RECORD OF DECISION

Country Cleaners
State Superfund Project
Huntington, Suffolk County
Site No. 152187
March 2012

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

DECLARATION STATEMENT - RECORD OF DECISION

Country Cleaners
State Superfund Project
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Site No. 152187
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Statement of Purpose and Basis

This document presents the remedy for the Country 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 Country 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. Remedial Design

A remedial design program will be implemented to provide the details necessary for the construction, operation, 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 gas 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. In-Situ Chemical Oxidation/Bioremediation

In-Situ Chemical Oxidation will be followed by In-situ Bioremediation on-site and near the site with In-Situ Bioremediation only in the off-site downgradient locations.

In-situ chemical oxidation is a technology used to treat volatile organic compounds in the soil and groundwater. The process injects a chemical oxidant into the subsurface via injection wells or an infiltration gallery. The method of injection and depth of injection is determined by location of the contamination. 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. For the purpose of this discussion Potassium Permanganate will be the chemical oxidant evaluated. At this site, the chemical oxidant would be applied through injection wells screened near the water table, about 60 ft bgs, to target the contaminants of concern.

Bioremediation uses microorganisms to degrade organic contaminants in soil and groundwater. The microorganisms break down contaminants by using them as a food source or co-metabolizing them with a food source. Aerobic processes require an oxygen source, and the end-products typically are carbon dioxide and water. Anaerobic processes are conducted in the absence of oxygen, and the end- products can include methane, hydrogen gas, sulfide, elemental sulfur, and nitrogen gas. Hydrogen is the primary electron donor for reductive de-chlorination, an anaerobic process. Depending on site conditions, slow-release or fast-release hydrogen compounds can be used as substrates. Slow release substrates, such as oils (e.g., olive oil, soybean oil, vegetable oil) and commercially produced Hydrogen Release Compound (HRC®), are relatively insoluble and produce low concentrations of hydrogen. More soluble compounds (e.g., lactic acid, molasses, and lactate) release high concentrations of hydrogen. At this site, injection of a micro-emulsion is proposed to facilitate the process. The micro-emulsion would provide free lactic acid, controlled release lactic acid and long release fatty acids for effective hydrogen production. Injection depths will near the water table, about 60 ft bgs.

Prior to the implementation of these technologies, laboratory and on-site pilot scale studies will be conducted to more clearly define design parameters.

3. Institutional Control

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,

- prohibits agriculture or vegetable gardens on the controlled property, and
- requires compliance with the Department approved Site Management Plan.

4. Site Management Plan

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

- 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.

Engineering Controls: The In-situ Chemical Oxidation and In-site Bioremediation systems as described above, and soil vapor intrusion mitigation systems if necessary.

This plan includes, but may not be limited to:

o descriptions of the provisions of the environmental easement including any land use and groundwater use restrictions,
o a provision for evaluation of the potential for soil vapor intrusion to impact any off-site buildings, buildings currently on the site, or buildings developed on the site in the future, including provision for implementing actions recommended to mitigate exposures related to soil vapor intrusion,
o provisions for the management and inspection of the identified engineering controls,
o maintaining site access controls and Department notification, and
o the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.

- A Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to:

o monitoring of groundwater and soil vapor to assess the performance and effectiveness of the remedy,
o a schedule of monitoring and frequency of submittals to the Department,
o monitoring for vapor intrusion for any buildings occupied or developed on the site, as may be required by the Institutional and Engineering Control Plan discussed above.

- An Operation and Maintenance (O&M) Plan to ensure continued operation, maintenance, monitoring, inspection, and reporting of any mechanical or physical components of the remedy. The plan includes, but is not limited to:

o compliance monitoring of treatment systems to ensure proper O&M as well as providing the data for any necessary permit or permit equivalent reporting,
o maintaining site access controls and Department notification, and
o providing the Department access to the site and O&M records.

The operation of the components of the remedy will continue until the remedial objectives have been achieved, or until the Department determines that continued operation is technically impractical or not feasible.

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 30,2012

Date

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

RECORD OF DECISION

Country Cleaners
Huntington, Suffolk County
Site No. 152187
March 2012

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 repository:

NYSDEC, Region 1 Office
Attn: Walter Parish
50 Circle Road
Stony Brook, NY 11790-3409
Phone: 631-444-0241

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 Country Cleaners site is located at 410 West Main Street in Huntington, NY at the southeast corner of the intersection of West Main Street and Hillside Avenue. The site is located about 1/2 mile west of Route 110.

Site Features: The site consists of a single story building with parking spaces in the front. Residences are located in the surrounding areas. There is a large residential complex (Nathan Hale condominiums) located north of the site. Commercial properties are located along West Main Street, including a Getty service station to the east of the site, a Rite Aid convenience store, and a medical doctor’s office. St. Patrick’s Roman Catholic Church and primary school are located east of the site.

Current Zoning/Use: The site is currently in use as a dry cleaning facility. The site is zoned for commercial use. The surrounding parcels are commercial and residential.

Historic Use: Dry cleaning operations have been conducted at the site since at least 1985 by Jim Dandy Cleaners and previous tenants including Country Cleaners and Pamper cleaners. The current occupant, Jim Dandy Cleaners, ceased on-site dry cleaning operations at the site around 2007. The site was listed as Class 2 in 2003. Information gathered from a site investigation conducted at the Getty station located adjacent to the site by the Suffolk County Department of Health Services and the NYSDEC pointed to the site being a source of contamination. Tetrachloroethene (PCE), a dry cleaning fluid, was found contaminating the soil beneath a condensate pipe at the southeast corner of the building and in a nearby storm drain. Under the order and oversight of the Suffolk County Department of Health Services, the owner remediated the storm drain and the removal of 2 inches of soil from the unpaved area adjacent to the building.

Site Geology and Hydrogeology: The upper soils from 0 to 20 ft bgs consists of sand, gravel, silt and clay, organic mud, peat, loam and shells. Site geology includes Upper Pleistocene deposits (0 to 300 ft bgs) consisting of the following: till, outwash deposits and ice contact deposits(crudely stratified sand and gravel and isolated masses of till). Below these formations are the Magothy formation, the Raritan formation clay member (an aquitard) and the Lloyd sand member overlaying bedrock. Groundwater at the site was encountered at 57 ft below ground surface (bgs), and is interpreted to flow northeast towards Huntington Harbor. This is in general agreement with the United States Geological Survey (USGS, 1995), who indicate groundwater flow in the Huntington, NY area is generally towards the north.

