IN SITU CHEMICAL OXIDATION
PILOT TEST REPORT
TROY (WATER STREET) SITE
TROY, NEW YORK

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EXECUTIVE SUMMARY

An in situ chemical oxidation (ISCO) pilot test was conducted at Area 2 of the Troy (Water Street) Site in Troy, Rensselaer County, New York to evaluate the potential effectiveness of ISCO via Fenton's Reagent to treat aqueous benzene, toluene, ethylbenzene, and xylenes (BTEX) concentrations in site groundwater.

ISCO was selected by The New York State Department of Environmental Conservation (NYSDEC) in the July 2003 Record-of-Decision (ROD) for the Site to address soil deeper than 18 feet below ground surface (bgs) containing total polycyclic aromatic hydrocarbons (PAHs) greater than 500 mg/kg or visual tar or nonaqueous phase liquid (NAPL). Pursuant to the ROD, ISCO treatment is to operate until groundwater standards for benzene, ethylbenzene, toluene and xylenes (BTEX) are met or until the DEC determines BTEX concentrations have achieved asymptotic levels for a sustained period of time and continued treatment would not result in significant mass removal of contaminants.

Based on a bench-scale treatability study, Fenton's Reagent was the ISCO process selected for field pilot testing. Initial pilot test activities commenced in November 2004 in the area west of the former water gas building on the northern portion of the site. The first pilot test was terminated on January 4, 2005 due to Site access issues. The results generated during this short period were not adequate to draw any conclusions about the effectiveness of ISCO, but it was apparent that the test area was more impacted with petroleum light NAPL (LNAPL) and coal tar residuals than was evident in earlier investigations, and that test procedures should be modified to address shallow and deep zones separately.

Pilot test activities resumed in July 2005, with deep injection point and monitoring well installations and baseline soil and groundwater monitoring. Reagent injections spanned the period from August 16 to September 29, 2005. Post-treatment monitoring commenced thereafter and the last round of post-treatment groundwater monitoring was conducted in late December 2005.

The available test results demonstrate ISCO will not be effective in achieving the remedial objectives stated in the ROD in the pilot test area or other areas similarly impacted by NAPL. Although the Fenton's Reaction was occurring in situ, initial aqueous BTEX concentrations were reduced only in a limited area averaging only 15 feet from the injection points. At several locations farther away from the injection points, an increase in aqueous constituent concentrations was observed. In some locations significant quantities of NAPL, apparently mobilized by the temperature increase associated with Fenton's Reagent applications, accumulated in wells. In such areas, NAPL represents a high oxidant demand and a continuing source of dissolved BTEX.

The groundwater samples collected six and twelve weeks after cessation of injections have yet to be fully analyzed, and the analytical results will be evaluated and discussed in a subsequent report. However, based on a preliminary review of the analytical results for the six-week shallow zone samples, it appears that BTEX concentrations have rebounded significantly and that the reductions in aqueous BTEX concentrations reported herein are temporary.

1 INTRODUCTION

The In Situ Chemical Oxidation (ISCO) Pilot Test Report (PTR), contained herein, provides a presentation, summary, and evaluation of the results of the ISCO pilot test conducted at Area 2 of the Troy (Water Street) Site in Troy, Rensselaer County, New York (referred to hereafter as the "Site"). This ISCO PTR was completed in accordance with the ISCO Pilot Test Work Plan Addendum dated July 8, 2005 and approved by the New York State Department of Environmental Conservation (NYSDEC) on July 14, 2005. The ISCO Pilot Test Work Plan Addendum updated and superseded the original work plan entitled In Situ Chemical Oxidation (ISCO) Pre-Design Pilot Test Work Plan, which was submitted in June 2004 (Brown and Caldwell, 2004).

1.1 Site History

A plan of the current Site configuration is shown in Figure 1-1. Industrial operations in Area 2 began in the mid-1800's with iron and steel making facilities. A manufactured gas plant (MGP) was operated in Area 2 from approximately 1924 until the 1950's. The property was sold in 1951 to Republic Steel Corporation, except for the portion of the property necessary to operate and maintain the water gas plant, and subsequently purchased in a series of transactions from 1968 through 1973 by The King Services, Inc. Most of Area 2 is owned by King Fuels, Inc. which, until recently, operated a bulk petroleum storage facility at the location. At present, all of the above ground storage tanks have been removed. It appears that King Fuels currently uses an on-Site petroleum tanker to fill distribution trucks and at times also fills the distribution trucks at an off-Site terminal. Storage tanks still exist underground and supply an on-site bus terminal with diesel fuel and gasoline.

National Grid currently owns a small portion of Area 2 on which a natural gas regulator station is situated. The Site is bordered by a railroad spur to the east, a former Chevron Asphalt terminal to the south and the Hudson River to the west.

1.2 Background

Pursuant to the July 2003 ROD issued by NYSDEC for the site, ISCO was selected as the remedy to address soil deeper than 18 feet below ground surface (bgs) containing total polycyclic aromatic hydrocarbons (PAHs) greater than 500 mg/kg or visual tar or nonaqueous phase liquid (NAPL). Pursuant to the ROD, the objective of ISCO treatment is to treat groundwater until groundwater quality standards for benzene, toluene, ethylbenzene, and xylenes (BTEX) are achieved or until the NYSDEC determines BTEX concentrations have achieved asymptotic levels for a sustained period of time.

A bench-scale treatability study was conducted to determine which ISCO process would be carried forward to the pilot study. Based on the results of bench-scale treatability testing, Fenton's Reagent was the ISCO process selected for field pilot testing.

Pilot test activities commenced in November 2004 with injections of ferrous iron catalyst. Hydrogen peroxide and phosphoric acid injections began on December 29, 2004 and were terminated on January 4, 2005 due to Site access issues. The results generated during this short period were not adequate to draw any conclusions about the effectiveness of ISCO or to establish design parameters. However, the vadose zone monitoring results indicated elevated levels of carbon dioxide, oxygen, and volatile organic compounds (VOCs) in the monitoring points located closest to the IP. Those results indicate that oxidation of organic carbon was taking place, however, the brevity of the test did not allow for any substantial conclusions to be made. Therefore, additional field pilot testing was required to evaluate ISCO once the access issues were resolved.

In June 2005, site access issues were resolved and in July 2005, an ISCO Pilot Test Work Plan Addendum (Brown and Caldwell, 2005), hereafter referred to as the "Work Plan Addendum" was prepared and submitted to NYSDEC. The Work Plan Addendum was approved by NYSDEC in July 2005 and included several pilot test modifications to enable a more thorough evaluation of ISCO via Fenton's Reagent. The pilot test modifications included:

- Installation of a deeper reagent injection point and procedures to conduct pilot testing of ISCO in the deeper groundwater zones;
- Modification of the reagent injection sequence; and
- Additional monitoring.

Pilot test activities resumed in July 2005. Post-treatment monitoring was completed in December 2005. In accordance with the Work Plan Addendum, this ISCO Pilot Test Report includes the following:

- A narrative summary of the pilot test activities;
- A summary of the ISCO reagents injected at each injection point and the time duration required to inject these ISCO reagents;
- Tabulated soil and groundwater sampling results from pre-treatment (i.e., baseline) and post-treatment (first post-treatment round only), and isopleth concentration maps for aqueous and saturated zone BTEX, TPH and PAHs;
- A discussion as to whether the field pilot test confirms the applicability of ISCO;
- Tabulated and/or graphed monitoring results obtained during the injection process to evaluate the horizontal radius of influence (ROI); and
- Tabulated process data results measured during the injection process to establish the injection rates and pressures for a full-scale system, and to evaluate potential permeability changes over time.

In addition, an ISCO *Post*-Pilot Test Sampling Report will be prepared to present the results of the final rounds of post-treatment sampling once the data are available. These results will be compared to the results from the prior post-treatment sampling events to evaluate potential rebound of BTEX levels in the groundwater and/or saturated zone soils.

1.2.1 Fenton's Chemistry

Fenton's chemistry involves the reaction of hydrogen peroxide and ferrous iron (Fenton's Reagent) in a low pH environment to create the highly reactive hydroxyl radical, which can oxidize a wide range of organic contaminants. The Fenton's Reaction is as follows:

$$Fe^{2+} + H_2O_2 \rightarrow Fe^{3+} + OH^{\bullet} + OH^{-}$$

The Fenton's Reaction was first observed in 1894 by H. J. H. Fenton. The classic Fenton's reaction involves low hydrogen peroxide (H_2O_2) concentrations of about 300 ppm (0.03%), oxidizing the ferrous iron (Fe^{2+}) to insoluble ferric iron (Fe^{3+}). If the pH is less than 5, the ferric iron can react with excess hydrogen peroxide to regenerate ferrous iron, which is then available to catalyze the Fenton's Reaction. For in situ applications, these low hydrogen peroxide concentrations are impractical given the inability to create completely mixed conditions. Therefore, higher peroxide concentrations (typically 4-20%) are used and the ISCO system is termed a modified Fenton's system (ITRC, 2005).

Different optimal pH values are reported in the literature with a pH range of 2 to 5. A variety of acids can be used to reduce the aquifer pH, including sulfuric acid, phosphoric acid, hydrochloric acid, and acetic acid.

Another reaction that is important when using Fenton's Reagents for ISCO is the decomposition of hydrogen peroxide, which is a disproportionation reaction (i.e., hydrogen peroxide is both oxidized and reduced) as follows:

$$2H_2O_2 \xrightarrow{\overset{\text{Metal Catalyst}}{\downarrow}} 2H_2O + O_2$$

The decomposition reaction is catalyzed by ferric iron and other common soil minerals (Suthersan et al., 2005). The decomposition reaction is important because the reaction wastes hydrogen peroxide and yields heat and gas (i.e., oxygen gas), which need to be considered during the ISCO injections. The rate of hydrogen peroxide decomposition increases logarithmically with increasing temperature, so once the exothermic process is initiated it rapidly accelerates. A certain amount of decomposition is inevitable due to the general ubiquitous presence of these metal catalysts in soil. However, high hydrogen peroxide concentrations or high injection rates can result in excessive decomposition, which can result in inefficient use of peroxide, extreme groundwater temperatures (i.e., temperatures at or approaching boiling), and large-scale gas generation.

1.3 Pilot Test Objectives

Pursuant the Work Plan Addendum, the objectives of the ISCO pilot test were to:

- Determine if field pilot testing confirms the applicability of ISCO as indicated by the bench-scale testing.
- Determine the range of horizontal and vertical radii of influence of the ISCO process around the injection point (IP).

- Determine the maximum rate of transfer of ISCO reagents into the Site's saturated zone.
- Determine the quantity of chemical reagents required to effectively reduce aqueous BTEX concentrations.
- Evaluate potential rebound of aqueous BTEX concentrations after chemical oxidant injections are suspended.

2 PILOT TEST METHODS AND PROCEDURES

2.1 Pilot Test Layout

The pilot test area is located in the northern end of Area 2 and to the west of the former water gas building (refer to Figures 1-1 and 2-1). This area is downgradient from a former tar liquor sump used during MGP operations and, during previous investigation activities and initial pilot test activities, was found to be significantly impacted with MGP- and petroleum-derived NAPL's. As indicated on Figures 1-1 and 2-1, the pilot test area is within the former alignment of the Wynants Kill, which was re-aligned to the north in the 1930s.

The overburden in the pilot test area consists of a fill layer overlying naturally occurring deposits. Figure 2-3 presents a geological cross-section of the pilot test area. The fill layer consist of a heterogeneous mixture of industrial fill, consisting primarily of slag, cinders, ash, bricks, and gravel. The fill layer overlies recent alluvial deposits. In general, silt and clay alluvial deposits overlie coarser, predominately sand and gravel alluvium. Glacial outwash deposits, consisting of stratified sand and gravel ranging from fine sand to coarse gravel with cobbles and boulders, occur beneath the alluvial deposits. Below the glacial outwash is glacial till, which consists of poorly sorted clay, silt, sand, and gravel mixtures. The unconsolidated overburden materials are underlain by thinly bedded, weathered, dark grey to black shale bedrock.

The fill materials in the pilot test extend to approximately 31 to 32 feet below ground surface (bgs) at the centerline of the former Wynants Kill channel and to approximately 24 feet bgs at the western and eastern banks of the former channel. The water table in the pilot test area occurs at approximately 17 to 19 feet bgs. Subsurface investigation results indicate that MGP and petroleum impacts in the pilot test area are primarily confined to the fill material and that the saturated, finer-grained alluvial deposits generally act as a vertical impediment to constituent migration. Therefore, the pilot test focused on the saturated fill materials.

The pilot test included two injections points (IP-1 and IP-2). IP-1 is screened from 18 to 23 feet bgs, which represents the upper portion of the saturated zone and, based on observations during the initial pilot test, is significantly impacted with petroleum hydrocarbon LNAPL in addition to MGP (coal tar) residuals. Since the petroleum LNAPL would likely impact the pilot test results for the shallow zone, a deeper injection point (IP-2), screened from 25.5-30.5 feet bgs, was installed to facilitate a deep zone pilot test to evaluate ISCO in zones impacted primarily with coal tar residuals. The shallow zone represents the zone extending from the water table to approximately 25 feet bgs. The deep zone represents the portion of saturated fill that is contained within the banks of the former Wynants Kill. This zone extends from approximately 25 feet bgs to the base of the fill layer within the former Wynants Kill channel, which is as deep as 31 to 32 feet bgs along the centerline.

Figure 2-1 presents the pilot test layout, which includes the two injection points (IP-1 and IP-2) and a network of monitoring wells (MWs) and shallow and deep zone monitoring points (MPs).

2.2 Pilot Test Activities

Following resolution of Site access issues, field activities associated with the ISCO pilot test commenced in July 2005. In general, the pilot test consisted of the following field activities, which are discussed in following subsections:

- Groundwater grab sampling
- Installation of deep zone injection point, IP-2 (the shallow zone injection point, IP-1, was previously installed in October 2004)
- Installation of supplemental monitoring points
- Baseline soil sampling and groundwater monitoring
- Mobilization
- Chemical reagent injections at IP-1 (shallow zone)
- Monitoring during shallow zone injections
- Chemical reagent injections at IP-2 (deep zone)
- Monitoring during deep zone injections
- Post-treatment soil sampling and groundwater monitoring
- Demobilization

2.2.1 Groundwater Grab Sampling

Prior to the pilot test, no monitoring points existed that were screened only in the deep zone. Therefore, prior to installing a deep injection point, groundwater grab sampling was conducted to confirm that elevated BTEX concentrations were present at depth in the saturated fill materials. Direct-push (Geoprobe®) methods were employed to collect 14 groundwater grab samples from 10 boreholes in the pilot test area. A Geoprobe® groundwater sampling probe was used in combination with an inertial pumping system, which consisted of polyethylene tubing and a stainless steel check valve (Waterra, Inc.), to extract the groundwater samples. Water was pumped through the tubing by oscillating the tubing up and down. In addition, five (5) samples were collected from existing monitoring points. The groundwater samples were submitted to Columbia Analytical Services, Inc. (CAS) of Rochester, New York for analysis of BTEX. The results from the groundwater grab sampling are presented in Table 2-1. As indicated in the table, elevated BTEX concentrations were detected in groundwater in the deeper fill deposits. Therefore, the deep zone pilot test was retained in the pilot test program.

2.2.2 Deep Zone Injection Point and Monitoring Point Installation

The shallow zone injection point, IP-1, was installed in October 2004 during the initial pilot test mobilization. Six (6) monitoring points were also installed during the initial pilot test mobilization, including MP-1S, MP-4S, MP-7S, MP-8S, MP-9S, and MP-10, which are shown on Figure 2-1.

After confirming that elevated BTEX concentrations were present in deep saturated fill materials at the pilot test area, the deep injection point (IP-2) and supplemental MPs were installed.

IP-2 was installed by hollow stem auger drilling methods. Split-spoon sampling was conducted to characterize the soil and facilitate placement of the screen in the fill materials. Similar to IP-1, IP-2 was constructed of Schedule 40, 2" outside diameter (OD), 304 stainless steel casing with Schedule 40, 2" OD, 20-slot, 304 stainless steel screen. A five-foot screen, spanning 25.5 to 30.5 feet bgs, was set within a silica sandpack (no. 1 Morie).

Three (3) additional shallow zone and 11 deep zone MPs were installed in July 2005. The shallow zone MPs installed in July 2005 consist of MP-11S, MP-12S, and MP-13S. The deep zone MPs consist of MP-1D, MP-2D, MP-4D, MP-7D, MP-8D, MP-9D, MP-11D, MP-12D, MP-13D, MP-21D, and MP-27D. The MPs were installed via Geoprobe® methods. The screened intervals were pre-determined based on the geological information generated from previous investigation activities. The MPs consist of Schedule 40, ¾" OD, PVC 10-slot screen and riser, completed with flush-mounted, drive-over road boxes with protective steel casings.

Table 2-2 summarizes the well construction information for the MPs and MWs employed during the pilot test activities. Three existing monitoring wells (MW-21, MW-27, and MW-39) were employed during the pilot test.

The well logs for IP-1, IP-2, and the MPs are included in Appendix E.

2.2.3 Baseline Monitoring

Baseline monitoring was conducted to evaluate pre-treatment constituent concentrations in soil and groundwater in the pilot test area. Baseline groundwater monitoring consisted of a round of groundwater monitoring at each of the wells in the pilot test area, including MPs, MWs, and the two IPs (26 wells total). Groundwater samples were sent to CAS for analysis of TPH, PAHs, BTEX, total manganese, total iron, total organic carbon (TOC), and alkalinity. The reduced form of iron (Fe^{+2}), dissolved manganese, and carbon dioxide were also monitored in the field with Hach kits. Water quality parameters of pH, temperature, dissolved oxygen, and ORP were measured in the field via an Horiba U-22.

12 soil borings (SB-200 to SB-211) were advanced in the pilot test area to characterize pre-treatment saturated soil conditions. The boring locations are depicted on Figure 2-2. In general, samples were collected at the following intervals (feet bgs): 18-20, 22-24, 26-28, and 28-30. SB-208 and SB-209 were advanced on the edges of the former Wynants Kill channel where the bottom of the fill layer is shallower. Therefore, these borings were terminated shallower than the other borings. A total of 48 baseline soil samples (including 3 duplicates) were submitted to CAS for analysis of TPH, PAHs, BTEX, total inorganic carbon (TIC), TOC, total manganese, and total iron.

2.2.4 Mobilization

Mobilization activities commenced on August 10, 2005 and included the following activities:

- Office trailer set-up
- Mobilize 20 kilowatt diesel generator to Site
- Set-up secondary containment area with perimeter fencing for storage of chemical reagents

- Set-up Emergency shower
- Set-up and fill 4,800-gallon potable water tank
- Mobilize and set-up ISCO remediation trailer
- Establish telephone and electrical connections
- Received first shipment of chemical reagents
- Perform miscellaneous mechanical connections

2.2.5 Reagent Injections

The ISCO reagents delivered to the site during the pilot test consisted of the following:

- Acid: 35% Phosphoric Acid
- Catalyst: ferrous sulfate heptahydrate ($FeSO_4 \cdot 7H_2O$)
- Peroxide: 35% Hydrogen Peroxide

The 35% phosphoric acid and 35% hydrogen peroxide were both delivered to the site in 300-gallon chemical totes which were stored within the fenced secondary containment area. The ferrous sulfate was delivered to the site in 50-pound bags arranged on a pallet, which was stored in a dry location away from the hydrogen peroxide totes.

A trailer-mounted ISCO system was employed to conduct the batch-mode chemical reagent injections. The ISCO system consisted of the following main components: 1) drum transfer pumps and flow meter systems for transferring reagents into a mix tank, 2) a 300-gallon capacity mix tank and mixer to prepare batches of ISCO reagent mixtures prior to injecting, 3) a centrifugal pump system including a variable frequency drive to control the pumping rate, and 4) IP manifold to connect the injection point to the delivery system.

ISCO reagents were injected first at the shallow zone injection point (IP-1) and then at the deep zone injection point (IP-2). At each injection point, the injection sequence consisted of iron catalyst/acid injections followed by hydrogen peroxide/acid solution injections. The frequency of cycling between catalyst and peroxide solution injections was based on the results of monitoring conducted during the injection phase. In general, depletion of ferrous iron catalyst was indicated by either low ferrous iron concentrations or high hydrogen peroxide concentrations (i.e., the presence of high concentrations of hydrogen peroxide in samples indicates that there is insufficient ferrous iron to react with the peroxide).

The iron catalyst/acid injections consisted of ferrous sulfate heptahydrate ($FeSO_4 \cdot 7H_2O$) dissolved into a solution of potable water and phosphoric acid. The peroxide/acid solution consisted of the bulk 35% hydrogen peroxide solution diluted with potable water and mixed with phosphoric acid to achieve the desired pH. The quantity of phosphoric acid added to each batch was adjusted during the pilot test to achieve and maintain the target pH range of 2-5 in groundwater.

Reagent injection volumes and duration were dictated by the data generated from monitoring during the injection phase, which included vadose zone and groundwater screening and periodic groundwater sampling and laboratory analysis for BTEX, which are discussed in Section 2.2.6.

Reagent injections in the shallow zone commenced on August 16, 2005 and continued until September 6, 2005. Deep zone injections took place from September 7 to September 29, 2005.

2.2.6 Interim Monitoring

Interim monitoring refers to monitoring conducted during reagent injections. During injections, the following parameters were periodically monitored in the field at selected MWs and MPs to provide real time information about ISCO performance, safety parameters of field personnel, and the basis for making field changes to the injection program.

Vadose Zone Screening Parameters:

1. total VOCs (via a photoionization detector);
2. combustible gas indicator parameters including Lower Explosion Limit (LEL), % oxygen, and carbon dioxide (via a toxic/combustible gas analyzer); and
3. hydrogen sulfide.

Groundwater Screening Parameters:

1. water quality parameters including pH, temperature, dissolved oxygen (via a water quality analyzer);
2. hydrogen peroxide concentration (via peroxide Reflectoquant test strips);
3. ferrous iron (via Hach kits); and
4. carbon dioxide (via Hach kits).

The vadose zone screening parameters were collected from the well headspace before and after the injection of each batch of ISCO reagents. The groundwater screening parameters were collected at a minimum two times daily (i.e., at the start and end of each day). Groundwater elevations were measured two to three times per week via an interface probe.

Additionally, the following process data were recorded:

1. water temperature (deg F) in the injection screen (via thermocouple);
2. injection pump speed (rpm), frequency (hertz), and flow rate (gpm);
3. injection pump discharge pressure (psi);
4. IP manifold (pump side) pressure (psi);
5. IP manifold (IP side) pressure (psi);
6. total mix tank batch injection time; and
7. total volume of solution injected.

During the course of the injections, periodic groundwater monitoring of BTEX compounds was conducted to assess the impact reagent injections were having on BTEX concentrations. During the course of the shallow zone injections, five (5) rounds of BTEX monitoring were performed. Four (4) rounds of BTEX monitoring were conducted during the deep zone injections. The samples were sent to CAS for analysis of BTEX.

2.2.7 Post-Treatment Monitoring

Post-treatment sampling events were conducted at approximately one (1), three (3), six (6), and 12 weeks following the completion of the ISCO reagent injections. The post-treatment sampling events were designed to evaluate potential seasonal fluctuations, as well as to assess potential rebound effects.

From October 3 to 10, 2005, 12 soil borings (SB-200P to SB-211P) were completed in the pilot test area to characterize post-treatment saturated soil conditions. The boring locations are depicted on Figure 2-2. In general, samples were collected at the following intervals (feet bgs): 18-20, 22-24, 26-28, and 28-30. A total of 50 post-treatment soil samples (including 3 duplicates) were submitted to CAS for analysis of TPH, PAHs, BTEX, TIC, TOC, total manganese, and total iron.

At approximately 1, 3, 6, and 12 weeks following cessation of reagent injections in the shallow zone, post-treatment groundwater samples were collected from the shallow zone MPs and MWs. These groundwater samples were sent to CAS for analysis of TPH, PAHs, BTEX, total manganese, total iron, TOC, and alkalinity. Ferrous iron, dissolved manganese, and carbon dioxide were monitored in the field with Hach kits. Water quality parameters of pH, temperature, and dissolved oxygen, were measured in the field with a water quality analyzer.

Similarly, at approximately 1, 3, 6, and 12 weeks following cessation of reagent injections in the deep zone, post-treatment groundwater samples were collected from the deep zone MPs. These groundwater samples were analyzed for the same parameters as the shallow zone samples.

Results from the first two post-treatment rounds (i.e., Post-Treatment Weeks 1 and 3) are presented herein. Results from the final rounds of post-treatment groundwater sampling (i.e., Post-Treatment Week 6 and 12) will be presented in a subsequent ISCO Post-Pilot Test Sampling Report.

3 PILOT TEST RESULTS AND DISCUSSION

3.1 Baseline Monitoring Data

Figure 3-1a depicts the groundwater contour map for baseline conditions. In general, groundwater at the site flows from the east to the west toward the Hudson River. Groundwater may also discharge to the present day Wynants Kill, particularly in the area east of the channelized portion of the creek. Groundwater flow within the pilot test area is influenced by the former Wynants Kill channel, which runs north to south through the pilot test area and may be in hydraulic communication with the present-day Wynants Kill. The relatively coarse granular fill materials in the former Wynants Kill provide a preferential pathway for groundwater flow, apparently causing groundwater to fan out to the north and south across the test area. The anomalous water elevation at MP-13S indicates a potential preferential flow pathway within the saturated fill, which may exist as a result of general variability in fill materials or the possible existence of former utility lines and associated bedding.

Consistent with previous investigation activities, the baseline monitoring results indicate that the pilot test area is impacted with MGP residuals (i.e., coal tar) and petroleum hydrocarbons. BTEX, PAHs, and TPH were detected throughout the shallow and deep zone soil and groundwater.

A comprehensive table of the groundwater analytical results, including baseline conditions, is presented in Appendix A. Appendix B presents a comprehensive table of the soil analytical results.

Figure 3-2a and 3-3a present the isocontours for baseline aqueous BTEX concentrations in shallow zone and deep zone groundwater, respectively. Figure 3-4a and 3-5a present the isocontours for baseline aqueous total PAH concentrations in shallow zone and deep zone groundwater, respectively. Figure 3-6a and 3-7a present the isocontours for baseline aqueous TPH concentrations in shallow zone and deep zone groundwater, respectively. Figure 3-8, 3-9, and 3-10 present the baseline BTEX, total PAH, and TPH concentrations in soil, respectively.

NAPL was encountered in each of the 12 borings completed during the baseline soil sampling. Petroleum NAPL was encountered in all but three borings (SB-208, SB-205, and SB-211). Coal tar was evident in all 12 borings. Identification of petroleum and coal tar NAPL was based on field observations (visible and odor indicators).

The groundwater monitoring data indicate little variation between constituent concentrations in the shallow and deep zones. In general, BTEX, total PAH, and TPH concentrations at corresponding well couplets are similar.

3.2 Reagent Injections

Table 3-1 presents a summary of the reagent injections for each the shallow and deep zones.

Shallow Zone

Reagent injections in the shallow zone commenced on August 16, 2005 and continued until September 6, 2005.

A total of 16,534 gallons of ISCO solutions were injected through IP-1. Assuming a total porosity of 35% and a 7-foot vertical zone of influence, the injected solution volume represents approximately 46% of the pore volume within a 25 foot radius of influence (ROI) or 72% of the pore volume within a 20 foot ROI. Groundwater flow occurs through a portion of the available pore space, which is represented by effective porosity. Therefore, the injected solution volume represents a greater percentage of the effective pore volume than the total pore volume. For example, assuming an effective porosity of 25%, the injected solution volume represents approximately 64% of the pore volume within a 25 foot ROI or 101% of the pore volume within a 20 foot ROI. In zones heavily impacted with NAPL, the effective porosity may be significantly reduced, as NAPL may occupy a considerable portion of the pore space.

Approximately 4,559 gallons of iron catalyst solution was injected through IP-1 in 18 batch injections. A total of 2,250 pounds of ferrous sulfate heptahydrate or 450 pounds of ferrous iron (20% by weight) was delivered to the test zone.

Approximately 11,975 gallons of hydrogen peroxide solution was injected through IP-1 in 47 batch injections. An approximate hydrogen peroxide concentration of 12-13% (by weight) was used at IP-1 to deliver a total of 12,867 pounds of hydrogen peroxide to the test zone.

As discussed previously, phosphoric acid was co-injected with each the iron catalyst and hydrogen peroxide to establish and maintain a groundwater pH within the target range of 2 to 5. In total, 966 gallons of phosphoric acid was injected at IP-1.

Deep Zone

Deep zone injections took place from September 7 to September 29, 2005.

A total of 18,006 gallons of reagents were injected through IP-2. Assuming a total porosity of 35% and a 5-foot zone of influence, the injected solution volume represents approximately 70% of the pore volume within a 25 foot ROI or 109% of the pore volume within a 20 foot ROI. Assuming an effective porosity of 25%, the injected solution volume represents approximately 98% of the pore volume within a 25 foot ROI or 153% of the pore volume within a 20 foot ROI.

Approximately 3,081 gallons of iron catalyst solution was injected through IP-2 in 18 batch injections. A total of 1,500 pounds of ferrous sulfate heptahydrate or 300 pounds of ferrous iron (20% by weight) was delivered to the test zone.

Approximately 14,670 gallons of hydrogen peroxide solution was injected through IP-2 in 47 batch injections. An approximate hydrogen peroxide concentration of 10% (by weight) was used at IP-2, resulting in delivery of a total of 13,082 pounds of hydrogen peroxide to the test zone. A 12-13% (by weight) hydrogen peroxide concentration was initially used at IP-2, however, excessive groundwater temperatures (as high as 84°C) and some foaming at MP-8S (located 2.5 feet from IP-2) were observed. As a result, the hydrogen peroxide concentration at IP-2 was reduced to approximately 10%, which avoided the high temperatures and foaming for the duration of injections.

In total, 770 gallons of phosphoric acid was injected at IP-2 to achieve the desired groundwater pH.

3.3 Interim Monitoring Data

As discussed previously, reagent injections in the shallow zone were conducted from August 16 to September 6, 2005. Deep zone injections took place from September 7 to September 29, 2005. During the reagent injections, monitoring was conducted to provide real time information about ISCO performance, provide monitoring of the safety conditions for field personnel, and provide the basis for making field changes to the injection program. The interim monitoring results are discussed in the following subsections.

3.3.1 Vadose Zone Screening

Vadose zone screening was conducted during the pilot test to characterize the vadose zone gases during reagent injections. The gases present in the vadose zone provide an indication of the reactions taking place in groundwater. The shallow monitoring points were screened across the water table into the vadose zone and were used as vadose zone monitoring points for both the shallow and deep zone injections. Vadose zone screening parameters were collected before and after the injection of each batch of ISCO reagents. It is important to note that gases can travel in any direction in the vadose zone and the presence of indicator gases at a monitoring point is not necessarily the result of reactions occurring in groundwater at that location.

When ISCO via Fenton's Reagent is effectively oxidizing VOCs in groundwater, elevated concentrations of oxygen, carbon dioxide, and VOCs would be anticipated in vadose zone gases (Suthersan et al, 2005). The significance of each parameter is discussed below:

- **Oxygen (O_2):** the generation of oxygen gas is inevitable when, hydrogen peroxide is applied to the subsurface, since ubiquitous soil minerals (e.g., ferric iron) catalyze the decomposition of hydrogen peroxide to oxygen and water. The absence of elevated oxygen levels indicates that peroxide has not reached the monitoring point.

- **Carbon Dioxide (CO_2):** carbon dioxide is a product of the chemical oxidation of hydrocarbons. Therefore, if hydroxyl radicals are being generated (i.e., hydrogen peroxide is effectively reacting with ferrous iron catalyst) then oxidation of organics will occur and carbon dioxide will be generated. Carbon dioxide can also be generated by the addition of acid, as the reduction in pH will cause the dissolved carbonate system to shift to carbon dioxide. The absence of elevated carbon dioxide levels could indicate that ferrous iron catalyst is depleted or that there is little organic carbon remaining to be oxidized.

- **VOCs:** oxygen and carbon dioxide bubbles generated during the process will strip VOCs from groundwater and carry them into the vadose zone. The stripping is enhanced by exothermic heating. The presence of VOCs in vadose zone gases indicates that VOCs remain in the aquifer. The presence of low VOC concentrations indicates that the either the ISCO process is not occurring at the monitoring point (i.e., if low oxygen and/or carbon dioxide levels accompany the low VOC readings) or that VOCs have been depleted (i.e., if high oxygen and/or carbon dioxide levels accompany the low VOC readings).

The vadose zone screening results are presented in graphical form in Appendix C.

The shallow zone vadose zone screening graphs indicate consistent ISCO influence in the vicinity of MP-7S, MP-8S, and MP-11S. The deep zone vadose zone screening graphs also indicate ISCO influence in the vicinity of MP-7S, MP-8S, and MP-11S. The graphs show isolated spikes in concentrations of indicator gases at several other monitoring points, which may be the result of ISCO activities. In general, the spikes consisted of elevated levels in one or two of the indicator gases, but not all three, and were not considered strong indications of consistent ISCO influence.

The vadose zone screening graphs also indicate several isolated spikes in hydrogen sulfide concentrations, particularly at MP-1S and MP-8S. Generation of hydrogen sulfide would not be anticipated in a strongly oxidizing environment such as that produced during ISCO activities. However, the presence of hydrogen sulfide may suggest that hydrogen sulfide gas is present in the saturated zone and/or the vadose zone and was displaced by the gases generated during ISCO. In general, the hydrogen sulfide detections occurred during the early stages of ISCO injection at either the shallow or deep IP, which supports that gases generated during ISCO displaced existing hydrogen sulfide gas.

3.3.2 Groundwater Screening

Groundwater screening was conducted during the pilot test to monitor changes in pH, temperature, dissolved oxygen (DO), hydrogen peroxide, ferrous iron, and carbon dioxide during reagent injections. Groundwater screening parameters were collected at a minimum two times daily (i.e., at the start and end of each day). In addition, groundwater elevations were measured several times per week via an interface probe. The significance of each parameter is discussed below:

- **pH:** the optimal pH range for the Fenton's Reaction is 2 to 5 pH units. Phosphoric acid was co-injected with the iron catalyst and hydrogen peroxide solutions to achieve and maintain the target pH. The quantity of acid per batch was adjusted based on the pH levels measured in the field. The zone of decreased pH does not necessarily indicate zone of influence of the ISCO reagents as the effects from the acid injections may have a greater areal extent than the iron catalyst and hydrogen peroxide.

- **Temperature:** application of Fenton's Reagents results in the generation of heat, primarily via the decomposition of peroxide catalyzed by soil minerals. The exothermic reaction peroxide decomposition reaction increases exponentially with increasing temperature, so once the exothermic process is initiated it rapidly accelerates. Therefore, temperature monitoring is important to confirm that the injections do not result in excessive groundwater temperatures. Temperature has a significant impact on the physical and chemical properties that affect the way constituents behave in the subsurface.

- **Dissolved Oxygen (DO):** application of hydrogen peroxide results in the generation of oxygen gas, a portion of which is dissolved into groundwater. Therefore, an increase in DO would be apparent in areas impacted by hydrogen peroxide applications.

- **Hydrogen Peroxide (H_2O_2):** hydrogen peroxide test strips were used to monitor the distribution of hydrogen peroxide in the subsurface. In general, the presence of hydrogen peroxide in a groundwater sample will only be observed in instances where excess peroxide is present relative to the reactive iron species (i.e., if ferrous or ferric iron are present at levels that satisfy the stoichiometric demand of the peroxide, then the peroxide will have been consumed in the subsurface prior to extracting the sample and peroxide will not show up in the sample).

- **Ferrous Iron (Fe^{+2}):** ferrous iron was measured to monitor the presence of iron catalyst in the pilot test area. When ferrous iron levels are low, hydroxyl radical will not be generated and oxidation will not occur at any appreciable level. Ferrous iron concentrations and vadose screening results were used to dictate the timing of catalyst injections.
- **Carbon Dioxide (CO_2):** as presented in Section 3.2.1 for vadose zone screening, carbon dioxide is a product of the chemical oxidation of hydrocarbons. Therefore, if hydroxyl radicals are being generated (i.e., hydrogen peroxide is effectively reacting with ferrous iron catalyst) then oxidation of organics will occur and carbon dioxide will be generated. Carbon dioxide can also be generated by the addition of acid, as the reduction in pH will cause the dissolved carbonate system to shift to carbon dioxide. The absence of carbon dioxide could indicate that ferrous iron catalyst is depleted or that there is little organic carbon remaining to be oxidized.
- **Water Levels:** groundwater levels were periodically measured to assess the extent of groundwater mounding resulting from the reagent injections. Groundwater mounding can be used to estimate the hydraulic gradient established by the injections and in turn to estimate the rate that reagent are transported in the aquifer (i.e., groundwater seepage velocity) from the injection point.

The groundwater screening results are presented in graphical form in Appendix D.

Shallow Zone

The shallow zone groundwater screening graphs indicate the distribution of the Fenton's Reagent constituents to MP-1S, MP-7S, MP-8S, MP-9S, and MP-11S. Hydrogen peroxide has a short half-life in the subsurface, which is on the order of hours (Pardieck et al., 1992). Consequently, the zone of influence of a Fenton's Reagent ISCO application is primarily dictated by the zone of influence of hydrogen peroxide, which is a function of the distribution velocity and hydrogen peroxide rate of reaction. The data indicate a hydrogen peroxide zone of influence extending approximately 24 feet downgradient from the injection point (i.e., at MP-7S, MP-8S, and MP-11S), more than 7 feet upgradient (i.e., at MP-9S), and more than 16 feet side-gradient (i.e., at MP-1S).

The screening data indicate that reduced pH levels (to within the target range of 2 to 5) and ferrous iron catalyst had a larger zone of influence than hydrogen peroxide. The data indicate that pH and iron catalyst did not limit the effective zone of influence of the ISCO.

The graphs indicate fluctuations in groundwater screening parameters at monitoring locations other than those identified to be within the ISCO zone of influence. The results at these locations are not considered strong indications of ISCO, since the results for one or more screening parameters are conflicting. For example, at MP-4S, fluctuations in carbon dioxide were observed, which could indicate oxidation. However, other parameters measured at this location do not support the occurrence of oxidation. The pH at MP-4S was reduced and maintained within the target range and ferrous iron concentrations were fairly stable indicating ferrous iron was not being consumed by the Fenton's reaction.

Temperature screening data indicate an 8 to 20°C increase in groundwater temperatures from baseline, which ranged from 19 to 22°C. Temperature increases were observed at MP-1S, MP-7S, MP-8S, MP-9S, MP-11S, MP-13S, and MW-21. Groundwater temperatures increased to as high as 41°C (i.e., at MP-7S) downgradient of injection point, 29°C upgradient (i.e., at MP-9S), and 28°C side-gradient (i.e., at MP-1S). Baseline temperatures generally ranged from 11 to 15°C.

Groundwater level monitoring indicated a slight increase in groundwater elevations over the course of the ISCO injections at IP-1, where injection rates ranged from 10 to 20 gpm and average approximately 17 gpm. At MP-8S and MP-9S, which are closest to IP-1, groundwater levels increased by approximately 0.7 and 0.9 feet, respectively. At MP-1S, MP-7S, MP-11S, and MP-13S, which are located from 16 to 26 feet from IP-1, a 0.2 to 0.3 foot increase in groundwater levels was observed. This small degree of groundwater mounding is attributable to the high hydraulic conductivity of the fill.

Increased DO and carbon dioxide levels were observed at most of the wells included in the pilot test monitoring network.

Deep Zone

Baseline groundwater screening in the deep zone indicated influence in the deeper zone from shallow zone injections, particularly for groundwater pH, temperature, carbon dioxide, and DO.

The deep zone groundwater screening graphs indicate the distribution of Fenton's Reagents to MP-7D and MP-8S. Groundwater at each of these wells is within the target pH range and indicates the presence of hydrogen peroxide when ferrous iron levels are low, which, as discussed above, is when it is expected that hydrogen peroxide would be detectable.

MP-8S is located only 2.5 feet from IP-2 and is screened from 11 to 26 feet bgs, which extends into the deep zone. Therefore, an impact from deep zone injections was anticipated at MP-8S and the monitoring point was incorporated into the deep zone groundwater screening.

It is inconclusive whether hydrogen peroxide distribution extended to MP-1D, MP-11D, MP-12D, MP-13D, and MP-21D. The graphs for MP-1D, MP-11D, MP-12D, MP-13D, and MP-21D are similar. Groundwater at each well is within the target pH range and ferrous iron catalyst is present at elevated concentrations. Large fluctuations in ferrous iron concentrations were apparent, which indicate reaction with hydrogen peroxide; however, hydrogen peroxide was not detected at any of these wells. As discussed previously, detecting hydrogen peroxide at these monitoring points would not be expected given the elevated ferrous iron concentrations.

Similar to the shallow zone groundwater screening results, the deep zone graphs indicate fluctuations in groundwater screening parameters at monitoring locations other than those identified to be within or potentially within the zone of influence of the deep zone injections. However, the results at these locations are not considered strong indications of ISCO, since the results for one or more screening parameters are conflicting. For example, if pH levels were not reduced to and maintained within the target range at a particular monitoring location, then it is likely that hydrogen peroxide did not reach the monitoring point, since the data suggests the injected acid had a larger zone of influence than hydrogen peroxide.

The screening data also indicate that MP-8D and MP-9D are not within the effective zone of influence of the deep ISCO injections, which was unexpected given their proximity to IP-2. pH levels at these two points are relatively unchanged from baseline conditions and are significantly higher than at surrounding monitoring points. It is suspected that the wells were screened within the relatively impermeable native soil and are in poor hydraulic communication with IP-2, which in screened in the more conductive fill layer.

To facilitate post-treatment monitoring, discussed in Section 3.3, RMW-8D was installed in October 2005 to replace MP-8D. A replacement well for MP-9D was not installed, since the screened interval for MP-9S (13 to 28 ft bgs) intersects the shallow and deep zones and, based on the soil boring log for the adjacent soil boring SB-205, is likely screened to the bottom of the fill layer.

Temperature screening data indicate elevated temperature at nearly every deep zone monitoring point (exceptions are MP-4D and MP-27D). Elevated groundwater temperatures ranged from approximately 26 to 42°C, compared to baseline temperatures, which generally ranged from 12 to 15°C.

Groundwater level monitoring indicated very little change over the course of the deep zone ISCO injections at IP-2, where injection rates averaged approximately 10 gpm.

Increased DO and carbon dioxide levels were observed at most of the wells included in the pilot test monitoring network.

3.3.3 Process Data

Shallow Zone

Groundwater temperature at IP-1 during the reagent injections is presented in Appendix D. In general groundwater temperatures ranged from 80 to 100°F (27 to 38°C) during injections, with a maximum detected groundwater temperature of 106°F (41°C).

Reagent injection rates at IP-1 ranged from 10 to 20 gpm and averaged approximately 17 gpm. The pressure gauge readings at IP-1 ranged from 0 to 1.0 psi during reagent injections, which reflect the highly conductive properties of the saturated fill. Occasionally, ISCO solutions flowed into the well under a siphon. The injection rates and pressure reading did not indicate any significant permeability changes in the vicinity of the IP-1.

For health and safety purposes, a flowrate for hydrogen peroxide solution higher than 20 gpm was not attempted at IP-1. An injection test was conducted at IP-1 to estimate the maximum achievable flowrate from a hydraulics standpoint. A flowrate of 45 gpm was achieved before the pump controller reached a maximum of 60 hertz. At this flowrate a wellhead pressure of 3 psi was recorded.

Deep Zone

Groundwater temperature at IP-2 during the reagent injections is presented also presented Appendix D. In general groundwater temperatures ranged from 80 to 100°F (27 to 38°C) during injections with the 10% hydrogen peroxide solution, with a maximum detected groundwater temperature of 105°F (41°C). During initial solution injections with a 12-13% hydrogen peroxide solution, groundwater temperatures reached 183°F (84°C).

Reagent injection rates at IP-2 ranged from approximately 8 to 11 gpm and averaged approximately 10 gpm. The pressure gauge readings at IP-1 ranged from 0 to 2.0 psi during reagent injections, which indicate the highly conducive properties of the saturated fill. A majority of the time reagents flowed into the IP-2 under a siphon. The injection rates and pressure reading did not indicate any significant permeability changes in the vicinity of the IP-2.

Initial hydrogen peroxide injections in the deep zone consisted of 12-13% (by weight) hydrogen peroxide solution at 10 gpm. Excessive groundwater temperatures and foaming were observed using this combination of hydrogen peroxide concentration and flow rate. Consequently, the hydrogen peroxide concentration was reduced to 10% and the unfavorable conditions, described above, were avoided.

3.3.4 Interim BTEX

Interim BTEX concentrations were monitored during reagent injections to monitor the progress of ISCO. It is important to note that during chemical injections, changes in constituent concentrations are not solely the result of chemical oxidation. Changes in constituent concentrations also occur from the effects of dilution, desorption, and dissolution. The volume of solution injected will result in lower constituent concentrations simply through dilution. Transient increases in constituent concentrations may also occur during injections. The injected reagent can displace contaminated groundwater from the vicinity of the injection point resulting in increased concentrations at points downgradient. In addition, the ISCO process can drastically disrupt the equilibrium of constituents in the subsurface. The process increases desorption of constituents as the natural organic carbon adsorption sites are oxidized releasing constituents into the aqueous phase. Furthermore, the increased temperature resulting from ISCO via Fenton's Reagent, increases the constituent solubility as well as the rate of partitioning into the aqueous phase. This shift in equilibrium, which results in higher aqueous phase concentrations, is favorable for ISCO, since effective chemical oxidation occurs on constituents in the aqueous phase. However, in scenarios where the mass of non-aqueous and adsorbed-phase constituents is high, more mass may partition into the aqueous phase than can be oxidized and higher dissolved concentrations may result.

Due to the effects of dilution, desorption, and dissolution, the more important groundwater comparison is that between baseline and post-treatment BTEX concentrations, as post-treatment results indicate the effects of rebound.

Shallow Zone

Table 3-2 presents a summary of the shallow zone interim BTEX monitoring results. The results indicate greater than 90% reductions in aqueous BTEX concentrations at IP-1, MP-1S, MP-7S, MP-8S, and MP-9S. A reduction of 84% was observed at MP-11S. A 45% reduction was observed at MP-10.

Several monitoring points exhibited increases in BTEX concentrations during ISCO injections. A two-order of magnitude increase in aqueous BTEX concentrations was observed at MP-13S. Concentrations at MW-27 and MP-4S increased approximately two-fold. NAPL accumulated in MP-12S and MP-13S in amounts far greater than noted in this area before the ISCO pilot test. MP-12S was not monitored after the first week of injections due to the quantities of NAPL in the monitoring point.

Deep Zone

Table 3-3 presents a summary of the deep zone interim BTEX monitoring results. The results indicated a 99.8% reduction in aqueous BTEX concentrations at MP-7D. A 60% reduction was observed at MP-12D.

As indicated in Section 3.3.2, it is suspected that MP-8D and MP-9D are screened within the native soil and are outside the zone of influence of the ISCO injections at IP-2. Therefore, the interim BTEX data from these wells, which remain elevated throughout the injections, are not considered representative of groundwater in the overlying fill zone at these locations.

MP-11D and MP-13D exhibited slight increases in aqueous BTEX concentrations and MP-21D exhibited an order of magnitude increase. NAPL accumulation was observed in MP-12D and MP-21D.

3.3.5 NAPL

As indicated in Section 3.3.4, significant accumulations of NAPL were observed in several of the monitoring wells during the ISCO reagent injections, including MP-12S, MP-13S, MP12D, and MP-21D. The influx of NAPL into these wells during the ISCO injections is likely due in part to the increased temperatures in the pilot test area. As the temperature increased, the viscosity of the NAPL decreased along with a possible decrease in interfacial surface tension. As the forces restricting NAPL migration were reduced, reagent injections pushed it radially outward.

ISCO is generally most applicable to saturated zones with high aqueous constituent concentrations that have little NAPL. ISCO can be effective in zones with residual NAPL, however, the area would require a high oxidant dose administered over multiple injection events to address rebound. When NAPL is present, ISCO is possible but challenging due to the high oxidant demand and rebound events (ITRC, 2005). When NAPL is present at levels that exceed residual saturation, temporary mobilization of NAPL is a concern when applying ISCO, in addition to high oxidant demand and rebound. The difficulties in implementing ISCO in areas of the site that contain NAPL at quantities exceeding residual saturation, which includes the pilot test area, include the following:

- The overall oxidant demand presented by the NAPL.
- Chemical oxidation will oxidize constituents in the aqueous phase. Therefore its effectiveness is limited by the constituent solubility and rate of desorption/dissolution from nonaqueous phases (i.e., diffusion rate-limited). Multiple ISCO applications would be required to continue to reduce aqueous phase concentrations until the constituent mass in the adsorbed and NAPL phases can dissolve into the aqueous phase. The diffusion-rate limiting effect is most significant for constituents with low solubilities, such as higher molecular weight PAHs.
- The temperature increase associated with ISCO via Fenton's Reagent, can temporarily increase the mobility of NAPL by reducing its viscosity and interfacial surface tension, allowing the NAPL to spread to a larger area or migrate into the treatment area.

3.4 Post-treatment Groundwater Monitoring Results

Post-treatment groundwater analytical results are summarized in Table 3-4 (Shallow Zone) and Table 3-5 (Deep Zone). The tables present post-treatment BTEX, total PAHs, TPH, TOC, Alkalinity, total and ferrous iron, total and dissolved manganese, and carbon dioxide. The summary tables include results collected approximately one week, three weeks, and six weeks following ISCO treatment. Results from the first two post-treatment rounds (i.e., Post-Treatment Weeks 1 and 3) are presented herein. Results from the final rounds of post-treatment groundwater sampling (i.e., Post-Treatment Weeks 6 and 12) will be presented in a subsequent ISCO Post-Pilot Test Sampling Report. A comprehensive table of the groundwater analytical results, including baseline and post-treatment rounds is presented in Appendix A.

When analyzing the groundwater data it is important to appreciate the heterogeneities in constituent concentrations in site groundwater. The primary factors contributing to heterogeneities in measured groundwater concentrations in the pilot test area are the presence of NAPL and suspended solids. The uneven distribution of NAPL in the subsurface adds to the difficulty in obtaining samples that are representative of the same matrix. In addition, the presence of NAPL globules suspended in groundwater can affect analytical results. Suspended solids present in groundwater samples can represent adsorption sites for constituents, resulting in analytical results that reflect constituent mass adsorbed to suspended solids in addition to the mass dissolved in groundwater. As presented in the groundwater analytical results tables (Appendix A), a substantial number of samples submitted for analysis exhibited high turbidity levels. The presence of high suspended solids concentrations can significantly affect constituent concentrations, particularly those with relatively high partitioning coefficients (i.e., constituents with general low aqueous solubilities and high K_{ow} that have a strong affinity for suspended solids), such as PAH compounds.

Duplicates samples were collected and analyzed during the baseline and post-treatment groundwater sampling to approximate variability in aqueous concentrations. Duplicates were collected from samples where suspended globules of NAPL were observed in the field. Total BTEX results exhibited an average variability of 15% (i.e., difference between sample and duplicate concentration divided by sample concentration), with a range of 0 to 57%. Total PAHs exhibited an average variability of 36%, with a range of 1 to 128%. Total PAHs exhibited an average variability of 18%, with a range of 0 to 30%. This data variability does not consider the spatial heterogeneities present as a result of uneven NAPL distribution.

Figures 3-2 to 3-7 depict isocontour maps for aqueous constituent concentrations for baseline and post-treatment sampling events. Figures 3-2 and 3-3 depict BTEX isocontours for the shallow zone and deep zone, respectively. Figures 3-4 and 3-5 depict total PAH isocontours for the shallow zone and deep zone, respectively. Figures 3-6 and 3-7 depict TPH isocontours for the shallow zone and deep zone, respectively.

Figure 3-1b and 3-1c depict groundwater contours from two rounds of the post-treatment monitoring. Figure 3-1b was generated from water levels collected in early October, approximately one week following cessation of deep zone reagent injections. Groundwater mounding in the vicinity of the injection points is evident. Figure 3-1c was generated from water levels collected in early December, approximately nine weeks after deep zone injections ceased. The groundwater contours indicate re-establishment of the general flow patterns evident during baseline conditions.

Overall groundwater levels during this event were higher than those measured during baseline monitoring, indicating seasonal fluctuations.

3.4.1 Shallow Zone

Figures 3-2b to 3-2c present isocontour maps for shallow zone aqueous BTEX concentrations for the two post-treatment rounds (i.e., one week and three weeks following ISCO treatment). Figures 3-4b to 3-4c and Figures 3-6b to 3-6c present post-treatment isocontour maps for shallow zone aqueous PAH and TPH concentrations, respectively.

Compared to baseline conditions (refer to Figure 3-2a, 3-4a, and 3-6a), post-treatment constituent concentrations indicate significant reductions at several of the monitoring locations. However, increases in constituent concentrations were also observed. Figures 3-2b and 3-2c indicated that aqueous BTEX concentrations were reduced over an area with an equivalent ROI of 15 feet.

Considered collectively, the vadose zone screening, groundwater screening, and interim BTEX results, indicate shallow zone ISCO injections had the most substantial impact at MP-1S, MP-7S, MP-8S, MP-9S, and MP-11S. The average baseline BTEX concentrations at these locations (579 µg/L) compared to Week 1 Post-Treatment results (46 µg/L) indicate a 92% reduction in BTEX (refer to Table 3-4 for shallow zone groundwater results). Similarly, the data indicate a 90% reduction for PAHs (i.e., 5,275 µg/L to 514 µg/L). For TPH, the data indicate an average 73% reduction in aqueous TPH at these locations (i.e., 48.0 mg/L to 13.1 mg/L). TOC concentrations at these locations increased significantly (i.e., from 10.4 mg/L to 148 mg/L), which may be due to the formation of intermediate degradation products. The general higher solubility of daughter products compared to parent compounds and the higher solubility limits at the post-treatment temperatures would result in an increase in TOC.

Shallow Zone Post-treatment Week 1 sampling was conducted during deep zone injections and Shallow Zone Post-treatment Week 3 was conducted approximately one week following deep zone injections. Comparing results from the two events indicates that deep zone injections had a considerable impact on shallow zone concentrations, particularly in the vicinity of MP-8S, MP-9S, and IP-1. The observed reductions in concentrations are likely the result of chemical oxidation and vapor stripping (i.e., as a result of the oxygen and carbon dioxide gases generated in the process). The results indicate that, in general, deep zone injections likely suppressed the effect of rebound between the Shallow Zone Post-treatment Week 1 and Week 3 sampling events. Rebound in the shallow zone will be evaluated based on the Week 6 and Week 12 groundwater sampling events, which will be presented in the Post-Pilot Test Sampling Report.

Consistent with NAPL observations during ISCO injections, accumulations of NAPL were observed in MP-12S and MP-13S. The post-treatment results indicate increased aqueous constituent concentrations at MP-13S, which would be expected in the presence of NAPL. NAPL present at MP-13S appeared to be predominantly coal tar. MP-12S could not be monitored due to the amount of accumulated NAPL, which based on field observations appeared to be petroleum-based.

Accumulated (or connected-phase) NAPL was also observed at MW-21 during post-treatment monitoring. Field observations indicated that the NAPL at MW-21 was a mix of petroleum and coal tar.

3.4.2 Deep Zone

Figures 3-3b to 3-3c present isocontour maps for deep zone aqueous BTEX concentrations for the three post-treatment rounds (i.e., one week and three weeks following ISCO treatment). Figures 3-5b to 3-5c and Figures 3-7b to 3-7c depict post-treatment isocontour maps for deep zone aqueous PAH and TPH concentrations, respectively.

As indicated previously, it is suspected that MP-8D and MP-9D were screened within the native soil and are in poor hydraulic communication with IP-2. Therefore, the results from these wells are not considered representative of groundwater in the fill zone at these locations and the data was not used in generating the deep zone isocontours.

Compared to baseline concentrations, post-treatment constituent concentrations in the deep zone show small reductions in aqueous constituent concentrations at a limited number of wells (refer to Figure 3-2a, 3-4a, and 3-6a). However, as shown in Table 3-3, deep zone BTEX concentrations were impacted by shallow zone injections. Comparing baseline BTEX concentrations to the first round of deep zone interim BTEX monitoring results shows that, at several monitoring points, including MP-1D, MP-7D, MP-11D, MP-12D, and MP-13D, BTEX concentrations increased as a result of shallow zone injections. Therefore, comparing BTEX concentrations from the first round of deep zone interim BTEX monitoring to post-treatment concentrations indicates a greater level of decrease in aqueous BTEX concentrations at MP-7D and a decrease (as opposed to an increase) at MP-12D. Also, as shown in Table 3-3, the BTEX concentrations at MP-7D and MP-12D from the fourth round of deep zone interim BTEX monitoring were lower than during the Deep Zone Post-treatment Week 1, indicating that concentrations had already started to rebound within one week following deep zone injections. The rebound effect may have been enhanced by the residual elevated groundwater temperatures present after reagent injections and the dispersion of diluting fluids.

The zone of influence of the ISCO injections in the deeper zone is difficult to assess in the side gradient and upgradient directions, as several key monitoring points (MP-8D and MP-9D) were not considered representative. The ROI in the downgradient direction is at least 11 feet as indicated by the results at MP-7D.

As noted previously, accumulation of NAPL was observed at MP-12D and, as a result, 12D was not monitored. Field observations indicate that the NAPL at MP-12D was predominately coal tar.

3.5 Post-treatment Soil Sampling Results

Tables 3-6 and 3-7 present the baseline and post-treatment soil results for the shallow and deep zone, respectively. Figure 3-8, 3-9, and 3-10 present the soil analytical results for baseline and post-treatment BTEX, total PAH, and TPH, respectively. Appendix B presents a comprehensive table of the soil analytical results.

The soil analytical results exhibit the considerable heterogeneities in constituent distribution in saturated fill within the pilot test area. For example, at boring locations where it was evident from screening and groundwater monitoring that ISCO injections had little impact, considerable variability in constituent concentrations was evident. For example, the results indicate a more than 20-fold reduction in PAH concentration at SB-209/SB-209P (shallow) and, at SB-211/SB-211P (shallow), a more than 10-fold reduction in BTEX concentrations. Conversely, the results indicate a more than 10-fold increase in PAH concentration at SB-211/SB-211P (deep).

NAPL was encountered at 10 of the 12 borings completed during the post-treatment soil sampling, the exceptions being SB-202 and SB-203 where only a slight sheen was observed. The uneven distribution of NAPL within the saturated fill adds to the difficulty in obtaining pre- and post-treatment soil samples that are representative of the same matrix.

Focusing on the borings closest to the injections points (i.e., SB-203/SB-203P, SB-204/SB-204P, and SB-205/SB-205P), where screening and groundwater monitoring indicated the largest impact of chemical oxidation, the soil analytical results from the shallow zone samples indicate a general decrease in constituent concentrations. In the shallow zone, average BTEX concentrations at these boring locations decreased 84%, average PAH decreased concentrations 61%, and TPH concentrations decreased 28%. There was little change in deep zone constituent concentrations at these locations, considering the heterogeneities in constituent concentrations. In the deep zone, average BTEX concentration at these boring locations decreased 37%, whereas PAH and TPH concentrations increased 16% and 6%, respectively.

The soil borings discussed above (i.e., SB-203/SB-203P, SB-204/SB-204P, and SB-205/SB-205P) are within an equivalent 15-foot radius from the injection points. The results from soil borings outside of this zone and within an equivalent 25-foot radius from the injection points include SB-200/SB-20P, SB-201/SB-201P, SB-202/SB-202P, SB-206/SB-206P, SB-207/SB-207P and SB-210/SB-210P. In this more distant zone, vadose zone and groundwater screening indicated a lesser impact from ISCO as well as the accumulation of NAPL in several monitoring points. In the shallow zone, average soil BTEX concentrations decreased 20%, whereas average PAH and TPH concentrations increased 15% and 9% There was little change in deep zone constituent concentrations in soil at these locations. In the deep zone, average soil BTEX concentration decreased 10%, whereas PAH and TPH concentrations increased 62% and 16% respectively.

In general, the soil data indicate a greater decrease for BTEX compounds, followed by total PAHs, and TPH. This is likely the result of a combination of factors, including chemical oxidation being more effective for lighter hydrocarbon molecules such as BTEX than heavier hydrocarbons such as PAHs and many of the compounds detected by TPH analysis. The preferential reduction in BTEX concentrations may also be explained by the higher volatility, higher solubility, and lower partitioning coefficient of BTEX compounds. The higher volatility of BTEX compounds results in greater mass removal through vapor stripping. The higher solubility and lower partitioning coefficient results in more partitioning into the aqueous phase, where constituent mass can be removed through either chemical oxidation or vapor stripping.

The TOC, TIC, total iron, and total manganese soil analytical results do not reveal any significant trends. The TOC concentrations in the shallow zone soil are generally greater than 100,000 mg/kg, which suggests a high chemical oxidant demand in the pilot test area. Deep zone TOC concentrations are considerably less than the shallow zone and average less than 30,000 mg/kg. Comparison of TOC concentrations to BTEX, PAH, and TPH concentrations in both zones indicates that the higher TOC levels in the shallow zone are likely attributable to the higher constituent mass as opposed to other organic carbon sources. It is reasonable to assume that non-constituent organic carbon associated with the fill materials would be similar in both the shallow and deep zones.

4 CONCLUSIONS

The test results indicate that the Fenton's Reaction was occurring in situ. Initial aqueous constituent concentrations were at least temporarily reduced in a limited area around the injection points, with the most significant decrease observed for BTEX compounds. The results indicated a limited zone of influence from the injections. In the shallow zone aqueous BTEX concentrations were reduced over an area with an equivalent ROI of 15 feet. In the deep zone aqueous BTEX concentrations appeared to be reduced over a smaller area. This limited ROI presents a significant drawback to implementing ISCO over a large target area.

In some locations significant quantities of NAPL accumulated in wells. The accumulation of NAPL in monitoring wells indicates an increase in NAPL mobility, possibly caused by the increased subsurface temperatures from ISCO and the corollary reduction in NAPL viscosity. The presence of NAPL at quantities that exceed residual saturation represents an obstacle to treatment via ISCO. ISCO is generally most applicable in saturated zones with high aqueous constituent concentrations but little NAPL. ISCO can be effective in zones with residual NAPL, however, the area would require a high oxidant dose administered over multiple injection events to address rebound. The presence of NAPL at quantities that exceed residual saturation in the pilot test area complicates the evaluation of results, as the migrating NAPL represents a continuing and potentially increasing source of aqueous phase constituents. A considerable amount of chemical oxidant would be required over numerous rounds of injections in order to completely oxidize the constituent mass. The accumulation of NAPL at monitoring locations away from the injection point caused aqueous concentrations in these locations to increase. Therefore, the aqueous concentration decrease that was evident closer to the injection points was offset by the increase in aqueous concentrations farther away.

The groundwater samples collected six and twelve weeks after cessation of injections have yet to be fully analyzed, and the analytical results will be evaluated and discussed in a subsequent report. However, based on a preliminary review of the analytical results for the six-week shallow zone samples, it appears that BTEX concentrations have rebounded significantly and that the reductions in aqueous BTEX concentrations reported herein are temporary. The effects of rebound will be discussed in greater detail in the subsequent ISCO Post-Pilot Test Sampling Report.

Pursuant to the ROD, ISCO treatment is to operate until groundwater standards for BTEX are met or until the DEC determines BTEX concentrations have achieved asymptotic levels for a sustained period of time and continued treatment would not result in significant mass removal of contaminants. The available pilot test results demonstrate that ISCO will not be effective in achieving the remedial objectives stated in the ROD in the pilot test area or other areas similarly impacted by NAPL.

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TABLE 2-1
GROUNDWATER GRAB SAMPLING BTEX ANALYTICAL RESULTS
ISCO Pilot Test
Troy (Water Street) Site - Area 2
Troy, New York

Chemical Name	NYS Part 703	GW-1S 7/14/05	GW-2S 7/14/05	GW-4S 7/14/05	GW-8S 7/14/05	GW-9S 7/14/05	MP-10 7/14/05	MP-9S 7/14/05	MW-21 7/14/05	MP-7S 7/14/05	MP-1S 7/14/05
Benzene	1	37	17	300	1400	96	53	270	170	14	25
Ethylbenzene	5	34	36	1500 D	1500	1100	720	490	880	95	6.8
Toluene	5	7.1	1.6 J	11 J	200	14 J	4.1 J	12 J	9.1 J	6.6	4.2
Xylene-o	5	17	17	230	580	310	210	180	130	35	4.7 J
Xylenes-p+m	5	6.1	3.2 J	39	810	48 J	50 J	43	81	8	3.8 J
Total BTEXs		101	75	2080	4490	1568	1037	995	1270	159	45

Chemical Name	NYS Part 703	GW-1D 7/13/05	GW-2D 7/13/05	GW-3D 7/13/05	GW-4D 7/13/05	GW-5D 7/13/05	GW-6D 7/13/05	GW-7D 7/13/05	GW-9D 7/13/05	GW-10D 7/13/05
Benzene	1	530	81	36	270	170	170	340	270	160
Ethylbenzene	5	1100 D	220	37	760	160	610	830	770 D	270
Toluene	5	29	8.2 J	15	55	12 J	21 J	30	18	5.5 J
Xylene-o	5	230	48	13	240	81	180	270	220	99
Xylenes-p+m	5	140	15	12 J	62	25	160	140	160	24
Total BTEXs		2029	372	113	1387	448	1141	1610	1438	559

Notes:

J - indicates that the analyte was detected below of the detection limit and the reported value is an estimated value

D - indicates that the reported value reflects using a secondary dilution factor

NA - indicated constituent not analyzed during the monitoring event

P:\^Clients\National_Grid\Nimo_Troy\28805(Add_ISCO_Pilot)\Pilot_Report\Tables\T0201(BTEX_DiscreteGW)

TABLE 2-2
WELL CONSTRUCTION DETAILS
ISCO Pilot Test
Troy (Water Street) Site - Area 2
Troy, New York

Well ID	Diameter	M.O.C.	Top of Casing	Total Depth	Top of Screen	Bottom of Screen	Screen Length	Distance from IP-1	Distance from IP-2
	(in)		(El.)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
IP-1	2	304 SS	29.37	23	18	23	5	-	8.4
IP-2	2	304 SS	26.71	31	25.5	30.5	5	8.4	-
MP-1S	0.75	PVC	27.00	26	11	26	15	15.9	15.5
MP-1D	0.75	PVC	26.81	31	26	31	5	7.8	12.1
MP-2D	0.75	PVC	27.11	31	26	31	5	52.7	48.8
MP-4S	0.75	PVC	26.83	28	13	28	15	36.8	35.9
MP-4D	0.75	PVC	26.64	31	26	31	5	36.8	35.6
MP-6	0.75	PVC	27.40	28	13	28	15	52.8	44.5
MP-7S	0.75	PVC	27.12	27	12	27	15	19.0	10.7
MP-7D	0.75	PVC	26.88	31	26	31	5	19.0	10.9
MP-8S	0.75	PVC	26.93	26	11	26	15	5.9	2.5
MP-8D	0.75	PVC	27.01	31	26	31	5	10.8	5.0
MP-9S	0.75	PVC	26.74	28	13	28	15	7.1	14.1
MP-9D	0.75	PVC	26.67	31	26	31	5	6.4	13.8
MP-10	0.75	PVC	26.77	28	13	28	15	19.9	28.2
MP-11S	0.75	PVC	26.89	25	10	25	15	23.7	17.9
MP-11D	0.75	PVC	26.90	31	26	31	5	25.2	19.5
MP-12S	0.75	PVC	27.18	25	10	25	15	32.5	24.8
MP-12D	0.75	PVC	27.26	30	25	30	5	32.2	24.2
MP-13S	0.75	PVC	27.85	25	10	25	15	25.7	19.4
MP-13D	0.75	PVC	27.96	30	25	30	5	27.4	20.9
MP-21D	0.75	PVC	26.82	31	26	31	5	26.0	21.9
MP-27D	0.75	PVC	26.81	31	26	31	5	29.0	30.9
MW-21	2	PVC	26.75	30	10	30	20	22.3	19.8
MW-27	2	PVC	26.69	31	6	31	25	29.4	31.9
MW-39	2	PVC	29.25	34	12	32	20	38.5	46.8
RMW-8D	2	PVC	NA*	27.5	22.5	27.5	5	8.0*	3.5*

* RMW-8D has not been surveyed. Distances from RMW-8D to IP-1 and IP-2 shall be considered approximate.

P:\^Clients\National_Grid\Nimo_Troy\28805(Add_ISCO_Pilot)\Pilot_Report\Tables\T0202(Well_Construction)

TABLE 3-1
SUMMARY OF CHEMICAL REAGENT INJECTIONS
ISCO Pilot Test
Troy (Water Street) Site - Area 2
Troy, New York

Date	Zone	Reagent	Total Solution Volume (gal)	No. Batches	Volume of 35% Hydrogen Peroxide (gal)	Volume of 35% Phosphoric Acid (gal)	Mass of Ferrous Sulfate Heptahydrate (lbs)	Volume of Water (gal)
8/16/2005	*Shallow*	Catalyst Solution	250	1	0	8	125	242
8/17/2005	*Shallow*	Catalyst Solution	1250	5	0	40	625	1,210
8/18/2005	*Shallow*	Peroxide Solution	500	2	166	84	0	250
8/19/2005	*Shallow*	Peroxide Solution	1,247	5	415	200	0	632
8/22/2005	*Shallow*	Peroxide Solution	1,271	5	415	160	0	696
8/23/2005	*Shallow*	Peroxide Solution	1,536	6	498	124	0	914
8/24/2005	*Shallow*	Catalyst Solution	1515	6	0	30	750	1,485
8/25/2005	*Shallow*	Peroxide Solution	1,022	4	332	40	0	650
8/26/2005	*Shallow*	Peroxide Solution	1,546	6	498	60	0	988
8/29/2005	*Shallow*	Peroxide Solution	488	2	166	20	0	302
8/30/2005	*Shallow*	Peroxide Solution	1,539	6	498	60	0	981
8/31/2005	*Shallow*	Catalyst Solution	1544	6	0	30	750	1,514
9/1/2005	*Shallow*	Peroxide Solution	1,527	6	498	60	0	969
9/6/2005	*Shallow*	Peroxide Solution	1,299	5	415	50	0	834

Shallow Zone Subtotal	**16,534**	**65**	**3,901**	**966**	**2,250**	**11,667**
Catalyst Solution	4,559	18	0	108	2,250	4,451
Peroxide Solution	11,975	47	3,901	858	0	7,216

Mass Ferrous Iron Applied:	450	lbs	(ferrous sulfate heptahydrate is approximately 20% ferrous iron by weight)
Mass of Hydrogen Peroxide Applied:	12,867	lbs	(35% hydrogen peroxide has an approximate specific gravity of 1.13)

TABLE 3-1
SUMMARY OF CHEMICAL REAGENT INJECTIONS
ISCO Pilot Test
Troy (Water Street) Site - Area 2
Troy, New York

Date	Zone	Reagent	Total Solution Volume (gal)	No. Batches	Volume of 35% Hydrogen Peroxide (gal)	Volume of 35% Phosphoric Acid (gal)	Mass of Ferrous Sulfate Heptahydrate (lbs)	Volume of Water (gal)
9/7/2005	*Deep*	Catalyst Solution	1,048	4	0	40	500	1,008
9/8/2005	*Deep*	Catalyst Solution	1,040	4	0	40	500	1,000
9/9/2005	*Deep*	Peroxide Solution	745	3	249	30	0	466
9/12/2005	*Deep*	Peroxide Solution	748	3	249	30	0	469
9/12/2005	*Deep*	Acid-Only Solution	255	1	0	40	0	215
9/13/2005	*Deep*	Peroxide Solution	1,014	4	332	80	0	602
9/14/2005	*Deep*	Peroxide Solution	1,295	5	364	50	0	881
9/15/2005	*Deep*	Peroxide Solution	1,037	4	264	40	0	733
9/16/2005	*Deep*	Peroxide Solution	1,007	4	264	40	0	703
9/19/2005	*Deep*	Peroxide Solution	502	2	132	20	0	350
9/20/2005	*Deep*	Peroxide Solution	1,293	5	330	50	0	913
9/21/2005	*Deep*	Peroxide Solution	1,288	5	330	50	0	908
9/22/2005	*Deep*	Peroxide Solution	1,041	4	264	40	0	737
9/23/2005	*Deep*	Catalyst Solution	993	4	0	40	500	953
9/26/2005	*Deep*	Peroxide Solution	1,057	4	264	40	0	753
9/27/2005	*Deep*	Peroxide Solution	1,585	6	396	60	0	1,129
9/28/2005	*Deep*	Peroxide Solution	1,553	6	396	60	0	1,097
9/29/2005	*Deep*	Peroxide Solution	505	2	132	20	0	353

Deep Zone Subtotal	**18,006**	**70**	**3,966**	**770**	**1,500**	**13,270**
Catalyst Solution	3,081	12	0	120	1,500	2,961
Acid Solution	255	1	0	40	0	215
Peroxide Solution	14,670	57	3,966	610	0	10,094

Mass Ferrous Iron Applied: 300 lbs (ferrous sulfate heptahydrate is approximately 20% ferrous iron by weight)

Mass of Hydrogen Peroxide Applied: 13,082 lbs (35% hydrogen peroxide has an approximate specific gravity of 1.13)

TABLE 3-1
SUMMARY OF CHEMICAL REAGENT INJECTIONS
ISCO Pilot Test
Troy (Water Street) Site - Area 2
Troy, New York

Totals

Reagent	Total Solution Volume	No. Batches	Volume of 35% Hydrogen Peroxide	Volume of 35% Phosphoric Acid	Mass of Ferrous Sulfate Heptahydrate	Volume of Water
			(gal)	(gal)	(lbs)	(gal)
Catalyst Solution	7,640	10	696	170	0	1,698
Acid Solution	255	2	132	20	0	350
Peroxide Solution	26,645	104	7,867	1,468	0	17,310
Total	**34,540**	**135**	**7,867**	**1,736**	**3,750**	**24,937**

Mass Ferrous Iron Applied:	750	lbs	(ferrous sulfate heptahydrate is approximately 20% ferrous iron by weight)
Mass of Hydrogen Peroxide Applied:	25,949	lbs	(35% hydrogen peroxide has an approximate specific gravity of 1.13)

TABLE 3-2
SHALLOW ZONE INTERIM AQUEOUS BTEX RESULTS SUMMARY
ISCO Pilot Test
Troy (Water Street) Site - Area 2
Troy, New York

				8/16/05 --- Shallow Injections ---9/6/05				9/7/05 --- Deep Injections --- 9/25/05				
	Constituents	Units	Baseline 8/3/2005	Round 1S 8/18/2005	Round 2S 8/25/2005	Round 3S 8/29/2005	Round 4S 9/6/2005	Round 5S 9/8/2005	Round 1D 9/14/2005	Round 2D 9/19/2005	Round 3D 9/23/2005	Round 4D 9/29/2005
MP-1S	Benzene	ug/L	37	53	28	19	16	16	NA	NA	NA	NA
	Ethylbenzene	ug/L	26	41	14	13	7.9	13	NA	NA	NA	NA
	m&p-Xylenes	ug/L	1.2 J	2.5 J	1.2 J	1.1 J	0.94 J	1.4 J	NA	NA	NA	NA
	o-Xylene	ug/L	9.3	16	7	5.7	4.5 J	6.4	NA	NA	NA	NA
	Toluene	ug/L	1.1 J	1.5 J	1.1 J	1.1 J	1 J	0.85 J	NA	NA	NA	NA
	Total BTEX	ug/L	75	114	51	40	30	38	NA	NA	NA	NA
MP-4S	Benzene	ug/L	5 U	NA	NA	NA	NA	2.3 J	NA	NA	NA	NA
	Ethylbenzene	ug/L	88	NA	NA	NA	NA	100	NA	NA	NA	NA
	m&p-Xylenes	ug/L	45	NA	NA	NA	NA	49	NA	NA	NA	NA
	o-Xylene	ug/L	30	NA	NA	NA	NA	36	NA	NA	NA	NA
	Toluene	ug/L	5.9	NA	NA	NA	NA	6.6	NA	NA	NA	NA
	Total BTEX	ug/L	169	NA	NA	NA	NA	194	NA	NA	NA	NA
MP-6	Benzene	ug/L	0.43 J	NA	NA	NA	NA	1.2 J	NA	NA	NA	NA
	Ethylbenzene	ug/L	0.68 J	NA	NA	NA	NA	2.6 J	NA	NA	NA	NA
	m&p-Xylenes	ug/L	5 U	NA	NA	NA	NA	0.6 J	NA	NA	NA	NA
	o-Xylene	ug/L	0.47 J	NA	NA	NA	NA	2 J	NA	NA	NA	NA
	Toluene	ug/L	5 U	NA	NA	NA	NA	0.38 J	NA	NA	NA	NA
	Total BTEX	ug/L	1.58	NA	NA	NA	NA	7	NA	NA	NA	NA

TABLE 3-2
SHALLOW ZONE INTERIM AQUEOUS BTEX RESULTS SUMMARY
ISCO Pilot Test
Troy (Water Street) Site - Area 2
Troy, New York

				8/16/05 --- Shallow Injections ---9/6/05				9/7/05 --- Deep Injections --- 9/25/05					
	Constituents	Units	Baseline 8/3/2005	Round 1S 8/18/2005	Round 2S 8/25/2005	Round 3S 8/29/2005	Round 4S 9/6/2005	Round 5S 9/8/2005	Round 1D 9/14/2005	Round 2D 9/19/2005	Round 3D 9/23/2005	Round 4D 9/29/2005
MP-7S	Benzene	ug/L	12	0.52 J	10	5 J	11	1.4 J	5 U	6.3	5 U	NA
	Ethylbenzene	ug/L	29	9.6	12	4.9 J	2.2 J	0.74 J	5 U	5.9	5 U	NA
	m&p-Xylenes	ug/L	2.3 J	1.3 J	3.1 J	3 J	1.4 J	0.39 J	5 U	2.5 J	5 U	NA
	o-Xylene	ug/L	13	7.4	7.3	2.8 J	1.4 J	0.38 J	5 U	2.3 J	5 U	NA
	Toluene	ug/L	1.1 J	0.29 J	5.1	2.8 J	2.9 J	0.64 J	5 U	2.5 J	5 U	NA
	Total BTEX	ug/L	57	19.1	38	19	19	3.6	ND	19.5	ND	NA
MP-8S	Benzene	ug/L	120	58	43	49	91	110	25 J	44	5.3	3.6 J
	Ethylbenzene	ug/L	210	300	170	180 D	240	400	92	50	15	16
	m&p-Xylenes	ug/L	12	19 J	10	13	18 J	28 J	9.6 J	7.9	2.1 J	5.8
	o-Xylene	ug/L	70	92	67	78	85	130	41	19	4.2 J	9.6
	Toluene	ug/L	6.5 J	4.2 J	4.5 J	7.8	9.2 J	10 J	6.2 J	9	1.6 J	2.5 J
	Total BTEX	ug/L	419	473	295	328	443	678	174	130	28	38
MP-9S	Benzene	ug/L	330	7.6 J	23	1.1 J	18	5 U	NA	NA	NA	NA
	Ethylbenzene	ug/L	1000	320	130	21	62	3.2 J	NA	NA	NA	NA
	m&p-Xylenes	ug/L	96	37	14	4.1 J	8.6	2 J	NA	NA	NA	NA
	o-Xylene	ug/L	300	160	51	12	29	5 J	NA	NA	NA	NA
	Toluene	ug/L	15 J	2.2 J	2 J	5 U	2.2 J	5 U	NA	NA	NA	NA
	Total BTEX	ug/L	1741	527	220	38	120	10	NA	NA	NA	NA

TABLE 3-2
SHALLOW ZONE INTERIM AQUEOUS BTEX RESULTS SUMMARY
ISCO Pilot Test
Troy (Water Street) Site - Area 2
Troy, New York

				8/16/05 --- Shallow Injections ---9/6/05				9/7/05 --- Deep Injections --- 9/25/05					
	Constituents	Units	Baseline 8/3/2005	Round 1S 8/18/2005	Round 2S 8/25/2005	Round 3S 8/29/2005	Round 4S 9/6/2005	Round 5S 9/8/2005	Round 1D 9/14/2005	Round 2D 9/19/2005	Round 3D 9/23/2005	Round 4D 9/29/2005
MP-10	Benzene	ug/L	82	63	70	64	NA	73	NA	NA	NA	NA
	Ethylbenzene	ug/L	980 D	810	870 D	990 D	NA	920 D	NA	NA	NA	NA
	m&p-Xylenes	ug/L	37	28 J	36	33	NA	32	NA	NA	NA	NA
	o-Xylene	ug/L	280 D	220	250 D	260	NA	260 D	NA	NA	NA	NA
	Toluene	ug/L	4.6 J	3.6 J	4.1 J	3.8 J	NA	4 J	NA	NA	NA	NA
	Total BTEX	ug/L	1384	1125	1230	1351	NA	1289	NA	NA	NA	NA
MP-11S	Benzene	ug/L	4.7 J	NA	5.2	8.1	14	4.5 J	4.2 J	NA	NA	NA
	Ethylbenzene	ug/L	170	NA	5.9	9.7	7	4.1 J	3.5 J	NA	NA	NA
	m&p-Xylenes	ug/L	5.6 J	NA	1.9 J	2.1 J	2.6 J	2.5 J	2 J	NA	NA	NA
	o-Xylene	ug/L	37 J	NA	3.8 J	4.6 J	3.8 J	2.6 J	2 J	NA	NA	NA
	Toluene	ug/L	1.3 J	NA	2.4 J	2.7 J	4.6 J	2.8 J	2.3 J	NA	NA	NA
	Total BTEX	ug/L	171	NA	19.2	27.2	32	16.5	14	NA	NA	NA
MP-12S	Benzene	ug/L	20	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Ethylbenzene	ug/L	8.5	NA	NA	NA	NA	NA	NA	NA	NA	NA
	m&p-Xylenes	ug/L	3.4 J	NA	NA	NA	NA	NA	NA	NA	NA	NA
	o-Xylene	ug/L	5.3	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Toluene	ug/L	1.4 J	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Total BTEX	ug/L	39	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 3-2
SHALLOW ZONE INTERIM AQUEOUS BTEX RESULTS SUMMARY
ISCO Pilot Test
Troy (Water Street) Site - Area 2
Troy, New York

				8/16/05 --- Shallow Injections ---9/6/05				9/7/05 --- Deep Injections --- 9/25/05					
	Constituents	Units	Baseline 8/3/2005	Round 1S 8/18/2005	Round 2S 8/25/2005	Round 3S 8/29/2005	Round 4S 9/6/2005	Round 5S 9/8/2005	Round 1D 9/14/2005	Round 2D 9/19/2005	Round 3D 9/23/2005	Round 4D 9/29/2005
MP-13S	Benzene	ug/L	3.7 J	NA	NA	NA	15 J	15 J	NA	NA	NA	NA
	Ethylbenzene	ug/L	2.8 J	NA	NA	NA	500	490	NA	NA	NA	NA
	m&p-Xylenes	ug/L	4.1 J	NA	NA	NA	220	220	NA	NA	NA	NA
	o-Xylene	ug/L	3.6 J	NA	NA	NA	230	220	NA	NA	NA	NA
	Toluene	ug/L	2.6 J	NA	NA	NA	140	130	NA	NA	NA	NA
	Total BTEX	ug/L	16.8	NA	NA	NA	1105	1075	NA	NA	NA	NA
MW-21	Benzene	ug/L	510	250	460	390	NA	370	NA	NA	NA	NA
	Ethylbenzene	ug/L	1400	860	1500	1400	NA	1200 D	NA	NA	NA	NA
	m&p-Xylenes	ug/L	160	89	160	170	NA	130	NA	NA	NA	NA
	o-Xylene	ug/L	300	180	310	330	NA	260	NA	NA	NA	NA
	Toluene	ug/L	19 J	11 J	18 J	17 J	NA	14	NA	NA	NA	NA
	Total BTEX	ug/L	2389	1390	2448	2307	NA	1974	NA	NA	NA	NA
MW-27	Benzene	ug/L	120	NA	NA	NA	NA	170	NA	NA	NA	NA
	Ethylbenzene	ug/L	110	NA	NA	NA	NA	360 D	NA	NA	NA	NA
	m&p-Xylenes	ug/L	5.5	NA	NA	NA	NA	35	NA	NA	NA	NA
	o-Xylene	ug/L	26	NA	NA	NA	NA	100	NA	NA	NA	NA
	Toluene	ug/L	2.6 J	NA	NA	NA	NA	5.2	NA	NA	NA	NA
	Total BTEX	ug/L	264	NA	NA	NA	NA	670	NA	NA	NA	NA

TABLE 3-2
SHALLOW ZONE INTERIM AQUEOUS BTEX RESULTS SUMMARY
ISCO Pilot Test
Troy (Water Street) Site - Area 2
Troy, New York

				8/16/05 --- Shallow Injections ---9/6/05				9/7/05 --- Deep Injections --- 9/25/05				
	Constituents	Units	Baseline 8/3/2005	Round 1S 8/18/2005	Round 2S 8/25/2005	Round 3S 8/29/2005	Round 4S 9/6/2005	Round 5S 9/8/2005	Round 1D 9/14/2005	Round 2D 9/19/2005	Round 3D 9/23/2005	Round 4D 9/29/2005
MW-39	Benzene	ug/L	250 D	NA	NA	NA	NA	210 D	NA	NA	NA	NA
	Ethylbenzene	ug/L	770 D	NA	NA	NA	NA	1100 D	NA	NA	NA	NA
	m&p-Xylenes	ug/L	50	NA	NA	NA	NA	60	NA	NA	NA	NA
	o-Xylene	ug/L	240 D	NA	NA	NA	NA	310 D	NA	NA	NA	NA
	Toluene	ug/L	8.1	NA	NA	NA	NA	7.5	NA	NA	NA	NA
	Total BTEX	ug/L	1318	NA	NA	NA	NA	1688	NA	NA	NA	NA
IP-1	Benzene	ug/L	100	NA	NA	NA	NA	5 U	NA	NA	NA	NA
	Ethylbenzene	ug/L	680	NA	NA	NA	NA	0.47 J	NA	NA	NA	NA
	m&p-Xylenes	ug/L	25 J	NA	NA	NA	NA	5 U	NA	NA	NA	NA
	o-Xylene	ug/L	200	NA	NA	NA	NA	5 U	NA	NA	NA	NA
	Toluene	ug/L	4.7 J	NA	NA	NA	NA	5 U	NA	NA	NA	NA
	Total BTEX	ug/L	1010	NA	NA	NA	NA	0.47	NA	NA	NA	NA

Notes:

U - indicates that the analyte was not detected above the associated value

J - indicates that the analyte was detected below of the detection limit and the reported value is an estimated value

D - indicates that the reported value reflects using a secondary dilution factor

NA - indicated constituent not analyzed during the monitoring event

TABLE 3-3
DEEP ZONE INTERIM AQUEOUS BTEX RESULTS SUMMARY
ISCO Pilot Test
Troy (Water Street) Site - Area 2
Troy, New York

				8/16/05 --- Shallow Injections ---9/6/05				9/7/05 --- Deep Injections --- 9/25/05					
	Constituents	Units	Baseline 8/3/2005	Round 1S 8/18/2005	Round 2S 8/25/2005	Round 3S 8/29/2005	Round 4S 9/6/2005	Round 5S 9/8/2005	Round 1D 9/14/2005	Round 2D 9/19/2005	Round 3D 9/23/2005	Round 4D 9/29/2005
MP-1D	Benzene	ug/L	290	NA	NA	NA	NA	NA	400	NA	NA	NA
	Ethylbenzene	ug/L	1000	NA	NA	NA	NA	NA	1800 D	NA	NA	NA
	m&p-Xylenes	ug/L	130	NA	NA	NA	NA	NA	210	NA	NA	NA
	o-Xylene	ug/L	230	NA	NA	NA	NA	NA	370	NA	NA	NA
	Toluene	ug/L	18 J	NA	NA	NA	NA	NA	19	NA	NA	NA
	Total BTEX	ug/L	1668	NA	NA	NA	NA	NA	2799	NA	NA	NA
MP-2D	Benzene	ug/L	350	NA	NA	NA	NA	NA	NA	180	190 D	190
	Ethylbenzene	ug/L	570	NA	NA	NA	NA	NA	NA	460	500 D	380 D
	m&p-Xylenes	ug/L	36	NA	NA	NA	NA	NA	NA	32	31	24
	o-Xylene	ug/L	93	NA	NA	NA	NA	NA	NA	69	67	57
	Toluene	ug/L	4.8 J	NA	NA	NA	NA	NA	NA	3.4 J	3.1 J	2.7 J
	Total BTEX	ug/L	1054	NA	NA	NA	NA	NA	NA	744	791	654
MP-4D	Benzene	ug/L	9.8	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Ethylbenzene	ug/L	170	NA	NA	NA	NA	NA	NA	NA	NA	NA
	m&p-Xylenes	ug/L	87	NA	NA	NA	NA	NA	NA	NA	NA	NA
	o-Xylene	ug/L	68	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Toluene	ug/L	6.1	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Total BTEX	ug/L	341	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 3-3
DEEP ZONE INTERIM AQUEOUS BTEX RESULTS SUMMARY
ISCO Pilot Test
Troy (Water Street) Site - Area 2
Troy, New York

