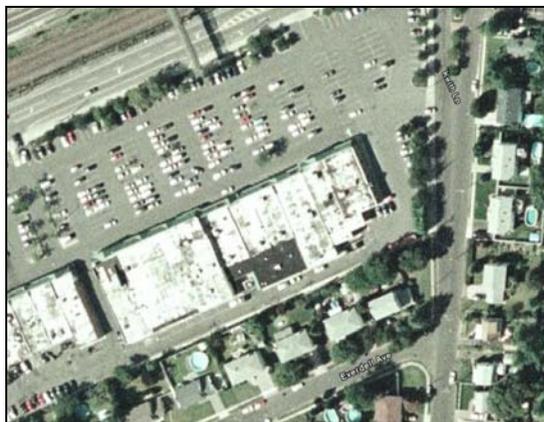


SITE CHARACTERIZATION WORK PLAN

**FORMER MOM'S CLEANERS SITE
SITE # 1-52-184
556 UNION BOULEVARD
WEST ISLIP, NY 11795**



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November 5, 2010



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SITE CHARACTERIZATION WORK PLAN

FORMER MOM'S CLEANERS SITE SITE # 1-52-184 556 UNION BOULEVARD WEST ISLIP, NY 11795

1.0 INTRODUCTION

This Site Characterization Work Plan (SC Work Plan) outlines the investigation activities to be conducted at the Former Mom's Cleaners Site (hereinafter referred to as the "Subject Property") located at 556 Union Boulevard in West Islip, New York (see **Figure 1-1**: Site Location Map). The Subject Property represents a former tenant space on the eastern portion of a strip-mall shopping center known as the Captree Village Shopping Center. According to a New York State Department of Environmental Conservation (NYSDEC) Order on Consent and Administrative Settlement (Order), the Subject Property is currently listed as Site # 1-51-184 in the New York State Registry of Inactive Hazardous Waste Sites. The Subject Property is currently listed as a Class 4 site by the NYSDEC.

It is understood that the NYSDEC is requesting completion of SC activities at the Subject Property based upon the following:

- Groundwater samples collected and analyzed in November of 2009 from two (2) on-site monitoring wells (i.e., MW-6 and MW-9) contained tetrachloroethene (PCE) in exceedance of its New York State Class GA groundwater quality standard of 5.0 micrograms per liter (ug/l); and,
- Due to the presence of shallow groundwater impacted by halogenated volatile organic compounds (VOCs) in the vicinity of the on-site building, there is the potential for soil vapor intrusion (SVI) into the overlying occupied structures.

The investigation activities planned for the Subject Property to assess the foregoing issues include the following general scope of work:

- Installation of two (2) additional groundwater monitoring wells, one (1) at an upgradient site location and one (1) at a downgradient site location;
- Collection and analyses of groundwater samples from existing wells MW-6, MW-9 and the two (2) newly-installed wells for NYSDEC Target Compound List (TCL) VOCs; and,
- Conduct of a SVI evaluation of the on-site structures in accordance with prevailing New York State Department of Health (NYSDOH) protocols.

The following sections of this SC Work Plan, when implemented in conjunction with the Site Health and Safety Plan (HASP) and the Quality Assurance Project Plan (QAPP), and review of previous investigation data, will meet the objectives of the SC as outlined in NYSDEC TAGM SW-96-09 – Development and Review of Site Analytical Plans dated May 3, 2001; and, NYSDEC DER-10 – Technical Guidance for Site Investigation and Remediation, dated May 2010, as amended.

The HASP and QAPP are submitted under separate cover.

1.1 Objectives

The components of the SC Program have been designed to meet the following specific objectives:

- Evaluate on-site groundwater quality conditions in the vicinity of the Subject Property, as well as directly upgradient of the nearest off-site residential structures; and,
- Evaluate SVI conditions and determine if any further action(s) (e.g., continued monitoring, mitigation, etc.) is warranted.

1.2 Site Description and Location

The Subject Property is currently occupied by several medical facilities on the eastern portion of a multi-tenant, shopping center, but was formerly the location of the Mom's Cleaner's facility (see **Figure 1-2**). A former on-site facility, known as Charlene Service Station, Inc., doing business as (dba) Louis's Service Center was located upgradient of the Mom's Cleaners facility. Louis's Service Center had documented, historic soil and groundwater contamination related to former tank operations associated with dispensing of gasoline but has achieved regulatory closure with the NYSDEC.

The former dry cleaner tenant space has been redeveloped with the following infrastructure:

- Good Samaritan Hospital Medical Center, 560 Union Boulevard – This building is situated at the east end of the existing, multi-tenant building, which is constructed slab-on-grade. The leased space is currently being utilized as office and work spaces by the Good Samaritan Hospital Medical Center (hereinafter "Good Samaritan"), which provides outpatient physical therapy, occupational therapy and speech language pathology. This western portion of this space reportedly overlays the former Mom's Dry Cleaner location;
- South Bay Cardiovascular Center, 540 Union Boulevard – This tenant space is situated west of the Good Samaritan leased space. The leased space is currently utilized by the South Bay Cardiovascular Center (hereinafter referred to as "South Bay") for the diagnosis, treatment and prevention of cardiovascular diseases, and is comprised of offices and work space areas.

The former Mom's Cleaners space was located on the opposite side of the east wall of the South Bay space with primary dry cleaning operations reportedly located near the rear of the space; and,

- Rite Aid Pharmacy, 532 Union Boulevard – The Rite Aid Pharmacy (Rite Aid) is located on the central-western portion of the overall strip mall, and is located at the west end of the single-story building. Rite Aid provides pharmaceutical services and health-related products, as well as convenience items.

1.3 Summary Site Environmental History

The Subject Property has been subject to environmental investigations and remedial actions over the last several years. As recently as 2009, Apex conducted groundwater and SVI investigatory actions, the results of which were provided to the NYSDEC circa April of 2010.

1.3.1 Soil and Groundwater History

Louis's Service Station and Mom's Cleaners historically operated at the Subject Property. Based upon the results of a gasoline spill investigation conducted at Louis's Service Center, additional contamination in the vicinity of the former Mom's Cleaners site was also detected. Although remediation at the Louis's Service Center has been completed and the work was approved by the NYSDEC, the NYSDEC determined that chlorinated solvent contamination downgradient of Louis's Service Center in the vicinity of Mom's Cleaners resulted from the disposal and / or spillage of PCE at the former dry cleaning unit and the associated septic tank at the Former Mom's Cleaners Site.

In August 1997, soils sampled proximate to Mom's Cleaners and the associated septic tank demonstrated elevated concentrations of PCE at 1,000 micrograms per kilogram (ug/kg) and 670 ug/kg, respectively. Areas of soil contamination were subsequently remediated by the property owner in September and October 1997. However, soil borings conducted in October 1998 indicated that residual PCE was present in soils at a concentration of 215 ug/kg which is well below its NYSDEC Unrestricted Use Soil Cleanup Objective of 1,300 ug/kg.

A site groundwater investigation was also completed in March 1997, EnviroComp, Inc. (EC) installed a series of groundwater monitoring wells on and near the former dry cleaning unit. The wells were monitored routinely through May 2000. The results of the final sampling event conducted by EC in May 2000 indicated that groundwater samples collected from two (2) wells identified as MW-6 and MW-9 contained 50 ug/l and 39 ug/l of PCE, respectively.

More recent groundwater sampling by Apex in November of 2009 indicated the presence of PCE in MW-6 and MW-9 groundwater samples at 34 ug/l and 47 ug/l, respectively.

1.3.2 Soil Vapor History

A preliminary SVI screening survey was conducted circa September 8, 2008 by Long Island Analytical Laboratories (LIAL). Three (3) SVI samples were collected using Summa canisters; two (2) of the three (3) samples were collected within 24 inches of MW-6 and MW-9 at a depth of approximately one (1) foot above the water table (about seven (7) to eight (8) feet below grade surface [bgs]). The remaining sample was collected as an upwind, ambient air sample.

The results of the LIAL SVI screening event reportedly indicated the following:

- Cis-1, 2-dichloroethene (cis-1,2-DCE) at 510 micrograms per cubic meter [$\mu\text{g}/\text{m}^3$], trichloroethene (TCE) at $280 \mu\text{g}/\text{m}^3$ and PCE at $800 \mu\text{g}/\text{m}^3$ were detected in the SV1 sample (immediately adjacent to MW-6); and,
- Acetone ($180 \mu\text{g}/\text{m}^3$), c-1,2-DCE ($3,800 \mu\text{g}/\text{m}^3$), TCE ($3,500 \mu\text{g}/\text{m}^3$) and PCE ($19,000 \mu\text{g}/\text{m}^3$) in the SV2 sample (immediately adjacent to MW-9).

It should be noted that as the LIAL soil vapor data were not collected below structure slabs and no corresponding indoor air quality samples were collected (all of which are required by prevailing NYSDOH protocols), the resulting data were only used to determine that a more formal SVI Investigation was warranted.

