COMPREHENSIVE
INVESTIGATION WORK PLAN
FINAL

ROSE CLEANERS
500 Lexington Avenue
Mount Kisco, New York 10549
Site No.: 3-60-059
Index No.: W3-0978-03-12

PREPARED FOR

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
625 BROADWAY
ALBANY, NEW YORK 12233-7016

PREPARED BY:

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Professional Engineer Certification

Certification:

I, John V. Soderberg, PE, certify that I am currently a Professional Engineer duly registered with the New York State Department of Education, and that this Comprehensive 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)

John V. Soderberg, P.E

Signature

SEAL:

NYS P.E License No. 49975

Dated: March 31, 2016

EXECUTIVE SUMMARY

A scope of continued off-site investigation has been developed to be performed as part of the on going Supplemental Remedial Investigation for the Rose Cleaners' facility located in Mount Kisco, Westchester, New York (Figure-1). As detailed in the June 2006 Remedial Investigation Work Plan, approved by the New York State Department of Environmental Conservation, Division of Environmental Remediation (NYSDEC DER), the triad approach is being utilized which allows for comprehensive data collection and the time-effective completion of the site characterization.

The primary purpose of this Comprehensive Investigation Work Plan (IWP) is to delineate the horizontal and vertical extent of tetrachloroethene (PCE) and its breakdown products, specifically focusing on off-site groundwater, to the extent feasible. The IWP will also focus on a complete soil vapor intrusion (SVI) study based on the updated conceptual site model (CSM) depicting the aerial extent of the plume.

A CSM has been developed based upon historic site data and primarily focuses on PCE concentrations and associated daughter breakdown products from the surface of the groundwater table (approximately 4' bgs) vertically to bedrock (approximately 22' bgs). The CSM will be used to determine the SVI study area as well as the nature and extent of contamination in all media on and off-site in order to determine if any completed exposure pathways are present.

1.0 INTRODUCTION

A Comprehensive Investigation Work Plan (IWP) for the Rose Cleaners' Inactive Hazardous Waste Disposal Site (IHWDS) has been prepared pursuant to the requirements of an executed Order on Consent (December 22, 2003) between the New York State Department of Environmental Conservation (NYSDEC), Division of Environmental Remediation (DER), and LRB Cleaners, Inc., the Respondent.

The subject property is listed on the NYSDEC DER Registry of Inactive Hazardous Waste Disposal Sites in New York State as Site Number 3-60-059 with a Classification of 2 pursuant to ECL 27-1305. The site is located at 500 Lexington Avenue, Mt. Kisco, New York 10549, fully described at Dist. 80.64, Section 01, Lot 14. (Figure-1)

1.1 Triad Approach in Site Investigation

As encouraged by the United States Environmental Protection Agency's (USEPA's) Office of Solid Waste and Emergency Response and the NYSDEC DER, an integrated "triad" or pre-planned approach for the continued investigation of this site is proposed. The triad approach includes systematic planning such as the development of dynamic work plans and real time data collection strategies to implement data collection and make technical decisions at hazardous waste sites.

Future investigation work is being proposed based upon the development of the site CSMs (Figures-2a-2f) drafted from a comprehensive data set from the study area. See Figure-3 defining the study area for the site. In addition to the CSM an essential component to guide systematic project planning will include the interpretation of the site specific groundwater flow model presented as Figure-4. The CSM developed for the supplemental investigation work included a multi-tiered sampling approach which extended north of the primary source area with a series of horizontal transects formed within. Delineation of groundwater contamination has been completed laterally and vertically down gradient (north) and west of the stream at three (3) locations. The east side of Lexington Ave, with the exception of one location to the northeast, has been fully delineated. The IWP will include at plan to fully delineate the contamination found northeast of the site to the extent feasible.

In addition to the collection of off-site groundwater samples, soil sampling is proposed at monitoring well installations locations to characterize soil conditions. This includes sampling of soil beneath the Rose Cleaners building at two (2) locations. The main purpose of the soil sampling will be to determine the presence of a confining layer of strata within the study area.

One (1) surface water grab sample is also proposed in order to delineate impacts near the confluence of the Kensico and Mt. Kisco Rivers. The IWP will include a plan to fully delineate the extent of the surface water contamination based on previous data collected. Historic surface water sampling locations will also be re-sampled (SW-1-4) in order to get current data and evaluate the current surface water conditions.

An SVI study will also be proposed based upon the CSM in order to evaluate the potential for soil vapor intrusion at surrounding residences within the study area. The SVI study pertaining to indoor air sampling and sub-slab sampling at surrounding properties was completed during March of 2016 for which validated lab results are pending. Outdoor ambient air sampling and soil gas sampling in order to determine the source contamination in the outdoor air is proposed as part of the IWP.

1.2. Site Background and History of Use

Site Name: Rose Cleaners
Owner: LRB Cleaners, Inc.
Operator: Hwa-Young Kim
Location: 500 Lexington Avenue, Mount Kisco, New York 10549
Latitude 41º 12' 16.914 N, Longitude 73º 43' 42.489" W
Remedial Investigation Agreement: IHWDS Site No.: 3-60-059
Index No.: W3-0978-03-12

The current site development consists of a one-story concrete block/masonry slab-on-grade approximately 5,810 ft^2 building. The building possesses a built-up metal flat roof. The building was remodeled in 1955 and 1962. A 100-ft^2 fur vault was added in addition to partitioned office spaces.

Approximately 10,900 ft^2 of asphalt paving (installed circa 1955 and maintained thereafter) is present exterior to the building. The property has always been used as a cleaning plant/facility. A tenant is located at the rear of the building; the date of occupancy by the tenant is unknown. The tenant is a plumbing company that uses the building space primarily as a warehouse for plumbing supplies.

1.3 Summary of Previous Site Investigations

Records available to Berninger Environmental, Inc. (BEI) indicated that on December 21, 2001, Tyree Brothers Environmental Services, Inc. (TBES) performed a limited subsurface investigation at the Rose Cleaners' facility. Two soil borings were manually drilled at the site with the locations chosen based on the presence of any exhaust piping and/or any location that would have the potential for chemical dumping.

Soil samples were collected at two (2) locations, one directly adjacent to the stoop by the back door, (SB-1) at a depth of 2.5 to 3 feet and one on the side of the building (SB-2) near the exhaust discharge piping at a depth of 3 to 4 feet. The increment with the highest Photoionization Detector (PID) reading was selected for laboratory analysis. PID readings ranged from 1.1 to 36.7 ppm PID response units. The samples were also analyzed for volatile organic compounds via EPA method 8260.

The results of the laboratory analysis were compared to New York State Department of Environmental Conservation (NYSDEC) 6 NYCRR Part 375-6. Laboratory results indicated that volatile organic compounds were detected in both of the soil samples. All concentrations in SB-1 were within NYSDEC acceptable levels; tetrachloroethene was present at a concentration of 591 *u*g/kg. Sample SB-2 contained a concentration of one (1) compound (tetrachloroethene at 12,400 *u*g/kg) that exceeded NYSDEC soil guidelines (currently 6 NYCRR Part 375-6.8 Unrestricted Use) of 1,300 *u*g/kg.

A surface water grab sample was also collected from a downstream location, between the dry

cleaners and the adjacent commercial property, during the soil sampling program. This sample was hand delivered under chain of custody documentation to a New York State certified laboratory. The stream is located in the back (west) of the dry cleaners. This sample was analyzed for volatile organic compounds via EPA Method 8260. The results of the laboratory analysis were compared to the Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1, Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations, April 2000.

Volatile organic compounds were detected in the surface water sample taken from the stream. The stream sample contained concentrations of VOCs that exceeded the NYSDEC Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1 surface water standards type H (WS) for two (2) compounds (cis-1,2-dichloroethene at 5.1 *u*g/L and tetrachloroethene at 9.3 *u*g/L). The TOGS surface water standards for each of these constituents is *5 ppb.* Due to the presence of volatiles that exceeded NYSDEC standards for soil and surface water, Spill Number 01-09709 was assigned to this site. Ultimately the site became listed as an Inactive Hazardous Waste Site No. 3-60-059 with a Classification of "2" pursuant to ECL 27-1305 as further investigation was required to determine the nature of the contamination, the extent of waste disposed and the contamination source(s). Please refer to Appendix-B for the original report of findings from the 2001 investigation.

In July of 2005 a Remedial Investigation Work Plan (RI Work Plan) was developed pursuant to the requirements of an executed Order on Consent (December 22, 2003) between the New York State Department of Environmental Conservation (NYSDEC), Division of Environmental Remediation (DER), and LRB Cleaners, Inc., the Respondent.

BEI proposed and conducted a series of tasks which included; soil gas sampling, indoor air quality testing, soil sampling, groundwater sampling and surface/sediment sampling of the adjacent creek. Multiple source areas were discovered as a result of this investigation, which prompted considerations for further investigation and remedial action.

Sampling results collected during 2005 indicated the presence of PCE above NYSDEC water quality

SGVs in one of the surface water samples collected from the creek adjacent to the dry-cleaner. Groundwater samples were also collected during this phase of investigation in close proximity to the creek (east of creek) which exhibited elevated concentrations of PCE from 5 to 27' bgs. Most of the soil and groundwater sampling conducted during this time focused on the rear of the building near the exhaust fan and the old dumpster area. At this point in time only limited investigation data for the northern portion of the property was obtained but, future investigation activities were proposed to be performed that would solely focus on this area. Tabulated results and sampling locations of this investigation are depicted on Figure-7.

In September of 2006 supplemental investigation activities performed by BEI continued with additional surface water/sediment sampling of the creek and off-site groundwater sampling. Off-site groundwater samples were collected down gradient from the site on either side of the creek as well as down creek surface water and sediment samples. PCE was detected in most of the samples collected, which confirmed the need for supplemental off-site investigation. Please refer to Figure-8 for additional groundwater sampling results and Figure-9 for surface water/sediment sampling results.

In February of 2008 three main locations were delineated with regard to PCE contamination: the north side of the building, the dumpster area and the rear of the building, exterior to the door and exhaust vents. Supplemental RI activities performed in February 2008 included the installation of thirty (30) soil borings at which fifty (50) soil samples were collected. This supplemental work was performed to allow for a complete delineation of the vertical and lateral extent of PCE contamination in the largest source area at the subject property. Please refer to Figure-10 for the location of soil samples and the highest concentrations detected in 2008.

In August of 2009 an Interim Remedial Measure (IRM) was executed in accordance with the August 2008 approved IRMWP. Remedial activities included the removal of source material via excavation of contaminated soil to the surface of the water table (Figure-6). Post excavation activities included the application of RegenOx to the open excavation in order to enhance the natural degradation of impacted soil and groundwater. Clean soil was backfilled into the excavation pit upon the

completion of the ISCO application.

Supplemental investigation included multiple mobilizations conducted during December 2012, January 2013 and November 2014. Each of these mobilization events focused on delineating groundwater contamination at multiple off-site locations including: sediment and surface water sampling within the Lexington Creek and Mt. Kisco River. The results from these investigations has determined that the plume has been delineated horizontally and vertically at the western side of the Lexington Creek and down gradient beyond Radio Circle Drive. The east of Lexington Avenue has been delineated at all but one location where PCE was detected above standards at GW-41 as shown on -2a and 2b. All other sampling points analyzed on the east side of Lexington Avenue have been documented below applicable PCE standards for groundwater.

2.0 PROPOSED SUPPLEMENTAL INVESTIGATION

Based upon the previous data developed from the June 2006 Investigation Work Plan and the Supplemental Investigation work conducted – which guided the development of the CSM – the following supplemental investigatory data needs are discussed below:

2.1 Off-site Groundwater Sampling

The supplemental sampling performed during November of 2014 was intended to fully delineate the nature and extent of contamination emanating from the site. To date, delineation has been accomplished down gradient to the north, the west and southeast throughout the study area. Data from this investigation indicates that additional sampling is needed in order to delineate the northeastern edge of the plume.

Based upon the updated CSM the following work is proposed in order to fully delineate the northeastern edge of the plume in order to meet groundwater quality standards: one (1) multi-level temporary groundwater sampling point located on the eastern edge of the plume. The location of this sampling point is depicted on Figure-3. This sample is proposed to be collected using a temporary

well point (2' mil-slot) and will be installed via the direct push method with the use of a 6610 track mounted portable geo-probe. Sampling intervals of 10-12' ft bgs, 15-17' ft bgs and 20-22' ft bgs (or until refusal is encountered due to bedrock) are proposed along the eastern side of Lexington Avenue. If contamination is documented above the NYS standards for chemicals of concern at any interval, a permanent monitoring well will be installed at this location. Samples will be submitted under strict chain of custody to an ELAP certified laboratory for analysis by TCL and TAL VOCs, EPA Method 8260C with TICs. Data will be provided as a NYSDEC ASP B deliverable package that will be used for third party data validation. Additional information regarding the groundwater sampling procedure is provided in section 3.2 of this work plan.

2.2 Soil Vapor Intrusion Study

An SVI study is being proposed in order to determine potential impacts to nearby receptors within the footprint of the plume and outward beyond the definition of the plume. The SVI study will be focused on determining the levels of parent and daughter/breakdown products of chlorinated contaminants. Based upon the CSM, in order to evaluate the potential for soil vapor intrusion at surrounding residences within the study area, the SVI study will propose indoor air sampling and sub-slab sampling at surrounding properties. Outdoor ambient air sampling and soil gas sampling is also proposed in order to determine the source contamination in the outdoor air. Previous studies of this area, initiated during September of 2006, included indoor air quality testing (IAQ) at multiple properties surrounding the site. This study was expanded during 2007 to include additional properties based upon the 2006 results. Subsequent sampling was conducted at additional residences from 2008-2015 and the field was narrowed to only two (2) properties (453 and 455) during 2015. Based upon the NYSDOH September 2013 PCE fact sheet, which lists the revised guidance value for PCE of *30.00 ug/m3*, a complete re-evaluation of the properties within the study area is being proposed based upon the revised CSM.

2.2.1 Outdoor Ambient Air Sampling

A total of four (4) outdoor ambient air locations were collected throughout the study area in

order to determine the source of PCE contamination found in an outdoor air sample, collected during January of 2015. PCE was discovered at 50.00 ug/m3 down gradient from the site between the 453 and 455 Lexington Avenue properties and has been re-sampled in order to substantiate this detection. All sampling protocol followed the NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York, October 2006. Samples were collected using six (6) liter, cleaned and certified summa canisters, set to a height between 3'-5' above grade in order to represent the typical breathing zone. Summa cans were affixed with a dedicated regulator set with a flow rate of less than 0.2 liters per minute, for a duration of 24 hours. Samples were transported under strict chain of custody to a New York State ELAP certified laboratory for testing by EPA method TO-15 with NYS ASP-B deliverable packages. All lab data will be certified by a third party data validator.

2.2.2 Soil Gas Sampling

Soil gas samples are proposed to be collected in conjunction with outdoor ambient air samples in order to determine preferential vapor migration pathways. During the January 2015 sampling event at 453 and 455 Lexington Avenue, an outdoor air sample was collected between the two properties, which detected a PCE concentration of 50.00 ug/m3. The proposed soil gas samples will provide information regarding the source of the contamination in the outdoor air sample, whether it be a result of sub-surface soil vapor or ambient background readings.

Soil gas samples will be collected in accordance with the October 2006, New York State Department of Health (NYSDOH) " Guidance for Evaluating Soil Vapor Intrusion in the State of New York" protocols. A track mounted Geoprobe equipped with a Post-Run Tubing System (PRT adapter) will be used to collect soil gas samples from approximately 4' bgs (depending on groundwater depth). Once the desired depth is reached, new polyethylene tubing fitted with a PRT adaptor will be inserted through the rods to the depth of the point holder and attached. After the PRT is set into the sub-surface at the selected interval the penetration surrounding the borehole will be sealed at grade using a hydraulic cement seal.

The area around the soil gas sample collection will be encompassed by a plastic container for the introduction of the helium tracer gas. The container will be sealed with a bentonite clay to the ground surface, and at two additional locations where the rod exits the top of the container and where the tubing exits the probe rod. Helium will be introduced via a barb fitting into the plastic container as a tracer gas in order to quantify that no circumvention of air is occurring. A helium detector will be used to ensure no more than 10% helium is interfering with the sample collection. Subsequent to the introduction of helium tracer gas, the annular space will be purged a minimum of one volume of soil gas using a personal sampling pump. During purging and sampling, the flow rate will not exceed 0.2 liters per minute. A pre-set two (2) hour regulator and dedicated six (6) liter summa canister will be used to procure the soil gas samples. The canisters will be labeled with all pertinent information for the laboratory, sealed and packaged for transport. After the sample collection is complete, the sampling location will be field screened with a PID meter to provide real time data. Upon completion of each sample collection, the summa canisters will be transported under strict chain-of-custody to an NYSDOH-ELAP certified laboratory for VOC analysis by EPA Method TO-15. NYS ASP-B deliverable packages will be requested in order to provide for third party data validation. The shallow borings associated with soil gas will be abandoned by clean sand and bentonite grout to grade. Please see Figure-3 for all proposed soil gas sampling locations.

2.2.3 Indoor Air Quality Investigation (IAQ)

Indoor air quality testing was conducted March 3 and 4 during the 2016 heating season at multiple properties surrounding the Rose Cleaners facility. The testing gas been performed in order to ensure concentrations in the indoor air at surrounding residences are not above the NYSDOH guideline of *30.00 ug/m3.* Indoor air samples were collected at surrounding properties during the 2016 heating season with the use of six (6) liter, cleaned and certified, summa canisters set to a height of 3'-5' above the floor. Stainless steal summa cans were affixed with a dedicated regulator set with a flow rate of less than 0.2 liters per minute for 24 hours. Samples were transported under strict chain of custody to a New York State ELAP

certified laboratory for testing by EPA method TO-15 with NYS ASP-B deliverable packages. All lab data will be certified by a third party data validator.

In order to gain entry to these private residences a generic access letter has been drafted and is included as Attachment-A. Properties selected for re-evaluation were determined by the NYSDEC and NYSDOH based upon the Figure-3 provided. Figure-3 depicts where we have bound contamination and where it still needs to be horizontally delineated with relation to the surrounding properties.

2.2.4 Sub-slab Sampling

During colder months, heating systems should be operating to maintain normal indoor air temperatures (i.e. 65°-75°F) for at least 24 hours prior to and during the scheduled sampling time. Prior to installation of the sub-slab vapor probe, the building floor was inspected and any penetrations (cracks floor drains, utility perforations, sumps, etc.) will be noted and recorded. Sub-slab probes were installed at locations where the potential for ambient air infiltration via floor penetrations is minimal. Sub-slab vapor probe installations were temporary. A vacuum was not used to remove boring debris from the sampling port. Sub-slab implants or probes were constructed in the same manner at all sampling locations to minimize possible discrepancies. The following procedures were included in the construction protocol for temporary probes:

Temporary probes were constructed with inert tubing (e.g. polyethylene tubing) of the appropriate size (typically 1/8 to 1/4 inch diameter) and of laboratory or food grade quality. Tubing did not extend further than 2 inches into the sub-slab material. Porous, inert backfill material was added to cover about 1 inch of the probe tip. Finally, temporary implants were sealed to the surface using a non-VOC containing and non-shrinking product.

After installation of the probes, one to three volumes (i.e., the volume of the sample probe and tube) was purged prior to collecting the samples to ensure samples collected are

representative. Flow rates for both purging and collecting did not exceed 0.2 liters per minute to minimize ambient air infiltration during sampling. Samples were collected using six (6) liter stainless steel summa canisters, certified clean by the laboratory. Samples were submitted for testing by EPA method TO-15 for volatile organic compounds with ASP category B deliverable packages for third party data validation (DUSR). All samples were collected concurrent with indoor and outdoor air samples.

When sub-slab vapor samples are collected, the following actions were taken to document conditions during sampling and ultimately to aid in the interpretation of the sampling results: historic and current storage and uses of volatile chemicals were identified, especially if sampling within a commercial or industrial building (e.g., use of volatile chemicals in commercial or industrial processes and/or during building maintenance); the use of heating or air conditioning systems during sampling were noted; floor plan sketches were drawn that include the floor layout with sampling locations, chemical storage areas, garages, doorways, stairways, location of basement sumps or subsurface drains and utility perforations through building foundations, HVAC system air supply and return registers, compass orientation (north), footings that create separate foundation sections, and any other pertinent information was completed; outdoor plot sketches were drawn that include the building site, area streets, outdoor air sampling locations (if applicable), compass orientation (north), and paved areas; weather conditions (e.g., precipitation and indoor and outdoor temperature) and ventilation conditions (e.g., heating system active and windows closed) were reported; and any pertinent observations, such as spills, floor stains, smoke tube results, odors and readings from field instrumentation (e.g., vapors via PID, ppb RAE, Jerome Mercury Vapor Analyzer, etc.), have been recorded. NYSDOH building questionnaires and inventory forms were filed in order to keep records of the building characteristics and sampling event.

2.3 Monitoring Well Installations

Groundwater contamination has been discovered throughout the study area and quantified at extremely high levels in select areas. The most significant levels of chlorinated contamination (PCE

and daughter breakdown products) where observed at the northern property boundary to approximately one hundred feet (100') down gradient from this boundary. PCE levels in this area were found as high as 350,000 ppb. In order to monitor and treat groundwater contamination at the northern property boundary, the installation of a single-level monitoring well network is being proposed. Two (2) monitoring wells will be installed using a track mounted 6610 geoprobe, utilizing the direct push method, which does not produce any drill cuttings. Since multiple monitoring wells are already installed in this area to monitor surface water, these monitoring wells will be screened at only one (1) interval. Well construction details include 10' of 0.02" slot screen set approximately 25 feet bgs (20' into groundwater) with solid, schedule 40, PVC riser pipe finishing the wells to grade surface. Clean sand (#2 morie fil-pro gravel) will encase the screened interval and a two foot (2') bentonite seal will be installed above the screened interval. Wells will be completed at grade surface with a 5" cast iron manhole cover, flush mounted, sealed and cemented in place. The locations of these proposed wells are depicted on Figure-3.

Ten (10) additional monitoring wells are proposed to be installed at off-site locations depicted on Figure-3. These wells will be installed down to the bedrock surface with multi-level screened intervals (shallow, intermediate and deep) from the groundwater surface (approximately 5') to 25' bgs (top of rock). The wells will contain multi-level screened intervals installed as single wells. Well construction details are as follows: three (3) five (5') screened intervals (2.5'-7.5',10-15' and 20-25') with riser pipe between each screened interval and finished to grade. Clean sand (#2 morie fil-pro gravel) will encase the screened intervals and a two foot (2') bentonite seal will be installed above the top screened interval. Wells will be completed at grade surface with a 5" cast iron manhole cover, flush mounted, sealed and cemented in place. Soil sampling will be collected at select well locations as discussed in the following section. Well development procedures are also discussed within section 3.2. All permanent monitoring wells will be developed a minimum of 24 hours post installation.

2.4 Bedrock Well Installation

On June 4th, 2015 a double cased bedrock well was installed at the northern property boundary in order to vertically delineate chlorinated contamination below the bedrock. The well specs included a six inch outer steel casing sealed to the surface of the rock at 25' bgs with 10' of 2" diameter 0.02" slot screen set to 40' bgs. See Figure-11 well log. The intention of the steel outer casing was to prevent the transport of DNAPL to deeper depths in order to provide for accurate data interpretation. Historic data for this area documented PCE and daughter breakdown products throughout the overburden formation, down to the surface of the bedrock at levels significantly above the NYS-DEC Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1, Ambient Water Quality Standards and Guidance Values. Additional data collected during previous investigations indicated that DNAPL pooling may be occurring off-site on top of an approximately 4' confining clay layer above the bedrock. This clay layer was documented in an April 2008 Remedial Investigation Report, which discussed a series of deep soil borings (DS-1-4) conducted along the north property line. Soil conditions (0'-19') throughout this area mainly consisted of sandy, silty loam with a densely packed tan clay layer observed from approximately 20-24' on top of the bedrock.

During the well installation, drill cuttings from 25-40' were dry and analysis of the cuttings indicated non-detect readings for all chlorinated constituents. Drill cuttings from the bedrock appeared to consist of a light tan sand, medium to fine grained and very tightly packed based upon the ability for it to cause refusal. Based upon observation of the pulverized drill cuttings, the bedrock lithology is described as a sedimentary sandstone, consisting mainly of quartz. No evidence of secondary permeability was observed from the drill cuttings.

Upon leaving the site for the day, the bedrock well was gauged with a depth to water meter, but the well was dry. On June 10, 2015 split sampling was performed with the NYSDEC and water level measurements were observed at approximately 3.50' which was consistent with the surrounding overburden wells. Samples collected from the well were analyzed for the full volatile list and PCE

was detected at 2,500 ppb. Information provided by the NYSDEC indicated a concentration of 7,500 ppb. This difference in the level of concentrations is most likely attributed to the dilution factor flagged in the lab data, although both levels are significantly above the regulatory standard for PCE (*5 ppb*).

In conclusion, the underlying geology in this area does not exhibit characteristics of secondary permeability within the bedrock aquifer based on the clean, dry soil cuttings observed at 40' bgs. The water sampled from the bedrock well in the days following the installation is likely perched water in the overburden that migrated through fractures in the bedrock surface manufactured by drilling. The nature of the bedrock has not definitively been identified but it appears to be an extremely tight layer of sandstone. The overall concern with the installation of this bedrock well is that a confining layer may have been punctured during installation, releasing DNAPL contamination into the upper portion of the bedrock. Based on these observations, vertical delineation of groundwater contamination has been conducted to the extent feasible and further installation of additional bedrock wells is highly unadvisable due to the risk of puncturing the confining layer, resulting in mechanical vertical dispersion of DNAPL. However, a series of soil samples discussed below will be conducted to confirm the presence of a confining unit.

2.4.1 Proposed Soil Sampling Locations

In an effort to determine the soil characteristics within the documented plume area, a series of transects are proposed in the study area to determine soil conditions and the presence of a confining layer of impermeable strata. A total of two transects each containing three (3) boring locations are proposed and depicted on Figure-3. Soil sampling locations were selected in areas where permanent monitoring well locations will be subsequently installed. Soil samples at each location will be collected continuously in 2.5' intervals until a confining clay layer is observed within the discrete soil liner. If no confining layer is observed then samples will be collected to approximately twenty (20') below grade or refusal. Sample intervals will be screened with a PID meter for the presence of volatile organic compounds

(VOCs) with the highest PID reading (below water table) selected for lab analyzation. Soil samples will also be collected above the water table to determine if contaminated groundwater has created a smear zone due to hydraulic fluctuation of the groundwater table between dry and wet periods. Soil samples will be transported under strict chain of custody to an ELAP certified laboratory and tested by EPA method 8260C with the full target compound list (TCL) and target analyte list (TAL). All data will be provided with NYS category B deliverables and submitted for third party validation by a certified validator. A total of 20% of the soil samples collected will be submitted for lab analysis. If the results of the soil investigation determine that no confining strata was encountered, additional bedrock wells will be proposed in order to determine the vertical extent of contamination. Bedrock wells would be installed using appropriate investigative techniques for minimizing the potential of downward migration (e.g.,double casing the well, allowing full cure time for the grout before drilling through it to go deeper (i.e, minimum of 24 hours), etc.) to avoid cross contamination. Continuous bedrock cores will also be collected and properly characterized as part of the well installations.

Interior soil samples are also proposed within the Rose Cleaners building near the northern wall adjacent to the former source material. These borings will be performed in order to determine if contamination is present under the building slab (slab on grade). As depicted on Figure-3, two (2) shallow soil borings are proposed within the cleaners. After boring through the floor, soil will be collected from the surface to ten feet (10') bgs using a manual slide hammer sampling device. Soil will be collected in two foot (2') discrete sampling liners until the desired depth is reached. Samples will be screened with a PID meter for which the sample interval exhibiting the highest PID reading will be submitted for the lab analysis mentioned above.

2.5 Surface Water Sampling

In effort to fully delineate surface water contamination down gradient from the site, one (1)

additional surface water sampling location is proposed at the confluence of the Kensico and Mt. Kisco Rivers. Samples will also be collected at historic locations SW-1-4 in order to get current surface water conditions. These samples will be collected using a disposable polyethylene bailer and polyethylene rope. The retrieved samples will be placed in laboratory-supplied analyte-free containers with HCL preservative. Samples will be tested by EPA method 8260 with TICs and submitted to a NYSDOH-ELAP certified laboratory with ASP-B deliverables used for third party data validation. The location of the surface water samples are depicted on Figure-5.

2.6 Project Schedule and Reporting

Mobilization of the necessary sampling equipment needed to perform all investigation activities will take place within 30 days of the approved Comprehensive Investigation Work Plan. The owner and tenant of the Rose Cleaners' property will be notified as well as the NYSDEC when an official work start date is confirmed. Off-site access agreements will also be taken into consideration when confirming the initial start date. IAQ testing, monitoring well installation, soil vapor sampling and groundwater sampling will all require access agreements due to the off-site locations. Once all access agreements have been granted, which could take up to two (2) weeks, the anticipated time frame for the completion of the investigation work will be 10-12 working days. Please see below for a detailed schedule including a timeline with target dates:

- Access of off-site locations (4 potential properties): 2 weeks; May 2-16, 2016
- Interior and off-site soil sampling (performed in conjunction with well installations)
- Installation of twelve (12) monitoring wells: 8 days; May 17-19, 24-26, 2016
- Off-site groundwater sampling: 1 day; May 31, 2016
- Soil Gas testing: 2 days; June 1 and 2, 2016
- Indoor Air Quality (IAQ) testing: 2 days; Completed March 3 and 4, 2016

Following the completion of the investigation work, the following analytical tasks have estimated time frames of:

- 4-6 weeks for Lab Data Category -B results
- 4-6 weeks for third party data validation

A Comprehensive Investigation Report (CIR) with a Feasibility Study (FS) will be issued to the Department within 45 days from the receipt of the validated lab data. The CIR will document the findings from the CIWP and included within, a FS with recommendations for potential clean-up technologies associated with the off-site contamination.

