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October 18, 2005

James Candiloro
Project Manager
Division of Remediation
NYSDEC
625 Broadway
Albany, NY 12233-7016

Re: Remedial Design Report
10 East Chester Street
Kingston, NY
Index No. W3-0980-03-12
Site No. C356032

Dear Mr. Candiloro:

Enclosed for your review are three (3) copies and one (1) electronic copy of the Remedial Design Report for the site referenced above.

If you, or any of your staff, have any questions regarding the enclosed report, please contact me, or Damian Vanetti, at (315) 422-4949.

Very truly yours,

S&W REDEVELOPMENT OF NORTH AMERICA, LLC

R Petrovich/DRS

Robert M. Petrovich
Executive Vice President

CC: Michael F. Rivara, NYSDOH (Cover Letter Only)
Denise J. D'Ambrosio, NYSDEC (Cover Letter Only)
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Remedial Design
In-Situ Chemical Oxidation
BCP Site No. C356032
Kingston, New York

October 2005

Stearns & Wheler
Companies

REMEDIAL DESIGN
IN-SITU CHEMICAL OXIDATION

BCP SITE No. C356032
KINGSTON, NEW YORK

Prepared by

Stearns & Wheler, LLC
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WAYNE EDWARD MCFARLAND
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Prepared for

New York State Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway
Albany, NY 12233-7016

Prepared on Behalf of:

10 East Chester Street, LLC
430 East Genesee Street
Syracuse, New York 13202

October 2005

Project No. N5007

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SECTION 1 – INTRODUCTION

As part of a Brownfield Cleanup Agreement (BCA) with the New York State Department of Environmental Conservation (NYSDEC) (BCA No. C356032), 10 East Chester Street, LLC (the Applicant and Owner) has completed a Remedial Investigation (RI) and is prepared to proceed with the Remedial Action component of the BCA. The site history, environmental conditions and findings of the investigation conducted on the site are contained in the RI Report completed by S&W Redevelopment of North America, LLC (SWRNA, 2005). A Remedial Action Plan (RAP) was prepared (SWRNA, 2005) based on the findings of the RI and the contemplated future use of the site, and prescribed a Track 4 remedial approach that would allow for institutional and engineering controls consistent with the proposed commercial end use.

Remedial action objectives (RAOs) set forth by the RAP will protect human health and the environment. The Track 4 cleanup approach will support commercial end use of the site, and meet the RAOs. The specific remedial actions to achieve the Track 4 approach were identified in the RAP as follows:

- Building Demolition to provide access to areas of remedial activities and allow for redevelopment of the site (demolition of building structures was completed December 2004).
- Source Removal consisting of removing the six (6) underground storage tanks (USTs) remaining at the site and impacted soil, if encountered. In addition, the floor drain in the sub slab crawl space of the former dry cleaning building will be excavated.
- In Situ Groundwater Treatment to decrease the volatile organic compounds (VOCs) contaminant mass in the shallow groundwater zone.
- Engineering Controls will be defined in a Site Management Plan and Environmental Easement that require a barrier consisting of either 6" asphalt paving, 6" concrete slabs, or 1' soil. In addition occupied buildings will require a sub slab vapor barrier.
- Institutional Controls will be put in place to prohibit the use of groundwater at the site without proper treatment and approval by the NYSDEC and restrictions on the end use for commercial development.

The RAP described the steps that will be taken to implement the above actions. Because if its complexity relative to the other specified actions, the implementation of the proposed in-situ groundwater remediation system warrants further description of system layout, installation, and operation. This Remedial Design document provides engineering design details relative to the in-situ groundwater treatment system.

The site specific technical plans contained herein describe the installation, operation, and performance monitoring of the in-situ groundwater treatment system.

This Remedial Design Document coupled with the Remedial Action Plan (SWRNA, 2005) will serve as the Remedial Action Work Plan for the Site. Once approved by the NYSDEC, the remedial action will be implemented in accordance with the Work Plan.

SECTION 2 - PROJECT OVERVIEW

The in-situ groundwater remediation system will provide contaminant mass reduction at the site, thereby reducing the potential for future exposure to site contaminants both on site and off site via groundwater and soil vapor.

2.1 SUMMARY OF RI FINDINGS

Data from the 2005 RI indicates that chlorinated compounds and petroleum compounds are the primary groundwater contaminants of concern (COCs) at the site. Groundwater contamination at the site is relatively limited to the upper water table zone, due to the presence of upward hydraulic gradients and a low-permeability clay/dense silt lower unit. Volatile organic compounds (VOCs), primarily chlorinated organic compounds (i.e. tetrachloroethene, trichloroethene, dichloroethene) and petroleum related compounds, were detected above Class GA water quality standards in groundwater samples taken from nine (9) of the ten (10) shallow monitoring wells. In contrast, VOCs were detected at relatively low levels in deep groundwater with only two (2) of the eleven (11) groundwater samples from deep monitoring wells containing VOCs above Class GA water quality standards . Although petroleum compounds indicative of petroleum (gasoline) impacts were detected in shallow groundwater samples co-mingled with the chlorinated organics plume, the degree of groundwater impact with respect to petroleum is comparatively minor. The prevailing site groundwater flow direction is to the east-southeast, and there is evidence that the groundwater plume may have migrated off the southeast portion of the site. The groundwater data indicate higher concentrations of contamination in the western and northwestern portions of the site, but discrete sources related to specific USTs or former site structures could not be verified. Although, it is suspected that the existing USTs are a likely source of petroleum contaminants.

2.2 REMEDIATION GOALS

The overall remediation goal for the site is to protect human health and the environment from site-related contamination, in a manner that supports redevelopment and reuse of the site to the benefit of the community. The remedial strategy will focus on eliminating or reducing human health exposure to site contamination. Under current site conditions, there are no complete, or potentially complete, fish or wildlife exposure pathways for this site.

In order to achieve site remediation goals, the following Remedial Action Objectives (RAOs) have been identified (Remedial Action Plan, SWRNA 2005).

- Eliminate, or reduce to the extent practicable, potential on-site sources of petroleum and chlorinated hydrocarbon impacts to shallow groundwater;

- Eliminate, or reduce to the extent practicable, human exposure to site groundwater through ingestion;

- Eliminate, or reduce to the extent practicable, petroleum and chlorinated VOC contamination in shallow groundwater to mitigate potential human exposure to volatile organic vapors that may migrate into future site structures;

- Eliminate, or reduce to the extent practicable, direct human contact with petroleum impacted soils on-site; and

- Eliminate, or reduce to the extent practicable, adverse effects of the site to fish and wildlife resources.

To address the groundwater and soil vapor RAOs, an in-situ chemical oxidation (ISCO) system has been designed that will treat groundwater contamination by chemical oxidation processes. By reducing the contaminant mass at the site, this system will permanently reduce the potential for future migration of, and exposure to, site contaminants. The basis of design and conceptual approach to implementing the ISCO groundwater treatment system were outlined in the RAP.

SECTION 3 - EVALUATION OF REMEDIAL APPROACH

The focus of the ISCO system will be treatment of shallow groundwater identified as the area of environmental concern, containing elevated concentrations of tetracholoethene (PCE), trichloroethene (TCE), and petroleum related compounds (typically Benzene, toluene ethybenzene and xylene (BTEX)). An in-situ chemical oxidation (ISCO) system will be installed that injects potassium permanganate ($KMnO_4$) solution into the shallow groundwater zone, to destroy organic contaminants. Although the removal of the chlorinated solvents will be the primary objective of the treatment system design, that the proposed design will also treat petroleum related compounds.

Oxidation using $KMnO_4$ involves cleavage of carbon-carbon bonds often facilitated by free-radical oxidation mechanisms. By-products from the reaction include carbon dioxide, manganese dioxide solids, potassium and chloride; these by-products are non-toxic at the levels produced. The following equation describes the overall chemical reaction for the oxidation of PCE and TCE using $KMnO_4$:

$$\text{PCE: } 4KMnO_4 + 3C_2Cl_4 + 4H_2O \Rightarrow 6CO_2 + 4MnO_2(s) + 4K^+ + 12Cl^- + 8H^+$$

$$\text{TCE: } 2KMnO_4 + C_2HCl_3 \Rightarrow 2CO_2 + 2MnO_2(s) + 2K^+ + 3Cl^- + H^+$$

The most important factor in the success of ISCO is the ability of the oxidant to reach the contamination. Once introduced into the saturated zone, chemical oxidants catalysts may be distributed by advection and dispersion to address the target treatment zone. Ideally, the oxidant concentrations are sustained from the point of application until the oxidants contact the contaminants. However, the concentrations of oxidant more typically decrease by dilution through mixing with subsurface pore water and through consumption via chemical reactions that are not related to the degradation of the target constituents of concern. The loss of oxidant due to subsurface reactions unrelated to contaminant oxidation is referred to as the natural oxidant demand (NOD).

3.1 BENCH SCALE TEST

Carus Chemical Company was retained by 10 East Chester Street, LLC to perform a bench test in July 2005 to determine the permanganate soil/site groundwater oxidant demand (PSOD). The permanganate demand is the amount of permanganate consumed in a given amount of time. The results are as follows:

Permanganate Concentrations	PSOD (per 48 hours)
3.1 g/kg	1.8 g/kg
15.5 g/kg	3.0 g/kg
31.0 g/kg	4.0 g/kg

Overall, the soil and groundwater samples had a low demand in all three scenarios, indicating that ISCO with permanganate is a workable remedy.

3.2 PILOT TEST

To help validate the potential of permanganate ISCO as a remedy, and to provide a more practical basis for system design, a pilot study was conducted at the site on August 8 and 9, 2005. A key goal of the pilot test was to obtain first-hand measurements of the radius of influence (ROI) of a potassium permanganate solution introduced in the subsurface via injection well. Approximately 1,000 gallons of a 3 percent potassium permanganate solution were introduced into groundwater monitoring well MW-7S. The effective ROI was determined by examining the color of water samples collected from four observation wells (OW-1, -2, -3, and -4), which were installed at respective distances of approximately 10 feet (OW-1 and OW-3) and 20 feet (OW-2 and OW-4) away from MW-7S. The ROI was verified when water samples from the observation wells turned purple, as occurs when permanganate is mixed with water. In addition to verifying permanganate breakthrough based on color, the hydraulic and chemical effects of the permanganate solution on the aquifer were monitored; water levels and field parameters were measured during the study, and pre- and post-study groundwater samples were collected and analyzed for volatile organic compounds (VOCs).

A. STUDY DESIGN

Figure 1 shows the orientation of observation wells OW-1, -2, -3, and -4 with respect to MW-7S. Monitoring well MW-7S is a 2-inch diameter PVC water table well installed in the shallow sandy/fill unit. It is 17.5 feet deep (below ground surface – "bgs"), and screened from 7.5 feet to 17.5 feet bgs, directly above the lower confining silt/clay unit at the site, and straddling the water table. Each of the observation wells is constructed of 1-

inch diameter PVC. The screen intervals of the observation wells, and depth to groundwater prior to the start of the pilot test, are indicated below:

Well I.D.	Screen Interval	Depth to Water
OW-1	6 – 16 ft bgs	9.83 ft bgs
OW-2	6 – 16 ft bgs	9.89 ft bgs
OW-3	8 – 18 ft bgs	9.91 ft bgs
OW-4	8 – 18 ft bgs	10.02 ft bgs

The permanganate compound introduced at MW-7S was provided by Carus Chemical Company. The permanganate solution was prepared on site, by mixing approximately 275 pounds of powdered potassium permanganate with approximately 1,000 gallons of water provided by a City of Kingston fire hydrant. This solution was introduced into MW-7S over a 10-hour period beginning at 6:00 pm on August 8, 2005, at a fairly uniform flow rate that ranged from approximately 3 gpm to approximately 3.5 gpm.

During the course of the pilot study, water samples were collected from the four observation wells and examined for evidence of purple permanganate solution. In addition, field parameters (pH, Eh, temperature, specific conductance, and salinity) were measured to determine if there were any notable changes in the chemical characteristics of the groundwater. Table 1 presents a summary of the field measurements for the observation wells. Appendix A includes the field log sheets for each observation well. Appendix B includes photographs of the pilot study.

B. PERMANGANATE BREAKTHROUGH

Purple potassium permanganate solution was observed in observation wells OW-1 and OW-3 (10 feet away from MW-7S) approximately 10 to 12 hours into the study (see photographs, Appendix B). The first indication of permanganate breakthrough occurred at observation well OW-3, just as the last of the permanganate solution was introduced into MW-7S, at 3:50 am, August 9, 2005. Breakthrough was next observed approximately 2 hours later, on August 9 at 6:00 am, at observation well OW-1.

No color was observed in groundwater from the more distant observation wells OW-2 and OW-4 (20 feet away from MW-7S) as of the last measurements taken on August 9, 2005, at 11:45 am. However, on August 24, 2005, two weeks after the pilot study ended, water samples collected from OW-2 had a deep purple color. Groundwater from wells MW-7S, OW-1, and OW-3 was also still purple. Aside from some natural turbidity, groundwater from observation well OW-4 had no indication of purple on August 24, 2005.

C. GROUNDWATER MOUNDING AND FLOW HYDRAULICS

Depth to groundwater was measured in the observation wells during the pilot study, and the measurements indicated only a slight groundwater mound due to the introduction of 1,000 gallons of permanganate solution. This suggests that the liquid was readily dispersed throughout the zone of saturation. Groundwater elevations in wells OW-1 and OW-3, which were approximately 10 feet away from MW-7S, increased by 4 to 5 inches. At observation wells OW-2 and OW-4, approximately 20 feet away from MW-7S, the increase was 1 to 3 inches. Water level measurements at the injection well indicated a four-foot rise in hydraulic head. This indicates the fluid level in MW-7S during the pilot test was approximately 5.6 feet bgs, which is approximately 2 feet above the top of the well screen.

Although hydraulic conductivity had been previously estimated from slug tests performed during the RI, data from the pilot study provide a better indication of hydraulic characteristics for the site. Because hydraulic tests are scale dependent, those that are conducted over a large area are more representative of a site than those that are conducted at a single borehole, such as a slug test. Slug test data typically underestimate hydraulic conductivity because they are too small in scale to account for bulk aquifer properties, such as fractures and high permeability zones, that increase the aquifer's capacity to transmit water.

The injection of permanganate solution at MW-7S can be viewed as a mirror of a pumping test. Accordingly, the same equations that are used to estimate hydraulic conductivity from pumping tests can be used for injection tests. According to Driscoll (1989), hydraulic conductivity can be estimated from a pumping test by the following equation:

$$K = \frac{1055 \times Q \times \log(r_2/r_1)}{h_2^2 - h_1^2}$$

where K = hydraulic conductivity (gpd/ft^2)
Q = injection rate (gpm)
r_1 = distance to closest observation well (ft)
r_2 = distance to farthest observation well (ft)
h_2 = saturated thickness at the farthest observation well (ft)
h_1 = saturated thickness at the nearest observation well (ft)

All of the parameters on the right side of the above equation can be determined by a pumping or injection test. In the case of an injection test, such as done for the pilot study, the flow rate (Q) is a negative value, since the equation was developed to describe the withdrawal of water, not injection. However, the hydraulic principles apply to either case.

Figure 2 shows how the parameters of the equation are defined, based on the pilot study. When the indicated values are plugged into the equation, K is calculated to be 594 gpd/ft^2, which is equivalent to 2.8×10^{-2} cm/sec. This result is an order of magnitude higher than the geometric mean calculated from slug test data during the RI, which means that the shallow groundwater seepage velocity is on the order of 200 feet per year at the site, as opposed to 20 feet per year as estimated in the RI Report. This finding indicates that groundwater at the site is potentially capable of transporting permanganate solution across the site, which should increase the ROI of oxidant before it is chemically consumed.

D. FIELD PARAMETERS AND VOC CHEMISTRY

Field parameter measurements made during the pilot test did not indicate a noticeable change in groundwater geochemistry from the start of the test to its conclusion. Figure 3 illustrates the data for pH and Eh. For each observation well, there was not a great deal of change over time, aside from what appears to be random fluctuation in field parameters. The data show a fair degree of precision; note that the data for each individual well is fairly distinct from the other wells. This finding increases the level of confidence in the data, and its capability of measuring relative differences in chemical parameters.

