Legend:

- Sub-slab Soil Vapor & Indoor Air Sample
- Building Layout
- Installation Area For Sub-slab Depressurization Systems
- Approximate BCP Site Boundary - Includes AOI 3

Source: Erie County GIS Mapping Website
Notes: All features should be considered approximate

0 15 30 60
SCALE IN FEET

N W E S

NORTHTOWN PLAZA
3045 SHERIDAN DRIVE
AMHERST, NEW YORK 14226

AOI 3 - SUB-SLAB DEPRESSURIZATION SYSTEMS

PREPARED BY:
GZA GeoEnvironmental, Inc.
Engineers and Scientists
www.gza.com

PREPARED FOR:
NORTHTOWN ASSOCIATES, LLC

PROJ MGR: JJR	REVIEWED BY: TGB	CHECKED BY: BK	FIGURE
DESIGNED BY: TGB	DRAWN BY: PCF	SCALE: 1 in = 30 ft	6
DATE: MAY 2015	PROJECT NO. 31.0056687.30	REVISION NO.	

APPENDIX A

SSDS Subcontractor Scope of Work

April 30, 2015

Mr. James J. Richert P.G., C.P.G.
Senior Project Manager
GZA GeoEnvironmental, Inc.
535 Washington Street, 11th Floor | Buffalo, New York 14203
Via email: James Richert <J.Richert@palmertongroup.com>

Re: Northtown Plaza, Amherst NY - Soil Vapor Intrusion Mitigation System Proposal
(2) south end units: Giro Cleaners and former Manhattan Bagel, and
(1) unit in building to west

Dear Mr. Richert,

For you review and comment, we submit the following work plan:

1.0 Introduction

Soil vapor containing chlorinated volatile organic compounds has been detected at or near this site. This document presents a Work Plan that consists of the installation and operation of three sub-slab depressurization systems (SSDSs) that are designed to mitigate the migration or potential migration of sub surface vapors into the building interiors. The subject areas are the foundation footprint of the two southernmost retail spaces, currently occupied by Giro Cleaners and formerly occupied by Manhattan Bagel and also the entire building to the west that is currently occupied by Total Automotive Repair. The SSDSs are not intended to remove or diminish the source of the contamination. After start-up, demonstration of SSDS effectiveness will be confirmed and thereafter, periodic maintenance and monitoring will be performed.

2.0 Objectives

This work plan was developed in general accordance with the NYS DOH document, "Guidance for Evaluating Soil Vapor Intrusion in the State of New York, October 2006".

The objective of the SSDS is to create and maintain a minimum negative pressure differential of .004 inches of water column (wci) below all concrete slabs which function as boundaries between sub-slab space and occupied interior space. Once an SSDS has been installed, testing will be performed to verify the extension of the pressure field. If and where necessary, additional measures will be furnished to ensure that performance objectives are met. Modeling based on sub-slab air flow data suggests that the proposed design is sufficient.

3.0 Work Plan Design and Specifications

3.1 Overview

Work descriptions are based on certain assumptions identified herein and are subject to modification based on further field observations and measurements before and during construction.

3.2 Predesign Communication Testing

Sub-slab air communication testing would be performed before construction to verify design and determine the most efficient system configuration. The test procedure will include drilling core borings and small diameter test holes to measure vacuum influence. Because of limited suction cavity placement opportunities, testing would be directed toward designing a network of perimeter suction points. Discovery of relatively dense sub-slab material may result in a higher number of suction cavities or higher vacuum fans.

3.3 Scope of Work

The Scope of Work is to furnish and install (3) multi-point active sub-slab depressurization systems at the designated locations. The Scope of Work is based on the construction necessary to achieve the design objective of furnishing a minimum .004 wci pressure differential at all areas of the sub -slab.

Furnish and Install:

- **SYSTEM 1**: Giro Cleaners
- System configuration - (1) RADONAWAY GP-501, roof mount over riser or manifold pipe, to provide sub-slab depressurization via 3" schedule 40 PVC pipe to roof exhaust; w/ (3) suction points along south perimeter wall and w/ (2) suction points along north perimeter wall
- **SYSTEM 2**: former Manhattan Bagel
- System configuration - (1) RADONAWAY GP-501, roof mount over riser or manifold pipe, to provide sub-slab depressurization via 3" schedule 40 PVC pipe to roof exhaust; w/ (2) suction points along south perimeter wall and w/ (3) suction points along north perimeter wall
- **SYSTEM 3**: Total Automotive Repair
- System configuration - (1) RADONAWAY GP-501, roof mount over riser or manifold pipe, to provide sub-slab depressurization via 3" schedule 40 PVC pipe to roof exhaust; w/ (4-5) suction points along south perimeter wall or as determined

- **COMMON ELEMENTS:**
- Pre-construction consultation to obtain approval for component placements
- Suction points as follows: connection via 3" Schedule 40 PVC pipe, to cavity in sub-slab, with urethane seal; access hole to suction cavity by 5"core drill or hand drill; suction cavity to consist of approximately 1 cu. ft. excavated material in sub-slab
- Electrical switch at fan with *Sealtite* conduit to building interior; final connection to panel by others at other's expense
- Roof flashing for pipe penetrations; extra cost if roof warranty requires work by original contractor
- Proportioning valves or plates for suction risers where required
- All exhaust points minimum 10" from any air intakes
- Exterior switch and *Sealtight* and/or MC conduit from fan housings to vicinity of electrical panel; final connection to circuit or panel in vicinity of fans
- (2) U-tube style vacuum indicator per system, on vertical pipe run; location TBD

