Vapor Intrusion Investigation Work Plan

18-38 / 18-40 / 18-48 / 18-50 Decatur Street
Ridgewood, Queens, New York

October 2, 2018

Prepared for:

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1. Introduction

Roux Environmental Engineering and Geology, D.P.C. (Roux), on behalf of Rigano LLC has prepared this Vapor Intrusion (VI) Investigation Work Plan (Work Plan) for the offsite properties associated with the property located at 18-46 Decatur Street, Ridgewood, Queens, New York. Specifically, the scope of work (SOW) includes evaluating potential VI at the following residential properties, located in either side of the 18-46 Decatur Street property:

- 18-38 Decatur Street (Block 3579, Lot 42);
- 18-40 Decatur Street (Block 3579, Lot 44);
- 18-48 Decatur Street (Block 3579, Lot 48); and
- 18-50 Decatur Street (Block 3579, Lot 50).

These four offsite residential properties are collectively referred to as "the Subject Properties" for the remainder of this Work Plan. A figure depicting the location of the 18-46 Decatur Street property and the Subject Properties is provided as Figure 1. The proposed sampling locations for the Subject Properties is to be investigated as part of this Work Plan are shown on Figure 2.

A brief description and summary of the regulatory history of the 18-46 Decatur Street site, the objectives of the Work Plan, and the organization of the Work Plan is provided below.

This Work Plan is intended to provide a summary of the proposed sub-slab soil gas, indoor air, and ambient air sampling and analysis to be conducted at the Subject Properties to satisfy New York State Department of Environmental Conservation (NYSDEC) and New York State Department of Health (NYSDOH) requirements, and a description of the schedule for the work.

The purpose of the VI Investigation is to evaluate vapor intrusion risks, if any, at the four Subject Properties listed above.

This Work Plan was developed in accordance with:

- A telephone conference call held with NYSDEC and the NYSDOH on September 12, 2018;
- DER-10 Technical Guidance for Site Investigation and Remediation, dated May 2010 (DER-10) issued by NYSDEC; and
- NYSDOH Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York (October 2006).

1.1 Work Plan Document Organization

This Work Plan contains a background section (Section 2); a section defining the objectives and scope of the investigation (Section 3); and Section 4 that describes the Health and Safety Plan. Reporting requirements and the project schedule are discussed in Section 5. Figures are provided to illustrate site conditions, and locations of proposed sampling locations.

1.2 Project Team and Contact Information

Roux's Project Principal will be Robert Kovacs, Professional Geologist, Principal Scientist. Mr. Kovacs, who is based in Roux's Islandia, New York headquarters office and can be reached at (631) 232-2600, will be

responsible for the overall implementation of the project. Roux's Project Manager will be David Bligh, Professional Engineer, Senior Engineer, who will be responsible for day-to-day management of the project, including preparation of work plans, scoping and directing field activities. The Field Manager for the duration of the project is yet to be determined and will be responsible for implementing and directing field activities onsite.

2. Background

This section provides pertinent background information, including a brief description of the 18-46 Decatur Street property, setting, and regulatory status.

The 18-46 Decatur Street property is approximately 0.11 acres and is comprised of Block 3579, Lot 45, and this property is being actively investigated and remediated by others under the NYSDEC Brownfields Cleanup Program (BCP Site #C241194). A May 2016 Phase II Environmental Site Assessment (ESA) as well as a subsequent Remedial Investigation (RI) performed at the 18-46 Decatur Street property confirmed the presence of contamination on the site associated with historic dry-cleaning activities conducted over a known period of approximately 24 years. Previous investigations confirmed the presence of chlorinated solvents, in particular tetrachloroethylene (PCE) and trichloroethylene (TCE), at elevated levels in soil, groundwater, and soil gas at the 18-46 Decatur Street property. Based on the findings of these previous investigations, NYSDEC and NYSDOH are requiring that a VI Investigation be conducted at the Subject Properties. As such, and in accordance with a telephone conference call held with NYSDEC and the NYSDOH on September 12, 2018, this Work Plan outlines the proposed tasks to complete this VI investigation at the Subject Properties.

3. Vapor Intrusion Investigation Work Plan Scope of Work

3.1 Objectives

Previous investigations have documented the presence of VOCs in groundwater at the 18-46 Decatur Street property located in Queens, New York. Based on the existing data, the objective of the WP is to evaluate the vapor intrusion risk at the following four properties:

- 18-38 Decatur Street (Block 3579, Lot 42);
- 18-40 Decatur Street (Block 3579, Lot 44);
- 18-48 Decatur Street (Block 3579, Lot 48); and
- 18-50 Decatur Street (Block 3579, Lot 50).