Groundwater samples were collected from wells MW-7S, OW-1, OW-2, OW-3, and OW-4 immediately prior to and two weeks after the pilot study. The results are presented below:

Well I.D.	Distance from MW-7S	Pre-Test VOCs	Post-Test VOCs*
OW-1	10 ft	600 ug/L	non-detect
OW-2	20 ft	580 ug/L	non-detect
OW-3	10 ft	740 ug/L	510 ug/L
OW-4	20 ft	450 ug/L	420 ug/L
MW-7S	--	290 ug/L	non-detect

* Post-test data indicated detections of acetone in all of the samples except OW-4. Acetone was not detected in the pre-test samples, and is believed to represent a laboratory artifact in the post-test samples. The reported values therefore do not include the detected acetone concentrations.

Laboratory analysis reports are provided as Appendix C. Aside from detections of acetone in three of the four post-test samples, the only detected VOC for both sampling events was tetrachloroethene (PCE). The comparison of pre- and post-test data indicate complete destruction of PCE in wells MW-7S, OW-1, and OW-2, and approximately 30% destruction in OW-3, after two weeks. There was no noticeable decline in contaminant levels in observation well OW-4, which did not contain purple colored groundwater, after two weeks. Overall, the pre- and post-test VOC data indicate that after only two weeks of residence time, there were substantial reductions in VOC levels due to destruction by the permanganate.

E. PILOT STUDY CONCLUSIONS

The results of the pilot study indicate an ROI of at least 20 feet can be achieved by injection of potassium permanganate solution, and the ROI is likely to be greater than this owing to the high hydraulic conductivity and groundwater seepage velocity that was observed in MW 7S. A deep purple signature color of permanganate was still evident in groundwater samples from the injection well and three of the four observation wells two weeks after the pilot study ended. This indicates that the permanganate solution had not been fully depleted within two weeks, and suggests that allowed more time, the permanganate solution could migrate even further than 20 feet downgradient from the injection point.

VOC levels in three of the four observation wells declined noticeably after two weeks. Further decline is expected over time, since the color of the water samples was still purple, indicating that some oxidation capacity remained.

SECTION 4 – REMEDIAL DESIGN

The remedial approach will involve an array of fifteen (15) injection wells that will be manifolded in four groups consisting of 3 to 4 injection wells each. During an injection episode, a 2 percent potassium permanganate solution will be injected sequentially into each of the four groups of injection wells. The 2% solution was selected for the full scale injection to ensure complete solution of the potassium permanganate.

4.1 INJECTION WELL LOCATIONS

The proposed layout of the injection well array is based on the 20-foot ROI that was verified by the pilot study. In reality, the ROI is likely to be greater than 20 feet, as indicated by the deep purple groundwater color two weeks after the pilot study in an observation well 20 feet away from the injection well. For design purposes, a conservative 20-foot ROI will be assumed.

Figure 4 depicts a network of fifteen (15) injection wells across the site. The shaded areas on the figure illustrate the zone of groundwater impact by total VOCs, based on analytical data from the RI. Isoconcentration contours for 1,000 ug/L and 100 ug/L are shown, to indicate the area of contamination to be treated. The proposed injection well locations will concentrate the injection of permanganate in the core of the groundwater plume, to destroy the VOC contaminant mass, and will also disperse permanganate across a wide area downgradient of the plume's core defined by the relatively higher contaminant concentrations (i.e. > 1,000 ppb).

Nine (9) injection wells will be located in the core of the groundwater plume (IW-1 through IW-9), where groundwater contaminant levels are highest. These wells will be installed in a tightly spaced circular array, to concentrate the permanganate solution in the area of highest contaminant concentrations. The core contaminant area injection wells will be centered 35 feet apart, to allow at least five feet of ROI overlap.

Three (3) injection wells (IW-10, -11, and -12) will be located along an arc at the downgradient margin of the core contaminant area, and three (3) injection wells will also be located along a line at the downgradient site boundary (IW-13, -14, and -15). It is proposed that these six injection wells, downgradient of the core of the plume, be spaced

40 feet apart to better disperse permanganate across the downgradient portion of the site where contaminant concentrations are lower.

4.2 INJECTION WELL DESIGN

Injection wells will be designed to treat the shallow water bearing zone, which is the surficial silt/sand/fill unit that overlies the contiguous silt/clay confining unit. Based on RI data, this treatment zone extends from the water table, which is approximately 8 to 10 feet below ground surface (bgs), down to the top of the confining silt/clay layer approximately 14 to 16 feet bgs. Overall, the saturated zone of contamination is approximately 4 to 6 feet thick. However, the injection wells will have at least 10 feet of screen to ensure that permanganate is dispersed across the entire treatment zone. A design schematic for the injection wells is shown as Figure 5.

The injection wells will be installed using 8 ½ inch inside diameter hollow stem augers, which will be drilled at least one foot into the silt/clay confining layer that underlies the surficial sand. The injection wells will be constructed of 4-inch diameter schedule 40 PVC, with 0.01 slot well screen. The well screen will extend up from the bottom of the borehole keyed into the silt/clay unit, so that the well screen will straddle the water table. The well screen will be positioned so that no less than 2 feet is above the water table.

The annular space of the borehole will be filled with #3 silica sand from the bottom of the borehole to at least 2 feet above the top of the well screen. At least two feet of bentonite pellets will be placed above the sand filter pack, and the remaining space will be backfilled with a grout/Portland cement mixture. The injection wells will be secured with locking stick-up protective iron casings. The top of the PVC riser will be threaded, with screw-on PVC caps, to provide easy connection with remediation system components.

4.3 - FEED SYSTEM COMPONENTS

The injection wells will be manifolded in groups of four, so that permanganate solution will be injected into four wells at a time. An injection episode will therefore consist of four sequential injections conducted at the following sets of injection wells:

Injection #1: IW-1, -2, -3, and -4
Injection #2: IW-5, -6, and -7

Injection #3: IW-8, -9, -10, and -11
Injection #4: IW-12, -13, -14, and -15

Potassium permanganate solution will be fed to each of the four respective groups of injection wells via a system that will be engineered to carefully control injection rates. The following is a schedule of basic feed system equipment that will be used.

Quantity	**Item Description**
1	Drum Handler
1	Volumetric Helix Feeder
1	Four-point Distribution Header
1	50 Gallon Solution Tank Setup which includes: • Tank • Mixer • Rotometer • Solenoid • Dissolver Level Switch
4	1-inch diameter hose 100 feet in length
1	1-inch diameter hose 150 feet in length
1	¾ Horsepower Pump (20 gpm)
2	60 Hz Generator
2	Flood light
4	Flow meter (0-10gpm)
7	Check valve
8	330 pound drum of potassium permanganate
3	50 foot outdoor extension cord
1	1-inch backflow preventer
2	12-volt DC marine battery • BCI Group size 24 • 630 MCA (max cranking amps) • 130 minute capacity

5.0 - SYSTEM OPERATION, MAINTENANCE & MONITORING

5.1- SYSTEM REQUIREMENTS

The volumetric helix requires a power source for operation. A variable speed drive consisting of a motor, controller, and control station determine the feed rate. The controller converts alternating current to direct current to drive the ¼ HP DC motor. The standard control panel consists of an ON-OFF switch and a speed adjusting potentiometer and operates on 115V 50/60 Hz AC current. The solution mixer has a ¼ HP DC motor and the pump is ¾ HP. The drum handler runs on a 12-volt DC battery which can be charged on a 120 volt system. One 40 amp generator can handle all four of these items. A separate generator will be on site to power the flood lights at night.

The system requires water at 15 gpm and a pressure between 10 psi and 40 psi. The City of Kingston Water Department hydrant on East Chester Street can provide potable water at this flow rate.

5.2 EQUIPMENT SET-UP [Note: Sections 5.2 thru 5.7 were prepared and provided by Carus Chemical Company]

The equipment and potassium permanganate drums will be delivered to the site via a shipping truck with a hydraulic lift. Two pallets will be ordered for each event and each pallet will have four drums (2,640 pounds of potassium permanganate for each injection event). The drums are made of heavy gauge steel to prevent damage and spills during handling and storage. The equipment will be mounted on wooden skids to eliminate the need for a fork lift to move the equipment around the site.

The volumetric helix feeder and 50 gallon mix tank will be situated on the same skid and the pump will be mounted on a separate skid. The volumetric feeder will have a 1 ½ inch diameter helix with a maximum of 84 RPM. This helix can feed between 17.5 lbs and 350 lbs of potassium permanganate per hour. The mix tank will have an agitator to assist in the dissolution of the potassium permanganate. The tank is made of HDPE and is surrounded by a metal support frame to hold the mixer.

All equipment will be stored outside but a tent is recommended to protect it from the elements. A trailer will be placed on site to house sampling equipment. An area of approximately 10 feet by 10 feet will be required to place the equipment. To avoid moving the equipment between each injection, it will be placed at a central location on the site between injection well Nos. 8, 10, and 12 (See Figure 4). The generators and lights will be placed at convenient locations around the equipment.

A 1-inch hose approximately 150 feet long, will be attached to the hydrant on East Chester Street and connected to the mix tank. A backflow preventer will be installed on the connection to prevent flow of the potassium permanganate solution into the hydrant. The volumetric feeder will be connected via an encased auger to the 50 gallon mix tank. The mixer will be situated on top of the mix tank. Both the volumetric feeder and the mixer must be plugged into separate receptacles on the generator. The mix tank has three 1½-inch orifices for removal of the potassium permanganate solution. One at the top of the tank for overflow and the other at the bottom to be used for flushing the permanganate solution. Both will drain into a bucket for collection and later disposal. A 1-inch diameter hose will be connected to the third orifice and attach to the 20 gpm pump, which will then be attached to the distribution head. The pump must also be plugged into the generator. Four 1-inch 100 foot diameter hoses will be attached to the outputs on the distribution head for injection into the wells. This equipment schematic can be found on Figure 6.

Pre-Startup Procedure:

a. With screwdriver and small wrenches, check tightness of all setscrews and mounting screws.
b. Initial lubrication is made at factory; further lubrication before starting is not necessary.
c. Turn on water supply temporarily and check tightness of all piping connections.
d. Adjust float valve arm so float shuts off water before water level reaches overflow.

5.3 SYSTEM START-UP

The helix feeder is volumetric, and gravimetric rate of feed varies widely from one chemical to the next. Therefore, calibration must be done at installation with the potassium permanganate. Since rate adjustment dial is approximately linear, it is only necessary to determine rate at the point near maximum rate setting. A linear calibration curve is desirable because they result in the best accuracy and precision. A plot of the calibration data and the fitted line should always be examined to check for outliers and to verify behavior of the feeder at a current setting with material inside.

Next, the potassium permanganate drum will be rolled from the pallet and placed on the battery operated drum handler by field personnel following the below directions:

Replace the solid plug on the hydraulic reservoir with the supplied breather cap for proper air venting before operating the drum handler. Remove the lid from a 330 lb. drum of potassium permanganate. Attach the stainless steel discharge cone to the drum with the bolt-on clamp provided. Before installing the cone, inspect the drum to insure the rim is round and free of defects such as indents, bends, etc. which will prevent the cone from seating properly. Locate the cone on the open drum being careful not to distort or misalign the gasket. Attach the locking ring to the cone and drum. Secure the locking ring in place with a nut & bolt. Make sure that the discharge iris valve is closed. Next, strap the drum to the lifting arms between the two center ribs of the drum and tighten the clamps with the ratchet handles. Once the drum is secured to the handler, press the raise switch to lift the drum and entire assembly off the ground. Roll the drum handler to the rear of the feeder. Press the raise button until the drum is approximately 4 feet off the ground. Next, press the rotate button to invert the drum and assembly. With the drum completely inverted, roll the drum handler and inverted drum over the inlet seal of the feeder. Take care to line up the discharge spout with the inlet seal. Once aligned, press the down button to lower the spout. This will engage the inlet seal. Set controls to the required feed rate.

Once the drum is attached, the hydrant will be opened and water will flow into the tank at approximately 15 gpm. When 2 inches of water is in the tank, power on the mixer and slowly open the iris valve. Material in the hopper will flow by gravity into a rotating horizontal feed helix, which is chain-driven by a variable speed motor and gear reducer. As the feed helix rotates, it moves the material along the base of the hopper and out through the discharge spout. The feeder is equipped with an electromagnetic vibrator that provides cycled agitation to assist chemical flow to the feed screw. The vibrator is typically set to cycle 45 sec ff and 5 sec (or less) on while the feeder is operating. The feeder will auger the potassium permanganate into the 50 gallon mix tank at 150 pounds per hour creating a 2% solution. **Note: To prevent damage to the helix, be sure to shut off the feeder whenever the water supply to the mix tank is shut off.**

Fill the mix tank three quarters before beginning application. At this point, open the outlet from the mix tank, turn the pump on and beginning discharging the solution to the injection wells at a flow rate of 3 gpm (30 pounds of potassium permanganate per hour into each injection point).

The depth at which permanganate is introduced into the wells will be determined during the injection, and can be adjusted as necessary, to provide vertical distribution in the water column. In an effort to maintain similar flow rates and pressures at each injection point, wells that are equidistant from the equipment setup will be injected at the same time as follows:

Injection	Well Numbers
1	1, 2 ,3 and 4
2	5, 6 and 7 (close shut off valve to fourth application point)
3	8, 9, 10 and 11
4	12, 13, 14 and 15

5.4 DRUM HANDLER MAINTENANCE

Check the hydraulic fluid after every 40 hours of use. Three quarts of fluid is needed to operate the system properly. Check the voltmeter reading for adequate charge on the batteries. An overnight charge is usually sufficient to fully re-charge the battery. The lifting and rotator chain should be oiled periodically as needed. The nylon straps should be checked occasionally for wear and replaced as necessary. The chain guards can be temporarily removed to grease the rotator chain. The handler should be greased after every 100 hours of use.

- One grease point on each of the two front wheels.
- Two grease zerks on the front of the rotator.
- Eight grease points on the back plate (which rides up & down the mast).

5.5 HELIX FEEDER MAINTENANCE

Pull side & back covers off every three months and remove material that may have contaminated these areas. While covers are off, check all parts for wear and replace where necessary. Check all hardware for tightness and tighten where necessary. Ball bearing motors usually have lifetime lubrication requiring no attention for two years. In either case, the motors should be inspected and serviced at least once a year. The equipment supplier should perform this maintenance prior to delivery to the project site.

5.6 TROUBLESHOOTING

The following table describes briefly possible failures and their causes. No table can include all possible symptoms but the list below is a guide to areas for investigation.

Symptom	Possible Cause	Corrective Action
Motor not running	Supply power not on	Turn on
	Power switch failure	Replace
	Timer not operating	Repair or replace
	Motor overload tripped	Check motor, if motor is OK, then reset OL
	Defective motor	Replace
Helix not turning but motor is running	Defective gearbox (input shaft turns, output shaft does not)	Replace or repair gearbox making sure to thoroughly clean when repairing
	Sprockets in drive compartment are loose	Re-tighten setscrews on shaft flats
	Loose setscrew on helix	Align to shaft flat & re-tighten
	Torque limiter on main drive shaft is slipping	Determine cause of slippage & reset to 8 ft. pounds per instruction manual
Material being fed at a constant inaccurate rate	Feeder potentiometer not set correctly	Reset

	SCR Control Boards not functioning correctly	See SCR instruction manual
	Material flow problem	See material section
Material in hopper is rat holing or bridging	Vibrator not operating	Correct
	Vibrator amplitude set too low	Increase amplitude
	Improper feed application for material	Contact your local Carus representative
	Vibrator amplitude set too high	Decrease amplitude
Material in hopper is packing	Vibrator is not synchronized with on/off cycle of the feeder and is running when the feeder is off	Interlock the feeder with the feed cycle
	Improper feed application for material	Contact your local Carus representative
	Vibrator amplitude set too high	Decrease amplitude
Material in hopper is flooding	Material flooding from spout	Plug the spout before refilling the hopper
		Refill the hopper before completely empty
	Improper feeder application for material	Contact your local Carus representative

5.7 EQUIPMENT STORAGE

At the end of each injection event, the feed equipment will be emptied of all potassium permanganate. The unit will be emptied by operating the feeder until the hopper is empty. During the last injection event, every effort will be made to empty liquid potassium permanganate into the injection points by draining the solution from the tank of each individual hose. If the feeder cannot be completely emptied by normal operation, the remaining potassium permanganate can be "scooped" from the hopper and placed in a clean, dry, metal or HDPE plastic drum for proper disposal or reuse. All crystalline potassium permanganate and/or all permanganate aqueous solution will be removed from the dissolver/mix tank, all pumps, hoses and accessories. It is important to note that as the crystalline potassium permanganate absorbs moisture, it will cake and harden. In this case, the only option may be to dissolve the permanganate using water. The permanganate solution must be collected in dilute solution (<6% by weight) and neutralized using a reducing agent such as sodium bisulfite before disposal.