3.0 QUALITY ASSURANCE / QUALITY CONTROL PROCEDURES

Quality Assurance/Quality Control (QA/QC) procedures were developed to ensure that suitable and verifiable data results from sampling and analyses are maintained during the field collection. The prior approved Investigation Work Plan provided detailed quality assurance procedures to be followed for sampling and laboratory analysis activities. These procedures were implemented during the initial RI Investigation and have been updated to reflect the current project personnel, materials and equipment. An updated description of the quality assurance procedures followed is provided below.

3.1 Sampling Personnel

The activities associated with the field sampling and analysis program will be performed under the supervision of a Quality Assurance Officer, in accordance with the NYSDEC, DER "Technical Guidance for Site Investigation and Remediation", effective June 18, 2010. All field personnel possess a minimum of two or more years experience in environmental/geological field work. Additionally, all field personnel have received mandatory forty-hour Occupational Safety and Health Administration (OSHA) training on working with potentially hazardous materials and appropriate Hazard Communication Program and Right-To-Know' training. Field personnel will wear personal protective equipment (PPE) 100% of the time they are in the work zone. Field personnel will also be directed to follow the site specific Health and Safety Plan (HASP).

3.2 Groundwater Sample Collection (Temporary and Permanent Wells)

Groundwater sampling will be conducted using a Geoprobe direct push sampling rig equipped with a mill-slotted well and/or a screen point-15 sampling tool. Once the desired depth is reached, new polyethylene tubing fitted with a Tubing Check Valve System (TCVS) and/or a peristaltic pump is inserted down into the rod to the depth of the slotted or screened point. For temporary well and permanent monitoring well sampling, EPA low flow procedures will be executed. Low flow procedures help to isolate the screened interval water from the overlying stagnant casing water allowing for most of the sample water to be drawn directly from the adjacent formation. Typical flow rates consist of collecting groundwater at a flow rate of 0.5-1.0 Liters per minute. Since tetrachloroethene is a dense non-aqueous fluid, groundwater grab samples will be collected from the bottom of the mill slotted/well screen. A new poly tube through the probe rods (very slowly) to the bottom of the slotted screen in order to purge and sample groundwater using a peristaltic pump with the flow rate mentioned above. The groundwater is then extracted through the polyethylene tubing by a peristaltic pump until 3 to 5 times the approximate volume in the probe rod has been purged. The retrieved samples will be placed in a laboratory supplied analyte free 40 (ml vials. The samples will be stored in a cooler containing ice to maintain a temperature of 4º Celsius and delivered under strict chain-of-custody to a NYSDOH ELAP certified laboratory providing Category B deliverables. Purged development water will be contained in a DOT approved 55 gallon drum. Upon completion of the project a liquid sample from the drum(s) will be analyzed for disposal by an NYSDOH ELAP-certified laboratory.

To ensure quality control, one (1) field blank will be collected per 20 samples by rinsing the field equipment with organic-free water and submitting the rinse water in standard sample containers to a certified laboratory for analysis by TCL and TAL VOCs by EPA Method 8260C plus TICs. One trip blank sample will be submitted per sampling day and will be analyzed for the same parameters as the field blank sample. A Matrix Spike/Matrix Spike Duplicate (MS/MSD) will also be collected at a rate of one per 20 water samples.

3.3 Surface Water Sample Collection

Surface water within the stream channel has been observed to flow to the north. One (1) surface water sample will be collected at the confluence of the Kensico and Mt. Kisco Rivers, and at historic locations in order to gather current data. A disposable polyethylene bailer and polyethylene rope will be used to collect the samples. The retrieved samples will be placed in laboratory-supplied analyte-free containers. The samples will be stored in a cooler containing ice to maintain a temperature of 4º Celsius and delivered under strict chain-of-custody to a New York State Department of Health (NYSDOH) ELAP-certified laboratory providing Category B deliverables. Surface water samples will not be collected for at least 24 hours after a large rain event.

To ensure quality control, one (1) field blank will be collected per 20 samples by rinsing the field equipment with organic-free water and submitting the rinse water in standard sample containers to a certified laboratory for analysis by EPA Method 8260C plus TICs. A Matrix Spike/Matrix Spike Duplicate (MS/MSD) will also be collected at a rate of one per 20 soil samples. The MS/MSD serves as a duplicate soil sample for NYSDEC ASP-B deliverables.

3.4 Soil Gas Sample Collection

The soil gas sampling will be conducted using a Geoprobe direct push sampling rig equipped with a Post-Run Tubing system. Once the desired depth is reached, new polyethylene tubing fitted with a PRT adaptor will be inserted down into the rods to the depth of the point holder and attached. The surface of the adapter will be sealed using a quick dry cement. The soil gas will then be extracted through the polyethylene tubing under vacuum using a dedicated stainless steel summa canister. The retrieved samples will be submitted for laboratory analysis for EPA Method TO-15 for tetrachloroethene and several of its most common breakdown products. The soil gas samples will be stored in a dark cool container and delivered under strict chain-of-custody to a NYSDOH ELAP certified laboratory.

3.5 Soil Sampling

The soil sampling will be conducted using a GeoProbe® 6610 direct push sampling rig using a discrete sampling device. A new PVC liner will be installed into the sampling barrel between each sampling intervel. The equipment (drive point, barrel, subs and adaptors) will be decontaminated before each sample collection following NYSDEC Sampling Guidelines & Protocols. The cleaning procedure will include the use of a standard laboratory grade phosphate-free detergent (Alconox) followed by a municipal-supplied potable water rinse. The retrieved samples will be placed in a laboratory supplied certified containers. The samples will be stored in a cooler containing ice to maintain a temperature of 4º Celsius and delivered under strict chain-of-custody to a NYSDOH ELAP-certified laboratory providing Category ASP-B deliverables. All generated soil cuttings will be maintained in a DOT approved 55 gallon drum, if required. Upon completion of the project a soil sample from the drum(s) will be analyzed for disposal by an NYSDOH ELAP-certified laboratory.

To ensure quality control, one (1) field blank will be collected per twenty soil samples by rinsing the decontaminated field equipment with organic-free water and submitting the rinse water in standard sample containers to a certified laboratory for TCL and TAL testing with Volatile Organic Compound analysis by EPA Method 8260 plus TICs. One (1) Matrix Spike/Matrix Spike Duplicate (MS/MSD) sample will be collected per twenty (20) soil samples and submitted with the rest of the samples to a certified laboratory for the same analysis. One trip blank sample will be submitted per sampling day and will be analyzed for the same parameters as the field blank sample.

3.6 Sampling Equipment

Individual QA/QC measures will be implemented for each of the types of equipment, field screening instruments, sample containers, etc. used in the performance of the sampling program.

3.6.1 Geoprobe

Prior to arrival on the subject property and between sample locations, the probes will be decontaminated by washing them with a detergent (Alconox) and potable water solution and rinsing them with distilled water.

3.6.2 Glassware

All sample glassware is "level A" certified decontaminated containers supplied by a NYSDOH-Certified Commercial Laboratory. Samples analyzed for media potentially containing VOCs will be placed in Teflon-lined containers. All samples will be preserved by cooling them to a temperature of approximately 4° degrees Celsius.

3.7 Sample Documentation

To establish and maintain proper sample documentation control, the following sample identification and chain-of custody procedures will be followed:

3.7.1 Sample Identification

Sample identification will be executed by use of a sample tag, log book and chain-of-custody form. Said documentation provides the following information: 1) the project code; 2) the sample laboratory number; 3) the sample preservation; 4) the date the sample was secured from the source media; 5) the time the sample was secured from the source media; and 6) the person who secured the sample from the source media.

3.7.2 Chain-of Custody Procedures

Due to the evidential nature of samples, possession will be traceable from the time the samples are collected until they are received by the testing laboratory. A sample will be considered under custody if it: was in a person's possession; it was in a person's view, after being in possession; if it was in a person's possession and they locked it up; or, it was in a designated secure area. When transferring custody, the individuals relinquishing and receiving the samples will sign, date and note the time on the Chain-of-Custody Form.

3.7.3 Laboratory-Custody Procedures

A designated sample custodian will accept custody of the delivered samples and verify that the information on the sample tags match that on the Chain-of-Custody Records. Pertinent information as to delivery, pick-up, courier, etc., will be entered in the "remarks" section.

The custodian will enter the sample tag data into a bound logbook. The laboratory custodian uses the sample tag number, or assigns a unique laboratory number to each sample tag, and assures that all samples are transferred to the proper analyst or stored in the appropriate source area. The laboratory custodian distributes samples to the appropriate analysts. Laboratory personnel are responsible for the care and custody of samples, from the time they are received, until the sample was exhausted or returned to the sample custodian. All identifying data sheets and laboratory records will be retained as part of the permanent documentation. Samples received by the laboratory will be retained until after analysis and quality assurance checks are completed.

4.0 COMMUNITY AIR MONITORING PLAN

A Community Air Monitoring Plan (CAMP) provides for real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

4.1 Continuous Monitoring

Continuous monitoring will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching and the installation of soil borings or monitoring wells.

4.2 Periodic Monitoring

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing or temporary monitoring wells. "Periodic" monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well bailing/purging and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

4.3 VOC Monitoring, Response Levels and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued.

- If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

- If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over groundwater background but, less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or

- Residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

All 15-minute readings must be recorded and be available for State (DEC and DOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

4.4 Particulate Monitoring, Response Levels and Actions

Particulate concentrations should be monitored continuously at the downwind perimeter of the exclusion zone at temporary particulate monitoring stations. The upwind perimeter will be monitored periodically, in tandem with the downwind perimeter. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period required during sampling activities. Examples of such situations include of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed.

- Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.

- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m^3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

All readings must be recorded and be available for New York State (DEC and DOH) personnel to review.

5.0 HEALTH AND SAFETY PLAN (HASP)

The Site Specific Health and Safety Plan has been updated and is attached as Appendix-A.

FIGURES

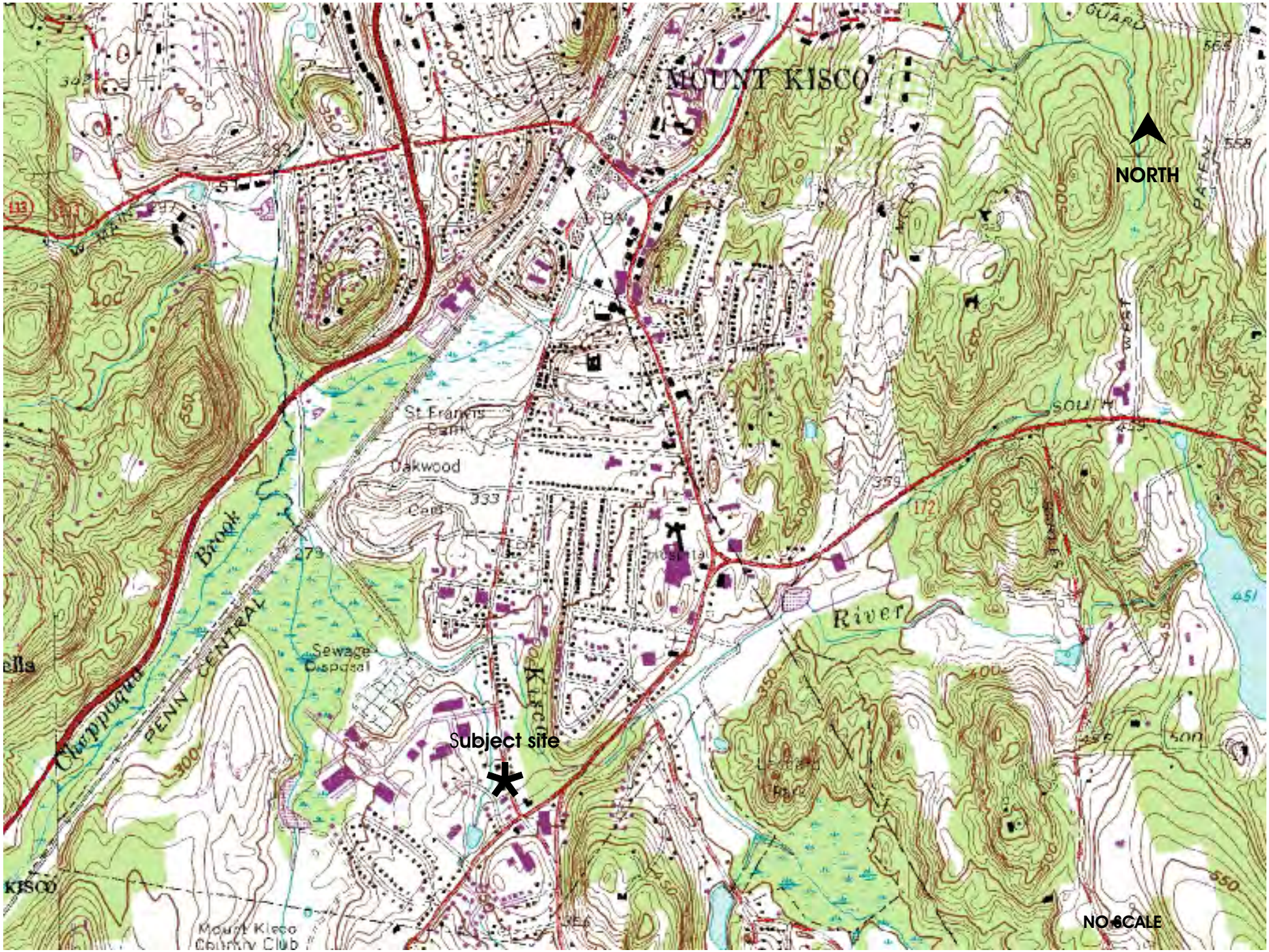


FIGURE 1 - SITE LOCATION AND TOPOGRAPHY

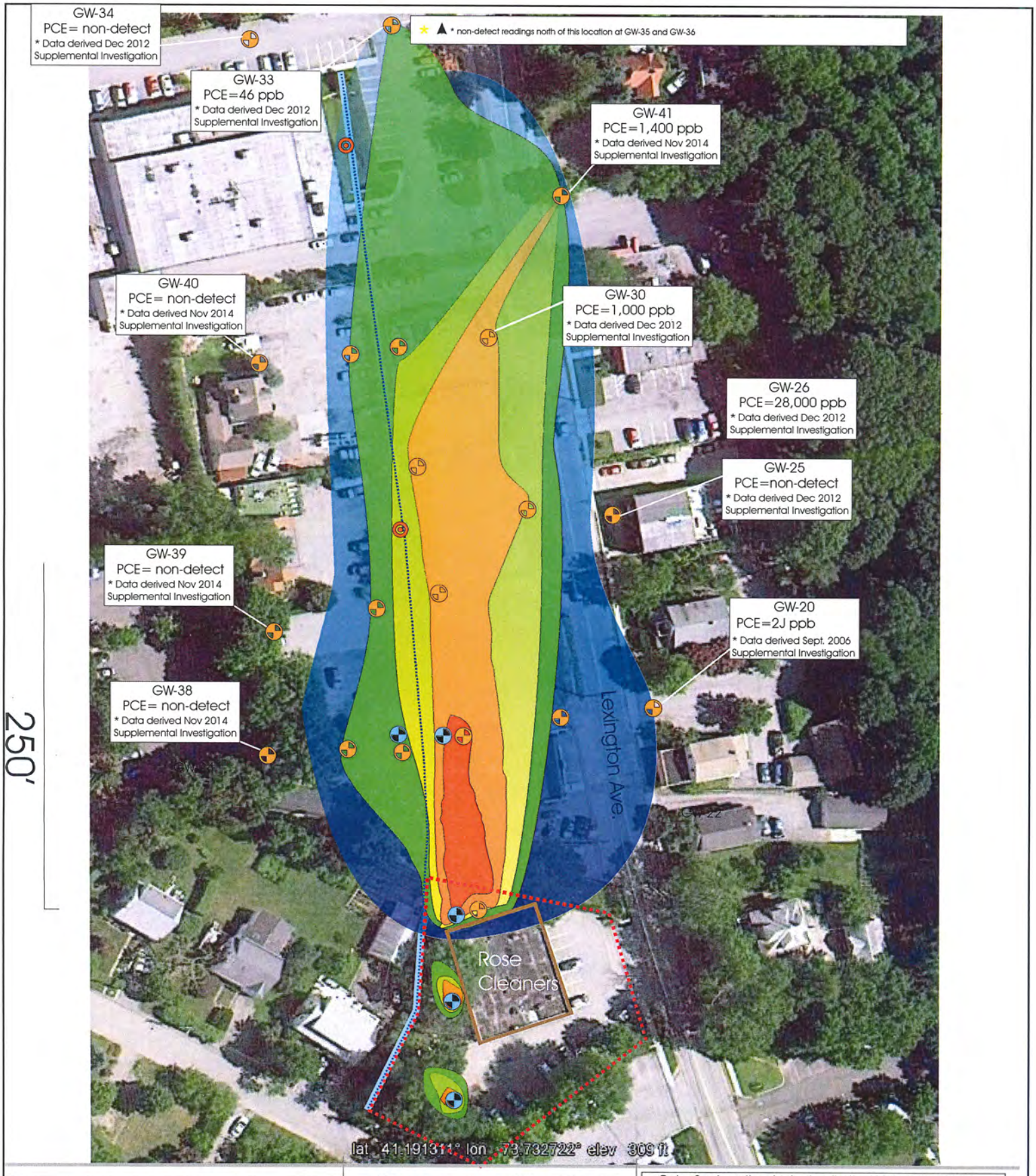


Figure-2a
John V. Soderberg
PO Box 263
Stony Brook NY, 11790

Conceptual Site Model
Groundwater 5-12'
PCE Parts per billion

Site: Rose Cleaners
Location: 500 Lexington Ave. Mt. Kisco, NY
Site #: 3-60-059
Index #: W3-0978-03-12

Color Scale estimated using limited historic GW data
>100,000ppb | > 1,000ppb | > 100ppb | ≤ 100ppb | ≤5 ppb

Prior GW Data | GW Sampling Locations

Sampling Depths: 10-12'; 15-17'; 20-22'

Creek | SW/Sed Sample

Property Boundary

Scale
1" = 95'

N W E S

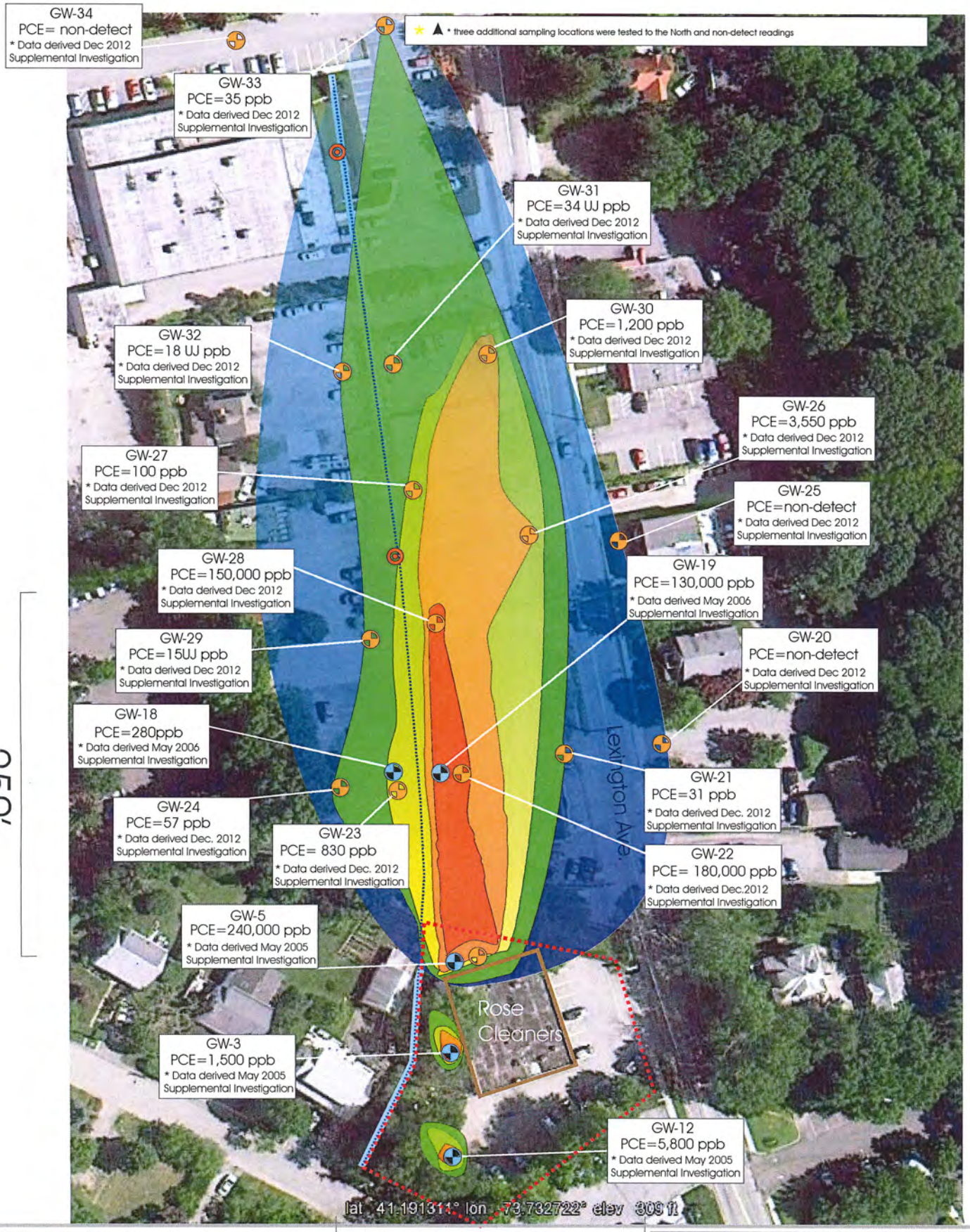


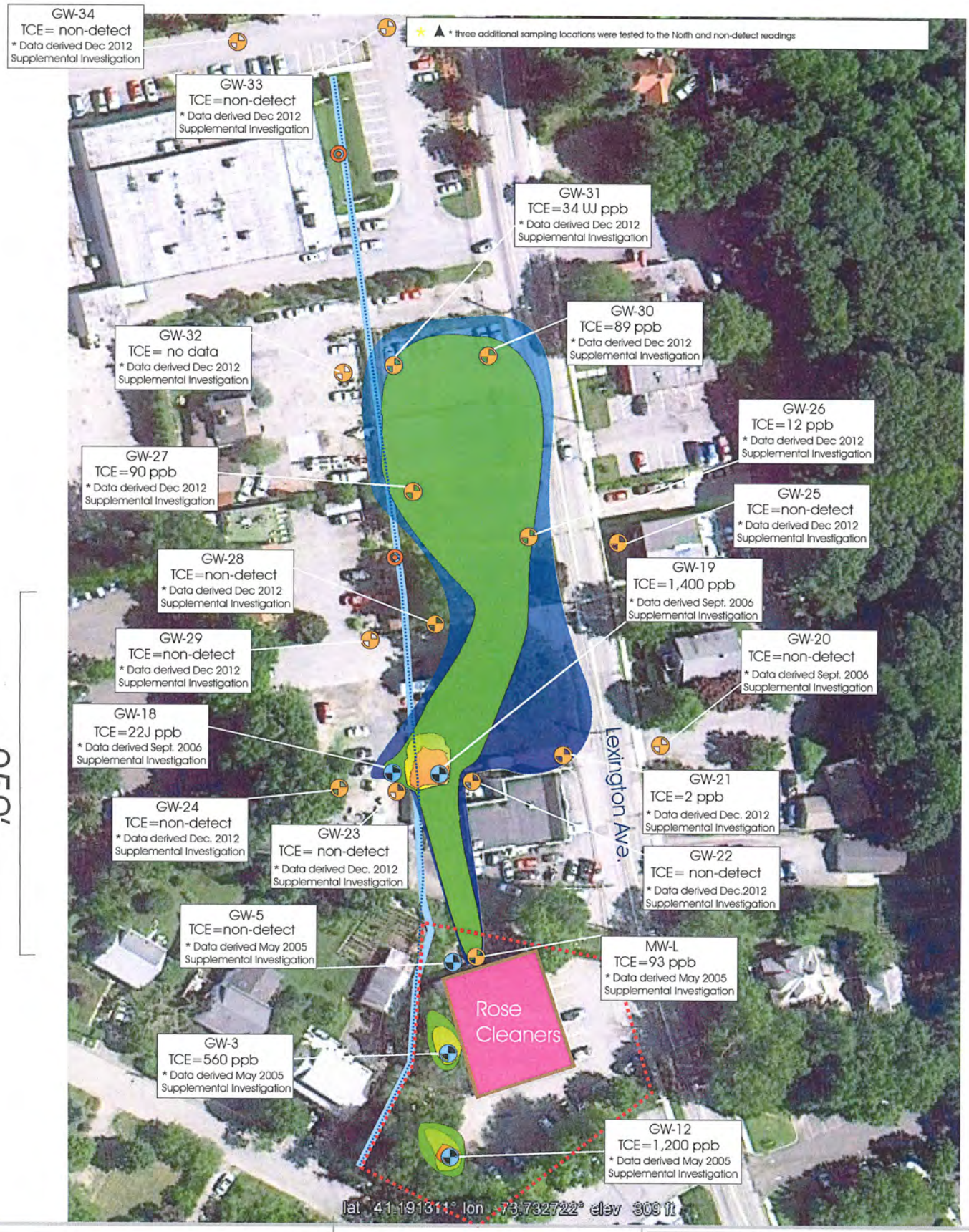
Figure-2b
John V. Soderberg
PO Box 263
Stony Brook NY, 11790

Conceptual Site Model
Groundwater 12-22'
PCE Parts per billion

Site: Rose Cleaners
Location: 500 Lexington Ave. Mt. Kisco, NY
Site #: 3-60-059
Index #: W3-0978-03-12

Color Scale estimated using limited historic GW data
>100,000ppb > 1,000ppb > 100ppb ≤ 100ppb ≤5 ppb

Prior GW Data
GW Sampling Locations Sampling Depths: 5-9'; 15-19'; 27-31'
Creek
SW/Sed Sample
Property Boundary
Scale 1"= 95'
N W E S



John V. Soderberg
PO Box 263
Stony Brook NY, 11790

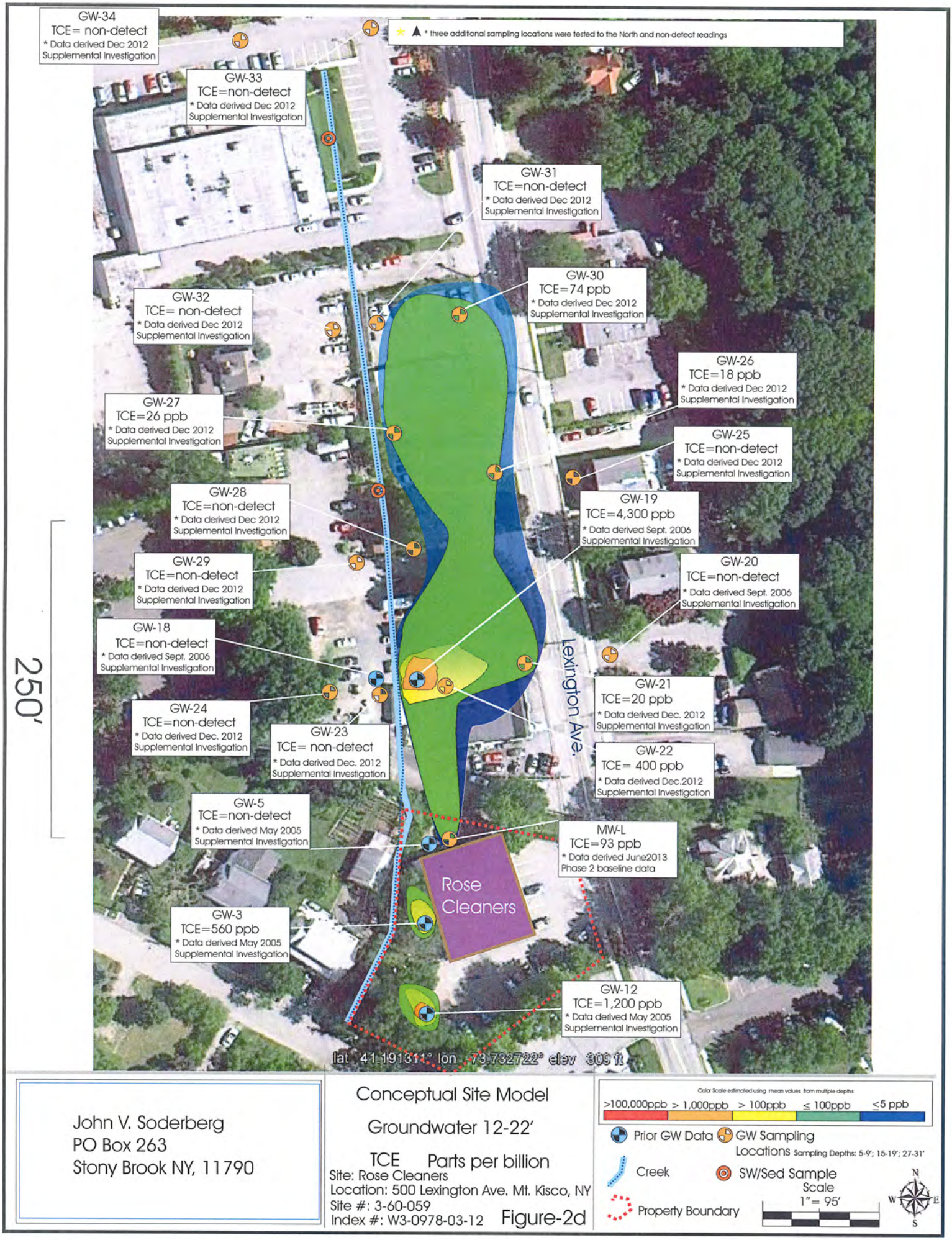
Conceptual Site Model
Groundwater 5-12'
TCE Parts per billion

