FINAL SUPPLEMENTAL INVESTIGATION WORK PLAN

FORMER STEWART STAMPING SITE
630 CENTRAL PARK AVENUE
YONKERS, NEW YORK 10704

VCP Site No. V00691-3
VCA Index No. W3-1005-04-06

Submitted to:
New York State Department of Environmental Conservation
Region 3, New Paltz, New York

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I, David S. Glass, certify that I am currently a New York State registered professional engineer and that this Final Supplemental Investigation Work Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

David S. Glass, P.E.

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1.0 INTRODUCTION

The purpose of this Final Supplemental Investigation Work Plan (Work Plan) is to present to the New York State Department of Environmental Conservation (NYSDEC), for review and approval, the proposed plan for further investigation at the Former Stewart Stamping Site located at 630 Central Park Avenue, Yonkers, New York 10704 (hereafter referred to as the "Site"). The Site has been assigned NYSDEC Voluntary Cleanup Program (VCP) Site No. V00691-3, and Voluntary Cleanup Agreement (VCA) Index No. W3-1005-04-06. The legal descriptions for the VCP Site, associated addresses and land uses are summarized below.

Table 1
Site Legal Descriptions, Addresses, and Land Uses

Section	Block	Lot	Address	City of Yonkers Zoning Designation	6 NYCRR Part 375-1.8(g)(2) Restricted Use
6	6342	5	10 Kettell Avenue	BA - General Business and Apartment Houses, High Density	Residential Use
	6343	1	630 Central Park Avenue	I - Industry, Residence Excluded	Industrial Use
		25 and 27	34 Whittier Avenue	I - Industry, Residence Excluded	Industrial Use
		47 and 49	27 Kettell Avenue	I - Industry, Residence Excluded	Industrial Use
		51	21 Kettell Avenue	M - Apartment Houses, Medium Density	Residential Use
	6344	1 and 2	640 and 642 Central Park Avenue	BR - Restricted Business, Residences Excluded	Commercial Use

This Final Supplemental Investigation Work Plan presents an approach to further investigate the on-site USTs and potential impacts to soil associated with former process operations. This Work Plan is consistent with NYSDEC DER-10 – Technical Guidance for Site Investigation and Remediation dated May 2010. Following completion of the investigation discussed herein, TRC Engineers, Inc. (TRC) will prepare and submit a Final Supplemental Investigation (SI) Report documenting the findings and conclusions of the investigation. The Final SI Report will also summarize the results of previous investigations, address the comments issued by NYSDEC in connection with the Voluntary Investigation Report dated September 1, 2008 and will include a remedial alternatives analysis, as appropriate.

2.0 SITE DESCRIPTION AND HISTORY

2.1 Site Location and Setting

The Site encompasses approximately 4 acres and is improved with a:

- 200,000-square foot two-story Industrial Building and associated 14,000-square foot industrial parking lot;
- 7,000-square foot and 15,000-square foot commercial parking lots;
- 1,800-square foot two-story residential structure; and,
- 750-square foot one-story garage on a 7,500-square foot residential property.

The Site is located in Yonkers, New York and bordered by Central Park Avenue to the west, Whittier Avenue and low-rise residential and commercial structures to the north, Kettell Avenue, Huber Place, and low-rise residential and commercial structures to the south, and residential structures followed by Trenchard Street to the east. A Site Location Map is presented in *Figure 1*. The VCP Site boundaries and uses are shown in *Figure 2*. Surrounding properties have been developed primarily for residential and commercial uses. The Site is almost completely covered by impervious material and is located in an urbanized area.

2.2 Current Site Use

The Site was previously utilized for metal parts manufacturing from circa 1942 until 2008, when manufacturing operations ceased. The Site is currently unoccupied. The manufacturing equipment has been removed from the Industrial Building and the two-story residential structure and three parking lots are currently unoccupied.

2.3 Historic Site Use

The Site was first developed with the initial portion of the existing Industrial Building reportedly constructed circa 1930 as a warehouse for Wanamaker Department Stores. The initial portion of the Industrial Building was added onto in 1953, 1958, 1974, and 1984. As stated above, the Site was utilized by Stewart from circa 1942 until 2008, when manufacturing operations ceased.
The Industrial Building housed high-speed stamping metal parts manufacturing processes for automotive and electronics components industries. Finishing processes including plating,

polishing, and heat treatment, were also conducted in the Industrial Building. In addition, there are seven abandoned underground storage tanks (USTs) beneath the footprint of the Industrial Building. There are also two active aboveground storage tanks (ASTs) in a containment room on the west side of the Industrial Building. The locations of the USTs and ASTs are shown on *Figure 4*.

The manufacturing operations were a source of regulated air emissions, regulated wastewater discharges, and hazardous waste generation. The materials used in the manufacturing operations included solvents [methylene chloride, 1,1,1-trichloroethane (TCA), trichloroethene (TCE), and tetrachloroethene (PCE)], copper, lead, nickel, silver, tin, zinc, coiled steel, steel alloy, plating chemistry, lubricants, and hydraulic oil.

2.4 Site Geology and Hydrogeology

The geology of Westchester County consists primarily of unconsolidated glacial till deposits overlying crystalline bedrock. Based on the findings of previous investigations and available literature, the subsurface geology in the area of the Site likely includes Manhattan Schist, Fordham Gneiss, and Inwood Marble. Manhattan Schist and Fordham Gneiss are generally found throughout Westchester County in irregular bands and the Inwood Marble occurs as north to south trending bands defining river channels such as the Bronx, Croton, and Saw Mill Rivers. Weathered bedrock has been encountered in soil borings advanced at the Site at depths from 12 to 17 feet below ground surface (bgs). According to prior reports, the hydraulic conductivity of the bedrock aquifer is very low.

Prior investigations on the Site found that the unconsolidated glacial till deposits at the Site consist of a mixture of clay, silt, sand, gravel, and boulders. Soil encountered during soil boring installation in the Industrial Building was found to consist of sand with silt, and gravel. Soil encountered during soil boring installation on the residential and commercial lots was found to consist primarily of brown, black and gray sand, silt and clay with gravel, concrete, red brick, ash, wood fragments and weathered bedrock.

The Site is located approximately 0.5 miles north of the Hillview Reservoir and approximately 0.75 miles west of the Bronx River. According to information obtained from prior reports and the Preliminary Supplemental Investigation performed by TRC in April-May 2011, groundwater occurs in shallow bedrock at depths ranging from 12 to 28 feet bgs (or below top of floor slab). Based on topography in the area, nearby surface water bodies, and information obtained from prior reports and the Preliminary Supplemental Investigation, the predominant direction of local groundwater flow is expected to be eastward towards the Bronx River. Estimated groundwater levels and/or flow directions may vary due to seasonal fluctuations in precipitation, local usage demands, geology, and underground structures.

3.0 PREVIOUS INVESTIGATIONS

Presented below are brief summaries of the results of the prior investigations performed at the Site as well as the results of the Preliminary Supplemental Investigation performed by TRC in April and May 2011. A summary of the historic sampling and results is provided in *Figure 3*. The Preliminary Supplemental Investigation Report is provided in *Appendix A*.

3.1 Draft Environmental Site Assessment and Limited Compliance Review

In 2002, Environmental Resources Management (ERM) conducted a Phase I Environmental Site Assessment (ESA) of the Industrial Building and the associated parking lot for the Insilco Corporation, the owner of the properties at that time. The purpose of the Phase I ESA was to evaluate the potential for environmental impacts to the Site as a result of past, or then current, activities on the Site and surrounding properties.

The ERM "Draft Phase I Environmental Site Assessment and Limited Compliance Review," dated September 2002, reports the following recognized environmental conditions and contaminants of concern identified inside the Industrial Building:

- Plating Chemical Spills (nickel, copper, lead, zinc, and silver);
- Chlorinated Solvent Use (methylene chloride, TCE, PCE, and 1,1,1-TCA); and
- Underground Storage Tanks (fuel oil and cutting oil).

There were no other recognized environmental conditions identified in the report

3.2 Phase II Site Investigation

In 2003, ERM conducted a Phase II Site Investigation for the Insilco Corporation. The Phase II Site Investigation included field activities in the Industrial Building and the associated parking lot. The following field activities were completed as part of the Phase II Site Investigation:

- Installation of four soil borings (twelve other attempts failed due to a "sub-floor");
- Analysis of five soil samples for volatile organic compounds (VOCs), polyaromatic hydrocarbons (PAHs), priority pollutant metals and cyanide;

- Installation of two bedrock wells; and,
- Collection and analysis of groundwater samples from three bedrock wells (two new and one existing) for VOCs, PAHs, priority pollutant metals and cyanide.

Soil sampling laboratory analytical data showed no exceedances of 6 NYCRR Part 375 Protection of Public Health Industrial Use Soil Cleanup Objectives (SCOs) and Protection of Groundwater SCOs.

Groundwater sampling laboratory analytical data showed no exceedances of New York State Class GA Groundwater Standards and Guidance Values (Class GA Values) for VOCs and semivolatile organic compounds (SVOCs). Arsenic was detected at a concentration slightly above the Class GA Value in MW-02. Chromium was detected at a concentration slightly above the Class GA Value in MW-03. In addition, zinc was detected at a concentration of 38,800 ug/L in MW-02. The Class GA Value for zinc is of 2,000 ug/L.

3.3 Voluntary Investigation Report

In 2008, ERM prepared a "Voluntary Investigation Report" for Stewart EFI New York, LLC. The purpose of the report was to summarize the results of soil, groundwater and soil vapor sampling performed at the Site and on surrounding properties.

The Voluntary Investigation Report, dated September 2008, presents descriptions and the results of the following field activities:

- Advancement and sampling of nine soil borings;
- Analysis of ten soil samples for TCL VOCs;
- Analysis of four soil samples and one sludge sample for TCL VOCs, TAL metals, and cyanide;
- Installation of two bedrock wells;
- Collection and analysis of groundwater samples from five bedrock wells (two new and three existing) for VOCs, PAHs, TAL metals and cyanide;
- Collection and analysis for VOCs of nine sub-slab soil vapor samples under the Industrial Building;
- Collection and analysis for VOCs of nine soil vapor samples around the perimeter of the Industrial Building;

- Collection and analysis for VOCs of seven indoor air and seven soil vapor samples in surrounding homes as part of a New York State Department of Health (NYSDOH) required offsite soil vapor intrusion study; and
- Collection and analysis for VOCs of three outdoor air samples near surrounding homes as part of a NYSDOH required off-site soil vapor intrusion study.

Soil sampling laboratory analytical data showed no exceedances of Industrial Use SCOs. The VOCs methylene chloride, 2-butanone and acetone were detected in soil at concentrations slightly above the Protection of Groundwater SCOs. The metals cadmium, nickel, and silver were also detected in soil at concentrations slightly above the Protection of Groundwater SCOs.

Groundwater sampling laboratory analytical data showed no exceedances of Class GA Values for SVOCs or cyanide. Naturally occurring metals (iron, magnesium, manganese and sodium) were detected at concentrations above Class GA Values. Thallium was also detected at concentrations slightly above the Class GA Value in two monitoring wells, although this appears to be related to a background condition. Arsenic, chromium and nickel were detected at concentrations slightly above Class GA Values. Zinc was detected at a concentration significantly above the Class GA Value. The VOCs chloroform, cis-1,2-dichloroethene and TCE were detected at concentrations slightly above Class GA Values near the down gradient corner of the Site. As mentioned above, a summary of the soil and groundwater sampling data from the Voluntary Investigation Report is provided on *Figure 3*.

Based on the NYSDOH Soil Vapor Intrusion Guidance, soil vapor sampling laboratory analytical data revealed elevated levels of PCE, TCE and 1,1,1-TCA in sub-slab and soil vapor samples collected inside and around the Industrial Building. Vapor intrusion sampling conducted off-site indicated the following:

- 21 Kettell Avenue: Mitigation required (subsequent sampling indicated no further action required);
- 45 Kettell Avenue: Continued monitoring required (subsequent sampling indicated no further action required); and

- 33 Whittier Avenue: Continued monitoring required (subsequent sampling indicated "take reasonable and practical action to identify source(s) and reduce exposures" [1] required).

3.4 Additional Soil Vapor Sampling and Indoor Air Sampling

In 2009, ERM performed additional soil vapor sampling and indoor air sampling at the Site and surrounding properties. The purpose of the additional sampling was to determine if, based on NYSDOH Guidance, mitigation was required at the sample locations. The report was presented to NYSDEC as "Progress Report No. 3," dated February 3, 2010.

Soil vapor and indoor air samples were collected at the following locations:

- 21 Kettell Avenue: One indoor air, one sub-slab soil vapor, and one outdoor air sample were collected and analyzed for VOCs; and
- Industrial Building: Ten indoor air samples were collected and analyzed for VOCs.

The results of the analyses of the samples collected at 21 Kettell Avenue were compared to the NYSDOH soil vapor intrusion guidance matrices and indicated that no further action is required.

The results of the analyses of the samples collected in the Industrial Building were also compared to the NYSDOH matrices. TCE was detected in ambient air at concentrations between 3.3 and 35 micrograms per cubic meter ($\mu g/m^3$), indicating that mitigation was required for the Industrial Building.

In 2010 ERM performed additional sub-slab vapor, outdoor air and indoor air sampling at 33 Whittier Avenue and 45 Kettell Avenue. The purpose of the additional sampling was to determine if, based on NYSDOH Guidance, continued monitoring was required at the sample locations. The results of the sampling were presented to NYSDEC as "Project Progress Report – Activities Through March 2010" dated May 19, 2010.
Sub-slab vapor, outdoor air and indoor air samples were collected as follows:

[1] "Take reasonable and practical action to identify source(s) and reduce exposures" - The concentration detected in the indoor air sample is likely due to indoor and/or outdoor sources rather than soil vapor intrusion given the concentration detected in the sub-slab vapor sample. Therefore, steps should be taken to identify potential source(s) and to reduce exposures accordingly (e.g., by keeping containers tightly capped or by storing volatile organic compound-containing products in places where people do not spend much time, such as a garage or outdoor shed). (NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York, October 2006)

- 45 Kettell Avenue: One indoor air, one sub-slab soil vapor, and one outdoor air sample were collected and analyzed for VOCs; and
- 33 Whittier Avenue: One indoor air, one sub-slab soil vapor, and one outdoor air sample were collected and analyzed for VOCs.

The results of the analyses of the samples collected at 45 Kettell Avenue and 33 Whittier Avenue were compared to the NYSDOH soil vapor intrusion guidance matrices and indicated that no further action and "reasonable and practical action to identify source(s) and reduce exposure", are required, respectively.

3.5 Final Vapor Intrusion Mitigation System Completion Report

A pilot study work plan for installation of a sub-slab depressurization system (SSDS) in the Industrial Building was prepared by TRC and submitted to NYSDEC in February 2010. In March 2010 sub-slab pressure field pilot testing was performed by TRC and in June 2010 a work plan for installation of a full-scale SSDS in the Industrial Building was submitted to NYSDEC. A full-scale SSDS was installed in the Industrial Building under the supervision of TRC in 2010, and testing of the SSDS was completed by TRC in August 2010. In November 2010, TRC issued a Final Vapor Intrusion Mitigation System Completion Report for the Industrial Building. The purpose of the report was to document the installation and results of testing of the SSDS in the Industrial Building. As documented in the Final Vapor Intrusion Mitigation System Completion Report, pressure field testing performed after installation of the SSDS showed that the Industrial Building sub-slab vapor had been successfully depressurized. Additionally, as part of the testing, eight (8) indoor air samples were collected inside the Industrial Building and analyzed for VOCs. The results of the analyses of the indoor air samples showed that TCE concentrations had been reduced by an order of magnitude when compared to the results of indoor air sampling performed prior to installation of the SSDS. The NYSDEC approved the Final Vapor Intrusion Mitigation System Completion Report in a letter dated December 10, 2010.

3.6 Preliminary Supplemental Investigation Report

The Preliminary Supplemental Investigation performed during April – May 2011, included the following field activities:

- Geophysical surveys to identify the portions of the former process wastewater drainage system beneath the Industrial Building floor slabs, confirm the locations and identify the dimensions of USTs inside the Industrial Building, and verify that the proposed soil boring locations were clear of subsurface utilities and structures;
- Visual surveys and mapping of the former process wastewater drainage system;
- Advancement to bedrock surface and continuous soil sampling of six soil borings on the residential and commercial lots which are part of the Site;
- Analysis of thirteen soil samples for Target Compound List (TCL) VOCs +10 tentatively identified compounds (TICs), TCL SVOCs +20 TICs, Target Analyte List (TAL) metals plus cyanide, TCL polychlorinated biphenyls (PCBs), and TCL pesticides;
- Collection of one groundwater sample from each of the five existing bedrock monitoring wells and analysis of each sample for TCL VOCs +10 TICs, TCL SVOCs +20 TICs, filtered and unfiltered Target Analyte List (TAL) metals and cyanide (unfiltered), TCL PCBs, and TCL pesticides; and,
- Survey by a licensed land surveyor of the soil sampling locations and monitoring wells.

The results of the Preliminary Supplemental Investigation are presented in a report dated May 13, 2011 which is in *Appendix A* of this Work Plan. In addition, a summary of the results is presented below.

The results of the Preliminary Supplemental Investigation indicate the following:

- The scattered geophysical anomalies detected on the residential and commercial lots are likely representative of unconsolidated soils, former building remnants and utilities. There were no indications of the presence of an UST on either the residential or commercial lots.
- Consistent with historic records, seven abandoned USTs were identified beneath the footprint of the Industrial Building. The locations and approximate dimensions of the abandoned USTs have been mapped.
- The former process wastewater drainage system was mapped via geophysical and visual surveys. It was determined that the floor and trench drains and sub-slab piping drain to

the sanitary sewer and sumps. The surveys confirmed that the sumps do not have outlets or drains, with the exception of one sump in the former Maintenance Equipment area which is connected to the sanitary sewer. Oil was found in one floor drain, one house trap, and one sump in the former North Press Room and a sludge-like material was found in a pit in the former Plating Room. Stewart EFI subsequently arranged for removal and off-site disposal of the oil and sludge, and cleaning of the floor drain, house trap, sump and the pit in the former Plating Room.

- Soil on the residential and commercial lots was found to consist primarily of brown, black and gray sand, silt and clay with gravel, concrete, red brick, ash, wood fragments and weathered bedrock. Bedrock was encountered in the soil borings at depths from 12 to 17 feet bgs. Field observations indicated evidence of potentially impacted soil in one sample collected from one of the six soil borings. The sample collected 2 to 4 feet bgs from TRC-SB3 exhibited PID readings up to 5.7 ppm (and was submitted for laboratory analysis). There was no staining or odors noted in the borings and no separate phase liquids (e.g., fuel oil, gasoline) identified in the soil.
- With respect to the soil samples collected on the residential and commercial lots and submitted for analysis, there were no VOCs, SVOCs, PCBs, or pesticides detected at a concentration exceeding the applicable Residential or Commercial Use SCOs. Also, cyanide was not detected above the SCOs. One metal (mercury) was detected at a concentration slightly above the Residential Use SCO in one soil sample. The concentration of mercury detected in the sample above Residential Use SCO can be attributed to the characteristics of urban fill material at the Site.
- Groundwater was encountered in existing Site monitoring wells at depths ranging from approximately 12 to 28 feet bgs (or below top of floor slab). Groundwater surface elevation measurements indicate that groundwater generally follows the local topography and flows outward radially towards the north, east and south from near the center of the Site.
- During gauging with an oil/water interface probe and sampling of the on-Site monitoring wells there was no sheen, odor, or discoloration detected in groundwater. Also, there were no significantly elevated PID headspace readings (greater than 0.1 ppm above background) recorded during collection of groundwater samples.
- There were no VOCs, SVOCs, PCBs, or pesticides detected at a concentration exceeding the Class GA Values in the groundwater samples collected from the five monitoring wells. Cyanide was not detected in groundwater above the Class GA Value. Excluding iron, magnesium, manganese, and sodium, zinc was the only metal detected in groundwater above a Class GA Value. Zinc was detected in filtered and unfiltered samples collected from MW-2 at concentrations of 2,210 µg/L and 2,920 µg/L, respectively.

Based on the results of the Preliminary Supplemental Investigation, the following was concluded:

- There are seven abandoned USTs beneath the footprint of the Industrial Building. There is no evidence of a buried UST on the commercial and residential lots.
- Process wastewater was formerly discharged to the sanitary sewer system and sumps. Wastewater which collected in sumps was conveyed via pumps and overhead piping to the on-Site wastewater pretreatment system.
- Based on the results of the laboratory analysis, there is no evidence of any releases to soil on the commercial and residential lots. Mercury was detected in one of the 13 soil samples slightly above the applicable criteria. The sample, TRC-SB3(2-4"), was collected from 2 to 4 inches bgs in the front yard of the residence at 21 Kettell Avenue. The concentration of mercury detected is most likely attributable to the characteristics of the urban fill material at the Site.
- Based on groundwater surface elevation measurements, the groundwater generally follows the local topography and flows outward radially towards the north, east and south from near the center of the Site.
- There was no evidence of impact to groundwater found, with the exception of the concentration of zinc detected slightly above the Class GA Value in one monitoring well (MW-2).

Based on the results of the Preliminary Supplemental Investigation, the following was recommended:

- The results of the Preliminary Supplemental Investigation should be incorporated and included in the Final Supplemental Investigation Work Plan for the Site. The scope of the Final Supplemental Investigation Work Plan should consist of soil sampling around the abandoned USTs, in former process areas adjacent to several representative floor drains and in or near several representative sumps and trench drains.
- Following completion of the Final Supplemental Investigation, a Final Investigation Report and Site Management Plan should be prepared to obtain a release and covenant not to sue under the Voluntary Cleanup Program.

Following submittal of the Preliminary Supplemental Investigation Report to NYSDEC in May 2011, Stewart EFI arranged for removal and off-site disposal of the sludge from the pit in the former Plating Room. Based on the results of the analysis of the sludge-like material, the material was classified as USEPA waste code F006 – Wastewater treatment sludges from electroplating operations.

After removal of the sludge and cleaning of the pit was complete, the pit was found to be approximately four feet long and four feet wide and three feet in depth, and have solid concrete walls and a solid concrete bottom. Additionally, a three inch diameter vertical drain pipe extending from the bottom of the pit terminating with a shut off valve was found. TRC and the geophysical survey subcontractor subsequently returned to the Site on May 26, 2010 to trace the drainpipe. The results of the geophysical survey indicated that the pipe runs west from the pit and connects with a sump as shown on *Figure 4*. Also, after issuance of the Preliminary Supplemental Investigation Report, the oil identified in a floor drain during the Preliminary Supplemental Investigation was removed by Stewart EFI. Also, after issuance of the Preliminary Supplemental Investigation Report, an additional sump in the scrap metal bay was identified and found to contain oil (refer to *Figure 4*). Stewart EFI plans to remove the oil.

TRC was also able to confirm during a Site visit on May 19, 2011 that several of the USTs have been filled with concrete. Refer to *Table 2* below for a description of the USTs based on the most recent Site visit. Refer to *Figure 4* for the locations of the USTs.

Table 2
NYSDEC Petroleum Bulk Storage Registration Information (PBS No. 3-012564)

Tank No.	Year Installed	Tank Type	Historic Contents*	Current Contents**	Tank Capacity (gallons)	Tank Status
1	1965	UST	Fuel Oil	Unknown	5,000	Closed
2	1978	UST	Water Soluble Cutting Oil	Unknown	5,000	Closed
3	1978	UST	Water Soluble Cutting Oil	Unknown	3,000	Closed
4	1994	AST	Fuel Oil	Fuel Oil	5,000	In Service
5	1994	AST	Fuel Oil	Fuel Oil	5,000	In Service
6	1978	UST	Water Soluble Cutting Oil	Concrete	3,000	Closed
7	1978	UST	Water	Concrete	8,000	Closed
8	1978	UST	Water	Concrete	8,000	Closed
9	NR	UST	Fuel Oil	Concrete	3,000	Closed

Note: * Information regarding contents of USTs provided by Stewart EFI.
** Information obtained from field inspection on May 19, 2011.
NR – Not Reported

4.0 SUPPLEMENTAL INVESTIGATION OBJECTIVES AND METHODS

This section of the Work Plan presents the objectives and methods for the proposed additional investigation for VCP Site No. V00691-3, and follows the guidance for an investigative work plan in NYSDEC Division of Environmental Remediation DER-10, Technical Guidance for Site Investigation and Remediation. The Work Plan has been prepared in consideration of the Site history and findings of previous investigations (refer to Sections 2.0 and 3.0).

The Quality Assurance Project Plan (QAPP) to be implemented as part of the Final Supplemental Investigation is in *Appendix B*. The site-specific Health and Safety Plan (HASP) for the Final Supplemental Investigation is included in *Appendix C*.

4.1 Recognized Environmental Conditions

Previous reports and investigations document the known or potential presence of releases to soil from the former operations and USTs inside and beneath the Industrial Building. Based on a review of the findings of the previous investigations, the environmental conditions of the two commercial parking lots, residential lot, industrial parking lot, and on-site groundwater have been characterized (refer to Section 3.4). Additional investigation of the soil beneath the Industrial Building in former process areas and to assess the potential for impacts from the former USTs located beneath the Industrial Building is the focus of this section of the Work Plan.

4.2 Current Conceptual Site Model

The Site was utilized as a metal stamping facility for over 60 years. Former Site operations included plating, polishing, heat treatment, degreasing, and petroleum bulk storage. Documented historic and existing metal plating and solvent-related impacts in and around the Site, in soil vapor and groundwater, may be attributable to former manufacturing operations at the Site. Significant investigation has been performed in and around the Site. An important consideration is that the Industrial Building was constructed in several phases and in several areas there are two concrete slab floors, representing difficult conditions for subsurface investigation, and potentially mitigating the potential for migration.

Based on the results of prior investigations, the upper glacial deposits at the Site consist of a mixture of clay, silt, sand, gravel, and boulders. Soil encountered during soil boring installation in the Industrial Building was found to consist of sand with silt and gravel. Soil encountered during soil boring installation on the residential and commercial lots was found to consist primarily of brown, black and gray sand, silt and clay with gravel, concrete, red brick, ash, wood fragments and weathered bedrock. The groundwater surface in the shallow bedrock at the Site is present at approximately 12 to 28 feet bgs (or below top of floor slab) and predominant local groundwater flow direction is to the east, towards the Bronx River.

Sub-slab vapor intrusion has been addressed by the installation of a NYSDEC approved active SSDS in the Industrial Building. Based on the results of perimeter and off-Site soil vapor intrusion investigations, no soil vapor intrusion monitoring or mitigation is required in connection with the residential and commercial parcels and off-Site areas.

Soil samples collected from beneath the Industrial Building indicate that the soil meets the Protection of Public Health Industrial criteria. It is anticipated that the Industrial Building will continue to be used for industrial purposes and that the building slab will continue to act as a cap, preventing contact with the soil.

There was no evidence of any releases to soil on the commercial and residential lots. Mercury was detected in one of the 13 soil samples slightly above the applicable criteria. The sample, TRC-SB3(2-4”), was collected from 2 to 4 inches bgs in the front yard of the residence at 21 Kettell Avenue. The concentration of mercury detected is most likely attributable to the characteristics of the urban fill material encountered at the Site. Therefore, no further investigation is warranted in connection with the commercial and residential lots which are part of the Site.

There was no evidence of impact to groundwater identified during the most recent round of groundwater sampling, with the exception of the concentrations of zinc detected slightly above the Class GA Value in the sample collected from one monitoring well (MW-2). Therefore, no further investigation is warranted in connection with groundwater at the Site.

The results of the geophysical survey and visual mapping identified seven abandoned USTs beneath the footprint of the Industrial Building, and it was determined that the floor and trench drains and sub-slab piping drain to the sanitary sewer and sumps. The surveys confirmed that the sumps do not have outlets or drains, with the exception of one sump in the former Maintenance Equipment area, which is connected to the sanitary sewer. Oil and/or oil staining were found in one floor drain, one house trap, and one sump in the former North Press Room, and in one sump in the scrap metal bay. A sludge-like material was found in a pit in the former Plating Room. The oil and sludge have been or will be removed.

Additional investigation near the seven abandoned USTs, floor and trench drains, and sumps is required to characterize these areas. Therefore, the scope of the planned Final Supplemental Investigation activities, which is the subject of this Work Plan, is limited to the soil beneath the footprint of the Industrial Building and the abandoned USTs.

4.3 Objectives

The principal objectives of this Final Supplemental Investigation are to complete the characterization of soil near the seven abandoned USTs, floor and trench drains, and sumps within the footprint of the Industrial Building and to determine the contents of three of the seven abandoned USTs. As mentioned previously, it has been determined that four of the seven USTs beneath the Industrial Building are filled with concrete.

4.4 Scope of Investigation

The scope of the planned investigation activities are as follows:

- Investigate contents of USTs;
- Soil sampling; and
- Sample location surveying.

The site-specific sampling techniques and analytical methods to be used in implementing the Final Supplemental Investigation are presented in the QAPP in *Appendix B*. The investigation activities will be performed in accordance with the site-specific HASP in *Appendix C*. Community air monitoring to be performed during implementation of the Work Plan field activities is described in the HASP.

4.5 Task 1 – Investigation of Contents of USTs

As stated above, it has been confirmed based on the May 19, 2010 investigation that four of the seven abandoned USTs beneath the Industrial Building are filled with concrete. The objective of Task 1 is to determine the contents of the three abandoned USTs which were not accessed on May 19, 2011. Refer to *Figure 4* for the locations of the USTs. All seven of the USTs were reportedly emptied, cleaned, and filled with concrete slurry. Manway access covers will be removed and, if found not to be filled with concrete, the inside of each tank will be screened with a combustible gas indicator and photoionization detector from above, and visually inspected from the open access way. If an UST is found to contain liquid, the contents will be gauged with an oil/water interface probe and sampled and analyzed for oil fingerprint, chlorinated VOCs, total halogens, and flash point. The results of sampling and analysis will be used to determine appropriate decontamination and closure requirements, if necessary.

4.6 Task 2 – Soil Sampling

The overall objective of Task 2 will be to characterize soil near the seven abandoned USTs, floor and trench drains, and sumps within the footprint of the Industrial Building. Twenty-five borings will be advanced, as shown on *Figure 4*. Prior to intrusive investigation work, boring locations will be evaluated for the potential presence of underground utilities as described in the site-specific HASP and locations will be adjusted, if appropriate.

The soil borings will be advanced by an environmental drilling subcontractor retained by TRC. Each boring will be advanced to the top of bedrock (or refusal). The soil cuttings will be returned to their original location, as prescribed in DER-10, paragraph 3.3(e)(1), unless grossly contaminated. Soil exhibiting evidence of gross contamination will be segregated and stored separately in steel 55-gallon drums for characterization. After completion, soil boring locations will be rough patched at the surface with concrete.

At each soil boring location, direct-push equipment will be used to advance 4- or 5-foot long 2-inch diameter macro-core. Soil samples will collected continuously to top of bedrock from each boring. A TRC scientist will screen each soil sample for organic vapors utilizing a photoionization detector (PID). Field observations, including evidence of contamination (i.e., odors, staining, non-aqueous phase liquid (NAPL), etc.), PID readings, and geological descriptions of each soil sample will be recorded in a field logbook.

Soil borings will be installed approximately 2 feet from the sides of USTs, floor and trench drains, and sumps located within the footprint of the Industrial Building (to the extent feasible). Boring locations may be adjusted in the field due to refusal or access restrictions.

The following is the planned methodology for selection of soil samples from each boring for laboratory analysis:

- The sample which represents the depth interval exhibiting the highest potential for contamination (based on field observations and PID readings), will be submitted for laboratory analysis. If no evidence of contamination is observed in a borehole (based on field observations and PID readings), the sample collected from directly above bedrock surface will be submitted for laboratory analysis.
- If indications of significant contamination are observed in a borehole (based on field observations and PID readings), a second sample from the first underlying apparent clean interval encountered may also be submitted for analysis.

An En Core™ sampler will be used to collect soil samples that will be submitted for VOC analysis. Other soil samples will be containerized in laboratory prepared jars. All soil samples collected will be labeled, sealed, and placed in a chilled cooler for shipment to the laboratory.

If groundwater is encountered above bedrock in a borehole, a temporary well point will be installed and a groundwater sample will be collected. Up to three groundwater samples will be collected based on evidence of contamination (i.e., odors, staining, non-aqueous phase liquid (NAPL), etc.). Dedicated 1-inch diameter polyvinyl chloride (PVC) well screen (temporary well point) will be inserted into the open borehole for sample collection. Clean, unused Teflon-lined polyethylene tubing will be lowered into the temporary PVC well and connected to a peristaltic pump (alternatively, a Geoprobe stainless steel check valve may be used). Prior to collection of a groundwater sample, purging will be performed until field parameters (i.e., turbidity, temperature, conductivity, pH, oxygen-reduction potential, salinity, and dissolved oxygen (DO)) are generally within ±10 percent for three consecutive readings, one minute apart. During purging, TRC will actively monitor the volume of water purged and the field parameter readings. Data will be recorded in the field logbook. The groundwater samples will be collected in sample bottles (pre-preserved, if appropriate), sealed, labeled, placed in iced coolers and removed from light immediately after collection. Sample bottles will be filled to the top to prevent aeration of the samples during transport.

The soil samples and groundwater samples collected from temporary well points (if any) will be analyzed for TCL VOCs + 10 TICs, TCL SVOCs + 20 TICs, TAL metals plus cyanide, PCBs and TCL pesticides. Analyses of groundwater samples for TAL metals will be performed on both field filtered and unfiltered samples. Laboratory analysis will be performed by a NYSDOH Environmental Laboratory Approval Program (ELAP) certified laboratory. The laboratory will provide Category B deliverables. Quality control samples including duplicates, trip blanks, and field blanks will also be collected. A trip blank will be placed in each sample cooler that contains groundwater samples for TCL VOC analysis and will be analyzed for TCL VOCs. Duplicates and field blanks will be collected and analyzed at a minimum frequency of one per twenty samples. Data validation will be performed and data usability summary reports (DUSRs) will be prepared. Additionally, the data will be submitted to the NYSDEC as an EQuIS Electronic Data Deliverable (EDD).

4.7 Task 3 – Sample Location Survey

The purpose of this task will be to establish the locations of the new soil borings. The locations of new borings will be surveyed and mapped by a land surveyor licensed to practice in the State of New York. A to-scale map will be prepared showing the locations and floor surface elevations in the vicinity of the new soil borings.

4.8 Task 4 – Management of Investigation Derived Waste

The soil cuttings will be returned to their original location, as prescribed in DER-10, paragraph 3.3(e)(1) unless grossly contaminated. Soil exhibiting evidence of gross contamination will be segregated and stored separately in steel 55-gallon drums for characterization and off-site treatment/disposal. Purge water and decontamination water will be contained in steel 55-gallon drums and staged on-Site, pending receipt of the laboratory results. Drums will be properly labeled and staged in the on-site truck bay. Used disposable personal protection equipment (PPE) and sampling equipment (e.g., gloves) will be placed in heavy-duty plastic bags and properly disposed off-site.

5.0 PROJECT PERSONNEL

Key project personnel and contact information are identified in *Table 3* below. Resumes of key TRC project personnel are in *Appendix D*.

Table 3
Key Personnel and Contact Information

Name	Role	Phone Number
Ralph Celone, Stewart EFI	Stewart EFI Manager	(860) 283-8213 ext. 219 cellular: (860) 449-3425
David Glass, TRC	TRC Project Director	(212) 221-7822, ext. 112
Jennifer Miranda, TRC	TRC Project Manager	(212) 221-7822, ext. 102 cellular: (646) 285-8990
Wes Lindemuth, TRC	TRC Site Manager and Health and Safety Officer	(212) 221-7822, ext. 132 cellular: (347) 738-1452
Daniel Warren, TRC	TRC Project Scientist	(212) 221-7822, ext. 138 cellular: (917) 232-9837
Daniel Schmidt, TRC	TRC Project Engineer	(212) 221-7822, ext. 139 cellular: (347) 213-0470
Patrick Narea, TRC	TRC Project Geologist	(212) 221-7822, ext. 133 cellular: (917) 589-4907
Elizabeth Denly, TRC	TRC Quality Assurance Officer	(978) 970-5600
William Poupis, Aquifer Drilling and Testing, Inc.	Drilling Services	(516) 616-6026
Levent Eskicakit, NOVA	Geophysical Services	(347) 556-7787
Aidan Scott, Test America	Laboratory Services	(646) 745-0906
Perfect Point	Land Surveying Services	(718) 474-7700

6.0 REPORTING

A comprehensive Remedial Investigation Report (RIR) will be prepared after receipt of surveying and laboratory data. The RIR will conform to the guidelines set forth in NYSDEC DER-10 Sections 3.14 (Remedial Investigation Report) and 4.4 (Remedy Selection Reporting Requirements) to the extent consistent with the scope of the investigation described above and to the extent necessary and applicable. The RIR will include the following:

- Summaries of historic data and the results of prior investigations;
- A description of the scope of the Final Supplemental Investigation;
- Descriptions of investigation methods;
- Scaled Site plan showing sampling locations;
- Field sample screening data and documentation (logs, chain-of-custody forms, etc.);
- Results of analyses of samples, including laboratory data packages, and a discussion of the findings;
- Data Usability Summary Reports (DUSRs);
- Map summarizing the results of the sampling, showing locations of and highlighting exceedances of relevant regulatory standards, criteria and guidance;
- Results of investigation of contents of USTs;
- Groundwater surface elevation contour map showing apparent flow gradients and inferred predominant local groundwater flow directions;
- Bedrock surface elevation contour map;
- Geologic cross sections;
- Human Health Exposure Assessment;
- An analysis and discussion with a supporting drawing showing the estimated overall extent of contamination, if appropriate; and,
- Evaluation of potential remedial alternatives for contaminated soil and groundwater, if appropriate.

In addition to the submission of the RIR, TRC will prepare and submit a draft Site Management Plan in accordance with the NYSDEC template. Stewart EFI has prepared a Deed Restriction that limits the use of the Site and restricts the use of groundwater and is prepared to file the Deed Restriction when directed to do so by the NYSDEC.

7.0 SCHEDULE

Presented below are estimated completion dates for key milestones associated with implementation of the Final Supplemental Investigation.

KEY MILESTONE	WORKING DAYS FROM WORK PLAN APPROVAL
NYSDEC Approval of Work Plan	0
Begin Final Supplemental Investigation Field Activities	10
Complete Final Supplemental Investigation (including laboratory analyses)	25
Submit Final Supplemental Investigation Report to NYSDEC	40

8.0 REFERENCES

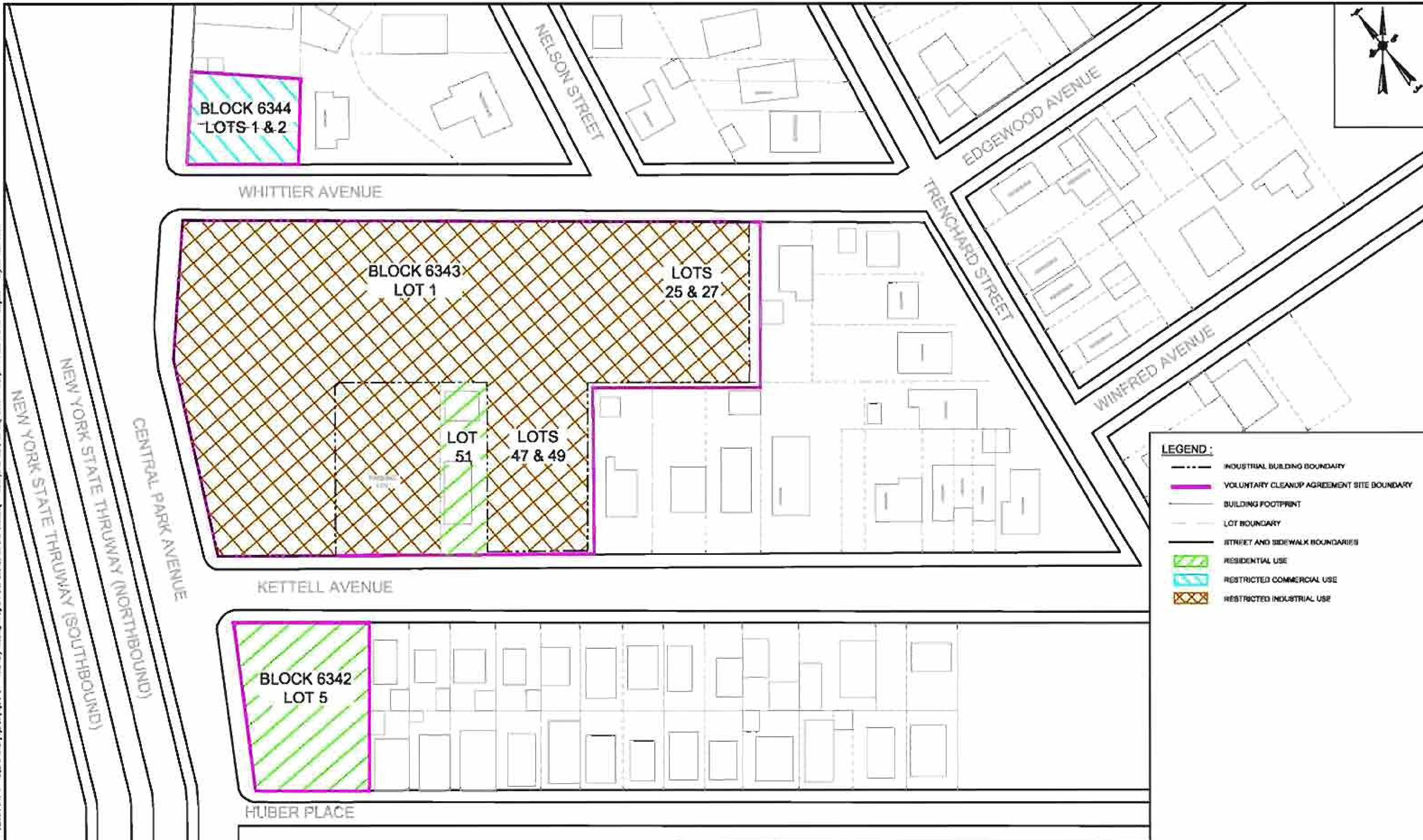
1. *Draft Phase I Environmental Site Assessment and Limited Compliance Review,* ERM, September 2002.
2. *Phase II Site Investigation*, ERM, January 2003.
3. *Voluntary Investigation Report*, ERM, September 2008.
4. *Additional Soil Vapor Sampling and Indoor Air Sampling (presented to the NYSDEC as Progress Report No. 3)*, ERM, February 2010.
5. *Project Progress Report – Activities Through March 2010,* ERM, May 19, 2010.
6. *Final Vapor Intrusion Mitigation System Completion Report*, TRC, December 2010.
7. *Response to NYSDEC Comments, 2008 Voluntary Investigation Report,* ERM, December 2009.
8. *Preliminary Supplemental Investigation Report,* TRC, May 2011.

FIGURES

DESIGNED BY: JM	FORMER STEWART STAMPING SITE VCP SITE NO. V00691-3, VCA INDEX NO. W3-1009-04-08 YONKERS, NEW YORK
DRAWN BY: HD	
CHECKED BY: DSG	
DATE: MAY 2011	SITE LOCATION MAP
SCALE: AS SHOWN	
PROJECT NUMBER: 181500.0000.0000	

TRC
1430 BROADWAY, 10TH FLOOR
NEW YORK, NEW YORK 10018
212-221-7822

FIGURE 1



REVISIONS			
NO.	DESCRIPTION	BY	DATE

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PAPER SIZE: 11" x 17"

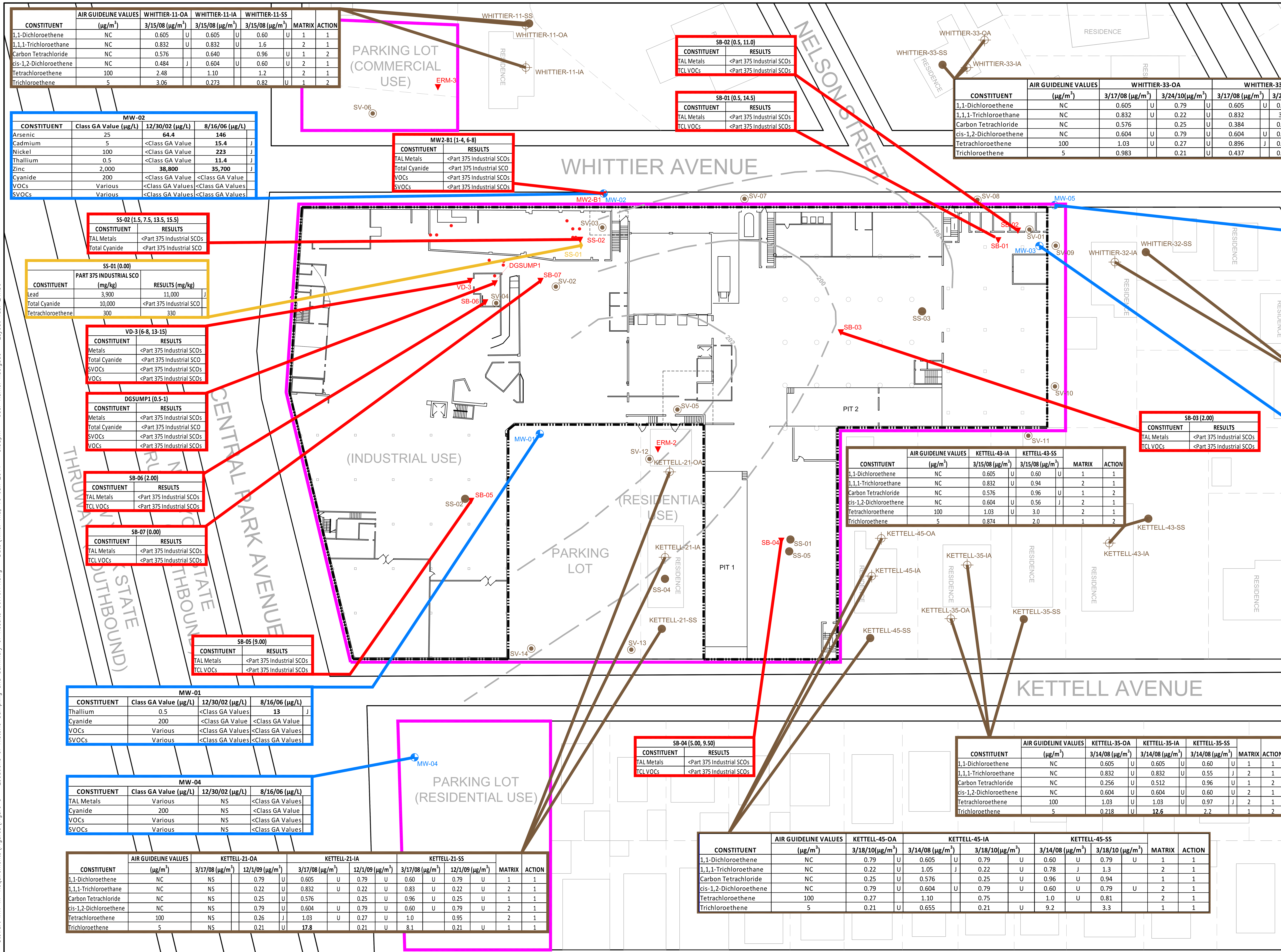
TRC
1430 BROADWAY, 10TH FLOOR
NEW YORK, NEW YORK 10018
212-221-7822

DESIGNED BY: JM
DRAWN BY: HD
CHECKED BY: DSG
DATE: MAY 2011
SCALE: AS SHOWN
PROJECT NUMBER: 151390.0000.0000

PROJECT NAME
FORMER STEWART STAMPING SITE
VCP SITE NO. V00691-3, VCA INDEX NO. W3-1006-04-06
YONKERS, NEW YORK

DRAWING TITLE
VOLUNTARY CLEANUP PROGRAM SITE BOUNDARIES AND USES

2



CONSTITUENT	AIR GUIDELINE VALUES (µg/m³)	WHITTIER-11-OA 3/15/08 (µg/m³)		WHITTIER-11-IA 3/15/08 (µg/m³)		WHITTIER-11-SS 3/15/08 (µg/m³)		MATRIX	ACTION
1,1-Dichloroethene	NC	0.605	U	0.605	U	0.60	U	1	1
1,1,1-Trichloroethane	NC	0.832	U	0.832	U	1.6		2	1
Carbon Tetrachloride	NC	0.576		0.640		0.96	U	1	2
cis-1,2-Dichloroethene	NC	0.484	J	0.604	U	0.60	U	2	1
Tetrachloroethene	100	2.48		1.10		1.2		2	1
Trichloroethene	5	3.06		0.273		0.82	U	1	2

MW-02				
CONSTITUENT	Class GA Value (µg/L)	12/30/02 (µg/L)	8/16/06 (µg/L)	
Arsenic	25	**64.4**	**146**	
Cadmium	5	<Class GA Value	**15.4**	J
Nickel	100	<Class GA Value	**223**	J
Thallium	0.5	<Class GA Value	**11.4**	J
Zinc	2,000	**38,800**	**35,700**	J
Cyanide	200	<Class GA Value	<Class GA Value	
VOCs	Various	<Class GA Values	<Class GA Values	
SVOCs	Various	<Class GA Values	<Class GA Values	

SB-02 (0.5, 11.0)	
CONSTITUENT	RESULTS
TAL Metals	<Part 375 Industrial SCOs
TCL VOCs	<Part 375 Industrial SCOs

SB-01 (0.5, 14.5)	
CONSTITUENT	RESULTS
TAL Metals	<Part 375 Industrial SCOs
TCL VOCs	<Part 375 Industrial SCOs

MW2-B1 (1-4, 6-8)	
CONSTITUENT	RESULTS
TAL Metals	<Part 375 Industrial SCOs
Total Cyanide	<Part 375 Industrial SCO
VOCs	<Part 375 Industrial SCOs
SVOCs	<Part 375 Industrial SCOs

CONSTITUENT	AIR GUIDELINE VALUES (µg/m³)	WHITTIER-33-OA 3/17/08 (µg/m³)		WHITTIER-33-OA 3/24/10(µg/m³)		WHITTIER-33-IA 3/17/08 (µg/m³)		WHITTIER-33-IA 3/24/10 (µg/m³)		WHITTIER-33-SS 3/17/08 (µg/m³)		WHITTIER-33-SS 3/24/10 (µg/m³)		MATRIX	ACTION
1,1-Dichloroethene	NC	0.605	U	0.79	U	0.605	U	0.79	U	0.6	U	0.79	U	1	1
1,1,1-Trichloroethane	NC	0.832	U	0.22	U	0.832		3.0		0.61	J	1.4		2	2
Carbon Tetrachloride	NC	0.576		0.25	U	0.384		0.25	U	0.96	U	0.25	U	1	1
cis-1,2-Dichloroethene	NC	0.604	U	0.79	U	0.604	U	0.79	U	0.56	J	0.79	U	2	1
Tetrachloroethene	100	1.03	U	0.27	U	0.896	J	0.27	U	0.69	J	0.54		2	1
Trichloroethene	5	0.983		0.21	U	0.437		0.21	U	9.4		12		1	1

MW-05				
CONSTITUENT	Class GA Value (µg/L)	12/30/02 (µg/L)	8/16/06 (µg/L)	
TAL Metals	Various	NS	<Class GA Values	
Cyanide	200	NS	<Class GA Value	
Chloroform	7	NS	**230**	
Trichloroethene	5	NS	**54**	
SVOCs	Various	NS	<Class GA Values	

SS-02 (1.5, 7.5, 13.5, 15.5)	
CONSTITUENT	RESULTS
TAL Metals	<Part 375 Industrial SCOs
Total Cyanide	<Part 375 Industrial SCO

SS-01 (0.00)			
CONSTITUENT	PART 375 INDUSTRIAL SCO (mg/kg)	RESULTS (mg/kg)	
Lead	3,900	11,000	J
Total Cyanide	10,000	<Part 375 Industrial SCO	
Tetrachloroethene	300	330	

VD-3 (6-8, 13-15)	
CONSTITUENT	RESULTS
Metals	<Part 375 Industrial SCOs
Total Cyanide	<Part 375 Industrial SCO
SVOCs	<Part 375 Industrial SCOs
VOCs	<Part 375 Industrial SCOs

DGSUMP1 (0.5-1)	
CONSTITUENT	RESULTS
Metals	<Part 375 Industrial SCOs
Total Cyanide	<Part 375 Industrial SCO
SVOCs	<Part 375 Industrial SCOs
VOCs	<Part 375 Industrial SCOs

SB-06 (2.00)	
CONSTITUENT	RESULTS
TAL Metals	<Part 375 Industrial SCOs
TCL VOCs	<Part 375 Industrial SCOs

SB-07 (0.00)	
CONSTITUENT	RESULTS
TAL Metals	<Part 375 Industrial SCOs
TCL VOCs	<Part 375 Industrial SCOs

CONSTITUENT	AIR GUIDELINE VALUES (µg/m³)	WHITTIER-32-IA 3/14/08 (µg/m³)		WHITTIER-32-SS 3/14/08 (µg/m³)		MATRIX	ACTION
1,1-Dichloroethene	NC	0.605	U	0.60	U	1	1
1,1,1-Trichloroethane	NC	0.832	U	0.83	U	2	1
Carbon Tetrachloride	NC	0.256	U	0.96	U	1	1
cis-1,2-Dichloroethene	NC	0.604	U	0.60	U	2	1
Tetrachloroethene	100	8.55		4.0		2	2
Trichloroethene	5	0.874		0.82	U	1	2

MW-03			
CONSTITUENT	Class GA Value (µg/L)	12/30/02 (µg/L)	8/16/06 (µg/L)
Chromium	50	**108**	<Class GA Value
Cyanide	200	<Class GA Values	<Class GA Value
VOCs	Various	<Class GA Values	<Class GA Values
SVOCs	Various	<Class GA Values	<Class GA Values

SB-03 (2.00)	
CONSTITUENT	RESULTS
TAL Metals	<Part 375 Industrial SCOs
TCL VOCs	<Part 375 Industrial SCOs

CONSTITUENT	AIR GUIDELINE VALUES (µg/m³)	KETTELL-43-IA 3/15/08 (µg/m³)		KETTELL-43-SS 3/15/08 (µg/m³)		MATRIX	ACTION
1,1-Dichloroethene	NC	0.605	U	0.60	U	1	1
1,1,1-Trichloroethane	NC	0.832	U	0.94		2	1
Carbon Tetrachloride	NC	0.576		0.96	U	1	2
cis-1,2-Dichloroethene	NC	0.604	U	0.56	J	2	1
Tetrachloroethene	100	1.03	U	3.0		2	1
Trichloroethene	5	0.874		2.0		1	2

SB-05 (9.00)	
CONSTITUENT	RESULTS
TAL Metals	<Part 375 Industrial SCOs
TCL VOCs	<Part 375 Industrial SCOs

MW-01				
CONSTITUENT	Class GA Value (µg/L)	12/30/02 (µg/L)	8/16/06 (µg/L)	
Thallium	0.5	<Class GA Values	**13**	J
Cyanide	200	<Class GA Value	<Class GA Value	
VOCs	Various	<Class GA Values	<Class GA Values	
SVOCs	Various	<Class GA Values	<Class GA Values	

MW-04			
CONSTITUENT	Class GA Value (µg/L)	12/30/02 (µg/L)	8/16/06 (µg/L)
TAL Metals	Various	NS	<Class GA Values
Cyanide	200	NS	<Class GA Value
VOCs	Various	NS	<Class GA Values
SVOCs	Various	NS	<Class GA Values

SB-04 (5.00, 9.50)	
CONSTITUENT	RESULTS
TAL Metals	<Part 375 Industrial SCOs
TCL VOCs	<Part 375 Industrial SCOs

CONSTITUENT	AIR GUIDELINE VALUES (µg/m³)	KETTELL-35-OA 3/14/08 (µg/m³)		KETTELL-35-IA 3/14/08 (µg/m³)		KETTELL-35-SS 3/14/08 (µg/m³)		MATRIX	ACTION
1,1-Dichloroethene	NC	0.605	U	0.605	U	0.60	U	1	1
1,1,1-Trichloroethane	NC	0.832	U	0.832	U	0.55	J	2	1
Carbon Tetrachloride	NC	0.256	U	0.512		0.96	U	1	2
cis-1,2-Dichloroethene	NC	0.604	U	0.604	U	0.60	U	2	1
Tetrachloroethene	100	1.03	U	1.03	U	0.97	J	2	1
Trichloroethene	5	0.218	U	**12.6**		2.2		1	2

CONSTITUENT	AIR GUIDELINE VALUES (µg/m³)	KETTELL-21-OA 3/17/08 (µg/m³)		KETTELL-21-OA 12/1/09 (µg/m³)		KETTELL-21-IA 3/17/08 (µg/m³)		KETTELL-21-IA 12/1/09 (µg/m³)		KETTELL-21-SS 3/17/08 (µg/m³)		KETTELL-21-SS 12/1/09 (µg/m³)		MATRIX	ACTION
1,1-Dichloroethene	NC	NS		0.79	U	0.605	U	0.79	U	0.60	U	0.79	U	1	1
1,1,1-Trichloroethane	NC	NS		0.22	U	0.832	U	0.22	U	0.83	U	0.22	U	2	1
Carbon Tetrachloride	NC	NS		0.25	U	0.576		0.25	U	0.96	U	0.25	U	1	1
cis-1,2-Dichloroethene	NC	NS		0.79	U	0.604	U	0.79	U	0.60	U	0.79	U	2	1
Tetrachloroethene	100	NS		0.26	J	1.03	U	0.27	U	1.0		0.95		2	1
Trichloroethene	5	NS		0.21	U	**17.8**		0.21	U	8.1		0.21	U	1	1

CONSTITUENT	AIR GUIDELINE VALUES (µg/m³)	KETTELL-45-OA 3/18/10(µg/m³)		KETTELL-45-IA 3/14/08 (µg/m³)		KETTELL-45-IA 3/18/10(µg/m³)		KETTELL-45-SS 3/14/08 (µg/m³)		KETTELL-45-SS 3/18/10 (µg/m³)		MATRIX	ACTION
1,1-Dichloroethene	NC	0.79	U	0.605	U	0.79	U	0.60	U	0.79	U	1	1
1,1,1-Trichloroethane	NC	0.22	U	1.05	J	0.22	U	0.78	J	1.3		2	1
Carbon Tetrachloride	NC	0.25	U	0.576		0.25	U	0.96	U	0.94		1	1
cis-1,2-Dichloroethene	NC	0.79	U	0.604	U	0.79	U	0.60	U	0.79	U	2	1
Tetrachloroethene	100	0.27		1.10		0.75		1.0	U	0.81		2	1
Trichloroethene	5	0.21	U	0.655		0.21	U	9.2		3.3		1	1

LEGEND (SYMBOLS NOT TO SCALE):

- INDUSTRIAL BUILDING BOUNDARY
- VOLUNTARY CLEANUP AGREEMENT SITE BOUNDARY
- SOIL SAMPLING LOCATION
- SOIL BORING LOCATION WITH NO RECOVERY
- SLUDGE SAMPLING LOCATION
- GROUNDWATER MONITORING WELL
- "SUB-SLAB" SOIL GAS SAMPLE (RESULTS FOR INDUSTRIAL BUILDING NOT SHOWN)
- SOIL VAPOR SAMPLE (RESULTS NOT SHOWN)
- AIR SAMPLE
- 200 GROUNDWATER SURFACE ELEVATION CONTOUR (FEET) ERM 2008
- BUILDING FOOTPRINT
- LOT BOUNDARY
- STREET AND SIDEWALK BOUNDARIES

NOTES:

1. LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. **BOLD** VALUES EXCEED THE AIR GUIDELINE VALUES.
3. SAMPLE RESULTS QUALIFIERS:
   U - COMPOUND NOT DETECTED
   J - ESTIMATED VALUE
   NC - NO CRITERIA
   NS - NOT SAMPLED
4. EXCEEDENCES OF NATURALLY OCCURRING IRON, MAGNESIUM, MANGANESE AND SODIUM ARE NOT SHOWN FOR GROUNDWATER RESULTS.
5. NYSDOH SOIL VAPOR/INDOOR AIR MATRIX ACTION # (IN CERTAIN INSTANCES DETECTION LIMITS ARE ABOVE CRITERIA. MOST RECENT RESULTS USED.):
   1 - NO FURTHER ACTION
   2 - TAKE REASONABLE AND PRACTICAL ACTIONS TO IDENTIFY SOURCE(S) AND REDUCE EXPOSURES
   3 - MONITOR
   4 - MITIGATE
6. LOCATIONS AND DIMENSIONS OF PHYSICAL FEATURES ARE APPROXIMATE.

REVISIONS			
NO.	DESCRIPTION	BY	DATE

0 30' 60'
SCALE: 1" = 30'
PAPER SIZE: 24" x 36"

TRC
1430 BROADWAY, 10TH FLOOR
NEW YORK, NEW YORK 10018
212-221-7822

DESIGNED BY: JM
DRAWN BY: HD
CHECKED BY: DSG
DATE: JUNE 2011
SCALE: AS SHOWN
PROJECT NUMBER: 181590.0000.0000

PROJECT NAME:
FORMER STEWART STAMPING SITE
VCP SITE NO. V00691-3, VCA INDEX NO. W3-1005-04-06
YONKERS, NEW YORK

DRAWING TITLE:
LOCATIONS OF HISTORIC SAMPLING AND SUMMARY OF RESULTS

FIGURE 3

Path\Name: I:\Projects\181590 – Stewart Inv. WP Requirements\Figures\Figure 3 – Locations of Historic Sampling and Summary of Results 06.16.11.dwg – Date\Time: Thu, 16 Jun 2011 – 3:58pm – User Name: hdelgado – Layout Tab: 24X36

LEGEND (SYMBOLS NOT TO SCALE):

- INDUSTRIAL BUILDING BOUNDARY
- BUILDING FOOTPRINT
- LOT BOUNDARY
- STREET AND SIDEWALK BOUNDARIES
- FLOOR DRAIN PIPING UNDER FLOOR SLAB
- TRENCH DRAIN
- PIPING TO SEWER
- UNDERGROUND STORAGE TANK AND ASSOCIATED PIPING
- ABOVEGROUND STORAGE TANK
- FLOOR DRAIN
- SUMP
- SEWER MANHOLE
- TANK FILL OR VENT
- SANITARY VENT LINE
- TRC-SBX PROPOSED SOIL BORING LOCATION AND IDENTIFICATION NUMBER

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION PETROLEUM BULK STORAGE REGISTRATION INFORMATION (PBS No. 3-012564)

Tank No.	Year Installed	Tank Type	Historic Contents*	Current Contents**	Tank Capacity	Tank Status
1	1965	UST	Fuel Oil	Unknown	5,000-gal	Closed
2	1978	UST	Water Soluble Cutting Oil	Unknown	5,000-gal	Closed
3	1978	UST	Water Soluble Cutting Oil	Unknown	3,000-gal	Closed
4	1994	AST	Fuel Oil	Fuel Oil	5,000-gal	In Service
5	1994	AST	Fuel Oil	Fuel Oil	5,000-gal	In Service
6	1978	UST	Water Soluble Cutting Oil	Concrete	3,000-gal	Closed
7	1978	UST	Water	Concrete	8,000-gal	Closed
8	1978	UST	Water	Concrete	8,000-gal	Closed
9	NR	UST	Fuel Oil	Concrete	3,000-gal	Closed

Note: * Information regarding contents of USTs provided by Stewart EFI.
** Information obtained from field inspection.

REVISIONS			
NO.	DESCRIPTION	BY	DATE

0 20 40 FT.
SCALE: 1" = 20'-0"
PAPER SIZE: 24" x 36"

TRC
1430 BROADWAY, 10TH FLOOR
NEW YORK, NEW YORK 10018
212-221-7822

DESIGNED BY: JM
DRAWN BY: HD
CHECKED BY: DSG
DATE: JUNE 2011
SCALE: AS SHOWN
PROJECT NUMBER: 181590.0000.0000

PROJECT NAME:
FORMER STEWART STAMPING SITE
VCP SITE NO. V00691-3, VCA INDEX NO. W3-1005-04-06
YONKERS, NEW YORK

DRAWING TITLE:
PROPOSED SOIL BORING LOCATIONS

FIGURE
4

Path\Name: I:\Projects\181590 – Stewart Inv. WP Requirements\Figures\Figure 4 – Proposed Soil Boring Locations 06.16.11.dwg – Date\Time: Thu, 16 Jun 2011 – 1:30pm – User Name: hdelgado – Layout Tab: 24X36

APPENDIX A

Preliminary Supplemental Investigation Report

1430 Broadway
10th Floor
New York, NY 10018

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June 10, 2011

Ms. Janet E. Brown, P.E.
Project Manager
NYSDEC Region 3
Division of Environmental Remediation
21 South Putt Corners Road
New Paltz, New York 12561

Re: **Preliminary Supplemental Investigation Report (Addendum 1)**
Former Stewart Stamping Site
630 Central Park Avenue
Yonkers, New York
VCP Site No. V00691-3, VCA Index No. W3-1005-04-06
TRC Project No. 181590

Dear Ms. Brown:

In response to your conditional acceptance letter dated June 9, 2011, please accept this letter as notification that Stewart EFI New York, LLC, accepts the conditions. Attached is the revised "Page 1" of the Preliminary Supplemental Investigation Report with the corrected tax parcels and associated addresses and the certification of the Preliminary Supplemental Investigation Report.

In addition, in accordance with your letter of June 9, 2011:

- The monitoring well purge and decontamination water will be discharge to the City of Yonkers sanitary sewer in accordance with Stewart's wastewater discharge permit No. 5449 or transported off-site to an appropriate disposal facility, depending on the results of analysis of the wastewater.
- The analytical data collected under this Preliminary Supplemental Investigation will be fully validated and data usability summary reports (DUSRs) will be submitted as an addendum to the report once the validation is complete. Also at that time, the data will be submitted electronically in the EQuIS format.
- Cleaning activities performed in the facility (e.g., removal of oil and sludge from sumps, floor drains, etc.) will be documented in the comprehensive Final Investigation Report.
- All of the Preliminary Supplemental Investigation data will be included in the forthcoming comprehensive Final Investigation Report.

Please do not hesitate to contact me at (212) 221-7822 x 102 if you have any questions.

Very truly yours,
TRC Engineers, Inc.

Jennifer Miranda

Jennifer Miranda
Senior Project Manager

cc: A. Perretta, NYSDOH
D. Stokes, Stewart EFI
R. Celone, Stewart EFI
D. Mettler, Hiscock & Barclay
D. Glass, TRC

Attachments:
Revised "Page 1" of the Preliminary Supplemental Investigation Report
Certification of the Preliminary Supplemental Investigation Report

TRC
1430 Broadway
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New York, NY 10018

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May 13, 2011

Ms. Janet E. Brown, P.E.
Project Manager
NYSDEC Region 3
Division of Environmental Remediation
21 South Putt Corners Road
New Paltz, New York 12561

Re: **Preliminary Supplemental Investigation Report**
Former Stewart Stamping Site
630 Central Park Avenue
Yonkers, New York
VCP Site No. V00691-3, VCA Index No. W3-1005-04-06
TRC Project No. 181590

Dear Ms. Brown:

In accordance with the Preliminary Supplemental Investigation Work Plan (Work Plan) dated April 1, 2011, the New York State Department of Environmental Conservation (NYSDEC) approval letter dated April 5, 2011, and at the request of Stewart EFI New York, LLC (Stewart EFI), TRC Engineers, Inc. (TRC) has completed a Preliminary Supplemental Investigation at the Former Stewart Stamping Site located at 630 Central Park Avenue, Yonkers, New York (hereafter referred to as the "Site"). *Figure 1* is a Site location map. The legal descriptions for the Voluntary Cleanup Program (VCP) Site, associated addresses, and land uses are summarized below.

Table 1
Site Legal Descriptions, Addresses, and Land Uses

Section	Block	Lot	Address	City of Yonkers Zoning Designation	6 NYCRR Part 375-1.8(g)(2) Restricted Use
6	6342	5	10 Kettell Avenue	BA - General Business and Apartment Houses, High Density	Residential Use
	6343	1	630 Central Park Avenue	I - Industry, Residence Excluded	Industrial Use
		25 and 27	34 Whittier Avenue	I - Industry, Residence Excluded	Industrial Use
		47 and 49	27 Kettell Avenue	I - Industry, Residence Excluded	Industrial Use
		51	21 Kettell Avenue	M - Apartment Houses, Medium Density	Residential Use
	6344	1 and 2	640 and 642 Central Park Avenue	BR - Restricted Business, Residences Excluded	Commercial Use

Certification

I, David S. Glass, certify that I am currently a New York State registered professional engineer and that this Preliminary Supplemental Investigation Report was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10) and that all activities were performed in full accordance with the DER-10 approved work plan and any DER-approved modifications.

David S. Glass, P.E.	June 10, 2011
NYS Professional Engineer No. 68884-1	Date

New York State Department of Environmental Conservation
Division of Environmental Remediation, Region 3
21 South Putt Corners Road, New Paltz, New York 12561-1696
Phone: (845) 256-3000 • **Fax:** (845) 255-3414
Website: www.dec.ny.gov

Joe Martens
Commissioner

Transmitted Via: Email

June 9, 2011

Ms. Jennifer Miranda
TRC
1430 Broadway, 10th Floor
New York, New York 10018

Re: Stewart EFI Site, NYSDEC Site No.: V00691
May 13, 2011 Preliminary Supplemental Investigation Report

Dear Ms. Miranda:

The New York State Departments of Environmental Conservation and Health (NYSDEC/NYSDOH) have reviewed the above-referenced report and provide a conditional acceptance based on the following:

- The monitoring well purge and decon water water will be disposed under the facility's existing SPDES permit or trucked off-site to an appropriate disposal facility depending on the analytical results.
- The analytical data collected under this Preliminary Supplemental Investigation will be fully validated and a data usability summary report (DUSR) submitted as an addendum to the above-referenced report once the validation is complete. The data will then be submitted in the Equis format.
- TRC will provide a revised page 1 containing the table of tax parcels and associated addresses that comprise the site per our recent communications.
- TRC will provide the appropriate certification for the Preliminary Supplemental Investigation Report consistent with DER-10 Section 1.5(b)2/Table 1.5.
- Any cleaning activities performed in the facility (e.g., removal of oil and sludge from sumps, floor drains, etc.) shall be documented in the comprehensive Remedial Investigation Report (RIR).

