250	<0.7	1J	0.25 J	<6.4	<4D	<20	<20	<10*	<10	<10	<10	<1*
MW-11A	--	<10	<0.7	<5	<1	<1	<1*	<1*	<1	<1	<1 *	<1	<1	<1
MW-11B	--	<50	<0.7	<5	0.39 J	<1.6	<1D	<5	<1	<10	<1	<10	<5	<1
MW-12A	--	<50	<0.7	<5	0.44 J	<1	<1	<1	0.26J*	<8	<5	<1	<1	<1
MW-12B	--	<50	<0.7	<5	0.36 J	<1	<1D	<10	<5	<4	<4	0.32 J	<4	<1
MW-13A	--	<10	<0.7	<5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-13B	--	<100	<1	<5	<1	<1	<1D	<10	<1	<1	<1	<4	<1	<1
MW-14A	--	<10	<0.7	<5	<1	<1	<1D	<1	<1	<1	<1	<1	<1	<1
MW-14B	--	<50	<0.7	<5	0.22 J	<1	0.23J	<1	<10	<5	<1	<1*	<1	<1
MW-15	--	--	<1	<5	0.3 J	<1.6	<1.6D	<5	0.26J	<20	<5	<5	<10	<1
MW-16A	--	--	--	--	NS	<1	<1D	<1	<2	<2	<4	<1	<2	<1
MW-16B	--	--	--	--	<1	<1	<1D	<2	<5	<10	<2	0.69 J	<10	0.84 J
MW-17A	--	--	--	--	0.27 J	<1.6	<1D	<10	<10	<10	<10	<10*	<8	<1
MW-17B	--	--	--	--	0.65 J	<3.2*	<3.2D	<40	<25	<25	<25	<25	<32.5*	1.2*
MW-18A	--	--	--	--	<1	<1	0.32J	<1	<2*	<1	<1 *	<2	<2	<1
MW-18B	--	--	--	--	0.4 J	<2	<2D	<20	<10	<1	<10	<10	<3.5*	<1
MW-19A	--	--	--	--	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-19B	--	--	--	--	<1	<1	<1	<1	<1	<1	<1	<2	<1	<1
MH-1	--	--	--	--	<1.2	<1.2	<1	<1	<5*	<1	<1	<1	<1*	<10*
MH-2	--	--	--	--	<1.2	<1.2	<1 J	<1	<5	<1	<1 *	<1	<10	<4
MH-3	--	--	--	--	<1.2	<1.2*	<1*	<1*	<5	<1*	<1	<1*	<10	<4

Units: ug/L

J indicates an estimated value

B indicates the analyte was found in an associated blank.

D indicates sample was diluted

NS indicates that MW-16B could not be sampled due to insufficient water volume in the well

NYSDEC (1991) (6NYCRR Part 703) Standard for Benzene is 0.7ug/L

* indicates reported concentration is average value of sample and duplicate sample concentrations

Table 3-8: Laboratory Analytical Results for 1,1-Dichloroethane (ug/L)

Monitoring Well	Sample Date													
				Round 1		Round 2		Round 3		Round 4		Round 5		Fall 2005
	Aug-92	May-96	Nov-97	Oct-99	Oct-00	May-01	Nov-01	May-02	Oct-02	May-03	Nov-03	May-04	Oct-04	Nov-05
MW-1A	2	--	<5	<5	<5 J	0.29J	<5	<5	<5	<5	<5	<5 J	<5	<5
MW-1B	3	--	<5	1J	1.5 J	1.70J	0.91J	1.3J	0.62J	0.87J	1.0J	1.2 J	<5	0.76 J
MW-2A	3	--	12	29	13 J	21	19	19	14	11	19	13 J	19	25
MW-2B	<10	--	<5	0.5J	<5 J	2	<5	<10	<25	<5	<20	<20 J	<20	<5
MW-3A	<10	--	<0.7	<5	<5	<5	<5	<5	<5	<5	<5	<5 J	<5	<5
MW-3B	<10	--	<0.7	<5	<5	<5	<5*	<5*	<5	<5	<5	<5 J	<5	<5
MW-4A	2	--	<0.7	2J	4.6 J	5.4	6.2D	8.8J	7.8J	12*	15J	23 J	19 J	17
MW-4B	<10	--	2	3J	3.2 J	2.5J	2.6J	2.8J	1.75J*	1.8J	2.05J *	2.1 J	1.6 J	1.8 J
MW-5A	<200	--	<5	<5	2.1 J	<5*	<5D	<25J	<5	1.1J	<5	0.96 J	2.8 J	1.4 J
MW-5B	3	--	<5	1J	1.1 J	<5	<5D	<25J	<25	<5	<25	0.61 J*	<25	0.65 J
MW-6	--	<100	<5	<5	0.28 J	<5	<5D	<5	<50	<5	<50	<50 J	<25	<5
MW-7A	--	<100	1500	690	1000	390	510D	430J	300J	280DJ	290	390 J	215 J*	345 D*
MW-7B	--	<100	<5	<5	<5	<5	<5D	<5	<10	<5	<10	<10 J	<5	<5
MW-8	--	<10	<5	<5	<5	<5*	<5	<5	<5	<5	<5	<5 J	<5	<5
MW-10A	--	<250	18	22	25	11D	13.5D*	15J*	15J	<120*	10J	11 J	<120	11
MW-10B	--	<250	<5	3J	1.2 J	46	<5D	<100	<100	<50*	<50	<50 J	<50	0.84 J*
MW-11A	--	<10	<5	<5	<5	<5	<5*	<5*J	<5	<5	<5 *	<5 J	<5	<5
MW-11B	--	<50	<5	0.7J	3.5 J	<5	<5D	1.4 J	0.45J	<50	1.6J	<50 J	<25	<5
MW-12A	--	<50	<5	2J	5.9	2.2J	4.2J	3.1 J	3.7J*	<40	3.3J	3.3 J	3.4 J	3.4 J
MW-12B	--	<50	<5	2J	2.3 J	<5	<5D	<50	1.3J	<20	1.8J	1.5 J	<20	1.8 J
MW-13A	--	<10	<5	<5	<5	<5	<5	<5J	<5	<5	<5	<5 J	<5	<5
MW-13B	--	<100	<10	1J	0.91 J	<5	<5D	<50J	0.83J	0.58J	0.68J	<20 J	0.56 J	0.77 J
MW-14A	--	<10	<5	<5	<5	<5	<5D	<5	<5	<5	<5	<5 J	<5	<5
MW-14B	--	<50	<5	0.8J	0.61 J	<5J	<5	0.62 J	<50	<25	0.38J	0.41 J*	<5	<5
MW-15	--	--	<10	1J	0.95 J	<5	<5D	1.7J	1.1J	<100	<25	<25 J	<50	2 J
MW-16A	--	--	--	--	NS	<5	<5D	<5J	<10	<10	<20	<5 J	<10	<5
MW-16B	--	--	--	--	<5	<5	<5D	<10J	<25	<50	<10	<10 J	<50	<5
MW-17A	--	--	--	--	59	75	75D	66	59	38J	48J	37 J	45	36
MW-17B	--	--	--	--	5.4	<5*	20D	40J	39J	28J	27J	26 J	26.5 J*	25.5*
MW-18A	--	--	--	--	5.6	4.9J	6	5.5	5.3J*	3.8J	4.95J *	5.2 J	7.3 J	6.1
MW-18B	--	--	--	--	<5	<5	<5D	<100	<50	<5	<50	<50 J	<17.5*	<5
MW-19A	--	--	--	--	<5	<5	<5	<5	<5	<5	<5	<5 J	<5	<5
MW-19B	--	--	--	--	<5	<5	<5	<5	<5	<5	<5	<10 J	<5	<5
MH-1	--	--	--	--	<5 J	<5	<5	<5	<25*	<5	<5	<5 J	<5*	<50*
MH-2	--	--	--	--	<5 J	<5	<5 J	<5	<25	<5	<5 *	<5 J	<50	<20
MH-3	--	--	--	--	<5 J	<5 *	<5*	<5*	<25	<5*	<5	<5 J*	<50	<20

Units: ug/L

J indicates an estimated value

D indicates sample was diluted

NS indicates that MW-16B could not be sampled due to insufficient water volume in the well

NYSDEC (1991) (TOGS 1.1.1) Standard for DCA is 5ug/L

* indicates reported concentration is average value of sample and duplicate sample concentrations

Table 3-9: Laboratory Analytical Results for Natural Attenuation Parameters

Monitoring Well I.D.		MW-1A									
Parameter	Units	Oct-00	May-01	Nov-01	May-02	Oct-02	May-03	Nov-03	May-04	Oct-04	Nov-05
Fe+2 (field measurement)	(mg/L)	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.2	0.3
Total Fe (lab measurement)	(mg/L)	nv	<0.05 J	11.7 J	6.3 J	11.8 J	4.16	12.2	9.34 J	1.97 J	5.44
Fe+3 (calculated)	(mg/L)	nc	<0.05	11.7	6.3	11.8	4.2	12.0	9.24	1.77	5.14
Methane	(ug/L)	23	30	40	36	41	40	19	43	42	34
Ethane	(ug/L)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Ethene	(ug/L)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Propane	(ug/L)	<1	nv	<1	<1	<1	<1	1.3	<1	<1	<1
Propene	(ug/L)	<1	nv	<1	<1	<1	<1	<1	<1	<1	<1
TOC	(mg/L)	<4	3.4	2.3	4.1 J	1.6	1.7	2.1	2.4	2.2	2.6
BOD	(mg/L)	<2	<2	<2	<2	<2	<2	<2	3.30	30.6	<2
COD	(mg/L)	<5	5.7J	<5 J	7.4 J	22.5 J	<10	<10	12.1	<10	<10
Chloride	(mg/L)	44.6	43.5	31.7	47.8	37.8	44.7	37.7	49.2	40.3	41.7
Nitrate	(mg/L)	<0.5J	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrite	(mg/L)	na	<0.02	<0.02	<0.02	<0.02	0.13	<0.05	<0.05	<0.05	<0.05
Sulfate	(mg/L)	135	159J	136 J	173	147	173	191	155	156	142
Sulfide	(mg/L)	31.5	<1	<1	<1	<1	<0.1	0.14	<0.1	<0.10	<0.10

Notes:

J indicates an estimated value

R indicates that data is unusable

nv indicates no value

nc indicates value could not be calculated based on available data

* indicates reported concentration is average value of sample and duplicate sample concentrations

** Field measurement exceeded lab value

Table 3-9: Laboratory Analytical Results for Natural Attenuation Parameters

Monitoring Well I.D.		MW-1B									
Parameter	Units	Oct-00	May-01	Nov-01	May-02	Oct-02	May-03	Nov-03	May-04	Oct-04	Nov-05
Fe+2 (field measurement)	(mg/L)	0.0	0.0	0.0	1.2	0.4	0.0	1.0	0.8	0.5	0.8
Total Fe (lab measurement)	(mg/L)	nv	1.1	5 J	1.8 J	4.33 J	1.22	1.21	1.48 J	0.56 J	1.56
Fe+3 (calculated)	(mg/L)	nc	1.1	5	0.6	3.93	1.22	0.21	0.68	0.06	0.76
Methane	(ug/L)	65	34	30	44	91	40	40	54	100	51
Ethane	(ug/L)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Ethene	(ug/L)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Propane	(ug/L)	<1	nv	<1	<1	<1	<1	<1	<1	<1	<1
Propene	(ug/L)	<1	nv	<1	<1	<1	<1	<1	<1	<1	<1
TOC	(mg/L)	6.2	6.6	9.7	6.7 J	6..2	3.8	4.6	2.8	3.8	3.2
BOD	(mg/L)	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
COD	(mg/L)	13	13J	37.2 J	16.9 J	17.2 J	10.4	<10	24.9	12.8	<10
Chloride	(mg/L)	83.1	83.3	74.2	72.1	95.4	73.7	72.1	70.2	82.2	85.3
Nitrate	(mg/L)	<0.5J	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrite	(mg/L)	na	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	(mg/L)	223	297J	268 J	239	304	276	277	240	257	177
Sulfide	(mg/L)	<1	<1	<1	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.10

Notes:

J indicates an estimated value

R indicates that data is unusable

nv indicates no value

nc indicates value could not be calculated based on available data

* indicates reported concentration is average value of sample and duplicate sample concentrations

** Field measurement exceeded lab value

Table 3-9: Laboratory Analytical Results for Natural Attenuation Parameters

Monitoring Well I.D.		MW-3A									
Parameter	Units	Oct-00	May-01	Nov-01	May-02	Oct-02	May-03	Nov-03	May-04	Oct-04	Nov-05
Fe+2 (field measurement)	(mg/L)	0.5	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Fe (lab measurement)	(mg/L)	nv	<0.05 J	1.9 J	10.7 J	6.47 J	7.94	16.5	13.5 J	9.55 J	8.73
Fe+3 (calculated)	(mg/L)	nc	<0.05	1.4	10.7	6.47	7.94	16.50	13.5	9.55	8.73
Methane	(ug/L)	45	4	1.2	4	<1	1.6	1.9	1.7	3.9	18.0
Ethane	(ug/L)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Ethene	(ug/L)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Propane	(ug/L)	<1	nv	<1	<1	<1	<1	<1	<1	<1	<1
Propene	(ug/L)	<1	nv	<1	<1	<1	<1	<1	<1	<1	<1
TOC	(mg/L)	2.1	2.9	3.8	5.1 J	2.5	2.4	3.4	2.7	2.1	2.7
BOD	(mg/L)	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
COD	(mg/L)	<5	<5	<5 J	<5 J	<5 J	<10	<10	<10	<10	<10
Chloride	(mg/L)	17.9	18.7	19.5	20.7	19.9	18.5	21.9	21.6	14.3	23.9
Nitrate	(mg/L)	<0.5J	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.067	<0.05	<0.05
Nitrite	(mg/L)	na	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	(mg/L)	399	462	444 J	400	512	332	373	345	311	270
Sulfide	(mg/L)	<1	<1	<1	<1	<1	0.73	<0.1	0.12	<0.1	<0.10

Notes:

J indicates an estimated value

R indicates that data is unusable

nv indicates no value

nc indicates value could not be calculated based on available data

* indicates reported concentration is average value of sample and duplicate sample concentrations

** Field measurement exceeded lab value

Table 3-9: Laboratory Analytical Results for Natural Attenuation Parameters

Monitoring Well I.D.		MW-3B									
Parameter	Units	Oct-00	May-01	Nov-01	May-02	Oct-02	May-03	Nov-03	May-04	Oct-04	Nov-05
Fe+2 (field measurement)	(mg/L)	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Fe (lab measurement)	(mg/L)	nv	<0.05 J	0.2* J	1.0* J	2.12	0.422	0.0705	<0.05 J	2.21 J	0.28
Fe+3 (calculated)	(mg/L)	nc	<0.05	0	1	2.12	0.42	0.07	<0.05	2.21	0.28
Methane	(ug/L)	260	90	175*	195*	280 J	130	59	140	150	190
Ethane	(ug/L)	<1	<1	<1	<1	<1 J	<1	<1	<1	<1	<1
Ethene	(ug/L)	<1	<1	<1	<1	<1 J	<1	<1	<1	<1	<1
Propane	(ug/L)	<	nv	<1	<1	<1 J	<1	<1	<1	<1	<1
Propene	(ug/L)	<1	nv	<1	<1	<1 J	<1	<1	<1	<1	<1
TOC	(mg/L)	3.6	4.6	4*	8.3*J	2.7	2.8	3.3	3.4	3.6	3.4
BOD	(mg/L)	<2	<2	<2	3.3*	7.8	<2	<2.2	<2	<2	<2
COD	(mg/L)	11.3	7.4	6* J	37.55*J	53.7 J	<10	<10	20.6	14.1	<10
Chloride	(mg/L)	93.6	92.5	99.2*	91.75*	110	96.8	116	83.6	114	137
Nitrate	(mg/L)	<0.5J	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrite	(mg/L)	na	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	(mg/L)	288	356	304* J	346*	562	240	394	413	347	240
Sulfide	(mg/L)	<1	<1	<1	1.2*	<1	<0.1	0.29	0.60	<0.1	0.10

Notes:

J indicates an estimated value

R indicates that data is unusable

nv indicates no value

nc indicates value could not be calculated based on available data

* indicates reported concentration is average value of sample and duplicate sample concentrations

** Field measurement exceeded lab value

Table 3-9: Laboratory Analytical Results for Natural Attenuation Parameters

Monitoring Well I.D.		MW-4A									
Parameter	Units	Oct-00	May-01	Nov-01	May-02	Oct-02	May-03	Nov-03	May-04	Oct-04	Nov-05
Fe+2 (field measurement)	(mg/L)	0.0	0.2**	0.0	0.4	nv	0.2	0.2	0.3	0.5	0.6
Total Fe (lab measurement)	(mg/L)	nv	0.1 J	12.1 J	1.9 J	4.23	54.0*	1.67	34.5 J	55.1 J	15.8
Fe+3 (calculated)	(mg/L)	nc	0.1	12.1	1.5	nc	53.8*	1.5	34.2	54.6	15.2
Methane	(ug/L)	54	44	40	130	87 J	89*	53	110	120	140
Ethane	(ug/L)	<1	<1	<1	<1	<1 J	<1*	<1	<1	<1	<1
Ethene	(ug/L)	3	1.5	1.5	1.8	2.5 J	2.1*	1.3	<1	3.1	3.8
Propane	(ug/L)	<1	nv	<1	<1	<1 J	<1*	<1	<1	<1	<1
Propene	(ug/L)	<1	nv	<1	<1	<1 J	<1*	<1	<1	<1	<1
TOC	(mg/L)	2.7	2.4	2.5	3	1.5	<1*	1.8	1.8	1.9	4.5
BOD	(mg/L)	<2	<2	<2	<2 J	<2	<2*	<2	<2	<2	<2
COD	(mg/L)	<5	<5	<5 J	10.3 J	<5 J	<10*	<10	<10	<10	11.7
Chloride	(mg/L)	100	185	89.3	132	80.1	168*	118	74.2	93.9	93.2
Nitrate	(mg/L)	<0.5J	<0.05	<0.05	<0.05	<0.05	<0.05*	<0.05	<0.05	<0.05	<0.05
Nitrite	(mg/L)	na	<0.02	<0.02	<0.02	<0.02	<0.05*	<0.05	<0.05	<0.05	<0.05
Sulfate	(mg/L)	222	318	281 J	322	258	302*	263	305	272	248
Sulfide	(mg/L)	31.5	<1	<1	<1	<1	<0.5*	<0.1	0.15	<0.1	<0.10

Notes:

J indicates an estimated value

R indicates that data is unusable

nv indicates no value

nc indicates value could not be calculated based on available data

* indicates reported concentration is average value of sample and duplicate sample concentrations

