PROPOSED REMEDIAL ACTION PLAN

Former Damshire Cleaners
State Superfund Project
Albany, Albany County
Site No. 401059
September 2017

Prepared by
Division of Environmental Remediation
New York State Department of Environmental Conservation

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SECTION 1: SUMMARY AND PURPOSE OF THE PROPOSED PLAN

The New York State Department of Environmental Conservation (the Department), in consultation with the New York State Department of Health (NYSDOH), is proposing a remedy for the above referenced site. The disposal of hazardous wastes at the site has resulted in threats to public health and the environment that would be addressed by the remedy proposed by this Proposed Remedial Action Plan (PRAP). The disposal of hazardous wastes at this site, as more fully described in Section 6 of this document, has contaminated various environmental media. The proposed remedy is intended to attain the remedial action objectives identified for this site for the protection of public health and the environment. This PRAP identifies the preferred remedy, summarizes the other alternatives considered, and discusses the reasons for the preferred remedy.

The New York State Inactive Hazardous Waste Disposal Site Remedial Program (also known as the State Superfund Program) is an enforcement program, the mission of which is to identify and characterize suspected inactive hazardous waste disposal sites and to investigate and remediate those sites found to pose a significant threat to public health and environment.

The Department has issued this document in accordance with the requirements of New York State Environmental Conservation Law and Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York; (6 NYCRR) Part 375. This document is a summary of the information that can be found in the site-related reports and documents in the document repository identified below.

SECTION 2: CITIZEN PARTICIPATION

The Department seeks input from the community on all PRAPs. This is an opportunity for public participation in the remedy selection process. The public is encouraged to review the reports and documents, which are available at the following repository:

William K. Sanford Town Library
629 Albany-Shaker Road
Loudonville, NY 12211
Phone: 518-458-9274

A public comment period has been set from **September 27 to October 27, 2017**
A public meeting is scheduled for **Tuesday, October 17**
The public meeting will be held at **the Crossings of Colonie, 580 Albany Shaker Rd, Loudonville**

At the meeting, the findings of the remedial investigation (RI) and the feasibility study (FS) will be presented along with a summary of the proposed remedy. After the presentation, a question-and-answer period will be held, during which verbal or written comments may be submitted on the PRAP.

Written comments may also be sent through to:

Michael MacCabe, P.E.
NYS Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway
Albany, NY 12233-7016
michael.maccabe@dec.ny.gov

The Department may modify the proposed remedy or select another of the alternatives presented in this PRAP based on new information or public comments. Therefore, the public is encouraged to review and comment on the proposed remedy identified herein. Comments will be summarized and addressed in the responsiveness summary section of the Record of Decision (ROD). The ROD is the Department's final selection of the remedy for this site.

Receive Site Citizen Participation Information by Email

Please note that the Department's Division of Environmental Remediation (DER) is "going paperless" relative to citizen participation information. The ultimate goal is to distribute citizen participation information about contaminated sites electronically by way of county email listservs. Information will be distributed for all sites that are being investigated and cleaned up in a particular county under the State Superfund Program, Environmental Restoration Program, Brownfield Cleanup Program, Voluntary Cleanup Program, and Resource Conservation and Recovery Act Program. The public is encouraged the public to sign up for one or more county listservs at http://www.dec.ny.gov/chemical/61092.html

SECTION 3: SITE DESCRIPTION AND HISTORY

Location: The 0.39 acre Former Damshire Cleaners site is located at 1205 Central Avenue in the Town of Colonie, Albany County (Tax Map No.: 53.06-06-35.1). The site is bordered by a church to the southeast, a commercial area to the northwest, a residential area to the northeast and Central Avenue and commercial and residential areas to the southwest. Patroon Creek is about 3,000 feet down gradient (southwest) of the subject site.

Site Features: The site is currently occupied by one vacant, approximately 3600 square foot concrete-block building that is abutted by an asphalt parking lot to the northwest and southwest, a wooded area to the northeast and a grassy area and a dirt driveway to the southeast. An overhead door is present on the southeast side of the building where dry cleaning solvent was likely delivered during active operations.

Current Zoning and Land Use: The site is currently inactive and is located in a mixed residential and commercial area in the Town of Colonie. The site is zoned Neighborhood Commercial Office Residential.

Past Use of the Site: Damshire Cleaners conducted dry cleaning operations on site until approximately 2001 (records do not identify when dry cleaning operations began at the site). Several notices of violation pertaining to fugitive air emission exceedances were issued to the dry cleaning facility in 1999 through 2000. Tetrachloroethene (PCE, a dry cleaning chemical) is reported to have been leaking on the floor below dry cleaning equipment for as long as a year prior to shut down in 2001.

A fuel oil spill at the site was reported to Department's Spill Response Program in November of 2001. Chlorinated solvent contamination was discovered in the soil during the response, which caused the spill project to remain open.

Ownership of the property was transferred in September of 2007. The current owner conducted a preliminary soil vapor intrusion study at the site in 2010. The study detected elevated levels of chlorinated solvent contamination in both the sub-slab vapor and indoor air. The property owner was not willing to conduct further investigation of the on-site soil and groundwater, which resulted in the site being referred to the New York State Superfund Program as a potential site. Additional subsurface investigation, limited to off-site areas, was conducted by the Department in 2011.

Site Geology and Hydrogeology: Overburden on the site and in the immediate area consists of silty-fine sand with clay lenses. Depth to groundwater on site is between 5 to 7-feet below ground surface (bgs) and flows to the southwest. The deepest well constructed during the Remedial Investigation (RI) was 70 feet below grade into a thick clay layer at approximately 60 feet below grade. No bedrock was encountered during the RI.

A site location map is attached as Figure 1.

SECTION 4: LAND USE AND PHYSICAL SETTING

The Department may consider the current, intended, and reasonably anticipated future land use of the site and its surroundings when evaluating a remedy for soil remediation. For this site, alternatives that restrict the use of the site to commercial use (which allows for industrial use) as described in Part 375-1.8(g) are being evaluated in addition to an alternative which would allow for unrestricted use of the site.

A comparison of the results of the investigation to the appropriate standards, criteria and guidance values (SCGs) for the identified land use and the unrestricted use SCGs for the site contaminants is included in the Tables for the media being evaluated in Exhibit A.

SECTION 5: ENFORCEMENT STATUS

Potentially Responsible Parties (PRPs) are those who may be legally liable for contamination at a site. This may include past or present owners and operators, waste generators and haulers.

The PRPs for the site, documented to date, include:

Ninamarie Crisafulli
Estate of Charles Yund

The PRPs for the site declined to implement a remedial program when requested by the Department. After the remedy is selected, the PRPs will again be contacted to assume responsibility for the remedial program. If an agreement cannot be reached with the PRPs, the Department will evaluate the site for further action under the State Superfund. The PRPs are subject to legal actions by the state for recovery of all response costs the state has incurred.

SECTION 6: SITE CONTAMINATION

6.1: Summary of the Remedial Investigation

A Remedial Investigation (RI) has been conducted. The purpose of the RI was to define the nature and extent of any contamination resulting from previous activities at the site. The field activities and findings of the investigation are described in the RI Report.

The following general activities are conducted during an RI:

- Research of historical information,
- Geophysical survey to determine the lateral extent of wastes,
- Test pits, soil borings, and monitoring well installations,
- Sampling of waste, surface and subsurface soils, groundwater, and soil vapor,

- Sampling of surface water and sediment,

- Ecological and Human Health Exposure Assessments.

The analytical data collected on this site includes data for:

- groundwater
- soil
- soil vapor
- indoor air
- sub-slab vapor

6.1.1: Standards, Criteria, and Guidance (SCGs)

The remedy must conform to promulgated standards and criteria that are directly applicable or that are relevant and appropriate. The selection of a remedy must also take into consideration guidance, as appropriate. Standards, Criteria and Guidance are hereafter called SCGs.

To determine whether the contaminants identified in various media are present at levels of concern, the data from the RI were compared to media-specific SCGs. The Department has developed SCGs for groundwater, surface water, sediments, and soil. The NYSDOH has developed SCGs for drinking water and soil vapor intrusion. The tables found in Exhibit A list the applicable SCGs in the footnotes. For a full listing of all SCGs see: http://www.dec.ny.gov/regulations/61794.html

6.1.2: RI Results

The data have identified contaminants of concern. A "contaminant of concern" is a hazardous waste that is sufficiently present in frequency and concentration in the environment to require evaluation for remedial action. Not all contaminants identified on the property are contaminants of concern. The nature and extent of contamination and environmental media requiring action are summarized in Exhibit A. Additionally, the RI Report contains a full discussion of the data. The contaminants of concern identified at this site are:

tetrachloroethene (PCE)	benzo(b)fluoranthene
trichloroethene (TCE)	benzo(k)fluoranthene
cis-1,2-dichloroethene (DCE)	chrysene
benzo(a)anthracene	dibenz(a,h)anthracene
benzo(a)pyrene	indeno(1,2,3-cd)pyrene

As illustrated in Exhibit A, the contaminants of concern exceed the applicable SCGs for:

- groundwater
- soil
- soil vapor intrusion

6.2: Interim Remedial Measures

An interim remedial measure (IRM) is conducted at a site when a source of contamination or exposure pathway can be effectively addressed before issuance of the Record of Decision. There were no IRMs performed at this site during the RI.

6.3: Summary of Environmental Assessment

This section summarizes the assessment of existing and potential future environmental impacts presented by the site. Environmental impacts may include existing and potential future exposure pathways to fish and wildlife receptors, wetlands, groundwater resources, and surface water.

Based upon the resources and pathways identified and the toxicity of the contaminants of ecological concern at this site, a Fish and Wildlife Resources Impact Analysis (FWRIA) was deemed not necessary.

Nature and Extent of Contamination:

Soil
Soil was analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, polychlorinated biphenyls (PCBs), pesticides and metals. Based upon investigations conducted to date, the primary contaminants of concern for the site include tetrachloroethene (PCE), trichloroethene (TCE) and cis-1,2-dichloroethene (DCE), though several polycyclic aromatic hydrocarbons (PAH) were also noted as requiring action.

The soil data show the presence of soil contamination, and groundwater data confirms the presence of an on-site source, although a specific source area has not been definitively located. Sub-slab soil sampling was limited by a thick reinforced floor slab and debris throughout the building. The highest on-site soil concentrations in samples collected from accessible locations during the RI was PCE at 12 parts per million (ppm) directly beneath the building slab. Note that the respective unrestricted use/groundwater protection and commercial use soil cleanup objectives (SCOs) are 1.3 ppm and 150 ppm. Soil samples obtained immediately off-site and down gradient from the site during the site characterization investigation found PCE (830 ppm) in one soil sample from below the water table at 14 feet below grade. TCE was found at 11 feet below grade at 12 ppm compared to its respective unrestricted and commercial SCOs of 0.47 ppm and 200 ppm.

At three locations, SVOCs, particularly the PAHs benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, and indeno(1,2,3-cd)pyrene, were detected above their respective commercial use SCOs in shallow soil (0-6 inches).

Groundwater
Groundwater was analyzed for VOCs, SVOCs, PCBs, pesticides, metals and cyanide. Results from on-site groundwater samples obtained upgradient of the building and septic system did not detect site-related contaminants.

Contaminants in on-site groundwater were present at concentrations ranging from non-detect to maximum concentrations of 970 parts per billion (ppb) of PCE, 190 ppb of TCE and 130 ppb of DCE. The higher concentrations were in the presumed area of an abandoned septic system to the east of the building.

Standing water within a sump inside the site building had elevated concentrations of PCE (55,000 ppb), TCE (4,000 ppb) and DCE (69,000 ppb), indicating a possible source in the area of the sump.

Groundwater directly down gradient (southwest) of the site exhibited significant site related contamination; PCE concentrations ranged from 2 to 48,000 ppb, TCE concentrations ranged from 5 to 7,900 ppb and DCE concentrations ranged from 27 to 432 ppb. The groundwater standard for each of these compounds is 5 ppb.

The chlorinated solvent plume is migrating southwesterly off-site under Central Avenue. However, the down gradient off-site groundwater data show a significant decrease in contaminant concentrations, indicating that the plume is naturally attenuating and dropping deeper in the aquifer.

The lack of site-related contaminants in upgradient groundwater and the elevated concentrations in down gradient sampling points confirm that the source is on the site.

Soil Vapor, Sub-slab Vapor, and Indoor Air

Prior to consideration as a potential State Superfund site, a soil vapor intrusion study was conducted in the on-site building on behalf of the property owner. The study detected elevated levels of chlorinated solvent contamination in the sub-slab vapor and indoor air of the vacant. Concentrations of the PCE were as high as 130,000 micrograms per cubic meter ($\mu g/m^3$) in the sub-slab vapor and 57 $\mu g/m^3$ in the indoor air. TCE concentrations were as high as 220 $\mu g/m^3$ in sub-slab vapor and non-detectable in indoor air.

