FORMER QUICK AND CLEAN CLEANERS
Site # 130198

DRAFT

REMEDIAL INVESTIGATION WORK PLAN
(RIWP)

PREPARED FOR:
380 ROCKAWAY TURNPIKE REALTY CORPORATION
36 LAWRENCE AVENUE
LAWRENCE, NEW YORK 11559

PREPARED BY:

BERNINGER ENVIRONMENTAL, INC.

90-B KNICKERBOCKER AVENUE
BOHEMIA, NEW YORK 11716

January 2013
2ndRevised Draft
Remedial Investigation Work Plan

Table of Contents

Table of Contents (cont'd)

Professional Engineer Certification

Certification

I, John V. Soderberg, certify that I am currently a Qualified Environmental Professional as defined in 6 NYCRR Part 375 and that this Remedial Investigation Work Plan for the Former Quick and Clean Cleaners Report was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation. (DER- 10).

John Soderberg, P.E

Signature

SEAL:

NYS P.E License No.: 049975

Dated: September 13, 2012

1.0 Introduction

The following report is a Remedial Investigation Work Plan (RIWP) prepared by Berninger Environmental Inc. (BEI) on behalf of 380 Rockaway Turnpike Corporation located at 380 Rockaway Turnpike, Cedarhurst, Nassau County, New York.

The Site is the location of the former Quick and Clean Cleaners, an on-site dry-cleaning service which operated on the premises from at least 1980 to 1991. Investigations performed by the Nassau County Department of Health (NCDOH) in 1980 and 1991 found that tetrachloroethene (PCE) had been released at the Site in discharge water and/or condensate (vapors).

The Site was assigned a "P" (potential) listing on the Inactive Hazardous Waste Site Registry by the New York Department of Environmental Conservation (NYSDEC) in 2009. The NYSDEC conducted a site characterization in July-August 2001 (SCR 8/10) and upgraded the registry listing to a Class 2 site in August 2011.

The purpose of this RIWP is to collect data in order to enhance the Site Characterization Report (SCR) and further delineate the nature and extent of chlorinated solvent contamination in off-site groundwater and soil gas. This report will also be considering multiple remedial technologies and alternatives with regard to the remediation of on and off-site soil and groundwater contamination. Remedial technologies will also be considered depending upon the results of the Soil Vapor Intrusion Study (SVIS).

1.1 Site Location and Description

The address for the subject property is 380 Rockaway Turnpike, Cedarhurst, NY. The subject property is designated as Section 39, Block 344, Lots 216 and 220 by the Nassau County Department of Assessment. The subject property is located within the Incorporated Village of Cedarhurst, Town of Hempstead, Nassau County, NY as shown in Figure-1. The lot has 123 feet of frontage on Rockaway Turnpike and is approximately 100 feet deep for a combined area of 0.318 acres (13,853 ft2). Figure-2.

The subject site is developed with a 3,984ft^2 1-story masonry building, built in 1962 for commercial (retail) use. Based on current zoning and the location of the property, it is likely to remain in commercial-retail use.

The elevation of the property ranges from approximately 10 to 13 feet above National Geodetic Vertical Datum (NGVD). The topography in the vicinity of the site generally slopes from southeast to northwest. The depth to groundwater beneath the site, as determined from field measurements, is approximately 4.5 to 5.0 feet below grade surface (bgs). Groundwater flow cannot be determined from regional water table elevation maps and has been reported as ranging

from north to southwest at the adjacent property to the north (former Cumberland Farms Service Station). Despite this wide range of anticipated flow the actual direction of groundwater flow is presumably to the northwest. This notion is based upon previously conducted investigation data indicating a northwesterly groundwater flow due to the nature of the findings northwest of the Site and/or source area.

The area surrounding the Site consists of retail "strip stores" and service stations along the east side of Rockaway Turnpike with single-family residential homes located adjacent to the east. Adjacent properties to the north include a former Cumberland Farms Service Station (CFSS) and an active Shell station. Adjacent properties to the south include a Sunoco, Getty and Gulf service stations. In total the subject property is flanked north and south by four (4) active and one (1) former service station. The west side of Rockaway Turnpike is characterized by larger shopping centers with industrial buildings/warehouses, major oil storage facilities (MOSF) and the Town of Hempstead incinerator plant adjacent to the west.

1.2 Site History

The environmental history of the subject lots was summarized in the SCR dated August 2010 as prepared by Environmental Assessment and Remediation (EAR) under contract to the NYSDEC. This summary consisted of a chronology of events based solely on NCDOH files. According to the SCR the NCDOH identified approximate PCE concentrations of 67,000 in a sample of "industrial wastewater discharge" at the Site on 3/26/80. In 1991 NCDOH reported PCE concentrations of 1.3 million ug/kg in shallow soil (<2 ft) adjacent to a vapor discharge pipe in the rear of the building. This soil was successfully removed in 1992 by the operator under NCDOH oversight and the case was closed by NCDOH on 3/30/92. In 2009 the NYSDEC classified the site with a "P" designation for potential listing on the Inactive Hazardous Waste Site Registry.

1.3 Summary of Site Characterization Report

The field investigation portion of the SCR was conducted at the site from December 8, 2009 through March 25, 2010 and consisted of the collection and analysis of 7 soil samples from 7 boring locations, 28 groundwater samples from 10 on-site locations, 39 groundwater samples from 9 off-site locations and 6 soil gas samples from 4 on-site and 2 off-site locations. All soil and groundwater samples were collected with GeoProbe®-type direct push equipment and tooling.

According to logs contained in the SCR, soil samples were collected for the first 8 feet through a 4 ft macro-core sampler using the single-tube method and then using a 4 ft large bore sampler for the remainder of the boring to a maximum of 20 ft. On-site groundwater sampling performed in December 2009 were collected through a 2 ft mill slotted rod which was driven to multiple depths ranging from 10 to 70 feet with samples

collected in 10 foot intervals. Off-site samples collected in March 2010 utilized a 2 ft wire wrap discrete sampler. Purge volumes varied considerably ranging from 0 to 0.5 gallons per sample for the mill slot sampler to 0.10 to 3 gallons for the wire wrap sampler.

The results of this investigation did not identify any chlorinated compounds above unrestricted soil clean up objectives (SCOs) in any of the soil samples collected. However, petroleum VOCs including ethylbenzene, toluene and xylene were reported in 5 of 7 soil samples at concentrations significantly above unrestricted and groundwater protection SCOs. Total petroleum VOCs in soil ranged from 2,550 ug/kg at location EP7 (12-14 ft) to 107,000 ug/kg at EP5 (12-14 ft). EP5 is located near the south property line adjacent to the Sunoco service station.

On-site groundwater samples reported elevated concentrations of both chlorinated VOCs (CVOCs) and petroleum VOCs (PVOCs) at every sampling location. With the exception of EP7 the highest concentrations of both CVOCs and PVOCs were reported in the shallowest samples. EP7 reported the highest detections of both CVOCs and PVOCs in the 70-72 ft interval and had the highest PVOC concentrations reported with a total of 185,426 ug/L.

CVOC detections in the shallow intervals ranged from low concentrations (<20 ug/L) at EP5 (20-22 ft) to 14,830 ug/L at EP9 (10-12 ft). In addition to EP9, the highest CVOC concentrations were reported at locations MW7, EP8 (10-12 ft) and EP3 (10-12 ft). On-site CVOC totals were comprised almost entirely of cis-dichloroethene ©-DCE) and vinyl chloride (VC). The highest tetrachloroethene (PCE) and trichloroethene (TCE) concentrations were reported as 595 and 217 ug/L, respectively, in EP8 (20-22 ft). On-site CVOC concentrations were generally highest at the rear (east) and north side of the building.

PVOC concentrations in shallow samples ranged from 2,907 ug/L at location EP1 (20-22 ft) to 30,821 ug/L at EP3 (10-12 ft). In almost all cases PVOC concentrations were considerably higher than the CVOC concentrations. The anomalously high CVOC and PVOC concentrations reported at EP7 (70-72 ft) were not explained in the SCR and are likely attributed to deficiencies in the method of sampling.

Off-site CVOC concentrations were highest in samples from the 30-32 ft interval and ranged from 51 ug/L at location EP10 (west of the subject site) to 21,149 ug/L at location EP15. Off-site CVOC concentrations were comprised for the most part of PCE with only small amounts of TCE and the other parameters. Off-site PVOC detections were generally low and ranged from non-detect to 162 ug/L with the highest detections reported in the 50-52 interval.

CVOC detections in soil gas ranged from 11 ug/m^3 to 5,717 ug/m^3 with the highest concentrations occurring in SP2 and SP5 located at the north property line. The main constituent in the soil gas at these locations was cis-DCE.

1.4 Site Geology / Hydrogeology

According to boring logs included in the SCR, subsurface materials at the site consist of medium to coarse sand and gravel for the upper 10 feet followed by fine to medium sand to 18 feet below grade. A 1 to 2 ft layer of silt and clay was reported at some locations. Soils deeper than 20 feet were not characterized though silt and clay zones were suspected at 34 feet to 52 feet based on limited groundwater recharge and clogging of the groundwater sampling tools with silt and clay. The boring log from location EP7 shows that this condition continued to a final depth of 72 feet. The depth to groundwater was not measured at the site during the site characterization though it is reported in the drill logs at a depth of 11 feet below the surface. However, this is inconsistent with water level measurements made in monitoring wells at the adjacent property to the north that report the depth to water ranging from 3.61 to 4.89 feet. The groundwater flow direction has not been determined at the site and historic measurements made on the adjacent property to the north indicate a variable direction from north to southwest.

1.5 Conceptual Site Model (CSM)

The source of the on-site CVOC contamination has been identified as a former shallow PCE impacted soil area at the rear of the building near the southeast corner of the property. Based on NCDOH reports and follow-up investigations the source area consisted of a 12 ft x 12 ft area which extended 3 to 3.5 feet deep. The area was exposed and covered at the surface with a layer of gravel. Precipitation recharging through this impacted soil would become contaminated with PCE transporting it to the shallow water table as a dissolved component and forming a contaminant plume. The plume would then migrate in the direction of groundwater flow.

The presence of high concentrations of petroleum (gasoline) constituents in soil and groundwater along the south property line and near the southeast corner indicates past migration from the known gasoline spill at the adjacent Sunoco S/S to the south.

According to the modeling figures, PCE is almost exclusively present off-site with almost no transformation products present. This may indicate a second source at an off-site location or the fact that transformation products of PCE tend to lag at the rear of the plume with PCE being detected at the lead or toe of the plume. PCE a DNAPL tends to initiate the formation of the plume by traveling vertical to depth while moving with the flow of groundwater, which in this case appears to be northwest.

CVOCs have been documented on the former CFSS property to the north including the far northwest corner of the property. This will be confirmed through the conduct of future investigatory activities which will propose multi-depth sampling to the north, west and southwest of the CFSS. The CFSS was known to include an auto repair shop with shallow recharge structures present across the property. PCE is also historically and

extensively used in automobile brake cleaning and engine degreasing products. It is therefore possible that there may be other sources of PCE responsible for the off-site groundwater contamination reported in the SCR.

In the absence of some induced vertical transport condition such as that created by a pumping well, there does not appear to be any mechanism to account for contaminant migration to the deeper zones of the aquifer. The fact that both CVOCs and PVOCs were found at depths combined with the description of silts, clays and limited recharge of groundwater to sampling equipment points, the possibility exists that PVOC and CVOC contamination may have been transported to deeper depths via sample tooling. In sampling groundwater through highly heterogeneous zones and formations of low permeability, leakage can occur around the borehole and through the threaded connections of the rods themselves, which can transport contamination vertically. An additional boring sampled to a depth of 72' bgs, located up gradient from the source area (south of former cleaners), will help determine the quantity of PVOC contamination found at this depth, if any at all. Since petroleum constituents are considered to be LNAPL's it is highly unlikely that petroleum impacts to groundwater at 72' bgs are conclusive. If in fact a petroleum related plume is present at this depth the performance of an up gradient boring to a depth of 72' bgs should provide conclusive evidence as to whether or not the on-site petroleum related impacts occurred naturally via vertical migration. More information regarding additional up gradient sampling locations is discussed later in the report.

2.0 Remedial Investigation

The purpose of this Work Plan will be to supplement the data set collected during the Site Characterization performed by the NYSDEC and to fill in data gaps as needed to produce data of sufficient quality and quantity to permit the development of a remedial plan for the Site. The investigation will consist of the following elements:

- Further vertical and horizontal delineation of CVOC's off-site to the northwest of the subject site (near Chase Bank) and off-site to the east, south east and south of the source area.

- Multiple borings to be conducted along the western side of the CFSS building in order to determine if CFSS is a contributing factor to the present plume.

- Installation of three (3) on-site monitoring wells in order to confirm the anticipated northwest groundwater flow direction. These wells will also be used for sample collection in order to analyze groundwater characteristics that pertain to anaerobic degradation. (additional multi-depth monitoring

wells will be proposed as part of the remedy selection process or remedial action plan)

- Continued delineation of former CSM locations in order to delineate vertical contamination

- Soil vapor study that consists of sampling all adjacent and surrounding properties in order to analyze sub-slab, outdoor and indoor air conditions as compared to the NYSDOH Guidance for Soil Vapor Intrusion, 2006**.**

2.1 Groundwater Sampling Procedure

Multiple off-site locations have been selected in order to complete the vertical and horizontal delineation of CVOC related groundwater impacts emanating from the site. Sample collection locations and depths are depicted in Figure-3.