In November of 2009, Apex conducted a SVI investigation in accordance with the applicable NYSDOH guidance document entitled "*Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York*," dated October 2006, as amended (hereinafter referred to as the "Guidance Document"). The investigation included the collection and analyses of five (5) collocated sub-slab and indoor air samples and one (1) outdoor ambient air sample (see **Figure 1-3**). Based upon the analyses of the samples for VOCs by EPA Method TO-15 by a NYSDOH Environmental Laboratory Accreditation Program (ELAP)-certified laboratory, Apex concluded:

- None of the VOCs assigned specific thresholds by the NYSDOH (i.e., carbon tetrachloride [CT], vinyl chloride [VC], 1,1-dichloroethene [1,1-DCE], PCE, TCE and TCA) were present exceeding concentrations of concern in the indoor air quality samples collected from within the Good Samaritan, South Bay and Rite Aid tenant spaces;
- Elevated concentrations of petroleum- and halogenated solvent-related VOCs were present in the sub-slab soil vapor samples underlying the aforementioned buildings. The types of chemicals detected were consistent with former site operations (i.e., the former gasoline service station and the former dry cleaner);
- The highest VOC concentrations within the sub-slab soil vapor samples were detected in the Good Samaritan tenant space ($2,800 \mu\text{g}/\text{m}^3$ of PCE) and the

South Bay tenant space (7,400 ug/m³ of PCE and 1,000 ug/m³ of TCE in one sample). Lower concentrations of VOCs were present in the soil vapor samples collected from underlying the Rite Aid building (i.e., toluene at 300 ug/m³); and,

- Isopropyl alcohol (IPA) and ethyl acetate were the only VOCs detected in exceedence of a NYSDOH guidance threshold for indoor air quality. IPA was confirmed to be in use at the Good Samaritan building for sanitization purposes, including instrument sterilization and hand sanitization; therefore, IPA is not considered to be associated with a soil vapor concern. Ethyl acetate is a common ingredient in towelettes and other products commonly used and / or sold at Rite Aid. Neither of these compounds was believed to be related to soil vapor concerns or historic subsurface contamination.

1.4 Overview of Work Plan Documents

This SC Work Plan includes the Field Sampling Plan (FSP). The Health and Safety Plan (HASP) and Quality Assurance Project Plan (QAPP) are under separate covers and are incorporated into this SC Work Plan by reference.

2.0 SCOPE OF WORK (FIELD SAMPLING PLAN)

The following sections of this SC Work Plan include all aspects of the FSP and will discuss the groundwater and SVI activities that will be completed as part of this characterization study.

2.1 Well Installation and Development

Based upon the results of groundwater investigation activities previously conducted at the Subject Property, groundwater exhibits a south to slightly southwest flow direction. Apex measured the depth-to-water in November of 2009 at approximately eight-feet bgs.

2.1.1 Data Quality Objectives

The data quality objectives (DQOs) for this portion of the work are to confirm the hydrogeologic conditions in the vicinity of the Subject Property through the installation of one (1) additional upgradient well, one (1) downgradient well and utilizing the two (2) existing wells. The two (2) additional monitoring wells will be installed at the approximate locations indicated in **Figure 1-2** (i.e., MW- 13 and MW-14).

2.1.2 Well Installation Procedures

Each boring will be pre-cleared by hand to approximately five-feet bgs and then the borings will be advanced by 4 ¼-inch inside diameter (ID) hollow stem auger or direct push drill rig with soil samples collected on a nominal continuous basis to ten (10) feet below the water table (e.g., a maximum anticipated depth of 18-feet bgs).

The wells will be installed with 15-feet of two-inch-diameter Schedule 40 PVC flush-joint #10 slot screen installed ten (10) feet below where groundwater is encountered. The well annular spaces will be filled from one (1) foot below the screen to two (2) feet above the screen with a Morie #1 gravel pack. A fine sand seal of Morie #00 sand will be installed above the gravel pack and a flexible bentonite seal will be emplaced above the sand seal. The wells will be grouted from the top bentonite seal to grade with a neat cement / bentonite grout. All wells will be finished at grade with a locking J-plug, lock, and bolt down manhole.

All drill cuttings will be placed in 55-gallon drums and staged at a centralized location. Based upon review of the associated soil / groundwater analytical data and waste characterization analyses,¹ the soils will either be properly disposed in accordance with Federal, State and

¹ The actual suite of waste-characterization analytes is based upon the individual potential disposal facilities. The list of analytes will be consistent with all Federal, State and Local requirements to ensure that the drill cuttings are disposed of in accordance with all prevailing regulations.

Local regulations; and / or soils that meet NYSDEC Unrestricted Use Soil Cleanup Objectives will be spread on the ground in the vicinity of the sampling location on in landscaped areas on-site.

All augers, rods, and split-spoon samplers will be decontaminated prior to beginning the drilling services and between borings by Liquinox wash and rinse or by steam cleaning. The spent decontamination liquids will be containerized, characterized and disposed of in accordance with all prevailing regulations.

2.1.3 Well Development

Prior to development, depth-to-water readings will be collected from each monitoring well with a decontaminated electronic interface probe (IP) to evaluate for the presence of light nonaqueous-phase liquids (LNAPL) and dense nonaqueous-phase liquids (DNAPL). The wells will not be developed in the event that DNAPL and /or LNAPL are observed. Neither LNAPL or DNAPL are anticipated based upon the review of available site data.

Development of the two (2) newly-installed wells will consist of pumping groundwater from each monitoring well until pH, specific conductivity, and turbidity measurements stabilize. Stabilization will be achieved when three (3) consecutive pH, specific conductivity, and turbidity readings (recorded approximately five [5] minutes apart) are within ten (10) percent of one another. If stability cannot be obtained, the wells will be developed for a minimum of ½ hour of continuous pumping.

If well yields are not sufficient to allow ½ hour of continuous pumping, the well will be fully evacuated (i.e., pumped dry) and allowed to fully recharge for a minimum of three (3) times.

Development water generated from the newly-installed shallow monitoring wells will be discharged to the ground surface adjacent to the wellhead where it was generated in such a fashion as not to impact nearby surface waters or storm drains (i.e., it will be discharged where it can infiltrate the ground locally without overland flow).

2.1.4 Surveying and Water Table Elevations

The top-of-casing elevation of the four (4) monitoring wells will be surveyed into a reference elevation point to an accuracy of 0.01 feet. A water-level survey that will consist of the collection of two (2) rounds of water-level data from the four (4) monitoring wells will be conducted will follow surveying. Water-level elevations will be calculated for each monitoring well based on the surveyed elevation of each monitoring well and measured depths to water. A groundwater elevation contour map indicating the inferred groundwater flow direction will then be prepared for the shallow groundwater beneath the Subject Property.

2.2 Groundwater Sampling and Analyses

Groundwater samples will be collected and analyzed from the two (2) newly-installed monitoring wells and from the two (2) existing monitoring wells (i.e., MW-6 and MW-9) as indicated in the following sections of the SC Work Plan.

2.2.1 Data Quality Objectives

The DQOs for this portion of the project are to evaluate existing groundwater quality conditions with respect to NYSDEC TCL VOCs and New York State Class GA groundwater quality standards. Specifically:

- New MW-13 has been located to evaluate existing groundwater quality conditions upgradient of the Subject Property;
- New MW-14 has been located to evaluate groundwater conditions at the property line, downgradient of the eastern portion of the Subject Property and upgradient of the nearest off-site downgradient residential structures; and
- The data acquired from existing wells MW-6 and MW-9 will be utilized to provide an evaluation of current groundwater conditions downgradient of the western portion of Subject Property, and to allow for an evaluation of historic versus recent groundwater quality conditions.

2.2.2 Well Purging and Sampling

Subsequent to a minimum three-day equilibration period after the installation of MW-13 and MW-14, groundwater samples will be collected from the four (4) on-site monitoring wells and submitted for laboratory analysis.

Prior to sampling, depth-to-water readings will be collected from each monitoring well with a decontaminated electronic IP to evaluate for the presence of LNAPL and DNAPL. It should be noted that LNAPL and DNAPL are not anticipated based upon the information currently available. If LNAPL or DNAPL are encountered, wells will not be purged nor will dissolved phase sampling be completed. Only depth to product and depth to water gauging will be performed.

Following the collection of depth-to-water measurements, a dedicated disposable polyethylene bailer will be lowered into each monitoring well and partially submerged into the groundwater. The groundwater in each bailer will be visually inspected for color, general appearance, odor, and presence or absence of a sheen on the surface or particulates in the water column.

Each monitoring well will be purged until at least three (3) well volumes of groundwater are removed. Purge waters will be removed with a decontaminated submersible pump. The well-purge waters will be handled using the same protocols for the well-development waters discussed previously.

The groundwater samples will be collected utilizing a factory-decontaminated, disposable bailer which will be lowered slowly to the bottom of the wells. Laboratory-supplied glassware will be filled directly from the bailer.

2.2.3 Analytical Parameters and Rationale

The groundwater samples collected from the four (4) monitoring wells will be analyzed for NYSDEC TCL VOCs by EPA Method 8260. The samples will be analyzed by a NYSDOH ELAP-certified laboratory (with appropriate chain-of-custody). Additional information with respect to the proposed analyses is included in the QAPP.

QA /QC sample collection and analysis including the collection of trip blanks, equipment rinsate blanks, blind duplicates, and matrix spike / matrix spike duplicate (MS / MSD) samples will be conducted at the site as per the QAPP.

2.3 SVI Evaluation

Co-located sub-slab soil and indoor air sample locations will be collected from five (5) interior building locations as indicated in **Figure 1-3**. One (1) outdoor ambient air sample will also be collected to represent ambient conditions.

2.3.1 Data Quality Objectives

The DQOs for this portion of the SC Work Plan are to evaluate soil vapor conditions beneath the on-site building slabs, and if impacted soil vapors are present, evaluate whether they are impacting the indoor air quality of the overlying occupied buildings.

