RECORD OF DECISION

Brewerton Jack's Cleaners
State Superfund Project
Brewerton, Onondaga County
Site No. 734112
March 2015

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

DECLARATION STATEMENT - RECORD OF DECISION

Brewerton Jack's Cleaners
State Superfund Project
Brewerton, Onondaga County
Site No. 734112
March 2015

Statement of Purpose and Basis

This document presents the remedy for the Brewerton Jack's Cleaners site, a Class 2 inactive hazardous waste disposal site. The remedial program was chosen in accordance with the 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, and is not inconsistent with the National Oil and Hazardous Substances Pollution Contingency Plan of March 8, 1990 (40CFR300), as amended.

This decision is based on the Administrative Record of the New York State Department of Environmental Conservation (the Department) for the Brewerton Jack's Cleaners site and the public's input to the proposed remedy presented by the Department. A listing of the documents included as a part of the Administrative Record is included in Appendix B of the ROD.

Description of Selected Remedy

The elements of the selected remedy are as follows:

1. 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. Groundwater Treatment

In-situ enhanced biodegradation will be employed to treat volatile organic compounds (VOCs) in groundwater in an area to be determined during the remedial design. The biological breakdown of contaminants through anaerobic reductive dechlorination will be enhanced by the placement of a hydrogen release compound (HRC), or similar material into the subsurface. The method and depth of injection will be determined during the remedial design.

3. Imposition of an institutional control in the form of an environmental easement for the controlled property that:

- requires 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);
- allows the use and development of the controlled property for commercial use or industrial use as defined by Part 375-1.8(g), although land use is subject to local zoning laws;
- restricts 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
- requires compliance with the Department approved Site Management Plan.

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

a. 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 in paragraph 3 above.

Engineering Controls: the groundwater treatment system discussed in paragraph 2 above.

This plan includes, but may not be limited to:

- descriptions of the provisions of the environmental easement including any land use, and groundwater use restrictions;
- a provision for the evaluation of soil vapor intrusion in off-site buildings in potentially affected areas; the existing on-site building should there be a change in operations (if PCE use is curtailed), and for any new buildings developed on the site or affected off-site areas, including provision for implementing actions recommended to address exposures related to soil vapor intrusion;
- a provision for investigation beneath the existing on-site building if the building is demolished to determine if further remedial action (such as excavation or a soil cover) is warranted;
- provisions for the management and inspection of the identified engineering controls;
- a provision for further investigation to determine the nature and extent of contamination within the footprint of the existing building if and when it is demolished;
- maintaining site access controls and Department notification;
- the steps necessary for the periodic reviews and certification of the institutional and/or

engineering controls; and

- a provision for supplemental groundwater treatment technologies to be applied if determined to be appropriate during operations.

b. 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; and
- monitoring for vapor intrusion for any on-site buildings or those developed on the site or affected off-site area, as may be required by the Institutional and Engineering Control Plan discussed above.

New York State Department of Health Acceptance

The New York State Department of Health (NYSDOH) concurs that the remedy for this site is protective of human health.

Declaration

The selected remedy is protective of human health and the environment, complies with State and Federal requirements that are legally applicable or relevant and appropriate to the remedial action to the extent practicable, and is cost effective. This remedy utilizes permanent solutions and alternative treatment or resource recovery technologies, to the maximum extent practicable, and satisfies the preference for remedies that reduce toxicity, mobility, or volume as a principal element.

March 30, 2015
Date

Robert W. Schick, P.E., Director
Division of Environmental Remediation

RECORD OF DECISION

Brewerton Jack's Cleaners
Brewerton, Onondaga County
Site No. 734112
March 2015

SECTION 1: SUMMARY AND PURPOSE

The New York State Department of Environmental Conservation (the Department), in consultation with the New York State Department of Health (NYSDOH), has selected 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. The disposal or release of hazardous wastes at this site, as more fully described in this document, has contaminated various environmental media. The remedy is intended to attain the remedial action objectives identified for this site for the protection of public health and the environment. This Record of Decision (ROD) identifies the selected remedy, summarizes the other alternatives considered, and discusses the reasons for selecting the 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 6 NYCRR Part 375. This document is a summary of the information that can be found in the site-related reports and documents.

SECTION 2: CITIZEN PARTICIPATION

The Department seeks input from the community on all remedies. A public comment period was held, during which the public was encouraged to submit comment on the proposed remedy. All comments on the remedy received during the comment period were considered by the Department in selecting a remedy for the site. Site-related reports and documents were made available for review by the public at the following document repositories:

Northern Onondaga Public Library at Brewerton
Attn: Nancy Boisseau
5437 Library Street
Brewerton, NY 13029
Phone: 315-676-7484

NYS Department of Environmental Conservation Region 7

Attn: Tara Blum
615 Erie Blvd. West
Syracuse, NY 13204
Phone: 315-426-7452

A public meeting was also conducted. At the meeting, the findings of the remedial investigation (RI) and the feasibility study (FS) were presented along with a summary of the proposed remedy. After the presentation, a question-and-answer period was held, during which verbal or written comments were accepted on the proposed remedy.

Comments on the remedy received during the comment period are summarized and addressed in the responsiveness summary section of the ROD.

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. We encourage 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 site is located at 9628 Brewerton Road (NYS Route 11), in Brewerton, town of Cicero, Onondaga County.

Site Features: The site is currently utilized as a dry cleaning facility. The site is occupied with one single-story, slab-on-grade, 1,400 square foot building that was built in 1945 according to assessment records. Most of the site is covered by the structure. A small asphalt parking area approximately 25 feet wide is located on the west side of the building.

Current Zoning and Land Use: The site is approximately 0.17 acres and is zoned for commercial use. The area surrounding the site is primarily residential and commercial, with most businesses located north and south along Brewerton Road. A municipal fire station is located west across Brewerton Road. To the east are several hundred feet of wooded area. Residential properties are located to the east and south of the property.

