KLEINFELDER
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REMEDIAL INVESTIGATION WORK PLAN

Orangeburg (Orangetown) Shopping Center

1-45 Orangetown Shopping Center

Orangeburg, NY 10962

NYSDEC Index #A3-0563-0906

NYSDEC Site #C344066

Prepared For:

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July 2007

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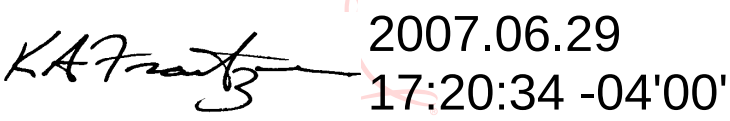
Quality Assurance/Quality Control

The undersigned Kleinfelder personnel certify that this report is true and accurate to the best of their knowledge.

Date July 2, 2007
Benjamin Rieger
Project Geologist/Task Manager



Date July 2, 2007
Kurt Frantzen
Project Manager & Certified Hazardous Materials Manager #14143

Table of Contents

Tables

Figures

Appendices

1.0 Introduction and Purpose

The subject New York State Brownfield Site is a 1.2-acre portion of the approximately 11-acre parcel located at 1-45 Orangetown Shopping Center, at the southeast corner of Orangeburg and Dutch Hill Roads, in the Town of Orangetown (Orangeburg), County of Rockland, New York. The Site is in the New York Brownfield Cleanup Program (BCP), assigned Site number C344066.

The general purpose of a Remedial Investigation (RI) under the New York Brownfield Cleanup Program is to identify the source of the contamination, define the nature and extent of contamination, assess the impact of contamination on public health and/or the environment, and to provide information for the development of a Remedial Work Plan (RWP).

This Investigation Work Plan (IWP) presents the proposed investigative steps required to close or narrow existing data gaps in the Site Characterization Report (SCR) prepared by RemVer (2005), so that the general conditions of establishing the nature and extent of contamination and assessing the potential impact to public health and environment can be met. Additionally, the proposed investigation will provide data required for the evaluation of remedial options.

The current data gaps include an incomplete delineation of groundwater, a lack of indoor and sub-slab air quality for Site and surrounding structures, a limited understanding of aquifer biological and chemical conditions within the plume, and uncertainty about perched groundwater at the source area, which may complicate remedial action.

The proposed IWP includes the installation of additional groundwater monitoring wells, the sampling of these wells for appropriate chemical and biological constituents, and the sampling for air quality evaluation within and surrounding the Site and off-site buildings.

2.0 Site History and Description

2.1 Description

The subject New York State Brownfield Site (Site) is a 1.2-acre portion of the approximately 11-acre parcel (Subject Property) located at 1-45 Orangetown Shopping Center, at the southeast corner of Orangeburg and Dutch Hill Roads, Town of Orangetown (Orangeburg), County of Rockland, New York. The Subject Property was acquired by JLJ Management Company in April 1990. Currently, the Subject Property is a strip mall, with a Dry Cleaning operation.

Owner:	JLJ Management Company
Street Address:	1-45 Orangetown Shopping Center
Hamlet/Town:	Orangeburg / Orangetown
County:	Rockland
State:	New York
Zip Code:	10962
Latitude (North):	41.045100 - 41° 2’ 42.4’’
Longitude (West):	3.953400 - 73° 57’ 12.2’’
Universal Transverse Mercator:	Zone 18
UTM X (Meters):	587963.7
UTM Y (Meters):	4544079.0
Elevation:	175 ft. above sea level (approx.)
Tax Identification:	74.10-1-67

The Subject Property is located at the southeast corner of Orangeburg and Dutch Hill Roads in Orangeburg, NY, in a suburban area of mixed land use, and improved with a retail strip shopping center comprised of five buildings and a total of seven distinct building components. The area is a well-developed village/town setting, characterized by general business, commercial, and institutional (public) development. The Town of Orangetown designates this general area as a Commercial (CS) Zone.

As mentioned above, the Subject Property is improved with three large buildings (of 1- or 2-stories) that appear to be built-up from or extended from connections between several smaller buildings, with a floor space in excess of 70,000 square feet and divided into more than 30 separate commercial units. The buildings were constructed in phases, with the first three buildings being erected in 1966. Building #1 now houses CVS and a small grocery. Building #2 houses various stores, including Sparkle Cleaners, and restaurants. The bank (Building #4, WaMu is the current tenant), bridges the two smaller structures (Buildings #3 [a former movie theater], #5, and #6 [US Post Office] originally built in the 1960s), and was erected around 1974. The western-most retail building (Building #7), with its back towards Dutch Hill Road, was built around 1978.

Figure 1 (Site Location) graphically indicates the physical location of the Subject Property within the state and locally. Figure 2 (Site Plan) diagrammatically presents the boundaries of the designated Brownfields Site and general layout of the project area within the Subject Property.

2.2 Historic Use of the Site and Adjoining Parcels

2.2.1 Historic Use

Before 1940 the area and the Subject Property were rural in character, with farmland as the primary land use, and some areas immediately to the east of the Site and west of Highway 303 subdivided into residential use.

The general area became part of Camp Shanks in September 1942. The Subject Property was developed by the US Army Corps of Engineers into an amphitheater, and this use persisted apparently through the World War II era and beyond, at least until the decline of Shanks Village and its ultimate sale to Sandra Construction in 1956 (Webber 1991).

At some point between 1956 and the early 1960s, the Subject Property was sold to the Prel Corporation; apparently, the property had not yet been developed, although there is some photographic evidence suggesting that Prel Plaza (at the southwest corner of Orangeburg Blvd. and Dutch Hill Rd.) was built by perhaps 1962.

In 1964, Prel Corp. sold the Subject Property to an investment group (Baum, Baum, Heiman, and Lehrer, also called BBH&L). This group developed the retail shopping center now extant at the Subject Property. In 1990, the property was purchased by the Client. Table 1 presents a complete outline of the Site history.

2.2.2 Abutters

North

Beyond Orangeburg Road, the Town's offices are across the intersection with Dutch Hill Road and the Fire Department is immediately north.

On the same block, at the intersection of Orangeburg Road and Dutch Hill Road, there is a bank.

East

There are single-family residential homes along the western side of Oak Street.

Along the eastern side of Oak Street is a residential apartment complex.

South

There are both single-family residential homes and commercial property along the northern side of Highview Avenue.

Along the southern side of Highview Avenue there are single-family residential homes.

West

Dutch Hill Road has commercial and office property along both sides west of the Site.

2.3 Previous Investigations

2.3.1 Phase I

Cashin

Cashin Associates, PC (Cashin, see IVI 1997a and 2003) prepared a Phase I Environmental Site Assessment (ESA) for the Subject Property in April 1993 for Lincoln Savings Bank. According to IVI, this report identified the heating oil UST behind the Anchor Bank (now Washington Mutual or WaMu), and recommend testing of the tank. Cashin submitted a Freedom of Information Act (FOIA) request to the NYSDEC regarding the Mobil Station's closed leaking UST incident. No other follow-up on this off-property potential source was reported as available. They further noted possible asbestos-containing materials and lead-based paint on building surfaces, as well as suspecting that transformers on and around the Subject Property were PCB-contaminated.

IVI

In 1997, IVI (1997a) performed a Phase I ESA. According to the report, during the assessment IVI observed an unmarked vessel behind the Sparkle Cleaners facility used to store spent dry cleaning solvent (perchloroethylene also called PERC or tetrachloroethylene). IVI reviewed the building records concerning Sparkle Cleaners and they noted that the store had been operational at this location since the shopping plaza opened in 1966. According to IVI's review, this store has used PERC continuously, and initially used a first-generation system.

These early dry cleaning systems were "transfer machines" that included the washer, an extractor (where the solvent was extracted from the garments by centrifugal force), and a tumbler (for drying). Later transfer machines incorporated the extractor into the washing machine. During operation, clothing was physically "transferred" from the washer to the tumbler, resulting in solvent vapor release. Some transfer operations capture some of the solvent vapors using inductive fans and a carbon adsorption unit known as a "sniffer." The store now uses a 4th-generation closed loop system, according to IVI.

To follow-up these observations, IVI investigated soils under the parking lot pavement immediately behind the store along the eastern-most side of the property. This investigation involved the placement of five soil borings (BV-1 to BV-5) running through the pavement and down to 12-feet below ground surface (bgs) (IVI 1997b). IVI detected nothing in any of the tested soils. All samples were taken from the 12-foot depth interval in all borings. IVI also made no in-field detections using a photoionization detector.

According to IVI (2003), they performed a Phase III Underground Storage Tank Removal and Contaminated Soil Remediation Program at the Subject Property in January 1998 on behalf of JLJ Management.

In a follow-up Phase I ESA in late 2003, IVI recites the information mentioned in IVI (1997a), and they further note "staining" at the rear of the Sparkle Cleaner facility, as well as the lack of secondary containment for spent cleaning fluid. Thus, IVI concludes that the potential for subsurface contamination continues and recommended another subsurface investigation.

ERM

In January 2004, ERM advanced three borings "to the water table." Based upon their results and visual observation of Site topography, they speculate that the groundwater flow direction is to the east-southeast. They collected one groundwater sample from each boring and had them analyzed for volatile organics.

The chemicals of note were Vinyl Chloride (VC) and cis-1,2-Dichlororethene (DCE), detected only in ERM-1 and ERM-2, and with the highest concentrations occurring in ERM-2, which is approximately 30-feet away from the back-door of Sparkle Cleaners near the eastern back of the plaza's lot. Nothing other than methyl ethyl ketone (also called 2-butanone) is notable concerning the chemicals detected in upgradient well ERM-3.

ERM concluded that because DCE and VC are two of the products of microbial degradation of PERC and Trichloroethene (TCE) that the observed chemicals are of dry cleaner origin.

ESC

In March 2004, ESC placed temporary groundwater probes (TMW-1 and -2) and established two monitoring wells. They collected one groundwater sample from each well and tested for volatile organic chemicals.

- ESC noted several volatile organics in the monitoring wells, but fewer chemicals and at lower concentrations in the temporary wells. Although ESC does not discuss it, the differences are important because of the depths of the wells (the temporary wells were both shallow ranging from 9-feet bgs for TMW-2 ESC to 16-feet bgs for TMW-1 ESC).
- Data from ESC's monitoring wells indicate a more complicated suite of chemicals than that observed by ERM; and for the first time, ESC detected very low levels of PCE and TCE, but at concentrations much lower than DCE.

ESC concluded that the contamination is not ongoing but historic in nature, a conclusion presumably based upon the very low levels of TCE and PERC, the occurrence of VC, and the elevated levels of DCE. Thus, like IVI and ERM, ESC intimates that the ultimate source of the contamination is the Sparkle Cleaner location. They further speculate that due to the severe topographic gradient that the contaminant plume likely has traveled off-site and possibly further eastward beyond Oak Street.

Based upon their conclusions, ESC recommended an additional investigation program and a remedial program involving a three-year operation of sub-surface air sparging (to remove volatile organics from soils) and a pump-and-treat system to deal with groundwater contamination.

RemVer

At the request of JLJ Management Co., RemVer conducted a Phase I Plus Environmental Site Assessment of the Subject Property. To support the assessment, RemVer collected additional information and recompiled all the available data to re-interpret the potential solvent plume to define its source, nature, and extent of the environmental contamination. Additionally, RemVer developed a conceptual approach to remedial and regulatory issues associated with Site closure.

Based upon its review of the previous data, RemVer opined that the groundwater contamination may not necessarily be associated with the dry cleaners. Environmental issues associated with dry cleaner operations are usually evidenced by elevated levels of the classic cleaning solvent

PERC and possibly other chlorinated solvents (*e.g.*, TCE). Additionally, a review of the various boring logs, well screen intervals, and the analytical data indicated that the various wells were not comparable (that is to say, they do not all monitor the same groundwater). Note that the temporary wells were placed at a time when soils of the type at the Site regularly form temporary (winter) perched water tables. Furthermore, the Site has a considerable volume of fill placed along its eastern boundary, which itself may have been contaminated. Considering the potential for historic and current (off-site) responsible parties and the potential for off-site migration of the observed chemicals, RemVer concluded in its Phase I Plus report that the interpretation given by ESC was premature.

In its Phase I Plus report, RemVer analyzed ESC's proposed remedial approach and concluded that the available Site characterization information did not justify the proposed approach. Moreover, ESC's proposed additional investigation can be better phased to clarify two critical issues: definition of the source(s) and evaluation of the significance for subsurface migration of volatile organic vapor. RemVer therefore proposed that an investigation be performed that considers the re-interpretation summarized above.

2.3.2 Phase II

In the fall of 2004, RemVer sought to resolve the following issues: the source of the groundwater contamination, define its nature and extent within the property, evaluate the potential for soil gas intrusion into buildings, clarify the depth to bedrock, determine if the contamination has migrated off-property, and better define the need for and extent of any remedial action. RemVer, through its sub-consultant GSC (a predecessor company of Kleinfelder), performed the investigation work in October 2004. Five additional monitoring wells were placed, active soil gas samples taken, subsurface soil and groundwater samples were collected and analyzed in the field for chlorinated organics using Color-Tec Screening, and additional samples were submitted for laboratory analysis.

Based upon the results of RemVer's work during the fall of 2004, JLJ contracted with RemVer in January 2005 to perform a Phase IIB ESA to complete the Site Characterization of on-site conditions. For this phase of work, RemVer sought to define the on-site source and the nature and extent of contamination, as well as collect additional hydrogeological data to better understand subsurface conditions.

RemVer concluded that the Sparkle Cleaners operation is the original source of the various chlorinated volatile organic chemicals (VOCs) detected in groundwater above New York State's groundwater standards at the Subject Property. This has created an Area of Concern (AOC) on-site, namely, the area behind Building #2, involving groundwater contamination and perhaps some soil contamination near or underneath Building #2. RemVer suspected the release occurred via the sewer line at the junction between the line extension from the building out to the collector behind the building into subsurface soils and subsequently downward into groundwater. This is demonstrated by soil samples (taken from around the sewer line) containing PERC, TCE and DCE. Considering the dissolved nature of the contamination, and the lack of observable dense non-aqueous phase liquid (DNAPL), groundwater is the main transport medium. However, DNAPL may have been and may still be present but undetectable due to its tendency to travel in narrow bands (ganglia) and within fractures or macropores in overburden soils due to binding to soil and residual saturation.

Upon entering the overburden water table, the chlorinated solvents appear to have spread laterally creating a 100 to 200-foot wide (north-south) plume, that is now nearing Oak Street to the east. The concentrations of the primary contaminate (DCE) decrease rapidly as one progresses further from the source, dropping over two orders of magnitude within about 50-feet. The data suggest that biologically-based reductive dechlorination is active in the subsurface soils and groundwater, explaining the significant amounts of DCE and general lack of PCE in groundwater.

Based upon these data, RemVer concluded that the AOC constitutes a situation requiring remedial action to insure that the source of groundwater contamination is removed, to prevent the further migration and spread of that groundwater contamination, to restore (to the extent practicable) subsurface conditions to a pre-release condition, and to prevent contact with or inhalation of volatiles from contaminated groundwater.

Table 2 and Figure 3 summarize the analytical data from these previous investigations.

2.3.3 BCP Application

Later in 2005, RemVer on behalf of JLJ Management, notified NYSDEC of these observations and in May 2006, JLJ Management formally submitted an application to enter the BCP. The application was accepted as complete in July 2006. Late in 2006, NYSDEC made a determination that JLJ Management would be a participant in the BCP. In January 2007, the Brownfields Site Cleanup Agreement between the NYSDEC and JLJ Management was signed.

2.4 Review and Interpretation of Pertinent Environmental Data

2.4.1 Definition of Source Area

Based upon the historical information and available characterization data, especially the findings of the test pit, it appears that there was a historical release of dry cleaning fluid, most likely PCE, from the Sparkle Dry Cleaner store in Building #2. The release most likely originated from a break or normal leakage around a joint near the buildings back foundation where the store's sewer line connects to the building's sewer collection line, which runs south-to-north about 5-8 feet east of the back wall. This release resulted in a build-up of chlorinated solvents in the soils around the immediate area, which subsequently became dissolved in overburden groundwater driven by either additional water released from the sewer, perched groundwater flowing from up-gradient, and/or infiltration of rainwater through cracks in the pavement.

The data indicate no other contaminants consistent with a dry cleaning release, although some very low levels of chloroform, methyl ethyl ketone, toluene, and naphthalene have been detected at least once, but in no consistent or persistent pattern.

Figure 2 depicts the source area and current known extent of the groundwater plume. Appendix A contains the Waste Management Plan for the Site. Appendix B contains the Health and Safety Plan for the Site.

2.4.2 Discussion Current Data Gaps

Based on the data developed during the prior Site investigation activities, discussed above, there are four outstanding data gaps that require additional investigation. These data gaps include a lack of vertical and horizontal delineation of dissolved chlorinated solvents in groundwater, the potential vapor migration pathway, the potential for a perched water table in the source area, and the monitored natural attenuation data required for remedy selection.

With respect to the delineation of groundwater, vertical contaminant distribution is unknown and will be evaluated using samples collected from the additional nested monitoring well clusters proposed below. The horizontal distribution of the plume to the south and east of MW-6 has not been determined and will also be evaluated with additional proposed groundwater monitoring wells. The horizontal and vertical gradients of the plume will be assessed utilizing static head within the monitoring wells. Plume migration velocity within the aquifer will be inferred based on slug test data from previous investigations.

The vapor intrusion pathway has only been evaluated in a conceptual manner. As part of the work plan below, sub-slab and indoor air sampling is proposed to evaluate this potential exposure pathway.

The potentially perched aquifer conditions at the source area will be evaluated using two sets of nested piezometers. The static head in these piezometers will be used to determine if a perched water table is present. This evaluation is necessary to determine if remedial excavation is possible within the source area.

Additional monitored natural attenuation groundwater data will be collected along with biological data to evaluate the current oxidation/reduction state of the aquifer, presence of electron donors, and presence of microbes that can degrade chlorinated solvents.

3.0 Objectives of Current Remedial Investigation

3.1 Qualitative Exposure Assessment

A public health exposure assessment qualitatively considers the potential for people to be exposed to chemicals originating from the Site. According to the New York State Department of Health (NYSDOH, as cited in Appendix 3B of NYSDEC's DER-10 Guidance, 2002), there are five elements necessary to have a complete **Exposure Pathway**:

1. A contaminant source, such as any waste disposal area;
2. A contaminant release and transport mechanism, which might carry contaminants from the source to points where exposure may occur;
3. A point of exposure, where actual or potential human contact with contaminated media may occur;
4. A route of exposure (inhalation, ingestion, absorption); and
5. A receptor population, such as people who could be exposed to the contaminants at the point of exposure.

Decisions regarding whether an exposure pathway exists or not are based upon the following:

- An **exposure pathway**, as defined, **exists** when all of these elements exist.
- A **potential exposure pathway exists** when one or more of the elements are not fully known, but the others are present and identifiable.
- An **exposure pathway does not exist** when any one of the five elements does not exist, has not existed in the past, and will not exist in the future.

The following discussion analyzes the potential for exposure pathways to exist at this Site.

3.1.1 Contaminant Source

As discussed previously Kleinfelder concludes that a leaking sewer fitting at Sparkle Cleaners is the most likely source of chlorinated solvents in soil and groundwater found at the Site.

3.1.2 Sensitive Receptor Survey

RemVer performed an off-site receptor survey. Kleinfelder conducted a check for registered drinking water wells, the results of which are discussed in Appendix C (Citizen Participation Activities) in the Citizen Participation Plan (CPP).

There are several private residential homes that are potential receptors immediately due east and downgradient of the Subject Property, along Oak Street. Across Oak Street is an apartment complex.

One school, Tappan Zee High School is between ¼ and ½ mile due north of the Site. Dominican College is about ½ mile due north of the Site. Schaefer Elementary School is more than ½ mile southwest of the Site. All of these sensitive receptors are either upgradient or cross-gradient from the Site.

3.1.3 Release/Transport Mechanisms

The following release/transport mechanisms have been identified for the Site:

- **Migration from Soil into Groundwater**—the available data suggest a possible soil source located around the sewer line. There may be some undetected contamination underneath Building #2; however, based upon current evidence, it appears that the release occurred outside, away from the foundation.
- **Migration of Contaminated Groundwater**—migration of contaminated groundwater has occurred on the Subject Property, consistent with groundwater flow to the south-east. The overburden aquifer plume continues eastward, but may not extend beyond Oak Street based on the concentrations present in MW-10. The vertical distribution of the plume is currently unknown.
- **Volatilization into Air**—the potential for volatile organic compounds (VOCs) such as the chemicals observed in groundwater to volatilize into soil gas and then into either ambient air or to intrude into indoor air at nearby buildings, while possible, is considered unlikely based upon the collection of limited soil gas samples. The largest unknown is the potential for contaminated soils and/or groundwater underneath Building #2, and/or residential homes that are located above a downgradient chlorinated solvent plume. However, the potential for these compounds to present an airborne hazard at the Subject Property currently appears to be unlikely based upon the available soil gas data.

3.1.4 Points of Exposure

The following have been identified as the potential points of exposure:

- **Use of Potable Water**—the commercial buildings and homes in this area are all served by public water. Drinking water is not a point of exposure.
- **Construction**—involving disturbance of subsurface soils will likely be performed in the upper 7-feet of surface soils. The concentrations detected in soils generally are very low to non-detect, except for immediately around the suspected source sewer line. We conclude that there is minimal potential exposure to workers (except near the sewer line) or the nearby community.
- **Volatilization of Groundwater Contamination**—groundwater measurements made during this assessment indicate a water table at approximately 40-feet bgs (with the possibility of limited area of shallower perched water tables). As discussed above, the potential for vapors to be generated from volatilization of compounds from groundwater through penetrations in building foundations, sumps, unpaved surfaces, etc. is unlikely. The potential for similar concerns to the east of the Subject Property, which is at lower surface elevations, remains undetermined.

3.1.5 Routes of Exposure

The following have been identified as the potential routes of exposure:

- **Ingestion of Contaminated Groundwater**—is unlikely because no down-gradient receptors (drinking water wells) are identifiable.
- **Inhalation of VOCs from Contaminated Groundwater**—is not likely because groundwater is at significant depth (>40-feet) and drinking water wells have not been identified.
- **Absorption through Dermal Contact of Contaminated Soils and Groundwater**—contact with soil is not a route of exposure for routine commercial workers because shallow soils are not contaminated. Dermal contact with groundwater (about 40-feet bgs) is not anticipated during normal construction related activities.

In summary, there are no known routes of exposure at the Subject Property; however, a potential route of exposure exists via the soil vapor intrusion pathway and will be investigated.

3.1.6 Receptor Population

The receptor population consists of commercial personnel and construction (utility, etc.) personnel. Downgradient of the Subject Property the receptor population might include occupants of downgradient commercial businesses and residential homes, as well as construction (utility, etc.) personnel.

3.1.7 Conclusion

Based on a review of the above elements, there are no complete exposure pathways known at the Site. Potentially complete exposure pathways exist for groundwater (on-site and possibly downgradient off-site) and for soils (behind Building #2 near the back of the Sparkle Cleaner store).

Possible human receptors of Site-related contamination include:

- Because of their immediate down gradient location, the residential homes along Oak Street are the most significant set of receptors. Because these homes are served by public water, it does not appear that drinking water is a possible route of exposure. Two of the homes appear to have swimming pools, but they appear to be of the above ground type and therefore, do not appear to pose a concern for exposure (unless they are filled by unseen and currently unknown and unregistered groundwater wells). Additionally, due to the depth of the contamination and the apparent slow transport in groundwater, exposure from direct contact with contaminated soils and/or groundwater is unlikely for these residents. The greatest source of exposure potential most likely is volatilization of the contaminants from groundwater and then migration of the vapors through the soil column into these homes. This is particularly of concern because of the occurrence of highly volatile vinyl chloride, although the concentrations in groundwater are low and only in a few monitoring wells upgradient of the homes. If the plume underlies these homes, the potential for exposure is greater because they appear to have basements. However, if the homes do not have sump pumps and have competent foundations, then the potential for entrainment of vapors decreases considerably.

- Another possible set of receptors is workers in the eastern retail building. Although the building's structure would likely preclude the entrainment of vapor from subsurface/groundwater contamination, this population is not considered as a possible receptor of concern.
- Workers (construction and/or utility) behind the eastern retail building are a possible receptor of concern because of their potential to encounter the source area underneath Building #2.

3.2 Fish and Wildlife Resource Impact Assessment

The NYSDEC normally requires the completion of the first component (i.e., Resource Characterization) of a Fish and Wildlife Resources Impact Analysis (FWIA, see §3.10.1 of NYSDEC 2002). The purpose of the analysis is to identify actual or potential impacts to fish and wildlife resources from Site contaminates of ecological concern.

The first step of the Resource Characterization is completion of the Agency's FWIA Decision Key (see Appendix 3C of NYSDEC 2002). RemVer completed the Decision Key as part of the previously published Site Characterization Report.

Based on the findings of that report Kleinfelder concludes that the completion of a FWIA is not justified.

3.3 Objectives

JLJ Management entered into a Brownfields Cleanup Agreement with NYSDEC in January 2007. The program will have several stages, including the following:

- *Application*
  - Prepare all necessary documentation required under the BCP and complete any supplemental investigation that the agency may require under the BCP Agreement
- *Investigation Work Plan (IWP)*
  - Develop an IWP and submit to NYSDEC for approval ***(this document)***
- *Investigation*
  - Complete investigation and submit report to NYSDEC for approval
- *Remedy Selection*
  - Based upon the investigation results, an approach to remedying the contamination will be developed in consultation with NYSDEC
- *Construction*
  - Implement remediation, which may include:
    - ► Remediate source soils in the vicinity of the sewer line behind Building #2
    - ► Treat the dissolved overburden plume
  - Complete construction and create/record any IC/EC issues and Environmental Easement

- *Release and OM&M*
    - NYSDEC issues statement of completion
    - Perform supplemental monitoring as needed
    - Achieve regulatory closure

3.4 Goals

The purposes of the soil and groundwater assessment plan are:

1. To further delineate, in three dimensions, the extent and speciation of chlorinated solvents and their degradation by products.

2. To gather information needed to assess monitored natural attenuation or bio-augmentation as a possible remedial approach for soil and groundwater.

3. To enhance the understanding of the Site's hydrology including vertical and horizontal gradients.

4. To gather data on the perched groundwater conditions around the building in order to assess the feasibility of source area excavation as a possible remedial approach.

4.0 Proposed Scope of Work

4.1 Investigation Field Team

Resumes of the key personnel on the field investigation team are included as Appendix E.

4.2 Soil and Groundwater Assessment Plan and Rationale

4.2.1 Soil Sampling and Monitoring Well Installation

Sonic drilling was selected as the preferred drilling method because it will allow soil sample collection from the zone of dense soils between 40 feet in depth and the bedrock surface. An understanding of the lithology across these depths is important to understanding the fate and transport of the contaminants. The drilling will be conducted using a 4-inch diameter sonic core barrel and two diameters of casing. The shallow portion of each boring will be cased with 8-inch override casing to the terminal depth of the shallow PVC well screen. A 6-inch diameter override casing will be used to the maximum extent of each boring. The 6-inch diameter override casing will be telescoped within the 8 inch diameter casing.

Figure 4 depicts the locations of existing groundwater monitoring wells and proposed locations for the additional groundwater monitoring wells described below. Table 3 details the depths and screened intervals of these groundwater monitoring wells.

Monitoring wells MW-8 and MW-9 will be over-drilled and rebuilt as nested one inch diameter well triplets. The purpose of reconstructing MW-8 and MW-9 is to provide the ability to sample groundwater at multiple depths within the aquifer at each location. This sampling will provide a better understanding of the vertical distribution of contaminates at these locations. No soil sampling will be conducted during the over drilling at these locations.

The proposed well construction for MW-8 includes three screen sections. The first screen section will cross the water table and have a total length of 10 feet, extending from approximately 33 to 43 feet below ground surface (bgs). All screen intervals will include a sand pack surrounding the well screen. The second screen section will be placed at mid-depth of the overburden aquifer and will have a total length of two feet, extending from approximately 55 to 57 feet bgs. The third screen section will be placed directly above the bedrock surface and will have a total screen length of two feet, extending from approximately 68 to 70 feet bgs.

