

491 WORTMAN AVENUE
BROOKLYN, NEW YORK
BCP SITE# C224139

SUPPLEMENTAL REMEDIAL INVESTIGATION WORK PLAN ADDEDNDUM

SUBMITTED TO:

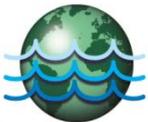


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PWGC Project Number: WAT 1201

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P.W. GROSSER CONSULTING PC
PROJECT No. WAT 1201

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FIGURES

Figure 1 Proposed Addendum Sample Locations

1.0 INTRODUCTION

P.W. Grosser Consulting, PC (PWGC) has prepared the following Supplemental Remedial Investigation Work Plan (SRIWP) Addendum to outline procedures and a scope of work intended to supplement the previously approved June 11, 2013 SRIWP. This SRIWP Addendum was prepared to specifically address comments raised by the New York State Department of Environmental Conservation's (NYSDEC) in a March 14, 2014 comment letter related to a review of the Supplemental Remedial Investigation Report (SRIR) submitted in December 2013.

The current property owner of 491 Wortman Avenue has been accepted into the NYSDEC Brownfield Cleanup Program (BCP) as a Participant. As such, the proposed Supplemental Remedial Investigation (SRI) is intended to delineate potential areas of concern within the property boundary and evaluate if off-site adjacent properties may be impacted.

A detailed description of the project background, findings of previous investigations, site description, site history, regional geology and hydrogeology, site geology and hydrogeology, standards, criteria and guidance, sampling protocol, decontamination procedures, health and safety requirements, community air monitoring, citizen participation plan, and references are included in the June 11, 2013 SRIWP.

This SRIWP Addendum has been prepared as an addendum to the June 11, 2013 SRIWP to document additional sample locations for groundwater, soil vapor, sub-slab vapor and indoor air samples to be collected.

2.0 OBJECTIVES, SCOPE AND RATIONALE

The primary objectives of the additional work detailed in this SRIWP Addendum will be to collect the information and field data necessary to address perceived data gaps related to off-site issues. The Scope of Work includes the following tasks:

1. Delineation of off-site groundwater impact;
2. Delineation of off-site soil vapor and indoor air impact; and,
3. Determination of the use and occupancy of the neighboring buildings.

2.1 Delineation of Off-Site Groundwater Impact

In order to further delineate off-site groundwater quality and confirm site specific groundwater flow direction, five additional multi-level monitoring wells will be installed off site. Proposed locations of the monitoring wells are illustrated in **Figure 1**.

Monitoring wells MW012 through MW017 will be screened at the water table, at 30- to 40-feet below grade surface (bgs), and at 50- to 60-feet bgs.

A rotary drill rig and/or Geoprobe® (or equivalent) direct-push drill rig outfitted for rotary drilling will be used to install the wells with hollow-stem augers using standard drilling methods. The wells will be constructed of two-inch diameter, schedule 40 PVC casing and screen with 0.010-inch slot. The wells will be constructed with a 10-foot screen section and riser to grade unless precluded by hydrogeologic conditions. The well annulus will be filled with #2 Morie sand, or equivalent, to two-feet above the well screen. A two-foot fine sand layer will be installed above the screen followed by a two-foot bentonite seal. Above the top bentonite layer, the annulus around the well will be filled with a cement/bentonite grout. A concrete surface pad (two-feet by two-feet by six-inches) will be installed. The wells will be finished with flush mount curb boxes. Monitoring well construction diagrams will be developed for each of the monitoring wells.

2.1.1 Monitoring Well Development

No less than 48-hours after installation, the newly installed monitoring wells will be developed by over-pumping to restore the hydraulic properties of the aquifer. Well development will continue until the turbidity of the groundwater is less than or equal to 50 Nephelometric Turbidity Units (NTUs), or when pH, temperature, and conductivity measurements stabilize. Stabilization is considered achieved when three consecutive readings of these field parameters are within five percent of each other over a period of 15 minutes. Monitoring well development water will be containerized for off-site disposal.

2.1.2 Monitoring Well Survey

New monitoring wells along with existing wells will be surveyed relative to an arbitrary on-site datum by a New York State licensed surveyor. The survey elevations will be utilized to determine groundwater table elevations and groundwater flow directions and gradients.

2.1.3 Sampling Protocol

These newly installed monitoring wells will be sampled by a low-stress (low-flow) method to collect representative samples while producing a minimal amount of purge water. Sampling will be performed with dedicated instruments to prevent cross-contamination between well locations. Purging of each well will continue until the turbidity is less than or equal to 50 NTUs, and when pH, temperature, and conductivity measurements stabilize. Stabilization will be considered achieved when three consecutive readings within five percent of each other are collected in five minutes. Portable field instruments will be used to collect measurements. If turbidity cannot be reduced to 50 NTUs, but other parameters stabilize, the well will be considered developed. Samples will be collected directly from the polyethylene tubing into laboratory-supplied glassware upon stabilization of field parameters.