Site: Rose Cleaners
Location: 500 Lexington Ave. Mt. Kisco, NY
Site #: 3-60-059
Index #: W3-0978-03-12

Figure-2c

Color Scale estimated using limited historic GW data
>100,000ppb > 1,000ppb > 100ppb ≤ 100ppb ≤5 ppb

Prior GW Data
GW Sampling Locations Sampling Depths: 5-9'; 15-19'; 27-31'
Creek
SW/Sed Sample
Property Boundary
Scale 1"= 95'
N W E S



John V. Soderberg
PO Box 263
Stony Brook NY, 11790

Conceptual Site Model

Groundwater 12-22'

TCE Parts per billion

Site: Rose Cleaners
Location: 500 Lexington Ave. Mt. Kisco, NY
Site #: 3-60-059
Index #: W3-0978-03-12

Figure-2d

Color Scale estimated using mean values from multiple depths

>100,000ppb | > 1,000ppb | > 100ppb | ≤ 100ppb | ≤5 ppb

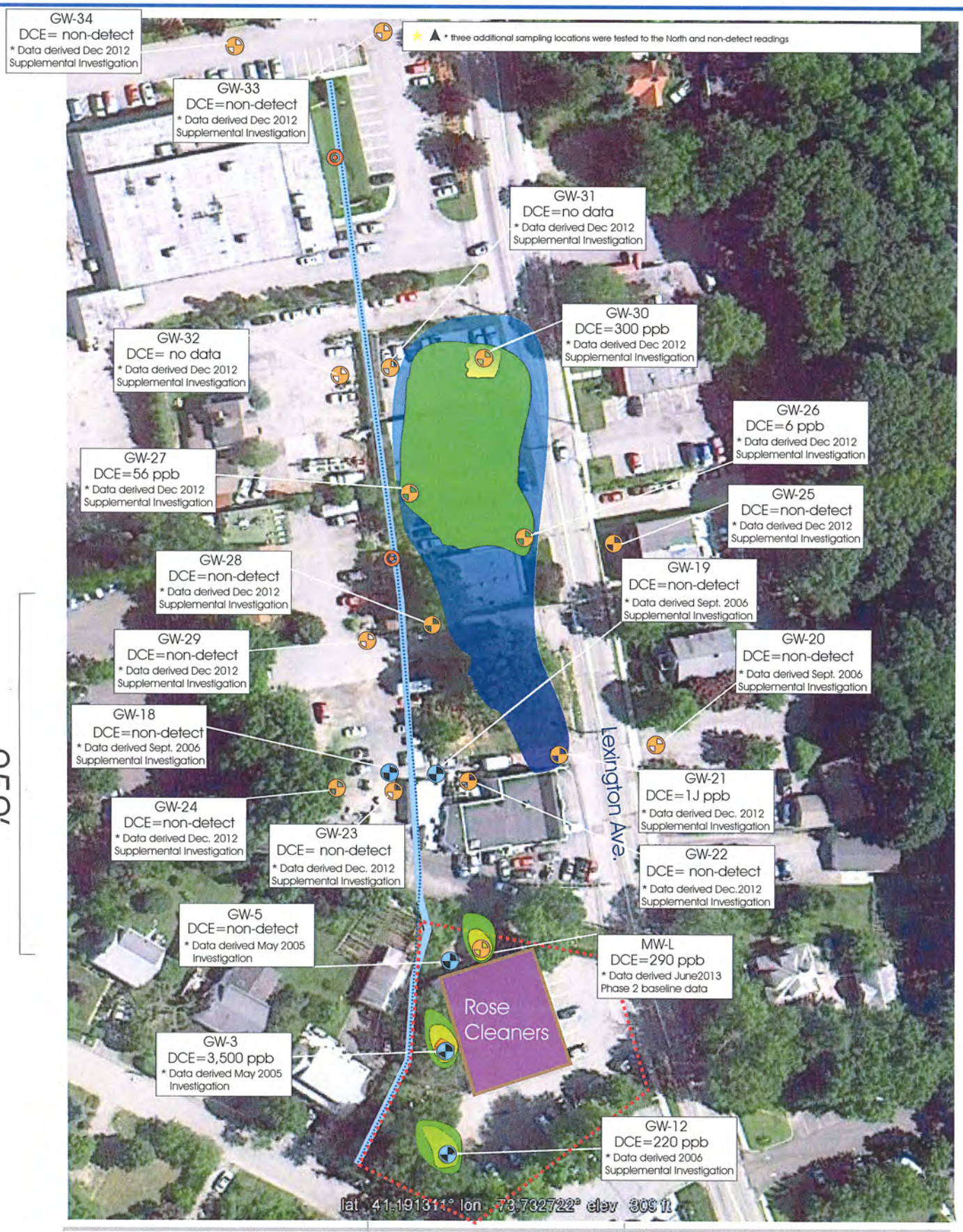
Prior GW Data | GW Sampling Locations Sampling Depths: 5-9'; 15-19'; 27-31'

Creek | SW/Sed Sample

Property Boundary

Scale 1" = 95'

N W E S



John V. Soderberg
PO Box 263
Stony Brook NY, 11790

Conceptual Site Model
Groundwater 5-12'
DCE Parts per billion

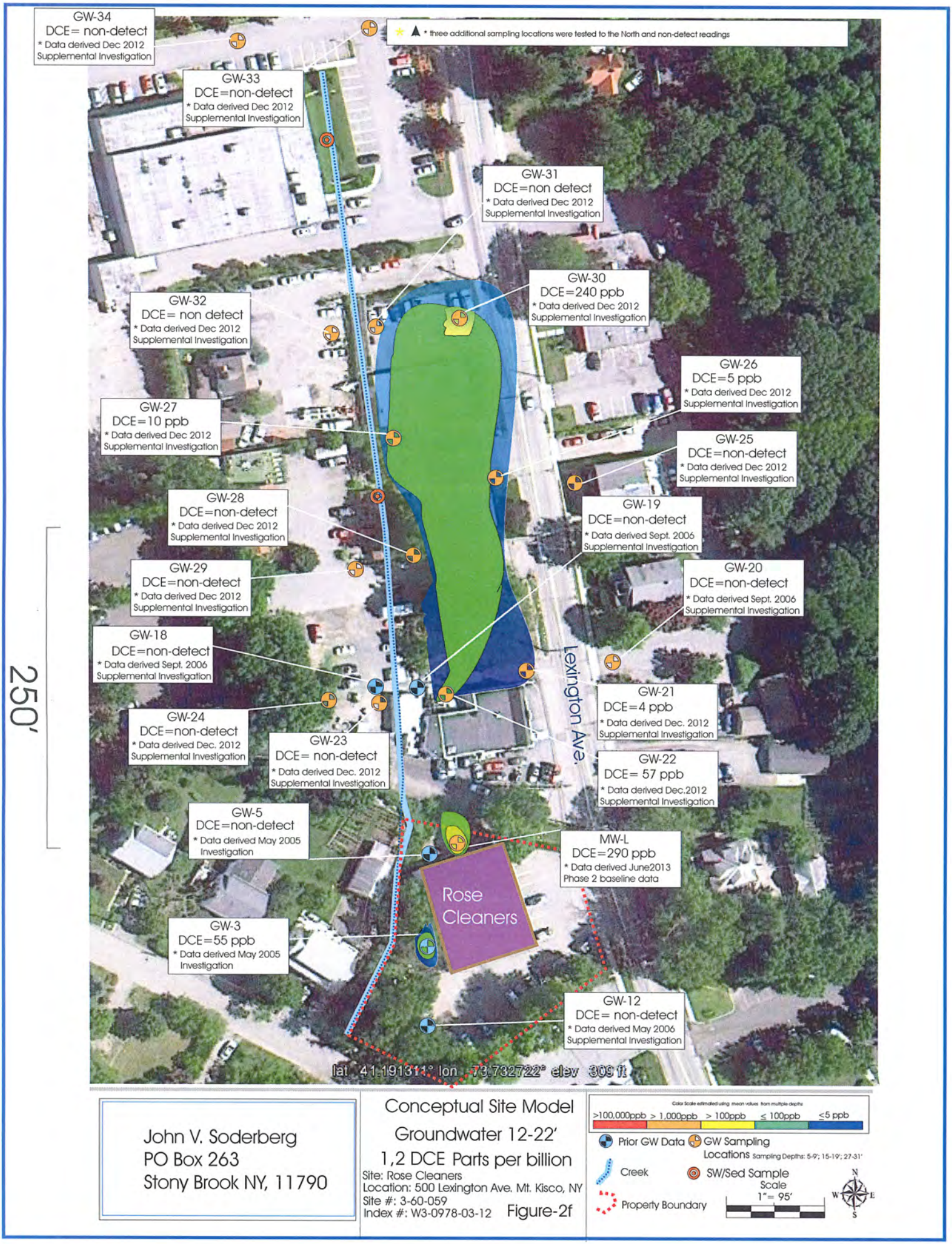
Site: Rose Cleaners
Location: 500 Lexington Ave. Mt. Kisco, NY
Site #: 3-60-059
Index #: W3-0978-03-12

Figure-2e

Color Scale estimated using mean values from multiple depths

>100,000ppb	> 1,000ppb	> 100ppb	≤ 100ppb	≤5 ppb

Prior GW Data
GW Sampling Locations Sampling Depths: 5-9'; 15-19'; 27-31'
Creek
SW/Sed Sample
Property Boundary
Scale 1"= 95'
N W E S



John V. Soderberg
PO Box 263
Stony Brook NY, 11790

Conceptual Site Model

Groundwater 12-22'

1,2 DCE Parts per billion

Site: Rose Cleaners
Location: 500 Lexington Ave. Mt. Kisco, NY
Site #: 3-60-059
Index #: W3-0978-03-12

Figure-2f

Color Scale estimated using mean values from multiple depths

>100,000ppb | > 1,000ppb | > 100ppb | ≤ 100ppb | ≤5 ppb

Prior GW Data | GW Sampling Locations Sampling Depths: 5-9'; 15-19'; 27-31'

Creek | SW/Sed Sample

Property Boundary

Scale 1"= 95'

N W E S

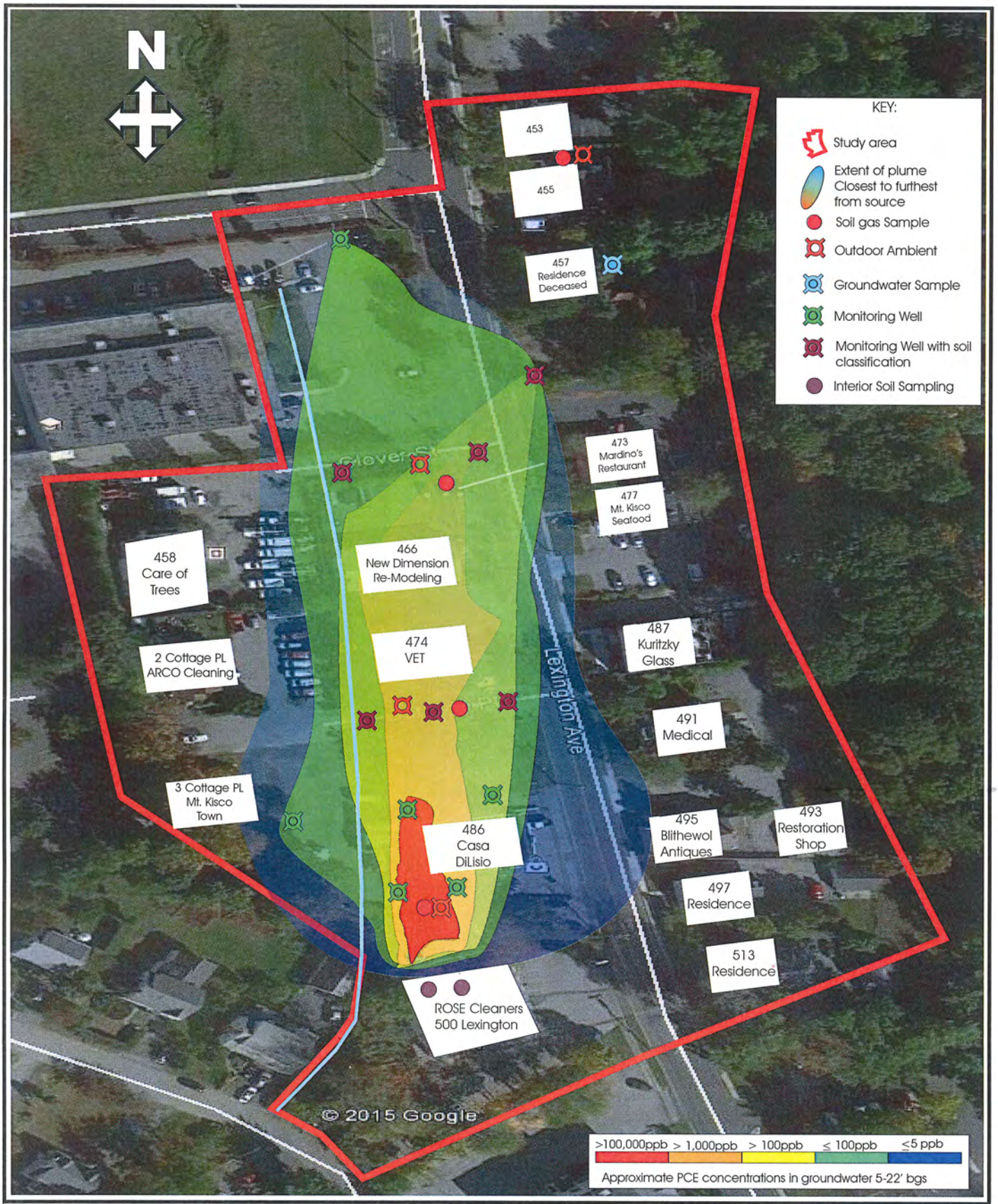


Figure-3
Study Area
with Proposed Sampling
Locations

367'

John V. Soderberg
PO Box 263
Stony Brook NY, 11790

Rose Cleaners
Comprehensive
Investigation

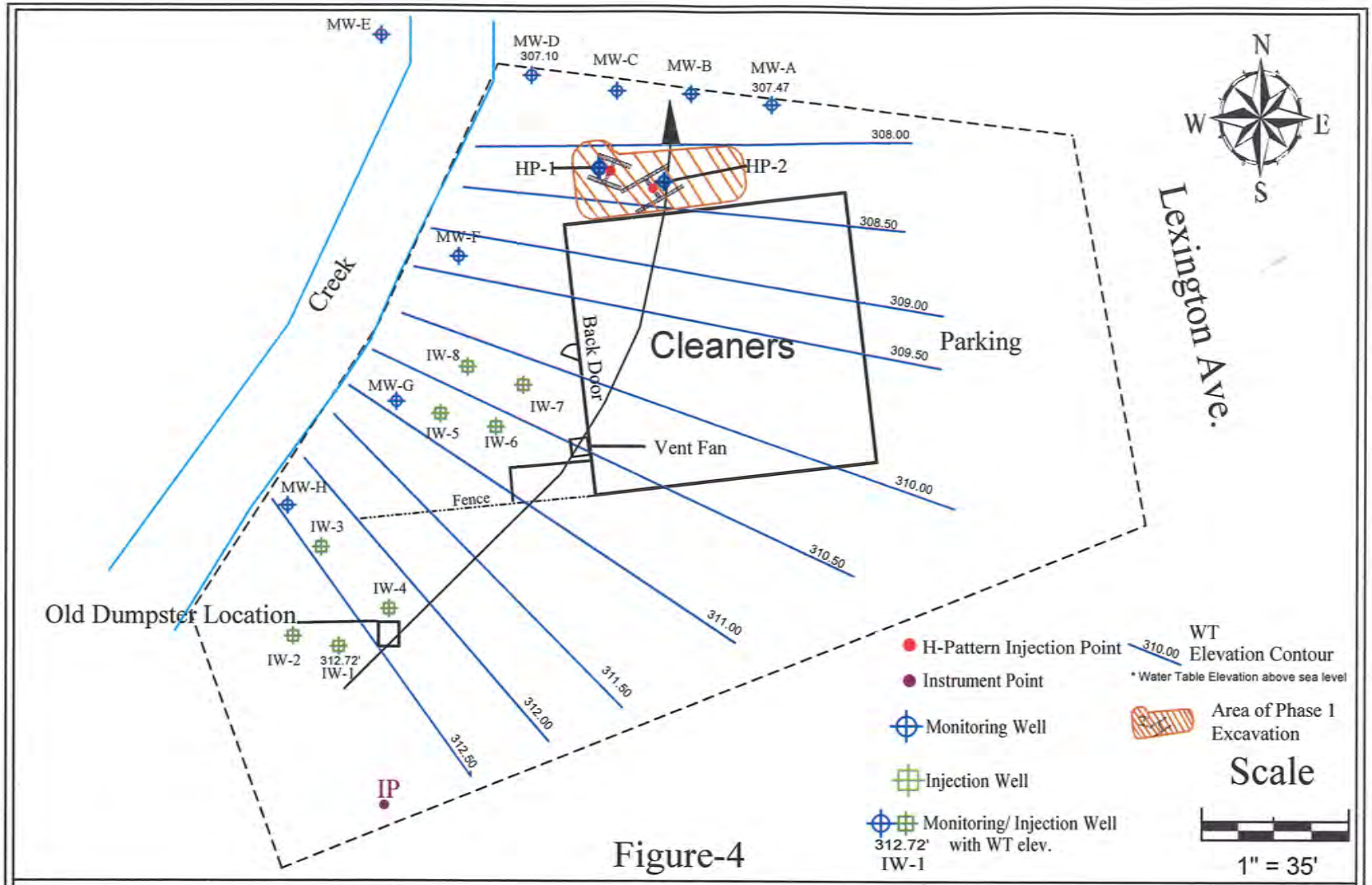
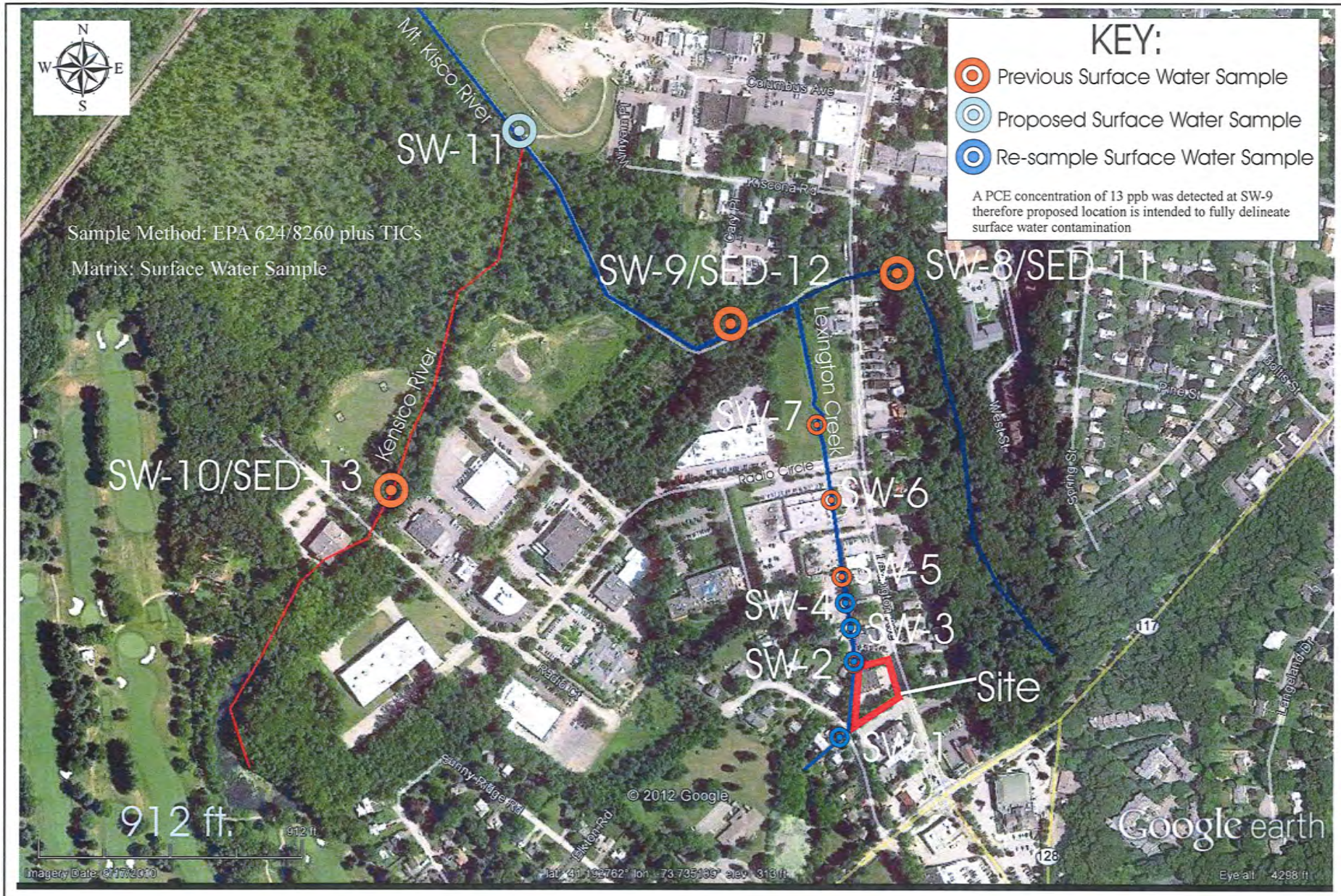


Figure-4

Groundwater Gradient Map	Rose Cleaners 500 Lexington Ave. Mt. Kisco, NY	John V. Soderberg PO Box 263 Stony Brook, NY



Additional Down Gradient
Surface Water Sample
Location

John V. Soderberg
PO Box 263
Stony Brook NY, 11790

Site: Rose Cleaners
Location: 500 Lexington Ave. Mt. Kisco, NY
Index #: W3-0978-03-12
Site #: 3-60-059
Figure-5

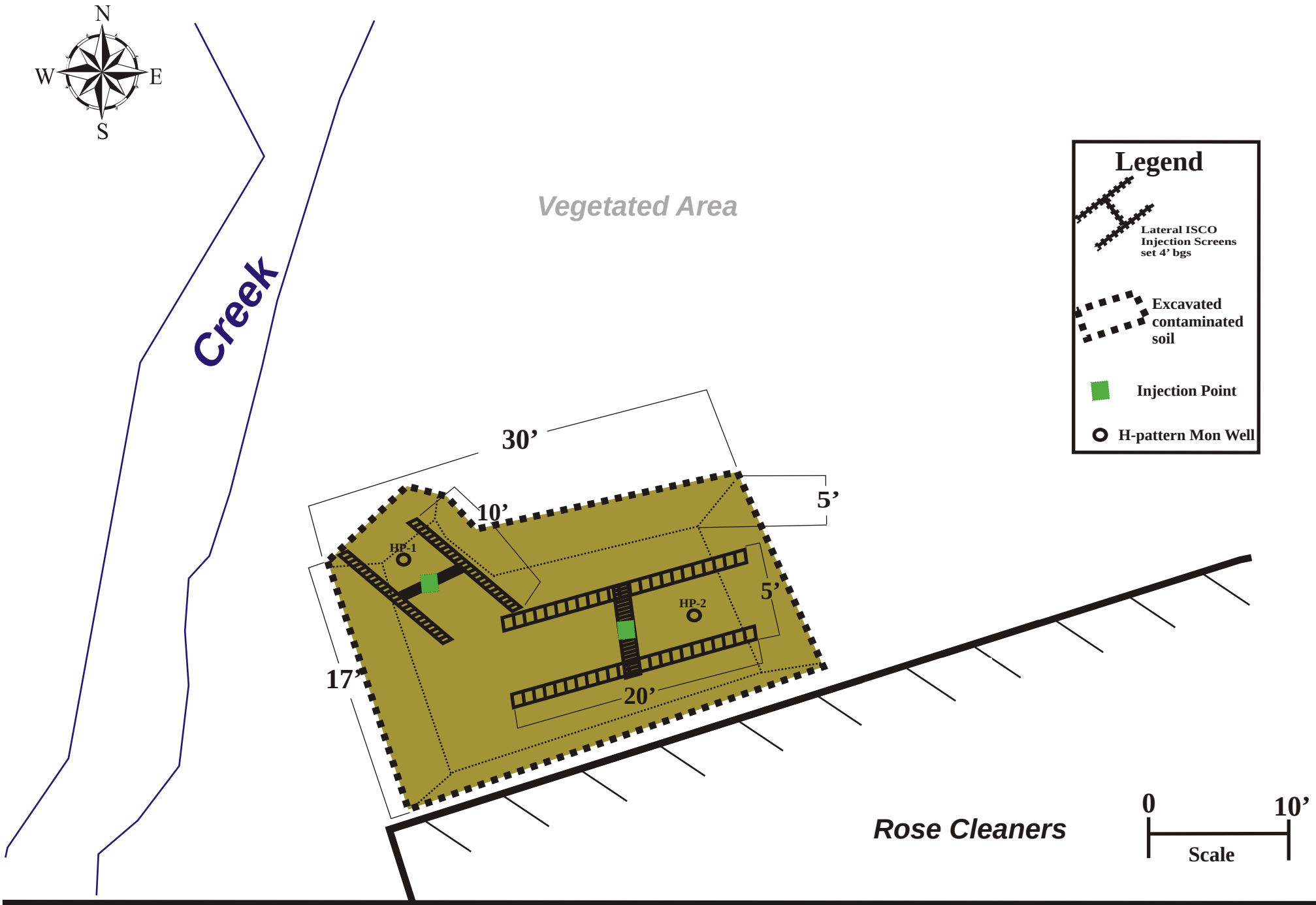
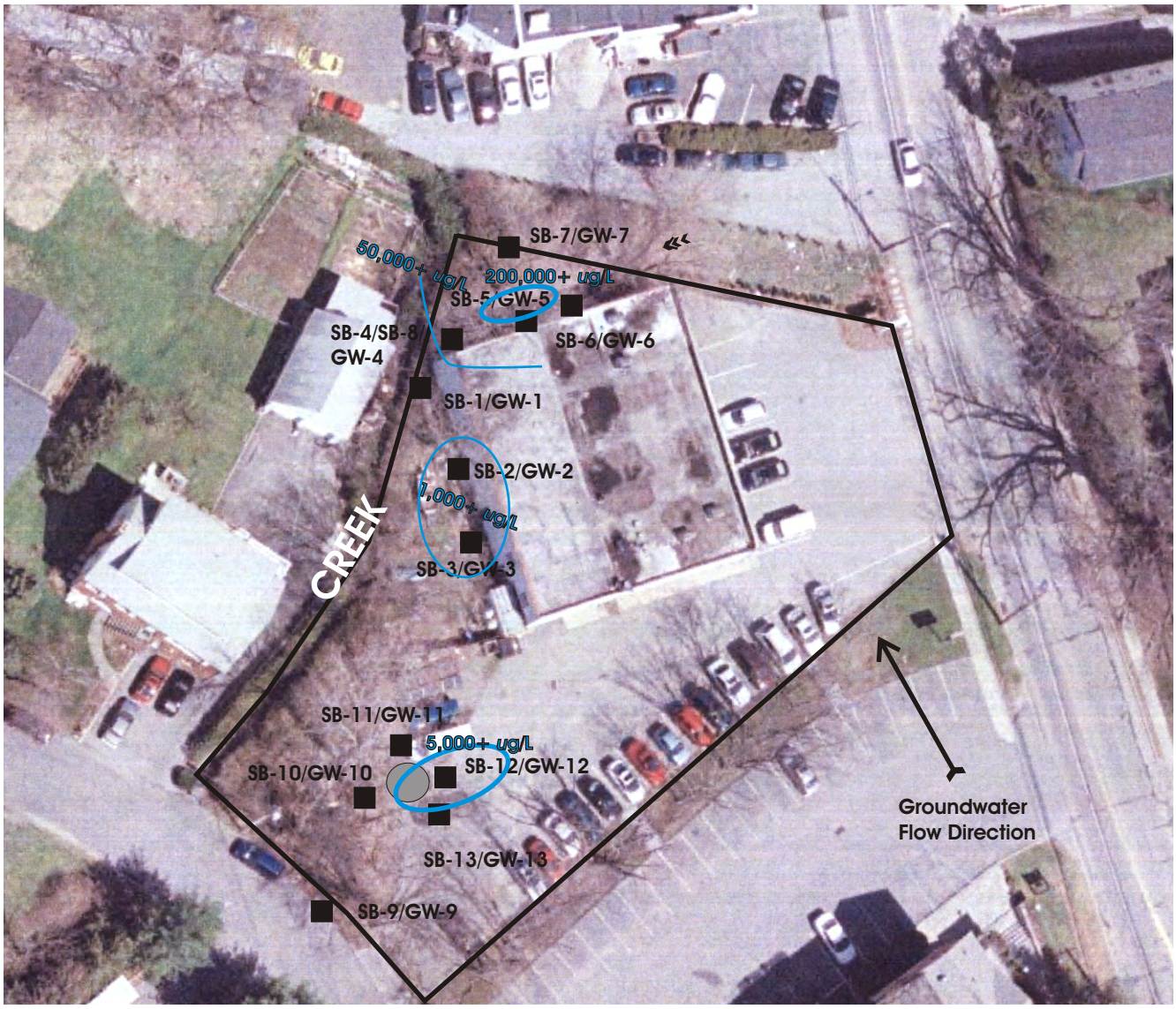