All equipment surfaces that may have residual potassium permanganate will be thoroughly cleaned. The equipment will be rinsed with water (inside and out) and allowed to dry before shipment. Wet rags will be used to wipe down the equipment and the rags will be thoroughly rinsed with copious amounts of water to wash away any visible purple. If not rinsed thoroughly, rags may become more concentrated with permanganate upon drying, increasing risk of spontaneous combustion. All valves shall be closed and hoses capped.

The equipment will be packaged by crating or palletizing and stretch-wrapped for return shipment. The crating, pallets, or packaging materials that the equipment was delivered in will be reused.

5.8 EFFECTIVENESS MONITORING

Effectiveness monitoring will be conducted before, during and after the injection operation. The overall objective will be to verify that the application of chemical oxidant via the system is operating as designed. This will be determined by the following measurements:

- Measuring flow rates/injection volumes during application
- Measuring the radius of influence around injection points based on the color of water samples taken from downgradient injection wells and monitoring wells
- Measuring contaminant levels in samples taken from adjacent effectiveness monitoring wells before, during, and after the application based on chemical signatures
- Measuring indicator parameters (pH, Eh, specific conductance, turbidity, temperature) in samples taken from effectiveness monitoring wells before, during, and after the application

Part of the effectiveness monitoring program will involve collecting groundwater samples from nine (9) monitoring wells located within and adjacent to the injection well network and groundwater plume. Six of the proposed monitoring wells to be used for this purpose already exist at the site (MW-1S, -2S, -3S, -5S, -7S, -8S). Three additional monitoring wells (MW-9S, -10S, -11S) will be installed to supplement the existing wells (see Figure 4). These "effectiveness monitoring wells" will be installed as standard 2-inch diameter flush-mount PVC monitoring wells, installed by hollow stem auger methods and consisting of ten (10) feet of 0.01-inch slot well screen. A silica sand pack (#0) will be placed from the bottom of the borehole and extend a minimum of one foot above the top of screen, and a 2-foot bentonite seal will be placed on top of the sand pack. The flush-mount curb box will be cemented in place at ground surface.

The effectiveness monitoring program will include three main elements, as described below.

A. BASELINE MONITORING

The effectiveness monitoring program will begin prior to permanganate injection, to establish a pre-remediation baseline. The nine effectiveness monitoring wells will be sampled for the following parameters:

- **VOCs**. Existing levels of VOC contamination have been measured in site soils and groundwater. VOCs are the contaminant of interest that will be destroyed by the application of chemical oxidant. Previous site investigation has determined that non-target organic compounds, such as semivolatile organic compounds (SVOCs), are generally absent or present in too small a quantity to exert an oxygen demand on the chemical oxidant and therefore will not be analyzed.

- **Metals and General Chemistry**. Site soil and groundwater samples were analyzed for a number of parameters that could potentially exert a demand on the chemical oxidant and reduce its ability to oxidize VOCs. ***Iron*** can potentially consume oxidants, but the iron concentrations in groundwater aren't prohibitively high (< 1 ppm upgradient). Iron levels increase slightly downgradient of the source areas, to greater than 4 ppm at the downgradient site boundary.

Manganese may cause more rapid consumption of permanganate. However, manganese levels are fairly low in site groundwater (< 1 ppm). ***Alkalinity*** in site groundwater is fairly low (less than 200 ppm for most of the site), which means that it probably won't exert much oxygen demand. ***pH*** of site groundwater is near neutral. Changes in pH from the application of the oxidant may include a decrease in pH, depending on the buffering capacity of the soil and groundwater. pH will be measured as a field parameter (see below).

- **Chemical Oxygen Demand (COD)**. The COD for groundwater measures the amount of oxidizable material dissolved in the water. Essentially, it is a measure of how much dissolved matter "wants" to be oxidized, and it is therefore an indicator of how much of the chemical oxidant may be consumed by parameters other than the target VOCs. The COD for site groundwater ranged from non-detect to over 100 mg/L, with an average of approximately 55 mg/L. These levels are not unusual for site contaminated with VOCs, and are therefore not considered prohibitively high.

- **Total Organic Carbon (TOC)**. TOC analysis measures all forms of organic carbon is the groundwater, both natural and contaminant-related. Because natural organic carbon may consume the chemical oxidant as well as the target VOCs, it is important to measure it as a baseline parameter. In the majority of groundwater samples analyzed, TOC was less than 10 mg/L, which is not prohibitively high.

- **Field Parameters**. In addition to pH, field parameters will be measured, including Eh, specific conductance, dissolved oxygen, temperature, and turbidity.

B. PROCESS MONITORING

Process monitoring refers to system performance measurements – such as flow rates and injection volumes – along with monitoring of groundwater conditions that develop as a result of injection period of the chemical oxidant.

The flow rate of permanganate injection will be maintained by a flow meter with an electronic display. The flow meter will be observed during injection episodes and adjusted as needed to maintain a flow rate of approximately 3 gallons per minute.

Groundwater monitoring will be provided by the nine effectiveness monitoring wells located around the injection points within the target area for treatment. The groundwater monitoring program will determine the rate of migration and reaction of the chemical oxidant with site groundwater, and the radius of influence (ROI).

For each injection episode, process monitoring will involve two rounds of field parameter measurements and groundwater sample collection from the effectiveness monitoring wells. The first round will occur immediately following the last injection of permanganate at the fourth injection well group (IW-12 through -15). The second round will occur at a minimum of four weeks thereafter. Each process monitoring event will include the above baselines parameters (i.e. VOCs, iron, manganese, alkalinity, TOC, COD, field parameters) to determine chemical changes in groundwater in the effectiveness monitoring wells. Chemical observations will help verify the ROI of the injection wells.

The expected behavior of these and other process monitoring parameters in response to the chemical oxidant is described below.

- **VOCs.** The cleanup goal of the program is to reduce the mass of contaminant by 90 percent. The remediation program may be determined complete, however, if conditions and trends indicate this level will be achieved. Groundwater samples will be collected from monitoring wells within the treatment area of the plume to measure the reduction in contaminant levels.

- **Iron and Manganese** baseline concentrations are not significantly elevated in site groundwater, so it is not anticipated that they will exert a significant demand on the chemical oxidant. During the injection period, it is expected that iron and manganese concentration in groundwater will decrease as they react with oxidant and form insoluble precipitates. A decrease in iron and manganese concentrations in the treatment zone would therefore indicate that the oxidant is dispersing through the treatment zone. Because baseline concentrations of iron and manganese are field low to begin with, it is doubtful that enough precipitate would form to clog aquifer pores and reduce dispersion of the oxidant.

- **pH** may decrease slightly depending on how well buffered (i.e. resistant to changes in pH) the soil and groundwater is. A decline in pH at a monitoring well downgradient of an injection point would indicate that the monitoring well is within the radius of influence (ROI) of the injection point.
- **Eh.** Like pH, Eh is measured as a field parameter. Eh is a measure of the "redox state" of groundwater – whether it is oxidizing or reducing. Dispersion of the chemical oxidant will increase Eh.
- **Temperature.** A slight rise in groundwater temperature may signal exothermic reactions that occur as permanganate reacts with dissolved groundwater constituents.
- **Color.** As permanganate reacts with water it produces a pink or purple color. In many cases the color is clearly visible so that no colorometric instruments are needed to verify it. In any case, color will be monitored during the injection period to determine the ROI of the permanganate solution.
- **COD & TOC.** Both of these parameters would be expected to decrease in the ROI of the injection points, as the chemical oxidant consumes oxidizable material.

C. POST-REMEDIATION EFFECTIVENESS MONITORING

After the first injection episode and process monitoring are complete, the nine effectiveness monitoring wells will be sampled for two (2) quarterly monitoring events for VOCs, iron, manganese, pH, Eh, TOC, and COD. This will be done to verify that no post-remediation rebound occurs, to confirm that remediation is acceptable.

After the second post-remediation monitoring event following the first injection episode, the percent of contaminant reduction will be determined by comparing the pre-remediation data (i.e. Remedial Investigation and baseline data) and post-remediation groundwater analytical data. Pre-remediation average concentrations of total VOCs, total chlorinated VOCs, and total BTEX will be determined, respectively, for each of the effectiveness monitoring wells at the site.[1] In addition, an average concentration of total VOCs, total chlorinated VOCs, and total BTEX will be determined based on results from all of the effectiveness monitoring wells to provide a site-wide pre-remediation estimate.

The pre-remediation averages for the individual effectiveness monitoring wells will be compared to each round of post-remediation data for each well, to determine the apparent remediation progress, and the percent decline in groundwater concentrations at each well will be used to compute the percent reduction of contamination.

The site-wide pre-remediation averages for total VOCs, total chlorinated VOCs, and total BTEX, respectively, will also be compared to the post-remediation site wide averages, based on data for the final post-remediation monitoring event.

By this approach, one of the following scenarios will result:

> Scenario No. 1. Little or no pink/purple coloration is observed in some of the effectiveness monitoring wells after the elapse of an adequate amount of time (i.e.: one month), indicating that the permanganate solution has not adequately dispersed. In this case, a subsequent injection episode(s) may occur in specific areas where dispersion has not yet occurred and/or may include the installation of additional injection wells to increase the potential for dispersion. This approach would utilize a specific injection well group or groups.
>
> Scenario No. 2: The analytical data for the three (3) sampling events (immediately after injection and two (2) quarterly events), either by individual effectiveness monitoring well or the site-wide average, will demonstrate that 90% or greater mass reduction of contamination has been achieved, or has reached conditions and trends indicating it is likely to be achieved. In this case, no further

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[1] For the newly installed effectiveness monitoring wells MW-9S, 10S, and 11S the single round of baseline data will be used instead of an average, since there is no RI data for these wells.

action would be recommended, aside from continued quarterly monitoring for two additional quarters.

Scenario No. 3: The analytical data indicate that a substantial reduction in contamination has occurred but has not achieved 90% reduction or reached conditions and trends indicating it is likely to be achieved, and there is indication that the potassium permanganate solution still resides in the injection and/or monitoring wells. In that case, it would be recommended that one or two additional quarterly monitoring event(s) be conducted to determine whether, given enough time, the permanganate injection may produce satisfactory results. If after the subsequent quarterly monitoring event(s), the 90% goal is not reached or trends indicate it is likely not to be achieved a subsequent injection episode would be conducted, including a repeat of the effectiveness monitoring program. The additional injection episode would focus on those wells or the areas where 90% or more reduction were not achieved or likely to be achieved.

Subsequent injection episodes may utilize the entire injection well array, or specific injection wells where data indicates additional permanganate is needed. The need and approach for subsequent injections will be determined following the post-remediation monitoring after the initial injection and reviewed with the NYSDEC for their concurrence. A summary of the decision process is depicted in Figure 7.

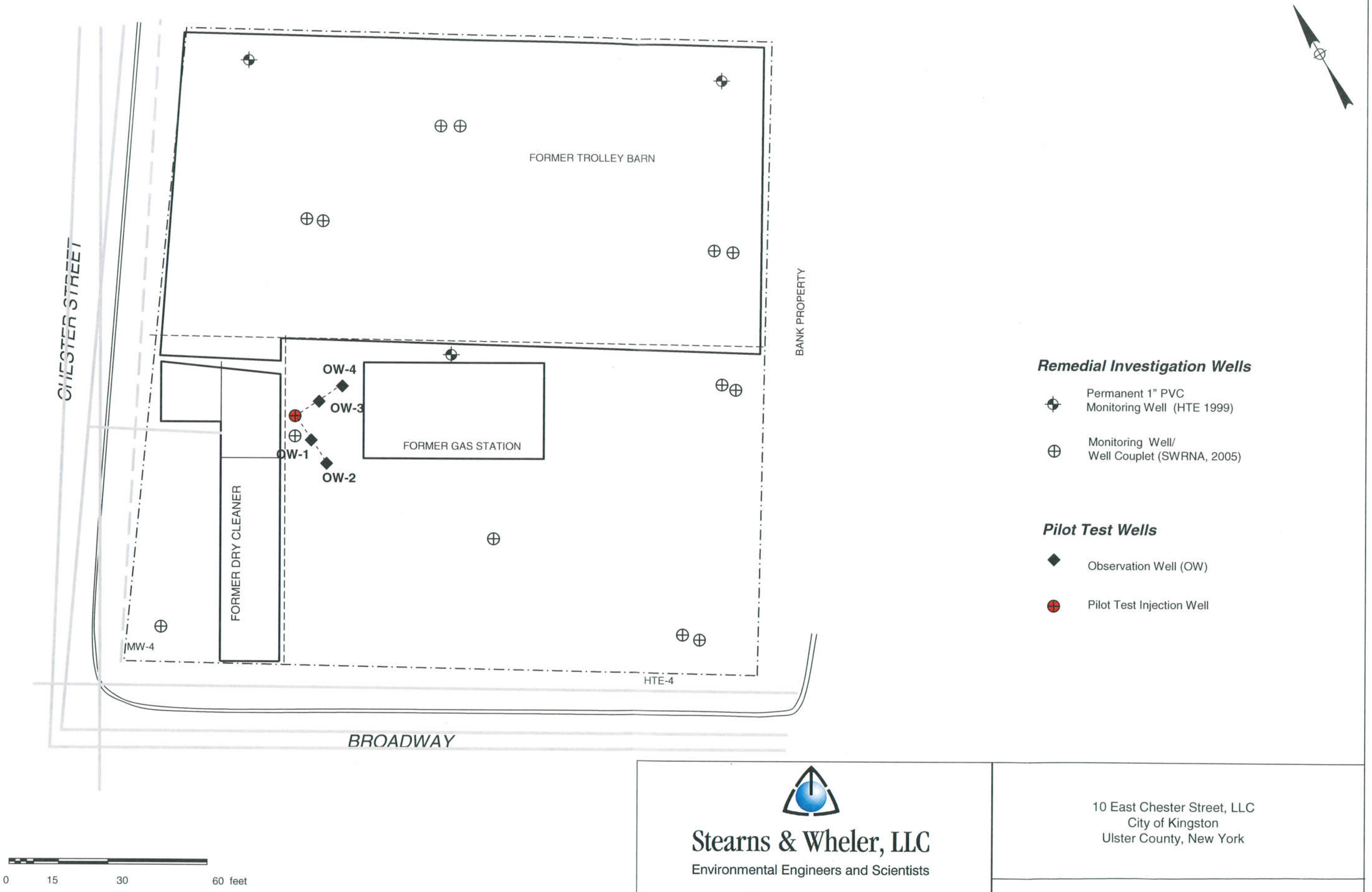
SECTION 6 – SCHEDULE

The following timeline is proposed implementing the remedial action, as set forth under the previously submitted Remedial Action Plan (SWRNA 2005), and including the in-situ remediation program described in this design document:

November 14-18, 2005 – Tank excavation and removal.
November 21, 2005 – Begin installation of injection wells and effective monitoring wells for ISCO system.
November 30, 2005 – Complete installation of injection wells and effectiveness monitoring wells for ISCO system.
December 1, 2005 – Collect baseline (pre-remediation) groundwater samples from nine (9) effectiveness monitoring wells.
December 1, 2005 – Begin construction/installation of ISCO feed and delivery system.

December 6, 2005 – Complete installation of ISO system.
December 7, 2005 – ISCO system start-up: injection episode #1.
December 21, 2005 – Injection episode #1 complete.
December 28, 2005 – complete 1st round of post-remediation groundwater sampling
March 22, 2006 – complete 2nd round of post-remediation groundwater sampling
April 15, 2006- Assess effectiveness of in-situ remediation and determining subsequent actions to be taken.

