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Soil Vapor Intrusion
Indoor Air
Outdoor Air
Sampling Work Plan
For
Little Tor Road, New City NY
Site No. V00310-3
April 17, 2013

Vapor Intrusion Investigation

Sub-slab vapor sampling will be performed to evaluate the potential for soil vapor intrusion to occur at the onsite buildings. Two permanent sub-slab sampling ports, identified as SG-1 and SG-2, will be installed in the storage basements of the Pizza Parlor and the adjacent Indian Restaurant at the middle of the building. Location of the proposed additional sampling ports can be referenced with the attached drawing.

Sub-slab samples will be acquired from sampling ports SG-1, and SG-2. Indoor air samples will be collected concurrently and co-located with sub-slab samples. In addition, an outdoor ambient air will be collected simultaneously with the sub-slab and indoor air samples. The samples will be subjected to ELAP certified laboratory analysis. The samples will be collected via summa canisters equipped with 8 hour calibrated valves. The laboratory analysis will consist of full TO-15 list of analytes which includes the contaminants of concern, PCE and its associated breakdown products, TCE, DCE and VC. The detection limits for TCE, VC and carbon tetrachloride will achieve 0.25 ug/m3 for all samples. All other analytes will meet 1 ug/m3 detection limit.

Sub-Slab Port Installation Procedures

A 3/8-inch diameter hole will be drilled through the concrete slab using an electric drill. The drill bit will be advanced approximately 2-inches into the sub-slab material to create an open cavity. The vapor probe will consist of a length of polyethylene tubing which will then be inserted into the hole. Approximately 1-inch of coarse sand will be inserted into the hole to cover the tip of the probe. The tubing implant will be sealed to the surface with a non-VOC containing material consisting of permagum grout or beeswax. Drill cuttings will be swept up.

Sub-Slab Sampling Procedures
Prior to attaching the sample container, the vapor probe/tubing will be purged of 1-3 probe volumes to eliminate air within the tubing. The flow rate during purging will not exceed 0.2 liters/minute. Prior to sample collection, helium trace gas testing will be performed at each sample port to determine whether a proper seal has been obtained at each port. A plastic shroud will be utilized over each port and the atmosphere in the immediate vicinity of the sampling port will be enriched by trace gas. A vapor sample will be collected via pump utilizing a real time helium detection meter. If the trace gas is present at greater than 10% the sample is considered diluted and the seal will be readjusted until retesting indicates tracer gas is not present at a concentration greater than 10%.

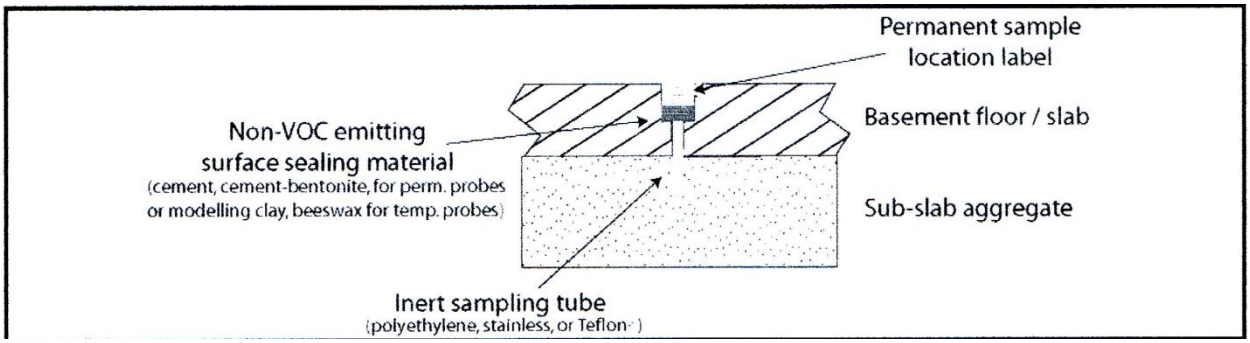
Following purging and trace gas testing, the tubing will be attached to a 6-liter summa canister fitted with an 8-hour flow regulator. Immediately after opening the summa canister, the initial vacuum (inches of mercury) will be noted. After approximately 8 hours, the summa canister will be closed and the final vacuum noted (the flow rate during sampling will not exceed 0.2 liter per minute and the final pressure will not reach zero). Air samples will be delivered to a laboratory certified to perform air analysis in New York State.

