ARAMARK UNIFORM SERVICES
CHRISTOPHER SERVICE COMPANY SITE
3009 & 3117 MILTON AVENUE
VILLAGE OF SOLVAY, NEW YORK

VOLUNTARY CLEANUP PROJECT

SITE INVESTIGATION WORK PLAN

JANUARY 2004

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Consulting Engineers

290 Elwood Davis Road
Box 3107
Syracuse, New York 13220

recycled paper

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PREPARED FOR:

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PROJECT NO.: 909.001

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1.0 INTRODUCTION

ARAMARK Uniform Services is pursuing an investigation of subsurface contamination under the Voluntary Cleanup Program at 3009 and 3117 Milton Avenue in the Village of Solvay, Onondaga County, New York (see Figure 1). The Site is approximately 0.75-acres and is situated at the southeast corner of the intersection of Milton Avenue and Bailey Street. The current primary site use is for an industrial laundry facility (3117 Milton Avenue), which does not include dry cleaning operations. There is also a residential property (3009 Milton Avenue) located on the east side of the property which is currently utilized as a rental property.

Previous investigations conducted at the site include a 1999 Phase I Environmental Site Assessment (Phase I ESA) completed by LCS and a Limited Environmental Site Assessment Report and Supplement to the Site Investigation Report conducted by Ransom Environmental in 2003. Soil and groundwater samples were collected as part of the Ransom investigations, and volatile and semi-volatile organic compounds were detected above NYSDEC standards. Based upon the findings of the 2003 Ransom Environmental Reports, low-level residual contamination appears to be present both on and off-site.

This program designates the preparation of a Site Investigation Report (SIR). The Site Investigation will be conducted in accordance with the NYSDEC's May 2002 Draft Voluntary Cleanup Program Guide. The investigation will concentrate on characterization of existing hydrogeologic and environmental conditions to determine the presence and extent of surface and subsurface contamination originating at the Site. The goal of the SIR is to produce sufficient data to develop a Remedial Action Work Plan. Components of the Remedial Action Work Plan are not included in this Site Investigation Work Plan.

Section 5 of this Work Plan describes the specific tasks that are intended to assess the conditions at the Site, as well as off-site. In the event that the findings of the Site Investigation identify conditions that are beyond the scope of this present work initiative, a supplemental Work Plan will be developed to address additional data collection and evaluation tasks.

Included as ancillary documents to this Work Plan are the Sampling and Analysis Plan (SAP - Appendix A) and the Health and Safety Plan (HASP - Appendix B). The SAP comprises a quality management plan and a data management plan. The quality management plan specifies the procedures for performing the investigation, sampling and laboratory analyses presented in the Work Plan, and establishes quality control and assurance procedures to be used during the Site Investigation. The data management plan establishes document control for the Site Investigation including data documentation materials and procedures, project file requirements and report formats.

The HASP establishes procedures to provide for the health and safety of personnel performing the work and identifies the potential hazard(s) to which personnel may be exposed.

2.0 SITE DESCRIPTION AND HISTORY

2.1 Site Description

The Site is approximately 0.75-acres and is situated at the southeast corner of the intersection of Milton Avenue and Bailey Street in the Village of Solvay, Onondaga County, New York. The Site is primarily used as an industrial laundry facility (3117 Milton Avenue), with a rental property (3009 Milton Avenue) located on the eastern portion of the site. ARAMARK Uniform Services is the current property owner. The Site Plan is depicted on Figure 2.

The majority of the Site consists of a two-story block building utilized for laundry services. The front side of the building faces north towards Milton Avenue. There is a small parking area between the north side of the building and Milton Avenue. The main entrances to the facility are located on the western portion of the north side of the building. The eastern portion of the north side of the building consists of vehicle loading docks. The west side of the main building is adjacent to Bailey Avenue and primarily consists of overhead bay doors. Beyond the rear of the building (south side) is a lawn forming the backyards of the residences located on Third Street. The eastern portion of the main building is immediately adjacent to the residential structure (3009 Milton Avenue) located on the property. The two-story residential structure located on the subject property is not considered as a source of the residual contamination associated with the site.

Currently there is a 10,000-gallon carbon dioxide aboveground storage tank (AST) located on the exterior of the main structure (north side) and an internal wastewater treatment system located at the Site. The wastewater treatment system discharges to the sanitary sewer. The impacts of these operations upon Site conditions will be evaluated as part of the Site Investigation.

2.2 Site History

The Site history was evaluated through a review of the Ransom Environmental Site Investigation Report and Supplement to the Site Investigation Report, along with the LCS, Inc Phase I ESA. Historical references available for review included the legal description and abstract of title, Sanborn Fire Insurance Maps, historic City directories, and historic aerial photographs. These documents are available for review in the VCP Application.[1]

The Site is currently owned and occupied by the Christopher Service Company, which began operating under the name ARAMARK Uniform Services in January 2003. The majority of the Site (3117 Milton Avenue) is utilized as a laundry facility. The adjacent residence (3009 Milton Avenue) is rented to tenants.

Research into the history of the Site indicates that the main use of the western portion of the Site has been for industrial laundry services (with the residential property located on the eastern portion of the Site). Historically, water washing and dry cleaning operations were conducted at the Site.

From 1946 to 1953 the Site was operated as a storage and auto repair facility, with the current residential property located on the eastern portion of the Site. The building that was historically the auto repair facility now appears to be

[1] At the time the application was submitted, Parcels A, B, and C were intended to be transferred from ARAMARK Uniform Acquisition, LLC to Christopher Services Company. Because of some corporate restructuring, described below, these transfers did not take place. On October 27, 2003, Aramark Uniform Acquisition, LLC changed its name to Aramark Uniform Services (Syracuse), LLC. Effective December 31, 2003, Christopher Services Company was merged into Aramark Uniform Services (Syracuse), LLC with Aramark Uniform Services (Syracuse), LLC as the surviving entity. All of these parcels that comprise the Site are now owned by Aramark Uniform Services (Syracuse), LLC.

the western portion of the current building located on the Site. The existing laundry facility building appears to have been expanded to the east between 1968 and the 1990s. Prior to the use as an auto repair facility in 1946, the Site was utilized solely for residential housing.

The potential environmental concerns associated with the Site are likely derived from historical on-site dry cleaning operations as a laundry facility, or from historical use as an auto repair facility. The primary Site contaminants are chlorinated solvents and petroleum hydrocarbons. The extent of the impacts of Site contaminants were largely defined through previous investigations as described below.

2.3 Previous Investigations

The first investigation conducted at the Site was a Phase I ESA by LCS, Inc. in 1999. The Phase I ESA included a records review and a non-intrusive site reconnaissance. No samples were collected as part of the Phase I ESA. LCS concluded that there was no historical evidence supporting the presence of a release of hazardous, toxic, or other contaminants of concern. The report did indicate the former presence of a 12,000-gallon heating oil UST, which was reportedly removed from the site in 1971.

A Limited Environmental Site Assessment was conducted Ransom Environmental in January 2003 and Site Investigation Report was prepared in May 2003. The Ransom investigation was focused on two areas of concern at the laundry facility Site. The areas of concern included the former location of the 12,000-gallon fuel oil UST (located below the existing 10,000-gallon carbon dioxide AST) and the former dry cleaning area located in the interior of the western portion of the building.

The January 2003 Ransom investigation included the installation of 10 soil/groundwater borings by direct push methods. The soil cores were screened with a photo-ionization detector (PID), and only one location exhibited elevated PID readings. Soil samples were collected at depths ranging from 7 to 8 feet below grade (approximately 6 inches above groundwater table) from each of the boring locations and analyzed for the presence of volatile organic compounds (VOCs) by EPA Method 8260, and semi-volatile organic compounds (SVOCs) by EPA Method 8270. The locations of the soil/groundwater borings are shown on Figure 3.

Following the collection of soil samples, groundwater samples were collected through the use of temporary 1-inch diameter PVC well points and disposable bailers at locations SB-1 and SB's 4-10. Groundwater was not observed at locations SB-2 and 3. Groundwater samples were also analyzed for the presence of VOCs by EPA Method 8260, and SVOCs by EPA Method 8270.

The investigation identified the presence of VOCs (including petroleum hydrocarbons and chlorinated solvents) and SVOCs (polynuclear aromatic hydrocarbons) at concentrations that exceed NYSDEC TAGM 4046 recommended soil cleanup objectives and NYSDEC Groundwater Quality Standards. The source and extent of this contamination has not been fully defined, however, the most significant of the low level impacts were observed adjacent to the former dry cleaning area. Decreased contaminant concentrations were observed adjacent to the former 12,000-gallon UST, and no impacts were observed adjacent to the residential property (3009 Milton Avenue).

A Supplement to the Limited Environmental Site Assessment and Site Investigation Report was prepared in November 2003, based on the collection of off-site groundwater samples in May 2003. Four geoprobe borings were installed north of Milton Avenue, and two borings were installed west of Bailey Street in order to collect groundwater samples to assess off-site impacts. Groundwater samples were analyzed for the presence of VOCs by EPA Method 625, and SVOCs by EPA Method 624. Although off-site impacts appear minimal, the presence of VOCs (including petroleum hydrocarbons and chlorinated solvents) and SVOCs (polynuclear aromatic hydrocarbons) were identified at concentrations that exceeded NYSDEC Groundwater Quality Standards.

At this time, the sources contributing to the contamination encountered at the Site are unknown. Potential sources of contamination may include the underground storage tank and/or associated conveyance lines, the former dry cleaning area, or the floor drain and septic system.

2.4 Neighboring Properties

The Site is bordered to the north by Milton Avenue. Directly across Milton Avenue from the site is a single row of employee parking for ARAMARK personnel. North of the parking area is a railroad embankment, with a vacant wetland area present further north. Also located along the north side of Milton Avenue, across the street from the eastern portion of the subject property, are Hercules Tires and Frazier & Jones steel mill.

The Site is bordered to the west by Bailey Street. Further west of Bailey Street is property occupied by the Village of Solvay Highway Garage. The Site is bordered to the south by residential properties along Third Street. The general topography of the surrounding area slopes from Third Street (south) to Milton Avenue (north). The Site is bordered to the east by a distribution facility for Deli Boy. There appears to be a diverse mix of land use in the area between small businesses, medium to large industrial operations, and residential housing.

A review of State and Federal regulatory agency files for the surrounding area identified two properties with businesses of concern that may affect the environmental integrity of the subject Site. The Stanton Foundry, located at 3004 Milton Avenue is upgradient of the Site and is listed as a leaking underground storage tank (LUST) Site and small quantity hazardous waste generator. Frazier & Jones is listed as a large quantity hazardous waste generator and has a closed NYSDEC Spill file.

3.0 PRELIMINARY RISK EVALUATION

3.1 Potential Exposure Scenarios

The land use surrounding the property consists of commercial, industrial and residential properties. The subject area is serviced by a public water supply and sanitary sewers. It is not known if all property owners are connected to the public facilities.

It appears that the primary contaminants associated with the Site are related to the release of petroleum hydrocarbons and chlorinated solvents. Potential on-site exposure scenarios include the inhalation of polyaromatic hydrocarbons and chlorinated solvents from indoor and/or outdoor air associated with residual soil and groundwater contamination. The apparent residual contamination present below the main building slab/basement creates the potential that indoor air quality may be affected. Given the depth of contamination observed during the previous investigations along with the site being paved, it is unlikely that outdoor air quality would be affected by the residual contamination present at the Site, and thus the likelihood for exposure of potential receptors is low. Historic soil and groundwater samples collected from the site indicate that the tenants of the adjacent residential property are not exposed to contaminant levels that would affect indoor or outdoor air quality. The potential on-site exposure scenarios, therefore, are limited to indoor air inhalation by employees of the laundry facility. This exposure scenario will be evaluated by the sub-slab vapor survey as outlined in Section 5.2.

The nearest likely downgradient receptors are adjacent industrial use properties. The primary contamination migration route is via groundwater. Exposure pathways could include indoor air inhalation via the volatilization of groundwater based contaminants into downgradient basements. Downgradient private supply wells (if any exist) could also be impacted. It should be noted that no downgradient private supply wells have been identified. Given the low-level contaminant concentrations observed at the Site's boundaries it is in our opinion that off-site outdoor air quality is not affected by the Site.

The Site Investigation will include a characterization study of the extent of subsurface contamination, hydrogeologic conditions, a sub-slab vapor survey, and may include an adjacent property survey in order to further evaluate environmental risk associated with the Site.

3.2 Areas and Contaminants of Concern

Based upon the results of the previous site investigations, the following areas and contaminants of concern have been identified:

LOCATION	MEDIA	CONTAMINANTS OF CONCERN
ON-SITE		
Former Dry Cleaning Area	Subsurface Soil	PAHs Chlorinated Solvents (VOCs)
Former 12,000-g heating oil UST	Subsurface Soil	PAHs
West of building	Subsurface Soil	PAHs
Former Dry Cleaning Area	Groundwater	PAHs Chlorinated Solvents (VOCs)
Former 12,000-g heating oil UST	Groundwater	PAHs Chlorinated Solvents (VOCs)
West of building	Groundwater	PAHs Chlorinated Solvents (VOCs)
OFF-SITE		
Downgradient (Bailey/Milton Streets)	Groundwater	PAHs Chlorinated Solvents (VOCs)

The contaminants of concern include chlorinated solvents (volatile organic compounds) likely associated with the former dry cleaning operations conducted at the Site, and PAHs that are indicative of heavy oils (i.e., heating oil) that may have been released from the prior use of an underground storage tank at the Site or may be a result of the on-site fill material.

4.0 PROJECT OBJECTIVES AND TECHNICAL APPROACH

4.1 Project Objectives

The overall objective of this Site Investigation is to define the nature and extent of contamination on the property related to former Site activities. The specific objectives of the Site Investigation include the following:

- Create a Base Site Plan with current survey data and accurate locations of internal building components including process equipment, floor drains, and other materials.
- Thoroughly define the presence and extent of soil and groundwater contamination on-site and off-site;
- Characterize the Site hydrogeologic conditions, including identification of depth to groundwater and flow direction, and the location of groundwater discharge areas.

4.2 Technical Approach

The following discussion presents the technical approach proposed to complete the project objectives outlined above. The technical approach has been structured to achieve these objectives in a progressive, deliberate and cost-effective manner. At the completion of each project task, the existing data will be reviewed to determine if the limits of the suspected contamination attributable to the Site have been adequately characterized, or if a subsequent task is required. It is possible that not all of the tasks described below will be required. Each of the specific components of the proposed technical approach is briefly discussed in the text below.

Initial tasks will involve the collection of Site specific data for the purpose of scoping the subsequent tasks for this project. Preliminary surveys of the Site will be performed to identify materials and potential sources of contamination present at the Site. The subsurface investigation includes the installation of overburden monitoring wells and sampling and analysis of groundwater.

Upon completion of Site investigation activities, the data will be reviewed to determine the nature and extent of contamination on the Site and to develop qualitative assessment of ecological and human health risks posed by the Site. The Site Investigation efforts will be presented in a Site Investigation Report (SIR).

5.0 SITE INVESTIGATION TASKS

In order to accomplish the objectives set forth in Section 4.1, the following task-by-task description is presented. These items are based on the technical approach previously provided in Section 4.2.

5.1 Project Startup

5.1.1 TASK 1 - Site Survey and Preparation of Site Map

The Site and immediately adjacent areas (road, adjacent properties) will by surveyed to create a topographic base map of the property. This will include surveying and locating the Site buildings, utility poles, streets, fences, manholes, subsurface utilities and other distinguishing features present at the Site. A benchmark will be established from which the elevations of monitoring wells can be referenced.