2.3.2 Soil Vapor Implant Installation

At each of the five (5) building interior locations, one-to-two-inch-diameter access holes will be cut through the overlying cover materials and soil vapor sampling implants will be installed utilizing hand-powered equipment (e.g., hand auger, post-hole digger, etc.). Each soil vapor probe will consist of a six-inch-long stainless-steel screen with one-quarter-inch-diameter Teflon tubing set two-inches below the floor slab / surface.

The annular space surrounding the screens will be filled with decontaminated glass beads or filter pack sand. A hydrated seal will be installed atop of the glass beads/ sand pack to prevent outdoor air infiltration. Each well head will be finished with a small-diameter, bolt-down, manhole cover.

2.3.3 Vapor Sampling

The five (5) interior vapor probes will be allowed to equilibrate for a minimum of 24 hours prior to sampling. Prior to sampling, each point will be purged of a minimum of three (3) tube volumes of soil vapor. Effectiveness of purging will be determined by using a photo-ionization detector (PID). A laboratory-supplied vacuum Summa canister will be connected to the Teflon tubing subsequent to the purging and the samples will be collected at a flow rate of 0.05 liters per minute (LPM), which is less than the maximum flow rate of 0.2 LPM as established in the NYSDOH Guidance Document.

In addition to the sub-slab vapor samples, five (5) indoor air quality samples, co-located with the sub-slab sampling points, and one (1) outdoor air /ambient sample will be collected utilizing laboratory-supplied Summa canisters set atop three-foot-tall stands, table tops or desks over an eight-hour period, concurrent with the indoor sub-slab sampling. The samples will be collected to establish indoor air concentrations and background conditions at the site. The sample elevation will be selected in order to represent the air quality within the typical breathing zone (between three-and-five-feet above grade, as required in the NYSDOH Guidance Document).

Sampling will be completed during the heating or cooling seasons.

2.3.4 QA / QC and Helium Monitoring

As a QA / QC measure, helium will be introduced into a closed / sealed space surrounding the sampling tube as a tracer gas to confirm the integrity of the probe seals and to ensure that no outdoor air intrusion impact the soil vapor sample (e.g., no "short circuiting" occurs). The closed / sealed space around the sampling tube will be formed utilizing an inverted container placed atop of the ground at the point where sampling tubing exits the subsurface. Teflon sampling tubing will be run through an air-tight fitting installed on the top of the container and polyethylene tubing will be run from the helium supply through another air-tight fitting on the side of the container. The vapors extracted from the monitoring point during purging will be evaluated with a field helium meter, or the sample will be analyzed by the laboratory for helium to confirm the efficacy of the system seal.

2.3.5 Facility Inspection / Chemical Inventory Review

In accordance with NYSDOH protocols, Apex personnel will complete a facility-wide inspection during the sampling period to evaluate chemical-use practices at the facilities. Labels will be reviewed to determine the chemical nature of various products including, but not limited to, cleaners, lubricants, glues/adhesives, paints, chemicals, etc. The data will be compared to the indoor air analytical data to determine if site chemical use has deleteriously impacted the indoor air quality of the structures.

2.3.6 Soil Vapor / Air Analyses

The soil vapor and air samples will be analyzed by a NYSDOH ELAP- certified laboratory (with appropriate chain-of-custody) for VOCs by EPA Method TO-15. The soil vapor samples may also be analyzed for helium to assist in data quality review. ASP Category B deliverables will be provided and all samples will be shipped under chain of custody procedures. The target laboratory method detection limits (MDLs) will be sufficiently low to allow the resulting data to be evaluated within the matrices included in the NYSDOH guidance document.

QA /QC sample collection and analysis including the collection of trip blanks, blind duplicates, and MS / MSD samples will be conducted at the site as per the QAPP.

2.4 Identification of NYS Standards, Criteria and Guidelines

The following provides the NYS standards, criteria and guidelines which will be utilized to evaluate the analytical data by matrix.

2.4.1 Groundwater

Groundwater analytical data will be evaluated in conjunction with NYSDEC Class GA Groundwater Standards and Guidance Values set forth in the NYSDEC Division of Water Technical and Operational Guidance Series 1.1.1 Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations - Reissued June 1998 and April 2000 Addendum.

2.4.2 Soil Vapor and Indoor Air Quality

With respect to soil vapor, the NYSDOH guidance document provides compound-specific thresholds for the following halogenated VOCs: CT; 1,1-DCE; cis-1,2-DCE; PCE; 1,1,1-TCA; TCE and VC. For compounds not specified in the NYSDOH matrices, the guidance document provides the results of background concentrations from various studies for a wider range of VOCs (i.e., fuel oil heated homes, public and commercial buildings). As the Subject Property consists of former and current commercial-uses, Apex will utilize the results of the

United States Environmental Protection Agency (USEPA) Building Assessment and Survey Evaluation (BASE) database to evaluate indoor air contaminant levels for non-specified compounds. Specifically, as discussed in the NYSDOH guidance, the 25th and 75th percentile of the BASE data will be utilized as typical "Background" levels for comparison to results obtained during this study. In addition, Apex will consider site-specific outdoor ambient air sample analytical results in the evaluation of data in accordance with the NYSDOH guidance.

2.5 SC Report

The SC Report prepared for this site will include at a minimum:

- Summary of previous NYSDEC and other study data;
- Description of work performed at the site (including site maps, boring logs, sampling descriptions and logs, well completion details, field screening data, etc.);
- Characteristics of the site area (including surface features, geology, hydrogeology, etc.);
- A summary of the analytical and physical data obtained to define possible source areas and groundwater quality at the site; and,
- Conclusions and recommendations.

3.0 PROJECT MANAGEMENT / STAFFING PLAN

Since the key element of any environmental investigation is the project team, a project team with extensive NYSDEC Inactive Hazardous Waste Disposal Site and USEPA Superfund site experience has been assembled. The proposed project team organization is presented in **Figure 3-1**.

The project manager for this project will be **Richard J. Baldwin, C.P.G., P.G.** Mr. Baldwin is a hydrogeologist with more than 20 years of experience in the fields of environmental consulting, hydrogeology and geology with particular experience in conducting and supervising environmental investigations and remedial actions at industrial, private, Federal and publicly-owned facilities and sites. Additionally, Mr. Baldwin has experience in evaluating potential environmental impacts of projects including golf courses, housing developments, senior housing, schools and retail shopping centers. For the last several years, Mr. Baldwin's work has focused primarily on sites and facilities located in the Long Island, New York City and Upstate New York areas. A copy of Mr. Baldwin's resume is included in **Appendix A**.

The Apex Project Director and Quality Assurance Officer (QAO) for the project will be **Daniel J. Smith, P.E.** Mr. Smith is a New York State-licensed Professional Engineer (PE) in Chemical Engineering with over 20 years of experience in the environmental consulting industry. Mr. Smith has been responsible for the implementation of investigations and remedial actions at numerous NYSDEC-regulated sites under the SPILLS and IHWDS program. The QAO's project responsibilities include conducting site audits to ensure that the QA/ QC procedures included in this Work Plan are being implemented. Additionally, the QAO will review all of the analytical data collected as part of the investigation to assure that the data are of sufficient quality to support the goals of the investigation. Mr. Smith is an officer of Apex and the Project Director for this project; thus he has the authority to ensure that appropriate staffing is available to complete the investigation. A copy of Mr. Smith's resume is included in **Appendix A**.

Field sampling and oversight of contractors will be performed by personnel experienced in proper field sampling techniques. All analytical work will be performed by a NYSDOH ELAP-certified analytical laboratory and drilling services will be performed by experienced contractors with extensive NYSDEC regulated site experience.

4.0 PROJECT SCHEDULE

The preliminary project schedule is presented below. This schedule is contingent upon the approval of the proposed scope of services. Please note that the schedule has been developed to allow for the review and evaluation of data on a task-by-task basis.

- **Installation of New Wells** - Within two (2) weeks of NYSDEC approval of SC Work Plan;
- **Well Surveying and Sampling** - Within two (2) weeks of well installation;
- **Laboratory Analyses and Initial Groundwater Reporting** - Within six (6) weeks of sample collection;
- **SVI Sampling Program** - To start in January during Winter heating season; and,
- **SC Report** - Within six (6) weeks of SVI sample collection.