A bentonite chip bridge will be installed above the bottom sand pack, followed by a portland cement-bentonite grout seal to two feet below the middle aquifer sand pack. Another bentonite chip bridge will be installed above the first grout interval to support the middle aquifer sand pack. A two foot bentonite bridge will be installed above the middle aquifer sand pack followed by another interval of portland cement-bentonite grout to two feet below the water table sand pack. A third bentonite bridge will be installed below the water table sand pack. Bentonite chip will be installed above the water table well sand pack to five feet below ground surface. This method of well sand and annular well seal will be applied to the other monitoring wells described below.

The proposed construction for MW-9 will be similar to MW-8 with a water table screen section at approximately 31 to 41 feet bgs, a mid-aquifer screen section from approximately 55 to 57 feet bgs, and a rock surface screen section from approximately 70 to 72 feet bgs.

Five additional soil borings will be advanced to bedrock and completed as nested well clusters.

- The first additional location will be installed up gradient of the shopping center building and will be designated MW-11a,b,c. The purpose of this boring is to allow for analysis of up gradient conditions in three dimensions and to confirm that the direction of contaminant migration from the source area does not vary with depth.

- The second additional boring will be installed within the paved area as far south of MW-6 as possible within the paved area and will be designated MW-12,a,b,c. The purpose of this boring is to further delineate the down gradient extent of the plume both vertically and horizontally.

- The third additional boring will be installed behind the most southern residential property which fronts on Oak Street, north of Highwood Avenue. This monitoring well will be designated MW-13a,b. The purpose of this boring is to further assess the potential plume migration towards the residential properties along Oak Street.

- The fourth additional boring will be installed upgradient of the source area. This monitoring well will be designated MW-14a,b. The purpose of this boring to confirm that there is not additional impact along the sewer line north of the current known source area.

- The fifth additional boring will be installed along Oak Street. This monitoring well will be designated MW-15a,b. The purpose of this boring is to further assess the downgradient extent of the plume.

Soil samples will be collected continuously during the advancement of these three borings. Field screening will be conducted using a photo ionization detector (PID). The soil will be classified and the classification recorded for inclusion in boring logs. Soil samples will be collected for laboratory analysis at the water table and at the maximum depth of the boring. If PID field screening indicates that volatile organic compounds (VOC) are present at other depth intervals the sample plan may be modified at the discretion of the geologist in the field. Laboratory analysis will be conducted for VOC by EPA 8260, semi-volatile organic compounds (SVOC) by EPA 8270, and total organic carbon. Table 4 details the proposed soil sampling locations and analytical methods.

The proposed well construction for MW-11 and MW-12 will be similar to MW-8 and MW-9 described above. Because the depth to groundwater and depth to bedrock are unknown at these locations, specific screen interval depths will be determined in the field based on soil conditions observed during drilling. Ten foot screens sections will be installed crossing the water table. Two foot screen sections will be installed at a middle depth, and directly above the bedrock surface.

The construction of MW-13, MW-14 and MW-15 will also be similar to MW-8 and MW-9 less the middle well screen depth. Due to the unknown depth to groundwater and depth to bedrock at this location specific well screen depths will be determined in the field based on soil conditions observed during drilling. A ten foot screen section will be installed crossing the water table and a two foot screen section installed above the bedrock surface. Table 3 details the existing and proposed monitoring well constructions. Table 4 details the planned soil sampling locations and analytical methods.

Soil samples will be collected from MW-11, 12, and 13 for potential future geotechnical analysis if required for future remedy selection.

MW-8, 9, 11a, 11b, 11c, 12a, 12b, 12c, 13a, 13b, 14a, 14b, 15a and 15b will be developed using pump and surge techniques. Well development will continue until the water clarity reaches 50 NTU or less, and until pH, temperature, and specific conductivity have stabilized. The new and reconstructed monitoring wells will be surveyed to establish location and well head elevation relative to other Site monitoring wells.

To evaluate potential perched water table conditions two sets of three piezometers will be installed by hand driven GeoProbe™. One set will be installed west of the building near MW-11. The other will be installed east of the building between MW-5 and MW-8. The piezometer clusters will be constructed of one foot long sections of one inch diameter PVC well screen and will be installed at depths of three, seven and twelve feet bgs at each location. The annular space around the screened intervals will be filled with a sand pack. The remaining annular space will be filled with a mix of granular bentonite and bentonite chips. The piezometers will be gauged for depth to water quarterly for on year. The first gauging will coincide with the sampling of groundwater from the newly installed monitoring wells described below.

4.2.2 Groundwater

Existing monitoring wells will be gauged for depth to water and the presence of DNAPL using an electronic interface probe, prior to any other work, including the conversion of MW-8 and MW-9 to multilevel wells. The purpose is to assure that DNAPL has not accumulated in any of the on-site wells and that over drilling of MW-8 and MW-9 will not mobilize DNAPL, which could be present in the sumps of these wells.

Select source area and down gradient monitoring wells will be sampled prior to the installation of the additional monitoring wells to assure that the current contaminant distribution is consistent with the historical data (on which the additional assessment plan is based.):

- MW-2 will be sampled representing the source area.
- MW-4 will be sampled representing conditions up gradient of the source area to the north.
- MW-6 will be sampled representing the most southern down gradient well within the plume.
- MW-7 will be sampled representing conditions up gradient of the source to the west.
- MW-10 will be sampled representing the most down gradient edge of the plume to the east.

Sampling of these wells will be conducted by purging three well volumes from each well using disposable Teflon lined polyethylene bailers. Sample collection will be via bailers following completion of the purge. Samples from these wells will be submitted for analysis of VOC by EPA method 8260 and SVOC by EPA method 8270. A summary of the wells to be sampled and analytical methods is included in Table 5.

Following reconstruction of MW-8 and 9 and the installation of the additional monitoring wells described in section 4.2.1, an additional round of groundwater sampling will be conducted. This

sampling will take place approximately two months after the initial round of groundwater sampling.

All Site monitoring wells will be gauged for depth to water and the presence of DNAPL using an electronic interface probe. Selected monitoring wells will be sampled using low flow sampling following the USEPA Region I *Low Stress (low flow) Purging and Sampling Procedure for the Collection of Ground Water Samples from Monitoring Wells* (July 1996). The low flow sampling will utilize Teflon lined polyethylene tubing. This sampling will be conducted no less than 48 hours after the completion of well development and not more than four weeks from the installation of the additional monitoring wells. A summary of the wells to be sampled and analytical methods is included in Table 5.

The gauging of static head in each groundwater monitoring well will be used along with relative well head elevations to determine both horizontal and vertical groundwater gradients.

The rationale for selection of the monitoring wells to be sampled and the analytical methods used involves the need for VOC data from each well to re-establish a baseline of conditions, and the need for geochemical and biological parameters for wells within the general section of the plume.

Additional geochemical parameter analysis will be conducted for the following selected monitoring wells; MW-2 and MW-3 representing shallow source area conditions, MW-6 representing shallow conditions within the plume down gradient of the source area, MW-8c representing conditions immediately above bedrock near the source area, and MW-11b representing mid-aquifer conditions at the most down gradient well in the parking area. These geochemical parameters are:

MONITORED NATURAL ATTENUATION PARAMATERS	ANALYTICAL METHODOLOGY
Ammonia, Nitrogen	USEPA Method 350.2
Ortho-phosphorous	USEPA Method 365
Nitrate/Nitrite	USEPA Method 353.2
Dissolved Organic Carbon	USEPA Method 415.1
Iron (total, Fe2+, Fe3+)	SM 3500
Sulfate/Sulfite/Sulfide, Chloride	USEPA Method 300
Methane/Ethane/Ethene, Carbon Dioxide	USEPA Method 8015
Hardness	USEPA Method 130

4.2.3 Monitored Natural Attenuation

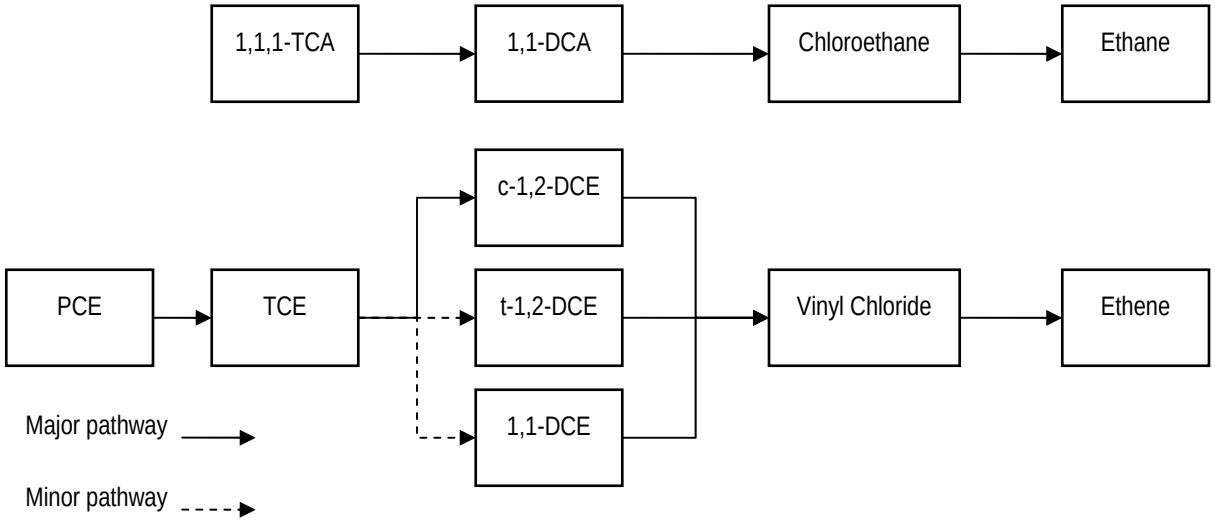
Biotransformation is a process that attenuates the levels of chlorinated solvents in the environment over time. Most of the degradation occurs by way of reductive dechlorination under anaerobic conditions (U.S.EPA, 1998). This dechlorination process involves bacteria that remove a chlorine atom from a chlorinated solvent molecule, replacing it with a hydrogen atom (see Vogel and McCarty, 1987). During reductive dechlorination, hydrogen acts as the electron

donor and chlorine-containing chemical accepts the electron, thereby becoming reduced, as shown below:

$$R\text{-}Cl + H^+ + 2e^- \longrightarrow R\text{-}H + Cl^-$$

The following reactions show the reductive transformation pathways for the common chlorinated solvents:

4 Chlorine Atoms: PCE: Perchloroethylene
3 Chlorine Atoms: TCE: Trichloroethene TCA: Trichloroethane
2 Chlorine Atoms: DCE: Dichloroethene DCA: Dichloroethane
1 Chlorine Atom: Vinyl Chloride
0 Chlorine Atoms: Ethene (CH_2CH_2) Ethane (CH_3CH_3)



The second degradation pathway, starting with PCE, is the most relevant. It is notable that the analytical data demonstrate very little PCE (with the highest levels occurring in soil around the sewer line near the building wall), low levels of TCE, little trans-1, 2-DCE, but significant amounts of cis-1, 2-DCE, and limited amounts of VC. Additionally, ethene, ethane, and methane are detectable.

Considering the previous discussions regarding possible sources and the uses of these various chlorinated solvents in the dry cleaning industry together with the findings of this characterization, the data strongly suggest that biological anaerobic reductive dechlorination is active in the subsurface soils and groundwater at the Site. This is the most likely explanation for the significant amounts of cis-1, 2-DCE and simultaneous lack of PCE. The data also suggest that this system is preferentially applying the major metabolic pathway and not the minor pathways.

For biological reductive dechlorination to occur, the following conditions must generally exist:

1. The subsurface environment must be anaerobic (that is, low in oxygen) and have a low oxidation-reduction potential.
2. Chlorinated solvents that are amenable to reductive dechlorination must be present.
3. A population of dechlorinating bacteria must be present.
4. An adequate supply of fermentation substrates to produce dissolved hydrogen must be present.

To fully assess the potential for biological dechlorination as a potential remedy for this Site the oxidation/reduction potential for the aquifer and the presence of bacteria capable of dechlorinating chlorinated solvents will be evaluated.

Microbiological samples will be colleted from MW-2, 3, 6, and 8c. Microbial analysis will be conducted using quantitative real time Polymerase Chain Reaction (PCR) analysis. This analysis will target *Dehalococcoides* spp., the only known group of bacteria capable of dechlorinating PCE and/or TCE to ethane, and *Dehalobacter* spp., capable of dechlorinating PCE and TCE to cis-DCE.

4.3 Quality Assurance Plan for Soil and Groundwater Assessment

4.3.1 Field Screening

4.3.1.1 Summary

Field screening of soil samples for volatile organic compounds will be conducted using photo ionization detectors. Field measurements of water samples for dissolved oxygen, pH, conductivity, salinity, specific conductance, oxidation-reduction potential (ORP), and turbidity will be collected using portable water quality instrumentation.

The field staff operating the analytical equipment are experienced in its operation and will perform proper calibrations and measurements.

4.3.1.2 Calibration

Photo-ionization detectors will be calibrated to ambient outdoor air for zero and a 100 ppm isobutylene standard for the span calibration at 100 ppm. Photo ionization detectors will be checked against the 100 ppm isobutylene standard at mid day. If the calibration is off by 5% or greater the instrument will be recalibrated. Water trap and particulate filters will be used on the photo ionization detectors and will be in place during calibration. The photo ionization detectors will be recalibrated if the filters are changed during the course of the work day.

Water quality parameter instrumentation will be calibrated according to the manufactures specification. Commercially available calibration solution appropriate for the instrument selected will be used to conduct this calibration. The calibration will be done daily at a minimum and more frequently if warranted based on the manufactures specifications or failure of the mid day calibration check. At mid day the water quality meters will be checked against the standard calibration solutions. If any of the parameters are out of calibration by more than 5% the instrument will be recalibrated.

4.3.1.3 Field Screening Methods

For soil screening using photo ionization detectors the soil will be placed in a Ziploc (or similar) plastic bag with air space above the soil sample. The soil will be allowed to sit in the bag for one minute or longer to allow diffusion of any volatile organics from the soil matrix to the air within the bag. The probe tip of the photo ionization detector will be inserted through the side of the bag to create a small hole with little or no dilution of the air inside the bag. The maximum reading within the bag over a 15 second observation period will be recorded.

For water quality parameter collection a flow through cell will be used. The well pump will be connected to the inlet side of the flow through cell and the water quality instrument will be connected to the cell through a sealed port. Water quality parameters will be recorded at set time intervals and the final readings will be noted only after stabilization of parameters based on the EPA guidance on low stress aquifer sampling. If stabilization does not occur within 45 minutes the lack of stabilization will be noted and the monitoring suspended. Water samples for laboratory analysis will not be collected from the flow through cell. The flow through cell and water quality instrument probe head will be rinsed with de-ionized water between sampling locations.

4.3.2 Laboratories

The laboratory selected for soil and water quality analysis will be certified pursuant to NYSDOH ELAP Certification for all constituents or constituent categories for which it analyzes in aqueous samples. The polymerase chain reaction analysis will be conducted by a laboratory qualified to conduct that analysis.

Non-aqueous samples will be analyzed according to methods included in EPA Publication SW-846, *Test Methods for Evaluating Solid Waste,* third edition, update IIF, January 1995 as amended and supplemented, for a constituent or constituent category. For parameters for which certification exists pursuant to NYSDOH Environmental Laboratory Approval Program (ELAP) Certification, the laboratory will be certified for that parameter or parameter category.

4.3.3 Analytical Methods

The analytical methods utilized in the laboratory analyses will be those published by the USEPA and in the most recent NYSDEC Analytical Services Protocol where applicable. The laboratories will perform the prescribed quality assurance for each analytical method that is used. To the extent that the methods accommodate, detection limits will be below the lowest standard guidance value in Part 375-6 Brownfield Soil Cleanup Objectives. Laboratory data reports will meet ASP Category B.

Genetic analysis of DNA extracted from groundwater samples is planned as part of this investigation. This will be conducted using polymerase chain reaction techniques by a qualified biological laboratory. There is not a specific hold time established for polymerase chain reaction analysis. Typical hold times for this analysis are between 24 and 72 hours. Degraded samples can result in false negative results but not false positive results for target organisms. For the purpose of this investigation the target hold time is 48 hours.

4.3.4 Environmental Media Sampling

Sample collection methods, sample preservation, sample holding times, and the number of field blank, field duplicate, and trip blank samples will conform to the NYSDEC Analytical Services Protocol (ASP). Details of the collection and comments concerning the samples will be included on chains of custody that will accompany the samples from the collector to the receiving laboratory. Tables 4 and 5 included in this report, provide a summary of the proposed sampling program, including the required QA/QC samples.

Soil samples will be collected in 10 foot disposable sleeves using sonic drilling techniques. Segments of the 10 foot sample will be transferred to laboratory provided, clean, sample containers using aluminum or stainless steel disposable scoops, disposal plastic soil syringes, and hands gloved with new nitrile disposal gloves. Following the use of any of the disposal soil sample handling tools the tool with be isolated and disposed of with other wastes from the Site.

Groundwater sampling conducted by purge and sample methods will be conducted with disposable polyethylene bailers which are prepackaged and will be opened on-site. The bailers will be attached to nylon string or rope to allow recovery from the monitoring wells. During the purging of the well the field personnel will wear nitrile gloves. These gloves will be changed to a fresh set of glove prior to sample collection.

Groundwater sampling conducted by low flow sampling techniques will follow the EPA guidance no low stress aquifer sampling. The sampling will be conducted using a bladder pump. At each well location a new bladder will and new sample tubing will be used. The sample tubing will be laboratory grade polyethylene tubing. Compressed air or nitrogen will be used to power the sampling pump. The pump body will be of stainless steel construction. Decontamination will be conducted by washing the pump in laboratory grade detergent and triple rinsing the pump with de-ionized. One pump blank will be collected by immersing the pump in de-ionized water and pumping a sample through the pump and a short length of sample tubing.

Field blanks will be collected by transferring de-ionized water to a sample container at the location of groundwater sample collection. This sample will be analyzed for the same parameters as the water groundwater samples less the polymerase chain reaction analysis.

Soil and groundwater samples will be stored on-site in a cooler with temperature maintained at 4 degrees Celsius or cooler using ice. The sample bottles will be placed into zip lock or similar plastic bags prior to placement in the cooler. Samples will be maintained under chain of custody and in the immediate control of the field personnel. Samples will either be shipped directly to the laboratory from the Site or will be transported to a Kleinfelder office location for pick up by a lab courier. Samples stored at Kleinfelder offices will be maintained within a refrigerator at 4 degrees Celsius or cooler until pick up by the laboratory.

4.3.5 Data Usability Summary Report

The project manager will prepare a Data Usability Summary Report (DUSR) documenting the sampling and analytical procedures and results. This will certify that the data are valid and usable.

4.4 Soil Vapor Intrusion Assessment Plan and Rationale

A soil vapor survey consistent with the New York State Department of Health's (NYSDOH) guidance will be conducted at the Site. The purpose of the soil vapor intrusion assessment is to evaluate the potential for soil vapor intrusion as an exposure pathway. If the initial survey is not conducted during the heating season an additional survey will be conducted following the same procedures during the next heating season. This soil vapor survey consists of three tasks:

- Sub Slab Sampling
- Indoor Air Sampling
- Ambient (outdoor) Air Sampling

4.4.1 Sampling Procedures

4.4.1.1 Sub Slab Samples

The purpose of sub-slab sampling is to evaluate the potential for human exposure within a building. Sub-slab samples for the Orangeburg JLJ project will be collected through the floor at each sampling location. The sampling locations will be positioned away from the foundation footings, and within the soil aggregate immediately below the basement slab or slab-on-grade. Provided access is granted, samples will be collected from the following locations.

- Orangetown Shopping Center at five shops in Building #2, including Sparkle Cleaners, Deli Spot Inc., HikarU Restaurant, and CVS;
- five residences immediately adjacent to the east of the subject Site along Oak Street (tax lots 43–47); and
- three residences immediately adjacent to the south of the subject Site along Highview Avenue (tax lots 48-50).

The locations of these structures and sample locations are shown on Figure 5.

Preparation for Sub-Slab Sampling

At each sub-slab sampling location a hole appropriate for the diameter of the sampling tube will be drilled completely through the concrete floor slab using an electric rotary hammer drill and masonry bit. The concrete dust will be brushed away from the hole after drilling is completed and the approximate thickness of the slab will be recorded. The interior of the drill hole will then be cleaned with small round brush to remove any concrete dust. The flexible tubing will be inserted through the hole ensuring that the distal end of the tubing does not extend more than two inches below the bottom of the slab. The tubing will be sealed into the hole using plumbers putty or bees wax. Any remaining concrete dust will be cleaned up with a vacuum equipped with a HEPA filter after the sample tubing is properly sealed and sample collection has been initiated.

Purging and Pre-Sample Testing of Sub-Slab Sample Points

To ensure that representative samples are being collected from the beneath the slab ambient air will be purged from the sample tubing and the bentonite seal will be tested. Three tube volumes will be purged from the tubing by attaching a syringe to the sample tubing to assure that the purge air flow rates do not exceed 0.2 liters per minute. A five gallon pail will be temporarily installed over the sampling location to create a confined atmosphere above the sample point. Helium gas will be applied to the inside of the five gallon pail and the atmosphere concentrations will be determined with direct reading instrument. The helium concentration within the bucket will be between 50 and 100%. This will be confirmed using a direct reading instrument. Once the high percentage helium atmosphere is established over the sample point the direct read instrument will be secured to sample tubing to determine if helium is passing through the bentonite seal or tubing. If the concentration within the sampling tubing is greater than 10% then the seal will be reconstructed and tested again. Once a good seal is confirmed, sample collection will begin.

Sample Collection of Sub-Slab Soil Vapor

Each sub-slab soil vapor sample will be collected using a certified clean, six liter, Summa® canister with pre-set flow controller. Sampling times for sub-slab soil vapor samples will be 8 hours within the commercial tenant spaces and 24 hours within the residences. The pre-set flow controllers will be calibrated such that the flow rates do not exceed 0.2 liters per minute.

For preparation of the canister and collection of the sample the following procedure will be implemented. The canister will be placed on a stable surface adjacent to the sample tube. The canister's serial number will be recorded on the chain of custody (COC) and field notebook/ sample form. A sample identification name will be recorded on the canister ID tag and recorded on the COC and field notebook or sample form. A copy of an example sample form is included in Appendix D, *TO-15.*

Once the canister is in place and the information about the canister identification and location has been recorded the plug from the canister fitting will be removed and the sample tubing will be connected to the flow controller. If applicable, the canister valve will be opened and closed. The pressure gauge will then be read and recorded. The pre-sampling pressure gauge reading should be -25 in Hg or less. If the pressure in the canister is greater than -25 in Hg, then verification from the laboratory of the initial pressure will be required to assure that the canister did not leak during transport.

Following confirmation that the canister has the appropriate internal pressure the valve to initiate sampling will be opened. The pressure gauge will be observed for the first two minutes. If the

pressure increases at a rate greater than ½ inch of Hg per minute it will be assumed that there is a leak in the sampling system and sample collection will be terminated. The leak will be identified and the sample will be recollected using a new Summa® canister and flow controller.

A digital photograph will be taken of the system set up and surrounding area for each sampling location. The sampling start time will be recorded on the Chain of Custody (COC) and field notebook/sample form. At the end of the sampling period the canister valve will be closed and the stop time recorded on the COC and field notebook/ sample form. The final gauge pressure will be read and recorded to ensure that it falls between -5 and 0 in Hg. The sampling tubing and flow controller will be disconnected from the canister and the plug will be installed on the canister. The sample container will be placed in its original box for transport to the laboratory. The sample collection log will be completed at this time and will include: sample identification, date and time of sample collection, identity of samplers, sampling methods and devices, purge volumes, volume of soil vapor extracted, vacuum pressure before and after, apparent moisture content (dry, moist, saturated, etc.) of the sampling zone, and log each sample on the COC.

The sampling tubing will be removed and the hole will be backfilled with commercially available concrete patching material.

4.4.1.2 Indoor Air Samples

The purpose of indoor air sampling is to characterize contaminant concentrations trends and potential exposures within the buildings. Indoor air sampling for the Orangeburg JLJ project will consist of samples collected in the basement and first or ground floor of each structure. The indoor air sampling locations within the structures include samples from the basement of each of the eight residential structures and five tenant spaces as described in section 4.4.1.1. The samples will be collected from within the breathing zone (three to five feet above the floor).

The procedure for collecting feasible indoor air samples in these residences and tenant spaces listed follows.

Prior to the indoor air sampling event a pre-sampling walk-through or building inspection will be conducted to identify conditions that may affect or interfere with the prescribed sampling event. The components of the building inspection will include: identification and compilation of potential background sources and generation of plot sketches of the building interior. For more information please refer to Appendix D, *New York State Department of Health Indoor Air Quality Questionnaire and Building Inventory Center for Environmental Health.*

If potential background sources are identified the occupant(s) will be asked to remove potential background sources and to ensure that all containers storing volatile chemicals are tightly sealed. After removal or sealing the building will be ventilated by operating the HVAC system. This preparation of the structure for sampling will occur twenty-four hours in advance of the scheduled sampling event.

Before sample collection, field screening of the structure will be conducted using a PPB Rae, or a similar instrument, which can detect VOCs in parts per billion. An inventory of any products stored in the building also will be completed.

The sample collection procedure for the indoor air samples will be the same as for the sub-slab sampling described above with a few exceptions. The sample canister will be placed such that the sample tube inlet is between three and five feet off the floor and helium tracer testing will not be conducted. The sampling periods for the indoor air sampling will be 24 hours for the residences and 8 hours for the tenant spaces within the commercial buildings. During air sampling, the pre-set flow controllers will be calibrated such that the flow rates do not exceed 0.2 liters per minute.

4.4.1.3 Outdoor Air Samples

The purpose of outdoor air sampling is to document outdoor air conditions during a planned sampling event in order to provide a baseline with which to compare the indoor air sampling results. Outdoor air samples will be collected whenever indoor air sampling is being conducted. The sampling will be conducted away from wind obstructions and at the same approximate height above the ground as the indoor air samples.

For more information regarding the locations for outdoor air sampling points please refer to Figure 5.

In preparation for the ambient air sampling, a plot sketch of the sampling area will be drawn that includes building Site, area streets, outdoor air sampling locations, the locations of potential interferences. Paved areas will be included on the Site sketch. The weather conditions and any other pertinent observations will be recorded. Pertinent observations may include observed odors, readings from field instruments, and significant activities in the area.

Purging of the sample tubing is not required for outdoor air sampling because the air in the tubing will be outside air.

The sample collection procedure described in Section 4.4.1.1 will be followed.

4.5 Quality Assurance of Soil Vapor Assessment

4.5.1 Quality Assurance for Air Sampling

The quality of data collected in an environmental study depends on the quality and thoroughness of field sampling activities. Due to the sensitivity of analytical methods and the extremely low levels of detection specified for sample analysis, the sampling process becomes integral to the integrity of the data generated. As a result, general field operations and practices, and specific sample collection and inventory must be well planned and carefully implemented.

The sampling methods and appropriate quality control measures for sample collection are included in the sampling procedures in Sections 4.4.1.1 - 4.4.1.3 of this report.

Sample volumes, container types, and preservation methods are included in the air and soil vapor sampling summary included as Table 6.

4.5.1.1 Sampling Instruments / Equipment Calibration and Frequency

Field screening of ambient air for volatile organic compounds will be conducted using photo ionization detectors during the building survey operations as sampling protocol.

The field staff operating the analytical equipment are experienced in its operation and will perform proper calibrations and measurements.

Photo ionization detectors will be calibrated to ambient outdoor air for zero and a 100 ppm isobutylene standard for the span calibration at 100 ppm. Photo ionization detectors will be checked against the 100 ppm isobutylene standard at mid day. If the calibration is off by 5% or greater the instrument will be recalibrated. Water trap and particulate filters will be used on the photo ionization detectors and will be in place during calibration. The photo ionization detectors will be recalibrated if the filters are changed during the course of the work day.

4.5.1.2 Analytical Methods

All air and soil vapor samples collected at the Site will be analyzed by USEPA Method TO-15 for the full compendium list of analytes. Selective ion monitoring (SIM) with a reporting limit of 0.25 micrograms per cubic meter will be used for trichloroethene and vinyl chloride for the indoor and outdoor air samples.

Laboratory analysis for the soil vapor and air samples will be conducted by a NYSDOH ELAP certified laboratory. The detection limits for USEPA Method TO-15 are typically 1 microgram per cubic meter or less.