The survey data will be used to develop a Base Site Plan for the presentation of Site data collected during the investigation (i.e., groundwater elevation contours, extent of contaminated soil and groundwater, etc.). Site elevation data will be used to develop cross-sections through the Site showing the configuration of geologic materials, elevation of the water table, building foundation, and vertical extent of soil and/or groundwater contamination.

5.1.2 TASK 2 - Site Inspection and Residential Well Survey

A Site inspection team will visit the Site for the purpose of documenting the existing operations conducted at the Site, along with identifying the current chemical use at the Site. In addition the internal building layout will be verified including a field check of the location of facility equipment and utilities. On-site drainage patterns will also be documented as part of this task.

A residential well survey will be conducted within the upgradient and downgradient proximity of the Site in order to determine if any local properties utilize a well as a water source. All residential properties within a 1/8 mile radius will be surveyed. The survey will consist of a review of public well records.

If the site investigation work described below identifies that subsurface soil or groundwater contamination extends under any off-site building, additional well survey work will be performed. The additional survey work will consist of in-person, or telephone interviews of the property owner and/or occupant of any structure which overlies the identified contaminated zone. For any affected properties, the presence and use of private supply wells, along with construction and condition of subsurface structures will be documented as part of the survey. The impacts of neighboring properties upon the subject property will also be evaluated in this task.

5.1.3 TASK 3 - Community Relations

The NYSDEC is taking the lead on creating the Citizen Participation Plan (CPP) for the project. The Department has indicated that some engineering assistance may be needed to develop the CPP.

5.2 Site Investigation

The Site Investigation will include a groundwater investigation to determine the water quality characteristics, groundwater flow regime and hydrogeologic data. The Site Investigation will also include a soil vapor survey to assess the concentration of the contaminants of concern in the area immediately below the building slab. Soils will also be evaluated while screening the split spoon samples collected from the rotary drill borings during monitoring well installation.

A Community Air Monitoring Plan (CAMP) will be instituted for volatile organic compounds (VOCs) and particulates (i.e., dust) during intrusive activities (i.e., monitoring well installation) completed as part of the Site Investigation. The CAMP's intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses, and on-site or nearby workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air. The CAMP is outlined in the HASP (Appendix B).

Periodic monitoring for VOCs will also be required during non-intrusive activities such as the collection of groundwater samples from monitoring wells. "Periodic" monitoring during sample collection will consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap, monitoring during well bailing/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities.

5.2.1 TASK 4 - Groundwater Investigation

Currently, it is anticipated that six groundwater monitoring wells will be installed at the locations shown on Figure 3. The anticipated groundwater flow direction is to the northwest, as based on an interpretation of the regional topography. The locations of the proposed monitoring wells were positioned to supply the following information:

- A determination of upgradient groundwater quality. Presumably, this location should not be impacted by historic Site uses. The designation of this monitoring well is MW-1.
- A determination of groundwater quality adjacent to the former dry cleaning area. This is the suspected source of the chlorinated solvent contamination observed at the site. The designation of this monitoring well is MW-2.
- A determination of groundwater quality downgradient from the site. The designation of these monitoring wells will be MW-3 through MW-6.

5.2.1.1 Monitoring Well Installation

Monitoring well construction and installation will be supervised by a B&L Engineer/Geologist or a qualified Engineer/Geologist representing B&L and follow the general specifications as shown in Figure 4. The drilling contractor will have available on-site prior to commencement of the drilling program, 2-inch diameter PVC threaded riser pipe and continuous slot well screens, including all fittings, bottom plugs, centralizers, caps, etc. In addition, the drilling contractor must have available all backfill materials necessary for well construction, including graded siliceous sand of various sizes for sand pack construction. The size of the sand used for the sand-pack materials will be appropriate for the grain size of the formation materials within the screen interval. Also, an approved concrete aggregate mixture must be used during the construction of the surface seal. The specific types of monitoring well backfill materials are discussed in the SAP (Appendix A).

During the construction and installation of the monitoring wells, the Supervising Engineer/Geologist's responsibilities will include, but not be limited to:

- Construction observation of the entire well assembly;
- Installation observation of the sand pack, fine sand pack, pelletized or granular bentonite seal and grout backfill placements;
- Performing measurements to certify that the placement of the well construction materials was in accordance with the specifications;
- Observation of the protective monitoring well cover installation and the concrete surface seal construction;
- Observation and monitoring of well development (where development is performed by drilling contractor);

- Labeling and marking water level monitoring reference point on the protective cover and riser pipe respectively; and;
- Consultation with the on-site NYSDEC representative.

5.2.1.2 Soil Screening During Monitoring Well Installation

Each monitoring well location will be sampled at two-foot intervals throughout the depth of the boring. Samples will be examined by the on-site representative and will be logged as described in the Sampling & Analysis Plan in Appendix A. The samples will also be examined for moisture content to determine the depth at which saturated samples are obtained, indicating the vertical position of the water table/first water-bearing unit.

Each split-spoon soil sample taken during the drilling program will be screened with a photoionization detector (PID) for total volatile organic vapors. Upon sample retrieval, the Engineer/Geologist will screen the sample directly with a PID. The process will involve placing the soil sample in a sealable bag, then inserting the PID probe in the bag. Two measurements will be recorded to identify the peak concentration and the sustained vapor concentration. Both measurements will be recorded in parts per million (ppm) from the direct readout on the instrument. All measurements will be recorded in the field log along with the ambient temperature for reference regarding determination of well screen intervals, analytical soil sample selection and definition of the vertical extent of groundwater and soil contamination.

Based on field observations, selected soil samples may be submitted for laboratory analysis for VOCs, and SVOCs using EPA SW-846 Methods. A composite soil sample will be collected if elevated PID readings (>25 ppm) are observed within a split-spoon sample.

Each exploratory monitoring well boring will continue until the B&L Engineer/Geologist determines the vertical position of the water table/first water-bearing unit and authorizes termination of the borehole to the desired screened interval. Any drilling method utilized must not introduce contaminants into the borehole during any phase of the borehole advancement or during monitoring well installation. All drilling equipment, tools and machines will be decontaminated upon initially arriving on-site and between each drilling location.

5.2.1.3 In-Situ Hydraulic Conductivity Testing

In-situ variable head hydraulic conductivity testing (slug or bail testing) will be performed at each completed monitoring well after sufficient development has been performed. The slug and/or bail testing will provide in-place permeability data of the screened geologic units. Slug and bail testing involves the removal of a bail of water or the displacement of water within the well by the insertion of a slug. Upon creating an elevated or depressed head, the water level within the monitoring well is measured and recorded over the time it takes to achieve 90% recovery (relative to the initial static water level). It is assumed that the rate of inflow to the monitoring well screen after inducing a hydraulic head differential is proportional to the hydraulic conductivity (k) and the unrecovered head distance.

5.2.1.4 Groundwater Sampling and Analysis & Water Level Monitoring

Upon completion of the monitoring well installation program, each of the new monitoring wells will be sampled for laboratory analysis. The wells will be sampled twice during the investigation (at least 60 days between sampling intervals) in order to provide an indication of seasonal variability in water quality. Monitoring wells will be purged prior to sampling in order to collect a representative sample of the formation groundwater. Each well will be sampled using the following general methodology:

- Measure and record the static water level in each well, and calculate the volume of water in the well;
- Purge at least three times the volume of water in each well. For wells exhibiting extremely slow recovery rates, it may only be possible to remove the initial well volume before it is dry. Rapidly recovering wells can be purged using peristaltic or bladder pumps to purge the required well volumes;
- Collect groundwater samples using disposable bailers; and,
- Ship or deliver samples to a NYSDOH ELAP certified laboratory using the appropriate chain-of-custody documentation. Analyses for VOCs and SVOCs will be performed on these samples.

All investigation final cleanup goal/no further action decision samples will be reported with a NYSDEC ASP Category B deliverables package. The data packages will be subjected to independent data validation following ASP procedures.

Water levels will be recorded on two events approximately two months apart at each of the new monitoring wells to determine the depth of groundwater and the configuration of the groundwater surface. Water level data will be used to develop groundwater contour maps and to identify the horizontal hydraulic gradient of the water table. Water level data will also be compared between each measurement to evaluate seasonal fluctuations.

5.2.2 TASK 5 - Soil Vapor Screening

5.2.2.1 Sub-slab Vapor Survey

NYSDOH has requested that sub-slab vapor samples be collected within the building to assess the potential migration of airborne contaminants from the soil and ground water strata. The purpose of this sampling is to assess the concentration of the contaminants of concern in the area immediately below the building slab, within the identified area of impact.

Vapor samples will be collected from air sampling probes installed through the building floor slab. Three sampling locations are proposed within the main laundry building, within the vicinity of the former dry cleaning operations. The proposed sampling locations are depicted on Figure 5. A fourth sample will be collected immediately outside of the structure (up gradient location), in order to provide a representation of soil gas beneath the building, versus soil gas outside the structure, and the potential for horizontal gas migration.

Soil gas samples will be collected following purging of the sampling equipment and tubing, into Summa gas canisters. The gas samples will be submitted for laboratory analysis of the Site contaminants of concern by EPA Method TO-14A.

The results of the sub-slab vapor sampling will be assessed against USEPA and OSHA reference concentrations for the contaminants. The sampling methodology is further described within the Sampling and Analysis Plan, Appendix A. Due to the nature of the industrial laundry business, where dirty rags and clothing is handled that is possibly impregnated with the contaminants of concern, the sampling will occur during periods when site operations are suspended (nights/weekends) and the room is properly ventilated.

5.3 Site Investigation Reporting

5.3.1 TASK 6 - Site Investigation Report

The Site Investigation Report (SIR) will be prepared in accordance with the NYSDEC's Draft Voluntary Cleanup Program Guide and will assemble information relative to the nature and extent of subsurface contaminants. The report will be organized into sections providing background information on the project, specific data collection methodologies used during the Site Investigation, the findings of these activities and the relation of identified Site contamination with observed hydrogeologic features and the potential risks to human health and the environment. Based on the findings of the Site Investigation, a list of areas/media of concern will be established indicating the types of hazards and environmental problems associated with each media of concern. The report will also include various appendices to present boring logs, monitoring well installation details, soil screening results, sample data, hydraulic conductivity test results, validation reports, and laboratory data.

Data generated from the analysis of soil and groundwater samples will be evaluated, along with observations of environmental impacts, public/private water supply sources and routes of contaminant exposure, to determine the relative existing risk that the Site poses to human health and wildlife. A qualitative assessment of potential ecological receptors will be performed for the Site. Given the highly developed nature of the project Site it is not believed that use of the Site by wildlife is likely.

It does not appear necessary at this time to perform a full-scale Baseline Human Health and Wildlife Risk Assessment including the development of toxicological profiles and hazard indices for chemicals, which may be present at the Site. However, in the event that significantly elevated contaminant concentrations are detected and adverse impacts to the local vegetative and/or wildlife communities are identified, it may be necessary to bring this level of assessment to the project.

Laboratory samples collected for closure verification will be sent for data validation as described in the SAP. The intention is not to submit all Site generated data for validation, but only those samples which are located in areas at the edges of contaminant plumes, and used for Site closure or remedial decisions.

5.3.2 TASK 7 - Project Administration

This task includes project administration duties including coordination of subcontractors and correspondence with State and Local agencies.

6.0 PROJECT MANAGEMENT STRUCTURE

6.1 Project Organization

Barton & Loguidice, P.C. (B&L), is the N.Y.S. remedial engineering consultant who will report directly to Samuel Niemann of the Wetlands Company, whom is the prime engineering contractor for Aramark Uniform Services. With approval from the Wetlands Company, B&L will have direct liaison with the New York State Department of Environmental Conservation (NYSDEC) throughout the duration of the project.

The B&L Project Officer will be William F. Southern, Jr., P. E. Mr. Southern is a Principal at B&L with the authority to commit resources and resolve scheduling conflicts.

The Project Managers will be Scott D. Nostrand, P.E. and John A. Benson. The Project Managers will have the primary responsibilities for planning and implementation of the Environmental Restoration Project. The Project Managers will be the primary contacts for all project-related communications with the Wetlands Company and NYSDEC.

The Site Managers will be Jeffrey J. Reed, I. E. and David R. Hanny. The Site Managers will be in charge of all field activities related to the Site Investigation program. The Site Managers will be responsible for scheduling and implementing the field activities and will have primary contact with project subcontractors designated to perform drilling, surveying and laboratory analysis as needed.

The Quality Assurance Officer for this project will be John A. Benson, CHMM. His responsibilities will include performing periodic field audits during the investigation (particularly sampling activities) and interfacing with the analytical laboratory to make requests or resolve problems in order to assure that the predetermined project objectives for data quality have been met; he will also evaluate the data package, and interface with the data validator.

6.2 Project Schedule

The project schedule for the ARAMARK Solvay Voluntary Cleanup Project is presented in Figure 5. The estimated duration of the project is 12 months. The schedule is based on preliminary assumptions concerning initiation and duration of field investigations, receipt of laboratory results and NYSDEC review and comment periods.

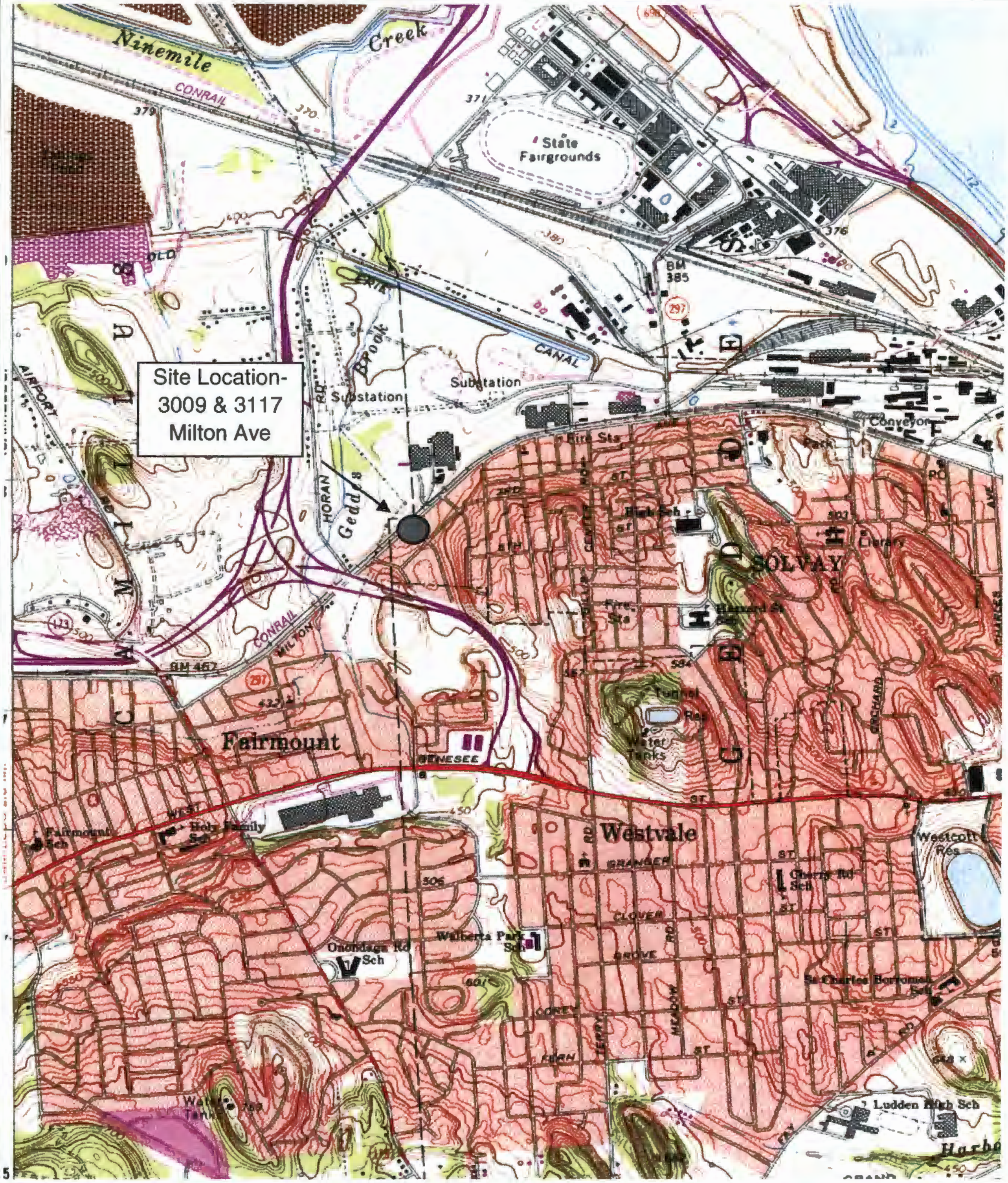
6.3 Project Cost Estimate

A project cost estimate has been prepared and is presented in Figure 6. The cost estimate is based on conducting the tasks included in this work plan, in accordance with the procedures described and required by NYSDEC. The estimate is divided into Engineering, Subcontractor and laboratory costs.

