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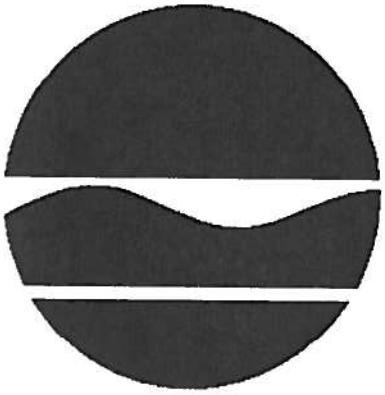
RECORD OF DECISION

Former Doro Dry Cleaners
State Superfund Project
Cheektowaga, Erie County
Site No. 915238
March 2014



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

DECLARATION STATEMENT - RECORD OF DECISION

Former Doro Dry Cleaners
State Superfund Project
Cheektowaga, Erie County
Site No. 915238
March 2014

Statement of Purpose and Basis

This document presents the remedy for the Former Doro Dry 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 Former Doro Dry Cleaners site and the public's input to the proposed remedy presented by the Department. A listing of the documents included as a part of the Administrative Record is included in Appendix B of the ROD.

Description of Selected Remedy

The elements of the selected remedy are as follows:

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

- Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
- Reducing direct and indirect greenhouse gases and other emissions;
- Increasing energy efficiency and minimizing use of non-renewable energy;
- Conserving and efficiently managing resources and materials;
- Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste;
- Maximizing habitat value and creating habitat when possible;
- Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals; and
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development.

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

- to define the horizontal extent of soil contamination on the west and east sides of the building, in the areas identified as Target Remediation Zones 1 and 3 and to locate the reported waste sludge disposal trench in Target Remediation Zone 3;
- confirm the groundwater contaminant concentrations directly under the building (Target Remediation Zone 2);
- verify the presence or absence of microbes capable of degrading the 2 major groundwater contaminants, cis-DCE and vinyl chloride; and evaluate the site buildings and design the necessary structural support for excavations nearby.

3. Excavation and off-site disposal of an estimated 648 cubic yards of unsaturated soils in Target Remediation Zones 1 and 3 contaminated with chlorinated VOCs (primarily PCE and TCE). The areal extent of the excavation will defined by the commercial SCOs, to the extent practicable given the need to maintain the structure of the buildings. If off-site excavation is needed, it will be defined by exceedances of residential SCOs.

4. On-site excavations will be backfilled in accordance with the requirements of 6NYCRR375-6.7(d) and intended commercial use of the site. Off-site excavations will be backfilled in accordance with the requirements of 6NYCRR375-6.7(d) for residential use. An amendment that promotes the degradation of groundwater contaminants (primarily cis-DCE and vinyl chloride) will be added to the soils used to backfill the excavation.

5. Installation of a sub-slab depressurization system (SSDS) in the on-site buildings and continued operation and maintenance of off-site SSDSs. An SSDS uses a fan-powered vent and piping to draw vapors from the soil beneath the buildings slab and discharge the vapors to the atmosphere. Depressurizing the area beneath the basement slab relative to indoor air pressure creates a relative vacuum which minimizes or prevents the infiltration of sub-slab vapors into the building. The system will include an exhaust fan sized to create enough negative pressure in the sub-slab area to minimize infiltration of vapors into the building. The system will exhaust to the outside.

6. Soil vapor intrusion sampling was offered to the property owners of one off-site building in 2011. The owners declined the sampling. Should the owners request to have the property sampled in the future, the NYSDEC, in consultation with the NYSDOH, shall determine whether soil vapor intrusion sampling is still appropriate. If any actions are recommended to address exposures related to soil vapor intrusion, then they will be implemented.

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; and

- requires compliance with the Department approved Site Management Plan.

8. A Site Management Plan, 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 above.
- Engineering Controls: The sub-slab depressurization systems installed in the site buildings and off-site residence.

b. an Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination;

c. 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 new buildings developed on the site, as may be required by the Institutional and Engineering Control Plan discussed above;
- a provision for further investigation to refine the nature and extent of contamination in areas where access was previously hindered (e.g., under the site buildings if and when they may be 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.

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 31, 2014
Date

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

RECORD OF DECISION

Former Doro Dry Cleaners
Cheektowaga, Erie County
Site No. 915238
March 2014

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 9 Office
270 Michigan Avenue
Buffalo, NY 14203
Phone: 716-851-7220

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 Former Doro Dry Cleaners Site is located at 3460-3466 Genesee Street in the Town of Cheektowaga, Erie County, New York. The site is located in a commercial and suburban setting, near Union Road and NYS Route 33.

Site Features:
The main site features include two attached buildings with parking areas located to the south and west. Directly to the north is undeveloped land covered by grass, bushes and trees; immediately adjacent and west of the open lot are the backyards of several homes. Located to the east is commercial property consisting of a large shopping plaza.

Current Zoning/Use(s):
The site is currently zoned for general commercial use. The current owner uses the north end of the building for storing office equipment and has made some renovations to the south end of the building for eventual use as office space. However, the site is largely inactive. Surrounding parcels are currently used for a combination of residential and commercial use. The nearest residential area is located immediately adjacent to the site to the west- northwest.

Historic Use(s):
Prior uses that have led to site contamination include the storage and use of chlorinated solvent for the dry cleaning facility that operated in the two buildings for approximately 40 years.

Completed site investigations include a Phase I Environmental Site Assessment (2008) and a Phase II Environmental Site Assessment (2010) which indicated contamination leading to the site's listing as a class 2. A 2012 Phase II Environmental Assessment of the commercial property immediately east of the site was also completed.

Site Geology and Hydrogeology:
Native soil, consisting of combinations of gravel, sand, and/or clay, is present beneath concrete/asphalt surfaces across the site to depths of at least 13 feet. Sub-grade layers consisting primarily of brown sand were encountered at some locations. Native soils were mostly noted as stiff or hard, which may have caused equipment (direct push soil probe) refusal at each boring location.