4.5.1.3 Quality Assurance / Quality Control Samples

The Quality Assurance / Quality Control Samples for the indoor air quality sampling will include co-located duplicates at a rate of one per twenty samples, equipment blank at a rate of one per twenty samples (conducted at the analytical laboratory), and trip blank samples at a rate of one trip blank sample per batch of sample containers shipped. The total number of these quality control samples is detailed in Table 6.

5.0 Schedule and Reporting

5.1 Schedule

5.1.1 Monitoring Well Installation

Monitoring well installation will be initiated within 60 days of the approval of this plan and will be completed within 15 days of the initiation of drilling activities. Table 7 contains the proposed schedule for Site investigation.

5.1.2 Groundwater Sampling

The initial round of groundwater sampling will be initiated within 30 day of the approval of this report. The groundwater sampling following the monitoring well installation will be initiated following the installation and development of the new monitoring wells and will be complete within 90 days of the approval of this report.

5.1.3 Soil Vapor and Indoor Air Sampling

Efforts to acquire access to the residential properties will be initiated within 14 days for the approval of this report. Once access has been approved or denied by all parties the initial survey of the properties will be completed followed by the sampling of the sub-slab soil vapor, indoor air, and outside air.

5.2 Reporting

An investigation report will be developed following the completion of all the above field activities. This report will include the data collected from the above described investigation along with interpretation of this data. This report will be issued 90 days following the completion of the field activities. This report will follow the format and include the content specified for remedial investigation reports as outlined in the Draft DER-10 Technical Guidance for Site Investigation and Remediation. If the initial soil vapor intrusion sampling is not conducted during the heating season additional soil vapor intrusion sampling may be required. If additional soil vapor intrusion sampling is required the data from the additional sampling will be provided as an addendum to the investigation report.

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TABLES

Table 1
Subject Property Timeline History
Orangetown Shopping Center
1-45 Orangetown Shopping Center
Orangeburg, New York

KLEINFELDER
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Year	Activity	Comment	Reference
Before 9/1942	Vacant Land		RemVer 2004a & Webber 1991
Sep-42	US Army purchases land for Camp Shanks	Subject Property used for amphitheater	*Op cit.*
May-46	Camp Shanks decommissioned	No change	*Op cit.*
1956	Sandra Construction purchases property	No change	*Op cit.*
	Prel Corporation purchases property	No change	*Op cit.*
Feb-64	Baum Baum Heiman & Lehrer purchase property	No change	*Op cit.*
Jul-65	Shopping Center Built	Construction drawings filed and approved at this time	*Op cit.*
Late 1966	Sparkhill/Sparkle Cleaner Store Started	First-generation dry cleaning machine suspected to be in use	D. Kwon
Early 1970s		Earliest second-generation dry cleaning machine used	EPA 1995
1989	Third-generation dry cleaning machine into service		D. Kwon
Apr-90	JLJ Management Purchases Shopping Center		Deed Notice
Jun-90	D. Kwon buys Sparkle Cleaner Store		D. Kwon
Apr-93	Cashin Phase I Report		See IVI 1997a
Oct-97	IVI Phase I Report	Reports Perchloroethylene in storage container outside backdoor; Suspects possible release; Recommends investigation	IVI 1997a
Oct-97	IVI Dry Cleaner Investigation	Five (5) soil borings behind store to 12-feet bgs; Soil samples analyzed; No contamination	IVI 1997b
1998	Suspect broken water / sewer line	Detected & Repaired	H Soniker (JLJ)
2000	Vapor barrier room installed & Fourth generation machine place into operation		D. Kwon & IVI 2003
Oct-03	IVI Phase I Report	Recommends further investigation of dry cleaner store	IVI 2003
Jan-04	ERM Initial Investigation	Two downgradient wells to 40-feet bgs; Two shallow up-hill/upgradient wells; Groundwater samples indicate DCE	ERM 2004 Letter
Mar-04	ESC Initial Investigation	Placed one downgradient well to 40-feet bgs; One shallow up-hill/upgradient well; Groundwater samples indicate DCE	ESC 2004a Letter
Apr-04	ESC Remedial Recommendation	Recommends additional investigation; Proposes groundwater remediation	ESC 2004b Letter
Aug-04	RemVer Phase I Plus	Reviews available data, notes gaps and undefined source; recommends Phase II program	RemVer 2004a
Nov-04	RemVer Phase II On-Site ESA	Initial investigation	RemVer 2004b
Mar-05	RemVer Phase IIB On-Site ESA	Current investigation	Current Report

Table 2
Historical Analytical Data Summary
Orangetown Shopping Center
1-45 Orangetown Shopping Center
Orangeburg, New York

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Installing Company	NYSDEC	IVI	IVI	IVI	IVI	IVI	ERM	ERM	ERM	ESC	ESC	ESC	ESC
ID #	Groundwater	B-1	B-2	B-3	B-4	B-5	MW-1	MW-2	3	TMW-1	TMW-2	MW-1	MW-2
Date	Stnd	9/29/1997	9/29/1997	9/29/1997	9/29/1997	9/29/1997	1/15/2004	1/15/2004	1/15/2004	3/18/2004	3/18/2004	3/30/2004	3/30/2004
Units	ug/L	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/L	ug/L	ug/L	ug/l	ug/L	ug/L	ug/L
Depth	feet bgs	12	12	12	12	12	?	?	?	15 (0-15)	9 (0-9)	40 (27-37)	44 (?)
Boring Log Available?		no	no	no	no	no	no	no	no	yes	yes	yes	no
Chemical		SOIL	SOIL	SOIL	SOIL	SOIL	GW	GW	GW	GW	GW	GW	GW
Acetone	50	<5	<5	<5	<5	<25	22 DJ	42 DJ	44	130	13	20	6.1
Benzene	1	<5	<5	<5	<5	<25	5 <	5 <	5 <	ND <	ND <	ND <	ND <
Bromodichloromethane	50	<5	<5	<5	<5	<25	5 <	5 <	5 <	2.3	ND <	ND <	ND <
Butanone, 2-	50	<5	<5	<5	<5	<25	5 <	14 <	19	ND <	21	26	ND <
Carbon Disulfide	60	<5	<5	<5	<5	<25	5 <	5 <	5 <	ND <	ND <	0.72 J	1.1
Chloroform	7	<5	<5	<5	<5	<25	5 <	5 <	5 <	13	ND <	ND <	ND <
Dibromochloromethane	50	<5	<5	<5	<5	<25	5 <	5 <	5 <	0.68 J	ND <	ND <	ND <
Dichloroethene, c-1,2-	5	<5	<5	<5	<5	<25	950 D	440 D	5 <	ND <	ND <	82 D	2,500 D
Dichloroethene, t-1,2-	5	<5	<5	<5	<5	<25	5 <	5 <	5 <	ND <	ND <	0.5 J	9.2
Methyl Acetate	no guide	<5	<5	<5	<5	<25	5 <	5 <	5 <	ND <	ND <	51 D	ND <
Methyl, 4- 2-pentanone	no guide	<5	<5	<5	<5	<25	5 <	5 <	5 <	ND <	5.4 J	3.8 J	ND <
Methyl tert butyl ether	10	<5	<5	<5	<5	<25	5 <	5 <	5 <	ND <	ND <	0.4 J	ND <
Methylene Chloride	5	<5	<5	<5	<5	<25	5 <	5 <	2 J	NO DATA			
Naphthalene	10	<5	<5	<5	<5	<25	18 DJB	5 DJB	5 <	NO DATA			
Tetrachloroethene	5	<5	<5	<5	<5	<25	5 <	5 <	5 <	ND <	ND <	ND <	0.5 J
Toluene	5	<5	<5	<5	<5	<25	5 <	5 <	5 <	0.98 J	ND <	1.9	0.52 J
Trichloroethene	5	<5	<5	<5	<5	<25	5 <	4 <	5 <	ND <	ND <	1.2	20
Vinyl Chloride	2	<5	<5	<5	<5	<25	5 <	9 <	5 <	ND <	ND <	27 D	15
Comments:				No dry-clean solvent in soil overburden			No dry-clean solvent	TCE 10% of DCE	No up grad source	Dwn grad Cleaners & ERM MW1 No dry-clean solvent thus, not perched	Dwn grad Mobile Site up grad No up grad source	Drilled near ERM MW2 TCE <10% of DCE	This well is most likely ERM MW1 TCE is 1% of DCE PCE is <1% of DCE

Sources: IVI 1997b
ERM 2004
ESC 2004b

J = estimated value
D = estimated value, after dilution

Table 3
Existing and Proposed
Monitoring Well Construction
Orangetown Shopping Center
1-45 Orangetown Shopping Center
Orangeburg, New York

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Location	Total Depth	Screen Interval	Comments
Existing Monitoring Wells			
MW-1	40	25-35	south of source area
MW-2	40	30-40	east of source area
MW-3	46	35-45	source area
MW-4	45	34-44	east of source area
MW-5	45	34-44	source area
MW-6	51	35-50	southern edge of plume
MW-7	45	35-45	upgradient overburden
MW-8	70	29-69	source area, need to overdrill and rebuild
MW-9	72	31-71	south of source area, need to overdrill and rebuild
MW-10	34	13-33	east of source area
Proposed Monitoring Wells			
MW-8a	70	33-43	overdrill at existing MW-8 Location
MW-8b	70	55-57	overdrill at existing MW-8 Location
MW8c	70	68-70	overdrill at existing MW-8 Location
MW-9a	72	31-41	overdrill at existing MW-9 Location
MW-9b	72	55-57	overdrill at existing MW-9 Location
MW-9c	72	70-72	overdrill at existing MW-9 Location
MW-11a	100	water table 10'	deep nested well upgradient of building
MW-11b	100	mid depth 2'	deep nested well upgradient of building
MW-11c	100	rock surface 2'	deep nested well upgradient of building
MW-12a	75	water table 10'	south of MW-6
MW-12b	75	mid depth 2'	south of MW-6
MW-12c	75	rock surface 2'	south of MW-6
MW-13a	35	water table 10'	down gradient by houses
MW-13b	35	rock surface 2'	down gradient by houses
MW-14a	75	water table 10'	upgradient of source area
MW-14b	75	rock surface 2'	upgradient of source area
MW-15a	30	water table 10'	downgradeint along Oak Street
MW-15b	30	rock surface 2'	downgradient along Oak Street

Table 4
Proposed Soil Sampling Locations and Analytical Methods
1-45 Orangetown Shopping Center
Orangeburg, New York

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Location	Depths	Methods	Comments
MW-8 overdrill	None	None	This is an overdrill of an existing location, no soil sampling will be conducted.
MW-9 overdrill	None	None	This is an overdrill of an existing location, no soil sampling will be conducted.
MW-11	water table	EPA 8260, EPA 8270, Total Organic Carbon	Continuous soil screening will be conducted using a PID.
	rock surface	EPA 8260, EPA 8270, Total Organic Carbon	
MW-12	water table	EPA 8260, EPA 8270, Total Organic Carbon	Continuous soil screening will be conducted using a PID.
	rock surface	EPA 8260, EPA 8270, Total Organic Carbon	
MW-13	water table	EPA 8260, EPA 8270, Total Organic Carbon	Continuous soil screening will be conducted using a PID.
	rock surface	EPA 8260, EPA 8270, Total Organic Carbon	
MW-14	water table	EPA 8260	Continuous soil screening will be conducted using a PID.
	rock surface	EPA 8260	
MW-15	water table	EPA 8260	Continuous soil screening will be conducted using a PID.
	rock surface	EPA 8260	
Sample duplicate		EPA 8260, EPA 8270, Total Organic Carbon	
Trip Blank		EPA 8260, EPA 8270, Total Organic Carbon	

EPA 8260 samples will be collected in VOA vials and preserved with either methanol or sodium bi-sulfate, the will be extracted and analyzed by the lab within 14 days.
EPA 8270 and Total Organic Carbon samples will be collected in unpreserved 1 liter amber glass bottles, the will be extracted by the lab within 7 days and analyzed within 40 days.

Table 5
Proposed Groundwater Sampling Locations and Analytical Methods
Orangetown Shopping Center
1-45 Orangetown Shopping Center
Orangeburg, New York

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Analytical Methods	VOC 8260B	SVOC 8270	Ammonia, nitrogen USEPA Method 350.2	Ortho-phosphorous USEPA Method 365.2	Nitrate/nitrite USEPA Method 353.2	Dissolved organic carbon USEPA Method 415.1	Iron (total, Fe2+, Fe3+) SM 3500	Sulfate/sulfite/ sulfide, chloride USEPA Method 300/377.1/376.2/300	Methane/ethane/ethene, carbon dioxide	Total Hardness	Biological analysis (dehalococcides and dehalobacer sp. by PCR)	Comments
Sample container and preservation method	(3) 40 ml VOA vials, HCL, 14 day hold time	1 Liter amber, 4 degrees C.	300 ml minimum volume, glass or plastic container, H2SO4 to pH<2, 4 degrees C, 28 day hold time	100 ml minimum volume, plastic or glass container, unpreserved, 4 degrees C, 48 hour hold time	400 ml minimum volume, plastic or glass container, H2SO4 to pH<2, 4 degrees C, 28 day hold time	1 Liter, glass contaner, H2SO4 to pH<2, 4 degrees C, 48 hour hold time	1 Liter, glass container, unpreserved, 4 degrees C, immediately upon receipt by the lab	1 Liter, glass container, 4 degrees C, unpreserved, immediately upon receipt by the lab	(3) 40 ml VOA vials, HCL, 4 degrees C, 14 day hold time	100 ml minimum, plastic or glass container, HNO3 to pH<2, 4 degrees C, 6 month hold time	lab provided filter media, 4 degrees C, 48 hour hold time	
Round #1/2007 - Sampling of existing wells prior to the installation of additional monitoring wells												**Performed to establish current condition of source area and plume fringe locations**
MW-1												located centrally withing the plume, sampling not needed
MW-2	X	X										representitive of source area
MW-3												located near MW-2, sampling not needed.
MW-4	X	X										upgradient of source area to the north
MW-5												located near MW-2, sampling not needed.
MW-6	X	X										most southern down gradient monitoring well
MW-7	X	X										upgradient of source to the west
MW-8												well to be reconstructed and sampled following reconstruction
MW-9												well to be reconstructed and sampled following reconstruction
MW-10	X	X										most eastern down gradient montoring well
Field Blank 1	X	X										
Equipment Blank 1	X	X										
Sample Duplicate	X	X										
Trip Blank 1	X	X										
Round #2/2007 - Sampling of monitoring wells after the installation of additional monitoring wells												**Sampling of two source area monitoring wells and one downgradient monitoring well for parameters used in evaluation of monitored natural attenuation potential including biological analysis**
MW-1	X	X										
MW-2			X	X	X	X	X	X	X	X	X	conducted to evaluate the potential for monitored natural attenuation - source area
MW-3	X	X	X	X	X	X	X	X	X	X	X	conducted to evaluate the potential for monitored natural attenuation - source area
MW-4												
MW-5	X	X										
MW-6			X	X	X	X	X	X	X	X	X	conducted to evaluate the potential for monitored natural attenuation - downgradient of source area
MW-7												
MW-8a	X	X										SVOC added to evaluate other potential carbon sources
MW-8b	X											
MW8c	X	X	X	X	X	X	X	X	X	X	X	SVOC added to evaluate other potential carbon sources
MW-9a	X	X										
MW-9b	X											
MW-9c	X	X										SVOC added to evaluate other potential carbon sources
MW-10	X	X										
MW-11a	X											
MW-11b	X	X	X	X	X	X	X	X	X	X		
MW-11c	X											
MW-12a	X	X										SVOC added to evaluate other potential carbon sources
MW-12b	X											
MW-12c	X	X										SVOC added to evaluate other potential carbon sources
MW-13a	X											
MW-13b	X											
MW-14a	X											
MW-14b	X											
MW-15a	X											
MW-15b	X											
Sample Duplicate	X	X	X	X	X	X	X	X	X	X		
Field Blank 2	X	X	X	X	X	X	X	X	X	X		one blank per 20 samples (23 samples = two blanks)
Field Blank 3	X	X										
Equipment Blank 2	X	X	X	X	X	X	X	X	X	X		
Equipment Blank 3	X	X										
Trip Blank 2	X	X	X	X	X	X	X	X	X	X		

Yellow = Monitoring wells to be installed as part of this investigation
Green = Pre-existing Monitoring wells

Orange "X" = To be sampled

Table 6
Proposed Air and Soil Vapor Sampling Locations and Analytical Methods
Orangetown Shopping Center
1-45 Orangetown Shopping Center
Orangeburg, New York

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Locations	# of Samples	Method	Sample Container
Basement Subslab	12	EPA Method TO-15	1 Liter SUMA analysis within 28 days
Basement Indoor Air	8	EPA Method TO-15	6 Liter SUMA analysis within 28 days
First Floor Indoor Air	12	EPA Method TO-15	6 Liter SUMA analysis within 28 days
Outdoor Air	7	EPA Method TO-15	6 Liter SUMA analysis within 28 days
Co-located Duplicates	2	EPA Method TO-15	1 Liter SUMA for sub slab colocated sample, 6 Liter SUMA for Indoor air colocated sample, both with analysis within 28 days
Equipment Blank	2	EPA Method TO-15	conducted at the laboratory, SUMA size at the discression of the laboratory
Trip Blanks	2	EPA Method TO-15	1 or 6 Liter SUMA analysis within 28 days
Totals	45		

Table 7
Proposed Schedule for Site Investigation
Orangetown Shopping Center
1-45 Orangetown Shopping Center
Orangeburg, New York

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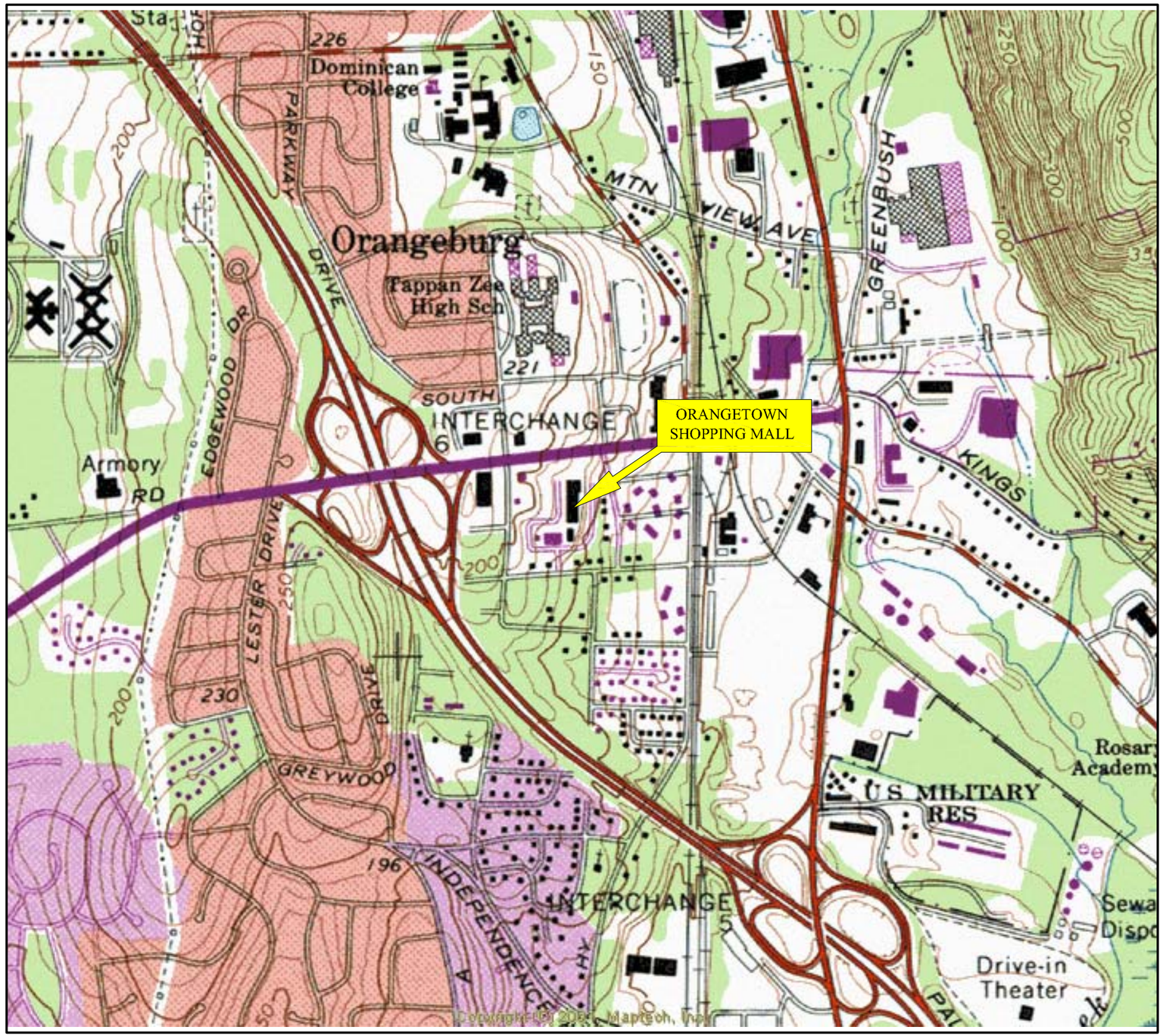
Task	Months past approval of Investigation Work Plan					
	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6
Pre monitoring well installation groundwater sampling						
New monitoring well installation						
Groundwater sampling						
Access agreements for air sampling						
Air sampling point installation						
Air sampling						
Data review and report prepartion						
Heating season sample point installation (if required)*						
Heating season air sampling (if required)*						
Data review and adendum prepartion (if required)*						

* - if required the schedule for heating season sampling will be established in consultation with NY DEC and DOH

FIGURES



0 900 1800

Scale in feet

LATITUDE: 41° 02' 42.13" N
LONGITUDE: 73° 57' 18.05" W

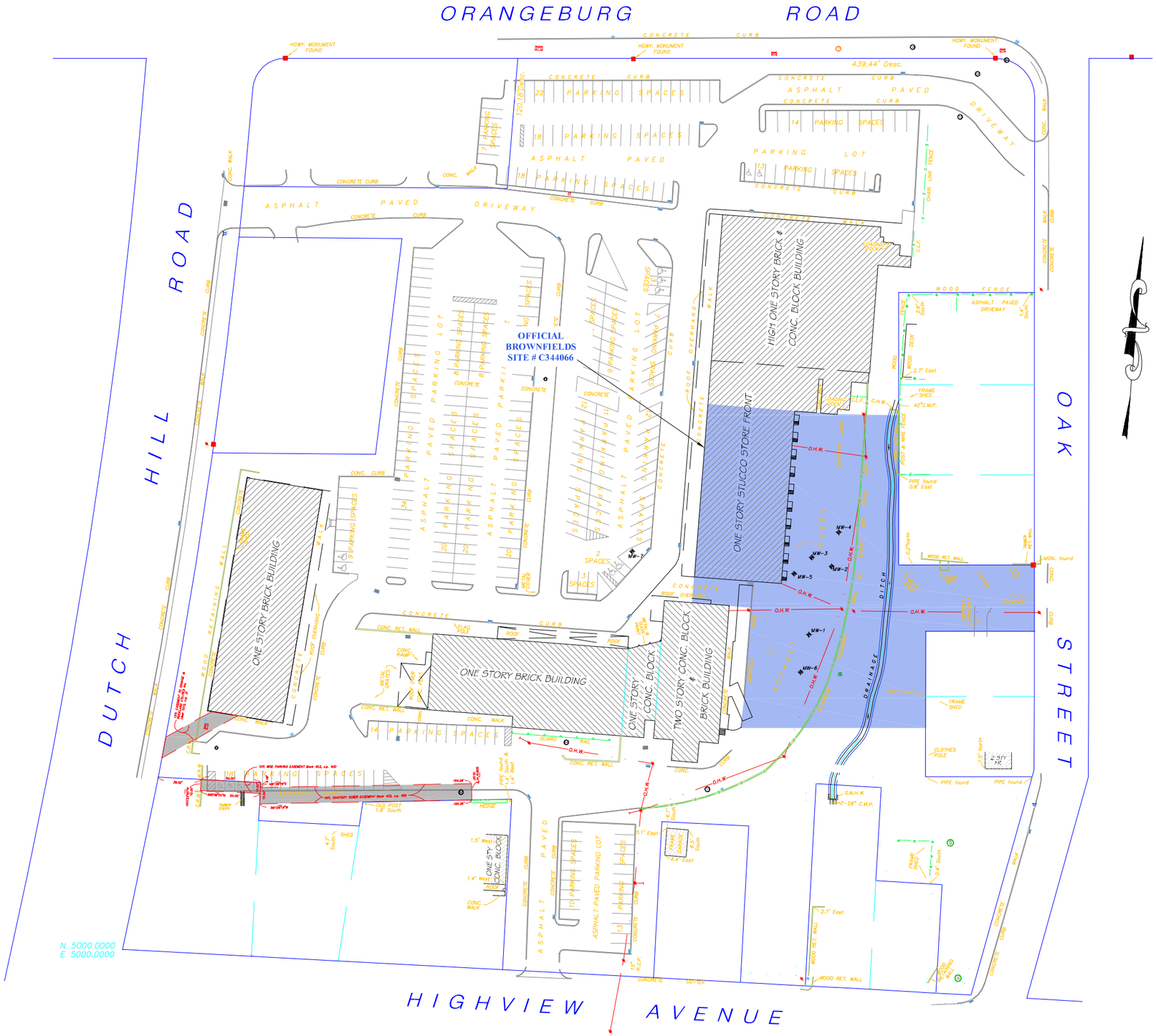
QUADRANGLE LOCATION

FIGURE 1
SITE LOCATION

ORANGETOWN SHOPPING CENTER
1-45 ORANGE BURG SHOPPING CENTER
ORANGEBURG, NEW YORK

DRAWN BY:	-	SCALE:	1" = 900'
REVISED BY:	CTH	PROJECT NUMBER:	69972
CHECKED BY:	-	SOURCE: USGS 7.5' Topographic Map, Nyack, NY-NJ Quad.	
DATE:	FEBRUARY 7, 2007		

KLEINFELDER
EXPECT MORE®



LEGEND

- MONITORING WELL LOCATION
- SOIL GAS MONITORING POINT
- HYDRANT
- UTILITY POLE
- ELECTRIC COVER
- MANHOLE COVER (unknown)
- TELEPHONE MANHOLE COVER
- CATCH BASIN
- LIGHT POLE
- SEWER MANHOLE

C.L.F.	CHAIN LINK FENCE
C.H.W.	CONCRETE HEAD WALL
C.M.P.	CORRUGATED METAL PIPE
O.H.W.	OVERHEAD WIRES
R.C.P.	REINFORCED CONCRETE PIPE
S.M.H.W.	STONE MASONRY HEAD WALL