3.2 Vapor Intrusion Investigation Scope

The scope of the VI Investigation will include the collection of Site data to satisfy NYSDEC and NYSDOH requirements. To accomplish this, the SOW for the VI Investigation will include the following:

- The completion of site reconnaissance;
- The installation and sampling of four sub-slab soil gas monitoring points;
- The collection of soil gas samples from four existing sub-slab monitoring points;
- The collection of four indoor air samples; and
- The collection of one outdoor ambient air sample.

The overall scope of each component of the VI Investigation is discussed in the following subsections. The proposed sampling locations are shown on Figure 2 of this WP.

3.2.1 Site Reconnaissance

Roux will perform a preliminary site reconnaissance prior to the installation of four sub-slab soil gas sampling points and prior to the collection of any air samples. An inspection of the existing conditions at each property and building operations will be conducted to determine final locations of sub-slab soil gas monitoring points, indoor air, and ambient air locations based on actual field conditions. Based on visual inspection of the four properties during site reconnaissance and based on current tenant operations, the layout of sub-slab soil gas sampling locations may change.

The site reconnaissance will be conducted by the field personnel to mark-out the sub-slab soil gas monitoring point locations prior to drilling.

Pre-Sampling Building Survey and Product Inventory
In accordance with the NYSDOH Guidance dated October 2006, a pre-sampling building survey will be performed prior to collecting sub-slab soil gas samples within each residence. The purpose of this pre-sampling building survey is to identify and minimize conditions that may interfere with the collection of accurate and representative samples. Potential conditions that may interfere with sample collection may include, but are not limited to the storage of products containing VOCs, freshly painted surfaces, new carpet, the use of petroleum products, etc. The building survey will evaluate the type of building structure, floor

layout, airflow patterns, and the physical condition of the building. Additionally, a product inventory will be completed to identify any potential sources of indoor air contamination by characterizing the occurrence and use of chemicals and products throughout the building. All information gathered during the pre-sampling building survey and the product inventory will be recorded on the NYSDOH Indoor Air Quality Questionnaire and Building Inventory Form.

If any chemicals on-site are found to be stored in a questionable manner (i.e., open container, yield positive photoionization detector screening results, emit odor, etc.) they will be controlled to eliminate potential interference. Control options may include removal of the container or ensuring containers are tightly closed. If corrective actions are required, sampling will not be conducted for a period of 24-hours following the corrective action to allow the building to equilibrate. Additionally, it will be requested that building occupants refrain from the activities listed below, to the best extent practical, for a period of 24-hours prior to, and during the sampling activities:

- Opening any windows, openings or vents within the building;
- Operating any ventilation fans within the building;
- Smoking in the building;
- Painting within the building;
- Using air fresheners or scented candles;
- Allowing containers of gasoline or oil to remain within the building, except for fuel oil tanks;
- Cleaning, waxing or polishing furniture, floors or other woodwork with petroleum or oil-based products within the building;
- Engaging in any activities that use materials containing VOCs within the building;
- Lawn mowing or paving;
- Applying pesticides; and
- Using building repair or maintenance products, such as caulk or roofing tar.

3.2.2 Sub-Slab Soil Gas, Indoor Air, and Ambient Air Sample Collection and Analysis

Four temporary soil gas monitoring points will be installed beneath the slab of each of the Subject Properties using vapor pins. The approximate proposed locations of the sub-slab soil gas monitoring points are presented on Figure 2 (note that these are subject to change based on site conditions. The vapor pins will be installed by drilling into the basement (or lowest concrete slab if a basement is not present) of the Subject Properties with a 1.5-inch diameter drill bit 1.75 inches in to the slab, then a 5/8-inch diameter drill bit will be used for the remainder of the boring through the concrete slab. Each sub-slab soil gas monitoring point will be terminated approximately 1 inch beneath the concrete slab. After completion of the drilling, the boring will be cleaned with a bottle brush and a stainless-steel vapor pin will be installed into the borehole using a dead blow hammer and the manufacturer-provided vapor pin installation tool.

A total of four temporary soil gas monitoring points will be sampled during the VI Investigation. Sub-slab soil gas sampling will be performed utilizing the following procedural steps and a tracer gas test will be performed on each vapor point prior to sampling in accordance with the procedures outlined in the NYSDOH Guidance (October 2006):

1. The sample tubing will be connected to a Teflon-lined “T” connector, three-way assembly, with one end of the “T” connector leading to a vacuum pump and the other end leading to a pre-evacuated Summa canister with a calibrated regulator.