The lithology on-site consists of a thin, 1- to 4-foot thick layer of topsoil and organics underlain by brown to reddish-brown clay, which varies in thickness from approximately 2 feet in the southeast corner of the site to approximately 10 feet northwest of the site. This clay layer is underlain by a light brown sandy clay layer, which varies in thickness from approximately 2 to 6 feet. The sandy clay is underlain by glacial till, which ranges in thickness from about 2 to 4 feet. The glacial till was deposited on Onondaga Limestone bedrock, which was estimated at depths of between 14 and 16 feet below ground surface (bgs) across the area sampled.

Groundwater elevation data collected in December 2012 shows groundwater flow on-site from a high point under the former Doro Cleaners building to the northwest and southwest. The groundwater occurs at depths of approximately 8 to 12 feet below ground surface.

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:

Doro Family Trust, LLC

Efforts to locate and contact the PRPs for this site have not been successful. After the remedy is selected, the Department will again seek to locate the PRPs 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:

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

6.1.1: Standards, Criteria, and Guidance (SCGs)

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

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

http://www.dec.ny.gov/regulations/61794.html

6.1.2: RI Results

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

TETRACHLOROETHYLENE (PCE)	VINYL CHLORIDE
TRICHLOROETHENE (TCE)	ETHENE, 1,2, Cis-Dichloro

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

- groundwater
- soil
- soil vapor intrusion
- indoor air

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 - Soil Vapor Intrusion Study

In 2011, a soil vapor intrusion (SVI) investigation of eight homes in the neighborhood immediately northwest of the Site on Colden Court was completed. Concentrations of PCE, TCE, and cis-DCE found in the indoor air and soil vapor, sampled from the basement and beneath the basement floor of one home, were high enough that mitigation was required. A sub-slab depressurization system (SSDS) was installed. At the other homes, contaminant concentrations in the indoor air and soil vapor beneath the basement floors were below the action limits for mitigation or further monitoring. Access to a ninth home was denied by the owner and a SVI evaluation was not completed.

An SSDS uses a fan-powered vent and piping to draw vapors from the soil beneath the building slab or basement floor and discharges the vapors to the atmosphere. Depressurizing the area beneath the basement slab relative to indoor air pressure creates a relative vacuum which minimizes or prevents the infiltration of sub-slab vapors into the building.

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:
Soil: Based upon investigations conducted to date, the primary contaminants of concern at the site are tetrachloroethene (PCE) and its degradation products. PCE was found in the deeper soil, beneath the water table, predominantly at the west end of the site. Concentrations of PCE found on site were up to 2,600 parts per million (ppm), significantly exceeding the soil cleanup objectives for the protection of groundwater (1.3 ppm). Above the water table, and again at the west end of the site, the concentration of PCE was 1,100 ppm.

For all of the soils sampled from off-site locations, VOCs and other contaminants analyzed were either not detected, or found at concentrations below their unrestricted SCOs. However, groundwater samples collected from a short distance beyond the eastern perimeter of the site indicate that soil contamination, above the unrestricted SCOs, may extend off-site.

Groundwater: PCE and its associated degradation products were also found in groundwater at concentrations exceeding groundwater standards of 5 parts per billion (ppb). PCE and trichloroethene (TCE) were found on site, in the groundwater beneath the parking area on the west side of the building, at concentrations of 33 and 44 ppb respectively. The highest groundwater concentration of cis-1,2 dichloroethene (cis-DCE) found on site was 22,000 ppb, beneath the same west parking area.

Off-site, the highest concentrations of cis-DCE and vinyl chloride, 15,000 and 3,500 ppb respectively, were found east of the site building, a few feet beyond the site property boundary. PCE and TCE were not detected off site at concentrations exceeding their SCGs.

Sump Water and Sediment: Water and sediment sampled from a sump/cistern in the on-site building were contaminated with PCE and cis-DCE. The concentration of PCE in the water (13 ppb) was higher than all but one of the groundwater samples collected from on-site. The concentration of cis-DCE (170 ppm) in the sediment was higher than any of the soils sampled on site. The sump/cistern is connected to a sanitary sewer beneath Colden Court; there was no water or sediment found in the sanitary sewer nearest the site.

Water samples were collected from two storm sewer catch basins, one on Colden Court and the other near the southeast corner on the site, on Genesee Street. Cis-DCE was the only VOC detected at a concentration exceeding groundwater SCGs, and only in the Genesee St. catch basin sample.

Sub-slab vapor and indoor air:

Two homes on Colden Court, the building on site and a commercial building to the east of the site, were evaluated for soil vapor intrusion. Contaminant concentrations detected in the indoor air and sub-slab soil vapor in and beneath the homes and the off-site commercial building were below action limits for mitigation or further monitoring. In the on-site building, concentrations of PCE and TCE in the indoor air were found to exceed the NYSDOH's air guidelines of 30 and 5 micrograms per cubic meter, respectively. The concentrations of PCE found in the soil vapor beneath the site building and in the indoor air warrant mitigation.

Based on the results of soil, groundwater and soil vapor testing, three areas of concern were identified on-site which warrant remedial action. Target Remediation Zone 1 is the source zone associated with the former location of the dry cleaning machine on the west side of the building. Target Remediation Zone 3 is the source zone on the east side of the building, where an unlined trench was reportedly once located and used to dispose of sludge from the dry cleaning machines. Target Remediation Zone 2 is the sandy clay, water-bearing zone in between Target Remediation Zones 3 and 1, beneath the building. It is assumed that the entire thickness of the water bearing zone in Target Remediation Zone 2 is contaminated.

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.*

Direct contact with contaminants in the soil is unlikely because the majority of soil contamination is covered with buildings and pavement. 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. Sampling results from the on-site building indicates that soil vapor intrusion is a concern. Sampling of off-site residential properties identified soil vapor intrusion concerns in one nearby residence. A subslab depressurization system was installed at this residence to prevent vapors beneath the slab from entering the building. Access was denied at one residential property to evaluate the potential for soil vapor intrusion; investigation of this residence remains warranted.

6.5: Summary of the Remediation Objectives

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

The remedial action objectives for this site are:

Groundwater

RAOs for Public Health Protection

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

RAOs for Environmental Protection

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

Soil

RAOs for Public Health Protection

- Prevent ingestion/direct contact with contaminated soil.
- Prevent inhalation 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 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 Limited Excavation Alternative remedy.