A GeoProbe® 6610 equipped with a 4 foot temporary well screen sampling tool (screen point 16 or SP-16), will be directly pushed into the aquifer zone to acquire sample collection at multiple depths. Since PCE is a DNAPL, groundwater grab samples will be collected from the bottom of the SP-16 well screen. This will be achieved by lowering new poly tubing through the probe rods to the bottom of the slotted screen with purging and sampling using a peristaltic pump with a low flow rate (less than 100 ml/minute). Sample procurement will be achieved through the use of dedicated polyethylene tubing and a peristaltic pump if the water level is below that from which the pump can draw (approximately 28' feet bgs). If beyond this depth a stainless steel check valve will be placed on the bottom of the sampling tube. Hand oscillation of the tube will then be used to extend the draw of the pump. Multi-depth samples at each selected boring location will be collected from the deepest target point in the aquifer first with the shallowest interval to be collected last. This bottom-up method is used with the SP-16 in order to limit the amount of boreholes to just one (1) per location when conducting the multi-depth sampling procedure. It also minimizes the chances for cross contamination.

All groundwater sampling activities will be recorded in the project dedicated field book. This will include a description of:

- Date and time of sample collection
- Sample location
- Purging time, duration and volume
- Sample appearance

Upon completion the borings will be abandoned by pumping a bentonite grout in the boring annular space to grade.

2.1.1 Off-site Groundwater Sampling Locations and Intervals

In order to fill data gaps and complete the delineation of chlorinated solvents to satisfy the previously conducted CSM the following areas (three total) need to be investigated; north, west and east of the Chase Bank located northwest of the subject site. Previous locations sampled as part of the CSM specifically EP-13, 15 and 18, will require further vertical delineation. This will complete data gaps where PCE was not fully delineated in groundwater to the northwest with regard to meeting regulatory standards. Three borings just inside the CFSS western property line will be conducted at multiple depths in order to recognize the possibility that CFSS is a contributing factor to the plume. Finally, southeast of the source area, where 1, 2 DCE has not been fully delineated; multiple borings will be conducted (directly south and east of the former cleaners) in order to expand upon CSM. Figure-3 shows all the locations of the proposed borings and the multiple depths at which groundwater samples will be collected.

Three (3) previous sampling locations EP-13, 15 and 18, located on Figure-3 are proposed to be re-sampled in order to vertically delineate chlorinated contamination discovered in these locations. PCE impacts as high as 4,620 ppb were discovered at EP-15 from 50-52' but no data beyond this depth has been collected. EP-13 and 18 also show PCE impacts at 50-52', not nearly as significant as EP-15, but concentrations do exceed SGVs. Sampling at these three locations is proposed to extend to a depth of 60' bgs.

Four (4) groundwater samples are proposed to be collected north, east and west of the Chase Bank located across the street from the former cleaners on the west side of Rockaway Turnpike. These samples will fill in the data gaps where PCE was not fully delineated in groundwater to the northwest of the source. The sampling intervals will be as follows: 20-24’, 30-34’, 40-44’, 50-54’ and 60-64'.

Three (3) groundwater samples are proposed to be collected along the western side of the CFSS. These borings are intended to offer more insight as to whether or not the CFSS is a contributing factor to the current plume. Three (3) existing monitoring wells are already in place along the western property boundary. Boring locations are proposed to be installed just east of these monitoring wells as seen on Figure-3. Sample intervals for these three (3) locations are as follows: 5-9’ bgs (surface of aquifer), 15-19’ and 25-29’.

The third and final area of the off-site investigation is located south and east of the former dry cleaning building. As depicted in Figure-3 five (5) boring locations have been selected in order to complete the delineation of 1, 2 DCE both horizontally and vertically. One (1) of these up-gradient borings will extend to a depth of 74’ bgs in order to determine if PVOCs and CVOCs discovered at this depth (in a previously conducted boring labeled EP-7) occurred as a result of natural migration processes or were manufactured via penetration of a confining

layer. This boring will be sampled at multiple intervals including; 5-9', 15-19', 25-29', 50-54', 60-64' and 70-74'bgs. The remaining four (4) borings located in Figure-3 will be collected at the following depths: 5-9', 15-19' and 25-29'. Please see Table-1 for sampling matrix.

According to the SCR, conducted by EAR, a majority of the 1, 2 DCE was found in and around the source area to a depth of approximately 25' bgs with the absolute highest concentrations found in the upper portion of the aquifer. It does not appear necessary to probe beyond a depth of 29' bgs in this area and risk puncturing a confining layer, which could result in the release of DNAPL to deeper depths. The rational behind the one (1) selected boring that extends to a depth of 74' bgs is that it will be located far enough up-gradient, outside of the immediate source area, where 1, 2 DCE concentrations should be significantly lower preventing the transport of any significant concentrations to deeper depths via sample tooling. The sampling procedure will include the use of o-rings (rubber gaskets applied to rods at connection points) to prevent the leakage of contaminated groundwater through the threaded connection points. After the review of laboratory results for this boring location, conclusions will be made in order to determine if a valid argument can link the transportation of elevated 1, 2 DCE concentrations at deeper depths to the sampling methods employed by EAR at the EP-7 location.

2.1.2 Laboratory Analysis and Sample Collection

All groundwater samples collected will be analyzed by EPA Method 8260 (VOCs) with a Category – B deliverable package provided for third party data validation purposes. Samples will be submitted to the laboratory for a standard turnaround time, which is estimated to be one to two weeks. Samples will be transported under strict chain of custody to an ELAP New York State certified laboratory.

For sample collection two (2) pre-preserved 40 milliliter glass vials will be filled to overflow so no air bubbles get entrapped in the vial. Samples will immediately be placed in an ice filled cooler to maintain a temperature of approximately 4 degrees C (39 degrees F). Each sample will be properly labeled and recorded on the chain of custody form. The required trip blanks, method blanks and matrix spike/ matrix spike duplicates will be collected as per the DER-10 sampling protocol. More information regarding laboratory analysis and sampling collection is discussed in the Quality Assurance and Quality Control section 3.0.

2.2 Monitoring Well Installation

Three (3) monitoring wells are proposed to be installed throughout the subject property with the use of a track mounted GeoProbe® 6610. Wells will be installed using the direct

push method in order to define the hydraulic characteristics of the aquifer beneath the site. The three (3) monitoring wells will be surveyed in order to retrieve casing elevation data from the northern side of the casing within 0.01 ft. Depth to water (DTW) measurements will be recorded from the north side of the casing within 0.01 ft. and angular readings will be recorded from the level/transit for well placement. After the field survey is completed the gathered calculations will be interpreted onto a digital image in order to portray the direction of groundwater flow. Please refer to Figure-4 for monitoring well locations.

The specifications for each monitoring well are as follows: 8' of 2" diameter PVC 0.02" slot screen; 2' of 2" diameter PVC riser pipe to finish well to grade. Monitoring wells will contain a bentonite seal above the well screen in order to prevent surface run-off from entering the well. All wells will be secured with a 5" cast iron manhole cover flush mounted and sealed with cement in place. Please see Figure-5 for well specifications as illustrated in a generic well log.

The monitoring wells will be used for surveying purposes and DTW measurement data. The wells can also be sampled in order to gather technical data that pertains to reductive de-chlorination for remediation purposes. Dechlorination parameters include dissolved oxygen readings (D.O), oxidation/reduction potential (ORP), terminal electron acceptors (TEA), pH, conductivity, temperature, total organic carbon (TOC) and total dissolved carbon (TDC). In the future multi-level monitoring wells will be installed based upon the results derived from the investigation. The multi-level monitoring well network will be used to collect additional slug test data (at depth), survey data and for any remedial action or interim remedial measures undertaken in order to treat the vertical extent of the plume. DTW in the area of the subject site has previously been recorded at approximately 4.0 ft. bgs.

2.3 Soil Vapor Intrusion Study

The phrase "soil vapor intrusion" refers to the process by which volatile chemicals migrate from a subsurface source into the indoor air of buildings. Soil vapor, also referred to as soil gas, is the air found in the pore spaces between soil particles. Primarily because of a difference between interior and exterior pressures, soil vapor can enter a building through cracks or perforations in slabs or basement floors and walls, and through openings around sump pumps or where pipes and electrical wires go through the foundation. For example, heating, ventilation or air-conditioning (HVAC) systems and/or the operation of large mechanical appliances (e.g., exhaust fans, dryers, etc.) may create a negative pressure that can draw soil vapor into the building. This intrusion is similar to how radon gas enters buildings from the subsurface. Soil vapor can become contaminated when chemicals evaporate from subsurface sources. If contaminated soil vapors enter a building, indoor air quality may become affected. (NYSDOH Guidance for Soil Vapor Intrusion, October 2006)

In order to identify potential impacts to indoor air at the subject site and residences/buildings that surround the subject site a soil vapor intrusion study is proposed to be conducted during the 2012/2013 heating season. Since many of the surrounding homes and businesses are off-site, access agreements need to be fulfilled in order to perform the necessary tests. Permission letters will be drafted and hand delivered to the neighboring property owners for which verbal authorization will be accepted. Permission letters will include a description of the testing to be performed, information regarding soil vapor intrusion, PCE and TCE fact sheets and a proposed schedule of work.

A total of eleven (11) locations (including subject property) have been selected to partake in the soil vapor intrusion study. Refer to Figure-3 which identifies the buildings that have been selected to be evaluated. One (1) sub-slab and one (1) indoor air sample is proposed to be collected at each residence or business. A total of three (3) outdoor air samples will be collected and placed according to the weather conditions we are presented with on the day of sampling.

Six (6) liter laboratory cleaned and certified summa canisters will be used for indoor and outdoor sample collection. All summa containers will be affixed with a 24 hour dedicated regulator with a maximum flow rate of 0.02 liters per minute. Indoor and outdoor air samples will be collected at a height of 3-5' feet above the grade surface in order to collect samples representative of the everyday breathing zone. NYSDOH fact sheets will be completed at the time of the sample set-up and collection in order to collect information on the building characteristics and product inventory.

Six (6) liter summa canisters will also be used for the collection of sub-slab samples. Installation of the sub-slab samples will include boring a small diameter hole in the sub-grade cement floor for insertion of a temporary soil vapor probe approximately 2" inches below the bottom of the slab. The vapor probe connects to a 3/8" diameter piece of poly-tubing, which is of laboratory and food grade quality. Gravel pack fills the void and annular space around the probe and the remaining void is sealed with bentonite clay to surface. After the construction of the temporary vapor point is completed it is purged for a sufficient amount of time in order to stimulate air flow to the summa. The poly-tubing is then connected to the summa canister after it has been purged. PID readings are collected and analyzed after the summa canister has been disconnected from the vapor probe. Refer to Figure-6 for the typical construction of a temporary vapor probe.

2.4 Rising Head (slug test) and Analysis

To assist in the evaluation and development of remedial alternatives, rising head aquifer (slug) tests will be performed on select monitoring wells installed at the Site. Slug test results will be used to calculate the hydraulic conductivity of the saturated zone for use in estimating the pore water velocity. Tests will be performed using a GeoProbe® level logger (GW 1600) pressure transducer/data logger. The GeoProbe® slug test kit uses a pneumatic method to displace groundwater in place of a manual slug. The test procedure

involves placement of the transducer approximately 1 foot above the bottom of the well or 18-24 inches below the surface of the water table. Using a laptop computer an initial baseline reading of the water column is taken prior to conducting the test. The test will continue until water levels return to pre-test conditions.

The hydraulic conductivity (K) for each well will then be calculated using the Bouwer-Rice unconfined solution formula which is included as part of the pre-programmed software offered by GeoProbe® Systems (Slug Test Analysis Software; STA version 1.0)

2.5 Management of Investigation Derived Wastes

Investigation derived wastes include contaminated soil, groundwater and disposable sampling equipment generated during the remedial investigation. Soil from pre-clearing activities will be returned to their original location. Contaminated soil and purge water will be drummed and disposed of properly. Disposable sampling equipment (gloves, tubing, acetate liners, etc.) will be placed in heavy-duty plastic bags and disposed of properly. No excess soils are proposed to be generated during the monitoring well installations using the direct push method.

3.0 Quality Assurance /Quality Control (QA/QC) Procedures

The Quality Assurance/Quality Control Procedures established herein have been prepared in accordance with DER-10 to detail procedures to be followed during the course of the sampling and analytical portion of the project, as required by the Work Plan. Quality Assurance/Quality Control (QA/QC) procedures were developed to ensure that suitable and verifiable data results from sampling and analyses are maintained in the field. The investigation work plan provided detailed quality assurance procedures to be followed for sampling and laboratory analysis activities. These procedures will be implemented during the investigation.