Past Use of the Site: The site was reportedly utilized as a gasoline station along with the adjacent property located south of the site from the 1930s to the 1950s and as a dry cleaning facility since at least 1972. The use of tetrachlroethene (PCE) as a cleaning agent is ongoing. However, recent inspections at the facility indicate compliance with applicable regulations.

A petroleum spill was reported on the commercial property adjacent to Brewerton Jack’s Cleaners

in September 2006. An investigation was conducted which revealed dry-cleaning solvent contamination in groundwater on the adjacent commercial property. Subsequent to that investigation, remedial efforts were undertaken under the Spill Program which included removal of two gasoline underground storage tanks and approximately 1,145 tons of associated petroleum-contaminated soil from this site. Confirmatory sampling indicated that the extent of soil impacts from petroleum compounds were reduced significantly by source removal in this area.

Site Geology and Hydrogeology: The thickness of the vadose zone is approximately 0-5 ft below ground surface (bgs) in most areas of the site. The soil is generally moist and consists of a mixture of sandy-silt and silty-sand, some peat and organic materials, rock fragments, and other debris. The soil in the saturated zone located 5-15 ft bgs generally consists of moist to wet silty and sandy clay with gravel. The bedrock unit, generally consisting of highly weathered grey shale, is encountered between 14.5 and 23 ft bgs. Shallow groundwater which fluctuates seasonally was encountered between 1.4 and 11 ft bgs and flows to the east/southeast and groundwater in bedrock which fluctuates between 2.5 and 16 ft bgs follows a similar pattern flowing to the southeast. There appears to be a vertical downward gradient between the shallow unconfined and bedrock aquifers.

A site location map is attached as Figure 3.

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, an alternative which allows for unrestricted use of the site was evaluated.

A comparison of the results of the RI against unrestricted use standards, criteria and guidance values (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:

Brewerton Jack's Cleaners

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
- outdoor ambient 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 contaminant(s) of concern identified at this site is/are:

TETRACHLOROETHYLENE (PCE)	cis-1,2-Dichloroethene
TRICHLOROETHENE (TCE)	trans-1,2-Dichloroethene
VINYL CHLORIDE	

As illustrated in Exhibit A, the contaminant(s) of concern exceed the applicable SCGs for:

- groundwater

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.

During the Site Characterization completed in March 2008, chlorinated volatile organic compounds (CVOCs) were detected in soil borings installed immediately behind the Brewerton Jack's Cleaners building. The septic system for the property was located in this area and was identified as the likely source of soil and groundwater impacts on-site. In September 2009, the septic system and approximately 172 tons of impacted soil was excavated, removed and properly disposed of off-site. The excavation was backfilled with clean off-site material that achieves the lower of commercial use or protection of groundwater soil cleanup objectives, as set forth in 6NYCRR Part 375-6.7(d). Confirmatory soil samples collected on the bottom and side walls of the excavation resulted in detections of CVOCs, however, the concentrations were less than Part 375 unrestricted use and protection of groundwater SCGs.

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 for OU 01.

Nature and Extent of Contamination:

Based upon investigations conducted to date, the primary contaminants of concern include chlorinated volatile organic compounds (CVOCs).

Waste/Source Areas

As described in the RI report, waste/source materials were identified at the site and although believed to have been removed by the IRM, remaining groundwater contamination continues to impact the site and potentially soil vapor.

Groundwater

Samples were collected from a network of overburden and bedrock monitoring wells to assess groundwater conditions both on the Jack's Drycleaner property and neighboring off-site properties. Samples were analyzed for VOCs associated with dry cleaning operations. The results indicate that contaminant levels in both shallow and deep groundwater both on the site and off-site significantly exceeds the SCGs for volatile organic compounds (5 ppb).

The primary groundwater contaminants are tetrachloroethene (PCE) associated with the past operation of the dry cleaning business and its degradation products typical of PCE breakdown which include trichloroethene (TCE), dichloroethene (both cis-1,2-DCE) and trans-1,2-DCE), and vinyl chloride (VC). PCE concentrations range from 0.96 to 41,300 ppb; TCE concentrations range from 1.5 to 4,470 ppb; cis-1,2-DCE from 1.3 – 10,300 ppb; trans-1,2-DCE from 0.6 – 190 ppb; and VC from 0.99 to 2,100 ppb. The primary groundwater contamination is located on the eastern side of the property, where the former septic system was located, and has migrated approximately 700 feet downgradient southeast of the property in the direction of groundwater flow.

Soil

During the site characterization, four subsurface soil samples were collected from behind the drycleaner building south and east of the septic system. Sampling focused on VOC contaminants typically found in drycleaner operations. Acetone in one soil sample at 0.18 mg/kg was the only analytical result above the unrestricted use SCG of 0.05 mg/kg. During the Remedial Investigation, two sub-slab soil samples were collected from beneath the drycleaner building. No VOC analytical results were above the unrestricted use SCGs. In addition, confirmatory soil sampling was done post IRM as discussed in Section 6.2 above. No site-related soil contamination of concern was identified during the RI. Therefore, no remedial alternatives need to be evaluated for soil.

Soil Vapor

A soil vapor investigation was completed in 2009 at the commercial building located adjacent to the site. Based on the results, actions were not needed to address exposures related to soil vapor intrusion in this commercial building. Due to the ongoing use of PCE at the on-site facility, no indoor air evaluation was completed.

To evaluate whether actions are needed to address exposures related to soil vapor intrusion, soil vapor, sub-slab vapor, and indoor air samples were collected from eight off-site structures located downgradient from the groundwater plume. A total of 23 air/vapor samples were collected. Chlorinated VOCs including methylene chloride, PCE, carbon tetrachloride, 1,1,1-trichloroethane, and trans-1,2-DCE were detected in samples collected from the structures, however, based on the

concentration detected, in comparison with the NYSDOH Soil Vapor Intrusion Guidance, no site-related soil vapor contamination at levels of concern were identified during the SVI -evaluation.

