

FOCUSED REMEDIAL INVESTIGATION

Final Work Plan

98-335

To Be Conducted At:

**Site Code # 1-30-043S
299 Main Street
Westbury, New York**

Client:

**2632 Realty Development Corp.
1025 Old Country Road
Westbury, New York**

User:

**New York State Department of Environmental Conservation
Bureau of Eastern Remedial Action
Division of Environmental Remediation
50 Wolf Road
Albany, New York**

Dated:

November 23, 1998

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DIVISION

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1.0 INTRODUCTION

This work plan details the various tasks that will be performed in the investigation of 299 Main Street in Westbury, New York (located in the western portion of the New Cassel Industrial Area), herein identified as the "Site". A Multisite PSA Task 4 Report prepared by Lawler, Matusky and Skelly Engineers (LMS) for the New York State Department of Environmental Conservation (NYSDEC) in 1997 identified chlorinated organic solvent contamination in the New Cassel Industrial Area (NCIA). The PSA suggested that the Site was a source of chlorinated organic solvent-related contaminants and that it should remain on the State Registry of Inactive Hazardous Waste Disposal Sites ("State Registry").

2632 Realty Development Corp. is the current owner of the site. The NYSDEC claims that past site operations may have led to groundwater contamination beneath and hydraulically down gradient of the Site with trichloroethylene (TCE), perchloroethylene (PCE) and their transformation compounds. As such, the Site has been designated by the NYSDEC as an inactive hazardous waste disposal site, as defined in ECL 27-1301.2. The site has been listed in the State Registry as Site Number 01-30-043S.

This Focused Remedial Investigation ("Focus Study") will delineate the nature and extent of contamination and the results will be submitted in a Focused Remedial Investigation Report in accordance with the provisions of the Draft Order on Consent between the NYSDEC and 2632 Realty Development Corp. If necessary, a Focused Feasibility Study evaluating remedial action alternatives will later be submitted to the Department pursuant to the terms of the Order on Consent.

2.0 PROPOSED SITE BACKGROUND STUDY

2.1 Site Location

The subject property is located at 299 Main Street in Westbury, New York. This location is on the north side of Main Street between Hopper Street and Garden Street. The areal extent of the subject property is approximately 51,200 square feet or 1.2 acres. A site location map is provided in Plate 1. A base map for the subject property is given in Figure #1.

2.2 Site History

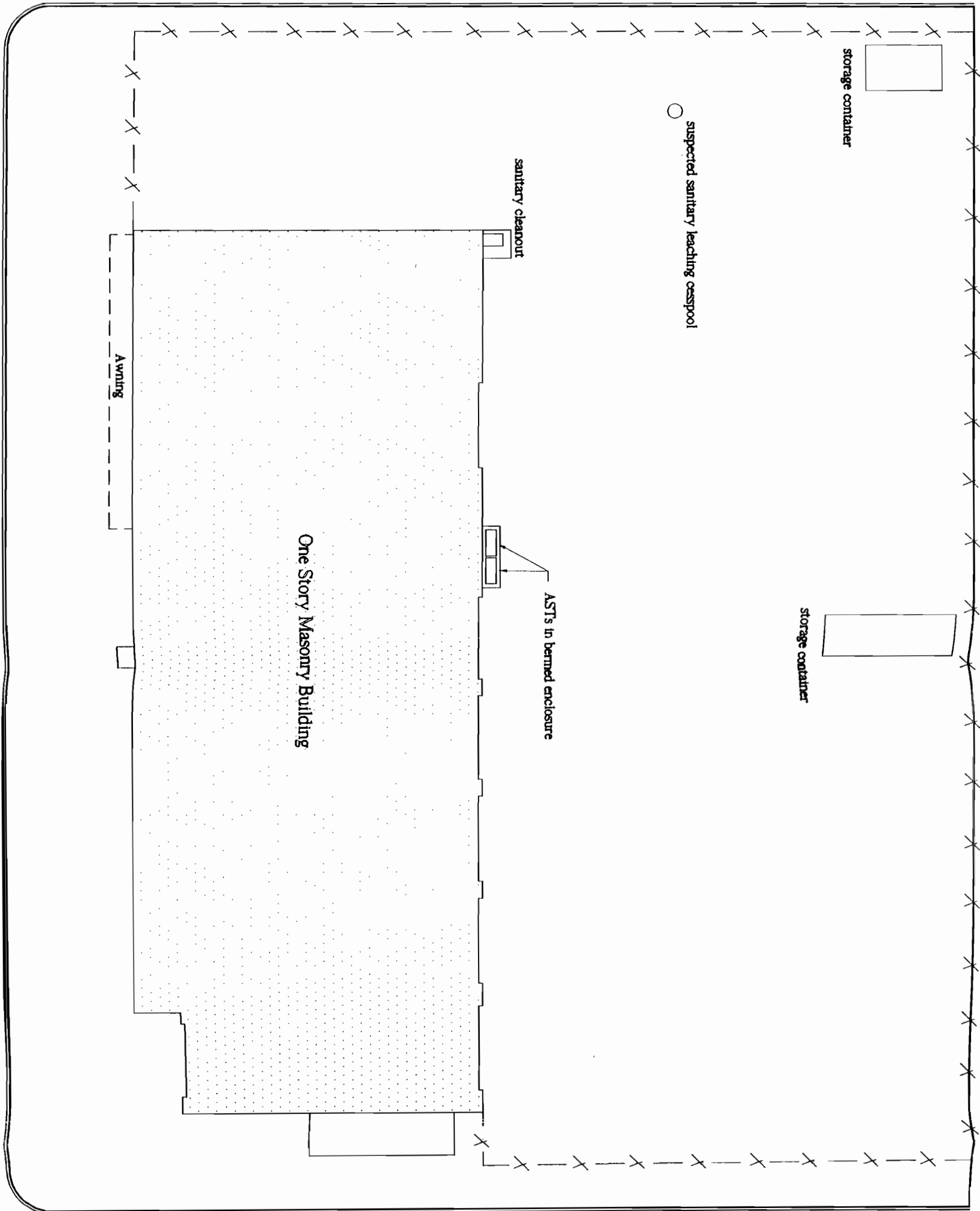
A 50-year site history will be conducted that will include information on past land uses on-site and uses in the immediate vicinity of site. Historic information will be compiled from various private and public sources including the Cole reverse telephone directories, Sanborn fire insurance maps, E. Belcher Hyde maps, LILCO (LIPA) records and aerial photographs.



Plate 1: Site Location Map, Bohemia, Tank

Garden Street

Main Street



Hopper Street



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98-335
Figure #1: Base Map
 New Cassel, New York

- Legend:**
- groundwater probe node
 - soil probe node
 - monitoring well

scale: 1" = 20'

2.3 Site Geology

A thorough discussion of site geology will be presented that will include descriptions of surficial geology, unconsolidated deposits and the underlying bedrock.

2.4 Site Geohydrology

The geohydrology of the Site will be examined using available groundwater potentiometric surface maps and data obtained from the results of the subsurface investigative activities proposed in this document. Additionally, the investigation data will be used to compile a potentiometric map of the water table, determine groundwater transport rates and understand the dynamics of on-site contaminant migration. On-site soils, as well as the location of underground aquifers and the presence of pre-existing wells, will be discussed.

3.0 SITE INVESTIGATIVE ACTIVITIES

3.1 Site Visit

A site survey will be performed under the oversight of an official from the NYSDEC. The survey will identify the present location of on-site buildings, parking lots, drains, underground injection wells, and potential areas of surface contamination (as indicated by the presence of drums, stored or spilled liquid contaminants, or stains). The location of any floor drains that may exist within the building will also be determined. All information collected during the site visit will be entered in a site survey form (See Appendix A).

3.2 Remote Sensing Survey

A ground penetrating radar (GPR) survey will be performed to locate the presence of any sources which may exist on the subject property, such as underground storage tanks, cesspools, leaching pools, etc. The GPR survey will also be used to locate subsurface anomalies that could represent sources of soil and/or groundwater contamination.

The data collected during the survey will be reviewed by the operator and compared against past experience, technical judgment, and prior Site knowledge to classify the anomalies. When a potential source is identified, the location will be marked using a small flag and plotted onto the

site plan. On asphalt, spray paint will be used to delineate the size and orientation of any UST or injection well.

3.3 Locating and Mapping Subsurface Sampling Locations

Soil probes will be installed at locations on the surface of the site on a 50-ft. x 50-ft. square grid. The proposed arrangement of the probe locations is presented in Figure #2. The probe locations will be surveyed on the site and marked using small flags. Any potential point pollution sources identified from the remote survey will be marked with a different flag and subsequently mapped onto the site plan.

The proposed location of the groundwater wells and geoprobe sampling probes are presented in Figure #3. These locations will be surveyed on the site from the site plan and marked using a small flag.

3.4 Evaluation of Emergency Procedures

The routes of emergency egress will be evaluated and marked with surveyor's flagging if necessary. This will be done to ensure that equipment or on-site vehicles cannot temporarily block routes of emergency egress from all boring locations. Additionally, the site safety plan will be reviewed on-site by all workers to insure compliance.