SCALE

0 100 200

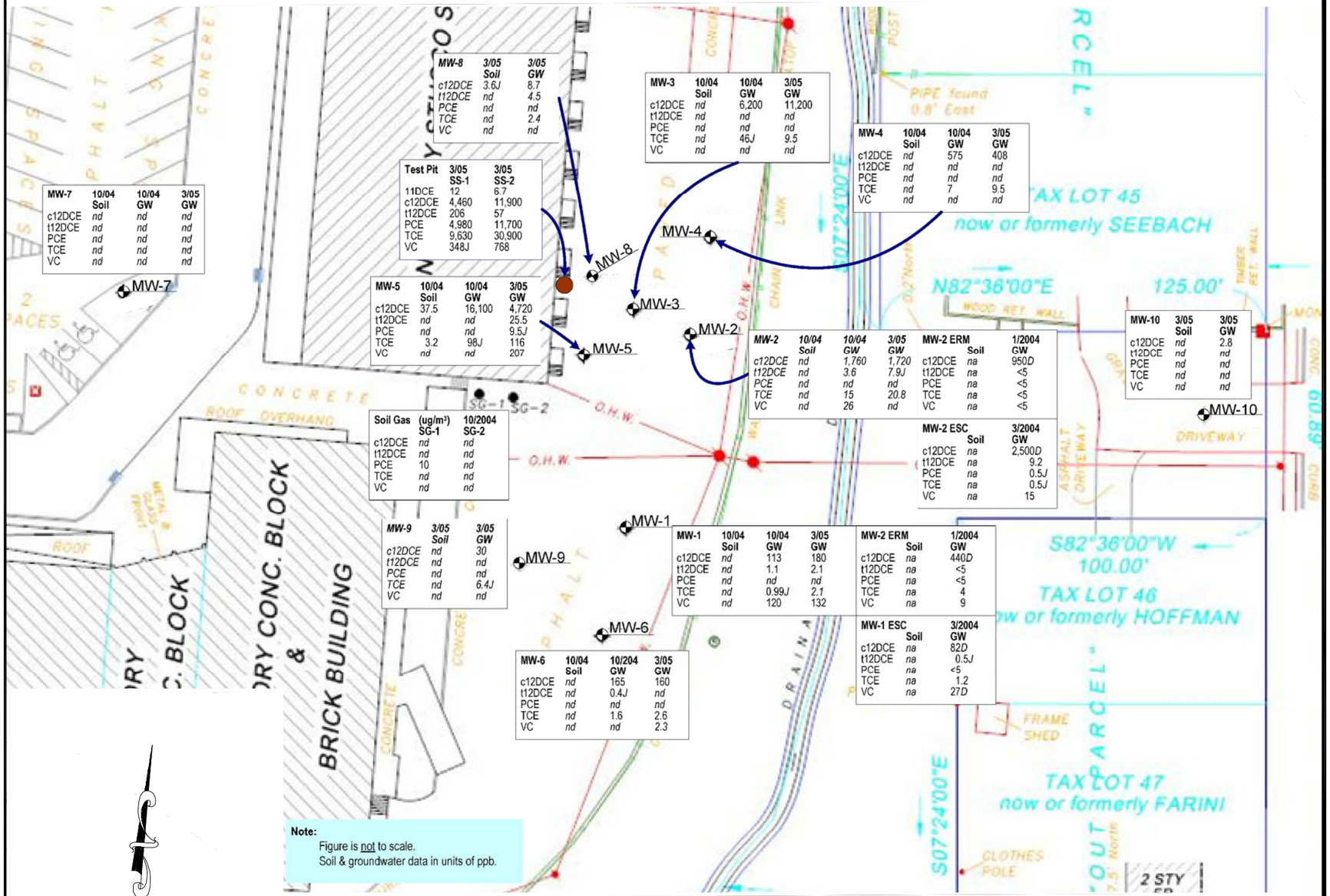
1 inch = 100 feet

FIGURE 2
SITE PLAN

ORANGETOWN SHOPPING CENTER
1-45 ORANGE BURG SHOPPING CENTER
ORANGEBURG, NEW YORK

DRAWN BY:	-	SCALE:	SEE ABOVE
REVISED BY:	CTH	PROJECT NUMBER:	69972
CHECKED BY:		SOURCE: LINK LAND SURVEYORS	
DATE:	FEBRUARY 7, 2007		

KLEINFELDER
EXPECT MORE®



LEGEND

- MONITORING WELL LOCATION
- SOIL GAS MONITORING POINT
- HYDRANT
- UTILITY POLE
- ELECTRIC COVER
- MANHOLE COVER (unknown)
- TELEPHONE MANHOLE COVER
- CATCH BASIN
- LIGHT POLE
- SEWER MANHOLE

C.L.F.	CHAIN LINK FENCE
C.H.W.	CONCRETE HEAD WALL
C.M.P.	CORRUGATED METAL PIPE
O.H.W.	OVERHEAD WIRES
R.C.P.	REINFORCED CONCRETE PIPE
S.M.H.W.	STONE MASONRY HEAD WALL

FIGURE 3
SITE PLAN WITH HISTORIC SAMPLING RESULTS

ORANGETOWN SHOPPING CENTER
1-45 ORANGE BURG SHOPPING CENTER
ORANGEBURG, NEW YORK

DRAWN BY:	-	SCALE:	NOT TO SCALE
REVISED BY:	CTH	PROJECT NUMBER:	69972
CHECKED BY:		SOURCE: LINK LAND SURVEYORS	
DATE:	APRIL 9, 2007		

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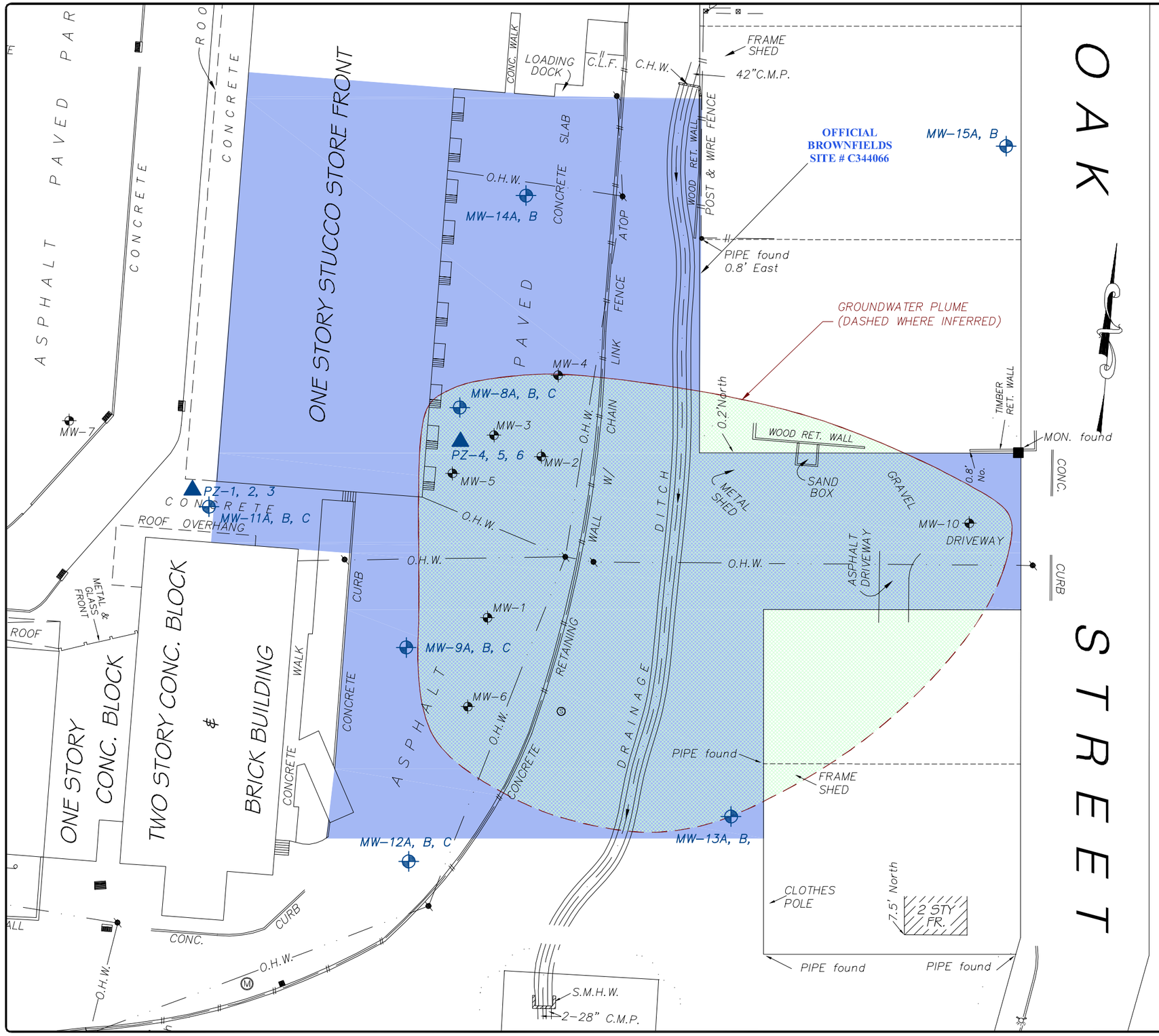


LEGEND

- MONITORING WELL LOCATION
- PROPOSED MONITORING WELL LOCATION
- PROPOSED PIEZOMETER LOCATION
- SOIL GAS MONITORING POINT
- HYDRANT
- UTILITY POLE
- ELECTRIC COVER
- MANHOLE COVER (unknown)
- TELEPHONE MANHOLE COVER
- CATCH BASIN
- LIGHT POLE
- SEWER MANHOLE

C.L.F.	CHAIN LINK FENCE
C.H.W.	CONCRETE HEAD WALL
C.M.P.	CORRUGATED METAL PIPE
O.H.W.	OVERHEAD WIRES
R.C.P.	REINFORCED CONCRETE PIPE
S.M.H.W.	STONE MASONRY HEAD WALL

SCALE

0 40 80

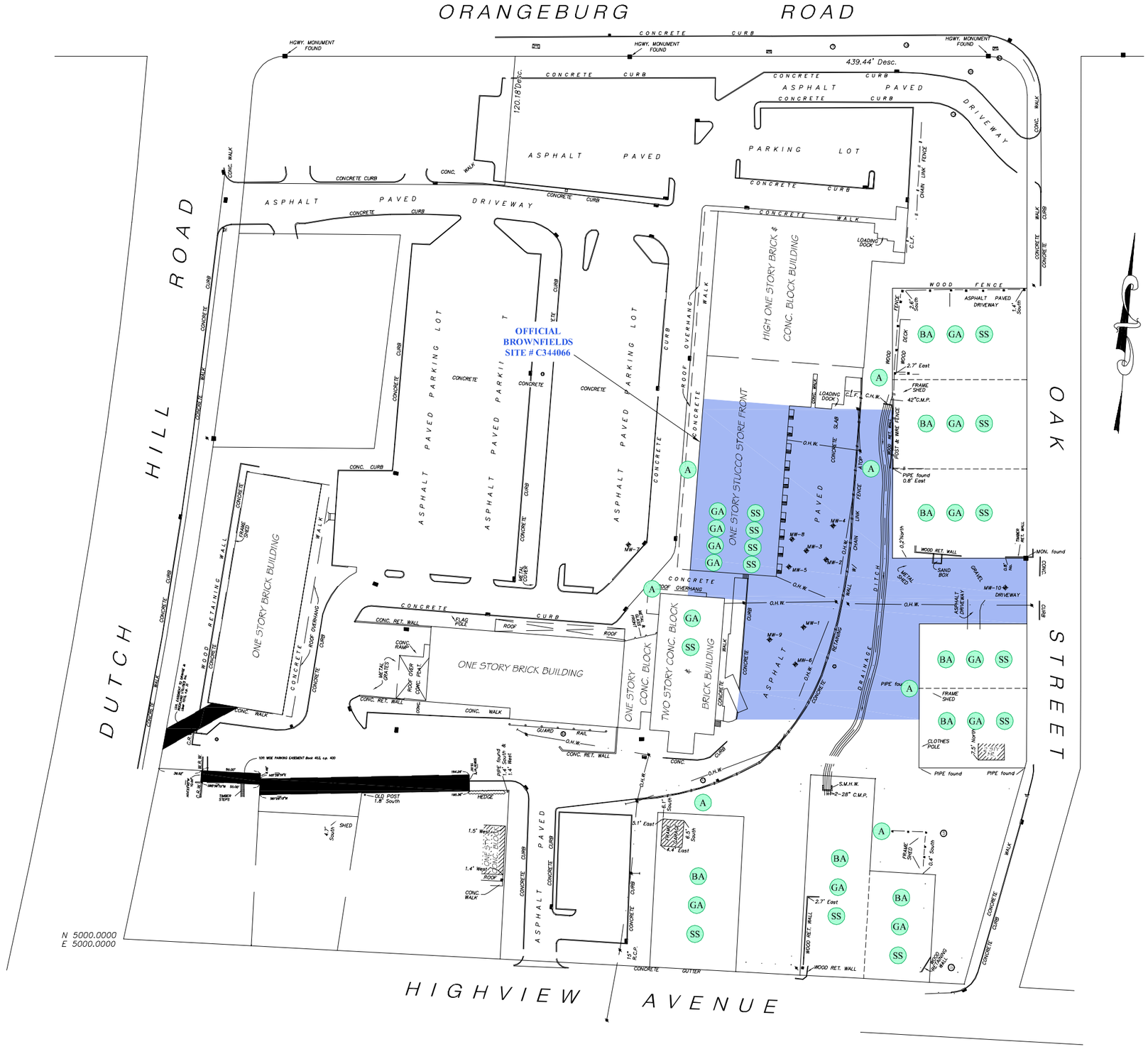
1 inch = 40 feet

FIGURE 4
PROPOSED MONITORING WELL LOCATION PLAN

ORANGETOWN SHOPPING CENTER
1-45 ORANGEBURG SHOPPING CENTER
ORANGEBURG, NEW YORK

DRAWN BY:	-	SCALE:	SEE ABOVE
REVISED BY:	CTH	PROJECT NUMBER:	69972
CHECKED BY:		SOURCE: LINK LAND SURVEYORS	
DATE:	JUNE 6, 2007		

KLEINFELDER
EXPECT MORE®



LEGEND

- MONITORING WELL LOCATION
- SOIL GAS MONITORING POINT
- HYDRANT
- UTILITY POLE
- ELECTRIC COVER
- (M) MANHOLE COVER (unknown)
- (T) TELEPHONE MANHOLE COVER
- CATCH BASIN
- LIGHT POLE
- (S) SEWER MANHOLE
- (A) PROPOSED OUTDOOR AMBIENT LOCATION
- (BA) PROPOSED BASEMENT AMBIENT LOCATION
- (GA) PROPOSED GROUND FLOOR AMBIENT LOCATION
- (SS) PROPOSED SUB-SLAB LOCATION

C.L.F.	CHAIN LINK FENCE
C.H.W.	CONCRETE HEAD WALL
C.M.P.	CORRUGATED METAL PIPE
O.H.W.	OVERHEAD WIRES
R.C.P.	REINFORCED CONCRETE PIPE
S.M.H.W.	STONE MASONRY HEAD WALL

SCALE

0 100 200

1 inch = 100 feet

FIGURE 5
PROPOSED AIR SAMPLE LOCATION PLAN

ORANGETOWN SHOPPING CENTER
1-45 ORANGEBURG SHOPPING CENTER
ORANGEBURG, NEW YORK

DRAWN BY:	-	SCALE:	SEE ABOVE
REVISED BY:	CTH	PROJECT NUMBER:	69972
CHECKED BY:		SOURCE: LINK LAND SURVEYORS	
DATE:	FEBRUARY 26, 2007		

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APPENDIX A

Waste Management Plan

KLEINFELDER
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WASTE MANGEMENT PLAN FOR REMEDIAL INVESTIGATION WORK PLAN

Orangeburg (Orangetown) Shopping Center

1-45 Orangetown Shopping Center

Orangeburg, NY 10962

NYSDEC Index #A3-0563-0906

NYSDEC Site #C344066

The purpose of a waste management plan is to establish procedures for proper collection, storage, transportation, and disposal of wasted generated from a specific activity or set of activities.

As part of the work plan proposed in the Remedial Investigation Work Plan wastes will be generated on-site. These wastes may include:

- soil removed from the subsurface during drilling activities
- groundwater removed from the subsurface during monitoring well development and sampling
- water used for the decontamination of equipment and sampling materials
- used sampling equipment, and used personal protective equipment

Soil removed from the subsurface during drilling activities will be collected on-site in 55-gallon steel DOT rated drums. These drums will be appropriately labeled and stored on site during the duration of the drilling activities. Following completion of the drilling waste characterization samples will be collected from the drums and submitted for laboratory analysis. Following receipt of the laboratory analytical results a classification of the soil will be made. If the soil is not suitable for re-use on site the drummed soil will be relabeled based on the waste classification in accordance with 49 CFR 172 and will be transported by a waste hauler with appropriate certifications to an approved disposal facility. If the material is classified as hazardous the transportation and disposal will be conducted in compliance with 6 NYCRR Part 372 “Hazardous Waste Manifest System and Related Standards for Generators, Transporters and Facilities”.

Groundwater removed from the subsurface during well development and sampling along with water from the decontamination of equipment and sampling materials will be managed as a single waste stream. This water will be collected on site in 55-gallon steel DOT rated drums. These drums will be appropriately labeled and stored on site during the duration of the drilling and sampling activities. Following completion of the groundwater sampling waste characterization samples will be collected from the drums and submitted for laboratory analysis. Following receipt of the laboratory analytical results a classification of the water will be made. If the water is not suitable for on-site infiltration the water will be relabeled based on the waste classification 49 CFR 172 and will be transported by a waste hauler with appropriate certifications to an approved facility for treatment. If the material is classified as hazardous the transportation and disposal will be conducted in compliance with 6 NYCRR Part 372 “Hazardous Waste Manifest System and Related Standards for Generators, Transporters and Facilities”.

Used disposable equipment including sample tubing, polyethylene bailers, nitrile gloves, and soil scoops will be collected on-site in 55-gallon steel DOT rated drums. Following completion of the monitoring well installation and groundwater sampling this material will be transported by a waste hauler with appropriate certifications to an approved facility for disposal.

APPENDIX B

Health and Safety Plan

KLEINFELDER
EXPECT MORE

SITE-SPECIFIC HEALTH AND SAFETY PLAN

BROWNFIELD SITE NUMBER C344066
1-45 ORANGEBURG SHOPPING CENTER
ORANGEBURG, NEW YORK

PREPARED BY:

Kleinfelder

KLEINFELDER
EXPECT MORE
7 Airport Park Blvd, Latham, NY 12110 Phone: 518-786-8750 Fax: 518-786-8755

KLEINFELDER

SITE SPECIFIC HEALTH AND SAFETY PLAN

BROWNFIELD SITE NUMBER C344066
1-45 ORANGEBURG SHOPPING CENTER
ORANGEBURG, NEW YORK

HASP REVISION 1
Revision Date: 6/15/2007

TABLE OF CONTENTS

HASP prepared by: **William E. Peters**

HASP approval: **Matthew Pickard**

Project Manager Approval: **Brian Kelly**

REVISION HISTORY:

3/15/07 - Original

KLEINFELDER

SITE HEALTH AND SAFETY PLAN —FOR CHLORONATED SOLVENTS INVESTIGATION/REMEDIATION ONLY

(For specific Procedures, refer to Kleinfelder's Health and Safety Procedures Manual)

I. PROJECT IDENTIFICATION

Project Name: **Orangetown Shopping Center**

Address of Site: **1-45 Orangeburg Shopping Center Orangeburg, New York** Site ID No.: NA

Client Contact: **Kurt A. Frantzen Ph.D.** Phone: **(609) 306-8281**

Kleinfelder Project Manager: **Ben Reiger** Phone: **(609) 306-8281**

Health and Safety Oversight:**Matthew Pickard** Phone: (**845) 567-6530**

II. EMERGENCY CONTACTS

Police: **911** **Fire**: **911** **Ambulance**: **911**

National Poison Control Center: **800-222-1222**

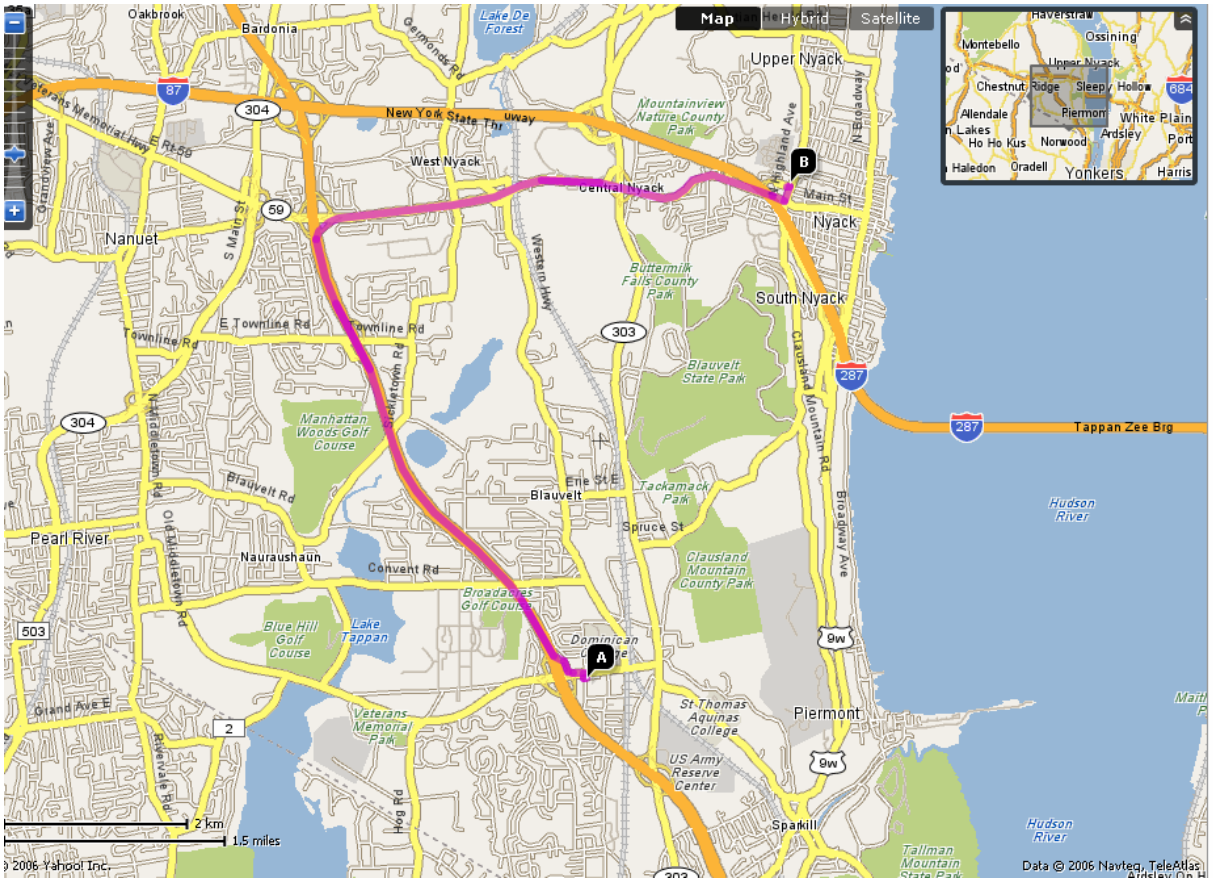
Utilities: Gas _____ Electric _____ Water _____

Phone _____ **One call/equivalent**: **1-800-272-4480**

Medical Treatment Facility: **Nyack Hospital** **Phone #**: **(845) 348-2000**
Address: **258 High Ave**
Nyack, New York

Directions from Site: (see attached map showing location of hospital relative to Site)

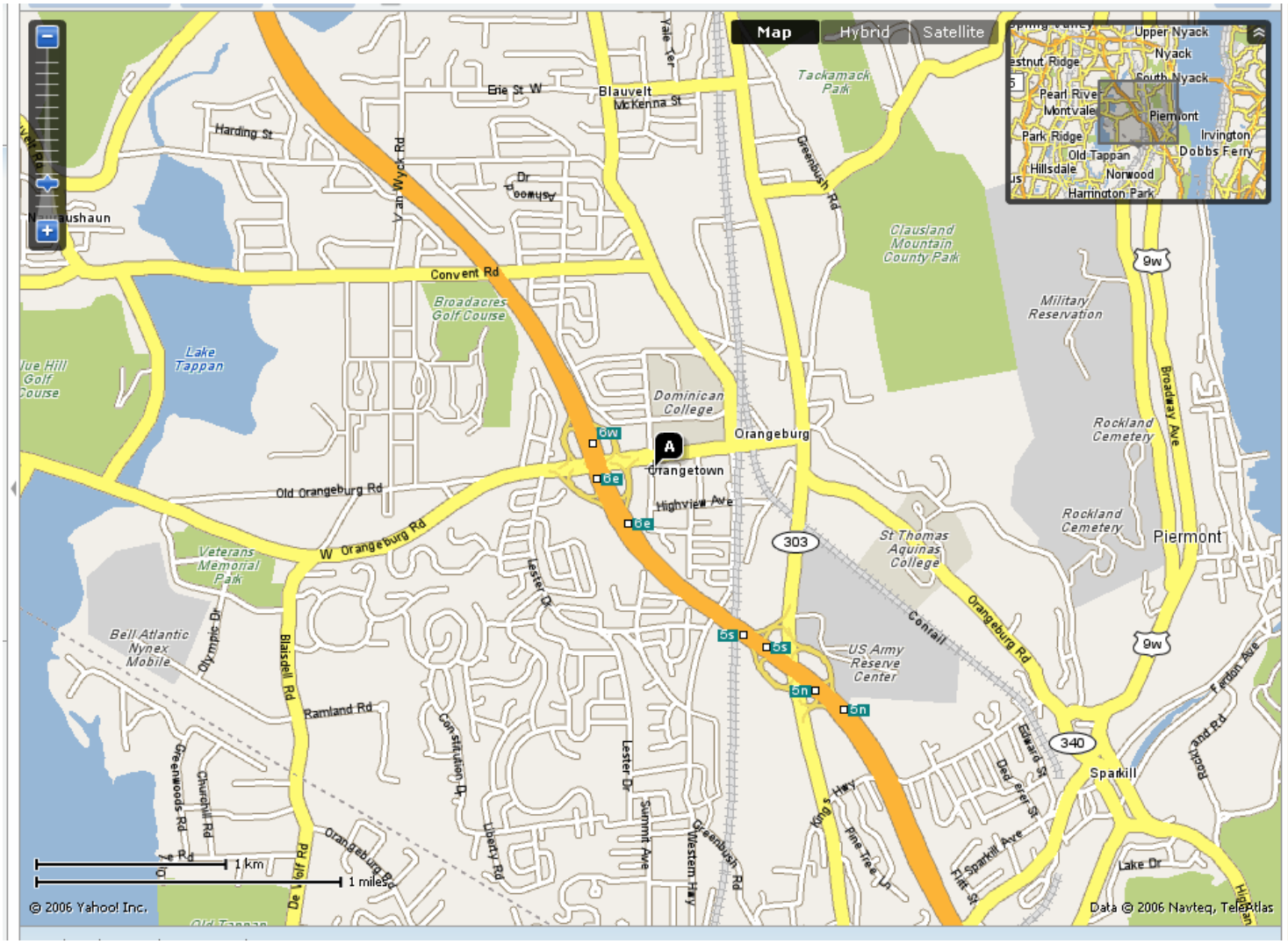
MAP TO HOSPITAL



1) Start at **1-45 Orangeburg Shopping Center**
2) Turn **right** on **Dutch Hill Road** – 0.0 mi
3) Turn **Left** on **W. Orangeburg Road** – 0.1 mi
4) Take ramp to **Palisades Interstate Parkway** and go **North** – 3.5 mi
5) Take **Exit 8E** to **Route 59 East** towards Nyack – 3.3 mi
6) Continue on **Main Street** - 0.1 mi
7) Turn **Left** onto **N Highland Ave (US-9W)** – 0.1 mi
8) Turn **Left** onto **High Ave** -0.0 mi
9) **Hospital** will be on the **Right** – 258 High Ave

III. SITE BACKGROUND INFORMATION (See attached Site Plan and map, page 6)

SITE LOCATION



IV. ANTICIPATED TASKS TO BE PERFORMED: (Check all appropriate tasks.)

Task	Personnel/ContractorsPerforming Task
X Supervision of Soil Boring/Monitoring Well Installation	Subcontractor Personnel
X Gauging/Sampling of Monitoring Well	Kleinfelder Personnel
___ Assessment of Tank Excavation	_____
___ Supervision of General Construction	_____
___ Trenching	_____
___ Dry well excavation	_____
___ Line replacement	_____
___ Soil loading and transport, etc.	_____
___ Other	_____
X Collection of Soil Samples	Kleinfelder Personnel
X Split spoon	Kleinfelder Personnel
X Hand auger	Kleinfelder Personnel
___ Grab Samples	
___ Jar headspace	
X Soil Vapor Survey	Kleinfelder Personnel
X Ambient Indoor Air Sampling	Kleinfelder Personnel
X Subslab Vapor Sampling	Kleinfelder Personnel
X External Ambient Air Sampling	Kleinfelder Personnel
___ Other	_____
___Remedial System Operation & Maintenance	_____

___ OTHER:_____

_____

_____

SITE MAP INSERT

(print out the latest Site Plan and attach behind this sheet)

See Attached

V. CHEMICAL HAZARDS/PPE (also refer to Kleinfelder Site Health and Safety Procedures sections 6.0, 7.0 and 9.0)

Level of PPE Required: X D *Zones established*: ___ NA
___C ___Support (52) ___ Decontamination (CRZ)
___B* ___Ground Intrusive (no eating, drinking smoking) (EZ)

*Level C and B work MAY NOT be done under this HASP. Contact HSO for further direction and assistance!

