WORK PLAN
REMEDIAL INVESTIGATION
AND
FEASIBILITY STUDY
RONHILL CLEANERS
(Site No.:1-30-071)
Glen Cove, New York

Prepared for

New York State Department of Environmental Conservation
Investigation and Design Engineering Services
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Introduction

This Work Plan for Ronhill Cleaners (herein referred to as the "site") located at 71 Forest Avenue in the City of Glen Cove, Nassau County, New York was prepared by Camp Dresser and McKee Inc. (CDM) for the New York State Department of Environmental Conservation (NYSDEC) under the Engineering Services for Investigation and Design, Standby Contract No. D004437. All background and site information used in the development of this Work Plan was furnished by NYSDEC. The site is a former dry cleaning facility at which soil, groundwater, and soil vapor contamination have been identified. The work plan was developed in accordance with the "State Superfund Standby Contract Work Assignment D004437-9, Remedial Investigation, Ronhill Cleaners, Site No. 130071."

1.1 Purpose and Objectives

The objective of this work assignment (WA) is to address the data gaps in the ongoing remedial investigation and evaluate remedial action alternatives for the site. The objectives of the work plan tasks will be to further:

- Delineate the extent of groundwater contamination;
- Delineate the extent of soil vapor contamination which is impacting local structures;
- Determine if a contaminant plume east of the site may be contributing to on-site contamination;
- Evaluate whether site contamination is impacting the Seaman Road public supply well;
- Conduct maintenance and monitoring of the existing onsite soil vapor extraction (SVE) system and eight (8) offsite sub-slab depressurization (SSD) systems;
- Evaluate remedial action alternatives using the data collected during the RI.

1.2 Site Description and Background

1.2.1 Site Description

The site is located at 71 Forest Avenue in the City of Glen Cove, Nassau County, New York as shown on Figure 1-1. More specifically, the site is located on the northeast corner of Bryce Avenue and Forest Avenue. The site is currently occupied by Payless Shoes store. The property is surrounded by residential and commercial properties.

1.2.2 Operational and Remedial History

Information on the site operations and previous remedial investigations were provided in the following documents:

- *Remedial Investigation Report, Former Ronhill Dry Cleaners Site, 71 Forest Avenue, Glen Cove, NY (Registry No. 1-30-071)*, dated May 23, 2001, prepared by Roux Associates, Inc.

- *Remedial Investigation & Feasibility Study Work Plan, Ronhill Cleaners, 71 Forest Avenue, City of Glen Cove, Nassau County, NY, NYSDEC Site No. 1-30-071, NYSDEC Work Assignment No. D003970-73*, dated April 2005, prepared by Environmental Resources Management (ERM).

- *Interim Remedial Measure Work Plan, Ronhill Cleaners, 71 Forest Avenue, City of Glen Cove, Nassau County, NY, NYSDEC Site No. 1-30-071, NYSDEC Work Assignment No. D003970-73*, dated June 2006, prepared by Environmental Resources Management (ERM).

- *Interim Remedial Investigation and Interim Remedial Action Report, Ronhill Cleaners Site, Glen Cove, New York, NYSDEC Site No. 1-30-071, Work Assignment No. D003970-17*, dated January 2007, prepared by Environmental Resources Management (ERM).

A dry cleaner operated at the site from 1963 until 1993. During the 1970's, tetrachloroethylene (also known as PCE) was detected in two public supply wells at the Seaman Road well field (N-03892 and N-05261). Due to the presence of elevated PCE concentrations in the well, the wells were taken out of service in 1978. The subsequent Nassau County Department of Health (NCDOH) investigation identified Ronhill Cleaners as one of five users of PCE in the area.

An environmental assessment was conducted in 1990 on behalf of the owner of the cleaners, Bedford Affiliates. The investigation included the collection of shallow soil samples outside the building's north and west walls and inside the building in an indoor trench located along the north and west sides of the building. Up to 14,000 mg/kg of PCE was detected in the soil samples within the trench near the northwest corner of the building.

In 1993, approximately 73 tons of soil was excavated from within the trench area by Tyree Brothers Environmental Services, Inc. (TBES). This remedial action was conducted without regulatory involvement. Reportedly the excavation extended to about four feet below grade. The excavation was not extended deeper based on building integrity considerations. Clean endpoint samples were not obtained from the excavation. The excavation was lined with 4-mil polyethylene sheeting and backfilled.

In March 1993 the site was listed in the New York State Registry of Inactive Hazardous Waste Sites when it was determined that leakage or improper disposal of dry cleaning chemicals had impacted the soil and groundwater beneath the site. Bedford Affiliates entered into a Consent Order with NYSDEC to perform a Preliminary Site Assessment (PSA). During this assessment four of the existing monitoring wells MW-1 through MW-4 were installed.

In June 1995, the site was listed as a Class 2 Inactive Hazardous Waste Site. Bedford Affiliates entered into a second Consent Order to perform an Interim Remedial Action.

In August 1996 a soil vapor extraction system designed to remove volatile organic compounds (VOCs) from the unsaturated soil beneath the site was started as an interim remedial measure (IRM). The SVE system operated at the site for about four years.

In 1998, the Site was referred to the NYSDEC Division of Environmental Enforcement (DER) for State funding. Roux Associates performed a supplemental investigation at the site, which was completed in July 1998. As part of this investigation, monitoring well WM-5 was installed upgradient of the site.

In July 1999 an RI/FS work plan was finalized, which was to be implemented by the NYSDEC. Subsequently, a former operator of the dry cleaner took over the project as a potentially responsible party (PRP) and developed a modified remedial investigation (RI) work plan, which was approved by NYSDEC in December 1999. This work plan was implemented between June and September 2000 and an RI report was completed in May 2001. The RI included a geophysical survey, ambient air sampling, soil vapor survey, shallow and deep soil sampling, vertical groundwater profiling, monitoring well installation, monitoring well sampling and groundwater level measurements.

The 2000 RI focused on the area to the southwest of the site, since based on groundwater data collected during the RI, groundwater generally flows to the southwest from the site. During this investigation three monitoring wells (MW-6 through MW-8) were installed. PCE was detected in the shallow unsaturated zone soils at concentrations ranging from not detected to 18 milligrams per kilogram (mg/kg) near the northwest corner of the building. Soil contamination was also identified between 20 and 85 feet below ground surface (bgs) near the northeast corner of the building, with a maximum concentration of 11 mg/kg detected at the 78-80 foot interval bgs-roughly corresponding to the reported depth of the water table. The investigation identified the presence of non-aqueous phase liquid (NAPL) at the groundwater table interface, approximately 80 feet bgs. On-site groundwater sampling identified dissolved contamination extending at least 120 feet below the water table (~200 feet bgs). The RI revealed that the offsite VOC plume was much

larger than anticipated. The data also suggested the presence of an offsite source of contamination originating east of the site. Based on the results of the RI, it was concluded that additional investigation would be needed to delineate the extent of the VOC plume. The highest concentrations of dissolved VOCs detected in groundwater were 190,000 µg/L on-site and 15,000 µg/L off-site.

VOC contamination has also been detected in the City of Glen Cove Public Water Supply Well Field located on Seaman Road, northeast of the site. The data collected during the 2000 RI suggests that the well field is located upgradient of the site; however groundwater elevation data collected by NYSDEC in 2000 indicated that pumping of the Seaman Road public supply wells could influence groundwater elevations and subsequently, groundwater flow pathways at the site. NYSDEC's analysis consisted of installing transducers in four of the site monitoring wells (MW-5, -6, -7, and -8) and recording pressure measurements every half hour for a month. During the test period, the City of Glen Cove was conducting pump tests at the Seaman Road supply well field. Based on this information, a second interim remedial measure (IRM) was considered by NYSDEC to address groundwater impacts beneath the site. The former operator declined to implement the IRM.

In 2003, NYSDEC referred the site for funding by the New York State Superfund for implementation of a remedial investigation/feasibility study (RI/FS) and IRM. At that time, a remedial investigation was initiated with a state consultant.

An RI/FS was prepared by Environmental Resources Management (ERM) and approved by NYSDEC in April 2005. The ERM work plan for the IRM, which incorporated the findings of the RI was approved by NYSDEC in June 2006.

The RI included the following:

- *Historic Records Search*: Freedom of Information Act requests were submitted to NYSDEC, Nassau County Department of Health, Nassau County Department of Assessment, Nassau County Department of Public Works and the City of Glen Cove for records pertaining to property ownership and recent municipal supply well data.

- *Potable and Existing Monitoring Well Search*: ERM obtained well records from the Nassau County Department of Public Works (NCDPW) and NYSDEC Water Supply Unit for potable public supply wells and monitoring wells located within the vicinity of the site. Information on the following wells was provided:
  - N-01149 (Upper Glacial Aquifer)
  - N01150 (Upper Glacial Aquifer)
  - N-05250 (Upper Glacial Aquifer)
  - N-09100 (North Shore Aquifer)
  - N-3892/Seaman Road Well No. 1 (Upper Glacial Aquifer)

- N-5261/Seaman Road Well No. 2 (Upper Glacial Aquifer)

Historic data provided for wells N-01149, N-05250, N-09100 and N-5261 identified PCE and TCE in the wells. A summary of the PCE and TCE data for these wells is provided in Table 1-1. ERM attempted to locate well N-09100, which is presumed to be located hydraulically downgradient of the site, however the well could not be found. Figure 1-2 identifies the above-listed wells as well as additional wells in the area of the site. NYSDEC Water Supply Unit records indicate that monthly pumpage rates for the Seaman Road well from May through November 2005 ranged from 3.809 gallons per minute (gpm) in May to 55.525 gallons in July, with an average rate of 26.54 gpm over the 7 month period. This well extends to 235 feet bgs and is screened from 131 feet to 170 feet bgs, 185 feet to 195 feet bgs, and 220 feet to 230 feet bgs. The maximum discharge for the well is 2000 gpm.

- *Geophysical Survey*: A geophysical survey was conducted to identify subsurface features which could potentially be sources of contamination. The property was surveyed for the presence of septic tank leach fields, sumps, stormwater and sanitary sewer piping, drains and four dry wells that were shown on a City of Glen Cove drawing. The survey identified the likely location of one of the four dry wells on the northwest corner of the property. No additional sources of contamination were identified.

- *Monitoring Well Sampling*: ERM sampled the eight existing on-site and off-site monitoring wells (MW-1 through MW-8). On-site monitoring wells were analyzed for the target compound list (TCL) volatile organic compounds (VOCs) , semi-volatile organic compounds (SVOCs), pesticides and PCBs using CLP method OLM04.2 and Target Analyte List (TAL) metals using CLP Method ILM04.1. Samples collected from off-site wells were analyzed for TCL VOCs. PCE was identified in wells MW-1 (37,000 µg/L), MW-2 (49,000 µg/L), MW-3 (110,000 µg/L), MW-4 (16,000 µg/L), MW-5 (1600 µg/L), MW-6 (400 µg/L), MW-7 (3,900 µg/L) and MW-8 (12,000 µg/L).

- *Soil Gas Sampling*: ERM collected soil gas samples to assess the potential for vadose zone migration of VOCs emanating from residual on-site sources or from impacted groundwater. Samples were collected at 14 locations. To maintain the privacy of the property owners, the locations are being kept confidential and are provided to NYSDEC separately on Table 1-2. The soil gas samples were collected from 10 to 12 feet bgs using summa canisters equipped with regulators set up for 2-hour sample collection. The samples were analyzed for VOCs using EPA Method TO-15. The results identified contaminated soil vapor on-site and extending to the north and west of the site. Off-site PCE soil vapor concentrations ranged from not detected at 39 Forest Avenue (SV-14) to 150,000 µg/m^3 at King Kullen (SV-10)

On-site PCE soil vapor concentrations were 390 µg/m^3 at the northern site property line (SV-03), 24,000 µg/m^3 at the edge of the asphalt parking area north of the building (SV-04) and 35,000 µg/m^3 at the southwest corner of the site (SV-07).

- *Sub-Slab Soil Vapor and Indoor Air Sampling*: Based on the results of the soil gas sampling, the NYSDOH directed ERM to collect sub-slab and indoor air samples at residences and businesses surrounding Ronhill Cleaners. Samples were collected at 30 locations. To maintain the privacy of the property owners, the locations are being kept confidential, and are being provided to NYSDEC separately on Table 1-3. The samples were collected using summa canisters equipped with 24-hour regulators, and were analyzed for VOCs using EPA Method TO-15. The sub-slab soil vapor sample at the on-site building identified 1,300,000 µg/m^3 PCE and the indoor air sample identified 1,000 µg/m^3 PCE.

- *Sub-Slab Depressurization System Installation*: NYSDOH reviewed the results of the samples collected in the structures listed in Table 1-3 and identified structures where intrusion of PCE contaminated vapors presented a potential health risk. The owners of these residences/businesses were offered NYSDEC funded installation of sub-slab depressurization systems (SSD) to mitigate the impacts of the vapor intrusion. Letters were sent by NYSDEC to about 18 residences. SSD systems were installed in the structures at eight properties. The details of these properties are provided to NYSDEC in Table 1-4.

- *On-Site SVE System*: The on-site SVE system consists of two 900 pound activated carbon vessels, a 30 gallon demister drum, one 180 cubic foot per minute blower, four vapor extraction wells and one sub-slab depressurization point. The on-site SVE system was repaired and put back on-line on October 24, 2005 using only well (VEW-1) for soil vapor extraction. ERM determined that the other three wells (VEW-2, 3, & 4) were unfit for use as vapor extraction wells because the screen lengths were too long to be effective while running at the same time. VEW-1 is located in the northwest corner of Payless Shoes. This well is about 80 feet deep and has a screen length of 77 feet. Since the restart of the system, ERM estimated that 4,000 pounds of VOCs have been removed from the unsaturated zone.

  As indicated above, the adjacent Cove 1-hour Photo had a SSD system installed in its basement to mitigate soil vapor infiltration in the building. This SSD system was connected to the on-site SVE unit via a 4-inch PVC line and has been in operation since the beginning of April 2006.

- *Vertical Profile Borings/Groundwater Sampling*: ERM installed three on-site vertical profile borings (VPR-02, -03 and -04) and seven off-site vertical profile borings (VPR-01 and VPW-01 through VPW-06) using a Waterloo Profiler with a hybrid drive platform. At the locations designated "VPR", groundwater samples were collected about every 5 feet from the initial water table sample to a depth of 130

feet bgs, beyond which samples were collected about every 10 feet. The groundwater samples at the "VPW" locations were collected at approximate ten foot intervals from the water table to the final depth of the vertical profile boring. The "VPR" profile locations were reportedly extended until the Raritan Clay was encountered. Borings VPR-01, -02 and -04 extended to 239, 212 and 220 feet bgs, respectively, however VPR-03 extended only to about 141 feet bgs and was terminated when drilling tools were lost down the borehole. Each groundwater sample was analyzed for VOCs by Gas Chromatography/Mass Spectrometry (GC/MS). According to the RIR, sampling was continued at the VPW profiles until five clean samples were obtained from below the last contaminated interval. If no contamination was observed, the profile was advanced until it was at least 50 feet below the contaminated interval in the nearest upgradient boring. The depths of the VPW wells ranged from 165 to 230 feet bgs. At VPR-03, PCE contamination was still detected at the last interval sampled (141.15 ft bgs).

The groundwater samples collected from the vertical profile borings were analyzed for VOCs by Method 8260. In the onsite vertical profile borings, the highest concentration of PCE was detected in the water table interval samples (~84 feet bgs) at each boring. The highest on-site concentration of PCE was 147,000 µg/L detected in VPR-02. In the off-site profiles, the highest concentration of PCE was detected at 117 feet bgs in VPR-01 (39.2 µg/L), 96.9 feet bgs in VPW-01 (121 µg/L), 162 feet bgs in VPW-02 (177 µg/L) and 114 feet bgs at VPW-03 (188.5 µg/L). VOC contamination was not detected in profiles VPW-04, -05 and -06.

Generally, dissolved PCE extended from the water table to at least 142 feet bgs in the profiles where PCE was detected. In profiles VPR-01 and VPR-02, dissolved PCE was distributed from the water table to between 140 and 160 feet bgs and then detected again near the base of the boring, between 181 and 199 feet bgs. In on-site profile VPR-04, PCE was detected from the water table to the top of the Raritan Clay, 220 feet bgs.

- *Monitoring Well Installation*: A monitoring well was installed at each off-site vertical profile boring location (VPR-01 and VPW-01 through VPW-06). The wells were identified as ERM-09 through ERM-15.The wells were screened to monitor to interval where the highest concentration of dissolved contamination was observed during the vertical profile boring sampling. Where no contamination was detected during the vertical profile borings, the well was screened across the water table. After installation, the wells were surveyed by a New York State-licensed surveyor.

  ERM suggests that based on the geologic information obtained during the installation of vertical profile borings and mapping done by Kilburn and Krulikas, wells ERM-14 and -15 are located in the Upper Glacial aquifer whereas the remaining wells (MW-1 through -8 and ERM-9 through -13) are located in the North Shore confining unit (also known as the Port Washington confining unit).

- *Interim Remedial Measure - Ozone Pilot Study*: ERM submitted a work plan to NYSDEC for an ozone pilot study to address chlorinated VOCs, primarily PCE present in both the saturated and vadose zones. The work plan was approved by NYSDEC in August 2006. The intent of the ozone injection system is for ozone to be injected below the water table to react with VOCs in groundwater. An extraction well screened near the surface would draw the ozone upward so that it could react with VOCs throughout the vertical extent of the vadose zone. To date, ERM has completed the following activities at the site in preparation of the pilot study:

    - Installed two soil vapor probes (SVP-01 and SVP-02) and collected soil vapor samples every ten feet from five feet below grade to the water table to assess the vertical extent/distribution of VOC impacts to obtain target intervals for the ozone injection. PCE was detected in all of the soil gas samples collected from SVP-01 and SVP-02; the concentration generally increased with depth.

    - Installed four vapor observation wells (VOW-1 through VOW-4) and conducted testing to determine the radius of influence (ROI) of the SVE system. Vapor extraction well VES-4 on the eastern side of the building was used for the ROI testing. Based on the data, ERM concluded that VES-4 should be sufficient to collect injected ozone during the pilot test.

The 2007 Interim Remedial Investigation and Interim Remedial Action Report identified the following data gaps:

1. The distribution of VOC contamination in the shallow unsaturated zone has not been delineated.

2. Horizontal and vertical delineation of the PCE contamination in groundwater has not been completed to the north, northeast, east, southeast, and south of the site. Based on 24-hour continuous logging of groundwater elevations by NYSDEC, groundwater elevations at the site are impacted by pumping at Seaman Road (Well N-5261), to the northeast of the site. The 24-hour continuous logging also suggests that groundwater elevation fluctuations at the site may be caused by pumping of the supply well on the Glen Cove Hospital property to the south. It was not clear if the fluctuations were caused by the Seaman Road well, the hospital well or a combination of the two. Current groundwater elevation data is not sufficient to make this determination.

3. The northern boundary of the dissolved plume to the west of the site has not been delineated.

4. Information has not been obtained regarding the dry cleaner located in the shopping center at the intersection of Forest Avenue and Walnut Road to the northeast of the site. There is a potential that a release from this location could be the source of the PCE contamination observed in the Seaman Road well and could be mixing with the on-site plume.

1.3 Environmental Setting

The site is relatively flat and lies at an approximate elevation of 125 feet above mean sea level (msl). The ground water table lies at an approximate elevation of 45 feet above msl at the site (~80 feet below ground surface). The closest surface water body to the site is Glen Cove Creek, which lies approximately 5,000 feet southwest of the site. Glen Cove Creek discharges into Hempstead Harbor.

1.3.1 Geology

The site is located within the Atlantic Coastal Plain Physiographic Province. A history of coastal submergence and emergence spanning the Cretaceous Period, significant differential erosion during the Cenozoic, and glaciation during the Quaternary is reflected in the present day geology of Long Island. The geology of Long Island is characterized by a southeastward-thickening wedge of unconsolidated sediments unconformably overlying a gently-dipping basement bedrock surface. The wedge ranges in thickness from zero feet where it outcrops along the north shore in Queens, up to about 2,000 feet along the south shore barrier islands.

Basement

Basement is composed of Precambrian to Early Paleozoic igneous or metamorphic consolidated bedrock. Unconformably overlying the basement is a thick succession of Late Cretaceous deposits: the Raritan and overlying Magothy Formations, both of fluvio-deltaic depositional origin. The Upper Cretaceous deposits are unconformably overlain by a veneer of Pliocene and Pleistocene deposits, chiefly of glacial origin.

Cretaceous

Raritan Formation: The Raritan Formation is divided into the basal Lloyd Sand Member and the overlying Raritan Clay Member. The Lloyd Sand rests unconformably on bedrock and is about 150 feet thick in the vicinity of the site. The top of the Lloyd Sand is found at approximately 200-250 feet below msl. It is composed of white and grey fine to coarse sand and gravel, commonly with a clayey matrix. The contact with the overlying clay member is gradational.

The Raritan Clay Member is composed chiefly of bedded variegated clay and silt, locally containing interbedded sands. Lignite fragments and iron and pyrite nodules are common. The clay member is approximately 100 feet thick in the vicinity of the site (Smolensky, et al. 1989). The Raritan Clay is the most widespread hydrologic confining layer on Long Island. The Raritan's updip erosional pinchout generally is

located subparallel to the northern coast of Nassau County. The clay unit dips gently to the south-southeast.

Matawan Group-Magothy Formation (Magothy): The Magothy unconformably overlies the Raritan; the contact is commonly marked by a change from the solid clays of the Raritan Clay Member to coarse sands and gravels of the basal unit of the Magothy. The dominant Magothy lithology generally is fine to medium quartz sand, interbedded clayey sand with silt, clay, and gravel interbeds or lenses. Interbedded clay is more common towards the top of the formation. The thickness of the Magothy varies between 100 feet in the vicinity of the site to over 800 feet beneath the barrier islands.

Cenozoic-Quaternary

After the Cretaceous, deep erosion of the land surface took place as a response to fluctuations in sea level. Sedimentological evidence indicates that sea level falls exposed the entire Atlantic continental margin during the Miocene epoch, which would have promoted rejuvenation and deep incision of rivers and streams across the Coastal Plain. Later deposition of abundant fluvial and glacial clastic deposits during the Pliocene and Quaternary filled these incised buried valleys. The top of the Cretaceous sequence is marked by a highly irregular erosion surface upon which rests deposits of Pleistocene and, in some places, Pliocene age.

Deposits of Pleistocene age mantle the Cretaceous formations. Within the study area, the Pleistocene deposits include three depositional sequences: the fluvial Jameco Gravel and marine Gardiners Clay; and the much more widespread Late Pleistocene glacial deposits of the Wisconsin glacial stage. Undifferentiated gravels and clays described in buried valleys within southern Long Island have been attributed to the Jameco Gravel and Gardiners Clay units. The Jameco Gravel and Gardiners Clay formations are well-defined, mapable stratigraphic units beneath the southern margin of Long Island where they are of hydrogeological significance. These stratigraphic units are not recognized in the vicinity of the site. The remainder of the Pleistocene succession belongs to the Wisconsin glacial stage Upper Glacial Deposits.

The thickness of the Pleistocene Upper Glacial Deposits in the study area varies but averages 100 feet. The thickness and distribution of the Pleistocene Upper Glacial Deposits were controlled by the older, now buried paleotopography discussed above. The pattern of stream and river valleys that dissected the surface of Long Island during the Cenozoic likely was later modified by Pleistocene overriding ice sheets and meltwater erosion and deposition.

1.3.2 Hydrogeology

The hydrogeology of Long Island has been well documented over the years by the USGS and others. Three major aquifers are present on Long Island: the Upper Glacial

aquifer, the Magothy aquifer and the Lloyd aquifer. A generalized cross section through Nassau County from is shown in Figures 1-3 and 1-4. Based on the cross section, the Magothy Aquifer is not present in the site area. Groundwater contours prepared for Nassau County's Groundwater Monitoring Program based on water levels collected in public wells in 2001, 2002, and 2003 indicates that the groundwater in the Upper Glacial aquifer (water table) in the site area generally flows to the southwest, but that there may be a northwest component to the groundwater flow. The mapping shows groundwater in the Lloyd aquifer flows more westerly in this area. Mapping conducted by Kilburn and Krulikas suggests that there is a groundwater high in the site area which may result in radial flow from the site.

Bedrock

The bedrock in the area has been mapped as the Hartland Formation of Middle Ordovician to Lower Cambrian Age. The bedrock surface generally slopes southeastward from about 350 to 800 ft below sea level except in the northernmost parts of the Oyster Bay area where glacial scouring has created north-northwestward dipping valleys. The formation consists of highly weathered biotite-garnet-schist with low hydraulic conductivity. A thick saprolitic zone 50 to 100 feet thick, consisting of white, yellow, and gray clay, underlies most of the peninsula except in the northernmost part.

Lloyd Aquifer

The Lloyd Sand Member of the Raritan Formation of the Late Cretaceous Age overlies the saprolitic bedrock surface and is Long Island's deepest aquifer. The Lloyd sand was deposited as a series of braided streams and deltaic deposits consisting of white and pale yellow sand with interbedded lenses of gravel and white clay. The aquifer does not outcrop on Long Island and is believed to extend to the north beneath Long Island Sound in eastern Nassau County and in Suffolk County, and offshore to the south, beyond the barrier beaches. The Lloyd aquifer is confined in most places, except where the overlying Raritan clay has been eroded away. The thickness of the Lloyd aquifer varies from 0 feet where it is not present along the north shore of Nassau County, to more than 500 feet in the southeastern areas of Nassau County. The average horizontal hydraulic conductivity is reported to be approximately 40 feet per day (ft/day) with a 10:1 vertical anisotropy.

Raritan Clay

Overlying the Lloyd aquifer is the Cretaceous Age clay member of the Raritan Formation, referred to as the Raritan clay. The Raritan clay is the major confining unit on Long Island, ranging between 150 and 250 feet in thickness. Like the Lloyd aquifer, the Raritan clay is absent from areas of northern Queens and northern Nassau County where it had been eroded. The Raritan clay outcrops in parts of Queens, and is believed to be present north of the island beneath Long Island Sound, and south of the island, beneath the barrier islands. This confining unit consists of

solid, multicolored, compact clay (gray, white, red, or tan) with interbedded lenses of sand. The average vertical hydraulic conductivity is reported to be approximately 0.001 ft/day.

North Shore Aquifer

The North Shore aquifer consists of a sequence of Pleistocene-age sediments found only in the northwestern, central, and northeastern parts of the study area. The aquifer consists of moderately sorted stratified drift and outwash deposits that infilled the low-lying areas after the partial removal of the Cretaceous deposits and parts of the bedrock (saprolitic zone) by glacial erosion. The deposits consist of poor to moderately sorted brown and olive gray sand, silt, and gravel. It contains subangular to subrounded quartz grains, rock fragments, unstable opaque minerals, and a large percentage of biotite and muscovite. The North Shore aquifer deposits are referred to locally as the Jameco Gravel.

North Shore Confining Unit

The North Shore confining unit is a sequence of Pleistocene-aged clay and silt deposits that are locally present along the northern shore of Nassau County. The unit consists of marine and postglacial lake deposits including olive brown and olive gray clay and silt deposits with minor lenses containing shells. The unit contains a minor sand unit that is moderately permeable. The presence of the North Shore confining unit in the site area is questionable.

Upper Glacial Aquifer

The upper glacial aquifer is the surficial unit on Long Island and is therefore entirely unconfined. Along the Harbor Hill and Ronkonkoma terminal moraines and parts of the north shore, the unit is composed of till consisting of poorly sorted clay, sand, gravel, and boulders. The till is generally poorly permeable and may contain perched water. The outwash deposits that are found are mainly between, and south of, the moraines. The outwash deposits are moderately to highly permeable, consisting of gray, brown, and yellow fine to very coarse sand and gravel. The upper glacial aquifer ranges up to 600 feet thick, however the saturated thickness is often much lower. The estimated average horizontal hydraulic conductivity generally exceeds 225 ft/day.