The estimated present worth cost to implement the remedy is $2,433,000. The cost to construct the remedy is estimated to be $1,824,000 and the estimated average annual cost is $50,000.

The elements of the selected remedy are as follows:

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

- Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
- Reducing direct and indirect greenhouse gases and other emissions;
- Increasing energy efficiency and minimizing use of non-renewable energy;
- Conserving and efficiently managing resources and materials;
- Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste;
- Maximizing habitat value and creating habitat when possible;
- Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals; and
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development.

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

- to define the horizontal extent of soil contamination on the west and east sides of the building, in the areas identified as Target Remediation Zones 1 and 3 and to locate the reported waste sludge disposal trench in Target Remediation Zone 3;
- confirm the groundwater contaminant concentrations directly under the building (Target Remediation Zone 2);
- verify the presence or absence of microbes capable of degrading the 2 major groundwater contaminants, cis-DCE and vinyl chloride; and evaluate the site buildings and design the necessary structural support for excavations nearby.

3. Excavation and off-site disposal of an estimated 648 cubic yards of unsaturated soils in Target Remediation Zones 1 and 3 contaminated with chlorinated VOCs (primarily PCE and TCE). The areal extent of the excavation will defined by the commercial SCOs, to the extent practicable given the need to maintain the structure of the buildings. If off-site excavation is needed, it will be defined by exceedances of residential SCOs.

4. On-site excavations will be backfilled in accordance with the requirements of 6NYCRR375-6.7(d) and intended commercial use of the site. Off-site excavations will be backfilled in accordance with the requirements of 6NYCRR375-6.7(d) for residential use. An amendment that promotes the degradation of groundwater contaminants (primarily cis-DCE and vinyl chloride) will be added to the soils used to backfill the excavation.

5. Installation of a sub-slab depressurization system (SSDS) in the on-site buildings and continued operation and maintenance of off-site SSDSs. An SSDS uses a fan-powered vent and piping to draw vapors from the soil beneath the buildings slab and discharge the vapors to the atmosphere. Depressurizing the area beneath the basement slab relative to indoor air pressure creates a relative vacuum which minimizes or prevents the infiltration of sub-slab vapors into the building. The system will include an exhaust fan sized to create enough negative pressure in the sub-slab area to minimize infiltration of vapors into the building. The system will exhaust to the outside.

6. Soil vapor intrusion sampling was offered to the property owners of one off-site building in 2011. The owners declined the sampling. Should the owners request to have the property sampled in the future, the NYSDEC, in consultation with the NYSDOH, shall determine whether soil vapor intrusion sampling is still appropriate. If any actions are recommended to address exposures related to soil vapor intrusion, then they will be implemented.

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

8. A Site Management Plan, 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 above.
- Engineering Controls: The sub-slab depressurization systems installed in the site buildings and off-site residence.

b. an Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination;

c. 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 new buildings developed on the site, as may be required by the Institutional and Engineering Control Plan discussed above;
- a provision for further investigation to refine the nature and extent of contamination in areas where access was previously hindered (e.g., under the site buildings if and when they may be 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.

Exhibit A

Nature and Extent of Contamination

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

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

Waste/Source Areas

As described in the RI report, waste/source materials were identified at the site and are impacting groundwater, soil, and soil vapor.

Wastes are defined in 6 NYCRR Part 375-1.2(aw) and include solid, industrial and/or hazardous wastes. Source areas are defined in 6 NYCRR Part 375(au). Source areas are areas of concern at a site were substantial quantities of contaminants are found which can migrate and release significant levels of contaminants to another environmental medium.

Three potential source areas of VOCs have been identified at the site based on soil and groundwater sampling performed and information gathered during the Remedial Investigation (RI). After the RI sampling and field work had already been completed, a former employee of the dry cleaner reported that there was once a shallow, unlined disposal trench along the east side of the building that was used to bury sludge removed from dry cleaning machines. While no soil or groundwater samples had been collected from the exact location that the former employee indicated, and the sludge and trench were not found; samples collected nearby did find that this source area is characterized by cis-1,2-dichloroethene (cis-DCE) and vinyl chloride contamination in the groundwater. A source area west of the on-site building, which may have been the result of VOCs leaking out of a dry cleaning machine found nearby, inside the building, is characterized by tetrachloroethene, also known as perchloroethylene (PCE) in the soil and groundwater. Cis-DCE was also detected in sediment and water samples collected from a sump inside the on-site building. The sump is connected to a floor drain and sanitary sewer which extends onto Colden Court.

The waste/source areas identified will be addressed in the remedy selection process. The waste/source areas on the west and east side of the building will be labeled as Target Remediation Zones 1 and 3 respectively in the discussion of remedial alternatives, later in this proposal. Target Remediation Zone 2 is the sandy clay water-bearing zone in between Target Remediation Zones 3 and 1, beneath the building. The sump source area, and connected floor drain and sewers, are not designated as target remediation zones but will be cleaned as components of any active remedial alternative considered.

Groundwater

Groundwater samples were collected from temporary and permanent overburden monitoring wells. The samples were collected 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 (VOCs) (Table 1 and Figure 2).

Select groundwater samples, were also analyzed for semi-volatile organic compounds (SVOCs), PCBs/pesticides and metals. SVOCs, PCB/Pesticides were either not detected or found at concentrations below their respective SCGs. The only metals found at a concentration above SCGs were manganese and iron. The groundwater concentrations of iron found upgradient of the site were similar to those found downgradient and have been deemed reflective of background levels. Manganese was analyzed in only one sample, from an on-site well, and therefore no comparison could be made to background levels. However, in the few soil samples on-site that were tested for metals, the concentrations of both manganese and iron were found to be below the unrestricted SCOs. The elevated concentration of manganese in this one groundwater sample is therefore not considered to be site-related.