				8/16/05 --- Shallow Injections ---9/6/05				9/7/05 --- Deep Injections --- 9/25/05				
	Constituents	Units	Baseline 8/3/2005	Round 1S 8/18/2005	Round 2S 8/25/2005	Round 3S 8/29/2005	Round 4S 9/6/2005	Round 5S 9/8/2005	Round 1D 9/14/2005	Round 2D 9/19/2005	Round 3D 9/23/2005	Round 4D 9/29/2005
MP-7D	Benzene	ug/L	15	0.82 J	34	41	NA	NA	63	70	69	5 U
	Ethylbenzene	ug/L	28	10	62	56	NA	NA	66	92	72	0.34 J
	m&p-Xylenes	ug/L	1.7 J	1 J	8.4 J	7.9	NA	NA	8.1	11	9.1	5 U
	o-Xylene	ug/L	11	3.8 J	21	20	NA	NA	23	30	26	5 U
	Toluene	ug/L	0.83 J	5 U	3.2 J	3.5 J	NA	NA	3.8 J	4.7 J	3.2 J	5 U
	Total BTEX	ug/L	57	16	129	128	NA	NA	164	208	179	0.34
MP-8D	Benzene	ug/L	170	160	170	160	NA	NA	170	180 D	NA	340
	Ethylbenzene	ug/L	210	270	240	230	NA	NA	190	190 D	NA	330
	m&p-Xylenes	ug/L	19	19 J	17 J	17 J	NA	NA	19	21	NA	35
	o-Xylene	ug/L	58	66	56	54	NA	NA	46	51	NA	91
	Toluene	ug/L	6.3 J	5.9 J	4.3 J	4.2 J	NA	NA	5.5	6.7	NA	12
	Total BTEX	ug/L	463	521	487	465	NA	NA	431	449	NA	808
MP-9D	Benzene	ug/L	150	2.3 J	190	280	NA	NA	210	180	NA	150
	Ethylbenzene	ug/L	1100	630	2800 D	3300 D	NA	NA	2400 D	2200 D	NA	1800 D
	m&p-Xylenes	ug/L	90	140	660	780	NA	NA	420	350	NA	260
	o-Xylene	ug/L	300	140	610	720	NA	NA	490	470	NA	400
	Toluene	ug/L	8.7 J	1.6 J	21 J	28 J	NA	NA	16	13 J	NA	10
	Total BTEX	ug/L	1649	914	4281	5108	NA	NA	3536	3213	NA	2620

TABLE 3-3
DEEP ZONE INTERIM AQUEOUS BTEX RESULTS SUMMARY
ISCO Pilot Test
Troy (Water Street) Site - Area 2
Troy, New York

				8/16/05 --- Shallow Injections ---9/6/05				9/7/05 --- Deep Injections --- 9/25/05				
	Constituents	Units	Baseline 8/3/2005	Round 1S 8/18/2005	Round 2S 8/25/2005	Round 3S 8/29/2005	Round 4S 9/6/2005	Round 5S 9/8/2005	Round 1D 9/14/2005	Round 2D 9/19/2005	Round 3D 9/23/2005	Round 4D 9/29/2005
MP-11D	Benzene	ug/L	59	NA	NA	NA	130	NA	160	160	190	200
	Ethylbenzene	ug/L	67	NA	NA	NA	87	NA	90	100	88	96
	m&p-Xylenes	ug/L	14	NA	NA	NA	9.6 J	NA	8 J	9 J	6.8 J	8.4 J
	o-Xylene	ug/L	21	NA	NA	NA	21 J	NA	19	24 J	16	18 J
	Toluene	ug/L	5.4	NA	NA	NA	8.1 J	NA	7.9 J	8.1 J	8.6 J	12 J
	Total BTEX	ug/L	166	NA	NA	NA	256	NA	285	301	309	334
MP-12D	Benzene	ug/L	20	NA	NA	NA	NA	NA	52	42	40	37
	Ethylbenzene	ug/L	4.7 J	NA	NA	NA	NA	NA	49	31	15 J	9.5 J
	m&p-Xylenes	ug/L	3.6 J	NA	NA	NA	NA	NA	4 J	3.1 J	2.8 J	1.9 J
	o-Xylene	ug/L	3.9 J	NA	NA	NA	NA	NA	32	20	7.6 J	4.5 J
	Toluene	ug/L	2.2 J	NA	NA	NA	NA	NA	2.6 J	2.6 J	2.4 J	2.3 J
	Total BTEX	ug/L	34	NA	NA	NA	NA	NA	140	99	68	55
MP-13D	Benzene	ug/L	8.9	NA	NA	NA	23	NA	18	24	27	29
	Ethylbenzene	ug/L	24	NA	NA	NA	150	NA	76	95	98	91
	m&p-Xylenes	ug/L	6.2	NA	NA	NA	36	NA	21	24	22	20
	o-Xylene	ug/L	5.6	NA	NA	NA	26	NA	21	25	24	22
	Toluene	ug/L	3.6 J	NA	NA	NA	8.2 J	NA	9	13	12	13
	Total BTEX	ug/L	48	NA	NA	NA	243	NA	145	181	183	175

TABLE 3-3
DEEP ZONE INTERIM AQUEOUS BTEX RESULTS SUMMARY
ISCO Pilot Test
Troy (Water Street) Site - Area 2
Troy, New York

				8/16/05 --- Shallow Injections ---9/6/05				9/7/05 --- Deep Injections --- 9/25/05				
	Constituents	Units	Baseline 8/3/2005	Round 1S 8/18/2005	Round 2S 8/25/2005	Round 3S 8/29/2005	Round 4S 9/6/2005	Round 5S 9/8/2005	Round 1D 9/14/2005	Round 2D 9/19/2005	Round 3D 9/23/2005	Round 4D 9/29/2005
MP-21D	Benzene	ug/L	46	NA	NA	NA	NA	NA	18	24	160 J	NA
	Ethylbenzene	ug/L	89	NA	NA	NA	NA	NA	84	57	740	NA
	m&p-Xylenes	ug/L	6.3	NA	NA	NA	NA	NA	6.7	5 J	43 J	NA
	o-Xylene	ug/L	40	NA	NA	NA	NA	NA	33	26	110 J	NA
	Toluene	ug/L	3.9 J	NA	NA	NA	NA	NA	4.4 J	5.5	500 U	NA
	Total BTEX	ug/L	185	NA	NA	NA	NA	NA	146	118	1053	NA
MP-27D	Benzene	ug/L	90	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Ethylbenzene	ug/L	95	NA	NA	NA	NA	NA	NA	NA	NA	NA
	m&p-Xylenes	ug/L	13	NA	NA	NA	NA	NA	NA	NA	NA	NA
	o-Xylene	ug/L	31	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Toluene	ug/L	4.2 J	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Total BTEX	ug/L	233	NA	NA	NA	NA	NA	NA	NA	NA	NA
IP-2	Benzene	ug/L	180	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Ethylbenzene	ug/L	210	NA	NA	NA	NA	NA	NA	NA	NA	NA
	m&p-Xylenes	ug/L	16	NA	NA	NA	NA	NA	NA	NA	NA	NA
	o-Xylene	ug/L	44	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Toluene	ug/L	5.4 J	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Total BTEX	ug/L	455	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

U - indicates that the analyte was not detected above the associated value

J - indicates that the analyte was detected below of the detection limit and the reported value is an estimated value

D - indicates that the reported value reflects using a secondary dilution factor

NA - indicated constituent not analyzed during the monitoring event

TABLE 3-4
SHALLOW ZONE GROUNDWATER ANALYTICAL RESULTS SUMMARY
ISCO Pilot Test
Troy (Water Street) Site - Area 2
Troy, New York

Shallow Wells	Distance from IP-1 (ft) and Direction	BTEX		
		Baseline	Post-Treatment - Week 1	Post-Treatment - Week 3
		ug/L	ug/L	ug/L
MP-1S	15.9 N	74.6	1.93	34.2
MP-4S	36.8 N	169	377	135
MP-6	52.8 W	1.58	3.20	4.20
MP-7S	19 W	57.4	ND	16.4
MP-8S	5.9 W	419	223	60.4
MP-9S	7.1 SE	1741	21.8	8.58
MP-10	19.9 E	1384	753	1359
MP-11S	23.7 SW	171	27.6	91.0
MP-12S	32.5 SW	38.6	NA	NA
MP-13S	25.7 NW	16.8	1126	NA
MW-21	22.3 S	2389	1491	1194
MW-27	29.4 N	264	657	587
MW-39	38.5 E	1318	1483	1522
IP-1	--	1010	ND	ND

Shallow Wells	Distance from IP-1 (ft) and Direction	Total PAHs		
		Baseline	Post-Treatment - Week 1	Post-Treatment - Week 3
		ug/L	ug/L	ug/L
MP-1S	15.9 N	139	44.8	343
MP-4S	36.8 N	6575	2252	3357
MP-6	52.8 W	1787	3056	999
MP-7S	19 W	205	116	303
MP-8S	5.9 W	6445	2033	723
MP-9S	7.1 SE	15117	311	169
MP-10	19.9 E	4561	5814	3731
MP-11S	23.7 SW	6128	500	129
MP-12S	32.5 SW	2505	NA	NA
MP-13S	25.7 NW	489	315900	NA
MW-21	22.3 S	12682	6745	5218
MW-27	29.4 N	199	629	660
MW-39	38.5 E	4056	7475	5787
IP-1	--	3615	78.9	20.6

TABLE 3-4
SHALLOW ZONE GROUNDWATER ANALYTICAL RESULTS SUMMARY
ISCO Pilot Test
Troy (Water Street) Site - Area 2
Troy, New York

Shallow Wells	Distance from IP-1 (ft) and Direction	TPH		
		Baseline	Post-Treatment - Week 1	Post-Treatment - Week 3
		ug/L	ug/L	ug/L
MP-1S	15.9 N	6400	4500	7700
MP-4S	36.8 N	37000	36000	7000
MP-6	52.8 W	1200	2200	1500
MP-7S	19 W	5400	14000	26000
MP-8S	5.9 W	100000	36000	51000
MP-9S	7.1 SE	61000	8500	2500
MP-10	19.9 E	15000	77000	18000
MP-11S	23.7 SW	90000	12000	1700
MP-12S	32.5 SW	50000	NA	NA
MP-13S	25.7 NW	13000	88000	NA
MW-21	22.3 S	58000	26000	40000
MW-27	29.4 N	1900	4300	3900
MW-39	38.5 E	17000	21000	26000
IP-1	--	25000	3700	1000

Shallow Wells	Distance from IP-1 (ft) and Direction	Total Organic Carbon (TOC)		
		Baseline	Post-Treatment - Week 1	Post-Treatment - Week 3
		mg/L	mg/L	mg/L
MP-1S	15.9 N	9.39	111	56.7
MP-4S	36.8 N	8.06	23.8	15.3
MP-6	52.8 W	17.5	35.6	19.0
MP-7S	19 W	11.8	128	150
MP-8S	5.9 W	11.6	244	28.0
MP-9S	7.1 SE	10.2	69.1	50.3
MP-10	19.9 E	8.40	7.93	6.77
MP-11S	23.7 SW	10.5	194	206
MP-12S	32.5 SW	15.0	NA	NA
MP-13S	25.7 NW	10.1	260	NA
MW-21	22.3 S	9.19	29.8	21.3
MW-27	29.4 N	7.17	8.00	8.59
MW-39	38.5 E	11.1	9.48	9.45
IP-1	--	9.15	33.4	17.7

TABLE 3-4
SHALLOW ZONE GROUNDWATER ANALYTICAL RESULTS SUMMARY
ISCO Pilot Test
Troy (Water Street) Site - Area 2
Troy, New York

Shallow Wells	Distance from IP-1 (ft) and Direction	Total Alkalinity		
		Baseline	Post-Treatment - Week 1	Post-Treatment - Week 3
		mg/L	mg/L	mg/L
MP-1S	15.9 N	164	2 U	2 U
MP-4S	36.8 N	190	75	2 U
MP-6	52.8 W	274	190	92.8
MP-7S	19 W	128	2 U	2 U
MP-8S	5.9 W	74.7	2 U	2 U
MP-9S	7.1 SE	263	2 U	2 U
MP-10	19.9 E	220	234	251
MP-11S	23.7 SW	181	2 U	2 U
MP-12S	32.5 SW	89.7	ND	NA
MP-13S	25.7 NW	197	2 U	NA
MW-21	22.3 S	196	59.6	146
MW-27	29.4 N	179	168	176
MW-39	38.5 E	281	300	296
IP-1	--	149	2 U	2 U

Shallow Wells	Distance from IP-1 (ft) and Direction	Carbon Dioxide		
		Baseline	Post-Treatment - Week 1	Post-Treatment - Week 3
		mg/L	mg/L	mg/L
MP-1S	15.9 N	50	500 E	1085
MP-4S	36.8 N	40	437.5	175
MP-6	52.8 W	NA	175	210
MP-7S	19 W	220	500 E	1000 E
MP-8S	5.9 W	NA	500 E	45.5
MP-9S	7.1 SE	NA	500 E	875
MP-10	19.9 E	80	87.5	87.5
MP-11S	23.7 SW	NA	500 E	1000 E
MP-12S	32.5 SW	NA	NA	NA
MP-13S	25.7 NW	45	500 E	NA
MW-21	22.3 S	NA	500 E	630
MW-27	29.4 N	65	122	105
MW-39	38.5 E	150	87.5	140
IP-1	--	NA	500 E	490

TABLE 3-4
SHALLOW ZONE GROUNDWATER ANALYTICAL RESULTS SUMMARY
ISCO Pilot Test
Troy (Water Street) Site - Area 2
Troy, New York

Shallow Wells	Distance from IP-1 (ft) and Direction	Iron, Total		
		Baseline	Post-Treatment - Week 1	Post-Treatment - Week 3
		mg/L	mg/L	mg/L
MP-1S	15.9 N	11.6N	228	310
MP-4S	36.8 N	1.83 N	125	26.4
MP-6	52.8 W	1200	3500	222
MP-7S	19 W	13.5	133	46.3
MP-8S	5.9 W	140 N	380	110
MP-9S	7.1 SE	145 N	1730	54.7
MP-10	19.9 E	18.4	66.8	20.2
MP-11S	23.7 SW	6.78	331	186
MP-12S	32.5 SW	303 N	NA	NA
MP-13S	25.7 NW	2120 N	1830	NA
MW-21	22.3 S	127	752	517
MW-27	29.4 N	11.2 N	25.9	27.5
MW-39	38.5 E	18.5	32.6	33.7
IP-1	--	352 N	42.1	56

Shallow Wells	Distance from IP-1 (ft) and Direction	Iron (II)		
		Baseline	Post-Treatment - Week 1	Post-Treatment - Week 3
		mg/L	mg/L	mg/L
MP-1S	15.9 N	6.7	0	9
MP-4S	36.8 N	0	3.6	2
MP-6	52.8 W	NA	4	15
MP-7S	19 W	5.4	0	1
MP-8S	5.9 W	NA	5.6	8
MP-9S	7.1 SE	NA	0	0
MP-10	19.9 E	3.75	3.8	3
MP-11S	23.7 SW	NA	2.2	3.5
MP-12S	32.5 SW	NA	NA	NA
MP-13S	25.7 NW	1.2	12	NA
MW-21	22.3 S	NA	9	10
MW-27	29.4 N	8	2.8	2
MW-39	38.5 E	5.4	5	4
IP-1	--	NA	0.1	0

TABLE 3-4
SHALLOW ZONE GROUNDWATER ANALYTICAL RESULTS SUMMARY
ISCO Pilot Test
Troy (Water Street) Site - Area 2
Troy, New York

Shallow Wells	Distance from IP-1 (ft) and Direction	Manganese, Total		
		Baseline	Post-Treatment - Week 1	Post-Treatment - Week 3
		mg/L	mg/L	mg/L
MP-1S	15.9 N	0.606	39.2	20.7
MP-4S	36.8 N	0.124	1.88	0.882
MP-6	52.8 W	22.0	73.7	6.06
MP-7S	19 W	0.359	36.9	14.2
MP-8S	5.9 W	2.74	117	32.5
MP-9S	7.1 SE	3.23	171	94.4
MP-10	19.9 E	0.437	1.25	0.506
MP-11S	23.7 SW	0.226	50	18.2
MP-12S	32.5 SW	3.63	NA	NA
MP-13S	25.7 NW	170	38.3	NA
MW-21	22.3 S	2.41	15.4	12.5
MW-27	29.4 N	0.87	3.47	4.54
MW-39	38.5 E	0.772	0.898	0.895
IP-1	--	4.28	84.8	37.5

Shallow Wells	Distance from IP-1 (ft) and Direction	Manganese, Dissolved		
		Baseline	Post-Treatment - Week 1	Post-Treatment - Week 3
		mg/L	mg/L	mg/L
MP-1S	15.9 N	0.0	0.0	1.5
MP-4S	36.8 N	0.0	0.2	0.0
MP-6	52.8 W	NA	0.0	0.6
MP-7S	19 W	0.0	0.0	0.0
MP-8S	5.9 W	NA	0.0	13.6
MP-9S	7.1 SE	NA	0.0	6.0
MP-10	19.9 E	0.0	0.0	0.0
MP-11S	23.7 SW	NA	0.0	0.0
MP-12S	32.5 SW	NA	NA	NA
MP-13S	25.7 NW	0.15	0.8	NA
MW-21	22.3 S	NA	1.4	1.6
MW-27	29.4 N	0.65	0.9	0.9
MW-39	38.5 E	0.15	0.3	0.0
IP-1	--	NA	27.84	18.4

TABLE 3-4
SHALLOW ZONE GROUNDWATER ANALYTICAL RESULTS SUMMARY
ISCO Pilot Test
Troy (Water Street) Site - Area 2
Troy, New York

Notes:
Refer to Appendix A for complete groundwater sampling results.

U - indicates that the analyte was not detected above the associated value
ND - indicates constituent not detected. Used where reported value is a summation of individual analytes (i.e., BTEX and total PAHs) and each analyte was undetected.
E - indicates the reported concentration exceeds the calibrated range of the instrument for that specific analysis.
N - Spiked sample recovery was not within the control limits.
NA - indicated constituent not analyzed during the monitoring event

TABLE 3-5
DEEP ZONE GROUNDWATER ANALYTICAL RESULTS SUMMARY
ISCO Pilot Test
Troy (Water Street) Site - Area 2
Troy, New York

Deep Wells	Distance from IP-2 (ft) and Direction	BTEX		
		Baseline	Post-Treatment - Week 1	Post-Treatment - Week 3
		ug/L	ug/L	ug/L
MP-1D	12.1 NE	1668	3252	3243
MP-2D	48.8 S	1054	732	845
MP-4D	35.6 N	341	653	292
MP-7D	10.9 W	57	47	136
MP-8D	5.0 S	463	579	583
RMW-8D	3.5 S	NA	2259	1676
MP-9D	13.8 E	1649	2917	2656
MP-11D	19.5 SW	166	359	412
MP-12D	24.2 SW	34	84	79
MP-13D	20.9 NW	48	272	279
MP-21D	21.9 S	185	NA	1224
MP-27D	31.9 N	233	492	219
IP-2	--	455	37	146

Deep Wells	Distance from IP-2 (ft) and Direction	Total PAHs		
		Baseline	Post-Treatment - Week 1	Post-Treatment - Week 3
		ug/L	ug/L	ug/L
MP-1D	12.1 NE	3399	6006	79270
MP-2D	48.8 S	34670	2369	3560
MP-4D	35.6 N	4631	18130	7167
MP-7D	10.9 W	1223	1597	2176
MP-8D	5.0 S	5792	49300	9710
RMW-8D	3.5 S	NA	21670	4150
MP-9D	13.8 E	5679	7900	15235
MP-11D	19.5 SW	1792	8383	1206
MP-12D	24.2 SW	2363	549	476
MP-13D	20.9 NW	1710	4139	1127
MP-21D	21.9 S	11367	NA	182200
MP-27D	31.9 N	2099	703	619
IP-2	--	973	63	39

TABLE 3-5
DEEP ZONE GROUNDWATER ANALYTICAL RESULTS SUMMARY
ISCO Pilot Test
Troy (Water Street) Site - Area 2
Troy, New York

Deep Wells	Distance from IP-2 (ft) and Direction	TPH		
		Baseline	Post-Treatment - Week 1	Post-Treatment - Week 3
		ug/L	ug/L	ug/L
MP-1D	12.1 NE	18000	22000	340000
MP-2D	48.8 S	25000	9200	16000
MP-4D	35.6 N	9000	25000	6900
MP-7D	10.9 W	11000	26000	20000
MP-8D	5.0 S	37000	130000	43000
RMW-8D	3.5 S	NA	75000	16000
MP-9D	13.8 E	19000	31000	47000
MP-11D	19.5 SW	15000	13000	6800
MP-12D	24.2 SW	78000	7000	5300
MP-13D	20.9 NW	15000	6100	7200
MP-21D	21.9 S	180000	NA	780000
MP-27D	31.9 N	7000	5300	4900
IP-2	--	8700	1000	2800

Deep Wells	Distance from IP-2 (ft) and Direction	Total Organic Carbon (TOC)		
		Baseline	Post-Treatment - Week 1	Post-Treatment - Week 3
		mg/L	mg/L	mg/L
MP-1D	12.1 NE	11.1	8.36	9.87
MP-2D	48.8 S	13.0	48.5	28.3
MP-4D	35.6 N	8.90	58.6	12.1
MP-7D	10.9 W	12.3	56.2	16.9
MP-8D	5.0 S	11.4	32.8	16.1
RMW-8D	3.5 S	NA	27.0	16.6
MP-9D	13.8 E	8.31	11.2	13.4
MP-11D	19.5 SW	9.45	135	49.9
MP-12D	24.2 SW	23.5	285	283
MP-13D	20.9 NW	11.5	62.8	77.0
MP-21D	21.9 S	15.05	NA	97.4
MP-27D	31.9 N	6.44	6.97	5.28
IP-2	--	8.768	55.4	11.1

TABLE 3-5
DEEP ZONE GROUNDWATER ANALYTICAL RESULTS SUMMARY
ISCO Pilot Test
Troy (Water Street) Site - Area 2
Troy, New York

Deep Wells	Distance from IP-2 (ft) and Direction	Total Alkalinity		
		Baseline	Post-Treatment - Week 1	Post-Treatment - Week 3
		mg/L	mg/L	mg/L
MP-1D	12.1 NE	192	198	240
MP-2D	48.8 S	196	2 U	67
MP-4D	35.6 N	211	46	196
MP-7D	10.9 W	120	2 U	2
MP-8D	5.0 S	200	156	168
RMW-8D	3.5 S	NA	266	124
MP-9D	13.8 E	190	204	262
MP-11D	19.5 SW	198	2 U	2 U
MP-12D	24.2 SW	158	2 U	2 U
MP-13D	20.9 NW	196	2 U	2 U
MP-21D	21.9 S	124	NA	2 U
MP-27D	31.9 N	162	290	168
IP-2	--	140	2 U	154

Deep Wells	Distance from IP-2 (ft) and Direction	Carbon Dioxide		
		Baseline	Post-Treatment - Week 1	Post-Treatment - Week 3
		mg/L	mg/L	mg/L
MP-1D	12.1 NE	NA	140	140
MP-2D	48.8 S	NA	1000 E	500 E
MP-4D	35.6 N	NA	525	175
MP-7D	10.9 W	NA	1000 E	350
MP-8D	5.0 S	NA	700	332.5
RMW-8D	3.5 S	NA	NA	438
MP-9D	13.8 E	NA	105	193
MP-11D	19.5 SW	NA	1000 E	500
MP-12D	24.2 SW	NA	1000 E	500 E
MP-13D	20.9 NW	NA	1000 E	500 E
MP-21D	21.9 S	NA	NA	500 E
MP-27D	31.9 N	NA	105	70
IP-2	--	95	1000 E	140

TABLE 3-5
DEEP ZONE GROUNDWATER ANALYTICAL RESULTS SUMMARY
ISCO Pilot Test
Troy (Water Street) Site - Area 2
Troy, New York

Deep Wells	Distance from IP-2 (ft) and Direction	Iron, Total		
		Baseline	Post-Treatment - Week 1	Post-Treatment - Week 3
		mg/L	mg/L	mg/L
MP-1D	12.1 NE	927 N	37.3	55.9
MP-2D	48.8 S	825	720	532
MP-4D	35.6 N	273 N	291	24.0
MP-7D	10.9 W	27.2	203	180
MP-8D	5.0 S	1050	356	379
RMW-8D	3.5 S	NA	404	148
MP-9D	13.8 E	86 N	87	73.3
MP-11D	19.5 SW	233	903	328
MP-12D	24.2 SW	1750 N	2460	3670000
MP-13D	20.9 NW	164 N	441	496
MP-21D	21.9 S	208	NA	1530
MP-27D	31.9 N	115 N	39.4	25.6
IP-2	--	28.6 N	102	17.8

Deep Wells	Distance from IP-2 (ft) and Direction	Iron (II)		
		Baseline	Post-Treatment - Week 1	Post-Treatment - Week 3
		mg/L	mg/L	mg/L
MP-1D	12.1 NE	NA	5	3
MP-2D	48.8 S	NA	14	3.5
MP-4D	35.6 N	NA	10	2
MP-7D	10.9 W	NA	4	3.5
MP-8D	5.0 S	NA	10	2.5
RMW-8D	3.5 S	NA	NA	2.5
MP-9D	13.8 E	NA	2.5	2.5
MP-11D	19.5 SW	NA	10	8
MP-12D	24.2 SW	NA	16	9
MP-13D	20.9 NW	NA	8	3.5
MP-21D	21.9 S	NA	NA	6
MP-27D	31.9 N	NA	8	2
IP-2	--	9.7	12	2

TABLE 3-5
DEEP ZONE GROUNDWATER ANALYTICAL RESULTS SUMMARY
ISCO Pilot Test
Troy (Water Street) Site - Area 2
Troy, New York

Deep Wells	Distance from IP-2 (ft) and Direction	Manganese, Total		
		Baseline	Post-Treatment - Week 1	Post-Treatment - Week 3
		mg/L	mg/L	mg/L
MP-1D	12.1 NE	24.7	2.80	2.60
MP-2D	48.8 S	10.9	20.9	14.0
MP-4D	35.6 N	2.73	6.71	0.595
MP-7D	10.9 W	0.805	7.81	5.60
MP-8D	5.0 S	15.7	16.5	14.2
RMW-8D	3.5 S	NA	29.4	13.8
MP-9D	13.8 E	3.56	12.2	8.68
MP-11D	19.5 SW	2.85	35	8.05
MP-12D	24.2 SW	8.22	49.8	54.9
MP-13D	20.9 NW	1.54	9.21	6.50
MP-21D	21.9 S	1.88	NA	40.2
MP-27D	31.9 N	3.74	3.02	2.01
IP-2	--	0.752	15.4	2.21

Deep Wells	Distance from IP-2 (ft) and Direction	Manganese, Dissolved		
		Baseline	Post-Treatment - Week 1	Post-Treatment - Week 3
		mg/L	mg/L	mg/L
MP-1D	12.1 NE	NA	0.6	1.1
MP-2D	48.8 S	NA	1.2	2.5
MP-4D	35.6 N	NA	0.5	0
MP-7D	10.9 W	NA	1	1.2
MP-8D	5.0 S	NA	3.6	1.4
RMW-8D	3.5 S	NA	NA	1.4
MP-9D	13.8 E	NA	0.8	1.3
MP-11D	19.5 SW	NA	0	1.4
MP-12D	24.2 SW	NA	0	0
MP-13D	20.9 NW	NA	0.6	1.3
MP-21D	21.9 S	NA	NA	1.8
MP-27D	31.9 N	NA	0.5	0.8
IP-2	--	0.015	1.6	0.4

TABLE 3-5
DEEP ZONE GROUNDWATER ANALYTICAL RESULTS SUMMARY
ISCO Pilot Test
Troy (Water Street) Site - Area 2
Troy, New York

Notes:

Refer to Appendix A for complete groundwater sampling results.

U - indicates that the analyte was not detected above the associated value

ND - indicates constituent not detected. Used where reported value is a summation of individual analytes (i.e., BTEX and total PAHs) and each analyte was undetected.

E - indicates the reported concentration exceeds the calibrated range of the instrument for that specific analysis.

N - Spiked sample recovery was not within the control limits.

NA - indicated constituent not analyzed during the monitoring event

TABLE 3-6
SHALLOW ZONE SOIL ANALYTICAL RESULTS SUMMARY
ISCO Pilot Test
Troy (Water Street) Site - Area 2
Troy, New York

Boring ID	Concentration (mg/kg)													
	BTEX		PAHs		TPH		TOC		TIC		Iron (total)		Manganese (tot)	
	Baseline	Post	Baseline	Post	Baseline	Post	Baseline	Post	Baseline	Post	Baseline	Post	Baseline	Post
SB-200/SB-200P	130	147	3,031	7,931	16,500	23,000	217,500	255,900	118,000	40,700	152,660	81,950	3,852	1,530
SB-201/SB-201P	527	322	2,411	1,961	13,850	7,050	48,350	37,200	15,000	9,850	79,600	137,000	8,000	3,975
SB-202/SB-202P	2.8	4.3	322	425	12,000	12,500	302,000	301,000	70,000	266,000	107,250	49,050	912	384
SB-203/SB-203P	9.9	3.5	1,414	113	15,000	25,100	209,000	241,500	35,000	26,500	72,650	60,830	1,709	2,022
SB-204/SB-204P	0.81	7.5	257	270	16,500	11,150	118,600	122,500	22,500	13,500	60,940	111,200	1,330	3,291
SB-205/SB-205P	183	19	4,675	2,092	24,400	4,110	206,500	53,400	12,500	89,300	76,900	165,000	2,709	4,830
SB-206/SB-206P	80	3.4	5,230	2,366	18,000	10,800	102,250	118,000	7,785	53,000	40,700	9,010	2,679	32
SB-207/SB-207P	36	9.6	695	687	20,200	33,000	269,500	310,500	10,750	97,500	30,365	62,800	1,220	912
SB-208/SB-208P	216	395	2,782	1,592	8,970	3,150	76,050	41,000	10,500	26,050	43,100	143,600	1,590	2,585
SB-209/SB-209P	0.91	0.08	3,439	159	4,235	6,700	117,750	115,000	68,950	26,000	153,200	267,000	1,948	2,460
SB-210/SB-210P	30	158	803	963	12,650	15,500	500	182,000	162,250	3,000	93,400	63,500	1,323	1,517
SB-211/SB-211P	115	9.6	3,602	1,685	22,500	17,000	3,000	204,000	254,500	16,500	80,150	48,415	1,141	531

Notes:

1. Refer to Appendix B for comprehensive soil analytical results.
2. Concentrations represent the average concentration of shallow zone samples collected from the indicated soil boring. Two shallow zone samples were collected per boring.
3. SB-200/SB-200P refers to the baseline (SB-200) and post-treatment (SB-200P) soil boring pairs, which were completed in the same general vicinity.
4. TOC - Total Organic Carbon; TIC - Total Inorganic Carbon

TABLE 3-7
DEEP ZONE SOIL ANALYTICAL RESULTS SUMMARY
ISCO Pilot Test
Troy (Water Street) Site - Area 2
Troy, New York

Boring ID	Concentration (mg/kg)													
	BTEX		PAHs		TPH		TOC		TIC		Iron (tot)		Manganese (tot)	
	Baseline	Post	Baseline	Post	Baseline	Post	Baseline	Post	Baseline	Post	Baseline	Post	Baseline	Post
SB-200/SB-200P	33	45	722	706	2,500	2,245	38400	33160	2550	ND	147350	178000	1936	2998
SB-201/SB-201P	163	75	1,608	1,247	3,650	3,255	33600	31200	12900	18700	118350	152500	2390	2150
SB-202/SB-202P	0.95	0.14	132	76	2,750	1,350	33650	34600	ND	6200	316500	216550	3740	1552
SB-203/SB-203P	3.8	4.2	165	147	880	855	70600	7405	8000	15690	232500	204000	10118	3585
SB-204/SB-204P	0.27	0.49	40	35	1,050	140	20900	26400	5000	23650	189500	370500	2495	4385
SB-205/SB-205P	99	61	676	841	3,000	4,250	21300	16900	5400	3400	133350	170750	2238	4126
SB-206/SB-206P	2.0	7.4	119	1,826	355	3,375	25850	85400	675	5800	279000	182900	3430	3539
SB-207/SB-207P	3.5	1.0	186	136	2,150	1,850	15100	22100	8305	6150	353000	369000	3690	4545
SB-208/SB-208P	14	1.6	95	192	490	700	28700	14295	2930	335	58300	47350	516	434
SB-209/SB-209P	NA	0.31	NA	315	NA	5,500	NA	18385	NA	13365	NA	49700	NA	817
SB-210/SB-210P	3.4	56	52	581	685	2,300	4600	45650	38150	ND	158000	47500	1886	760
SB-211/SB-211P	0.53	1.9	30	393	110	3,000	3750	21900	66100	4200	117650	130350	1746	1717

Notes:

1. Refer to Appendix B for comprehensive soil analytical results.
2. Concentrations represent the average concentration of deep zone samples collected from the indicated soil boring. In general, two deep zone samples were collected per boring.
3. SB-200/SB-200P refers to the baseline (SB-200) and post-treatment (SB-200P) soil boring pairs, which were completed in the same general vicinity.
4. TOC - Total Organic Carbon; TIC - Total Inorganic Carbon

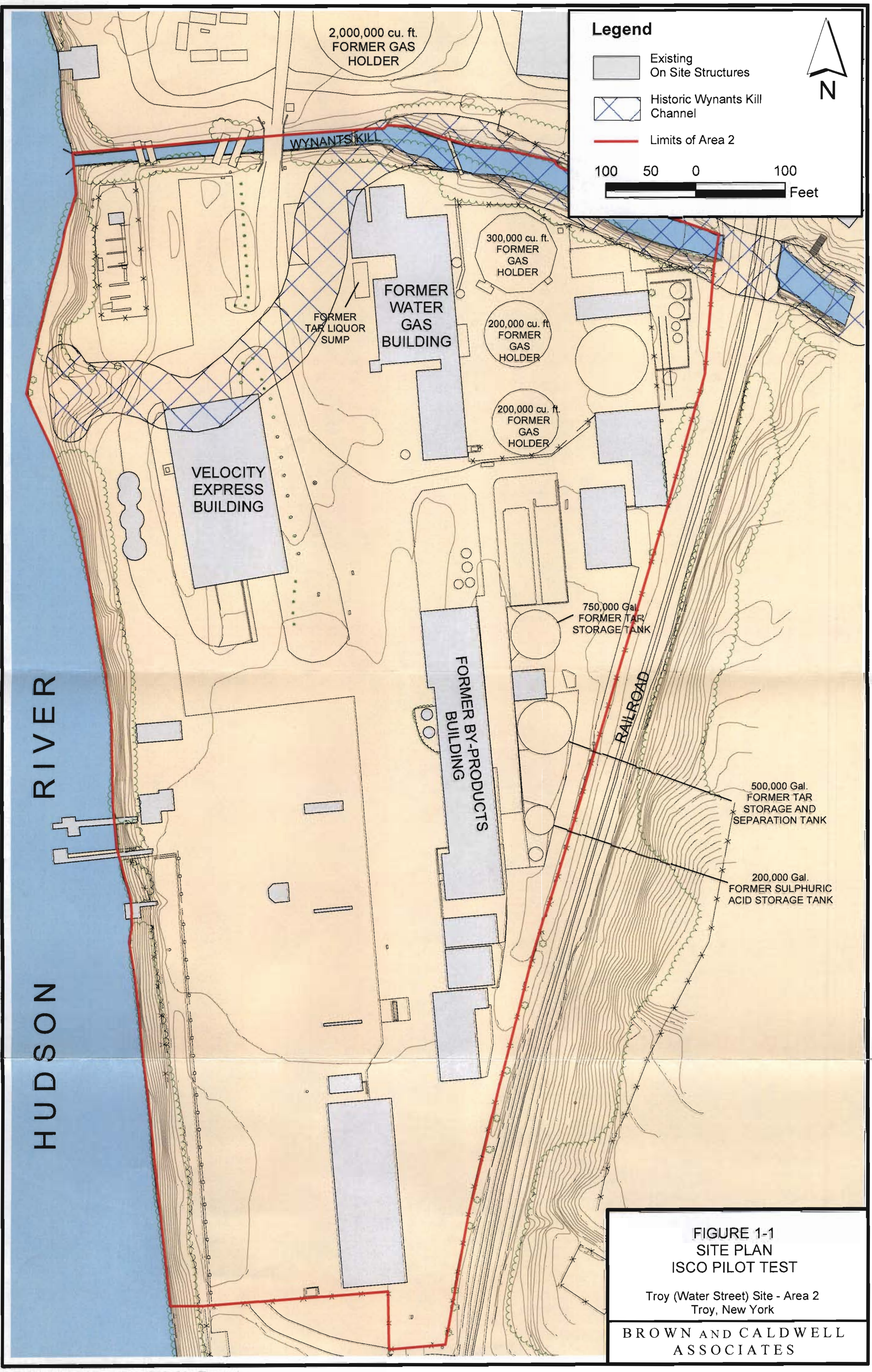
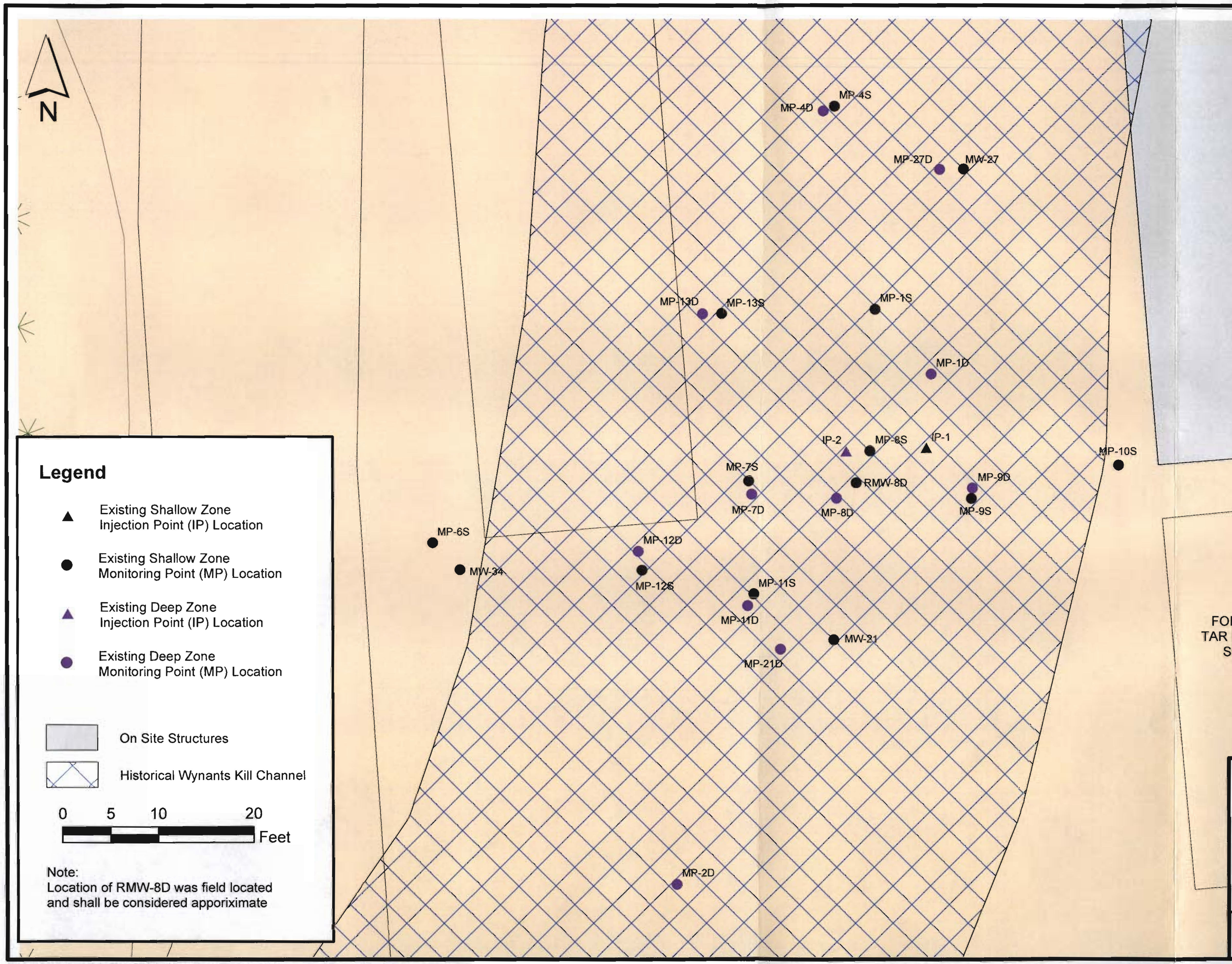


FIGURE 1-1
SITE PLAN
ISCO PILOT TEST

Troy (Water Street) Site - Area 2
Troy, New York

BROWN AND CALDWELL
ASSOCIATES

P:/GIS/National_Grid/Troy/Troy_ISCO_Site_Plan.mxd



Note:
Location of RMW-8D was field located
and shall be considered apporiximate

FIGURE 2-1
SURVEYED ISCO
PILOT TEST LAYOUT
ISCO PILOT TEST

Troy (Water Street) Site - Area 2
Troy, New York

BROWN AND CALDWELL
ASSOCIATES

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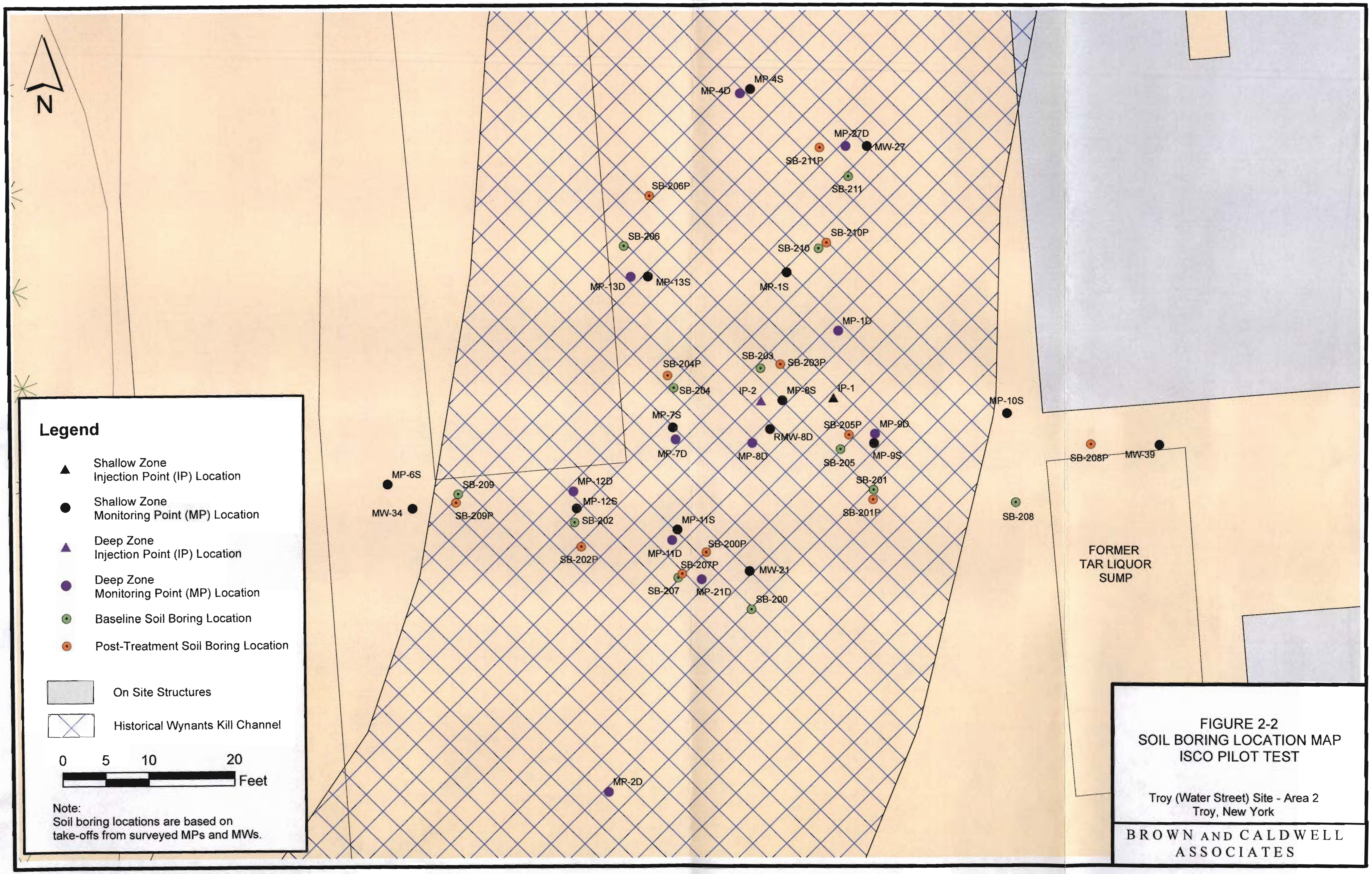

Note:
Soil boring locations are based on take-offs from surveyed MPs and MWs.

FIGURE 2-2
SOIL BORING LOCATION MAP
ISCO PILOT TEST

Troy (Water Street) Site - Area 2
Troy, New York

BROWN AND CALDWELL
ASSOCIATES

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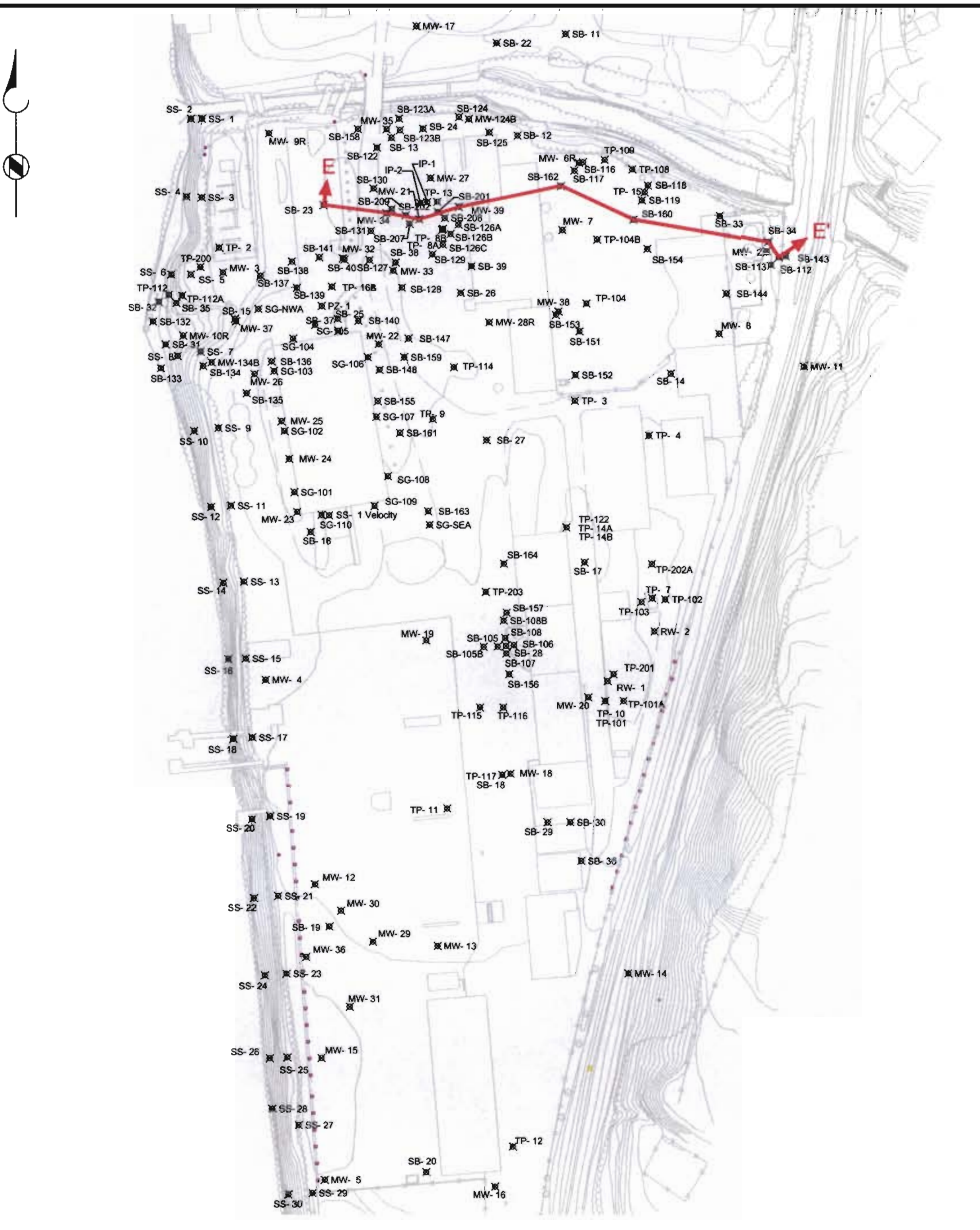
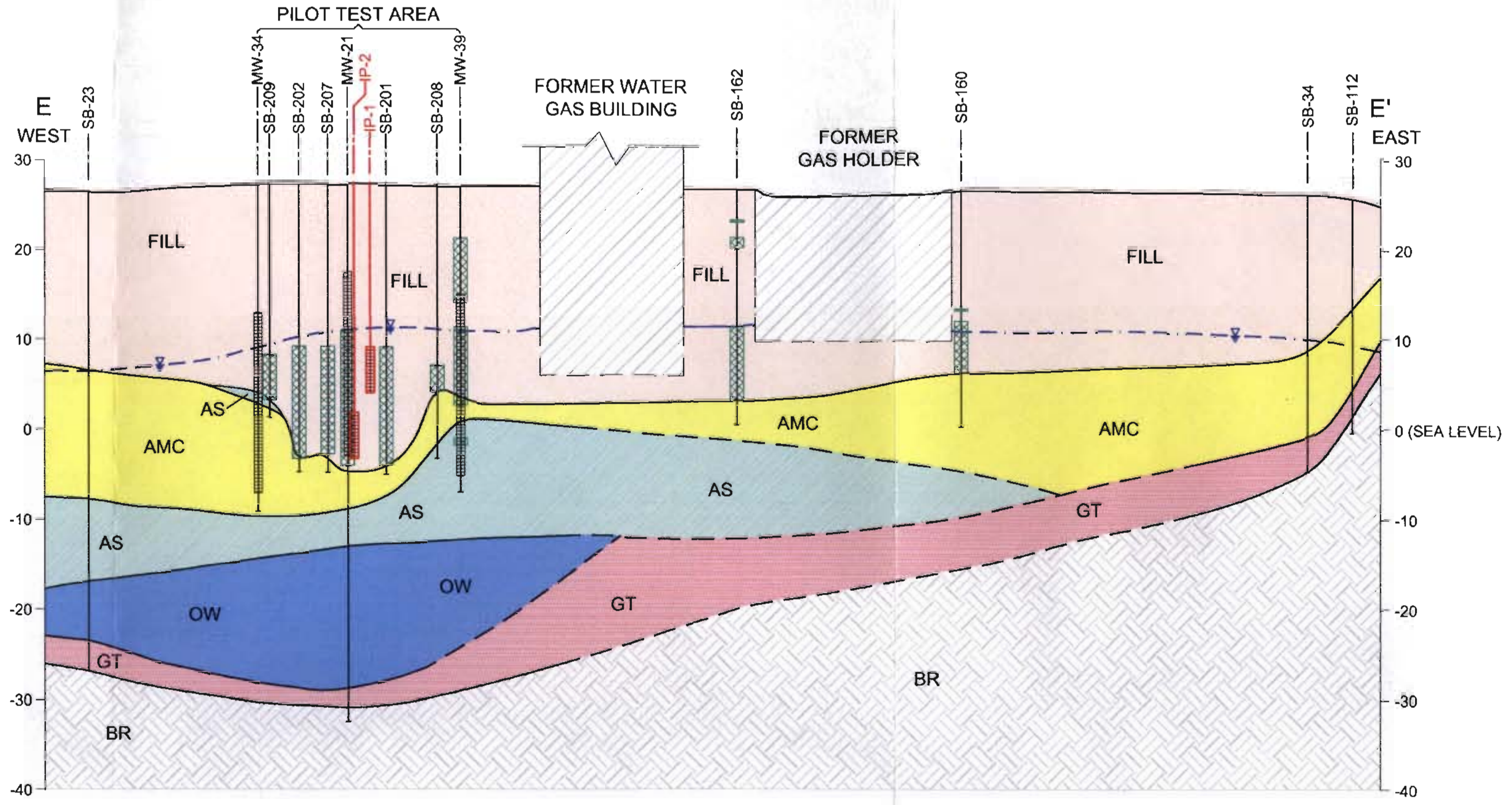


SITE PLAN



CROSS-SECTION E-E'

LEGEND:

SB-112 MONITORING WELL / SOIL BORING TEST PIT IDENTIFICATION AND APPROXIMATE LOCATION. INJECTION POINTS SHOWN IN RED

GENERALIZED GROUNDSURFACE

WELL SCREEN INTERVAL

▨	FILL
🟨	AMC - ALLUVIUM (SILT / CLAY)
▨	AS- ALLUVIUM (SAND / GRAVEL))
▨	GR - GRAVEL
🟦	OW - OUTWASH
🟥	GT- GLACIAL TILL
▨	BR - BEDROCK
—▽—·—▽—	WATER TABLE
▨	NAPL - NON AQUEOUS PHASE LIQUID, OBSERVED

40 0 40 80
scale feet
HORIZONTAL
1" = 40'-0"

10 0 10 20
scale feet
VERTICAL
1" = 10'-0"

FIGURE 2-3
GEOLOGICAL CROSS-SECTION
ISCO PILOT TEST

Troy (Water Street) Site - Area 2
Troy, New York

BROWN AND CALDWELL
ASSOCIATES

P:\DRAFTING\NATIONAL_GRID\NIMO_TROY\128805\003\FIGURE 2-3.dwg

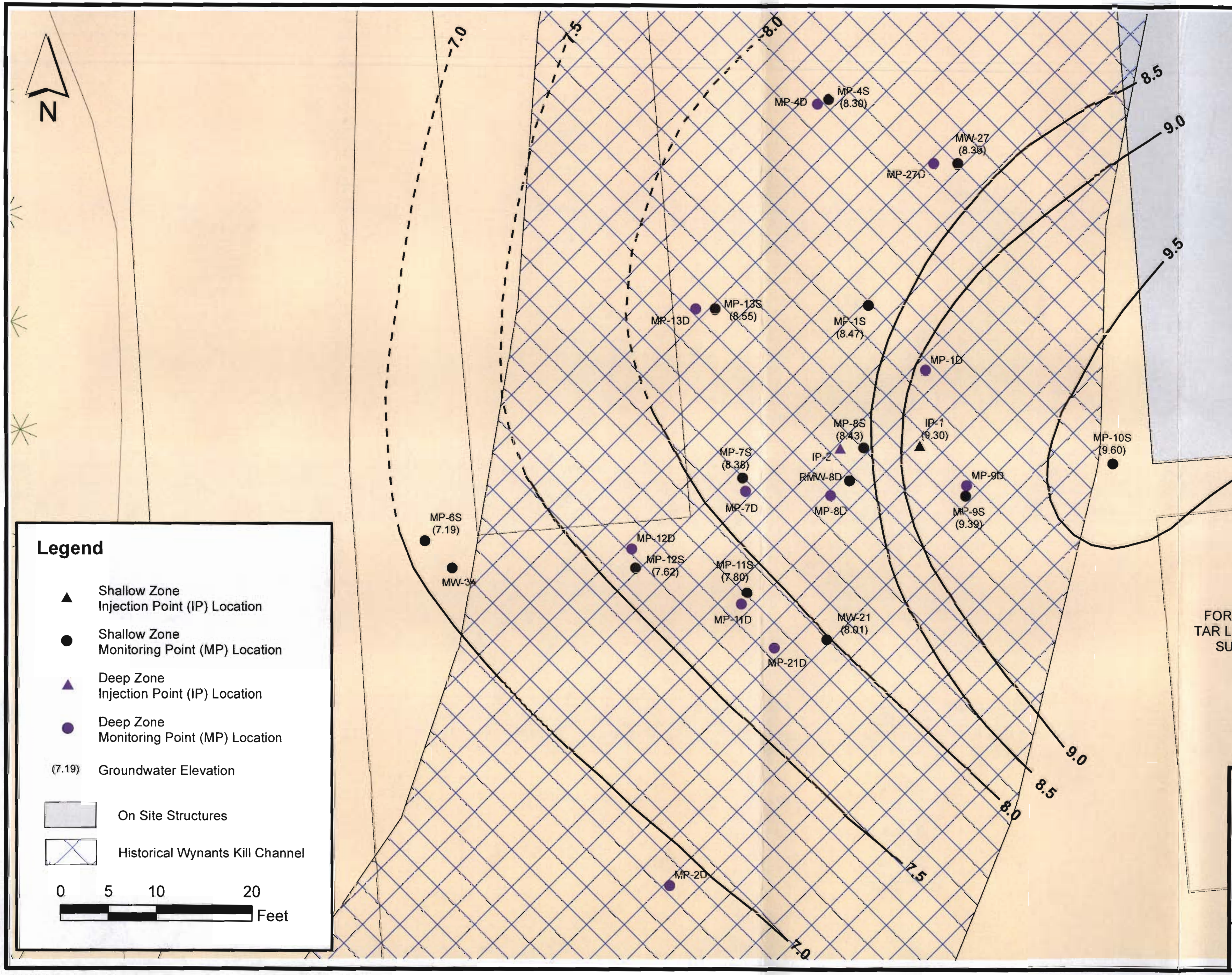


FIGURE 3-1a
GROUNDWATER CONTOUR MAP
BASELINE 8/2/05 - 8/5/05
ISCO PILOT TEST

Troy (Water Street) Site - Area 2
Troy, New York

BROWN AND CALDWELL
ASSOCIATES

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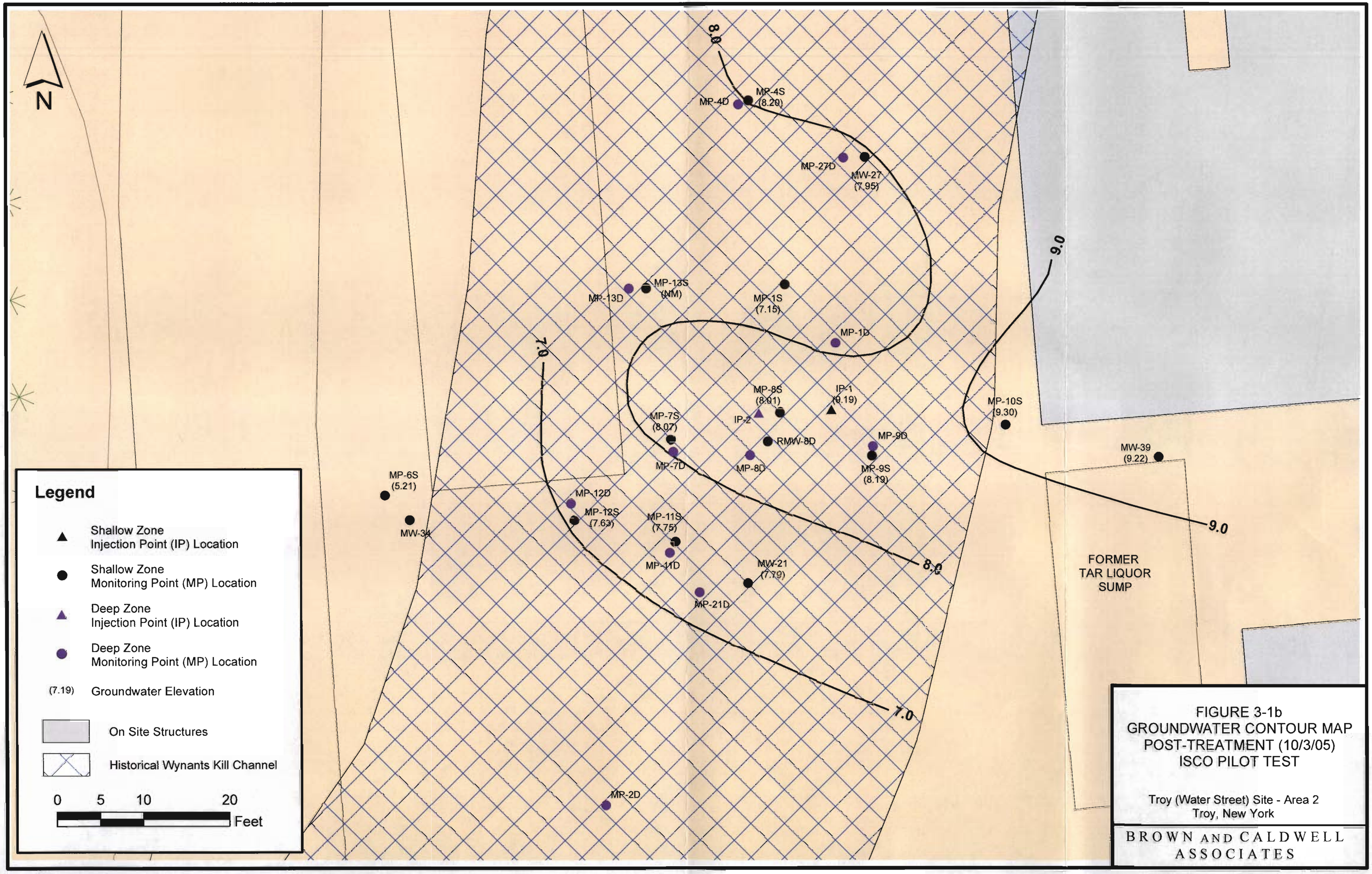

FIGURE 3-1b
GROUNDWATER CONTOUR MAP
POST-TREATMENT (10/3/05)
ISCO PILOT TEST

Troy (Water Street) Site - Area 2
Troy, New York

BROWN AND CALDWELL
ASSOCIATES

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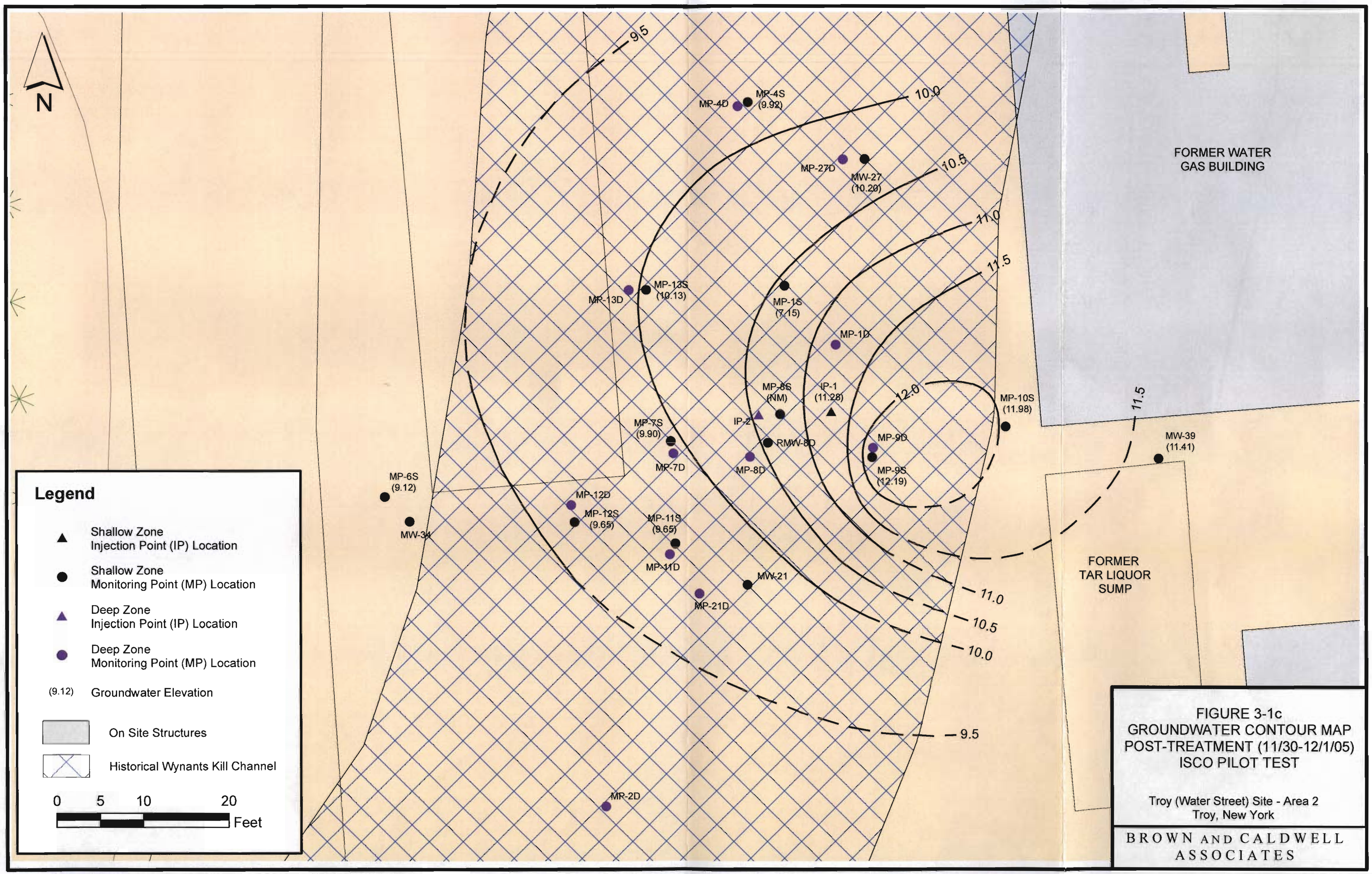

FIGURE 3-1c
GROUNDWATER CONTOUR MAP
POST-TREATMENT (11/30-12/1/05)
ISCO PILOT TEST

Troy (Water Street) Site - Area 2
Troy, New York

BROWN AND CALDWELL
ASSOCIATES

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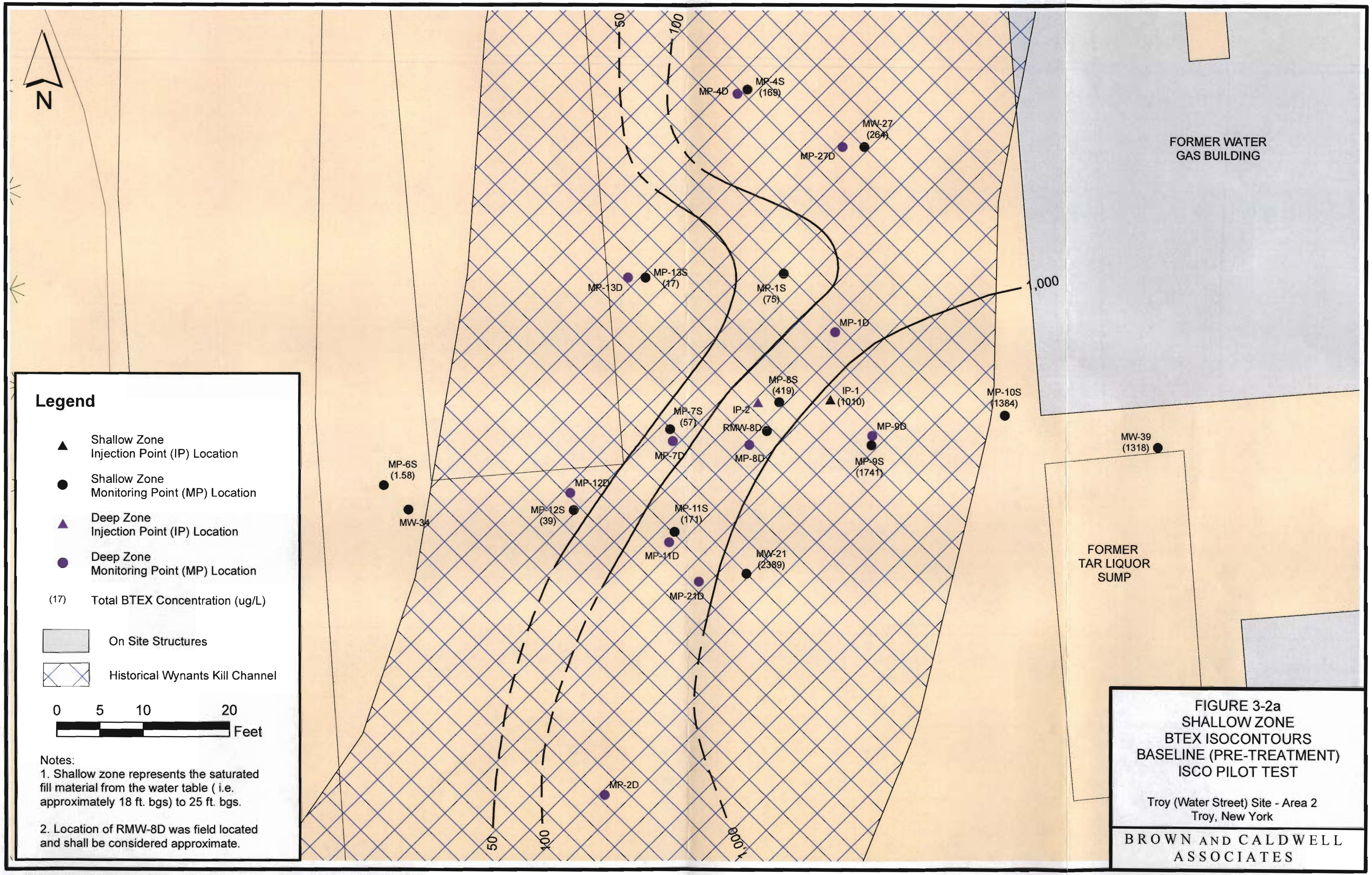

Notes:

1. Shallow zone represents the saturated fill material from the water table (i.e. approximately 18 ft. bgs) to 25 ft. bgs.

2. Location of RMW-8D was field located and shall be considered approximate.

FIGURE 3-2a
SHALLOW ZONE
BTEX ISOCONTOURS
BASELINE (PRE-TREATMENT)
ISCO PILOT TEST

Troy (Water Street) Site - Area 2
Troy, New York

BROWN AND CALDWELL ASSOCIATES

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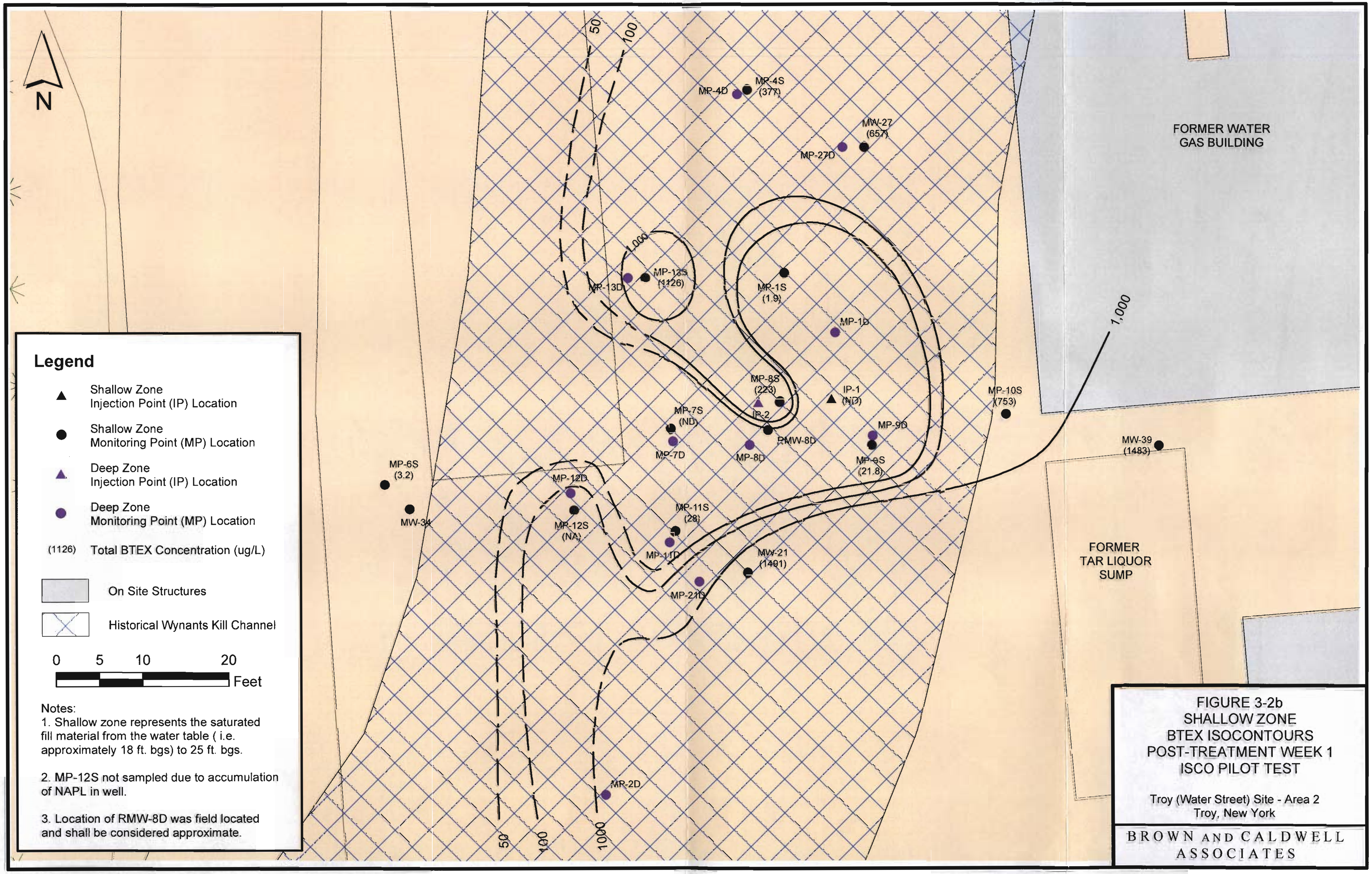

Notes:

1. Shallow zone represents the saturated fill material from the water table (i.e. approximately 18 ft. bgs) to 25 ft. bgs.

2. MP-12S not sampled due to accumulation of NAPL in well.

3. Location of RMW-8D was field located and shall be considered approximate.

FIGURE 3-2b
SHALLOW ZONE
BTEX ISOCONTOURS
POST-TREATMENT WEEK 1
ISCO PILOT TEST

Troy (Water Street) Site - Area 2
Troy, New York

BROWN AND CALDWELL
ASSOCIATES

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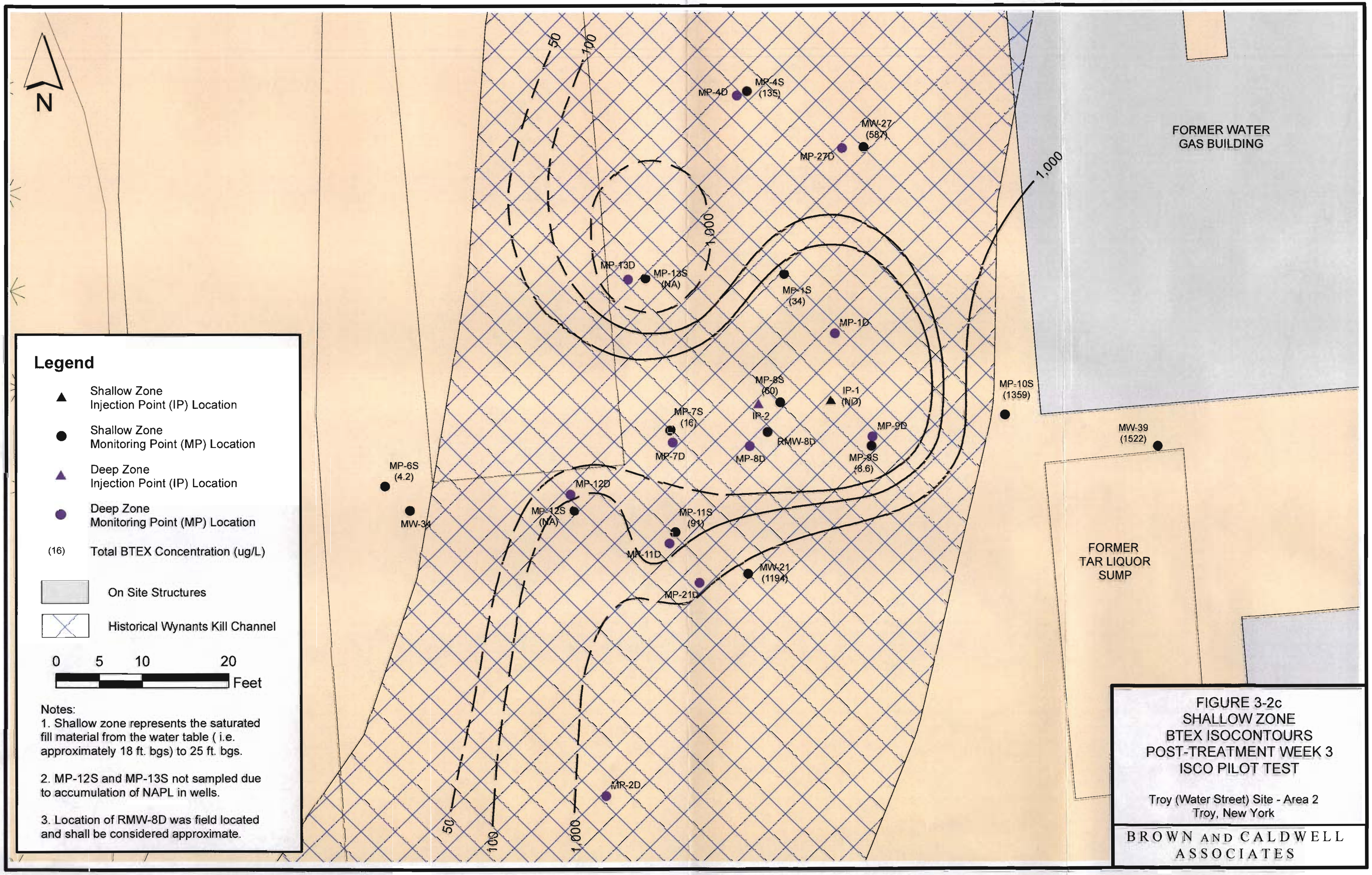

Legend

▲	Shallow Zone Injection Point (IP) Location
●	Shallow Zone Monitoring Point (MP) Location
▲	Deep Zone Injection Point (IP) Location
●	Deep Zone Monitoring Point (MP) Location
(16)	Total BTEX Concentration (ug/L)
▨	On Site Structures
▨	Historical Wynants Kill Channel

0 5 10 20 Feet

Notes:
1. Shallow zone represents the saturated fill material from the water table (i.e. approximately 18 ft. bgs) to 25 ft. bgs.

2. MP-12S and MP-13S not sampled due to accumulation of NAPL in wells.

3. Location of RMW-8D was field located and shall be considered approximate.

FIGURE 3-2c
SHALLOW ZONE
BTEX ISOCONTOURS
POST-TREATMENT WEEK 3
ISCO PILOT TEST

Troy (Water Street) Site - Area 2
Troy, New York

BROWN AND CALDWELL
ASSOCIATES

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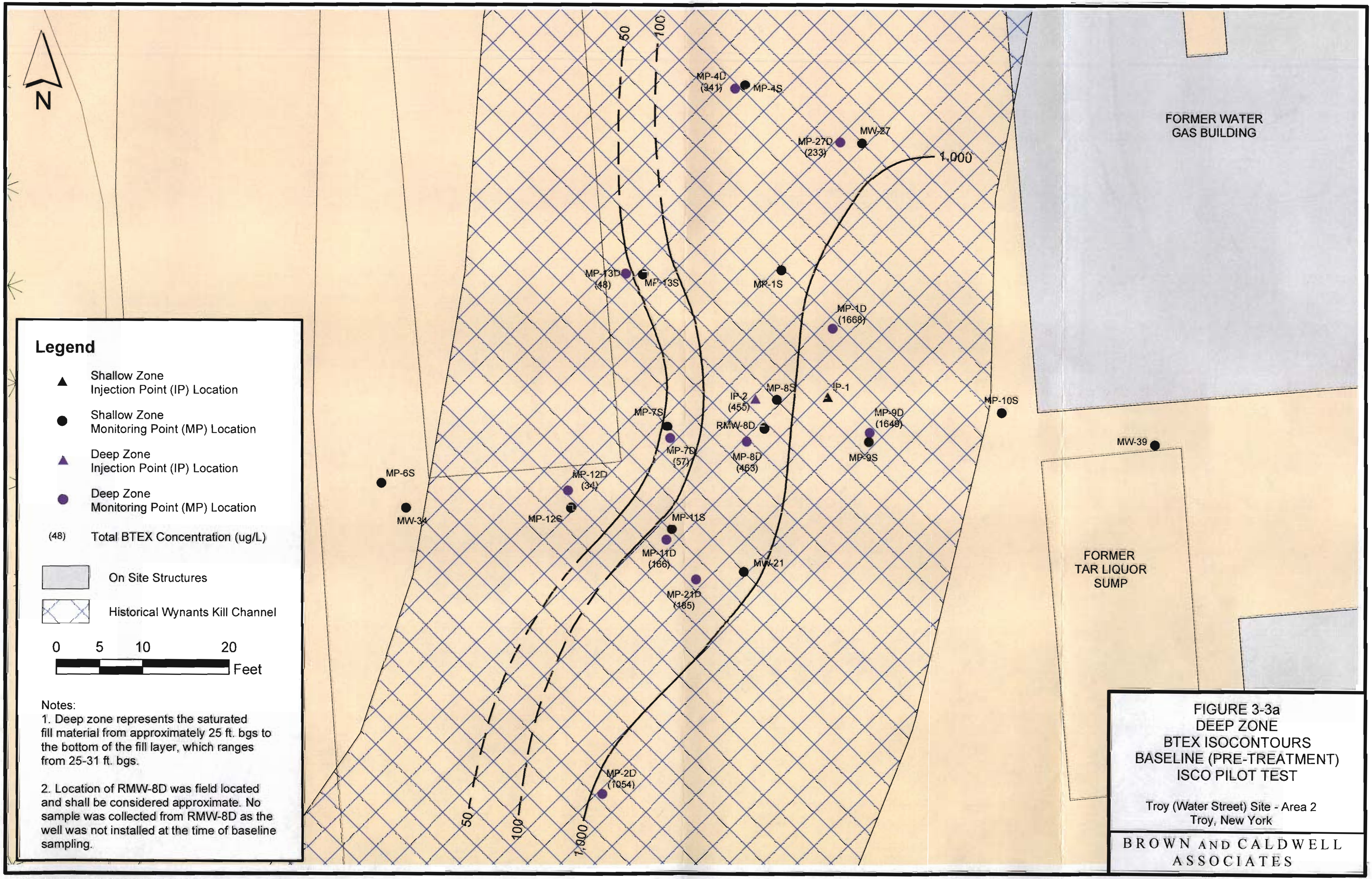

Legend

▲ Shallow Zone Injection Point (IP) Location

● Shallow Zone Monitoring Point (MP) Location

▲ Deep Zone Injection Point (IP) Location

● Deep Zone Monitoring Point (MP) Location

(48) Total BTEX Concentration (ug/L)

▭ On Site Structures

▨ Historical Wynants Kill Channel

0 5 10 20 Feet

Notes:
1. Deep zone represents the saturated fill material from approximately 25 ft. bgs to the bottom of the fill layer, which ranges from 25-31 ft. bgs.

2. Location of RMW-8D was field located and shall be considered approximate. No sample was collected from RMW-8D as the well was not installed at the time of baseline sampling.

FIGURE 3-3a
DEEP ZONE
BTEX ISOCONTOURS
BASELINE (PRE-TREATMENT)
ISCO PILOT TEST

Troy (Water Street) Site - Area 2
Troy, New York

BROWN AND CALDWELL
ASSOCIATES

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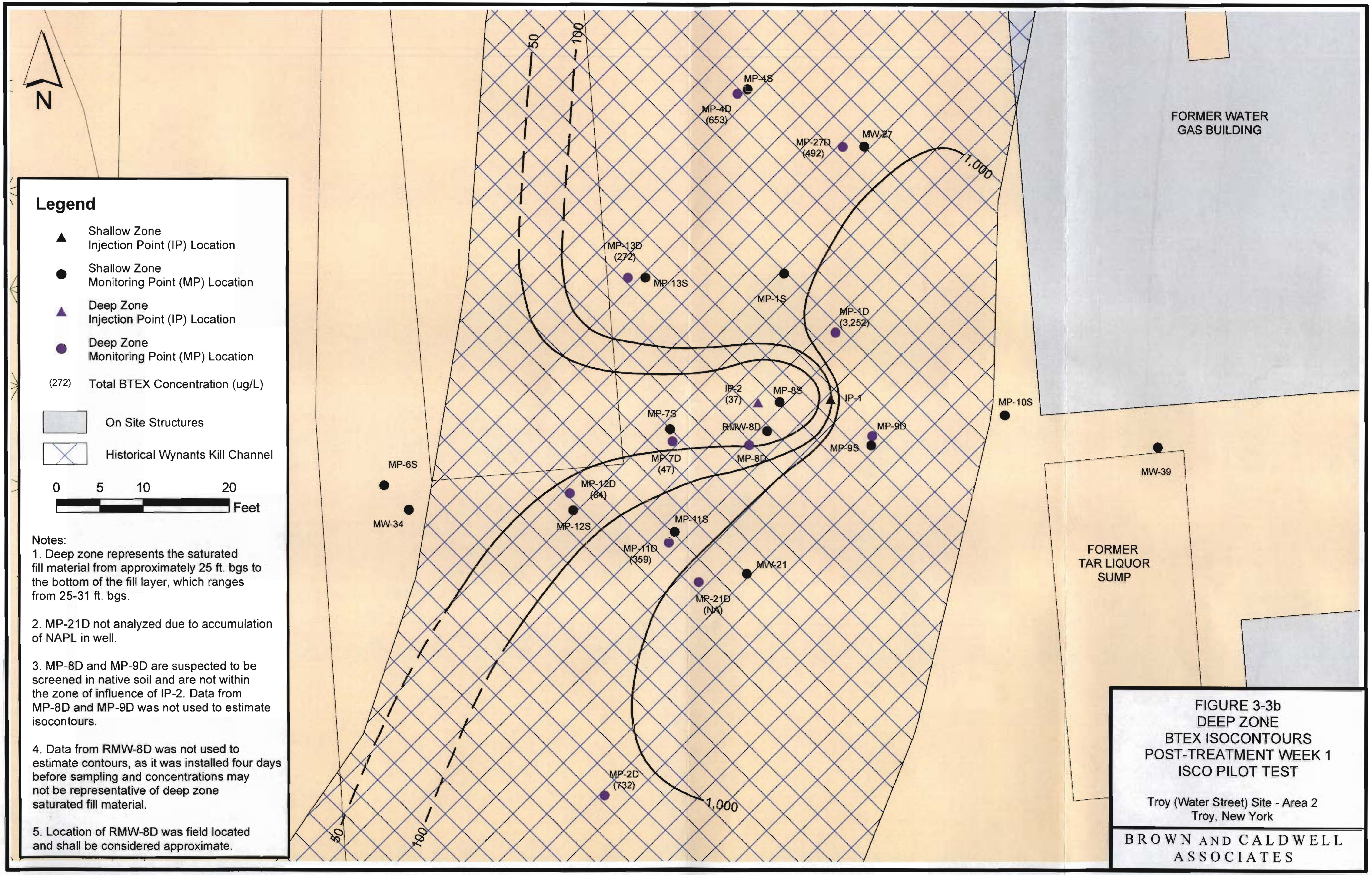


Legend

▲	Shallow Zone Injection Point (IP) Location
●	Shallow Zone Monitoring Point (MP) Location
▲	Deep Zone Injection Point (IP) Location
●	Deep Zone Monitoring Point (MP) Location
(272)	Total BTEX Concentration (ug/L)
▨	On Site Structures
☒	Historical Wynants Kill Channel

0 5 10 20 Feet

Notes:

1. Deep zone represents the saturated fill material from approximately 25 ft. bgs to the bottom of the fill layer, which ranges from 25-31 ft. bgs.

2. MP-21D not analyzed due to accumulation of NAPL in well.

3. MP-8D and MP-9D are suspected to be screened in native soil and are not within the zone of influence of IP-2. Data from MP-8D and MP-9D was not used to estimate isocontours.

4. Data from RMW-8D was not used to estimate contours, as it was installed four days before sampling and concentrations may not be representative of deep zone saturated fill material.

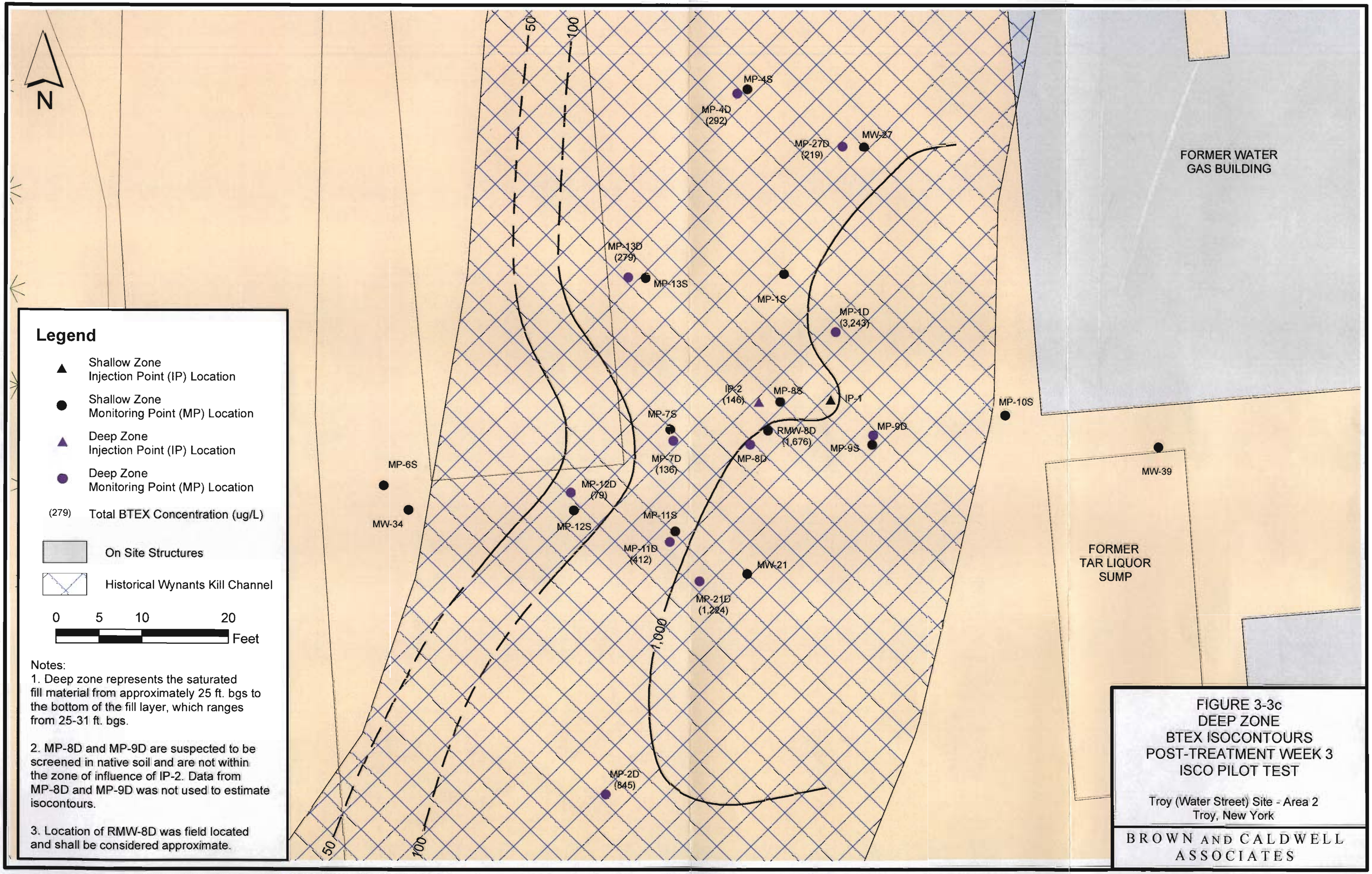
5. Location of RMW-8D was field located and shall be considered approximate.