FIGURES

FIGURE 1

SITE LOCATION MAP



Project No. 909.001

December 2003

Figure 1- Project Location Map
ARAMARK Uniform Services
Voluntary Cleanup Project

Village of Solvay

Onondaga Co., NY

N

Barton & Loguidice, P.C.
Consulting Engineers

Base Map: USGS 7.5' Topographic Quadrangle Syracuse West, N.Y. (1978)

FIGURE 2

SITE PLAN

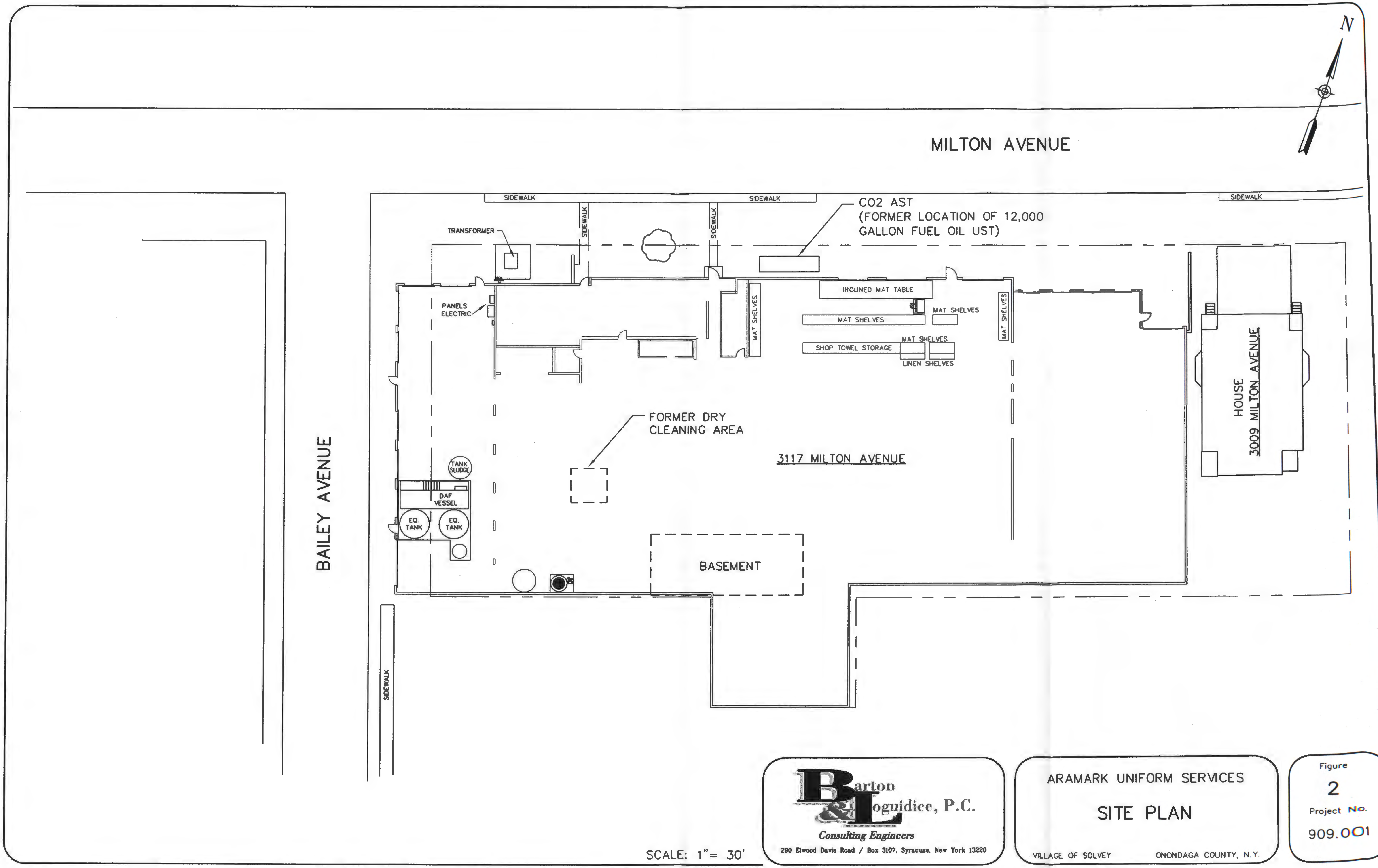
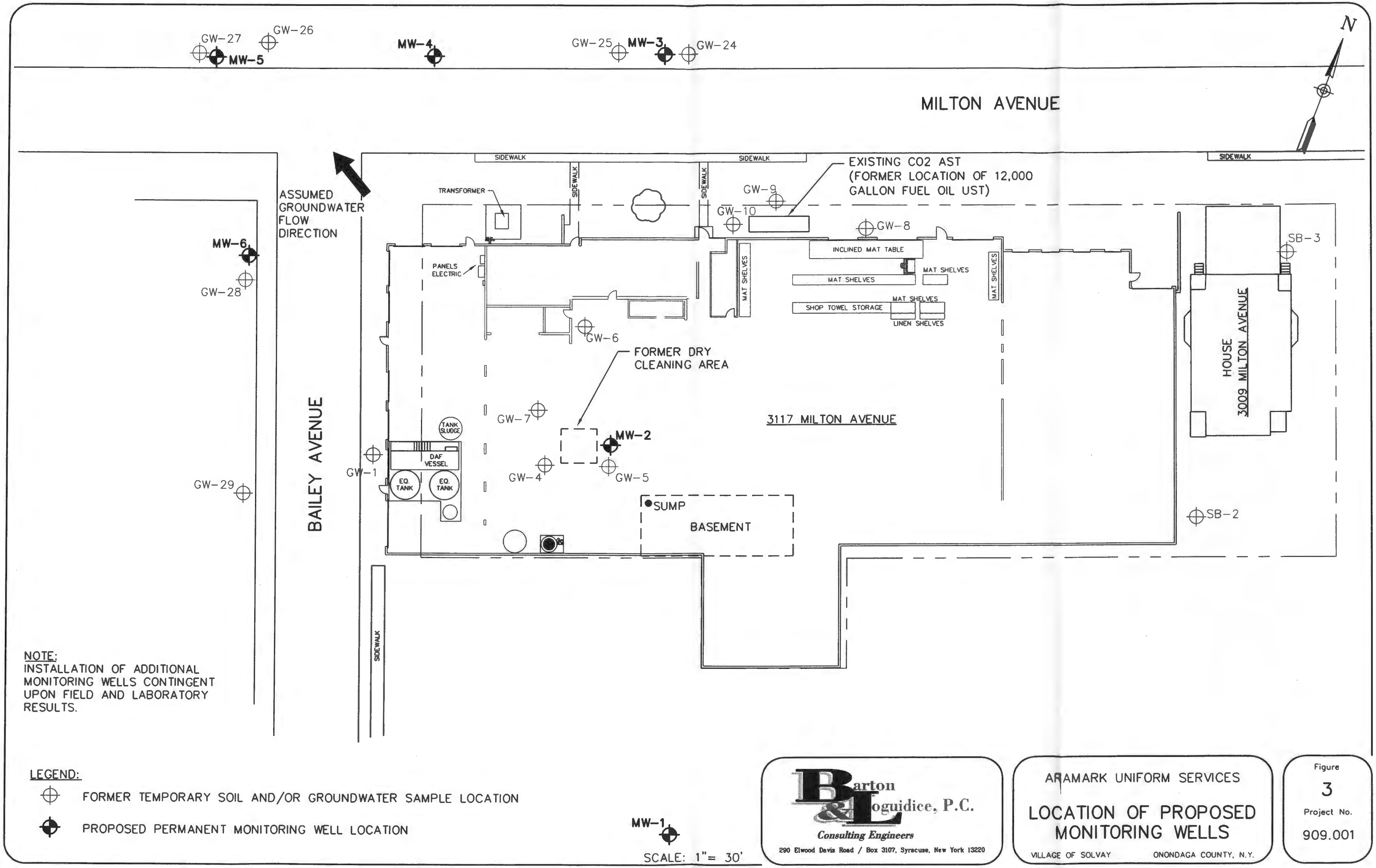

N
MILTON AVENUE
SIDEWALK
SIDEWALK
SIDEWALK
SIDEWALK
SIDEWALK
SIDEWALK
CO2 AST
(FORMER LOCATION OF 12,000
GALLON FUEL OIL UST)
TRANSFORMER
PANELS
ELECTRIC
INCLINED MAT TABLE
MAT SHELVES
MAT SHELVES
MAT SHELVES
MAT SHELVES
MAT SHELVES
SHOP TOWEL STORAGE
LINEN SHELVES
HOUSE
3009 MILTON AVENUE
FORMER DRY
CLEANING AREA
3117 MILTON AVENUE
BAILEY AVENUE
TANK
SLUDGE
DAF
VESSEL
EQ.
TANK
EQ.
TANK
BASEMENT
SCALE: 1"= 30'
Barton & Loguidice, P.C.
Consulting Engineers
290 Elwood Davis Road / Box 3107, Syracuse, New York 13220
ARAMARK UNIFORM SERVICES
SITE PLAN
VILLAGE OF SOLVEY
ONONDAGA COUNTY, N.Y.
Figure
2
Project No.
909.001

FIGURE 3

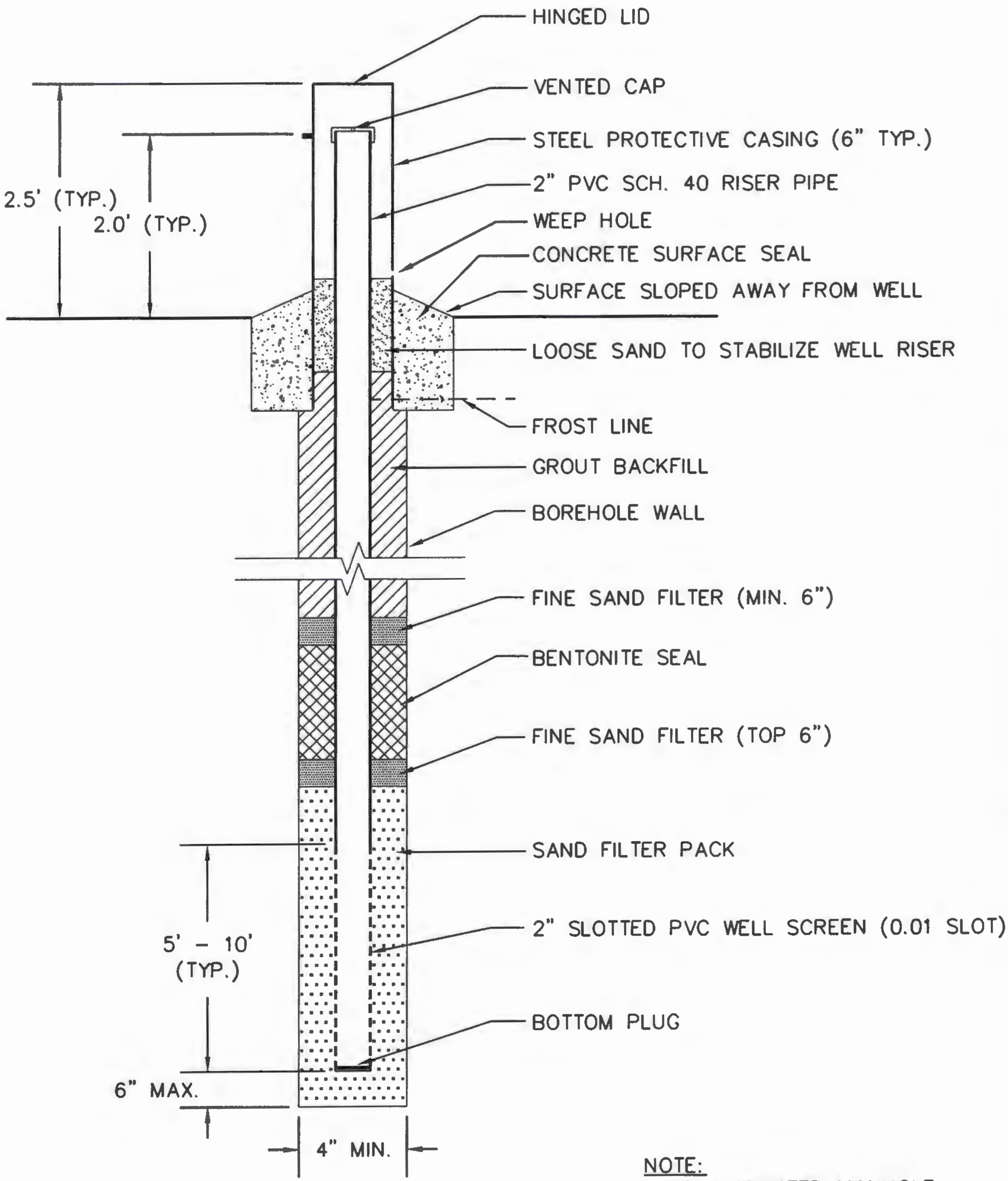
LOCATION OF PROPOSED MONITORING WELLS



MILTON AVENUE
N
GW-27
GW-26
MW-5
MW-4
GW-25
MW-3
GW-24
SIDEWALK
SIDEWALK
SIDEWALK
SIDEWALK
SIDEWALK
SIDEWALK
ASSUMED GROUNDWATER FLOW DIRECTION
TRANSFORMER
EXISTING CO2 AST (FORMER LOCATION OF 12,000 GALLON FUEL OIL UST)
GW-9
GW-10
GW-8
INCLINED MAT TABLE
MAT SHELVES
MAT SHELVES
MAT SHELVES
MAT SHELVES
MAT SHELVES
SHOP TOWEL STORAGE
LINEN SHELVES
PANELS ELECTRIC
MW-6
GW-28
GW-6
FORMER DRY CLEANING AREA
SB-3
HOUSE
3009 MILTON AVENUE
BAILEY AVENUE
GW-7
TANK SLUDGE
MW-2
3117 MILTON AVENUE
DAF VESSEL
GW-1
EQ. TANK
EQ. TANK
GW-4
GW-5
GW-29
SUMP
BASEMENT
SB-2
NOTE:
INSTALLATION OF ADDITIONAL MONITORING WELLS CONTINGENT UPON FIELD AND LABORATORY RESULTS.
LEGEND:
FORMER TEMPORARY SOIL AND/OR GROUNDWATER SAMPLE LOCATION
PROPOSED PERMANENT MONITORING WELL LOCATION
MW-1
SCALE: 1"= 30'
Barton & Loguidice, P.C.
Consulting Engineers
290 Elwood Davis Road / Box 3107, Syracuse, New York 13220
ARAMARK UNIFORM SERVICES
LOCATION OF PROPOSED MONITORING WELLS
VILLAGE OF SOLVAY
ONONDAGA COUNTY, N.Y.
Figure
3
Project No.
909.001

FIGURE 4

TYPICAL MONITORING WELL DETAIL: OVERBURDEN WELL



NOTE:
FLUSH-MOUNTED MANHOLE COVER WILL BE USED FOR WELLS INSTALLED IN TRAFFIC AREAS.