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 (or an alternative) that restrict(s) the use of the site to commercial use (which allows for industrial use) as described in Part 375-1.8(g) were/was evaluated in addition to an alternative which would allow for unrestricted use of the site.

A comparison of the results of the RI 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:

Country Cleaners, Inc.

KBK Huntington Corp.

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

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) TRICHLOROETHENE (TCE)
DICHLOROETHYLENE

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.

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 for OU 01.

Nature and Extent of Contamination:

Groundwater

Contaminants Detected: Based upon investigations conducted to date, the primary contaminant of concern is PCE. PCE degradation products TCE and DCE were also detected.

Areal/depth extent of contamination: The PCE groundwater plume is centered at the Country Cleaners site and the adjacent Getty Service Center. The plume extends downgradient towards the northeast onto the Nathan Hale condominium property. There are no detections of PCE in the deep wells, indicating that the maximum depth of contamination has been adequately bounded.

Contaminant Concentrations: The maximum PCE concentration in shallow wells was 680 ug/l. The maximum concentration found in shallow hydropunch samples was approximately 1500 ug/l and was found in HP-02E. Both of these are located along Lawrence Hill Road, approximately 55 ft bgs, near the top of the water table.

Soil

This investigation did not find concentrations of volatile organic contaminants in excess of unrestricted SCGs in on-site soils.

The site presents a significant threat to the environment due to contravention of groundwater standards in a sole-source acquifer.

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 the contaminated groundwater because the area is served by a public water supply that is not affected by this contamination. 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. The potential exists for inhalation of site-related contaminants via soil vapor intrusion in on- and off-site buildings.

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.
- Prevent the discharge of contaminants to surface water.
- Remove the source of ground 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 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 remedy.

The estimated present worth cost to implement the remedy is $1,169,000. The cost to construct the remedy is estimated to be $678,000 and the estimated average annual cost is $28,000.

The elements of the selected remedy are as follows:

1. Remedial Design

A remedial design program will be implemented to provide the details necessary for the construction, operation, 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 gas 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. In-Situ Chemical Oxidation/Bioremediation

In-Situ Chemical Oxidation will be followed by In-situ Bioremediation on-site and near the site with In-Situ Bioremediation only in the off-site downgradient locations.

In-situ chemical oxidation is a technology used to treat volatile organic compounds in the soil and groundwater. The process injects a chemical oxidant into the subsurface via injection wells or an infiltration gallery. The method of injection and depth of injection is determined by location of the contamination. 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. For the purpose of this discussion Potassium Permanganate will be the chemical oxidant evaluated. At this site, the chemical oxidant would be applied through injection wells screened near the water table, about 60 ft bgs, to target the contaminants of concern.

Bioremediation uses microorganisms to degrade organic contaminants in soil and groundwater. The microorganisms break down contaminants by using them as a food source or co-metabolizing them with a food source. Aerobic processes require an oxygen source, and the end-products typically are carbon dioxide and water. Anaerobic processes are conducted in the absence of oxygen, and the end- products can include methane, hydrogen gas, sulfide, elemental sulfur, and nitrogen gas. Hydrogen is the primary electron donor for reductive de-chlorination, an anaerobic process. Depending on site conditions, slow-release or fast-release hydrogen compounds can be used as substrates. Slow release substrates, such as oils (e.g., olive oil, soybean oil, vegetable oil) and commercially produced Hydrogen Release Compound (HRC®), are relatively insoluble and produce low concentrations of hydrogen. More soluble compounds (e.g., lactic acid, molasses, and lactate) release high concentrations of hydrogen. At this site, injection of a micro-emulsion is proposed to facilitate the process. The micro-emulsion would provide free lactic acid, controlled release lactic acid and long release fatty acids for effective hydrogen production. Injection depths will near the water table, about 60 ft bgs.

Prior to the implementation of these technologies, laboratory and on-site pilot scale studies will be conducted to more clearly define design parameters.

3. Institutional Control

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,
- prohibits agriculture or vegetable gardens on the controlled property, and
- requires compliance with the Department approved Site Management Plan.

4. Site Management Plan

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

• 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.

Engineering Controls: The In-situ Chemical Oxidation and In-site Bioremediation systems as described above, and soil vapor intrusion mitigation systems if necessary.

This plan includes, but may not be limited to:

o descriptions of the provisions of the environmental easement including any land use and groundwater use restrictions,

o a provision for evaluation of the potential for soil vapor intrusion to impact any off-site buildings, buildings currently on the site, or buildings developed on the site in the future, including provision for implementing actions recommended to mitigate exposures related to soil vapor intrusion,

o provisions for the management and inspection of the identified engineering controls,

o maintaining site access controls and Department notification, and

o the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.

• A Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to:

o monitoring of groundwater and soil vapor to assess the performance and effectiveness of the remedy,

o a schedule of monitoring and frequency of submittals to the Department,

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

• An Operation and Maintenance (O&M) Plan to ensure continued operation, maintenance, monitoring, inspection, and reporting of any mechanical or physical components of the remedy. The plan includes, but is not limited to:

o compliance monitoring of treatment systems to ensure proper O&M as well as providing the data for any necessary permit or permit equivalent reporting,

o maintaining site access controls and Department notification, and

o providing the Department access to the site and O&M records.

The operation of the components of the remedy will continue until the remedial objectives have been achieved, or until the Department determines that continued operation is technically impractical or not feasible.

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, 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 at the site are volatile organic compounds (VOCs). For comparison purposes, the SCGs are provided for each medium that allows for unrestricted use.

Groundwater

Groundwater samples were collected from overburden wells. The samples were collected from 8 shallow and 7 deep wells to assess groundwater conditions on and off-site. The results indicate that contamination in shallow groundwater at the site exceeds the SCGs for volatile organic compounds. See Figure 2 for monitoring well locations.