Figure-6 Locations of Lateral Injection Screens within IRM Excavation Area

Rose Cleaners
500 Lexington Avenue
Mount Kisco, New York

John V. Soderberg
PO Box 263
Stony Brook NY, 11790



Notes:

SB-9/GW-9 ■ Soil & Groundwater Sampling Locations

Historic Dumpster Location

Areas of Highest Groundwater Impacts

Groundwater Sample	Depth, bgs	PCE	TCE	1,2-DCE	VC	TVOCS
GW-1	4-6 ft	**14 J**	ND	**13,000**	**6,900**	19,936
	14-16 ft	**14,000**	ND	**110**	**42**	14,152
	24-26 ft	**2,300**	ND	**45**	**16 J**	2,361
GW-2	5-7 ft	**1,200**	**230**	**2,800**	**85**	4,315
	15-17 ft	**140**	**8**	**14**	ND	162
	25-27 ft	**220**	**8**	**32**	ND	268
GW-3	5-7 ft	**1,500**	**560**	**3,500**	**80 J**	5,640
	15-17 ft	**150**	**20**	**55**	ND	225
GW-4	5-7 ft	**55,000**	**10,000**	**11,000**	**400**	76,400
	15-17 ft	**57,000**	**590**	**480**	ND	58,070
	25-27 ft	**12,000**	**430**	**440**	ND	12,870
GW-5	5-7 ft	**240,000**	ND	ND	ND	240,000
	15-17 ft	**300,000**	**2,200**	**1,100 J**	ND	303,300
	25-27 ft	**300,000**	**1,800**	**660 J**	ND	302,460
GW-6	5-7 ft	**34,000**	**860**	**360**	**6 J**	35,226
	15-17 ft	**2,500**	**50 J**	**22 J**	ND	2,572
	25-27 ft	**1,400**	**48 J**	**34 J**	ND	1,482

Groundwater Sample	Depth, bgs	PCE	TCE	1,2-DCE	VC
GW-7	5-7 ft	**1,200**	**32 J**	**81 J**	ND
	15-17 ft	**150,000**	**480**	**360**	**26**
	25-27 ft	**140,000**	**420**	**160**	**8J**
GW-9	5-7 ft	2 J	ND	ND	ND
	15-17 ft	2 J	ND	ND	ND
GW-10	5-7 ft	**380**	**47 J**	**15**	ND
	15-17 ft	**120**	**17 J**	**7**	ND
GW-11	5-7 ft	**26**	4 J	2 J	ND
	15-17 ft	**17**	ND	3 J	ND
GW-12	5-7 ft	**5,800**	**1200 J**	**220**	ND
	15-17 ft	**5,400**	**910 J**	**120**	ND
GW-13	5-7 ft	**3,500**	**640 J**	**210**	ND
	15-17 ft	**1,900**	**560 J**	**330**	ND

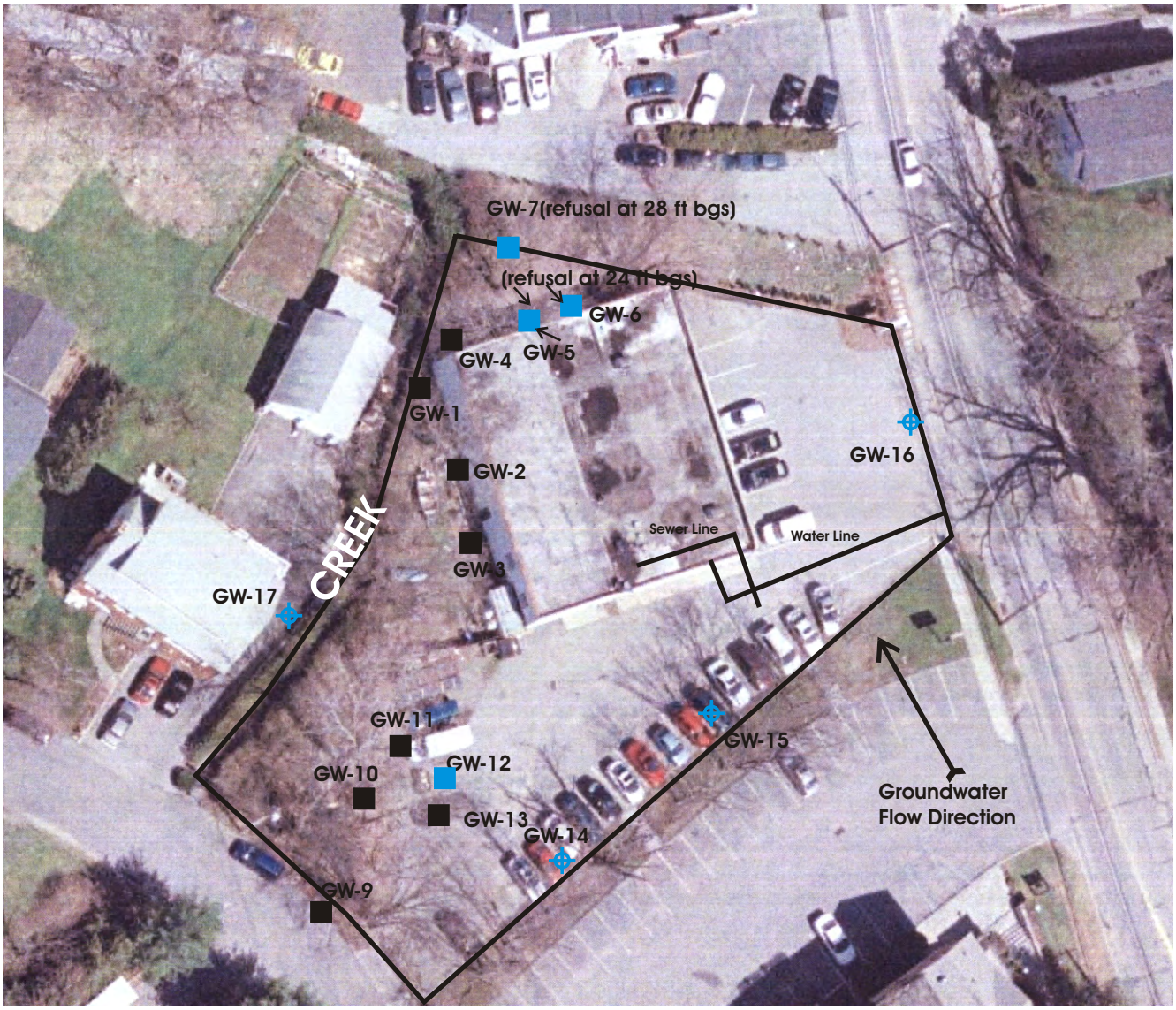
PCE - Tetrachloroethene; TCE - Trichloroethene; 1,2-DCE - Dichloroethene; VC- Vinyl Chloride;
TVOCs - Total Volatile Organic Compounds. Bold # = Exceedance of NYSDEC Potable Groundwater SGVs or Surface Water SGVs

Scale
0 — 41 Feet

Figure 7 -Groundwater Analytical Testing Results for 5-27 feet bgs (*ug*/L)

Rose Cleaners
500 Lexington Avenue
Mt. Kisco, New York

John V. Soderberg
PO Box 263
Stony Brook NY, 11790



Sample #	Depth, bgs	PCE	TCE	1,2-DCE	VC
GW-1	4-6 ft	14 J	ND	13,000	6,900
	14-16 ft	14,000	ND	110	42
	24-26 ft	2,300	ND	45	16 J
GW-2	5-7 ft	1,200	230	2,800	85
	15-17 ft	140	8	14	ND
	25-27 ft	220	8	32	ND
GW-3	5-7 ft	1,500	560	3,500	80 J
	15-17 ft	150	20	55	ND
GW-4	5-7ft	55,000	10,000	11,000	400
	15-17 ft	57,000	590	480	ND
	25-27 ft	12,000	430	440	ND
GW-5	5-7 ft	240,000	ND	ND	ND
	15-17 ft	300,000	2,200	1,100 J	ND
	25-27 ft	300,000	1,800	660 J	ND
GW-6	5-7 ft	34,000	860	360	6 J
	15-17 ft	2,500	50 J	22 J	ND
	25-27 ft	1,400	48 J	34 J	ND

Sample #	Depth, bgs	PCE	TCE	1,2-DCE	VC
GW-7	5-7 ft	1,200	32 J	81 J	ND
	15-17 ft	150,000	480	360	26
	25-27 ft	140,000	420	160	8 J
GW-9	5-7 ft	2 J	ND	ND	ND
	15-17 ft	2 J	ND	ND	ND
GW-10	5-7 ft	380	47 J	15	ND
	15-17 ft	120	17 J	7	ND
GW-11	5-7 ft	26	4 J	2 J	ND
	15-17 ft	17	ND	3 J	ND
GW-12	5-7 ft	5,800	1,200 J	220	ND
	15-17 ft	5,400	910 J	120	ND
	19.5-23.5 ft	5	ND	ND	ND
GW-13	5-7 ft	3,500	640 J	210	ND
	15-17 ft	1,900	560 J	330	ND
GW-14	5-9 ft	9,900	17	ND	ND
	15-19 ft	11,000	13	ND	ND

Sample #	Depth, bgs	PCE	TCE	1,2-DCE	VC
GW-15	5-9 ft	46	ND	ND	ND
	15-19 ft	560	ND	ND	ND
GW-16	5-9 ft	94	ND	ND	ND
	15-19 ft	32	ND	ND	ND
GW-17	6-8 ft	2,600	6	ND	ND
	16-18 ft	190	ND	ND	ND
GW-18	8-10 ft	280	22 J	ND	ND
	14-16 ft	68	ND	ND	ND
GW-19	5-7 ft	130,000	1,400	ND	ND
	15 - 17 ft	44,000	4,300 J	ND	ND

Prior Groundwater Sampling Locations

Prior Groundwater Sampling Location with Supplemental Sampling Depth Interval

Supplemental Groundwater Sampling Location

Scale

0 41 ft

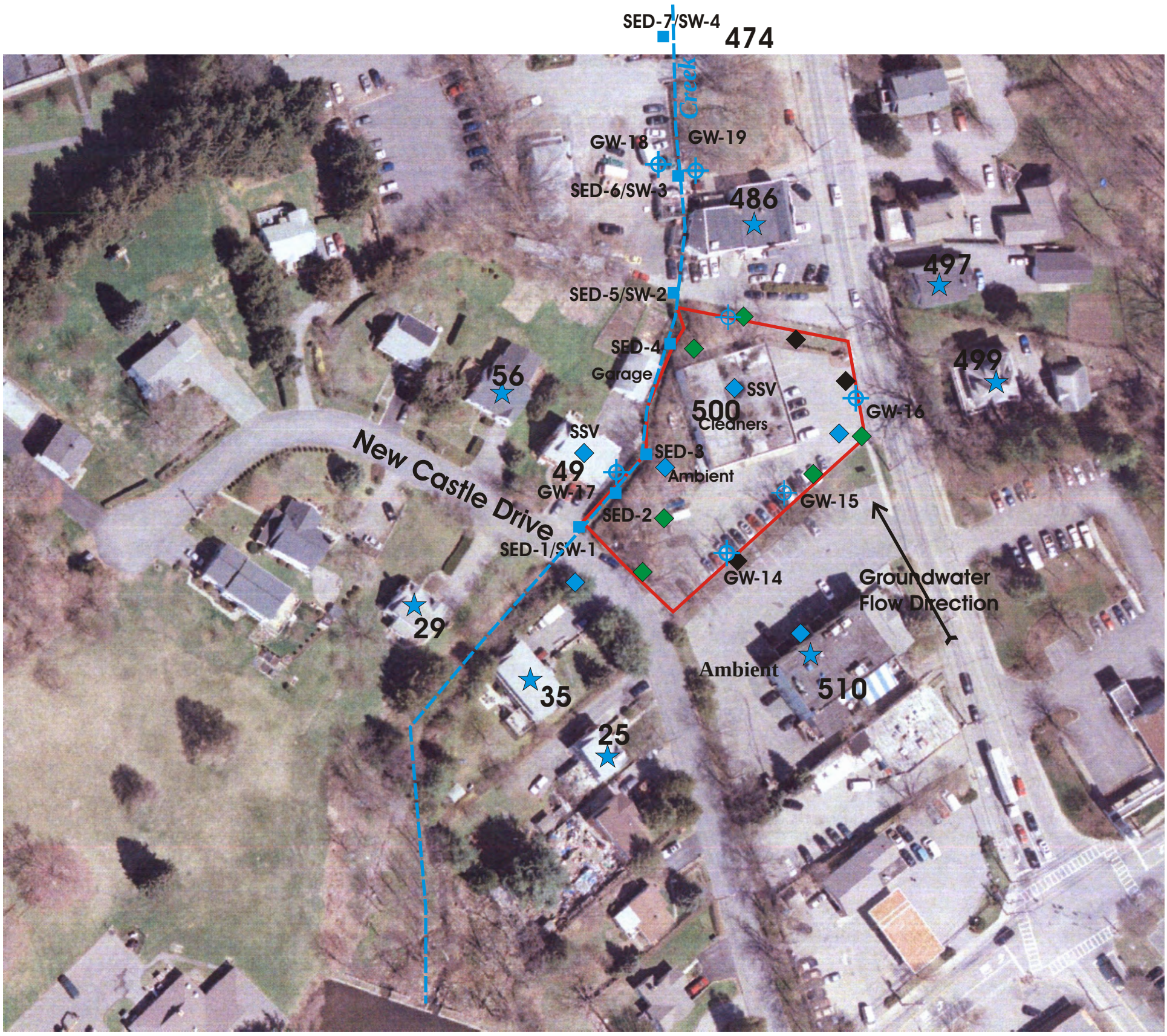
PCE - Tetrachloroethene; TCE - Trichloroethene; 1,2-DCE - Dichloroethene; VC- Vinyl Chloride;

TVOCs - Total Volatile Organic Compounds. Bold # = Exceedance of NYSDEC Potable Groundwater SGVs or Surface Water SGVs

Figure 8 - Supplemental Groundwater Sampling Locations - September 2006

Rose Cleaners
500 Lexington Avenue
Mt. Kisco, New York

John V. Soderberg P.E.
PO Box 263
Stony Brook NY, 11790



Creek Sediment Samples

Sample #	Depth, bgs	PCE	TCE	1,2-DCE	VC	TVOCs
SED-1	0-6"	ND	ND	ND	ND	664
SED-2	0-6"	ND	ND	ND	ND	ND
SED-3	0-6"	ND	ND	ND	ND	127
SED-4	0-6"	ND	5 J	81	ND	86
SED-5	0-6"	43	5J	4 J	ND	52
SED-6	0-6"	**5,100 J**	**4,600 J**	**24,000**	150	33,869
SED-7	0-6"	130 J	ND	15 J	ND	145

Surface Water Samples

Sample #	Depth, bgs	PCE	TCE	1,2-DCE	VC
SW-1	0-1 ft	ND	ND	ND	ND
SW-2	0.5 -1ft	**11**	2 J	4 J	ND
SW-3	0.5 -1ft	**230**	**22 J**	**41**	ND
SW-4	0.5 -1ft	220	23 J	53	ND
Culvert		ND	ND	ND	ND

◆ **Locations of PCE in Soil Gas > 100 *u*g/m^3**

★ **PCE Badge Sampling Locations**

◆ **Supplemental Soil Gas Sampling Locations**

■ **Supplemental Surface Water/Sediment Sampling Locations**

⌖ **Supplemental On- & Off-Site Groundwater Sampling Locations (see Figure 3 for detailed locations and intervals)**

510 **House Address #**

VOC concentrations in sediment samples are in micrograms per kilogram (g/kg)in surface water samples in micrograms per liter (g/L).
PCE- Tetrachloroethene; TCE - Trichloroethene; 1,2-DCE - 1,2 dichloroethene; VC- Vinyl Chloride; TVOCs - Total Volatile Organic Compounds
Bolded values are contaminants detected at concentrations exceeding applicable NYSDEC RSCOs and/or NYSDEC Class GA SGVs

No scale

Figure 9-Supplemental Surface Water/ Sediment & Sampling Locations - September 2006 with VOCs detected in Sediment/Surface Water Samples

Rose Cleaners
500 Lexington Avenue
Mt. Kisco, New York

John V. Soderberg P.E.
PO Box 263
Stony Brook NY, 11790

0' to 6' Contamination within Excavation Area and Deep Soil Borings DS-1-4

- 100<PCE<9,999
- 10,000<PCE<99,999
- 100,000<PCE<999,999

PCE > 1,000,000
PCE concentrations in ug / kg

Figure 10- Rose Cleaner' January / February 2008 Investigation

John V. Soderberg P.E.
PO Box 263
Stony Brook, NY 11790

Well Log

Figure-11

Project: Rose Cleaners
Client: Leonard Rose
Location: Mt. Kisco, NY
Well No: BW-1 **Use:** Monitoring/ Sampling
Drilling Method: Air rotary
Casing Type: Steel/PVC **Casing Dia:** 10", 6", 2" **Casing Length:** 20', 30'
Screen Type: PVC **Screen Dia:** 2" **Screen Length:** 10'
Screen Slot: .02" **Gravel Pack:** #2 Fil-pro
Casing Seal: Grout/Cement **Finish:** Cement flush

Date: June 4, 2015
Be Job No:
Driller: Salomone Bros.
Bore Hole Dia: 10"
Sample Method: N/A
Depth to Water: 4'-5'
Total Depth: 41'
Security: Flush Mounted Manhole

Depth Below Grade	Sample Information	Well Design	Identification/Remarks
0			cement sealed manhole
			DTW
10			
	(30') of 2" PVC riser		6" steel outer casing
20			
bedrock (25')			casing grout seal
30			bentonite seal
	Fil-pro gravel pack		
			(10') of 2" PVC .02" slot screen
40			
			(1') DNAPL Sump

Attachment-A

Generic SVI Access Letter

JOHN V. SODERBERG, P.E.

PO Box 263
Stony Brook, NY 11790
Phone 631 751-6458
Fax 631-675-1185
Cell 631 834-9537
Email jvsode@hotmail.com

Insert Date

Property Owner
Lexington Ave./Cottage Place
Mt. Kisco, New York

Re: **Rose Cleaners** **Environmental Sampling Program**
500 Lexington Avenue Indoor Air Quality Testing
Mt. Kisco, New York

Dear Property Owner,

I am writing on behalf of the Rose Dry Cleaner property for which I am their environmental consultant. The site has been investigated and some levels of contamination have been discovered in soil and groundwater at the site. As a responsible member of the community, the owners of the site have entered into a state-overseen program to investigate the contamination and all areas where contamination may have migrated into soils, groundwater and air. As your property is in close proximity to Rose Cleaners' property, the New York State Department of Environmental Conservation (NYSDEC) and New York State Department of Health (NYSDOH) require that we investigate the air quality in and around your home or business for the possible presence of gaseous contamination associated with Rose Cleaners. Please be advised that nobody in your office or home is in danger. These are just precautionary measures.

The investigation we would be performing would in no way interfere with the use and enjoyment of your home or business. We would like to simply perform a small diameter boring (1/2") at some location (to be determined) inside your home or business through the foundation floor to obtain a sub-slab vapor sample and also an air quality sample inside the living area of your home or business. These two tests will be performed simultaneously and after completion of the testing the boring hole will be sealed closed using a quick setting cement.

All samples will be sent to a New York State certified laboratory for testing of dry cleaner chemicals. We will notify you after test results are received and validated.

If you have any health-related questions, please contact Mr. Chris Doroski, Bureau of Environmental Exposure Investigation of the New York State Department of Health (NYSDOH) at 1-518-402-7860. If you have any questions relating to the environmental investigation of the Rose Cleaners' site, please contact Mrs. Jamie Verrigni P.E of the New York State Department of Environmental Conservation (NYSDEC) at 1-518-402-9662.

Please contact my environmental contractor, Berninger Environmental (BEI) at 631-589-6521to arrange a schedule for the proposed sampling. We are more than happy to discuss this testing with you and any questions you may have.

Sincerely,

John V. Soderberg P.E.

cc: Walter Berninger (BEI)
Justin Halpin (BEI)

Appendix A

Site-Specific Health and Safety Plan for Work Activities

at

ROSE CLEANERS
500 Lexington Avenue
Mount Kisco, New York 10549
Site No.: 3-60-059
Index No.: W3-0978-03-12

PREPARED FOR

NEW YORK STATE DEPARTMENT OF
ENVIRONMENTAL CONSERVATION
625 BROADWAY
ALBANY, NEW YORK

PREPARED BY

John V. Soderberg, P.E.
PO Box 263
Stony Brook, NY

March 2016

TABLE OF CONTENTS

FOREWORD

The Occupational Safety and Health Act (OSHA) implementing regulations of 29 CFR 1910.120 govern hazardous waste operations and emergency response. These regulations require that employers of employees involved in certain specific hazardous waste operations 1) develop and implement a written health and safety PROGRAM for employees involved in hazardous waste operations and 2) that the PROGRAM incorporate a site-specific health and safety plan.

John V. Soderberg P.E (JVS) has employees/contractors conducting activities which fall within the scope of these regulations, and thus, has in place a written health and safety PROGRAM as required. Its contents are contained in the BEI HAZWOPER Program Manual. Some activities conducted at the contaminated portion of the Rose Cleaners' facility may fall within the scope of these OSHA regulations. Thus, to assure regulatory compliance, this site-specific health and safety plan covering activities conducted at the contaminated portion of the Rose Cleaners' facility has been prepared. The Integrated Safety Management System (ISMS) and Environmental Safety, Health and Quality check lists will be used to define safe work procedures for work conducted in uncontaminated areas of the Rose Cleaners' facility.

The regulatory requirements for site-specific health and safety plans are found at 29 CFR 1910.120 (b)(4) and include ten specific elements which are designated with the letters A through J. Each of these elements is addressed in this health and safety plan for the Rose Cleaners' facility. Each element is listed below along with the section number where it is addressed in this health and safety plan.

	Health and safety plan ELEMENT	**SECTION NO. IN THIS PLAN**
A)	Health and safety risk hazard analysis	4.0
B)	Employee training assignments and requirements	6.1
C)	Personal protective equipment requirements	4.0, 5.4
D)	Medical surveillance requirements	6.2
E)	Frequency and types of monitoring required	4.0, 5.2
F)	Site control measures	5.3
G)	Decontamination procedures	4.0, 5.6
H)	Emergency response plan	5.7
I)	Confined space entry procedures	none (no confined space entry)
J)	Spill containment program	5.3

1.0 INTRODUCTION AND PROJECT DESCRIPTION

An Inactive Hazardous Waste Disposal Site (IHWDS) Investigation Work Plan (Work Plan) has been developed pursuant to the requirements of an executed Order of Consent (December 22, 2003) between the New York State Department of Environmental Conservation (NYSDEC), Division of Environmental Remediation (DER), and LRB Cleaners, Inc., the Respondent. The subject property is listed on the NYSDEC DER Registry of Inactive Hazardous Waste Disposal Sites in New York State as Site Number 3-60-059 with a Classification of "2" pursuant to ECL 27-1305. The site is located at 500 Lexington Avenue, Mt Kisco, New York, 10549, fully described as Dist. 80.64, Section 01, Lot 14. An IHWDS Investigation Work Plan was directed as part of the Order of Consent to determine the nature and extent of site contamination and off-site migration pathways in order to allow a decision by the NYSDEC DER regarding remedial action required to be undertaken at said site and/or off-site areas.

1.1 Purpose

The purpose of an IHWDS investigation is to:

- Determine the nature and delineate the areal and vertical extent of contamination in all media for each area of concern or emanating from the site;
- Delineate the surface and subsurface environmental media, including topography and depth to groundwater;
- Identify the source(s) of contamination, migration paths and actual or potential receptors of contamination on or through air, soil, sediment, groundwater, surface water, utilities and structures at the site without regard to property boundaries;
- Collect and evaluate all necessary data to evaluate the actual and potential impact to public health and the environment;
- Collect and evaluate information for a Fish and Wildlife Resource Impact Analysis (if necessary);
- Collect data to facilitate selection and design of remedial action alternatives; and
- Identify collected data needed for monitoring natural attenuation, potential feasible cleanup technologies and presumptive remedies.

This Site-Specific Health and Safety Plan (HASP) addresses the safety aspects of the spectrum of work activities to be conducted at the contaminated area(s). Activities at the contaminated area (but not the uncontaminated background area) fall under the scope of Code of Federal Regulations, 29 CFR 1910.120, *Hazardous Waste Operations and Emergency Response (HAZWOPER*). The purpose of this document is to establish overall site-specific health and safety guidelines to be followed by

all personnel conducting work at this site regardless of organizational affiliation. Work will be performed in accordance with requirements, as stipulated.

The levels of protection and procedures specified in this HASP are based on the best information available from historical data and recent evaluations of the area. Therefore, these recommendations represent the minimum health and safety requirements to be observed by all personnel engaged in work at the site. Unforeseeable site conditions, changes in scope of work or hazardous conditions not previously considered will warrant a reassessment of the protection levels and controls stated. Refer to Section 5.1 for requirements pertaining to field modifications and changes to the HASP.

2.0 SITE ORGANIZATION AND COORDINATION

Subsurface Investigation activities will be performed by Berninger Environmental (BEI) (JVS's contractor) personnel. All work is performed under the direction of the Site Supervisor and support staff, all of whom are employed by BEI.

The following section describes the organizational structure for the subsurface investigation. Key personnel and their responsibilities are listed. Mr. Walter Berninger will be the Project Manager (PM), Mr. Justin Halpin will be the Site Supervisor (SS), Mr. Joel Meyers will serve as the Site Safety and Health Officer (SSHO) and Mr. Eusi Watkins will act as the Emergency Response Coordinator (ERC).

2.1 SITE SAFETY AND HEALTH OFFICER

The SSHO advises the Site Supervisor on health and safety issues and conducts briefings prior to initiation of site activities. The SSHO assesses the potential for worker exposures to hazardous agents, recommends appropriate hazard controls for protection of task site personnel and will require personnel to obtain immediate medical attention in the event of a work-related injury or illness. The SSHO ensures any necessary monitoring of potential chemical hazards is performed, reviews the effectiveness of monitoring and personal protective equipment and recommends upgrades or downgrades in protective health and safety measures. The SSHO ensures that appropriate fall protection measures are available and that needed work permits such as Radiological Work Permits (RWPs) are obtained. The SSHO notifies the Office of Radiation Protection when radiological support is required. The SSHO has stop work authority and advises emergency response personnel of an emergency. The SSHO authorizes the return to work following resolution of any health and safety hazards or other stop work issues. The SSHO ensures that this HASP is revised and approved if there are changes in site conditions or tasks. The SSHO will be available for consultation when required and will be aware of project-related work occurring on-site.

2.2 SITE SUPERVISOR

The Site Supervisor has primary responsibility for directing and managing all subsurface investigation field activities, including coordination with any support organizations. The Site Supervisor ensures that all on-site project personnel meet the required level of training, have reviewed the HASP and are instructed in safe work practices. The Site Supervisor also ensures that a qualified SSHO is designated, maintains a current copy of the HASP and documents field changes to the HASP in the project logbook. In addition, the Site Supervisor and staff perform oversight of field activities, maintain awareness of site operations and ensure that all project personnel adhere to ES&H requirements in order to prevent potential accidents from occurring.

The Site Supervisor is responsible for ensuring that the following five core functions of the Integrated Safety Management System (ISMS) are fulfilled appropriately:

- Define the work, roles and responsibilities. Allocate resources to ensure that research goals are balanced with safe work practices.

- Identify and analyze the hazards using the ESH&Q evaluation, consultation with subject matter experts, material safety data sheet information, Work Smart Standards (WSS), lessons learned by other Principal Investigators (PIs) and staff and other resources.

- Develop and implement hazard controls tailored to the work being performed.

    - Resources include BEI staff, subject matter experts, the Hazardous Materials Inventory System, ESD Chemical Hygiene Plan, Division and project procedures, Training Needs Assessment process, Laboratory Operating Manuals, Laboratory Stewards and Lessons Learned and Alerts.
    - Examples of actions and tools include optimization of engineering controls and procedural approaches with training, HAZCOM job-specific training, job pre-briefings, compliance-based and project-specific training, ES&H permits (e.g., RWPs, Lockout/Tagout process) and protective equipment.

- Perform work within controls to ensure the work is done safely:

    - Communicate expectations to project staff.
    - Ensure that the controls identified in the ESH&Q evaluation and this HASP are carried out.
    - Ensure opportunity for procedure modification to respond to unanticipated situations.
    - Stop work if imminent danger exists.

- Provide feedback and continuous improvement:

    - Solicit feedback from project staff regarding ESH&Q issues and act on that input.
    - Communicate concerns to and seek help from supervisors and the ESH&Q group.
    - Reallocate resources to address issues that arise.
    - Ensure safety meetings and site briefings are performed.

2.3 PRINCIPAL INVESTIGATORS AND FIELD PROJECT PERSONNEL

PIs and field project personnel involved in on-site operations are responsible for understanding the intent of the principles of Integrated Safety Management and are to be knowledgeable of the processes in place to satisfy the intent of Integrated Safety Management.

Define the Scope of Work

- Understand the expectations they are to meet in their particular work assignment.
- Understand the responsibilities of the Site Supervisor and SSHO.
- Provide documentation of training to the Site Supervisor.

Identify and Analyze the Hazard

- Notify the SSHO of any special medical conditions (i.e., allergies, diabetes, etc.).
- Actively participate in identification of hazards prior to beginning work.
- Ensure that potential work hazards have been evaluated by subject matter experts and are accounted for in all work practices.