** Field measurement exceeded lab value

Table 3-9: Laboratory Analytical Results for Natural Attenuation Parameters

Monitoring Well I.D.		MW-4B									
Parameter	Units	Oct-00	May-01	Nov-01	May-02	Oct-02	May-03	Nov-03	May-04	Oct-04	Nov-05
Fe+2 (field measurement)	(mg/L)	0.0	0.0	0.0	0.6	nv	0.5	0.5	0.5	0.5	0.4
Total Fe (lab measurement)	(mg/L)	nv	0.3 J	2 J	1.1 J	1.35*	1.14	1.06 *	0.7 J	0.93 J	0.82
Fe+3 (calculated)	(mg/L)	nc	0.3	2	0.5	nc	0.64	0.56	0.20	0.43	0.42
Methane	(ug/L)	230	150	120	200	220* J	230	140 *	230	190	170
Ethane	(ug/L)	<1	<1	<1	<1	<1* J	<1	<1 *	<1	<1	<1
Ethene	(ug/L)	1	<1	<1	<1	<1* J	<1	<1 *	<1	<1	<1
Propane	(ug/L)	<1	nv	<1	<1	<1* J	<1	<1 *	<1	<1	<1
Propene	(ug/L)	<1	nv	<1	<1	<1* J	<1	<1 *	<1	<1	<1
TOC	(mg/L)	<10	3.6	3.2	3.3	2.25*	1.2	2.65 *	2.4	2.6	3.1
BOD	(mg/L)	<2	<2	<2	<2 J	<2*	<2	<2 *	<2	<2	<2
COD	(mg/L)	7.4	<5	<5 J	7.7 J	11.1* J	<10	<10 *	16.4	<10	18.1
Chloride	(mg/L)	167	136	123	133	127.5*	121	143 *	69.4	131	126
Nitrate	(mg/L)	<0.5J	0.076	<0.05	<0.05	<0.05*	<0.05	<0.05 *	<0.05	<0.05	<0.05
Nitrite	(mg/L)	na	<0.02	<0.02	<0.02	<0.02*	<0.05	<0.05 *	<0.05	<0.05	<0.05
Sulfate	(mg/L)	314	502	524 J	402	462*	228	355 *	355	320	252
Sulfide	(mg/L)	<1	<1	<1	<1	<1*	<0.1	<0.1 *	0.11	<0.1	<0.10

Notes:

J indicates an estimated value

R indicates that data is unusable

nv indicates no value

nc indicates value could not be calculated based on available data

* indicates reported concentration is average value of sample and duplicate sample concentrations

** Field measurement exceeded lab value

Table 3-9: Laboratory Analytical Results for Natural Attenuation Parameters

Monitoring Well I.D.		MW-7A									
Parameter	Units	Oct-00	May-01	Nov-01	May-02	Oct-02	May-03	Nov-03	May-04	Oct-04	Nov-05
Fe+2 (field measurement)	(mg/L)	0.2	0.0	0.0	1.3	0.1	0.2	1.4	2.1	0.9	2.2
Total Fe (lab measurement)	(mg/L)	nv	1.0 J	26.5 J	21.2 J	11.9	8.62	13.6	10.5 J	11.2 J*	81.15 J*
Fe+3 (calculated)	(mg/L)	nc	1.0	26.5	19.9	11.8	8.4	12.2	8.40	10.3	79.0
Methane	(ug/L)	16	7	11	13	8.6 J	4.7	4.2	7.3	10.5*	17*
Ethane	(ug/L)	2	1	1.9	2.1	1 J	<1	<1	<1	1.4*	2.55*
Ethene	(ug/L)	2	2	2.4	5.9	7 J	4.1	3.7	<1	3.75*	4.45*
Propane	(ug/L)	<1	nv	<1	<1	<1 J	<1	<1	<1	<1*	<1*
Propene	(ug/L)	<1	nv	<1	<1	<1 J	<1	<1	<1	<1*	<1*
TOC	(mg/L)	<10	<4	3.6	4.5 J	2	<1	2.1	2.0	1.95*	4.05*
BOD	(mg/L)	<2	<2	<2	<2	<2	<2	<2.2	<2	<2*	<2*
COD	(mg/L)	33.2	<5	<5 J	9.3 J	<5 J	<10	<10	14.4	<10*	<10 UJ*
Chloride	(mg/L)	56.7	36.2	43.3	37.8	35.7	28.8	36.3	29.5	24.25*	23.85*
Nitrate	(mg/L)	<0.5J	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05*	<0.05*
Nitrite	(mg/L)	na	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05*	<0.05*
Sulfate	(mg/L)	50.4	340	128 J	239	398	249	348	266	246*	241.5*
Sulfide	(mg/L)	3.4	<1	1.8	<1	<1	<0.2	<0.1	<0.1	<0.1*	<0.10*

Notes:

J indicates an estimated value

R indicates that data is unusable

nv indicates no value

nc indicates value could not be calculated based on available data

* indicates reported concentration is average value of sample and duplicate sample concentrations

** Field measurement exceeded lab value

Table 3-9: Laboratory Analytical Results for Natural Attenuation Parameters

Monitoring Well I.D.		MW-7B									
Parameter	Units	Oct-00	May-01	Nov-01	May-02	Oct-02	May-03	Nov-03	May-04	Oct-04	Nov-05
Fe+2 (field measurement)	(mg/L)	0.0	0.0	0.4**	0.0	0.1	0.0	0.0	0.3**	0.0	0.0
Total Fe (lab measurement)	(mg/L)	nv	<0.05 J	0.1 J	0.8 J	0.142	0.606	0.056	<0.05 J	0.056 J	0.05 J
Fe+3 (calculated)	(mg/L)	nc	<0.05	nc	0.8	0.042	0.606	0.056	<0.05	0.056	0.050
Methane	(ug/L)	270	120	230	260	280 J	200	190	190	220	180
Ethane	(ug/L)	<1	<1	<1	<1	<1 J	<1	<1	<1	<1	<1
Ethene	(ug/L)	1	<1	<1	1.5	1.5 J	1.4	<1	<1	1.0	1.3
Propane	(ug/L)	<1	nv	<1	<1	<1 J	<1	<1	<1	<1	<1
Propene	(ug/L)	<1	nv	<1	<1	<1 J	<1	<1	<1	<1	<1
TOC	(mg/L)	3.2	4.6	3.7	6 J	2.7	2.4	3.3	2.9	3.5	3.4
BOD	(mg/L)	<2	<2	<2	<2	<2	<2	<2.2	<2	<2	<2
COD	(mg/L)	<5	5.7	<5 J	14.6 J	<5 J	<10	<10	21.7	<10	<10 UJ
Chloride	(mg/L)	97.3	88.8	98.9	95.6	117	96.3	140	82.0	118	137
Nitrate	(mg/L)	<0.5J	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.12
Nitrite	(mg/L)	na	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	(mg/L)	250	248	272 J	218	388	197	320	251	219	237
Sulfide	(mg/L)	<1	<1	<1	<1	<1	0.11	0.1	0.14	<0.1	<0.10

Notes:

J indicates an estimated value

R indicates that data is unusable

nv indicates no value

nc indicates value could not be calculated based on available data

* indicates reported concentration is average value of sample and duplicate sample concentrations

** Field measurement exceeded lab value

Table 3-9: Laboratory Analytical Results for Natural Attenuation Parameters

Monitoring Well I.D.		MW-10A									
Parameter	Units	Oct-00	May-01	Nov-01	May-02	Oct-02	May-03	Nov-03	May-04	Oct-04	Nov-05
Fe+2 (field measurement)	(mg/L)	1.0	0.5	1.8	3.1	1.6	0.0	2.8	2.2	2.8	2.1
Total Fe (lab measurement)	(mg/L)	nv	2.8	33.2* J	35.4* J	21.9 J	24.2*	19.0	43.4 J	29.4 J	23.1 J
Fe+3 (calculated)	(mg/L)	nc	2.3	31.4	32.3	20.3	24.2*	16.2	41.2	26.6	21.0
Methane	(ug/L)	72	40	40*	63*	37	68*	35	43	40	33
Ethane	(ug/L)	3	2.8	3.2*	2.15*	1.8	3.9*	1.6	2.4	1.5	<1
Ethene	(ug/L)	9	7.7	6*	11.5*	7	9.3*	4.6	5.3	6.5	5.4
Propane	(ug/L)	<1	<1	<1	<1	<1	<1*	<1	<1	<1	<1
Propene	(ug/L)	<1	<1	<1	<1	<1	<1*	<1	<1	<1	<1
TOC	(mg/L)	<4	<10	2.8*	2.75*	1.6	<1*	1.8	1.7	1.5	2.5
BOD	(mg/L)	<2	<2	<2	<2 J	<2	<2*	<2.2	<2	<2	<2
COD	(mg/L)	9.4	6.3	7.2* J	9.7* J	<5 J	<10*	<10	<10	<10	<10 UJ
Chloride	(mg/L)	560	558	646*	812*	703	728*	972	1080	1040	1020
Nitrate	(mg/L)	<0.5J	<0.05	<0.05	<0.05	<0.05	<0.05*	<0.05	0.085	<0.05	<0.05
Nitrite	(mg/L)	na	<0.02	<0.02	<0.02	<0.02	<0.05*	<0.05	<0.05	<0.05	<0.05
Sulfate	(mg/L)	398	254	338*	406*	564	197*	313	325	376	276
Sulfide	(mg/L)	<1	<1	<1	<2	<1	<0.1*	0.26	0.13	<0.1	<0.10

Notes:

J indicates an estimated value

R indicates that data is unusable

nv indicates no value

nc indicates value could not be calculated based on available data

* indicates reported concentration is average value of sample and duplicate sample concentrations

** Field measurement exceeded lab value

Table 3-9: Laboratory Analytical Results for Natural Attenuation Parameters

Monitoring Well I.D.		MW-10B									
Parameter	Units	Oct-00	May-01	Nov-01	May-02	Oct-02	May-03	Nov-03	May-04	Oct-04	Nov-05
Fe+2 (field measurement)	(mg/L)	0.0	0.4	0.9	0.6	1.8**	1.1**	0.6	0.9**	0.5	0.5
Total Fe (lab measurement)	(mg/L)	nv	0.5	1.1 J	2.5 J	1.39 J	0.737	0.66	0.782 J	1.44 J	0.559 J*
Fe+3 (calculated)	(mg/L)	nc	0.1	0.2	1.9	nc	nc	0.06	<0.05	0.94	0.06
Methane	(ug/L)	89	50	90	39	83	67	54	77	94	87
Ethane	(ug/L)	3	<1	<1	<1	<1	<1	<1	<1	<1	<1
Ethene	(ug/L)	3	<1	2	<1	1.3	<1	<1	<1	<1	<1
Propane	(ug/L)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Propene	(ug/L)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
TOC	(mg/L)	3.4	4.5	4	4.9	4.1	2.7	4.2	5.7	3.8	4.25*
BOD	(mg/L)	<2	<2	<2	<2 J	<2	<2	<4.5	<2	<2	<2*
COD	(mg/L)	<5	<5	5.4 J	15.5 J	<5 J	12.9	<10	<10	<10	17 J*
Chloride	(mg/L)	99.8	76.5	104	78.4	119	76.6	84.8	75.8	87.9	88.25*
Nitrate	(mg/L)	<0.5J	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05*
Nitrite	(mg/L)	na	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05*
Sulfate	(mg/L)	254	274	301	238	296	193	345	242	231	232.5*
Sulfide	(mg/L)	<1	<1	<1	<1	<1	0.1	<0.1	0.11	<0.1	<0.10*

Notes:

J indicates an estimated value

R indicates that data is unusable

nv indicates no value

nc indicates value could not be calculated based on available data

* indicates reported concentration is average value of sample and duplicate sample concentrations

** Field measurement exceeded lab value

Table 3-9: Laboratory Analytical Results for Natural Attenuation Parameters

Monitoring Well I.D.		MW-14A									
Parameter	Units	Oct-00	May-01	Nov-01	May-02	Oct-02	May-03	Nov-03	May-04	Oct-04	Nov-05
Fe+2 (field measurement)	(mg/L)	1.3	nv	0.5	1.0	1.0	0.0	0.7	1.5	1.4	1.4
Total Fe (lab measurement)	(mg/L)	nv	0.5	2 J	44.4 J	59.3 J	50.4	49.5	39.4 J	49.2 J	63.4
Fe+3 (calculated)	(mg/L)	nc	nv	1.5	43.4	58.3	50.4	48.8	37.9	47.8	62.0
Methane	(ug/L)	36	10	30	23	22	16	14	45	30	29
Ethane	(ug/L)	3	<1	2.2	2.2	1.2	1.8	1.5	2.3	1.3	1.4
Ethene	(ug/L)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Propane	(ug/L)	<1	<1	<1	1.4	<1	<1	<1	<1	<1	<1
Propene	(ug/L)	<1	<1	<1	1.5	<1	<1	<1	<1	<1	<1
TOC	(mg/L)	<10	<20	3.9	4	3.5	3.2	3.7	2.6	3.3	5.6
BOD	(mg/L)	<2	2	<2	<2 J	<2	<2	<2	3.3	<2	<2
COD	(mg/L)	34.2	27.9	11.6 J	16.2 J	14.9 J	<10	13.4	12.4	<10	14.6
Chloride	(mg/L)	77.2	105	107	74.3	68.4	84.2	98.6	83.9	75.0	79.5
Nitrate	(mg/L)	<0.5J	0.087	<0.05	<0.05	<0.05	<0.05	0.28	0.2	0.14	0.14
Nitrite	(mg/L)	na	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	0.068	<0.05
Sulfate	(mg/L)	38.4	28.4	352	123	184	173	151	182	190	178
Sulfide	(mg/L)	<1	<1	1.8	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.10

Notes:

J indicates an estimated value

R indicates that data is unusable

nv indicates no value

nc indicates value could not be calculated based on available data

* indicates reported concentration is average value of sample and duplicate sample concentrations

** Field measurement exceeded lab value

Table 3-9: Laboratory Analytical Results for Natural Attenuation Parameters

Monitoring Well I.D.		MW-14B									
Parameter	Units	Oct-00	May-01	Nov-01	May-02	Oct-02	May-03	Nov-03	May-04	Oct-04	Nov-05
Fe+2 (field measurement)	(mg/L)	0.5	0.0	0.0	0.5	0.0	0.3**	0.3**	0.5**	0.6**	0.5
Total Fe (lab measurement)	(mg/L)	nv	0.2	148 J	1.1 J	0.792 J	0.134	0.282	0.093 J*	<0.05 J	0.076
Fe+3 (calculated)	(mg/L)	nc	0.2	148	0.6	0.792	nc	nc	<0.05	nc	nc
Methane	(ug/L)	210	100	80	200	200	130	150	215*	180	180
Ethane	(ug/L)	<1	<1	<1	<1	<1	<1	<1	<1*	<1	<1
Ethene	(ug/L)	2	<1	<1	1.1	1.4	<1	<1	<1*	<1	1
Propane	(ug/L)	<1	<1	<1	<1	<1	<1	<1	<1*	<1	<1
Propene	(ug/L)	<1	<1	<1	<1	<1	<1	<1	<1*	<1	<1
TOC	(mg/L)	2.8	4.3	4.6	3.8	2.8	2.5	3.1	1.4*	2.8	3.2
BOD	(mg/L)	<2	<2	<2	<2 J	<2	<2	<2	3.65*	<2	<2
COD	(mg/L)	8.4	<5	23.1 J	8.7 J	<5 J	10.4	<10	18.0*	<10	11.4
Chloride	(mg/L)	93.2	89.5	85.5	124	116	110	126	87.5*	121	113
Nitrate	(mg/L)	<0.5J	<0.05	0.12	<0.05	<0.05	<0.05	<0.05	<0.05*	<0.05	<0.05
Nitrite	(mg/L)	na	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05*	<0.05	<0.05
Sulfate	(mg/L)	308	251	151	248	398	391	391	306*	325	252
Sulfide	(mg/L)	<1	<1	1.7	<1	<1	<0.1	0.12	0.18*	0.21	<0.10

Notes:

J indicates an estimated value

R indicates that data is unusable

nv indicates no value

nc indicates value could not be calculated based on available data

* indicates reported concentration is average value of sample and duplicate sample concentrations

** Field measurement exceeded lab value

Table 3-9: Laboratory Analytical Results for Natural Attenuation Parameters

Monitoring Well I.D.		MW-16A									
Parameter	Units	Oct-00	May-01	Nov-01	May-02	Oct-02	May-03	Nov-03	May-04	Oct-04	Nov-05
Fe+2 (field measurement)	(mg/L)	Well Dry	nv	1.0	nv	0.0	0.0	0.0	0.0	0.3	0.2
Total Fe (lab measurement)	(mg/L)	No Sample	nv	4.9 J	5.8	3.37 J	9.37	12.5	7.61 J	8.26 J	8.16
Fe+3 (calculated)	(mg/L)	Collected	nv	3.9	nc	3.37	9.37	12.50	7.61	7.96	7.96
Methane	(ug/L)		6.3	4.3	1.8	3.1	1.6	3.6	1.4	1.9	4.2
Ethane	(ug/L)		<1	<1	<1	<1	<1	<1	<1	<1	<1
Ethene	(ug/L)		<1	<1	<1	<1	<1	1.6	<1	1.1	3.8
Propane	(ug/L)		nv	<1	<1	<1	<1	<1	<1	<1	<1
Propene	(ug/L)		nv	<1	<1	<1	<1	<1	<1	<1	<1
TOC	(mg/L)		8.7	8.4	7.4	6.8	4.7	6.6	4.9	5.9	4.7
BOD	(mg/L)		<2	<2	<2 J	<2	<2	<2	<2	<2	<2
COD	(mg/L)		38.2J	23.5 J	25.3	12.7 J	14.6	<10	16.4	15.4	26.8
Chloride	(mg/L)		327	334	385	349	367	347	259	308	86.2
Nitrate	(mg/L)		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.12	0.12	0.076
Nitrite	(mg/L)		<0.02	<0.02	<0.02 R	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	(mg/L)		1250J	1060	955	1060	993	1080	985	1120	41.1
Sulfide	(mg/L)		<1	<1	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.10

Notes:

J indicates an estimated value

R indicates that data is unusable

nv indicates no value

nc indicates value could not be calculated based on available data

* indicates reported concentration is average value of sample and duplicate sample concentrations