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*.

People are not drinking contaminated groundwater because the area is served by a public water supply that is not affected by site-related contamination. People are not expected to come into direct contact with the contaminated groundwater unless they dig below the ground surface. 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. A potential exists for the inhalation of site contaminants due to soil vapor intrusion in the on-site building and in any buildings developed on-site in the future. The potential for soil vapor intrusion to occur in off-site buildings requires further evaluation due to plume migration.

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.

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 SELECTED REMEDY

To be selected the remedy must be protective of human 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 feasibility study (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 remedy is set forth at Exhibit D.

The selected remedy is referred to as the In-situ Enhanced Bioremediation remedy.

The estimated present worth cost to implement the remedy is $597,000. The cost to construct the remedy is estimated to be $389,000 and the estimated average annual cost is $64,000 for the first two years and $16,000 for years three through ten.

The elements of the selected remedy are as follows:

1. 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. Groundwater Treatment

In-situ enhanced biodegradation will be employed to treat volatile organic compounds (VOCs) in groundwater in an area to be determined during the remedial design. The biological breakdown of contaminants through anaerobic reductive dechlorination will be enhanced by the placement of a hydrogen release compound (HRC), or similar material into the subsurface. The method and depth of injection will be determined during the remedial design.

3. Imposition of an institutional control in the form of an environmental easement for the controlled property that:

- requires 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);
- allows the use and development of the controlled property for commercial use or industrial use as defined by Part 375-1.8(g), although land use is subject to local zoning laws;
- restricts 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
- requires compliance with the Department approved Site Management Plan.

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

a. 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 in paragraph 3 above.

Engineering Controls: the groundwater treatment system discussed in paragraph 2 above.

This plan includes, but may not be limited to:

- descriptions of the provisions of the environmental easement including any land use, and groundwater use restrictions;
- a provision for the evaluation of soil vapor intrusion in off-site buildings in potentially affected areas; the existing on-site building should there be a change in operations (if PCE use is curtailed), and for any new buildings developed on the site or affected off-site areas, including provision for implementing actions recommended to address exposures related to soil vapor intrusion;
- a provision for investigation beneath the existing on-site building if the building is demolished to determine if further remedial action (such as excavation or a soil cover) is warranted;
- provisions for the management and inspection of the identified engineering controls;
- a provision for further investigation to determine the nature and extent of contamination within the footprint of the existing building if and when it is demolished;
- maintaining site access controls and Department notification;

- the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls; and
- a provision for supplemental groundwater treatment technologies to be applied if determined to be appropriate during operations.

b. 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; and
- monitoring for vapor intrusion for any on-site buildings or those developed on the site or affected off-site area, as may be required by the Institutional and Engineering Control Plan discussed above.

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, the findings of the investigation are summarized below. Since only the groundwater medium continues to have exceedances of the SCGs, there is just one table that presents the range of contamination found at the site in groundwater and compares the data with the applicable SCGs that allows for unrestricted use for the site. The contaminants of concern (COCs) include just one category--volatile organic compounds (VOCs).

Waste/Source Areas

As described in the RI report, waste/source materials were identified at the site and although believed to have been removed by the IRM, remaining groundwater contamination continues to impact the site and potentially soil vapor. Wastes are defined in 6 NYCRR Part 375-1.2 (aw) and include solid, industrial and/or hazardous wastes. Source areas are defined in 6 NYCRR Part 375 (au). Source areas are areas of concern at a site were substantial quantities of contaminants are found which can migrate and release significant levels of contaminants to another environmental medium.

A petroleum spill was reported on the commercial property adjacent to Brewerton Jack's Cleaners in September 2006. An investigation was conducted in October 2006 which revealed dry cleaning solvent contamination in groundwater on the adjacent commercial property. Subsequent to that investigation, remedial efforts were undertaken under the Spill Program which included removal of two gasoline underground storage tanks and approximately 1,145 tons of associated petroleum-contaminated soil from this site. Confirmatory sampling indicated that the extent of soil impacts from petroleum compounds were reduced significantly by source removal in this area. During the Site Characterization completed in March 2008, chlorinated volatile organic compounds (CVOCs) were detected in soil borings installed immediately behind the Brewerton Jack's Cleaners building. The septic system for the property was located in this area (see Figure 2) and was identified as the likely source of soil and groundwater impacts on-site. In September 2009, the septic system and approximately 172 tons of impacted soil was excavated, removed and properly disposed of off-site. Confirmatory soil samples collected on the bottom and side walls of the excavation resulted in detections of CVOCs, however, the concentrations were less than Part 375 unrestricted use and protection of groundwater SCGs.

Groundwater

Groundwater samples were collected from a network of overburden and bedrock monitoring wells. See Figure 3-1 for locations of the monitoring wells. The samples were collected to assess groundwater conditions on the Brewerton Jack's Cleaners property and off-site. The results indicate that contamination in shallow groundwater both on the property and off-site exceeds the SCGs for volatile organic compounds. Contaminant levels in bedrock groundwater also exceeds the SCGs for volatile organic compounds.

Table 1 - Groundwater

Detected Constituents	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)	Frequency Exceeding SCG
VOCs			
Tetrachloroethene (PCE)	0.96 – 41,300	5	34/67
Trichloroethene (TCE)	1.5 – 4,470	5	28/67
Cis-1,2-Dichloroethene (cis-1,2-DCE)	1.3 – 10,300	5	31/67
Trans-1,2-Dichloroethene (trans-1,2-DCE)	0.6 – 190	5	15/67
Vinyl chloride (VC)	0.99 – 2,100	5	22/67

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

The primary groundwater contaminants are tetrachloroethene (PCE) associated with operation of the dry cleaning business and the degradation byproducts typical of PCE breakdown which include trichloroethene (TCE), dichloroethene (both cis-1,2-DCE) and trans-1,2-DCE), and vinyl chloride (VC). As shown on Figure 4 Selected Chlorinated Solvents in Groundwater, the primary groundwater contamination is associated with the former septic system located on the eastern side of the property and has migrated approximately 700 feet downgradient southeast of the property in the direction of groundwater flow. A comparison of groundwater monitoring data collected from 2007 to 2011 show a decrease in total VOC levels.