Specific Site Entry/Access Procedures: If LEL concentrations are >5% LEL, all work must cease and area(s) evacuated.

Potential/Expected Exposure Constituents: (MSDS's are Attached as Appendix)

Contaminant	Source/Location	Acute Exposure Symptoms	PEL/TLV Established	Action Level	Level of PPE/Specific PPE required
Trichloroethylene	Former drycleaning operations	Irratation to the eyes, skin; Headache, visual disturbance, weakness, exhaustion, dizziness, tremors, drowsiness, nausea, vomiting, dermatitis, Cardiac arrhythmias.	ACGIH TLV—50 ppm		**< Action Level**—Level D > **Action Level**-Consult PM and HSO
Perchloroethylene	Former drycleaning operations	Irritation of eyes, nose, skin; CNS depression; giddiness, nausea, headache	TLV— 25 ppm		**< Action Level**—Level D > **Action Level**-Consult PM and HSO
Vinyl Chloride	Breakdown product of TCE and PCE	Irritation of eyes, nose, skin; CNS depression; giddiness, nausea, headache	PEL—1 ppm	0.5 ppm	**< Action Level**—Level D > **Action Level**-Consult PM and HSO

NOTE: IF ANY LEVELS EXCEED THE PEL/TLV BY MORE THAN 10X, ALL WORK MUST CEASE AND SPECIFIC VENTILATION PRACTICES OR RESPIRATORY PROTECTION METHODS EMPLOYED.

Air Monitoring Instruments to be Employed: (also refer to Kleinfelder HASP Manual, section 9.0)
Monitoring Instrumentation To Be Used:(SEE INDIVIDUAL PROCEDURES FOR MONITORING BELOW)

___ Combustible Gas Indicator
___ Oxygen Meter
___ Dual CGI and O2
___ Flame Ionization Detector (calibration date:_____)
X Photo Ionization Detector (calibration date: ____)
___ Hydrogen Sulfide Detector
___ Colorimetric Indicator Tubes
___ Personnel Sampling Pump w/ media
X OTHER: Multirae (LEL Meter)
___ Radiation Survey Meter w/probe
___ Particulate Monitor
___ Dosimeter Badges

Specific Personnel Air Monitoring Procedures to be employed: Personnel air monitoring samples are to be collected in workers' breathing zone (18"-24" from mouth/nose) using the monitoring instruments specified above. Air monitoring shall be conducted prior to site activities and at least once every 2 hours. Sampling shall be be conducted continuously for 15 minutes per collection. Any sustained readings above the action level shall require notification of the Project Manager and Health & Safety Officer.

VI. Physical Hazards/Traffic Control (refer to Kleinfelder Site Health and Safety Procedures, section 5.0, 6.0,7.0, and 8.0)

Hazard Description	Location	Control Methods/ Protective Equipment
Slips, Trips, and Falls	Site Wide	Good Housekeeping
Traffic	Site Wide	Set up work area
Hand Safety	Site Wide	Wear Correct PPE
Use of tools	Site Wide	Inspect tools and be trained on how to use them.

Confined Space Entry? Y N (If Y, then a completed Confined Space Permit must be attached)
Description: _____

Illumination: ____Adequate ___X___ Inadequate (if inadequate, describe illumination methods to be utilized): Be prepared to set up lighting in the basements of the residents.

Hot Work? Y N (If Y, then a Hot Work Permit MUST be completed and attached)
Description: Employ hot work permit for drilling monitoring wells and for drilling for sub-slab soil vapor samples.

VII. Decontamination Procedures (also refer to Kleinfelder Site Health and Safety Procedures section 12.)

Decontamination required: Personnel? Y N Equipment? Y N
Method of Decontamination/Procedures to be Implemented: Personnel decontamination will be removing gloves between samples and drilling locations. Equipment will be decontaminated by an alconox rinse followed by a water rinse. Then a methanol rinse followed by a final water rinse. All equipment will be decontaminated between sampling locations and drilling locations.

Method of disposal for Contaminated Materials: Soil cuttings will be drummed and shipped off-site via an approved waste transporter.

VIII. Training Requirements for Site Personnel (See Kleinfelder Site Health and Safety Procedures, Sect. 10)

In addition to initial site specific health and safety training, all Kleinfelder Project Field Team Members shall be required to be trained in accordance with 29CFR 1910.120, Hazardous Waste Operations and Emergency Response. Any other personnel visiting the site must check in with the HSO, or designee, for orientation and briefing of site hazards.

Supervisory personnel on-site and specialized site workers may be required to have been trained in accordance with 29CFR 1910.120, depending on the nature of their work, exposure potential, and specific type of activities being conducted. However, each will be trained on site-specific hazards, site conditions and emergency operating procedures as well as other pertinent topics prior to job initiation in the areas of environmental concern (AOEC). All personnel on-site are required to attend pre-work "tailgate" meetings. These meetings shall discuss Health and Safety items related to those activities.

In the event hazardous waste or other conditions are encountered in the AOEC requiring upgrade from level D, all activities in the AOEC will be stopped. Continuation of work and entry into the AOEC will be conducted by personnel trained in accordance with 29 CFR 1910.120.

If respiratory protection is required, certification of mandatory training, medical monitoring and documentation of respirator fit testing shall be provided to the HSO before personnel are permitted on site. These records will be maintained as part of the permanent record.

IX. Loss/Near Loss/Injury Reporting

In the event of an injury, near miss, or incident, site personnel must **IMMEDIATELY:**

- Determine the need for medical treatment and administer First Aid. Immediately call 911 if an injury or illness is obviously serious.
- IMMEDIATELY stop operations and notify Kleinfelder contact on site.
- IMMEDIATELY notify Kleinfelder Project Management/Operations Manager.

- Complete Kleinfelder Loss/Near Loss Investigation report as soon as possible, describing the incident IN DETAIL.

- Refer to Kleinfelder Health and Safety Procedures for detailed responsibilities.

X. HASP REVISIONS/SITE CONDITION CHANGE FORM

Non-Conformance of Health and Safety Procedures/Comments regarding implementation:

_____

_____

_____

Change in Site Conditions: _____

___ Site personnel notified and informed of changes on: Date/Time notified: _____
___ Contractor Notification and Consent Form updated. Date performed: _____

Plan of Action for Non-routine task/HASP Non-Conformance Issues/Change in conditions: _____

_____

_____

_____

Incident Summary: ___ NA ___ Evacuation ___ Hazardous Material Over Exposure

___ Loss ___ Near Loss ___ OTHER:_____

(complete Kleinfelder Loss/Near Loss investigation form, see Kleinfelder SOP Manual, SOP#15 for a complete analysis)

___ PM notified ___ Client notified ___ OSHA notified

___ HASP Revision Document Submitted to H&S Department for HASP revision:
Name of Submittor:_____ DATE:_____
Received By:_____ DATE:_____

FORWARD TO HSO FOR HASP REVISION AS NECESSARY; FILE A COPY UNDER "SITE INSPECTION" IN AUDIT FILE

ATTACHMENT A – Air Monitoring Data Observation Record

INSERT HARD COPY

New York State Department of Health
Generic Community Air Monitoring Plan

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

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical-specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for volatile organic compounds (VOCs) and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate NYSDEC/NYSDOH staff.

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

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

VOC Monitoring, Response Levels, and Actions

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

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

- If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over 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.

Particulate Monitoring, Response Levels, and Actions

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

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.

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

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

June 20, 2000

P:\Bureau\Common\CommunityAirMonitoringPlan (CAMP)\GCAMPR1.DOC

ATTACHMENT B: AUTHORIZATION FOR MEDICAL TREATMENT/PHYSICIAN'S REPORT

PLEASE RENDER TREATMENT TO: Employee _____
for the illness/injury that occurred on: (Date) _____

____ Conduct an alcohol and drug screen (reasonable cause).

Describe nature and cause of illness/injury including the object, equipment or substance inflicting injury/illness: **(Attach copy of MSDS when a hazardous material is involved)**

_____

_____

Authorized by:

_____ _____ _____
Signature & Title Telephone Date

PHYSICIAN'S REPORT

_____

MEDICAL FACILITY: _____
ADDRESS: _____
Treating Physician: _____ Date of illness/injury: _____

Previously treated? (Y / N) If yes, give dates_____
Diagnosis:(Industrial illness/injury only)_____

Treatment:(Industrial illness/injury only)_____
_____
Prescription medication prescribed? Yes_____ No_____

Can employee return to work on next scheduled period? Yes_____ No_____
If no, what date can employee return to work? _____
List any medical/physical restrictions: _____
Number of days of restricted activity: _____
The employee is able to return to regular work on: _____

Follow-up treatment required? Yes_____ No_____; Date_____

Physician's signature: _____

EMPLOYEE MUST RETURN THIS RELEASE TO OPERATIONS OFFICE WITHIN 24 HOURS.

ATTACHMENT C: KLEINFELDER LOSS/NEAR LOSS INVESTIGATION REPORT

KLEINFELDER-EAST INCIDENT/INJURY/NEAR LOSS INVESTIGATION REPORT (Incident #)

SECTION 1: INCIDENT INFORMATION (SUBMIT TO DIV. H&S WITHIN 24 HOURS OF INCIDENT)

KLEINFELDER-EAST Office:
☐ Hamilton, NJ ☐ MA ☐ CT ☐ HV ☐ LI ☐ AL ☐ RO ☐ West Chester, PA
☐ FL ☐ MD ☐ Cranberry, PA ☐ Cinnaminson, NJ

BUSINESS CLIENT: ☐ NONE (KLEINFELDER-EAST Internal incident only)
☐ Client and region: _____

INCIDENT STATUS and TYPE:
☐ **Initial. Date submitted:** _____
☐ **Final. Date submitted:**_____
☐ **V&V Complete; incident closed**

PERSONNEL INVOLVED
☐ **KLEINFELDER-EAST PERSONNEL** ☐ **SUB CONTRACTOR**
☐ **CONTRACTOR** ☐ **THIRD PARTY/GENERAL PUBLIC**

JOB TASK

☐ Carbon Changeout	☐ Gauging/Bailing	☐ Operations/Maintenance	☐ Subsurface Clearance
☐ Demolition	☐ Geoprobe	☐ Pavement Cutting	☐ System Install
☐ Dewatering	☐ Heavy Equip Ops	☐ Pump/Pilot Test	☐ System Startup
☐ Drilling	☐ Mobil Rem/Vac Event	☐ Rigging/Lifting	☐ UST Removal
☐ Excavation/Trenching	☐ Motor Vehicle	☐ Sampling	☐ Waste Management
☐ NAPL Recovery	☐ Other:____		

COMPANY NAME AND SUBCONTRACTOR COMPANY NAME (IF APPLICABLE)	**NAME OF EMPLOYEE INVOLVED**

DATE MM/DD/YY	**TIME** hh:mm ☐ **AM** ☐ **PM**	**# OF YEARS WORKED FOR COMPANY**	**# OF YEARS IN CURRENT POSITION**	**WAS ALCOHOL / DRUG USE SUSPECTED?** ☐ **YES** ☐ **NO**

INCIDENT LOCATION (CITY, STATE AND COUNTRY IF OUTSIDE THE U.S.)	**SITE / FACILITY / LOCATION ID#/ PROJ. #**	**SUPERVISOR'S NAME**

SUPERVISOR'S PHONE NUMBER	**CONTACT NAME**	**CONTACT PHONE NUMBER**		**DIVISION/CORP. NOTIFICATIONS MADE?** ☐ **YES** ☐ **NO**

NAMES OF OTHER INDIVIDUALS INVOLVED	**COMPANY NAME / # OF YRS. WORKING / # OF YRS. IN CURRENT POSITION / EXTENT OF INJURIES**

ESTIMATED COST OF INCIDENT: ☐ **< $500** ☐ **> $500**	**IF A SPILL / RELEASE - MATERIAL INVOLVED:**	**TOTAL QUANTITY:** ___ ___**U.S. GALLONS**

***SUMMARY DESCRIPTION OF INCIDENT / NEAR LOSS (INCLUDE THE SEQUENCE OF EVENTS, THE CAUSAL FACTORS TO EXPLAIN THE PROBLEM AND ALL PERTINENT FACTS ABOUT INJURY AND TREATMENT GIVEN, ACCIDENT, LOSS or NEAR MISS; RESPONSE ACTIONS TAKEN)**

BRIEF DESCRIPTION OF INCIDENT:

POTENTIAL LOSS/INJURY (if Near Loss):

BACKGROUND DETAILS (i.e. overview of activities being performed; locations; etc.):

SECTION 2: INCIDENT DETAILS

TYPE OF INCIDENT: (Check all that apply)

INCIDENT TYPES
- ☐ INJURY
- ☐ ILLNESS

------Severity Level------
- ☐ Fatality
- ☐ Lost Time
- ☐ Restricted Work
- ☐ Medical Treatment
- ☐ First Aid

ENVIRONMENTAL
- ☐ Spill / Release
- ☐ Permit Exceedance
- ☐ Fine / Penalty
- ☐ NOV
- ☐ Misdirected Waste
- ☐ Consent Order

PROPERTY DAMAGE
- ☐ Property Damage

IF DRUG/ALCOHOL TESTING WAS CONDUCTED, SUMMARIZE ACTIONS TAKEN/ TESTING (NOTE: ANY KA EMPLOYEE INVOLVED IN A MOTOR VEHICLE ACCIDENT, OR SUSTAINS AN INJURY REQUIRING PROFESSIONAL MEDICAL TREATMENT MUST SUBMIT TO A DRUG/ALCOHOL SCREEN).

EQUIPMENT INVOLVED: (Select all that apply)

Fixed – Piping, General
- ☐ Piping
- ☐ Piping, Hose

Fixed – Storage/Tankage
- ☐ Tank, Underground
- ☐ Tank, Underground Double Wall

Fixed - Vessel
- ☐ Drum, Separator, Vertical

Instrumentation – Instrument System
- ☐ Local Control Panel

Machinery – Drilling Equipment
- ☐ Drill Rig

Machinery - Pump
- ☐ Pump, Submerged

Support Equipment – Communication/Computing
- ☐ Audio Communication (Telemetry)

Support Equipment – Maintenance/Testing Tools
- ☐ Hand Tool, Hammer
- ☐ Hand Tool, Knife
- ☐ Hand Tool, Non Powered
- ☐ Hand Tool, Powered
- ☐ Hand Tool, Powered, Drill
- ☐ Hand Tool, Powered, Grinder
- ☐ Hand Tool, Powered, Hydraulic Torque
- ☐ Hand Tool, Powered, Saw
- ☐ Hand Tool, Powered, Wrench
- ☐ Hand Tool, Saw
- ☐ Hand Tool, Screwdriver
- ☐ Hand Tool, Shears
- ☐ Hand Tool, Shovel
- ☐ Hand Tool, Wrench
- ☐ Ladder, Extension
- ☐ Ladder, Platform
- ☐ Ladder, Step
- ☐ Maintenance Tool, General
- ☐ Space Heater, Electric

Support Equipment – Oil Spill Response
- ☐ Boom Material

Support Equipment – Remediation Equipment
- ☐ Blower
- ☐ Carbon Drum/Vessel
- ☐ Compressor
- ☐ Critical Equipment
- ☐ Drilling Equipment, Vacuum
- ☐ Exclusion Zone Equipment
- ☐ Fencing
- ☐ Filter
- ☐ Fire Extinguisher
- ☐ Manifold
- ☐ Oxidizer
- ☐ PPE - Eye
- ☐ PPE - Fall
- ☐ PPE - Foot
- ☐ PPE - Hand
- ☐ PPE - Head
- ☐ PPE - Hearing
- ☐ PPE - Respiratory
- ☐ PPE – Vest/Clothing
- ☐ PPE - Other
- ☐ Pumps (transfer, electrical)
- ☐ Remediation Shed/Trailer
- ☐ Separator
- ☐ Surge Tanks
- ☐ System - Air Sparging
- ☐ System - Carbon Treatment
- ☐ System - Chemical Oxidation
- ☐ System - Dual Phase Product Recovery
- ☐ System - Groundwater Pump and Treat
- ☐ System - Vapor Extraction
- ☐ System - Vapor Phase Treatment
- ☐ System - Other
- ☐ Well - Extraction
- ☐ Well - Monitoring
- ☐ Well - Recovery

Support Equipment – Sampling Equipment
- ☐ Bailer
- ☐ Geoprobe
- ☐ Hand Auger
- ☐ Photo-ionization Device
- ☐ Sample Container
- ☐ Split Spoon Sampler

Support Equipment - Snow Removal
- ☐ Snow Plow

Work Equipment – Crane
- ☐ Crane, Mobile

Work Equipment – Earth Moving Equip.
- ☐ Bulldozer
- ☐ Dump Truck
- ☐ Excavator/Power Shovel
- ☐ Front End Loader
- ☐ Grader

Work Equipment – Lifting Equipment
- ☐ Chain Block
- ☐ Forklift
- ☐ Hoist
- ☐ Hook/Clamp/Buckle etc.
- ☐ Jack
- ☐ Manlift/Basket/Cherry Picker
- ☐ Rope
- ☐ Sling
- ☐ Winch
- ☐ Wire Rope

Work Equipment - Transportation
- ☐ Automobile
- ☐ Tractor Trailer
- ☐ Truck, Flatbed
- ☐ Truck, Pick-up
- ☐ Truck, Tank Truck
- ☐ Truck, Vacuum

Other:____

TYPE OF INJURY/ILLNESS (OR POTENTIAL IF NEAR LOSS)
- ☐ Amputation/Avulsion
- ☐ Bruise/Contusion
- ☐ Burn - Chemical
- ☐ Burn - Thermal or Electrical
- ☐ Concussion/Unconscious
- ☐ Crush
- ☐ Cut/Scrape/Puncture
- ☐ Dislocation
- ☐ Foreign Object in Eye
- ☐ Fracture
- ☐ Hernia/Rupture
- ☐ Irritation
- ☐ Poisoning
- ☐ Sprain/Strain
- ☐ Sting/Bite
- ☐ Heat Stress/Exhaustion/Sunstroke
- ☐ Hypothermia
- ☐ Physical Agents - Radiation, etc.
- ☐ Repeat Trauma - CTS
- ☐ Repeat Trauma - Other Disorder
- ☐ Respiratory - Toxic Agents
- ☐ Skin Disease or Disorder
- ☐ Other ____
- ☐ Unknown

BODY PART AFFECTED (OR LIKELY PRIMARY INJURY IF NEAR LOSS)
- ☐ Abdomen/Groin
- ☐ Ankle
- ☐ Back/Spine
- ☐ Calf/Shin
- ☐ Central Nervous
- ☐ Chest
- ☐ Circulatory/Blood
- ☐ Ear
- ☐ Elbow
- ☐ Eye
- ☐ Face
- ☐ Fingers
- ☐ Foot
- ☐ Forearm
- ☐ Hand
- ☐ Hip
- ☐ Internal Organs
- ☐ Jaw
- ☐ Knee
- ☐ Neck
- ☐ Nose
- ☐ Respiratory
- ☐ Ribs
- ☐ Scalp
- ☐ Shoulder
- ☐ Skull
- ☐ Thigh
- ☐ Toes
- ☐ Tongue
- ☐ Tooth/Teeth
- ☐ Upper Arm
- ☐ Urinary
- ☐ Wrist

SOURCE OF INCIDENT

Body Position/Force
- ☐ Line of Fire
- ☐ Overexertion/Strain
- ☐ Personal Energy
- ☐ Struck Against Object
- ☐ Struck By Object
- ☐ **Buried**
- ☐ **Caught In, Under, Between**

Chemical Exposure
- ☐ Inhalation
- ☐ Ingestion
- ☐ Physical Contact

Contact By
- ☐ Animal/Insect/Plant
- ☐ Blood/Potentially Infectious Materials
- ☐ Electricity
- ☐ Noise
- ☐ Other Physical Agents
- ☐ Radiation
- ☐ Temperature Extremes

- ☐ **Drowning**

Falls
- ☐ Fall, From Elevation
- ☐ Fall, Same Level
- ☐ Slip or Trip Without Fall
- ☐ **Other**
- ☐ **Suffocate/Asphyxiate (Lack of Oxygen)**
- ☐ **Transportation Incident**

LOST TIME or RESTRICTED WORK:	START DATE	# OF ESTIMATED DAYS	# OF ACTUAL DAYS	☐ No Reassignment ☐ Permanently Reassigned ☐ Temporarily Reassigned

ATTACHED INFORMATION: ☐ **NEWSPAPERS** ☐ **PHOTO** ☐ **SKETCHES** ☐ **VEHICLE REPORT (ATTACHMENT 21A)** ☐ **OTHER**
(Check all that apply)

NAME OF OWNER	ADDRESS	PHONE

DESCRIPTION OF INJURY / DAMAGE

NAME	STREET ADDRESS	CITY/STATE	PHONE

AUTHORITIES NOTIFIED

PUBLICITY

COMMENTS

PREPARED BY	PREPARER'S TITLE	PHONE	DATE PREPARED MM/DD/YY

SECTION 3: INVESTIGATION INFORMATION

INVESTIGATION AND CONCLUSIONS: DESCRIBE IN DETAIL THE CAUSAL FACTORS; WHY THE INCIDENT OCCURRED AND IDENTIFY THE ROOT CAUSES

List all factors relevant to the incident

Brief summary of incident/near loss:

Potential loss/injury (if near loss):

Brief background description (i.e. locations; activities being performed; general background of task):

ROOT CAUSE ANALYSIS AND RECOMMENDATIONS: HOW TO PREVENT INCIDENT FROM RECURRING

FACTOR #	ROOT CAUSE #	Recommendations	PERSON RESPONSIBLE	AGREED DUE DATE	COMPLETION DATE

INVESTIGATION TEAM			
PRINT NAME	JOB POSITION	DATE	SIGNATURE

REVIEWED BY:			
PRINT NAME	JOB POSITION	DATE	SIGNATURE

SECTION 4: STEWARDSHIP ACTIONS

QUALITY REVIEW QUESTIONS

Were the root causes identified? ☐YES If no, explain: ____

Do root cause and recommendation "match?" ☐YES If no, explain:____

Is the recommendation feasible and maintainable? ☐YES If no, explain:____

Is this a repeat incident? ☐NO If yes, explain: ____

QUALITY REVIEWED BY: (See questions above)

PRINT NAME	JOB POSITION	DATE	SIGNATURE

RESULTS OF VERIFICATION AND VALIDATION

Verification: Were the solutions implemented? ☐YES ☐NO

VERIFICATION BY:

SOL #	VERIFIER'S NAME	JOB POSITION (COMPANY)	DATE VERIFIED	DETAILS	SIGNATURE

Validation: Were the solutions effective in addressing the root causes? ☐YES ☐NO

VALIDATION BY:

SOL #	VALIDATOR'S NAME	JOB POSITION (COMPANY)	DATE VALIDATED	DETAILS	SIGNATURE

APPENDIX C

Citizen Participation Activities

The Citizen Participation Plan (CPP) was approved in April 2007, and is attached as Appendix C.

New York State Department of Environmental Conservation

Brownfield Cleanup Program

Citizen Participation Plan
for
Orangeburg Shopping Center
C344066

1-45 Orangetown Shopping Center
Orangeburg, NY 10962
Rockland County, New York

March 2007

Table of Contents

* * * * *

Note: The information presented in this Citizen Participation Plan was current as of the date of its approval by the New York State Department of Environmental Conservation. Portions of this Citizen Participation Plan may be revised during the brownfield site's remedial process.

Applicant: **JLJ Management Company, Inc. ("Applicant")**
Site Name: **Orangeburg Shopping Center ("site")**
Site Address: **1-45 Orangetown Shopping Center**
Site County: **Rockland**
Site Number: **C344066**

1.0 What is New York's Brownfield Cleanup Program?

New York's Brownfield Cleanup Program (BCP) is designed to encourage the private sector to investigate, remediate (clean up) and redevelop brownfields. A brownfield is any real property where redevelopment or reuse may be complicated by the presence or potential presence of a contaminant. A brownfield typically is a former industrial or commercial property where operations may have resulted in environmental contamination. A brownfield can pose environmental, legal and financial burdens on a community. If the brownfield is not addressed, it can reduce property values in the area and affect economic development of nearby properties.

The BCP is administered by the New York State Department of Environmental Conservation (NYSDEC) which oversees Applicants that conduct brownfield site remedial activities.[1] An Applicant is a person whose request to participate in the BCP has been accepted by NYSDEC. The BCP contains investigation and remediation (cleanup) requirements, ensuring that cleanups protect public health and the environment. When NYSDEC certifies that these requirements have been met, the property can be reused or redeveloped for the intended use.

For more information about the BCP, go online at: **www.dec.state.ny.us/website/der/bcp .**

2.0 Citizen Participation Plan Overview

This Citizen Participation (CP) Plan provides members of the affected and interested public with information about how NYSDEC will inform and involve them during the investigation and remediation of the site identified above. The public information and involvement program will be carried out with assistance, as appropriate, from the Applicant.

Appendix A contains a map identifying the location of the site.

[1] "Remedial activities", "remedial action", and "remediation" are defined as all activities or actions undertaken to eliminate, remove, treat, abate, control, manage, or monitor contaminants at or coming from a brownfield site.

2.1 Project Contacts

Appendix B identifies NYSDEC project contact(s) to whom the public should address questions or request information about the site's remedial program. The public's suggestions about this CP Plan and the CP program for the site are always welcome. Interested people are encouraged to share their ideas and suggestions with the project contacts at any time.

2.2 Document Repositories

The locations of the site's document repositories also are identified in Appendix B. The document repositories provide convenient access to important project documents for public review and comment.

2.3 Site Contact List

Appendix C contains the brownfield site contact list. This list has been developed to keep the community informed about, and involved in, the site's investigation and remediation process. The brownfield site contact list will be used periodically to distribute fact sheets that provide updates about the status of the project. These will include notifications of upcoming remedial activities at the site (such as fieldwork), as well as availability of project documents and announcements about public comment periods.

The brownfield site contact list includes, at a minimum:

- chief executive officer and official(s) principally involved with relevant zoning and planning matters of each county, city, town and village in which the site is located;
- residents, owners, and occupants of the site and properties adjacent to the site;
- the public water supplier which services the area in which the site is located;
- any person who has requested to be placed on the site contact list;
- the administrator of any school or day care facility located on or near the site for purposes of posting and/or dissemination of information at the facility; and
- document repositories.

Where the site or adjacent real property contains multiple dwelling units, the Applicant will work with NYSDEC to develop an alternative method for providing such notice in lieu of mailing to each individual. For example, the owner of such a property that contains multiple dwellings may be requested to prominently display fact sheets and notices required to be developed during the site's remedial process. This procedure would substitute for the mailing of such notices and fact sheets, especially at locations where renters, tenants and other residents may number in the hundreds or thousands, making the mailing of such notices impractical.

The brownfield site contact list will be reviewed periodically and updated as appropriate. Individuals and organizations will be added to the site contact list upon request. Such requests should be submitted to the NYSDEC project contact(s) identified in Appendix B. Other additions to the brownfield site contact list may be made on a site-specific basis at the discretion of the NYSDEC project manager, in consultation with other NYSDEC staff as appropriate.

2.4 CP Activities

Appendix D identifies the CP activities, at a minimum, that have been and will be conducted during the site's remedial program. The flowchart in Appendix E shows how these CP activities integrate with the site remedial process. The public is informed about these CP activities through fact sheets and notices developed at significant points in the site=s remedial process.

- **Notices and fact sheets** help the interested and affected public to understand contamination issues related to a brownfield site, and the nature and progress of efforts to investigate and remediate a brownfield site.

- **Public forums, comment periods and contact with project managers** provide opportunities for the public to contribute information, opinions and perspectives that have potential to influence decisions about a brownfield site's investigation and remediation.

The public is encouraged to contact project staff at any time during the site's remedial process with questions, comments, or requests for information about the remedial program.

This CP Plan may be revised due to changes in major issues of public concern identified in Section 6, or in the nature and scope of remedial activities. Modifications may include additions to the brownfield site contact list and changes in planned citizen participation activities.

3.0 Site Information

3.1 Site Description

The subject property (Site) consists of an approximately 11-acre parcel located at 1-45 Orangetown Shopping Center, at the southeast corner of Orangeburg and Dutch Hill Roads, Town of Orangetown (Orangeburg), County of Rockland, New York. The Site was acquired by JLJ Management Company (the Applicant) in April 1990. Currently, the site is a strip mall, with a Dry Cleaning operation.