On-Site Groundwater

One or more VOCs were detected in seven of eleven on-site groundwater samples at concentrations that exceeded the NYSDEC Class GA Groundwater Standard or Guidance Values. Cis-DCE concentrations detected near or above its 5 ppb SCG ranged from 4.9 to 22,000 ppb, with the highest concentrations found in the groundwater sampled from the permanent monitoring well MW-06, located in the parking area along the west side of the building. This well is located in one of the suspected source areas discussed above and labeled as Target Remediation Zone 1. Benzene was found in one groundwater sample from the temporary monitoring well B-28 at a concentration above its SCG but it was not detected in a duplicate of that same sample. B-28 was located near MW-06 in the same parking area. The other VOCs detected at concentrations above the SCGs, but to a lesser degree, included: PCE, trichloroethene (TCE) and vinyl chloride. Vinyl chloride was found in nearly all of the on-site locations, PCE and TCE were encountered primarily near the east and west source areas and to a lesser extent in the parking area southwest of the on-site building.

It is assumed that the entire thickness of the water-bearing zone beneath the on-site building, Target Remediation Zone 2, is contaminated. The rationale for the designation of this zone is that contamination entered groundwater on the upgradient side of the building—Target Remediation Zone 3—and due to the westerly groundwater gradient, migrated by advection through the water bearing zone under the building.

Off-Site Groundwater

Cis-DCE was detected in three off-site samples at concentrations in excess of its SCG, ranging in concentrations from 53 to 15,000 ppb. The highest concentration was found at MW-04 which is located a few feet beyond the property boundary of the site, east of the site building, in Target Remediation Zone 3. The other two locations where cis-DCE was found at concentrations in excess of its SCG were to the west of the site on Colden Court near a storm sewer catch basin and south of the site, on the opposite side of Genesee Street. Vinyl chloride was also detected at concentrations exceeding its 2 ppb SCG, in the same three off-site locations where cis-DCE was found. PCE and TCE were not detected at concentrations exceeding their SCGs.

Acetone was the only other VOC detected at concentrations exceeding its SCG at off-site locations: one location to the east of the site building and another to the west of the site, within the residential area. Both of these locations are well outside the suspected on-site source areas and the Target Remediation Zones. Acetone was not detected in any of the other groundwater samples collected from on-site or off-site locations. As discussed below, acetone was found in one soil sample, collected from an on-site location, at a concentration

equal to its unrestricted SCO. Acetone is a common laboratory solvent but not one that was widely used in the dry cleaning industry. The acetone findings were therefore not considered to be site-related.

Table 1 - Groundwater

Detected Constituents	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)	Frequency Exceeding SCG
VOCs			
Cis-1,2 Dichloroethene	1.1 – 22,000	5	10 of 36 samples
Trichloroethene	2.2 -44	5	5 of 36
Vinyl chloride	6.2 – 3,500	2	8 of 36
Tetrachloroethylene	1.4 -33	5	11 of 36
Acetone	68-72	50	2 of 36

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

While PCE and TCE are present in groundwater on-site at concentrations of up to 33 and 44 ppb, cis-DCE and vinyl chloride, secondary degradation products of PCE found at concentrations of up to 22 and 3.5 ppm respectively, are the principle groundwater contaminants. These two contaminants, cis-DCE and vinyl chloride, are known to be biodegradable under the aerobic conditions that exist at the site.

Based on the findings of the RI, the presence of chlorinated solvents 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: cis-DCE and vinyl chloride.

The distant portions of the plume are not included in the Target Remediation Zones as it is assumed that contamination will be addressed through natural processes without active remediation.

Soil

No surface soil samples were collected during the RI, as the impacted portions of the site are covered by pavement or buildings. Earlier investigations indicated that the primary contaminants of concern were volatile and therefore unlikely to be found remaining on the ground surface. However, all soil boring samples collected during the RI, including those collected from the near surface, were examined with a photo-ionization detector (PID); there was no indication found of volatile contamination in the near surface.

Soil samples were advanced at on-site and off-site boring locations to depths ranging from 0-16 feet below ground surface (bgs). Most of the samples collected were analyzed for VOCs. Samples from one off-site and two on-site locations were also analyzed for semi-volatile organic compounds (SVOCs), PCBs/Pesticides and metals and cyanide.

The results indicate that on-site soils exceed the unrestricted SCOs for VOCs. For all of the soils sampled from off-site locations, VOCs and other contaminants analyzed were either not detected, or found at concentrations below their unrestricted SCOs. Analytical detections for the subsurface soil investigation are presented in Table

2 and the VOC exceedances are shown on Figure 3. While none of the off-site soils collected during the RI exceeded the unrestricted SCOs, based on the groundwater contamination found just beyond the site's eastern boundary and the report of a waste sludge disposal trench on site near the boundary, Target Remediation Zone 3 extends off-site onto the neighboring commercial property.

PCE was the one VOC found in on-site soils at the highest concentrations, in soil borings on the west side of building, directly outside the area where dry cleaning machinery was once located (i.e. Target Remediation Zone 1). PCE was also detected inside the building, 8 to 10 feet beneath the floor where the dry cleaning machinery stood, but at a concentration below its unrestricted SCO.

Acetone was detected near the same area on the west side of the building at a concentration equal to its unrestricted SCO. Acetone was not detected in the groundwater from that area or anywhere else on site. Acetone is a common laboratory solvent, sometimes used in paint thinners but not known to have been used in the dry cleaning industry; acetone is therefore not considered to be site-related.

Vinyl chloride and cis-DCE were also detected at concentrations above their unrestricted SCOs, in a sample collected from the east side of the building, near the area where sludge from the cleaning equipment was reportedly buried.

As noted above, two on-site soil samples were also tested for SVOCs, PCB/pesticides, metals and cyanide. The samples were collected from the same area where PCE was detected, one of the suspected source areas for VOC contamination. Breakdown products of DDT, which was used widely between the 1940's and 1970's in the United States as an insecticide for both agricultural and residential uses, were found at concentrations above unrestricted SCOs but below the residential SCOs. DDT and its breakdown products were not however detected in the groundwater at the site and are therefore not considered site-related. SVOCs, PCBs, metals and cyanide were either not detected in the two on-site soil samples tested or were found at concentrations below their unrestricted SCOs.