Develop and Implement Hazard Controls

- Seek the help of the SSHO and other subject matter experts, as appropriate, to analyze the hazards.
- Ensure that control strategies are developed and implemented, as appropriate, before work begins.
- Ensure safety measures are incorporated into activities (i.e., through HASP addendums or amendments, work aides or standard operating procedures).

Perform Work Within Controls

- Perform only those tasks that they believe they can do safely.
- Meet the responsibilities and safely perform the tasks that are delegated to them.
- Take all reasonable precautions to prevent injury to themselves and to their fellow employees; be alert to potentially harmful situations.
- Suspend work if unexpected concerns arise and modify plans to address concerns before resuming work.
- Comply with the work plan and HASP as well as postings and rules at the project site.

Provide Feedback and Continuous Improvement

- Keep the SSHO and Site Supervisor informed of any issues, problems or concerns regarding all aspects of their work.
- Notify appropriate Rose Cleaners' management personnel or the facility point of contact of any unsafe condition, violation, noncompliance or environmental threat discovered in a facility.
- Report to the SSHO any changes in site conditions that may affect health and safety .

- Immediately notify the SSHO of symptoms or signs of exposure potentially related to any chemical, physical or biological hazards present at the site and immediately report any accidents, injuries and/or unsafe conditions to the SSHO.
- If unsafe conditions develop, task site personnel are authorized and expected to stop work and notify the SSHO and Site Supervisor of the unsafe condition.

3.0 INTEGRATED SAFETY MANAGEMENT SYSTEM (ISMS)

The ISMS process systematically integrates safety into management and work practices at all levels so missions are accomplished while protecting the public, the worker and the environment. Direct involvement of workers during the development and implementation of safety management systems is essential for success. DOE requires that the principles of ISMS be implemented for all ORNL activities. Therefore, all BEI personnel are expected to incorporate the following basic ISMS core functions during all work activities:

- Defining the scope of work;
- Identifying and analyzing hazards associated with the work;
- Developing and implementing hazard controls;
- Performing work activities within these controls; and
- Providing feedback on the adequacy of the controls to continue improving safety management.

4.0 TASK SPECIFIC HAZARD EVALUATION AND CONTROLS

The purpose of this Subsurface Investigation hazard evaluation is to identify and assess potential hazards that personnel might encounter and to prescribe methods of hazard control. Historical site data provided in Appendix A gives the results of chemical analyses in shallow soils and adjoining surface water (creek) at the Rose Cleaners' property. Material Safety Data Sheets (MSDS) for chemicals that are likely to be handled when conducting field work are included in Attachment B.

A description of sampling procedures and the activities to be conducted at the Rose Cleaners site is described below.

4.1 WATER LEVEL MEASUREMENTS

Task Description: Manual water level measurements will be collected from any monitoring wells installed in order to determine current depth to groundwater in the area. These measurements are taken by lowering an electronic water level sounder down the well. As the sounder is brought out of the well the tip of the sounder that has been submerged is rinsed with distilled water to rinse off the groundwater. The rinse water is allowed to drip back down into the well.

Equipment and Materials: Equipment includes water level sounder.

Task Hazards and Controls:

- **Chemical and Radiological Hazards**

    - Groundwater Contact: Based on previously obtained sample data (only available for soils or surface water; no known groundwater contamination is present), the risk of chemical or radiological exposure from short-term exposure to groundwater and surface water samples is minimal. However, direct contact with contaminated materials should be avoided; therefore, disposable latex or nitrile gloves and safety glasses will be worn when conducting groundwater monitoring and during the handling of sample tubes to prevent eye and skin contact.

    - Downhole equipment: Rinse downhole equipment with distilled water as it is brought out of the well.

- **Physical Hazards**

  - Tripping/Falling: Precautions should be taken to avoid trip, slip and fall accidents when climbing irregular or slippery surfaces. Before changing location visually survey the area for slippery surfaces and tripping hazards.

  - Heat/Cold Stress: Wear clothing appropriate for environmental and weather conditions. Temperature extremes may be a hazard for consideration depending on the timing of the activity. Refer to Section 5.5 for discussion of recognition of symptoms and controls.

- **Biological/Vector Hazards**

  - Ticks/Snakes/Pathogens: Be cautious of snakes and vector carriers such as ticks. Check clothing and skin for ticks after walking in brush. Wash hands before eating and drinking.

- **Personal Protective Equipment Required to Address General Site Hazards**

  - Level of Protection: D
  - Protective Clothing: BEI-issued work clothes or disposable tyvek
  - Head Gear: Safety glasses
  - Gloves: Latex or nitrile (when conducting groundwater sampling or handling corrosive or oxidizing reagents)
  - Footwear: Sturdy work shoes

- **Monitoring Requirements**

  - None

4.2 FIELD SAMPLING AND ANALYSIS OF GROUNDWATER/SURFACE WATER

Task Description: Procedures for field sampling and analysis of groundwater and surface water are described in the Rose Cleaners' IHWDS Investigation Work Plan. Groundwater will generally be sampled with a peristaltic pump. Slow purge techniques will be used in order to reduce the disturbance caused by removal of large volumes of water from the system. Field parameters will be monitored until stable groundwater chemistry (e.g. specific conductance, pH, temperature, dissolved oxygen) readings are obtained on the Myron 6P Ultrameter among others. The purge water will be collected in DOT approved 55-gallon drums, if deemed to be necessary or discharged in proximity to the wellhead with regulatory approval. Upon completion of the project, the drum contents (if any) will be sampled and analyzed for disposal at an approved facility. Surface water will be collected via disposable dedicated polyethylene bailers and rope.

Samples will be handled and transported according to regulatory requirements and procedures outlined in the Rose Cleaners' IHWDS Investigation Work Plan. Samples will be preserved and

stored as required by the analytical protocols (e.g. cooled, preservative added). Storage on site may occur for short periods of time in ice chests containing "blue ice" but will be quickly transferred to refrigerator storage in the field laboratory or at the fixed base laboratory at the appropriate temperatures. All storage of contaminated samples will follow procedures and relevant regulations.

Equipment and Materials: Sampling equipment includes sampling tubing which is dedicated for each sample collected; peristaltic pump; filters and sample containers (for collecting samples); HACH meter and test kits (see Appendix B for reagent MSDSs). Some samples may be preserved with a few drops of nitric, hydrochloric or sulfuric acid. Calibration standards including pH and conductivity are also used.

Task Hazards and Controls:

- **Chemical and Radiological Hazards**

  - Groundwater Contact: Based on previously obtained sample data (only available for soils or surface water), the risk of chemical exposure from short-term exposure to groundwater or surface water is minimal. However, direct contact with contaminated materials should be avoided, therefore, disposable latex or nitrile gloves and safety glasses will be worn when conducting groundwater and surface water sampling to prevent eye and skin contact.

  - Reagent Contact: Corrosive or oxidizing reagents pose a contact hazard. To prevent eye and skin contact when corrosive or oxidizing reagents are used disposable latex or nitrile gloves and safety glasses will be worn.

- **Physical Hazards**

  - Tripping/Falling: Precautions should be taken to avoid trip, slip and fall accidents when climbing irregular or slippery surfaces. Before changing location visually survey the area for slippery surfaces and tripping hazards.

  - Heat/Cold Stress: Wear clothing appropriate for environmental and weather conditions. Temperature extremes may be a hazard for consideration depending on the timing of the activity. Refer to Section 5.5 for discussion of recognition of symptoms and controls.

- **Explosion Hazards**

  - Gas cylinders: Pressurized gas cylinders (if any) will be transported and handled in accordance with applicable Department of Transportation guidance and regulations. Care will be taken to secure the cylinders upright during transport to ensure they are not damaged. Cylinders will also be secured at the site so they will not tip over during the injection process.

- **Biological/Vector Hazards**

  - Ticks/Snakes/Pathogens: Be cautious of snakes and vector carriers such as ticks. Check clothing and skin for ticks after walking in brush. Wash hands before eating and drinking.

- **Personal Protective Equipment Required to Address General Site Hazards**

  - Level of Protection: D
  - Protective Clothing: BEI-issued work clothes or disposable tyvek
  - Head Gear: Safety glasses
  - Gloves: Latex or nitrile (when conducting groundwater sampling or handling corrosive or oxidizing reagents)
  - Footwear: Sturdy work shoes

- **Monitoring Requirements**

  - Air Quality: Air monitoring with an organic vapor analyzer or other suitable instrument will be performed during all groundwater or surface water sampling activities. A VOC ambient air monitoring result of 3ppm will trigger a warning response. If a detection of 5ppm VOC in ambient air is detected, the SSHO will suspend work and instruct the workers to move to a safe zone until such time the work zone is tested safe.

4.3 FIELD SAMPLING AND ANALYSIS OF SOIL/SOIL GAS/SEDIMENT

Task Description: Procedures for field sampling and analysis of subsurface soils, soil gas, vapors and sediment are described in the Rose Cleaners' IHWDS Investigation Work Plan. Soil samples and soil gas samples will generally be obtained by a discrete sampler by hand, Geoprobe direct push sampling rig or Hollow Stem Auger Drilling Rig. This method ensures dedicated, undisturbed samples protected in a PVC liner or split spoon sampler. Sediment samples will be collected via decontaminated stainless steel sludge or dredge sampler. Field testing for total volatile organic compounds (VOCs) in the breathing zone (work zone), as well as the downwind perimeter will be monitored by an HNu or Minirae portable Photoionization Detector (PID). The air monitoring action levels using PID readings cited in Section 8.0 - Community Air Monitoring Plan will be used to safeguard workers and observers during the implementation of the field investigation program.

Any discarded soil or sediments will be collected in DOT approved 55-gallon drums. Upon completion of the project, the drum contents will be sampled and analyzed for disposal at an approved facility. It may also be possible to replace the discarded soil back in the bore hole and/or sediment in the creek if approved by the regulators.

Samples will be handled and transported according to regulatory requirements and procedures outlined in the Rose Cleaners' IHWDS Investigation Work Plan. Samples will be preserved and

stored as required by the analytical protocols (e.g. cooled, preservative added). Storage on site may occur for short periods of time in ice chests containing "blue ice" but will be quickly transferred to refrigerator storage in the field laboratory or at the fixed base laboratory at the appropriate temperatures. All storage of contaminated samples will follow procedures and relevant regulations.

Equipment and Materials: Sampling equipment includes a Geoprobe direct push sampling rig for exterior sample locations and a weighted slide hammer for interior sample collection. A PVC liner is dedicated for each soil sample collected. Soil gas samples will be collected directly into and containerized in dedicated stainless steel summa canisters. A stainless steel sludge or dredge sampler will be used to collect discrete sediment samples from select areas along the adjoining creek.

Task Hazards and Controls:

- **Chemical and Radiological Hazards**
  - Soil or Sediment Contact: Based on previously obtained sample data, the risk of chemical exposure from short-term exposure to soil samples is minimal (See Appendix A); no data is available for sediment. However, direct contact with contaminated materials should be avoided, therefore, disposable latex or nitrile gloves and safety glasses will be worn when conducting soil and sediment sampling to prevent eye and skin contact.
- **Physical Hazards**
  - Tripping/Falling: Precautions should be taken to avoid trip, slip and fall accidents when climbing irregular or slippery surfaces. Before changing location visually survey the area for slippery surfaces and tripping hazards.
  - Heat/Cold Stress: Wear clothing appropriate for environmental and weather conditions. Temperature extremes may be a hazard for consideration depending on the timing of the activity. Refer to Section 5.5 for discussion of recognition of symptoms and controls.
- **Biological/Vector Hazards**
  - Ticks/Snakes/Pathogens: Be cautious of snakes and vector carriers such as ticks. Check clothing and skin for ticks after walking in brush. Wash hands before eating and drinking.
- **Personal Protective Equipment Required to Address General Site Hazards**
  - Level of Protection: D
  - Protective Clothing: BEI-issued work clothes or disposable tyvek
  - Head Gear: Safety glasses
  - Gloves: Latex or nitrile (when conducting groundwater sampling or handling corrosive or oxidizing reagents)

- Footwear: Sturdy work shoes

- **Monitoring Requirements**

  - Air Quality: Air monitoring with an organic vapor analyzer or other suitable instrument will be performed during all soil sampling activities. A VOC ambient air monitoring result of 3ppm will trigger a warning response. If a detection of 5ppm VOC in ambient air is detected, the SSHO will suspend work and instruct the workers to move to a safe zone until such time the work zone is tested safe.

4.4 GEOPROBE BORINGS AND MONITORING WELL INSTALLATION

Task Description: Probe rods are installed by using a Geoprobe direct push rig which hydraulically pushes or hammers steel drive pipe into the ground (please refer to the Rose Cleaners' IHWDS Investigation Work Plan for a more complete description). Sections of probe rods are added (threaded attachment) until the desired depth is reached. A sampling tool is opened to obtain the soil or groundwater which then is retrieved. If desired, a small diameter well can then be constructed inside the hollow pipe as it is withdrawn from the ground or in the uncased hole after the drive pipe is removed completely. The drive point is left in the ground. Sampling equipment and probe rods are cleaned and decontaminated by detergent wash and potable water rinse. Hollow-stem augers and other drilling methods may also be used to install groundwater monitoring wells and/or to collect soil samples. These methods produce drill cuttings that will be collected in DOT approved 55-gallon drums. Upon completion of the project, the drum contents will be sampled and analyzed for disposal at an approved facility. It may also be possible to replace the discarded soil back in the bore hole if approved by the regulators.

Equipment and Materials: Equipment includes Geoprobe rig, drill rigs and associated equipment and support vehicles such as air compressors, pressure washers, generators, probe rod and well construction materials.

Task Hazards and Controls:

- **Chemical and Radiological Hazards**

  - Groundwater Contact: Based on previously obtained sample data, the risk of chemical exposure from short-term exposure to groundwater samples is minimal. However, direct contact with contaminated materials should be avoided, therefore, disposable latex or nitrile gloves and safety glasses will be worn when conducting groundwater sampling to prevent eye and skin contact.

  - Soil/cuttings Contact: Workers could be exposed to contaminated soil remaining on the probe rods as it is raised out of the ground. This hazard will be minimized by screening the drive pipe as it is raised out of the hole. Prior to removal from the site,

    all drill pipe, drill cuttings and any core samples collected will be scanned for VOC contamination. An exclusion area will be set up around the drill rig to prevent entry

by personnel that are not trained or wearing proper protection.

- **Physical Hazards**

  - Tripping/Falling: Precautions should be taken to avoid trip, slip and fall accidents when climbing irregular or slippery surfaces. Before changing location visually survey the area for slippery surfaces and tripping hazards. Operators will avoid accessing locations greater than six feet above ground. If it becomes necessary to perform work on the drill mast, the mast will be lowered prior to performing work.
  - Heat/Cold Stress: Wear clothing appropriate for environmental and weather conditions. Temperature extremes may be a hazard for consideration depending on the timing of the activity. Refer to Sect. 5.5 for discussion of recognition of symptoms and controls.
  - Abrasions, Scrapes and Sprains: Always use appropriate care when using tools and mechanical equipment. Maintain awareness of body and limb location and think ahead to probable body and object path before applying force to tools. Wear protective clothing as listed below. Drill rods, augers and tools will be properly stowed and restrained during transport. Support rails will have adequate strength to hold tools. Operators will avoid placing body parts at points of operation and/or pinch points.
  - Lifting: Use your legs to lift heavy objects, avoid awkward positions and twisting of the body and ask for assistance with awkward or heavy loads.
  - Mechanical Hazard: Working with drill rigs can result in injuries from equipment dislodging and striking unsuspecting personnel and from impacts due to flying objects or overturning vehicles. Therefore, follow these precautions:
    - ✓ Drill rig will be inspected visually before each use. If inspection reveals unsafe conditions, rig will be removed from service and repaired. Only qualified individuals shall make repairs to the drill rig.
    - ✓ Drill rig cabs will be kept free of all nonessential items and all loose items will be secured.
    - ✓ Drill rigs will be provided with necessary safety equipment.
    - ✓ Drill rig shall be properly maintained per manufacturer's recommendations. Only qualified individuals shall make repairs to the drill rig.
    - ✓ Parking brakes will be set before shutting off any heavy equipment or vehicle.
    - ✓ High pressure hoses will be secured to prevent "whipping" in the event of a failure.
    - ✓ Only competent individuals shall be allowed to operate the drill rig.
    - ✓ To minimize overhead hazards, wire cables will be inspected by the rig operator prior to use. Any frayed, kinked, marked or otherwise damaged cables will be taken out of service. Operator and other personnel in area during lifting of tools onto rig mast shall position themselves so that they are not under the load and/or between equipment.

  - Electrical Hazard: Of special concern to drilling operations is the possibility for conducting electricity through the drilling tower through either inadvertent contact with underground or overhead power lines or by lightning strikes. In addition, some of the equipment used is operated by electricity. Unless safe work practices are

observed, serious injury or death can result. Therefore, observe the following precautions:

- ✓ Treat all electrical wires and circuits as 'live" unless certain they are not.
- ✓ Always maintain a firm work base to prevent a loss of balance and potential fall onto energized busses or parts (which should be covered with a good electrical insulator such as a rubber blanket).
- ✓ All tools should have insulated handles, be electrically grounded or double insulated.
- ✓ Do not drill within 10 ft of an overhead power line that is ≤ 50 kV (or within 50 ft for > 50 kV) unless power to the line is first turned off for the duration of the drilling.
- ✓ Ground fault circuit interrupters will be used for electrical extension cords in use between a fixed electrical system (permanent outlet) and a tool.
- ✓ Prior to drilling have site representatives delineate location of underground power lines and other utilities.
- ✓ Do not drill within 25 ft of any known underground power line.
- ✓ Maintain a watch for electrical storms. If electrical activity appears to be imminent, cease drilling operations and evacuate the area around the drill rig. If time permits do not leave auger or drill string in the borehole.

- Noise: Unprotected exposure of site workers to noise from drilling activities can result in noise induced hearing loss. Hearing protection must be worn where noise levels are greater than 85 dBA. The SSHO will ensure that either ear muffs or disposable foam earplugs are made available to all personnel and are used by the personnel in the immediate vicinity of the drill rig.

- **Biological/Vector Hazard**

  - Ticks/Snakes/Pathogens: Be cautious of snakes and vector carriers such as ticks. Check clothing and skin for ticks after walking in brush. Wash hands before eating and drinking.

- **Personal Protective Equipment Required to Address General Site Hazard**

  - Level of Protection: D
  - Protective Clothing: BEI-issued work clothes or disposable tyvek
  - Head Gear
    - Hard hat required for drill rig operations; not required for steam cleaning and washing
    - Safety glasses or goggles required during drilling and decon operations
    - Ear muffs or disposable foam earplugs required in the vicinity of drill rig
  - Gloves: Leather work gloves over nitrile or latex gloves during drilling or decon operations
  - Footwear: Steel-toed work shoes

- **Monitoring Requirements**

  - Air Quality: Air monitoring with a PID or other suitable instrument will be performed during all well installation activities. A VOC ambient air monitoring

result of 3ppm will trigger a warning response. If a detection of 5 ppm VOC in ambient air is detected, the SSHO will suspend work and instruct the workers to move to a safe zone until such time the work zone is tested safe.

5.0 OTHER HEALTH AND SAFETY PLAN ELEMENTS

5.1 REVISIONS/ MODIFICATIONS TO THE HASP

The following actions will warrant revision and approval of this plan by the appropriate health and safety disciplines:

- Change in tasks (or previously unidentified tasks) that could impact employee health and safety.
- Changes in hazards (unknown or not previously addressed) which require a significant change in, or addition to, respiratory protection (as defined in exemptions to the plan modifications), physical/barrier protection features or other engineering controls.
- Occurrences as defined by DOE Order 232.1A.

5.1.1 Modifications allowed

The SSHO may upgrade PPE. These changes must be documented in the field logbook. The change and reason or evidence for the change must also be documented in the field logbook. For upgrades to include respiratory protection (including air-purifying and supplied air) for previously unidentified non-radiological issues or contaminants such as VOCs, the appropriate health and safety disciplines must be contacted. The SSHO will approve and document changes in PPE in the field logbook. Upgrades to include respiratory protection will require the SSHO to ensure workers have 40 Hour HAZWOPER Training and to assess any additional medical surveillance requirements.

5.2 MONITORING

Historical site data indicate that chemical exposure of site personnel is not a significant concern within the scope of this project. However as only limited site characterization has been performed, monitoring will be required for all field activities. Site monitoring requirements may change based on site conditions. All changes must be documented in the site logbook.

5.3 SITE AND SPILL CONTROL

Site access is available from public roads through the area and therefore will not be controlled to the general site. Based on the anticipated levels of contamination, formal barricaded work zones will not be established unless new monitoring data indicate the need for such barriers. An exclusion zone may be required for drilling operations and other field activities if required to reduce the accidental spread of hazardous substances from contaminated areas to clean areas. The SSHO will determine, as needed, the locations of the support zone, contamination reduction zone and the exclusion zone. Personnel accessing the zones must meet access requirements as stated in this plan.

5.4 PERSONAL PROTECTIVE EQUIPMENT

Level D protection is normally used when the potential for personnel contamination is low, as is the case with this project. Level D protection will include BEI-furnished clothing or disposable tyvek. Details and special requirements have been covered in the hazard control sections of the specific

tasks in Sect. 4 above. Unexpected new hazards will require a reassessment of the specified PPE.

5.5 TEMPERATURE EXTREMES AND SITE CHARACTERISTICS

The effect of temperature extremes on personnel is a primary hazard associated with the activities conducted at the site. Symptoms and controls related to temperature extremes are considered in detail in this section.

Field activities conducted during the summer or winter pose a hazard because of temperature extremes. Since the project site is located in a relatively open area, workers shall dress appropriately for environmental conditions, wearing clothing that provides reasonable protection against winter cold and summer sun. Although extreme physical exertion will not be likely within the scope of this project, during hot weather workers are encouraged to be aware of their own symptoms of heat stress (headaches, dizziness, increased heart rate), to drink plenty of water and to take breaks as needed. Heat stress symptoms, remedies and monitoring are discussed in Section 5.5.1. Cold exposure effects are discussed in Section 5.5.2.

Workers are also encouraged to apply insect repellant and/or sunscreen as needed prior to field activities. Workers should exercise caution by visually inspecting their immediate area of activity for presence of poisonous/harmful plant, insect and animal species as well as any hazard resulting from previous human activity.

5.5.1 Effects and Prevention of Heat Stress

If the body's physiological processes fail to maintain a normal body temperature because of excessive heat, a number of physical reactions can occur. They can range from mild symptoms such as fatigue, irritability, anxiety, and decreased concentration, dexterity, or movement, to death.

Heat-related health concerns can include the following:

- **Heat rash:** Caused by continuous exposure to heat and humid air and aggravated by chafing clothes. Decreases ability to tolerate heat and is a nuisance.
- **Heat cramps:** Caused by profuse perspiration combined with inadequate fluid intake and chemical replacement, particularly salts. Signs include muscle spasm and pain in the extremities and abdomen.
- **Heat exhaustion:** Caused by increased stress on various organs to meet increased demands to cool the body. Signs include shortness of breath; increased pulse rate (120-200 beats per minute); pale, cool, moist skin; profuse sweating; dizziness; and lassitude.
- **Heat stroke:** Is the most severe form of heat stress. Body must be cooled immediately to prevent severe injury and/or death. Signs include red, hot, dry skin; no perspiration; nausea; dizziness and confusion; strong, rapid pulse; and possibly coma. Medical help must be obtained immediately.

Medical attention must be obtained for the more serious symptoms of heat stress. One or more of the following methods are recommended to help reduce the potential for heat stress:

1. Provide plenty of liquids. To replace body fluids (water and electrolytes) lost due to sweating, use a 0.1 percent saltwater solution, more heavily salted foods, or commercial mixes. The commercial mixes may be preferable for those employees on a low-sodium diet.
2. Provide cooling devices to aid natural body ventilation. These devices, however, add weight, and their use should be balanced against worker efficiency.
3. Wear long cotton underwear, which acts as a wick to help absorb moisture and protect the skin from direct contact with heat-absorbing protective clothing.
4. Install mobile showers and/or hose-down facilities to reduce body temperature and cool protective clothing.
5. In extremely hot weather, conduct non-emergency response operations in the early morning or evening.
6. Ensure that adequate shelter is available to protect personnel against sun, heat, or other adverse weather conditions that decrease physical efficiency and increase the probability of accidents.
7. In hot weather, rotate workers wearing protective clothing.
8. Maintain good hygiene frequently changing clothing and showering daily. Clothing should be permitted to dry during rest periods. Workers who notice skin problems should immediately consult medical personnel.

5.5.2 Cold Exposure

Persons working outdoors in temperatures at or below freezing may suffer from cold exposure. During prolonged outdoor periods with inadequate clothing for protection, the effects of cold exposure may occur even at temperatures well above freezing. Cold exposure may cause severe injury due to freezing of exposed body surfaces (frostbite) or profound generalized cooling (hypothermia), possibly resulting in death. Areas of the body which have high surface area-to-volume ratios such as fingers, toes and ears are the most susceptible to frostbite.

Local injury resulting from cold is included in the generic term frostbite. There are several degrees of damage. Frostbite of the extremities can be categorized into:

- **Frost nip or incident frostbite:** characterized by sudden blanching or whitening of skin.
- **Superficial frostbite:** skin has a waxy or white appearance and is firm to the touch, but tissue beneath is resilient.
- **Deep frostbite:** tissues are cold, pale and solid; extremely serious injury.

Systemic hypothermia, or lowering of the core body temperature, is caused by exposure to freezing or rapidly dropping temperatures. Symptoms are usually exhibited in five stages: 1) shivering and loss of coordination; 2) apathy, listlessness, sleepiness and (sometimes) rapid cooling of the body to less than 95ºF (35ºC); 3) unconsciousness, glassy stare, slow pulse and slow respiratory rate; 4) freezing the extremities; and 5) death.

5.6 DECONTAMINATION

BEI will maintain on-site decontamination equipment such as a steam cleaner, potable water, alconox, pressure washer, water reservoir tank, and a wastewater transfer system and receiving tank. Groundwater, soil sampling and drilling equipment will be decontaminated between each boring, well installation, sampling event and prior to mobilization on or off site.

Decontamination of personnel shall be conducted only in the unexpected event that contamination is detected. At a minimum, personnel who have conducted work at the site will wash their hands prior to eating or drinking. BEI personnel shall supervise, assist and document incidents involving personnel contamination.

5.7 EMERGENCY PREPAREDNESS/RESPONSE

All emergency services can be reached by dialing 911 from any facility or mobile telephone. Access to phones and/or radios will be provided to on-site personnel. The Emergency Response Coordinator (ERC) will coordinate all emergency response operations.

Should evacuation from the site become necessary, the evacuation route to the hospital in the Village/Town of Mt. Kisco is shown in Figure 2. Emergency telephone numbers are given below.

Emergency Telephone Numbers

FIRE / POLICE 911

Town/Village of Mt. Kisco Fire Department
Union Hook & Ladder Co. No. 1
Town/Village of Mt. Kisco (914) 241-1100

Westchester County Police Department - (845)382-111
Town/Village of Mt. Kisco Water Department (914) 864-0020
Water & Sewer (914) 864-0021

Northern Westchester Hospital Center
400 East Main Street
Mount Kisco New York - (914) 666-1200

6.0 TRAINING/MEDICAL REQUIREMENTS

6.1 SITE-SPECIFIC HAZARD COMMUNICATION AND ACCESS BRIEFING

Since different training requirements may be needed based on the nature of different tasks to be performed, specific training requirements may be identified. However, generally applicable training requirements are presented here. Visitors not entering any exclusion zone or contamination reduction zone who have very limited potential for exposure to contaminants require:

- Site-specific hazard communication and access briefing.

All project personnel performing hands-on work that could potentially expose them to hazardous substances, safety, or health hazards will meet the following training requirements:

- General Employee Training (GET)
- 40 hour HAZWOPER (SARA/OSHA) training, or equivalent (Note: for certain types of low risk work, 24 hour training is acceptable)
- Current HAZWOPER 8-hour Annual Refresher (as applicable)
- Site-specific hazard communication and access briefing

In addition, the Site Safety and Health Officer requires:

- 8-hour HAZWOPER Supervisor training

Personnel involved in service or maintenance work on energized equipment require:

- Lockout/Tagout training

Prior to beginning work at the project site, all personnel will review this Health and Safety Plan and sign the training acknowledgment form (Appendix C). The site-specific hazard communication and access briefing is documented in the project logbook. If site conditions change, or other hazards are detected, the training and access requirements will be revised accordingly.

6.2 MEDICAL SURVEILLANCE

A medical surveillance program will be conducted in accordance with the requirements of 29 CFR 1910.120 for:

- All employees who are or may be exposed to hazardous substances or health hazards at or above the established permissible exposure limits or, if there is no permissible exposure limit, above the published exposure levels for these substances, without regard to the use of respirators, for 30 days or more a year.

- All employees who wear a respirator for 30 days or more a year or as required by 29 CFR 1910.134.
- All employees who are injured, become ill or develop signs or symptoms due to possible overexposure involving hazardous substances or health hazards from an emergency response or hazardous waste operation.

- Members of HAZMAT teams.

All BEI employees receive periodic medical examinations. Because of the low potential for exposure to hazardous agents, it is not expected that additional medical surveillance will be required for BEI personnel at the Rose Cleaners' facility. Non-BEI personnel will be required to acknowledge coverage by a medical surveillance program sufficient to satisfy the requirements of 29 CFR 1910.120 (Appendix C).