FIGURE 3-3b
DEEP ZONE
BTEX ISOCONTOURS
POST-TREATMENT WEEK 1
ISCO PILOT TEST

Troy (Water Street) Site - Area 2
Troy, New York

BROWN AND CALDWELL ASSOCIATES

P:/GIS/National Grid/Troy/Troy_ISCO_POST_Week_1_BTEX_Contours_Deep.mxd



Legend

▲ Shallow Zone
Injection Point (IP) Location

● Shallow Zone
Monitoring Point (MP) Location

▲ Deep Zone
Injection Point (IP) Location

● Deep Zone
Monitoring Point (MP) Location

(279) Total BTEX Concentration (ug/L)

▨ On Site Structures

▨ Historical Wynants Kill Channel

0 5 10 20
Feet

Notes:
1. Deep zone represents the saturated fill material from approximately 25 ft. bgs to the bottom of the fill layer, which ranges from 25-31 ft. bgs.

2. MP-8D and MP-9D are suspected to be screened in native soil and are not within the zone of influence of IP-2. Data from MP-8D and MP-9D was not used to estimate isocontours.

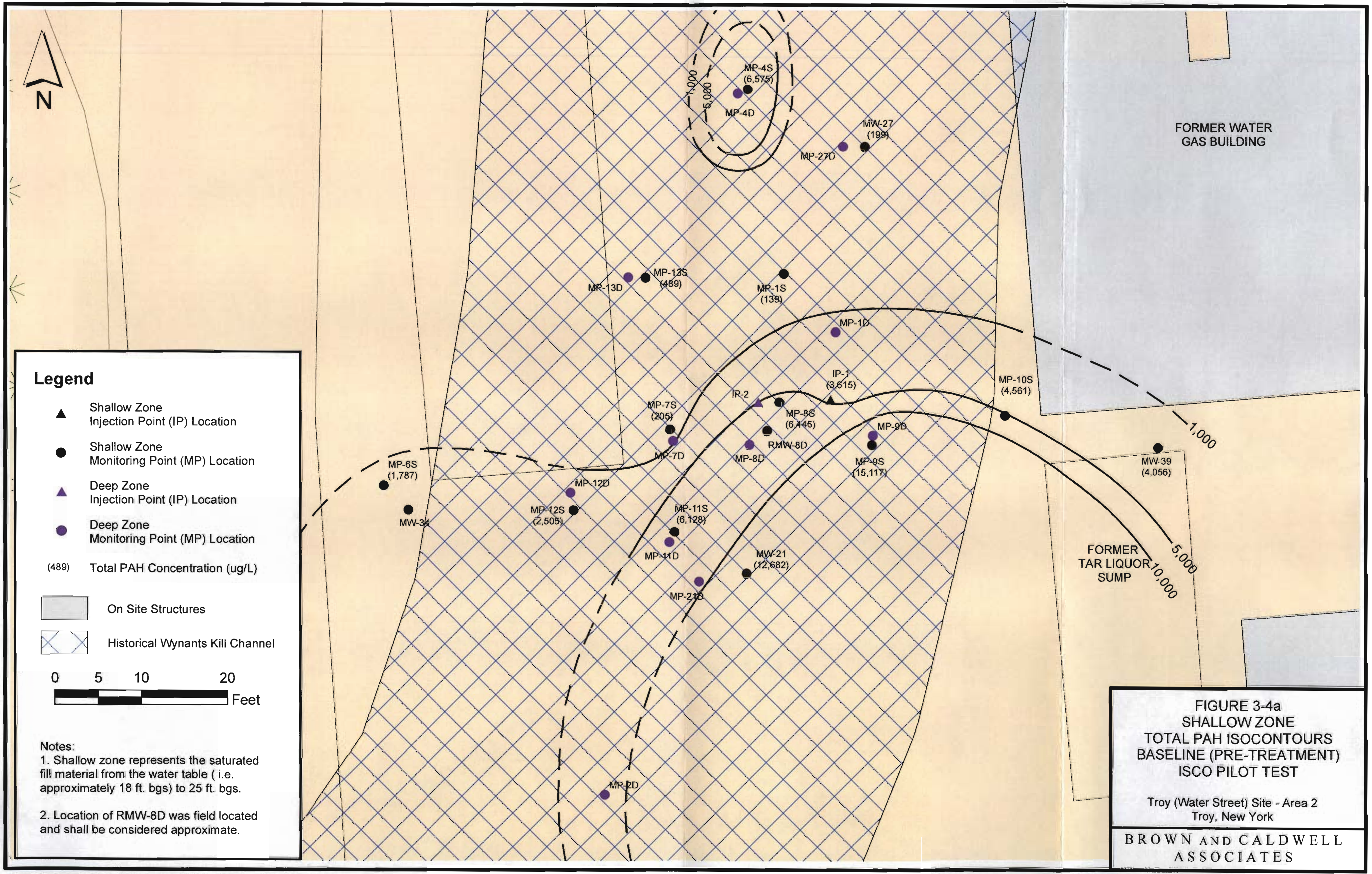
3. Location of RMW-8D was field located and shall be considered approximate.

FIGURE 3-3c
DEEP ZONE
BTEX ISOCONTOURS
POST-TREATMENT WEEK 3
ISCO PILOT TEST

Troy (Water Street) Site - Area 2
Troy, New York

BROWN AND CALDWELL
ASSOCIATES

P:/GIS/National Grid/Troy/Troy_ISCO_POST_Week_3_BTEX_Contours_Deep.mxd



Notes:
1. Shallow zone represents the saturated fill material from the water table (i.e. approximately 18 ft. bgs) to 25 ft. bgs.

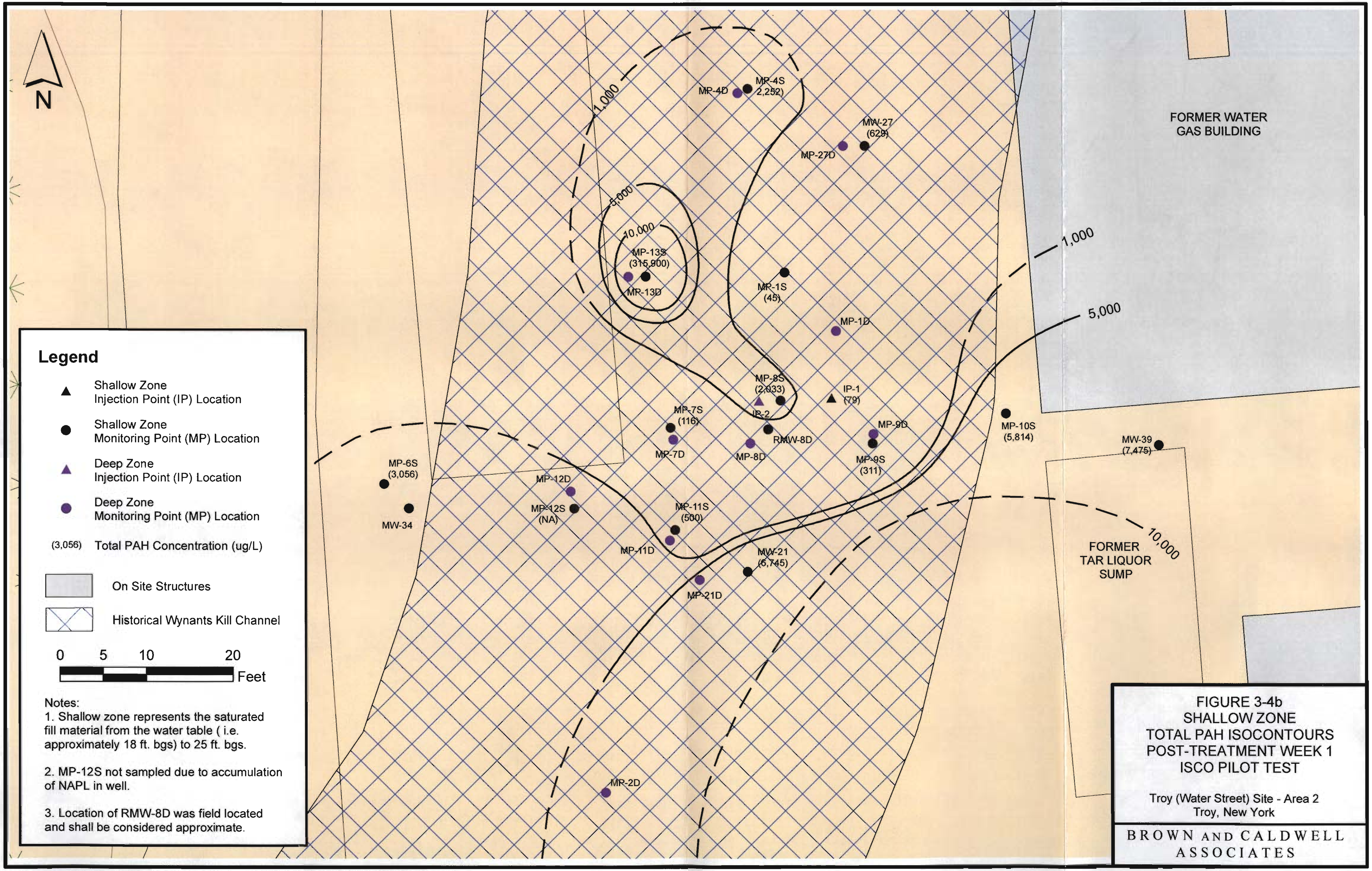
2. Location of RMW-8D was field located and shall be considered approximate.

FIGURE 3-4a
SHALLOW ZONE
TOTAL PAH ISOCONTOURS
BASELINE (PRE-TREATMENT)
ISCO PILOT TEST

Troy (Water Street) Site - Area 2
Troy, New York

BROWN AND CALDWELL
ASSOCIATES

P:/GIS/National Grid/Troy/Troy_ISCO_Baseline_Pre_Total_PAH_Contours_Shallow.mxd



Notes:

1. Shallow zone represents the saturated fill material from the water table (i.e. approximately 18 ft. bgs) to 25 ft. bgs.

2. MP-12S not sampled due to accumulation of NAPL in well.

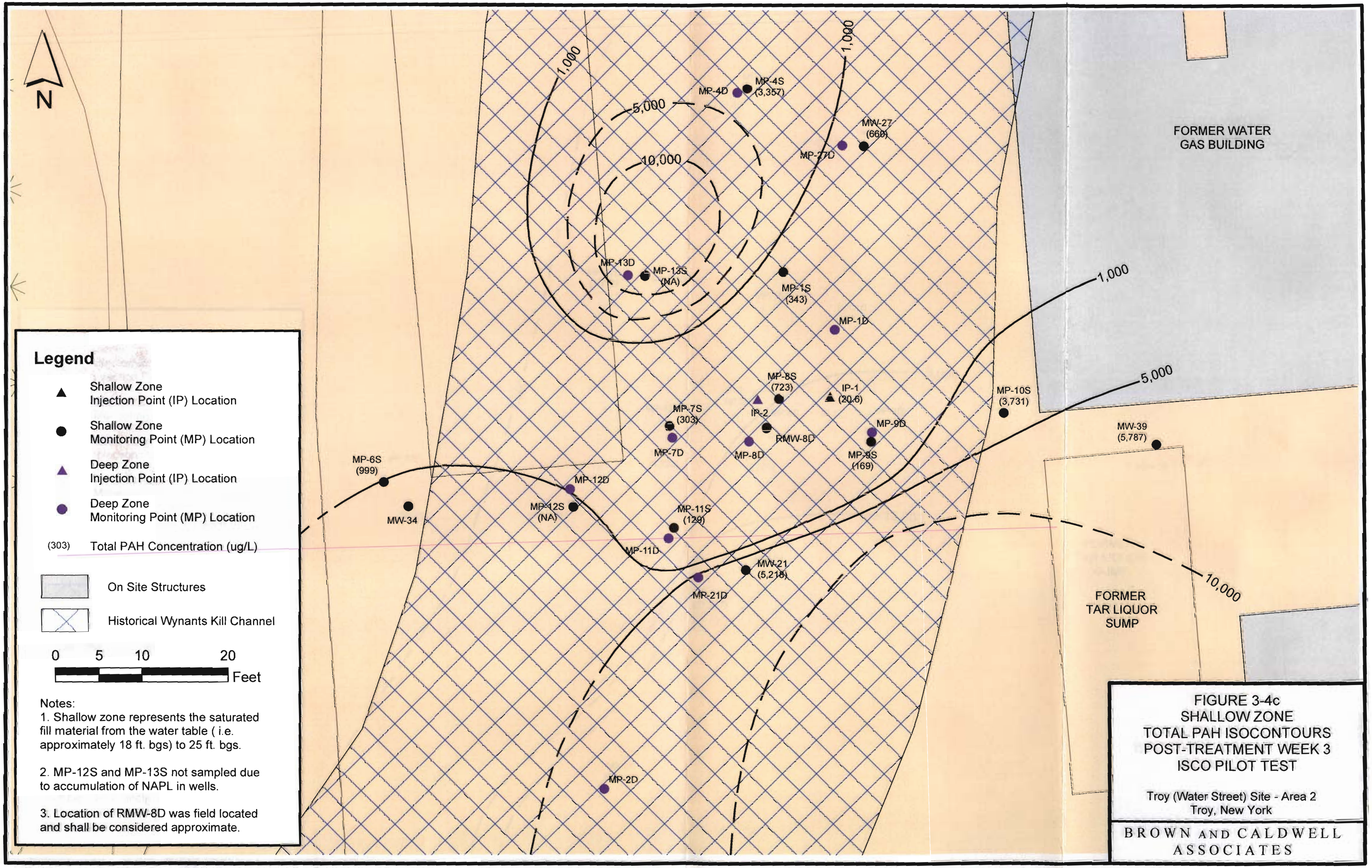
3. Location of RMW-8D was field located and shall be considered approximate.

FIGURE 3-4b
SHALLOW ZONE TOTAL PAH ISOCONTOURS POST-TREATMENT WEEK 1 ISCO PILOT TEST

Troy (Water Street) Site - Area 2
Troy, New York

BROWN AND CALDWELL ASSOCIATES

P:/GIS/National Grid/Troy/Troy_ISCO_POST_WEEK_1_Total_PAH_Contours_Shallow.mxd



Legend

▲	Shallow Zone Injection Point (IP) Location
●	Shallow Zone Monitoring Point (MP) Location
▲	Deep Zone Injection Point (IP) Location
●	Deep Zone Monitoring Point (MP) Location
(303)	Total PAH Concentration (ug/L)
▨	On Site Structures
☒	Historical Wynants Kill Channel

0 5 10 20
Feet

Notes:

1. Shallow zone represents the saturated fill material from the water table (i.e. approximately 18 ft. bgs) to 25 ft. bgs.

2. MP-12S and MP-13S not sampled due to accumulation of NAPL in wells.

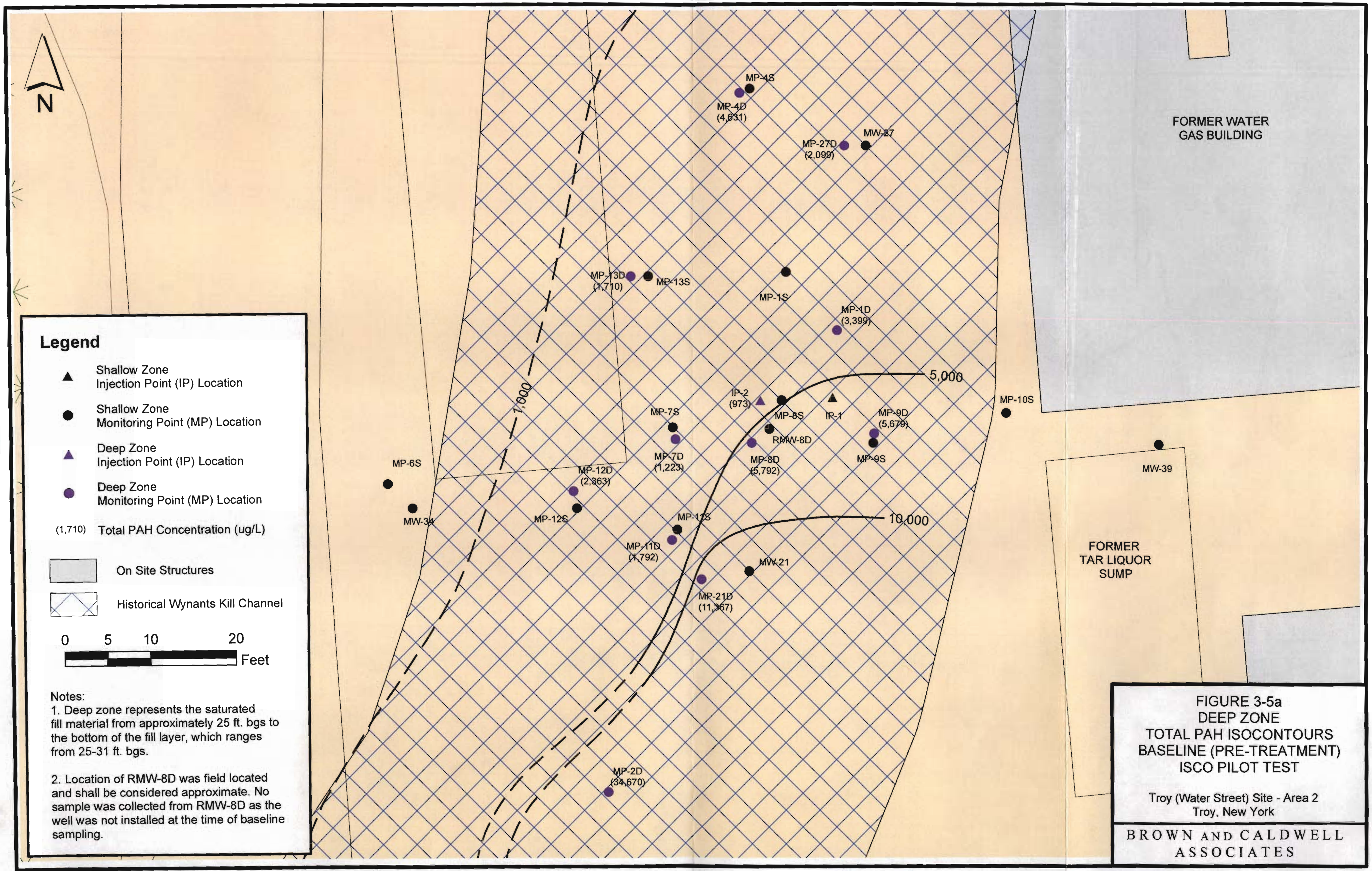
3. Location of RMW-8D was field located and shall be considered approximate.

FIGURE 3-4c
SHALLOW ZONE
TOTAL PAH ISOCONTOURS
POST-TREATMENT WEEK 3
ISCO PILOT TEST

Troy (Water Street) Site - Area 2
Troy, New York

BROWN AND CALDWELL
ASSOCIATES

P:/GIS/National Grid/Troy/Troy_ISCO_POST_WEEK_3_Total_PAH_Contours_Shallow.mxd



Notes:

1. Deep zone represents the saturated fill material from approximately 25 ft. bgs to the bottom of the fill layer, which ranges from 25-31 ft. bgs.

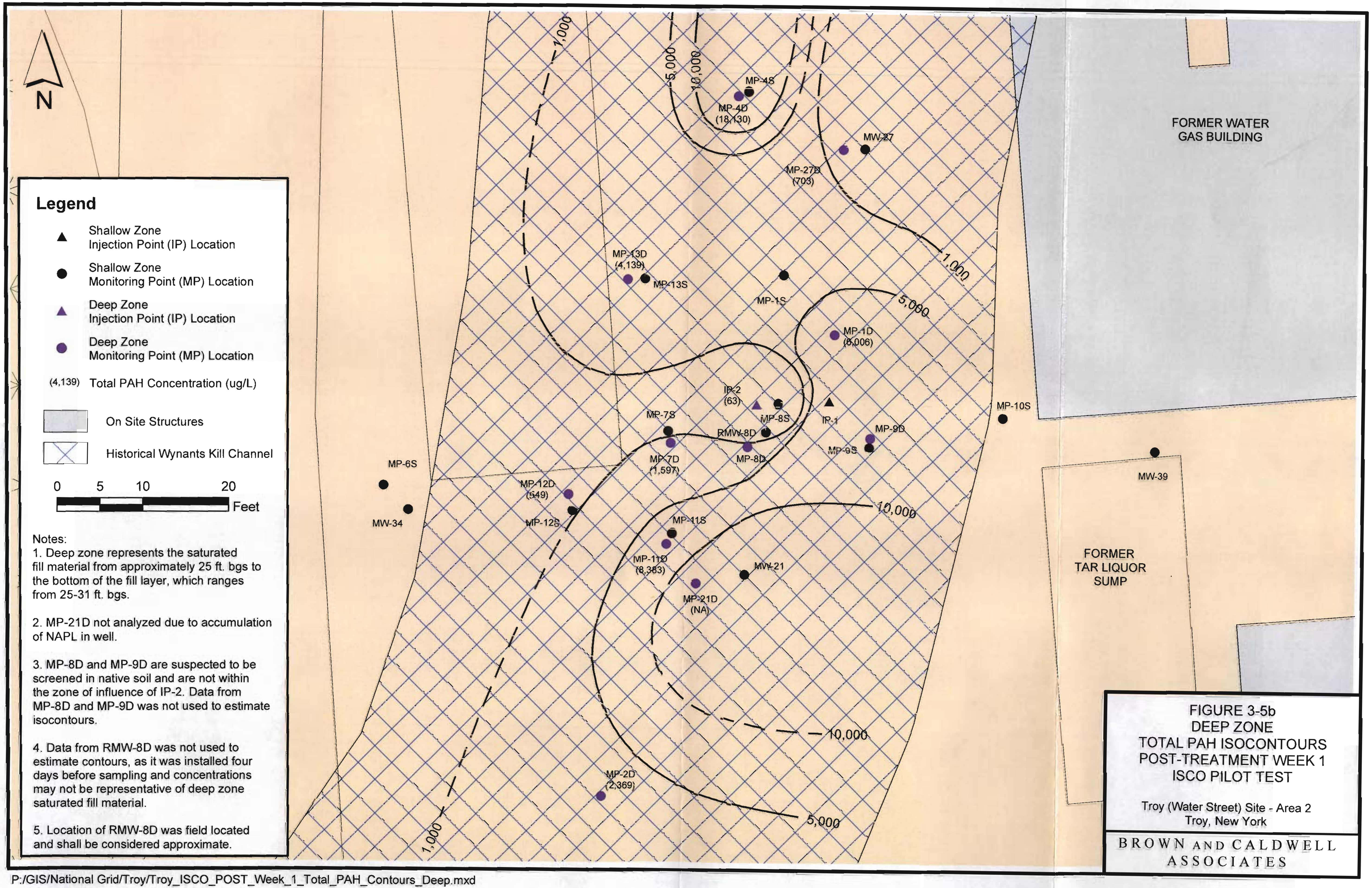
2. Location of RMW-8D was field located and shall be considered approximate. No sample was collected from RMW-8D as the well was not installed at the time of baseline sampling.

FIGURE 3-5a
DEEP ZONE
TOTAL PAH ISOCONTOURS
BASELINE (PRE-TREATMENT)
ISCO PILOT TEST

Troy (Water Street) Site - Area 2
Troy, New York

BROWN AND CALDWELL
ASSOCIATES

P:/GIS/National Grid/Troy/Troy_ISCO_Baseline_Pre_Total_PAH_Contours_Deep.mxd



Legend

▲ Shallow Zone Injection Point (IP) Location

● Shallow Zone Monitoring Point (MP) Location

▲ Deep Zone Injection Point (IP) Location

● Deep Zone Monitoring Point (MP) Location

(4,139) Total PAH Concentration (ug/L)

▨ On Site Structures

☒ Historical Wynants Kill Channel

0 5 10 20 Feet

Notes:

1. Deep zone represents the saturated fill material from approximately 25 ft. bgs to the bottom of the fill layer, which ranges from 25-31 ft. bgs.

2. MP-21D not analyzed due to accumulation of NAPL in well.

3. MP-8D and MP-9D are suspected to be screened in native soil and are not within the zone of influence of IP-2. Data from MP-8D and MP-9D was not used to estimate isocontours.

4. Data from RMW-8D was not used to estimate contours, as it was installed four days before sampling and concentrations may not be representative of deep zone saturated fill material.

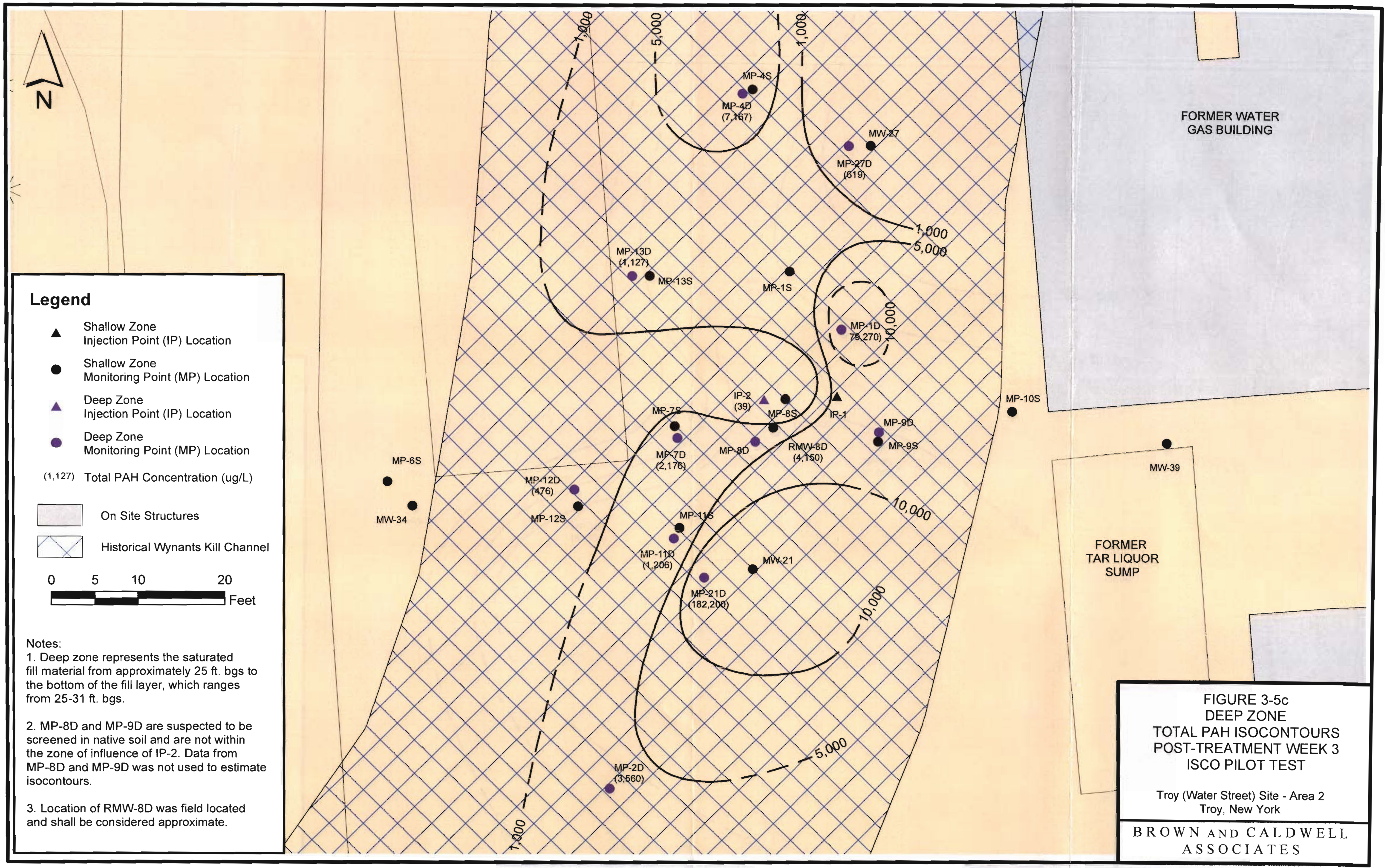
5. Location of RMW-8D was field located and shall be considered approximate.

FIGURE 3-5b
DEEP ZONE
TOTAL PAH ISOCONTOURS
POST-TREATMENT WEEK 1
ISCO PILOT TEST

Troy (Water Street) Site - Area 2
Troy, New York

BROWN AND CALDWELL
ASSOCIATES

P:/GIS/National Grid/Troy/Troy_ISCO_POST_Week_1_Total_PAH_Contours_Deep.mxd



Legend

▲ Shallow Zone Injection Point (IP) Location

● Shallow Zone Monitoring Point (MP) Location

▲ Deep Zone Injection Point (IP) Location

● Deep Zone Monitoring Point (MP) Location

(1,127) Total PAH Concentration (ug/L)

▭ On Site Structures

▨ Historical Wynants Kill Channel

0 5 10 20 Feet

Notes:

1. Deep zone represents the saturated fill material from approximately 25 ft. bgs to the bottom of the fill layer, which ranges from 25-31 ft. bgs.

2. MP-8D and MP-9D are suspected to be screened in native soil and are not within the zone of influence of IP-2. Data from MP-8D and MP-9D was not used to estimate isocontours.

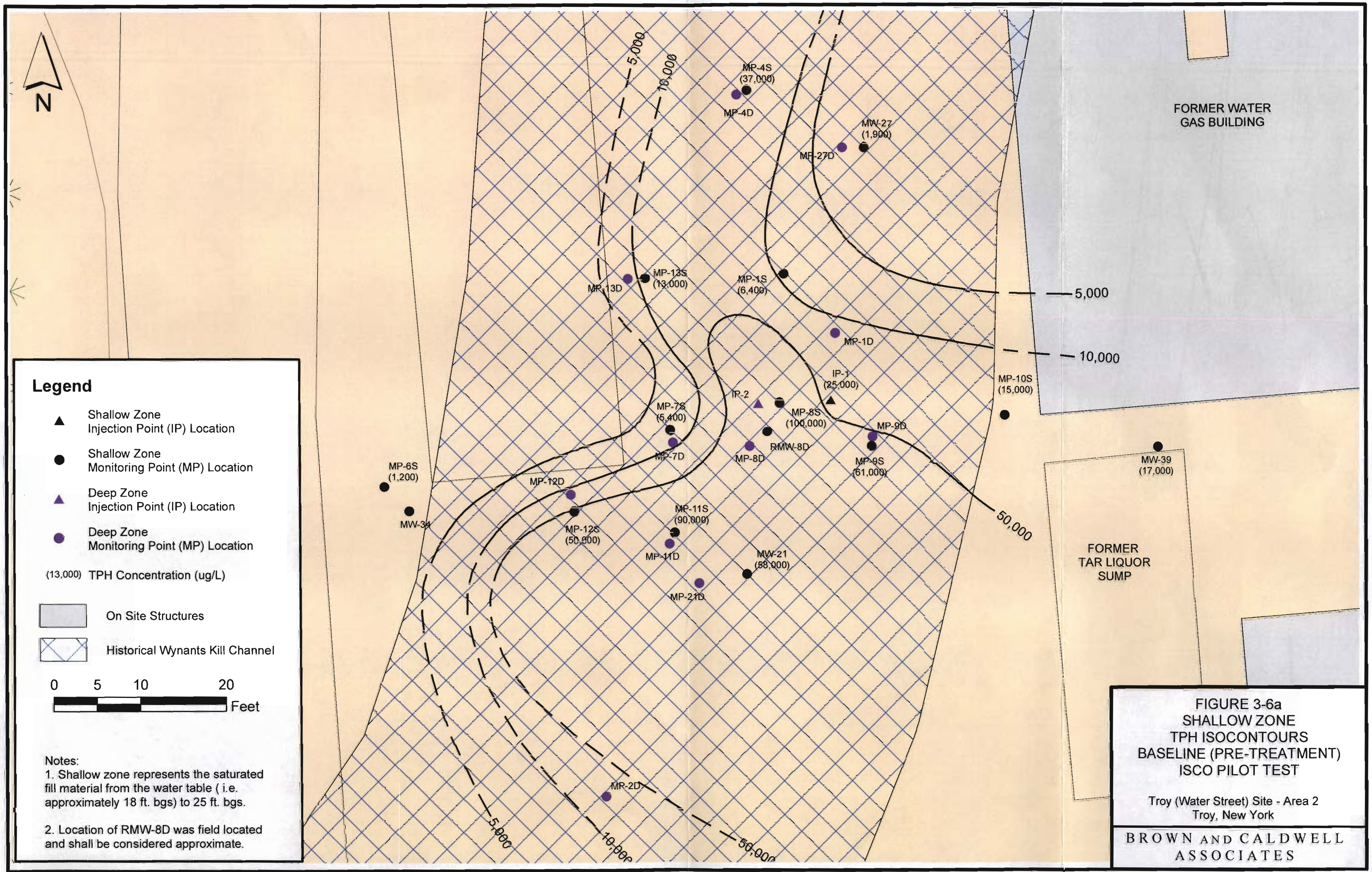
3. Location of RMW-8D was field located and shall be considered approximate.

FIGURE 3-5c
DEEP ZONE
TOTAL PAH ISOCONTOURS
POST-TREATMENT WEEK 3
ISCO PILOT TEST

Troy (Water Street) Site - Area 2
Troy, New York

BROWN AND CALDWELL
ASSOCIATES

P:/GIS/National Grid/Troy/Troy_ISCO_POST_Week_3_Total_PAH_Contours_Deep.mxd



Notes:

1. Shallow zone represents the saturated fill material from the water table (i.e. approximately 18 ft. bgs) to 25 ft. bgs.

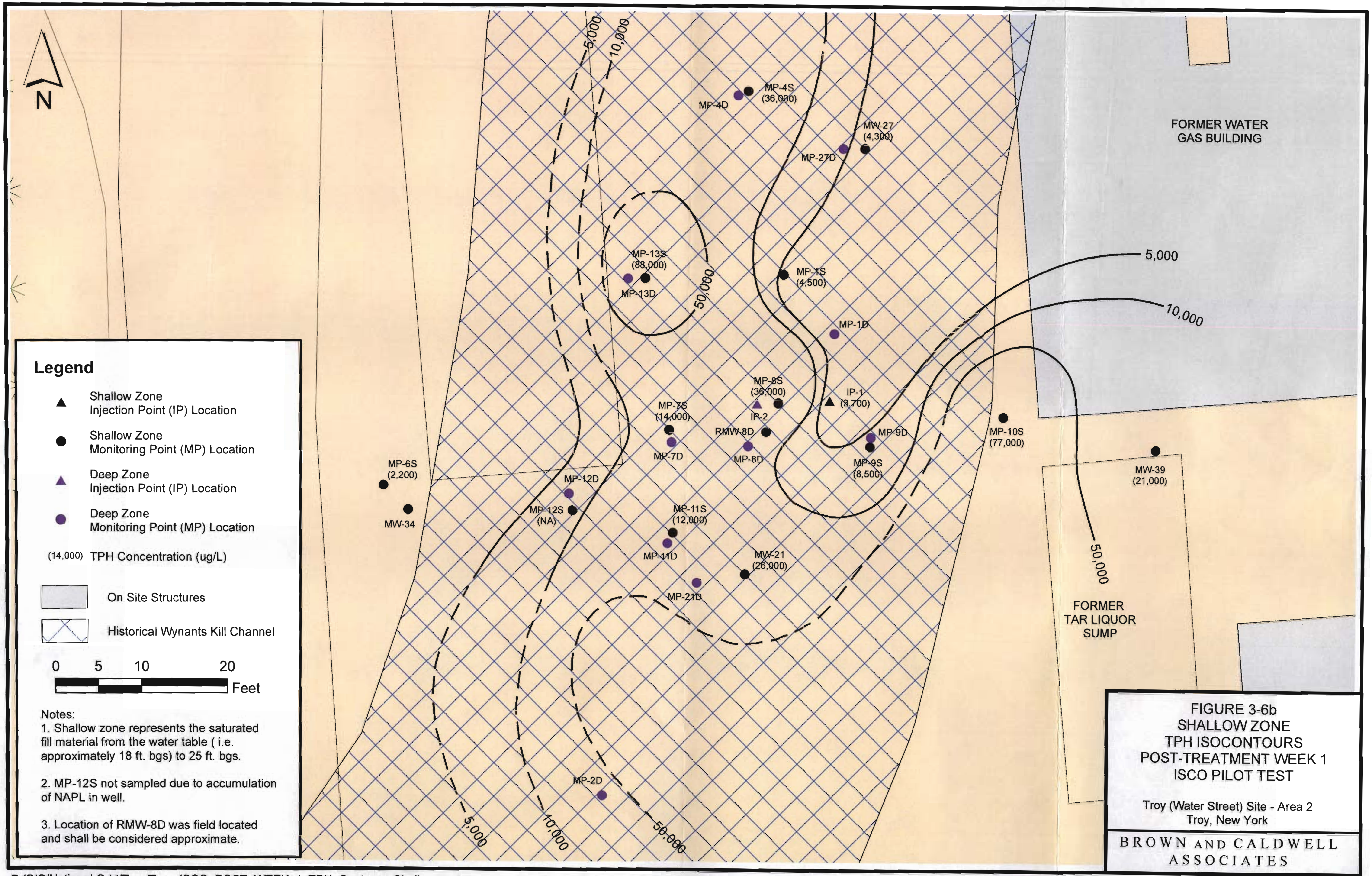
2. Location of RMW-8D was field located and shall be considered approximate.

FIGURE 3-6a
SHALLOW ZONE
TPH ISOCONTOURS
BASELINE (PRE-TREATMENT)
ISCO PILOT TEST

Troy (Water Street) Site - Area 2
Troy, New York

BROWN AND CALDWELL
ASSOCIATES

P:/GIS/National Grid/Troy/Troy_ISCO_Baseline_PRE_TPH_Contours_Shallow.mxd



Legend

▲ Shallow Zone Injection Point (IP) Location

● Shallow Zone Monitoring Point (MP) Location

▲ Deep Zone Injection Point (IP) Location

● Deep Zone Monitoring Point (MP) Location

(14,000) TPH Concentration (ug/L)

▨ On Site Structures

▨ Historical Wynants Kill Channel

0 5 10 20 Feet

Notes:

1. Shallow zone represents the saturated fill material from the water table (i.e. approximately 18 ft. bgs) to 25 ft. bgs.

2. MP-12S not sampled due to accumulation of NAPL in well.

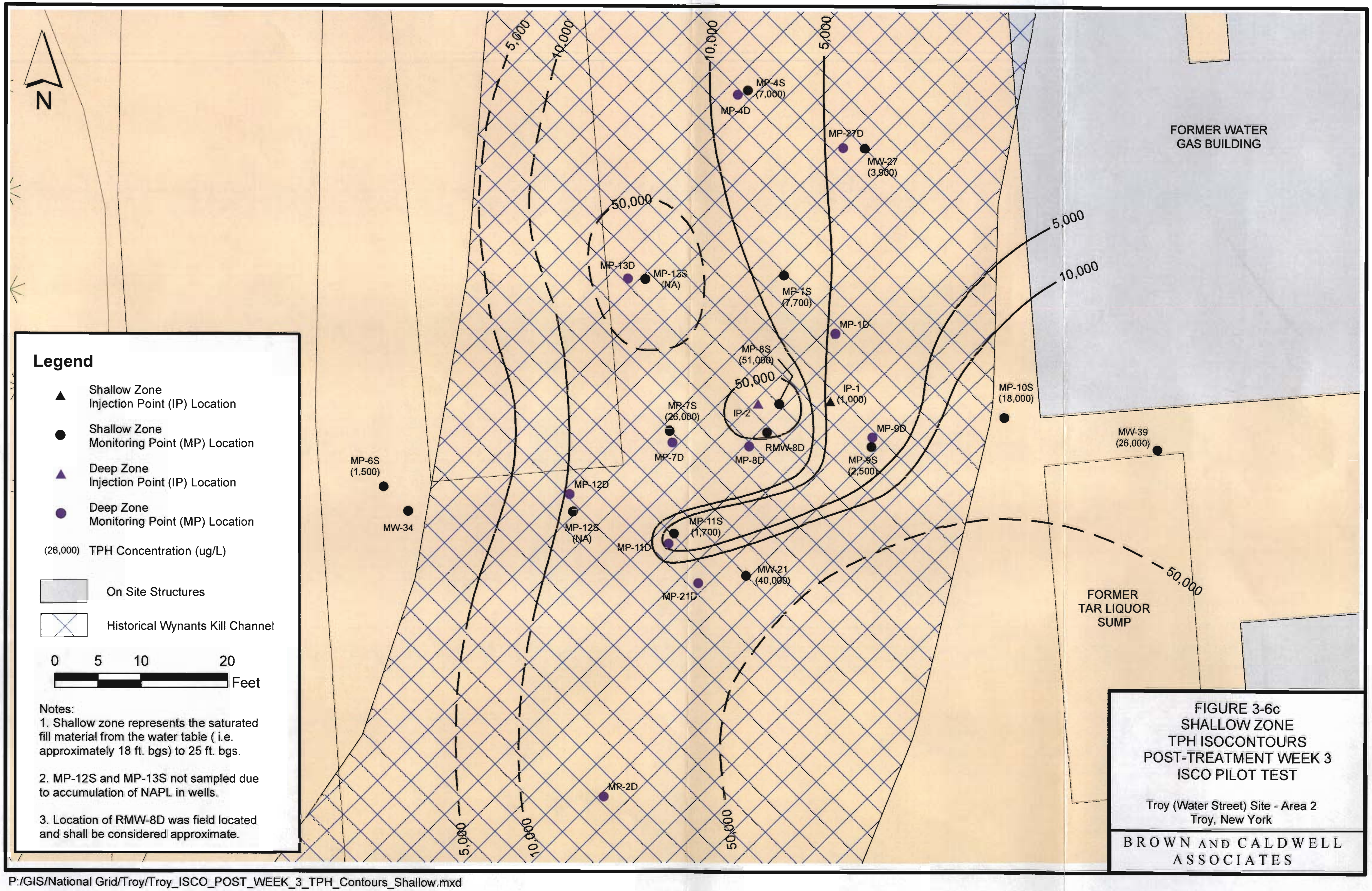
3. Location of RMW-8D was field located and shall be considered approximate.

FIGURE 3-6b
SHALLOW ZONE TPH ISOCONTOURS POST-TREATMENT WEEK 1 ISCO PILOT TEST

Troy (Water Street) Site - Area 2
Troy, New York

BROWN AND CALDWELL ASSOCIATES

P:/GIS/National Grid/Troy/Troy_ISCO_POST_WEEK_1_TPH_Contours_Shallow.mxd



Notes:

1. Shallow zone represents the saturated fill material from the water table (i.e. approximately 18 ft. bgs) to 25 ft. bgs.

2. MP-12S and MP-13S not sampled due to accumulation of NAPL in wells.

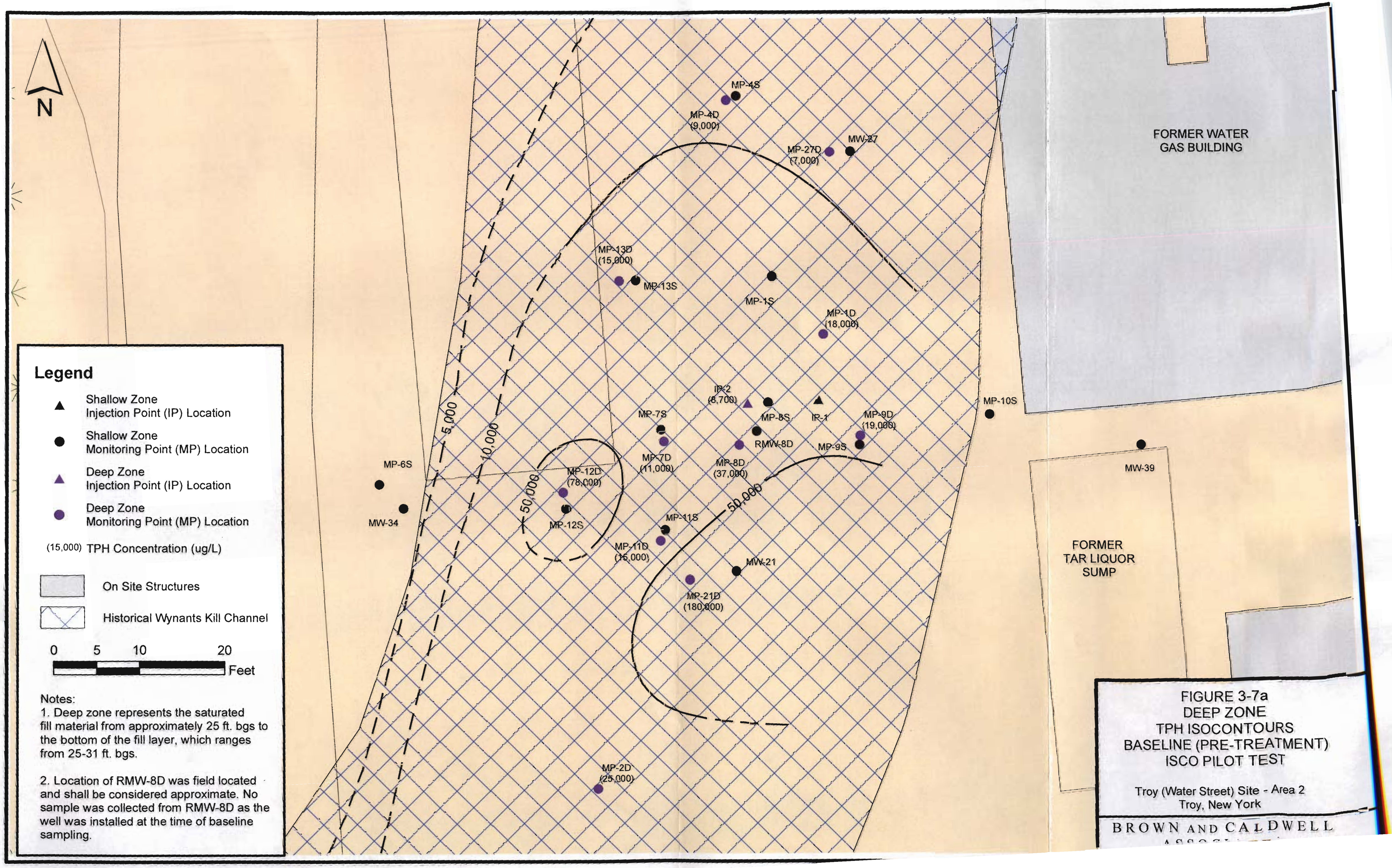
3. Location of RMW-8D was field located and shall be considered approximate.

FIGURE 3-6c
SHALLOW ZONE
TPH ISOCONTOURS
POST-TREATMENT WEEK 3
ISCO PILOT TEST

Troy (Water Street) Site - Area 2
Troy, New York

BROWN AND CALDWELL
ASSOCIATES

P:/GIS/National Grid/Troy/Troy_ISCO_POST_WEEK_3_TPH_Contours_Shallow.mxd



Notes:

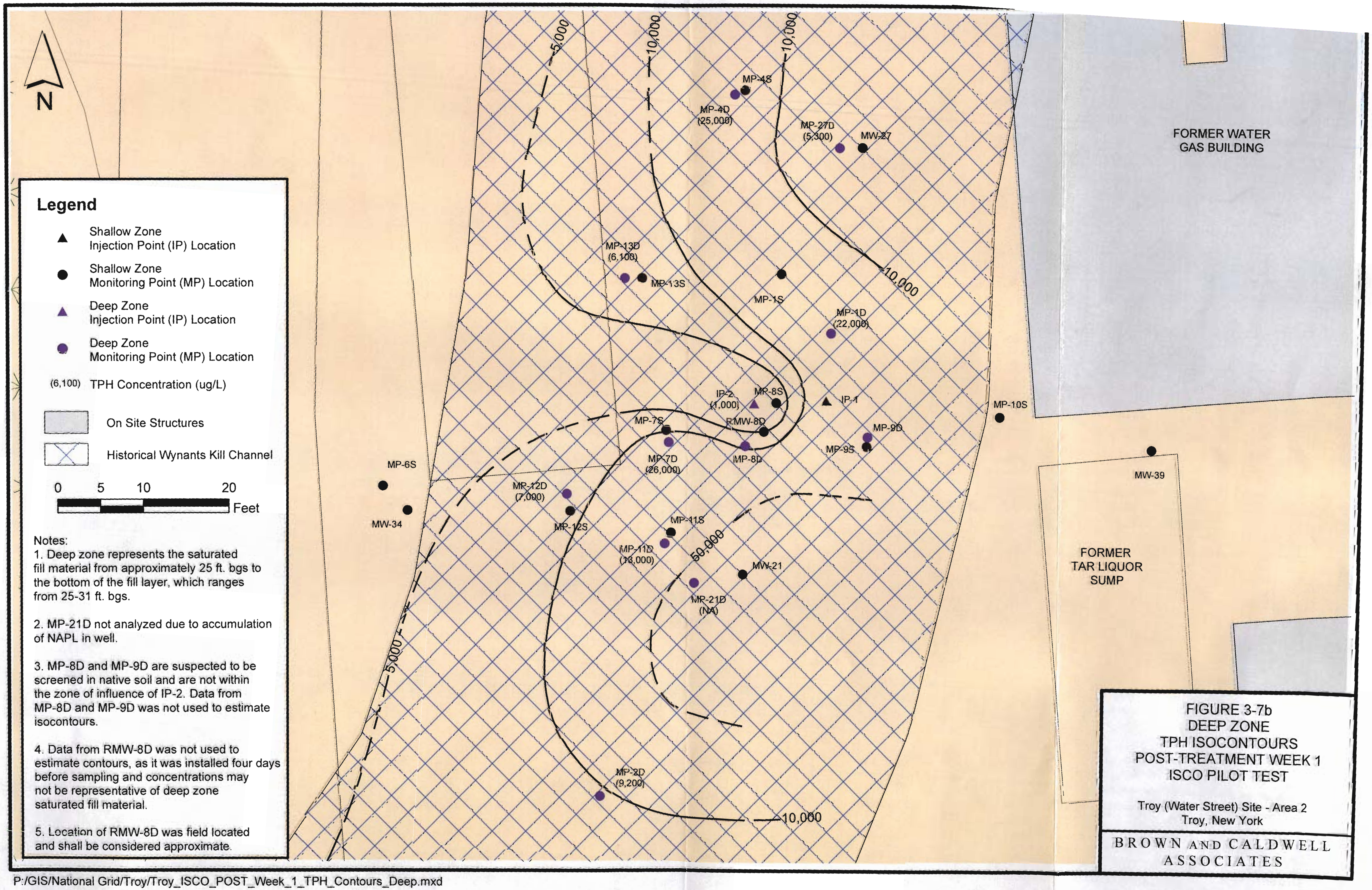
1. Deep zone represents the saturated fill material from approximately 25 ft. bgs to the bottom of the fill layer, which ranges from 25-31 ft. bgs.

2. Location of RMW-8D was field located and shall be considered approximate. No sample was collected from RMW-8D as the well was installed at the time of baseline sampling.

FIGURE 3-7a
DEEP ZONE
TPH ISOCONTOURS
BASELINE (PRE-TREATMENT)
ISCO PILOT TEST

Troy (Water Street) Site - Area 2
Troy, New York

BROWN AND CALDWELL



Legend

- ▲ Shallow Zone Injection Point (IP) Location
- ● Shallow Zone Monitoring Point (MP) Location
- ▲ Deep Zone Injection Point (IP) Location
- ● Deep Zone Monitoring Point (MP) Location
- (6,100) TPH Concentration (ug/L)
- ▨ On Site Structures
- ▨ Historical Wynants Kill Channel

Notes:

1. Deep zone represents the saturated fill material from approximately 25 ft. bgs to the bottom of the fill layer, which ranges from 25-31 ft. bgs.

2. MP-21D not analyzed due to accumulation of NAPL in well.

3. MP-8D and MP-9D are suspected to be screened in native soil and are not within the zone of influence of IP-2. Data from MP-8D and MP-9D was not used to estimate isocontours.

4. Data from RMW-8D was not used to estimate contours, as it was installed four days before sampling and concentrations may not be representative of deep zone saturated fill material.

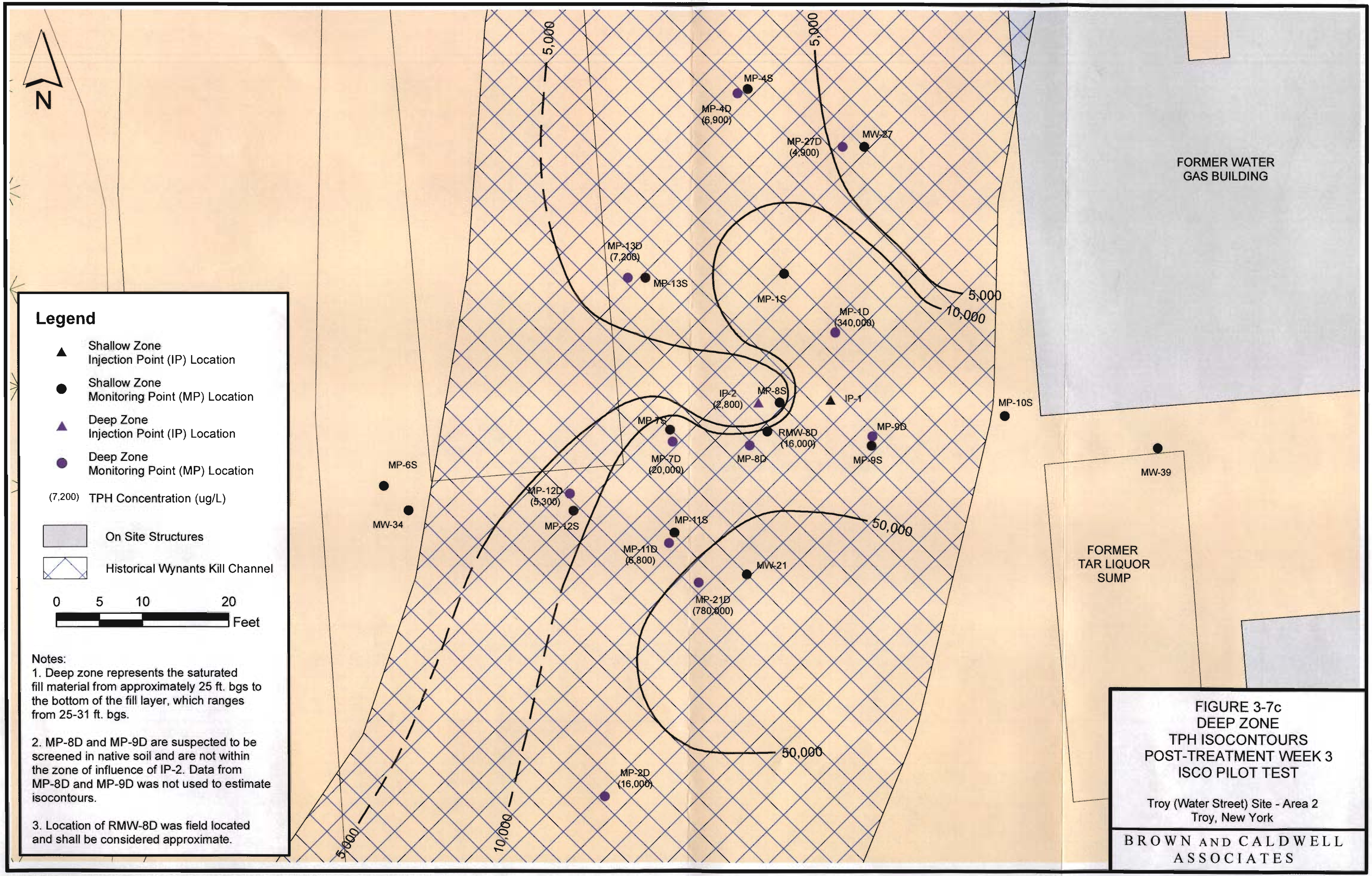
5. Location of RMW-8D was field located and shall be considered approximate.

FIGURE 3-7b
DEEP ZONE
TPH ISOCONTOURS
POST-TREATMENT WEEK 1
ISCO PILOT TEST

Troy (Water Street) Site - Area 2
Troy, New York

BROWN AND CALDWELL
ASSOCIATES

P:/GIS/National Grid/Troy/Troy_ISCO_POST_Week_1_TPH_Contours_Deep.mxd



Legend

▲ Shallow Zone Injection Point (IP) Location

● Shallow Zone Monitoring Point (MP) Location

▲ Deep Zone Injection Point (IP) Location

● Deep Zone Monitoring Point (MP) Location

(7,200) TPH Concentration (ug/L)

■ On Site Structures

▨ Historical Wynants Kill Channel

Notes:

1. Deep zone represents the saturated fill material from approximately 25 ft. bgs to the bottom of the fill layer, which ranges from 25-31 ft. bgs.

2. MP-8D and MP-9D are suspected to be screened in native soil and are not within the zone of influence of IP-2. Data from MP-8D and MP-9D was not used to estimate isocontours.

3. Location of RMW-8D was field located and shall be considered approximate.

FIGURE 3-7c
DEEP ZONE
TPH ISOCONTOURS
POST-TREATMENT WEEK 3
ISCO PILOT TEST

Troy (Water Street) Site - Area 2
Troy, New York

BROWN AND CALDWELL
ASSOCIATES

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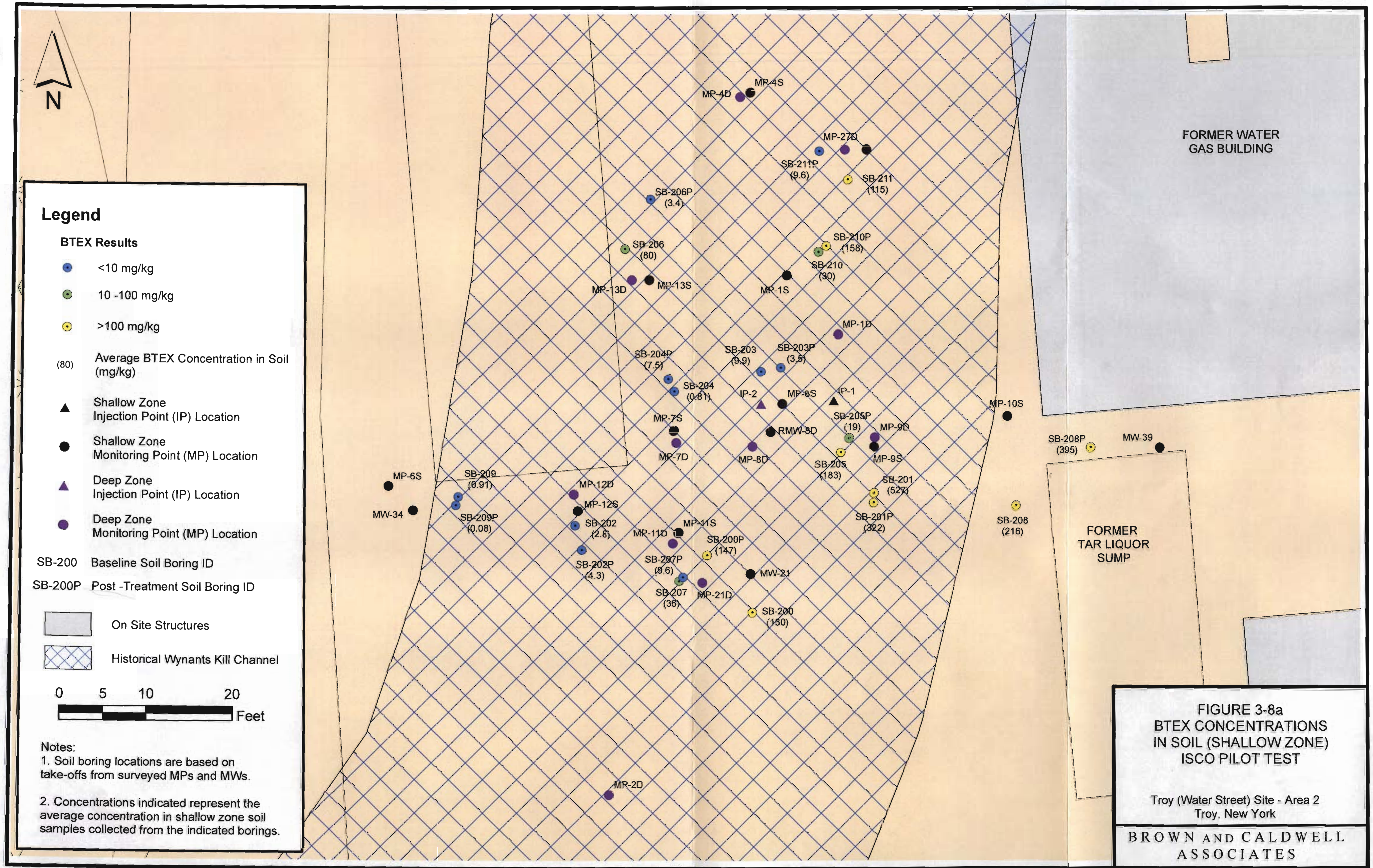


Notes:
1. Soil boring locations are based on take-offs from surveyed MPs and MWs.

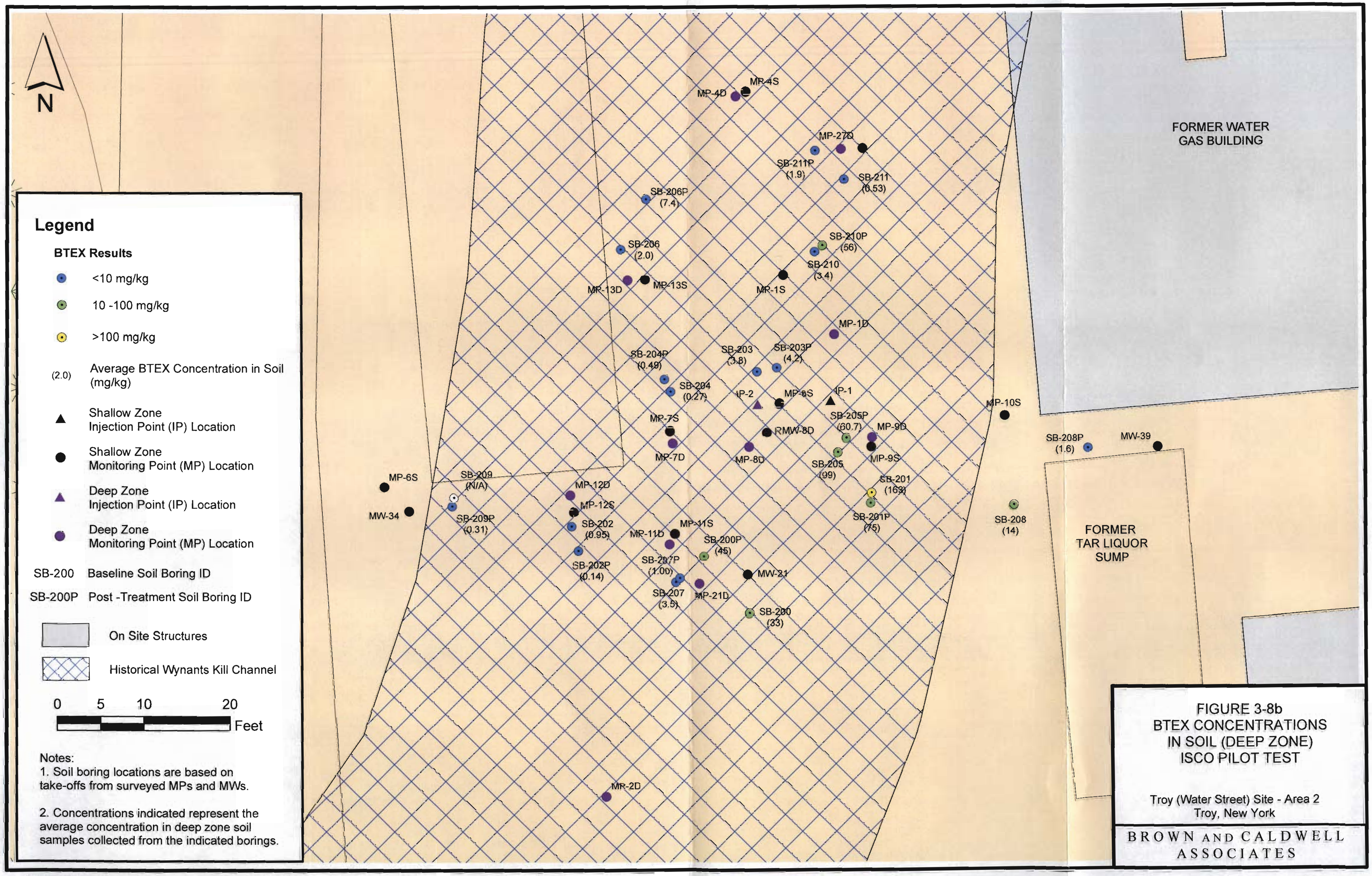
2. Concentrations indicated represent the average concentration in shallow zone soil samples collected from the indicated borings.

FIGURE 3-8a
BTEX CONCENTRATIONS
IN SOIL (SHALLOW ZONE)
ISCO PILOT TEST

Troy (Water Street) Site - Area 2
Troy, New York

BROWN AND CALDWELL
ASSOCIATES

P:/GIS/National Grid/Troy/Troy_ISCO_Pilot_Soil_BTEX_Shallow.mxd



Notes:
1. Soil boring locations are based on take-offs from surveyed MPs and MWs.

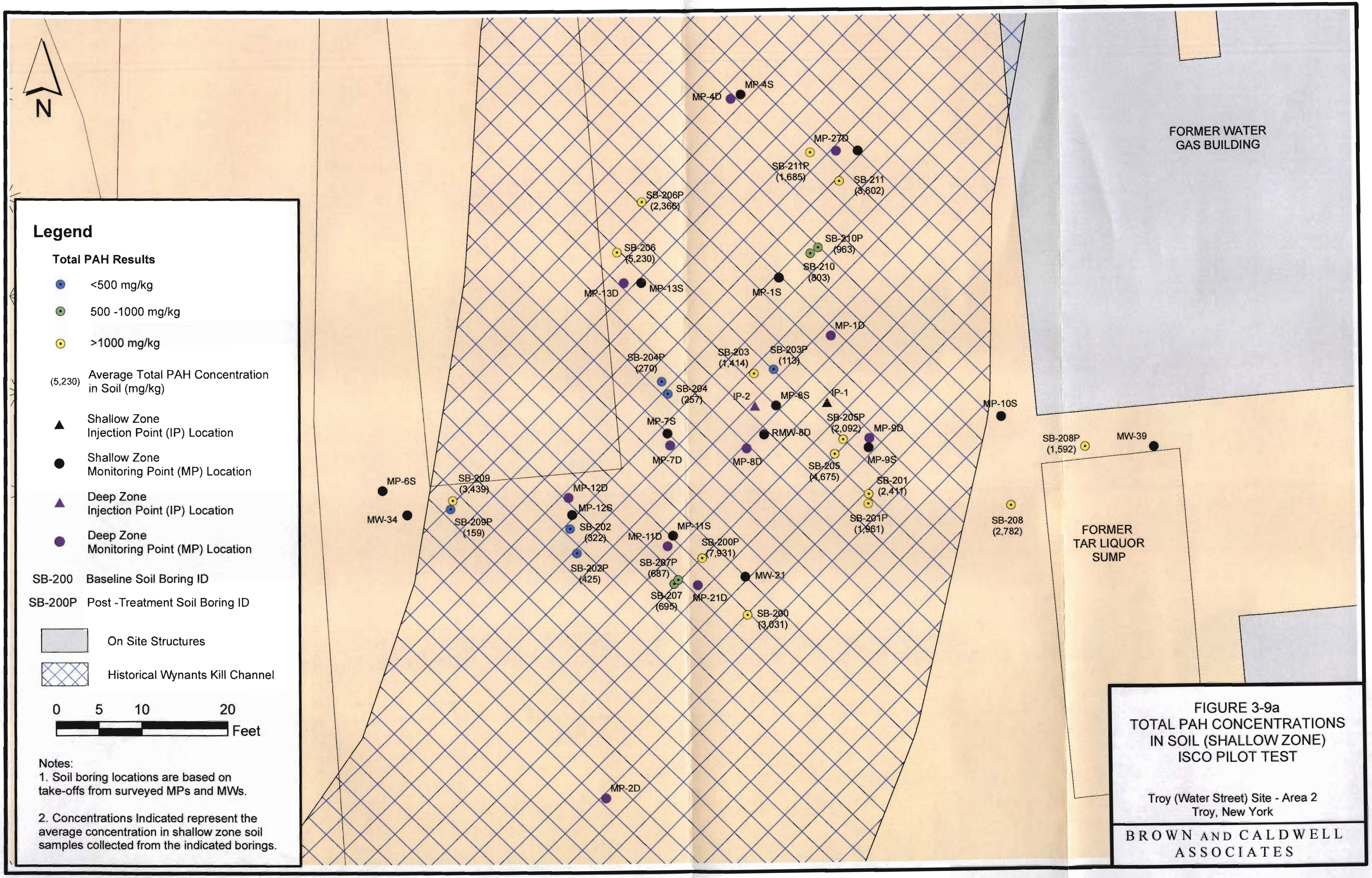
2. Concentrations indicated represent the average concentration in deep zone soil samples collected from the indicated borings.

FIGURE 3-8b
BTEX CONCENTRATIONS
IN SOIL (DEEP ZONE)
ISCO PILOT TEST

Troy (Water Street) Site - Area 2
Troy, New York

BROWN AND CALDWELL
ASSOCIATES

P:/GIS/National Grid/Troy/Troy_ISCO_Pilot_Soil_BTEX_Deep.mxd



Notes:
1. Soil boring locations are based on take-offs from surveyed MPs and MWs.

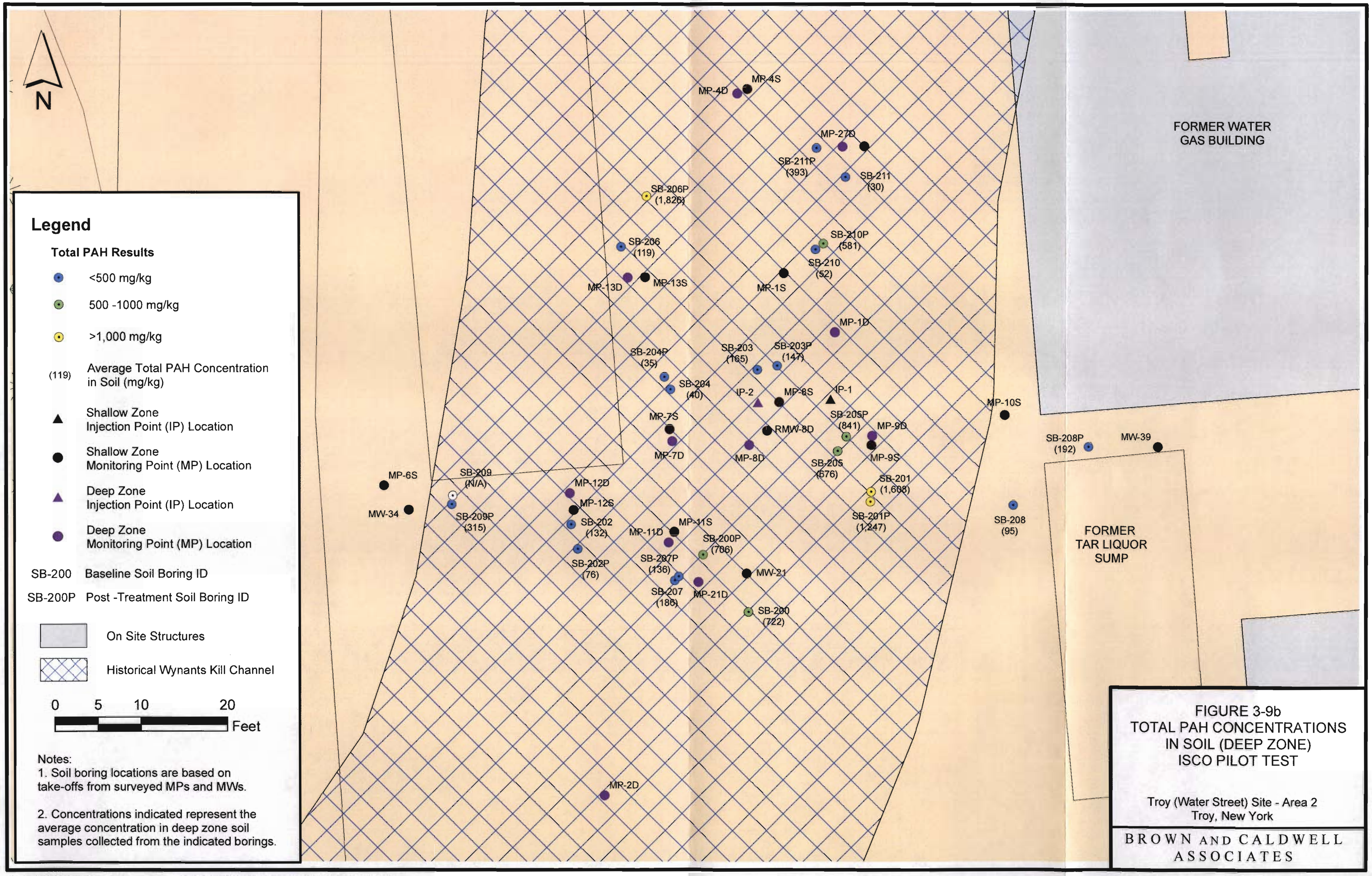
2. Concentrations Indicated represent the average concentration in shallow zone soil samples collected from the indicated borings.

FIGURE 3-9a
TOTAL PAH CONCENTRATIONS
IN SOIL (SHALLOW ZONE)
ISCO PILOT TEST

Troy (Water Street) Site - Area 2
Troy, New York

BROWN AND CALDWELL
ASSOCIATES

P:/GIS/National Grid/Troy/Troy_ISCO_Pilot_Soil_Total_PAH_Shallow.mxd



Notes:
1. Soil boring locations are based on take-offs from surveyed MPs and MWs.

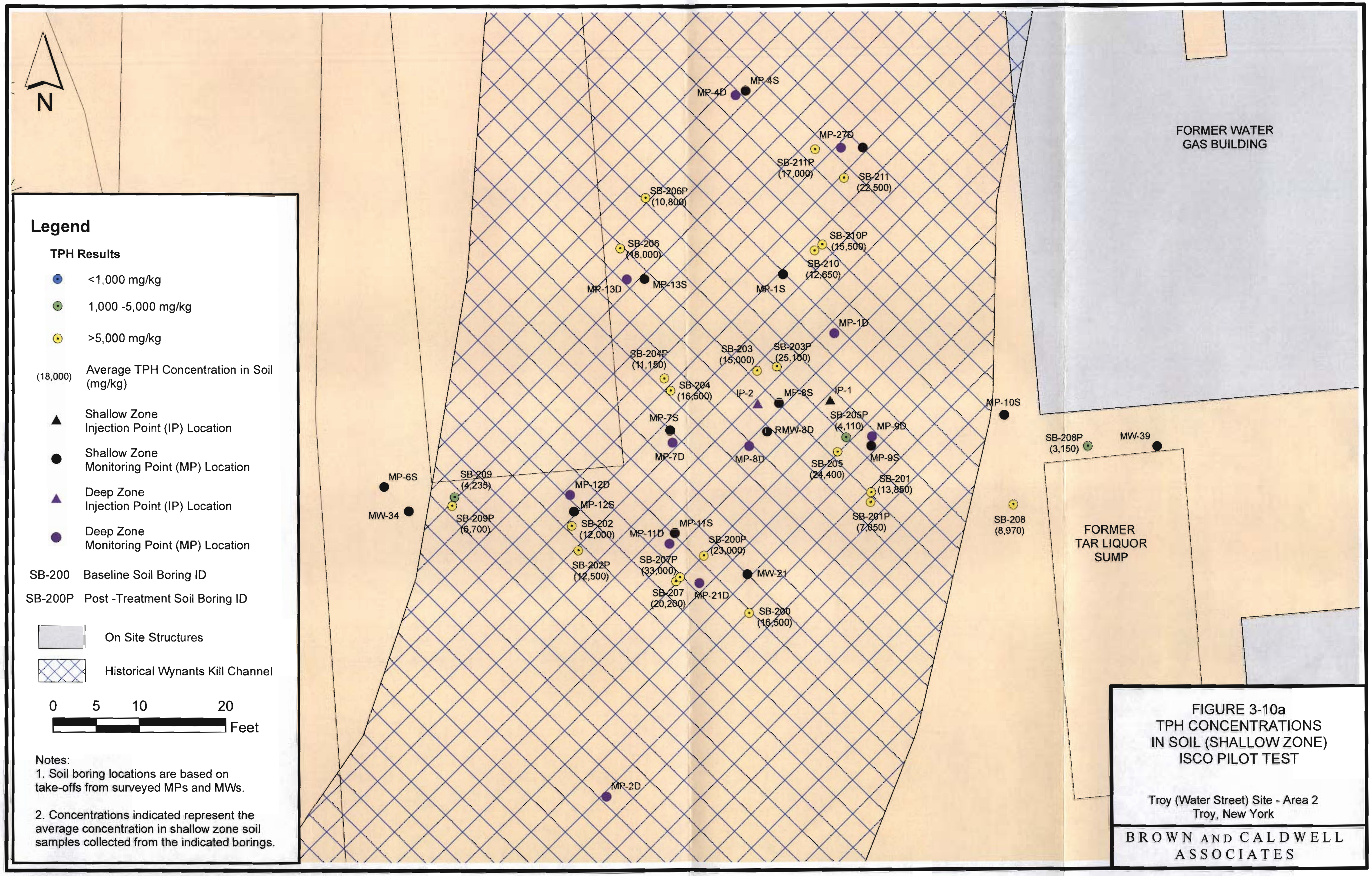
2. Concentrations indicated represent the average concentration in deep zone soil samples collected from the indicated borings.

FIGURE 3-9b
TOTAL PAH CONCENTRATIONS
IN SOIL (DEEP ZONE)
ISCO PILOT TEST

Troy (Water Street) Site - Area 2
Troy, New York

BROWN AND CALDWELL
ASSOCIATES

P:/GIS/National Grid/Troy/Troy_ISCO_Pilot_Soil_Total_PAH_Deep.mxd



Legend

TPH Results

- ● <1,000 mg/kg
- ● 1,000 -5,000 mg/kg
- ● >5,000 mg/kg
- (18,000) Average TPH Concentration in Soil (mg/kg)
- ▲ Shallow Zone Injection Point (IP) Location
- ● Shallow Zone Monitoring Point (MP) Location
- ▲ Deep Zone Injection Point (IP) Location
- ● Deep Zone Monitoring Point (MP) Location
- SB-200 Baseline Soil Boring ID
- SB-200P Post -Treatment Soil Boring ID
- ▭ On Site Structures
- ▨ Historical Wynants Kill Channel

Notes:

1. Soil boring locations are based on take-offs from surveyed MPs and MWs.

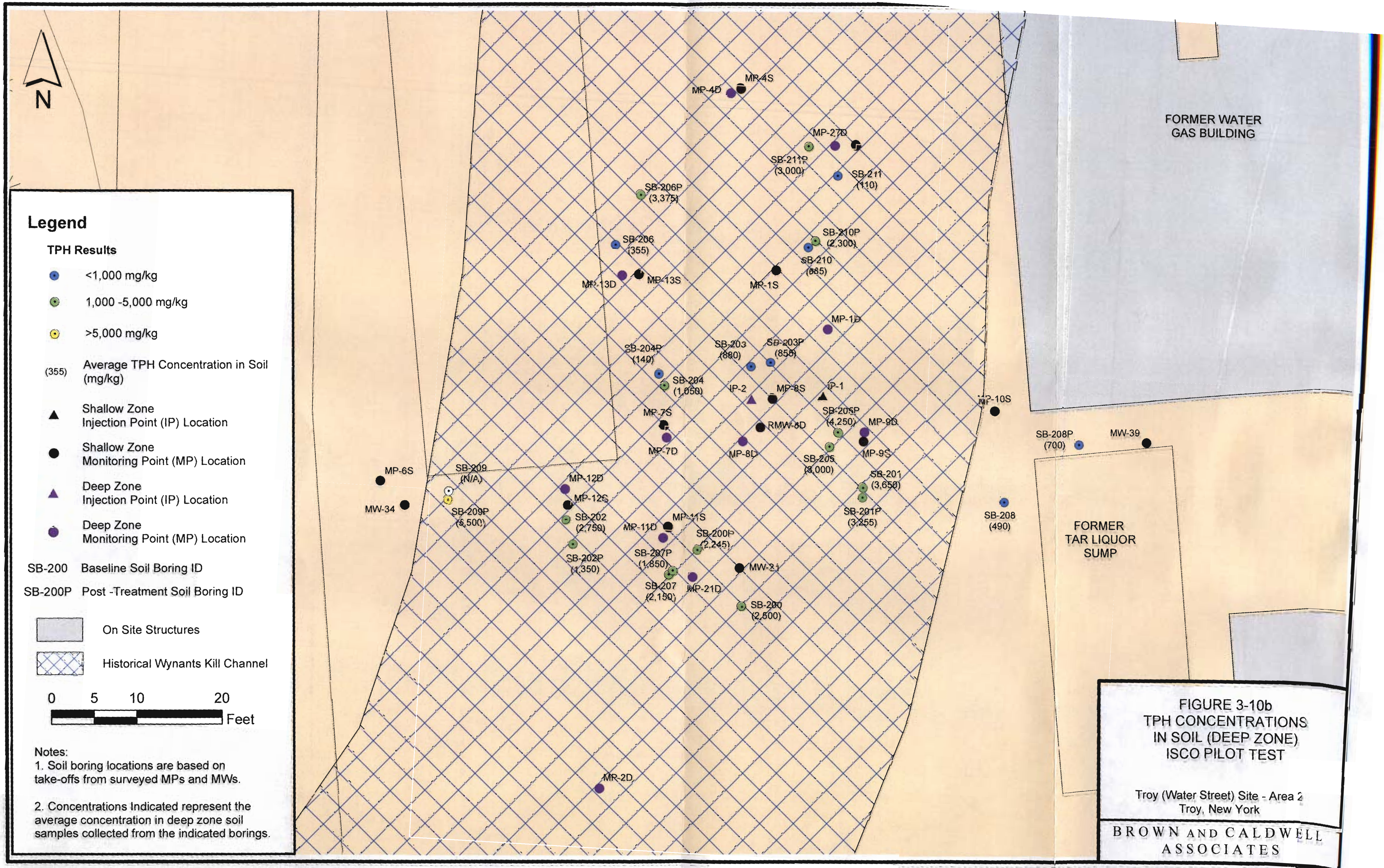
2. Concentrations indicated represent the average concentration in shallow zone soil samples collected from the indicated borings.

FIGURE 3-10a
TPH CONCENTRATIONS
IN SOIL (SHALLOW ZONE)
ISCO PILOT TEST

Troy (Water Street) Site - Area 2
Troy, New York

BROWN AND CALDWELL
ASSOCIATES

P:/GIS/National Grid/Troy/Troy_ISCO_Pilot_Soil_TPH_Shallow.mxd



Notes:
1. Soil boring locations are based on take-offs from surveyed MPs and MWs.

2. Concentrations Indicated represent the average concentration in deep zone soil samples collected from the indicated borings.