Based on the findings of the RI, the past disposal of hazardous waste 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, cis-1,2-DCE, trans-1,2-DCE, and VC.

Soil

During the site characterization, four subsurface soil samples were collected from behind the drycleaner building south and east of the septic system. Sampling focused on VOC contaminants typically found in drycleaner operations. Acetone in one soil sample at 0.18 mg/kg was the only analytical result above the unrestricted use SCG of 0.05 mg/kg. During the remedial investigation, two sub-slab soil samples were collected from beneath the drycleaner building. No VOC analytical results were above the unrestricted use SCGs. In addition, confirmatory soil sampling was done post IRM as discussed in Section 6.2 above. No site-related soil contamination of concern was identified during the RI. Therefore, no remedial alternatives need to be evaluated for soil.

Soil Vapor

A soil vapor investigation was completed in 2009 at the commercial building located adjacent to the site. Based on the results, actions were not needed to address exposures related to soil vapor intrusion in this commercial building. Due to the ongoing use of PCE at the on-site facility, no indoor air evaluation was completed.

To evaluate whether actions are needed to address exposures related to soil vapor intrusion, soil vapor, sub-slab vapor, and indoor air samples were collected from eight off-site structures located downgradient from the groundwater plume. A total of 23 air/vapor samples were collected. Chlorinated VOCs including methylene chloride, PCE, carbon tetrachloride, 1,1,1-trichloroethane, and trans-1,2-DCE were detected in samples collected from the structures, however, based on the concentration detected, in comparison with the NYSDOH Soil Vapor Intrusion Guidance, no site-related soil vapor contamination at levels of concern were identified during the SVI - evaluation.

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: In-situ Enhanced Bioremediation

In-situ enhanced biodegradation is employed to treat volatile organic compounds (VOCs) in groundwater in an area to be determined during the remedial design. The biological breakdown of contaminants through anaerobic reductive dechlorination is enhanced by the placement of a hydrogen release compound (HRC), or similar material into the subsurface. The method and depth of injection will be determined during the remedial design.

For purposes of estimating costs for this alternative, a preliminary design was done as shown in Figure 5. It was assumed that the electron donor emulsion will be injected into 42 points within the source area and 105 injection points within the plume area which includes the site property and off-site. While only one injection event was included in this alternative, it is possible that additional events may be required to attain SCGs. The need for supplementary injections will be assessed during the remedial design phase. It is expected that this alternative will take 1-2 years to design and implement. Monitoring will be conducted for up to 10 years, or until cleanup goals are achieved.

In addition to the Engineering Control of the groundwater treatment system described above, this alternative includes the following Institutional Controls:

An environmental easement for the controlled property that:

- requires 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);
- allows the use and development of the controlled property for commercial use or industrial use as defined by Part 375-1.8(g), although land use is subject to local zoning laws;
- restricts 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
- requires compliance with the Department approved Site Management Plan.

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

a. 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 engineering controls remain in place and effective:

Institutional Controls: the environmental easement discussed above.

Engineering Controls: the groundwater treatment system discussed above.

This plan includes, but may not be limited to:

- descriptions of the provisions of the environmental easement including any land use, and groundwater use restrictions;
- a provision for the evaluation of soil vapor intrusion in the existing on-site building should there be a change in operations, off-site buildings in potentially affected areas, and for any new buildings developed on the site or affected off-site areas, including provision for implementing actions recommended to address exposures related to soil vapor intrusion;
- a provision for investigation beneath the existing on-site building if the building is demolished to determine if further remedial action (such as excavation or a soil cover) is warranted;
- provisions for the management and inspection of the identified engineering controls;
- a provision for further investigation to determine the nature and extent of contamination within the footprint of the existing building if and when it is demolished;
- maintaining site access controls and Department notification;
- the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls; and
- a provision for supplemental treatment technologies to be applied if determined to be appropriate during operations.

b. 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; and
- monitoring for vapor intrusion for any on-site buildings or those developed on the site or affected off-site area, as may be required by the Institutional and Engineering Control Plan discussed above.

Present Worth: *$602,000*
Capital Cost: *$389,000*
Annual Costs (Years 1-2): *$64*,000
Annual Costs (Years 3-10): *$16*,000

Alternative 3: In-Situ Ozone Enhanced Air Sparging

Air sparging can be implemented to address the groundwater plume contaminated by VOCs. VOCs are physically removed from the groundwater and soil below the water table (saturated soil) by injecting air combined with ozone into the subsurface. As the injected air rises through the groundwater, the VOCs volatilize and transfer 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 is typically used to remove the injected air. The SVE system applies 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 is then treated as necessary prior to being discharged to the atmosphere.

At this site, approximately 116 air sparging wells would be installed in a 30 foot grid throughout the plume footprint. This alternative would include the same Institutional Controls as described in Alternative 2.

It is expected that this alternative will take 1 year to design and construct and 10 years to operate. Monitoring will be conducted for up to 10 years, or until cleanup goals are achieved.

Present Worth: *$2,041,000*
Capital Cost: *$1,087,000*
Annual Costs (Years 1-2): *$64,*000
Annual Costs (Years 3-10): *$16,*000

Alternative 4: Groundwater Extraction and Treatment

Groundwater extraction and treatment can be implemented to treat VOCs in groundwater and to ensure contaminated groundwater does not migrate off-site. The groundwater extraction system is designed and installed so that the capture zone is sufficient to intercept the groundwater contaminant plume to stop further migration. The extraction system creates a depression of the water table so that contaminated groundwater is directed toward the extraction wells within the plume area. Groundwater would be extracted from the subsurface from the area of the groundwater contaminant plume via 10 extraction wells installed to approximately 35 feet bgs, 30 feet apart within the southeastern part of the plume. Further details of the extraction system would be determined during the remedial design.