** Field measurement exceeded lab value

Table 3-9: Laboratory Analytical Results for Natural Attenuation Parameters

Monitoring Well I.D.		MW-16B									
Parameter	Units	Oct-00	May-01	Nov-01	May-02	Oct-02	May-03	Nov-03	May-04	Oct-04	Nov-05
Fe+2 (field measurement)	(mg/L)	0.0	nv	0.7	0.3	0.0	0.0	0.4	0.4	0.3	nv
Total Fe (lab measurement)	(mg/L)	nv	0.3 J	160 J	6.8	4.65 J	1.92	16.9	0.588 J	1.2 J	3.11
Fe+3 (calculated)	(mg/L)	nc	nv	159.3	6.5	4.65	1.92	16.50	0.19	0.9	nc
Methane	(ug/L)	132.5	120	110	17	200	150	160	190	200	130
Ethane	(ug/L)	<1	<1	2.3	<1	<1	<1	<1	<1	<1	<1
Ethene	(ug/L)	<1	<1	<1	<1	2.9	3	2.5	24	3.3	2.2
Propane	(ug/L)	<1	nv	<1	1.2	<1	<1	<1	<1	<1	<1
Propene	(ug/L)	<1	nv	<1	1.7	<1	<1	<1	<1	<1	<1
TOC	(mg/L)	5.6	5.9	8.8	4.3	5.2	3.4	4.2	4.1	3.9	2.8
BOD	(mg/L)	<2	<2	11.2	8.6 J	<2	<2	<2	<2	<2	<2
COD	(mg/L)	10.35	46.1J	135 J	48.2	22.2 J	22.2	49	<10	<10	17.5
Chloride	(mg/L)	95.1J	74.2	88.4	62.4	78.1	86.6	90.4	79	83.3	13
Nitrate	(mg/L)	<0.5J	0.062	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrite	(mg/L)	na	<0.02	<0.02	<0.02 R	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	(mg/L)	500.5J	510J	258	170	159	173	267	264	251	90.2
Sulfide	(mg/L)	<1	<1	3.2	<1	<1	<0.1	0.12	0.28	0.11	<0.10

Notes:

J indicates an estimated value

R indicates that data is unusable

nv indicates no value

nc indicates value could not be calculated based on available data

* indicates reported concentration is average value of sample and duplicate sample concentrations

** Field measurement exceeded lab value

Table 3-9: Laboratory Analytical Results for Natural Attenuation Parameters

Monitoring Well I.D.		MW-17A									
Parameter	Units	Oct-00	May-01	Nov-01	May-02	Oct-02	May-03	Nov-03	May-04	Oct-04	Nov-05
Fe+2 (field measurement)	(mg/L)	0.6	2.5**	1.2	2.0	3.2	1.8	2.0	3.4	2.8	3.6
Total Fe (lab measurement)	(mg/L)	nv	1.7 J	142 J	39.6 J	52.4	14.6	8.25	16.8 J*	32.2 J	11.5
Fe+3 (calculated)	(mg/L)	nc	1.7	140.8	37.6	49.2	12.8	6.3	13.4	29.4	7.9
Methane	(ug/L)	61	78	100	120	98 J	78	52	62*	81	57
Ethane	(ug/L)	4	7.1	3.1	2.6	4 J	<1	<1	<1*	<1	<1
Ethene	(ug/L)	1	<1	<1	1.3	4.2 J	1.1	<1	<1*	<1	<1
Propane	(ug/L)	<1	nv	<1	<1	<1 J	<1	<1	<1*	<1	<1
Propene	(ug/L)	<1	nv	<1	<1	<1 J	<1	<1	<1*	<1	<1
TOC	(mg/L)	4.3	<20	3.9	3	2.5	<1	1.9	1.8*	2.1	2.8
BOD	(mg/L)	<2	<2	<2	<2 J	<2	<2	<2	<2*	<2	<2
COD	(mg/L)	19.6	30J	44.8 J	13.9 J	17.6 J	<10	<10	12.6*	<10	10.8
Chloride	(mg/L)	612J	640	845	982	1090	924	1270	1000*	1010	1080
Nitrate	(mg/L)	<0.5J	0.052	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05*	<0.05	<0.05
Nitrite	(mg/L)	na	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05*	<0.05	<0.05
Sulfate	(mg/L)	76.9J	220J	156	202	274	159	252	227*	196	181
Sulfide	(mg/L)	<1	<1	1.7	<1	<1	<0.1	<0.1	<0.1*	<0.1	<0.10

Notes:

J indicates an estimated value

R indicates that data is unusable

nv indicates no value

nc indicates value could not be calculated based on available data

* indicates reported concentration is average value of sample and duplicate sample concentrations

** Field measurement exceeded lab value

Table 3-9: Laboratory Analytical Results for Natural Attenuation Parameters

Monitoring Well I.D.		MW-17B									
Parameter	Units	Oct-00	May-01	Nov-01	May-02	Oct-02	May-03	Nov-03	May-04	Oct-04	Nov-05
Fe+2 (field measurement)	(mg/L)	0.0	0.0	0.3	1.4	--	1.9	1.2	1.4	1.0	1.0
Total Fe (lab measurement)	(mg/L)	nv	0.1 J	71.1 J	11.2 J	89.4	5.16	4.61	2.82 J	3.76 J	2.89
Fe+3 (calculated)	(mg/L)	nc	0.1	70.8	9.8		3.26	3.41	1.42	2.76	1.89
Methane	(ug/L)	96	93	70	180	160 J	150	110	150	150	140
Ethane	(ug/L)	5	7.8	<1	4.6	6.7 J	<1	<1	<1	<1	<1
Ethene	(ug/L)	1	<1	<1	2.9	3.5 J	5.4	2.7	<1	5.3	4.7
Propane	(ug/L)	<1	nv	<1	1.1	<1 J	<1	<1	<1	<1	<1
Propene	(ug/L)	<1	nv	<1	<1	<1 J	<1	<1	<1	<1	1.5
TOC	(mg/L)	4.8	<10	4.1	4	3.9	1.8	2.8	3.3	3.2	3.5
BOD	(mg/L)	<2	<2	4.6	<2 J	4.9	<2	<2	<2	<2	<2
COD	(mg/L)	24.3	13.6J	84.2 J	27 J	61.2 J	<10	<10	<10	<10	13.6
Chloride	(mg/L)	124J	107	495	461	445	359	412	241	381	477
Nitrate	(mg/L)	<0.5J	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrite	(mg/L)	na	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	(mg/L)	56.2J	244J	110	196	340	91.8	371	252	226	221
Sulfide	(mg/L)	<1	<1	2.6	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.10

Notes:

J indicates an estimated value

R indicates that data is unusable

nv indicates no value

nc indicates value could not be calculated based on available data

* indicates reported concentration is average value of sample and duplicate sample concentrations

** Field measurement exceeded lab value

Table 3-9: Laboratory Analytical Results for Natural Attenuation Parameters

Monitoring Well I.D.		MW-18A									
Parameter	Units	Oct-00	May-01	Nov-01	May-02	Oct-02	May-03	Nov-03	May-04	Oct-04	Nov-05
Fe+2 (field measurement)	(mg/L)	0.0	0.0	0.0	1.5	1.2	0.0	0.9	0.8	1.0	1.2
Total Fe (lab measurement)	(mg/L)	nv	1.0 J	35.7 J	18.6 J	24.75* J	17.7	18.55 *	11.2 J	7.7 J	8.98
Fe+3 (calculated)	(mg/L)	nc	1.0	35.7	17.1	11.2	17.7	17.7	10.4	6.7	7.8
Methane	(ug/L)	35	27	30	32	15.5*	22	18 *	22	15	24
Ethane	(ug/L)	7	5.6	3.9	1.6	<1*	<1	1.75 *	<1	<1	<1
Ethene	(ug/L)	<1	<1	<1	<1	<1*	<1	<1 *	<1	<1	<1
Propane	(ug/L)	<1	nv	<1	<1	<1*	<1	1.0 *	<1	<1	<1
Propene	(ug/L)	<1	nv	<1	<1	<1*	<1	<1 *	<1	<1	<1
TOC	(mg/L)	2.8	<1	2.4	2.6	1.85*	1.3	2.15 *	<1	2.0	2.1
BOD	(mg/L)	<2	<2	<2	<2 J	<2*	<2	<2.1 *	2.8	<2	<2
COD	(mg/L)	12	6.7J	<5 J	<5 J	10.5* J	<10	11.9 *	<10	<10	13.3
Chloride	(mg/L)	58.6J	40.2	45.4	48.2	69.4*	46.8	68.1 *	57.6	58.4	72.7
Nitrate	(mg/L)	<0.5J	<0.05	<0.05	<0.05	<0.05*	<0.05	<0.05 *	<0.05	<0.05	<0.05
Nitrite	(mg/L)	na	<0.02	<0.02	<0.02	<0.02*	<0.05	<0.05 *	<0.05	<0.05	<0.05
Sulfate	(mg/L)	130J	590J	125	136	166.5*	173	167 *	139	156	147
Sulfide	(mg/L)	<1	<1	<1	<1	<1*	<0.1	<0.1 *	0.1	<0.1	<0.10

Notes:

J indicates an estimated value

R indicates that data is unusable

nv indicates no value

nc indicates value could not be calculated based on available data

* indicates reported concentration is average value of sample and duplicate sample concentrations

** Field measurement exceeded lab value

Table 3-9: Laboratory Analytical Results for Natural Attenuation Parameters

Monitoring Well I.D.		MW-18B									
Parameter	Units	Oct-00	May-01	Nov-01	May-02	Oct-02	May-03	Nov-03	May-04	Oct-04	Nov-05
Fe+2 (field measurement)	(mg/L)	0.6	0.0	0.5	0.9	1.8	0.3	0.6	0.8	0.5	0.7
Total Fe (lab measurement)	(mg/L)	nv	0.8 J	1.4 J	1.1 J	8.22 J	1.02	1.98	0.854 J	1.615 J*	0.933
Fe+3 (calculated)	(mg/L)	nc	0.8	0.9	0.2	6.4	0.7	1.4	0.1	1.115	0.233
Methane	(ug/L)	120	40	40	94	100	110	74	35	120*	100
Ethane	(ug/L)	3	<1	<1	<1	4.5	<1	3.3	<1	<1*	<1
Ethene	(ug/L)	13	<1	<1	<1	<1	<1	<1	<1	1.05*	<1
Propane	(ug/L)	<1	nv	<1	<1	<1	<1	1.2	<1	<1*	<1
Propene	(ug/L)	<1	nv	<1	<1	<1	<1	<1	<1	<1*	<1
TOC	(mg/L)	4.5	5.6	4.5	5.4	5.6	3.2	5.2	2.4	4.0*	4.1
BOD	(mg/L)	<2	<2	<2	2.3 J	<2	<2	2.6	<2	<2*	<2
COD	(mg/L)	12	15.9J	<5 J	29.6 J	22.2 J	15.6	<10	15.4	<10*	12.7
Chloride	(mg/L)	103J	90.5	69.7	76.8	72.4	78.6	83	79	80.5*	91.5
Nitrate	(mg/L)	<0.5J	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05*	<0.05
Nitrite	(mg/L)	na	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05*	<0.05
Sulfate	(mg/L)	279J	348J	292	165	348	230	349	253	255*	278
Sulfide	(mg/L)	<1	<1	<1	<1	<1	0.13	<0.1	<0.1	<0.1*	<0.10

Notes:

J indicates an estimated value

R indicates that data is unusable

nv indicates no value

nc indicates value could not be calculated based on available data

* indicates reported concentration is average value of sample and duplicate sample concentrations

** Field measurement exceeded lab value

Table 3-10: Preliminary Screening for Anaerobic Biodegradation Processes

USEPA Evaluation Criteria				Resulting Scores	
				Fall-05	
Analysis	Concentration in Most Contaminated Zone	Interpretation	Value	Overburden Groundwater	Bedrock Groundwater
Oxygen*	<0.5 mg/L	Tolerated, suppresses the reductive pathway at higher concentrations	3	0	0
Oxygen*	>5 mg/L	Not tolerated; however, VC may be oxidized aerobically	-3	0	0
Nitrate	<1 mg/L	At higher Concentrations may compete with reductive pathway	2	2	2
Iron II*	>1 mg/L	Reductive pathway possible; VC may be oxidized under Fe(III) - reducing conditions	3	3	3
Sulfate*	<20 mg/L	At higher concentrations may compete with reductive pathway	2	0	0
Sulfide*	>1 mg/L	Reductive pathway possible	3	0	0
Methane*	<0.5 mg/L >0.5 mg/L	VC oxidizes Ultimate reductive daughter product, VC Accumulates	0 3	0	0
Oxidation Reduction Potential* (ORP) against Ag/AgCI electrode	<50 millivolts (mV) <-100mV	Reductive pathway possible Reductive pathway likely	1 2	1	1
pH*	5 < pH < 9 5 > pH > 9	Optimal range for reductive pathway Outside optimal range for reductive pathway	0 -2	0	0
TOC	> 20 mg/L	Carbon and energy source; drives dechlorination; can be natural or anthropogenic	2	0	0
Temperature*	>20°C	At T>20°C biochemical process is accelerated	1	0	0
Chloride*	>2x background	Daughter product of organic chlorine	2	0	2
Tetrachloroethene		Material released	0	0	0
Trichloroethene*		Material released Daughter product of PCE	0 2[a/]	0	0
DCE*		Material released Daughter product of TCE If cis is > 80% of total DCE it is likely a daughter product 1, 1-DCE can be chemical reaction product of TCA	0 2[a/]	2	2
VC*		Material released Daughter product of DCE	0 2[a/]	2	2
DCA		Daughter product of TCA under reducing conditions	2	2	2
Ethene/Ethane	>0.01 mg/L >0.1 mg/L	Daughter product of VC/ethene	2 3	0	0
Total Score				**12**	**14**

[a/] Points awarded only if it can be shown that the compound is a daughter product (i.e.., not a constituent of the source NAPL)

Evaluating Scores: 0 to 5: Inadequate evidence for anaerobic biodegradation of chlorinated organics
6 to 14: Limited evidence for anaerobic biodegradation of chlorinated organics
15 to 20: Adequate evidence for anaerobic biodegradation of chlorinated organics
>20: Strong evidence for anaerobic biodegradation of chlorinated organics

APPENDIX A

DISCHARGE PERMIT

City of Niagara Falls, New York

P.O. Box 69. Niagara Falls. NY 14302-0069

August 11, 1999

Ms. Kristen E. Hanson, M.Sc.
Senior Hydrogeologist
Duke Engineering & Services (Canada), Inc.
3075 14th Avenue, Suite 207
Markham Ontario L3R0G9

Dear Ms. Hanson:

The City has completed the review of your request dated July 29, 1999 which requests permission to discharge wastewater from the Carborundum remedial site, generated incidental to periodic sample collection. It is estimated that 500 gallons of contaminated groundwater would be generated during each sampling event. Based on previous pollutant analysis collected during the excavation phase the pollutant load would be well below City Sewer Use Ordinance limits (list attached).

Based on this information the City hereby grants approval of this discharge subject to the following conditions.

a) The discharge shall be limited to a daily maximum of 1,000 gallons and a total of 6,000 gallons per year.
b) The pollutant analysis results from each sample collection event will be submitted to the City as soon as available.
c) This discharge is subject to all conditions and limitations contained in the City of Niagara Falls Sewer Use Ordinance Chapter 250.
d) The cost of disposal will be a flat rate of $1000.00 per year. The amount will be made payable to "The City Controller" and submitted by January 15 of each year.

Sincerely,
DEPARTMENT OF WASTEWATER FACILITIES

Albert C. Zaepfel
Industrial Monitoring Coordinator

Att
ACZ:vr
Cc: W. Bolents
K. Martineau
Semi-Ann. Report NYSDEC/USEPA
File – Duke Eng. (ICU)

F:\ADMIN\WINWORD\ZAEPFEL\MEMOS99\HANSON DUKE ENG AUG 10.99

8/29/96

LOCAL ORDINANCE LIMITS

PARAMETER	LBS/DAY
Volatile Organics	
Benzene	0.062
Carbon Tetrachloride	0.046
Chlorodibromomethane	0.015
Monochlorobenzene	0.200
Dichlorobromomethane	0.011
Chloroform	0.055
1,1-Dichloroethylene	0.065
1,2-Dichloroethylene	0.065
Bromoform	0.020
Ethyl Benzene	0.047
1,1,2,2-Tetrachloroethane	0.027
Tetrachloroethylene	0.114
Toluene	0.344
1,1-Trichloroethane	0.020
1,2-Trichloroethane	0.020
Trichloroethylene	0.088
Methylene Chloride	0.150
Vinyl Chloride	0.030
Acid Extractable Organics	
Monochlorophenol	0.063
Dichlorophenol	0.038
Monochlorocresol (Chloro-Methyl-Phenol)	0.036
Trichlorophenol	0.102
Pentachlorophenol	0.038
Base/Neutral Extractable Organics	
Dimethyl Phthalate	0.052
Butyl Benzyl Phthalate	0.102
Di-N-Butyl Phthalate	0.052
Diethyl Phthalate	0.204
Di-N-Octyl Phthalate	0.052
Monochlorotoluene	1.400
Nitrosodiphenylamine	0.025
Dichlorobenzene	0.016
Dichlorotoluene	0.016
Acenaphthene	0.024

LOCAL ORDINANCE LIMITS

PARAMETER	LBS/DAY
Base/Neutral Extractable Organics	
Fluoranthene	0.009
Chrysene	0.009
Naphthalene	0.022
Benzo(a)Anthracene	0.009
Pyrene	0.009
Phenathrene	0.017
Trichlorobenzene	0.076
Trichlorotoluene	0.076
Hexachlorobutadiene	0.009
Tetrachlorobenzene	0.076
Hexachlorocyclopentadiene	0.088
Hexachlorobenzene	0.009
Monochlorobenzotrifluoride	0.200
Dichlorobenzotrifluoride	0.200
PCB's and Pesticides	
Hexachlorocyclohexane	0.014
PCB (as Arochlor 1248)	0.006
Endosulfan I + Endosulfan II + Endosulfan Sulfate	0.002
Mirex	0.006
Dechlorane Plus	0.006
Heptachlor + Heptachlor Epoxide	0.002
Metals (Total)	
Cadmium	0.008
Chromium	0.040
Copper	0.965
Lead	0.320
Mercury	0.008
Nickel	0.400
Zinc	1.380

LOCAL ORDINANCE LIMITS

PARAMETER	LBS/DAY
Other	
Total Phenols	0.474
Soluble Organic Carbon	48.8
Total Suspended Solids	200.0
Phosphorus	2.0
Cyanide	0.155
Flow	0.025 (MGD)

/91.96

APPENDIX B

DATA USABILITY SUMMARY REPORT - FALL 2005

Data Usability Summary Report

Site Name:	BP Amoco Former Carborundum-Niagara Falls, NY	**Matrix:**	Water
Laboratory:	Severn Trent Services (STL) and 10 Hazelwood Drive Suite 106 Amherst, NY 14228		Severn Trent Services (STL) 3355 McLemore Drive Pensacola, FL 32514
Reviewer:	INTERA Inc.	**Completion Date:**	January 6, 2006

STL Job #s: A05-C437 A05-C498 A05-C499 A05-C502 A05-C503 A05-C518 A05-C566 A05-C567 A05-C568 A05-C569 1105SA 400-6636-1 400-6731-1

Part I. Data Review

Forty groundwater samples and five trip blanks were collected for the November 2005 BP Carborundum groundwater monitoring event (STL New York Job #s A05-C437, A05-C498, A05-C499, A05-C502, A05-C503, A05-C518, A05-C566, A05-C567, A05-C568, A05-C569, 1105SA, 400-6636-1, 400-6731-1). All sample numbers and corresponding analyses are summarized in Attachment 1. BP Carborundum samples were analyzed using the following established SW-846 methods:

- Target Compound List Volatile Organic Compounds by EPA Method 8260B (45 water samples)
- Dissolved Gases by Method RSK175 (20 water samples)
- Total Iron by EPA Method 6010B (20 water samples)
- Biological Oxygen Demand by EPA Method 405.1 (20 water samples)
- Chloride by EPA Method 325.2 (20 water samples)
- Total Organic Carbon by EPA Method 415.1 (20 water samples)
- Chemical Oxygen Demand by EPA Method 410.4 (20 water samples)
- Sulfide/Sulfate by EPA Method 376.2/375.4 (20 water samples)
- Nitrate/Nitrite by EPA Method 353.2 (20 water samples)

The data package was reviewed for the following items, as applicable: laboratory case narrative, chain-of-custody documentation, sample holding times, Contract Required Quantitation Limits, method/equipment/trip blank data, field duplicates, surrogate recovery data, laboratory control

samples, and matrix/matrix spike duplicates. Additionally, VOC data packages were reviewed for initial and continuing calibrations, GC/MS tunings, and internal standard areas. Each of these items were compared to review criteria presented in the Region 2 Data Validation Guidelines (SOP HW-2 and HW-24) (EPA 1992 and 1999), the NYSDEC Analytical Services Protocol (NYSDEC 2000), and/or the Groundwater Monitoring Work Plan for the BP Carborundum facility (DE&S 2000). A checklist of the review criteria was created for each method in the data package. By completing the checklist, the data reviewer identified whether or not the laboratory or sampler met, or failed to meet, the review criteria stipulated in the Region 2 data validation guidance, the analytical method, and/or the project work plan. A summary of the comments and qualifiers generated during the data review process is presented in Table 1.