FIGURE 3-10b
TPH CONCENTRATIONS
IN SOIL (DEEP ZONE)
ISCO PILOT TEST

Troy (Water Street) Site - Area 2
Troy, New York

BROWN AND CALDWELL
ASSOCIATES

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APPENDIX A

GROUNDWATER ANALYTICAL RESULTS

SHALLOW ZONE

SHALLOW ZONE GROUNDWATER ANALYTICAL RESULTS
ISCO Pilot Test
Troy (Water Street) Site - Area 2
Troy, New York

BASELINE

Constituents	Units	MP-1S	MP-4S	MP-6	MP-7S	MP-8S	MP-9S	MP-10	MP-11S	MP-11S DUP	MP-12S	MP-13S	MW-21	MW-27	MW-39	IP-1
		8/3/2005	8/2/2005	8/4/2005	8/4/2005	8/2/2005	8/3/2005	8/4/2005	8/11/2005	8/11/2005	8/2/2005	8/2/2005	8/11/2005	8/3/2005	8/4/2005	8/3/2005
Benzene	ug/L	37	5 U	0.43 J	12	120	330	82	5	4.7 J	20	3.7 J	510	120	250 D	100
Ethylbenzene	ug/L	26	88	0.68 J	29	210	1000	980 D	130	170	8.5	2.8 J	1400	110	770 D	680
m&p-Xylenes	ug/L	1.2 J	45	5 U	2.3 J	12	96	37	5.2	5.6 J	3.4 J	4.1 J	160	5.5	50	25 J
o-Xylene	ug/L	9.3	30	0.47 J	13	70	300	280 D	29	37 J	5.3	3.6 J	300	26	240 D	200
Toluene	ug/L	1.1 J	5.9	5 U	1.1 J	6.5 J	15 J	4.6 J	1.5 J	1.3 J	1.4 J	2.6 J	19 J	2.6 J	8.1	4.7 J
Total BTEX	ug/L	75	169	1.58	57	419	1741	1384	171	219	39	16.8	2389	264	1318	1010
Acenaphthene	ug/L	22	500	140	19	720	1400	160	510	520	220	50	880	20	160 JD	180 J
Acenaphthylene	ug/L	4.1 J	180	49	4.8 J	140 J	200 J	98 U	110	120	61	17 J	110	19 U	9.3 U	26 J
Anthracene	ug/L	9.4	500	150	17	380	600	20 J	400	450	180	30	380	19 U	15	62 J
Benzo(a)anthracene	ug/L	5.8 J	330	110	9.8 J	220	310 J	98 U	270	320	140	21 J	250	19 U	3.9 J	52 J
Benzo(a)pyrene	ug/L	3.9 J	210	64	6.8 J	160	240 J	98 U	200	230	97	18 J	210	19 U	3.1 J	30 J
Benzo(b)fluoranthene	ug/L	4 J	220	73	7.5 J	150 J	180 J	98 U	130	160	99	18 J	93 J	19 U	2.3 J	33 J
Benzo(g,h,i)perylene	ug/L	1.9 J	80 J	23 J	2.8 J	67 J	99 J	98 U	85 J	96 J	41 J	7.2 J	100 U	19 U	1.4 J	190 U
Benzo(k)fluoranthene	ug/L	1.4 J	84 J	30 J	3 J	56 J	65 J	98 U	150	170	38 J	6.3 J	130	19 U	9.3 U	190 U
Chrysene	ug/L	5 J	280	82	9.7 J	190	290 J	98 U	230	270	120	19 J	240	19 U	3.7 J	40 J
Dibenzo(a,h)anthracene	ug/L	9.3 U	32 J	12 J	1.3 J	28 J	560 U	98 U	34 J	41 J	19 J	3 J	32 J	19 U	9.3 U	190 U
Fluoranthene	ug/L	15	760	260	30	590	670	14 J	560	680	350	54	460	19 U	11	120 J
Fluorene	ug/L	17	660	220	22	570	790	60 J	480	520	240	56	480	6.3 J	64	110 J
Indeno(1,2,3-cd)pyrene	ug/L	2 J	99 J	27 J	3.1 J	74 J	93 J	98 U	79 J	92 J	50 J	7.3 J	77 J	19 U	1.1 J	190 U
Naphthalene	ug/L	5.1 J	560	17 J	11	1000	7000	4200 D	850	770	80	70	7000 D	170	3700 D	2600
Phenanthrene	ug/L	30	1500	370	35	1600	2300	88 J	1400	1500	530	63	1600	2.2 J	76	270
Pyrene	ug/L	12	580	160	22	500	880	19 J	640	720	240	49	740	19 U	14	92 J
Total PAHs	ug/L	139	6575	1787	205	6445	15117	4561	6128	6659	2505	489	12682	199	4056	3615
TPH	ug/L	6400	37000	1200	5400	100000	61000	15000	90000	100000	50000	13000	58000	1900	17000	25000
Total Organic Carbon	mg/L	9.4	8.1	17.5	11.8	11.6	10.2	8.4	10.5	9.9	15.0	10.1	9.2	7.2	11.1	9.1
Total Alkalinity	mg/L	164	190	274	128	75	263	220	181	180	90	197	196	179	281	149
Iron, Total	mg/L	11.6 N	1.83 N	1200	13.5	140 N	145 N	18.4	6.8	6.5	303 N	2120 N	127	11.2 N	28.5	352 N
Manganese, Total	mg/L	0.6	0.1	22.0	0.4	2.7	3.2	0.4	0.2	0.2	3.6	170.0	2.4	0.9	0.8	4.3
Carbon Dioxide	mg/L	50	40	NA	220	NA	NA	80	NA	NA	NA	45	NA	65	150	NA
Dissolved Oxygen	mg/L	10.5	3.24	1.32	1.57	2.9	11.51	6.71	16.65	NA	1.82	6.53	2.71	2.13	2.53	11.22
Iron (II)	mg/L	6.7	0	NA	5.4	NA	NA	3.75	NA	NA	NA	1.2	NA	8	5.4	NA
Manganese, Dissolved	mg/L	0	0	NA	0	NA	NA	0	NA	NA	NA	0.15	NA	0.65	0.15	NA
ORP	mv	-55	-46	58	-54	-67	-134	-150	-145	NA	-83	-99	97	-57	-125	-69
pH	su	6.76	7.06	6.86	6.93	6.74	7	7.48	7.73	NA	6.61	7.59	8.11	6.9	7.12	6.82
Spec. Cond.	umho/cm	0.526	0.657	0.9	0.79	0.523	0.968	0.815	0.003	NA	0.612	0.674	0.9	0.644	0.999	0.592
Temp	oC	13.88	14.98	14.48	13.17	12.4	12.5	12.16	15.75	NA	14.11	13.84	13.95	11.23	15.95	15.8
Turbidity	NTU	83.5	23.6	999	162	852	570	129	285	NA	862	75.3	807	NA	118	999

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SHALLOW ZONE GROUNDWATER ANALYTICAL RESULTS
ISCO Pilot Test
Troy (Water Street) Site - Area 2
Troy, New York

POST-TREATMENT WEEK 1

Constituents	Units	MP-1S	MP-4S	MP-6	MP-7S	MP-8S	MP-9S	MP-10	MP-11S	MP-13S	MW-21	MW-27	MW-27 DUP	MW-39	IP-1
		9/14/2005	9/14/2005	9/15/2005	9/15/2005	9/14/2005	9/15/2005	9/14/2005	9/14/2005	9/15/2005	9/15/2005	9/14/2005	9/14/2005	9/15/2005	9/15/2005
Benzene	ug/L	0.75 J	2.9 J	1 J	5 U	30	0.66 J	45	14	16 J	300	160	150	180	5 U
Ethylbenzene	ug/L	0.41 J	190	1.1 J	5 U	120	7.5	530	4.8 J	520	920	370	350	970	5 U
m&p-Xylenes	ug/L	5 U	99	5 U	5 U	14	4.2 J	22 J	2.6 J	220	82	30	29	46	5 U
o-Xylene	ug/L	0.77 J	67	1.1 J	5 U	50	9.4	150	2.2 J	240	180	91	87	280 D	5 U
Toluene	ug/L	5 U	18	5 U	5 U	9.2 J	5 U	6.3 J	4 J	130	8.6 J	6 J	7 J	6.5	5 U
Total BTEX	ug/L	1.93	377	3	ND	223	21.8	753	28	1126	1491	657	623	1483	ND
Acenaphthene	ug/L	10 U	200	250	2 J	210	23	300	44	15000	390	77	67	420	11 U
Acenaphthylene	ug/L	1.9 J	63	130	5.2 J	100 U	15	29 J	12 J	7400	37 J	10 U	10 U	31 J	7.6 J
Anthracene	ug/L	1.8 J	160	220	3.1 J	55 J	11	84 J	15 J	20000	140	4.2 J	3.7 J	120	3.3 J
Benzo(a)anthracene	ug/L	4 J	120	190	9.1 J	46 J	22	50 J	21	16000	83 J	10 U	10 U	77 J	8.1 J
Benzo(a)pyrene	ug/L	3.6 J	74	110	5.6 J	29 J	14	42 J	14 J	9400	68 J	10 U	10 U	69 J	5.5 J
Benzo(b)fluoranthene	ug/L	2.5 J	48 J	83	5.3 J	17 J	11	18 J	9.4 J	7500	30 J	10 U	10 U	27 J	6.4 J
Benzo(g,h,i)perylene	ug/L	2 J	27 J	37 J	3.1 J	12 J	8.3 J	17 J	6.6 J	3100 J	28 J	10 U	10 U	30 J	3.3 J
Benzo(k)fluoranthene	ug/L	3 J	63	100	6.1 J	21 J	12	23 J	13 J	8200	35 J	10 U	10 U	38 J	6.9 J
Chrysene	ug/L	4.4 J	100	140	10 J	44 J	26	52 J	21	12000	82 J	10 U	10 U	81 J	7.9 J
Dibenzo(a,h)anthracene	ug/L	10 U	14 J	21 J	1.6 J	100 U	3.4 J	97 U	2.9 J	1700 J	100 U	10 U	10 U	98 U	1.9 J
Fluoranthene	ug/L	5.2 J	250	420	15	99 J	32	86 J	47	36000	160	1.2 J	1.1 J	130	8 J
Fluorene	ug/L	10 U	240	380	12	160	11	120	89	32000	220	23	19	170	1.3 J
Indeno(1,2,3-cd)pyrene	ug/L	1.7 J	27 J	40 J	3 J	100 U	6.9 J	13 J	6.1 J	3600 J	22 J	10 U	10 U	22 J	3.6 J
Naphthalene	ug/L	3 J	46 J	15 J	4.1 J	840	19	4500 D	49	48000	4600 D	500 D	92	5500 D	2.4 J
Phenanthrene	ug/L	5 J	570	620	16	350	46	330	100	70000	570	22	16	500	5.1 J
Pyrene	ug/L	6.7 J	250	300	15	150	50	150	50	26000	280	1.6 J	1.5 J	260	7.6 J
Total PAHs	ug/L	45	2252	3056	116	2033	311	5814	500	315900	6745	629	200	7475	79
TPH	ug/L	4500	36000	2200	14000	36000	8500	77000	12000	88000	26000	4300	5600	21000	3700
Total Organic Carbon	mg/L	111	23.8	35.6	128	244	69.1	7.93	194	260	29.8	8.00	8.46	9.48	33.4
Total Alkalinity	mg/L	2 U	75	190	2 U	2 U	2 U	234	2 U	2 U	59.6	168	168	300	2 U
Iron, Total	mg/L	228	125	3500	133	380	1730	66.8	331	1830	752	25.9	24.2	32.6	42.1
Manganese, Total	mg/L	39.2	1.88	73.7	36.9	117	171	1.25	50	38.3	15.4	3.47	3.34	0.898	84.8
Carbon Dioxide	mg/L	500 E	437.5	175	500 E	500 E	500 E	87.5	500 E	500 E	500 E	122	NA	87.5	500 E
Dissolved Oxygen	mg/L	10.35	12.17	12.39	4.93	4.58	8.8	15.5	6.03	6.71	9.54	16.38	NA	15.8	7.7
Iron (II)	mg/L	0	3.6	4	0	5.6	0	3.8	2.2	12	9	2.8	NA	5	0.1
Manganese, Dissolved	mg/L	0	0.2	0	0	0	0	0	0	0.8	1.4	0.9	NA	0.3	27.84
ORP	mv	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
pH	su	1.89	5.12	6.13	1.62	1.94	7.14	6.73	1.41	1.62	5.57	6.26	NA	6.6	2.22
Spec. Cond.	umho/cm	7.8	0.93	1.08	16.3	8.01	5.71	0.57	33.4	23.7	3.16	0.678	NA	0.732	3.13
Temp	oC	25	22	18.2	40.7	45.5	25.8	18	38.8	33.7	22.7	14.7	NA	15.8	29.5
Turbidity	NTU	540	413	662	157	374	999	44.8	178	691	503	180	NA	437	999

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SHALLOW ZONE GROUNDWATER ANALYTICAL RESULTS
ISCO Pilot Test
Troy (Water Street) Site - Area 2
Troy, New York

POST-TREATMENT WEEK 3

Constituents	Units	MP-1S	MP-4S	MP-6	MP-7S	MP-8S	MP-8S	MP-8S DUP	MP-9S	MP-10	MP-11S	MP-11S DUP	MW-21	MW-27	MW-27 DUP	MW-39	IP-1
		10/3/2005	10/3/2005	10/4/2005	10/3/2005	10/3/2005	10/5/2005	10/5/2005	10/4/2005	10/4/2005	10/4/2005	10/4/2005	10/4/2005	10/3/2005	10/3/2005	10/4/2005	10/3/2005
Benzene	ug/L	16	0.8 J	1.1 J	5.2	27	56	49	8.2	81	61	60	260	180	160	200	5 U
Ethylbenzene	ug/L	11	67	1.3 J	5.6	17	45	49	0.38 J	960	10	9.4	740	320	290 D	980	5 U
m&p-Xylenes	ug/L	1.4 J	40	5 U	1.7 J	4.3 J	9.7 J	7.8	5 U	40 J	4.4 J	4.3 J	63	22	25	51	5 U
o-Xylene	ug/L	4.3 J	25	1.8 J	1.9 J	7.2	21	22	5 U	270	2.6 J	2.5 J	120	61	55	280	5 U
Toluene	ug/L	1.5 J	2.4 J	5 U	2 J	4.9 J	12	8.2	5 U	8.3 J	13	12	11 J	4.4 J	4.6 J	11 J	5 U
Total BTEX	ug/L	34	135	4.2	16	60	144	136	8.6	1359	91	88	1194	587	535	1522	ND
Acenaphthene	ug/L	41	230	120	21	43	NA	NA	11	150	15	16	380	60	66	330	10 U
Acenaphthylene	ug/L	7.5 J	70 J	57	9.2 J	21 J	NA	NA	7 J	93 U	1.8 J	1.8 J	40 J	2.7 J	3 J	22 J	2.2 J
Anthracene	ug/L	17	220	60	9.7 J	19 J	NA	NA	5.8 J	16 J	10 U	30	130	4.4 J	4.9 J	84 J	10 U
Benzo(a)anthracene	ug/L	10	160	67	15 J	21 J	NA	NA	12	93 U	1.4 J	1.8 J	76 J	9.8 U	9.8 U	50 J	2.4 J
Benzo(a)pyrene	ug/L	7.2 J	98 J	40	7.6 J	15 J	NA	NA	7.9 J	93 U	10 U	10 U	64 J	9.8 U	9.8 U	44 J	1.4 J
Benzo(b)fluoranthene	ug/L	6.8 J	120	30	14 J	18 J	NA	NA	5.4 J	93 U	10 U	10 U	30 J	9.8 U	9.8 U	16 J	3.1 J
Benzo(g,h,i)perylene	ug/L	3.4 J	36 J	14 J	4.3 J	7.9 J	NA	NA	5.1 J	93 U	10 U	10 U	27 J	9.8 U	9.8 U	18 J	10 U
Benzo(k)fluoranthene	ug/L	2.7 J	45 J	35	4.7 J	7.6 J	NA	NA	5.8 J	93 U	10 U	10 U	34 J	9.8 U	9.8 U	20 J	1.2 J
Chrysene	ug/L	8.6 J	130	50	15 J	17 J	NA	NA	13	93 U	1.8 J	2.1 J	76 J	9.8 U	9.8 U	53 J	2.6 J
Dibenzo(a,h)anthracene	ug/L	1.3 J	17 J	7.6 J	2.4 J	3.4 J	NA	NA	1.8 J	93 U	10 U	10 U	100 U	9.8 U	9.8 U	93 U	10 U
Fluoranthene	ug/L	25	360	140	31	45	NA	NA	16	12 J	7.4 J	8.2 J	140	1.6 J	1.6 J	87 J	2.6 J
Fluorene	ug/L	34	310	85	33	57	NA	NA	6.6 J	51 J	35	36	210	20	22	140	10 U
Indeno(1,2,3-cd)pyrene	ug/L	3.3 J	41 J	16 J	5.4 J	9.4 J	NA	NA	3.9 J	93 U	10 U	10 U	21 J	9.8 U	9.8 U	13 J	1.4 J
Naphthalene	ug/L	71	490	7.3 J	58	290	NA	NA	7.6 J	3400 D	32	30	3200 D	550 D	550 D	4400 D	10 U
Phenanthrene	ug/L	78	740	150	48	110	NA	NA	28	80 J	28	30	540	20	22	340	1.5 J
Pyrene	ug/L	26	290	120	25	39	NA	NA	32	22 J	6.2 J	7.6 J	250	1.6 J	1.6 J	170	2.2 J
Total PAHs	ug/L	343	3357	999	303	723	NA	NA	169	3731	129	164	5218	660	671	5787	20.6
TPH	ug/L	7700	7000	1500	26000	51000	NA	NA	2500	18000	1700	1700	40000	3900	4800	26000	1000
Total Organic Carbon	mg/L	56.7	15.3	19.0	150	28.0	NA	NA	50.3	6.77	206	194	21.3	8.59	8.57	9.45	17.7
Total Alkalinity	mg/L	2 U	2 U	92.8	2 U	2 U	NA	NA	2 U	251	2 U	2 U	146	176	177	296	2 U
Iron, Total	mg/L	310	26.4	222	46.3	110	NA	NA	54.7	20.2	186	186	517	27.5	28.8	33.7	56
Manganese, Total	mg/L	20.7	0.882	6.06	14.2	32.5	NA	NA	94.4	0.506	18.2	18.1	12.5	4.54	4.75	0.895	37.5
Carbon Dioxide	mg/L	1085	175	210	1000 E	45.5	NA	NA	875	87.5	1000 E	NA	630	105	NA	140	490
Dissolved Oxygen	mg/L	7.07	12.4	11.76	5.71	7.52	NA	NA	9.96	14.46	5.23	NA	8.23	11.88	NA	13.71	7.53
Iron (II)	mg/L	9	2	15	1	8	NA	NA	0	3	3.5	NA	10	2	NA	4	0
Manganese, Dissolved	mg/L	1.5	0	0.6	0	13.6	NA	NA	6	0	0	NA	1.6	0.9	NA	0	18.4
ORP	mv	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
pH	su	3.96	6.48	6.6	2.82	4.37	NA	NA	2.65	7.61	1.95	NA	6.56	6.9	NA	7.14	4.09
Spec. Cond.	umho/cm	3.17	0.668	0.95	10.8	1.39	NA	NA	2.73	0.552	11.2	NA	1.84	0.64	NA	0.637	1.32
Temp	oC	29.8	15.9	16.3	37.7	27.8	NA	NA	23.9	15.9	42.9	NA	23.3	15.2	NA	17.3	24.2
Turbidity	NTU	135	140	549	777	520	NA	NA	398	18	6	NA	999	10	NA	26	342

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DEEP ZONE

DEEP ZONE GROUNDWATER ANALYTICAL RESULTS
ISCO Pilot Test
Troy (Water Street) Site - Area 2
Troy, New York

BASELINE

Constituents	Units	MP-1D	MP-2D	MP-4D	MP-7D	MP-8D	MP-8D DUP	MP-9D	MP-11D	MP-12D	MP-13D	MP-21D	MP-27D	IP-2
		8/3/2005	8/4/2005	8/2/2005	8/4/2005	8/2/2005	8/2/2005	8/3/2005	8/11/2005	8/2/2005	8/2/2005	8/5/2005	8/3/2005	8/3/2005
Benzene	ug/L	290	350	9.8	15	170	180	150	59	20	8.9	46	90	180
Ethylbenzene	ug/L	1000	570	170	28	210	230	1100	67	4.7 J	24	89	95	210
m&p-Xylenes	ug/L	130	36	87	1.7 J	19	20	90	14	3.6 J	6.2	6.3	13	16
o-Xylene	ug/L	230	93	68	11	58	65	300	21	3.9 J	5.6	40	31	44
Toluene	ug/L	18 J	4.8 J	6.1	0.83 J	6.3 J	7 J	8.7 J	5.4	2.2 J	3.6 J	3.9 J	4.2 J	5.4 J
Total BTEX	ug/L	1668	1054	341	57	463	502	1649	166	34	48	185	233	455
Acenaphthene	ug/L	120 J	3300	340	120	530	600	290 J	150	370	110	1300	300	62
Acenaphthylene	ug/L	20 J	440 J	110 J	24 J	82 J	95 J	370 U	33 J	67	54	180 J	32 J	56 U
Anthracene	ug/L	22 J	2000	270	98	250	290	91 J	71	190	120	640	120	6.8 J
Benzo(a)anthracene	ug/L	7.6 J	980 J	160	57	130 J	150 J	55 J	49 J	120	110	370 J	56	56 U
Benzo(a)pyrene	ug/L	4.5 J	840 J	98 J	40	95 J	110 J	43 J	36 J	79	77	280 J	45	56 U
Benzo(b)fluoranthene	ug/L	4.2 J	590 J	110 J	38	72 J	85 J	370 U	20 J	78	94	220 J	31 J	56 U
Benzo(g,h,i)perylene	ug/L	37 U	330 J	37 J	15 J	39 J	45 J	370 U	15 J	30 J	34	110 J	18 J	56 U
Benzo(k)fluoranthene	ug/L	37 U	220 J	42 J	14 J	26 J	28 J	370 U	22 J	29 J	36	79 J	8.1 J	56 U
Chrysene	ug/L	5.6 J	950 J	130	49	110 J	130 J	50 J	43 J	100	98	310 J	48	56 U
Dibenzo(a,h)anthracene	ug/L	37 U	1000 U	110 U	6.6 J	190 U	220 U	370 U	50 U	12 J	16 J	38 J	5.5 J	56 U
Fluoranthene	ug/L	24 J	2400	390	150	290	330	110 J	110	320	230	800	120	56 U
Fluorene	ug/L	69 J	2400	390	120	330	380	140 J	130	350	130	850	150	26 J
Indeno(1,2,3-cd)pyrene	ug/L	37 U	320 J	44 J	17 J	38 J	40 J	370 U	13 J	35 J	41	110 J	15 J	56 U
Naphthalene	ug/L	3000 D	9400	1400	74	2500	2800	4400	690	93	160	2600	540	840
Phenanthrene	ug/L	100 J	7300	840	280	950	1100	360 J	290	250	250	2500	450	38 J
Pyrene	ug/L	22 J	3200	270	120	350	400	140 J	120	240	150	980	160	56 U
Total PAHs	ug/L	3399	34670	4631	1223	5792	6583	5679	1792	2363	1710	11367	2099	973
TPH	ug/L	18000	25000	9000	11000	37000	46000	19000	15000	78000	15000	180000	7000	8700
Total Organic Carbon	mg/L	11.1	13.0	8.90	12.3	11.4	12.3	8.31	9.45	23.5	11.5	15.1	6.44	8.77
Total Alkalinity	mg/L	192	196	211	120	200	204	190	198	158	196	124	162	140
Iron, Total	mg/L	927 N	825	273 N	27.2	1050	624 N	86 N	233	1750 N	164 N	208	115 N	28.6 N
Manganese, Total	mg/L	24.7	10.9	2.73	0.805	15.7	7.93	3.56	2.85	8.22	1.54	1.88	3.74	0.752
Carbon Dioxide	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	95
Dissolved Oxygen	mg/L	10.03	11.03	3.21	7.37	0.23	NA	3.17	0.77	1.36	3.18	2.64	12.04	9.35
Iron (II)	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	9.7
Manganese, Dissolved	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.015
ORP	mv	-105	-111	-105	-25	-148	NA	-131	70	-59	-68	-92	-69	-112
pH	su	7.23	6.69	7	6.89	7.31	NA	7.25	7.83	6.56	7.78	6.6	6.75	7.1
Spec. Cond.	umho/cm	0.762	0.9	0.676	0.799	0.63	NA	0.63	0.9	0.748	0.697	0.9	0.585	0.689
Temp	oC	12.13	13.77	15.35	13.72	12.09	NA	12.61	19.76	13.77	13.65	13.34	12.85	12.33
Turbidity	NTU	999	999	999	347	999	NA	570	870	999	553	999	451	80.5

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DEEP ZONE GROUNDWATER ANALYTICAL RESULTS
ISCO Pilot Test
Troy (Water Street) Site - Area 2
Troy, New York

POST-TREATMENT WEEK 1

Constituents	Units	MP-1D	MP-2D	MP-4D	MP-7D	MP-8D	RMW-8D	MP-9D	MP-11D	MP-11D DUI	MP-12D	MP-13D	MP-13D DUI	MP-27D	IP-2
		10/5/2005	10/5/2005	10/5/2005	10/6/2005	10/6/2005	10/10/2005	10/6/2005	10/5/2005	10/5/2005	10/6/2005	10/10/2005	10/10/2005	10/5/2005	10/6/2005
Benzene	ug/L	380	210	45	12	310 D	340	170	180	200	52	35	31	140	14
Ethylbenzene	ug/L	2200	430	330	15	190	1400	2000 D	110	110	16	140	120	270	9.7
m&p-Xylenes	ug/L	270	28	150	8.7	20	200	290	22	12 J	4 J	40	34	20	3.9 J
o-Xylene	ug/L	380	58	110	6.7	48	280	440	30	23	7.3	40	36	57	3.6 J
Toluene	ug/L	22 J	5.6 J	18	4.8 J	11	39 J	17 J	17	14	4.2 J	17	15	4.6 J	5.8
Total BTEX	ug/L	3252	732	653	47	579	2259	2917	359	359	84	272	236	492	37
Acenaphthene	ug/L	180	160	1300	150	6400	1900	310	660	410	79	230	240	120	6.1 J
Acenaphthylene	ug/L	19 U	10 J	370 J	30 J	820 J	240 J	100 U	160	89 J	12 J	84 J	86 J	9.3 U	1.8 J
Anthracene	ug/L	10 J	35	1300	95	3400	830 J	52 J	480	270	29	220	230	11	1.4 J
Benzo(a)anthracene	ug/L	19 U	20 J	800	72	2000	480 J	28 J	320	180	19	170	170	1.2 J	9.6 U
Benzo(a)pyrene	ug/L	19 U	17 J	470	50	1500 J	370 J	22 J	260	150	13 J	100	100	9.3 U	9.6 U
Benzo(b)fluoranthene	ug/L	19 U	7.3 J	350 J	29 J	620 J	190 J	100 U	110 J	67 J	7.6 J	79 J	74 J	9.3 U	9.6 U
Benzo(g,h,i)perylene	ug/L	19 U	7.6 J	160 J	22 J	630 J	160 J	100 U	120 J	59 J	4.9 J	34 J	33 J	9.3 U	9.6 U
Benzo(k)fluoranthene	ug/L	19 U	10 J	440	35 J	970 J	200 J	100 U	150	77 J	8 J	94	88 J	9.3 U	9.6 U
Chrysene	ug/L	19 U	19 J	700	69	1900 U	470 J	29 J	300	170	17 J	120	130	1.1 J	9.6 U
Dibenzo(a,h)anthracene	ug/L	19 U	20 U	80 J	6.6 J	1900 U	970 U	100 U	34 J	20 J	2 J	20 J	20 J	9.3 U	9.6 U
Fluoranthene	ug/L	4 J	38	1700	150	3400	970	45 J	570	320	46	370	370	4.5 J	2.2 J
Fluorene	ug/L	49	85	1600	130	3300	940 J	100 J	450	290	60	390	400	39	11
Indeno(1,2,3-cd)pyrene	ug/L	19 U	5.5 J	160 J	18 J	460 J	120 J	100 U	89 J	45 J	4.1 J	38 J	37 J	9.3 U	9.6 U
Naphthalene	ug/L	5700 D	1700 D	3000	120	5800	10000	7000 D	1900	1400	100	1100	1000	460 D	24
Phenanthrene	ug/L	57	180	4000	400	13000	3300	220	1800	1000	95	770	790	58	14
Pyrene	ug/L	5.9 J	75	1700	220	7000	1500	94 J	980	530	52	320	320	8.2 J	2.3 J
Total PAHs	ug/L	6006	2369	18130	1597	49300	21670	7900	8383	5077	549	4139	4088	703	63
TPH	ug/L	22000	9200	25000	26000	130000	75000	31000	13000	9600	7000	6100	6100	5300	1000
Total Organic Carbon	mg/L	8.36	48.5	58.6	56.2	32.8	27.0	11.2	135	129	285	62.8	62.6	6.97	55.4
Total Alkalinity	mg/L	198	2 U	46	2 U	156	266	204	2 U	2 U	2 U	2 U	2 U	290	2 U
Iron, Total	mg/L	37.3	720	291	203	356	404	87	903	902	2460	441	444	39.4	102
Manganese, Total	mg/L	2.8	20.9	6.71	7.81	16.5	29.4	12.2	35	34.7	49.8	9.21	9.25	3.02	15.4
Carbon Dioxide	mg/L	140	1000 E	525	1000 E	700	NA	105	1000 E	NA	1000 E	1000 E	NA	105	1000 E
Dissolved Oxygen	mg/L	12.55	9.11	13.56	6.75	6.59	4.09	10.22	8.06	NA	7.85	8.94	NA	13.8	4.12
Iron (II)	mg/L	5	14	10	4	10	NA	2.5	10	NA	16	8	NA	8	12
Manganese, Dissolved	mg/L	0.6	1.2	0.5	1	3.6	NA	0.8	0	NA	0	0.6	NA	0.5	1.6
ORP	mv	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
pH	su	6.81	5.66	5.45	2.56	6.15	6.01	6.51	2.83	NA	2.64	2.93	NA	7.08	2.38
Spec. Cond.	umho/cm	0.602	2.81	1.46	2.94	1.83	1.55	0.611	4	NA	7.47	2.81	NA	0.585	3.37
Temp	oC	19.4	23.2	16.5	25.5	28.7	26.9	15.8	24.5	NA	21	24.7	NA	16.5	32.8
Turbidity	NTU	0	356	830	NA	NA	999	NA	0	NA	NA	235	NA	0	16

U - indicates that the analyte was not detected above the associated value

J - indicates that the analyte was detected below of the detection limit and the reported value is an estimated value

D - indicates that the reported value reflects using a secondary dilution factor

E - indicates the reported concentration exceeds the calibrated range of the instrument for that specific analysis.

N - Spiked sample recovery was not within the control limits.

DEEP ZONE GROUNDWATER ANALYTICAL RESULTS
ISCO Pilot Test
Troy (Water Street) Site - Area 2
Troy, New York

POST-TREATMENT WEEK 3

Constituents	Units	MP-1D	MP-2D	MP-4D	MP-7D	MP-8D	RMW-8D	MP-9D	MP-11D	MP-12D	MP-13D	MP-13D (DUP)	MP-21D	MP-27D	IP-2
		10/18/2005	10/19/2005	10/19/2005	10/18/2005	10/18/2005	10/18/2005	10/19/2005	10/18/2005	10/19/2005	10/18/2005	10/18/2005	10/18/2005	10/19/2005	10/19/2005
Benzene	ug/L	330	230	6.4	62	240	320	220	180	53	35	55	180	76	34
Ethylbenzene	ug/L	2200	510	150	44	250	1000	1800	160	12	130	38	830	100	68
m&p-Xylenes	ug/L	270	34	77	7.2	25	120	260	14	3.5 J	42	6.8	56 J	12	6.1
o-Xylene	ug/L	420	64	54	17	55	210	360	43	5.4	44	16	140	28	36
Toluene	ug/L	23 J	6.8 J	5.0 J	5.5	13	26	16 J	15	4.6 J	28	5.2	18 J	3.2 J	2.2 J
Total BTEX	ug/L	3243	845	292	136	583	1676	2656	412	79	279	121	1224	219	146
Acenaphthene	ug/L	8800	270	560	230	910	180	1100	130	74	110	240	18000	130	19
Acenaphthylene	ug/L	1000 J	200 U	190	42	170 J	16 J	95 J	13 J	12 J	30 J	51	2200 J	40 U	9.6 U
Anthracene	ug/L	3900 J	76 J	520	130	560	40	380 J	32 J	25	45 J	160	10000	15 J	1.4 J
Benzo(a)anthracene	ug/L	1900 J	36 J	310	93	330	18 J	220 J	14 J	14 J	14 J	120	6000	40 U	9.6 U
Benzo(a)pyrene	ug/L	1500 J	29 J	210	72	270 J	15 J	200 J	10 J	10 J	7.0 J	91	5200	40 U	9.6 U
Benzo(b)fluoranthene	ug/L	1000 J	20 J	240	63	220 J	11 J	150 J	7.6 J	9.2 J	7.4 J	78	3900 J	40 U	9.6 U
Benzo(g,h,i)perylene	ug/L	570 J	200 U	72 J	31 J	120 J	6.3 J	81 J	71 U	3.5 J	65 U	42 J	2300 J	40 U	9.6 U
Benzo(k)fluoranthene	ug/L	3900 U	200 U	76 J	17 J	62 J	3.7 J	490 U	71 U	2.9 J	65 U	24 J	1100 J	40 U	9.6 U
Chrysene	ug/L	1700 J	30 J	260	86	300 J	16 J	220 J	12 J	11 J	11 J	110	5400	40 U	9.6 U
Dibenzo(a,h)anthracene	ug/L	3900 U	200 U	31 J	12 J	38 J	29 U	490 U	71 U	21 U	65 U	13 J	4800 U	40 U	9.6 U
Fluoranthene	ug/L	3500 J	89 J	720	180	640	38	420 J	33 J	38	46 J	240	11000	7.4 J	1.8 J
Fluorene	ug/L	4900	150 J	690	170	670	84	500	86	64	100	190	11000	50	9.2 J
Indeno(1,2,3-cd)pyrene	ug/L	500 J	200 U	88 J	30 J	100 J	5.7 J	69 J	71 U	3.4 J	65 U	39 J	2100 J	40 U	9.6 U
Naphthalene	ug/L	30000	2400	1300	300	2400	3500 D	9800 D	680	100	600	290	50000	340	9.6 U
Phenanthrene	ug/L	14000	340	1400	480	2000	160	1400	140	78	120	580	36000	67	5.7 J
Pyrene	ug/L	6000	120 J	500	240	920	56	600	48 J	31	37 J	300	18000	9.4 J	1.5 J
Total PAHs	ug/L	79270	3560	7167	2176	9710	4150	15235	1206	476	1127	2568	182200	619	39
TPH	ug/L	340000	16000	6900	20000	43000	16000	47000	6800	5300	7200	9100	780000	4900	2800
Total Organic Carbon	mg/L	9.9	28.3	12.1	16.9	16.1	16.6	13.4	49.9	282.8	77.0	18.9	97.4	5.3	11.1
Total Alkalinity	mg/L	240	67	196	2	168	124	262	2 U	2 U	2 U	25.2	2 U	168	154
Iron, Total	mg/L	55.9	532	24	180	379	148	73.3	328	3670000	496	159	1530	25.6	17.8
Manganese, Total	mg/L	2.60	14.0	0.595	5.60	14.2	13.8	8.68	8.05	54.9	6.50	5.11	40.2	2.01	2.21
Carbon Dioxide	mg/L	140	500 E	175	350	332.5	438	193	500	500 E	500 E	500 E	500 E	70	140
Dissolved Oxygen	mg/L	8.09	5.2	10.36	6.87	5	6.45	7.59	5.26	6.42	7.29	7.29	4.39	10.08	7.86
Iron (II)	mg/L	3	3.5	2	3.5	2.5	2.5	2.5	8	9	3.5	3.5	6	2	2
Manganese, Dissolved	mg/L	1.1	2.5	0	1.2	1.4	1.4	1.3	1.4	0	1.3	1.3	1.8	0.8	0.4
ORP	mV	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
pH	su	6.83	5.44	6.09	5.99	6.21	6.07	6.2	3.38	2.99	4.06	4.06	3.84	6.23	6.03
Spec. Cond.	umho/cm	0.653	2.18	0.679	0.9	1.07	1.08	0.687	1.89	8.66	2.02	2.02	4.26	0.438	0.503
Temp	oC	15.1	22.6	13.6	18.4	18.5	17.5	14.4	18.8	19.5	17.5	17.5	25.8	13.9	12.8
Turbidity	NTU	387	10	541	484	1	253	477	49	405	999	999	464	10	307

U - indicates that the analyte was not detected above the associated value

J - indicates that the analyte was detected below of the detection limit and the reported value is an estimated value

D - indicates that the reported value reflects using a secondary dilution factor

E - indicates the reported concentration exceeds the calibrated range of the instrument for that specific analysis.

N - Spiked sample recovery was not within the control limits.

APPENDIX B

SOIL ANALYTICAL RESULTS

BASELINE SOIL ANALYTICAL RESULTS
ISCO Pilot Test
Troy (Water Street) Site - Area 2
Troy, New York

Constituent	Units	SB-200				SB-201				
		18-20	22-24	26-28	30-31	18-20	18-20 DUP	22-24	26-28	28-30
		7/25/2005	7/25/2005	7/25/2005	7/25/2005	7/26/2005	7/26/2005	7/26/2005	7/26/2005	7/26/2005
Benzene	mg/kg	1.4 J	5	0.62 J	0.67 J	15	11	14	7.8 J	2.8
Ethylbenzene	mg/kg	55	130 D	37	1.9	120	110	490 D	180	17
m&p-Xylenes	mg/kg	3.8	8.2	15	0.45 J	34	22	170	64	3.8
o-Xylene	mg/kg	22	33	9.4	0.35 J	54	46	150	41	4
Toluene	mg/kg	0.71 J	0.69 J	0.53 J	0.11 J	2.9 J	1.3 J	4.9 J	5.6 J	0.83 J
Total BTEX	mg/kg	83	177	63	3.5	226	190	829	298	28
Acenaphthene	mg/kg	200	230	41	100	170	140	230	200	130
Acenaphthylene	mg/kg	51 J	29 J	8.8 J	12 J	47 J	26 J	32 J	22 J	13 J
Anthracene	mg/kg	180	110	27	50	110	76	110	89 J	58
Benzo(a)anthracene	mg/kg	170	71	18 J	34	73 J	43 J	54 J	52 J	39
Benzo(a)pyrene	mg/kg	120	66	16 J	32	59 J	37 J	43 J	47 J	36
Benzo(b)fluoranthene	mg/kg	130	50	13 J	24	54 J	28 J	33 J	34 J	26 J
Benzo(g,h,i)perylene	mg/kg	45 J	29 J	6.6 J	14	24 J	17 J	16 J	22 J	15 J
Benzo(k)fluoranthene	mg/kg	49 J	15 J	4.1 J	9.1 J	17 J	8.4 J	11 J	12 J	8.6 J
Chrysene	mg/kg	120	66	17 J	35	58 J	42 J	49 J	54 J	36
Dibenzo(a,h)anthracene	mg/kg	20 J	9.7 J	20 U	4.7 J	80 U	56 U	85 U	100 U	4.9 J
Fluoranthene	mg/kg	400	140	40	66	160	93	120	100 J	73
Fluorene	mg/kg	270	130	32	58	160	110	150	100 J	67
Indeno(1,2,3-cd)pyrene	mg/kg	55 J	27 J	6.2 J	14	26 J	16 J	15 J	19 J	13 J
Naphthalene	mg/kg	820	930 D	190	180	830	650	1000	920	250
Phenanthrene	mg/kg	720	410	100	180	460	320	420	330	210
Pyrene	mg/kg	240	160	38	74	150	120	140	150	86
Total PAHs	mg/kg	3590	2473	558	887	2398	1726	2423	2151	1066
TPH	mg/kg	21000	12000	2100	2900	21000	16000	6700	5000	2300
Total Organic Carbon	mg/kg	260000	175000	38900	37900	39300	47500	57400	43600	23600
Total Inorganic Carbon	mg/kg	56000	180000	5100	300 U	20000	600	10000 J	25000 J	800 J
Iron, Total	mg/kg	9320	296000	242000	52700	79400	116000	79800	174000	62700
Manganese, Total	mg/kg	34 *	7670 *	3420 *	452 *	5800 *	4910 *	10200 *	3760 *	1020 *

BASELINE SOIL ANALYTICAL RESULTS
ISCO Pilot Test
Troy (Water Street) Site - Area 2
Troy, New York

Constituent	Units	SB-202				SB-203			
		18-20	22-24	26-28	28-30	18-20	22-24	26-28	28-30
		7/26/2005	7/26/2005	7/26/2005	7/26/2005	7/27/2005	7/27/2005	7/27/2005	7/27/2005
Benzene	mg/kg	0.0039 J	0.67 J	0.51 J	0.012	0.73 J	1.4	2.5	1.1
Ethylbenzene	mg/kg	0.045	2.7	0.56 J	0.019	4	5.7	0.97	0.4 J
m&p-Xylenes	mg/kg	0.0073 J	0.68 J	0.24 J	0.008	1.1	1.2	0.48 J	0.65 J
o-Xylene	mg/kg	0.029 J	1.2	0.42 J	0.013	2	2.3	0.25 J	0.28 J
Toluene	mg/kg	0.0025 J	0.35 J	0.12 J	0.0014 J	0.73 J	0.65 J	0.53 J	0.51 J
Total BTEX	mg/kg	0.088	5.6	1.85	0.053	9	11.3	4.7	2.9
Acenaphthene	mg/kg	30	44	31	12	23 J	62	11	6.8
Acenaphthylene	mg/kg	10	6.3	2.9 J	1.3 J	60	16 J	2.8 J	5
Anthracene	mg/kg	23	18	14	6.1	100	74	8.8	12
Benzo(a)anthracene	mg/kg	21	10	6.3	3.1	93	79	6.5	10
Benzo(a)pyrene	mg/kg	16	7.3	5.1	2.5	64	78	5.2	7.2
Benzo(b)fluoranthene	mg/kg	16	6.6	4.1	2.1	47	33	3 J	4.6 J
Benzo(g,h,i)perylene	mg/kg	7.3 J	3.4 J	2 J	1.1 J	29 J	40	2.4 J	3.2 J
Benzo(k)fluoranthene	mg/kg	5.4 J	2.2 J	1.3 J	0.74 J	50	41	3.7 J	6.8
Chrysene	mg/kg	18	9.2	5.5	2.7	74	70	5.5	8.4
Dibenzo(a,h)anthracene	mg/kg	2.8 J	1 J	0.78 J	0.39 J	11 J	9 J	0.72 J	1.4 J
Fluoranthene	mg/kg	46	22	15	7.4	200	130	11	21
Fluorene	mg/kg	31	28	22	8.3	130	55	9.7	15
Indeno(1,2,3-cd)pyrene	mg/kg	8.2 J	3 J	1.9 J	0.98 J	30 J	29	2.1 J	3.2 J
Naphthalene	mg/kg	17	27	9.2	3.5	180	60	20	23
Phenanthrene	mg/kg	79	64	47	20	350	240	33	43
Pyrene	mg/kg	36	25	17	7.6	150	220	15	18
Total PAHs	mg/kg	367	277	185	80	1591	1236	140	189
TPH	mg/kg	12000	12000	4500	1000	20000	10000	1300	460
Total Organic Carbon	mg/kg	194000	410000	53400	13900	304000	114000	26200	115000
Total Inorganic Carbon	mg/kg	140000	300 U	300 U	300 U	26000	44000	10000	6000
Iron, Total	mg/kg	174000	40500	315000	318000	34300 *	111000 *	371000 *	94000 *
Manganese, Total	mg/kg	1410 *	414 *	5400 *	2080 *	228	3190	19500	736

BASELINE SOIL ANALYTICAL RESULTS
ISCO Pilot Test
Troy (Water Street) Site - Area 2
Troy, New York

Constituent	Units	SB-204				SB-205			
		18-20	22-24	26-28	28-30	18-20	22-24	26-28	28-30
		7/27/2005	7/27/2005	7/27/2005	7/28/2005	7/28/2005	7/28/2005	7/28/2005	7/28/2005
Benzene	mg/kg	0.005 J	0.37	0.12	0.076	11	1.5 J	1.8 J	3.1 J
Ethylbenzene	mg/kg	0.0084 J	0.37	0.064	0.033	190	64	48	84
m&p-Xylenes	mg/kg	0.025 J	0.18	0.088	0.021	11	6.3	17	7.5
o-Xylene	mg/kg	0.059	0.53	0.097	0.017	63	16	13	22
Toluene	mg/kg	0.0097 J	0.064	0.021 J	0.012	2.8 J	1.3 J	0.63 J	1.1 J
Total BTEX	mg/kg	0.107	1.51	0.39	0.159	278	89	80	118
Acenaphthene	mg/kg	13	35	15	2.1	460	130	72	74
Acenaphthylene	mg/kg	13	6.9 U	1.5 U	0.27 J	160 J	41 J	8 J	6.8 J
Anthracene	mg/kg	22	19	5.4	0.76	380	93	35	33
Benzo(a)anthracene	mg/kg	18	11	2.9	0.62	290	62	23	22
Benzo(a)pyrene	mg/kg	13	8.6	2.2	0.51	230	41 J	21	19
Benzo(b)fluoranthene	mg/kg	9.2	4.7 J	1.1 J	0.35 J	120 J	26 J	7.6 J	7.6 J
Benzo(g,h,i)perylene	mg/kg	4.5 J	4 J	0.97 J	0.16 J	100 J	18 J	9.6 J	9 J
Benzo(k)fluoranthene	mg/kg	9.2	5.3 J	1.2 J	0.36 J	190 J	35 J	12 J	11 J
Chrysene	mg/kg	16	10	2.6	0.56	270	49 J	23	22
Dibenzo(a,h)anthracene	mg/kg	1.9 J	1.2 J	0.27 J	0.067 J	34 J	5.5 J	2.7 J	2.3 J
Fluoranthene	mg/kg	42	20	6.1	1.3	580	130	39	35
Fluorene	mg/kg	23	26	7.4	1.2	470	120	35	33
Indeno(1,2,3-cd)pyrene	mg/kg	4.6 J	3.3 J	0.76 J	0.16 J	89 J	16 J	6.6 J	6.7 J
Naphthalene	mg/kg	13	7	1.8	1.3	2000	550	250	150
Phenanthrene	mg/kg	28	67	10	1.9	1500	360	130	120
Pyrene	mg/kg	34	28	9.5	1.2	670	130	65	61
Total PAHs	mg/kg	264	250	67	12.8	7543	1807	740	612
TPH	mg/kg	20000	13000	2100	120 U	43000	5800	3100	2900
Total Organic Carbon	mg/kg	140000	97200	17300	24500	371000	42000	24700	17900
Total Inorganic Carbon	mg/kg	26000	19000	10000	300 U	25000	300 U	9300	1500
Iron, Total	mg/kg	6880 *	115000 *	243000 *	136000 *	67900 *	85900 *	237000 *	29700 *
Manganese, Total	mg/kg	60.7	2600	3140	1850	367	5050	4130	345

BASELINE SOIL ANALYTICAL RESULTS
ISCO Pilot Test
Troy (Water Street) Site - Area 2
Troy, New York

Constituent	Units	SB-206					SB-207			
		18-20	22-24	22-24 DUP	26-28	28-30	18-20	22-24	26-28	28-30
		7/29/2005	7/29/2005	7/29/2005	7/29/2005	7/29/2005	8/1/2005	8/1/2005	8/1/2005	8/1/2005
Benzene	mg/kg	0.0041 J	0.6 J	1	0.3 J	0.02 J	0.07 J	7.6	0.68 J	0.59 J
Ethylbenzene	mg/kg	0.012 J	76 D	53 D	1.4	0.047	0.99	48	2	1.2
m&p-Xylenes	mg/kg	0.078	44	36	1.1	0.034	0.27 J	2.1 J	0.57 J	0.26 J
o-Xylene	mg/kg	0.053	34 D	30	0.75 J	0.022 J	0.83 J	11	0.95	0.51 J
Toluene	mg/kg	0.026 J	6	5.3	0.32 J	0.0097 J	0.89 U	0.43 J	0.18 J	0.15 J
Total BTEX	mg/kg	0.173	161	125	3.9	0.13	2.16	69	4	2.7
Acenaphthene	mg/kg	7.7 J	400	260	6.9	3.2	23	120	27	14
Acenaphthylene	mg/kg	53	230 J	130	5.2	1.3	7.9	51 U	5.2	2.5 J
Anthracene	mg/kg	53	1200	640	18	4.3	19	55	16	8.4
Benzo(a)anthracene	mg/kg	72	440	280	9.7	2.6	11	29 J	9.5	4.9
Benzo(a)pyrene	mg/kg	69	270	160	6.9	1.7	8.2	20 J	7.9	3.8 J
Benzo(b)fluoranthene	mg/kg	54	200 J	130	5.2	1.4	5.3	11 J	3.6 J	2 J
Benzo(g,h,i)perylene	mg/kg	31	93 J	59 J	3 J	0.71 J	3.6 J	8.4 J	3.5 J	1.7 J
Benzo(k)fluoranthene	mg/kg	53	250	140	5.8	1.5	6.4	12 J	5	2 J
Chrysene	mg/kg	69	400	240	8.7	2.2	9.6	26 J	8.8	4.3
Dibenzo(a,h)anthracene	mg/kg	13 J	46 J	34 J	1.5 J	0.34 J	1.2 J	51 U	0.89 J	0.59 J
Fluoranthene	mg/kg	120	1000	630	22	5.7	27	58	18	9.4
Fluorene	mg/kg	42	850	530	16	5.2	31	72	16	8.6
Indeno(1,2,3-cd)pyrene	mg/kg	31	100 J	63 J	3.2 J	0.76 J	3.4 J	7.4 J	2.8 J	1.4 J
Naphthalene	mg/kg	34	1500	880	23	6.7	6.7	430	36	20
Phenanthrene	mg/kg	100	2000	1300	38	10	68	210	61	32
Pyrene	mg/kg	90	590	390	14	3.8	22	78	24	12
Total PAHs	mg/kg	892	9569	5866	187	51	253	1137	245	128
TPH	mg/kg	22000	14000	9300	710	120 U	9400	31000	2600	1700
Total Organic Carbon	mg/kg	165000	39500	71700	35800	15900	192000	347000	19600	10600
Total Inorganic Carbon	mg/kg	10900	4670	13900	432 U	1350	21500	581 U	11000	5610
Iron, Total	mg/kg	12800 *	68600 *	133000 *	285000 *	273000 *	8830 *	51900 *	372000 *	334000 *
Manganese, Total	mg/kg	88 N	5270 N	3330 N	2950 N	3910 N	60.4 N	2380 N	3770 N	3610 N

BASELINE SOIL ANALYTICAL RESULTS
ISCO Pilot Test
Troy (Water Street) Site - Area 2
Troy, New York

Constituent	Units	SB-208			SB-209	
		20-22	22-24	26-28	18-20	22-24
		8/1/2005	8/1/2005	8/1/2005	8/2/2005	8/1/2005
Benzene	mg/kg	24	6.2	2.7	0.12 J	0.0087
Ethylbenzene	mg/kg	130	110	8	0.67 J	0.021
m&p-Xylenes	mg/kg	41	10	0.94	0.4 J	0.019
o-Xylene	mg/kg	44	32	2.2	0.39 J	0.014
Toluene	mg/kg	28	7.4	0.29 J	0.16 J	0.016
Total BTEX	mg/kg	267	166	14	1.7	0.079
Acenaphthene	mg/kg	230	210	7.2	41 J	8.5
Acenaphthylene	mg/kg	68 J	38 J	1.5 J	190	6.1
Anthracene	mg/kg	160	110	4.7	480	13
Benzo(a)anthracene	mg/kg	130	77	3.1 J	480	15
Benzo(a)pyrene	mg/kg	100 J	68	2.7 J	340	9.9
Benzo(b)fluoranthene	mg/kg	52 J	27 J	1.2 J	240	7.4
Benzo(g,h,i)perylene	mg/kg	46 J	31 J	1.3 J	160	4.1 J
Benzo(k)fluoranthene	mg/kg	72 J	37 J	1.4 J	300	8.8
Chrysene	mg/kg	130	76	3.1 J	390	12
Dibenzo(a,h)anthracene	mg/kg	18 J	9.4 J	4 U	67 J	1.9 J
Fluoranthene	mg/kg	240	120	5.3	1000	34
Fluorene	mg/kg	160	110	4 J	450	20
Indeno(1,2,3-cd)pyrene	mg/kg	40 J	24 J	0.9 J	170	4.3 J
Naphthalene	mg/kg	1000	530	32	100 J	5.8
Phenanthrene	mg/kg	690	450	18	1500	23
Pyrene	mg/kg	320	190	9	770	27
Total PAHs	mg/kg	3456	2107	95	6678	201
TPH	mg/kg	17000	940	490	7600	870
Total Organic Carbon	mg/kg	93200	58900	28700	198000	37500
Total Inorganic Carbon	mg/kg	10300	10700	2930	127000	10900
Iron, Total	mg/kg	45500 *	40700 *	58300 *	74400 *	232000 *
Manganese, Total	mg/kg	1900 N	1280 N	516 N	956 N	2940 N

BASELINE SOIL ANALYTICAL RESULTS
ISCO Pilot Test
Troy (Water Street) Site - Area 2
Troy, New York

Constituent	Units	SB-210					SB-211			
		20-22	20-22 DUP	22-24	26-28	28-30	18-20	22-24	26-28	28-30
		8/3/2005	8/3/2005	8/3/2005	8/3/2005	8/3/2005	8/3/2005	8/3/2005	8/3/2005	8/3/2005
Benzene	mg/kg	3.9	0.96	1.6	1	0.028	4.8	0.7 J	0.07	0.03 J
Ethylbenzene	mg/kg	2.2	1	25	3.3	0.088	75 D	2.4	0.23	0.1
m&p-Xylenes	mg/kg	8.3	0.75 J	2	0.83	0.021	72	0.88	0.22	0.079
o-Xylene	mg/kg	3.3	1.6	7.2	1.1	0.032	35	1.2	0.13	0.067
Toluene	mg/kg	6.8	0.46 J	0.38 J	0.42 J	0.005 J	38	0.4 J	0.11	0.026 J
Total BTEX	mg/kg	24.5	4.8	36	7	0.174	225	5.6	0.76	0.3
Acenaphthene	mg/kg	81	86	66	8	4.2	100 J	46	2.1	3.1
Acenaphthylene	mg/kg	33	45	11 J	2.6 J	0.57 J	420	43	2.3	0.41 J
Anthracene	mg/kg	65	83	28	5.8	1.3 J	320	53	2.9	0.81
Benzo(a)anthracene	mg/kg	46	64	15 J	3.9 J	0.82 J	290 J	36	2.2	0.56
Benzo(a)pyrene	mg/kg	35	52	12 J	3 J	0.61 J	210 J	27	1.5	0.41 J
Benzo(b)fluoranthene	mg/kg	23 J	34	6.5 J	1.7 J	0.36 J	150 J	16 J	1	0.24 J
Benzo(g,h,i)perylene	mg/kg	12 J	16 J	5.1 J	0.84 J	2 U	90 J	12 J	0.59 J	0.16 J
Benzo(k)fluoranthene	mg/kg	26	34	8.1 J	2 J	0.43 J	160 J	21	1.3	0.29 J
Chrysene	mg/kg	39	55	13 J	3.4 J	0.74 J	240 J	30	1.8	0.49
Dibenzo(a,h)anthracene	mg/kg	4.2 J	6.9 J	1.8 J	4.1 U	2 U	42 J	4 J	0.24 J	0.069 J
Fluoranthene	mg/kg	100	140	35	8.4	1.9 J	600	79	4.7	1.1
Fluorene	mg/kg	64	78	34	5.9	2.4	430	59	4	2.1
Indeno(1,2,3-cd)pyrene	mg/kg	11 J	16 J	4.2 J	0.79 J	2 U	88 J	11 J	0.56 J	0.15 J
Naphthalene	mg/kg	170	160	190	8.4	3.5	1600	130	5.9	1.6
Phenanthrene	mg/kg	230	300	110	18	4.1	1200	200	9.6	3
Pyrene	mg/kg	89	120	38	8.9	1.9 J	430	67	3.8	1.2
Total PAHs	mg/kg	1028	1290	578	82	22.8	6370	834	44	16
TPH	mg/kg	17000	20000	8300	1200	170	28000	17000	220	140 U
Total Organic Carbon	mg/kg	1000	253000	300 U	1100	8100	6000	300 U	300 U	7500
Total Inorganic Carbon	mg/kg	267000	300 U	57500	25300	51000	357000	152000	104000	28200
Iron, Total	mg/kg	34800 *	47700 *	152000 *	242000	74000 *	15300 *	145000 *	204000 *	31300 *
Manganese, Total	mg/kg	726 *	847 *	1920 *	2980	792 *	202 *	2080 *	3060 *	432 *

U - indicates that the analyte was not detected above the associated value

J - indicates that the analyte was detected below of the detection limit and the reported value is an estimated value

D - indicates that the reported value reflects using a secondary dilution factor

E - indicates the reported concentration exceeds the calibrated range of the instrument for that specific analysis.

N - Spiked sample recovery was not within the control limits.

* - indicates reported value is an estimate as the inorganic analyte could not bne accurately determined because the amount detected in the sample was four times greater than the amount added as spike.

POST-TREATMENT SOIL ANALYTICAL RESULTS
ISCO Pilot Test
Troy (Water Street) Site - Area 2
Troy, New York

Constituent	Units	SB-200 POST					SB-201 POST			
		18-20	22-24	26-28	26-28 DUP	30-32	18-20	22-24	26-28	28-30
		10/7/2005	10/7/2005	10/7/2005	10/7/2005	10/7/2005	10/6/2005	10/6/2005	10/6/2005	10/6/2005
Benzene	mg/kg	6.6	4.6	2.5	1.7	0.15 J	11	13	3.2 J	1.2
Ethylbenzene	mg/kg	100 D	90 D	58	17	1.5	100	240 D	85	12
m&p-Xylenes	mg/kg	12	8.9	15	4.4	0.23 J	20	120 D	24	3.1
o-Xylene	mg/kg	42 D	28	12	2.3	0.42 J	38	59 D	16	2.5
Toluene	mg/kg	1.3	1.4 J	1 J	0.4 J	0.8 U	1.4 J	42	3.2 J	0.7 J
Total BTEX	mg/kg	162	133	89	26	2.3	170	474	131	20
Acenaphthene	mg/kg	570	240	100	49	41	190	130	180	56
Acenaphthylene	mg/kg	240	29 J	9.6 J	5 J	3.9 J	45 J	19 J	17 J	7 J
Anthracene	mg/kg	770	120	42 J	21 J	18	120	57	74	30
Benzo(a)anthracene	mg/kg	730	79 J	25 J	12 J	9.7	85	36 J	49 J	19 J
Benzo(a)pyrene	mg/kg	560	72 J	24 J	11 J	8.4	78 J	34 J	43 J	18 J
Benzo(b)fluoranthene	mg/kg	600	57 J	18 J	8.8 J	6.5	64 J	26 J	33 J	14 J
Benzo(g,h,i)perylene	mg/kg	230 J	31 J	10 J	4.3 J	3.6 J	34 J	14 J	20 J	7.5 J
Benzo(k)fluoranthene	mg/kg	230 J	17 J	5.1 J	3 J	2 J	19 J	8.8 J	12 J	4 J
Chrysene	mg/kg	590	72 J	26 J	12 J	9.1	77 J	36 J	48 J	18 J
Dibenzo(a,h)anthracene	mg/kg	94 J	11 J	42 U	21 U	1.1 J	11 J	4.8 J	67 U	2.4 J
Fluoranthene	mg/kg	1500	150	49	24	18	160	67	90	34
Fluorene	mg/kg	1000	140	53	27	23	140	73	92	32
Indeno(1,2,3-cd)pyrene	mg/kg	280	30 J	9.2 J	4.2 J	3.2 J	31 J	13 J	17 J	6.8 J
Naphthalene	mg/kg	2100	1000	510	260	70	820	590	870	140
Phenanthrene	mg/kg	2500	420	150	74	61	430	200	270	100
Pyrene	mg/kg	1200	200	75	35	27	210	100	140	50
Total PAHs	mg/kg	13194	2668	1106	550	306	2514	1409	1955	539
TPH	mg/kg	34000	12000	4000	6200	490	11000	3100	5800	710
Total Organic Carbon	mg/kg	476000	35800	58900	87100	7420	37700	36700	49400	13000
Total Inorganic Carbon	mg/kg	32000	49400	300 U	300 U	300 U	13700	6000	300 U	37400
Iron, Total	mg/kg	13900 *	150000 *	319000 *	86800 *	37000 *	151000 *	123000 *	164000 *	141000 *
Manganese, Total	mg/kg	120 *	2940 *	5540 *	1520 *	455 *	2580 *	5370 *	2490 *	1810 *

POST-TREATMENT SOIL ANALYTICAL RESULTS
ISCO Pilot Test
Troy (Water Street) Site - Area 2
Troy, New York

Constituent	Units	SB-202 POST				SB-203 POST			
		18-20	22-24	26-28	28-30	18-20	22-24	26-28	28-30
		10/3/2005	10/3/2005	10/3/2005	10/3/2005	10/5/2005	10/5/2005	10/5/2005	10/5/2005
Benzene	mg/kg	0.58 J	0.27 J	0.054	0.0014 J	0.091 J	1.4	1	1.1
Ethylbenzene	mg/kg	3	0.5 J	0.077	0.0015 J	0.39 J	2.3	0.92	2.3
m&p-Xylenes	mg/kg	0.5 J	0.3 J	0.045	0.0069 U	0.26 J	0.77 J	0.51 J	1
o-Xylene	mg/kg	2.4	0.63 J	0.078	0.0036 J	0.26 J	0.81	0.42 J	0.57 J
Toluene	mg/kg	0.35 J	0.11 J	0.0096 J	0.00065 J	0.15 J	0.48 J	0.32 J	0.26 J
Total BTEX	mg/kg	7	1.8	0.264	0.0072	1.15	5.8	3	5
Acenaphthene	mg/kg	47	54	24	2.1	3 J	16	19	16
Acenaphthylene	mg/kg	8.3 J	8.3 J	3	0.32 J	8	3.2	3.2 J	2.6 J
Anthracene	mg/kg	26	29	13	1.4	4.7 J	9.3	12	9.2
Benzo(a)anthracene	mg/kg	22	21	6.7	1.2	5.7	5.2	6.5	5.8
Benzo(a)pyrene	mg/kg	17	16	4.8	0.88	5.8	4.1	4.9	4.9
Benzo(b)fluoranthene	mg/kg	18	18	4.4	0.94	5.7	3.8	3.8 J	4.2
Benzo(g,h,i)perylene	mg/kg	7 J	7 J	2 J	0.35 J	4.1 J	2 J	2.1 J	2.4 J
Benzo(k)fluoranthene	mg/kg	5.7 J	6 J	1.6 J	0.31 J	2.2 J	1.3 J	1.3 J	1.4 J
Chrysene	mg/kg	19	19	5.6	1	5.2	4.7	5.6	5.1
Dibenzo(a,h)anthracene	mg/kg	2.8 J	2.7 J	0.62 J	0.14 J	1.2 J	0.64 J	0.65 J	0.73 J
Fluoranthene	mg/kg	45	42	16	2.3	11	9.8	13	11
Fluorene	mg/kg	34	37	19	1.8	6.2	13	13	11
Indeno(1,2,3-cd)pyrene	mg/kg	8.2 J	8.3 J	2 J	0.4 J	4 J	2 J	1.9 J	2.2 J
Naphthalene	mg/kg	35	12	1.7 J	0.23 J	3.8 J	8.4	10	14
Phenanthrene	mg/kg	89	100	15	2.1	16	32	43	32
Pyrene	mg/kg	43	43	16	2.1	12	12	18	14
Total PAHs	mg/kg	427	423	135	18	99	127	158	137
TPH	mg/kg	11000	14000	2700	140 U	45000	5200	1200	510
Total Organic Carbon	mg/kg	393000	209000	42000	27200	270000	213000	3410	11400
Total Inorganic Carbon	mg/kg	73000	459000	8600	3800	53000	300 U	3280	28100
Iron, Total	mg/kg	46500 *	51600 *	384000 *	49100 *	5660	116000	263000	145000
Manganese, Total	mg/kg	429	338	2430	674	13.6 *	4030 *	3980 *	3190 *

POST-TREATMENT SOIL ANALYTICAL RESULTS
ISCO Pilot Test
Troy (Water Street) Site - Area 2
Troy, New York

Constituent	Units	SB-204 POST				SB-205 POST			
		18-20	22-24	26-28	28-30	18-20	22-24	26-28	28-30
		10/4/2005	10/4/2005	10/4/2005	10/4/2005	10/10/2005	10/10/2005	10/10/2005	10/10/2005
Benzene	mg/kg	0.45 J	0.5 J	0.061	0.076	1.4	0.61 J	4.9	0.75
Ethylbenzene	mg/kg	0.39 J	3.2	0.25	0.12	11	15	68	7.7
m&p-Xylenes	mg/kg	4.7	0.93	0.11	0.13	2.6	1 J	19	1.7
o-Xylene	mg/kg	1.7	0.77 J	0.09	0.074	2.4	3.8	15	1.9
Toluene	mg/kg	2.1	0.22 J	0.027 J	0.048	0.39 J	0.47 J	2.2 J	0.24 J
Total BTEX	mg/kg	9.3	5.6	0.54	0.45	18	21	109	12.3
Acenaphthene	mg/kg	14	19	3.7	1.1	210	48	100	77
Acenaphthylene	mg/kg	15	2.4 J	0.93	0.83	110	5.8 J	13 J	9.5 J
Anthracene	mg/kg	19	7.7	3.8	1.5	210	23	47	43
Benzo(a)anthracene	mg/kg	34	4.9	2.5	1.3	180	13	31	30
Benzo(a)pyrene	mg/kg	28	3.5	1.7	0.92	140	12	27	27
Benzo(b)fluoranthene	mg/kg	33	3.9	1.9	1.1	140	9.1 J	22 J	21
Benzo(g,h,i)perylene	mg/kg	14	1.7 J	0.72 J	0.38 J	56 J	4.9 J	12 J	12 J
Benzo(k)fluoranthene	mg/kg	12	1.6 J	0.7 J	0.4 J	48 J	2.9 J	7.2 J	5.6 J
Chrysene	mg/kg	30	4.3	2.1	1	150	12	29	28
Dibenzo(a,h)anthracene	mg/kg	5.9 J	0.65 J	0.3 J	0.18 J	25 J	1.7 J	3.8 J	4 J
Fluoranthene	mg/kg	62	9.8	5.5	2.5	390	24	56	50
Fluorene	mg/kg	23	17	4.7	2.1	290	27	57	44
Indeno(1,2,3-cd)pyrene	mg/kg	17	1.8 J	0.9	0.49 J	66 J	4.8 J	11 J	11 J
Naphthalene	mg/kg	12	16	2.9	2.9	690	110	360	100
Phenanthrene	mg/kg	44	21	10	4.4	760	77	160	140
Pyrene	mg/kg	52	10	4.6	2	310	33	74	69
Total PAHs	mg/kg	415	125	47	23	3775	408	1010	671
TPH	mg/kg	17000	5300	280	120 U	7800	420	6200	2300
Total Organic Carbon	mg/kg	131000	114000	36200	16600	74800	32000	10600	23200
Total Inorganic Carbon	mg/kg	18000	9000	24400	22900	159000	19600	300 U	6800
Iron, Total	mg/kg	6400 *	216000 *	390000 *	351000	209000 *	121000 *	296000 *	45500 *
Manganese, Total	mg/kg	11.5	6570	4180	4590	4650 *	5010 *	7630 *	622 *

POST-TREATMENT SOIL ANALYTICAL RESULTS
ISCO Pilot Test
Troy (Water Street) Site - Area 2
Troy, New York

Constituent	Units	SB-206 POST					SB-207 POST			
		20-22	20-22 DUP	22-24	26-28	28-30	18-20	22-24	26-28	28-30
		10/4/2005	10/4/2005	10/4/2005	10/4/2005	10/4/2005	10/6/2005	10/6/2005	10/6/2005	10/6/2005
Benzene	mg/kg	0.088 J	0.084	0.092 J	0.36 J	0.035	0.31 J	1.8	0.46 J	0.019 J
Ethylbenzene	mg/kg	0.074 J	0.028 J	2.9	6.7	0.11	1.1	8.5	0.67 J	0.029 J
m&p-Xylenes	mg/kg	0.93 U	0.1	1.8	3.6	0.04	0.9 J	1.4	0.32 J	0.015 J
o-Xylene	mg/kg	0.1 J	0.069	1.4	3.2	0.041	0.66 J	3.2	0.39 J	0.021 J
Toluene	mg/kg	0.11 J	0.072	0.25 J	0.63 J	0.012 J	0.63 J	0.73 J	0.15 J	0.0045 J
Total BTEX	mg/kg	0.4	0.4	6.4	14.5	0.24	3.6	15.6	1.99	0.089
Acenaphthene	mg/kg	7.5 J	8.4	190	170	11	110	61	35	7.9
Acenaphthylene	mg/kg	13	11	85	64	4.2	21 J	11 J	3.7 J	0.95 J
Anthracene	mg/kg	20	21	470	370	19	53	32	16	4.3
Benzo(a)anthracene	mg/kg	32	34	220	170	11	32	17 J	7.2	2.1
Benzo(a)pyrene	mg/kg	24	25	130	100	6.1	23 J	14 J	5.8	1.7 J
Benzo(b)fluoranthene	mg/kg	29	31	160	120	7.4	24 J	13 J	4.5	1.5 J
Benzo(g,h,i)perylene	mg/kg	12	12	49 J	36 J	2.2 J	9.5 J	6 J	2.3 J	0.73 J
Benzo(k)fluoranthene	mg/kg	10	11	59	54	3 J	8.3 J	3.5 J	1.4 J	0.54 J
Chrysene	mg/kg	29	31	210	150	9.6	27	15 J	6.3	1.8 J
Dibenzo(a,h)anthracene	mg/kg	5.1 J	5.4	25 J	19 J	1.3 J	24 U	2.2 J	0.8 J	0.24 J
Fluoranthene	mg/kg	51	53	460	370	23	84	38	17	5.1
Fluorene	mg/kg	18	15	420	360	20	110	45	22	5.7
Indeno(1,2,3-cd)pyrene	mg/kg	14	15	66	50	3.1 J	10 J	6 J	2.2 J	0.73 J
Naphthalene	mg/kg	19	8.5	650	510	2.2 J	22 J	140	14	4.2
Phenanthrene	mg/kg	35	24	840	680	38	220	110	56	15
Pyrene	mg/kg	49	50	330	250	17	68	39	19	5.5
Total PAHs	mg/kg	368	355	4364	3473	178	822	553	213	58
TPH	mg/kg	12000	8400	9600	6600	150	47000	19000	2600	1100
Total Organic Carbon	mg/kg	122000	88300	114000	155000	15800	425000	196000	32100	12100
Total Inorganic Carbon	mg/kg	98000	33700	8000	300 U	11600	300 U	195000	8500	3800
Iron, Total	mg/kg	6920 *	13000 *	11100 *	53800 *	312000 *	13600 *	112000 *	572000 *	166000 *
Manganese, Total	mg/kg	38.4	120	26.5	337	6740	23.6 *	1800 *	6290 *	2800 *

POST-TREATMENT SOIL ANALYTICAL RESULTS
ISCO Pilot Test
Troy (Water Street) Site - Area 2
Troy, New York

Constituent	Units	SB-208 POST					SB-209 POST			
		18-20	22-24	22-24 DUP	26-28	28-30	18-20	20-22	22-24	24-26
		10/5/2005	10/5/2005	10/5/2005	10/5/2005	10/5/2005	10/3/2005	10/3/2005	10/3/2005	10/3/2005
Benzene	mg/kg	46	0.49 J	0.26 J	0.2 J	0.012 J	0.0014 J	0.003 J	0.021 J	0.0021 J
Ethylbenzene	mg/kg	430 D	40	22	2	0.074	0.006 U	0.035	0.31	0.019
m&p-Xylenes	mg/kg	160 D	2.1	1.3 J	0.29 J	0.011 J	0.006 U	0.012 J	0.036	0.0027 J
o-Xylene	mg/kg	100 D	9.2	4.6	0.51 J	0.036	0.006 U	0.096	0.21	0.016
Toluene	mg/kg	2.3	0.27 J	0.23 J	0.74 U	0.0038 J	0.00082 J	0.0032 J	0.012 J	0.00087 J
Total BTEX	mg/kg	738	52	28	3	0.137	0.0022	0.149	0.59	0.041
Acenaphthene	mg/kg	150	78	45	34	4.1	4 U	NA	31	4.7
Acenaphthylene	mg/kg	22 J	7.2 J	4.7 J	3.3 J	0.49 J	3.3 J	NA	30	2.5
Anthracene	mg/kg	100	33	20	16	1.7	5.5	NA	35	4.6
Benzo(a)anthracene	mg/kg	100	20 J	12 J	10	1.2 J	17	NA	30	4.7
Benzo(a)pyrene	mg/kg	78	17 J	11 J	9.1	1.1 J	12	NA	18	3
Benzo(b)fluoranthene	mg/kg	57 J	13 J	8.1 J	6.8 J	0.88 J	15	NA	21	3.5
Benzo(g,h,i)perylene	mg/kg	31 J	7 J	4.4 J	3.6 J	0.51 J	6.1	NA	6.3 J	1.2 J
Benzo(k)fluoranthene	mg/kg	19 J	4 J	2.9 J	2.4 J	0.27 J	5.5	NA	7.8 J	1.4
Chrysene	mg/kg	93	20 J	12 J	10	1.2 J	14	NA	24	3.9
Dibenzo(a,h)anthracene	mg/kg	7.7 J	32 U	15 U	1.1 J	0.16 J	2.5 J	NA	3.4 J	0.51 J
Fluoranthene	mg/kg	180	39	24	19	2.2	29	NA	66	8.7
Fluorene	mg/kg	130	44	26	19	2.4	2.6 J	NA	67	7.1
Indeno(1,2,3-cd)pyrene	mg/kg	28 J	5.9 J	3.7 J	3.2 J	0.45 J	7.3	NA	8.3 J	1.5
Naphthalene	mg/kg	760	320	170	120	9.9	4 U	NA	26	4
Phenanthrene	mg/kg	360	130	79	61	6.5	18	NA	130	14
Pyrene	mg/kg	270	61	35	29	3.2	21	NA	52	8
Total PAHs	mg/kg	2386	799	458	348	36.3	159	NA	556	73
TPH	mg/kg	5200	1100	2100	1400	130 U	6700	NA	11000	130 U
Total Organic Carbon	mg/kg	39300	42700	50800	3890	24700	115000	NA	27900	8870
Total Inorganic Carbon	mg/kg	15800	36300	16800	670	300 U	26000	NA	24900	1830
Iron, Total	mg/kg	236000	51200	45200	75600	19100	267000 *	215000 *	23700 *	75700 *
Manganese, Total	mg/kg	1890 *	3280 *	2590 *	550 *	317 *	2460	1970	344	1290

POST-TREATMENT SOIL ANALYTICAL RESULTS
ISCO Pilot Test
Troy (Water Street) Site - Area 2
Troy, New York

Constituent	Units	SB-210_POST			SB-211_POST			
		20-22	22-24	28-30	18-20	22-24	26-28	28-30
		10/7/2005	10/7/2005	10/7/2005	10/4/2005	10/4/2005	10/4/2005	10/4/2005
Benzene	mg/kg	4.2	2.8	2.4	0.15 J	1.3	0.25 J	0.32 J
Ethylbenzene	mg/kg	170 D	91 D	91 D	0.54 J	10	1.2	0.56 J
m&p-Xylenes	mg/kg	6.3	4.1	5.5	1.2	0.89 J	0.31 J	0.2 J
o-Xylene	mg/kg	21	14	12	0.64 J	3.7	0.52 J	0.22 J
Toluene	mg/kg	0.59 J	1.2 J	0.7 J	0.47 J	0.37 J	0.15 J	0.16 J
Total BTEX	mg/kg	202	113	112	3.0	16	2.4	1.5
Acenaphthene	mg/kg	63	100	110	32 J	66	82	29
Acenaphthylene	mg/kg	19 J	16 J	19 J	150	12 J	10 J	4.2 J
Anthracene	mg/kg	49	52	66	190	36	45	16
Benzo(a)anthracene	mg/kg	46	30 J	40	150	23	21	8.5
Benzo(a)pyrene	mg/kg	35	24 J	32	110	27	16 J	6.6
Benzo(b)fluoranthene	mg/kg	38	22 J	31	120	21	11 J	4.8 J
Benzo(g,h,i)perylene	mg/kg	15 J	9.5 J	13 J	44 J	19 J	6.4 J	2.8 J
Benzo(k)fluoranthene	mg/kg	14 J	6.8 J	9.8 J	51 J	8 J	3.2 J	1.5 J
Chrysene	mg/kg	36	22 J	32	120	26	17 J	7.4
Dibenzo(a,h)anthracene	mg/kg	6.4 J	42 U	5.1 J	20 J	4.3 J	20 U	0.88 J
Fluoranthene	mg/kg	88	66	82	320	40	42	17
Fluorene	mg/kg	65	67	77	230	39	50	19
Indeno(1,2,3-cd)pyrene	mg/kg	18 J	9.8 J	14 J	57	16 J	5.3 J	2.4 J
Naphthalene	mg/kg	170	330	320	370	130	31	8.8
Phenanthrene	mg/kg	170	190	220	550	120	170	55
Pyrene	mg/kg	74	74	92	210	59	67	25
Total PAHs	mg/kg	906	1019	1163	2724	646	577	209
TPH	mg/kg	17000	14000	4600	19000	15000	4900	1100
Total Organic Carbon	mg/kg	240000	124000	91300	264000	144000	10000	33800
Total Inorganic Carbon	mg/kg	6000	300 U	300 U	16000	17000	8400	300 U
Iron, Total	mg/kg	19000 *	108000 *	95000 *	5230 *	91600 *	223000 *	37700 *
Manganese, Total	mg/kg	443 *	2590 *	1520 *	12.9	1050	3030	403

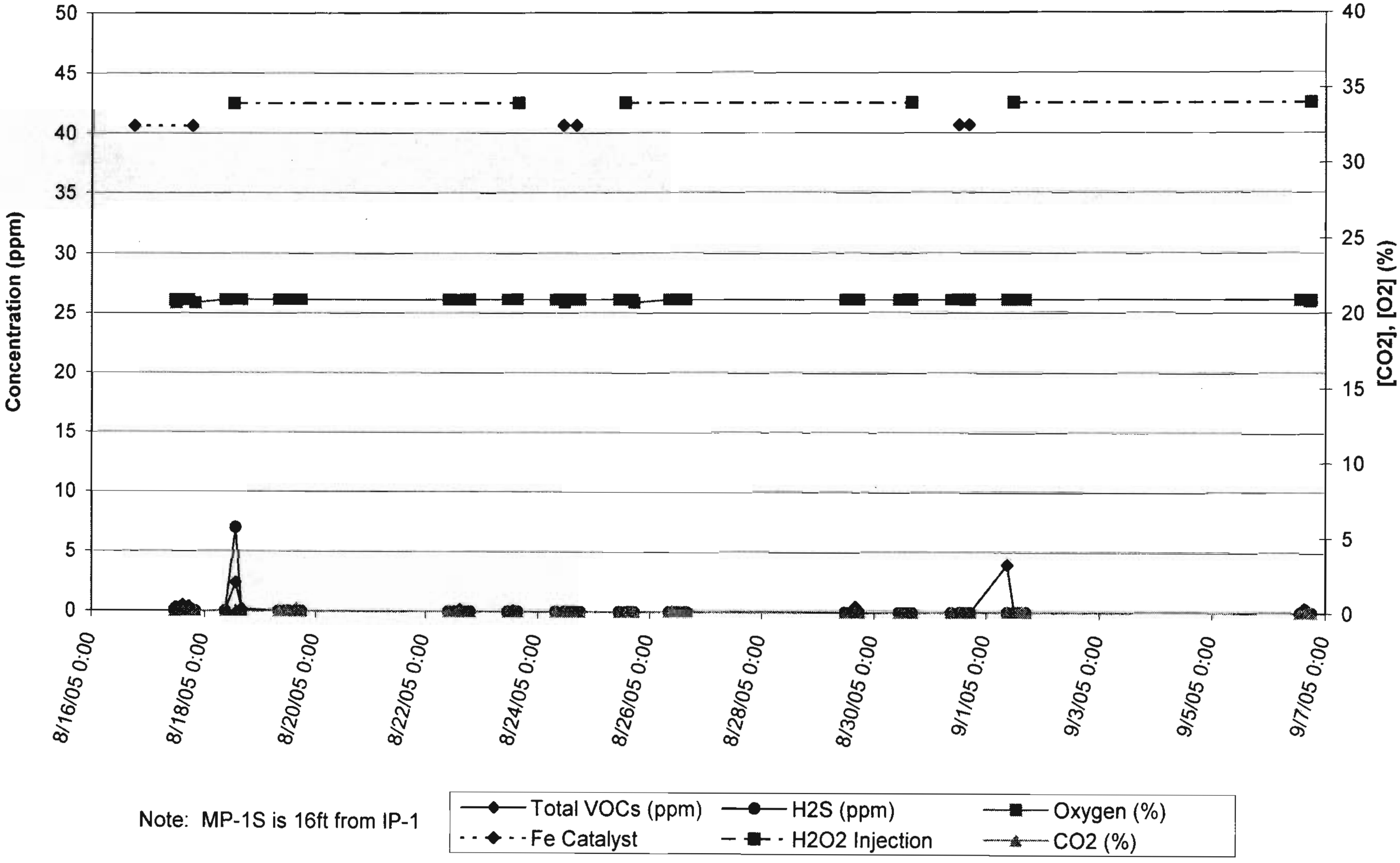
U - indicates that the analyte was not detected above the associated value
J - indicates that the analyte was detected below of the detection limit and the reported value is an estimated value
D - indicates that the reported value reflects using a secondary dilution factor
E - indicates the reported concentration exceeds the calibrated range of the instrument for that specific analysis.
N - Spiked sample recovery was not within the control limits.
* - indicates reported value is an estimate as the inorganic analyte could not bne accurately determined because the amount detected in the sample was four times greater than the amount added as spike.

