Adirondack Regional Business Incubator Site
36 Elm Street
City of Glens Falls, New York
Site Number E557019

Environmental Restoration Project

Site Investigation Work Plan

April 2006

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1.0 Introduction

The Greater Glens Falls Development Corporation (GGFDC) is the current owner of the property at 36 Elm Street, a roughly 0.14 acre parcel situated in the City's central business district (see figure 1). The project site includes a 17,550 square foot, three-story masonry building with a basement, and the building footprint encompasses the entire limits of the property. It is our understanding that the three-story structure was constructed in the 1920's, and was predominantly used as a shirt and lingerie manufacturing facility from the period of 1920 to 1970, with the exception of a short time period in the 1930s, when the site also included an automobile repair shop. There are four 500-gallon aboveground storage tanks (ASTs) located in the basement that were previously used to store fuel oil for the building's heating system. The tanks, which have reportedly been out of service for 30 years, are presently contained within concrete block walls, and the entire enclosure is filled with sand.

In addition to the above, the findings presented in a January 2003 Phase I Environmental Site Assessment Report of 36 Elm Street – Glens Falls, New York prepared by Clough, Harbour & Associates (CHA) of Albany, New York indicate that an underground storage tank (UST) of unknown capacity or contents possibly exists along the east side of the building. It is our understanding that the UST may have been associated with the automobile repair shop referenced above. The CHA Phase I ESA report also discusses the identification of suspect asbestos-containing materials (ACMs) throughout the three-story building, including the potential presence of lead-based paint based on the age of the structure.

Other potential environmental concerns identified in the CHA Phase I ESA report include the historical use of neighboring properties and their potential impact on the subject parcel. Specifically, a gasoline station at one time existed across the street from the study site, and an auto repair facility was located adjacent to the south side of the

property. Both of these facilities no longer exist, and their potential impact, if any, on the subject parcel is currently unknown.

The GGFDC has been awarded funding from the New York State Department of Environmental Conservation (NYSDEC), under the provisions of the Environmental Restoration Program (ERP), to conduct a Site Investigation and related activities at the subject parcel. The overall objective of the project is to complete a Site Investigation/ Remedial Alternatives Report (SI/RAR) to further define and evaluate the nature and extent of contamination on the 0.13 acre property related to the former site activities, including potential impacts to the on-site soil and groundwater, if any, from off site parcels. The Site Investigation will require investigation of the subsurface soil and groundwater conditions related to the identified site history and contaminants of concern. In addition, the Site Investigation will involve the further evaluation and testing of ACM present in the basement area of the three-story building, as documented in the CHA Phase II ESA Report.

During the Site Investigation, an interim remedial measure will be performed to remove the regulated ACM present in the basement area of the building. In addition, an interim remedial measure will be conducted to remove the four ASTs and remaining tank residuals (if any), the concrete block tank vault and sand backfill material, the boiler tank and associated piping, and asbestos contaminated soil piles and miscellaneous debris that currently exist in the northeast corner of the basement. Also, if the proposed geophysical investigation indicates the presence of an outdoor UST along the east side of the building, the IRM will include the removal and closure of that structure as well.

Section 5 of this Work Plan describes the specific tasks that are intended to characterize the existing site conditions, including off-site areas if deemed necessary. 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.

An evaluation of potential Remedial Alternatives will be performed following completion of the Site Investigation. This evaluation will be based on identifying methods to prevent, minimize or eliminate the presence and possible release of contaminants from the Site. Within this general framework, emphasis will be placed on identifying technically feasible, cost effective solutions that are environmentally sound.

Included as ancillary documents to this Work Plan are the Sampling and Analysis Plan (SAP - appendix A); the Health and Safety Plan (HASP - appendix B); and the Citizen Participation Plan (CPP - appendix C) - bound separately. The SAP includes a quality management plan and a data management plan. The quality management plan describes the procedures to be followed in performing the field investigation, including the sampling and laboratory analyses presented in the Work Plan, and the quality control and assurance procedures to be used during the Site Investigation. The data management plan establishes document control policies to be adhered to during the Site Investigation, including a description of data documentation materials and procedures, project file requirements, and report formats.

The HASP outlines procedures to be followed to provide for the health and safety of personnel performing the field investigation, and identifies the potential hazard(s) to which personnel may be exposed.

The CPP establishes the procedures to be followed in providing the public with the opportunity to be present at open meetings, review project documents and comment on project issues.

2.0 Site Description and History

2.1 Site Description

The property at 36 Elm Street in the City of Glens Falls, Warren County, New York is referred to as the "Adirondack Regional Business Incubator Brownfield Project", and has been assigned Project # E-557019 by the NYSDEC. The 0.14 acre parcel is located on the south side of Elm Street, approximately 100 feet northwest of the intersection of Elm Street and South Street. The project site is designated on the City of Glens Falls tax map as parcel number 309.28-1-13.