FIGURES

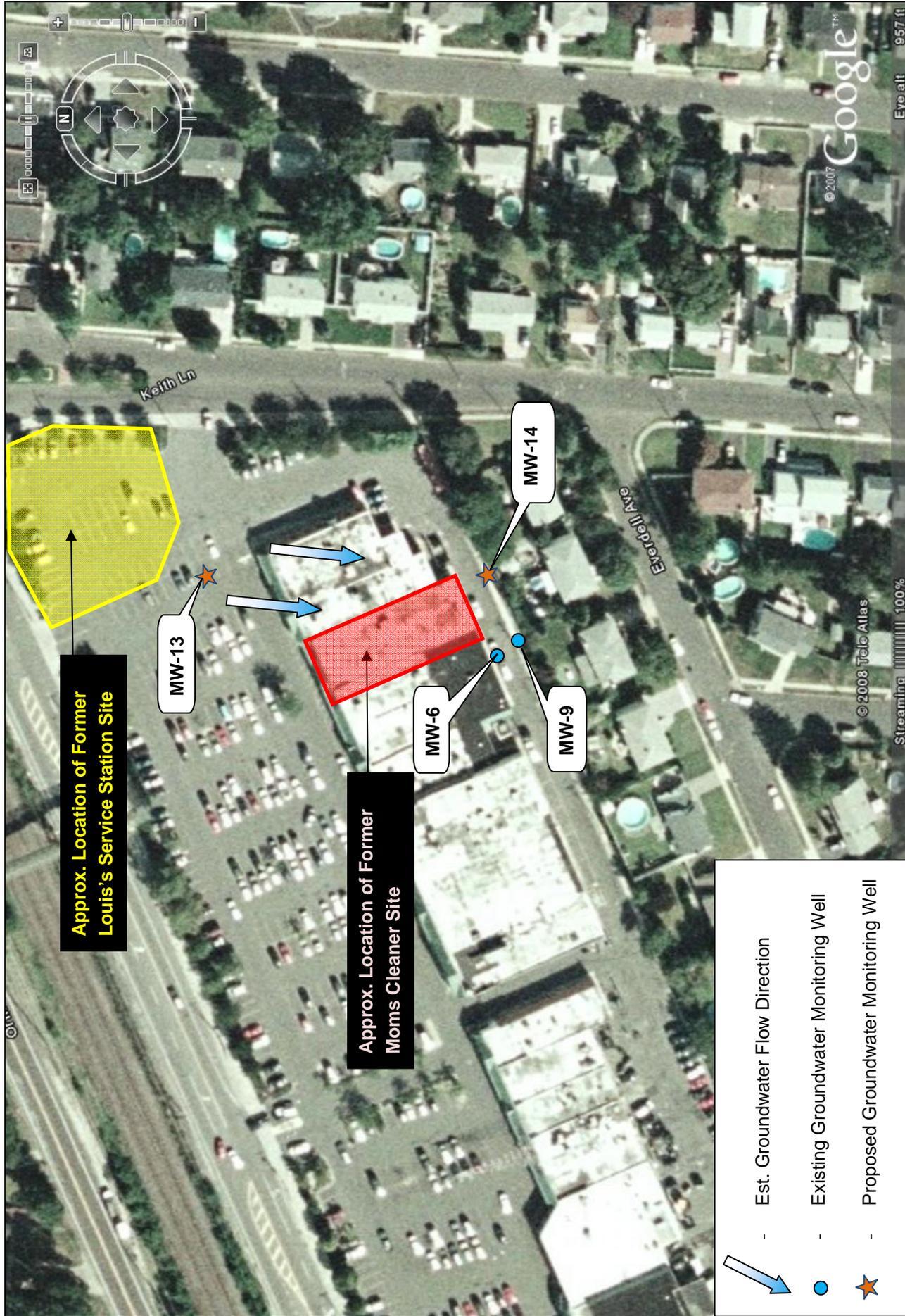


3-D TopoQuads Copyright © 1999 DeLorme Yarmouth, ME 04096 Source Data: USGS 1000 ft Scale 1 : 25,000 Detail: 13-0 Datum: WGS84



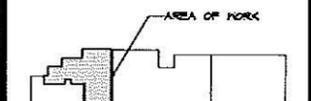
Figure 1-1
Former Mom's Cleaners Site
 Site Location Map

Client:	Delilah Realty
Project No.:	85130.003
Project Location:	West Islip, NY
Date:	November 2010



Client: Deiliah Realty
 Project No.: 85130.003
 Project Location: West Islip, NY
 Date: November 2010

Figure 1-2
Former Mom's Cleaners Site
Site Map



FOR
PHYSICAL THERAPY
REHABILITATION CENTER
AT
560 UNION BLVD
WEST ISIP, NEW YORK

CON #

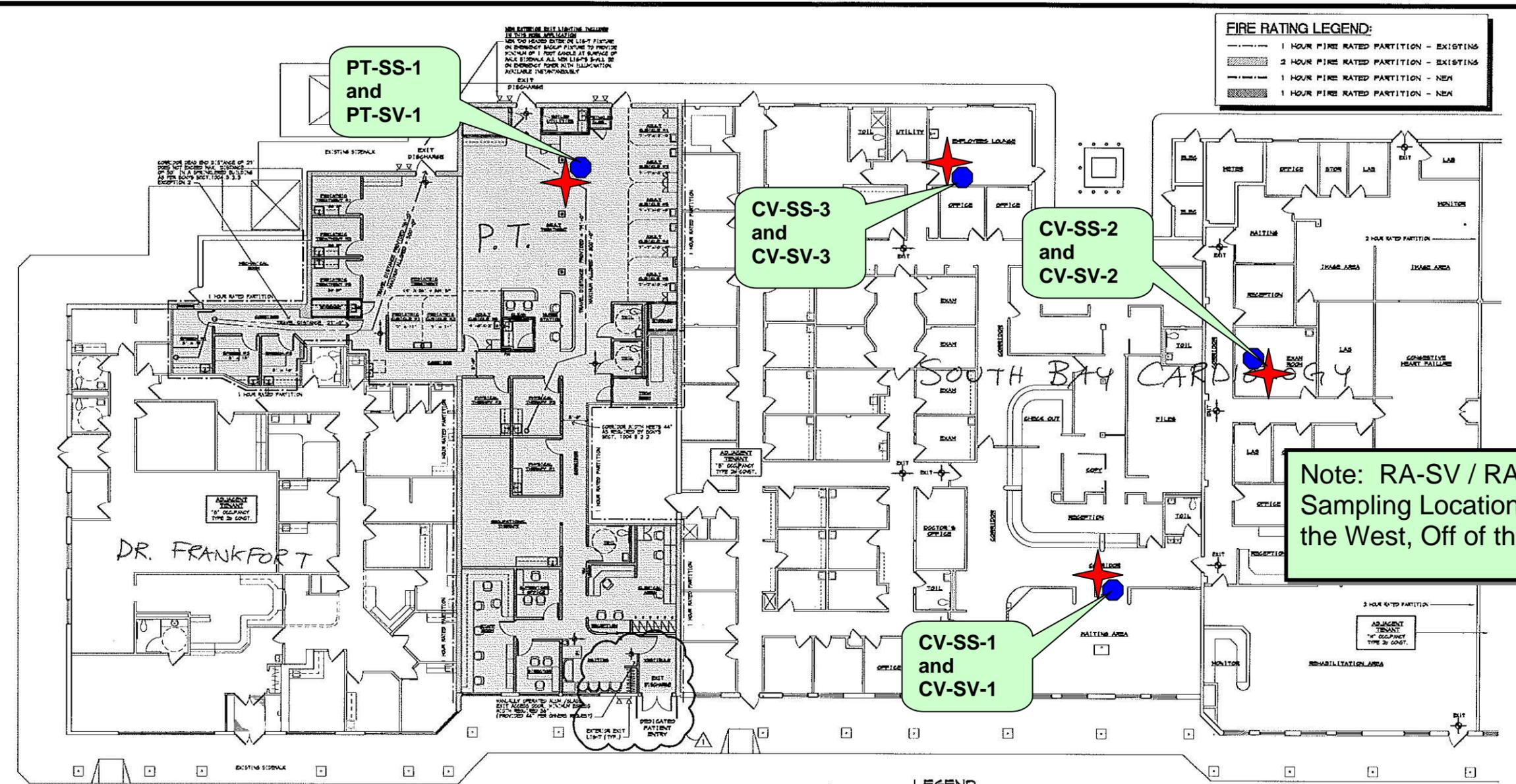
TITLE
CODE COMPLIANCE

SCALE - AS NOTED
DRAWN BY - J.H.H./D.M.O.
CHECKED BY - ERG
DATE - MAY 2, 2007
REVISED
APRIL 10, 2008
D.O.H. RESUBMISSION

PROJECT NO. DRAWING NO.

FIRE RATING LEGEND:

(Dashed line)	1 HOUR FIRE RATED PARTITION - EXISTING
(Stippled pattern)	2 HOUR FIRE RATED PARTITION - EXISTING
(Dotted line)	1 HOUR FIRE RATED PARTITION - NEW
(Cross-hatched pattern)	1 HOUR FIRE RATED PARTITION - NEW

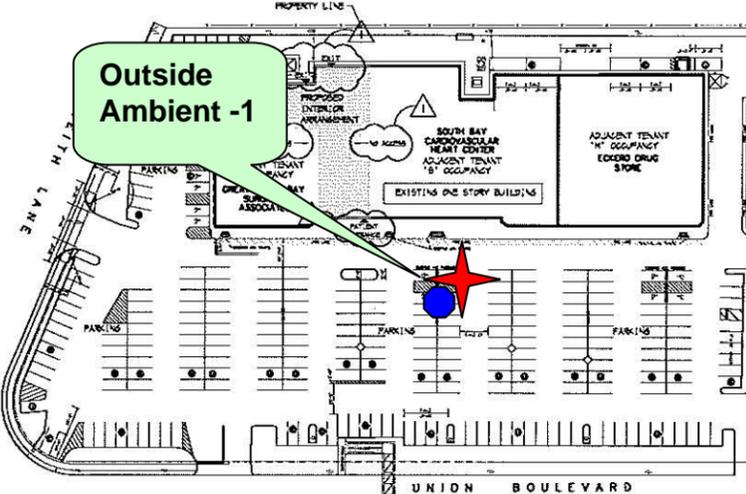


CODE ANALYSIS FLOOR PLAN
SCALE: 3/32" = 1'-0"