FIGURES



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Environmental Engineers and Scientists

October 2005

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Ulster County, New York

Figure 1
Pilot Test Monitoring Array

$$K = \frac{1055 \times Q \times \log(r_2/r_1)}{h_2^2 - h_1^2}$$

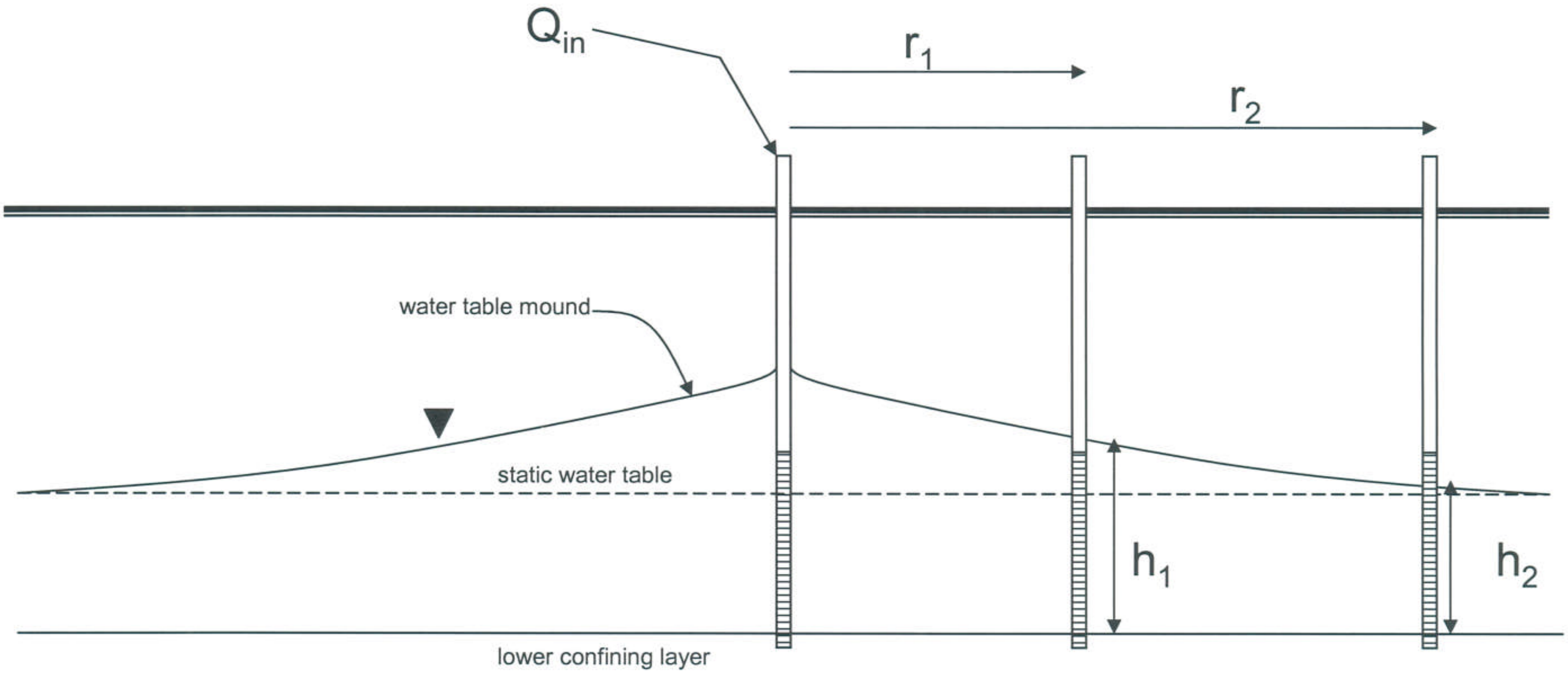

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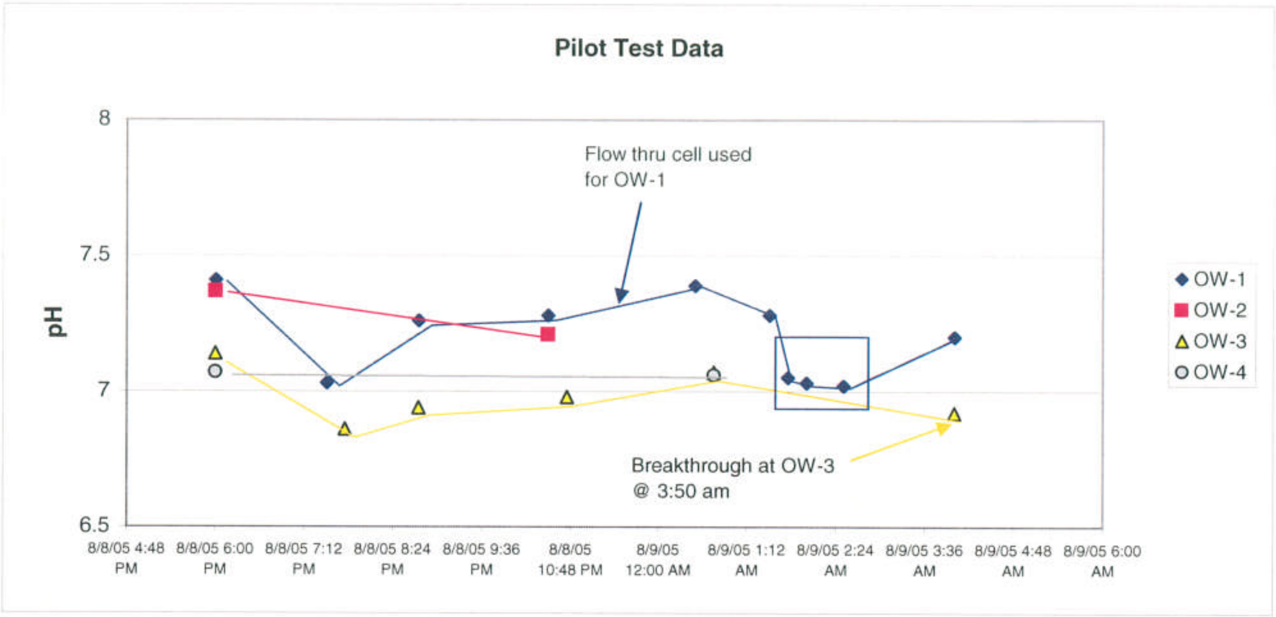
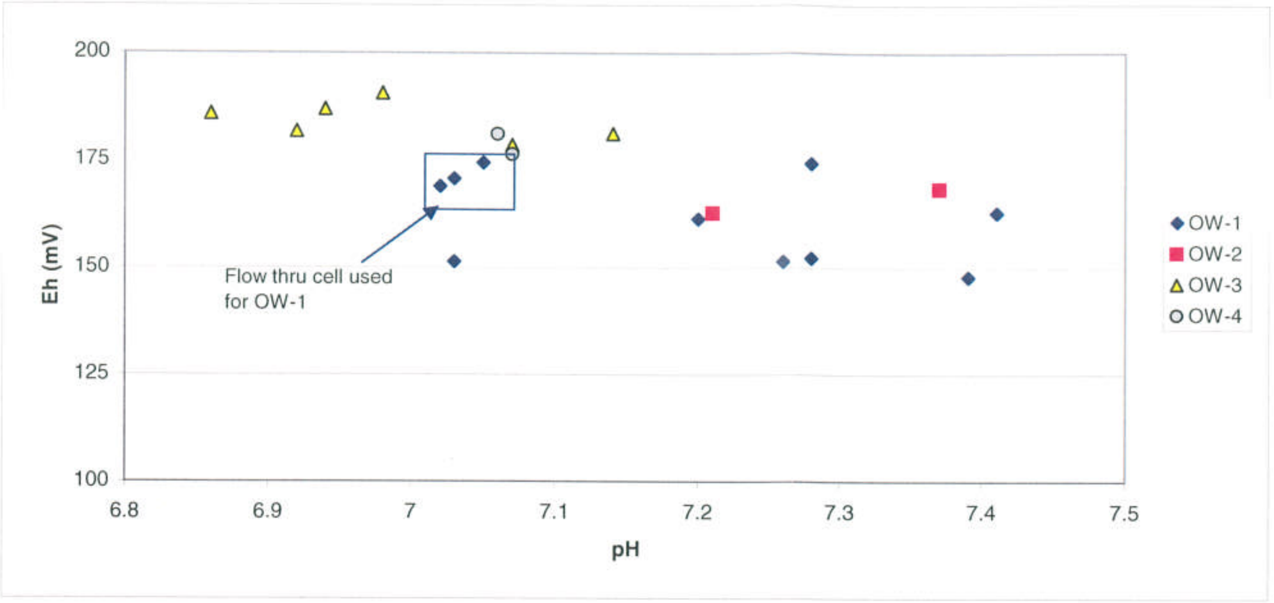
Figure 2
Aquifer Hydraulics and Terms





Flow through cell used to measure field parameters in OW-1 from 1:30 am to 2:37 am, Aug 9, 2005, produced higher Eh and lower pH than by manual probe measurements. Otherwise, the manual measurments are fairly precise for each observation well. Note that observation wells OW-3 and OW-4, east of MW-7S, generally produced groundwater samples with a higher Eh and lower pH than groundwater samples collected from observation wells OW-1 and OW-2, located south of MW-7S. This observation has little to do with the injection of permanganate, since the plots to the left do not indicate a significant change in Eh or pH over time during the injection.

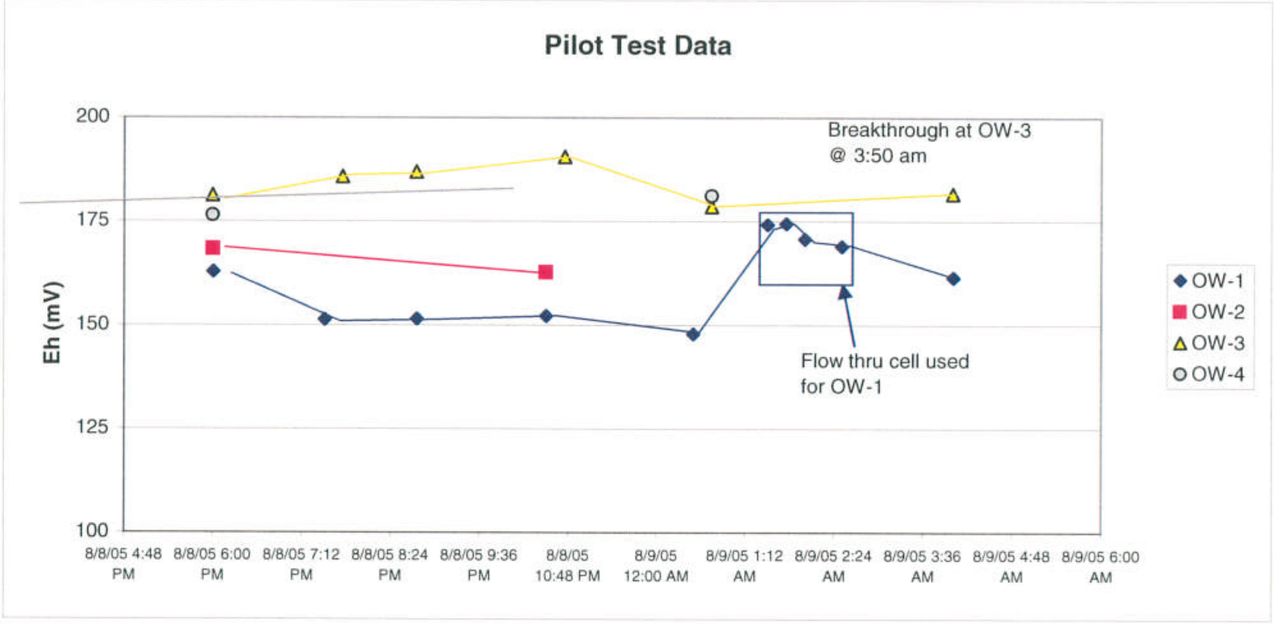


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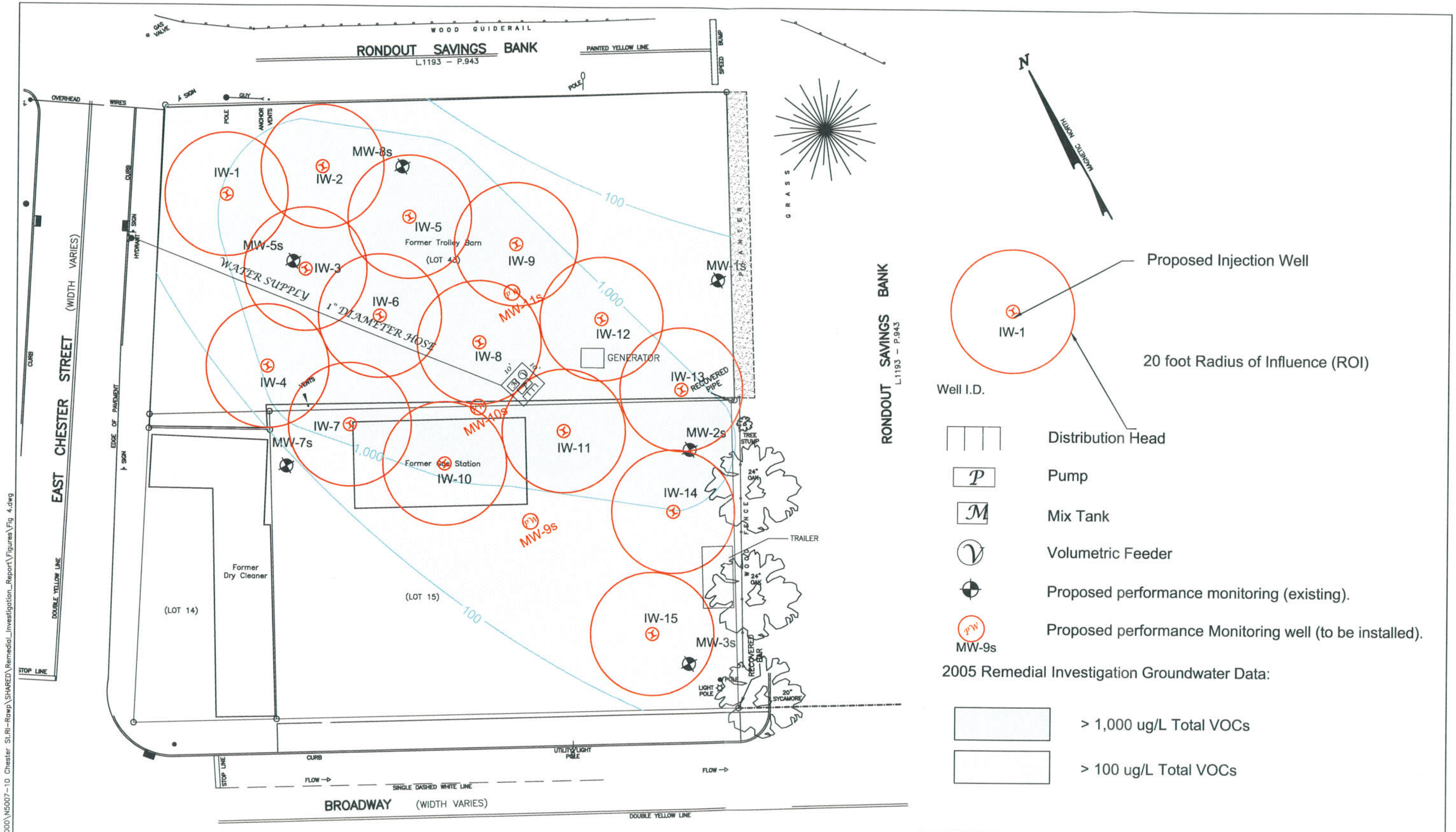
Figure 3
Pilot Test Chemical Data - pH/Eh



Map features based on HTE Northeast, Inc. base survey drawings, March 1999.

Base map from Brinnier & Larios, P.C. Survey, August 2004.