Additional on-site soil vapor intrusion (SVI) and off-site down gradient soil vapor sampling was conducted in the spring of 2015. Sampling near and at one upgradient off-site building indicated that actions were not necessary to address exposures related to soil vapor intrusion at this location. Off-site down gradient soil vapor data showed PCE at concentrations of 130 and 1,300 µg/m3 in samples located immediately across Central Avenue (to the southwest) from the site. Based on this data the Department requested access from the property owners to collect sub-slab vapor and indoor air samples from down gradient properties, but our requests for access were denied.

In April 2017, an SVI investigation was conducted in an off-site building east of the site at the request of a tenant. Investigation results near and at the building indicated no actions were needed to address exposures related to soil vapor intrusion at this location.

6.4: Summary of Human Exposure Pathways

This human exposure assessment identifies ways in which people may be exposed to site-related contaminants. Chemicals can enter the body through three major pathways (breathing, touching or swallowing). This is referred to as *exposure*.

Access to the site is unrestricted. However, contact with contaminated soil or groundwater is unlikely unless they dig below the ground surface. People are not drinking the contaminated groundwater since the area is served by a public water supply system that is not contaminated by the site. Volatile organic compounds in the groundwater may move into the soil vapor (air spaces within the soil), which in turn may move into overlying buildings and affect the indoor air quality. This process, which is similar to the movement of radon gas from the subsurface into the indoor air of buildings is referred to as soil vapor intrusion. Because the site is vacant, the inhalation of site-related contaminants due to soil vapor intrusion does not represent a current concern for the on-site building. The potential exists for soil vapor intrusion in off-site structures.

6.5: Summary of the Remediation Objectives

The objectives for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375. The goal for the remedial program is to restore the site to pre-disposal conditions to the extent feasible. At a minimum, the remedy shall eliminate or mitigate all significant threats to public health and the environment presented by the contamination identified at the site through the proper application of scientific and engineering principles.

The remedial action objectives for this site are:

Groundwater

RAOs for Public Health Protection

- Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards.
- Prevent contact with, or inhalation of volatiles, from contaminated groundwater.

RAOs for Environmental Protection

- Restore ground water aquifer to pre-disposal/pre-release conditions, to the extent practicable.
- Remove the source of ground or surface water contamination.

Soil

RAOs for Public Health Protection

- Prevent ingestion/direct contact with contaminated soil.
- Prevent inhalation exposure to contaminants volatilizing from soil.

RAOs for Environmental Protection

- Prevent migration of contaminants that would result in groundwater or surface water contamination.

Soil Vapor

RAOs for Public Health Protection

- Mitigate impacts to public health resulting from existing, or the potential for, soil vapor intrusion into buildings at a site.

SECTION 7: SUMMARY OF THE PROPOSED REMEDY

To be selected, the remedy must be protective of public health and the environment, be cost-effective, comply with other statutory requirements, and utilize permanent solutions, alternative technologies or resource recovery technologies to the maximum extent practicable. The remedy must also attain the remedial action objectives identified for the site, which are presented in Section 6.5. Potential remedial alternatives for the site were identified, screened and evaluated in the FS report.

A summary of the remedial alternatives that were considered for this site is presented in Exhibit B. Cost information is presented in the form of present worth, which represents the amount of money invested in the current year that would be sufficient to cover all present and future costs associated with the alternative. This enables the costs of remedial alternatives to be compared on a common basis. As a convention, a time frame of 30 years is used to evaluate present worth costs for alternatives with an indefinite duration. This does not imply that operation, maintenance, or monitoring would cease after 30 years if remediation goals are not achieved. A summary of the Remedial Alternatives Costs is included as Exhibit C.

The basis for the Department's proposed remedy is set forth at Exhibit D.

The proposed remedy is referred to as the Air Sparging and Soil Vapor Extraction remedy.

The estimated present worth cost to implement the remedy is $641,000. The cost to construct the remedy is estimated to be $351,000 and the estimated average annual cost is $35,000.

The elements of the proposed remedy are as follows:

1. Remedial Design

A remedial design program will be implemented to provide the details necessary for the construction, operation, optimization, maintenance, and monitoring of the remedial program. Green remediation principles and techniques will be implemented to the extent feasible in the design, implementation, and site management of the remedy as per DER-31. The major green remediation components are as follows;

- Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
- Reducing direct and indirect greenhouse gases and other emissions;
- Increasing energy efficiency and minimizing use of non-renewable energy;
- Conserving and efficiently managing resources and materials;
- Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste;

- Maximizing habitat value and creating habitat when possible;
- Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals; and
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development.

2. Air Sparge with Soil Vapor Extraction (AS/SVE)

Air sparging will be implemented to address the groundwater plume contaminated by volatile organic compounds (VOCs). VOCs will be physically removed from the groundwater and soil below the water table (saturated soil) by injecting air into the subsurface. The injected air rising through the groundwater will volatilize and transfer the VOCs from the groundwater and/or soil into the injected air. The VOCs are carried with the injected air into the vadose zone (the area below the ground surface but above the water table) where a soil vapor extraction (SVE) system designed to remove the injected air will be installed. The SVE system will apply a vacuum to a network of perforated pipes installed into the vadose zone to remove the VOCs along with the air introduced by the sparging process. The air extracted from the SVE wells will be treated as necessary prior to being discharged to the atmosphere.

It is estimated 15 air injection wells will be installed in the area of the site to be treated. Installation will occur at a 30-foot spacing throughout the plume footprint, as depicted on Figure 12, to a depth of approximately 55 to 60 feet, which is 45 feet below the water table. To capture the volatilized contaminants, a network of perforated pipes will be installed in the vadose zone at a depth of approximately 5 to 10 feet below ground surface. The air containing VOCs extracted from the SVE wells will be treated by passing the air stream through activated carbon which removes the VOCs from the air prior to it being discharged to the atmosphere.

3. Cover System

A site cover will be required to allow for commercial use of the site in areas where the upper one foot of exposed surface soil will exceed the applicable soil cleanup objectives (SCOs). The site cover may consist of paved surface parking areas, sidewalks, or a soil cover. Where a soil cover is to be used it will be a minimum of one foot of soil placed over a demarcation layer, with the upper six inches of soil of sufficient quality to maintain a vegetative layer. Soil cover material, including any fill material brought to the site, will meet the SCOs for cover material as set forth in 6 NYCRR Part 375-6.7(d). In areas where building foundations or building slabs preclude contact with the soil, the requirements for a site cover will be deferred until such time that they are removed.

4. Vapor Mitigation

Any on-site buildings will be required to have a sub-slab depressurization system, or other acceptable measures, to mitigate the migration of vapors into the building from soil and/or groundwater. It is anticipated that the SVE system discussed in remedial element 2 will serve to mitigate vapor intrusion until such time that its operation is discontinued.

5. Institutional Controls

Imposition of an institutional control in the form of an environmental easement for the controlled property which will:

- require the remedial party or site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3);
- allow the use and development of the controlled property for commercial use as defined by Part 375-1.8(g), although land use is subject to local zoning laws;
- restrict the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or County DOH; and
- require compliance with the Department approved Site Management Plan.

6. Site Management Plan

A Site Management Plan is required, which includes the following:

1. An Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to ensure the following institutional and/or engineering controls remain in place and effective:

   Institutional Controls:
   The Environmental Easement discussed above in paragraph 4.

   Engineering Controls:
   The Air Sparge with Soil Vapor Extraction system discussed above in paragraph 2.

   This plan includes, but may not be limited to:
   - an Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination;
   - descriptions of the provisions of the environmental easement including any land use and groundwater use restrictions;
   - a provision for evaluation of the potential for soil vapor intrusion for any new buildings developed on the site or for buildings in off-site areas of contamination, including provision for implementing actions recommended to address exposures related to soil vapor intrusion;
   - a provision that should the owners of properties where sampling was previously declined request to have their properties sampled in the future, the NYSDEC, in consultation with the NYSDOH, shall assess the need for soil vapor intrusion sampling and take appropriate action.
   - provisions for the management and inspection of the identified engineering controls;
   - maintaining site access controls and Department notification; and
   - the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.
2. A Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to:

- monitoring of groundwater to assess the performance and effectiveness of the remedy;
- a schedule of monitoring and frequency of submittals to the Department;
- monitoring for vapor intrusion for any buildings, as may be required by the Institutional and Engineering Control Plan discussed above.

3. An Operation and Maintenance (O&M) Plan to ensure continued operation, maintenance, optimization, monitoring, inspection, and reporting of any mechanical or physical components of the remedy. The plan includes, but is not limited to:
    - procedures for operating and maintaining the remedy;
    - compliance monitoring of treatment systems to ensure proper O&M as well as providing the data for any necessary permit or permit equivalent reporting;
    - maintaining site access controls and Department notification; and
    - providing the Department access to the site and O&M records.

Exhibit A

Nature and Extent of Contamination

This section describes the findings of the Remedial Investigation for all environmental media that were evaluated. As described in Section 6.1, samples were collected from various environmental media to characterize the nature and extent of contamination.

For each medium for which contamination was identified, a table summarizes the findings of the investigation. The tables present the range of contamination found at the site in the media and compares the data with the applicable SCGs for the site. The contaminants of concern for this site are all volatile organic compounds (VOCs). For comparison purposes, the SCGs are provided for each medium that allows for unrestricted use. For soil the Restricted Use SCGs identified in Section 4 and Section 6.1.1 are also presented.

Groundwater

Groundwater sampling conducted as part of the Remedial Investigation (RI) included the collection of two samples from each of eleven on-site soil boring locations (i.e., one sample at the water table approximately 6 to 11 feet below grade and one at the bottom of the boring approximately 16 to 20 feet below grade). Also, low-flow samples were collected from nine shallow (10 to 30 feet below grade) and two deep (54.5 to 59.5 feet below grade) monitoring wells. Five of those wells were constructed on-site, and the remainder were off site.

Groundwater samples were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), PCBs, pesticides, metals and cyanide. SVOCs, PCBs, pesticides and cyanide were not detected in groundwater. The metals detected in groundwater were naturally occurring and typical of local groundwater.

Table 1 - Groundwater

Detected Constituents	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)	Frequency Exceeding SCG
VOCs			
tetrachloroethene (PCE)	ND - 14,000	5	17 of 36
trichloroethene (TCE)	ND - 190	5	11 of 36
cis-dichloroethene (DCE)	ND - 630	5	14 of 36

a - ppb: parts per billion, which is equivalent to micrograms per liter, µg/L, in water.
b - SCG: Standard Criteria or Guidance - Ambient Water Quality Standards and Guidance Values (TOGs 1.1.1), 6 NYCRR Part 703, ND – non detect
Surface water and Groundwater Quality Standards, and Part 5 of the New York State Sanitary Code (10 NYCRR Part 5).

Based on analytical results of the groundwater samples collected from on-site borings in October 2013, elevated concentrations of PCE, TCE, and/or DCE above their Class GA standards (5 ppb each) were present in shallow groundwater immediately southeast and south of the former Damshire Cleaners building (Figure 2) in an area presumed to be a former septic system. Elevated concentrations of contaminants were detected at the groundwater table at nine borings located at and downgradient of that area and at lower depths in downgradient borings.

Groundwater samples collected in January 2014 showed that PCE, TCE, and/or DCE exceeded the Class GA standard in a water sample collected from the rear sump within the building; a groundwater sample collected from

a monitoring well immediately downgradient and in front of the site along Central Avenue and groundwater samples collected from two monitoring wells located southeast of the building, and downgradient of the former septic system. (Figure 3)

Based on the findings of the RI, the presence of PCE and its breakdown products has resulted in the contamination of groundwater. The site contaminants that are considered to be the primary contaminants of concern which will drive the remediation of groundwater to be addressed by the remedy selection process are: PCE, TCE and DCE. The groundwater data indicate a source under the building and another source in the former septic system area. The data indicate a site-related contaminant plume extending southwest under Central Avenue to approximately 300 feet from the on-site building. (Figure 4) The lateral extent of contamination in shallow groundwater extends approximately 175 feet from Rooney Avenue to the adjacent property southeast of the site.

Soil

Eight shallow soil (0 - 6 inches below grade) samples were collected in the proximity of the overhead door, the rear sump and the former septic system. (Figure 5) A total of 11 soil borings (3 - 6 feet below grade) were completed in the same areas. (Figure 6) Two borings were driven through the building slab and one was driven through the rear sump. (Figure 7) The thick, reinforced concrete slab prohibited further soil sampling under the building.

Soil samples were submitted for analysis of VOCs, SVOCs, metals, PCBs and pesticides.