Table 1- Groundwater

Detected Constituents	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)	Frequency Exceeding SCG
VOCs in Shallow Groundwater Monitoring Wells			
Tetrachloroethene (PCE)	ND-680	5	5/8
Trichloroethene (TCE)	ND-8	5	1/8
Dichloroethene (DCE)	ND-9	5	1/8
VOCs in Shallow Hydropunch Samples			
PCE	ND-1500	5	4/10
TCE	ND-36	5	4/10
DCE	ND-41	5	3/10
VOCs in Deep Hydropunch Samples			
PCE	ND-92	5	5/16
TCE	ND-2.8	5	0/16
DCE	ND-1.3	5	0/16

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).

As shown on Table 1, the primary contaminants are PCE, TCE and DCE, which were detected at concentrations exceeding the NYS Class GA groundwater criteria. TCE and DCE are detected less frequently and are considered "daughter" compounds resulting from the degradation or dechlorination of PCE. In 2010, PCE was detected in six of the eight shallow wells (five of which exceeded the NYS Class GA groundwater criterion) at concentrations ranging from 1.1 µg/L to 680 µg/L. TCE was detected in one well at 8 µg/L (MW-2S), and DCE was detected in one well at 9.3 µg/L (MW-4S). PCE, TCE and DCE were not detected in any of the seven deep monitoring wells. No other VOCs were detected at concentrations exceeding the NYS Class GA groundwater criteria. Hydropunch data collected in 2008 gave maximum levels of PCE of 1700 ppb in HP-02E. The data from the 2010 groundwater sampling event and the 2008 Hydropunch sampling event are consistent with data from previous investigations.

For this RI, the wells (and groundwater data) have been assigned to one of two depth intervals. It should be noted that the well depth suffix (S and D) reflects a relative depth of a well within a well pair. Well MW-2 is a shallow well installed by BEI in 1996 for the owners of the Getty Service Station property.

- Shallow: The screen elevation for shallow wells is around the water table, about 60 ft bgs
- Deep: The screen elevation for deep wells is around 90 ft bgs

While the major discussion of contaminant migration (transport) is in the following sections of this report, the discussion of contaminant distribution in this chapter does assume that groundwater flow is generally to the north or northeast.

A contaminant distribution map was developed for PCE in the shallow wells (Figure 2). The 5 µg/L limit is shown on Figure 2, representing the horizontal extent of the groundwater plume exceeding the NYS Class GA groundwater criterion for PCE. The extent of the line is extrapolated beyond the extent of the shallow wells. The highest concentrations of PCE (up to 680 µg/L) are centered at the Country Cleaners site and downgradient at the Getty Service Center property. The concentrations decrease moving downgradient towards the Nathan Hale condominiums where PCE was detected at 21 µg/L and 42 µg/L. There are no detections of PCE in the deep wells, indicating that the maximum depth of contamination has been adequately bounded.

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 and DCE.

Soil

Subsurface soil samples were collected at 19 intervals at 9 hydropunch locations during the RI. These samples were collected from a depth of 9 - 52 feet bgs to assess soil contamination impacts to groundwater. No exceedences of the unrestricted SCOs were found.

No site-related soil contamination of concern was identified during the RI. Therefore, no remedial alternatives need to be evaluated for soil.

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.

Present Worth: *$0*
Capital Cost: *$0*
Annual Costs: *$0*

Alternative 2: Monitored Natural Attenuation

Alternative 2 will involve taking no further action to remedy site conditions other than to perform groundwater monitoring. This alternative allows for natural attenuation of impacted groundwater. Natural attenuation relies on natural processes to clean up or attenuate pollution in soil and groundwater. Natural attenuation occurs at most polluted sites. However, the right conditions must exist underground to clean sites properly. The groundwater monitoring will test these conditions to make sure natural attenuation is working. This is called monitored natural attenuation or MNA.

Costs include an environmental easement and preparation of a report summarizing the groundwater monitoring data. Periodic groundwater sampling will be required to evaluate the effectiveness of the treatment. Monitoring for vapor intrusion in off-site buildings will be done to assess the performance and effectiveness of the remedies, including a provision for implementing actions to address exposures related to soil vapor intrusion.

It is estimated that it will take in excess of 30 years to meet the remedial goals.

The costs for this option are: capital costs of $62,000, present worth O&M costs for 30 years of $491,000, and total present worth for 30 years of $553,000.

Present Worth: *$553,000*
Capital Cost: *$62,000*
Annual Costs: *$28,000*

Alternative 3: Groundwater Extraction and *Ex-situ* Treatment

This alternative will implement groundwater extraction for *ex-situ* treatment by air stripping as the primary treatment. Other treatment alternatives are viable, but this technology was selected for evaluation as representative of *ex-situ* treatment options.

An extraction and treatment remedy that employs *ex-situ* air stripping is considered a presumptive remedy. This *ex-situ* presumptive remedy creates a depression of the water table so that contaminated groundwater is directed toward pumping wells within the plume area. The groundwater extraction system is designed so that the capture zone is sufficient to cover the lateral extent of the area of concern. The total number of extraction wells would be determined during the pilot test and the design. Both free product (if present) and groundwater are collected during recovery operations.

Air stripping uses volatilization to transfer contaminants from groundwater to air. In general, water is contacted with an air stream to volatilize dissolved contaminants into the air stream. Depending on the level of contaminants in the air discharge, the contaminated air stream may need further treatment. The treated groundwater will comply with the NYS Class GA groundwater criteria. The treatment system will extract and treat groundwater from the most highly contaminated region of the plume. The extent of the capture zone may be limited due to the relatively high hydraulic conductivity of the aquifer and limitations on locating the extraction wells because of current land use.

Costs include an environmental easement and preparation of a report summarizing the monitoring data. Periodic groundwater sampling will be required to evaluate the effectiveness of the treatment. Monitoring for vapor intrusion in off-site buildings will be done to assess the performance and effectiveness of the remedies, including a provision for implementing actions to address exposures related to soil vapor intrusion.

It is estimated that the time required to design the remedy will be one year, the time required to implement the remedy will be one year, and the time necessary to achieve the remedial goals will be 30 years or less.

The costs for this option are: capital costs of $652,000, present worth O&M costs for 30 years of $738,000, and present worth for 30 years of $1,390,000.