Based on the results of the data review, some data were qualified. INTERA added qualifiers to the data sheets in accordance with the guidelines provided in the EPA Region 2 data validation guidance, unless otherwise noted. Qualifiers amended to the lab data packages were also added to the project data tables in Attachment 2. Laboratory qualifiers were not modified by the data reviewer.

Each of the review criteria has been summarized below. Each review parameter has been assessed to determine the overall quality of the laboratory or sampler's performance. An indication of the quality of the data has been provided by using one of the following three terms: acceptable, provisional, or unusable. These terms are defined below:

Acceptable = No results were qualified for any problem associated with this QC parameter.

Provisional = Some results were qualified because of problems associated with this QC parameter.

Unusable = Some results are unusable because of major problems associated with this QC parameter.

Laboratory Case Narrative and Sample Log-In:

- All Analyses: Acceptable. No problems were noted.

Data Package Completeness:

- All Analyses: Acceptable. All data packages were complete as defined under NYSDEC Analytical Services Protocol Category B deliverables.

Chain-of-Custody Documentation:

- All Analyses: Acceptable. No problems were noted.

Sample Storage:

- All Analyses: Acceptable. No problems were noted.

Sample Preservation:

- All Analyses: Acceptable. No problems were noted.

Sample Holding Times:

- VOC by 8260: Acceptable. No problems were noted.
- Dissolved Gases: Acceptable. No problems were noted.
- Other Natural Attenuation Parameters (Biological Oxygen Demand, Chloride, Total Organic Carbon, Chemical Oxygen Demand, Sulfate/Sulfide, Nitrate/Nitrite, and Total Iron): Acceptable. No problems were noted.

Contract Required Quantitation Limits:

Laboratory reporting limits were compared to the Contract Required Quantitation Limits (CRQLs) presented in Exhibit C – Section 1 for Organics and Section 2 for Inorganics of the NYSDEC Analytical Services Protocol (2000).

- VOC by 8260: Acceptable. No samples were qualified for CRQLs; however, some samples which were indicated on the COC to have low level contamination were run diluted and therefore have some reporting limits above the CRQLs. Refer to Table 1 for a list of related samples.
- Total Iron by 6010: Acceptable. No problems were noted with the CRQL.

Method Blank Data:

- VOC by 8260: Acceptable. No problems were noted.
- All Other Analyses: Acceptable. No problems were noted.

Equipment Blank Data:

- All Analyses: Acceptable. Equipment blanks were not required for this project since dedicated or disposable equipment was used for sampling activities.

Trip Blank Data:

- VOC by 8260: Acceptable. No problems were noted.

Field Duplicates:

Four field duplicate pairs were collected during groundwater sampling. MW-7A Dup (OU2-1005-G13) is a duplicate of MW-7A (OU2-1005-G12), MW-10B Dup (OU2-1005-G18) is a duplicate of MW-10B (OU2-1005-G17) , MW-17B Dup (OU2-1005-G32) is a duplicate of MW-17B (OU2-1004-G31), and MH-1 Dup (OU2-1005-E02) is a duplicate of MH-1 (OU2-1005-E01). Since Region 2 guidelines do not provide criteria for evaluating field duplicates, relative percent difference (RPD) control limits of 20% for water and 30% for soil were used for reviewing all project data.

- VOC by 8260: Provisional. RPD for duplicate pair MH-1 (OU2-1005-E01)/MH-1 Dup (OU2-1005-E02) was outside control limits for trichloroethene. Associated samples were qualified as estimates (J/UJ). Samples requiring qualification include OU2-1005-E01 through OU2-1005-E04 (MH-1, MH-1 Dup, MH-2 and MH-3).

- Dissolved Gases: Acceptable. No problems were noted.

- Other Natural Attenuation Parameters (Total Iron): Provisional. RPD for duplicate pair MW-7A (OU2-1005-G12)/MW-7A Dup (OU2-1005-G13) was outside control limits. Associated samples were qualified as estimates (J/UJ). Samples requiring qualification include OU2-1005-G12 through OU2-1005-G14 and OU2-1005-G16 through OU2-1005-G18 (MW-7A, MW-7A Dup, MW-7B, MW-10A, MW-10B and MW-10B Dup).

- Other Natural Attenuation Parameters (Chemical Oxygen Demand): RPD for duplicate pair MW-10B (OU2-1005-G17)/MW-10B Dup (OU2-1005-G18) was outside control limits. Associated samples were qualified as estimates (J/UJ). Samples requiring qualification include OU2-1005-G12 through OU2-1005-G14 and OU2-1005-G16 through OU2-1005-G18 (MW-7A, MW-7A Dup, MW-7B, MW-10A, MW-10B and MW-10B Dup).

- Other Natural Attenuation Parameters (Biological Oxygen Demand, Chloride, Total Organic Carbon, Sulfate/Sulfide, and Nitrate/Nitrite): Acceptable. No problems were noted.

Surrogate Recovery Data:

- VOC by 8260: Acceptable. No problems were noted.

Internal Standards:

- VOC by 8260: Acceptable. No problems were noted.

Laboratory Control Sample Results:

- All Analyses: Acceptable. No problems were noted.

Matrix Spike/Matrix Spike Duplicate Recovery Data:

- VOC by 8260: Acceptable. No problems were noted; however, only one MS/MSD was analyzed using a project sample. A frequency of one MS/MSD per twenty project samples is required.

- Other Natural Attenuation Parameters (Total Iron): Acceptable. No problems were noted; however, an MS/MSD was not analyzed using a project sample. A frequency of one MS/MSD per twenty project samples is required.

- Other Natural Attenuation Parameters (Biological Oxygen Demand, Chloride, Total Organic Carbon, Chemical Oxygen Demand, Sulfate/Sulfide, and Nitrate/Nitrite): Acceptable. No problems were noted.

Post Digestion Spike:

- Other Natural Attenuation Parameters (Total Iron): Acceptable. Post digestion spike recoveries for iron analyses were not reported in this data package; however, no project samples were qualified as a result of this oversight.

Initial Calibrations:

- VOC by 8260: Provisional. The percent relative standard deviation for one of the initial calibrations was outside control limits for chloromethane, bromomethane, chloroethane, methylene chloride and acetone. The percent relative standard deviation for the initial calibration of a second instrument was outside control limits for bromomethane, chloroethane, and 1,1,2-trichloroethane. Associated data were qualified as estimates (J/UJ). Refer to Table 1 for a list of samples associated with each initial calibration.

Continuing Calibration Verifications:

- VOC by 8260: Provisional. The continuing calibration percent differences were outside control limits in some continuing calibrations for chloroethane, carbon disulfide, vinyl acetate, bromomethane, chloromethane, 1,1,2-trichloroethane, bromoform and/or 1,1,2,2-tetrachloroethane. Associated data were qualified as estimates (J/UJ). Refer to Table 1 for a list of samples and analytes associated with each continuing calibration.

- Other Natural Attenuation Parameters (Total Iron): Acceptable. No problems were noted.

Part II. Data Usability

All data collected as part of the November 2005 sampling event at the BP Carborundum facility were generated using established and agreed upon analytical protocols. The majority of the November 2005 data did not require qualification and can be used to make project decisions. However, the iron and chemical oxygen demand samples qualified based on field duplicates and the VOC data qualified for initial, continuing calibrations and/or field duplicates should be considered estimates when making project decisions. The true value for these samples may be higher or lower than what is reported on the laboratory data sheets.

Part III. Suggestions for Next Sampling Event and Laboratory Analysis

No corrective actions were identified for either the field sampling team or the laboratory.

Part IV. References

Duke Engineering & Services (DE&S) 2000. Final Groundwater Monitoring Work Plan for the Former BP Carborundum Facility. September.

Environmental Protection Agency (EPA) 1992. USEPA Region 2 Quality Assurance Guidance [Online]. Standard Operating Procedure HW-2. Available: http://www.epa.gov/region2/desa/hsw/sops.htm.

EPA 1999. USEPA Region 2 Quality Assurance Guidance [Online]. Standard Operating Procedure HW-24. Available: http://www.epa.gov/region2/desa/hsw/sops.htm.

New York State Department of Environmental Conservation (NYSDEC) 2000. Analytical Services Protocol. June.

TABLE

Table 1. Qualified Data for BP Carborundum Based on Data Review per EPA Region 2 Data Validation Guidelines

Severn Trent Job #	Analysis	Lab Sample Numbers	INTERA Sample Numbers	Analyte	Qualifier	Reason Data was Qualified by Region 2 Data Validation Criteria
A05-C437 A05-C498 A05-C499 A05-C502 A05-C503 A05-C518 A05-C566 A05-C567 A05-C568 A05-C569	VOC 8260	A5C43701 thru A5C43704	OU2-1005-E01 thru OU2-1005-E04	Not Applicable	Not Applicable	Reporting limits for samples indicated as low contamination were run diluted; therefore, reporting limits are above contract required quantitation limits (CRQLs).
		A5C43701 thru A5C43704	OU2-1005-E01 thru OU2-1005-E04	Trichloroethene	J for detects UJ for non-detects	RPD is oustide control limits for field duplicate pairs OU2-1005-E01/OU2-1005-E02.
		All samples	All samples	All analytes	Not Applicable	Only one project sample was analyzed for MS/MSD for 40 project samples.
		A5C43701 thru A5C43709, A5C43711 thru A5C43714, A5C43707DL thru A5C43709DL, A5C43710, A5C43711DL thru A5C43713DL	OU2-1005-E01, OU2-1005-E02, OU2-1005-E03, OU2-1005-E04, OU2-1005-G03, OU2-1005-G04, OU2-1005-G11, OU2-1005-G12, OU2-1005-G13, OU2-1005-G16, OU2-1005-G17, OU2-1005-G18, TRIP BLANK-1, OU2-1005-G11DL, OU2-1005-G12DL, OU2-1005-D13DL, OU2-1005-G14, OU2-1005-16DL, OU2-1005-G17DL, OU2-1005-G18DL	Chloromethane Bromomethane Chloroethane Methylene chloride Acetone	J for detects UJ for non-detects	Initial calibration % RSD for several analytes was greater than 15%. Associated samples were qualified as estimates.

Table 1. Qualified Data for BP Carborundum Based on Data Review per EPA Region 2 Data Validation Guidelines

Severn Trent Job #	Analysis	Lab Sample Numbers	INTERA Sample Numbers	Analyte	Qualifier	Reason Data was Qualified by Region 2 Data Validation Criteria
A05-C437 A05-C498 A05-C499 A05-C502 A05-C503 A05-C518 A05-C566 A05-C567 A05-C568 A05-C569	VOC 8260	A5C49801, A5C49802, A5C49901 thru A5C49903, A5C49803, A5C49804, A5C49904 thru A5C49910, A5C49805, A5C49806, A5C56601, A5C56609, A5C56610, A5C56602, A5C49801DL, A5C56603, A5C56604, A5C49902DL, A5C49803DL, A5C49904DL thru A5C49907DL, A5C56605 thru A5C56608, A5C56701 thru A5C56703, A5C49901DL, A5C56704, A5C56705, A5C49908DL, A5C49910DL, A5C56701DL, A5C56703DL, A5C56704DL, A5C56705DL	OU2-1005-G07, OU2-1005-G08, OU2-1005-G21 thru OU2-1005-G27, OU2-1005-G30 thru OU2-1005-G34, TRIP BLANK-2, TRIP BLANK-3, OU2-1005-G01, OU2-1005-G02, OU2-1005-G05, OU2-1005-G06, OU2-1005-G07DL, OU2-1005-G15, OU2-1005-G19, OU2-1005-G22DL, OU2-1005-G24DL, OU2-1005-G26DL, OU2-1005-G27DL, OU2-1005-G30DL, OU2-1005-G31DL, OU2-1005-G35, OU2-1005-G36, TRIP BLANK-4, TRIP BLANK-5, OU2-1005-G09, OU2-1005-G10, OU2-1005-G20, OU2-1005-G21DL, OU2-1005-G28, OU2-1005-G29, OU2-1005-G32DL, OU2-1005-G34DL, OU2-1005-G09DL, OU2-1005-G20DL, OU2-1005-G28DL, OU2-1005-G29DL	Bromomethane Chloroethane 1,1,2-Trichloroethane	J for detects UJ for non-detects	Initial calibration % RSD for several analytes was greater than 15%. Associated samples were qualified as estimates.
		A5C43701 thru A5C43709, A5C43711 thru A5C43714	OU2-1005-E01, OU2-1005-E02, OU2-1005-E03, OU2-1005-E04, OU2-1005-G03, OU2-1005-G04, OU2-1005-G11, OU2-1005-G12, OU2-1005-G13, OU2-1005-G16, OU2-1005-G17, OU2-1005-G18, TRIP BLANK-1	Chloroethane	J for detects UJ for non-detects	Percent difference for continuing calibration verification was greater than 20%. Associated samples qualified as estimates.
		A5C43707DL thru A5C43709DL, A5C43710, A5C43711DL thru A5C43713D	OU2-1005-G11DL, OU2-1005-G12DL, OU2-1005-G13DL, OU2-1005-G14, OU2-1005-G16DL, OU2-1005-G17DL, OU2-1005-G18DL	Carbon disulfide Vinyl acetate		
		A5C49801, A5C49802, A5C49901 thru A5C49903, A5C49803, A5C49804, A5C49904 thru A5C49910, A5C49805, A5C49806	OU2-1005-G07, OU2-1005-G08, OU2-1005-G21 thru OU2-1005-G27, OU2-1005-G30 thru OU2-1005-G34, TRIP BLANK-2, TRIP BLANK-3	Chloroethane		

Table 1. Qualified Data for BP Carborundum Based on Data Review per EPA Region 2 Data Validation Guidelines

Severn Trent Job #	Analysis	Lab Sample Numbers	INTERA Sample Numbers	Analyte	Qualifier	Reason Data was Qualified by Region 2 Data Validation Criteria
A05-C437 A05-C498 A05-C499 A05-C502 A05-C503 A05-C518 A05-C566 A05-C567 A05-C568 A05-C569	VOC 8260	A5C56601, A5C56609, A5C56610, A5C56602, A5C49801DL, A5C56603, A5C56604, A5C49902DL, A5C49803DL, A5C49904DL thru A5C49907DL, A5C56605 thru A5C56608	OU2-1005-G01, OU2-1005-G02, OU2-1005-G05, OU2-1005-G06, OU2-1005-G07DL, OU2-1005-G15, OU2-1005-G19, OU2-1005-G22DL, OU2-1005-G24DL, OU2-1005-G26DL, OU2-1005-G27DL, OU2-1005-G30DL, OU2-1005-G31DL, OU2-1005-G35, OU2-1005-G36, TRIP BLANK-4, TRIP BLANK-5	Bromomethane	J for detects UJ for non-detects	Percent difference for continuing calibration verification was greater than 20%. Associated samples qualified as estimates.
		A5C56701 thru A5C56703, A5C49901DL, A5C56704, A5C56705, A5C49908DL, A5C49910DL	OU2-1005-G09, OU2-1005-G10, OU2-1005-G20, OU2-1005-G21DL, OU2-1005-G28, OU2-1005-G29, OU2-1005-G32DL, OU2-1005-G34DL	Chloromethane Bromomethane		
		A5C56701DL, A5C56703DL thru AA5C56705DL	OU2-1005-G09DL, OU2-1005-G20DL, OU2-1005-G28DL, OU2-1005-G29DL	1,1,2-Trichloroethane Bromoform 1,1,2,2-Tetrachloroethane		
1105SA	Other Natural Attenuation Parameters (Iron)[1]	AD564230, AD564231, AD564232, AD564233, AD564234, AD564235	OU2-1005-G12 thru OU2-1005-G14, OU2-1005-G16 thru OU2-1005-G18	Iron	J for detects UJ for non-detect	RPD is oustide control limits for field duplicate pairs OU2-1005-G12/OU2-1005-G13.
		AD564198, AD564200, AD564201, AD564199, AD564189, AD564190, AD564230, AD564231, AD564232, AD564233, AD564234, AD564235, AD564191, AD564275, AD5464298, AD564299, AD564276, AD564277, AD564278, AD564279	OU2-1005-G01, OU2-1005-G02, OU2-1005-G05 thru OU2-1005-G08, OU2-1005-G12 thru OU2-1005-G14, OU2-1005-G16 thru OU2-1005-G18, OU2-1005-G25 , OU2-1005-G26, OU2-1005-G28 thru OU2-1005-G31, OU2-1005-G33, OU2-1005-G34		Not Applicable	Post digestion spike analytical results not provided.
					Not Applicable	No project sample analyzed for MS/MSD.
	Other Natural Attenuation Parameters (COD)1	AD564230, AD564231, AD564232, AD564233, AD564234, AD564235	OU2-1005-G12 thru OU2-1005-G14, OU2-1005-G16 thru OU2-1005-G18	Chemical Oxygen Demand	J for detects UJ for non-detect	RPD is oustide control limits for field duplicate pairs OU2-1005-G17/OU2-1005-G18.

