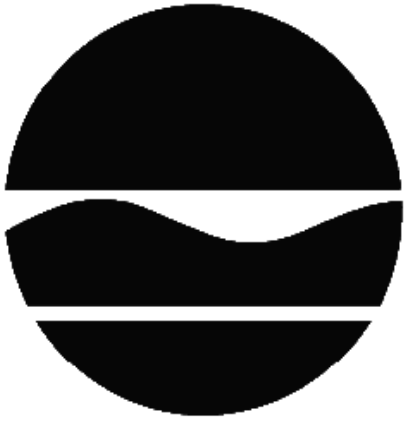
PROPOSED REMEDIAL ACTION PLAN

Gent Uniform Rental Service
Operable Unit Number 02: Off-Site Groundwater
State Superfund Project
Massapequa, Nassau County
Site No. 130056
May 2013



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

PROPOSED REMEDIAL ACTION PLAN

Gent Uniform Rental Service
Massapequa, Nassau County
Site No. 130056
May 2013

SECTION 1: SUMMARY AND PURPOSE OF THE PROPOSED PLAN

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

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

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

SECTION 2: CITIZEN PARTICIPATION

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

A public comment period has been set from:

5/1/2013 to 5/31/2013

A public meeting is scheduled for the following date:

Thursday, 5/16/2013 at 7:00 PM

Public meeting location:

The Massapequa Public Library, 40 Harbor Lane, Massapequa Park, NY 11762

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

Written comments may also be sent through to:

Stephen Malsan
NYS Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway
Albany, NY 12233
sgmalsan@gw.dec.state.ny.us

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

Receive Site Citizen Participation Information By Email

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

SECTION 3: SITE DESCRIPTION AND HISTORY

Location:
The Gent Uniform site is located at 5680 Merrick Road in Massapequa, Town of Oyster Bay, Nassau County. The site is bordered on the north by Merrick Road, to the east by Stone Boulevard, and south and west by commercial properties.

Site Features:
The site is approximately 0.3 acres in size and is developed with one, two-story masonry building and an asphalt paved parking and loading area.

Current Zoning and Land Use:
The site is currently used as a commercial laundry and uniform supply business, and is zoned GB - General Business use. The site is located in a mixed use commercial/residential area. Land use along Merrick Road is predominantly commercial and neighboring roads to the north and south are predominantly residential.

Operable Units:
The site was divided into two operable units. An operable unit represents a portion of a remedial program for a site that for technical or administrative reasons can be addressed separately to investigate, eliminate or mitigate a release, threat of release or exposure pathway resulting from the site contamination. Operable unit 1 (OU1) is the on-site source area. OU2 consists of the off-site groundwater and soil vapor contamination attributable to the site.

Past Use of the Site:
Dry cleaning operations were initiated on site in 1979 and the dry cleaning machine was removed from the site in 1998. Uniforms are no longer cleaned with solvents and are now cleaned with detergents only.

The Nassau County Department of Health began an investigation in this area in response to finding tetrachloroethene in the tap water at the commercial property directly to the south of the site at a level of 300,000 parts per billion (ppb). Investigations completed in 1989 and 1990 found high levels of tetrachloroethene in groundwater located in the southwest corner of the Gent property. Subsequent groundwater sampling conducted by Department in the fall of 1996 revealed high levels of tetrachloroethene in soils and shallow groundwater beneath the Gent building.

Historical discharges of tetrachloroethene (PCE) were discovered to have occurred as a result of a corroded fitting on a grease trap, which caused a release to the former sanitary system located beneath the western side of building. A removal effort was performed by the owner to remove soils surrounding the grease trap. An air sparge/soil vapor extraction system (AS/SVE) was installed not under the Department's oversite by the owner in 1997 in the vicinity of the former cesspool beneath the building and operated on a periodic basis.

The responsible party signed a Consent Order on December 31, 2001 and agreed to do a supplemental investigation to confirm the effectiveness of the on-site removal effort and to investigate the off-site groundwater. A Remedial Investigation required by the consent order found that soil samples were within applicable soil cleanup objectives (SCO)s, that on-site groundwater improved significantly (410 ppb of PCE), and that additional off-site groundwater sampling was necessary to determine nature and extent of contamination. The Record of Decision for on-site contamination was issued in March 2005 that required the restarting of the AS/SVE system as the primary component of the on-site remedy.

Site Geology and Hydrogeology:
The site is nearly completely covered with buildings or pavement. Subsurface soil is

unconsolidated glacial outwash deposits consisting of mostly sand and gravel. These glacial outwash deposits are approximately 80 feet thick with a clay confining layer encountered at approximately 80 feet.

