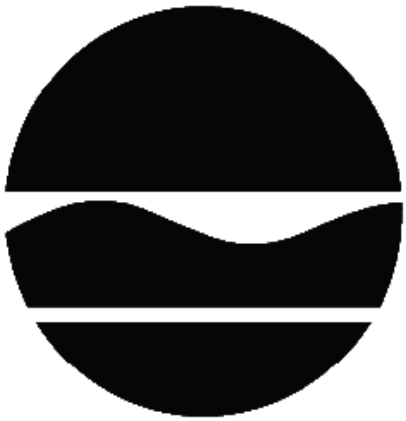
PROPOSED REMEDIAL ACTION PLAN

Former C&B Dry Cleaners
Environmental Restoration Project
Jamestown, Chautauqua County
Site No. E907028
February 2013



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 contaminants 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 contaminants at this site, as more fully described in Section 6 of this document, has contaminated various environmental media. Contaminants include hazardous waste and/or petroleum. 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 1996 Clean Water/ Clean Air Bond Act provides funding to municipalities for the investigation and cleanup of brownfields. Brownfields are abandoned, idled, or under-used properties where redevelopment is complicated by real or perceived environmental contamination. They typically are former industrial or commercial properties where operations may have resulted in environmental contamination. Brownfields often pose not only environmental, but legal and financial burdens on communities. Under the Environmental Restoration Program, the state provides grants to municipalities to reimburse up to 90 percent of eligible costs for site investigation and remediation activities. Once remediated, the property can then be reused.

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:

A public comment period has been set from:

to

A public meeting is scheduled for the following date:

Public meeting location:

At the meeting, the findings of the remedial investigation (RI) and the alternatives analyses (AA) 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:

Anthony Lopes, P.E.
NYS Department of Environmental Conservation
Division of Environmental Remediation
270 Michigan Ave
Buffalo, NY 14203-2915
allopes@gw.dec.state.ny.us

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. 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 former 0.22 acre C&B Dry Cleaners site is located in an urban area at 2241

Washington Street in the City of Jamestown, Chautauqua County. The site is 200 feet from the Pelican Manufacturing Site (Class C – Remediation complete), and 1,000 feet from the Former Jamestown City Landfill Site (Class 3 - contamination does not presently and is not reasonably foreseeable to constitute a significant threat to public health or the environment).

Site Features: The main site features include a gravel access road, parking areas, and the foundation remains of the former 2,170 sq ft building, demolished in 2003. The site is generally flat.

Current Zoning and Land Use: The site is currently inactive, and is zoned C-M, service and highway commercial. The surrounding parcels are currently used for a combination of commercial and utility right-of-ways. The nearest residential area is 0.3 miles east. A vacant commercial building, known as the Swanson Building, is located immediately adjacent to the sites southern property line.

Past Use of the Site: From 1931 to 1999, the site was used as a commercial dry cleaner. The County of Chautauqua obtained the property through foreclosure in 2001. In 2001, based on an Environmental Site Assessment (ESA) and site inspections, the County conducted an emergency removal action to remove various abandoned chemicals and solvents, including bleach, ethylene based solvents, and tetrachlorethene (PCE). Two 500 gallon underground storage tanks (USTs), associated piping, UST contents (pea gravel and volatile liquid), and excavated soil/fill were also removed and disposed off-site during this 2001 emergency removal action. The building was demolished in 2003.

Site Geology and Hydrology: Overburden consists of 6-8 ft of sand/gravel/fill material underlain in some areas by a thin layer of peat, grading into a native gravelly sand and silt. Depth to groundwater is roughly 6 feet. Site groundwater flow is to the south.

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, an alternative that restricts the use of the site to Commercial Use as described in Part 375-1.8(g) is being evaluated.

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.

No PRPs have been documented to date.

Since no viable PRPs have been identified, there are currently no ongoing enforcement actions. However, legal action may be initiated at a future date by the state to recover state response costs should PRPs be identified.

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

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 contaminant 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)	ARSENIC
TRICHLOROETHENE (TCE)	DICHLOROETHYLENE

As illustrated in Exhibit A, the contaminant(s) 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.