1.4 Fate and Transport

Tetrachloroethene is a manufactured chemical that is widely used in the dry-cleaning industry. It is also used for degreasing and is found in consumer products including some paint and spot removers, water repellents, brake and wood cleaners, glues, and suede protectors. Other names for tetrachloroethene include tetrachloroethylene, perchloroethylene, and PCE.

1.4.1 Fate of PCE

The fate of PCE is dominated by its volatility and degradation. PCE's presence in surface soils or surface water is, usually short-lived, providing a continuing source is not present.

In the atmosphere, PCE is expected to be present primarily in the vapor phase and not sorbed to particulates because of its high vapor pressure of 18 mm Hg. Vapor-phase PCE will be degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals. Direct photolysis is not expected to be an important environmental fate process since PCE only absorbs light weakly in the environmental ultraviolet (UV) spectrum.

The dominant fate of PCE in soils is volatilization. Based on its K_{oc} value of 265 mL/g, PCE is moderately mobile in soils. Consequently, PCE has the potential to migrate through the soil into groundwater. PCE has a specific gravity greater than water (1.62) indicating that pure liquid phase PCE will sink when dissolved in groundwater. The solubility of PCE in water is 150 mg/L. Biodegradation under anaerobic conditions in soil and groundwater may occur at a relatively slow rate with half lives on the order of months or longer. PCE in groundwater can undergo reductive dechlorination catalyzed by anaerobic bacteria. The PCE will tend to degrade to trichloroethylene (TCE). Subsequent degradation to *cis*-1,2-dichloroethene (DCE) or *trans*-1,2-DCE and then to vinyl chloride can also occur via anaerobic mechanisms. Vinyl chloride can further degrade to ethylene.

Volatilization is also an important fate process of PCE in surface waters based on its Henry's Law constant of 1.73×10^{-2} atm-m^3/mol. PCE is also not expected to adsorb to suspended solids and sediment in water based upon its K_{oc} value. The half-lives in soil and groundwater were reported to be 180-360 days and 270 days respectively. A reported K_{ow} value of 351 in fish suggests that the potential for PCE to bioconcentrate in aquatic organisms is low.

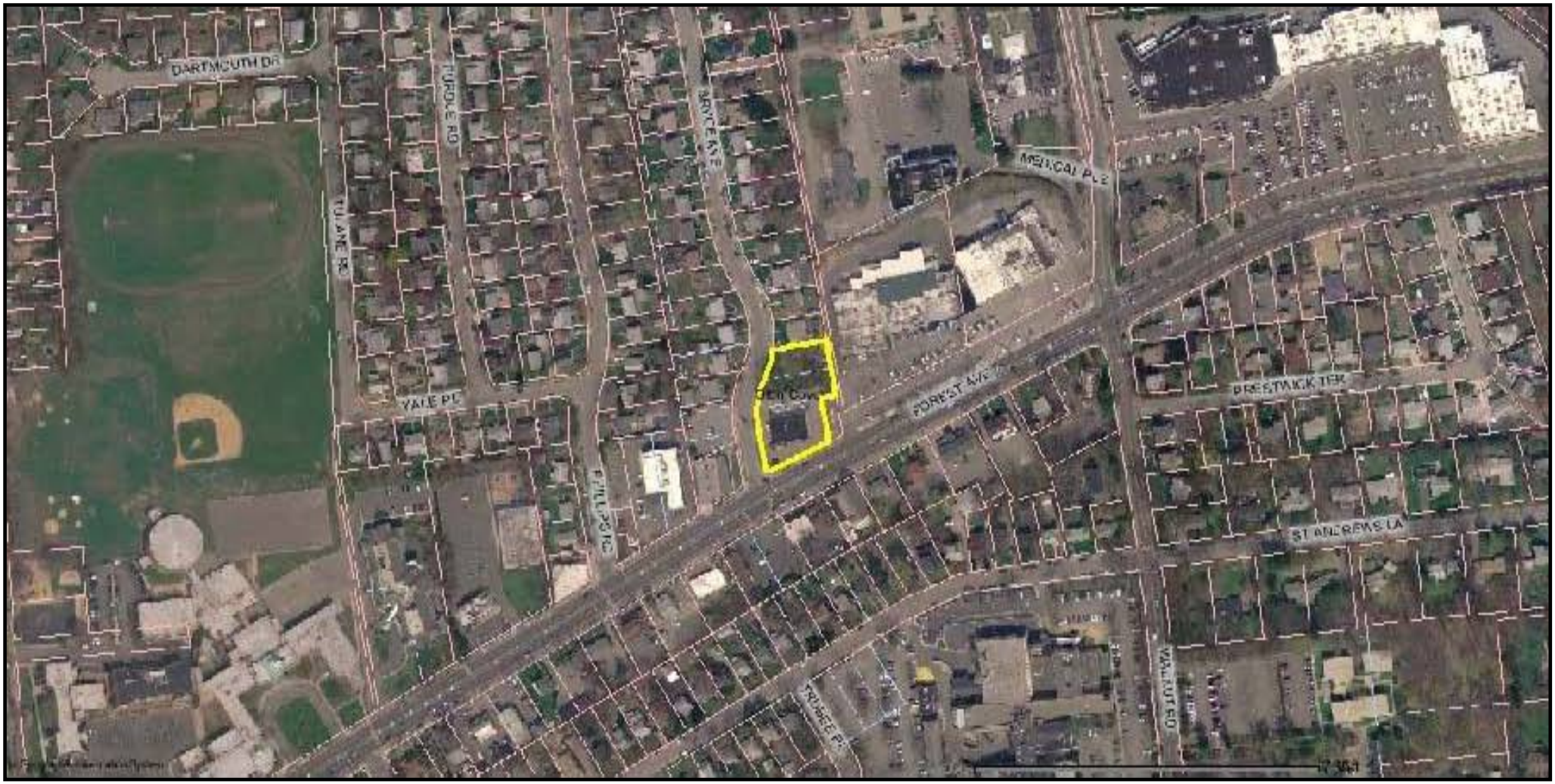
1.4.2 Transport of PCE

Liquid phase PCE discharged directly to the ground surface would be expected to migrate downward through the unsaturated zone in a relatively linear pattern, with minimal dispersion from the discharge location. The unsaturated zone is primarily sandy material, so complex migration pathway along lower permeability zones is not expected. The unsaturated zone is approximately 80 feet thick.

Significant soil vapor contamination may be present in the unsaturated zone. The vapor phase PCE vaporizes upward while the liquid phase migrates downward. Chlorinated solvents in the vapor phase can cause significant indoor air contamination due to residual unsaturated soil contamination or vaporization directly from the groundwater table interface.

Once liquid phase PCE encounters the water table, some of the solvent will become dissolved in the groundwater and begin to move in the direction of groundwater flow. If the quantity of solvent reaching the water table is sufficient, some of the solvent will remain in an undissolved state as a DNAPL and, since PCE is denser than water, the solvent will continue to move downward under the influence of gravity. DNAPL will continue to sink until it encounters a lower permeability zone, which would slow or stop the downward migration. DNAPL could pool or accumulate on top of a lower permeability zone and remain stationary or move in the down-slope direction of the lower permeability zone. If sufficient DNAPL is pooled or trapped in the aquifer, it will act as a continual source of dissolved groundwater contamination. Movement of DNAPL in the saturated zone can be very complex, with movement controlled by the permeability of subsurface stratigraphic units, the shape and configuration of lower permeability zones, and/or the dip of bedding planes.

At the site, groundwater generally flows toward the southwest. However, movement of PCE in the saturated zone at the site may have been complicated by complex geology resulting in radial flow in the area and groundwater extraction at the Seaman Road supply well and the supply well at Glen Cove Hospital.



Source: Nassau County Tax Assessment Records

Figure 1-1
Site Location Map
Ronhill Cleaners
71 Forest Avenue
Glen Cove, NY

NORTH

CDM

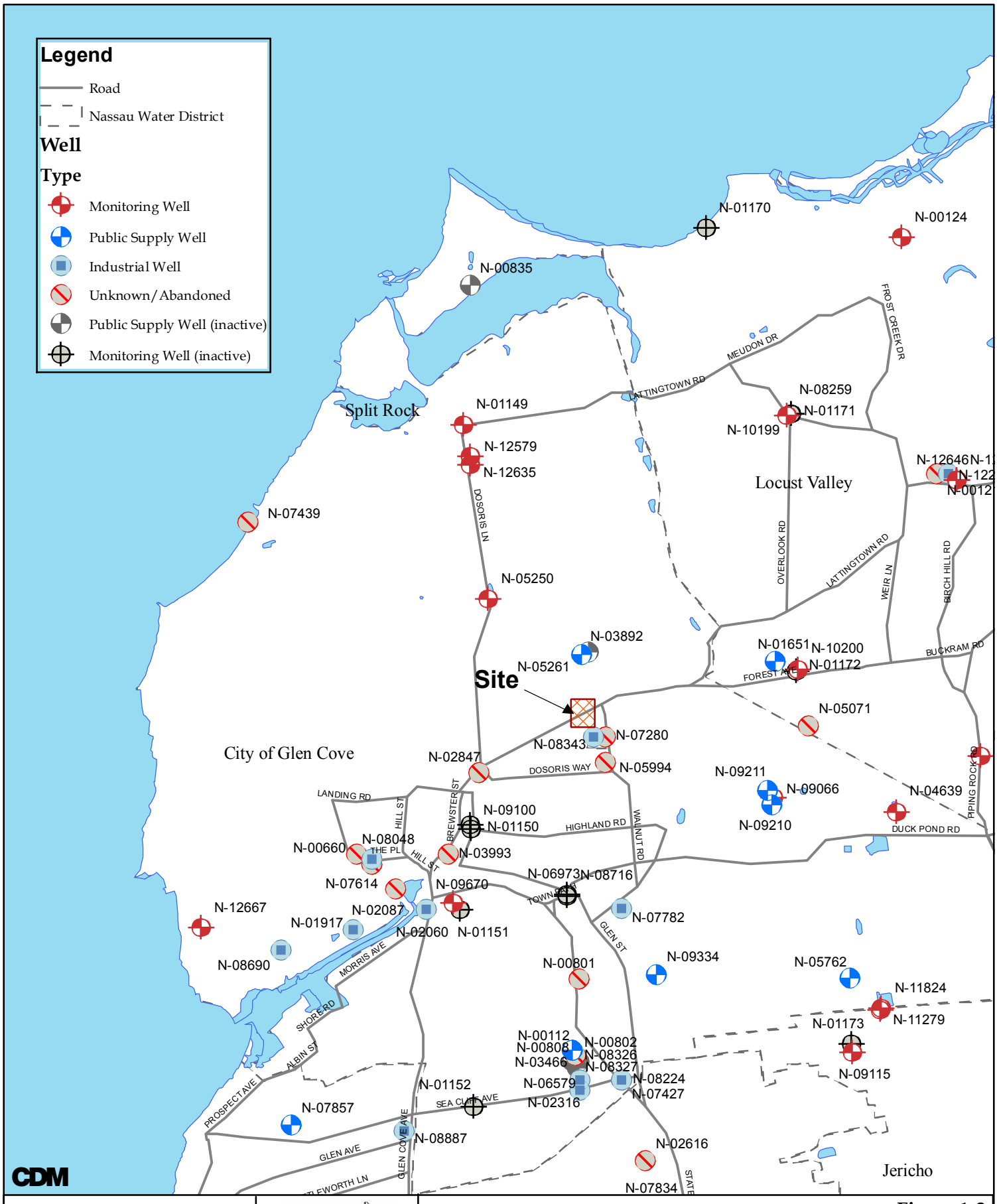
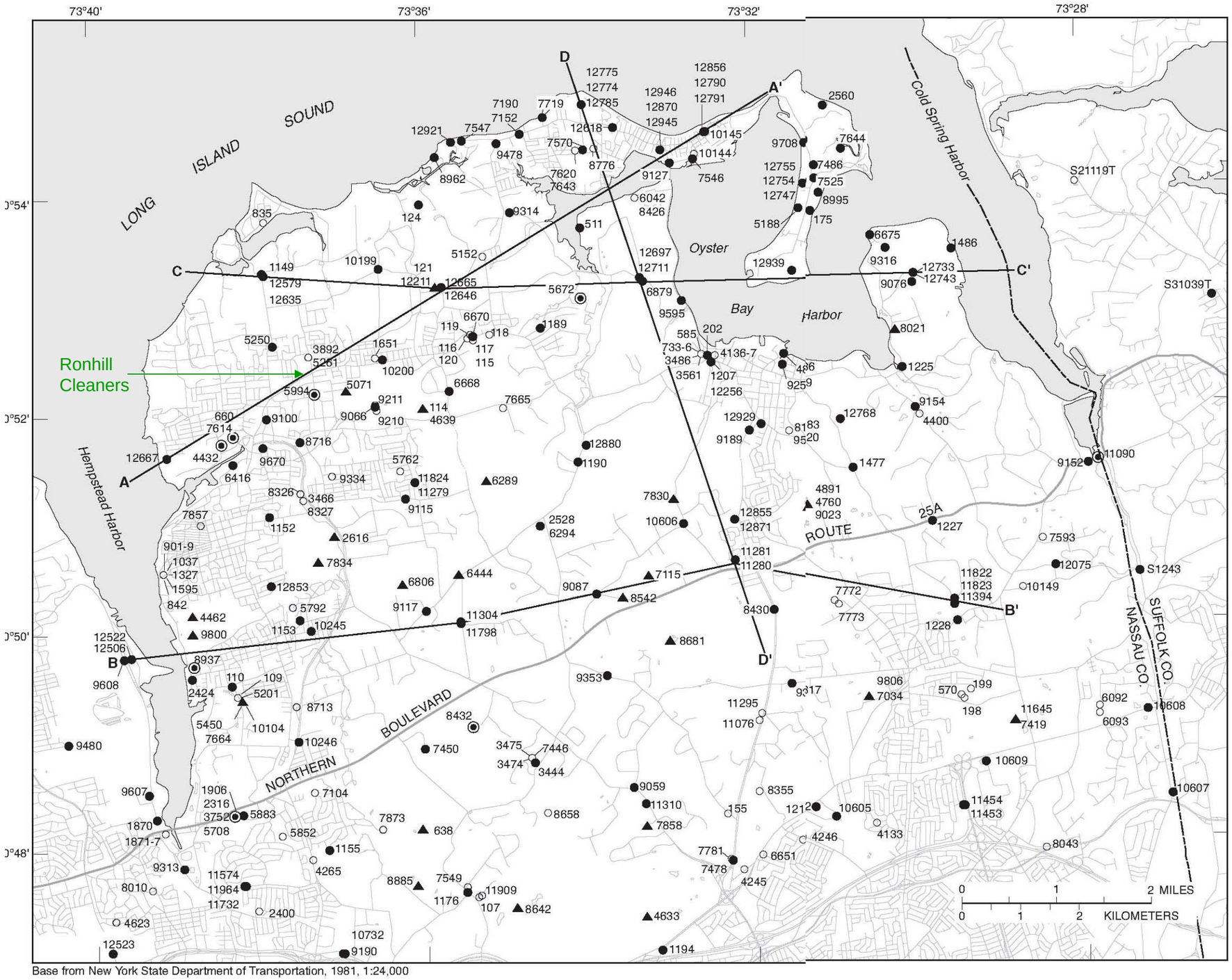


Figure 1-2
Wells Surrounding the Ronhill Cleaners Site
NYSDEC Site No. 1-30-071
71 Forest Avenue
Glen Cove, New York



EXPLANATION

A — A'	LINE OF HYDROGEOLOGIC SECTION
1149	OBSERVATION WELL
3892	PRODUCTION WELL
5071	GOLF-COURSE WELL
4432	INDUSTRIAL WELL

Numbers are assigned by New York State Department of Environmental Conservation. (Prefix N for Nassau County is omitted; prefix S represents Suffolk County; suffix T represents test boring.)

Base from New York State Department of Transportation, 1981, 1:24,000

Figure 1-3: Locations of production, observation, industrial, and golf-course-irrigation wells within the Oyster Bay study area, Nassau County, N.Y.

Source: USGS Water-Resources Investigations Report 03-4288: Hydrogeology and Extent of Saltwater Intrusion in the Northern Part of the Town of Oyster Bay, Nassau County, New York: 1995-98

CDM

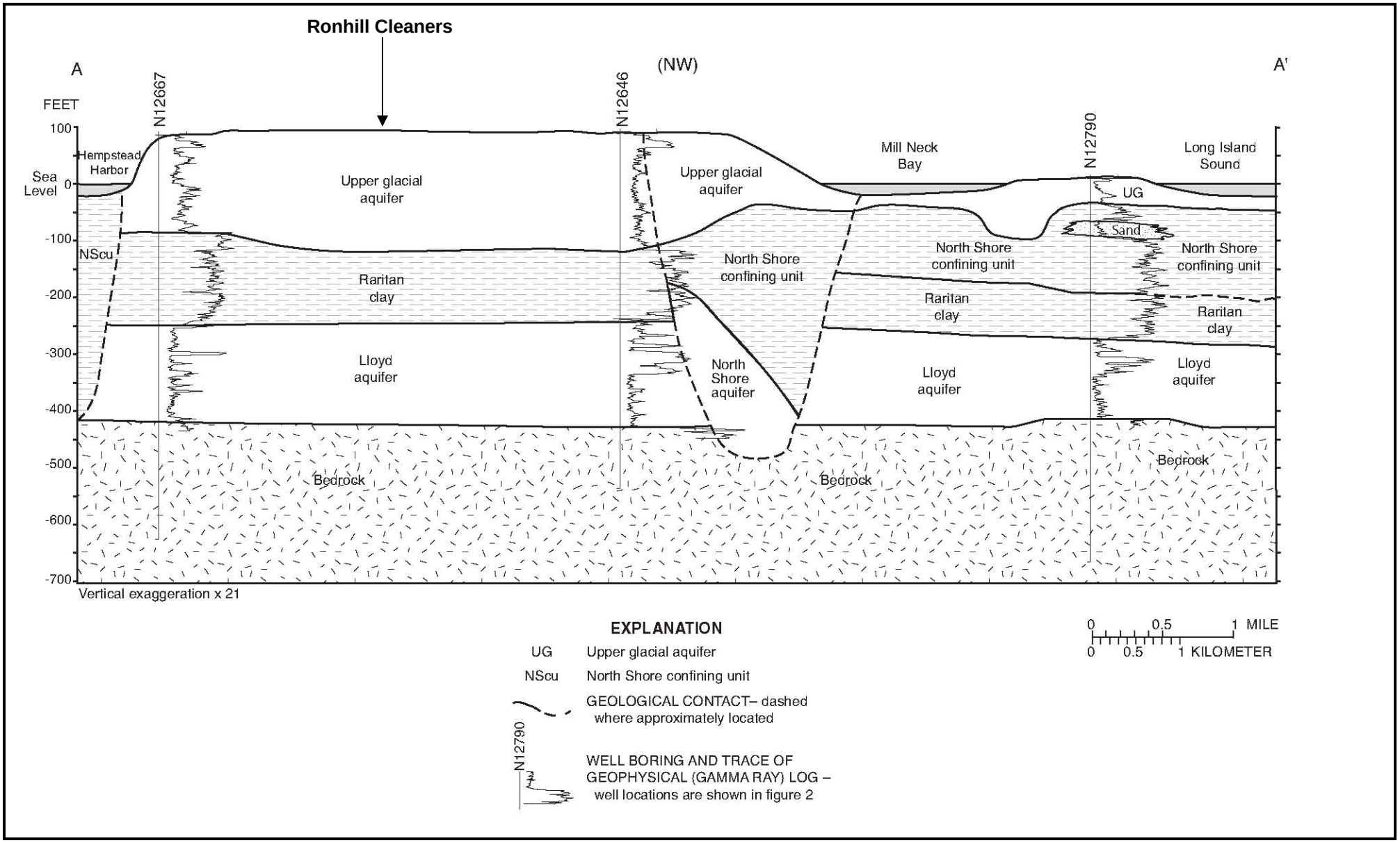


Figure 1-4: Hydrogeologic section A-A' in Oyster Bay study area, Nassau County, N.Y.

Source: USGS Water-Resources Investigations Report 03-4288: Hydrogeology and Extent of Saltwater Intrusion in the Northern Part of the Town of Oyster Bay, Nassau County, New York: 1995-98

Table 1-1
Historic PCE and TCE Concentrations in Local Public Supply Wells

WELL (Year)	Sample Date	PCE Concentration (ug/L)	TCE Concentration (ug/L)
N-01149	3/12/1986	7.4	2.2
N-05250	8/22/1988	32	ND
	8/31/1989	ND	ND
	4/30/1990	ND	ND
	6/19/1991	ND	ND
N-09100	8/22/1988	3,150	7.2
	7/14/1989	2,235	6
	12/5/1989	2,148	2.3
	8/30/1990	854	5.5
	5/13/1991	1,334	14.8
	5/18/1992	1,324	7
	7/7/1992	1,050	3
	6/17/1993	ND	ND
	11/16/1994	404	26.1
	2/21/1996	1,548	21.1
	12/31/1996	4,336	32.4
	4/14/1999	2,803	31.2
N-5261 (Seaman Road #2)	8/24/2005	7.1	ND
	9/12/2005	9.1	ND
	10/19/2005	8.3	ND
	11/2/2005	8	ND

Section 2
Scope of Work

2.1 Task 1 - Work Plan Development

This Work Plan references procedures detailed in the CDM Generic Quality Assurance Project Plan (QAPP) revised July 2007 which has been provided to NYSDEC for Contract Number D-004437. The Generic QAPP presents methods that will be used to collect field data including project samples, and focuses on the analytical methods and quality assurance/quality control (QA/QC) procedures that will be used to analyze project samples, ensure the data are of known and acceptable quality, and manage the resultant data. Procedures that are not contained in the current version of the CDM Generic QAPP are provided in Appendix A of this Work Plan.

This Work Plan also includes a site specific Health and Safety Plan (HASP) presented in Appendix B and a Citizen Participation Plan (CPP) presented in Appendix C. The HASP describes the site health and safety for the field activities that will be performed and includes a community air monitoring plan (CAMP). The CPP provides the primary contacts for the site as well as various public entities and provides ways for citizens to be involved in the project.

2.2 Task 2A – Remedial Investigation

Prior to outdoor intrusive work, a private utility locate firm will be subcontracted to mark out subsurface structures and utilities at the proposed locations. Their work will be conducted in addition to the general utility markout (One-Call) to limit the potential for encountering subsurface utilities and structures during the intrusive work.

In addition to the activities detailed below, CDM will try to obtain well construction and recent operation records for Seaman Road Well #2 (N-05261) and the Glen Cove Hospital supply wells to determine flow rates and pumping frequency for the wells. This information will be utilitzed to evaluate the impact of pumping from these well on the contaminant plume.

2.2.1 Groundwater Monitoring Well Installation

Four monitoring wells (MW-16 through MW-19) are proposed to further delineate the extent of the VOC groundwater contamination. The locations will be drilled using hollow stem augers. The monitoring wells will be constructed using a pre-assembled Solinst CMT multi-level system to allow the collection of groundwater samples at multiple depths at each location. This flexible system uses continuous polyethylene tubing, with customized screen intervals based on the borehole logs. The 1.7-inch OD tubing is fixed with seven semi-circular channels or ports. The six outer channels, although not circular, have an ID of approximately 7/16 inch (11 mm) and the smaller center channel has an ID of 3/8 inch (9.5 mm). The multi-channel tubing has a ridge down its entire length to allow for easy identification of specific channels.

Holes are drilled in a vertical line into a given channel at a specified depth according to the zone to be monitored, forming a port. A stainless steel mesh is fixed in place over the port to prevent fines from entering. Each channel is sealed with a polyethylene sealant below the port openings to prevent cross contamination. A vent hole is drilled into the channel just below the port. This allows water from the monitoring zone to fill the channel below the zone and allowed air to escape as the system was lowered into the hole, avoiding buoyancy. Each of the ports is screened at a different depth to determine the vertical distribution of contamination in the aquifer.

Based on the review of previous groundwater data for the site, VOC contamination consisting primarily of PCE extends from the water table (~80 feet bgs) to at least 142 feet bgs in off-site wells. At several locations dissolved PCE is present in the upper 60 feet of the water table and then encountered again at depth above the Raritan clay, approximately 200 feet bgs. It is suspected that this deep contamination may be originating from another source, east of the site. Onsite, contamination is highest near the water table but is distributed throughout the aquifer from the water table to the Raritan clay. The proposed wells would be installed with seven sample ports placed starting five feet below the water table surface and then every 20 feet thereafter to approximately 200 feet bgs. Each port will have a one foot screen. The final port placement will be based on field observations. CDM proposes to install the wells as follows:

- MW-16: Northwest, along Philips Road to delineate the extent of groundwater contamination in this direction and assess flow direction.

- MW-17: East of the site along Walnut Road, between the site and the dry cleaner located in the strip mall at Forest Avenue and Walnut Road to determine if there may be impacts from the dry cleaner to the east.

- MW-18: Southeast of the site along St. Andrew Lane between the site and Glen Cove Hospital, to delineate the extent of VOC groundwater contamination in this direction, determine the flow in this direction, and the influence of pumping of the supply well at the hospital.

- MW-19: Northwest of the site along Tulane Road or on the Elementary School property to delineate the northern boundary of the plume west of the site.

The proposed well locations are shown on Figure 2-1. The final well locations will be determined in consultation with the NYSDEC Project Manager. The drilling logs for the new off-site wells will be evaluated along with existing well and vertical profile gamma logs to determine if there are preferential layers of groundwater migration. Soil cuttings and well development water generated during installation of the monitoring wells will be containerized and stored in a secure location on-site until waste characterization can be completed. Field documentation, well installation, decontamination, and IDW sampling procedures are provided in the Generic QAPP.

2.2.2 Groundwater Sample Collection

Groundwater samples will be collected from all of the site wells following the installation of monitoring wells MW-16 through 20 to obtain current groundwater quality data. Prior to sampling, depth to water measurements will be collected from the wells using an interface probe prior. Three well volumes will be purged from wells MW-3 (old), MW-1 through -8 and ERM-9 through -15 prior to sampling. Final determination of well purging and sampling protocols will be developed in consultation with NYSDEC. During purging, pH, temperature, conductivity, oxidation-reduction potential (ORP), dissolved oxygen, and turbidity will be measured. Groundwater samples will be collected from each of these wells using a disposable bailer or alternate apparatus/methodology approved by NYSDEC.

At the multi-port well locations, the sample lines will be purged prior to sample collection. Groundwater samples will be collected in accordance with the procedures outlined in the Generic QAPP. Purge water will be containerized and staged in a secure location on-site until waste characterization can be completed. IDW sampling procedures are detailed in the Generic QAPP.

The groundwater samples will be sent to an off-site laboratory for VOC analysis via EPA Method SOM01.2-Trace, to obtain detection limits below the New York Ambient Groundwater Quality Standards. All samples will be analyzed by an ELAP certified laboratory. A NYSDEC ASP Category B data deliverable will be provided for these analyses. Table 2-1 presents a summary of the analytical program for the site.

2.2.3 Sub-Slab Soil Vapor and Indoor Air Sampling

Sub-slab soil vapor and indoor air sampling will be conducted at up to six structures along Bryce Avenue, north of the previously sampled buildings to determine the extent of VOC contaminated soil vapor north of the site. Sub-slab soil vapor and indoor air sampling will also be conducted at and at three locations east of the Site, to determine the extent of VOC contamination east of the site. The proposed locations are identified on Figure 2-2. These samples will be collected in accordance with the NYSDOH "Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York, dated October 2006" and the NYSDEC "Draft Division of Environmental Remediation (DER)-10 Technical Guidance for Site Investigation and Remediation, dated December 2002".

This task will include:

- Collect one sub-slab soil vapor sample at each structure,
- Collect an indoor air sample at the basement level (if present) and first floor of each structure, and

- Collect one outdoor ambient air sample at each structure; where two structures are located within close proximity to each other, one ambient air sample will be collected to represent both locations.