NOT TO SCALE

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Consulting Engineers
290 Elwood Davis Road / Box 3107, Syracuse, New York 13220

ARAMARK UNIFORM SERVICES

TYPICAL MONITORING WELL DETAIL OVERBURDEN WELLS

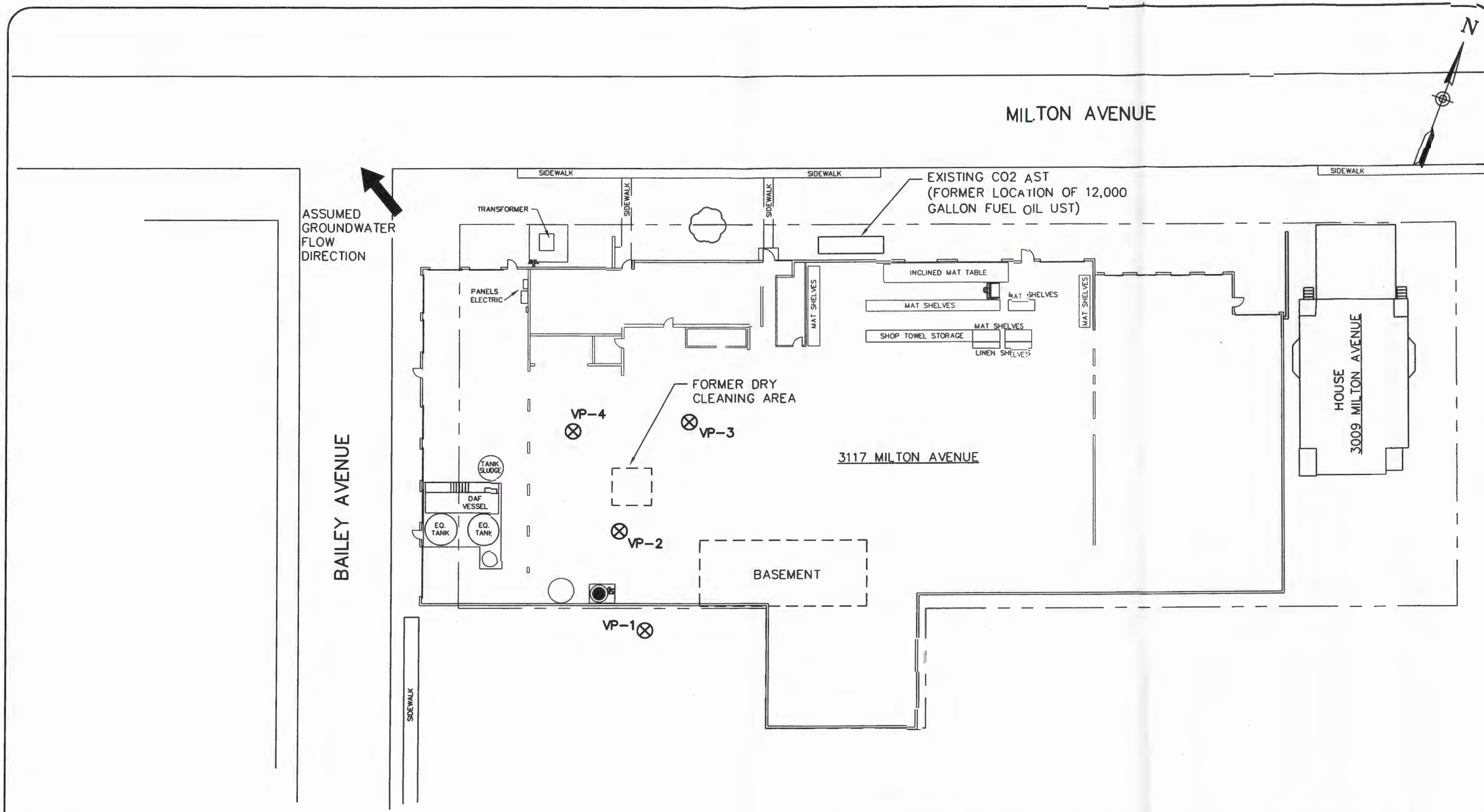
VILLAGE OF SOLVAY — ONONDAGA COUNTY, NEW YORK

Figure 4

Project No. 909.001

FIGURE 5

LOCATION OF PROPOSED SUB-SLAB VAPOR SURVEY POINTS



LEGEND:

⊗ SUB-SLAB VAPOR SURVEY POINT

SCALE: 1"= 30'

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Consulting Engineers
290 Elwood Davis Road / Box 3107, Syracuse, New York 13220

ARAMARK UNIFORM SERVICES

LOCATION OF SUB-SLAB VAPOR SURVEY POINTS

VILLAGE OF SOLVAY ONONDAGA COUNTY, N.Y.

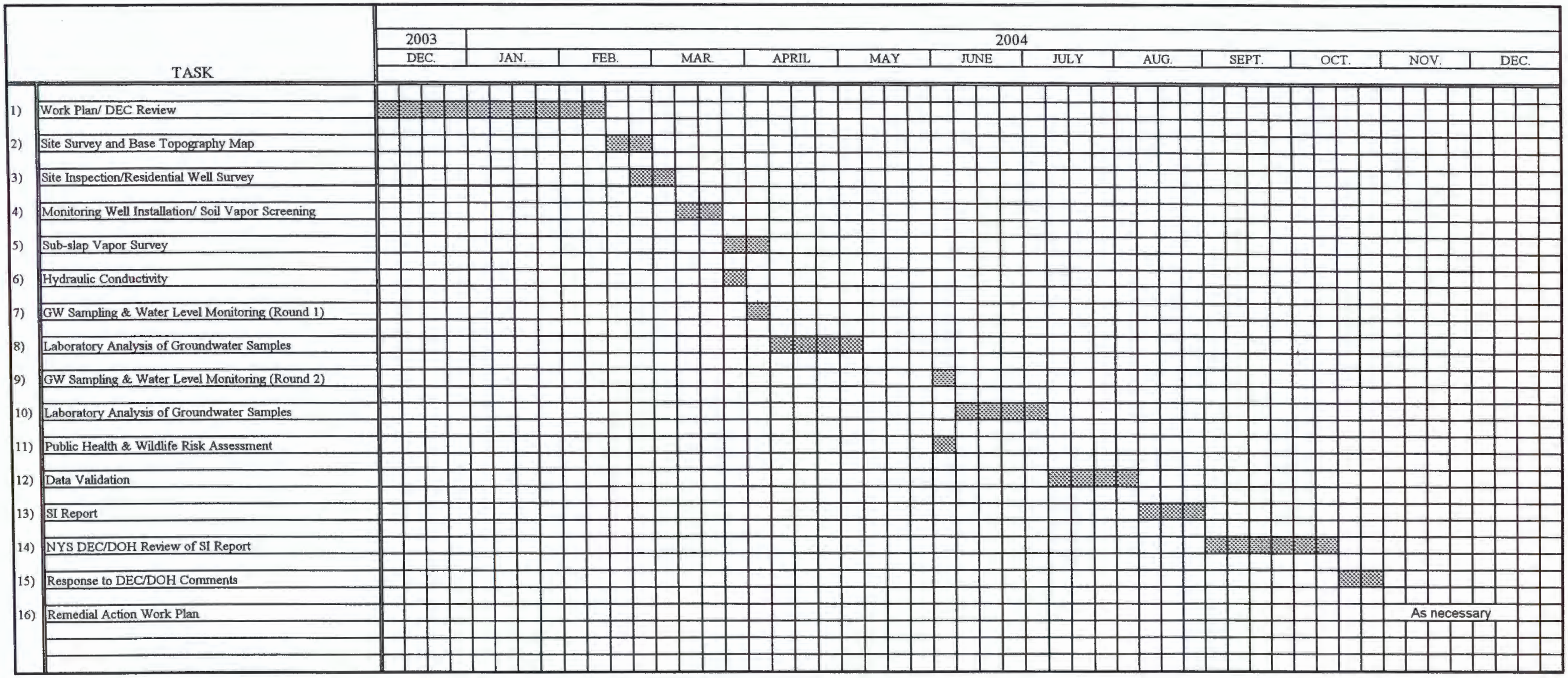
Figure 5

Project No. 909.001

FIGURE 6

PROJECT SCHEDULE

FIGURE 6
PROJECT SCHEDULE
Voluntary Cleanup Project
ARAMARK Uniform Services - Solvay Property



Monthly Progress Reports due on the 10th of each month following Work Plan approval.

FIGURE 7

PROJECT COST ESTIMATE

FIGURE 7

ARAMARK UNIFORM SERVICES
SOLVAY PROPERTY
PRELIMINARY COST ESTIMATE

Task	Engineering	Subcontractor	Laboratory
Work Plan	$4,900	$0	$0
Task 1 - Survey and Base Topographic Map	$400	$2,600	$0
Task 2 - Site Inspection/Residential Well Survey	$2,000	$0	$0
Task 3 - Community Relations*	$400	$0	$0
Task 4 - Groundwater Investigation			
4a. Monitoring Well Installation	$6,700	$9,500	$0
4b. Hydraulic Conductivity Analysis	$4,700	$0	$0
4c. Groundwater Sampling & Water Level Monitoring	$4,800	$0	$6,000
Task 5 - Sub-Slab Vapor Survey	$1,800	$1,500	$1,500
Task 6 - Site Investigation Report (SIR)	$11,500	$1,600	$0
Task 7 - Project Administration/Subcontractor Coordination	$4,500	$0	$0
Subtotal by Category	$41,700	$15,200	$7,500

Subtotal for Project	**$64,400**
Contingency (10%)	**$6,440**
Total Estimated Project Cost	**$70,840**
Rounded Total	**$70,800**

*NYSDEC to perform primary community relations tasks. Additional fees may be assessed if significant engineering assistance with this task is required.

APPENDICES

APPENDIX A

SAMPLING AND ANALYSIS PLAN (SAP)

ARAMARK UNIFORM SERVICES
CHRISTOPHER SERVICE COMPANY SITE
3009 & 3117 MILTON AVENUE
VILLAGE OF SOLVAY, NEW YORK

VOLUNTARY CLEANUP PROJECT

APPENDIX A

SAMPLING AND ANALYSIS PLAN

JANUARY 2004

Barton & Loguidice, P.C.
Consulting Engineers

290 Elwood Davis Road
Box 3107
Syracuse, New York 13220

ARAMARK UNIFORM SERVICES
CHRISTOPHER SERVICE COMPANY SITE
3009 & 3117 MILTON AVENUE
VILLAGE OF SOLVAY, NEW YORK

VOLUNTARY CLEANUP PROJECT

APPENDIX A

SAMPLING AND ANALYSIS PLAN

JANUARY 2004

PREPARED FOR:

THE WETLANDS COMPANY
1040 EAST 86TH STREET
SUITE 46C
INDIANAPOLIS, INDIANA 46240

ARAMARK UNIFORM SERVICES
2300 WARRENVILLE ROAD
DOWNERS GROVE, ILLINOIS 60515

PREPARED BY:

BARTON & LOGUIDICE, P.C.
CONSULTING ENGINEERS
290 ELWOOD DAVIS ROAD
BOX 3107
SYRACUSE, NEW YORK 13220

PROJECT NO.: 909.001

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ATTACHMENTS

FIGURES

1.0 INTRODUCTION

This document presents the Sampling and Analysis Plan (SAP) for the ARAMARK Uniform Services Voluntary Cleanup Project located at 3009 and 3117 Milton Avenue in the Village of Solvay, Onondaga County, New York. The SAP defines the procedures to be followed during all field investigation activities.

The SAP contains five sections including this Introduction (Section 1). Section 2 outlines the sampling objectives of the Site Investigation; Section 3 provides a description of the field investigation and sampling program, including sample designation, sample handling, and analytical requirements; Section 4 details the field investigation procedures; and finally, Section 5 outlines the field sampling and sample quality assurance/quality control (QA/QC) mechanisms.

2.0 SAMPLING OBJECTIVES

2.1 Chemical Characterization

Chemical analysis of soil and groundwater samples collected from the Site during a Limited Environmental Site Assessment and Supplemental Investigation conducted by Ransom Environmental in January and May 2003 indicated an exceedance of NYSDEC TAGM 4046 recommended soil cleanup objectives and NYSDEC Groundwater Quality Standards for specific VOCs and SVOCs. The full extent of the subsurface contamination was not identified during this investigation.

Based on this information and our knowledge of past site uses, it is assumed that the majority of contaminants encountered during the Site Investigation (if present) will be of a petroleum and chlorinated solvent nature.

2.2 Data Quality Objectives

Data quality objectives (DQOs) are based on the concept that different data uses may require different levels of data quality. Data quality can be defined as the degree of uncertainty in the data with respect to precision, accuracy and completeness. The four levels of data quality are:

- Field Screening - This provides the lowest level of data quality, but with the most rapid turnaround on results. It is often used for monitoring of health and safety conditions, preliminary comparison to Applicable or Relevant and Appropriate Requirements (ARARs), initial site characterization and location of areas designated for higher levels of sampling and analyses, and for screening of bench-scale remediation tests. These data are typically generated on-site using real-time measuring devices and include total organic vapor concentrations from PID readings, pH, specific conductance, dissolved oxygen, airborne particulates and any other data obtained using direct-reading instruments.

- Field Analyses - This level provides rapid results in the field and is generally of better quality than Field Screening data. Analyses include mobile lab generated data and computer generated modeling of site data (i.e., hydraulic conductivity data).

- Laboratory Screening (Non ASP/CLP) - These methods provide an intermediate level of data quality and are used for site characterization. Engineering analyses may include higher levels of mobile lab generated data or laboratory generated data using rapid turnaround methods. These types of methods provide useful site characterization data, but are generally considered for screening purposes since the results are generated without the benefit of full quality control documentation.

- Laboratory Confirmational (ASP/CLP) - This provides the highest level of data quality and is appropriate for use in risk assessments, engineering design and for cost evaluations. This level requires the analytical laboratory to be NYSDOH ELAP certified for ASP/CLP categories and to provide internal quality control documentation derived from such reporting protocols. Some projects requiring the full ASP/CLP laboratory reporting will also be subject to independent third-party data validation or an internal Data Usability Summary Reporting (DUSR) at the discretion of the Project Manager.