The extracted groundwater would be treated using three granular activated carbon vessels in series and the treated water discharged to the municipal storm sewer system pending permit application and acceptance. This alternative would also include the same Institutional Controls as described in Alternative 2.

It is expected that this alternative will take less than 1 year to design and construct and 30 years to operate. Monitoring will be conducted for up to 30 years, or until cleanup goals are achieved.

Present Worth: *$1,400,000*
Capital Cost: *$479,000*
Annual Costs (Years 1-5): *$70,*000
Annual Costs (Years 6-30): *$56,*000

Exhibit C

Remedial Alternative Costs

Remedial Alternative	Capital Cost ($)	Annual Costs ($)	Total Present Worth ($)
No Action	0	0	0
In-situ Enhanced Bioremediation	389,000	64,000 (Years 1-2) 16,000 (Years 3-10)	602,000
In-situ Ozone-Enhanced Air Sparging	1,087,000	64,000 (Years 1-2) 16,000 (Years 3-10)	2,041,000
Groundwater Extraction and Treatment	479,000	70,000 (Years 1-5) 56,000 (Years 6-30)	1,400,000

Exhibit D

SUMMARY OF THE SELECTED REMEDY

The Department is selecting Alternative 2, In-situ Enhanced Bioremediation as the remedy for this site. Alternative 2 would achieve the remediation goals for the site by injecting substrate via direct push wells into groundwater so that biological activity will flourish and cause the contaminants to degrade. Groundwater monitoring will take place to evaluate the need for further treatment for up to 10 years, or until cleanup goals are achieved. The elements of this remedy are described in Section 7. The selected remedy is depicted in Figure 5.

Basis for Selection

The selected 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 selected remedy Alternative 2 would satisfy this criterion by addressing the groundwater contamination, which is the most significant threat to public health and the environment. Alternative 1 (No Action) does not provide any additional protection to public health and the environment and will not be evaluated further. Alternatives 3 and 4 also comply with this criterion. It would be expected that Alternatives 2, 3 and 4 would ultimately restore groundwater and the institutional controls would help prevent exposure to contaminated groundwater and 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.

Alternatives 2, 3 and 4 would comply with SCGs for groundwater via treatment. It is expected Alternative 2 will achieve groundwater SCGs for the entire plume in less than 5 years, Alternative 3 in less than 10 years while groundwater contamination above SCGs would be expected to remain under Alternative 4 for as many as 30 years. Because Alternatives 2, 3 and 4 satisfy the threshold criteria, the remaining criteria are particularly important in selecting a final remedy for the site.

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.

Alternatives 2, 3 and 4 each provide long-term effectiveness and permanence via groundwater treatment. The ICs corresponding to these alternatives would sufficiently and reliably control site risks related to the groundwater plume.

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 and 3 are in-situ treatments that break down the contaminants thereby reducing the volume and mobility of contaminants. Alternative 4, groundwater extraction and treatment, is an ex-situ treatment process that reduces the toxicity, mobility and volume of contaminants by removing contaminants from the groundwater for disposal at a properly permitted facility. All three alternatives would employ irreversible treatment technologies that are not expected to leave significant remaining groundwater contamination after full implementation.

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 2, 3 and 4 each have potential short-term impacts (such as increased noise and traffic) which could easily be controlled, however, Alternative 2 would have the least short term impact. The time needed to achieve the remediation goals is the shortest for Alternative 2 [estimated less than 5 years] and longer for Alternative 3 [estimated at less than 10 years]. Alternative 4 is estimated to take the longest to achieve the remediation goals [around 30 years] and would require extraction wells to be installed on off-site private property which may impact nearby property owners for a long duration. All three alternatives have similar potential short-term adverse impacts and risks to the community, workers and environment during the construction and implementation. However Alternative 4 is more energy intensive due to the need to run the system for a longer duration. The potential public impacts are mitigated through standard construction practices and permitting; and potential risks to workers are minimized by health and safety controls.

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.

Alternative 2 is readily and easily implementable. Alternatives 3 and 4 are also implementable, but require more infrastructure, energy, area for equipment and treatment, and longer durations for implementation and monitoring. Equipment and specialists are available for all alternatives. Alternative 4 is the least administratively implementable since it requires obtaining approvals for discharge of treated water and access to off-site private property for a longer duration.

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.

The costs of the alternatives vary as shown in Exhibit C. Alternative 2 is the most cost effective because it is less costly than the other alternatives and it has been shown to be a viable option as determined by a bio-trap analysis that was done in Fall 2012.