2. The soil gas sample tubing will be purged of approximately three volumes of air using a vacuum pump set at a rate of approximately 0.2 liters per minute.
3. Tracer gas testing will be conducted on all monitoring points in an effort to verify that ambient air did not dilute the soil gas sample during collection. To conduct the test, a plastic container (i.e., bucket) will be placed over the monitoring point with a seal, and helium (i.e., the tracer gas) will be injected into the bucket during purging of the monitoring point in an effort to enrich the interior of the bucket with the tracer gas. The three-way valves at the monitoring points will also be placed under the shroud (i.e., the bucket enclosure), and included in the tracer gas verification. This will be done in an effort to ensure that the valves do not provide a potential means by which ambient air would enter the canister and possibly dilute the sample. Both the purge volume from the sample tubing (i.e., also the air that passed through the three-way valve), and the helium enriched area within the bucket will be screened for the tracer gas. The tracer gas will be measured utilizing a direct-read helium detector, which will be used to measure the rate of helium leakage at the surface or the concentration of helium in a container. If the screening results show that the rate or concentration of helium detected in the sample tubing is greater than 10% of that found in the bucket, the seals around the sampling equipment will be reset and the sample tubing purged again. This process of resetting and purging will continue until the tracer gas is no longer detected at levels greater than 10% of the enriched area. The screening data will be recorded on soil gas sampling field forms.
4. Following the purging and tracer gas verification steps, the valve leading to the pump will be closed, the pump will be turned off, and the soil gas will be directed to a 6-liter Summa canister for sample collection. A laboratory-supplied, flow controller calibrated to collect the sample over an 8-hour collection period will be used.

In addition to sub-slab soil gas samples, indoor air samples will be collected at the lowest occupied floor of each of the Subject Properties. All four indoor air samples will be collected from a height above the ground to represent breathing zones (i.e., three to five feet). Indoor air samples will be collected using pre-cleaned 6-liter Summa canisters with regulators calibrated to collect samples over an 8-hour interval. To the extent practicable, the indoor air Summa canisters will be placed in a well-ventilated and open area, typical of the normal environment and paired with sub-slab soil gas samples.

One ambient air sample will be collected outside and upwind of the four Subject Properties simultaneously with the sub-slab soil gas and indoor air samples in the building. The ambient air sample will be collected using a pre-cleaned 6-liter Summa canister with a regulator calibrated to collect the sample over an 8-hour interval.

3.2.3 Laboratory Analysis

All soil gas samples will be collected using pre-cleaned 6-liter Summa canisters with calibrated regulators and analyzed by Alpha Analytical Laboratories of Westborough, Massachusetts, a NYSDOH Environmental Laboratory Approval Program (ELAP) -certified laboratory using USEPA Analytical Method TO-15 for VOCs.

All data will be produced in accordance with NYSDEC ASP Category B deliverables. All analytical data will be reviewed by an independent data validator, and a Data Usability Summary Report (DUSR) will be prepared.

3.2.4 Screening Level Comparison

Sub-slab soil gas and indoor air samples will be compared to the NYSDOH Guidance Soil Vapor/Indoor Air Matrices. The results of the comparison will be provided in the Final Report.

4. Health and Safety

A Site-specific Health and Safety Plan (HASP) will be developed in accordance with guidelines outlined in OSHA standard 29 CFR 1910.120(b). The purpose of the HASP is to address the safety and health hazards that may exist during field operations and to identify procedures to ensure field operations are conducted as safe as possible with full consideration and awareness of the potential risks. The HASP will include a discussion of potential hazards, including biological hazards, precautions to be taken, equipment, clothing, training of personnel, Health and Safety Officer duties, notices and signs, and activities to inform and protect the public. A copy of the HASP will be available at the Site at all times during implementation of the VI Investigation.