To ensure the successful completion of the project each individual responsible for a given component of the project must be aware of the quality assurance objectives of his / her particular work and of the overall project. The BEI Project Director, Walter Berninger will be directly responsible to the client for the overall project conduct and quality assurance/quality control (QA/QC) for the project. The Project Director will be responsible for overseeing all technical and administrative aspects of the project and for directing QA/QC activities. As Project Director Mr. Berninger will also serve as the Quality Assurance Officer (QAO) and in this role may conduct:

- conduct periodic field sampling audits;
- interface with the analytical laboratory to resolve problems; and
- interface with the data validator to resolve problems

Justin Halpin will serve as the Project Manager and will be responsible for implementation of the Remedial Investigation and coordination with the field sampling crew. Justin Halpin will also act as the Field Operations Officer, who will serve as the on-Site qualified environmental professional who will record observations, direct the drilling crew and be responsible for the collection and handling of all samples.

3.1 Organization

Project QA will be maintained under the direction of the Project Manager, in accordance with the QA/QC. QC for specific tasks will be the responsibility of the individuals and organizations listed below, under the direction and coordination of the Project Manager.

GENERAL RESPONSIBILITY	SCOPE OF WORK	RESPONSIBILITY OF QUALITY CONTROL
Field Operations	Supervise field crew, sample collection and handling	Justin Halpin, BEI
Project Manager	Implementation of the RI according to the RIWP	Justin Halpin, BEI
Laboratory Analysis	Analysis of samples by NYSDEC ASP methods Laboratory	H2M Labs NYSDOH certified Laboratory
Data review	Review for completeness and compliance	3rd party data validation

3.2 Quality Assurance Objectives

Overview

Overall project goals are defined through the development of Data Quality Objectives (DQOs), which are qualitative and quantitative Statements that specify the quality of the data required to support decisions; DQOs, as described in this section, are based on the end uses of the data as described in the work plan.

Quality Assurance and Quality Control are defined as follows:

- Quality Assurance - The overall integrated program for assuring reliability of monitoring and measurement data.
- Quality Control - The routine application of procedures for obtaining prescribed standards of performance in the monitoring and measurement process.

3.3 QA/QC Requirements for Analytical Laboratory

Samples will be analyzed by a New York State Department of Health (NYSDOH) certified laboratory. Data generated from the laboratory will be used primarily to evaluate on and off-site contaminant levels of PCE and known break-down products. The QA requirements for all subcontracted analytical laboratory work performed on this project are described below. QA elements to be evaluated include accuracy, precision, sensitivity, representativeness, and completeness. The data generated by the analytical laboratory for this project are required to be sensitive enough to achieve detection levels low enough to meet required quantification limits as specified in NYSDEC Analytical Services Protocol (NYSDEC ASP, 07/2005). The analytical results meeting the required quantification limits will provide data sensitive enough to meet the data quality objectives of this remedial program as described in the Work Plan. Reporting of the data must be clear, concise, and comprehensive. The QC elements that are important to this project are completeness of field data, sample custody, sample holding times, sample preservation, sample storage, instrument calibration and blank contamination.

3.3.1 Instrument Calibration

Calibration curves will be developed for each of the compounds to be analyzed. Standard concentrations and a blank will be used to produce the initial curves. The development of calibration curves and initial calibration response factors must be consistent with method requirements presented in the most recent version of NYSDEC ASP 07/2005).

3.3.2 Continuing Instrument Calibration

The initial calibration curve will be verified every 12 hrs by analyzing one calibration standard. The standard concentration will be the midpoint concentration of the initial calibration curve. The calibration check compound must come within 25% relative percent difference (RPD) of the average response factor obtained during initial calibration. If the RPD is greater than 25%, then corrective action must be taken as provided in the specific methodology.

3.3.3 Method Blanks

Method blank or preparation blank is prepared from an analyte free matrix which includes the same reagents, internal standards and surrogate standards as the related samples. It is carried through the entire sample preparation and analytical procedure. A method blank analysis will be performed once for each 12 hr period during the analysis of samples for volatiles. An acceptable method blank will contain less than two (2) times the CRQL of methylene chloride, acetone and 2-butane one. For all other target compounds, the method blank must contain less than or equal to the CRQL of any single target compound. For non-target peaks in the method blank, the peak area must be less than 10 percent of the nearest internal standard. The method blank will be used to demonstrate the level of laboratory background and reagent contamination that might result from the analytical process itself.

3.3.4 Trip Blanks

Trip blanks consist of a single set of sample containers filled at the laboratory with deionized laboratory-grade water. The water used will be from the same source as that used for the laboratory method blank. The containers will be carried into the field and handled and transported in the same way as the samples collected that day. Analysis of the trip blank for VOCs is used to identify contamination from the air, shipping containers, or from other items coming in contact with the sample bottles. (The bottles holding the trip blanks will not be opened during this procedure.) A complete set of trip blanks will be provided with each shipment of samples to the certified laboratory.

3.3.5 Surrogate Spike Analysis

For organic analyses, all samples and blanks will be spiked with surrogate compounds before purging or extraction in order to monitor preparation and analyses of samples. Surrogate spike recoveries shall fall within the advisory limits in accordance with the NY5DEC ASP protocols for samples falling within the quantification limits without dilution.

3.3.6 Matrix Spike/ Matrix Spike Duplicate/Matrix Spike Blank Analysis

MS, MSD and MSB analyses will be performed to evaluate the matrix effect of the sample upon the analytical methodology along with the precision of the instrument by measuring recoveries. The MS/MSD/MSB samples will be analyzed for each group of samples of a similar matrix at a rate of one for every 20 field samples. The RPD will be calculated from the difference between the MS and MSD. Matrix spike blank analysis will be performed to indicate the appropriateness of the spiking solution(s) used for the MS/MSD.

3.4 Accuracy, Precision, Sensitivity, Representativeness, Completeness, Custody

3.4.1 Accuracy

Accuracy is defined as the nearness of a real or the mean (x) of a set of results to the true value. Accuracy is assessed by means of reference samples and percent recoveries. Accuracy includes both precision and recovery and is expressed as percent recovery (% REC). The MS sample is used to determine the percent recovery. The matrix spike percent recovery (% REC) is calculated by the following equation:

%REC = SSR - SR/SA x 100

Where:
SSR = spike sample results
SR = sample results
SA = spike added from spiking mix

3.4.2 Precision

Precision is defined as the measurement of agreement of a set of replicate results among themselves without a Precision is defined as the measurement of agreement of a set of replicate results among themselves without assumption of any prior information as to the true result. Precision is assessed by means of duplicate/replicate sample analyses. Analytical precision is expressed in terms of RPD. The RPD is calculated using the following formula:

$RPD = D_1 – D_2 / (D_1 – D_2)/2 \times 100$

Where:
RPD = relative percent difference
D_1 = first sample value
D_2 = second sample value (duplicate)

3.4.3 Sensitivity

The sensitivity objectives for this plan require that data generated by the analytical laboratory achieve quantification levels low enough to meet the required detection limits specified by NYSDEC ASP and to meet all site-specific standards, criteria and guidance values (SGCs) established for this project.

3.4.4 Representativeness

Representativeness is a measure of the relationship of an individual sample taken from a particular site to the remainder of that site and the relationship of a small aliquot of the sample (i.e., the one used in the actual analysis) to the sample remaining on site. The representativeness of samples is assured by adherence to sampling procedures described in the Remedial Investigation Work Plan.

3.4.5 Completeness

Completeness is a measure of the quantity of data obtained from a measurement system as compared to the amount of data expected from the measurement system. Completeness is defined as the percentage of all results that are not affected by failing QC qualifiers, and should be between 70 and 100% of all analyses performed. The objective of completeness in laboratory reporting is to provide a thorough data support package. The laboratory data package provides documentation of sample analysis and results in the form of summaries, QC data, and raw analytical data. The laboratory will be required to submit data packages that follow NYSDEC ASP reporting format which, at a minimum, will include the following components:

1. All sample chain-of-custody forms.
2. The case narrative(s) presenting a discussion of any problems and/or procedural changes required during analyses. Also presented in the case narrative are sample summary forms.
3. Documentation demonstrating the laboratory's ability to attain the contract specified detection limits for all target analytes in all required matrices.
4. Tabulated target compound results and tentatively identified compounds.
5. Surrogate spike analysis results (organics).
6. Matrix spike/matrix spike duplicate/matrix spike blank results.
7. QC check sample and standard recovery results
8. Blank results (field, trip, and method).
9. Internal standard area and RT summary.

3.4.6 Laboratory Custody Procedures

The following elements are important for maintaining the field custody of samples:

- Sample identification
- Sample labels
- Custody records
- Shipping records

• Packaging procedures

Sample labels will be attached to all sampling bottles before field activities begin; each label will contain an identifying number. Each number will have a suffix that identifies the site and where the sample was taken. Approximate sampling locations will be marked on a map with a description of the sample location. The number, type of sample, and sample identification will be entered into the field logbook. A chain-of-custody form, initiated at the analytical laboratory will accompany the sample bottles from the laboratory into the field. Upon receipt of the bottles and cooler, the sampler will sign and date the first received blank space. After each sample is collected and appropriately identified, entries will be made on the chain-of-custody form that will include:

• Site name and address
• Samplers' names and signatures

3.5 Analytical Procedures

3.5.1 Laboratory Analysis

Samples will be analyzed by the NYSDOH ELAP laboratory for groundwater by USEPA Method 8260. If any modifications or additions to the standard procedures are anticipated, and if any nonstandard sample preparation or analytical protocol is to be used, the modifications and the nonstandard protocol will be explicitly defined and documented. Prior approval by BEI PM will be necessary for any nonstandard analytical or sample preparation protocol used by the laboratory, i.e., dilution of samples or extracts by greater than a factor of five (5).

3.6 Data Reduction, Review and Reporting

3.6.1 Overview

The process of data reduction, review, and reporting ensures the assessments or a conclusion based on the final data accurately reflects actual site conditions. This plan presents the specific procedures, methods, and format that will be employed for data reduction, review and reporting of each measurement parameter determined in the laboratory and field. Also described in this section is the process by which all data, reports, and work plans are proofed and checked for technical and numerical errors prior to final submission.

3.6.2 Data Reduction

Standard methods and references will be used as guidelines for data handling, reduction, validation, and reporting. All data for the project will be compiled and

summarized with an independent verification at each step in the process to prevent transcription/typographical errors. Any computerized entry of data will also undergo verification review. Sample analysis for VOCs will be provided by a New York State certified environmental laboratory. Sample analysis for natural oxidant demand will be performed by the oxidant manufacturer and will not be subject to data reduction. Laboratory reports for VOCs will include ASP category B deliverables for use in the preparation of a Data Usability Summary Report (DUSR). VOC results will be provided in accordance with the NYSDEC Environmental Information Management System (EIMS) electronic data deliverable (EDD) format. Analytical results for VOCs shall be presented on standard NYSDEC ASP-B forms or equivalents, and include the dates the samples were received and analyzed, and the actual methodology used. Note that natural oxidant demand analysis will not be subject to ASP-B or EDD reporting requirements and will not be reviewed under the DUSR. Natural oxidant demand analysis will be provided in a results-only format. Laboratory QA/QC information required by the method protocols will be compiled, including the application of data QA/QC qualifiers as appropriate. In addition, laboratory worksheets, laboratory notebooks, chains-of-custody, instrument logs, standards records, calibration records, and maintenance records, as applicable, will be provided in the laboratory data packages to determine the validity of data. Specifics on internal laboratory data reduction protocols are identified in the laboratory's SOPs. Following receipt of the laboratory analytical results by BEI, the data results will be compiled and presented in an appropriate tabular form. Where appropriate, the impacts of QA/QC qualifiers resulting from laboratory or external validation reviews will be assessed in terms of data usability.

3.6.3 Lab Data Reporting

All sample data packages submitted by the analytical laboratory will be required to be reported in conformance to the NYSDEC ASP (7/2005), Category B data deliverable requirements as applicable to the method utilized. All results will be provided in accordance with the NYSDEC Environmental Information Management System (EIMS) electronic data deliverable (EDD) format. Note that natural oxidant demand analysis will not be subject to ASP-B or EDD reporting requirements and will not be reviewed under the DUSR. Natural oxidant demand analysis will be provided in a results-only format.

3.7 Corrective Action

Review and implementation of systems and procedures may result in recommendations for corrective action. Any deviations from the specified procedures within approved project plans due to unexpected site-specific conditions shall warrant corrective action. All errors, deficiencies, or other problems shall be brought to the immediate attention of

the BEI PM, who in turn shall contact the Quality Assurance/Data Quality Manager or his designee (if applicable).

Procedures have been established to ensure that conditions adverse to data quality are promptly investigated, evaluated and corrected. These procedures for review and implementation of a change are as follows:

- Define the problem.
- Investigate the cause of the problem.
- Develop a corrective action to eliminate the problem, in consultation with the personnel who defined the problem and who will implement the change.
- Complete the required form describing the change and its rationale (see below for form requirements).
- Obtain all required written approvals.
- Implement the corrective action.
- Verify that the change has eliminated the problem.

During the field investigation, all changes to the sampling program will be documented in field logs/sheets and the PM will be advised.