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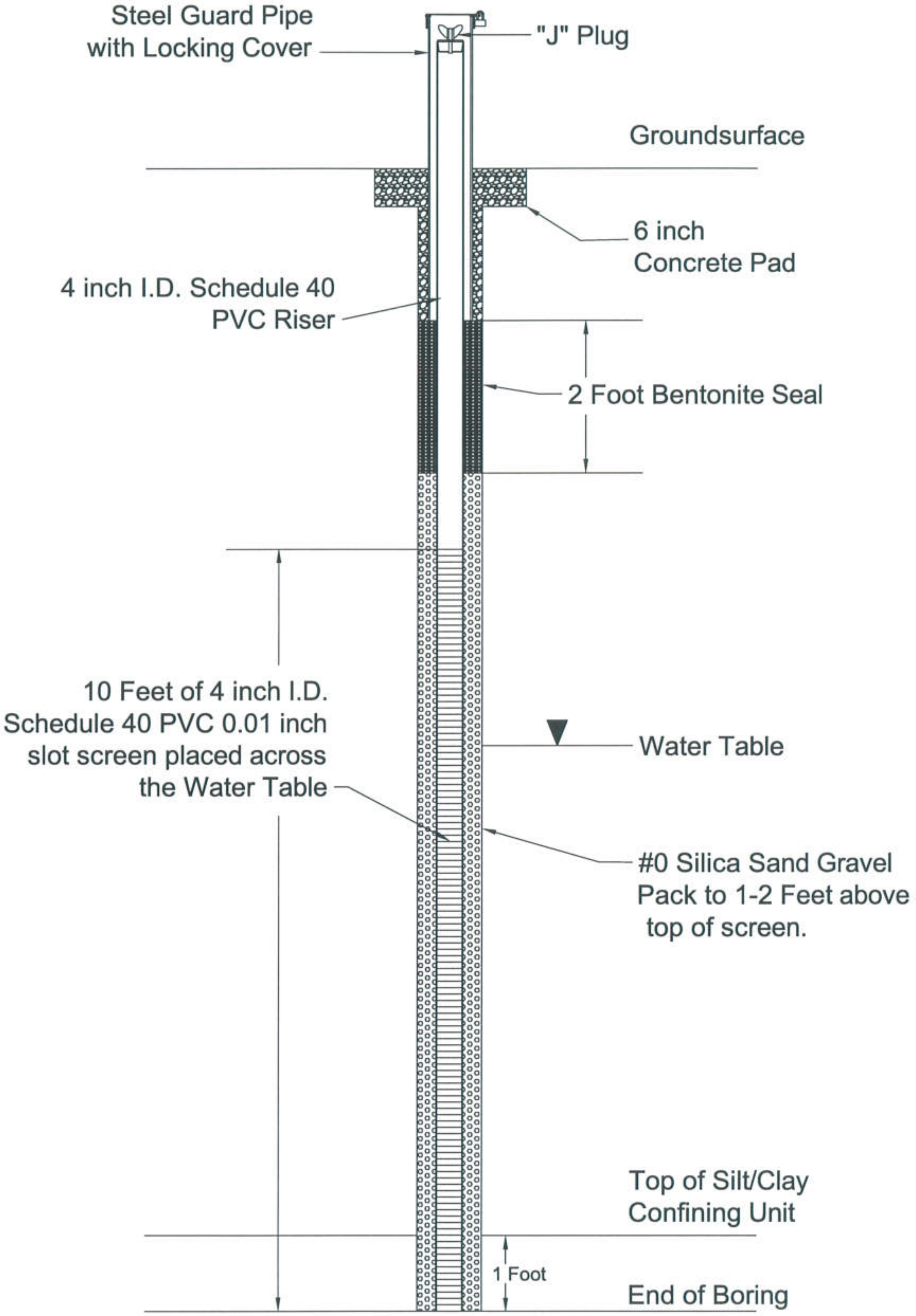
Figure 4
Equipment Setup

X-REF: NAMES?
2005/May/Syracusr/jlk
J:\PROJECTS\N-xxxx\N5000\N5007-10 Chester St.RI-Rawp\SHARED\Remedial_Investigation_Report\Figures\Fig 4.dwg



Not
to
Scale

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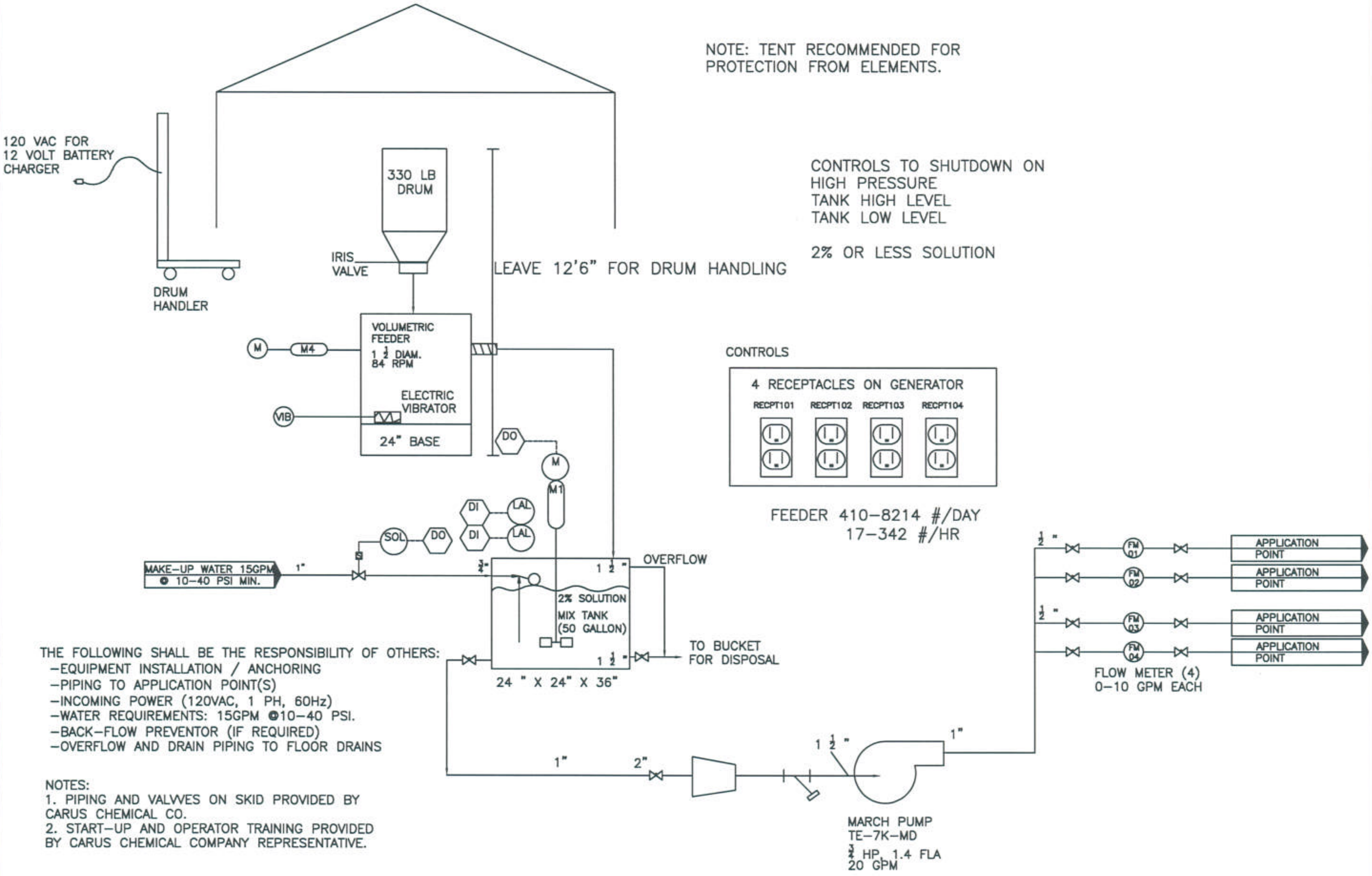
Figure – 5
Injection Well Construction Detail

X-REF: NAMES?
2005/Sept/Syracuse/jlk
J:|PROJECTS|N-xxxx\N(%)))\N5007-10 Chester St.RI-RAWP\SHARED\Remedial_Investigation_Report\Figure\Fig 5.dwg



THE FOLLOWING SHALL BE THE RESPONSIBILITY OF OTHERS:

- EQUIPMENT INSTALLATION / ANCHORING
- PIPING TO APPLICATION POINT(S)
- INCOMING POWER (120VAC, 1 PH, 60Hz)
- WATER REQUIREMENTS: 15GPM @10-40 PSI.
- BACK-FLOW PREVENTOR (IF REQUIRED)
- OVERFLOW AND DRAIN PIPING TO FLOOR DRAINS

NOTES:

1. PIPING AND VALVVES ON SKID PROVIDED BY CARUS CHEMICAL CO.
2. START-UP AND OPERATOR TRAINING PROVIDED BY CARUS CHEMICAL COMPANY REPRESENTATIVE.

Note: Base information & equipment represented in this schematic provided by Carus Chemical Company, Peru, Illinois.

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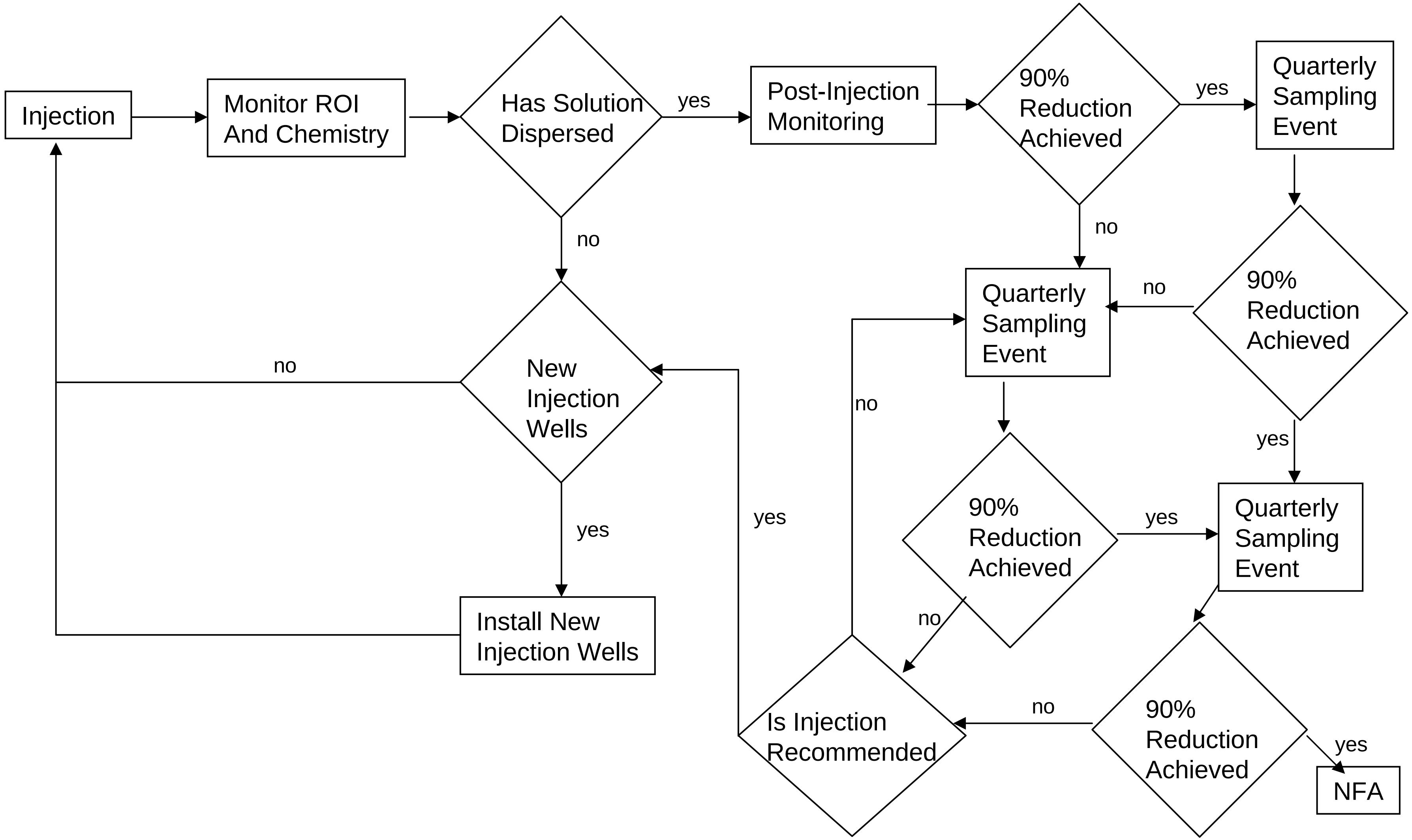
Figure 6

Equipment Schematic

X-HLP
DRAFTER_INFO
J:\PROJECTS\N-XXXX\N5000\N5007-10_CHESTER_ST._RI-RAMP\SHARED\RAMP\REMEDIAL_DESIGN\DRAWINGS\EQUIPMENT_SCHEMATIC.DWG

Figure 7
Decision Tree
In-Situ Oxidation Effectiveness
10 East Chester Street
Kingston, New York



TABLES

TABLE 1. PILOT TEST DATA SUMMARY
10 EAST CHESTER STREET, KINGSTON NY

	OW-1			OW-2			OW-3			OW-4		
Time	pH	Eh	DTW	pH	Eh	DTW	pH	Eh	DTW	pH	Eh	DTW
8/8/05 6:00 PM	7.41	162.8	9.83	7.37	168.4	9.89	7.14	181.3	9.92	7.07	176.4	10.02
15:00.0			9.73			9.89			9.84			
30:00.0			9.65						9.77			
45:00.0			9.61			9.67			9.72			
8/8/05 7:00 PM												
15:00.0												
30:00.0	7.03	151.3										
45:00.0							6.86	185.8				
8/8/05 8:00 PM			9.58			9.64			9.69			9.95
15:00.0												
30:00.0			9.5			9.61			9.59			9.91
45:00.0	7.26	151.4					6.94	186.9				
8/8/05 9:00 PM												
15:00.0												
30:00.0												
45:00.0												
8/8/05 10:00 PM												
15:00.0			9.46						9.56			9.88
30:00.0	7.28	152.1		7.21	162.7	9.58						
45:00.0							6.98	190.6				
8/8/05 11:00 PM												
15:00.0												
30:00.0												
45:00.0												
8/9/05 12:00 AM												
15:00.0												
30:00.0	7.39	147.8	9.42									
45:00.0							7.07	178.6		7.06	181.1	
8/9/05 1:00 AM												
15:00.0												
30:00.0	7.28	174.2										
45:00.0	7.05	174.4										
8/9/05 2:00 AM	7.03	170.7										
15:00.0												
30:00.0	7.02	168.9										
45:00.0												
8/9/05 3:00 AM												
15:00.0												
30:00.0												
45:00.0												
8/9/05 4:00 AM	7.2	161.4	9.41			9.6	6.92	181.7				9.89
15:00.0												
30:00.0												
45:00.0												

APPENDIX A
PILOT TEST
FIELD OBSERVATION LOGS

OBSERVATION LOG - PILOT TEST - POTASSIUM PERMANGANATE INJECTION
10 EAST CHESTER STREET, KINGSTON, NY

S&W Redevelopment
of North America, LLC

Initial Conditions

pH	7.41	DTW	9.83
Eh	162.8		
Cond	1.58		
Temp	19.95		

TEST START TIME: 8/8/2005 18:00

TEST COMPL TIME: 8/9/2005 3:50

OBSERVATION WELL I.D. OW-1

Page 1 of 1

Date	Time	DTW	pH	Eh	Sal	Temp	Cond	Observations/Comments
8/8/2005	18:15	9.73						Injected at 3.2 to 3.25 gpm at MW-7S
	18:30	9.65						
	18:45	9.61						
	19:30		7.03	151.3	0.85	18.65	1.467	Water turbid and brown
	20:00	9.58						
	20:30	9.5						
	20:40		7.26	151.4	0.85	18.36	1.459	Water turbid and brown
	22:20	9.46						
	22:30		7.28	152.1	0.81	18.5	1.403	Water turbid and brown
8/9/2005	0:35	9.42	7.39	147.8	0.78	18.41	1.352	Water turbid and brown
	1:30		7.28	174.2		19.22	1.349	Started using flow thru cell
	1:35		7.12	177		19.18		Water clear
	1:42		7.05	174.4	0.76	19.214	1.346	Water clear
	1:55		7.04	172.7	0.76	19.52	1.353	Water clear
	2:02		7.03	170.7	0.76	19.53	1.347	Water clear
	2:37		7.02	168.9	0.76	19.56	1.346	Water clear
	3:50	9.41	7.2	161.4	0.95	19.41		Water clear - test stopped (** ***Purple at 0600 hrs***)

***** Breakthrough at ~ 12 hrs - Water purple***

OBSERVATION LOG - PILOT TEST - POTASSIUM PERMANGANATE INJECTION
10 EAST CHESTER STREET, KINGSTON, NY

S&W Redevelopment
of North America, LLC

Initial Conditions

pH	7.37	DTW	9.89
Eh	168.4		
Cond	1.674		
Temp	19.84		

TEST START TIME: 8/8/2005 18:00

TEST COMPL TIME: 8/9/2005 3:50

OBSERVATION WELL I.D. OW-2

Page 1 of 1

Date	Time	DTW	pH	Eh	Sal	Temp	Cond	Observations/Comments
8/8/2005	1815	9.89						Water turbid - brown
	1845	9.67						Water clear
	2000	9.64						Water clear
	2030	9.61						Water clear
	2220	9.58	7.21	162.7	0.91	19.76	1.589	Water turbid - brown
8/9/2005	350	9.6						Water clear
								Water checked at 11:45, 8-9-05, and still clear