Soil samples for laboratory analysis had been selected from various depths based on PID readings. After reviewing data on the complex hydrogeology of the site, it was determined that some of these soil samples were collected from the saturated zone (i.e., below the water table). In order to better understand the extent of soil contamination in the unsaturated or vadose zone that may be contributing to groundwater contamination, Figure 4 was developed depicting only VOC exceedances from soil samples collected above the water table. The data suggests that the VOC contamination in the unsaturated soils exists primarily in the source areas east and west of the building, Target Remediation Zones 1 and 3, with the west source area characterized by PCE and the east source area to a lesser degree by cis-DCE and vinyl chloride contamination.

In the 2010 Phase II Site Assessment, soils sampled from beneath the floor the on-site building, near where the dry cleaning equipment was used (near Target Remediation Zone 1) contained PCE at concentrations of 53 and 92 ppm; this is above the unrestricted use SCO but below the commercial use SCO of 150 ppm. However, two samples collected during the RI, from the same area and similar depths (at and below the water table), found PCE concentrations less than the unrestricted use SCO.

Table 2 - Soil

Detected Constituents	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b] (ppm)	Frequency Exceeding Unrestricted SCG	Restricted Use SCG[c] (ppm)	Frequency Exceeding Restricted SCG
VOCs					
Cis-1,2-Dichloroethene	0.0027 - 64	0.25	13 of 35	0.25	13 of 36
Tetrachloroethene	0.0028 - 2600	1.3	21 of 35	1.3	21 of 36
Trichloroethene	0.003 - 12	0.47	10 of 35	0.47	10 of 36
Vinyl chloride	0.016 – 0.096	0.02	2 of 35	0.02	2 of 36

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

Based on the findings of the Remedial Investigation, the presence of chlorinated solvents has resulted in the contamination of soil. The site contaminants identified in soil which are considered to be the primary contaminants of concern, to be addressed by the remedy selection process is PCE and its secondary degradation products (TCE, cis-DCE and vinyl chloride).

Sump Water

One liquid sample was collected from the on-site sump/cistern located in the north end of the on-site building. PCE and cis-DCE were the only two VOCs found at concentrations exceeding water quality standards. The PCE concentration was higher than all but one of the groundwater samples collected on-site.

Two storm water runoff samples were collected from off-site locations, catch basins CB-1 and CB-2, located near the southeast corner of the site, on Genesee Street and to the northwest of the site, on Colden Court respectively. Analytical detections for the samples are presented in Table 3 and Figure 2. Only the CB-2 sample contained a VOC, cis-DCE, at a concentration exceeding water quality standards but it was lower than the concentrations detected in the groundwater from nearby wells. The storm sewer that discharges to CB-2, passes through Target Remediation Zone 3; contamination may have infiltrated the storm sewer in that zone.

Table 3 - Sump Water

Detected Constituents	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)	Frequency Exceeding SCG
VOCs			
Cis-1,2-Dichloroethene	ND - 620	5	2 of 3
Tetrachlorethene	ND - 13	5	1 of 3

a - ppb: parts per billion, which is equivalent to micrograms per liter, µg/L, in water.
b - SCG: Ambient Water Quality Standards and Guidance Values (TOGs 1.1.1) and 6 NYCRR Part 703: Surface Water and Groundwater Quality Standards.

Based on the findings of the Remedial Investigation, the presence of chlorinated solvents has resulted in the contamination of the sump water. The site contaminants that are considered to be the primary contaminants of concern which will drive the remediation of surface water to be addressed by the remedy selection process is, cis-DCE, one of the same contaminants of concern identified in the groundwater.

Sump Sediments

There was no sediment found in the same two catch basins that were sampled for storm water runoff. A sample of the sediment from the sump/cistern located inside the site building was collected and analyzed. The concentration of cis-DCE found in this sample was 170 ppm, higher than the concentrations of that contaminant found in any of the soils sampled on site.

Based on the findings of the Remedial Investigation, the presence of chlorinated solvents has resulted in the contamination of sediment. The site contaminant that is considered to be the primary contaminants of concern which will drive the remediation of sediment to be addressed by the remedy selection process is cis-DCE.

Soil Vapor

The evaluation of the potential for soil vapor intrusion resulting from the presence of site related soil or groundwater contamination was evaluated by the sampling of sub-slab soil vapor under structures, and indoor air inside structures. At this site, due to the presence of buildings in the impacted area, a full suite of samples were collected to evaluate whether soil vapor intrusion was occurring.

In April and July 2011, soil vapor and indoor samples were collected from beneath and within the basements of eight homes nearest the site, in the neighborhood immediately northwest of the site on Colden Court. PCE, trichloroethylene (TCE), and cis-DCE were found in the samples taken from one structure located north of the site at concentrations which warranted mitigation. A sub-slab depressurization system was installed at this structure in October 2011. VOCs were detected in the sub-slab vapor and indoor air sampled from the other seven homes, but at concentrations which did not require mitigation or further monitoring. One other home, located near the site, was not evaluated for soil vapor intrusion as the owner did not grant access to the property.

In 2013, part of the Remedial Investigation, four additional structures were evaluated, both on and off-site, to assess the potential for soil vapor intrusion. The analytical results are presented in Figure 5. Based on the concentration of PCE detected in the sub-slab soil vapor sample from the front and rear portions of the on-site building, mitigation is recommended. In the on-site building, concentrations of PCE and TCE in the indoor air were found to exceed the NYSDOH's air guidelines of 30 and 5 micrograms per cubic meter, respectively. The three remaining structures sampled are located off-site, two are private residences and the third is a neighboring commercial building. Carbon tetrachloride and/or 1,1,1-trichloroethane were the only VOCs found, and at concentrations which do not require mitigation or further monitoring.

Based on the findings of the Remedial Investigation, the presence of dry cleaning solvents has resulted in the contamination of soil vapor. The site contaminants that are considered to be the primary contaminants of concern which will drive the remediation of soil vapor to be addressed by the remedy selection process are, PCE and its degradation products.