Owner:	JLJ Management Company	
Street Address:	1-45 Orangetown Shopping Center	
Hamlet/Town:	Orangeburg / Orangetown	
County:	Rockland	
State:	New York	
Zip Code:	10962	
Latitude (North):	41.045100	- 41° 2’ 42.4’’
Longitude (West):	3.953400	- 73° 57’ 12.2’’
Universal Transverse Mercator:	Zone 18	
UTM X (Meters):	587963.7	
UTM Y (Meters):	4544079.0	
Elevation:	175 ft. above sea level (approx.)	
Tax Identification:	74.10-1-67	

The site is situated in a suburban area of mixed land use and is comprised of five buildings and a total of seven distinct building components (see Appendix A for Figures 1 and 2). The area is a well-developed village/town setting, characterized by general business, commercial, and institutional (public) development. The Town of Orangetown designates this general area as a Commercial (CS) Zone.

As mentioned above, the Subject Property is improved with three large buildings (of 1- or 2-stories) that appear to be built-up from or extended connections between several smaller buildings, with a floor space in excess of 70,000 and more than 30 separate commercial units. The buildings were constructed in phases, with the first three buildings being erected in 1966. Building #1 now houses CVS and a small grocery. Building #2 houses various stores, including Sparkle Cleaners, and restaurants. The bank (Building #4, WaMu is the current tenant), bridges the two smaller structures (Buildings #3 [a former movie theater], #5, and #6 [US Post Office]), originally built in the 1960s, and was erected around 1974. The western-most retail building (Building #7), with its back towards Dutch Hill Rd., was built around 1978.

In Appendix A, Figure 1 (Locus Plan) graphically indicates the physical location of the Subject Property within the state and locally. Figure 2 (Site Plan) diagrammatically presents the boundaries of the designated Brownfields Site and general layout of the project area within the Subject Property.

3.1.1 Abutters

North

Beyond Orangeburg Road, the Town's offices are across the intersection with Dutch Hill Road and the Fire Department is immediately north.

On the same block, at the intersection of Orangeburg Road and Dutch Hill Road, there is a bank.

East

There are single-family residential homes along the western side of Oak Street.

Along the eastern side of Oak Street is a residential apartment complex.

South

There are both single-family residential homes and commercial property along the northern side of Highview Avenue.

Along the southern side of Highview Avenue there are single-family residential homes.

West

Dutch Hill Road has commercial and office property along both sides west of the site.

3.2 Site History

3.2.1 Historic Use

Before 1940 the area and the Subject Property were rural in character, with farmland as the primary land use, and some areas immediately to the east of the site and west of Highway 303 subdivided into residential use.

The general area became part of Camp Shanks in September 1942. The Subject Property was developed by the US Army Corps of Engineers into an amphitheater, and this use persisted apparently through the World War II era and beyond, at least until the decline of Shanks Village and its ultimate sale to Sandra Construction in 1956 (Webber 1991).

At some point between 1956 and the early 1960s, the Subject Property was sold to the Prel Corporation; apparently, the property had not yet been developed, although there is some photographic evidence suggesting that Prel Plaza (at the southwest corner of Orangeburg Blvd. and Dutch Hill Rd.) was built by perhaps 1962.

In 1964, Prel Corp. sold the Subject Property to an investment group (Baum, Baum, Heiman, and Lehrer, also called BBH&L). This group developed the retail shopping center now extant at the site. In 1990, the property was purchased by the Applicant.

3.3 Environmental History

3.3.1 Investigations

At the request of the Applicant, RemVer (an environmental consulting firm based in Windsor, CT) conducted a Phase I Environmental Site Assessment of the Site in August 2004.

In the fall of 2004, an investigation was performed to try to resolve the following issues: the source of the groundwater contamination, define its nature and extent within the property, evaluate the potential for soil gas intrusion into buildings, clarify the depth to bedrock, determine if the contamination has migrated off-property, and better define the need for and extent of any remedial action. RemVer, through its sub-consultant GSC (a predecessor company of Kleinfelder), performed the investigation work in October 2004. Five monitoring wells were placed, soil gas samples were taken, and subsurface soil and groundwater samples were collected and analyzed for chlorinated organic solvents (such as dry cleaning agents).

Additional investigation occurred in the spring of 2005 to complete the Site Characterization. For this phase of work, the goal was to define the on-site source and the nature and extent of contamination, as well as collect additional hydrogeological data to better understand subsurface conditions.

RemVer concluded that the Sparkle Cleaners operation was the original source of the various chlorinated volatile organic chemicals (VOCs) detected in groundwater above New York State's groundwater standards at the Subject Property. This has created an Area of Concern (AOC) at the property, namely, the area behind Building #2, involving groundwater contamination and perhaps some soil contamination near or underneath Building #2. The AOC is only a limited portion of the entire property. RemVer suspected the release occurred via the sewer line behind the building into soil, and subsequently downward into groundwater. Considering the dissolved nature of the contamination, and the lack of observable dense non-aqueous phase liquid (DNAPL), groundwater appears to be the main transport medium. However, DNAPL may have been and may still be present but undetectable within overburden soils.

Upon entering the overburden water table, the chlorinated solvents appear to have spread laterally creating a 100 to 200-foot wide (north-south) plume, that is now nearing Oak Street to the east. The concentrations of the primary contaminate, cis-1,2-Dichloroethene (DCE) decrease rapidly further from the source, dropping over two orders of magnitude within about 50-feet. The data suggest that biologically-based (micro-organism) dechlorination is active in the subsurface soils and groundwater, explaining the elevated amounts of the degradation chemical DCE and general lack of dry cleaning solvent Perchloroethene (PCE) in groundwater.

Based upon these data, RemVer concluded that the AOC constitutes a situation requiring remedial action.

3.3.2 BCP Application

Later in 2005, RemVer on behalf of JLJ Management, notified NYSDEC of these observations and in May 2006, JLJ Management formally submitted an application to enter the BCP. The application was accepted as complete in July 2006. Late in 2006, NYSDEC made a determination that JLJ Management would be a participant in the BCP. In January 2007, the Brownfields Site Cleanup Agreement between the NYSDEC and JLJ Management was signed.

4.0 Remedial Process

Note: See Appendix E for a flowchart of the brownfield site remedial process.

4.1 Application

The Applicant has applied for and been accepted into New York's Brownfield Cleanup Program as a Participant. This means that the Applicant was the owner of the site at the time of the disposal or discharge of contaminants or was otherwise liable for the disposal or discharge of the contaminants. The Participant must fully characterize the nature and extent of contamination onsite, as well as the nature and extent of contamination that has migrated from the site. The Participant also must conduct a "qualitative exposure assessment," a process that characterizes the actual or potential exposures of people, fish and wildlife to contaminants on the site and to contamination that has migrated from the site.

The Applicant in its Application proposes that the site will be used for restricted purposes.

To achieve this goal, the Applicant will conduct remedial activities at the site with oversight provided by NYSDEC. The Brownfield Cleanup Agreement executed by NYSDEC and the Applicant sets forth the responsibilities of each party in conducting a remedial program at the site.

4.2 Investigation

If the Applicant conducts a remedial investigation (RI) of the site, it will be performed with NYSDEC oversight. The Applicant must develop a remedial investigation workplan, which is subject to public comment as noted in Appendix D. The goals of the investigation are as follows:

1) Define the nature and extent of contamination in soil, surface water, groundwater and any other impacted media;

2) Identify the source(s) of the contamination;

3) Assess the impact of the contamination on public health and/or the environment; and

4) Provide information to support the development of a Remedial Work Plan to address the contamination, or to support a conclusion that the contamination does not need to be addressed.

The Applicant will prepare an RI Report after it completes the RI. This report will summarize the results of the RI and will include the Applicant's recommendation of whether remediation is needed to address site-related contamination. The RI Report is subject to review and approval by NYSDEC. Before the RI Report is approved, a fact sheet that describes the RI Report will be sent to the site's contact list.

NYSDEC will determine if the site poses a significant threat to public health and/or the environment. If NYSDEC determines that the site is a "significant threat," a qualifying community group may apply for a Technical Assistance Grant (TAG). The purpose of a TAG is to provide funds to the qualifying community group to obtain independent technical assistance. This assistance helps the TAG recipient to interpret and understand existing environmental information about the nature and extent of contamination related to the site and the development/implementation of a remedy.

An eligible community group must certify that its membership represents the interests of the community affected by the site, and that its members' health, economic well-being or enjoyment of the environment may be affected by a release or threatened release of contamination at the eligible site.

For more information about the TAG Program and the availability of TAGs, go online at: **www.dec.state.ny.us/website/der/guidance/tag/ .**

4.3 Remedy Selection

After NYSDEC approves the RI Report, the Applicant will be able to develop a Remedial Work Plan if remediation is required. The Remedial Work Plan describes how the Applicant would address the contamination related to the site.

The public will have the opportunity to review and comment on the draft Remedial Work Plan. The site contact list will be sent a fact sheet that describes the draft Remedial Work Plan and announces a 45-day public comment period. NYSDEC will factor this input into its decision to approve, reject or modify the draft Remedial Work Plan.

A public meeting may be held by NYSDEC about the proposed Remedial Work Plan if requested by the affected community and if significant substantive issues are raised about the draft Remedial Work Plan. Please note that, in order to request a public meeting, the health, economic well-being or enjoyment of the environment of those requesting the public meeting must be threatened or potentially threatened by the site. In addition, the request for the public meeting should be made within the first 30 days of the 45-day public comment period for the draft Remedial Work Plan. A public meeting also may be held at the discretion of the NYSDEC project manager in consultation with other NYSDEC staff as appropriate.

4.4 Construction

Approval of the Remedial Work Plan by NYSDEC will allow the Applicant to design and construct the alternative selected to remediate the site. The site contact list will receive notification before the start of site remediation. When the Applicant completes remedial activities, it will prepare a final engineering report that certifies that remediation requirements have been achieved or will be achieved within a specific time frame. NYSDEC will review the report to be certain that the remediation is protective of public health and the environment for the intended use of the site. The site contact list will receive a fact sheet that announces the completion of remedial activities and the review of the final engineering report.

4.5 Certificate of Completion and Site Management

Once NYSDEC approves the final engineering report, it will issue the Applicant a Certificate of Completion. This Certificate states that remediation goals have been achieved, and relieves the Applicant from future remedial liability, subject to statutory conditions. The Certificate also includes a description of any institutional and engineering controls or monitoring required by the approved remedial work plan. If the Applicant uses institutional controls or engineering controls to achieve remedial objectives, the site contact list will receive a fact sheet that discusses such controls.

An institutional control is a non-physical restriction on use of the brownfield site, such as a deed restriction that would prevent or restrict certain uses of the remediated property. An institutional control may be used when the remedial action leaves some contamination that makes the site suitable for some, but not all uses.

An engineering control is a physical barrier or method to manage contamination, such as a cap or vapor barrier.

Site management will be conducted by the Applicant as required. NYSDEC will provide appropriate oversight. Site management involves the institutional and engineering controls required for the brownfield site. Examples include: operation of a water treatment plant, maintenance of a cap or cover, and monitoring of groundwater quality.

5.0 Citizen Participation Activities

CP activities that have already occurred and are planned during the investigation and remediation of the site under the BCP are identified in Appendix D: Identification of Citizen Participation Activities. These activities also are identified in the flowchart of the BCP process in Appendix E. NYSDEC will ensure that these CP activities are conducted, with appropriate assistance from the Applicant.

All CP activities are conducted to provide the public with significant information about site findings and planned remedial activities, and some activities announce comment periods and request public input about important draft documents such as the Remedial Work Plan.

All written materials developed for the public will be reviewed and approved by NYSDEC for clarity and accuracy before they are distributed. Notices and fact sheets can be combined at the discretion, and with the approval of, NYSDEC.

6.0 Major Issues of Public Concern

This section of the CP Plan identifies major issues of public concern, if any, that relate to the site. Additional major issues of public concern may be identified during the site's remedial process. This information will help the NYSDEC to effectively implement the citizen participation requirements and identify any additional citizen participation activities that should be conducted.

JLJ Management and the NYSDEC have attempted to identify major issues that are of interest to the community surrounding the Site. Currently, JLJ Management and the NYSDEC are anticipating the community may have the following questions:

1. Is contamination present that is impacting soil and groundwater at, or beyond the limits of the Site?
2. Is there any potential for the community to be exposed to contamination attributable to this Site, either now, or during the clean up?
3. What security measures will be taken during the clean up, and how long will the clean up take?
4. How will the remediation of this Site affect the community?
5. Who will pay for the clean up of the contamination?

The key points that JLJ Management and the NYSDEC want to communicate to the community through the Citizen Participation Program are:

1. This Brownfield project is intended to remediate and revitalize the Site.
2. JLJ's environmental investigation and remediation consultant, Kleinfelder, has more than 40 years of experience investigating and remediating contaminated sites.
3. The remediation of the Site will be conducted in a safe and workmanlike manner, and under the oversight of the NYSDEC.
4. The health and safety of current and future residents as well as neighbors is a priority concern, and monitoring and mitigation measures will be implemented during the clean up project to prevent exposures to the public.
5. The site and all surrounding properties are supplied with public water. As a result, local residents are not exposed to groundwater contamination.

7.0 Citizens Glossary of Environmental Terms and Acronyms

7.1 Glossary

This glossary defines some terms associated with New York State's Brownfield Clean Up Program. Words in bold in the definitions are defined elsewhere in the glossary. A list of acronyms often used in the program follows the glossary.

Availability Session
A scheduled gathering of program staff and members of the public in a casual setting, without a formal presentation or agenda, but usually focusing on a specific aspect of a site's investigation or remedial process.

Brownfield
An abandoned, idled, or under-used property where expansion or redevelopment is complicated by real or perceived environmental contamination. Brownfields are typically former industrial or commercial properties where improper operations may have resulted in soil and/or groundwater contamination.

Citizen Participation
A program of planning and activities to encourage communication among people affected by or interested in brownfield sites and the government and municipal agencies responsible for investigation and remediating them.

Citizen Participation Plan
A document which must be developed at a site's investigation stage. A CP Plan describes the citizen participation activities that will be conducted during a site's investigation and remedial process.

Citizen Participation Specialist
A staff member from a NYSDEC central office or regional office who has specialized training and experience to assist with a site-specific citizen participation program.

Clean Up
Action taken to respond to a hazardous material release or threat of a release that could affect humans and/or the environment. Also called remedial action, removal action, response action, or corrective action.

Comment Period
A time period for the public to review and comment about various documents and actions.

Contaminant
Any physical, chemical, biological, or radiological substance or matter that has an adverse effect on air, water, or soil.

Contaminant Plume
See Plume

Division of Environmental Remediation
Formerly the Division of Hazardous Waste Remediation, a major program unit within the New York State Department of Environmental Conservation that conducts the brownfield program. Staff include: engineers, geologists, chemists, attorneys, citizen participation specialists, environmental program specialists and support staff.

Document Repository
A file of documents pertaining to a site's investigation, remedial and citizen participation programs which is made available for public review. The file generally is maintained in a public building near the brownfield site to provide access at times and a location convenient to the public.

Groundwater
Water found beneath the earth's surface that fills pores between soil particles or that fills cracks in bedrock. "Well water" is groundwater.

Inorganic
Substances that do not contain carbon. Metals such as zinc and lead are inorganic substances.

Interim Remedial Measure (IRM)
A discrete action which can be conducted at a site relatively quickly to reduce the risk to people's health and the environment from a well-defined contamination problem. An IRM can involve removing contaminated soil and drums, providing alternative water supplies or securing a site to prevent access.

Mailing List
Names, addresses and/or telephone numbers of individuals, groups, organizations, government officials and media affected by or interested in a particular brownfield site. The size of a mailing list and the categories included are influenced by population density, degree of interest in a site, the state of the investigation or remedial process and other factors.

Micrograms per kilogram (µg/kg)
A unit of measure: micrograms (µg) or a substance contained in a kilogram (kg) of soil. (A microgram is one millionth of a gram).

Micrograms per liter (µg/l)
A unit of measure: the number of micrograms of one substance in a liter of liquid. One microgram per liter means one microgram of chemical per liter of water, and is essentially equivalent to one part per billion (ppb) at very low concentrations.

Milligrams per kilogram (mg/kg)
A unit of measure: milligrams (mg) of a substance per kilogram (kg) of soil. (A milligram is one thousandth or a gram).

Milligrams per liter (mg/l)
A unit of measure: the number of milligrams of one substance in a liter of liquid. One milligram per liter means one milligram of chemical per liter of water, and is essentially equivalent to one part per million (ppm) at very low concentrations.

Monitoring Well
A hole drilled into the soil or bedrock which enables officials to collect samples of groundwater at a specific horizontal and vertical location. The samples can then be tested to look for contaminants.

New York State Department of Health
New York State government agency which: performs health-related inspections at suspected hazardous waste sites; conducts health assessments to determine potential risk from environmental exposure; reviews Risk Assessments prepared during site investigations; conducts health-related community outreach around sites; and reviews remedial actions to assure that public health concerns are adequately addressed.

Permeability
The extent to which a liquid or gas can move through a substance. For example, water moves easily through sandy soil (a high permeability soil) and slowly through clay (a low permeability soil).

Plume
An area of chemicals moving away from its source in a feather-like (hence the name, plume) shape. For example, a plume can be a column of smoke drifting away from a chimney, or an area of dissolved chemicals moving with groundwater.

ppb/ppm
The concentration of a substance in air, water, or soil, the abbreviations stand for part per billion (ppb) and part per million (ppm). One ppb means there is one part of a substance for every billion parts of the air, water, or soil in which it is measured. One ppb is 1,000 times less than 1 ppm.

Project Manager
A DEC staff member within the Division of Environmental Remediation (usually an engineer, geologist, or hydrogeologist) responsible for oversight of brownfield projects. The Project Manager works with legal, health, citizen participation and other staff to accomplish site-related goals and objectives.

Public Meeting
A scheduled gathering or agency staff and the public to give and receive information, ask, questions and discuss concerns about a site's investigation or remedial program. A public meeting, unlike an availability session, generally features a formal presentation and a detailed agenda.

Remedial/Remediate/Remediation
Refers to any procedures or strategies used to address contamination at a brownfield or hazardous waste site. For example, a proposed remedial work plan described remedial actions (clean up methods) that have been recommended for a specific site; remediation of a site could include removing contaminated soil or installing a groundwater treatment system.

Remedial Construction
The physical development, assembly and implementation of the remedial alternative selected to remediate a site. Construction follows the Remedial Design stage of a site's remedial program.

Remedial Design
The process following finalization of the Remedial Work Plan in which plans and specifications are developed for the Remedial Construction of the alternative selected to remediate a site.

Responsiveness Summary
A written summary of major oral and written comments received during the comment period for a Proposed Remedial Work Plan, and responses to those comments.

Remedial Alternatives Analysis Report
The Remedial Alternatives Analysis Report uses information developed during the Site Investigation to examine alternative remedial actions to eliminate or reduce the threat of contamination to public health and the environment. This report is sometimes combined with the Remedial Investigation Report.

Remedial Investigation Report
The Remedial Investigation Report defines and characterizes the type and extent of contamination at the site. This report is sometimes combined with the Remedial Alternatives Analysis Report.

Semi-Volatile Organic Compounds (SVOCs)
A group of chemicals similar to Volatile Organic Compounds that do not evaporate as easily.

Soil Boring
A circular hole made in the ground by a drill to collect sol samples deep in the ground. Samples are collected for testing to see if the subsoil has been contaminated. Sometimes these borings are converted into groundwater monitoring wells.

Soil Gas Survey
A method for investigating the underground distribution of volatile organic compounds by looking for their vapors in the soil gas (air trapped between soil particles). In a soil gas survey, a small amount of soil gas is collected from various locations and tested for the presence of contaminants.

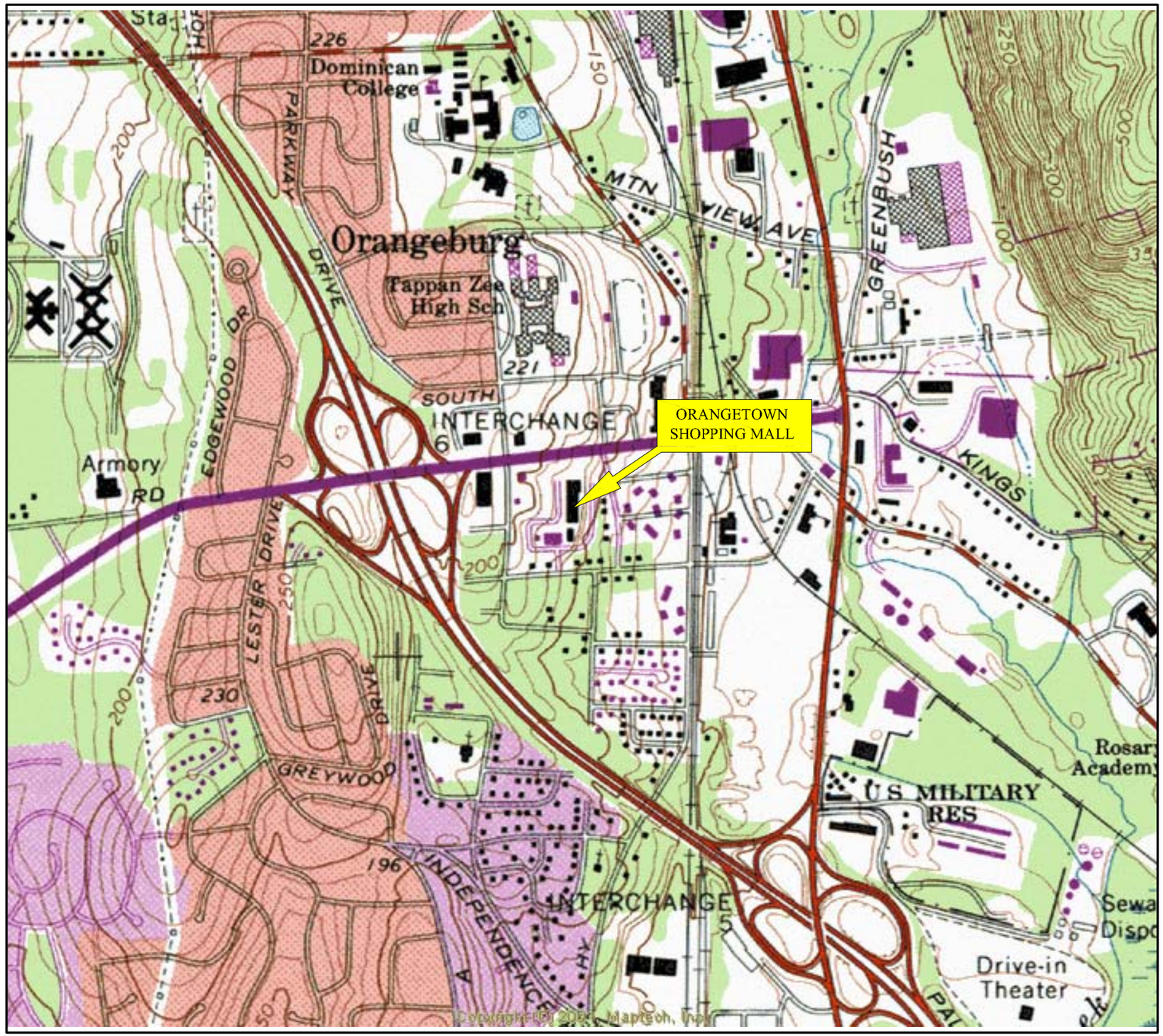
Volatile Organic Compounds (VOCs)
A group of chemicals that contain carbon and evaporate easily. These chemicals include substances such as industrial cleaning solvents and gasoline.

7.2 Acronyms

AG	--	New York State Attorney General's Office
AOC	--	Area of Concern
AST	--	Above-Ground Storage Tank
BCP	--	Brownfields Cleanup Program
C & D	--	Construction and Demolition Debris
CERCLA	--	Comprehensive Environmental Response, Compensation and Liability Act of 1980 (Federal "Superfund" Law)
CO	--	Consent Order
CP	--	Citizen Participation
CPP	--	Citizen Participation Plan
CPS	--	Citizen Participation Specialist
DCE	--	cis-1,2-Dichloroethene
DEC	--	Department of Environmental Conservation (New York State)
DER	--	Division of Environmental Remediation (DEC)
DNAPL	--	Dense Non-Aqueous Phase Liquid
DOH	--	Department of Health (New York State)
DOL	--	Department of Law (New York State)
ENB	--	Environmental Notice Bulletin
EQBA	--	1986 Environmental Quality Bond Act (New York State "Superfund")
EPA	--	United States Environmental Protection Agency
FOIA	--	Freedom of Information Act
FOIL	--	Freedom of Information Law
GPM	--	Gallons per Minute
IC/EC	--	Institutional Control/Engineering Control
IRM	--	Interim Remedial Measure
LNAPL	--	Light Non-Aqueous Phase Liquid
mg/kg	--	Milligrams per kilogram
mg/l	--	Milligrams per liter
MW	--	Monitoring Well
NAPL	--	Non-Aqueous Phase Liquid
ND	--	Not Detected
NPL	--	National Priorities List
NYCRR	--	New York Codes, Rules and Regulations
NYSDEC	--	New York State Department of Environmental Conservation
NYSDOH	--	New York State Department of Health

O & M	--	Operation and Maintenance
OM & M	--	Operation, Maintenance and Monitoring
OSHA	--	United States Occupational Safety and Health Administration
OU	--	Operable Unit
PAHs	--	Poly-Aromatic Hydrocarbons
PCBs	--	Poly-Chlorinated Biphenyls
PCE	--	Perchloroethene (Tetrachloroethene)
PERC	--	Perchloroethylene
PID	--	Photoionization Detector
POTW	--	Publicly Owned Treatment Works (sewage treatment plant)
ppb	--	parts per billion
ppm	--	parts per million
ppt	--	parts per trillion
PRAP	--	Proposed Remedial Action Plan
PRP	--	Potentially Responsible Party
QA/QC	--	Quality Assurance/Quality Control
RA	--	Remedial Action
RAR	--	Remedial Alternatives Report
RCRA	--	Resource Conservation and Recovery Act (Federal Law)
RD	--	Remedial Design
ROD	--	Record of Decision (DEC document)
SAC	--	State Assistance Contract
SCGs	--	Standards, Criteria and Guidance Values
SEQR	--	State Environmental Quality Review Act
SI	--	Site Investigation
SI/RAR	--	Site Investigation/Remedial Alternatives Report
SPDES	--	State Pollution Discharge Elimination System
STARS	--	Spill Technology and Remediation Series
SVOCs	--	Semi-Volatile Organic Compounds (chemicals)
TAGM	--	Technical and Administrative Guidance Memorandum (DEC documents)
TCA	--	Trichloroethane
TCE	--	Trichloroethylene (trichloroethene)
TCLP	--	Toxicity Characteristic Leaching Procedure
TMW	--	Temporary Monitoring Well
TOGS	--	Technical and Operational Guidance Series
TSDF	--	Treatment, Storage and Disposal Facility
TWA	--	Time-weighted Average
µg/kg	--	Micrograms per kilogram
µg/l	--	Micrograms per liter
USGS	--	U.S. Geological Service
UST	--	Underground Storage Tank
VC	--	Vinyl Chloride
VOCs	--	Volatile Organic Compounds (chemicals)

Appendix A – Site Location Map and Site Plan



0 900 1800

Scale in feet

LATITUDE: 41° 02' 42.13" N
LONGITUDE: 73° 57' 18.05" W

QUADRANGLE LOCATION

FIGURE 1
SITE LOCATION

ORANGETOWN SHOPPING CENTER
1-45 ORANGE BURG SHOPPING CENTER
ORANGEBURG, NEW YORK

DRAWN BY:	-	SCALE:	1" = 900'
REVISED BY:	CTH	PROJECT NUMBER:	69972
CHECKED BY:	-	SOURCE: USGS 7.5' Topographic Map, Nyack, NY-NJ Quad.	
DATE:	FEBRUARY 7, 2007		

