

February 3, 2016
GEI Project 1512010



Consulting
Engineers and
Scientists

Ms. Sarah Saucier, P.E.
Division of Environmental Remediation
New York State Department of Environmental Conservation
625 Broadway
Albany, NY 12233-7014

**Re: Soil Vapor Intrusion Evaluation Work Plan
Operable Unit 2
Haverstraw 93B Maple Avenue Former MGP Site
Haverstraw, New York
NYSDEC Site # 3-44-044**

Dear Ms. Saucier:

GEI Consultants, Inc., P.C. (GEI), on behalf of Orange and Rockland Utilities, Inc. (O&R), has prepared this Work Plan to describe proposed methods for performing soil vapor intrusion (SVI) evaluation sampling at Operable Unit 2 (OU2) of the Haverstraw 93B Maple Avenue Former Manufactured Gas Plant (MGP) site.

Background

O&R executed an Administrative Consent Order (ACO) with the NYSDEC on July 13, 1998 for the 93B Maple Avenue Former MGP site. Interim Remedial Measures (IRMs) were performed for two separate Operable Units (OU1 and OU2) to accomplish the remedial work. The Phase I IRM corresponds to Operable Unit 1 (OU1). NYSDEC issued a Record of Decision (ROD) for OU1 in March 2005 that approved unrestricted land use for the OU1 area.

The Phase II IRM corresponds to Operable Unit 2 (OU2). Remedial excavation was conducted in 2004 and 2005 at 99, 103, and 104 Maple Avenue, and in-situ chemical oxidation (ISCO) activities were performed at 93B and 95 Maple Avenue. Because the excavation portion of the IRM achieved the cleanup objectives for Unrestricted Residential Use, neither an Operation, Maintenance, and Monitoring (OM&M) Plan nor Institutional Controls are required for the 99, 103, and 104 Maple Avenue properties. The NYSDEC issued a ROD for OU2 in March 2006.

For the OU2 portions of 93B and 95 Maple Avenue parcels, the ISCO activities significantly reduced the total mass of total polycyclic aromatic hydrocarbons (TPAH) within the treated areas, but did not achieve the cleanup objectives required to achieve Unrestricted land use. Therefore an Institutional Control and SMP are required for 93B and 95 Maple Avenue parcels. The SMP for this area is currently being updated and will be submitted to the NYSDEC.

The garage at 93B Maple Avenue has not been used since the ISCO remediation was performed. The owner of the garage has been re-located to an off-site area to conduct the business formerly conducted in the building. Before the property owner may re-occupy the garage, the NYSDEC and the NYSDOH have indicated that SVI evaluation sampling will need to be performed to assess the potential for an exposure to constituents in air in this building. A proposed scope of work for performing the SVI evaluation is described below.

SVI Evaluation Scope of Work

Figure 1 shows the garage building at the 93B parcel and the proposed locations for the SVI samples.

Field procedures for the SVI evaluation will be performed in general accordance with the NYSDOH's "Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York" (October 2006). The tasks for the evaluation are summarized as follows:

- **Correspondence and Notification** – O&R will contact the property owner to arrange access to the garage. Following approval for access, GEI will then notify the agencies of the planned schedule for the SVI field activities.
- **Initial Site Reconnaissance and Utilities** – GEI will perform an initial reconnaissance prior to the SVI sampling event. A Dig Safely NY stakeout will be called in. A meeting will be requested and GEI will meet with any companies or municipalities involved to mark out and document utilities around the building. GEI will subcontract a utility locating company to further assess whether there may be subsurface utilities present around the building and beneath the concrete floor slab for the garage.
- **NYSDOH Documentation** – During the reconnaissance, if products or chemicals are observed in the garage, they will be documented in a NYSDOH Product Inventory Form. If possible, the products and chemicals will then be moved out of the garage so that the materials will not have the potential to adversely affect the indoor air results.
- **SVI Evaluation Sampling** – GEI will complete a second mobilization to the garage to perform the SVI sampling.
 - Two sub-slab soil vapor sampling points will be located underneath the garage concrete floor. One sample will be located in the former ISCO footprint, and one in the portion of the garage where non-impacted conditions were identified (Figure 1).
 - Once locations clear of utilities have been identified, temporary sub-slab soil vapor points will be installed by drilling holes through the concrete floor slab and advancing the drill bit 2 to 3 inches into the sub-slab material to create an open cavity. Dedicated Teflon® tubing will be used and the inlet will be set just above the bottom of the cavity, or directly below the concrete slab. The sampling port will be sealed with an inert non-shrinking sealant such as inert clay.
 - Sample collection will begin approximately 15 minutes after soil vapor point installation. A chamber will be created above the point. Helium will be used as a tracer gas to evaluate whether the tubing has been sealed from the ambient air above ground. Approximately three implant volumes of air will be purged using a pump set at a flow rate not to exceed 0.2 liters per minute.
 - After purging, a photo-ionization detector will measure volatile organic compound (VOC) concentrations inside the tubing.
 - A 6-liter SUMMA® canister with a flow controller that is calibrated for 4-hour sample duration will then be attached to the tubing and deployed. Time and pressure will be recorded at the start and completion of sampling. The Summa® canister will be certified clean by the laboratory, which is calibrated for a 4-hour sample duration, will then be attached to the tubing and deployed.
 - A final VOC measurement will be collected after the canister has been disconnected. After sampling is complete, the soil vapor points will be decommissioned by removing the tubing and filling the hole in the slab with quick-setting concrete.
 - One indoor air, one duplicate of indoor air (QA/QC sample), and one ambient (outdoor) air sample will be collected at the same time as the sub-slab samples are collected. The locations are shown on Figure 1.

- Chemicals or products will be returned to the garage (if needed) and final documentation of building conditions will be performed.
- **Laboratory Analyses** – Test America Laboratories (Knoxville, TN) will analyze the samples. The samples will be analyzed for VOCs and MGP-indicator compounds, naphthalene, indan, indene, thiophene, styrene, 2-methylpentane, isopentane, 2,3-dimethylpentane, isooctane, and methyl tert-butyl ether (MTBE) by Environmental Protection Agency (EPA) Method TO-15. Soil vapor samples will also be analyzed for helium.
- **Validation** – The analytical data will be validated per Analytical Services Protocol (ASP) Category B Requirements by GEI data validators.
- **Reporting** – A letter report will be prepared to present the results to the NYSDEC and the NYSDOH.
 - Property information for the building will be collected in general accordance with the NYSDOH Center of Environmental Health’s Indoor Air Quality Questionnaire and Building Form that is provided as Appendix B of the NYSDOH’s “*Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York*” (October 2006).
 - A discussion of the heating system for the garage will be included, including whether the heating system was operational during the period for the sampling, and the significance of the system or operation for the SVI evaluation.
 - The final data will be tabulated in tables with comparisons to NYSDOH background studies.
 - Following approval of the report by the NYSDEC, the SVI data will be submitted to the NYSDEC EMIS website.

Following review and approval by the NYSDEC and the NYSDOH, the report will be provided to the property owner. Any follow-up requirements for the SVI evaluation will be discussed with the agencies.

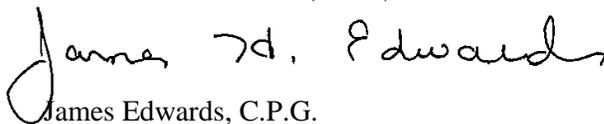
Schedule

Following approval of this Work Plan, the field activities will be scheduled. It is anticipated that the SVI report will be submitted within 6 weeks following the collection of the laboratory samples.

Please call me at (607) 216-8958 if you have any questions regarding the scope of work described in this letter. Please direct any official correspondence to Ms. Maribeth McCormick, O&R’s Project Manager for the Haverstraw 93B site remediation.

Sincerely,

GEI CONSULTANTS, INC., P.C.