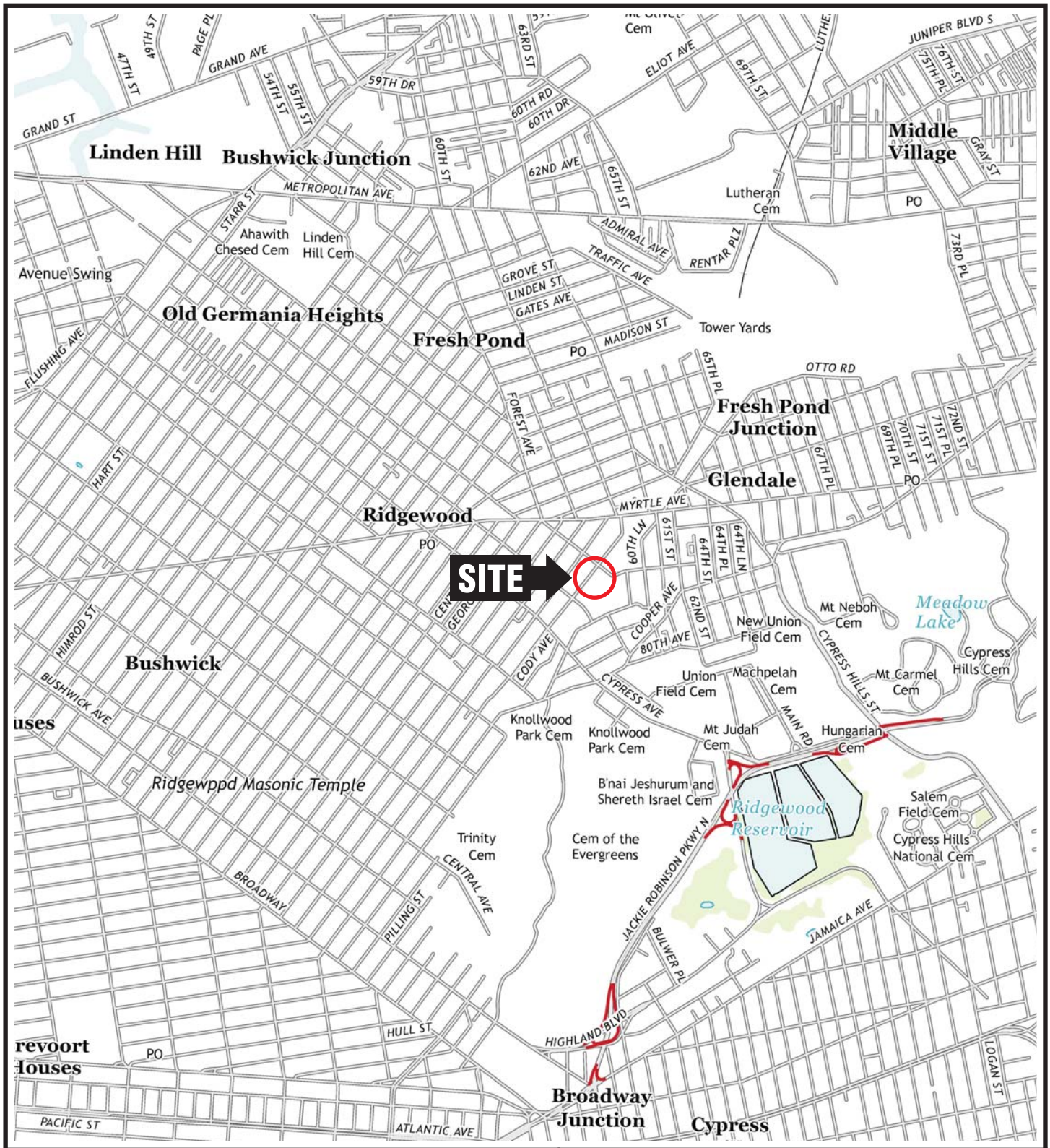
5. Project Schedule and Reporting

Roux will commence implementation of this Work Plan within twenty days after receipt of NYSDEC's and NYSDOH's written approval of the Work Plan, but not sooner than the start of the heating season (as defined by NYSDOH). Roux will notify NYSDEC and NYSDOH no less than seven days in advance of implementation of the Work Plan, unless NYSDEC and NYSDOH agree to a shorter period in writing.

A Final Report will be prepared and submitted to NYSDEC and NYSDOH within thirty days of the receipt of validated laboratory data. The Final Report will include a detailed synopsis of all work performed; figures depicting the layout of the sampling locations, figures presenting the analytical results and analyses performed, tables presenting all laboratory data results, results of the screening level comparison, laboratory data packages, a DUSR, and soil gas field forms.