Groundwater at the site was measured at 10 feet below ground surface (approximately 3 feet above mean sea level). Groundwater flows southwest, toward Carmans River, a saltwater river. The estimated average groundwater velocity is approximately 0.52 ft/d or 190 feet per year.

The closest downgradient surface water body to the site is Carmans River which empties into Great South Bay, a saltwater body south of Long Island. Great South Bay is located approximately one mile south of the site. Two saltwater rivers, Carmans River and Narraskatuck River, which both empty into the Great South Bay, are located approximately 900 feet to the west and 1,100 feet to the east, respectively from the site.

Operable Unit (OU) Number 02 is the subject of this document.

A Record of Decision was issued previously for OU 01.

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 residential use (which allows for restricted-residential use, commercial use and industrial use) as described in Part 375-1.8(g) are/is being evaluated in addition to an alternative which would allow for unrestricted use of the site.

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

SECTION 5: ENFORCEMENT STATUS

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

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

Gent Uniform Rental Service

The Department and Gent Uniform Rental Service entered into a Consent Order on December 31, 2001. The Order obligates the responsible parties to implement a full remedial program for the site. The Office of the New York State Attorney General is also negotiating an Order on Consent with Gent to address continued compliance with the OU1 Record of Decision through

the company's bankruptcy proceeding.

The PRPs for the site declined to implement a remedial program for off-site groundwater 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
- surface water
- soil
- soil vapor
- indoor air
- sub-slab vapor

6.1.1: Standards, Criteria, and Guidance (SCGs)

The remedy must conform to promulgated standards and criteria that are directly applicable or that are relevant and appropriate. The selection of a remedy must also take into consideration

guidance, as appropriate. Standards, Criteria and Guidance are hereafter called SCGs.

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

6.1.2: RI Results

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

TETRACHLOROETHYLENE (PCE) TRICHLOROETHENE (TCE)

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 02.

Nature and Extent of Contamination:

For OU1: On-Site Areas

Based upon investigations conducted to date, the primary contaminant of concern for OU1 is tetrachloroethene (PCE) and its associated degradation products.

Past site operations have contaminated soil, soil vapor and groundwater beneath the building with tetrachloroethene. Limited soil removal was done without Department oversight. On-site soil, soil vapor and groundwater have been treated by an air sparge/soil vapor extraction (AS/SVE) system. Based on the results of previous investigations, there is some limited on-site groundwater contamination remaining in the southwestern portion of the site. The ROD for OU1 requires continued operation of the AS/SVE system. The majority of the on-site contamination has been remediated.

Soil - All soil samples collected during the RI that was conducted after the AS/SVE system was operational were shown to be below applicable SCOs.

Soil Vapor - PCE was detected at a concentration of 6,800 micrograms per cubic meter (ug/m3) underneath the building.

Groundwater - PCE and its associated degradation products are found in groundwater at the site exceeding groundwater standards (typically 5 ppb). The highest detection of PCE in groundwater migrating off-site was at MW-1RR (921 ppb). Analysis of deeper groundwater samples taken from MW-3A (86' bgs) indicated PCE contamination in the groundwater at 146 ppb.

For OU2: Off-site Areas

The primary contaminant of concern for OU2 is PCE and its associated degradation products.

Soil - Soil contamination was not identified in OU2.

Groundwater - PCE and its associated degradation products are migrating in groundwater from the site towards Carmans River, a saltwater river, approximately 1,500 feet southwest of the site exceeding groundwater standards. PCE concentrations in OU2 groundwater diminish slightly from the highest detection at MW-1RR (921 ppb), to the next highest detection at MW-10 (760 ppb). Concentrations in groundwater continue to diminish as groundwater moves through the residential neighborhood southwest of the site (146 ppb at MW-14).

Surface Water - Surface water in the Carmans River was investigated during the RI. VOCs were not detected and no impact was identified.

Soil Vapor and Indoor Air - Based on an evaluation of soil vapor and indoor air samples collected from six residences within the OU2 VOC plume, no further action for these properties is required for soil vapor. Based on the data collected from an adjacent unoccupied commercial structure, no further action was recommended. However, additional sampling is recommended prior to the structure being re-occupied. In OU2, downgradient of the adjacent unoccupied

commercial structure, PCE is present in groundwater which is overlain by un-impacted groundwater, thus limiting the potential for contamination of soil vapor in OU2.