Please indicate your acceptance of the above conditions and provide responses/requested information as it becomes available. This conditional acceptance letter and your associated response(s) shall be considered addenda to the May 13, 2011 Preliminary Supplemental Investigation Report. All of the Preliminary Supplemental Investigation data shall be included in the forthcoming comprehensive RIR.

Please feel free to contact me at 845-256-3826 or jebrown@gw.dec.state.ny.us with any questions.

Sincerely,

Janet E Brown

Janet E. Brown, P.E.
Project Manager

ec: D. Stokes, Stewart EFI
R. Celone, Stewart EFI
D. Mettler, Esq, Hiscock & Barclay
D. Glass, TRC
R. Rusinko, Esq., NYSDEC
E. Moore, NYSDEC
M. Ryan, NYSDEC
A. Perretta, NYSDOH

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May 13, 2011

Janet E. Brown, P.E.
Project Manager
NYSDEC Region 3
Division of Environmental Remediation
21 South Putt Corners Road
New Paltz, New York 12561

Re: **Preliminary Supplemental Investigation Report**
Former Stewart Stamping Site
630 Central Park Avenue
Yonkers, New York
VCP Site No. V00691-3, VCA Index No. W3-1005-04-06
TRC Project No. 181590

Dear Ms. Brown:

In accordance with the Preliminary Supplemental Investigation Work Plan (Work Plan) dated April 1, 2011, the New York State Department of Environmental Conservation (NYSDEC) approval letter dated April 5, 2011, and at the request of Stewart EFI New York, LLC (Stewart EFI), TRC Engineers, Inc. (TRC) has completed a Preliminary Supplemental Investigation at the Former Stewart Stamping Site located at 630 Central Park Avenue, Yonkers, New York (hereafter referred to as the "Site"). *Figure 1* is a Site location map. The legal descriptions for the Voluntary Cleanup Program (VCP) Site, associated addresses, and land uses are summarized below.

Table 1
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Section	Block	Lot	Address	City of Yonkers Zoning Designation	6 NYCRR Part 375-1.8(g)(2) Restricted Use
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		51	21 Kettell Avenue	M - Apartment Houses, Medium Density	Residential Use
	6344	1 and 2	640 and 642 Central Park Avenue	BR - Restricted Business, Residences Excluded	Commercial Use

The Site has been assigned NYSDEC VCP Site No. V00691-3, and Voluntary Cleanup Agreement Index No. W3-1005-04-06. *Figure 2* shows the VCP Site boundaries and uses. The purpose of the Preliminary Supplemental Investigation was to collect information regarding existing conditions necessary to prepare a comprehensive Final, Supplemental Investigation Work Plan for the Site.

The Preliminary Supplemental Investigation activities were performed in accordance with TRC's Preliminary Supplemental Investigation Work Plan dated April 1, 2011 (approved by the NYSDEC April 5, 2011), the site-specific Health and Safety Plan (HASP) dated April 2011, and the Quality Assurance Project Plan (QAPP) dated April 11, 2011.

Description of Preliminary Supplemental Investigation Field Activities

The Preliminary Supplemental Investigation field activities were completed on April 13 to 15, 18, 19, and 21, 2011, and consisted of the following:

- Geophysical surveys to identify the sub-slab portions of the former process wastewater drainage system, confirm the locations and identify the dimensions of underground storage tanks (USTs) inside the Industrial Building, and verify that the proposed soil boring locations were clear of subsurface utilities and structures;
- Visual surveys and mapping of the former process wastewater drainage system;
- Advancement of six soil borings and continuous soil sampling to a maximum depth of 17 feet below ground surface (bgs) and laboratory analysis of 13 discrete soil samples;
- Gauging of the five existing groundwater monitoring wells and collection and analysis of one groundwater sample from each monitoring well; and
- A survey, conducted by a land surveyor licensed to practice in the State of New York, to locate and map soil boring and monitoring well locations and elevations.

Geophysical Survey

Geophysical survey activities were performed on April 13 to 15, 2011, by NOVA Geophysical Services of Forest Hills, New York to identify the sub-slab portions of the former process wastewater drainage system (i.e., sub-slab drainage piping) and discharge locations, identify the locations and approximate dimensions of USTs and associated piping inside the Industrial Building, and verify the proposed soil boring locations were clear of subsurface utilities and structures.

The geophysical survey equipment consisted of a CSUL Pipe and Cable Locator (a magnetic detector), a Ditch-Witch™ utility locator, electromagnetic detector (Geonics EM61), MALA™ and NOGGIN's™ 250 kHz and 500 kHz ground-penetrating radar (GPR) units, and a Conquest Concrete Imaging GPR with 350 to 750 MHz antenna unit.

Surveyed areas included the Industrial Building interior ground floor level and basement areas, sidewalk areas adjacent to the Site, and the areas in and around the sample locations shown on *Figure 4*. Sample locations were established and confirmed to be located in areas that do not conflict with subsurface structures or utilities. The geophysical survey report is presented as *Appendix A.*

Visual Survey and Mapping of the Former Process Wastewater Drainage System

Visual survey and mapping activities were performed on April 13 to 15, 2011. The locations of former process wastewater sumps, pits, floor and trench drains, and associated sub-slab drainage piping in the Industrial Building were mapped, along with former process wastewater discharge locations.

The locations of sumps, pits, and trench and floor drains were visually identified and located on a floor plan using field measurements. The approximate dimensions (lengths, widths and depths) of sumps and pits were recorded. Sub-slab drainage piping was located using the geophysical techniques described above, and the piping was field located and added to field sketches for mapping purposes.

Soil Sampling on Residential and Commercial Lots

Soil sampling was conducted on April 18 and 19, 2011 to assess surface and subsurface conditions on the two residential lots (Block 6342, Lot 5 and Block 6343, Lot 51) and the commercial lot (Block 6344, Lots 1 and 2) (refer to *Figure 4*). Six soil borings (TRC-SB1, TRC-SB2, TRC-SB3, TRC-SB4, TRC-SB5, and TRC-SB6) were completed and 13 samples were submitted for laboratory analysis. Additionally, one duplicate sample was collected and submitted for laboratory analysis to evaluate sampling precision.

Aquifer Drilling and Testing, Inc. (ADT) was retained as a subcontractor by TRC for drilling services. Direct push-drilling methods, utilizing a track mounted direct drive rig, were used to retrieve soil samples from the six boring locations. Soil samples were collected continuously from the ground surface to the maximum boring depth of 17 feet bgs in 5-foot long, 2-inch diameter macro-core samplers lined with acetate sleeves. A description of the soils retained in each sample core was logged by TRC's on-Site environmental scientist and the soils were screened in the field for the presence of volatile organic compounds (VOCs) with a photoionization detector (PID). The soil boring logs are presented in *Appendix C.*

In general, the following methodology was used for selecting soil sample intervals for laboratory analyses from each boring:

- One soil sample from the 0 to 2-inch interval beneath the asphalt pavement and sub-base material or the vegetative root zone was collected and submitted for laboratory analysis.
- A second soil sample which was representative of the depth interval exhibiting the highest potential for contamination (based on field observations and PID readings) was submitted for laboratory analysis. If no evidence of contamination was observed in a borehole (based on field observations and PID readings), the sample collected from the depth interval immediately above bedrock surface was submitted for laboratory analysis.
- If indications of significant contamination were observed in a borehole, a third sample from the first underlying apparent clean interval encountered was also submitted for analysis.

There was no evidence of potential contamination observed in the soil borings with the exception of TRC-SB3. A PID reading of 5.7 parts per million (ppm) was recorded in the sample collected 2 to 4 feet bgs from TRC-SB3. There was no other evidence of potential contamination observed in the sample. In general, brown, black and gray sand, silt and clay with gravel, concrete, red brick, ash, wood fragments and weathered bedrock were encountered in the soil borings. Groundwater was not encountered in the soil borings. Bedrock and/or refusal was encountered at depths ranging from approximately 12 to 17 feet bgs.

Soil samples were collected and containerized in accordance with NYSDEC/United States Environmental Protection Agency (USEPA) protocols in laboratory supplied containers, labeled, sealed, and placed in a chilled cooler for shipment to Test America of Edison, New Jersey a New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP) certified laboratory. An En Core™ sampler was used to collect soil samples submitted for Target Compound List (TCL) VOC +10 Tentatively Identified Compounds (TICs) analysis. Standard chain-of-custody procedures were followed.

The 13 discrete soil samples and one duplicate soil sample submitted for laboratory analysis were analyzed for TCL VOCs +10 TICs, TCL semivolatile organic compounds (SVOCs) +20 TICs, TAL metals plus cyanide, TCL polychlorinated biphenyls (PCBs) and TCL pesticides. In addition, one sample [TRC-SB3(2-4")] was submitted for matrix spike/matrix spike duplicate (MS/MSD) analysis. Finally, two soil samples [TRC-SB3(2-4") and TRC-SB3(4-6')] were analyzed for hexavalent chromium. Data validation was performed and Data Usability Summary Reports (DUSR) were prepared. The DUSRs are included in *Appendix G*. The laboratory reports, included in *Appendix F*, are Category B data deliverables. The data was also submitted in the EQuIS™ electronic data deliverable format.

After completion of each boring, the soil cuttings were returned to their original location, as prescribed in DER-10, paragraph 3.3(e)(1), any remaining voids were backfilled with sand and hydrated bentonite, and the ground surface was restored with concrete or asphalt cold patch, where applicable. Used disposable personal protection equipment (PPE) and sampling equipment (e.g., gloves, tubing, tape, etc.) were placed in heavy-duty plastic bags and disposed of properly off-site.

Gauging and Sampling of Existing Groundwater Monitoring Wells

The five existing Site groundwater monitoring wells were gauged and sampled on April 15, 18 and 19, 2011. The primary purposes of the gauging and sampling were to confirm groundwater surface elevation gradients and characterize current groundwater quality conditions. *Figure 4* shows the locations of the five existing groundwater monitoring wells. The identification numbers of the five groundwater monitoring wells gauged and sampled are: MW-1, MW-2, MW-3, MW-4, and MW-5.

Upon opening each monitoring well, the concentration of VOCs in the headspace was measured using a PID and each well was gauged with an electronic oil/water interface probe. The data was recorded in a field logbook.

The groundwater samples were collected following USEPA "low flow" sampling procedures. Groundwater monitoring wells were purged using a stainless steel bladder pump lined with a

Teflon bladder, operated by compressed carbon dioxide, and disposable Teflon lined tubing. Groundwater quality field parameters (i.e., turbidity, temperature, conductivity, pH, oxygen-reduction potential, salinity, and dissolved oxygen (DO)) were monitored during well purging using a Horiba U22 water quality meter equipped with a flow-through cell. The flow rate was maintained at approximately 200 milliliters per minute (ml/min). Each groundwater monitoring well was purged until three consecutive stable field parameter readings (at one minute intervals) for the field parameters were recorded.

Water level measurements were recorded during the purging process to confirm that drawdown did not exceed the USEPA-recommended maximum of 0.3 feet, when possible. Groundwater sampling logs are included in *Appendix B*.

Samples of groundwater were collected immediately after purging in accordance with USEPA guidelines. Groundwater was allowed to flow directly from the Teflon-lined tubing into pre-cleaned laboratory-supplied sample glassware. Three trip blanks, one duplicate groundwater sample (duplicate of MW-1), and one equipment field rinsate blank were collected for quality control purposes.

PID organic vapor readings 0.1 ppm above background were recorded in the headspaces of wells MW-1, MW-2, and MW-4. There were no visual or olfactory indications of contamination observed in any of the groundwater samples collected. Non-aqueous phase liquid (NAPL) was not encountered in any of the groundwater monitoring wells during gauging with an electronic oil/water interface probe or sampling.

The samples were containerized in accordance with NYSDEC/ USEPA protocols. Each container was properly labeled, preserved, and placed in a cooler for transport via courier to Test America of Edison, New Jersey, which is a NYSDOH ELAP certified laboratory. Standard chain-of-custody procedures were followed.

The groundwater samples were analyzed for TCL VOCs+10 TICs, TCL SVOCs +20 TICs, field filtered and unfiltered (total and dissolved) Target Analyte List (TAL) metals plus cyanide (unfiltered), TCL PCBs and TCL pesticides. One duplicate groundwater sample (duplicate of MW-1) and one field equipment rinsate blank were collected and analyzed for TCL VOCs +10 TICs, TCL SVOCs +20 TICs, unfiltered TAL metals plus cyanide, TCL PCBs and TCL pesticides. In addition, one sample (MW-2) was submitted for MS/MSD analysis. Finally, three trip blank samples were submitted for analysis of TCL VOCs +10 TICs. Data validation was performed and DUSRs were prepared. The DUSRs are included in *Appendix G*. The laboratory reports, included in *Appendix F,* are Category B data deliverables. The data was also submitted in the EQuIS™ electronic data deliverable format.

Purge water and decontamination water from the groundwater sampling were contained in properly labeled steel 55-gallon drums and staged in the on-Site truck bay. Used disposable PPE and sampling equipment (e.g., gloves, tubing, tape, etc.) were placed in heavy-duty plastic bags and disposed of properly off-site.

Boring and Monitoring Well Survey

Surveying activities were performed on April 21, 2011, by Perfect Point Land Surveying of Brooklyn, New York to verify the locations of the existing monitoring wells and soil boring sample locations. The elevation of the top of each monitoring well casing or bottom of stick-up was surveyed. Included as *Appendix E* is a to-scale map showing the locations and elevations of the tops of casings of the monitoring wells and soil boring locations.

Preliminary Supplemental Investigation Findings

This section presents a discussion of the findings of the Preliminary Supplemental Investigation. Tabulated results of laboratory analyses are presented in the Tables attachment of this report. Laboratory quality control (QC) issues for specific media, if any, are discussed in the appropriate sections below. Based on a review of the data, the data quality is acceptable for its intended use. The complete laboratory analytical data packages are included in *Appendix F*. Photographs of the Preliminary Supplemental Investigation field activities are included in *Appendix D*.

Applicable Regulatory Standards

The established NYSDEC regulatory standards and guidelines used to evaluate the results of the soil sampling and groundwater sampling are identified below.

Soil Cleanup Objectives (SCOs)

The results of analyses of the soil samples were compared to the New York State Unrestricted Use Soil Cleanup Objectives (SCOs), Protection of Groundwater SCOs, and either the Residential Use SCOs or the Commercial Use SCOs in 6 NYCRR 375-6 (Remedial Program Soil Cleanup Objectives). The current land uses for the Site are shown on *Figure 2*. Based on the current residential, restricted commercial, and restricted industrial land uses and planned future uses of the Site, presented below is a summary of the land use categories which apply to the portions of the Site where samples were collected during the Preliminary Supplemental Investigation.

Block 6342, Lot 5 and Block 6343, Lot 51 – Residential Use:

The Residential Use category allows a site to be used for any use other than raising livestock or producing animal products for human consumption. Engineering controls for soil vapor intrusion and restrictions on the use of groundwater are allowed, but (excluding certain other exceptions) no other institutional or engineering controls are allowed. Residential Use is the land use category intended for single-family housing.

Block 6344, Lots 1 and 2 – Commercial Use:

The Commercial Use category allows a site to be used by businesses with the primary purpose of buying, selling or trading merchandise or services. The Commercial Use category allows passive recreational uses with limited potential for soil contact.

The SCOs are applicable to remedial program activities (e.g., the Voluntary Cleanup Program) under NYSDEC oversight. The soil data were also compared to the Unrestricted Use SCOs and Protection of Groundwater SCOs for informational purposes only.

Groundwater Quality Standards and Guidance Values

The results of the analyses of groundwater samples were compared to New York State Class GA Groundwater Standards and Guidance Values (Class GA Values), in the NYSDEC Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1, “Ambient Water Quality Standards and Guidance Values and Effluent Limitations.” Ambient water quality standards are enforceable regulatory limits. Where ambient water quality standards do not exist, ambient water quality guidance values were used to evaluate the results.

Geophysical Survey

Residential and Commercial Lots

The results of the geophysical survey on the residential and commercial lots revealed evidence of minor scattered anomalies. The scattered anomalies are likely representative of the characteristics of unconsolidated soils located throughout these portions of the Site, former building remnants (e.g., foundations, etc.) and utilities. None of the anomalies on the residential and commercial lots were indicative of the presence of an UST. There was no evidence of utilities or subsurface structures, which would interfere with the boring locations, identified during the geophysical survey. The geophysical survey report is in *Appendix A*.

Industrial Building

The geophysical survey identified the locations of former drainage system sub-slab piping and discharge locations and identified the locations and approximate dimensions of the USTs and associated piping beneath the floor slabs of the Industrial Building. A total of seven USTs and associated piping were identified in the Industrial Building. The survey indicated that the floor and trench drains and sub-slab piping drain to the sanitary sewer and sumps. The results of the geophysical survey are shown on *Figure 3*.

Visual Survey and Mapping of the Former Process Wastewater Drainage System

The former process wastewater drainage system sumps, pits, trench and floor drains, and discharge locations in the Industrial Building were identified and mapped, as shown on *Figure 4*. As mentioned above, floor and trench drains and piping drain to the sanitary sewer and sumps. The survey confirmed that the sumps located in the building do not have outlets or drains, with the exception of one sump in the former Maintenance Equipment area which is connected to the sanitary sewer. When the Industrial Building was active, process wastewater, which accumulated in the sumps, was removed via sump pumps which discharged to overhead piping. The overhead piping conveyed the wastewater to the wastewater pretreatment system. The results of the visual survey are shown on *Figure 3*.

Oil was identified in one floor drain, one house trap, and one sump. In addition, a sludge-like material was found in an approximately four feet wide and four feet deep pit in the former Plating Room. The sump pit contained approximately three feet of sludge material. TRC collected a sample (TRC-Sludge-1) of the sludge for waste characterization analysis. The results of the analyses of the sludge sample are presented in *Appendix F*. Chlorinated and non-chlorinated VOCs, the PCB Aroclor 1262, several metals, and cyanide were detected in the sludge sample. Stewart EFI has arranged for removal and off-site disposal of the oil and sludge, and cleaning of the floor drain, house trap, sump and the pit in the former Plating Room.

Soil Sampling

Summaries of the results of the analyses of the soil samples are presented in *Tables 2* through *6*. The complete laboratory analytical data report and DUSRs are presented in *Appendices F* and *G*. A summary of the results of the analyses of the soil samples is also shown on *Figure 4*. A review of the results of the analyses of the soil samples is presented below.

Volatile Organic Compounds (VOCs) in Soil

A total of 13 soil samples and one duplicate soil sample were analyzed for TCL VOCs +10 TICs. The analytical data is summarized in *Table 2*. There were no VOCs detected at concentrations greater than the applicable Residential Use SCOs or Commercial Use SCOs.

Semivolatile Organic Compounds (SVOCs) in Soil

A total of 13 soil samples and one duplicate soil sample were analyzed for TCL SVOCs +20 TICs. The analytical data is summarized in *Table 3*. There were no SVOCs detected at concentrations greater than the applicable Residential Use SCOs or Commercial Use SCOs.

Metals and Cyanide in Soil

A total of 13 soil samples and one duplicate soil sample were analyzed for TAL metals and cyanide. The analytical data is summarized in *Table 4.* Cyanide was not detected above the Residential Use SCO. One metal was detected at a concentration above the Residential Use SCO. Mercury was detected at a concentration of 1.7 milligram per kilogram (mg/kg) in the soil sample collected 2 to 4 inches bgs from boring TRC-SB3 on Block 6434, Lot 51. The Residential Use SCO for mercury is 0.81 mg/kg.

The mercury detected above the Residential Use SCO can be attributed to the characteristics of urban fill material. Fill material at the Site contains concrete, brick, ash, and wood fragments.

Two samples [TRC-SB3(2-4") and TRC-SB3(4-6')] were analyzed for hexavalent chromium because total chromium was detected at concentrations slightly above the Residential Use SCO in these samples. Hexavalent chromium was not detected above the reporting limit or the applicable Residential Use SCO in the samples.

Polychlorinated Biphenyls (PCBs) in Soil

A total of 13 soil samples and one duplicate soil sample were analyzed for TCL PCBs. The analytical data is summarized in *Table 5*. There were no PCBs detected at concentrations greater than the applicable Residential Use SCOs or Commercial Use SCOs.

Pesticides in Soil

A total of 13 soil samples and one duplicate soil sample were analyzed for TCL pesticides. The analytical data is summarized in *Table 6*. There were no pesticides detected at concentrations greater than the applicable Residential Use SCOs or Commercial Use SCOs.

Groundwater Surface Elevation Measurements

Depth to groundwater measurements were collected on April 19, 2011 by gauging each of the five monitoring wells with an electronic oil/water interface probe. The depth to groundwater measurements were converted to elevations using the survey data provided by Perfect Point Land Surveying. The groundwater surface elevation at each monitoring well is shown on *Figure 4*. Additionally, *Figure 4* shows inferred groundwater surface elevation contours. Generally, the groundwater follows the local topography and flows outward radially towards the north, east and south from near the center of the Site.

Groundwater Sampling

Summaries of the results of the analyses of the groundwater samples are presented in *Tables 7 through 11*. A summary of the results of the analyses of the groundwater samples is also shown on *Figure 4*. The complete laboratory analytical data reports are presented in *Appendix F*. A review of the results of the analyses of the groundwater samples is presented below.

Volatile Organic Compounds (VOCs) in Groundwater

A total of five groundwater samples and one duplicate groundwater sample were analyzed for TCL VOCs+10 TICs. The analytical data is summarized in *Table 7*. There were no VOCs detected at concentrations greater than Class GA Values. Three trip blanks and one equipment blank were also analyzed for TCL VOCs+10 TICs. One VOC, methylene chloride, was detected at low levels in the equipment field rinsate blank and one of the three trip blank samples. These detections are likely due to laboratory contamination.

Semivolatile Organic Compounds (SVOCs) in Groundwater

A total of five groundwater samples and one duplicate groundwater sample were analyzed for TCL SVOCs+20 TICs. The analytical data is summarized in *Table 8*. There were no SVOCs detected above the reporting limits or the Class GA Values.

Metals and Cyanide in Groundwater (Filtered and Unfiltered)

A total of five groundwater samples and one duplicate groundwater sample were analyzed for TAL metals (filtered and unfiltered) and cyanide (unfiltered). The analytical data is summarized in *Table 9*. Cyanide was not detected above the reporting limit or the Class GA Value. Excluding the naturally occurring metals (i.e., iron, magnesium, manganese and sodium), zinc was the only metal detected above the Class GA Values. Zinc was detected above the Class GA Value in the filtered and unfiltered samples collected from MW-2 at concentrations of 2,210 micrograms per liter (µg/L) and 2,920 µg/L, respectively. The Class GA Value for zinc is 2,000 µg/L.

Polychlorinated Biphenyls (PCBs) in Groundwater

A total of five groundwater samples and one duplicate groundwater sample were analyzed for TCL PCBs. The analytical data is summarized in *Table 10*. PCBs were not detected in any of the groundwater samples collected.

Pesticides in Groundwater

A total of five groundwater samples and two duplicate groundwater samples were analyzed for TCL pesticides. The analytical data is summarized in *Table 11*. Pesticides were not detected in any of the groundwater samples collected.

Summary of Findings

The Preliminary Supplemental Investigation consisted of a geophysical survey, visual survey and mapping of the former process wastewater drainage system, advancement of soil borings and collection of soil samples, gauging and sampling of existing on-site groundwater monitoring wells, and laboratory analysis of soil and groundwater samples. The results of the Preliminary Supplemental Investigation indicate the following:

- The scattered geophysical anomalies detected on the residential and commercial lots are likely representative of unconsolidated soils, former building remnants and utilities. There were no indications of the presence of an UST on either the residential or commercial lots.
- Consistent with historic records, seven abandoned USTs were identified beneath the footprint of the Industrial Building. The locations and approximate dimensions of the abandoned USTs have been mapped.
- The former process wastewater drainage system was mapped via geophysical and visual surveys. It was determined that the floor and trench drains and sub-slab piping drain to the sanitary sewer and sumps. The surveys confirmed that the sumps do not have outlets or drains, with the exception of one sump in the former Maintenance Equipment area which is connected to the sanitary sewer. Oil was found in one floor drain, one house trap, and one sump in the former North Press Room and a sludge-like material was found in a pit in the former Plating Room. Stewart EFI has arranged for removal and off-site disposal of the oil and sludge, and cleaning of the floor drain, house trap, sump and the pit in the former Plating Room.
- Soil on the residential and commercial lots was found to consist primarily of brown, black and gray sand, silt and clay with gravel, concrete, red brick, ash, wood fragments and weathered bedrock. Bedrock was encountered in the soil borings at depths from 12 to 17 feet bgs. Field observations indicated evidence of potentially impacted soil in one sample collected from one of the six soil borings. The sample collected 2 to 4 feet bgs from TRC-SB3 exhibited PID readings up to 5.7 ppm. There was no staining or odors noted in the borings and no separate phase liquids (e.g., fuel oil, gasoline) identified in the soil.
- There were no VOCs, SVOCs, PCBs, or pesticides detected at a concentration exceeding the applicable Residential or Commercial Use SCOs. Also, cyanide was not detected above the SCOs. One metal (mercury) was detected at a concentration slightly above the Residential Use SCO in one soil sample. The concentration of mercury detected in the sample above Residential Use SCO can be attributed to the characteristics of urban fill material at the Site.

- Groundwater was encountered in existing Site groundwater monitoring wells at depths ranging from approximately 12 to 28 feet bgs (or below top of floor slab). Groundwater surface elevation measurements indicate that groundwater follows the local topography and flows outward radially towards the north, east and south from near the center of the Site.
- During gauging with an oil/water interface probe and sampling of the on-Site monitoring wells there was no sheen, odor, or discoloration detected in groundwater. Also, there were no significantly elevated PID headspace readings (greater than 0.1 ppm above background) recorded during collection of groundwater samples.
- There were no VOCs, SVOCs, PCBs, or pesticides detected at a concentration exceeding the Class GA Values. Cyanide was not detected in groundwater above the Class GA Value. Excluding iron, magnesium, manganese, and sodium, zinc was the only metal detected in groundwater above a Class GA Value. Zinc was detected in filtered and unfiltered samples collected from MW-2 at concentrations of 2,210 µg/L and 2,920 µg/L, respectively.

<u>Conclusions and Recommendations</u>

Based on the results of the Preliminary Supplemental Investigation, the following can be concluded:

- There are seven abandoned USTs beneath the footprint of the Industrial Building. There is no evidence of buried USTs on the commercial and residential lots.
- Process wastewater was formerly discharged to the sanitary sewer system and sumps. Wastewater which collected in sumps was conveyed via pumps and overhead piping to the on-Site wastewater pretreatment system.
- Based on the results of the laboratory analysis, there is no evidence of any releases to soil on the commercial and residential lots. Mercury was detected in one of the 13 soil samples slightly above the applicable criteria. The sample, TRC-SB3(2-4”), was collected from 2 to 4 inches bgs in the front yard of the residence at 21 Kettell Avenue. The concentration of mercury detected is most likely attributable to the characteristics of the urban fill material encountered on the Site.
- Based on groundwater surface elevation measurements, the groundwater follows the local topography and flows outward radially towards the north, east and south from near the center of the Site.
- There was no evidence of impact to groundwater found, with the exception of the concentrations of zinc detected slightly above the Class GA Values in one monitoring well (MW-2).

Based on the results of the Preliminary Supplemental Investigation, the following is recommended:

- The results of the Preliminary Supplemental Investigation should be incorporated and included in the Final Supplemental Investigation Work Plan for the Site. The scope of the Final Supplemental Investigation Work Plan should consist of soil sampling around the abandoned USTs, in former process areas adjacent to several representative floor drains and in or near several representative sumps and trench drains.

Following completion of the Final Supplemental Investigation, a Final Investigation Report and Site Management Plan should be prepared to obtain a release and covenant not to sue under the Voluntary Cleanup Program.

Please do not hesitate to contact me at (212) 221-7822 x102 if you have any questions.

Very truly yours,
TRC Engineers, Inc.

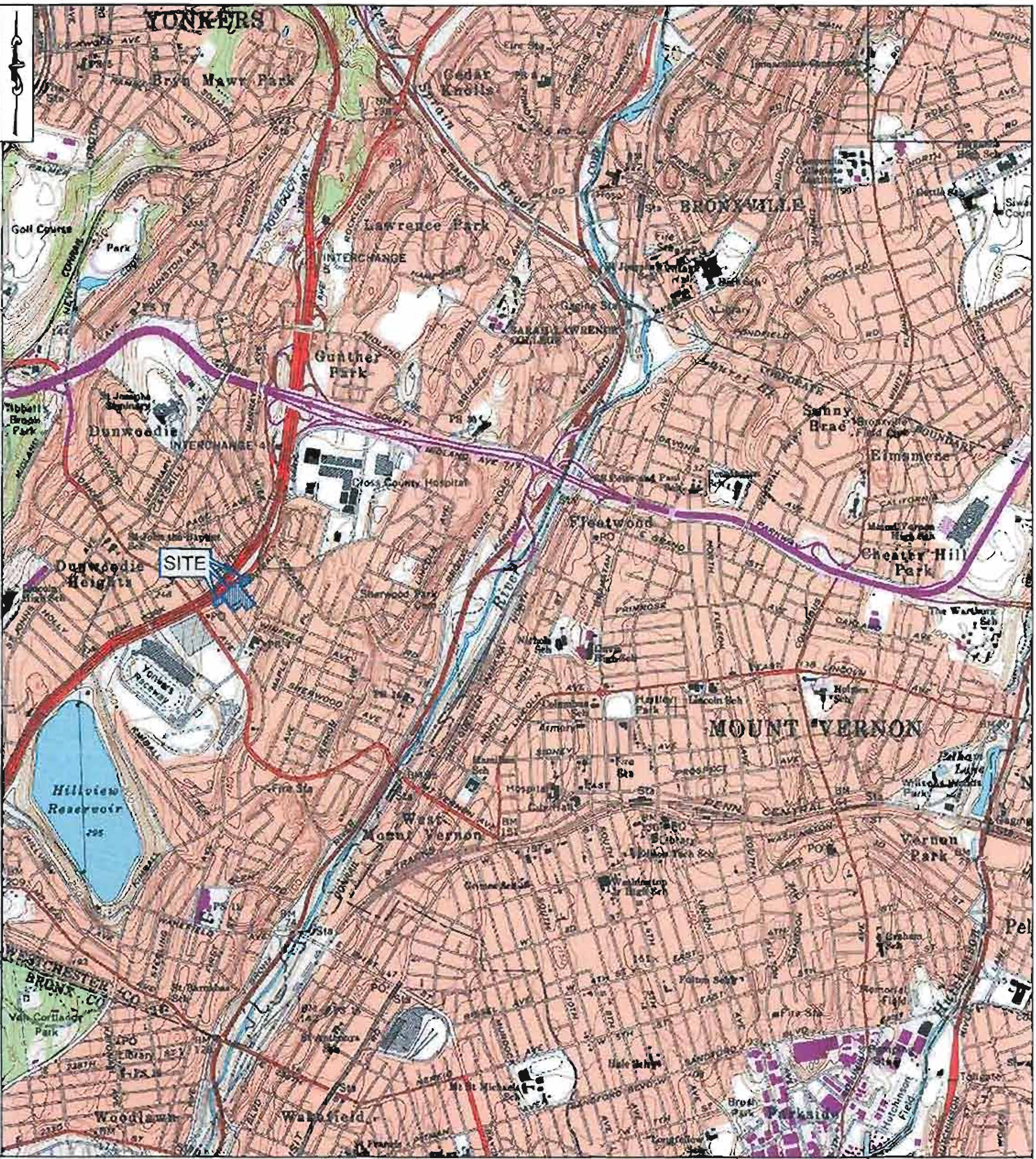
Jennifer Miranda

Jennifer Miranda
Senior Project Manager

cc: A. Perretta, NYSDOH
D. Stokes, Stewart EFI
R. Celone, Stewart EFI
D. Mettler, Hiscock & Barclay
D. Glass, TRC

Attachments:

FIGURES



SCALE 1:24 000

1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 KILOMETER

CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929
DEPTH CURVES AND SOUNDINGS IN FEET—DATUM IS MEAN LOW WATER

NEW YORK

QUADRANGLE LOCATION

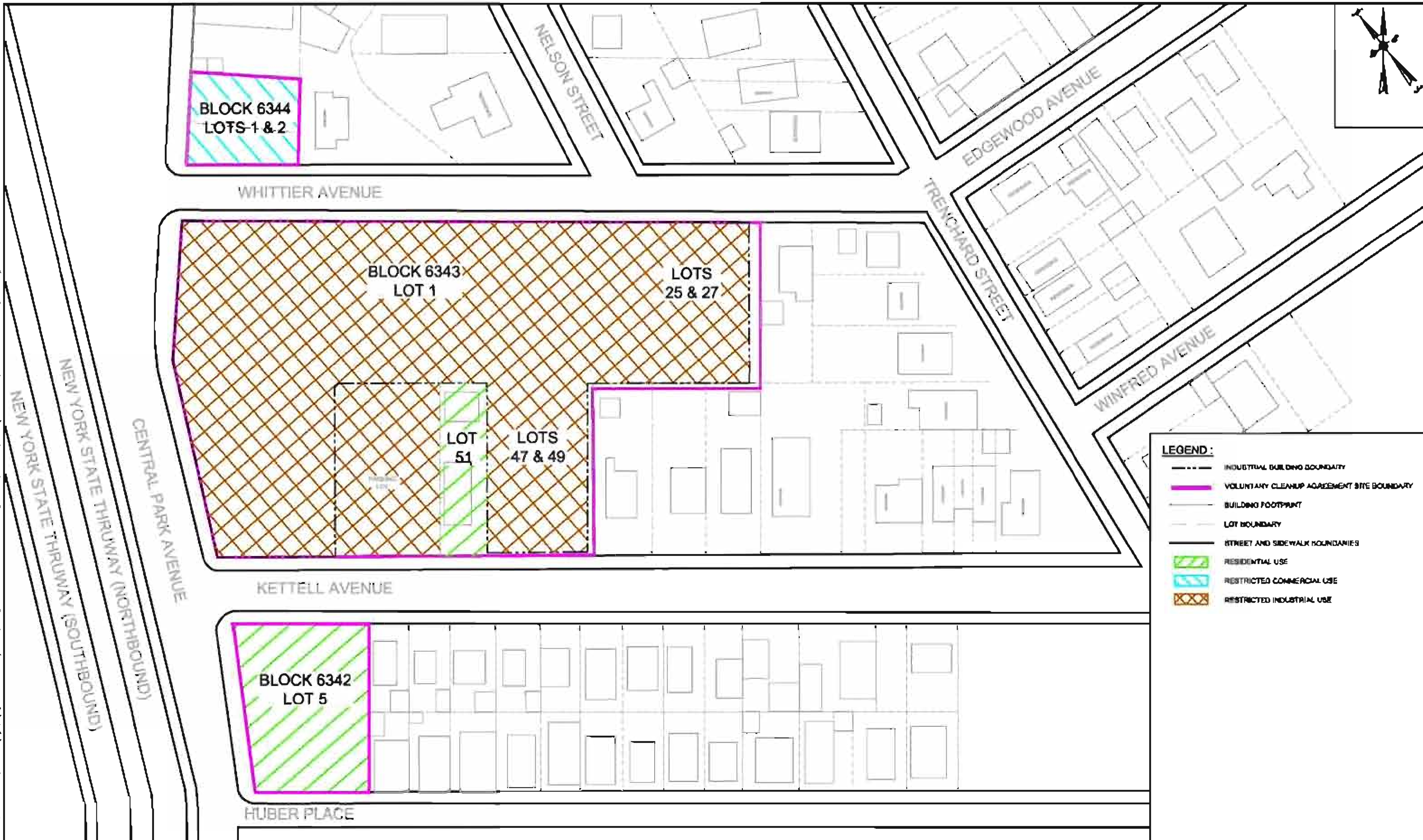
MOUNT VERNON, N.Y.

MAP OBTAINED THROUGH USE OF MAPTECH TERRAIN NAVIGATOR PRO SOFTWARE.

TRC
1430 BROADWAY, 10TH FLOOR
NEW YORK, NEW YORK 10018
212-221-7822

DESIGNED BY: JM	PROJECT NAME: FORMER STEWART STAMPING SITE VCP SITE NO. V00691-3, VCA INDEX NO. W3-1005-04-06 YONKERS, NEW YORK
DRAWN BY: HD	
CHECKED BY: DSG	
DATE: APRIL 2011	DRAWING TITLE: SITE LOCATION MAP
SCALE: AS SHOWN	
PROJECT NUMBER: 181590.0000.0000	

FIGURE 1



REVISIONS			
NO.	DESCRIPTION	BY	DATE

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APPROXIMATE SCALE: 1"=80'
PAPER SIZE: 11" x 17"

TRC
1430 BROADWAY, 10TH FLOOR
NEW YORK, NEW YORK 10018
212-221-7822

DESIGNED BY: JM
DRAWN BY: HD
CHECKED BY: DBD
DATE: MAY 2011
SCALE: AS SHOWN
PROJECT NUMBER 161590.0000.0000

PROJECT NAME:
FORMER STEWART STAMPING SITE
VCP SITE NO. [illegible], VCA INDEX NO. [illegible]
YONKERS, NEW YORK

DRAWING TITLE:
VOLUNTARY CLEANUP PROGRAM SITE BOUNDARIES AND USES

2

LEGEND (SYMBOLS NOT TO SCALE):

- INDUSTRIAL BUILDING BOUNDARY
- BUILDING FOOTPRINT
- LOT BOUNDARY
- STREET AND SIDEWALK BOUNDARIES
- FLOOR DRAIN PIPING UNDER FLOOR SLAB
- TRENCH DRAIN
- PIPING TO SEWER
- UNDERGROUND STORAGE TANK AND ASSOCIATED PIPING
- ABOVEGROUND STORAGE TANK
- FLOOR DRAIN
- SUMP
- SEWER MANHOLE
- TANK FILL OR VENT
- SANITARY VENT LINE

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION PETROLEUM BULK STORAGE REGISTION INFORMATION

Tank No.	Year Installed	Tank Type	Contents*	Tank Capacity	Tank Status
1	1965	UST	Fuel Oil	5,000-gal	Closed
2	1978	UST	Water Soluble Cutting Oil	5,000-gal	Closed
3	1978	UST	Water Soluble Cutting Oil	3,000-gal	Closed
4	1994	AST	Fuel Oil	5,000-gal	In Service
5	1994	AST	Fuel Oil	5,000-gal	In Service
6	1978	UST	Water Soluble Cutting Oil	3,000-gal	Closed
7	1978	UST	Water	8,000-gal	Closed
8	1978	UST	Water	8,000-gal	Closed
9	NR	UST	Fuel Oil	3,000-gal	Closed

Note: * Information regarding contents of USTs provided by Stewart EFI.

REVISIONS			
NO.	DESCRIPTION	BY	DATE

SCALE: 1" = 20'-0"
PAPER SIZE: 24" x 36"

TRC
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NEW YORK, NEW YORK 10018
212-221-7822

DESIGNED BY: JM
DRAWN BY: HD
CHECKED BY: DSG
DATE: MAY 2011
SCALE: AS SHOWN
PROJECT NUMBER: 181590.0000.0000

PROJECT NAME:
FORMER STEWART STAMPING SITE
VCP SITE NO. V00691-3, VCA INDEX NO. W3-1005-04-06
YONKERS, NEW YORK

DRAWING TITLE:
RESULTS OF DRAINAGE SYSTEM MAPPING AND LOCATIONS OF PETROLEUM BULK STORAGE TANKS

FIGURE 3

Path\Name: I:\Projects\181590 – Stewart Inv. WP Requirements\Figures\Figure 3 – Results of Drainage System Mapping and Locations of Petroleum Bulk Storage Tanks and Soil and GW Sampling.dwg – Date\Time: Thu, 12 May 2011 – 5:40pm – User Name: hdelgado – Layout Tab: 24X36

TRC-SB5 (6-8" AND 10-12')

CONSTITUENT	RESULT
TCL VOCs	<Part 375 Commercial SCOs
TCL SVOCs	<Part 375 Commercial SCOs
TAL Metals and Cyanide	<Part 375 Commercial SCOs
TCL PCBs	<Part 375 Commercial SCO
TCL Pesticides	<Part 375 Commercial SCOs

TRC-SB6 (6-8" AND 12-14')

CONSTITUENT	RESULT
TCL VOCs	<Part 375 Commercial SCOs
TCL SVOCs	<Part 375 Commercial SCOs
TAL Metals and Cyanide	<Part 375 Commercial SCOs
TCL PCBs	<Part 375 Commercial SCO
TCL Pesticides	<Part 375 Commercial SCOs

MW-2

CONSTITUENT	RESULT
TCL VOCs	<Class GA Values
TCL SVOCs	<Class GA Values
TAL Metals (Filtered and Unfiltered) and Cyanide	<Class GA Values
TCL PCBs	<Class GA Value
TCL Pesticides	<Class GA Values

MW-5

CONSTITUENT	RESULT
TCL VOCs	<Class GA Values
TCL SVOCs	<Class GA Values
TAL Metals (Filtered and Unfiltered) and Cyanide	<Class GA Values
TCL PCBs	<Class GA Value
TCL Pesticides	<Class GA Values

MW-3

CONSTITUENT	Class GA Value (µg/L)	RESULT (µg/L)
Zinc (Filtered)	2,000	**2,210**
Zinc (Unfiltered)	2,000	**2,920**
TCL VOCs	Various	<Class GA Values
TCL SVOCs	Various	<Class GA Values
TAL Metals (Filtered and Unfiltered) and Cyanide (2)	Various	<Class GA Values
TCL PCBs	0.09	<Class GA Value
TCL Pesticides	Various	<Class GA Values

Note (2) - Does not include zinc

MW-1

CONSTITUENT	RESULT
TCL VOCs	<Class GA Values
TCL SVOCs	<Class GA Values
TAL Metals (Filtered and Unfiltered) and Cyanide	<Class GA Values
TCL PCBs	<Class GA Value
TCL Pesticides	<Class GA Values

TRC-SB4 (12-14" AND 10-12')

CONSTITUENT	RESULT
TCL VOCs	<Part 375 Residential SCOs
TCL SVOCs	<Part 375 Residential SCOs
TAL Metals and Cyanide	<Part 375 Residential SCOs
TCL PCBs	<Part 375 Residential SCO
TCL Pesticides	<Part 375 Residential SCOs

TRC-SB3 (2-4' AND 4-6')

CONSTITUENT	RESULT
TCL VOCs	<Part 375 Residential SCOs
TCL SVOCs	<Part 375 Residential SCOs
TAL Metals and Cyanide	<Part 375 Residential SCOs
TCL PCBs	<Part 375 Residential SCO
TCL Pesticides	<Part 375 Residential SCOs

TRC-SB3 (2-4")

CONSTITUENT	PART 375 RESIDENTIAL USE SCO (mg/kg)	RESULT (mg/kg)
Mercury (Total)	0.81	**1.7**
TCL VOCs	Various	<Part 375 Residential SCOs
TCL SVOCs	Various	<Part 375 Residential SCOs
TAL Metals and Cyanide (1)	Various	<Part 375 Residential SCOs
TCL PCBs	1	<Part 375 Residential SCO
TCL Pesticides	Various	<Part 375 Residential SCOs

Note (1) - Does not include mercury

MW-4

CONSTITUENT	RESULT
TCL VOCs	<Class GA Values
TCL SVOCs	<Class GA Values
TAL Metals (Filtered and Unfiltered) and Cyanide	<Class GA Values
TCL PCBs	<Class GA Value
TCL Pesticides	<Class GA Values

TRC-SB2 (6-8" AND 14-16')

CONSTITUENT	RESULT
TCL VOCs	<Part 375 Residential SCOs
TCL SVOCs	<Part 375 Residential SCOs
TAL Metals and Cyanide	<Part 375 Residential SCOs
TCL PCBs	<Part 375 Residential SCO
TCL Pesticides	<Part 375 Residential SCOs

TRC-SB1 (6-8" AND 15-17')

CONSTITUENT	RESULT
TCL VOCs	<Part 375 Residential SCOs
TCL SVOCs	<Part 375 Residential SCOs
TAL Metals and Cyanide	<Part 375 Residential SCOs
TCL PCBs	<Part 375 Residential SCO
TCL Pesticides	<Part 375 Residential SCOs

LEGEND (SYMBOLS NOT TO SCALE):

- INDUSTRIAL BUILDING BOUNDARY
- VOLUNTARY CLEANUP AGREEMENT SITE BOUNDARY
- BUILDING FOOTPRINT
- LOT BOUNDARY
- STREET AND SIDEWALK BOUNDARIES
- 201.00 — GROUNDWATER SURFACE ELEVATION CONTOUR (FEET) APRIL 19, 2011
- MW-X 200.62' — GROUNDWATER MONITORING WELL LOCATION AND IDENTIFICATION NUMBER AND GROUNDWATER SURFACE ELEVATION (NORTH AMERICAN VERTICAL DATUM 1988)
- TRC-SBX — SOIL SAMPLING LOCATION AND IDENTIFICATION NUMBER

NOTES:

1. LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. **BOLD** VALUES EXCEED THE CRITERIA.
3. EXCEEDANCES OF NATURALLY OCCURRING IRON, MAGNESIUM, MANGANESE AND SODIUM ARE NOT SHOWN FOR GROUNDWATER RESULTS.
4. VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM 1988 HORIZONTAL COORDINATE SYSTEM: NY STATE PLANE
5. THE GROUNDWATER SURFACE ELEVATION FOR MW-3 (THE DEEP ON-SITE PRODUCTION WELL) WAS NOT USED TO GENERATE THE GROUNDWATER SURFACE ELEVATION CONTOUR.

Path\Name: I:\Projects\181590 -- Stewart Inv. WP Requirements\Figures\Figure 4 -- Summary of Soil and GW Sampling Results and GW Surface Elevation Contours.dwg -- Date\Time: Thu, 12 May 2011 -- 5:00pm -- User Name: lndelgado -- Layout Tab: 24X36

REVISIONS			
NO.	DESCRIPTION	BY	DATE

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SCALE: 1" = 40'-0"
PAPER SIZE: 24" x 36"

TRC
1430 BROADWAY, 10TH FLOOR
NEW YORK, NEW YORK 10018
212-221-7822

DESIGNED BY: JM
DRAWN BY: HD
CHECKED BY: DSG
DATE: MAY 2011
SCALE: AS SHOWN
PROJECT NUMBER: 181590.0000.0000

PROJECT NAME:
FORMER STEWART STAMPING SITE
VCP SITE NO. V00691-3, VCA INDEX NO. W3-1005-04-06
YONKERS, NEW YORK

DRAWING TITLE:
SUMMARY OF SOIL AND GROUNDWATER SAMPLING RESULTS AND GROUNDWATER SURFACE ELEVATION CONTOURS

FIGURE 4

TABLES

TABLE 2
STEWART EFI NEW YORK, LLC
FORMER STEWART STAMPING SITE, YONKERS, NEW YORK
PRELIMINARY SUPPLEMENTAL INVESTIGATION REPORT
SUMMARY OF RESULTS OF ANALYSIS OF SOIL SAMPLES FOR VOLATILE ORGANIC COMPOUNDS

Sample ID					TRC-SB1(6-8")		TRC-SB1(15-17')		TRC-SB2(6-8")		TRC-SB2(6-8")A		TRC-SB2(14-16')		TRC-SB3(2-4")		TRC-SB3(2-4')		TRC-SB3(4-6')		TRC-SB4(12-14")		TRC-SB4(10-12')		TRC-SB5(6-8")		TRC-SB5(10-12')		TRC-SB6(6-8")		TRC-SB6(12-14')	
Lab Sample ID					460-25491-1		460-25491-2		460-25491-3		460-25491-4		460-25491-5		460-25491-6		460-25491-7		460-25491-8		460-25517-1		460-25517-2		460-25517-3		460-25517-4		460-25517-5		460-25517-6	
Sampling Date					04-18-11		04-18-11		04-18-11		04-18-11		04-18-11		04-18-11		04-18-11		04-18-11		04-19-11		04-19-11		04-19-11		04-19-11		04-19-11		04-19-11	
Matrix					Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid	
Dilution Factor					1		1		1		1		1		1		1		1		1		1		1		1		1		1	
Units					µg/kg		µg/kg		µg/kg		µg/kg		µg/kg		µg/kg		µg/kg		µg/kg		µg/kg		µg/kg		µg/kg		µg/kg		µg/kg		µg/kg	
Land Use					Residential		Residential		Residential		Residential		Residential		Residential		Residential		Residential		Residential		Residential		Commercial		Commercial		Commercial		Commercial	
VOLATILE ORGANIC COMPOUNDS (VOCs) (µg/kg)	Unrestricted Use SCO	Residential SCO	Commercial SCO	Protection of Groundwater SCO	Result		Result		Result		Result		Result		Result		Result		Result		Result		Result		Result		Result		Result		Result	
1,1,1-Trichloroethane (TCA)	680	100,000	500,000	680	0.86	U	0.89	U	0.94	U	1.0	U	1.1	U	1.2	U	1.1	U	1.1	U	1.1	U	1.1	U	0.97	U	1.1	U	0.94	U	0.94	U
1,1,2,2-Tetrachloroethane	NC	NC	NC	NC	0.86	U	0.89	U	0.94	U	1.0	U	1.1	U	1.2	U	1.1	U	1.1	U	1.1	U	1.1	U	0.97	U	1.1	U	0.94	U	0.94	U
1,1,2-Trichloroethane	NC	NC	NC	NC	0.86	U	0.89	U	0.94	U	1.0	U	1.1	U	1.2	U	1.1	U	1.1	U	1.1	U	1.1	U	0.97	U	1.1	U	0.94	U	0.94	U
1,1-Dichloroethane	270	19,000	240,000	270	0.86	U	0.89	U	0.94	U	1.0	U	1.1	U	1.2	U	1.1	U	1.1	U	1.1	U	1.1	U	0.97	U	1.1	U	0.94	U	0.94	U
1,1-Dichloroethene	330	100,000	500,000	330	0.86	U	0.89	U	0.94	U	1.0	U	1.1	U	1.2	U	1.1	U	1.1	U	1.1	U	1.1	U	0.97	U	0.49	J	0.94	U	0.94	U
1,2,3-Trichlorobenzene	NC	NC	NC	NC	0.86	U	0.89	U	0.94	U	1.0	U	1.1	U	1.2	U	1.1	U	1.1	U	1.1	U	1.1	U	0.97	U	1.1	U	0.94	U	0.94	U
1,2,4-Trichlorobenzene	NC	NC	NC	NC	0.86	U	0.89	U	0.94	U	1.0	U	1.1	U	1.2	U	1.1	U	1.1	U	1.1	U	1.1	U	0.97	U	1.1	U	0.94	U	0.94	U
1,2,4-Trimethylbenzene	3,600	47,000	190,000	3,600	0.86	U	0.89	U	0.94	U	1.0	U	1.1	U	1.2	U	1.1	U	1.1	U	1.1	U	1.1	U	0.97	U	1.1	U	0.94	U	0.94	U
1,2-Dibromo-3-Chloropropane	NC	NC	NC	NC	0.86	U	0.89	U	0.94	U	1.0	U	1.1	U	1.2	U	1.1	U	1.1	U	1.1	U	1.1	U	0.97	U	1.1	U	0.94	U	0.94	U
1,2-Dibromoethane	NC	NC	NC	NC	0.86	U	0.89	U	0.94	U	1.0	U	1.1	U	1.2	U	1.1	U	1.1	U	1.1	U	1.1	U	0.97	U	1.1	U	0.94	U	0.94	U
1,2-Dichlorobenzene	1,100	100,000	500,000	1,100	0.86	U	0.89	U	0.94	U	1.0	U	1.1	U	1.2	U	1.1	U	1.1	U	1.1	U	1.1	U	0.97	U	1.1	U	0.94	U	0.94	U
1,2-Dichloroethane	20	2,300	30,000	20	0.86	U	0.89	U	0.94	U	1.0	U	1.1	U	1.2	U	1.1	U	1.1	U	1.1	U	1.1	U	0.97	U	1.1	U	0.94	U	0.94	U
1,2-Dichloropropane	NC	NC	NC	NC	0.86	U	0.89	U	0.94	U	1.0	U	1.1	U	1.2	U	1.1	U	1.1	U	1.1	U	1.1	U	0.97	U	1.1	U	0.94	U	0.94	U
1,3,5-Trimethylbenzene	8,400	47,000	190,000	8,400	0.86	U	0.89	U	0.94	U	1.0	U	1.1	U	1.2	U	1.1	U	1.1	U	1.1	U	1.1	U	0.97	U	1.1	U	0.94	U	0.94	U
1,3-Dichlorobenzene	2,400	17,000	280,000	2,400	0.86	U	0.89	U	0.94	U	1.0	U	1.1	U	1.2	U	1.1	U	1.1	U	1.1	U	1.1	U	0.97	U	1.1	U	0.94	U	0.94	U
1,4-Dichlorobenzene	1,800	9,800	130,000	1,800	0.86	U	0.89	U	0.94	U	1.0	U	1.1	U	1.2	U	1.1	U	1.1	U	1.1	U	1.1	U	0.97	U	1.1	U	0.94	U	0.94	U
1,4-Dioxane	100	9,800	130,000	100	43	U	44	U	47	U	51	U	54	U	60	U	53	U	54	U	56	U *	53	U *	49	U *	56	U *	47	U *	47	U *
2-Butanone (MEK)	120	100,000	500,000	120	8.6	U	8.9	U	6.6	J	10		11	U	12	U	11	U	11	U	11	U	11	U	9.7	U	3.5	J	9.4	U	9.4	U
2-Hexanone	NC	NC	NC	NC	8.6	U	8.9	U	9.4	U	10	U	11	U	12	U	11	U	11	U	11	U	11	U	9.7	U	11	U	9.4	U	9.4	U
4-Methyl-2-pentanone	NC	NC	NC	NC	8.6	U	8.9	U	9.4	U	10	U	11	U	12	U	11	U	11	U	11	U	11	U	9.7	U	2.4	J	9.4	U	9.4	U
Acetone	50	100,000	500,000	50	8.6	U	3.4	J B	24	B	40	B	4.0	J B	12	U	11	U	11	U	11	U	14		9.7	U	60		9.4	U	9.4	U
Benzene	60	2,900	44,000	60	0.86	U	0.89	U	0.94	U	1.0	U	1.1	U	1.2	U	1.1	U	1.1	U	1.1	U	1.1	U	0.97	U	0.84	J	0.94	U	0.94	U
Bromochloromethane	NC	NC	NC	NC	0.86	U	0.89	U	0.94	U	1.0	U	1.1	U	1.2	U	1.1	U	1.1	U	1.1	U	1.1	U	0.97	U	1.1	U	0.94	U	0.94	U
Bromodichloromethane	NC	NC	NC	NC	0.86	U	0.89	U	0.94	U	1.0	U	1.1	U	1.2	U	1.1	U	1.1	U	1.1	U	1.1	U	0.97	U	1.1	U	0.94	U	0.94	U
Bromoform	NC	NC	NC	NC	0.86	U	0.89	U	0.94	U	1.0	U	1.1	U	1.2	U	1.1	U	1.1	U	1.1	U	1.1	U	0.97	U	1.1	U	0.94	U	0.94	U
Bromomethane	NC	NC	NC	NC	0.86	U	0.89	U	0.94	U	1.0	U	1.1	U	1.2	U	1.1	U	1.1	U	1.1	U	1.1	U	0.97	U	1.1	U	0.94	U	0.94	U
Carbon disulfide	NC	NC	NC	NC	0.86	U	0.89	U	0.44	J	0.67	J	1.1	U	1.2	U	1.1	U	1.1	U	1.1	U	1.1	U	0.97	U	1.8		0.94	U	0.94	U
Carbon tetrachloride	760	1,400	22,000	760	0.86	U	0.89	U	0.94	U	1.0	U	1.1	U	1.2	U	1.1	U	1.1	U	1.1	U	1.1	U	0.97	U	1.1	U	0.94	U	0.94	U
Chlorobenzene	1,100	100,000	500,000	1,100	0.86	U	0.89	U	0.94	U	1.0	U	1.1	U	1.2	U	1.1	U	1.1	U	1.1	U	1.1	U	0.97	U	1.1	U	0.94	U	0.94	U
Chloroethane	NC	NC	NC	NC	0.86	U	0.89	U	0.94	U	1.0	U	1.1	U	1.2	U	1.1	U	1.1	U	1.1	U	1.1	U	0.97	U	1.1	U	0.94	U	0.94	U
Chloroform	370	10,000	350,000	370	0.86	U	0.89	U	0.94	U	1.0	U	1.1	U	1.2	U	1.1	U	1.1	U	1.1	U	1.1	U	0.97	U	1.1	U	0.94	U	0.94	U
Chloromethane	NC	NC	NC	NC	0.86	U	0.89	U	0.94	U	1.0	U	1.1	U	1.2	U	1.1	U	1.1	U	1.1	U	1.1	U	0.97	U	1.1	U	0.94	U	0.94	U
cis-1,2-Dichloroethene	250	59,000	500,000	250	0.86	U	0.89	U	0.94	U	1.0	U	1.1	U	1.2	U	1.1	U	1.1	U	1.1	U	1.1	U	0.97	U	1.1	U	0.94	U	0.94	U
cis-1,3-Dichloropropene	NC	NC	NC	NC	0.86	U	0.89	U	0.94	U	1.0	U	1.1	U	1.2	U	1.1	U	1.1	U	1.1	U	1.1	U	0.97	U	1.1	U	0.94	U	0.94	U
Cyclohexane	NC	NC	NC	NC	0.86	U	0.89	U	0.94	U	1.0	U	1.1	U	1.2	U	1.1	U	1.1	U	1.1	U	1.1	U	0.97	U	1.1	U	0.94	U	0.94	U
Dibromochloromethane	NC	NC	NC	NC	0.86	U	0.89	U	0.94	U	1.0	U	1.1	U	1.2	U	1.1	U	1.1	U	1.1	U	1.1	U	0.97	U	1.1	U	0.94	U	0.94	U
Dichlorodifluoromethane	NC	NC	NC	NC	0.86	U	0.89	U	0.94	U	1.0	U	1.1	U	1.2	U	1.1	U	1.1	U	1.1	U *	1.1	U *	0.97	U *	1.1	U *	0.94	U *	0.94	U *
Ethylbenzene	1,000	30,000	390,000	1,000	0.86	U	0.89	U	0.94	U	1.0	U	1.1	U	1.2	U	1.1	U	1.1	U	0.25	J B	0.92	J B	0.20	J B	0.29	J B	0.94	U	0.94	U
Freon TF[2]	NC	NC	NC	NC	0.86	U	0.89	U	0.94	U	1.0	U	1.1	U	1.2	U	1.1	U	1.1	U	1.1	U	1.1	U	0.97	U	1.1	U	0.94	U	0.94	U
Isopropylbenzene	NC	NC	NC	NC	0.86	U	0.89	U	0.94	U	1.0	U	1.1	U	1.2	U	1.1	U	1.1	U	1.1	U	1.1	U	0.97	U	1.1	U	0.94	U	0.94	U
m&p-Xylene	260[1]	100,000[1]	500,000[1]	1,600[1]	1.7	U	0.42	J	1.9	U	2.0	U	2.2	U	2.4	U	2.1	U	2.2	U	0.61	J B	2.2	B	0.50	J B	0.79	J B	1.9	U	1.9	U
Methyl acetate	NC	NC	NC	NC	0.86	U	0.89	U	0.94	U	1.0	U	1.1	U	1.2	U	1.1	U	1.1	U	1.1	U	1.1	U	0.97	U	1.1	U	0.94	U	0.94	U
Methylcyclohexane	NC	NC	NC	NC	0.86	U	0.89	U	0.94	U	1.0	U	1.1	U	1.2	U	1.1	U	1.1	U	1.1	U	1.1	U	0.97	U	1.1	U	0.94	U	0.94	U
Methylene Chloride	50	51,000	500,000	50	0.86	U	0.89	U	0.94	U	1.0	U	1.1	U	1.2	U	1.1	U	1.1	U	1.1	U	1.1	U	0.97	U	1.1	U	0.94	U	0.94	U
Methyl tert-butyl ether (MTBE)	930	62,000	500,000	930	0.86	U	0.89	U	0.94	U	1.0	U	1.1	U	1.2	U	1.1	U	1.1	U	1.1	U	1.1	U	0.97	U	1.1	U	0.94	U	0.94	U
n-Butylbenzene	12,000	100,000	500,000	12,000	0.86	U	0.89	U	0.94	U	1.0	U	1.1	U	1.2	U	1.1	U	1.1	U	1.1	U	1.1	U	0.97	U	1.1	U	0.94	U	0.94	U
n-Propylbenzene	3,900	100,000	500,000	3,900	0.86	U	0.89	U	0.94	U	1.0	U	1.1	U	1.2	U	1.1	U	1.1	U	1.1	U	1.1	U	0.97	U	1.1	U	0.94	U	0.94	U
o-Xylene	260[1]	100,000[1]	500,000[1]	1,600[1]	0.86	U	0.89	U	0.94	U	1.0	U	1.1	U	1.2	U	1.1	U	1.1	U	1.1	U	0.57	J	0.97	U	1.1	U	0.94	U	0.94	U
p-Isopropyltoluene	NC	NC	NC	NC	0.86	U	0.89	U	0.94	U	1.0	U	1.1	U	1.2	U	1.1	U	1.1	U	1.1	U	1.1	U	0.97	U	1.1	U	0.94	U	0.94	U
sec-Butylbenzene	11,000	100,000	500,000	11,000	0.86	U	0.89	U	0.94	U	1.0	U	1.1	U	1.2	U	1.1	U	1.1	U	1.1	U	1.1	U	0.97	U	1.1	U	0.94	U	0.94	U
Styrene	NC	NC	NC	NC	0.86	U	0.89	U	0.94	U	1.0	U	1.1	U	1.2	U	1.1	U	1.1	U	1.1	U	1.1	U	0.97	U	1.1	U	0.94	U	0.94	U
tert-Butylbenzene	5,900	100,000	500,000	5,900	0.86	U	0.89	U	0.94	U	1.0	U	1.1	U	1.2	U	1.1	U	1.1	U	1.1	U	1.1	U	0.97	U	1.1	U	0.94	U	0.94	U
Tetrachloroethene (PCE)	1,300	5,500	150,000	1,300	0.86	U	0.89	U	0.94	U	1.0	U	1.1	U	1.2	U	1.1	U	1.1	U	1.1	U	1.1	U	0.97	U	1.1	U	1.2		0.94	U
Toluene	700	100,000	500,000	700	0.86	U	0.89	U	0.94	U	1.0	U	1.1	U	1.2	U	1.1	U	1.1	U	1.1	U	0.88	J	0.97	U	0.53	J	0.94	U	0.94	U
trans-1,2-Dichloroethene	190	100,000	500,000	190	0.86	U	0.89	U	0.94	U	1.0	U	1.1	U	1.2	U	1.1	U	1.1	U	1.1	U	1.1	U	0.97	U	1.1	U	0.94	U	0.94	U
trans-1,3-Dichloropropene	NC	NC	NC	NC	0.86	U	0.89	U	0.94	U	1.0	U	1.1	U	1.2	U	1.1	U	1.1	U	1.1	U	1.1	U	0.97	U	1.1	U	0.94	U	0.94	U
Trichloroethene (TCE)	470	10,000	200,000	470	0.86	U	0.89	U	0.94	U	1.0	U	1.1	U	1.2	U	1.1	U	1.1	U	1.1	U	1.1	U	0.97	U	1.1	U	0.94	U	0.94	U
Trichlorofluoromethane	NC	NC	NC	NC	0.86	U	0.89	U	0.94	U	1.0	U	1.1	U	1.2	U	1.1	U	1.1	U	1.1	U	1.1	U	0.97	U	1.1	U	0.94	U	0.94	U
Vinyl chloride	20	210	13,000	20	0.86	U	0.89	U	0.94	U	1.0	U	1.1	U	1.2	U	1.1	U	1.1	U	1.1	U	1.1	U	0.97	U	1.1	U	0.94	U	0.94	U
Total VOCs	NC	NC	NC	NC	0		3.82		31.04		50.67		4		0		0		0		0.86		18.57		0.7		70.64		1.2		0	

Notes:
µg/kg - micrograms per kilogram
(1) - The SCO for m/p xylene and o-xylene applies to Total Xylenes.
(2) - Also known as 1,1,2-trichloro-1,2,2-trifluoroethane and 1,1,2-trichlorotrifluoroethane.
Residential - Property is zoned Residential and results are compared to Unrestricted Use SCOs, Residential Use SCOs, and Protection of Groundwater SCOs.
Commercial - Property is zoned Commercial and results are compared to Unrestricted Use SCOs, Commercial Use SCOs, and Protection of Groundwater SCOs.
B - Compound was found in the blank and sample.
J - Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U - Analyte was not detected.
NC - No Criterion
SCO - Soil Cleanup Objective
Shading indicates result above SCO. Color representing least stringent SCO exceeded is shown unless otherwise noted.
* - Recovery or RPD exceeds control limits

TABLE 3
STEWART EFI NEW YORK, LLC
FORMER STEWART STAMPING SITE, YONKERS, NEW YORK
PRELIMINARY SUPPLEMENTAL INVESTIGATION REPORT
SUMMARY OF RESULTS OF ANALYSIS OF SOIL SAMPLES FOR SEMIVOLATILE ORGANIC COMPOUNDS