4.0 PROPOSED INVESTIGATION OF SITE SOIL AND GROUNDWATER QUALITY

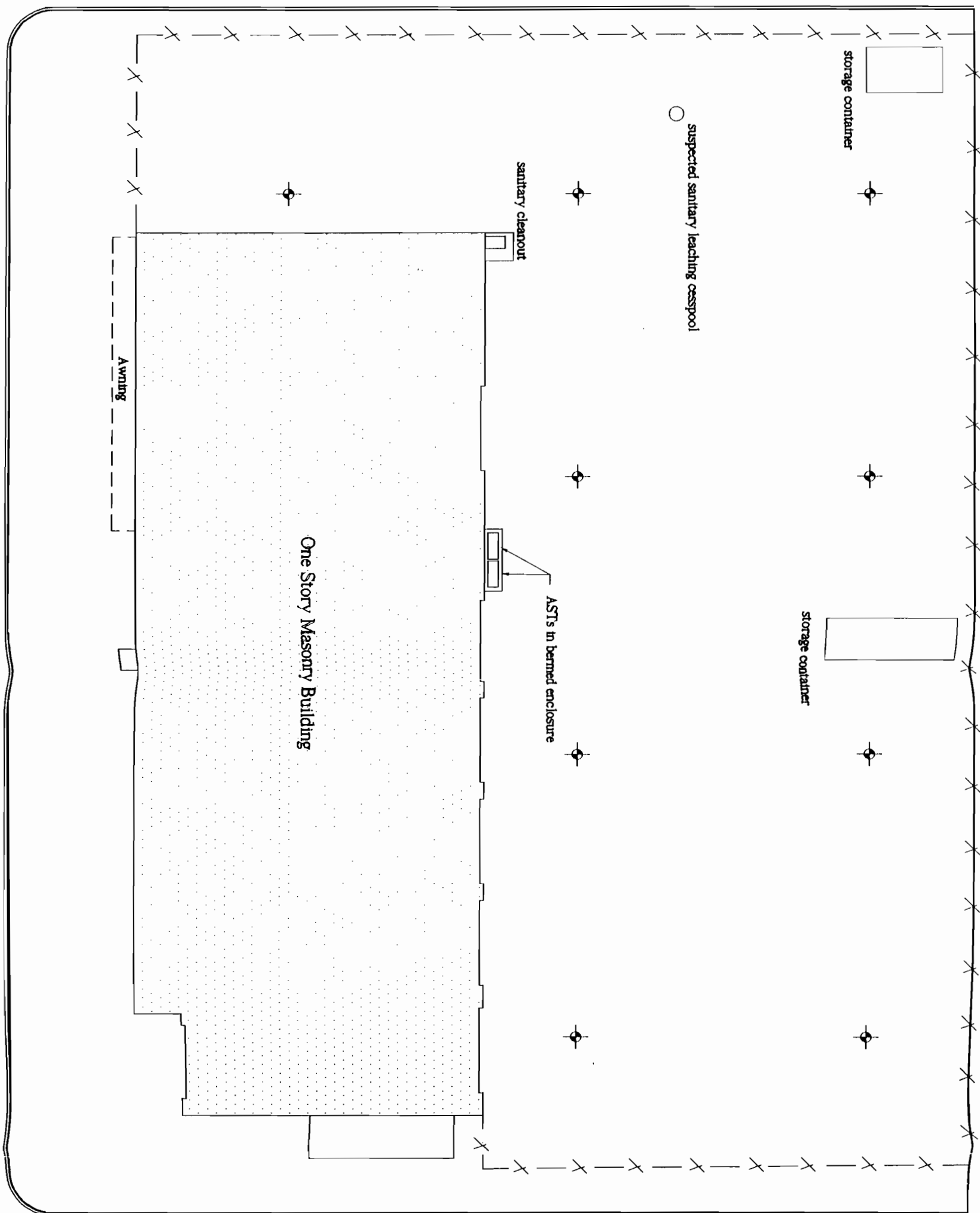
4.1 Soil Sampling

Nine soil probes will be installed at locations on the surface of the site on a 50-ft. x 50-ft. square grid. Samples will be obtained from each probe location on a 15-ft. vertical interval to groundwater. A soil sample will also be obtained from each location at a depth of 10 feet. Additional samples will be obtained where contamination is suspected based upon the results of the GPR survey and the site history. Analysis of these samples will be performed using USEPA test method 8260 for volatile organic compounds. Table 1 below provides a target analyte list for USEPA Method 8260.

A visual inspection of all samples that will be recovered during the installation of each of the probes will be conducted to identify any gross signs of chemical contamination and to classify the sample media.

Garden Street

Main Street



Hopper Street



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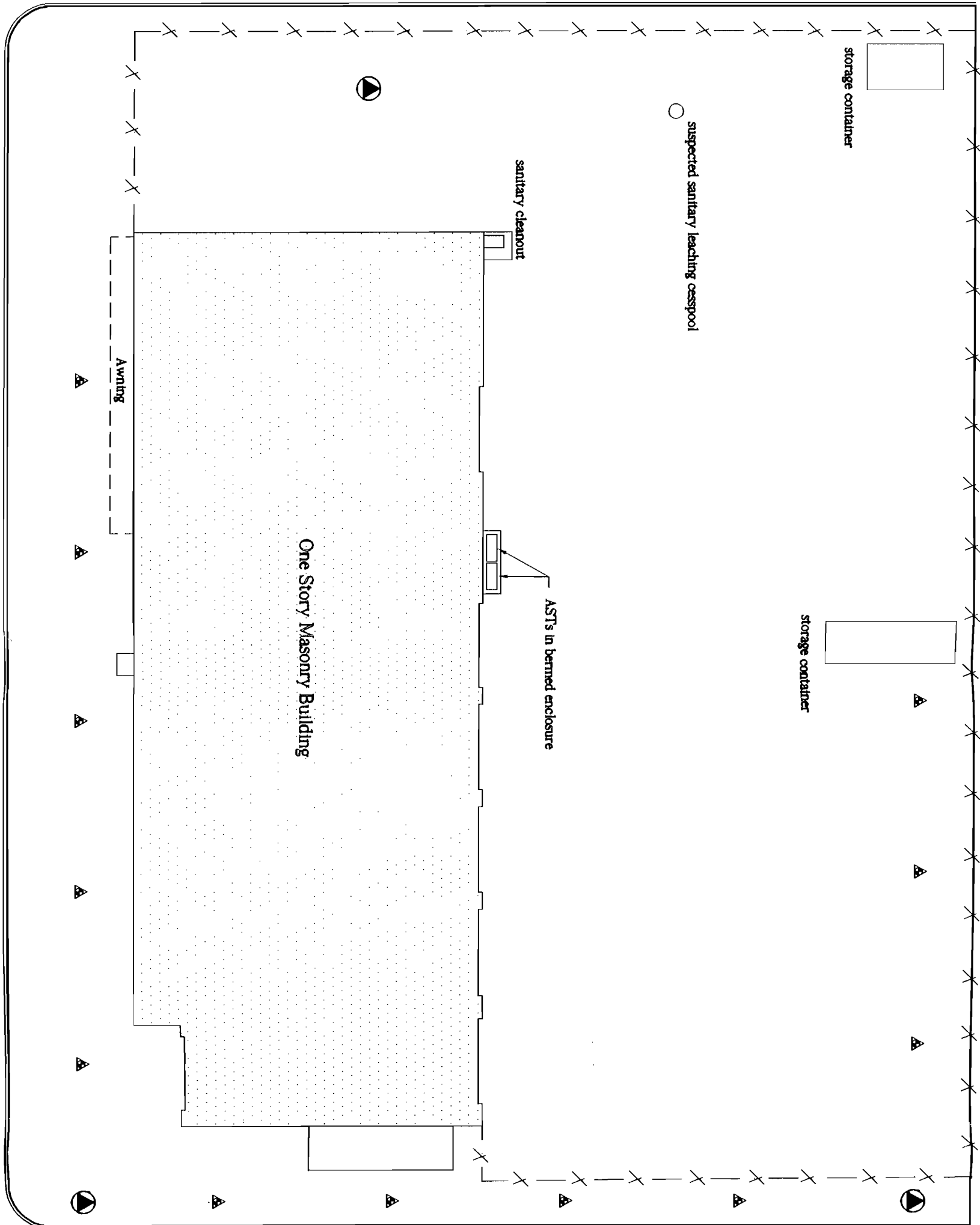
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Figure #2: Soil Acquisition Plan
New Cassel, New York

- Legend;**
- groundwater probe node
 - soil probe node
 - monitoring well

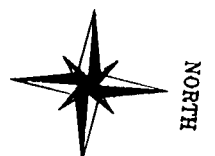
scale: 1" = 20'

Garden Street

Main Street



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Figure #3: Groundwater Acquisition Plan
 New Cassel, New York

Legend;
 ▲ groundwater probe node
 ⊕ soil probe node
 ● monitoring well

scale: 1" = 20'

4.2 Groundwater Sampling

A total of three groundwater monitoring wells will be installed, developed and sampled using the procedures outlined in *A Compendium of Superfund Field Operations Methods*, USEPA, 1987, and 6 NYCRR Part 360.2.11 (C) (1) (I). A minimum of ten additional groundwater samples will be acquired from Geoprobe temporary well points. These well points will be installed at locations where soil contamination is likely based upon the results of the GPR survey and site history. The groundwater samples will be recovered at a depth of approximately 70 feet below grade. Analysis of these samples will be performed using USEPA test method 624 (modified to include target analytes and tentatively identified compounds (TICs) for volatile organic compounds). Additionally, the laboratory will perform the calibration on the samples every 12 hours.