Present Worth: *$1,390,000*
Capital Cost: *$652,000*
Annual Costs: *$97,000*

Alternative 4: *In-situ* Treatment

In-Situ Chemical Oxidation would be employed only in the on-site and near site area with *In-Situ* Bioremediation employed both in the on-site and near site area following the *In-Situ* Chemical Oxidation, and in the off-site downgradient locations.

In-situ chemical oxidation is a technology used to treat volatile organic compounds in the soil and groundwater. The process injects a chemical oxidant into the subsurface via injection wells or an infiltration gallery. The method of injection and depth of injection is determined by location of the contamination. 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, including Sodium Permanganate, Potassium Permanganate and Fenton's Reagent. For the purpose of this discussion Sodium Permanganate will be the chemical oxidant evaluated. At this site, the chemical oxidant would applied through injection wells screened near the water table, about 60 ft bgs, to target the contaminants of concern.

Bioremediation uses microorganisms to degrade organic contaminants in soil and groundwater. The microorganisms break down contaminants by using them as a food source or co-metabolizing them with a food source. Aerobic processes require an oxygen source, and the end- products typically are carbon dioxide and water. Anaerobic processes are conducted in the absence of oxygen, and the end- products can include methane, hydrogen gas, sulfide, elemental sulfur, and nitrogen gas. Hydrogen is the primary electron donor for reductive de-chlorination, an anaerobic process. Depending on site conditions, slow-release or fast-release hydrogen compounds can be used as substrates. Slow release substrates, such as oils (e.g., olive oil, soybean oil, vegetable oil) and commercially produced Hydrogen Release Compound (HRC®), are relatively insoluble and produce low concentrations of hydrogen. More soluble compounds (e.g., lactic acid, molasses, and lactate) release high concentrations of hydrogen. At this site, injection of a micro-emulsion will facilitate the process. The micro-emulsion would provide free lactic acid, controlled release lactic acid and long release fatty acids for effective hydrogen production. Injection depths would be near the water table, about 60 ft bgs.

Prior to the implementation of these technologies, laboratory and on-site pilot scale studies would be conducted to more clearly define design parameters.

Costs include an environmental easement and preparation of a report summarizing the monitoring data. Periodic groundwater sampling will be required to evaluate the effectiveness of the treatment. Monitoring for vapor intrusion in off-site buildings will be done to assess the performance and effectiveness of the remedies, including a provision for implementing actions to address exposures related to soil vapor intrusion.

It is estimated that the time required to design the remedy will be one year, the time required to implement the remedy will be one wear, and the time required to meet the remedial goals will be 30 years or less.

The costs for this option are: capital costs of $678,000, present worth O&M costs for 30 years of $491,000, and present worth for 30 years of $1,169,000.

Present Worth: *$1,169,000*
Capital Cost: *$678,000*
Annual Costs: *$28,000*

Alternative 5: Groundwater Treatment at Downstream Public Wells

This alternative will provide treatment at the two public wells (S-71533 and S-26681) located downgradient from the site. PCE concentrations in these wells do not currently exceed the NYS Class GA groundwater criterion and the NY State drinking water standards. If selected, this alternative will be implemented in the event PCE concentrations consistently exceed NYS Class GA groundwater criterion for PCE or daughter products. Although PCE can be treated by a number of technologies, for this alternative analysis it is assumed that an air stripper will be installed as the primary removal technology because long term O&M requirements are relatively low.

Air stripping uses volatilization to transfer contaminants from groundwater to air. In general, water is contacted with an air stream to volatilize dissolved contaminants into the air stream. Depending on the level of contaminants in the air discharge, the contaminated air stream may need further treatment. The treated groundwater will comply with the NYS Class GA groundwater criteria.

Costs include an environmental easement and preparation of a report summarizing the monitoring data.

Periodic groundwater sampling will be required to evaluate the effectiveness of the treatment. Monitoring for vapor intrusion in off-site buildings will be done to assess the performance and effectiveness of the remedies, including a provision for implementing actions to address exposures related to soil vapor intrusion.

It is estimated that the time required to design the remedial system will be one year, the time required for implementation will be one year, and that the remedial goals will require in excess of 30 years to be realized.

The costs for this option are: capital costs of $399,000, present worth O&M costs for 30 years of $637,000, and present worth for 30 years of $1,036,000.

Present Worth: *$1,036,000*
Capital Cost: *$399,000*
Annual Costs: *$45,000*

Exhibit C

Table C
Remedial Alternative Costs

Remedial Alternative	Capital Cost ($)	Annual Costs ($)	Total Present Worth ($)
Alternative 1 - No Action	0	0	0
Alternative 2 - Monitored Natural Attenuation	62,000	28,000	553,000
Alternative 3 - Groundwater Extraction/*Ex-situ* Treatment	652,000	97,000	1,390,000
Alternative 4 - *In-situ* Treatment	678,000	28,000	1,169,000
Alternative 5 - Groundwater Treatment at Downstream Public Wells	399,000	45,000	1,036,000

In addition to capital and groundwater monitoring costs, the total present worth of Alternatives 2 through 5 includes budgeting for periodic review reports.

Exhibit D

SUMMARY OF THE SELECTED REMEDY

The Department is selecting Alternative 4, *In-situ* Treatment as the remedy for this site. Alternative 4 will achieve the remediation goals for the site by *in-situ* treatment of VOC-contaminated groundwater. The elements of this remedy are described in Section 7. The selected remedy is depicted in Figure 3.

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 4 will satisfy this criterion by chemical oxidation and bioremediation of chlorinated VOC contaminants in groundwater beneath the site, which constitutes the most significant threat to human health and the environment. Alternative 3 also satisfies these requirements by *ex-situ* remediation of the VOC contaminants. Alternative 1 leaves the site in its present condition and does not provide any additional

protection to public health and the environment. Similarly, Alternative 2 provides no treatment to the contaminated groundwater, and does not provide any protection to public health and the environment. Alternative 5 provides treatment of the public water supply and is protective of human health at the point of exposure, but is not protective of the environment.

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.