Sample ID					TRC-SB1(6-8")		TRC-SB1(15-17')		TRC-SB2(6-8")		TRC-SB2(6-8")A		TRC-SB2(14-16')		TRC-SB3(2-4")		TRC-SB3(2-4')		TRC-SB3(4-6')		TRC-SB4(12-14")		TRC-SB4(10-12')		TRC-SB5(6-8")		TRC-SB5(10-12')		TRC-SB6(6-8")		TRC-SB6(12-14')	
Lab Sample ID					460-25491-1		460-25491-2		460-25491-3		460-25491-4		460-25491-5		460-25491-6		460-25491-7		460-25491-8		460-25517-1		460-25517-2		460-25517-3		460-25517-4		460-25517-5		460-25517-6	
Sampling Date					04-18-11		04-18-11		04-18-11		04-18-11		04-18-11		04-18-11		04-18-11		04-18-11		04-19-11		04-19-11		04-19-11		04-19-11		04-19-11		04-19-11	
Matrix					Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid	
Dilution Factor					1		1		1		1		1		1		1		1		1		1		1		1		1		1	
Units					µg/kg		µg/kg		µg/kg		µg/kg		µg/kg		µg/kg		µg/kg		µg/kg		µg/kg		µg/kg		µg/kg		µg/kg		µg/kg		µg/kg	
Land Use					Residential		Residential		Residential		Residential		Residential		Residential		Residential		Residential		Residential		Residential		Commercial		Commercial		Commercial		Commercial	
SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)	Unrestricted Use SCO	Residential SCO	Commercial SCO	Protection of Groundwater SCO	Result		Result		Result		Result		Result		Result		Result		Result		Result		Result		Result		Result		Result		Result	
1,2,4,5-Tetrachlorobenzene	NC	NC	NC	NC	370	U *	360	U	370	U	390	U	370	U	400	U	410	U	400	U	380	U	350	U	360	U	370	U	370	U	350	U
2,2'-oxybis[1-chloropropane]	NC	NC	NC	NC	370	U	360	U	370	U	390	U	370	U	400	U	410	U	400	U	380	U	350	U	360	U	370	U	370	U	350	U
2,3,4,6-Tetrachlorophenol	NC	NC	NC	NC	370	U	360	U *	370	U *	390	U *	370	U *	400	U *	410	U *	400	U *	380	U	350	U	360	U	370	U	370	U	350	U
2,4,5-Trichlorophenol	NC	NC	NC	NC	370	U	360	U	370	U	390	U	370	U	400	U	410	U	400	U	380	U	350	U	360	U	370	U	370	U	350	U
2,4,6-Trichlorophenol	NC	NC	NC	NC	370	U	360	U	370	U	390	U	370	U	400	U	410	U	400	U	380	U	350	U	360	U	370	U	370	U	350	U
2,4-Dichlorophenol	NC	NC	NC	NC	370	U	360	U	370	U	390	U	370	U	400	U	410	U	400	U	380	U	350	U	360	U	370	U	370	U	350	U
2,4-Dimethylphenol	NC	NC	NC	NC	370	U	360	U	370	U	390	U	370	U	400	U	410	U	400	U	380	U	350	U	360	U	370	U	370	U	350	U
2,4-Dinitrophenol	NC	NC	NC	NC	1,100	U	1,100	U *	1,100	U *	1,200	U *	1,100	U *	1,200	U *	1,200	U *	1,200	U *	1,100	U	1,100	U	1,100	U	1,100	U	1,100	U	1,100	U
2,4-Dinitrotoluene	NC	NC	NC	NC	75	U	73	U	76	U	79	U	75	U	82	U	82	U	81	U	77	U	71	U	73	U	74	U	76	U	71	U
2,6-Dinitrotoluene	NC	NC	NC	NC	75	U	73	U	76	U	79	U	75	U	82	U	82	U	81	U	77	U	71	U	73	U	74	U	76	U	71	U
2-Chloronaphthalene	NC	NC	NC	NC	370	U	360	U	370	U	390	U	370	U	400	U	410	U	400	U	380	U	350	U	360	U	370	U	370	U	350	U
2-Chlorophenol	NC	NC	NC	NC	370	U	360	U	370	U	390	U	370	U	400	U	410	U	400	U	380	U	350	U	360	U	370	U	370	U	350	U
2-Methylnaphthalene	NC	NC	NC	NC	370	U	360	U	370	U	390	U	370	U	400	U	410	U	400	U	380	U	350	U	360	U	370	U	370	U	350	U
2-Methylphenol (o-cresol)	330	100,000	500,000	330	370	U	360	U	370	U	390	U	370	U	400	U	410	U	400	U	380	U	350	U	360	U	370	U	370	U	350	U
2-Nitroaniline	NC	NC	NC	NC	750	U	730	U	760	U	790	U	750	U	820	U	820	U	810	U	770	U	710	U	730	U	740	U	760	U	710	U
2-Nitrophenol	NC	NC	NC	NC	370	U	360	U	370	U	390	U	370	U	400	U	410	U	400	U	380	U	350	U	360	U	370	U	370	U	350	U
3 & 4 Methylphenol (m&p-cresol)	330	34,000	500,000	330	370	U	360	U	370	U	390	U	370	U	400	U	410	U	400	U	380	U	350	U	360	U	370	U	370	U	350	U
3,3'-Dichlorobenzidine	NC	NC	NC	NC	750	U	730	U	760	U	790	U	750	U	820	U	820	U	810	U	770	U	710	U	730	U	740	U	760	U	710	U
3-Nitroaniline	NC	NC	NC	NC	750	U	730	U	760	U	790	U	750	U	820	U	820	U	810	U	770	U	710	U	730	U	740	U	760	U	710	U
4,6-Dinitro-2-methylphenol	NC	NC	NC	NC	1,100	U	1,100	U	1,100	U	1,200	U	1,100	U	1,200	U	1,200	U	1,200	U	1,100	U	1,100	U	1,100	U	1,100	U	1,100	U	1,100	U
4-Bromophenyl phenyl ether	NC	NC	NC	NC	370	U	360	U	370	U	390	U	370	U	400	U	410	U	400	U	380	U	350	U	360	U	370	U	370	U	350	U
4-Chloro-3-methylphenol	NC	NC	NC	NC	370	U	360	U	370	U	390	U	370	U	400	U	410	U	400	U	380	U	350	U	360	U	370	U	370	U	350	U
4-Chloroaniline	NC	NC	NC	NC	370	U	360	U	370	U	390	U	370	U	400	U	410	U	400	U	380	U	350	U	360	U	370	U	370	U	350	U
4-Chlorophenyl phenyl ether	NC	NC	NC	NC	370	U	360	U	370	U	390	U	370	U	400	U	410	U	400	U	380	U	350	U	360	U	370	U	370	U	350	U
4-Methylphenol	NC	NC	NC	NC	370	U	360	U	370	U	390	U	370	U	400	U	410	U	400	U	380	U	350	U	360	U	370	U	370	U	350	U
4-Nitroaniline	NC	NC	NC	NC	750	U	730	U	760	U	790	U	750	U	820	U	820	U	810	U	770	U	710	U	730	U	740	U	760	U	710	U
4-Nitrophenol	NC	NC	NC	NC	1,100	U	1,100	U	1,100	U	1,200	U	1,100	U	1,200	U	1,200	U	1,200	U	1,100	U	1,100	U	1,100	U	1,100	U	1,100	U	1,100	U
Acenaphthene	20,000	100,000	500,000	98,000	370	U	360	U	370	U	390	U	370	U	400	U	410	U	400	U	380	U	350	U	360	U	370	U	370	U	350	U
Acenaphthylene	100,000	100,000	500,000	107,000	370	U	360	U	370	U	390	U	370	U	400	U	410	U	400	U	380	U	350	U	360	U	370	U	370	U	350	U
Acetophenone	NC	NC	NC	NC	370	U	360	U	370	U	390	U	370	U	400	U	410	U	400	U	380	U	350	U	360	U	370	U	370	U	350	U
Anthracene	100,000	100,000	500,000	1,000,000	370	U	360	U	370	U	390	U	370	U	82	J	410	U	400	U	380	U	350	U	360	U	370	U	370	U	350	U
Atrazine	NC	NC	NC	NC	370	U	360	U	370	U	390	U	370	U	400	U	410	U	400	U	380	U	350	U	360	U	370	U	370	U	350	U
Benzaldehyde	NC	NC	NC	NC	370	U	360	U	370	U	390	U	370	U	400	U	410	U	400	U	380	U	350	U	360	U	370	U	370	U	350	U
Benzo[a]anthracene	1,000	1,000	5,600	1,000	37	U	36	U	37	U	140		37	U	450		41	U	40	U	38	U	35	U	99		91		140		35	U
Benzo[a]pyrene	1,000	1,000	1,000	22,000	39	*	36	U	110		120		37	U	480		41	U	40	U	38	U	35	U	130		110		150		35	U
Benzo[b]fluoranthene	1,000	1,000	5,600	1,700	41		36	U	140		180		37	U	720		41	U	40	U	38	U	35	U	150		120		180		35	U
Benzo[g,h,i]perylene	100,000	100,000	500,000	1,000,000	44	J	360	U	75	J	85	J	370	U	430		410	U	400	U	380	U	350	U	120	J	110	J	110	J	350	U
Benzo[k]fluoranthene	800	1,000	56,000	1,700	37	U	36	U	37	U	61		37	U	40	U	41	U	40	U	38	U	35	U	36	U	53		37	U	35	U
Bis(2-chloroethoxy)methane	NC	NC	NC	NC	370	U	360	U	370	U	390	U	370	U	400	U	410	U	400	U	380	U	350	U	360	U	370	U	370	U	350	U
Bis(2-chloroethyl)ether	NC	NC	NC	NC	37	U	36	U	37	U	39	U	37	U	40	U	41	U	40	U	38	U	35	U	36	U	37	U	37	U	35	U
Bis(2-ethylhexyl) phthalate	NC	NC	NC	NC	370	U	360	U	320	J	150	J	370	U	190	J	410	U	400	U	380	U	350	U	130	J	370	U	370	U	350	U
Butyl benzyl phthalate	NC	NC	NC	NC	370	U	360	U	370	U	390	U	370	U	400	U	410	U	400	U	380	U	350	U	360	U	370	U	370	U	350	U
Caprolactam	NC	NC	NC	NC	370	U	360	U	370	U	390	U	370	U	400	U	410	U	400	U	380	U	350	U	360	U	370	U	370	U	350	U
Carbazole	NC	NC	NC	NC	370	U	360	U	370	U	390	U	370	U	400	U	410	U	400	U	380	U	350	U	360	U	370	U	370	U	350	U
Chrysene	1,000	1,000	56,000	1,000	370	U	360	U	200	J	150	J	370	U	580		410	U	400	U	380	U	350	U	100	J	99	J	150	J	350	U
Dibenz(a,h)anthracene	330	330	560	1,000,000	19	J	36	U	37	U	26	J	37	U	120		41	U	40	U	38	U	35	U	36	U	37	U	27	J	35	U
Dibenzofuran	7,000	14,000	350,000	210,000	370	U	360	U	370	U	390	U	370	U	400	U	410	U	400	U	380	U	350	U	360	U	370	U	370	U	350	U
Diethyl phthalate	NC	NC	NC	NC	370	U	360	U	370	U	390	U	370	U	400	U	410	U	400	U	380	U	350	U	360	U	370	U	370	U	350	U
Dimethyl phthalate	NC	NC	NC	NC	370	U	360	U	370	U	390	U	370	U	400	U	410	U	400	U	380	U	350	U	360	U	370	U	370	U	350	U
Di-n-butyl phthalate	NC	NC	NC	NC	370	U	360	U	370	U	390	U	370	U	400	U	410	U	400	U	380	U	350	U	360	U	370	U	370	U	350	U
Di-n-octyl phthalate	NC	NC	NC	NC	370	U	360	U	370	U	390	U	370	U	400	U	410	U	400	U	380	U	350	U	360	U	370	U	370	U	350	U
Diphenyl (1,1'-Biphenyl)	NC	NC	NC	NC	370	U	360	U	370	U	390	U	370	U	400	U	410	U	400	U	380	U	350	U	360	U	370	U	370	U	350	U
Fluoranthene	100,000	100,000	500,000	1,000,000	370	U	360	U	370	U	280	J	370	U	890		410	U	400	U	380	U	350	U	140	J	170	J	160	J	350	U
Fluorene	30,000	100,000	500,000	386,000	370	U	360	U	370	U	390	U	370	U	400	U	410	U	400	U	380	U	350	U	360	U	370	U	370	U	350	U
Hexachlorobenzene	330	330	6,000	3,200	37	U	36	U	37	U	39	U	37	U	40	U	41	U	40	U	38	U	35	U	36	U	37	U	37	U	35	U
Hexachlorobutadiene	NC	NC	NC	NC	75	U	73	U	76	U	79	U	75	U	82	U	82	U	81	U	77	U	71	U	73	U	74	U	76	U	71	U
Hexachlorocyclopentadiene	NC	NC	NC	NC	370	U	360	U *	370	U *	390	U *	370	U *	400	U *	410	U *	400	U *	380	U	350	U	360	U	370	U	370	U	350	U
Hexachloroethane	NC	NC	NC	NC	37	U	36	U	37	U	39	U	37	U	40	U	41	U	40	U	38	U	35	U	36	U	37	U	37	U	35	U
Indeno[1,2,3-cd]pyrene	500	500	5,600	8,200	36	J	36	U	56		95		37	U	400		41	U	40	U	38	U	35	U	110		100		120		35	U
Isophorone	NC	NC	NC	NC	370	U	360	U	370	U	390	U	370	U	400	U	410	U	400	U	380	U	350	U	360	U	370	U	370	U	350	U
Naphthalene	12,000	100,000	500,000	12,000	370	U	360	U	370	U	390	U	370	U	400	U	410	U	400	U	380	U	350	U	360	U	370	U	370	U	350	U
Nitrobenzene	NC	NC	NC	NC	37	U	36	U	37	U	39	U	37	U	40	U	41	U	40	U	38	U	35	U	36	U	37	U	37	U	35	U
N-Nitrosodi-n-propylamine	NC	NC	NC	NC	37	U *	36	U	37	U	39	U	37	U	40	U	41	U	40	U	38	U	35	U	36	U	37	U	37	U	35	U
N-Nitrosodiphenylamine	NC	NC	NC	NC	370	U	360	U	370	U	390	U	370	U	400	U	410	U	400	U	380	U	350	U	360	U	370	U	370	U	350	U
Pentachlorophenol	800	2,400	6,700	800	1,100	U	1,100	U	1,100	U	1,200	U	1,100	U	1,200	U	1,200	U	1,200	U	1,100	U	1,100	U	1,100	U	1,100	U	1,100	U	1,100	U
Phenanthrene	100,000	100,000	500,000	1,000,000	370	U	360	U	370	U	160	J	370	U	330	J	410	U	400	U	380	U	350	U	360	U	64	J	370	U	350	U
Phenol	330	100,000	500,000	330	370	U	360	U	370	U	390	U	370	U	400	U	410	U	400	U	380	U	350	U	360	U	370	U	370	U	350	U
Pyrene	100,000	100,000	500,000	1,000,000	370	U	360	U	110	J	190	J	370	U	710		410	U	400	U	380	U	350	U	140	J	140	J	140	J	350	U
Total SVOCs	NC	NC	NC	NC	179		0		1,011		1,637		0		5,382		0		0		0		0		1,119		1,057		1,177		0	

Notes:
µg/kg - micrograms per kilogram
Residential - Property is zoned Residential and results are compared to Unrestricted Use SCOs, Residential Use SCOs, and Protection of Groundwater SCOs.
Commercial - Property is zoned Commercial and results are compared to Unrestricted Use SCOs, Commercial Use SCOs, and Protection of Groundwater SCOs.
* - Recovery or RPD exceeds control limits
J - Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U - Analyte was not detected.
NC - No Criterion
Shading indicates result above SCO. Color representing least stringent SCO exceeded is shown unless otherwise noted.
SCO - Soil Cleanup Objective

TABLE 4
STEWART EFI NEW YORK, LLC
FORMER STEWART STAMPING SITE, YONKERS, NEW YORK
PRELIMINARY SUPPLEMENTAL INVESTIGATION REPORT
SUMMARY OF RESULTS OF ANALYSIS OF SOIL SAMPLES FOR METALS AND CYANIDE

Sample ID					TRC-SB1(6-8")		TRC-SB1(15-17')		TRC-SB2(6-8")		TRC-SB2(6-8")A		TRC-SB2(14-16')		TRC-SB3(2-4")	
Lab Sample ID					460-25491-1		460-25491-2		460-25491-3		460-25491-4		460-25491-5		460-25491-6	
Sampling Date					04-18-11		04-18-11		04-18-11		04-18-11		04-18-11		04-18-11	
Matrix					Solid		Solid		Solid		Solid		Solid		Solid	
Dilution Factor					4		4		4		4		4		4	
Units					mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
Land Use					Residential		Residential		Residential		Residential		Residential		Residential	
METALS AND CYANIDE	Unrestricted Use SCO	Residential SCO	Commercial SCO	Protection of Groundwater SCO	Result		Result		Result		Result		Result		Result	
Aluminum	NC	NC	NC	NC	8,320		6,800		7,430		8,160		6,160		10,800	
Antimony	NC	NC	NC	NC	2.2	U	2.2	U	2.2	U	2.3	U	2.2	U	2.4	U
Arsenic	13	16	16	16	4.3		1.5		3.3		3.7		3.1		6.6	
Barium	350	350	400	820	74.4		55.6		112		99.4		43.1	J	72.6	
Beryllium	7.2	14	590	47	0.55		0.49		0.54		0.56		0.48		0.72	
Cadmium	2.5	2.5	9.3	7.5	1.1	U	1.1	U	0.17	J	1.1	U	1.1	U	1.2	U
Calcium	NC	NC	NC	NC	22,300		1,440		7,970		10,700		987	J	1,310	
Chromium (Total)	1[1]	22[1]	400[1]	19[1]	17.1		14		15.3		17.7		19.7		26.4[2]	
Chromium (Hexavalent)	1[1]	22[1]	400[1]	19[1]	NA		NA		NA		NA		NA		2.4	U
Cobalt	NC	NC	NC	NC	5.2	J	6	J	5.3	J	5.8	J	5.8	J	7.4	J
Copper	50	270	270	1,720	50.7		9.1		29.9		29.8		10		25.5	
Cyanide (Total)	27	27	27	40	0.56	UA	0.54	UA	0.16	JA	0.59	UA	0.56	UA	0.61	UA
Iron	NC	NC	NC	NC	13,800		11,700		10,900		12,500		11,900		16,000	
Lead	63	400	1,000	450	136		3.8		119		169		6.5		152	
Magnesium	NC	NC	NC	NC	9,720		2,610		3,210		3,080		2,170		2,140	
Manganese	1,600	2,000	10,000	2,000	370		302		197		344		362		440	
Mercury (Total)	0.18	0.81	2.8	0.73	0.062	A	0.035	UA	0.15	A	0.17	A	0.036	UA	1.7	A
Nickel	30	140	310	130	12.3		11.3		12.5		14.0		11.6		14.3	
Potassium	NC	NC	NC	NC	461	J	1,040	J	584	J	759	J	693	J	499	J
Selenium	3.9	36	1,500	4	2.2	U	2.2	U	2.2	U	2.3	U	2.2	U	2.4	U
Silver	2	36	1,500	8.3	0.22	J	0.18	J	0.33	J	2.3	U	2.2	U	2.4	U
Sodium	NC	NC	NC	NC	1,110	U	1,090	U	1,120	U	71.5	J	1,120	U	1,220	U
Thallium	NC	NC	NC	NC	2.2	U	2.2	U	2.2	U	2.3	U	2.2	U	2.4	U
Vanadium	NC	NC	NC	NC	22.5		18.7		20.5		22.9		19.2		31.5	
Zinc	109	2,200	10,000	2,480	131		28.5		161		145		33.1		123	

Sample ID	TRC-SB3(2-4')		TRC-SB3(4-6')		TRC-SB4(12-14")		TRC-SB4(10-12')		TRC-SB5(6-8")		TRC-SB5(10-12')		TRC-SB6(6-8")		TRC-SB6(12-14')	
Lab Sample ID	460-25491-7		460-25491-8		460-25517-1		460-25517-2		460-25517-3		460-25517-4		460-25517-5		460-25517-6	
Sampling Date	04-18-11		04-18-11		04-19-11		04-19-11		04-19-11		04-19-11		04-19-11		04-19-11	
Matrix	Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid	
Dilution Factor	4		4		4		4		4		4		4		4	
Units	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
Land Use	Residential		Residential		Residential		Residential		Commercial		Commercial		Commercial		Commercial	
METALS AND CYANIDE	Result		Result		Result		Result		Result		Result		Result		Result	
Aluminum	13,600		10,400		9,880		4,120		5,230		5,390		6,370		2,760	
Antimony	2.4	U	2.4	U	2.1	U	2.1	U	2.2	U	2.2	U	2.1	U	2.0	U
Arsenic	4.1		2.2		5.7		11.4		2.3		2.1		2.1		4.3	
Barium	80.0		35.3	J	40.6	J	44.0		59.3		106		83.0		17.0	J
Beryllium	0.72		0.61		0.30	J	0.42	U	0.44	U	0.44	U	0.42	U	0.39	U
Cadmium	1.2	U	1.2	U	0.33	J	0.26	J	0.35	J	3.0		0.28	J	0.98	U
Calcium	1,020	J	1,060	J	1,600		507	J	20,200		26,300		67,400	AA	1,150	
Chromium (Total)	20.3		22.9[2]		14.2		2.0	J	15.3		14.7		33.6		2.3	
Chromium (Hexavalent)	NA		2.4	U	NA		NA		NA		NA		NA		NA	
Cobalt	6.6	J	8.1	J	6.6	J	1.5	J	4.7	J	5.1	J	6.0	J	9.8	U
Copper	5.5	J	12.8		12.9		22.2		24.3		26.2		24.0		4.0	J
Cyanide (Total)	0.61	UA	0.61	UA	0.57	UA	0.53	UA	0.37	JA	0.17	JA	0.17	JA	0.53	UA
Iron	16,800		15,000		17,600		10,100		11,500		21,600		12,700		6,820	
Lead	9.0		11.3		9.0		3.4		52.2		131		44.6		3.0	
Magnesium	2,390		2,940		2,020		455	J	4,810		8,840		6,110		538	J
Manganese	256		212		230		241		236		275		203		142	
Mercury (Total)	0.096	A	0.050	A	0.051	A	0.034	UA	0.15	A	0.13	A	0.12	A	0.033	UA
Nickel	11.0		13.7		9.2		4.0	J	13.0		13.9		21.0		1.7	J
Potassium	398	J	599	J	632	J	879	J	1,370		1,340		2,510		670	J
Selenium	2.4	U	2.4	U	2.1	U	2.1	U	2.2	U	2.2	U	2.1	U	2.0	U
Silver	2.4	U	2.4	U	2.1	U	2.1	U	2.2	U	2.2	U	2.1	U	2.0	U
Sodium	1,200	U	1,180	U	107	J	65.8	J	141	J	221	J	145	J	60.3	J
Thallium	2.4	U	2.4	U	2.1	U	2.1	U	2.2	U	2.2	U	2.1	U	2.0	U
Vanadium	28.7		29.5		22.8		12.4		17.2		17.5		23.2		3.4	J
Zinc	35.1		34.4		35.6		35.5		53.1		1,590		57.8		27.1	

Notes:
mg/kg - milligrams per kilogram
Residential - Property is zoned Residential and results are compared to Unrestricted Use SCOs, Residential Use SCOs, and Protection of Groundwater SCOs.
Commercial - Property is zoned Commercial and results are compared to Unrestricted Use SCOs, Commercial Use SCOs, and Protection of Groundwater SCOs.
A - Dilution Factor 1
AA - Dilution Factor 40
B - Compound was found in the blank and sample.
[1] - Hexavalent chromium SCO
[2] - Sample analyzed for hexavalent chromium. Hexavalent chromium was not detected.
J - Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U - Analyte was not detected.
NC - No Criterion
Shading indicates result above SCO. Color representing least stringent SCO exceeded is shown unless otherwise noted.
SCO - Soil Cleanup Objective
NA - Not analyzed

TABLE 5
STEWART EFI NEW YORK, LLC
FORMER STEWART STAMPING SITE, YONKERS, NEW YORK
PRELIMINARY SUPPLEMENTAL INVESTIGATION REPORT
SUMMARY OF RESULTS OF ANALYSIS OF SOIL SAMPLES FOR POLYCHLORINATED BIPHENYLS

Sample ID					TRC-SB1(6-8")		TRC-SB1(15-17')		TRC-SB2(6-8")		TRC-SB2(6-8")A		TRC-SB2(14-16')		TRC-SB3(2-4")		TRC-SB3(2-4')	
Lab Sample ID					460-25491-1		460-25491-2		460-25491-3		460-25491-4		460-25491-5		460-25491-6		460-25491-7	
Sampling Date					04-18-11		04-18-11		04-18-11		04-18-11		04-18-11		04-18-11		04-18-11	
Matrix					Solid		Solid		Solid		Solid		Solid		Solid		Solid	
Dilution Factor					1		1		1		1		1		1		1	
Units					µg/kg		µg/kg		µg/kg		µg/kg		µg/kg		µg/kg		µg/kg	
Land Use					Residential		Residential		Residential		Residential		Residential		Residential		Residential	
POLYCHLORINATED BIPHENYLS (PCBs)	Unrestricted Use SCO	Residential SCO	Commercial SCO	Protection of Groundwater SCO	Result		Result		Result		Result		Result		Result		Result	
Aroclor 1016	NC	NC	NC	NC	74	U	73	U	76	U	79	U	75	U	82	U	82	U
Aroclor 1221	NC	NC	NC	NC	74	U	73	U	76	U	79	U	75	U	82	U	82	U
Aroclor 1232	NC	NC	NC	NC	74	U	73	U	76	U	79	U	75	U	82	U	82	U
Aroclor 1242	NC	NC	NC	NC	74	U	73	U	76	U	79	U	75	U	82	U	82	U
Aroclor 1248	NC	NC	NC	NC	74	U	73	U	76	U	79	U	75	U	82	U	82	U
Aroclor 1254	NC	NC	NC	NC	74	U	73	U	76	U	79	U	75	U	82	U	82	U
Aroclor 1260	NC	NC	NC	NC	52	J	18	J	76	U	85		56	J	82	U	47	J
Aroclor 1262	NC	NC	NC	NC	74	U	73	U	830		79	U	75	U	82	U	82	U
Aroclor 1268	NC	NC	NC	NC	74	U	73	U	76	U	79	U	75	U	270		82	U
Total PCBs	100	1,000	1,000	3,200	52	J	18	J	830		85		56	J	270		47	J

Sample ID	TRC-SB3(4-6')		TRC-SB4(12-14")		TRC-SB4(10-12')		TRC-SB5(6-8")		TRC-SB5(10-12')		TRC-SB6(6-8")		TRC-SB6(12-14')	
Lab Sample ID	460-25491-8		460-25517-1		460-25517-2		460-25517-3		460-25517-4		460-25517-5		460-25517-6	
Sampling Date	04-18-11		04-19-11		04-19-11		04-19-11		04-19-11		04-19-11		04-19-11	
Matrix	Solid		Solid		Solid		Solid		Solid		Solid		Solid	
Dilution Factor	1		1		1		1		1		1		1	
Units	µg/kg		µg/kg		µg/kg		µg/kg		µg/kg		µg/kg		µg/kg	
Land Use	Residential		Residential		Residential		Commercial		Commercial		Commercial		Commercial	
POLYCHLORINATED BIPHENYLS (PCBs)	Result		Result		Result		Result		Result		Result		Result	
Aroclor 1016	81	U	76	U	71	U	73	U	74	U	76	U	71	U
Aroclor 1221	81	U	76	U	71	U	73	U	74	U	76	U	71	U
Aroclor 1232	81	U	76	U	71	U	73	U	74	U	76	U	71	U
Aroclor 1242	81	U	76	U	71	U	73	U	74	U	76	U	71	U
Aroclor 1248	81	U	76	U	71	U	73	U	74	U	76	U	71	U
Aroclor 1254	81	U	76	U	71	U	73	U	74	U	76	U	71	U
Aroclor 1260	81	U	76	U	71	U	740		100		55	J	71	U
Aroclor 1262	800		76	U	71	U	73	U	74	U	76	U	71	U
Aroclor 1268	81	U	76	U	71	U	73	U	74	U	76	U	71	U
Total PCBs	800		0		0		740		100		55	J	0	

Notes:
µg/kg - micrograms per kilogram
Residential - Property is zoned Residential and results are compared to Unrestricted Use SCOs, Residential Use SCOs, and Protection of Groundwater SCOs.
Commercial - Property is zoned Commercial and results are compared to Unrestricted Use SCOs, Commercial Use SCOs, and Protection of Groundwater SCOs.
J - Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U - Analyte was not detected.
NC - No Criterion
Shading indicates result above SCO. Color representing least stringent SCO exceeded is shown unless otherwise noted.
SCO - Soil Cleanup Objective

TABLE 6
STEWART EFI NEW YORK, LLC
FORMER STEWART STAMPING SITE, YONKERS, NEW YORK
PRELIMINARY SUPPLEMENTAL INVESTIGATION REPORT
SUMMARY OF RESULTS OF ANALYSIS OF SOIL SAMPLES FOR PESTICIDES

Sample ID					TRC-SB1(6-8")		TRC-SB1(15-17')		TRC-SB2(6-8")		TRC-SB2(6-8")A		TRC-SB2(14-16')		TRC-SB3(2-4")		TRC-SB3(2-4')		TRC-SB3(4-6')		TRC-SB4(12-14")		TRC-SB4(10-12')		TRC-SB5(6-8")		TRC-SB5(10-12')		TRC-SB6(6-8")		TRC-SB6(12-14')	
Lab Sample ID					460-25491-1		460-25491-2		460-25491-3		460-25491-4		460-25491-5		460-25491-6		460-25491-7		460-25491-8		460-25517-1		460-25517-2		460-25517-3		460-25517-4		460-25517-5		460-25517-6	
Sampling Date					04-18-11		04-18-11		04-18-11		04-18-11		04-18-11		04-18-11		04-18-11		04-18-11		04-19-11		04-19-11		04-19-11		04-19-11		04-19-11		04-19-11	
Matrix					Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid	
Dilution Factor					1		1		1		1		1		1		1		1		1		1		1		1		1		1	
Units					µg/kg		µg/kg		µg/kg		µg/kg		µg/kg		µg/kg		µg/kg		µg/kg		µg/kg		µg/kg		µg/kg		µg/kg		µg/kg		µg/kg	
Land Use					Residential		Residential		Residential		Residential		Residential		Residential		Residential		Residential		Residential		Residential		Commercial		Commercial		Commercial		Commercial	
PESTICIDES	Unrestricted Use SCO	Residential SCO	Commercial SCO	Protection of Groundwater SCO	Result		Result		Result		Result		Result		Result		Result		Result		Result		Result		Result		Result		Result		Result	
4,4'-DDD	3.3	2,600	92,000	14,000	4.4	J p	7.3	U	15		6.0	J p	7.5	U	6.8	J p	8.2	U	8.1	U	7.6	U	7.1	U	7.3	U	19		7.6	U	7.1	U
4,4'-DDE	3.3	1,800	62,000	17,000	7.5	U	7.3	U	5.5	J p	7.9	U	7.5	U	8.2	U	8.2	U	8.1	U	7.6	U	7.1	U	7.3	U	7.5		7.6	U	7.1	U
4,4'-DDT	3.3	1,700	47,000	136,000	3.8	J p	7.3	U	8.2		8.9		7.5	U	13		8.2	U	8.1	U	7.6	U	7.1	U	59		31		9.2		7.1	U
Aldrin	5	19	680	190	7.5	U	7.3	U	7.6	U	7.9	U	7.5	U	8.2	U	8.2	U	8.1	U	7.6	U	7.1	U	7.3	U	7.4	U	7.6	U	7.1	U
alpha-BHC	20	97	3,400	20	7.5	U	7.3	U	7.6	U	7.9	U	7.5	U	8.2	U	8.2	U	8.1	U	7.6	U	7.1	U	7.3	U	7.4	U	7.6	U	7.1	U
alpha-Chlordane	94	910	24,000	2,900	7.5	U	7.3	U	5.9	J p	7.9	U	7.5	U	8.2	U	11	p	7.6	J p	7.6	U	7.1	U	7.3	U	10		7.6	U	7.1	U
beta-BHC	36	72	3,000	90	7.5	U	7.3	U	7.6	U	7.9	U	7.5	U	8.2	U	8.2	U	8.1	U	7.6	U	7.1	U	7.3	U	7.4	U	7.6	U	7.1	U
Chlordane	NC	NC	NC	NC	75	U	73	U	76	U	79	U	75	U	82	U	72	J p	81	U	76	U	71	U	73	U	140	p	76	U	71	U
delta-BHC	40	100,000	500,000	250	7.5	U	7.3	U	7.6	U	7.9	U	7.5	U	8.2	U	8.2	U	8.1	U	7.6	U	7.1	U	7.3	U	7.4	U	7.6	U	7.1	U
Dieldrin	5	39	1,400	100	7.5	U	7.3	U	7.6	U	7.9	U	7.5	U	6.6	J	8.2	U	8.1	U	7.6	U	7.1	U	7.8	p	39		7.6	U	7.1	U
Endosulfan I	2,400	4,800	200,000	102,000	7.5	U	7.3	U	7.6	U	7.9	U	7.5	U	8.2	U	8.2	U	8.1	U	7.6	U	7.1	U	7.3	U	7.4	U	7.6	U	7.1	U
Endosulfan II	2,400	4,800	200,000	102,000	7.5	U	7.3	U	7.6	U	7.9	U	7.5	U	8.2	U	8.2	U	8.1	U	7.6	U	7.1	U	7.3	U	7.4	U	7.6	U	7.1	U
Endosulfan sulfate	2,400	4,800	200,000	1,000,000	7.5	U	7.3	U	7.6	U	7.9	U	7.5	U	8.2	U	8.2	U	8.1	U	7.6	U	7.1	U	7.3	U	7.4	U	7.6	U	7.1	U
Endrin	14	2,200	89,000	60	7.5	U	7.3	U	7.6	U	7.9	U	7.5	U	4.8	J	8.2	U	8.1	U	7.6	U	7.1	U	3.9	J	7.4	U	7.6	U	7.1	U
Endrin aldehyde	NC	NC	NC	NC	3.9	J p	7.3	U	7.6	U	7.9	U	7.5	U	8.1	J p	8.2	U	8.1	U	7.6	U	7.1	U	7.3	U	7.4	U	7.6	U	7.1	U
Endrin ketone	NC	NC	NC	NC	12		4.6	J	8.0		15		7.5	U	8.2	U	8.2	U	8.1	U	7.6	U	7.1	U	19	p	7.4	U	7.6	U	7.1	U
gamma-BHC (Lindane)	100	280	9,200	100	7.5	U	7.3	U	7.6	U	7.9	U	7.5	U	8.2	U	8.2	U	8.1	U	7.6	U	7.1	U	7.3	U	7.4	U	7.6	U	7.1	U
gamma-Chlordane	NC	NC	NC	NC	7.5	U	7.3	U	6.2	J p	7.9	U	7.5	U	8.2	U	7.6	J	8.1	U	7.6	U	7.1	U	7.3	U	7.4	U	7.6	U	7.1	U
Heptachlor	42	420	15,000	380	7.5	U	7.3	U	7.6	U	7.9	U	7.5	U	8.2	U	8.2	U	8.1	U	7.6	U	7.1	U	7.3	U	7.4	U	7.6	U	7.1	U
Heptachlor epoxide	NC	NC	NC	NC	7.5	U	7.3	U	7.6	U	7.9	U	7.5	U	8.2	U	8.2	U	8.1	U	7.6	U	7.1	U	7.3	U	7.4	U	7.6	U	7.1	U
Methoxychlor	NC	NC	NC	NC	7.5	U	7.3	U	7.6	U	7.9	U	7.5	U	8.2	U	8.2	U	8.1	U	7.6	U	7.1	U	7.3	U	7.4	U	7.6	U	7.1	U
Silvex (2,4,5-TP)	3,800	58,000	500,000	3,800	19	U	19	U	19	U	20	U	19	U	21	U	21	U	21	U	19	U	18	U	19	U	19	U	19	U	18	U
Toxaphene	NC	NC	NC	NC	75	U	73	U	76	U	79	U	75	U	82	U	82	U	81	U	76	U	71	U	73	U	74	U	76	U	71	U

Notes:
µg/kg - micrograms per kilogram
Residential - Property is zoned Residential and results are compared to Unrestricted Use SCOs, Residential Use SCOs, and Protection of Groundwater SCOs.
Commercial - Property is zoned Commercial and results are compared to Unrestricted Use SCOs, Commercial Use SCOs, and Protection of Groundwater SCOs.
J - Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
p - The %RPD between the primary and confirmation column/detector is >40%. The lower value has been reported.
U - Analyte was not detected.
NC - No Criterion
Shading indicates result above SCO. Color representing least stringent SCO exceeded is shown unless otherwise noted.
SCO - Soil Cleanup Objective

TABLE 7
STEWART EFI NEW YORK, LLC
FORMER STEWART STAMPING SITE, YONKERS, NEW YORK
PRELIMINARY SUPPLEMENTAL INVESTIGATION REPORT
SUMMARY OF RESULTS OF ANALYSIS OF GROUNDWATER SAMPLES FOR VOLATILE ORGANIC COMPOUNDS

Sample ID		MW-1		MW-1A		MW-2		MW-3		MW-4		MW-5	
Lab Sample ID		460-25492-1		460-25492-2		460-25492-3		460-25524-1		460-25426-1		460-25524-2	
Sampling Date		04-18-11		04-18-11		04-18-11		04-19-11		04-15-11		04-19-11	
Matrix		Water		Water		Water		Water		Water		Water	
Dilution Factor		1		1		1		1		1		1	
Units		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
		Unfiltered		Unfiltered		Unfiltered		Unfiltered		Unfiltered		Unfiltered	
VOLATILE ORGANIC COMPOUNDS (VOCs)	Class GA Values (µg/L)	Result		Result		Result		Result		Result		Result	
1,1,1-Trichloroethane (TCA)	5	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
1,1,2,2-Tetrachloroethane	5	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
1,1,2-Trichloroethane	1	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
1,1-Dichloroethane	5	1.0	U	1.0	U	0.21	J	1.0	U	1.0	U	1.0	U
1,1-Dichloroethene	5	1.0	U	1.0	U	0.25	J	1.0	U	1.0	U	1.0	U
1,2,3-Trichlorobenzene	5	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
1,2,4-Trichlorobenzene	5	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
1,2,4-Trimethylbenzene	5	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
1,2-Dibromo-3-Chloropropane	0.04	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
1,2-Dibromoethane	0.0006	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
1,2-Dichlorobenzene	3	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
1,2-Dichloroethane	0.6	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
1,2-Dichloropropane	1	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
1,3,5-Trimethylbenzene	5	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
1,3-Dichlorobenzene	3	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
1,4-Dichlorobenzene	3	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
1,4-Dioxane	NC	50	U	50	U	50	U	50	U	50	U	50	U
2-Butanone (MEK)	50	10	U	10	U	10	U	10	U	10	U	10	U
2-Hexanone	50	10	U	10	U	10	U	10	U	10	U	10	U
4-Methyl-2-pentanone	NC	10	U	10	U	10	U	10	U	10	U	10	U
Acetone	50	10	U	10	U	10	U	10	U	10	U	10	U
Benzene	1	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Bromochloromethane	5	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Bromodichloromethane	50	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Bromoform	50	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Bromomethane	5	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Carbon disulfide	60	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Carbon tetrachloride	5	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Chlorobenzene	5	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Chloroethane	5	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Chloroform	7	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Chloromethane	5	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
cis-1,2-Dichloroethene	5	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
cis-1,3-Dichloropropene	0.4[(a)]	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Cyclohexane	NC	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Dibromochloromethane	50	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Dichlorodifluoromethane	5	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Ethylbenzene	5	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Freon TF[(1)]	5	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Isopropylbenzene	5	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
m&p-Xylene	5[(b)]	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Methyl acetate	NC	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Methylcyclohexane	NC	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Methylene Chloride	5	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Methyl tert-butyl ether (MTBE)	10	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
n-Butylbenzene	5	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
N-Propylbenzene	5	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
o-Xylene	5[(b)]	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
p-Isopropyltoluene	5	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
sec-Butylbenzene	5	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Styrene	5	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
tert-Butylbenzene	5	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Tetrachloroethene (PCE)	5	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Toluene	5	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
trans-1,2-Dichloroethene	5	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
trans-1,3-Dichloropropene	0.4[(a)]	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Trichloroethene (TCE)	5	1.0	U	1.0	U	1.0	U	0.53	J	1.0	U	1.0	U
Trichlorofluoromethane	5	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Vinyl chloride	2	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Total VOCs	NC	0		0		0.46		0.53		0		0	

Notes:
µg/L - micrograms per liter
J - Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U - Analyte was not detected.
NC - No Criterion
[(a)] 0.4 µg/L applies to the sum of cis- and trans-1,3-dichloropropene
[(b)] There is no Standard or Guidance Value for total xylenes. The Standard for o-xylene, m-xylene, and p-xylene is 5 µg/L.
NC - No Criterion
[(1)] - Also known as 1,1,2-trichloro-1,2,2-trifluoroethane and 1,1,2-trichlorotrifluoroethane.

TABLE 7
STEWART EFI NEW YORK, LLC
FORMER STEWART STAMPING SITE, YONKERS, NEW YORK
PRELIMINARY SUPPLEMENTAL INVESTIGATION REPORT
SUMMARY OF RESULTS OF ANALYSIS OF GROUNDWATER SAMPLES FOR VOLATILE ORGANIC COMPOUNDS

Sample ID		GW EQUIP BLANK 1		TRIP BLANK 1		TRIP BLANK 2		TRIP BLANK 3	
Lab Sample ID		460-25426-2		460-25426-3		460-25492-4		460-25524-3	
Sampling Date		04-15-11		04-15-11		04-18-11		04-19-11	
Matrix		Water		Water		Water		Water	
Dilution Factor		1		1		1		1	
Units		µg/L		µg/L		µg/L		µg/L	
		Unfiltered		Unfiltered		Unfiltered		Unfiltered	
VOLATILE ORGANIC COMPOUNDS (VOCs)	Class GA Values (µg/L)	Result		Result		Result		Result	
1,1,1-Trichloroethane (TCA)	5	1.0	U	1.0	U	1.0	U	1.0	U
1,1,2,2-Tetrachloroethane	5	1.0	U	1.0	U	1.0	U	1.0	U
1,1,2-Trichloroethane	1	1.0	U	1.0	U	1.0	U	1.0	U
1,1-Dichloroethane	5	1.0	U	1.0	U	1.0	U	1.0	U
1,1-Dichloroethene	5	1.0	U	1.0	U	1.0	U	1.0	U
1,2,3-Trichlorobenzene	5	1.0	U	1.0	U	1.0	U	1.0	U
1,2,4-Trichlorobenzene	5	1.0	U	1.0	U	1.0	U	1.0	U
1,2,4-Trimethylbenzene	5	1.0	U	1.0	U	1.0	U	1.0	U
1,2-Dibromo-3-Chloropropane	0.04	1.0	U	1.0	U	1.0	U	1.0	U
1,2-Dibromoethane	0.0006	1.0	U	1.0	U	1.0	U	1.0	U
1,2-Dichlorobenzene	3	1.0	U	1.0	U	1.0	U	1.0	U
1,2-Dichloroethane	0.6	1.0	U	1.0	U	1.0	U	1.0	U
1,2-Dichloropropane	1	1.0	U	1.0	U	1.0	U	1.0	U
1,3,5-Trimethylbenzene	5	1.0	U	1.0	U	1.0	U	1.0	U
1,3-Dichlorobenzene	3	1.0	U	1.0	U	1.0	U	1.0	U
1,4-Dichlorobenzene	3	1.0	U	1.0	U	1.0	U	1.0	U
1,4-Dioxane	NC	50	U	50	U	50	U	50	U
2-Butanone (MEK)	50	10	U	10	U	10	U	10	U
2-Hexanone	50	10	U	10	U	10	U	10	U
4-Methyl-2-pentanone	NC	10	U	10	U	10	U	10	U
Acetone	50	10	U	10	U	10	U	10	U
Benzene	1	1.0	U	1.0	U	1.0	U	1.0	U
Bromochloromethane	5	1.0	U	1.0	U	1.0	U	1.0	U
Bromodichloromethane	50	1.0	U	1.0	U	1.0	U	1.0	U
Bromoform	50	1.0	U	1.0	U	1.0	U	1.0	U
Bromomethane	5	1.0	U	1.0	U	1.0	U	1.0	U
Carbon disulfide	60	1.0	U	1.0	U	1.0	U	1.0	U
Carbon tetrachloride	5	1.0	U	1.0	U	1.0	U	1.0	U
Chlorobenzene	5	1.0	U	1.0	U	1.0	U	1.0	U
Chloroethane	5	1.0	U	1.0	U	1.0	U	1.0	U
Chloroform	7	1.0	U	1.0	U	1.0	U	1.0	U
Chloromethane	5	1.0	U	1.0	U	1.0	U	1.0	U
cis-1,2-Dichloroethene	5	1.0	U	1.0	U	1.0	U	1.0	U
cis-1,3-Dichloropropene	0.4[(a)]	1.0	U	1.0	U	1.0	U	1.0	U
Cyclohexane	NC	1.0	U	1.0	U	1.0	U	1.0	U
Dibromochloromethane	50	1.0	U	1.0	U	1.0	U	1.0	U
Dichlorodifluoromethane	5	1.0	U	1.0	U	1.0	U	1.0	U
Ethylbenzene	5	1.0	U	1.0	U	1.0	U	1.0	U
Freon TF[(1)]	5	1.0	U	1.0	U	1.0	U	1.0	U
Isopropylbenzene	5	1.0	U	1.0	U	1.0	U	1.0	U
m&p-Xylene	5[(b)]	2.0	U	2.0	U	2.0	U	2.0	U
Methyl acetate	NC	2.0	U	2.0	U	2.0	U	2.0	U
Methylcyclohexane	NC	1.0	U	1.0	U	1.0	U	1.0	U
Methylene Chloride	5	1.0	U	0.25	J	1.0	U	0.26	J
Methyl tert-butyl ether (MTBE)	10	1.0	U	1.0	U	1.0	U	1.0	U
n-Butylbenzene	5	1.0	U	1.0	U	1.0	U	1.0	U
N-Propylbenzene	5	1.0	U	1.0	U	1.0	U	1.0	U
o-Xylene	5[(b)]	1.0	U	1.0	U	1.0	U	1.0	U
p-Isopropyltoluene	5	1.0	U	1.0	U	1.0	U	1.0	U
sec-Butylbenzene	5	1.0	U	1.0	U	1.0	U	1.0	U
Styrene	5	1.0	U	1.0	U	1.0	U	1.0	U
tert-Butylbenzene	5	1.0	U	1.0	U	1.0	U	1.0	U
Tetrachloroethene (PCE)	5	1.0	U	1.0	U	1.0	U	1.0	U
Toluene	5	1.0	U	1.0	U	1.0	U	1.0	U
trans-1,2-Dichloroethene	5	1.0	U	1.0	U	1.0	U	1.0	U
trans-1,3-Dichloropropene	0.4[(a)]	1.0	U	1.0	U	1.0	U	1.0	U
Trichloroethene (TCE)	5	1.0	U	1.0	U	1.0	U	1.0	U
Trichlorofluoromethane	5	1.0	U	1.0	U	1.0	U	1.0	U
Vinyl chloride	2	1.0	U	1.0	U	1.0	U	1.0	U
Total VOCs	NC	0		0.25		0		0.26	

Notes:
µg/L - micrograms per liter
J - Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U - Analyte was not detected.
NC - No Criterion
[(a)] 0.4 µg/L applies to the sum of cis- and trans-1,3-dichloropropene
[(b)] There is no Standard or Guidance Value for total xylenes. The Standard for o-xylene, m-xylene, and p-xylene is 5 µg/L.
NC - No Criterion
[(1)] - Also known as 1,1,2-trichloro-1,2,2-trifluoroethane and 1,1,2-trichlorotrifluoroethane.

TABLE 8
STEWART EFI NEW YORK, LLC
FORMER STEWART STAMPING SITE, YONKERS, NEW YORK
PRELIMINARY SUPPLEMENTAL INVESTIGATION REPORT
SUMMARY OF RESULTS OF ANALYSIS OF GROUNDWATER SAMPLES FOR SEMIVOLATILE ORGANIC COMPOUNDS

Sample ID		MW-1		MW-1A		MW-2		MW-3		MW-4		MW-5		GW EQUIP BLANK 1	
Lab Sample ID		460-25492-1		460-25492-2		460-25492-3		460-25524-1		460-25426-1		460-25524-2		460-25426-2	
Sampling Date		04-18-11		04-18-11		04-18-11		04-19-11		04-15-11		04-19-11		04-15-11	
Matrix		Water		Water		Water		Water		Water		Water		Water	
Dilution Factor		1		1		1		1		1		1		1	
Units		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
		Unfiltered		Unfiltered		Unfiltered		Unfiltered		Unfiltered		Unfiltered		Unfiltered	
SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs)	Class GA Values (µg/L)	Result		Result		Result		Result		Result		Result		Result	
1,2,4,5-Tetrachlorobenzene	5	11	U	11	U	11	U	11	U	11	U	12	U	11	U
2,2'-oxybis[1-chloropropane]	5	11	U	11	U	11	U	11	U	11	U	12	U	11	U
2,3,4,6-Tetrachlorophenol	NC	11	U	11	U	11	U	11	U	11	U	12	U	11	U
2,4,5-Trichlorophenol	NC	11	U	11	U	11	U	11	U	11	U	12	U	11	U
2,4,6-Trichlorophenol	NC	11	U	11	U	11	U	11	U	11	U	12	U	11	U
2,4-Dichlorophenol	5	11	U	11	U	11	U	11	U	11	U	12	U	11	U
2,4-Dimethylphenol	50	11	U	11	U	11	U	11	U	11	U	12	U	11	U
2,4-Dinitrophenol	10	32	U	33	U	33	U	33	U	33	U	35	U	32	U
2,4-Dinitrotoluene	5	2.1	U	2.2	U	2.2	U	2.2	U	2.2	U	2.4	U	2.1	U
2,6-Dinitrotoluene	5	2.1	U	2.2	U	2.2	U	2.2	U	2.2	U	2.4	U	2.1	U
2-Chloronaphthalene	10	11	U	11	U	11	U	11	U	11	U	12	U	11	U
2-Chlorophenol	NC	11	U	11	U	11	U	11	U	11	U	12	U	11	U
2-Methylnaphthalene	NC	11	U	11	U	11	U	11	U	11	U	12	U	11	U
2-Methylphenol (o-cresol)	NC	11	U	11	U	11	U	11	U	11	U	12	U	11	U
2-Nitroaniline	5	21	U	22	U	22	U	22	U	22	U	24	U	21	U
2-Nitrophenol	NC	11	U	11	U	11	U	11	U	11	U	12	U	11	U
3 & 4 Methylphenol (m&p-cresol)	NC	11	U	11	U	11	U	11	U	11	U	12	U	11	U
3,3'-Dichlorobenzidine	5	21	U	22	U	22	U	22	U	22	U	24	U	21	U
3-Nitroaniline	5	21	U	22	U	22	U	22	U	22	U	24	U	21	U
4,6-Dinitro-2-methylphenol	NC	32	U	33	U	33	U	33	U	33	U	35	U	32	U
4-Bromophenyl phenyl ether	NC	11	U	11	U	11	U	11	U	11	U	12	U	11	U
4-Chloro-3-methylphenol	NC	11	U	11	U	11	U	11	U	11	U	12	U	11	U
4-Chloroaniline	5	11	U	11	U	11	U	11	U	11	U	12	U	11	U
4-Chlorophenyl phenyl ether	NC	11	U	11	U	11	U	11	U	11	U	12	U	11	U
4-Methylphenol	NC	11	U	11	U	11	U	11	U	11	U	12	U	11	U
4-Nitroaniline	5	21	U	22	U	22	U	22	U	22	U	24	U	21	U
4-Nitrophenol	NC	32	U	33	U	33	U	33	U	33	U	35	U	32	U
Acenaphthene	20	11	U	11	U	11	U	11	U	11	U	12	U	11	U
Acenaphthylene	NC	11	U	11	U	11	U	11	U	11	U	12	U	11	U
Acetophenone	NC	11	U	11	U	11	U	11	U	11	U	12	U	11	U
Anthracene	50	11	U	11	U	11	U	11	U	11	U	12	U	11	U
Atrazine	7.5	11	U	11	U	11	U	11	U	11	U	12	U	11	U
Benzaldehyde	NC	11	U	11	U	11	U	11	U	11	U	12	U	11	U
Benzo[a]anthracene	0.002	1.1	U	1.1	U	1.1	U	1.1	U	1.1	U	1.2	U	1.1	U
Benzo[a]pyrene	>ND	1.1	U	1.1	U	1.1	U	1.1	U	1.1	U	1.2	U	1.1	U
Benzo[b]fluoranthene	0.002	1.1	U	1.1	U	1.1	U	1.1	U	1.1	U	1.2	U	1.1	U
Benzo[g,h,i]perylene	NC	11	U	11	U	11	U	11	U	11	U	12	U	11	U
Benzo[k]fluoranthene	0.002	1.1	U	1.1	U	1.1	U	1.1	U	1.1	U	1.2	U	1.1	U
Bis(2-chloroethoxy)methane	5	11	U	11	U	11	U	11	U	11	U	12	U	11	U
Bis(2-chloroethyl)ether	1	1.1	U	1.1	U	1.1	U	1.1	U	1.1	U	1.2	U	1.1	U
Bis(2-ethylhexyl) phthalate	5	11	U	11	U	11	U	11	U	11	U	12	U	11	U
Butyl benzyl phthalate	50	11	U	11	U	11	U	11	U	11	U	12	U	11	U
Caprolactam	NC	11	U	11	U	11	U	11	U	11	U	12	U	11	U
Carbazole	NC	11	U	11	U	11	U	11	U	11	U	12	U	11	U
Chrysene	0.002	11	U	11	U	11	U	11	U	11	U	12	U	11	U
Dibenz(a,h)anthracene	NC	1.1	U	1.1	U	1.1	U	1.1	U	1.1	U	1.2	U	1.1	U
Dibenzofuran	NC	11	U	11	U	11	U	11	U	11	U	12	U	11	U
Diethyl phthalate	50	11	U	11	U	11	U	11	U	11	U	12	U	11	U
Dimethyl phthalate	50	11	U	11	U	11	U	11	U	11	U	12	U	11	U
Di-n-butyl phthalate	50	11	U	11	U	11	U	11	U	11	U	12	U	11	U
Di-n-octyl phthalate	50	11	U	11	U	11	U	11	U	11	U	12	U	11	U
Diphenyl (1,1'Biphenyl)	5	11	U	11	U	11	U	11	U	11	U	12	U	11	U
Fluoranthene	50	11	U	11	U	11	U	11	U	11	U	12	U	11	U
Fluorene	50	11	U	11	U	11	U	11	U	11	U	12	U	11	U
Hexachlorobenzene	0.04	1.1	U	1.1	U	1.1	U	1.1	U	1.1	U	1.2	U	1.1	U
Hexachlorobutadiene	0.5	2.1	U	2.2	U	2.2	U	2.2	U	2.2	U	2.4	U	2.1	U
Hexachlorocyclopentadiene	5	11	U	11	U	11	U	11	U	11	U	12	U	11	U
Hexachloroethane	5	1.1	U	1.1	U	1.1	U	1.1	U	1.1	U	1.2	U	1.1	U
Indeno[1,2,3-cd]pyrene	0.002	1.1	U	1.1	U	1.1	U	1.1	U	1.1	U	1.2	U	1.1	U
Isophorone	50	11	U	11	U	11	U	11	U	11	U	12	U	11	U
Naphthalene	10	11	U	11	U	11	U	11	U	11	U	12	U	11	U
Nitrobenzene	0.4	1.1	U	1.1	U	1.1	U	1.1	U	1.1	U	1.2	U	1.1	U
N-Nitrosodi-n-propylamine	NC	1.1	U	1.1	U	1.1	U	1.1	U	1.1	U	1.2	U	1.1	U
N-Nitrosodiphenylamine	50	11	U	11	U	11	U	11	U	11	U	12	U	11	U
Pentachlorophenol	1	32	U	33	U	33	U	33	U	33	U	35	U	32	U
Phenanthrene	50	11	U	11	U	11	U	11	U	11	U	12	U	11	U
Phenol	1	11	U	11	U	11	U	11	U	11	U	12	U	11	U
Pyrene	50	11	U	11	U	11	U	11	U	11	U	12	U	11	U
Total SVOCs	NC	0		0		0		0		0		0		0	

Notes:
µg/L - micrograms per liter
U - Analyte was not detected.
NC - No Criterion
>ND - Benzo(a)pyrene exceedance is any concentration above the detection limit
NC - No Criterion

TABLE 9
STEWART EFI NEW YORK, LLC
FORMER STEWART STAMPING SITE, YONKERS, NEW YORK
PRELIMINARY SUPPLEMENTAL INVESTIGATION REPORT
SUMMARY OF RESULTS OF ANALYSIS OF GROUNDWATER SAMPLES FOR METALS AND CYANIDE

Sample ID		MW-1		MW-1		MW-1A		MW-1A		MW-2		MW-2		MW-3		MW-3		MW-4		MW-4		MW-5	
Lab Sample ID		460-25492-1		460-25492-1		460-25492-2		460-25492-2		460-25492-3		460-25492-3		460-25524-1		460-25524-1		460-25426-1		460-25426-1		460-25524-2	
Sampling Date		04-18-11		04-18-11		04-18-11		04-18-11		04-18-11		04-18-11		04-19-11		04-19-11		04-15-11		04-15-11		04-19-11	
Matrix		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water	
Dilution Factor		1		1		1		1		1		1		1		1		1		1		1	
Units		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
		Filtered		Unfiltered		Filtered		Unfiltered		Filtered		Unfiltered		Filtered		Unfiltered		Filtered		Unfiltered		Filtered	
METALS AND CYANIDE	Class GA Values (µg/L)	Result		Result		Result		Result		Result		Result		Result		Result		Result		Result		Result	
Aluminum	NC	200	U	200	U	200	U	200	U	200	U	200	U	200	U	200	U	200	U	153	J	200	U
Antimony	3	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U
Arsenic	25	5.0	U	4.9	J	5.0	U	5.0	U	6.2		6.0		5.0	U	5.0	U	5.0	U	4.2	J	5.0	U
Barium	1,000	11.8	J	9.8	J	11.8	J	9.6	J	11.0	J	9.5	J	10.2	J	11.3	J	41.7	J	39.7	J	6.2	J
Beryllium	3	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Cadmium	5	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
Calcium	NC	64,000		67,000		63,000		66,100		34,200		37,200		60,600		60,800		155,000		137,000		27,200	
Chromium (Total)	50	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U
Cobalt	NC	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U
Copper	200	25.0	U	25.0	U	25.0	U	25.0	U	25.0	U	25.0	U	25.0	U	25.0	U	7.9	J	25.0	U	25.0	U
Cyanide (Total)	200	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Iron	300	150	U	4,750		150	U	3,990		150	U	64.9	J	384		3,470		150	U	150	U	150	U
Lead	25	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
Magnesium	35,000	14,300		13,900		14,300		13,700		6,610		6,640		32,300		33,400		49,300		45,500		3,290	J
Manganese	300	119		141		120		136		109		140		361		403		292		275		15.0	U
Mercury (Total)	0.7	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
Nickel	100	40.0	U	40.0	U	40.0	U	40.0	U	16.4	J	21.1	J	40.0	U	40.0	U	40.0	U	40.0	U	40.0	U
Potassium	NC	3,360	J	3,240	J	3,110	J	3,200	J	2,160	J	2,310	J	6,090		6,050		4,200	J	3,990	J	2,390	J
Selenium	10	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U
Silver	50	10.0	U	1.1	J	10.0	U	10.0	U	10.8		13.1		10.0	U	10.0	U	10.0	U	10.0	U	10.0	U
Sodium	20,000	72,000		64,800		66,800		63,900		88,600		86,400		113,000		112,000		126,000		115,000		16,100	
Thallium	0.5	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U
Vanadium	NC	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U
Zinc	2,000	30.0	U	30.0	U	30.0	U	30.0	U	2,210		2,920		30.0	U	30.0	U	30.0	U	30.0	U	30.0	U

Notes:
µg/L - micrograms per liter
J - Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U - Analyte was not detected.
NC - No Criterion

TABLE 9
STEWART EFI NEW YORK, LLC
FORMER STEWART STAMPING SITE, YONKERS, NEW YORK
PRELIMINARY SUPPLEMENTAL INVESTIGATION REPORT
SUMMARY OF RESULTS OF ANALYSIS OF GROUNDWATER SAMPLES FOR METALS AND CYANIDE

Sample ID		MW-5		GW EQUIP BLANK 1	
Lab Sample ID		460-25524-2		460-25426-2	
Sampling Date		04-19-11		04-15-11	
Matrix		Water		Water	
Dilution Factor		1		1	
Units		µg/L		µg/L	
		Unfiltered		Unfiltered	
METALS AND CYANIDE	Class GA Values (µg/L)	Result		Result	
Aluminum	NC	200	U	200	U
Antimony	3	10.0	U	10.0	U
Arsenic	25	5.0	U	5.0	U
Barium	1,000	6.3	J	200	U
Beryllium	3	2.0	U	2.0	U
Cadmium	5	5.0	U	5.0	U
Calcium	NC	27,100		5,000	U
Chromium (Total)	50	10.0	U	10.0	U
Cobalt	NC	50.0	U	50.0	U
Copper	200	25.0	U	25.0	U
Cyanide (Total)	200	10	U	10	U
Iron	300	59.8	J	150	U
Lead	25	5.0	U	5.0	U
Magnesium	35,000	3,340	J	5,000	U
Manganese	300	15.0	U	15.0	U
Mercury (Total)	0.7	0.20	U	0.20	U
Nickel	100	40.0	U	40.0	U
Potassium	NC	2,370	J	5,000	U
Selenium	10	10.0	U	10.0	U
Silver	50	10.0	U	10.0	U
Sodium	20,000	14,900		5,000	U
Thallium	0.5	10.0	U	10.0	U
Vanadium	NC	50.0	U	50.0	U
Zinc	2,000	30.0	U	30.0	U

Notes:
µg/L - micrograms per liter
J - Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U - Analyte was not detected.
NC - No Criterion

TABLE 10
STEWART EFI NEW YORK, LLC
FORMER STEWART STAMPING SITE, YONKERS, NEW YORK
PRELIMINARY SUPPLEMENTAL INVESTIGATION REPORT
SUMMARY OF RESULTS OF ANALYSIS OF GROUNDWATER SAMPLES FOR POLYCHLORINATED BIPHENYLS

Sample ID		MW-1		MW-1A		MW-2		MW-3		MW-4		MW-5		GW EQUIP BLANK 1	
Lab Sample ID		460-25492-1		460-25492-2		460-25492-3		460-25524-1		460-25426-1		460-25524-2		460-25426-2	
Sampling Date		04-18-11		04-18-11		04-18-11		04-19-11		04-15-11		04-19-11		04-15-11	
Matrix		Water		Water		Water		Water		Water		Water		Water	
Dilution Factor		1		1		1		1		1		1		1	
Units		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
		Unfiltered		Unfiltered		Unfiltered		Unfiltered		Unfiltered		Unfiltered		Unfiltered	
POLYCHLORINATED BIPHENYLS (PCBs)	Class GA Values (µg/L)	Result		Result		Result		Result		Result		Result		Result	
Aroclor 1016	NC	0.51	U	0.51	U	0.52	U	0.51	U	0.51	U	0.53	U	0.64	U
Aroclor 1221	NC	0.51	U	0.51	U	0.52	U	0.51	U	0.51	U	0.53	U	0.64	U
Aroclor 1232	NC	0.51	U	0.51	U	0.52	U	0.51	U	0.51	U	0.53	U	0.64	U
Aroclor 1242	NC	0.51	U	0.51	U	0.52	U	0.51	U	0.51	U	0.53	U	0.64	U
Aroclor 1248	NC	0.51	U	0.51	U	0.52	U	0.51	U	0.51	U	0.53	U	0.64	U
Aroclor 1254	NC	0.51	U	0.51	U	0.52	U	0.51	U	0.51	U	0.53	U	0.64	U
Aroclor 1260	NC	0.51	U	0.51	U	0.52	U	0.51	U	0.51	U	0.53	U	0.64	U
Aroclor 1262	NC	0.51	U	0.51	U	0.52	U	0.51	U	0.51	U	0.53	U	0.64	U
Aroclor 1268	NC	0.51	U	0.51	U	0.52	U	0.51	U	0.51	U	0.53	U	0.64	U
Total PCBs	0.09	0		0		0		0		0		0		0	

Notes:
µg/L - micrograms per liter
U - Analyte was not detected.
NC - No Criterion

TABLE 11
STEWART EFI NEW YORK, LLC
FORMER STEWART STAMPING SITE, YONKERS, NEW YORK
PRELIMINARY SUPPLEMENTAL INVESTIGATION REPORT
SUMMARY OF RESULTS OF ANALYSIS OF GROUNDWATER SAMPLES FOR PESTICIDES

Sample ID		MW-1		MW-1A		MW-2		MW-3		MW-4		MW-5		GW EQUIP BLANK 1	
Lab Sample ID		460-25492-1		460-25492-2		460-25492-3		460-25524-1		460-25426-1		460-25524-2		460-25426-2	
Sampling Date		04-18-11		04-18-11		04-18-11		04-19-11		04-15-11		04-19-11		04-15-11	
Matrix		Water		Water		Water		Water		Water		Water		Water	
Dilution Factor		1		1		1		1		1		1		1	
Units		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
		Unfiltered		Unfiltered		Unfiltered		Unfiltered		Unfiltered		Unfiltered		Unfiltered	
PESTICIDES	Class GA Values (µg/L)	Result		Result		Result		Result		Result		Result		Result	
4,4'-DDD	0.3	0.051	U	0.051	U	0.054	U	0.053	U	0.051	U	0.052	U	0.064	U
4,4'-DDE	0.2	0.051	U	0.051	U	0.054	U	0.053	U	0.051	U	0.052	U	0.064	U
4,4'-DDT	0.2	0.051	U	0.051	U	0.054	U	0.053	U	0.051	U	0.052	U	0.064	U
Aldrin	>ND	0.051	U	0.051	U	0.054	U	0.053	U	0.051	U	0.052	U	0.064	U
alpha-BHC	0.01	0.051	U	0.051	U	0.054	U	0.053	U	0.051	U	0.052	U	0.064	U
alpha-Chlordane	NC	0.051	U	0.051	U	0.054	U	0.053	U	0.051	U	0.052	U	0.064	U
beta-BHC	0.04	0.051	U	0.051	U	0.054	U	0.053	U	0.051	U	0.052	U	0.064	U
Chlordane	0.05	0.51	U	0.51	U	0.54	U	0.53	U	0.51	U	0.52	U	0.64	U
delta-BHC	0.04	0.051	U	0.051	U	0.054	U	0.053	U	0.051	U	0.052	U	0.064	U
Dieldrin	0.004	0.051	U	0.051	U	0.054	U	0.053	U	0.051	U	0.052	U	0.064	U
Endosulfan I	NC	0.051	U	0.051	U	0.054	U	0.053	U	0.051	U	0.052	U	0.064	U
Endosulfan II	NC	0.051	U	0.051	U	0.054	U	0.053	U	0.051	U	0.052	U	0.064	U
Endosulfan sulfate	NC	0.051	U	0.051	U	0.054	U	0.053	U	0.051	U	0.052	U	0.064	U
Endrin	>ND	0.051	U	0.051	U	0.054	U	0.053	U	0.051	U	0.052	U	0.064	U
Endrin aldehyde	5	0.051	U	0.051	U	0.054	U	0.053	U	0.051	U	0.052	U	0.064	U
Endrin ketone	5	0.051	U	0.051	U	0.054	U	0.053	U	0.051	U	0.052	U	0.064	U
gamma-BHC (Lindane)	0.05	0.051	U	0.051	U	0.054	U	0.053	U	0.051	U	0.052	U	0.064	U
gamma-Chlordane	NC	0.051	U	0.051	U	0.054	U	0.053	U	0.051	U	0.052	U	0.064	U
Heptachlor	0.04	0.051	U	0.051	U	0.054	U	0.053	U	0.051	U	0.052	U	0.064	U
Heptachlor epoxide	0.03	0.051	U	0.051	U	0.054	U	0.053	U	0.051	U	0.052	U	0.064	U
Methoxychlor	35	0.051	U	0.051	U	0.054	U	0.053	U	0.051	U	0.052	U	0.064	U
Silvex (2,4,5-TP)	0.26	0.52	U	0.52	U	0.54	U	0.52	U	0.51	U	0.56	U	0.57	U
Toxaphene	0.06	0.51	U	0.51	U	0.54	U	0.53	U	0.51	U	0.52	U	0.64	U

Notes:
µg/L - micrograms per liter
U - Analyte was not detected.
NC - No Criterion
>ND - Class GA Value is any detected concentration

APPENDIX A

GEOPHYSICAL SURVEY REPORT

NOVA GEOPHYSICAL SERVICES
SUBSURFACE MAPPING SOLUTIONS
56-01 Marathon Parkway, PO Box 765, Douglaston, New York 11362
Ph. 347-556-7787 Fax. 718-261-1527
www.nova-gsi.com

April 25, 2011

Patrick Narea
TRC
1430 Broadway, 10th Floor
New York, NY 10018
Direct: 212.221.7822
Email: PNarea@trcsolutions.com

Re: Geophysical Survey Report
Former Stewart Stamping Facility
630 Central Park Avenue
Yonkers, New York 10704

Dear Mr. Narea:

Nova Geophysical Services (NOVA) is pleased to provide findings of our geophysical survey at the above referenced project site: former Stewart Stamping Facility located at 630 Central Park Avenue, Yonkers, New York (the "Site"). Please see attached Geophysical Survey map for more details.

INTRODUCTION TO GEOPHYSICAL SURVEY

NOVA performed a Geophysical survey consisting of Ground Penetrating Radar (GPR), Electromagnetic (EM) surveys and comprehensive subsurface utility (CSUL) surveys at the project Site. The purpose of this survey is to identify and trace existing floor drains and their final destinations and to locate any underground storage tanks (USTs), subsurface structures, utilities and to clear and mark proposed boring locations located at the project site on April 13th, 14th & 15th, 2011.

The equipment selected for this investigation included a CSUL Pipe and Cable Locator (an magnetic detector), Ditch-Witch utility locator, Electromagnetic detector (Geonics EM61), MALAs 350 MHz and 750 MHz ground-penetrating radar (GPR).

A GPR system consists of a radar control unit, control cable and a transducer (antenna). The control unit transmits a trigger pulse at a normal repetition rate of 750 MHz. The trigger pulse is sent to the transmitter electronics in the transducer via the control cable. The transmitter electronics amplify the trigger pulses into bipolar pulses that are radiated to the surface. The transformed pulses vary in shape and frequency according to the transducer used. In the subsurface, variations of the signal occur at boundaries where there is a dielectric contrast (void, steel, soil type, etc.). Signal reflections travel back to the control unit and are represented as color graphic images for interpolation.

GEOPHYSICAL METHODS

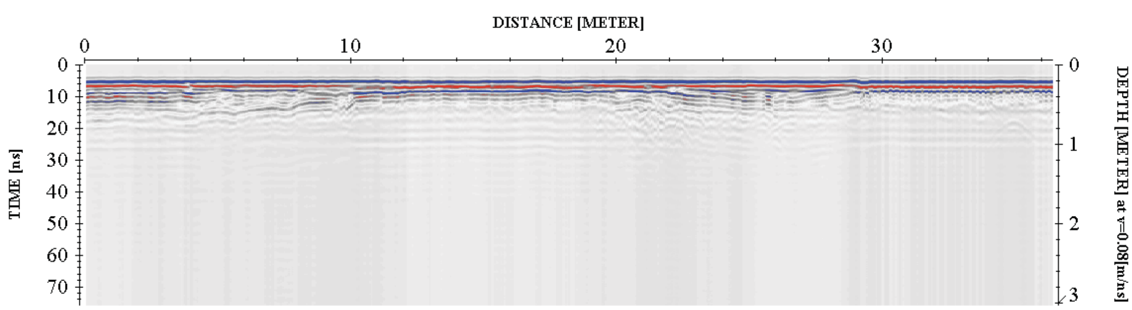
The targeted areas within the project site were first screened using the Geonics(tm) electromagnetic detector by carrying the instrument over the target areas (floor drains, anomalies, USTs, etc.) at the site. When evidence of anomalies (utility, drain pipes, USTs) were observed, the Ditch-witch(tm) and TW-6 utility/pipe locator was then used to determine if the anomalies were utilities or other large sub-surface metal objects. Finally, GPR profiles were collected over each metal-detector anomaly and inspected for reflections, which could be indicative of major anomalies.

GPR data profiles were collected for the areas of the Site specified by the client. The surveyed area consisted of a concrete paved areas (inside the building) and asphalt paved areas outside the site building.

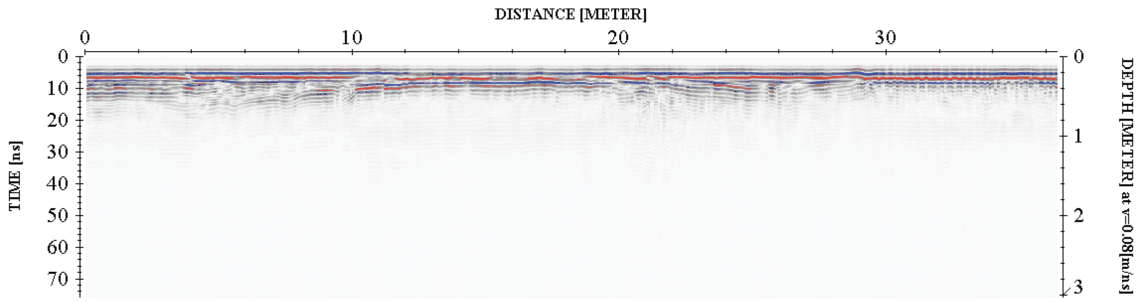
DATA PROCESSING

In order to improve the quality of the results and to better identify subsurface anomalies NOVA processed the collected data. The processes flow is briefly described at this section.