2.2.3.1 Sub-Slab Soil Vapor Sample Collection

At each structure, sub-slab soil vapor samples will be collected from the basement level (if present) and first floor of the building. A duplicate sub-slab soil vapor sample will also be collected at one of the six structures along Bryce Avenue and one of the three structures east of the Site. Sample port installation and vapor sample collection will parallel the procedures and methods of previous investigators.

The sub-slab sample locations will be installed as permanent points to facilitate future sampling events. After the slab has been inspected, the location of any subsurface utilities determined, and the ambient air surrounding the proposed sampling location screened with a PID, a hammer drill will be used to advance a boring to a depth of approximately two inches beneath the building slab. A permanent port constructed of stainless steel tubing and fittings will be installed in the opening. The annular space between the borehole and the sample tubing will be filled and sealed with anchoring cement. Teflon tubing will be connected to the stainless steel sample port and utilized for sample collection. Flow rates for both purging and sample collection must not exceed 0.2 liters per minute to minimize ambient air infiltration during sampling. Approximately three dead air volumes of gas will be purged from the subsurface probe and captured in a Tedlar™ bag using a syringe. PID readings will be observed from this sample and the highest reading shall be recorded on the appropriate field form. A three-way valve will be utilized to allow purging of all the lines. The end of the tubing will be connected directly to the summa canister's regulator intake valve. The sample shall be collected with a laboratory-certified summa canister with dedicated regulator set for 24-hour sample collection. Field documentation and sampling procedures are provided in the Generic QAPP.

2.2.3.2 Indoor Air Sample Collection

Indoor air samples will be collected on the basement level (if present) and main floor level of the six structures. One of the indoor air samples will be collocated with the sub-slab sample. The New York State Department of Health Indoor Air Quality Questionnaire and Building Inventory shall be completed for each structure where indoor air testing is being conducted. Field documentation and sampling procedures are provided in the Generic QAPP. A copy of the NYSDOH questionnaire is also provided as Attachment 1 to the QAPP.

All indoor air samples will be collected with a laboratory-certified summa canister regulated for a 24-hour sample collection. The summa canister will be placed in such a location as to collect a representative sample from the breathing zone at three feet above the floor.

2.2.3.3 Outdoor (Ambient) Air Sample Collection

An outdoor ambient air sample will be collected at each structure where indoor air sampling is being conducted. Where two structures are located within close proximity to each other, one ambient air sample will be collected to represent both locations. All outdoor air samples will be collected with a laboratory-certified summa canister regulated for a 24-hour sample collection. The summa canister will be placed upwind of the structures in such a location as to collect a representative sample from the breathing zone at four or six feet above the ground. Field documentation and sampling procedures are provided in the Generic QAPP.

The sub-slab soil vapor and indoor air samples will be sent to an off-site laboratory for VOC analysis via EPA Method TO-15. All samples will be analyzed by an ELAP certified laboratory. A NYSDEC ASP Category B data deliverable will be provided for these analyses. Table 2-1 presents a summary of the analytical program for the site.

2.2.4 Investigative Derived Waste

Soil cuttings and purge water from well installation and sampling will be containerized in drums or other appropriate vessel and staged on-site in a secure location until they can be disposed of off-site.

2.2.5 Decontamination Procedures

All non-dedicated equipment and tools used to collect samples for chemical analysis will be decontaminated prior to and between each sample interval using an Alconox rinse and potable water rinse prior to reuse. Additional cleaning of the equipment with steam may be needed under some circumstances. Decontamination fluids will be containerized in drums or an appropriate container and staged in a secure location until they can be disposed of appropriately.

2.3 Task 2B – SVE System Maintenance and Monitoring

The on-site SVE system currently operates utilizing two 900 pound activated carbon vessels, a 30 gallon demister drum, one 180 cubic foot per minute blower, one vapor extraction well and one sub-slab depressurization point. The system has been online since October 24, 2005. CDM will take over the operation and maintenance of the onsite SVE system, which will include:

- Weekly monitoring of the influent and effluent using a PID
- Sampling of the influent and effluent for VOCs using summa canisters with regulators set to collect grab samples will be conducted every other month
- Scheduling and supervising carbon changeouts.
- General maintenance

The Operation and Maintenance procedures are detailed in the Site-specific QAPP

(Appendix A).

2.4 Task 2C – Sub-Slab Depressurization System Monitoring and Annual Sub-Slab and Indoor Air Monitoring

CDM will conduct maintenance of the Sub-slab depressurization (SSD) systems installed at the eight (8) locations shown on Figure 2-3. The names and address of the owners at these locations are being kept confidential in this work plan and have been provided to NYSDEC separately (Table 1-4).

Monitoring of the systems will be conducted in conjunction with the SVE system O&M visits. The Operation and Maintenance procedures are detailed in the Site Specific QAPP (Appendix A).

Sub-slab and indoor air sampling will be conducted annually at 20 structures. These samples will be collected in accordance with the "Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York, dated October 2006" and the "Draft Division of Environmental Remediation (DER)-10 Technical Guidance for Site Investigation and Remediation, dated December 2002". The 20 structures to be sampled will be determined by NYSDEC. At each of the 20 structures, sub-slab and indoor air samples will be collected using 6 Liter Summa Canisters regulated for 24-hour sample collection. Six outdoor ambient air samples will be collected to represent the outdoor air quality surrounding the 20 structures. Field documentation and sampling procedures are provided in the Generic QAPP.

2.5 Task 3 - Field Documentation and Reporting

2.5.1 Field Documentation Procedures

Field notebooks will be used during all on-site work. A dedicated field notebook will be maintained by the field technician overseeing the site activities. In addition to the notebook, any and all original sampling forms, and purge forms used during the field activities, will be submitted to the NYSDEC as part of the final report. Field and sampling procedures, including installation of the sample boreholes, existing monitoring wells, etc., will be photo-documented.

2.5.2 Sample Identification

Each sample collected will be designated by an alphanumeric code that will identify the type of sampling location, matrix sampled, and the specific sample designation (identifier). Site specific procedures are described in the QAPP (Appendix A).

2.5.3 Sample Location

The newly installed monitoring wells will be surveyed by a subcontracted New York State licensed surveyor to identify the location (X,Y coordinates) and elevation of the wells. Subsequently, these data will be used to update the site maps. Costs to develop

and update site plans are based on the assumption that electronic AUTOCAD site plans will be provided to CDM by NYSDEC.

2.5.4 Reporting

A total of four copies of a draft Remedial Investigation Report (RIR) will be submitted to NYSDEC for review and comment. The report will document the work conducted and will present the results of the sample analysis and provide recommendations for further investigation should it be warranted. Upon receipt of the comments, CDM will revise the draft RIR and print the four final copies and submit to NYSDEC. One copy of the final RIR; text, tables, maps, photos, etc., will be submitted as a single pdf file. All electronic files will be submitted to NYSDEC on a compact disc. The site investigation data will be submitted in the most recent version of the NYSDEC Electronic Data Deliverable (EDD) with the final report submission. Currently this is the USEPA Region 2 EDD dated December 2003.

2.5.5 Laboratory Analysis and Validation

All samples will be analyzed by a NYSDOH approved ELAP certified laboratory. Air samples will be analyzed for VOC using EPA Method TO-15. The analysis for air samples will achieve detection limits of 1 µg/m3 for each compound. For specific parameters identified by the NYSDOH, where the selected parameters may have a higher detection limit (e.g., acetone), and the higher detection limits will be designated by the NYSDOH. Groundwater samples will be analyzed for VOC by EPA Method SOM01.2-Trace. The analysis for groundwater samples will achieve the detection limits discussed in the Generic QAPP. A NYSDEC ASP Category B data deliverable will be provided for these analyses (Table 2-1).

All samples collected will be validated in accordance with NYSDEC Data Usability Summary Report (DUSR) guidance by a party that is independent of the laboratory which performed the analyses and CDM. A usability analysis will be conducted by a qualified data validator and a DUSR will be submitted to the NYSDEC.

2.6 Task 4 – Feasibility Study

Following the implementation of the Remedial Investigation, CDM will conduct a feasibility study (FS) to evaluate remedial action alternatives using the data collected during the RI. The Feasibility study will include the evaluation of the existing SVE system and the proposed Ozone Pilot study for the site. The objectives of the FS will be to identify a list of potential alternatives that may be used to remediate the soil and groundwater on- and off-site. Each alternative will be evaluated based on technical feasibility, cost, overall protection of human health and the environment, and duration. A FS report will be prepared detailing the results of the remedial alternatives analysis and provide a recommendation for a site remedy.

Figure 2-1
Proposed Monitoring Well Locations
Ronhill Cleaners
71 Forest Avenue
Glen Cove, NY

Table 2-1
Analytical Program Summary
Ronhill Cleaners
Glen Cove, New York

Analytical Parameter	Sample Matrix	Number of Samples	Analytical Method	Field Duplicates (a)	MS/MSDs	Ambient Air Sample (b)	Field Blank (c)	Trip Blanks (d)	Container (e)	Sample Preservation	Holding Time
TASK 2A - REMEDIAL INVESTIGATION SAMPLES											
GROUNDWATER SAMPLES (20 wells)											
VOCs	Groundwater	20	SOM01.2-Trace	2	2	–	4	4	3 - 40ml clear glass vial with Teflon septum	HCl to pH <2; Cool to 4°C	14 days
SUB-SLAB SOIL VAPOR AND INDOOR AIR SAMPLES (9 structures)											
VOCs	Vapor	27	EPA TO-15	3	(f)	9	–	–	6-liter SUMMA canister	None	30 days
TASK 2B - SVE SYSTEM O&M SAMPLES											
Bi-MONTHLY INFLUENT AND EFFLUENT SAMPLES (g) (18 month period)											
VOCs	Vapor	18	EPA TO-15	-	(f)	-	–	–	6-liter SUMMA canister	None	30 days
TASK 2C - ANNUAL SUB-SLAB AND INDOOR AIR MONITORING SAMPLES											
ANNUAL SOIL VAPOR SAMPLES (20 structures)											
VOCs	Vapor	60	EPA TO-15	9	(f)	6	–	–	6-liter SUMMA canister	None	30 days
TASK 2E - OZONE PILOT STUDY (Provided in Supplement)											
GROUNDWATER SAMPLES (baseline, 2/month during, and post pilot test samples)											
VOCs	Groundwater	34	SOM01.2-Trace	2	2	–	6	6	3 - 40ml clear glass vial with Teflon septum	HCl to pH <2; Cool to 4°C	14 days
Chloride	Groundwater	34	EPA 325.3	2	2	–	6	–	50ml polyethylene or glass	None	28 days
Bromate	Groundwater	34	EPA 300.1	2	2	–	6	–	50 ml polyethylene or glass	None	28 days
Alkalinity	Groundwater	34	EPA 310.1	2	2	–	6	–	100ml polyethylene or glass	Cool to 4°C	14 days
COD	Groundwater	34	EPA 410.4	2	2	–	6	–	50ml polyethylene or glass	Cool to 4°C, H_2SO_4 to pH<2	28 days
TOC	Groundwater	34	EPA 415.1	2	2	–	6	–	25ml polyethylene or glass	Cool to 4°C, H_2SO_4 to pH<2	28 days
TDS	Groundwater	34	EPA 160.1	2	2	–	6	–	100ml polyethylene or glass	Cool to 4°C	7 days
Dissolved Iron	Groundwater	34	EPA 200.7	2	2	–	6	–	300ml polyethylene or glass	Cool to 4°C, HNO_3 to pH<2	6 months
Dissolved Manganse	Groundwater	34	EPA 200.7	2	2	–	6	–	300ml polyethylene or glass	Cool to 4°C, HNO_3 to pH<2	6 months
ON-SITE AND COVE 1-HR PHOTO SUB-SLAB SOIL VAPOR AND INDOOR AIR SAMPLES (baseline,during pilot, post)											
VOCs	Vapor	12	EPA TO-15	3	(f)	3	–	–	6-liter SUMMA canister	None	30 days
ON-SITE SOIL VAPOR SAMPLING (SV-1S/1D, SV-2S/2D) (baseline, during pilot, post)											
VOCs	Vapor	12	EPA TO-15	3	(f)	(h)	-	–	6-liter SUMMA canister	None	30 days

Notes:
(a) A minimum of 5% of all samples will be collected in duplicate. A duplicate of each sample type will be collected for sub-slab and indoor air samples (3 samples represents a set of duplicate samples)
(b) Ambient air samples will be collected at each structure where indoor air sampling is being conducted.
(b) Groundwater field blanks are collected at a frequency of 1 per day.
(d) Trip blanks are collected at a frequency of 1 per sample cooler or 1 per every five days.
(e) Cannister should be used within 15 days of being shipped to the field for sample collection.
(f) SUMMA canisters containing samples are not spiked in the field.
(g) An SVE influent and Effluent sample are collected every other month
(h) Soil Vapor Sampling will coincide with Sub-Slab and indoor air soil vapor samples, so additional abient air samples will not be necessary.

Section 3
Project Schedule

The following tabulation provides the proposed project schedule and key milestones for this work assignment. As currently planned, field work will be initiated within two weeks of written receipt of final work plan approval. Field activity duration for the Remedial Investigation activities is estimated to be ten weeks assuming no delays are experienced due to inclement weather, site access problems, or for other unforeseen reason. Annual sub-slab and indoor air sampling is estimated to take five days.

The scheduled submittal dates for deliverables are based on standard laboratory turnaround times of four weeks, and turnaround for data validation of three weeks.

Project Milestone	Date
Issue Work Assignment (WA)	February 16, 2007
Work Assignment Acceptance	14 Days after Issuance
Submit Task 1 Draft Work Plan Deliverable	April 6, 2007
Submit Task 1 Draft Supplemental Work Plan Deliverable	May 25, 2007
DEC/DOH Comment on Draft Work Plans	September 6, 2007
Submit Task 1 revised Work Plan and Supplemental Work Plan Deliverable	September 28, 2007
DEC/DOH Comment on Draft Work Plans	November 6, 2007
Submit Task 1 revised Work Plan and Supplemental Work Plan Deliverable	November 9, 2007
DEC/DOH Comment on Draft Work Plans	December 7, 2007
Submit Task 1 FINAL Work Plan and Supplemental Work Plan Deliverable	December 19, 2007
Receive Technical Approval of Work Plan	January 16, 2008
Received DEC comments on Schedule 2.11s	February 13, 2008
Submit Task 1 FINAL Work Plan and Supplemental Work Plan Deliverable	March 11, 2008
Notice to Proceed (NTP)	March 31, 2008
Commence Task 2A,2B, 2C Field Work	April 21, 2008
Task 2 Field Work Completed	June 13, 2008
Task 3 and Task 4 Submit Draft RI Report and Draft Feasibility Study	August 30, 2008

Project Milestone	Date
Approve Draft Report	30 Days after Draft Report Submitted
Task 3 and Task 4 Submit Final Report and Final Feasibility Study	30 Days after Approval of Draft Report

Section 4
Budget Estimates

Estimated Budget and Level of Effort (LOE) Summary
Ronhill Cleaners
Glen Cove, New York
Site No. 1-30-071

Task Items	Description/Cost	Dollars
1	Work Plan Development	$32,727
2A	Remedial Investigation	$214,124
2B	SVE System Maintenance & Monitoring	$100,966
2C	SSD System Maintenance & Monitoring	$35,284
2D	SVE System Upgrade (Provided as Supplement)	$49,014
2E	Ozone Pilot Study (Provided as Supplement)	$172,478
3	Field Documentation and Reporting	$21,814
4	Feasibility Study	$18,287
5	Ozone Pilot Study Report (Detailed in Supplement)	$20,903
	Total Estimate Budget (Tasks 1 - 5)	**$665,596**

Appendix D presents the detailed costs by task and subtask on the NYSDEC schedule 2.11.

General Assumptions:

- Work will be performed from March 2008 to September, 2009 (18 months).
- All costs are based upon the scope and schedule provided in this Work Plan. Costs associated with project delays or expedited schedules beyond CDM's control are not assumed.
- CDM will provide four hard copies by mail and one electronic file (pdf) by e-mail for each report submitted to the NYSDEC.

Task 1 - Work Plan Development:

- Only conference calls are anticipated to be necessary for this phase. Meetings are not assumed to be required for this task.

- Only one round of comments received concurrently is anticipated on draft deliverables. The review comments will be consolidated by NYSDEC. It is assumed that comments are minimal in nature and no re-evaluation is required. It is assumed that all comments can be addressed in 8 hours.
- Project management, subcontractor procurement, scheduling, budgeting, administrative activities are included in this task.

Task 2 – Groundwater and Soil Vapor Investigations:

- A notice to proceed must be received at least one week prior to mobilization.
- NYSDEC will provide access to all sampling and drilling locations.
- NYSDEC will provide staging areas for containerized IDW.
- Drilling, analytical, surveying and validation will be subcontracted.
- CDM will provide oversight during field activities.
- No schedule delays are assumed due to inclement weather or equipment failure.
- Delays due to the site owner or public are not assumed.
- Groundwater samples will be analyzed by EPA Method SOM01.2-Trace to obtain detection limits below the NYS Ambient Groundwater Quality Standards. Should an alternate analytical method be requested by NYSDEC, requests should be made at least 10 working days before the scheduled sampling to avoid or minimize costs impacts.
- Only one mobilization/demobilization is assumed to be required.
- CDM assumes that all material and equipment staged in access areas will be removed to allow easy access to all sampling locations by the drilling equipment.
- It is assumed that 32 drums of non-hazardous waste will be generated from field activities and require off-site disposal.
- It is assumed that laboratory-grade helium will not be required for tracer testing.
- It is assumed that monitoring of the SSD systems can be conducted on the days that CDM is on-site for SVE monitoring.
- Costs include one annual sub-slab and indoor air sampling event at 20 structures.
- Costs include eighteen months (9 sampling events) for O&M sampling of SVE influent and effluent

- It is assumed that four carbon change outs (each vessel four times) will be required during the eighteen month period.

- Annual O&M does not include electricity or other utility bills to run the SVE system.

- It is assumed that all 20 structures sampled during the annual sub-slab and indoor air sampling event can be accessed during the same week.

Task 3 - Field Documentation and Reporting:

- Only conference calls are anticipated to be necessary for this phase. Meetings are not assumed to be required for this task.

- Only one round of comments received concurrently is anticipated on draft deliverables. The review comments will be consolidated by NYSDEC. It is assumed that comments are minimal in nature and no re-evaluation is required. It is assumed that all comments can be addressed within 8 hours.

- During site work, digital photographs and field notes will be kept.

- A Remedial Investigation Report will be developed including a description of work conducted with field notes, photos, validated analytical data, figures, field measurements, and summary tables.

Task 4 – Feasibility Study:

- Only conference calls are anticipated to be necessary for this phase. Meetings are not assumed to be required for this task.

- Only one round of comments received concurrently is anticipated on draft deliverables. The review comments will be consolidated by NYSDEC. It is assumed that comments are minimal in nature and no re-evaluation is required. It is assumed that all comments can be addressed within 8 hours.

Task 5 – Ozone Pilot Study Report:

- Only conference calls are anticipated to be necessary for this phase. Meetings are not assumed to be required for this task.

- Only one round of comments received concurrently is anticipated on draft deliverables. The review comments will be consolidated by NYSDEC. It is assumed that comments are minimal in nature and no re-evaluation is required. It is assumed that all comments can be addressed within 8 hours.

Section 5
Staffing Plan

This project management organization for this project is to provide a clear delineation of functional responsibility and authority.

5.1 Program Manager – Michael A. Memoli, P.E., DEE

The primary responsibilities for program management activities rest with the Program Manager (PRM). The Program Manager, Mr. Memoli, will have ultimate contract responsibility for the project, including responsibility for the technical content of all engineering work. Mr. Memoli will direct, review and approve all project deliverables, schedule staff and resources, resolve scheduling conflicts and identify and solve potential program problems. He will be directly accountable to NYSDEC's Division of Hazardous Waste Remediation for program execution. He has authority to assign staff, negotiate and execute contracts and amendments, as well as execute subcontracts. The PRM will communicate directly with CDM's Project Manager.

5.2 Project Manager – David Keil, P.G.

The Project Manager, Mr. David Keil, will have the overall responsibility for the technical and financial aspects of this project. He will assign technical staff, maintain control of the project budget and schedule, prepare monthly progress reports, review and approve project invoices, evaluate the technical quality of the project deliverables as well as the adherence to QA/QC procedures and manage subcontractors. He will serve as CDM's point of contact for this project.

5.3 Program Quality Assurance Manager – Jeniffer M. Oxford

The Program Quality Assurance Officer, Ms. Jeniffer Oxford, will monitor QC activities of program management and technical staff, as well as identify and report needs of corrective action to the Program Manager. He will also conduct an internal review of all project deliverables prepared by CDM staff and sign off on the final investigation reports.

5.4 Health and Safety Officer – Christopher S. Marlowe, C.I.H., Q.E.P

The Program Health and Safety Officer, Mr. Chris Marlow, will review and make recommendations to the Subcontractors on health and safety plans for compliance with OSHA requirements. He will develop a Health and Safety plan for CDM and NYSDEC employees, handle over-sight activities, evaluate the performance of health and safety officers and maintain required health and safety records. He will report to the Program Manager

5.5 Project Geologist – Jessica R. Beattie, P.G.

The Project Geologist, Ms. Jessica Beattie, will assist the Project Manager with the work plan draft and final, as well as general geologic tasks related to field work, subcontractor coordination, reporting, etc. She is directly accountable to the Project Manager.

5.6 Field Manager/Health and Safety Site Supervisor/Coordinator – Melissa Koberle

The Field Manager, Ms. Melissa Koberle, will be responsible for overseeing and coordinating field activities. This will include, but is not limited to: overseeing the installation of monitoring wells, coordinating drill work, coordinating work with other subcontractors and monitoring health and safety conditions in accordance with the approved Health and Safety Plan. She is directly accountable to the Project Manager.

As the Health and Safety Site Supervisor/Coordinator, she will be responsible for ensuring that the Health and Safety Plan is implemented during field activities and that a copy of the site-specific Health and Safety Plan are maintained at the site at all times. He/she is also responsible for upgrading or downgrading personnel protection based on actual conditions at the time of the investigation. The Coordinator must also present an overview of the Health and Safety Plan to field personnel prior to initiating any field activities and is responsible for insuring that field personnel sign off on this plan. She will contact the Program Health and Safety Officer if any questions or issues arise during the field activities that she cannot answer.

Section 6
Subcontracting

Appendix E presents a comparison of quotes from various subcontractors. CDM proposes to engage subcontractors to provide the following services for this work assignment:

6.1 Geophysical Survey (Utility Markout) – Advanced Geological Services

At this time, CDM is proposing to use Advanced Geological Services (AGS) to perform the geophysical survey work. They are located at 3 Mystic Lane, Malvern, Pennsylvania, 19355.

6.2 Well Installation – Delta Well

At this time, CDM is proposing to use Delta Well (WBE) as the well installation subcontractor of the Solinst CMT Multi-level wells. They are located at 97 Union Avenue, Ronkonkoma, New York 11779.

6.2 Analytical Laboratory – ChemTech

At this time, CDM is proposing to use ChemTech (MBE) as the analytical laboratory subcontractor. They are located at 284 Sheffield Street, Mountainside, New Jersey, 07092.

6.3 Direct Push Drilling – Zebra Environmental Corp.

CDM will be using Zebra Environmental Corp (Zebra) as the direct push subcontractor. They are located at 30 N. Prospect Avenue, Lynbrook, New York 11563.

6.4 Data Validation – Nancy Potak

At this time, CDM is proposing to use Nancy Potak (WBE) as the data validation subcontractor. She is located at 1796 Craftsbury Road, Greensboro, Vermont 05841.

6.5 M/WBE Reporting – Kenneth Shider

At this time, CDM is proposing to utilize Ken Shider (MBE) to prepare the quarterly M/WBE reports that are required by NYSDEC.

6.6 GPS Survey/Field Tech Support – YEC, Inc

At this time, CDM is proposing to utilize YEC, Inc (MBE) as the field technical support subcontractor. They are located at 612 Corporate Way, Valley Cottage, New York 10989. They will perform GPS survey and assist the Field Manager with the coordination of field work and are directly accountable to the Project Manager

6.7 IDW Disposal – EarthCare

At this time, CDM is proposing to utilize EarthCare as the IDW disposal subcontractor. They are located at 972 Nicholls Road, Deer Park, New York 11729.

Section 7
MBE/WBE Utilization Plan

To meet the requirements of the MBE/WBE program, CDM has prepared the following utilization plan:

Total Dollar Value of the work assignment	**$665,596**
MBE Percentage Goal	15%
MBE Dollar Value Goal	$99,839
WBE Percentage Goal	5%
WBE Dollar Value Goal	$33,280
Combined MBE/WBE Percentage Goal	20%
Combined MBE/WBE Dollar Value Goal	$133,119

Minority and woman-owned firms are expected to participate as follows:

Services to be Provided	Description of Services	Subcontractor Name and Contact Information	Proposed Subcontract Price
WBE - Drilling	Well Installation	Delta Well Chris Okon (631) 981-2255	$80,599
MBE - Laboratory Analysis	Vapor and Water Sample Analysis	ChemTech Joe Dockery (908-789-8900)	$62,645
M/WBE Quarterly Reports	M/WBE Quarterly Reports	Kenneth Shider (518) 269-2207	$1200
MBE - Survey and Technical Field Support	Survey and Technical Field Support	YEC, Inc Ed Chen (845) 268-3203	$6,170
WBE - Data Validation	DUSR	Nancy Potak (802) 533-9206	$6061
		TOTAL	$156,674

Appendix A

QUALITY ASSURANCE PROJECT PLAN (QAPP)

Site Specific Field Procedures

Ronhill Cleaners
71 Forest Avenue
Glen Cove, NY

1.0 Monitoring the CMT Multi-ports

Water level measurements can be taken in each port of the five multi-port wells to monitor or to generate data to determine water table or potentiometric surfaces.

Water levels can be accurately measured using the Solinst Mini 101 Water Level Meter or similar equipment. The water level meter is a narrow ¼" (6 mm) tape and mounted on a small reel. Water levels in the multi-ports should be measured within a 24-hour maximum period whenever possible. When measuring the multi-ports for water table or potentiometric surface analysis, and if the contaminant history is known for each of the multi-ports, it is advisable to monitor water levels beginning with the least contaminated wells first and progressing to the most contaminated wells last.

The standard procedure for monitoring the multi-ports is described below.

- Calibrate measuring devices according to the manufacturer's specifications.

- Prior to taking a water level measurement at each multi-port, decontaminate the measuring device. During decontamination, measuring tapes should be inspected for kinks, cracks, or tears and, if present, repaired or replaced with undamaged equipment.

- Visually inspect the multi-port to ensure that it is undamaged, properly labeled and secured. Any damage or problems with the multi-port head should be noted on the field log book and the appropriate personnel notified for repair or replacement of the equipment.

- Uncap the multi-port and monitor the air space (if contamination is suspected) above the open casing per the project-specific health and safety plan. Observe if any air is flowing into or out of the casing. If such conditions are observed, note them in the field log book or Water Level Measurement Form, as appropriate. Lower the electric sounder or equivalent (product probe or steel tape) into the multi-port until the water surface is encountered. If air is observed to be entering or flowing out of the casing, the sounder should not be placed inside the multi-port until the airflow stops and pressure equalizes.

- Measure the distance from the water surface to the permanent reference point. If no permanent reference point is available for an aboveground completion, measure from another permanently fixed structure or from ground level. The point of measurement should then be noted in the field log book and the appropriate form on which the water level is recorded. For flush mount completions, such as street boxes, the water level measurement should be referenced to a point marked on the top of the casing.

Any aboveground completions without permanent reference points or marks should be brought to the attention of the appropriate supervisory personnel per the project-specific work plans.