Table 2 - Soil

Detected Constituents	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b] (ppm)	Frequency Exceeding Unrestricted SCG	Restricted Commercial Use SCG[c] (ppm)	Frequency Exceeding Restricted SCG
VOCs					
tetrachloroethene (PCE)	ND - 830	1.3	5 of 25	1.3[d]	5 of 25
trichloroethene (TCE)	ND - 12	0.47	1 of 25	.47 [d]	1 of 25
cis-dichloroethene (DCE)	ND - 0. 015	0.25	0 of 25	.25 [d]	0 of 25
SVOCs					
benzo(a)anthracene	ND - 9.4	1	1 of 19	5.6	1 of 19
benzo(a)pyrene	ND - 8.9	1	5 of 19	1	5 of 19
benzo(b)fluoanthene	ND - 11	1	1 of 19	5.6	1 of 19
indeno(1,2,3-cd)pyrene	ND - 7	0.5	7 of 19	5.6	1 of 19
pesticides					
4,4-DDD	ND - 0.058	0.0033	3 of 19	92	0 of 19
4,4-DDE	ND - 0.03	0.0033	5 of 19	62	0 of 19
4,4-DDT	ND - 0.089	0.0033	7 of 19	47	0 of 19

Detected Constituents	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b] (ppm)	Frequency Exceeding Unrestricted SCG	Restricted Commercial Use SCG[c] (ppm)	Frequency Exceeding Restricted SCG
dieldrin	ND - 0.03	1.4	2 of 19	1.4	0 of 19
PCBs					
PCB aroclor 1248	ND - 0.34	0.1	2 of 19	1	0 of 19
PCB aroclor 1254	ND - 0.61	0.1	3 of 19	1	0 of 19
PCB aroclor 1260	ND - 0.16	0.1	2 of 19	1	0 of 19
inorganics					
barium	ND - 800	350	1 of 19	400	1 of 19
copper	ND - 240	50	3 of 19	270	0 of 19
lead	ND - 530	63	8 of 19	1,000	0 of 19
mercury	ND - 0.85	0.18	7 of 19	2.8	0 of 19
zinc	ND - 34,000	109	6 of 19	10,000	0 of 19

a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;
b - SCG: Part 375-6.8(a), Unrestricted Soil Cleanup Objectives.
c - SCG: Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Public Health for Commercial Use, unless otherwise noted.
d - SCG: Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Groundwater.

No VOCs were detected at concentrations exceeding unrestricted use soil cleanup objectives (UUSCOs) or restricted commercial use SCOs (RCUSCOs) in any of the onsite surface soil samples (located in the southeastern side of the site).

PCE was detected at low concentrations below UUSCOs in shallow subsurface soil within the footprint of the building and in the area east of the rear sump. PCE was detected above the UUSCO but below the CUSCO in soil collected at depth from in front of the building. However, a soil sample obtained during the 2011 site characterization from 14 feet below grade, in the water table and immediately in front of the site revealed an elevated concentration of PCE well above the CUSCO for PCE. (Figure 8)

Based on the findings of the Remedial Investigation, the presence of chlorinated VOCs has resulted in the contamination of the soil. The site contaminants identified in soil which are considered to be the primary contaminants of concern, to be addressed by the remedy selection process are PCE, TCE and DCE.

Soil Vapor

Samples of soil vapor, sub-slab vapor under structures and indoor air inside structures were collected to determine, along with the other environmental samples collected, whether actions are needed to address exposures related to soil vapor intrusion.

Prior to Department involvement in the site, a soil vapor intrusion (SVI) investigation was conducted in 2010 in the vacant on-site building. Elevated concentrations of PCE in sub-slab soil vapor indicated the presence of a PCE source under the building.

In March 2015, an SVI investigation was conducted at a building located upgradient from the site. The data are presented in Figure 9. One sub-slab vapor and two co-located indoor air samples were collected in the basement. Elevated concentrations of PCE and TCE were detected in one of the two indoor air samples. As a result of the discrepancy between the two indoor air samples, sub-slab vapor and indoor air at Structure 1 was resampled in May 2015. During the second sampling event, PCE and TCE were detected in sub-slab vapor, but they were not detectable in indoor air. Based on the sampling results, it was determined that actions were not needed to address exposures via soil vapor intrusion at that location. No additional structures were included in the SVI evaluation at that time, as access to three down gradient structures was denied.

Soil vapor sampling points were installed in the front of two buildings located downgradient of the site across Central Avenue. PCE and TCE were detected at both locations at elevated concentrations. (Figure 9)

In April 2017, SVI sampling was conducted at a one off-site structure at the request of a building tenant. Site-related contaminants were not detected in indoor air or sub-slab vapor.

Where soil vapor data is elevated, that data, along with groundwater data indicating elevated contaminant concentrations in the same area, suggest that PCE and TCE are volatilizing from shallow groundwater and impacting the vadose zones.

Based on the findings of the Remedial Investigation, the site contaminants that are considered to be the primary contaminants of concern which will drive the remediation of soil vapor to be addressed by the remedy selection process are PCE, TCE and DCE.

Building Sump

PCE was detected in material/debris collected from the opening/crack in the rear sump at a concentration of 3.4 mg/kg, which is above the UUSCO but below the RCUSCO of 150 mg/kg. PCE was also detected above the UUSCO in soil from a sample collected immediately below the rear sump during the installation of MW-15 at 2 to 4 feet below grade. VOCs were not detected in the soil sample collected from beneath the cleanout pipe.

During the initial building inspection, water was observed in the discharge piping located within the rear building sump. A water sample was collected from the discharge pipe showed elevated concentrations of PCE, TCE, and DCE well above water quality standards and well above any concentrations found on or off site. Impacted material/debris, soil, and water data at and within the immediate vicinity of the rear sump suggests the possibility of discharges from the sump.

Exhibit B

Description of Remedial Alternatives

The following alternatives were considered based on the remedial action objectives (see Section 6.5) to address the contaminated media identified at the site as described in Exhibit A.

Alternative 1: No Action

The No Action Alternative is evaluated as a procedural requirement and as a basis for comparison. This alternative leaves the site in its present condition and does not provide any additional protection to public health and the environment.

Alternative 2: Enhanced Bioremediation

In-situ enhanced biodegradation will be employed to treat contaminants in groundwater around and under the building. The biological breakdown of contaminants through anaerobic reductive dechlorination will be enhanced by the injection an electron donor emulsion at approximately 100 locations into the contaminated aquifer, as well as into the vadose zone beneath the building, to optimize anaerobic biodegradation. Two injection events are included in this alternative for the purpose of costing; however, it is possible additional events may be required to attain SCGs. The need for supplementary injections will depend on field conditions. (Figure 10)

Injection at each location will occur at 5-foot vertical intervals starting at a depth of 60 feet below grade and working upward to ground surface. To address soil contamination under the building, emulsion will be injected into the vadose zone for the 28 locations located within the building.

In areas where shallow soil contamination has been observed on-site, a cover system will be installed to allow for commercial use of the site. The site cover may consist of paved surface parking areas, sidewalks, buildings or a one-foot soil cover that will allow for vegetation.

Groundwater samples will be collected quarterly for the first 2 years, and annually thereafter, to measure the concentration of VOCs (monitoring is estimated to be conducted for 10 years or until SCGs are achieved). Samples will be collected from up to 15 monitoring wells.

A soil vapor intrusion investigation will be initiated at offsite buildings within proximity of the groundwater contaminant plume and in areas of soil vapor contamination.

Implementation of an institutional control in the form of an environmental easement for the controlled property that will allow the use and development of the site for commercial use, restrict the use of groundwater as a source of potable or process water, and require compliance with the Department approved site management plan.

A site management plan will be implemented that will include an institutional and engineering control plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to ensure that the institutional and engineering controls remain in place and effective.

Present Worth $1,698,000
Capital Cost $1,564,000
Annual Costs (Years 1-2) $40,400
Annual Costs (Years 3-10) $10,100

Alternative 3: In Situ Ozone-Enhanced Aquifer Air Sparging

Air combined with ozone will be forced into the aquifer via a network of wells installed as a grid designed to cover the extent of the plume; thereby, promoting contaminant degradation vertically and horizontally within the dissolved phase plume. (Figure 11) This remedy will involve the installation of treatment infrastructure at the site. Ozone sparging will operate continuously until site data show that SCGs have been met. For the cost estimates it as assumed that the system will operate for five years.

An ozone generator will produce and relay ozone to an air sparger which will force the air/ozone into the wells by a network of conveyance hoses and pipes. A grid network of 15 stainless steel ozone injection wells will be installed at a 30-foot spacing throughout the plume footprint. Each ozone injection location will consist of two screened intervals. The lower screened interval will be 55 to 60-feet below grade, and the upper screened interval 25 to 30-feet below grade. Displaced soil gas, excess ozone and VOCs are carried with the injected air into the vadose zone and removed with a soil vapor extraction (SVE) system. The SVE system will apply a vacuum to wells that have been installed into the vadose zone. The air extracted from the SVE wells will be treated as necessary prior to being discharged to the atmosphere. Bi-weekly operation and maintenance visits will be required during treatment system operations.

In areas where shallow soil contamination has been observed on-site, a cover system will be installed to allow for commercial use of the site. The site cover may consist of paved surface parking areas, sidewalks, buildings or a one-foot soil cover that will allow for vegetation.

Groundwater monitoring of up to 15 monitoring wells will be conducted quarterly for the first 2 years, and annually thereafter, to measure the concentration of VOCs. Monitoring will be continued until SCGs are achieved.

A soil vapor intrusion investigation will be conducted in offsite buildings within proximity of the groundwater contaminant plume.

The institutional controls and site management plan detailed in Alternative 2 would be implemented under this alternative, as well.

Present Worth $972,000
Capital Cost $526,000
Annual Costs (Years 1-2) $112,400
Annual Costs (Years 3-5) $82,100
Annual Costs (Years 6-10) $10,100

Alternative 4: Air Sparging and Soil Vapor Extraction

Air sparging will be implemented to address the groundwater contamination. VOCs will be physically removed from the groundwater and soil below the water table by injecting air into the subsurface. (Figure 12) The injected air rising through the groundwater will volatilize and transfer the VOCs from the groundwater and/or soil into the injected air. The VOCs are carried with the injected air into the vadose zone and removed with an SVE system.

The SVE system will apply a vacuum to wells that have been installed into the vadose zone to remove the VOCs along with the air introduced by the sparging process. The air extracted from the SVE wells will be treated as necessary prior to being discharged to the atmosphere.

A grid network of 15 air sparge injection wells will be installed at a 30-feet spacing throughout the plume footprint. Each air sparge location will consist of two screened intervals. The lower screened interval will be 55 to 60-feet below grade, and the upper screened interval 25 to 30-feet below grade. To capture the volatilized contaminants, the SVE system will be conducted with perforated pipes in a trench system installed in the vadose zone at a depth of approximately five below ground surface.

In areas where shallow soil contamination has been observed on-site, a cover system will be installed to allow for commercial use of the site. The site cover may consist of paved surface parking areas, sidewalks, buildings or a one-foot soil cover that will allow for vegetation.

Groundwater monitoring of up to 15 monitoring wells will be conducted quarterly for the first 2 years, and annually thereafter, to measure the concentration of VOCs. Monitoring will be continued until SCGs are achieved.

A soil vapor intrusion investigation will be conducted in off-site buildings within proximity of the groundwater contaminant plume.

The institutional controls and site management plan detailed in Alternative 2 would be implemented under this alternative, as well.

Present Worth $655,000
Capital Cost $365,000
Annual Costs (Years 1-2) $76,400
Annual Costs (Years 3-5) $46,100
Annual Costs (Years 6-10) $10,100

Alternative 5: In Situ Enhanced Reductive Dechlorination

In-situ chemical oxidation (ISCO) will be implemented to treat the contaminants. A chemical oxidant will be injected into the subsurface to destroy the contaminants under the building and in on-site groundwater. It is estimated that the remedy will require approximately 100 injection points in an approximately 7,500 square foot area as shown in Figure 13. Injections will occur at five foot intervals starting at 60 feet below grade up to the water table or to the surface under the building.

In areas where shallow soil contamination has been observed on-site, a cover system will be installed to allow for commercial use of the site. The site cover may consist of paved surface parking areas, sidewalks, buildings or a one-foot soil cover that will allow for vegetation.

For ten years or until SCGs are achieved, groundwater monitoring of up to 15 monitoring wells will be conducted quarterly for the first 2 years, and annually thereafter, to measure the concentration of VOCs.

A soil vapor intrusion investigation will be conducted in offsite buildings within proximity of the groundwater contaminant plume.

The institutional controls and site management plan detailed in Alternative 2 would be implemented under this alternative, as well.