Both Alternative 3 and Alternative 4 are expected to achieve substantial compliance with the chemical-specific SCGs/remediation action objectives for groundwater within 30 years. Alternatives 1 and 2 are not expected to achieve compliance within 30 years. Alternative 5 achieves compliance with the chemical-specific SCGs at the point of exposure, but not for on-site groundwater.

Alternative 1, Alternative 2 and Alternative 5 do not meet the threshold criteria because contamination concentrations remain either on site or in the vicinity of the site in excess of standards. Alternative 3 and Alternative 4 are expected to meet both threshold criteria, i.e., protection of human health and the environment, and compliance with SCGs. Because Alternative 3 and Alternative 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.

Both Alternative 3, a presumptive remedy, and Alternative 4, which incorporates a presumptive remedy, are considered to be adequate, reliable and permanent remedies for the remediation of groundwater.

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.

Both Alternative 3 and Alternative 4 provide for similar reduction of toxicity, mobility and volume of impacted groundwater by providing treatment of the contaminated groundwater.

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.

Both Alternative 3 and Alternative 4 involve intrusive work which may disrupt business at the dry cleaner and Getty Service Station during construction activities. Alternative 3 requires more construction due to providing *ex-situ* treatment of the extracted groundwater. Alternative 3 and Alternative 4 are expected to realize significant reductions in the groundwater contaminant levels within the first year after construction.

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.

Both Alternative 3 and Alternative 4 are technically implementable with readily available methods, equipment, materials, and services. Alternative 3 and Alternative 4 are also administratively implementable. Property owners or tenants may object to the larger degree of intrusive work required for Alternative 3 than that needed for Alternative 4. Alternative 3 will also require a discharge permit for the treated groundwater.

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 estimated costs associated with the implementation of each alternative are summarized in Table C. Both Alternative 3 and Alternative 4 are expected to provide effective remediation of groundwater. The present worth costs for Alternative 3 is $1,391,000 and for Alternative 4 is $1,160,000.

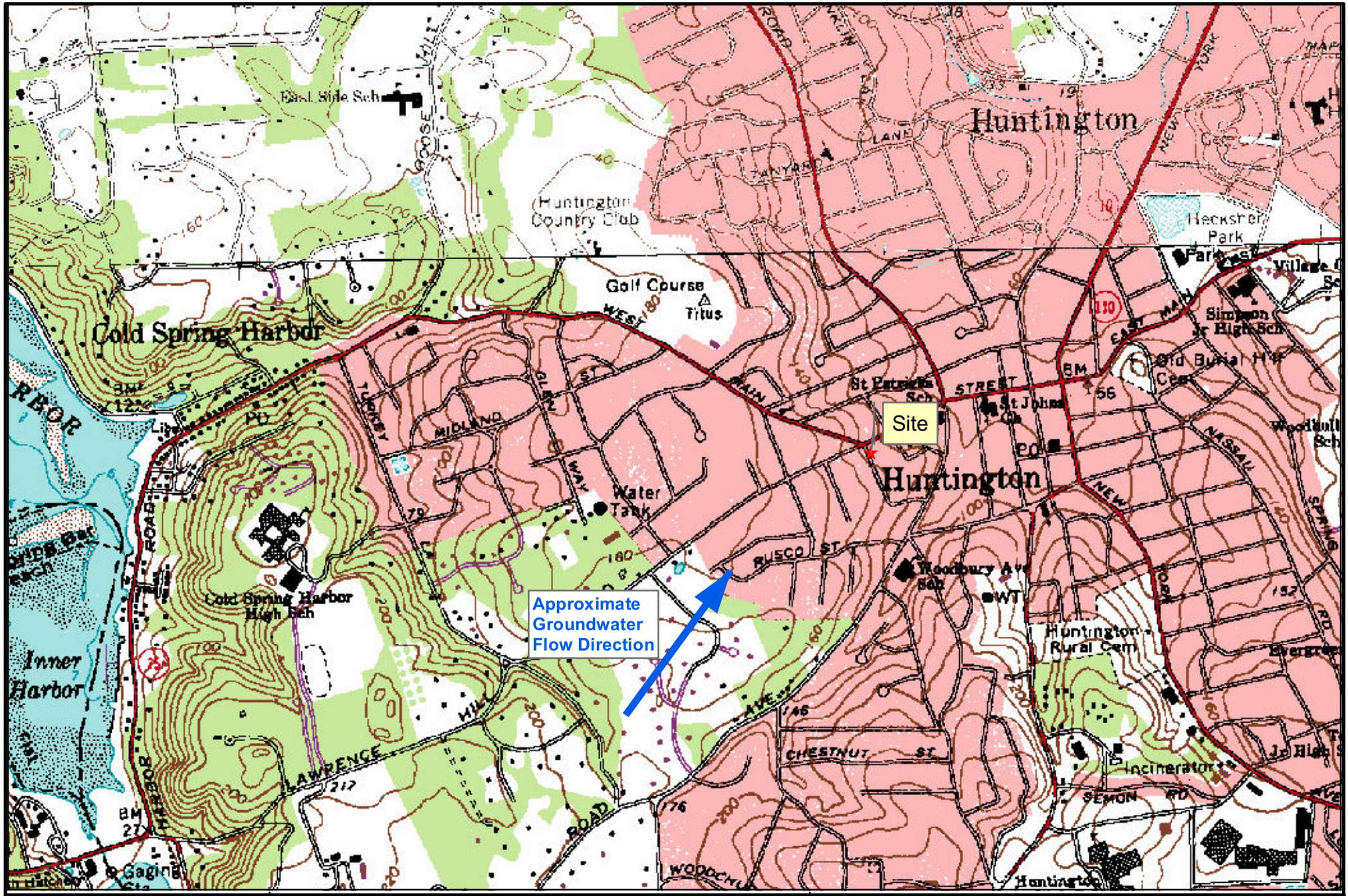
8. Land Use. When cleanup to pre-disposal conditions is determined to be infeasible, the Department may consider the current, intended, and reasonable anticipated future land use of the site and its surroundings in the selection of the soil remedy.

An environmental easement is required for both Alternative 3 and Alternative 4 because groundwater contamination is expected to remain above the NYS Class GA groundwater criteria during the treatment period.