4.3 Proposed Investigation of Point Source Pollution Areas

The information obtained from the site survey (Section 3.1) and the remote survey (Section 3.2) will be used to determine the locations in which hazardous materials, if any were processed, handled, or stored on the subject property (identified as point sources).

4.3.1 *Underground Injection Wells*

Soil probes will be installed within the confines of any storm water drywells, leaching lagoons, waste water disposal wells, retention pits or cesspools identified on-site. Samples will be secured from the probes on a 15-foot vertical interval to groundwater. Analysis of these samples will be performed using USEPA test method 8260 for volatile organic compounds.

4.3.2 *Storage Tanks*

Soil probes will be installed at locations adjacent to any underground storage tanks identified on-site. Samples will be taken from the probes at intervals of eight (8) to ten (10) feet and twelve (12) to fourteen (14) feet below existing grade. Analysis of these samples will be performed using USEPA test methods relevant to the tank content.

In the case of above ground storage tanks, samples will be secured by hand from locations beneath the base. Analysis of these samples will be performed using USEPA test methods relevant to the tank content.

5.0 PROPOSED SUBSURFACE INVESTIGATION PROCEDURES

5.1 GPR Survey Procedures

A qualified Impact Environmental Consulting, Inc. technician will specify a coordinate system on the plainmetric surface of the site to map any subsurface dielectric anomalies detected on the premises. The operator uses knowledge of the subsurface soil composition to calibrate the SIR-2 system to site specific conditions. Factor settings such as range, gain, number of gain points, and scans per unit will be modified to yield the most accurate data to describe the subsurface conditions.

Upon finding a dielectric anomaly, a more spatially specific coordinate system will be designed over the area to determine its size, shape, and orientation.

5.2 Subsurface Geoprobe Installation

Subsurface probes will be installed using a Geoprobe hydraulically powered probing tool (see information on Geoprobe Systems in Appendix B, Figure 2.1, Page 5). Mechanized, vehicle mounted probe systems apply both static force and hydraulically powered percussion hammers for tool placement (static down forces up to 3,000 pounds combined with percussion hammers of eight horsepower continuous output). Recovery of large sample volumes will be facilitated with a probe-driven sampler. The probe-driven sampler consists of a hollow probe that opens via a remote control mechanism at the selected sampling depth in the soil profile to allow soil to enter as it is advanced. Discrete media samples will be secured at the desired depths and are contained within a non-reactive transparent plastic sleeve that lined the hollow probe. The plastic sleeves will be removed for subsequent inspection and sample aliquot acquisition.

5.3 Sample Characterization

A visual inspection of all samples that will be recovered during the installation of each of the probes will be conducted to identify any gross signs of chemical contamination and to classify the sample media. Gradation classifications will be performed in accordance with the Unified Soil Classification System. Color classifications will be made in accordance with the Munsell Classification System. In addition, samples will be screened for VOC contamination using an Hnu or PID meter.

5.4 Geoprobe Temporary Well Point Sampling Procedure

The groundwater sampling system that will be used is the Screen Point 15 that is designed to accurately collect grab samples of groundwater. The Screen Point 15 uses a screen with a standard slot size of 0.004 inches that is sealed inside a 1.5-inch ID alloy steel sheath as it is driven to depth. The screen is sealed inside the sheath with Neoprene O-rings, which prevents infiltration of formation fluids until the desired depth is attained. When the screen has been driven to the depth of interest in the formation, extension rods are used to hold the screen in position as the driving rods are retracted approximately 4 feet. The 4-foot long sampler sheath forms a seal above the screen as it is retracted. A total of 41.5 inches of slotted screen is placed into contact with the formation. The Screen Point 15 groundwater sampler has a total boring diameter of 1.5 inches and the outside diameter of the screen is 1.0 inch. This provides for a maximum of 0.25 inches between the screen and the natural formation as the sampler sheath is retracted. These conditions approach the ideal for natural formation development that can be conducted when lower turbidity samples are required.

Each groundwater sample will be collected from the sampler utilizing 3/8-inch in diameter disposable tubing equipped with a bottom check valve. The tubing is extended from the surface down to the sampler. The tubing is oscillated in a controlled manner to avoid excessive turbulence that would result in a loss of volatile compound from the sample. The collection continues until the check valve has trapped an adequate volume of a groundwater sample. The tubing is then removed and the water is poured into appropriate sample vessels for subsequent laboratory analysis.

5.5 Construction of Site Monitoring Wells

The new wells will be constructed using a five and one-half inch diameter hollow stem auger. The auger annulus will allow the installation of a four-inch monitoring well casing and wire wrapped screen section. The screen slot size will be a function of the gradation of the filter pack (able to hold back at 95% of the filter pack). A filter pack will be installed within the annular space of the auger. The filter pack will extend to a depth of six inches below the bottom of the well screen to a point one-foot above the water table. The material used for the filter pack will consist of clean siliceous sand. The grain size of the filter pack sand will be three to five times the average (50% passing) size of the formation material as determined from existing and proposed sieve analysis. This will minimize the amount of the material entering the well from the screened part of the formation and, at the same time, not inhibit water inflow into the well. A finer grained siliceous sand pack will be placed to a point one-foot above the water table (approximately thirty feet in thickness). A Bentonite seal will be placed above the sand pack using a tremie pipe to form a seal at least three feet thick. Above the seal, a one-foot, fine-grained siliceous sand will be placed to minimize grout infiltration.

Each of the wells will be constructed of four-inch schedule PVC riser, screened at a discrete interval in the saturated soil column. Groundwater at the site occurs under unconfined conditions at approximately 70 feet below grade. The screen casing of the proposed deep wells will be installed at depths ranging from 10 feet below to 10 feet above the groundwater interface. The screened length of each of the wells will be twenty-feet (the bottom twenty-feet). The wells will be constructed of PVC, as it possesses the required tensile strength (risers and threading) to accommodate the required installation depths. Additionally, PVC is resistant and non-reactive with contaminants typically found in landfill plumes and thus will be appropriate material for long term performance without contributing or removing contaminants from the groundwater. The PVC riser and screens will be interconnected with standard flush threaded couplings (ASTM F-480) containing fluorocarbon (Viton) O-rings. A filter pack will be installed around the outside of each well using a tremie pipe. The material used for the filter pack will consist of uniform clean siliceous sand. The PVC screens will be wire wrapped.

A bentonite seal will be placed above the sand pack using a tremie pipe to form a seal at least three feet thick. Above the seal, a one-foot fine-grained siliceous sand pack will be placed to minimize grout infiltration. The balance of the casing annulus will be filled with grout to the surface. The grout will consist of a commercially available high-solids cement/bentonite grout. The grout mixture will set up without being diluted by formation of water, and will displace water in the annular space to ensure a continuous seal. The grout will be placed under pressure using a tremie pipe.

An eight-inch steel casing (manway) will be placed over the four-inch diameter protective screened casing and secured in a surface well seal to adequately protect it. A drain hole will be drilled at the base of the steel casing. A vent hole will be located near the top of the steel casing to prevent explosive gas build up and to allow well water levels to respond naturally to changes in barometric pressure. The annulus of the casing will be filled with gravel. A twelve-inch weather sealed locking cap will have at least two inches of clearance between the top of each clustered well cap and the bottom of the locking cap. Duplicate keys to the locking cap will be submitted to the NYSDEC.

A concrete surface seal will be constructed. The surface seal will extend below the frost line. The top of the seal will be constructed by pouring concrete into a form with a minimum three-foot side. The seal will prevent surface runoff from ponding and entering the well casing. In areas of excessive vehicle traffic, protective bollards will be installed around the seal. Complete construction diagrams for the proposed wells are provided in Appendix C.

The wells will be developed between sampling events by purging three well volumes from each. The field parameters that will be sampled are conductivity, pH, temperature, and turbidity.

6.0 RECORD KEEPING AND DOCUMENTATION

A site field log and a master sample log will be used on-site to record notes pertaining to the sampling. For the groundwater wells, a well log sheet will be used to record information. A sample form is provided in Appendix D.

ICM Laboratories will be used for all laboratory work in this study. A statement of qualifications for ICM can be found in Appendix E.

6.1 Sample Tracking System

In order to provide for proper identification in the field, and proper tracking in the laboratory, all samples must be labeled clear and in a consistent fashion using the procedures and protocols described below and with the following subsections.

Sample labels will be waterproof and have a pre-assigned, unique number that is indelible.

Field personnel must maintain a field notebook. This notebook must be water resistant with sequentially numbered pages. Field activities shall be sequentially recorded at a later time. The notebook, along with the chain of custody form, must contain sufficient information to allow reconstruction of the sample collection and handling procedure at a later time. Each sample shall have a corresponding notebook entry that includes:

- Sample ID number

- Well location and number

- Date and time

- Analysis for which sample was collected

- Additional comments as necessary

- Sampler's name

Each sample must have a corresponding notebook entry on a chain-of-custody form. The manifest entry for sampling at any one well is to be completed before sampling is initiated by the same sampling team at any other well. In cases where the samples leave the immediate control of the sampling team, the samples must be sealed.

6.2 Sample Identification System

Each sample collected shall be designated by an alphanumeric code that shall identify the type of sampling location, the specific location, the matrix sampled, and a specific sample designation. Site specific procedures are described below.