- Urethane sealant at slab joints, accessible cracks and penetrations in vicinity of suction points
- Horizontal pipe near ceiling, with metal bracketing direct to structure, sloped as required, above drop ceiling where present
- At completion, perform backdraft testing, measure pressure differentials and document; label components and provide system description and operational instructions
- Permits and inspections at additional cost
- Consult with client engineering representatives to develop operation, maintenance and periodic inspection plan
- Two year warranty; labor and installed components

3.4 Post Installation Pressure Field Extension Testing

A digital micromanometer will be used to measure pressure differentials and values will be recorded on a floor plan. All test holes will be repaired with urethane caulk (MSDS available) applied over a closed cell backer rod. Smoke tubes will be used to identify floor cracks and other openings to the sub-slab that could "short circuit" the pressure field. Backdrafting testing will be performed.

3.5 System Operation Following Power Loss

The systems will restart automatically after power restoration.

3.6 General Work Plan Provisions

- Daily tailgate meeting for safety review
- Hazwoper trained personnel to perform drilling operations
- PID monitoring not included
- Level 4 PPE for on-site personnel
- Procedures to follow site specific HASP

3.7 IRM Construction Completion Report

At conclusion of construction, a Construction Completion Report (CCR) will be submitted. This report will include an as-built drawing, showing SSDS locations and components. The CCR will include measurements of created sub-slab to ambient air static pressure differentials, detailed descriptions of SSDS components, and post-installation sampling results.

An Operations, Maintenance, and Monitoring (OM&M) Plan will be submitted with the CCR. The OM&M Plan will be provided to the owner and occupants to facilitate their understanding of the system's operation, maintenance and monitoring. The OM&M Plan will include the following:

- a description of the SSDS Installed and its basic operating principles, with diagram;
- how the owner or tenant can check that the SSDS is operating properly;
- how the SSDS will be maintained and monitored and by whom;
- a description of long-term reporting and annual SSDS certification requirements;
- a list of appropriate actions for the owner or tenant to take if a SSDS warning device (manometer) indicates system degradation or failure;
- a description of the proper operating procedures for the SSDS, including manufacturer's operation and maintenance instructions and warrantees; and
- contact information if the owner or tenant has questions, comments, or concerns.

3.8 Maintenance and Monitoring

Future monitoring will be proposed to monitor system communication via differential pressure measurements. The monitoring will be performed annually until a less-frequent monitoring frequency is approved. This routine monitoring will include:

- visual inspection of the equipment and piping;
- inspection of exhaust points to verify that no air intakes have been located nearby;
- identification and subsequent repair of any leaks;
- audible operational status check of vent fans;
- damper adjustments as required to balance parallel branches of system;
- measurement of differential pressure between the indoor air and the sub-slab to ensure a lower pressure is being maintained in the sub-slab relative to indoor ambient, as indicated by the pressure gauge on the fan suction pipe.

The SSDS will be operated until such time as permission in writing is received from NYSDEC to terminate operation of the system and remove the equipment.

3.9 Schedule

Client shall provide notification to tenants for timing of construction and shall obtain any necessary access agreements.

It is anticipated that work can be completed within thirty days of receipt of order. It is anticipated that portions of the work involving considerable noise or intrusion will take place after hours.

3.10 Discharge Permitting

It is understood that an air discharge permit to discharge treated vapors will not be required. It is further understood that all discharges will be direct to the atmosphere and that a Community Air Monitoring Plan is not required.

4.0 Cost: To be provided under separate cover

END OF WORK PLAN

Thank you.

Nicholas E. Mouganis EPA listing # 15415-I; NEHA ID# 100722

55 SHUMWAY ROAD, BROCKPORT, NEW YORK, 14420 * OFFICE/FAX 585-637-7430

APPENDIX B

Quality Assurance Project Plan

QUALITY ASSURANCE PROJECT PLAN NORTHTOWN INC. AMHERST, NEW YORK BROWNFIELD CLEANUP PROGRAM SITE NO. C915292

Prepared For:
New York State Department of Environmental Conservation
Region 9
Buffalo, New York

Prepared By:
GZA GeoEnvironmental of New York
Buffalo, New York

May 2015
File No: 31.0056687.30

QUALITY ASSURANCE PROJECT PLAN
NORTHTOWN INC.
ELLICOTTVILLE, NEW YORK
BROWNFIELD CLEANUP PROGRAM
SITE NO. C915292

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1.0 INTRODUCTION

1.1 PURPOSE AND OBJECTIVE

This Quality Assurance Project Plan (QAPP) has been developed by GZA GeoEnvironmental of New York (GZA) for project activities associated with the Northtown Inc. Brownfield Cleanup Program (BCP) Site No. C915292 located at 3097 Sheridan Drive, Amherst, New York (see Figure 1). This QAPP presents the project scope, objectives, organization, planned activities, sampling procedures, data quality objectives and quality assurance/quality control (QA/QC) procedures.

Protocols for sample collection, sample handling and storage, equipment decontamination, chain-of-custody procedures, etc. are described in Section 3. This QAPP was developed in general accordance with the requirements of Section 2.4 of the NYSDEC DER-10/Technical Guidance for Site Investigation and Remediation, effective May 3, 2010 (NYSDEC DER-10).