For this project, Field Screening and Field Analysis data will be generated in the field by B&L personnel (both periodically and on an as needed basis) to document health and safety monitoring, field characterization of sampling media, demonstration of the adequacy of monitoring well development efforts, and to provide rationale for construction of groundwater monitoring wells. All samples collected by B&L will be analyzed by a NYSDOH ELAP laboratory certified for appropriate ASP/CLP categories in order to generate Laboratory Confirmational data.

Only laboratory sample data to be used for closure or IRM decisions, at the discretion of the B&L Project Manager and NYSDEC Project Representative, will be subject to independent third-party data validation. Examples of data requiring validation include contaminated groundwater plume clearance samples and/or samples utilized to define the extent and concentrations present in a defined groundwater plume.

3.0 FIELD INVESTIGATION

3.1 Field Investigation and Sampling Program

The objective of this task is to conduct the necessary field investigations to characterize the Site and its actual or potential hazard to public health and the environment, and to identify both contaminant sources and receptors. The field investigation is designed to provide data of adequate technical content to support the development and evaluation of remedial alternatives as part of the Site Investigation/Remedial Alternatives Report. The primary objectives of the field investigation are to:

- Characterize groundwater flow conditions and delineate the extent of groundwater contamination; and
- Collect data to evaluate the potential risks, if any, that the site may pose to human health and the environment;

The field investigation at the Site will include the following:

1. Site Survey and Preparation of Site Map
2. Site Inspection and Residential Well Survey
3. Community Relations
4. Groundwater Investigation
    - Monitoring Well Installation
    - Hydraulic Conductivity Analysis
    - Groundwater Sampling and Water Level Monitoring
5. Sub-slab Vapor Survey
6. Site Investigation Report
7. Project Administration and Subcontractor Coordination

The objectives and methodologies of these field activities are described greater detail in the Work Plan and within subsequent sections of this Appendix.

3.2 Sample Designation

Samples will be designated using an alphanumeric code to identify the location and media sampled. Sampling media will be identified by a two-letter code, for example: MW (monitoring well). A two-digit number, beginning with 01 and increasing sequentially will also identify each sample location.

3.3 Sample Handling

3.3.1 Sample Container Requirements and Holding Times

Specific sample containers are required for each of the media types to be sampled, as well as the proposed analyses to be performed. Samples should be received by the laboratory within 48 hours of sample collection. In addition, there are specific holding time requirements for the type of analyses requested for each sample. These requirements are described below:

Soils

EPA Method 8260 analysis requires samples to be collected in a 4 oz. glass container with a teflon-lined cap. The container must be completely filled with material to create a "zero head space" condition. The holding time is limited to 10 days. These samples require storage at <4°C.

EPA Method 8270 analysis requires samples to be collected in an 8 oz. glass container with a teflon-lined cap. The holding time is limited to 5 days for extraction and 40 days for analysis. These samples require storage at <4°C.

Groundwater

EPA Method 8260 analysis requires samples to be collected in two 40-ml., glass vials with a teflon-lined septum cap. The container must be completely filled with water to create a "zero head space" condition. The holding time is limited to 10 days for analysis. These samples require hydrochloric acid (HCL) as a preservative along with storage at <4°C

EPA Method 8270 analysis requires samples to be collected in a 1-liter amber glass container with a teflon-lined cap. The holding time is limited to 5 days for extraction and 40 days for analysis. These samples require storage at <4°C.

Soil Vapor

EPA Method TO-14A analysis requires that samples be collected in 6-liter stainless steel SUMMA canisters (or equivalent). The holding time is limited to 14 days and there are no preservation requirements for this analysis.

SAMPLE COLLECTION CONTAINER SUMMARY CHART				
Matrix	Bottle	Preservative	Analytical Method*	Holding Time
Soil	4 oz. Glass w/ teflon-lined cap	< 4ºC	8260	10 days
	8 oz. Glass w/ teflon-lined cap	< 4ºC	8270	5 days for extraction 40 days for analysis
Water	2-40 ml. Glass Vials with teflon-lined septum	< 4ºC, HCL	8260	10 days
	1-liter amber glass w/ teflon-lined cap	< 4ºC	8270	5 days for extraction 40 days for analysis
Soil Vapor	6-liter SUMMA canister	None Required	TO-14A	14 days
**USEPA SW-846 Methods*				

3.3.2 Sample Packaging and Shipping

Samples will be packaged and shipped in accordance with the procedures outlined in Section 5.1 of this Appendix. Samples will be delivered to the selected contract laboratory within 48 hours of sample collection.

3.3.3 Quality Assurance/Quality Control Samples

The proposed analytical program includes the collection and analysis of QA/QC samples. Duplicate groundwater water samples will be collected to demonstrate the reproducibility of sampling techniques and laboratory analysis. Field equipment blanks will not be required for groundwater sampling events since single use disposable bailers will be used to collect these samples. A trip blank will also accompany each daily sample group delivered to the laboratory. The trip blank will consist of a laboratory-prepared vial for VOC which has accompanied the bottle set for EPA 8260 analysis only. Trip blanks, blind duplicates and matrix spike/matrix spike duplicate (MS/MSD) samples will be collected at a minimum frequency of 1 in 20.

4.0 FIELD INVESTIGATION PROCEDURES

4.1 Preparation for Field Entry

Prior to the initiation of field activities, the following tasks will be performed:

- Kick-off meeting with all involved personnel to review the scope of work to be performed and the Sampling and Analysis Plan;
- Review of the Health and Safety Plan by all on-site personnel;
- Operational checkout and pre-calibration of all equipment to be taken into the field;
- Identify and obtain clearance of all underground utilities associated with local utility companies and the Site;
- Arrange access for drill rig at proposed drilling locations;
- Designate decontamination area and identify water and power sources; and
- Mobilization of equipment and personnel to site.

4.2 Decontamination Procedures

4.2.1 Decontamination of Sampling Equipment

Decontamination of field sampling equipment should not be necessary since disposable materials will be utilized. If decontamination of field sampling equipment is required the procedures are outlined below:

1. Alconox detergent and potable water scrub;
2. Deionized water rinse;
3. Methanol rinse;
4. Deionized water rinse;
5. Repeat deionized water rinse; and
6. Air dry

Following this decontamination procedure, equipment will be stored in airtight polyethylene wrap or bags for future on-site use. Whenever possible, pre-cleaned or disposable equipment will be used; however, if the need arises, equipment will be cleaned in the field according to the general procedures described above.

4.2.2 Decontamination of Drilling Equipment and Reusable Tools

All drilling equipment and reusable tools will be properly decontaminated prior to site use. The purpose of this activity is to ensure that all equipment utilized at the site is contaminant free; and as such, the potential introduction of contaminants into a monitoring well, or cross-contamination between wells, will be eliminated.

A decontamination area will be constructed on-site to facilitate the steam cleaning of the drilling rig and equipment, and miscellaneous decontamination procedures (e.g., prior to sampling, during collection of field blank samples). Ideally, this area will be constructed on a gently sloping surface to aid in the collection of wash water used in the decontamination process. Polyethylene sheeting will be placed on the ground (overlapped, if necessary, in the downslope direction to avoid any loss of water between sheets) and bermed on three sides with timbers.

The polyethylene will be draped over the timbers to provide lateral containment of the wash water. The height of the berms will be sufficient to contain twice the volume of water to be generated during any decontamination event. The depth of water in the containment area will be monitored to ensure that the level remains below the midway mark of the downslope berm. All decontamination water will be placed in storage drums for subsequent disposal before the close of each workday.

A staging area will be designated on-site for the storage of well construction materials and clean drilling equipment and tools. All materials and decontaminated equipment will be placed on clean surfaces or stored on pallets, sawhorses or plastic sheeting in the staging area.

Equipment Condition

1. All drilling and excavation equipment entering the site will be inspected for hydraulic fluid and oil leaks, and for general cleanliness. Leaking hoses, tanks, hydraulic lines, etc., must be replaced or repaired prior to entering the site.

2. All well casing and screens, and other construction materials must be new. Used materials will not be permitted for use during well construction.

3. All observations regarding the condition of equipment and materials entering or leaving the site will be recorded daily in a field book by the Site Manager or Supervising Engineer/Geologist.

Equipment Cleaning and Handling

Initial Cleaning

1. Following initial inspection, all drilling equipment and associated tools will be steam cleaned at the decontamination area. Typical tools and equipment to be cleaned include:

    - Drilling rods, bits
    - Augers (clips, pins and associated hardware)
    - Samplers (i.e., split-spoon, Denison, etc.)
    - Casing materials
    - Wrenches, hammers and miscellaneous hand tools
    - Mud tub/pan
    - Hoses, tanks
    - Cable clamps and other holding devices in direct contact with the drilling rods
    - Drill rig and undercarriage, wheel wells, chassis, and any other items that may come in contact with the work area

2. During the cleaning operation, equipment will be handled only with clean gloves. A new set of gloves will be utilized between successive cleanings for each location.

3. Cleaned materials will be protected from contamination during transport to the staging area by such means as the Supervising Engineer/Geologist or Site Manager deems necessary.

4. The Site Manager will document equipment decontamination.

On-Site Cleaning Between Borings

1. Following each boring or well installation, all drilling equipment (listed above under "initial cleaning") will be steam cleaned before moving to the next location.

4.3 Drilling Program

It is not anticipated that any of the well locations will require the installation of more than one groundwater monitoring well to characterize the hydrogeologic or environmental conditions. In the unlikely event, however, two or more wells are needed to fully characterize separate (vertically isolated) water bearing horizons, the deepest boring will be completed first to identify the vertical extent of contamination and to determine the screening depth of subsequent shallower monitoring wells. It may also be necessary to seal off upper contaminated horizons through the use of multiple casings in which progressively smaller-diameter casings are telescoped through larger casings terminated at the depth of each encountered contaminant zone.

4.3.1 Rotary Drill Borings

The following drilling procedures will be utilized to complete the rotary drill borings:

1. The borings will be advanced using rotary drill methods until the required depth is encountered;
2. Drilling will proceed in a manner to permit continuous sampling with split spoons through the overburden materials until the required depth has been achieved;

3. Pertinent drilling and sampling information will be recorded in the field log by the B&L Supervising Engineer/Geologist.

4.3.2 Soil Sampling and Screening

The following procedures will be performed during the drilling program to collect, characterize and screen soil samples:

1. At each exploratory boring location, continuous samples will be taken through the overburden materials and the extent of contamination. Before each sample is taken, the B&L Supervising Engineer/Geologist will confirm the sample depth;

2. Soils will be classified in accordance with the Modified Burmister Classification System. Field classification will include color, grain size, lithology, relative density, moisture content, soil texture and structure, relative permeability and common term of geologic unit;

3. PID readings will be recorded from each split-spoon as the samples are opened. The PID instrument measures airborne vapors that are detectable by photoionization. The PID will be equipped with an 11.7 electron volt (eV) ionization source, which will ionize any organic compound having an ionization potential below 11.7 eV. The ionized compounds are brought to an excited state from which their relative concentration in ppm (parts per million) can be read. The types of organic compounds most likely to be encountered at the site have ionization potentials below that of the 11.7 eV ionization source. The PID

instrument is not designed to identify individual compounds, but is meant to quantify the concentration of total ionizable compounds present in an airborne state. The PID will be calibrated each day in order to maintain a degree of accuracy and to record the daily drifting of the instrument between calibrations;

4. If PID vapor concentrations are observed to be greater than 25 ppm, samples will be collected and may submitted for laboratory analysis at the discretion of the B&L Project Manager and NYSDEC Project Representative, based on other site findings.

5. Samples for volatile organic compound analysis will be transferred directly, and as soon as possible, into appropriately sized and preserved soil sample containers. The remaining soil will be placed into appropriate sample containers for the analysis of total lead and semi-volatile organic compounds;

6. Follow record keeping and chain-of-custody procedures as detailed in Section 5.1 of this Appendix;

7. Soil samples not set aside for laboratory analysis will be placed in eight-ounce, wide-mouth, moisture-tight glass jars. The opening of the jar will be sealed with a foil liner and then a screw-on cap; alternatively these samples may be placed in sealable plastic bags and sealed;

8. Sample jars or bags will be labeled with the following information: project name, project number, location identification, sample depth interval, blow counts and date. This information will also be recorded in the field log;

9. The organic vapor levels in the headspace above the soil sample in each jar or bag will be screened using a PID (samples placed in jars should allow for a minimum 1-inch headspace for screening) once the samples have had an opportunity to release vapors from contaminants present in the soil matrix (typically one hour). The jar's cap will be gently removed, and the tip of the PID will be inserted through the foil liner, taking care not to drive the tip into the soil. The B&L Supervising Engineer/Geologist will record peak and steady PID readings in the field log. Upon completion of the PID screening the soil will emptied from the jars and properly disposed of; and,

10. Soil samplers will be decontaminated between sample intervals using the procedures outlined below:

    - Detergent wash with alconox
    - Deionized water rinse
    - Methanol rinse
    - Deionized water rinse
    - Air dry
    - Final deionized water rinse
    - Air dry

4.3.3 Installation of Monitoring Wells

Overburden monitoring well installation procedures are outlined below:

1. A minimum eight-inch diameter borehole will be advanced using 4-inch (inside diameter) hollow-stem augers with split-spoon sampling.

2. A six-inch thick sand pack will be placed at the bottom of the borehole for seating of the well.

3. Following initial backfilling, the well screen and riser section will be installed. The monitoring well will be constructed of 2-inch Schedule 40 PVC riser with an appropriate length of continuous slot PVC well screen.

4. The well screens will be placed in accordance with Section 5.2.1.1 of the Work Plan.

5. A clean, coarse sand pack will be placed in the annular space between the well screen and the borehole to a minimum height of 1-foot above the top of the screen section.

6. A six-inch thick, fine sand filter will be placed above the coarse sand pack.

7. A bentonite seal will be placed above the fine sand filter.

8. An additional six-inch fine sand filter will be placed above the bentonite seal.

9. The remaining annular space will be filled to within 2-3 feet of ground surface with cement-bentonite grout using the tremie installation method and be allowed to set for a minimum of 12 hours.

10. A concrete surface seal, no less than 18 inches in diameter, and approximately 2-3 feet below ground surface will be constructed around the PVC riser.

11. A six-inch diameter locking, steel protective casing will be installed over the stickup portion of the PVC well riser and set into the concrete surface seal. Flush-mounted manholes will be used for wells installed within parking lot or other traffic areas.

12. The steel protective casing (or well manholes) will be clearly and permanently marked with the well identification number.

13. Protective pipe bollards shall be installed adjacent to any stick-up well located in an area that supports vehicular traffic. These bollards shall consist of three-inch diameter carbon steel pipe placed in a concrete base and installed to a depth of two feet below ground surface. The number and location of these bollards will be determined in the field on a case by case basis by the B&L Supervising Engineer/Geologist.

4.3.4 Sand Pack, Bentonite Seal and Cement Grout

Sand Pack

1. The sand pack will consist of uniformly graded, clean, inert sand, of suitable grain-size to minimize the amount of fine materials from entering the well. The fine sand filter layer above the sand pack will exhibit 100% by weight passing the No. 30 sieve, and less than 2% by weight passing the No. 200 sieve.