OBSERVATION LOG - PILOT TEST - POTASSIUM PERMANGANATE INJECTION
10 EAST CHESTER STREET, KINGSTON, NY

S&W Redevelopment
of North America, LLC

Initial Conditions

pH	7.14	DTW	9.92
Eh	181.3		
Cond	5.124		
Temp	19.98		

TEST START TIME: 8/8/2005 18:00

TEST COMPL TIME: 8/9/2005 3:50

OBSERVATION WELL I.D. OW-3

Page 1 of 1

Date	Time	DTW	pH	Eh	Sal	Temp	Cond	Observations/Comments
8/8/2005	1815	9.84						
	1830	9.77						
	1845	9.72						
	1945		6.86	185.8	3	18.31	4.82	Water turbid - brown
	2000	9.69						
	2030	9.59						
	2045		6.94	186.9	2.75	17.97	4.402	Water turbid - brown
	2220	9.56						
	2240		6.98	190.6	2.59	18.46	4.216	
8/9/2005	0:40		7.07	178.6	2.27	18.1	3.688	
	350		6.92	181.7	4.1	18.98		***Water PURPLE, turbid***
								Breakthrough at 9 hours, 50 minutes

OBSERVATION LOG - PILOT TEST - POTASSIUM PERMANGANATE INJECTION
10 EAST CHESTER STREET, KINGSTON, NY

S&W Redevelopment
of North America, LLC

Initial Conditions

pH	7.07	DTW	10.02
Eh	176.4		
Cond	7.274		
Temp	19.67		

TEST START TIME: 8/8/2005 18:00

TEST COMPL TIME: 8/9/2005 3:50

OBSERVATION WELL I.D. OW-4

Page 1 of 1

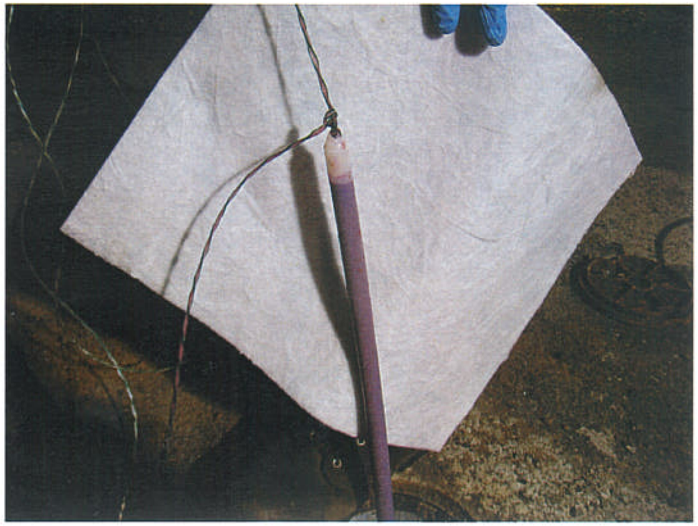
Date	Time	DTW	pH	Eh	Sal	Temp	Cond	Observations/Comments
8/8/2005	1845	9.97						Water slightly turbid
	2000	9.95						
	2030	9.91						
	2220	9.88						
8/9/2005	0:48		7.06	181.1	4.39	18.66	6.918	Water clear - no color
	3:50	9.89						
								Water checked at 11:45, 8-9-05, and still clear

APPENDIX B

PILOT TEST PHOTOGRAPHS


HESS


HESS



APPENDIX C
LABORATORY ANALYSIS RESULTS

LSL

Mr. Mike Pilipczuk
S&W Redevelopment N.A., LLC
430 East Genesee Street
Suite 401
Syracuse, NY 13202

Phone: (315) 422-4949
FAX: (315) 422-2124

Laboratory Analysis Report
For
S&W Redevelopment N.A., LLC

Client Project ID:

Job# N5007

LSL Project ID: **0513361**

Receive Date/Time: 08/10/05 12:23

Project Received by: RD

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Life Science Laboratories, Inc.

LSL Central Lab	LSL North Lab	LSL Finger Lakes Lab	LSL Southern Tier Lab	LSL MidLakes Lab
5854 Butternut Drive	131 St. Lawrence Avenue	16 N. Main St., PO Box 424	30 East Main Street	699 South Main Street
East Syracuse, NY 13057	Waddington, NY 13694	Wayland, NY 14572	Cuba, NY 14727	Canandaigua, NY 14424
Tel. (315) 445-1105	Tel. (315) 388-4476	Tel. (585) 728-3320	Tel. (585) 968-2640	Tel. (585) 396-0270
Fax (315) 445-1301	Fax (315) 388-4061	Fax (585) 728-2711	Fax (585) 968-0906	Fax (585) 396-0377
NYS DOH ELAP #10248	NYS DOH ELAP #10900	NYS DOH ELAP #11667	NYS DOH ELAP #10760	NYS DOH ELAP #11369
PA DEP #68-2556				

This report was reviewed by: Life Science Laboratories, Inc. *Date:* 8/22/05

A copy of this report was sent to:

-- LABORATORY ANALYSIS REPORT --

S&W Redevelopment N.A., LLC   Syracuse, NY

Sample ID: OW-1   **LSL Sample ID:** 0513361-001

Location:

Sampled: 08/09/05 15:05   **Sampled By:** Client

Sample Matrix: NPW

Analytical Method Analyte	Result	Units	Prep Date	Analysis Date & Time	Analyst Initials
(1) EPA 8260B TCL Volatiles					
Acetone	<100	ug/l		8/16/05	LEF
Benzene	<10	ug/l		8/16/05	LEF
Bromodichloromethane	<10	ug/l		8/16/05	LEF
Bromoform	<10	ug/l		8/16/05	LEF
Bromomethane	<10	ug/l		8/16/05	LEF
2-Butanone (MEK)	<100	ug/l		8/16/05	LEF
Carbon disulfide	<10	ug/l		8/16/05	LEF
Carbon tetrachloride	<10	ug/l		8/16/05	LEF
Chlorobenzene	<10	ug/l		8/16/05	LEF
Chloroethane	<10	ug/l		8/16/05	LEF
Chloroform	<10	ug/l		8/16/05	LEF
Chloromethane	<10	ug/l		8/16/05	LEF
Dibromochloromethane	<10	ug/l		8/16/05	LEF
1,1-Dichloroethane	<10	ug/l		8/16/05	LEF
1,2-Dichloroethane	<10	ug/l		8/16/05	LEF
1,1-Dichloroethene	<10	ug/l		8/16/05	LEF
1,2-Dichloroethene, Total	<10	ug/l		8/16/05	LEF
1,2-Dichloropropane	<10	ug/l		8/16/05	LEF
cis-1,3-Dichloropropene	<10	ug/l		8/16/05	LEF
trans-1,3-Dichloropropene	<10	ug/l		8/16/05	LEF
Ethyl benzene	<10	ug/l		8/16/05	LEF
2-Hexanone	<100	ug/l		8/16/05	LEF
Methylene chloride	<20	ug/l		8/16/05	LEF
4-Methyl-2-pentanone (MIBK)	<100	ug/l		8/16/05	LEF
Styrene	<10	ug/l		8/16/05	LEF
1,1,2,2-Tetrachloroethane	<10	ug/l		8/16/05	LEF
Tetrachloroethene	600	ug/l		8/16/05	LEF
Toluene	<10	ug/l		8/16/05	LEF
1,1,1-Trichloroethane	<10	ug/l		8/16/05	LEF
1,1,2-Trichloroethane	<10	ug/l		8/16/05	LEF
Trichloroethene	<10	ug/l		8/16/05	LEF
Vinyl chloride	<10	ug/l		8/16/05	LEF
Xylenes (Total)	<10	ug/l		8/16/05	LEF
Surrogate (1,2-DCA-d4)	111	%R		8/16/05	LEF
Surrogate (Tol-d8)	100	%R		8/16/05	LEF
Surrogate (4-BFB)	102	%R		8/16/05	LEF

-- LABORATORY ANALYSIS REPORT --

S&W Redevelopment N.A., LLC ***Syracuse, NY***

Sample ID: OW-2 **LSL Sample ID:** 0513361-002

Location:

Sampled: 08/09/05 15:11 **Sampled By:** Client

Sample Matrix: NPW

Analytical Method Analyte	Result	Units	Prep Date	Analysis Date & Time	Analyst Initials
(1) EPA 8260B TCL Volatiles					
Acetone	<100	ug/l		8/16/05	LEF
Benzene	<10	ug/l		8/16/05	LEF
Bromodichloromethane	<10	ug/l		8/16/05	LEF
Bromoform	<10	ug/l		8/16/05	LEF
Bromomethane	<10	ug/l		8/16/05	LEF
2-Butanone (MEK)	<100	ug/l		8/16/05	LEF
Carbon disulfide	<10	ug/l		8/16/05	LEF
Carbon tetrachloride	<10	ug/l		8/16/05	LEF
Chlorobenzene	<10	ug/l		8/16/05	LEF
Chloroethane	<10	ug/l		8/16/05	LEF
Chloroform	<10	ug/l		8/16/05	LEF
Chloromethane	<10	ug/l		8/16/05	LEF
Dibromochloromethane	<10	ug/l		8/16/05	LEF
1,1-Dichloroethane	<10	ug/l		8/16/05	LEF
1,2-Dichloroethane	<10	ug/l		8/16/05	LEF
1,1-Dichloroethene	<10	ug/l		8/16/05	LEF
1,2-Dichloroethene, Total	<10	ug/l		8/16/05	LEF
1,2-Dichloropropane	<10	ug/l		8/16/05	LEF
cis-1,3-Dichloropropene	<10	ug/l		8/16/05	LEF
trans-1,3-Dichloropropene	<10	ug/l		8/16/05	LEF
Ethyl benzene	<10	ug/l		8/16/05	LEF
2-Hexanone	<100	ug/l		8/16/05	LEF
Methylene chloride	<20	ug/l		8/16/05	LEF
4-Methyl-2-pentanone (MIBK)	<100	ug/l		8/16/05	LEF
Styrene	<10	ug/l		8/16/05	LEF
1,1,2,2-Tetrachloroethane	<10	ug/l		8/16/05	LEF
Tetrachloroethene	580	ug/l		8/16/05	LEF
Toluene	<10	ug/l		8/16/05	LEF
1,1,1-Trichloroethane	<10	ug/l		8/16/05	LEF
1,1,2-Trichloroethane	<10	ug/l		8/16/05	LEF
Trichloroethene	<10	ug/l		8/16/05	LEF
Vinyl chloride	<10	ug/l		8/16/05	LEF
Xylenes (Total)	<10	ug/l		8/16/05	LEF
Surrogate (1,2-DCA-d4)	109	%R		8/16/05	LEF
Surrogate (Tol-d8)	103	%R		8/16/05	LEF
Surrogate (4-BFB)	104	%R		8/16/05	LEF

-- LABORATORY ANALYSIS REPORT --

S&W Redevelopment N.A., LLC   Syracuse, NY

Sample ID: OW-3   **LSL Sample ID:** 0513361-003

Location:

Sampled: 08/09/05 14:43   **Sampled By:** Client

Sample Matrix: NPW

Analytical Method Analyte	Result	Units	Prep Date	Analysis Date & Time	Analyst Initials
(1) EPA 8260B TCL Volatiles					
Acetone	<100	ug/l		8/16/05	LEF
Benzene	<10	ug/l		8/16/05	LEF
Bromodichloromethane	<10	ug/l		8/16/05	LEF
Bromoform	<10	ug/l		8/16/05	LEF
Bromomethane	<10	ug/l		8/16/05	LEF
2-Butanone (MEK)	<100	ug/l		8/16/05	LEF
Carbon disulfide	<10	ug/l		8/16/05	LEF
Carbon tetrachloride	<10	ug/l		8/16/05	LEF
Chlorobenzene	<10	ug/l		8/16/05	LEF
Chloroethane	<10	ug/l		8/16/05	LEF
Chloroform	<10	ug/l		8/16/05	LEF
Chloromethane	<10	ug/l		8/16/05	LEF
Dibromochloromethane	<10	ug/l		8/16/05	LEF
1,1-Dichloroethane	<10	ug/l		8/16/05	LEF
1,2-Dichloroethane	<10	ug/l		8/16/05	LEF
1,1-Dichloroethene	<10	ug/l		8/16/05	LEF
1,2-Dichloroethene, Total	<10	ug/l		8/16/05	LEF
1,2-Dichloropropane	<10	ug/l		8/16/05	LEF
cis-1,3-Dichloropropene	<10	ug/l		8/16/05	LEF
trans-1,3-Dichloropropene	<10	ug/l		8/16/05	LEF
Ethyl benzene	<10	ug/l		8/16/05	LEF
2-Hexanone	<100	ug/l		8/16/05	LEF
Methylene chloride	<20	ug/l		8/16/05	LEF
4-Methyl-2-pentanone (MIBK)	<100	ug/l		8/16/05	LEF
Styrene	<10	ug/l		8/16/05	LEF
1,1,2,2-Tetrachloroethane	<10	ug/l		8/16/05	LEF
Tetrachloroethene	740	ug/l		8/16/05	LEF
Toluene	<10	ug/l		8/16/05	LEF
1,1,1-Trichloroethane	<10	ug/l		8/16/05	LEF
1,1,2-Trichloroethane	<10	ug/l		8/16/05	LEF
Trichloroethene	<10	ug/l		8/16/05	LEF
Vinyl chloride	<10	ug/l		8/16/05	LEF
Xylenes (Total)	<10	ug/l		8/16/05	LEF
Surrogate (1,2-DCA-d4)	112	%R		8/16/05	LEF
Surrogate (Tol-d8)	101	%R		8/16/05	LEF
Surrogate (4-BFB)	104	%R		8/16/05	LEF

-- LABORATORY ANALYSIS REPORT --

S& W Redevelopment N.A., LLC   *Syracuse, NY*

Sample ID: OW-4   **LSL Sample ID:** 0513361-004

Location:

Sampled: 08/09/05 14:57   **Sampled By:** Client

Sample Matrix: NPW

Analytical Method Analyte	Result	Units	Prep Date	Analysis Date & Time	Analyst Initials
(1) EPA 8260B TCL Volatiles					
Acetone	<100	ug/l		8/16/05	LEF
Benzene	<10	ug/l		8/16/05	LEF
Bromodichloromethane	<10	ug/l		8/16/05	LEF
Bromoform	<10	ug/l		8/16/05	LEF
Bromomethane	<10	ug/l		8/16/05	LEF
2-Butanone (MEK)	<100	ug/l		8/16/05	LEF
Carbon disulfide	<10	ug/l		8/16/05	LEF
Carbon tetrachloride	<10	ug/l		8/16/05	LEF
Chlorobenzene	<10	ug/l		8/16/05	LEF
Chloroethane	<10	ug/l		8/16/05	LEF
Chloroform	<10	ug/l		8/16/05	LEF
Chloromethane	<10	ug/l		8/16/05	LEF
Dibromochloromethane	<10	ug/l		8/16/05	LEF
1,1-Dichloroethane	<10	ug/l		8/16/05	LEF
1,2-Dichloroethane	<10	ug/l		8/16/05	LEF
1,1-Dichloroethene	<10	ug/l		8/16/05	LEF
1,2-Dichloroethene, Total	<10	ug/l		8/16/05	LEF
1,2-Dichloropropane	<10	ug/l		8/16/05	LEF
cis-1,3-Dichloropropene	<10	ug/l		8/16/05	LEF
trans-1,3-Dichloropropene	<10	ug/l		8/16/05	LEF
Ethyl benzene	<10	ug/l		8/16/05	LEF
2-Hexanone	<100	ug/l		8/16/05	LEF
Methylene chloride	<20	ug/l		8/16/05	LEF
4-Methyl-2-pentanone (MIBK)	<100	ug/l		8/16/05	LEF
Styrene	<10	ug/l		8/16/05	LEF
1,1,2,2-Tetrachloroethane	<10	ug/l		8/16/05	LEF
Tetrachloroethene	450	ug/l		8/16/05	LEF
Toluene	<10	ug/l		8/16/05	LEF
1,1,1-Trichloroethane	<10	ug/l		8/16/05	LEF
1,1,2-Trichloroethane	<10	ug/l		8/16/05	LEF
Trichloroethene	<10	ug/l		8/16/05	LEF
Vinyl chloride	<10	ug/l		8/16/05	LEF
Xylenes (Total)	<10	ug/l		8/16/05	LEF
Surrogate (1,2-DCA-d4)	111	%R		8/16/05	LEF