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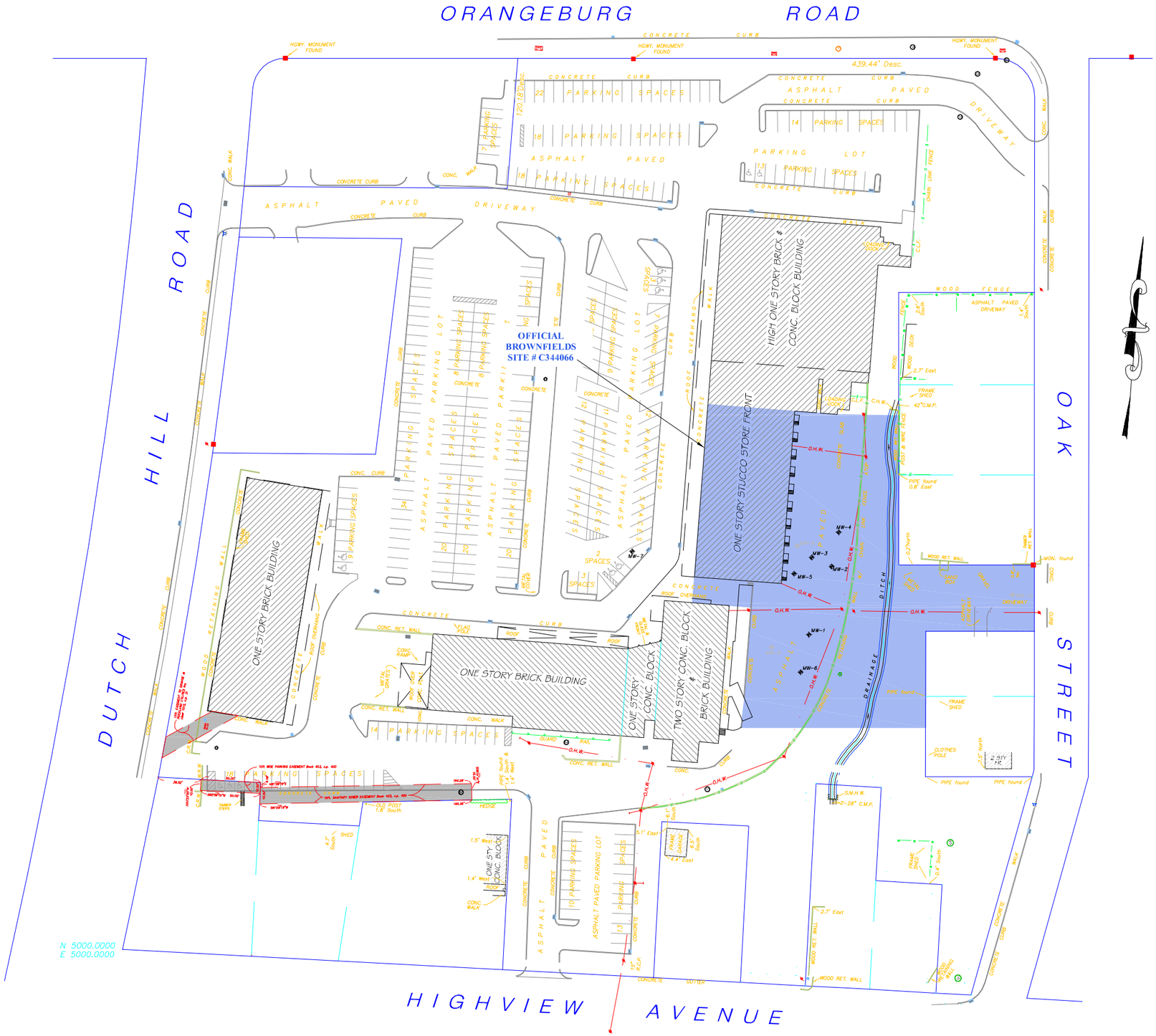

LEGEND

- MONITORING WELL LOCATION
- SOIL GAS MONITORING POINT
- HYDRANT
- UTILITY POLE
- ELECTRIC COVER
- MANHOLE COVER (unknown)
- TELEPHONE MANHOLE COVER
- CATCH BASIN
- LIGHT POLE
- SEWER MANHOLE

C.L.F.	CHAIN LINK FENCE
C.H.W.	CONCRETE HEAD WALL
C.M.P.	CORRUGATED METAL PIPE
O.H.W.	OVERHEAD WIRES
R.C.P.	REINFORCED CONCRETE PIPE
S.M.H.W.	STONE MASONRY HEAD WALL

SCALE

0 100 200

1 inch = 100 feet

FIGURE 2
SITE PLAN

ORANGETOWN SHOPPING CENTER
1-45 ORANGE BURG SHOPPING CENTER
ORANGEBURG, NEW YORK

DRAWN BY:	-	SCALE:	SEE ABOVE
REVISED BY:	CTH	PROJECT NUMBER:	69972
CHECKED BY:		SOURCE: LINK LAND SURVEYORS	
DATE:	FEBRUARY 7, 2007		

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Appendix B – Project Contacts and Document Repositories

Project Contacts

For information about the site's remedial program, the public may contact any of the following project staff:

New York State Department of Environmental Conservation (NYSDEC):

Joshua Cook
Project Manager
NYSDEC Division of Environmental Remediation
Remedial Bureau C
625 Broadway
Albany, NY 12233-7014
(518) 402-9564

Michael Knipfing
Citizen Participation Specialist
NYSDEC Region 3
21 South Putt Corners Road
New Paltz, NY 12561
(845) 256-3154

New York State Department of Health (NYSDOH):

Nate Walz
Project Manager
NYSDOH
Bureau of Environmental Exposure Investigation
547 River Street
Troy, NY 12180-2216
(518) 402-7850

Environmental Consultant for Applicant:

Kleinfelder
Kurt A. Frantzen, Ph.D., CHMM
Project Manager
Kleinfelder, Inc.
99 Lamberton Road
Suite 201
Windsor, CT 06095
(860) 683-4200

Document Repositories

The document repositories identified below have been established to provide the public with convenient access to important project documents:

Orangeburg Library
20 South Greenbush Road
Orangeburg, NY 10962
Attn: Nancy Wissman, Director
Phone: (845) 359-2244
Hours: Mon-Thurs 10:00 AM – 9:00 PM
Fri-Sat 10:00 AM – 5:00 PM
Sun 1:00 PM – 5:00 PM

NYSDEC Region 3
21 South Putt Corners Road
New Paltz, NY 12561
Attn: Michael Knipfing
Phone: (845) 256-3154
Hours: Mon – Fri 8:30 AM – 4:45 PM
(call for appointment)

The following documents are available for review at the repositories, as of the date of the preparation of this CPP:

Document	**Date**
Phase IIB Environmental Site Assessment Site Characterization Report RemVer Inc. 1-45 Orangetown Shopping Center Orangeburg, NY 10962	May 2005
BCP Application	May 2006
Executed BCP Agreement	January 2007
CPP	March 2007

Appendix C – Brownfield Site Contact List

The NYSDEC, JLJ Management, and Kleinfelder maintain this list of agency officials, local elected officials, property owners and residents in the vicinity of the Site, and other parties interested in the 1-45 Orangetown Shopping Center Site. If you have any corrections, or want your name added or removed, please contact one of the state officials listed in Appendix B.

NOTE: Due to privacy concerns, the adjacent property owners and residents mail list is maintained separately from this document in confidence in the official NYSDEC project file.

State Government Officials

Marc Moran, Regional Director
NYSDEC
21 S. Putt Corners Road
New Paltz, NY 12561

Wendy Rosenbach
Public Affairs Officer
NYSDEC
21 S. Putt Corners Road
New Paltz, NY 12561

Richard Baldwin
NYSDEC
21 South Putt Corners Rd.
New Paltz, NY 12561

Joshua Cook
NYSDEC
625 Broadway
Albany, NY 12233

Robert Schick
NYSDEC
625 Broadway
Albany, NY 12233

Margaret Duke, Permits
NYSDEC
21 S. Putt Corners Rd.
New Paltz, NY 12561

Sonia Meyer, Esq.
NYSDEC
625 Broadway
Albany, NY 12233

Michael J. Knipfing
NYSDEC
21 S. Putt Corners Road
New Paltz, NY 12561

Harold Evans
NYSDEC
625 Broadway
Albany, NY 12233

Sal Ervolina
NYSDEC
625 Broadway
Albany, NY 12233

Mary Young
NYSDEC
625 Broadway
Albany, NY 12233

Nate Walz
NYSDOH
547 River Street
Troy, NY 12180

Joe Crua
NYSDOH
547 River Street
Troy, NY 12180

Gary Litwin
NYSDOH
547 River Street
Troy, NY 12180

Michael Rivara
NYSDOH
547 River Street
Troy, NY 12180

Richard Morse
NYS Assembly Waste Commissions
Agency Bldg. 4, Fifth Floor, ESP
Albany, NY 12248

Environmental Groups

Scenic Hudson
1 Civic Center Plaza
Poughkeepsie, NY 12601

Greenway Conservancy
Capitol Building
Capitol Station, Rm 254
Albany, NY 12224

The Nature Conservancy
Eastern NY Chapter
265 Chestnut Ridge Road
Mt. Kisco, NY 10549

Karl Coplan, Esq.
Pace/Riverkeeper
78 N. Broadway
White Plains, NY 10603

Citizen's Environmental Coalition
119 Washington Avenue
Suite 3
Albany, NY 12210

Laura Haight
NYPIRG
107 Washington Ave.
Albany, NY 12210

Rockland County EMC
50 Sanitarium Road
Building P
Pomona, NY 10970

Rockland County Health Dept.
Attn: Thomas Micelli, PE
Building D
Sanitarium Road
Pomona, NY 10970

Rockland County Conservation Association
P.O. Box 213
Pomona, NY 10970

Larry Larson
Natural Resource Conservation Service
225 Dolson Avenue, Suite 103
Middletown, NY 10940

Cornell Cooperative Extension Service
c/o 10 Patriot Hills Drive
Stony Point, NY 10980

Media

City Editor
Hudson Valley Business Journal
86 E. Main St
Wappingers Falls, NY 12590

City Editor
Our Town Media Inc.
P.O. Box 329
Ramsey, NJ 07446

City Editor
El Clarin
48 Broadway
Haverstraw, NY 10927

City Editor
Journal News
200 North Rte.303
West Nyack, NY 10994

City Editor
OurTown/ Courier/ Independent
36 Ridge
Pearl River, NY 10965

City Editor
Rockland Review
26 Snake Hill Rd.
West Nyack, NY 10994

City Editor
Rockland County Times
119 Main St.
Nanuet, NY 10954

City Editor, The Jewish Tribune
Executive Office
78 Randall Avenue
Rockville Center, NY 11570

City Editor
The Record
150 River Street
Hackensack, NJ 07601

WNYK
Nyack College
Nyack, NY 10960

News Director
WRGX
1 Skyline Drive
Hawthorne, NY 10532

News Director
WRKL
1551 Route 202
Pomona, NY 10970

News Director
Cablevision
235 W. Nyack Road
W. Nyack, NY 10994

News Director, MediaOne
N. Rockland High School
Hammond Road
Theills, NY 10984

News Director
WRNN TV
721 Broadway
Kingston, NY 12401

Lisa Phillips, Bureau Chief
WAMC
44 Main Street
Kingston, NY 12401

Hank Gross
Mid-Hudson News Service
42 Marcy Lane
Middletown, NY 10941

News Director
Women's e news
395 Hudson Street
New York, NY 10014

News Director
WLIR
750 Chestnut Ridge Road
Chestnut Ridge, NY 10977

News Director
WTBQ
62 N. Main St.
Florida, NY 10921

News Director
WRCR
75 West Rt. 59, Suite 2126
Nanuet, NY 10954

County Officials

Paul Piperato, County Clerk
Office of the Rockland County Clerk
Rockland County Courthouse
1 South Main Street, Suite 100
New City, NY 10956

Honorable Harriet D. Cornell
Rockland County Legislature
11 New Hempstead Road
New City, NY 10956

Honorable Patrick J. Moroney
Rockland County Legislature
11 New Hempstead Road
New City, NY 10956

Honorable John A. Murphy
Rockland County Legislature
11 New Hempstead Road
New City, NY 10956

Honorable Connie Coker
Rockland County Legislature
11 New Hempstead Road
New City, NY 10956

Laurence O. Toole, Clerk
Rockland County Legislature
11 New Hempstead Road
New City, NY 10956

Local Officials

Charlotte E. Madigan, Clerk
Orangetown Town Hall
26 Orangeburg Road
Orangeburg, NY 10962

Marie Manning
Orangeburg Town Hall
26 Orangeburg Road
Orangeburg, NY 10962

Tom Morr
Orangeburg Town Hall
26 Orangeburg Road
Orangeburg, NY 10962

Denis A. O'Donnell
Orangeburg Town Hall
26 Orangeburg Road
Orangeburg, NY 10962

Denis Troy
Orangeburg Town Hall
26 Orangeburg Road
Orangeburg, NY 10962

State Elected Officials

Honorable Thomas P. Morahan
158 Airport Exec. Park
Nanuet, NY 10954

Honorable Ellen Jaffee
637 Legislative Office Building
Albany, NY 12248

Federal Elected Officials

Senator Charles E. Schumer
313 Hart Senate Building
Washington, DC 20510

Senator Hillary Rodham Clinton
United States Senate
476 Russell Senate Office Building
Washington, DC 20510

Honorable Eliot L. Engel
261 West Nyack Rd
West Nyack, NY 10994

Schools, Daycares, Hospitals

Dominican College of Blauvelt
Western Highway 470
Orangeburg, NY 10962

ATTN: Superintendent
South Orangetown Central School District
15 Dutch Hill Road
Orangeburg, NY 10962

Pre-School Playhouse
557 Western Highway
Orangeburg, NY 10962

Rockland Children's Psychiatric Center
599 Convent Road
Orangeburg, NY 10962

Rockland Psychiatric Center
140 Old Orangeburg Road
Orangeburg, NY 10962

Long Island University-Rockland Campus
70 Route 340
Orangeburg, NY 10962

St. Catharine of Alexandra School
517 Western Highway
Blauvelt, NY 10913

Rosary Academy
Route 340
Sparkill, NY 10976

Rockland Psychiatric Center
140 Old Orangeburg Road
Orangeburg, NY 10962

Michael Fiorentino
Cottage Lane Elementary School
120 Cottage Lane
Blauvelt, NY 10913

Dr. Margaret Mary Fitzpatrick, S.C.
Saint Thomas Aquinas College
125 Route 340
Sparkill, NY 10976

Lynn Gorey
South Orangetown Middle School
160 Van Wyck Road
Orangeburg, NY 10962

William Lee, Ph.D.
Tappan Zee Elementary School
561 Route 9W
Piermont, NY 10968

Catherine McCue
South Orangetown Early Childhood Program
at William O. Schaefer School
140 Lester Drive
Tappan, NY 10983

Lynn Trager
Tappan Zee High School
15 Dutch Hill Road
Orangeburg, NY 10962

Marianne Tully, Ed.D.
William O. Schaefer Elementary School
140 Lester Drive
Tappan, NY 10983

Chief Executive and Zoning

Mr. C. Scott Vanderhoef, Chief Executive
Office of the County Executive
11 New Hempstead Road
Rockland County
New City, NY 10956

Mr. Salvatore Corallo, Commissioner of Planning
Dr. Robert L. Yeager Health Center
50 Sanatorium Road
Rockland County
Pomona, NY 10970

Mr. Thom Kleiner, Chief Supervisor
Town of Orangetown
Town Hall
26 Orangeburg Road
Orangeburg, NY 10962

Mr. John Giardiello, PE, Zoning Board Director
Town of Orangetown
20 Greenbush Road
Orangeburg, NY 10962

Library Repository

Nancy Wissman
Orangeburg Library
20 South Greenbush Road
Orangeburg, NY 10962

Public Water Supplier

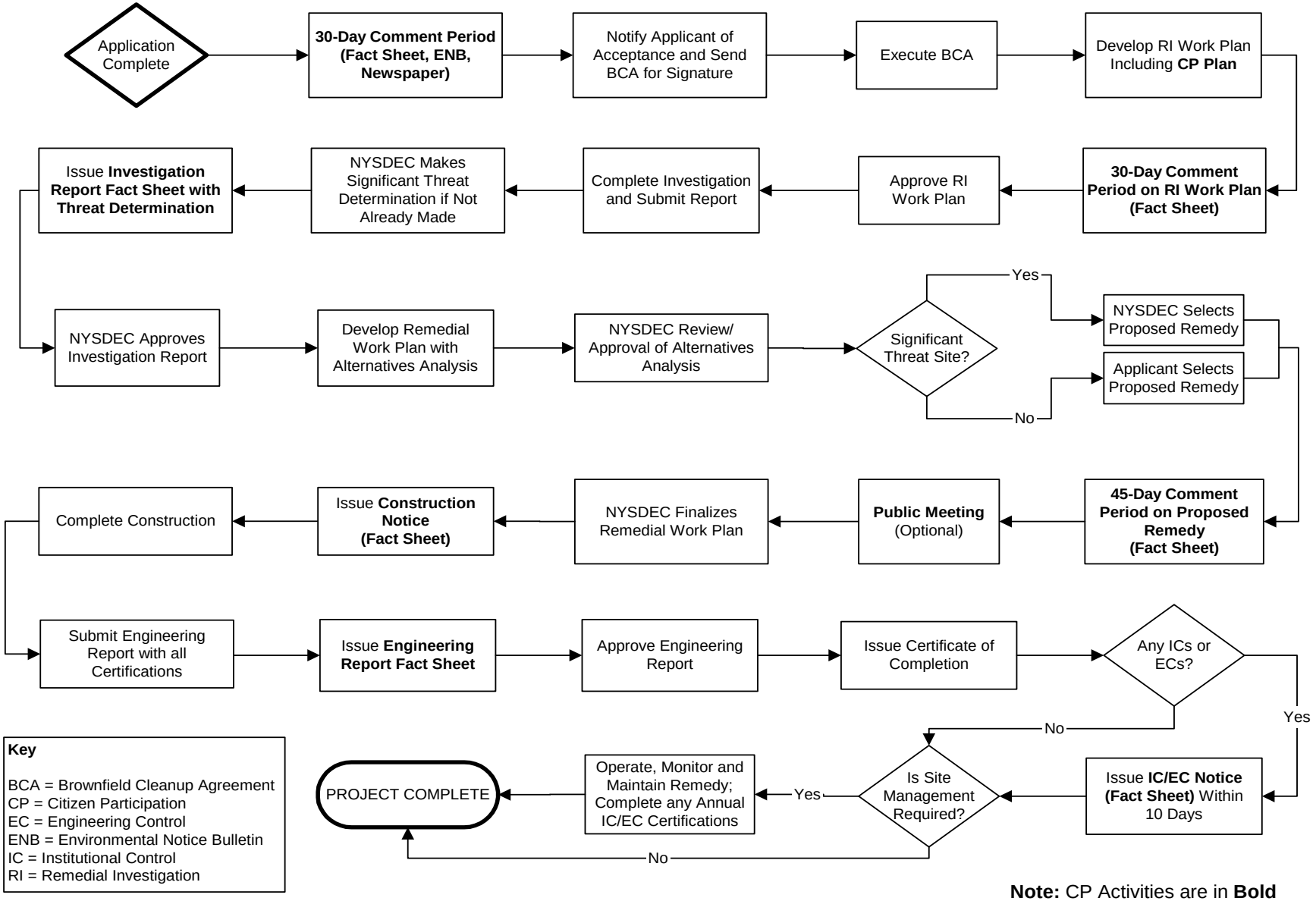
Current Occupant
United Water New York
360 West Nyack Road
West Nyack, NY 10994

Mr.Donald Distante
United Water New York
360 West Nyack Road
West Nyack, NY 10994

Appendix D – Identification of Citizen Participation Activities

Required Citizen Participation (CP) Activities	CP Activities) Occur at this Point
Application Process:	
• Prepare brownfield site contact list (BSCL) • Establish document repositories	At time of preparation of application to participate in BCP.
• Publish notice in Environmental Notice Bulletin (ENB) announcing receipt of application and 30-day comment period	When NYSDEC determines that BCP application is complete. The 30-day comment period begins on date of publication of notice in ENB. End date of comment period is as stated in ENB notice. Therefore, ENB notice, newspaper notice and notice to the BSCL should be provided to the public at the same time.
After Execution of Brownfield Site Cleanup Agreement:	
• Prepare citizen participation (CP) plan	Draft CP Plan must be submitted within 20 days of entering Brownfield Site Cleanup Agreement. CP Plan must be approved by NYSDEC before distribution.
After Remedial Investigation (RI) Work Plan Received:	
• Mail fact sheet to BSCL about proposed RI activities and announcing 30-day public comment period on draft RI Work Plan	Before NYSDEC approves RI Work Plan. If RI Work Plan is submitted with application, comment periods will be combined and public notice will include fact sheet. 30-day comment period begins/ends as per dates identified in fact sheet.
After RI Completion:	
• Mail fact sheet to BSCL describing results of RI	Before NYSDEC approves RI Report.
After Remedial Work Plan (RWP) Received:	
• Mail fact sheet to BSCL about proposed RWP and announcing 45-day comment period • Public meeting by NYSDEC about proposed RWP (if requested by affected community or at discretion of NYSDEC project manager in consultation with other NYSDEC staff as appropriate)	Before NYSDEC approves RWP. 45-day comment period begins/ends as per dates identified in fact sheet. Public meeting would be held within the 45-day comment period.
After Approval of RWP:	
• Mail fact sheet to BSCL summarizing upcoming remedial construction	Before the start of remedial construction.
After Remedial Action Completed:	
• Mail fact sheet to BSCL announcing that remedial construction has been completed • Mail fact sheet to BSCL announcing issuance of Certificate of Completion (COC)	At the time NYSDEC approves Final Engineering Report. These two fact sheets should be combined when possible if there is not a delay in issuance of the COC.

Appendix E – Brownfield Cleanup Program Process



Note: CP Activities are in **Bold**

APPENDIX D

NYSDOH Indoor Air Quality Questionnaire And Building Inventory Center for Environmental Health

NEW YORK STATE DEPARTMENT OF HEALTH
INDOOR AIR QUALITY QUESTIONNAIRE AND BUILDING INVENTORY
CENTER FOR ENVIRONMENTAL HEALTH

This form must be completed for each residence involved in indoor air testing.

Preparer's Name _____ Date/Time Prepared _____

Preparer's Affiliation _____ Phone No._____

Purpose of Investigation_____

1. OCCUPANT:

Interviewed: Y / N

Last Name: _____ First Name: _____

Address: _____

County: _____

Home Phone: _____ Office Phone: _____

Number of Occupants/persons at this location _____ Age of Occupants _____

2. OWNER OR LANDLORD: (Check if same as occupant ___)

Interviewed: Y / N

Last Name: _____ First Name: _____

Address: _____

County: _____

Home Phone: _____ Office Phone: _____

3. BUILDING CHARACTERISTICS

Type of Building: (Circle appropriate response)

Residential	School	Commercial/Multi-use
Industrial	Church	Other: _____

If the property is residential, type? (Circle appropriate response)

Ranch	2-Family	3-Family
Raised Ranch	Split Level	Colonial
Cape Cod	Contemporary	Mobile Home
Duplex	Apartment House	Townhouses/Condos
Modular	Log Home	Other:_____

If multiple units, how many? _____

If the property is commercial, type?

Business Type(s) _____

Does it include residences (i.e., multi-use)? Y / N If yes, how many? _____

Other characteristics:

Number of floors_____ Building age_____

Is the building insulated? Y / N How air tight? Tight / Average / Not Tight

4. AIRFLOW

Use air current tubes or tracer smoke to evaluate airflow patterns and qualitatively describe:

Airflow between floors

_____

_____

_____

Airflow near source

_____

_____

_____

Outdoor air infiltration

_____

_____

_____

Infiltration into air ducts

_____

_____

_____

5. BASEMENT AND CONSTRUCTION CHARACTERISTICS (Circle all that apply)

a. Above grade construction:	wood frame	concrete	stone	brick
b. Basement type:	full	crawlspace	slab	other _____
c. Basement floor:	concrete	dirt	stone	other _____
d. Basement floor:	uncovered	covered	covered with _____	
e. Concrete floor:	unsealed	sealed	sealed with _____	
f. Foundation walls:	poured	block	stone	other _____
g. Foundation walls:	unsealed	sealed	sealed with _____	
h. The basement is:	wet	damp	dry	moldy
i. The basement is:	finished	unfinished	partially finished	
j. Sump present?	Y / N			
k. Water in sump?	Y / N / not applicable			

Basement/Lowest level depth below grade: _____(feet)

Identify potential soil vapor entry points and approximate size (e.g., cracks, utility ports, drains)

_____

_____

6. HEATING, VENTING and AIR CONDITIONING (Circle all that apply)

Type of heating system(s) used in this building: (circle all that apply – note primary)

Hot air circulation	Heat pump	Hot water baseboard	
Space Heaters	Stream radiation	Radiant floor	
Electric baseboard	Wood stove	Outdoor wood boiler	Other _____

The primary type of fuel used is:

Natural Gas	Fuel Oil	Kerosene
Electric	Propane	Solar
Wood	Coal	

Domestic hot water tank fueled by: _____

Boiler/furnace located in:	Basement	Outdoors	Main Floor	Other_____
Air conditioning:	Central Air	Window units	Open Windows	None

Are there air distribution ducts present? Y / N

Describe the supply and cold air return ductwork, and its condition where visible, including whether there is a cold air return and the tightness of duct joints. Indicate the locations on the floor plan diagram.

_____

_____

_____

_____

7. OCCUPANCY

Is basement/lowest level occupied? Full-time Occasionally Seldom Almost Never

Level	**General Use of Each Floor (e.g., familyroom, bedroom, laundry, workshop, storage)**
Basement	_____
1st Floor	_____
2nd Floor	_____
3rd Floor	_____
4th Floor	_____

8. FACTORS THAT MAY INFLUENCE INDOOR AIR QUALITY

a. Is there an attached garage? Y / N

b. Does the garage have a separate heating unit? Y / N / NA

c. Are petroleum-powered machines or vehicles stored in the garage (e.g., lawnmower, atv, car) Y / N / NA Please specify_____

d. Has the building ever had a fire? Y / N When?_____

e. Is a kerosene or unvented gas space heater present? Y / N Where? _____

f. Is there a workshop or hobby/craft area? Y / N Where & Type? _____

g. Is there smoking in the building? Y / N How frequently? _____

h. Have cleaning products been used recently? Y / N When & Type? _____

i. Have cosmetic products been used recently? Y / N When & Type? _____

j. Has painting/staining been done in the last 6 months? Y / N Where & When? _____

k. Is there new carpet, drapes or other textiles? Y / N Where & When? _____

l. Have air fresheners been used recently? Y / N When & Type? _____

m. Is there a kitchen exhaust fan? Y / N If yes, where vented?_____

n. Is there a bathroom exhaust fan? Y / N If yes, where vented?_____

o. Is there a clothes dryer? Y / N If yes, is it vented outside? Y / N

p. Has there been a pesticide application? Y / N When & Type?_____

Are there odors in the building? Y / N
If yes, please describe: _____

Do any of the building occupants use solvents at work? Y / N
(e.g., chemical manufacturing or laboratory, auto mechanic or auto body shop, painting, fuel oil delivery, boiler mechanic, pesticide application, cosmetologist

If yes, what types of solvents are used? _____

If yes, are their clothes washed at work? Y / N

Do any of the building occupants regularly use or work at a dry-cleaning service? (Circle appropriate response)

Yes, use dry-cleaning regularly (weekly) No
Yes, use dry-cleaning infrequently (monthly or less) Unknown
Yes, work at a dry-cleaning service

Is there a radon mitigation system for the building/structure? Y / N Date of Installation: _____
Is the system active or passive? Active/Passive

9. WATER AND SEWAGE

Water Supply:	Public Water	Drilled Well	Driven Well	Dug Well	Other: _____
Sewage Disposal:	Public Sewer	Septic Tank	Leach Field	Dry Well	Other: _____

10. RELOCATION INFORMATION (for oil spill residential emergency)

a. Provide reasons why relocation is recommended: _____

b. Residents choose to: remain in home relocate to friends/family relocate to hotel/motel

c. Responsibility for costs associated with reimbursement explained? Y / N

d. Relocation package provided and explained to residents? Y / N

11. FLOOR PLANS

Draw a plan view sketch of the basement and first floor of the building. Indicate air sampling locations, possible indoor air pollution sources and PID meter readings. If the building does not have a basement, please note.