The subject site is bordered to the north by Elm Street, and the properties located immediately across the street on the north side of Elm Street consist of a parking lot and a commercial food and drink establishment (Café Sandu). A commercial building directly abuts the south wall of the building structure, while both commercial and residential buildings exist further to the south. To the east, the subject site is bordered by a three-story commercial building that contains retail shops on the first floor, with a combination of office space and apartments on the second and third floors. A narrow, locked alleyway separates the two buildings on the east side. To the west, the building structure is bordered by a single-story commercial building that is currently occupied by a Labor–Ready office. A driveway exists between the subject structure and the Labor-Ready office.

The masonry building structure at 36 Elm Street was most recently used by ABC Equipment for the storage of restaurant supplies and equipment. Specifically, all three (3) floors of the building (including the basement area) are being used for the storage of dishes, tables, chairs and stools, stainless steel

sinks, appliances, and miscellaneous cleaning supplies.

The site structure, which is currently unheated, was formerly heated by a fuel oil-fired boiler system that was located in the northeast corner of the basement. According to the CHA Phase I ESA report, the fuel burner component of the system has been removed from the basement, but the boiler tank and four (4) ASTs that supplied the boiler unit with fuel oil still exist. However, the above described heating system has reportedly not been used for the past thirty (30) years. The utilities at the subject site consist of public water and sewer, electricity, and natural gas (though not actively used), with electricity being the only utility that is actively used.

As described in the CHA Phase I ESA report, the three-story building was constructed in the 1920s for use as a shirt manufacturing facility, and the structural components of the building remain unchanged. The basement area consists of a concrete floor with concrete walls, with the exception of the west wall, which is constructed with stone. The boiler tank and piping associated with the former heating system occupy the northeast corner of the basement, while the freight elevator that services the three-story building can be accessed in the northwest corner of the basement. The upper floors contain bare wooden floors, painted concrete walls, and suspended tin ceilings. All of the windows in the upper floors have been removed and the openings boarded up. According to information gathered by CHA, the building contains a flat, layered roof system that is covered with a rubber membrane unit.

2.2 Site History

The CHA Phase I ESA report states the subject property was used for residential purposes prior to the construction of the existing building in the early 1920s. As previously noted, the three-story structure was used from the early

1920s through the 1940s as a shirt factory, and then from the 1950s through the early 1970s as a manufacturing facility of ladies garments. Based on the review of City of Glens Falls telephone directories, CHA was also able to determine that the McNaughton & Hughes Auto Repair facility occupied a portion of the structure during the 1930s. The chronology of property ownership, as presented in the CHA Phase I ESA report is presented below:

Site Ownership History	
Company Name	**Date of Ownership**
U.J. Limited Partnership	July 1998 to present
Jack Lebowitz	July 1998
Jack and Philip Lebowitz	October 1971 to July 1998
Iser Realty Corporation	February 1956 to October 1971
Simon Milberg	April 1955 to February 1956
Milstone Undergarment Corporation	August 1952 to April 1955
Milestone Foundation	June 1948 to August 1952

The potential environmental concerns associated with the subject site appear to be due to the prior use of a fuel oil-fired heating system in the building structure, including the presence of four (4) ASTs and a boiler tank that remain in the basement area; the former use of the site as an automobile repair facility in the 1930s; the presence of ACM and lead-based paint throughout the entire structure; the presence of potential PCB-containing light ballasts in the building; and potential off-site impacts associated with the prior operation of automobile repair and gasoline station facilities in the immediate surrounding area. Specifically, the CHA Phase I ESA report states that during the 1950s and 1960s a gasoline station existed across from the subject parcel at 37 Elm Street, and

from the period of the 1920s through the 1960s an automobile repair facility was located in the building directly abutting the south side of the structure.

2.3 Previous Investigations

Following the completion of the previously referenced Phase I ESA report by CHA dated January 2003, a Phase II ESA report was issued by CHA in November 2003. A copy of this report is included in appendix D for the reader's use and information. A summary of the Phase II ESA findings are presented below:

- Based on the laboratory analysis of soil and groundwater samples collected from a soil boring/monitoring well (B-1/MW-1) located on the north side of the building in the sidewalk, and a soil boring (B-2) in the basement (refer to figure 2), there is no apparent evidence of subsurface soil or groundwater contamination related to previously identified on-site and off site potential environmental concerns.

- The laboratory analysis of two sand samples collected from the north side of the tank vault exhibited low level concentrations of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, and PCBs. However, the detected concentrations are below the applicable NYSDEC TAGM No. 46 guidance values.