Prior to purging, depth-to-bottom and depth-to-water measurements will be collected at each monitoring well. Water level measurements will be obtained with an electronic water level probe relative to the marked measuring point. Measurements will be recorded in a dedicated bound project field notebook along with the

time collected. Measuring equipment will be decontaminated between wells using a laboratory-grade detergent and water solution and tap water rinse.

2.2 Off-Site Sub-Slab Vapor and Indoor Air Sampling

In order to determine if volatile organic compounds (VOCs) vapors are impacting the indoor air of the adjacent properties to the south and west of the subject site, sub-slab vapor and indoor air sampling will be performed in buildings south of Wortman Avenue and west of Linwood St. in buildings identified as 482 Wortman Avenue and 465 Wortman Avenue respectively. Access approvals will be requested; if PWGC is unable to attain access, alternative sampling locations and/or methodology will be discussed with the NYSDEC. The sampling will consist of the collection of one sub-slab vapor sample, one indoor air sample from each building, and one outdoor ambient air sample. **Figure 1** indicates the proposed location of the off-site sub-slab vapor, indoor air and outdoor ambient air samples to be collected.

In order to comply with the NYSDOH guidance, a pre-sampling building inspection and chemical inventory will be performed for the off-site building. The objective of the inspection is to identify sources of chemicals located in the building which may impact the sampling analysis. For this purpose, the NYSDEC's "Structure Sampling Questionnaire and Building Inventory" form will be completed.

In order to facilitate the collection of a sub-slab vapor sample, PWGC will install a temporary sampling port adjacent to the initial port utilizing a hammer drill with a concrete bit. PWGC will perform a tracer gas test on the sub-slab vapor port both prior to and after the collection of the sub-slab vapor sample utilizing a helium detector. The sample will be collected at a depth less than two inches below the bottom of the slab.

The indoor air sample will be collected from the ambient air in the vicinity of the sub-slab vapor point, at a height between 3- and 5-feet above the floor. Additionally, one ambient air sample will be collected from the upwind exterior of the building as a background or control sample. A total of three samples are assumed for this task.

As the adjacent site is an industrial building, the samples will be collected concurrently for a period of 8-hours. Samples will be collected in Summa canisters and submitted to a NYSDOH ELAP certified laboratory for analysis of VOCs by EPA Method TO-15.

The sub-slab soil vapor and indoor air samples at this location will be collected following approval of site access from the property owner. PWGC will attempt to obtain site access to collect the samples initially. If unsuccessful at obtaining access, it is anticipated that NYSDEC and/or NYSDOH will assist the NYSDEC BCP applicant in obtaining site access to the neighboring sites in order to obtain the requested samples. In the event that access cannot be obtained in a timely fashion, the remainder of the proposed SRI Work Plan will be implemented and reported.

2.3 Off-Site Soil Vapor Sampling

In order to determine if VOC vapors exist at off-site locations, soil vapor samples will be collected on the sidewalks in the locations indicated on **Figure 1**. Proper sampling protocols will be followed in accordance with the NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York, October 2006. A Geoprobe or equivalent will be utilized to install permanent soil vapor probes at a depth of approximately five-foot bgs. The probes will consist of stainless steel screens attached to polyethylene tubing. The probe will be protected with a manhole cover.

These samples will be collected for a time period of 1-hour. Samples will be collected in Summa canisters and submitted to a NYSDOH ELAP certified laboratory for analysis of VOCs by EPA Method TO-15.

2.4 Adjacent Property Use and Occupancy Status

In order to determine the current use and occupancy status of several neighboring properties, in order to evaluate potential exposure risks, building records will be reviewed and property owners will be contacted and surveyed. This assessment will be conducted for the buildings located to the immediate north, west and south of the subject site at 920 Essex St., 465 Wortman Avenue and 482 Wortman Avenue respectively.

Depending upon responsiveness from property owners, assistance from NYSDEC may be needed to obtain additional information needed to evaluate the current use and occupancy of these buildings. NYSDEC will be contacted if support is needed.

3.0 QUALITY ASSURANCE PROJECT PLAN

This quality assurance project plan (QAPP) presents the objectives, functional activities, methods, and quality assurance/quality control (QA/QC) requirements associated with sample collection and laboratory analysis for characterization activities. The QAPP follows requirements detailed in DER-10, Section 2.

3.1 Laboratory Analysis

Requirements for sample analysis are described below. All samples will be submitted to a NYSDOH ELAP certified laboratory (to be determined) for analysis. A summary of laboratory analyses to be performed is included as **Table 1**.