Present Worth $1,440,000
Capital Cost $1,306,000
Annual Costs (Years 1-2) $40,400
Annual Costs (Years 3-10) $10,100

Alternative 6: Building Demolition, Soil Excavation, and Air Sparging / Soil Vapor Extraction

The Former Damshire Cleaners building will be demolished and the building material disposed of at a C&D landfill. Contaminated soil from beneath the building (446 yd^3) and the contaminated site soil outside the footprint of the building (210 yd^3) would then be excavated and removed from the site using an excavator and dump truck. Excavated soil will be transported to an approved offsite disposal facility. The excavated area would be restored to original grades using certified clean fill from an offsite source. Six inches of topsoil and seed will be placed over clean common fill. Approximately 656 yd^3 of impacted soil would be removed from the site under this alternative. Figure 14 depicts the proposed excavation extents under this alternative.

Following completion of building demolition and soil excavation and removal, an air sparging and soil vapor extraction system would be installed and implemented at the site as detailed in Alternative 4. Following installation of the treatment system the site would be restored to its original condition.

A soil vapor intrusion investigation will be conducted in offsite buildings within proximity of the groundwater contaminant plume.

The institutional controls and site management plan detailed in Alternative 2 would be implemented under this alternative, as well.

Present Worth $971,000
Capital Cost $681,000
Annual Costs (Years 1-2) $76,400
Annual Costs (Years 3-5) $46,100
Annual Costs (Years 6-10) $10,100

Exhibit C
Remedial Alternative Costs

	Remedial Alternative	**Capital Cost ($)**	**Average Annual Costs ($)**	**Total Present Worth ($)**
1	No Action	0	0	0
2	Enhanced Bioremediation	1,564,000	16,200	1,698,000
3	In Situ Ozone-Enhanced Aquifer Air Sparging	526,000	52,200	972,000
4	Air Sparging and Soil Vapor Extraction	365,000	35,000	655 ,000
5	In-Situ Enhanced Reductive Dechlorination	1,306,000	16,200	1.440,000
6	Building Demolition, Soil Excavation, and Air Sparge/SVE	681,000	34,200	971,000

Exhibit D

SUMMARY OF THE PROPOSED REMEDY

The Department is proposing Alternative 4, Air Sparging and Soil Vapor Extraction as the remedy for this site. Alternative 4 will achieve the environmental remediation goals for the site by the installation of air sparge wells that will remove VOCs from the groundwater that will then be collected by the soil vapor extraction (SVE) wells; the SVE wells will also remove VOC contamination from the unsaturated soil. The elements of this remedy are described in Section 7. The proposed remedy is depicted in Figure 12.

Basis for Selection

The proposed remedy is based on the results of the RI and the evaluation of alternatives. The criteria to which potential remedial alternatives are compared are defined in 6 NYCRR Part 375. A detailed discussion of the evaluation criteria and comparative analysis is included in the FS report.

The first two evaluation criteria are termed "threshold criteria" and must be satisfied in order for an alternative to be considered for selection.

1. Protection of Human Health and the Environment. This criterion is an overall evaluation of each alternative's ability to protect public health and the environment.

The proposed remedy (Alternative 4, Air Sparging and Soil Vapor Extraction) satisfies the criterion by directly reducing the concentrations of contaminants of concern (COCs) in all three media at the site and by preventing exposures to contamination through institutional and engineering controls, namely the environmental easement, Site Management Plan, and soil vapor extraction system.

Alternative 1 does not protect public health or the environment because there will be no change in existing conditions at the site and therefore is removed from further consideration. Alternative 6 satisfies the criterion by addressing the source area (i.e., the contaminated soil beneath the building) and directly reduces the concentrations of the COCs in all three media (soil, groundwater and soil vapor) at the site to levels protective of human health and the environment. Alternatives 2, 3 and 5 also satisfy this criterion; however, to a lesser degree than Alternative 4 because they do not address source area removal or directly address soil vapor.

2. Compliance with New York State Standards, Criteria, and Guidance (SCGs). Compliance with SCGs addresses whether a remedy will meet environmental laws, regulations, and other standards and criteria. In addition, this criterion includes the consideration of guidance which the Department has determined to be applicable on a case-specific basis.

Alternative 6 will be fully compliant and is efficient at achieving SCGs because it removes the source area (i.e. the onsite building and contaminated soil beneath the building) and directly reduces the concentration of COCs in all three media (soil, groundwater and soil vapor). Alternative 4 will also achieve SCGs; however, it will take a longer period of time to address source area removal. Alternatives 2 and 5 will also achieve SCGs; however, additional injections may be required. Alternative 3 will achieve SCGs in all soil, groundwater and soil vapor media; however, it will take the longest to achieve SCGs in soil and address the source area.

The next six "primary balancing criteria" are used to compare the positive and negative aspects of each of the remedial strategies.

3. Long-term Effectiveness and Permanence. This criterion evaluates the long-term effectiveness of the remedial alternatives after implementation. If wastes or treated residuals remain on-site after the selected remedy has been implemented, the following items are evaluated: 1) the magnitude of the remaining risks, 2) the adequacy of the engineering and/or institutional controls intended to limit the risk, and 3) the reliability of these controls.

Alternative 6 would be permanent for source area removal (i.e., the building and soil contamination both beneath the building) and soil contamination onsite. Alternative 6 would also install a groundwater air sparge and soil vapor extraction treatment system that will directly address groundwater and soil vapor. Alternatives 2 and 5 may require one or more additional rounds of injections as rebound of COCs commonly occurs after the injected material is consumed, therefore increasing the length of time to achieve SCGs. Long-term monitoring would be used to identify the need for further injections; however, the cost for additional injections is not included in the cost estimates. Alternatives 3 and 4 would be long term treatment systems that will provide the most effectiveness with continued operation.

4. Reduction of Toxicity, Mobility or Volume. Preference is given to alternatives that permanently and significantly reduce the toxicity, mobility or volume of the wastes at the site.

Alternatives 2, 3, 4 and 5 do not guarantee source removal. Alternative 4 would significantly reduce toxicity in soil vapor with direct treatment. Alternatives 3 and 4 would directly reduce groundwater concentrations without mobilizing COCs. Alternative 6 includes guaranteed and rapid source removal (i.e. building and soil contamination beneath the building), directly eliminates soil contamination onsite, would most significantly reduce toxicity in soil vapor with direct treatment, and would directly reduce groundwater concentrations without mobilizing COCs.

5. Short-term Impacts and Effectiveness. The potential short-term adverse impacts of the remedial action upon the community, the workers, and the environment during the construction and/or implementation are evaluated. The length of time needed to achieve the remedial objectives is also estimated and compared against the other alternatives.

Alternatives 3 and 4 pose a potential for increased short-term adverse impacts to the public during the site activities associated with the construction of the remediation systems, most notably during excavation for system installation and backfill around pipes, through the production of dust and the presence of construction equipment in a high traffic area; however, earthwork would only take a short amount of time during the two-month construction period. In addition, the permanent treatment systems would produce nuisance noise during operations. Alternatives 2 and 5 pose a potential for increased short term adverse impacts to the public during the direct-push injection events, which are expected to take more than two months and potentially be repeated within the treatment period. Alternative 6 poses a potential for increased short-term adverse impacts to the public during building demolition, excavation and loading activities, and activities associated with the construction of the remediation system. These potential impacts can be reduced through the implementation of standard dust mitigation construction practices, adequate fencing, proper safety signs, and other measures that have been implemented successfully at similar sites.

Workers can potentially be exposed to impacted media during construction of the remedial systems for Alternatives 3, 4, and 6, and during excavation activities for Alternative 6. Workers can also be exposed to the hazardous chemicals used during injections in Alternatives 2 and 5 if not handled carefully. Risks can be minimized by implementing health and safety controls, including the use of appropriate personal protective equipment.

Alternative 6 is the quickest way to meet standards for groundwater and vapor due to source removal. Alternatives 2 through 5 are expected to reach the remedial objectives within a comparable timeframe, although the exact amount of time for each is unknown. This depends on both physical and chemical site conditions.

6. Implementability. The technical and administrative feasibility of implementing each alternative are evaluated. Technical feasibility includes the difficulties associated with the construction of the remedy and the ability to monitor its effectiveness. For administrative feasibility, the availability of the necessary personnel and materials is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, institutional controls, and so forth.

Alternatives 2 and 5 would be easiest to implement because they require the least amount of design and construction. Alternatives 3 and 4 would include additional logistic effort during construction activities and design of a permanent treatment system. Alternative 6 would require negotiation/approval from the landowner (to proceed with building demolition activities) as well as additional logistic effort during the building demolition process, construction/disposal activities and site restoration. These alternatives have all been implemented successfully at similar sites.

7. Cost-Effectiveness. Capital costs and annual operation, maintenance, and monitoring costs are estimated for each alternative and compared on a present worth basis. Although cost-effectiveness is the last balancing criterion evaluated, where two or more alternatives have met the requirements of the other criteria, it can be used as the basis for the final decision.

Alternative 6 is the quickest way to meet SCGs via source removal, however it is the third most costly and requires full building demolition and off-site disposal. Alternatives 2 through 5 would all be effective at achieving SCGs at the site. Alternative 2 is the most expensive and least cost-effective. Alternative 4 is the more desirable from a cost standpoint because it satisfies all of the criterion and is overall the least expensive alternative. Alternative 3 is less expensive than Alternative 5, but Alternative 5 is more effective than Alternative 3.

8. Land Use. When cleanup to pre-disposal conditions is determined to be infeasible, the Department may consider the current, intended, and reasonable anticipated future land use of the site and its surroundings in the selection of the soil remedy.

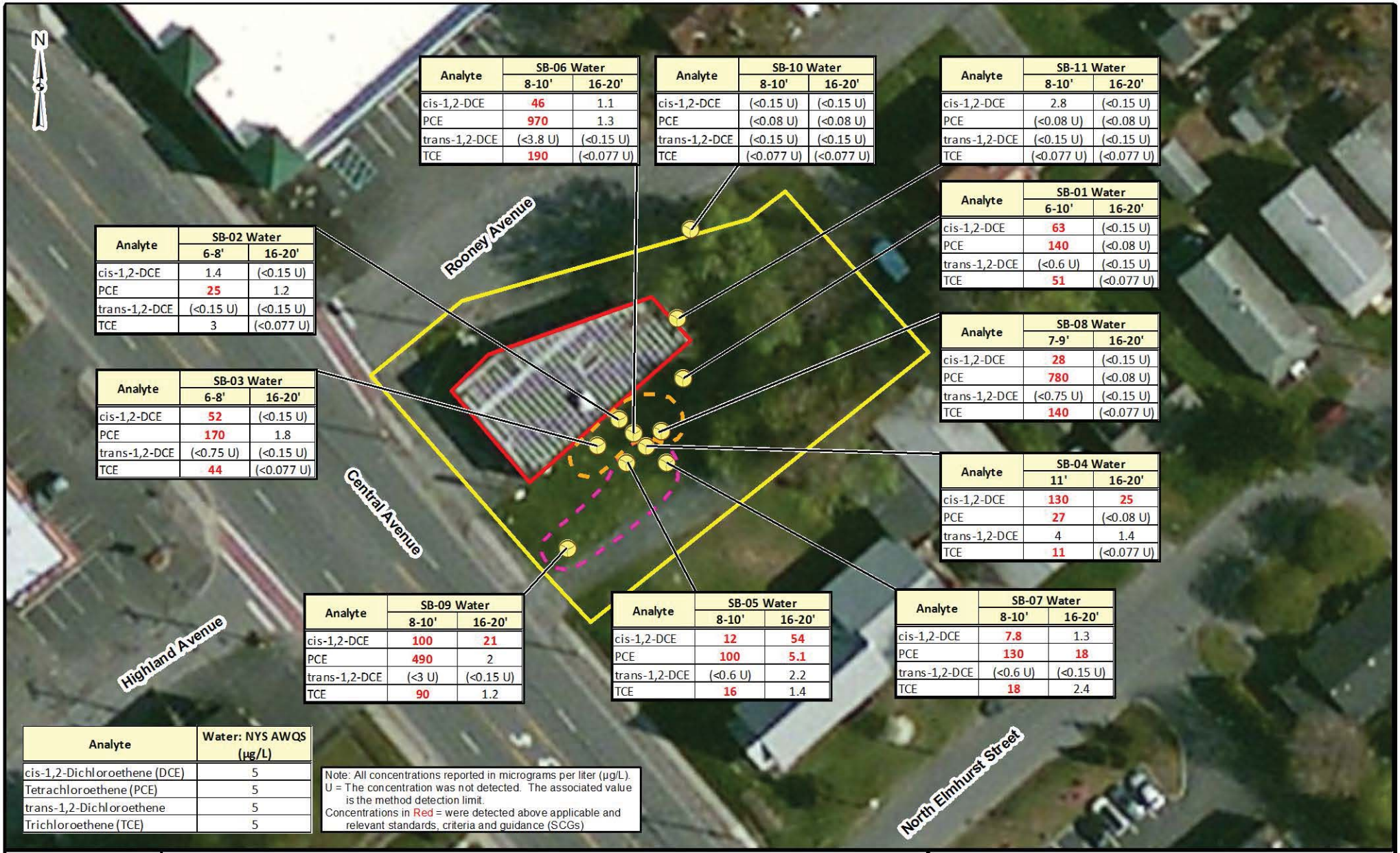
All alternatives evaluated other than no action, would result in the site being suitable for its reasonable anticipated future use as a commercial property.