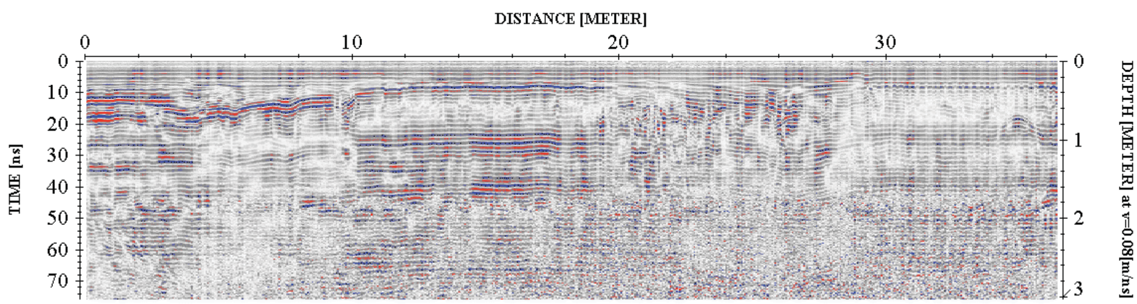
Step 1. Import raw RAMAC data to standard processing format



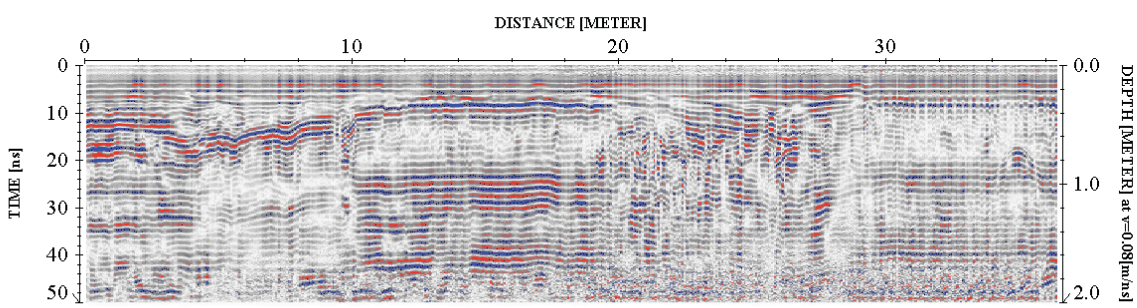
Step 2. Remove instrument noise *(dewow)*



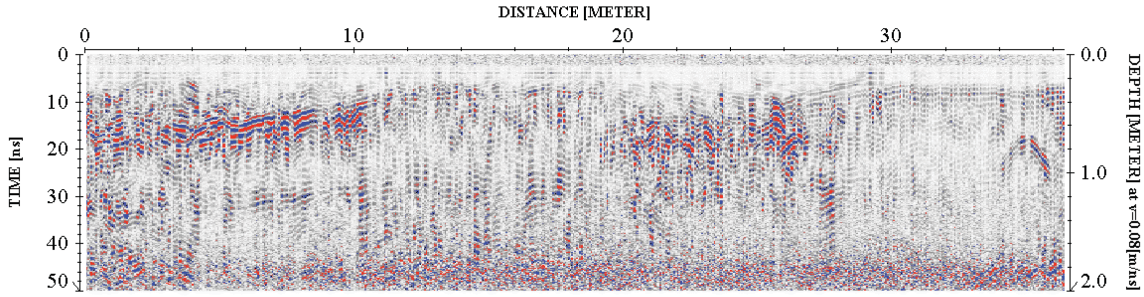
Step 3. Correct for attenuation losses *(energy decay function)*



Step 4. Remove static from bottom of profile *(time cut)*



Step 5. Mute horizontal ringing/noise *(subtracting average)*



The above example shows the significance of data processing. The last image (step 5) has higher resolution than the starting image (raw data – step 1) and describes the subsurface anomalies more accurately.

PHYSICAL SETTINGS

NOVA observed the following physical conditions at the time of the survey:

The weather: Mostly, partly cloudy.
Temp: 43 to 55 degrees
Surface: Concrete paved (indoor) areas and asphalt-paved areas (outside).
Geophysical Noise Level (GNL): Geophysical Noise Level (GNL) was medium due to reinforced concrete slab with rebar and existing metallic settings located throughout of the project site.

RESULTS

The results of the geophysical survey identified following anomalies located at the project Site:

- Geophysical survey identified total of seven major anomalies consistant with underground storage tanks (USTs), were located underneath the concrete floor slab located at the inside the site building.

- Geophysical survey – Electromagnetic & magnetic survey (Ditch witch & TW -6) equipment was used to survey and map drains, piping located throughout of the project site building.

- Geophysical survey identified number of minor anomalies located throughout of the project site.

- Geophysical survey identified utility lines (electric, gas, sewer and water) located along the north, west and south sides of the project site facing Central Park Avenue, Whittier Avenue and Kettle Avenue.

- Geophysical survey identified trace of former utility lines located along the center of the asphalt paved areas facing Kettle Avenue, Whittier Avenue and Central Park Avenue. None of these lines were active at the time of the survey.

- Geophysical Survey Plan portrays the areas investigated during the geophysical survey.

If you have any questions please do not hesitate to contact the undersigned.
Sincerely,

NOVA Geophysical Services

Levent Eskicakit, P.G., E.P.
Project Engineer

Attachments:

Figure 1 Site Location Map
Geophysical Survey Plan
Geophysical Images

FIGURE 1

SITE LOCATION MAP

Yahoo Maps Westchester County, New York

NOVA
Geophysical Services
Subsurface Mapping Solutions
56-01 Marathon Parkway, P.O. Box 765
Douglaston, NY 11362
(718) 261-1527 Fax (718) 261-1528
www.nova-gsi.com

SITE: **Former Stewart Stamping Facility**
630 Central Park Avenue
Yonkers, New York 10704

SCALE: See Map

NOTES

1- All anomalies were marked in the field.
2- Proposed Boring ⊕ locations were cleared and marked in the field.

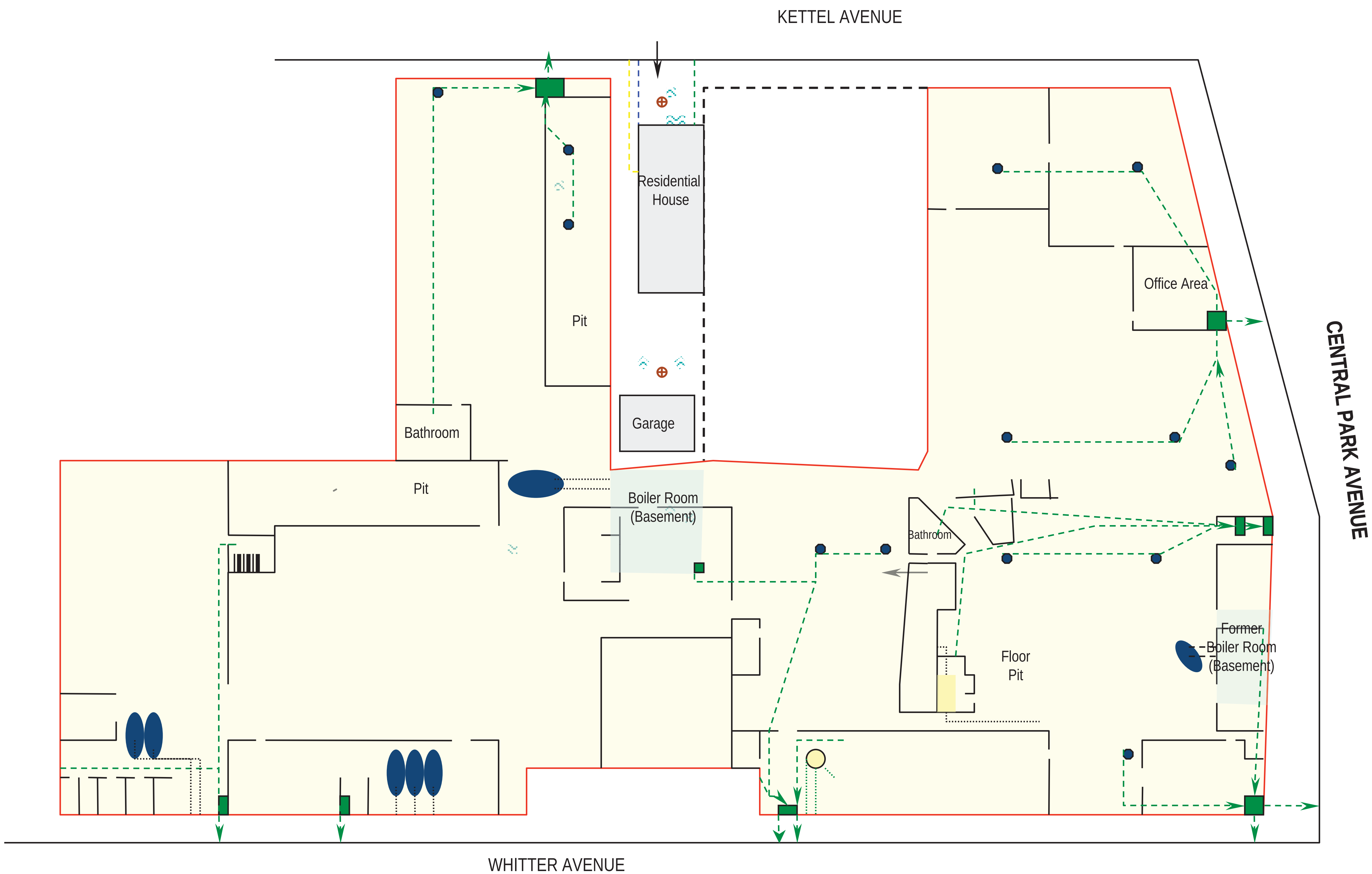
Proposed Soil Sampling Plan

NOVA
Geophysical Services
Subsurface Mapping Solutions
56-01 Marathon Parkway, PO Box 765
Douglaston, New York11362
Phone (347) 556-7787 * Fax (718) 261-1527
www.nova-gsi.com

SITE : **Former Stewart Stamping Facility**
630 Central Park Avenue, Yonkers, New York
CLIENT TRC
SCALE See Map
DATE April 13, 14 & 15, 2011

INFORMATION

GPR/EM Surveyed Areas	Underground Lines/Pipes/Utilities
Proposed Boring Location	Minor / Scattered Anomaly
Anomaly	



NOTES

1- All anomalies were marked in the field.

2- Proposed Boring ⊕ locations were cleared and marked in the field.

GEOPHYSICAL SURVEY PLAN

NOVA
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SITE : **Former Stewart Stamping Facility**
630 Central Park Avenue, Yonkers, New York

CLIENT TRC

SCALE See Map

DATE April 13, 14 & 15, 2011

INFORMATION

GPR/EM Surveyed Areas

UST (Underground Storage Tank)

Sewer Cleanout Locations

Underground Lines/Pipes/Utilities

Minor / Scattered Anomaly

FloorPit

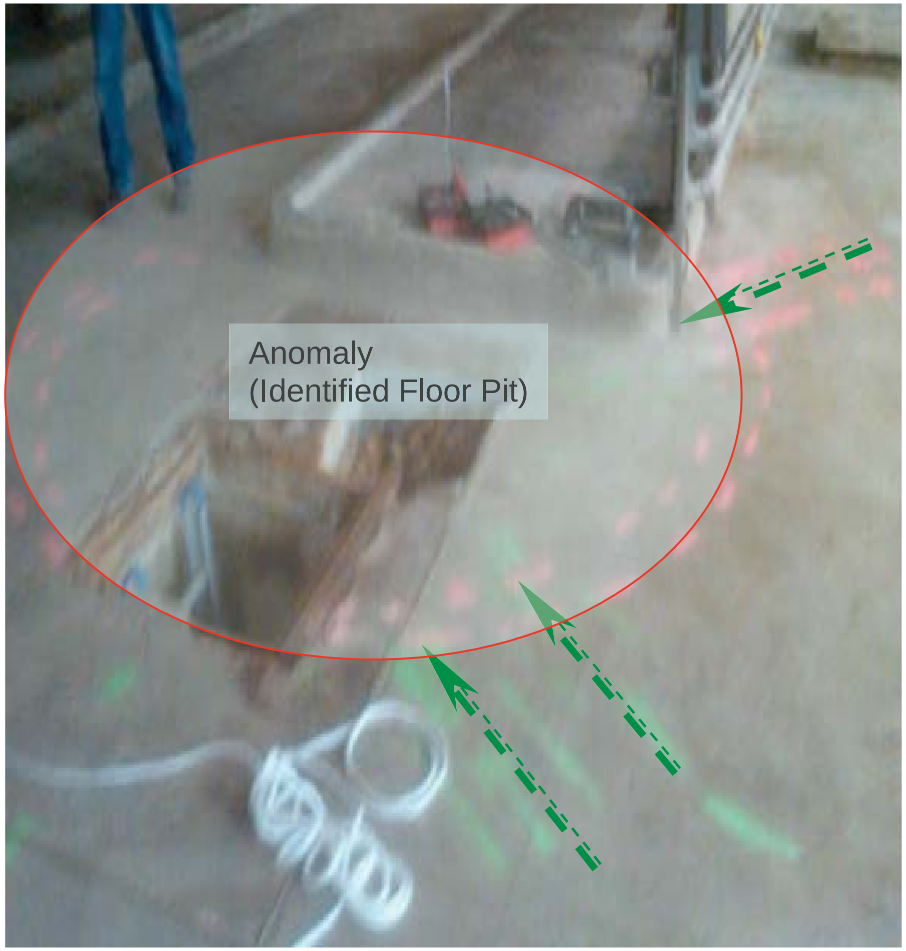
Floor Drain

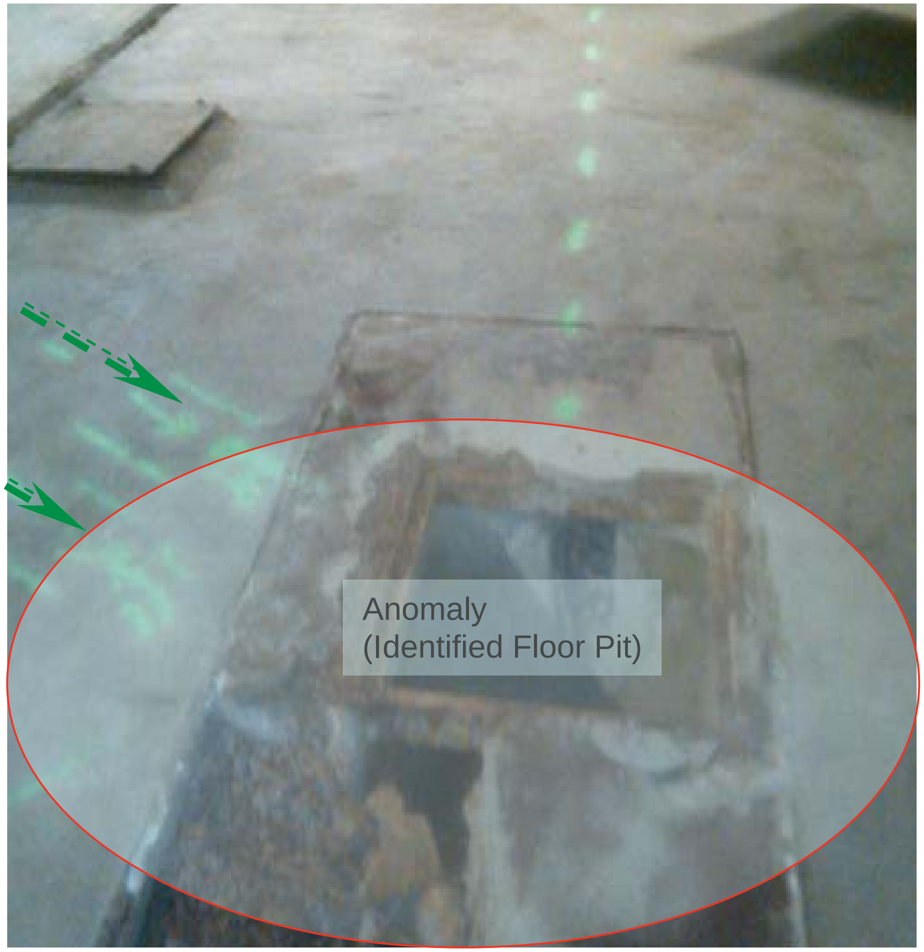
GEOPHYSICAL IMAGES

Former Stewart Stamping Facility

630 Central Park Avenue, Yonkers, New York

April 13, 14 & 15, 2011





GEOPHYSICAL IMAGES

Former Stewart Stamping Facility

630 Central Park Avenue, Yonkers, New York

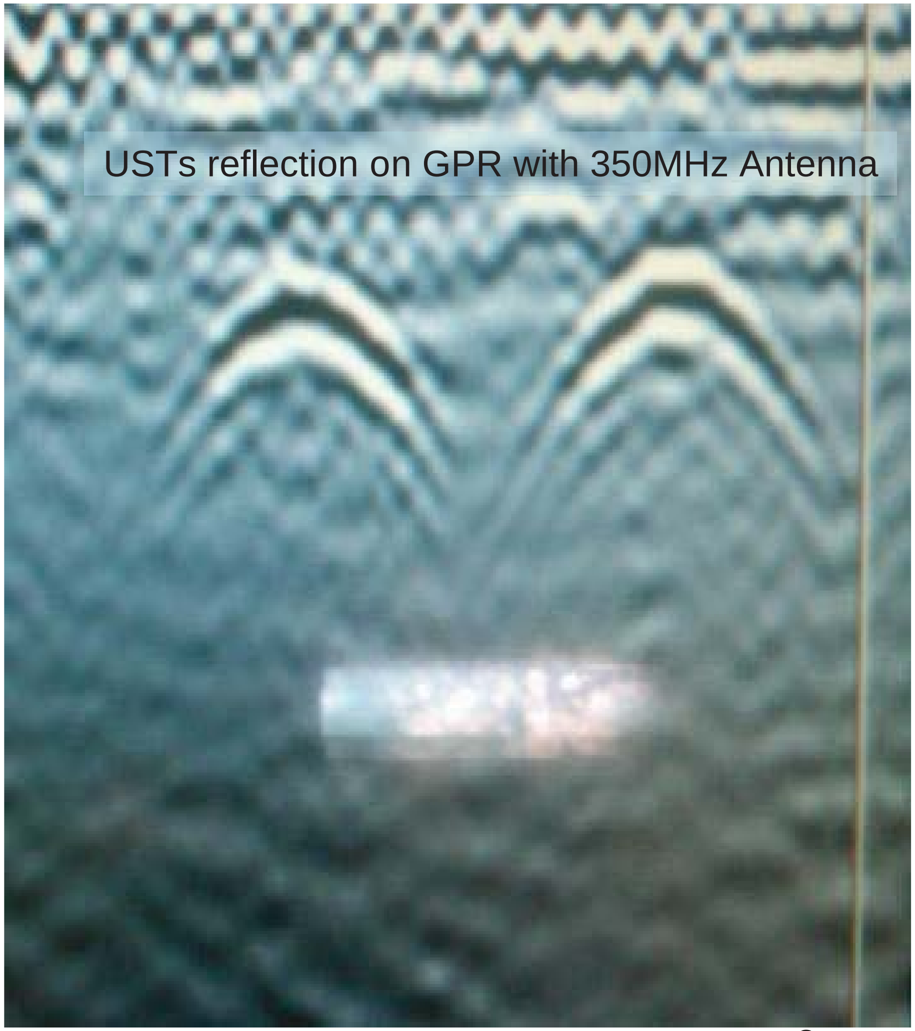
April 13, 14 & 15, 2011

GEOPHYSICAL IMAGES

Former Stewart Stamping Facility

630 Central Park Avenue, Yonkers, New York

April 13, 14 & 15, 2011



GEOPHYSICAL IMAGES

Former Stewart Stamping Facility

630 Central Park Avenue, Yonkers, New York

April 13, 14 & 15, 2011

GEOPHYSICAL IMAGES

Former Stewart Stamping Facility

630 Central Park Avenue, Yonkers, New York

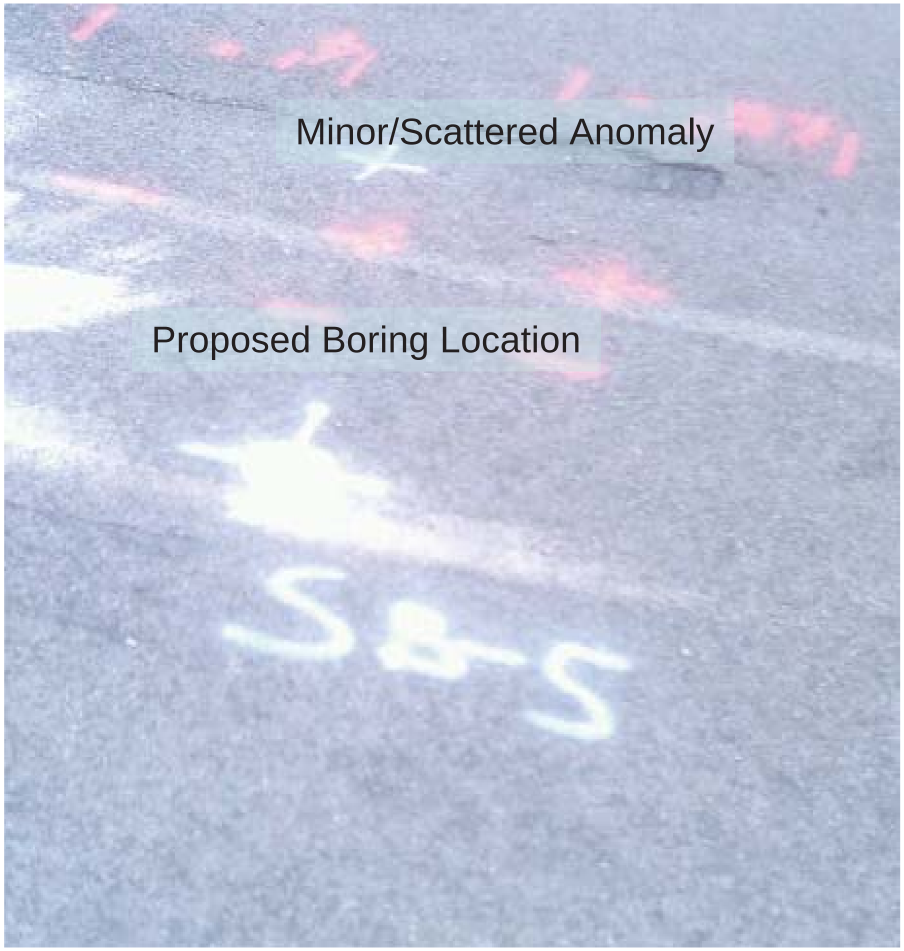
April 13, 14 & 15, 2011

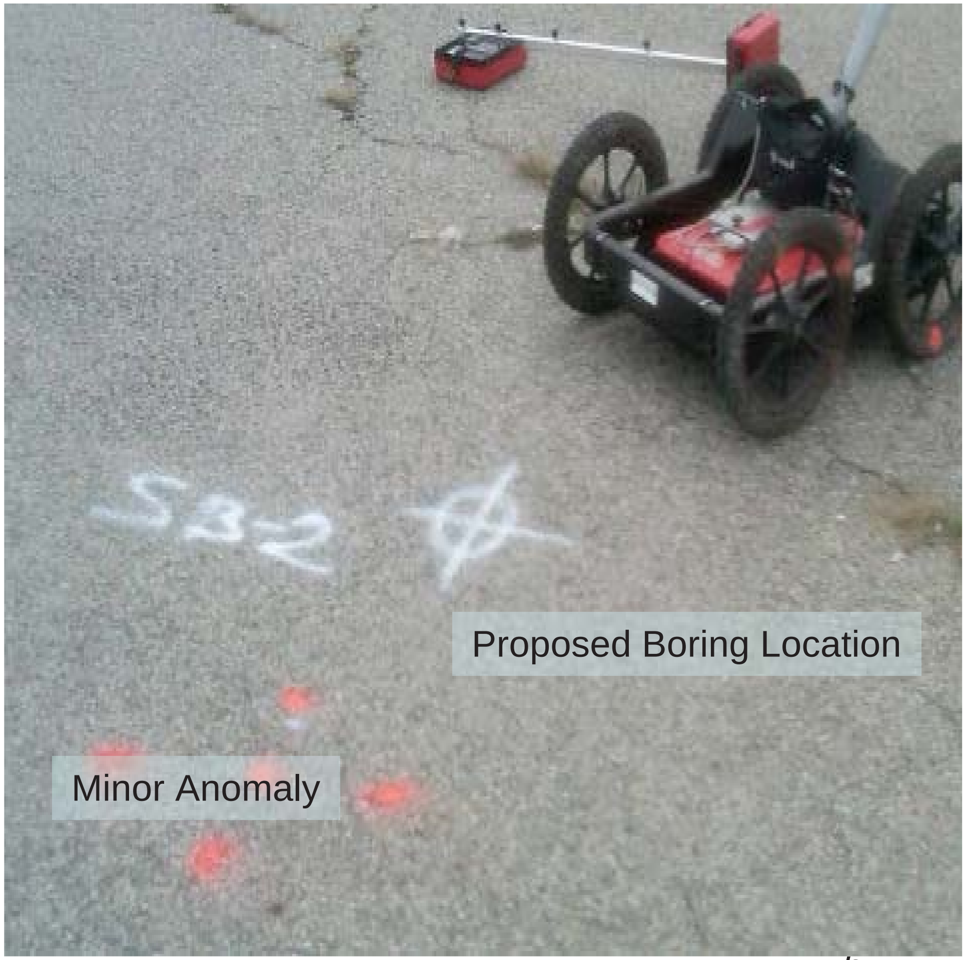
GEOPHYSICAL IMAGES

Former Stewart Stamping Facility

630 Central Park Avenue, Yonkers, New York

April 13, 14 & 15, 2011





GEOPHYSICAL IMAGES

Former Stewart Stamping Facility

630 Central Park Avenue, Yonkers, New York

April 13, 14 & 15, 2011

APPENDIX B

GROUNDWATER SAMPLING LOGS

TRC

Groundwater Sampling Data Record Form

Project:	**Project No.:**	**Date/Time:**	**Sheet 1 of 1**
Stewart EFI, Yonkers, NY	181590.0000.0000	4/18/2011 8:50	

TRC Personnel: Dan Schmidt

Well Identification: MW-1

WELL INTEGRITY

	YES	NO
Protect. Casing Secure	X	
Concrete Collar Intact	X	
PVC Stick-up Intact	X	
Well Cap Present	X	
Security Lock Present		X

Top of Casing Elevation (From Ground Surface): 6" bgs

WELL DIAMETER: [ ] 2 inch [ ] 4 inch [X] 6 inch [ ] 1 inch

Well Depth (ft.): 43.3

Depth to Water (ft): 20.42

Reference Point: [ ] top of riser [X] top of casing [ ] __________

[ ] historical [ ] measured: [ ] notch [X] north side [ ] high pt [ ] pen mark

Depth of pump intake (ft.): 25' Below TOC

Start purge	9:00
Start sample collection	9:57
End sample collection	10:30

PID SCREENING (ppmV)

Background:	0.1	
Well Mouth:	0.2	(if required)

WELL MATERIAL: [ ] PVC [ ] SS [X] Steel

Height of water column (ft.): 22.88

[ ] .16 gal/ft (2 in.)
[ ] .65 gal/ft (4 in.)
[X] 1.47 gal/ft (6 in.)
[ ] ___ gal/ft (__in.)

Volume of Water in Well (gal):	33.6	Depth to NAPL (ft.):	ND
Total Gallons Purged:	~ 4.0	Thickness of NAPL (ft.):	ND

[Vol. = $r^2h(0.041)$]

FIELD WATER QUALITY MEASUREMENTS

Time	9:05	9:10	9:15	9:20	9:25	9:30	9:35	9:40	9:45
Temp. (C.)	15.52	16.35	16.1	16.2	16.24	16.27	16.33	16.39	16.45
Conduct.(ms/cm)	0.283	0.459	0.475	0.287	0.288	0.335	0.384	0.458	0.531
DO (mg/L)	2.86	2.51	2.31	1.81	1.82	1.84	1.9	1.97	2.03
pH (Std.Units)	6.45	6.59	6.63	6.81	6.81	6.75	6.7	6.64	6.61
ORP (millivolts)	80	68	58	47	47	52	57	61	65
Turb. (NTU)	321	96.2	84.4	81.9	68.4	23.9	22.7	6.1	4.0
Salinity	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Flow (ml/min)	250	250	250	250	250	250	250	250	250
Depth to water (ft)	20.47	20.51	20.56	20.6	20.62	20.64	20.66	20.68	20.7
Comments	NO/NS	NO/NS	NO/NS	NO/NS	NO/NS	NO/NS	NO/NS	NO/NS	NO/NS
Color	Lt Brown	Lt Brown	Lt Brown	Lt Brown	Lt Brown	Lt Brown	Lt Brown	Lt Brown	Lt Brown

Time	9:50	9:55	9:56	9:57					
Temp. (C.)	16.47	16.48	16.48	16.49					
Conduct.(umhos/com)	0.577	0.576	0.577	0.577					
DO (mg/L)	2.11	2.12	2.12	2.13					
pH (Std.Units)	6.6	6.6	6.61	6.61					
ORP (millivolts)	70	71	72	72					
Salinity	0.0	0.0	0.0	0.0					
Turb. (NTU)	0.0	0.0	0.0	0.0					
Flow (ml/min)	250	250	250	250					
Depth to water (ft)	20.72	20.74	20.74	20.75					
Comments	NO/NS	NO/NS	NO/NS	NO/NS					
Color	Clear	Clear	Clear	Clear					

Pump Type	Purge	Sample
Peristaltic Pump		
Submersible Pump		
Bladder Pump	X	X
Other:		

Description of Sampling Equipment

Submersible bladder pump, Teflon bladder, 1/4" x 1/4" Teflon-lined tubing

QED backpack sampler, Horiba U-22, Quickfilter 0.45m water filter

Analytical Parameters	Filtered (Y/N)	Preservation	Volume/Containers	Time Collected	Sample ID
VOCs	N	HCl, 4°C	(3) 40 mL VOAs	9:57	MW-1
SVOCs	N	None, 4°C	(2) 950 mL Ambers	9:58	MW-1A
PCBs	N	None, 4°C	(2) 950 mL Ambers		
Pesticides	N	None, 4°C	(2) 950 mL Ambers		
Herbicides	N	None, 4°C	(2) 950 mL Ambers		
Cyanide	Y	NaOH, 4°C	(2) 500 mL Plastic		
Metals	Y	HNO_3, 4°C	(2) 500 mL Plastic		

TRC

Groundwater Sampling Data Record Form

Project: Stewart EFI, Yonkers, NY	**Project No.:** 181590.0000.0000
Date/Time: 4/18/2011 11:45	**Sheet_1__of_1_**
TRC Personnel:	Dan Schmidt

Well Identification: MW-2

WELL INTEGRITY

	YES	NO
Protect. Casing Secure	X	
Concrete Collar Intact	X	
PVC Stick-up Intact	X	
Well Cap Present	X	
Security Lock Present		X

Top of Casing Elevation (From Ground Surface): 6" bgs

WELL DIAMETER: [ ] 2 inch [ ] 4 inch [X] 6 inch [ ] 1 inch

Well Depth (ft): 41.5

Depth to Water (ft): 18.05

Reference Point: [ ] top of riser [X] top of casing [ ] __________

[ ] historical [ ] measured: [ ] notch [X] north side [ ] high pt [ ] pen mark

Depth of pump intake (ft.): 25' Below TOC

Start purge	11:57
Start sample collection	12:39
End sample collection	14:05

PID SCREENING (ppmV)

Background:	0.0	
Well Mouth:	0.1	(if required)

WELL MATERIAL: [ ] PVC [ ] SS [X] Steel

Height of water column (ft.): 23.45

[ ] .16 gal/ft (2 in.) [ ] .65 gal/ft (4 in.) [X] 1.47 gal/ft (6 in.) [ ] ___ gal/ft (__in.)

Volume of Water in Well (gal):	34.5	Depth to NAPL (ft.):	ND
Total Gallons Purged:	~3.0	Thickness of NAPL (ft.):	ND

[Vol. = r²h(0.041)]

FIELD WATER QUALITY MEASUREMENTS

Time	12:02	12:07	12:12	12:17	12:22	12:27	12:32	12:37	12:38
Temp. (C.)	17.23	17.14	17.08	17.04	16.93	16.92	16.91	16.91	16.91
Conduct.(ms/cm)	0.682	0.677	0.67	0.667	0.666	0.665	0.664	0.663	0.663
DO (mg/L)	8.21	7.63	7.5	7.53	7.53	7.57	7.57	7.55	7.55
pH (Std.Units)	6.31	5.63	5.67	5.89	5.99	6.08	6.1	6.11	6.12
ORP (millivolts)	186	226	233	230	227	224	224	222	221
Turb. (NTU)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Salinity	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Flow (ml/min)	250	250	250	250	250	250	250	250	250
Depth to water (ft)	18.07	18.11	18.15	18.19	18.23	18.26	18.29	18.32	18.32
Comments	NO/NS	NO/NS	NO/NS	NO/NS	NO/NS	NO/NS	NO/NS	NO/NS	NO/NS
Color	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear

Time	12:39								
Temp. (C.)	16.91								
Conduct.(umhos/com)	0.662								
DO (mg/L)	7.55								
pH (Std.Units)	6.12								
ORP (millivolts)	221								
Salinity	0.0								
Turb. (NTU)	0.0								
Flow (ml/min)	250								
Depth to water (ft)	18.33								
Comments	NO/NS								
Color	Clear								

Pump Type	Purge	Sample
Peristaltic Pump		
Submersible Pump		
Bladder Pump	X	X
Other:		

Description of Sampling Equipment

Submersible bladder pump, Teflon bladder, 1/4" x 1/4" Teflon-lined tubing

QED backpack sampler, Horiba U-22, Quickfilter 0.45m water filter

Analytical Parameters	Filtered (Y/N)	Preservation	Volume/Containers	Time Collected	Sample ID
VOCs	N	HCl, 4°C	(9) 40 mL VOAs	12:39	MW-2
SVOCs	N	None, 4°C	(6) 950 mL Ambers		
PCBs	N	None, 4°C	(6) 950 mL Ambers		
Pesticides	N	None, 4°C	(6) 950 mL Ambers		
Herbicides	N	None, 4°C	(6) 950 mL Ambers		
Cyanide	Y	NaOH, 4°C	(6) 500 mL Plastic		
Metals	Y	HNO_3, 4°C	(6) 500 mL Plastic		

Note: Two extra volumes were collected for each parameter for MS/MSD analysis.

TRC

Groundwater Sampling Data Record Form

Project:	Project No.:	Date/Time:	Sheet 1 of 1
Stewart EFI, Yonkers, NY	181590.0000.0000	4/19/2011 8:05	

TRC Personnel: Dan Schmidt

Well Identification: MW-3

WELL INTEGRITY

	YES	NO
Protect. Casing Secure	X	
Concrete Collar Intact		X
PVC Stick-up Intact		X
Well Cap Present		X
Security Lock Present		X

Start purge	8:15
Start sample collection	8:57
End sample collection	9:55

PID SCREENING (ppmV)

Background:	0.0	
Well Mouth:	0.0	(if required)

Top of Casing Elevation (From Ground Surface): 2.33' abover ground surface

WELL DIAMETER

	2 inch
	4 inch
X	6 inch
	1 inch

WELL MATERIAL

PVC	SS	Steel
		X

Well Depth (ft.):	161
Depth to Water (ft):	29.92

Reference Point:

	top of riser
X	top of casing
	__________

	historical
	measured:
	notch
X	north side
	high pt
	pen mark

Depth of pump intake (ft.): 35' Below TOC

Height of water column (ft.):	131.08

	.16 gal/ft (2 in.)
	.65 gal/ft (4 in.)
X	1.47 gal/ft (6 in.)
	___ gal/ft (__in.)

Volume of Water in Well (gal):	192.7	Depth to NAPL (ft.):	ND
Total Gallons Purged:	2.5	Thickness of NAPL (ft.):	ND

[Vol. = $r^2h(0.041)$]

FIELD WATER QUALITY MEASUREMENTS

Time	8:20	8:25	8:30	8:35	8:40	8:45	8:50	8:55	8:56
Temp. (C.)	13.99	14.11	14.13	14.06	14.13	14.16	14.15	14.15	14.15
Conduct.(ms/cm)	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24
DO (mg/L)	0.59	0.16	0.06	0.03	0.0	0.0	0.0	0.0	0.0
pH (Std.Units)	7.04	7.07	7.12	7.16	7.16	7.2	7.19	7.18	7.18
ORP (millivolts)	-28	-33	-37	-38	-41	-46	-42	-41	-40
Turb. (NTU)	14.9	13.8	13.1	15.1	13.1	18.1	16.5	16.5	16.6
Salinity	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Flow (ml/min)	175	175	175	175	175	175	175	175	175
Depth to water (ft)	29.95	29.97	29.99	30.01	30.03	30.05	30.07	30.09	30.09
Comments	NO/NS	NO/NS	NO/NS	NO/NS	NO/NS	NO/NS	NO/NS	NO/NS	NO/NS
Color	LT Brown	LT Brown	LT Brown	LT Brown	LT Brown	LT Brown	LT Brown	LT Brown	LT Brown
Time	8:57								
Temp. (C.)	14.14								
Conduct.(umhos/com)	1.24								
DO (mg/L)	0.0								
pH (Std.Units)	7.18								
ORP (millivolts)	-40								
Salinity	0.1								
Turb. (NTU)	16.6								
Flow (ml/min)	175								
Depth to water (ft)	30.1								
Comments	NO/NS								
Color	Clear								

Pump Type	Purge	Sample
Peristaltic Pump		
Submersible Pump		
Bladder Pump	X	X
Other:		

Description of Sampling Equipment

Submersible bladder pump, Teflon bladder, 1/4" x 1/4" Teflon-lined tubing

QED backpack sampler, Horiba U-22, Quickfilter 0.45m water filter

Analytical Parameters	Filtered (Y/N)	Preservation	Volume/Containers	Time Collected	Sample ID
VOCs	N	HCl, 4°C	(3) 40 mL VOAs	8:57	MW-3
SVOCs	N	None, 4°C	(2) 950 mL Ambers		
PCBs	N	None, 4°C	(2) 950 mL Ambers		
Pesticides	N	None, 4°C	(2) 950 mL Ambers		
Herbicides	N	None, 4°C	(2) 950 mL Ambers		
Cyanide	Y	NaOH,4°C	(2) 500 mL Plastic		
Metals	Y	HNO_3, 4°C	(2) 500 mL Plastic		

TRC

Groundwater Sampling Data Record Form

Project: Stewart EFI, Yonkers, NY

Project No.: 181590.0000.0000

Date/Time: 4/15/2011 13:00

Sheet_1__of_1_

TRC Personnel: Dan Schmidt

Well Identification: MW-4

WELL INTEGRITY

	YES	NO
Protect. Casing Secure	X	
Concrete Collar Intact	X	
PVC Stick-up Intact	X	
Well Cap Present	X	
Security Lock Present		X

Start purge	13:25
Start sample collection	13:57
End sample collection	14:30

PID SCREENING (ppmV)

Background:	0.0	
Well Mouth:	0.1	(if required)

Top of Casing Elevation (From Ground Surface)

6" bgs

WELL DIAMETER

	2 inch
	4 inch
X	6 inch
	1 inch

WELL MATERIAL

PVC	SS	Steel
		X

Well Depth (ft.):	50.7
Depth to Water (ft):	29.08

Reference Point:

	top of riser
X	top of casing
	___________

	historical
	measured:
	notch
X	north side
	high pt
	pen mark

Depth of pump intake (ft.): 35' Below TOC

	.16 gal/ft (2 in.)
	.65 gal/ft (4 in.)
X	1.5 gal/ft (6 in.)
	___ gal/ft (__in.)

Height of water column (ft.):	21.62
Volume of Water in Well (gal):	31.8
Total Gallons Purged:	~2.5

[Vol. = $r^2h(0.041)$]

Depth to NAPL (ft.):	ND
Thickness of NAPL (ft.):	ND

FIELD WATER QUALITY MEASUREMENTS

Time	13:30	13:35	13:40	13:45	13:50	13:55	13:56	13:57	
Temp. (C.)	15.64	15.63	15.62	15.63	15.63	15.64	15.61	15.6	
Conduct.(ms/cm)	1.62	1.63	1.64	1.63	1.64	1.64	1.64	1.64	
DO (mg/L)	2.53	1.47	1.39	1.24	1.16	1.12	1.12	1.12	
pH (Std.Units)	6.19	6.21	6.22	6.23	6.23	6.23	6.24	6.24	
ORP (millivolts)	152	152	154	155	156	156	1.57	157	
Turb. (NTU)	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Salinity	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
Flow (ml/min)	250	250	250	250	250	250	250	250	
Depth to water (ft)	NA	NA	NA	NA	NA	NA	NA	NA	
Comments	NO/NS	NO/NS	NO/NS	NO/NS	NO/NS	NO/NS	NO/NS	NO/NS	
Color	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	

Time									
Temp. (C.)									
Conduct.(umhos/com)									
DO (mg/L)									
pH (Std.Units)									
ORP (millivolts)									
Salinity									
Turb. (NTU)									
Flow (ml/min)									
Depth to water (ft)									
Comments									
Color									

Pump Type	Purge	Sample
Peristaltic Pump		
Submersible Pump		
Bladder Pump	X	X
Other:		

Description of Sampling Equipment

Submersible bladder pump, Teflon bladder, 1/4" x 1/4" Teflon-lined tubing

QED backpack sampler, Horiba U-22, Quickfilter 0.45m water filter

Analytical Parameters	Filtered (Y/N)	Preservation	Volume/Containers	Time Collected	Sample ID
VOCs	N	HCl, 4°C	(3) 40 mL VOAs	13:57	MW-4
SVOCs	N	None, 4°C	(2) 950 mL Ambers		
PCBs	N	None, 4°C	(2) 950 mL Ambers		
Pesticides	N	None, 4°C	(2) 950 mL Ambers		
Herbicides	N	None, 4°C	(2) 950 mL Ambers		
Cyanide	Y	NaOH, 4°C	(2) 500 mL Plastic		
Metals	Y	HNO_3, 4°C	(2) 500 mL Plastic		

TRC

Groundwater Sampling Data Record Form

Project: Stewart EFI, Yonkers, NY

Project No.: 181590.0000.0000

Date/Time: 4/19/2011 10:42

Sheet 1 **of** 1

TRC Personnel: Dan Schmidt

Well Identification: MW-5

WELL INTEGRITY

	YES	NO
Protect. Casing Secure	X	
Concrete Collar Intact	X	
PVC Stick-up Intact	X	
Well Cap Present	X	
Security Lock Present		X

Top of Casing Elevation (From Ground Surface): 6" bgs

WELL DIAMETER: [ ] 2 inch [ ] 4 inch [X] 6 inch [ ] 1 inch

Well Depth (ft.): 34.96

Depth to Water (ft): 12.4

Reference Point: [ ] top of riser [X] top of casing [ ] ___________

[ ] historical [ ] measured: [ ] notch [X] north side [ ] high pt [ ] pen mark

Depth of pump intake (ft.): 18' Below TOC

Start purge	11:00
Start sample collection	11:37
End sample collection	12:05

WELL MATERIAL: [ ] PVC [ ] SS [X] Steel

Height of water column (ft.): 22.56

[ ] .16 gal/ft (2 in.) [ ] .65 gal/ft (4 in.) [X] 1.5 gal/ft (6 in.) [ ] ___ gal/ft (__in.)

PID SCREENING (ppmV)

Background:	0.0
Well Mouth:	0.0 (if required)

Volume of Water in Well (gal): 33.2

Total Gallons Purged: ~3.0

[Vol. = $r^2h(0.041)$]

Depth to NAPL (ft.): ND

Thickness of NAPL (ft.): ND

FIELD WATER QUALITY MEASUREMENTS

Time	11:05	11:10	11:15	11:20	11:25	11:30	11:35	11:36	11:37
Temp. (C.)	12.53	12.6	12.65	12.67	12.69	12.71	12.68	12.68	12.68
Conduct.(ms/cm)	0.223	0.222	0.222	0.222	0.223	0.224	0.224	0.224	0.225
DO (mg/L)	11.52	10.76	9.94	9.63	8.41	7.84	7.83	7.8	7.8
pH (Std.Units)	5.79	6.09	6.07	6.07	6.11	6.1	6.11	6.1	6.1
ORP (millivolts)	179	173	174	176	177	179	180	180	180
Turb. (NTU)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Salinity	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Flow (ml/min)	250	250	250	250	250	250	250	250	250
Depth to water (ft)	12.47	12.49	12.51	12.53	12.55	12.57	12.59	12.59	12.59
Comments	NO/NS	NO/NS	NO/NS	NO/NS	NO/NS	NO/NS	NO/NS	NO/NS	NO/NS
Color	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear

Time									
Temp. (C.)									
Conduct.(umhos/com)									
DO (mg/L)									
pH (Std.Units)									
ORP (millivolts)									
Salinity									
Turb. (NTU)									
Flow (ml/min)									
Depth to water (ft)									
Comments									
Color									

Pump Type	Purge	Sample
Peristaltic Pump		
Submersible Pump		
Bladder Pump	X	X
Other:		

Description of Sampling Equipment

Submersible bladder pump, Teflon bladder, 1/4" x 1/4" Teflon-lined tubing

QED backpack sampler, Horiba U-22, Quickfilter 0.45m water filter

Analytical Parameters	Filtered (Y/N)	Preservation	Volume/Containers	Time Collected	Sample ID
VOCs	N	HCl, 4°C	(3) 40 mL VOAs	11:37	MW-5
SVOCs	N	None, 4°C	(2) 950 mL Ambers		
PCBs	N	None, 4°C	(2) 950 mL Ambers		
Pesticides	N	None, 4°C	(2) 950 mL Ambers		
Herbicides	N	None, 4°C	(2) 950 mL Ambers		
Cyanide	Y	NaOH, 4°C	(2) 500 mL Plastic		
Metals	Y	HNO_3, 4°C	(2) 500 mL Plastic		

APPENDIX C

SOIL BORING LOGS

TRC	TRC Engineers, Inc. 1430 Broadway, 10th Floor New York, New York 10018 Phone 212 221 7822	**BORING LOG**	**BORING** TRC-SB1 **SHEET 1 OF 1**
JOB NAME/ CLIENT Stewart EFI	**PROJECT NO.** 181590.0000.0000	**AREA OF CONCERN** Block 6342 Lot 5	
ADDRESS 630 Central Park Avenue, Yonkers, NY		**ELEVATION/DATUM** 230.94/NAVD 1988	
DRILLING CONTRACTOR Aquifer, Drilling, and Testing, Inc.	**DRILLER** Jeremy Meyers	**INSPECTOR** W. Lindemuth	
DRILLING RIG Truck Mounted Geoprobe	**TYPE/SIZE BIT** 6610 DT 2"x60" Macrocore	**START DATE** 4/18/2011	**END DATE** 4/18/2011
SAMPLER TYPE Macrocore	**HAMMER WEIGHT/DROP** NA	**TOTAL DEPTH** 17' bgs	**WATER LEVEL** ND

SAMPLES				DESCRIPTION OF SOILS	REMARKS
NUMBER	RECOVERY IN FEET	DEPTH	WATER	(SAA = Same As Above) f - fine m - medium c - coarse lt - light dk - dark tr - trace ltl - little	(PID, STAINING, ODORS, ETC.) FP = Free Product N/S = No Staining, N/O = No odors SO = Slight Odor, MO = Moderate Odor STO = Strong Odor
1	2.5	2.5		0-0.5': Black asphalt black top and gravel sub base (dry) 0.5-2.5': Brown silt, some f-c sand, ltl clay, tr f-c gravel (moist)	PID = 0.1 ppm, N/S, N/O PID = 0.1 ppm, N/S, N/O Sample: TRC-SB1(6-8")
		5.0			
2	3.1	7.5		0-3.1': Brown f-c sand, some silt, tr f-c gravel (moist)	PID = 0.1 ppm, N/S, N/O
		10.0			
3	3.2	12.5		0-3.2': Brown f-c sand, some silt, tr f-c gravel (moist)	PID = 0.0 ppm, N/S, N/O
		15.0			
4	3.1	17.5		0-2.1': Brown f-c sand, some silt, tr f-c gravel (moist) 2.1-3.1': Brown gray crushed bedrock <weathered bedrock> (dry)	PID = 0.0 ppm, N/S, N/O PID = 0.0 ppm, N/S, N/O Sample: TRC-SB1(15-17')
				End of boring at 17' bgs at refusal.	
		20.0			

TRC Engineers, Inc.
1430 Broadway, 10th Floor
New York, New York 10018
Phone 212 221 7822

BORING LOG

BORING TRC-SB2
SHEET 1 OF 1

JOB NAME/ CLIENT	**PROJECT NO.**	**AREA OF CONCERN**	
Stewart EFI	181590.0000.0000	Block 6342 Lot 5	
ADDRESS		**ELEVATION/DATUM**	
630 Central Park Avenue, Yonkers, NY		230.38/NAVD 1988	
DRILLING CONTRACTOR	**DRILLER**	**INSPECTOR**	
Aquifer, Drilling, and Testing, Inc.	Jeremy Meyers	W. Lindemuth	
DRILLING RIG	**TYPE/SIZE BIT**	**START DATE**	**END DATE**
Geoprobe 6610 DT	2"x60" Macrocore	4/18/2011	4/18/2011
SAMPLER TYPE	**HAMMER WEIGHT/DROP**	**TOTAL DEPTH**	**WATER LEVEL**
Macrocore	NA	16' bgs	ND

SAMPLES: NUMBER	SAMPLES: RECOVERY IN FEET	DEPTH	WATER	DESCRIPTION OF SOILS (SAA = Same As Above) f - fine m - medium c - coarse lt - light dk - dark tr - trace ltl - little	REMARKS (PID, STAINING, ODORS, ETC.) FP = Free Product N/S = No Staining, N/O = No odors SO = Slight Odor, MO = Moderate Odor STO = Strong Odor
1	3.6	2.5		0-0.5': Black asphalt and gravel sub base (dry) 0.5-2.0': Black silt and f-c sand, tr wood, red brick, ash <fill> (moist) 2-3.6': Light brown silt and clay, ltl f-c sand (moist)	PID = 0.1 ppm, N/S, N/O PID = 0.0 ppm, N/S, N/O PID = 0.0 ppm, N/S, N/O Sample: TRC-SB2(6-8") Sample: TRC-SB2(6-8")A
2	3.8	5.0 7.5		0-3.8': Light brown silt and f-c sand, ltl clay, tr f-c gravel (moist)	PID = 0.1 ppm, N/S, N/O
3	4.1	10.0 12.5		0-4.1': Light brown silt and f-c sand, tr f-c gravel (moist)	PID = 0.0 ppm, N/S, N/O
4	1	15.0 17.5 20.0		0-1.0': Light brown f-c sand, ltl silt (moist) End of boring at 16' bgs at refusal. Crushed weathered bedrock in shoe of sampler	PID = 0.0 ppm, N/S, N/O Sample: TRC-SB2(14-16')

TRC Engineers, Inc.
1430 Broadway, 10th Floor
New York, New York 10018
Phone 212 221 7822

BORING LOG

BORING TRC-SB3

SHEET 1 OF 1

JOB NAME/ CLIENT Stewart EFI	**PROJECT NO.** 181590.0000.0000	**AREA OF CONCERN** Block 6343 Lot 51	
ADDRESS 630 Central Park Avenue, Yonkers, NY		**ELEVATION/DATUM** 226.20/NAVD 1988	
DRILLING CONTRACTOR Aquifer, Drilling, and Testing, Inc.	**DRILLER** Jeremy Meyers	**INSPECTOR** W. Lindemuth	
DRILLING RIG Geoprobe 6610 DT	**TYPE/SIZE BIT** 2"x60" Macrocore	**START DATE** 4/18/2011	**END DATE** 4/18/2011
SAMPLER TYPE Macrocore	**HAMMER WEIGHT/DROP** NA	**TOTAL DEPTH** 12' bgs	**WATER LEVEL** ND

SAMPLES: NUMBER	SAMPLES: RECOVERY IN FEET	DEPTH	WATER	DESCRIPTION OF SOILS (SAA = Same As Above) f - fine m - medium c - coarse lt - light dk - dark tr - trace ltl - little	REMARKS (PID, STAINING, ODORS, ETC.) FP = Free Product N/S = No Staining, N/O = No odors SO = Slight Odor, MO = Moderate Odor STO = Strong Odor
1	2.8	2.5		0-2": Vegetative layer <grass> silt (moist) 2"-1': Brown silt and clay, tr organic <roots> (moist) 1-1.5': Brown Silt and clay, tr red brick (moist) 1.5-2.8': Brown silt and clay (moist)	PID = 0.3 ppm, N/S, N/O PID = 0.3 ppm, N/S, N/O PID = 5.7 ppm, N/S, N/O PID = 0.5 ppm, N/S, N/O Sample: TRC-SB3(2-4") Sample: TRC-SB3(2-4')
		5.0			
2	3.2	7.5		0-1.8': Brown/orange f-c sand and some silt (moist) 1.8-3.2': Brown, white, gray crushed weathered bedrock (dry)	PID = 0.0 ppm, N/S, N/O PID = 0.0 ppm, N/S, N/O Sample: TRC-SB3(4-6')
		10.0		0-3': Brown, white, gray crushed weathered bedrock (dry)	PID = 0.0 ppm, N/S, N/O
3	3	12.5		End of boring at 12' bgs at refusal.	
		15.0			
		17.5			
		20.0			

TRC Engineers, Inc.
1430 Broadway, 10th Floor
New York, New York 10018
Phone 212 221 7822

BORING LOG

BORING TRC-SB4
SHEET 1 OF 1

JOB NAME/ CLIENT Stewart EFI	**PROJECT NO.** 181590.0000.0000	**AREA OF CONCERN** Block 6343 Lot 51	
ADDRESS 630 Central Park Avenue, Yonkers, NY		**ELEVATION/DATUM** 224.58/NAVD 1988	
DRILLING CONTRACTOR Aquifer, Drilling, and Testing, Inc.	**DRILLER** Jeremy Meyers	**INSPECTOR** W. Lindemuth	
DRILLING RIG Geoprobe 6610 DT	**TYPE/SIZE BIT** 2"x60" Macrocore	**START DATE** 4/19/2011	**END DATE** 4/19/2011
SAMPLER TYPE Macrocore	**HAMMER WEIGHT/DROP** NA	**TOTAL DEPTH** 12' bgs	**WATER LEVEL** ND

SAMPLES: NUMBER	SAMPLES: RECOVERY IN FEET	DEPTH	WATER	DESCRIPTION OF SOILS (SAA = Same As Above) f - fine m - medium c - coarse lt - light dk - dark tr - trace ltl - little	REMARKS (PID, STAINING, ODORS, ETC.) FP = Free Product N/S = No Staining, N/O = No odors SO = Slight Odor, MO = Moderate Odor STO = Strong Odor
1	3.5	2.5		0-1': Asphalt, c gravel and cobbles, some silt (dry) 1-3.5': Light brown silt and clay (moist)	PID = 0.0 ppm, N/S, N/O PID = 0.0 ppm, N/S, N/O Sample: TRC-SB4(12-14")
2	4.1	5.0 7.5		0-1': Light brown silt and clay (moist) 1-3': Brown f-c sand, some silt (moist) 3-4.1': Brown, gray, white crushed weathered bedrock (moist)	PID = 0.0 ppm, N/S, N/O PID = 0.0 ppm, N/S, N/O PID = 0.0 ppm, N/S, N/O
3	1.9	10.0 12.5		0-1.9': Brown, white, gray crushed weathered bedrock (moist)	PID = 0.0 ppm, N/S, N/O Sample: TRC-SB4(10-12')
				End of boring at 12' bgs at refusal.	
		15.0 17.5 20.0			

TRC Engineers, Inc.
1430 Broadway, 10th Floor
New York, New York 10018
Phone 212 221 7822

BORING LOG

BORING TRC-SB5

SHEET 1 OF 1

JOB NAME/ CLIENT Stewart EFI	**PROJECT NO.** 181590.0000.0000	**AREA OF CONCERN** Block 6344 Lots 1 and 2	
ADDRESS 630 Central Park Avenue, Yonkers, NY		**ELEVATION/DATUM** 217.15/NAVD 1988	
DRILLING CONTRACTOR Aquifer, Drilling, and Testing, Inc.	**DRILLER** Jeremy Meyers	**INSPECTOR** W. Lindemuth	
DRILLING RIG Geoprobe 6610 DT	**TYPE/SIZE BIT** 2"x60" Macrocore	**START DATE** 4/19/2011	**END DATE** 4/19/2011
SAMPLER TYPE Macrocore	**HAMMER WEIGHT/DROP** NA	**TOTAL DEPTH** 12' bgs	**WATER LEVEL** ND

SAMPLES: NUMBER	SAMPLES: RECOVERY IN FEET	DEPTH	WATER	DESCRIPTION OF SOILS (SAA = Same As Above) f - fine m - medium c - coarse lt - light dk - dark tr - trace ltl - little	REMARKS (PID, STAINING, ODORS, ETC.) FP = Free Product N/S = No Staining, N/O = No odors SO = Slight Odor, MO = Moderate Odor STO = Strong Odor
1	3	2.5		0-5': Asphalt and gravel sub base (dry) 0.5-3': Brown silt and f-c sand, ltl f-c gravel, tr concrete, red brick, wood, ash <fill> (moist)	PID = 0.0 ppm, N/S, N/O PID = 0.0 ppm, N/S, N/O PID = 0.0 ppm, N/S, N/O Sample: TRC-SB5(6-8")
		5.0			
2	1.8	7.5		0-1.8': Brown-gray ash and wood, some f-c gravel, ltl f-c sand, tr silt, glass <fill> (moist)	PID = 0.0 ppm, N/S, N/O
		10.0		0-0.8': Light brown f-c sand and f-c gravel, some wood, ltl ash, tr red brick <fill> (dry)	PID = 0.0 ppm, N/S, N/O Sample: TRC-SB5(10-12')
3	0.8	12.5		End of boring at 12' bgs at refusal.	
		15.0			
		17.5			
		20.0			

TRC Engineers, Inc.
1430 Broadway, 10th Floor
New York, New York 10018
Phone 212 221 7822

BORING LOG

BORING TRC-SB6

SHEET 1 OF 1

JOB NAME/ CLIENT Stewart EFI	**PROJECT NO.** 181590.0000.0000	**AREA OF CONCERN** Block 6344 Lots 1 and 2	
ADDRESS 630 Central Park Avenue, Yonkers, NY		**ELEVATION/DATUM** 215.46/NAVD 1988	
DRILLING CONTRACTOR Aquifer, Drilling, and Testing, Inc.	**DRILLER** Jeremy Meyers	**INSPECTOR** W. Lindemuth	
DRILLING RIG Geoprobe 6610 DT	**TYPE/SIZE BIT** 2"x60" Macrocore	**START DATE** 4/19/2011	**END DATE** 4/19/2011
SAMPLER TYPE Macrocore	**HAMMER WEIGHT/DROP** NA	**TOTAL DEPTH** 14' bgs	**WATER LEVEL** ND

SAMPLES: NUMBER	SAMPLES: RECOVERY IN FEET	DEPTH	WATER	DESCRIPTION OF SOILS (SAA = Same As Above) f - fine m - medium c - coarse lt - light dk - dark tr - trace ltl - little	REMARKS (PID, STAINING, ODORS, ETC.) FP = Free Product N/S = No Staining, N/O = No odors SO = Slight Odor, MO = Moderate Odor STO = Strong Odor
1	2	2.5		0-2': Brown/black silt and f-c gravel, some red brick, ltl ash, tr wood <fill> (moist)	PID = 0.0 ppm, N/S, N/O Sample: TRC-SB6(6-8")
2	4.1	5.0 7.5		0-4.1': Gray/white crushed weathered bedrock, ltl silt (dry)	PID = 0.0 ppm, N/S, N/O
3	4	10.0 12.5		0-4': Grey/white crushed weathered bedrock (dry)	PID = 0.0 ppm, N/S, N/O Sample: TRC-SB6(12-14')
				End of boring at 14' bgs at refusal.	
		15.0 17.5 20.0			

APPENDIX D

PHOTOGRAPH LOG

PHOTOGRAPH LOG

Photo No.	Description	Date
Photo No.1	**Description:** View of the sump in the plating room.	**Date: 4/14/11**

Photo No.	Description	Date
Photo No.2	**Description:** View of the inside of the sump in the plating room.	**Date: 4/13/11**

PHOTOGRAPH LOG

Photo No.3	**Description:** View of drain pipe entering the sump in the plating room.	**Date:** 4/13/11
		
Photo No.4	**Description:** View of a pit containing sludge in the plating room. TRC collected sample TRC-Sludge-1.	**Date:** 4/14/11
		

PHOTOGRAPH LOG

Photo No.5	**Description:** View of two sumps located in the tumbling room.	**Date: 4/13/11**

Photo No.6	**Description:** View of a trench drain leading to a sump (typical).	**Date: 4/13/11**

PHOTOGRAPH LOG

<table>
<tr><td>Photo No.7</td><td>Description: View of sump constructed with a polyethylene 55-gallon drum set into the floor with no drain (typical).</td><td>Date:
4/13/11</td></tr>
<tr><td colspan="3"></td></tr>
<tr><td>Photo No.8</td><td>Description: View of in floor oil water separator.</td><td>Date:
4/13/11</td></tr>
<tr><td colspan="3"></td></tr>
</table>

PHOTOGRAPH LOG

Photo No.9	**Description:** View of a six inch diameter floor drain (typical).	**Date:** **4/13/11**

Photo No.10	**Description:** View of sanitary sewer house trap (typical).	**Date:** **4/13/11**

PHOTOGRAPH LOG

Photo No.11	**Description:** View of the wastewater treatment system discharge pipe pit.	**Date:** 4/14/11
		
Photo No.12	**Description:** View of sump with drain located along the north side of the building.	**Date:** 4/14/11
		

PHOTOGRAPH LOG

Photo No.13	**Description:** View of existing groundwater monitoring well MW-3.	**Date: 4/14/11**
		
Photo No.14	**Description:** View of soil boring installation activities at soil boring location TRC-SB2 (typical).	**Date: 4/18/11**
		

PHOTOGRAPH LOG

Photo No.15	**Description:** View of soil boring location TRC-SB3 installed in the grass area south of the residential house.	**Date:** **4/18/11**

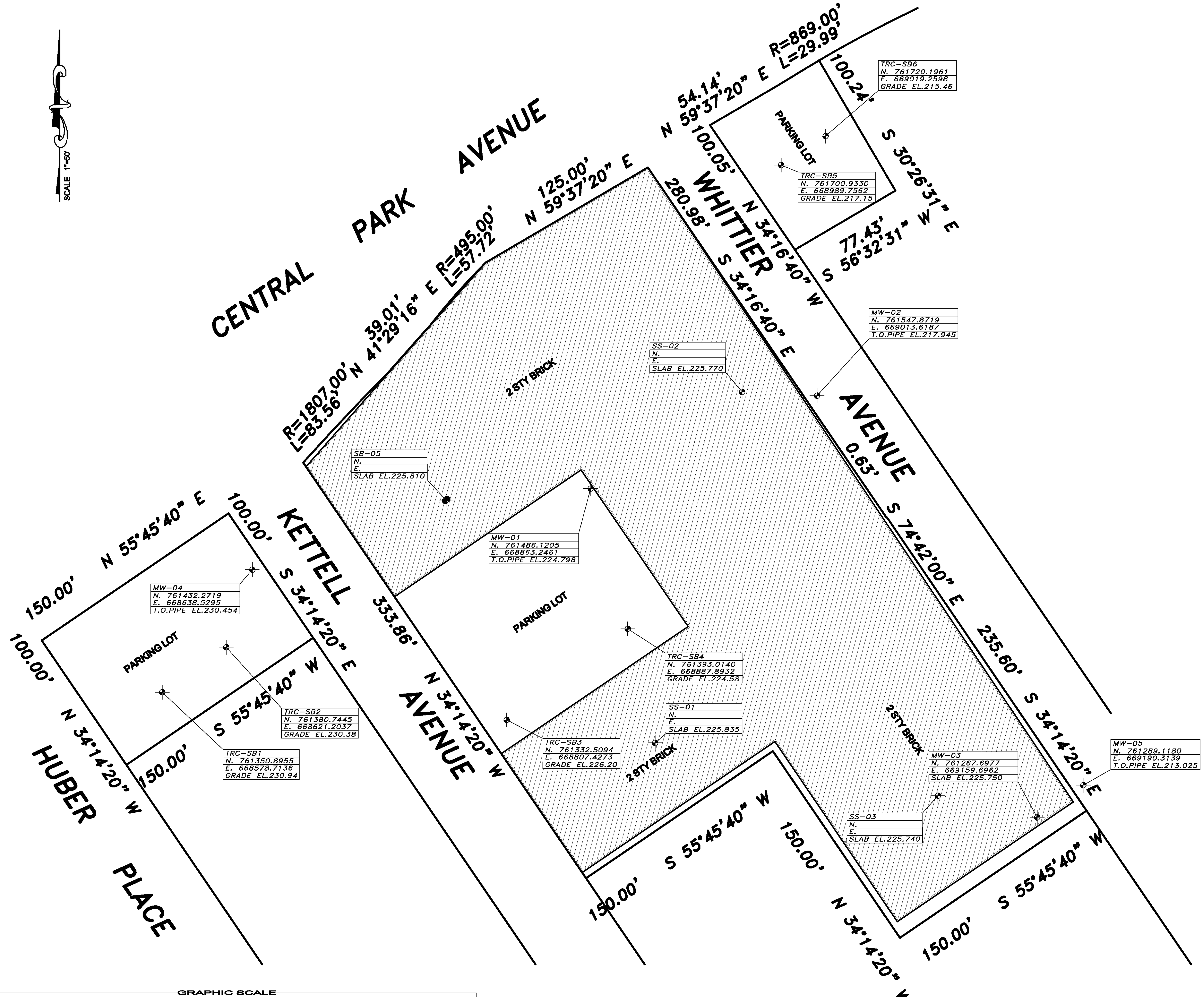
Photo No.16	**Description:** View of two labeled 55-gallon DOT drums containing groundwater generated during groundwater sample collection and two empty drums.	**Date:** **4/19/11**

APPENDIX E

SITE SURVEY MAP

JOB NO. W 6343-1-MW

SURVEYED ON: APRLL 25, 2011



GRAPHIC SCALE

ALL WRITTEN MEASUREMENTS AND OFFSETS NOTED ON THIS SURVEY SUPERSEDE MEASUREMENTS SCALED OF THIS PLOT.

SCALE 1:20

0 5 10 15 20 25 30 35 40 45 50 100

SYMBOLS AND ABBREVIATIONS

FENCE	CH.L.FE. / WOOD FE.
UTILITY POLE	U.P.
PARKING METER	P.M.
OIL FILL	O.F.
TRAFFIC LIGHT	T.L.
LIGHT	
STREET LIGHT	L.P.
FIRE HYDRANT	HYD.
SIAMESE CONNECTION	SPR.
SHUT OFF VALVE	G.V. / G.V. / W.V. / W.V.
HANDICAPPED PARKING	
EXISTING TREE	#12"
DRAINS	DR. / DR.
ROOF OVER	R.O.
EXISTING ELEVATIONS	TOP OF CURB / BOTTOM OF CURB
CITY ESTABLISHED GRADES	L.G.7.52
CURB AND CURB CUT	CURB CUT
OVERHEAD SERVICE	O.H.S.W.
CABLE TV MANHOLE	CTV
MANHOLES	MH / E / T / W / S / RIM EL. INV.EL.
CATCH BASIN	C.B. / C.B.
FIRE ESCAPE	F.E.
PLATFORM	PL. or PLTF.
BASEMENT ENTRANCE	C.E.
CELLAR ENTRANCE	B.E.
AIR WAY	A.W.
BAY WINDOW	B.W.
CONCRETE	CONC.
PAVEMENT	PVMT.
AIR CONDITION	AC
METAL	MET.
NORTH OF PROPERTY LINE	N
SOUTH OF PROPERTY LINE	S
EAST OF PROPERTY LINE	E
WEST OF PROPERTY LINE	W

GENERAL NOTES

SUBSURFACE UTILITIES ARE NOT GUARANTEED BY SURVEYOR. HIGH CAUTION RECOMMENDED AND VERIFICATION WITH PROPER CITY AGENCIES, IS MANDATORY BEFORE COMMENCING ALL NEW WORK.

ALL SUBSURFACE AND OVERHEAD UTILITIES (AS TO SIZE , TYPE AND DEPTH) SHOWN ON THIS SURVEY ARE TAKEN FROM RECORDS OF GOVERNMENTAL AGENCIES AND UTILITY COMPANIES, UNLESS OTHERWISE NOTED AND SHOWN.

COVER OR DEPTH OF UTILITIES WHICH DERIVED FROM FIELD MEASUREMENTS SHOWN ON THIS SURVEY SHOULD BE VERIFIED WITH PROPER AGENCY PRIOR TO CONSTRUCTION OF PROJECT. INVERT ELEVATIONS ARE DERIVED FROM CITY AGENCY RECORDS WHEN NOT AVAILABLE BY FIELD SURVEY AND NOTED AS "PER RECORD" ON THE SURVEY.

ALL SUBSURFACE UTILITY AS TO LOCATION AND DEPTH, SHOULD BE RECHECKED AND LEGAL GRADES SHOULD BE VERIFIED WITH THE TOPOGRAPHICAL BUREAU, PREFERABLY IN WRITING BEFORE COMMENCING CONSTRUCTION.

THIS IS TO CERTIFY THAT THERE ARE NO STREAMS OR NATURAL WATER COURSES ON THE SURVEYED PROPERTY EXCEPT AS SHOWN AND/OR DESCRIBED ON THIS SURVEY.

ALL OPERATIONS OF UNDERGROUND FACILITIES AND ALL EXCAVATORS ARE OBLIGATED TO COMPLY WITH ARTICLE 36 OF THE GENERAL BUSINESS LAW AND WITH PROVISIONS OF INDUSTRIAL CODE PART (RULE NO.35) BEFORE ANY EXCAVATION OR DEMOLITION IS COMMENCED. EVERY EXCAVATOR IS REQUIRED BY THESE LAWS TO GIVE ADVANCE NOTICE TO EVERY OPERATOR OF UNDERGROUND FACILITIES OF HIS INTENT TO PERFORM EXCAVATION OR DEMOLITION WORK IN THE SPECIFIED AREA

ALL ELEVATIONS SHOWN REFER TO THE NAVD 1988 DATUM.