If any problems occur with the laboratory or analyses, the laboratory must immediately notify the PM, who will consult with other project staff. All approved corrective actions shall be controlled and documented.

All corrective action documentation shall include an explanation of the problem and a proposed solution which will be maintained in the project file or associated logs. Each report must be approved by the necessary personnel (e.g., the PM) before implementation of the change occurs. The PM shall be responsible for controlling, tracking, implementing and distributing identified changes.

3.8 Sub-slab, Indoor Air and Outdoor Air Collection (SVI)

The general approach for selecting sampling locations as part of a Soil Vapor Intrusion (SVI) investigation is similar to the approach for the investigation of other environmental media (e.g., soil and groundwater). Sampling locations should be selected with consideration of the CSM. These locations should be selected to meet the stated objectives of the sampling program. Additionally, similar to the investigation of soil and groundwater, it is typical to start at a known or suspected source and work outward. The specific approach, however, will be dependent upon site-specific and building-specific conditions. The following sub-slab vapor, indoor air and outdoor air sampling procedures were derived from the NYSDOH Guidance for Soil Vapor Intrusion dated 2006.

3.8.1 Sub-slab Collection

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 should be inspected and any penetrations (cracks floor drains, utility perforations, sumps, etc.) should be noted and recorded. Probes should be installed at locations where the potential for ambient air infiltration via floor penetrations is minimal. Sub-slab vapor probe installations may be permanent, semi-permanent or temporary. A vacuum should not be used to remove boring debris from the sampling port. Sub-slab implants or probes should be constructed in the same manner at all sampling locations to minimize possible discrepancies. The following procedures will be included in any construction protocol for temporary probes:

1. Temporary probes will be 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;

2. Tubing will not extend further than 2 inches into the sub-slab material;

3. Porous, inert backfill material will be added to cover about 1 inch of the probe tip;

4. Finally, temporary implants will be sealed to surface using a non-VOC containing and non-shrinking products.

In order to obtain representative samples that meet the data quality objectives, sub-slab vapor samples should be collected in the following manner:

a. after installation of the probes, one to three volumes (i.e., the volume of the sample probe and tube) will be purged prior to collecting the samples to ensure samples collected are representative;

b. flow rates for both purging and collecting will not exceed 0.2 liters per minute to minimize ambient air infiltration during sampling; and

c. samples should be collected, using conventional sampling methods, in an appropriate container — one which:

i. meets the objectives of the sampling (e.g., investigation of areas where low or high concentrations of volatile chemicals are expected; to minimize losses of volatile chemicals that are susceptible to photodegradation),

ii. is consistent with the sampling and analytical methods (e.g., low flow rate; Summa® canisters if analyzing by using EPA Method TO-15), and

iii. is certified clean by the laboratory;

d. sample size depends upon the volume of that will achieve minimum reporting limits the flow rate, and the sampling duration; and

e. ideally, samples should be collected over the same period of time as concurrent indoor and outdoor air samples.

When sub-slab vapor samples are collected, the following actions should be taken to document conditions during sampling and ultimately to aid in the interpretation of the sampling results:

a. historic and current storage and uses of volatile chemicals should be 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);

b. the use of heating or air conditioning systems during sampling should be noted;

c. floor plan sketches should be 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 should be completed;

d. outdoor plot sketches should be drawn that include the building site, area streets, outdoor air sampling locations (if applicable), compass orientation (north), and paved areas;

e. weather conditions (e.g., precipitation and indoor and outdoor temperature) and ventilation conditions (e.g., heating system active and windows closed) should be reported; and

f. 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.), should be recorded.

Additional documentation that could be gathered to assist in the interpretation of the results includes information about air flow patterns and pressure relationships obtained by using smoke tubes or other devices (especially between floor levels). NYSDOH building questionnaires and inventory forms will also be filed in order to keep records of the building characteristics and sampling event.

3.8.2 Indoor Air Collection

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. If possible, prior to collecting indoor samples, a pre-sampling inspection should be performed to evaluate the physical layout and conditions of the building being investigated to identify conditions that may affect or interfere with the proposed sampling and to prepare the building for sampling. This process is described in general, indoor air samples should be collected in the following manner:

a. sampling duration should reflect the exposure scenario being evaluated without compromising the detection limit or sample collection flow rate (e.g., and 8 hour sample from a workplace with a single shift versus a 24 hour sample from a workplace with multiple shifts). To ensure that air is representative of the locations sampled and to avoid undue influence from sampling personnel, samples should be collected for at least 1 hour. If the goal of the sampling is to represent average concentrations over longer periods, then longer duration sampling periods may be appropriate. Typically, 24 hour samples are collected from residential settings;

b. personnel should avoid lingering in the immediate area of the sampling device while samples are being collected;

c. sample flow rates must conform to the specifications in the sample collection method and, if possible, should be consistent with the flow rates for concurrent outdoor air and sub-slab samples; and

d. samples must be collected, using conventional sampling methods in an appropriate container–one which:

i. meets the objectives of the sampling (e.g., investigation of areas where low or high concentrations of volatile chemicals are expected; to minimize losses of volatile chemicals that are susceptible to photodegradation),

ii. is consistent with the sampling and analytical methods (e.g., low flow rate; Summa® canisters if analyzing by using EPA Method TO-15), and

iii. is certified clean by the laboratory.

NYSDOH building questionnaires and inventory forms will also be filed in order to keep records of the building characteristics and sampling event.

3.8.3 Outdoor Air Collection

Outdoor air samples should be collected simultaneously with indoor air samples to evaluate the potential influence, if any, of outdoor air on indoor air quality. They may also be collected simultaneously with soil vapor samples to identify potential outdoor air interferences associated with infiltration of outdoor air into the sampling apparatus while the soil vapor is collected. To obtain representative samples that meet the data quality objectives, outdoor air samples should be collected in a manner consistent with that for indoor air samples (described in Section 3.4.2).

The following actions should be taken to document conditions during outdoor air sampling and ultimately to aid in the interpretation of the sampling results:

a. outdoor plot sketches should be drawn that include the building site, area streets, outdoor air sampling locations, the location of potential interferences (e.g., gasoline stations, factories, lawn movers, etc.), compass orientation (north), and paved areas; the local drive-thru facility will also be avoided

b. weather conditions (e.g., precipitation and outdoor temperature) should be reported; wind direction and;

c. any pertinent observations, such as odors, readings from field instrumentation, and significant activities in the vicinity (e.g., operation of heavy equipment or dry cleaners) should be recorded.

4.0 Health and Safety Plan

The Health and Safety Plan (HASP) takes into account the specific hazards inherent in conducting the off-site RI, and presents the minimum requirements which are to be met by Berninger Environmental Inc. (BEI) and other personnel in order to avoid and, if necessary, protect against health and/or safety hazards. A HASP has been prepared and is provided in Appendix - A of this Work Plan. Activities performed under the HASP will comply with applicable parts of OSHA Regulations, primarily 29 CFR Parts 1910 and 1926. Modifications to the HASP may be made with the approval of the BEI Site Safety Manager (SSO) and/or Project Manager (PM).

5.0 Community Air Monitoring Plan

The Community Air Monitoring Plan (CAMP) provides measures for protection for on/off-site workers and the downwind community (i.e., off-site receptors including residences, businesses, and on-site commercial workers) from potential airborne contaminant releases resulting from investigation activities. The action levels specified require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that the investigation work did not spread contamination off-site through the air. The primary concerns during the investigation are odors from VOCs. The CAMP for this investigation is provided as Appendix - B.

6.0 Remedial Investigation Report

Following completion of the investigation and receipt of the analytical data, BEI will prepare a Remedial Investigation Report (RIR) in accordance with DER-10. The RIR will include the following:

1. A description of the work which was performed under the RI.
2. Any modification from this work scope and the reason for the modifications
3. The nature and extent of the off-site groundwater plume
4. Groundwater conditions that were observed
5. Analytical data in tabular form comparing results to part 375-6 SCOs
6. Cross sections and data figures
7. Laboratory analytical data, sampling logs and well completion logs for all samples and areas covered by the investigation
8. Scaled drawings showing the locations of temporary sampling points, monitoring wells and water sampling locations
9. A Qualitative Human Health Exposure Assessment (QHHEA)
10. Third party Laboratory Validation of ASP-B data.

7.0 Project Schedule

Implementation of the RI will be performed following the DEC approval of this RIWP. Access to most of the proposed sampling locations will need to be granted prior to mobilization. However, some preparation may be required in order to access many of the off-site locations. (i.e. borings in the area of the Chase Bank, former CFSS and residential homes/businesses south and east of the subject property) The tenant will be notified prior to the start of investigation activities. Scheduling will be coordinated and modified as much as possible to accommodate the requests of the tenant to minimize any disturbance to operation of the business. Mobilization for the field work is anticipated to begin approximately 3 weeks following NYSDEC approval of the RI Work Plan The

estimated duration of the full RI activity is two to three weeks total field time. The anticipated schedule of events is as follows:

- NYSDEC Approval of RIWP
- Access agreements within 2-4 weeks of approved RIWP
- Mobilize equipment to the Site (begin) within 3 weeks of RIWP approval
- Complete Field Work within 3 weeks of mobilization date
  - SVI Field Work 2-4 days
  - Monitoring Well Installation (3 wells) 1 day
  - Groundwater sampling (15 locations) 5-7 days
- Receive all Laboratory Reports and Validated data within 6-8 weeks of completion of field work
- Submit Remedial Investigation Report (RIR) within 6 weeks of receipt of Validated lab data.

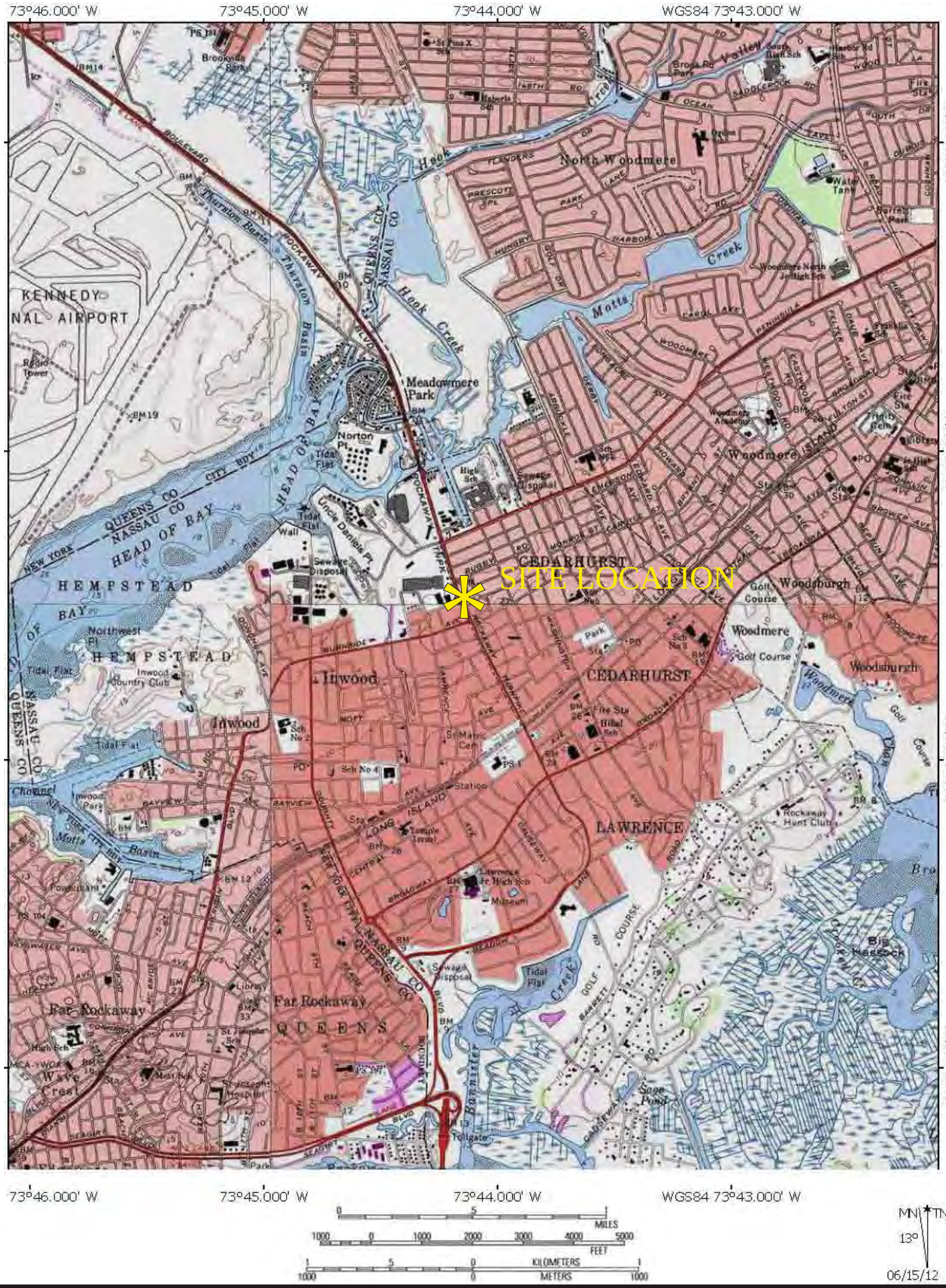
TABLES

Table-1
Summary of Investigation, Sampling Rationale and Analysis

Matrix	Location	Approx. Number of Samples	Rationale for Sampling	Laboratory Analysis
Groundwater (water table)	5 borings south and east of property as per Figure-3	15-18	To supplement previous sampling as per SCR for delineation of elevated 1, 2 DCE concentrations in area south and east of source area.	VOCs EPA Method 8260
Groundwater (water table)	3 borings west of CFSS as per Figure-3	9	Determine if former site activities at CFSS is contributing to off-site plume	VOCs EPA Method 8260
Groundwater (water table)	4 borings northwest (down gradient) of site on west side of Rockaway Turnpike near Chase Bank	16	Delineate off-site PCE plume in order to expand on the CSM developed by EAR and fill in data gaps	VOCs EPA Method 8260
Soil Vapor Intrusion	10 properties	23(10 indoor air; 10 sub-slab and 3 outdoor air)	SVI in order to evaluate potential off-site exposures at surrounding properties and exposure assessment	VOCs EPA TO-15 as per NYSDOH Guidance for Soil Vapor Intrusion
Monitoring Well Installation	3 monitoring wells	surveying/GW flow	GW gradient map	RDC parameters (TEA,TOC,etc..)