Sample identifications shall contain a sequential code consisting of three segments. The first segment shall designate the project number. The second segment shall identify the location type. Location types shall be identified by a two-letter code. For example, MW will be used for monitoring well and GP for geoprobe. The third segment shall identify the specific sample location. The specific sampling location shall be identified using a three-digit number.

The fourth segment shall identify the matrix type and sample designation or identifier that identifies the sample depth, the sample event number, or other designation depending on the sample type. The matrix type shall be designated by a two-letter code. For example: GW will be used for groundwater. The sample identifier shall be represented by a two digit numeric code. Sampling events or rounds, such as for groundwater sampling shall be numbered in sequence beginning with "01" that corresponds to the round of sampling.

The following shall be a general guide for sample identification:

First Segment	Second Segment	Third Segment	Fourth Segment
NNN	AA	NNN	AANN
Project #	Location Type	Specific Type	Matrix Sample Identifier
963	MW	281	GW01

Symbol Definitions:

A = Alphabetic

N = Numeric

Location Type:

MW = Monitoring Well

GP = Geoprobe

Matrix Type:

S = Soil

GW = Groundwater

Sample Identifier:

1st round of sampling = 01

2nd round of sampling = 02

6.3 Sample Containers and Analytical Requirements

As required in the NYSDEC Analytical Sampling Protocol (ASP), the laboratory must provide all sample containers. If glass bottles are used, extra glass bottles will be obtained from the laboratory to allow for accidental breakage that may occur. Necessary preservatives will be placed in the sample bottles by the laboratory. The sample bottles will be handled carefully so that preservatives and glassware are not inadvertently spilled. All soil samples will be put into four 6-ounce glass jars with Teflon liners. All liquid samples will be put into 40-ml glass vials with Teflon liners.

6.4 Sample Packaging

Samples shall be packaged and shipped according to Section 6.2 of the USEPA's *Compendium of Superfund Field Operations Methods* entitled, "Packaging, Labeling, and Shipping." Chain of custody forms, sample labels, custody seals, and other sample documents shall be filled out as specified in the USEPA *CLP Users Guide*. Sample bottles and samples shall either be delivered/picked up at the site daily by ICM Laboratories, or delivered via overnight courier.

The proper procedures for packaging and shipping must be followed once the samples have been collected.

Packaging

Prior to shipment, samples must be packaged in accordance with current US DOT regulations. All required government and commercial carrier shipping papers must be filled out. The procedure below should be followed regardless of transport method.

As required in the NYSDEC ASP, samples will be transported in metal ice chests or sturdy plastic coolers.

Remove previously used labels, tape, and postage from cooler.

Ship filled sample bottles in same cooler in which empty bottles were received.

Check that all bottle labels are complete.

Check that all sample bottles are tightly capped.

Affix return address labels.

Be sure that chain-of-custody forms are complete.

Wrap sample bottles in bubble pack and place in cooler.

Pack bottles with extra bubble pack, vermiculite, or Styrofoam.

Keep samples refrigerated in cooler with bagged ice or frozen cold packs. Do not use ice for packing material.

Separate and retain the sampler's copy of chain-of-custody.

Tape paperwork in zipper bag to inside of cooler lid.

Close cooler and apply signed and dated custody seal in such a way that the seal must be broken to open the cooler.

Securely close cooler lid with packing or duct tape. Be sure to tape latches and drain plugs in closed position.

Shipping

Samples should arrive at the lab as soon as possible following sample collection to ensure holding times are not exceeded. All samples must be hand delivered on the same day as sampling or sent via overnight courier. Coolers will contain ice packs to maintain a temperature below 4 °F. Samples will be delivered to the laboratory within the seven-day holding period prescribed for VOC analysis.

6.5 Sampling Documentation

The sample team or individual performing a particular activity shall be required to keep a weatherproof field notebook. Field notebooks are intended to provide sufficient data and observations to enable participants to reconstruct events that occurred during projects and to refresh the memory of the field personnel if called upon to give testimony during legal proceedings. In a legal proceeding, notes, if referred to, are subject to cross-examination and are admissible as evidence. The field notebook entries should be factual, detailed, and objective. All entries are to be signed and dated. All members of the field investigation team are to use this notebook, which shall be kept as a permanent record. The field notebook shall be filled out at the location of sample collection immediately after sampling. It shall contain sample descriptions including: sample number, sample collection time, sample location, sample description, sampling method used, daily weather conditions, field measurements, name of sampler, and other site-specific observations. The field notebook shall contain any deviations from the protocol contained herein, visitor's names, community contacts made during sampling, and geologic and other site-specific information that may be noteworthy.

Chain-of-custody forms, sample labels, custody seals, and other documents shall be filled out as specified in Section 4.0 of the USEPA *A Compendium of Superfund Field Operations Manual*, 1987.

Additionally, a dedicated sampling master log shall be maintained as the field program progresses. The sample logbook shall contain the sample number, sample date/time, sampling team, and chain-of-custody.

6.6 Chain-of-Custody Protocol

The primary objective of the sample custody procedures is to create an accurate written record that can be used to trace the possession and handling of all samples from the moment of their collection, through analysis, until their final disposition. Sample custody for samples collected during the investigation will be maintained by the on-site hydrogeologist or the field personnel collecting the samples. Field personnel are responsible for documenting each sample transfer and maintaining custody of all samples until they are shipped to the laboratory.

Chain-of-custody forms will be completed at the time of sample collection and will accompany the samples inside the cooler for shipment to the selected laboratory.

7.0 PERFORMANCE CRITERIA

7.1 Field and Consulting Engineering Services

Impact Environmental Consulting, Inc. (“contractor”) and its designated subcontractors, will perform all field activities. The subcontractors that are anticipated to be used for the performance of the Focus Study are presented below:

ICM Laboratories, Inc.

1152 Route 10

Randolph, NJ 07869

(973) 584-0330

ADT Drilling Corp.

51-41 59th Place

Woodside, NY 11377

(800) 238-3745

Tank Specialists (Excavators)

2 Park Place

Glen Cove, New York

(516) 759-9318

7.2 Site Representation

All on-site activities will be supervised by a representative of 2632 Realty Development Corp. that is qualified to audit all field mobilization and investigative activities. Said representative will be identified as the Project Field Manager. The Project Field Manager will be on-site during the performance of all work performed by the contractor and its subcontractors. The qualifications of key personnel including the Project Field Manager are provided in Appendix F.

7.3 Chronological Description of Focus Study

The time line that will be used for the study is outlined in Table 2.

Table 2
Time Line For Study

Week 1	Week 2	Week 3	Week 4	Week 5
Site Background Study				
Site Investigation Activities				

Week 6	Week 7	Week 8	Week 9	Week 10
Investigation of Soil and Groundwater Quality				

Week 11	Week 12	Week 13	Week 14	Week 15
Report Preparation				

Table 1**USEPA Target Analyte Compounds Determined by Method 8260**

Benzene	Methylene chloride
Bromobenzene	Naphthalene
Bromochloromethane	n-Propylbenzene
Bromodichloromethane	Styrene
Bromoform	1,1,1,2-Tetrachloroethane
Bromomethane	1,1,2,2-Tetrachloroethane
n-Butylbenzene	Tetrachloroethene
sec-Butylbenzene	Toluene
tert-Butylbenzene	1,2,3-Trichlorobenzene
Carbon tetrachloride	1,2,4-Trichlorobenzene
Chlorobenzene	1,1,1-Trichloroethane
Chloroethane	1,1,2-Trichloroethane
Chloroform	Trichloroethene
Chloromethane	Trichlorofluoromethane
2-Chlorotoluene	1,2,3-Trichloropropane
4-Chlorotoluene	1,2,4-Trimethylbenzene
Dibromochloromethane	1,3,5-Trimethylbenzene
1,2-Dibromo-3-chloropropane	Vinyl chloride
1,2-Dibromoethane	
Dibromomethane	
1,2-Dichlorobenzene	
1,3-Dichlorobenzene	
1,4-Dichlorobenzene	
Dichlorodifluoromethane	
1,1-Dichloroethane	
1,2-Dichloroethane	
1,2-Dichloropropane	
1,3-Dichloropropane	
2,2-Dichloropropane	
1,1-Dichloropropene	
Ethylbenzene	
Hexachlorobutadiene	
Isopropylbenzene	
p-Isopropyltoluene	

8.0 REPORTING OF RESULTS

All laboratory-reporting procedures will comply with the NYSDEC ASP and the New York State Department of Health Environmental Laboratory Approval Program (NYSDOH ELAP). In addition, all sample analyses will be done by a NYSDOH ELAP CLP certified laboratory and the data will be reported in the NYSDEC ASP Category B deliverables package format. The NYSDEC Department of Environmental Remediation (DER) Data Usability Summary Report (DUSR) will be used for data review. The data packages will be evaluated according to the DER DUSR Guidelines, Revised 9/97. Richard Parrish and George Wright will author the DUSR.

9.0 HEALTH AND SAFETY PLAN

9.1 Emergency Response

In order to properly prepare for emergencies, personal protective equipment (PPE) will be worn by site workers and first aid equipment will be kept at the site. Material Safety Data Sheets (MSDS) will be maintained for all contaminants that workers may be exposed to.