ALL COORDINATES SHOWN REFER TO THE NEW YORK EAST ZONE FIPSZONE: 3101, ADSZONE: 4801, UTM ZONE: 18

EASEMENTS IF ANY ARE NOT SHOWN ON THIS SURVEY. NO INFORMATION PROVIDED TO SURVEYOR AT THIS TIME.

UNDERGROUND UTILITIES NOTES

UNDERGROUND, OVERHEAD AND GROUND LEVEL UTILITIES ARE NOT GUARANTEED AS TO ACCURACY, EXACT LOCATION, TYPE OR USE, ACTIVE OR INACTIVE. VERIFICATION IS MANDATORY WITH MUNICIPAL AGENCIES, PUBLIC AND PRIVATE UTILITY COMPANIES PRIOR TO TAKING TITLE AND OR DESIGN WORK. BOUNDARIES ARE NOT GUARANTEED UNLESS SO NOTED.

ALL OPERATIONS OF UNDERGROUND FACILITIES AND ALL EXCAVATORS ARE OBLIGATED TO COMPLY WITH ARTICLE 36 OF THE GENERAL BUSINESS LAW AND WITH PROVISIONS OF INDUSTRIAL CODE PART (RULE NO. 35) BEFORE ANY EXCAVATION OR DEMOLITION IS COMMENCED. EVERY EXCAVATOR IS REQUIRED BY THESE LAWS TO GIVE ADVANCE NOTICE TO EVERY OPERATOR OF UNDERGROUND FACILITIES OF HIS INTENT TO PERFORM EXCAVATION OR DEMOLITION WORK IN THE SPECIFIED AREA

GUARANTEED TO:

COUNTY: WESTCHESTER CITY: YONKERS

SECTION: BLOCK: 6343-1 LOT(S): 1

PROPERTY ADDRESS: 630 CENTRAL PARK AVENUE

MONITORING WELLS SURVEY

PREPARED BY

PERFECT POINT
LAND SURVEYING RT
brooklyn - queens - manhattan - bronx
staten island - nassau
phone: (718) 474-7700
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N.Y.S. L.L.S. 049844

APPENDIX F

LABORATORY ANALYTICAL DATA REPORTS
(COMPACT DISC)

APPENDIX G

DATA USABILITY SUMMARY REPORTS (DUSR)

APPENDIX B

Quality Assurance Project Plan

QUALITY ASSURANCE PROJECT PLAN

For the

Final Supplemental Investigation
Former Stewart Stamping Site
630 Central Park Avenue
Yonkers, New York 10704
VCP Site No. V00691-3, VCA Index No. W3-1005-04-06

Submitted to
New York State Department of Environmental Conservation.
Region 3, New Paltz, New York

Prepared for
Stewart EFI New York, LLC
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TRC Project No. 181590

JUNE 2011

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1.0 INTRODUCTION

This Quality Assurance Project Plan (QAPP) presents the organization, objectives, planned activities, and specific quality assurance/quality control (QA/QC) procedures for the Final Supplemental Investigation to be performed at the Former Stewart Stamping facility located at 630 Central Park Avenue, Yonkers, New York (VCP Site No. V00691-3, VCA Index No. W31005-04-06). Task-specific addenda to this QAPP will be provided for future investigations or remediation elements, as appropriate.

The QAPP describes specific protocols for field sampling, sampling handling and storage, chain- of-custody, laboratory analysis, and data handling and management. Preparation of the Plan was based on United States Environmental Protection Agency (USEPA) QAPP guidance documents, including:

- *USEPA Requirements for Quality Assurance Project Plans (EPA QA/R-5, March 2001), and*
- *Guidance for Quality Assurance Project Plans (EPA QA/G-5, December 2002).*

The data generated from the analysis of samples will be used to determine the nature and extent of contamination. A list of the potential parameters to be analyzed, including quantitation limits (QLs), and data quality levels (DQLs), is shown in Tables 1A and 1B.

2.0 PROJECT ORGANIZATION AND RESPONSIBILITIES

TRC Engineers, Inc. (TRC) Project Manager – Ms. Jennifer Miranda, will coordinate and manage the Final Supplemental Investigation sampling and analysis program, data reduction, QA/QC, data validation, analysis, and reporting. The TRC Project QA Officer will be Ms. Elizabeth Denly.

Ms. Elizabeth Denly, TRC's QA Chemist, will insure that the QAPP is implemented and will oversee laboratory data management. Ms. Denly will provide oversight and technical support for the sampling and analytical procedures. Ms. Denly has the broad authority to approve or disapprove project plans, specific analyses, and final reports. The TRC Project QA Officer is independent from the data generation activities. In general, the QA Officer will be responsible for reviewing and advising on all QA/QC aspects of this program.

Test America Laboratories of Edison, New Jersey will provide analyses of all soil and groundwater samples. Test America is a New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP)-certified laboratory. The laboratory will communicate directly with TRC regarding the analytical results and reporting. Test America will be responsible for providing all labels, sample jars, field blank water, trip blanks, shipping coolers, and laboratory documentation.

3.0 QA OBJECTIVES FOR DATA MANAGEMENT

All analytical data will be provided by the laboratory using the New York State Analytical Services Protocol (ASP) Category B deliverable format.

All analytical measurements will be made so that the results are representative of the media sampled (soil and groundwater) and the conditions measured. Data will be reported in consistent dry weight units for solid samples [i.e., micrograms per kilogram (µg/kg) and/or milligrams per kilogram (mg/kg) and in micrograms per liter (µg/L) or milligrams per kilogram (mg/L)] for aqueous samples. Table 2 presents the proposed samples, sampling and analytical parameters, analytical methods, sample preservation requirements and containers for the Final Supplement Investigation.

Quantitation Limits (QLs) are laboratory-specific and reflect those values achievable by the laboratory performing the analyses (i.e., laboratory reporting limit). Data Quality Levels (DQLs) are those reporting limits required to meet the objectives of the program (i.e., program action levels, cleanup standards, etc.). Data Quality Objectives (DQOs) define the quality of data and documentation required to support decisions made in the various phases of the data collection activities. The DQOs are dependent on the end uses of the data to be collected and are also expressed in terms of objectives for precision, accuracy, representativeness, completeness, and comparability.

The analytical methods to be used at this site provide the highest level of data quality and can be used for purposes of risk assessment, evaluation of remedial alternatives and verification that cleanup standards have been met. However, in order to ensure that the analytical methodologies are capable of achieving the DQOs, measurement performance criteria have been set for the analytical measurements in terms of accuracy, precision, and completeness.

The overall QA objective is to develop and implement procedures for field sampling, chain-of-custody, laboratory analysis, and reporting which will provide results that are scientifically valid, and the levels of which are sufficient to meet DQOs. Specific procedures for sampling, chain of custody, laboratory instrument calibration, laboratory analysis, reporting of data, internal quality control, and corrective action are described in other sections of this Plan.

Tables 3A and 3B present the precision and accuracy requirements for each parameter and matrix to be analyzed. For quantitation limits for parameters associated with soil, sediment, and solid waste samples, the laboratory will be required to attempt to meet or surpass the parameter-specific limits listed in 6 NYCRR Part 375: Table 375-6.8(a):Unrestricted Use Soil Cleanup Objectives.

For quantitation limits for parameters associated with groundwater samples, the laboratory will be required to attempt to meet or surpass the parameter-specific limits for groundwater in the Division of Water Technical and Operational Guidance Series (1.1.1) Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations (TOGS). In certain instances, if the TOGS criteria are not achievable due to analytical limitations, the laboratory will report the lowest possible quantitation limit.

The QA objectives are defined as follows:

- ***Accuracy*** is the closeness of agreement between an observed value and an accepted reference value. The difference between the observed value and the reference value includes components of both systematic error (bias) and random error.

  Accuracy in the field is assessed through the adherence to all field instrument calibration procedures, sample handling, preservation, and holding time requirements, and through the collection of equipment blanks prior to the collection of samples for each type of equipment being used (e.g., split spoons, groundwater sampling pumps).

  The laboratory will assess the overall accuracy of their instruments and analytical methods (independent of sample or matrix effects) through the measurement of "standards," materials of accepted reference value. Accuracy will vary from analysis to analysis because of individual sample and matrix effects. In an individual analysis, accuracy will be measured in terms of blank results, the percent recovery (%R) of surrogate compounds in organic analyses, or %R of spiked compounds in matrix spikes (MSs), matrix spike duplicates (MSDs) and/or laboratory control samples (LCSs). This gives an indication of expected recovery for analytes tending to behave chemically like the spiked or surrogate compounds. Tables 3A and 3B summarize the laboratory accuracy requirements.

- ***Precision*** is the agreement among a set of replicate measurements without consideration of the "true" or accurate value (i.e., variability between measurements of the same material for the same analyte). Precision is measured in a variety of ways including statistically, such as calculating variance or standard deviation.

  Precision in the field is assessed through the collection and measurement of field duplicates (one extra sample in addition to the original field sample). Field duplicates will be collected at a frequency of **one per twenty** investigative samples per matrix per analytical parameter. Precision will be measured through the calculation of relative percent differences (RPDs). The resulting information will be used to assess sampling and analytical variability. Field duplicate RPDs must be ≤50 for soil samples and ≤30 for aqueous samples. These criteria apply only if the sample and/or duplicate results are >5x the quantitation limit; if both results are ≤5x the quantitation limit, the criterion will be doubled.

Precision in the laboratory is assessed through the calculation of RPD for duplicate samples. For organic soil and water analyses, laboratory precision will be assessed through the analysis of MS/MSD samples and field duplicates. MS/MSD samples or laboratory duplicates will be performed at a frequency of **one per twenty** investigative samples per matrix per parameter. Tables 3A and 3B summarize the laboratory precision requirements.

- ***Completeness*** is a measure of the amount of valid data obtained from a measurement system compared to the amount that was expected to be obtained under normal conditions. "Normal conditions" are defined as the conditions expected if the sampling plan was implemented as planned.

  Field completeness is a measure of the amount of (1) valid measurements obtained from all the measurements taken in the project and (2) valid samples collected. The field completeness objective is greater than 90 percent.

  Laboratory completeness is a measure of the amount of valid measurements obtained from all valid samples submitted to the laboratory. The laboratory completeness objective is greater than 95 percent.

- ***Representativeness*** is a qualitative parameter which expresses the degree to which data accurately and precisely represents either a characteristic of a population, parameter variations at a sampling point, a process condition, or an environmental condition within a defined spatial and/or temporal boundary. To ensure representativeness, the sampling locations have been selected to provide coverage over a wide area and to highlight potential trends in the data. In addition, field duplicate samples will provide an additional measure of representativeness at a given location.

  Representativeness is dependent upon the proper design of the sampling program and will be satisfied by ensuring that the Work Plan and QAPP are followed and that proper sampling, sample handling, and sample preservation techniques are used.

  Representativeness in the laboratory is ensured by using the proper analytical procedures, appropriate methods, and meeting sample holding times.

- ***Comparability*** expresses the confidence with which one data set can be compared to another. Comparability is dependent upon the proper design of the sampling program and will be satisfied by ensuring that the Work Plan and QAPP are followed and that proper sampling techniques are used. Maximization of comparability with previous data sets is expected because the sampling design and field protocols are consistent with those previously used. Comparability is dependent on the use of recognized EPA or equivalent analytical methods and the reporting of data in standardized units. Laboratory procedures are consistent with those used for previous sampling efforts.

Table 1A
Soil Sampling
Chemical Parameters, Quantitation Limits and Data Quality Levels

Parameter	QL	DQL[1]
	Test America	
Volatile Organic Compounds (µg/kg)		
1,1,1-Trichloroethane	1.0	680
1,1,2,2-Tetrachloroethane	1.0	NC
1,1,2-Trichloroethane	1.0	NC
1,1,2-Trichloro-1,2,2-trifluoroethane (1,1,2-Trichlorotrifluoroethane or Freon TF)	1.0	NC
1,1-Dichloroethane	1.0	270
1,1-Dichloroethene	1.0	330
1,2,3-Trichlorobenzene	1.0	NC
1,2,4-Trichlorobenzene	1.0	NC
1,2,4-Trimethylbenzene	1.0	3,600
1,2-Dibromo-3-Chloropropane	1.0	NC
1,2-Dibromoethane	1.0	NC
1,2-Dichlorobenzene	1.0	1,100
1,2-Dichloroethane	1.0	20
1,2-Dichloropropane	1.0	NC
1,3,5-Trimethylbenzene	1.0	8,400
1,3-Dichlorobenzene	1.0	2,400
1,4-Dichlorobenzene	1.0	1,800
1,4-Dioxane	50.0	100
2-Butanone [Methyl ethyl ketone (MEK)]	10.0	120
2-Hexanone	10.0	NC
4-Methyl-2-pentanone	10.0	NC
Acetone	10.0	50
Benzene	1.0	60
Bromochloromethane	1.0	NC
Bromodichloromethane	1.0	NC
Bromoform	1.0	NC
Bromomethane	1.0	NC
Carbon disulfide	1.0	NC
Carbon tetrachloride	1.0	760
Chlorobenzene	1.0	1,100
Chloroethane	1.0	NC
Chloroform	1.0	370
Chloromethane	1.0	NC
cis-1,2-Dichloroethene	1.0	250
cis-1,3-Dichloropropene	1.0	NC

Table 1A (Continued)
Soil Sampling
Chemical Parameters, Quantitation Limits and Data Quality Levels

Parameter	QL	DQL[1]
	Test America	
Volatile Organic Compounds (µg/kg)		
Cyclohexane	1.0	NC
Dibromochloromethane	1.0	NC
Dichlorodifluoromethane	1.0	NC
Ethylbenzene	1.0	1,000
Isopropylbenzene	1.0	2,300[A]
m&p-Xylene	2.0	260[B]
Methyl acetate	1.0	NC
Methylcyclohexane	1.0	NC
Methylene Chloride	1.0	50
Methyl tert-butyl ether (MTBE)	1.0	930
n-Butylbenzene	1.0	12,000
n-Propylbenzene	1.0	3,900
o-Xylene	1.0	260[B]
p-Isopropyltoluene	1.0	10,000[A]
sec-Butylbenzene	1.0	11,000
Styrene	1.0	NC
tert-Butylbenzene	1.0	5,900
Tetrachloroethene	1.0	1,300
Toluene	1.0	700
trans-1,2-Dichloroethene	1.0	190
trans-1,3-Dichloropropene	1.0	NC
Trichloroethene	1.0	470
Trichlorofluoromethane	1.0	NC
Vinyl chloride	1.0	20
Semivolatile Organic Compounds (µg/kg)		
1,2,4,5-Tetrachlorobenzene	330	NC
2-Chloronaphthalene	330	NC
2-Chlorophenol	330	NC
2-Methylnaphthalene	330	NC
2-Methylphenol (o-cresol)	330	330
2-Nitroaniline	670	NC
2-Nitrophenol	330	NC
2,2'-oxybis(1-Chloropropane)	330	NC
2,3,4,6-Tetrachlorophenol	330	NC
2,4,5-Trichlorophenol	330	NC
2,4,6-Trichlorophenol	330	NC
2,4-Dichlorophenol	330	NC

Table 1A (Continued)
Soil Sampling
Chemical Parameters, Quantitation Limits and Data Quality Levels

Parameter	QL	DQL[1]
	Test America	
Semivolatile Organic Compounds (µg/kg) (continued)		
2,4-Dimethylphenol	330	NC
2,4-Dinitrophenol	1,000	NC
2,4-Dinitrotoluene	67	NC
2,6-Dinitrotoluene	67	NC
3-Nitroaniline	670	NC
3,3'-dichlorobenzidine	670	NC
3&4-methylphenol (m&p-cresol)	330	330
4,6-Dinitro-2-methylphenol	1,000	NC
4-Bromophenyl-phenylether	330	NC
4-Chloro-3-methylphenol	330	NC
4-Chloroaniline	330	NC
4-Chlorophenyl-phenyl ether	330	NC
4-Methylphenol	330	NC
4-Nitroaniline	670	NC
4-Nitrophenol	1,000	NC
Acenaphthene	330	20,000
Acenaphthylene	330	100,000
Acetophenone	330	NC
Anthracene	330	100,000
Atrazine	330	NC
Benzaldehyde	330	NC
Benzo(a)anthracene	33	1,000
Benzo(a)pyrene	33	1,000
Benzo(b)fluoranthene	33	1,000
Benzo(g,h,i)perylene	330	100,000
Benzo(k)fluoranthene	33	800
Bis(2-Chloroethoxy)methane	330	NC
Bis(2-Chloroethyl)ether	33	NC
Bis(2-ethylhexyl) phthalate	330	NC
Butylbenzylphthalate	330	NC
Caprolactam	330	NC
Carbazole	330	NC
Chrysene	330	1,000
Di-n-butylphthalate	330	NC
Di-n-octylphthalate	330	NC
Dibenzo(a,h)anthracene	33	330
Dibenzofuran	330	7,000

Table 1A (Continued)
Soil Sampling
Chemical Parameters, Quantitation Limits and Data Quality Levels

Parameter	QL Test America	DQL[1]
Semivolatile Organic Compounds (μg/kg) (continued)		
Diethyl phthalate	330	NC
Diphenyl(1,1'-Biphenyl)	330	NC
Dimethyl phthalate	330	NC
Fluoranthene	330	100,000
Fluorene	330	30,000
Hexachlorobenzene	33	330
Hexachlorobutadiene	67	NC
Hexachlorocyclopentadiene	330	NC
Hexachloroethane	33	NC
Indeno(1,2,3,-cd) pyrene	33	500
Isophorone	330	NC
N-Nitroso-di-n-propylamine	33	NC
N-Nitrosodiphenylamine	330	NC
Naphthalene	330	12,000
Nitrobenzene	33	NC
Pentachlorophenol	1,000	800
Phenanthrene	330	100,000
Phenol	330	330
Pyrene	330	100,000
Metals and Cyanide (mg/kg)		
Aluminum	10	NC
Antimony	0.5	NC
Arsenic	0.25	13
Barium	10	350
Beryllium	0.1	7.2
Cadmium	0.25	2.5
Calcium	250	NC
Chromium (total)	0.5	1[C]
Cobalt	2.5	NC
Copper	1.25	50
Cyanide	0.5	27
Iron	7.5	NC
Lead	0.25	63
Magnesium	250	NC
Manganese	0.75	1,600
Mercury	0.033	0.18

Table 1A (Continued)
Soil Sampling
Chemical Parameters, Quantitation Limits and Data Quality Levels

Parameter	QL	DQL[1]
	Test America	
Metals and Cyanide (mg/kg)		
Nickel	2.0	30
Potassium	250	NC
Selenium	0.5	3.9
Silver	0.5	2
Sodium	250	NC
Thallium	0.5	NC
Vanadium	2.5	NC
Zinc	1.5	109
Pesticides & Herbicides (µg/kg)		
2,4,5-TP (Silvex)	17	3,800
4,4'-DDD	6.7	3.3
4,4'-DDE	6.7	3.3
4,4'-DDT	6.7	3.3
Aldrin	6.7	5
alpha–BHC	6.7	20
alpha-Chlordane	6.7	94
beta-BHC	6.7	36
delta-BHC	6.7	40
Dieldrin	6.7	5
Endosulfan I	6.7	2,400
Endosulfan II	6.7	2,400
Endosulfan Sulfate	6.7	2,400
Endrin	6.7	14
Endrin Aldehyde	6.7	NC
Endrin Ketone	6.7	NC
gamma-BHC (Lindane)	6.7	100
gamma-Chlordane	6.7	NC
Heptachlor	6.7	42
Heptachlor Epoxide	6.7	NC
Methoxychlor	6.7	NC
Toxaphene	67	NC
Polychlorinated Biphenyls (PCBs) (mg/kg)		
Aroclor-1016	0.067	0.1[D]
Aroclor-1221	0.067	0.1[D]
Aroclor-1232	0.067	0.1[D]

Table 1A (Continued)
Soil Sampling
Chemical Parameters, Quantitation Limits and Data Quality Levels

Parameter	QL	DQL[1]
	Test America	
Aroclor-1242	0.067	0.1[D]
Aroclor-1248	0.067	0.1[D]
Aroclor-1254	0.067	0.1[D]
Aroclor-1260	0.067	0.1[D]
Aroclor-1262	0.067	0.1[D]
Aroclor-1268	0.067	0.1[D]

[1]Analyses for VOCs, SVOCs, Pesticides, PCBs and Metals will consist of the contaminants listed in Table 375-6.8(a) of the 6 NYCRR Part 375 Environmental Remediation Programs, VOCs and SVOCs listed in Table 3 of the "Commissioner Policy 51 - Soil Cleanup Guidance (CP –51)", and TCL for VOCs, SVOCs, Metals and Cyanide, Pesticides and PCBs listed in table SOM01.2.
QL = Quantitation Limit is the Test America Laboratory Reporting Limit
DQL = Data Quality Level is the Part 375 Unrestricted Use Soil Cleanup Objective Unless Otherwise Noted
NC = No Criterion
Shading indicates QL is higher than DQL
[A] = Criteria is CP-51 Soil Cleanup Level
[B] = The Unrestricted Use SCO for Total Xylenes is 0.26 mg/kg
[C] = The Unrestricted Use SCO for Hexavalent Chromium is 1.0 mg/kg
[D] = The Unrestricted Use SCO for Total PCBs is 0.1 mg/kg

Table 1B
Groundwater Sampling
Chemical Parameters, Quantitation Limits and Data Quality Levels

Parameter	QL Test America	DQL[1]
Volatile Organic Compounds (µg/L)		
1,1,1-Trichloroethane	1.0	5.0
1,1,2,2-Tetrachloroethane	1.0	5.0
1,1,2-Trichloroethane	1.0	1.0
1,1,2-Trichloro-1,2,2-trifluoroethane (1,1,2-Trichlorotrifluoroethane or Freon TF)	1.0	5.0
1,1-Dichloroethane	1.0	5.0
1,1-Dichloroethene	1.0	5.0
1,2,3-Trichlorobenzene	1.0	5.0
1,2,4-Trichlorobenzene	1.0	5.0
1,2,4-Trimethylbenzene	1.0	5.0
1,2-Dibromo-3-Chloropropane	1.0	0.04
1,2-Dibromoethane	1.0	0.0006
1,2-Dichlorobenzene	1.0	3.0
1,2-Dichloroethane	1.0	0.6
1,2-Dichloropropane	1.0	1.0
1,3,5-Trimethylbenzene	1.0	5.0
1,3-Dichlorobenzene	1.0	3.0
1,4-Dichlorobenzene	1.0	3.0
1,4-Dioxane	50.0	NC
2-Butanone [Methyl ethyl ketone (MEK)]	10.0	50.0
2-Hexanone	10.0	50.0
4-Methyl-2-pentanone	10.0	NC
Acetone	10.0	50.0
Benzene	1.0	1.0
Bromochloromethane	1.0	5.0
Bromodichloromethane	1.0	50.0
Bromoform	1.0	50.0
Bromomethane	1.0	5.0
Carbon disulfide	1.0	60.0
Carbon tetrachloride	1.0	5.0
Chlorobenzene	1.0	5.0
Chloroethane	1.0	5.0
Chloroform	1.0	7.0
Chloromethane	1.0	5.0
cis-1,2-Dichloroethene	1.0	5.0
cis-1,3-Dichloropropene	1.0	0.4[a]

Table 1B (Continued)
Groundwater Sampling
Chemical Parameters, Quantitation Limits and Data Quality Levels

Parameter	QL Test America	DQL[1]
Volatile Organic Compounds (µg/L)		
Cyclohexane	1.0	NC
Dibromochloromethane	1.0	50.0
Dichlorodifluoromethane	1.0	5.0
Ethylbenzene	1.0	5.0
Isopropylbenzene	1.0	5.0
m&p-Xylene (1,3&1,4-Xylene)	2.0	5.0[(b)]
Methyl acetate	2.0	NC
Methylcyclohexane	1.0	NC
Methylene Chloride	1.0	5.0
Methyl tert-butyl ether (MTBE)	1.0	10.0
n-Butylbenzene	1.0	5.0
n-Propylbenzene	1.0	5.0
o-Xylene (1,2-Xylene)	1.0	5.0[(b)]
p-Isopropyltoluene	1.0	5.0
sec-Butylbenzene	1.0	5.0
Styrene	1.0	5.0
tert-Butylbenzene	1.0	5.0
Tetrachloroethene	1.0	5.0
Toluene	1.0	5.0
trans-1,2-Dichloroethene	1.0	5.0
trans-1,3-Dichloropropene	1.0	0.4[(a)]
Trichloroethene	1.0	5.0
Trichlorofluoromethane	1.0	5.0
Vinyl Chloride	1.0	2.0
Semivolatile Organic Compounds (µg/L)		
1,2,4,5-Tetrachlorobenzene	10.0	5.0
2-Chloronaphthalene	10.0	10.0
2-Chlorophenol	10.0	NC
2-Methylnaphthalene	10.0	NC
2-Methylphenol (o-cresol)	10.0	NC
2-Nitroaniline	20.0	5.0
2-Nitrophenol	10.0	NC
2,2’-oxybis(1-Chloropropane)	10.0	5.0
2,3,4,6-Tetrachlorophenol	10.0	NC
2,4,5-Trichlorophenol	10.0	NC
2,4,6-Trichlorophenol	10.0	NC
2,4-Dichlorophenol	10.0	5.0

Table 1B
Groundwater Sampling
Chemical Parameters, Quantitation Limits and Data Quality Levels

Parameter	QL	DQL[1]
	Test America	
2,4-Dimethylphenol	10.0	50.0
Semivolatile Organic Compounds (µg/L)		
2,4-Dinitrophenol	30.0	10.0
2,4-Dinitrotoluene	2.0	5.0
2,6-Dinitrotoluene	2.0	5.0
3-Nitroaniline	20.0	5.0
3,3'-dichlorobenzidine	20.0	5.0
3&4-methylphenol (m&p-cresol)	10.0	NC
4,6-Dinitro-2-methylphenol	30.0	NC
4-Bromophenyl-phenylether	10.0	NC
4-Chloro-3-methylphenol	10.0	NC
4-Chloroaniline	10.0	5.0
4-Chlorophenyl-phenyl ether	10.0	NC
4-Nitroaniline	20.0	5.0
4-Nitrophenol	30.0	NC
Acenaphthene	10.0	20.0
Acenaphthylene	10.0	NC
Acetophenone	10.0	NC
Anthracene	10.0	50.0
Atrazine	10.0	7.5
Benzaldehyde	10.0	NC
Benzo(a)anthracene	1.0	0.002
Benzo(a)pyrene	1.0	ND[(c)]
Benzo(b)fluoranthene	1.0	0.002
Benzo(g,h,i)perylene	10.0	NC
Benzo(k)fluoranthene	1.0	0.002
Bis(2-Chloroethoxy)methane	10.0	5.0
Bis(2-Chloroethyl)ether	1.0	1.0
Bis(2-ethylhexyl)phthalate	10.0	5.0
Butylbenzylphthalate	10.0	50.0
Caprolactam	10.0	NC
Carbazole	10.0	NC
Chrysene	10.0	0.002
Di-n-butylphthalate	10.0	50.0
Di-n-octylphthalate	10.0	50.0
Dibenzo(a,h)anthracene	1.0	NC
Dibenzofuran	10.0	NC
Diethyl phthalate	10.0	50.0
Diphenyl (1,1'-Biphenyl)	10.0	5.0

Table 1B
Groundwater Sampling
Chemical Parameters, Quantitation Limits and Data Quality Levels

Parameter	QL	DQL[1]
	Test America	
Dimethyl phthalate	10.0	50
Semivolatile Organic Compounds (µg/L)		
Fluoranthene	10.0	50.0
Fluorene	10.0	50.0
Hexachlorobenzene	1.0	0.04
Hexachlorobutadiene	2.0	0.5
Hexachlorocyclopentadiene	10.0	5.0
Hexachloroethane	1.0	5.0
Indeno(1,2,3,-cd) pyrene	1.0	0.002
Isophorone	10.0	50.0
N-Nitroso-di-n-propylamine	1.0	NC
N-Nitrosodiphenylamine	10.0	50.0
Naphthalene	10.0	10.0
Nitrobenzene	1.0	0.4
Pentachlorophenol	30.0	1.0
Phenanthrene	10.0	50.0
Phenol	10.0	1.0
Pyrene	10.0	50.0
Metals and Cyanide (µg/L) [Field Filtered (dissolved) and Unfiltered (total)]		
Aluminum	200	NC
Antimony	10	3.0
Arsenic	5	25
Barium	200	1,000
Beryllium	2	3.0
Cadmium	5	5.0
Calcium	5,000	NC
Chromium (total)	10	50.0
Cobalt	50	NC
Copper	25	200
Cyanide (total)	0.01	200
Iron	150	300
Lead	5	25
Magnesium	5,000	35,000
Manganese	15	300
Mercury	0.2	0.7
Nickel	40	100
Potassium	5,000	NC
Selenium	10	10

Table 1B
Groundwater Sampling
Chemical Parameters, Quantitation Limits and Data Quality Levels

Parameter	QL Test America	DQL[1]
Silver	10	50
Sodium	5,000	20,000
Metals and Cyanide (µg/L) [Field Filtered (dissolved) and Unfiltered (total)] (continued)		
Thallium	10	0.5
Vanadium	50	NC
Zinc	30	2,000
Pesticides & Herbicides (**µg/L**)		
2,4,5-TP (Silvex)	0.5	0.26
4,4'-DDD	0.05	0.3
4,4'-DDE	0.05	0.2
4,4'-DDT	0.05	0.2
Aldrin	0.05	>ND
alpha–BHC	0.05	0.01
alpha-Chlordane	0.05	NC
beta-BHC	0.05	0.04
Chlordane	0.5	0.05
delta-BHC	0.05	0.04
Dieldrin	0.05	0.004
Endosulfan I	0.05	NC
Endosulfan II	0.05	NC
Endosulfan Sulfate	0.05	NC
Endrin	0.05	>ND
Endrin Aldehyde	0.05	5.0
Endrin Ketone	0.05	5.0
gamma-BHC (Lindane)	0.05	0.05
gamma-Chlordane	0.05	NC
Heptachlor	0.05	0.04
Heptachlor Epoxide	0.05	0.03
Methoxychlor	0.05	35
Toxaphene	0.5	0.06
Polychlorinated Biphenyls (PCBs) (**µ**g/L)		
Aroclor-1016	0.5	0.9[(c)]
Aroclor-1221	0.5	0.9[(c)]
Aroclor-1232	0.5	0.9[(c)]
Aroclor-1242	0.5	0.9[(c)]
Aroclor-1248	0.5	0.9[(c)]

Table 1B
Groundwater Sampling
Chemical Parameters, Quantitation Limits and Data Quality Levels

Parameter	QL	DQL[1]
	Test America	
Aroclor-1254	0.5	0.9[(c)]
Aroclor-1260	0.5	0.9[(c)]
Aroclor-1262	0.5	0.9[(c)]
Aroclor-1268	0.5	0.9[(c)]

[1]Analyses for VOCs, SVOCs, Pesticides, PCBs and Metals will consist of the contaminants listed in Table 375-6.8(a) of the 6 NYCRR Part 375 Environmental Remediation Programs, VOCs and SVOCs listed in Table 3 of the "Commissioner Policy 51 - Soil Cleanup Guidance (CP –51)", and TCL for VOCs, SVOCs, Metals and Cyanide, Pesticides and PCBs listed in table SOM01.2.
QL = Quantitation Limit is the Test America Laboratory Reporting Limit
DQL = Data Quality Level is the TOGS Class GA Groundwater Quality Standards and Guidance Values
NC = No Criterion
(a) = 0.4 µg/L applies to the sum of cis- and trans-1,3-dichloropropene
(b) = There is no Standard Guidance Value for Total Xylenes
(c) = 0.9 µg/L applies to Total PCBs
>ND = Class GA Value is any detected concentration
Shading indicates QL is higher than DQL.

Table 2
Soil and Groundwater
Analytical Parameters, Methods, Preservation and Container Requirements

Sample Matrix	Analytical Parameter	Sample Type[1]	No. of Samples[2]	EPA Analytical Method	Sample Preservation	Holding Time[3]	Sample Container[4,5]
Soil	VOCs	Grab	50	SW-846 Method 8260B	Cool to 4^0 C; 2 extruded with DI, 1 extruded with methanol	48 hours to preservation, 14 days to analysis	(3) 5 gram En-core samplers; (1) 4 oz. glass jar
Soil	SVOCs	Grab	50	SW-846 Method 8270C	Cool to 4^0 C	14 days to extract; 40 days to analysis	(1) 8 oz. glass jar
Soil	Metals	Grab	50	SW-846 Method 6010B	Cool to 4^0 C	6 months to analysis	(1) 8 oz. glass jar
Soil	Cyanide	Grab	50	SW-846 Method 9012A	Cool to 4^0 C	14 days to analysis	(1) 8 oz. glass jar
Soil	Mercury	Grab	50	SW-846 Method 7471A	Cool to 4^0 C	28 days to analysis	(1) 8 oz. glass jar
Soil	PCBs	Grab	50	SW-846 Method 8082	Cool to 4^0 C	14 days to extract; 40 days to analysis	(1) 8 oz. glass jar
Soil	Pesticides	Grab	50	SW-846 Method 8081A	Cool to 4^0 C	14 days to extract; 40 days to analysis	(1) 8 oz. glass jar
Soil	Herbicide (2,4,5-TP (Silvex)	Grab	50	SW-846 Method 8151A	Cool to 4^0 C	14 days to extract; 40 days to analysis	(1) 8 oz. glass jar
Groundwater	VOCs	Grab	Up to 3	SW-846 Method 8260B	pH < 2 with HCl; Cool to 4^0 C; no headspace	14 days to analysis	(3) 40 mL VOA vials
Groundwater	SVOCs	Grab	Up to 3	SW-846 Method 8270C	Cool to 4^0 C, no headspace	7 days to extract; 40 days to analyze	(2) 1 L amber glass jars
Groundwater	Metals (Field Filtered and Unfiltered)	Grab	Up to 3	SW-846 Method 6010B	pH < 2 with $HNO_{3;}$ Cool to 4^0 C	6 months to analysis	(2) 500ml Plastics
Groundwater	Mercury	Grab	Up to 3	SW-846 Method 7470A	pH < 2 with $HNO_{3;}$ Cool to 4^0 C	28 days to analysis	(1) 500ml Plastic
Groundwater	Cyanide	Grab	Up to 3	SW-846 Method SM 4500 CN E	pH > 12 with NaOH; Cool to 4^0 C	14 days to analysis	(1) 500ml Plastic

Table 2
Soil and Groundwater
Analytical Parameters, Methods, Preservation and Container Requirements

Sample Matrix	Analytical Parameter	Sample Type[1]	No. of Samples[2]	EPA Analytical Method	Sample Preservation	Holding Time[3]	Sample Container[4,5]
Groundwater	PCBs	Grab	Up to 3	SW-846 Method 8082	Cool to 4^0 C	7 days to extract; 40 days to analysis	(2) 1 L amber glass jars
Groundwater	Pesticides	Grab	Up to 3	SW-846 Method 8081A	Cool to 4^0 C	7 days to extract; 40 days to analysis	(2) 1 L amber glass jars
Groundwater	Herbicide (2,4,5-TP (Silvex)	Grab	Up to 3	SW-846 Method 8151A	Cool to 4^0 C	7 days to extract; 40 days to analysis	(2) 1 L amber glass jars

[1] For soil samples, a two-foot sampling interval is the preferred sample size; however, sample volume recovery, analytical method requirements, and field conditions can affect the actual sample interval size. For these reasons, the actual sampling interval may change in order to obtain adequate volume.
[2] Actual number of samples may vary depending on field conditions, sample material availability, and field observations
[3] From date of sample collection
[4] I-Chem Series 300 bottles
[5] MS/MSDs require duplicate volume for all parameters for solid matrices; MS/MSDs require triplicate volume for organic parameters for aqueous matrices
TBD = To Be Determined

Table 3A
Soil Samples
Data Quality Objectives for Precision and Accuracy

Parameter	Method	Matrix	Accuracy Control Limits	Accuracy Frequency Requirements	Precision (RPD) Control Limits	Precision Frequency Requirements
VOCs	SW-846 Method 8260B	Soil	Surrogates — % Rec. 1,2-Dichloroethane-d4 70-138 4-Bromofluorobenzene 72-132 Toluene-d8 66-126 Matrix Spikes Chloromethane 50-151 Bromomethane 54-142 Vinyl chloride 67-133 Chloroethane 56-146 Methylene Chloride 74-137 Acetone 27-164 Carbon disulfide 72-128 Trichlorofluoromethane 61-139 1,1-Dichloroethene 71-126 1,1-Dichloroethane 76-125 trans-1,2-Dichloroethene 75-122 cis-1,2-Dichloroethene 80-120 Chloroform 77-120 2-Butanone 77-117 1,2-Dichloroethane 76-118 1,1,1-Trichloroethane 78-117 Carbon tetrachloride 79-118 Benzene 77-117 Bromoform 59-125 Styrene 82-122 m&p-Xylene 81-121 o-Xylene 82-122 Ethylbenzene 81-121 Chlorobenzene 80-120 Cyclohexane 80-121 Isopropylbenzene 65-129	Surrogates: All samples, standards, QC samples Matrix Spikes: One per 20 per matrix type	Field Duplicates RPD ≤30 MS/MSDs — RPD Chloromethane 30 Bromomethane 30 Vinyl chloride 30 Chloroethane 30 Methylen Chloride 30 Acetone 30 Carbon disulfide 30 Trichlorofluoromethane 30 1,1-Dichloroethene 30 1,1-Dichloroethane 30 trans-1,2-Dichloroethene 30 cis-1,2-Dichloroethene 30 Chloroform 30 2-Butanone 30 1,2-Dichloroethane 30 1,1,1-Trichloroethane 30 Carbon tetrachloride 30 Benzene 30 Bromoform 30 Styrene 30 m&p-Xylene 30 o-Xylene 30 Ethylbenzene 30 Chlorobenzene 30 Cyclohexane 30 Isopropylbenzene 30	Field Duplicates: One per 20 per soils MS/MSDs: One per 20 per matrix type

Table 3A
Soil Samples
Data Quality Objectives for Precision and Accuracy

Parameter	Method	Matrix	Accuracy Control Limits	Accuracy Frequency Requirements	Precision (RPD) Control Limits	Precision Frequency Requirements
			Matrix Spikes (Cont.) % Rec.		MS/MSDs (Cont.) RPD.	
			2-Hexanone 70-122		2-Hexanone 30	
			MTBE 78-120		MTBE 30	
			Freon TF 73-123		Freon TF 30	
			Methyl acetate 73-137		Methyl acetate 30	
			1,4-Dioxane 69-131		1,4-Dioxane 30	
			Trichloroethene 79-119		Trichloroethene 30	
			Toluene 75-115		Toluene 30	
			trans-1,3-Dichloropropene 67-121		trans-1,3-Dichloropropene 30	
			4-Methyl-2-pentanone 68-120		4-Methyl-2-pentanone 30	
			cis-1,3-Dichloropropene 80-123		cis-1,3-Dichloropropene 30	
			1,2-Dichlorobenzene 80-120		1,2-Dichlorobenzene 30	
			1,3-Dichlorobenzene 80-120		1,3-Dichlorobenzene 30	
			1,4-Dichlorobenzene 80-120		1,4-Dichlorobenzene 30	
			1,2,4-Trichlorobenzene 80-120		1,2,4-Trichlorobenzene 30	
			1,2,3-Trichlorobenzene 75-121		1,2,3-Trichlorobenzene 30	
			1,2-Dichloropropane 82-122		1,2-Dichloropropane 30	
			Methylcyclohexane 78-118		Methylcyclohexane 30	
			Tetrachloroethene 80-120		Tetrachloroethene 30	
			1,2-Dibromo-3-Chloropropane 74-118		1,2-Dibromo-3-Chloropropane 30	
			1,1,2,2-Tetrachloroethane 79-122		1,1,2,2-Tetrachloroethane 30	
			1,1,2-Trichloroethane 73-118		1,1,2-Trichloroethane 30	
			Dibromochloromethane 68-120		Dibromochloromethane 30	
			1,2-Dibromoethane 75-117		1,2-Dibromoethane 30	
			Dichlorodifluoromethane 52-144		Dichlorodifluoromethane 30	
			Bromochloromethane 74-125		Bromochloromethane 30	
			Bromodichloromethane 79-119		Bromodichloromethane 30	
			1,2,4-Trimethylbenzene 81-121		1,2,4-Trimethylbenzene 30	
			1,3,5-Trimethylbenzene 82-122		1,3,5-Trimethylbenzene 30	
			N-Propylbenzene 81-121		N-Propylbenzene 30	
			p-Isopropyltoluene 82-122		p-Isopropyltoluene 30	
			sec-Butylbenzene 82-122		sec-Butylbenzene 30	
			tert-Butylbenzene 82-122		tert-Butylbenzene 30	

Table 3A
Soil Samples
Data Quality Objectives for Precision and Accuracy

Parameter	Method	Matrix	Accuracy Control Limits	Accuracy Frequency Requirements	Precision (RPD) Control Limits	Precision Frequency Requirements
			n-Butylbenzene 82-122		n-Butylbenzene 30	
SVOCs	SW-846 Method 8270C	Soil	Surrogates % Rec. Phenol-d5 41-118 2-Fluorophenol 37-125 2,4,6-Tribromophenol 10-120 Nitrobenzene-d5 38-105 2-Fluorobiphenyl 40-109 Terphenyl-d14 16-151 Matrix Spikes/LCSs Phenol 54-115 2-Chlorophenol 56-110 2-Methylphenol 54-117	Surrogates: All samples, standards, QC samples Matrix Spikes: One per 20 per batch	Field Duplicates RPD ≤30 MS/MSDs RPD Phenol 30 2-Chlorophenol 30 2-Methylphenol 30	 MS/MSDs: One per 20 per batch

Table 3A
Soil Samples
Data Quality Objectives for Precision and Accuracy

Parameter	Method	Matrix	Accuracy Control Limits	Accuracy Frequency Requirements	Precision (RPD) Control Limits	Precision Frequency Requirements
			4-Methylphenol 47-103 3 & 4 Methylphenol 47-103 Benzaldehyde 10-160 Acetophenone 40-95 Bis(2-chloroethyl)ether 44-101 2,2'-oxybis[1-chloropropane] 45-102 N-Nitrosodi-n-propylamine 42-107 Nitrobenzene 42-106 Hexachloroethane 45-90 Isophorone 48-97 2-Nitrophenol 55-101 2,4-Dimethylphenol 56-112 2,4-Dichlorophenol 58-115 Bis(2-chloroethoxy)methane 51-100 Naphthalene 53-94 4-Chloroaniline 10-96 Hexachlorobutadiene 45-98 Caprolactam 10-127 4-Chloro-3-methylphenol 55-117 2-Methylnaphthalene 51-98 Hexachlorobenzene 43-104 Hexachlorocyclopentadiene 24-98 Matrix Spikes/LCSs (Cont.) % Rec. 2,4,6-Trichlorophenol 53-118 2,4,5-Trichlorophenol 50-115 Diphenyl 50-105 2-Chloronaphthalene 51-102 2-Nitroaniline 51-109 2,6-Dinitrotoluene 51-115 Dimethyl phthalate 52-112 Acenaphthylene 51-103 3-Nitroaniline 32-104 Acenaphthene 46-100		4-Methylphenol 30 3 & 4 Methylphenol 30 Benzaldehyde 30 Acetophenone 30 Bis(2-chloroethyl)ether 30 2,2'-oxybis[1-chloropropane] 30 N-Nitrosodi-n-propylamine30 Nitrobenzene 30 Hexachloroethane 30 Isophorone 30 2-Nitrophenol 30 2,4-Dimethylphenol 30 2,4-Dichlorophenol 30 Bis(2-chloroethoxy)methane30 Naphthalene 30 4-Chloroaniline 30 Hexachlorobutadiene 30 Caprolactam 30 4-Chloro-3-methylphenol 30 2-Methylnaphthalene 30 Hexachlorobenzene 30 Hexachlorocyclopentadiene 30 MS/MSDs(Cont.) RPD 2,4,6-Trichlorophenol 30 2,4,5-Trichlorophenol 30 Diphenyl 30 2-Chloronaphthalene 30 2-Nitroaniline 30 2,6-Dinitrotoluene 30 Dimethyl phthalate 30 Acenaphthylene 30 3-Nitroaniline 30 Acenaphthene 30	

Table 3A
Soil Samples
Data Quality Objectives for Precision and Accuracy

Parameter	Method	Matrix	Accuracy Control Limits	Accuracy Frequency Requirements	Precision (RPD) Control Limits	Precision Frequency Requirements
			4-Nitrophenol 45-114		4-Nitrophenol 30	
			2,4-Dinitrophenol 10-129		2,4-Dinitrophenol 30	
			Dibenzofuran 52-106		Dibenzofuran 30	
			Diethyl phthalate 52-114		Diethyl phthalate 30	
			Fluorene 51-108		Fluorene 30	
			Fluoranthene 49-108		Fluoranthene 30	
			Di-n-butyl phthalate 50-108		Di-n-butyl phthalate 30	
			2,4-Dinitrotoluene 53-110		2,4-Dinitrotoluene 30	
			4-Chlorophenyl phenyl ether 50-106		4-Chlorophenyl phenyl ether 30	
			4-Nitroaniline 45-106		4-Nitroaniline 30	
			4,6-Dinitro-2-methylphenol 10-110		4,6-Dinitro-2-methylphenol 30	
			4-Bromophenyl phenyl ether 44-102		4-Bromophenyl phenyl ether 30	
			Atrazine 30-100		Atrazine 30	
			Anthracene 50-107		Anthracene 30	
			Carbazole 49-104		Carbazole 30	
			Phenanthrene 48-108		Phenanthrene 30	
			Pentachlorophenol 19-113		Pentachlorophenol 30	
			Pyrene 49-116		Pyrene 30	
			Chrysene 45-114		Chrysene 30	
			Benzo[k]fluoranthene 35-115		Benzo[k]fluoranthene 30	
			Benzo[g,h,i]perylene 43-106		Benzo[g,h,i]perylene 30	
			Benzo[b]fluoranthene 33-96		Benzo[b]fluoranthene 30	
			Benzo[a]pyrene 36-89		Benzo[a]pyrene 30	
			Benzo[a]anthracene 46-112		Benzo[a]anthracene 30	
			N-Nitrosodiphenylamine 49-106		N-Nitrosodiphenylamine 30	
			Butyl benzyl phthalate 49-117		Butyl benzyl phthalate 30	
			Bis(2-ethylhexyl) phthalate 49-119		Bis(2-ethylhexyl) phthalate 30	
			Di-n-octyl phthalate 40-106		Di-n-octyl phthalate 30	
			Indeno[1,2,3-cd]pyrene 43-109		Indeno[1,2,3-cd]pyrene 30	
			Dibenz(a,h)anthracene 43-107		Dibenz(a,h)anthracene 30	
			3,3'-Dichlorobenzidine 24-105		3,3'-Dichlorobenzidine 30	
			1,2,4,5-Tetrachlorobenzene 70-130		1,2,4,5-Tetrachlorobenzene 30	
			2,3,4,6-Tetrachlorophenol 70-130		2,3,4,6-Tetrachlorophenol 30	

Table 3A
Soil Samples
Data Quality Objectives for Precision and Accuracy

Parameter	Method	Matrix	Accuracy Control Limits	Accuracy Frequency Requirements	Precision (RPD) Control Limits	Precision Frequency Requirements
PCBs	SW-846 Method 8082	Soil	Surrogates — % Rec. Decachlorobiphenyl 30-150 Tetrachloro-m-xylene 40-150 Matrix Spikes Aroclor 1016 60-144 Aroclor 1260 63-143	Surrogates: All samples, standards, QC samples Matrix Spikes: One per 20 per matrix type	Field Duplicates RPD ≤30 MS/MSDs — RPD Aroclor 1016 30 Aroclor 1260 30	Field Duplicates: One per 20 per soils MS/MSDs: One per 20 per matrix type
Pesticides	SW-846 Method 8081A	Soil	Surrogates — % Rec. Decachlorobiphenyl 53-150 Tetrachloro-m-xylene 40-150 Matrix Spikes Aldrin 58-143 alpha-BHC 58-138 beta-BHC 60-139 delta-BHC 60-141 gamma-BHC (Lindane) 58-136 Chlordane 62-150 4,4'-DDD 63-150 4,4'-DDE 58-150 4,4'-DDT 57-150 Dieldrin 55-128 Matrix Spikes(Cont.) — % Rec. Endosulfan I 60-138 Endosulfan II 59-133 Endosulfan sulfate 56-133 Endrin 61-150 Endrin aldehyde 55-122 Endrin ketone 62-139 Heptachlor 58-137 Heptachlor epoxide 59-136 Methoxychlor 42-150	Surrogates: All samples, standards, QC samples Matrix Spikes: One per 20 per matrix type	Field Duplicates RPD ≤30 MS/MSDs — RPD Aldrin 30 alpha-BHC 30 beta-BHC 30 delta-BHC 30 gamma-BHC (Lindane) 30 Chlordane 30 4,4'-DDD 30 4,4'-DDE 30 4,4'-DDT 30 Dieldrin 30 MS/MSDs(Cont.) — RPD Endosulfan I 30 Endosulfan II 30 Endosulfan sulfate 30 Endrin 30 Endrin aldehyde 30 Endrin ketone 30 Heptachlor 30 Heptachlor epoxide 30 Methoxychlor 30	Field Duplicates: One per 20 MS/MSDs: One per 20 per matrix type

Table 3A
Soil Samples
Data Quality Objectives for Precision and Accuracy

Parameter	Method	Matrix	Accuracy Control Limits	Accuracy Frequency Requirements	Precision (RPD) Control Limits	Precision Frequency Requirements
			Toxaphene 70-130 gamma-Chlordane 45-147 alpha-Chlordane 49-143		Toxaphene 30 gamma-Chlordane 30 alpha-Chlordane 30	
Herbicides	SW-846 Method 8151A	Soil	<u>Surrogates</u> <u>% Rec.</u> 2,4-DCAA 101-150 <u>Matrix Spikes</u> 2,4-D 52-150 2,4,5-TP 73-148 2,4,5-T 69-150	Surrogates: All samples, standards, QC samples Matrix Spikes: One per 20 per matrix type	<u>Field Duplicates</u> RPD ≤30 <u>MS/MSDs</u> <u>RPD</u> 2,4-D 30 2,4,5-TP 30 2,4,5-T 30	Field Duplicates: One per 20 MS/MSDs: One per 20 per matrix type
Metals	SW-846 Methods 6010B/7000 Series	Soil	<u>Matrix Spikes</u> 75-125% recovery	Matrix Spikes: One per 20 per matrix type	<u>Field Duplicates</u> RPD ≤30 <u>Matrix Duplicates</u> RPD ≤30	Field Duplicates: One per 20 per soils Matrix Duplicates: One per 20 per matrix type
Cyanide	SW-846 Method 9012A	Soil	<u>Matrix Spikes</u> 87-115% recovery	Matrix Spikes: One per 20 per matrix type	<u>Field Duplicates</u> RPD ≤30 <u>Matrix Duplicates</u> RPD ≤10	Field Duplicates: One per 20 per soils Matrix Duplicates: One per 20 per matrix type

Table 3B
Groundwater Samples
Data Quality Objectives for Precision and Accuracy

Parameter	Method	Matrix	Accuracy Control Limits		Accuracy Frequency Requirements	Precision (RPD) Control Limits		Precision Frequency Requirements
VOCs	SW-846 Method 8260B	Groundwater	Surrogates	% Rec.	Surrogates: All samples, standards, QC samples	Field Duplicates		Field Duplicates: One per 20
			1,2-Dichloroethane-d4	70-122				
			Toluene-d8	69-125		RPD ≤30		
			Bromofluorobenzene	69-135				
			Matrix Spikes		Matrix Spikes: One per 20	MS/MSDs	RPD	MS/MSDs: One per 20
			Chloromethane	58-146		Chloromethane	30	
			Bromomethane	55-153		Bromomethane	30	
			Vinyl chloride	61-144		Vinyl chloride	30	
			Chloroethane	69-145		Chloroethane	30	
			Methylene Chloride	79-119		Methylene Chloride	30	
			Acetone	45-156		Acetone	30	
			Carbon disulfide	58-139		Carbon disulfide	30	
			Trichlorofluoromethane	69-147		Trichlorofluoromethane	30	
			1,1-Dichloroethene	56-139		1,1-Dichloroethene	30	
			1,1-Dichloroethane	78-122		1,1-Dichloroethane	30	
			trans-1,2-Dichloroethene	75-122		trans-1,2-Dichloroethene	30	
			cis-1,2-Dichloroethene	80-120		cis-1,2-Dichloroethene	30	
			Chloroform	82-123		Chloroform	30	
			2-Butanone	65-114		2-Butanone	30	
			1,2-Dichloroethane	74-118		1,2-Dichloroethane	30	
			1,1,1-Trichloroethane	74-128		1,1,1-Trichloroethane	30	
			Carbon tetrachloride	73-120		Carbon tetrachloride	30	
			Benzene	83-124		Benzene	30	
			Bromoform	73-123		Bromoform	30	
			Styrene	69-112		Styrene	30	
			m&p-Xylene	76-120		m&p-Xylene	30	
			o-Xylene	78-118		o-Xylene	30	
			Ethylbenzene	79-126		Ethylbenzene	30	
			Chlorobenzene	81-121		Chlorobenzene	30	
			Cyclohexane	58-133		Cyclohexane	30	
			Isopropylbenzene	80-125		Isopropylbenzene	30	

Table 3B
Groundwater Samples
Data Quality Objectives for Precision and Accuracy

Parameter	Method	Matrix	Accuracy Control Limits		Accuracy Frequency Requirements	Precision (RPD) Control Limits		Precision Frequency Requirements
			Matrix Spikes (Cont.)	% Rec.		MS/MSDs (Cont.)	RPD	
			2-Hexanone	53-121		2-Hexanone	30	
			MTBE	71-115		MTBE	30	
			Freon TF	47-139		Freon TF	30	
			Methyl acetate	50-151		Methyl acetate	30	
			1,4-Dioxane	52-126		1,4-Dioxane	30	
			Trichloroethene	78-119		Trichloroethene	30	
			Toluene	80-120		Toluene	30	
			trans-1,3-Dichloropropene	78-118		trans-1,3-Dichloropropene	30	
			4-Methyl-2-pentanone	53-120		4-Methyl-2-pentanone	30	
			cis-1,3-Dichloropropene	80-120		cis-1,3-Dichloropropene	30	
			1,2-Dichlorobenzene	82-122		1,2-Dichlorobenzene	30	
			1,3-Dichlorobenzene	81-126		1,3-Dichlorobenzene	30	
			1,4-Dichlorobenzene	83-123		1,4-Dichlorobenzene	30	
			1,2,4-Trichlorobenzene	66-120		1,2,4-Trichlorobenzene	30	
			1,2,3-Trichlorobenzene	76-123		1,2,3-Trichlorobenzene	30	
			1,2-Dichloropropane	80-120		1,2-Dichloropropane	30	
			Methylcyclohexane	61-129		Methylcyclohexane	30	
			Tetrachloroethene	68-139		Tetrachloroethene	30	
			1,2-Dibromo-3-Chloropropane	70-116		1,2-Dibromo-3-Chloropropane	30	
			1,1,2,2-Tetrachloroethane	74-126		1,1,2,2-Tetrachloroethane	30	
			1,1,2-Trichloroethane	79-119		1,1,2-Trichloroethane	30	
			Dibromochloromethane	80-120		Dibromochloromethane	30	
			1,2-Dibromoethane	78-118		1,2-Dibromoethane	30	
			Dichlorodifluoromethane	46-145		Dichlorodifluoromethane	30	
			Bromochloromethane	80-121		Bromochloromethane	30	
			Bromodichloromethane	79-119		Bromodichloromethane	30	
			1,2,4-Trimethylbenzene	68-120		1,2,4-Trimethylbenzene	30	
			1,3,5-Trimethylbenzene	69-118		1,3,5-Trimethylbenzene	30	
			N-Propylbenzene	67-130		N-Propylbenzene	30	
			p-Isopropyltoluene	47-138		p-Isopropyltoluene	30	
			sec-Butylbenzene	64-124		sec-Butylbenzene	30	
			tert-Butylbenzene	65-116		tert-Butylbenzene	30	

Table 3B
Groundwater Samples
Data Quality Objectives for Precision and Accuracy

Parameter	Method	Matrix	Accuracy Control Limits		Accuracy Frequency Requirements	Precision (RPD) Control Limits		Precision Frequency Requirements
			n-Butylbenzene	77-129		n-Butylbenzene	30	
SVOCs	SW-846 Method 8270C	Groundwater	Surrogates	% Rec	Surrogates: All samples, standards, QC samples	Field Duplicates		Field Duplicates: One per 20
			Phenol-d5	10-48				
			2-Fluorophenol	10-65		RPD ≤30		
			2,4,6-Tribromophenol	46-122				
			Nitrobenzene-d5	56-112				
			2-Fluorobiphenyl	53-108				
			Terphenyl-d14	50-122				
			Matrix Spikes/LCSs		Matrix Spikes: One per 20	MS/MSDs	RPD	MS/MSDs: One per 20
			Phenol	12-44		Phenol	30	
			2-Chlorophenol	53-101		2-Chlorophenol	30	
			2-Methylphenol	40-90		2-Methylphenol	30	
			4-Methylphenol	30-75		4-Methylphenol	30	
			Benzaldehyde	52-150		Benzaldehyde	30	
			3 & 4 Methylphenol	30-75		3 & 4 Methylphenol	30	
			Acetophenone	68-109		Acetophenone	30	
			Bis(2-chloroethyl)ether	62-108		Bis(2-chloroethyl)ether	30	
			2,2'-oxybis[1-chloropropane]	68-107		2,2'-oxybis[1-chloropropane]	30	
			N-Nitrosodi-n-propylamine	70-109		N-Nitrosodi-n-propylamine	730	
			Nitrobenzene	66-106		Nitrobenzene	30	
			Hexachloroethane	50-99		Hexachloroethane	30	
			Isophorone	68-108		Isophorone	30	
			2-Nitrophenol	65-107		2-Nitrophenol	30	
			2,4-Dimethylphenol	55-100		2,4-Dimethylphenol	30	
			2,4-Dichlorophenol	64-107		2,4-Dichlorophenol	30	
			Bis(2-chloroethoxy)methane	69-108		Bis(2-chloroethoxy)methane	30	
			Naphthalene	63-101		Naphthalene	30	
			4-Chloroaniline	58-105		4-Chloroaniline	30	
			Hexachlorobutadiene	52-99		Hexachlorobutadiene	30	
			Caprolactam	10-30		Caprolactam	30	
			4-Chloro-3-methylphenol	57-106		4-Chloro-3-methylphenol	30	
			2-Methylnaphthalene	66-102		2-Methylnaphthalene	30	

Table 3B
Groundwater Samples
Data Quality Objectives for Precision and Accuracy

Parameter	Method	Matrix	Accuracy Control Limits	Accuracy Frequency Requirements	Precision (RPD) Control Limits	Precision Frequency Requirements
			Hexachlorobenzene 65-107		Hexachlorobenzene 30	
			Hexachlorocyclopentadiene 40-105		Hexachlorocyclopentadiene 30	
			Matrix Spikes/LCSs (Cont.) % Rec		MS/MSDs (Cont.) RPD	
			2,4,6-Trichlorophenol 67-111		2,4,6-Trichlorophenol 30	
			2,4,5-Trichlorophenol 67-114		2,4,5-Trichlorophenol 30	
			Diphenyl 66-112		Diphenyl 30	
			2-Chloronaphthalene 65-107		2-Chloronaphthalene 30	
			2-Nitroaniline 73-116		2-Nitroaniline 30	
			2,6-Dinitrotoluene 68-114		2,6-Dinitrotoluene 30	
			Dimethyl phthalate 69-111		Dimethyl phthalate 30	
			Acenaphthylene 67-107		Acenaphthylene 30	
			3-Nitroaniline 59-108		3-Nitroaniline 30	
			Acenaphthene 66-108		Acenaphthene 30	
			4-Nitrophenol 10-44		4-Nitrophenol 30	
			2,4-Dinitrophenol 19-113		2,4-Dinitrophenol 30	
			Dibenzofuran 68-105		Dibenzofuran 30	
			Diethyl phthalate 66-109		Diethyl phthalate 30	
			Fluorene 68-105		Fluorene 30	
			Fluoranthene 68-108		Fluoranthene 30	
			Di-n-butyl phthalate 68-111		Di-n-butyl phthalate 30	
			2,4-Dinitrotoluene 65-113		2,4-Dinitrotoluene 30	
			4-Chlorophenyl phenyl ether 68-105		4-Chlorophenyl phenyl ether 30	
			4-Nitroaniline 49-119		4-Nitroaniline 30	
			4,6-Dinitro-2-methylphenol 58-115		4,6-Dinitro-2-methylphenol 30	
			4-Bromophenyl phenyl ether 66-110		4-Bromophenyl phenyl ether 30	
			Atrazine 56-116		Atrazine 30	
			Anthracene 68-108		Anthracene 30	
			Carbazole 67-110		Carbazole 30	
			Phenanthrene 68-110		Phenanthrene 30	
			Pentachlorophenol 55-116		Pentachlorophenol 30	
			Pyrene 61-110		Pyrene 30	
			Chrysene 68-112		Chrysene 30	
			Benzo[k]fluoranthene 66-114		Benzo[k]fluoranthene 30	

Table 3B
Groundwater Samples
Data Quality Objectives for Precision and Accuracy

Parameter	Method	Matrix	Accuracy Control Limits	Accuracy Frequency Requirements	Precision (RPD) Control Limits	Precision Frequency Requirements
			Benzo[g,h,i]perylene 65-134 Benzo[b]fluoranthene 65-111 Benzo[a]pyrene 58-101 Matrix Spikes/LCSs (Cont.) % Rec Benzo[a]anthracene 65-106 N-Nitrosodiphenylamine 71-121 Butyl benzyl phthalate 66-115 Bis(2-ethylhexyl) phthalate 66-114 Di-n-octyl phthalate 61-115 Indeno[1,2,3-cd]pyrene 68-121 Dibenz(a,h)anthracene 67-124 3,3'-Dichlorobenzidine 69-129 1,2,4,5-Tetrachlorobenzene 70-130 2,3,4,6-Tetrachlorophenol 70-130		Benzo[g,h,i]perylene 30 Benzo[b]fluoranthene 30 Benzo[a]pyrene 30 MS/MSDs (Cont.) RPD Benzo[a]anthracene 30 N-Nitrosodiphenylamine 30 Butyl benzyl phthalate 30 Bis(2-ethylhexyl) phthalate 30 Di-n-octyl phthalate 30 Indeno[1,2,3-cd]pyrene 30 Dibenz(a,h)anthracene 30 3,3'-Dichlorobenzidine 30 1,2,4,5-Tetrachlorobenzene 30 2,3,4,6-Tetrachlorophenol 30	
Cyanide	EPA Method 335.3	Groundwater	Matrix Spikes 85-110% recovery	Matrix Spikes: One per 20	Field Duplicates RPD ≤30 Matrix Duplicates RPD ≤10	Field Duplicates: One per 20 Matrix Duplicates: One per 20
Total Dissolved Solids	EPA Method 160.1	Groundwater	Matrix Spikes 85-115% recovery	Not Applicable	Field Duplicates RPD ≤30 Matrix Duplicates RPD ≤30	Field Duplicates: One per 20 Matrix Duplicates: One per 20

Table 3B
Groundwater Samples
Data Quality Objectives for Precision and Accuracy

Parameter	Method	Matrix	Accuracy Control Limits		Accuracy Frequency Requirements	Precision (RPD) Control Limits		Precision Frequency Requirements
Pesticides (TCL)	SW-846 Method 8081A	Groundwater	Surrogates	% Rec	Surrogates: All Samples, Standards, QC Samples	Field Duplicates		Field Duplicates: One per 20
			Decachlorobiphenyl	49-132				
			Tetrachloro-m-xylene	37-144		RPD ≤30		
			Matrix Spikes		Matrix Spikes: One per 20	MS/MSDs	RPD	MS/MSDs: One per 20
			Aldrin	61-122		Aldrin	30	
			alpha-BHC	63-122		alpha-BHC	30	
			beta-BHC	64-119		beta-BHC	30	
			delta-BHC	62-124		delta-BHC	30	
			gamma-BHC (Lindane)	59-121		gamma-BHC (Lindane)	30	
			Chlordane	70-130		Chlordane	30	
			4,4'-DDD	68-136		4,4'-DDD	30	
			4,4'-DDE	66-132		4,4'-DDE	30	
			4,4'-DDT	66-132		4,4'-DDT	30	
			Dieldrin	62-112		Dieldrin	30	
			Endosulfan I	64-123		Endosulfan I	30	
			Endosulfan II	63-116		Endosulfan II	30	
			Endosulfan sulfate	56-121		Endosulfan sulfate	30	
			Endrin	42-138		Endrin	30	
			Endrin aldehyde	56-119		Endrin aldehyde	30	
			Endrin ketone	62-125		Endrin ketone	30	
			Heptachlor	61-118		Heptachlor	30	
			Heptachlor epoxide	64-120		Heptachlor epoxide	30	
			Methoxychlor	56-125		Methoxychlor	30	
			Toxaphene	70-130		Toxaphene	30	
			gamma-Chlordane	63-120		gamma-Chlordane	30	
			alpha-Chlordane	62-119		alpha-Chlordane	30	

Table 3B
Groundwater Samples
Data Quality Objectives for Precision and Accuracy

Parameter	Method	Matrix	Accuracy Control Limits	Accuracy Frequency Requirements	Precision (RPD) Control Limits	Precision Frequency Requirements
Metals (TAL)	SW-846 Methods 6010B/7000 Series	Groundwater/ Wastewater			Field Duplicates RPD ≤30	Field Duplicates: One per 20
			Matrix Spikes 75-125% recovery	Matrix Spikes: One per 20	Matrix Duplicates RPD ≤30	Matrix Duplicates: One per 20

4.0 SOIL AND GROUNDWATER SAMPLING PLAN

Environmental sampling for the Final Supplemental Investigation of the Former Stewart Stamping Site will include soil and groundwater. Direct push methods will be the preferred method for obtaining subsurface soil and installing groundwater monitoring wells; however, other drilling methods including mud rotary and drive and wash may also be used if warranted by site conditions. A Site Plan showing Site features and proposed soil boring locations is provided in Figure 1 of the Final Supplemental Investigation Work Plan.

4.1 SOIL SAMPLING

4.1.1 Grab Sampling

Grab soil samples will be collected from the material or interval in question by retrieving a volume for analysis using a clean unused Teflon scoop or a clean stainless steel, aluminum, or mild steel scoop, trowel, spoon, or bucket auger. Samples for volatile organic compound (VOC) analysis will be collected directly from the macrocore sampler using EnCore® samplers.

4.1.2 Direct Push

During the advancement of soil borings TRC-SB7 through TRC-SB31, soil samples will be collected continuously using four or five-foot-long acetate sleeves that will be advanced continuously to the top of bedrock or refusal. Soil samples from each sleeve will be screened using a photoionization detector (PID), to detect possible organic vapors. Organic vapor screening will be performed by slicing open the acetate sleeve, making a small slice in the soil column with a clean knife or sampling tool, inserting the PID probe and pushing the slice closed, and monitoring the soil for approximately 5 to 10 seconds. This procedure will be repeated at intervals along the soil column at the field geologist's/scientist's discretion.

The samples will be examined for separate-phase product, staining, discoloration, odors, and debris indicative of contamination (ash, coal fragments, wood chips, cinders, petroleum staining, etc.). Samples will be selected for analysis based upon the depth interval most likely to be contaminated, as indicated by PID readings, discoloration, staining, and the field geologist's judgment, and in accordance with the requirements of the Final Supplemental Investigation Work Plan. For soil samples, a two-foot sampling interval is the preferred sample size; however, sample volume recovery, analytical method requirements, and field conditions can affect the actual sample interval size. For these reasons, the actual sampling interval may change in order to obtain adequate volume. Samplers will wear phthalate-free gloves such as nitrile (no latex will be used) and will avoid contact of the gloves with the sample. Using the EnCore® samplers, three aliquots of sample will be collected directly from the sampler as soon as possible for VOC analysis, and then immediately placed on ice. This will be performed prior to the collection of samples for other parameters.

4.2 GROUNDWATER SAMPLING

Groundwater sampling of existing permanent monitoring wells and temporary groundwater wells is described according to the following distinct phases of this work: well installation/construction, well purging, and well sampling.

4.2.1 Temporary Groundwater Well Installation/Construction

Soil borings advanced via direct push drilling methods may be converted into temporary one-inch diameter monitoring wells. Groundwater monitoring wells will be constructed of threaded one-inch diameter PVC well casing and 10-slot well screen, such that the well screen extends approximately 10 feet below the water table. Wells will be screened from the bottom to approximately five feet above the groundwater table. No sand will be placed around the temporary well screens. Well construction diagrams will be prepared for each well.

4.2.2 Temporary and Existing Well Purging

The objective is to purge monitoring wells until turbidity stabilizes to a level as low as possible and this parameter will be given the greatest weight in determining when groundwater sampling may begin. With this objective in mind, the well purging will be performed utilizing a low-flow pump to avoid entrainment of particulates within the well or from the formation. Groundwater from each well will be purged until groundwater parameters have stabilized. A turbidity level of fifty NTUs or less is the well purging goal, but not an absolute value before sampling. Other field parameters including temperature, conductivity, pH, and dissolved oxygen (DO) will also be monitored. As practical, all field measurements will be taken from the flow cell and will be recorded during and after purging, and before sampling. Field parameters should generally be within ±10 percent for three consecutive readings, one minute apart, so that it may be determined when the parameters stabilize.