APPENDIX C

VADOSE ZONE SCREENING RESULTS

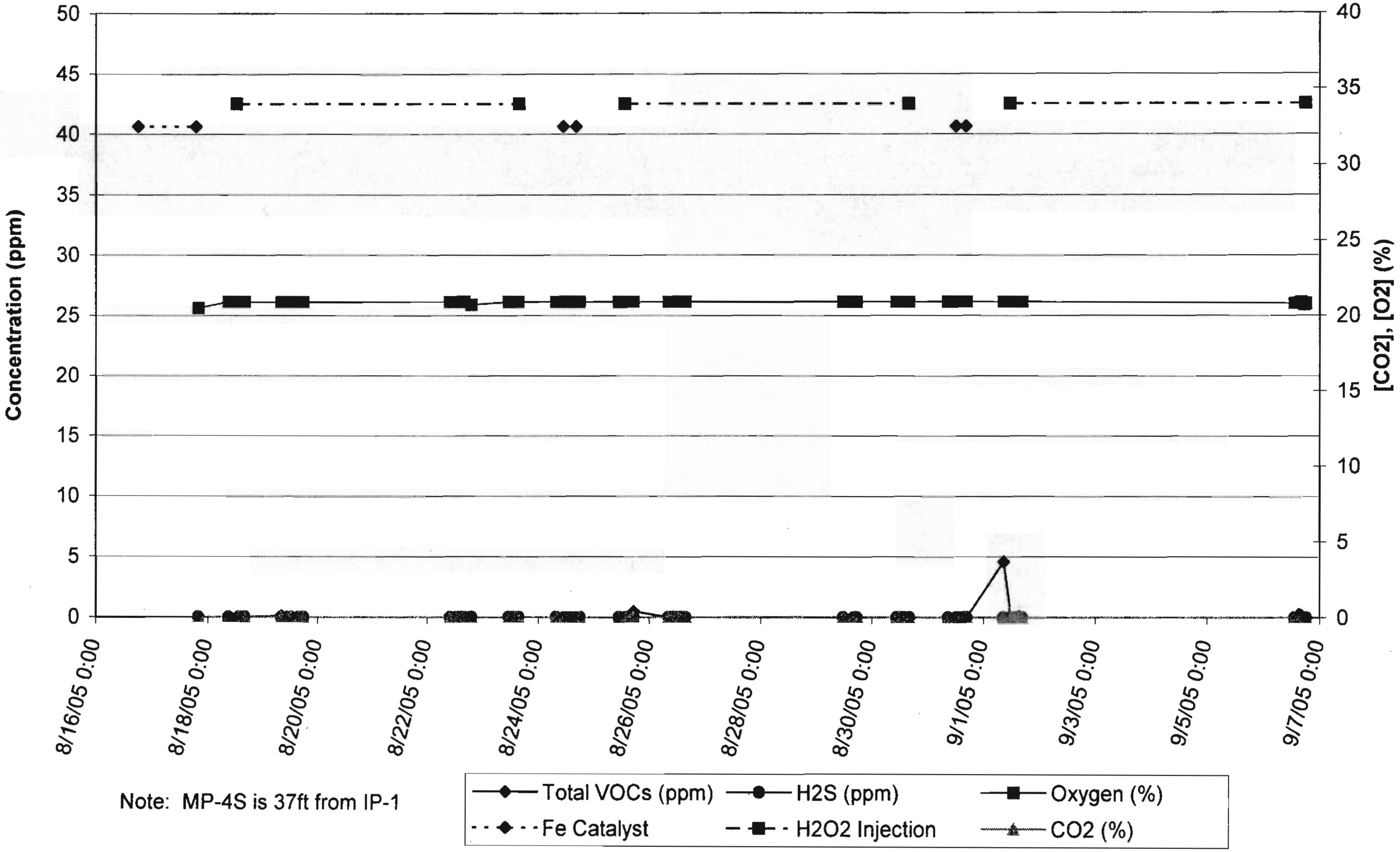
SHALLOW ZONE TEST

MP-1S Vadose Zone Monitoring Results
Shallow Pilot Test (Injection Point - IP-1)



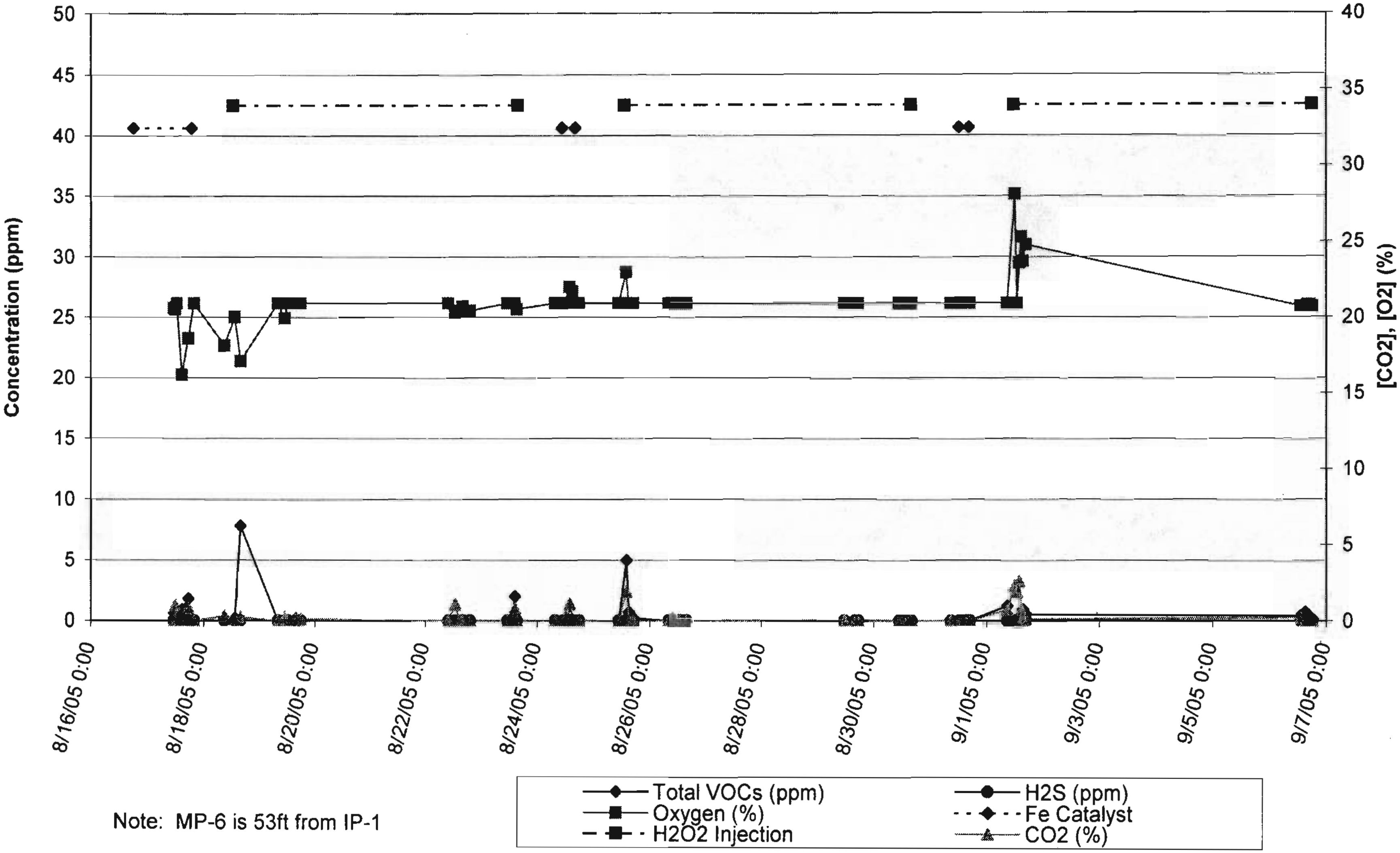
Note: MP-1S is 16ft from IP-1

MP-4S Vadose Zone Monitoring Results
Shallow Pilot Test (Injection Point - IP-1)



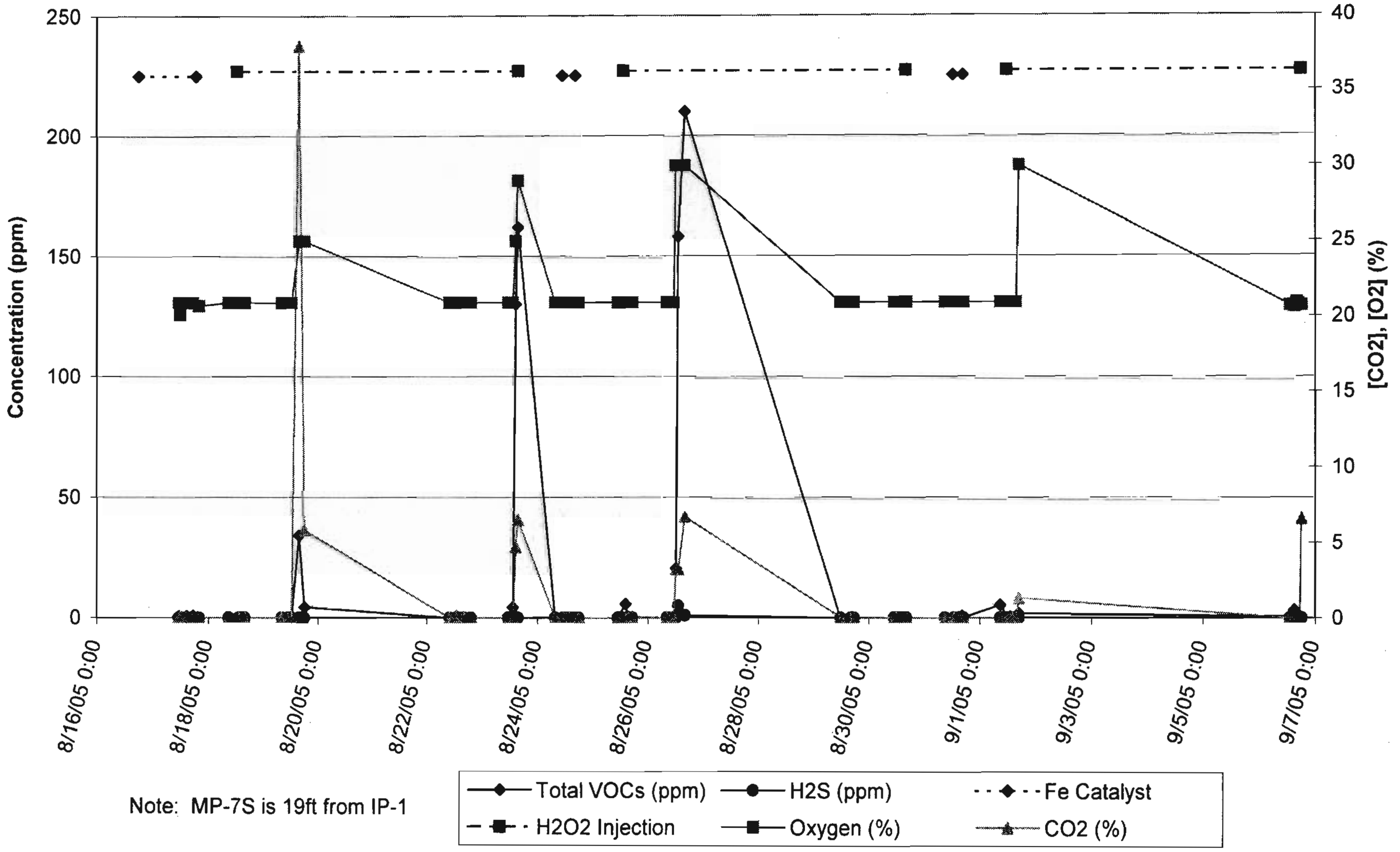
Note: MP-4S is 37ft from IP-1

MP-6 Vadose Zone Monitoring Results
Shallow Pilot Test (Injection Point - IP-1)



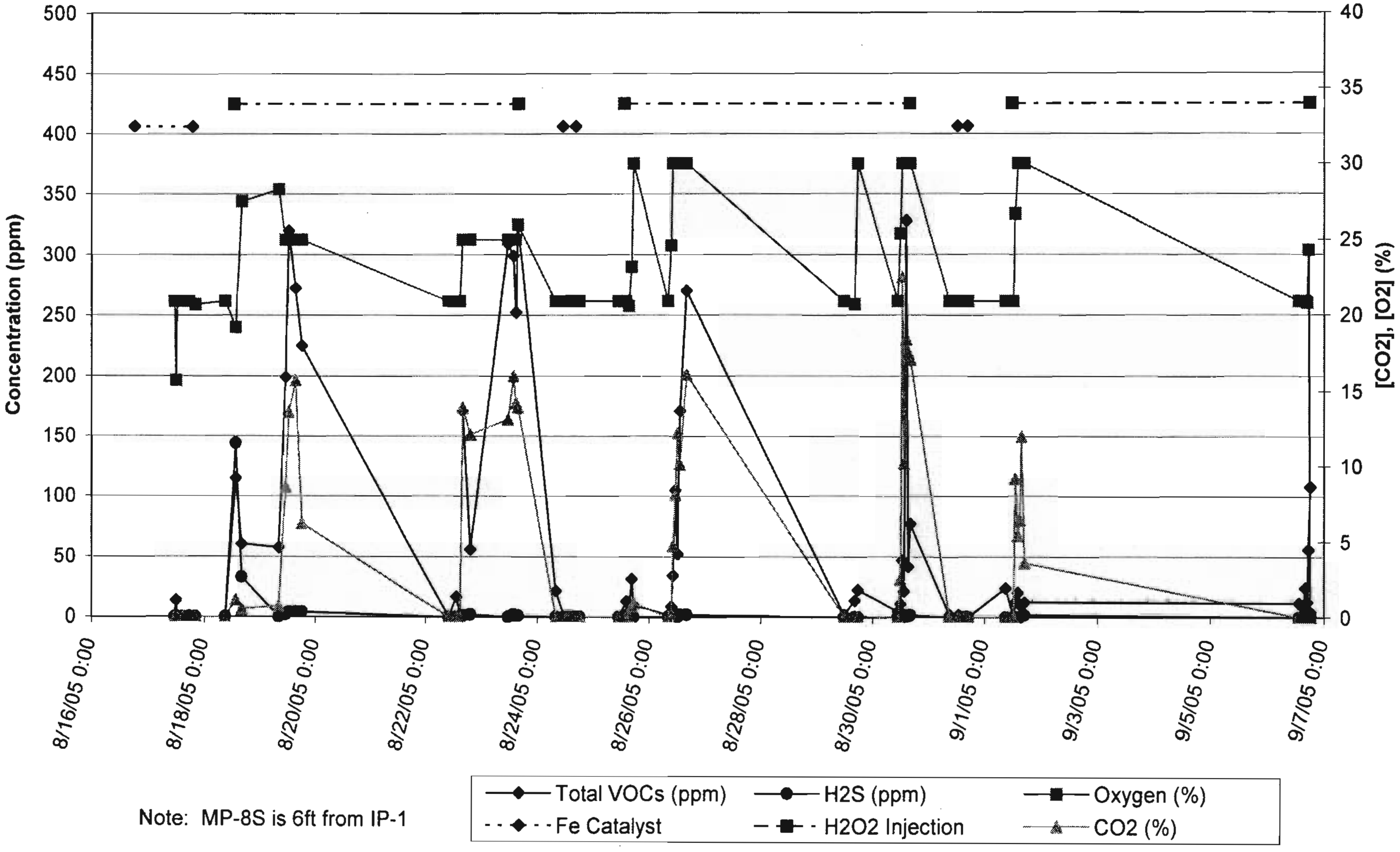
Note: MP-6 is 53ft from IP-1

MP-7S Vadose Zone Monitoring Results
Shallow Pilot Test (Injection Point - IP-1)



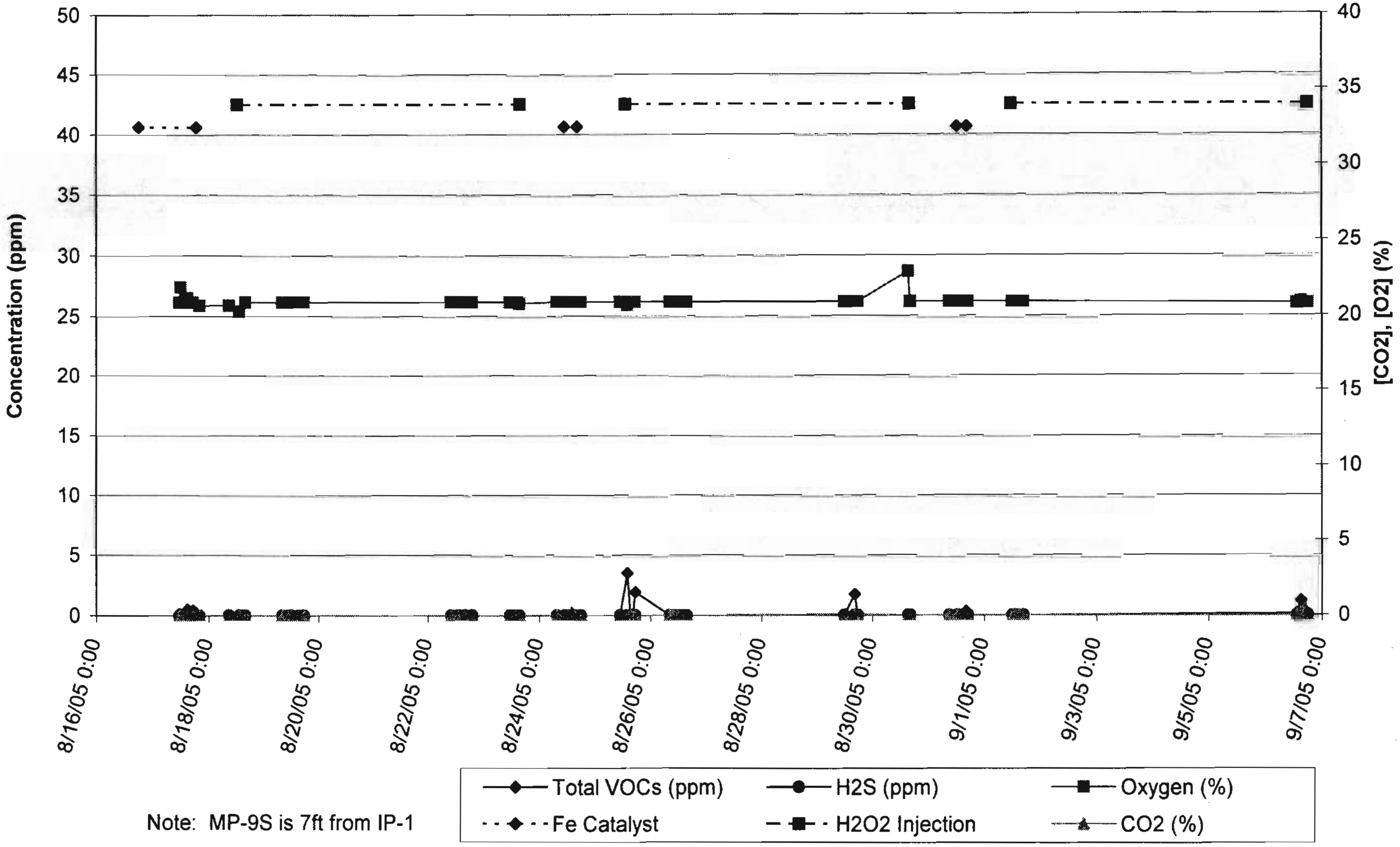
Note: MP-7S is 19ft from IP-1

MP-8S Vadose Zone Monitoring Results
Shallow Pilot Test (Injection Point - IP-1)



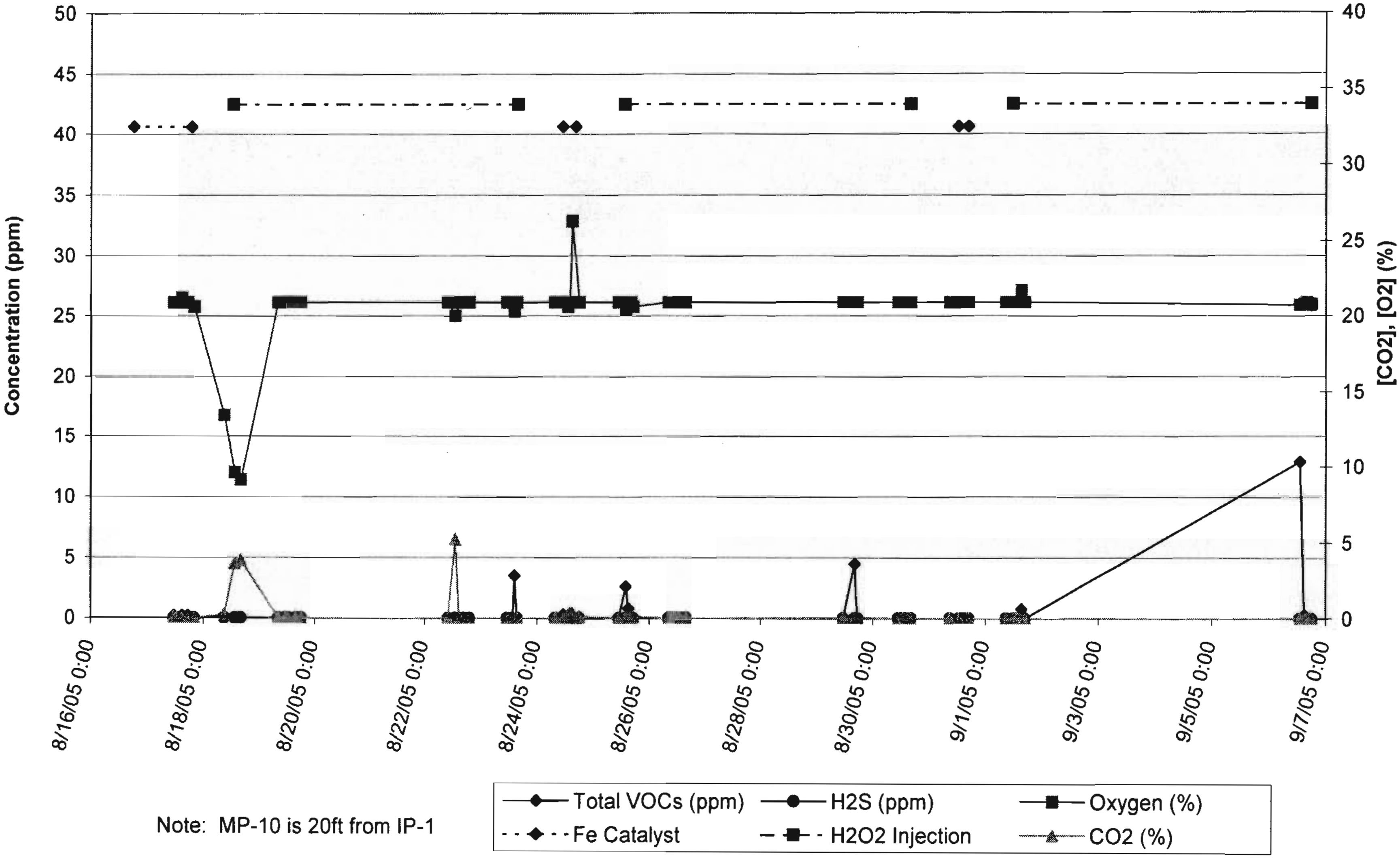
Note: MP-8S is 6ft from IP-1

MP-9S Vadose Zone Monitoring Results
Shallow Pilot Test (Injection Point - IP-1)



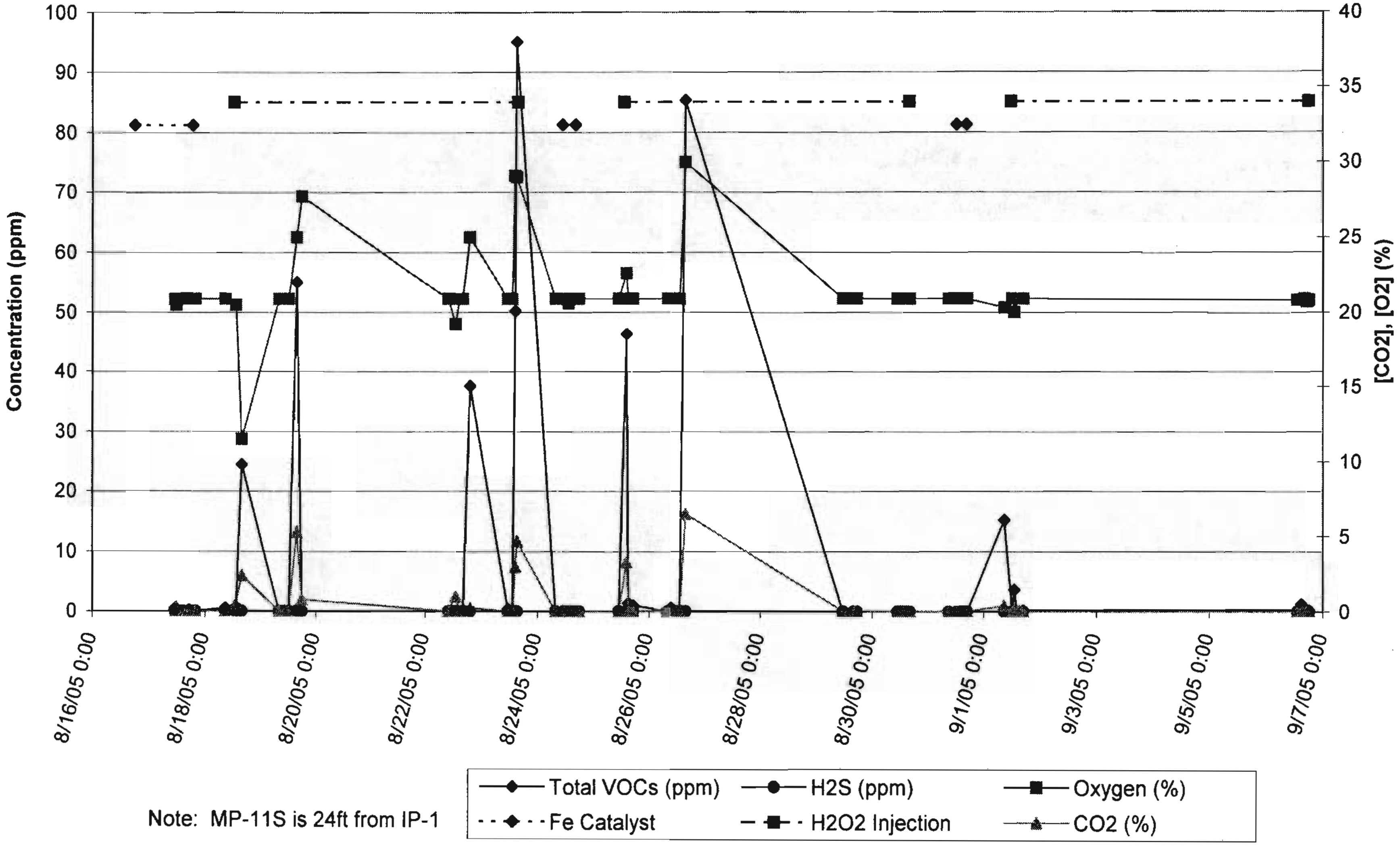
Note: MP-9S is 7ft from IP-1

MP-10 Vadose Zone Monitoring Results
Shallow Pilot Test (Injection Point - IP-1)



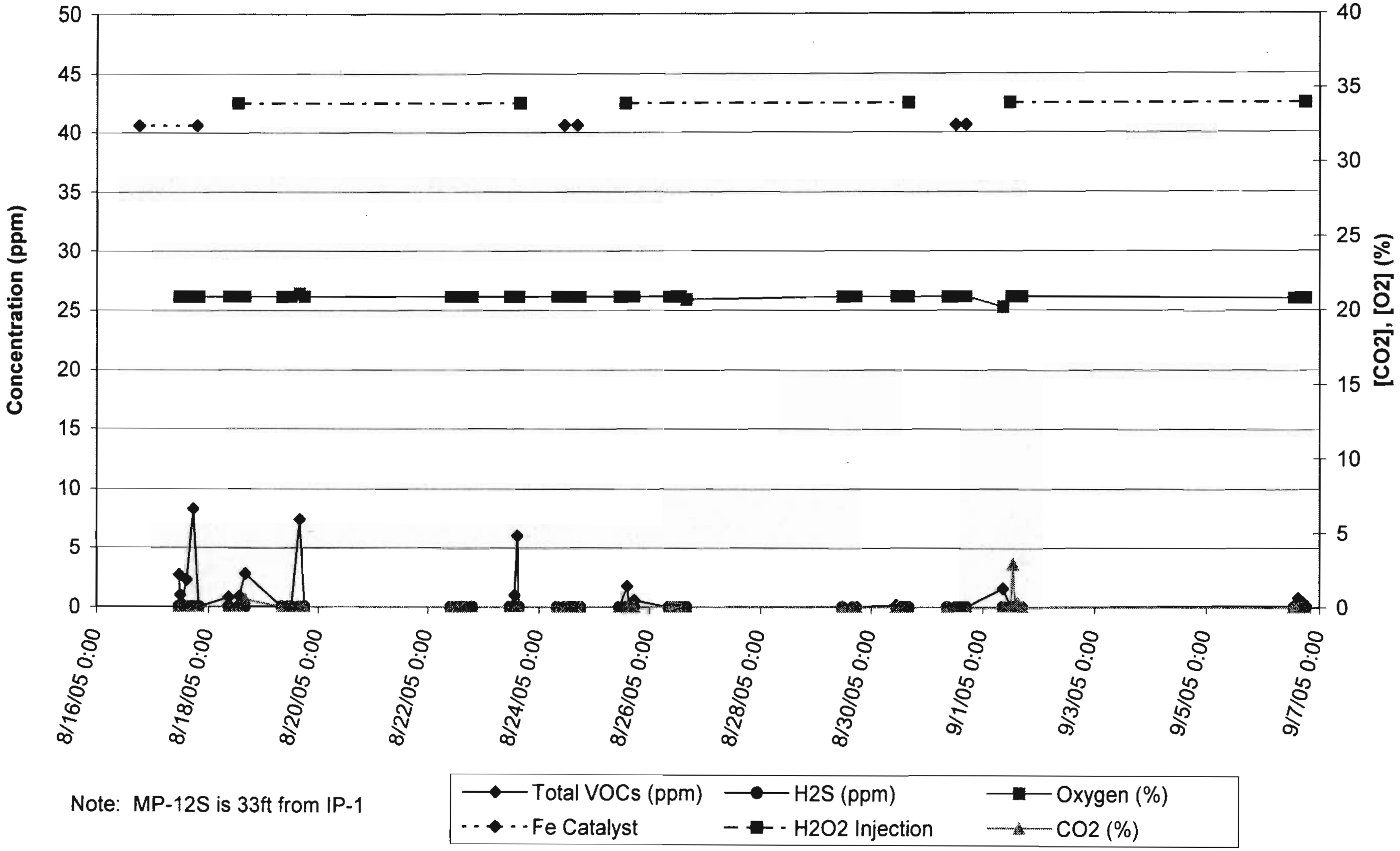
Note: MP-10 is 20ft from IP-1

MP-11S Vadose Zone Monitoring Results
Shallow Pilot Test (Injection Point - IP-1)



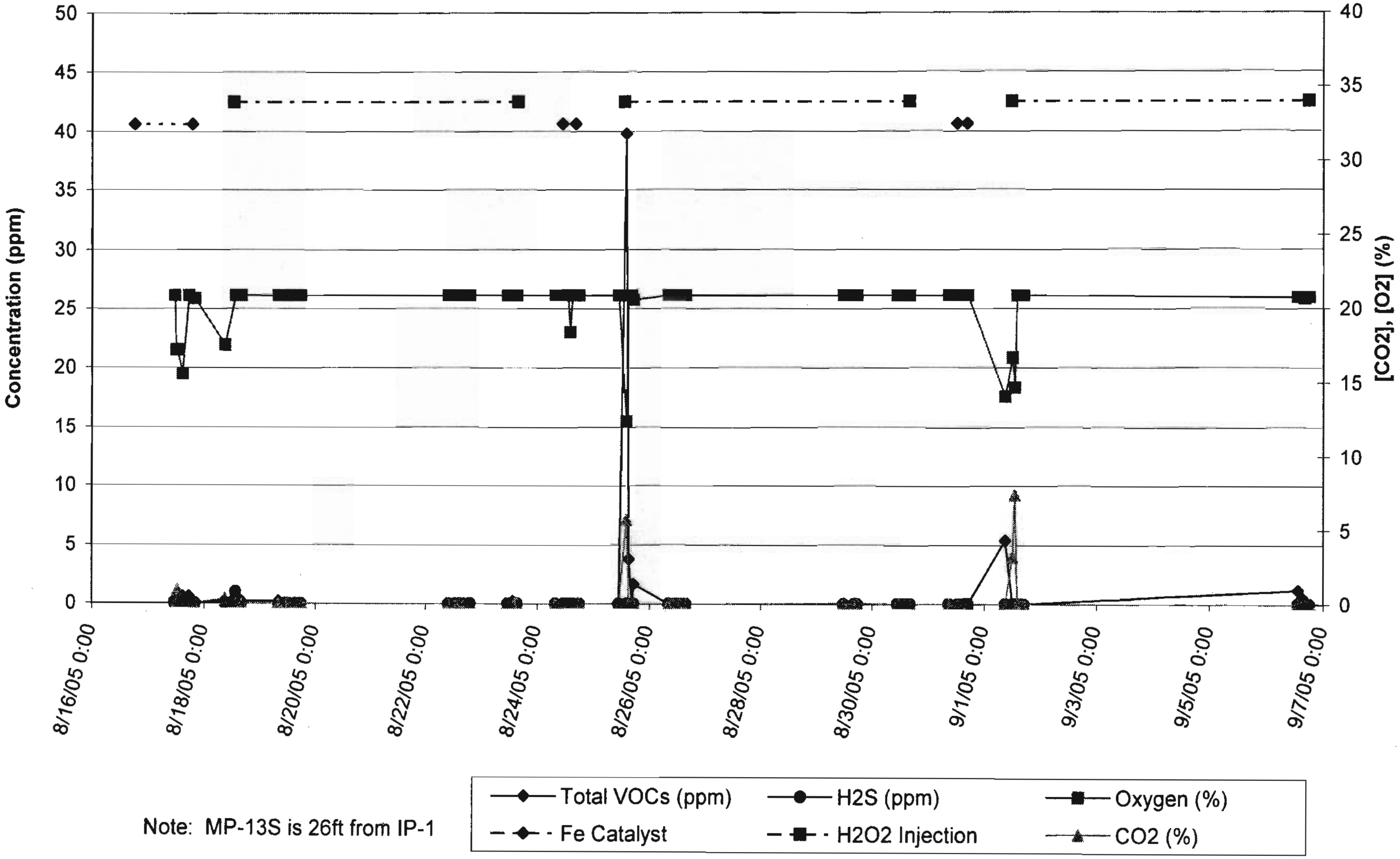
Note: MP-11S is 24ft from IP-1

MP-12S Vadose Zone Monitoring Results
Shallow Pilot Test (Injection Point - IP-1)



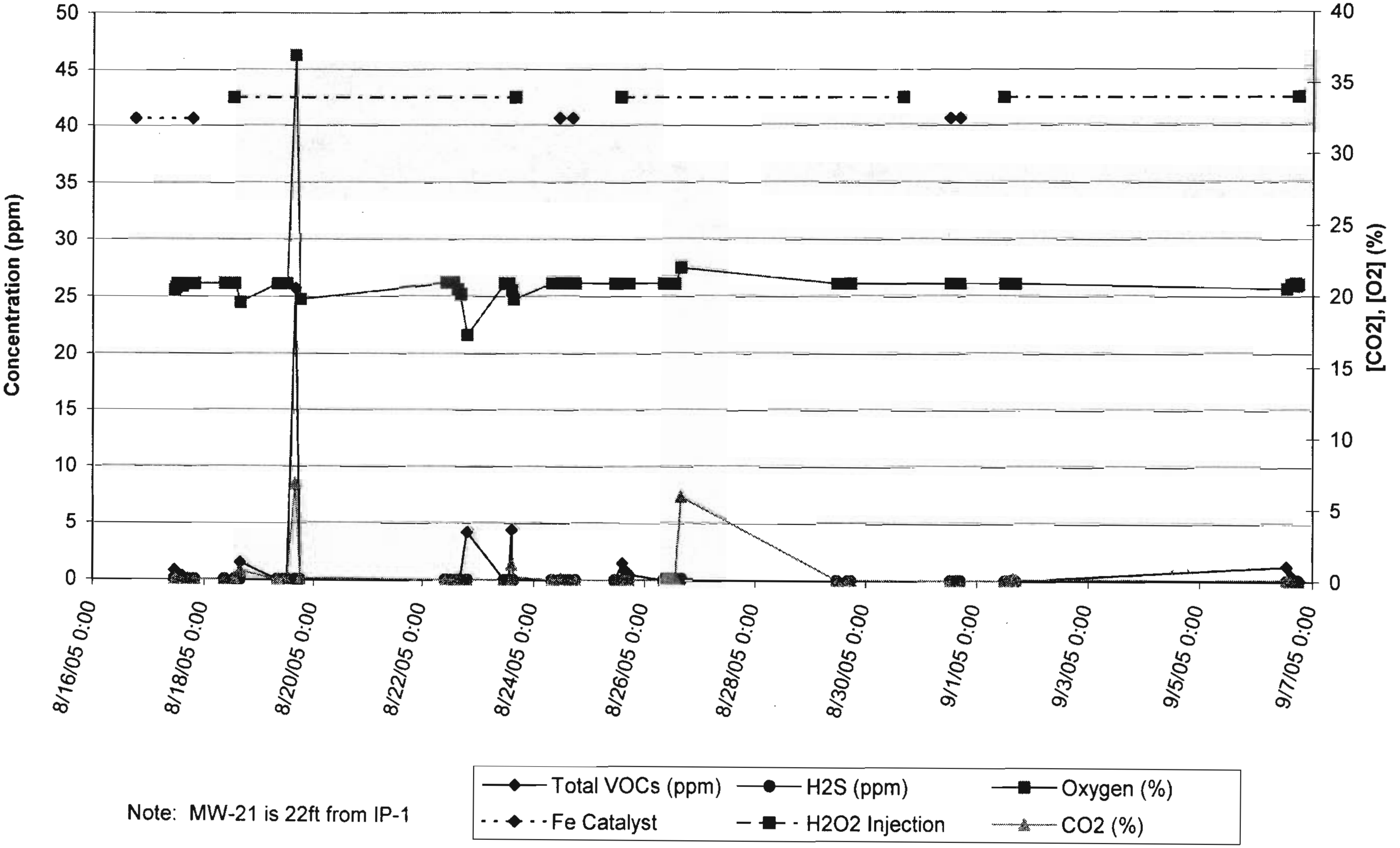
Note: MP-12S is 33ft from IP-1

MP-13S Vadose Zone Monitoring Results
Shallow Pilot Test (Injection Point - IP-1)



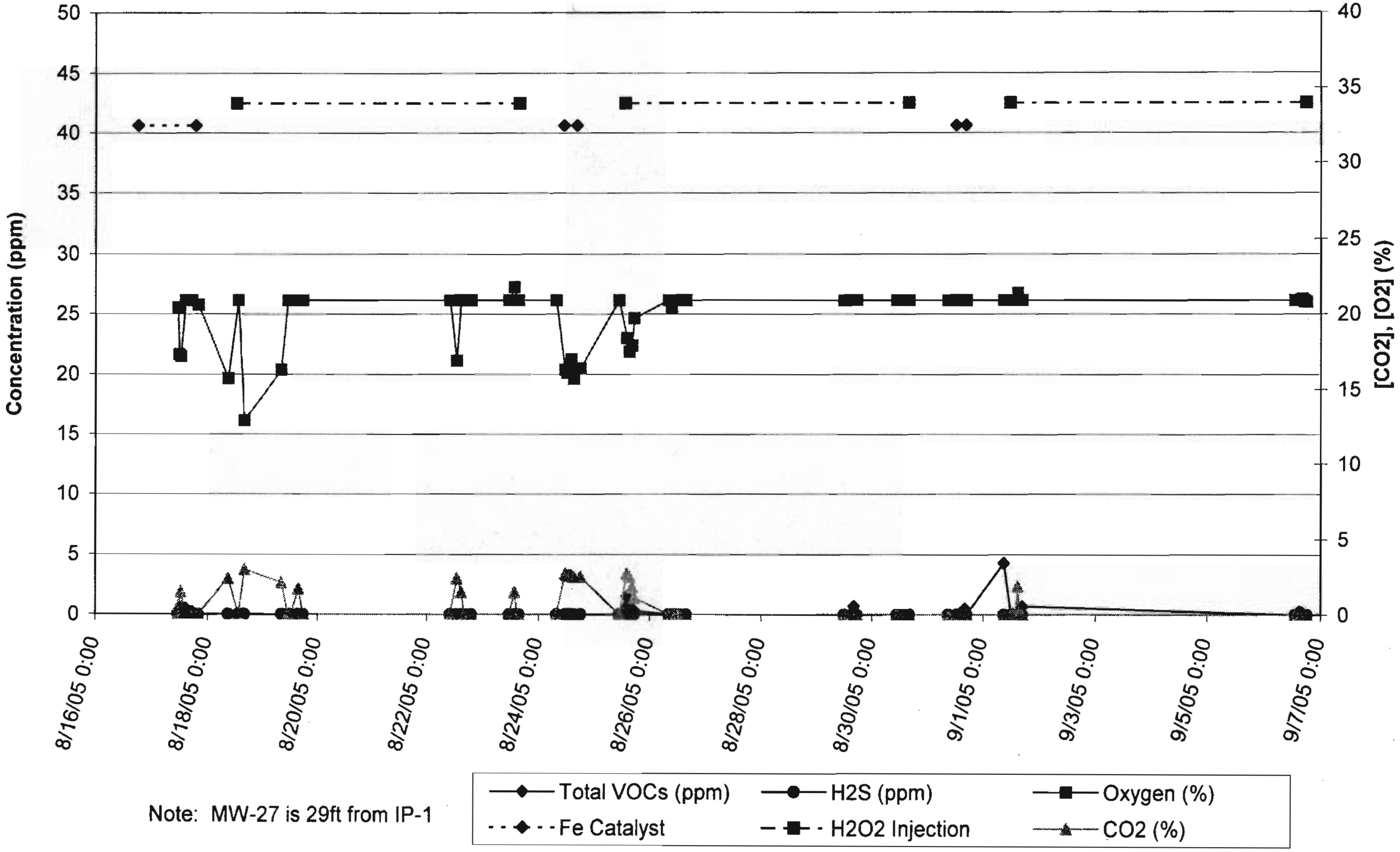
Note: MP-13S is 26ft from IP-1

MW-21 Vadose Zone Monitoring Results
Shallow Pilot Test (Injection Point - IP-1)



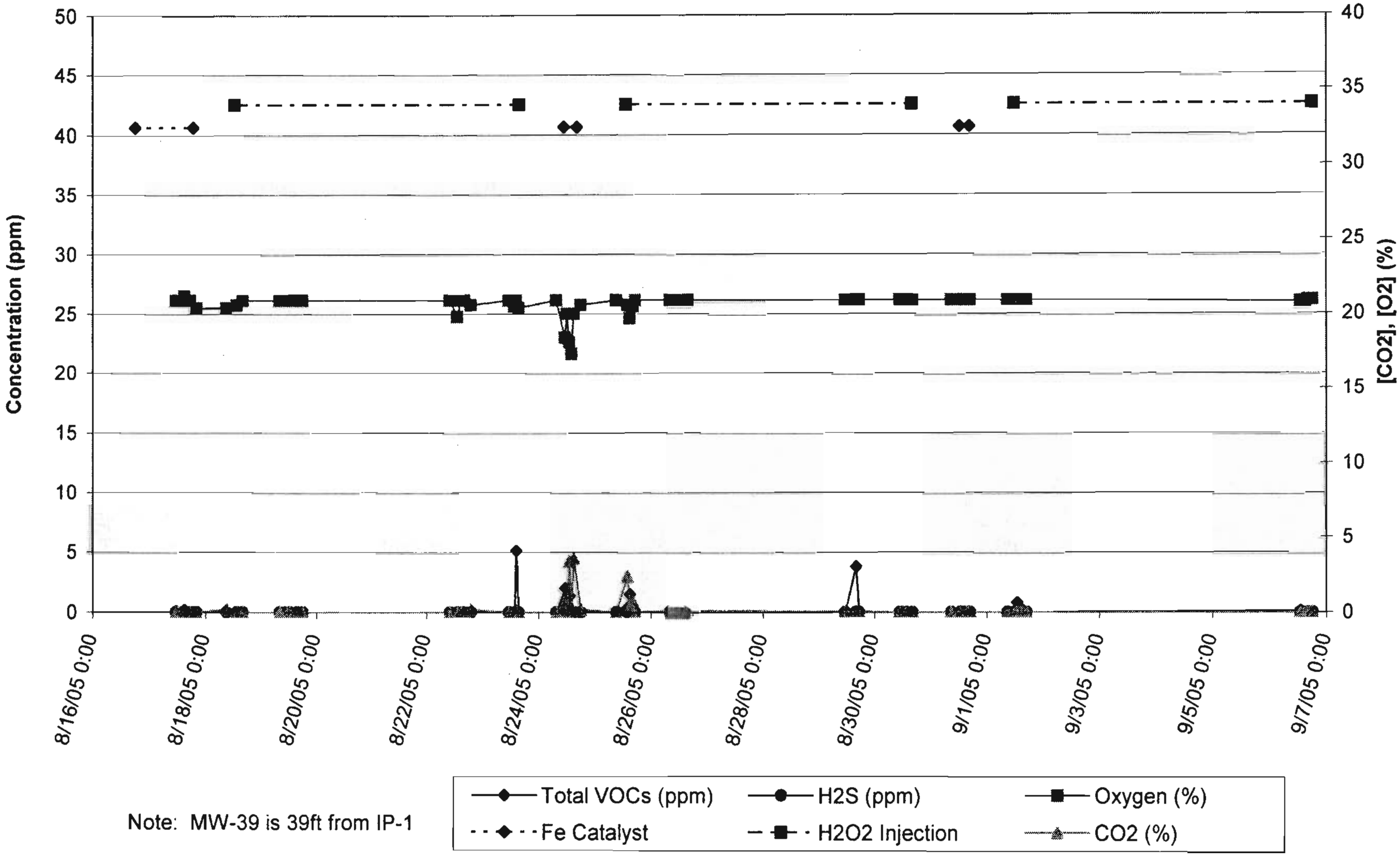
Note: MW-21 is 22ft from IP-1

MW-27 Vadose Zone Monitoring Results
Shallow Pilot Test (Injection Point - IP-1)



Note: MW-27 is 29ft from IP-1

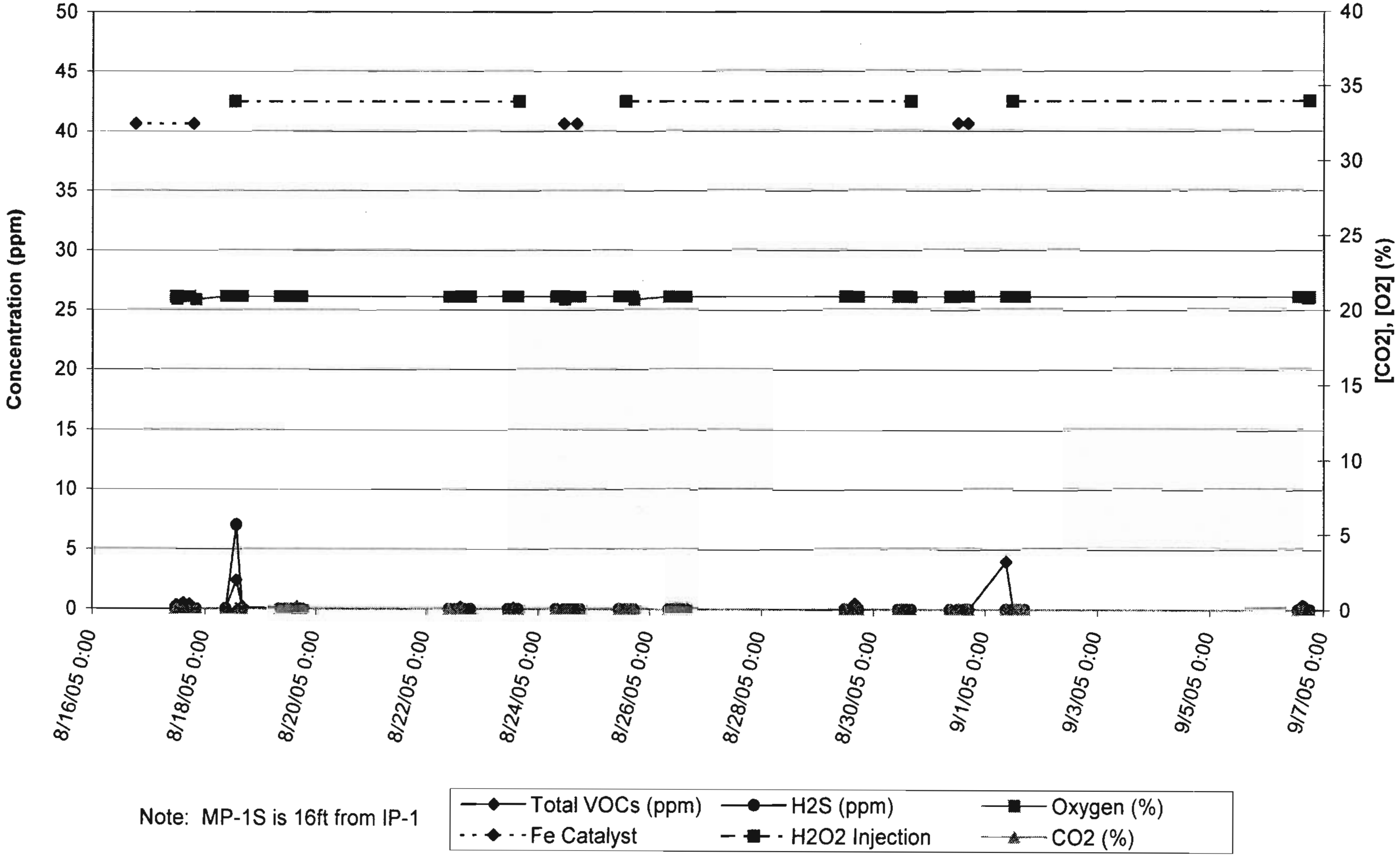
MW-39 Vadose Zone Monitoring Results
Shallow Pilot Test (Injection Point - IP-1)



Note: MW-39 is 39ft from IP-1

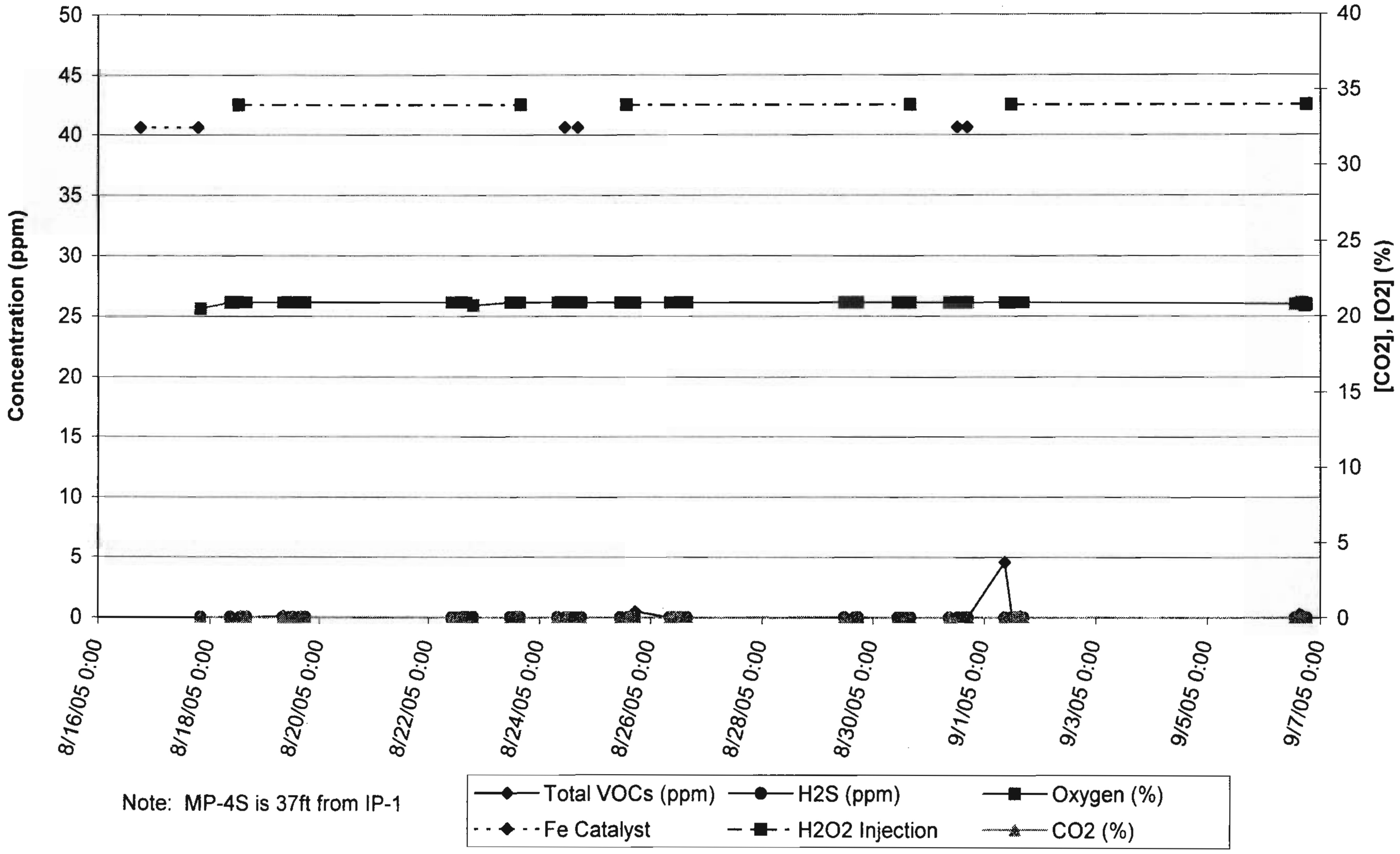
DEEP ZONE TEST

MP-1S Vadose Zone Monitoring Results
Shallow Pilot Test (Injection Point - IP-1)



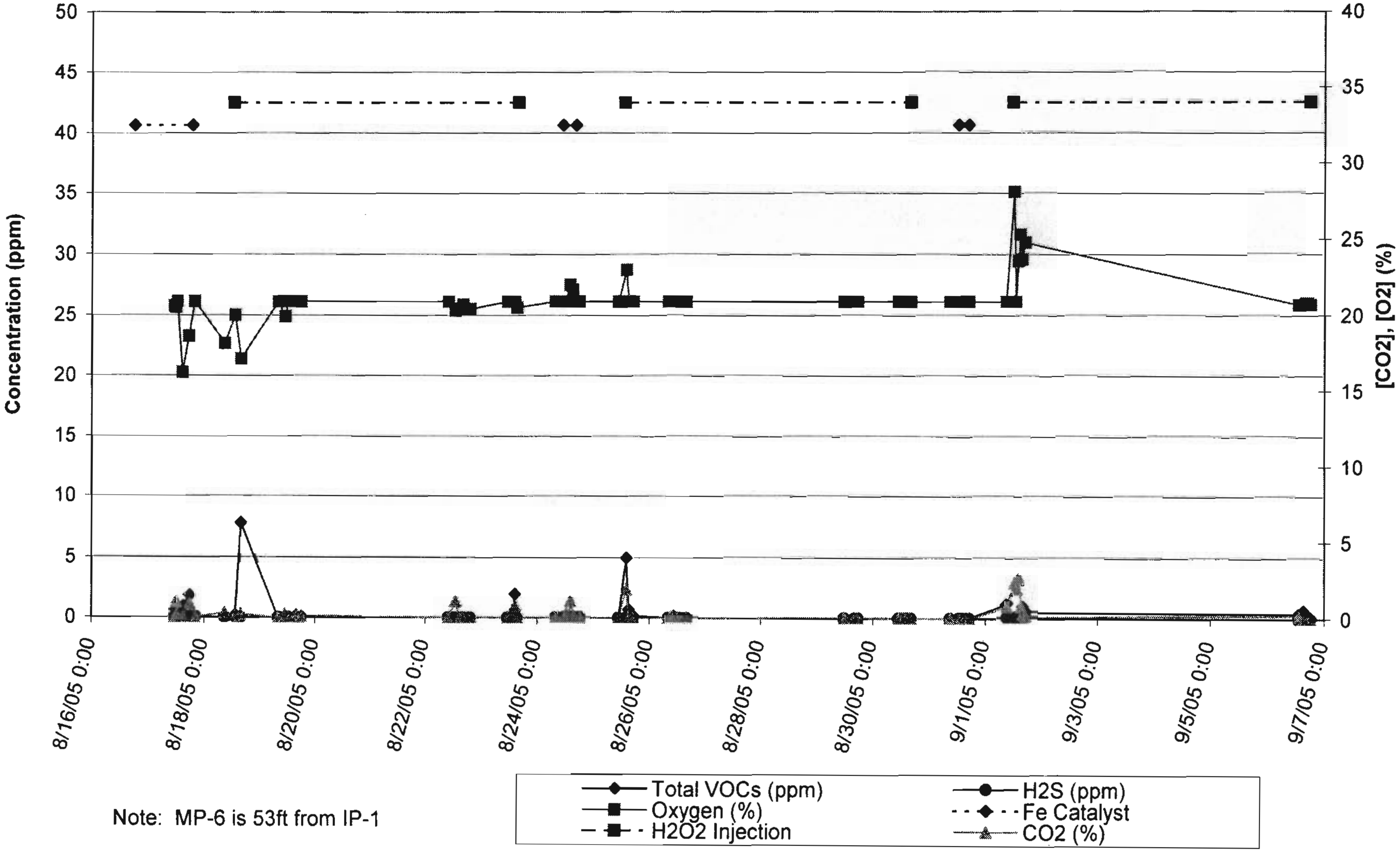
Note: MP-1S is 16ft from IP-1

MP-4S Vadose Zone Monitoring Results
Shallow Pilot Test (Injection Point - IP-1)



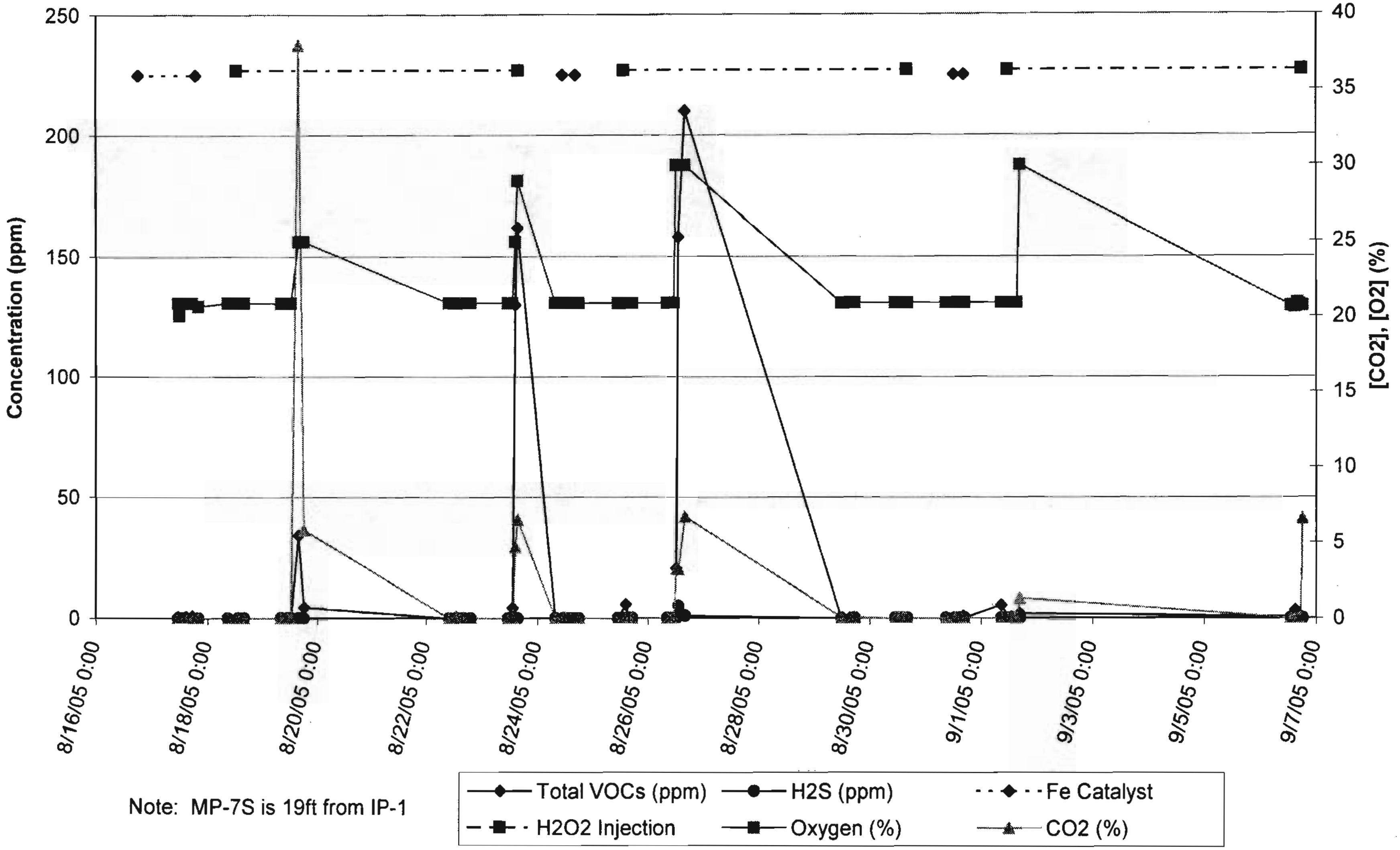
Note: MP-4S is 37ft from IP-1

MP-6 Vadose Zone Monitoring Results
Shallow Pilot Test (Injection Point - IP-1)



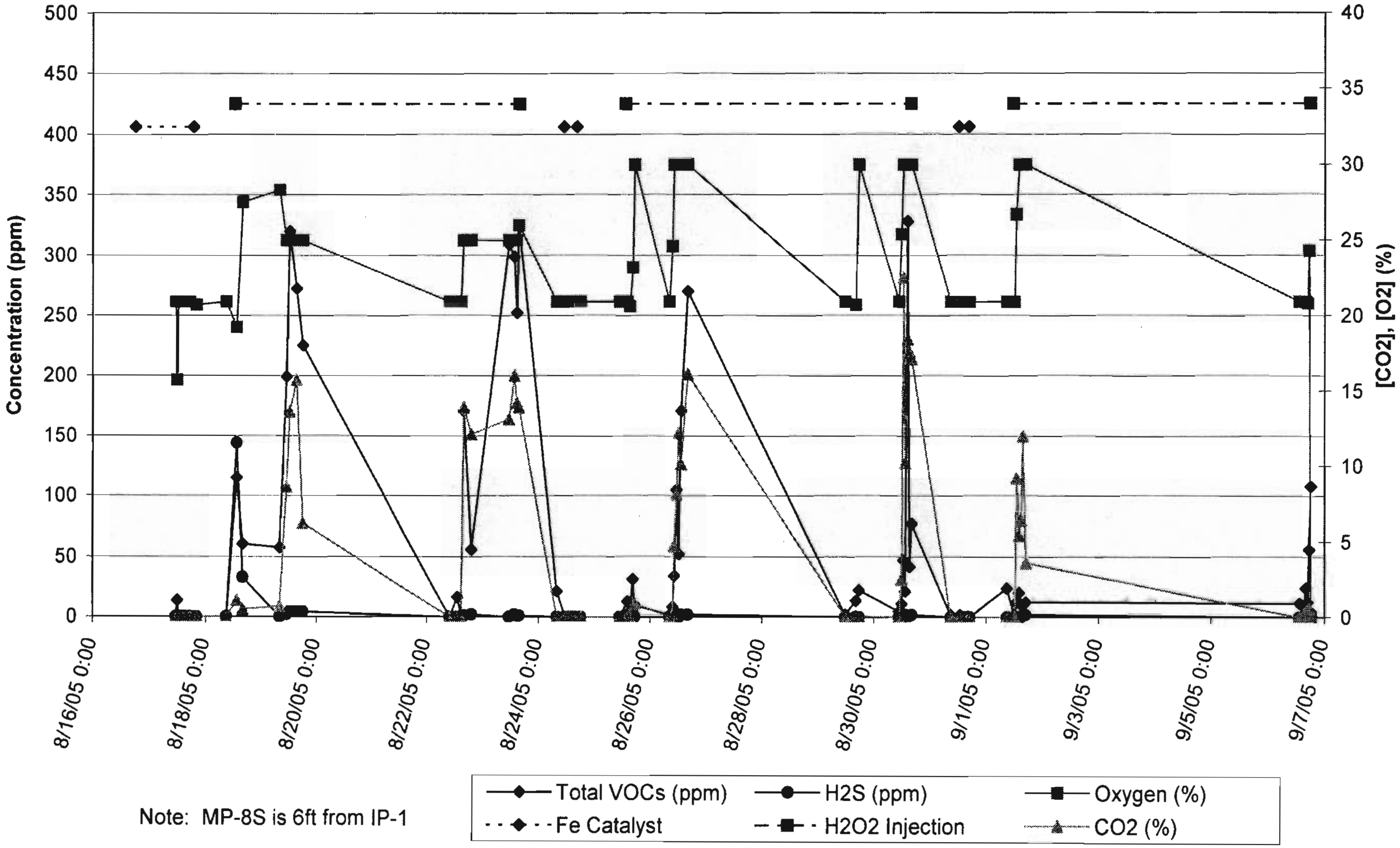
Note: MP-6 is 53ft from IP-1

MP-7S Vadose Zone Monitoring Results
Shallow Pilot Test (Injection Point - IP-1)



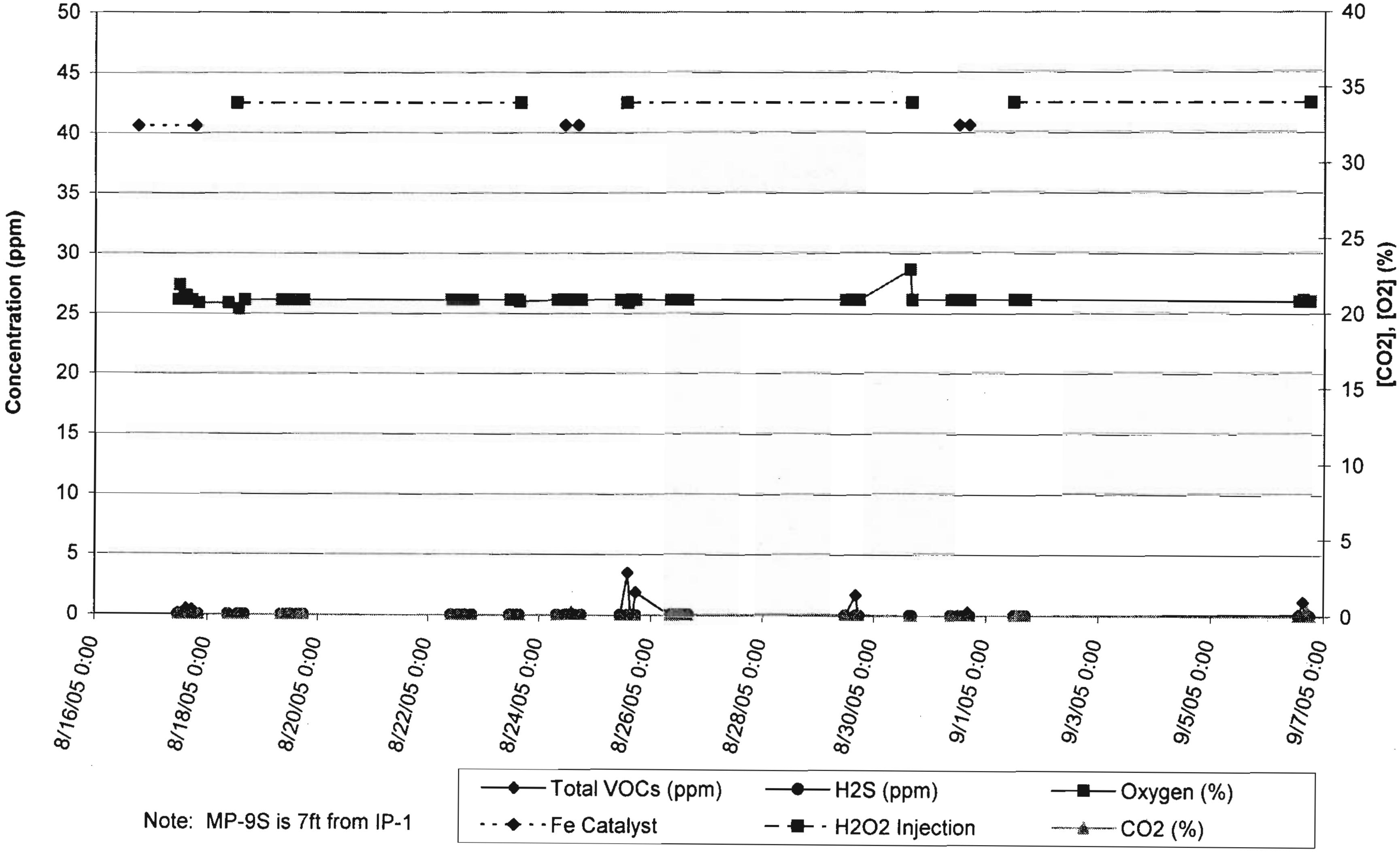
Note: MP-7S is 19ft from IP-1

MP-8S Vadose Zone Monitoring Results
Shallow Pilot Test (Injection Point - IP-1)



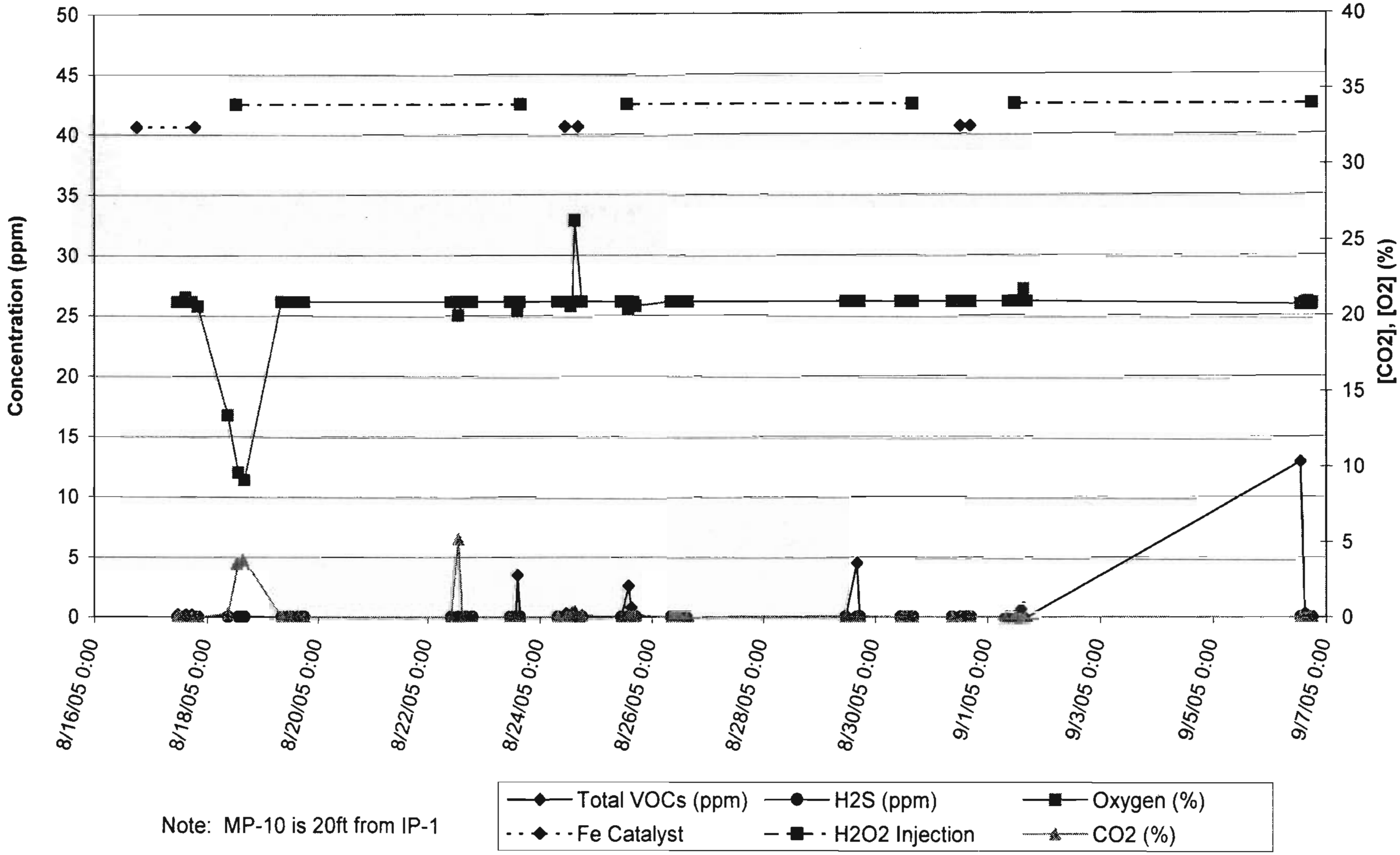
Note: MP-8S is 6ft from IP-1

MP-9S Vadose Zone Monitoring Results
Shallow Pilot Test (Injection Point - IP-1)



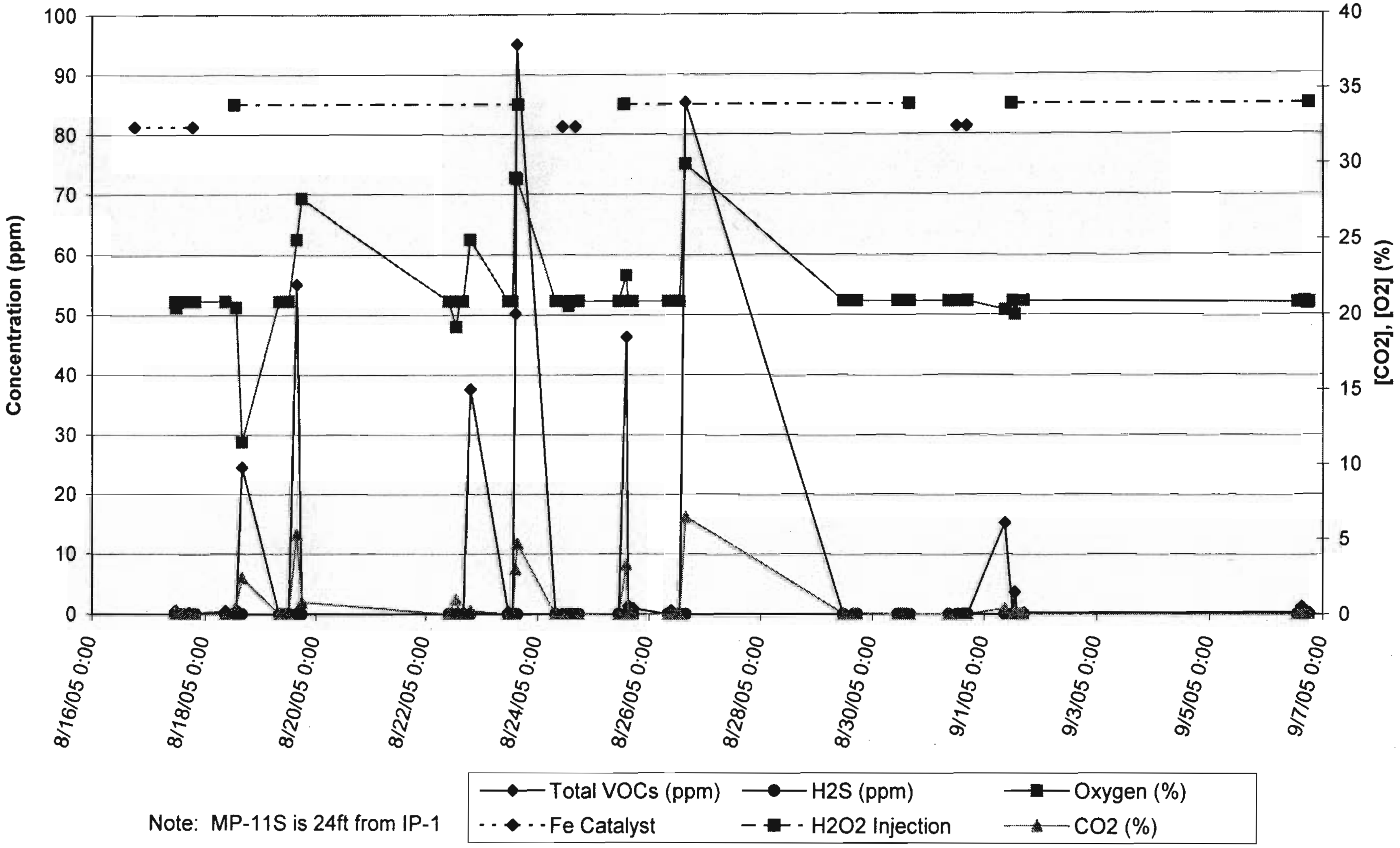
Note: MP-9S is 7ft from IP-1

MP-10 Vadose Zone Monitoring Results
Shallow Pilot Test (Injection Point - IP-1)



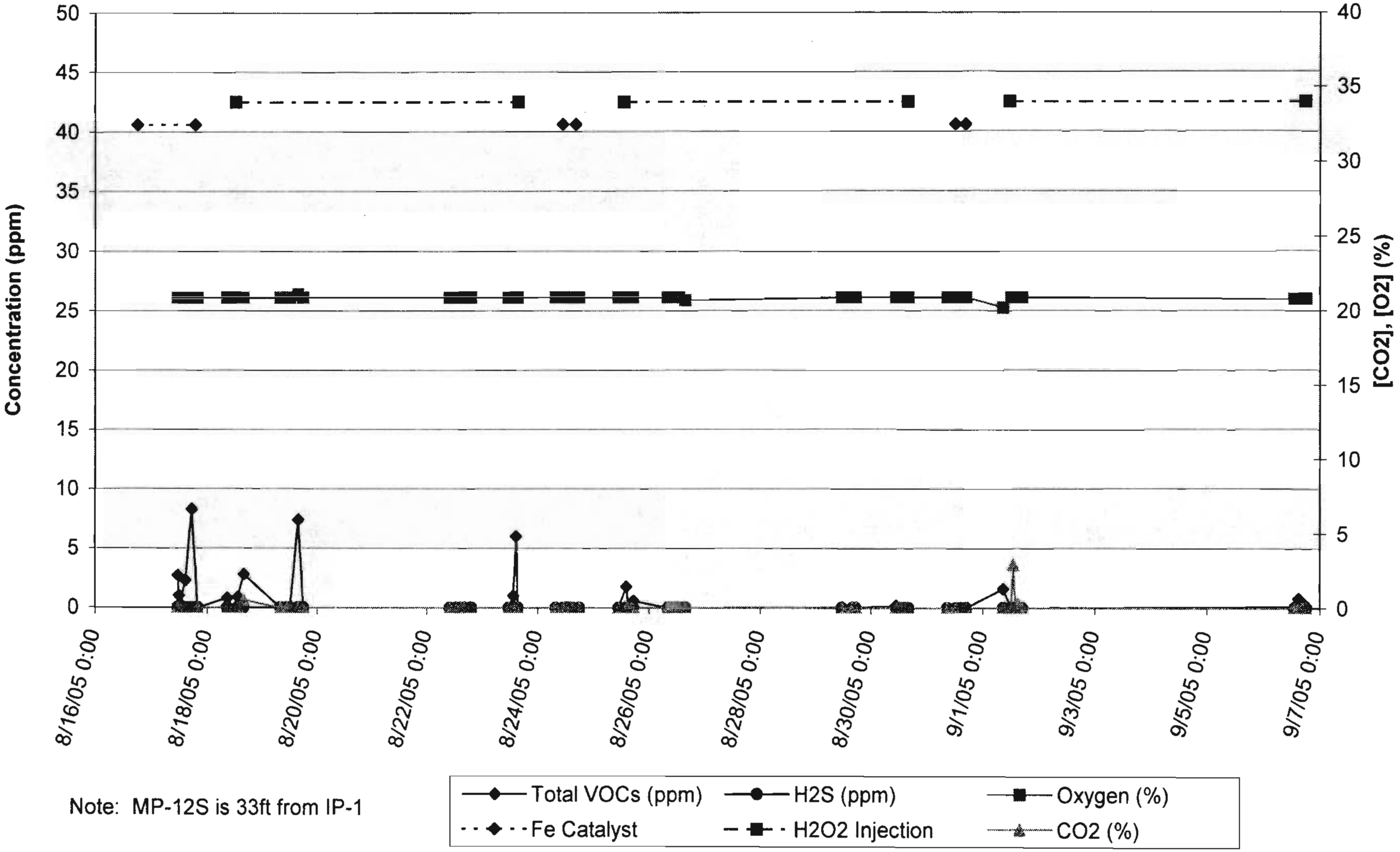
Note: MP-10 is 20ft from IP-1

MP-11S Vadose Zone Monitoring Results
Shallow Pilot Test (Injection Point - IP-1)



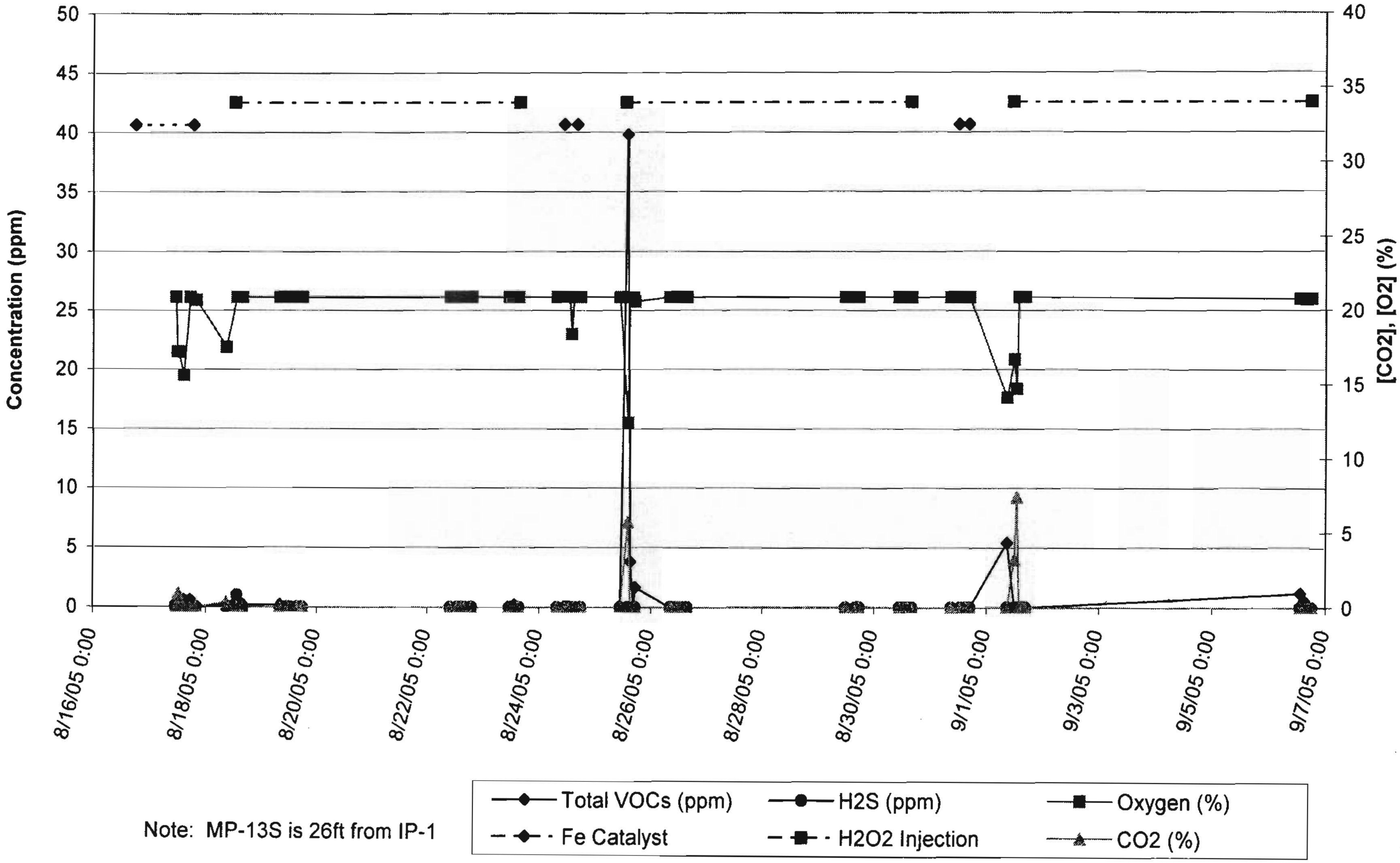
Note: MP-11S is 24ft from IP-1

MP-12S Vadose Zone Monitoring Results
Shallow Pilot Test (Injection Point - IP-1)



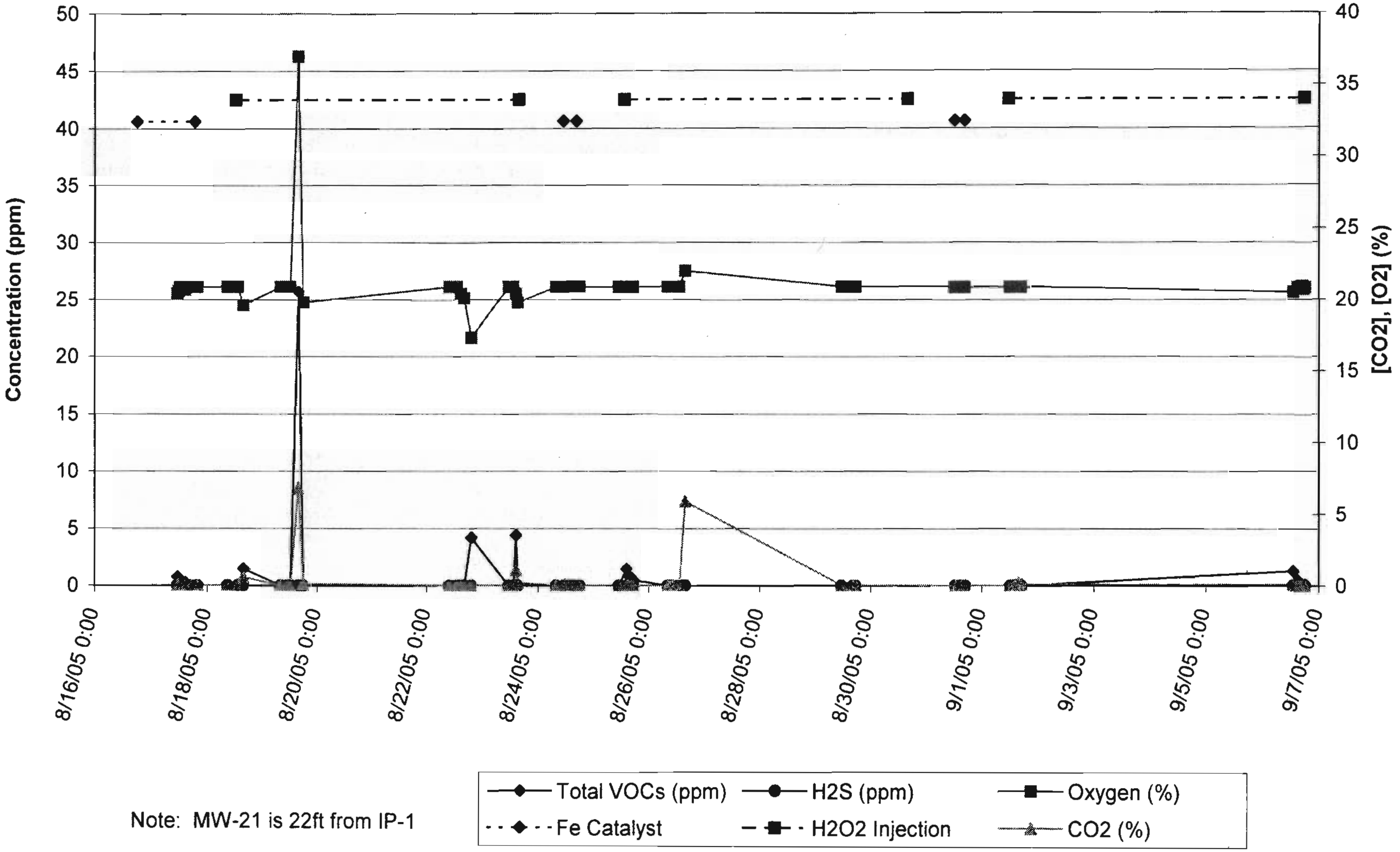
Note: MP-12S is 33ft from IP-1

MP-13S Vadose Zone Monitoring Results
Shallow Pilot Test (Injection Point - IP-1)



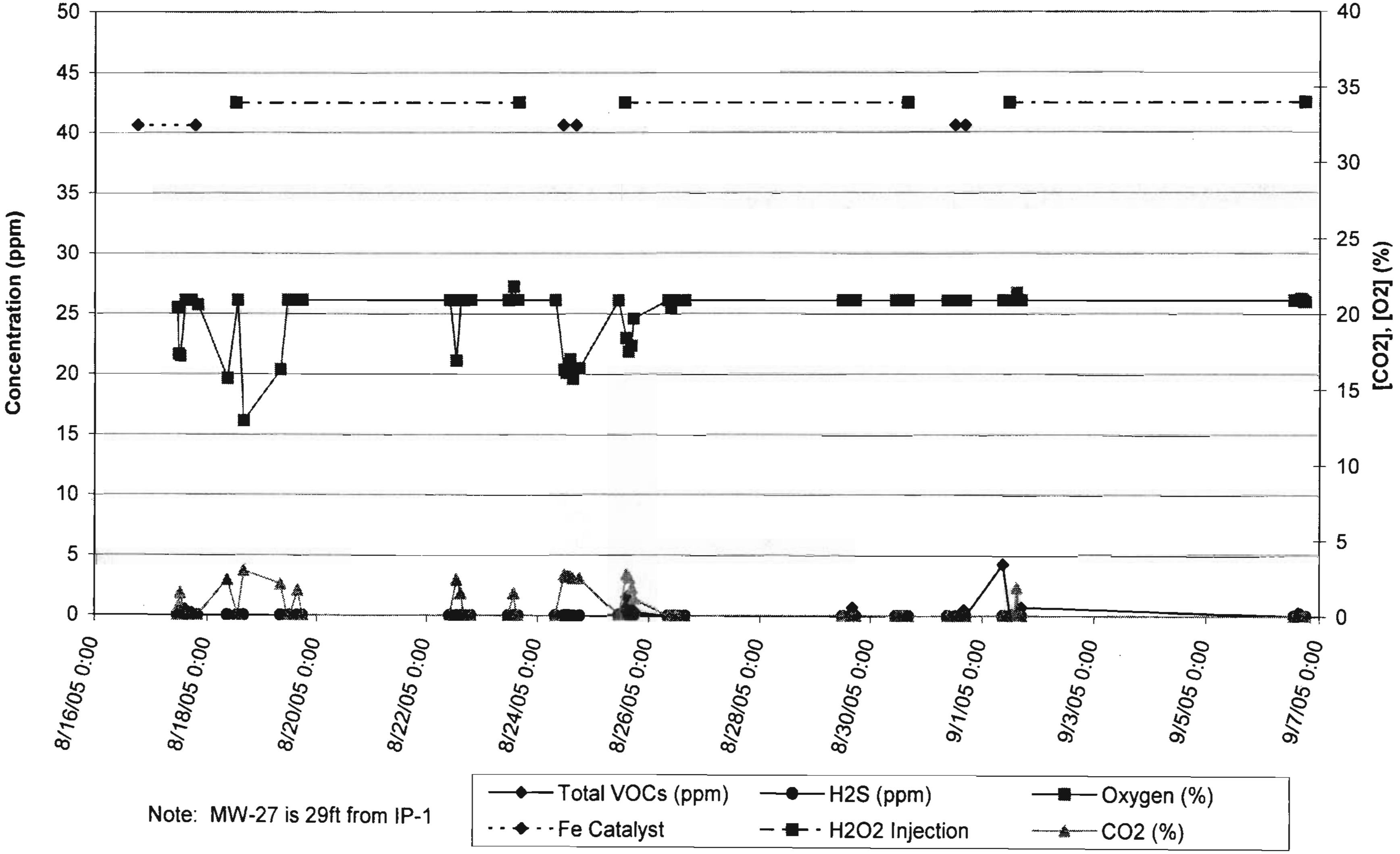
Note: MP-13S is 26ft from IP-1

MW-21 Vadose Zone Monitoring Results
Shallow Pilot Test (Injection Point - IP-1)



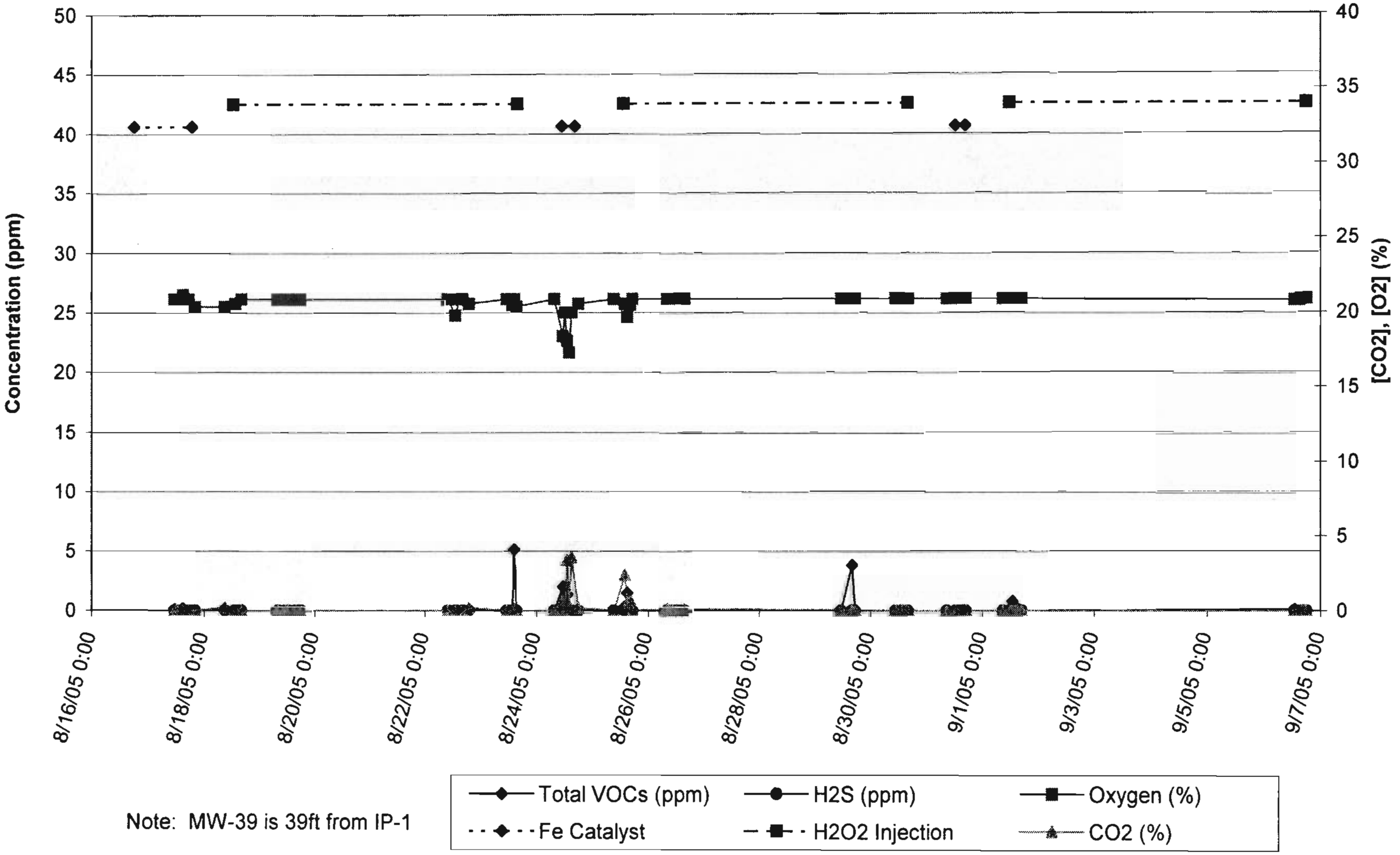
Note: MW-21 is 22ft from IP-1

MW-27 Vadose Zone Monitoring Results
Shallow Pilot Test (Injection Point - IP-1)



Note: MW-27 is 29ft from IP-1

MW-39 Vadose Zone Monitoring Results
Shallow Pilot Test (Injection Point - IP-1)



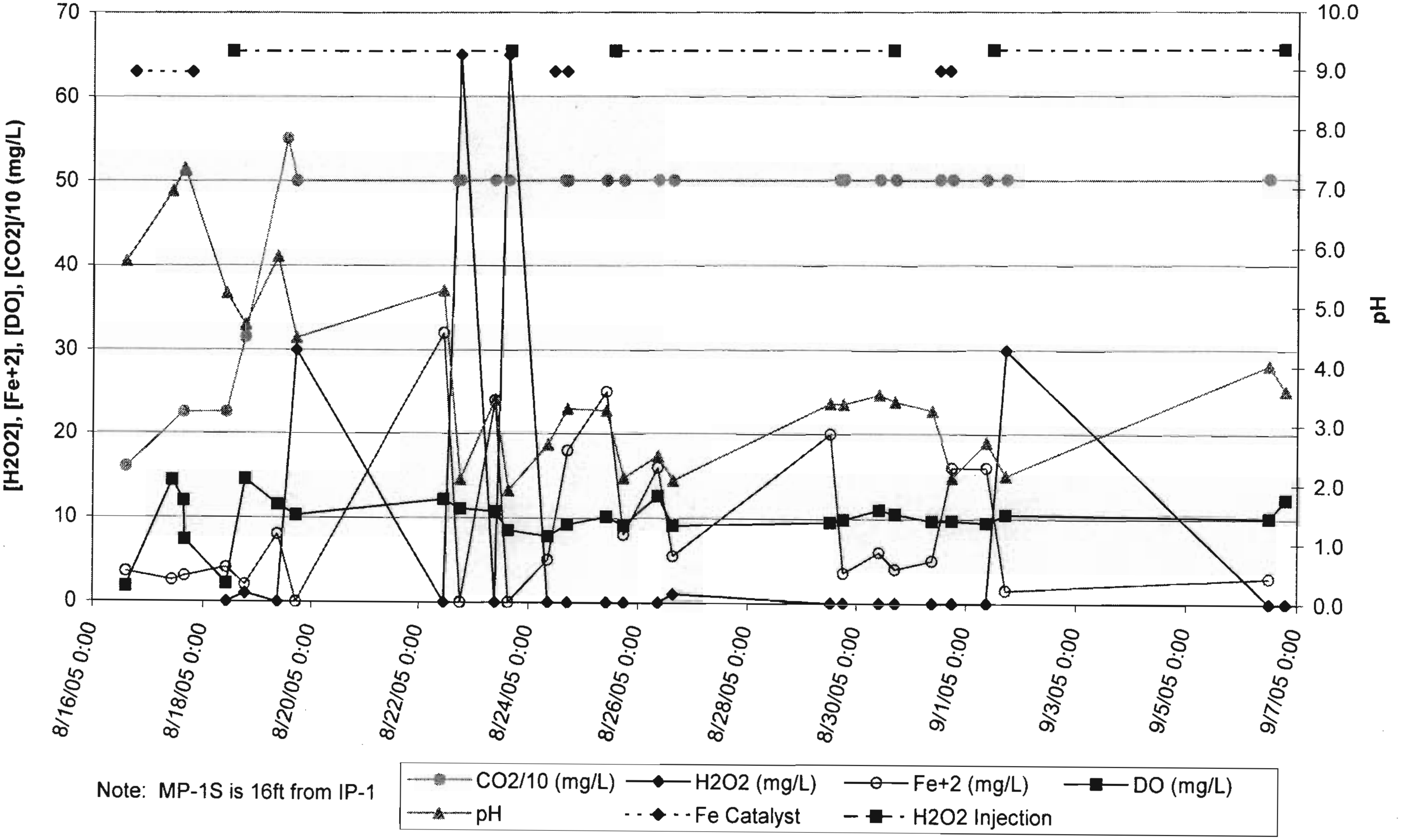
Note: MW-39 is 39ft from IP-1

APPENDIX D

GROUNDWATER SCREENING RESULTS

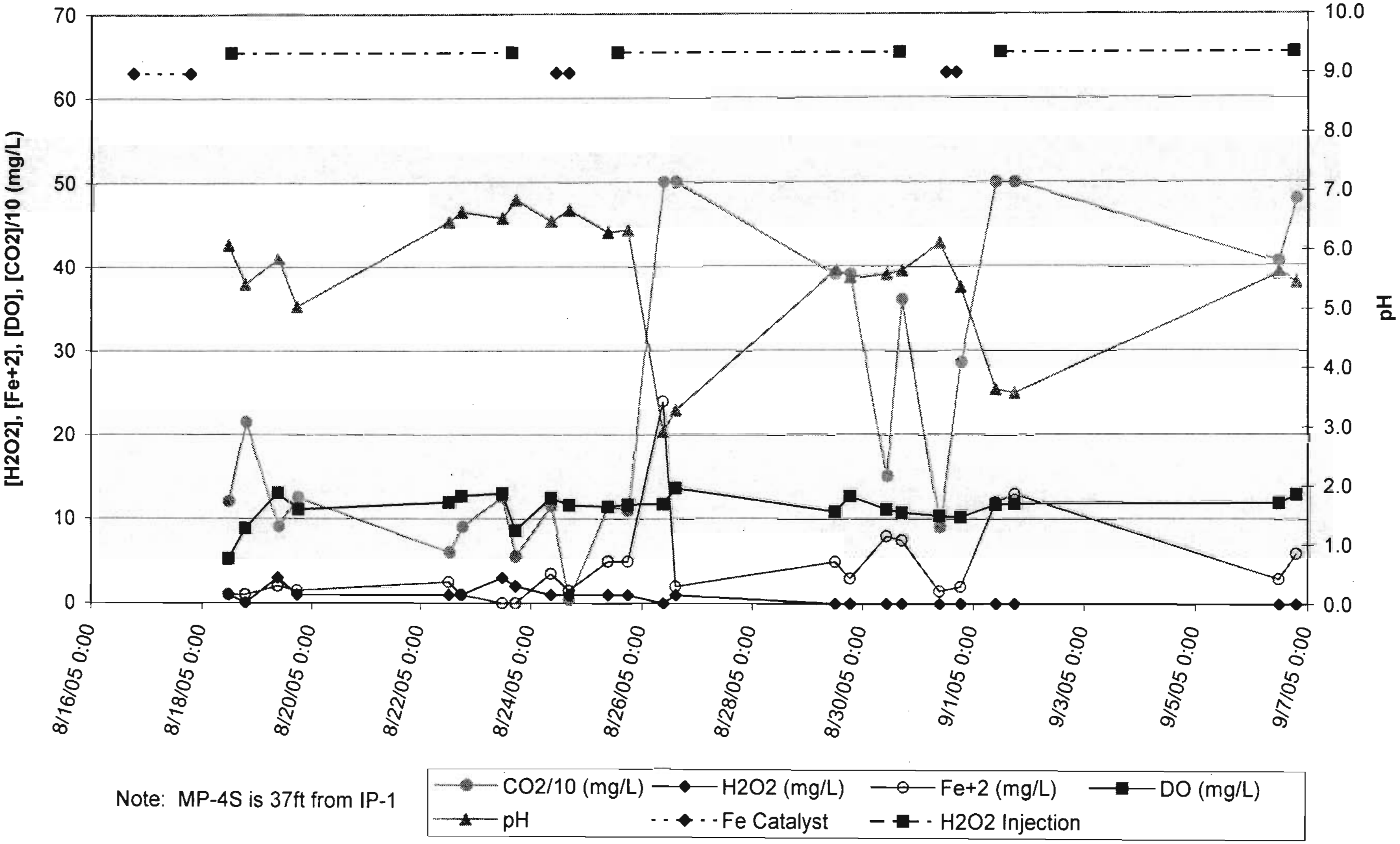
SHALLOW ZONE TEST

MP-1S Groundwater Screening Results
Shallow Zone Pilot Test (Injection Point - IP-1)