- Based on the collection and laboratory analysis of 17 suspect ACM samples, ACM was found to be present in the aircell-type pipe insulation present in the basement and second and third floors of the building, in the window glazing on the building's windows, and in the layered roof system underlying the rubber membrane roof.

- The laboratory analysis of three paint chip samples collected from the first, second, and third floors of the building revealed that lead-based paint is present, and therefore the paint must be handled and disposed of properly if disturbed.

2.4 Recognized Environmental Concerns

The recognized environmental concerns (RECs) associated with the Site include: potential residual contaminants associated with the four (4) ASTs and boiler tank present in the basement area; potential subsurface petroleum contamination associated with an outdoor UST that may exist along the east side of the building; the former use of the site as an automobile repair facility; the presence of ACM and lead-based paint at various locations in the building structure; the potential presence of PCB-containing light ballasts in the building; and the potential off-site impacts associated with the prior operation of automobile repair and gasoline station facilities in the immediate surrounding area.

The following tables summarize the analytical test results for subsurface soil, sand backfill (from the AST vault located in the basement), and groundwater samples collected at the site by CHA personnel in September and October of 2003.

Phase II Subsurface Soil Sample Analytical Results					
Location	**Compound**	**Recorded Value**	**Soil Cleanup Obj. to Protect GW**	**Rec. Soil Cleanup Objective (ppm)**	**Exceedance of Regulatory Limit**
Soil Boring MW-1 (12 to	VOCs	Not Detected	Varies	Varies	No
	SVOCs	Varies	Varies	Varies	No

16 ft bgs)	Metals	Below Background	--	Site Background	No
	PCBs	Not Detected	10.0 ppm	10.0	No
Soil Boring B-2 (2 ft bgs)	VOCs	Varies	Varies	Varies	No
	SVOCs	Varies	Varies	Varies	No
	Metals	Below Background	--	Site Background	No
	PCBs	Not Detected	10.0 ppm	10.0	No

CHA personnel collected two (2) sand samples (designated as SAN-1 and SAN-2, respectively) from the AST vault located in the basement area. The samples were collected by coring a hole in the concrete vault wall approximately six inches above the concrete floor surface and extracting a sample of sand with the use of a hand auger. Sand sample SAN-1 was collected from the west side of the vault at the south end, while sand sample SAN-2 was collected from the west side of the vault at the north end.

Phase II Sand Sample Analytical Results					
Location	**Compound**	**Recorded Value**	**Soil Cleanup Obj. to Protect GW**	**Rec. Soil Cleanup Objective (ppm)**	**Exceedance of Regulatory Limit**
SAN-1 (west end of vault)	VOCs	Varies	Varies	Varies	No
	SVOCs	Varies	Varies	Varies	No
	Metals	Below Background	--	Site Background	No
	PCBs	0.07 ppm	10.0 ppm	10.0	No
SAN-2 (east end of vault)	VOCs	Varies	Varies	Varies	No
	SVOCs	Varies	Varies	Varies	No
	Metals	Below Background	--	Site Background	No
	PCBs	0.018 ppm	10.0 ppm	10.0	No

CHA collected a representative groundwater sample from monitoring well MW-1, which is located on the north side of the building, and had the sample analyzed for the same list of parameters as the subsurface soil and sand

samples.

Phase II Groundwater Sample Results				
Location	**Compound**	**Recorded Value**	**Water Quality Standard (ppb)**	**Exceedance of Regulatory Limit**
MW-1	VOCs	Varies	Varies	No
	SVOCs	Varies	Varies	No
	Metals	Varies	Varies	No
	PCBs	Not Detected	0.1	No

As part of the Phase II ESA investigation, CHA personnel also collected a total of 17 bulk samples of suspect ACM at various locations throughout the building. Based on the laboratory test results, it was determined that the aircell pipe insulation present in the basement area and on the third floor, the window glazing on the second floor, and the second layer of the built-up roof system all contain asbestos at greater than one percent (1%) by weight.

In conjunction with the above activity, a total of three (3) paint chip samples were collected by CHA personnel from the first, second, and third floors of the building. The laboratory results indicate while all three (3) samples had measurable amounts of lead, only the paint chip sample collected from the third floor contained greater than 0.5 percent lead by weight.

3.0 Preliminary Risk Evaluation

The land use surrounding the property is mixed commercial and residential. The subject site and surrounding properties are all serviced with public water and sewer provided by the City of Glens Falls. Therefore, there are no drinking water wells that are suspected to have been impacted by contaminant releases (if any) at the site. The Site Investigation will include a characterization study of the extent of subsurface contamination (if any) at the subject parcel, hydrogeologic site conditions, and an environmental risk evaluation.