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. Since the site is covered by pavement and a building, contact with contaminated groundwater and residual contaminated soils is unlikely unless people dig below the ground surface. Volatile organic compounds in the contaminated groundwater or soil may move into the soil vapor (air spaces within the soil), which in turn, may move into overlying buildings and affect 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. There is a potential for soil vapor intrusion to impact indoor air quality in the on-site building and in the adjacent off-site commercial structure. However, it is expected that the continuous operation of an on-site Air Sparge/Soil Vapor Extraction system will prevent sub-slab soil vapors from entering the on-site building. The potential for soil vapor intrusion to impact indoor air quality does not represent a current concern in the off-site commercial structure because it is vacant.

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 contact with, or inhalation of volatiles, from contaminated groundwater.

RAOs for Environmental Protection

- Restore ground water aquifer to pre-disposal/pre-release conditions, to the extent practicable.

Soil Vapor

RAOs for Public Health Protection

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

SECTION 7: SUMMARY OF THE PROPOSED REMEDY

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

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

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

The proposed remedy is referred to as the Alternative 3a Permeable Reactive Barrier remedy.

The estimated present worth cost to implement the remedy is $548,000. The cost to construct the remedy is estimated to be $172,000 and the estimated average annual cost is $13,000.

The elements of the proposed remedy are as follows:

Based on the results of the investigations at the site and the evaluation presented here, the Department is proposing the installation of a permeable reactive barrier to treat chlorinated volatile organic compounds (CVOCs) in groundwater. The Department believes that this remedy is protective of human health and the environment and satisfies the remediation objectives.

1. Remedial Design

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

- Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;

- Reducing direct and indirect greenhouse gases and other emissions;

- Increasing energy efficiency and minimizing use of non-renewable energy;

- Conserving and efficiently managing resources and materials;

- Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste;

- Maximizing habitat value and creating habitat when possible;

- Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals; and

- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development.

2. Permeable Reactive Barrier

A permeable reactive barrier wall using in-situ chemical reduction (ISCR) will be implemented to treat chlorinated volatile organic compounds (CVOCs) in groundwater. A chemical reducing agent will be injected into the subsurface to destroy the contaminants along the public right of way south of the site. The injected material will form a permeable reactive barrier and remain active as groundwater passes through it. Additional injections may be required at intervals and will continue until the remedial objectives have been achieved, or until the Department determines that they are technically impracticable or not feasible. The method and depth of injection will be determined during the remedial design.

3. Site Management Plan

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

a) an 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 engineering controls remain in place and effective:

Engineering Controls: The permeable reactive barrier discussed in Paragraph 2 above.

This plan includes, but may not be limited to:

- provisions for the management and inspection of the identified engineering controls;

- maintaining site access controls and Department notification; and

- a provision for evaluation of the potential for soil vapor intrusion of the downgradient vacant commercial building should it become occupied including provision for implementing actions recommended to address exposures related to soil vapor intrusion; and

- the steps necessary for the periodic reviews and certification of the engineering controls.

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

- monitoring of groundwater to assess the performance and effectiveness of the remedy;
- sampling for vapor intrusion of the downgradient vacant commercial building should it become occupied;
- a schedule of monitoring and frequency of submittals to the Department.

Exhibit A

Nature and Extent of Contamination

This section describes the findings of the Remedial Investigation for all environmental media that were evaluated in OU2. 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 two categories; volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs). For comparison purposes, the SCGs are provided for each medium that allows for unrestricted use.

Waste/Source Areas

As described in the March 2005 ROD for OU1, waste/source materials were identified at the site and are impacting groundwater, soil and/or soil vapor on-site.

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. Wastes and source areas were identified at the site include:

Historical discharges of PCE were discovered to have occurred as a result of a corroded fitting on a grease trap, which caused a release to the former sanitary system located beneath the western side of building. A removal effort was performed by the owner to remove soils surrounding the grease trap. An air sparge/soil vapor extraction system (AS/SVE) was installed without Department oversight by the owner in 1997 in the vicinity of the former cesspool beneath the building.

The waste/source areas identified at the site are being addressed by the ROD for OU1.

Groundwater

Groundwater samples were collected from overburden monitoring wells during the OU2 investigation. The samples were collected to assess groundwater conditions off-site. The results indicate that contamination in shallow groundwater (to 80 feet below ground surface) exceeds the SCGs for volatile organic compounds. PCE and its associated degradation products are migrating in groundwater from the site towards Carmans River approximately 1,500 feet southwest of the site. PCE concentrations in OU2 groundwater diminish from the highest detection at MW-1RR (921 ppb), to the next highest detection at MW-10 (760 ppb) (Figure 3). Concentrations in groundwater continue to diminish as groundwater moves southwest of the site (146 ppb at MW-14). The PCE present in groundwater is overlain by un-impacted groundwater (Figure 4).