Table 1. Qualified Data for BP Carborundum Based on Data Review per EPA Region 2 Data Validation Guidelines

Severn Trent Job #	Analysis	Lab Sample Numbers	INTERA Sample Numbers	Analyte	Qualifier	Reason Data was Qualified by Region 2 Data Validation Criteria
1105SA	Other Natural Attenuation Parameters[1]	A5C56601, A5C56609, A5C56610, A5C56602, A5C49801, A5C49802, A5C43708, A5C43709, A5C43710, A5C43711, A5C43712, A5C43713, A5C49804, A5C49904, AA5C56704, A5C56705, A5C49906, A5C49907, A5C49909, A5C49910	OU2-1005-G01, OU2-1005-G02, OU2-1005-G05 thru OU2-1005-G08, OU2-1005-G12 thru OU2-1005-G14, OU2-1005-G16 thru OU2-1005-G18, OU2-1005-G25 , OU2-1005-G26, OU2-1005-G28 thru OU2-1005-G31, OU2-1005-G33, OU2-1005-G34	Other Natural Attenuation Parameters[1]	Not Applicable	No problems noted during review.
400-6636-1 400-6731-1	Dissolved Gases	400-6636-1 thru 400-6636-14, 400-6731-1 thru 400-6731-6	OU2-1005-G01, OU2-1005-G02, OU2-1005-G05 thru OU2-1005-G08, OU2-1005-G12 thru OU2-1005-G14, OU2-1005-G16 thru OU2-1005-G18, OU2-1005-G25 , OU2-1005-G26, OU2-1005-G28 thru OU2-1005-G31, OU2-1005-G33, OU2-1005-G34	Methane Ethane Ethene Propane Propene	Not Applicable	No problems noted during review.

[1]Other Natural Attenuation Parameters: Biological Oxygen Demand, Chloride, Total Organic Carbon, Chemical Oxygen Demand, Sulfate/Sulfide, Nitrite/Nitrate.

RSD: Relative Standard Deviation

VOC: Volatile Organic Compounds

ATTACHMENT 1
SAMPLE IDENTIFICATION

GROUNDWATER SAMPLING PROGRAM AT FORMER CARBORUNDUM FACILITY, NIAGARA FALLS, NY
October-05

Sample ID	Sample Well/Sewer	Date Sampled	Analyses
OU2-1005-G01	MW1A	Nov 3/05 8:20	VOCs; methane, ethene, propane, propene; TOC; BOD; COD; total Fe; chloride; nitrate/nitrite; sulfate; sulfide
OU2-1005-G02	MW1B	Nov 3/05 8:10	VOCs; methane, ethene, propane, propene; TOC; BOD; COD; total Fe; chloride; nitrate/nitrite; sulfate; sulfide
OU2-1005-G03	MW2A	Nov 1/05 16:00	VOCs
OU2-1005-G04	MW2B	Nov 1/05 16:15	VOCs
OU2-1005-G05	MW3A	Nov 3 12:45	VOCs; methane, ethene, propane, propene; TOC; BOD; COD; total Fe; chloride; nitrate/nitrite; sulfate; sulfide
OU2-1005-G06	MW3B	Nov 3 12:30	VOCs; methane, ethene, propane, propene; TOC; BOD; COD; total Fe; chloride; nitrate/nitrite; sulfate; sulfide
OU2-1005-G07	MW4A	Nov 2 14:20	VOCs; methane, ethene, propane, propene; TOC; BOD; COD; total Fe; chloride; nitrate/nitrite; sulfate; sulfide
OU2-1005-G08	MW4B	Nov 2 14:00	VOCs; methane, ethene, propane, propene; TOC; BOD; COD; total Fe; chloride; nitrate/nitrite; sulfate; sulfide
OU2-1005-G09	MW5A	Nov 3 11:10	VOCs
OU2-1005-G10	MW5B	Nov 3 10:55	VOCs
OU2-1005-G11	MW6	Nov 1, 17:00	VOCs
OU2-1005-G12	MW7A	Nov 1, 14:35	VOCs; methane, ethene, propane, propene; TOC; BOD; COD; total Fe; chloride; nitrate/nitrite; sulfate; sulfide
OU2-1005-G13	MW7A Dup	Nov 1, 14:55	VOCs; methane, ethene, propane, propene; TOC; BOD; COD; total Fe; chloride; nitrate/nitrite; sulfate; sulfide
OU2-1005-G14	MW7B	Nov 1, 14:15	VOCs; methane, ethene, propane, propene; TOC; BOD; COD; total Fe; chloride; nitrate/nitrite; sulfate; sulfide
OU2-1005-G15	MW8	Nov 3 13:30	VOCs
OU2-1005-G16	MW10A	Nov 1, 11:10	VOCs; methane, ethene, propane, propene; TOC; BOD; COD; total Fe; chloride; nitrate/nitrite; sulfate; sulfide
OU2-1005-G17	MW10B	Nov 1, 11:40	VOCs; methane, ethene, propane, propene; TOC; BOD; COD; total Fe; chloride; nitrate/nitrite; sulfate; sulfide
OU2-1005-G18	MW10B Dup	Nov 1, 11:50	VOCs; methane, ethene, propane, propene; TOC; BOD; COD; total Fe; chloride; nitrate/nitrite; sulfate; sulfide
OU2-1005-G19	MW11A	Nov 3 10:05	VOCs
OU2-1005-G20	MW11B	Nov 3 9:50	VOCs
OU2-1005-G21	MW12A	Nov 2 8:55	VOCs
OU2-1005-G22	MW12B	Nov 2 8:45	VOCs
OU2-1005-G23	MW13A	Nov 2 12:30	VOCs
OU2-1005-G24	MW13B	Nov 2 12:45	VOCs
OU2-1005-G25	MW14A	Nov 2 11:10	VOCs; methane, ethene, propane, propene; TOC; BOD; COD; total Fe; chloride; nitrate/nitrite; sulfate; sulfide
OU2-1005-G26	MW14B	Nov 2 11:00	VOCs; methane, ethene, propane, propene; TOC; BOD; COD; total Fe; chloride; nitrate/nitrite; sulfate; sulfide
OU2-1005-G27	MW15	Nov 2 10:00	VOCs
OU2-1005-G28	MW16A	Nov 4 8:20	VOCs; methane, ethene, propane, propene; TOC; BOD; COD; total Fe; chloride; nitrate/nitrite; sulfate; sulfide
OU2-1005-G29	MW16B	Nov 3 15:10	VOCs; methane, ethene, propane, propene; TOC; BOD; COD; total Fe; chloride; nitrate/nitrite; sulfate; sulfide
OU2-1005-G30	MW17A	Nov 2 15:45	VOCs; methane, ethene, propane, propene; TOC; BOD; COD; total Fe; chloride; nitrate/nitrite; sulfate; sulfide
OU2-1005-G31	MW17B	Nov 2 15:30	VOCs; methane, ethene, propane, propene; TOC; BOD; COD; total Fe; chloride; nitrate/nitrite; sulfate; sulfide
OU2-1005-G32	MW17B Dup	Nov 2 15:40	VOCs
OU2-1005-G33	MW18A	Nov 2 16:10	VOCs; methane, ethene, propane, propene; TOC; BOD; COD; total Fe; chloride; nitrate/nitrite; sulfate; sulfide
OU2-1005-G34	MW18B	Nov 2 16:50	VOCs; methane, ethene, propane, propene; TOC; BOD; COD; total Fe; chloride; nitrate/nitrite; sulfate; sulfide
OU2-1005-G35	MW19A	Nov 3 14:15	VOCs
OU2-1005-G36	MW19B	Nov 3 14:30	VOCs
OU2-1005-E01	MH1	Oct 31 15:55	VOCs
OU2-1005-E02	MH1 Dup	Oct 31 16:05	VOCs
OU2-1005-E04	MH2	Oct 31 16:15	VOCs
OU2-1005-E03	MH3	Oct 31 16:25	VOCs
TRIPBLANK-1		Nov 1 —	VOCs
TRIPBLANK-2		Nov 2 17:30	VOCs
TRIPBLANK-3		Nov 2 17:30	VOCs
TRIPBLANK-4		Nov 3 17:00	VOCs
TRIPBLANK-5		Nov 3 17:00	VOCs
~~TRIPBLANK-6~~			VOCs
~~TRIPBLANK-7~~			VOCs

ATTACHMENT 2
DATA TABLES WITH QUALIFIERS

Table 3-5: Laboratory Analytical Results for Vinyl Chloride (ug/L)

Monitoring Well	Sample Date													
				Round 1		Round 2		Round 3		Round 4		Round 5		Fall 2005
	Aug-92	May-96	Nov-97	Oct-99	Oct-00	May-01	Nov-01	May-02	Oct-02	May-03	Nov-03	May-04	Oct-04	Nov-05
MW-1A	2J	--	<2	<10	0.44 J	1.4J	0.75J	1.1J	0.74J	0.73J	1.0J	0.74 J	3.0	1.7 J
MW-1B	<10	--	<2	2J	3.8	2	3	1.4J	19	1.3J	2.6	1.50 J	5.1	5.1
MW-2A	<10	--	<2	<10	<2	<2	<2	<2	5.5	<2	<2	<2	<2	0.52 J
MW-2B	66	--	59	46	92	15	60D	70D	100	60D	86	60	81	90
MW-3A	<10	--	<2	<10	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
MW-3B	5	--	<2	2J	2.3	1.8J	2.6*	2.45	2.1	1.7J	2	1.90 J	2.6	2.6
MW-4A	13	--	32	47	45	24	40D	31	54	31*	46	34	48	57
MW-4B	26	--	22	23	35	37	27	35	25*	18	23.5 *	20	19	17
MW-5A	1300	--	14	1J	42	17DJ*	45D	15	7	120D	4.1	67 D	260 D	110 D
MW-5B	75	--	33	61	45	13J	37D	38	54	44D	55	45.5*	59	58
MW-6	--	<100	68	68	91	72	55D	97D	72	84D	96	81	100	130 D
MW-7A	--	<1000	11	86	220	100	140D	170J	130J	120DJ	180	170 J	125*	205 D*
MW-7B	--	<100	23	40	39	23	33D	44D	44	6.2D	42	50	36	46
MW-8	--	<10	<2	2J	1.9 J	2.75*	2.5	2.6	2.0	1.9J	2.5	1.8 J	2.3	1.9 J
MW-10A	--	38	65	73	86	80DJ	95D*	160	240	115*	100	110	120	150 D
MW-10B	--	120	52	210J	95	410J	100D	45	84	54*	82	63	80	115 D*
MW-11A	--	<10	<2	<10	<2	0.39J	<2*	0.34J*	<2	<2	<2 *	0.82 J	0.59 J	0.95 J
MW-11B	--	<50	56	69	81	88J	85D	80	79D	80	110D	91	66	80
MW-12A	--	13	14	16	49	27J	51	34	49.5D*	26	41	33	38 D	34
MW-12B	--	16	53	73	77	86J	100D	100	100	39	110	100 D	96	85
MW-13A	--	<10	<2	<10	<2	<2J	<2	<2	<2	<2	<2	<2	<2	<2
MW-13B	--	<100	31	35	40	27D	37D	33	36D	90D	81D	43	62 D	60
MW-14A	--	<10	<2	<10	0.37 J	<2J	59D	0.46J	4.6	<2	2.2	2.7	3.8	4.6
MW-14B	--	<50	65	63	110	50DJ	1.5J	48D	120	68	87D	71.5*	99 D	98 D
MW-15	--	--	68	79	120	58DJ	93D	98	100D	110	100	65	130	120 D
MW-16A	--	--	--	--	--	NS	35DJ	48D	39	44	52	120	35	35	180 D
MW-16B	--	--	--	--	35	22	34D	6	89	54	52	49	60	75
MW-17A	--	--	--	--	18	14	19D	19J	16J	20	27	21*	34	28
MW-17B	--	--	--	--	69	41D*	76D	94	81	92	100	88	125*	115 D*
MW-18A	--	--	--	--	4.4	0.98J	8.3	2.3	3.1J*	1.6J	4.5 *	1.6 J	3.2 J	3.1
MW-18B	--	--	--	--	90	60	91D	88	100	140D	170	140	185 D*	180 D
MW-19A	--	--	--	--	<2	<2	<2	0.3J	0.66J	0.78J	1.0J	0.69 J	<2	1.6 J
MW-19B	--	--	--	--	6.3	2.2D	4.4	9.7	1.8J	5.9	7.9	7.2	<2	5.3
MH-1	--	--	--	--	<2	<2	<2	<2	<10*	<2	<2	<2	<2*	<20*
MH-2	--	--	--	--	<2	<2	<2 J	<2	<10	<2	<2*	<2	<20	<8
MH-3	--	--	--	--	<2	<2*	<2*	<2*	1.2J	<2*	<2	<2*	<20	<8

Units: ug/L

J indicates an estimated value

D indicates sample was diluted

NS indicates that MW-16B could not be sampled due to insufficient water volume in the well

NYSDEC (1991) (6NYCRR Part 703) Standard for Vinyl Chloride is 2ug/L

* indicates reported concentration is average value of sample and duplicate sample concentrations

Table 3-6: Laboratory Analytical Results for Cis- & Trans-1,2-Dichloroethene (ug/L)

Monitoring Well	Sample Date													
				Round 1		Round 2		Round 3		Round 4		Round 5		Fall 2005
	Aug-92	May-96	Nov-97	Oct-99	Oct-00	May-01	Nov-01	May-02	Oct-02	May-03	Nov-03	May-04	Oct-04	Nov-05
MW-1A	14	--	<5	<5	2.4 J	0.78J	0.96J	0.75J	0.61J	0.45J	0.59J	0.80 J	2.0 J	1.4 J
MW-1B	10	--	<5	6	4.7 J	1.1J	11	1.3	16	1.3J	2.2J	1.50 J	5.4	5.5
MW-2A	<10	--	<5	<5	1.2 J	0.46J	1.7J	0.28J	14	0.63J	0.38J	<5	<5	<5
MW-2B	2300	--	450	325	260	64	140D	110	150	87D	120J	86	85	90
MW-3A	<10	--	<5	1J	1.5 J	1.7J	1.4J	3J	1.1J	1.3J	0.78J	1.6 J	<5	0.90 J
MW-3B	18	--	5	4J	4.8 J	3.5J	1.96J*	3.55J*	3.4J	2.6J	2.7J	3.3 J	2.1 J	2.7 J
MW-4A	230	--	49	30	74	140	110D	390D	160	170D*	250J	370	240	250 D
MW-4B	130	--	45	33	39	30	29	33	18*	20	22J *	25	14	17
MW-5A	1900	--	110	14	320	116DJ*	220D	110	32	300D	16J	210 D	580 D	300 D
MW-5B	520	--	270	530	420	140J	170D	150	140	110D	110J	120*	110	87
MW-6	--	1000	595	480	560	360	300D	350D	250	220D	220J	230	220 D	210 D
MW-7A	--	1200	5206	2900	4800	2200	3400D	2600	2100	1800D	2000DJ	2200	1650 D*	1950 D*
MW-7B	--	370	110	89	84	40	46D	34	35	23	24J	26	21	18
MW-8	--	<10	6	5	5.55	4.4J*	4.4J	3.8J	3.2J	3.0J	3.4J	2.8 J	2.8 J	3.2 J
MW-10A	--	690	1212	1200	1200	790DJ	865D*	950*	990	655*	640J	760	620	660 D
MW-10B	--	1900	921	2100	1800	3200J	1100D	400	520	260*	320J	300	260	320 D*
MW-11A	--	<10	<5	<5	1.3 J	<5J	2.67J*	<5*	0.34J	<5	<5J *	<5	<5	<5
MW-11B	--	390	705	385	590	460J	320D	340D	190D	230	250DJ	280	150	140 D
MW-12A	--	430	120	130	540	270J	340	510D	260D*	170	200DJ	210 D	230 D	200 D
MW-12B	--	250	250	380	210	200J	170D	220	160	92	130J	160 D	120	150 D
MW-13A	--	<10	<5	<5	<5	<5J	0.26J	<5	<5	<5	<5J	<5	<5	<5
MW-13B	--	810	410	330	310	210DJ	220D	190	160D	120D	140DJ	130	140 D	110 D
MW-14A	--	<10	<5	<5	1.6 J	0.69J	250D	2J	12	0.82J	4.0J	2.1 J	2.3 J	2.3 J
MW-14B	--	310	765	330	300	280DJ	8.2	130D	200	170	150DJ	170*	130 D	130
MW-15	--	--	640	460	400	410DJ	390D	440D	340D	440	330DJ	310 D	400 D	340 D
MW-16A	--	--	--	--	NS	77D	81D	47D	42	26	33J	26	20	21
MW-16B	--	--	--	--	130	140	92D	55	290D	290	210DJ	290 D	250	320 D
MW-17A	--	--	--	--	230	260	260D	320	300	280	380DJ	350*	380 D	320 D
MW-17B	--	--	--	--	1000	505D*	740D	840	710	720	820	860	955*	985 D*
MW-18A	--	--	--	--	47	30	33	34	33*	26	29.5J *	33	40	37
MW-18B	--	--	--	--	690	420	550D	370	290	270D	240J	240	190 D*	170
MW-19A	--	--	--	--	33	4.1J	10	4.3J	5.8	3.2J	4.3J	4.0 J	4.0 J	5.2
MW-19B	--	--	--	--	41	25D	14	66D	8.6	33	24 J	52	1.8 J	21
MH-1	--	--	--	--	4.7 J	6.6	4.4J	<5	4.7J*	5.6	5.8J	2.5 J	3.2 J*	11.1 J*
MH-2	--	--	--	--	<5	5.9	7.8 J	<5	4.4J	5.1	5.15J*	2.8 J	<50	8.8 J
MH-3	--	--	--	--	2 J	9.4*	5.8*	<5*	7.8J	7.5*	6.9J	4.0* J	<50	18 J

Units: ug/L

J indicates an estimated value

D indicates sample was diluted

NS indicates that MW-16B could not be sampled due to insufficient water volume in the well

NYSDEC (1991) (TOGS 1.1.1) Standard for DCE is 5ug/L

* indicates reported concentration is average value of sample and duplicate sample concentrations

Table 3-7: Laboratory Analytical Results for Trichloroethene (ug/L)