2. Samples of the coarse sand pack and fine sand filter materials will be provided to B&L in 8 oz. wide-mouth glass jars. Samples will then be transferred to the client for on-site storage to be retained for a period of one year.

Bentonite Seal

1. Pure Wyoming sodium bentonite pellets or chips will be used for the bentonite seal. The size of the pellets or chips will be less than one-half the width of the annular space. An alternative method could be the use of a granular bentonite slurry, which would be installed by pressure grouting with tremie rods.

2. After the seal is installed, there will be a minimum 30-minute waiting period to allow for proper hydration of the bentonite materials before placement of the grout.

Cement-Bentonite Grout

1. Cement will be Portland cement, Type I, in conformance with ASTM C150.
2. Bentonite will be a powdered Wyoming sodium bentonite.
3. Proportions of cement-bentonite grout mix will be approximately 94 pounds cement: 3-5 pounds bentonite: 7 gallons water.
4. The grout mix will be installed by pressure grouting through tremie rods.
5. The grouting will be complete when the grout mixture returns to the ground surface. Grouting of any temporary wells will not be performed.

4.3.5 Boring Logs and Record Keeping

During the installation of each monitoring well, an accurate log will be kept and will include the following information:

1. Date and time of construction, driller's and helper's name, and B&L Supervising Engineer/Geologist;
2. Drilling method used;
3. The reference point for all depth measurements (e.g., ground surface);

4. The depth to changes in the geologic formation(s);

5. The depth to the first water bearing zone;

6. The thickness of each stratum;

7. The description of the material comprising each stratum, including:

   - Depth and sample number;
   - Grain-size, as defined by the Modified Burmister System;
   - Color;
   - Degree of weathering, cementation and density;
   - Other physical characteristics.

8. The depth interval from which each formation sample was taken.

9. The depth at which borehole diameters (drill bit sizes) change, if applicable.

10. The depth to the static water level and changes in this level with borehole depth.

11. Total depth of completed boring (and well if not the same).

12. The depth and description of the well casing materials, screen and riser lengths, sand pack, bentonite seal, grout, and concrete surface seal.

13. The depth or location of any lost drilling materials or tools.

14. The amount of cement, bentonite and sand (number of bags) used for the installation of the well seals and sand pack.

15. Screen materials and design.

16. Casing and screen joint type.

17. Screen slot size and length.

18. Type of protective well casing and cap.

19. PID readings.

Figure A-1 presents a sample boring log to be used during the drilling program.

A daily summary will be recorded in the field log, giving a complete description of all formations encountered, number of feet drilled, number of hours on the job, standby or shutdown time, the water level in the boring/well at the beginning and end of each shift, water level at changes in formations, and other pertinent data.

4.4 Well Development

The purpose of well development is to remove fine materials from the area of the screen and prepare the monitoring well for future groundwater level measurement and sampling activities. This is achieved through various development methods until consistent water quality conditions are observed and recorded. These include generally stabilized temperature, pH, specific conductance and turbidity measurements. Well development will be performed using the following outlined field procedures. Well development will not be performed on temporary wells.

4.4.1 Well Development Procedures

1. Inspect locking casing and surface concrete seal for integrity.

2. Open the well.

3. Measure the static water level from the top of the well casing and then the well bottom depth; calculate the volume of water in the well from the formula:

   $$V = \pi R^2 H$$

   Where:

   V = volume (ft3)
   R = inside well radius (ft)
   H = length of water column (ft)
   π = ~3.14

4. Lower a pre-cleaned or disposable bailer connected to a new solid braid nylon or polypropylene rope to the bottom of the well.

5. Under ideal conditions the well will be bailed until all fines are removed from the well and there is no solid sediment on the well bottom. Complete well development may not be achievable due to the existing site formations.

6. Continue bailing or install a well pumping system to complete well development. Pumps should be equipped with a backflow prevention valve.

7. If a pumping system is used, activate the pump; record the time and flow rate.

8. At 15-minute intervals during development, record temperature, pH, specific conductance and turbidity using calibrated instruments.

9. The pump will be periodically raised and lowered throughout the water column to ensure the screened interval is completely developed.

10. If low yield and slow recovery do not permit continuous pumping, the well will be periodically pumped or bailed.

11. Development will be considered complete when the following conditions have been achieved for three successive measurement intervals:

    - Temperature and specific conductance are within 10% of the previous readings.
    - pH is within 0.5 units.
    - Turbidity has reached 50 NTU's or lower. In the event that 50 NTU's cannot be achieved because of the nature of the formation, the NYSDEC will be notified and alternative criteria will be mutually agreed upon (e.g., purging to continue until NTU readings have stabilized to within ±10% of previous readings).

12. When the preceding conditions have been met, remove the pump, measure the water level, and secure and lock the well.

13. Record all pertinent information in the field log.

4.5 In-Situ Hydraulic Conductivity Testing

In-situ variable hydraulic conductivity testing will be performed within each completed monitoring well after sufficient development work has been accomplished. Also known as the slug or bail test, this method involves either the removal of a bail of water or the displacement of water within the well by the insertion of a slug. Upon creating an elevated or depressed head, the water level in the well is measured and recorded periodically over the recovery time.

The underlying assumption in the analysis of these tests is that the rate of inflow to the well, after inducing a hydraulic head difference, is a function of the hydraulic conductivity (k) and the unrecovered head distance. The analytical method, typically relying on graphical solution techniques (time vs. head or head ratio), rearranges the flow equation to solve for parameter k. For unconfined groundwater conditions, the Hvorslev and Bouwer-Rice methods will be used. Details of these methods are given in the publications by Hvorslev (1951), Cedergren (1977), and by Bouwer & Rice (1976) and Bouwer (1989), respectively. For confined groundwater conditions, if any are encountered, the Cooper-Bredehoeft-Papadopulos method will be used (Cooper et al. 1967; Papadopulos et al. 1973).

The following equation will be used to calculate the in-situ hydraulic conductivity of the saturated materials at the screened interval of the well (Cedergren, 1977).

$$K = \frac{r^2}{2L(t_2-t_1)} \ln(L/R) \times \ln(h_1/h_2)$$

Where:

r = screen radius

R = gravel pack radius

L = screen length

t_1 = time interval corresponding to h1

t_2 = time interval corresponding to h2

h_1 = head ratio at time t1

h_2 = head ratio at time t2

K = hydraulic conductivity in cm/sec

It is important to observe whether the static water level, recorded prior to the start of the variable head test, occurs within the screened interval of the well. If so, the use of the slug test (falling head) is inappropriate due to drainage into the vadose zone above the water table. A bail test (rising head) is preferred in such circumstances.

Depending on the rate of recovery, the water levels are recorded during the test either with an electronic probe and/or tape equipped with a sounding "popper", or with an immersed pressure transducer connected to an automatic data logger. The latter is appropriate for rapid recovery conditions, since considerable data are recorded during the first few seconds and minutes of the test, with greater accuracy than is possible using the manual observation method.

4.6 Groundwater Sampling

4.6.1 Monitoring Well Sampling Procedure

Each monitoring well will be equipped with a dedicated bailer used for well purging and sample collection. The following sampling procedures should be used:

- Sampling will be conducted in sequence from upgradient/ background wells to the downgradient wells, or from the potentially least contaminated to the potentially most contaminated in order to minimize any potential cross contamination.

- Inspect each well for any visible damage to the well casing or surface seal. If well damage is present indicate on field data sheets with detailed description.

- For wells with documented contamination, where contamination by non-soluble phase liquids may be present, standing water in the well must be checked for immiscible layers or other contaminants that are lighter or heavier than water (floaters or sinkers). If present, floaters or sinkers will be sampled and analyzed separately.

- Measure and record the groundwater level to the nearest 0.01-foot. The measuring device will be cleaned prior to initial use with a phosphate-free detergent (such as alconox), rinsed thoroughly with distilled water and finally wiped dry with a clean paper towel. Groundwater levels should be compared to past levels as a check.

- Field personnel will put on new disposable gloves at each sampling location to avoid cross-contamination.

- Purge each well of at least three volumes of water or evacuate completely at least once, depending on the well hydraulics. The volume of water contained in a 2-inch cased well may be determined by multiplying the height of water column by a volumetric conversion factor of 0.163 gallons per foot of water column height. Periodic measurements of specific conductance, temperature and pH during purging can, on the attainment of stabilized readings, indicate that all stagnant water has been removed and replaced by fresh formation water. Evacuation methods must create the least possible turbidity in the well and should not lower the water level below the top of the sand pack when feasible.

- When purging a well with a bailer, the rope will not touch the ground. During well purging, the bailer will be carefully lowered just below the surface of the water, retrieved and emptied, etc. The same bailer will be used to obtain the sample.

- After purging of the well, volatile organic samples must be collected first (when required).

- Measure and record the field-determined parameters: oxidation-reduction potential (ORP or Eh), specific conductance, temperature, and pH (as necessary). Measurement devices will be calibrated daily. Decontamination of meters will occur after each use. Also note the general sample appearance: color, sediment, immiscible components, and odor.

- Samples should be collected and containerized in the order of the volatilization sensitivity of the parameters. The general preferred order of collection is as follows:

  - Volatile organic compounds (EPA Method 8260)
  - Semi-volatile organic compounds (EPA Method 8270)

- Volatile organic analyses samples must be filled to capacity with no headspace for volatilization. Bottles must be gently filled, tightly capped, inverted and inspected. If any bubbles can be seen in the sample, the sample must be retaken. When a satisfactory sample has been obtained, it should be immediately chilled.

- The remaining sample containers should be filled leaving a ten percent void at the top of the container to prevent loss of preservatives and allow for expansion during transport.

- The laboratory will supply all sample containers and coolers. Necessary preservatives will be placed in the sample bottles by the laboratory.

- Pack the filled sample bottles in a cooler chest for transportation to the laboratory. All samples shall be shipped the same day they are obtained. Samples should be stored and transported at a temperature of approximately 4 degrees Celsius.

- Complete the field sampling data sheets, chain-of-custody form, and any other notes in the field-sampling logbook prior to leaving the site.

- All locations are to be cleaned up and the well locked before proceeding to the next well.

4.7 Water Level Monitoring

In order to determine the horizontal hydraulic gradient(s) exhibited by the surface of the water table and potential routes of contaminant migration, water level measurements will be made at each newly installed well using the following procedures:

1. After noting the general conditions of the well (surface seal, lock, etc.) the bottom of the well will be sounded by lowering a decontaminated, weighted probe into the well.

2. Well bottom conditions will be noted (silty, blockages, etc.). The distance from the base of the screen to the top of the casing will be recorded to the nearest 1/100th of a foot.

3. The static water level will be measured and noted by sounding with an electronic tape or "popper" to the nearest 1/100th of a foot.

4. The water level readings will always be taken from a marked point on the well casing.

5. Other measurements to be taken are:

   - Stickup of well casing from ground surface or surface seal;
   - Depth to bottom of well from the top of the riser.

6. The date and time will be recorded for these measurements. Also, any pertinent weather conditions will be noted (i.e., significant recent precipitation or drought conditions).

7. Upon completion, the wells will be secured, and all downhole equipment will be decontaminated with methanol and deionized water.

8. As practicable, all water levels should be collected on the same day.

4.8 Sub-slab Vapor Survey

The following procedures will be utilized to collect samples of sub-slab and soil vapor. Three of the proposed sub-slab soil vapor points are situated within the building (see Figure 5 of the Work Plan), and will require installation of a soil vapor probe through the slab. The fourth soil vapor point is located outside of the structure, in an area with a lawn surface.

The interior vapor probe points will be installed through the slab. A hole will be cored through the slab with a hammer drill. If the hammer drill is ineffective at completing the hole, then a core drill may be utilized.

Once the hole is installed in the slab, a section of stainless steel tubing slightly smaller than the diameter of the core-hole will be installed into the soil. The tubing will be installed to a depth below the concrete slab, and will terminate within 1) the air space created below the slab by subsidence of the sub-slab soils, or 2) the sub-slab soil aggregate backfill (if no subsidence has occurred). The steel tubing will be sealed to the concrete with paraffin wax.

The exterior vapor probe point will be installed with a direct drilling unit. The sampling probe rods, outfitted with a gas sampling pull-back probe point will be driven to a depth of 5.5 feet, and pulled back several inches to open the gas sampling vents.

Following installation of the probe points, the pints will be allowed to equilibrate to minimize soil gas matrix interference from the installation methods. For the internal probe points installed by hammer or core drills, the equilibration time shall be 24 hours minimum. For the external probe point installed by direct push equipment, the equilibration time shall be 30 minutes.

Both interior and exterior probe points will be outfitted with laboratory grade rubber stoppers, sealed to the pipes with parafilm. A 1/4 inch polyethylene tubing will be installed through the stopper through a parafilm seal, and extended to the sample depth (below slab for the internal points, 5 feet bgs for the exterior point).

Prior to sample collection, the sample tubing will be purged to remove any non-soil gas and stagnant air from the tubing system. Purge volumes will be calculated based on the quantity of tubing utilized. Purge flow rates shall be less than 100 ml./min. A vacuum test will be conducted with a large diameter syringe, to establish that low flow conditions do not exist that would prohibit adequate sample volume collection.

Upon completion of the purge and documentation that low flow conditions do not exist, the soil gas will be sampled. Gas will be collected over a 2-hour period directly into pre-evacuated SUMMA canisters. A flow regulator will be utilized to control the gas flow. One trip blank, and one blind duplicate sample will be collected. The SUMMA canisters will be submitted to a NYSDOH ELAP approved laboratory for analysis of the contaminants of concern by EPA Method TO-14A protocols.

Upon completion of the sample collection, the vapor survey points will be sealed with concrete grout.

5.0 QUALITY ASSURANCE/QUALITY CONTROL

5.1 Record Keeping and Chain-of-Custody Documentation

The B&L sampler's field records will contain sufficient information such that someone else can reconstruct the sampling situation without reliance on the sampler's memory. The field sampling data sheet is presented as Figure A-2. Entries in the field records will include, at a minimum, the following:

- Site name and location
- Project number
- Name and affiliation of Project Manager and sampler involved
- Sampling point name and description
- Type of sample container(s) used
- Preservative(s) used
- Well purging procedures and equipment
- Well-specific data including water level, depth and volume purged
- Sample collection procedure and equipment
- Date and time of collection
- Sample identification number(s)
- Laboratory's sample identification number(s)
- References such as maps or photographs of the sampling site, if available
- Field observations
- Pertinent weather factors such as temperature, wind direction and precipitation
- Any field measurements made, including pH, Eh, temperature, turbidity and dissolved oxygen

Chain-of-custody records for all samples will be maintained. A sample will be considered to be "in custody" of any individual if said sample is either in direct view of or otherwise directly controlled by that individual. Storage of samples during custody will be accomplished according to established preservation techniques, in appropriately sealed and numbered containers. Chain-of-custody will be accomplished when the samples are directly transferred from one individual to the next, with the first individual witnessing the signature of the recipient on the chain-of-custody record.

The chain-of-custody records will contain the following information:

- Respective sample numbers of the laboratory and B&L, if available
- Signature of the collector
- Date and time of collection
- Sample type (e.g., groundwater, sediment)
- Identification of well or sampling point
- Number of containers
- Parameter requested for analysis
- Signature of person(s) involved in the chain of possession
- Description of sample bottles and their condition
- Problems associated with sample collection (i.e., breakage, preservatives missing), if any

A sample chain-of-custody form is presented as Figure A-3.