Exhibit B

Description of Remedial Alternatives

It is assumed that the common elements listed below will be included as part of each of the remedial alternatives (except Alternative 1):

- Vapor mitigation - Vapor mitigation will be installed at the on-site building until the sources of vapor contamination have been remediated. The off-site vapor mitigation system will continue to be operated and maintained. An evaluation of the off-site residence where access was denied by the owner, will be offered again.
- Sewer and sump cleanout - Site-related contaminants were detected in the sump in the building, the floor drain and the sanitary sewer west of the building on Colden Court and in the storm sewer east of the building. The sump and the sewers will be cleaned out, and the sump will be closed and cemented in.
- Long-term monitoring - Periodic monitoring of groundwater and/or soil vapor will be implemented when contaminants remain above levels that allow for unrestricted use. The monitoring program should continue until concentrations have stabilized or met remedial action objectives for soil, groundwater and soil vapor..
- Institutional controls - Institutional controls such as environmental easements will restrict the future use of the site and groundwater. They will require precautions to be taken to protect human health in the event remedial measures are disturbed.

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. Groundwater will continue to migrate and the contamination will continue to attenuate through dilution, dispersion, limited biodegradation, etc. This alternative does not include vapor mitigation, institutional controls or long term monitoring of soil, vapor, or groundwater. There will be no cost under this alternative.

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

Alternative 2: Restoration to Pre-Disposal or Unrestricted Conditions

This alternative achieves all of the SCGs discussed in Section 6.1.1 and Exhibit A and soil meets the unrestricted soil clean objectives listed in Part 375-6.8(a). This alternative will include: a pre-design investigation, excavation and disposal, backfill with bio-stimulating amendments and in-situ treatment of groundwater.

The Doro Cleaners site is characterized by contamination in both the unsaturated soils, saturated soils, and diffusion-driven contamination in the underlying unsaturated till and bedrock. Significant (e.g., ppm-level) groundwater contamination is limited to the area under and immediately adjacent to the site building. Under

Alternative 2, cleanup to pre-disposal or unrestricted condition at the site is achieved through removal of contaminated soil, saturated soil, and bedrock by excavation and off-site disposal in Target Remediation Zones 1 and 3, in-situ treatment of the ppm-level (greater than 999 ppb) groundwater contamination (Target Remediation Zone 2), and reliance on natural processes in the distant parts of the groundwater plume.

Pre-Design Investigation. In order to develop a cost-effective remedial design, environmental, microbiological, geotechnical, and structural data will be collected. For groundwater outside the target remediation zones, samples will be collected to verify the presence or absence of microbes capable of degrading the 2 major groundwater contaminants, cis-DCE and vinyl chloride. Soil borings and/or test pits will be completed and soil samples will be collected in Target Remediation Zones 1 and 3, to define the horizontal limits of excavation and to locate the reported waste sludge disposal trench in Target Remediation Zone 3. Additionally, an evaluation of the site building will be conducted to determine the structural support of the on-site building required during the excavations.

Excavation and Disposal. Approximately 1,296 cubic yards of soil will be removed from the site. Clean fill will be brought in to replace the excavated soil and establish the designed grades at the site. For this alternative, the soils in Target Remediation Zones 1 and 3 will be excavated and disposed of off-site. The depth of the excavations would be determined during the pre-design investigation. For cost estimate purposes, it is assumed the excavations will extend 6 inches into the top of bedrock (to a total depth of 14 feet). The removal of all contaminated soils will be confirmed by performing post-excavation sampling in the excavated areas. Excavation will extend horizontally until the unrestricted SCOs for PCE and its degradation products are reached or further excavation is restricted by the presence of buried utilities or the on-site structure; the soils beneath the on-site building will not be removed. During excavation and backfill activities, dewatering will be performed in order to maintain the water levels below the depths of excavation/backfill activities. The contaminated water generated during the dewatering activities will be tested for toxicity characteristics and disposed of off-site. Toxicity characteristic analysis of the excavated soils will categorize the contaminated materials as either hazardous or nonhazardous waste and determine the appropriate landfill type for disposal. For purposes of cost estimation, it is assumed that 10% of the materials disposed of offsite will be classified as hazardous.

Backfill with amendments: An amendment that promotes biodegradation of the remaining low-level contamination in groundwater will be added to the soils used to backfill the excavation. For cost estimating purposes, it is assumed that an oxygen releasing amendment will be added to the backfill. Over time, storm water infiltrating through the backfill will carry amendment into the groundwater, and advection will carry amendment downgradient. The amendment will ensure continuation of the aerobic conditions in groundwater conducive to biodegradation of the residual cis-DCE and vinyl chloride in groundwater.

In-situ treatment of groundwater: The contaminated groundwater in Target Remediation Zone 2 will be treated by in-situ chemical oxidation (ISCO). An innovative technology, electrokinetics, will likely be the most effective way to distribute ISCO amendment at this site, and is thus the assumed method for this alternative. With electrokinetics, electrodes will be placed at the elevation of the contamination (approximately a 5 foot thickness) and wired together to create an array of anodes and cathodes. A DC current will be applied to create an electric field in the subsurface between the cathodes and anodes. Since the oxidant, permanganate, exists in solution as a negatively charged ion, it is drawn to the positively charged cathode. The critical benefit of this technique is that the oxidant can be distributed into the low permeability sandy clay.

Present Worth: *$3,902,000*
Capital Cost: *$3,368,000*

Annual Costs: *$43,000*

Alternative 3: Excavation

This alternative will include pre-design investigation, excavation, disposal, and placement of amended backfill as described in Alternative 2. The major difference is that there is no in-situ treatment of groundwater for this alternative. Contaminants in groundwater at the site, including the groundwater under the site building, are expected to attenuate by natural processes, assisted by the amendments in the backfill of the excavated areas. The areal extent of the excavation will defined by the SCOs, to extent practicable given the need to maintain the structure of the neighboring buildings.

All on-site soils in Target Remediation Zones 1 and 3 which exceed unrestricted use SCOs, as defined by 6 NYCRR Part 375-6.8, for PCE and its degradation products will be excavated and transported off-site for disposal.