-- LABORATORY ANALYSIS REPORT --

S& W Redevelopment N.A., LLC   Syracuse, NY

Sample ID:	OW-4	**LSL Sample ID:**	0513361-004
Location:			
Sampled:	08/09/05 14:57	**Sampled By:**	Client
Sample Matrix:	NPW		

Analytical Method Analyte	Result	Units	Prep Date	Analysis Date & Time	Analyst Initials
(1) EPA 8260B TCL Volatiles					
Acetone	<100	ug/l		8/16/05	LEF
Benzene	<10	ug/l		8/16/05	LEF
Bromodichloromethane	<10	ug/l		8/16/05	LEF
Bromoform	<10	ug/l		8/16/05	LEF
Bromomethane	<10	ug/l		8/16/05	LEF
2-Butanone (MEK)	<100	ug/l		8/16/05	LEF
Carbon disulfide	<10	ug/l		8/16/05	LEF
Carbon tetrachloride	<10	ug/l		8/16/05	LEF
Chlorobenzene	<10	ug/l		8/16/05	LEF
Chloroethane	<10	ug/l		8/16/05	LEF
Chloroform	<10	ug/l		8/16/05	LEF
Chloromethane	<10	ug/l		8/16/05	LEF
Dibromochloromethane	<10	ug/l		8/15/05	LEF
1,1-Dichloroethane	<10	ug/l		8/16/05	LEF
1,2-Dichloroethane	<10	ug/l		8/16/05	LEF
1,1-Dichloroethene	<10	ug/l		8/16/05	LEF
1,2-Dichloroethene, Total	<10	ug/l		8/16/05	LEF
1,2-Dichloropropane	<10	ug/l		8/16/05	LEF
cis-1,3-Dichloropropene	<10	ug/l		8/16/05	LEF
trans-1,3-Dichloropropene	<10	ug/l		8/16/05	LEF
Ethyl benzene	<10	ug/l		8/16/05	LEF
2-Hexanone	<100	ug/l		8/16/05	LEF
Methylene chloride	<20	ug/l		8/16/05	LEF
4-Methyl-2-pentanone (MIBK)	<100	ug/l		8/16/05	LEF
Styrene	<10	ug/l		8/16/05	LEF
1,1,2,2-Tetrachloroethane	<10	ug/l		8/16/05	LEF
Tetrachloroethene	450	ug/l		8/16/05	LEF
Toluene	<10	ug/l		8/16/05	LEF
1,1,1-Trichloroethane	<10	ug/l		8/16/05	LEF
1,1,2-Trichloroethane	<10	ug/l		8/16/05	LEF
Trichloroethene	<10	ug/l		8/16/05	LEF
Vinyl chloride	<10	ug/l		8/16/05	LEF
Xylenes (Total)	<10	ug/l		8/16/05	LEF
Surrogate (1,2-DCA-d4)	111	%R		8/16/05	LEF
Surrogate (Tol-d8)	100	%R		8/16/05	LEF
Surrogate (4-BFB)	106	%R		8/16/05	LEF

-- LABORATORY ANALYSIS REPORT --

S&W Redevelopment N.A., LLC *Syracuse, NY*

Sample ID: MW-7S **LSL Sample ID:** 0513361-005

Location:

Sampled: 08/09/05 14:20 **Sampled By:** Client

Sample Matrix: NPW

Analytical Method Analyte	Result	Units	Prep Date	Analysis Date & Time	Analyst Initials
(1) EPA 8260B TCL Volatiles					
Acetone	<50	ug/l		8/16/05	LEF
Benzene	<5	ug/l		8/16/05	LEF
Bromodichloromethane	<5	ug/l		8/16/05	LEF
Bromoform	<5	ug/l		8/16/05	LEF
Bromomethane	<5	ug/l		8/16/05	LEF
2-Butanone (MEK)	<50	ug/l		8/16/05	LEF
Carbon disulfide	<5	ug/l		8/16/05	LEF
Carbon tetrachloride	<5	ug/l		8/16/05	LEF
Chlorobenzene	<5	ug/l		8/16/05	LEF
Chloroethane	<5	ug/l		8/16/05	LEF
Chloroform	<5	ug/l		8/16/05	LEF
Chloromethane	<5	ug/l		8/16/05	LEF
Dibromochloromethane	<5	ug/l		8/16/05	LEF
1,1-Dichloroethane	<5	ug/l		8/16/05	LEF
1,2-Dichloroethane	<5	ug/l		8/16/05	LEF
1,1-Dichloroethene	<5	ug/l		8/16/05	LEF
1,2-Dichloroethene, Total	<5	ug/l		8/16/05	LEF
1,2-Dichloropropane	<5	ug/l		8/16/05	LEF
cis-1,3-Dichloropropene	<5	ug/l		8/16/05	LEF
trans-1,3-Dichloropropene	<5	ug/l		8/16/05	LEF
Ethyl benzene	<5	ug/l		8/16/05	LEF
2-Hexanone	<50	ug/l		8/16/05	LEF
Methylene chloride	<10	ug/l		8/16/05	LEF
4-Methyl-2-pentanone (MIBK)	<50	ug/l		8/16/05	LEF
Styrene	<5	ug/l		8/16/05	LEF
1,1,2,2-Tetrachloroethane	<5	ug/l		8/16/05	LEF
Tetrachloroethene	290	ug/l		8/16/05	LEF
Toluene	<5	ug/l		8/16/05	LEF
1,1,1-Trichloroethane	<5	ug/l		8/16/05	LEF
1,1,2-Trichloroethane	<5	ug/l		8/16/05	LEF
Trichloroethene	<5	ug/l		8/16/05	LEF
Vinyl chloride	<5	ug/l		8/16/05	LEF
Xylenes (Total)	<5	ug/l		8/16/05	LEF
Surrogate (1,2-DCA-d4)	112	%R		8/16/05	LEF
Surrogate (Tol-d8)	103	%R		8/16/05	LEF
Surrogate (4-BFB)	108	%R		8/16/05	LEF

LSL

SURROGATE RECOVERY CONTROL LIMITS FOR ORGANIC METHODS

Method	Surrogate(s)	Water Limits, %R	SHW Limits, %R
EPA 504	TCMX	80-120	NA
EPA 508	DCB	70-130	NA
EPA 515.4	DCAA	70-130	NA
EPA 524.2	1,2-DCA-d4, 4-BFB	80-120	NA
EPA 525.2	1,3-DM-2-NB, TPP, Per-d12	70-130	NA
EPA 526	1,3-DM-2-NB, TPP	70-130	NA
EPA 528	2-CP-3,4,5,6-d4, 2,4,6-TBP	70-130	NA
EPA 551.1	Decafluorobiphenyl	80-120	NA
EPA 552.2	2,3-DBPA	80-120	NA
EPA 601	1,2-DCA-d4, Tol-d8, 4-BFB	70-130	NA
EPA 602	1,2-DCA-d4, Tol-d8, 4-BFB	70-130	NA
EPA 608	DCB	30-150	NA
EPA 624	1,2-DCA-d4, Tol-d8, 4-BFB	70-130	NA
EPA 625, AE	2-Fluorophenol	21-110	NA
EPA 625, AE	Phenol-d5	10-110	NA
EPA 625, AE	2,4,6-Tribromophenol	10-123	NA
EPA 625, BN	Nitrobenzene-d5	35-114	NA
EPA 625, BN	2-Fluorobiphenyl	43-116	NA
EPA 625, BN	Terphenyl-d14	33-141	NA
EPA 8010	1,2-DCA-d4, Tol-d8, 4-BFB	70-130	70-130
EPA 8020	1,2-DCA-d4, Tol-d8, 4-BFB	70-130	70-130
EPA 8021	1,2-DCA-d4, Tol-d8, 4-BFB	70-130	70-130
EPA 8081	TCMX, DCB	30-150	30-150
EPA 8082	DCB	30-150	30-150
EPA 8151	DCAA	30-130	30-120
EPA 8260	1,2-DCA-d4, Tol-d8, 4-BFB	70-130	70-130
EPA 8270, AE	2-Fluorophenol	21-110	25-121
EPA 8270, AE	Phenol-d5	10-110	24-113
EPA 8270, AE	2,4,6-Tribromophenol	10-123	19-122
EPA 8270, BN	Nitrobenzene-d5	35-114	23-120
EPA 8270, BN	2-Fluorobiphenyl	43-116	30-115
EPA 8270, BN	Terphenyl-d14	33-141	18-137
DOH 310-13	Dodecane	40-110	40-110
DOH 310-14	Dodecane	40-110	40-110
DOH 310-15	Dodecane	40-110	40-110
DOH 310-34	4-BFB	50-150	50-150
DOH 313-4	DCB	NA	30-150
8015M_GRO	4-BFB	50-150	50-150
8015M_DRO	Terphenyl-d14	50-150	50-150

Units Key:
ug/l = microgram per liter
ug/kg = microgram per kilogram
mg/l = milligram per liter
mg/kg = milligram per kilogram
%R = Percent Recovery

Figure 4-5

CHAIN OF CUSTODY RECORD

0513361
S+W_Redevelopment

S&W Redevelopment
of North America, LLC
430 East Genesee Street
Syracuse, New York 13202
(315) 422-4949 fax (315) 422-2124

Job # N6007

Due Date 8/22/05

Company: S+W Redevelopment
Address: 430 East Genesee St. Syracuse NY
Phone #: (315) 422-4949 Fax #: (315) 422-2124
Contact Person:

Sample Type
1. wastewater
2. soil
3. sludge
4. sediment
5. drinking water
6. water (gw/mw/sw)
7. other (specify)

Container Type
P - plastic
G - clear glass
AG - amber glass
V - voa

Lab ID	Sample ID	Sample Type	Container Size / Type	Sampling Date/Time	Preservative Information	ANALYSES: 8260 · VOCs						
001 AB	OW-1	GRAB/WATER	40 ml VOA	8/9/05 15:05	HCl 4°C	X						
002 ↓	OW-2	↓	40 ml VOA	↓ 15:11	↓ ↓	X						
003	OW-3		40 ml VOA	14:43		X						
004	OW-4		40 ml VOA	14:57		X						
005	MW 75		40 ml VOA	14:20		X						

Sampled By:	Date/Time: 8/9/05 ~~[illegible]~~	°C:	
Relinquished By:	Date/Time: 8/10/05 12:20	°C:	Received By:	Date/Time:	°C:
Relinquished By:	Date/Time: / /	°C:	Received By: L Dubner	Date/Time: 08/10/05 12:23	°C: 5.0
Method of Shipment:			

SWCOC.XLS

Make and Keep a Copy of This Document Prior to Forwarding With Samples!!

LSL

Mark S. Sergott
S&W Redevelopment N.A., LLC
430 East Genesee Street
Suite 401
Syracuse, NY 13202

Phone: **(315) 422-4949**
FAX: **(315) 422-2124**

Laboratory Analysis Report
For
S&W Redevelopment N.A., LLC

Client Project ID:
10 East Chester Street
LSL Project ID: **0514386**
Receive Date/Time: 08/24/05 10:48
Project Received by: MW

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Life Science Laboratories, Inc.

LSL Central Lab	LSL North Lab	LSL Finger Lakes Lab	LSL Southern Tier Lab	LSL MidLakes Lab
5854 Butternut Drive	131 St. Lawrence Avenue	16 N. Main St., PO Box 424	30 East Main Street	699 South Main Street
East Syracuse, NY 13057	Waddington, NY 13694	Wayland, NY 14572	Cuba, NY 14727	Canandaigua, NY 14424
Tel. (315) 445-1105	Tel. (315) 388-4476	Tel. (585) 728-3320	Tel. (585) 968-2640	Tel. (585) 396-0270
Fax (315) 445-1301	Fax (315) 388-4061	Fax (585) 728-2711	Fax (585) 968-0906	Fax (585) 396-0377
NYS DOH ELAP #10248	NYS DOH ELAP #10900	NYS DOH ELAP #11667	NYS DOH ELAP #10760	NYS DOH ELAP #11369
PA DEP #68-2556				

This report was reviewed by: _______________ *Date:* 9/2/05
Life Science Laboratories, Inc.

A copy of this report was sent to:

Date Printed: 9/2/05

- - LABORATORY ANALYSIS REPORT - -

S& W Redevelopment N.A., LLC *Syracuse, NY*

Sample ID: OW-1 **LSL Sample ID:** 0514386-001
Location: 10 East Chester Street
Sampled: 08/23/05 14:45 **Sampled By:** MSS
Sample Matrix: NPW

Analytical Method Analyte	Result	Units	Prep Date	Analysis Date & Time	Analyst Initials
(1) EPA 8260B TCL Volatiles					
Acetone	410	ug/l		8/31/05	LEF
Benzene	<10	ug/l		8/31/05	LEF
Bromodichloromethane	<10	ug/l		8/31/05	LEF
Bromoform	<10	ug/l		8/31/05	LEF
Bromomethane	<10	ug/l		8/31/05	LEF
2-Butanone (MEK)	<100	ug/l		8/31/05	LEF
Carbon disulfide	<10	ug/l		8/31/05	LEF
Carbon tetrachloride	<10	ug/l		8/31/05	LEF
Chlorobenzene	<10	ug/l		8/31/05	LEF
Chloroethane	<10	ug/l		8/31/05	LEF
Chloroform	<10	ug/l		8/31/05	LEF
Chloromethane	<10	ug/l		8/31/05	LEF
Dibromochloromethane	<10	ug/l		8/31/05	LEF
1,1-Dichloroethane	<10	ug/l		8/31/05	LEF
1,2-Dichloroethane	<10	ug/l		8/31/05	LEF
1,1-Dichloroethene	<10	ug/l		8/31/05	LEF
1,2-Dichloroethene, Total	<10	ug/l		8/31/05	LEF
1,2-Dichloropropane	<10	ug/l		8/31/05	LEF
cis-1,3-Dichloropropene	<10	ug/l		8/31/05	LEF
trans-1,3-Dichloropropene	<10	ug/l		8/31/05	LEF
Ethyl benzene	<10	ug/l		8/31/05	LEF
2-Hexanone	<100	ug/l		8/31/05	LEF
Methylene chloride	<20	ug/l		8/31/05	LEF
4-Methyl-2-pentanone (MIBK)	<100	ug/l		8/31/05	LEF
Styrene	<10	ug/l		8/31/05	LEF
1,1,2,2-Tetrachloroethane	<10	ug/l		8/31/05	LEF
Tetrachloroethene	<10	ug/l		8/31/05	LEF
Toluene	<10	ug/l		8/31/05	LEF
1,1,1-Trichloroethane	<10	ug/l		8/31/05	LEF
1,1,2-Trichloroethane	<10	ug/l		8/31/05	LEF
Trichloroethene	<10	ug/l		8/31/05	LEF
Vinyl chloride	<10	ug/l		8/31/05	LEF
Xylenes (Total)	<10	ug/l		8/31/05	LEF
Surrogate (1,2-DCA-d4)	109	%R		8/31/05	LEF
Surrogate (Tol-d8)	99	%R		8/31/05	LEF
Surrogate (4-BFB)	102	%R		8/31/05	LEF

Elevated detection limit due to matrix interference.