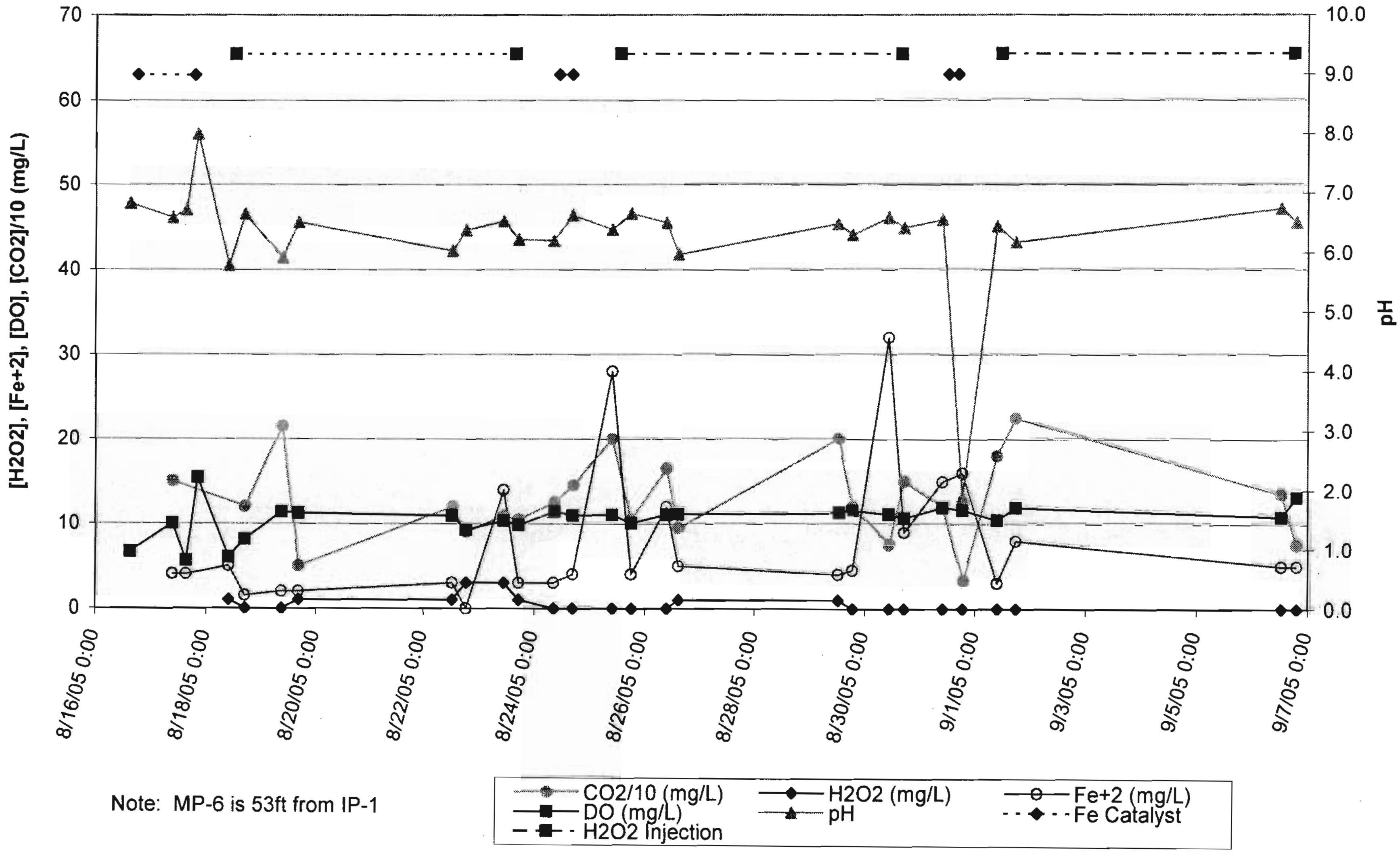
Note: MP-1S is 16ft from IP-1

MP-4S Groundwater Screening Results
Shallow Zone Pilot Test (Injection Point - IP-1)



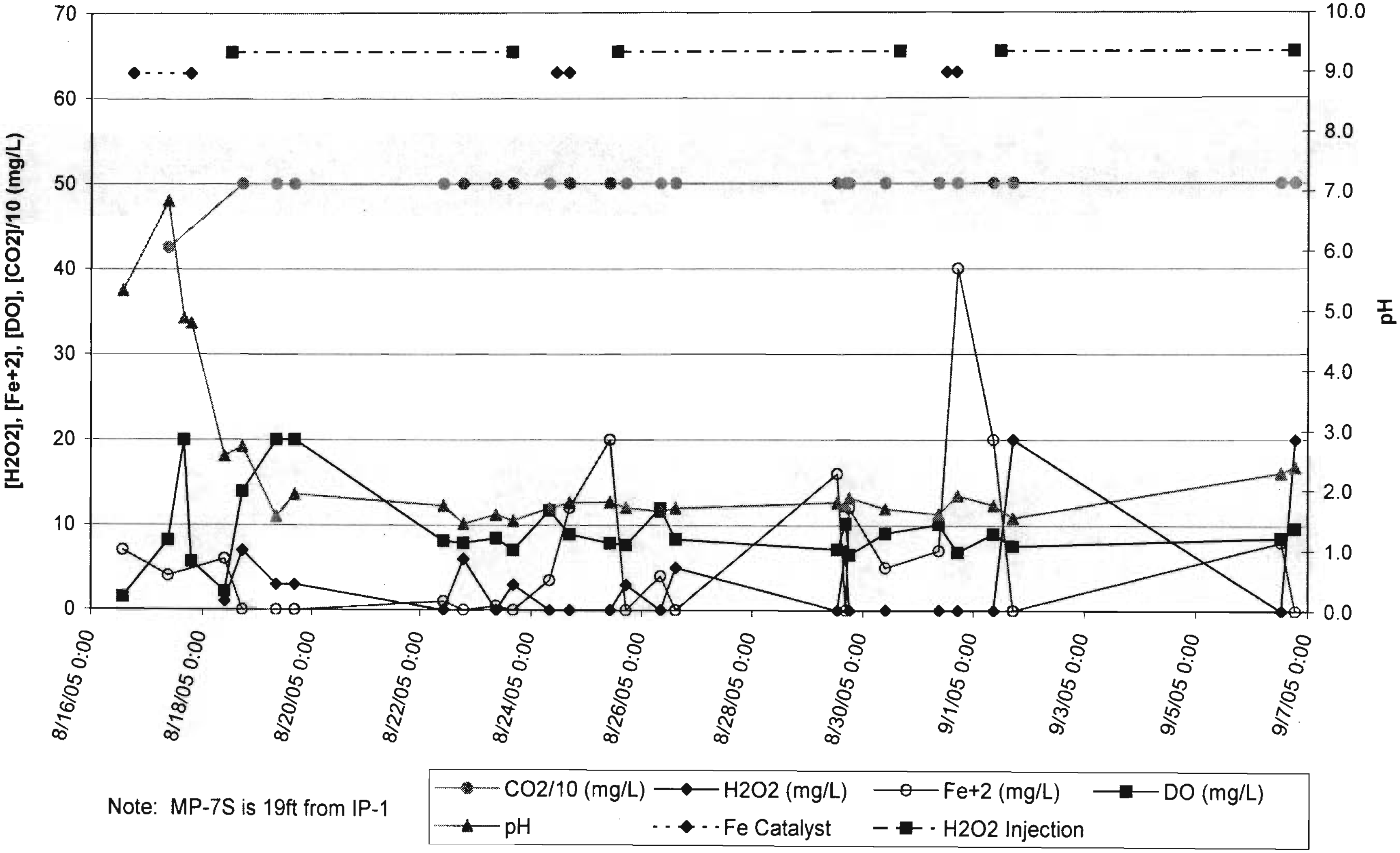
Note: MP-4S is 37ft from IP-1

MP-6 Groundwater Screening Results
Shallow Zone Pilot Test (Injection Point - IP-1)



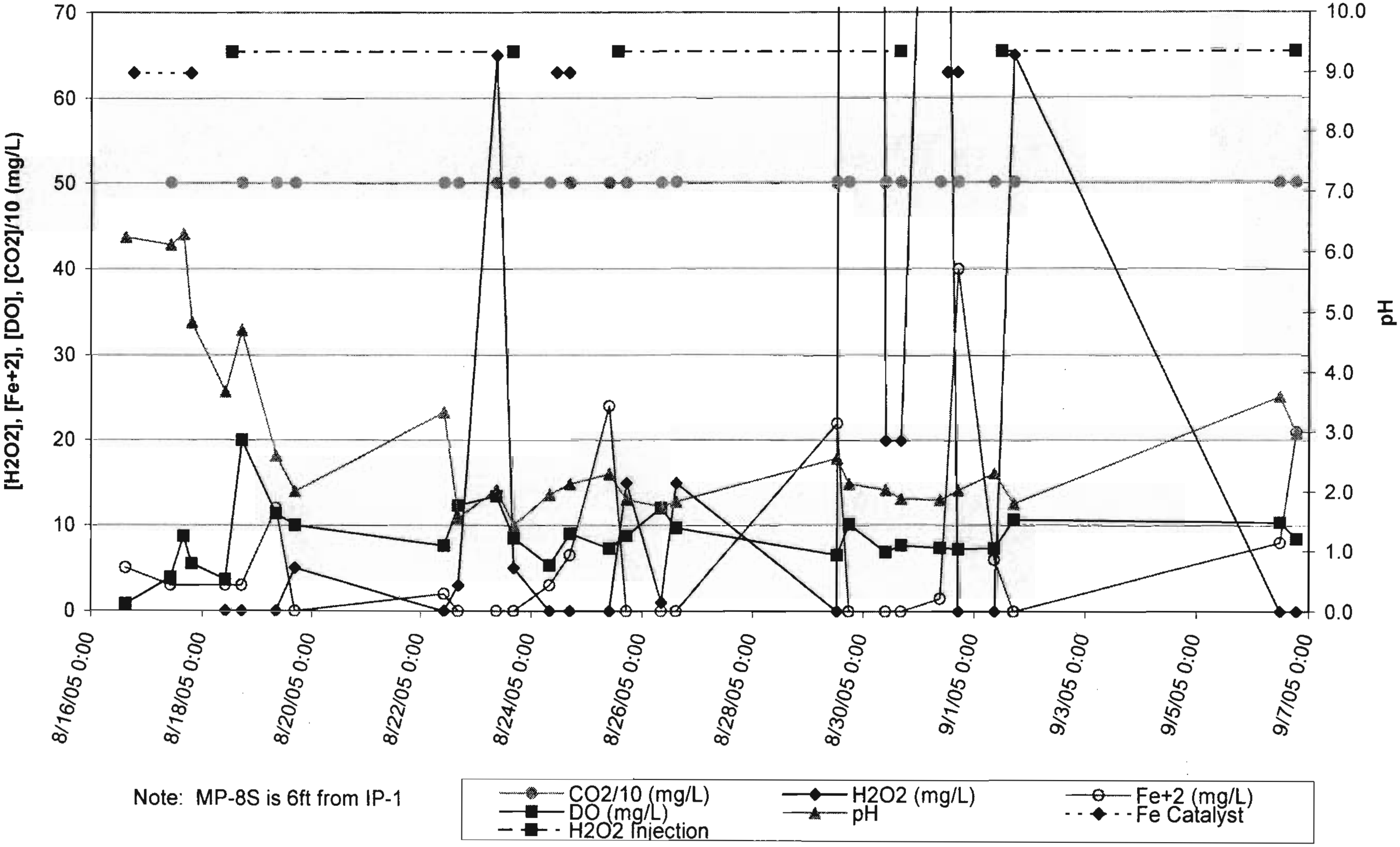
Note: MP-6 is 53ft from IP-1

MP-7S Groundwater Screening Results
Shallow Zone Pilot Test (Injection Point - IP-1)



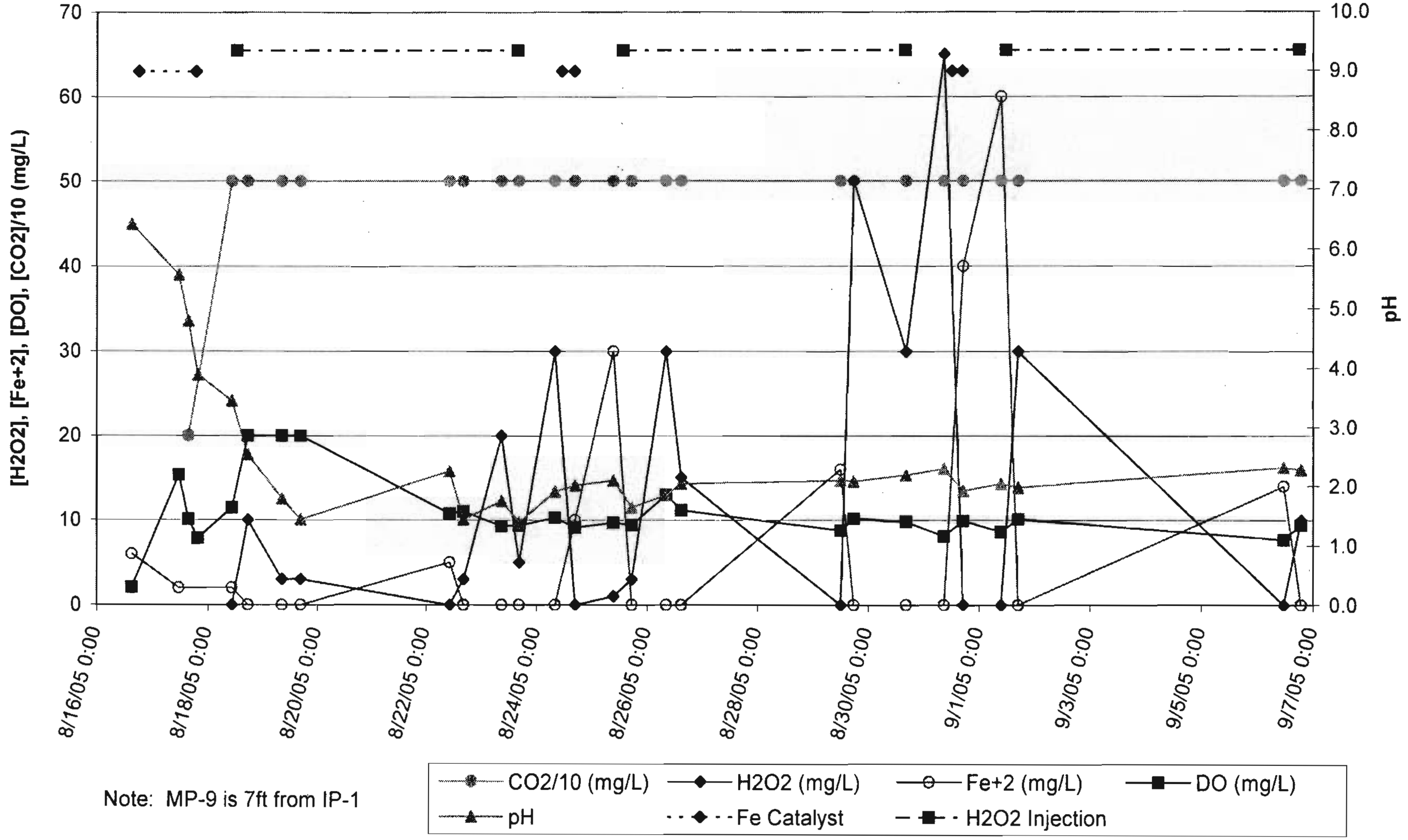
Note: MP-7S is 19ft from IP-1

MP-8S Groundwater Screening Results
Shallow Zone Pilot Test (Injection Point - IP-1)



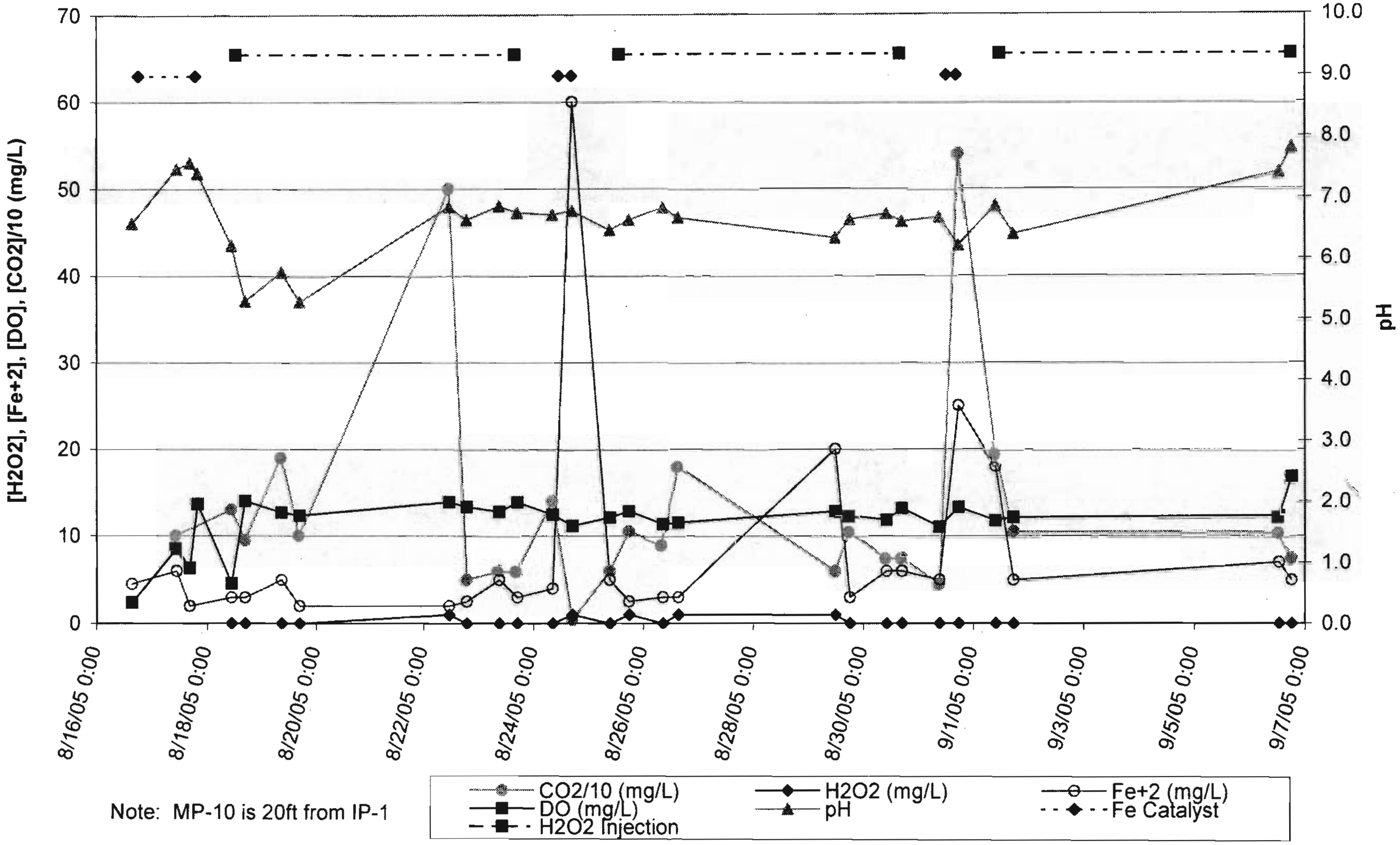
Note: MP-8S is 6ft from IP-1

MP-9S Groundwater Screening Results
Shallow Zone Pilot Test (Injection Point - IP-1)



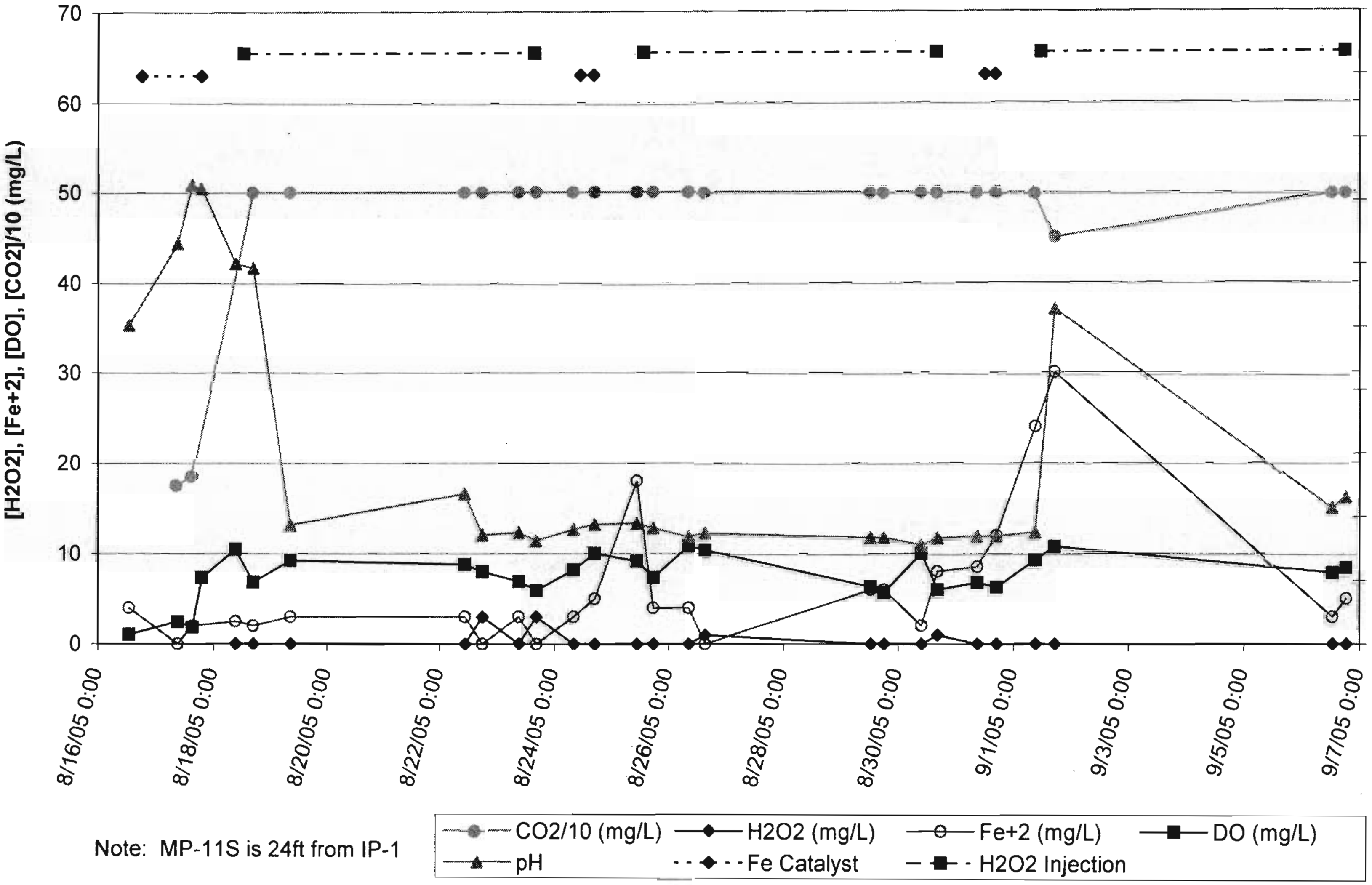
Note: MP-9 is 7ft from IP-1

MP-10 Groundwater Screening Results
Shallow Zone Pilot Test (Injection Point - IP-1)



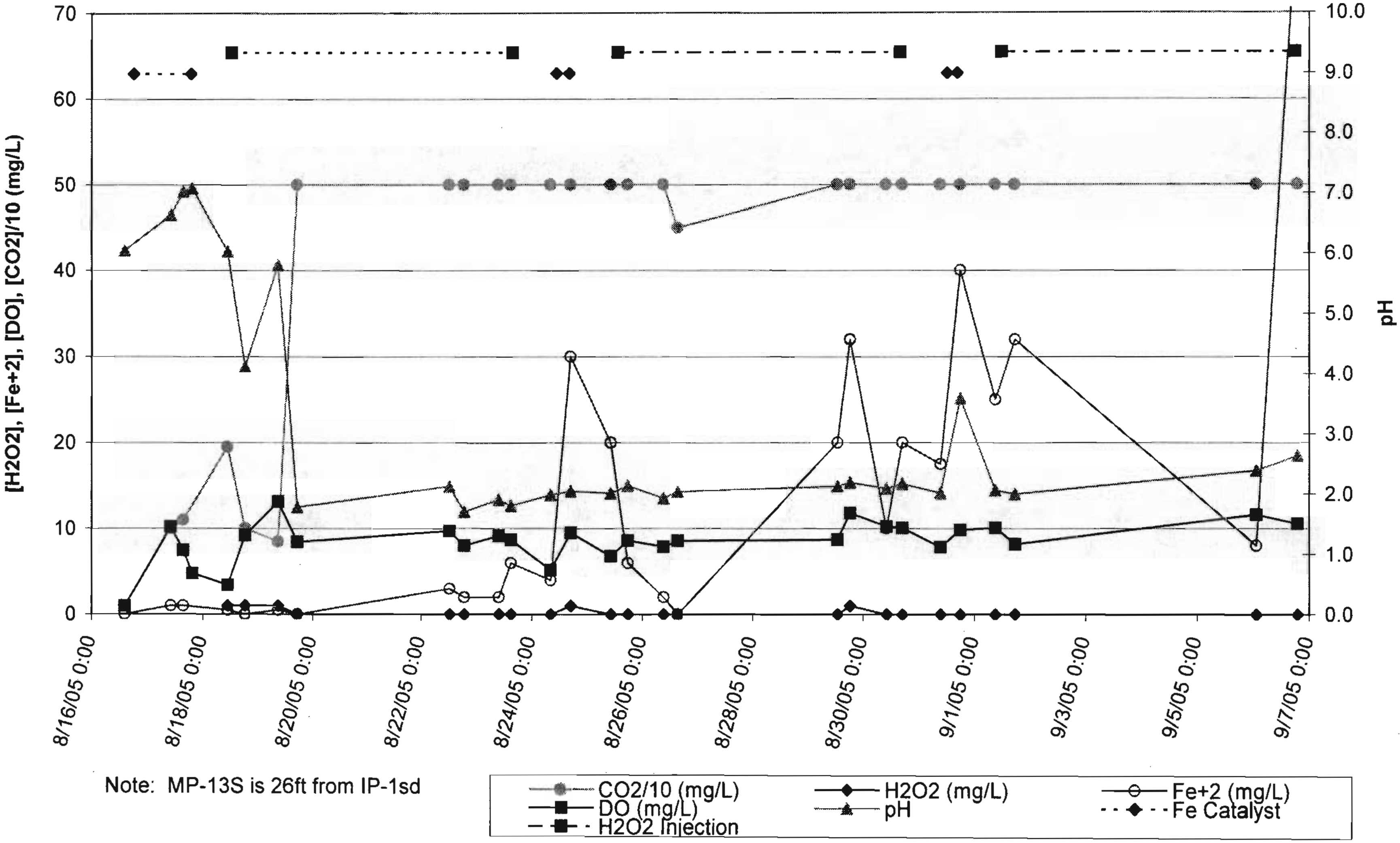
Note: MP-10 is 20ft from IP-1

MP-11S Groundwater Screening Results
Shallow Zone Pilot Test (Injection Point - IP-1)



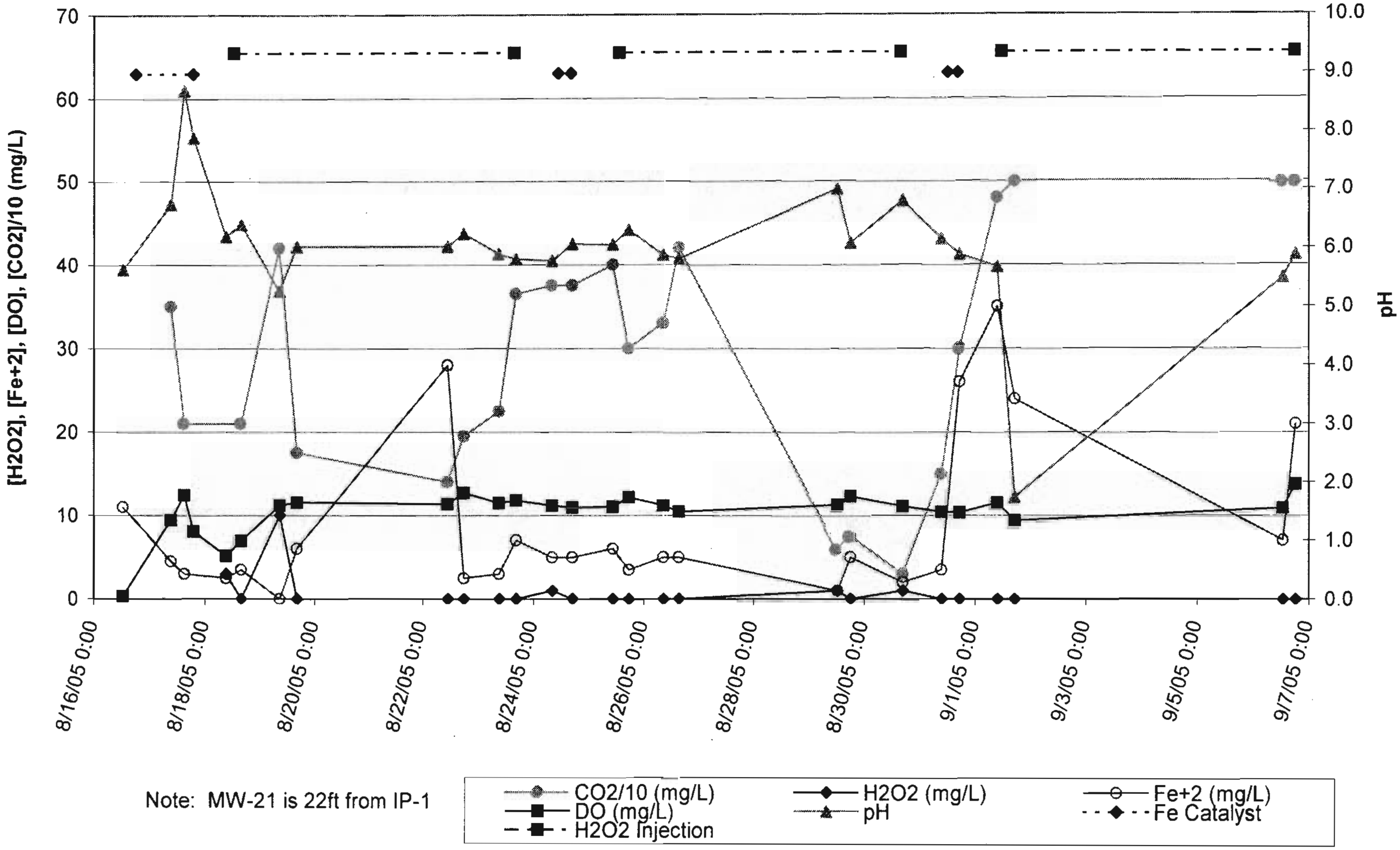
Note: MP-11S is 24ft from IP-1

MP-13S Groundwater Screening Results
Shallow Zone Pilot Test (Injection Point - IP-1)



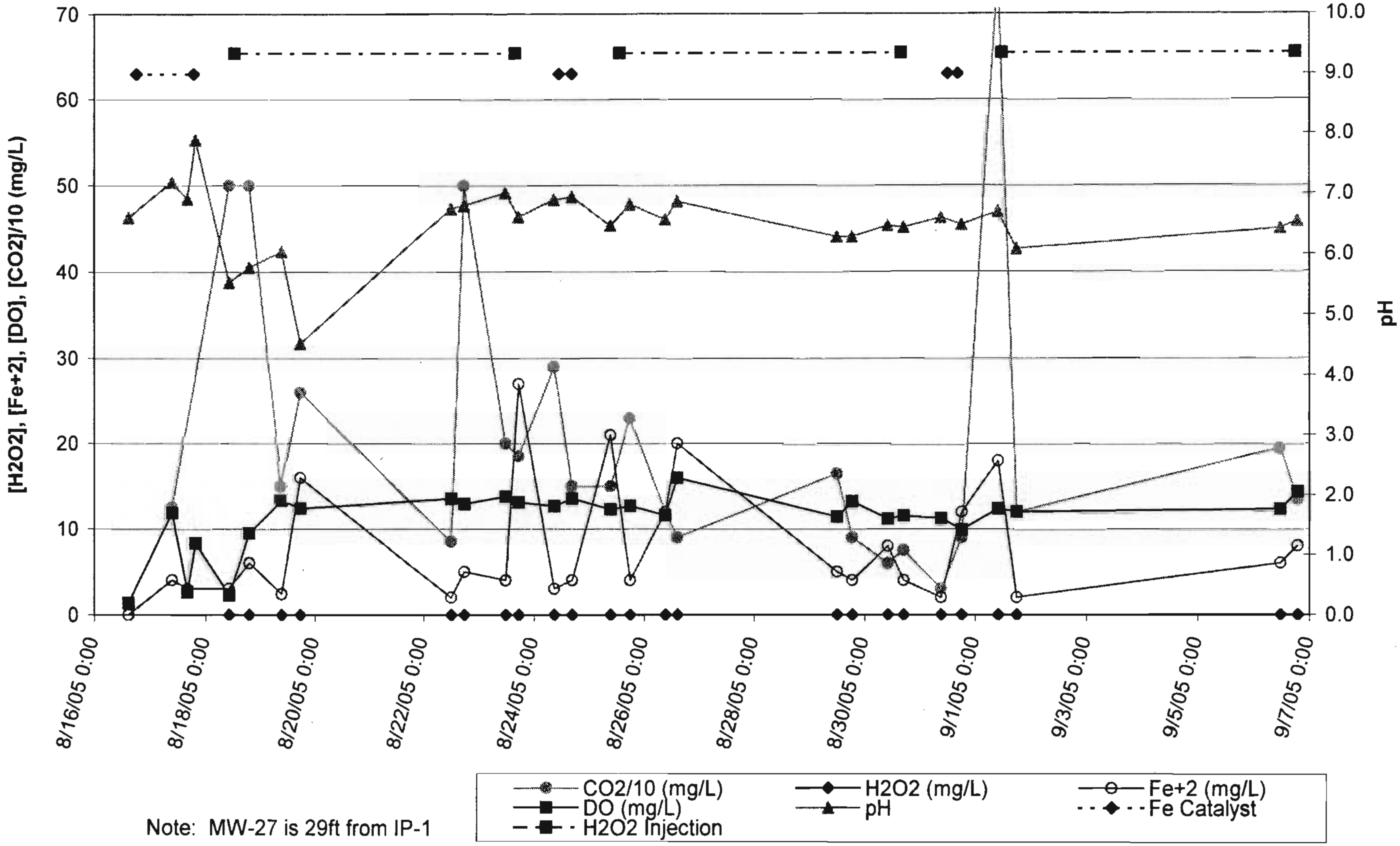
Note: MP-13S is 26ft from IP-1sd

MW-21 Groundwater Screening Results
Shallow Zone Pilot Test (Injection Point - IP-1)



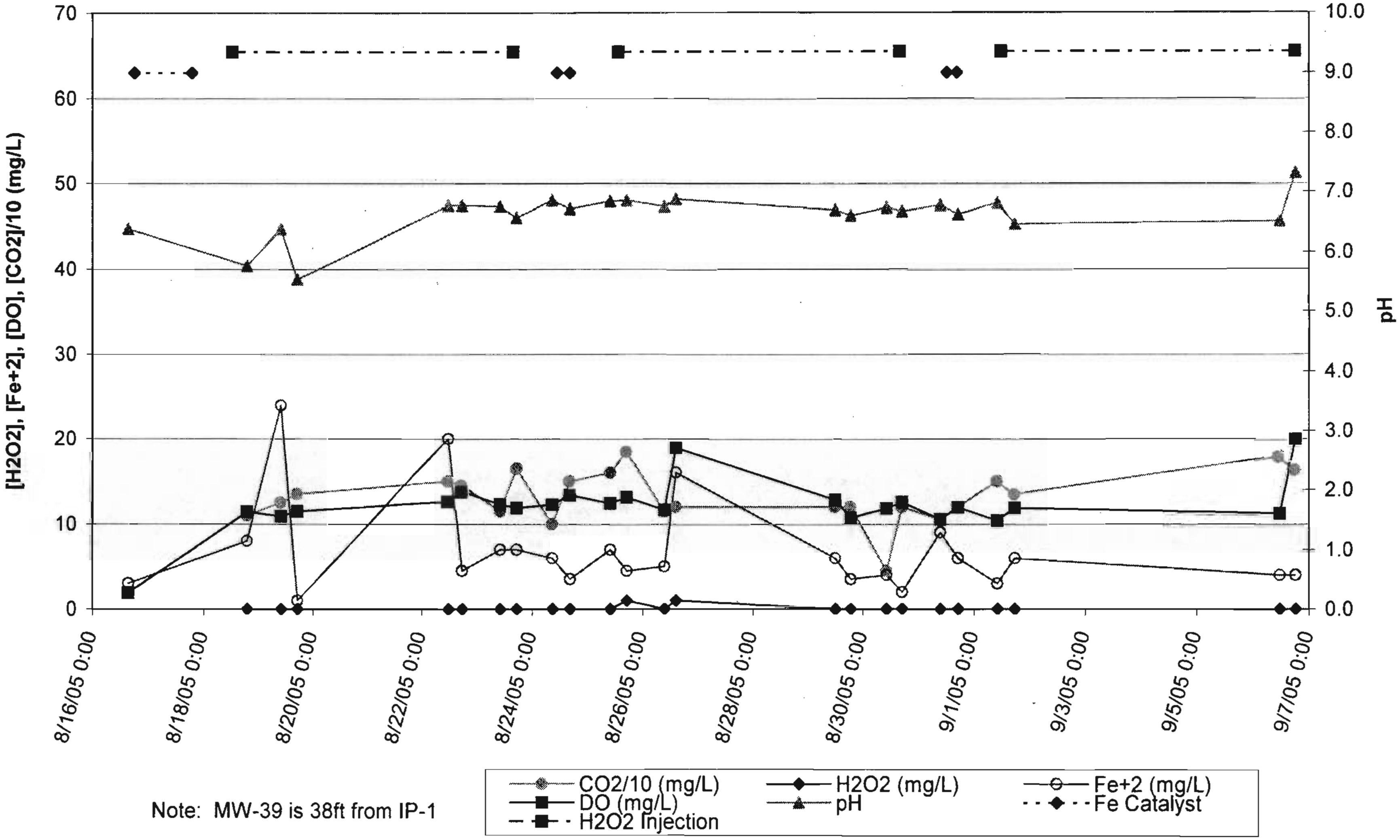
Note: MW-21 is 22ft from IP-1

MW-27 Groundwater Screening Results
Shallow Zone Pilot Test (Injection Point - IP-1)



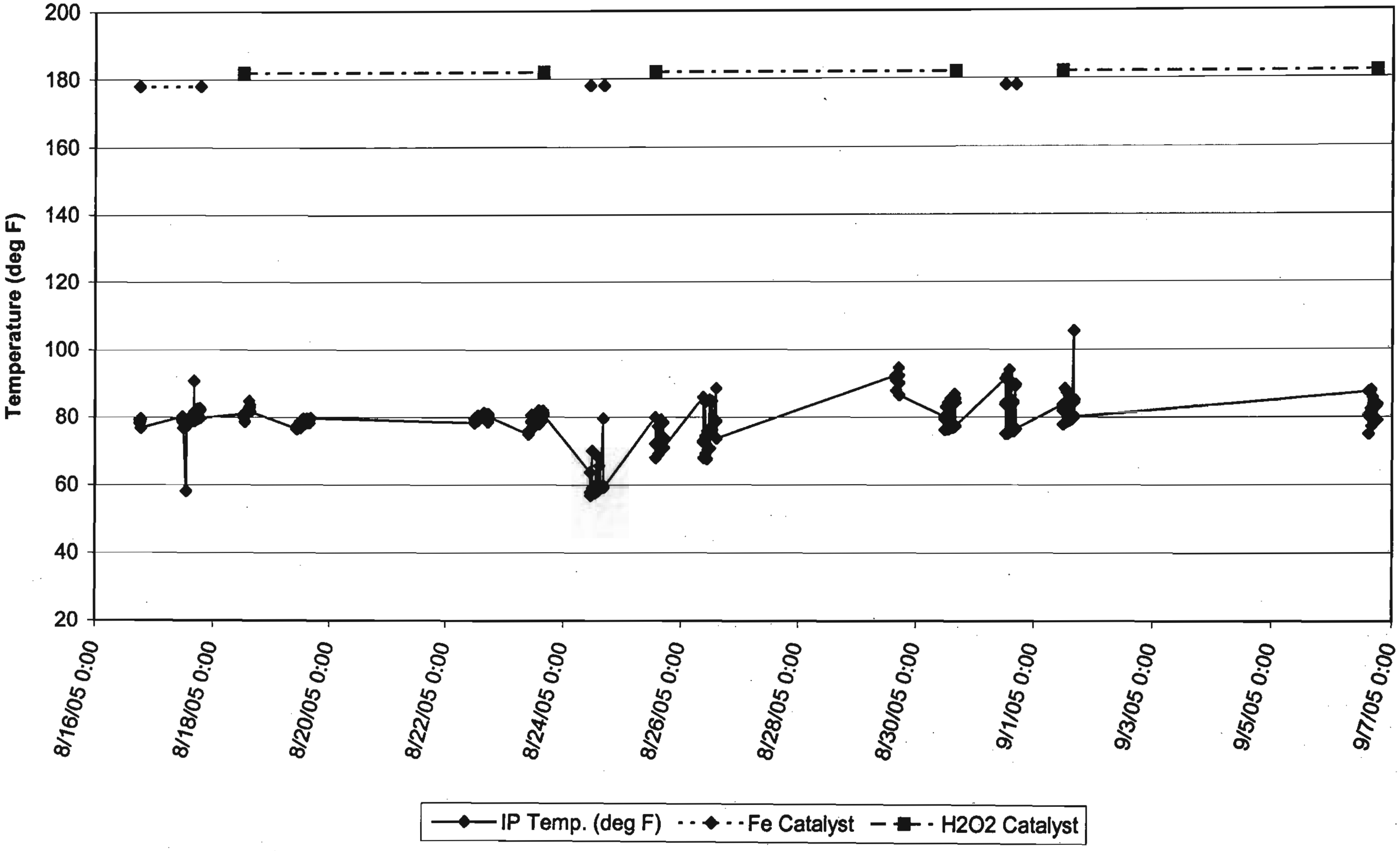
Note: MW-27 is 29ft from IP-1

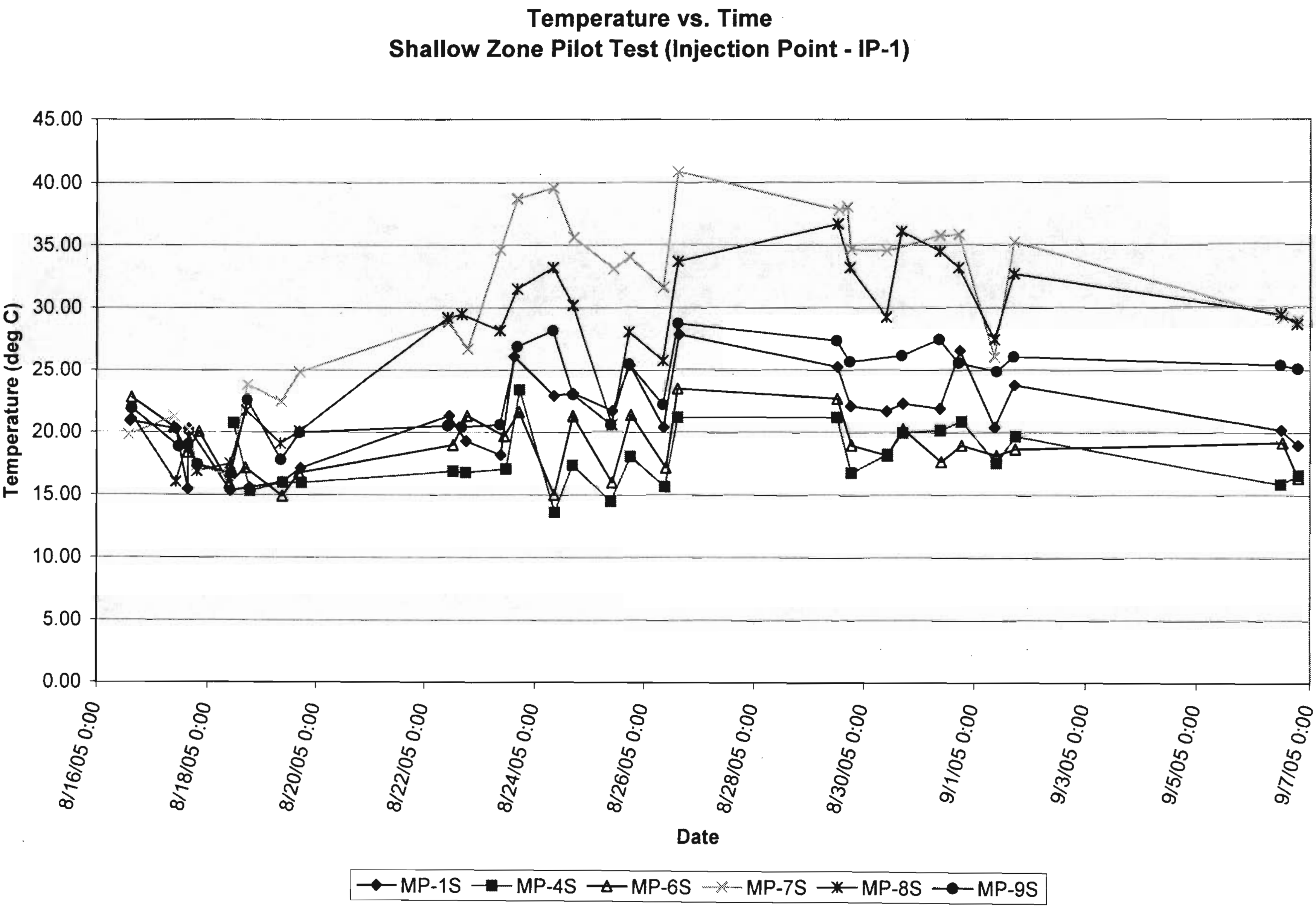
MW-39 Groundwater Screening Results
Shallow Zone Pilot Test (Injection Point - IP-1)



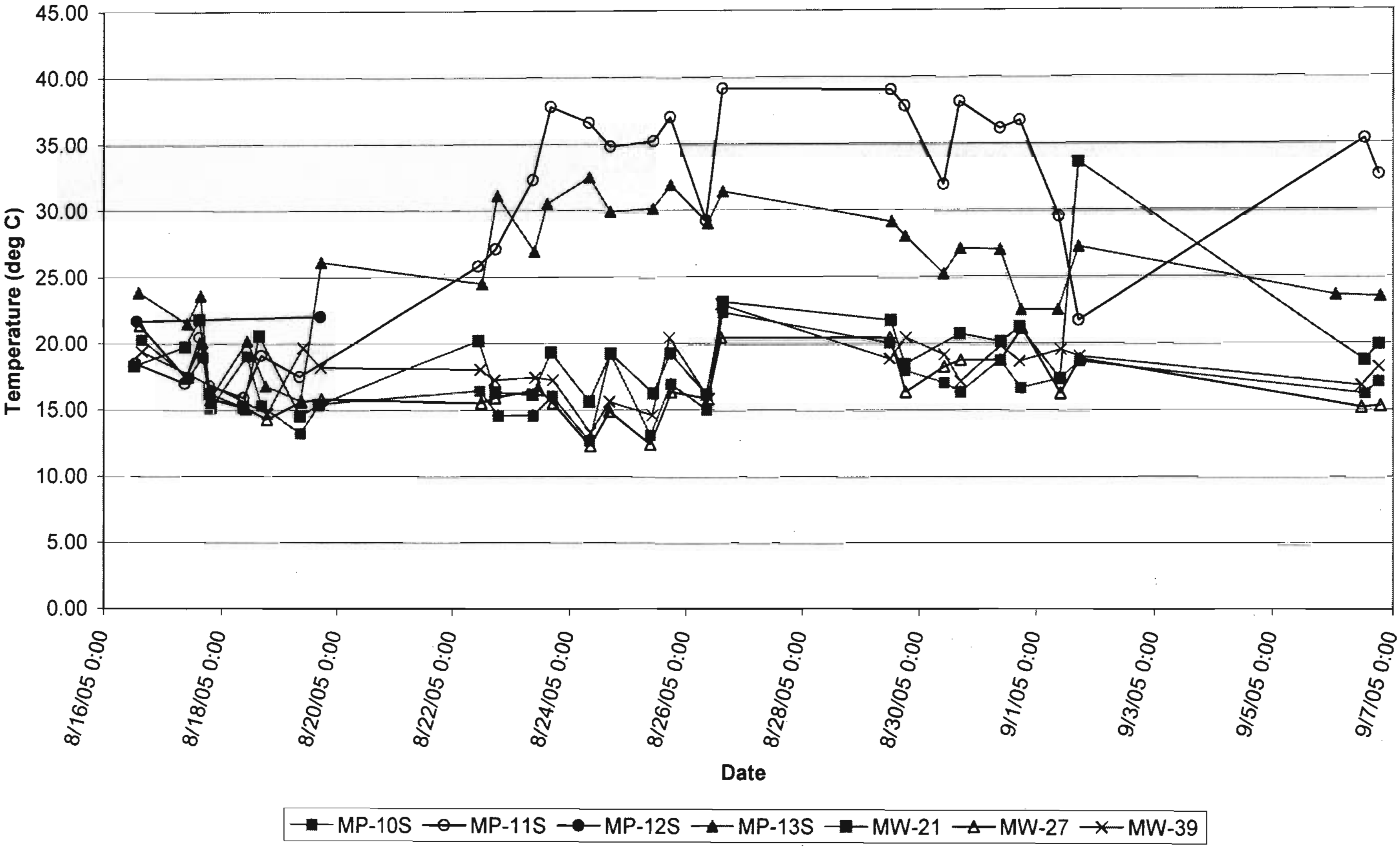
Note: MW-39 is 38ft from IP-1

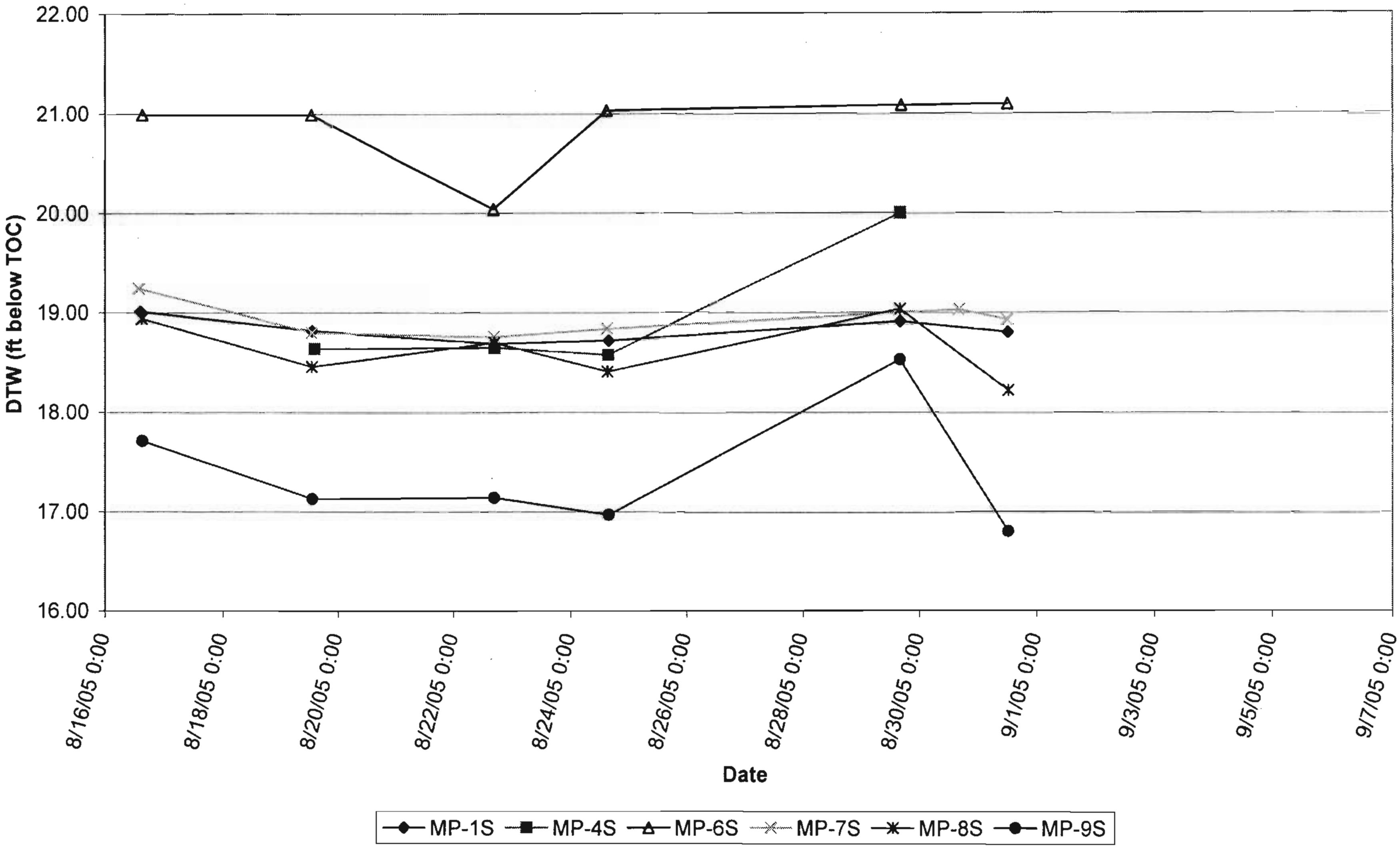
Injection Point Temperature
Shallow Pilot Test




Temperature vs. Time
Shallow Zone Pilot Test (Injection Point - IP-1)
Temperature (deg C)
45.00
40.00
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
8/16/05 0:00
8/18/05 0:00
8/20/05 0:00
8/22/05 0:00
8/24/05 0:00
8/26/05 0:00
8/28/05 0:00
8/30/05 0:00
9/1/05 0:00
9/3/05 0:00
9/5/05 0:00
9/7/05 0:00
Date
MP-1S
MP-4S
MP-6S
MP-7S
MP-8S
MP-9S

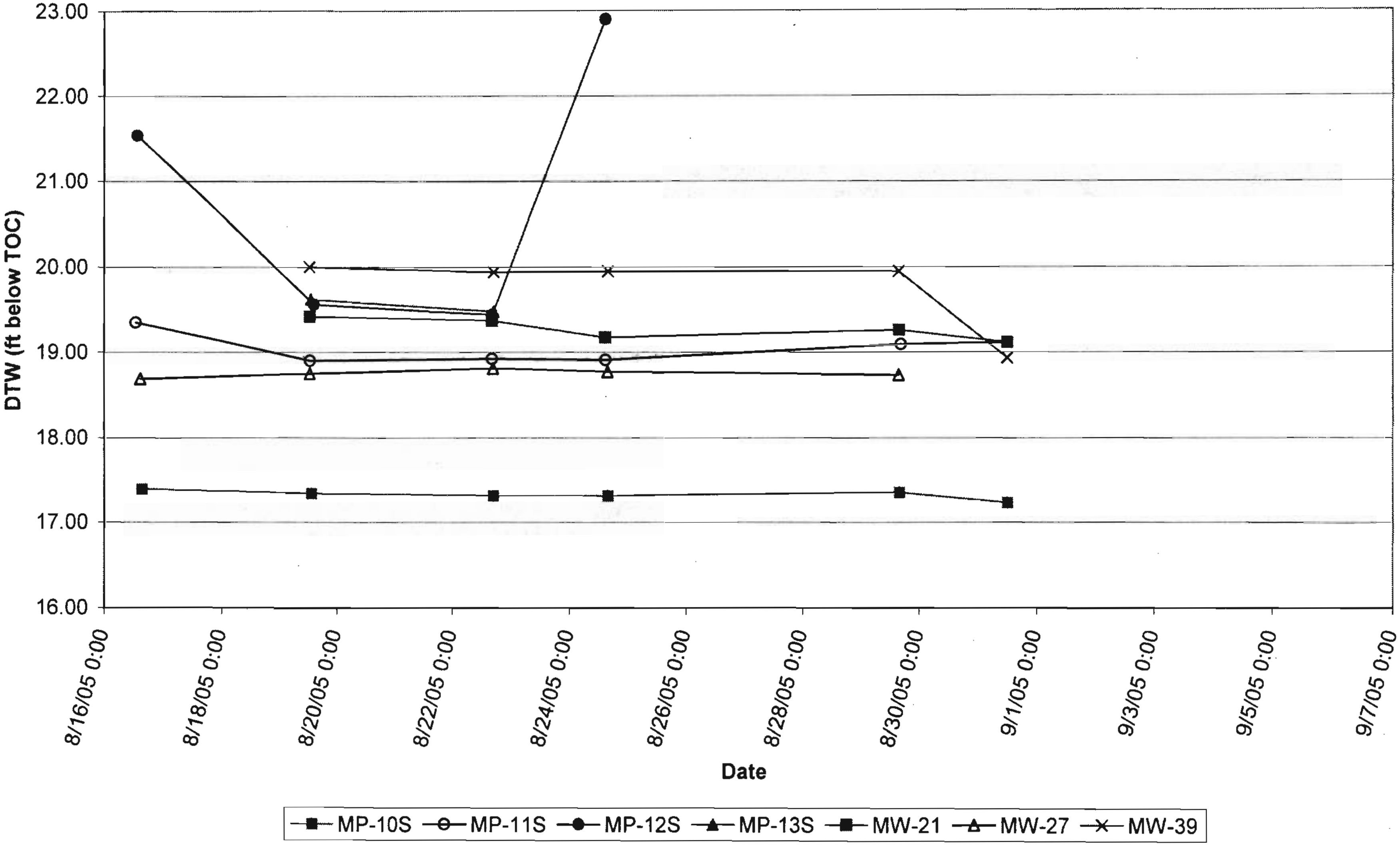
Temperature vs. Time
Shallow Zone Pilot Test (Injection Point - IP-1)





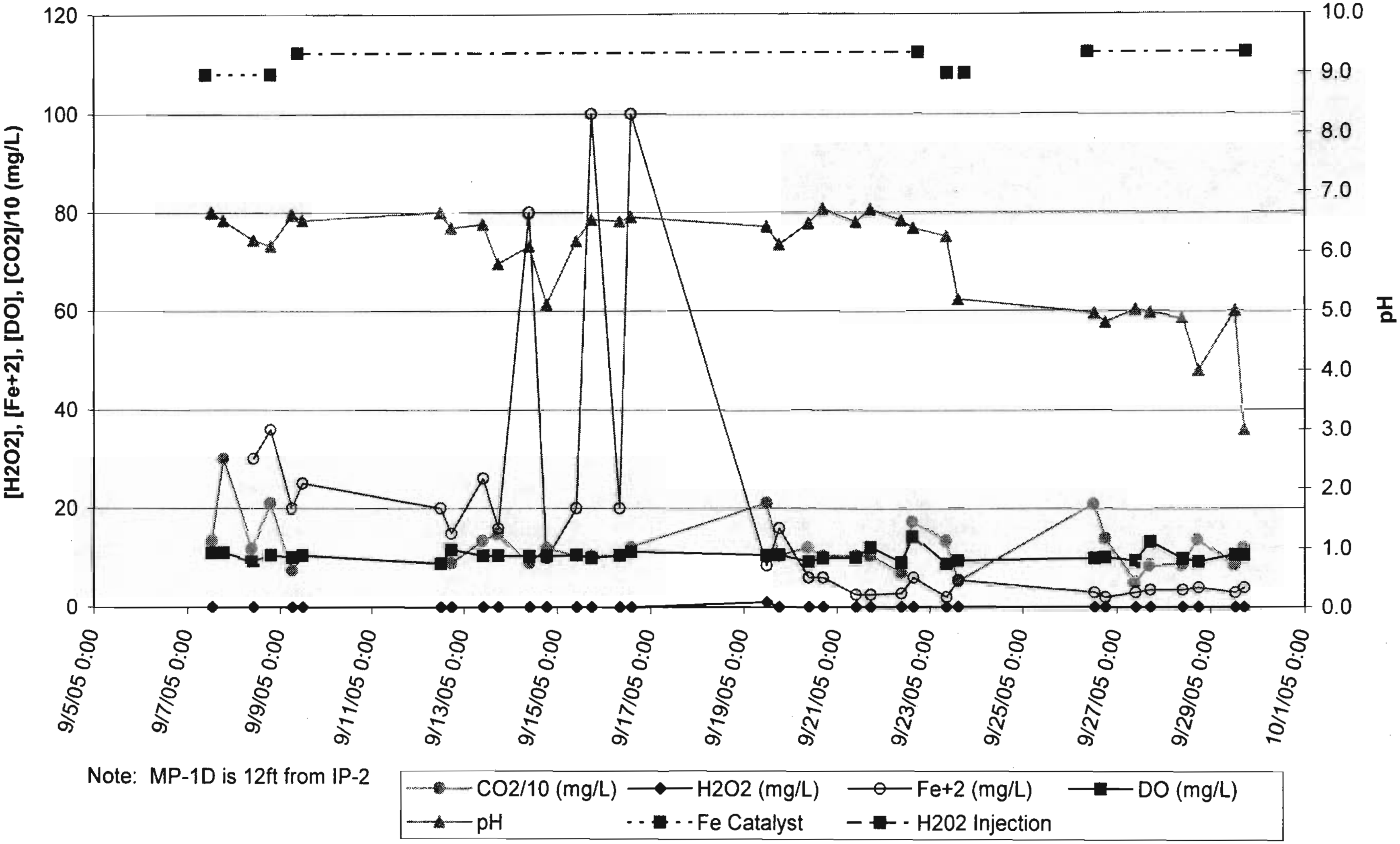
Depth to Water (DTW) vs. Time
Shallow Zone Pilot Test (Injection Point - IP-1)

Depth to Water (DTW) vs. Time
Shallow Zone Pilot Test (Injection Point - IP-1)



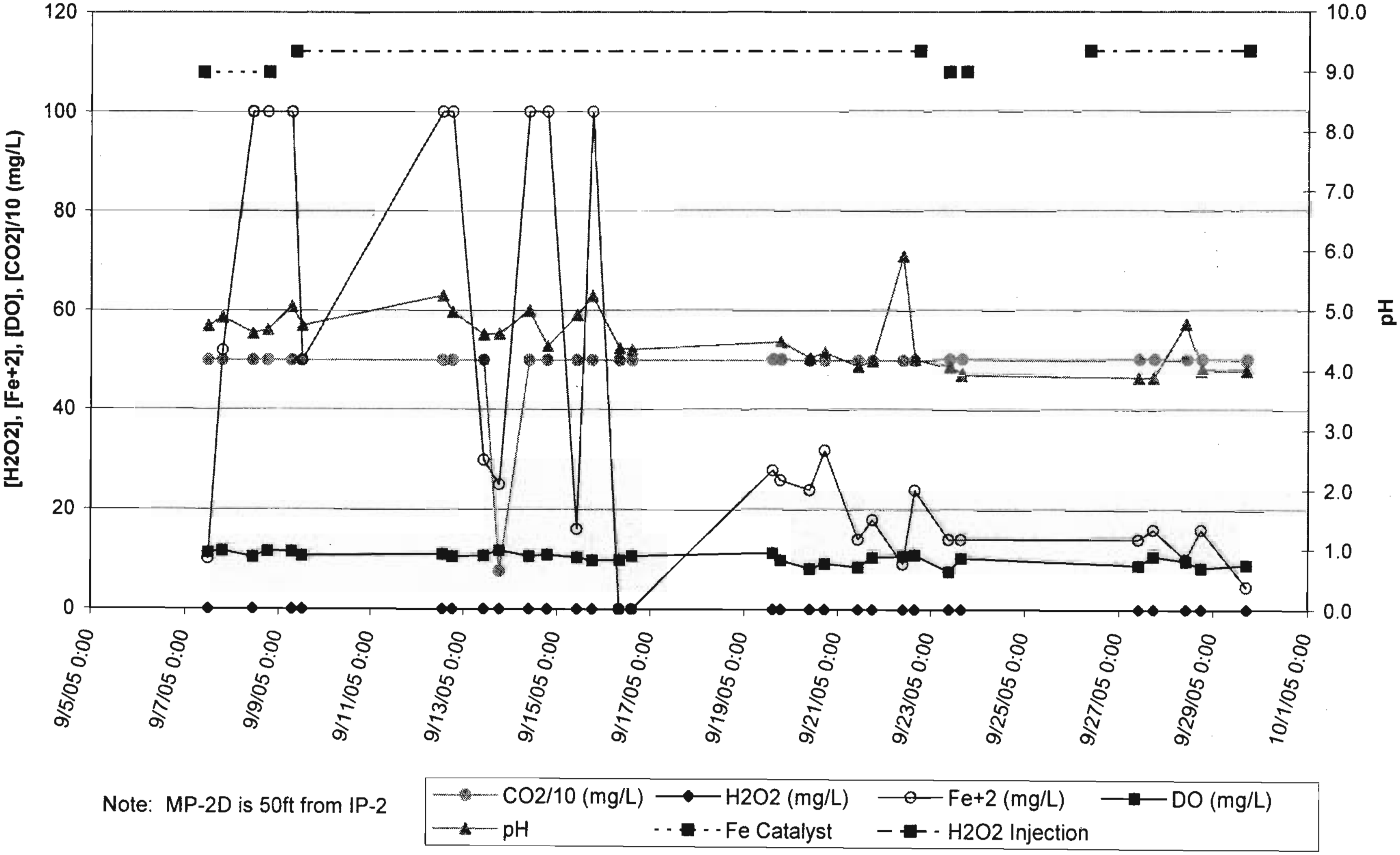
DEEP ZONE TEST

MP-1D Groundwater Screening Results
Deep Zone Pilot Test (Injection Point - IP-2)



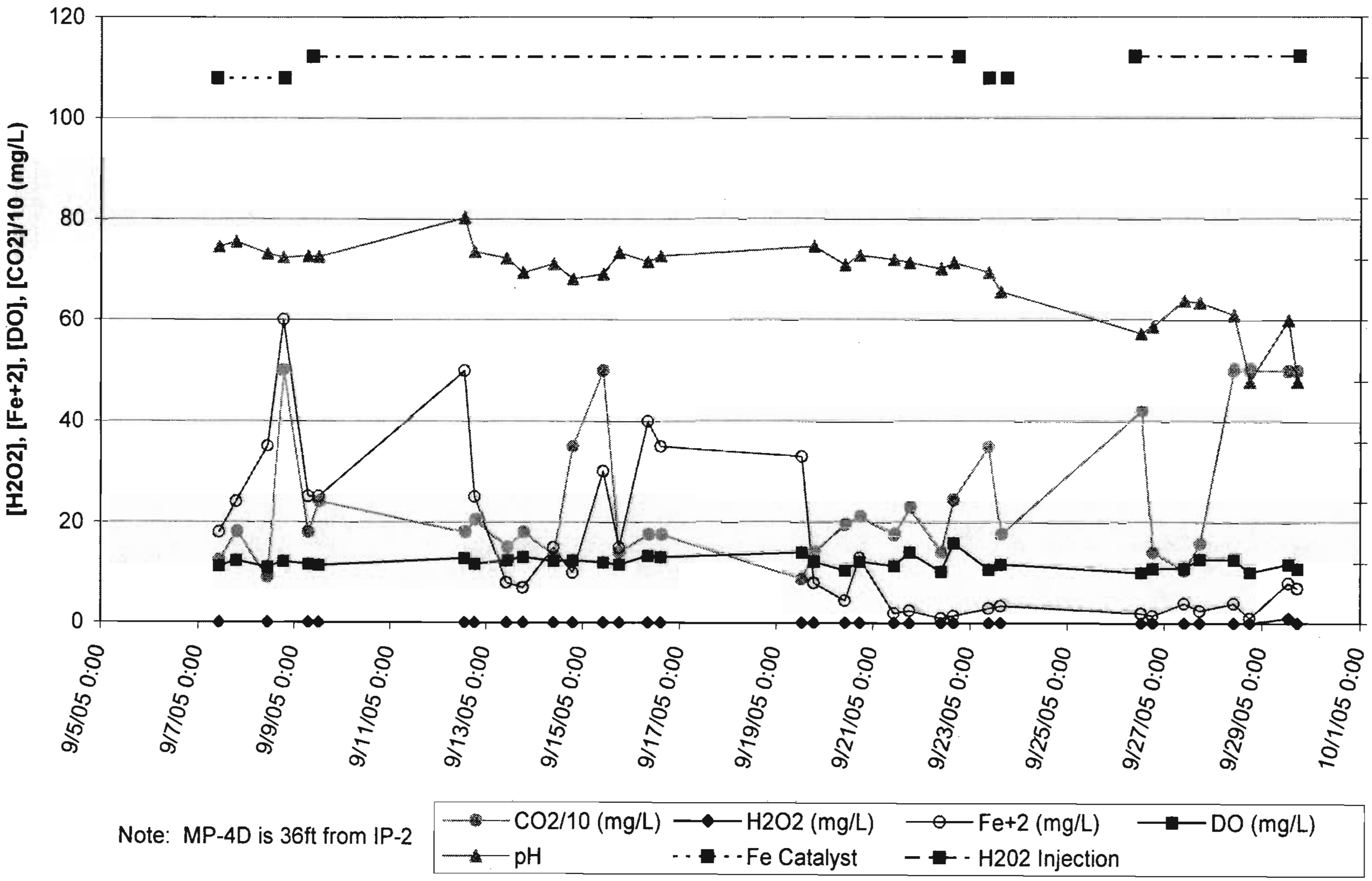
Note: MP-1D is 12ft from IP-2

MP-2D Groundwater Screening Results
Deep Zone Pilot Test (Injection Point - IP-2)



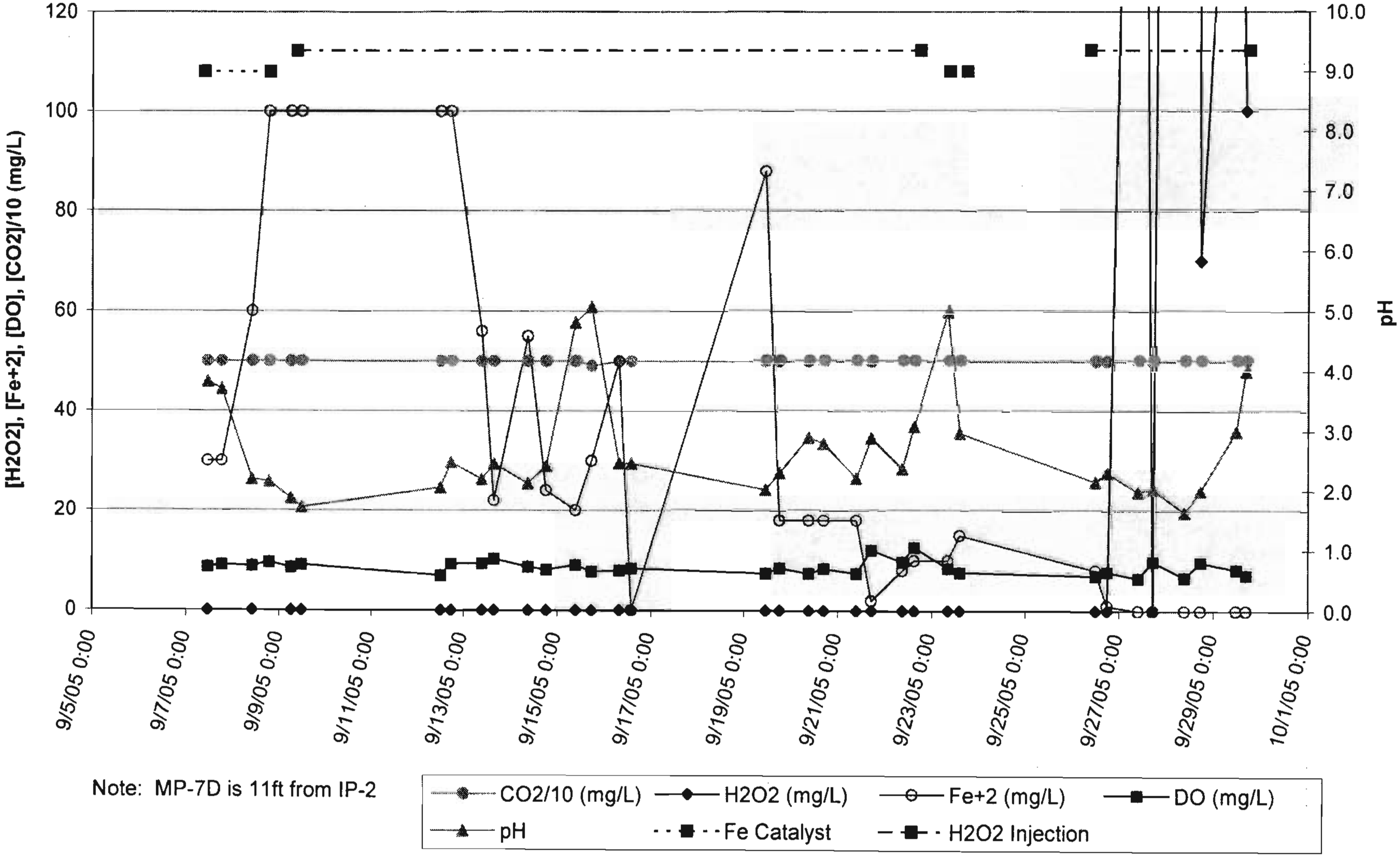
Note: MP-2D is 50ft from IP-2

MP-4D Groundwater Screening Results
Deep Zone Pilot Test (Injection Point - IP-2)



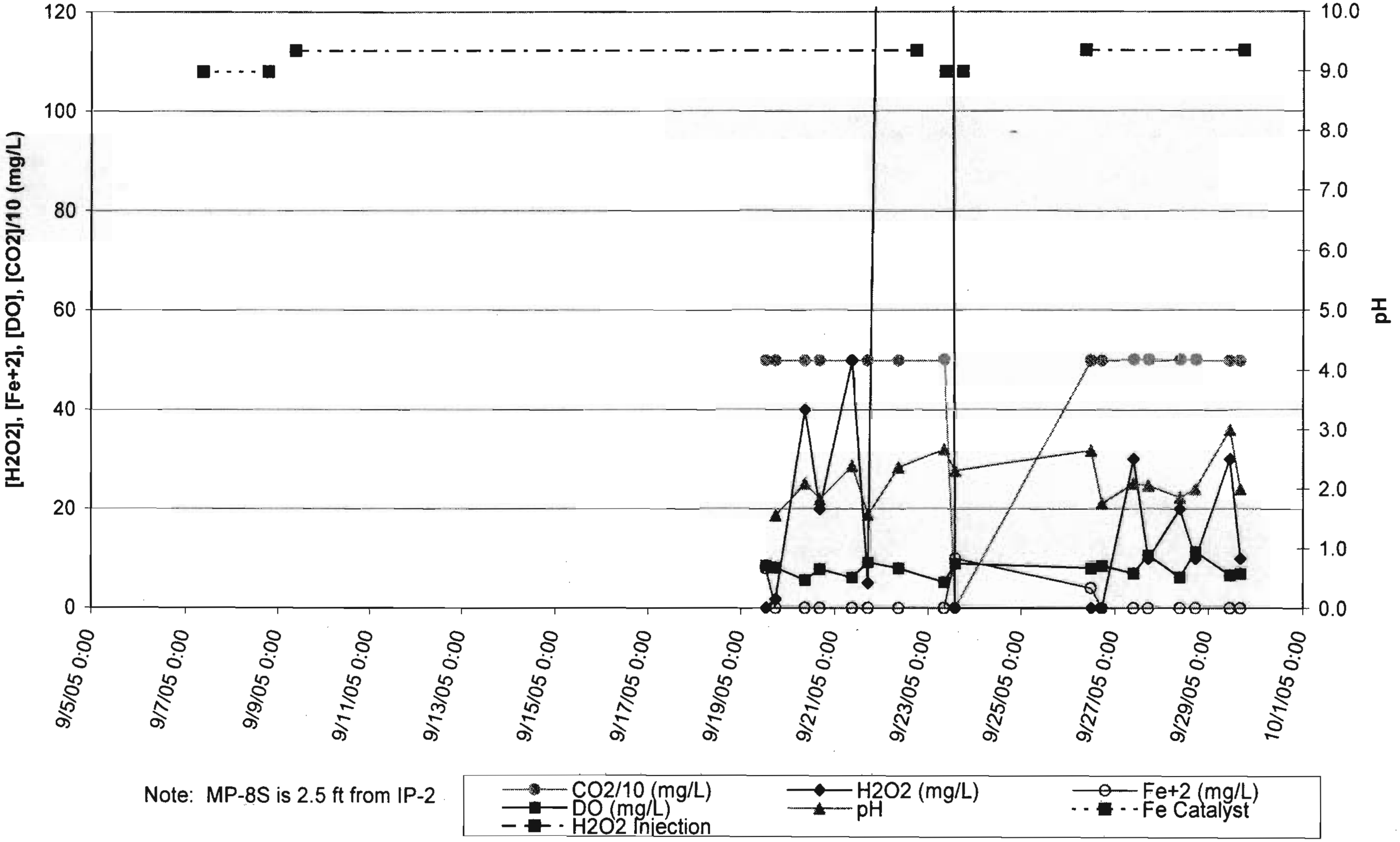
Note: MP-4D is 36ft from IP-2

MP-7D Groundwater Screening Results
Deep Zone Pilot Test (Injection Point - IP-2)



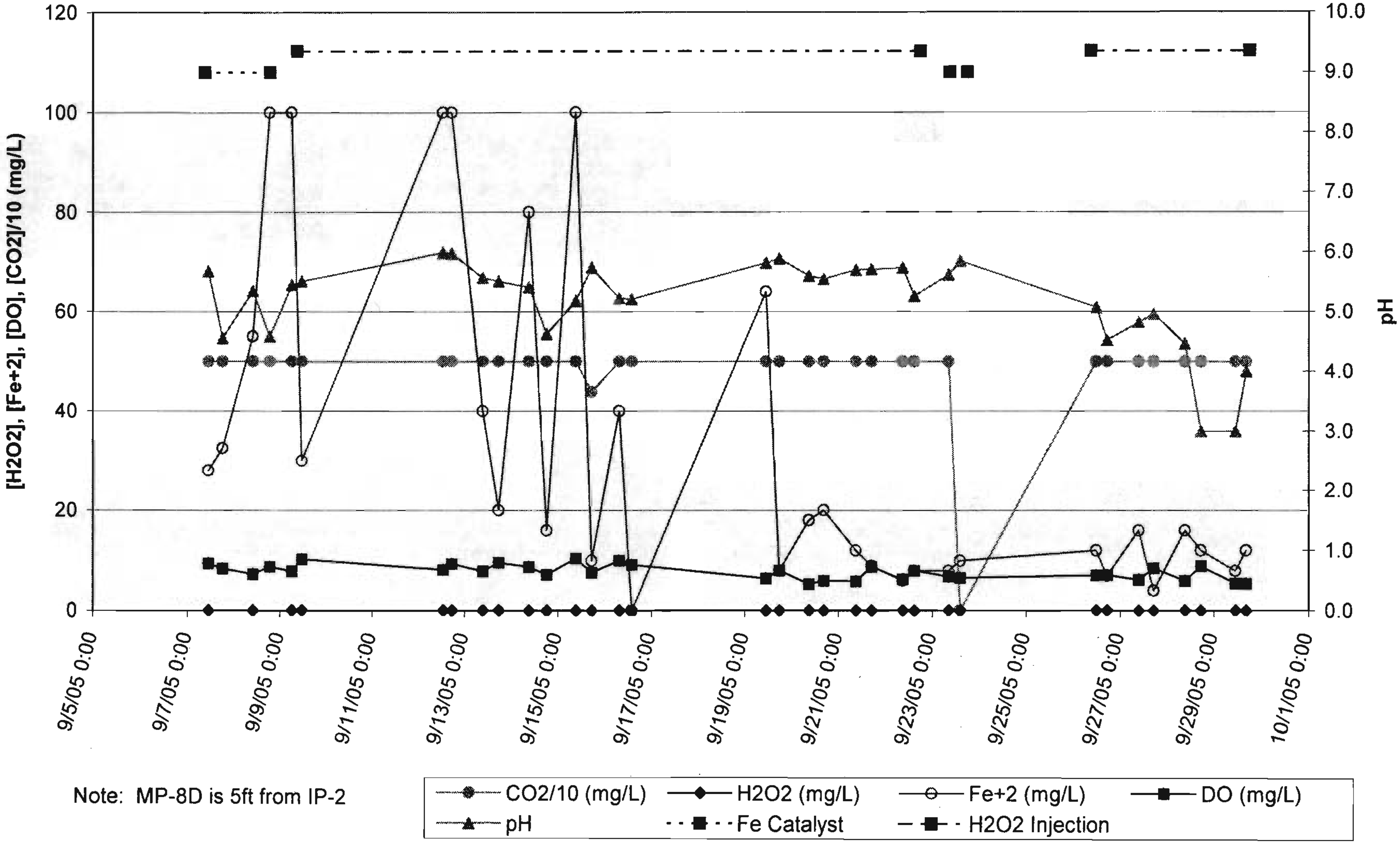
Note: MP-7D is 11ft from IP-2

MP-8S Groundwater Screening Results
Deep Zone Pilot Test (Injection Point - IP-2)



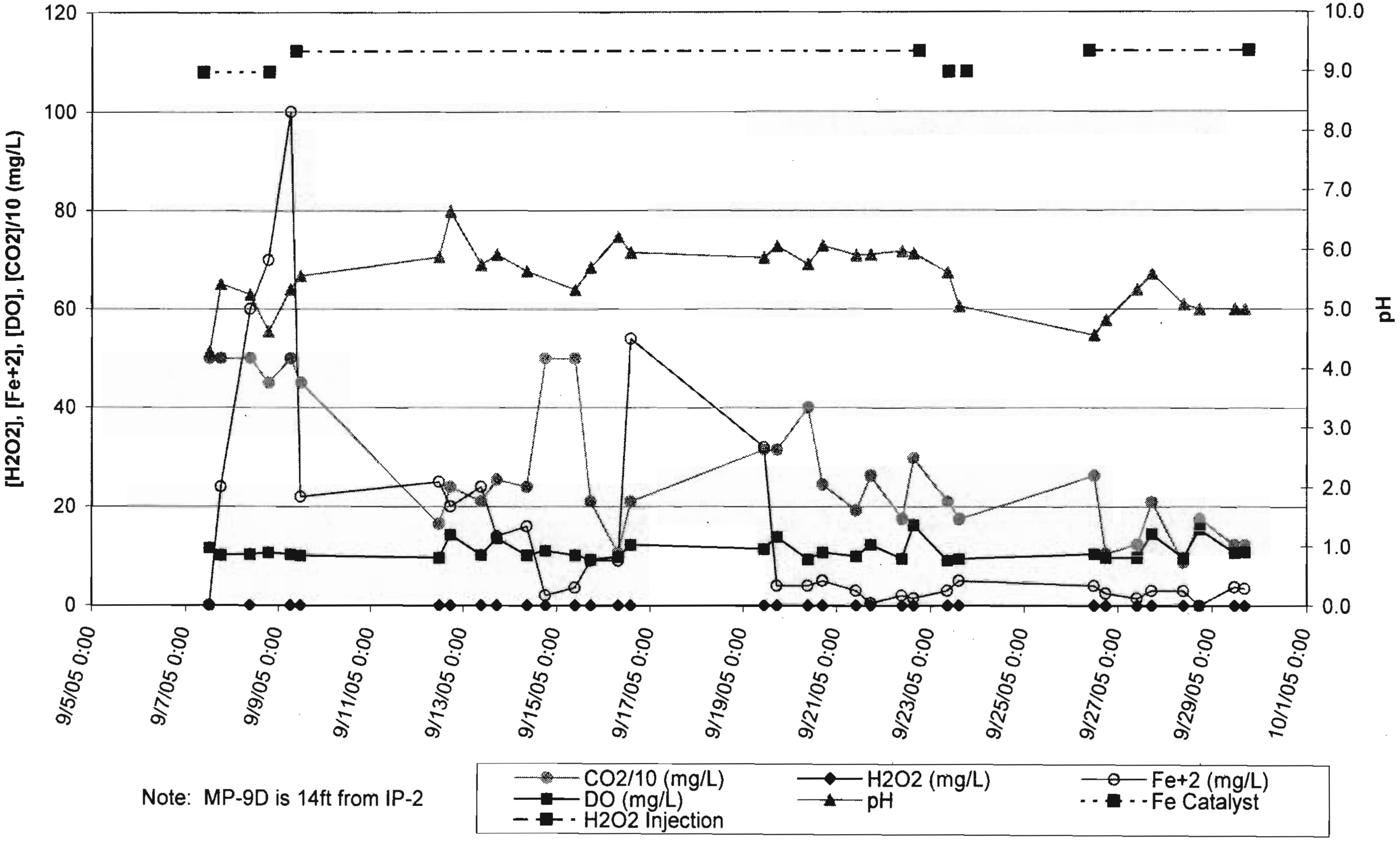
Note: MP-8S is 2.5 ft from IP-2

MP-8D Groundwater Screening Results
Deep Zone Pilot Test (Injection Point - IP-2)



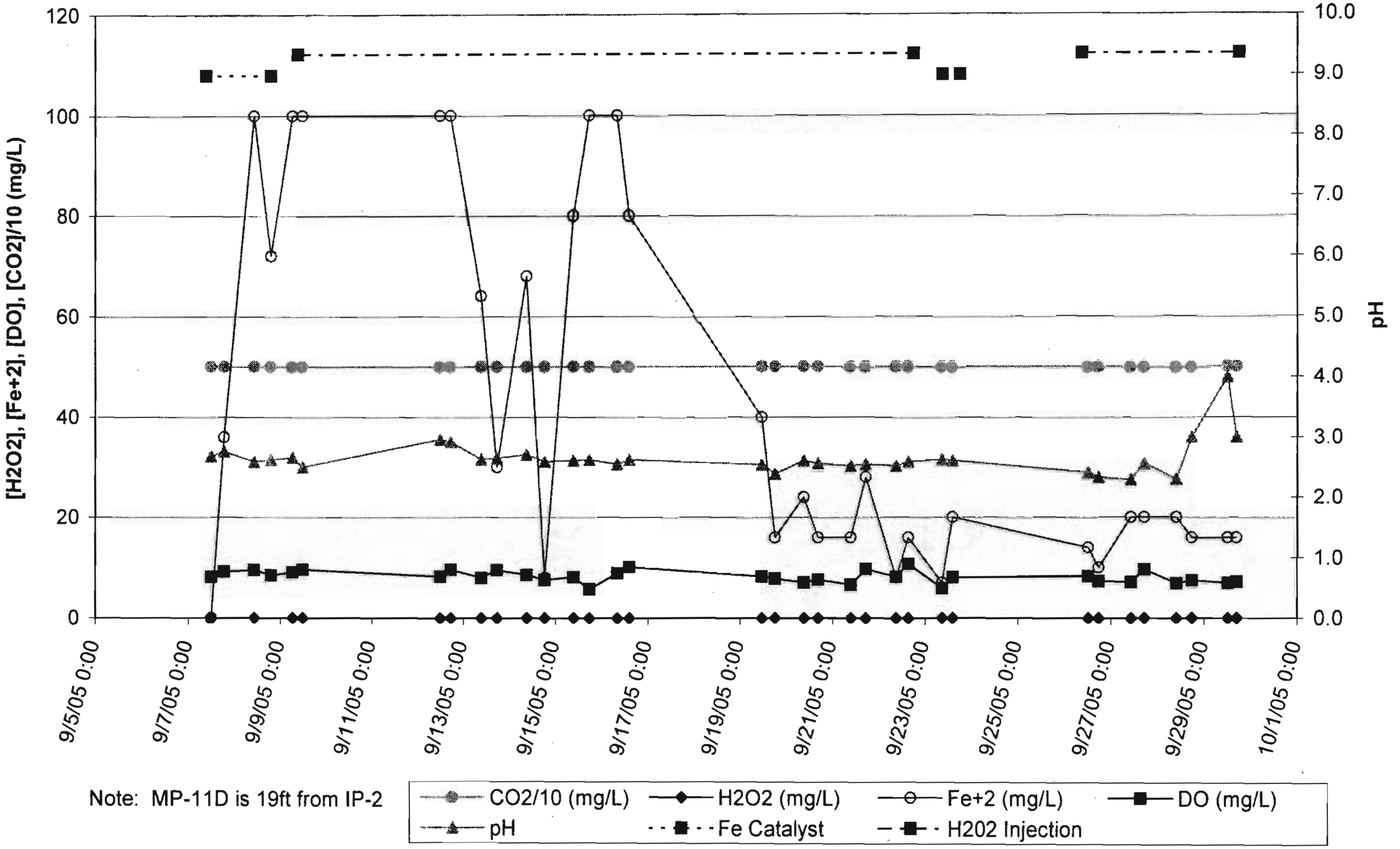
Note: MP-8D is 5ft from IP-2

MP-9D Groundwater Screening Results
Deep Zone Pilot Test (Injection Point - IP-2)