- Collect measurements until two consecutive measurements are identical or within the specified tolerance of the project-specific work plans (usually 0.01 ft). Record appropriate information in the field log book or on the Water Level Measurement Form. At a minimum, the following information must be recorded:
  - Project name and number
  - Date and time of measurement collection
  - Water level measurement
  - Total depth measurement
  - Weather conditions
  - Problems encountered
- Sound the bottom of the port, to verify total depth and as a cross-reference for identify and verification of the port.
- If product or other nonaqueous liquid is encountered, record the information and bring it to the attention of the appropriate supervisory personnel.
- Cap and relock the multi-port.

2.0 Operations & Maintenance Procedures: Soil Vapor Extraction (SVE) System

The SVE Operation and Maintenance (O&M) procedures are as follows:

- Ascertain if the blower is in operation by listening for audible noise or opening the starter box on the side of the blower housing and depressing the start or stop switch.
- Turn off the blower and open the demister drum and check if there is any water accumulated inside.
- If water is present, transfer the water into a DOT approved 55-gallon drum for storage until it can be removed as Hazardous Waste.
- Check the applied vacuum to ensure the system is operating at full capacity. The first reading should be collected from the port located above where the piping enters the ground leading to the well field. The applied vacuum at this port is generally 14-inches of water column (WC). The second reading should be collected from the Cove Photo depressurization line. Since this point is used for depressurization of the sub-

slab, the applied vacuum is adjusted to only 4-inches WC by adjusting the ball valve. The last applied vacuum reading to be taken is from VEW-1 (via a port at the well head). VEW-1 is currently the only well in operation. Because VEW-1 is the last well in series in the system, a decrease in vacuum of approximately 50-percent is generally observed a drop in between the blower and the well head.

- Collect the Photoionization detector (PID) readings at the influent and effluent of the SVE system and record them including the time of measurement in the log book. To check concentrations on the influent side (of the carbon vessels) fill a Tedlar bag by connecting it to the port located on the discharge line of the blower. Once the Tedlar bag is filled, remove it from the port, connect the PID, and record the reading. On the effluent side, a 2–inch ball valve is located just above the base of the stack, place the tip of the PID inside the open ball valve and record the reading

- Record the current reading on the hour totalizer located on the starter box on the side of the blower housing.

- Report any abnormal noise during start up and shutdown of blower which may have occurred due to loose belt tension, mechanical abrasion of internal parts.

- Report any leaks in the SVE vapor line as well as leaks in knockout tank (demister drum).

3.0 Operations & Maintenance Procedures: Sub-Slab Depressurization System

The sub-slab depressurization system Operation and Maintenance (O&M) procedures are as follows:

- Conduct a visual inspection of the complete system (e.g vent fan, piping, warning indicator, labeling on system, etc)

- Ascertain if the blower is in operation by listening for audible noise or opening the starter box on the side of the blower housing and depressing the start or stop switch

- Report any abnormal noise coming from the blower which may have occurred due to loose belt tension, mechanical abrasion of internal parts.

- Check the applied vacuum to ensure the system is operating at full capacity.

- Check the system for leaks. With the depressurization system operating, smoke tubes will be used to check for leaks through concrete crack, floor joints, and at the suction point. Any leaks identified should be resealed until smoke is no longer observed flowing through the opening.

- Inspect the exhaust point to verify no air intakes have been located nearby

- Conduct appropriate preventative maintenance (e.g., replacing vent fans), repairs and/or adjustments to the system to ensure its continued effectiveness at mitigating exposures related to soil vapor intrusion.

Appendix B

HEALTH AND SAFETY PLAN (HASP)

HEALTH AND SAFETY PLAN FORM	*This document is for the exclusive*	**CAMP DRESSER & McKEE INC.**
CDM Health and Safety Program	*use of CDM and its subcontractors*	**PROJECT DOCUMENT #:**

PROJECT NAME	Ronhill Cleaners Site No. 130071	**PROJECT#**		**REGION**	PSG NER
JOBSITE ADDRESS	71 Forest Ave. Glen Cove, NY	**CLIENT**			NYSDEC
		CLIENT CONTACT			Nathan Putnam
		CLIENT CONTACT PHONE #			(518) 402-9620

( ) AMENDMENT TO EXISTING APPROVED H&SP
( ) H&SP AMENDMENT NUMBER? _____ **( ) DATE EXISTING APPROVED H&SP** _____

OBJECTIVES OF FIELD WORK:
(e.g. collect surface soil samples):

1)collect subslab and indoor air samples
2) Install groundwater monitoring wells
3) sample groundwater monitoring wells
4) conduct maintenance and monitoring of existing SVE system

Type *Check as many as applicable*

Active	(X)	Landfill	( )	Unknown	( )
Inactive	( )	Uncontrolled	( )	Military	( )
Secure	( )	Industrial	(X)	Other (specify)	( )
Unsecure	(X)	Recovery	( )		
Enclosed space	( )	Well Field	( )		

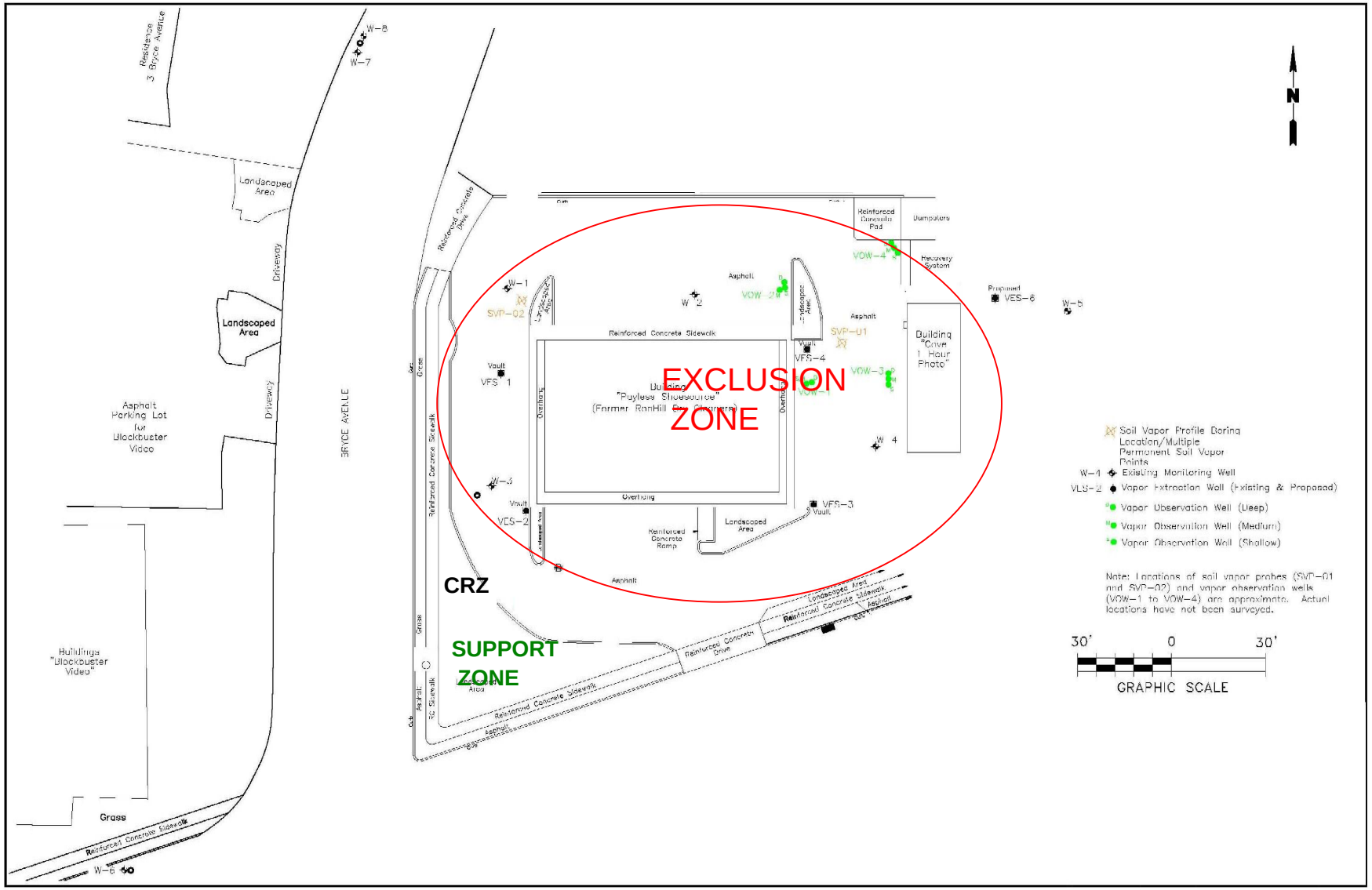
All requirements described in the CDM Health and Safety Assurance Manual for Hazardous Waste Operations are incorporated in this health and safety plan by reference.

DESCRIPTION AND FEATURES:

Presently the site is an operating reatil establishment, the former Ronhill Cleaners conducted dry cleaning operations from 1963 through 1993. In 2003 the site was place on the State's Superfund list and a remedial investigation was conducted. Investigation identified the contamination at the surrounding soils, soil vapor and groundwater in and around the site. The presence of contaminated soils vapor lead to the installation of subslab venting systems at the site and at residential dwelling north of the site on Bryce Ave. A series of groudwater monitoring wells was installed southwest of the site. They confirm the offsite presence of site related contamination in area groundwater, a sole source aquifer.

SURROUNDING POPULATION: (x) Residential (X) Industrial (x) Commercial ( ) Rural (x) Urban OTHER:

SITE MAP: *Show Exclusion, Contamination Reduction, and Support Zones. Indicate Evacuation and Reassembly Points*



Exculsion zones are ten (10) feet around the wells/vapor points and contamination reduction zones are located 10 feet around the exclusion zone.

HEALTH AND SAFETY PLAN FORM	*This document is for the exclusive*	**CAMP DRESSER & McKEE INC.**
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HISTORY: *Summarize conditions that relate to hazard. Include citizen complaints, spills, previous investigations or agency actions, known injuries, etc.*

VOCs have been a concern at this site due to spills associated with several dry cleaners along Willis and Albertson Avenues. In 1998 the EPA sent out letters informing NYSDOH of the satisfactory closure of any underground injection wells and floor drains that were contaminated located at the many dry cleaners. From 1996 to 2002 packed tower aeration systems were put in place at the Alberston Water District supply wells. VOCs are also believed to be emanating from unknown sources. It is the objective of this investigation to locate the unknown sources and size/location of the plume.

WASTE TYPES: ( ) Liquid ( ) Solid ( ) Sludge ( ) Gas ( ) Unknown (X) Other, specify: contaminated groundwater

Check as many as applicable.

( ) Corrosive	( ) Flammable	( ) Radioactive
( ) Toxic	**(X) Volatile**	( ) Reactive
( ) Inert Gas	( ) Unknown	**(x) Other, specify:** **PCE in groundwater,** soil vapor and subsurface soils

WORK ZONES: *Describe the Exclusion, Contamination Reduction, and Support Zones in terms on-site personnel will recognize*

The exclusion zone will include all points within 10 feet of the investigation activities or a sampling location. The contamination reduction zone will consist of a ten foot radius outside of the exclusion zone. The support zone will be a 10 foot radius outside of the CRZ. All zones are mobile, established in consideration of the prevailing wind direction and will be established and moved as work crew advances to new locations.

HAZARDS OF CONCERN:

(X) Heat Stress	**(X) Noise**
(X) Cold Stress	( ) Inorganic Chemicals
( ) Explosive/Flammable	**(X) Organic Chemicals**
( ) Oxygen Deficient	**(X) Motorized Traffic**
( ) Radiological	**(X) Heavy Machinery:Drill Rig**
( ) Biological	**(X) Slips, Trips, & Falls**
( ) Other	

FACILITY'S PAST AND PRESENT DISPOSAL METHODS AND PRACTICES:

The site is an investigation of potential sources of contamination to a public supply well. Historic facilities investigated are no longer operational and buildings have been converted to other retail establishments. A small scale SVE system is currently in operation.

HEALTH AND SAFETY PLAN FORM **CDM Health and Safety Program**	*This document is for the exclusive use of CDM and its subcontractors*	**CAMP DRESSER & McKEE INC.** **PROJECT DOCUMENT #:**

HAZARDOUS MATERIAL SUMMARY: *Circle waste type and estimate amounts by category.*

CHEMICALS: *Amount/Units:*	**SOLIDS:** *Amount/Units:*	**SLUDGES:** *Amount/Units:*	**SOLVENTS:** *Amount/Units:*	**OILS:** *Amount/Units:*	**OTHER:** *Amount/Units:*
Acids	Flyash	Paints	**Halogenated (chloro, bromo) Solvents**	Oily Wastes	Laboratory
Pickling Liquors	Mill or Mine Tailings	Pigments		Gasoline	Pharmaceutical
Caustics	Asbestos	Metals Sludges	Hydrocarbons	Diesel Oil	Hospital
Pesticides	Ferrous Smelter	POTW Sludge	Alcohols	Lubricants	Radiological
Dyes/Inks	Non-Ferrous Smelter	Aluminum	Ketones	PCBs	Municipal
Phenols	Metals	Distillation Bottoms	Esters	Polynuclear Aromatics	Construction
Halogens	Other	Other	Ethers	Other	Munitions
Metals	*specify:*	*specify:*	Other *specify:* **PCE**	*specify:*	Other *specify:*
Dioxins					
Other *specify:*					

OVERALL HAZARD EVALUATION: ( ) High () Medium (x) Low ( ) Unknown *(Where tasks have different hazards, evaluate each.)*

JUSTIFICATION: The contamination is isolated to a sole source aquifer and the VOC concentration is considered low for human health hazards.

FIRE/EXPLOSION POTENTIAL: ( ) High ( ) Medium (x) Low ( ) Unknown

BACKGROUND REVIEW: (X) Complete ( ) Incomplete

KNOWN CONTAMINANTS		HIGHEST OBSERVED CONCENTRATION	PEL/TLV *ppm or mg/m3 (specify)*	IDLH *ppm or mg/m3 (specify)*	Warning Concentration *(in ppm)*	SYMPTOMS & EFFECTS OF ACUTE EXPOSURE	PHOTO IONIZATION POTENTIAL
Tetrachloroethylene (PCE)	GW	190000 ug/L	25 ppm	150 ppm	47 ppm	Irritated eyes, nose, throat, flushed face & neck, dizziness	9.32
Trichloroethylene (TCE)	GW	170 ug/L	50 ppm	1,000 ppm	82 ppm	Vertigo, visual disturbance, headache, drowsiness	9.45
Tetrachloroethylene (PCE)	S	18000 mg/kg	25 ppm	150 ppm	47 ppm	Irritated eyes, nose, throat, flushed face & neck, dizziness	9.32
Tetrachloroethylene (PCE)	A	211 ug/m^3	25 ppm	150 ppm	47 ppm	Irritated eyes, nose, throat, flushed face & neck, dizziness	9.32
Tetrachloroethylene (PCE)	SV	1077 ug/m^3	25 ppm	150 ppm	47 ppm	Irritated eyes, nose, throat, flushed face & neck, dizziness	9.32

Chemicals which detected concentrations at estimated levels are not presented.

NA = Not Available **NE = None Established** **U = Unknown**

Attach, to this plan, an MSDS for each chemical you will use at the site.

S = Soil SW = Surface Water T = Tailings W = Waste TK = Tanks SD = Sediment SV = Soil Vapor
A = Air GW = Ground Water SL = Sludge D = Drums L = Lagoons OFF = Off-Site

HEALTH AND SAFETY PLAN FORM	*This document is for the exclusive*	**CAMP DRESSER & McKEE INC.**
CDM Health and Safety Program	*use of CDM and its subcontractors*	**PROJECT DOCUMENT #:**

TASK DESCRIPTION/SPECIFIC TECHNIQUE/SITE LOCATION *(attach additional sheets as necessary)*	**Type**	**Primary**	**Contingency**	**HAZARD & SCHEDULE**
1. Collect soil vapor and indoor air samples	**Intrusive** (circled)	A B C (D)	A B C D	Hi Med (Low)
	Non-intrusive	Modified	(Exit Area)	Jun-07
2. Install groundwater monitoring wells	**Intrusive** (circled)	A B C (D)	A B C D	Hi Med (Low)
	Non-intrusive	Modified	(Exit Area)	Jun-07
3. Sample new and existing groundwater wells	Intrusive	A B C (D)	A B C D	Hi Med (Low)
	Non-intrusive (circled)	Modified	(Exit Area)	Jun-07
4. Monitor and maintain existing SVE system	Intrusive	A B C (D)	A B C D	Hi Med (Low)
	Non-intrusive (circled)	Modified	(Exit Area)	Jun-07

PERSONNEL AND RESPONSIBILITIES

NAME	**FIRM/DIVISION**	**CDM HEALTH CLEARANCE**	**RESPONSIBILITIES**	**On Site?**
Frank Robinson	CDM/EMP	B-S	H & S Coordinator/Field Manager	(1-2-3-4-5)
Melisa Koberle	CDM/EMP	D-S	PM	(1-2-3-4-5)

Buddy system must be complied with either by client, CDM or contractor serving as buddy.

HEALTH AND SAFETY PLAN FORM *This document is for the exclusive* **CAMP DRESSER & McKEE INC.**

CDM Health and Safety Program *use of CDM and its subcontractors* **PROJECT DOCUMENT #:**

PROTECTIVE EQUIPMENT: *Specify by task. Indicate type and/or material, as necessary. Group tasks if possible. Use copies of this sheet if needed.*

BLOCK A - Primary

TASKS: 1 - 2 - 3 - 4 - 5 - 6 - 7 - 8
LEVEL: A - B - C - D - Modified
(x) Primary ( ) Contingency

Respiratory: (**XX**) Not needed
( ) SCBA, Airline
( ) APR
( ) Cartridge
( ) Escape Mask
( ) Other:

Head and Eye: ( ) Not needed
(x) Safety Glasses:
( ) Face Shield:
( ) Goggles:
(x) Hard Hat:
( ) Other:

Boots: ( ) Not needed
(XX) Steel-Toe
( ) Rubber **(X) Leather**
( ) Overboots: Latex (optional)

Prot. Clothing: (x) Not needed
( ) Encapsulated Suit
( ) Splash Suit
( ) Apron
( ) Tyvek Coverall
( ) Saranex Coverall
( ) Cloth Coverall
(**XX**) Other: **work clothes**

Gloves: ( ) Not needed
(**XX**) Undergloves: nitrile
(XX) Gloves: Nitrile (9 mil)
( ) Overgloves: Nitrile

Other: specify below
( ) Tick Spray
( ) Flotation Device
( ) Heating Protection
(X) Sun Screen

BLOCK B-Contingency

TASKS: 1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9 - 10
LEVEL: A - B - C - D - Modified
( ) Primary (x) Contingency

Respiratory: ( ) Not needed
( ) SCBA, Airline
( ) APR
( ) Cartridge
( ) Escape Mask
( ) Other:

Head and Eye: ( ) Not needed
( ) Safety Glasses
( ) Face Shield
( ) Goggles
( ) Hard Hat
( ) Other:

( ) Rubber ( ) Leather
( ) Overboots: Latex

Prot. Clothing: ( ) Not needed
( ) Encapsulated Suit
( ) Splash Suit
( ) Apron:
( ) Tyvek Coverall
( ) Saranex Coverall
( ) Other:

Gloves: ( ) Not needed
( ) Undergloves: PVC
( ) Gloves: Cotton
( ) Overgloves: Nitrile

( ) Flotation Device
( ) Heating Protection
( ) Sun Screen

BLOCK C

TASKS: 1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9 - 10
LEVEL: A - B - C - D - Modified
(x) Primary ( ) Contingency

Respiratory: ( ) Not needed
( ) SCBA, Airline:
( ) APR:
( ) Cartridge:
( ) Escape Mask:
( ) Other:

Head and Eye: ( ) Not needed
( ) Safety Glasses:
( ) Face Shield:
( ) Goggles:
( ) Hard Hat:
( ) Other:

Boots: ( ) Not needed
( ) Steel-Toe ( ) Steel Shank
( ) Rubber ( ) Leather
( ) Overboots:

Prot. Clothing: ( ) Not needed
( ) Encapsulated Suit:
( ) Splash Suit
( ) Apron:
( ) Tyvek Coverall
( ) Saranex Coverall
( ) Cloth Coverall:
( ) Other:

Gloves: ( ) Not needed
( ) Undergloves:
( ) Gloves:
( ) Overgloves:

Other: specify below
( ) Tick Spray
( ) Flotation Device
( ) Heating Protection
( ) Sun Screen

BLOCK D

TASKS: 1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9 - 10
LEVEL: A - B - C - D - Modified
( ) Primary ( ) Contingency

Respiratory: ( ) Not needed
( ) SCBA, Airline
( ) APR
( ) Cartridge
( ) Escape Mask
( ) Other:

Head and Eye: ( ) Not needed
( ) Safety Glasses
( ) Face Shield
( ) Goggles
( ) Hard Hat
( ) Other:

Boots: ( ) Not needed
( ) Steel-Toe ( ) Steel Shank
( ) Rubber ( ) Leather
( ) Overboots

Prot. Clothing: ( ) Not needed
( ) Encapsulated Suit
( ) Splash Suit
( ) Apron
( ) Tyvek Coverall
( ) Saranex Coverall
( ) Cloth Coverall
( ) Other:

Gloves: ( ) Not needed
( ) Undergloves
( ) Gloves
( ) Overgloves

Other: specify below
( ) Tick Spray
( ) Flotation Device
( ) Heating Protection
( ) Sun Screen

Exit Area

HEALTH AND SAFETY PLAN FORM	*This document is for the exclusive*	**CAMP DRESSER & McKEE INC.**
CDM Health and Safety Program	*use of CDM and its subcontractors*	**PROJECT DOCUMENT #:**

MONITORING EQUIPMENT: *Specify by task. Indicate type as necessary. Attach additional sheets if needed.*

INSTRUMENT	**TASK**	**ACTION GUIDELINES**		**COMMENTS** *(When and how will you use the monitor?)*
Combustible Gas Indicator	1-2-3-4-5-6-7-8	0-10% LEL 10-25% LEL >25% LEL 21.0% O2 <21.0% O2 <19.5% O2	*No explosion hazard* *Potential explosion hazard; notify SHSC* *Explosion hazard; interrupt task/evacuate* *Oxygen normal* *Oxygen deficient; notify SHSC* *Interrupt task/evacuate*	(x) Not Needed
Radiation Survey Meter	1-2-3-4-5-6-7-8	3 x Background: >2mR/hr:	*Notify HSM* *Establish REZ*	(X) Not Needed
Photoionization Detector 10.6eV Lamp Type OVM	(1-2-3)-4-5-6-7-8	*Specify:* 0 to 5 ppm: Level D. >5 ppm: Leave area. Call HSM		( ) Not Needed Monitor breathing zone continuously. Compare action levels to time-averaged breathing zone measurements
Flame Ionization Detector Type_____	1-2-3-4-5-6-7-8	*Specify:*		(X) Not Needed
Detector Tubes/ Monitox Type: Benzene	1-2-3-4-5-6-7-8	*Specify:*		(X) Not Needed
Respirable Dust Monitor Type_____	(1-2-3-4)-5-6-7-8	*Specify:* If team observes visible concentrations of airborne dust or dry, windy conditions that dust, team will leave area.		( ) Not Needed
Other *Specify:*	(1-2-3-4)-5-6-7-8	*Specify:* If team notices unusual odors or irritation of the eye or throat, they will leave the area.		

DECONTAMINATION PROCEDURES

ATTACH SITE MAP INDICATING EXCLUSION, DECONTAMINATION, AND SUPPORT ZONES AS PAGE TWO

Personnel Decontamination	**Sampling Equipment Decontamination**	**Heavy Equipment Decontamination**
Summarize below or attach diagram;	*Summarize below or attach diagram;*	*Summarize below or attach diagram;*
Team members will remove their protective clothing in the following order: 1. Equipment drop. 2. Glove removal 3. Hand and face wash. ( ) Not Needed	Sampling equipment will be decontaminated by: 1. Gross mechanical removal of dirt. 2. Detergent in water wash. 3. Potable water rinse. 4. Distilled water rinse. ( ) Not Needed	CDM will require heavy equipment contractors to decontaminate their equipment before it leaves the site. ( ) Not Needed
Containment and Disposal Method	**Containment and Disposal Method**	**Containment and Disposal Method**
Disposable protective equipment will be disposed of in CDM dumpster, unless heavily contaminated. If heavily contaminated, disposable equipment will be contained in drums and left on site for proper disposal.	Sampling equipment cleaning water solutions will be allowed to drain to the groundwater. If heavily contaminated, disposable equipment will be contained in drums and left on site for proper disposal.	Decontamination fluids will be released to the ground, unless heavily contaminated. If heavily contaminated, contractor will contain the waste in drums, and left on site for proper disposal.

HEALTH AND SAFETY PLAN FORM *This document is for the exclusive* **CAMP DRESSER & McKEE INC.**

CDM Health and Safety Program *use of CDM and its subcontractors* **PROJECT DOCUMENT #:**

EMERGENCY CONTACTS	NAME	PHONE
Water Supply		
Site Telephone		NA
EPA Release Report #:		800-424-8802
CDM 24-Hour Emergency #:		732-539-8128
CHEMTREC Emergency #:		800-424-9300
Underground Utility	UFPO	800-962-7962

CONTINGENCY PLANS:

Summarize below

If CDM work team observes hazards for which they have not prepared, they will withdraw from the area and call the CDM Project Manager

SHSC will designate evacuation routes. Teams will cease work if they see lightning or thunder storms in the area.

CDM may rely on instruments operated by contractor personnel only upon HSM approval. If contractor directs a higher level of protection than this plan does, CDM personnel will wear that level. CDM personnel may choose to wear more potection than directed by this plan.

Contractor will be expected to inspect the drill rig and certify its suitability for the project to the CDM site health and safety coordinator.

If work team encounters pure perchloroethylene, the safety procedures described in this safety plan should protect them adequately. Team members will avoid contact, and minimize their exposure to the vapors emitted.