Monitoring Well	Sample Date													
				Round 1		Round 2		Round 3		Round 4		Round 5		Fall 2005
	Aug-92	May-96	Nov-97	Oct-99	Oct-00	May-01	Nov-01	May-02	Oct-02	May-03	Nov-03	May-04	Oct-04	Nov-05
MW-1A	<10	--	<5	<5	<5	<5	<5	<5	<5	<5	<5J	<5	<5	<5
MW-1B	<10	--	<5	<5	<5	<5	<5	<5	<5	<5	<5J	<5	<5	<5
MW-2A	<10	--	<5	<5	<5	<5	3.4J	0.61J	4.0J	<5	<5J	<5	<5	<5
MW-2B	670	--	6	5.5	0.44 J	1.1BJ	0.82DJ	<10	<25	<5	<20J	<20	<20	<5
MW-3A	4	--	<5	<5	0.43 J	0.84BJ	0.82J	3.6J	0.58J	1.5J	0.75J	1.3 J	0.46 J	<5
MW-3B	<10	--	<5	<5	<5	<5	2.7J*	<5*	<5	<5	<5J	<5	<5	<5
MW-4A	3	--	<5	4J	2.8 J	3.4BJ	4DJ	8.1J	6.3J	9.55*	11J	23 J	30 J	37
MW-4B	5	--	<5	0.9J	3.2 J	0.99BJ	3.8J	1.4J	0.585J*	<5	0.73J *	0.35 J	0.41 J	0.63 J
MW-5A	<200	--	<5	0.8J	1.3 J	<5*	<5D	<25	0.69J	0.48J	0.65J	0.7 J	0.88 J	0.89 J
MW-5B	71	--	5	8	2.6 J	2.4BJ	2.6DJ	1.3J	1.6J	0.99J	<25J	1.0* J	<25	1.5 J
MW-6	--	<100	<5	<5	<5	<5	<5D	0.23J	<50	<5	<50J	<50	<25	<5
MW-7A	--	8700	1400	170 J	1200	1800	2000D	1400	1100	610D	600J	730	530*	475 D*
MW-7B	--	<100	<5	<5	<5	0.5J	<5D	<5	<10	<5	<10J	<10	<5	<5
MW-8	--	<10	<5	<5	<5	<5*	<5	<5	<5	<5	<5J	<5	<5	<5
MW-10A	--	<250	<5	<5	<5	<5	<5*	<185*	<120	<120*	<120J	<120	<120	0.63 J
MW-10B	--	90	28	120	68	<6.4	63D	13J	13J	4.5J*	3.3J	3.0 J	<50	1.25 J*
MW-11A	--	<10	<5	<5	<5	<5	<5*	<5*	0.23J	<5	<5J *	<5	<5	<5
MW-11B	--	<50	<5	<5	<5	<5	<5	<25	<5	<50	<5	<50	<25	<5
MW-12A	--	<50	<5	<5	2.6 J	<5	<5	1.3J	0.31J*	<40	<25J	0.39 J	0.40 J	0.54 J
MW-12B	--	18	<5	<5	<5	<5	<5	<50	<25	<20	<20J	<5	<20	<5
MW-13A	--	<10	<5	<5	<5	<5	<5	<5	<5	<5	<5J	<5	<5	<5
MW-13B	--	48	36	22	12	7.9D	12D	7.6J	9.1	2.8J	5J	3.1 J	1.2 J	1.4 J
MW-14A	--	<10	<5	<5	<5	<5	<5D	<5	<5	<5	<5J	<5	<5	<5
MW-14B	--	<50	<5	<5	<5	<5	<5	<5	<50	<25	<5J	<5*	<5	<5
MW-15	--	--	<10	<5	<5	<5	<5D	<25	<5	<100	<25J	<25	<50	<5
MW-16A	--	--	--	--	NS	4.2DJ	1.9DJ	1.2J	0.77J	<10	<20J	0.70 J	<10	0.56 J
MW-16B	--	--	--	--	0.97 J	<5	<5D	<10	<25	<50	0.63J	0.65 J	<50	<5
MW-17A	--	--	--	--	115	58	73D	54	62	42J	49J	38* J	57	48
MW-17B	--	--	--	--	22	4.2DJ*	18D	23J	20J	19J	12J	12 J	12 J**	11*
MW-18A	--	--	--	--	36	30	37	40	53*	22D	47.5DJ *	43	67	52
MW-18B	--	--	--	--	7.7	<5	<5D	<100	<50	<5	<50J	<50	<17.5*	<5
MW-19A	--	--	--	--	1.7 J	1.3J	2.2J	1.1J	0.99J	0.61J	0.52J	0.40 J	0.26 J	<5
MW-19B	--	--	--	--	2.4 J	1.0DJ	0.28J	0.35J	<5	<5	<5J	<10	<5	<5
MH-1	--	--	--	--	<5	3.6BJ	0.59J	<5	<25*	5.0	4.5J	3.5 J	1.5 J*	5.3 J*
MH-2	--	--	--	--	<5	3.3BJ	0.82J	<5	<25	5.1	4.2J *	4.3 J	<50	3.1 J
MH-3	--	--	--	--	<5	5.8B*	0.74J*	<5*	1.4J	7.65*	5.7J	5.8*	2.6 J	8.1 J

Units: ug/L

J indicates an estimated value

B indicates the analyte was found in an associated blank.

D indicates sample was diluted

NS indicates that MW-16B could not be sampled due to insufficient water volume in the well

NYSDEC (1991) (TOGS 1.1.1) Standard for TCE is 5ug/L

* indicates reported concentration is average value of sample and duplicate sample concentrations

** indicates reported concentration of duplicate, sample is non-detect with an MDL of 200 ug/L

Table 3-8: Laboratory Analytical Results for Benzene (ug/L)

Monitoring Well	Sample Date													
				Round 1		Round 2		Round 3		Round 4		Round 5		Fall 2005
	Aug-92	May-96	Nov-97	Oct-99	Oct-00	May-01	Nov-01	May-02	Oct-02	May-03	Nov-03	May-04	Oct-04	Nov-05
MW-1A	<10	--	<0.7	<5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-1B	<10	--	<0.7	<5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-2A	<10	--	<0.7	<5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-2B	1J	--	<0.7	<5	0.32 J	<1	<1D	<2	<5	<1	<4	<4	<4	<1
MW-3A	<10	--	<5	<5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-3B	0.6	--	<5	<5	<1	<1	<1*	<1*	<1	<1	<1	<1	<1	<1
MW-4A	<10	--	<5	<5	<1	<1	<1D	<4	<5	<1*	<10	<10	<10	0.6 J
MW-4B	<10	--	<0.7	<5	0.23 J	0.24BJ	<1	<1	<1*	<1	<1 *	<1	<1	<1
MW-5A	<200	--	<0.7	<5	0.24 J	<1*	<1D	<5	<1	<1	<1	<1	0.47 J	<1
MW-5B	<10	--	<0.7	<5	<1	<1	<1D	<5	<5	<1	<5	<1*	<5	<1
MW-6	--	<100	<0.7	<5	0.39 J	<1.2	<1D	0.27 J	<10	<1	<10	<10	<5	<1
MW-7A	--	<1000	4	2J	2.9	<12	<16D	<100	<100	1	<50	<100	<45*	1.4*
MW-7B	--	<100	<0.7	<5	0.21 J	<1	<1D	<1	<2	<1	<2	<2	<1	<1
MW-8	--	<10	<0.7	<5	<1	<1*	<1	<1	<1	<1	<1	<1	<1	<1
MW-10A	--	<250	<0.7	0.6J	0.52 J	<3.2	<4D*	<37.5*	<25	<25*	<25	<25	<25	<1
MW-10B	--	<250	<0.7	1J	0.25 J	<6.4	<4D	<20	<20	<10*	<10	<10	<10	<1*
MW-11A	--	<10	<0.7	<5	<1	<1	<1*	<1*	<1	<1	<1 *	<1	<1	<1
MW-11B	--	<50	<0.7	<5	0.39 J	<1.6	<1D	<5	<1	<10	<1	<10	<5	<1
MW-12A	--	<50	<0.7	<5	0.44 J	<1	<1	<1	0.26J*	<8	<5	<1	<1	<1
MW-12B	--	<50	<0.7	<5	0.36 J	<1	<1D	<10	<5	<4	<4	0.32 J	<4	<1
MW-13A	--	<10	<0.7	<5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-13B	--	<100	<1	<5	<1	<1	<1D	<10	<1	<1	<1	<4	<1	<1
MW-14A	--	<10	<0.7	<5	<1	<1	<1D	<1	<1	<1	<1	<1	<1	<1
MW-14B	--	<50	<0.7	<5	0.22 J	<1	0.23J	<1	<10	<5	<1	<1*	<1	<1
MW-15	--	--	<1	<5	0.3 J	<1.6	<1.6D	<5	0.26J	<20	<5	<5	<10	<1
MW-16A	--	--	--	--	NS	<1	<1D	<1	<2	<2	<4	<1	<2	<1
MW-16B	--	--	--	--	<1	<1	<1D	<2	<5	<10	<2	0.69 J	<10	0.84 J
MW-17A	--	--	--	--	0.27 J	<1.6	<1D	<10	<10	<10	<10	<10*	<8	<1
MW-17B	--	--	--	--	0.65 J	<3.2*	<3.2D	<40	<25	<25	<25	<25	<32.5*	1.2*
MW-18A	--	--	--	--	<1	<1	0.32J	<1	<2*	<1	<1 *	<2	<2	<1
MW-18B	--	--	--	--	0.4 J	<2	<2D	<20	<10	<1	<10	<10	<3.5*	<1
MW-19A	--	--	--	--	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW-19B	--	--	--	--	<1	<1	<1	<1	<1	<1	<1	<2	<1	<1
MH-1	--	--	--	--	<1.2	<1.2	<1	<1	<5*	<1	<1	<1	<1*	<10*
MH-2	--	--	--	--	<1.2	<1.2	<1 J	<1	<5	<1	<1 *	<1	<10	<4
MH-3	--	--	--	--	<1.2	<1.2*	<1*	<1*	<5	<1*	<1	<1*	<10	<4

Units: ug/L

J indicates an estimated value

B indicates the analyte was found in an associated blank.

D indicates sample was diluted

NS indicates that MW-16B could not be sampled due to insufficient water volume in the well

NYSDEC (1991) (6NYCRR Part 703) Standard for Benzene is 0.7ug/L

* indicates reported concentration is average value of sample and duplicate sample concentrations

Table 3-9: Laboratory Analytical Results for 1,1-Dichloroethane (ug/L)

Monitoring Well	Sample Date													
				Round 1		Round 2		Round 3		Round 4		Round 5		Fall 2005
	Aug-92	May-96	Nov-97	Oct-99	Oct-00	May-01	Nov-01	May-02	Oct-02	May-03	Nov-03	May-04	Oct-04	Nov-05
MW-1A	2	--	<5	<5	<5 J	0.29J	<5	<5	<5	<5	<5	<5 J	<5	<5
MW-1B	3	--	<5	1J	1.5 J	1.70J	0.91J	1.3J	0.62J	0.87J	1.0J	1.2 J	<5	0.76 J
MW-2A	3	--	12	29	13 J	21	19	19	14	11	19	13 J	19	25
MW-2B	<10	--	<5	0.5J	<5 J	2	<5	<10	<25	<5	<20	<20 J	<20	<5
MW-3A	<10	--	<0.7	<5	<5	<5	<5	<5	<5	<5	<5	<5 J	<5	<5
MW-3B	<10	--	<0.7	<5	<5	<5	<5*	<5*	<5	<5	<5	<5 J	<5	<5
MW-4A	2	--	<0.7	2J	4.6 J	5.4	6.2D	8.8J	7.8J	12*	15J	23 J	19 J	17
MW-4B	<10	--	2	3J	3.2 J	2.5J	2.6J	2.8J	1.75J*	1.8J	2.05J *	2.1 J	1.6 J	1.8 J
MW-5A	<200	--	<5	<5	2.1 J	<5*	<5D	<25J	<5	1.1J	<5	0.96 J	2.8 J	1.4 J
MW-5B	3	--	<5	1J	1.1 J	<5	<5D	<25J	<25	<5	<25	0.61 J*	<25	0.65 J
MW-6	--	<100	<5	<5	0.28 J	<5	<5D	<5	<50	<5	<50	<50 J	<25	<5
MW-7A	--	<100	1500	690	1000	390	510D	430J	300J	280DJ	290	390 J	215 J*	345 D*
MW-7B	--	<100	<5	<5	<5	<5	<5D	<5	<10	<5	<10	<10 J	<5	<5
MW-8	--	<10	<5	<5	<5	<5*	<5	<5	<5	<5	<5	<5 J	<5	<5
MW-10A	--	<250	18	22	25	11D	13.5D*	15J*	15J	<120*	10J	11 J	<120	11
MW-10B	--	<250	<5	3J	1.2 J	46	<5D	<100	<100	<50*	<50	<50 J	<50	0.84 J*
MW-11A	--	<10	<5	<5	<5	<5	<5*	<5*J	<5	<5	<5 *	<5 J	<5	<5
MW-11B	--	<50	<5	0.7J	3.5 J	<5	<5D	1.4 J	0.45J	<50	1.6J	<50 J	<25	<5
MW-12A	--	<50	<5	2J	5.9	2.2J	4.2J	3.1 J	3.7J*	<40	3.3J	3.3 J	3.4 J	3.4 J
MW-12B	--	<50	<5	2J	2.3 J	<5	<5D	<50	1.3J	<20	1.8J	1.5 J	<20	1.8 J
MW-13A	--	<10	<5	<5	<5	<5	<5	<5J	<5	<5	<5	<5 J	<5	<5
MW-13B	--	<100	<10	1J	0.91 J	<5	<5D	<50J	0.83J	0.58J	0.68J	<20 J	0.56 J	0.77 J
MW-14A	--	<10	<5	<5	<5	<5	<5D	<5	<5	<5	<5	<5 J	<5	<5
MW-14B	--	<50	<5	0.8J	0.61 J	<5J	<5	0.62 J	<50	<25	0.38J	0.41 J*	<5	<5
MW-15	--	--	<10	1J	0.95 J	<5	<5D	1.7J	1.1J	<100	<25	<25 J	<50	2 J
MW-16A	--	--	--	--	NS	<5	<5D	<5J	<10	<10	<20	<5 J	<10	<5
MW-16B	--	--	--	--	<5	<5	<5D	<10J	<25	<50	<10	<10 J	<50	<5
MW-17A	--	--	--	--	59	75	75D	66	59	38J	48J	37 J	45	36
MW-17B	--	--	--	--	5.4	<5*	20D	40J	39J	28J	27J	26 J	26.5 J*	25.5*
MW-18A	--	--	--	--	5.6	4.9J	6	5.5	5.3J*	3.8J	4.95J *	5.2 J	7.3 J	6.1
MW-18B	--	--	--	--	<5	<5	<5D	<100	<50	<5	<50	<50 J	<17.5*	<5
MW-19A	--	--	--	--	<5	<5	<5	<5	<5	<5	<5	<5 J	<5	<5
MW-19B	--	--	--	--	<5	<5	<5	<5	<5	<5	<5	<10 J	<5	<5
MH-1	--	--	--	--	<5 J	<5	<5	<5	<25*	<5	<5	<5 J	<5*	<50*
MH-2	--	--	--	--	<5 J	<5	<5 J	<5	<25	<5	<5 *	<5 J	<50	<20
MH-3	--	--	--	--	<5 J	<5 *	<5*	<5*	<25	<5*	<5	<5 J*	<50	<20

Units: ug/L

J indicates an estimated value

D indicates sample was diluted

NS indicates that MW-16B could not be sampled due to insufficient water volume in the well

NYSDEC (1991) (TOGS 1.1.1) Standard for DCA is 5ug/L

* indicates reported concentration is average value of sample and duplicate sample concentrations

Table 3-10: Laboratory Analytical Results for Natural Attenuation Parameters

Monitoring Well I.D.		MW-1A									
Parameter	Units	Oct-00	May-01	Nov-01	May-02	Oct-02	May-03	Nov-03	May-04	Oct-04	Nov-05
Fe+2 (field measurement)	(mg/L)	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.2	0.3
Total Fe (lab measurement)	(mg/L)	nv	<0.05 J	11.7 J	6.3 J	11.8 J	4.16	12.2	9.34 J	1.97 J	5.44
Fe+3 (calculated)	(mg/L)	nc	<0.05	11.7	6.3	11.8	4.2	12.0	9.24	1.77	5.14
Methane	(ug/L)	23	30	40	36	41	40	19	43	42	34
Ethane	(ug/L)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Ethene	(ug/L)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Propane	(ug/L)	<1	nv	<1	<1	<1	<1	1.3	<1	<1	<1
Propene	(ug/L)	<1	nv	<1	<1	<1	<1	<1	<1	<1	<1
TOC	(mg/L)	<4	3.4	2.3	4.1 J	1.6	1.7	2.1	2.4	2.2	2.6
BOD	(mg/L)	<2	<2	<2	<2	<2	<2	<2	3.30	30.6	<2
COD	(mg/L)	<5	5.7J	<5 J	7.4 J	22.5 J	<10	<10	12.1	<10	<10
Chloride	(mg/L)	44.6	43.5	31.7	47.8	37.8	44.7	37.7	49.2	40.3	41.7
Nitrate	(mg/L)	<0.5J	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrite	(mg/L)	na	<0.02	<0.02	<0.02	<0.02	0.13	<0.05	<0.05	<0.05	<0.05
Sulfate	(mg/L)	135	159J	136 J	173	147	173	191	155	156	142
Sulfide	(mg/L)	31.5	<1	<1	<1	<1	<0.1	0.14	<0.1	<0.10	<0.10

Notes:

J indicates an estimated value

R indicates that data is unusable

nv indicates no value

nc indicates value could not be calculated based on available data

* indicates reported concentration is average value of sample and duplicate sample concentrations

** Field measurement exceeded lab value

Table 3-10: Laboratory Analytical Results for Natural Attenuation Parameters

Monitoring Well I.D.		MW-1B									
Parameter	Units	Oct-00	May-01	Nov-01	May-02	Oct-02	May-03	Nov-03	May-04	Oct-04	Nov-05
Fe+2 (field measurement)	(mg/L)	0.0	0.0	0.0	1.2	0.4	0.0	1.0	0.8	0.5	0.8
Total Fe (lab measurement)	(mg/L)	nv	1.1	5 J	1.8 J	4.33 J	1.22	1.21	1.48 J	0.56 J	1.56
Fe+3 (calculated)	(mg/L)	nc	1.1	5	0.6	3.93	1.22	0.21	0.68	0.06	0.76
Methane	(ug/L)	65	34	30	44	91	40	40	54	100	51
Ethane	(ug/L)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Ethene	(ug/L)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Propane	(ug/L)	<1	nv	<1	<1	<1	<1	<1	<1	<1	<1
Propene	(ug/L)	<1	nv	<1	<1	<1	<1	<1	<1	<1	<1
TOC	(mg/L)	6.2	6.6	9.7	6.7 J	6..2	3.8	4.6	2.8	3.8	3.2
BOD	(mg/L)	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
COD	(mg/L)	13	13J	37.2 J	16.9 J	17.2 J	10.4	<10	24.9	12.8	<10
Chloride	(mg/L)	83.1	83.3	74.2	72.1	95.4	73.7	72.1	70.2	82.2	85.3
Nitrate	(mg/L)	<0.5J	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrite	(mg/L)	na	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	(mg/L)	223	297J	268 J	239	304	276	277	240	257	177
Sulfide	(mg/L)	<1	<1	<1	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.10