9.1.1 Onsite Emergency Response

In the event of an accident or emergency situation, emergency procedures will be executed. Said procedures can and will be executed by the first person to observe an accident or emergency situation. The Project Field Manager will be notified about the situation immediately after emergency procedures are implemented. A list of the pertinent personnel authorized to be present on site is as follows:

<u>Title</u>	<u>Name</u>	<u>Telephone Number</u>
Project Manager	George Wright	(516) 269-8800
Health & Safety Officer	Richard S. Parrish	(516) 269-8800
Project Field Manager	Keith Franzen	(516) 269-8800
Site Safety Officer	Jim Mulvey	(516) 269-8800

Title	Name	Telephone Number
Client Contact	Charlotte Biblow	(516) 357-3000
Site Contact	Paula Scappatura	(516) 333-4005
State Agency Contact (NYS DEC)	Anna Ruepp	(518) 457-1708
Quality Assurance Officer	Rich Parrish	(516) 269-8800

9.1.2 *Emergency Contacts*

Ambulance/Emergency:	<i>Nassau County Medical Center</i> 516-572-6655
Police:	911 or <i>Westbury Police Dept.</i> 516-573-5275
Fire Department:	<i>Westbury Fire Dept.</i> 516-921-0000
Poison Control Center:	800-336-6997
Hospital:	<i>Nassau County Medical Center</i> 516-572-0123
Directions:	Take Garden Street south and turn left onto Grand Blvd. Continue east on Grand Blvd. and turn right onto Carman Ave. Travel approximately two miles south on Carman Ave. and the hospital will be on the left immediately after the Nassau County Jail.
State Police:	516-756-3300
National Response Center:	800-424-8802
US EPA (24 hour hotline):	800-424-9346

9.1.3 *Who to Contact Before Initiating Subsurface Investigation Work*

Impact Environmental Consulting, Inc. ("Impact") representatives are responsible for contacting appropriate agencies prior to conducting on-site activities when applicable.

Gas Company:	<i>Brooklyn Union Gas</i> 718-643-4050
Telephone Company:	<i>Bell Atlantic</i> 516-661-6000
Electric Company:	<i>Marketspan</i> 516-222-7700

9.1.4 Contingency / Evacuation Plan

It may be possible that a site emergency could necessitate the evacuation of all personnel from the site. If such a situation develops, an audible alarm shall be given for site evacuation (consisting of an air horn). Personnel shall evacuate the site in a calm and controlled fashion and regroup at a predetermined location. The route of evacuation will be dependent on wind direction, severity, type of incident, etc.

The site must not be re-entered until back-up help, monitoring equipment, and/or personal protective equipment are on hand and the appropriate regulatory agencies have been notified.

9.1.5 Standard Procedures for Injury

1. Telephone for ambulance/medical assistance if necessary. Whenever possible, notify the receiving hospital (listed in 9.1.2) of the nature of physical injury or chemical overexposure. If no phone is available, transport the person to the nearest hospital. Refer to Appendix for map to hospital.
2. Bring this Health and Safety Plan with the attached MSDS's to the medical facility with the injured person.
3. If the injury is minor, proceed to administer first aid.
4. Notify the Site Safety Officer, Project Manager, and the Regional Safety Director of all accidents, incidents, and near emergency situations.

9.1.6 Emergency Treatment

When transporting an injured person to a hospital, bring this Health and Safety Plan to assist medical personnel with diagnosis and treatment. In all cases of chemical overexposure, follow standard procedures as outlined below for poison management, first aid, and, if applicable, cardiopulmonary resuscitation. Different routes of exposure and their respective first aid/poison management procedures are outlined below.

9.1.7 Ingestion

Do not induce vomiting unless prompted by a health professional. Transport person to nearest hospital immediately.

9.1.8 Inhalation / Confined Space

Do not enter a confined space to rescue someone who has been overcome unless properly equipped and a standby person present.

9.1.9 Inhalation / Other

Move the person from the contaminated environment. Initiate CPR if necessary. Call or have someone call for medical assistance. Refer to MSDS for additional specific information. If necessary, transport the victim to the nearest hospital as soon as possible.

9.1.10 Skin Contact / Non-Caustic Contaminant (Petroleum, Gasoline, etc.)

Wash off skin with a large amount of water immediately. Remove any affected clothing and rewash skin using soap, if available. Transport person to a medical facility if necessary.

9.1.11 Skin Contact / Corrosive Contaminant (Acids, Hydrogen Peroxide, etc.)

Wash off skin with a large amount of water immediately. Remove any affected clothing and rewash skin with water. Transport person to a medical facility if necessary.

9.1.12 Eyes

Hold eyelids open and rinse the eyes immediately with large amounts of water for 15 minutes. Never permit the eyes to be rubbed. Transport person to a medical facility as soon as possible.

9.2 Informational Summary

9.2.1 *Health and Safety Summary*

Chemicals of Concern: Benzene, MTBE, Tetrachloroethene, Toluene, Trans 1,2 Dichloroethane, Trichloroethene, Xylene(s), Vinyl Chloride.

These chemicals are of moderate to low hazard. Therefore, modified level D personal protective equipment will be required at all times when on site. Changes to this requirement will be required as follows.

Level C protection, as described in this plan, will be available at a minimum for those activities that involve surface and subsurface soil (strata disturbance, such as well installation, and all subsurface media sampling activities such as split-spoon sampling and borings).

The Site Safety Officer will determine whether or not a level of protection can be upgraded or downgraded. Changes in the level of protection will be recorded in the dedicated site logbook along with the rationale for the changes. Level D protection may be used for those activities that do not pose a potential threat of exposure to toxic or hazardous substances. Typical Level D activities may include sediment, logging and groundwater sampling, as well as surficial site surveys. Level C protection equipment should be readily available at all times. Consistent with OSHA training, prior to donning Level C, oxygen percent must be continuously monitored.

Action levels represent those conditions that a person requires an upgrade of personal protective equipment (PPE). Organic vapor concentrations are to be monitored in the field by the use of a flame ionization or photo ionization detector (FID or PID) with readings being taken in a breathing zone occupied by field personnel to determine whether an action level has been exceeded. The information presented below applies to the above chemical constituents. All air monitoring results should be logged on the Vapor Monitoring Sheet in Appendix G.

All initial site access and activities will be done in Level D attire.

Ionization Detector Response

Flame Ionization Detector (FID)

<u>Concentrations (in ppm)</u>	<u>Level of PPE Required</u>
0.0 to 5.0	Level D
5.0 to 250.0	Level C
250.0 to 750.0	Level B
Above 750.0	Immediately withdraw from the area

Combustible Gas Response

Combustible Gas Indicator (CGI)

<u>Results (% of LEL)</u>	<u>Procedure</u>
0.0 to 20.0	Continue with normal activity
Above 20.0	Immediately withdraw from the area

Oxygen Detector Response

Combustible Gas Indicator (CGI)

<u>Results (% Oxygen)</u>	<u>Procedure</u>
0.0 to 19.5	Level B PPE is required
19.5 to 23.0	Continue with normal activity
Above 23.0	Immediately withdraw from the area

9.3 Introduction

This HASP describes the procedures to be followed in order to reduce employee exposure to potential health hazards that may be present at the project site. The emergency response procedures necessary to respond to such hazards are also described within this HASP.

9.3.1 Purpose

The purpose of this Health and Safety Plan (HASP) is to provide the contractor's field personnel, subcontractors, and other visitors with an understanding of the potential chemical and physical hazards that exist or may arise while the tasks of this project are being performed.

9.3.2 Objective

This Health and Safety Plan is required in accordance with OSHA 29 CFR 1910.120. The primary objective is to ensure the well being of all field personnel and the community surrounding this site. In order to accomplish this, project staff and approved subcontractors shall acknowledge and adhere to the policies and procedures established herein. Accordingly, all personnel assigned to this project shall read this HASP and sign the Agreement and Acknowledgment Statement (Appendix) to certify that they have read, understood, and agree to abide by its provisions.

The contractor's personnel have the authority to stop work performed by our subcontractors at this site if said work is not performed in accordance with the requirements of this HASP.

9.3.3 Amendments

Any changes in the scope of work of this project and/or site conditions must be amended in writing and approved by the Regional Health and Safety Manager.

9.4 Hazard Evaluation

9.4.1 Site Tasks

The field tasks covered by the HASP may include well installation, development, gauging, and bailing; soil & groundwater handling/sampling; and confined space (excavation) entry and job task hazards.

9.4.2 Job Task Hazards

The following hazards may be encountered.

- Organic Vapors

The inhalation of volatile organic vapors during all operations can pose a potential health hazard. Hazard reduction procedures include monitoring the ambient air with a FID and the use of appropriate PPE. Workers should stand upwind of the source of contamination whenever possible.

- Flammable Vapors

The presence of flammable vapors can pose a potential fire and health hazard. Hazard reduction procedures include monitoring the ambient air with an oxygen/LEL meter (combustible gas indicator). If the LEL reading exceeds 20%, leave the site immediately and contact the fire department.

- Oxygen

Atmospheres that contain a level of oxygen greater than 23% pose an extreme fire hazard (the usual ambient oxygen level is approximately 20.5%). This hazard can be compounded by the fact that vapors associated with this site are highly flammable. All personnel encountering atmospheres that contain a level of oxygen greater than 23% must evacuate the site immediately and must notify the Fire Department. If the oxygen level is less than 19.5%, do not enter the space without level B PPE.

- Vehicular Traffic

All employees will be required to wear a fluorescent safety vest at all times while on site. In addition, supplemental traffic safety equipment use can be exercised when warranted by specific task. Supplemental equipment can be items such as cones, flags, barricades, and/or caution tape.