The final criterion, Community Acceptance, is considered a "modifying criterion" and is taken into account after evaluating those above. It is evaluated after public comments on the Proposed Remedial Action Plan have been received.

9. Community Acceptance. Concerns of the community regarding the investigation, the evaluation of alternatives, and the PRAP are evaluated. A responsiveness summary has been prepared that describes public comments received and the manner in which the Department will address the concerns raised. If the selected remedy differs significantly from the proposed remedy, notices to the public will be issued describing the differences and reasons for the changes.

Alternative 4 is being proposed because, as described above, it satisfies the threshold criteria and provides the best balance of the balancing criterion.

Figure 1
Former Damshire Cleaners
Site Location



Analyte	SB-06 Water	
	8-10'	16-20'
cis-1,2-DCE	46	1.1
PCE	970	1.3
trans-1,2-DCE	(<3.8 U)	(<0.15 U)
TCE	190	(<0.077 U)

Analyte	SB-10 Water	
	8-10'	16-20'
cis-1,2-DCE	(<0.15 U)	(<0.15 U)
PCE	(<0.08 U)	(<0.08 U)
trans-1,2-DCE	(<0.15 U)	(<0.15 U)
TCE	(<0.077 U)	(<0.077 U)

Analyte	SB-11 Water	
	8-10'	16-20'
cis-1,2-DCE	2.8	(<0.15 U)
PCE	(<0.08 U)	(<0.08 U)
trans-1,2-DCE	(<0.15 U)	(<0.15 U)
TCE	(<0.077 U)	(<0.077 U)

Analyte	SB-02 Water	
	6-8'	16-20'
cis-1,2-DCE	1.4	(<0.15 U)
PCE	25	1.2
trans-1,2-DCE	(<0.15 U)	(<0.15 U)
TCE	3	(<0.077 U)

Analyte	SB-01 Water	
	6-10'	16-20'
cis-1,2-DCE	63	(<0.15 U)
PCE	140	(<0.08 U)
trans-1,2-DCE	(<0.6 U)	(<0.15 U)
TCE	51	(<0.077 U)

Analyte	SB-03 Water	
	6-8'	16-20'
cis-1,2-DCE	52	(<0.15 U)
PCE	170	1.8
trans-1,2-DCE	(<0.75 U)	(<0.15 U)
TCE	44	(<0.077 U)

Analyte	SB-08 Water	
	7-9'	16-20'
cis-1,2-DCE	28	(<0.15 U)
PCE	780	(<0.08 U)
trans-1,2-DCE	(<0.75 U)	(<0.15 U)
TCE	140	(<0.077 U)

Analyte	SB-04 Water	
	11'	16-20'
cis-1,2-DCE	130	25
PCE	27	(<0.08 U)
trans-1,2-DCE	4	1.4
TCE	11	(<0.077 U)

Analyte	SB-09 Water	
	8-10'	16-20'
cis-1,2-DCE	100	21
PCE	490	2
trans-1,2-DCE	(<3 U)	(<0.15 U)
TCE	90	1.2

Analyte	SB-05 Water	
	8-10'	16-20'
cis-1,2-DCE	12	54
PCE	100	5.1
trans-1,2-DCE	(<0.6 U)	2.2
TCE	16	1.4

Analyte	SB-07 Water	
	8-10'	16-20'
cis-1,2-DCE	7.8	1.3
PCE	130	18
trans-1,2-DCE	(<0.6 U)	(<0.15 U)
TCE	18	2.4

Analyte	Water: NYS AWQS (µg/L)
cis-1,2-Dichloroethene (DCE)	5
Tetrachloroethene (PCE)	5
trans-1,2-Dichloroethene	5
Trichloroethene (TCE)	5

Note: All concentrations reported in micrograms per liter (µg/L).
U = The concentration was not detected. The associated value is the method detection limit.
Concentrations in Red = were detected above applicable and relevant standards, criteria and guidance (SCGs)

Legend

- Approximate Site Boundary
- Approximate Building Outline
- Soil Boring / In Situ Groundwater Sampling Location
- Shallow (Water Table) Groundwater Detections
- Shallow (Water Table Interface) and Deeper (16-20 feet) Groundwater Detections

Feet
0 12.5 25 50 75 100
1 in = 50 ft

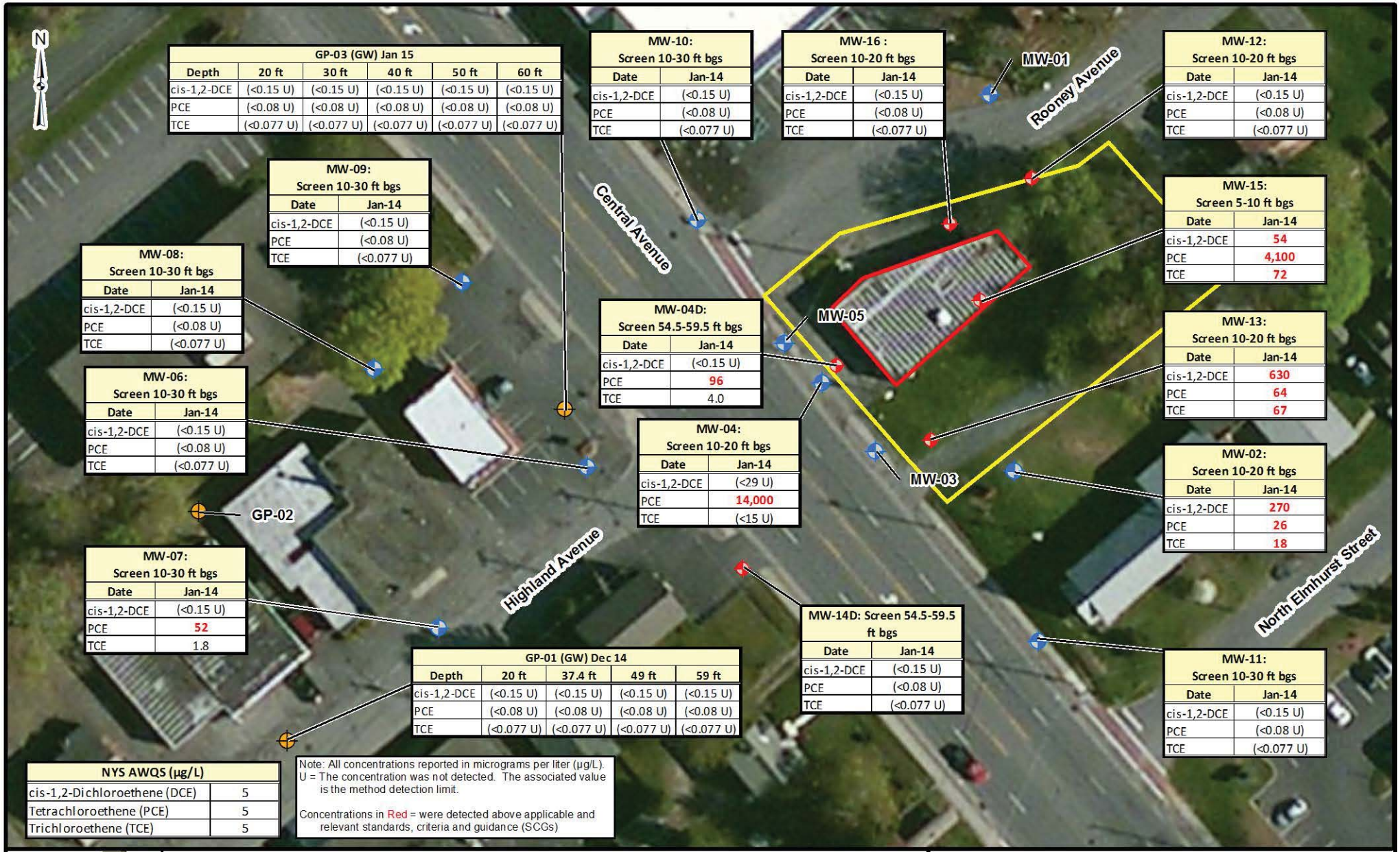
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

NEW YORK STATE OF OPPORTUNITY Department of Environmental Conservation

REMEDIAL INVESTIGATION REPORT
FORMER DAMSHIRE CLEANERS SITE (401059)
COLONIE, NEW YORK

Figure 2
IN SITU GROUNDWATER VOC
ANALYTICAL RESULTS OCTOBER 2013

PROJECT MGR:	DESIGNED BY:	CREATED BY:	CHECKED BY:	SCALE:	DATE:	PROJECT NO:	FILE NO:
JVU	ALK	ALK	SN	AS SHOWN	FEBRUARY 2016	1490723	GIS/PROJECTS/ RI_FIGURES/FIGURE 3-6

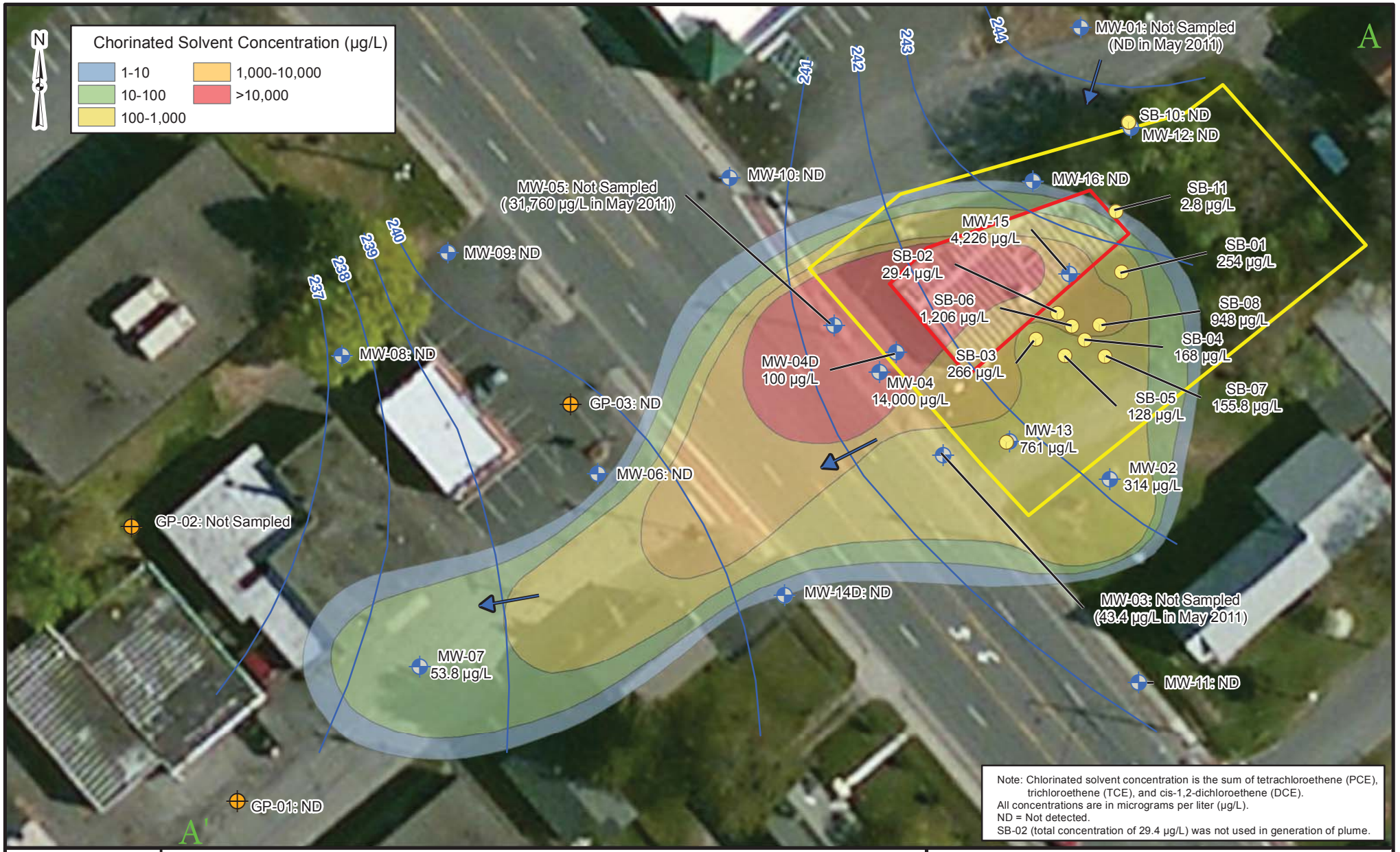


NEW YORK STATE OF OPPORTUNITY Department of Environmental Conservation

REMEDIAL INVESTIGATION REPORT
FORMER DAMSHIRE CLEANERS SITE (401059)
COLONIE, NEW YORK

Figure 3
GROUNDWATER MONITORING WELL AND PROFILING VOC ANALYTICAL RESULTS

PROJECT MGR:	DESIGNED BY:	CREATED BY:	CHECKED BY:	SCALE:	DATE:	PROJECT NO:	FILE NO:
JVU	ALK	ALK	SN	AS SHOWN	FEBRUARY 2016	1490723	GIS/PROJECTS/ RI_FIGURES/FIGURE 3-7