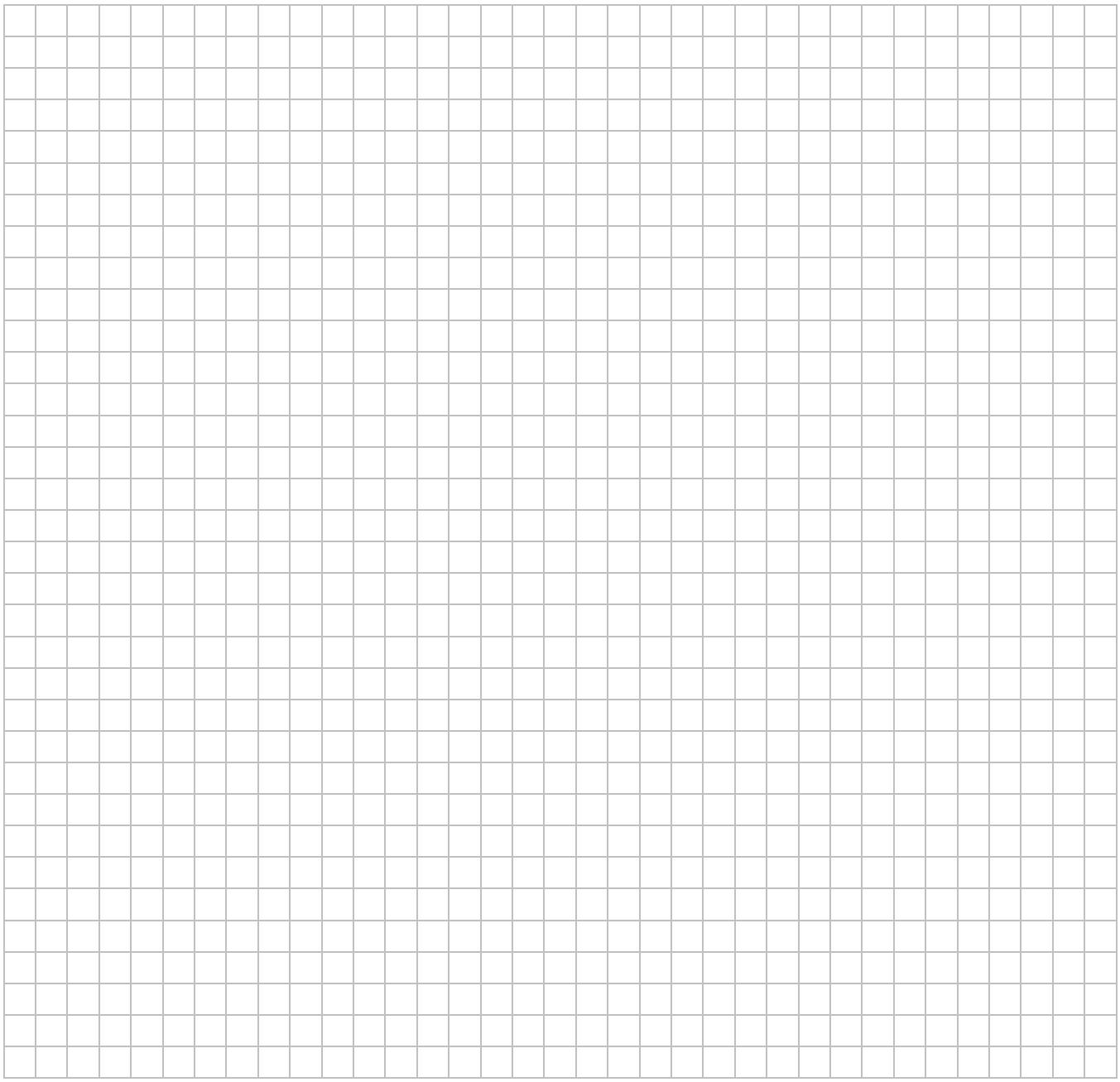
Basement:

First Floor:

12. OUTDOOR PLOT

Draw a sketch of the area surrounding the building being sampled. If applicable, provide information on spill locations, potential air contamination sources (industries, gas stations, repair shops, landfills, etc.), outdoor air sampling location(s) and PID meter readings.

Also indicate compass direction, wind direction and speed during sampling, the locations of the well and septic system, if applicable, and a qualifying statement to help locate the site on a topographic map.



13. PRODUCT INVENTORY FORM

Make & Model of field instrument used: _____

List specific products found in the residence that have the potential to affect indoor air quality.

Location	Product Description	Size (units)	Condition*	Chemical Ingredients	Field Instrument Reading (units)	Photo ** Y / N

* Describe the condition of the product containers as **Unopened (UO), Used (U),** or **Deteriorated (D)**
** Photographs of the **front and back** of product containers can replace the handwritten list of chemical ingredients. However, the photographs must be of good quality and ingredient labels must be legible.

New York State Department of Health
Generic Community Air Monitoring Plan

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

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical-specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for volatile organic compounds (VOCs) and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate NYSDEC/NYSDOH staff.

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

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

VOC Monitoring, Response Levels, and Actions

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

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

- If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over 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.

Particulate Monitoring, Response Levels, and Actions

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

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.

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

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

June 20, 2000

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APPENDIX E

Investigation Team Qualifications

KURT FRANTZEN
Program Manager

Principal Professional

Eastern Division Leader--Risk Analysis & Toxicology Practice

Summary of Experience

Through risk-based approaches that limit remedial cost, Dr. Frantzen serves clients by interfacing science, engineering, and planning to resolve complex property contamination matters. With extensive risk assessment experience and with large investigation/remediation project management experience, he is a hands-on practitioner achieving high equity results for his clients. A biochemist by training, he has more than 20 years of experience in environmental risk analysis, hazardous waste site/Brownfields investigation/remediation, environmental R&D, and cost accountable management. He has worked on state-led, Superfund, DOE, and DOD sites around the US.

Education

BS, Biology, University of Nebraska System : Omaha, Nebraska, 1978
MS, Plant Pathology, Kansas State University, Kansas, 1980
PhD, Life Sciences/Biochemistry, University of Nebraska System : Omaha, Nebraska, 1985

Registrations

Certified Hazardous Materials Manager (C.H.M.M.), No.14143,

Select Project Experience

The following is a representative selection of Kurt Frantzen's project experience.

Environmental Site Assessment & Characterization

Fish and Wildlife Impact Assessment REALCO Incorporated Site, Dunkirk, NY, 2006
Prepared an assessment of potential environmental/ecological impacts due to polychlorinated biphenyls (PCBs) released from the site into a nearby stream and wetland. For NYSDEC via Benchmark Engineering and Environmental Sciences, PLLC, Buffalo, NY.

Phase I Environmental Site Assessment Newburgh Dye & Printing, Newburgh, NY, 2005
Prepared an assessment of environmental concerns to support real estate due diligence. Magna Fabrics, Hackensack, NJ

Phase II Environmental Site Assessments for the Commonwealth Heights and Beacon Parcel Developments, Marlborough, MA, 2005
Prepared a site assessment evaluating residual pesticides (lead arsenate, DDT, and dieldrin) in the soils of these former orchard sites to support future real estate development. The Gutierrez Company, Burlington, MA

Phase IIB Site Characterization for the Orangeburg Shopping Center, Orangeburg, NY, 2005
Additional assessment of nature and extent a chlorinated solvent release on the subject property. JLJ Management.

Phase II On-Site Environmental Site Assessment for the Orangeburg Shopping Center, Orangeburg, NY, 2004
Assessed the nature and extent a chlorinated solvent release on the subject property. JLJ Management

Phase I Plus Environmental Site Assessment Orangeburg Shopping Center, Orangeburg, NY, 2004
Prepared an assessment of environmental concerns specially regarding a potential chlorinated solvent release at the subject property. JLJ Management

Risk Assessment & Characterization

Ecological Risk Assessment for the Hinkley Site, 1988
Compressor station in Mojave Desert with hexavalent chromium spill to groundwater - the Erin Brockovich - Evaluated fate and transport, the baseline ecological risks and risks associated with remedial alternatives. Concept creator of the implemented remedial alternative that involved pumping and treatment by natural attenuation. Prepared for Pacific Gas and Electric Co. Served as Task Manager and lead ecotoxicologist.

Superfund Ecological Risk Assessment - Peter Cooper/Markhams Sites, Town of Dayton, NY, 2005
Prepared screening-level ecological risk assessment of upland and wetland resources at a large landfill with hide/glue manufacturing wastes from the former Peter Cooper operation in Gowanda, NY, which contained chromium, arsenic, zinc, and various organic solvents. Benchmark EE&S, PLLC

Risk Appraisal Transactional Due Diligence Support of a Chlorinated Solvent Contaminated Property, Stamford, CT. 2001
Prepared appraisal of the environmental risk issues associated with a property transaction involving a contaminated commercial property. Followed the Risk Appraisal approach developed by K. Frantzen (see Books and Articles section below). Confidential Client. Project Manager.

Baseline Risk Assessment for Former MGP Site, Plattsburgh, NY. 1998
Prepared a baseline human health and ecological risk assessment for the upland portion of this former manufactured gas plant site situated within an urban area and along the Saranac River, an important trout fishery. The work included development of remedial objectives and target cleanup levels. For NYSEG, Task Manager and lead author.

Method 3 Risk Characterization for a Former Manufactured Gas Plant Site, Southbridge, MA, 1998.
Completed a Massachusetts Contingency Plan (MCP) Method 3 Risk Characterization to support a Phase II investigation at a former MGP site currently used as a utility service center. For Mass. Electric Corp., Task Manager.

Method 2 Risk Characterization for Franklin Manufacturing Facility, MA, 1998.
Evaluated risks associated with the accumulation of volatile organics within a facility overlying contaminated soils and groundwater to support a No Further Action (NFA) decision. Prepared for Franklin Manufacturing Co. Risk Assessor.

Risk Assessment for the Former Manufactured Gas Plant Site, Cambridge, MD, 1997
prepared a site-specific analysis of risk associated with MGP-related chemicals in surface soil. The assessment was prepared to guide decision-making regarding future use and need for mitigative actions. Prepared for confidential client. Task manager and author.

Bioaccumulation of PAHs into Garden Produce and Associated Health Risks, 1997
Literature review and geochemical analysis of distribution of PAHs in soils, and exposure and associated health risk to gardeners and consumers of garden produce grown in PAH contaminated soils. Prepared for a confidential client. Project Manager and lead author.

Screening-level Ecological Risk Assessment for the Chevron Cincinnati Refinery, 1996
Multimedia analysis of potential risks to ecological resources. Prepared for Chevron Research and Technical Co. Served as Project Director.

Human Health Risk Assessment for the Tar Creek Superfund Site, Ottawa County, Oklahoma, 1995
An assessment of residential exposures to lead and other metals in the soils in and around homes located near former Picher Mine in the Tri-State Mining District. Part of remedial investigation. Prepared for U.S. EPA Region VI. Served as Task Manager.

Public Health and Ecological Risk Assessment, 1994
Part of a series of reports for a comprehensive investigation of a former manufactured gas plant site for Brooklyn Union Gas Co. Served as lead author and Program Manager.

Risk Assessment Guidance, 1993
Developed a six part series of guidance documents for use by various contractors at the U.S. Department of Energy Idaho National Engineering Laboratory (INEL). Served as technical coordinator and principal author.

Public Health and Ecological Risk Assessment, 1993
Part of a series of reports for a comprehensive investigation and remediation of a former manufactured gas plant site in San Francisco. Developed supporting scientific document for cleanup goal negotiations. Prepared for Pacific Gas and Electric. Served as Principal Toxicologist.

Risk Assessment for the Madison Wire/Orban Industries Site Remedial Investigation, 1989
Prepared for the New York State Department of Environmental Conservation. Served as Task Manager and lead toxicologist.

Human Health Risks Associated with Cooling Tower Emissions, 1987
Prepared for Ocean States Public Power as part of an Environmental Assessment, evaluated potential human health risks from both heavy metals and Legionella in tower drift. A member of the risk assessment team.

Environmental Risk Management

Environmental Risk Management Support and Program Consultant 1997-2004
Key consultant for a program involving a large portfolio of former Manufactured Gas Plant (MGP) sites and ancillary properties for an energy company in the eastern U.S. (100 in all). The scope of work included coordinating site reconnaissance, quality assurance of work plans, participating in developing strategic and tactical approaches to regulatory issues and negotiations, preparing individual property risk appraisals and portfolio threat analysis (comparative risk ranking), quality assurance of remedial investigations, and service as technical spokesperson in public forums. Managed teams performing investigation and remediation of sites, and led the team preparing all exposure and risk assessments and establishing cleanup goals. KeySpan Energy

Environmental Manager for Nott Street Industrial Park, Schenectady, NY, 2001-present
Serve as environmental consultant overseeing and monitoring conditions at the Park, which is under a Stipulation and a VCA from the NYSDEC. Interact with counsel, agency personnel, and tenets (including GE Power Systems) to assure compliance and direct work to achieve closure of extant environmental orders. Schenectady Industrial Corporation. Project Manager.

Environmental Risk Management Support to Real Estate Developers of Former Apple Orchards, Marlborough, MA. 2000-2001
Providing technical (toxicology and exposure analysis) support during the evaluation of environmental reports of several large parcels former part of a large apple orchard. Public concern expressed over lead arsenate and chlorinated pesticides in soils and their disturbance during development. Also, supported risk communication program at public hearings. MetLife, Avalon, and Gutierrez Companies.

Environmental Risk Management Due Diligence Review of a Mercury Contaminated Building Planned for Redevelopment as Office Space, Danvers, MA. 2000 - 2001
Worked as senior environmental reviewer and consultant to guide Phase I and II ESA activities of the former OSRAM Sylvania Manufacturing Facility. Worked for Redeveloper. Project Manager and Risk Analyst.

Environmental Risk Management Program for the Brooklyn Borough Gas Works Site, 1997-1998
Conducted baseline human health and ecological risk assessment of the former manufactured gas plant site (18 acres) along Coney Island Creek. Prepared and supported negotiations of remedial objectives and target cleanup levels. The project also required supporting a risk communication program of newsletters, public documents, public meetings, and hearings. For Brooklyn Union / KeySpan Energy. Project Manager and lead author.

General

Soil Management Plans for the Commonwealth Heights and Beacon Parcel Developments, Marlborough, MA, 2005
Prepared soil management plans to deal with residual pesticides (lead arsenate, DDT, and dieldrin) in the soils of these former orchard sites during real estate development (single family homes and commercial restaurant, respectively. The Gutierrez Company, Burlington, MA

Publications and Papers

Author, *Risk-Based Analysis for Environmental Managers*, Lewis Publishers/CRC Press, Boca Raton, FL, 2001

Author, *Using Risk Appraisals to Manage Environmentally Impaired Properties*, VHB SiteWorks, Watertown, MA, Report 108, 28p, 1999.

Author, *Risk-Based Analysis*, The Brownfields Newsletter , 3(17) 1, King Communication, Washington, D.C., August 27th Issue, 1998.

Author, *Chapters on Antimony and Chromium*, Hamilton and Hardy's Industrial Toxicology, RD Harbison, Ed., New York: Mosby, Chapter 5 and 12, pp. 25-26 and 51-54, respectively, 1998.

Author, *Risk Appraisals: A Pivotal Brownfields Management Tool*, Abstract, Conference Papers, Brownfields 2000, Atlantic City, NJ.

BENJAMIN RIEGER
Environmental Scientist

Project Manager

Summary of Experience

Mr. Rieger is currently a program manager, based out of Kleinfelder's Connecticut and Massachusetts offices. His responsibilities include management of junior and senior staff working on more than 160 environmental projects across the New England region, programmatic client account management, scope of work and cost development, project coordination and implementation, direction and oversight of field activities and report preparation and review.

Mr Rieger oversees environmental data warehousing and geographic information systems in the Connecticut office. In this capacity Mr. Rieger facilitates the collection of spatial data and the integration of spatial data with an EPA Region 5 format environmental database.

Mr. Rieger has conducted and/or supervised subsurface investigations on more than 50 commercial petroleum sites in Connecticut, Massachusetts, New Hampshire, New York and Rhode Island. Responsibilities have included historical and regulatory research, design and implementation of sampling programs for soil, soil vapor and groundwater, well installation (monitoring wells, multi-level piezometers, bedrock wells), data evaluation and report preparation and review.

Mr. Rieger designed and supervised feasibility testing for remediation system design including soil vapor extraction, air sparging, and groundwater pump and treat at multiple petroleum impacted sites in Connecticut and Rhode Island.

Mr. Rieger has installed environmental remediation systems to address soil and groundwater contamination at various petroleum sites in Connecticut, Rhode Island and New Hampshire. These installation included contractor safety oversight and system performance optimization during the initial period of operation.

Education

BS, Biology, Houghton College, New York, 1997
MS, Environmental Studies, State University of New York System : College of Environmental Science & Forestry, New York, 2002

Professional Affiliations

National Groundwater Association
Environmental Professionals of Connecticut
Urban Land Institute

Select Project Experience

The following is a representative selection of Benjamin Rieger's project experience.

Assessment & Remediation

Gasoline Release at an Active Retail Gasoline Facility

Mr. Rieger is in the process of conducting a subsurface site assessment to determine the potential for offsite migration of a contaminant plume in an aquifer with known drinking water wells and no alternative source of drinking water. A series of multilevel piezometers were installed to just above the bedrock surface. Relative piezometric surfaces from the multilevel wells along with contaminant concentrations in these wells will be used to determine the extent and flow path of the plume.

MTBE Impacted Bedrock Aquifer

Mr. Rieger oversees groundwater monitoring and remedial system operation for a property currently under a Connecticut Department of Environmental Protection Consent Order. He evaluates data from site monitoring wells and twenty three active drinking water wells. He manages interaction with State and Local regulators and residents. The groundwater extraction system has pumped and treated in excess of six million gallons of water. Contaminant concentrations surrounding bedrock wells have decreased by four orders of magnitude during system operation.

Pilot Testing of a Subslab Liquid Phase Petroleum Plume

Mr. Rieger designed and executed an assessment and remediation feasibility study for LNAPL plume that has migrated under an occupied offsite building. Mr. Rieger coordinated with the offsite property owner to install ten monitoring wells and eight soil vapor sampling points within an active warehouse. Pilot testing was conducted within the warehouse. Mr. Rieger designed a remediation system to address the liquid phase petroleum and sub slab soil vapor. This system was designed to allow for all routine operation to be conducted on the client's property reducing the interference to offsite parties.

*Emergency Spill Response Activities
*

Mr. Rieger served as incident commander for a 21,000 gallon gasoline release in Rhode Island. Gasoline was release to groundwater surface in a excavation due to contractor error. Mr. Rieger coordinated response contractors, RI DEM spill response staff, two fire companies and GSC|Kleinfelder staff during the incident. Mr. Rieger was responsible for the Health and Safety of all personnel on site and in the surrounding neighborhood. Over the first two days of the response action approximately 18,000 gallons of gasoline was recovered.

MATTHEW PICKARD
Regional Health & Safety Manager

Certified Industrial Hygienist

Summary of Experience

Mr. Pickard is the Regional Health and Safety Manager for the Great Lakes Region. He is a Certified Industrial Hygienist, and is based out of the Newburgh, NY, office. He is responsible for the management of the corporate health and safety program in four area offices, and in addition, he is also responsible for the development and delivery of industrial hygiene services. His fields of competence include occupational health and safety program development, compliance and liability auditing, employee work task hazard evaluations, building decontamination and demolition, safety and industrial hygiene management, and accident investigation.

Education

BS, Environmental Toxicology/ Industrial Hygiene, Clarkson University, 1999

Registrations

Certified Industrial Hygienist (C.I.H.), No.9240CP, American Board of Industrial Hygienists, 2006

Professional Affiliations

Member of the American Society of Safety Engineers
Member of American Industrial Hygiene Association

Select Project Experience

The following is a representative selection of Matthew Pickard's project experience.

Key Projects

St. Lawrence River PCB Remediation Project - From 9/1/2001 To 9/16/2002
Mr. Pickard managed the health and safety for all land based operations involving 50 people at the St. Lawrence River PCB Remediation Project. This included, conducting scheduled and unscheduled field audits to ensure worker compliance with mandated health and safety/personal protective equipment procedures. Additionally, Mr. Pickard was responsible for health and safety plan development and compliance including field investigative techniques and accuracy of sampling methodology, equipment calibration and quality control procedures during the performance of remedial investigations.

Demolition of Defense Supply Center for the Department of Defense - From 2/1/99 To 8/2/99
Mr. Pickard managed the health and safety for demoltion activities involving 20 people at the Demolition of the Defense Supply Center. This included, conducting scheduled and unscheduled field audits to ensure worker compliance with mandated health and safety/personal protective equipment procedures. Additionally, Mr. Pickard was responsible for health and safety plan development and compliance including field investigative techniques .

Implosion of Three Rivers Stadium City of Pittsburgh - From 1/1/2001 To 5/22/2001
Mr. Pickard managed the health and safety of 200 individuals and 30 different subcontractors over three shifts at the Implosion of Three Rivers Stadium Project. Mr. Pickard's duties included, coordination of subcontractor activities, conducting scheduled and unscheduled field audits to ensure worker compliance with mandated health and safety/personal protective equipment procedures. Additionally, Mr. Pickard was responsible for health and safety plan development and compliance including field investigative techniques and accuracy of sampling methodology, equipment calibration and quality control procedures during the performance of remedial investigations.

New York City Transit Authority, Long Island Rail Road and Metro North Rail Roads - From 9/1/2002 To 9/2/2003
Mr. Pickard managed the health and safety of 200 individuals at multiple rail yards within the New York City Metropolitan area during the installation of new subway cars for the NYCTA, Long Island Railroad, and Metro North Railroads. Mr. Pickard was responsible for the generation and institution of a uniform Blue Flag Policy within his orgainization. Additionally, Mr. Pickard generated and instituted formal a Job Hazard Analyses Policy.

Environmental Health and Safety Audits for General Electric and NBC Universal
Mr. Pickard reviewed on-site records for injuries, training, and process specific activities. Work processes and on-site employee activities were observed. Recommendations for compliance were developed from record review and observations.

Industrial Hygiene Assessment of Tubing Manufacturing Facility - From 10/16/06 To 10/22/06
Mr. Pickard reviewed on-site records for injuries, training, and process specific activities. Work processes and on-site employee activities were observed. Recommendations for compliance were developed from record review and observations. Additionally, Mr. Pickard performed exposure assessments for operations involving cyclohexanone and soldering flux to assess employee exposure during these activities. Moreover, Mr. Pickard assisted the facility's Health and Safety committee in generating a Hazard Communication Policy.

Mold Investigations and Assessment of Indoor Air Quality
Mr. Pickard has inspected multiple office facilities. Varied construction types and different extent of water intrusion make each project unique. Mr. Pickard is experienced in visually identifying mold contamination and understands the different types of samples that can be collected to ensure that potential mold contamination is identified.

Drafted and Implemented Lead Health Protection Plans for the Demolition of Catenary Structures Transit Authority Railroad
Mr. Pickard drafted and implemented Lead Health Protection Plans for the abatement and demolition of various lead coated steel catenary structures. The plans included outlining acceptable work practices, engineering and administrative controls, determining similar exposure groups and instituting representative air monitoring and wipe sampling plans to assess employee exposures. Additionally, Mr. Pickard provided consultation on medical surveillance results and drafted and implemented a respiratory protection plan for those employees involved in lead emitting operations.

Hydrated Lime Exposure Assessment at Local Water Bureau
Mr. Pickard determined similar exposure groups and implemented a representative sampling plan for respirable dusts within individuals breathing zones during pH adjustment operations. Moreover, Mr. Pickard assessed the efficacy of the existing engineering controls and work procedures.

Exposure Assessment for the Application of Alkyd Base Enamel Paint
The exposure assessment consisted of the review of pertinent Material Safety Data Sheets (MSDSs), the review of existing standard operating procedures, and the subsequent generation and implementation of a personnel sampling plan outlining the chemical constituents of concern associated with Alkyd Oil Base Enamel with a volatile organic compound (VOC) mass to volume ratio of 380 grams/liter. Moreover, the use of dilution ventilation as an engineering control was assessed.

UST Removal Program
Mr. Pickard managed the health and safety for a UST removal program involving multiple retail gasoline sites. The managment of the program included, conducting scheduled and unscheduled field audits to ensure worker compliance with mandated health and safety/personal protective equipment procedures. Additionally, Mr. Pickard was responsible for the management of health and safety plan development and compliance including field investigative techniques. Moreover, Mr. Pickard oversaw the implementation of a behavior based safety system including the management of the incident investigation program.

Additional Experience

Conducted scheduled and unscheduled field audits to ensure worker compliance with mandated health and safety/personal protective equipment procedures.

Conducted facility audits for a variety of manufacturers to evaluate compliance with state and federal employee safety, health and environmental regulations.

Responsible for the development and implementation of health and safety procedures during the excavation and processing of chemical, biological and high hazard materials.

Evaluated worker exposures to a variety of chemicals for comparison to applicable permissible exposure limits and appropriate personal protective equipment.

Responsible for health and safety plan development and compliance including field investigative techniques and accuracy of sampling methodology, equipment calibration and quality control procedures during the performance of remedial investigations and corrective actions conducted at hazardous waste sites and various manufacturing and industrial facilities.

Supervised Lead-Based Paint (LBP) surveys to identify potential risks with both interior and exterior LBP.

Responsible for development and implementation of blue flag and railcar offloading policies and procedures in accordance with Federal Railroad Administration guidelines within an active rail yard and subsequent shops.

Seminars/Training

Emergency Program Manager IS-1.This independent study course provides an introduction to Comprehensive Emergency Management (CEM) and the Integrated emergency Management System (IEMS). Included is an in-depth look at the four phases of comprehensive emergency management; mitigation, preparedness, response, and recovery. The text is accompanied by illustrations, diagrams, and figures. In most units, there are worksheets, exercises, and tasks to complete.

Emergency Preparedness IS-2.This independent study course provides an introduction to Comprehensive Emergency Management (CEM) and the Integrated emergency Management System (IEMS). Included is an in-depth look at the four phases of comprehensive emergency management; mitigation, preparedness, response, and recovery. The text is accompanied by illustrations, diagrams, and figures. In most units, there are worksheets, exercises, and tasks to complete.

SHANTAR ZUIDEMA

Summary of Experience

Mr. Zuidema is a hydrogeologist in GSC|Kleinfelder's Hudson Valley operations. His responsibilities include case coordination and implementation, direction and oversight of field activities, data analysis and report preparation. Current responsibilities focus on a large Due Diligence Environmental Site Assessment (ESA) case load for a major divestment in the Capital District of New York. Mr. Zuidema manages Phase II activities at the case level for 12 properties and is preparing Phase I ESA Reports for over 25 properties. In addition, Mr. Zuidema manages open cases for six Sites in the New York Petroleum Spill Program.

Education

Environmental Earth Science Chemistry/ Hydrology, Eastern Connecticut State University, 2004

Select Project Experience

The following is a representative selection of Shantar Zuidema's project experience.

Abstracts

Drzewiecki, PA, and S Zuidema, 2004, Hierarchy of cyclicity in ancient playa and perennial lake sediments of the upper East Berlin formation (Jurassic, Hartford rift basin, Connecticut), Geological Society of America Abstracts with Programs, Vol. 36, No. 5, p. 35.

Zuidema, S, A Shirk, 2004,
Longitudinal aqueous biogeochemistry of the Little Chazy River watershed, northeastern New York, Geological Society of America Abstracts with Programs, Vol. 36, No. 2, p. 126. Abstract

Key Projects

Management of low-flow groundwater sampling activity at a field Site for a national study
Managed groundwater sampling and field work at a small surficial glacial aquifer in western Connnecticut for the Trends in Anthropogenic and Natural Contaminants project.

Acquired an intricate knowledge of low-flow groundwater sampling principles for a variety of constituents including volatile organic compounds, metals, pesticides, and age-dating isotopic parameters.

Phase I and II Property Environmental Site Assessments, Albany and Capital District , New York
Conducted due diligence Phase I environmental database reviews, historical file reviews, site inspections and reconnaissance to identify existing and potential future environmental liability associated with past property use and property location prior to confidential clients' major real estate divestment.

Completed expedited Phase II environmental assessments to quantify environmental liability due to past or existing property use. Assessments included rapid scope of work development from information from Phase I work, and the collection of soil and groundwater data for comparison with state and federal guidelines to determine the environmental condition of the property.

Case history compilation and litigation support in determining potentially responsible parties for MTBE discovered in a public water supply well
Reviewed two decades worth of case history for a Site charged with causing methyl tertiary-butyl ether contamination of a series of public water supply wells in the vicinity.

Addressed impacts and historical negligence from properties located upgradient identified as other potentially responsible parties.