Matrix	Location	Approx. Number of Samples	Rationale for Sampling	Laboratory Analysis
Groundwater (water table)	3 borings at former CSM locations EP-13, EP-15 and EP-18	3 at 60'+	Supplement previous CSM locations to delineate vertical contamination and complete CSM	VOCs EPA Method 8260

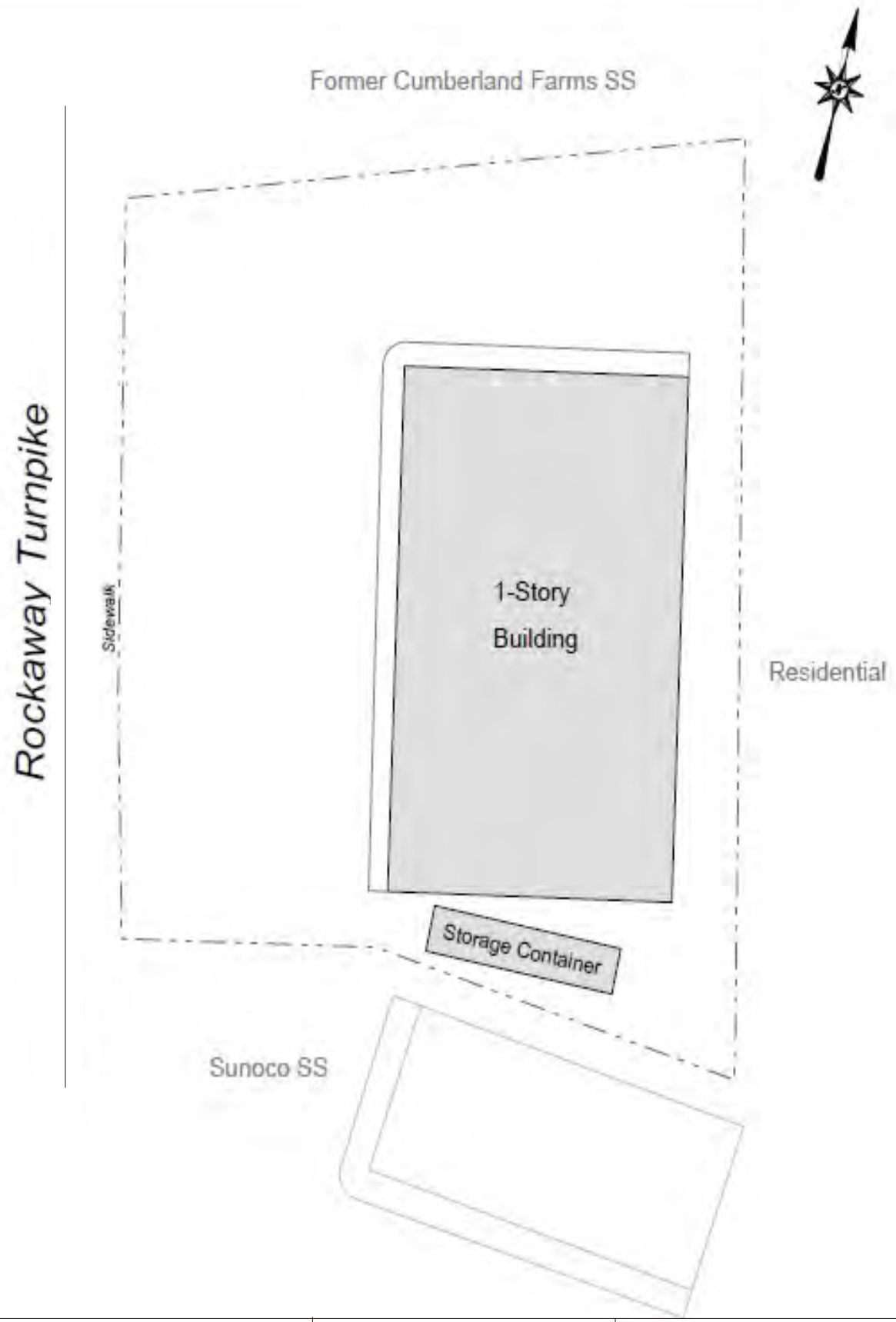
FIGURES



Former Quick and Clean Cleaners
380 Rockaway Turnpike
Cedarhurst, New York

Figure-1
Site Location

BERNINGER ENVIRONMENTAL INC.
groundwater consultants and geologists
90 B Knickerbocker Avenue
Bohemia, New York 11716
Phone # (631) 589-6521
Fax # (631) 589-6528



Former Quick and Clean Cleaners
380 Rockaway Turnpike
Cedarhurst, New York

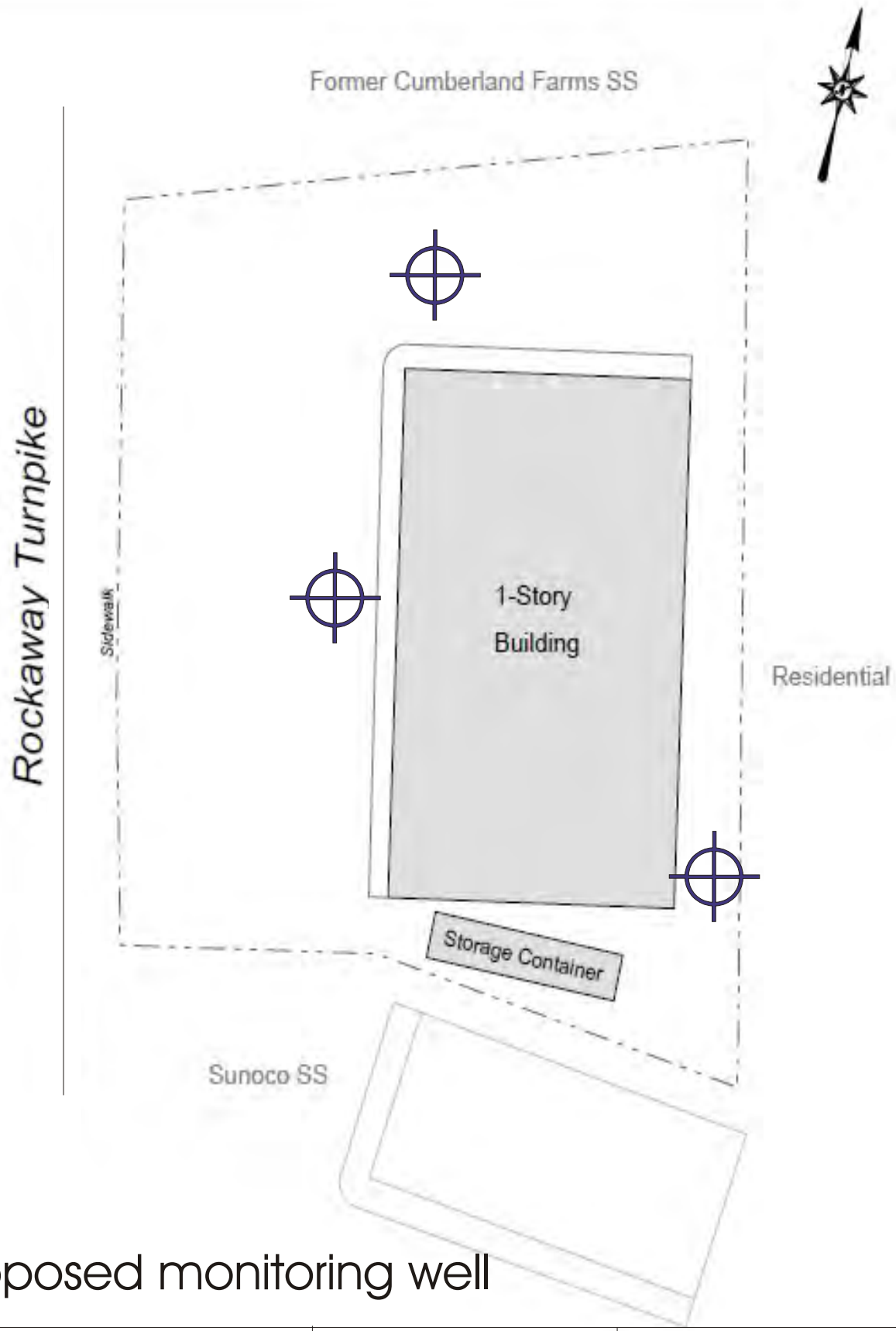
Figure-2
Site Map

BERNINGER ENVIRONMENTAL INC.
groundwater consultants and geologists
90 B Knickerbocker Avenue
Bohemia, New York 11716
Phone # (631) 589-6521
Fax # (631) 589-6528

Former Quick and Clean Cleaners
380 Rockaway Turnpike
Cedarhurst, New York

Figure-3
Sample Locations

BERNINGER ENVIRONMENTAL INC.
groundwater consultants and geologists
90 B Knickerbocker Avenue
Bohemia, New York 11716
Phone # (631) 589-6521
Fax # (631) 589-6528



Proposed monitoring well

Former Quick and Clean Cleaners
380 Rockaway Turnpike
Cedarhurst, New York

Figure-4
Monitoring
Well Locations

BERNINGER ENVIRONMENTAL INC.
groundwater consultants and geologists
90 B Knickerbocker Avenue
Bohemia, New York 11716
Phone # (631) 589-6521
Fax # (631) 589-6528

Berninger Environmental, Inc.

groundwater consultants and geologists
Phone:631-589-6521
90-B Knickerbocker Ave. Bohemina ,NY 11716

Drawn By: JGH

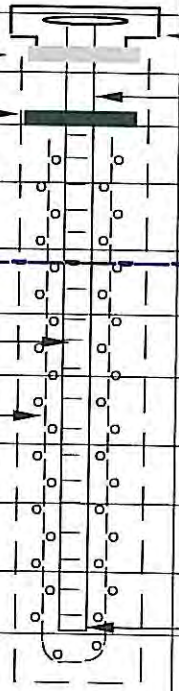
Figure 5

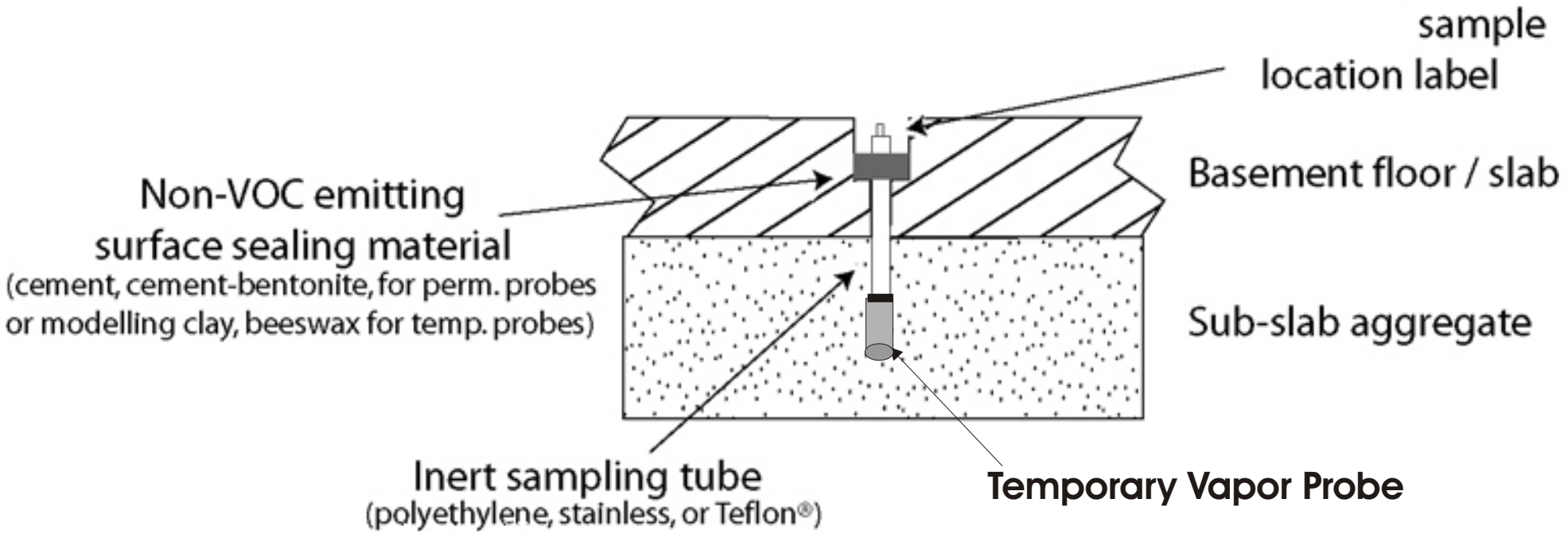
Well Log

Project: Former Quick and Clean Cleaners
Client: 380 Rockaway Turnpike Corp
Location: Cedarhurst, NY
Well No: All Proposed Wells **Use:** Survey/Monitoring Well
Drilling Method: Geoprobe direct push
Casing Type: PVC **Casing Dia:** 2" **Casing Length:** 2'
Screen Type: PVC **Screen Dia:** 2" **Screen Length:** 8'
Screen Slot: .02 inch **Gravel Pack:** #2 Fil-pro
Casing Seal: Cement **Finish:** Cement flush