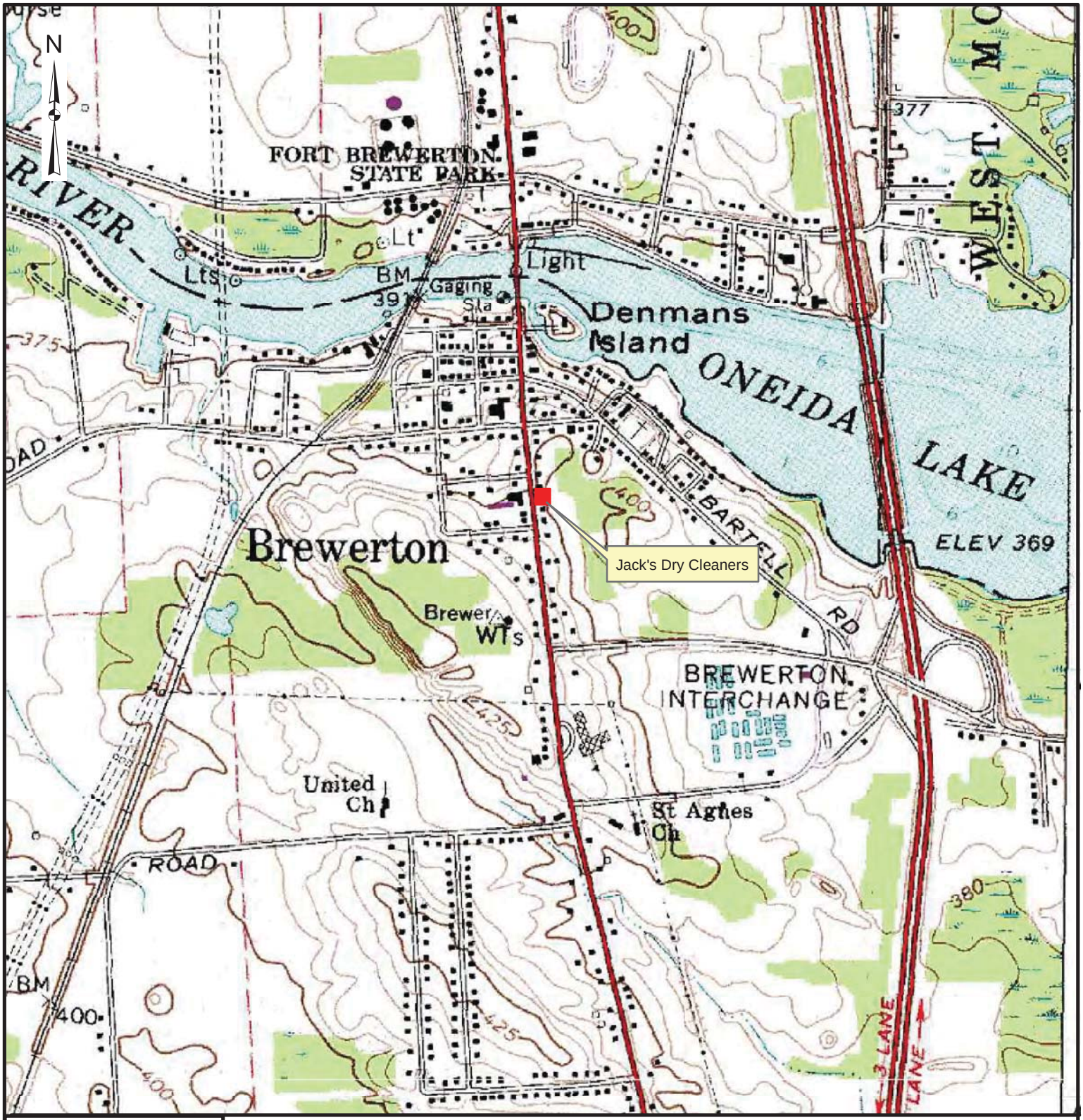
8. Land Use. When cleanup to pre-disposal conditions is determined to be infeasible, the Department may consider the current, intended, and reasonable anticipated future land use of the site and its surroundings in the selection of the soil remedy.

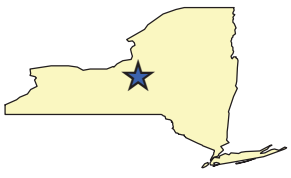
None of the three alternatives would prevent the current or reasonably anticipated future land use.

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 will be 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 2 has been selected because, as described above, it satisfies the threshold criteria and provides the best balance of the balancing criterion.