9.4.3 Well Installation, Development, Gauging, Bailing; Soil & Groundwater Sampling

Skin and eye contact with contaminated groundwater and/or soil may occur during these tasks. Nitrile gloves and approved safety glasses must be worn.

9.4.4 Sample Preservation

When hydrochloric acid is used, skin and eye contact can occur. This hazard can be reduced with the use of Nitrile gloves and safety glasses. Safety goggles should be worn if there is a potential for a splash hazard.

9.4.5 Cleaning Equipment

Skin and eye contact with methanol, “Alconox”, or other cleaning substances can occur while decontaminating equipment. This hazard can be reduced with the use of Nitrile gloves and safety glasses.

9.4.6 Confined Space Entry

Excavation pits, storage tanks, soil trenches, subsurface vaults, basements, and sheds are examples of confined spaces. Confined spaces can be identified as an area having one of the following characteristics:

- Limited access and egress
- Unfavorable for natural ventilation
- Not designed for continuous human occupancy

Organic and/or combustible vapors may be trapped in confined spaces, resulting in lack of oxygen (anoxia) and/or overexposure to vapors. When site work takes place in a confined space, the air must be monitored for oxygen level, flammable vapors, and toxic vapors.

The following air monitoring procedures must be followed before entering a confined space.

a. Oxygen Level

Monitor for percent oxygen with an oxygen/LEL meter (e.g., CGI) to ensure an oxygen level between 19.5 and 23%. Because of the high vapor density of the contaminants associated with this site, there is a high probability that vapors in the enclosed spaces or vaults will replace any oxygen that is present, even if the space is open to the air.

Therefore, oxygen level monitoring will be done at the top, middle, and bottom of the enclosed space to determine if there is a minimum acceptable oxygen level of 19.5% prior

to entry. The oxygen/LEL meter is factory-set to sound an alarm at levels less than 19.5% oxygen. **If oxygen is less than 19.5% or greater than 23%, do not enter the space.**

b. Explosive Vapors

Monitor the percentage of the Lower Explosive Limit (LEL) with an oxygen/LEL meter to determine whether vapor concentrations within the confined space are within the flammable range. If LEL readings exceed 10%, personnel should exercise extreme caution, use non-sparking tools, and utilize ventilation engineering controls to reduce LEL levels. The oxygen/LEL meter is factory set to sound an alarm at levels greater than 20% LEL. If LEL readings exceed 20%, **personnel MUST leave the site immediately and contact the project manager.**

c. Toxic Vapors

Monitor for toxic vapors with a FID (e.g., Photovac OVA) to determine whether toxic vapors within the confined space exceed the action levels. PID readings will be taken at the top, middle, and bottom of a vault, shed, or other confined space to determine vapor levels.

Summary

Do not enter the confined space unless:

- the oxygen concentration is between 19.5 and 23%;
- the LEL is less than 20%; and
- FID readings are less than 250 ppm (a respirator must be worn if the readings exceed 5 ppm)

All monitoring equipment must be calibrated and maintained in accordance with manufacturer's recommendations.

9.4.7 Occupational Noise

Requirements set forth in the OSHA Hearing Conservation Regulation (OSHA 1910.95) shall be adhered to during work on-site. Hearing protection shall be provided to the employees where sound pressure levels exceed 85 dB. Hearing protection shall be worn where sound pressure levels in areas and/or on equipment exceeds 90 dB. Typical drilling

operations have been monitored with a sound level meter and indicate that hearing protection is required for all personnel while engaged in this action.

9.4.8 Heat Stress

Since climatic changes cannot be avoided, work schedules will be adjusted to provide time intervals for intake of juices, juice products, and water in an area free from contamination and in quantities appropriate for fluid replacement.

Heat stress may occur even in moderate temperature areas and may present any or all of the following:

A. Heat Rash

Result of continuous exposure to heat, humid air, and chafing clothes. Heat rash is uncomfortable and decreases the ability to tolerate heat.

B. Heat Cramps

Result of the inadequate replacement of body electrolytes lost through perspiration. Signs include severe spasms and pain in the extremities and abdomen.

C. Heat Exhaustion

Result of increased stress on the vital organs of the body in the effort to meet the body's cooling demands. Signs include shallow breathing; pale, cool, moist skin; profuse sweating; and dizziness.

D. Heat Stroke

Result of overworked cooling system. Heat stroke is the most serious form of heat stress. Body surfaces must be cooled and medical help must be obtained immediately to prevent severe injury and/or death. Signs include red, hot, dry skin, absence of perspiration, nausea, dizziness and confusion, strong, rapid pulse, coma, and death.

Heat Stress Prevention

- A. Replace body fluids (water and electrolytes) lost through perspiration. Solutions may include a 0.1% salt and water solution or commercial mixes such as

“Gatorade”. Employees must be encouraged to drink more than the amount required in order to satisfy thirst.

- B. Use cooling devices to aid the natural body ventilation. Cooling occurs through evaporation of perspiration and limited body contact with heat-absorbing protective clothing. Utilize fans and air conditioners to assist in evaporation. Long, cotton underwear is suggested to absorb perspiration and limit any contact with heat-absorbing protective clothing (i.e., coated Tyvek suits).
- C. Conduct non-emergency response activities in the early morning or evening during very hot weather.
- D. Provide shelter against heat and direct sunlight to protect personnel. Take breaks in shaded areas.
- E. Rotate workers utilizing protective clothing during hot weather.
- F. Establish a work regime that will provide adequate rest periods, with personnel working in shifts.

Heat Stress Monitoring

Heat stress may occur even in moderate temperatures and may present heat rash, heat cramps, heat exhaustion, and/or heat stroke.

Monitoring procedures should be implemented to prevent heat stress arising from environmental conditions, use of PPE, and/or intensity of workload.

For temperatures above 70 °F, the following regime shall be followed for workers wearing permeable coveralls:

<u>Adjusted Temperature</u>	<u>Normal Ensemble</u>	<u>Impermeable Ensemble</u>
90 °F or above	After 45 min. of work	After 15 min. of work
87.5 to 90 °F	After 60 min. of work	After 30 min. of work
82.5 to 87.5 °F	After 90 min. of work	After 60 min. of work
77.5 to 82.5 °F	After 120 min. of work	After 90 min. of work
72.5 to 77.5 °F	After 150 min. of work	After 120 min. of work

Workers wearing semipermeable or impermeable encapsulating protective clothing should be monitored for heart rate and temperature when the temperature in the work area is above 70 °F. In order to monitor the worker, measure:

- A. Heart rate - Count the radial pulse during a 30-second period as early as possible in the rest period. If the heart rate exceeds 110 beats per minute at the beginning of the rest period, shorten the next work cycle by one-third.
- B. Oral temperature - Use a clinical thermometer or similar device to measure the oral temperature at the end of the work period (before drinking). If oral temperature exceeds 99.6 °F, shorten the next work cycle by one-third.

Do not permit a worker to wear a semipermeable or impermeable garment if the core body temperature exceeds 100.6 °F.

Workers shall not be required to continue working if they feel any of the symptoms of heat stress. Rest periods should be a minimum of 15 minutes. Length of rest period should be extended as appropriate or as recommended by the Site Safety Officer or alternate.

9.4.9 Exposure: Cold Stress

Work schedules will be adjusted to provide sufficient rest periods in a heated area for warming up during operations conducted in cold weather. Also, thermal protective clothing such as wind and/or moisture resistant outerwear is recommended to be worn.

If work is performed continuously in the cold at or below -7 °C (20 °F), including wind chill factor, heated warming shelters (tents, cabins, company vehicles, rest rooms, etc.) shall be made available nearby and the worker should be encouraged to use these shelters at regular intervals, the frequency depending on the severity of the environmental exposure. The onset of heavy shivering, frostnip, the feeling of excessive fatigue, drowsiness, irritability, or euphoria, are indications for immediate return to the shelter. When entering the heated shelter, the outer layer of clothing shall be removed and the

remainder of the clothing loosened to permit sweat evaporation. A change of dry work clothing shall be provided as necessary to prevent workers from returning to their work with wet clothing.

Dehydration, or the loss of body fluids, occurs in the cold environment and may increase the susceptibility of the worker to cold injury due to a significant change in blood flow to the extremities. Warm sweet drinks and soups should be provided at the work site to provide caloric intake and fluid volume. The intake of coffee should be limited because of a diuretic and circulatory effect (Adapted from TLV's and Biological Exposure Indices 1988-1989, ACGIH).

9.5 Personal Protective Equipment

The following is a breakdown of the types of protective clothing and equipment to be used during the site activities. Personal protective equipment (PPE) is in conformance with EPA criteria for Level B, C, and D protection. All respiratory protective equipment used will be approved by NIOSH/MSHA.

Level C protection, as described in this plan, will be available at a minimum for those activities that involve surface and subsurface soil (strata disturbance such as well installation, and all subsurface media sampling activities such as split-spoon sampling and borings). Some activities may require Level B protection. In atmospheres potentially containing toluene and xylenes, the protective ensemble should include chemical resistant clothing since the two compounds have skin absorption potential.

The Site Safety Officer will determine whether or not a level of protection can be upgraded or downgraded. Changes in the level of protection will be recorded in the dedicated site logbook along with the rationale for the changes. Level D protection may be used for those activities that do not pose a potential threat of exposure to toxic or hazardous substances. Typical Level D activities may include sediment, logging and groundwater sampling, as well as surficial site surveys. Level C protection equipment

should be readily available at all times. Consistent with OSHA training, prior to donning Level C, the percentage of oxygen must be continuously monitored.