3.1 Relevant Standards, Criteria, and Guidance

The Standards, Criteria, and Guidance (SCGs) to be utilized for this project include, but are not limited to, the following publications: NYSDEC DRAFT DER-10 Technical Guidance for Site Investigation and Remediation, December 2002 (DER-10), NYSDEC Technical and Guidance Memorandum (TAGM) 4046 – Determination of Soil Cleanup Objectives and Cleanup Levels, NYSDEC T.O.G.S. 1.1.1 – Ambient Water Quality Standards & Guidance Values and Groundwater Effluent Limitations, 6 NYCRR Parts 700-706 – Water Quality Standards, and 10 NYCRR Part 5 of the State Sanitary Code – Drinking Water Supplies.

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:

- Further characterize and remove the ACM present in the entire building structure;
- Characterize and remove the residual contents of the four (4) ASTs, including the piles of dirt, miscellaneous debris (i.e. containers and jars of chemicals and cleaning agents), and standing water present in the basement area;
- Inspect the fluorescent light fixtures located throughout the building, and the electrical panels on the first floor, for PCB labeling or age labeling for categorization as Universal waste;
- Identify the location, orientation, and extent of any unknown ASTs or USTs, in particular the UST of unknown capacity or contents that possibly exists along the east side of the building;
- Characterize, remove, and dispose of potential sources of contamination present in the basement area, including the four (4) ASTs, concrete block tank vault and sand backfill material, boiler tank and associated piping, and any PCB light ballasts. In addition, the UST that possibly exists along the east side of the building will also be removed if found to be present;
- Define the magnitude and extent (if any) of subsurface soil and groundwater contamination at the site (and potentially off-site);
- Conduct a soil vapor intrusion (SVI) investigation to determine if soil

gas is being generated on-site and potentially migrating off-site;

- Characterize the site hydrogeologic conditions, including identification of depth to groundwater and flow direction; and
- Assess potential impacts to wildlife and identify potential exposure pathways to site-related contamination for current and future users of the site and beyond, if applicable.

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 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.

The initial task will involve the further characterization and subsequent removal of the ACM present in the entire building structure to insure that the proposed subsurface investigation and interim remedial measure (IRM) activities are performed in an asbestos free environment. In conjunction with this task, the sampling and laboratory analysis of the residual contents of the ASTs, including the piles of dirt, containers and jars of chemicals and cleaning agents, and standing water observed in the basement area, will be performed to classify the wastes as either hazardous or non-hazardous and arrange for their subsequent removal.

A geophysical survey will be conducted along the northern and eastern

perimeter of the building to identify potential buried tanks, including the previously referenced UST that may exist along the east side of the building. This information will then be used to refine the scope of the subsurface investigation and subsequent IRM activities (i.e., removal of the four ASTs, concrete block tank vault and sand backfill material, boiler tank and piping, piles of dirt, containers and jars of chemicals and cleaning agents, standing water, miscellaneous debris, and any identified USTs).

The subsurface investigation includes the advancement of several soil borings through the basement floor and around the outside perimeter of the building, followed by the installation of overburden monitoring wells. Due to the impervious cover (i.e., asphalt and concrete) that exists around the entire perimeter of the building, no provisions have been made at this time for the collection of surface soil samples. Therefore, subsurface soil and groundwater samples will be collected and analyzed as part of the site investigation.

In conjunction with the above described tasks, a soil vapor intrusion investigation will be performed to determine if soil gas is being generated on-site and potentially migrating off-site. Specifically, soil gas survey probes will be installed in the basement area and around the perimeter of the building, followed by the collection and analysis of representative soil gas samples.

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 a qualitative assessment of ecological and human health risks posed by the Site. These results will be used to evaluate the need for subsequent remedial activities and perform an analysis of alternatives. The Site Investigation efforts and Remedial Alternatives Analysis will be presented in a Site Investigation/Remedial Alternatives Report (SI/RAR).

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 recently completed property boundary survey will be reviewed and digitized to create a preliminary plan for the property. Where necessary, the existing mapping will be supplemented with information obtained from a site survey, including general topography. The mapping will include site features, utility poles, adjacent 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.). The Site Plan will also be used to present the various remediation alternatives identified during preparation of the Site Investigation/Remedial Alternatives Report. 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 - Community Relations

A Citizen Participation Plan (CPP) is included as appendix C of this Work Plan. The CPP was prepared to assist GGFDC with providing information about the project to the public. The elements of the CPP are as follows:

- Introduction to the Environmental Restoration Project (Brownfields Program)
- Basic site information
- Project description
- Identification of interested public (contact list)
- Identification of Department contacts
- Identification of document repositories
- Specific citizen participation activities
- Identification of adjacent property owners.