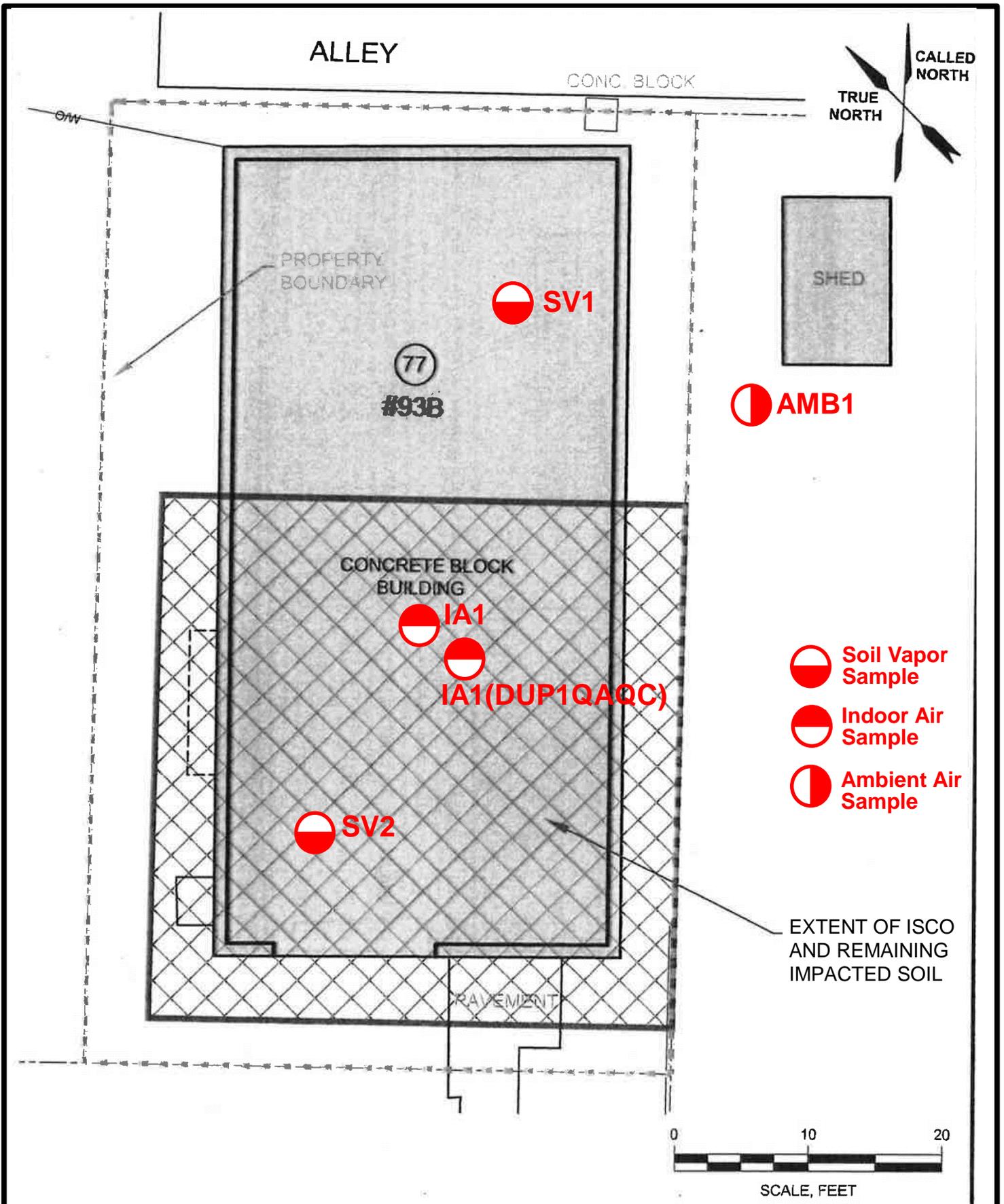


James Edwards, C.P.G.
Project Manager

JHE:mlr

Attachments: Figure 1 – SVI Sample Locations

- c: Maribeth McCormick – Orange and Rockland Utilities, Inc. (electronic copy)
- Anthony Perretta – NYSDOH (electronic copy)
- Edward Moore – NYSDEC Region 3 (electronic copy)
- Joe Simone, P.E. – GEI



SVI WORK PLAN
93B MAPLE AVENUE MGP SITE
HAVERSTRAW, NEW YORK

ORANGE & ROCKLAND
GOSHEN, NEW YORK



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SOIL VAPOR INTRUSION
EVALUATION
SAMPLE LOCATIONS

February 2016

Figure 1