HEALTH AND SAFETY PLAN APPROVALS

Prepared by J. Beattie Date March 2007

Date _____

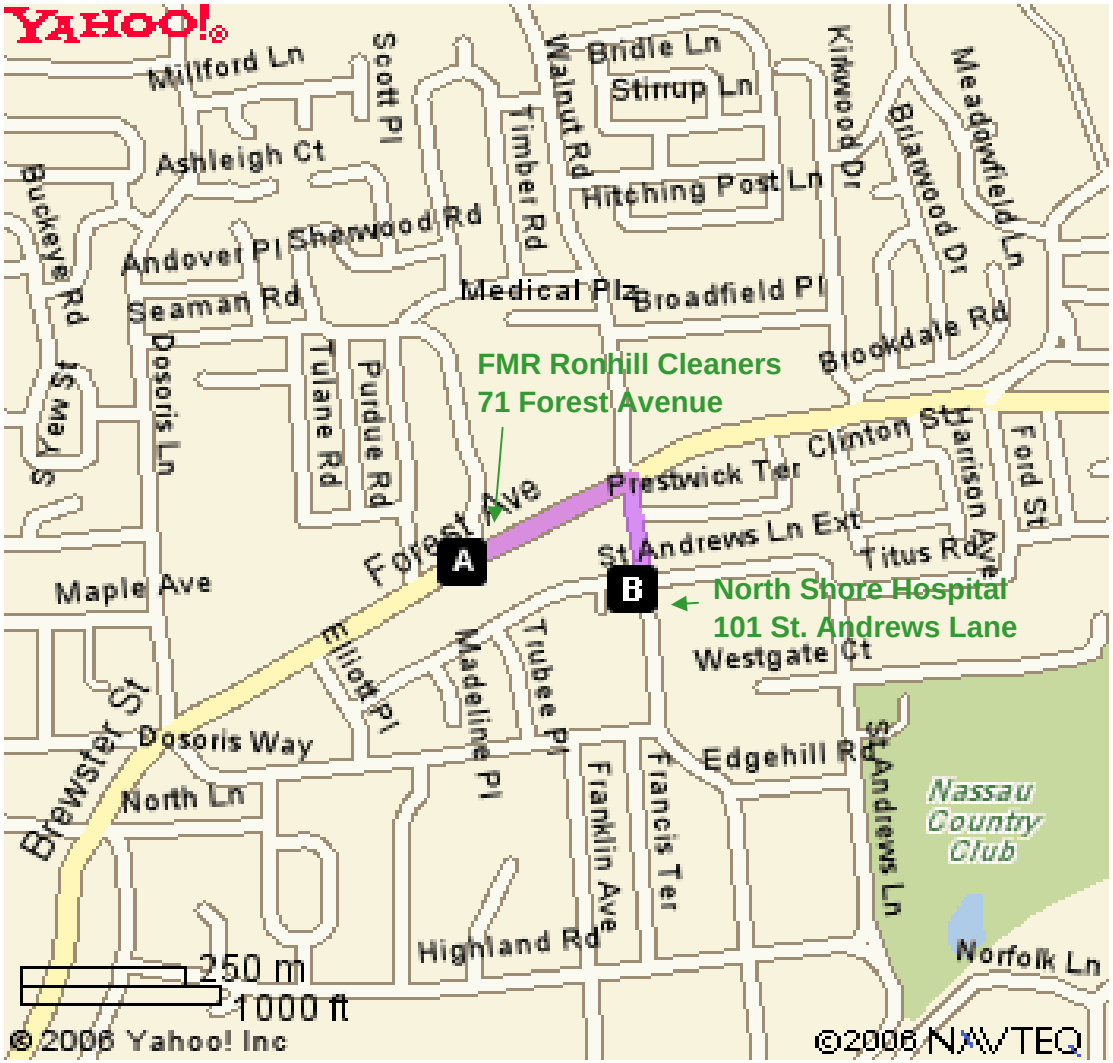
HSM Signature _____ Date 9/27/2007

EMERGENCY CONTACTS	NAME	PHONE
CDM Health and Safety Manager	Chris Marlowe	732-590-4632
CDM Field Manager	Melissa Koberle	212-785-9160
CDM Site Safety Coordinator	Melissa Koberle	212-785-9160
Client Contact	Nathan Putnam	212-402-9620
Other *(specify)*		
Environmental Agency		
State Spill Number	New York	800-342-9296
Fire Department		911
Police Department		911
State Police		911
Health Department		
Poison Control Center	Nationwide	800 / 222 - 1222
Occupational Physician	Kenneth Chase	800 / 777 - WOHA

HOSPITAL INFORMATION

Name North Shore Hospital
Phone 516 674-7501
Addre ss: 101 Saint Andrews Lane, Glen Cove, NY 11542
Route Northeast on Forest Ave,
Turn Right onto Walnut Road,
Turn Right onto St. Andrews Lane
(Total travel distance: 0.29 miles)

ROUTE TO HOSPITAL MAP:



HEALTH AND SAFETY PLAN SIGNATURE FORM

CDM Health and Safety Program

All site personnel must sign this form indicating receipt of the HASP. Keep this original on site or with the field manager. It becomes part of the permanent project files. Send a copy to the Health and Safety Manager (HSM).

SITE NAME/NUMBER: Ronhill Cleaners Site Number 130071

DIVISION/LOCATION: 71 Forest Ave., Glen Cove, NY 11542

CERTIFICATION:

I understand, and agree to comply with, the provisions of the above referenced HASP for work activities on this project. I agree to report any injuries, illnesses or exposure incidents to the site Health and Safety Coordinator (SHSC). I agree to inform the SHSC about any drugs (legal and illegal) that I take within three days of site work.

PRINTED NAME	SIGNATURE	DATE

November 2006

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November 2006

Generic Community Air Monitoring Plan

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

Appendix C

CITIZEN PARTICIPATION PLAN (CPP)

CITIZENS PARTICIPATION PLAN
RONHILL CLEANERS
(Site No.:1-30-071)
Glen Cove, New York

Prepared for

New York State Department of Environmental Conservation
Investigation and Design Engineering Services
Standby Contract No. D004437
Work Assignment No. D004437-9

Prepared by

Camp Dresser & McKee
Raritan Plaza I, Raritan Center
Edison, New Jersey

March 2008

Contents

Section 1
Introduction

This Citizens Participation Plan (CPP) for Ronhill Cleaners (herein referred to as the "site") located at 71 Forest Avenue in the City of Glen Cove, Nassau County, New York was prepared by Camp Dresser and McKee Inc. (CDM) for the New York State Department of Environmental Conservation (NYSDEC) under the Engineering Services for Investigation and Design, Standby Contract No. D004437. All background and site information used in the development of this CPP was furnished by NYSDEC. The site is a former dry cleaning facility at which soil, groundwater, and soil vapor contamination have been identified.

1.1 Purpose and Objectives

The objective of this work assignment (WA) is to address the data gaps in the ongoing remedial investigation and evaluate remedial action alternatives for the site. The objectives of the work plan tasks will be to further:

- Delineate the extent of groundwater contamination;
- Delineate the extent of soil vapor contamination which is impacting local structures;
- Determine if a contaminant plume east of the site may be contributing to on-site contamination;
- Evaluate whether site contamination is impacting the Seaman Road public supply well;
- Conduct maintenance and monitoring of the existing onsite soil vapor extraction (SVE) system and eight (8) offsite sub-slab depressurization (SSD) systems;
- Evaluate remedial action alternatives using the data collected during the RI.

1.2 Site Description and Background

1.2.1 Site Description

The site is located at 71 Forest Avenue in the City of Glen Cove, Nassau County, New York. More specifically, the site is located on the northeast corner of Bryce Avenue and Forest Avenue. The site is currently occupied by Payless Shoes store. The property is surrounded by residential and commercial properties.

1.2.2 Operational and Remedial History

Information on the site operations and previous remedial investigations were provided by NYSDEC and are summarized below.

A dry cleaner operated at the site from 1963 until 1993. In March 1993 the site was listed in the New York State Registry of Inactive Hazardous Waste Sites when it was determined that leakage or improper disposal of dry cleaning chemicals had impacted the soil and groundwater beneath the site. The contaminant of concern on the site is tetrachloroethylene (also known as PCE). In June 1995, the site was listed as a Class 2 Inactive Hazardous Waste Site.

In August 1996 a soil vapor extraction system designed to remove volatile organic compounds (VOCs) from the unsaturated soil beneath the site was started as an interim remedial measure (IRM). The SVE system operated at the site for about four years.

In 1998, the Site was referred to the NYSDEC Division of Environmental Enforcement (DER) for State funding. In July 1999 an RI/FS work plan was finalized, which was to be implemented by the NYSDEC. Subsequently, a former operator of the dry cleaner took over the project as a potentially responsible party (PRP) and developed a modified remedial investigation (RI) work plan, which was approved by NYSDEC in December 1999. This work plan was implemented in June 2000 and an RI report was completed in March 2001.

The 2000 RI focused on the area to the southwest of the site, since based on groundwater data collected during the RI, groundwater generally flows to the southwest from the site. During this investigation eight monitoring wells (MW-1 through MW-8) were installed. PCE was detected in the shallow unsaturated zone soils at concentrations ranging from not detected to 18 milligrams per kilogram (mg/kg) near the northwest corner of the building. Soil contamination was also identified between 20 and 85 feet below ground surface (bgs) near the northeast corner of the building, with a maximum concentration of 11 mg/kg detected at the 78-80 foot interval bgs-roughly corresponding to the reported depth of the water table. The investigation identified the presence of non-aqueous phase liquid (NAPL) at the groundwater table interface, approximately 80 feet bgs. On-site groundwater sampling identified dissolved contamination extending at least 120 feet below the water table (~200 feet bgs). The RI revealed that the offsite VOC plume was much larger than anticipated. The data also suggested the presence of an offsite source of contamination originating east of the site. Based on the results of the RI, it was concluded that additional investigation would be needed to delineate the extent of the VOC plume. The highest concentrations of dissolved VOCs detected in groundwater were 190,000 µg/L on-site and 15,000 µg/L off-site.

VOC contamination has also been detected in the City of Glen Cove Public Water Supply Well Field located on Seaman Road, northeast of the site. The data collected during the 2000 RI suggests that the well field is located upgradient of the site; however groundwater elevation data collected by NYSDEC in 2000 indicated that pumping of the Seaman Road public supply wells could influence groundwater

elevations and subsequently, groundwater flow pathways at the site. NYSDEC's analysis consisted of installing transducers in four of the site monitoring wells (MW-5, -6, -7, and -8) and recording pressure measurements every half hour for a month. During the test period, the City of Glen Cove was conducting pump tests at the Seaman Road supply well field. Based on this information, a second interim remedial measure (IRM) was considered by NYSDEC to address groundwater impacts beneath the site. The former operator declined to implement the IRM.

In 2003, NYSDEC referred the site for funding by the New York State Superfund for implementation of a remedial investigation/feasibility study (RI/FS) and IRM. At that time, a remedial investigation was initiated with a state consultant.

An RI/FS was prepared by Environmental Resources Management (ERM) and approved by NYSDEC in April 2005. The ERM work plan for the IRM, which incorporated the findings of the RI was approved by NYSDEC in June 2006.

1.3 Environmental Setting

The site is relatively flat and lies at an approximate elevation of 125 feet above mean sea level (msl). The ground water table lies at an approximate elevation of 45 feet above msl at the site (~80 feet below ground surface). The closest surface water body to the site is Glen Cove Creek, which lies approximately 5,000 feet southwest of the site. Glen Cove Creek discharges into Hempstead Harbor.

1.4 Fate and Transport

Tetrachloroethene is a manufactured chemical that is widely used in the dry-cleaning industry. It is also used for degreasing and is found in consumer products including some paint and spot removers, water repellents, brake and wood cleaners, glues, and suede protectors. Other names for tetrachloroethene include tetrachloroethylene, perchloroethylene, and PCE.

1.4.1 Fate of PCE

The fate of PCE is dominated by its volatility and degradation. PCE's presence in surface soils or surface water is, usually short-lived, providing a continuing source is not present.

In the atmosphere, PCE is expected to be present primarily in the vapor phase and not sorbed to particulates because of its high vapor pressure of 18 mm Hg. Vapor-phase PCE will be degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals. Direct photolysis is not expected to be an important environmental fate process since PCE only absorbs light weakly in the environmental ultraviolet (UV) spectrum.

The dominant fate of PCE in soils is volatilization. Based on its K_{oc} value of 265 mL/g, PCE is moderately mobile in soils. Consequently, PCE has the potential to migrate through the soil into groundwater. PCE has a specific gravity greater than water (1.62) indicating that pure liquid phase PCE will sink when dissolved in groundwater. The solubility of PCE in water is 150 mg/L. Biodegradation under anaerobic conditions in soil and groundwater may occur at a relatively slow rate with half lives on the order of months or longer. PCE in groundwater can undergo reductive dechlorination catalyzed by anaerobic bacteria. The PCE will tend to degrade to trichloroethylene (TCE). Subsequent degradation to *cis*-1,2-dichloroethene (DCE) or *trans*-1,2-DCE and then to vinyl chloride can also occur via anaerobic mechanisms. Vinyl chloride can further degrade to ethylene.

Volatilization is also an important fate process of PCE in surface waters based on its Henry's Law constant of 1.73×10^{-2}atm-m^3/mol. PCE is also not expected to adsorb to suspended solids and sediment in water based upon its K_{oc} value. The half-lives in soil and groundwater were reported to be 180-360 days and 270 days respectively. A reported K_{ow} value of 351 in fish suggests that the potential for PCE to bioconcentrate in aquatic organisms is low.

1.4.2 Transport of PCE

Liquid phase PCE discharged directly to the ground surface would be expected to migrate downward through the unsaturated zone in a relatively linear pattern, with minimal dispersion from the discharge location. The unsaturated zone is primarily sandy material, so complex migration pathway along lower permeability zones is not expected. The unsaturated zone is approximately 80 feet thick.

Significant soil vapor contamination may be present in the unsaturated zone. The vapor phase PCE vaporizes upward while the liquid phase migrates downward. Chlorinated solvents in the vapor phase can cause significant indoor air contamination due to residual unsaturated soil contamination or vaporization directly from the groundwater table interface.

Once liquid phase PCE encounters the water table, some of the solvent will become dissolved in the groundwater and begin to move in the direction of groundwater flow. If the quantity of solvent reaching the water table is sufficient, some of the solvent will remain in an undissolved state as a DNAPL and, since PCE is denser than water, the solvent will continue to move downward under the influence of gravity. DNAPL will continue to sink until it encounters a lower permeability zone, which would slow or stop the downward migration. DNAPL could pool or accumulate on top of a lower permeability zone and remain stationary or move in the down-slope direction of the lower permeability zone. If sufficient DNAPL is pooled or trapped in the aquifer, it will act as a continual source of dissolved groundwater contamination. Movement of DNAPL in the saturated zone can be very complex, with movement

controlled by the permeability of subsurface stratigraphic units, the shape and configuration of lower permeability zones, and/or the dip of bedding planes.

At the site, groundwater generally flows toward the southwest. However, movement of PCE in the saturated zone at the site may have been complicated by complex geology resulting in radial flow in the area and groundwater extraction at the Seaman Road supply well and the supply well at Glen Cove Hospital.

Section 2
Scope of Work

2.1 Task 1 - Work Plan Development

This Work Plan references procedures detailed in the CDM Generic Quality Assurance Project Plan (QAPP) revised July 2007 which has been provided to NYSDEC for Contract Number D-004437. The Generic QAPP presents methods that will be used to collect field data including project samples, and focuses on the analytical methods and quality assurance/quality control (QA/QC) procedures that will be used to analyze project samples, ensure the data are of known and acceptable quality, and manage the resultant data. Procedures that are not contained in the current version of the CDM Generic QAPP are provided in Appendix A of the RI/FS Work Plan.

2.2 Task 2A – Remedial Investigation

Prior to outdoor intrusive work, a private utility locate firm will be subcontracted to mark out subsurface structures and utilities at the proposed locations. Their work will be conducted in addition to the general utility markout (One-Call) to limit the potential for encountering subsurface utilities and structures during the intrusive work.

In addition to the activities detailed below, CDM will try to obtain well construction and recent operation records for Seaman Road Well #2 (N-05261) and the Glen Cove Hospital supply wells to determine flow rates and pumping frequency for the wells. This information will be utilitzed to evaluate the impact of pumping from these well on the contaminant plume.

2.2.1 Groundwater Monitoring Well Installation

Four monitoring wells (MW-16 through MW-19) are proposed to further delineate the extent of the VOC groundwater contamination. The locations will be drilled using hollow stem augers. The monitoring wells will be constructed using a pre-assembled Solinst CMT multi-level system to allow the collection of groundwater samples at multiple depths at each location. This flexible system uses continuous polyethylene tubing, with customized screen intervals based on the borehole logs. The 1.7-inch OD tubing is fixed with seven semi-circular channels or ports. The six outer channels, although not circular, have an ID of approximately 7/16 inch (11 mm) and the smaller center channel has an ID of 3/8 inch (9.5 mm). The multi-channel tubing has a ridge down its entire length to allow for easy identification of specific channels.

Holes are drilled in a vertical line into a given channel at a specified depth according to the zone to be monitored, forming a port. A stainless steel mesh is fixed in place over the port to prevent fines from entering. Each channel is sealed with a polyethylene sealant below the port openings to prevent cross contamination. A vent hole is drilled into the channel just below the port. This allows water from the monitoring zone to fill the channel below the zone and allowed air to escape as the system was lowered into the hole, avoiding buoyancy. Each of the ports is screened at

a different depth to determine the vertical distribution of contamination in the aquifer.

Based on the review of previous groundwater data for the site, VOC contamination consisting primarily of PCE extends from the water table (~80 feet bgs) to at least 142 feet bgs in off-site wells. At several locations dissolved PCE is present in the upper 60 feet of the water table and then encountered again at depth above the Raritan clay, approximately 200 feet bgs. It is suspected that this deep contamination may be originating from another source, east of the site. Onsite, contamination is highest near the water table but is distributed throughout the aquifer from the water table to the Raritan clay. The proposed wells would be installed with seven sample ports placed starting five feet below the water table surface and then every 20 feet thereafter to approximately 200 feet bgs. Each port will have a one foot screen. The final port placement will be based on field observations. CDM proposes to install the wells as follows:

- MW-16: Northwest, along Philips Road to delineate the extent of groundwater contamination in this direction and assess flow direction.
- MW-17: East of the site along Walnut Road, between the site and the dry cleaner located in the strip mall at Forest Avenue and Walnut Road to determine if there may be impacts from the dry cleaner to the east.
- MW-18: Southeast of the site along St. Andrew Lane between the site and Glen Cove Hospital, to delineate the extent of VOC groundwater contamination in this direction, determine the flow in this direction, and the influence of pumping of the supply well at the hospital.
- MW-19: Northwest of the site along Tulane Road or on the Elementary School property to delineate the northern boundary of the plume west of the site.

The final well locations will be determined in consultation with the NYSDEC Project Manager. The drilling logs for the new off-site wells will be evaluated along with existing well and vertical profile gamma logs to determine if there are preferential layers of groundwater migration. Soil cuttings and well development water generated during installation of the monitoring wells will be containerized and stored in a secure location on-site until waste characterization can be completed. Field documentation, well installation, decontamination, and IDW sampling procedures are provided in the Generic QAPP.

2.2.2 Groundwater Sample Collection

Groundwater samples will be collected from all of the site wells following the installation of monitoring wells MW-16 through 20 to obtain current groundwater quality data. Prior to sampling, depth to water measurements will be collected from the wells using an interface probe prior. Three well volumes will be purged from

wells MW-3 (old), MW-1 through -8 and ERM-9 through -15 prior to sampling. Final determination of well purging and sampling protocols will be developed in consultation with NYSDEC. During purging, pH, temperature, conductivity, oxidation-reduction potential (ORP), dissolved oxygen, and turbidity will be measured. Groundwater samples will be collected from each of these wells using a disposable bailer or alternate apparatus/methodology approved by NYSDEC.

At the multi-port well locations, the sample lines will be purged prior to sample collection. Groundwater samples will be collected in accordance with the procedures outlined in the Generic QAPP. Purge water will be containerized and staged in a secure location on-site until waste characterization can be completed. IDW sampling procedures are detailed in the Generic QAPP.

The groundwater samples will be sent to an off-site laboratory for VOC analysis via EPA Method SOM01.2-Trace, to obtain detection limits below the New York Ambient Groundwater Quality Standards. All samples will be analyzed by an ELAP certified laboratory. A NYSDEC ASP Category B data deliverable will be provided for these analyses.

2.2.3 Sub-Slab Soil Vapor and Indoor Air Sampling

Sub-slab soil vapor and indoor air sampling will be conducted at up to six structures along Bryce Avenue, north of the previously sampled buildings to determine the extent of VOC contaminated soil vapor north of the site. Sub-slab soil vapor and indoor air sampling will also be conducted at and at three locations east of the Site, to determine the extent of VOC contamination east of the site. These samples will be collected in accordance with the NYSDOH "*Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York, dated October 2006"* and the NYSDEC "*Draft Division of Environmental Remediation (DER)-10 Technical Guidance for Site Investigation and Remediation, dated December 2002"*. This task will include:

- Collect one sub-slab soil vapor sample at each structure,
- Collect an indoor air sample at the basement level (if present) and first floor of each structure, and
- Collect one outdoor ambient air sample at each structure; where two structures are located within close proximity to each other, one ambient air sample will be collected to represent both locations.

2.2.3.1 Sub-Slab Soil Vapor Sample Collection

At each structure, sub-slab soil vapor samples will be collected from the basement level (if present) and first floor of the building. A duplicate sub-slab soil vapor sample will also be collected at one of the six structures along Bryce Avenue and one of the three structures east of the Site. Sample port installation and vapor sample collection will parallel the procedures and methods of previous investigators.

The sub-slab sample locations will be installed as permanent points to facilitate future sampling events. After the slab has been inspected, the location of any subsurface utilities determined, and the ambient air surrounding the proposed sampling location screened with a PID, a hammer drill will be used to advance a boring to a depth of approximately two inches beneath the building slab. A permanent port constructed of stainless steel tubing and fittings will be installed in the opening. The annular space between the borehole and the sample tubing will be filled and sealed with anchoring cement. Teflon tubing will be connected to the stainless steel sample port and utilized for sample collection. Flow rates for both purging and sample collection must not exceed 0.2 liters per minute to minimize ambient air infiltration during sampling. Approximately three dead air volumes of gas will be purged from the subsurface probe and captured in a Tedlar™ bag using a syringe. PID readings will be observed from this sample and the highest reading shall be recorded on the appropriate field form. A three-way valve will be utilized to allow purging of all the lines. The end of the tubing will be connected directly to the summa canister's regulator intake valve. The sample shall be collected with a laboratory-certified summa canister with dedicated regulator set for 24-hour sample collection. Field documentation and sampling procedures are provided in the QAPP.

2.2.3.2 Indoor Air Sample Collection

Indoor air samples will be collected on the basement level (if present) and main floor level of the six structures. One of the indoor air samples will be collocated with the sub-slab sample. The New York State Department of Health *Indoor Air Quality Questionnaire and Building Inventory* shall be completed for each structure where indoor air testing is being conducted. Field documentation and sampling procedures are provided in CDM's Generic QAPP. A copy of the NYSDOH questionnaire is also provided as Attachment 1 to the Generic QAPP.

All indoor air samples will be collected with a laboratory-certified summa canister regulated for a 24-hour sample collection. The summa canister will be placed in such a location as to collect a representative sample from the breathing zone at three feet above the floor.

2.2.3.3 Outdoor (Ambient) Air Sample Collection

An outdoor ambient air sample will be collected at each structure where indoor air sampling is being conducted. Where two structures are located within close proximity to each other, one ambient air sample will be collected to represent both locations. All outdoor air samples will be collected with a laboratory-certified summa canister regulated for a 24-hour sample collection. The summa canister will be placed upwind of the structures in such a location as to collect a representative sample from the breathing zone at four or six feet above the ground. Field documentation and sampling procedures are provided in the Generic QAPP.

The sub-slab soil vapor and indoor air samples will be sent to an off-site laboratory for VOC analysis via EPA Method TO-15. All samples will be analyzed by an ELAP

certified laboratory. A NYSDEC ASP Category B data deliverable will be provided for these analyses.

2.2.4 Investigative Derived Waste

Soil cuttings and purge water from well installation and sampling will be containerized in drums or other appropriate vessel and staged on-site in a secure location until they can be disposed of off-site.

2.2.5 Decontamination Procedures

All non-dedicated equipment and tools used to collect samples for chemical analysis will be decontaminated prior to and between each sample interval using an Alconox rinse and potable water rinse prior to reuse. Additional cleaning of the equipment with steam may be needed under some circumstances. Decontamination fluids will be containerized in drums or an appropriate container and staged in a secure location until they can be disposed of appropriately.

2.3 Task 2B – SVE System Maintenance and Monitoring

The on-site SVE system currently operates utilizing two 900 pound activated carbon vessels, a 30 gallon demister drum, one 180 cubic foot per minute blower, one vapor extraction well and one sub-slab depressurization point. The system has been online since October 24, 2005. CDM will take over the operation and maintenance of the on-site SVE system, which will include:

- Weekly monitoring of the influent and effluent using a PID
- Weekly monitoring of the vapor observation (VOW) wells using a PID
- Periodic measurement of vacuum from the VOW wells, MW-2 and MW-4 to evaluate the radius of influence of SVE system (specifically the influence at well VES-4)
- Weekly measurement of SVE system pressure, vacuum, temperature and extraction flow rates
- Bi-Monthly sampling of the influent and effluent with summa canisters; samples to be analyzed for VOCs by EPA Method TO-15.

The Operation and Maintenance procedures are detailed in the Site-specific QAPP.

2.4 Task 2C – Sub-Slab Depressurization System Monitoring and Annual Sub-Slab and Indoor Air Monitoring

CDM will conduct maintenance of the Sub-slab depressurization (SSD) systems installed at eight (8) locations. The names and address of the owners at these locations are being kept confidential in this work plan and have been provided to NYSDEC separately

Monitoring of the systems will be conducted in conjunction with the SVE system O&M visits. The Operation and Maintenance procedures are detailed in the Site-specific QAPP.

Sub-slab and indoor air sampling will be conducted annually at 20 structures. These samples will be collected in accordance with the "*Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York, dated October 2006"* and the "*Draft Division of Environmental Remediation (DER)-10 Technical Guidance for Site Investigation and Remediation, dated December 2002"*. The 20 structures to be sampled will be determined by NYSDEC. At each of the 20 structures, sub-slab and indoor air samples will be collected using 6 Liter Summa Canisters regulated for 24-hour sample collection. Six outdoor ambient air samples will be collected to represent the outdoor air quality surrounding the 20 structures. Field documentation and sampling procedures are provided in the Generic QAPP.

2.5 Task 2D – Soil Vapor Extraction System Enhancement

The objective of this work assignment task is to propose recommendations for an SVE system upgrade in order to improve system efficiency and increase contaminant removal. The following upgrades and modifications are recommended to achieve this objective:

- The current SVE system lacks efficient vapor extraction wells for extracting contaminated vapor from different soil zones. CDM recommends installing four new 4-inch vapor extraction wells (VES-1A, -2A, -3A and 5) to improve the overall performance of SVE system. Wells VES-1A and VES-5 will be screened from 10 to 20 feet bgs. Wells VES-2A and VES-3A will be screened from 55 to 65 feet bgs. Extraction well VES-4 will remain online since the location and short screen length of this well (~7 feet) is adequate for the system. The proposed locations of the new SVE wells are shown on Figure 1. The final well locations will be determined in consultation with the on-site representative of NYSDEC. After installation, the new wells will be surveyed by a New York State licensed surveyor.

- In order to minimize the trenching and piping cost associated with the proposed new wells, the use of existing pipeline network will be used as practical.

- Based on the proposed locations of the new SVE wells, the current SVE wells may become the pathways for short circuiting from upper zones into the proposed SVE wells. CDM recommends completely abandoning these wells by filling them with a cement and bentonite mixture.

- The current SVE system uses only one VPGAC unit to treat the contaminated soil vapor. CDM recommends adding a lag unit in series to treat contaminated vapor exiting the lead unit, when breakthrough occurs.

- The current SVE system uses a regenerative blower with 180 SCFM capacity. It is strongly recommended that the blower be upgraded. CDM recommends a blower with a minimum capacity of 400 SCFM. The presence of larger capacity blower will enable adequate vapor extraction from all of the proposed SVE wells and would also be compatible with the use of two VPGAC units in series.

- The existing demister drum is rusted and in need of replacement. The current demister drum has a capacity of 30 gallons. A larger 55 gallon-demister drum is recommended to hold larger amount of water in order to reduce the decanting frequency and let the SVE system operate on a more continuous basis.

- We suspect at this time that the soil vapor profile points may not be effective and may be in need of replacement. This determination will be made in consultation with NYSDEC. CDM does not recommend using these wells for future purposes.

2.6 Task 2E – Ozone Pilot Study

The pilot study will consist of the following activities:

- Installation of two (2) injection well clusters consisting of a shallow well (screened 98-100 feet bgs) and a deep well (screened 118-120 ft bgs). These wells will be designated IW-1S and -1D and IW-2S and -2D.

- Installation of a monitoring well (PTW-1) downgradient of the injection wells to monitor groundwater downgradient of the ozone sparge curtain.

- Installation of a permanent sub-slab soil vapor sample collection point on-site and at the Cove 1-Hour Photo to collect sub-slab soil vapor samples before, during and after the ozone pilot study

- Installation of two co-located shallow and deep soil vapor locations (SV-1S/D and SV-2S/D) on-site to monitoring for the presence of VOCs in the unsaturated zone before, during and after the pilot study.