Level D

- hard hat
- safety glasses
- steel toe and shank boots
- fluorescent vest
- splash goggles
- hearing protection (as appropriate)

Modified Level D

- hard hat
- safety glasses
- steel toe and shank boots
- fluorescent vest
- Nitrile "N-Dex" inner gloves
- latex outer boots (chemical resistant)
- splash goggles
- polyethylene coated Tyvek suit
- hearing protection (as appropriate)

Level C

- buddy system required at all times
- full face respirator with NIOSH approved OV/AG/HEPA combination cartridges (MSA GMC-H)
- Saranex coated Tyvek Suit
- inner Nitrile "N-Dex" gloves
- outer Nitrile (NBR) gloves
- steel toe and shank boots
- outer boots (chemical resistant)

- hard hat
- hearing protection (as appropriate)

Level B

Regional Health and Safety representatives must be on site upon start-up of any project requiring level B protection. This should be understood to include subcontractors conducting Level B activity.

- buddy system required at all times
- supplied air respirator or SCBA
- Saranex coated Tyvek Suit
- inner Nitrile "N-Dex" gloves
- outer Nitrile (NBR) gloves
- steel toe and shank boots
- outer boots (chemical resistant)
- hard hat
- hearing protection (as appropriate)

Note: Respirator cartridges will be changed once per day at a minimum. This can be accomplished at the end of the work day during respirator decontamination. If odor breakthrough is detected while wearing the respirator or if breathing becomes difficult, change cartridges immediately.

Contact with contaminated surfaces, or surfaces suspected of being contaminated, should be avoided. This includes walking through, kneeling in, or placing equipment in puddles, mud, discolored surfaces, or on drums and other containers. Eating, smoking, drinking, and/or the application of cosmetics in the immediate work area is prohibited.

When utilizing protective garments such as Tyvek suits, gloves, and booties, all seams between protective items will be sealed with duct tape.

The use of contact lenses on the job site is strongly advised against. However, when glasses are not available, contact lenses are preferred over faulty vision. When contact lenses are worn, safety glasses and/or goggles must be worn at all times while on the job site.

9.6 Decontamination

9.6.1 *General*

Personnel involved in work activities at the site may be exposed to compounds in a number of ways, despite the most stringent protective procedures. Site personnel may come in contact with vapors, gases, mists, or particulates in the air, or other site media while performing site duties. Use of monitoring instruments and site equipment can also result in exposure and transmittal of hazardous substances.

In general, decontamination involves scrubbing with a detergent water solution followed by clean water rinses. All disposable items shall be disposed of in a dry container. Certain parts of contaminated respirators, such as harness assemblies and leather or cloth components, are difficult to decontaminate. If grossly contaminated, they may have to be discarded. Rubber components can be soaked in detergent and water and scrubbed with a brush. In addition to being contaminated, all respirators, non-disposable protective clothing, and other personal articles must be sanitized or replaced before they can be used again if they become soiled from exhalation, body oils, and perspiration. The manufacturer's instructions should be followed in sanitizing the respirator masks.

The Site Safety Officer will be responsible for the proper maintenance, decontamination, and sanitizing of all respirator equipment.

The decontamination zone layout and procedures should match the prescribed levels of personal protection. A detailed discussion for the establishment of the project decontamination zone and the procedures required for the various levels of personnel protection follows.

Exclusion Zone (EZ)

It is within this zone that the work activities are performed. No one shall enter this zone unless the appropriate PPE is donned.

Contaminant Reduction Zone (CRZ)

It is within this zone that the decontamination process is undertaken. Personnel and their equipment must be adequately decontaminated before leaving this zone for the support zone. This zone will be set up between the EZ and a well-ventilated open area.

Support Zone (SZ)

The support zone is considered to be uncontaminated; as such, protective clothing and equipment are not required but should be available for use in emergencies. All equipment and materials are stored and maintained within this zone. Protective clothing is put on in the SZ before entering the CRZ. The SZ will be established in a safe environment.

The following procedures have been established to provide site personnel with minimum guidelines for proper decontamination. Personnel leaving the point of operations designated as the EZ must follow these minimum procedures. The decontamination process shall take place at a reasonable distance away from any area of potential contamination.

9.6.2 Minimum Decontamination Procedure

Personnel leaving the point of operations should wash outer gloves and boots. At a minimum, the outer boots shall be removed first and stored in an appropriate area or disposed of properly. Outer boots must be properly washed where gross contamination is evident. Personnel shall then remove and dispose of the Tyvek suits. Personnel should remove the Tyvek suits so that the inner clothing does not come in contact with any contaminated surfaces. After Tyvek removal, personnel shall remove and discard outer Nitrile gloves. Personnel shall then remove the respirator, where applicable. Respirators shall be disinfected between uses with towelettes or other sanitary methods. Potable

water, at a minimum, will be present so that site personnel can thoroughly wash hands and face after leaving the point of operations.

Portable wash stations shall be utilized for easy and efficient access. The wash station shall consist of a potable water supply, hand soap, and clean towels. Portable sprayer units filled with Alconox solution and potable water should also be available to wash and rinse off grossly contaminated boots, gloves, and equipment. The Site Safety Officer will monitor decontamination procedures to ensure their effectiveness. Modifications of the decontamination procedure may be necessary as determined by the Site Safety Officer's observations.

9.6.3 Standard Decontamination Procedure

The following decontamination procedures should be implemented during site operations for the appropriate level of protection.

Level B

Segregated equipment drop

Deposit equipment (tools, sampling devices, notes, monitoring instruments, radios, etc.) used on the site onto plastic drop cloths.

Boot covers and glove wash

Outer boots and outer gloves should be scrubbed with a decontamination solution of detergent and water or replaced.

Rinse off boot covers and gloves

Decontamination solution should be rinsed off boot covers and gloves using generous amounts of water. Repeat as many times as necessary.

Tape removal

Remove tape from around boots and gloves and place into container with plastic liner.

Boot cover removal

Remove disposable boot covers and place into container with plastic liner.

Outer glove removal

Remove outer gloves and deposit in container with plastic liner.

Suit / safety boot wash

Completely wash splash suit, SCBA, gloves, and safety boots. Care should be exercised that no water is allowed into the SCBA regulator. It is suggested that the SCBA regulator be wrapped in plastic.

Suit / safety boot rinse

Thoroughly rinse off all decontamination solution from protective clothing.

Tank or canister changes

This is the last step in the decontamination procedure for those workers wishing to change air tanks and return to the EZ. The worker's air tank or cartridge is exchanged, new outer glove and boot covers are donned, and joints taped.

Removal of safety boots

Remove safety boots and deposit in container with a plastic liner.

SCBA backpack removal

Without removing the face piece, the SCBA backpack should be removed and placed on a table. The face piece should then be disconnected from the remaining SCBA unit and then proceed to the next station.

Splash suit removal

With care, remove the splash suit. The exterior of the splash suit should not come in contact with any inner layers of clothing.

Inner glove wash

The inner gloves should be washed with a mild decontamination solution (detergent / water)

Inner glove rinse

Generously rinse the inner gloves with water.

Face piece removal

Without touching the face with gloves, remove the face piece. The face piece should be deposited into a container that has a plastic liner.

Inner glove removal

Remove the inner glove and deposit into a container that has a plastic liner.

Field wash

Wash hands and face thoroughly. If highly toxic, skin corrosive, or skin absorbent materials are known or suspected to be present, a shower should be taken.

Level C and Level D

The decontamination procedure for Level C and Level D personal protection will employ applicable steps detailed in the Level B decontamination process.

9.6.4 Sampling Equipment and Sample Container Decontamination

All non-disposable sampling equipment will be decontaminated with an Alconox / water solution followed by a clean water rinse. As an added precaution against cross-contamination, all non-disposable sampling equipment will be rinsed with distilled water. All disposable sampling equipment will be properly disposed of in dry containers.

Before leaving the site, all sample containers will be thoroughly decontaminated using a detergent and water solution followed by a clean water rinse. The decontamination procedure should include a complete scrubbing of the container's surface to remove

possible contamination. Care must be exercised to prevent damage to sample container identification labels.

9.7 Health and Safety Requirements

9.7.1 *Medical Monitoring Program*

A baseline physical examination must be conducted on all employees before they are permitted to engage in sampling, cleanup, and remedial action work. A complete medical survey should be completed on each employee upon start of employment. Yearly re-examination should be performed to update information on employee health status. Additional re-evaluation will be considered in the event of a chemical overexposure. These medical surveillance requirements shall comply with OSHA regulations as defined in 29 CFR 1910.120.

9.7.2 *Training*

All personnel working at this site should have received a minimum of 40 hours of initial hazardous waste activity instruction, and a minimum of three days of field experience under direct supervision of a trained, experienced person. Personnel assigned to the site will also receive eight hours refresher training per year. On-site managers and supervisors directly responsible for employees engaged in hazardous waste operations have received an additional eight hours of supervisory training. These training requirements comply with the OSHA Hazardous Waste Operations and Emergency Response Regulation, 29 CFR 1910.120.

9.7.3 *Visitor Policy*

All visitors and/or trainees on site must submit to the limitations described herein.