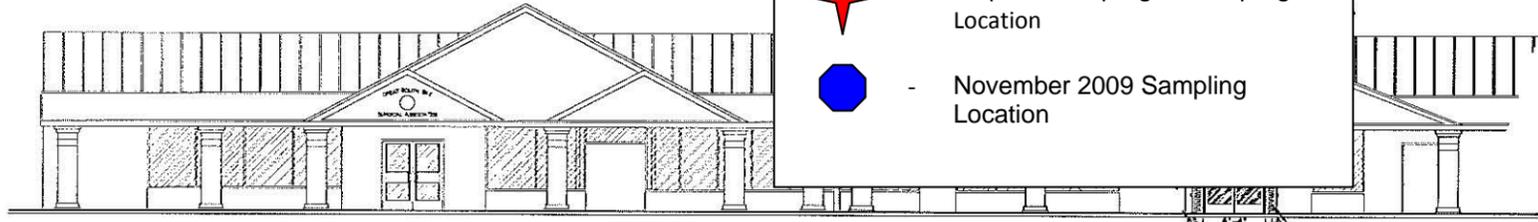
LEGEND

(Red star)	- NEW PHYSICAL THERAPY - 6,865 SQ. FT
(Blue circle)	- ILLUMINATED EXIT SIGN AND DIRECTIONAL INDICATOR

NOTE:
THERE ARE NO INTERVAL ENTRANCES FROM ANY ADJACENT SUITE, OFFICE LOCATED IN THIS EXISTING BUILDING



Outside Ambient -1



BUILDING ELEVATIONS - NORTH
SCALE: 1/8" = 1'-0"

Figure 1-3: SVI Sampling Locations

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SITE PLAN

**Figure 3-1
Project Organization Chart
SC Team Organization Chart**



New York State Department of Environmental Conservation

Quality Assurance Officer
Project Director
Daniel J. Smith, P.E.

- Principal-in-Charge
- Quality Assurance / Quality Control
- Data Usability Summary Report

Project Manager
Richard J. Baldwin, P.G., C.P.G.

- In-Charge of Field Implementation
- Ensure Appropriate Data Collection
- Report Preparation
- NYSDEC Coordination

Project Staff
Robert Bennett

- Oversee Contractors
- Collection of Samples
- Data Summary Tables

Project Staff
Heather Moran-Botta

- Oversee Contractors
- Collection of Samples
- Field Data Tabulation

Project Support
Tim Botta

- Contractor Coordination
- Data Management
- Data Table QA / QC

Field Team Leader
Thomas Stolorthy

- Implement SC / RI Work Plan
- Ensure Quality Data Acquisition
- Contractor Coordination



Where excellence meets value.

APPENDICES

Appendix A

Resumes of Key SC Team Personnel

Richard J. Baldwin, Baldwin, C.P.G., P.G

Apex Companies, LLC

Senior Project Director

Mr. Baldwin is a hydrogeologist/environmental scientist with over twenty years of experience in the fields of environmental consulting, hydrogeology and geology with particular experience in conducting and supervising environmental investigations and remedial actions at industrial, private, Federal and publicly-owned facilities and sites. Mr. Baldwin has extensive experience in evaluating and remediating gasoline and fuel oil releases, many of which included the contaminant methyl tertiary-butyl ether (MTBE). Additionally, Mr. Baldwin has experience in evaluating potential environmental impacts of projects including golf courses, housing developments, senior housing, schools and retail shopping centers. For the last several years, Mr. Baldwin's work has focused primarily on sites and facilities located in the Long Island, New York City and Upstate New York areas. He has extensive knowledge and experience pertaining to Long Island's federally-designated sole-source drinking water aquifer system.

Education

- Graduate Course Work, San Jose State University, 1985-1988
- BA Geology, San Francisco State University, 1982

Professional Registrations

- Professional Geologist, PG-000552-G, Commonwealth of Pennsylvania
- Certified Professional Geologist, CPG #9158, Amer.Inst. of Prof. Geologists
- OSHA Certification, 40-hour Health and Safety Training at Hazardous Waste Sites
- OSHA Certification, 8-hour Refresher Health and Safety Training at Hazardous Waste Sites
- OSHA Certification, 8-hour Management Training
- OSHA Certification, 8-hour Radiation Safety Training

Continuing Education

- Princeton Groundwater Hydrogeology and Pollution course
- Environmental Law and Regulations Course, U.C. Berkeley Extension
- NGWA MODFLOW and MODPATH Modeling Course
- NGWA Visual MODFLOW Modeling Course

General Project Experience

Mr. Baldwin has extensive experience in the selection, design, installation and maintenance of a wide range of soil and groundwater remediation systems. Remedial systems have included both active and passive free-product recovery, traditional groundwater pump and treat, soil-vapor extraction, air sparging, bioventing, bioremediation, excavation, impacted-soil management and natural attenuation. MTBE and other petroleum-related volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) were the contaminants of concern in many of these project sites.

Mr. Baldwin has been involved in hundreds of subsurface soil and groundwater investigations ranging from Phase I & II Environmental Site Assessments (ESAs) to Remedial Investigations. Investigation and delineation techniques have included soil borings, groundwater monitoring well networks, Hydropunch / GeoProbe sampling, surface and bore-hole geophysical methods, soil-gas surveys, aquifer testing, surface water and sediment sampling, waste characterization (soils piles, drums, USTs, aboveground storage tanks (ASTs), landfills, etc), test pits, and computer fate and transport modeling. Materials investigated have included petroleum products (heating/fuel oil and gasoline), PCB oils, coal tar, heavy metals, chlorinated solvents, explosives, pesticides, herbicides and buried medical waste.

Mr. Baldwin has evaluated the potential environmental impacts of proposed projects including golf courses, housing developments, senior housing, schools, automobile repair facilities and retail shopping centers. The potential impacts included those to groundwater quality from herbicide/pesticide application, disposal of sanitary waste and school laboratory waste and the impacts to soil quality from handling and disposal of hazardous materials, leaking petroleum underground storage tanks (USTs), historic disposal of hazardous waste and pesticide/herbicide application. These impacts were evaluated through a variety of means including the collection and analysis of soil and groundwater samples, geo- and organic-chemistry modeling, groundwater fate and transport modeling and basic research of materials, their uses and their potential migration pathways. Mr. Baldwin has provided expert witness services for various venues ranging from New York State Department of Environmental Conservation (NYSDEC) spill and hazardous waste sites to potential noise impacts.

Mr. Baldwin works closely with the U.S. Environmental Protection Agency (EPA), NYSDEC Region 1, Region 2, Region 3 and Central Office, New York State Department of Health (NYSDOH), Suffolk County Department of Health Services (SCDHS) and Nassau County Department of Health (NCDOH). Mr. Baldwin also works with local planning and review boards including the Town of East Hampton, Town of Southampton, Town of Babylon, Town of Brookhaven, Village of

Richard J. Baldwin, Baldwin, C.P.G., P.G (continued)

Apex Companies, LLC

Senior Project Director

Patchogue, Village of Great Neck and New York City on issues ranging from groundwater quality to historic resources to noise impacts.

Mr. Baldwin has been in the forefront of both evaluating and addressing shallow soils on Long Island which have been impacted by pesticides (particularly arsenic) and herbicides. This important issue is particularly of concern due to the re-development of agricultural lands for residential and educational end uses. Mr. Baldwin has work closely with the SCDHS and Town of Brookhaven to develop effective and easily implementable Soil Management Plans.

Mr. Baldwin's projects include supervising and performing Remedial Investigations/Feasibility Studies (RI/FSSs), Interim Remedial Actions (IRMs), and implementation of selected remedies at NYSDEC Class 2 and 2a Inactive Hazardous Waste Disposal sites. Other work, conducted with the NYSDEC, includes evaluating and implementing large-scale groundwater and soil in-situ and ex-situ treatment systems to remediate MTBE.

Mr. Baldwin also has extensive experience in conducting other types of environmental work ranging from NYSDEC spill sites to remediating buried medical waste at a Long Island psychiatric center. Mr. Baldwin has extensive experience providing expert testimony/meeting presentation services in various venues. He has provided same in support of work being conducted in the Village of Greenport, Village of Lake Success, New Hyde Park, Dutchess County Supreme Court, South Farmingdale, Bay Shore, Brookhaven, Wassaic, Central Islip, Plainview and Amityville, New York. Before moving to the East Coast in 1993, Mr. Baldwin worked in the environmental industry in California. His work in the environmental industry consisted primarily of conducting large-scale environmental investigations at United States military and Department of Energy facilities

Selected Project Experience

Groundwater Evaluation and Treatment, Taconic Developmental Disabilities Services Office, Wassaic, NY

Worked on a public water supply site in New York conducting a full-scale groundwater investigation in the vicinity of the facility's supply wells which have been impacted by MTBE. Multiple well clusters were installed surrounding the high-capacity wells to evaluate subsurface conditions. One impacted well was converted to a remediation well to provide hydraulic capture of the MTBE plume prior to its impacting the remaining downgradient wells. A large-scale granulated-activated carbon (GAC) system was installed to treat the water extracted from the well. A 40,000-pound GAC unit was also installed in standby mode to address the facility's drinking water should the concentrations of MTBE ever warrant treatment. Several rounds of groundwater investigation were also conducted to confirm the MTBE source area as a nearby gasoline service station. Pilot testing was conducted and an on-site groundwater treatment system was being designed to provide source area remediation. Part of the pilot testing including evaluating specialized GAC manufactured specifically to address MTBE. Drawdown data associated with a long-term pumping well was utilized to accurately characterize aquifer/hydrogeologic conditions in order to evaluate well capture zones.