- Set-up of the ozone generation and delivery systems including appropriate piping and appurtenances

- Conduct *in situ* ozone sparge testing and determine ozone radius of influence, the ozone dose required to achieve satisfactory PCE destruction in terms of the in situ ozone demand, PCE removal kinetics, formation of PCE oxidation products, and potential of in situ ozone treatment to reduce aquifer permeability

- Conduct the ozone injection pilot study over a two-month period

- Monitor groundwater to evaluate the effectiveness of the pilot study

2.7 Task 3 - Field Documentation and Reporting

2.7.1 Field Documentation Procedures

Field notebooks will be used during all on-site work. A dedicated field notebook will be maintained by the field technician overseeing the site activities. In addition to the notebook, any and all original sampling forms, and purge forms used during the field activities, will be submitted to the NYSDEC as part of the final report. Field and sampling procedures, including installation of the sample boreholes, existing monitoring wells, etc., will be photo-documented.

2.7.2 Sample Identification

Each sample collected will be designated by an alphanumeric code that will identify the type of sampling location, matrix sampled, and the specific sample designation (identifier). Site specific procedures are described in the Generic QAPP.

2.7.3 Sample Location

The newly installed monitoring wells will be surveyed by a subcontracted New York State licensed surveyor to identify the location (X,Y coordinates) and elevation of the wells. Subsequently, these data will be used to update the site maps. Costs to develop and update site plans are based on the assumption that electronic AUTOCAD site plans will be provided to CDM by NYSDEC.

2.7.4 Reporting

A total of four copies of a draft Remedial Investigation Report (RIR) will be submitted to NYSDEC for review and comment. The report will document the work conducted and will present the results of the sample analysis and provide recommendations for further investigation should it be warranted. Upon receipt of the comments, CDM will revise the draft RIR and print the four final copies and submit to NYSDEC. One copy of the final RIR; text, tables, maps, photos, etc., will be submitted as a single pdf file. All electronic files will be submitted to NYSDEC on a compact disc. The site investigation data will be submitted in the most recent version of the NYSDEC Electronic Data Deliverable (EDD) with the final report submission. Currently this is the USEPA Region 2 EDD dated December 2003.

2.7.5 Laboratory Analysis and Validation

All samples will be analyzed by a NYSDOH approved ELAP certified laboratory. Air samples will be analyzed for VOC using EPA Method TO-15. The analysis for air samples will achieve detection limits of 1 µg/m^3 for each compound. For specific parameters identified by the NYSDOH, where the selected parameters may have a higher detection limit (e.g., acetone), and the higher detection limits will be designated by the NYSDOH. Groundwater samples will be analyzed for VOC by EPA Method SOM01.2-Trace. The analysis for groundwater samples will achieve the detection limits discussed in the Generic QAPP. A NYSDEC ASP Category B data deliverable will be provided for these analyses.

All samples collected will be validated in accordance with NYSDEC Data Usability Summary Report (DUSR) guidance by a party that is independent of the laboratory which performed the analyses and CDM. A usability analysis will be conducted by a qualified data validator and a DUSR will be submitted to the NYSDEC.

2.8 Task 4 – Feasibility Study

Following the implementation of the Remedial Investigation, CDM will conduct a feasibility study (FS) to evaluate remedial action alternatives using the data collected during the RI. The Feasibility study will include the evaluation of the existing SVE system and the proposed Ozone Pilot study for the site. The objectives of the FS will be to identify a list of potential alternatives that may be used to remediate the soil and groundwater on- and off-site. Each alternative will be evaluated based on technical feasibility, cost, overall protection of human health and the environment, and duration. A FS report will be prepared detailing the results of the remedial alternatives analysis and provide a recommendation for a site remedy.

2.9 Task 5 – Ozone Pilot Study Report

Following the implementation of the ozone Pilot Study, CDM will prepare a Pilot Study report. The report will detail the methods and results of the tests. Engineering and economic analyses will be conducted based on the results of the ozone pilot study. Elements of this analysis will include:

- Evaluate overall effectiveness of the technology.
- Identify critical requirements and limitations for successful implementation of a full-scale system.
- Evaluation of the costs of different oxidants.
- Evaluate the engineering and economic implementation requirements for in situ ozone sparging as a hot spot treatment technology.

Section 3
Project Schedule

The following tabulation provides the proposed project schedule and key milestones for this work assignment. As currently planned, field work will be initiated within two weeks of written receipt of final work plan approval. Field activity duration is estimated to be fifteen work days assuming no delays are experienced due to inclement weather, site access problems, or for other unforeseen reason. The scheduled submittal dates for deliverables are based on standard laboratory turnaround times of four weeks, and turnaround for data validation of three weeks.

Project Milestone	Date
Issue Work Assignment (WA)	February 16, 2007
Work Assignment Acceptance	14 Days after Issuance
Submit Task 1 Draft Work Plan Deliverable	April 6, 2007
Submit Task 1 Draft Supplemental Work Plan Deliverable	May 25, 2007
DEC/DOH Comment on Draft Work Plans	September 6, 2007
Submit Task 1 revised Work Plan and Supplemental Work Plan Deliverable	September 28, 2007
DEC/DOH Comment on Draft Work Plans	November 6, 2007
Submit Task 1 revised Work Plan and Supplemental Work Plan Deliverable	November 9, 2007
DEC/DOH Comment on Draft Work Plans	December 7, 2007
Submit Task 1 FINAL Work Plan and Supplemental Work Plan Deliverable	December 19, 2007
Receive Technical Approval of Work Plan	January 16, 2008
Received DEC comments on Schedule 2.11s	February 13, 2008
Submit Task 1 FINAL Work Plan and Supplemental Work Plan Deliverable	March 11, 2008
Notice to Proceed (NTP)	March 31, 2008
Commence Task 2A,2B, 2C Field Work	April 21, 2008
Task 2 Field Work Completed	June 13, 2008
Task 3 and Task 4 Submit Draft RI Report and Draft Feasibility Study	August 30, 2008
Approve Draft Report	30 Days after Draft Report Submitted
Task 3 and Task 4 Submit Final Report and Final Feasibility Study	30 Days after Approval of Draft Report

Section 4
Contacts

4.1 Key Project Contacts

It is the expressed intent of NYSDEC and the City of Glen Cove, NY to provide information to the public in a timely, complete, and accurate manner. Towards this end, the State has compiled a list of individuals to whom the public can address specific requests for information. These contacts are both local and state public officials and are knowledgeable of the proposed investigative activities. This list of contacts is provided below:

Environmental Concerns

Nathan Putnam
Environmental Engineer
Project Manager
NYSDEC Division of Environmental Remediation
625 Broadway, 11th Floor
Albany, NY 12233-7015
(518) 402-9621

Health Related Concerns

Sharon McLelland
NYSDOH
547 River Street
Troy, NY 12180-2216
(518) 402-7880

4.2 Repository

Four document repositories have been established to provide the public with convenient access to important project documents and other information. A copy of the documents relevant to the Remedial Investigation and Feasibility Study, including the Work Plan, will be placed in the repositories to allow interested citizens and groups to review these documents.

All documents pertaining to this site will be available for public review at the following repository locations:

1) ***NYSDEC Division of Environmental Remediation***
625 Broadway, 11th Floor
Albany, NY 12233-7017
Mon-Fri 8:30 am – 4:45 pm
By appointment only
(518) 402-9621

2) ***NYSDEC Region 1 Office – Division of Environmental Remediation***
SUNY Campus, Bldg 40
Stony Brook, NY 11790-2356
Mon-Fri 8:30 am – 4:45 pm
By appointment only
(631) 444-0240

3) ***Glen Cove Public Library***
4 Glen Cove Avenue
Glen Cove, NY 11542
Mon-Thurs 9:00 am – 9:00 pm
Fri – Sat 9:00 am – 5:00 pm
Summer Saturdays 9:00 am – 1:00 pm
Sundays 1:00 pm – 5:00 pm (October – May)
(516) 676-2130

4) ***City of Glen Cove - City Clerk***
City Hall
9 Glen Street
Glen Cove, NY 11542
Mon-Fri 9:00 am – 12:30 pm & 2:30 pm – 4:00 pm
(516) 676-2000

Section 5
Citizen Participation Activities

5.1 Fact Sheet and Mailing List

A Fact Sheet detailing the availability of the Remedial Investigation Work Plan will be sent out to the residents and other interested parties on the mailing list. This mailing will include information about the document repositories, the name and address of NYSDEC Citizen Participation Specialist, NYSDEC Project Manager and NYS Department of Health contact. Parties who express interest in being placed on or removed from the mailing list will be added or removed as requested.

The Fact Sheet will also serve as an invitation for the public to provide input on the Work Plan or other project related documents via written or oral comments. Additional activities, such as a public meeting and/or Fact Sheet after the site investigation is completed will be added as appropriate.

5.2 Proposed Remedial Action Plan (PRAP) and Public Meeting

Once the Remedial Investigation Report has been accepted, the NYSDEC will issue a Proposed Remedial Action Plan (PRAP) for the site. This plan will use the information contained in the Remedial Investigation Report (RI) and Feasibility Study. The RI will detail the investigation findings and will present the analytical data from the samples collected during the investigation. The Feasibility study will evaluate several alternatives to address the contamination at the site and propose a course of remedial action for the site.

A public meeting will then be held to present the results and plans to the public. This presentation will be followed by a formal question and answer period. The public will also have a 45-day comment period, during which written comments and questions can be submitted.

5.3 Record of Decision

After the comment period, a Record of Decision (ROD) will be issued by the NYSDEC identifying the remedy selected for the site, and the basis for this selection. As part of the ROD, a responsiveness summary will be prepared. This responsiveness summary will include all relevant and significant questions and comments received and the NYSDEC/NYSDOH responses to this input.

The ROD and all NYSDEC-approved reports, plans, and fact sheets on this project will be placed in the document repositories for public review. These documents may be distributed more widely, such as to interested local groups, if warranted.

Appendix D

SCHEDULE 2.11

Schedule 2.11(a)

Summary of Work Assignment Price

Work Assignment Number D004437-9

1) Direct Salary Costs (Schedules 2.10(a) and 2.11(b))	$100,633.87
2) Indirect Costs (Schedule 2.10(g))	$168,964.27
3) Direct Non-Salary Costs (Schedules 2.10(b)(c)(d) and 2.11(c)(d))	$86,788.90

4) Subcontract Costs

Cost-Plus-Fixed-Fee Subcontracts (Schedule 2.10(e) and 2.11(e))

	Name of Subcontractor	Services To Be Performed	Subcontract Price
i)	Ken Schider Consulting	W/MBE Reporting	$1,199.94
ii)	YEC, Inc	MBE Surveying & Field Support	$6,169.50
iii)			

A) Total Cost-Plus-Fixed-Fee Subcontracts $7,369.44

Unit Price Subcontracts (Schedule 2.10 (f) and 2.11 (f))

	Name of Subcontractor	Services To Be Performed	Subcontract Price
i)	Delta Well	WBE Driller	$80,598.80
ii)	ChemTech	MBE Laboratory	$62,644.60
iii)	Nancy Potak	WBE Data Validator	$6,061.00
iv)	AGS	Geophysical Survey	$4,000.00
iv)	EarthCare	IDW Removal	$17,170.00
v)	Bensin Contracting	SVE Equipment Installation	$10,008.00
vi)	BLUE Lightening Underground/R	Ozone Pilot	$85,446.00
vii)	Zebra Environmental	Geoprobe	$3,943.00

B) Total Unit Price Subcontracts $269,871.40

5) Subcontract Management Fee	$13,096.42	
6) Total Subcontract Costs (lines 4A + 4B + 5)		$290,337.26
7) Fixed Fee (Schedule 2.10(h))		$18,871.87
8) Total Work Assignment Price (Lines 1 + 2 + 3 + 6 + 7)		$665,596.17

Engineer/Contract # D004437
Project Name Ronhill Cleaners
Work Assignment No. D004437-9

Date Prepared: 5/25/2007

Schedule 2.11(b)
Direct Labor Hours Budgeted

Labor Classification	***IX***		***VIII***		***VII***		***VI***		***V***		***III***		***II***		***I***		***Admin Support***		***Total No. of Direct Labor Hours and Costs Budgeted***	
*Av. Salary Rate ($) Year 2008	$65.24		$59.42		$52.09		$45.95		$38.75		$28.62		$25.52		$21.12		$21.12		0	
Description	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost
Task 1 Work Plan Development	12	$782.88	28	$1,663.76	4	$208.36	30	$1,378.50	115	$4,456.25	66	$1,888.92		$0.00		$0	12	$253.44	267	$10,632.11
Task 2A Remdial Investigation	4	$260.96	40	$2,376.80		$0.00	16	$735.20	40	$1,550.00	475	$13,594.50	470	$11,994.40		$0	6	$126.72	1051	$30,638.58
Task 2B SVE Maintenance & Monitoring	2	$130.48	16	$950.72		$0.00		$0.00		$0.00	650	$18,603.00	40	$1,020.80		$0	6	$126.72	714	$20,831.72
Task 2C SSD System monitoring & annual sub-slab and indoor air monitoring	2	$130.48	16	$950.72		$0.00		$0.00		$0.00	50	$1,431.00	50	$1,276.00		$0	6	$126.72	124	$3,914.92
Task 2D SVE System Enhancement	8	$521.92	16	$950.72		$0.00		$0.00	40	$1,550.00	60	$1,717.20	16	$408.32		$0	6	$126.72	146	$5,274.88
Task 2E Ozone Pilot Study	8	$521.92	24	$1,426.08		$0.00		$0.00	60	$2,325.00	100	$2,862.00	60	$1,531.20		$0	6	$126.72	258	$8,792.92
Task 3 Field Documentation and Reporting	8	$521.92	40	$2,376.80	8	$416.72		$0.00	50	$1,937.50	50	$1,431.00	12	$306.24		$0	12	$253.44	180	$7,243.62
Task 4 Feasibility Study	8	$521.92	24	$1,426.08		$0.00		$0.00	80	$3,100.00	2	$57.24	40	$1,020.80		$0	12	$253.44	166	$6,379.48
Task 5 Ozone Pilot Study Report	8	$521.92	24	$1,426.08		$0.00		$0.00	80	$3,100.00	30	$858.60	30	$765.60		$0	12	$253.44	184	$6,925.64
Total Hours	60		228		12		46		465		1483		718		0		78		3090	
Total Direct Labor Cost ($) **Year 2008**		$3,914.40		$13,547.76		$625.08		$2,113.70		$18,018.75		$42,443.46		$18,323.36		$0		$1,647.36		$100,633.87

* For multiple years use one average salary rate row for each year and each years subtotal Labor Cost.

Engineer/Contract # D004437
Project Name Ronhill Cleaners
Work Assignment No. D004437-9

Date Prepared: _____

Schedule 2.11(b-1)
Direct Administrative Labor Hours Budgeted

Labor Classification		*IX*	*VIII*	*VII*	*VI*	*V*	*IV*	*III*	*II*	*I*	*Admin. Support*	*Total No. of Direct Labor Hrs.*
Task 1	Work Plan Development	12	2	0	1	0	0	0	0	0	12	27
Task 2A	Remedial Investigation	4	0	0	0	0	0	0	0	0	6	10
Task 2B	SVE Maintenance & Monitoring	2	0	0	0	0	0	0	0	0	6	8
Task 2C	SSD System monitoring & annual sub-slab and indoor air monitoring	2	0	0	0	0	0	0	0	0	6	8
Task 2D	SVE System Enhancement	8	2	0	0	0	0	0	0	0	6	16
Task 2E	Ozone Pilot Study	8	2	0	0	0	0	0	0	0	6	16
Task 3	Field Documentation and Reporting	8	2	0	0	0	0	0	0	0	12	22
Task 4	Feasibility Study	8	2	1	0	0	0	0	0	0	12	23
Task 5	Ozone Pilot Study Report	8	2	1	0	0	0	0	0	0	12	23
TOTAL HOURS		60	12	2	1	0	0	0	0	0	78	153

Contract/Project administrative hours would include (subject to contract allowability) but not necessarily be limited to the following activities:

1) Work Plan Budget Development
   > Conflict of Interest Check
   > Budget schedules & supporting documentation
2) Review work assignment (WA) progress
   > Conduct progress reviews
   > Prepare monthly project report
   > Update WA progress schedule
   > Prepare M/WBE Utilization Report
3) Contractor Application for Payment (CAP)
   > Oversee and prepare monthly CAP
4) Program Management
   > Prepare monthly cost control report
   > Cost control reviews
<> Staffing Plans
   >Manage subcontracts
   > NSPE list update
   > Equipment inventory
5) Miscellaneous
   > Conduct Health and Safety Reviews
   > Word processing and graphic artists
   > Report editing

Contract/Project Administration hours would **not** include

1) QA/QC reviews
2) Techincal oversight by management
3) Develop subcontracts
4) Work plan development
5) Review of deliverables

Schedule 2.11 (c)

Direct Non-Salary Costs
Work Assignment Number **D004437-9**

	Item		Max. Reimbursement * Rate (Specify Unit)	Est. No. of Units	Total Estimated Cost
A)	Other				
	1)	Shipping Task 1	LS	1	$250.00
	2)	Outside Printing Task 1	LS	1	$800.00
	3)	Shipping Task 3/4	LS	1	$250.00
	4)	Outside Printing Task 3/4	LS	1	$800.00
	5)	Shipping Task 5	LS	1	$250.00
	6)	Outside Printing Task 5	LS	1	$800.00
				Sub-Total Other	$3,150.00
B)	Miscellaneous Task 2A - Remedial Investigation				
	1)	Meals (per day)	$64.00	100	$6,400.00
	2)	Lodging (per day)	$159.00	80	$12,720.00
	3)	Mileage (per mile)	$0.505	400	$202.00
	4)	PPE (level D) (per day)	$15.00	100	$1,500.00
	5)	Tolls	$15.00	10	$150.00
	6)	LVE	$1.00	1000	$1,000.00
				Sub-Total Miscellaneous Task 2A	$21,972.00
C)	Miscellaneous Task 2B - SVE O&M				
	1)	Meals (per day)	$64.00	78	$4,992.00
	2)	Lodging (per day)	$159.00	0	$0.00
	3)	Mileage (per mile)	$0.505	2730	$1,378.65
	4)	PPE (level D) (per day)	$15.00	78	$1,170.00
	5)	Tolls	$15.00	78	$1,170.00
	6)	LVE	$1.00	695	$695.00
				Sub-Total Miscellaneous Task 2B	$9,405.65
D)	Miscellaneous Task 2C - SSD O&M & Annual Sampling				
	1)	Meals (per day)	$64.00	10	$640.00
	2)	Lodging (per day)	$159.00	8	$1,272.00
	3)	Mileage (per mile)	$0.505	500	$252.50
	4)	PPE (level D) (per day)	$15.00	10	$150.00
	5)	Tolls	$15.00	6	$90.00
	6)	LVE	$1.00	100	$100.00
				Sub-Total Miscellaneous Task 2C	$2,504.50
E)	Miscellaneous Task 2D - SVE System Enhancement				
	1)	Meals (per day)	$64.00	10	$640.00
	2)	Lodging (per day)	$159.00	8	$1,272.00
	3)	Mileage (per mile)	$0.505	500	$252.50
	4)	PPE (level D) (per day)	$15.00	10	$150.00
	5)	Tolls	$15.00	6	$90.00
	6)	LVE	$1.00	122	$122.00
				Sub-Total Miscellaneous Task 2D	$2,526.50
E)	Miscellaneous Task 2E - Ozone Pilot Study				
	1)	Meals (per day)	$64.00	28	$1,792.00
	2)	Lodging (per day)	$159.00	20	$3,180.00
	3)	Mileage (per mile)	$0.505	2250	$1,136.25
	4)	PPE (level D) (per day)	$15.00	28	$420.00
	5)	Tolls	$15.00	28	$420.00
	6)	LVE	$1.00	225	$225.00
				Sub-Total Miscellaneous Task 2E	$7,173.25
				Total Direct Non-Salary Costs	**$46,731.90**

Work Assignment No. D004437-9

Schedule 2.11(d) 3

Maximum Reimbursement Rate for Vendor Rented Equipment

Item	Max Reimbursement Rate ($)*	Est. Usage (unit of time)	Est. Rental Cost ($) (Col. 2 x 3)
Task 2A			
PID (per month)	$399.00	1	$399.00
Submersible pump (per month)	$638.00	2	$1,276.00
Horiba U-22 Water Quality meter (per week	$170.00	2	$340.00
Generator (per month)	$300.00	2	$600.00
Truck (per day)	$68.48	50	$3,424.00
		SUBTOTAL:	**$6,039.00**
Task 2C			
Van (per day)	$125.00	5	$625.00
		SUBTOTAL:	**$625.00**
Task 2E			
Water Level Meter (per month)	$110.00	2	$220.00
Ozone Meter (per month)	$450.00	2	$900.00
Horiba U-22 Water Quality meter (per week	$165.00	2	$330.00
		SUBTOTAL:	**$1,450.00**
		TOTAL:	**$8,114.00**

* Reimbursement will be made at the Maximum Reimbursement rate or the actual rental rate, whichever is less.

Work Assignment No. D004437-9

Schedule 2.11(d) 4

Site -Dedicated Equipment

Item	Estimated Quanitity	Unit Cost ($)	Total Budgeted Cost (Col 2 x 3) ($)
Task 2A - Remedial Investigation			
Teflon tubing (per ft)	30	$2.50	$75.00
		SUBTOTAL:	**$75.00**
Task 2B - SVE O&M			
PID	1	$2,914.00	$2,914.00
Carbon Vessel Changeout	8	$2,736.00	$21,888.00
55-gallon drums	5	$55.00	$275.00
Tool Box	1	$200.00	$200.00
		SUBTOTAL:	**$25,277.00**
Task 2C - Soil Vapor Monitoring			
Teflon tubing (per ft)	80	$2.50	$200.00
		SUBTOTAL:	**$200.00**
Task 2D - SVE Enhacment			
Blower with 425 CFM capacity including shipping - Gast Mfg Inc. (Model No. R7100R-50)	1	$4,000	$4,000.00
55 gallon demister drum including shipping - Gast Mfg Inc. (Model No. RMS400)	1	$2,091	$2,091.00
Dilution valve with air filter including shipping - McMaster Carr. (9825K55)	1	$300	$300.00
		SUBTOTAL:	**$6,391.00**
		TOTAL:	**$31,943.00**

Schedule 2.11 (e)

Cost-Plus-Fixed-Fee Subcontracts
Work Assignment Number **D004437-9**

Name of Subcontractor	**Services to be Performed**	**Subcontract Price**
Ken Schider Consulting	**M/WBE Reporting**	**$1,199.94**

A) Direct Salary Costs

Professional Responsibility Level	**Labor Classification**	**Ave. Reimbursement Rate ($/Hr.)**	**Max. Reimbursement Rate ($/Hr.)**	**Est. No. of Hours**	**Total Est Direct Salary Cost (Ave. Reimb. Rate x Est. # of Hrs.)**
IV	Eng/Scientist 4	$32.60	$36.78	16	$521.60

Total Direct Salary Costs **$521.60**

Footnotes:

1) The labor rate averages and maximums shall be adjusted by a rate equal to the increase in the CPI index CUURA101SAO-"All Urban Consumers-New York-Northern N.J.-Long Island" for the previous year. This index is published by the U.S. Department of Labor's Bureau of Labor Statistics. The adjustment will be calculated every January and will be effective for subsequent work assignment billing and budgeting purposes.
2) Schedule 2.11(e) may be re-negotiated after four (4) years at the request of either party. Any revision as a result of re-negotiation will be subject to the approval of the Office of the State Comptroller.
3) The maximum annual escalation is limited to 5%.
4) Reimbursement will be limited to the lesser of either the individual's actual hourly rate or the maximum rate for each labor
5) Reimbursement will be limited to the maximum reimbursement rate for the professional responsibility level of the actual work
6) Only those labor classifications indicated with an asterisk will be entitled to overtime.
7) Reimbursement for technical time of principals, owners, and officers will be limited to the maximum reimbursement rate of that category, the actual hourly labor rate paid, or the State M-6 rate, whichever is lower.
8) Maximum reimbursement rates may be exceeded for work assignment activities that are under the jurisdiction of the Schedule of Prevailing Wage Rates set by the New York State Department of Labor.

B) Indirect Costs

Indirect costs shall be paid based on a percentage of direct salary costs incurred which shall not exceed a maximum of 115 % or the actual rate calculated in accordance with 48 CFR Federal Acquisition Regulation, whichever is lower.

Amount budgeted for indirect costs is: **$599.84**

C) Maximum Reimbursement Rates for Direct Non-Salary Costs

Item	**Max Reimbursement Rate (Specify Unit)**	**Est. No. of Units**	**Total Est. Cost**
1) Travel	See Schedule 2.10 (d) for rates		
2) Supplies			

Total Direct Non-Salary Costs **$0**

D) Fixed Fee

The fixed fee is: 7% **$78.50**
See Schedule 2.10 (h) for how the fixed fee should be claimed.

Schedule 2.11 (e)
Cost Plus Fixed-Fee Subcontracts

Ronhill Cleaners

March 12, 2008

NAME OF SUBCONTRACTOR	SERVICES TO BE PERFORMED	SUBCONTRACT PRICE
YEC, INC.	GPS Survey & Technical Field Support	$6,169.50

A. Direct Salary Costs

Professional Responsibilty Level	Labor Classi-fication	Average Reimbursement Rate ($/Hr.)		Maximum Reimbursement Rate ($/Hr.)		Estimated Number o Hours	Total Estimated Direct Salary Cost ($)
Principal	VIII	2007	65.12	2007	70.35	1	65.12
Senior Geologist/Scientist/ Engineer/ Licensed Surveyor	V	2007	43.06	2007	47.36	20	861.20
Staff Geologist/ Scientist/Engineer	IV	2007	37.40	2007	41.17	0	0.00
Staff Geologist/ Scientist/Engineer/CAD	III	2007	32.49	2007	36.04	4	129.96
Senior Technician/Staff Engineer/Scientist/Geologist	II	2007	24.02	2007	26.93	24	576.48
Technician/Draftsperson	I	2007	21.76	2007	24.39	24	522.24
						Total Direct Salary Costs:	2,155.00

B. Indirect Costs - 117% of direct salary cost

Indirect Costs:	2,521.35

C. Maximum Reimbursement Rates for Direct Non-Salary Costs:

Item	Maxium Reimbursement Rate		Estimated No. of Units			
Mileage	0.485	/mi.	110	miles/trip	2 trips	106.70
Tolls	20	/day	1	trips		20.00
Meals	65	/day	0	days		0.00
Lodging	159	/day	0	days		0.00
Survey Equipment Rental	65	day	1	days		65.00
CAD Rental	15	/hr	0	hours		0.00
GPS tie in to NYSP Coords	600	lump	1	lump sum		600.00
Postage/Reproduction/Phone	50	/lump	0	lump sum		0.00
					Total Direct Non Salary Costs:	791.70

D. Fixed Fee (15% of Total Direct and Indirect Salary Costs)

Fixed Fee:	701.45

Schedule 2.11 (f)

Unit Price Subcontracts
Work Assignment Number **D004437-9**

Name of Subcontractor	Services to be Performed	Subcontract Price	Management Fee
AGS	**Utility Locate**	**$4,000**	**$0**

Item	Max. Reimbursement Rate (Specify Uni	Est. No. of Units	Total Est. Cost
Task 2A Geophysical Survey (Clear Off-site Drilling Locations)			
Daily Rate	$2,000 day	1	$2,000
Task 2D & E Geophsyical Survey (Clear On-Site SVE, Injection & downgradient Well locations)			
Daily Rate	$2,000 day	1	$2,000
Subtotal-Subcontract Price			**$4,000**
Subcontract Management Fee*			**$0**
TOTAL			**$4,000**

Schedule 2.11 (f)

Unit Price Subcontracts
Work Assignment Number **D004437-2**

Name of Subcontractor	**Services to be Performed**	**Subcontract Price**	**Management Fee**
Nancy Potak	**WBE Data Validator**	**$6,061.00**	**$303.05**

Item	**Max. Reimbursement Rate (Specify Unit)**	**Est. No. of Units**		**Total Est. Cost**
DATA VALIDATION Task 2A				
Low Level VOCs	$11.55 /Sample	32		$370
TO-15 VOCs	$11.55 /Sample	39		$450
TO-15 Dilution	$11.55 /Sample	39		$450
			Subtotal	$1,271
DATA VALIDATION Task 2B				
TO-15 VOCs	$11.55 /Sample	18		$208
TO-15 Dilution	$11.55 /Sample	18		$208
			Subtotal	$416
DATA VALIDATION Task 2C				
TO-15 VOCs	$11.55 /Sample	75		$866
TO-15 Dilution	$11.55 /Sample	75		$866
			Subtotal	$1,733
DATA VALIDATION Task 2E				
Low Level VOCs GW	$11.55 /Sample	50		$578
Bromate	$2.10 /Sample	44		$92
Chloride	$2.10 /Sample	44		$92
Alkalinity	$2.10 /Sample	44		$92
TOC	$2.10 /Sample	44		$92
TDS	$2.10 /Sample	44		$92
COD	$2.10 /Sample	44		$92
Dissolved Iron & Manganese	$17.00 /Sample	44		$748
TO-15 VOCs	$11.55 /Sample	33		$381
TO-15 Dilution	$11.55 /Sample	33		$381
			Subtotal	$2,642
Subtotal-Subcontract Price				**$6,061.00**
Subcontract Management Fee*				**$303.05**
TOTAL				**$6,364.05**

* A subcontract management fee of 5% has been included for M/WBE subcontracts.