Upon opening each monitoring well and point, the concentration of VOCs in the headspace will be measured using a PID and water level measurements will be recorded using an electronic oil-water interface probe. The depth to separate-phase product (if present), depth to water, and the total depth will be measured from the top of the marked PVC casings. Water level and separate-phase product measurements will first be made and the volume of water in the well determined. The volume of water in the well will be calculated so that the number of well volumes purged and an estimate of the time required to purge the well can be made. Before sampling, the existing permanent wells will be purged utilizing a low-flow stainless steel bladder pump using dedicated Teflon® or Teflon®-lined polyethylene tubing connected to a flow cell. Prior to sampling the temporary groundwater wells will be purged utilizing a peristaltic pump Teflon® or Teflon®-lined polyethylene tubing connected to a flow cell. Very low purging rates are proposed, on the order of 100 ml/minute to 500 ml/minute, so as to minimize suspension of particulate matter in the well.

Purging will be done with the pump or tubing intake placed near the top of the water column to insure that all stagnant water in the well is removed, while not stirring sediment that may have accumulated on the bottom of the well. Equipment will be lowered into the well very carefully so as to prevent suspension of bottom sediment and subsequent entrainment onto sampling equipment. Surging will be avoided. Tubing will be replaced between each well. Pumps must be carefully cleaned between wells according to the procedures specified in Section 4.8. It is anticipated that no more than three well volumes will be purged in order for turbidity to reach a minimum and the other parameters to stabilize. Ideally, pumping rates will be at a rate so that no draw-down of the groundwater level occurs (i.e., pumping rate is less than recharge rate). During purging, TRC will actively monitor and track the volume of water purged and the field parameter readings. Data will be recorded in the field logbook. For example, TRC will record the running total volume purged from each well and note the readings for the corresponding field parameters.

4.2.3 Existing and temporary Well Sampling

Once groundwater conditions have stabilized and groundwater levels have recovered, samples for VOC, SVOC, metals and cyanide, PCBs, and pesticide analysis will be collected using a low-flow pump used or purging. All sampling equipment will be cleaned according to the procedures specified in Section 4.8.

The VOC vials must be filled so a meniscus forms over the mouth of the vial. This ensures no air bubbles or headspace will be formed after it has been capped. Ensure the lack of air bubbles and headspace by turning the vial upside down and tapping it lightly. If any bubbles are observed, discard the sample and collect a new sample. The acid must be added to the vials before sample collection.

The samples will be collected in sample bottles (pre-preserved, if appropriate), placed in iced coolers and removed from light immediately after collection. In addition, all samples bottles must be filled to the top so that no aeration of the samples occurs during transport. All bottles will be filled so as to avoid cascading and aeration of the samples, the goal being to minimize any precipitation of colloidal matter.

In addition, each groundwater sample collected and submitted for metals analysis will be consist of two aliquots a field filtered volume and an unfiltered volume.

4.3 SOLID WASTE

Solid sampling methods include utilizing dedicated stainless steel or Teflon® scoops/shovels, triers, and thiefs. Scoops and shovels are the preferred method for sampling solids from piles or containers. Stainless steel triers are similar to a scoop and are used for the collection of a core sample of a solid material. Thiefs are long hollow tubes, with an inner tube, and are used for sampling of dry free running solids (e.g., pile of fine sand). To sample solid material at varying depths, a hollow stem auger or a core sampler in conjunction with an auger can be utilized (See Soil Sampling Section).

4.4 LIQUID WASTE

Liquid sampling methods include utilizing dedicated dippers, glass tube samplers, pump and tubing, kemmerer bottles, and Bacon Bomb samplers. Dippers are used to collect samples from the surface of the liquid, and are appropriate for wastes that are homogeneous. Glass tube samplers consist of glass tubes of varying length and diameter used to collect a full-depth liquid sample from a drum or similar container. Pump and tubing (e.g., bladder pump or peristaltic pump) are used to collect liquid samples from a depth (up to approximately 20 feet below grade), and are typically relied upon for sampling subsurface structures, such as underground storage tanks. To minimize the loss of volatile organic components in the liquid, the lowest achievable flow rate is utilized for collecting the sample by this method. Kemmerer bottles and Bacon Bomb samplers are discrete-depth samplers. These samplers are lowered into the liquid and opened to collect a sample at a desired depth.

4.5 GRAB AND COMPOSITE SAMPLING

Waste characterization of a liquid or a solid can involve grab or composite sampling depending upon the homogeneity and the volume of the waste. Grab sampling consists of collecting discrete sample or samples of a material, and submitting each sample for separate analysis. Grab sampling is appropriate for characterizing small quantities of waste as well as waste streams of varying content (e.g., drums of different contents). Composite sampling consists of taking discrete grab samples of a material and combining them into a smaller number of samples for analysis. Composite sampling generally is appropriate for large volumes of a homogenous waste material, such as a pile of soil or construction debris. The specific number of composite and grab samples largely will depend upon the size and nature of the waste as well as the analysis required for characterization of the waste.

4.6 QC SAMPLE COLLECTION

QC samples will include equipment blanks, trip blanks, field duplicates and MS/MSDs.

Equipment blanks will consist of distilled water and will be used to check for potential contamination of the equipment which may cause sample contamination. Equipment blanks will be collected by routing the distilled water through the sampling equipment prior to sample collection.

Equipment blanks will be submitted to the laboratory at a frequency of one per 20 samples per matrix per type of equipment being used per parameter.

Trip blanks will consist of distilled water (supplied by the laboratory) for groundwater samples and will be used to assess the potential for volatile organic compound contamination of groundwater samples due to contaminant migration during sample shipment and storage. Trip blanks will be transported to the site unopened, stored with the investigative samples, and kept closed until analyzed by the laboratory. Trip blanks will be submitted to the laboratory at a frequency of one per cooler which contains VOC groundwater samples.

Field duplicates are an additional aliquot of the same sample submitted for the same parameters as the original sample. Field duplicates will be used to assess the sampling and analytical reproducibility. Field duplicates will be collected by alternately filling sample bottles from the source being sampled. Field duplicates will be submitted at a frequency of one per 20 samples for all matrices and all parameters.

MSs and MSDs are two additional aliquots of the same sample submitted for the same parameters as the original sample. However, the additional aliquots are spiked with the compounds of concern. Matrix spikes provide information about the effect of the sample matrix on the measurement methodology. MS/MSDs will be submitted at a frequency of one per 20 investigative samples per matrix for organic parameters for soil and groundwater.

Refer to Table 4 for a summary of QC sample preservation and container requirements.

4.7 SAMPLE PRESERVATION AND CONTAINERIZATION

The analytical laboratory will supply the sample containers for the chemical samples. These containers will be cleaned by the manufacturer to meet or exceed all analyte specifications established in the latest U.S. EPA's *Specifications and Guidance for Contaminant-Free Sample Containers*. Certificates of analysis are provided with each bottle lot and maintained on file to document conformance to EPA specifications. The containers will be pre-preserved, where appropriate (See Table 2).

4.8 EQUIPMENT DECONTAMINATION

4.8.1 Sampling Equipment

Disposal dedicated Teflon®, stainless steel, and aluminum sampling equipment shall be cleaned between each use in the following manner:

- Wash and scrub with Alconox and water mixture
- Tap water rinse
- Wash/scrub with a biodegradable degreaser ("ZEP") if there is oily residue on equipment surface
- Tap water rinse
- Distilled/deionized water rinse
- Air dry

Cleaned equipment shall be wrapped in aluminum foil if not used immediately after air-drying.

Groundwater sampling pumps will be cleaned by washing and scrubbing with an Alconox/water mixture, rinsing with tap water and irrigating with deionized water.

Table 4
Soil and Groundwater
QC Sample Preservation and Container Requirements

Sample Matrix	Analytical Parameter	Sample Type	No. of Samples	EPA Analytical Method	Sample Preservation	Holding Time[1]	Sample Container[2]
Soil	VOCs	Field Duplicate	1 per 20	SW-846 Method 8260B	Cool to 4^0 C; 2 extruded with DI, 1 extruded with methanol	48 hours to preservation, 14 days to analysis	(3) 5 gram En-core samplers; (1) 4 oz. glass jar
Soil	SVOCs	Field Duplicate	1 per 20	SW-846 Method 8270C	Cool to 4^0 C	14 days to extract; 40 days to analysis	(1) 8 oz. glass jar
Soil	Metals	Field Duplicate	1 per 20	SW-846 Method 6010B	Cool to 4^0 C	6 months to analysis	(1) 8 oz. glass jar
Soil	Cyanide	Field Duplicate	1 per 20	SW-846 Method 9012A	Cool to 4^0 C	14 days to analysis	(1) 8 oz. glass jar
Soil	Mercury	Field Duplicate	1 per 20	SW-846 Method 7471A	Cool to 4^0 C	28 days to analysis	(1) 8 oz. glass jar
Soil	PCBs	Field Duplicate	1 per 20	SW-846 Method 8082	Cool to 4^0 C	14 days to extract; 40 days to analysis	(1) 8 oz. glass jar
Soil	Pesticides	Field Duplicate	1 per 20	SW-846 Method 8081A	Cool to 4^0 C	14 days to extract; 40 days to analysis	(1) 8 oz. glass jar
Soil	Herbicide (2,4,5-TP (Silvex)	Field Duplicate	1 per 20	SW-846 Method 8151A	Cool to 4^0 C	14 days to extract; 40 days to analysis	(1) 8 oz. glass jar
Groundwater	VOCs	Field Duplicate	1 per 20	SW-846 Method 8260B	pH < 2 with HCl; Cool to 4^0 C; no headspace	14 days to analysis	(3) 40 mL VOA vials
Groundwater	SVOCs	Field Duplicate	1 per 20	SW-846 Method 8270C	Cool to 4^0 C, no headspace	7 days to extract; 40 days to analyze	(2) 1 L amber glass jars
Groundwater	Metals (Field Filtered and Unfiltered)	Field Duplicate	1 per 20	SW-846 Method 6010B	pH < 2 with $HNO_{3;}$ Cool to 4^0 C	6 months to analysis	(2) 500ml Plastics
Groundwater	Mercury	Field Duplicate	1 per 20	SW-846 Method 7470A	pH < 2 with $HNO_{3;}$ Cool to 4^0 C	28 days to analysis	(1) 500ml Plastic

Table 4
Soil and Groundwater
QC Sample Preservation and Container Requirements

Sample Matrix	Analytical Parameter	Sample Type	No. of Samples	EPA Analytical Method	Sample Preservation	Holding Time[1]	Sample Container[2]
Groundwater	Cyanide	Field Duplicate	1 per 20	SW-846 Method SM 4500 CN E	pH > 12 with NaOH; Cool to 4^0 C	14 days to analysis	(1) 500ml Plastic
Groundwater	PCBs	Field Duplicate	1 per 20	SW-846 Method 8082	Cool to 4^0 C	7 days to extract; 40 days to analysis	(2) 1 L amber glass jars
Groundwater	Pesticides	Field Duplicate	1 per 20	SW-846 Method 8081A	Cool to 4^0 C	7 days to extract; 40 days to analysis	(2) 1 L amber glass jars
Groundwater	Herbicide (2,4,5-TP (Silvex)	Field Duplicate	1 per 20	SW-846 Method 8151A	Cool to 4^0 C	7 days to extract; 40 days to analysis	(2) 1 L amber glass jars
Groundwater	VOCs	Equipment Blank	1 per 20	SW-846 Method 8260B	pH < 2 with HCl; Cool to 4^0 C; no headspace	14 days to analysis	(3) 40 mL VOA vials
Groundwater	SVOCs	Equipment Blank	1 per 20	SW-846 Method 8270C	Cool to 4^0 C, no headspace	7 days to extract; 40 days to analyze	(2) 1 L amber glass jars
Groundwater	Metals (Field Filtered and Unfiltered)	Equipment Blank	1 per 20	SW-846 Method 6010B	pH < 2 with $HNO_{3;}$ Cool to 4^0 C	6 months to analysis	(2) 500ml Plastics
Groundwater	Mercury	Equipment Blank	1 per 20	SW-846 Method 7470A	pH < 2 with $HNO_{3;}$ Cool to 4^0 C	28 days to analysis	(1) 500ml Plastic
Groundwater	Cyanide	Equipment Blank	1 per 20	SW-846 Method SM 4500 CN E	pH > 12 with NAOH; Cool to 4^0 C	14 days to analysis	(1) 500ml Plastic
Groundwater	PCBs	Equipment Blank	1 per 20	SW-846 Method 8082	Cool to 4^0 C	7 days to extract; 40 days to analysis	(2) 1 L amber glass jars
Groundwater	Pesticides	Equipment Blank	1 per 20	SW-846 Method 8081A	Cool to 4^0 C	7 days to extract; 40 days to analysis	(2) 1 L amber glass jars
Groundwater	Herbicide (2,4,5-TP (Silvex)	Equipment Blank	1 per 20	SW-846 Method 8151A	Cool to 4^0 C	7 days to extract; 40 days to analysis	(2) 1 L amber glass jars

Table 4
Soil and Groundwater
QC Sample Preservation and Container Requirements

Sample Matrix	Analytical Parameter	Sample Type	No. of Samples	EPA Analytical Method	Sample Preservation	Holding Time[1]	Sample Container[2]
Groundwater	VOCs	Trip Blank	1 per cooler with VOCs	SW-846 Method 8260B	pH < 2 with HCl; Cool to 4^0 C; no headspace	14 days to analysis	(3) 40 mL VOA vials

[1] From date of sample collection
[2] I-Chem Series 300 bottles
TBD = To Be Determined

5.0 DOCUMENTATION AND CHAIN-OF-CUSTODY

5.1 SAMPLE COLLECTION DOCUMENTATION

5.1.1 Field Notes

Field team members will keep a field logbook to document all field activities. Field logbooks will provide the means of recording the chronology of data collection activities performed during the investigation. As such, entries will be described in as much detail as possible so that a particular situation could be reconstructed without reliance on memory.

The logbook will be a bound notebook with water-resistant pages. Logbook entries will be dated, legible, and contain accurate and inclusive documentation of the activity. The title page of each logbook will contain the following:

- Person to whom the logbook is assigned,
- The logbook number,
- Project name and number,
- Site name and location,
- Project start date, and
- End date.

Entries into the logbook will contain a variety of information. At the beginning of each entry, the date, start time, weather, and names of all sampling team members present will be entered. Each page of the logbook will be signed and dated by the person making the entry. All entries will be made in permanent ink, signed, and dated and no erasures or obliterations will be made. If an incorrect entry is made, the information will be crossed out with a single strike mark which is signed and dated by the sampler. The correction shall be written adjacent to the error.

Field activities will be fully documented. Information included in the logbook will include, but may not be limited to the following:

- Chronology of activities, including entry and exit times,
- Names of all people involved in sampling activities,
- Level of personal protection used,
- Any changes made to planned protocol,

- Names of visitors to the site during sampling and reason for their visit,
- Sample location and identification,
- Changes in weather conditions,
- Dates (month/day/year) and times (military) of sample collection,
- Measurement equipment identification (model/manufacturer) and calibration information,
- Sample collection methods and equipment,
- Sample depths,
- Whether grab or composite sample collected,
- How sample composited, if applicable,
- Sample description (color, odor, texture, etc.)
- Sample identification code.
- Tests or analyses to be performed,
- Sample preservation and storage conditions,
- Equipment decontamination procedures,
- QC sample collection,
- Unusual observations,
- Record of photographs,
- Sketches or diagrams, and
- Signature of person recording the information.

Field logbooks will be reviewed on a daily basis by the Field Team Leader. Logbooks will be supported by standardized forms.

5.1.2 Chain-of-Custody Records

Sample custody is discussed in detail in Section 5.2 of this Plan. Chain-of-custody (COC) records are initiated by the samplers in the field. The field portion of the custody documentation should include: (1) the project name; (2) signatures of samplers; (3) the sample number, date and time of collection, and whether the sample is grab or composite; (4) signatures of individuals involved in sampling; and (5) if applicable, air bill or other shipping number. Sample receipt and log-in procedures at the laboratory are described in Section 5.2.2 of this Plan.

On a regular basis (daily or on such a basis that all holding times will be met), samples will be transferred to the custody of the respective laboratories, via third-party commercial carriers or via laboratory courier service. Sample packaging and shipping procedures, and field chain-of-custody procedures are described in Section 5.2.1 of this Plan.

5.1.3 Sample Labeling

Immediately upon collection, each sample will be labeled with a pre-printed adhesive label, which includes the date and time of collection, sampler's initials, tests to be performed, preservative (if applicable), and a unique identifier. The following identification scheme will be used:

A. The sample ID number will include the soil or monitoring well location, along with the sample depth, sample interval, and the depth interval at which it was collected.

Example:

Sample TRC-SB7(5-7) indicates the sample was taken by TRC, at soil boring location SB7, from the 2-foot interval in the spoon beginning at 5 feet below grade and ending at 7 feet below grade.

Duplicate samples will be labeled as blind duplicates by giving them sample numbers indistinguishable from a normal sample.

Blanks should be spelled out and identify the associated matrix, (e.g., Equipment Blank).

Examples:

Duplicate Sample: TRC-SB7A(5-7)
Equipment Blank Sample: GW Equip Blank 1
Trip Blank: Trip Blank 1

MS/MSDs will be noted in the comments column of the COC.

B. The job number will be the number assigned to the particular site.

Example: 181590

C. The analysis required will be indicated for each sample.

Example: VOC

D. Date taken will be the date the sample was collected, using the format: MM-DD-YY.

Example: 07-22-11

E. Time will be the time the sample was collected, using military time.

Example: 1335

F. The sampler's name will be printed in the "Sampled By" section.

G. Other information relevant to the sample.

Example: Equipment Blank

An example sample label is presented below:

Site Name:	Stewart
Client:	TRC
Sample No:	TRC-SB7(5-7)
Matrix:	Soil
Date Taken:	07/22/11
Time Taken:	1335
Sampler:	D. Schmidt
Analysis:	VOC

Job No. ____________________
Client: ____________________
Sample Number ____________________
Date ____________________ Sample Time ____________________
Sample Matrix ____________________
Grab or Composite (explain) ____________________
Preservatives ____________________
Analyses ____________________
Sampler Signature ____________________

This sample label contains the authoritative information for the sample. Inconsistencies with other documents will be settled in favor of the vial or container label unless otherwise corrected in writing from the field personnel collecting samples or the TRC Project QA Officer.

5.1.4 Sample Custody

Custody is one of several factors that are necessary for the admissibility of environmental data as evidence in a court of law. Custody procedures help to satisfy the two major requirements for admissibility: relevance and authenticity. Sample custody is addressed in three parts: field sample collection, laboratory analysis, and final evidence files.

A sample or evidence file is considered to be under a person's custody if:

- the item is in the actual possession of a person;
- the item is in the view of the person after being in actual possession of the person;
- the item was in the actual physical possession of the person but is locked up to prevent tampering;
- the item is in a designated and identified secure area.

5.1.5 Field Custody Procedures

Samples will be collected following the sampling procedures documented in Section 4.0 of this Plan. Documentation of sample collection is described in Section 5.1 of this Plan. Sample chain-of-custody and packaging procedures are summarized below. These procedures will ensure that the samples will arrive at the laboratory with the chain-of-custody intact.

- The field sampler is personally responsible for the care and custody of the samples until they are transferred or dispatched properly. Field procedures have been designed such that as few people as possible will handle the samples.

- All bottles will be identified by the use of sample labels with sample numbers, sampling locations, date/time of collection, and type of analysis. The sample numbering system is presented in Section 5.1.3 of this Plan.

- Sample labels will be completed for each sample using waterproof ink unless prohibited by weather conditions. For example, a logbook notation would explain that a pencil was used to fill out the sample label because the pen would not function in wet weather.

- Samples will be accompanied by a properly completed chain-of-custody form. The sample numbers and locations will be listed on the chain-of-custody form. When transferring the possession of samples, the individuals relinquishing and receiving will sign, date, and note the time on the record. This record documents the transfer of custody of samples from the sampler to another person, to a mobile laboratory, to the permanent laboratory, or to/from a secure storage location.

- All shipments will be accompanied by the chain-of-custody record identifying the contents. The original record will accompany the shipment, and copies will be retained by the sampler and placed in the project files.

- Samples will be properly packaged for shipment and dispatched to the appropriate laboratory for analysis, with a separate signed custody record enclosed in and secured to the inside top of each sample box or cooler. Shipping containers will be secured with strapping tape and custody seals for shipment to the laboratory. The custody seals will be attached to the front right and back left of the cooler and covered with clear plastic tape after being signed by field personnel. The cooler will be strapped shut with strapping tape in at least two locations.

- If the samples are sent by common carrier, the air bill will be used. Air bills will be retained as part of the permanent documentation. Commercial carriers are not required to sign off on the custody forms since the custody forms will be sealed inside the sample cooler and the custody seals will remain intact.

- Samples remain in the custody of the sampler until transfer of custody is completed. This consists of delivery of samples to the laboratory sample custodian, and signature of the laboratory sample custodian on chain-of-custody document as receiving the samples and signature of sampler as relinquishing samples.

5.1.6 Laboratory Custody Procedures

Samples will be received and logged in by a designated sample custodian or his/her designee. Upon sample receipt, the sample custodian will:

- Examine the shipping containers to verify that the custody tape is intact,

- Examine all sample containers for damage,

- Determine if the temperature required for the requested testing program has been maintained during shipment and document the temperature on the chain-of-custody records,

- Compare samples received against those listed on the chain-of-custody,

- Verify that sample holding times have not been exceeded,

- Examine all shipping records for accuracy and completeness,

- Determine sample pH (if applicable) and record on chain-of-custody forms,

- Sign and date the chain-of-custody immediately (if shipment is accepted) and attach the air bill,

- Note any problems associated with the coolers and/or samples on the cooler receipt form and notify the Laboratory Project Manager, who will be responsible for contacting the TRC Project QA Officer,

- Attach laboratory sample container labels with unique laboratory identification and test, and

- Place the samples in the proper laboratory storage.

Following receipt, samples will be logged in according to the following procedure:

- The samples will be entered into the laboratory tracking system. At a minimum, the following information will be entered: project name or identification, unique sample numbers (both client and internal laboratory), type of sample, required tests, date and time of laboratory receipt of samples, and field ID provided by field personnel.

- The Laboratory Project Manager will be notified of sample arrival.

- The completed chain-of-custody, air bills, and any additional documentation will be placed in the final evidence file.

6.0 CALIBRATION PROCEDURES

6.1 FIELD INSTRUMENTS

Field instruments will be calibrated according to the manufacturer's specifications. All calibration procedures performed will be documented in the field logbook and will include the date/time of calibration, name of person performing the calibration, reference standard used, temperature at which the readings were taken, and the readings.

6.2 LABORATORY INSTRUMENTS

Calibration procedures for a specific laboratory instrument will consist of initial calibrations, initial calibration verifications, and/or continuing calibration verification. Detailed descriptions of the calibration procedures for a specific laboratory instrument are included in the laboratory's standard operating procedures (SOPs), which describe the calibration procedures, their frequency, acceptance criteria, and the conditions that will require recalibration. These procedures are as required in the respective analytical methodologies (summarized in Table 2 of this Plan). The initial calibration associated with all analyses must contain a low-level calibration standard which is less than or equal to the quantitation limit.

7.0 SAMPLE PREPARATION AND ANALYTICAL PROCEDURES

No field analyses are anticipated for this program. If site conditions were to warrant field analysis, TRC will prepare an addendum establishing the field analytical procedures. Analyses of all soil and groundwater samples will be performed by Test America Laboratories in Edison, New Jersey. Table 2 summarizes the analytical methods to be used during this investigation.

8.0 DATA REDUCTION, VALIDATION, AND REPORTING

Appropriate QC measures will be used to ensure the generation of reliable data from sampling and analysis activities. Proper collection and organization of accurate information followed by clear and concise reporting of the data is a primary goal in this project. Complete data packages suitable for data validation to support the generation of a Data Usability Summary Report (DUSR) according to NYSDEC requirements will be provided by the analytical laboratory.

For all analyses, the laboratory will report results which are below the laboratory's reporting limit; these results will be qualified as estimated (J) by the laboratory.

8.1 DATA EVALUATION/VALIDATION

8.1.1 Field Data Evaluation

Measurements and sample collection information will be transcribed directly into the field logbook or onto standardized forms. If errors are made, results will be legibly crossed out, initialed and dated by the person recording the data, and corrected in a space adjacent to the original (erroneous) entry. Daily reviews of the field records by the Field Team Leader will ensure that:

- Logbooks and standardized forms have been filled out completely and that the information recorded accurately reflects the activities that were performed.
- Records are legible and in accordance with good record keeping procedures, i.e., entries are signed and dated, data are not obliterated, changes are initialed, dated, and explained.
- Sample collection, handling, preservation, and storage procedures were conducted in accordance with the protocols described in the Plan, and that any deviations were documented and approved by the appropriate personnel.

8.1.2 Analytical Data Validation

TRC will be responsible for performing an independent validation of the analytical data. Project-specific procedures will be used to validate analytical laboratory data. The basis for the validation will be the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, EPA-540-R-08-01, (June 2008) and the USEPA Contract

Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, EPA 540-R-10-011 (January 2010), modified to accommodate the criteria in the analytical methods used in this program, and Region II Standard Operating Procedures (SOPs) for data validation. Tables 1A, 1B, 2, 3A, 3b and 5 highlight the QC criteria and holding time requirements for all analyses conducted under this program. These criteria will be used to evaluate and qualify the data during validation.

Validation will include all technical holding times, as well as QC sample results (blanks, surrogate spikes, laboratory duplicates, MS/MSDs, and LCSs), tunes, internal standards, calibrations, target compound identification, and results calculations.

The overall completeness of the data package will also be evaluated by the data validator. Completeness checks will be administered on all data to determine whether full data deliverables were provided. The reviewer will determine whether all required items are present and request copies of missing deliverables.

Upon completion of the validation, a report will be prepared. This report will summarize the samples reviewed, elements reviewed, any nonconformance with the established criteria, and validation actions. Data qualifiers will be consistent with EPA National Functional Guidelines. This report will be in a format consistent with NYSDEC’s DUSR.

Identification and Treatment of Outliers

Any data point which deviates markedly from others in its set of measurements will be investigated; however, the suspected outlier will be recorded and retained in the data set. One or both of the following tests will be used to identify outliers.

Since an outlier may result from unique circumstances at the time of sample analysis or data collection, those persons involved in the analysis and data reduction will be consulted. This may provide an experimental reason for the outlier. Further statistical analysis may be performed with and without the outlier to determine its effect on the conclusions. In many cases, two data sets may be reported, one including, and one excluding the outlier.

In summary, every effort will be made to include the outlying values in the reported data. If the value is rejected, it will be identified as an outlier, reported with its data set and its omission noted.

9.0 INTERNAL QUALITY CONTROL

The subcontracting laboratory Quality Assurance Project Plan will identify the supplemental internal analytical quality control procedures to be used. At a minimum, this will include:

- Matrix spike and/or matrix spike duplicate samples
- Laboratory control samples
- Instrument calibrations
- Instrument tunes
- Method and/or instrument blanks
- Surrogate spikes for organic analyses
- Internal standard spikes
- Quantitation limit determination and confirmation by analysis of low-level calibration standard

Field quality control samples will include:

- Equipment blanks as outlined in Table 4
- Field duplicate samples as outlined in Table 4
- Trip blanks as outlined in Table 4
- MS/MSDs described in Section 4.7

10.0 CORRECTIVE ACTION

The entire sampling program will be under the direction of TRC's Project QA officer. The emphasis in this program is on preventing problems by identifying potential errors, discrepancies, and gaps in the data-collection-laboratory-analysis-interpretation process. Any problems identified will be promptly resolved. Likewise, follow-up corrective action is always an option in the event that preventative corrective actions are not totally effective.

The acceptance limits for the sampling and analyses to be conducted in this program will be those stated in the method or defined by other means in the Plan. Corrective actions are likely to be immediate in nature and most often will be implemented by the contracted laboratory analyst or the TRC Program Manager. The corrective action will usually involve recalculation, reanalysis, or resampling.

10.1 IMMEDIATE CORRECTIVE ACTION

Corrective action in the field may be needed when the sample network is changed (i.e., more/less samples, sampling locations other than those specified in the Plan), or when sampling procedures and/or field analytical procedures require modification, etc. due to unexpected conditions. The field team may identify the need for corrective action. The Field Team Leader will approve the corrective action and notify the TRC Program Manager. The TRC Program Manager will approve the corrective measure. The Field Team Leader will ensure that the corrective measure is implemented by the field team.

Corrective actions will be implemented and documented in the field record book. Documentation will include:

- A description of the circumstances that initiated the corrective action,
- The action taken in response,
- The final resolution, and
- Any necessary approvals.

No staff member will initiate corrective action without prior communication of findings through the proper channels.

Corrective action in the laboratory may occur prior to, during, and after initial analyses. A number of conditions such as broken sample containers, omissions or discrepancies with chain-of-custody documentation, low/high pH readings, and potentially high concentration samples may be identified during sample log-in or just prior to analysis. Following consultation with laboratory analysts and Laboratory Section Leaders, it may be necessary for the Laboratory QA Manager to approve the implementation of corrective action. The laboratory SOPs specify some conditions during or after analysis that may automatically trigger corrective action or optional procedures. These conditions may include dilution of samples, additional sample extract cleanup, automatic reinjection/reanalysis when certain QC criteria are not met, loss of sample through breakage or spillage, etc.

The analyst may identify the need for corrective action. The Laboratory Section Leader, in consultation with the staff, will approve the required corrective action to be implemented by the laboratory staff. The Laboratory QA Manager will ensure implementation and documentation of the corrective action. If the nonconformance causes project objectives not to be achieved, the TRC Project QA Officer will be notified. The TRC Project QA Officer will notify the TRC Program Manager, who in turn will contact all levels of project management for concurrence with the proposed corrective action.

These corrective actions are performed prior to release of the data from the laboratory. The corrective action will be documented in both the laboratory's corrective action files, and the narrative data report sent from the laboratory to the TRC Program Manager. If the corrective action does not rectify the situation, the laboratory will contact the TRC Program Manager, who will determine the action to be taken and inform the appropriate personnel.

If potential problems are not solved as an immediate corrective action, the contractor will apply formalized long-term corrective action, if necessary.

APPENDIX C
Health and Safety Plan

SITE-SPECIFIC
HEALTH AND SAFETY PLAN

Final Supplemental Investigation
Former Stewart Stamping Site

630 Central Park Avenue
Yonkers, New York 10704
VCP Site No. V00691-3, VCA Index No. W3-1005-04-06

Prepared by:

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TRC Project No. 181590

JUNE 2011

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1.0 INTRODUCTION

This Site-Specific Health and Safety Plan (SSHSP) was designed to prevent occupational injuries and prevent chemical exposure during activities associated with the final supplemental investigation at the Former Stewart Stamping Site, located at 630 Central Park Avenue in Yonkers, New York (the "Site"). All on-site personnel are required to read, review and strictly comply with the SSHSP. It is the responsibility of the Project Manager (PM) to ensure that the Plan is implemented and enforced. This SSHSP was prepared in accordance with requirements established by the Occupational Safety and Health Administration, the National Institute of Occupational Safety and Health and the Environmental Protection Agency. This plan was also prepared to comply with 29 CFR 1910.120 and 1926.65.

1.1 Best Management Practices

Contractors working on the Site must adhere to Best Management Practices for construction. This includes recognizing that soil and groundwater may contain elevated concentrations of volatile organic compounds (VOCs) and/or metals. As a result, soil cuttings and groundwater from drilling procedures also may contain elevated concentrations of these chemical compounds. The best way to reduce exposure to these materials is to minimize direct contact and wash exposed skin whenever possible. It is recommended that all workers in direct contact with the soil change shoes and dirty clothing before leaving the site. All on-site subcontractors are responsible for the protection and safety of their workers and must provide a safe work environment during this project. This includes restricting smoking, eating and drinking in work areas and providing opportunities for workers to change dirty clothes, work boots and wash exposed skin. Included as part of the Best Management Practices is proper dust control measures to minimize on-site and off-site impact. Examples of proper dust control include fine misting with water, wetting travel areas, using dust stabilizers such as calcium chloride and working more deliberately.

1.2 Work Plan

The work plan involves subsurface soil and groundwater sampling. The objective of the proposed investigation is to collect information regarding existing conditions necessary to further investigate the on-site USTs and former process wastewater drainage system consistent with NYSDEC DER-10 – Technical Guidance for Site Investigation and Remediation dated May 2010.. The proposed investigation will be performed in accordance with the Final Supplemental Investigation Work Plan submitted by TRC June 2011 to the New York State Department of Environmental Conservation (NYSDEC).

1.3 Site Description

The Site is known as the Former Stewart Stamping Site and is located at 630 Central Park Avenue, Yonkers, New York 10704. A map showing the site location is included as Figure 1.

2.0 ASSIGNMENT OF RESPONSIBILITIES

2.1 General

All activities on or around the Site which either have a potential for exposure to soil or groundwater or which pose the potential for injury due to physical hazards are subject to this SSHSP. These activities include but are not limited to: installation of soil borings, and sampling of soil and groundwater. All personnel, including subcontract personnel, will be responsible for continuous adherence to the safety procedures during the performance of this work. Deviations from the procedures or intent of the SSHSP will not be allowed without express consent of the responsible Site Health and Safety Officer (SHSO) who shall coordinate all significant changes with the Project Manager. After due warnings, personnel who violate health and safety procedures will be dismissed from the site operations. It must be remembered that the person most responsible for the health and safety of an individual is the individual himself.

2.2 Certified Safety Professional (CSP)

The CSP, Mr. Gary Ritter, will be responsible for providing overall technical and administrative oversight of the health and safety program on-site. He will review and approve the specific health and safety program and any significant changes to the plan must be approved by him. In addition, the SHSO shall report to the CSP on all safety-related matters.

2.3 Site Safety Health Officer (SHSO)

Mr. Wes Lindemuth of TRC will be the SHSO for this project as well as the on-site project manager. The primary duties of the SHSO will include:

1. Directing and implementing the HASP
2. Ensuring all project personnel have been adequately trained in the recognition and avoidance of unsafe conditions, this HASP and the regulations applicable to the work environment to control or eliminate any hazards or other exposure to illness or injury.
3. Authorizing Stop Work Orders which shall be executed upon the determination of an

imminent health and safety concern.

4. Contacting the CSP and Project Manager on the issuance of a Stop Work Order when the SHSO has made the determination of an imminent health and safety concern.
5. Authorizing work to resume upon approval from the CSP and Project Manager.
6. Directing activities as defined in this HASP during emergency situations.

The SHSO will be on-site during all site activities related to the SSHSP. The SHSO will be the designated on site safety representative. This person will be responsible for assessing the site activities to assure compliance with all provisions of the SSHSP. Should any deviations occur they will be corrected, noted, and reported to the Project Manager. The SHSO is responsible for enforcing this SSHSP and monitoring compliance with the plan. The SHSO or designee will conduct air monitoring, maintain site logs and document compliance. The SHSO will conduct daily toolbox safety meetings and initiate evacuation procedures when necessary.

2.4 Project Manager

The Project Manager for this project is Ms. Jennifer Miranda. The Project Manager is responsible for ensuring that all project personnel abide by the requirements set forth in this plan and the overall project.

2.5 Staff Organization

Safety and Environmental Oversight, TRC:

Gary Ritter, 860-298-6256

Site Personnel

Wes Lindemuth, 347-738-1452

Subcontracted Companies and Roles:

Aquifer Drilling and Testing, Inc. (ADT)

- Soil boring installation

Perfect Point Corporation

- Surveying services

Nova Geophysical Services (NOVA)

- Private utility locating

TestAmerica Laboratories Inc.

- Laboratory services

2.6 Underground Utilities and Facilities

The implementation of the supplemental investigation will require installation of borings near underground utilities at on-site and off-site locations. The following precautions will be taken to avoid damage to underground utilities:

- Contact DIGNET for mark-out of public utilities on public streets prior to drilling,
- Obtain drawings of city water and sewer lines, and
- Utility clear boring locations utilizing appropriate geophysical survey methods.

NOVA will be responsible for identifying and marking out underground utilities using geophysical methods.

2.7 Site Hazard Assessment

Material safety data sheets (MSDS) for the principal constituents of concern (TCE, PCE, 1,1,1-TCA, fuel oil, copper, lead, nickel, silver, and zinc) are included in **Appendix B**.

2.8 Health Risks

Potential health risks are exposure via dermal contact and general physical hazards associated with the supplemental investigation.

2.9 Fire Safety Hazards

There are low to moderate fire hazards currently present on site.

2.10 Site Access

All personnel will be required to sign in daily. Orange safety fencing will be installed around work areas as needed.

3.0 STANDARD OPERATING PROCEDURES

The following work practices and engineering controls may be used during this phase of work. The work practices are Standard Operating Procedures, and will not be deviated from without consent of the SHSO. Hazards associated with site work such as, confined space entry, bonding and grounding, heat stress, and cold stress are covered under this Site-Specific Health and Safety Plan.

Work Practices

1. The following Personal Protective Equipment (PPE) will be inspected prior to use:

   a) Respiratory Equipment:

      Action Level: The **threshold limit values (TLV)** is the exposure limit permissible for an 8 hour day 40 hours per week. This will be the field action level for all site activities. The TLV for TCE is 50 ppm. Should the TLV for TCE be exceeded, the following procedure shall occur:

      - Draeger tubes will be used to monitor specific chemicals of concern.
      - Work will be stopped until the condition has dissipated.
      - If work stoppages increase in regularity and work progress is slowed the following procedures will take place:
      - TRC Staff will use respirators in accordance with TRC's Respirator Program including proper fitting, issuance and medical monitoring. Subcontract personnel will need to supply their own respirators and must comply with OSHA regulations on respirators.
      - Respiratory equipment will be inspected and field-fit tested daily.
      - Selection of respiratory protection will be reviewed with Gary Ritter, prior to the use of respirators.
      - Cartridges will be changed every two hours.

   b) Chemical Protective Clothing (CPC) and Gloves:

      - CPC and gloves will be inspected prior to donning to ensure their integrity.

- CPC will be chosen with assistance from the CSP according to the chemical hazards present.

c) Hearing Protection: Hearing protection will be worn by all personnel exposed to at least 85 dB of sound during the workday. It is not expected that noise exposure will exceed 85 dB but hearing protection will be provided if needed.

d) Safety Boots: Steel-toe and steel shank safety boots will be worn by all personnel during this project.

e) Eye Protection: Eye protection will be worn when personnel are exposed to flying debris, chemical vapors or particulates.

- Chemical splash goggles will be worn for protection against chemical gases, vapors or particulates; and
- Safety glasses will be worn for protection against flying objects.

f) Hard Hats: Appropriately rated hard hats will be worn by personnel for protection against overhead hazards. Hard hats should clearly identify the company the individual is working for in order to quickly identify site personnel since multiple contractors could be working on site.

2. To avoid falling objects:

a) Do not walk or stand under suspended/overhead loads (including scaffolding).

b) Be aware of falling objects in the work area.

c) Secure overhead objects.

3. When using hand tools:

a) Hand tools will meet the manufacturer's safety standards.

b) Hand tools will not be altered in any way.

c) Makeshift tools will not be used.

d) At a minimum, eye protection will be used when working with hand tools.

e) Wrenches, including adjustable, pipe, end and socket wrenches, will not be used when jaws are sprung to the point that slippage occurs.

f) Impact tools such as drift pins, wedges and chisels, will be kept free of mushroom heads.

g) Wooden handles will be free of splinters or cracks and secured tightly to the tool.

4. Housekeeping:

   a) The work areas will be kept neat and orderly as possible.

   b) Walking surfaces will be kept free of debris or loose objects.

   c) Aisles, stairways and walkways will be kept clear at all times.

   d) Clean, store and maintain tools and machinery.

5. Lighting:

   a) Lighting, when necessary, will be provided so that a sufficient amount of light will illuminate the work area, as required by Table H 120.1 in 40 CFR 1910.120.

   b) All electrical lighting will be protected with a Ground Fault Circuit Interrupter (GFCI).

   c) In areas where flammable or combustible vapors or dust are encountered, all lighting will be approved for use in Class 1, Division 1 hazardous locations.

6. Overhead Wires:

   a) If contact is possible, i.e drilling equipment etc. one or more of the following will be done:

      - Power sources will be disconnected by the utility;
      - Power sources will be shielded by the utility;
      - Object will get no closer than 12' to overhead wires to prevent arcing.

7. Use of Power Tools:

   a) All power tools will be inspected regularly and used in accordance with the manufacturer's instructions and its capabilities.

b) Electrical tools will not be used in flammable areas, unless they are approved for that purpose.

c) Portable electric tools will be used only with a GFCI.

d) Proper eye protection will be worn when working with power tools.

e) Personnel will be trained in the proper use of the specific tool.

f) Any defective power tools will be immediately tagged and removed from service.

g) Tools will be stored properly after use.

8. Slips, Trips and Falls:

a) Proper lighting will be maintained at all times.

b) Walkways will remain clear and unobstructed at all times.

c) When possible, cords, hoses, lines, etc. will be raised to reduce or eliminate trip hazards.

d) Use appropriate climbing equipment.

9. Ground Fault Circuit Interrupters and Electrical Cords:

a) GFCIs will be used on all 120 Volt, single phase, 15 and 20 ampere receptacle outlets when electrical equipment is used on site.

b) Electrical cords will be inspected for cracks, tears, or general wear to the outer protective casing. If the wiring of the cord is exposed, the cord will be repaired, if possible, or disposed of.

c) All extension cords will contain a grounding prong. If the grounding prong is missing, or if the cord was designed to contain only 2 prongs, the cord will not be allowed for use and is to be red tagged until repaired. These cords are dangerous and cannot be grounded through the use of a GFCI.

10. Communication: Visual contact will be maintained while work activities are being conducted. Hand signals will be used during times verbal communication is not possible. This includes times of loud noise or when the wearing of respiratory protection makes oral communication difficult.

11. Intensive Investigation Safety:

 a) All soil and groundwater drilling locations will be cleared of subsurface utilities utilizing the appropriate geophysical methods.

 b) For soil sampling locations offsite, DIGNET will be contacted prior to the start of drilling operations to ensure that all utilities have been properly located. Potential utilities include underground water, sewer and electrical lines. These lines will be identified before drilling in the area.

 c) DRILL RIG SAFETY

 The following will be applicable to work around the drilling equipment and any other heavy equipment. Prior to work of this nature, a review of these principles shall be given to workers by the SHSO.

 - Pay attention at all times.
 - Use common sense.
 - Hard hats shall be worn when within 20’ of the drill rig.
 - When noise makes verbal communication difficult, hand signals should be established. One person should be responsible for hand signals to heavy equipment operators.
 - When lifting objects, use your legs, not your back.
 - Use appropriate equipment to move heavy objects.
 - Only qualified operators shall use heavy equipment.
 - Maintain visual contact at all times.
 - Be aware of footing at all times.
 - Never walk in the vicinity of heavy equipment without confirming first that the operator is aware of your intended path.
 - Be aware of all underground and overhead power lines, gas lines, etc.
 - Make sure that gas cylinders are secured.

12. Confined Space Entry: Confined space entry is not anticipated for this project but if necessary, all confined space entries will be made in accordance with OSHA

requirements at 29CFR 1910.146, Confined Space Entry.

13. Ventilation: Mechanical ventilation will be utilized to reduce the concentration of flammable/explosive vapors within the work areas if appropriate. The blower will be bonded and grounded to reduce the static charge, and exhausted away from potential ignition sources. The exhaust area will be monitored to assure that flammable vapors do not accumulate in low-lying areas. If a combustible gas concentration of 10% of the lower explosive limit (LEL) or greater is detected, the ventilation will be shut down, all ignition sources within 50 feet of the site will be shut down, and the vapors will be allowed to dissipate before continuing.

14. Work Area: The size of the work area is dependent upon how much space is available for setting up equipment and if the area contains any inherent hazards. Therefore, the Project Manager will determine the size of the work area based on the latest available information. If the Project Manager believes unacceptable risks may exist, then the Project Manager will contact the SHSO for assistance. There may-be multiple work areas and each will be designated by the Project Manager.

4.0 PERSONAL PROTECTIVE EQUIPMENT

Personal safety protection will be required during all site activities at most of the site locations unless information is obtained indicating that contaminants are not present. Conditions that develop that would require increased protective measures would require the SHSO to stop operations and evaluate the situation. It is anticipated that most work will be performed under Level D protection which consists of the following:

Level D

1. Work uniform (overalls)
2. Steel-toe work boots
3. Hard hat
4. Safety glasses
5. Hearing protection
6. Gloves
7. Orange Safety Vest

If excessive vapors are detected or direct contact with contaminated media is expected workers may need to upgrade to Level C protection. Level C Protection consists at a minimum of the following:

Level C

1. Full body disposable suits appropriate for petroleum exposure
2. Steel-toe work boots
3. Hard hat
4. Safety glasses
5. Hearing protection
6. Gloves
7. Half or full-face Air Purifying Respirator
8. Orange Safety Vest

If entry into a confined space is to be performed, a full-body harness with life line, attached to an extraction unit will be part of the required PPE. This will be performed in compliance with Confined Space Standard 29 CFR 1910.146. Confined spaces are not expected to be encountered during investigation activities.

It is recommended that all workers change clothes at the end of the work shift to minimize bringing potentially contaminated soil off site and to reduce cumulative build-up in personal vehicles. Boots should be changed prior to leaving the site to reduce tracking of soil off-site. This procedure prevents workers from bringing impacted materials off-site. If disposable coveralls are used, they should be disposed of in accordance with applicable regulations.

Levels of Protection to be utilized by on-site personnel will be continually evaluated by the SHSO, with assistance from the CSP. The levels of protection may be modified, as necessary, with approval by the CSP. Any change in the level of protection must be documented.

5.0 TRAINING

5.1 Site Training Requirements

All TRC and drilling subcontractor workers must have attended 40-hour hazardous waste operations and emergency response (HAZWOPER) training as defined in OSHA 29 CFR 1910.120. All workers must have attended an 8-hour refresher class within the past year in order to stay current in the HAZWOPER Standard training requirements. The SHSO and PM and other supervisory personnel must have appropriate training to:

- Ensure maximum regard for the health and safety of all employees, the public, and the environment;
- Comply with all laws, rules, and regulations required for safeguarding the health and safety of all employees, the public, and the environment;
- Increase the ability of employees to react responsibly and safely under normal conditions and during emergency situations; and
- Educate personnel relative to potential site hazards, adverse chemical effects, and the importance of good safety and industrial hygiene practices.

Mandatory safety training programs must be held periodically to refresh employee health and safety awareness. Certificates of completion of this training must be presented to the SHSO, and kept on site for the duration of the project. The training certificate checklist is in **Appendix C**. Workers with supervisory responsibility must have an additional 8 hours of supervisory training in addition to the initial 40-hour training and annual refresher.

5.2 On-Site Safety Training

In addition to the 40-hour OSHA safety training, specific safety training will be given in the field. General comprehensive safety training will be given to each employee prior to conducting any field work. The SHSO will be responsible for this training which will consist of, at a minimum, the following:

1. Each employee will be provided access to a copy of the SSHSP and the plan will be reviewed with each employee performing work on-site.
2. On-site personal hygiene will be reviewed to prevent contaminants from being brought off site on clothing or foot wear.

3. Decontamination procedures will be reviewed.
4. Emergency procedures will be reviewed.
5. Individual medical data sheets will be collected. Sample data sheets are included as **Appendix D.**

5.3 Daily Safety Meeting

Prior to the start of site activities each day, a meeting will be held to detail the new day's activities, answer any questions that might arise, and to reiterate health and safety procedures.

5.4 Daily Safety Inspections

In order to maintain a safe working environment, the SHSO will conduct safety inspections at least on a daily basis. Any deviations from the SSHSP will be noted and addressed. The inspections shall include an evaluation of work practices and the work area as they relate to safety.

6.0 SITE AIR MONITORING

A key component in maintaining low exposure to site workers is through air monitoring of work operations. If dusts are generated during the investigation, dust monitoring will be necessary. Dust-monitoring will consist of real-time dust monitoring using a Mini Real-Time Aerosol Monitor (Mini RAM), DataRAM, Dust Trak or similar instrument. Air monitoring for VOCs will be conducted in the immediate work area during all drilling activities. A photoionization detector (PID) with a 10.6 eV lamp will be used to detect VOCs. Sampling will be performed upwind and downwind of the work area and will be recorded in the site log and used to determine if excessive levels are present in the work area.

Air monitoring will be performed by the SHSO. Based on the results of the air monitoring the SHSO will decide on upgrading control measures. The threshold limit values (TLV) is the exposure limit permissible for an 8 hour day 40 hours per week. The TLV for TCE is 50 ppm. If site monitoring equipment confirms that concentrations have exceeded the TLV for TCE, the SHSO will stop work immediately, allow the levels to dissipate and Draeger tubes will be used to monitor specific chemicals of concern. Once concentrations have returned to a safe level work may resume. Should conditions persist, see Section 3.0, Standard Operating Procedures, “Respiratory Equipment”.

6.1 Community Air Monitoring Requirements

TRC will implement community air monitoring, in accordance with the NYSDOH generic CAMP, only during the installation of permanent groundwater monitoring wells or other activity which generates soil cuttings outside of the on-Site structures.

The NYSDEC issued a 1989 memorandum on controlling fugitive dust emissions during “ground intrusive activities” (e.g., excavation, hollow stem auger drilling). The National Ambient Air Quality Standard (NAAQS) for Respirable Particulates which are defined as particles 10*u*m (PM10) in diameter or less is 150 *u*g/m^3. Based on this standard, community dust exposure from ground intrusive activities should not exceed 150 *u*g/m^3 above background and monitoring should be performed upwind, downwind and within the work area. Dust-monitoring will consist of real-time dust monitoring using a Mini Real-Time Aerosol Monitor (Mini RAM), DataRAM, Dust Trak or similar instrument.

The NYSDEC defines fugitive dust as particulate matter that is not from a specific source and could include discrete particles, droplets and solids over a wide range of sizes. Most continuous dust monitors are designed to provide maximum response to PM10 particulate since these particles are considered inhalable. The NYSDEC guideline requires sampling at downwind sites for 15 minutes at each site and for 15 minutes at upwind sites to establish background. Sampling locations will be dictated based on wind direction which must be monitored using a wind sock, anemometer or telltale that is at least 10 feet off the ground.

Based on the air monitoring results dust suppression may need to be implemented. This could include the following:

- Applying water
- Wetting equipment
- Spraying work area
- Utilizing alternate methods

Background dust monitoring should be performed prior to the start of the work day. Sampling should be performed at an upwind location at the property boundary for a minimum of fifteen minutes. Sampling should be performed at three downwind locations at least twice each day. Monitoring results should be kept in a log book and used to evaluate whether additional dust control measures are necessary.

Air monitoring equipment shall include a PID to be used along with the dust monitor at upwind and downwind locations. The PID readings will be recorded at the same regularity as the dust monitor.

7.0 EMERGENCY PROCEDURES

Should outside assistance be needed for accidents, fire, or release of hazardous substances, the emergency numbers will be available and posted at the site (see **Appendix A**) where a readily accessible telephone is made available for emergency use.

Also, in the event of an incident where a team member becomes exposed or suffers from an acute symptom from contact with site materials and has to be taken to a hospital, a short medical data sheet for that individual will be made available to the attending physician. The medical data sheet will include the following:

1. Name, address, home phone
2. Age, height, weight
3. Name of person to be notified in case of an accident
4. Allergies
5. Particular sensitivities
6. Does he/she wear contact lenses?
7. Short checklist of previous illness
8. Name of personal physician and phone
9. Name of company physician and phone
10. Prescription and non-prescription medications currently used.

A sample medical data sheet is included in **Appendix D**. A map showing the directions to the nearest hospital is included as **Figure 2**.

7.1 Emergency Site Evacuation Procedure

Evacuation Plan

In the event that an emergency situation arises, including but not limited to fire, explosion, etc. all personnel will evacuate the site and assemble at a designated location. Necessary instructions will be given by the SHSO. After the emergency has been resolved, the SHSO will indicate when staff should resume their normal duties. The SHSO will determine, by wind sock or other acceptable means, if toxic gas release or other similar emergency is upwind of any designated assembly sites. To the extent that this becomes a danger to the health and safety of those at the designated assembly point, another designated location of assembly will be established.

In order to quickly mobilize the manpower resources and equipment necessary to cope with a fire or other emergency, a clear definition of the authority to initiate action has been established. For the purposes of this plan, the SHSO will have the authority to initiate proper action in any emergency situation for the duration of this project.

It will be the responsibility of the SHSO to report immediately to the scene of the fire or emergency, assess the seriousness of the situation and direct fire fighting and containment efforts should they be necessary until arrival of the local fire fighters, should they be necessary. The SHSO may also order the closure of the site for an indefinite period as long as the SHSO deems it necessary.

Under no circumstances will incoming visitors be allowed to proceed to the fire area once the alarm has been sounded. Visitors or other persons present in the area of the emergency shall be instructed to evacuate the area. Upon the sound of the alarm, the SHSO will ensure that access roads are not obstructed and will remain on-site to provide stand-by assistance upon arrival of emergency apparatus.

Upon initiation of any alarm, someone will be designated by the SHSO to attend the designated emergency telephone for the duration of the emergency. All project personnel will be instructed on proper emergency response and emergency telephone numbers. It may be necessary to control traffic in the event of a fire or explosion. Persons trained in traffic control procedures will be utilized to perform this function. Proper reflection warning vests will be worn by those persons controlling traffic.

Should an accident occur in which personnel are injured or exposed, the following actions will be taken. The site SHSO will assume control, and will assign someone to notify emergency personnel from the emergency telephone. Companion personnel who are unaffected by the incident or personnel partially dressed in protective gear but outside the work zone will be alerted to rescue any workers whose health or safety is endangered. The buddy system will be enforced. Victims will be located and their conditions will be assessed. If possible, the hazardous situation will be brought under complete or temporary control and victims will be assisted or removed from the area. The SHSO will determine, based on the type and severity of the illness or injury, whether or not to decontaminate the victim, and whether the victim needs to be stabilized.

8.0 MEDICAL PROCEDURES

8.1 Physical Examination Documents

Documentation of medical physical examinations must be submitted and maintained for workers with the potential to wear respirators. This must also include a signed statement by a board-certified or board-eligible licensed physician who practices occupational medicine that the employee is approved for the wearing of Personal Protective Equipment (PPE) including respiratory protection. Physical examinations must be current within one year of the date of intended site work.

8.2 Physical Examination

Employees whose work assignments require their presence at a hazardous work site are required to have a baseline medical evaluation prior to commencement of hazardous work activity. The baseline medical evaluation consists of the following [*=Required; •=Preferred]:

- * Medical and Occupational History
- * Physical Examination
- * Pulmonary Function
- • Urinalysis
- • CBC (with differential and RCB) Chem 24 (SMAC)
- • RBC Cholinesterase
- • Urine Heavy Metal Panel
- • Blood Lead with zpp
- • Chest X-Ray (2-view)
- * EKG (over 40 years of age)
- • Audiometry

The annual medical evaluation consists of the following [*=Required; •=Preferred]:

- * Physical Examination and History
- * Pulmonary Function

- Urinalysis
- CBC (with differential and RCB) Chem 24 (SMAC)
- RBC Cholinesterase
- Blood Lead with zpp
- EKG (Over 40 years of age)
- Audiometry

Additional tests which may be performed as part of the annual examination include the following [*=Required; •=Preferred]:

- Cholinesterase - plasma
- Urine - heavy metal
- Blood - PCB
- Chest X-Ray (2-view)

Based upon examination and a review of the employee's job description, the physician identifies any medical restrictions which would affect an employee's ability to safely perform his/her job. If no restrictions are imposed, the physician certifies the employee as capable of full participation in the work program.

If an employee suspects exposure to a toxic chemical or other hazard while performing project tasks, additional tests are ordered immediately following the exposure period. Individuals are encouraged to discuss changes in their health status with the Company Health and Safety Director and/or physician.

8.3 Emergency First Aid

An individual, preferably the SHSO, who has a current certificate for emergency first aid and cardiopulmonary resuscitation will be on site at all times during the project with an emergency first aid kit. In the event of a medical emergency the SHSO must immediately call 911 and request an ambulance or emergency medical team. The SHSO should designate a person to flag down the ambulance and direct it to the injured person. The SHSO should initiate first aid procedures until arrival. A vehicle designated for transport of injured individuals to medical facilities will be on-site during the project. This vehicle will not be used for other purposes on-site so it will remain free for transportation in case of an emergency. The use of on-site transportation will be based on the availability of an ambulance which should be the primary mode of emergency transportation.

8.4 Heat Stress

Heat stress is a result of a build-up of heat in the body. This can occur when the body produces heat at a greater rate than it is dispersed by conduction, radiation, and evaporation of sweat from the surface of the skin. The internal heat of the body is brought to the surface by blood. When heat build-up occurs, the body temperature is raised causing a fever. When this condition exists it produces a cycle which further aggravates the situation. The fever causes certain body functions to accelerate. This generates excess heat which must be dispersed in addition to the normal heat generated by a person's body. Heat loss from the body is slow during conditions of high temperature and high humidity, such as a hot, humid day. These conditions, however, can be artificially caused by the wearing of non-porous, protective clothing. Therefore, caution should be exercised during field activities performed within high temperature environments.

Based on the allowable work periods (minutes per hour), a work rest regimen should be established based upon ambient conditions at the start of the job, and the acclimatization of the workforce in those conditions. Temperature extremes, as determined by a globe thermometer device (WBGT or equivalent) may require scaling back work cycles within the regimen. Greater active work times are allowable, so long as no symptoms of heat stress are noted. Heat stress symptoms are discussed in detail below.

There are three classes or types of heat stress: heat exhaustion, heat cramps, and heat stroke.

Heat Exhaustion

Heat exhaustion is brought about by the concentration of blood in the vessels of the skin. This condition may lead to an inadequate return of blood to the heart and, eventually, to physical collapse. The symptoms are:

- General weakness

- Excessive perspiration
- Dizziness
- Appearance of having fainted
- Pale and clammy skin
- Weak pulse
- Rapid and shallow breathing

To treat for heat exhaustion, place the individual in a cool place and remove as much clothing as possible. The individual should drink cool water; "Gatorade" or other similar liquid. The individual should be fanned, however, do not over cool or allow chilling. Treat the individual for shock and remove to medical facility if condition persists.

Heat Cramps

Heat cramps are usually caused by loss of salt when an individual has perspired a great deal. Cramps usually in the leg and abdominal muscles can also be caused by drinking iced liquids quickly or in large amounts. The symptoms of heat cramps are as follows:

- Pain and cramps in legs or abdomen
- Faintness
- Profuse perspiration

Heat Stroke

Heat stroke is a breakdown of the body heat-regulating mechanism causing high fever and collapse. This condition can result in unconsciousness, convulsions, and even death. Persons in poor physical condition or of advanced age are particularly susceptible. The symptoms of heat stroke are:

- Muscle twitching or convulsions
- Dry hot skin
- Flushed skin
- Suddenness of condition
- High body temperature
- Loss of consciousness
- Deep breathing, then shallow or absent

- Dilated pupils

Heat stroke is a serious condition for which an individual should be transported to a medical facility as soon as possible. In the interim the following steps can be taken. The individual should be removed to a cool environment and the body temperature should be reduced promptly by dousing the body with water or by wrapping in a wet sheet. If ice is available, it should be placed under the arms and around the neck and ankles. Drinking water should be provided. Intake of these liquids will be monitored by the SHSO so as not to be excessive. Steps should be taken to protect patient from injury during convulsions, especially from biting the tongue.

To avoid problems from heat stress during conditions of high temperature and humidity, the SHSO should insure that the employees drink plenty of fluids; should provide breaks in accordance with the previously outlined guidance and monitoring; and should revise work schedules as necessary to take advantage of the cooler parts of the day. Some basic guidelines for maintaining workers' body fluids at normal levels during conditions of high temperature and humidity are as follows:

- have workers drink 16 ounces of fluid before beginning work.
- have workers drink 4 to 8 ounces of fluid every 15 to 20 minutes, or at each scheduled break. A total of 1 to 1.6 gallons of fluid per day are recommended, but more may be necessary to maintain body weight.

To measure the effectiveness of the heat recovery rest periods, the employee heart rate should be monitored as follows:

- Count the pulse rate for the last 30 seconds of the first minute of a three minute period, the last 30 seconds of the second minute, and the last 30 seconds of the third minute.
- Double the count to obtain an equivalent one minute rate.

If the first rate is less than 100 beats/minute and the second two readings are at least 10 beats/minute less than the previous reading than the rest periods should be considered adequate. Otherwise, the rest periods should be extended.

Another method of measuring the effectiveness of the rest periods is to take oral temperatures. If body temperature exceeds 100ºF, then the rest periods should be extended.

If heat stress may be a factor due to ambient temperature and humidity, then it is recommended that both methods be used. Also, these tests should be performed in the morning prior to any work to establish a background level.

8.5 Cold Stress

Fatal exposures to cold among workers have almost always resulted from accidental exposures involving failure to escape from low environmental air temperatures or from immersion in low temperature water. The single most important aspect of life-threatening hypothermia (cold stress) is the fall in the deep core temperature of the body. Workers should be protected from exposure to cold so that the deep core temperature does not fall below 36°C (96.8°F); lower body temperatures will very likely result in reduced mental alertness, reduction in rational decision making, or loss of consciousness with the threat of fatal consequences.

Pain in the extremities may be the first early warning of danger to cold stress. During exposure to cold, maximum severe shivering develops when the body temperature has fallen to 35°C (95°F). This must be taken as a sign of danger to the workers and exposure to cold should be immediately terminated for all workers when severe shivering becomes evident. Useful physical, or mental work is limited when severe shivering occurs.

Since prolonged exposure to cold air or to immersion in cold water, at temperatures well above freezing can lead to dangerous hypothermia, whole body protection must be provided. Adequate insulating clothing to maintain core temperatures above 36ºC must be provided to workers if work is performed in air temperatures below 4ºC (40ºF). In addition, it should be kept in mind that, the higher the wind speed and the lower the temperature in the work area, the greater the insulation value of the protective clothing required.

Special protection of the hands is required to maintain manual dexterity for the prevention of accidents:

1. If fine work is to be performed with bare hands for more than 10-20 minutes in an environment below 16ºC (60ºF), special provisions should be established for keeping the workers' hands warm. Metal handles or tools and control bars should be covered

with thermal insulating material at temperatures below -1ºC (30ºF).

2. If the air temperature falls below 16ºC (60ºF) for sedentary, 4ºC (40ºF) for light, -7ºC (20ºF) for moderate work and fine manual dexterity is not required, then gloves must be used by the workers. Winter "Monkey-grip" gloves consisting of a cotton lining with a textured PVC coating are typically used in cold weather. To prevent contact frostbite, the workers should wear anti-contact gloves.

Provisions for additional body protection is required if work is performed in an environment at or below 4ºC (40ºF). The workers shall wear cold protective clothing appropriate for the level of cold and physical activity:

1. If the air velocity at the job sites is increased by wind, draft, or artificial ventilating equipment, the cooling effect of the wind shall be reduced by shielding the work area, or by wearing an easily removable outer windbreak layer garment.
2. If only light work is involved and if the clothing on the worker may become wet on the job site, the outer layer of the clothing in use may be of a type impermeable to water. With more severe work under such conditions, the outer layer should be water repellent and the outerwear should be changed as it becomes wetted. The SHSO should assure that adequate replacement garments are available for use by the employees.
3. If the available clothing does not give adequate protection to prevent hypothermia or frostbite, the SHSO can suspend work on the site until adequate clothing is available or until weather conditions improve.
4. Workers handling evaporative liquids (gasoline, alcohols, solvents, etc.) at air temperatures below 4ºC (40ºF) shall take special precautions to avoid soaking of clothing or gloves with the liquids because of the added danger of cold injury due to evaporative cooling. Special note should be taken of the particularly acute effects of splashes or "cryogenic fluids" or those liquids with a boiling point only just above ambient temperatures.

8.6 Emergency Medical Procedures

All accidents or incidents will be dealt with in a manner to minimize further injury to the individual or others. In the event that an accident does occur, the following general procedures should be followed:

- First aid and other appropriate action shall be given by the qualified individual closest to the event.
- Contact hospital and arrange for ambulance if necessary.
- As soon as practicable, the incident shall be reported to the SHSO. The SHSO shall be responsible for making all decisions concerning treatment, and/or other appropriate action.
- The appropriate reports/forms will be completed and forwarded to SHSO where they will be kept on file. The incident will also be noted in the site field log.

8.7 Accident and Injury Report Forms

8.7.1 Accident Report

All injuries, no matter how slight, shall be reported to the SHSO. An accident report will be filled out on all accidents by the SHSO. Project personnel will be instructed on the location of the first aid station, hospital, doctor, and ambulance service near the job. The emergency phone numbers will be conspicuously posted. First aid supplies will be centrally located and conspicuously posted between restricted and non-restricted areas so as to be readily accessible to all on the site.

8.7.2 First Aid Treatment Record

This form (**Appendix D**) will be used for recording all non-lost time injuries treated by the project first-aid attendant, local physician or hospital. "Minor" treatment of scratches, cuts, etc. will receive the same recording attention as treatment of more severe injuries.

8.7.3 Occupational Injuries & Illnesses Form (OSHA 301) (Appendix E)

All recordable occupational injuries and illnesses as required by the regulations issued under the

Occupational Safety and Health Act (OSHA) shall be recorded on this form. Occupational injuries and illnesses shall be recorded within 48 hours of a recordable case as required by statute. This is the responsibility of the employer, and will be recorded by the site SHSO in so far as reportable injuries/illnesses happen to on site employees.

9.0 DEMARCATION OF ZONES

9.1 Exclusion (Work) Zone

Work zones for all activities will be demarcated with appropriate barriers. Only authorized personnel will be allowed access into the work zones. All appropriate safety criteria associated with these zones will be followed.

9.2 Decontamination Zone

Decontamination areas where personnel and equipment decontamination procedures will be performed, if appropriate, will be located as close as possible to work areas. These areas will be demarcated by appropriate barriers and signs and all unauthorized personnel will be excluded. Decontamination could be necessary if contaminated materials are uncovered or spills occur.

10.0 DECONTAMINATION PROCEDURES

The decontamination of personnel, portable equipment, tools and sampling equipment will take place in designated decontamination areas. Specific personnel and equipment decontamination procedures are provided in the next sections.

10.1 Specific Procedures

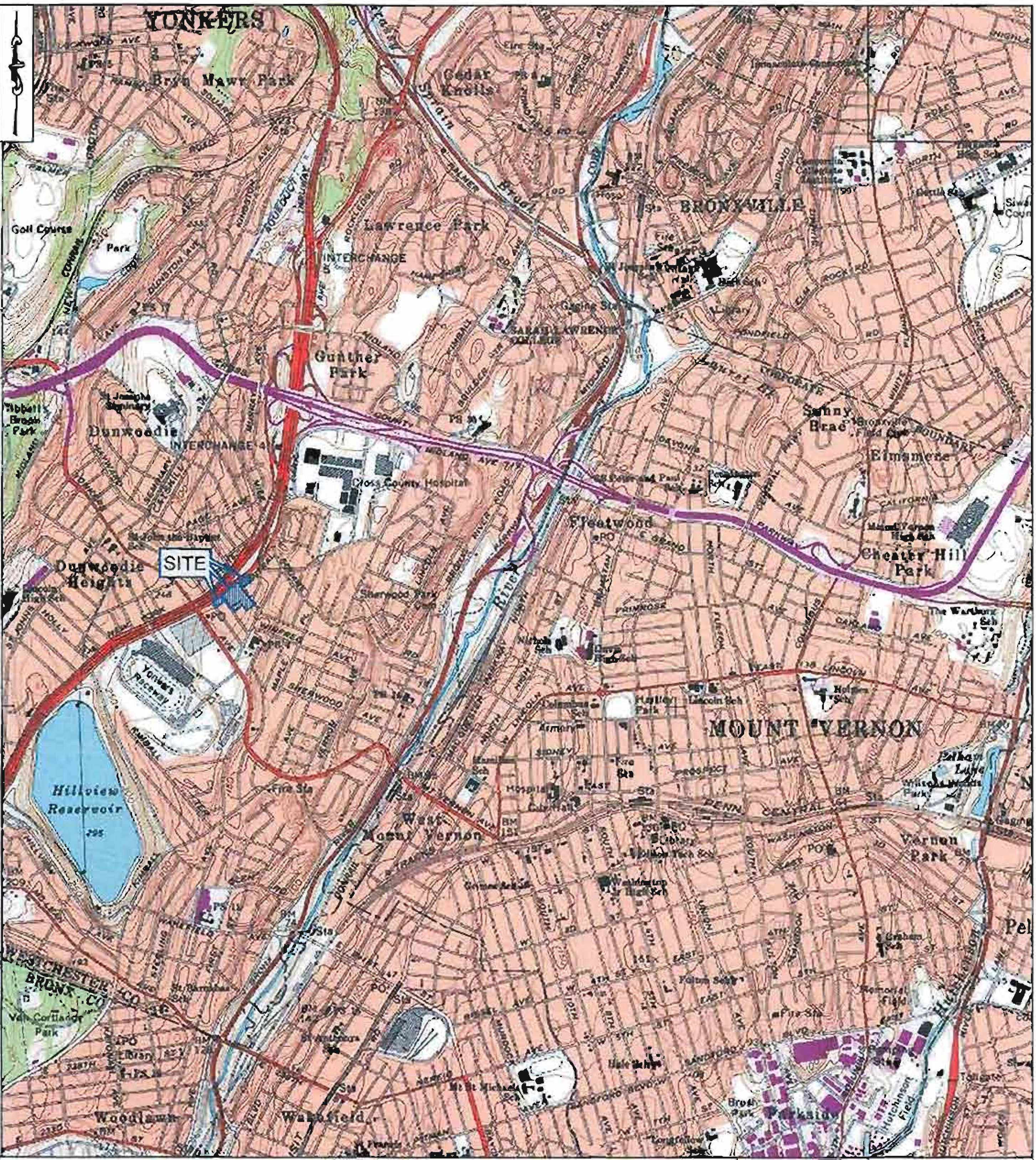
The following describes procedures to be employed for personnel and equipment decontamination.