All samples will be placed in a cooler on ice. If samples are to be hand delivered, no further measures are required. If samples are to be shipped via common carrier (e.g., Federal Express) bottle lids and labels are to be covered with clear tape, each sample bottle will be placed in a sealable plastic bag and individually wrapped in bubble wrap. Ice is to be double bagged. The cooler drain and seams will be sealed with duct tape. The cooler will be sealed with strapping tape and custody seals shall be place on the front and back of the cooler lid.

5.2 Field Sample QA/QC Procedures

5.2.1 Trip Blanks

A trip blank for water samples and/or soil samples to be analyzed for VOCs will accompany sample containers through all phases of the sampling event to ensure proper bottle preparation and laboratory integrity. Trip blank samples will receive identical handling procedures as on-site samples.

Trip blanks are used as control or external QA/QC samples to detect contamination that may be introduced in the field (either atmospheric or from sampling equipment), in transit to or from the sampling site, or in the bottle preparation, sample login, or sample storage stages within the laboratory. The blanks will also show any contamination that may occur during the analytical process.

As previously stated, trip blanks are samples of analyte-free water, prepared at the same location and time as the preparation of bottles that are to be used for sampling. They remain with the sample bottles while in transit to the site, during sampling, and during the return trip to the laboratory. At no time during these procedures are they to be opened. Upon return to the laboratory, they are analyzed as if they were another sample, receiving the same QA/QC procedures as ordinary field samples. If these samples are accidentally opened, it will be noted on the chain-of-custody.

Trip blanks are not part of the laboratory QA/QC procedures. Trip blanks are included as part of the laboratory services to assess the validity of the laboratory analytical procedures. Trip blanks are required as part of QA/QC procedures for the overall sampling and analytical program.

Field blanks are not anticipated to be required since samples will be collected with disposable equipment.

5.2.2 Duplicate Samples

Duplicate samples will be collected at a frequency of one for every twenty samples from each matrix. If less than twenty samples are collected from any matrix, then at least one duplicate will be collected from that matrix. Duplicate samples are analyzed to check the sample collection and handling process relative to the uniformity of the samples.

Matrix spike/matrix spike duplicate (MS/MSD) samples will also be collected at a frequency of one for every twenty samples for each sample matrix. If less than twenty samples are collected from any matrix, then at least one MS/MSD will be collected from that matrix. The purpose of these samples is to evaluate the effect of the sample matrix on the analytical results.

5.3 Field Instrument Calibration

The on-site B&L personnel are responsible for assuring that a master calibration/maintenance log will be maintained for each measuring device. Each log will include at least the following information where applicable:

- Name of device and/or instrument calibrated
- Device/instrument serial and/or ID number
- Frequency of calibration
- Date of calibration
- Results of calibration
- Name of person performing the calibration
- Identification of the calibration gas for PID
- Buffer solutions (pH meter)

5.4 Sample Analysis QA/QC Procedures

5.4.1 Overview

The purpose of the laboratory QA/QC program is to establish and maintain laboratory practices that will ensure the scientific reliability and comparability of the data generated in support of the project.

Quality assurance (QA) is the system for ensuring that all information, data, and resulting decisions compiled under an investigation are technically sound, statistically valid, and properly documented. Quality control (QC) is the mechanism through which quality assurance achieves its goals. Quality control programs define the frequency and methods of checks, audits, and reviews necessary to identify problems and dictate corrective action, thus high quality data.

The laboratory quality assurance program plan (QAPP) program will outline the purpose, policies, organizations and operations established to support the chemical analyses.

The laboratory QAPP will be submitted as part of the laboratory selection process. The QAPP document submitted by the laboratory will be submitted under separate cover. The laboratory selected will be certified under the NYSDOH ELAP program for appropriate ASP/CLP categories. All data deliverables will be ASP Category B.

5.4.2 Laboratory Selection Criteria

A laboratory will be selected that is qualified to perform the work required for the site. Examples of selection criteria are as follows:

1. Capabilities (facilities, personnel, instrumentation)
    a. previous use
    b. certification
    c. references (recommendations by other users of the laboratory)
2. Services
    a. turnaround time
    b. completeness of reports
    c. compliance with holding times
3. QA/QC Programs

    All laboratories must have a detailed written QA/QC program meeting the minimum requirements of the NYS Department of Environmental Conservation and the NYS Department of Health, and must be NYSDOH ELAP ASP/CLP certified for all analyses being performed.

4. Approvals

All laboratories used will be approved by Barton & Loguidice, P.C., prior to the analysis of samples. The selected analytical laboratory will be committed to providing analytical services for groundwater and soil that are commensurate with the required protocols and current state-of-the-art analytical procedures, laboratory practices and instrumentation.

5.4.3 Data Validator Selection Criteria

A third-party independent data validator will be selected based on the required qualification presented in Attachment A, and must meet NYSDEC and NYSDOH requirements for performing data validation.

ATTACHMENT A

DATA VALIDATION SCOPE OF WORK

DATA VALIDATION SCOPE OF WORK

Data validation is the systematic process by which the data quality is determined with respect to data quality criteria that are defined in project and laboratory quality control programs and in the referenced analytical methods. The data validation process consists of an assessment of the acceptability or validity of project data with respect to stated project goals and requirements for data usability. Ideally, data validation establishes the data quality in terms of project data quality objectives. Data validation consists of data editing, screening, checking, auditing, certification, review and interpretation. The purpose of data validation is to define and document analytical data quality and determine if the data quality is sufficient for the intended use(s) of the data. Data validation is performed to establish the data quality for all data which are to be considered when making project closure decisions. Laboratories will be required to submit results that are supported by sufficient back-up data and QA/QC results to enable the reviewer to conclusively determine the quality of the data.

Qualifications of a Data Validator

In order to ensure an acceptable level of performance, the following qualifications and requirements are established for all Consultants/Contractors functioning as data validators. Consultant/Contractor functioning as a data validator shall be independent of the laboratory generating the data.

The Consultant/Contractor functioning as a data validator shall provide evidence that all staff members involved in the data validation process have: a) a bachelor's degree in chemistry or natural sciences with a minimum of 20 hours in chemistry; and b) one (1) year experience in the implementation and application of the protocols used in generating the data for which they are responsible. The successful completion of the EPA Data Validation Training course may be substituted for the analytical experience requirement. In addition, these same staff members must have a minimum of one (1) year experience evaluating CLP data packages for contract protocol compliance.

Specific Tasks To Be Completed By The Data Validator

Evaluated Completeness of Laboratory Data Package

The data validator shall review the data package to determine completeness. A complete data package will consist of the following components:

- All sample chain-of-custody forms;
- The case narrative(s) including all sample analysis summary forms*;
- Quality Assurance/Quality Control summaries including all supporting documentation;
- All relevant calibration data including all supporting documentation;
- Instrument and method performance data;
- Documentation showing the laboratory's ability to attain the contract specified method detection limits for all target analytes in all required matrices;
- All data report forms including examples of the calculations used in determining final concentrations; and
- All raw data used in the identification and quantification of the contract specified target compounds.

***These forms appear as an addendum to the NYSDEC CLP forms package and will be required for all data submissions regardless of the protocol requested.**

All deficiencies in the requirement for completeness shall be reported to the consultant immediately. The laboratory shall be contacted by the consultants Quality Assurance Officer and shall be given ten calendar days to produce the documentation necessary to remove the deficiencies.

Compliance of Data Packages with Work Plan

The validator shall review the submitted data package to determine compliance with those portions of the Work Plan that pertain to the generation of laboratory data. Compliance is defined by the following criteria:

- The data package is complete as defined above;
- The data has been generated and reported in a manner consistent with the requirements of the Quality Assurance Program Plan and the laboratory subcontract;
- All protocol required QA/QC criteria have been met;
- All instrument tune and calibration requirements have been met for the time frame during which the analyses were completed;
- All protocol required initial and continuing calibration data is present and documented;
- All data reporting forms are complete for all samples submitted. This will include all requisite flags, all sample dilution/concentration factors and all pre-measurement sample cleanup procedures; and
- All problems encountered during the analytical process have been reported in the case narrative along with any and all actions taken by the laboratory to correct these problems.

The data validation task requires that the validator conduct a detailed comparison of the reported data with raw data submitted as part of the supporting documentation package. It is the responsibility of the validator to determine that the reported data can be completely substantiated by applying protocol defined procedures for the identification and quantification of the individual analytes. To assist the validator in this determination, the following documents are recommended; however, the EPA Functional Guidelines will be used for format only. The specific requirements noted in the project Work Plan are prerequisite, for example holding times or special analytical project needs, to those noted in the Functional Guidelines.

- The particular protocol(s) under which the data was generated (e.g., NYSDEC Contract Laboratory Protocol; EPA SW-846; EPA Series 500 Protocols).

- Data validation guidance documents such as:

    - "Functional Guidelines for Evaluation of Inorganic Data" (published by EPA Region 2);
    - "Functional Guidelines for Evaluation of Organic Analyses", Technical Directive Document No. HQ-8410-01 (published by EPA); and
    - "Functional Guidelines for Evaluating Pesticides/PCB's Analyses" Technical Directive Document No. HQ-8410-01 (published by EPA).

NOTE: These documents undergo periodic revision. It is assumed that the selected data validator will have access to the most current applicable documents and guidelines.

Reporting

The validator shall submit a final report covering the results of the data review process. This report shall be submitted to the Project Manager or his designee and shall include the following:

- A general assessment of the data package as determined by the degree to which the package is complete and complies with the protocols set forth in the Work Plan;

- A detailed description of any and all deviations from the required protocols. These descriptions must include references to the portions of the protocols involved in the alleged deviations;

- Any and all failures in the validator's attempt to reconcile the reported data with the raw data from which it was derived. Specific references must be included. Telephone logs should be included in the validation report;

- Detailed assessment by the validator of the degree to which the data has been compromised by any deviations from protocol, QA/QC breakdowns, lack of analytical control, etc. that occurred during the analytical process;

- The report shall include, as an attachment, a copy of the laboratory's case narrative, including the NYSDEC required sample and analysis summary sheets;

- The report shall include an overall appraisal and usability assessment of the data package; and

- The validation report shall include a chart presented in a spreadsheet format, consisting of site name, sample numbers, data submitted to laboratory, year of CLP or analytical protocol used, matrix, fractions analyzed (e.g., volatiles, semi-volatiles. Space should be provided for a reference to the NYSDEC CLP when non-compliancy is involved and a column for an explanation of such violation.

FIGURES

FIGURE A-1

SAMPLE BORING LOG

Barton & Loguidice, P.C.
Consulting Engineers

SUBSURFACE INVESTIGATION LOG

BORING NO. ________

B & L Project No. ____-____

Project:

Client:

Project Location:

Drill Rig:	Elevation Datum:
Casing	Northing: Easting:
Soil Sampler:	Start Date: Finish Date:
Sample Hammer Wt. -- Fall: -- inches	Contractor:
Rock Sampler: --	Driller:
Other:	Geologist:

Depth	Sample Type	Blows per 6"	N or RQD %	Recovery (ft)	PID (PPM)	Headspace	Material Description	Well Completion Details
5								
10								
15								

Notes:

FIGURE A-2

FIELD SAMPLING DATA SHEET

Barton & Loguidice, P.C.
Consulting Engineers

FIELD SAMPLING DATA SHEET

SITE: ______________________ **SAMPLE LOCATION:** ______________________

CLIENT: ______________________ **JOB #:** ______________________

Weather Conditions: ______________________ Temp: ______________________

SAMPLE TYPE: Groundwater ☐ Surface Water ☐ Other (specify):_________

Sediment ☐ Leachate ☐ _________

WATER LEVEL DATA

Static Water Level (feet)*:	
Measured Well Depth (feet)*:	
Well Casing Diameter (inches):	
Volume in Well Casing (gallons):	

*depth from measuring point

Measuring Point: Top of Riser ☐
Other (specify): _________
Measured by
Time:________ Date:

PURGING METHOD

Equipment: Bailer ☐ Submersible Pump ☐ Air Lift System ☐

Bladder Pump ☐ Foot Valve ☐ Peristaltic Pump ☐

Dedicated ☐ *Non-dedicated* ☐

Volume of Water Purged (gallons):

Did well purge dry? No ☐ Yes ☐

Did well recover? No ☐ ☐ Recovery time: _________

SAMPLING METHOD

Equipment: Bailer ☐ Submersible Pump ☐ Air Lift System ☐

Bladder Pump ☐ Foot Valve ☐ Peristaltic Pump ☐

Dedicated ☐ *Non-dedicated* ☐

Sampled by:____ Time: ____________ Date:

SAMPLING DATA

Sample Appearance

Color ______________________ Sediment ______________________

Odor ______________________

Field Measured Parameters

pH (Standard Units)		Sp. Conductivity (umhos/cm)	
Temperature (F)		Eh-Redox Potential (mV)	
Turbidity (NTUs)		Dissolved Oxygen (mg/L)	

Samples Collected (Number/Type):

____

Samples Delivered to: ______________________ Time:________ Date:__________

COMMENTS: ______

FIGURE A-3

CHAIN-OF-CUSTODY FORM

CHAIN OF CUSTODY RECORD

Client:		Client Project/Project Name	Special Turn around Time__________
Client Contact:	Phone #	Site Location (city/state)	

Sample Location:	Date	Time	Matrix	Grab. or Comp	Internal use Only	No. of Containers	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	Remarks

parameter and method	sample bottle: type	size	pres.
1)			
2)			
3)			
4)			
5)			
6)			
7)			
8)			
9)			
10)			

Sampled by: (Please Print)			Company:
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)

Note: The numbered columns above cross-reference with the numbered columns in the upper right-hand corner.

APPENDIX B

HEALTH AND SAFETY PLAN (HASP)

ARAMARK UNIFORM SERVICES
CHRISTOPHER SERVICE COMPANY SITE
3009 & 3117 MILTON AVENUE
VILLAGE OF SOLVAY, NEW YORK

VOLUNTARY CLEANUP PROJECT

APPENDIX B

HEALTH AND SAFETY PLAN

JANUARY 2004

Barton & Loguidice, P.C.
Consulting Engineers

290 Elwood Davis Road
Box 3107
Syracuse, New York 13220

ARAMARK UNIFORM SERVICES
CHRISTOPHER SERVICE COMPANY SITE
VILLAGE OF SOLVAY

VOLUNTARY CLEANUP PROJECT

APPENDIX B

HEALTH AND SAFETY PLAN

JANUARY 2004

PREPARED FOR:

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PREPARED BY:

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290 ELWOOD DAVIS ROAD
BOX 3107
SYRACUSE, NEW YORK 13220

PROJECT NO.: 909.001

PLAN CERTIFICATION STATEMENT

The following Health and Safety Plan (HASP) has been prepared in accordance with the protocols and guidance criteria outlined in 29 CFR 1910.120. Having reviewed the HASP, the undersigned certifies the Plan has been prepared in accordance with standard professional practices and in accordance with project specifications regarding health and safety.

____

John A. Benson, CHMM
Certification Number #7159

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1.0 PURPOSE

The purpose of this Health and Safety Plan for the ARAMARK Uniform Services Voluntary Cleanup Project is to provide specific guidelines and establish procedures for the protection of personnel during the field investigation. The Plan is based on the site information available at this time and anticipated conditions to be encountered during the different phases of work. This Plan is subject to modification as data are collected and evaluated.