Schedule 2.11 (f)

Unit Price Subcontracts
Work Assignment Number **DOO4437-9**

Name of Subcontractor	**Services to be Performed**	**Subcontract Price**	**Management Fee**
Bensin Contracting	**Equipment Installation**	**$10,008.00**	**$500.40**

Item	**Unit Cost**		**Est. No. of Units**	**Total Est. Cost**
Task 2D - SVE Enhancement				
Installing the sub surface 4" schedule 40 pipeli and connect to the new lines to existing pipeline network	$24.50	per foot	100	$2,450.00
100 ft Schedule 80 Dark Gray PVC pipe including shipping	$5.58	per foot	100	$558.00
Fittings and accessories including shipping	$500.00		1	$500.00
Blower installation cost	$4,500.00	per unit	1	$4,500.00
Demister Drum and dilution valve installation (	$2,000.00	per unit	1	$2,000.00
Subtotal-Subcontract Price				**$10,008.00**
Subcontract Management Fee*				**$500.40**
TOTAL				**$10,508.40**

* A subcontract management fee of 5% has been included for contracts over $10,000

Schedule 2.11 (f)

Unit Price Subcontracts
Work Assignment Number **DOO4437-9**

Name of Subcontractor	Services to be Performed	Subcontract Price	Management Fee
BLUE Lightening Undergrounf/ The Resources Companies (RCC)	**Ozone Pilot**	**$85,446.00**	**$4,272.30**

Item		Est. No. of Units	Total Est. Cost
Task 2E - Ozone Pilot Study			
A -	Design, Planning, Permitting and Remedial Action Work Plan		$961.00
B -	Equipment Usage and Technology License (2 months)		$29,141.00
C -	Injection Well Installation		$19,754.00
D -	System Installation Infrastructure		$21,633.00
E -	Remediation System Startup and Demob		
E-1	Remedial System Startup		$3,722.00
E-2	Demobilization		$1,750.00
F -	Operation & Optimization (2 months)		$6,485.00
G -	Project Management		$2,000.00
Subtotal-Subcontract Price			**$85,446.00**
Subcontract Management Fee*			**$4,272.30**
TOTAL			**$89,718.30**

* A subcontract management fee of 5% has been included for subcontracts over $10,000.

Schedule 2.11 (f)

Unit Price Subcontracts
Work Assignment Number **DOO4437-9**

Name of Subcontractor	Services to be Performed	Subcontract Price	Management Fee
Delta Well	**WBE Driller**	**$80,598.80**	**$4,029.94**

Item	Unit Cost		Est. No. of Units	Total Est. Cost
Task 2A (5 CMT Wells)				
MOB/DEMOB				
Mob/Demob	$3,000	ls	1	$3,000.00
EQUIPMENT				
Solinst CMT Multi-level Syster	$20,646	ls	1	$20,831.80
DRILL RIG AND CREW				
4.25" Hollow Stem Auger	$26	LF	820	$21,320.00
bentonite pellets	$75	bucket	25	$1,875.00
filter pack material	$20	bag	25	$500.00
installation of CMT filter packs	$225	hr	4	$900.00
Cement bentonite grout	$9	LF	750	$6,750.00
Decon Pad	$875	ls	1	$875.00
Protective Casing	$225	ea	4	$900.00
IDW handling	$225	hr	4	$900.00
Steam cleaning	$180	hr	4	$720.00
Well Development	$180	hr	8	$1,440.00
			Subtotal	$60,011.80
Task 2D (4 SVE Wells)				
MOB/DEMOB				
Mob/Demob	$800	ls	1	$800.00
DRILL RIG AND CREW				
4.25" Hollow Stem Auger	$20	LF	320	$6,400.00
bentonite pellets	$75	pail	12	$900.00
filter pack material	$20	bag	12	$240.00
Cement bentonite grout	$9	LF	280	$2,520.00
Decon Pad	$875	ls	1	$875.00
Protective Casing	$225	ea	4	$900.00
IDW handling	$225	hr	4	$900.00
Steam cleaning	$180	hr	4	$720.00
			Subtotal	$14,255.00
Task 2E (1 Monitoring Well)				
MOB/DEMOB				
Mob/Demob	$800	ls	1	$800.00
DRILL RIG AND CREW				
4.25" Hollow Stem Auger	$20	LF	120	$2,400.00
bentonite pellets	$75	pail	5	$375.00
filter pack material	$20	bag	5	$100.00
Cement bentonite grout	$9	LF	108	$972.00
Decon Pad	$875	ls	1	$875.00
Protective Casing	$225	ea	1	$225.00
IDW handling	$225	hr	1	$225.00
Steam cleaning	$180	hr	1	$180.00
Well Development	$180	hr	1	$180.00
			Subtotal	$6,332.00
Subtotal-Subcontract Price				**$80,598.80**
Subcontract Management Fee*				**$4,029.94**
TOTAL				**$84,628.74**

* Subcontract Management Fee of 5% on M/WBE Subcontracts

Schedule 2.11 (f)

Unit Price Subcontracts
Work Assignment Number **DOO4437-9**

Name of Subcontractor	Services to be Performed	Subcontract Price	Management Fee
Zebra Environmental	**Direct Push**	**$3,943.00**	**$0.00**

Item	Unit Cost		Est. No. of Units	Total Est. Cost
Task 2E (Soil Vapor Points SV1S/D, SV2S/D)				
MOB/DEMOB				
Mob/Demob Geoprobe	155	trip	2	$310.00
DRILL RIG AND CREW				
Geoprobe Unit w/ Operator	$1,365	day	2	$2,730.00
Macro Core Samples	$9.45	sample	0	$0.00
Shallow Soil Vapor Implants	$99.75	pt	2	$199.50
Deep Soil Vapor Implants	$131.25	pt	2	$262.50
Standby Time	$210.00	hr	1	$210.00
55-Gallon DOT Drum	$57.75	ea	4	$231.00
Subtotal-Subcontract Price				**$3,943.00**
Subcontract Management Fee*				**$0.00**
TOTAL				**$3,943.00**

Schedule 2.11 (f)

Unit Price Subcontracts
Work Assignment Number D004437-9

Name of Subcontractor **ChemTech**
Services to be Performed **MBE Laboratory**
Subcontract Price **$62,644.60**
Management Fee **$3,132.23**

Item	Max. Reimbursement Rate	Specify Unit	Est. No. of Units	Total Est. Cost
Task 2A - RI				
SAMPLING EQUIPMENT				
Summa Cannisters/Regulators	$36.75	Sample	42	$1,544
Cannister Re-Certification	$110.25	Canister	3	$331
LABORATORY ANALYSIS				
Low Level VOCs Water (SOM01.2)	$120.75	Sample	32	$3,864
TO-15 Air	$187.95	Sample	39	$7,330
SEDD	$131.25	ea	1	$131
RCRA Characteristics	$603.75	Sample	4	$2,415
			Subtotal	**$15,615**
Task 2B - SVE O&M				
SAMPLING EQUIPMENT				
Summa Cannisters/Regulators	$36.75	Sample	20	$735
Cannister Re-Certification	$110.25	Canister	2	$221
LABORATORY ANALYSIS				
TO-15 Air	$187.95	Sample	18	$3,383
			Subtotal	**$4,339**
Task 2C - Annual Structure Sampling				
SAMPLING EQUIPMENT				
Summa Cannisters/Regulators	$36.75	Sample	82	$3,014
Cannister Re-Certification	$110.25	Canister	7	$772
LABORATORY ANALYSIS				
TO-15 Air	$187.95	Sample	75	$14,096
SEDD	$131.25	ea	1	$131
			Subtotal	**$18,013**
Task 2E - Ozone Pilot Study				
SAMPLING EQUIPMENT				
Summa Cannisters/Regulators	$36.75	Sample	36	$1,323
Cannister Re-Certification	$110.25	Canister	3	$331
LABORATORY ANALYSIS				
Low Level VOCs Water (SOM01.2)	$120.75	Sample	50	$6,038
Alkalinity	$16.00	Sample	44	$704
Bromate	$16.00	Sample	44	$704
Total Dissolved Solids (TDS)	$16.00	Sample	44	$704
Total Organic Carbon (TOC)	$16.00	Sample	44	$704
Chloride	$16.00	Sample	44	$704
Dissolved Iron and Manganese	$110.25	Sample	44	$4,851
Chemical Oxygen Demand (COD)	$18.90	Sample	44	$832
TO-15 Air	$187.95	Sample	33	$6,202
SEDD	$125.00	ea	3	$375
RCRA Characteristics	$603.75	Sample	2	$1,208
			Subtotal	**$24,679**
			Subtotal-Subcontract Price	**$62,645**
			Subcontract Management Fee*	**$3,132.23**
			TOTAL	**$65,776.83**

* A subcontract management fee of 5% has been included for W/MBE subcontracts.

Schedule 2.11 (f)

Unit Price Subcontracts
Work Assignment Number D004437-9

Name of Subcontractor	Services to be Performed	Subcontract Price	Management Fee
Earth Care	**IDW Removal**	**$17,170.00**	**$858.50**

Item	Max. Reimbursement Rate (Specify Unit)		Est. No. of Units	Total Est. Cost
Task 2A				
21,000 gallon tank - transportation	$675	ea	1	$675.00
20-cy roll-off - transportation	$225	ea	2	$450.00
Clean out sediment from 21,000 gallon tank	$2,500	per event	1	$2,500.00
Rental of 20-cy roll-off	$600	per month	4	$2,400.00
rental of 21,000 gallon tank	$780	per month	2	$1,560.00
Handling/Disposal of Non-Haz Soil and Drill Cut	$160	per cy	24	$3,840.00
PPE Disposal (Non-Hazardous)	$185	drum	2	$370.00
			Subtotal	**$11,795.00**
Task 2B				
IDW Removal (Non-Hazardous)	$175	drum	5	$875.00
IDW Removal (Hazardous)		drum	0	$0.00
Transportation	$150	per shipment	1	$150.00
			Subtotal	**$1,025.00**
Task 2D &E				
IDW Removal (Non-Hazardous)	$175	drum	24	$4,200.00
IDW Removal (Hazardous)		drum	0	$0.00
Transportation	$150	per shipment	1	$150.00
			Subtotal	**$4,350.00**
Subtotal-Subcontract Price				**$17,170.00**
Subcontract Management Fee*				**$858.50**
TOTAL				**$18,028.50**

* A subcontract management fee of 5% has been included for subcontracts over $10,000.

Schedule 2.11 (g) - Summary

Monthly Cost Control Report
Summary of Fiscal Information

Engineer **Camp Dresser & McKee**
Contract No. **D004437**
Project Name **Ronhill Cleaners**
Work Assignment No. **D004437-9**
Summary of Tasks
Percentage Completed

Date Prepared _____
Billing Period _____
Payment No. _____ **Invoice No.** _____

Expenditure Category	*A* *Costs Claimed This Period*	*B* *Paid to Date*	*C* *Total Disallowed to Date*	*D* *Total Costs Incurred to Date (A+B+C)*	*E* *Estimated Costs to Completion*	*F* *Estimated Total Work Assignment Price (A+B+E)*	*G* *Approved Budget*	*H* *Estimated Under/Over (G-F)*
1. Direct Salary Costs	$0	$0	$0	$0			$100,633.87	$0
2. Indirect Costs - '167.9%	$0	$0	$0	$0			$168,964.27	$0
3. Subtotal Direct Salary Costs and Indirect Costs	$0	$0	$0	$0			$269,598.14	$0
4. Travel	$0	$0	$0	$0			$36,129.90	$0
5. Other Non-Salary Costs	$0	$0	$0	$0			$50,659.00	$0
6. Subtotal Direct Non-Salary	$0	$0	$0	$0			$86,788.90	$0
7. Subcontractors	$0	$0	$0	$0			$277,240.84	$0
7a. Subcontract Mgt. Fee	$0	$0	$0	$0			$13,096.42	$0
8. Total Work Assignment Cos	$0	$0	$0	$0			$646,724.30	$0
9. Fixed Fee	$0	$0	$0	$0			$18,871.87	$0
10. Total Work Assignment Pr	$0	$0	$0	$0			$665,596.17	$0

Project Manager (Engineer) **Dave Keil**

Date _____

Schedule 2.11 (g)

Monthly Cost Control Report
Summary of Fiscal Information

Engineer Camp Dresser & McKee
Contract No. D004437
Project Name Ronhill Cleaners
Work Assignment No. D004437-9
Task #/Name Task 1 - Work Plan Development
Complete 0%

Date Prepared
Billing Period
Invoice No.

Expenditure Category	*A* *Costs Claimed This Period*	*B* *Paid to Date*	*C* *Total Disallowed to Date*	*D* *Total Costs Incurred to Date (A+B+C)*	*E* *Estimated Costs to Completion*	*F* *Estimated Total Work Assignment Price (A+B+E)*	*G* *Approved Budget*	*H* *Estimated Under/Over (G-F)*
1. Direct Salary Costs	$0	$0	$0	$0	$0	$0	$10,632.11	$0
2. Indirect Costs - '167.9%	$0	$0	$0	$0	$0	$0	$17,851.31	$0
3. Subtotal Direct Salary Costs and Indirect Costs	$0	$0	$0	$0	$0	$0	$28,483.42	$0
4. Travel	$0	$0	$0	$0	$0	$0	$0.00	$0
5. Other Non-Salary Costs	$0	$0	$0	$0	$0	$0	$1,050.00	$0
6. Subtotal Direct Non-Salary Costs	$0	$0	$0	$0	$0	$0	$1,050.00	$0
7. Subcontractors	$0	$0	$0	$0	$0	$0	$1,199.94	$0
7a. Subcontract Mgt. Fee	$0	$0	$0	$0	$0	$0	$0.00	$0
8. Total Work Assignment Cost	$0	$0	$0	$0	$0	$0	$30,733.36	$0
9. Fixed Fee	$0	$0	$0	$0	$0	$0	$1,993.84	$0
10. Total Work Assignment Price	$0	$0	$0	$0	$0	$0	$32,727.20	$0

Project Manager (Engineer) Dave Keil

Date

Schedule 2.11 (g)

Monthly Cost Control Report
Summary of Fiscal Information

Engineer Camp Dresser & McKee
Contract No. D004437
Project Name Ronhill Cleaners
Work Assignment No. D004437-9
Task #/Name Task 2A- Remedial Investigation
Complete 0%

Date Prepared
Billing Period
Invoice No.

Expenditure Category	*A* *Costs Claimed This Period*	*B* *Paid to Date*	*C* *Total Disallowed to Date*	*D* *Total Costs Incurred to Date (A+B+C)*	*E* *Estimated Costs to Completion*	*F* *Estimated Total Work Assignment Price (A+B+E)*	*G* *Approved Budget*	*H* *Estimated Under/Over (G-F)*
1. Direct Salary Costs	$0	$0	$0	$0	$0	$0	$30,638.58	$0
2. Indirect Costs 167.9%	$0	$0	$0	$0	$0	$0	$51,442.18	$0
3. Subtotal Direct Salary Costs and Indirect Costs	$0	$0	$0	$0	$0	$0	$82,080.76	$0
4. Travel	$0	$0	$0	$0	$0	$0	$19,322.00	$0
5. Other Non-Salary Costs	$0	$0	$0	$0	$0	$0	$8,764.00	$0
6. Subtotal Direct Non-Salary Costs	$0	$0	$0	$0	$0	$0	$28,086.00	$0
7. Subcontractors	$0	$0	$0	$0	$0	$0	$93,776.60	$0
7a. Subcontract Mgt. Fee	$0	$0	$0	$0	$0	$0	$4,434.59	$0
8. Total Work Assignment Cost	$0	$0	$0	$0	$0	$0	$208,377.95	$0
9. Fixed Fee	$0	$0	$0	$0	$0	$0	$5,745.65	$0
10. Total Work Assignment Price	$0	$0	$0	$0	$0	$0	$214,123.60	$0

Project Manager (Engineer) Dave Keil **Date**

Schedule 2.11 (g)

Monthly Cost Control Report
Summary of Fiscal Information

Engineer Camp Dresser & McKee
Contract No. D004437
Project Name Ronhill Cleaners
Work Assignment No. D004437-9
Task #/Name Task 2B - SVE O&M
Complete 0%

Date Prepared
Billing Period
Invoice No.

Expenditure Category	*A* *Costs Claimed This Period*	*B* *Paid to Date*	*C* *Total Disallowed to Date*	*D* *Total Costs Incurred to Date (A+B+C)*	*E* *Estimated Costs to Completion*	*F* *Estimated Total Work Assignment Price (A+B+E)*	*G* *Approved Budget*	*H* *Estimated Under/Over (G-F)*
1. Direct Salary Costs	$0	$0	$0	$0	$0	$0	$20,831.72	$0
2. Indirect Costs 167.9%	$0	$0	$0	$0	$0	$0	$34,976.46	$0
3. Subtotal Direct Salary Costs and Indirect Costs	$0	$0	$0	$0	$0	$0	$55,808.18	$0
4. Travel	$0	$0	$0	$0	$0	$0	$6,370.65	$0
5. Other Non-Salary Costs	$0	$0	$0	$0	$0	$0	$28,312.00	$0
6. Subtotal Direct Non-Salary Costs	$0	$0	$0	$0	$0	$0	$34,682.65	$0
7. Subcontractors	$0	$0	$0	$0	$0	$0	$5,779.40	$0
7a. Subcontract Mgt. Fee	$0	$0	$0	$0	$0	$0	$789.37	$0
8. Total Work Assignment Cost	$0	$0	$0	$0	$0	$0	$97,059.60	$0
9. Fixed Fee	$0	$0	$0	$0	$0	$0	$3,906.57	$0
10. Total Work Assignment Price	$0	$0	$0	$0	$0	$0	$100,966.17	$0

Project Manager (Engineer) Dave Keil

Date

Schedule 2.11 (g)

Monthly Cost Control Report
Summary of Fiscal Information

Engineer Camp Dresser & McKee
Contract No. D004437
Project Name Ronhill Cleaners
Work Assignment No. D004437-9
Task #/Name Task 2C - SSD O&M and Annual Sampling
Complete 0%

Date Prepared _____
Billing Period _____
Invoice No. _____

Expenditure Category	*A* *Costs Claimed This Period*	*B* *Paid to Date*	*C* *Total Disallowed to Date*	*D* *Total Costs Incurred to Date (A+B+C)*	*E* *Estimated Costs to Completion*	*F* *Estimated Total Work Assignment Price (A+B+E)*	*G* *Approved Budget*	*H* *Estimated Under/Over (G-F)*
1. Direct Salary Costs	$0	$0	$0	$0	$0	$0	$3,914.92	$0
2. Indirect Costs 167.9%	$0	$0	$0	$0	$0	$0	$6,573.15	$0
3. Subtotal Direct Salary Costs and Indirect Costs	$0	$0	$0	$0	$0	$0	$10,488.07	$0
4. Travel	$0	$0	$0	$0	$0	$0	$2,164.50	$0
5. Other Non-Salary Costs	$0	$0	$0	$0	$0	$0	$1,165.00	$0
6. Subtotal Direct Non-Salary Costs	$0	$0	$0	$0	$0	$0	$3,329.50	$0
7. Subcontractors	$0	$0	$0	$0	$0	$0	$19,745.25	$0
7a. Subcontract Mgt. Fee	$0	$0	$0	$0	$0	$0	$987.26	$0
8. Total Work Assignment Cost	$0	$0	$0	$0	$0	$0	$34,550.08	$0
9. Fixed Fee	$0	$0	$0	$0	$0	$0	$734.16	$0
10. Total Work Assignment Price	$0	$0	$0	$0	$0	$0	$35,284.25	$0

Project Manager (Engineer) Dave Keil

Date _____

Schedule 2.11 (g)

Monthly Cost Control Report
Summary of Fiscal Information

Engineer Camp Dresser & McKee
Contract No. D004437
Project Name Ronhill Cleaners
Work Assignment No. D004437-9
Task #/Name Task 2D - SVE System Enhancement
Complete 0%

Date Prepared
Billing Period
Invoice No.

Expenditure Category	*A* *Costs Claimed This Period*	*B* *Paid to Date*	*C* *Total Disallowed to Date*	*D* *Total Costs Incurred to Date (A+B+C)*	*E* *Estimated Costs to Completion*	*F* *Estimated Total Work Assignment Price (A+B+E)*	*G* *Approved Budget*	*H* *Estimated Under/Over (G-F)*
1. Direct Salary Costs	$0	$0	$0	$0	$0	$0	$5,274.88	$0
2. Indirect Costs 167.9%	$0	$0	$0	$0	$0	$0	$8,856.52	$0
3. Subtotal Direct Salary Costs and Indirect Costs	$0	$0	$0	$0	$0	$0	$14,131.40	$0
4. Travel	$0	$0	$0	$0	$0	$0	$2,164.50	$0
5. Other Non-Salary Costs	$0	$0	$0	$0	$0	$0	$6,753.00	$0
6. Subtotal Direct Non-Salary Costs	$0	$0	$0	$0	$0	$0	$8,917.50	$0
7. Subcontractors	$0	$0	$0	$0	$0	$0	$24,263.00	$0
7a. Subcontract Mgt. Fee	$0	$0	$0	$0	$0	$0	$712.75	$0
8. Total Work Assignment Cost	$0	$0	$0	$0	$0	$0	$48,024.65	$0
9. Fixed Fee	$0	$0	$0	$0	$0	$0	$989.20	$0
10. Total Work Assignment Price	$0	$0	$0	$0	$0	$0	$49,013.85	$0

Project Manager (Engineer) Dave Keil

Date

Schedule 2.11 (g)

Monthly Cost Control Report
Summary of Fiscal Information

Engineer Camp Dresser & McKee
Contract No. D004437
Project Name Ronhill Cleaners
Work Assignment No. D004437-9
Task #/Name Task 2E - Ozone Pilot Study
Complete 0%

Date Prepared _____
Billing Period _____
Invoice No. _____

Expenditure Category	*A* *Costs Claimed This Period*	*B* *Paid to Date*	*C* *Total Disallowed to Date*	*D* *Total Costs Incurred to Date (A+B+C)*	*E* *Estimated Costs to Completion*	*F* *Estimated Total Work Assignment Price (A+B+E)*	*G* *Approved Budget*	*H* *Estimated Under/Over (G-F)*
1. Direct Salary Costs	$0	$0	$0	$0	$0	$0	$8,792.92	$0
2. Indirect Costs 167.9%	$0	$0	$0	$0	$0	$0	$14,763.31	$0
3. Subtotal Direct Salary Costs and Indirect Costs	$0	$0	$0	$0	$0	$0	$23,556.23	$0
4. Travel	$0	$0	$0	$0	$0	$0	$6,108.25	$0
5. Other Non-Salary Costs	$0	$0	$0	$0	$0	$0	$2,515.00	$0
6. Subtotal Direct Non-Salary Costs	$0	$0	$0	$0	$0	$0	$8,623.25	$0
7. Subcontractors	$0	$0	$0	$0	$0	$0	$132,476.65	$0
7a. Subcontract Mgt. Fee	$0	$0	$0	$0	$0	$0	$6,172.45	$0
8. Total Work Assignment Cost	$0	$0	$0	$0	$0	$0	$170,828.58	$0
9. Fixed Fee	$0	$0	$0	$0	$0	$0	$1,648.94	$0
10. Total Work Assignment Price	$0	$0	$0	$0	$0	$0	$172,477.52	$0

Project Manager (Engineer) Dave Keil

Date _____

Schedule 2.11 (g)

Monthly Cost Control Report
Summary of Fiscal Information

Engineer Camp Dresser & McKee
Contract No. D004437
Project Name Ronhill Cleaners
Work Assignment No. D004437-9
Task #/Name Task 3 - Field Documentation and Reporting
Complete 0%

Date Prepared
Billing Period
Invoice No.

Expenditure Category	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*
	Costs Claimed This Period	*Paid to Date*	*Total Disallowed to Date*	*Total Costs Incurred to Date (A+B+C)*	*Estimated Costs to Completion*	*Estimated Total Work Assignment Price (A+B+E)*	*Approved Budget*	*Estimated Under/Over (G-F)*
1. Direct Salary Costs	$0	$0	$0	$0	$0	$0	$7,243.62	
2. Indirect Costs 167.9%	$0	$0	$0	$0	$0	$0	$12,162.04	
3. Subtotal Direct Salary Costs and Indirect Costs	$0	$0	$0	$0	$0	$0	$19,405.66	
4. Travel	$0	$0	$0	$0	$0	$0	$0.00	
5. Other Non-Salary Costs	$0	$0	$0	$0	$0	$0	$1,050.00	
6. Subtotal Direct Non-Salary Costs	$0	$0	$0	$0	$0	$0	$1,050.00	
7. Subcontractors	$0	$0	$0	$0	$0	$0	$0.00	
7a. Subcontract Mgt. Fee	$0	$0	$0	$0	$0	$0	$0.00	
8. Total Work Assignment Cost	$0	$0	$0	$0	$0	$0	$20,455.66	
9. Fixed Fee	$0	$0	$0	$0	$0	$0	$1,358.40	
10. Total Work Assignment Price	$0	$0	$0	$0	$0	$0	$21,814.05	

Project Manager (Engineer) Dave Keil

Date

Schedule 2.11 (g)

Monthly Cost Control Report
Summary of Fiscal Information

Engineer Camp Dresser & McKee
Contract No. D004437
Project Name Ronhill Cleaners
Work Assignment No. D004437-9
Task #/Name Task 4 - Feasibility Study
Complete 0%

Date Prepared
Billing Period
Invoice No.

Expenditure Category	*A* *Costs Claimed This Period*	*B* *Paid to Date*	*C* *Total Disallowed to Date*	*D* *Total Costs Incurred to Date (A+B+C)*	*E* *Estimated Costs to Completion*	*F* *Estimated Total Work Assignment Price (A+B+E)*	*G* *Approved Budget*	*H* *Estimated Under/Over (G-F)*
1. Direct Salary Costs	$0	$0	$0	$0	$0	$0	$6,379.48	$0
2. Indirect Costs - '167.9%	$0	$0	$0	$0	$0	$0	$10,711.15	$0
3. Subtotal Direct Salary Costs and Indirect Costs	$0	$0	$0	$0	$0	$0	$17,090.63	$0
4. Travel	$0	$0	$0	$0	$0	$0	$0.00	$0
5. Other Non-Salary Costs	$0	$0	$0	$0	$0	$0	$0.00	$0
6. Subtotal Direct Non-Salary Costs	$0	$0	$0	$0	$0	$0	$0.00	$0
7. Subcontractors	$0	$0	$0	$0	$0	$0	$0.00	$0
7a. Subcontract Mgt. Fee	$0	$0	$0	$0	$0	$0	$0.00	$0
8. Total Work Assignment Cost	$0	$0	$0	$0	$0	$0	$17,090.63	$0
9. Fixed Fee	$0	$0	$0	$0	$0	$0	$1,196.34	$0
10. Total Work Assignment Price	$0	$0	$0	$0	$0	$0	$18,286.97	$0

Project Manager (Engineer) Dave Keil

Date

Schedule 2.11 (g)

Monthly Cost Control Report
Summary of Fiscal Information

Engineer Camp Dresser & McKee
Contract No. D004437
Project Name Ronhill Cleaners
Work Assignment No. D004437-9
Task #/Name Task 5 - Ozone Pilot Study Report
Complete 0%

Date Prepared
Billing Period
Invoice No.