FIGURES

1. Site Location Map
2. Sample Locations



QUADRANGLE LOCATION

SOURCE:
USGS; 2013, Brooklyn, NY
7.5 Minute Topographic Quadrangle

N

0 2000'

Title:

SITE LOCATION MAP

18-38, 18-40, 18-48 & 18-50 DECATUR STREET
RIDGEWOOD, QUEENS, NEW YORK

Prepared for:

RIGANO LLC

ROUX

Compiled by: D.B.	Date: 20SEPT18	FIGURE 1
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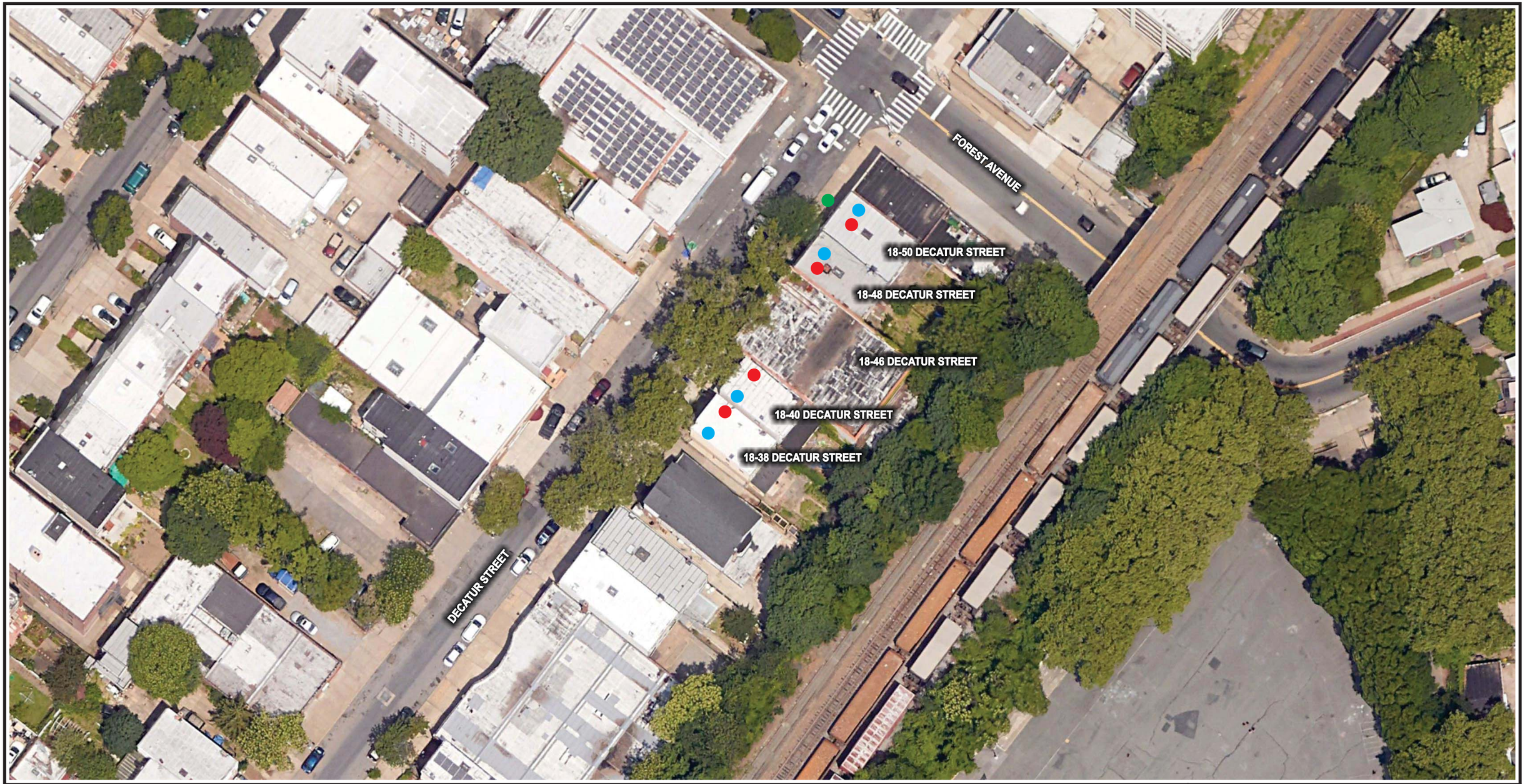

LEGEND

- PROPOSED SUB-SLAB VAPOR SAMPLE LOCATION
- PROPOSED INDOOR AIR SAMPLE LOCATION
- PROPOSED AMBIENT AIR SAMPLE LOCATION

NOTE

PROPOSED SAMPLE LOCATIONS ARE SUBJECT TO CHANGE BASED ON FIELD CONDITIONS.

N

0 50’ 100’

Title:

PROPOSED SAMPLE LOCATIONS

18-38, 18-40, 18-48 & 18-50 DECATUR STREET
RIDGEWOOD, QUEENS, NEW YORK

Prepared for:

RIGANO LLC

ROUX

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