3.1.1 *Groundwater Samples*

Groundwater samples will be collected as described in Section 4.2. Groundwater samples will analyzed for Target Compound List VOCs by USEPA Method 8260. Analysis will conform to NYSDEC Analytical Services Protocol (ASP) Category B data deliverables will be submitted.

3.1.2 *Sub-Slab Vapor, Soil Vapor, Indoor Air and Ambient Air Samples*

Sub-Slab vapor, soil vapor, indoor air, and outdoor air samples will be collected as described in Section 4.5 and 4.6. Samples will be analyzed for VOCs by USEPA Method TO-15. Analysis will conform to NYSDEC ASP Category B data deliverables will be submitted.

3.2 Field/Laboratory Data Control Requirements

Quality Control (QC) procedures will be followed in the field and at the laboratory to facilitate that reliable data are obtained. When performing field sampling, care shall be taken to prevent the cross-contamination of sampling equipment, sample bottles, and other equipment that could compromise sample integrity. QC sampling requirements are detailed in the SRIWP.

3.3 Sample Identification

Each sample will be identified with a set of information relating individual sample characteristics. Required information consists of Sample Designation, Depth, Date, Time, and Matrix. Examples of sample IDs are shown below.

- MW0012 30-40' (groundwater sample from 30-40' deep screen in monitoring well #12).
- 465 Wortman IA-001 (indoor air sample from the building located at 465 Wortman Avenue).
- OA-04/02/14 (ambient air sample collected April 2, 2014).
- SV006 (soil vapor sample at location SV006).

Sample frequency, locations, depths, and nomenclature may change subject to field decisions and professional judgment.

3.4 Chain-of-Custody, Sample Packaging and Shipment

Each day that samples are collected, a chain-of-custody/request for analysis form will be completed and submitted to the laboratory with samples to be analyzed. A copy of the chain-of-custody will be retained by the Project Manager. The chain-of-custody will include the project name, sampler's signature, sample IDs, date and time of sample collection, and analysis requested.

Samples will be packaged and shipped in a manner that maintains sample preservation requirements during transport (i.e., ice to keep samples cool until receipt at the laboratory), ensures that sample holding times can be achieved by the laboratory, and prevents samples from being tampered with.

If a commercial carrier ships samples, a bill of lading (waybill) will be used as documentation of sample custody. Receipts for bills of lading and other documentation of shipment shall be maintained as part of the permanent custody documentation. Commercial carriers are not required to sign the chain-of-custody as long as it is

enclosed in the shipping container and evidence tape (custody seal) remains in place on the shipping container.

3.5 Data Usability and Validation

The main purpose of the data is for use in defining the extent of contamination at the site, to aid in evaluation of potential human health and ecological exposure assessments, and to support remedial action decisions. Based upon this, data usability and validation will be performed as described below. Complete data packages will be archived in the project files, and if deemed necessary additional validation can be performed using procedures in the following sections.

Data usability and validation requirements are detailed in the SRIWP.

4.0 SUPPLEMENTAL REMEDIAL INVESTIGATION REPORT ADDENDUM PREPARATION

A SRIR Addendum will incorporate the methods and findings of the Supplemental Investigation addendum activities performed as outlined in this work plan. The report will identify specific contamination concentrations throughout each media (e.g. soil, groundwater, etc), delineate the extent of contamination in soil and groundwater, evaluate potential exposure pathways, and provide conclusions and recommendations for additional investigation and/or remedial action. The SRIR Addendum will include the results of a Qualitative Human Health Exposure Assessment. Electronic copies of the SRIR Addendum will be submitted to the NYSDEC along with hard copies. Analytical results of the investigation will be submitted in the electronic data delivery (EDD) format through the Department's environmental information management system (EIMS).

5.0 COMMUNITY AIR MONITORING PLAN

A site specific Community Air Monitoring Plan (CAMP) will be prepared to provide measures for protection for on-site workers and the downwind community from potential airborne contaminants as a direct result of the Supplemental Investigation.

CAMP Requirements are detailed in the SRIWP.

6.0 PROJECT SCHEDULE

The schedule for implementation and issuing a SRIR Addendum Report will be dependent upon obtaining access agreements with the neighboring property owners/operators at 465 Wortman Avenue and 482 Wortman Avenue and upon upcoming discussions with NYSDEC regarding a submittal and implementation of a Remedial Action Work Plan detailing remedial strategies to address the known sub-surface impact located on and off-site. Upon meeting these milestones, the field effort detailed above is anticipated to take five weeks, followed by an additional five weeks for analytical reporting and data usability reporting, followed by another three weeks to prepare and submit a SRIR Addendum to NYSDEC.