Sample collection and analysis will be conducted in a fashion that will achieve the lowest possible analytical detection limits in order to properly evaluate the data.

Indoor/Outdoor Air
Two indoor ambient air samples will be collected adjacent to and concurrently with sub-slab samples (SG-1 and SG-2). 6-liter summa canisters fitted with 8-hour flow regulators will be placed within the breathing zone (3 feet above ground surface). Sample collection will commence once sub-slab sampling has begun. Immediately after opening the summa canister, the initial vacuum (inches of mercury) will be noted. After approximately 8 hours, the summa canister will be closed and the final vacuum noted (the flow rate during sampling will not exceed 0.2 liter per minute and the final pressure will not reach zero). Air samples will be delivered to a laboratory certified to perform air analysis in New York State. The laboratory analysis will consist of full TO-15 list of analytes which includes the contaminants of concern, PCE and its associated breakdown products, TCE, DCE and VC. The detection limits for TCE, VC and carbon tetrachloride will achieve 0.25 ug/m3 for all samples. All other analytes will meet 1 ug/m3 detection limit.

Ambient outdoor air sample will be collected from an upwind area not affected by the site. The proposed location is indicated on the attached figure however the location may be relocated based on wind direction. Temperature, relative humidity, barometric pressure, and precipitation conditions will be documented prior to and at the conclusion of sampling. Ambient photoionization detector readings will be noted before sampling as well as observations of odors and potential interferences such as gas staions, factories, heavy equipment operation, etc. Immediately after opening the summa canister, the initial vacuum (inches of mercury) will be noted. After approximately 8 hours, the summa canister will be closed and the final vacuum noted (the flow rate during sampling will not exceed 0.2 liter per minute and the final pressure will not reach zero). Air samples will be delivered to a laboratory certified to perform air

analysis in New York State. The laboratory analysis will consist of full TO-15 list of analytes which includes the contaminants of concern, PCE and its associated breakdown products, TCE, DCE and VC. The detection limits for TCE, VC and carbon tetrachloride will achieve 0.25 ug/m3 for all samples. All other analytes will meet 1 ug/m3 detection limit.



Schematic of Sub-Slab Vapor Probe to be Installed

Pre-sampling Building Inspection/Preparation and Product Inventory
Twenty four hours (24) hours prior to sample collection, occupants of on-site buildings will be advised to minimize opening of windows and doors and use of ventilations systems. In addition occupants will be advised to avoid smoking inside and use of paints/solvents/fuels or other products/activities that may interfere with sample results. The on-site buildings will be inspected for specific characteristics including, but not limited to the type of construction, airflow patterns, building systems (ie: heating and ventilation) and recent renovations. The inspection will also include: a product inventory of chemicals currently stored/used in on-site buildings; use of a photoionization detector to measure vapor concentrations to evaluate precursory air quality data; and identify building features that may function as preferential pathways (ie; sumps, cracks in foundation, floor drains, etc.).

The pre-building inspection and product inventory will be detailed in the Structure Sampling Questionnaire and Building Inventory Survey form that will be completed for each sample location.

Record Keeping and Documentation
<u>Sampling Documentation</u>
The sample team or individual performing a particular activity shall be required to keep a weatherproof Site field notebook. The Site field notebook will be used on-site to record notes pertaining to the field sampling plan. 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.

Sample Containers and Analytical Requirements

All sample vessels will be "level A" certified decontaminated containers supplied by a New York State Certified Commercial Laboratory.

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
- 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 location is to be completed before sampling is initiated by the same sampling team at any other location. In cases where the samples leave the immediate control of the sampling team, the samples must be sealed.

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.