The following IRM(s) has/have been completed at this site based on conditions observed during the RI.

IRM - Offsite Soil Vapor Mitigation

A sub-slab vapor mitigation system was installed at an adjacent commercial building in September 2006 to address the high concentrations of PCE (190,000 ug/m3) found in soil vapor.

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

Prior to Remediation: Based on investigations to date, the primary contaminants of concern are chlorinated volatile organic compounds, including tetrachloroethylene [PCE], trichlorethylene [TCE], and cis-1,2-dichloroethylene, and arsenic.

Soil (on-site) - Eleven different TCL VOCs were detected in on-site subsurface soils, but only PCE was detected at concentrations that exceeded the commercial SCGs in two locations. The PCE concentrations detected in soil were 8,000 parts per million (ppm) and 160 ppm exceeding the Protection of Groundwater Soil Cleanup Objectives (SCOs) of 1.3 ppm. The Protection of Groundwater SCO (1.3 ppm) is also exceeded at several other locations. Toxicity Characteristic Leaching Procedure (TCLP) analysis of subsurface soil from two areas indicate the concentration of PCE at 45 mg/l and 2.7 mg/l respectively, exceeding the regulatory threshold for characteristic hazardous waste of 0.7 mg/l. These samples were from near the former UST area and the former wash tubs.

Arsenic was detected at concentrations that exceeded the SCOs in the four on-site soil samples analyzed for TAL metals. Arsenic was detected at concentrations of 109 ppm and 85.7 ppm respectively, above the Protection of Groundwater and Commercial Use SCO of 16 ppm.

Soil (off-site) - VOCs detected in off-site subsurface soil were below the protection of groundwater SCO's.

Groundwater (on-site) - Seven different TCL VOCs were detected in all but one of seven on-site groundwater samples at concentrations that exceeded NYSDEC Class GA Groundwater Standard or Guidance Value. PCE concentrations ranged from 7 to 1,000,000 parts per billion (ppb), with the most significantly elevated concentrations detected in the groundwater sample in the vicinity of the former USTs. The PCE concentrations in a majority of the remaining on-site locations were significantly above the SCG of 5.0 ppb, but none approached the levels near the former USTs. The other VOCs detected at concentrations above the SCGs include 1,1,2,2-tetrachloroethane; 1,1-dichloroethene (1,1-DCE); vinyl chloride; cis-1,2-dichloroethene; isopropylbenzene; and TCE.

Groundwater (off-site) - Five different TCL VOCs were detected in all but one of the 18 off-site groundwater samples at concentrations that exceeded SCGs. PCE was present in 15 of the 21 samples at concentrations above the SCG, with concentrations up to 9,200 ppb. These concentrations were highest near the project site and decreased significantly with distance from the project site. The other VOCs detected at concentrations above the SCGs included 1,1,1-trichloroethane, cis-1,2-DCE, vinyl chloride and TCE.

The results indicate that the groundwater contaminant plume has migrated off-site to the south of the project site, impacting the two adjacent properties. The contaminant plume also slightly extends beyond the northerly boundary of the site.

Soil Vapor and Indoor Air - Contaminants from the site have adversely impacted indoor air quality at an adjacent property north of the site which was addressed by an IRM. PCE was

detected in the sub-slab soil vapor and in an ambient air sample collected from the basement and the results exceeded the NYSDOH indoor air guidance value for PCE. The concentration of PCE in the sub-slab sample was 190,000 ug/m3, and in the ambient air basement sample 2,200 ug/m3.

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 people dig below the ground surface. People are not drinking the contaminated groundwater because the area is served by a public water supply 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 there is no on-site building, inhalation of site contaminants in indoor air due to soil vapor intrusion does not represent a concern for the site in its current condition. However, the potential exists for the inhalation of site contaminants due to soil vapor intrusion for any future on-site development. A sub-slab depressurization system (system that ventilates/removes the air beneath the building) has been installed in an off-site building to prevent the indoor air quality from being affected by the contamination in soil vapor beneath the building.

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.