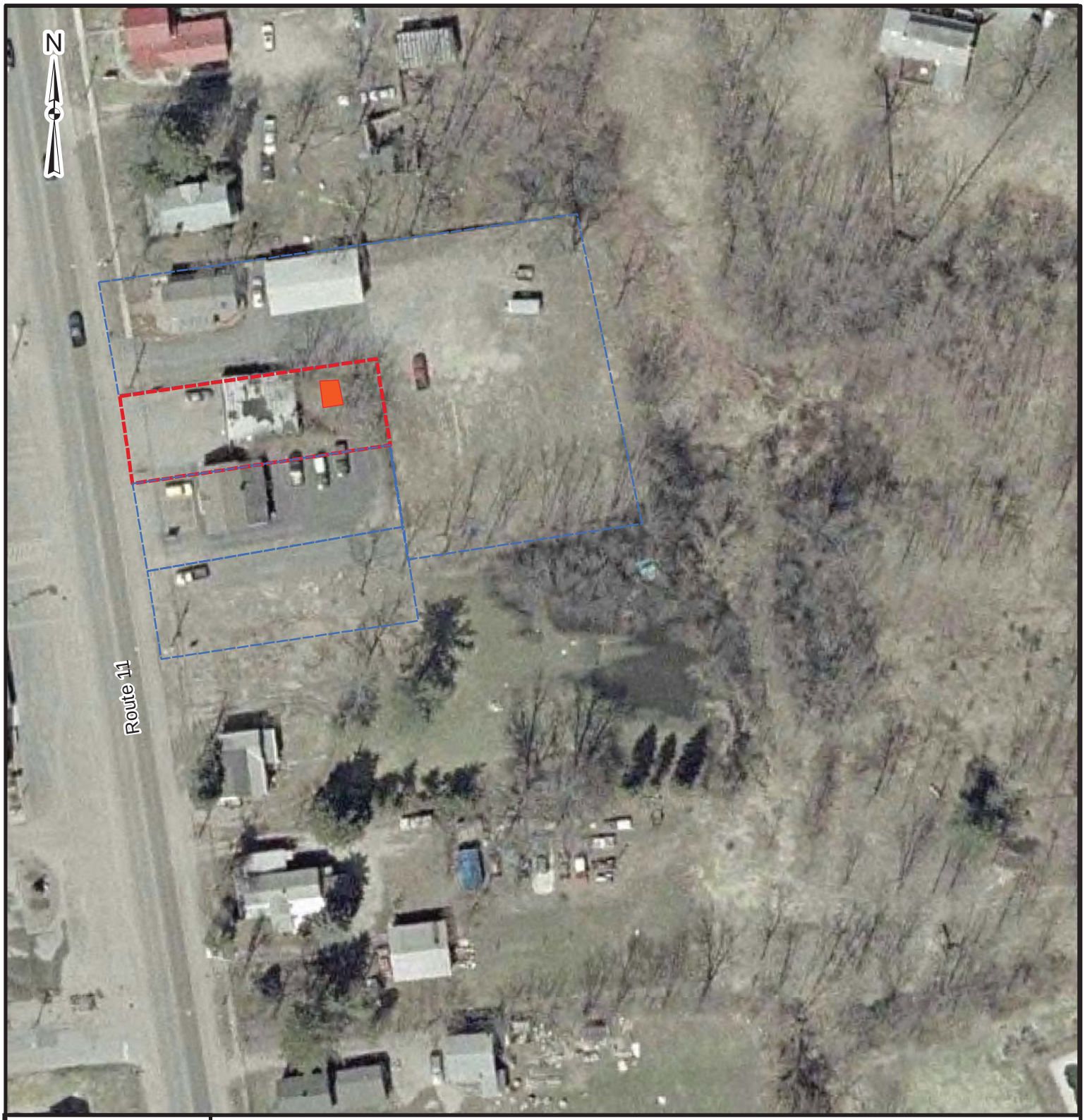
Jack's Drycleaners

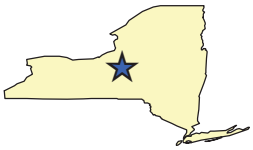
0 25 50 100 150 200 Feet

JACKS DRYCLEANERS (7-34-112)
FEASIBILITY STUDY
BREWERTON, NEW YORK

FIGURE 3
USGS Topographic Map

PROJECT MGR:	DESIGNED BY:	CREATED BY:	CHECKED BY:	SCALE:	DATE:	PROJECT NO:	FILE NO:
JAG	CJS	DCC	JAG	AS SHOWN	MAY 2012	14368.38	...GIS/PROJECTS/ FIGURE3.MXD





Legend

- Jack's Drycleaners
- Surrounding Parcels
- Historic Location of Septic System

Feet
0 25 50 100

Source: USGS EROS 2005

JACK'S DRYCLEANERS (7-34-112)
FEASIBILITY STUDY
BREWERTON, NEW YORK

FIGURE 2
Site Map

PROJECT MGR:	DESIGNED BY:	CREATED BY:	CHECKED BY:	SCALE:	DATE:	PROJECT NO:	FILE NO:
JAG	MEM	MEM	JAG	AS SHOWN	MAY 2012	14368.38	GIS/PROJECTS/ FIGURE2.MXD

Legend

- Soil VaporSample Location
- Bedrock Monitoring Well
- Overburden Monitoring Well
- Jack's Dry Cleaners
- Surrounding Parcels