The CPP will establish responsibilities for project activities and provide the names and addresses of authorized representatives for response to public inquiries.

5.2 Site Investigation

5.2.1 Task 3 – Asbestos Survey and Abatement Design

Task 3a – Pre-Demolition Asbestos Survey

Our services for this task will include a supplemental pre-demolition survey for asbestos-containing materials (ACM) that

were previously identified by CHA to be present in the building structure. In addition, the asbestos survey will also include the sampling of spoil material and debris piles scattered on the basement floor. During an October 14, 2005 site visit, B&L personnel observed areas in the basement where ACM had fallen off ceiling pipes and was laying on the ground. Consequently, it is imperative that the supplemental asbestos survey, including abatement design and ACM removal tasks, be completed prior to any subsurface investigation and interim remedial measure (IRM) activities occurring in the basement area in order to insure that all work is conducted in an asbestos free environment.

The pre-demolition asbestos survey to be performed by B&L will consist of the following tasks:

- B&L will review, to the extent feasible, suspect ACM used in the construction of the structure. Previous survey information provided in the CHA Phase II report will be reviewed and used as a reference.

- At a minimum, triplicate bulk samples will be collected from each additional (if applicable) homogeneous material located in the building structure, with the exclusion of non-friable organically bound materials (NOBs). Triplicate sampling is recommended by the U.S. EPA as a means of reducing erroneous findings due to random variations in asbestos content or analytical error. Single samples of additional NOBs will be collected for analysis. Any materials that are currently labeled as asbestos or are

known to be asbestos-containing products shall be assumed to be ACM and will not be sampled.

- Serial analysis will be performed on sets of friable samples at an appropriately accredited laboratory contracted by B&L. Bulk asbestos samples will be analyzed using the EPA interim method of dispersion staining/polarized light microscopy (PLM). The laboratory will analyze the first sample of each series (set). If this sample tests positive for asbestos, then no additional samples of the series will be analyzed. If the first sample tests negative for asbestos, then additional samples in the series will be analyzed until a sample tests positive. If all samples in a series test negative for asbestos, then the material will be considered asbestos free. The laboratory will review samples in each set for similarity of materials. Where required, the laboratory will supplement the PLM method with the stratified point count method. It is anticipated that up to 5 sets (15 samples) of bulk samples will be submitted for PLM analysis.

- NOBs, which will include floor tiles/mastics and roofing materials, found to be negative for asbestos by PLM will be verified as negative by transmission electron microscopy (TEM). TEM analysis is the most definitive analysis for determination of asbestos in a NOB. An accredited TEM laboratory subcontracted by B&L will analyze the NOB samples. For cost estimation purposes we have assumed that up to 6 samples of NOB materials will be submitted for

laboratory analysis.

- If necessary, an accredited B&L asbestos inspector will return to the site to locate, quantify, and assess ACM once laboratory analysis has determined those materials contain asbestos.

- Sample locations and identified ACM will be recorded on single line AutoCADD drawings (not to scale) developed by B&L. The drawings will illustrate sample locations and material type. The drawings developed will be suitable for use during the remediation phase of the project.

- A pre-demolition survey report will be issued by B&L that identifies all materials sampled, results of the laboratory analysis, and survey methodologies. The type and quantities of ACM will be presented in tabular form and on the drawings. Laboratory reports, sample chain of custody documentation and all pertinent data generated during the survey will be included in the report.

Task 3b – Asbestos Abatement Design

For this task, B&L will provide project technical specifications for the removal of ACM from the entire building structure (as a separate IRM) prior to the commencement of the planned subsurface investigation and IRM activities. Specifications will be developed that will identify the scope of ACM removal in the building and cite regulations and standards applicable to the

project. Performance criteria as they relate to the removal and disposal of materials will be defined. Levels of personal protection, acceptable equipment/materials, and execution of material removal and specific coordination items between trades will be identified in the specification.

Project drawings for asbestos removal will be developed depicting the scope of work, material quantities, project phasing details as necessary, and information pertinent to the performance of the asbestos removal. The documents will be developed under the supervision of a certified EPA/NYSDOL asbestos project designer and reviewed and stamped by a licensed professional engineer also certified as an EPA/NYSDOL asbestos project designer.

5.2.2 Task 4 – Sampling and Analysis of AST Residual Contents and Miscellaneous Debris Piles in the Basement Area

According to the CHA Phase I ESA report, the four (4) ASTs in the basement have reportedly been out of service for 30 years. The ASTs were previously used to store fuel oil for the building's heating system, however to the best of our knowledge there is no current information available regarding the contents of the ASTs. As previously stated, the CHA Phase II ESA report indicated that two sand samples collected from the north side of the tank vault exhibited low level concentrations of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, and PCBs. As reported by CHA, the detected parameter concentrations are below the applicable NYSDEC TAGM No. 4046

guidance values.