All personnel conducting activities on-site must be in compliance with all applicable Federal and State rules and regulations regarding safe work practices. Personnel conducting field activities must also be familiar with the procedures, requirements and provisions of this Plan. In the event of conflicting Plans and requirements, personnel must implement those safety practices that afford the highest level of protection.

1.1 Personnel

Barton & Loguidice, P.C.:

Principal – William F. Southern, Jr., P.E.
Project Manager - Scott D. Nostrand, P.E.
Site Managers - Jeffrey Reed, I.E. and David R. Hanny
Field Technicians - Darik Jordan and Bryce Dingman

Wetlands Company:

Principal – Samuel J. Niemann, CPG

Subcontractors:

To be determined

2.0 SITE CONTROL

The purpose of site control is to minimize the exposure of site workers to potential contamination, protect the public from the site's hazards, and prevent vandalism. The degree of site control necessary depends on site characteristics and the surrounding community. At this time, there are no access restrictions to the site. During the field activities, Barton & Loguidice, P.C. (B&L), is requesting that personnel, subcontractors and visitors report to the on-site B&L supervisor prior to entering the work area.

2.1 Work Zones

Since there are no access restrictions to the Site, particular attention will be placed on the condition of the site regarding three main work zone areas:

Activity Zone

This zone applies to the immediate work area and includes all materials, equipment, vehicles and personnel involved in the site activity. For example, during the installation of a monitoring well, the activity zone will encompass the borehole, drilling rig, monitoring well construction materials and equipment, sampling equipment, decontamination supplies, and drilling/well inspection personnel. Site control measures will include flagging the perimeter of the activity zone to clearly mark the limits of work and to warn employees, passers-by and visitors of the site activity. In addition, the Site Supervisor will maintain communication with personnel as the location of this zone (and the type of work being performed) changes throughout the project.

Material and Equipment Storage Zone

This zone exhibits the least amount of activity, and as a result, will require the least security. An appropriate area will be designated on-site for the storage of all equipment and supplies to be used throughout the site investigation. The area is to be kept clean and orderly at all times and free from loose equipment, tools, materials or supplies which may compromise the safety of site workers, personnel or the public. Construction materials and equipment will be covered with plastic at the end of each workday. Any spills or breakages occurring in this area will be immediately attended to before the Site work continues.

Decontamination Zone

In order to prevent incidental contact with contaminants on investigation equipment or in the wash water, all activities within the decontamination area will be completed before subsequent site work or any other activity begins. This includes:

- Complete removal of contaminants on all equipment used during the preceding phase of the investigation;
- Placement of the waste wash water and sediment in sealed drums;
- Storage of the drums in a secure and out-of-the-way place for future disposal;
- Proper labeling of drum contents;
- Cleanup (if necessary) of area outside of decontamination area; and,
- Storage of all decontamination equipment, site investigation equipment and materials in the Materials and Equipment Storage Zone.

3.0 SITE INVESTIGATION ACTIVITIES AND PERSONAL PROTECTION

3.1 General Guidelines

The following is a list of the general guidelines required for the Site Investigation of the ARAMARK Uniform Services Solvay property. These guidelines follow the established guidelines of the Barton & Loguidice, P.C., Corporate Health and Safety Program:

All field investigation activities must be coordinated through the designated B&L Site Manager.

During any activity conducted on-site in which a potential exists for exposure to hazardous materials, accident or injury, at least two persons must be present who are in constant communication with each other.

Samples obtained from areas known or suspected to contain contaminated substances or materials must be handled with appropriate personal protection equipment.

All equipment used to conduct the Site Investigation must be properly decontaminated and maintained in good working order. Equipment must be inspected for signs of defects and/or contamination before and after each use.

Eating, drinking, chewing gum or tobacco, and smoking are prohibited within the work zones previously defined.

The discovery of any condition that would suggest the existence of a situation more hazardous than anticipated will result in the evacuation of the activity zone until a complete evaluation of the hazard can be performed.

3.2 Training Requirements

All personnel performing intrusive work tasks contained in and related to the Work Plan will have received training which meets the requirements of Federal Occupational Safety and Health Organization (OSHA) regulations contained in 29 CFR 1910.120 and will also have received refresher training as specified by the same standard.

3.3 Hazard Evaluation

Table 3-1 presents a summary of the potential hazards that personnel involved with this Site Investigation may encounter during the fieldwork. The table includes chemical, mechanical, electrical and temperature hazards and routes of possible entry for hazardous compounds.

3.4 Personal Protective Clothing and Equipment

The documented site history is evidence that contaminants associated with petroleum fuels and oils and chlorinated solvents will likely be encountered. Most of the activities proposed at the site, however, involve only limited, if any, direct contact with these contaminants. As a result, it is anticipated that all site investigation activities will be performed in Level D protective clothing and equipment. This level of protection will afford site workers with adequate safeguard regarding the typical hazards expected at the Site.

TABLE B3-1 SITE INVESTIGATION ACTIVITY HAZARD EVALUATION						
	Hazard Type					
Activity	**Mechanical**	**Electrical**	**Chemical**	**Physical**	**Biological**	**Temperature**
Initial Site Inspection	Accidental injury from sampling equipment	Exposed cords and broken lights	Accidental inhalation, ingestion, skin absorption or eye contact with contaminants	Cuts from broken glass, slips, trips and fall hazards.	Bees and wasps	Heat Stress Frost Bite
Boring/Well Installation, Testing and Monitoring	Accidental injury from drilling rig or soil boring equipment	Buried power lines	Accidental inhalation, ingestions, skin absorption or eye contact with contaminants	Strains from carry heavy objects, slips, trips and fall hazards. Excessive noise.	None Anticipated	Heat Stress Frost Bite
Split-Spoon Soil Sampling	None Anticipated	None Anticipated	Accidental inhalation ingestion, skin absorption or eye contact with contaminants	Fall hazards.	Bees and wasps, animals	Heat Stress Frost Bite
Sub-slab Soil Vapor Survey	Accidental injury from soil boring equipment or drilling equipment	Buried power lines	Accidental inhalation ingestion, skin absorption or eye contact with contaminants	Strains from carry heavy objects, slips, trips and fall hazards. Excessive noise.	None Anticipated	Heat Stress Frost Bite
Well Sampling	None Anticipated	Generators and power cords	Accidental inhalation, ingestion, skin absorption or eye contact with contaminants	Strains from lifting. Fall hazards.	Bees and wasps	Heat Stress Frost Bite

3.5 Air Monitoring

The Site Manager or designee will conduct DOH Community Air Monitoring Plan (CAMP). Direct reading instruments will be calibrated in accordance with manufacturer's requirements and the results of the calibration will be documented.

This Community Air Monitoring Plan (CAMP) sets forth the procedures for performing real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area with respect to specific activities to be completed as part of the remedial investigation. 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 or nearby 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.

Continuous monitoring will be required for all ground intrusive activities performed during the remedial investigation. The only anticipated ground intrusive activity includes monitoring well installation.

Periodic monitoring for VOCs will also be required during non-intrusive activities such as the collection of groundwater samples from monitoring wells. "Periodic" monitoring during sample collection will consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap, monitoring during well bailing/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities.

Volatile organic compounds (VOCs) will be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis. Upwind concentrations will be measured at the start of each workday and periodically thereafter to establish background conditions.

- 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 will be recorded and available for State (NYSDEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision making purposes will also be recorded.

Particulate concentrations will also be monitored continuously at the

Particulate concentrations will also be monitored continuously at the upwind and downwind perimeters of the exclusion zone or work area. The particulate monitoring will 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 will be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration will 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 will 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 will be recorded and available for State (NYSDEC and NYSDOH) personnel to review.

TABLE B3-2
MONITORING PROTOCOLS AND CONTAMINANT ACTION LEVELS

CONTAMINANT/ ATMOSPHERIC CONDITION	MONITORING EQUIPMENT	MONITORING PROTOCOL	WORK ZONE* ACTION LEVEL CONCENTRATIONS	
			MONITORED LEVEL FOR MANDATORY RESPIRATOR USE**	MONITORED LEVEL FOR MANDATORY WORK STOPPAGES***
VOCs	Photoionization detector (PID) with an 11.7 eV lamp	Initially readings will be recorded every 15 minutes. If no sustained readings are obtained in the breathing zone, readings will be recorded every 30 minutes.	10 ppm above background	50 ppm above background
Particulates	MiniRam or Dusttrak or equivalent	Three times daily when work is being conducted that can generate dust, e.g., monitoring well installation	Dust suppression techniques required at 100 ppm above background	150 ug/m3 at property line (institute engineering controls to control dust) per NYSDEC TAGM 4031

*Monitoring performed in the working zone for sustained readings of 5 minutes or more. Monitor source first; near the source, or if above the action level concentration, monitor in the breathing zone.
**Monitored levels will require the use of approved respiratory protection.
***Consult the Site Manager.

4.0 EMERGENCY RESPONSE PLAN

In the event of an unplanned occurrence or situation requiring outside or support service, the appropriate contact from the following list will be made:

CONTACT	PERSON OR AGENCY	PHONE NUMBER
B&L Project Managers	Scott Nostrand, P.E. or John Benson	(315) 457-5200
B&L Site Managers/Site Safety Officers	Jeffrey Reed, I.E. or David R. Hanny	(315) 457-5200
B&L Officer-in-Charge	William F. Southern, Jr., P.E.	(315) 457-5200
Aramark The Wetlands Company	Noll Ferris Samuel J. Niemann, CPG	(315) 488-5477 (317) 581-0668
NYSDEC Project Manager	Brian Davidson	(518) 402-9775
Law Enforcement	(V) Solvay Police, NYS Police	911
Fire Department	(V) Solvay FD	911
Ambulance	Emergency Services A&E Transport Service Empire Transportation Service	911 422-1021 477-1486
Hospital - Emergency	St. Joseph's Hospital	(315) 448-5111

4.1 Site Resources

A cellular phone will be located in the Site Manager's vehicle for emergency use.

4.2 Emergency Routes

The closest hospital to the site is St. Joseph's Hospital in Syracuse, New York. The route to be used in transport to the hospital is shown on Figure 1.

4.3 Emergency Procedures

In the event that an emergency develops on-site, the procedures identified herein are to be immediately followed. Emergency conditions are considered to exist if:

- Any member of the field team is involved in an accident or experiences any adverse effects or symptoms relating to site work; or,
- A condition is discovered that suggests the existence of a situation more hazardous than anticipated.

The following general emergency procedures should be accounted for in advance of, and upon acknowledgment of, either of the previous two observations:

- Site work area entrance and exit routes should be planned; and,
- Emergency escape routes identified and discussed prior to any site activity.

In the event of an emergency situation, the entire field team will immediately halt work, and act according to the instructions provided by the Site Manager. The appropriate emergency response agency or department will be contacted.

The Site Manager will complete the necessary accident forms and make provisions to complete the project task in progress at the time of the incident.

FIGURE 1

EMERGENCY HOSPITAL ROUTE

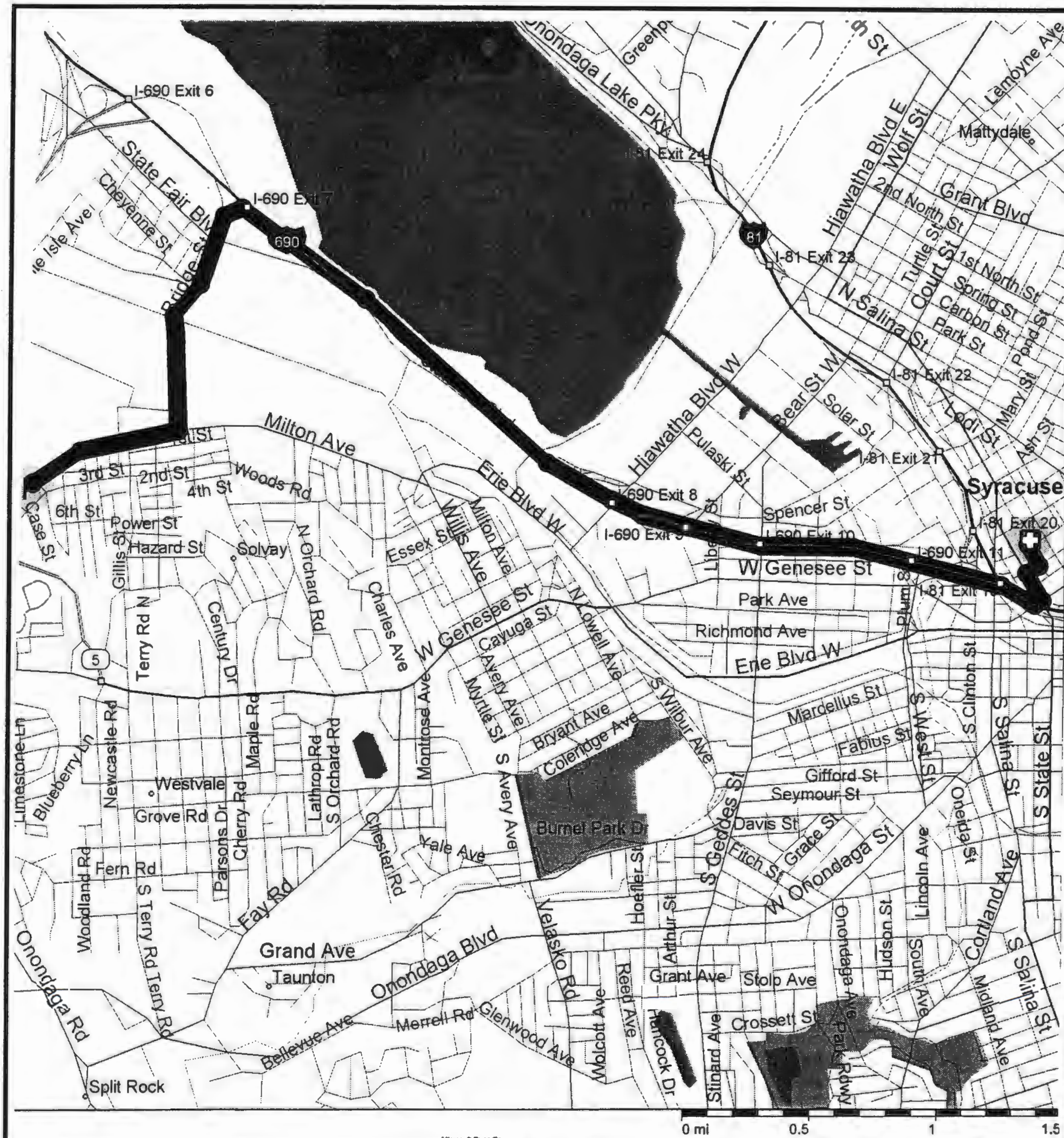

Figure 4-1

Hospital Route Map

ARAMARK UNIFORM SERVICES

Onondaga County, New York

909.001

Barton & Loguidice, P.C.

Consulting Engineers

Base Map from Streets '98

Emergency Hospital Route Directions

1.	Go east on Milton Avenue	0.7 Miles
2.	Turn Left on Bridge Street/NY-297	0.8 Miles
3.	Take I-690 East	2.9 Miles
4.	Take the West Genesee St. Exit (Exit 12)	0.2 Miles
5.	Turn Left on W. Genesee St.	0.3 Miles
6.	W. Genesee becomes James St.	0.2 Miles
7.	Turn Left onto N. State St.	0.1 Miles
8.	Turn Right onto Hickory St.	0.1 Miles
9.	Turn Left onto Prospect Avenue	

Total Distance = 5.8 Miles

Approximate Time = 10 Minutes