Legend

- Approximate Property Boundary
- Approximate Building Outline
- In Situ Groundwater Sampling Location
- Monitoring Well
- Profiling Point
- Interpolated 1-ft Groundwater Contour
- Groundwater Flow Direction

Feet
0 12.5 25 50 75 100
1 in = 50 ft

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

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REMEDIAL INVESTIGATION REPORT
FORMER DAMSHIRE CLEANERS SITE (401059)
COLONIE, NEW YORK

FIGURE 4-A
CHLORINATED SOLVENT
DISSOLVED-PHASE PLUME PLAN VIEW

PROJECT MGR:	DESIGNED BY:	CREATED BY:	CHECKED BY:	SCALE:	DATE:	PROJECT NO:	FILE NO:
JVU	ALK	ALK	SN	AS SHOWN	FEBRUARY 2016	1490723	GIS/PROJECTS/ RI_FIGURES/FIGURE 4-1

A
Northeast

A'
Southwest

Property Boundary

Former Dry Cleaner Building

Property Boundary

Central Avenue

Highland Avenue

MW-12
SB-11
MW-15 / Rear Sump
MW-04D
MW-04
MW-06
MW-07
GP-01

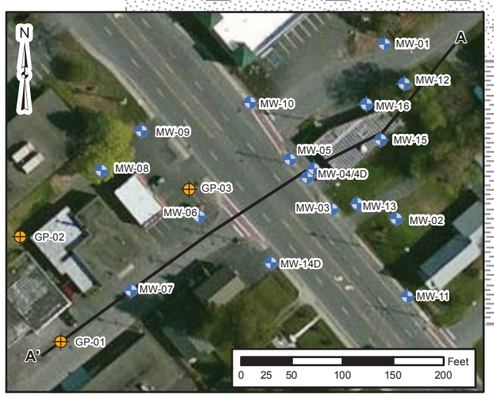
2.8 µg/L
4,226 µg/L
Not Detected
Not Detected
14,000 µg/L
Not Detected
53.8 µg/L
100 µg/L

20 ft bgs: Not Detected
30 ft bgs: Not Detected
40 ft bgs: Not Detected
50 ft bgs: Not Detected
60 ft bgs: Not Detected

ELEVATION (Feet above mean sea level)

250
240
230
220
210
200
190
180
170

Ft AMSL



Total CVOC Concentration (µg/L)
(Faded where inferred)

1-10	1,000-10,000
10-100	>10,000
100-1,000	

Note: Chlorinated solvent concentration is the sum of tetrachloroethene (PCE), trichloroethene (TCE), and cis-1,2-dichloroethene (DCE). All concentrations are in micrograms per liter (µg/L).

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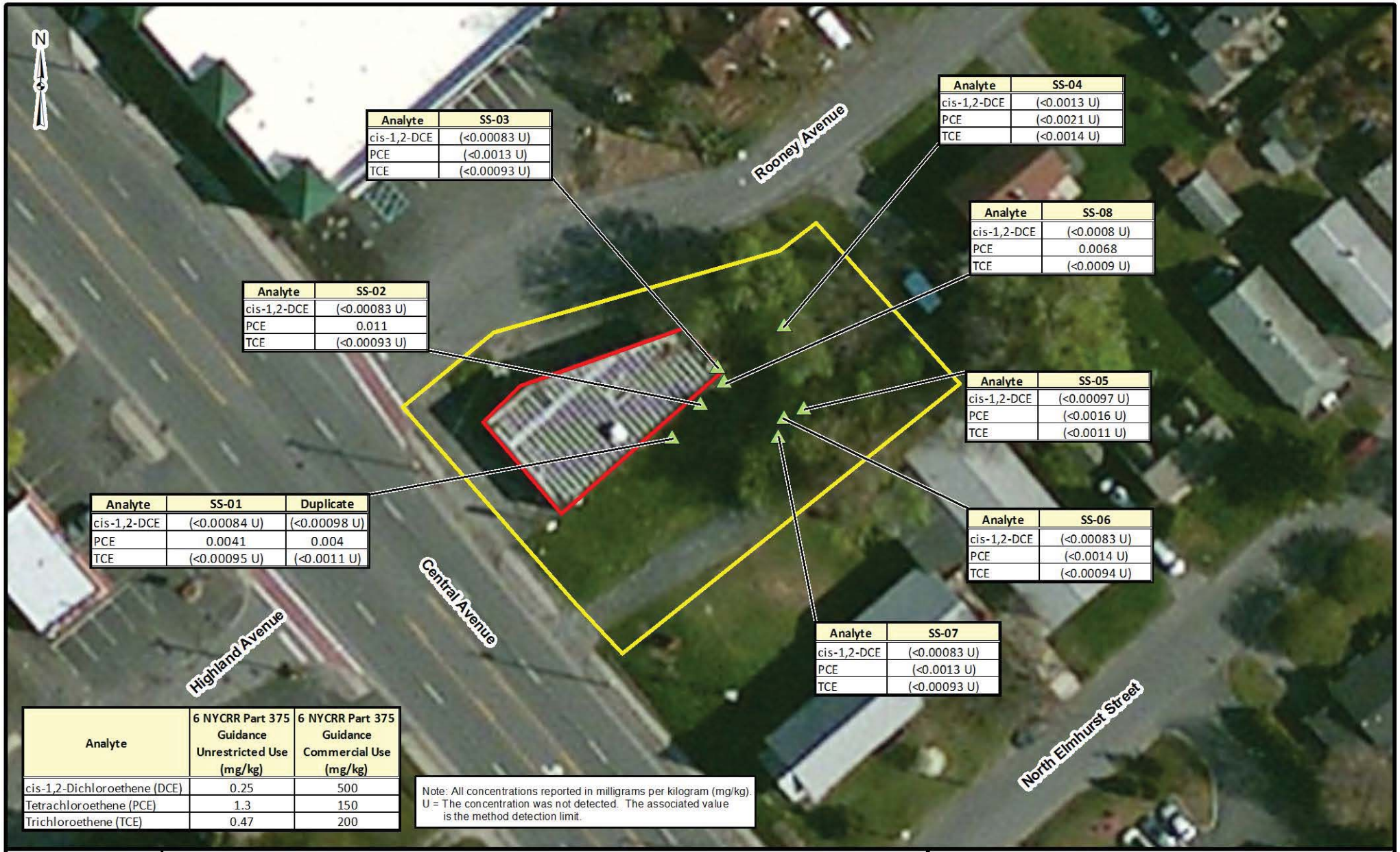
FORMER DAMSHIRE CLEANERS SITE (401059)
COLONIE, NEW YORK

FIGURE 4-B
CHLORINATED SOLVENT PLUME
CROSS SECTION A-A'
(NORTHEAST TO SOUTHWEST)

0 20 40 60 80
Feet
1 in = 40 ft

PROJECT MGR:	DESIGNED BY:	CREATED BY:	CHECKED BY:	PROJECT NO:	DATE:	SCALE:	FILE NO:
JMB	ALK	ALK	SN	14907.23	DECEMBER 2015	AS SHOWN	GIS/PROJECTS/ RI_FIGURES/ **FIGURE 4b**

- Asphalt / Concrete
- Grass
- Central Ave
- Groundwater Elevation
- Groundwater Flow Direction
- Water Table
- Topsoil
- Fill
- Asphalt/Subbase
- Fine to Medium Sand, Trace to Some Gravel
- Fine to Medium Sand
- Fine to Very Fine Sand and Silt, Trace to Some Clay
- Clay (Confining Unit)



Analyte	SS-03
cis-1,2-DCE	(<0.00083 U)
PCE	(<0.0013 U)
TCE	(<0.00093 U)

Analyte	SS-04
cis-1,2-DCE	(<0.0013 U)
PCE	(<0.0021 U)
TCE	(<0.0014 U)

Analyte	SS-08
cis-1,2-DCE	(<0.0008 U)
PCE	0.0068
TCE	(<0.0009 U)

Analyte	SS-02
cis-1,2-DCE	(<0.00083 U)
PCE	0.011
TCE	(<0.00093 U)

Analyte	SS-05
cis-1,2-DCE	(<0.00097 U)
PCE	(<0.0016 U)
TCE	(<0.0011 U)

Analyte	SS-01	Duplicate
cis-1,2-DCE	(<0.00084 U)	(<0.00098 U)
PCE	0.0041	0.004
TCE	(<0.00095 U)	(<0.0011 U)

Analyte	SS-06
cis-1,2-DCE	(<0.00083 U)
PCE	(<0.0014 U)
TCE	(<0.00094 U)

Analyte	SS-07
cis-1,2-DCE	(<0.00083 U)
PCE	(<0.0013 U)
TCE	(<0.00093 U)

Analyte	6 NYCRR Part 375 Guidance Unrestricted Use (mg/kg)	6 NYCRR Part 375 Guidance Commercial Use (mg/kg)
cis-1,2-Dichloroethene (DCE)	0.25	500
Tetrachloroethene (PCE)	1.3	150
Trichloroethene (TCE)	0.47	200

Note: All concentrations reported in milligrams per kilogram (mg/kg).
U = The concentration was not detected. The associated value is the method detection limit.

Legend

- Approximate Property Boundary
- Approximate Building Outline
- Surface Soil Sampling Location

Feet
0 12.5 25 50 75 100
1 in = 50 ft

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

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FORMER DAMSHIRE CLEANERS SITE (401059)
COLONIE, NEW YORK

Figure 5
SURFACE SOIL VOC ANALYTICAL RESULTS
OCTOBER 2013

PROJECT MGR:	DESIGNED BY:	CREATED BY:	CHECKED BY:	SCALE:	DATE:	PROJECT NO:	FILE NO:
JVU	ALK	ALK	SN	AS SHOWN	FEBRUARY 2016	1490723	GIS/PROJECTS/ RI_FIGURES/FIGURE 3-4a

Analyte	SB-06 3-4'
cis-1,2-DCE	(<0.0011 U)
PCE	(<0.0017 U)
TCE	(<0.0012 U)

Analyte	SB-10 3-4'
cis-1,2-DCE	(<0.00085 U)
PCE	(<0.0014 U)
TCE	(<0.00095 U)

Analyte	SB-11 3-5'
cis-1,2-DCE	(<0.00091 U)
PCE	(<0.0015 U)
TCE	(<0.001 U)

Analyte	SB-02 3-5'	Duplicate
cis-1,2-DCE	(<0.00086 U)	(<0.00084 U)
PCE	0.012	0.016
TCE	(<0.00096 U)	(<0.00095 U)

Analyte	SB-01 3-4'
cis-1,2-DCE	(<0.00075 U)
PCE	0.024
TCE	(<0.00084 U)

Analyte	SB-08 3-4'
cis-1,2-DCE	(<0.00091 U)
PCE	0.0032
TCE	(<0.001 U)

Analyte	SB-03 3-4'
cis-1,2-DCE	(<0.00081 U)
PCE	(<0.0013 U)
TCE	(<0.00091 U)

Analyte	SB-04 3-4'
cis-1,2-DCE	0.0047
PCE	0.069
TCE	0.0062

Analyte	MW-04D Dec 2013 32-34'	MW-04D Dec 2013 54-56'
cis-1,2-DCE	(<0.00095 U)	(<0.0010 U)
PCE	1.8	4.7
TCE	0.015 J	0.014

Analyte	SB-07 3-4'
cis-1,2-DCE	(<0.00085 U)
PCE	0.007
TCE	(<0.00096 U)

Analyte	SB-05 3-6'
cis-1,2-DCE	(<0.00089 U)
PCE	(<0.0014 U)
TCE	(<0.001 U)

Analyte	SB-09 3-4'
cis-1,2-DCE	(<0.00091 U)
PCE	(<0.0015 U)
TCE	(<0.001 U)

Analyte	6 NYCRR Part 375 Guidance Unrestricted Use (mg/kg)	6 NYCRR Part 375 Guidance Commercial Use (mg/kg)
cis-1,2-Dichloroethene (DCE)	0.25	500
Tetrachloroethene (PCE)	1.3	150
Trichloroethene (TCE)	0.47	200

Note: All concentrations reported in milligrams per kilogram (mg/kg).
U = The concentration was not detected. The associated value is the method detection limit.