9.7.4 Work Zone Area

Work and support areas shall be established based on ambient air data and proposed work sites. They shall be established in order to contain contamination within the smallest areas possible and shall ensure that each employee has the proper PPE for the area or zone in which work is to be performed.

9.7.5 First Aid Equipment

Vehicles used for site work will be equipped with a first aid kit and safety equipment including:

- fluorescent vests
- cones (and flags as needed)
- hazard tape (barricades as needed)
- mounted fire extinguisher (10 pound A/B/C type)
- working flashlight
- water, suitable for drinking
- portable eye wash
- first aid kit with appropriate bandage material
- full body harness with lifeline (for confined space entry)

9.7.6 Fire Prevention

During equipment operation, periodic vapor concentration measurements should be taken with an explosimeter or combustimeter. If at any time the vapor concentrations exceed 20% of the LEL, then the Site Safety Officer or designated field worker should immediately shut down all operations.

Only approved safety cans will be used to transport and store flammable liquids.

All gasoline and diesel-driven engines requiring refueling must be shut down and allowed to cool prior to filling.

Smoking is not allowed during any operations within the work area in which petroleum products or solvents in free-floating, dissolved, or vapor forms, or other flammable liquids may be present.

No open flame or spark is allowed in any area containing petroleum products or other flammable liquids.

9.7.7 Heavy Machinery / Equipment

All site employees must remain aware of those site activities that involve the use of heavy equipment and machinery. Respiratory protection and protective eyewear may be worn frequently during site activities. This protective equipment significantly reduces peripheral vision of the wearer. Therefore, it is essential that all employees at the site exercise extreme caution during operation of equipment and machinery to avoid physical injury to themselves or others.

9.7.8 Additional Safety Practices

The following are important safety precautions that will be enforced during work activities.

1. Eating, drinking, chewing gum or tobacco, smoking, or any practice that increases the probability of hand-to-mouth transfer and ingestion of material is prohibited in any area designated as contaminated.
2. Hands and face must be thoroughly washed upon leaving the work area and before eating, drinking, or any other activity.
3. Whenever decontamination procedures for outer garments are in effect, the entire body should be thoroughly washed as soon as possible after the protective garments are removed.
4. No excessive facial hair that interferes with the effectiveness of a respirator will be permitted on personnel required to wear respiratory protection equipment. The respirator must seal against the face so that the wearer receives air only

through the air purifying cartridges attached to the respirator. Fit testing shall be performed prior to respirator use to ensure the wearer obtains a proper seal.

5. Contact with potentially contaminated surfaces should be avoided whenever possible. One should not walk through puddles; kneel on the ground; lean, sit, or place equipment on drums, containers, vehicles, or the ground.
6. Medicine and alcohol can potentate the effect from exposure to certain compounds. Prescribed drugs and alcoholic beverages should not be consumed by personnel involved in the project.
7. Personnel and equipment in the work areas should be minimized, consistent with effective site operations.
8. Work areas for various operational activities should be established.
9. Procedures for leaving the work area must be planned and implemented prior to going to the site. Work areas and decontamination procedures must be established on the basis of prevailing site conditions.
10. Respirators will be issued for the exclusive use of one worker and will be cleaned and disinfected after each use.
11. Safety gloves and boots shall be taped to the disposable, chemical-protective suits as necessary.
12. All unsafe equipment left unattended will be identified by a "DANGER, DO NOT OPERATE" tag.
13. Noise mufflers or earplugs may be required for all site personnel working around heavy equipment. This requirement will be at the discretion of the Site Safety Officer. Disposable, form-fitting plugs are preferred.
14. Cartridges for air-purifying respirators in use will be changed daily at a minimum.

9.8 Project Personnel

9.8.1 Project Manager

The Project Manager will be responsible for implementing the project and obtaining any necessary personnel or resources for the completion of the project. Specific duties will include:

- coordinating the activities of all subcontractors, to include informing them of the required PPE and insuring their signature acknowledging this Site Safety Plan
- selecting a Site Safety Officer and field personnel for the work to be undertaken on site
- ensuring that the tasks assigned are being completed as planned and on schedule
- providing authority and resources to ensure that the Site Safety Officer is able to implement and manage safety procedures
- preparing reports and recommendations about the project to clients and affected personnel
- ensuring that all persons allowed to enter the site (i.e., EPA, contractors, state officials, visitors are made aware of the potential hazards associated with the substances known or suspected to be on site, and are knowledgeable as to the on-site copy of the specific site safety plan.
- ensuring that the Site Safety Officer is aware of all of the provisions of this site safety plan and is instructing all personnel on site about the safety practices and emergency procedures defined in the plan
- ensuring that the Site Safety Officer is making an effort to monitor site safety, and has designated a Field Team Leader to assist with the responsibility when necessary.

9.8.2 Site Safety Officer

The Site Safety Officer shall be responsible for the implementation of the site safety plan on site. Specific duties will include:

- monitoring the compliance of field personnel for the routine and proper use of the PPE that has been designated for each task.
- routinely inspecting PPE and clothing to ensure that it is in good condition and is being stored and maintained properly.
- stopping work on the site or changing work assignments or procedures if any operation threatens the health and safety of workers or the public.
- monitoring personnel who enter and exit the site and all controlled access points.

- reporting any signs of fatigue, work-related stress, or chemical exposures to the Project Manager and/or Health and Safety Officer.
- dismissing field personnel from the site if their actions or negligence endangers themselves, co-workers, or the public, and reporting the same to the Project Manager.
- reporting any accidents or violations of the site safety plan to the Project Manager and documenting the same for the project in the records.
- knowing emergency procedures, evacuation routes, and the telephone numbers of the ambulance, local hospital, poison control center, fire and police departments.
- ensuring that all project-relating personnel have signed the personnel agreement and acknowledgments form contained in this site safety plan.
- coordinate upgrading and downgrading PPE as necessary due to changes in exposure levels, monitoring results, weather, and other site conditions.
- perform air monitoring with approved instruments in accordance with requirements stated in this Site Safety Plan.

9.8.3 Project Field Manager

In the event that the Project Manager and the Site Safety Officer are not on site, the Project Field Manager will assume all responsibility of the Site Safety Officer.

9.8.4 Other Field Personnel

All field personnel shall be responsible for acting in compliance with all safety procedures outlined in the Site Safety Plan. Any hazardous work situations or procedures should be reported to the Site Safety Officer so that corrective steps can be taken.

10.0 QUALITY ASSURANCE/QUALITY CONTROL PROTOCOL

The following sampling QA/QC protocol is in accordance with the United States Environmental Protection (USEPA) Agency's accepted sampling procedures for hazardous waste streams

(Municipal Research Laboratory, 1980, *Sampling and Analysis Procedures for Hazardous Material Waste Streams*, Office of Emergency and Remedial Response, Cincinnati, Ohio. EPA-600/280-018) and The American Society of Testing and Material's (ASTM) sampling procedures.

10.1 Sampling Personnel

The activities associated with the survey, sampling and analysis plan will be performed by or under the auspices of a Quality Assurance Officer (Richard Parrish, see qualifications in Appendix F). The sample staff (samplers) will possess a minimum of a B.A. Degree in the Earth, Space or Biological Sciences or a B.S. Degree in Engineering. Samplers had a minimum of one (1) year experience in environmental/geological fieldwork. Additionally, all samplers will have received mandatory forty-hour Occupational Safety and Health Administration (OSHA) training on working with potentially hazardous materials and appropriate Hazard Communication Program and "Right-To-Know" training.

10.2 Sampling Equipment

Separate QA/QC measures will be implemented for each of the instruments used in the performance of the SAP.

10.2.1 Geoprobe

Prior to arrival on the subject property and between sample locations, the probes will be decontaminated by steam cleaning, Alconox wash, and rinsing with distilled water. This will be followed by air drying as per project requirements. All sampling apparatus will be dedicated or disposable. A clean, new liner will be used for each sample. Parts will be inspected for wear and damage before each use.

10.2.2 Bailers

In order to prevent contamination, all bailers will be dedicated and disposable.

10.3.3 Laboratory-Custody Procedures

A designated sample custodian will accept custody of the shipped samples and will verify that the information on the sample tags matches that on the Chain-of-Custody Records. Pertinent information as to shipment, pick-up, courier, etc., will be entered in the "remarks" section. The custodian will enter the sample tag data into a bound logbook.

The laboratory custodian will use the sample tag number, or assign a unique laboratory number to each sample tag, and assure that all samples will be transferred to the proper analyst or stored in the appropriate source area. The laboratory custodian will distribute samples to the appropriate analysts. Laboratory personnel will be responsible for the care and custody of samples, from the time they are received, until the sample is exhausted or returned to the sample custodian. All identifying data sheets and laboratory records will be retained as part of the permanent documentation. Samples received by the laboratory will be retained until after analysis and quality assurance checks are completed.

11.0 COMMUNITY HEALTH AND SAFETY PLAN

Due to the minimal ground disturbance that is anticipated during the sampling phase of the project, it is expected that only a small impact from generated dust could occur in the vicinity of the site. Well installation using the hollow stem auger, Geoprobe sampling, and GPR work can generate dust in small quantities. The ingress and egress of onsite vehicles can also create airborne dust.

To minimize the effects of dust on the community, sampling will only be performed on days that the local wind speeds (as measured by the National Weather Service at JFK Airport) are below 15 mph. All onsite vehicles will be required to travel at speeds no greater than 15 mph.

APPENDIX G

VAPOR MONITORING SHEET

[illegible]