1.2 PROJECT BACKGROUND

The BCP Site consists of three AOIs collectively comprising approximately 1.5 acres of an approximately 18.6 acre parcel of land on which the Northtown Plaza is located. Currently the Plaza property is occupied by six commercial buildings, most containing multiple tenant spaces. The Site is bordered by other areas of the Northtown Shopping Plaza and beyond that Sheridan Drive to the North, Eggert Road to the south, Bailey Avenue to the east and Niagara Falls Boulevard to the west. Northtown Shopping Plaza is located in a commercial business area along Sheridan Drive and Niagara Falls Boulevard. The primary use of the area is as a shopping district, with major retailers located within a ½ mile of the Site. Residential properties are located on the side streets surrounding the site. Figure 2 presents a site plan.

The Site appears to have been agricultural land until it was developed for commercial use in the early-1950s. Site development occurred from the mid-1950s to 1983 when it reached site usage similar to today. Site occupant uses of environmental concern have included a dry cleaner. On-site dry cleaning operations ceased at the Site in the 1990s but there currently is an active pick-up/drop-off dry cleaning business in the same location (cleaning operation is performed at an off-site facility).

No underground storage tanks (USTs) are currently being used at the Site or other portions of Northtown Plaza. However, two USTs formerly used for heating oil remain at the Site.

A Phase I Environmental Site Assessment completed by GZA for the entire Northtown Plaza property in accordance with ASTM 1527 identified Recognized Environmental Conditions (RECs) including the former use of USTs (see above) and the former on-site dry cleaning operations at the Site.

A Phase II Environmental Site Assessment was completed by GZA to assess the RECs identified in the Phase I. The assessment included the following:

- The completion of 51 soil probes and the installation of 3 groundwater monitoring wells;

- The analyses of 53 soil samples for Target Compound List (TCL) Volatile Organic Compounds (VOCs) EPA Method 8260, Spill Technology and Remediation Series (STARS) Semi-Volatile Organic Compounds (SVOCS) EPA Method 8270, and Poly Chlorinated Biphenyl's (PCBs) EPA Method 8082;
- The analyses of three groundwater samples for TCL VOCs EPA Method 8260;
- Indoor air and sub-slab soil vapor sampling at three tenant spaces;
- A camera survey of sewer lines associated with the dry cleaning unit; and
- A Ground Penetrating Radar (GPR) study of known current and past UST locations.

Soil impacts were detected at three discreet locations: proximate to the two abandoned fuel oil USTs locations, and in the vicinity of the dry cleaners unit. No VOCs were detected above the NYSDEC Class GA Criteria in groundwater collected from the three deep overburden monitoring wells completed at the Site.

Limited areas of visual and olfactory evidence of petroleum were encountered in the vicinity of the southern (AOI1) and western (AOI2) inactive heating oil USTs. NYSDEC was notified on May 9, 2014 and spill number 1401409 was assigned for both USTs. The extent of the impact detected in the UST areas are immediately adjacent to the USTs and limited to the uppermost 6 to 8 feet. Approximately 20 soil probes were completed on the west side of the dry cleaner's space (AOI3). Fifty three soil samples were analyzed for VOCs. PCE was detected above the Unrestricted Soil Cleanup Objectives (USCO) in 16 soil samples, above the Commercials Soil Cleanup Objectives (CSCO) in two samples, and above the Industrial Soil Cleanup Objectives (ISCO) in one sample. The PCE impacts were restricted to a depth between 6 and 18 feet below ground surface. No surficial soil impacts were identified.

One deep monitoring well was installed in the area of the PCE soil impacts and two other locations did not show impacts to the groundwater in this area. Groundwater was encountered at approximately 50 feet below ground surface.

To further characterize AOI3, GZA completed a Pre-Design Field Characterization (PDFC) in March and April of 2015. Twenty five additional soil probes were advanced using direct push drilling methods. Eighteen of these soil probes were located at exterior areas of AOI 3, and 7 were located within the vacant tenant space #13, which is directly north and adjacent to the dry cleaner space. GZA installed six, 1-inch diameter, shallow water monitoring wells at six of the soil probe locations.

Based on the results of the Phase II and PDFC, four areas of PCE impacted subsurface soil were identified at the western exterior of AOI3. The four samples that exceeded CSCOs for PCE are SP-

23, SP-47, SP-56, and SP-62 and the extent of impact at each of these areas is of limited extent. The impacted depth intervals in exceedance of the CSCOs range from six feet at SP-47 to seventeen feet SP-62. Soil samples collected from probes surrounding the four data points contained PCE at concentrations below the CSCO, illustrating the limited extent of the higher concentrations of PCE.

1.3 PROJECT DESCRIPTION

This QAPP is the quality control basis for the scope of work, which is further described in the Interim Remedial Measures Work Plan. The major tasks involved at the Site are:

- Interim Remedial Measures Work Plan Development (Field Activity Plan, Health and Safety Plan, and Quality Assurance Project Plan).
- Implementation of an Interim Remedial Measure
- Revision of the Alternatives Analysis Report

1.4 PROJECT MANAGEMENT AND ORGANIZATION

1.4.1 Personnel

The general responsibilities of key project personnel are listed below.

NYSDEC Project Manager – Tim Dieffenbach will have the responsibility for regulatory oversight for the work associated with BCP Site No. C915292.

Northtown Associates LLC Project Manager – Andrew Manning will have the responsibility for implementing the project and has the authority to commit funding necessary to meet the objectives and requirements.

GZA Project Manager – Jim Richert will be responsible for managing the implementation of the activities associated with the BCP investigation, remediation and coordinating the collection of data during the project. The Project Manager is responsible for technical quality control and project oversight.