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



NYSDEC Site No. 152187
Country Cleaners
Huntington, New York

0 500 1,000 2,000 Feet

★ Site

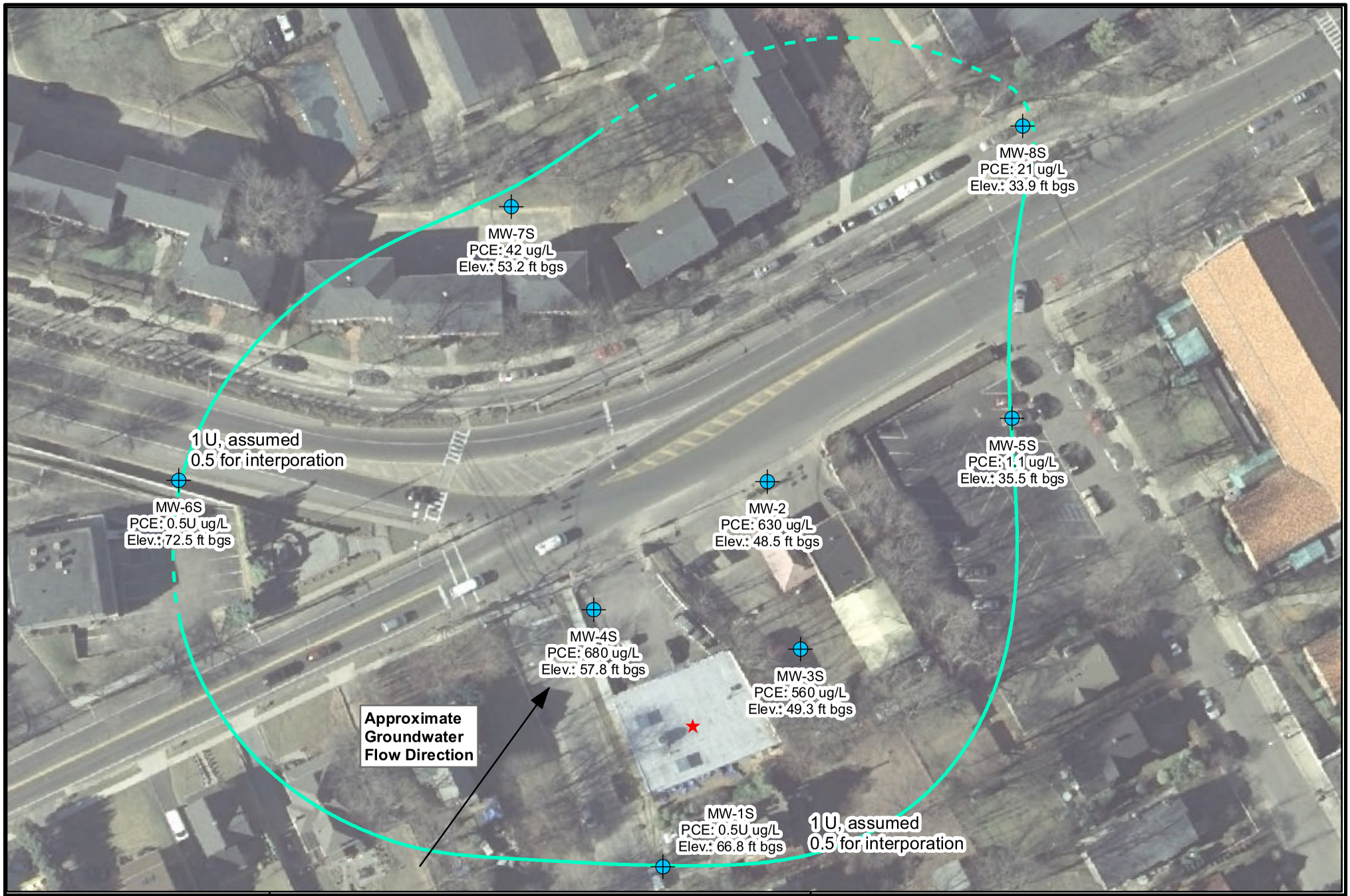
Prepared for: NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Prepared by: AECOM

Site Location Map

Project No: 60133623
Figure No: 1

January 18, 2012



NYSDEC Site No. 152187
Country Cleaners
Huntington, New York

0 17.5 35 70
Feet

Shallow Wells
Site
PCE NYS Class GA Groundwater Criterion 5 ug/L
Extrapolation of 5 ug/L
Approximate Groundwater Flow Direction

Labels show the assumed lowest elevation of the PCE plume (ft bgs).

Prepared for:
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Prepared by:
AECOM

PCE Concentration - Shallow Wells

Project No: 60133623
Figure No: 2

January 18, 2012

NYSDEC Site No. 152187
Country Cleaners
Huntington, New York

0 17.5 35 70
Feet

⊗ Injection Points
★ Site
→ Approximate Groundwater Flow Direction

Prepared for:
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Prepared by:
AECOM

Preferred Remedy

Project No: 60133623
Figure No: 3

January 18, 2012

APPENDIX A

Responsiveness Summary

RESPONSIVENESS SUMMARY

Country Cleaners
State Superfund Project
Huntington, Suffolk County, New York
Site No. 152187

The Proposed Remedial Action Plan (PRAP) for the Country 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 29, 2012. The PRAP outlined the remedial measure proposed for the contaminated groundwater at the Country 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 15, 2012, which included a presentation of the remedial investigation feasibility study (RI/FS) for the Country Cleaners site 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 30, 2012.

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: What has the NYSDOH done to determine if vapors from the site are affecting children at the church school (St. Patrick's)?

RESPONSE 1: An indoor air sample was collected from a building owned by St. Patrick's church in 2003. This building is located between the school and the Country Cleaners site, and data from the sample indicated that the indoor air of the building was not being impacted by site-related contamination. Based on this information, and based on the known extent of the groundwater plume, St. Patrick's School is not expected to be impacted by contamination originating at the Country Cleaners site.

COMMENT 2: Could you discuss the effects of PERC? People may think it's a possible carcinogen. Direct contact would not burn through your skin and cause cancer.