Based on the above information, B&L intends to collect a representative sludge and/or aqueous sample from each AST (for a total of 4 samples) and submit the procured samples to a qualified laboratory for the analysis of Target Compound List (TCL) volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), TPH, metals, and PCBs using EPA SW-846 Methods. In addition, B&L will collect up to four samples of soil, standing water, and other miscellaneous debris (i.e. containers and jars of chemicals and cleaning agents) present in the basement area and have the various media samples analyzed for the same suite of parameters as the AST residual samples. For cost estimation purposes, we have assumed that four (4) AST sludge/aqueous samples and four (4) debris pile/standing water samples, plus two (2) Quality Assurance/ Quality Control (QA/QC) samples (for a total of 10 samples), will be submitted for laboratory analysis.

5.2.3 Task 5 – Geophysical Survey

Due to the reported former use of the site as an automobile repair shop, a geophysical survey will be performed along the northern and eastern perimeter of the building structure to identify potential buried tanks, including the previously referenced UST that may exist along the east side of the building. Ground penetrating radar (GPR) and electromagnetics (EM) will be used to identify magnetic anomalies and conductivity variations. The information developed from this effort will be used to refine the scope for the soil and groundwater investigations and any removal activities that

may be necessary. We have estimated that the geophysical survey will require one (1) day on site.

5.2.4 Task 6 - IRM Activities: Removal of Residual Wastes and Affected Structures

Following the completion of the waste characterization activities described herein, it is anticipated that an IRM will be implemented in order to remove the previously identified structures present in the basement area, including the UST that may exist along the east side of the building. Specifically, the four ASTS, concrete block tank vault and sand backfill material, boiler tank and piping, contaminated soil piles, containers and jars of chemicals and cleaning agents, miscellaneous debris, and any identified USTs will be removed and the potential for contaminant migration below these structures investigated. Prior to the start of the IRM, plans and specifications will be developed and approved by the NYSDEC. These contract documents will constitute a public works project for the site. At the completion of construction, an IRM certification report will be prepared and submitted to DEC.

In the event that it becomes necessary to excavate beneath the concrete floor in the basement area, or anywhere outside of the building, the investigation and sampling of excavations associated with source removal will follow the guidelines of provided in DER-10. All soil samples collected will be sent for laboratory analysis for the chemicals of concern dependant upon the source). It is assumed that a minimum of 5 composite soil samples will be collected from each source excavation to assess soil contamination in accordance with DER-10. Below grade piping will be sampled at

one sample for the first 15 linear feet of piping and additional sampling performed as described in DER-10 Section 3.9(a)(5). Test pit sampling will be conducted at a rate of one soil sample per test pit as described in DER-10.

The cleanup goals for the project are to meet NYSDEC TAGM 4046 Recommended Soil Cleanup Objectives. Due to the unknown extent of contamination in the subsurface, it is not the intention during the IRM to remove contaminated soils encountered at the site. Soils located beyond the immediate excavation area required for source removal would remain on site to be characterized during the site investigation subsequent to the IRM. The necessity for remediation of these areas would be assessed as part of the Remedial Alternatives Analysis.

5.2.5 Task 7 – Subsurface Soil Investigation

Based on the information presented in the CHA Phase II ESA Report, the encountered subsurface soils at the site consist of well graded, fine to coarse sand. Examination of the soil boring log for B-1 indicates that the soils become saturated at a depth of approximately 12 feet below ground surface (bgs).

A supplementary soil investigation program will be implemented by B&L to further delineate the presence and extent of contaminants in subsurface soil and/or groundwater that may have been impacted by the on-site tanks, in addition to potential off-site sources of concern referenced in the CHA Phase I ESA report. The investigation will utilize direct push soil borings (assuming

favorable site access conditions) and 1-inch temporary monitoring wells.

Currently, it is anticipated that five (5) direct push soil borings will be performed along the perimeter of the building within the affected areas, and three (3) direct push borings in the basement area, as depicted on Figure 2. The actual number and location of the borings may be modified based on the information obtained during the work plan preparation phase and during the actual field work. Information developed from the soil boring investigation will be used to determine the presence and extent of contamination. Three (3) days are assumed for installation of these borings.