Quality Assurance (QA) Officer – Todd Bown will report to the Project Manager and will be responsible for ensuring that QA/QC procedures are being followed. The QA Officer will be responsible for overseeing the review of field and laboratory data.

The QA Officer will monitor the performance of the laboratory to verify that the Data Quality Objectives for the project are met.

Field QA Officer – Todd Bown will be responsible for the overall operation of the field team and reports directly to the Project Manager.

1.4.2 Specific Tasks and Services

GZA will obtain subcontractor specialists for services relating to underground storage tank removal, soil excavation, soil transport and disposal, sub-slab vapor mitigation system design and installation, laboratory/analytical services and data validation services. The subcontractors to be utilized will be determined at a later time.

2.0 SITE INVESTIGATION PROCEDURES AND RATIONALE

AOI 1 and AOI 2 of the BCP Site each contain one inactive underground storage tank (UST) that were reportedly used to store fuel oil. Petroleum impacted soil is present adjacent to each UST. At AOI 3, chlorinated solvent impacts are present in the overburden soil and shallow pore water of the overburden. The IRM fieldwork proposed by GZA is the result of extensive site characterization work and focuses mainly on removal of the USTs and impacted soils as well and installation of sub-slab depressurization of two tenant units at AOI 3 and one space to the west of AOI3. Environmental sampling will be performed in conjunction with the removal actions for the following purposes:

- confirmation sampling of excavation sidewalls and bottom;
- characterization of "clean" backfill materials; and
- characterization of soil and waters (if present) for disposal purposes.

Environmental sampling and other field activities will be performed in general accordance with the NYSDEC DER-10 guidance document.

General field activities are described in the following sections and described in further detail in the Interim Remedial Measures Work Plan.

2.1 AIR SURVEILLANCE AND MONITORING

Air surveillance screening for total volatile organics and particulates for health and safety concerns will be performed with a portable organic vapor meter (OVM) equipped with a photoionization detector (PID) that is using a 11.7 electron volt (eV) bulb and dust monitors placed both upwind and downwind of intrusive work sites. Monitoring will be performed during invasive activities such as soil excavation and UST removal. The OVM will also be used to field screen samples. Additional details are presented in the Site-specific Health and Safety Plan which includes the NYSDOH generic Community Air Monitoring Plan (CAMP).

2.2 SOIL SAMPLING

Soil sampling will occur during remedial activities involving excavation and removal of impacted soil and USTs, confirmatory sampling and waste characterization. Samples will be collected and transferred to sample containers as soon as possible after being retrieved from the subsurface (i.e., excavator bucket).

The excavator will be decontaminated by the subcontractor prior to arrival on-Site. During remedial activities, decontamination will be accomplished using steam cleaning or high pressure hot water to wash equipment prior to moving to the next location. Stainless steel sampling devices will be cleaned manually with non-phosphate detergent (i.e., alconox) wash and potable water followed by a potable water rinse or a second steam cleaning followed by a distilled/deionized water rinse. Equipment will be similarly cleaned prior to leaving the Site.

Soil samples, with the exception of those for VOCs, will be homogenized using a "coning and quartering" procedure. The soil will be removed from the sampling equipment and transferred to a clean surface (metal foil, steel pan, bowl, etc.). Observed debris, such as bricks, large stones, organics, etc. will be removed from the sample. The soil will be mixed to provide a more homogeneous sample for lab analysis. The soil will be scraped from the sides, corners, and bottom of the clean surface, rolled to the middle, and thoroughly mixed until the material appears homogenous. An aliquot of this pile will then be transferred to the required sample containers, slightly tamped-down, filled to near the top of the container, and sealed with the appropriate cap. Soil or sediment on the threads of the container will be removed prior to placing the cap on the sample container. Soil samples for VOC analysis will be collected and directly placed into one unpreserved 2 oz jar per sample location.

Soil screening will be performed in two ways: by holding the probe of the OVM directly over the sample once it is retrieved from the subsurface and again by headspace screening after a representative portion of the soil samples has been placed in plastic bags, allowed to warm to ambient temperature, and placing the tip of the OVM into the plastic bag. The OVM used will be equipped with a PID that is using a 11.7 eV bulb.

The OVM will be calibrated daily, in accordance to manufacturer's requirements using a standard gas. Prior to screening, the headspace soil samples will be allowed to equilibrate to ambient temperature. For headspace screening, a hole will be made in the sample bag and the tip of the OVM inserted into the bag, and the peak response will be recorded. A response of less than 1 part per million (ppm), using this method, is not considered significant and will be reported as not detected. A blank will be run between test samples to check that extraneous contamination was not carried over.

2.3 EQUIPMENT DECONTAMINATION

To avoid cross contamination, non-disposable sampling equipment (defined as any piece of re-usable equipment which may contact a sample) will be decontaminated according to the following procedures outlined below.

2.3.1 Non-Dedicated Reusable Equipment

Non-dedicated reusable equipment such as stainless steel mixing bowls; pumps used for groundwater evacuation (and sampling, if applicable) etc. will require field decontamination. Acids and solvents will not be used in the field decontamination of such equipment.

Decontamination typically involves scrubbing/washing with a laboratory grade detergent (e.g. alconox) to remove visible contamination, followed by potable (tap) water and analyte-free water rinses. Tap water may be used from any treated municipal water system; the use of an untreated potable water supply is not an acceptable substitute. Equipment should be allowed to dry prior to use. Steam cleaning or high pressure hot water cleaning may be used in the initial removal of gross, visible contamination. Tubing will not be re-used (new tubing will be used for each well).