PERSONNEL DECONTAMINATION PROCEDURES FOR LEVEL D PROTECTION

Station 1:	Segregated Equipment Drop	1.	Deposit equipment used on-site (tools, sampling devices and containers, monitoring instruments, radios, clip-boards, etc.) on plastic drop cloths or in different containers with plastic liners. Segregation at the drop reduces the probability of cross-contamination. During hot weather operations, cool down stations may be set up within this area.
Station 2:	Outer Glove Removal	2.	Remove outer gloves and deposit in waste container.
Station 3:	Inner Glove Removal	3.	Remove inner gloves and deposit in container with liner.
Station 4:	Field Wash (as necessary)	4.	Wash hands and face.
Station 5:	Re-dress (as necessary)	5.	Put on clean clothes.

FIGURE 1

SITE LOCATION



SCALE 1:24 000

1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 KILOMETER

CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929
DEPTH CURVES AND SOUNDINGS IN FEET—DATUM IS MEAN LOW WATER

NEW YORK

QUADRANGLE LOCATION

MAP OBTAINED THROUGH USE OF MAPTECH TERRAIN NAVIGATOR PRO SOFTWARE.

MOUNT VERNON, N.Y.

1966
PHOTOREVISED 1979

TRC
1430 BROADWAY, 10TH FLOOR
NEW YORK, NEW YORK 10018
212-221-7822

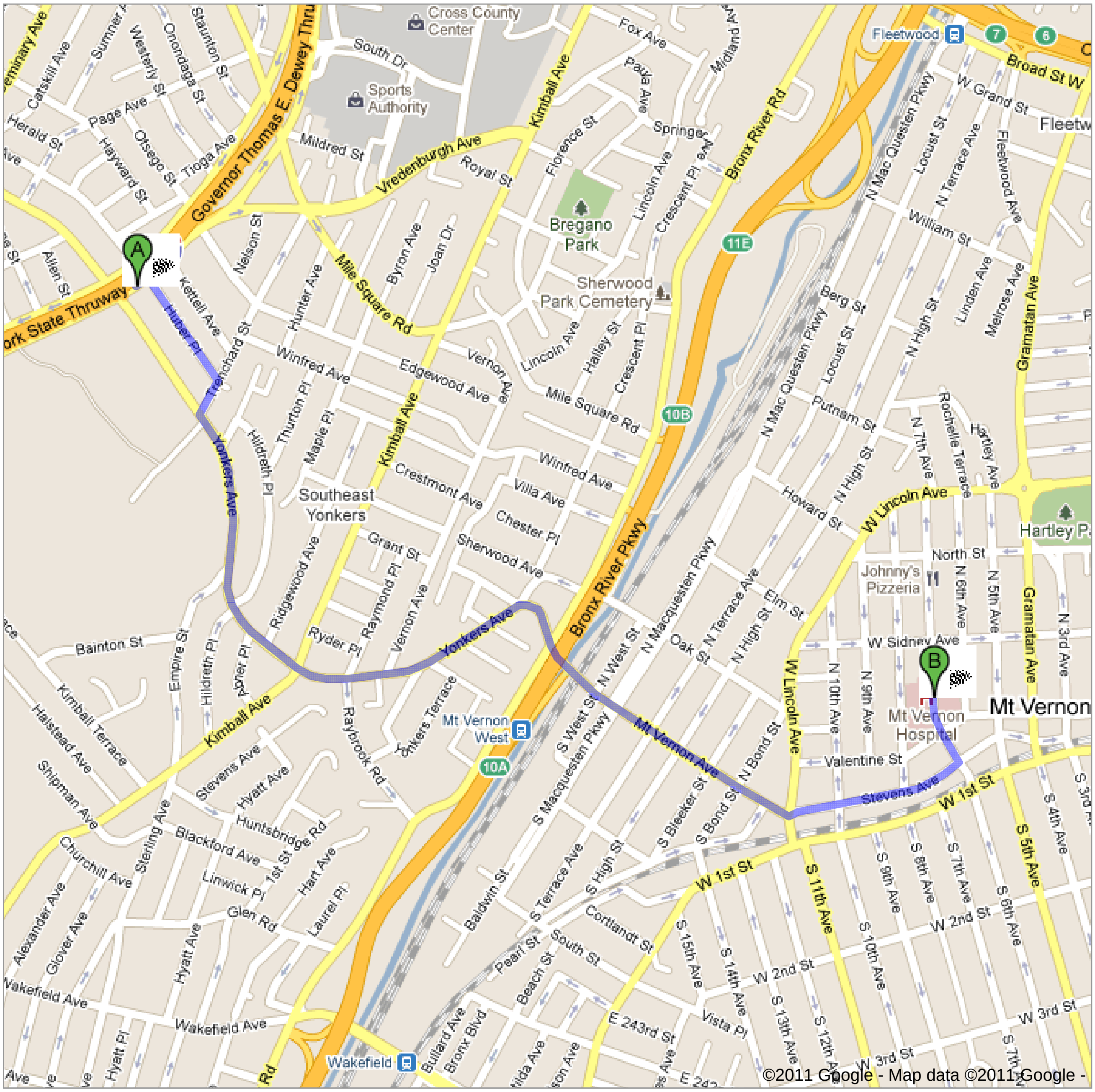
DESIGNED BY: JM	PROJECT NAME: FORMER STEWART STAMPING SITE VCP SITE NO. V00691-3, VCA INDEX NO. W3-1005-04-06 YONKERS, NEW YORK	FIGURE 1
DRAWN BY: HD		
CHECKED BY: DSG		
DATE: APRIL 2011	DRAWING TITLE: SITE LOCATION MAP	
SCALE: AS SHOWN		
PROJECT NUMBER: 181590.0000.0000		

FIGURE 2

HOSPITAL EMERGENCY ROUTE

Google maps

Directions to 12 N 7th Ave, Mt Vernon, NY 10550
1.9 mi – about **7 mins**



630 Central Park Ave, Yonkers, NY 10704

1. Head **northeast** on **Central Park Ave** toward **Huber Pl**	go 118 ft total 118 ft
2. Take the 1st right onto **Huber Pl**	go 0.2 mi total 0.2 mi
3. Take the 1st right onto **Trenchard St**	go 299 ft total 0.3 mi
4. Turn left at **Yonkers Ave** About 3 mins	go 1.0 mi total 1.2 mi
5. Continue onto **Mt Vernon Ave**	go 0.3 mi total 1.5 mi
6. Turn left at **Stevens Ave** About 1 min	go 0.3 mi total 1.8 mi
7. Turn left at **W Roosevelt Square**	go 259 ft total 1.9 mi
8. Continue onto **N 7th Ave** Destination will be on the left	go 285 ft total 1.9 mi

12 N 7th Ave, Mt Vernon, NY 10550

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

Directions weren't right? Please find your route on maps.google.com and click "Report a problem" at the bottom left.

APPENDIX A

KEY PERSONNEL AND EMERGENCY PHONE NUMBERS

APPENDIX A

Key Personnel and Emergency Phone Numbers

City of Yonkers Police Department	911 or 377-7777 (if using cell phone)
City of Yonkers Fire Department	(914) 377-7500
Mount Vernon Hospital 12 North Seventh Avenue Mount Vernon, New York 10550	914-664-8000
Emergency Medical Service (ambulance)	911
Ralph Celone, Stewart EFI, LLC Manager of Continuous Improvement	(860) 283-8213,ext. 219 cellular: (860) 449-3425
Wes Lindemuth, TRC Site Health and Safety Officer	(212)-221-7822, ext. 132 cellular: (347)-738-1452
Jennifer Miranda, TRC Project Manager (Primary)	(212) 221-7822, ext. 102 cellular: (646) 285-8990
Gary Ritter, TRC Corporate Safety Director	(860) 298-6256 Pager: (860) 948-4503
National Response Center	(800) 424-8802
NYSDEC Spill Hotline	(800) 457-7362

APPENDIX A (continued)

Subcontractors

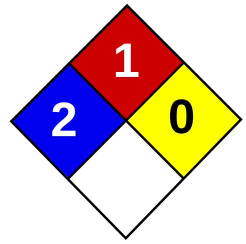
Firm (Type of Work)/ Contact Name/Title	**Phone Number**	**E-Mail Address**	**Fax Number**
Aquifer Drilling and Testing, Inc. Soil Boring Installation William A. Poupis, Vice President/General Manager 150 Nassau Terminal Road New Hyde Park, NY 11040	(516) 616-6026	wpoupis@aquiferdrilling.com	(516) 326-0589
Nova Geophysical Services Utility Location and Geophysical Investigation Levent Eskicakit, P.G., E.P. 56-01 Marathon Parkway P.O. Box 765 Douglaston, New York 11362	(347) 556-7787	levent@nova-gsi.com	(718) 261-1527
TestAmerica Laboratory Analysis Aidan Scott 777 New Durham Road Edison, NJ 08817	(732) 549-3900 (646) 745-0906	aidan.scott@testamericainc.com	(732) 549-3679
Perfect Point Corporation Surveying 7914 Rockaway Beach Blvd, Suite 4B Rockaway Beach, New York 11693	(718) 474-7700	info@ppsurveying.com	(718) 872-9699

APPENDIX B

MATERIAL DATA SAFETY SHEETS

(MSDS)

ScienceLab.com
Chemicals & Laboratory Equipment



Health	2
Fire	1
Reactivity	0
Personal Protection	H

Material Safety Data Sheet
Trichloroethylene MSDS

Section 1: Chemical Product and Company Identification

Product Name: Trichloroethylene

Catalog Codes: SLT3310, SLT2590

CAS#: 79-01-6

RTECS: KX4560000

TSCA: TSCA 8(b) inventory: Trichloroethylene

CI#: Not available.

Synonym:

Chemical Formula: C2HCl3

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Trichloroethylene	79-01-6	100

Toxicological Data on Ingredients: Trichloroethylene: ORAL (LD50): Acute: 5650 mg/kg [Rat]. 2402 mg/kg [Mouse]. DERMAL (LD50): Acute: 20001 mg/kg [Rabbit].

Section 3: Hazards Identification

Potential Acute Health Effects: Hazardous in case of skin contact (irritant, permeator), of eye contact (irritant), of ingestion, of inhalation.

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Classified + (PROVEN) by OSHA. Classified A5 (Not suspected for human.) by ACGIH. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance is toxic to kidneys, the nervous system, liver, heart, upper respiratory tract. Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:

Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Cold water may be used. Do not use an eye ointment. Seek medical attention.

Skin Contact:
After contact with skin, wash immediately with plenty of water. Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. Cover the irritated skin with an emollient. If irritation persists, seek medical attention. Wash contaminated clothing before reusing.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek medical attention.

Inhalation: Allow the victim to rest in a well ventilated area. Seek immediate medical attention.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.

Ingestion:
Do not induce vomiting. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: May be combustible at high temperature.

Auto-Ignition Temperature: 420°C (788°F)

Flash Points: Not available.

Flammable Limits: LOWER: 8% UPPER: 10.5%

Products of Combustion: These products are carbon oxides (CO, CO_2), halogenated compounds.

Fire Hazards in Presence of Various Substances: Not available.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

Special Remarks on Fire Hazards: Not available.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill: Absorb with an inert material and put the spilled material in an appropriate waste disposal.

Large Spill:
Absorb with an inert material and put the spilled material in an appropriate waste disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep locked up Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapour/

spray. Wear suitable protective clothing In case of insufficient ventilation, wear suitable respiratory equipment If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes

Storage:
Keep container dry. Keep in a cool place. Ground all equipment containing material. Carcinogenic, teratogenic or mutagenic materials should be stored in a separate locked safety storage cabinet or room.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection:
Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 50 STEL: 200 (ppm) from ACGIH (TLV) TWA: 269 STEL: 1070 (mg/m3) from ACGIH Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid.

Odor: Not available.

Taste: Not available.

Molecular Weight: 131.39 g/mole

Color: Clear Colorless.

pH (1% soln/water): Not available.

Boiling Point: 86.7°C (188.1°F)

Melting Point: -87.1°C (-124.8°F)

Critical Temperature: Not available.

Specific Gravity: 1.4649 (Water = 1)

Vapor Pressure: 58 mm of Hg (@ 20°C)

Vapor Density: 4.53 (Air = 1)

Volatility: Not available.

Odor Threshold: 20 ppm

Water/Oil Dist. Coeff.: The product is equally soluble in oil and water; log(oil/water) = 0

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water, methanol, diethyl ether, acetone.

Solubility:
Easily soluble in methanol, diethyl ether, acetone. Very slightly soluble in cold water.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Not available.

Incompatibility with various substances: Not available.

Corrosivity:
Extremely corrosive in presence of aluminum. Non-corrosive in presence of glass.

Special Remarks on Reactivity: Not available.

Special Remarks on Corrosivity: Not available.

Polymerization: No.

Section 11: Toxicological Information

Routes of Entry: Dermal contact. Eye contact. Inhalation. Ingestion.

Toxicity to Animals:
Acute oral toxicity (LD50): 2402 mg/kg [Mouse]. Acute dermal toxicity (LD50): 20001 mg/kg [Rabbit].

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: Classified + (PROVEN) by OSHA. Classified A5 (Not suspected for human.) by ACGIH. The substance is toxic to kidneys, the nervous system, liver, heart, upper respiratory tract.

Other Toxic Effects on Humans: Hazardous in case of skin contact (irritant, permeator), of ingestion, of inhalation.

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Passes through the placental barrier in human. Detected in maternal milk in human.

Special Remarks on other Toxic Effects on Humans: Not available.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are more toxic.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Section 14: Transport Information

DOT Classification: CLASS 6.1: Poisonous material.

Identification: : Trichloroethylene : UN1710 PG: III

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Trichloroethylene California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: Trichloroethylene Pennsylvania RTK: Trichloroethylene Florida: Trichloroethylene Minnesota: Trichloroethylene Massachusetts RTK: Trichloroethylene New Jersey: Trichloroethylene TSCA 8(b) inventory: Trichloroethylene CERCLA: Hazardous substances.: Trichloroethylene

Other Regulations: OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

Other Classifications:

WHMIS (Canada):
CLASS D-1B: Material causing immediate and serious toxic effects (TOXIC). CLASS D-2B: Material causing other toxic effects (TOXIC).

DSCL (EEC):
R36/38- Irritating to eyes and skin. R45- May cause cancer.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 1

Reactivity: 0

Personal Protection: h

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 1

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

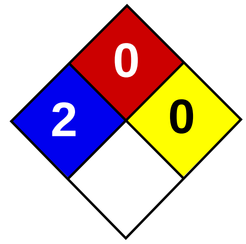
Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 10/10/2005 08:54 PM

Last Updated: 11/01/2010 12:00 PM



Health	2
Fire	0
Reactivity	0
Personal Protection	G

Material Safety Data Sheet
Tetrachloroethylene MSDS

Section 1: Chemical Product and Company Identification

Product Name: Tetrachloroethylene

Catalog Codes: SLT3220

CAS#: 127-18-4

RTECS: KX3850000

TSCA: TSCA 8(b) inventory: Tetrachloroethylene

CI#: Not available.

Synonym: Perchloroethylene; 1,1,2,2-Tetrachloroethylene; Carbon bichloride; Carbon dichloride; Ankilostin; Didakene; Dilatin PT; Ethene, tetrachloro-; Ethylene tetrachloride; Perawin; Perchlor; Perclene; Perclene D; Percosolvel; Tetrachloroethene; Tetraleno; Tetralex; Tetravec; Tetroguer; Tetropil

Chemical Name: Ethylene, tetrachloro-

Chemical Formula: C2-Cl4

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Tetrachloroethylene	127-18-4	100

Toxicological Data on Ingredients: Tetrachloroethylene: ORAL (LD50): Acute: 2629 mg/kg [Rat]. DERMAL (LD): Acute: >3228 mg/kg [Rabbit]. MIST(LC50): Acute: 34200 mg/m 8 hours [Rat]. VAPOR (LC50): Acute: 5200 ppm 4 hours [Mouse].

Section 3: Hazards Identification

Potential Acute Health Effects:
Hazardous in case of skin contact (irritant), of inhalation. Slightly hazardous in case of skin contact (permeator), of eye contact (irritant), of ingestion.

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Classified A3 (Proven for animal.) by ACGIH. Classified 2A (Probable for human.) by IARC, 2 (anticipated carcinogen) by NTP. MUTAGENIC EFFECTS: Mutagenic for bacteria and/or yeast. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to kidneys, liver, peripheral nervous system, respiratory tract, skin, central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation occurs.

Skin Contact:
In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek medical attention.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if symptoms appear.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Non-flammable.

Auto-Ignition Temperature: Not applicable.

Flash Points: Not applicable.

Flammable Limits: Not applicable.

Products of Combustion: Not available.

Fire Hazards in Presence of Various Substances: Not applicable.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions: Not applicable.

Special Remarks on Fire Hazards: Not available.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill: Absorb with an inert material and put the spilled material in an appropriate waste disposal.

Large Spill:
Absorb with an inert material and put the spilled material in an appropriate waste disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Do not ingest. Do not breathe gas/fumes/ vapor/spray. Avoid contact with skin. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Keep away from incompatibles such as oxidizing agents, metals, acids, alkalis.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value.

Personal Protection:
Safety glasses. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 25 (ppm) from OSHA (PEL) [United States] TWA: 25 STEL: 100 (ppm) from ACGIH (TLV) [United States] TWA: 170 (mg/m3) from OSHA (PEL) [United States] Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid.

Odor: Ethereal.

Taste: Not available.

Molecular Weight: 165.83 g/mole

Color: Clear Colorless.

pH (1% soln/water): Not available.

Boiling Point: 121.3°C (250.3°F)

Melting Point: -22.3°C (-8.1°F)

Critical Temperature: 347.1°C (656.8°F)

Specific Gravity: 1.6227 (Water = 1)

Vapor Pressure: 1.7 kPa (@ 20°C)

Vapor Density: 5.7 (Air = 1)

Volatility: Not available.

Odor Threshold: 5 - 50 ppm

Water/Oil Dist. Coeff.: The product is more soluble in oil; log(oil/water) = 3.4

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility:
Miscible with alcohol, ether, chloroform, benzene, hexane. It dissolves in most of the fixed and volatile oils. Solubility in water: 0.015 g/100 ml @ 25 deg. C It slowly decomposes in water to yield Trichloroacetic and Hydrochloric acids.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Incompatible materials

Incompatibility with various substances: Reactive with oxidizing agents, metals, acids, alkalis.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity:
Oxidized by strong oxidizing agents. Incompatible with sodium hydroxide, finely divided or powdered metals such as zinc, aluminum, magnesium, potassium, chemically active metals such as lithium, beryllium , barium. Protect from light.

Special Remarks on Corrosivity: Slowly corrodes aluminum, iron, and zinc.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Eye contact. Inhalation. Ingestion.

Toxicity to Animals:
WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 2629 mg/kg [Rat]. Acute dermal toxicity (LD50): >3228 mg/kg [Rabbit]. Acute toxicity of the vapor (LC50): 5200 4 hours [Mouse].

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: Classified A3 (Proven for animal.) by ACGIH. Classified 2A (Probable for human.) by IARC, 2 (Some evidence.) by NTP. MUTAGENIC EFFECTS: Mutagenic for bacteria and/or yeast. May cause damage to the following organs: kidneys, liver, peripheral nervous system, upper respiratory tract, skin, central nervous system (CNS).

Other Toxic Effects on Humans:
Hazardous in case of skin contact (irritant), of inhalation. Slightly hazardous in case of skin contact (permeator), of ingestion.

Special Remarks on Toxicity to Animals:
Lowest Publishe Lethal Dose/Conc: LDL [Rabbit] - Route: Oral; Dose: 5000 mg/kg LDL [Dog] - Route: Oral; Dose: 4000 mg/kg LDL [Cat] - Route: Oral; Dose: 4000 mg/kg

Special Remarks on Chronic Effects on Humans:
May cause adverse reproductive effects and birth defects(teratogenic). May affect genetic material (mutagenic). May cause cancer.

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects: Skin: Causes skin irritation with possible dermal blistering or burns. Symtoms may include redness, itching, pain, and possible dermal blistering or burns. It may be absorbed through the skin with possible systemic effects. A single prolonged skin exposure is not likely to result in the material being absorbed in harmful amounts. Eyes: Contact causes transient eye irritation, lacrimation. Vapors cause eye/conjunctival irritation. Symptoms may include redness and pain. Inhalation: The main route to occupational exposure is by inhalation since it is readily absorbed through the lungs. It causes respiratory tract irritation, . It can affect behavior/central nervous system (CNS depressant and anesthesia ranging from slight inebriation to death, vertigo, somnolence, anxiety, headache, excitement, hallucinations, muscle incoordination, dizziness, lightheadness, disorentiation, seizures, enotional instability, stupor, coma). It may cause pulmonary edema Ingestion: It can cause nausea, vomiting, anorexia, diarrhea, bloody stool. It may affect the liver, urinary system (proteinuria, hematuria, renal failure, renal tubular disorder), heart (arrhythmias). It may affect behavior/central nervous system with symptoms similar to that of inhalation. Chronic Potential Health Effects: Skin: Prolonged or repeated skin contact may result in excessive drying of the skin, and irritation. Ingestion/Inhalation: Chronic exposure can affect the liver(hepatitis,fatty liver degeneration), kidneys, spleen, and heart (irregular heartbeat/arrhythmias, cardiomyopathy, abnormal EEG), brain, behavior/ central nervous system/peripheral nervous system (impaired memory, numbness of extremeties, peripheral neuropathy and other

Section 12: Ecological Information

Ecotoxicity:
Ecotoxicity in water (LC50): 18.4 mg/l 96 hours [Fish (Fathead Minnow)]. 18 mg/l 48 hours [Daphnia (daphnia)]. 5 mg/l 96 hours [Fish (Rainbow Trout)]. 13 mg/l 96 hours [Fish (Bluegill sunfish)].

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The product itself and its products of degradation are not toxic.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: CLASS 6.1: Poisonous material.

Identification: : Tetrachloroethylene UNNA: 1897 PG: III

Special Provisions for Transport: Marine Pollutant

Section 15: Other Regulatory Information

Federal and State Regulations:
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Tetrachloroethylene California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: Tetrachloroethylene Connecticut hazardous material survey.: Tetrachloroethylene Illinois toxic substances disclosure to employee act: Tetrachloroethylene Illinois chemical safety act: Tetrachloroethylene New York release reporting list: Tetrachloroethylene Rhode Island RTK hazardous substances: Tetrachloroethylene Pennsylvania RTK: Tetrachloroethylene Minnesota: Tetrachloroethylene Michigan critical material: Tetrachloroethylene Massachusetts RTK: Tetrachloroethylene Massachusetts spill list: Tetrachloroethylene New Jersey: Tetrachloroethylene New Jersey spill list: Tetrachloroethylene Louisiana spill reporting: Tetrachloroethylene California Director's List of Hazardous Substances: Tetrachloroethylene TSCA 8(b) inventory: Tetrachloroethylene TSCA 8(d) H and S data reporting: Tetrachloroethylene: Effective date: 6/1/87; Sunset date: 6/1/97 SARA 313 toxic chemical notification and release reporting: Tetrachloroethylene CERCLA: Hazardous substances.: Tetrachloroethylene: 100 lbs. (45.36 kg)

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada):
CLASS D-1B: Material causing immediate and serious toxic effects (TOXIC). CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

DSCL (EEC):
R40- Possible risks of irreversible effects. R51/53- Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. S23- Do not breathe gas/fumes/vapour/spray S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S37- Wear suitable gloves. S61- Avoid release to the environment. Refer to special instructions/Safety data sheets.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 0

Reactivity: 0

Personal Protection: g

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 0

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Safety glasses.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 10/10/2005 08:29 PM

Last Updated: 11/01/2010 12:00 PM

Safety data for vinyl chloride

Glossary of terms on this data sheet.

The information on this web page is provided to help you to work safely, but it is intended to be an overview of hazards, not a replacement for a full Material Safety Data Sheet (MSDS). MSDS forms can be downloaded from the web sites of many chemical suppliers.

General

Synonyms: vinyl chloride monomer, monochloroethylene, ethylene monochloride, monochloroethene, VC, VCM, chloroethene, chloroethylene
Molecular formula: C_2H_3Cl
CAS No: 75-01-4
EINECS No: 200-831-0
Annex I Index No: 602-023-00-7

Physical data

Appearance: colourless gas
Melting point: -153.7 C
Boiling point: -13.9 C
Vapour density: 2.2 (air = 1)
Vapour pressure: 2580 mm Hg at 20 C
Density (g cm^{-3}): 0.9106
Flash point: -61 C (closed cup)
Explosion limits:
Autoignition temperature:
Water solubility: 0.11 g 100 cm^{-3} at 25 C
Critical temperature: 156.5 C

Stability

Stable, but may be light sensitive. May undergo autopolymerization. Incompatible with strong oxidizing agents, chemically active metals, copper.

Highly flammable. Severe explosion risk at concentrations of around 3%. It is reported that "large fires of this material are practically inextinguishable".

Toxicology

This material is a known human carcinogen. Harmful if inhaled or absorbed through the skin. May be a reproductive hazard. Typical TWA 1 ppm.

Toxicity data

(The meaning of any abbreviations which appear in this section is given here.)
IHL-MAN TCLO 500 ppm/4y-i
ORL-RAT LD50 500 mg kg^{-1}

Risk phrases

(The meaning of any risk phrases which appear in this section is given here.)
R13 R20 R21 R22 R45.

Transport information

(The meaning of any UN hazard codes which appear in this section is given here.)
UN No 1086. Major hazard class 2. Subsidiary hazard class 3. Not permitted as cargo on passenger planes.

Personal protection

Safety glasses, good ventilation. Handle as a carcinogen.

Safety phrases

(The meaning of any safety phrases which appear in this section is given here.)
S9 S16 S44 S53.

[Return to Physical & Theoretical Chemistry Lab. Safety home page.]

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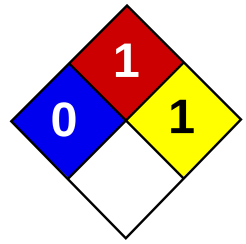

Health	1
Fire	1
Reactivity	1
Personal Protection	E

Material Safety Data Sheet
Zinc Metal MSDS

Section 1: Chemical Product and Company Identification

Product Name: Zinc Metal

Catalog Codes: SLZ1054, SLZ1159, SLZ1267, SLZ1099, SLZ1204

CAS#: 7440-66-6

RTECS: ZG8600000

TSCA: TSCA 8(b) inventory: Zinc Metal

CI#: Not applicable.

Synonym: Zinc Metal Sheets; Zinc Metal Shot; Zinc Metal Strips

Chemical Name: Zinc Metal

Chemical Formula: Zn

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Zinc Metal	7440-66-6	100

Toxicological Data on Ingredients: Zinc Metal LD50: Not available. LC50: Not available.

Section 3: Hazards Identification

Potential Acute Health Effects: Slightly hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation.

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. Repeated or prolonged exposure is not known to aggravate medical condition.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation occurs.

Skin Contact: Wash with soap and water. Cover the irritated skin with an emollient. Get medical attention if irritation develops.

Serious Skin Contact: Not available.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation: Not available.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Flammable.

Auto-Ignition Temperature: 480°C (896°F)

Flash Points: Not available.

Flammable Limits: Not available.

Products of Combustion: Not available.

Fire Hazards in Presence of Various Substances:
Slightly flammable to flammable in presence of open flames and sparks, of heat, of oxidizing materials, of acids, of alkalis, of moisture. Non-flammable in presence of shocks.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
Flammable solid. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray or fog. Cool containing vessels with water jet in order to prevent pressure build-up, autoignition or explosion.

Special Remarks on Fire Hazards:
Zinc + NaOH causes ignition. Oxidation of zinc by potassium proceeds with incandescence. Residues from zinc dust /acetic acid reduction operations may ignite after long delay if discarded into waste bins with paper. Incandescent reaction when Zinc and Arsenic or Tellurium, or Selenium are combined. When hydrazine mononitrate is heated in contact with zinc, a flamming decomposition occurs at temperatures a little above its melting point. Contact with acids and alkali hydroxides (sodium hydroxide, postasium hydroxide, calcium hydroxide, etc.) results in evolution of hydrogen with sufficient heat of reaction to ignite the hydrogen gas. Zinc foil ignites if traces of moisture are present. It is water reactive and produces flammable gases on contact with water. It may ignite on contact with water or moist air.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill:
Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

Large Spill:
Flammable solid that, in contact with water, emits flammable gases. Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Cover with dry earth, sand or other non-combustible material. Prevent entry into sewers, basements or confined areas; dike if needed. Eliminate all ignition sources. Call for assistance on disposal. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system.

Section 7: Handling and Storage

Precautions:
Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not breathe dust. Keep away from incompatibles such as oxidizing agents, acids, alkalis, moisture.

Storage:
Keep container tightly closed. Keep container in a cool, well-ventilated area. Keep from any possible contact with water. Do not allow water to get into container because of violent reaction.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection: Safety glasses. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits: Not available.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid. (Lustrous solid. Metal solid.)

Odor: Not available.

Taste: Not available.

Molecular Weight: 65.39 g/mole

Color: Bluish-grey

pH (1% soln/water): Not applicable.

Boiling Point: 907°C (1664.6°F)

Melting Point: 419°C (786.2°F)

Critical Temperature: Not available.

Specific Gravity: Not available.

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility: Insoluble in cold water, hot water, methanol, diethyl ether, n-octanol, acetone.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Excess heat, incompatible materials, moisture

Incompatibility with various substances:
Reactive with oxidizing agents, acids, alkalis. Slightly reactive to reactive with moisture. The product may react violently with water to emit flammable but non toxic gases.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity:
Incompatible with acids, halogenated hydrocarbons, NH_4NO_3, barium oxide, $Ba(NO_3)_2$, Cadmium, CS_2, chlorates, Cl_2, CrO_3, F_2, Hydroxylamine, $Pb(N_3)_2$, $MnCl_2$, HNO_3, performic acid, $KClO_3$, KNO_3, N_2O_2, Selenium, $NaClO_3$, Na_2O_2, Sulfur, Te, water, $(NH_4)_2S$, As_2O_3, CS_2, $CaCl_2$, chlorinated rubber, catalytic metals, halocarbons, o-nitroanisole, nitrobenzene, nonmetals, oxidants, paint primer base, pentacarbonoyliron, transition metal halides, seleninyl bromide, HCl, H_2SO_4, (Mg +$Ba(NO_3)_2$ +BaO_2), (ethyl acetoacetate +tribromoneopentyl alcohol. Contact with Alkali Hydroxides(Sodium Hydroxide, Potassium Hydroxide, Calcium Hydroxide, etc) results in evolution of hydrogen. Ammonium nitrate + zinc + water causes a violent reaction with evolution of steam and zinc oxide. May react with water.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Inhalation. Ingestion.

Toxicity to Animals:
LD50: Not available. LC50: Not available.

Chronic Effects on Humans: Not available.

Other Toxic Effects on Humans: Slightly hazardous in case of skin contact (irritant), of ingestion, of inhalation.

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Not available.

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects: Skin: May cause skin irritation. Dermal exposure to zinc may produce leg pains, fatigue, anorexia and weight loss. Eyes: May cause eye irritation. Ingestion: May be harmul if swallowed. May cause digestive tract irritation with tightness in throat, nausea, vomiting, diarrhea, loss of appetite, malaise, abdominal pain. fever, and chills.
May affect behavior/central nervous system and autonomic nervous system with ataxia, lethargy, staggering gait, mild derrangement in cerebellar function, lightheadness, dizzness, irritability, muscular stiffness, and pain. May also affect blood.
Inhalation: Inhalation of zinc dust or fumes may cause respiratory tract and mucous membrane irritation with cough and chest pain. It can also cause "metal fume fever", a flu-like condition characterized appearance of chills, headached fever, maliase, fatigue, sweating, extreme thirst, aches in the legs and chest, and difficulty in breathing. A sweet taste may also be be present in metal fume fever, as well as a dry throat, aches, nausea, and vomiting, and pale grey cyanosis. The toxicological properties of this substance have not been fully investisgated.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: Not available.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: Not a DOT controlled material (United States).

Identification: Not applicable.

Special Provisions for Transport: Not applicable.

Section 15: Other Regulatory Information

Federal and State Regulations:
New York release reporting list: Zinc Metal Rhode Island RTK hazardous substances: Zinc Metal Pennsylvania RTK: Zinc Metal Florida: Zinc Metal Michigan critical material: Zinc Metal Massachusetts RTK: Zinc Metal New Jersey: Zinc Metal California Director's List of Hazardous Substances: Zinc Metal TSCA 8(b) inventory: Zinc Metal TSCA 12(b) one time export: Zinc Metal SARA 313 toxic chemical notification and release reporting: Zinc Metal CERCLA: Hazardous substances.: Zinc Metal: 1000 lbs. (453.6 kg)

Other Regulations: EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada): Not Available

DSCL (EEC):
R15- Contact with water liberates extremely flammable gases. R17- Spontaneously flammable in air. S7/8- Keep container tightly closed and dry.

HMIS (U.S.A.):

- **Health Hazard:** 1
- **Fire Hazard:** 1
- **Reactivity:** 1
- **Personal Protection:** E

National Fire Protection Association (U.S.A.):

- **Health:** 0
- **Flammability:** 1
- **Reactivity:** 1
- **Specific hazard:**

Protective Equipment:
Gloves. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Safety glasses.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 10/10/2005 12:18 AM

Last Updated: 11/01/2010 12:00 PM

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Health	2
Fire	1
Reactivity	0
Personal Protection	J

Material Safety Data Sheet
Silver MSDS

Section 1: Chemical Product and Company Identification

Product Name: Silver

Catalog Codes: SLS4222, SLS2005, SLS3427, SLS1210, SLS2632, SLS4054, SLS1837

CAS#: 7440-22-4

RTECS: VW3500000

TSCA: TSCA 8(b) inventory: Silver

CI#: Not applicable.

Synonym:

Chemical Formula: Ag

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Silver	7440-22-4	100

Toxicological Data on Ingredients: Silver: ORAL (LD50): Acute: 100 mg/kg [Mouse].

Section 3: Hazards Identification

Potential Acute Health Effects:
Very hazardous in case of eye contact (irritant), of ingestion, of inhalation. Severe over-exposure can result in death. Inflammation of the eye is characterized by redness, watering, and itching.

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. Repeated exposure to an highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. Do not use an eye ointment. Seek medical attention.

Skin Contact: No known effect on skin contact, rinse with water for a few minutes.

Serious Skin Contact: Not available.

Inhalation: Allow the victim to rest in a well ventilated area. Seek immediate medical attention.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.

Ingestion:
Do not induce vomiting. Examine the lips and mouth to ascertain whether the tissues are damaged, a possible indication that the toxic material was ingested; the absence of such signs, however, is not conclusive. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: May be combustible at high temperature.

Auto-Ignition Temperature: Not available.

Flash Points: Not available.

Flammable Limits: Not available.

Products of Combustion: Some metallic oxides.

Fire Hazards in Presence of Various Substances: Not available.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

Special Remarks on Fire Hazards: Not available.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill: Use appropriate tools to put the spilled solid in a convenient waste disposal container.

Large Spill:
Use a shovel to put the material into a convenient waste disposal container. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep locked up Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. Do not ingest. Do not breathe dust. Avoid contact with eyes In case of insufficient ventilation, wear suitable respiratory equipment If ingested, seek medical advice immediately and show the container or the label.

Storage:
Keep container dry. Keep in a cool place. Ground all equipment containing material. Keep container tightly closed. Keep in a cool, well-ventilated place. Highly toxic or infectious materials should be stored in a separate locked safety storage cabinet or room.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection: Splash goggles. Lab coat.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Boots. Gloves. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 0.01 (mg/m3) from OSHA (PEL) TWA: 0.01 (mg/m3) from OSHA NIOSH Australia: TWA: 0.1 (mg/m3)Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid. (Solid metallic powder. Metal solid.)

Odor: Not available.

Taste: Not available.

Molecular Weight: 107.87 g/mole

Color: Not available.

pH (1% soln/water): Not applicable.

Boiling Point: 2212°C (4013.6°F)

Melting Point: 961°C (1761.8°F)

Critical Temperature: Not available.

Specific Gravity: 10.4 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: Is not dispersed in cold water, hot water.

Solubility: Insoluble in cold water, hot water.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Not available.

Incompatibility with various substances: Not available.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity: Not available.

Special Remarks on Corrosivity: Not available.

Polymerization: No.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Eye contact. Inhalation. Ingestion.

Toxicity to Animals: Acute oral toxicity (LD50): 100 mg/kg [Mouse].

Chronic Effects on Humans: Not available.

Other Toxic Effects on Humans: Very hazardous in case of ingestion, of inhalation.

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Not available.

Special Remarks on other Toxic Effects on Humans: Not available.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are as toxic as the original product.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Section 14: Transport Information

DOT Classification:

Identification:

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
Rhode Island RTK hazardous substances: Silver Pennsylvania RTK: Silver Minnesota: Silver Massachusetts RTK: Silver New Jersey: Silver TSCA 8(b) inventory: Silver TSCA 8(a) PAIR: Silver TSCA 8(d) H and S data reporting: Silver SARA 313 toxic chemical notification and release reporting: Silver: 1% CERCLA: Hazardous substances.: Silver: 1000 lbs. (453.6 kg)

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada):
CLASS D-1B: Material causing immediate and serious toxic effects (TOXIC). CLASS D-2B: Material causing other toxic effects (TOXIC).

DSCL (EEC): R41- Risk of serious damage to eyes.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 1

Reactivity: 0

Personal Protection: j

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 1

Reactivity: 0

Specific hazard:

Protective Equipment:
Not applicable. Lab coat. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 10/10/2005 08:26 PM

Last Updated: 11/01/2010 12:00 PM

Health	2
Fire	1
Reactivity	0
Personal Protection	E

Material Safety Data Sheet
Copper MSDS

Section 1: Chemical Product and Company Identification

Product Name: Copper

Catalog Codes: SLC4939, SLC2152, SLC3943, SLC1150, SLC2941, SLC4729, SLC1936, SLC3727, SLC5515

CAS#: 7440-50-8

RTECS: GL5325000

TSCA: TSCA 8(b) inventory: Copper

CI#: Not available.

Synonym:

Chemical Name: Not available.

Chemical Formula: Cu

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Copper	7440-50-8	100

Toxicological Data on Ingredients: Copper LD50: Not available. LC50: Not available.

Section 3: Hazards Identification

Potential Acute Health Effects:
Very hazardous in case of ingestion. Hazardous in case of eye contact (irritant), of inhalation. Slightly hazardous in case of skin contact (irritant).

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance is toxic to lungs, mucous membranes. Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. Do not use an eye ointment. Seek medical attention.

Skin Contact:
After contact with skin, wash immediately with plenty of water. Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. Cover the irritated skin with an emollient. If irritation persists, seek medical attention. Wash contaminated clothing before reusing.

Serious Skin Contact: Not available.

Inhalation: Allow the victim to rest in a well ventilated area. Seek immediate medical attention.

Serious Inhalation: Not available.

Ingestion:
Do not induce vomiting. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: May be combustible at high temperature.

Auto-Ignition Temperature: Not available.

Flash Points: Not available.

Flammable Limits: Not available.

Products of Combustion: Some metallic oxides.

Fire Hazards in Presence of Various Substances: Not available.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

Special Remarks on Fire Hazards: Not available.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill:
Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

Large Spill:
Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. Do not breathe dust. Avoid contact with eyes Wear suitable protective clothing In case of insufficient ventilation, wear suitable respiratory equipment If you feel unwell, seek medical attention and show the label when possible.

Storage:
Keep container dry. Keep in a cool place. Ground all equipment containing material. Keep container tightly closed. Keep in a cool, well-ventilated place. Combustible materials should be stored away from extreme heat and away from strong oxidizing agents.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection:
Splash goggles. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 1 (mg/m3) from ACGIH [1990] Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid.

Odor: Not available.

Taste: Not available.

Molecular Weight: 63.54 g/mole

Color: Not available.

pH (1% soln/water): Not applicable.

Boiling Point: 2595°C (4703°F)

Melting Point: 1083°C (1981.4°F)

Critical Temperature: Not available.

Specific Gravity: 8.94 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility: Insoluble in cold water.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Not available.

Incompatibility with various substances: Not available.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity: Not available.

Special Remarks on Corrosivity: Not available.

Polymerization: No.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Eye contact. Inhalation. Ingestion.

Toxicity to Animals:
LD50: Not available. LC50: Not available.

Chronic Effects on Humans: The substance is toxic to lungs, mucous membranes.

Other Toxic Effects on Humans:
Very hazardous in case of ingestion. Hazardous in case of inhalation. Slightly hazardous in case of skin contact (irritant).

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Human: passes through the placenta, excreted in maternal milk.

Special Remarks on other Toxic Effects on Humans: Not available.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are as toxic as the original product.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Section 14: Transport Information

DOT Classification: Not a DOT controlled material (United States).

Identification: Not applicable.

Special Provisions for Transport: Marine Pollutant

Section 15: Other Regulatory Information

Federal and State Regulations:
Pennsylvania RTK: Copper Massachusetts RTK: Copper TSCA 8(b) inventory: Copper CERCLA: Hazardous substances.: Copper

Other Regulations: OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

Other Classifications:

WHMIS (Canada): CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

DSCL (EEC): R36- Irritating to eyes.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 1

Reactivity: 0

Personal Protection: E

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 1

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 10/09/2005 04:58 PM

Last Updated: 11/01/2010 12:00 PM

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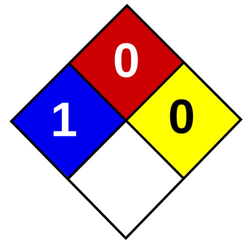

Health	1
Fire	0
Reactivity	0
Personal Protection	E

Material Safety Data Sheet
Lead MSDS

Section 1: Chemical Product and Company Identification

Product Name: Lead

Catalog Codes: SLL1291, SLL1669, SLL1081, SLL1459, SLL1834

CAS#: 7439-92-1

RTECS: OF7525000

TSCA: TSCA 8(b) inventory: Lead

CI#: Not available.

Synonym: Lead Metal, granular; Lead Metal, foil; Lead Metal, sheet; Lead Metal, shot

Chemical Name: Lead

Chemical Formula: Pb

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Lead	7439-92-1	100

Toxicological Data on Ingredients: Lead LD50: Not available. LC50: Not available.

Section 3: Hazards Identification

Potential Acute Health Effects: Slightly hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation.

Potential Chronic Health Effects:
Slightly hazardous in case of skin contact (permeator). CARCINOGENIC EFFECTS: Classified A3 (Proven for animal.) by ACGIH, 2B (Possible for human.) by IARC. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to blood, kidneys, central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:

Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation occurs.

Skin Contact: Wash with soap and water. Cover the irritated skin with an emollient. Get medical attention if irritation develops.

Serious Skin Contact: Not available.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation: Not available.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: May be combustible at high temperature.

Auto-Ignition Temperature: Not available.

Flash Points: Not available.

Flammable Limits: Not available.

Products of Combustion: Some metallic oxides.

Fire Hazards in Presence of Various Substances: Non-flammable in presence of open flames and sparks, of shocks, of heat.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

Special Remarks on Fire Hazards: When heated to decomposition it emits highly toxic fumes of lead.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill:
Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

Large Spill:
Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep locked up.. Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. Do not ingest. Do not breathe dust. Wear suitable

protective clothing. If ingested, seek medical advice immediately and show the container or the label. Keep away from incompatibles such as oxidizing agents.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection: Safety glasses. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 0.05 (mg/m3) from ACGIH (TLV) [United States] TWA: 0.05 (mg/m3) from OSHA (PEL) [United States] TWA: 0.03 (mg/m3) from NIOSH [United States] TWA: 0.05 (mg/m3) [Canada]Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid. (Metal solid.)

Odor: Not available.

Taste: Not available.

Molecular Weight: 207.21 g/mole

Color: Bluish-white. Silvery. Gray

pH (1% soln/water): Not applicable.

Boiling Point: 1740°C (3164°F)

Melting Point: 327.43°C (621.4°F)

Critical Temperature: Not available.

Specific Gravity: 11.3 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility: Insoluble in cold water.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Incompatible materials, excess heat

Incompatibility with various substances: Reactive with oxidizing agents.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity:
Can react vigorously with oxidizing materials. Incompatible with sodium carbide, chlorine trifluoride, trioxane + hydrogen peroxide, ammonium nitrate, sodium azide, disodium acetylide, sodium acetylide, hot concentrated nitric acid, hot concentrated hydrochloric acid, hot concentrated sulfuric acid, zirconium.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Inhalation. Ingestion.

Toxicity to Animals:
LD50: Not available. LC50: Not available.

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: Classified A3 (Proven for animal.) by ACGIH, 2B (Possible for human.) by IARC. May cause damage to the following organs: blood, kidneys, central nervous system (CNS).

Other Toxic Effects on Humans: Slightly hazardous in case of skin contact (irritant), of ingestion, of inhalation.

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Not available.

Special Remarks on other Toxic Effects on Humans:
Acute Potential: Skin: Lead metal granules or dust: May cause skin irritation by mechanical action. Lead metal foil, shot or sheets: Not likely to cause skin irritation Eyes: Lead metal granules or dust: Can irritate eyes by mechanical action. Lead metal foil, shot or sheets: No hazard. Will not cause eye irritation. Inhalation: In an industrial setting, exposure to lead mainly occurs from inhalation of dust or fumes. Lead dust or fumes: Can irritate the upper respiratory tract (nose, throat) as well as the bronchi and lungsby mechanical action. Lead dust can be absorbed through the respiratory system. However, inhaled lead does not accumulate in the lungs. All of an inhaled dose is eventually abssorbed or transferred to the gastrointestinal tract. Inhalation effects of exposure to fumes or dust of inorganic lead may not develop quickly. Symptoms may include metallic taste, chest pain, decreased physical fitness, fatigue, sleep disturbance, headache, irritability, reduces memory, mood and personality changes, aching bones and muscles, constipation, abdominal pains, decreasing appetite. Inhalation of large amounts may lead to ataxia, deliriuim, convulsions/seizures, coma, and death. Lead metal foil, shot, or sheets: Not an inhalation hazard unless metal is heated. If metal is heated, fumes will be released. Inhalation of these fumes may cause "fume metal fever", which is characterized by flu-like symptoms. Symptoms may include metallic taste, fever, nausea, vomiting, chills, cough, weakness, chest pain, generalized muscle pain/aches, and increased white blood cell count. Ingestion: Lead metal granules or dust: The symptoms of lead poisoning include abdominal pain or cramps (lead cholic), spasms, nausea, vomiting, headache, muscle weakness, hallucinations, distorted perceptions, "lead line" on the gums, metallic taste, loss of appetite, insomnia, dizziness and other symptoms similar to that of inhalation. Acute poisoning may result in high lead levels in the blood and urine, shock, coma and death in extreme cases. Lead metal foil, shot or sheets: Not an ingestion hazard for usual industrial handling.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: Not a DOT controlled material (United States).

Identification: Not applicable.

Special Provisions for Transport: Not applicable.

Section 15: Other Regulatory Information

Federal and State Regulations:
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Lead California prop. 65: This product contains the following ingredients for which the State of California has found to cause reproductive harm (female) which would require a warning under the statute: Lead California prop. 65: This product contains the following ingredients for which the State of California has found to cause reproductive harm (male) which would require a warning under the statute: Lead California prop. 65 (no significant risk level): Lead: 0.0005 mg/day (value) California prop. 65: This product contains the following ingredients for which the State of California has found to cause birth defects which would require a warning under the statute: Lead California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: Lead Connecticut hazardous material survey.: Lead Illinois toxic substances disclosure to employee act: Lead Illinois chemical safety act: Lead New York release reporting list: Lead Rhode Island RTK hazardous substances: Lead Pennsylvania RTK: Lead

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada): CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

DSCL (EEC):
R20/22- Harmful by inhalation and if swallowed. R33- Danger of cumulative effects. R61- May cause harm to the unborn child. R62- Possible risk of impaired fertility. S36/37- Wear suitable protective clothing and gloves. S44- If you feel unwell, seek medical advice (show the label when possible). S53- Avoid exposure - obtain special instructions before use.

HMIS (U.S.A.):

Health Hazard: 1

Fire Hazard: 0

Reactivity: 0

Personal Protection: E

National Fire Protection Association (U.S.A.):

Health: 1

Flammability: 0

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Safety glasses.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 10/10/2005 08:21 PM

Last Updated: 11/01/2010 12:00 PM

NFPA 704 (Section 16)

AMERADA HESS CORPORATION

MATERIAL SAFETY DATA SHEET

No. 2 Fuel Oil **MSDS No. 0088**

1. CHEMICAL PRODUCT and COMPANY INFORMATION (rev. Jan-98)

Amerada Hess Corporation
1 Hess Plaza
Woodbridge, NJ 07095-0961

EMERGENCY TELEPHONE NUMBER (24 hrs): CHEMTREC (800) 424-9300
COMPANY CONTACT (business hours): Corporate Safety (732) 750-6000
SYNONYMS: #2 Heating Oil; 2 Oil; Off-road Diesel Fuel

See Section 16 for abbreviations and acronyms.

2. COMPOSITION and INFORMATION ON INGREDIENTS (rev. Sep-98)

INGREDIENT NAME	EXPOSURE LIMITS	CONCENTRATION PERCENT BY WEIGHT
#2 Fuel Oil CAS NUMBER: 68476-30-2	OSHA PEL-TWA: 5 mg/m^3 as mineral oil mist ACGIH TLV-TWA: 1997 NOIC - 100 mg/m^3, skin, A3	100
Naphthalene CAS NUMBER: 91-20-3	OSHA PEL-TWA: 10 ppm ACGIH TLV-TWA/STEL: 10 / 15 ppm, A4	Typically 0.1

A complex combination of hydrocarbons with carbon numbers in the range C9 and higher produced from the distillation of petroleum crude oil.

3. HAZARDS IDENTIFICATION (rev. Jan-98; Tox-98)

EMERGENCY OVERVIEW
CAUTION!
OSHA/NFPA COMBUSTIBLE LIQUID - SLIGHT TO MODERATE IRRITANT - EFFECTS CENTRAL NERVOUS SYSTEM - HARMFUL OR FATAL IF SWALLOWED

Moderate fire hazard. Avoid breathing vapors or mists. May cause dizziness and drowsiness. May cause moderate eye irritation and skin irritation. Long-term, repeated exposure may cause skin cancer.

If ingested, do NOT induce vomiting, as this may cause chemical pneumonia (fluid in the lungs).

EYES
Contact with eyes may cause mild irritation.

SKIN
Practically non-toxic if absorbed following acute (single) exposure. May cause skin irritation with prolonged or repeated contact. Liquid may be absorbed through the skin in toxic amounts if large areas of skin are repeatedly exposed.

INGESTION
The major health threat of ingestion occurs from the danger of aspiration (breathing) of liquid drops into the lungs, particularly from vomiting. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure and even death.

Ingestion may cause gastrointestinal disturbances, including irritation, nausea, vomiting and diarrhea, and central nervous system (brain) effects similar to alcohol intoxication. In severe cases, tremors, convulsions, loss of consciousness, coma, respiratory arrest, and death may occur.

INHALATION
Excessive exposure may cause irritations to the nose, throat, lungs and respiratory tract. Central nervous system (brain) effects may include headache, dizziness, loss of balance and coordination, unconsciousness, coma, respiratory failure, and death.

WARNING: the burning of any hydrocarbon as a fuel in an area without adequate ventilation may result in hazardous levels of combustion products, including carbon monoxide, and inadequate oxygen levels, which may cause unconsciousness, suffocation, and death.

CHRONIC EFFECTS and CARCINOGENICITY

Similar products have produced skin cancer and systemic toxicity in laboratory animals following repeated applications. The significance of these results to human exposures has not been determined - see Section 11Toxicological Information.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

Irritation from skin exposure may aggravate existing open wounds, skin disorders, and dermatitis (rash).

4. FIRST AID MEASURES (rev. Jan-98; Tox-98)

EYES

In case of contact with eyes, immediately flush with clean, low-pressure water for at least 15 min. Hold eyelids open to ensure adequate flushing. Seek medical attention.

SKIN

Remove contaminated clothing. Wash contaminated areas thoroughly with soap and water or with waterless hand cleanser. Obtain medical attention if irritation or redness develops.

INGESTION

DO NOT INDUCE VOMITING. Do not give liquids. Obtain immediate medical attention. If spontaneous vomiting occurs, lean victim forward to reduce the risk of aspiration. Monitor for breathing difficulties. Small amounts of material which enter the mouth should be rinsed out until the taste is dissipated.

INHALATION

Remove person to fresh air. If person is not breathing, provide artificial respiration. If necessary, provide additional oxygen once breathing is restored if trained to do so. Seek medical attention immediately.

5. FIRE FIGHTING MEASURES (rev. Sep-94)

FLAMMABLE PROPERTIES:

FLASH POINT:	100 ^oF (38 ^oC) minimum PMCC
AUTOIGNITION POINT:	494 ^oF (257 ^oC)
LOWER EXPLOSIVE LIMIT (%):	0.6
UPPER EXPLOSIVE LIMIT (%):	7.5

FIRE AND EXPLOSION HAZARDS

OSHA and NFPA Class 2 COMBUSTIBLE LIQUID (see Section 14 for transportation classification). Vapors may be ignited rapidly when exposed to heat, spark, open flame or other source of ignition. When mixed with air and exposed to an ignition source, flammable vapors can burn in the open or explode in confined spaces. Being heavier than air, vapors may travel long distances to an ignition source and flash back. Runoff to sewer may cause fire or explosion hazard.

EXTINGUISHING MEDIA

SMALL FIRES: Any extinguisher suitable for Class B fires, dry chemical, CO2, water spray, fire fighting foam, or Halon.

LARGE FIRES: Water spray, fog or fire fighting foam. Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers.

FIRE FIGHTING INSTRUCTIONS

Small fires in the incipient (beginning) stage may typically be extinguished using handheld portable fire extinguishers and other fire fighting equipment.

Firefighting activities that may result in potential exposure to high heat, smoke or toxic by-products of combustion should require NIOSH/MSHA- approved pressure-demand self-contained breathing apparatus with full facepiece and full protective clothing.

Isolate area around container involved in fire. Cool tanks, shells, and containers exposed to fire and excessive heat with water. For massive fires the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure. Major fires may require withdrawal, allowing the tank to burn. Large storage tank fires typically require specially trained personnel and equipment to extinguish the fire, often including the need for properly applied fire fighting foam.

See Section 16 for the NFPA 704 Hazard Rating.

6. ACCIDENTAL RELEASE MEASURES (rev. Jan-98)

ACTIVATE FACILITY'S SPILL CONTINGENCY OR EMERGENCY RESPONSE PLAN.

Evacuate nonessential personnel and remove or secure all ignition sources. Consider wind direction; stay upwind and uphill, if possible. Evaluate the direction of product travel, diking, sewers, etc. to confirm spill areas. Spills may infiltrate subsurface soil and groundwater; professional assistance may be necessary to determine the extent of subsurface impact.

Carefully contain and stop the source of the spill, if safe to do so. Protect bodies of water by diking, absorbents, or absorbent boom, if possible. Do not flush down sewer or drainage systems, unless system is designed and permitted to handle such material. The use of fire fighting foam may be useful in certain situations to reduce vapors. The proper use of water spray may effectively disperse product vapors or the liquid itself, preventing contact with ignition sources or areas/equipment that require protection.

Take up with sand or other oil absorbing materials. Carefully shovel, scoop or sweep up into a waste container for reclamation or disposal. Response and clean-up crews must be properly trained and must utilize proper protective equipment (see Section 8).

7. HANDLING and STORAGE (rev. Jan-98)

HANDLING PRECAUTIONS

Handle as a combustible liquid. Keep away from heat, sparks, excessive temperatures and open flame! No smoking or open flame in storage, use or handling areas. Bond and ground containers during product transfer to reduce the possibility of static-initiated fire or explosion.

Special slow load procedures for "switch loading" must be followed to avoid the static ignition hazard that can exist when this product is loaded into tanks previously containing low flash point products (such as gasoline) - see API Publication 2003, "Protection Against Ignitions Arising Out Of Static, Lightning and Stray Currents."

STORAGE PRECAUTIONS

Keep containers closed and clearly labeled. Use approved vented storage containers. Empty product containers or vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose such containers to sources of ignition.

Store in a well-ventilated area. This storage area should comply with NFPA 30 "Flammable and Combustible Liquid Code". Avoid storage near incompatible materials. The cleaning of tanks previously containing this product should follow API Recommended Practice (RP) 2013 "Cleaning Mobile Tanks In Flammable and Combustible Liquid Service" and API RP 2015 "Cleaning Petroleum Storage Tanks."

WORK/HYGIENIC PRACTICES

Emergency eye wash capability should be available in the near proximity to operations presenting a potential splash exposure. Use good personal hygiene practices. Avoid repeated and/or prolonged skin exposure. Wash hands before eating, drinking, smoking, or using toilet facilities. Do not use as a cleaning solvent or harsh abrasive skin cleaners for washing this product from exposed skin areas. Waterless hand cleaners are effective. Promptly remove contaminated clothing and launder before reuse.

Use care when laundering to prevent the formation of flammable vapors which could ignite via washer or dryer. Consider the need to discard contaminated leather shoes and gloves.

8. EXPOSURE CONTROLS and PERSONAL PROTECTION (rev. Jan-98)

ENGINEERING CONTROLS

Use adequate ventilation to keep vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces.

EYE/FACE PROTECTION

Safety glasses or goggles are recommended where there is a possibility of splashing or spraying.

SKIN PROTECTION

Gloves constructed of nitrile, neoprene, or PVC are recommended. Chemical protective clothing such as of E.I. DuPont TyChem®, Saranex® or equivalent recommended based on degree of exposure. Note: The resistance of specific material may vary from product to product as well as with degree of exposure. Consult manufacturer specifications for further information.

RESPIRATORY PROTECTION

A NIOSH/MSHA-approved air-purifying respirator with organic vapor cartridges or canister may be permissible under certain circumstances where airborne concentrations are or may be expected to exceed exposure limits or for odor or irritation. Protection provided by air-purifying respirators is limited. Refer to OSHA 29 CFR 1910.134, ANSI Z88.2-1992, NIOSH Respirator Decision Logic, and the manufacturer for additional guidance on respiratory protection selection.

Use a positive pressure, air-supplied respirator if there is a potential for uncontrolled release, exposure levels are not known, in oxygen-deficient atmospheres, or any other circumstance where an air-purifying respirator may not provide adequate protection.

9. PHYSICAL and CHEMICAL PROPERTIES (rev. Jul-98)

APPEARANCE

Red or reddish/orange colored (dyed) liquid

ODOR

Mild, petroleum distillate odor

BASIC PHYSICAL PROPERTIES

BOILING RANGE:	340 to 700 ^oF (171 to 371 ^oC)
VAPOR PRESSURE:	0.009 psia @ 70 ^oF (21 ^oC)
VAPOR DENSITY (air = 1):	> 1.0
SPECIFIC GRAVITY (H_2O = 1):	AP 0.87
PERCENT VOLATILES:	100 %
EVAPORATION RATE:	Slow; varies with conditions
SOLUBILITY (H_2O):	Negligible

10. STABILITY and REACTIVITY (rev. Sep-94)

STABILITY: Stable. Hazardous polymerization will not occur

CONDITIONS TO AVOID and INCOMPATIBLE MATERIALS

Avoid high temperatures, open flames, sparks, welding, smoking and other ignition sources. Keep away from strong oxidizers; Viton ®; Fluorel ®

HAZARDOUS DECOMPOSITION PRODUCTS

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke).

11. TOXICOLOGICAL PROPERTIES (rev. Jan-98; Tox-98)

ACUTE TOXICITY

Acute Oral LD50 (rat): 14.5 ml/kg
Acute Dermal LD50 (rabbit): > 5 ml/kg
Guinea Pig Sensitization: negative
Primary dermal irritation: moderately irritating (Draize mean irritation score - 3.98 rabbits)
Draize eye irritation: mildly irritating (Draize score, 48 hours, unwashed - 2.0 rabbits)

CHRONIC EFFECTS AND CARCINOGENICITY

Carcinogenic: IARC: NO NTP: NO OSHA: NO ACGIH: 1997 NOIC: A3
Dermal carcinogenicity: positive - mice

Studies have shown that similar products produce skin tumors in laboratory animals following repeated applications without washing or removal. The significance of this finding to human exposure has not been determined. Other studies with active skin carcinogens have shown that washing the animal's skin with soap and water between applications reduced tumor formation.

This product is similar to Diesel Fuel. IARC classifies whole diesel fuel exhaust particulates as probably carcinogenic to humans (Group 2A) and NIOSH regards it as a potential cause of occupational lung cancer based on animal studies and limited evidence in humans.

MUTAGENICITY (genetic effects)

Material of similar composition has been positive in a mutagenicity study.

12. ECOLOGICAL INFORMATION (rev. Jan-98)

Keep out of sewers, drainage areas and waterways. Report spills and releases, as applicable, under Federal and State regulations.

13. DISPOSAL CONSIDERATIONS (rev. Jan-98)

Consult federal, state and local waste regulations to determine appropriate disposal options.

14. TRANSPORTATION INFORMATION (rev. Jan-98)

PROPER SHIPPING NAME:	FUEL OIL, NO. 2
HAZARD CLASS & PACKING GROUP:	3, PG III
DOT IDENTIFICATION NUMBER:	NA 1993
DOT SHIPPING LABEL:	FLAMMABLE LIQUID

May be reclassified for transportation as a COMBUSTIBLE LIQUID under conditions of DOT 49 CFR 173.120(b)(2).

15. REGULATORY INFORMATION (rev. Feb-01)

U.S. FEDERAL, STATE, and LOCAL REGULATORY INFORMATION

This product and its constituents listed herein are on the EPA TSCA Inventory. Any spill or uncontrolled release of this product, including any substantial threat of release, may be subject to federal, state and/or local reporting requirements. This product and/or its constituents may also be subject to other regulations at the state and/or local level. Consult those regulations applicable to your facility/operation.

CLEAN WATER ACT (OIL SPILLS)

Any spill or release of this product to "navigable waters" (essentially any surface water, including certain wetlands) or adjoining shorelines sufficient to cause a visible sheen or deposit of a sludge or emulsion must be reported immediately to the National Response Center (1-800-424-8802) or, if not practical, the U.S. Coast Guard with follow-up to the National Response Center, as required by U.S. Federal Law. Also contact appropriate state and local regulatory agencies as required.

CERCLA SECTION 103 and SARA SECTION 304 (RELEASE TO THE ENVIRONMENT)

The CERCLA definition of hazardous substances contains a "petroleum exclusion" clause which exempts crude oil, refined, and unrefined petroleum products and any indigenous components of such. However, other federal reporting requirements (e.g., SARA Section 304 as well as the Clean Water Act if the spill occurs on navigable waters) may still apply.

SARA SECTION 311/312 - HAZARD CLASSES

ACUTE HEALTH	CHRONIC HEALTH	FIRE	SUDDEN RELEASE OF PRESSURE	REACTIVE
X	X	X	--	--

SARA SECTION 313 - SUPPLIER NOTIFICATION

This product may contain listed chemicals below the *de minimis* levels which therefore are not subject to the supplier notification requirements of Section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 and of 40 CFR 372. If you may be required to report releases of chemicals listed in 40 CFR 372.28, you may contact Amerada Hess Corporate Safety if you require additional information regarding this product.

CANADIAN REGULATORY INFORMATION (WHMIS)

Class B, Division 3(Combustible Liquid); Class D, Division 2, Subdivision B (Toxic by other means)

16. OTHER INFORMATION (rev. Feb-01)

NFPA® HAZARD RATING	HEALTH:	0	Negligible
	FIRE:	2	Moderate
	REACTIVITY:	0	Negligible
HMIS® HAZARD RATING	HEALTH:	1 *	Slight
	FIRE:	2	Moderate
	REACTIVITY:	0	Negligible
			* Chronic

SUPERSEDES MSDS DATED: 09/03/98

ABBREVIATIONS:

AP = Approximately	< = Less than	> = Greater than
N/A = Not Applicable	N/D = Not Determined	ppm = parts per million

ACRONYMS:

ACGIH	American Conference of Governmental Industrial Hygienists
AIHA	American Industrial Hygiene Association
ANSI	American National Standards Institute (212) 642-4900
API	American Petroleum Institute (202) 682-8000
CERCLA	Comprehensive Emergency Response, Compensation, and Liability Act
DOT	U.S. Department of Transportation [General info: (800) 467-4922]
EPA	U.S. Environmental Protection Agency
HMIS	Hazardous Materials Information System
IARC	International Agency For Research On Cancer
MSHA	Mine Safety and Health Administration
NFPA	National Fire Protection Association (617) 770-3000
NIOSH	National Institute of Occupational Safety and Health
NOIC	Notice of Intended Change (proposed change to ACGIH TLV)
NTP	National Toxicology Program
OPA	Oil Pollution Act of 1990
OSHA	U.S. Occupational Safety & Health Administration
PEL	Permissible Exposure Limit (OSHA)
RCRA	Resource Conservation and Recovery Act
REL	Recommended Exposure Limit (NIOSH)
SARA	Superfund Amendments and Reauthorization Act of 1986 Title III
SCBA	Self-Contained Breathing Apparatus

SPCC	Spill Prevention, Control, and Countermeasures
STEL	Short-Term Exposure Limit (generally 15 minutes)
TLV	Threshold Limit Value (ACGIH)
TSCA	Toxic Substances Control Act
TWA	Time Weighted Average (8 hr.)
WEEL	Workplace Environmental Exposure Level (AIHA)
WHMIS	Canadian Workplace Hazardous Materials Information System

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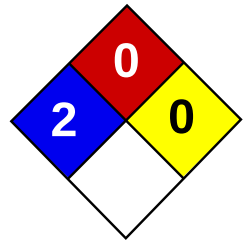

Health	2
Fire	0
Reactivity	0
Personal Protection	E

Material Safety Data Sheet
Nickel metal MSDS

Section 1: Chemical Product and Company Identification

Product Name: Nickel metal

Catalog Codes: SLN2296, SLN1342, SLN1954

CAS#: 7440-02-0

RTECS: QR5950000

TSCA: TSCA 8(b) inventory: Nickel metal

CI#: Not applicable.

Synonym: Nickel Metal shot; Nickel metal foil.

Chemical Name: Nickel

Chemical Formula: Ni

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Nickel metal	7440-02-0	100

Toxicological Data on Ingredients: Nickel metal LD50: Not available. LC50: Not available.

Section 3: Hazards Identification

Potential Acute Health Effects:
Hazardous in case of inhalation. Slightly hazardous in case of skin contact (irritant, sensitizer), of eye contact (irritant), of ingestion.

Potential Chronic Health Effects:
Slightly hazardous in case of skin contact (sensitizer), of ingestion, of inhalation (lung sensitizer). CARCINOGENIC EFFECTS: Classified 2B (Possible for human.) by IARC. Classified 2 (Some evidence.) by NTP. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance is toxic to skin. The substance may be toxic to kidneys, lungs, liver, upper respiratory tract. Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:

Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation occurs.

Skin Contact:
In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

Serious Skin Contact: Not available.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation: Not available.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Non-flammable.

Auto-Ignition Temperature: Not applicable.

Flash Points: Not applicable.

Flammable Limits: Not applicable.

Products of Combustion: Not available.

Fire Hazards in Presence of Various Substances: Not applicable.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
Flammable solid. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray or fog. Cool containing vessels with water jet in order to prevent pressure build-up, autoignition or explosion.

Special Remarks on Fire Hazards: Material in powder form, capable of creating a dust explosion. This material is flammable in powder form only.

Special Remarks on Explosion Hazards:
Material in powder form, capable of creating a dust explosion. Mixtures containing Potassium Perchlorate with Nickel & Titanium powders & infusorial earth can explode. Adding 2 or 3 drops of approximately 90% peroxyformic acid to powdered nickel will result in explosion. Powdered nickel reacts explosively upon contact with fused ammonium nitrate at temperatures below 200 deg. C.

Section 6: Accidental Release Measures

Small Spill:
Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

Large Spill:
Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep locked up.. Do not breathe dust. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If you feel unwell, seek medical attention and show the label when possible. Keep away from incompatibles such as oxidizing agents, combustible materials, metals, acids.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection: Safety glasses. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 1 (mg/m3) from ACGIH (TLV) [United States] Inhalation Respirable. TWA: 0.5 (mg/m3) [United Kingdom (UK)] TWA: 1 (mg/m3) from OSHA (PEL) [United States] InhalationConsult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid. (Metal solid. Lustrous solid.)

Odor: Odorless.

Taste: Not available.

Molecular Weight: 58.71 g/mole

Color: Silvery.

pH (1% soln/water): Not applicable.

Boiling Point: 2730°C (4946°F)

Melting Point: 1455°C (2651°F)

Critical Temperature: Not available.

Specific Gravity: Density: 8.908 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility:

Insoluble in cold water, hot water. Insoluble in Ammonia. Soluble in dilute Nitric Acid. Slightly soluble in Hydrochloric Acid, Sulfuric Acid.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Incompatible materials

Incompatibility with various substances: Reactive with oxidizing agents, combustible materials, metals, acids.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity:
Incompatible with strong acids, selenium, sulfur, wood and other combustibles, nickel nitrate, aluminum, aluminum trichloride, ethylene, p-dioxan, hydrogen, methanol, non-metals, oxidants, sulfur compounds, aniline, hydrogen sulfide, flammable solvents, hydrazine, and metal powders (especially zinc, aluminum, and magnesium), ammonium nitrate, nitryl fluoride, bromine pentafluoride, potassium perchlorate + titanium powder + indusorial earth.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Inhalation. Ingestion.

Toxicity to Animals:
LD50: Not available. LC50: Not available.

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: Classified 2B (Possible for human.) by IARC. Classified 2 (Some evidence.) by NTP. Causes damage to the following organs: skin. May cause damage to the following organs: kidneys, lungs, liver, upper respiratory tract.

Other Toxic Effects on Humans:
Hazardous in case of inhalation. Slightly hazardous in case of skin contact (irritant, sensitizer), of ingestion.