Date: TBA
Be Job No:
Driller: Joel/Eusi
Bore Hole Dia: 3.5"
Sample Method: N/A
Depth to Water: 4'-5'
Total Depth: 10'
Security: 5" Manhole

Depth Below Grade	Sample Information	Well Design	Identification/Remarks
Grade Surface			
	Hydraulic Cement Seal		5" manhole cover cemented in place
2'	Bentonite Seal		2' of 2" PVC riser
4'			DTW
6'	8' of .02 inch PVC slot screen		
	Fil-Pro Gravel Pack Material		
8'			
10'			10' Depth to Bottom





Former Quick and Clean Cleaners
380 Rockaway Turnpike
Cedarhurst, New York

Figure-6
Temporary Vapor
Probe Construction

BERNINGER ENVIRONMENTAL INC.
groundwater consultants and geologists
90 B Knickerbocker Avenue
Bohemia, New York 11716
Phone # (631) 589-6521
Fax # (631) 589-6528

APPENDICES

APPENDIX A

HASP

FORMER QUICK AND CLEAN CLEANERS

INVESTIGATION HEALTH AND SAFETY PLAN
(HASP)

PREPARED FOR:
380 ROCKAWAY TURNPIKE REALTY CORPORATION
36 LAWRENCE AVENUE
LAWRENCE, NY 11559

PREPARED BY:

BERNINGER ENVIRONMENTAL, INC.

90-B KNICKERBOCKER AVENUE
BOHEMIA, NEW YORK 11716

September 2012

TABLE OF CONTENTS

FIGURES

APPENDICES

STATEMENT OF COMMITMENT

This Health and Safety Plan (HASP) has been prepared to ensure that workers are not exposed to risks from hazardous materials during the planned Remedial Investigation at the Former Quick and Clean Cleaners Site at 380 Rockaway Turnpike, Cedarhurst, New York.

This HASP, which applies to persons present at the site actually or potentially exposed to hazardous materials, describes emergency response procedures for actual and potential chemical hazards. This HASP is also intended to inform and guide personnel entering the work area or exclusion zone. Persons are to acknowledge that they understand the potential hazards and the contents of this Health and Safety policy by signing off on receipt of their individual copy of the document. Contractors and suppliers are retained as independent contractors and are responsible for ensuring the health and safety of their own employees.

1.0 Introduction and Site Entry Requirements

This document describes the health and safety guidelines developed by Berninger Environmental Inc. (BEI) for the proposed Remedial Investigation at 380 Rockaway Turnpike, Cedarhurst, New York to protect on-site personnel, visitors, and the public from physical harm and exposure to hazardous materials or wastes during subsurface investigation activities. In accordance with the Occupational Safety and Health Administration (OSHA) 29 CFR Part 1910.120 Hazardous Waste Operations and Emergency Response Final rule, this HASP, including the attachments, addresses safety and health hazards related to subsurface sample collection activities and is based on the best information available. The HASP may be revised by BEI at the request of 380 Rockaway Turnpike Corp and/or a regulatory agency upon receipt of new information regarding site conditions. Changes will be documented by written amendments signed by BEI's project manager, site safety officer and/or the BEI's health and safety consultant.

1.1 Training Requirements

Personnel entering the exclusion zone or decontamination zone are required to be certified in health and safety practices for hazardous waste site operations as specified in the Federal OSHA Regulations CFR 1910.120e (revised 3/6/90).

Paragraph (e - 3) of the above referenced regulations requires that all on-site management personnel directly responsible for or who supervise employees engaged in hazardous waste operations, must initially receive 8 hours of supervisor training related to managing hazardous waste work.

Paragraph (e - 8) of the above referenced regulations requires that workers and supervisors receive 8 hours of refresher training annually on the items specified in Paragraph (e-1) and/or (e-3).

Additionally all on-site personnel must receive adequate site-specific training in the form of an on-site Health and Safety briefing prior to participating in field work with emphasis on the following:

- Protection of the adjacent community from hazardous vapors and/or dust which may be released during intrusive activities.
- Identification of chemicals known or suspected to be present on-site and the health effects and hazards of those substances.
- The need for vigilance in personnel protection, and the importance of attention to proper use, fit and care of personnel protective equipment.
- Decontamination procedures.
- Site control including work zones, access and security.
- Hazards and protection against heat or cold.
- The proper observance of daily health and safety practices, such as entry and exit of work zones and site. Proper hygiene during lunch, break, etc.
- Emergency procedures to be followed in case of fire, explosion and sudden release of hazardous gases.

Health and Safety meetings will be conducted on a daily basis and will cover protective clothing and other equipment to be used that day, potential and chemical and physical hazards, emergency procedures, and conditions and activities from the previous day.

1.2 Medical Monitoring Requirements

Field personnel and visitors entering the exclusion zone or decontamination zone must have completed appropriate medical monitoring required under OSHA 29 CFR 1910.120(f). Medical monitoring enables a physician to monitor each employee's health, physical condition, and his fitness to wear respiratory protective equipment and carry out on-site tasks.

1.3 Site Safety Plan Acceptance, Acknowledgments and Amendments

The project superintendent and the site safety officer are responsible for informing personnel (BEI) employees and/or owner or owner's representatives) entering the work area of the contents of this plan and ensuring that each person signs the safety plan acknowledging the on-site hazards and procedures required to minimize exposure to adverse effects of these hazards. A copy of the Acknowledgment Form is included in **Appendix - A**.

Site conditions may warrant an amendment to the HASP. Amendments to the HASP are acknowledged by completing forms included in **Appendix - B**.

1.4 Key Personnel, Roles and Responsibilities

Personnel responsible for implementing this Health and Safety Plan are:

Name	Title	Address	Contact No.
Mr. Justin Halpin	Project Manager	90-B Knickerbocker Ave.,Bohemia, NY	631-589-6521(office) 631-774-6682 (cell)
Mr. Peter Daniels	Site Safety Officer/ Supervisor	90-B Knickerbocker Ave., Bohemia, NY	631-589-6521
Mr. Joel Meyers	Geo-Technician	90-B Knickerbocker Ave., Bohemia, NY	631-589-6521
Mr. Eusi Watkins	Geo-Technician	90-B Knickerbocker Ave., Bohemia, NY	631-589-6521

The project manager is responsible for overall project administration and, with guidance from the site safety officer, for supervising the implementation of this HASP. The site safety officer will conduct daily (tail gate or tool box) safety meetings at the project site and oversee daily safety issues. Each subcontractor and supplier (defined as an OSHA employer) is also responsible for the health and safety of its employees. If there is any dispute about health and safety or project activities, on-site personnel will attempt to resolve the issue. If the issue cannot be resolved at the site, then the project manager will be consulted.

The site safety officer is also responsible for coordinating health and safety activities related to hazardous material exposure on-site. The site safety officer is responsible for the following:

1. Educating personnel about information in this HASP and other safety requirements to be observed during site operations, including, but not limited to, decontamination procedures, designation of work zones and levels of protection, air monitoring, fit testing, and emergency procedures dealing with fire and first aid.

2. Coordinating site safety decisions with the project manager.

3. Designating exclusion, decontamination and support zones on a daily basis.

4. Monitoring the condition and status of known on-site hazards and maintaining and implementing the air quality monitoring program specified in this HASP.

5. Maintaining the work zone entry/exit log and site entry/exit log.

6. Maintaining records of safety problems, corrective measures and documentation of chemical exposures or physical injuries (the site safety officer will document these conditions in a bound notebook and maintain a copy of the notebook on-site).

The person who observes safety concerns and potential hazards that have not been addressed in the daily safety meetings should immediately report their observations/concerns to the site safety officer or appropriate key personnel.

2.0 Site Background and Scope of Work

The address for the subject property is 380 Rockaway Turnpike, Cedarhurst, NY. The subject property is designated as Section 39, Block 344, Lots 216 and 220 by the Nassau County Department of Assessment. The subject property is located in the Incorporated Village of Cedarhurst, Town of Hempstead, Nassau County, NY as shown on **Figure 1**. The lot has 123 feet of frontage on Rockaway Turnpike and is approximately 100 feet deep for a combined area of 0.318 acres (13,852 sf). **Figure-2**

The subject site is developed with a 3,984^{sf} 1-story masonry building, built in 1962 for commercial (retail) use. Based on current zoning and the location of the property, it is likely to remain in commercial-retail use.

The elevation of the property ranges from approximately 10 to 13 feet above the National Geodetic Vertical Datum (NGVD). The topography in the vicinity of the site generally slopes from southeast to northwest. The depth to groundwater beneath the site, as determined from field measurements, is approximately 4.5 to 5 feet below grade. Groundwater flow can not be determined from regional water table elevation maps and has been reported as ranging from north to southwest at the adjacent property to the north (former Cumberland Farms SS).

The area surrounding the Site consists of retail "strip stores" and service stations along the east side of Rockaway Turnpike with single-family residential homes adjacent to the east. Adjacent properties to the north include a former Cumberland Farms service station and an active Shell service station. Adjacent properties to the south include a Sunoco, Getty and Gulf service stations. In total the subject property is flanked north and south by 4 active and 1 former service station. The west side of Rockaway Turnpike is characterized by larger shopping centers with industrial buildings/ warehouses, major oil storage facilities (MOSF) and the Town of Hempstead incinerator plant adjacent to the west.

2.1 Previous Investigations

The field investigation portion of the Site Characterization Report (SCR) was conducted at the site from December 8, 2009 through March 25, 2010 and consisted of the collection and analysis of 7 soil samples from 7 boring locations, 28 groundwater samples from 10 on-site locations, 39 groundwater samples from 9 off-site locations and 6 soil gas samples from 4 on-site and 2 off-site locations. All soil and groundwater samples were collected with GeoProbe®-type direct push equipment and tooling.

According to logs contained in the SCR, soil samples were collected for the first 8 feet through a 4 ft macro-core sampler using the single-tube method and then using a 4 ft large bore sampler for the remainder of the boring to a maximum of 20 ft. On-site groundwater sampling performed in December 2009 were collected through a 2 ft mill slotted rod which was driven to multiple depths ranging from 10 to 70 feet with samples collected in 10 foot intervals. Off-site samples collected in

March 2010 utilized a 2 ft wire wrap discrete sampler. Purge volumes varied considerably ranging from 0 to 0.5 gallons per sample for the mill slot sampler to 0.10 to 3 gallons for the wire wrap sampler. The results of this investigation did not identify any chlorinated compounds above unrestricted soil clean up objectives (SCOs) in any of the soil samples collected. However, petroleum VOCs including ethylbenzene, toluene and xylene were reported in 5 of 7 soil samples at concentrations significantly above unrestricted and groundwater protection SCOs. Total petroleum VOCs in soil ranged from 2,550 ug/kg at location EP7 (12-14 ft) to 107,000 ug/kg at EP5 (12-14 ft). EP5 is located near the south property line adjacent to the Sunoco service station.

On-site groundwater samples reported elevated concentrations of both chlorinated VOCs (CVOCs) and petroleum VOCs (PVOCs) at every sampling location. With the exception of EP7 the highest concentrations of both CVOCs and PVOCs were reported in the shallowest samples. EP7 reported the highest detections of both CVOCs and PVOCs in the 70-72 ft interval and had the highest PVOC concentrations reported with a total of 185,426 ug/L.

CVOC detections in the shallow intervals ranged from non-detect at EP5 (20-22 ft) to 14,830 ug/L at EP9 (10-12 ft). In addition to EP9, the highest CVOC concentrations were reported at locations MW7, EP8 (10-12 ft) and EP3 (10-12 ft). On-site CVOC totals were comprised almost entirely of cis-dichloroethene ©-DCE) and vinyl chloride (VC). The highest tetrachloroethene (PCE) and trichloroethene (TCE) concentrations were reported as 595 and 217 ug/L, respectively, in EP8 (20-22 ft). On-site CVOC concentrations were generally highest at the rear (east) and north side of the building.