Each boring location will be sampled continuously throughout the depth of the boring. The retrieved soil samples will be examined by the on-site representative and will be logged as will be described in the project Sampling and Analysis Plan. In addition, collected soil samples will be field screened with a photoionization detector (PID) for the presence of volatile organic compounds (VOCs) in the following manner. Upon retrieval from the borehole, a portion of the split spoon soil sample will immediately be placed in a laboratory sample jar and the lid secured. The sample jar will be appropriately labeled and placed in a chilled cooler for possible future laboratory analysis. The remaining portion of the split spoon soil sample will be placed in a sealable bag and subsequently checked for the presence of VOCs by inserting the PID probe in the bag. Two measurements will be recorded to identify: 1) the peak concentration, and 2) 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 future reference regarding determination of well screen intervals, analytical soil sample selection and definition of the vertical extent of groundwater and soil contamination.

Should contaminated soils be encountered during the advancement of the soil borings, as evidenced by either visual inspection of the soils or PID field screening readings, B&L will collect one (1) soil sample from each soil boring for laboratory analysis. Soil samples will be analyzed for TCL VOCs, SVOCs, metals, and PCBs using EPA SW-846 Methods. All laboratory samples submitted for the project will be analyzed at a NYSDOH ELAP program approved laboratory in accordance with the NYSDEC Category B ASP deliverables protocols. For cost estimation purposes we have assumed that up to ten (10) soil samples (8 soil boring samples plus 2 QA/QC samples) will be submitted for laboratory analysis.

In selected locations, 1-inch temporary monitoring wells will be installed in the soil borings. The purpose of these temporary wells will be to establish groundwater levels across the site and allow for collection of screening level water samples from the identified areas of concern. Water samples collected from these wells will be analyzed for the same suite of parameters proposed for the soil samples. Up to four (4) temporary monitoring wells are proposed.

5.2.6 Task 8 – Groundwater Investigation

Task 8a - Monitoring Well Installation

Based upon the analytical laboratory test results of the water quality samples obtained from the permanent on-site monitoring well installed by CHA, and from the above referenced 1-inch temporary monitoring wells, a number of permanent groundwater monitoring wells may be installed at the site to address overburden groundwater quality. Specifically, it is assumed for cost estimation purposes that three (3) permanent shallow overburden groundwater monitoring wells will be installed at the site to supplement the existing on-site monitoring well. The wells will be positioned based on the results of the soil investigation, the existing monitoring well, and the temporary monitoring well network. Well placement will also relate to the specific contaminant areas confirmed at the site.

Monitoring well construction and installation will be supervised by a B&L geologist and follow the general specifications as shown in Figure 3. The monitoring well construction detail is discussed in the SAP (Appendix A).

During the construction and installation of the monitoring wells, the Supervising 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.

Task 8b - 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 percent 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.

Task 8c - Water Level Monitoring

Water levels will be recorded on two (2) events approximately three (3) months apart at each of the on-site 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.

Task 8d - Groundwater Sampling and Analysis

Upon completion of the monitoring well installation program, each of the newly installed monitoring wells and the existing well (for a total of 4 wells) will be sampled for laboratory analysis. The wells will be sampled on two (2) separate occasions during the investigation in order to provide an indication of 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. The analyses for the permanent groundwater samples will be based on the results of the temporary monitoring well 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.

5.2.7 Task 9 – Soil Vapor Intrusion Investigation

A soil vapor intrusion investigation will be performed in accordance with the guidelines presented in the draft *NYSDOH Guidance for Evaluating Soil Vapor in the State of New York* to determine if soil gas is being generated on-site and potentially migrating off-site. Due to the presence of the four ASTs and abandoned boiler furnace unit in the basement area, including the previously referenced UST that may exist along the east side of the building, a series of soil vapor probe sampling points will be installed in the basement area and along the northern and eastern perimeter of the building. The purpose of the soil vapor screening is to quantify the level of soil gas generated from the site and to establish whether a soil gas pathway exists from the site to the adjacent dwellings. The results of the soil vapor intrusion investigation will be evaluated and additional vapor monitoring, including indoor/outdoor air monitoring, will be conducted if necessary.

The locations of the proposed soil gas borings are depicted on Figure 2. Soil gas samples will be collected following minimal purging of the sampling equipment and tubing. The samples will be collected in 400-cc Summa gas canisters equipped with regulators set to collect the sample over a two-hour time period (approximately 3.33 cc/minute). The soil gas samples will be submitted for laboratory analysis of the Site contaminants of concern by EPA Method TO-14A or TO-15. The results of the soil vapor survey sampling will be assessed against USEPA and OSHA reference concentrations for the contaminants of concern.

5.2.8 Task 10 – Public Health and Wildlife Exposure Assessment

A qualitative assessment of potential ecological receptors will be performed for the site. In the event that significantly elevated contaminant concentrations are detected and adverse impacts to the local vegetative and/or wildlife communities are identified, a full-scale Baseline Human Health and Wildlife Risk Assessment would be proposed. Presently this level of assessment is not scoped for this project.