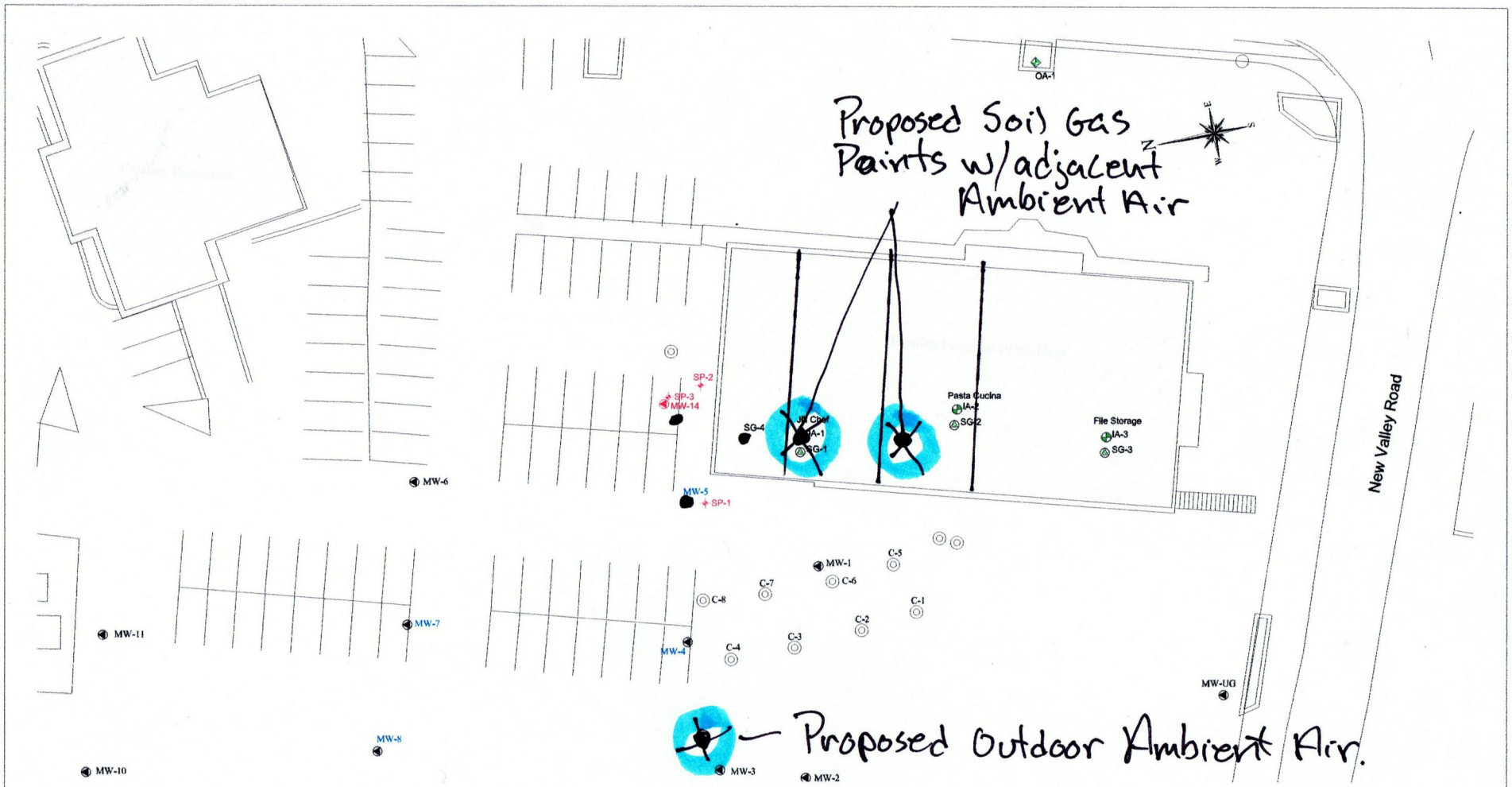
Chain-of-Custody Protocol

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 field personnel collecting the samples. Field personnel are responsible for documenting each sample transfer and maintaining custody of all samples until they are transferred to the mobile laboratory.

Final documentation

Preliminary SVI data will be provided to the agencies for review as soon as they are available so that actions, if required, can be taken. This will be followed by a detailed report on the sampling event and data, including all observations and deviations from the approved WP. Sample results will be provided to the property owner within 30 days of data validation. The SVI report will be provided within 30 days.

5 Total Air Samples



Legend

- Groundwater Monitoring Well
- Soil Probe

TITLE: Proposed Soil Survey Locations

Little Tor Road Site
New City, New York

DRAWN BY:	WF
CHECKED BY:	KK
DATE:	9-18-2009
SCALE:	1" = 30'

Scale In Feet: 10 5 0 10 20 30

PROJECT # 04-268
PLATE # 01

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