PVOC concentrations in shallow samples ranged from 2,907 ug/L at location EP1 (20-22 ft) to 30,821 ug/L at EP3 (10-12 ft). In almost all cases PVOC concentrations were considerably higher than the CVOC concentrations. The anomalously high CVOC and PVOC concentrations reported at EP7 (70-72 ft) were not explained in the SCR and are likely attributed to deficiencies in the method of sampling. This will be confirmed as part of the Remedial Investigation work.

Off-site CVOC concentrations were highest in samples from the 30-32 ft interval and ranged from 51 ug/L at location EP10 (west of the subject site) to 21,149 ug/L at location EP15. Off-site CVOC concentrations were comprised for the most part of PCE with only small amounts of TCE and the other parameters. Off-site PVOC detections were generally low and ranged from non-detect to 162 ug/L with the highest detections reported in the 50-52 interval.

CVOC detections in soil gas ranged from 11 ug/m3 to 5,717 ug/m3 with the highest concentrations occurring in SP2 and SP5 located at the north property line. The main constituent in the soil gas at these locations was cis-DCE.

2.2 Scope of Remedial Investigation

The Remedial Investigation will include the installation of up to 12 groundwater borings, 3 monitoring wells and the conduct of a soil vapor intrusion study (SVI). The location of the

groundwater borings, monitoring wells and SVI locations are shown on **Figure 3** of the Remedial Investigation Work Plan.

Groundwater borings will be sampled at select intervals from the aquifer surface to a depth of approximately 74 feet below grade (interval depths vary per location). Multiple groundwater samples will be collected from each boring location.

All borings will be advanced with GeoProbe® direct push equipment and sampled with a 4 foot screen point 16 (SP-16) sampler tool. Groundwater conditions will be characterized by the staff scientist or Geo-technician. Retained water samples from each boring will be submitted to a New York State Department of Health ELAP-certified laboratory for EPA Method 8260 analysis.

The groundwater samples will be collected by installing a 4 foot screen point 16 (SP-16) sampling tool to the desired depth below the water table. Groundwater samples will be collected from the temporary wells using disposable polyethylene tubing connected to a peristaltic pump equipped with disposable peristaltic pump tubing or with a stainless steel check valve attached to the poly-tubing.

3.0 Site Hazard Evaluation

This section identifies the hazards associated with the proposed scope of work, general physical hazards that can be expected at most sites; and presents a summary of documented or potential chemical hazards at the site. Every effort must be made to reduce or eliminate these hazards. Those that cannot be eliminated must be guarded against using engineering controls and/or personal protective equipment.

This HASP has been developed for work performed at the site in association with a subsurface investigation. The primary hazards to the field crew will be physical hazards related to sample collection procedures and equipment, and chemical exposures to the sampling crew from exposure to potential contaminants, which may be present at the site.

3.1 Physical Hazards

3.1.1 Tripping Hazards

An area of risk associated with on-site activities are presented by uneven ground, concrete, curbstones or equipment which may be present at the site thereby creating a potential tripping hazard. During intrusive work, care should be taken to mark or remove any obstacles within the exclusion zone.

3.1.2 Cuts and Lacerations

Field activities that involve boring equipment may result in cuts or lacerations from machinery and tools used in collecting samples, cutting disposable tubing and opening acetate sleeves and liners. A first aid kit approved by the American Red Cross will be available during all subsurface investigative activities.

3.1.3 Lifting Hazards

Improper lifting by workers is one of the leading causes of industrial injuries. Field workers may be required to lift heavy objects such as boring tools, buckets of decontamination water, cement, etc. Therefore, all members of the field crew should be trained in the proper methods of lifting heavy objects. All workers should be cautioned against lifting objects too heavy for one person.

3.1.4 Utility Hazards

Before conducting any subsurface boring or sampling, the contractor will be responsible for locating and verifying all existing utilities at each boring location.

3.1.5 Traffic Hazards

All traffic, vehicular and pedestrian, shall be maintained and protected at all times consistent with local, state and federal agency regulations regarding such traffic and in accordance with NYCDOT

guidelines. The contractor shall carry on his operations without undue interference or delays to traffic. The contractor shall furnish all labor, materials, guards, barricades, signs, lights, and anything else necessary to maintain traffic and to protect his work and the public, during operations.

3.2 Work in Extreme Temperatures

Work under extremely hot or cold weather conditions requires special protocols to minimize the chance that employees will be affected by heat or cold stress.

3.2.1 Heat Stress

The combination of high ambient temperature, high humidity, physical exertion, and personal protective apparel, which limits the dissipation of body heat and moisture, can cause heat stress.

The following prevention, recognition and treatment strategies will be implemented to protect personnel from heat stress. Personnel will be trained to recognize the symptoms of heat stress and to apply the appropriate treatment.

1. Prevention

    a. Provide plenty of fluids. Available in the support zone will be a 50% solution of fruit punch and water or plain water.

    b. Work in Pairs. Individuals should avoid undertaking any activity alone.

    c. Provide cooling devices. A spray hose and a source of water will be provided to reduce body temperature, cool protective clothing and/or act as a quick-drench shower in case of an exposure incident.

    d. Adjustment of the work schedule. As is practical, the most labor-intensive tasks should be carried out during the coolest part of the day.

2. Recognition and Treatment

    a. Heat Rash (or prickly heat):
    Cause: Continuous exposure to hot and humid air, aggravated by chafing clothing.

Symptoms: Eruption of red pimples around sweat ducts accompanied by intense itching and tingling.
Treatment: Remove source or irritation and cool skin with water or wet cloths.

b. Heat Cramps (or heat prostration)

Cause: Profuse perspiration accompanied by inadequate replenishment of body water and electrolytes.
Symptoms: Muscular weakness, staggering gait, nausea, dizziness, shallow breathing, pale and clammy skin, approximately normal body temperature.
Treatment: Perform the following while making arrangement for transport to a medical facility. Remove the worker to a contamination reduction zone. Remove protective clothing. Lie worker down on back in a cool place and raise feet 6 to 12 inches. Keep warm, but loosen all clothing. If conscious, provide sips of salt-water solution, using one teaspoon of salt in 12 ounces of water. Transport to a medical facility.

c. Heat Stroke

Cause: Same as heat exhaustion. This is also an extremely serious condition.
Symptoms: Dry and hot skin, dry mouth, dizziness, nausea, headache and rapid pulse.
Treatment: Cool worker immediately by immersing or spraying with cool water or sponge bare skin after removing protective clothing. Transport to hospital.

3.2.2 Cold Exposure

Exposure to cold weather, wet conditions and extreme wind-chill factors may result in excessive loss of body heat (hypothermia) and/or frostbite. To guard against cold exposure and to prevent cold injuries, appropriate warm clothing should be worn, warm shelter must be readily available, rest periods should be adjusted as needed, and the physical conditions of on-site field personnel should be closely monitored. Personnel and supervisors working on-site will be made aware of the signs and symptoms of frost bite and hypothermia such as shivering, reduced blood pressure, reduced coordination, drowsiness, impaired judgment, fatigue, pupils dilated but reactive to light and numbing of the toes and fingers.

3.3 Chemical Hazards

A Site Characterization previously performed at the site identified both chlorinated and petroleum volatile organic compounds in soil and groundwater which may be encountered during the investigation. In addition, chlorinated compounds in soil vapors were also reported at the Site particularly along the northern property line.

The primary routes of exposure to these contaminants are inhalation, ingestion and absorption.

Appendix - C includes information sheets for suspected chemicals that may be encountered at the site.

3.3.1 Respirable Dust and Direct Contact with Soil and Groundwater

Dust may be generated from boring activities. If visible observation detects elevated levels of dust, a program of wetting will be employed by the site safety officer. If elevated dust levels persist, the site safety office will employ dust monitoring using a particulate monitor (MiniRae or equivalent). If monitoring detects concentrations greater than 150 µg/m3 over daily background, the site safety officer will take corrective actions as defined herein, including the use of water for dust suppression and if this is not effective, requiring workers to wear APRs with efficiency particulate air (HEPA) cartridges.

Absorption pathways for dust and direct contact with soil and groundwater will be mitigated with the implementation of latex gloves, hand washing and decontamination exercises when necessary.

3.3.2 Organic Vapors

Considering the past and present use of the properties, VOCs may be encountered at the site in soil and/or groundwater. Therefore, boring activities may cause the release of organic vapors to the atmosphere. The site safety officer will periodically monitor organic vapors with a Photoionization Detector (PID) during boring activities to determine whether organic vapor concentrations exceed action levels shown below.

PID Response	Action
Sustained readings of 5 ppm or greater	Shut down equipment and allow area to vent. Resume when readings return to background
Sustained readings of 5 ppm or greater that do not subside after venting	Implement Vapor Release Plan (Section 6.8). Re-evaluate respiratory protection as upgrade may be required.

4.0 Personal Protective Equipment (PPE)

Personal protective equipment (PPE) shall be selected in accordance with the site air monitoring program, OSHA 29 CFR 1910.120©, (g), and 1910.132. Protective equipment shall be NIOSH approved and respiratory protection shall conform to OSHA 29 CFR Part 1910.133 and 1910.134 specifications; head protection shall conform to 1910.135; eye and face protection shall conform to 1910.133; and foot protection shall conform to 1910.136. The only true difference among the levels of protection from D thru B is the addition of the type of respiratory protection.

It is anticipated that work will be performed in Level D PPE.

4.1 Level D

Level D PPE shall be donned when the atmosphere contains no known hazards and work functions preclude splashes, immersion, or the potential for inhalation of, or contact with, hazardous concentrations of harmful chemicals. Level D PPE consists of:

- standard work uniform, coveralls, or tyvek, as needed;
- steel toe and steel shank work boots;
- hard hat;
- gloves, as needed;
- safety glasses;
- hearing protection;
- equipment replacements are available as needed.

4.2 Level C

Level C PPE shall be donned when the concentrations of measured total organic vapors in the breathing zone exceed background concentrations (using a portable OVA, or equivalent), but are less than 5 ppm. The specifications on the APR filters used must be appropriate for contaminants identified or expected to be encountered. Level C PPE shall be donned when the identified contaminants have adequate warning properties and criteria for using APR have been met. Level C PPE consists of:

- chemical resistant or coated tyvek coveralls;
- steel-toe and steel-shank work boots;
- chemical resistant over boots or disposable boot covers;
- disposable inner gloves (surgical gloves);
- disposable outer gloves;
- full face APR fitted with organic vapor/dust and mist filters or filters appropriate for the
- identified or expected contaminants;
- hard hat;
- splash shield, as needed; and,
- ankles/wrists taped with duct tape.

4.3 Activity-Specific Levels of Personal Protection

The required level of PPE is activity-specific and is based on air monitoring results (Section 4.0) and properties of identified or expected contaminants. **It is expected that site work will be performed in Level D.** If air monitoring results indicate the necessity to upgrade the level of protection engineering controls (i.e. Facing equipment away from the wind and placing site personnel upwind of excavations, active venting, etc.) will be implemented before requiring the use of respiratory protection.

5.0 Site Control

5.1 Work Zones

The primary purpose of site controls is to establish the perimeter of a hazardous area, to reduce the migration of contaminants into clean areas, and to prevent access or exposure to hazardous materials by unauthorized persons. When operations are to take place involving hazardous materials, the site safety officer will establish an exclusion zone, a decontamination zone, and a support zone. These zones "float" (move around the site) depending on the tasks being performed on any given day. The site safety officer will outline these locations before work begins and when zones change. The site safety officer records this information in the site log book. **It is expected that for soil boring and sampling activities, identification of an exclusion zone, decontamination zone, and support zone will not be necessary.**

Tasks requiring OSHA 40-hour Hazardous Waste Operations and Emergency Response Operations training are carried out in the exclusion zone. The exclusion zone is defined by the site safety officer but will typically be a 50-foot area around work activities. Gross decontamination (as determined by the site Health and Safety Officer) is conducted in the exclusion zone; all other decontamination is performed in the decontamination zone or trailer.

Protective equipment is removed in the decontamination zone. Disposable protective equipment is stored in receptacles staged in the decontamination zone, and non-disposable equipment is decontaminated. All personnel and equipment exit the exclusion zone through the decontamination zone. If a decontamination trailer is provided the first aid equipment, an eye wash unit, and drinking water are kept in the decontamination trailer.

The support zone is used for vehicle parking, daily safety meetings, and supply storage. Eating, drinking, and smoking are permitted only in the support zone. When a decontamination trailer is not provided, the eye wash unit, first aid equipment, and drinking water are kept at a central location designated by the site safety officer.

6.0 Contingency Plan/Emergency Response Plan

Site personnel must be prepared in the event of an emergency. Emergencies can take many forms: illnesses, injuries, chemical exposure, fires, explosions, spills, leaks, releases of harmful contaminants, or sudden changes in the weather.