-- LABORATORY ANALYSIS REPORT --

S&W Redevelopment N.A., LLC   Syracuse, NY

Sample ID: OW-2   **LSL Sample ID:** 0514386-002
Location: 10 East Chester Street
Sampled: 08/23/05 15:05   **Sampled By:** MSS
Sample Matrix: NPW

Analytical Method Analyte	Result	Units	Prep Date	Analysis Date & Time	Analyst Initials
(1) EPA 8260B TCL Volatiles					
Acetone	830	ug/l		8/31/05	LEF
Benzene	<10	ug/l		8/31/05	LEF
Bromodichloromethane	<10	ug/l		8/31/05	LEF
Bromoform	<10	ug/l		8/31/05	LEF
Bromomethane	<10	ug/l		8/31/05	LEF
2-Butanone (MEK)	<100	ug/l		8/31/05	LEF
Carbon disulfide	<10	ug/l		8/31/05	LEF
Carbon tetrachloride	<10	ug/l		8/31/05	LEF
Chlorobenzene	<10	ug/l		8/31/05	LEF
Chloroethane	<10	ug/l		8/31/05	LEF
Chloroform	<10	ug/l		8/31/05	LEF
Chloromethane	<10	ug/l		8/31/05	LEF
Dibromochloromethane	<10	ug/l		8/31/05	LEF
1,1-Dichloroethane	<10	ug/l		8/31/05	LEF
1,2-Dichloroethane	<10	ug/l		8/31/05	LEF
1,1-Dichloroethene	<10	ug/l		8/31/05	LEF
1,2-Dichloroethene, Total	<10	ug/l		8/31/05	LEF
1,2-Dichloropropane	<10	ug/l		8/31/05	LEF
cis-1,3-Dichloropropene	<10	ug/l		8/31/05	LEF
trans-1,3-Dichloropropene	<10	ug/l		8/31/05	LEF
Ethyl benzene	<10	ug/l		8/31/05	LEF
2-Hexanone	<100	ug/l		8/31/05	LEF
Methylene chloride	<20	ug/l		8/31/05	LEF
4-Methyl-2-pentanone (MIBK)	<100	ug/l		8/31/05	LEF
Styrene	<10	ug/l		8/31/05	LEF
1,1,2,2-Tetrachloroethane	<10	ug/l		8/31/05	LEF
Tetrachloroethene	<10	ug/l		8/31/05	LEF
Toluene	<10	ug/l		8/31/05	LEF
1,1,1-Trichloroethane	<10	ug/l		8/31/05	LEF
1,1,2-Trichloroethane	<10	ug/l		8/31/05	LEF
Trichloroethene	<10	ug/l		8/31/05	LEF
Vinyl chloride	<10	ug/l		8/31/05	LEF
Xylenes (Total)	<10	ug/l		8/31/05	LEF
Surrogate (1,2-DCA-d4)	103	%R		8/31/05	LEF
Surrogate (Tol-d8)	95	%R		8/31/05	LEF
Surrogate (4-BFB)	104	%R		8/31/05	LEF

Elevated detection limit due to matrix interference.

-- LABORATORY ANALYSIS REPORT --

S&W Redevelopment N.A., LLC *Syracuse, NY*

Sample ID: OW-3 **LSL Sample ID:** 0514386-003
Location: 10 East Chester Street
Sampled: 08/23/05 14:35 **Sampled By:** MSS
Sample Matrix: NPW

Analytical Method Analyte	Result	Units	Prep Date	Analysis Date & Time	Analyst Initials
(1) EPA 8260B TCL Volatiles					
Acetone	47	ug/l		8/27/05	LEF
Benzene	<1	ug/l		8/27/05	LEF
Bromodichloromethane	<1	ug/l		8/27/05	LEF
Bromoform	<1	ug/l		8/27/05	LEF
Bromomethane	<1	ug/l		8/27/05	LEF
2-Butanone (MEK)	<10	ug/l		8/27/05	LEF
Carbon disulfide	<1	ug/l		8/27/05	LEF
Carbon tetrachloride	<1	ug/l		8/27/05	LEF
Chlorobenzene	<1	ug/l		8/27/05	LEF
Chloroethane	<1	ug/l		8/27/05	LEF
Chloroform	<1	ug/l		8/27/05	LEF
Chloromethane	<1	ug/l		8/27/05	LEF
Dibromochloromethane	<1	ug/l		8/27/05	LEF
1,1-Dichloroethane	<1	ug/l		8/27/05	LEF
1,2-Dichloroethane	<1	ug/l		8/27/05	LEF
1,1-Dichloroethene	<1	ug/l		8/27/05	LEF
1,2-Dichloroethene, Total	<1	ug/l		8/27/05	LEF
1,2-Dichloropropane	<1	ug/l		8/27/05	LEF
cis-1,3-Dichloropropene	<1	ug/l		8/27/05	LEF
trans-1,3-Dichloropropene	<1	ug/l		8/27/05	LEF
Ethyl benzene	<1	ug/l		8/27/05	LEF
2-Hexanone	<10	ug/l		8/27/05	LEF
Methylene chloride	<2	ug/l		8/27/05	LEF
4-Methyl-2-pentanone (MIBK)	<10	ug/l		8/27/05	LEF
Styrene	<1	ug/l		8/27/05	LEF
1,1,2,2-Tetrachloroethane	<1	ug/l		8/27/05	LEF
Tetrachloroethene	510	ug/l		8/31/05	LEF
Toluene	<1	ug/l		8/27/05	LEF
1,1,1-Trichloroethane	<1	ug/l		8/27/05	LEF
1,1,2-Trichloroethane	<1	ug/l		8/27/05	LEF
Trichloroethene	<1	ug/l		8/27/05	LEF
Vinyl chloride	<1	ug/l		8/27/05	LEF
Xylenes (Total)	<1	ug/l		8/27/05	LEF
Surrogate (1,2-DCA-d4)	114	%R		8/27/05	LEF
Surrogate (Tol-d8)	103	%R		8/27/05	LEF
Surrogate (4-BFB)	111	%R		8/27/05	LEF

- - LABORATORY ANALYSIS REPORT - -

S&W Redevelopment N.A., LLC   Syracuse, NY

Sample ID:	OW-4	**LSL Sample ID:**	0514386-004
Location:	10 East Chester Street		
Sampled:	08/23/05 14:00	**Sampled By:**	MSS
Sample Matrix:	NPW		

Analytical Method Analyte	Result	Units	Prep Date	Analysis Date & Time	Analyst Initials
(1) EPA 8260B TCL Volatiles					
Acetone	<10	ug/l		8/30/05	LEF
Benzene	<1	ug/l		8/30/05	LEF
Bromodichloromethane	<1	ug/l		8/30/05	LEF
Bromoform	<1	ug/l		8/30/05	LEF
Bromomethane	<1	ug/l		8/30/05	LEF
2-Butanone (MEK)	<10	ug/l		8/30/05	LEF
Carbon disulfide	<1	ug/l		8/30/05	LEF
Carbon tetrachloride	<1	ug/l		8/30/05	LEF
Chlorobenzene	<1	ug/l		8/30/05	LEF
Chloroethane	<1	ug/l		8/30/05	LEF
Chloroform	<1	ug/l		8/30/05	LEF
Chloromethane	<1	ug/l		8/30/05	LEF
Dibromochloromethane	<1	ug/l		8/30/05	LEF
1,1-Dichloroethane	<1	ug/l		8/30/05	LEF
1,2-Dichloroethane	<1	ug/l		8/30/05	LEF
1,1-Dichloroethene	<1	ug/l		8/30/05	LEF
1,2-Dichloroethene, Total	1.4	ug/l		8/30/05	LEF
1,2-Dichloropropane	<1	ug/l		8/30/05	LEF
cis-1,3-Dichloropropene	<1	ug/l		8/30/05	LEF
trans-1,3-Dichloropropene	<1	ug/l		8/30/05	LEF
Ethyl benzene	<1	ug/l		8/30/05	LEF
2-Hexanone	<10	ug/l		8/30/05	LEF
Methylene chloride	<2	ug/l		8/30/05	LEF
4-Methyl-2-pentanone (MIBK)	<10	ug/l		8/30/05	LEF
Styrene	<1	ug/l		8/30/05	LEF
1,1,2,2-Tetrachloroethane	<1	ug/l		8/30/05	LEF
Tetrachloroethene	420	ug/l		8/31/05	LEF
Toluene	<1	ug/l		8/30/05	LEF
1,1,1-Trichloroethane	<1	ug/l		8/30/05	LEF
1,1,2-Trichloroethane	<1	ug/l		8/30/05	LEF
Trichloroethene	3.3	ug/l		8/30/05	LEF
Vinyl chloride	<1	ug/l		8/30/05	LEF
Xylenes (Total)	<1	ug/l		8/30/05	LEF
Surrogate (1,2-DCA-d4)	92	%R		8/30/05	LEF
Surrogate (Tol-d8)	101	%R		8/30/05	LEF
Surrogate (4-BFB)	116	%R		8/30/05	LEF

-- LABORATORY ANALYSIS REPORT --

S& W Redevelopment N.A., LLC   Syracuse, NY

Sample ID: MW-7S   **LSL Sample ID:** 0514386-005

Location: 10 East Chester Street

Sampled: 08/23/05 14:20   **Sampled By:** MSS

Sample Matrix: NPW

Analytical Method Analyte	Result	Units	Prep Date	Analysis Date & Time	Analyst Initials
(1) EPA 8260B TCL Volatiles					
Acetone	290	ug/l		8/31/05	LEF
Benzene	<1	ug/l		8/27/05	LEF
Bromodichloromethane	<1	ug/l		8/27/05	LEF
Bromoform	<1	ug/l		8/27/05	LEF
Bromomethane	<1	ug/l		8/27/05	LEF
2-Butanone (MEK)	42	ug/l		8/27/05	LEF
Carbon disulfide	<1	ug/l		8/27/05	LEF
Carbon tetrachloride	<1	ug/l		8/27/05	LEF
Chlorobenzene	<1	ug/l		8/27/05	LEF
Chloroethane	<1	ug/l		8/27/05	LEF
Chloroform	2.2	ug/l		8/27/05	LEF
Chloromethane	<1	ug/l		8/27/05	LEF
Dibromochloromethane	<1	ug/l		8/27/05	LEF
1,1-Dichloroethane	<1	ug/l		8/27/05	LEF
1,2-Dichloroethane	<1	ug/l		8/27/05	LEF
1,1-Dichloroethene	<1	ug/l		8/27/05	LEF
1,2-Dichloroethene, Total	<1	ug/l		8/27/05	LEF
1,2-Dichloropropane	<1	ug/l		8/27/05	LEF
cis-1,3-Dichloropropene	<1	ug/l		8/27/05	LEF
trans-1,3-Dichloropropene	<1	ug/l		8/27/05	LEF
Ethyl benzene	<1	ug/l		8/27/05	LEF
2-Hexanone	<10	ug/l		8/27/05	LEF
Methylene chloride	<2	ug/l		8/27/05	LEF
4-Methyl-2-pentanone (MIBK)	<10	ug/l		8/27/05	LEF
Styrene	<1	ug/l		8/27/05	LEF
1,1,2,2-Tetrachloroethane	<1	ug/l		8/27/05	LEF
Tetrachloroethene	<1	ug/l		8/27/05	LEF
Toluene	<1	ug/l		8/27/05	LEF
1,1,1-Trichloroethane	<1	ug/l		8/27/05	LEF
1,1,2-Trichloroethane	<1	ug/l		8/27/05	LEF
Trichloroethene	<1	ug/l		8/27/05	LEF
Vinyl chloride	<1	ug/l		8/27/05	LEF
Xylenes (Total)	<1	ug/l		8/27/05	LEF
Surrogate (1,2-DCA-d4)	103	%R		8/27/05	LEF
Surrogate (Tol-d8)	95	%R		8/27/05	LEF
Surrogate (4-BFB)	101	%R		8/27/05	LEF

LSL

SURROGATE RECOVERY CONTROL LIMITS FOR ORGANIC METHODS

Method	Surrogate(s)	Water Limits, %R	SHW Limits, %R
EPA 504	TCMX	80-120	NA
EPA 508	DCB	70-130	NA
EPA 515.4	DCAA	70-130	NA
EPA 524.2	1,2-DCA-d4, 4-BFB	80-120	NA
EPA 525.2	1,3-DM-2-NB, TPP, Per-d12	70-130	NA
EPA 526	1,3-DM-2-NB, TPP	70-130	NA
EPA 528	2-CP-3,4,5,6-d4, 2,4,6-TBP	70-130	NA
EPA 551.1	Decafluorobiphenyl	80-120	NA
EPA 552.2	2,3-DBPA	80-120	NA
EPA 601	1,2-DCA-d4, Tol-d8, 4-BFB	70-130	NA
EPA 602	1,2-DCA-d4, Tol-d8, 4-BFB	70-130	NA
EPA 608	DCB	30-150	NA
EPA 624	1,2-DCA-d4, Tol-d8, 4-BFB	70-130	NA
EPA 625, AE	2-Fluorophenol	21-110	NA
EPA 625, AE	Phenol-d5	10-110	NA
EPA 625, AE	2,4,6-Tribromophenol	10-123	NA
EPA 625, BN	Nitrobenzene-d5	35-114	NA
EPA 625, BN	2-Fluorobiphenyl	43-116	NA
EPA 625, BN	Terphenyl-d14	33-141	NA
EPA 8010	1,2-DCA-d4, Tol-d8, 4-BFB	70-130	70-130
EPA 8020	1,2-DCA-d4, Tol-d8, 4-BFB	70-130	70-130
EPA 8021	1,2-DCA-d4, Tol-d8, 4-BFB	70-130	70-130
EPA 8081	TCMX, DCB	30-150	30-150
EPA 8082	DCB	30-150	30-150
EPA 8151	DCAA	30-130	30-120
EPA 8260	1,2-DCA-d4, Tol-d8, 4-BFB	70-130	70-130
EPA 8270, AE	2-Fluorophenol	21-110	25-121
EPA 8270, AE	Phenol-d5	10-110	24-113
EPA 8270, AE	2,4,6-Tribromophenol	10-123	19-122
EPA 8270, BN	Nitrobenzene-d5	35-114	23-120
EPA 8270, BN	2-Fluorobiphenyl	43-116	30-115
EPA 8270, BN	Terphenyl-d14	33-141	18-137
DOH 310-13	Dodecane	40-110	40-110
DOH 310-14	Dodecane	40-110	40-110
DOH 310-15	Dodecane	40-110	40-110
DOH 310-34	4-BFB	50-150	50-150
DOH 313-4	DCB	NA	30-150
8015M_GRO	4-BFB	50-150	50-150
8015M_DRO	Terphenyl-d14	50-150	50-150

Units Key:
ug/l = microgram per liter
ug/kg = microgram per kilogram
mg/l = milligram per liter
mg/kg = milligram per kilogram
%R = Percent Recovery

LSL

Life Science Laboratories, Inc.

CHAIN OF CUSTODY RECORD

LSL North Lab.
131 St. Lawrence Ave.
Waddington, N.Y. 13694
Phone: 315-388-4476
Fax: 315-388-4061

LSL Central Lab.
5854 Butternut Drive
E. Syracuse, N.Y. 13057
Phone: 315-445-1105
Fax: 315-445-1301

LSL Finger Lakes
16 N. Main St., P
Wayland, NY 14
Phone: 716-728-3320
Fax: 716-728-2711

0514386
S+W_Redevelopment

Turnaround Time
Normal 14 DAY ☒
Pre-Authorized Next Day* ☐ 2-Day * ☐ 3-Day * ☐ 7-Day* ☐
*Additional Charges may apply

Date Needed or Special Instructions:

Authorization or P.O. # 10 East Chester Street

LSL Project Number

Report Address:
Name: Mark S. Sergott
Company: S&W Redevelopment of N.A., LLC
Street: 430 E. Genesee St./Suite 401
City/State: Syracuse, NY 13202
Zip: [redacted] 13202
Phone: 422-4949
Fax: 422-2124
Email: msergott@swredev.com

Client Project ID/Client Site ID 10 East Chester Street

Client's Sample Identifications	Sample Date	Sample Time	Type [✓ grab]/comp	Matrix	Preserv Added	Containers #	Containers size/type	Analyses	Preserv Check	LSL ID#
OW-1	8/23/05	2:45	Grab	water	HCl	2	VOA	VOCs (8260)	HCl	[illegible] BB
OW-2	↓	3:05	↓	↓	↓	2	↓	↓	↓	002
OW-3	↓	2:35	↓	↓	↓	2	↓	↓	↓	003
OW-4	↓	2:00	↓	↓	↓	2	↓	↓	↓	004
MW-75	↓	2:20	↓	↓	↓	2	↓	↓	↓	005

LSL use only:

Containers this C-O-C

Custody Transfers

		Date	Time
Sampled By: Mark S. Sergott	Received By:		
Relinquished By: Mark S. Sergott	Received By:		
Relinquished By:	Rec'd for Lab By: MV	03-24-05	10:48
Shipment Method: 10:45 AM 8/24/05	Received Intact: Y N	Sample Temp 10	

*** All areas of this Chain of Custody Record MUST be filled out in order to process samples in a timely manner IN PEN ONLY***

Reg COC