Concentrations in Red were detected above the 6 New York Code of Rules and Regulations (NYCRR) Environmental Remediation Programs – Unrestricted Use – Soil Cleanup Objectives (SCOs).

Legend

- Approximate Property Boundary
- Approximate Building Outline
- Soil Boring
- Newly Installed Monitoring Well

Feet
0 12.5 25 50 75 100
1 in = 50 ft

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

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REMEDIAL INVESTIGATION REPORT
FORMER DAMSHIRE CLEANERS SITE (401059)
COLONIE, NEW YORK

Figure 6
SUBSURFACE SOIL VOC ANALYTICAL RESULTS
OCTOBER/DECEMBER 2013

PROJECT MGR:	DESIGNED BY:	CREATED BY:	CHECKED BY:	SCALE:	DATE:	PROJECT NO:	FILE NO:
JVU	ALK	ALK	SN	AS SHOWN	FEBRUARY 2016	1490723	GIS/PROJECTS/ RI_FIGURES/FIGURE 3-5a

ISB-1 (1-1.8 ft)	
Analyte	Mar '15 Soil
cis-1,2-DCE	(<0.0011 U)
PCE	6.2
TCE	0.061

ISB-2 (2-2.5 ft)	
Analyte	Mar '15 Soil
cis-1,2-DCE	0.0086
PCE	12
TCE	0.011

Rear Sump Oct 2013			
Analyte	Discharge Pipe (Water)	Sediment/Debris	MW-15 Soil 2-4'
cis-1,2-DCE	69,000	(<0.0073 U)	(<0.00087 U)
PCE	55,000	3.4	8.1
TCE	4,000	(<0.00082 U)	(<0.00098 U)

Clean-Out October 2013	
Analyte	Sediment/Debris
cis-1,2-DCE	(<0.00087 U)
PCE	(<0.0014 U)
TCE	(<0.00098 U)

Analyte	6 NYCRR Part 375 Guidance Unrestricted Use (mg/kg)	6 NYCRR Part 375 Guidance Commercial Use (mg/kg)	NYS AWQS (µg/L)
cis-1,2-Dichloroethene (cis-1,2-DCE)	0.25	500	5
Tetrachloroethene (PCE)	1.3	150	5
Trichloroethene (TCE)	0.47	200	5

Note: All soil concentrations reported in milligrams per kilogram (mg/kg). All water concentrations reported in micrograms per liter (ug/L).
U = The concentration was not detected. The associated value is the method detection limit.
Concentrations in Red were detected above the 6 New York Code of Rules and Regulations (NYCRR) Environmental Remediation Programs – Unrestricted Use – Soil Cleanup Objectives (SCOs) or the New York State (NYS) Ambient Water Quality Standards (AWQS).
Concentrations highlighted in yellow were detected above the 6 NYCRR Part 375 Environmental Remediation Programs – Restricted Use – Commercial – SCOs.

Legend

- Approximate Property Boundary
- Approximate Building Outline
- Sump Location
- Clean-Out Location
- Sub-Slab Soil Sampling Location

Feet
0 12.5 25 50 75 100
1 in = 50 ft

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

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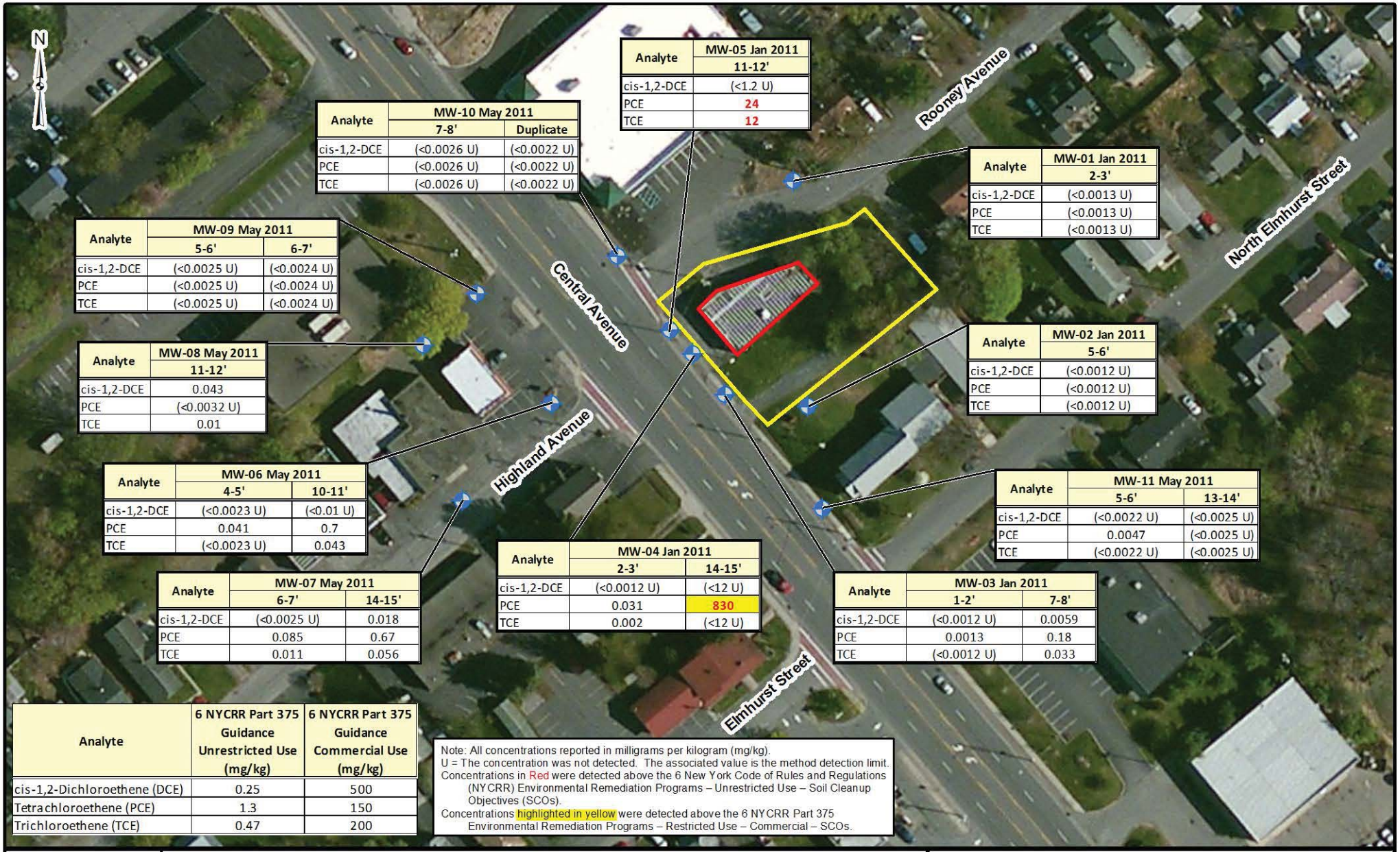
REMEDIAL INVESTIGATION REPORT
FORMER DAMSHIRE CLEANERS SITE (401059)
COLONIE, NEW YORK

Figure 7
FORMER DAMSHIRE CLEANERS BUILDING
ANALYTICAL RESULTS

PROJECT MGR:	DESIGNED BY:	CREATED BY:	CHECKED BY:	SCALE:	DATE:	PROJECT NO:	FILE NO:
JVU	ALK	ALK	SN	AS SHOWN	FEBRUARY 2016	1490723	GIS/PROJECTS/ RI_FIGURES/FIGURE 3-3



Analyte	MW-05 Jan 2011
	11-12'
cis-1,2-DCE	(<1.2 U)
PCE	24
TCE	12

Analyte	MW-10 May 2011	
	7-8'	Duplicate
cis-1,2-DCE	(<0.0026 U)	(<0.0022 U)
PCE	(<0.0026 U)	(<0.0022 U)
TCE	(<0.0026 U)	(<0.0022 U)

Analyte	MW-01 Jan 2011
	2-3'
cis-1,2-DCE	(<0.0013 U)
PCE	(<0.0013 U)
TCE	(<0.0013 U)

Analyte	MW-09 May 2011	
	5-6'	6-7'
cis-1,2-DCE	(<0.0025 U)	(<0.0024 U)
PCE	(<0.0025 U)	(<0.0024 U)
TCE	(<0.0025 U)	(<0.0024 U)

Analyte	MW-02 Jan 2011
	5-6'
cis-1,2-DCE	(<0.0012 U)
PCE	(<0.0012 U)
TCE	(<0.0012 U)

Analyte	MW-08 May 2011
	11-12'
cis-1,2-DCE	0.043
PCE	(<0.0032 U)
TCE	0.01

Analyte	MW-06 May 2011	
	4-5'	10-11'
cis-1,2-DCE	(<0.0023 U)	(<0.01 U)
PCE	0.041	0.7
TCE	(<0.0023 U)	0.043

Analyte	MW-11 May 2011	
	5-6'	13-14'
cis-1,2-DCE	(<0.0022 U)	(<0.0025 U)
PCE	0.0047	(<0.0025 U)
TCE	(<0.0022 U)	(<0.0025 U)

Analyte	MW-04 Jan 2011	
	2-3'	14-15'
cis-1,2-DCE	(<0.0012 U)	(<12 U)
PCE	0.031	830
TCE	0.002	(<12 U)

Analyte	MW-07 May 2011	
	6-7'	14-15'
cis-1,2-DCE	(<0.0025 U)	0.018
PCE	0.085	0.67
TCE	0.011	0.056

Analyte	MW-03 Jan 2011	
	1-2'	7-8'
cis-1,2-DCE	(<0.0012 U)	0.0059
PCE	0.0013	0.18
TCE	(<0.0012 U)	0.033

Analyte	6 NYCRR Part 375 Guidance Unrestricted Use (mg/kg)	6 NYCRR Part 375 Guidance Commercial Use (mg/kg)
cis-1,2-Dichloroethene (DCE)	0.25	500
Tetrachloroethene (PCE)	1.3	150
Trichloroethene (TCE)	0.47	200

Note: All concentrations reported in milligrams per kilogram (mg/kg).
U = The concentration was not detected. The associated value is the method detection limit.
Concentrations in Red were detected above the 6 New York Code of Rules and Regulations (NYCRR) Environmental Remediation Programs – Unrestricted Use – Soil Cleanup Objectives (SCOs).
Concentrations highlighted in yellow were detected above the 6 NYCRR Part 375 Environmental Remediation Programs – Restricted Use – Commercial – SCOs.

Legend

- Approximate Property Boundary
- Approximate Building Outline
- Monitoring Well

Feet
0 25 50 100 150 200
1 in = 100 ft

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

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REMEDIAL INVESTIGATION REPORT
FORMER DAMSHIRE CLEANERS SITE (401059)
COLONIE, NEW YORK

Figure 8
PREVIOUS SOIL VOC
ANALYTICAL RESULTS (2011)

PROJECT MGR:	DESIGNED BY:	CREATED BY:	CHECKED BY:	SCALE:	DATE:	PROJECT NO:	FILE NO:
JVU	ALK	ALK	SN	AS SHOWN	FEBRUARY 2016	1490723	GIS/PROJECTS/ RI_FIGURES/FIGURE 1-3

Upgradient, off-site SVI investigation

401059-IA-5		401059-FD-032515-1		401059-IA-1 (resample)	
Analyte	3/25/2015	Analyte	3/25/2015	Analyte	5/19/2015
cis-1,2-DCE	(<0.11)	cis-1,2-DCE	5.4	cis-1,2-DCE	(<0.18)
PCE	(<0.14)	PCE	**350**	PCE	(<0.1)
TCE	(<0.07)	TCE	**8.8**	TCE	(<0.18)
401059-SS-5		**401059-FD-032515-2**		**401059-SS-1 (resample)**	
Analyte	3/25/2015	Analyte	3/25/2015	Analyte	5/19/2015
cis-1,2-DCE	(<0.66)	cis-1,2-DCE	(<0.10)	cis-1,2-DCE	(<0.21)
PCE	(<1.4)	PCE	2.4	PCE	1.4
TCE	(<1.1)	TCE	(<0.068)	TCE	**3.2**

401059-SVT-2	
Analyte	3/25/2015
cis-1,2-DCE	(<0.9 U)
PCE	**130**
TCE	**7.7**

401059-SVT-1	
Analyte	3/25/2015
cis-1,2-DCE	(<0.86 U)
PCE	**1,300**
TCE	**93**

NYSDOH Air Guidelines	
cis-1,2-Dichloroethene (DCE)	No Standard
Tetrachloroethene (PCE)	30
Trichloroethene (TCE)	2

Note: All concentrations reported in micrograms per cubic meter.
U = The concentration was not detected. The associated value is the reporting limit.