2.3.2 Disposable Sampling Equipment

Disposable sampling equipment will not be field-decontaminated; equipment may be rinsed with laboratory-provided analyte-free water prior to use. Disposable spoons or spatulas purchased from non-environmental equipment vendors (such as restaurant supply houses) will be decontaminated by scrubbing/washing with a laboratory grade detergent followed by potable water and Analyte-free water rinse; or by using steam or high pressure hot water rinse, followed by analyte free water rinse. The equipment will be allowed to air dry prior to use.

2.3.3 Heavy Equipment

Certain heavy equipment such as, excavator buckets, etc. may be used to obtain samples. Such equipment will be subject to high pressure hot water or steam cleaning between uses. A member of the sampling team will visually inspect the equipment to check that visible contamination has been removed by this procedure prior to sampling. Such equipment will be cleaned between excavation locations. Decontamination between excavation samples at a single location will be performed using alconox and water to clean the samplers. Samples submitted for analysis will not include material, which has been in direct contact with the excavator bucket.

2.4 STORAGE AND DISPOSAL OF INVESTIGATION-DERIVED WASTE

The sampling methods and equipment have been selected to limit both the need for decontamination and the volume of waste material to be generated. Investigation-derived material (e.g., decon sediments and water) generated during this project shall be presumed to be non-hazardous waste and will be characterized for off-site disposal at a permitted and NYSDEC-approved waste disposal facility.

Personal protective equipment and disposable sampling equipment will be placed in plastic garbage bags for disposal as a non-hazardous solid waste.

Decontamination Fluids

Wash water and rinse water, including detergent, may be generated during Site work. Non-phosphate detergent and water rinse will be disposed off-Site along with water generated from excavations if present.

3.0 SAMPLE HANDLING

3.1 SAMPLE IDENTIFICATION/LABELING

Samples will be assigned a unique identification using the sample location or other sample-specific identifier. Sample identification will be limited to seven alphanumeric characters to be consistent with the limitations of the laboratory tracking/reporting software. The general sample identification format follows.

SW - XX - Y-Y

Where:

SW	=	Type of sample (i.e., Side Wall, Excavation Bottom)
XX	=	Numeric character indicating the number from which the sample was obtained.
Y-Y	=	Depth of the sample.

Quality control (QC) field duplicate samples will be submitted blind to the laboratory; a fictitious sample identification will be created using the same system as the original. The sample identifications (of the original sample and its field duplicate) will be marked in the project specific field book and on the copy of the chain-of-custody kept by the sampler and copied to the project manager. Sample containers will be labeled in the field prior to the collection of samples. Affixed to each sampling container will be a non-removable label on which the following information will be recorded with permanent water-proof ink:

- Site name and location;
- Sample identification code;
- Date and time;
- Sampler's initials;
- Preservative; and
- Requested analyses.

3.2 SAMPLES, BOTTLES, PRESERVATION, AND HOLDING TIME

Table 1 specifies the analytical method, matrix, holding time, containers, and preservatives for the various analyses to be completed. Sample bottle requirements and holding times are discussed further below.

3.2.1 Sample Bottles

The selection of sample containers used to collect samples is based on the criteria of sample matrix, analytical method, potential contaminants of concern, reactivity of container material with the sample, QA/QC requirements and regulatory protocol requirements. Sample bottles will be provided by the analytical laboratory and will conform to the requirements of USEPA's Specifications and Guidance for Contaminant-Free sample Containers.

3.2.2 Holding Times

Holding times are judged from the verified time of sample receipt (VTSR) by the laboratory; samples will be shipped from the field to arrive at the lab no later than 48 hours from the time of sample collection. Holding time requirements will be those specified in the NYSDEC ASP; it should be noted that for some analyses, these holding times are more stringent than the holding time for the corresponding USEPA method.

Although trip blanks are prepared in the analytical laboratory and shipped to the Site prior to the collection of environmental samples, for the purposes of determining holding time conformance, trip blanks will be considered to have been generated on the same day as the environmental samples with which they are shipped and delivered. Procurement of bottles and blanks will be scheduled to prevent trip blanks from being stored for excessive periods prior to their return to the laboratory; the goal is that trip blanks should be held for no longer than one week prior to use.

3.3 CHAIN OF CUSTODY AND SHIPPING

A chain-of-custody form will trace the path of sample containers from the project site to the laboratory. A sample Chain of Custody is included in Attachment 1, Field Forms. Sample/bottle tracking sheets or the chain-of-custody will be used to track the containers from the laboratory to the containers' destination. The project manager will notify the laboratory of upcoming field sampling events and the subsequent transfer of samples. This notification will include information concerning the number and type of samples, and the anticipated date of arrival. Insulated sample shipping containers (typically coolers) will be provided by the laboratory for shipping samples. All sample bottles within each shipping container will be individually labeled with an adhesive identification label provided by the laboratory. Project personnel receiving the sample containers from the laboratory will check each cooler for the condition and integrity of the bottles prior to field work.

Once the sample containers are filled, they will be immediately placed in the cooler with ice (in plastic bags to prevent leaking) or synthetic ice packs to maintain the samples at 4 ^{o}C. The field sampler will indicate the sample designation/location number in the space provided on the chain-of-custody form for each sample. The chain of custody forms will be signed and placed in a sealed plastic bag in the cooler. The completed shipping container will be closed for transport with nylon strapping, or a similar shipping tape, and two paper seals will be affixed to the lid. The seals must be broken to open the cooler and will indicate tampering if the seals are broken before receipt at the laboratory. The cooler will be shipped either by laboratory-provided courier or by an overnight delivery service to the laboratory. When the laboratory receives the coolers, the custody seals will be checked and lab personnel will sign the chain-of-custody form.