FIGURES

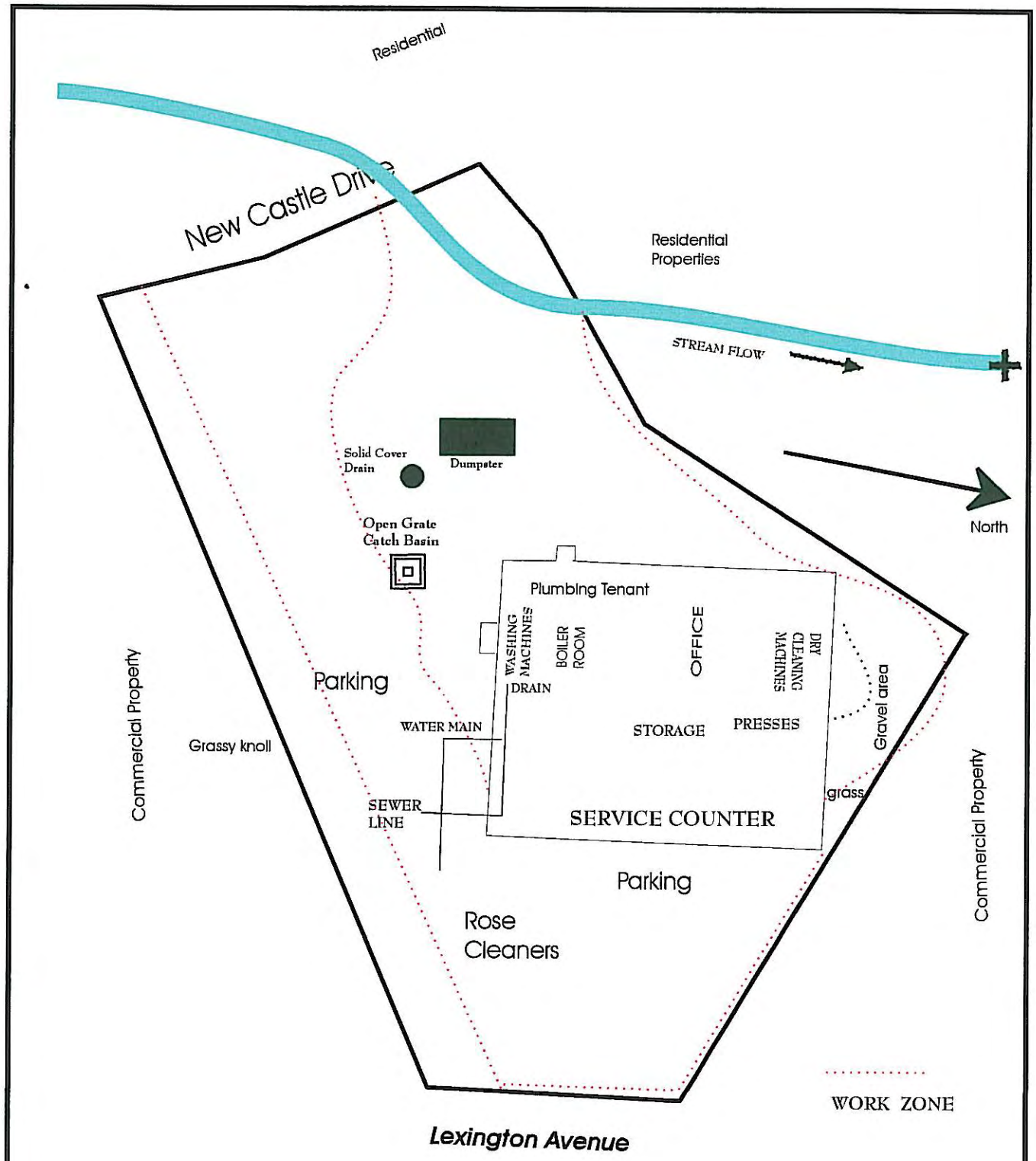


FIGURE 1 - HEALTH AND SAFETY WORK ZONES

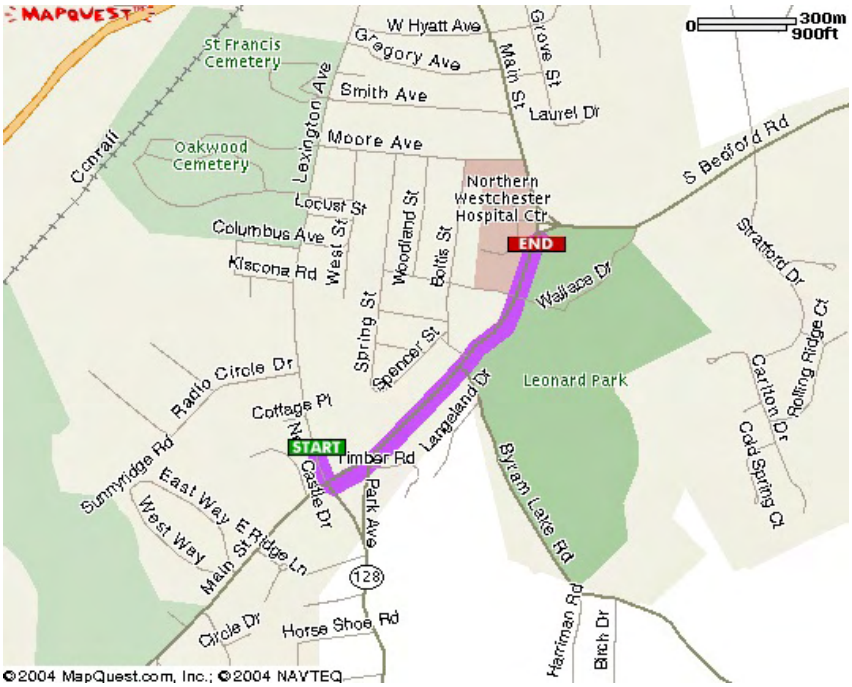


Figure 2 - EMERGENCY ROUTE TO NORTHERN WESTCHESTER HOSPITAL

1:	**: Start out going South on LEXINGTON AVE toward MAIN ST/NY-117/E MAIN ST.**	**<0.10 miles**
2:	**Turn LEFT onto MAIN ST/NY-117/E MAIN ST.**	**0.06 miles**
3:	**End at 400 E MAIN ST MOUNT KISCO NY**	
4:	**NY-32 becomes NY-32 Broadway.**	**0.30 miles**
5:	**Stay straight to go onto, Broadway.**	**0.5 miles**

TOTAL ESTIMATED TIME: 8 minutes

TOTAL DISTANCE: 2.4 miles

Appendix A

HISTORIC SITE DATA

SUMMARY OF PAST INVESTIGATIONS

Records available to Berninger Environmental, Inc. (BEI) indicate that on December 21, 2001, Tyree Brothers Environmental Services, Inc. (IBES) performed a limited subsurface investigation at the Rose Cleaners' facility. Two soil borings were manually drilled at the site with the locations chosen based on the presence of any exhaust piping and/or any location that would have the potential for chemical dumping.

Soil samples were collected at two locations; one directly adjacent to the stoop by the back door, at a depth of 2.5 to 3 feet, and one on the side of the building near the exhaust discharge piping at a depth of 3 to 4 feet. The increment with the highest photoionization detector reading was selected for laboratory analysis. PID readings ranged from 1.1 to 36.7 ppm PID response units. The samples were analyzed for volatile organic compounds via EPA method 8260.

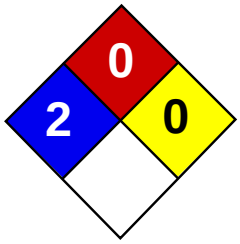
The results of the laboratory analysis were compared to New York State Department of Environmental Conservation (NYSDEC) Determination of Soil Cleanup Objectives and Cleanup Levels, December 20, 2000.Laboratory results indicated that volatile organic compounds were detected in both of the soil samples. All concentrations in SB-I were within NYSDEC acceptable levels; tetrachloroethene was present at a concentration of 591 ug/kg. Sample SB-2 contained a concentration of one (1) compound (tetrachloroethene at 12,400 ug/kg) that exceeded NYSDEC soil guidelines of 1,400 ug/kg.

A surface water grab sample was also collected from a downstream location, between the dry cleaners and the adjacent commercial property, during the soil sampling program. This sample was hand delivered under chain of custody documentation to a New York State certified laboratory. The stream was located in back (west) of the dry cleaners. This sample was analyzed for volatile organic compounds via EPA method 8260. The results of the laboratory analysis were compared to the Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1, Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations, April 2000,

Volatile organic compounds were also detected in the surface water sample taken from the stream. The stream sample contained concentrations of volatiles that exceeded NYSDEC surface water standards for two (2) compounds (cis-1,2- dichloroethene at 5.1 *u*g/L and tetrachloroethene at 9.3 *u*g/L). Due to the presence of concentrations of volatiles that exceeded NYSDEC standards for soil and surface water, Spill Number 01-09709 was assigned to this site.

Appendix B

MATERIAL SAFETY DATA SHEETS



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 (Fatthead 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.

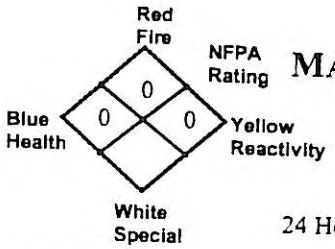
Other Special Considerations: Not available.

Created: 10/10/2005 08:29 PM

Last Updated: 05/21/2013 12:00 PM

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall ScienceLab.com be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if ScienceLab.com has been advised of the possibility of such damages.

Alconox ®



MATERIAL SAFETY DATA SHEET

Alconox, Inc.
30 Glenn Street
White Plains, NY 10603

24 Hour Emergency Number – Chem-Tel (800) 255-3924

I. IDENTIFICATION

Product Name (as appears on label)	ALCONOX
CAS Registry Number:	Not Applicable
Effective Date:	January 1, 2001
Chemical Family:	Anionic Powdered Detergent
Manufacturer Catalog Numbers for sizes	1104, 1125, 1150, 1101, 1103 and 1112

II. HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

There are no hazardous ingredients in ALCONOX as defined by the OSHA Standard and Hazardous Substance List 29 CFR 1910 Subpart Z.

III. PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point (F):	Not Applicable
Vapor Pressure (mm Hg):	Not Applicable
Vapor Density (AIR=1):	Not Applicable
Specific Gravity (Water=1):	Not Applicable
Melting Point:	Not Applicable
Evaporation Rate (Butyl Acetate=1):	Not Applicable
Solubility in Water:	Appreciable-Soluble to 10% at ambient conditions
Appearance:	White powder interspersed with cream colored flakes.
pH:	9.5 (1%)

IV. FIRE AND EXPLOSION DATA

Flash Point (Method Used):	None
Flammable Limits:	LEL: No Data UEL: No Data
Extinguishing Media:	Water, dry chemical, CO_2, foam
Special Fire fighting Procedures:	Self-contained positive pressure breathing apparatus and protective clothing should be worn when fighting fires involving chemicals.
Unusual Fire and Explosion Hazards:	None

V. REACTIVITY DATA

Stability:	Stable
Hazardous Polymerization:	Will not occur
Incompatibility (Materials to Avoid):	None
Hazardous Decomposition or Byproducts:	May release CO_2 on burning

VI. HEALTH HAZARD DATA

Route(s) of Entry:	Inhalation? Yes Skin? No Ingestion? Yes
Health Hazards (Acute and Chronic):	Inhalation of powder may prove locally irritating to mucous membranes. Ingestion may cause discomfort and/or diarrhea. Eye contact may prove irritating.
Carcinogenicity:	NTP? No IARC Monographs? No OSHA Regulated? No
Signs and Symptoms of Exposure:	Exposure may irritate mucous membranes. May cause sneezing.
Medical Conditions Generally Aggravated by Exposure:	Not established. Unnecessary exposure to this product or any industrial chemical should be avoided. Respiratory conditions may be aggravated by powder.
Emergency and First Aid Procedures:	Eyes: Immediately flush eyes with water for at least 15 minutes. Call a physician. Skin: Flush with plenty of water. Ingestion: Drink large quantities of water or milk. Do not induce vomiting. If vomiting occurs administer fluids. See a physician for discomfort.

VII. PRECAUTIONS FOR SAFE HANDLING AND USE

Steps to be Taken if Material is Released or Spilled:	Material foams profusely. Recover as much as possible and flush remainder to sewer. Material is biodegradable.
Waste Disposal Method:	Small quantities may be disposed of in sewer. Large quantities should be disposed of in accordance with local ordinances for detergent products.
Precautions to be Taken in Storing and Handling:	Material should be stored in a dry area to prevent caking.
Other Precautions:	No special requirements other than the good industrial hygiene and safety practices employed with any industrial chemical.

VIII. CONTROL MEASURES

Respiratory Protection (Specify Type):	Dust mask - Recommended
Ventilation:	Local Exhaust-Normal Special-Not Required Mechanical-Not Required Other-Not Required
Protective Gloves:	Impervious gloves are useful but not required.
Eye Protection:	Goggles are recommended when handling solutions.
Other Protective Clothing or Equipment:	None
Work/Hygienic Practices:	No special practices required

MSDS Number: A2052 • • • • • *Effective Date: 02/18/03* • • • • • *Supercedes: 02/21/00*

MSDS Material Safety Data Sheet

From Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300
National Response in Canada
CANUTEC: 613-996-6666
Outside U.S. And Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

ALCONOX®

1. Product Identification

Synonyms: Proprietary blend of sodium linear alkylaryl sulfonate, alcohol sulfate, phosphates, and carbonates.
CAS No.: Not applicable.
Molecular Weight: Not applicable to mixtures.
Chemical Formula: Not applicable to mixtures.
Product Codes: A461

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Alconox® proprietary detergent mixture	N/A	90 - 100%	Yes

3. Hazards Identification

Emergency Overview

CAUTION! MAY BE HARMFUL IF SWALLOWED OR INHALED. MAY CAUSE IRRITATION TO EYES AND RESPIRATORY TRACT.

J.T. Baker SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 1 - Slight
Flammability Rating: 0 - None
Reactivity Rating: 1 - Slight
Contact Rating: 2 - Moderate
Lab Protective Equip: GOGGLES; LAB COAT
Storage Color Code: Orange (General Storage)

Potential Health Effects

Inhalation:
May cause irritation to the respiratory tract. Symptoms may include coughing and shortness of breath.
Ingestion:
May cause irritation to the gastrointestinal tract. Symptoms may include nausea, vomiting and diarrhea.
Skin Contact:
No adverse effects expected.
Eye Contact:
May cause irritation, redness and pain.
Chronic Exposure:
No information found.
Aggravation of Pre-existing Conditions:
No information found.

VI. HEALTH HAZARD DATA

Route(s) of Entry:	Inhalation? Yes Skin? No Ingestion? Yes
Health Hazards (Acute and Chronic):	Inhalation of powder may prove locally irritating to mucous membranes. Ingestion may cause discomfort and/or diarrhea. Eye contact may prove irritating.
Carcinogenicity:	NTP? No IARC Monographs? No OSHA Regulated? No
Signs and Symptoms of Exposure:	Exposure may irritate mucous membranes. May cause sneezing.
Medical Conditions Generally Aggravated by Exposure:	Not established. Unnecessary exposure to this product or any industrial chemical should be avoided. Respiratory conditions may be aggravated by powder.
Emergency and First Aid Procedures:	Eyes: Immediately flush eyes with water for at least 15 minutes. Call a physician. Skin: Flush with plenty of water. Ingestion: Drink large quantities of water or milk. Do not induce vomiting. If vomiting occurs administer fluids. See a physician for discomfort.

VII. PRECAUTIONS FOR SAFE HANDLING AND USE

Steps to be Taken if Material is Released or Spilled:	Material foams profusely. Recover as much as possible and flush remainder to sewer. Material is biodegradable.
Waste Disposal Method:	Small quantities may be disposed of in sewer. Large quantities should be disposed of in accordance with local ordinances for detergent products.
Precautions to be Taken in Storing and Handling:	Material should be stored in a dry area to prevent caking.
Other Precautions:	No special requirements other than the good industrial hygiene and safety practices employed with any industrial chemical.

VIII. CONTROL MEASURES

Respiratory Protection (Specify Type):	Dust mask - Recommended
Ventilation:	Local Exhaust-Normal Special-Not Required Mechanical-Not Required Other-Not Required
Protective Gloves:	Impervious gloves are useful but not required.
Eye Protection:	Goggles are recommended when handling solutions.
Other Protective Clothing or Equipment:	None
Work/Hygienic Practices:	No special practices required

Odor:
No information found.
Solubility:
Moderate (1-10%)
Specific Gravity:
No information found.
pH:
No information found.
% Volatiles by volume @ 21C (70F):
0
Boiling Point:
No information found.
Melting Point:
No information found.
Vapor Density (Air=1):
No information found.
Vapor Pressure (mm Hg):
No information found.
Evaporation Rate (BuAc=1):
No information found.

10. Stability and Reactivity

Stability:
Stable under ordinary conditions of use and storage.
Hazardous Decomposition Products:
Carbon dioxide and carbon monoxide may form when heated to decomposition.
Hazardous Polymerization:
Will not occur.
Incompatibilities:
No information found.
Conditions to Avoid:
No information found.

11. Toxicological Information

No LD50/LC50 information found relating to normal routes of occupational exposure.

--------\Cancer Lists\----------

Ingredient	---NTP Carcinogen--- Known	Anticipated	IARC Category
Alconox® proprietary detergent mixture	No	No	None

12. Ecological Information

Environmental Fate:
This product is biodegradable.
Environmental Toxicity:
No information found.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Not regulated.

15. Regulatory Information

--------\Chemical Inventory Status - Part 1\--------

Ingredient	TSCA	EC	Japan	Australia
Alconox® proprietary detergent mixture	Yes	No	No	No

--------\Chemical Inventory Status - Part 2\--------

Ingredient	Korea	--Canada-- DSL	NDSL	Phil.
Alconox® proprietary detergent mixture	No	No	Yes	No

--------\Federal, State & International Regulations - Part 1\--------

Ingredient	-SARA 302- RQ	TPQ	------SARA 313------ List	Chemical Catg.
Alconox® proprietary detergent mixture	No	No	No	No

--------\Federal, State & International Regulations - Part 2\--------

Ingredient	CERCLA	-RCRA- 261.33	-TSCA- 8(d)
Alconox® proprietary detergent mixture	No	No	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: No Fire: No Pressure: No
Reactivity: No Pure / Solid

Australian Hazchem Code: None allocated.
Poison Schedule: None allocated.
WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other Information

NFPA Ratings: Health: **0** Flammability: **0** Reactivity: **0**
Label Hazard Warning:
CAUTION! MAY BE HARMFUL IF SWALLOWED OR INHALED. MAY CAUSE IRRITATION TO EYES AND RESPIRATORY TRACT.
Label Precautions:
Avoid contact with eyes.
Keep container closed.
Use with adequate ventilation.
Avoid breathing dust.
Wash thoroughly after handling.
Label First Aid:
If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of eye contact, immediately flush eyes with plenty of water for at least 15 minutes. In all cases, get medical attention.
Product Use:
Laboratory Reagent.
Revision Information:
MSDS Section(s) changed since last revision of document include: 8.
Disclaimer:
****
Mallinckrodt Baker, Inc. provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose. MALLINCKRODT BAKER, INC. MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS. ACCORDINGLY, MALLINCKRODT BAKER, INC. WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM USE OF OR RELIANCE UPON THIS INFORMATION.
****
Prepared by: Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

MSDS Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

TRICHLOROETHYLENE

MSDS Number: T4940 — *Effective Date: 09/14/00*

1. Product Identification

Synonyms: Trichloroethene; TCE; acetylene trichloride; Ethinyl trichloride
CAS No.: 79-01-6
Molecular Weight: 131.39
Chemical Formula: C2HCl3
Product Codes:
J.T. Baker: 5376, 9454, 9458, 9464, 9473, 9474
Mallinckrodt: 8598, 8600, 8633

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Trichloroethylene	79-01-6	100%	Yes

3. Hazards Identification

Emergency Overview

WARNING! HARMFUL IF SWALLOWED OR INHALED. AFFECTS HEART, CENTRAL NERVOUS SYSTEM, LIVER AND KIDNEYS. CAUSES SEVERE SKIN

IRRITATION. CAUSES IRRITATION TO EYES AND RESPIRATORY TRACT. SUSPECT CANCER HAZARD. MAY CAUSE CANCER. Risk of cancer depends on level and duration of exposure.

J.T. Baker SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 3 - Severe (Cancer Causing)
Flammability Rating: 1 - Slight
Reactivity Rating: 1 - Slight
Contact Rating: 2 - Moderate
Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES
Storage Color Code: Blue (Health)

Potential Health Effects

Inhalation:
Vapors can irritate the respiratory tract. Causes depression of the central nervous system with symptoms of visual disturbances and mental confusion, incoordination, headache, nausea, euphoria, and dizziness. Inhalation of high concentrations could cause unconsciousness, heart effects, liver effects, kidney effects, and death.

Ingestion:
Cases irritation to gastrointestinal tract. May also cause effects similar to inhalation. May cause coughing, abdominal pain, diarrhea, dizziness, pulmonary edema, unconsciousness. Kidney failure can result in severe cases. Estimated fatal dose is 3-5 ml/kg.

Skin Contact:
Cause irritation, redness and pain. Can cause blistering. Continued skin contact has a defatting action and can produce rough, dry, red skin resulting in secondary infection.

Eye Contact:
Vapors may cause severe irritation with redness and pain. Splashes may cause eye damage.

Chronic Exposure:
Chronic exposures may cause liver, kidney, central nervous system, and peripheral nervous system effects. Workers chronically exposed may exhibit central nervous system depression, intolerance to alcohol, and increased cardiac output. This material is linked to mutagenic effects in humans. This material is also a suspect carcinogen.

Aggravation of Pre-existing Conditions:
Persons with pre-existing skin disorders, cardiovascular disorders, impaired liver or kidney or respiratory function, or central or peripheral nervous system disorders may be more susceptible to the effects of the substance.

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4. First Aid Measures

Inhalation:
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.
Ingestion:
Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Call a physician.
Skin Contact:
Immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.
Eye Contact:
Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

Note to Physician:
Do not administer adrenaline or epinephrine to a victim of chlorinated solvent poisoning.

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5. Fire Fighting Measures

Fire:
Autoignition temperature: 420C (788F)
Flammable limits in air % by volume:
lel: 8; uel: 12.5
Explosion:
A strong ignition source, e. g., a welding torch, can produce ignition. Sealed containers may rupture when heated.
Fire Extinguishing Media:
Use water spray to keep fire exposed containers cool. If substance does ignite, use CO2, dry chemical or foam.
Special Information:
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. Combustion by-products include phosgene and hydrogen chloride gases. Structural firefighters' clothing provides only limited protection to the combustion products of this material.

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6. Accidental Release Measures

Ventilate area of leak or spill. Remove all sources of ignition. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Use non-sparking tools and equipment. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! US Regulations (CERCLA) require reporting

spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from any source of heat or ignition. Isolate from incompatible substances. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
Trichloroethylene:
-OSHA Permissible Exposure Limit (PEL):
100 ppm (TWA), 200 ppm (Ceiling),
300 ppm/5min/2hr (Max)

-ACGIH Threshold Limit Value (TLV):
50 ppm (TWA) 100 ppm (STEL);
listed as A5, not suspected as a human carcinogen.

Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):
If the exposure limit is exceeded and engineering controls are not feasible, wear a supplied air, full-facepiece respirator, airlined hood, or full-facepiece self-contained breathing apparatus. Breathing air quality must meet the requirements of the OSHA respiratory protection standard (29CFR1910.134). This substance has poor warning properties. Where respirators are required, you must have a written program covering the basic requirements in the OSHA respirator standard. These include training, fit testing, medical approval, cleaning, maintenance, cartridge change schedules, etc. See 29CFR1910.134 for details.

Skin Protection:
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact. Neoprene is a recommended material for personal protective equipment.

Eye Protection:
Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Appearance:
Clear, colorless liquid.
Odor:
Chloroform-like odor.
Solubility:
Practically insoluble in water. Readily miscible in organic solvents.
Specific Gravity:
1.47 @ 20C/4C
pH:
No information found.
% Volatiles by volume @ 21C (70F):
100
Boiling Point:
87C (189F)
Melting Point:
-73C (-99F)
Vapor Density (Air=1):
4.5
Vapor Pressure (mm Hg):
57.8 @ 20C (68F)
Evaporation Rate (BuAc=1):
No information found.

---

10. Stability and Reactivity

Stability:
Stable under ordinary conditions of use and storage. Will slowly decompose to hydrochloric acid when exposed to light and moisture.
Hazardous Decomposition Products:
May produce carbon monoxide, carbon dioxide, hydrogen chloride and phosgene when heated to decomposition.
Hazardous Polymerization:
Will not occur.
Incompatibilities:
Strong caustics and alkalis, strong oxidizers, chemically active metals, such as barium, lithium, sodium, magnesium, titanium and beryllium, liquid oxygen.
Conditions to Avoid:
Heat, flame, ignition sources, light, moisture, incompatibles

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11. Toxicological Information

Toxicological Data:
Trichloroethylene: Oral rat LD50: 5650 mg/kg; investigated as a tumorigen, mutagen, reproductive effector.
Reproductive Toxicity:
This material has been linked to mutagenic effects in humans.

--------\Cancer Lists\----------

Ingredient	---NTP Carcinogen--- Known	Anticipated	IARC Category
Trichloroethylene (79-01-6)	No	Yes	2A

12. Ecological Information

Environmental Fate:
When released into the soil, this material may leach into groundwater. When released into the soil, this material is expected to quickly evaporate. When released to water, this material is expected to quickly evaporate. This material has an experimentally-determined bioconcentration factor (BCF) of less than 100. This material is not expected to significantly bioaccumulate. When released into the air, this material may be moderately degraded by reaction with photochemically produced hydroxyl radicals. When released into the air, this material is expected to have a half-life between 1 and 10 days.
Environmental Toxicity:
The LC50/96-hour values for fish are between 10 and 100 mg/l. This material is expected to be slightly toxic to aquatic life.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved incinerator or disposed in a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: TRICHLOROETHYLENE
Hazard Class: 6.1
UN/NA: UN1710

Packing Group: III
Information reported for product/size: 5GL

International (Water, I.M.O.)

Proper Shipping Name: TRICHLOROETHYLENE
Hazard Class: 6.1
UN/NA: UN1710
Packing Group: III
Information reported for product/size: 5GL

International (Air, I.C.A.O.)

Proper Shipping Name: TRICHLOROETHYLENE
Hazard Class: 6.1
UN/NA: UN1710
Packing Group: III
Information reported for product/size: 5GL

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15. Regulatory Information

--------\Chemical Inventory Status - Part 1\--------

Ingredient	TSCA	EC	Japan	Australia
Trichloroethylene (79-01-6)	Yes	Yes	Yes	Yes

--------\Chemical Inventory Status - Part 2\--------

Ingredient	Korea	--Canada-- DSL	NDSL	Phil.
Trichloroethylene (79-01-6)	Yes	Yes	No	Yes

--------\Federal, State & International Regulations - Part 1\--------

Ingredient	-SARA 302- RQ	TPQ	------SARA 313------ List	Chemical Catg.
Trichloroethylene (79-01-6)	No	No	Yes	No

--------\Federal, State & International Regulations - Part 2\--------

Ingredient	CERCLA	-RCRA- 261.33	-TSCA- 8(d)
Trichloroethylene (79-01-6)	100	U228	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No
Reactivity: No (Pure / Liquid)

WARNING:

THIS PRODUCT CONTAINS A CHEMICAL(S) KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER.

Australian Hazchem Code: No information found.
Poison Schedule: S6
WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

---

16. Other Information

NFPA Ratings: Health: **2** Flammability: **1** Reactivity: **0**
Label Hazard Warning:
WARNING! HARMFUL IF SWALLOWED OR INHALED. AFFECTS HEART, CENTRAL NERVOUS SYSTEM, LIVER AND KIDNEYS. CAUSES SEVERE SKIN IRRITATION. CAUSES IRRITATION TO EYES AND RESPIRATORY TRACT. SUSPECT CANCER HAZARD. MAY CAUSE CANCER. Risk of cancer depends on level and duration of exposure.
Label Precautions:
Do not get in eyes, on skin, or on clothing.
Do not breathe vapor.
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.
Keep away from heat and flame.
Label First Aid:
If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. In all cases call a physician. Note to physician: Do not administer adrenaline or epinephrine to a victim of chlorinated solvent poisoning.
Product Use:
Laboratory Reagent.
Revision Information:
MSDS Section(s) changed since last revision of document include: 8, 11.
Disclaimer:
****

Mallinckrodt Baker, Inc. provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose. MALLINCKRODT BAKER, INC. MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A

PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS. ACCORDINGLY, MALLINCKRODT BAKER, INC. WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM USE OF OR RELIANCE UPON THIS INFORMATION.

****

Prepared by: Strategic Services Division
Phone Number: (314) 539-1600 (U.S.A.)

Flammables-area.

**** SECTION 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION ****

Engineering Controls:

Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low. Use adequate general or local explosion-proof ventilation to keep airborne levels to acceptable levels.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
1,1-Dichloroethane	100 ppm	100 ppm TWA; 400 mg/m3 TWA; see Appendix C (Chloroethanes) for supplementary exposure limits 3000 ppm IDLH	100 ppm TWA; 400 mg/m3 TWA

OSHA Vacated PELs:

1,1-Dichloroethane:
100 ppm TWA; 400 mg/m3 TWA

Personal Protective Equipment

Eyes:

Wear chemical goggles. Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin:

Wear appropriate protective gloves to prevent skin exposure.

Clothing:

Wear appropriate protective clothing to prevent skin exposure.

Respirators:

A respiratory protection program that meets OSHA's 29 CFR §1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.

**** SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES ****

Physical State:	Liquid
Appearance:	clear colorless to very faint yellow
Odor:	None reported.
pH:	Not available.
Vapor Pressure:	244 mbar @ 20 C
Vapor Density:	3.41
Evaporation Rate:	Not available.
Viscosity:	Not available.
Boiling Point:	57 deg C @ 760.00mm Hg
Freezing/Melting Point:	-97 deg C
Autoignition Temperature:	660 deg C (1,220.00 deg F)
Flash Point:	-10 deg C (14.00 deg F)
NFPA Rating:	(est.) Health: 2; Flammability: 3; Reactivity: 0
Explosion Limits, Lower:	.16 vol %
Upper:	.06 vol %
Decomposition Temperature:	
Solubility:	0.5g/100ml
Specific Gravity/Density:	1.1770g/cm3
Molecular Formula:	C2H4Cl2
Molecular Weight:	98.96

**** SECTION 10 - STABILITY AND REACTIVITY ****

Chemical Stability:
Stable under normal temperatures and pressures.
Conditions to Avoid:
Incompatible materials, ignition sources, excess heat, strong oxidants.
Incompatibilities with Other Materials:
Oxidizing agents.
Hazardous Decomposition Products:
Hydrogen chloride, phosgene, carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.
Hazardous Polymerization: Has not been reported.

**** SECTION 11 - TOXICOLOGICAL INFORMATION ****

RTECS#:
CAS# 75-34-3: KI0175000
LD50/LC50:
CAS# 75-34-3: Inhalation, rat: LC50 =13000 ppm/4H; Oral, rat: LD50 = 725 mg/kg.
Carcinogenicity:
1,1-Dichloroethane -
ACGIH: A4 - Not Classifiable as a Human Carcinogen
California: carcinogen; initial date 1/1/90
Epidemiology:
No information available.
Teratogenicity:
No information available.
Reproductive Effects:
No information available.
Neurotoxicity:
No information available.
Mutagenicity:
No information available.
Other Studies:
See actual entry in RTECS for complete information.

**** SECTION 12 - ECOLOGICAL INFORMATION ****

**** SECTION 13 - DISPOSAL CONSIDERATIONS ****

Chemical waste generators must determine whether a discarded chemical is classif as a hazardous waste.
US EPA guidelines for the classification determination are listed in 40 CFR Part Additionally, waste generators must consult state and local hazardous waste regu ensure complete and accurate classification.
RCRA P-Series: None listed.
RCRA U-Series: CAS# 75-34-3: was a number U076.

**** SECTION 14 - TRANSPORT INFORMATION ****

US DOT
Shipping Name: 1,1-DICHLOROETHANE
Hazard Class: 3
UN Number: UN2362
Packing Group: II
Canadian TDG
Shipping Name: 1,1-DICHLOROETHANE
Hazard Class: 3
UN Number: UN2362
Other Information: FLASHPOINT -10 C

**** SECTION 15 - REGULATORY INFORMATION ****

US FEDERAL
TSCA

CAS# 75-34-3 is listed on the TSCA inventory.
Health & Safety Reporting List
CAS# 75-34-3: Effective Date: June 1, 1987; Sunset Date: June 1, 1997
Chemical Test Rules
None of the chemicals in this product are under a Chemical Test Rule.
Section 12b
CAS# 75-34-3: 4/12b
TSCA Significant New Use Rule
None of the chemicals in this material have a SNUR under TSCA.

SARA
Section 302 (RQ)
CAS# 75-34-3: final RQ = 1000 pounds (454 kg)
Section 302 (TPQ)
None of the chemicals in this product have a TPQ.
Section 313
This material contains 1,1-Dichloroethane (CAS# 75-34-3, 99%),which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 372.

Clean Air Act:
CAS# 75-34-3 is listed as a hazardous air pollutant (HAP).
This material does not contain any Class 1 Ozone depletors.
This material does not contain any Class 2 Ozone depletors.

Clean Water Act:
None of the chemicals in this product are listed as Hazardous Substances under the CWA.
CAS# 75-34-3 is listed as a Priority Pollutant under the Clean Water Act.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:
None of the chemicals in this product are considered highly hazardous by OSHA.

STATE
1,1-Dichloroethane can be found on the following state right to know lists: California, New Jersey, Florida, Pennsylvania, Minnesota, Massachusetts.
The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:
WARNING: This product contains 1,1-Dichloroethane, a chemical known to the state of California to cause cancer.
California No Significant Risk Level:
CAS# 75-34-3: no significant risk level = 100 ug/day

European/International Regulations
European Labeling in Accordance with EC Directives
Hazard Symbols: XN F
Risk Phrases:
R 11 Highly flammable.
R 22 Harmful if swallowed.
R 36/37 Irritating to eyes and respiratory system.
R 52/53 Harmful to aquatic organisms; may cause long-term adverse effects in the aquatic environment.
Safety Phrases:
S 9 Keep container in a well-ventilated place.
S 16 Keep away from sources of ignition - No smoking.
S 23 Do not inhale gas/fumes/vapour/spray.
S 28A After contact with skin, wash immediately with plenty of water.
S 33 Take precautionary measures against static discharges.
S 37 Wear suitable gloves.
S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S 61 Avoid release to the environment. Refer to special instructions/Safety data sheets.

WGK (Water Danger/Protection)
CAS# 75-34-3: 3
United Kingdom Occupational Exposure Limits
CAS# 75-34-3: OES-United Kingdom, TWA 200 ppm TWA; 823 mg/m3 TWA

CAS# 75-34-3: OES-United Kingdom, STEL 400 ppm STEL; 1650 mg/m3 STEL
Canada

CAS# 75-34-3 is listed on Canada's DSL/NDSL List.
This product has a WHMIS classification of B2, D2B.
CAS# 75-34-3 is not listed on Canada's Ingredient Disclosure List.
Exposure Limits

CAS# 75-34-3: OEL-ARAB Republic of Egypt
OEL-AUSTRALIA:TWA 200 ppm (810 mg/m3);STEL 250 pp (1010 mg/m3)
OEL-AUSTRIA:TWA 100 ppm (400 mg/m3)
OEL-BELGIUM:TWA 200 ppm (810 mg/m3);STEL 250 ppm (1010 mg/m3)
OEL-DENMARK:TWA 100 ppm (400 mg/m3)
OEL-FINLAND:TWA 100 ppm (400 mg/m3);STEL 250 ppm (1000 mg/m3)
OEL-FRANCE:TWA 200 ppm (810 mg/m3)
OEL-GERMANY:TWA 100 ppm (400 mg/m3)
OEL-JAPAN:TWA 100 ppm (400 mg/m3)
OEL-THE NETHERLANDS:TWA 200 ppm (820 mg/m3)
OEL-THE PHILIPPINES:TWA 100 ppm (400 mg/m3)
OEL-RUSSIA:TWA 100 ppm
OEL-SWITZERLAND:TWA 100 ppm (400 mg/m3);STEL 200 ppm (800 mg/m3)
OEL-THAILAND:TWA 50 ppm;STEL 100 ppm
OEL-TURKEY:TWA 100 ppm (400 mg/m3)
OEL-UNITED KINGDOM:TWA 200 ppm (810 mg/m3);STEL 400 ppm
OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA check ACGIH TLV
OEL IN NEW ZEALAND, SINGAPORE, VIETNAM check ACGI TLV

**** SECTION 16 - ADDITIONAL INFORMATION ****

MSDS Creation Date: 9/02/1997 Revision #5 Date: 8/02/2000

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no way shall the company be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if the company has been advised of the possibility of such damages.

1,2-Dichloroethane, 99.8+% (GC) ACROS96087

**** SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION ****

MSDS Name: 1,2-Dichloroethane, 99.8+% (GC)
Catalog Numbers:
AC113360000, AC113360010, AC113360025, AC113360250, AC113361000
Synonyms:
Ethylene Dichloride; 1,2- Ethylene Dichloride; Glycol Dichloride; Ethane 1,2-Dichloro-.
Company Identification (Europe): Acros Organics N.V.
Janssen Pharmaceuticalaan 3a
2440 Geel, Belgium
Company Identification (USA): Acros Organics
One Reagent Lane
Fairlawn, NJ 07410
For information in North America, call: 800-ACROS-01
For information in Europe, call: 0032(0) 14575211
For emergencies in the US, call CHEMTREC: 800-424-9300
For emergencies in Europe, call: 0032(0) 14575299

**** SECTION 2 - COMPOSITION, INFORMATION ON INGREDIENTS ****

CAS#	Chemical Name	%	EINECS#
107-06-2	1,2-DICHLOROETHANE	>99.8	203-458-1

Hazard Symbols: T F
Risk Phrases: 11 22 36/37/38 45

**** SECTION 3 - HAZARDS IDENTIFICATION ****

EMERGENCY OVERVIEW

Appearance: colourless. Flash Point: 58 deg F.
Warning! Flammable liquid. Causes respiratory tract irritation. May cause digestive tract irritation. Irritant. May be harmful if swallowed. May cause central nervous system depression. May cause liver and kidney damage. Causes eye and skin irritation. May cause cancer based on animal studies. Potential cancer hazard.
Target Organs: Kidneys, central nervous system, liver.

Potential Health Effects

Eye:

Causes eye irritation. Vapors may cause eye irritation. May cause chemical conjunctivitis and corneal damage.

Skin:

Causes skin irritation. May be absorbed through the skin. May cause irritation and dermatitis. May cause cyanosis of the extremities.

Ingestion:

May cause central nervous system depression, kidney damage, and liver damage. May cause gastrointestinal irritation with nausea, vomiting and diarrhea. May cause liver and kidney damage. May cause effects similar to those for inhalation exposure. May be harmful if swallowed.

Inhalation:

Inhalation of high concentrations may cause central nervous system effects characterized by headache, dizziness, unconsciousness and coma. Causes respiratory tract irritation. May cause liver and kidney damage. Aspiration may lead to pulmonary edema. Vapors may cause

dizziness or suffocation. Can produce delayed pulmonary edema. May cause burning sensation in the chest.

Chronic:

Possible cancer hazard based on tests with laboratory animals. Prolonged or repeated skin contact may cause dermatitis. Prolonged or repeated eye contact may cause conjunctivitis. May cause liver and kidney damage. Effects may be delayed.

**** SECTION 4 - FIRST AID MEASURES ****

Eyes:

Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin:

Get medical aid. Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion:

Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation:

Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid. DO NOT use mouth-to-mouth respiration.

Notes to Physician:

Treat symptomatically and supportively.

**** SECTION 5 - FIRE FIGHTING MEASURES ****

General Information:

As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Vapors may form an explosive mixture with air. Vapors can travel to a source of ignition and flash back. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Will burn if involved in a fire. Use water spray to keep fire-exposed containers cool. Containers may explode in the heat of a fire. Flammable Liquid. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas. May polymerize explosively when involved in a fire.

Extinguishing Media:

For small fires, use dry chemical, carbon dioxide, water spray or alcohol-resistant foam. For large fires, use water spray, fog, or alcohol-resistant foam. Use water spray to cool fire-exposed containers. Water may be ineffective. Do NOT use straight streams of water.

**** SECTION 6 - ACCIDENTAL RELEASE MEASURES ****

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks:

Absorb spill with inert material, (e.g., dry sand or earth), then place into a chemical waste container. Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Remove all sources of ignition. Use a spark-proof tool. Provide ventilation. A vapor suppressing foam may be used to reduce vapors.

**** SECTION 7 - HANDLING and STORAGE ****

Handling:

Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Ground and bond containers when transferring material. Use spark-proof tools and explosion proof equipment. Avoid contact with eyes, skin, and clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep

container tightly closed. Avoid contact with heat, sparks and flame. Avoid ingestion and inhalation. Use with adequate ventilation. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.

Storage:

Keep away from heat, sparks, and flame. Keep away from sources of ignition. Store in a tightly closed container. Keep from contact with oxidizing materials. Store in a cool, dry, well-ventilated area away from incompatible substances. Flammables-area.

**** SECTION 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION ****

Engineering Controls:

Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local explosion-proof ventilation to keep airborne levels to acceptable levels.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
1,2-DICHLOROETHANE	10 ppm	1 ppm TWA; 4 mg/m3 TWA; NIOSH Potential Occupational Carcinogen - see Appendix A ; see Appendix C (Chloroethanes) for supplementary exposure limits Potential NIOSH carcinogen.	50 ppm TWA; C 100 ppm; C 100 ppm

OSHA Vacated PELs:

1,2-DICHLOROETHANE:

1 ppm TWA; 4 mg/m3 TWA

Personal Protective Equipment

Eyes:

Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin:

Wear appropriate protective gloves to prevent skin exposure.

Clothing:

Wear appropriate protective clothing to prevent skin exposure.

Respirators:

A respiratory protection program that meets OSHA's 29 CFR §1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.

**** SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES ****

Physical State:	Liquid
Appearance:	colourless
Odor:	chloroform-like
pH:	Not available.
Vapor Pressure:	66 mm Hg @ 20 C
Vapor Density:	3.5 (Air=1)
Evaporation Rate:	0.3 (Butyl acetate=1)
Viscosity:	Not available.
Boiling Point:	181 deg F

Freezing/Melting Point:	-31.9 deg F
Autoignition Temperature:	775 deg F (412.78 deg C)
Flash Point:	58 deg F (14.44 deg C)
NFPA Rating:	(est.) Health: 2; Flammability: 3; Reactivity: 0
Explosion Limits, Lower:	6.2
Upper:	15.9
Decomposition Temperature:	Not available.
Solubility:	Silghtly soluble in water
Specific Gravity/Density:	1.26 (Water=1)
Molecular Formula:	C2H4Cl2
Molecular Weight:	98.934

**** SECTION 10 - STABILITY AND REACTIVITY ****

Chemical Stability:
Stable at room temperature in closed containers under normal storage and handling conditions.
Conditions to Avoid:
Incompatible materials, ignition sources, excess heat, electrical sparks.
Incompatibilities with Other Materials:
Aluminum, bases, alkali metals, ketones, organic peroxides, nitric acid, strong oxidizing agents, strong reducing agents, liquid ammonia.
Hazardous Decomposition Products:
Hydrogen chloride, carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.
Hazardous Polymerization: Has not been reported.

**** SECTION 11 - TOXICOLOGICAL INFORMATION ****

RTECS#:
CAS# 107-06-2: KI0525000
LD50/LC50:
CAS# 107-06-2: Inhalation, rat: LC50 =1000 ppm/7H; Oral, mouse: LD50 = 413 mg/kg; Oral, rabbit: LD50 = 860 mg/kg; Oral, rat: LD50 = 670 mg/kg; Skin, rabbit: LD50 = 2800 mg/kg.
Carcinogenicity:
1,2-DICHLOROETHANE -
ACGIH: A4 - Not Classifiable as a Human Carcinogen
California: carcinogen; initial date 10/1/87
NIOSH: occupational carcinogen
NTP: Suspect carcinogen
OSHA: Possible Select carcinogen
IARC: Group 2B carcinogen
Epidemiology:
IARC Group 2B: Proven animal carcinogenic substance of potential relevance to humans. IARC Group 2B: No data available on human carcinogenicity, however sufficient evidence of carcinogenicity in animals.
Teratogenicity:
May cause decreased fertility and other adverse effects in pregnant female rats and the progeny of the first generation, but not of the second, by giving them repeated 4-hr/day exposures to 57 mg/m3. Death, Ihl-rat, TCLo=20100 ug/m3/1H (female 7-14D post); Stunted fetus, Oral-rat, TDLo=1260 mg/kg (6-15D preg) Developmental abnormalities: Craniofacial, Ihl-mouse, TCLo=100 ppm/7H (female 6-15D post); Musculoskeletal, Oral-rat, TDLo=1260 mg/kg (6-15D preg)
Reproductive Effects:
No information found.
Neurotoxicity:
No information found.
Mutagenicity:
No information found.
Other Studies:
See actual entry in RTECS for complete information.

**** SECTION 12 - ECOLOGICAL INFORMATION ****

Ecotoxicity:

The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:
WARNING: This product contains 1,2-DICHLOROETHANE, a chemical known to the state of California to cause cancer.
California No Significant Risk Level:
CAS# 107-06-2: no significant risk level = 10 ug/day

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols: T F

Risk Phrases:

R 11 Highly flammable.
R 22 Harmful if swallowed.
R 36/37/38 Irritating to eyes, respiratory system and skin.
R 45 May cause cancer.

Safety Phrases:

S 53 Avoid exposure - obtain special instructions before use.
S 9 Keep container in a well-ventilated place.
S 16 Keep away from sources of ignition - No smoking.
S 33 Take precautionary measures against static discharges.
S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

WGK (Water Danger/Protection)
CAS# 107-06-2: 3

United Kingdom Occupational Exposure Limits

Canada

CAS# 107-06-2 is listed on Canada's DSL/NDSL List.
This product has a WHMIS classification of B2, D2B, D2A.
CAS# 107-06-2 is not listed on Canada's Ingredient Disclosure List.

Exposure Limits

CAS# 107-06-2: OEL-ARAB Republic of Egypt:TWA 5 ppm (2 mg/m3)
OEL-AUSTRALIA:TWA 10 ppm (40 mg/m3)
OEL-AUSTRIA:TWA 20 ppm (80 mg/m3)
OEL-BELGIUM:TWA 10 ppm (40 mg/m3)
OEL-DENMARK:TWA 1 ppm (4 mg/m3);Skin
OEL-FINLAND:TWA 10 ppm (40 mg/m3);STEL 20 ppm (80 mg/m3);CAR
OEL-FRANCE:TWA 10 ppm (40 mg/m3)
OEL-GERMANY;Carcinogen
OEL-HUNGARY:STEL 4 mg/m3;Carcinogen
OEL-JAPAN:TWA 10 ppm (40 mg/m3)
OEL-THE NETHERLANDS:TWA 50 ppm (200 mg/m3)
OEL-THE PHILIPPINES:TWA 50 ppm (200 mg/m3)
OEL-RUSSIA:TWA 10 ppm
OEL-SWEDEN:TWA 1 ppm (4 mg/m3);STEL 5 ppm (20 mg/m3);Skin;CAR
OEL-SWITZERLAND:TWA 10 ppm (40 mg/m3);STEL 20 ppm (80 mg/m3)
OEL-TURKEY:TWA 50 ppm (200 mg/m3)
OEL-UNITED KINGDOM:TWA 10 ppm (40 mg/m3);STEL 15 ppm (60 mg/m3)
OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA check ACGIH TLV
OEL IN NEW ZEALAND, SINGAPORE, VIETNAM check ACGI TLV

**** SECTION 16 - ADDITIONAL INFORMATION ****

MSDS Creation Date: 9/02/1997 Revision #4 Date: 8/02/2000

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no way shall the company be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if the company has been advised of the possibility of such damages.

Seton Resource Center

Allow access to non-virtual folders: 0

Appendix C

HEALTH AND SAFETY PLAN ACCEPTANCE
AND TRAINING ACKNOWLEDGMENT

Instructions: This form is to be completed by each person that works on the Rose Cleaners' IHWDS Investigation Work Plan site and returned to the Site Safety and Health Officer.

I have read and agree to abide by the contents of the SITE-SPECIFIC HEALTH AND SAFETY PLAN for work activities at the site. I have completed the training requirements specified in the plan. I am currently participating in a medical surveillance program that satisfies the requirements of CFR 1910.120.

Signature:	Date:
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Return to:

Site Safety and Health Officer or

Berninger Environmental

17 Old Dock Road Yaphank, NY

RAPID INTERVENTION

Certificate of Completion

JUSTIN HALPIN

Has Successfully Completed The Requirements Of Training For

Hazardous Waste Operations and Emergency Response–8 Hour Refresher Course

29 CFR/OSHA Part 1910.120

Dated this 1st Day of March, 2008

Director of Training

RAPID INTERVENTION

Certificate of Completion

WALTER BERNINGER

Has Successfully Completed The Requirements Of Training For

Hazardous Waste Operations and Emergency Response–8 Hour Refresher Course

29 CFR/OSHA Part 1910.120

Dated this 1st Day of March, 2008

Director of Training

RAPID

INTERVENTION

Certificate of Completion

JOEL MEYERS

Has Successfully Completed The Requirements Of Training For

Hazardous Waste Operations and Emergency Response–8 Hour Refresher Course

29 CFR/OSHA Part 1910.120

Dated this 1st Day of March, 2008

Director of Training

RAPID

INTERVENTION

Certificate of Completion

EUSI WATKINS

Has Successfully Completed The Requirements Of Training For

Hazardous Waste Operations and Emergency Response–8 Hour Refresher Course

29 CFR/OSHA Part 1910.120

Dated this 1st Day of March, 2008

Director of Training

CERTIFICATE OF TRAINING

Alicia Patti

Has Successfully Completed A Course Of Instruction On

40-Hour HAZWOPER

AS REQUIRED BY OSHA (29 CFR 1910.120(e)(q))

Course Completed: 6/5/2015

Course Number: 20150067

Certificate Number: 20150067-16199

MILLER ENVIRONMENTAL GROUP INC.
538 Edwards Ave.
Calverton, NY 11933 USA

Randy Nelson

Instructor

Shaun C. Reardon

Director of Training

Appendix-B

December 2001 Investigation Report

Tyree Brothers Environmental Services, Inc.

208 Route 109, Farmingdale, NY 11735 · Fax: 631-249-3281 · Phone: 631-249-3150

January 24, 2002

Rose Cleaners
500 Lexington Avenue
Mount Kisco, New York 10549
Attention: John Kim

Re: Premises
Spill # 01-09709

Dear Mr. Kim:

On December 21, 2001, Tyree Brothers Environmental Services, Inc. (TBES) performed a limited subsurface investigation at the above-referenced dry cleaners. The (2) soil borings were manually drilled at the site. The locations of the borings were chosen based on the presence of any exhaust piping and/or any location that would have the potential for chemical dumping. A grab sample was also obtained from a stream on the western side of the building. The three (3) locations were sampled by a field hydrogeologist. A hand-operated soil auger was utilized to obtain soil samples from the targeted areas (see enclosed Site Map). A disposal polyethylene bailer was utilized to obtain the stream sample. This investigation was conducted based upon a request from the present tenant.

Soil samples were collected at two (2) locations, one directly adjacent to the stoop by the back door, at a depth of 2.5 to 3 feet, and one on the side of the building near the exhaust/ discharge piping at a depth of 3 to 4 feet. The increment with the highest photoionization detector reading was jarred for laboratory analysis. These two (2) samples (SB-1 and SB-2) were hand delivered under chain of custody documentation to a New York State certified laboratory. These samples were analyzed for volatile organic compounds via EPA method 8260. The results of the laboratory analysis were compared to New York State Department of Environmental Conservation (NYSDEC) Determination of Soil Cleanup Objectives and Cleanup Levels, December 20, 2000.

The sampled soils were screened using a photoionization detector. The PID meter is used to measure organic vapors as they evolve from the soil. The readings are not exact determinations of true volatile content, but instead provide qualitative indications of the degree of volatile organic contamination. The readings ranged from 1.1 to 36.7 ppm, and are listed on the enclosed boring logs. It should be noted that the hydrogeologist detected neither odors nor staining on site.

Laboratory results indicated that volatile organic compounds were detected in both of the soil samples. All concentrations in SB-1 were within NYSDEC acceptable levels. Sample SB-2 contained a concentration of one (1) compound (tetrachloroethene) that greatly exceeded NYSDEC soil guidelines (see Table 1).

A surface water sample was collected from a downstream location, between the dry cleaners and the adjacent commercial property, and was hand delivered under chain of custody documentation to a New York State certified laboratory. The stream was located in back (west) of the dry cleaners.

This sample was analyzed for volatile organic compounds via EPA method 8260. The results of the laboratory analysis were compared to the Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1, Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations, April 2000.

Volatile organic compounds were also detected in the sample taken from the stream. The stream sample contained concentrations of volatiles that exceeded NYSDEC surface water standards for two (2) compounds (c-1,2- Dichloroethene and Tetrachloroethene). See Table 2 for a summary of the stream sampling results.

Due to the presence of concentrations of volatiles that exceeded NYSDEC standards for soil and surface water, spill number 01-09709 was assigned to this site. Ms. Jiana Alezza a NYSDEC case manager has been assigned to this site.

Due to the levels of volatile organic compounds above NYSDEC guidelines found in the two soil borings and the stream it is recommended that an extended Phase II investigation, utilizing a Geoprobe drill rig be performed. The necessity for further cleanup procedures are to be determined by the New York State Department of Environmental Conservation upon their review of the laboratory results.

If you have questions regarding any of the enclosed information, please feel free to contact me at (631) 249-3150, extension 319.

Sincerely,

Dennis Madigan
Project Manager

Reviewed by:

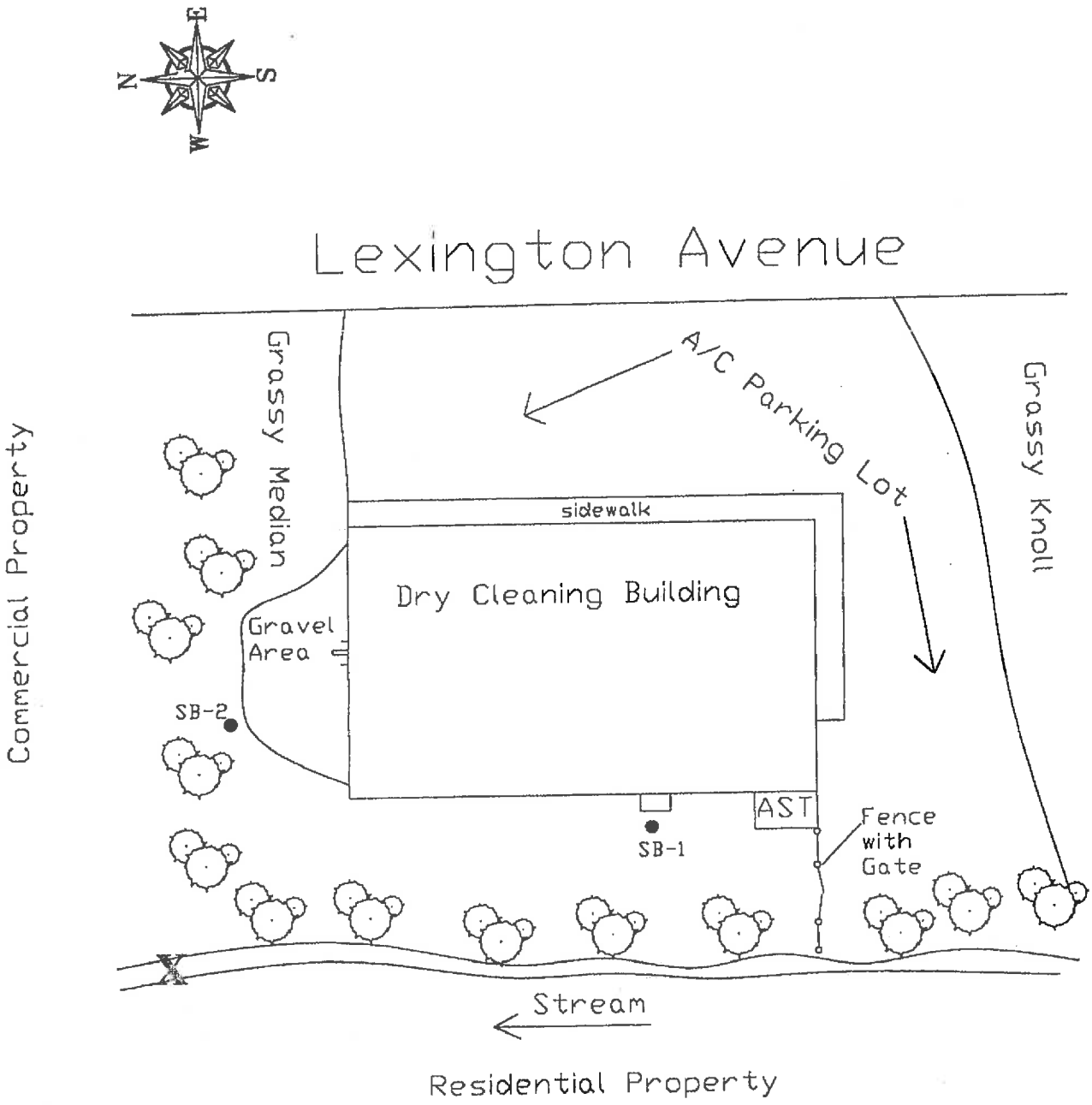
Dawn M. Ruffini
Consulting Group Manager

Enclosures

cc: Jiana Alezza - NYSDEC Region 3

Member
The Tyree Organization

Site Map



Legend

- Trees/Woodland Area
- SB-1 Soil Boring Location
- X Water-Grab Sample Location

Tyree Brothers Environmental Services, Inc.
Phone: (631) 249-3150 Fax: (631) 249-3281
208 Route 109
FARMINGDALE, NY 11735

FIGURE 1: SITE MAP

Rose Cleaners
500 Lexington Avenue
Mt. Kisco, N.Y.

DRAWN BY: Jerry Zolobkowski
DATE: 1/8/02
SCALE: NTS
PLATE:

Tables

Table 1

Summary of Soil Analytical Results
Soil Borings SB-1 and Sb-2
Volatile Organic Compounds
via EPA method 8260
(Concentrations in ppb)

Compound	SB-1 (2.5-3' b.g.)	SB-2 (3-4' b.g.)	Guidance Value
Acetone	31.4	10.4	200
Methylene Chloride	5.6	*	100
Methyl t-butyl ether	11.6	*	120
c-1,2-Dichloroethene	133	13	300**
Trichloroethene	294	31.3	700
Toluene	8.2	*	1,500
Tetrachloroethene	591	**12,400**	1,400

* Analytical value was detected below its respective method detection limit.
** For 1,2-Dichloroethene (trans)
Bold numbers indicate concentrations above the guidance values.