Potable Water Treatment System, Village of Brewster, NY

Designed and constructed a supplemental water treatment system at a public water supply plant to address MTBE contamination in the system prior to its distribution. The treatment system consisted of a large air stripping tower, installed in line with an existing air stripper to remove the MTBE to non-detectable concentrations. Additionally, a source area investigation was being conducted to determine the potential source(s) of the MTBE contamination.

Potable Water Treatment System, Sullivan Correctional Facility, Fallsburg, NY

Worked with the NYSDEC to evaluate, design and install a supplemental water treatment system to address MTBE present in a New York State Correctional Facility's drinking water. All four of the facility's wells were impacted. Several remedial options including utilizing GAC or air strippers were evaluated. The selected alternative was a 20,000-pound GAC system which was installed inline and in standby mode.

Richard J. Baldwin, Baldwin, C.P.G., P.G (continued)

Apex Companies, LLC

Senior Project Director

Former Fuel Terminal, Patchogue River, Patchogue, NY

Conducted a site investigation program at this former major fuel oil terminal site to evaluate the efficacy of same for residential re-development, which would have included a residence-use only marina. The site had been the subject of previous site remediation activities, and the NYSDEC had closed its spill file assuming that the site would only be utilized for commercial or industrial purposes. Soil, groundwater, soil vapor and outdoor ambient air samples were collected and analyzed as part of this evaluation. The results of the investigation indicated that, in part due to the presence of MTBE and other gasoline-related VOCs, additional soil remediation would have been required to make the property suitable for residential re-development. Additionally, the NYSDEC would have likely required the installation and operation of sub-slab depressurization systems for all on-site residential buildings prior to their approving the plans for the site.

Active Marina Facility, Hampton Bays, NY

The owner of this active marina facility was served with a Notice of Violation (NOV) by the NYSDEC for various environmental issues, mostly related to on-site petroleum storage/delivery systems, as well as impacts potentially associated with marine-activity uses such as vessel bottom paint removal and application, use of preserved woods, vessel maintenance activities, housing-keeping issues, etc. Apex was responsible, with input from the NYSDEC, for developing and implementing a Site Investigation Program to investigate potential soil and groundwater impacts associated with the aforementioned on-site practices. Based upon the results of the investigation, Apex was able to conclude that the fuel distribution system was not leaking and that groundwater was not deleteriously impacted. Minor concentrations of MTBE in groundwater were thought to represent ambient conditions typical for an active marina. Minor areas of impacted soil, likely from vessel bottom cleaning activities, were identified. Apex is currently assisting with negotiations with the NYSDEC to potentially allow for the implementation of engineering controls to address the impacted soils.

Aerospace Facility Superfund Site, Lake Success, NY

Managed large-scale site activities at a major Long Island aerospace facility. Activities included operations of on-going IRMs (soil vapor extraction and groundwater extraction and treatment systems); citizen participation activities; design and implementation of on-site remedies (drywell removal and soil excavation, installation of fencing and an 1,800 gallon per minute groundwater extraction and treatment system); on- and off-site RIs; regulatory compliance activities; client interactions; multi-task, multi-contractor scheduling and management; and general project management. As part of the RI, prepared a large three-dimensional groundwater flow and particle model utilizing Visual MODFLOW and MODPATH. The model was then utilized to design an optimum groundwater treatment system.

Prepared a scoping plan and RI report for an Inactive Hazardous Waste Disposal site in New York under the NYSDEC Superfund program

The work involved evaluating the nature and extent of halogenated solvents in soil and groundwater both on and off of the site. Was responsible for overseeing all phases of the report preparation, including communications with the NYSDEC and for implementing the citizen participation program. Also involved in the preparation of the FS report and selection of the final remedy which included the use of an innovative groundwater treatment technology, in-well air stripping

Former Manufacturing Facility Superfund Site, Central Islip, NY

Prepared an RI report for a Class 2 Inactive Hazardous Waste Disposal site under the NYSDEC Superfund program. The work involved evaluating the nature and extent of 1,2,3-trichloropropane (1,2,3-TCP) in soil, soil vapor and groundwater. Additionally, was responsible for evaluating the physical characteristics of this uncommon contaminant and determining potential human health effects as part of the Human Health Evaluation. Oversaw all phases of the report generation, including communications with the NYSDEC and for implementing the citizen participation program, including preparing and presenting the results of the RI at a public meeting.

Former Manufacturing Facility Superfund Site, Plainview, NY

Designed and managed targeted on- and off-site groundwater investigations, reporting and remedial design activities for a Class 2a Inactive Hazardous Waste site under the NYSDEC Voluntary Cleanup Program (VCP). By utilizing existing and recently acquired data, that resulted in a significant cost savings to the client. Oversaw the design of an air sparge/soil vapor extraction system to remediate halogenated volatile organic compounds in the site's source area unsaturated soils and underlying groundwater.

Richard J. Baldwin, Baldwin, C.P.G., P.G (continued)

Apex Companies, LLC

Senior Project Director

Psychiatric Facility, Islip, NY

Conducted all phases of an expedited buried medical waste program at a large New York State psychiatric hospital. Upon discovery of buried medical waste during the installation of a sewer main, a site investigation program was designed and implemented for the purpose of determining the extent of the buried waste. A successful remediation program was then implemented, which included a project-specific Health and Safety Plan dealing with medical “sharps” and potential blood-borne pathogens. The work was conducted under NYSDEC oversight.

Psychiatric Facility, Middletown, NY

Designed and implemented a subsurface investigation and oxygen release compound (ORC)/bio-venting pilot testing program at an upstate New York State psychiatric facility to remediate a No. 6 fuel oil spill. Due to the existence of on-site infrastructure, in-situ bioremediation techniques were required to remediate the petroleum without disrupting facility operations.

Former Marina Facility, Greenport, NY

Managed one of the few active NYSDEC Brownfield sites on Long Island utilizing New York State Environmental Bond Act funding. The work included evaluating the presence of undocumented USTs utilizing surface geophysical techniques, removing the USTs and associated impacted soils and preparing Site Investigation and Remedial Action reports. Responsible for all regulatory interactions, subcontractor management and Citizen Participation Plan implementation. The work was conducted concurrently with the redevelopment of the site for use as a public park.

General Environmental Planning Experience, NY

Responsible for preparing various chapters of Environmental Impact Statements (EISs) including Geology, Soil and Topography; Groundwater; Utilities, Open Space and Recreational Resources; and Project Alternatives. Reviewed other consultants' EISs for local municipalities to determine compliance with the State Environmental Quality Review Act (SEQRA) and to evaluate the potential impacts of proposed projects. Prepared potential environmental impact sections (e.g., groundwater, wetlands, air quality, visual quality, zoning, etc.) of New York Public Service Commission Article X pre-application packages for four proposed power plants.

General Military Base Experience, Nation-wide

Conducting large-scale environmental investigations at United States Military and Department of Energy facilities. Assignments included: evaluating the nature and extent of soil and groundwater contamination associated with landfills, fire training facilities and miscellaneous disposal areas on several military bases for the United States Army Corps of Engineers and the United States Navy; characterizing the nature and extent of unexploded ordnance; obtaining and interpreting surface and borehole geophysical surveys; conducting large-scale aquifer pumping tests; preparing Remedial Investigation and Site Investigation reports

Daniel J. Smith, P.E.
Apex Companies, LLC, New York Division Manager
National Remediation Group Coordinator

Mr. Smith is a licensed Professional Engineer (chemical engineering) with over 20 years of consulting, engineering, construction, and litigation support experience in the environmental industry. He serves as New York Division Director and National Remediation Group coordinator for Apex and is responsible for day-to-day operations in the metropolitan New York City market as well as coordination of remediation and litigation support projects nationwide. He has extensive experience in environmental compliance, investigation, remediation, and site construction at residential, commercial and industrial properties. Mr. Smith has managed several large national accounts and understands the business concepts that drive remediation and litigation support projects.

Selected Project Experience

Education

- Case Western Reserve University, Biomedical Engineering
- Polytechnic University, Brooklyn, NY, B.S. Chemical Engineering, 1987

Professional Registration

- Professional Engineer, NYS

Continuing Education

- "Advanced Technologies for Cost-Effective Clean-up of Contaminated Properties," *Regenesis*, November 2008
- "Phase I and Phase II Environmental Site Assessment Process," *ASTM*, Oct/Nov. 2007
- "Property Condition Assessments," *ASTM*, October 2007
- "Erosion Control and Stormwater Management, *Institute for Design Professionals*," March 2006
- "Oxidation and Reduction Technologies for In-Situ Treatment of Soil and Groundwater", *ORTs-4*, Chicago, Illinois, October 2005
- "In-situ Thermal Treatment for Remediation of DNAPLS," *United States Environmental Protection Agency*, December 1999
- "Airport Fueling System Management," *University of Wisconsin*, October 1997
- "Airport Fuel Storage and Distribution Systems," *Air Transport Association*, March 1997

Dry Cleaner Legal Support, Groundwater Monitoring Impacts and Soil Vapor Intrusion, Confidential Client, Suffolk County, NY

Completed a detailed evaluation of historic assessment and remediation activities at a former dry cleaner site in Suffolk County. Work included review of soil and groundwater data and implementation of a Soil Vapor Intrusion Evaluation at a NYSDE Inactive Hazardous Waste Disposal Site (i.e., State Superfund Site). Contaminants of concern focused on PCE and its degradation products. In addition, to technical evaluations, work also included coordination with counsel regarding reporting obligations to commercial tenants and impact of environmental conditions on real estate valuation.