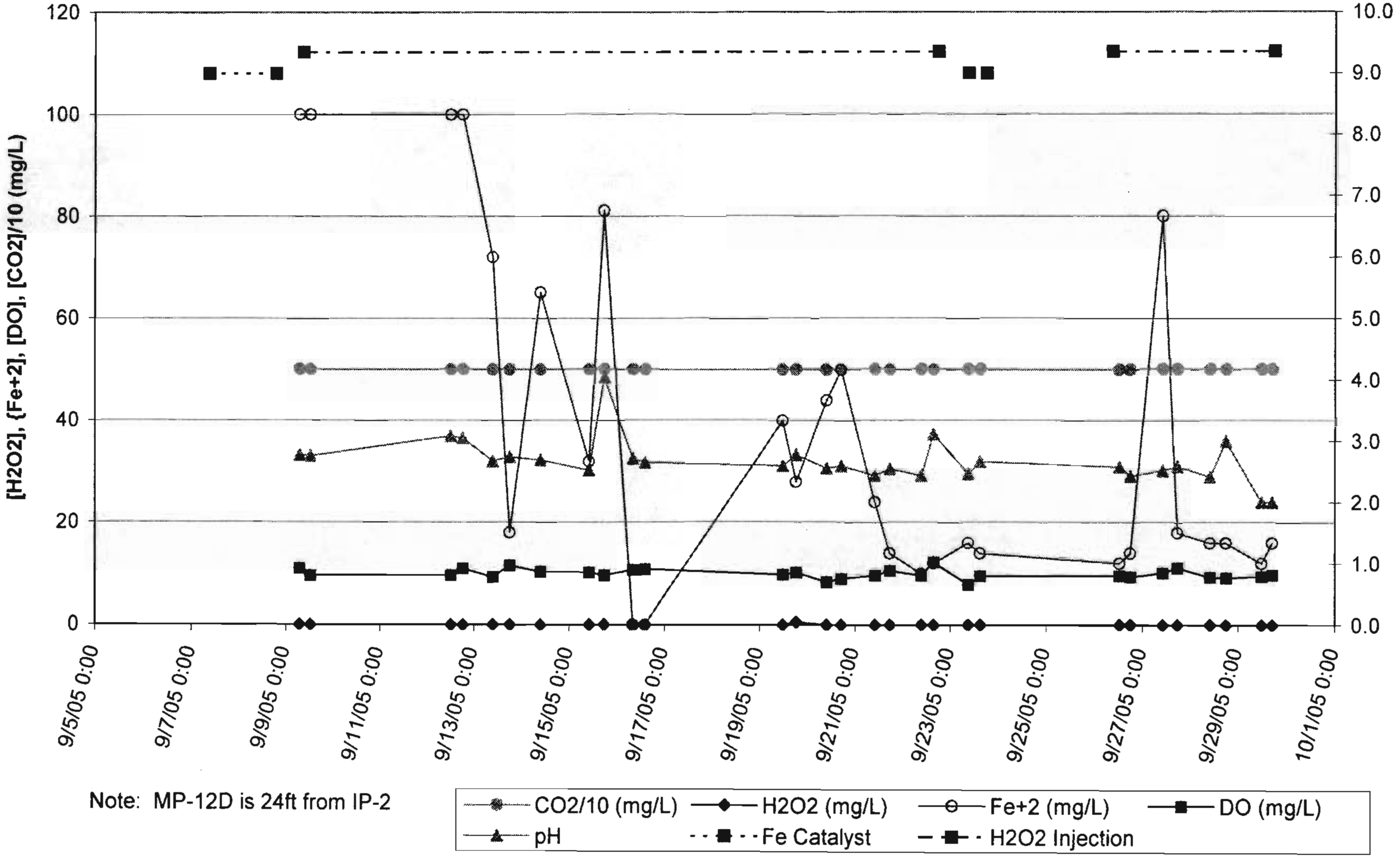
Note: MP-9D is 14ft from IP-2

MP-11D Groundwater Screening Results
Deep Zone Pilot Test (Injection Point - IP-2)



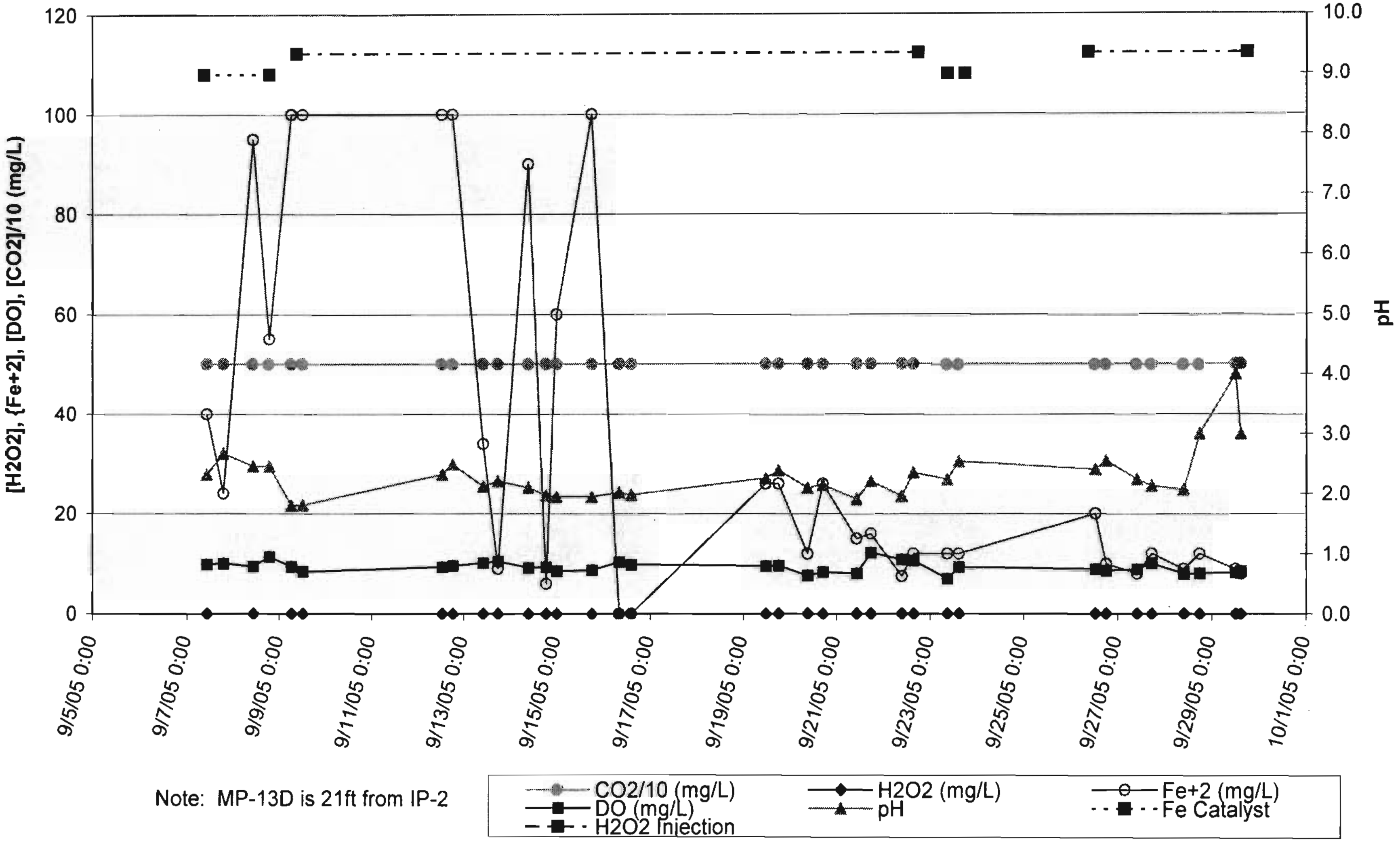
Note: MP-11D is 19ft from IP-2

MP-12D Groundwater Screening Results
Deep Zone Pilot Test (Injection Point - IP-2)



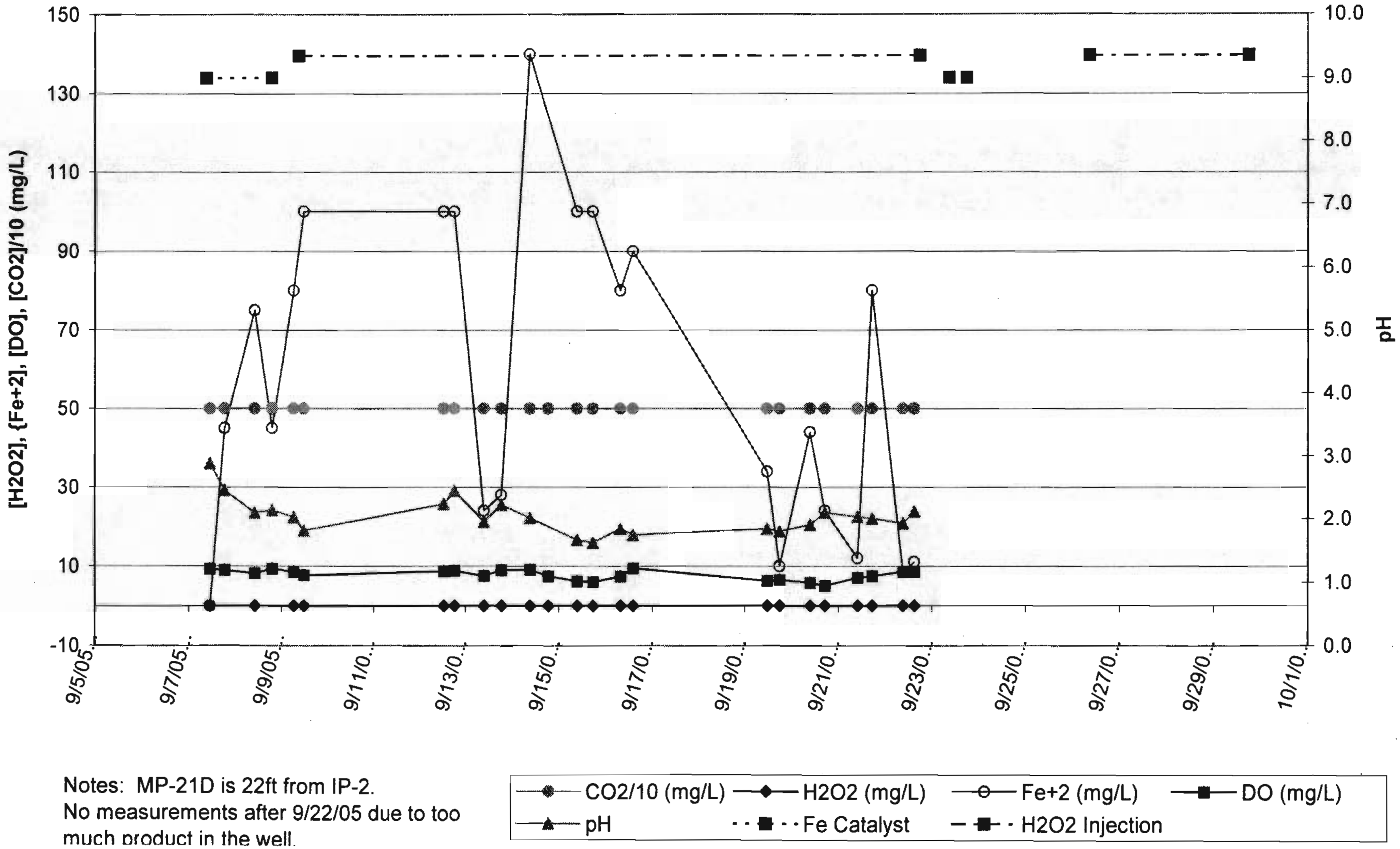
Note: MP-12D is 24ft from IP-2

MP-13D Groundwater Screening Results
Deep Zone Pilot Test (Injection Point - IP-2)



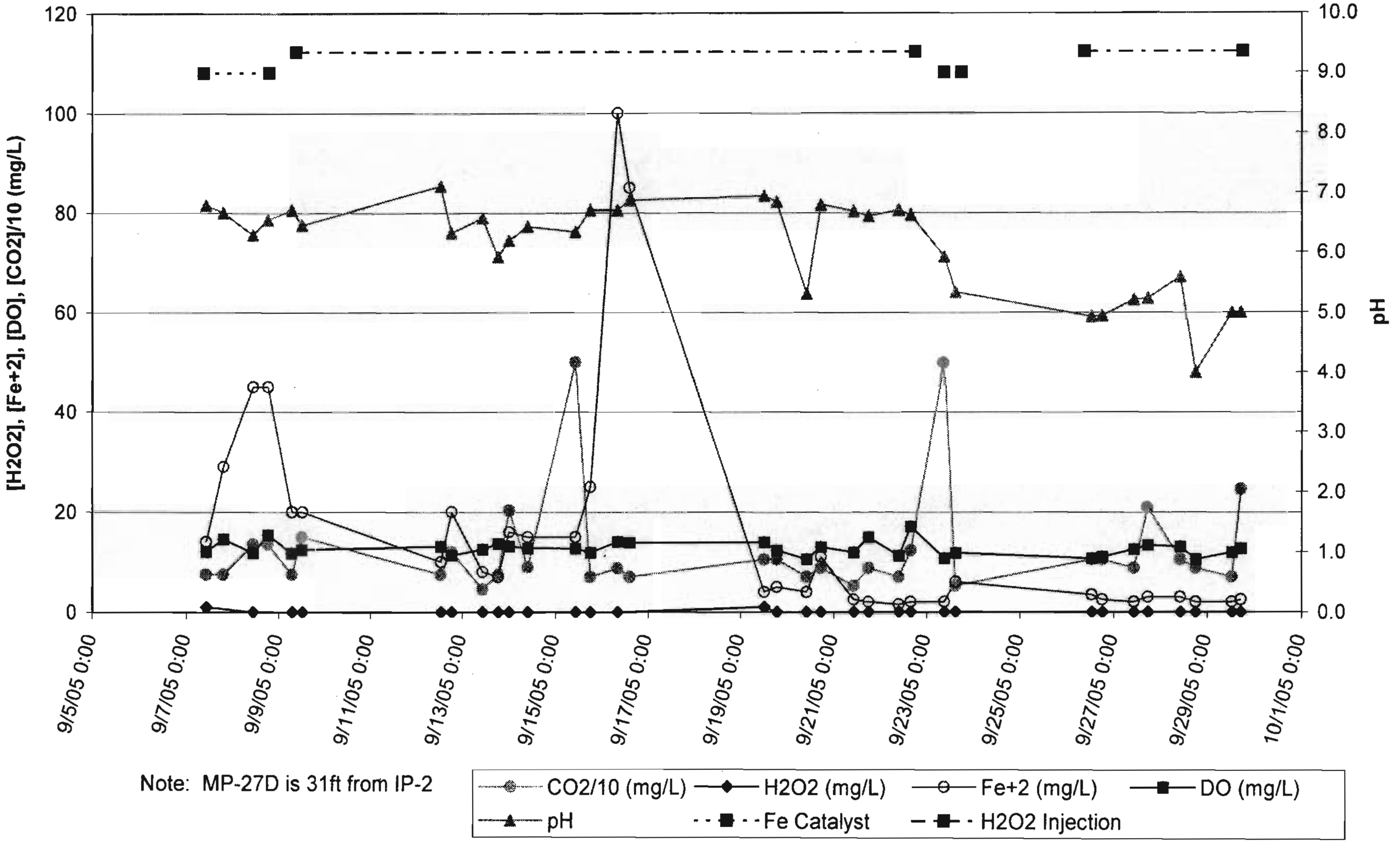
Note: MP-13D is 21ft from IP-2

MP-21D Groundwater Screening Results
Deep Zone Pilot Test (Injection Point - IP-2)



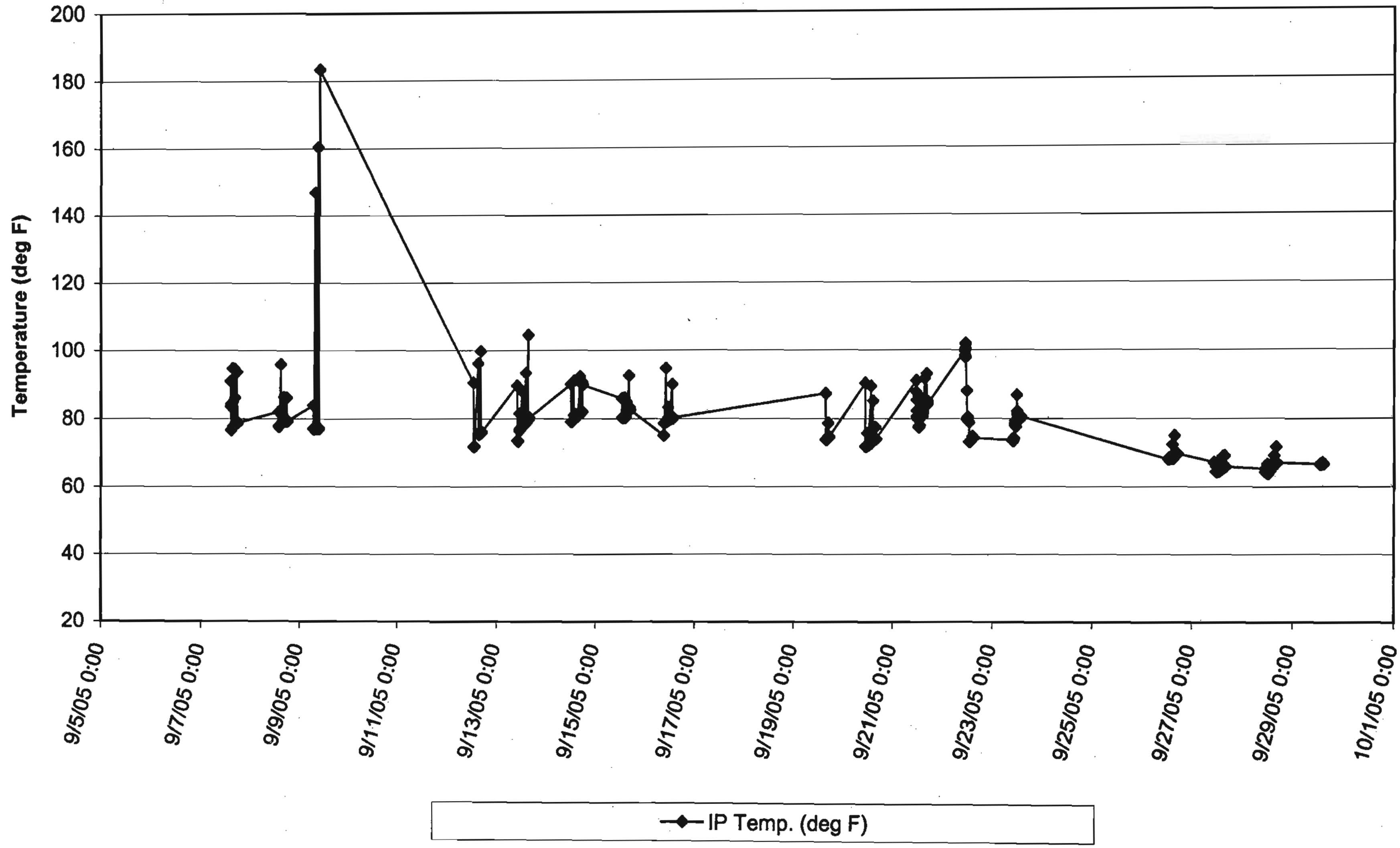
Notes: MP-21D is 22ft from IP-2.
No measurements after 9/22/05 due to too much product in the well.

MP-27D Groundwater Screening Results
Deep Zone Pilot Test (Injection Point - IP-2)

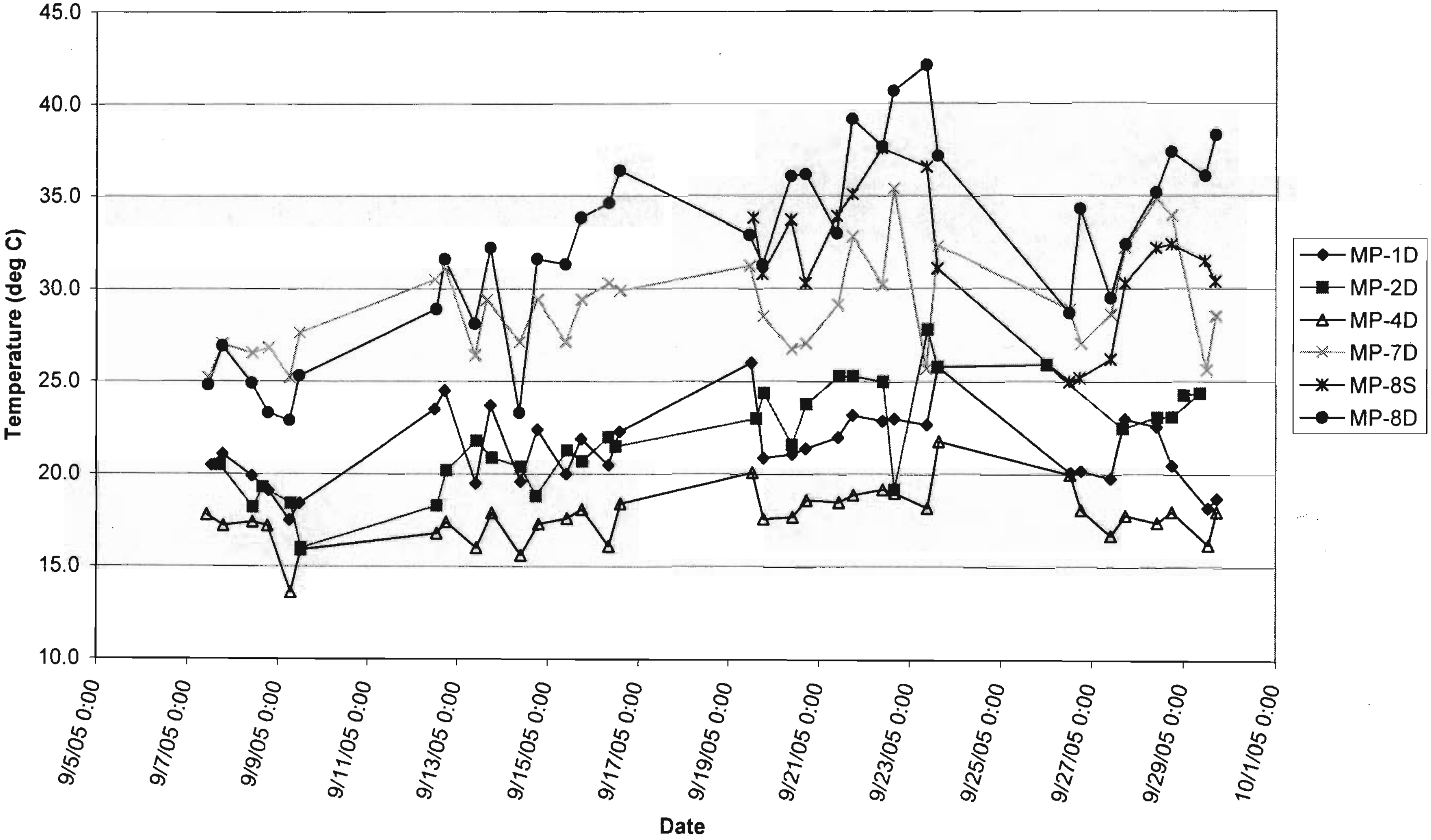


Note: MP-27D is 31ft from IP-2

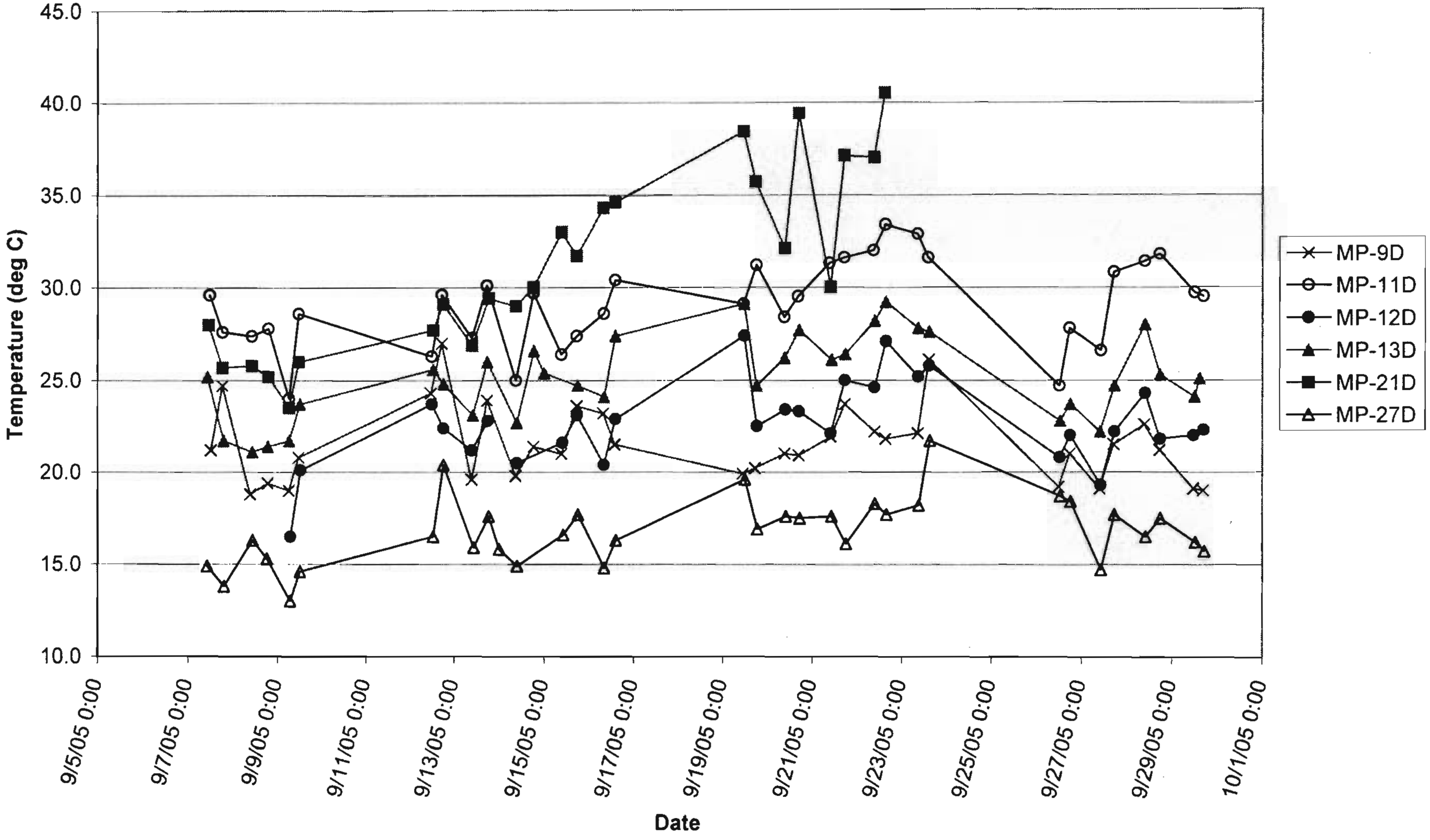
Injection Point Temperature
Deep Pilot Test



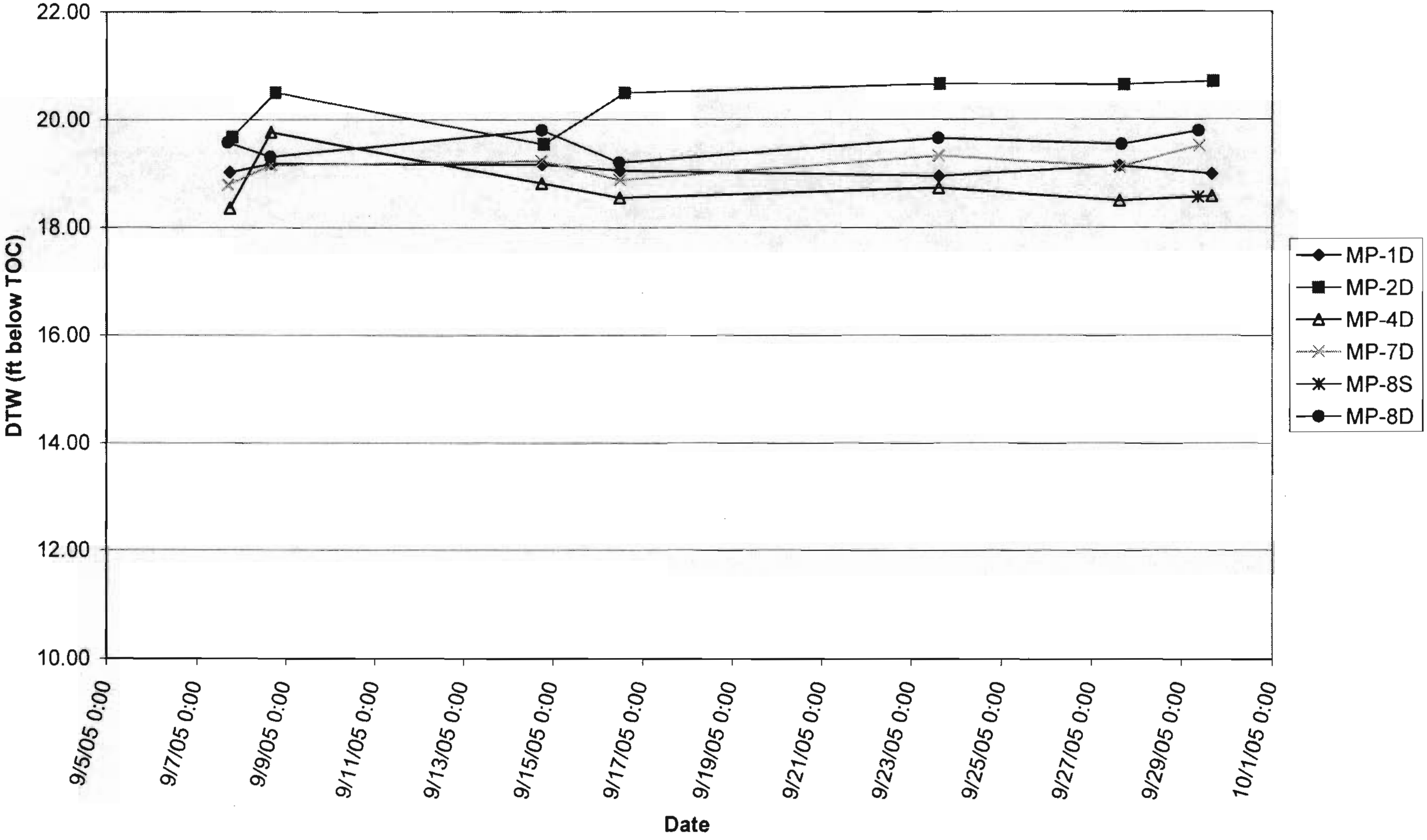
Temperature vs. Time
Deep Zone Pilot Test (Injection Point - IP-2)



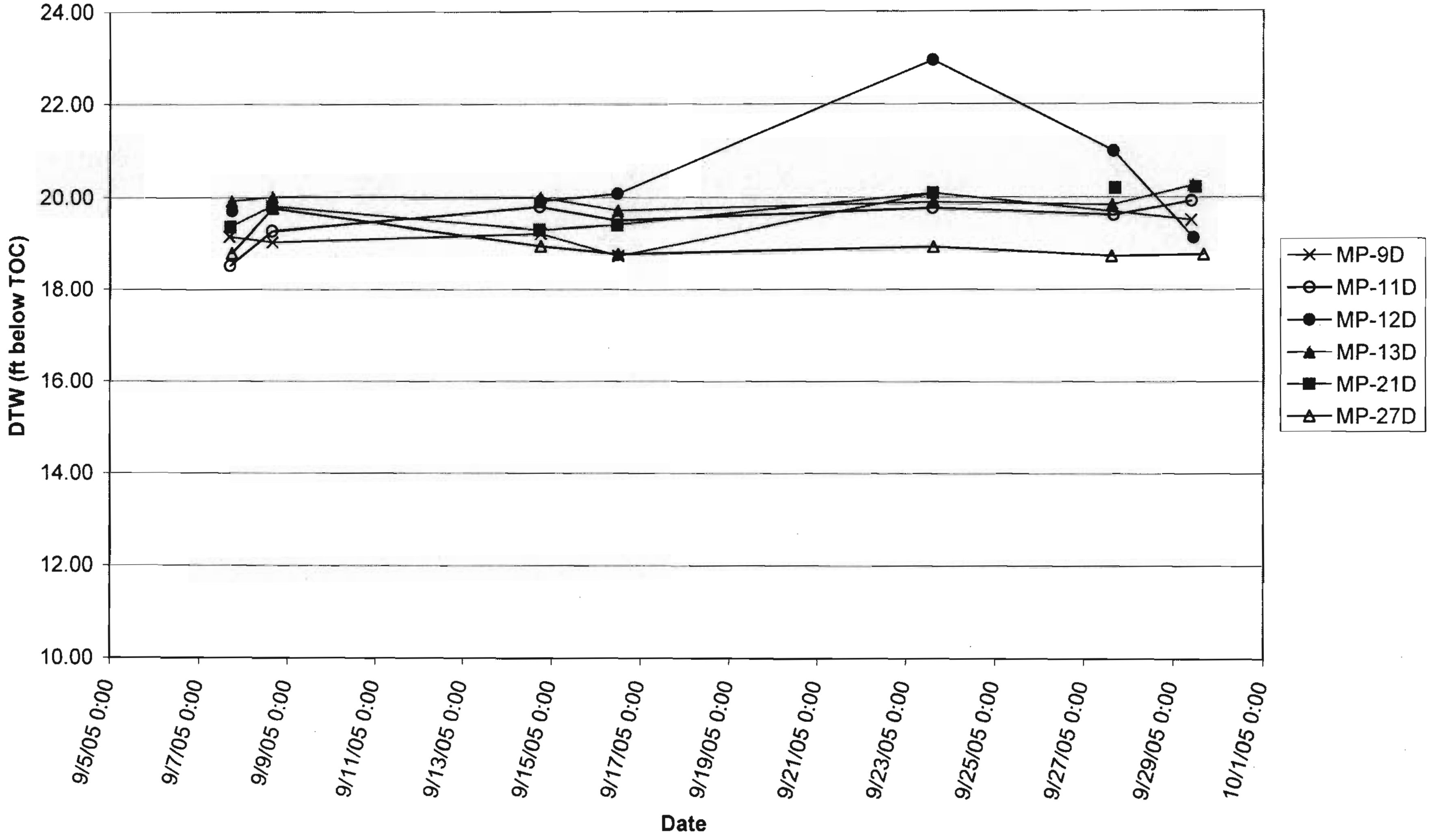
Temperature vs. Time
Deep Zone Pilot Test (Injection Point - IP-2)



Depth to Water (DTW) vs. Time
Deep Zone Pilot Test (Injection Point - IP-2)



Depth to Water (DTW) vs. Time
Deep Zone Pilot Test (Injection Point - IP-2)



APPENDIX E

WELL AND SOIL BORING LOGS

MONITORING WELL LOG

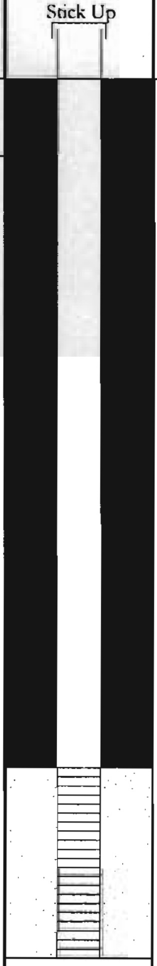
BROWN AND CALDWELL	**Project Name:** Troy Area 2 ISCO & CPT Testing **Project Number:** 24758.021 **Project Location:** Troy, NY	**Permit Number:** NA	**Well No.** IP-1 **Page** 1 **of** 1

Geologist/Office	**Checked By:**	**Borehole Diameter:**	**Screen Diameter and Type:**	**Slot Size:**	**Total Boring Depth (ft)**
J. Vorbach/Allendale	J. Vorbach	8"	2" Schedule 40, 304 Stainless Steel	.020"	23.0 ft.

Start/Finish Date	**Drilling Contractor:**	**Sampling:** **Hammer Type:**	**Development Method:**
10/12/04 - 10/12/04	Cone Tec		NA

Driller:	**Drilling Method:**	**Drilling Equipment:**	**Horiz Datum/Proj:** **Vert Datum:** **Ground Surface Elev:** --	**Easting:** 706928.5 ft. **Northing:** 1411563.0 ft. **TOC Elev:** 29.4 ft.
Andy Carpenter	SSA & 25 ton CPT	Cone Penetrometer		

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Sample Int	Recovery	Lithology	Well	Readings (ppm)	Remarks
			No Sediment Samples Collected.						Stick Up		2' stickup with male threads, 4" diameter protective steel casing with locking top and concrete collar
5											
10											Schedule 40, 304 Stainless Steel Riser, Bentonite Grout
15											
											18' - 23' Screened Zone
20											



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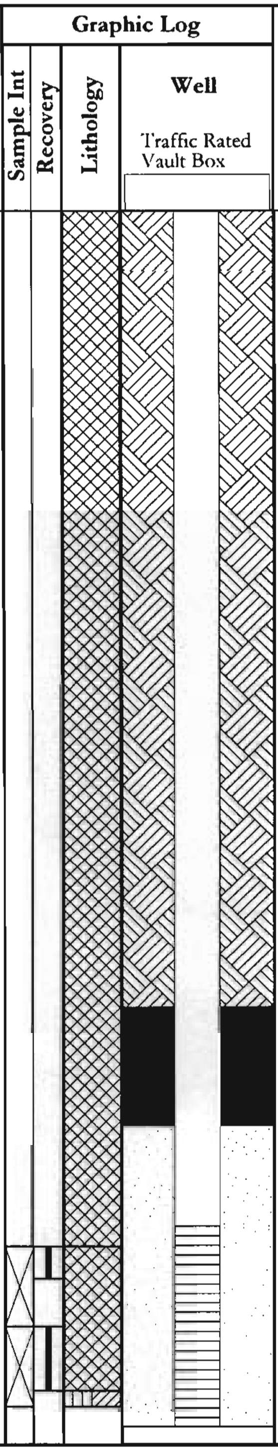
MONITORING WELL LOG

BROWN AND CALDWELL	**Project Name:** Troy Area 2 ISCO MP **Project Number:** 24758.022/128805 **Project Location:** Troy, NY	**Permit Number:**	**Well No.** IP-2 **Page** 1 **of** 1

Geologist/Office	**Checked By:**	**Borehole Diameter:**	**Screen Diameter and Type:**	**Slot Size:**	**Total Boring Depth (ft)**
N. Krupinski/Allendale	JLM	6"	2" Steel	0.01"	30.5 ft.

Start/Finish Date	**Drilling Contractor:**	**Sampling:** Split Spoon **Hammer Type:** Automatic	**Development Method:**
7/28/05 - 7/29/05	ADT		Surge & Purge w/ Whale pump

Driller:	**Drilling Method:**	**Drilling Equipment:**	**Horiz Datum/Proj:** **Vert Datum:** **Ground Surface Elev:** --	**Easting:** 706920.1 ft. **Northing:** 1411562.0 ft. **TOC Elev:** 26.7 ft.
L. Darrow	HSA	CME-55		



Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Readings (ppm)	Remarks
		FILL	No split spoon samples collected.				0-1.5' Concrete pad
							1.5-20.0' Cement/bentonite grout
5							
10							
15							
20							20-23' Bentonite grout
							23.0-23.5' #00 Choker sand
25							23.5-30.5' #1 Filter sand
		FILL	**FILL** Black mf GRAVEL and cmf SAND, trace Silt & Clay.	22-25-14-14	1	49.4	
				3-6-5-3	2	32.8	25.5-30.5' 0.01 Slot steel screen
30		ML CL	**NATIVE SOILS** Gray SILT & CLAY.				

MONITORING WELL LOG

BROWN AND CALDWELL

Project Name: Troy Area 2 ISCO & CPT Testing
Project Number: 24758.021
Project Location: Troy, NY

Permit Number: NA

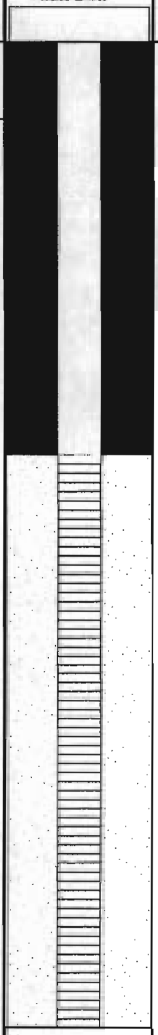
Well No. MP-1S
Page 1 **of** 1

Geologist/Office	**Checked By:**	**Borehole Diameter:**	**Screen Diameter and Type:**	**Slot Size:**	**Total Boring Depth (ft)**
J. Vorbach/Allendale	J. Vorbach	8"	.75" Schedule 40 PVC	.010"	25.8 ft.

Start/Finish Date: 10/12/04 - 10/12/04
Drilling Contractor: Cone Tec
Sampling:
Hammer Type:
Development Method: NA

Driller: Andy Carpenter
Drilling Method: SSA & 25 ton CPT
Drilling Equipment: Cone Penetrometer
Horiz Datum/Proj:
Vert Datum:
Ground Surface Elev: --
Easting: 706923.2 ft.
Northing: 1411577.0 ft.
TOC Elev: 27.0 ft.

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Sample Int	Recovery	Lithology	Well	Readings (ppm)	Remarks
			No Sediment samples Collected.						Traffic Rated Vault Box		6" diameter vault box, sealed with a concrete collar
5											Schedule 40 PVC Riser, Bentonite Grout
10											10.75' - 25.75' Screened Zone
15											
20											
25											



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MONITORING WELL LOG

BROWN AND CALDWELL

Project Name: Troy Area 2 ISCO MP
Project Number: 24758.022/128805
Project Location: Troy, NY

Permit Number: NA

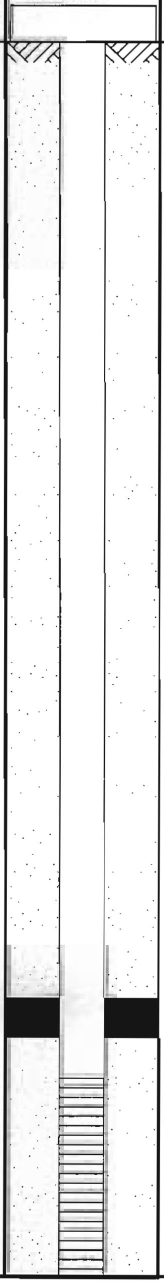
Well No. MP-1D
Page 1 of 1

Geologist/Office: M. Cavas/Allendale
Checked By: JLM
Borehole Diameter: 2"
Screen Diameter and Type: 3/4" PVC
Slot Size: .010"
Total Boring Depth (ft): 31.0 ft.

Start/Finish Date: 7/18/05 - 7/18/05
Drilling Contractor: Zebra Environmental
Sampling: NA
Hammer Type: NA
Development Method: NA

Driller: Will McAllister
Drilling Method: Direct-Push
Drilling Equipment: GeoProbe 6600
Horiz Datum/Proj:
Vert Datum:
Ground Surface Elev: --
Easting: 706928.9 ft.
Northing: 1411570.0 ft.
TOC Elev: 27.0 ft.

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log				Readings (ppm)	Remarks
						Sample Int	Recovery	Lithology	Well Traffic Rated Vault Box		
5											
10											
15											
20											
25											
30											



MONITORING WELL LOG

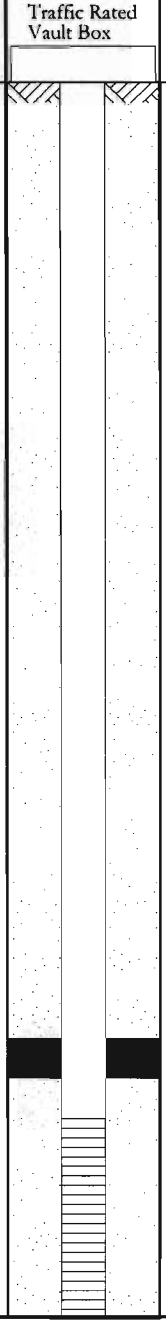
BROWN AND CALDWELL	**Project Name:** Troy Area 2 ISCO MP **Project Number:** 24758.022/128805 **Project Location:** Troy, NY	**Permit Number:** NA	**Well No.** **MP-2D** **Page** 1 **of** 1

Geologist/Office	**Checked By:**	**Borehole Diameter:**	**Screen Diameter and Type:**	**Slot Size:**	**Total Boring Depth (ft)**
M. Cavas/Allendale	JLM	2"	3/4" PVC	.010"	31.0 ft.

Start/Finish Date	**Drilling Contractor:**	**Sampling:** NA **Hammer Type:** NA	**Development Method:**
7/18/05 - 7/18/05	Zebra Environmental		NA

Driller:	**Drilling Method:**	**Drilling Equipment:**	**Horiz Datum/Proj:** **Vert Datum:** **Ground Surface Elev:** --	**Easting:** 706902.4 ft. **Northing:** 1411517.0 ft. **TOC Elev:** 27.3 ft.
Will McAllister	Direct-Push	GeoProbe 6600		

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log: Sample Int	Recovery	Lithology	Well	Readings (ppm)	Remarks
5											
10											
15											
20											
25											
30											



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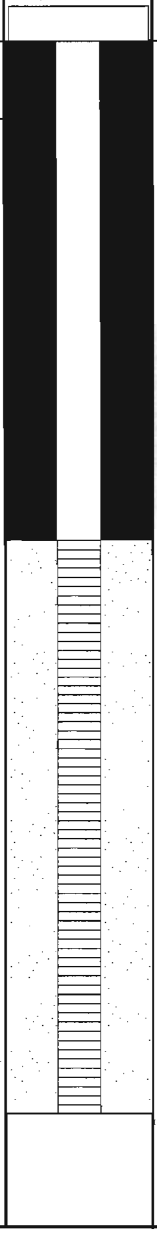
MONITORING WELL LOG

BROWN AND CALDWELL	**Project Name:** Troy Area 2 ISCO & CPT Testing **Project Number:** 24758.021 **Project Location:** Troy, NY	**Permit Number:** NA	**Well No.** **MP-4S** **Page** 1 **of** 1

Geologist/Office	**Checked By:**	**Borehole Diameter:**	**Screen Diameter and Type:**	**Slot Size:**	**Total Boring Depth (ft)**
J. Vorbach/Allendale	J. Vorbach	8"	.75" Schedule 40 PVC	.010"	28.0 ft.

Start/Finish Date	**Drilling Contractor:**	**Sampling:** **Hammer Type:**	**Development Method:**
10/11/04 - 10/11/04	Cone Tec		NA

Driller:	**Drilling Method:**	**Drilling Equipment:**	**Horiz Datum/Proj:** **Vert Datum:** **Ground Surface Elev:** --	**Easting:** 706919.1 ft. **Northing:** 1411598.0 ft. **TOC Elev:** 27.0 ft.
Andy Carpenter	SSA & 25 ton CPT	Cone Penetrometer		

Depth (feet)	**Elevation (feet)**	**USC Soil Type**	**Description**	**Blow Counts**	**Sample No.**	**Sample Int**	**Recovery**	**Lithology**	**Well** Traffic Rated Vault Box	**Readings (ppm)**	**Remarks**
			No Sediment Samples Collected.								6" diameter vault box, sealed with a concrete collar
5											
											Schedule 40 PVC Riser, Bentonite Grout
10											
											13' - 28' Screened Zone
15											
20											
25											

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MONITORING WELL LOG

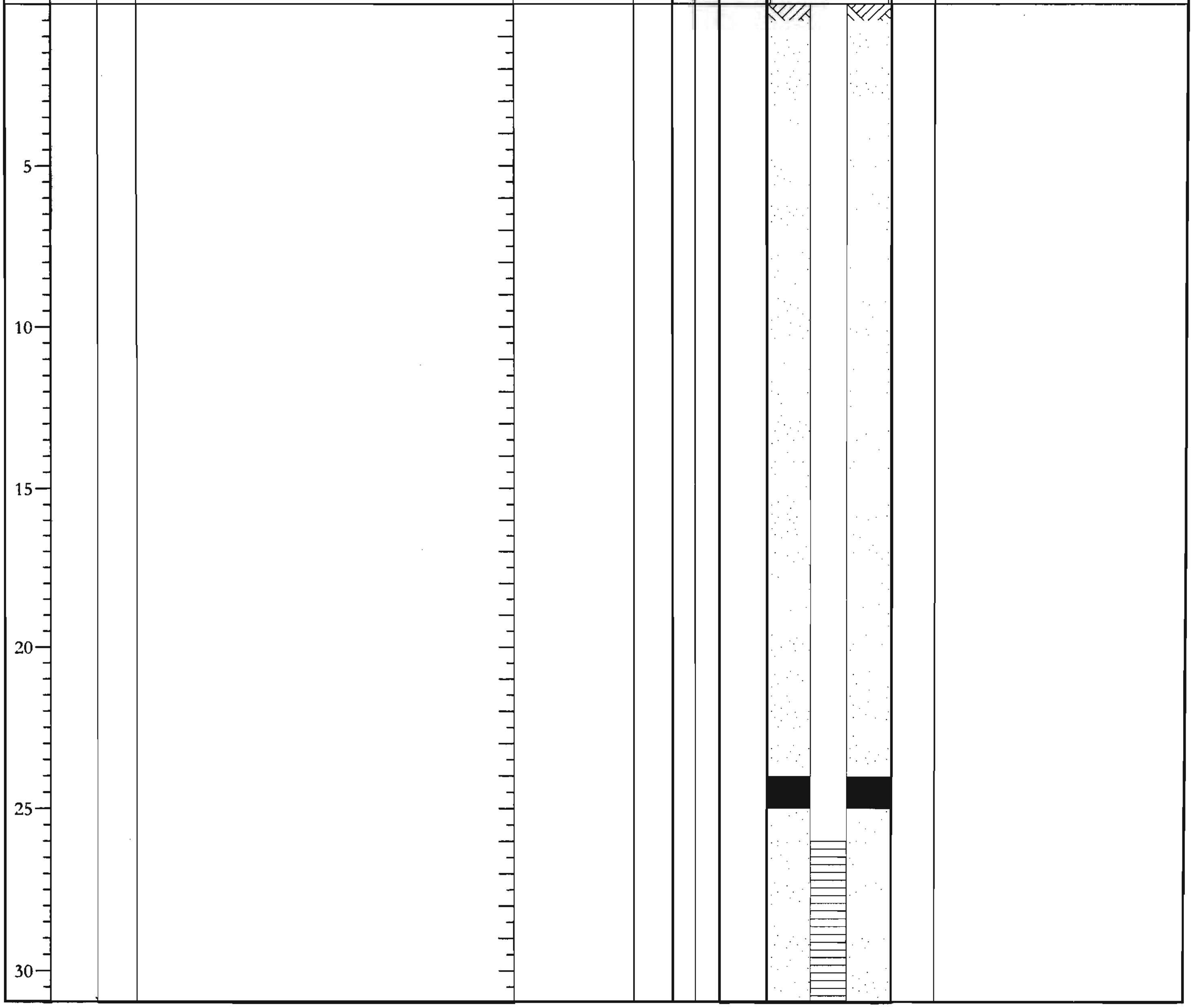
BROWN AND CALDWELL	**Project Name:** Troy Area 2 ISCO MP **Project Number:** 24758.022/128805 **Project Location:** Troy, NY	**Permit Number:** NA	**Well No.** **MP-4D** **Page** 1 **of** 1

Geologist/Office	**Checked By:**	**Borehole Diameter:**	**Screen Diameter and Type:**	**Slot Size:**	**Total Boring Depth (ft)**
M. Cavas/Allendale	JLM	2"	3/4" PVC	.010"	31.0 ft.

Start/Finish Date	**Drilling Contractor:**	**Sampling:** NA	**Development Method:**
7/18/05 - 7/18/05	Zebra Environmental	**Hammer Type:** NA	NA

Driller:	**Drilling Method:**	**Drilling Equipment:**	**Horiz Datum/Proj:** **Vert Datum:** **Ground Surface Elev:** --	**Easting:** 706917.8 ft. **Northing:** 1411598.0 ft. **TOC Elev:** 27.0 ft.
Will McAllister	Direct-Push	GeoProbe 6600		

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log: Sample Int	Graphic Log: Recovery	Graphic Log: Lithology	Graphic Log: Well	Readings (ppm)	Remarks
									Traffic Rated Vault Box		



MONITORING WELL LOG

BROWN AND CALDWELL

Project Name: Troy Area 2 ISCO & CPT Testing
Project Number: 24758.021
Project Location: Troy, NY

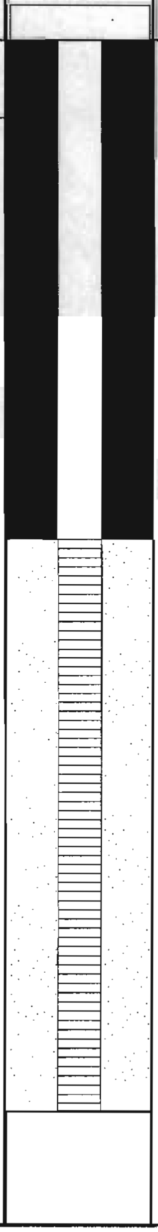
Permit Number: NA

Well No. **MP-6**
Page 1 **of** 1

Geologist/Office	**Checked By:**	**Borehole Diameter:**	**Screen Diameter and Type:**	**Slot Size:**	**Total Boring Depth (ft)**
J. Vorbach/Allendale	J. Vorbach	8"	.75" Schedule 40 PVC	.010"	28.0 ft.

Start/Finish Date	**Drilling Contractor:**	**Sampling:** / **Hammer Type:**	**Development Method:**
10/11/04 - 10/11/04	Cone Tec		NA

Driller:	**Drilling Method:**	**Drilling Equipment:**	**Horiz Datum/Proj:** **Vert Datum:** **Ground Surface Elev:** --	**Easting:** 706876.1 ft. **Northing:** 1411553.0 ft. **TOC Elev:** 27.4 ft.
Andy Carpenter	SSA & 25 ton CPT	Cone Penetrometer		

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Sample Int	Recovery	Lithology	Well Traffic Rated Vault Box	Readings (ppm)	Remarks
			No Sediment Samples Collected.								6" diameter vault box, sealed with a concrete collar
5											
											Schedule 40 PVC Riser, Bentonite Grout
10											
											13' - 28' Screened Zone
15											
20											
25											

MONITORING WELL LOG

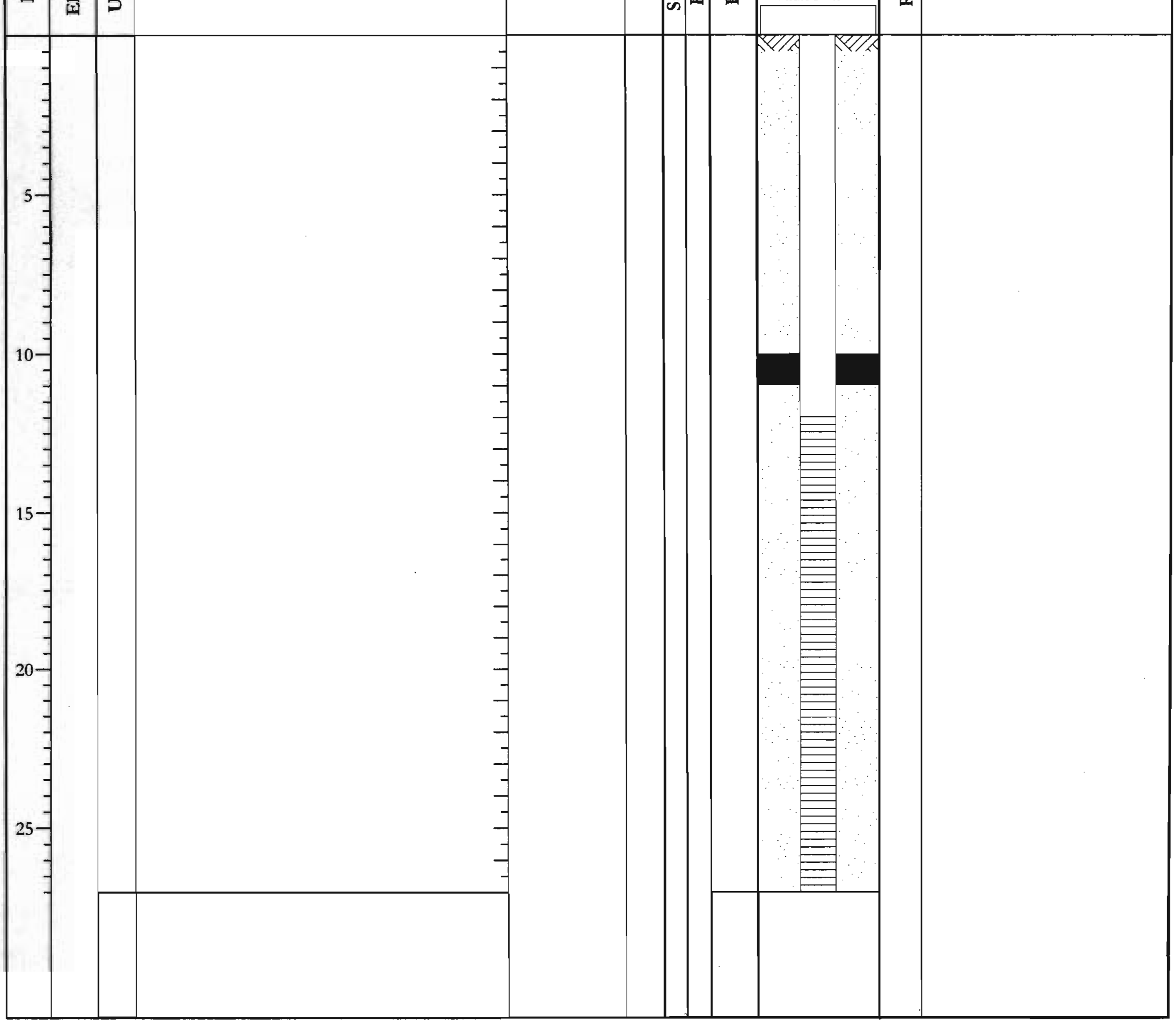
BROWN AND CALDWELL	**Project Name:** Troy Area 2 ISCO MP **Project Number:** 24758.022/128805 **Project Location:** Troy, NY	**Permit Number:** NA	**Well No.** **MP-7S** **Page** 1 **of** 1

Geologist/Office	**Checked By:**	**Borehole Diameter:**	**Screen Diameter and Type:**	**Slot Size:**	**Total Boring Depth (ft)**
N. Krupinski/Allendale	JLM	2"	3/4" PVC	.010"	27.0 ft.

Start/Finish Date	**Drilling Contractor:**	**Sampling:** NA **Hammer Type:** NA	**Development Method:**
12/13/04 - 12/13/04	Zebra Environmental		NA

Driller:	**Drilling Method:**	**Drilling Equipment:**		
Will McAllister	Direct-Push		**Horiz Datum/Proj:** **Vert Datum:** **Ground Surface Elev:** --	**Easting:** 706909.9 ft. **Northing:** 1411559.0 ft. **TOC Elev:** 27.1 ft.

Depth (feet)	**Elevation (feet)**	**USC Soil Type**	**Description**	**Blow Counts**	**Sample No.**	**Graphic Log** Sample Int	Recovery	Lithology	Well	**Readings (ppm)**	**Remarks**
									Traffic Rated Vault Box		



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MONITORING WELL LOG

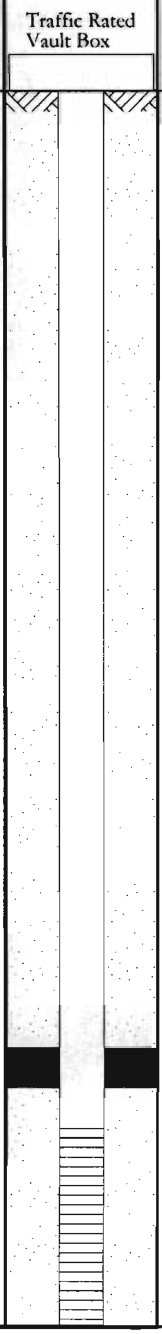
BROWN AND CALDWELL	**Project Name:** Troy Area 2 ISCO MP **Project Number:** 24758.022/128805 **Project Location:** Troy, NY	**Permit Number:** NA	**Well No.** MP-7D **Page** 1 **of** 1

Geologist/Office	**Checked By:**	**Borehole Diameter:**	**Screen Diameter and Type:**	**Slot Size:**	**Total Boring Depth (ft)**
M. Cavas/Allendale	JLM	2"	3/4" PVC	.010"	31.0 ft.

Start/Finish Date	**Drilling Contractor:**	**Sampling:** NA	**Development Method:**
7/18/05 - 7/18/05	Zebra Environmental	**Hammer Type:** NA	NA

Driller:	**Drilling Method:**	**Drilling Equipment:**	**Horiz Datum/Proj:** **Vert Datum:** **Ground Surface Elev:** --	**Easting:** 706910.5 ft. **Northing:** 1411558.0 ft. **TOC Elev:** 27.1 ft.
Will McAllister	Direct-Push	GeoProbe 6600		

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log: Sample Int	Graphic Log: Recovery	Graphic Log: Lithology	Graphic Log: Well	Readings (ppm)	Remarks
5											
10											
15											
20											
25											
30											



MONITORING WELL LOG

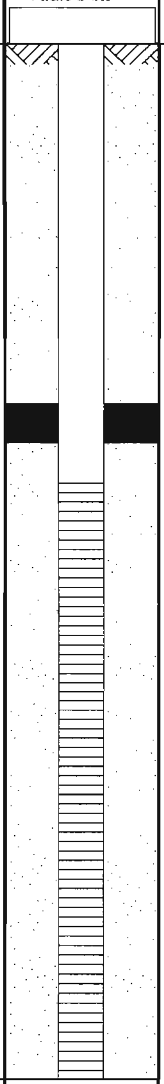
BROWN AND CALDWELL	**Project Name:** Troy Area 2 ISCO MP **Project Number:** 24758.022/128805 **Project Location:** Troy, NY	**Permit Number:** NA	**Well No.** MP-8S **Page** 1 **of** 1

Geologist/Office	**Checked By:**	**Borehole Diameter:**	**Screen Diameter and Type:**	**Slot Size:**	**Total Boring Depth (ft)**
N. Krupinski/Allendale	JLM	2"	3/4" PVC	.010"	26.0 ft.

Start/Finish Date	**Drilling Contractor:**	**Sampling:** NA	**Development Method:**
12/13/04 - 12/13/04	Zebra Environmental	**Hammer Type:** NA	NA

Driller:	**Drilling Method:**	**Drilling Equipment:**	**Horiz Datum/Proj:** **Vert Datum:** **Ground Surface Elev:** --	**Easting:** 706922.6 ft. **Northing:** 1411562.0 ft. **TOC Elev:** 26.9 ft.
Will McAllister	Direct-Push			

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log: Sample Int	Recovery	Lithology	Well Traffic Rated Vault Box	Readings (ppm)	Remarks
5											
10											
15											
20											
25											



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MONITORING WELL LOG

BROWN AND CALDWELL

Project Name: Troy Area 2 ISCO MP
Project Number: 24758.022/128805
Project Location: Troy, NY

Permit Number: NA

Well No. MP-8D
Page 1 **of** 1

Geologist/Office	**Checked By:**	**Borehole Diameter:**	**Screen Diameter and Type:**	**Slot Size:**	**Total Boring Depth (ft)**
M. Cavas/Allendale	JLM	2"	3/4" PVC	.010"	31.0 ft.

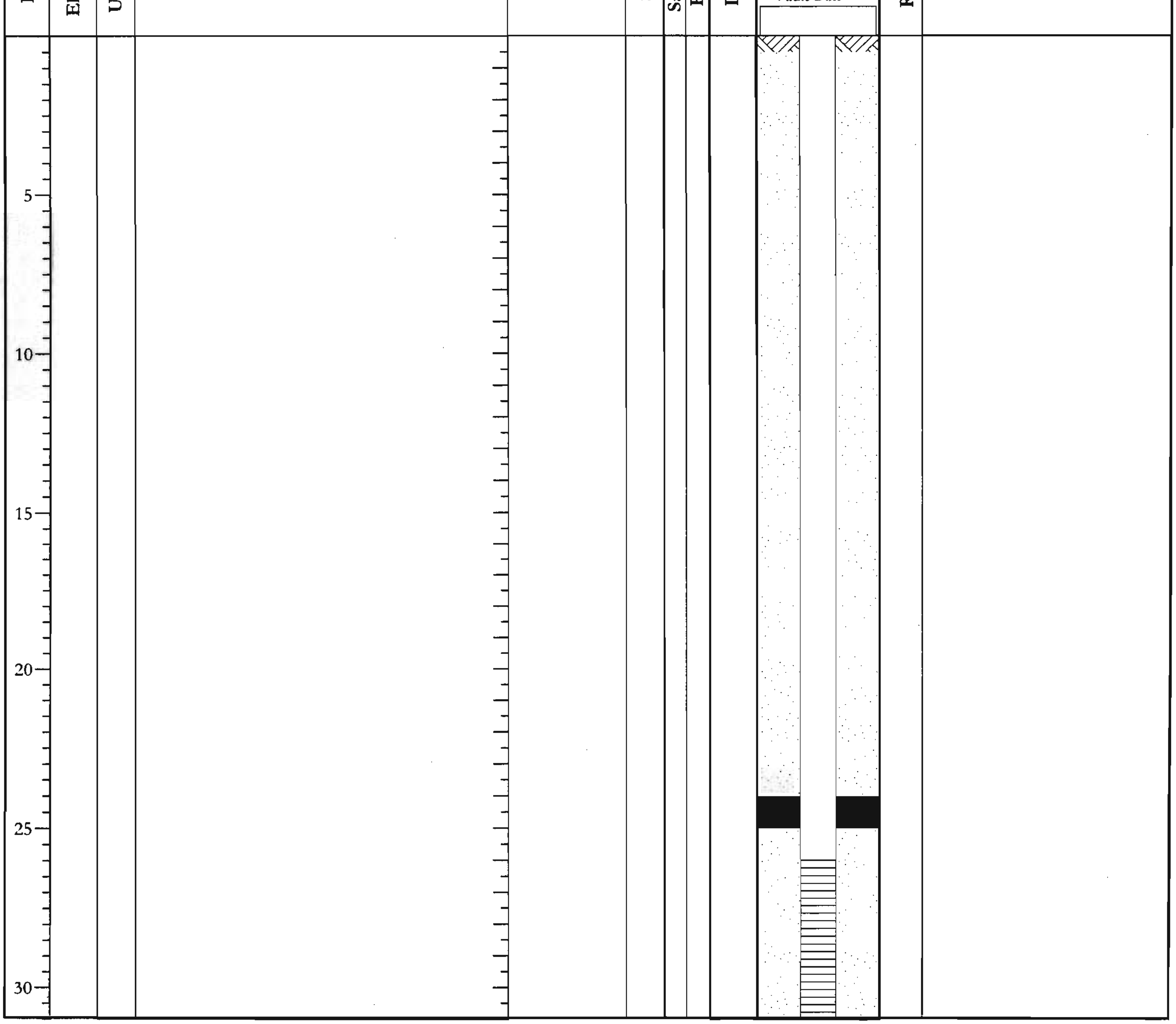
Start/Finish Date	**Drilling Contractor:**	**Sampling:** NA **Hammer Type:** NA	**Development Method:**
7/18/05 - 7/18/05	Zebra Environmental		NA

Driller:	**Drilling Method:**	**Drilling Equipment:**
Will McAllister	Direct-Push	GeoProbe 6600

Horiz Datum/Proj:
Vert Datum:
Ground Surface Elev: --

Easting: 706922.5 ft.
Northing: 1411563.0 ft.
TOC Elev: 27.1 ft.

Depth (feet)	**Elevation (feet)**	**USC Soil Type**	**Description**	**Blow Counts**	**Sample No.**	**Graphic Log** **Sample Int**	 **Recovery**	 **Lithology**	 **Well** Traffic Rated Vault Box	**Readings (ppm)**	**Remarks**



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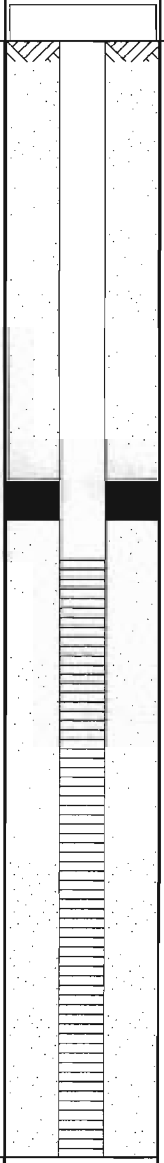
MONITORING WELL LOG

BROWN AND CALDWELL	**Project Name:** Troy Area 2 ISCO MP **Project Number:** 24758.022/128805 **Project Location:** Troy, NY	**Permit Number:** NA	**Well No.** MP-9S Page 1 of 1

Geologist/Office	**Checked By:**	**Borehole Diameter:**	**Screen Diameter and Type:**	**Slot Size:**	**Total Boring Depth (ft)**
N. Krupinski/Allendale	JLM	2"	3/4" PVC	.010"	28.0 ft.

Start/Finish Date	**Drilling Contractor:**	**Sampling:** NA	**Development Method:**
12/13/04 - 12/13/04	Zebra Environmental	**Hammer Type:** NA	NA

Driller:	**Drilling Method:**	**Drilling Equipment:**	**Horiz Datum/Proj:** **Vert Datum:** **Ground Surface Elev:** --	**Easting:** 706933.3 ft. **Northing:** 1411557.0 ft. **TOC Elev:** 26.7 ft.
Will McAllister	Direct-Push			

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log				Readings (ppm)	Remarks
						Sample Int	Recovery	Lithology	Well Traffic Rated Vault Box		
5 10 15 20 25											

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MONITORING WELL LOG

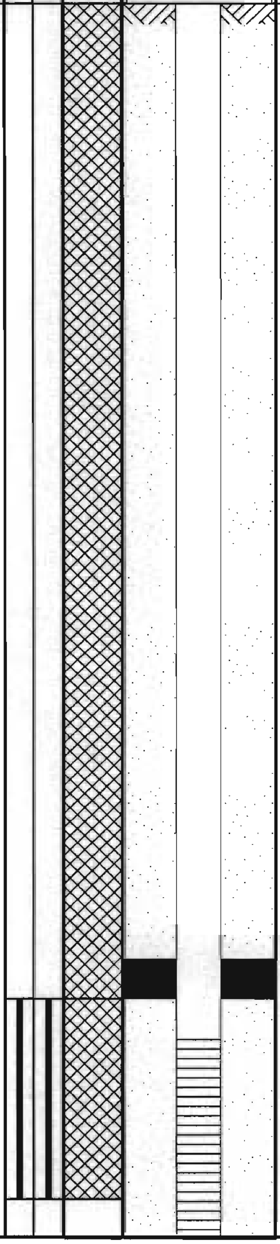
BROWN AND CALDWELL	**Project Name:** Troy Area 2 ISCO MP **Project Number:** 24758.022/128805 **Project Location:** Troy, NY	**Permit Number:** NA	**Well No.** MP-9D **Page** 1 **of** 1

Geologist/Office M. Cavas/Allendale	**Checked By:** JLM	**Borehole Diameter:** 2"	**Screen Diameter and Type:** 3/4" PVC	**Slot Size:** .010"	**Total Boring Depth (ft)** 31.0 ft.

Start/Finish Date 7/18/05 - 7/18/05	**Drilling Contractor:** Zebra Environmental	**Sampling:** Continuous Core **Hammer Type:** NA	**Development Method:** NA

Driller: Will McAllister	**Drilling Method:** Direct-Push	**Drilling Equipment:** GeoProbe 6600	**Horiz Datum/Proj:** **Vert Datum:** **Ground Surface Elev:** --	**Easting:** 706933.3 ft. **Northing:** 1411558.0 ft. **TOC Elev:** 26.8 ft.

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log: Sample Int / Recovery / Lithology / Well (Traffic Rated Vault Box)	Readings (ppm)	Remarks
		FILL	**FILL**					
5								
10								
15								
20								
25		FILL	Black SILT & CLAY. Brick fragment.	NA	1		NA	NAPL blebs throughout with slight MGP odor.
30								



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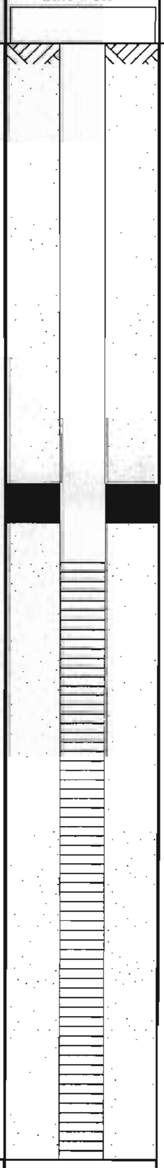
MONITORING WELL LOG

BROWN AND CALDWELL	**Project Name:** Troy Area 2 ISCO MP **Project Number:** 24758.022/128805 **Project Location:** Troy, NY	**Permit Number:** NA	**Well No.** **MP-10S** **Page** 1 **of** 1

Geologist/Office	**Checked By:**	**Borehole Diameter:**	**Screen Diameter and Type:**	**Slot Size:**	**Total Boring Depth (ft)**
N. Krupinski/Allendale	JLM	2"	3/4" PVC	.010"	28.0 ft.

Start/Finish Date	**Drilling Contractor:**	**Sampling:** NA **Hammer Type:** NA	**Development Method:**
12/13/04 - 12/13/04	Zebra Environmental		NA

Driller:	**Drilling Method:**	**Drilling Equipment:**	**Horiz Datum/Proj:** **Vert Datum:** **Ground Surface Elev:** --	**Easting:** 706948.8 ft. **Northing:** 1411561.0 ft. **TOC Elev:** 26.8 ft.
Will McAllister	Direct-Push			

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log				Readings (ppm)	Remarks
						Sample Int	Recovery	Lithology	Well Traffic Rated Vault Box		
5 10 15 20 25											

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MONITORING WELL LOG

BROWN AND CALDWELL

Project Name: Troy Area 2 ISCO MP
Project Number: 24758.022/128805
Project Location: Troy, NY

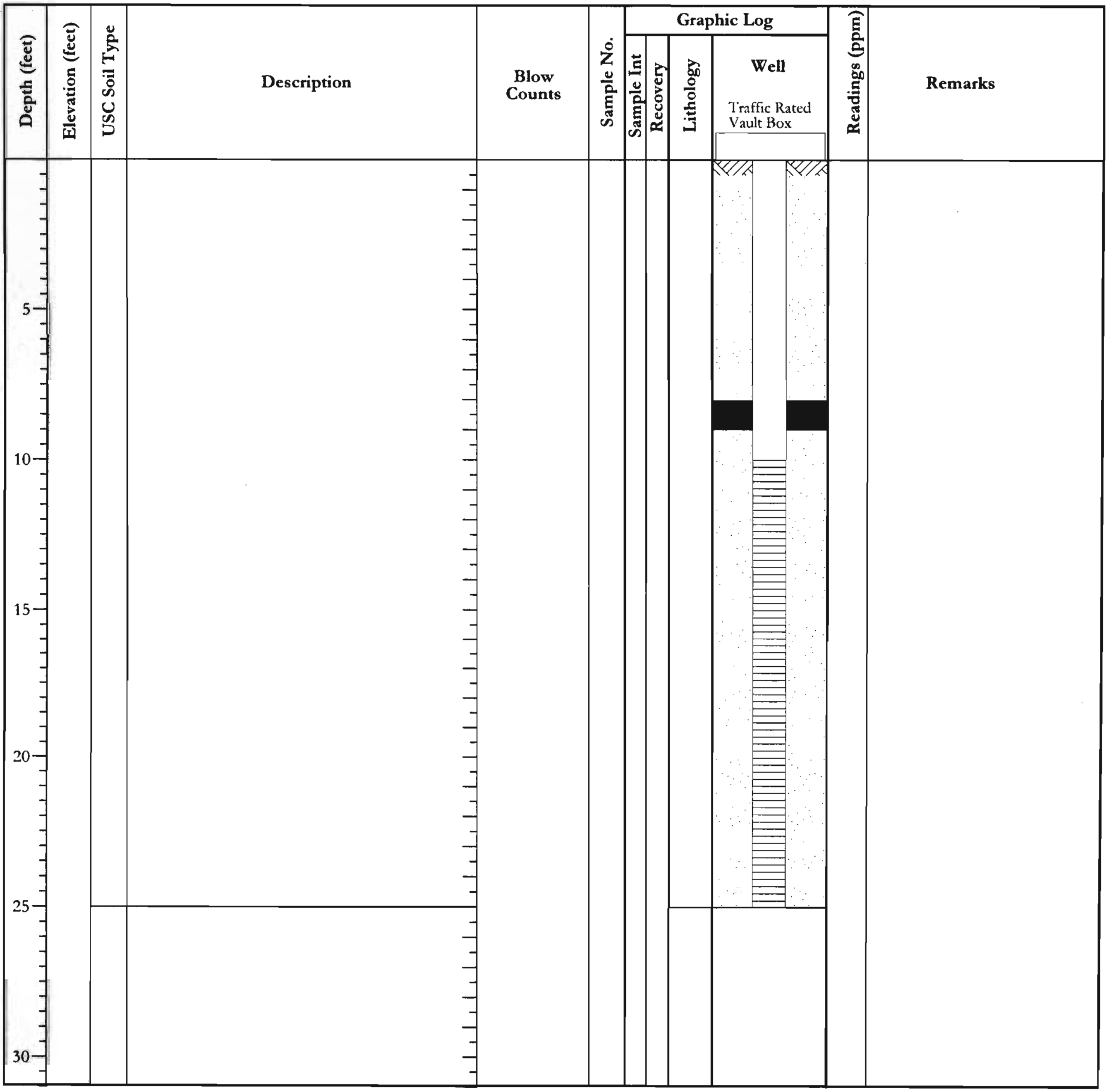
Permit Number: NA

Well No. MP-11S
Page 1 **of** 1

Geologist/Office	**Checked By:**	**Borehole Diameter:**	**Screen Diameter and Type:**	**Slot Size:**	**Total Boring Depth (ft)**
M. Cavas/Allendale	JLM	2"	3/4" PVC	.010"	31.0 ft.

Start/Finish Date 7/18/05 - 7/18/05
Drilling Contractor: Zebra Environmental
Sampling: NA
Hammer Type: NA
Development Method: NA

Driller: Will McAllister
Drilling Method: Direct-Push
Drilling Equipment: GeoProbe 6600
Horiz Datum/Proj:
Vert Datum:
Ground Surface Elev: --
Easting: 706910.4 ft.
Northing: 1411547.0 ft.
TOC Elev: 26.9 ft.



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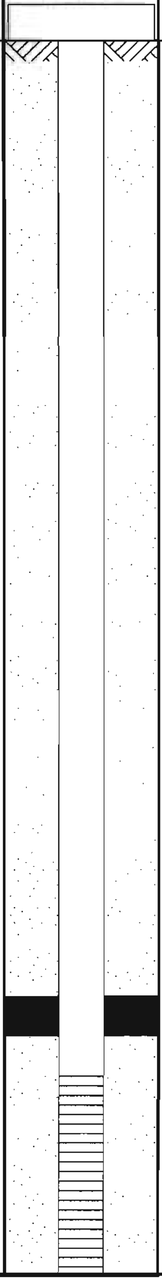
MONITORING WELL LOG

BROWN AND CALDWELL	**Project Name:** Troy Area 2 ISCO MP **Project Number:** 24758.022/128805 **Project Location:** Troy, NY	**Permit Number:** NA	**Well No.** MP-11D Page 1 of 1

Geologist/Office	**Checked By:**	**Borehole Diameter:**	**Screen Diameter and Type:**	**Slot Size:**	**Total Boring Depth (ft)**
M. Cavas/Allendale	JLM	2"	3/4" PVC	.010"	31.0 ft.

Start/Finish Date	**Drilling Contractor:**	**Sampling:** NA **Hammer Type:** NA	**Development Method:**
7/18/05 - 7/18/05	Zebra Environmental		NA

Driller:	**Drilling Method:**	**Drilling Equipment:**	**Horiz Datum/Proj:** **Vert Datum:** **Ground Surface Elev:** --	**Easting:** 706909.7 ft. **Northing:** 1411546.0 ft. **TOC Elev:** 26.9 ft.
Will McAllister	Direct-Push	GeoProbe 6600		

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log: Sample Int	Graphic Log: Recovery	Graphic Log: Lithology	Graphic Log: Well Traffic Rated Vault Box	Readings (ppm)	Remarks
5 10 15 20 25 30											

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MONITORING WELL LOG

BROWN AND CALDWELL

Project Name: Troy Area 2 ISCO MP
Project Number: 24758.022/128805
Project Location: Troy, NY

Permit Number: NA

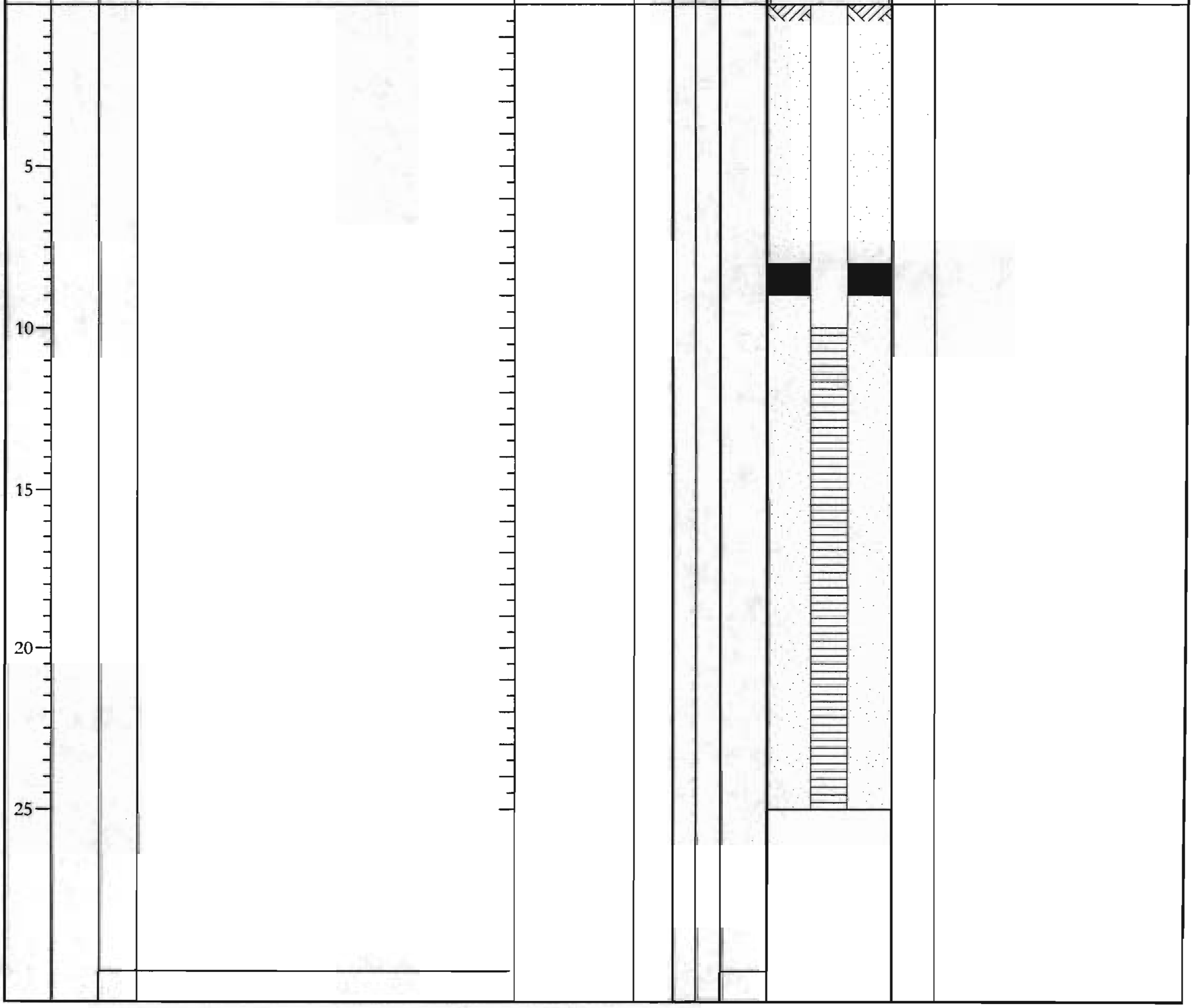
Well No. MP-12S
Page 1 of 1

Geologist/Office	**Checked By:**	**Borehole Diameter:**	**Screen Diameter and Type:**	**Slot Size:**	**Total Boring Depth (ft)**
M. Cavas/Allendale	JLM	2"	3/4" PVC	.010"	25.0 ft.

Start/Finish Date: 7/14/05 - 7/14/05
Drilling Contractor: Zebra Environmental
Sampling: NA
Hammer Type: NA
Development Method: NA

Driller: Will McAllister
Drilling Method: Direct-Push
Drilling Equipment: GeoProbe 6600
Horiz Datum/Proj:
Vert Datum:
Ground Surface Elev: --
Easting: 706898.7 ft.
Northing: 1411550.0 ft.
TOC Elev: 27.2 ft.

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Sample Int	Recovery	Lithology	Well Traffic Rated Vault Box	Readings (ppm)	Remarks



MONITORING WELL LOG

BROWN AND CALDWELL

Project Name: Troy Area 2 ISCO MP
Project Number: 24758.022/128805
Project Location: Troy, NY

Permit Number: NA

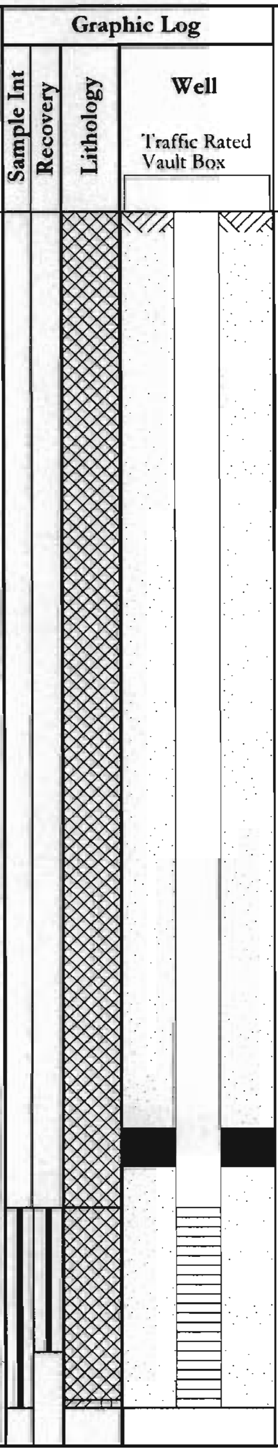
Well No. MP-12D
Page 1 **of** 1

Geologist/Office	**Checked By:**	**Borehole Diameter:**	**Screen Diameter and Type:**	**Slot Size:**	**Total Boring Depth (ft)**
M. Cavas/Allendale	JLM	2"	3/4" PVC	.010"	30.0 ft.

Start/Finish Date: 7/14/05 - 7/14/05
Drilling Contractor: Zebra Environmental
Sampling: Continuous Core
Hammer Type: NA
Development Method: NA

Driller: Will McAllister
Drilling Method: Direct-Push
Drilling Equipment: GeoProbe 6600
Horiz Datum/Proj:
Vert Datum:
Ground Surface Elev: --
Easting: 706898.6 ft.
Northing: 1411552.0 ft.
TOC Elev: 27.4 ft.

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Readings (ppm)	Remarks
		FILL	**FILL**				
5							
10							
15							
20							
25		FILL	Black cmf mcf GRAVEL, some (-) cmf Sand, trace (+) Clayey Silt. Brick and slag ore.	NA	1	NA	NAPL blebs in coarse material, MGP odor.
30		CL ML	**NATIVE SOILS** Glacial Fluvial Deposits. Blk Silty CLAY.				



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MONITORING WELL LOG

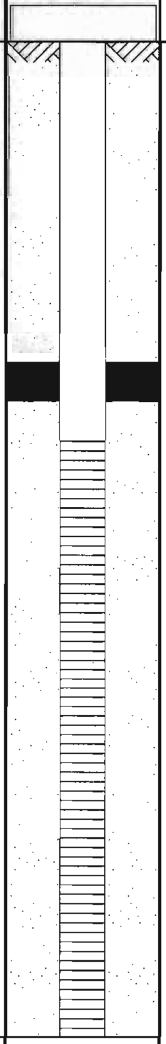
BROWN AND CALDWELL	**Project Name:** Troy Area 2 ISCO MP **Project Number:** 24758.022/128805 **Project Location:** Troy, NY	**Permit Number:** NA	**Well No.** MP-13S **Page** 1 **of** 1

Geologist/Office	**Checked By:**	**Borehole Diameter:**	**Screen Diameter and Type:**	**Slot Size:**	**Total Boring Depth (ft)**
M. Cavas/Allendale	JLM	2"	3/4" PVC	.010"	31.0 ft.

Start/Finish Date	**Drilling Contractor:**	**Sampling:** NA	**Development Method:**
7/14/05 - 7/14/05	Zebra Environmental	**Hammer Type:** NA	NA

Driller:	**Drilling Method:**	**Drilling Equipment:**		
Will McAllister	Direct-Push	GeoProbe 6600	**Horiz Datum/Proj:** **Vert Datum:** **Ground Surface Elev:** --	**Easting:** 706907.2 ft. **Northing:** 1411577.0 ft. **TOC Elev:** 28.0 ft.