Table 2

Summary of Surface Water Analytical Results
Stream
Volatile Organic Compounds
via EPA method 8260
(Concentrations in ppb)

Compound	Stream	Standard
Acetone	7.9	50
Methylene Chloride	*	5
Methyl t-butyl ether	*	10
c-1,2-Dichloroethene	**5.1**	5
Trichloroethene	2.3	5
Toluene	*	5
Tetrachloroethene	**9.3**	0.7

* Analytical value was detected below its respective method detection limit.
Bold numbers indicate concentrations above the guidance values.

Boring Logs

Tyree Brothers Environmental Services, Inc.

208 Route 109

Farmingdale, New York 11735

Location: Rose Cleaners 500 Lexington Avenue Mt. Kisco, NY	Drill Rig: N/A Drill Method: Hand Auger Driller: Jerry Zolobkowski Logged By: Jerry Zolobkowski Sample Type: Grab Date: 12/21/01 Weather: Cloudy, 30's	Bore Hole/Well Data Diam. (in.): 4 Screen Lgth. (ft): ---- Depth (ft.): 3 Screen Intvl. (ft): ---- Casing Diam. (in.)--- Screen Type: ---- Casing Lgth. (ft): --- Screen Slot: ---- Boring Number: SB-1 DTW (ft): --	

Depth Below Grade	P.I.D. Readings (ppm)	Recovery	Field Description of Soil:	Drillers Remarks:
0	9.1	12"	Brown, silty sand with organics and small pebbles	No odor
	13.8	12"		
	7.8	12"		
			Boring terminated @ 3'	
5				
10				
15				
20				
25				
30				
35				
40				
45				
50				

Tyree Brothers Environmental Services, Inc.

208 Route 109

Farmingdale, New York 11735

Location: Rose Cleaners 500 Lexington Avenue Mt. Kisco, NY	Drill Rig: N/A Drill Method: Hand Auger Driller: Jerry Zolobkowski Logged By: Jerry Zolobkowski Sample Type: Grab Date: 12/21/01 Weather: Cloudy, 30's	Bore Hole/Well Data Diam. (in.): 4 Screen Lgth. (ft): ---- Depth (ft.): 4 Screen Intvl. (ft): ---- Casing Diam. (in.)--- Screen Type: ---- Casing Lgth. (ft): --- Screen Slot: ---- Boring Number: SB-2 DTW (ft): --	

Depth Below Grade	P.I.D. Readings (ppm)	Recovery	Field Description of Soil:	Drillers Remarks:
0	1.1	12"	Dark brown, silty sand with organics	No odor
	17.9	12"	Brown, clayey sand	No odor
	10.4	12"		
	36.7	12"	Brown, sandy clay	No odor
			Boring terminated @ 4'	
5				
10				
15				
20				
25				
30				
35				
40				
45				
50				

Laboratory Results

Environmental Testing Laboratories, Inc.
208 Route 109, Farmingdale NY 11735
Phone - 631-249-1456 Fax - 631-249-8344

01/03/2002

Custody Document: M6689

Received: 12/26/2001 10:03
Sampled by: Jerry Zolobkowski
Job Number: 17185

Client: Tyree Bros Env #20 (83140)
208 Route 109
Farmingdale,
NY 11735

Project: Rose Cleaners
500 Lexington Avenue

Manager: Dennis Madigan

Respectfully submitted,

Laboratory Manager

NYS Lab ID # 10969
NJ Cert. # 73812
CT Cert. # PH0645
MA Cert. # NY061
PA Cert. # 68-535
VA Cert. # 108
NH Cert. # 252592-BA
RI Cert. # 161

Environmental Testing Laboratories, Inc.
208 Route 109, Farmingdale NY 11735
Phone - 631-249-1456 Fax - 631-249-8344

01/03/2002

Volatiles - EPA 8260B

Sample: M6689-1
Client Sample ID: SB-1 2.5-3'
Matrix: Soil
Remarks: See Case Narrative
Analyzed Date: 12/28/2001

Type: Grab

Collected: 12/21/2001
% Solid: 81.6%

Cas No	Analyte	File ID	MDL	Concentration	Units	Q
75-71-8	Dichlorodifluoromethane	A415-5992	1.66	1.66	ppb	U
75-45-6	Chlorodifluoromethane	A415-5992	1.47	1.47	ppb	U
74-87-3	Chloromethane	A415-5992	2.08	2.08	ppb	U
75-01-4	Vinyl Chloride	A415-5992	1.53	1.53	ppb	U
74-83-9	Bromomethane	A415-5992	2.57	2.57	ppb	U
75-00-3	Chloroethane	A415-5992	1.35	1.35	ppb	U
75-69-4	Trichlorofluoromethane	A415-5992	1.59	1.59	ppb	U
76-13-1	1,1,2-Trichlorotrifluoroethane	A415-5992	1.59	1.59	ppb	U
75-35-4	1,1-Dichloroethene	A415-5992	1.41	1.41	ppb	U
67-64-1	Acetone	A415-5992	38.1	31.4	ppb	J
75-15-0	Carbon disulfide	A415-5992	1.59	1.59	ppb	U
75-09-2	Methylene Chloride	A415-5992	3.43	5.60	ppb	
156-60-5	t-1,2-Dichloroethene	A415-5992	1.66	1.66	ppb	U
1634-04-4	Methyl t-butyl ether	A415-5992	1.29	11.6	ppb	
75-34-3	1,1-Dichloroethane	A415-5992	1.41	1.41	ppb	U
590-20-7	2,2-Dichloropropane	A415-5992	1.10	1.10	ppb	U
156-59-2	c-1,2-Dichloroethene	A415-5992	1.16	133	ppb	
78-93-3	2-Butanone	A415-5992	30.6	30.6	ppb	U
74-97-5	Bromochloromethane	A415-5992	1.66	1.66	ppb	U
67-66-3	Chloroform	A415-5992	1.47	1.47	ppb	U
71-55-6	1,1,1-Trichloroethane	A415-5992	1.47	1.47	ppb	U
56-23-5	Carbon Tetrachloride	A415-5992	1.29	1.29	ppb	U
563-58-6	1,1-Dichloropropene	A415-5992	2.39	2.39	ppb	U
71-43-2	Benzene	A415-5992	1.47	1.47	ppb	U
107-06-2	1,2-Dichloroethane	A415-5992	0.67	0.67	ppb	U
79-01-6	Trichloroethene	A415-5992	0.80	294	ppb	
78-87-5	1,2-Dichloropropane	A415-5992	0.37	0.37	ppb	U
74-95-3	Dibromomethane	A415-5992	0.98	0.98	ppb	U
75-27-4	Bromodichloromethane	A415-5992	0.80	0.80	ppb	U
110-75-8	2-Chloroethylvinylether	A415-5992	1.53	1.53	ppb	U
10061-01-5	c-1,3-Dichloropropene	A415-5992	0.74	0.74	ppb	U
108-10-1	4-Methyl-2-pentanone	A415-5992	30.6	30.6	ppb	U
108-88-3	Toluene	A415-5992	0.61	8.20	ppb	
10061-02-6	t-1,3-Dichloropropene	A415-5992	0.86	0.86	ppb	U
79-00-5	1,1,2-Trichloroethane	A415-5992	0.74	0.74	ppb	U
127-18-4	Tetrachloroethene	A411-5916	30.6	591	ppb	

Environmental Testing Laboratories, Inc.
208 Route 109, Farmingdale NY 11735
Phone - 631-249-1456 Fax - 631-249-8344

01/03/2002

Volatiles - EPA 8260B

Sample: M6689-1...continue
Client Sample ID: SB-1 2.5-3'
Matrix: Soil
Remarks: See Case Narrative
Analyzed Date: 12/28/2001

Type: Grab

Collected: 12/21/2001
% Solid: 81.6%

Cas No	Analyte	File ID	MDL	Concentration	Units	Q
142-28-9	1,3-Dichloropropane	A415-5992	0.43	0.43	ppb	U
591-78-6	2-Hexanone	A415-5992	30.6	30.6	ppb	U
124-48-1	Dibromochloromethane	A415-5992	0.49	0.49	ppb	U
106-93-4	1,2-Dibromoethane	A415-5992	0.49	0.49	ppb	U
108-90-7	Chlorobenzene	A415-5992	0.43	0.43	ppb	U
630-20-6	1,1,1,2-Tetrachloroethane	A415-5992	0.18	0.18	ppb	U
100-41-4	Ethylbenzene	A415-5992	0.74	0.74	ppb	U
108-38-3	m,p-xylene	A415-5992	1.35	1.35	ppb	U
95-47-6	o-xylene	A415-5992	0.55	0.55	ppb	U
100-42-5	Styrene	A415-5992	0.86	0.86	ppb	U
75-25-2	Bromoform	A415-5992	0.37	0.37	ppb	U
98-82-8	Isopropylbenzene	A415-5992	0.43	0.43	ppb	U
108-86-1	Bromobenzene	A415-5992	0.80	0.80	ppb	U
79-34-5	1,1,2,2-Tetrachloroethane	A415-5992	0.55	0.55	ppb	U
103-65-1	n-Propylbenzene	A415-5992	0.61	0.61	ppb	U
96-18-4	1,2,3-Trichloropropane	A415-5992	0.67	0.67	ppb	U
622-96-8	p-Ethyltoluene	A415-5992	0.98	0.98	ppb	U
108-67-8	1,3,5-Trimethylbenzene	A415-5992	0.55	0.55	ppb	U
95-49-8	2-Chlorotoluene	A415-5992	0.74	0.74	ppb	U
106-43-4	4-Chlorotoluene	A415-5992	0.74	0.74	ppb	U
98-06-6	tert-Butylbenzene	A415-5992	0.67	0.67	ppb	U
95-63-6	1,2,4-Trimethylbenzene	A415-5992	0.61	0.61	ppb	U
135-98-8	sec-Butylbenzene	A415-5992	0.37	0.37	ppb	U
99-87-6	4-Isopropyltoluene	A415-5992	0.61	0.61	ppb	U
541-73-1	1,3-Dichlorobenzene	A415-5992	1.04	1.04	ppb	U
106-46-7	1,4-Dichlorobenzene	A415-5992	1.10	1.10	ppb	U
95-50-1	1,2-Dichlorobenzene	A415-5992	0.86	0.86	ppb	U
105-05-5	p-Diethylbenzene	A415-5992	0.98	0.98	ppb	U
104-51-8	n-Butylbenzene	A415-5992	0.98	0.98	ppb	U
95-93-2	1,2,4,5-Tetramethylbenzene	A415-5992	1.04	1.04	ppb	U
96-12-8	1,2-Dibromo-3-chloropropane	A415-5992	0.98	0.98	ppb	U
120-82-1	1,2,4-Trichlorobenzene	A415-5992	1.66	1.66	ppb	U
87-68-3	Hexachlorobutadiene	A415-5992	0.98	0.98	ppb	U
91-20-3	Naphthalene	A415-5992	2.70	2.70	ppb	U
87-61-6	1,2,3-Trichlorobenzene	A415-5992	1.72	1.72	ppb	U

Environmental Testing Laboratories, Inc.
208 Route 109, Farmingdale NY 11735
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01/03/2002

Volatiles - EPA 8260B

Sample: M6689-1...continue
Client Sample ID: SB-1 2.5-3'
Matrix: Soil
Remarks: See Case Narrative
Analyzed Date: 12/28/2001

Type: Grab

Collected: 12/21/2001
% Solid: 81.6%

Cas No	Surrogate	File ID	% Recovery	QC Limits	Q
460-00-4	4-BROMOFLUOROBENZENE	A411-5916	97.9 %	(77 - 123)	
2037-26-5	TOLUENE-D8	A411-5916	100.0 %	(73 - 127)	
4774-33-8	DIBROMOFLUOROMETHANE	A411-5916	99.8 %	(62 - 138)	
460-00-4	4-BROMOFLUOROBENZENE	A415-5992	97.0 %	(77 - 123)	
2037-26-5	TOLUENE-D8	A415-5992	96.9 %	(73 - 127)	
4774-33-8	DIBROMOFLUOROMETHANE	A415-5992	105.0 %	(62 - 138)	

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01/03/2002

Volatiles - EPA 8260B

Sample: M6689-2
Client Sample ID: SB-2 3-4'
Matrix: Soil
Remarks: See Case Narrative
Analyzed Date: 12/27/2001

Type: Grab

Collected: 12/21/2001
% Solid: 73.3%

Cas No	Analyte	File ID	MDL	Concentration	Units	Q
75-71-8	Dichlorodifluoromethane	A 409-5863	0.37	0.37	ppb	U
75-45-6	Chlorodifluoromethane	A 409-5863	0.33	0.33	ppb	U
74-87-3	Chloromethane	A 409-5863	0.46	0.46	ppb	U
75-01-4	Vinyl Chloride	A 409-5863	0.34	0.34	ppb	U
74-83-9	Bromomethane	A 409-5863	0.57	0.57	ppb	U
75-00-3	Chloroethane	A 409-5863	0.30	0.30	ppb	U
75-69-4	Trichlorofluoromethane	A 409-5863	0.35	0.35	ppb	U
76-13-1	1,1,2-Trichlorotrifluoroethane	A 409-5863	0.35	0.35	ppb	U
75-35-4	1,1-Dichloroethene	A 409-5863	0.31	0.31	ppb	U
67-64-1	Acetone	A 409-5863	8.46	10.4	ppb	
75-15-0	Carbon disulfide	A 409-5863	0.35	0.35	ppb	U
75-09-2	Methylene Chloride	A 409-5863	0.76	0.76	ppb	U
156-60-5	t-1,2-Dichloroethene	A 409-5863	0.37	0.37	ppb	U
1634-04-4	Methyl t-butyl ether	A 409-5863	0.29	0.29	ppb	U
75-34-3	1,1-Dichloroethane	A 409-5863	0.31	0.31	ppb	U
590-20-7	2,2-Dichloropropane	A 409-5863	0.24	0.24	ppb	U
156-59-2	c-1,2-Dichloroethene	A 409-5863	0.26	13.0	ppb	
78-93-3	2-Butanone	A 409-5863	6.80	6.80	ppb	U
74-97-5	Bromochloromethane	A 409-5863	0.37	0.37	ppb	U
67-66-3	Chloroform	A 409-5863	0.33	0.33	ppb	U
71-55-6	1,1,1-Trichloroethane	A 409-5863	0.33	0.33	ppb	U
56-23-5	Carbon Tetrachloride	A 409-5863	0.29	0.29	ppb	U
563-58-6	1,1-Dichloropropene	A 409-5863	0.53	0.53	ppb	U
71-43-2	Benzene	A 409-5863	0.33	0.33	ppb	U
107-06-2	1,2-Dichloroethane	A 409-5863	0.15	0.15	ppb	U
79-01-6	Trichloroethene	A 409-5863	0.18	31.3	ppb	
78-87-5	1,2-Dichloropropane	A 409-5863	0.082	0.082	ppb	U
74-95-3	Dibromomethane	A 409-5863	0.22	0.22	ppb	U
75-27-4	Bromodichloromethane	A 409-5863	0.18	0.18	ppb	U
110-75-8	2-Chloroethylvinylether	A 409-5863	0.34	0.34	ppb	U
10061-01-5	c-1,3-Dichloropropene	A 409-5863	0.16	0.16	ppb	U
108-10-1	4-Methyl-2-pentanone	A 409-5863	6.80	6.80	ppb	U
108-88-3	Toluene	A 409-5863	0.14	0.14	ppb	U
10061-02-6	t-1,3-Dichloropropene	A 409-5863	0.19	0.19	ppb	U
79-00-5	1,1,2-Trichloroethane	A 409-5863	0.16	0.16	ppb	U
127-18-4	Tetrachloroethene	A 411-5917	34.2	12400	ppb	

Environmental Testing Laboratories, Inc.
208 Route 109, Farmingdale NY 11735
Phone - 631-249-1456 Fax - 631-249-8344

01/03/2002

Volatiles - EPA 8260B

Sample: M6689-2...continue
Client Sample ID: SB-2 3-4'
Matrix: Soil
Remarks: See Case Narrative
Analyzed Date: 12/27/2001

Type: Grab

Collected: 12/21/2001
% Solid: 73.3%

Cas No	Analyte	File ID	MDL	Concentration	Units	Q
142-28-9	1,3-Dichloropropane	A409-5863	0.095	0.095	ppb	U
591-78-6	2-Hexanone	A409-5863	6.80	6.80	ppb	U
124-48-1	Dibromochloromethane	A409-5863	0.11	0.11	ppb	U
106-93-4	1,2-Dibromoethane	A409-5863	0.11	0.11	ppb	U
108-90-7	Chlorobenzene	A409-5863	0.095	0.095	ppb	U
630-20-6	1,1,1,2-Tetrachloroethane	A409-5863	0.041	0.041	ppb	U
100-41-4	Ethylbenzene	A409-5863	0.16	0.16	ppb	U
108-38-3	m,p-xylene	A409-5863	0.30	0.30	ppb	U
95-47-6	o-xylene	A409-5863	0.12	0.12	ppb	U
100-42-5	Styrene	A409-5863	0.19	0.19	ppb	U
75-25-2	Bromoform	A409-5863	0.082	0.082	ppb	U
98-82-8	Isopropylbenzene	A409-5863	0.095	0.095	ppb	U
108-86-1	Bromobenzene	A409-5863	0.18	0.18	ppb	U
79-34-5	1,1,2,2-Tetrachloroethane	A409-5863	0.12	0.12	ppb	U
103-65-1	n-Propylbenzene	A409-5863	0.14	0.14	ppb	U
96-18-4	1,2,3-Trichloropropane	A409-5863	0.15	0.15	ppb	U
622-96-8	p-Ethyltoluene	A409-5863	0.22	0.22	ppb	U
108-67-8	1,3,5-Trimethylbenzene	A409-5863	0.12	0.12	ppb	U
95-49-8	2-Chlorotoluene	A409-5863	0.16	0.16	ppb	U
106-43-4	4-Chlorotoluene	A409-5863	0.16	0.16	ppb	U
98-06-6	tert-Butylbenzene	A409-5863	0.15	0.15	ppb	U
95-63-6	1,2,4-Trimethylbenzene	A409-5863	0.14	0.14	ppb	U
135-98-8	sec-Butylbenzene	A409-5863	0.082	0.082	ppb	U
99-87-6	4-Isopropyltoluene	A409-5863	0.14	0.14	ppb	U
541-73-1	1,3-Dichlorobenzene	A409-5863	0.23	0.23	ppb	U
106-46-7	1,4-Dichlorobenzene	A409-5863	0.24	0.24	ppb	U
95-50-1	1,2-Dichlorobenzene	A409-5863	0.19	0.19	ppb	U
105-05-5	p-Diethylbenzene	A409-5863	0.22	0.22	ppb	U
104-51-8	n-Butylbenzene	A409-5863	0.22	0.22	ppb	U
95-93-2	1,2,4,5-Tetramethylbenzene	A409-5863	0.23	0.23	ppb	U
96-12-8	1,2-Dibromo-3-chloropropane	A409-5863	0.22	0.22	ppb	U
120-82-1	1,2,4-Trichlorobenzene	A409-5863	0.37	0.37	ppb	U
87-68-3	Hexachlorobutadiene	A409-5863	0.22	0.22	ppb	U
91-20-3	Naphthalene	A409-5863	0.60	0.60	ppb	U
87-61-6	1,2,3-Trichlorobenzene	A409-5863	0.38	0.38	ppb	U

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01/03/2002

Volatiles - EPA 8260B

Sample: M6689-2...continue
Client Sample ID: SB-2 3-4'
Matrix: Soil
Remarks: See Case Narrative
Analyzed Date: 12/27/2001

Type: Grab

Collected: 12/21/2001
% Solid: 73.3%

Cas No	Surrogate	File ID	% Recovery	QC Limits	Q
460-00-4	4-BROMOFLUOROBENZENE	A409-5863	91.5 %	(77 - 123)	
2037-26-5	TOLUENE-D8	A409-5863	97.4 %	(73 - 127)	
4774-33-8	DIBROMOFLUOROMETHANE	A409-5863	105.0 %	(62 - 138)	
460-00-4	4-BROMOFLUOROBENZENE	A411-5917	97.3 %	(77 - 123)	
2037-26-5	TOLUENE-D8	A411-5917	100.0 %	(73 - 127)	
4774-33-8	DIBROMOFLUOROMETHANE	A411-5917	101.0 %	(62 - 138)	

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01/03/2002

Volatiles - EPA 8260B

Sample: M6689-3
Client Sample ID: Stream H2O
Matrix: Liquid
Type: Grab
Collected: 12/21/2001
Remarks: See Case Narrative
Analyzed Date: 12/29/2001

Cas No	Analyte	File ID	MDL	Concentration	Units	Q
75-71-8	Dichlorodifluoromethane	A412-5934	0.26	0.26	ppb	U
75-45-6	Chlorodifluoromethane	A412-5934	0.090	0.090	ppb	U
74-87-3	Chloromethane	A412-5934	0.37	0.37	ppb	U
75-01-4	Vinyl Chloride	A412-5934	0.070	0.070	ppb	U
74-83-9	Bromomethane	A412-5934	0.45	0.45	ppb	U
75-00-3	Chloroethane	A412-5934	0.18	0.18	ppb	U
75-69-4	Trichlorofluoromethane	A412-5934	0.23	0.23	ppb	U
76-13-1	1,1,2-Trichlorotrifluoroethane	A412-5934	0.24	0.24	ppb	U
75-35-4	1,1-Dichloroethene	A412-5934	0.14	0.14	ppb	U
67-64-1	Acetone	A412-5934	1.44	7.90	ppb	
75-15-0	Carbon disulfide	A412-5934	0.22	0.22	ppb	U
75-09-2	Methylene Chloride	A412-5934	0.15	0.15	ppb	U
156-60-5	t-1,2-Dichloroethene	A412-5934	0.14	0.14	ppb	U
1634-04-4	Methyl t-butyl ether	A412-5934	0.080	0.080	ppb	U
75-34-3	1,1-Dichloroethane	A412-5934	0.12	0.12	ppb	U
590-20-7	2,2-Dichloropropane	A412-5934	0.30	0.30	ppb	U
156-59-2	c-1,2-Dichloroethene	A412-5934	0.14	5.10	ppb	
78-93-3	2-Butanone	A412-5934	6.25	6.25	ppb	U
74-97-5	Bromochloromethane	A412-5934	0.21	0.21	ppb	U
67-66-3	Chloroform	A412-5934	0.15	0.15	ppb	U
71-55-6	1,1,1-Trichloroethane	A412-5934	0.16	0.16	ppb	U
56-23-5	Carbon Tetrachloride	A412-5934	0.13	0.13	ppb	U
563-58-6	1,1-Dichloropropene	A412-5934	0.67	0.67	ppb	U
71-43-2	Benzene	A412-5934	0.13	0.13	ppb	U
107-06-2	1,2-Dichloroethane	A412-5934	0.13	0.13	ppb	U
79-01-6	Trichloroethene	A412-5934	0.17	2.30	ppb	
78-87-5	1,2-Dichloropropane	A412-5934	0.15	0.15	ppb	U
74-95-3	Dibromomethane	A412-5934	0.060	0.060	ppb	U
75-27-4	Bromodichloromethane	A412-5934	0.070	0.070	ppb	U
110-75-8	2-Chloroethylvinylether	A412-5934	0.36	0.36	ppb	U
10061-01-5	c-1,3-Dichloropropene	A412-5934	0.070	0.070	ppb	U
108-10-1	4-Methyl-2-pentanone	A412-5934	0.97	0.97	ppb	U
108-88-3	Toluene	A412-5934	0.14	0.14	ppb	U
10061-02-6	t-1,3-Dichloropropene	A412-5934	0.060	0.060	ppb	U
79-00-5	1,1,2-Trichloroethane	A412-5934	0.20	0.20	ppb	U
127-18-4	Tetrachloroethene	A412-5934	0.20	9.30	ppb	

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01/03/2002

Volatiles - EPA 8260B

Sample: M6689-3...continue
Client Sample ID: Stream H2O
Matrix: Liquid
Type: Grab
Collected: 12/21/2001
Remarks: See Case Narrative
Analyzed Date: 12/29/2001

Cas No	Analyte	File ID	MDL	Concentration	Units	Q
142-28-9	1,3-Dichloropropane	A412-5934	0.070	0.070	ppb	U
591-78-6	2-Hexanone	A412-5934	1.48	1.48	ppb	U
124-48-1	Dibromochloromethane	A412-5934	0.12	0.12	ppb	U
106-93-4	1,2-Dibromoethane	A412-5934	0.090	0.090	ppb	U
108-90-7	Chlorobenzene	A412-5934	0.12	0.12	ppb	U
630-20-6	1,1,1,2-Tetrachloroethane	A412-5934	0.13	0.13	ppb	U
100-41-4	Ethylbenzene	A412-5934	0.18	0.18	ppb	U
108-38-3	m,p-xylene	A412-5934	0.31	0.31	ppb	U
95-47-6	o-xylene	A412-5934	0.16	0.16	ppb	U
100-42-5	Styrene	A412-5934	0.14	0.14	ppb	U
75-25-2	Bromoform	A412-5934	0.090	0.090	ppb	U
98-82-8	Isopropylbenzene	A412-5934	0.19	0.19	ppb	U
108-86-1	Bromobenzene	A412-5934	0.16	0.16	ppb	U
79-34-5	1,1,2,2-Tetrachloroethane	A412-5934	0.090	0.090	ppb	U
103-65-1	n-Propylbenzene	A412-5934	0.31	0.31	ppb	U
96-18-4	1,2,3-Trichloropropane	A412-5934	0.13	0.13	ppb	U
622-96-8	p-Ethyltoluene	A412-5934	0.22	0.22	ppb	U
108-67-8	1,3,5-Trimethylbenzene	A412-5934	0.11	0.11	ppb	U
95-49-8	2-Chlorotoluene	A412-5934	0.16	0.16	ppb	U
106-43-4	4-Chlorotoluene	A412-5934	0.17	0.17	ppb	U
98-06-6	tert-Butylbenzene	A412-5934	0.18	0.18	ppb	U
95-63-6	1,2,4-Trimethylbenzene	A412-5934	0.22	0.22	ppb	U
135-98-8	sec-Butylbenzene	A412-5934	0.20	0.20	ppb	U
99-87-6	4-Isopropyltoluene	A412-5934	0.21	0.21	ppb	U
541-73-1	1,3-Dichlorobenzene	A412-5934	0.15	0.15	ppb	U
106-46-7	1,4-Dichlorobenzene	A412-5934	0.16	0.16	ppb	U
95-50-1	1,2-Dichlorobenzene	A412-5934	0.070	0.070	ppb	U
105-05-5	p-Diethylbenzene	A412-5934	0.21	0.21	ppb	U
104-51-8	n-Butylbenzene	A412-5934	0.19	0.19	ppb	U
95-93-2	1,2,4,5-Tetramethylbenzene	A412-5934	0.21	0.21	ppb	U
96-12-8	1,2-Dibromo-3-chloropropane	A412-5934	0.15	0.15	ppb	U
120-82-1	1,2,4-Trichlorobenzene	A412-5934	0.18	0.18	ppb	U
87-68-3	Hexachlorobutadiene	A412-5934	0.32	0.32	ppb	U
91-20-3	Naphthalene	A412-5934	0.41	0.41	ppb	U
87-61-6	1,2,3-Trichlorobenzene	A412-5934	0.12	0.12	ppb	U

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01/03/2002

Volatiles - EPA 8260B

Sample: M6689-3...continue
Client Sample ID: Stream H2O
Matrix: Liquid
Remarks: See Case Narrative
Analyzed Date: 12/29/2001

Type: Grab

Collected: 12/21/2001

Cas No	Surrogate	File ID	% Recovery	QC Limits	Q
460-00-4	4-BROMOFLUOROBENZENE	A412-5934	95.1 %	(76 - 118)	
2037-26-5	TOLUENE-D8	A412-5934	100.0 %	(90 - 111)	
4774-33-8	DIBROMOFLUOROMETHANE	A412-5934	95.9 %	(83 - 113)	

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01/03/2002

Case Narrative

EPA 8260

The following compounds were calibrated at 25, 50, 100, 150 and 200 ppb levels in the initial calibration curve:

Acetone
2-Butanone
4-Methyl-2-pentanone
2-Hexanone

M&P-Xylenes were calibrated at 10, 40, 100, 200 and 300 ppb levels.

All other compounds were calibrated at 5, 20, 50, 100 and 150 ppb levels.

Samples were quantitated using the continuing calibration standard response factor as opposed to the initial calibration average response factor.

Reviewed by: _____

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01/03/2002

ORGANIC METHOD QUALIFIERS

Q - Qualifier - specified entries and their meanings are as follows:

U - The analytical result is a non-detect.

J - Indicates an estimated value. The concentration reported was detected below the Method Detection Limit.

B - The analyte was found in the associated method blank as well as the sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.

E - The concentration of the analyte exceeded the calibration range of the instrument.

D - This flag identifies all compounds identified in an analysis at a secondary dilution. In the case of a surrogate this flag indicates a system mointoring compound diluted out.

INORGANIC METHOD QUALIFIERS

C - (Concentration) qualifiers are as follows:

B - Entered if the reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Entered when the analyte was analyzed for, but not detected.

J - Indicates an estimated value. The concentration reported was detected below the Method Detection Limit.

Q - Qualifier specific entries and their meanings are as follows:

E - Reported value is estimated because of the presence of interferences.

M - (Method) qualifiers are as follows:

A - Flame AA

AS - Semi-automated Spectrophotometric

AV - Automated Cold Vapor AA

C - Manual Spectrophotometric

F - Furnace AA

NR - when the analyte is not required to be analyzed.

P - ICP

T - Titrimetric

OTHER QUALIFIERS

ND - Not Detected

NA - Not Applicable

* - Outside Expected Range (NYCDEP Table I/II or Surrogate Limits)