Soil and Groundwater Pilot Test and Remediation, Confidential Environmental Risk Management Firm, Largo, Florida

Designed and implemented a comprehensive pilot test program to evaluate the use of *in-situ* enhanced reductive dechlorination at a former RCRA facility to remediate soil and groundwater impacted with chlorinated Volatile Organic Compounds (VOCs). Work was coordinated with FDEP, the local site owner, the risk management firm, and a major insurance company to expedite remediation under a "lump sum to closure" liability acquisition contract. Initial injections of Edible Oil Substrate (EOS®) and Hydrogen Reducing Compound (HRC®) indicated transformation of the subsurface to a reducing environment and significant reduction of contaminant levels in most wells within 6 months of injection. Work was coordinated with a hydraulic control system to address inorganic contaminants as the VOC remedy was implemented.

Groundwater Contaminant Fate & Transport Modeling, Public Water Supplier and NYSDEC Inactive Hazardous Waste Disposal Site (State Superfund), Nassau County, NY

Completed a QA/QC evaluation of a complex, three-dimensional groundwater flow and contaminant fate and transport model for a public water supplier in order to identify upgradient sources of chlorinated VOC contamination and to predict future impacts to public supply wells. QA/QC review included assessment of boundary conditions, research of geologic conditions, estimation of hydraulic properties, and evaluation of model calibration and sensitivity. Data generated from the review was used to determine possible long-term water treatment requirements and the need for a monitoring well network downgradient of the source area and upgradient of the public supply wells.

Remediation Cost Evaluation & Sensitivity Analysis, Confidential Manufacturing Facility, British Columbia, Canada

Completed a detailed cost evaluation that included evaluating potential environmental liabilities under multiple site expansion, reduction, and development scenarios. Cost estimates included excavation, *in-situ* remediation, dredging, and landfill alternatives. Sensitivity analyses were performed on all major unit costs driving total remediation costs. Socio-economic factors impacting site redevelopment were considered as part of the evaluation process.

UST System Evaluation, Ground Service Equipment Facility, SeaTac, Washington

Coordinated the evaluation of an existing UST and hydraulics system at an active Ground Service Equipment (GSE) maintenance facility where petroleum products had been detected in soils underlying the facility. Work included identification of source areas, development and implementation

Continuing Education (cont'd)

- "Lead Symposium '94" Con-Test Educational Resource Center, February 1994
- "Soil Remediation Techniques - In-Situ and Ex-Situ Technologies," National Groundwater Association, December 1994
- "Risk Assessment for Soil Contamination," University of Wisconsin, December 1992
- "Site Remediation - Source Control," University of Connecticut, April 1992
- "Bioremediation, State of Practice in Hazardous Remediation Operations," USEPA, January 1992
- "Soil Vapor Extraction Short Course, University of Connecticut, Oct 1991

Publications / Presentations

- "Expedited Environmental Closure," AIG Environmental Department Meeting, August 2007
- "In-Situ Chemical Oxidation, A Case Study," Apex Companies Annual Project Managers Meeting, 2005
- "Horizontal Well Applications in Environmental Remediation," Suffolk County Bar Association, Environmental Committee Meeting, October 1999
- "Aggressive Remediation Approaches at JFK International Airport," IT Technical Exchange, Orlando, Florida, February 1999
- "Emulsified Oils with Dual Phase, High Vacuum Extraction," Fluor Daniel GTI Tech Notes, Volume I, No. 1, October 1997
- "Waste Minimization Cuts Compliance Costs," LI Environmental Expo, 1995
- "Solid Waste Minimization, Recycling & Reuse," Hauppauge Industrial Association, October 1995

of soil delineation program and comparison of soil data to regulations and risk-based cleanup levels under Department of Ecology (DOE) Model Toxics Control Act and UST regulations.

Air Sparge/Soil Vapor Extraction System Design, Brookhaven National Laboratory, DOE CERCLA (Federal "Superfund") Facility

Completed the design of a large-scale air sparge/soil vapor extraction system to remediate a combination of fuel oils and chlorinated organics. The project included review of existing data to identify the extent of contamination followed by the design of over 40 air sparge wells, 20 soil vapor extraction wells, and a monitoring well network. The design package included 30%, 90%, and 100% design drawings and full CSI specifications for well construction, mechanical equipment, air emissions control, and system start-up and operation. Modeling of the air emissions was completed to predict control system loading rates and permitting requirements.

NYCTA and NYCOGS, Various City Property Remediation Systems, Multiple Boroughs, New York City, NY

Managed the remediation of several bus terminal and police station sites impacted by Underground Storage Tank (UST) systems within NYC. Remediation technologies included product recovery, total fluids recovery, bioventing, and soil vapor extraction. Work was completed following New York City Site-Specific Investigative Summary and Remedial Plan (ISRP) recommendations and guidelines under the NYSDEC Spills program.

Aviation Fueling System Investigation and Contaminant Delineation, Hydrant Fueling Line Study, SeaTac, Washington

Coordinated an investigation of a large-scale, high pressure fuel delivery system serving Seattle-Tacoma International Airport (SEATAC) in advance of a proposed terminal re-development project. The linear assessment included development of a cost-effective program to delineate several miles of underground fuel hydrant lines to identify areas of possible soil contamination and to develop a soil management plan to be implemented during future demolition activities. As part of the scope of work, contaminant data was compared to DOE evaluation criteria under the Model Toxics Control Act regulations and recommendations to prioritize remedial activities were made.

Horizontal Well, Dual Phase High Vacuum Extraction System, Major Airline Terminal, JFK Airport, NY

Work under the project included three major phases: negotiations with potentially responsible parties to structure a technical partnering agreement; remedial design of a DPHVE system with optional conversion to an air sparging / soil vapor extraction system; and operation and maintenance of the remediation system. Since the major impacted areas were located near gate operations, a horizontal well system was designed to minimize disruptions to gate operations. The horizontal well system design consisted of over 20 horizontal wells and an associated water treatment system including solids removal and VOC treatment. Bench-scale treatability and field pilot testing was performed as part of the technology evaluation phase of the project.

Bulk Fuel Farm UST and AST Evaluation, Soil and Groundwater Impacts, Confidential Airline, Portland, Oregon

Performed an evaluation of soil and groundwater remediation requirements and environmental liability assessments for a former bulk fuel farm at a major international airport. Work was performed to settle environmental claims as part of the bankruptcy proof of claim process. Work included evaluation of local UST area impacts as well as contaminant migration via stormwater systems and associated impacts to local surface waterways. As part of the project, cost estimates for environmental liability were prepared for settlement of claims.

Airline Hangar Investigation & Remediation, JFK Airport, Jamaica, NY

Completed a baseline environmental assessment at an active hangar facility. The assessment identified potential environmental liabilities and served as a basis for remedial design. The project was completed under a negotiated Stipulation Agreement with the NYSDEC's Region 2 Spills group. A feasibility study which included evaluation of real estate related factors (i.e., cost of maintaining a leasehold during long-term remediation v. expedited remediation to eliminated leasehold costs) identified several approaches that saved the customer at least \$500,000. A

Publications / Presentations (cont'd)

- "RCRA - Hazardous Waste Management Overview," International Facilities Managers Association (IFMA), LI Chapter Meeting, 1994
- "Site Remediation - A Cost Effective Approach," LI Environmental Expo, 1994
- "The NYSDEC Voluntary Cleanup Policy: How will it impact remediation projects in New York State?" NYWEA Spring 1995 technical meeting, Saratoga Springs, NY
- "Phase I Environmental Site Assessments," In-house seminar program, H2M Group, 1993
- "Proper Field Sampling Techniques for Soil and Groundwater," In-house seminar program, H2M Group, 1993

Business Affiliations

- Long Island Business Aviation Association
- Hauppauge Industrial Association - Inactive

technology consisting of dual phase high vacuum extraction and steam injection was implemented to expedite remediation. The majority of closure goals were met within only 6 months from the onset of the design effort, ahead of schedule and under budget.

Soil Vapor Extraction Pilot Test Program, Retail Gasoline Station, Suffolk County, NY

Completed a pilot test program for a soil vapor extraction system at a former gasoline station where USTs had reportedly leaked. The pilot test program determined the radius of influence of extraction wells, likely contaminant emission concentrations and flow rates, vacuum profiles in subsurface soils, and possible adsorption system removal efficiencies. Contaminants of concern included benzene, toluene, ethylbenzene, xylenes (BTEX), naphthalene and MTBE.

Soil / Groundwater Investigation, Municipal Wastewater Treatment Facility, Wards Island, NY

Directed a comprehensive soil gas, soil, and groundwater investigation including the installation of over 50 soil borings and 10 monitoring wells. A soil gas survey was performed using a Geoprobe and soil and groundwater samples were collected to characterize the site prior to a planned expansion of the facility. On-site debris piles were screened for contaminants including volatile organic compounds and radioactive materials, and the piles sorted for cost-effective disposal. The investigation report identified several areas of concern to be addressed prior to the planned expansion. Work completed under this project also included development and implementation of Work Plans and QA/QC Plans.

Industrial Wastewater Treatment System Design, GAC Treatment and Filtration, Photographic Equipment Manufacturer, Suffolk County, NY

Designed a granular activated carbon (GAC) system for removal of acetone and other organics prior to on-site discharge in accordance with state pollutant discharge elimination system requirements. The upgrade included evaluation of adsorption isotherms, carbon regeneration requirements, and estimated time for breakthrough of contaminants. A complete cost evaluation was also included as part of the design effort.