RESPONSE 2: Some human studies how an association between exposures to high levels of tetrachloroethene, or PERC in workplace air, and certain forms of cancer. PERC causes cancer in laboratory animals that are exposed to high levels over the course of their lifetimes. Overall, the human and animal studies do not prove that PERC causes cancer in people, but the studies are

suggestive of an increased risk for cancer in people who are exposed to PERC (particularly at high concentrations) over long periods of time. Based on the human and animal data the USEPA classifies PERC as "likely to be carcinogenic in humans by all routes of exposure." People exposed to elevated levels of PERC in air showed nervous system effects or slight changes to their liver and kidneys. Some studies show a slightly increased risk for some types of reproductive effects among workers (including dry-cleaning workers) exposed to high levels of PERC in air and other chemicals. The reproductive effects included increased risks for spontaneous abortion, menstrual and sperm disorders, and reduced fertility. The data suggest, but do not prove, that the effects were caused by PERC and not by some other factor or factors. Exposure to high levels of PERC has been found to cause liver, kidney, and nervous system effects in laboratory animals. Taken together, the human and animal studies indicate that human exposure to high levels of PERC in air can cause effects on the nervous system, and suggest that human exposure to high levels of PERC in air may increase the risk for liver and kidney toxicity. Direct contact with PERC can cause skin and eye irritation and burns. Absorption through intact skin is slow and would only be expected to occur if PERC is on the skin and cannot evaporate because of heavy clothing or other impermeable covering.

COMMENT 3: I am concerned because there are children around the area within one thousand feet of the site. Shouldn't we capture and remove any vapors in the area?

RESPONSE 3: Even if soil vapor near the ground surface is impacted by site-related contaminants, concentrations above the ground surface in outdoor air are not expected to be an inhalation concern for children.

COMMENT 4: What will you do to mitigate vapors rising from the contaminant plume?

RESPONSE 4: If the soil vapor intrusion monitoring in nearby buildings indicates that vapor intrusion represents a threat to human health, appropriate mitigation measures will be taken. The most commonly employed mitigation measure is the installation of a subslab depressurization system which prevents the migration of soil vapor into the building, typically by using a fan-powered vent and piping to draw vapors from the soil underneath the building's slab.

COMMENT 5: When contamination is found, is there a way to date how old it is?

RESPONSE 5: Typically, the date of a contaminant spill is established from records.

COMMENT 6: Please explain the process. When you drill the wells, how do you physically inject the chemicals? How long does the pump run to put the chemicals in and how frequently do the applications occur? How fast do you see results?

RESPONSE 6: Chemical oxidation does not involve digging up polluted soil or groundwater. Instead, wells are drilled at different depths in the polluted area. The wells pump the oxidant into the ground. The oxidant mixes with the harmful chemicals and causes them to break down. When the process is complete, only water and other harmless chemicals are left behind.

The time it takes for chemical oxidation to clean up a site depends on several factors:

- size and depth of the polluted area
- type of soil and conditions present
- how groundwater flows through the soil (How fast? Along what path?)

In general, chemical oxidation offers rapid cleanup times compared to other methods. Cleanup times can be measured in months, rather than years.

Bioremediation allows natural processes to clean up harmful chemicals in the environment. Microscopic "bugs" or microbes that live in soil and groundwater like to eat certain harmful chemicals. In order for microbes to clean up harmful chemicals, the right temperature, nutrients (fertilizers), and amount of oxygen must be present in the soil and groundwater. One way they improve conditions is to pump air, nutrients, or other substances (such as molasses) underground. Sometimes microbes are added if enough aren't already there. When microbes completely digest these chemicals, they change them into water and harmless gases such as carbon dioxide.

The time it takes to bioremediate a site depends on several factors:

- types and amounts of harmful chemicals present
- size and depth of the polluted area
- type of soil and the conditions present
- whether cleanup occurs above ground or underground

These factors vary from site to site. It can take a few months or even several years for microbes to eat enough of the harmful chemicals to clean up the site.

COMMENT 7: I've heard about the use of enzymes at these sites. Will you use enzymes at this site?

RESPONSE 7: No, the selected remedy does not use enzymes. Instead, it uses both a chemical oxidant for on-site groundwater treatment, and a substrate to promote bioremediation for both on-site and off-site groundwater treatment.

COMMENT 8: Does the bioremediation process use the same wells as the chemical oxidation process?

RESPONSE 8: While this decision will be made during the design of the treatment system, the same injection wells may be used for both chemical oxidation and for bioremediation.

COMMENT 9: Explain the difference between chemical oxidation and bioremediation.

RESPONSE 9: Chemical oxidation uses chemicals called oxidants to destroy pollution in soil and groundwater. Oxidants help change harmful chemicals into harmless ones, like water and carbon dioxide. Bioremediation, on the other hand, allows natural processes to clean up harmful chemicals in the environment. Microscopic "bugs" or microbes that live in soil and groundwater like to eat certain harmful chemicals, such as those found in gasoline and oil spills. When microbes completely digest these chemicals, they change them into water and harmless gases such as carbon dioxide. Also see Response 6.

COMMENT 10: In the cost analysis, provision is made for monitoring period of 10 to 20 years. Is this correct?

RESPONSE 10: The Department develops estimates of the remedial action costs including all costs associated with the development and implementation of a remedial alternative. The period of performance evaluated generally does not exceed 30 years to allow consistent evaluation of costs only among alternatives. It does not imply that the site management of a remedy will end after the cost estimating period. In this instance, the selected remedy provides for up to 30 years of monitoring.

COMMENT 11: Would the monitoring results be publically available? Where?

RESPONSE 11: Monitoring results accepted by the State are provided to the property owner and would be available to the public at the document repository.

COMMENT 12: Would additional treatment be needed five years down the road? If so, will they result in additional cost?

RESPONSE 12: The selected remedy provides for monitoring of groundwater contaminant levels at and downgradient of the site and soil vapor intrusion in buildings near the site. This information would be reviewed to determine if additional treatment was needed. If additional treatment is necessary, additional costs will be incurred.

COMMENT 13: What percentage of cleanup costs are typically due to monitoring and lab analysis?

RESPONSE 13: Site management plans include, at a minimum, a monitoring plan which details the monitoring and reporting needed for the performance and/or effectiveness of the remedy, and an operation and maintenance plan which details the operation and maintenance of a component of the

remedy. The annual costs of the remedy are due to both activities. These annual costs can become a substantial portion of the total costs depending on the remedy selected.