Approximately 1,296 cubic yards of soil will be removed from the site. Clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) will be brought in to replace the excavated soil and establish the designed grades at the site. An amendment that promotes biodegradation of remaining low-level contamination in groundwater will be added to the soils used to backfill the excavation.

Present Worth: *$2,733,000*
Capital Cost: *$2,174,000*
Annual Costs: *$45,000*

Alternative 4: Cover System

This alternative will include, ground covers for Target Remediation Zones 1 and 3 as shown on Figure 6. The purpose of the covers is to reduce rainwater infiltration as much as possible through the contaminated soils. The existing building on site also needs to be retained to serve as an effective cover because it diverts rainwater from the Target Remediation Zone 2 under the building. For cost estimating purposes, it is assumed that the covers will consist of concrete overlying the native clay soils or existing pavement.

Cover Installation. Construction techniques and equipment are widely available for installing covers. The cover will be the outdoor area in and around the target remediation zones. Approximately 6 inches of concrete will be laid to form the cover, over a surface area of approximately 3,500 square feet, which is anticipated to be larger than the remediation target zones in order to limit any horizontal infiltration of water. The cover will be engineered to limit any infiltration of rainwater into the contaminated soils, meaning that durable, low-permeability material will be used, and rainwater will be directed away from the remediation zone. It is assumed that installation will take place over approximately 1 month.

Cover Monitoring and Maintenance. The cover will require yearly inspection to look for cracks or other areas where water could seep through and into the soils. For costing purposes, it is assumed that maintenance will be needed every 7 years to seal cracks or replace deteriorated concrete.

Present Worth: *$1,075,000*
Capital Cost: *$447,000*
Annual Costs: *$51,000*

Alternative 5: Limited Excavation

This alternative will include, pre-design investigation, excavation, disposal, and amended backfill as described in Alternative 3 for Target Remediation Zones 1 and 3, but the excavation will stop at the water table (approximately 7 feet). The areal extent of the excavation will defined by the SCOs, to the extent practicable given the need to maintain the structure of the neighboring buildings The remedial design program will include a pre-design investigation to define the horizontal extent of soil contamination in Target Remediation Zones 1 and 3 and to locate the reported waste sludge disposal trench in Target Remediation Zone 3.

The data collected during the RI indicate that Target Remediation Zone 1 may be the principal source of the indoor air contamination seen in the on-site building. Thus, removing this source will have the most effect for reducing indoor air contamination. The addition of the amended backfill and natural processes will be relied upon to attenuate contaminants in groundwater at the Site, including the groundwater under the site building.

Contaminants detected in groundwater (Target Remediation Zone 2) will not be directly treated. Amendments added to the soil backfill in Target Remediation Zones 1 and 3 are expected to mitigate the groundwater contamination in Target Remediation Zone 2. While aerobic conditions in groundwater are conducive to the direct oxidation of cis-DCE and vinyl chloride (the principle contaminants in groundwater), attenuation rates are not known. Long-term monitoring will be conducted to ensure that the plume does not further expand and concentrations reduce by natural processes over time. Vapor rising from the groundwater will not impact occupants of the site building or off-site residence as long as the vapor mitigation systems remain operational.

Approximately 648 cubic yards of soil will be removed from the site. Clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) and intended commercial use of the site will be brought in to replace the excavated soil and establish the designed grades at the site. An amendment that promotes biodegradation of remaining low-level contamination in groundwater will be added to the soils used to backfill the excavation.

Present Worth: *$2,433,000*
Capital Cost: *$1,824,000*
Annual Costs: *$50,000*

Exhibit C

Remedial Alternative Costs

Remedial Alternative	Capital Cost ($)	Annual Costs ($)	Total Present Worth ($)
1. No Action	0	0	0
2. Return to Pre-disposal	*$3,368,000*	*$43,000*	*$3,902,000*
3. Excavation	*$2,174,000*	*$45,000*	*$2,733,000*
4. Cover	*$447,000*	*$51,000*	*$1,075,000*
5 Limited Excavation	*$1,824,000*	*$50,000*	*$2,433,000*

Exhibit D

SUMMARY OF THE SELECTED REMEDY

The Department is selecting Alternative 5, Limited Excavation as the remedy for this site. Alternative 5 will achieve the remediation goals for the site by removing contaminated, unsaturated soils from the upper portions of the two, outdoor target remediation zones and replacing that material with clean soils mixed with chemical agents to treat the contamination remaining in the soils and groundwater below. The elements of this remedy are described in Section 7. The selected remedy is depicted in Figure 7.

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 5) will satisfy this criterion by removing the upper, unsaturated soil from Target Remediation Zones 1 and 3. Removal of this material will mitigate further impact to the groundwater. Zone 1 is the presumed primary source of indoor air contamination to the on-site building, and with the groundwater, a contributor to the indoor air contamination found off site as well. Alternative 5 satisfies this criterion without the added risks/costs of additional soil excavation to bedrock, i.e. the greater degree of engineering issues (stability) with excavating deep along the foundations of the on-site building and dealing with volumes of groundwater during excavation.

Alternative 1, the no-action alternative, does not provide protection of human health and the environment since contamination remains in place and with no mechanism implemented to prevent exposure. Alternative 1 will therefore not be evaluated further.

Alternatives 2 through 5 are comparable with respect to overall protection of public health. For protection of the environment, Alternative 2 provides the most protection since groundwater will be actively treated. The remaining alternatives rely on natural processes to disperse groundwater concentrations and thus there is less certainty regarding protection of the environment. Of these 3 remaining alternatives, the excavation alternatives (Alternatives 3 and 5) provide the most protection since sources of continuing groundwater contamination, contaminated soils, will be removed. Containment (Alternative 4) will provide conditional protection as long as the cover is maintained.

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.

The remaining 4 active remedy alternatives are designed to meet SCGs; the main differentiator is the amount of time required to reach SCGs. Alternative 2 will be the most rapid since ppm-level groundwater will be treated; however, natural processes will still be relied upon in the distant portions of the plume to meet SCGs, and this is expected to take on the order of decades given the slow groundwater velocity. Alternatives 3, 4, and 5 also rely on natural processes in the distant portions of the plume and will require a significant time period to meet SCGs. Additionally, these Alternatives 3, 4 and 5 rely on natural processes in the ppm-level groundwater under the building, and thus will take longer.