Soil

RAOs for Public Health Protection

- Prevent ingestion/direct contact with contaminated soil.
- Prevent inhalation of or exposure from contaminants volatilizing from contaminants in 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 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 AA 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 Alternative C: Vadose Soil Excavation and In-situ Soil/Groundwater Treatment remedy.

The estimated present worth cost to implement the remedy is $1,287,000. The cost to construct the remedy is estimated to be $1,264,000 and the estimated average annual cost is $5,300.

The elements of the proposed remedy are as follows:

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.

1. The remedial design program will include a Pre-Design Investigation to:

    a. Verify arsenic soil contamination results and limits of in the northwest area of the site (SP-13 & SP 15).
    b. Verify PCE soil contamination results in the vadose zone.
    c. Determine the insitu chemical oxidation parameters.

2. Excavation and off-site disposal of on-site soils located in the area of soils contaminated with arsenic which exceed SCGs for Protection of Groundwater of 16 ppm.

3. This alternative includes the removal and off-site disposal of the VOC contaminated subsurface soil/fill down to the top of the groundwater table (unsaturated soil removal, 4-6 feet bgs), with the areal extent defined by the use of the protection of groundwater soil cleanup objectives to the extent practicable given any need to maintain structures in the excavation areas. The excavations will be backfilled in accordance with the requirements of 6NYCRR375-6.7(d).

4. Prior to backfilling the former UST area excavation, a chemical oxidant will be mixed in the groundwater in the bottom of the excavation to rapidly reduce the concentrations of PCE in this area. In-situ chemical oxidation is a technology used to treat chlorinated ethene compounds (a type of volatile organic compound) in saturated soils/groundwater. The process injects a chemical oxidant into the subsurface groundwater via injection wells, an infiltration gallery, or excavation. As the chemical oxidant comes into contact with the contaminant, an oxidation reaction occurs that breaks down the contaminant into relatively benign compounds such as carbon dioxide and water. Several chemical oxidants are commercially available such as: Fenton's Reagent, Permanganate (as either potassium and/or sodium permanganate), Persulfate (as either potassium and/or sodium persulfate), and ozone. These will be the chemical oxidants evaluated prior to the full implementation of this technology to determine the one best suited for this site. Laboratory and on-site pilot scale studies would be conducted to more clearly define design parameters.

5. Upon development, a sub-slab depressurization system (SSDS) will be installed in the Swanson Building. Upon obtaining all required permits/approvals, the existing sump in the building would be connected directly to the sanitary sewer.

6. The contaminated groundwater plume (on and off-site) will be treated in-situ with a Hydrogen Release Compound (HRC®), sodium lactate, molasses, vegetable oil and microbial colonies/stimulants to facilitate bioaugmentation for anaerobic reductive dechlorination (ERD). These chemical oxidants will be evaluated prior to the full implementation of this technology to determine the one best suited for this site. Laboratory and on-site pilot scale studies would be conducted to more clearly define design parameters.

At this site, the material would be applied through injection wells screened in the saturated zone (approximately 6 to 9 feet bgs) to target the VOC contaminants of concern in groundwater. The method of injection and depth of injection will be determined by location of the contamination. It is estimated that the material would be injected in three applications over several months.

7. 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 and industrial uses 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;
- requires compliance with the Department approved Site Management Plan.

8. 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/or engineering controls remain in place and effective:

   Institutional Controls: The Environmental Easement discussed in number 7 above.

   Engineering Controls: The sub-slab depressurization system discussed in number 4 above.

   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;

- a provision for further investigation to refine the nature and extent of contamination in areas where access was previously hindered (i.e., under the Swanson Building) if and when the building is demolished;
- descriptions of the provisions of the environmental easement including any land use, groundwater and/or surface water use restrictions;
- a provision for evaluation of the potential for soil vapor intrusion for any buildings developed on the site, including provision for implementing actions recommended to address exposures related to soil vapor intrusion;
- 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.

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;
- monitoring for vapor intrusion for any buildings developed on and near the site, as may be required by the Institutional and Engineering Control Plan discussed above.

c. 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:

- 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.