Messrs. John C. Bird and Stephen R. Henshaw, of Environmental Forensic Investigations, Inc., submitted a letter dated March 30, 2012, which included the following comments:

COMMENT 14: The In Situ Treatment remedy was selected without first conducting a pilot test to determine effectiveness of in situ chemical application, aquifer parameters (including, but not limited to the injection radius of influence, baseline dissolved oxygen and baseline oxidation-reduction potential) and anticipated chemical residency within native aquifer material. Each of these parameters can have major consequences on the cost of an In Situ Treatment remedy.

RESPONSE 14: The Department recognizes that the parameters listed can impact the cost of an in-situ treatment remedy, however even with some increase in cost, this is still the most effective remedy. Appropriate pilot tests will be conducted during remedial design to provide the details necessary for the construction, operation, maintenance, and monitoring of the remedial program

COMMENT 15: No rational was provided for the placement of the enhanced bioremediation injection points located on the north side of West Main Street. The well placement appears to be focused on the shallow groundwater monitoring results from MW-8S, which has a concentration of 21 micrograms per liter; whereas the shallow groundwater monitoring results from MW-7S, which has a concentration of 42 micrograms per liter does not have injections points in the area.

RESPONSE 15: The locations of the enhanced bioremediation injection points immediately upgradient of Nathan Hale Residential Cooperative were chosen, in part, to minimize the potential for soil vapor intrusion in the area of the cooperative while at the same time meeting the remedial action objectives which are found in Section 6.5 of the Record of Decision.

COMMENT 16: Using an assumed 1U microgram per liter for the contouring of the PCE concentrations in shallow groundwater in Figure 2 PCE Concentration – Shallow Wells is misleading. The 5 microgram per liter infers a much larger plume size than the data suggests.

RESPONSE 16: The selected remedy addresses the contaminant plume both at the source area and upgradient of the residential cooperative located downgradient (northeast) of the site, to meet the remedial action objectives which are found in Section 6.5 of the Record of Decision. A remedial design program will be implemented to further define the extent of the plume and well as details necessary for the construction, operation, maintenance, and monitoring of the remedial program.

COMMENT 17: The costs associated with the selected alternative appear excessive. Based on the Table 8-3 Alternative 4: In Situ Treatment/MNA – Cost Estimate Summary from the January 2012 Feasibility Study Report for the Site, it appears that the Department assumed that it would take 12 days to inject ChemOx at 23 locations; and it would take 16 days to inject the enhanced bio at 9

locations. In addition, the Department is using a $150,000 lump sum estimate to perform a pilot study for the selected remedy. In addition, the Department has used a twenty percent contingency for all capitol costs. These assumptions appear excessive.

RESPONSE 17: The development of cost for the remedial alternatives was in accordance with DER-10: Technical Guidance for Site Investigation and Remediation, which may range from -30% to +50% per EPA guidanc. These costs are then used in the evaluation of alternatives to select a cost-effective remedy.

COMMENT 18: According to the PRAP, the estimated time required to implement the remedy will be one wear (we are assuming that it should read, year) and the time required to meet the remedial goals will be 30 years or less. It is difficult to predict a remedial end point; although a reduction in groundwater sampling wells should be anticipated over this time frame. The Department's cost estimate assumes a $25,000 per year; we believe that reduced number of wells should be anticipated and therefore, a reduced cost for the monitoring should occur over time.

RESPONSE 18: The period of performance for the remedy is developed according to DER-10: Technical Guidance for Site Investigation and Remediation and generally does not exceed 30 years to allow consistent evaluation of costs only. This period of performance does not imply that the site management of a remedy will either end before or after the cost estimating period. The operation of the components of the remedy will continue until the remedial objectives have been achieved, or until the Department determines that continued operation is technically impractical or not feasible.

COMMENT 19: In February 2012, the U.S. Environmental Protection Agency (EPA) published the final health assessment for Tetrachloroethylene (PCE) to the EPA's Integrated Risk Information System (IRIS) database. Will the Department be evaluating the IRIS toxicity values to set the remedial goals for this Site?

RESPONSE 19: 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. The Department has not, as of this writing, made any changes to its groundwater standards, criteria and guidance based on the EPA's Integrated Risk Information System database.

Mr. Howard E. Sayetta, Esq., on behalf of the Nathan Hale Owners Corp., submitted a letter (dated March 27, 2012) which included the following comment:

COMMENT 20: Our co-operative consists of 244 residential garden apartment units, on the north side of Route 25A. The co-operative owns the paved area of the drive-by to the north of the median area in the roadway of Route 25A; the median area is owned by New York State. Proposed injection sites on your figure no. 3 dated January 18, 2012 appear to be placed in our drive-by area. Access to this area is needed for emergency vehicles, and parking and the entrance to the drive-by is tight. We ask that any necessary test wells be placed on the median, to avoid interference with the roadway. If this is not feasible, then placement of the wells should be made after consultation with the cooperative's property manager, to minimize inconvenience to residents; in no event should wells be placed in the roadway of the drive-by area itself.

RESPONSE 20: A remedial design program will be implemented to further define the details necessary for the construction, operation, maintenance, and monitoring of the remedial program including the locations of the injection wells. During the remedial design process, due consideration will be given to the safety and convenience of area residents. We would coordinate with the property manager to ensure that adverse impacts on the residents are minimized.

APPENDIX B

Administrative Record

Administrative Record

Country Cleaners
State Superfund Project
Huntington, Suffolk County, New York
Site No. 152187

Proposed Remedial Action Plan for the Country Cleaners site, dated February 2012, prepared by the Department

Referral Memorandum dated January 5, 2007 for an RI/FS at the Country Cleaners site

Final Dynamic Work Plan, Remedial Investigation/Feasibility Study for Country Cleaners, 410 West Main St., Huntington, NY, Site No. 152187, dated May 2008, Prepared by AECOM, Work Assignment No. D004436-13

Final Remedial Investigation/Feasibility Study for Country Cleaners, 410 West Main St., Huntington, NY, Site No. 152187, dated February 2012, Prepared by AECOM, Work Assignment No. D004436-13