Intrusive site activities will include air monitoring in conformance with the NYSDOH Generic Community Air Monitoring Plan (CAMP). The specific community air monitoring procedures to be employed by B&L field personnel in the performance of the site investigation are described in detail in Section 6.2 (Air Monitoring Procedures) of the Health and Safety Plan (Appendix B).

5.2.9 Task 11 - Data Validation

Laboratory samples collected for closure verification and/or IRM decision making will be sent for data validation as described in the SAP. The intention of this task 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.

5.2.10 Task 12 - Site Investigation/Remedial Alternatives Report

The Site Investigation/Remedial Alternatives Report (SI/RAR) will be prepared in accordance with the Municipal Assistance Environmental Restoration Project "Brownfields Program" Procedures Handbook and will assemble information relative to the presence and extent of surficial and subsurface contaminants. This report will generally characterize the environmental conditions of the site. 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. 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.

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. Using this list, potential remedial responses will be evaluated for each area/media of concern. Each response will be evaluated according to the extent that it will effectively remediate the problem area and its technical feasibility. Following this evaluation, a list of potential remedial alternatives will be developed using combinations of the remedial responses referred to above to address each specific area/media of concern.

The resulting list of Remedial Alternatives will be evaluated against the standards, criteria, and guidelines (SCGs) established for the project site. The report will identify if additional IRMs are warranted for the site and whether the site should be divided into operable units for remedial management. Selected remedial alternatives will be presented to Avalon Associates, the GGFDC, and the NYSDEC for consideration prior to the detailed analysis of alternatives.

5.2.11 Task 13 - Detailed Analysis of Alternatives

Following approval of the identified remedial alternatives, each alternative will be subjected to a detailed analysis. Each remedial alternative will be evaluated for the seven (7) criteria identified in the NYSDEC Environmental Restoration Program guidance documents. These criteria include:

- Protection of Human Health and the Environment
- Compliance with SGCs

- Implementability
- Reduction in Toxicity, Mobility, or Volume
- Short-term Effectiveness
- Long-term Effectiveness
- Cost

Following this analysis, a preferred remedial alternative will be selected, which appears to satisfy the remediation goals for the site and presents the most cost-effective solution. The final SI/RAR report will be submitted to Avalon Associates, the GGFDC, and the NYSDEC for review and approval.

5.2.12 Task 14 - Project Administration, Subcontractor Coordination, Reimbursement Applications and Public Meetings

This task includes project administration duties, coordination of subcontractors, coordination and planning with GGFDC officials, correspondence with State and Local agencies, attendance at one (1) public meeting or information session, and preparation and assistance with Brownfields reimbursement applications.

6.0 Project Management Structure

6.1 Project Organization

Barton & Loguidice, P.C. (B&L), is the prime engineering contractor for the City of Glens Falls Adirondack Regional Business Incubator Brownfield Project. B&L will report directly to Avalon Associates, Inc. for all services required on the project. With approval from the GGFDC and Avalon Associates, B&L will have direct liaison with the New York State Department of Environmental Conservation (NYSDEC) during the site investigation portion 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 Director will be Scott D. Nostrand, P. E. The Project Director will have primary responsibility for planning and implementation of the Environmental Restoration Project.

The Project Manager will be Stephen B. Le Fevre, P.G., C.P.G. The Project Manager will be in charge of all field activities related to the Site Investigation program. The Project Manager 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 Project Manager will be the primary contact for all project-related communications with Avalon Associates and the NYSDEC.

The Quality Assurance Officer for this project will be Andrew J. Barber, Senior Environmental Consultant. 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.

The Project Industrial Hygienist will be John Rigge, Senior Managing Industrial Hygienist. Mr. Rigge will be responsible for conducting the asbestos and lead-based paint surveys for the project.

Additional project staff will be assigned to this project to support the key personnel identified above.

6.2 Project Cost Estimate

A project cost estimate has been prepared and is presented in Figure 4. 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 (Surveyor, Driller, IRM Contractor) and laboratory costs.

Figures

Figure 1

Site Location Map

Figure 2

Site Plan

Figure 3

Typical Monitoring Well Detail: Overburden Well

Figure 4

Project Cost Estimate

Appendices

Appendix A

Sampling and Analysis Plan (SAP)

Appendix B

Health and Safety Plan (HASP)

Appendix C

Citizen Participation Plan (CPP)
[Bound Separately]

Appendix D

Phase II Environmental Site Assessment Report
(November 2003 – Clough, Harbour & Associates)