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.

The active alternatives (2 through 5) all rely on natural processes to achieve SCGs. Each relies on natural processes in the distant parts of the plume; as long as the processes continue unabated, the alternatives will provide effectiveness and permanence (this will be confirmed with long-term monitoring). However, Alternative 2 will treat the ppm-level contamination under the building, and Alternatives 3, 4, and 5 will rely on natural processes to reach SCGs in this zone. The ppm-level contamination will take a significantly longer time frame to attenuate to SCGs than the low-level contamination in the distant portions of the plume. Thus Alternative 2 will achieve permanence faster than Alternatives 3, 4, or 5.

Additionally, Alternative 4 relies on a cover to protect human health and the environment. Covers may not provide a permanent remedy since contamination will remain in place, and natural processes are not expected to cause significant attenuation of contaminant mass.

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.

All the active alternatives (2 – 5) rely on natural processes to achieve SCGs in the distant portions of the plume; long term monitoring is required to ensure that toxicity, mobility, and volume do not increase over time. Alternative 2 will cause the greatest reduction in these factors because soil contamination will be excavated and groundwater contamination in Target Remediation Zone 2 will be destroyed in-situ. The excavation alternatives will reduce the volume of contamination through treatment. Alternative 4 will be designed to reduce the mobility of contamination from the unsaturated soils into groundwater by reducing rainwater infiltration through the contamination. However, this reduction in mobility is contingent upon the continued maintenance of the cover.

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.
The key element that differentiates Alternatives 2, 3, 4 and 5 for short-term effectiveness is the amount of time that remedial operations will be required on-site. These time periods are:
Alternative 2 – Approximately 36 months

Alternative 3 – Approximately 1 month
Alternative 4 – Approximately 1 week
Alternative 5 – Approximately 1 month

Alternatives 3 through 5 all have short-term impacts which could easily be controlled, however, Alternative 4 will have the smallest impact. Alternative 2 will cause significant disruption to the on-site building as the remediation infrastructure will cover a large portion of the indoor space of the site building for a period of three years. The time needed to achieve the remediation goals is the shortest for Alternative 2 and longer for Alternative 3. Alternatives 4 and 5 take the longest to achieve the remediation goals.

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

Alternative 4 will be the easiest to implement since the only site work will be to cover the surface soils. The excavation portion of Alternatives 2, 3, and 5 will be potentially difficult to implement since shoring of the site building will likely be required to excavate safely. Geotechnical and structural evaluation will need to be completed during a pre-design investigation. Alternative 2 will be the most difficult to implement because of the additional need to procure a specialty vendor to implement an innovative technology for in situ treatment of the 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 costs of the alternatives vary significantly. Alternative 4 has a low cost, but the contaminated soil will not be addressed other than by institutional and engineering controls (easement use restrictions and cover respectively). With the complications of excavation shoring required close to the building and innovative, in-situ technology included to address the groundwater, Alternative 2 will have the highest present worth cost.

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.

Since the anticipated use of the site is commercial, Alternatives 4 and 5 will be less desirable because at least some contaminated soil will remain on the property whereas Alternatives 2 and 3 will remove or treat the contaminated soil permanently. However, the residual contamination with Alternatives 4 and 5 will be controllable with implementation of a Site Management Plan. With Alternatives 2 and 3, by removing all of the contaminated soil from both outdoor target remediation zones, the unsaturated overburden will be removed and fewer restrictions on the site use will be necessary.

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

9. Community Acceptance. Concerns of the community regarding the investigation, the evaluation of alternatives, and the PRAP are evaluated. A responsiveness summary has been prepared that describes public comments received and the manner in which the Department will address the concerns raised.

Alternative 5 has been selected because, as described above, it satisfies the threshold criteria and provides the best balance of the balancing criterion. Alternative 2 will achieve a higher degree of permanence the soonest but lacks in implementability, whereas Alternative 4 is the least permanent alternative but perhaps the easiest to implement. Alternatives 3 and 5 are comparable in terms of overall protection, short-term effectiveness, implementability and land use, but Alternative 5 would be the more cost effective of the two.

APPENDIX A

Responsiveness Summary

RESPONSIVENESS SUMMARY

Former Doro Dry Cleaners Site
State Superfund Project
Town of Cheektowaga, Erie County, New York
Site No. 915238

The Proposed Remedial Action Plan (PRAP) for the Former Doro Dry 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 26, 2014. The PRAP outlined the remedial measure proposed for the contaminated soil, groundwater and soil vapor at the Former Doro Dry 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 19, 2014, which included a presentation of the remedial investigation/feasibility study (RI/FS) for the Former Doro Dry 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. The public comment period for the PRAP ended on March 28, 2014.

There were no comments received.

APPENDIX B

Administrative Record

Administrative Record

Former Doro Dry Cleaners Site
State Superfund Project
Town of Cheektowaga, Erie County, New York
Site No. 915238

1. Proposed Remedial Action Plan for the Former Doro Dry Cleaners site, dated February 2014, prepared by the Department.

2. Phase I Environmental Assessment–3466 Genesee Street, Buffalo NY, dated December 2008, prepared by Fifty-Six Services, Inc.

3. Phase II Environmental Assessment-Former Doro Dry Cleaning Facility, 3460-3466 Genesee Street, Cheektowaga, NY, dated January 2010, prepared by MS Analytical, LLC.

4. Soil Vapor Intrusion Investigation Summary-Former Doro Dry Cleaners, 3460-3466 Genesee Street, Cheektowaga, NY, dated December 2011, prepared by Groundwater & Environmental Services, Inc.

5. Phase II Environmental Site Assessment-3470 Genesee Street, Cheektowaga, NY, dated January 2012, prepared by Matrix Environmental Technologies, Inc.

6. Final Remedial Investigation/Feasibility Study Report-Former Doro Cleaners, dated February 2014, prepared by CDM Smith.