4.0 QUALITY ASSURANCE/QUALITY CONTROL PROTOCOLS

This section describes the analytical methods, principles and procedures that will be used to generate quality data. These protocols include laboratory calibration, field equipment calibration, QC sample collection and analysis, quantitative evaluation of data quality protocols and data qualification, if necessary.

4.1 ANALYTICAL METHODS, PROCEDURES & CALIBRATION

4.1.1 Methods

Analytical methods to be used during this project are presented in the NYSDEC Analytical Services Protocol (ASP), June 2005. Specific methods and references for each parameter are shown in Table 1. The sample preservation and holding time requirements are also identified in Table 1. Quantification and detections limits for all analysis are those specified under the appropriate test methods.

It is the laboratory's responsibility to be familiar with this document, procedures and deliverables pertaining to the Site work. Alpha Analytical is tentatively scheduled to perform the analytical testing. Alpha is certified by the NYSDOH Environmental Laboratory Approval Program and Contract Laboratory Protocol certified.

4.1.2 Laboratory Instrumentation & Equipment

Laboratory instruments and equipment will be calibrated following SW-846 analytical methods protocol. Initial calibrations will be performed before samples analysis. Calibration checks will be performed at the frequencies specified in each analytical method.

4.1.3 Field Equipment

Field equipment will be used during various activities of the project and during the collection of environmental samples. The field equipment to be used may include the following.

Field equipment used includes:

- OVM with a photoionization detector.
- Electronic water level indicator.
- Multi-gas meter (CO, LEL, O_2, and H_2S).
- Particulate monitor

Field equipment will be cleaned and calibrated prior to use. The Operating and Maintenance (O&M) manuals for the field equipment will be kept in the field when in use and a copy will be retained in project files.

Calibration and standardization for the field equipment during project use will be in accordance with the manufacturer's recommendations, and will be recorded in the field log book. If instrument performance or data fall outside acceptable limits, then corrective actions will be taken. These actions may include recalibration of instruments, acquiring new standards, replacing equipment or repairing equipment. Subcontractors providing analytical services should perform their own internal laboratory audits and calibration procedures with data review conducted at a frequency so that errors and problems are detected early, thus avoiding the prospect of redoing large segments of work.

4.2 QUALITY CONTROL SAMPLES

4.2.1 Analytical Equipment

The analytical methods to be utilized (see Table 1) for laboratory sample analysis address the quality control to be used and the frequency of replicates, blanks and calibration standards for laboratory analytical equipment.

4.2.2 Field Samples

Field quality control samples will consist of trip blanks, sample duplicate, matrix spike and matrix spike duplicate. Trip blanks, for VOCs only, will consist of analyte free reagent grade water in VOC sampling containers to be used for the project. Trip blanks will be prepared at the laboratory, sealed, transported to the Site and returned without being opened to assess contamination that may have occurred during transport. Trip blanks will be submitted at a rate of one per sampling event when VOCs are shipped to the laboratory.

Field duplicate samples are used to assess the variability of a matrix at a specific sampling point and to assess the reproducibility of the sampling method. For soil samples, these samples are separate aliquots of the same sample; prior to dividing the sample into "sample" and "duplicate" aliquots, the samples are homogenized (except for the VOC aliquots, which are not homogenized). Aqueous field duplicate samples are second samples collected from the same location, at the same time, in the same manner as the first, and placed into a separate container. Each duplicate sample will be analyzed for the same parameters as the original sample collected that day. The blind field duplicate Relative Percent Difference (RPD) objective will be $\pm$50% percent RPD for all matrices. Field duplicates will be collected at a frequency of 1 per 20 environmental samples for both matrices (aqueous and non-aqueous) and test parameters.

Matrix spike/matrix spike duplicate (MS/MSD) samples are used to assess the laboratory method's accuracy and precision. These samples are spiked with known quantities of target analytes at the laboratory. The samples are collected at a frequency of five percent(1 in 20).

5.0 DATA DOCUMENTATION

5.1 FIELD NOTEBOOK

Field notebooks will be initiated at the start of on-Site work, in addition to field forms that will be filled out summarizing field work and become part of the project file. The field notebook will include the following daily information for Site activities:

- Date;
- Meteorological conditions (temperature, wind, precipitation);
- Site conditions (e.g., dry, damp, dusty, etc.);
- Identification of crew members (GZA and subcontractor present) and other personnel (e.g., agency or site owner) present;
- Description of field activities;
- Location(s) where work is performed;
- Problems encountered and corrective actions taken;
- Records of field measurements or descriptions recorded; and,
- Notice of modifications to the scope of work.

5.2 FIELD REPORTING FORMS

Field reporting forms (or their equivalent) to be utilized during the remediation may include the following:

- Excavation Log;
- Sample Collection Log;
- Chain of Custody Form; and
- Calibration Log.

These forms, when completed, will become part of the project file.

6.0 CORRECTIVE ACTIONS

If instrument performance or data fall outside acceptable limits, then corrective actions will be taken. These actions may include recalibration or standardization of instruments, acquiring new standards, replacing equipment, repairing equipment, and reanalyzing samples or redoing sections of work. Subcontractors providing analytical services should perform their own internal laboratory audits and calibration procedures with data review conducted at a frequency so that errors and problems are detected early, thus avoiding the prospect of redoing large segments of work.