FIGURE



PWGC

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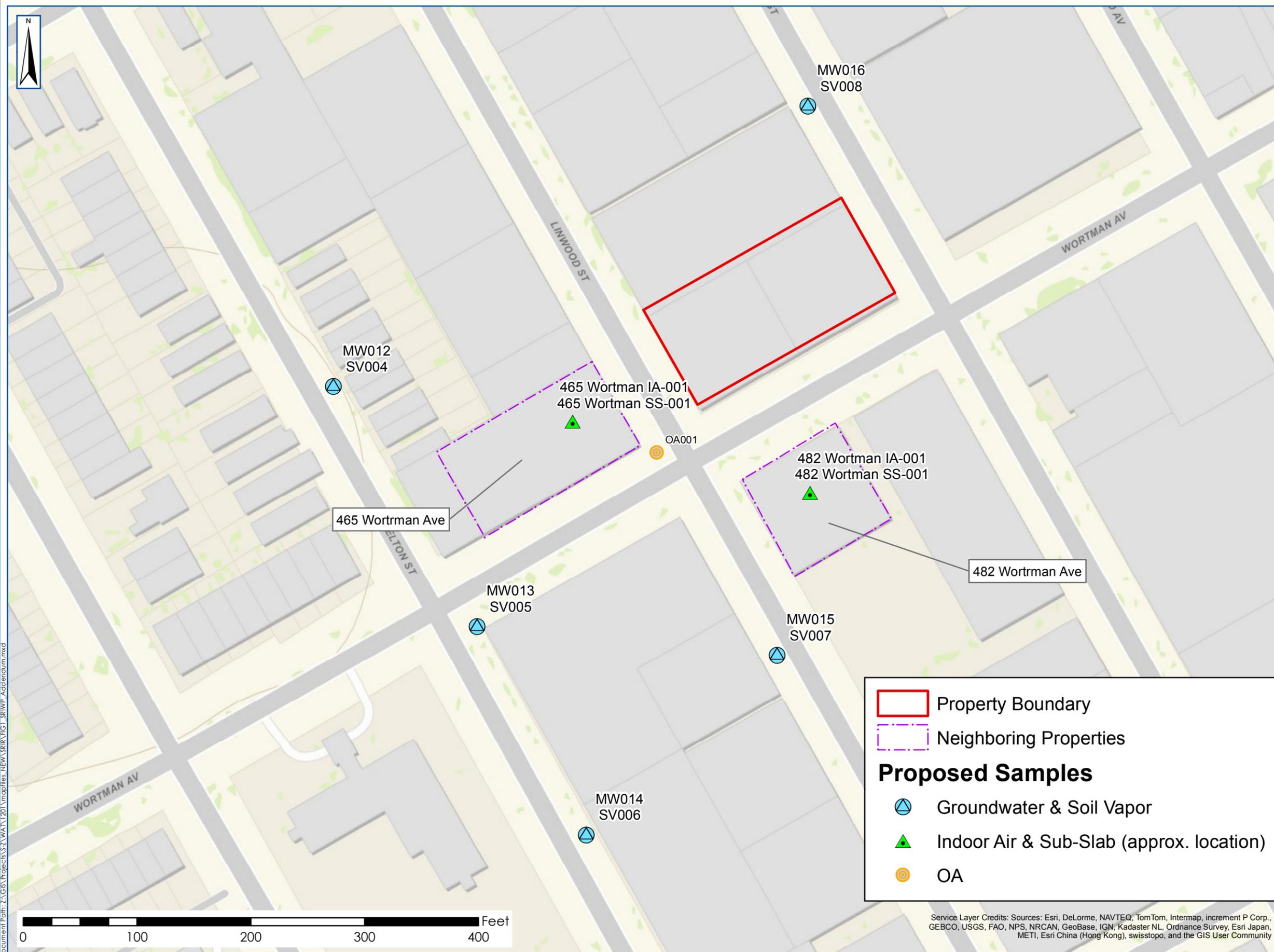
Project:	WAT1201	Designed by:	KEA
Date:	03/31/2014	Drawn by:	JCG
Scale:	AS SHOWN	Approved by:	KEA

**SRIWP ADDENDUM:
PROPOSED SAMPLE
LOCATION**
491 WORTMAN AVENUE
BROOKLYN, NY

FIGURE NO:

1

SHEET:

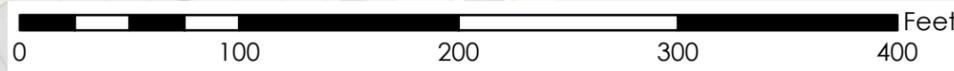


Proposed Samples

-  Groundwater & Soil Vapor
-  Indoor Air & Sub-Slab (approx. location)
-  OA

 Property Boundary

 Neighboring Properties



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