Depth (feet)	**Elevation (feet)**	**USC Soil Type**	**Description**	**Blow Counts**	**Sample No.**	**Graphic Log** Sample Int	Recovery	Lithology	Well Traffic Rated Vault Box	**Readings (ppm)**	**Remarks**
5											
10											
15											
20											
25											
30											



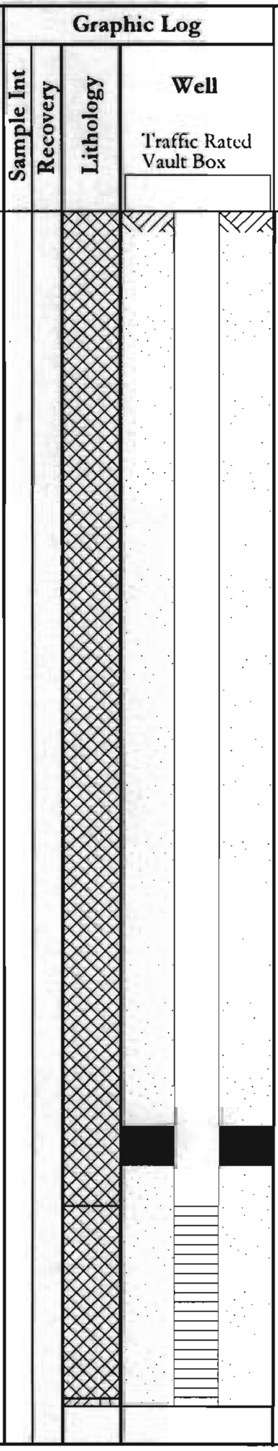
MONITORING WELL LOG

BROWN AND CALDWELL	**Project Name:** Troy Area 2 ISCO MP **Project Number:** 24758.022/128805 **Project Location:** Troy, NY	**Permit Number:** NA	**Well No.** **MP-13D** **Page** 1 **of** 1

Geologist/Office	**Checked By:**	**Borehole Diameter:**	**Screen Diameter and Type:**	**Slot Size:**	**Total Boring Depth (ft)**
M. Cavas/Allendale	JLM	2"	3/4" PVC	.010"	30.0 ft.

Start/Finish Date	**Drilling Contractor:**	**Sampling:** Continuous Core	**Development Method:**
7/14/05 - 7/14/05	Zebra Environmental	**Hammer Type:** NA	NA

Driller:	**Drilling Method:**	**Drilling Equipment:**	**Horiz Datum/Proj:** **Vert Datum:** **Ground Surface Elev:** --	**Easting:** 706905.2 ft. **Northing:** 1411577.0 ft. **TOC Elev:** 28.2 ft.
Will McAllister	Direct-Push	GeoProbe 6600		



Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Readings (ppm)	Remarks
		FILL	**FILL**				
25		FILL	Black cmf GRAVEL, little (-) cmf Sand. Slag ore and brick fragments.				Slight MGP odor and sheen present.
30		CL ML	**NATIVE SOILS** Blk Clayey SILT, little (+) f Sand.				

MONITORING WELL LOG

BROWN AND CALDWELL

Project Name: Troy Area 2 ISCO MP
Project Number: 24758.022/128805
Project Location: Troy, NY

Permit Number: NA

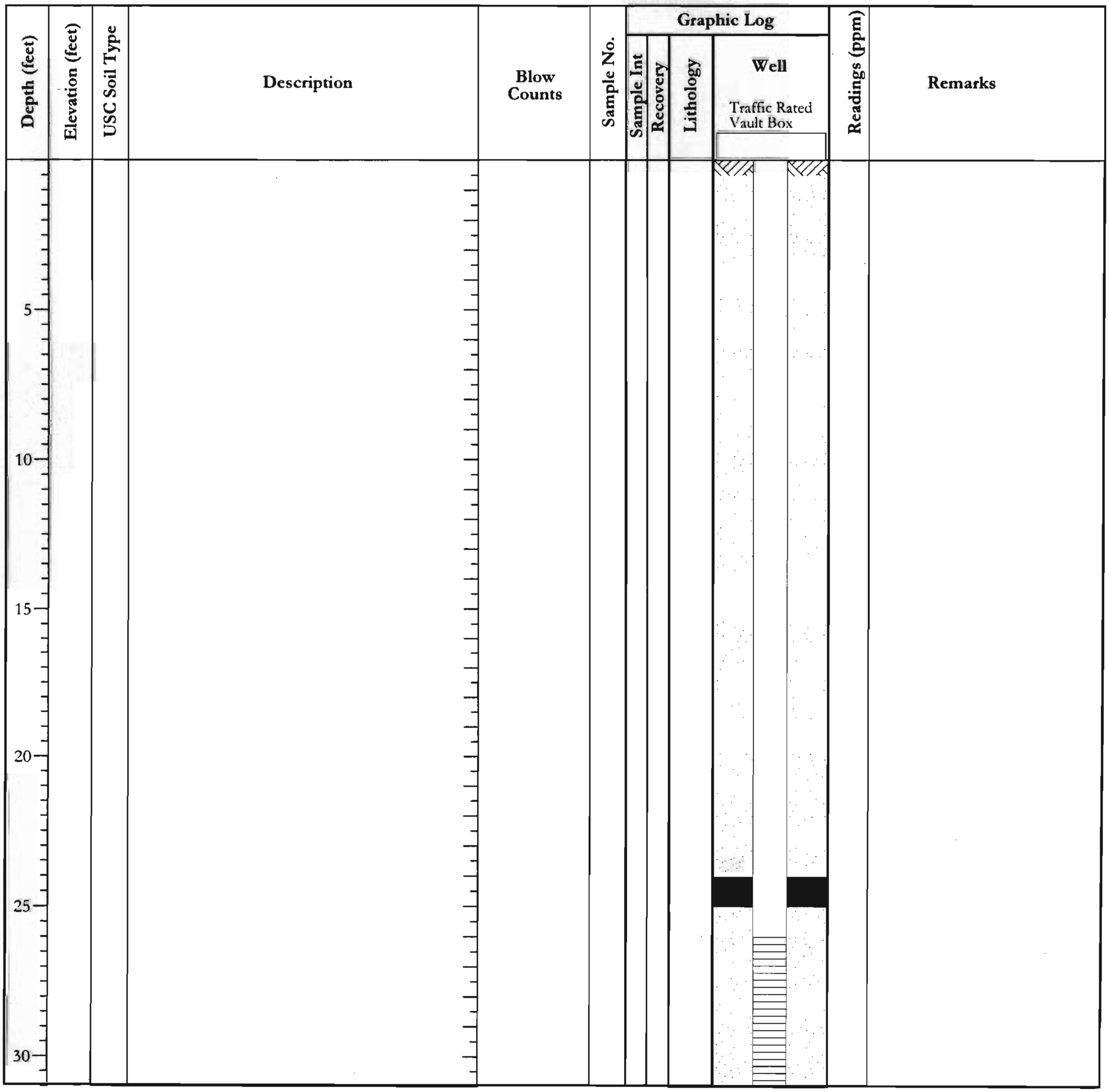
Well No. MP-21D
Page 1 of 1

Geologist/Office	**Checked By:**	**Borehole Diameter:**	**Screen Diameter and Type:**	**Slot Size:**	**Total Boring Depth (ft)**
M. Cavas/Allendale	JLM	2"	3/4" PVC	.010"	31.0 ft.

Start/Finish Date	**Drilling Contractor:**	**Sampling:** NA	**Development Method:**
7/18/05 - 7/18/05	Zebra Environmental	**Hammer Type:** NA	NA

Driller:	**Drilling Method:**	**Drilling Equipment:**	
Will McAllister	Direct-Push	GeoProbe 6600	**Horiz Datum/Proj:** **Vert Datum:** **Ground Surface Elev:** --

Easting: 706913.1 ft.
Northing: 1411542.0 ft.
TOC Elev: 27.2 ft.



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MONITORING WELL LOG

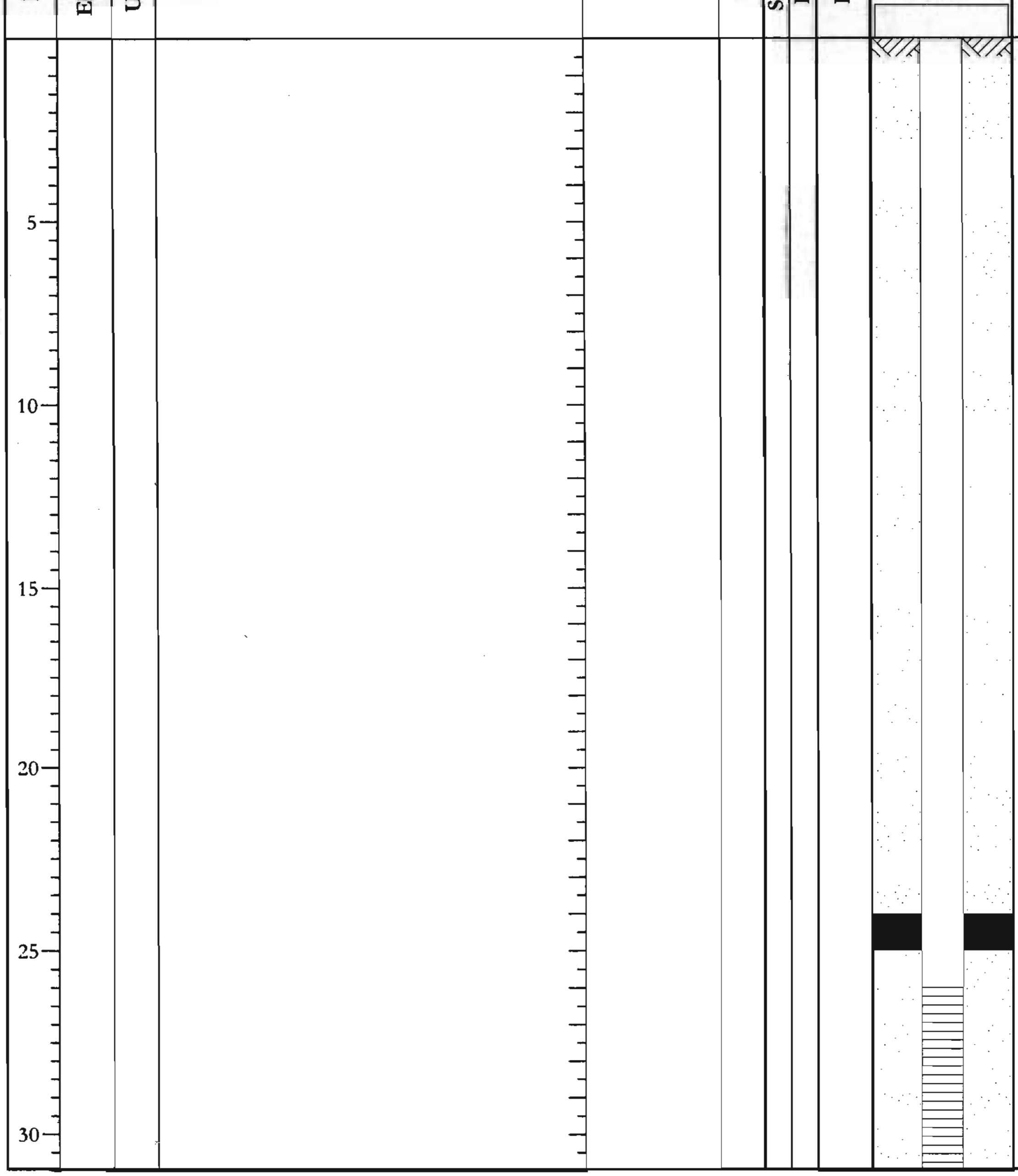
BROWN AND CALDWELL	**Project Name:** Troy Area 2 ISCO MP **Project Number:** 24758.022/128805 **Project Location:** Troy, NY	**Permit Number:** NA	**Well No.** **MP-27D** **Page** 1 **of** 1

Geologist/Office	**Checked By:**	**Borehole Diameter:**	**Screen Diameter and Type:**	**Slot Size:**	**Total Boring Depth (ft)**
M. Cavas/Allendale	JLM	2"	3/4" PVC	.010"	31.0 ft.

Start/Finish Date	**Drilling Contractor:**	**Sampling:** NA	**Development Method:**
7/18/05 - 7/18/05	Zebra Environmental	**Hammer Type:** NA	NA

Driller:	**Drilling Method:**	**Drilling Equipment:**		
Will McAllister	Direct-Push	GeoProbe 6600	**Horiz Datum/Proj:** **Vert Datum:** **Ground Surface Elev:** --	**Easting:** 706930.0 ft. **Northing:** 1411592.0 ft. **TOC Elev:** 26.9 ft.

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log: Sample Int	Graphic Log: Recovery	Graphic Log: Lithology	Graphic Log: Well	Readings (ppm)	Remarks



MONITORING WELL LOG

BROWN AND CALDWELL

Project Name: Troy Area 2 ISCO MP
Project Number: 24758.022/128805
Project Location: Troy, NY

Permit Number: NA

Well No. RMW-8D
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Geologist/Office	**Checked By:**	**Borehole Diameter:**	**Screen Diameter and Type:**	**Slot Size:**	**Total Boring Depth (ft)**
N. Krupinski/Allendale	JLM	4"	2" PVC	.010"	30.0 ft.

Start/Finish Date 10/6/05 - 10/6/05

Drilling Contractor: ADT

Sampling: Split Spoon
Hammer Type: Automatic

Development Method: Surging/Purging w/ Whale pump

Driller: Richie Comfort

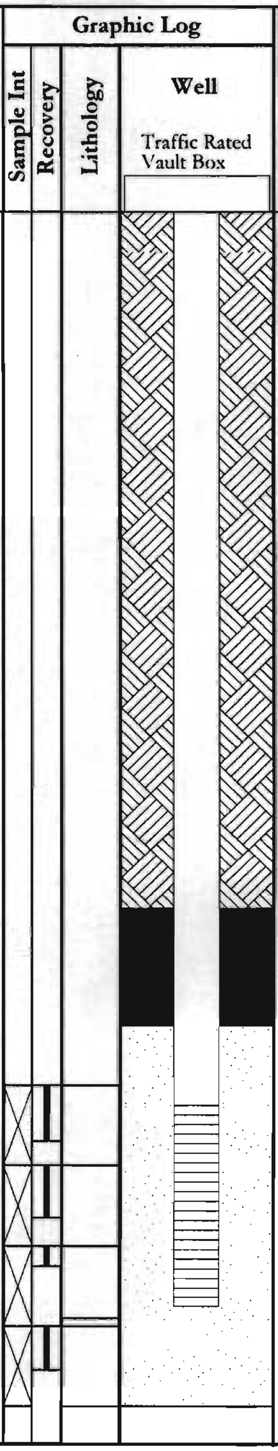
Drilling Method: HSA

Drilling Equipment: CME-55

Horiz Datum/Proj:
Vert Datum:
Ground Surface Elev: --

Easting: --
Northing: --
TOC Elev: --

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Readings (ppm)	Remarks
			No split spoon samples collected.				0-1.5' Concrete pad 1.5-17.5' Cement/bentonite grout
5							
10							
15							17.5-20.5 Bentonite Pellet Seal
20							20.5-30.0' #1 Filter sand
			FILL Black cmf SANd and mf GRAVEL, trace Silt. Saturated.	12-8-10-24	1	499	22-24' Saturated with yellow-brown NAPL and water.
25			Black mcf GRAVVEL, some (-) cmf Sand, little Clayey Silt.	7-15-18-21	2	256	24-28' Little NAPL, strong odor. 22.5-27.5' 0.01 Slot screen
			Black cmf SAND, some fm Gravel, trace Silt.	15-9-6-11	3	206	
30			**NATIVE SOILS** Black-gray mf GRAVEL, some Silt & Clay. Gravel is mostly angular, some smaller rounded. Dark Gray cmf SAND, some (+) fm Grael,	13-9-6-4	4	47.1	28-29' Viscous black coal tar.



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MONITORING WELL LOG

BROWN AND CALDWELL	**Project Name:** Troy Area 2 ISCO MP **Project Number:** 24758.022/128805 **Project Location:** Troy, NY	**Permit Number:** NA	**Well No.** RMW-8D **Page** 2 **of** 2

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log				Readings (ppm)	Remarks
						Sample Int	Recovery	Lithology	Well		
			little (-) Silt & Clay. @ 29.5' Gray SILT & CLAY and mf GRAVEL.								

BORING LOG

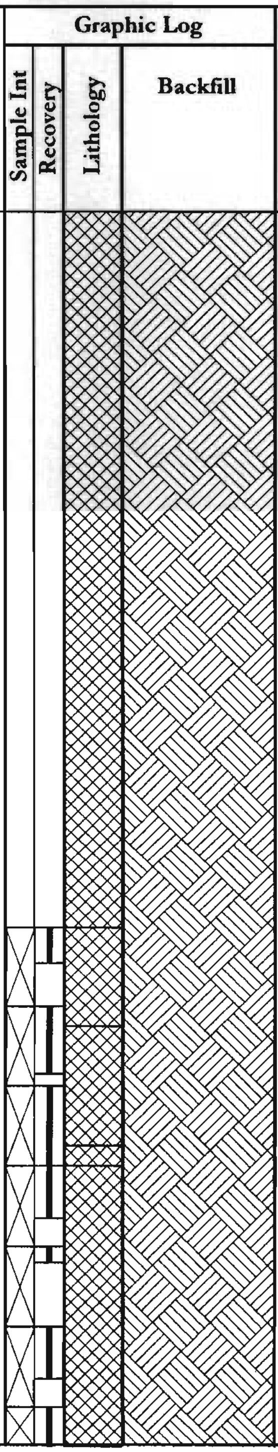
BROWN AND CALDWELL	**Project Name:** Troy Area 2 ISCO MP **Project Number:** 24758.022/128805 **Project Location:** Troy, NY	**Permit Number:** NA	**Boring No.** SB-200 **Page** 1 **of** 2

Geologist/Office	**Checked By:**	**Borehole Diameter:**	**Screen Diameter and Type:**	**Slot Size:**	**Total Boring Depth (ft)**
N. Krupinski/Allendale	JLM	6"		NA"	32.0 ft.

Start/Finish Date	**Drilling Contractor:**	**Sampling:** Split Spoon	**Development Method:**
7/25/05 - 7/25/05	ADT	**Hammer Type:** Automatic	NA

Driller:	**Drilling Method:**	**Drilling Equipment:**	**Horiz Datum/Proj:** **Vert Datum:** **Ground Surface Elev:** --	**Easting:** -- **Northing:** -- **TOC Elev:** --
L. Darrow	HSA	CME-55		

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Readings (ppm)	Remarks
		FILL	No split spoon samples collected.				
5							
10							
15							
		FILL	**FILL** Black-stained mcf GRAVEL (coke, slag), some (-) cmf Sand, little (-) Silt.	16-6-6-8	1	107	18.0-20.5' Black coal tar and yellow NAPL throughout, saturated w/ NAPL.
20				12-7-23-36	2	86	
		FILL	Black-stained cmf SAND, come mf Gravel, some Silt & Clay. Piece of gray brick @ 21.6-8'. Saturated.	25-16-15-26	3	179	20.5-23.5' Saturated w/ wate, NAPL, coal tar and petroleum (brown and yellow).
25		FILL FILL	Black fm SAND, little Silt. Black cmf SAND and fm GRAVEL, trace Silt & Clay. @ 25.2-6', 29.3-5' lens of black-brown tar. @ 25.8'-26.0' lens of Black mf GRAVEL (slag), little Clayey Silt. @ 28.0'-28.4' lens of Black Clayey SILT, some mf Gravel, little cmf Sand.	23-18-12-11	4	217	23.5-24.0' Black-brown coal tar, little petroleum. Strong odor. 24.0-31.0' Coal tar, strong odor. @ 25.2-6', 29.3-5' lens of black-brown tar.
				12-23-9-8	5	238	
				2-4-4-4	6	47.6	
30				3-3-3-3	7	16.1	



BORING LOG

BROWN AND CALDWELL	Project Name: Troy Area 2 ISCO MP Project Number: 24758.022/128805 Project Location: Troy, NY	Permit Number: NA	Boring No. SB-200 Page 2 of 2

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log: Sample Int	Graphic Log: Recovery	Graphic Log: Lithology	Graphic Log: Backfill	Readings (ppm)	Remarks
		ML CL	**NATIVE SOILS** Gray SILT & CLAY. Occasional sticks @ 31.0-5'.			☒	I	▥	▨		

BORING LOG

BROWN AND CALDWELL

Project Name: Troy Area 2 ISCO MP
Project Number: 24758.022/128805
Project Location: Troy, NY

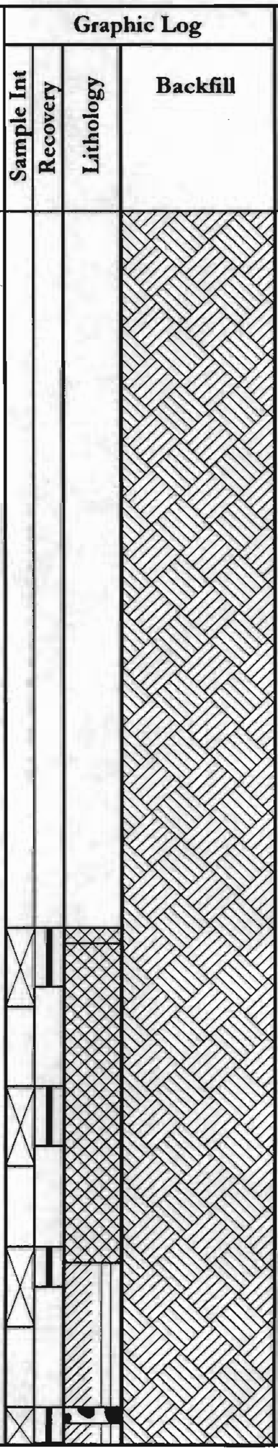
Permit Number: NA

Boring No. SB-200_Post
Page 1 **of** 2

Geologist/Office	**Checked By:**	**Borehole Diameter:**	**Screen Diameter and Type:**	**Slot Size:**	**Total Boring Depth (ft)**
M. Cavas/Allendale	JLM	3"		NA"	32.0 ft.

Start/Finish Date: 10/7/05 - 10/7/05
Drilling Contractor: ADT
Sampling: Split Spoon
Hammer Type: Automatic
Development Method: NA

Driller: Richie Comfort
Drilling Method: HSA
Drilling Equipment: CME-55
Horiz Datum/Proj:
Vert Datum:
Ground Surface Elev: --
Easting: --
Northing: --
TOC Elev: --



Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Readings (ppm)	Remarks
			No SS samples collected				
5							
10							
15							
		FILL FILL	**FILL** Slag ore, cinders, purifier waste. Blk cmf SAND, little (+) Silt & Clay. Blk cmf GRAVEL, some (-) to little (-) cmf Sand, trace (+) to no Silt & Clay.	8-3-4-8	1	56.9	NAPL throughout, slight odor. SB-200_Post-18-20
20							
				8-20-12-13	2	79.1	Moderate MGP odor and NAPL. SB-200_Post-22-24
25							
		CL ML	**NATIVE SOIL** Glacial Fluvial Deposits Blk Clayey SILT, some (-) fmc Sand. Minor stratification.	11-4-3-5	3	6.1	NAPL until 26.85'. SB-200_Post-26-28
30		GW	Blk cmf GRAVEL.	6-3-3-3	4	24.9	Strong MGP odor and

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BORING LOG

BROWN AND CALDWELL	**Project Name:** Troy Area 2 ISCO MP **Project Number:** 24758.022/128805 **Project Location:** Troy, NY	**Permit Number:** NA	**Boring No.** **SB-200_Post** **Page** 2 **of** 2

Depth (feet)	**Elevation (feet)**	**USC Soil Type**	**Description**	**Blow Counts**	**Sample No.**	**Graphic Log**				**Readings (ppm)**	**Remarks**
						Sample Int	**Recovery**	**Lithology**	**Backfill**		
		CL ML	Blk Silty CLAY.			☒		▨	▨		NAPL on sides of SS. SB-200_Post-30-32

BORING LOG

BROWN AND CALDWELL

Project Name: Troy Area 2 ISCO MP
Project Number: 24758.022/128805
Project Location: Troy, NY

Permit Number: NA

Boring No. SB-201
Page 1 **of** 2

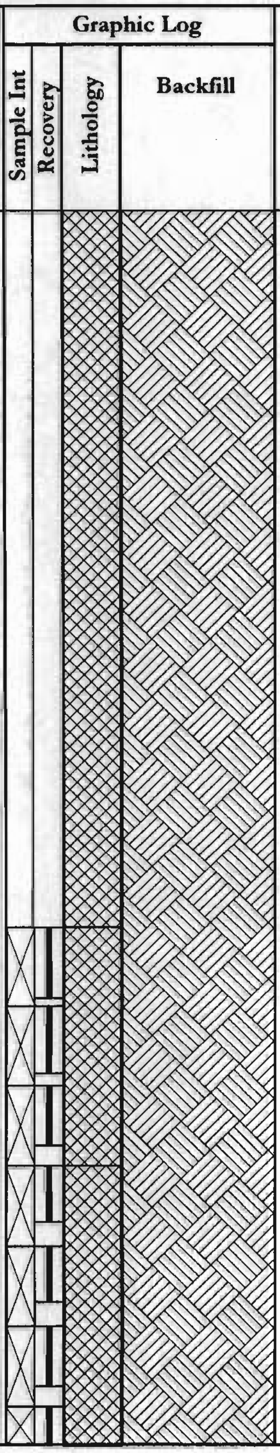
Geologist/Office	**Checked By:**	**Borehole Diameter:**	**Screen Diameter and Type:**	**Slot Size:**	**Total Boring Depth (ft)**
N. Krupinski/Allendale	JLM	6"		NA"	32.0 ft.

Start/Finish Date	**Drilling Contractor:**	**Sampling:** Split Spoon **Hammer Type:** Automatic	**Development Method:**
7/26/05 - 7/26/05	ADT		NA

Driller:	**Drilling Method:**	**Drilling Equipment:**	**Horiz Datum/Proj:** **Vert Datum:** **Ground Surface Elev:** --	**Easting:** -- **Northing:** -- **TOC Elev:** --
L. Darrow	HSA	CME-55		

Depth (feet)	**Elevation (feet)**	**USC Soil Type**	**Description**	**Blow Counts**	**Sample No.**	**Readings (ppm)**	**Remarks**
		FILL	No split spoon samples collected.				
5							
10							
15							
		FILL	**FILL** Black mcf GRAVEL (slag, coke), some (-) cmf Sand, trace Silt. Saturated. Slag chunks @ 20.0-4'. @ 23.7-9' lens of Black SILT & CLAY, some fm Gravel, little cmf Sand.	14-25-42-39	1	181	18-24' Coal tar throughout, petroleum @ 18-20'. Extensive coal tar @ 21.6-22.0'.
20				17-15-12-14	2	297	
				19-9-9-15	3	122	
		FILL	Black mcf GRAVEL, little cmf Sand, trace Silt & Clay. @27.1-4' lens of Black SILT & CLAY.	15-18-19-30	4	28	24-31' Extensive coal tar throughout.
25				21-8-6-5	5	191	
				2-4-4-4	6	125	
30				2-4-4-5	7	14.3	

Graphic Log



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BORING LOG

BROWN AND CALDWELL	**Project Name:** Troy Area 2 ISCO MP **Project Number:** 24758.022/128805 **Project Location:** Troy, NY	**Permit Number:** NA	**Boring No.** **SB-201** **Page** 2 **of** 2

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log				Readings (ppm)	Remarks
						Sample Int	Recovery	Lithology	Backfill		
		CL ML	**NATIVE SOILS** Dark Gray CLAY & SILT, very faint odor.			☒	I	▨	▨		31-32' Very faint odor/ no visual contamination.

BORING LOG

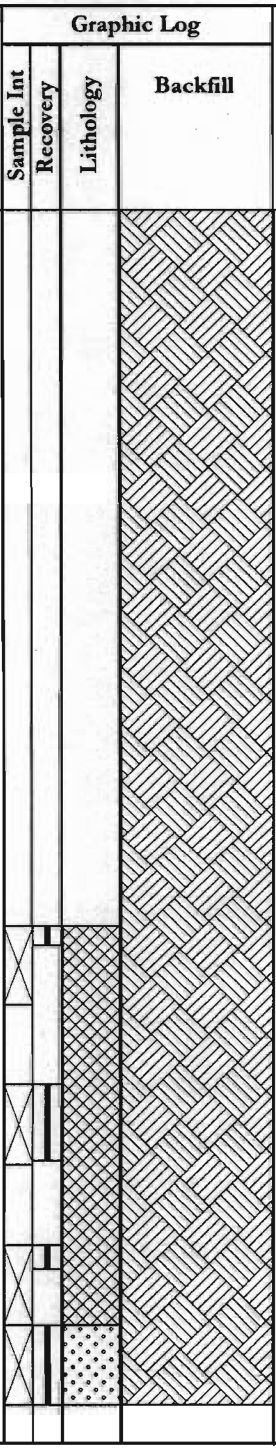
BROWN AND CALDWELL	**Project Name:** Troy Area 2 ISCO MP **Project Number:** 24758.022/128805 **Project Location:** Troy, NY	**Permit Number:** NA	**Boring No.** **SB-201_Post** **Page** 1 **of** 1

Geologist/Office	**Checked By:**	**Borehole Diameter:**	**Screen Diameter and Type:**	**Slot Size:**	**Total Boring Depth (ft)**
N. Krupinski/Allendale	JLM	3"		NA"	30.0 ft.

Start/Finish Date	**Drilling Contractor:**	**Sampling:** Split Spoon **Hammer Type:** Automatic	**Development Method:**
10/6/05 - 10/6/05	ADT		NA

Driller:	**Drilling Method:**	**Drilling Equipment:**	**Horiz Datum/Proj:** **Vert Datum:** **Ground Surface Elev:** --	**Easting:** -- **Northing:** -- **TOC Elev:** --
Richie Comfort	HSA	CME-55		

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Readings (ppm)	Remarks
			No SS samples collected.				
5							
10							
15							
		FILL	**FILL** Brick. Blk-tan cmf SAND and to little fm GRAVEL, little to trace Clayey Silt.	7-12-15-45	1	NR	Wet, NAPL. SB-201_Post-18-20
20							
				2-19-12-23	2	NR	Strong odor and sheen, NAPL. SB-201_Post-22-24
25							
				6-4-6-7	3	NR	NAPL throughout. SB-201_Post-26-28
		SW	Dk. gray mcf SAND, some fm Gravel, little Silt & Clay.	7-5-7-6	4	NR	Minor NAPL. SB-201_Post-28-30
30							



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BORING LOG

BROWN AND CALDWELL	**Project Name:** Troy Area 2 ISCO MP **Project Number:** 24758.022/128805 **Project Location:** Troy, NY	**Permit Number:** NA	**Boring No.** **SB-202** **Page** 1 **of** 2

Geologist/Office	**Checked By:**	**Borehole Diameter:**	**Screen Diameter and Type:**	**Slot Size:**	**Total Boring Depth (ft)**
N. Krupinski/Allendale	JLM	6"		NA"	32.0 ft.

Start/Finish Date	**Drilling Contractor:**	**Sampling:** Split Spoon **Hammer Type:** Automatic	**Development Method:**
7/26/05 - 7/26/05	ADT		NA

Driller:	**Drilling Method:**	**Drilling Equipment:**	**Horiz Datum/Proj:** **Vert Datum:** **Ground Surface Elev:** --	**Easting:** -- **Northing:** -- **TOC Elev:** --
L. Darrow	HSA	CME-55		

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log Sample Int	 Recovery	 Lithology	 Backfill	Readings (ppm)	Remarks
		FILL	No split spoon samples collected.								
5											
10											
15											
		FILL	**FILL** Black mcf GRAVEL (slag, coke), some cmf Sand, trace Silt. Saturated.	8-17-23-13	1					70.1	18-20' Saturated with little coal tar, petroleum and water, strong odor.
20		FILL	Black cmf SAND (slag, coke), trace Silt. Saturated.	5-4-3-2	2					78.6	20-22' Saturated with petroleum, little coal tar and water. Strong odor.
		FILL	Black cmf SAND (slag, coke), some fm Gravel, trace Silt.	4-4-15-22	3					32.8	22-24' Saturated with petroleum and water. Strong petroleum odor.
25		FILL	Black mfc GRAVEL, some cmf Sand, trace Silt.	15-12-12-15	4					42.3	24-30.2' Extensive petroleum NAPL throughout, bright yellow to orange. Some coal tar.
				23-38-30-38	5					38.6	
				22-32-43-30	6					27.3	
30		ML	**NATIVE**	2-2-3-5	7					12.1	

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BORING LOG

BROWN AND CALDWELL	Project Name: Troy Area 2 ISCO MP Project Number: 24758.022/128805 Project Location: Troy, NY	Permit Number: NA	Boring No. SB-202 Page 2 of 2

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log				Readings (ppm)	Remarks
						Sample Int	Recovery	Lithology	Backfill		
		CL	Dark Gray Clayey SILT, trace f Sand. Occasional sticks.			☒	▮	▨	▨		

BORING LOG

BROWN AND CALDWELL

Project Name: Troy Area 2 ISCO MP
Project Number: 24758.022/128805
Project Location: Troy, NY

Permit Number: NA

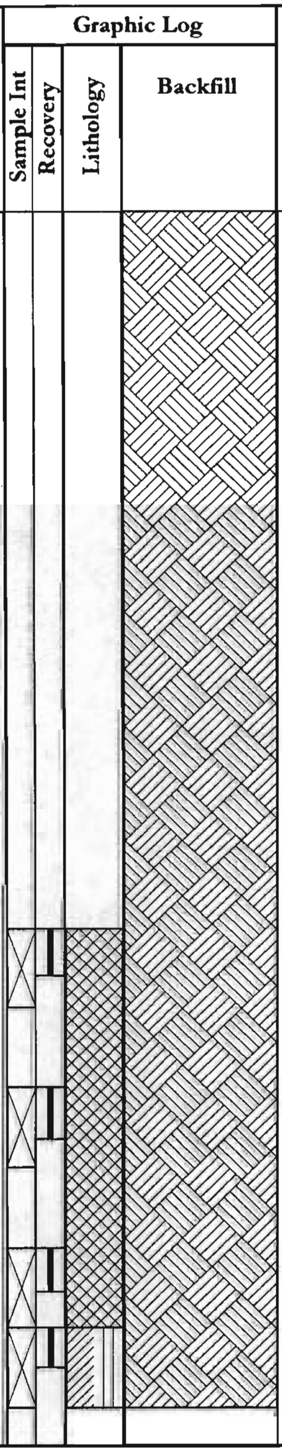
Boring No. **SB-202_Post**
Page 1 **of** 1

Geologist/Office	**Checked By:**	**Borehole Diameter:**	**Screen Diameter and Type:**	**Slot Size:**	**Total Boring Depth (ft)**
M. Cavas/Allendale	JLM	3"		NA"	30.0 ft.

Start/Finish Date	**Drilling Contractor:**	**Sampling:** Split Spoon **Hammer Type:** Automatic	**Development Method:**
10/3/05 - 10/3/05	ADT		NA

Driller:	**Drilling Method:**	**Drilling Equipment:**	**Horiz Datum/Proj:** **Vert Datum:** **Ground Surface Elev:** --	**Easting:** -- **Northing:** -- **TOC Elev:** --
Richie Comfort	HSA	CME-55		

Depth (feet)	**Elevation (feet)**	**USC Soil Type**	**Description**	**Blow Counts**	**Sample No.**	**Readings (ppm)**	**Remarks**
0			No SS samples collected.				
18		FILL	**FILL** Brick and cinders. Blk cmf SAND and to some (-) cmf GRAVEL, little (-) to no Silt & Clay.	8-17-13-8	1	15.5	Slight odor and sheen. SB-202_Post-18-20
22				5-5-7-15	2	43.3	Slight odor and sheen. SB-202_Post-22-24
26				39-75-31-30	3	51.1	Odor and slight sheen. SB-202_Post-26-28
28		CL ML	**NATIVE SOILS** Glacial Fluvial Deposits Blk SILT & CLAY.	3-2-3-3	4	4.1	Slight odor. SB-202_Post-28-30



Depth scale: 5, 10, 15, 20, 25, 30

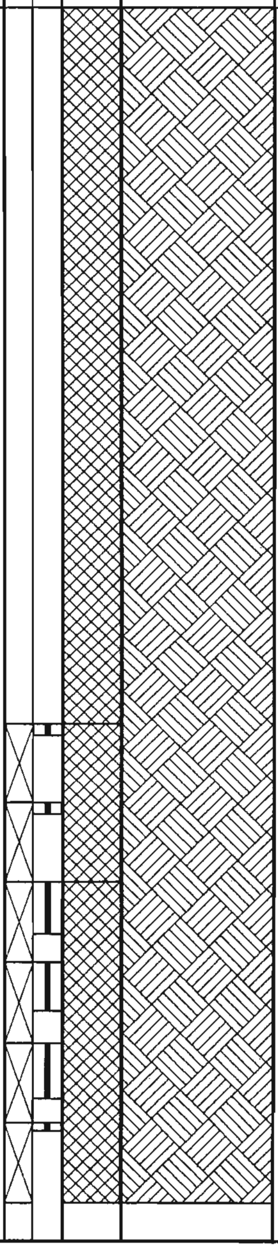
BORING LOG

BROWN AND CALDWELL	**Project Name:** Troy Area 2 ISCO MP **Project Number:** 24758.022/128805 **Project Location:** Troy, NY	**Permit Number:** NA	**Boring No.** **SB-203** **Page** 1 **of** 1

Geologist/Office	**Checked By:**	**Borehole Diameter:**	**Screen Diameter and Type:**	**Slot Size:**	**Total Boring Depth (ft)**
N. Krupinski/Allendale	JLM	6"		NA"	30.0 ft.

Start/Finish Date	**Drilling Contractor:**	**Sampling:** Split Spoon	**Development Method:**
7/27/05 - 7/27/05	ADT	**Hammer Type:** Automatic	NA

Driller:	**Drilling Method:**	**Drilling Equipment:**	**Horiz Datum/Proj:** **Vert Datum:** **Ground Surface Elev:** --	**Easting:** -- **Northing:** -- **TOC Elev:** --
L. Darrow	HSA	CME-55		



Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log: Sample Int	Graphic Log: Recovery	Graphic Log: Lithology	Graphic Log: Backfill	Readings (ppm)	Remarks
		FILL	No split spoon samples collected.								
5											
10											
15											
		FILL	**FILL** Black cmf SAND, some f Gravel, trace Silt. Saturated.	7-9-9-6	1					68.4	18-26' Yellow-light orange petroleum NAPL throughout, strong petroleum odor.
20				5-5-5-6	2					58.6	
		FILL	Black fm GRAVEL and cmf SAND, little Silt & Clay. Piece of wood @ 23.5-24.0.	4-7-10-6	3					157.8	
				3-9-15-16	4					97.3	
25											
				11-27-34-29	5					19.6	26-30' Little orange-brown NAPL.
				4-4-11-6	6					9.4	
30											

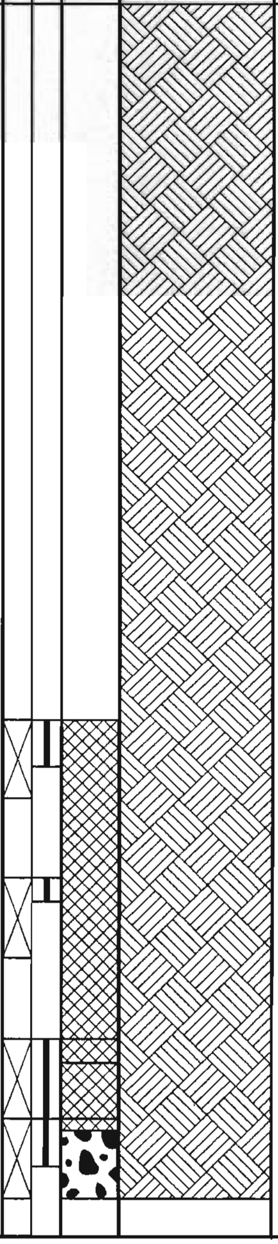
BORING LOG

BROWN AND CALDWELL	Project Name: Troy Area 2 ISCO MP Project Number: 24758.022/128805 Project Location: Troy, NY	Permit Number: NA	Boring No. **SB-203_Post** Page 1 of 1

Geologist/Office	**Checked By:**	**Borehole Diameter:**	**Screen Diameter and Type:**	**Slot Size:**	**Total Boring Depth (ft)**
M. Cavas/Allendale	JLM	3"		NA"	30.0 ft.

Start/Finish Date	**Drilling Contractor:**	**Sampling:** Split Spoon **Hammer Type:** Automatic	**Development Method:**
10/5/05 - 10/5/05	ADT		NA

Driller:	**Drilling Method:**	**Drilling Equipment:**	**Horiz Datum/Proj:** **Vert Datum:** **Ground Surface Elev:** --	**Easting:** -- **Northing:** -- **TOC Elev:** --
Richie Comfort	HSA	CME-55		



Depth (feet)	**Elevation (feet)**	**USC Soil Type**	**Description**	**Blow Counts**	**Sample No.**	**Graphic Log** Sample Int	Recovery	Lithology	Backfill	**Readings (ppm)**	**Remarks**
			No SS samples collected.								
5											
10											
15											
		FILL	**FILL** Cinders, slag ore, and bricks. Brwn cmf SAND, little (+) to no Silt & Clay, little (-) to trace (+) fmc Gravel	2-2-2-2	1					63.4	Slight sheen, minor NAPL and burnt odor. SB-203_Post-18-20
20											
				2-6-13-10	2					NR	Wet, slight sheen and MGP odor. SB-203_Post-22-24
25											
		FILL FILL	Blk cmf GRAVEL, little (-) cmf Sand. Blk fmc SAND, little (-) Silt & Clay.	6-75-83-25	3					44.8	Rainbow sheen and MGP odor. SB-203_Post-26-28
		FILL	Blk Silty CLAY.	11-11-3-4	4					NR	Slight rainbow sheen and MGP odor. SB-203_Post-28-30
30		GW	**NATIVE SOIL** Glacial Fluvial Deposits Blk fmc GRAVEL, some (-) cmf Sand, trace (+) Silt & Clay.								

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BORING LOG

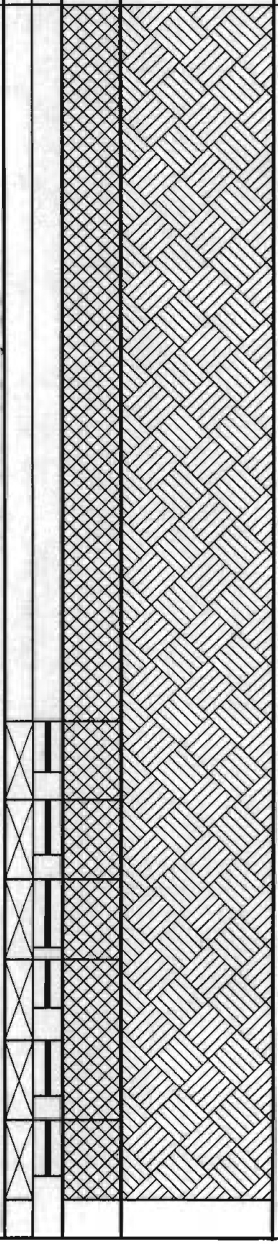
BROWN AND CALDWELL	**Project Name:** Troy Area 2 ISCO MP **Project Number:** 24758.022/128805 **Project Location:** Troy, NY	**Permit Number:** NA	**Boring No.** **SB-204** **Page** 1 **of** 1

Geologist/Office	**Checked By:**	**Borehole Diameter:**	**Screen Diameter and Type:**	**Slot Size:**	**Total Boring Depth (ft)**
N. Krupinski/Allendale	JLM	6"		NA"	30.0 ft.

Start/Finish Date	**Drilling Contractor:**	**Sampling:** Split Spoon **Hammer Type:** Automatic	**Development Method:**
7/27/05 - 7/28/05	ADT		NA

Driller:	**Drilling Method:**	**Drilling Equipment:**	**Horiz Datum/Proj:** **Vert Datum:** **Ground Surface Elev:** --	**Easting:** -- **Northing:** -- **TOC Elev:** --
L. Darrow	HSA	CME-55		

Depth (feet)	**Elevation (feet)**	**USC Soil Type**	**Description**	**Blow Counts**	**Sample No.**	**Graphic Log** **Sample Int**	**Recovery**	**Lithology**	**Backfill**	**Readings (ppm)**	**Remarks**
		FILL	No split spoon samples collected.								
5											
10											
15											
		FILL	**FILL** Brown f GRAVEL, some cmf Sand, trace Silt. Saturated.	2-2-2-2	1					82.6	18-20' Some yellow-brown NAPL, strong odor.
20		FILL	Black-brown fm GRAVEL (cinders), little cm Sand, trace Silt.	2-2-2-2	2					32.0	20-22' Little yellow-brown NAPL
		FILL	Black-yellow fmc GRAVEL, some (+) cmf Sand, trace Silt & Clay.	5-11-9-10	3					-	22-24' Yellow-brown NAPL throughout, strong odor, saturated with NAPL and water.
25		FILL	Black mcf GRAVEL, little cmf Sand, trace (+) Silt & Clay.	15-27-49-54	4					-	24-30' Saturated with coal tar (black NAPL) and water, stained, moderate odor.
				17-30-18-27	5					-	
		FILL	Black fm GRAVEL, some cmf Sand, little Silt & Clay.	18-30-21-10	6					9.7	
30											



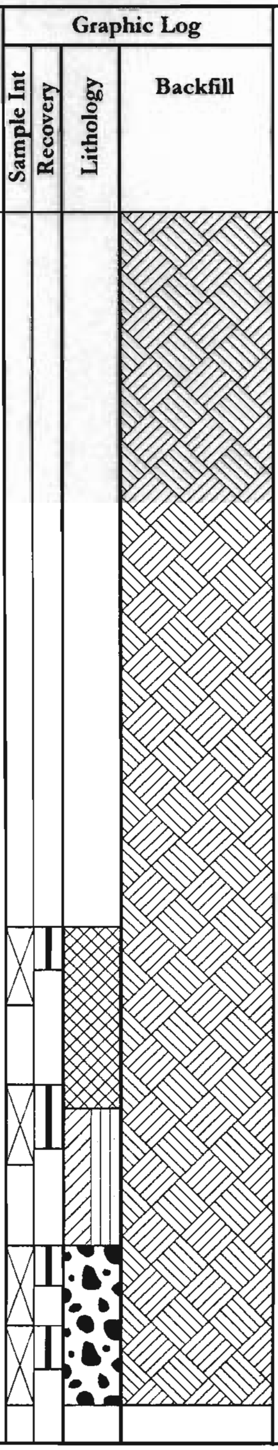
BORING LOG

BROWN AND CALDWELL	**Project Name:** Troy Area 2 ISCO MP **Project Number:** 24758.022/128805 **Project Location:** Troy, NY	**Permit Number:** NA	**Boring No.** SB-204_Post **Page** 1 **of** 1

Geologist/Office	**Checked By:**	**Borehole Diameter:**	**Screen Diameter and Type:**	**Slot Size:**	**Total Boring Depth (ft)**
M. Cavas/Allendale	JLM	3"		NA"	30.0 ft.

Start/Finish Date	**Drilling Contractor:**	**Sampling:** Split Spoon	**Development Method:**
10/4/05 - 10/4/05	ADT	**Hammer Type:** Automatic	NA

Driller:	**Drilling Method:**	**Drilling Equipment:**	**Horiz Datum/Proj:** **Vert Datum:** **Ground Surface Elev:** --	**Easting:** -- **Northing:** -- **TOC Elev:** --
Richie Comfort	HSA	CME-55		



Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Readings (ppm)	Remarks
5 10 15			No split spoon samples collected.				
20		FILL	**FILL** Blk to dk. brwn cmf SAND, little (+) Silt & Clay, trace (-) cmf Gravel.	6-4-3-3	1	NR	Burnt odor. SB-204_Post-18-20
				7-13-16-12	2	NR	Wet, slight MGP odor. SB_204_Post-22-24
25		SC SM	**NATIVE SOILS** Glacial Fluvial Deposits Blk fmc SAND and Clayey SILT, little (-) fmc Gravel.				
		GW	Blk cmf GRAVEL, little (+) cmf Sand.	27-24-27-24	3	NR	Rainbow sheen, NAPL. SB-204_Post-26-28
30				11-13-9-7	4	NR	NAPL. SB-204_Post-28-30

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BORING LOG

BROWN AND CALDWELL	**Project Name:** Troy Area 2 ISCO MP **Project Number:** 24758.022/128805 **Project Location:** Troy, NY	**Permit Number:** NA	**Boring No.** **SB-205** **Page** 1 **of** 1

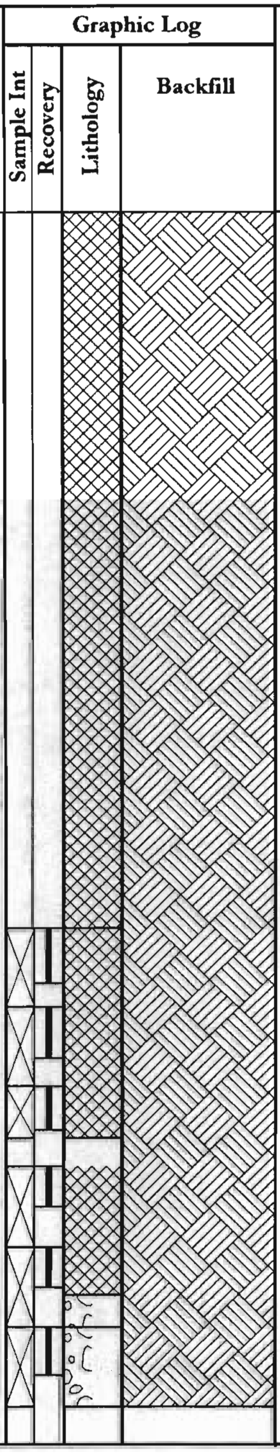
Geologist/Office	**Checked By:**	**Borehole Diameter:**	**Screen Diameter and Type:**	**Slot Size:**	**Total Boring Depth (ft)**
N. Krupinski/Allendale	JLM	6"		NA"	30.0 ft.

Start/Finish Date	**Drilling Contractor:**	**Sampling:** Split Spoon	**Development Method:**
7/28/05 - 7/28/05	ADT	**Hammer Type:** Automatic	NA

Driller:	**Drilling Method:**	**Drilling Equipment:**	**Horiz Datum/Proj:** **Vert Datum:** **Ground Surface Elev:** --	**Easting:** -- **Northing:** -- **TOC Elev:** --
L. Darrow	HSA	CME-55		

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Readings (ppm)	Remarks
		FILL	No split spoon samples collected.				
5							
10							
15							
		FILL	**FILL** Black-brown GRAVEL and cmf SAND (slag, coke), little Silt & Clay. Moist. @ 19.6' becomes Black, saturated.	6-10-10-8	1	112.2	18-27.2' Extensive black-brown coal tar throughout, strong odor.
20				3-4-14-8	2	228.6	
				2-16-50/0.3	3	68.9	
		FILL	Black mfc GRAVEL (slag, coke), little (+) cmf Sand, trace Silt & Clay.	2-9-16-19	4	219.8	
25							
				4-5-4-3	5	96.8	
		GP SP GP SP	**NATIVE SOILS** Dark Gray f GRAVEL, some cmf Sand (sub-rounded), trace (+) Silt & Clay. As above, black. @ 29.3-7' lens of Dark Gray SILT & CLAY, occasional sticks.	3-2-5-6	6	51.7	27.4-7' Brown-black NAPL (coal tar) throughout. 28-30' Brown-black NAPL.
30							

Graphic Log



BORING LOG

BROWN AND CALDWELL

Project Name: Troy Area 2 ISCO MP
Project Number: 24758.022/128805
Project Location: Troy, NY

Permit Number: NA

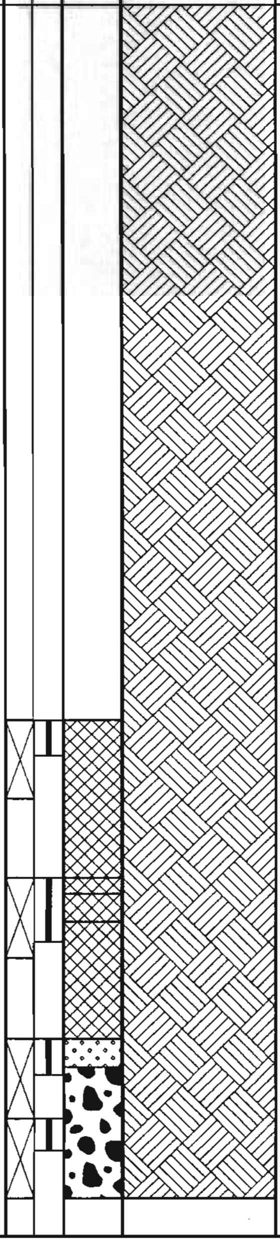
Boring No. SB-205_Post
Page 1 **of** 1

Geologist/Office	**Checked By:**	**Borehole Diameter:**	**Screen Diameter and Type:**	**Slot Size:**	**Total Boring Depth (ft)**
M. Cavas/Allendale	JLM	3"		NA"	30.0 ft.

Start/Finish Date: 10/10/05 - 10/10/05
Drilling Contractor: ADT
Sampling: Split Spoon
Hammer Type: Automatic
Development Method: NA

Driller: Richie Comfort
Drilling Method: HSA
Drilling Equipment: CME-55
Horiz Datum/Proj:
Vert Datum:
Ground Surface Elev: --
Easting: --
Northing: --
TOC Elev: --

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log: Sample Int	Graphic Log: Recovery	Graphic Log: Lithology	Graphic Log: Backfill	Readings (ppm)	Remarks
			No SS samples collected.								
5											
10											
15											
		FILL	**FILL** Cinders and slag ore. Blk cmf SAND, some (-) Silt & Clay, trace (-) cmf Gravel.	22-17-16-40	1					26.1	Wet, minor NAPL, MGP odor and sheen. SB-205_Post-18-20. Large coal tar at 18.8'
20											
		FILL FILL FILL	Gray cmf SAND, some (-) Silty Clay. Gray fmc GRAVEL, some (-) cmf Sand, little (-) Silt & Clay. Blk cmf GRAVEL, some (-) cmf Sand, little (-) Silt & Clay.	8-18-18-11	2					61.6	Rainbow sheen, MGP odor and NAPL throughout. SB-205_Post-22-24
25											
		SW GW	**NATIVE SOIL** Glacial Fluvial Deposits Blk cmf SAND, trace (+) Silt & Clay. Blk cmf GRAVEL, some (-) cmf Sand.	9-10-9-8	3					87.3	NAPL throughout, MGP + petroleum odor. SB-205_Post-26-28
				6-7-7-8	4					57.6	Rainbow sheen and NAPL throughout. SB-205_Post-28-30
30											



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BORING LOG

BROWN AND CALDWELL

Project Name: Troy Area 2 ISCO MP
Project Number: 24758.022/128805
Project Location: Troy, NY

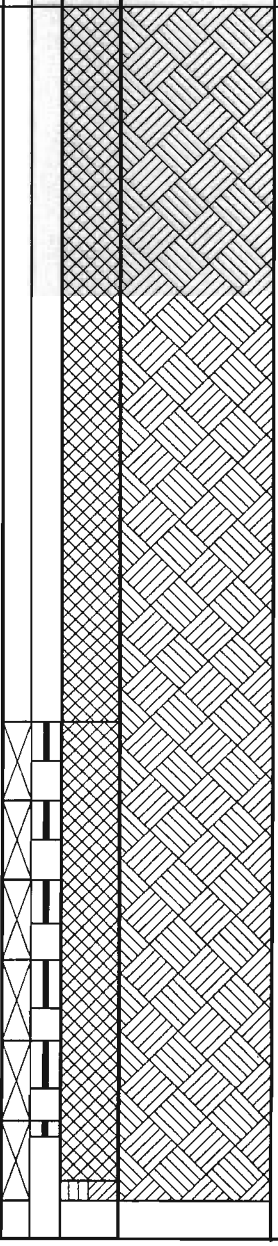
Permit Number: NA

Boring No. SB-206
Page 1 **of** 1

Geologist/Office	**Checked By:**	**Borehole Diameter:**	**Screen Diameter and Type:**	**Slot Size:**	**Total Boring Depth (ft)**
N. Krupinski/Allendale	JLM	6"		NA"	30.0 ft.

Start/Finish Date	**Drilling Contractor:**	**Sampling:** Split Spoon **Hammer Type:** Automatic	**Development Method:**
7/29/05 - 7/29/05	ADT		NA

Driller:	**Drilling Method:**	**Drilling Equipment:**	**Horiz Datum/Proj:** **Vert Datum:** **Ground Surface Elev:** --	**Easting:** -- **Northing:** -- **TOC Elev:** --
L. Darrow	HSA	CME-55		



Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Sample Int	Recovery	Lithology	Backfill	Readings (ppm)	Remarks
		FILL	No split spoon samples collected.								
5											
10											
15											
		FILL	**FILL** Black-brown fm GRAVEL, some cmf Sand, trace Silt. Slag/coke @ 24-29.5'. Saturated.	2-2-2-2	1					32.1	18-22' Little to trace light-colored petroleum NAPL, stained, moderate odor.
20				1-2-2-2	2					82.6	
				2-2-9-9	3					85.1	
25				10-20-24-27	4					24.8	22.8-23.2' Thick sicky/viscous stringy tar througout, little black-brown liquid NAPL throughout. 24-29.5' Some black-brown tar droplets throughout.
				6-6-8-20	5					4.2	
				7-15-9-5	6					-	
30		ML CL	**NATIVE SOILS** Dark Gray SILT & CLAY.								

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BORING LOG

BROWN AND CALDWELL

Project Name: Troy Area 2 ISCO MP
Project Number: 24758.022/128805
Project Location: Troy, NY

Permit Number: NA

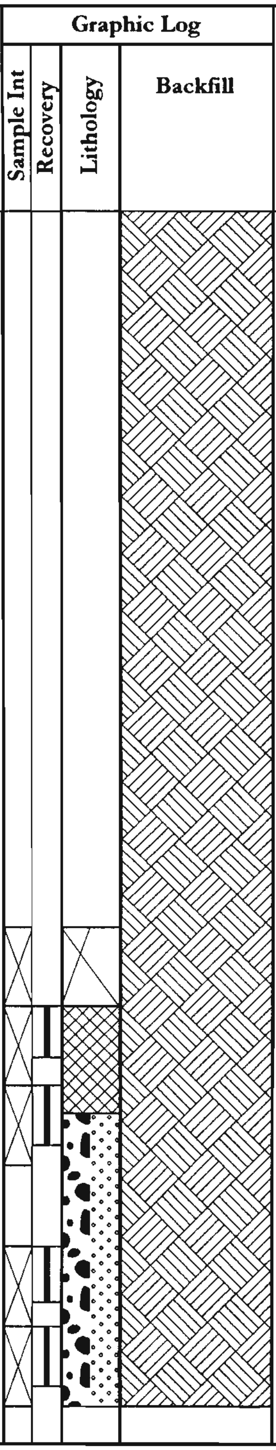
Boring No. SB-206_Post
Page 1 **of** 1

Geologist/Office: M. Cavas/Allendale
Checked By: JLM
Borehole Diameter: 3"
Screen Diameter and Type:
Slot Size: NA"
Total Boring Depth (ft): 30.0 ft.

Start/Finish Date: 10/4/05 - 10/4/05
Drilling Contractor: ADT
Sampling: Split Spoon
Hammer Type: Automatic
Development Method: NA

Driller: Richie Comfort
Drilling Method: HSA
Drilling Equipment: CME-55
Horiz Datum/Proj:
Vert Datum:
Ground Surface Elev: --
Easting: --
Northing: --
TOC Elev: --

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Readings (ppm)	Remarks
			NO SS samples collected.				
		NR	No recovery	4-5-7-6	1	NR	
20		FILL	**FILL** Brick fragments. Blk cmf SAND, little (+) to no cmf Gravel, little (-) to no Silt & Clay.	10-6-3-3	2	24.8	Rainbow sheen and MGP odor. SB-206_Post-20-22
				4-6-7-9	3	73.9	Coal Tar. SB-206_Post-22-24.
		GW SW	**NATIVE SOIL** Glacial Fluvial Deposits Blk stained fmc GRAVEL, little (-) to some (-) cmf Sand.				
				5-7-9-13	4	20.4	NAPL throughout. SB-206_Post-26-28
				15-28-19-8	5	9.5	NAPL throughout, possible brick fragment. SB-206_Post-28-30
30							



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BORING LOG

BROWN AND CALDWELL	**Project Name:** Troy Area 2 ISCO MP **Project Number:** 24758.022/128805 **Project Location:** Troy, NY	**Permit Number:** NA	**Boring No.** **SB-207** **Page** 1 **of** 2

Geologist/Office	**Checked By:**	**Borehole Diameter:**	**Screen Diameter and Type:**	**Slot Size:**	**Total Boring Depth (ft)**
N. Krupinski/Allendale	JLM	6"		NA"	32.0 ft.

Start/Finish Date	**Drilling Contractor:**	**Sampling:** Split Spoon **Hammer Type:** Manual	**Development Method:**
8/1/05 - 8/1/05	ADT		NA

Driller:	**Drilling Method:**	**Drilling Equipment:**	**Horiz Datum/Proj:** **Vert Datum:** **Ground Surface Elev:** --	**Easting:** -- **Northing:** -- **TOC Elev:** --
B. Unick	HSA	CME-55		

Depth (feet)	**Elevation (feet)**	**USC Soil Type**	**Description**	**Blow Counts**	**Sample No.**	**Graphic Log**				**Readings (ppm)**	**Remarks**
						Sample Int	**Recovery**	**Lithology**	**Backfill**		
		FILL	No split spoon samples collected.								
5											
10											
15											
		FILL	**FILL** Brown-black fm GRAVEL, some (-) cmf Sand, trace Silt.	9-5-4-3	1					107.1	18-24' Yellow-brown-green NAPL, strong odor.
20				2-4-4-3	2					41.3	
		FILL	Brown-yellow mf GRAVEL, some to little cmf Sand, trace Silt. Pieces of brick.								
				2-2-5-30	3					56	
		FILL	Brown-orange-black cmf SAND and fm GRAVEL (brick and slag), trace Silt.	30-142-72-29	4					78.9	24-30' Extensive brown NAPL, strong odor.
25		FILL	Black fmc GRAVEL (slag), little cmf Sand, trace Silt.								
				29-42-62-100/0.2'	5					21.1	
		FILL	Black fm GRAVEL and cmf SAND, trace Silt.	14-150/0.3'	6					-	
30		ML	**NATIVE SOILS**	4-6-6-7	7					-	

BORING LOG

BROWN AND CALDWELL	**Project Name:** Troy Area 2 ISCO MP **Project Number:** 24758.022/128805 **Project Location:** Troy, NY	**Permit Number:** NA	**Boring No.** SB-207 **Page** 2 **of** 2

Depth (feet)	**Elevation (feet)**	**USC Soil Type**	**Description**	**Blow Counts**	**Sample No.**	**Graphic Log**				**Readings (ppm)**	**Remarks**
						Sample Int	**Recovery**	**Lithology**	**Backfill**		
		CL	Gray SILT & CLAY. Rounded pebble @ 30.8', occasional sticks.			☒		▥	▨		

BORING LOG

BROWN AND CALDWELL

Project Name: Troy Area 2 ISCO MP
Project Number: 24758.022/128805
Project Location: Troy, NY

Permit Number: NA

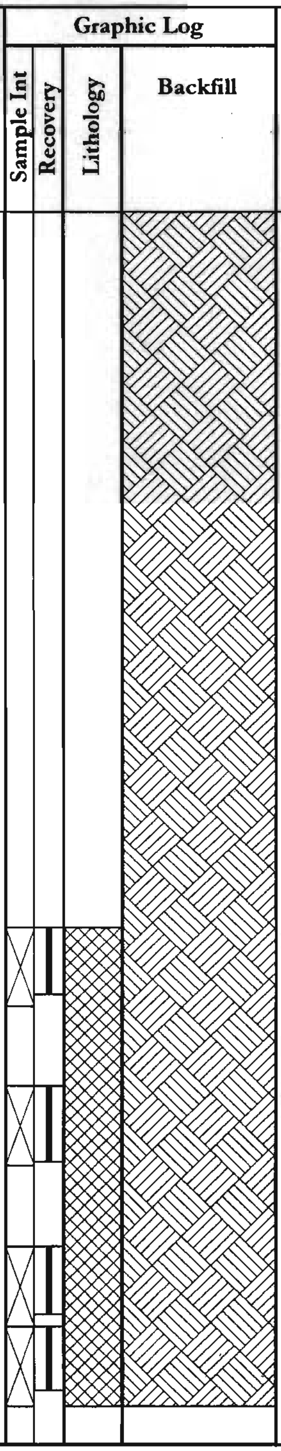
Boring No. SB-207_Post
Page 1 **of** 1

Geologist/Office: N. Krupinski/Allendale
Checked By: JLM
Borehole Diameter: 3"
Screen Diameter and Type:
Slot Size: NA"
Total Boring Depth (ft) 30.0 ft.

Start/Finish Date: 10/6/05 - 10/6/05
Drilling Contractor: ADT
Sampling: Split Spoon
Hammer Type: Automatic
Development Method: NA

Driller: Richie Comfort
Drilling Method: HSA
Drilling Equipment: CME-55
Horiz Datum/Proj:
Vert Datum:
Ground Surface Elev: --
Easting: --
Northing: --
TOC Elev: --

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Readings (ppm)	Remarks
			No SS samples collected				
5							
10							
15							
		FILL	**FILL** Slag ore. Brwn-blk mfc to cmf SAND and to little fm GRAVEL, little to trace Silt.	6-4-1-1	1	NR	Slight sheen and odor. SB-207_Post-18-20
20							
				4-9-11-18	2	NR	NAPL and strong odor. SB-207_Post-22-24
25							
				12-26-33-40	3	NR	Strong sheen and odor. SB-207_Post-26-28
				23-53-13-10	4	NR	Strong odor w/ moderate sheen. SB-207_Post-28-30
30							



BORING LOG

BROWN AND CALDWELL

Project Name: Troy Area 2 ISCO MP
Project Number: 24758.022/128805
Project Location: Troy, NY

Permit Number: NA

Boring No. SB-208
Page 1 **of** 1

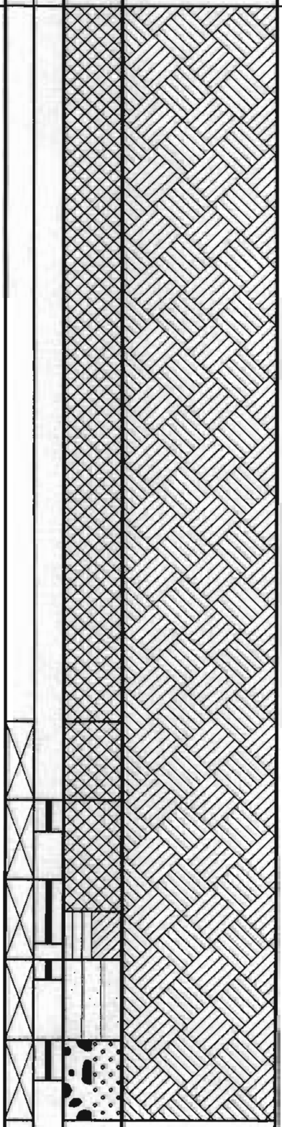
Geologist/Office	**Checked By:**	**Borehole Diameter:**	**Screen Diameter and Type:**	**Slot Size:**	**Total Boring Depth (ft)**
N. Krupinski/Allendale	JLM	6"		NA"	28.0 ft.

Start/Finish Date	**Drilling Contractor:**	**Sampling:** Split Spoon	**Development Method:**
8/1/05 - 8/1/05	ADT	**Hammer Type:** Manual	NA

Driller:	**Drilling Method:**	**Drilling Equipment:**	**Horiz Datum/Proj:** **Vert Datum:** **Ground Surface Elev:** --	**Easting:** -- **Northing:** -- **TOC Elev:** --
B. Unick	HSA	CME-55		

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Readings (ppm)	Remarks
		FILL	No split spoon samples collected.				
5							
10							
15							
		FILL	**FILL** No recovery.	60-62-47-46	1	-	
20		FILL	Black cmf SAND and mf GRAVEL, trace (+) Silt.	17-7-9-8	2	226.5	20-22.8' Saturated with liquid viscous coal tar and water. Strong tar odor.
				2-3-2-20	3	119.7	
		ML CL SM	**NATIVE SOILS** Gray SILT & CLAY. Occasional black mottling. Gray f SAND and Clayey SILT.	17-14-13-14	4	12.6	
25							
		GW SW	Black-gray f GRAVEL (sub-angular shale), some (-) cmf Sand, trace Silt.	19-14-6-3	5	26.2	

Graphic Log



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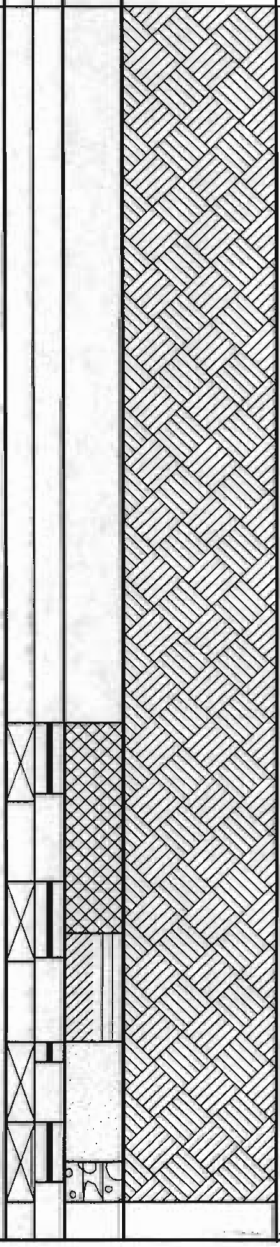
BORING LOG

BROWN AND CALDWELL	**Project Name:** Troy Area 2 ISCO MP **Project Number:** 24758.022/128805 **Project Location:** Troy, NY	**Permit Number:** NA	**Boring No.** **SB-208_Post** **Page** 1 **of** 1

Geologist/Office	**Checked By:**	**Borehole Diameter:**	**Screen Diameter and Type:**	**Slot Size:**	**Total Boring Depth (ft)**
J. Marolda/Allendale	JLM	3"		NA"	30.0 ft.

Start/Finish Date	**Drilling Contractor:**	**Sampling:** Split Spoon **Hammer Type:** Automatic	**Development Method:**
10/5/05 - 10/5/05	ADT		NA

Driller:	**Drilling Method:**	**Drilling Equipment:**	**Horiz Datum/Proj:** **Vert Datum:** **Ground Surface Elev:** --	**Easting:** -- **Northing:** -- **TOC Elev:** --
Richie Comfort	HSA	CME-55		



Depth (feet)	**Elevation (feet)**	**USC Soil Type**	**Description**	**Blow Counts**	**Sample No.**	**Graphic Log** Sample Int	Recovery	Lithology	Backfill	**Readings (ppm)**	**Remarks**
			No SS samples collected								
5											
10											
15											
		FILL	**FILL** Cinders. Blk mfc to cmf GRAVEL and to some mc SAND, some (-) Silt.	16-11-14-13	1					20.9	Wet, MGP odor. SB-208_Post-18-20
20											
				6-7-8-5	2					50.9	Ranbow sheen. SB-208_Post-22-24
		CL ML	**NATIVE SOIL** Glacial Fluvial Deposits Dk. Gray SILT/Clayey SILT, some (+) f Sand.								
25											
		SP	Dk. Gray mcf SAND, little mf Gravel, little to no Silt.	3-9-8-10	3					57.8	NAPL and MGP odor. SB-208_Post-26-28
				3-4-7-8	4					17.9	SB-208_Post-28-30
30		GM	Dk. Gray mcf SAND, some mcf Gravel, little (-) mf Sand.								

BORING LOG

BROWN AND CALDWELL

Project Name: Troy Area 2 ISCO MP
Project Number: 24758.022/128805
Project Location: Troy, NY

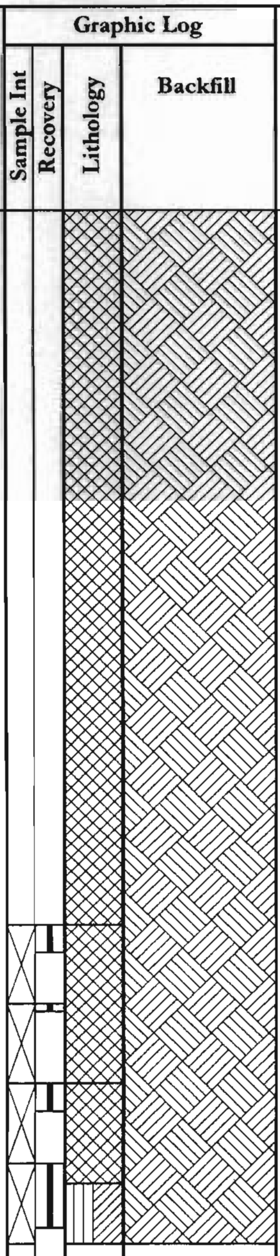
Permit Number: NA

Boring No. SB-209
Page 1 **of** 1

Geologist/Office	**Checked By:**	**Borehole Diameter:**	**Screen Diameter and Type:**	**Slot Size:**	**Total Boring Depth (ft)**
N. Krupinski/Allendale	JLM	6"		NA"	26.0 ft.

Start/Finish Date	**Drilling Contractor:**	**Sampling:** Split Spoon **Hammer Type:** Manual	**Development Method:**
8/2/05 - 8/2/05	ADT		NA

Driller:	**Drilling Method:**	**Drilling Equipment:**	**Horiz Datum/Proj:** **Vert Datum:** **Ground Surface Elev:** --	**Easting:** -- **Northing:** -- **TOC Elev:** --
B. Unick	HSA	CME-55		



Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Readings (ppm)	Remarks
		FILL	No split spoon samples collected.				
		FILL	**FILL** Brown-black cmf SAND, some (-) f Gravel, little Silt & Clay. Saturated @ 19.2'.	35-31-61-32	1	21.8	
				57-46-39-31	2	18.5	19.2-22' Saturated with water and yellow NAPL, moderate odor.
		FILL	Black fm GRAVEL, little cmf Sand, trace (+) Silt & Clay.	21-17-18-19	3	6.4	22-24.5' Droplets of black-brown NAPL throughout, strong odor.
				8-2-3-4	4	1.2	
		ML CL	**NATIVE SOILS** Gray SILT & CLAY, trace (-) f Sand. Occasional sticks and wood throughout.				

Depth scale: 5, 10, 15, 20, 25

BORING LOG

BROWN AND CALDWELL	**Project Name:** Troy Area 2 ISCO MP **Project Number:** 24758.022/128805 **Project Location:** Troy, NY	**Permit Number:** NA	**Boring No.** **SB-209_Post** **Page** 1 **of** 1

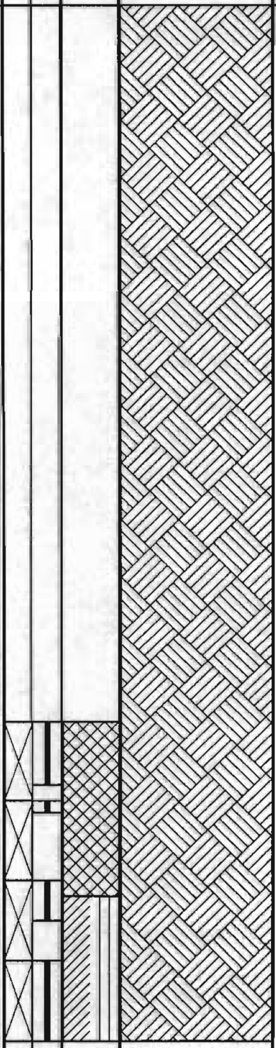
Geologist/Office	**Checked By:**	**Borehole Diameter:**	**Screen Diameter and Type:**	**Slot Size:**	**Total Boring Depth (ft)**
M. Cavas/Allendale	JLM	3"		NA"	26.0 ft.

Start/Finish Date	**Drilling Contractor:**	**Sampling:** Split Spoon **Hammer Type:** Automatic	**Development Method:**
10/3/05 - 10/3/05	ADT		NA

Driller:	**Drilling Method:**	**Drilling Equipment:**	**Horiz Datum/Proj:** **Vert Datum:** **Ground Surface Elev:** --	**Easting:** -- **Northing:** -- **TOC Elev:** --
Richie Comfort	HSA	CME-55		

Depth (feet)	**Elevation (feet)**	**USC Soil Type**	**Description**	**Blow Counts**	**Sample No.**	**Readings (ppm)**	**Remarks**
			No SS samples collected				
5							
10							
15							
		FILL	**FILL** Slag ore, cinders, coal, and purifier waste(?). Brwn to blk fmc to cmf GRAVEL, some (-) to little (-) cmf Sand, trace (+) to no Silt & Clay.	5-11-27-55	1	NR	SB-209_Post-18-20
20				24-18-17-11	2	NR	SB-209_Post-20-22
		CL ML	**NATIVE SOILS** Glacial Fluvial Deposits Blk Silty CLAY.	10-3-3-5	3	NR	Wet @ 22'. Odor and rainbow sheen w/ NAPL droplets.
				WH-2-2-4	4	NR	SB-209_Post-22-24 SB-209_Post-24-26
25							
							Slight MGP odor.

Graphic Log



BORING LOG

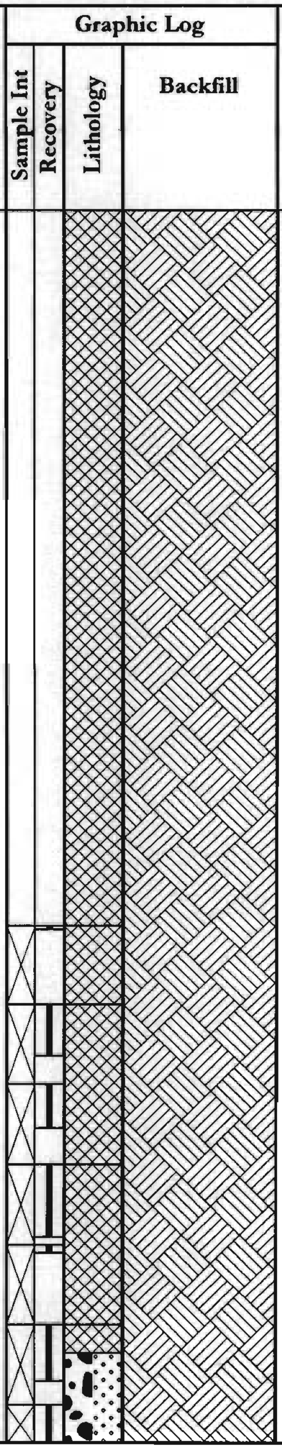
BROWN AND CALDWELL	**Project Name:** Troy Area 2 ISCO MP **Project Number:** 24758.022/128805 **Project Location:** Troy, NY	**Permit Number:** NA	**Boring No.** **SB-210** **Page** 1 **of** 2

Geologist/Office	**Checked By:**	**Borehole Diameter:**	**Screen Diameter and Type:**	**Slot Size:**	**Total Boring Depth (ft)**
N. Krupinski/Allendale	JLM	6"		NA"	32.0 ft.

Start/Finish Date	**Drilling Contractor:**	**Sampling:** Split Spoon **Hammer Type:** Manual	**Development Method:**
8/3/05 - 8/3/05	ADT		NA

Driller:	**Drilling Method:**	**Drilling Equipment:**	**Horiz Datum/Proj:** **Vert Datum:** **Ground Surface Elev:** --	**Easting:** -- **Northing:** -- **TOC Elev:** --
B. Unick	HSA	CME-55		

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Readings (ppm)	Remarks
		FILL	No split spoon samples collected.				
5							
10							
15							
		FILL	**FILL** Brown cmf SAND (slag), trace Silt. Saturated.	14-13-20-14	1	90.4	18-20' Some yellow NAPL throughout, moderate odor.
20		FILL	Black-yellow fm GRAVEL (slag) and cmf SAND (slag), little Silt & Clay.	11-7-6-12	2	126.8	20-28' Extensive yellow-brown NAPL throughout, very strong odor.
				13-9-26-22	3	207.1	
25		FILL	Black mf GRAVEL, some cmf Sand, trace Silt.	22-31-43-56	4	56.1	
				20-21-27-20	5	48.8	
		FILL	Black-gray fm GRAVEL and cmf SAND, little Silt & Clay.	7-11-9-8	6	10.6	28.0-7' Some yellow-brown NAPL throughout, strong odor.
30		GW SW	**NATIVE SOILS** Black-gray fm GRAVEL and cmf SAND, little Silt & Clay. Gravel, sand is	7-6-7-6	7	8.1	



BORING LOG

BROWN AND CALDWELL	**Project Name:** Troy Area 2 ISCO MP **Project Number:** 24758.022/128805 **Project Location:** Troy, NY	**Permit Number:** NA	**Boring No.** **SB-210** **Page** 2 **of** 2

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log: Sample Int	Graphic Log: Recovery	Graphic Log: Lithology	Graphic Log: Backfill	Readings (ppm)	Remarks
		ML	sub-rounded/sub-angular.			☒		▥	▨		
		CL	Gray SILT & CLAY.								

BORING LOG

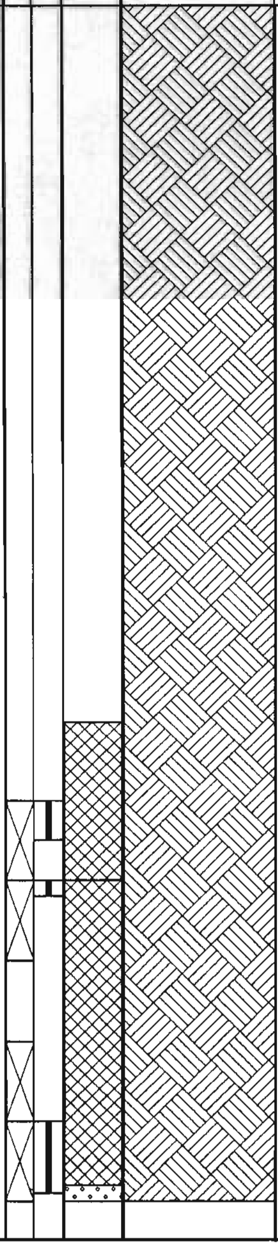
BROWN AND CALDWELL	Project Name: Troy Area 2 ISCO MP Project Number: 24758.022/128805 Project Location: Troy, NY	Permit Number: NA	Boring No. SB-210_Post Page 1 of 2

Geologist/Office	Checked By:	Borehole Diameter:	Screen Diameter and Type:	Slot Size:	Total Boring Depth (ft)
M. Cavas/Allendale	JLM	3"		NA"	30.0 ft.

Start/Finish Date	Drilling Contractor:	Sampling: Split Spoon Hammer Type: Automatic	Development Method:
10/7/05 - 10/7/05	ADT		NA

Driller:	Drilling Method:	Drilling Equipment:	Horiz Datum/Proj: Vert Datum: Ground Surface Elev: --	Easting: -- Northing: -- TOC Elev: --
Richie Comfort	HSA	CME-55		

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log				Readings (ppm)	Remarks
						Sample Int	Recovery	Lithology	Backfill		
			No SS samples collected.								
5											
10											
15											
20		FILL	**FILL** Slag ore, cinders and bricks. Blk cmf SAND, some (-) fmc Gravel, trace (+) organics.	7-9-5-4	1					27.9	NAPL throughout. SB-210_Post-20-22
		FILL	Blk cmf GRAVEL, little (+/-) cmf Sand.	5-7-24-32	2					NR	NAPL throughout and MGP odor. SB-210_Post-22-24
25				3-2-1-1	3					NR	
				15-14-21-11	4					16.3	MGP odor and NAPL. SB-210_Post-28-30
30		SW	**NATIVE SOIL** Glacial Fluvial Deposits								



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BORING LOG

BROWN AND CALDWELL	**Project Name:** Troy Area 2 ISCO MP **Project Number:** 24758.022/128805 **Project Location:** Troy, NY	**Permit Number:** NA	**Boring No.** SB-210_Post **Page** 2 **of** 2

Depth (feet)	**Elevation (feet)**	**USC Soil Type**	**Description**	**Blow Counts**	**Sample No.**	**Graphic Log**				**Readings (ppm)**	**Remarks**
						Sample Int	**Recovery**	**Lithology**	**Backfill**		
			Blk fmc SAND, little (-) Clayey Silt.								

BORING LOG

BROWN AND CALDWELL

Project Name: Troy Area 2 ISCO MP
Project Number: 24758.022/128805
Project Location: Troy, NY

Permit Number: NA

Boring No. SB-211
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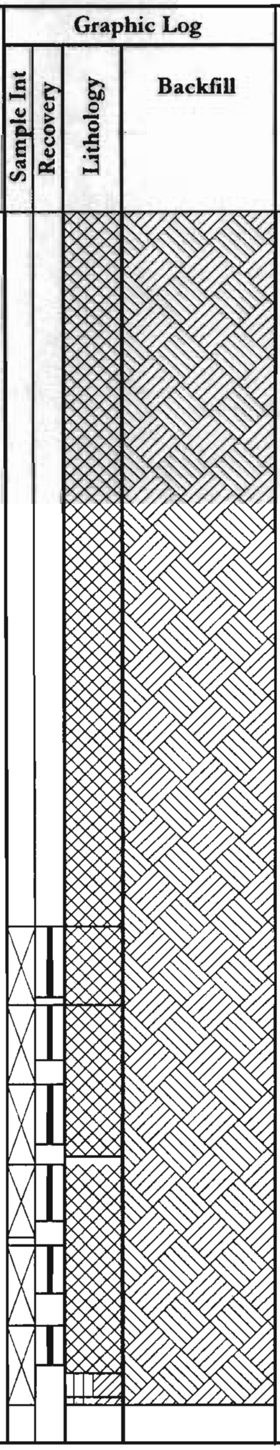
Geologist/Office: N. Krupinski/Allendale
Checked By: JLM
Borehole Diameter: 6"
Screen Diameter and Type:
Slot Size: NA"
Total Boring Depth (ft): 30.0 ft.

Start/Finish Date: 8/3/05 - 8/3/05
Drilling Contractor: ADT
Sampling: Split Spoon
Hammer Type: Manual
Development Method: NA

Driller: B. Unick
Drilling Method: HSA
Drilling Equipment: CME-55
Horiz Datum/Proj:
Vert Datum:
Ground Surface Elev: --
Easting: --
Northing: --
TOC Elev: --

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Readings (ppm)	Remarks
		FILL	No split spoon samples collected.				
5							
10							
15							
		FILL	**FILL** Black fill and white coke - m GRAVEL, little cm Sand, trace Silt. Saturated.	4-6-9-14	1	186.2	18-20' Extensive thick/viscous coal tar throughout, strong odor.
20		FILL	Black-brown cmf SAND and fm GRAVEL, trace Silt. Occasional bits of white coke. @ 21.0-6' Lens of Brown-black mf SAND, trace Silt. @21.6-7' lens of viscous tar.	7-9-8-14	2	179.6	
				11-14-29-52	3	75.1	21.6-7' Lens of viscous tar. 22-26' Liquid brown-orange NAPL droplets throughout, strong odor.
		FILL	Black mf GRAVEL (slag) and cmf SAND (slag), trace Silt.	34-61-74-150/0.3'	4	19.5	
25							
				38-30-23-28	5	0	26-29.2' Little brown NAPL, slight odor.
				5-5-4-5	6	0	
30		ML CL SM	**NATIVE SOILS** Gray SILT & CLAY. Gray fm SAND, little (+) Silt & Clay.				



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BORING LOG

BROWN AND CALDWELL	Project Name: Troy Area 2 ISCO MP Project Number: 24758.022/128805 Project Location: Troy, NY	Permit Number: NA	Boring No. SB-211 Page 2 of 2

Depth (feet)	Elevation (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log				Readings (ppm)	Remarks
						Sample Int	Recovery	Lithology	Backfill		
		SC									

BORING LOG

BROWN AND CALDWELL

Project Name: Troy Area 2 ISCO MP
Project Number: 24758.022/128805
Project Location: Troy, NY

Permit Number: NA

Boring No. SB-211_Post
Page 1 **of** 1

Geologist/Office	**Checked By:**	**Borehole Diameter:**	**Screen Diameter and Type:**	**Slot Size:**	**Total Boring Depth (ft)**
M. Cavas/Allendale	JLM	3"		NA"	30.0 ft.

Start/Finish Date	**Drilling Contractor:**	**Sampling:** Split Spoon **Hammer Type:** Automatic	**Development Method:**
10/4/05 - 10/4/05	ADT		NA

Driller:	**Drilling Method:**	**Drilling Equipment:**	**Horiz Datum/Proj:** **Vert Datum:** **Ground Surface Elev:** --	**Easting:** -- **Northing:** -- **TOC Elev:** --
Richie Comfort	HSA	CME-55		

Depth (feet)	**Elevation (feet)**	**USC Soil Type**	**Description**	**Blow Counts**	**Sample No.**	**Graphic Log**				**Readings (ppm)**	**Remarks**
						Sample Int	**Recovery**	**Lithology**	**Backfill**		
			No SS samples collected.								
5											
10											
15											
		FILL	**FILL** Cinders, bricks, purifier waste. Blk cmf SAND, little (+) to no cmf Gravel, trace (+) Silt & Clay.	2-3-3-3	1					11.8	Wet, rainbow sheen and slight odor. SB-211_Post-18-20
20											
				4-3-3-2	2					23.6	Strong MGP odor, NAPL. SB-211_Post-22-24
		FILL	Blk cmf GRAVEL, little (+) cmf Sand, trace (-) Silt & Clay.								
25											
				26-17-13-16	3					70.6	Rainbow sheen, NAPL. SB-211_Post-26-28
				8-5-5-5	4					22.1	NAPL. SB-211_Post-28-30
		CL ML	**NATIVE SOILS** Glacial Fluvial Deposits Blk SILT & CLAY, little (-) organics.								
30