Situations related to this project requiring corrective action will be documented and made part of the project file. For each measurement system identified requiring corrective action, the responsible individual for initiating the corrective action and also the individual responsible for approving the corrective action, if necessary, will be identified. As part of its total quality management program, GZA makes the results of laboratory audits and data validation reports available to the analytical laboratories. The laboratories are therefore made aware of non-critical items and areas where improvement may be made in subsequent NYSDEC ASP work.

7.0 DATA REDUCTION, VALIDATION, AND REPORTING

The guidance followed to perform quality data validation, and the methods and procedures outlined herein pertain to initiating and performing data validation, as well as reviewing data validation performed by others (if applicable). An outline of the data validation process is presented here, followed by a description of data validation review summaries.

7.1 LABORATORY DATA REPORTING AND REDUCTION

The laboratory will meet the applicable documentation, data reduction, and reporting protocols as specified in the 2005 revision of the NYSDEC ASP CLP. Laboratory data reports for non-CLP data will conform to NYSDEC Category B deliverable requirements. With full CLP documentation, deliverables will include, but not be limited to:

Organics	**Inorganics**
Chains of Custody	Chains of Custody
Blanks	Blanks
Holding Times	Holding Times
Internal Standards	Furnace AA QC
Laboratory Duplicates	CRDL Standards
Tentatively Identified Compounds	ICP Serial Dilutions
GC/MS Instrument Performance Check	Laboratory Control Samples
System Monitoring Compound Recovery	Laboratory Duplicates
Matrix Spike & Matrix Spike Duplicates	ICP Interference Check
GC/MS Tuning	Spiked Sample Recovery
Surrogate Recoveries	

Copies of the laboratory's generic Quality Assurance Plan (QAP) will be on file at GZA. The laboratory's QAP will indicate the standard methods and practices for obtaining and assessing data, and how data are reduced from the analytical instruments to a finished report, indicating levels of review along the way.

In addition to the hard copy of the data report, the laboratory will be asked to provide the sample data in spreadsheet form to minimize possible transcription errors resulting from the manual transcription of data.

7.2 DATA VALIDATION AND DATA USABILITY SUMMARY REPORT

CLP data will be validated by a data validation subcontractor. Data validation will be performed in accordance with guidelines established in Appendix 2B of the NYSDEC DER-10. Where necessary and appropriate, supplemental validation criteria may be derived from the EPA Functional Guidelines (USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, EPA-540/R-94/012, February 1993; and USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA-540/R-94/013, February, 1994).

Data Usability Summary Reports (DUSRs) will consist of text results of the review and marked up copies of Form I (results with qualifiers applied by the validator). Validation will consist of target and non-target compounds with corresponding method blank data, spike and surrogate recoveries, sample data, and a final note of validation decision or qualification, along with any pertinent footnote references. Qualifiers applied to the data will be documented in the report text.

There may be some analyses for which there is no established USEPA or NYSDEC data validation protocol. In such cases, validation will be based on the EPA Region II SOPs and EPA Functional Guidelines as much as possible, as well as the laboratory's adherence to the technical requirements of the method, and the professional judgment of the validator. The degree of rigor in such validation will correspond to the nature of the data and the significance of the data and its intended use. Unless otherwise requested, non-CLP data (e.g., total organic carbon) is not subject to validation.

7.3 FIELD DATA

Field chemistry data collected during air monitoring, and soil screening (e.g., OVM readings), will be presented on field logs and provided in the appendices of the report.

8.0 PERFORMANCE AND SYSTEM AUDITS

An audit of the laboratory(s) during the BCP work will not be performed unless warranted by a problem(s) that cannot be resolved by any other means, or at the discretion of GZA or NYSDEC.

9.0 QUALITY ASSURANCE REPORTS TO MANAGEMENT

Monthly project status reporting to the NYSDEC will include aspects of quality control that were pertinent during the month's activities. Problems revealed during review of the month's activities will be documented and addressed. These reports will include a description of completed and on-going activities, and an indication how each task is progressing relative to the project schedule.

The project manager, through task managers, will be responsible for verifying that records and files related to this project are stored appropriately and are retrievable.

The laboratory will submit memoranda or correspondence related to quality control of this project's samples as part of its deliverables package.