Industrial Wastewater Treatment System Upgrade, Metal-Finishing Facility, Suffolk, NY

Designed a system upgrade for a 70,000-gallon per day wastewater treatment system. The upgrade included designing floc settling and sludge dewatering systems. Bench-scale treatability tests were performed as part of the design effort. As a result of the dewatering system, hazardous waste sludge generation has been decreased by more than 50 percent at the site. Regulatory negotiations regarding the applicability of RCRA TSD requirements were included as part of the upgrade program.

Remedial Investigation, Risk Assessment, and Preliminary Feasibility Study, New York State Inactive Hazardous Waste Disposal Site (State Superfund), Queens, NY

Managed and oversaw QA/QC on a site impacted by VOC and TPH contamination in soil and groundwater. Remedies evaluated for possible implementation included soil vapor extraction (SVE), bioremediation, excavation, and thermal treatment. In addition, a baseline risk assessment was performed. The baseline risk assessment indicated that site controls would be a cost-effective mechanism for protection of human health.

Underground Storage Tank (UST) Removal and Remediation Program, Staten Island, New York

Designed and implemented a program consisting of work plan preparation, delineating the extent of contamination, groundwater modeling, evaluating remedial alternatives, pilot testing of a pump and treat groundwater remediation system, and evaluating possible dewatering schemes. The project was performed as part of the demolition and reconstruction of the maintenance area at a major New York City transportation hub.

Daniel J. Smith, P.E. (continued)
Apex Companies, LLC, New York Division Manager
National Remediation Group Coordinator

Groundwater Modeling, New York City Marine Terminal, Staten Island, NY

Developed a groundwater model to predict contaminant migration pathways in a tidally influenced shallow aquifer with fill material. The model included estimating hydraulic parameters, reviewing tidal influence study data, evaluating the impacts of manmade structures, and a particle tracking analysis.

Multi-Media Pollution Prevention Audit - Electronics Manufacturing Facility

Completed a multi-media, pollution prevention (M2P2) audit for a Fortune 500 electronics manufacturing facility. The audit included review of hazardous waste management procedures; air emissions compliance; process wastewater collection, treatment, and disposal; secondary containment permit compliance; UST and AST management; SARA Title III compliance; employee training; corporate and departmental record keeping and tracking; and stormwater management. The audit was performed prior to a multi-agency audit. The findings of the audit allowed the company to remedy deficiencies prior to the State agency audits, thereby preventing fines of several hundred thousand dollars.

Environmental Compliance Audit - Metals Machining Facility

Completed an environmental compliance audit for an international machining company with headquarters in New Jersey. The audit focused on waste oil handling and compliance, but also considered wastewater discharges, air emissions, and Community Right-To Know compliance. New Jersey ISRA requirements as well as importer and exporter regulations were included in the auditing program. The audit report was submitted as a working database to improve facility environmental tracking procedures and to ensure that recommended actions were incorporated into the overall facility operations schedule and budget.

Compliance Documents, Various Customers and Locations

Prepared various environmental compliance documents including hazardous waste analysis plans, closure plans and certification reports, contingency plans, Best Management Practices (BMP) plans, Spill Prevention Control and Countermeasures (SPCC) Plans, discharge monitoring reports, Tier I and Tier II Community Right-to-Know forms, and Form R submittals.

Industrial Compliance Audit and Wastewater Study, Aircraft Parts Manufacturer

The environmental compliance audit focused on waste storage, treatment and disposal and wastewater handling. As a result of the audit a new process wastewater collection system was designed to ensure compliance with local and state discharge requirements. As part of the program, internal inspection and environmental compliance programs were developed to educate workers on proper record keeping techniques.

Litigation and Legal Support Experience

Legal Support, New York State Inactive Hazardous Waste Disposal Site (State Superfund), Filtration System Manufacturer, Nassau County, NY

Managed a groundwater investigation consisting of review of existing on-site and off-site data, installation of monitoring wells, determination of groundwater flow direction, and identification of possible upgradient sources of contamination through review of groundwater quality data and the nature of contaminants in the subsurface. The primary contaminants of concern included PCE, TCE, 111-TCA, DCE, Vinyl Chloride and Freon®. Assisted counsel in negotiations with third parties and regulatory agencies that focused on the differentiation of chlorinated organic plumes from multiple sources. As part of the legal support project, contaminant fate and transport models and a conceptual site model was developed to identify source areas and potential impacts to a downgradient municipal well field. Mr. Smith also worked with the client and potential purchasers of the facility to help facilitate a real estate transaction of the contaminated property.

Litigation Support for MTBE Class Action Suit Defense, Consolidated in NY

Recently retained as an expert witness in a national class action suit involving MTBE contamination of public supply wells. Work is just initiating (January 2009).

Litigation Support for Former Manufacturing Company, Cost Recovery Defense, Westchester County, NY

Served as a technical expert in the evaluation of historic and proposed remediation costs to address a chlorinated VOC plume underlying a former manufacturing building. Work has included preparation of expert reports, attendance and presentation at settlement meetings, and general coordination with counsel and the client. Work is currently underway to try to reach settlement between the two parties.

Daniel J. Smith, P.E. (continued)
Apex Companies, LLC, New York Division Manager
National Remediation Group Coordinator

Litigation Support for Printing Company, Underground Injection Control and RCRA Closure, Nassau County, NY

Served as an expert witness in a dispute between a tenant and landlord related to alleged disposal of wastes (primarily inorganics including chromium and lead, and solvents) into drains and site underground structures. Work included evaluation of Underground Injection Control (UIC) program applicability and review of work completed by third parties to remedy historic contamination. The project focused on the costs and technical effectiveness of remediation and coordination of site remediation with RCRA closure requirements. Work included deposition preparation and reviews, affidavit reviews, and other litigation support tasks.

Litigation Support for Major Airline, Bankruptcy Proof of Claim Evaluations, Nationwide

Served as technical expert in the analysis of environmental Proof of Claims ranging from tank farm spill issues to multi-million dollar airport-wide cleanups. Work focused on detailed cost estimation for remediation scenarios for both *in-situ* and *ex-situ* remediation and development of presentations for airport authorities. Cost estimates included evaluation of union issues and complicating airport security factors. Work was performed for both environmental counsel and bankruptcy counsel.

Litigation Support for Major Airline, Miami International Airport Remediation, Miami Florida

Represented a major international air carrier in a litigation matter involving the remediation of soil and groundwater contaminated with petroleum products and chlorinated VOCs throughout the airport. Work included evaluation of remedial approaches taken, claimed environmental costs, cost-effectiveness, and schedule impacts on cost claims. Technical settlement scenarios were developed and presented, each with detailed cost backup. Work involved review of hundreds of file boxes spanning data from the 1950 to the present time. All work was also completed on an expedited schedule.

Litigation Support for Pesticide Manufacturer, Suffolk County, NY

Prepared investigation, damage assessment, and remediation feasibility reports to support litigation related to the impacts of pesticides on several public water supply wells. Records for over a decade of operations were reviewed and an engineering evaluation of a granular activated carbon treatment system was performed. In addition, a thorough QA/QC review of analytical data packages was completed for trial. Cost estimates for all remedial options considered were evaluated and a ranking system was used to recommend an alternative remedial / treatment approach.

Litigation Support for Regional Environmental Agency, Nassau County, NY

Evaluated site investigation procedures employed by a local environmental agency regarding a felony complaint that alleged illegal disposal of hazardous substances. Mr. Smith's role included preparation of an expert report rendering opinions on the applicability of RCRA and CERCLA and on the reliability of environmental quality data.

Litigation Support for National Petroleum Company, Suffolk County, NY

Represented a major petroleum company in litigation with the owner of a retail petroleum station property and an adjacent vacant parcel. Developed a technical report and corresponding professional opinion regarding the extent of contamination at the site, the source of contamination, and potential remedies that could be implemented in coordination with proposed site development plans. Remedial cost estimates were developed for multiple development scenarios.

Litigation Support, Major International Airline, Queens, NY

Reviewed and prepared documents for a Fortune 500 airline to support counsel. Work included identification of contaminated areas, evaluation of the extent of separate phase hydrocarbons, potential contaminant migration pathways, remedial technologies applicable at the site, and development of detailed cost estimates for remediation. Work also included differentiation of sources of contamination and a determination of potentially responsible parties for the Airline. Multiple experts were coordinated under the litigation support contract to provide comprehensive litigation support services with a focus on investigation, remediation, airport terminal construction, product and plume aging, and construction planning and scheduling.

Litigation Support, Printed Circuit Board Manufacturer Former NYS Superfund Site), Suffolk County, NY

Following the completion of a comprehensive RCRA Closure program, Mr. Smith represented the tenant of a site in Melville, NY in the defense of a Complaint made by the property owner pertaining to environmental conditions at the site of the Closure program. Litigation support work included preparation of a closure report documenting investigative and remedial activities at the site, and the extent of residual contamination remaining upon completion of closure.

Remediation Cost Evaluation & Technical Mediation, Confidential Airline Client, Philadelphia, Pennsylvania

Coordinated a technical mediation focusing on development of an independent cost estimate for remediation performed by a major airline. Work included review of actual cost documents submitted by the airline and the local aviation authority. Based upon review of the documents, a recommended cost allocation mechanism was presented to the parties.