Special Remarks on Toxicity to Animals:
Lowest Published Lethal Dose/Conc: LDL [Rat] - Route: Oral; Dose: 5000 mg/kg LDL [Guinea Pig] - Route: Oral; Dose: 5000 mg/kg

Special Remarks on Chronic Effects on Humans: May cause cancer based on animal test data

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects: Skin: Nickel dust and fume can irritate skin. Eyes: Nickel dust and fume can irritate eyes. Inhalation: Inhalation of dust or fume may cause respiratory tract irritation with non-productive cough, hoarseness, sore throat, headache, vertigo, weakness, chest pain, followed by delayed effects, including tachypnea, dyspnea, and ARDS. Death due to ARDS has been reported following inhalation of high concentrations of respirable metallic nickel dust. Later effects may include pulmonary edema and fibrosis. Ingestion: Metallic nickel is generally considered not to be acutely toxic if ingested. Ingestion may cause nausea, vomiting, abdominal , and diarrhea. Nickel may damage the kidneys(proteinuria), and may affect liver function. It may also affect behavior (somnolence), and cardiovascular system (increased cornary artery resistance, decreased myocardial contractility, myocardial damage, regional or general arteriolar or venus dilation). Chronic Potential Health Effects: Skin: May cause skin allergy. Nickel and nickel compounds are among the most common sensitizers inducing allergic contact dermatitis. Inhalation: Chronic inhalation nickel dust or fume can cause chronic hypertrophic rhinitis, sinusitis, nasal polyps, perforation of the nasal septum, chronic pulmonary irritation, fibrosis, pulmonary edema, pulmonary eosinophilia, Pneumoconiosis, allergies (asthma-like allergy), and cancer of the nasal sinus cavities, lungs, and possibly other organs. Future exposures can cause asthma attacks with shortness of breath, wheezing, cough, and/or chest tightness. Chronic inhalation of nickel dust or fume may also affect the liver (impaired liver function tests), and blood (changes in red blood cell count). Ingestion: Prolonged or repeated ingestion of nickel can be a source chronic urticaria and other signs of allergy.

Chronic ingestion of NIckel may also affect respiration and cause pneumoconiosis or fibrosis. Note: In the general population, sensitization occurs from exposure to nickel-containing coins, jewelry, watches,

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are as toxic as the original product.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: Not a DOT controlled material (United States).

Identification: Not applicable.

Special Provisions for Transport: Not applicable.

Section 15: Other Regulatory Information

Federal and State Regulations:
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Nickel metal California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: Nickel metal Connecticut hazardous material survey.: Nickel metal Illinois toxic substances disclosure to employee act: Nickel metal Illinois chemical safety act: Nickel metal New York release reporting list: Nickel metal Rhode Island RTK hazardous substances: Nickel metal Pennsylvania RTK: Nickel metal Michigan critical material: Nickel metal Massachusetts RTK: Nickel metal Massachusetts spill list: Nickel metal New Jersey: Nickel metal New Jersey spill list: Nickel metal Louisiana spill reporting: Nickel metal California Director's List of Hazardous Substances: Nickel metal TSCA 8(b) inventory: Nickel metal

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada): CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

DSCL (EEC):
R40- Possible risks of irreversible effects. R43- May cause sensitization by skin contact. S22- Do not breathe dust. S36- Wear suitable protective clothing.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 0

Reactivity: 0

Personal Protection: E

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 0

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Safety glasses.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

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Last Updated: 11/01/2010 12:00 PM

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MSDS No: 71-55-6
Date: 03/09/2001

SUPPLIER ADDRESS: 6141 Easton Road, Bldg. 1
PO Box 310
Plumsteadville, PA 18949-0310

EMERGENCY PHONE NUMBER: (215) 766-8861

1. CHEMICAL PRODUCT

PRODUCT NAME: 1,1,1-TRICHLOROETHANE

SYNONYMS: Methyl chloroform, MC, alpha-trichloroethane

2. COMPOSITION, INFORMATION ON INGREDIENTS

				Exposure Limits (PPM)			
Ingredient Name	**Formula**	**CAS #**	**Concentration**	**ACGIH TLV**	**OSHA PEL**	**MAC**	**Other STEL**
1,1,1-TRICHLOROETHANE	C2Cl3H3	71-55-6	99+%	350	350	200	450

Note: NE = NONE ESTABLISHED S/A = SIMPLE ASPHYXIANT

3. HAZARD INDENTIFICATION

* * * EMERGENCY OVERVIEW * * *
Poisonous, flammable liquid and vapor.
May cause central nervous system damage.
Can cause damage to eyes, skin and respiratory tract.

POTENTIAL HEALTH EFFECTS

ROUTES OF ENTRY: Inhalation , Ingestion

ACUTE EFFECTS: Vapor exposure can cause irritation of the eyes, nose, throat and respiratory tract. Skin exposure may cause irritation, itching, erythema, swelling, burning and pain. Eye contact may cause irritation, redness, or blurred vision. Possible central nervous system depression. Symptoms include shortness of breath, headache, confusion, nausea, dizziness, and unconsciousness.

CHRONIC EFFECTS: Possible dermatitis from skin contact. Kidney and liver damage.

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE: Respiratory problems.

OTHER EFFECTS OF OVEREXPORSURE: None

CARCINOGENICITY (US ONLY):

NTP - No
IARC MONOGRAPHS - No
OSHA REGULATED - No

4. FIRST AID MEASURES

INHALATION: Immediately remove victim to fresh air. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen.

EYE CONTACT: Immediately flush with copious amounts of water for at least 15 minutes. Do not allow victim to rub or keep eyes tightly shut.

SKIN CONTACT: Immediately flush with copious amounts of water for at least 15 minutes while removing contaminated clothing.

INGESTION: Never give anything by mouth to an unconscious person. Have conscious and alert person drink 1 to 2 glasses of water.

IN EVENT OF EXPOSURE, CONSULT A PHYSICIAN

NOTE TO PHYSICIAN: None

5. FIRE FIGHTING MEASURES

FLASH POINT: Not established

AUTOIGNITION TEMPERATURE: 500 deg.C

FLAMMABLE LIMITS: Vol.%

LOWER: 7.5
UPPER: 12.5

EXTINGUISHING MEDIA: Extinguish with water spray, water fog, dry chemical, or carbon dioxide.

SPECIAL FIRE FIGHTING INSTRUCTION AND EQUIPMENT: Wear self-contained breathing apparatus and full protective clothing. Keep fire exposed cylinders cool with water spray.

HAZARDOUS COMBUSTION PRODUCTS: Toxic carbon monoxide, hydrogen chloride and phosgene.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Cylinder rupture may occur under fire conditions. Emits toxic fumes under fire conditions. Vapors may travel a considerable distance to the source of ignition and flash back.

6. ACCIDENTAL RELEASE MEASURES

CLEAN UP PROCEDURES: Evacuate and ventilate area. Remove leaking cylinder to exhaust hood or safe outdoor area. Shut off source if possible and remove source of heat. Absorb with sand or vermiculite and place in closed containers for disposal.

SPECIALIZED EQUIPMENT: None

7. HANDLING AND STORAGE

PRECAUTIONS TO BE TAKEN IN HANDLING: Secure cylinder when using to protect from falling. Use suitable hand truck to move cylinders. Use only in a well-ventilated area.

PRECAUTIONS TO BE TAKEN IN STORAGE: Store in well ventilated areas. Keep valve protection cap on cylinders when not in use. Store away from oxidizers, combustible materials, and source of ignition or heat.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS: Provide adequate general and local exhaust ventilation to maintain concentrations below exposure and flammable limits.

EYE / FACE PROTECTION: Goggles. A safety shower and eyewash station should be readily available.

SKIN PROTECTION: Wear suitable protective clothing.

RESPIRATORY PROTECTION: Use a self-contained breathing apparatus in case of emergency or non-routine use.

OTHER PROTECTIVE EQUIPMENT: Safety shoes when handling cylinders.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: Colorless

ODOR: Sweet ether-like odor.

PHYSICAL PRESSURE: Liquid

VAPOR PRESSURE: @20 deg.C: 100 mm Hg

VAPOR DENSITY (AIR=1): 4.6

BOILING POINT (C): 75 deg.C

SOLUBILITY IN WATER: Negligible

SPECIFIC GRAVITY (H_2O=1): @25 deg.C: 1.338

EVAPORATION RATE: (CCl_4=1): 1

ODOR THRESHOLD: 44 ppm

10. STABILITY AND REACTIVITY

STABILITY: Stable under normal storage conditions.

CONDITIONS TO AVOID: Storage in poorly ventilated areas. Storage near a heat source.

MATERIALS TO AVOID: Potassium, powdered aluminum, magnesium, zinc, oxidizing agents, amines and amides.

HAZARDOUS POLYMERIZATION: Will not occur.

HAZARDOUS DECOMPOSITION: HCl gas, phosgene gas, CO and oxides of chlorine.

11. TOXICOLOGICAL INFORMATION

LETHAL CONCENTRATION (LC50): 36,000 ppm, rat 1 hour.

LETHAL DOSE 50 (LD50): N/Ap

TERATOGENICITY: N/Ap

REPRODUCTIVE EFFECTS: N/Ap

MUTAGENICITY: N/Ap

12. ECOLOGICAL INFORMATION

This material is a Class 1 ozone depleting material.

13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD: Dispose of non-refillable cylinders in accordance with federal, state and local regulations. Allow gas to vent slowly to atmosphere in an unconfined area or exhaust hood. If the cylinders are the refillable type, return cylinders to supplier with any valve outlet plugs or caps secured and valve protection caps in place. Waste can be burned in an approved incinerator equipped with an afterburner and scrubber.

14. TRANSPORT INFORMATION

CONCENTRATION: 99+%

DOT DESCRIPTION (US ONLY):

PROPER SHIPPING NAME: 1,1,1-Trichloroethane
HAZARD CLASS: 6.1 (poison), Packing Group III
INDENTIFICATION NUMBER: UN2831
REPORTABLE QUANTITIES: 1,000 lb.
LABELING: KEEP AWAY FROM FOOD

ADR / RID (EU Only): Class 6.1, 15(c)

SPECIAL PRECAUTIONS: Cylinders should be transported in a secure upright position in a well ventilated truck.

15. REGULATORY INFORMATION

OSHA: Process Safety Management: Material is not listed in appendix A of 29 CFR 1910.119 as highly hazardous chemical.

TSCA: Material is listed in TSCA inventory.

SARA: The threshold planning quantity for material is 10,000 lbs.

EU NUMBER: 200-756-3

NUMBER IN ANNEX 1 OF DIR 67/548: Material is listed in annex 1.

EU CLASSIFICATION: N/Av

R: 20-59

S: (2-)24/25-59-61

16. OTHER INFORMATION

OTHER PRECAUTIONS: Protect containers from physical damage. Do not deface cylinders or labels. Cylinders should be refilled by qualified producers of compressed gas. Shipment of a compressed gas cylinder which has not been filled by the owner or with his written consent is a violation of federal law (49 CFR).

ABBREVIATIONS: N/Ap - Not Applicable N/Av - Not Available SA - Simple Asphyxiant NE - None Established

DISCLAIMER: Information included in this document is given to the best of our knowledge, however, no warranty is made that the information is accurate or complete. We do not accept any responsibility for damages by the use of the document.

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APPENDIX C

EMPLOYEE SAFETY TRAINING CHECKLIST

APPENDIX C

Employee Safety Training Checklist

Employee Name: ______________________________ Hire Date: __________________

Position: _____________________________________ Trainer: ____________________

I acknowledge that I have been trained in the SAFETY AND HEALTH areas checked below, and agree to follow all TRC Environmental Corporation Safety and Health Rules, Policies and Procedures.

_____ Safety and Health Program

- My right to ask questions, or report any safety hazards, either directly or anonymously without any fear of reprisal.
- The location of TRC Environmental Corporation safety bulletins and required safety postings (i.e., summary of occupational injuries and illnesses, and Safety and Health Protection Poster).
- Disciplinary procedures that may be used to ensure compliance with safe work practices.
- Reporting safety concerns.
- Accessing the department safety committee.

_____ Incident Reporting and Reporting Occupational Injuries and Illnesses.

_____ Hazard Communication

- The potential occupational hazards in the work area associated with my job assignment.
- The safe work practices and personal protective equipment required for my job title.
- The location and availability of MSDSs.
- The hazards of any chemicals to which I may be exposed, and my right to the information contained on Material Safety Data Sheets (MSDS's) for those Chemicals.

_____ Hazardous Material Spill Response

_____ Bloodborne Pathogen Response

_____ Personal Protective Equipment

_____ Employee Safety Manual

_____ Machinery Tag Out Program

_____ Emergency Procedures

_____ HAZWOPER

_____ Drug and Alcohol Policy

_____ Other: ____

I understand the above items and agree to comply with safe work practices in my work area.

____ ________________

Employee Signature Date

I have trained the above employee in the categories indicated on this form.

____ ________________

Trainers Signature Date

APPENDIX D

EMPLOYEE MEDICAL DATA SHEET/MEDICAL EVALUATION STATEMENT/

FIRST AID ACCIDENT REPORT

APPENDIX D

Employee Medical Data Sheet

In case of injury, this form is to accompany personnel to the hospital. It is designed to provide needed medical information in times of emergency.

This form is to be kept on-site under the care of the SHSO or his designee.

Employee Name:____

Address:____

Home Telephone:____

Occupation:____

Age:________Height:_________ Weight:_______ Blood Type:__________

Name and Number of Emergency Contact:

1.) ____

2.) ____

Allergies and Sensitivities (*please list allergies to drugs or other materials*):

____

____

Medications (*please list any medications, prescription or non-prescription that you are presently using or expect to use*):

____

____

Medical Restrictions (*please list any current or past medical restrictions or significant illnesses experienced in the past):*

Your Doctor’s name, address and phone number:

APPENDIX D (continued)

MEDICAL EVALUATION FORM

Employee Name: ___________________________ Employee Number: ________________
Office: _____________________________ Date of Exam: __________
________ Initial _________ Annual ____________ Exit Protocol

I have reviewed the results of the medical health history, physical examination, and laboratory tests prescribed by __________________________: and certify that: the record is complete, and the following were not performed:

____

____

____

Based upon my examination, I certify that this employee:

______ Have no medical contraindications to the use of supplied air or self-contained breathing apparatus (SCBA) and air purifying respirators.

______ Has a medical restriction in the use of respiratory equipment (describe below):

____

____

____

Based upon by examination, I certify that this employee:

______ Have no medical contraindications to full participation in hazardous waste site work, when conducted under the conditions of adequate training and a health and safety plan.

______ Have medical limitations that restrict full participation in hazardous waste site work. Describe work functions limitations (i.e., lifting, temporary limitation, pending medical follow-up work, etc.).

Comments: ____

____

____________________ Is medically restricted from any direct work with hazardous waste or hazardous waste sites, but **may** continue to perform office work.

Comments: ____

____

____

I have communicated the examination results to the employees and have informed the employee about medical conditions discovered during my examination that require further examination or treatment.

____

Name of Physician Signature of Examining Physician

Address: ______________________________ Date: ____________

______________________________ ____________

______________________________ ____________

First Aid Accident Report

Complete this form for all accidents involving only first aid treatment, and which are non-reportable as defined by OSHA 29 CFR 1910.4.

Name of employee receiving treatment: ______________________

Date of treatment ______________________

Occupation of employee receiving treatment ______________________

Employer ______________________

Employee's home telephone number ______________________

Name of First Aid Provider ______________________

Time of accident ______________________

Date of accident ______________________

Location of accident ______________________

Describe how the accident occurred (be specific; indicate the cause such as: debris, oil spill, ladder in poor condition or not tied-off)

____

____

Describe the injury:

____

____

Indicate First Aid measures taken:

____

____

What can be done to prevent future accidents of this kind:

____

____

APPENDIX E

OCCUPATIONAL INJURIES AND ILLNESS FORM

(OSHA 301)

OSHA's Form 301

Injury and Illness Incident Report

Attention: This form contains information relating to employee health and must be used in a manner that protects the confidentiality of employees to the extent possible while the information is being used for occupational safety and health purposes.

U.S. Department of Labor
Occupational Safety and Health Administration

Form approved OMB no. 1218-0176

This *Injury and Illness Incident Report* is one of the first forms you must fill out when a recordable work-related injury or illness has occurred. Together with the *Log of Work-Related Injuries and Illnesses* and the accompanying *Summary*, these forms help the employer and OSHA develop a picture of the extent and severity of work-related incidents.

Within 7 calendar days after you receive information that a recordable work-related injury or illness has occurred, you must fill out this form or an equivalent. Some state workers' compensation, insurance, or other reports may be acceptable substitutes. To be considered an equivalent form, any substitute must contain all the information asked for on this form.

According to Public Law 91-596 and 29 CFR 1904, OSHA's recordkeeping rule, you must keep this form on file for 5 years following the year to which it pertains.

If you need additional copies of this form, you may photocopy and use as many as you need.

Completed by ____________________

Title ____________________

Phone (______)______-________ Date ___/___/___

Information about the employee

1) Full name ____________________

2) Street ____________________

City ____________ State ______ ZIP ______

3) Date of birth ___/___/___

4) Date hired ___/___/___

5) ☐ Male
☐ Female

Information about the physician or other health care professional

6) Name of physician or other health care professional ____________________

7) If treatment was given away from the worksite, where was it given?

Facility ____________________

Street ____________________

City ____________ State ______ ZIP ______

8) Was employee treated in an emergency room?
☐ Yes
☐ No

9) Was employee hospitalized overnight as an in-patient?
☐ Yes
☐ No

Information about the case

10) Case number from the Log ____________ *(Transfer the case number from the Log after you record the case.)*

11) Date of injury or illness ___/___/___

12) Time employee began work ____________ AM / PM

13) Time of event ____________ AM / PM ☐ Check if time cannot be determined

14) ***What was the employee doing just before the incident occurred?*** Describe the activity, as well as the tools, equipment, or material the employee was using. Be specific. *Examples:* "climbing a ladder while carrying roofing materials"; "spraying chlorine from hand sprayer"; "daily computer key-entry."

15) ***What happened?*** Tell us how the injury occurred. *Examples:* "When ladder slipped on wet floor, worker fell 20 feet"; "Worker was sprayed with chlorine when gasket broke during replacement"; "Worker developed soreness in wrist over time."

16) ***What was the injury or illness?*** Tell us the part of the body that was affected and how it was affected; be more specific than "hurt," "pain," or sore." *Examples:* "strained back"; "chemical burn, hand"; "carpal tunnel syndrome."

17) ***What object or substance directly harmed the employee?*** *Examples:* "concrete floor"; "chlorine"; "radial arm saw." *If this question does not apply to the incident, leave it blank.*

18) ***If the employee died, when did death occur?*** Date of death ___/___/___

Public reporting burden for this collection of information is estimated to average 22 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Persons are not required to respond to the collection of information unless it displays a current valid OMB control number. If you have any comments about this estimate or any other aspects of this data collection, including suggestions for reducing this burden, contact: US Department of Labor, OSHA Office of Statistical Analysis, Room N-3644, 200 Constitution Avenue, NW, Washington, DC 20210. Do not send the completed forms to this office.

APPENDIX F

EMPLOYEE ACKNOWLEDGEMENT OF THE HASP

APPENDIX F

EMPLOYEE ACKNOWLEDGEMENT OF SITE SPECIFIC HEALTH AND SAFETY PLAN

TRC management is committed to the safety of our employees. It is the responsibility of management and supervision to see that every employee is provided with safety instructions for this job, information, the location and opportunity to review the Site Health and Safety Plan. It is also the responsibility of management to provide a safe work environment and observe all safety regulations. No management policy can be effective, however, if each employee does not also have a commitment to the safety policies of the company. To ensure the safety and health of Company employees, the company has developed, and shall implement, the following disciplinary policies.

Any infraction of TRC safety policies and/or Federal, State, or local regulations by a TRC employee will result in disciplinary actions.

- A first infraction will result in a verbal warning and the infraction will be documented and become part of the employee’s work record. If, during investigation, it is determined that the employee’s first infraction causes or could cause serious harm to himself and/or another employee, the result may be other disciplinary actions, including dismissal.

- A second infraction may result in suspension from work. The duration of the suspension will be determined on a case-by-case basis and will be commensurate with the seriousness of the infraction, and may result in dismissal. The infraction will be documented and become part of the employee’s work record.

- A third infraction may result in dismissal. This will be documented and become part of the employee’s work record, and the employee’s name shall be placed on a not-for-rehire list maintained by the company. All information and documentation will be retained by the Company and will not be available to other employers.

TRC safety policies and regulations were developed to protect each employee, however, **it is every employee’s responsibility to observe and follow the company’s safety policies.**

I have been notified of, received, and understand TRC safety policies and acknowledge the disciplinary actions that may be taken as a result of non-compliance with such policies.

Date: ______________________

____________________________________ ______________________________

Employee Name Employee Signature

____

TRC Supervisor

APPENDIX D
Key Personnel Qualifications

PATRICK NAREA

EDUCATION

B.A., Geology, State University of New York at Buffalo, 1998

AREAS OF EXPERTISE

Mr. Narea has ten years of experience and has assumed progressively increasing responsibilities in environmental consulting. His experience includes environmental investigation, environmental remediation, construction inspection and construction management. Mr. Narea's background includes service to public and private-sector clients including the New York City School Construction Authority, Queens West Development Corporation, New York City Department of Environmental Protection, New York City Economic Development Corporation, and Consolidated Edison of New York. He currently serves in the capacity of Project Manager in TRC's Remediation and Site Assessment Practice and is based in the New York City office.

Mr. Narea has experience in the following general areas:

- Environmental Site Assessment
- Site Investigation
- Environmental Remediation
- Construction Inspection and Construction Management
- Underground Storage Tank Testing, Removal, and Closure
- Vapor Intrusion Investigation and Ambient Air Monitoring

REPRESENTATIVE EXPERIENCE

New York City School Construction Authority

Under TRC's on-call hazardous materials services contract with the New York City School Construction Authority, Mr. Narea served as the project geologist and project manager for preparation and implementation of the remedial investigation work plan and preparation of the RI report for a petroleum contaminated site (NYSDEC Spill No. 0508302) located on Jerome Avenue in the Bronx. The site, known as the New Settlement Community Center, is being re-developed into a New York City public school and community center. He supervised the waste characterization sampling for disposal, and delineation of petroleum contaminated soil and a floating gasoline plume. He supervised field activities, which included investigation of shallow bedrock for petroleum-related impacts, including collection of rock cores and construction of a bedrock well. Mr. Narea prepared the RI Report, including bedrock and groundwater surface elevation contour maps. The RI report, which included detailed recommendations for remediation, was accepted by NYSDEC Region 2.

Additionally Mr. Narea served as the environmental construction inspector at PS

133K in Brooklyn. His responsibilities included construction and excavation oversight, oversight of backfilling of excavations and daily tracking of lead-contaminated soil removed off-site for proper disposal. In addition, Mr. Narea was responsible for the operation and maintenance of a network of high-volume air samplers that tested for airborne respirable dust and for closely monitoring that dust levels generated by on-site construction activities were maintained below the action limits established for the site.

Long Island Rail Road (LIRR) West Side Storage Yard (NYSDEC Spill No. 0407411) – New York, NY
Mr. Narea served as the project geologist and assistant project manager for the environmental investigation of an open spill case which was assigned to the Long Island Rail Road (LIRR) West Side Storage Yard (NYSDEC Spill No. 0407411) in Manhattan. He supervised the field activities, performed in accordance with a NYSDEC-approved work plan, which included installation and sampling of groundwater monitoring wells, characterization of the local groundwater flow regime, a tidal influence study, and the delineation of petroleum contaminated soil and groundwater. The field activities were performed on an active rail yard with limited site access, adjacent to the Hudson River, and at NYSDEC's request included collecting groundwater samples from each monitoring well at multiple depth intervals using low-flow sampling techniques. Mr. Narea prepared the RI Report which included high and low tide groundwater surface elevation contour maps and recommendations for future site management activities.

Consolidated Edison Company of New York, Inc. Hudson Avenue Generation Station - Brooklyn, New York
Mr. Narea served as the project geologist and project manager for the environmental investigation of a planned project site on the Consolidated Edison (Con Edison) Hudson Avenue Generation Station property, located in Brooklyn, New York, known as the "Hudson Avenue Replacement Project" (HARP). Con Edison was proposing to construct a new generating plant on the project site to replace the existing steam plant. The planned project area encompasses areas of known spills of petroleum products. The field activities, supervised by Mr. Narea, included the investigation of deep bedrock for manufactured gas plant (MGP) impacts, which included the collection of 30 rock cores. Rock cores were visually inspected and screened with a PID by Mr. Narea for MGP impacts, and the RQD for each rock core was recorded. Mr. Narea also supervised the delineation of petroleum contaminated soil and light non-aqueous phase liquid (LNAPL) within the planned project site via installation of soil borings and groundwater monitoring wells, and performed sub-slab soil vapor sampling in the basement of the maintenance building on the project site. Mr. Narea prepared the Site Investigation Report which included groundwater surface elevation contour maps and recommendations for remediation.

Queens West Development – Stage 2 Site – Long Island City, NY

Mr. Narea served as assistant project manager for the preparation of the Final Engineering Reports for the remediation of a former oil refinery in Long Island City. The Queens West Development – Stage 2 Site consists of over 21 acres being developed for residential and public recreational use. Responsibilities included management and evaluation of laboratory analytical data for soil and groundwater samples collected throughout the site and daily tracking of hazardous and non-hazardous soil being removed off-site for proper disposal.

Albee Square Mall – Brooklyn, NY

Mr. Narea served as the assistant project manager for the investigation of the Albee Square Mall in Downtown, Brooklyn. An “e-designation” was assigned to the site which required mandatory review by the New York City Department of Environmental Protection’s Office of Environmental Planning and Assessment (DEP) for evaluating the potential of contamination by hazardous materials. Mr. Narea prepared and submitted numerous documents to the NYCDEP which included the Remedial Investigation Work Plan, implemented the Work Plan which was performed with limited site access and an aggressive schedule for completion, the Remedial Investigation Report and Remedial Action Plan. A Notice to Proceed was subsequently approved by the NYCDEP.

New York City Housing Authority

Mr. Narea prepared and submitted Site Specific Work Plans for ten New York City Housing Authority Sites throughout the five boroughs. The work plans were prepared and implemented in order to investigate and assess the conditions of the underground storage tanks and the subsurface soil around the tanks. Mr. Narea coordinated field activities and supervised the installation of soil borings and monitoring wells.

Consolidated Edison Waterside Generating Station (NYSDEC VCP Site Nos. V00429 – V00432) Site – Manhattan, NY

Mr. Narea served as the project geologist for the environmental investigation of the 7-acre Consolidated Edison Waterside Generating Station (NYSDEC VCP Site Nos. V00429 – V00432) site located in Midtown Manhattan. The scope of the contract included the decommissioning and demolition of all structures and environmental remediation. Mr. Narea coordinated field activities, and supervised the installation of soil borings and monitoring wells, collection for analysis and description of soil and groundwater samples, and the collection of rock core samples. The field activities, supervised by Mr. Narea during the collection of rock cores, consisted of visual inspection and screening with a PID for petroleum-related contamination, recording of rock quality designation (RQD), and construction of bedrock wells.

New York City Economic Development Corporation

Mr. Narea has been responsible for the investigation and report preparation in connection with several Phase II Environmental Site Investigations for the New York City Economic Development Corporation. The scopes of the investigations included assessment of soil, groundwater, soil vapor and sub-slab vapor. Mr. Narea also served as the environmental construction manager during the remediation and construction of a minor league ballpark on a former railroad site. Due to prior use the subsurface had been impacted with petroleum and metals contamination. Mr. Narea oversaw the implementation of the remedial action work plan, community air monitoring program, storm water pollution prevention plan, and health and safety.

Ferry Point Partners, Ferry Point Park – Bronx, NY
Mr. Narea served as a Project Scientist in support of the methane monitoring program for the construction of a golf course on the site. Mr. Narea supervised the installation of monitoring wells and conducted biweekly methane monitoring events.

SPECIALIZED TRAINING

- 40-Hour OSHA Health and Safety Training
- 10-Hour OSHA Construction Safety Training
- 8-Hour OSHA Health and Safety Refresher
- MTA LIRR Safety Training

JENNIFER L. MIRANDA

EDUCATION
M.S., Environmental and Occupational Health Science, Hunter College, 2002
National Institute of Environmental and Occupational Health Fellow 2002
B.S., Anthropology and Human Biology, Co-Major Human and Natural Ecology, Emory University, 1998

PROFESSIONAL REGISTRATION/CERTIFICATIONS
Certified Asbestos Inspector, New York State Department of Labor

AREAS OF EXPERTISE
Ms. Jennifer Miranda has 12 years of experience and has assumed progressively increasing responsibility in environmental consulting and remedial construction management. Ms. Miranda serves as Senior Project Manager in TRC's New York office, in the Environmental Remediation and Site Assessment Practice. Her qualifications include extensive planning, field investigation, work plan and report preparation, cost estimating, remedial construction management, project management and health and safety oversight at inactive hazardous waste sites. Ms. Miranda has served in the capacity of project manager and health and safety officer for a number of diverse environmental projects, including the extensive investigation and remediation of the Queens West Development – Stage 2 Site located in Long Island City, Queens, New York.

Ms. Miranda has project management and technical experience in the following areas:

- Remedial Investigation
- Remedial Construction Oversight
- Environmental Assessments and Audits
- Health and Safety Program Management
- Underground Storage Tank Management

REPRESENTATIVE EXPERIENCE

Queens West Development Site – Long Island City, NY
Ms. Miranda served as the Project Manager for the over $60 million remediation of the Queens West Development – Stage 2 Site, the site of a former oil refinery in Long Island City. In addition to the presence of several historic abandoned underground storage tank systems, buried on the site was an extensive network of historic refinery piping. The Site was contaminated with petroleum-related VOCs and SVOCs and metals, in several instances found to be present at concentrations above TCLP regulatory limits, and a large LNAPL plume, resulting in several feet of LNAPL in several monitoring wells. In connection with Operable

Units 3 and 4 (OUs 3 and 4) (NYSDEC VCP Site Nos. V00505C and V00505D, BCP Site Nos. C241095 and C241096), which consist of over 9 acres adjacent to the East River being developed for primarily residential/public recreational use, Ms. Miranda has been responsible for the preparation of the Remedial Investigation (RI) Work Plan, RI Report, Remedial Action Work Plan, Final Engineering Reports and Site Management Plans as well as Odor and Vapor Control and Enhanced Community Air Monitoring Plans. Ms. Miranda was also responsible for supervising implementation of the work plans. The RI included advancement and sampling of over 100 soil borings, installation and sampling of a monitoring well network, soil gas sampling within the footprints of the planned buildings, sediment and surface water sampling in the East River to determine potential site impacts, locating and characterizing buried historic refinery remnants, a tidal influence study, a human health risk assessment and fish and wildlife impact analyses. Implementation of the remedial action work plan, supervised by Ms. Miranda, included high vacuum extraction of thousands of gallons of LNAPL, pre-excavation waste characterization and re-use sampling (over 250 borings and thousands of samples were collected for analysis), excavation of over 100,000 tons of contaminated soil under negative pressure enclosures (i.e., tents) and off-site disposal of excavated material, and post-remediation soil, groundwater and soil gas sampling. Ms. Miranda was responsible for financial management, investigation and construction phase field coordination and management, health and safety program management, daily and monthly reporting to the NYSDEC, community outreach program implementation and subcontractor procurement and management. Ms. Miranda served as a primary point of contact for nearby residents during the site remediation, presented at public meetings, prepared fact sheets for distribution to the public, and served as a primary point of contact with the NYSDEC and NYSDOH in connection with responding to local citizens' concerns. In addition, Ms. Miranda managed implementation of a chemical oxidation pilot test on the site, including preparation of a NYSDEC-approved pilot test work plan. In December 2010 NYSDEC issued the final Certificates of Completion for Operable Units 3 and 4 under the BCP.

Consolidated Edison, Hudson Avenue Generating Station - Brooklyn, NY
The Consolidated Edison Hudson Avenue Generating Station is the 12-acre site of an active electric and steam generating plant that has been used as a generating station for over 80 years. Consolidated Edison was proposing to install new steam boilers to replace the existing steam boilers at the Hudson Avenue Generating Station. As part of re-development of the Hudson Avenue Generating Station, Ms. Miranda supervised the Phase I Environmental Site Assessment, Hazardous Materials Pre-Demolition Assessments (for all existing on-site structures), and preparation of the Phase II Environmental Site Investigation Work Plan and Health and Safety Plan.

New York City School Construction Authority, Environmental Consulting/Hazardous Materials Services - New York, NY
Under TRC's on-call hazardous materials services contract with the New York City School Construction Authority, Ms. Miranda has served as project manager for numerous site assessments. Responsibilities have included supervising the preparation of Phase I Environmental Site Assessment reports, preparation of a subsurface investigation summary report for a site with an active spill case, management of the preparation of Phase II Environmental Site Assessment reports, and focused regulatory agency database and prior report reviews for leased properties (over 50 properties).

New York City Economic Development Corporation , On-Call Environmental Services Contract - New York, NY
Under TRC's on-call environmental services contract with the New York City Economic Development Corporation (NYCEDC) Ms. Miranda has managed numerous environmental site assessments and site investigations. Ms. Miranda managed all technical, financial and safety-related aspects of the Site Characterization Investigation of Governors Island in Upper New York Bay. Governors Island is the site of historic military and US Coast Guard operations. The Island-wide investigation included extensive soil and groundwater sampling.

Corporate Health and Safety Program – New York, NY
Ms. Miranda assisted with implementation of the corporate Health and Safety Program. Ms. Miranda prepared updates to the corporate health and safety plan that included such topics as personnel protective clothing, air monitoring, site control procedures, medical surveillance program, respiratory protection program, hearing conservation, assessment of biological hazards, hazard communications, and emergency response. Ms. Miranda updated medical surveillance and incident record-keeping practices and implemented a right-to-know program. In addition, in her role as an assistant to the corporate health and safety director, Ms. Miranda conducted annual 8-hour health and safety-training classes, prepared site-specific environmental investigation and construction phase health and safety plans, and supervised implementation of health and safety activities during hazardous waste operations.

Consolidated Edison, Pre-Demolition Building Hazard Characterizations - Brooklyn, NY
In connection with the environmental assessment of the Second Avenue Subway route in Manhattan, Ms. Miranda prepared the Hazardous Materials chapter of the Environmental Impact Statement for the proposed transportation project. Ms. Miranda also performed the Phase I Environmental Site Assessment using a Global Information System data sorting process to create a comprehensive database. The database was then mapped using State Plane Coordinates and summarized in the Environmental Impact Statement.

Cross Harbor Freight Movement Project – NY and NJ
In connection with the New York and New Jersey Cross Harbor Freight Movement Project, Ms. Miranda prepared the Hazard Materials chapter of the Environmental Impact Statement (EIS) for the proposed transportation project. Ms. Miranda prepared the Phase I Environmental Site Assessment report using a Global Information System data sorting process to create a comprehensive database. The proposed study area included 10 rail yards and approximately 25 miles of track running through New Jersey, Staten Island, Brooklyn and Queens. The data was categorized by potential to require additional investigation and entered into the GIS database. The GIS database was then mapped using State Plane Coordinates. The resulting maps and tables and an analysis of sites of potential concern were summarized in a chapter of the project Environmental Impact Statement.

Columbia University Master Plan – New York, NY
In connection with Columbia University's plans to build a new, separate campus on a 17-acre site in Harlem, Ms. Miranda performed a nine-block survey of hazardous materials and prepared a large-scale demolition and remediation cost estimate for the purpose of long-term planning. The study area has been historically used for commercial, manufacturing and industrial uses over the past 90 years.

Long Island City Rezoning, Site Assessment – Long Island City, NY
Ms. Miranda performed a Phase I Environmental Site Assessment of a portion of Long Island City being considered for rezoning due to potential restrictive declarations or E-designations assigned by the New York City Department of Environmental Protection arising from environmental concerns. This site consisted of a block of buildings with a history of manufacturing and commercial uses.

SPECIALIZED TRAINING

- Practical Applications in Hydrogeology, Rutgers University
- EPA's All Appropriate Inquiry Rule, National Brownfields Association
- USEPA Region 4 Standard Operating Procedures for Field Sampling
- Hazard Ranking System Training Course
- OSHA 40-Hour Hazardous Waste Operations and Emergency Response Training

WES D. LINDEMUTH

EDUCATION
B.S., Environmental Science, Kutztown University, 2004

PROFESSIONAL REGISTRATIONS/CERTIFICATIONS
NYSDOL – Certified Asbestos Air Technician (No. 06-04502)
NYSDEC – Erosion and Sediment Control Training (No. 8492)

AREAS OF EXPERTISE
Mr. Wes D. Lindemuth has technical experience in the following areas:

- Environmental Remediation
- Construction Inspection and Construction Management
- Environmental Site Assessment
- Soil and Groundwater Investigations
- Underground Storage Tank Investigation, Testing, Removal, and Closure
- Hazardous Materials Building Inspections
- Asbestos, Lead Based Paint, and Mold Surveys
- Indoor Air Quality Surveys
- Ambient Air Monitoring
- Soil Vapor Intrusion Investigations

Mr. Lindemuth has over six years of experience and has been assigned progressively increasing responsibilities in environmental consulting. His experience includes oversight of environmental remediation, construction inspection and construction management, environmental investigations, permitting, cost estimating, and project management. Mr. Lindemuth's background includes service to public and private-sector clients including Queens West Development Corporation, New York City School Construction Authority, New York City Economic Development Corporation, Consolidated Edison, Lower Manhattan Development Corporation, and a large real estate investment trust (REIT). He currently serves in the capacity of Assistant Project Manager in TRC's Remediation and Site Assessment Practice and is based in the New York City office.

REPRESENTATIVE EXPERIENCE

Queens West Development – Stage 2 Site, Operable Units 3 and 4, Long Island City, New York
Mr. Lindemuth served as the site construction manager during remediation of Operable Units (OUs) 3 and 4 (NYSDEC BCP Site Nos. C241095 and C241096) of the Queens West Development – Stage 2 Site. OUs 3 and 4 consist of over 9 acres being developed for primarily residential and public recreational uses. The site is the location of a former oil refinery in Long Island City adjacent to the East

River. Under the supervision of Mr. Lindemuth over 100,000 tons of contaminated soil were excavated under negative pressure enclosures (tents) for off-site disposal. Mr. Lindemuth oversaw the removal of LNAPL via high vacuum extraction, excavation of “grossly contaminated” soil below a lower permeability “peat” layer and the water table, and implementation of an in-situ chemical oxidation pilot test using direct injection methods and a 5-foot diameter soil mixing/injection tool. After remediation Mr. Lindemuth oversaw the installation of a 21-well groundwater monitoring network and was also responsible for post-excavation (end point) soil sampling, and post-remediation groundwater and soil gas sampling. Mr. Lindemuth also performed daily reporting to NYSDEC Region 2, oversight of dewatering, management of off-site transportation and disposal of excavated material, procurement of clean soil backfill, oversight of backfilling of excavations, and implementation of the site storm water pollution prevention plan, community air monitoring plan, and health and safety plan.

New York City School Construction Authority
Under TRC’s “on call” hazardous material services contract with the New York City School Construction Authority (NYCSCA) Mr. Lindemuth has performed environmental site assessments and investigations (soil, groundwater and soil vapor sampling), indoor air quality surveys and remediation oversight in connection with proposed New York City school sites. Mr. Lindemuth has served as project scientist in connection with over 20 Phase I Environmental Site Assessments and 12 Phase II Environmental Site Investigations for proposed New York City School sites. Mr. Lindemuth’s responsibilities have included all aspects of preparation of Phase I ESA reports and all elements of field investigations, subcontractor supervision and report writing associated with completion of Phase II ESIs. Additionally, Mr. Lindemuth has supervised the removal of underground storage tank systems and remediation of contaminated soil at five New York City school construction sites. Mr. Lindemuth supervised the remediation of PCB contaminated soil at several New York City school sites. Under the supervision of Mr. Lindemuth PCB contaminated soils were excavated for off-site disposal. Mr. Lindemuth was also responsible for post-excavation (end point) soil sampling, and oversight of procurement of clean soil backfill, backfilling of excavations, and implementation of the community air monitoring plan and health and safety plan.

New York City Economic Development Corporation
Under TRC’s ”on call” environmental consulting services contract with the New York City Economic Development Corporation (NYCEDC) Mr. Lindemuth has served as project scientist and environmental site inspector in connection with several sites. Mr. Lindemuth has served as project scientist in connection with seven Phase I Environmental Site Assessments, four Phase II Environmental Site Investigations (soil, groundwater and soil vapor sampling), one Remedial Investigation, and one hazardous material building inspection for NYCEDC. Mr. Lindemuth’s responsibilities have included all aspects of preparation of Phase I ESA reports and all elements of Phase II ESI field investigations. Additionally,

Mr. Lindemuth was responsible for field inspection services during initial preparation of the Bush Terminal Landfill for development into a park. Responsibilities included inspection of dynamic compaction activities on the landfill, storm water management, and soil gas sampling.

GDF SUEZ, Astoria Energy Power Plant, Queens, NY
Mr. Lindemuth served as an Article X Environmental Inspector at Astoria Energy II (AEII), on behalf of Suez Energy (owner), during the construction phase of a power generating facility in Astoria, New York. Mr. Lindemuth's responsibilities included verifying construction activities and environmental measures were performed in compliance with the certificate conditions, as well as federal, state and local statutes, ordinances, rules and regulations. In addition, Mr. Lindemuth provided oversight of tracking and disposal of hazardous and non-hazardous waste generated at both AEII and the adjacent Con Edison facility during the excavation and installation of gas and electric transmission lines.

Consolidated Edison of New York, Inc.
Mr. Lindemuth served as Assistant Project Manager during subsurface investigations and hazardous materials building inspections at Consolidated Edison properties in Brooklyn including at the Hudson Avenue Generating Station. His responsibilities included oversight of Phase II Environmental Site Investigations (groundwater monitoring well installation and soil and groundwater sampling) and performing inspections of former substations to identify hazardous materials and characterize pre-demolition waste streams.

AIMCO, West Harlem Portfolio – Manhattan, NY
Mr. Lindemuth has performed pre-acquisition due diligence surveys for 95 apartment buildings located throughout Harlem, New York for AIMCO, a real estate investment trust company. His responsibilities also included preparation of Phase I Environmental Site Assessments reports for each property and radon sampling. Additionally, Mr. Lindemuth has provided construction oversight for remediation projects and oversaw the removal of an underground storage tank system, in-situ chemical oxidation for groundwater remediation, and several Phase II Environmental Site Assessments for AIMCO involving groundwater monitoring well installation, and soil, groundwater and soil vapor sampling.

Ferry Point Partners, Ferry Point Park – Bronx, NY
Mr. Lindemuth served as a senior project scientist as part of the methane monitoring and investigation program for the construction of a golf course on the former landfill site. Responsibilities included installation of methane pressure probes and conducting biweekly methane monitoring sampling events in which more than sixty monitoring wells were analyzed for methane and oxygen concentrations using a portable landfill gas detection meter.

Lower Manhattan Development Corporation, Deutsche Bank – Manhattan, NY

Mr. Lindemuth served as a project scientist as part of the ambient air monitoring team during the deconstruction of the former Deutsche Bank building which was damaged during the September 11, 2001 terrorist attack. Responsibilities included ambient air sampling for particulates, silica, mercury, asbestos, and organic compounds.

SPECIALIZED TRAINING

- 40-Hour OSHA Hazardous Waste Operations and Emergency Response Training
- 8-Hour OSHA Hazardous Waste Operations and Emergency Response Supervisor Training
- 30-Hour OSHA Construction Safety Training
- 10-Hour OSHA Construction Safety Training
- 4-Hour NYSDEC Erosion and Sediment Control Training
- 4-Hour NYC Supported Scaffold User Training
- 4-Hour OSHA First Aid Training
- 4-Hour DOT Hazardous Materials
- 1-Hour OSHA Asbestos Awareness
- 1-Hour OSHA Benzene Awareness
- 1-Hour OSHA Confined Space Entry
- 1-Hour OSHA Lead Awareness
- 1-Hour OSHA Radiation Safety
- Asbestos Air Sampling Technician
- Long Island Rail Road Roadway Protection Training
- Metro-North Railroad Roadway Worker Procedures
- Transportation Worker Identification Credential (TWIC)

DAVID S. GLASS, PE

EDUCATION
M. E., Chemical Engineering, McGill University, 1986
B.A., Chemistry, Colby College, 1983

PROFESSIONAL REGISTRATIONS/CERTIFICATIONS
Professional Engineer, New York, 1992
Professional Engineer, New Jersey, 2001
Professional Engineer, Connecticut, 2005
Certified for UST Subsurface Evaluation and Closure, New Jersey

AREAS OF EXPERTISE
Mr. Glass manages TRC's Environmental Remediation and Site Assessment Practice in the New York City office and has over 24 years of experience providing environmental engineering, investigation, design, construction, and permitting services. He has managed many large, complex remedial investigations, feasibility studies, site assessments, remedial design, construction, and site management projects as well as permitting and regulatory compliance assignments. Mr. Glass has extensive management and technical experience in the following areas:

- Remedial Investigation and Design
- Remedial Construction Management/Inspection
- Remedial Systems Monitoring, Operation and Maintenance
- Underground and Aboveground Storage Tank Management
- Soil Vapor Intrusion Investigation and Mitigation
- Environmental Regulatory Compliance

Mr. Glass has extensive experience with NYSDEC in connection with investigation, remediation and close-out of contaminated sites. He has been responsible for engineering services in connection with inspection, testing, maintenance, spill prevention planning, remediation, closure and replacement of hundreds of storage tank systems in the New York City metropolitan area, including hazardous substance, hazardous waste and petroleum product storage tank systems. Mr. Glass served as an instructor at Rutgers University (Office of Continuing Professional Education) for the "Regulatory Training in Underground Storage Tanks" course. This course is required for individuals seeking NJDEP certification for installation, closure and testing of USTs and certification to install cathodic protection and perform subsurface evaluations in connection with USTs.

REPRESENTATIVE EXPERIENCE

New York City School Construction Authority Environmental Consulting/Hazardous Material Services Contract
Mr. Glass serves as Principal-in-Charge for TRC's environmental consulting hazardous materials services contract with the New York City School Construction Authority (NYCSCA). TRC has provided a broad range of services to the NYCSCA, under two consecutive on-call

contracts, including environmental site assessment and remedial design and construction phase services, and has successfully completed over 200 assignments for NYCSCA since 2006.

Queens West Development - Stage 2 Site Remedial Action - Long Island City, NY
In connection with an approximately $1.5 billion development on the East River, Mr. Glass supervised the preparation of the Remedial Investigation (RI) Work Plan, RI Report, Remedial Work Plan, Final Engineering Report, and Site Management Plan, and supervised remediation of Operable Units (OUs) 3 and 4 of the Queens West Development – Stage 2 Site, an approximately 9-acre parcel which is the location of a former Standard Oil Company refinery. In December 2010 NYSDEC issued Certificates of Completion for both OUs 3 and 4 under the New York State Brownfield Cleanup Program (BCP). Mr. Glass also managed the design of active sub-slab depressurization systems for several high-rise residential buildings at the site.

MTA Long Island Rail Road (LIRR) General Engineering Consultants (GEC) Environmental Engineering Contract
Mr. Glass serves as Project Director for TRC's GEC contract for environmental engineering services with the MTA Long Island Rail Road. In this capacity Mr. Glass has supervised services provided to LIRR in connection with a remedial investigation of the Morris Park Yard, design and construction of a petroleum remediation system at the Morris Park Yard, and a remedial investigation of a petroleum spill at the West Side Storage Yard on the west side of Manhattan.

Avis Budget Group, Inc. - New York, New Jersey and Connecticut
Mr. Glass serves as Principal-in-Charge for TRC's national environmental engineering services contract with the Avis Budget Group, Inc. TRC has provided a broad range of services to the Avis Budget Group since 2006, including environmental arbitration-related, site assessment, petroleum spill closure, and remedial design and construction phase services at several sites in New York, New Jersey and Connecticut, including properties operated by Avis Budget in Manhattan and at JFK, LaGuardia and Newark airports.

NYSDEC Superfund Standby Contract
Between 1996 and 2005, under consecutive Superfund Standby Contracts, Mr. Glass managed environmental design, construction phase and site management services provided to the NYSDEC. Under the multi-site "on-call" contracts with NYSDEC Mr. Glass supervised preparation of work plans, pre-design investigation reports, engineering design reports, design drawings and specifications, and engineering cost estimates for remediation of State Superfund dry cleaner sites, landfills, a metal finishing site, and several former manufacturing facility sites throughout New York State.

NJDEP Remedial Design Services Contract
Between 2001 and 2004, under a remedial design services contract, Mr. Glass managed pre-design investigation and design services provided to the NJDEP. Under the multi-site "on-call" contract with NJDEP Mr. Glass supervised preparation of work plans, pre-design investigation reports, engineering design reports, design drawings and specifications, and engineering cost

estimates for abandoned landfills, a truck fueling facility site, a former electronics manufacturing site, a bulk chemical storage terminal, an oil storage terminal, and a former metal fabricator site.

Environmental Compliance, Design and Construction Services – Danbury, CT
Mr. Glass serves as Principal-in-Charge for TRC's environmental engineering contract with the City of Danbury, CT. TRC has provided a broad range of services to the City since 2005, including air quality management services in connection with the closed Danbury Landfill and Public Works Complex; optimization of the landfill gas control system and enclosed landfill gas flare; city-wide compliance surveys of underground storage tanks; preparation of storm water pollution prevention plans for the City's Public Works Complex and Water Pollution Control Plant; preparation of Spill Prevention, Control and Countermeasure (SPCC) Plans for the City's Public Works Complex and Police Department Headquarters and related training and compliance assistance; design and construction inspection services for the removal and replacement of a 5,000-gallon gasoline storage tank and dispenser at the Fire Department headquarters; design and construction inspection services for a new vehicle fueling facility at the Public Works Complex which includes a 10,000-gallon aboveground diesel fuel tank, an 8,000-gallon aboveground gasoline tank, and overhead canopy with recessed lighting; and, design services for removal and replacement of fuel oil storage tanks at the City Airport and City Hall.

ExxonMobil Bayway Refinery - Linden, NJ
Mr. Glass supervised the design of the hydraulic control system for the Sludge Lagoon Operable Unit (SLOU) at the Bayway Refinery in Linden, NJ. The hydraulic control system, which was designed under Mr. Glass's supervision, includes 21 dual pump extraction wells, thousands of feet of buried piping, and sophisticated instrumentation and controls. The dual pump extraction wells were designed to automatically extract separately groundwater (for hydraulic control) and oil in the SLOU.

KeySpan Corporation Cable Fluid Release Site - Sands Point, NY
Mr. Glass managed the pre-design investigation, design and construction phase services for the ground water extraction and treatment system to contain and remediate the release of dielectric cable fluid from a high voltage underground electric utility-owned cable. Mr. Glass was responsible for design of the dual phase extraction well, solids filters, carbon adsorption system, instrumentation and controls, treatment system building, utilities, on-site treated water recharge system (dry well network), site access road, site drainage structures and landscaping.

Consolidated Edison Former MGP Plant - New York, NY
Mr. Glass supervised preparation of the Remedial Work Plan for the Consolidated Edison West 42nd Street former Manufactured Gas Plant Site. The RWP was prepared in accordance with the terms of a Voluntary Cleanup Agreement (VCA) with the NYSDEC. The remedial plan developed for the site was designed to meet the requirements of the NYSDEC for cleanup of the former MGP site, as well as allow for the planned future use of the site: construction of a high rise residential building.

Former Textiles Processing Facility, Soil and Groundwater Remediation Services – Moonachie, NJ
Mr. Glass managed services provided for remediation of tetrachloroethene contaminated soil and groundwater, including dense non-aqueous phase liquid (DNAPL), at a former textiles processing facility in Moonachie, New Jersey. Remedial design included selective building demolition, deep excavation, water-tight sheeting, and in-situ chemical oxidation.

Brookhaven National Laboratory, Remediation Services – Upton, NY
Mr. Glass managed preparation of the conceptual design drawings for remediation of contaminated sediment in the Peconic River at Brookhaven National Laboratory in Upton, New York. Mr. Glass also served as project manager for closure of the hazardous waste and mixed waste storage facility at Brookhaven National Laboratory (BNL), a Department of Energy (DOE) operated facility. Responsibilities included oversight of decontamination of four hazardous waste storage buildings and two mixed waste storage units, post-closure sampling and preparation of the final closure certification report.

City of Paterson Sewer System Overflow Study – Paterson, NJ
Mr. Glass managed services provided to the City of Paterson, New Jersey, for a combined sewer system overflow study. His responsibilities included supervising mapping of the combined sewer system, cleaning and televising sewers, flow monitoring, and modeling to identify sources of inflow and infiltration and minimize combined system overflows to surface water.

Bergen County Overpeck Park Site, Wetland and Landfill Closure Services – Leonia, NJ
Mr. Glass was manager for stream bank stabilization, wetland restoration and landfill cover repair and closure of the over 400-acre Bergen County Department of Parks Overpeck County Park site (Leonia, New Jersey). The project included redevelopment of the landfill property for passive and active recreation.

Southhold Landfill, Landfill Closure Services – Southhold, NY
Mr. Glass managed engineering services for the closure of a 34-acre municipal solid waste landfill in Southhold, New York. His responsibilities included preparation of the final landfill closure plan, plans and specifications, and a cost estimate for construction of the landfill capping system as well as supervising construction inspection services.

Fishers Island Landfill, Landfill Closure Services – Fishers Island, NY
Mr. Glass managed engineering services for the closure of a 10-acre landfill located in Fishers Island, New York. His responsibilities included preparation of the final landfill closure plan, and plans and specifications for closure of the landfill.

Captain's Cove Landfill – Landfill Remediation Services – Glen Cove, NY
Mr. Glass managed engineering services for remediation of the Captain's Cove landfill located in Glen Cove, New York (New York State Superfund Site Registry No. 1-30-032). His responsibilities included preparation of plans and specifications for reclamation of the landfill, backfill, grading and drainage, and supervising construction inspection services.

SPECIALIZED TRAINING

- 40-Hour OSHA Health and Safety Training

PROFESSIONAL AFFILIATIONS

- American Chemical Society
- American Institute of Chemical Engineers

ELIZABETH DENLY

EDUCATION
B.A., Chemistry, University of New Hampshire, 1987

PROFESSIONAL REGISTRATIONS/CERTIFICATIONS
Licensed Site Professional Association, Massachusetts, Associate Member

AREAS OF EXPERTISE
Ms. Denly has management and technical experience in the following areas:

- Quality Assurance/Quality Control
- Data Validation
- Laboratory Audits
- Gas Chromatography: Field and Laboratory Analyses
- Gas Chromatography/Mass Spectrometry: Field and Laboratory Analyses

Ms. Elizabeth Denly, as a Quality Assurance Chemist, is responsible for providing QA/QC oversight in support of a variety of environmental investigations, including ambient air monitoring, human health and ecological risk assessments, risk-based soil cleanups, and remedial investigation and cleanup programs. Ms. Denly has provided this oversight under several different environmental protection regulatory programs, including programs administered by the MADEP, NYSDEC, NJDEP, and USEPA Regions 1, 2, 3, and 5. In this role, Ms. Denly has been responsible for the preparation of project-specific Quality Assurance Project Plans (QAPP), coordination with laboratories, selection of appropriate analytical methodologies to achieve required regulatory standards, oversight and performance of the data validation process, and determination of the usability of the data in comparison to project objectives.

Ms. Denly provides oversight and senior review on data validation performed for a wide range of analytical parameters. Ms. Denly performs data validation for organic parameters including VOCs, SVOCs, pesticides, PCB aroclors, PCB homologues/congeners, dioxins, specialty analyses, including GC/MS/SIM, and air analyses. Validation and reporting guidelines utilized by Ms. Denly include USEPA National Functional Guidelines, and guidelines established by USEPA Regions 1 through 5, NYSDEC and NJDEP. Ms. Denly developed internal protocols for the validation of the MADEP EPH/VPH methodologies. Ms. Denly also serves as TRC's Eastern Region Quality Control Coordinator, responsible for the creation and implementation of the TRC Eastern Region Quality Management Plan.

REPRESENTATIVE EXPERIENCE

Queens West Development – Long Island City, NY (Project QA Officer)
Ms. Denly prepared the QAPP under the NYSDEC Voluntary Cleanup Program and Brownfield Cleanup Program for investigation and remediation of the Queens West Development – Stage 2 Site (VCP Site Nos. V00505A, V00505B, V00505C and V0050D, BCP Site Nos. C241095 and C241096) in Long Island City, New York. During the field program, she provided QA oversight of the field team. Ms. Denly performed data validation for the project and was responsible for performing assessment of data to determine overall usability. Ms. Denly also provided daily support to the project team on chemistry, laboratory and QA issues. She was responsible for ensuring project objectives were achieved by the laboratory and for oversight of laboratory QA issues.

Consolidated Edison Waterside Generating Station – New York, NY (Project QA Officer)
In support of the investigation and remediation of the former Consolidated Edison Waterside Generating Station in Manhattan under the NYSDEC Voluntary Cleanup Program (NYSDEC VCP Site Nos. V00429 - V00432), Ms. Denly prepared the QAPP for Supplemental Soil Investigation and Voluntary Cleanup of four sites as part of this project. She provided QA oversight of the field team during field activities to ensure that the investigative procedures were performed in accordance with the QAPP. As part of this project, Ms. Denly also performed data validation of select data points used for decision-making and was responsible for performing assessment of data to determine overall usability for the Remedial Work Plans.

Woodbrook Road Superfund Site – South Plainfield, NJ (Project QA Officer)
Ms. Denly prepared the QAPP for a complex remedial investigation under USEPA Region 2 oversight at the Woodbrook Road Superfund Site in New Jersey. The program involved use of the TRIAD approach for real-time PCB results and sampling and analysis of soil, sediment, groundwater and surface water for all TCL/TAL parameters, dioxins/furans, PCB congeners, and a variety of wet chemistry parameters, most of which were used for human health/ecological risk assessment. Ms. Denly was responsible for the oversight of three analytical laboratories and for coordination of data validation for all parameters, which included frequent communication with the laboratories to ensure proper receipt of samples, confirming proper utilization of project-specific analytical protocols to achieve project action levels and monitoring the overall performance of the laboratories. In addition, Ms. Denly was responsible for the oversight and performance of field and laboratory audits.

130 Liberty Street – New York, NY (Project QA Officer)
Ms. Denly prepared the QAPP for an extensive ambient air monitoring program and waste management program under USEPA Region 2 oversight in New York City at 130 Liberty Street (the former Deutsche Bank Building at Ground Zero),

which was impacted by the September 11th terrorist attacks. She provided oversight of six analytical laboratories and was responsible for coordination and performance of data validation for asbestos, metals, dioxins/furans, PAHs, PCBs and silica ambient air data, as well as TCLP and metals waste stream data. Ms. Denly communicated frequently with the laboratories to ensure proper receipt of samples and proper utilization of project-specific analytical protocols, and monitored the overall performance of the laboratories. Ms. Denly was also responsible for the oversight and performance of field and laboratory audits and review of all data prior to submission to EPA.

FAA, Region II – Atlantic City, NJ (Project QA Officer)
Ms. Denly assisted in the preparation of QA protocols for a Remedial Investigation and Ecological Risk Assessment Work Plan prepared by TRC for the FAA Technical Center in Atlantic City, NJ. Ms. Denly was responsible for providing QA support to the field team and interfaced with the analytical laboratories to ensure achievement of data which could be utilized for comparison to risk-based standards. Ms. Denly performed data validation and/or oversight of data validation for all data generated.

Mattiace Petrochemical – Glen Cove, NY (Project QA Officer)
In connection with the Mattiace Petrochemical Facility NPL Site (NYSDEC Site Registry No. 130017) in Glen Cove, New York, Ms. Denly prepared the QAPP for Long Term Remedial Action in accordance with USEPA Region 2 guidance. As part of this project, Ms. Denly provided QA oversight of the field team and performed data validation of data generated for assessment of the progress of remediation with respect to cleanup objectives. She was also responsible for performing assessment of data to determine overall usability.

Consolidated Edison Company, Electrical Power Generator – New York, NY (Project Chemist)
Ms. Denly performed a method validation study to establish the applicability of an ASTM UV method for the measurement of dielectric fluids in soils at a Consolidated Edison electrical power generation facility in New York City. Detection limits, precision, accuracy, and comparability to laboratory analyses using a MADEP EPH methodology were investigated for each oil.

Consolidated Edison Company, Electrical Power Generator – New York, NY (Project Chemist)
Ms. Denly prepared and analyzed soil samples for an RFI at a Consolidated Edison facility in Astoria, New York. She quantitatively identified samples for TPH by GC/FID. Ms. Denly performed qualitative identification of the soils based on analysis of several categories of oils used at the facility, including fuel oil #2, fuel oil #6, transformer oil, gas condensate and dielectric fluids.

SPECIALIZED TRAINING

- Data Evaluation for Vapor Intrusion Studies

- Sediment Toxicity Testing: Methods to Achieve Strong Data Sets and Interpret Results
- Assessing the Vapor Intrusion Pathway at Contaminated Sites
- Perchlorate Webinar, USEPA
- Overview of Statistical Data Quality Assessment, USEPA
- Assessing Quality Systems, USEPA
- Understanding and Evaluating Data Quality Assessments, USEPA

PROFESSIONAL SOCIETIES

- American Chemical Society

TRC

DANIEL A. SCHMIDT, LEED AP

Environmental Engineer

EDUCATION
MBA, Business Administration, University of Delaware, 2008
B.S., Environmental Engineering, University of Delaware, 2006

PROFESSIONAL REGISTRATIONS/CERTIFICATIONS
Professional Engineer-in-Training, Delaware, 2005
Leadership in Energy and Environmental Design (LEED) Accredited Professional, 2009
NYSDEC – Erosion and Sediment Control Training (SWT #: 4081), 2009

AREAS OF EXPERTISE
Mr. Schmidt has over 3 years of environmental consulting services experience and has assumed progressively increasing responsibilities in environmental engineering. Specifically he has experience in remedial investigation, design and construction.

Mr. Schmidt has experience in the following general areas:

- Environmental Site Investigation
- Groundwater and Soil Remediation
- Underground Storage Tank Testing, Removal and Closure
- Remedial Investigations
- Remedial Construction Inspection
- Hazardous Waste Management
- Indoor Air Quality Assessments

REPRESENTATIVE EXPERIENCE (Descriptions marked with an asterisk (*) undertaken within past three years)

New York City School Construction Authority (NYCSCA)*
Under TRC's on-call hazardous materials services contract with the New York City School Construction Authority (NYCSCA), Mr. Schmidt has served as project engineer/construction inspector for the inspection of construction of vapor intrusion mitigation systems for four (4) New York City public schools. In connection with construction, Mr. Schmidt's responsibilities have included submittal review and performing inspections at critical milestones including: completion of construction of gas permeable aggregate layer, completion of construction of sub-slab depressurization pits and piping, pressure testing of piping, completion of construction of suction fans and instrumentation, and completion of preparation of sub-grade for application of gas vapor barriers. As a construction inspector, Mr. Schmidt has also been responsible for preparing inspection reports and performing sub-slab pressure field testing to verify performance of SSDSs.

Ferry Point Park – Bronx, NY*
Mr. Schmidt served as a project engineer for design of the environmental controls for conversion of the closed Ferry Point Park landfill in the Bronx into a golf course and community park. Mr. Schmidt's responsibilities included serving as project engineer for design of the landfill gas extraction well and piping network for the 200+ acre site.

ExxonMobil Bayway Refinery – Linden, NJ*
In connection with design of a hydraulic control system for the sludge lagoon operable unit at the ExxonMobil Bayway refinery in Linden, NJ, Mr. Schmidt was responsible for preparing profiles for thousands of feet of groundwater extraction system piping. Mr. Schmidt evaluated bend radii for the HDPE piping, and using AutoCAD prepared drawings which maintain piping below the frost line, at appropriate and uniform slopes and shallow enough to facilitate trenching for installation.

Long Island Rail Road – Queens, NY*
Mr. Schmidt assists in quarterly groundwater sampling at Long Island Rail Road's Morris Park and Richmond Hill Yards. Responsibilities include field activities for sampling of a groundwater monitoring well network consisting of over 50 wells.

Columbia University – New York, NY*
Mr. Schmidt provided oversight of cleaning and closure of two (2) 10,000-gallon underground storage tanks (USTs) at Columbia University. The tanks were closed in place under Mr. Schmidt's supervision, as part of a fuel oil storage facility conversion project.

SPECIALIZED TRAINING

- OSHA 40-Hour Hazardous Waste and Emergency Response Training
- OSHA 8-Hour Hazardous Waste and Emergency Response Refresher Training
- OSHA 10-Hour Construction Safety Training
- MTA Long Island Rail Road Roadway Protection Training

DANIEL H. WARREN, LEED A.P.

EDUCATION
B.Sc., Horticulture, Magna cum Laude, University of Connecticut, 2007

AREAS OF EXPERTISE
Mr. Daniel H. Warren has experience in the following areas:

- Environmental Site Investigation
- Groundwater and Soil Remediation
- Remediation Systems Monitoring, Operation and Maintenance
- Underground Storage Tank Investigation and Removal
- Forensic Petroleum Investigation
- Hazardous Waste Management
- Indoor Air Quality Assessments
- Arbitration Support
- Project Management

Mr. Warren has over three years of experience as an environmental scientist. His experience includes: hazardous materials building assessments, remediation oversight, LNAPL remediation systems (product skimmers) installation oversight, groundwater monitoring well sampling, product gauging and LNAPL extraction, monitoring well installation oversight, soil sampling, soil vapor sampling, sediment sampling, surface water sampling, implementation of community air monitoring plans (CAMP), and fuel release investigations.

REPRESENTATIVE EXPERIENCE

MTA Long Island Rail Road Morris Park and Richmond Hill Yards – Queens, NY
Under a general engineering consulting (GEC) contract for environmental services with the MTA Long Island Rail Road (LIRR), Mr. Warren served for 10 consecutive quarters as field operations manager for quarterly groundwater sampling at the Morris Park and Richmond Hill Yards (NYSDEC Spill Nos. 92-12990 and 89-08760). His responsibilities included field activity management and report preparation. The groundwater monitoring well network consists of approximately 45 wells. Mr. Warren also served as field operations manager for bi-weekly groundwater sampling for nitrates to assess impacts associated with a bioamendment remediation system at the Morris Park Yard, and was responsible for assisting in performing an annual assessment of the effectiveness of the remediation system.

New York City School Construction Authority
Mr. Warren serves as project scientist for Phase II Environmental Site Investigations for proposed New York City public school sites. Responsibilities have included performing groundwater, soil and soil vapor sampling, indoor air quality surveys and the preparation

of Phase II Environmental Site Investigation reports. Additionally, Mr. Warren provided technical support in connection with installation and operation of a belt skimmer system to recover oil beneath the boiler room of a school in Manhattan (PS 192M).

Former Mattiace Petrochemical Superfund Site (EPA NPL ID NYD000512459) - Glen Cove, NY

Mr. Warren served as plant operator and now serves as plant manager and assistant project manager for the groundwater and soil vapor extraction and treatment facility at the Former Mattiace Petrochemical Site, a federal Superfund/NPL site. Responsibilities include O+M optimization, monthly and semiannual reporting to USEPA, and assisting with the development of a phytoremediation and enhanced biorestoration system including preparation of a Supplemental Remedial Investigation Work Plan and Focused Feasibility Study. Mr. Warren was responsible for implementing a variety of alternative treatment technologies at the site including a network of semi-permanent bladder pumps for groundwater extraction. Mr. Warren's role also includes project management tasks including preparation of invoices, monthly progress and budget reports and subcontractor agreements.

Mr. Warren also developed the hazardous waste management program for treatment system wastes. Separate phase liquid that exhibited the potential to be characterized as hazardous waste was discovered at the site. Mr. Warren developed and implemented a management plan for removal, storage and disposal of the separate phase liquid while maintaining the Conditionally Exempt Small Quantity Generator (CESG) status of the facility. The implementation of this management plan represents a significant cost avoidance that the project would have incurred if the facility CESQG status was not maintained.

Avis Budget Group, Inc. - New York, NY and Fairfield, CT

Mr. Warren serves as the lead project scientist and assistant project manager for various Avis Budget Group car rental facilities in connection with underground storage tanks and petroleum spill cases in New York City (NYSDEC Spill Case Nos. 95-00664, 99-14694, 07-11724 and 09-07633). His responsibilities have included site investigation, oversight of tank closures and removals, closure report preparation and oversight, on behalf of Avis Budget, of a third party remedial excavation project.

Consolidated Edison of New York, Inc. - New York, NY

Mr. Warren served as a field investigator for various abandoned facilities in New York City. Responsibilities included inspection, documenting and sampling of potentially hazardous materials in buildings as part of pre-demolition surveys.

Queens West Development – Stage 2 Site - Long Island City, NY

Mr. Warren served as a project scientist for environmental tasks in connection with the remediation of Operable Units (OUs) 3 and 4 of the Queens West Development – Stage 2 Site (NYSDEC VCP Site Nos. V00505C and V00505D, BCP Site Nos. C241095 and C241096) in Long Island City. The site is an approximately nine-acre parcel which is the location of a former oil refinery. Prior use of the property resulted in metals and petroleum-related contamination in soil and groundwater, including an approximately one-acre LNAPL plume. Mr. Warren was responsible for installation of groundwater monitoring wells, monitoring well development, groundwater sampling, implementation of the CAMP, oversight of utility clearance and related reporting. Mr. Warren has also been responsible for preparation of site management reports for submittal to NYSDEC Region 2.

Ferry Point Partners, Ferry Point Park- Bronx, NY
Mr. Warren performed routine methane monitoring and site inspections during the construction of a golf course on the 200+- acre landfill site. Responsibilities included monitoring of more than sixty points using a portable methane monitoring device. Mr. Warren also performed subsurface soil vapor characterization, utilizing drill rigs as well as manual tools, across the site and served as a project scientist in connection with a landfill gas extraction pilot study.

SPECIALIZED TRAINING

- 40-Hour OSHA Health and Safety Training
- 10-Hour OSHA Construction Safety Training
- Forklift Training Certificate
- Confined Space Training
- Lead Awareness Health and Safety Training
- Asbestos Awareness Health and Safety Training
- Lockout /Tag out For Authorized Persons Training
- Hazardous Materials Management Training
- Centrifugal Pumps – Types and Components Training
- Long Island Rail Road Safety Training
- TRC Project Management Training

PROFESSIONAL AFFILIATIONS

- Gamma Sigma Delta, Honorary Society of Agriculture