Notes:

J indicates an estimated value

R indicates that data is unusable

nv indicates no value

nc indicates value could not be calculated based on available data

* indicates reported concentration is average value of sample and duplicate sample concentrations

** Field measurement exceeded lab value

Table 3-10: Laboratory Analytical Results for Natural Attenuation Parameters

Monitoring Well I.D.		MW-3A									
Parameter	Units	Oct-00	May-01	Nov-01	May-02	Oct-02	May-03	Nov-03	May-04	Oct-04	Nov-05
Fe+2 (field measurement)	(mg/L)	0.5	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Fe (lab measurement)	(mg/L)	nv	<0.05 J	1.9 J	10.7 J	6.47 J	7.94	16.5	13.5 J	9.55 J	8.73
Fe+3 (calculated)	(mg/L)	nc	<0.05	1.4	10.7	6.47	7.94	16.50	13.5	9.55	8.73
Methane	(ug/L)	45	4	1.2	4	<1	1.6	1.9	1.7	3.9	18.0
Ethane	(ug/L)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Ethene	(ug/L)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Propane	(ug/L)	<1	nv	<1	<1	<1	<1	<1	<1	<1	<1
Propene	(ug/L)	<1	nv	<1	<1	<1	<1	<1	<1	<1	<1
TOC	(mg/L)	2.1	2.9	3.8	5.1 J	2.5	2.4	3.4	2.7	2.1	2.7
BOD	(mg/L)	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
COD	(mg/L)	<5	<5	<5 J	<5 J	<5 J	<10	<10	<10	<10	<10
Chloride	(mg/L)	17.9	18.7	19.5	20.7	19.9	18.5	21.9	21.6	14.3	23.9
Nitrate	(mg/L)	<0.5J	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.067	<0.05	<0.05
Nitrite	(mg/L)	na	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	(mg/L)	399	462	444 J	400	512	332	373	345	311	270
Sulfide	(mg/L)	<1	<1	<1	<1	<1	0.73	<0.1	0.12	<0.1	<0.10

Notes:

J indicates an estimated value

R indicates that data is unusable

nv indicates no value

nc indicates value could not be calculated based on available data

* indicates reported concentration is average value of sample and duplicate sample concentrations

** Field measurement exceeded lab value

Table 3-10: Laboratory Analytical Results for Natural Attenuation Parameters

Monitoring Well I.D.		MW-3B									
Parameter	Units	Oct-00	May-01	Nov-01	May-02	Oct-02	May-03	Nov-03	May-04	Oct-04	Nov-05
Fe+2 (field measurement)	(mg/L)	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Fe (lab measurement)	(mg/L)	nv	<0.05 J	0.2* J	1.0* J	2.12	0.422	0.0705	<0.05 J	2.21 J	0.28
Fe+3 (calculated)	(mg/L)	nc	<0.05	0	1	2.12	0.42	0.07	<0.05	2.21	0.28
Methane	(ug/L)	260	90	175*	195*	280 J	130	59	140	150	190
Ethane	(ug/L)	<1	<1	<1	<1	<1 J	<1	<1	<1	<1	<1
Ethene	(ug/L)	<1	<1	<1	<1	<1 J	<1	<1	<1	<1	<1
Propane	(ug/L)	<	nv	<1	<1	<1 J	<1	<1	<1	<1	<1
Propene	(ug/L)	<1	nv	<1	<1	<1 J	<1	<1	<1	<1	<1
TOC	(mg/L)	3.6	4.6	4*	8.3*J	2.7	2.8	3.3	3.4	3.6	3.4
BOD	(mg/L)	<2	<2	<2	3.3*	7.8	<2	<2.2	<2	<2	<2
COD	(mg/L)	11.3	7.4	6* J	37.55*J	53.7 J	<10	<10	20.6	14.1	<10
Chloride	(mg/L)	93.6	92.5	99.2*	91.75*	110	96.8	116	83.6	114	137
Nitrate	(mg/L)	<0.5J	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrite	(mg/L)	na	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	(mg/L)	288	356	304* J	346*	562	240	394	413	347	240
Sulfide	(mg/L)	<1	<1	<1	1.2*	<1	<0.1	0.29	0.60	<0.1	0.10

Notes:

J indicates an estimated value

R indicates that data is unusable

nv indicates no value

nc indicates value could not be calculated based on available data

* indicates reported concentration is average value of sample and duplicate sample concentrations

** Field measurement exceeded lab value

Table 3-10: Laboratory Analytical Results for Natural Attenuation Parameters

Monitoring Well I.D.		MW-4A									
Parameter	Units	Oct-00	May-01	Nov-01	May-02	Oct-02	May-03	Nov-03	May-04	Oct-04	Nov-05
Fe+2 (field measurement)	(mg/L)	0.0	0.2**	0.0	0.4	nv	0.2	0.2	0.3	0.5	0.6
Total Fe (lab measurement)	(mg/L)	nv	0.1 J	12.1 J	1.9 J	4.23	54.0*	1.67	34.5 J	55.1 J	15.8
Fe+3 (calculated)	(mg/L)	nc	0.1	12.1	1.5	nc	53.8*	1.5	34.2	54.6	15.2
Methane	(ug/L)	54	44	40	130	87 J	89*	53	110	120	140
Ethane	(ug/L)	<1	<1	<1	<1	<1 J	<1*	<1	<1	<1	<1
Ethene	(ug/L)	3	1.5	1.5	1.8	2.5 J	2.1*	1.3	<1	3.1	3.8
Propane	(ug/L)	<1	nv	<1	<1	<1 J	<1*	<1	<1	<1	<1
Propene	(ug/L)	<1	nv	<1	<1	<1 J	<1*	<1	<1	<1	<1
TOC	(mg/L)	2.7	2.4	2.5	3	1.5	<1*	1.8	1.8	1.9	4.5
BOD	(mg/L)	<2	<2	<2	<2 J	<2	<2*	<2	<2	<2	<2
COD	(mg/L)	<5	<5	<5 J	10.3 J	<5 J	<10*	<10	<10	<10	11.7
Chloride	(mg/L)	100	185	89.3	132	80.1	168*	118	74.2	93.9	93.2
Nitrate	(mg/L)	<0.5J	<0.05	<0.05	<0.05	<0.05	<0.05*	<0.05	<0.05	<0.05	<0.05
Nitrite	(mg/L)	na	<0.02	<0.02	<0.02	<0.02	<0.05*	<0.05	<0.05	<0.05	<0.05
Sulfate	(mg/L)	222	318	281 J	322	258	302*	263	305	272	248
Sulfide	(mg/L)	31.5	<1	<1	<1	<1	<0.5*	<0.1	0.15	<0.1	<0.10

Notes:

J indicates an estimated value

R indicates that data is unusable

nv indicates no value

nc indicates value could not be calculated based on available data

* indicates reported concentration is average value of sample and duplicate sample concentrations

** Field measurement exceeded lab value

Table 3-10: Laboratory Analytical Results for Natural Attenuation Parameters

Monitoring Well I.D.		MW-4B									
Parameter	Units	Oct-00	May-01	Nov-01	May-02	Oct-02	May-03	Nov-03	May-04	Oct-04	Nov-05
Fe+2 (field measurement)	(mg/L)	0.0	0.0	0.0	0.6	nv	0.5	0.5	0.5	0.5	0.4
Total Fe (lab measurement)	(mg/L)	nv	0.3 J	2 J	1.1 J	1.35*	1.14	1.06 *	0.7 J	0.93 J	0.82
Fe+3 (calculated)	(mg/L)	nc	0.3	2	0.5	nc	0.64	0.56	0.20	0.43	0.42
Methane	(ug/L)	230	150	120	200	220* J	230	140 *	230	190	170
Ethane	(ug/L)	<1	<1	<1	<1	<1* J	<1	<1 *	<1	<1	<1
Ethene	(ug/L)	1	<1	<1	<1	<1* J	<1	<1 *	<1	<1	<1
Propane	(ug/L)	<1	nv	<1	<1	<1* J	<1	<1 *	<1	<1	<1
Propene	(ug/L)	<1	nv	<1	<1	<1* J	<1	<1 *	<1	<1	<1
TOC	(mg/L)	<10	3.6	3.2	3.3	2.25*	1.2	2.65 *	2.4	2.6	3.1
BOD	(mg/L)	<2	<2	<2	<2 J	<2*	<2	<2 *	<2	<2	<2
COD	(mg/L)	7.4	<5	<5 J	7.7 J	11.1* J	<10	<10 *	16.4	<10	18.1
Chloride	(mg/L)	167	136	123	133	127.5*	121	143 *	69.4	131	126
Nitrate	(mg/L)	<0.5J	0.076	<0.05	<0.05	<0.05*	<0.05	<0.05 *	<0.05	<0.05	<0.05
Nitrite	(mg/L)	na	<0.02	<0.02	<0.02	<0.02*	<0.05	<0.05 *	<0.05	<0.05	<0.05
Sulfate	(mg/L)	314	502	524 J	402	462*	228	355 *	355	320	252
Sulfide	(mg/L)	<1	<1	<1	<1	<1*	<0.1	<0.1 *	0.11	<0.1	<0.10

Notes:

J indicates an estimated value

R indicates that data is unusable

nv indicates no value

nc indicates value could not be calculated based on available data

* indicates reported concentration is average value of sample and duplicate sample concentrations

** Field measurement exceeded lab value

Table 3-10: Laboratory Analytical Results for Natural Attenuation Parameters

Monitoring Well I.D.		MW-7A									
Parameter	Units	Oct-00	May-01	Nov-01	May-02	Oct-02	May-03	Nov-03	May-04	Oct-04	Nov-05
Fe+2 (field measurement)	(mg/L)	0.2	0.0	0.0	1.3	0.1	0.2	1.4	2.1	0.9	2.2
Total Fe (lab measurement)	(mg/L)	nv	1.0 J	26.5 J	21.2 J	11.9	8.62	13.6	10.5 J	11.2 J*	81.15 J*
Fe+3 (calculated)	(mg/L)	nc	1.0	26.5	19.9	11.8	8.4	12.2	8.40	10.3	79.0
Methane	(ug/L)	16	7	11	13	8.6 J	4.7	4.2	7.3	10.5*	17*
Ethane	(ug/L)	2	1	1.9	2.1	1 J	<1	<1	<1	1.4*	2.55*
Ethene	(ug/L)	2	2	2.4	5.9	7 J	4.1	3.7	<1	3.75*	4.45*
Propane	(ug/L)	<1	nv	<1	<1	<1 J	<1	<1	<1	<1*	<1*
Propene	(ug/L)	<1	nv	<1	<1	<1 J	<1	<1	<1	<1*	<1*
TOC	(mg/L)	<10	<4	3.6	4.5 J	2	<1	2.1	2.0	1.95*	4.05*
BOD	(mg/L)	<2	<2	<2	<2	<2	<2	<2.2	<2	<2*	<2*
COD	(mg/L)	33.2	<5	<5 J	9.3 J	<5 J	<10	<10	14.4	<10*	<10 UJ*
Chloride	(mg/L)	56.7	36.2	43.3	37.8	35.7	28.8	36.3	29.5	24.25*	23.85*
Nitrate	(mg/L)	<0.5J	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05*	<0.05*
Nitrite	(mg/L)	na	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05*	<0.05*
Sulfate	(mg/L)	50.4	340	128 J	239	398	249	348	266	246*	241.5*
Sulfide	(mg/L)	3.4	<1	1.8	<1	<1	<0.2	<0.1	<0.1	<0.1*	<0.10*

Notes:

J indicates an estimated value

R indicates that data is unusable

nv indicates no value

nc indicates value could not be calculated based on available data

* indicates reported concentration is average value of sample and duplicate sample concentrations

** Field measurement exceeded lab value

Table 3-10: Laboratory Analytical Results for Natural Attenuation Parameters

Monitoring Well I.D.		MW-7B									
Parameter	Units	Oct-00	May-01	Nov-01	May-02	Oct-02	May-03	Nov-03	May-04	Oct-04	Nov-05
Fe+2 (field measurement)	(mg/L)	0.0	0.0	0.4**	0.0	0.1	0.0	0.0	0.3**	0.0	0.0
Total Fe (lab measurement)	(mg/L)	nv	<0.05 J	0.1 J	0.8 J	0.142	0.606	0.056	<0.05 J	0.056 J	0.05 J
Fe+3 (calculated)	(mg/L)	nc	<0.05	nc	0.8	0.042	0.606	0.056	<0.05	0.056	0.050
Methane	(ug/L)	270	120	230	260	280 J	200	190	190	220	180
Ethane	(ug/L)	<1	<1	<1	<1	<1 J	<1	<1	<1	<1	<1
Ethene	(ug/L)	1	<1	<1	1.5	1.5 J	1.4	<1	<1	1.0	1.3
Propane	(ug/L)	<1	nv	<1	<1	<1 J	<1	<1	<1	<1	<1
Propene	(ug/L)	<1	nv	<1	<1	<1 J	<1	<1	<1	<1	<1
TOC	(mg/L)	3.2	4.6	3.7	6 J	2.7	2.4	3.3	2.9	3.5	3.4
BOD	(mg/L)	<2	<2	<2	<2	<2	<2	<2.2	<2	<2	<2
COD	(mg/L)	<5	5.7	<5 J	14.6 J	<5 J	<10	<10	21.7	<10	<10 UJ
Chloride	(mg/L)	97.3	88.8	98.9	95.6	117	96.3	140	82.0	118	137
Nitrate	(mg/L)	<0.5J	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.12
Nitrite	(mg/L)	na	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	(mg/L)	250	248	272 J	218	388	197	320	251	219	237
Sulfide	(mg/L)	<1	<1	<1	<1	<1	0.11	0.1	0.14	<0.1	<0.10

Notes:

J indicates an estimated value

R indicates that data is unusable

nv indicates no value

nc indicates value could not be calculated based on available data

* indicates reported concentration is average value of sample and duplicate sample concentrations

** Field measurement exceeded lab value

Table 3-10: Laboratory Analytical Results for Natural Attenuation Parameters

Monitoring Well I.D.		MW-10A									
Parameter	Units	Oct-00	May-01	Nov-01	May-02	Oct-02	May-03	Nov-03	May-04	Oct-04	Nov-05
Fe+2 (field measurement)	(mg/L)	1.0	0.5	1.8	3.1	1.6	0.0	2.8	2.2	2.8	2.1
Total Fe (lab measurement)	(mg/L)	nv	2.8	33.2* J	35.4* J	21.9 J	24.2*	19.0	43.4 J	29.4 J	23.1 J
Fe+3 (calculated)	(mg/L)	nc	2.3	31.4	32.3	20.3	24.2*	16.2	41.2	26.6	21.0
Methane	(ug/L)	72	40	40*	63*	37	68*	35	43	40	33
Ethane	(ug/L)	3	2.8	3.2*	2.15*	1.8	3.9*	1.6	2.4	1.5	<1
Ethene	(ug/L)	9	7.7	6*	11.5*	7	9.3*	4.6	5.3	6.5	5.4
Propane	(ug/L)	<1	<1	<1	<1	<1	<1*	<1	<1	<1	<1
Propene	(ug/L)	<1	<1	<1	<1	<1	<1*	<1	<1	<1	<1
TOC	(mg/L)	<4	<10	2.8*	2.75*	1.6	<1*	1.8	1.7	1.5	2.5
BOD	(mg/L)	<2	<2	<2	<2 J	<2	<2*	<2.2	<2	<2	<2
COD	(mg/L)	9.4	6.3	7.2* J	9.7* J	<5 J	<10*	<10	<10	<10	<10 UJ
Chloride	(mg/L)	560	558	646*	812*	703	728*	972	1080	1040	1020
Nitrate	(mg/L)	<0.5J	<0.05	<0.05	<0.05	<0.05	<0.05*	<0.05	0.085	<0.05	<0.05
Nitrite	(mg/L)	na	<0.02	<0.02	<0.02	<0.02	<0.05*	<0.05	<0.05	<0.05	<0.05
Sulfate	(mg/L)	398	254	338*	406*	564	197*	313	325	376	276
Sulfide	(mg/L)	<1	<1	<1	<2	<1	<0.1*	0.26	0.13	<0.1	<0.10

Notes:

J indicates an estimated value

R indicates that data is unusable

nv indicates no value

nc indicates value could not be calculated based on available data

* indicates reported concentration is average value of sample and duplicate sample concentrations

** Field measurement exceeded lab value

Table 3-10: Laboratory Analytical Results for Natural Attenuation Parameters

Monitoring Well I.D.		MW-10B									
Parameter	Units	Oct-00	May-01	Nov-01	May-02	Oct-02	May-03	Nov-03	May-04	Oct-04	Nov-05
Fe+2 (field measurement)	(mg/L)	0.0	0.4	0.9	0.6	1.8**	1.1**	0.6	0.9**	0.5	0.5
Total Fe (lab measurement)	(mg/L)	nv	0.5	1.1 J	2.5 J	1.39 J	0.737	0.66	0.782 J	1.44 J	0.559 J*
Fe+3 (calculated)	(mg/L)	nc	0.1	0.2	1.9	nc	nc	0.06	<0.05	0.94	0.06
Methane	(ug/L)	89	50	90	39	83	67	54	77	94	87
Ethane	(ug/L)	3	<1	<1	<1	<1	<1	<1	<1	<1	<1
Ethene	(ug/L)	3	<1	2	<1	1.3	<1	<1	<1	<1	<1
Propane	(ug/L)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Propene	(ug/L)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
TOC	(mg/L)	3.4	4.5	4	4.9	4.1	2.7	4.2	5.7	3.8	4.25*
BOD	(mg/L)	<2	<2	<2	<2 J	<2	<2	<4.5	<2	<2	<2*
COD	(mg/L)	<5	<5	5.4 J	15.5 J	<5 J	12.9	<10	<10	<10	17 J*
Chloride	(mg/L)	99.8	76.5	104	78.4	119	76.6	84.8	75.8	87.9	88.25*
Nitrate	(mg/L)	<0.5J	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05*
Nitrite	(mg/L)	na	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05*
Sulfate	(mg/L)	254	274	301	238	296	193	345	242	231	232.5*
Sulfide	(mg/L)	<1	<1	<1	<1	<1	0.1	<0.1	0.11	<0.1	<0.10*