Expenditure Category	*A* *Costs Claimed This Period*	*B* *Paid to Date*	*C* *Total Disallowed to Date*	*D* *Total Costs Incurred to Date (A+B+C)*	*E* *Estimated Costs to Completion*	*F* *Estimated Total Work Assignment Price (A+B+E)*	*G* *Approved Budget*	*H* *Estimated Under/Over (G-F)*
1. Direct Salary Costs	$0	$0	$0	$0	$0	$0	$6,925.64	$0
2. Indirect Costs - '167.9%	$0	$0	$0	$0	$0	$0	$11,628.15	$0
3. Subtotal Direct Salary Costs and Indirect Costs	$0	$0	$0	$0	$0	$0	$18,553.79	$0
4. Travel	$0	$0	$0	$0	$0	$0	$0.00	$0
5. Other Non-Salary Costs	$0	$0	$0	$0	$0	$0	$1,050.00	$0
6. Subtotal Direct Non-Salary Costs	$0	$0	$0	$0	$0	$0	$1,050.00	$0
7. Subcontractors	$0	$0	$0	$0	$0	$0	$0.00	$0
7a. Subcontract Mgt. Fee	$0	$0	$0	$0	$0	$0	$0.00	$0
8. Total Work Assignment Cost	$0	$0	$0	$0	$0	$0	$19,603.79	$0
9. Fixed Fee	$0	$0	$0	$0	$0	$0	$1,298.77	$0
10. Total Work Assignment Price	$0	$0	$0	$0	$0	$0	$20,902.55	$0

Project Manager (Engineer) Dave Keil

Date

Schedule 2.11 (g) - Supplemental

Cost Control Report for Subcontracts

Engineer Camp Dresser & McKee
Contract No. D004437
Project Name Ronhill Cleaners
Work Assignment No. D004437-9

Date Prepared
Billing Period
Invoice No.

Subcontract Name	*A* *Subcontract Costs Claimed this Application Inc. Resubmittals*	*B* *Subcontract Costs Approved for Payment on Previous Applications*	*C* *Total Subcontract Costs to Date (A plus B)*	*D* *Subcontract Approved Budget*	*E* *Management Fee Budget*	*F* *Management Fee Paid*	*G* *Total Costs to Date (C plus F)*
1. Delta Well (MBE Driller)	$0	$0	$0	$80,598.80	$4,029.94	$0	$0
2. ChemTech (MBE Lab)	$0	$0	$0	$62,644.60	$3,132.23	$0	$0
3. YEC - Surveying (MBE)	$0	$0	$0	$6,169.50	$0.00	$0	$0
4. Nancy Potak (WBE)	$0	$0	$0	$6,061.00	$303.05	$0	$0
5. Ken Shider Consulting (MBE)	$0	$0	$0	$1,199.94	$0.00	$0	$0
6. AGS - Geophysical Survey	$0	$0	$0	$4,000.00	$0.00	$0	$0
7. EarthCare	$0	$0	$0	$17,170.00	$858.50	$0	$0
8. Bensin Contracting	$0	$0	$0	$10,008.00	$500.40	$0	$0
9. BLUE/RCC	$0	$0	$0	$85,446.00	$4,272.30	$0	$0
10. Zebra Environmental	$0	$0	$0	$3,943.00	$0.00		$0
TOTALS	$0	$0	$0	$277,240.84	$13,096.42	$0	$0

Project Manager (Engineer) Dave Keil **Date**

NOTES:

1) Costs listed in Columns A, B, C & D do not include any management fee costs.
2) Management fee is applicable to only properly procured, satisfactorily completed, unit price subcontracts over $10,000.
3) Line 11, Cloumn G should equal Line 7 (Subcontractors), Column D of Summary Cost Control Report.

Schedule 2.11(h)
Monthly Cost Control Report
Summary of Labor Hours

Number of Direct Labor Hours Expended to Date/Estimated Number of Direct Labor Hours to Completion

Engineer/Contract # **D004437**
Project Name **Ronhill Cleaners**
Work Assignment No. **D004437-9**

Date Prepared _____
Billing Period _____
Invoice No. _____

NSPE Labor Classification	*IX Exp/Est*	*VIII Exp/Est*	*VII Exp/Est*	*VI Exp/Est*	*V Exp/Est*	*III Exp/Est*	*II Exp/Est*	*I Exp/Est*	*Admin.*	*Total No. of Direct Labor Hrs. Exp/Est*
Task 1	0 / 12	0 / 28	0 / 4	0 / 30	0 / 115	0 / 66	0 / 0	0 / 0	0 / 12	0 / 267
Task 2A	0 / 4	0 / 40	0 / 0	0 / 16	0 / 40	0 / 475	0 / 470	0 / 0	0 / 6	0 / 1051
Task 2B	0 / 2	0 / 16	0 / 0	0 / 0	0 / 0	0 / 650	0 / 40	0 / 0	0 / 6	0 / 714
Task 2C	0 / 2	0 / 16	0 / 0	0 / 0	0 / 0	0 / 50	0 / 50	0 / 0	0 / 6	0 / 124
Task 2D	0 / 8	0 / 16	0 / 0	0 / 0	0 / 40	0 / 60	0 / 16	0 / 0	0 / 6	0 / 146
Task 2E	0 / 8	0 / 24	0 / 0	0 / 0	0 / 60	0 / 100	0 / 60	0 / 0	0 / 6	0 / 258
Task 3	0 / 8	0 / 40	0 / 8	0 / 0	0 / 50	0 / 50	0 / 12	0 / 0	0 / 12	0 / 180
Task 4	0 / 8	0 / 24	0 / 0	0 / 0	0 / 80	0 / 2	0 / 40	0 / 0	0 / 12	0 / 166
Task 5	0 / 8	0 / 24	0 / 0	0 / 0	0 / 80	0 / 30	0 / 30	0 / 0	0 / 12	0 / 184
Total Hours	0 / 60	0 / 228	0 / 12	0 / 46	0 / 465	0 / 1483	0 / 718	0 / 0	0 / 78	0 / 3090

* Expended/Estimated

Appendix E

CONTRACTOR BACKUP

Ronhill Cleaners Project
Subcontractor Quote Comparison

Ozone Pilot Study
Blue Lightening Underground (RCC) was selected to conduct the ozone pilot study. Ozone injection is an innovative technology. Since this technology is so new, there are only a few firms that provide the service. RCC provides this specialized service, and comes recommended. We were unable to identify other contractors in the area that could provide the same level of service. A copy of Blue Lightening Underground's proposal is included with the Work Plan.

Multi-Channel Wells	Amount	Units	Solnist CMT	Westbay System	FLUTe
EQUIPMENT					
Multi-level system	4	each	$6,859	$38,800	$70,668
sampling equipment	4	each	$8,479	$4,150	$1,210
In-field Training	1	lump sum	$1,600	$14,000	$8,804
Shipping			$2,000		$6,000
		Totals	$18,938	$56,950	$86,682

* The selected driller will be purchasing the equipment from Solinst and marking up the cost 10% — $20,831.80

Drilling - Task 2A - Multi-Channel Well Installation	**Amount**	**Units**	**Delta Well (WBE)**	**Land, Air, Water (WBE)**	**Geologic (WBE)**
Mobilization			3000	Declined	6500
Hollow Stem Auger	820	per ft	$26	$27	$22
Betonite pellets	25	per bucket	$75	$14	$30
Filter Pack	25	per bag	$20	$10	$30
Installation of CMT filter packs and Seals	4	per hr	$225	$245	$225
Cement-bentonite grout	750	per ft	$9	$5	$10
Decon Pad	1	ea	$875	$250	$400
Protective Casing	4	ea	$225	$300	$300
IDW Handling	4	per hr	$225	$245	$225
Steam Cleaning	4	per hr	$180	$200	$175
Well Development	8	per hr	$180	$245	$225
		Task 2A Total	$39,180	NA	$39,440
Drilling - Task 2D (4 SVE Wells)					
Mob/Demob	1		$800	Declined	$6,500
4.25" Hollow Stem Auger	320	LF	$20	$21	$16
bentonite pellets	12	pail	$75	$14	$30
filter pack material	12	bag	$20	$10	$30
Cement bentonite grout	280	LF	$9	$5	$10
Decon Pad	1	ls	$875	$250	$400
Protective Casing	4	ea	$225	$300	$300
IDW handling	4	hr	$225	$245	$225
Steam cleaning	4	hr	$180	$200	$225
		Task 2D Total	$14,255	NA	$18,540
Drilling - Task 2E (1 Monitoring Well)					
Mob/Demob			$800	Declined	$6,500
4.25" Hollow Stem Auger	120	LF	$20	$21	$16
bentonite pellets	5	pail	$75	$14	$30
filter pack material	5	bag	$20	$10	$30
Cement bentonite grout	108	LF	$9	$5	$10
Decon Pad	1	ls	$875	$250	$400
Protective Casing	1	ea	$225	$300	$300
IDW handling	1	hr	$225	$245	$225
Steam cleaning	1	hr	$180	$200	$175
Well Development	1	hr	$180	$245	$225
		Task 2E Total	$6,332	NA	$11,125
		Drilling Total with CMT	$80,599	NA	$89,937

*Three other drillers on the standby list were contacted but because of the depth of the wells (200+ ft) and inexperience with installing multi-channel wells, they declined to bid. Drilling to depths greater than 200 feet is beyond the capacity of most standard drill rigs.

Ronhill Cleaners Project
Subcontractor Quote Comparison

Soil Vapor and Groundwater Point Installation	Quantity	Units	Zebra	SGS	Hydro Tech
Task 2E			**Unit Rate**	**Unit Rate**	**Unit Rate**
Mob/Demob					
Senior Technician/Driller	16	per hour	included	included	$28.50
Technician	16	per hour	included	included	$23.50
Rig Mileage Rate	Subcontractor Specific	per mile	included	$600	$108.00
Support Truck	Subcontractor Specific		included	$350	included
Per Diem Rate	2	per day	$155	$150.00	$90.00
Drill Rig and Crew					
Truck Drill Rig & Crew	2	per day	$1,365.00	$1,749.00	$1,384.53
Soil Vapor Point Installation					
Shallow Soil Vapor Point Installation (0-8')	2	each	$99.75	$121.90	$115.50
Deep Soil Vapor Point Installation	2	each	$131.25	$159.00	$128.10
Miscellaneous					
Decontamination	2	per hour	$0.00	$174.90	$47.25
Standby Time	1	per hour	$210.00	$192.90	$103.95
55-Gallon DOT Drum	4	each	$57.75	$69.00	$54.08
	TOTAL		$3,943.00	$6,128.50	$4,791

Surveyor & Field Services			YEC (MBE)*	Donald Dekenipp	Om P. Popli, P.E., L.S., P.C.
Surveying	1	day	$3,509	$2,500	$5,400
Field Services			$2,660.50	NA	NA
		Totals	$6,169.50	NA	NA

*YEC was selected because they also provides field services, which are not offered by the other firms

Geophysical Survey			AGS	Naeva	Hagar Richter
	2	day	2000	2525	2550
		Totals	$4,000	$5,050	$5,100

SVE Equipment Installation	Amount	Units	Bensin Contracting	Bigler Associates Inc.	Fleet Environmental Services	Recovery Environmental Services	AWT Environmental Services, Inc.
Installing the sub surface 4" schedule 40 pipeline and connect new lines to existing pipeline network	100	ft	$24.50	$110.00	$134.80	Included	$64.10
100 ft Schedule 80 Dark Gray PVC pipe including shipping	100	ft	$5.58	$5.58	Included	Included	included
Fittings and accessories including shipping	1	ea	$500.00	$500.00	Included	Included	$870
Blower installation cost	1	ea	$4,500.00	$6,000.00	$930	Included	$2,490
Demister Drum and dilution valve installation cost	1	ea	$2,000.00	$2,000.00	$930	Included	$940
		Totals	$10,008.00	$20,058.00	$15,340.00	$37,500	$10,710

Ronhill Cleaners Project
Subcontractor Quote Comparison

Investigation Derived Waste Disposal	Amount	Units	EarthCare	Innovative Recycling Technologies, Inc.	Seacoast Environmental Services, Inc.	H&S Environmental (WBE)	Trade-Winds Environmental
21,000 gallon tank - transportation	1	ea	$675	$2,200	$1,880	$600	$1,250
20-cy roll-off - transportation	2	ea	$225	$1,430	$1,880	$600	$595
Clean out sediment from 21,000 gallon tank	1	event	$2,500	$1,750	$1,700	$4,375	$2,800
Rental of 20-cy roll-off	4	month	$600	$2,200	$2,500	$558	$750
rental of 21,000 gallon tank	2	month	$780	$2,200	$2,500	$1,550	$2,850
Handling/Disposal of Non-Haz Soil and Drill Cuttings	24	per cy	$160	$234	$135	$285	$750
PPE Disposal (Non-Hazardous)	2	drum	$185	$95	$98	$130	$175
IDW Removal (Non-Hazardous)	29	drum	$175	$95	$98	$138	$175
IDW Removal (Hazardous)	0	drum		$195	$175		
Freight Fee/Transportation	2	event	$150	$200	$200	$2,500	$395
Totals			**$17,170.00**	**$28,971.00**	**$29,018.00**	**$27,609.00**	**$38,155.00**

Equipment Purchase >$1000	Amount	Units	PINE Environmental	US Environmental	Environmental Equipment and Supply
Submersible Pump	2	months	$638	$1,020	$1,460
		Totals	$1,276	$2,040	$2,920

Truck	Amount	Units	Enterprise	Budget	Penske
Truck Rental	50	days	$3,424	$5,511	$7,250

Equipment Purchase >$1000	Amount	Units	PINE Environmental	US Environmental	Geotech Environmental Equipment Inc.
PID & Calibration Kit					
OVM 580B	1	each	$3,462	$3,000	$4,347
MiniRae 2000	1	each	$2,914	$3,235	$3,868
Photocheck+ 1000EX	1	each	$2,995	$2,620	$3,108

Carbon Vessel	Amount	Units	General Carbon	Carbon Activated	US Filters	Fleet Environmental Services	Moran Environmental Recovery
Carbon Vessel Changeout	8	each	$21,888	$23,580	$24,230	$66,240	$57,040

Other	Amount	Units	Van Air Hydraulics, NJ	Gast Mfg. Inc, MI	kinequip Inc, PA
55 gallon **Demister Drum** (Shipping included if ordered with Blower)	1	each	$2,091	$2,091	$2,091
Blower with 425 CFM capacity including shipping. (Model No. R7100R-50)	1	each	$4,000	$5,000	$4,181
		TOTALS	$6,091	$7,091	$6,272

New York State
Department of Environmental Conservation
Division of Environmental Remediation

Subcontract Certification

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David J. Keil — 2/1/08

Signature of Contractor's Authorized Representative — Date

CDM — D004437-9

Contractor Name — Contract No. WA No.

Delta Well

Subcontractor Name — 3/2/07

New York State
Department of Environmental Conservation
Division of Environmental Remediation

Subcontract Certification

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David J. Kid — 2/1/08

Signature of Contractor's Authorized Representative — Date

CDM — D004437-9

Contractor Name — Contract No. WA No.

ChemTech

Subcontractor Name — 3/2/07

New York State
Department of Environmental Conservation
Division of Environmental Remediation

Subcontract Certification

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David J. Kail — 2/1/08

Signature of Contractor's Authorized Representative — Date

CDM — D004437-9

Contractor Name — Contract No. WA No.

YEC

Subcontractor Name — 3/2/07

New York State
Department of Environmental Conservation
Division of Environmental Remediation

Subcontract Certification

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David J. Keil — 2/1/08

Signature of Contractor's Authorized Representative — Date

CDM — D004437-9

Contractor Name — Contract No. WA No.

NANCY POTAK

Subcontractor Name — 3/2/07

New York State
Department of Environmental Conservation
Division of Environmental Remediation

Subcontract Certification

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David J. Kail — 2/1/08

Signature of Contractor's Authorized Representative — Date

COM — D004437-9

Contractor Name — Contract No. WA No.

Ken Shider

Subcontractor Name — 3/2/07

New York State
Department of Environmental Conservation
Division of Environmental Remediation

Subcontract Certification

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David J. Kiel — 2/1/08

Signature of Contractor's Authorized Representative — Date

CDM — D004437-9

Contractor Name — Contract No. WA No.

ADVANCED Geological Services (AGS)

Subcontractor Name — 3/2/07

New York State
Department of Environmental Conservation
Division of Environmental Remediation

Subcontract Certification

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David J. Kiel — 2/1/08

Signature of Contractor's Authorized Representative — Date

CDM — D004433-9

Contractor Name — Contract No. WA No.

EARTHCARE

Subcontractor Name — 3/2/07

New York State
Department of Environmental Conservation
Division of Environmental Remediation

Subcontract Certification

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David J. Keil — 2/1/08

Signature of Contractor's Authorized Representative — Date

CDM — D004437-9

Contractor Name — Contract No. WA No.

Bensin Subcontracting

Subcontractor Name

3/2/07

New York State
Department of Environmental Conservation
Division of Environmental Remediation

Subcontract Certification

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David J. Keil — 2/1/08

Signature of Contractor's Authorized Representative — Date

CDM — D004437-9

Contractor Name — Contract No. WA No.

Zebra Environmental

Subcontractor Name — 3/2/07

New York State
Department of Environmental Conservation
Division of Environmental Remediation

Subcontract Certification

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David J. Keil — 2/1/08

Signature of Contractor's Authorized Representative — Date

COM — D004437-9

Contractor Name — Contract No. WA No.

Blue Lightening Underground / Resource Control Corp (RCC)

Subcontractor Name

3/2/07

September 23, 2007

Paresh Patel
Project Engineer
CDM
Raritan Plaza 1, Raritan Center
Edison, New Jersey 08818

RE: Revised Proposal for RemedO_3zone Pilot Study
Ronhill Cleaners Site
Glen Cove, New York
BLUE Proposal #B-0175-1

Dear Mr. Patel:

Blue Lightning Underground Enterprises (BLUE) is pleased to present this revised proposal to conduct a pilot study at the above referenced site in Glen Cove, New York. BLUE provides in-situ chemical oxidation (ISCO) systems and services using our vast experience with ozone based remedial solutions. This revised proposal is based upon additional site information provided by CDM since the submission of the original proposal (B-0175) by BLUE on May 24, 2007.

In preparing this proposal, BLUE has evaluated the feasibility of ozone based solutions, and provides herein, a turnkey approach for the installation of a system for a pilot test to assess the treatibility of soil and groundwater impacted by percholroethylene (PCE). The proposal includes remedial design, mobilization, system installation, 60 days of operation, operation and maintenance visits with performance monitoring and project management.

Objective

The objective of this pilot study is to confirm that an ISCO system is feasible for remediation of PCE impacted soil and groundwater.

BLUE RemedO_3zone™ Remediation

RemedO_3zone™ technology provides state-of-the art oxidant delivery to the in-situ soil and groundwater remediation market, and has been developed, as a cutting edge in-situ cleanup method for safe and effective site remediation.

Ozone is one of the post powerful oxidants available for this purpose. Delivered in micro-bubbles as a gas mixed with air or oxygen, or suspended in water, ozone provides a controllable, highly effective means of delivering strong oxidant into site soils and groundwater.

Remedial Description

The conceptual remedial action evaluation for the site will consist of an ozone injection pilot test into four injection points (two co-located points) installed on-site in the area of sorbed soil and dissolved groundwater impacts. This remedial approach should remove a significant mass of dissolved phase and soil sorbed phase PCE from the saturated zone within the area of concern through chemical oxidation by the application of ozone and free radicals.

BLUE will perform testing during pilot system operation to confirm the conceptual design parameters and obtain data necessary for the optimal full-scale remedial operation. The anticipated duration of the pilot study is for two months of active injection.

BLUE anticipates installing four ozone injection points. The injection points will be installed by hollow stem auger (or equivalent) drilling methodology to a maximum depth of 120 feet below grade.

BLUE will supervise the injection point installations, and install all necessary plumbing to connect the wells with below grade piping. BLUE will provide a remediation system utilizing gas phase oxygen and ozone micro-bubble production. The remediation will be performed using a pulsed gas application into the subsurface. BLUE has provided for 2 months of pilot scale operation.

A brief summary of the scope of work is presented below.

Design, Permitting and Regulatory Work Plan

This task includes the preparation of information that will be provided to CDM for inclusion into a Remedial Action Plan (RAP), and or necessary permit applications that will meet the needs of all the parties involved. BLUE will work closely with CDM, such that the combined teaming of efforts most effectively achieves the project goals. BLUE will develop appropriate operations documents for the implementation of ozone remediation. The work plan document may contain:

- Summary of the remediation apparatus, and application methods;
- Summary of process and subsurface monitoring parameters, frequencies and durations;
- Operation and Optimization Plan for the remediation system, including field data forms and operation log; and,
- Well construction details, process piping and manifold construction specifications, and electrical power supply specifications.

Equipment Usage and Technology License

BLUE will provide a site-specific technology license from Kerfoot Technologies, Inc. (Kerfoot) for application of patented ozone injection technology at this site. BLUE will supply a portable, self-contained, ozone system for use at the subject site. The system will contain ozone generating equipment, system controls and fail-safe controls for continuous operation. Soil vapor extraction equipment and operation are the responsibility of others.

Remediation Point Installation

This task includes procurement of the appropriate, ozone injection point materials and installation oversight for installation of four (4) injection points. Injection point installation is critical to the success of the project, and as such, proper materials of construction and installation techniques must be followed.

BLUE will retain the services of a New York licensed well driller for the installation of injection points, utilizing small diameter hollow stem augers. The driller will provide gravel pack, sealing and grouting, and surface completion for the injection points. Disposal of any waste material created during drilling will be the responsibility of others.

BLUE understands that the project site already has vapor monitoring, vapor extraction and groundwater monitoring points.

Infrastructure Installation

Work includes all labor, vehicles, supplies and construction equipment usage related to installation of system components, wellhead connections, and related equipment connections. This task includes process piping installation, connections and manifold construction and equipment trailer installation. All piping will be below grade. BLUE assumes that the area for the trench will be made accessible.

BLUE will retain a licensed electrician for making electrical connections. The electrician will obtain necessary electrical permits.

Remedial System Startup

This task includes all labor, equipment and materials related to startup and calibration of the ozone remediation system at the site, system performance verification during start-up, and initially optimizing the remediation system. Labor includes mechanical and electrical testing of all components, in-situ testing, and injection point testing to document baseline engineering data.

This task also includes shutdown of the remediation system, including disconnection of all electrical, remediation systems, piping, and return transportation of all equipment. Injection point abandonment is not included. BLUE assumes others are responsible for abandonment of any monitoring or vapor extraction/monitoring wells.

Operation & Optimization

This task includes operation of the proposed active remediation system at the subject site. O&O is needed to ensure proper equipment operation, to make adjustments, and to perform field screening as needed. It is estimated that the duration will not exceed 2 months of active in-situ system operation. At least 2 site visits per month will be performed to ensure that the system remains properly optimized for efficient operation.

Electrical usage costs are assumed to be the responsibility of others.

Project Management & Meetings

Communication is the key to the successful completion of a remediation project, particularly when multiple parties are involved. This task includes project management by BLUE for coordinating the scope, schedule, budget and subcontractors; as well as communication with CDM.

Project Monitoring

BLUE will collect field measurements during system O&O to evaluate equipment operation and determine system performance and system optimization. Field measurements include flow and pressure readings, hour meter readings, and ozone concentration.

Project Schedule

BLUE anticipates that system installation can be completed within 60 days of receipt of all contracts, permits and approvals. This would be followed by an estimated 2 months of active pilot remediation.

Any soil or groundwater sampling required by New York State Department of Environmental Conservation (NYSDEC) will be performed by others. The number of samples, locations and parameters should be based on regulatory requirements. The scope for soil and groundwater sampling and analysis tasks are not included in BLUE's scope of work, as defined in the terms and conditions listed below. The project schedule is subject to change based on date of contract award and equipment availability.

Price Schedule

BLUE provides lump sum by task effort price which includes installation of the remediation system and operation of this system for 2 months.

Price for RemedO_3zone™ Pilot Remediation – 2 Months

Task / Subtask	Fixed Fee Price
A - Design, Planning, Permitting and Remedial Action Work Plan	$961
B - Equipment Usage and Technology License (2 months)	$29,141
C - Remediation Point Install (4 injection points to 110 FBG)	$19,754
D - System Installation Infrastructure	$21,633*
E - Remediation System Startup and Demob	
E-1 Remedial System Startup	$3,722
E-2 Demobilization	$1,750
F - Operation & Optimization (2 months)	$6,485
G - Project Management	$2,000
Total:	**$85,446**

***-Includes estimated price for tree-clearing.**

TERMS, CONDITIONS AND ASSUMPTIONS

The above prices are prepared based on the following assumptions:

1. This project will be performed for a lump sum by task basis as detailed above and below. The pricing provided assumes the following payment terms;
   a. Schedule:
      i. Billing for equipment usage and technology license fees (Task B) will be billed 100 % upon contract execution. Billing for Remedial Point installation (Task C) will be billed 60% upon contract execution. Other tasks will be billed monthly on a percent complete basis.
      ii. The patent license and equipment will be available for use on this site for the 2 month duration of the remediation.
      iii. The remediation equipment will be the property of BLUE during and after the completion of the project.
   b. Price is based on payment within 15 days of receipt of invoice.
   c. This price is valid for 90 days from the date of this proposal.

2. This proposal assumes BLUE's conceptual remedial approach is approved by client and regulators. This includes gas injection. Changes to the proposed scope of work required by third parties may affect the price quoted herein. BLUE will provide necessary information for application of any permits, however any permit application and/or fees is the responsibility of others. (Note: Electrician will obtain electrical permits).

3. This proposal assumes the PCE plume exists at the site as described in the reports and other data supplied by CDM.

4. The property owners will allow access to the property to perform the above-specified work. Access will be available, daily, between the hours of 7:00 A.M. and 7:00 P.M., including weekends.

5. This proposal is for remedial services and associated consulting and reporting and does not include additional delineation activities or other consulting services that may be required by the NYSDEC.

6. Schedule assumes that the appropriate RemedO_3zone™ equipment is available for the specified time frame.

7. All work will be conducted in level D PPE, and assumes non-union labor.

8. BLUE assumes that all drilling and trenching locations are accessible. Site restoration that may include landscaping or other surface restoration is not included. Waste disposal for any drill cuttings is not included in this proposal, and is the responsibility of others. All waste will be staged as directed by BLUE.

9. BLUE assumes others will provide paving. If paving is required, BLUE will provide this as cost +10%.

10. BLUE has provided an estimate for tree removal. This is an estimate at this time only.

BLUE appreciates this opportunity to bid on this project. BLUE has worked for several years to develop safe and effective processes and procedures to provide ozone based, in-situ oxidation to the subsurface remediation market. BLUE values the opportunity to team with consulting and remediation firms to provide these services.

Upon your approval, please contact us to discuss contractual arrangements. Should you have any questions on the above information, please contact us at BLUE.

Sincerely,
Blue Lightning Underground Enterprises

Jeffrey C. Dey
President and CEO

CC. Proposal File B-0175
P. Borst (BLUE)