Emergency telephone numbers and a map to the hospital will be posted in the command post. Site personnel should be familiar with the emergency procedures, and the locations of site safety, first aid, and communication equipment.

6.1 Emergency Equipment On-site

Private telephones: Site personnel.
Two-way radios: Site personnel where necessary.
Emergency Alarms: On-site vehicle horns*.
First aid kits: On-site, in vehicles or office.
Fire extinguisher: On-site, in office or on equipment.

* Horns: Air horns will be supplied to personnel at the discretion of the project superintendent or site safety officer.

6.2 Emergency Telephone Numbers

General Emergencies 911
Nassau County Police (4rth precinct Hewlett, NY) 516-573-6400
St. John's Hospital 718-869-7000
NYSDEC Spills Division 800-457-7362
NYSDEC Hazardous Waste Division 718-482-4994
NCDOH Nassau County Department of Health 516-227-9697
Lawrence-Cedarhurst Fire Department 516-569-0042
National Response Center 800-424-8802
Poison Control 212-340-4494
Site Safety Officer 631-589-6521
Project Manager 631-589-6521 or cell 631-774-6682

6.3 Personnel Responsibilities During an Emergency

The project manager is primarily responsible for responding to and correcting any emergency situations. However, in the absence of the project manager, the site safety officer shall act as the project manager's on-site designee and perform the following tasks:

- Take appropriate measures to protect personnel including: withdrawal from the exclusion zone, evacuate and secure the site, or upgrade/downgrade the level of protective clothing and respiratory protection;

- Ensure that appropriate federal, state, and local agencies are informed and emergency response plans are coordinated. In the event of fire or explosion, the local fire department should be summoned immediately. If toxic materials are released to the air, the local authorities should be informed in order to assess the need for evacuation;

- Ensure appropriate decontamination, treatment, or testing for exposed or injured personnel;

- Determine the cause of incidents and make recommendations to prevent recurrence; and,

- Ensure that all required reports have been prepared.

The following key personnel are planned for this project:

- Project Manager: Mr. Justin Halpin 631-589-6521 (office) 631-774-6682 (cell)

- Site Safety Officer/Supervisor: Mr. Peter Daniels 631-589-6521

- Geo-Technician: Mr. Joel Meyers 631-589-6521

- Geo-Technician: Mr. Eusi Watkins 631-589-6521

6.4 Medical Emergencies

A person who becomes ill or injured in the exclusion zone will be decontaminated to the maximum extent possible. If the injury or illness is minor, full decontamination will be completed and first aid administered prior to transport. First aid will be administered while waiting for an ambulance or paramedics. A Field Accident Report (**Appendix D**) must be filled out for any injury.

A person transporting an injured/exposed person to a clinic or hospital for treatment will take thedirections to the hospital (**Appendix D**) and information on the chemical(s) to which they may have been exposed (**Appendix C**).

6.5 Fire or Explosion

In the event of a fire or explosion, the local fire department will be summoned immediately. The site safety officer or his designated alternate will advise the fire commander of the location, nature and

identification of the hazardous materials on-site. If it is safe to do so, site personnel may:

- use fire fighting equipment available on site; or,
- remove or isolate flammable or other hazardous materials that may contribute to the fire.

6.6 Evacuation Routes

Evacuation routes established by work area locations for each site will be reviewed prior to commencing site operations. As the work areas change, the evacuation routes will be altered accordingly, and the new route will be reviewed.

Under extreme emergency conditions, evacuation is to be immediate without regard for equipment. The evacuation signal will be a continuous blast of a vehicle horn, if possible, and/or by verbal/radio communication. When evacuating the site, personnel will follow these instructions:

- Keep upwind of smoke, vapors, or spill location.
- Exit through the decontamination corridor if possible.
- If evacuation through the decontamination corridor is not possible, personnel should remove contaminated clothing once they are in a safe location and leave it near the exclusion zone or in a safe place.
- The site safety officer will conduct a head count to ensure that all personnel have been evacuated safely. The head count will be correlated to the site and/or exclusion zone entry/exit log.
- If emergency site evacuation is necessary, all personnel are to escape the emergency situation and decontaminate to the maximum extent practical.

6.7 Spill Control Procedures

Spills associated with site activities may be attributed to project equipment and include gasoline, diesel and hydraulic oil. In the event of a leak or a release, site personnel will inform their supervisor immediately, locate the source of spillage and stop the flow if it can be done safely. A spill containment kit including absorbent pads, booms and/or granulated speedy dry absorbent material will be available to site personnel to facilitate the immediate recovery of the spilled material. Daily inspections of site equipment components including hydraulic lines, fuel tanks, etc. will be performed by their respective operators as a preventative measure for equipment leaks and to ensure equipment soundness. In the event of a spill, site personnel will immediately notify the NYSDEC (1-800-457-7362), and a spill number will be generated.

6.8 Vapor Release Plan

If work zone organic vapor (excluding methane) exceeds 5 ppm, then a downwind reading will be made either 200 feet from the work zone or at the property line, whichever is closer. If readings at this location exceed 5 ppm over background, the work will be stopped.

If 5 ppm of VOCs are recorded over background on a PID at the property line, then an off-site reading will be taken within 20 feet of the nearest residential or commercial property, whichever is closer. If efforts to mitigate the emission source are unsuccessful for 30 minutes, then the designated site safety officer will:

- contact the local police;
- continue to monitor air every 30 minutes, 20 feet from the closest off-site property. If two successive readings are below 5 ppm (non-methane), off-site air monitoring will be halted.
- All property line and off site air monitoring locations and results associated with vapor releases will be recorded in the site safety log book.

APPENDIX B

CAMP

NEW YORK STATE
INACTIVE HAZARDOUS WASTE SITE PROGRAM

COMMUNITY AIR MONITORING PLAN
(CAMP)

FORMER QUICK AND CLEAN CLEANERS SITE
SITE NO. 130198
380 ROCKAWAY TURNPIKE
CEDARHURST, NY

Prepared by:
Berninger Environmental Inc.

90-B Knickerbocker Avenue
Bohemia, NY 11716

January - 2013

TABLE OF CONTENTS

1.0 INTRODUCTION

This Community Air Monitoring Plan (CAMP) has been prepared for the boring and sampling activities to be performed under a Remedial Investigation Work Plan (RIWP) at the Former Quick and Clean Cleaners Site. The CAMP provides measures for protection for the downwind community (i.e., off-site receptors including residences, businesses, and on-site workers not directly involved in the remedial work) from potential airborne contaminant releases resulting from investigative activities at the site.

Compliance with this CAMP is required during all ground intrusive activities that have the potential to generate airborne particulate matter and volatile organic compounds (VOCs). These activities include, but are not limited to; boring, soil and groundwater sampling activities. This CAMP has been prepared to ensure that investigation activities do not adversely affect passers by, residents, or workers in the area immediately surrounding the Site and to preclude or minimize airborne migration of investigation-related contaminants to off-site areas.

1.1 Regulatory Requirements

This CAMP was established in accordance with the following requirements:

- New York State Department of Health's (NYSDOH) Generic Community Air Monitoring Plan as presented in DER-10 Technical Guidance for Site Investigation and Remediation (NYSDEC May 3, 2010). This guidance specifies that a community air-monitoring program shall be implemented to protect the surrounding community and to confirm that the work does not spread contamination off-site through the air;

- New York State Department of Environmental Conservation (DER-10 Appendix-1a and 1b) Fugitive Dust Suppression and Particulate Monitoring Program at Inactive Hazardous Waste Sites: This guidance provides a basis for developing and implementing a fugitive dust suppression and particulate monitoring program as an element of a hazardous waste site's health and safety program.

2.0 AIR MONITORING

Chlorinated volatile organic compounds (VOCs) and petroleum VOCs are the constituents of concern at the Site. The appropriate method to monitor air for these constituents during remediation activities is through real-time VOC and air particulate (dust) monitoring.

2.1 Meteorological Data

At a minimum, wind direction will be evaluated at the start of each workday, noon of each workday, and the end of each workday. These readings will be utilized to position the monitoring equipment in appropriate upwind and downwind locations.

2.2 Community Air Monitoring Requirements

To establish ambient air background concentrations, air will be monitored at several locations around the site perimeter before activities begin. These points will be monitored periodically in series during the site work. When the boring area is within 20 feet of potentially exposed populations or occupied structures, the perimeter monitoring points will be located to represent the nearest potentially exposed individuals at the downwind location.

Fugitive respirable dust will be monitored using a MiniRae Model PDM-3 aerosol monitor (or equivalent). Air will be monitored for VOCs with a portable Ionscience 3000 photoionization detector (PID), or equivalent. All air monitoring data will be documented in a site log book by the designated site safety officer. The site safety officer or delegate must ensure that air monitoring instruments are calibrated and maintained in accordance with manufacturer's specifications. All instruments will be zeroed daily and checked for accuracy. A daily log will be kept. If additional monitoring is required, the protocols will be developed and appended to this plan.

3.0 VOC MONITORING, RESPONSE LEVELS, AND ACTIONS

Volatile organic compounds (VOCs) will 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 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.

All readings will be recorded and made available for NYSDEC and NYSDOH personnel to review. If an exceedance of the Action Limits occurs, an Action Limit Report, as shown in **Appendix A**, will be completed.

3.1 Potential Corrective Measures and VOC Suppression Techniques

If the 15-minute integrated VOC level at the downwind location persists at a concentration that exceeds the upwind level by more than 5 ppm but less than 25 ppm during remediation activities,

then vapor suppression techniques will be employed. The following techniques, or others, may be employed to mitigate the generation and migration of fugitive organic vapors:

- Collection of purge water in covered containers;
- storage of excess samples and soils in drums or covering with plastic

4.0 PARTICULATE MONITORING

Air monitoring for particulates (i.e., dust) will be performed continuously during boring activities using both air monitoring equipment and visual observation at upwind and downwind locations. Monitoring equipment capable of measuring particulate matter smaller than 10 microns (PM_{10}) and capable of integrating (averaging) over periods of 15 minutes or less will be set up at upwind (i.e., background) and downwind locations, at heights approximately four to five feet above land surface (i.e., the breathing zone). Monitoring equipment will be MIE Data Ram monitors, or equivalent. The audible alarm on the particulate monitoring device will be set at 90 micrograms per cubic meter (ì g/m3). This setting will allow proactive evaluation of worksite conditions prior to reaching the action level of 100 ì g/m3 above background. The monitors will be calibrated at least once per day prior to work activities and recalibrated as needed thereafter. In addition, fugitive dust migration will be visually assessed during all intrusive work activities.

The following summarizes particulate action levels and the appropriate responses:

- If the downwind PM-10 particulate level is 100 ì g/m3 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 ì g/m3 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 ì g/m3 above the upwind level, work must be stopped and an evaluation of activities initiated. Work can resume provided that dust suppression measures (as described in Section 2.3.1 below) and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 ì g/m3 of the upwind level and in preventing visible dust migration.

All readings will be recorded and be available for NYSDEC and NYSDOH personnel to review. If an exceedance of the Action Limits occurs, an Action Limit Report will be completed.

4.1 Potential Particulate Suppression Techniques

If the integrated particulate level at the downwind location exceeds the upwind level by more than 100 ì g/m3 at any time during boring activities, then dust suppression techniques will be employed. The following techniques, or others, may be employed to mitigate the generation and migration of fugitive dusts:

- Placement of soils in drums or covering stockpiles with plastic;
- Misting of the boring area with a fine water spray from a hand-held spray bottle

Work may continue with dust suppression techniques provided that downwind PM_{10} levels are not more than 150 ì g/m3 greater than the upwind levels.

There may also be situations where the dust is generated by boring activities and migrates to downwind locations, but is not detected by the monitoring equipment at or above the action level. Therefore, if dust is observed leaving the working area, dust suppression techniques such as those listed above will be employed.

If dust suppression techniques do not lower particulates to below 150 ì g/m3, or visible dust persists, work will be suspended until appropriate corrective measures are identified and implemented to remedy the situation.

All air monitoring readings will be recorded in the field logbook and will be available for the NYSDEC and NYSDOH personnel to review.

5.0 DATA QUALITY ASSURANCE

5.1 Calibration

Instrument calibration shall be documented on instrument calibration and maintenance sheets or in the designated field logbook. All instruments shall be calibrated as required by the manufacturer. Calibration checks may be used during the day to confirm instrument accuracy. Duplicate readings may be taken to confirm individual instrument response.

5.2 Operations

All instruments shall be operated in accordance with the manufacturer's specifications. Manufacturers' literature, including an operations manual for each piece of monitoring equipment will be maintained on-site by the SSO for reference.

5.3 Data Review

The SSO will interpret all monitoring data based upon the established criteria and his/her professional judgment. The SSO shall review the data with the PM to evaluate the potential for worker exposure, upgrades/downgrades in level of protection, comparison to direct reading instrumentation and changes in the integrated monitoring strategy.

Monitoring and sampling data, along with all sample documentation will be periodically reviewed by the PM.

6.0 RECORDS AND REPORTING

All air readings must be recorded on daily air monitoring log sheets and made available for review by personnel from NYSDEC and NYSDOH.