Notes:

J indicates an estimated value

R indicates that data is unusable

nv indicates no value

nc indicates value could not be calculated based on available data

* indicates reported concentration is average value of sample and duplicate sample concentrations

** Field measurement exceeded lab value

Table 3-10: Laboratory Analytical Results for Natural Attenuation Parameters

Monitoring Well I.D.		MW-14A									
Parameter	Units	Oct-00	May-01	Nov-01	May-02	Oct-02	May-03	Nov-03	May-04	Oct-04	Nov-05
Fe+2 (field measurement)	(mg/L)	1.3	nv	0.5	1.0	1.0	0.0	0.7	1.5	1.4	1.4
Total Fe (lab measurement)	(mg/L)	nv	0.5	2 J	44.4 J	59.3 J	50.4	49.5	39.4 J	49.2 J	63.4
Fe+3 (calculated)	(mg/L)	nc	nv	1.5	43.4	58.3	50.4	48.8	37.9	47.8	62.0
Methane	(ug/L)	36	10	30	23	22	16	14	45	30	29
Ethane	(ug/L)	3	<1	2.2	2.2	1.2	1.8	1.5	2.3	1.3	1.4
Ethene	(ug/L)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Propane	(ug/L)	<1	<1	<1	1.4	<1	<1	<1	<1	<1	<1
Propene	(ug/L)	<1	<1	<1	1.5	<1	<1	<1	<1	<1	<1
TOC	(mg/L)	<10	<20	3.9	4	3.5	3.2	3.7	2.6	3.3	5.6
BOD	(mg/L)	<2	2	<2	<2 J	<2	<2	<2	3.3	<2	<2
COD	(mg/L)	34.2	27.9	11.6 J	16.2 J	14.9 J	<10	13.4	12.4	<10	14.6
Chloride	(mg/L)	77.2	105	107	74.3	68.4	84.2	98.6	83.9	75.0	79.5
Nitrate	(mg/L)	<0.5J	0.087	<0.05	<0.05	<0.05	<0.05	0.28	0.2	0.14	0.14
Nitrite	(mg/L)	na	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	0.068	<0.05
Sulfate	(mg/L)	38.4	28.4	352	123	184	173	151	182	190	178
Sulfide	(mg/L)	<1	<1	1.8	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.10

Notes:

J indicates an estimated value

R indicates that data is unusable

nv indicates no value

nc indicates value could not be calculated based on available data

* indicates reported concentration is average value of sample and duplicate sample concentrations

** Field measurement exceeded lab value

Table 3-10: Laboratory Analytical Results for Natural Attenuation Parameters

Monitoring Well I.D.		MW-14B									
Parameter	Units	Oct-00	May-01	Nov-01	May-02	Oct-02	May-03	Nov-03	May-04	Oct-04	Nov-05
Fe+2 (field measurement)	(mg/L)	0.5	0.0	0.0	0.5	0.0	0.3**	0.3**	0.5**	0.6**	0.5
Total Fe (lab measurement)	(mg/L)	nv	0.2	148 J	1.1 J	0.792 J	0.134	0.282	0.093 J*	<0.05 J	0.076
Fe+3 (calculated)	(mg/L)	nc	0.2	148	0.6	0.792	nc	nc	<0.05	nc	nc
Methane	(ug/L)	210	100	80	200	200	130	150	215*	180	180
Ethane	(ug/L)	<1	<1	<1	<1	<1	<1	<1	<1*	<1	<1
Ethene	(ug/L)	2	<1	<1	1.1	1.4	<1	<1	<1*	<1	1
Propane	(ug/L)	<1	<1	<1	<1	<1	<1	<1	<1*	<1	<1
Propene	(ug/L)	<1	<1	<1	<1	<1	<1	<1	<1*	<1	<1
TOC	(mg/L)	2.8	4.3	4.6	3.8	2.8	2.5	3.1	1.4*	2.8	3.2
BOD	(mg/L)	<2	<2	<2	<2 J	<2	<2	<2	3.65*	<2	<2
COD	(mg/L)	8.4	<5	23.1 J	8.7 J	<5 J	10.4	<10	18.0*	<10	11.4
Chloride	(mg/L)	93.2	89.5	85.5	124	116	110	126	87.5*	121	113
Nitrate	(mg/L)	<0.5J	<0.05	0.12	<0.05	<0.05	<0.05	<0.05	<0.05*	<0.05	<0.05
Nitrite	(mg/L)	na	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05*	<0.05	<0.05
Sulfate	(mg/L)	308	251	151	248	398	391	391	306*	325	252
Sulfide	(mg/L)	<1	<1	1.7	<1	<1	<0.1	0.12	0.18*	0.21	<0.10

Notes:

J indicates an estimated value

R indicates that data is unusable

nv indicates no value

nc indicates value could not be calculated based on available data

* indicates reported concentration is average value of sample and duplicate sample concentrations

** Field measurement exceeded lab value

Table 3-10: Laboratory Analytical Results for Natural Attenuation Parameters

Monitoring Well I.D.		MW-16A									
Parameter	Units	Oct-00	May-01	Nov-01	May-02	Oct-02	May-03	Nov-03	May-04	Oct-04	Nov-05
Fe+2 (field measurement)	(mg/L)	Well Dry	nv	1.0	nv	0.0	0.0	0.0	0.0	0.3	0.2
Total Fe (lab measurement)	(mg/L)	No Sample	nv	4.9 J	5.8	3.37 J	9.37	12.5	7.61 J	8.26 J	8.16
Fe+3 (calculated)	(mg/L)	Colelcted	nv	3.9	nc	3.37	9.37	12.50	7.61	7.96	7.96
Methane	(ug/L)		6.3	4.3	1.8	3.1	1.6	3.6	1.4	1.9	4.2
Ethane	(ug/L)		<1	<1	<1	<1	<1	<1	<1	<1	<1
Ethene	(ug/L)		<1	<1	<1	<1	<1	1.6	<1	1.1	3.8
Propane	(ug/L)		nv	<1	<1	<1	<1	<1	<1	<1	<1
Propene	(ug/L)		nv	<1	<1	<1	<1	<1	<1	<1	<1
TOC	(mg/L)		8.7	8.4	7.4	6.8	4.7	6.6	4.9	5.9	4.7
BOD	(mg/L)		<2	<2	<2 J	<2	<2	<2	<2	<2	<2
COD	(mg/L)		38.2J	23.5 J	25.3	12.7 J	14.6	<10	16.4	15.4	26.8
Chloride	(mg/L)		327	334	385	349	367	347	259	308	86.2
Nitrate	(mg/L)		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.12	0.12	0.076
Nitrite	(mg/L)		<0.02	<0.02	<0.02 R	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	(mg/L)		1250J	1060	955	1060	993	1080	985	1120	41.1
Sulfide	(mg/L)		<1	<1	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.10

Notes:

J indicates an estimated value

R indicates that data is unusable

nv indicates no value

nc indicates value could not be calculated based on available data

* indicates reported concentration is average value of sample and duplicate sample concentrations

** Field measurement exceeded lab value

Table 3-10: Laboratory Analytical Results for Natural Attenuation Parameters

Monitoring Well I.D.		MW-16B									
Parameter	Units	Oct-00	May-01	Nov-01	May-02	Oct-02	May-03	Nov-03	May-04	Oct-04	Nov-05
Fe+2 (field measurement)	(mg/L)	0.0	nv	0.7	0.3	0.0	0.0	0.4	0.4	0.3	nv
Total Fe (lab measurement)	(mg/L)	nv	0.3 J	160 J	6.8	4.65 J	1.92	16.9	0.588 J	1.2 J	3.11
Fe+3 (calculated)	(mg/L)	nc	nv	159.3	6.5	4.65	1.92	16.50	0.19	0.9	nc
Methane	(ug/L)	132.5	120	110	17	200	150	160	190	200	130
Ethane	(ug/L)	<1	<1	2.3	<1	<1	<1	<1	<1	<1	<1
Ethene	(ug/L)	<1	<1	<1	<1	2.9	3	2.5	24	3.3	2.2
Propane	(ug/L)	<1	nv	<1	1.2	<1	<1	<1	<1	<1	<1
Propene	(ug/L)	<1	nv	<1	1.7	<1	<1	<1	<1	<1	<1
TOC	(mg/L)	5.6	5.9	8.8	4.3	5.2	3.4	4.2	4.1	3.9	2.8
BOD	(mg/L)	<2	<2	11.2	8.6 J	<2	<2	<2	<2	<2	<2
COD	(mg/L)	10.35	46.1J	135 J	48.2	22.2 J	22.2	49	<10	<10	17.5
Chloride	(mg/L)	95.1J	74.2	88.4	62.4	78.1	86.6	90.4	79	83.3	13
Nitrate	(mg/L)	<0.5J	0.062	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrite	(mg/L)	na	<0.02	<0.02	<0.02 R	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	(mg/L)	500.5J	510J	258	170	159	173	267	264	251	90.2
Sulfide	(mg/L)	<1	<1	3.2	<1	<1	<0.1	0.12	0.28	0.11	<0.10

Notes:

J indicates an estimated value

R indicates that data is unusable

nv indicates no value

nc indicates value could not be calculated based on available data

* indicates reported concentration is average value of sample and duplicate sample concentrations

** Field measurement exceeded lab value

Table 3-10: Laboratory Analytical Results for Natural Attenuation Parameters

Monitoring Well I.D.		MW-17A									
Parameter	Units	Oct-00	May-01	Nov-01	May-02	Oct-02	May-03	Nov-03	May-04	Oct-04	Nov-05
Fe+2 (field measurement)	(mg/L)	0.6	2.5**	1.2	2.0	3.2	1.8	2.0	3.4	2.8	3.6
Total Fe (lab measurement)	(mg/L)	nv	1.7 J	142 J	39.6 J	52.4	14.6	8.25	16.8 J*	32.2 J	11.5
Fe+3 (calculated)	(mg/L)	nc	1.7	140.8	37.6	49.2	12.8	6.3	13.4	29.4	7.9
Methane	(ug/L)	61	78	100	120	98 J	78	52	62*	81	57
Ethane	(ug/L)	4	7.1	3.1	2.6	4 J	<1	<1	<1*	<1	<1
Ethene	(ug/L)	1	<1	<1	1.3	4.2 J	1.1	<1	<1*	<1	<1
Propane	(ug/L)	<1	nv	<1	<1	<1 J	<1	<1	<1*	<1	<1
Propene	(ug/L)	<1	nv	<1	<1	<1 J	<1	<1	<1*	<1	<1
TOC	(mg/L)	4.3	<20	3.9	3	2.5	<1	1.9	1.8*	2.1	2.8
BOD	(mg/L)	<2	<2	<2	<2 J	<2	<2	<2	<2*	<2	<2
COD	(mg/L)	19.6	30J	44.8 J	13.9 J	17.6 J	<10	<10	12.6*	<10	10.8
Chloride	(mg/L)	612J	640	845	982	1090	924	1270	1000*	1010	1080
Nitrate	(mg/L)	<0.5J	0.052	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05*	<0.05	<0.05
Nitrite	(mg/L)	na	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05*	<0.05	<0.05
Sulfate	(mg/L)	76.9J	220J	156	202	274	159	252	227*	196	181
Sulfide	(mg/L)	<1	<1	1.7	<1	<1	<0.1	<0.1	<0.1*	<0.1	<0.10

Notes:

J indicates an estimated value

R indicates that data is unusable

nv indicates no value

nc indicates value could not be calculated based on available data

* indicates reported concentration is average value of sample and duplicate sample concentrations

** Field measurement exceeded lab value

Table 3-10: Laboratory Analytical Results for Natural Attenuation Parameters

Monitoring Well I.D.		MW-17B									
Parameter	Units	Oct-00	May-01	Nov-01	May-02	Oct-02	May-03	Nov-03	May-04	Oct-04	Nov-05
Fe+2 (field measurement)	(mg/L)	0.0	0.0	0.3	1.4	--	1.9	1.2	1.4	1.0	1.0
Total Fe (lab measurement)	(mg/L)	nv	0.1 J	71.1 J	11.2 J	89.4	5.16	4.61	2.82 J	3.76 J	2.89
Fe+3 (calculated)	(mg/L)	nc	0.1	70.8	9.8		3.26	3.41	1.42	2.76	1.89
Methane	(ug/L)	96	93	70	180	160 J	150	110	150	150	140
Ethane	(ug/L)	5	7.8	<1	4.6	6.7 J	<1	<1	<1	<1	<1
Ethene	(ug/L)	1	<1	<1	2.9	3.5 J	5.4	2.7	<1	5.3	4.7
Propane	(ug/L)	<1	nv	<1	1.1	<1 J	<1	<1	<1	<1	<1
Propene	(ug/L)	<1	nv	<1	<1	<1 J	<1	<1	<1	<1	1.5
TOC	(mg/L)	4.8	<10	4.1	4	3.9	1.8	2.8	3.3	3.2	3.5
BOD	(mg/L)	<2	<2	4.6	<2 J	4.9	<2	<2	<2	<2	<2
COD	(mg/L)	24.3	13.6J	84.2 J	27 J	61.2 J	<10	<10	<10	<10	13.6
Chloride	(mg/L)	124J	107	495	461	445	359	412	241	381	477
Nitrate	(mg/L)	<0.5J	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrite	(mg/L)	na	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate	(mg/L)	56.2J	244J	110	196	340	91.8	371	252	226	221
Sulfide	(mg/L)	<1	<1	2.6	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.10

Notes:

J indicates an estimated value

R indicates that data is unusable

nv indicates no value

nc indicates value could not be calculated based on available data

* indicates reported concentration is average value of sample and duplicate sample concentrations

** Field measurement exceeded lab value

Table 3-10: Laboratory Analytical Results for Natural Attenuation Parameters

Monitoring Well I.D.		MW-18A									
Parameter	Units	Oct-00	May-01	Nov-01	May-02	Oct-02	May-03	Nov-03	May-04	Oct-04	Nov-05
Fe+2 (field measurement)	(mg/L)	0.0	0.0	0.0	1.5	1.2	0.0	0.9	0.8	1.0	1.2
Total Fe (lab measurement)	(mg/L)	nv	1.0 J	35.7 J	18.6 J	24.75* J	17.7	18.55 *	11.2 J	7.7 J	8.98
Fe+3 (calculated)	(mg/L)	nc	1.0	35.7	17.1	11.2	17.7	17.7	10.4	6.7	7.8
Methane	(ug/L)	35	27	30	32	15.5*	22	18 *	22	15	24
Ethane	(ug/L)	7	5.6	3.9	1.6	<1*	<1	1.75 *	<1	<1	<1
Ethene	(ug/L)	<1	<1	<1	<1	<1*	<1	<1 *	<1	<1	<1
Propane	(ug/L)	<1	nv	<1	<1	<1*	<1	1.0 *	<1	<1	<1
Propene	(ug/L)	<1	nv	<1	<1	<1*	<1	<1 *	<1	<1	<1
TOC	(mg/L)	2.8	<1	2.4	2.6	1.85*	1.3	2.15 *	<1	2.0	2.1
BOD	(mg/L)	<2	<2	<2	<2 J	<2*	<2	<2.1 *	2.8	<2	<2
COD	(mg/L)	12	6.7J	<5 J	<5 J	10.5* J	<10	11.9 *	<10	<10	13.3
Chloride	(mg/L)	58.6J	40.2	45.4	48.2	69.4*	46.8	68.1 *	57.6	58.4	72.7
Nitrate	(mg/L)	<0.5J	<0.05	<0.05	<0.05	<0.05*	<0.05	<0.05 *	<0.05	<0.05	<0.05
Nitrite	(mg/L)	na	<0.02	<0.02	<0.02	<0.02*	<0.05	<0.05 *	<0.05	<0.05	<0.05
Sulfate	(mg/L)	130J	590J	125	136	166.5*	173	167 *	139	156	147
Sulfide	(mg/L)	<1	<1	<1	<1	<1*	<0.1	<0.1 *	0.1	<0.1	<0.10

Notes:

J indicates an estimated value

R indicates that data is unusable

nv indicates no value

nc indicates value could not be calculated based on available data

* indicates reported concentration is average value of sample and duplicate sample concentrations

** Field measurement exceeded lab value

Table 3-10: Laboratory Analytical Results for Natural Attenuation Parameters

Monitoring Well I.D.		MW-18B									
Parameter	Units	Oct-00	May-01	Nov-01	May-02	Oct-02	May-03	Nov-03	May-04	Oct-04	Nov-05
Fe+2 (field measurement)	(mg/L)	0.6	0.0	0.5	0.9	1.8	0.3	0.6	0.8	0.5	0.7
Total Fe (lab measurement)	(mg/L)	nv	0.8 J	1.4 J	1.1 J	8.22 J	1.02	1.98	0.854 J	1.615 J*	0.933
Fe+3 (calculated)	(mg/L)	nc	0.8	0.9	0.2	6.4	0.7	1.4	0.1	1.115	0.233
Methane	(ug/L)	120	40	40	94	100	110	74	35	120*	100
Ethane	(ug/L)	3	<1	<1	<1	4.5	<1	3.3	<1	<1*	<1
Ethene	(ug/L)	13	<1	<1	<1	<1	<1	<1	<1	1.05*	<1
Propane	(ug/L)	<1	nv	<1	<1	<1	<1	1.2	<1	<1*	<1
Propene	(ug/L)	<1	nv	<1	<1	<1	<1	<1	<1	<1*	<1
TOC	(mg/L)	4.5	5.6	4.5	5.4	5.6	3.2	5.2	2.4	4.0*	4.1
BOD	(mg/L)	<2	<2	<2	2.3 J	<2	<2	2.6	<2	<2*	<2
COD	(mg/L)	12	15.9J	<5 J	29.6 J	22.2 J	15.6	<10	15.4	<10*	12.7
Chloride	(mg/L)	103J	90.5	69.7	76.8	72.4	78.6	83	79	80.5*	91.5
Nitrate	(mg/L)	<0.5J	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05*	<0.05
Nitrite	(mg/L)	na	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05*	<0.05
Sulfate	(mg/L)	279J	348J	292	165	348	230	349	253	255*	278
Sulfide	(mg/L)	<1	<1	<1	<1	<1	0.13	<0.1	<0.1	<0.1*	<0.10

Notes:

J indicates an estimated value

R indicates that data is unusable

nv indicates no value

nc indicates value could not be calculated based on available data

* indicates reported concentration is average value of sample and duplicate sample concentrations

** Field measurement exceeded lab value

APPENDIX C

LABORATORY ANALYTICAL RESULTS