Concentrations in Red = were detected above applicable and relevant standards, criteria and guidance (SCGs)

Legend

- Approximate Property Boundary
- Approximate Building Outline
- Initial Soil Vapor Point
- Soil Vapor Point

Feet
0 12.5 25 50 75 100
1 in = 50 ft

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

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REMEDIAL INVESTIGATION REPORT
FORMER DAMSHIRE CLEANERS SITE (401059)
COLONIE, NEW YORK

Figure 9
SOIL VAPOR AND VAPOR INTRUSION
VOC ANALYTICAL RESULTS

PROJECT MGR:	DESIGNED BY:	CREATED BY:	CHECKED BY:	SCALE:	DATE:	PROJECT NO:	FILE NO:
JVU	ALK	ALK	SN	AS SHOWN	FEBRUARY 2016	1490723	GIS/PROJECTS/ RI_FIGURES/FIGURE 3-7

Legend

- Approximate Property Boundary
- Approximate Building Outline
- Approximate Dissolved-Phase Plume Boundary
- Enhanced Bioremediation Well

Feet
0 7.5 15 30 45 60
1 in = 30 ft

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

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FEASIBILITY STUDY
FORMER DAMSHIRE CLEANERS SITE (401059)
COLONIE, NEW YORK

Alternative 2 FIGURE 10
ENHANCED BIOREMEDIATION

PROJECT MGR:	DESIGNED BY:	CREATED BY:	CHECKED BY:	SCALE:	DATE:	PROJECT NO:	FILE NO:
JVU	ALK	ALK	SN	AS SHOWN	DECEMBER 2016	1490723	GIS/PROJECTS/ FS_FIGURES/FIGURE 6-1

Legend

- Approximate Property Boundary
- Approximate Building Outline
- Approximate Dissolved-Phase Plume Boundary
- Ozone Injection Point
- Soil Vapor Extraction Trench
- Air Sparge Well

Feet

0 7.5 15 30 45 60

1 in = 30 ft

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

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FEASIBILITY STUDY
FORMER DAMSHIRE CLEANERS SITE (401059)
COLONIE, NEW YORK

Alternative 3 FIGURE 11
Ozone Injection and SVE System

PROJECT MGR:	DESIGNED BY:	CREATED BY:	CHECKED BY:	SCALE:	DATE:	PROJECT NO:	FILE NO:
JVU	ALK	ALK	SN	AS SHOWN	DECEMBER 2016	1490723	GIS/PROJECTS/ FS_FIGURES/FIGURE 6-2

Legend

- Approximate Property Boundary
- Approximate Building Outline
- Approximate Dissolved-Phase Plume Boundary
- Air Sparge Well
- Soil Vapor Extraction Trench

Feet

0 7.5 15 30 45 60

1 in = 30 ft

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

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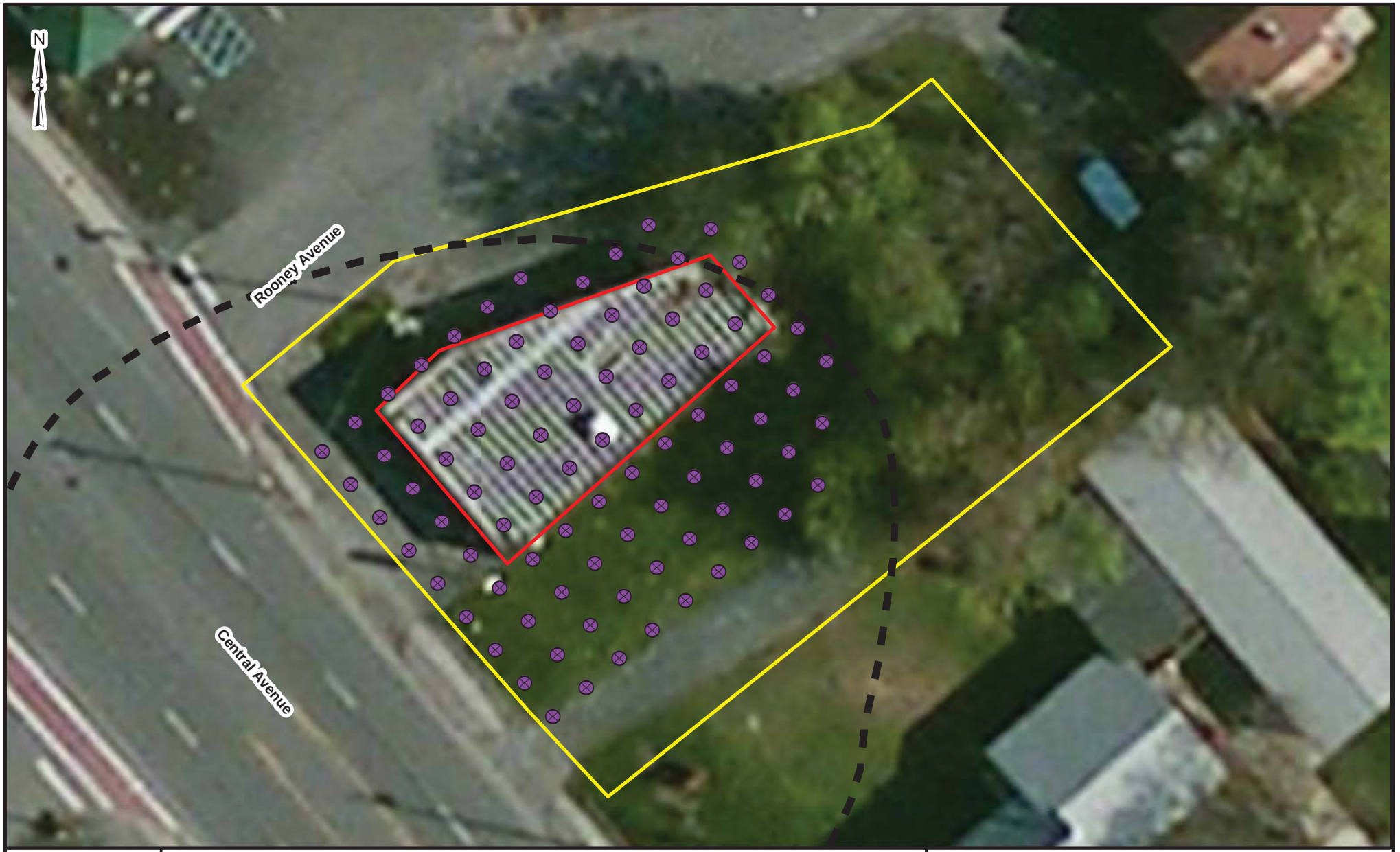
FEASIBILITY STUDY
FORMER DAMSHIRE CLEANERS SITE (401059)
COLONIE, NEW YORK

Alternative 4 FIGURE 12
Air Sparge / SVE System

PROJECT MGR:	DESIGNED BY:	CREATED BY:	CHECKED BY:	SCALE:	DATE:	PROJECT NO:	FILE NO:
JVU	ALK	ALK	SN	AS SHOWN	DECEMBER 2016	1490723	GIS/PROJECTS/ FS_FIGURES/FIGURE 6-3



Legend

- Approximate Property Boundary
- Approximate Building Outline
- Approximate Dissolved-Phase Plume Boundary
- In-Situ Chemical Oxidation Point

Feet
0 7.5 15 30 45 60
1 in = 30 ft

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

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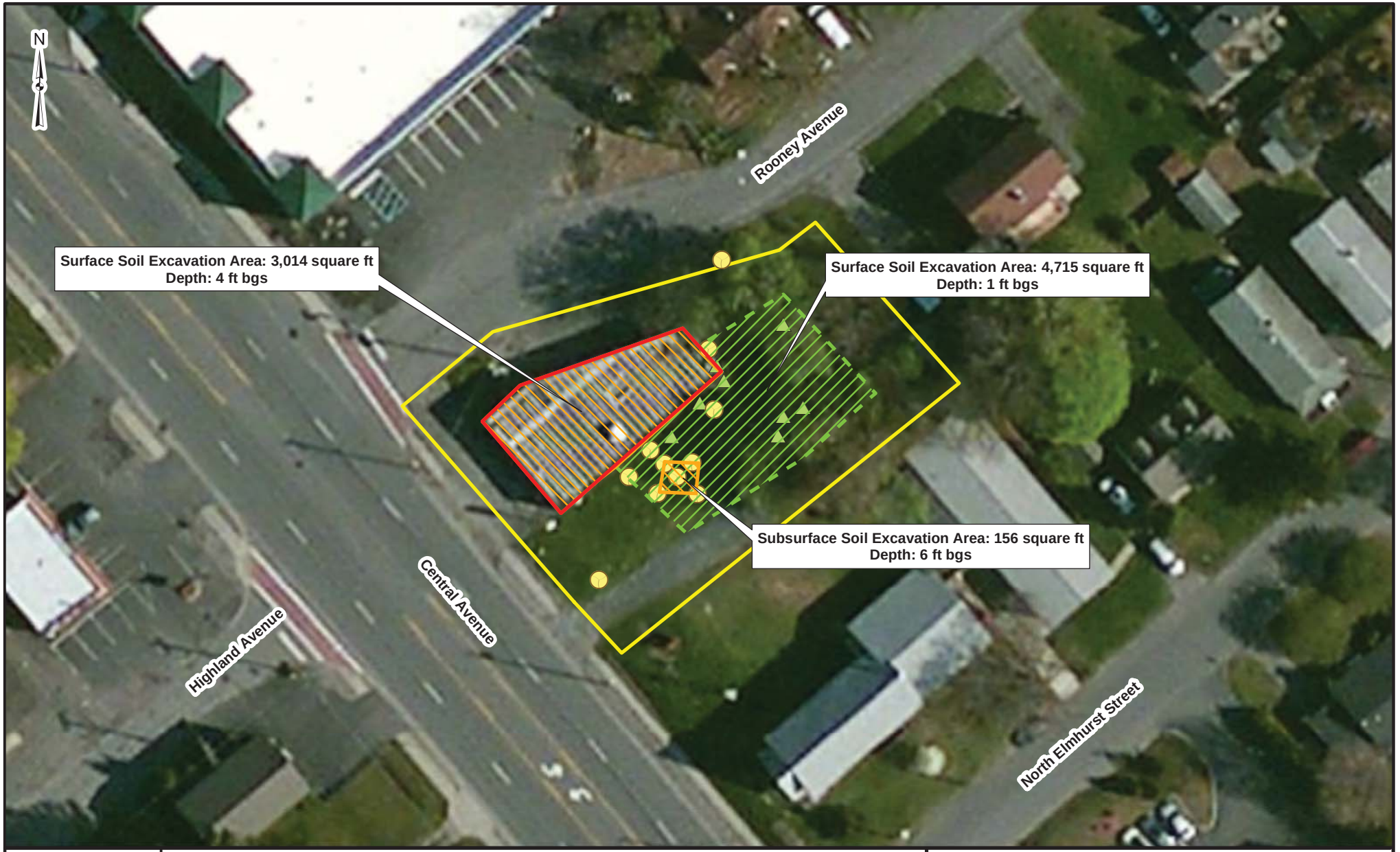
FEASIBILITY STUDY
FORMER DAMSHIRE CLEANERS SITE (401059)
COLONIE, NEW YORK

Alternative 5 FIGURE 13
In Situ Chemical Oxidation

PROJECT MGR:	DESIGNED BY:	CREATED BY:	CHECKED BY:	SCALE:	DATE:	PROJECT NO:	FILE NO:
JVU	ALK	ALK	SN	AS SHOWN	DECEMBER 2016	1490723	GIS/PROJECTS/ FS_FIGURES/FIGURE 6-4



Legend

- Approximate Property Boundary
- Approximate Building Outline
- Surface Soil Sampling Location
- Soil Boring
- Subsurface Soil Excavation Area
- Surface Soil Excavation ARea

Feet

0 12.5 25 50 75 100

1 in = 50 ft

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

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FEASIBILITY STUDY
FORMER DAMSHIRE CLEANERS SITE (401059)
COLONIE, NEW YORK

Alternative 6 FIGURE 14
SURFACE AND SUBSURFACE SOIL EXCAVATION AREAS

PROJECT MGR:	DESIGNED BY:	CREATED BY:	CHECKED BY:	SCALE:	DATE:	PROJECT NO:	FILE NO:
JVU	ALK	ALK	SN	AS SHOWN	DECEMBER 2016	1490723	GIS/PROJECTS/FS_FIGURES/FIGURE 6-5