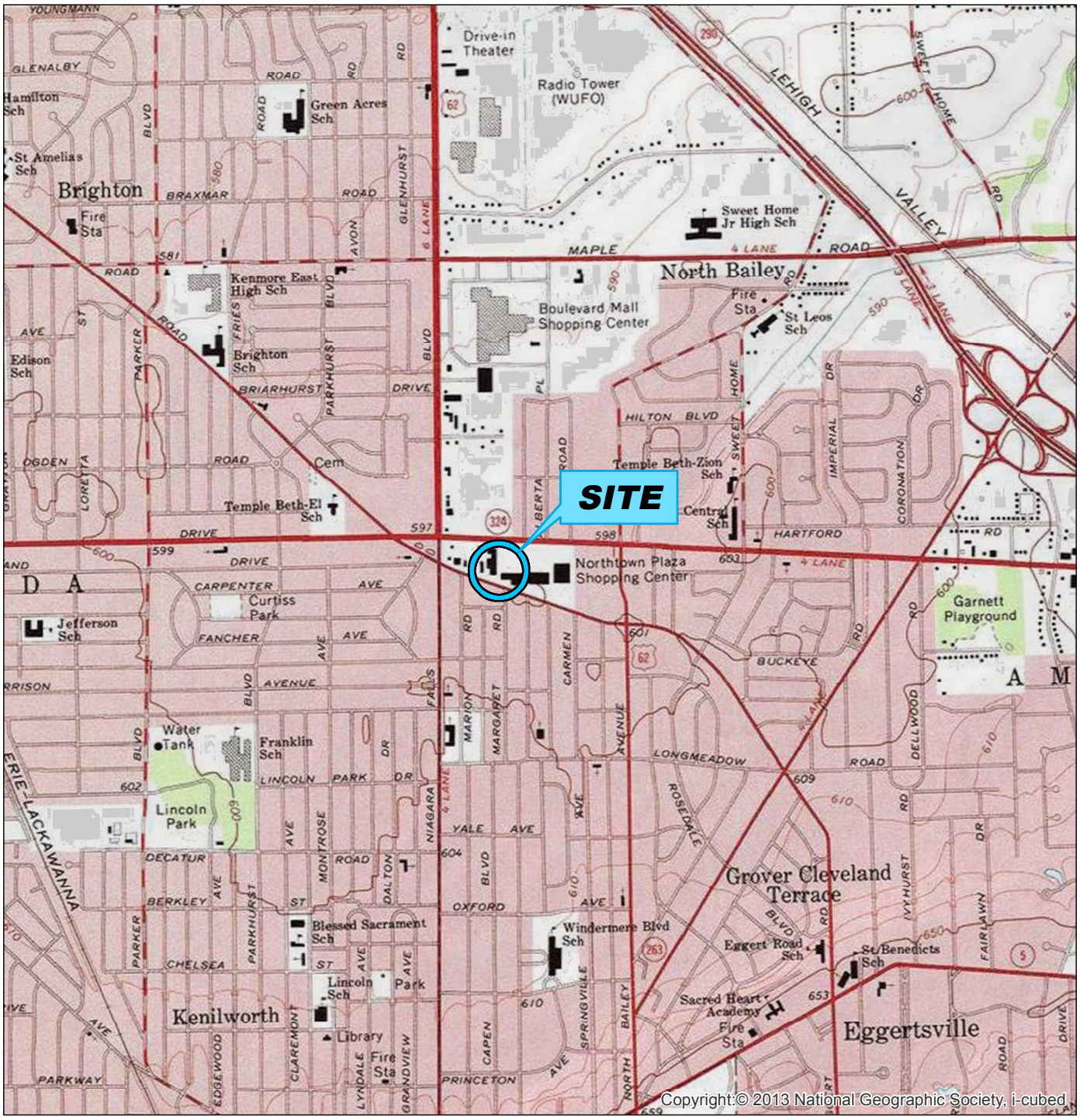
TABLES

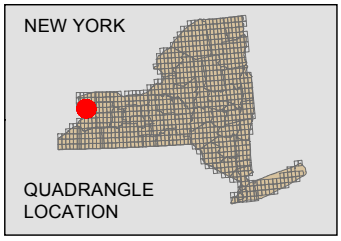
Table 1
Summary of Sample Methods, Container, Preservation and Holding Time Requirements
Quality Assurance Project Plan
Northtown Inc.
Amherst, New York
Brownfield Cleanup Program
Site No. C915292

Analysis	Method	Holding Time (days)		Containers		Preservative
		To Extraction	To Analyze	Number	Type	
Soil Samples						
Volatile Organic Compounds	SW-846 8260B		14	2	L	Cool
Semivolatile Organic Compounds	SW-846 8270C	14	40	1 *	J	Cool
Aqueous Samples						
Volatile Organic Compounds	SW-846 8260B		14	3	G	Cool
Semivolatile Organic Compounds	SW-846 8270C	7	40	2	H	Cool

Notes:
Container Types
G - 40 ml glass, Teflon septum cap liner, HCL
H - 1000 ml glass, Teflon cap liner
J - 8 oz. wide mouth glass, Teflon cap liner
L - 2 oz. glass widemouth with Teflon cap liner
Preservatives
Cool - Cool to 4 degrees Celsius
* - Semi-volatiles analyses can take place from a single 8 ounce glass widemouth jar with a teflon lined cap.

FIGURES





SOURCE : THIS MAP CONTAINS THE ESRI ARCGIS ONLINE USA TOPOGRAPHIC MAP SERVICE, PUBLISHED DECEMBER 12, 2009 BY ESRI ARCIMS SERVICES AND UPDATED AS NEEDED. THIS SERVICE USES UNIFORM NATIONALLY RECOGNIZED DATUM AND CARTOGRAPHY STANDARDS AND A VARIETY OF AVAILABLE SOURCES FROM SEVERAL DATA PROVIDERS

Data Supplied by : esri

0 1,000 2,000 4,000

SCALE IN FEET

N W E S

NO.	ISSUE/DESCRIPTION	BY	DATE

3045 SHERIDAN DRIVE
AMHERST, NEW YORK 14226

PREPARED BY:
GZA GeoEnvironmental, Inc.
of Buffalo
Engineers and Scientists
535 WASHINGTON ST
BUFFALO, NEW YORK 14203

PREPARED FOR:
NORTHTOWN ASSOCIATES, LLC

SITE LOCUS MAP

PROJ MGR: JJR	REVIEWED BY: TGB	CHECKED BY: BK	FIGURE 1
DESIGNED BY: TGB	DRAWN BY: PCF	SCALE: 1 " = 2,000 '	
DATE: April 2015	PROJECT NO. 31.0056687.30	REVISION NO.	

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