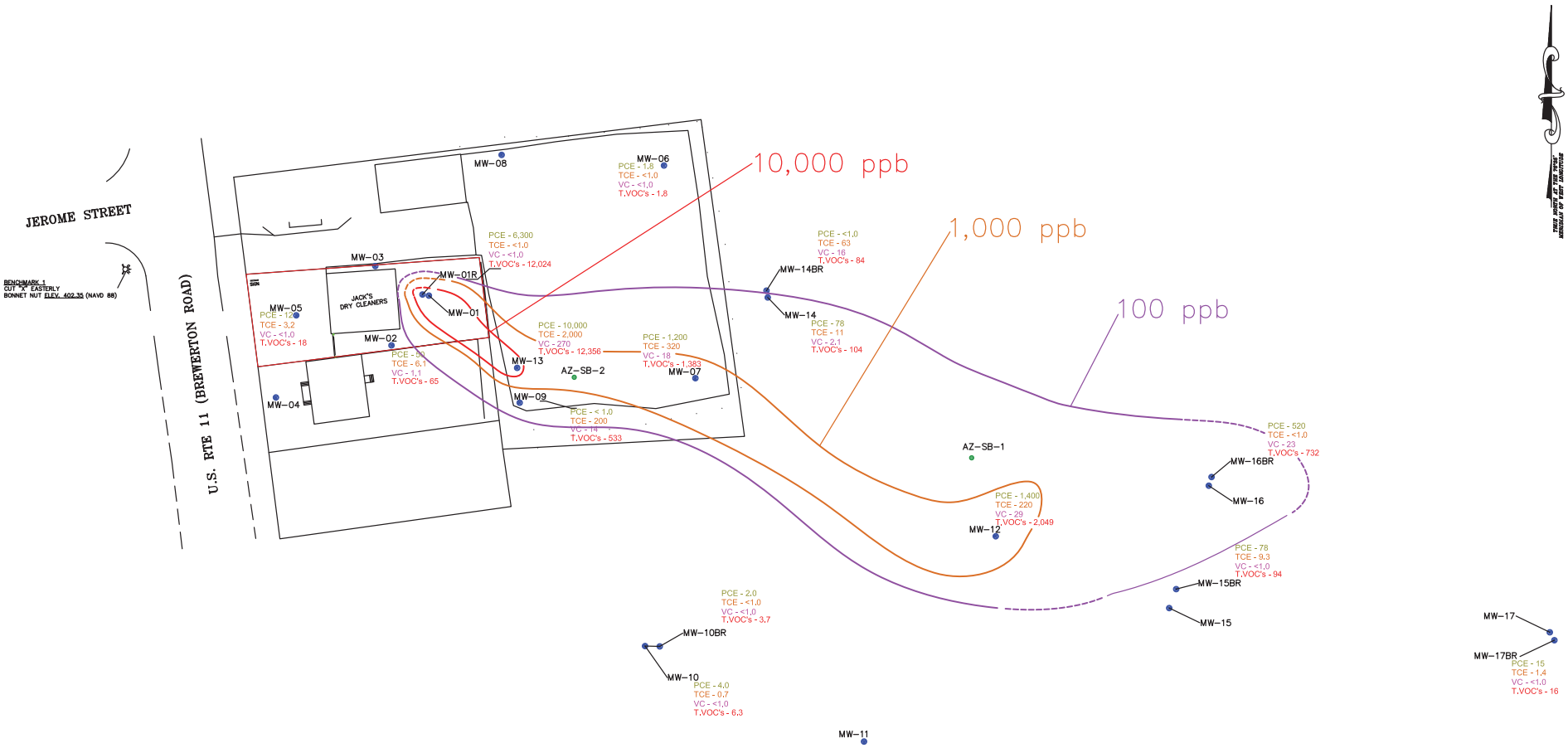
Source: NYS GIS Clearing House

JACK'S DRY CLEANERS SITE (734112)
REMEDIAL INVESTIGATION
BREWERTON, NEW YORK

FIGURE 3-1
Groundwater and Soil Vapor
Sampling Locations

Feet
0 15 30 60 90 120

PROJECT MGR:	DESIGNED BY:	CREATED BY:	CHECKED BY:	SCALE:	DATE:	PROJECT NO:	FILE NO:
JAG	CJS	DCC	JAG	AS SHOWN	DECEMBER 2010	14368.38	GIS/PROJECTS/ FIGURE4-X.MXD



Selected Chlorinated Solvents in Groundwater

LEGEND

- VOC Contour
- MW-12 - Monitoring Well ID
- Monitoring Well Symbol
- Monitoring Well Symbol
- Site Boundary
- Inferred VOC Contour
- Tetrachlorothene (PCE) 30.3
- Trichlorothene (TCE) 30.3
- Vinyl Chloride (VC) 30.3
- Total VOC's (T.VOC's) 30.3

All results reported in parts per billion

Aztech Technologies, Inc.
Woman Owned Business

Remediation Solutions ● Environmental Consulting ● Drilling Applications
5 McCrea Hill Road
Ballston Spa, NY 12020
p 518.885.5383 I f 518.885.5385
info@aztechtech.com I www.aztechtech.com

SITE: Jack's Dry Cleaners
9628 NYS Route 11
Brewerton, NY
NYSDEC Site No. 734112

FIGURE 4

DATE: Sept. 17 - 21, 2012

Scale (feet) 0 30 60 120 180

Legend

- Bedrock Monitoring Well
- Overburden Monitoring Well
- Direct-push injection point
- Approximate Isopleth Concentration

Source: NYS GIS Clearing House

JACKS DRYCLEANERS SITE (734112)
FEASIBILITY STUDY
BREWERTON, NEW YORK

FIGURE 5
In-Situ Enhanced Reductive
Dechlorination System Layout

Feet
0 15 30 60 90 120

PROJECT MGR:	DESIGNED BY:	CREATED BY:	CHECKED BY:	SCALE:	DATE:	PROJECT NO:	FILE NO:
JAG	MEM	MEM	JAG	AS SHOWN	OCTOBER 2011	14368.38	GIS/PROJECTS/ FIGURE5.MXD

APPENDIX A

Responsiveness Summary

RESPONSIVENESS SUMMARY

Brewerton Jack's Cleaners
State Superfund Project
Brewerton, Onondaga County, New York
Site No. 734112

The Proposed Remedial Action Plan (PRAP) for the Brewerton Jack's Cleaners site was prepared by the New York State Department of Environmental Conservation (the Department) in consultation with the New York State Department of Health (NYSDOH) and was issued to the document repositories on February 25, 2015. The PRAP outlined the remedial measure proposed for the contaminated groundwater at the Brewerton Jack's Cleaners site.

The release of the PRAP was announced by sending a notice to the public contact list, informing the public of the opportunity to comment on the proposed remedy.

A public meeting was held on March 3, 2015, which included a presentation of the remedial investigation feasibility study (RI/FS) for the Brewerton Jack's Cleaners as well as a discussion of the proposed remedy. The meeting provided an opportunity for citizens to discuss their concerns, ask questions and comment on the proposed remedy. These comments have become part of the Administrative Record for this site. The public comment period for the PRAP ended on March 27, 2015.

This responsiveness summary responds to all questions and comments raised during the public comment period. The following are the comments received, with the Department's responses:

COMMENT 1: The current owner of Brewerton Jack's Cleaners asked why the previous owner(s) of the business was not financially responsible for the cleanup?

RESPONSE 1: The prior owners of the site, who are potentially responsible parties (PRPs) for the site, declined to implement a remedial program when requested by the Department. Now that the remedy has been selected, these 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 to date and going forward if they decline to implement the remedy.

There were no written comments received during the Public Comment Period.

APPENDIX B

Administrative Record

Administrative Record

Brewerton Jack's Cleaners
State Superfund Project
Brewerton, Onondaga County, New York
Site No. 734112

1. Proposed Remedial Action Plan for the Brewerton Jack's Cleaners site, dated February 2015, prepared by the Department.

2. Referral Memorandum dated March 24, 2009 for the implementation of an RI/FS for Jack's Dry Cleaners.

3. "Summary Report for Jack's Drycleaners Site, Site Investigation" August 2008, prepared by EA Engineering, P.C. and Its Affiliate EA Science and Technology.

4. "Summary Report for Soil Vapor Intrusion Investigation" August 2009, prepared by EA Engineering, P.C. and Its Affiliate EA Science and Technology.

5. "Final Remedial Investigation Report Jack's Drycleaners Site" December 2010, prepared by EA Engineering, P.C. and Its Affiliate EA Science and Technology.

6. "Vapor Intrusion Evaluation Summary Letter Report" June 2011, prepared by EA Engineering, P.C. and Its Affiliate EA Science and Technology.

7. "Feasibility Study Jack's Drycleaners Site" December 2011, prepared by EA Engineering, P.C. and Its Affiliate EA Science and Technology.

8. "Draft Pre-Remedial Design Investigation Report" April 2013, prepared by Aztech Technologies, Inc.