Table #1 - Groundwater

Detected Constituents	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)	Frequency Exceeding SCG
VOCs			
1,4-Dichlorobenzene	2.7 - 6.6	3	1 / 407
Acetone	3.3 - 110	50	1 / 407
Chlorobenzene	1.1 - 16.2	5	2 / 407
Chloroform	1.2 - 14	7	5 / 407
Cis-1,2-Dichloroethene	1.3 - 526	5	7 / 407
Ethyl benzene	1.1 - 34.1	5	2 / 407
Isopropylbenzene	6.6 - 6.6	5	1 / 407
Methyl Tertbutyl Ether	0.71 - 21.4	10	1 / 407
Methylene chloride	15 - 15	5	1 / 407
Tetrachloroethene	1 - 978	5	86 / 407
trans-1,2-Dichloroethene	1.2 - 6	5	1 / 407
Trichloroethene	0.99 - 237	5	18 / 407
Vinyl chloride	2.1 - 6.2	2	2 / 407
Xylenes, Total	1.1 - 36	5	2 / 407
Semi-volatile Organic Compounds			
Acenaphthene	58.3 - 61.6	20	2 / 22
Benzo(a)anthracene	7.8 - 7.8	0.002	1 / 22
Biphenyl	14.4 - 20.1	5	2 / 22
Bis(2-Ethylhexyl)phthalate	11.3 - 11.3	5	1 / 22
Chrysene	6.6 - 6.6	0.002	1 / 22
Naphthalene	34.4 - 52.1	10	2/ 22
Phenanthrene	48.9 - 80.2	50	1 / 22

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).

Based on the findings of the RI, the past disposal of hazardous waste has resulted in the contamination of groundwater. SVOCs and inorganics (metals and cyanide) were sampled and determined not to be contaminants of concern for the site. 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: tetrachloroethene (PCE) and trichloroethene (TCE).

Surface Water

Surface water in the Carmans River was investigated during the RI. Surface water samples were collected from two (2) locations at the presumed OU2 downgradient groundwater discharge area. Grab samples were collected at the time of low tide and submitted for VOC analysis. VOCs were not reported as being detected in either sample. While the plume discharges into the Carmans River, no impact was identified.

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

Soil Vapor

Sub-slab and indoor air samples were collected from six residential properties and one commercial structure to evaluate the potential for soil vapor intrusion to impact the indoor air of these structures. PCE concentrations in the residential indoor air samples ranged from 0.24 micrograms per cubic meter (ug/m3) to 1.0 ug/m3. These indoor air concentrations are within typical background ranges. PCE concentrations in the sub-slab soil vapor samples ranged from 0.69 ug/m3 to 2.9 ug/m3. TCE concentrations in the residential indoor air samples ranged from 0.19 ug/m3 to 0.27 ug/m3; these levels are well within the typical background range for this compound. TCE concentrations in the sub-slab soil vapor samples ranged from 0.54 ug/m3 to 1.6 ug/m3. Results of the residential structure sampling indicated that indoor air concentrations were generally within background ranges typically found in residential homes and do not represent a health concern. Based on an evaluation of the residential data, soil vapor intrusion is not affecting the indoor air quality of the off-site residential structures.

PCE was detected in the indoor air of an adjacent commercial structure at 20 ug/m3. This level of PCE is slightly above typical background levels found in a commercial setting. However, the PCE concentration is below the NYSDOH Air Guideline value of 100 ug/m3, which was developed to be protective of public health. PCE was detected at a concentration of 89 ug/m3 in the sub-slab soil vapor underneath the commercial structure. TCE was detected in the indoor air of the commercial structure at a concentration of 0.27 ug/m3 and in the sub-slab soil vapor sample at a concentration of 0.35 ug/m3. The levels of TCE detected do not represent a health concern. Although the commercial structure is currently vacant, additional sampling is recommended prior to the structure being re-occupied.

Based on the concentrations detected, and in comparison with the NYSDOH Soil Vapor Intrusion Guidance, and with the exception of the commercial structure that additional sampling is recommended if re-occupied, no site-related soil vapor contaminants of concern was identified during the RI for OU2. Should re-sampling of the commercial structure indicate a potential for soil vapor intrusion, appropriate actions shall be implemented. Therefore, no remedial alternatives need to be evaluated for soil vapor.

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.

Alternatives 2a and 2b: Enhanced Bioremediation

Enhanced anaerobic bioremediation involves the addition of an electron donor to the subsurface for use by local microorganisms capable of degrading volatile organic compounds found in soil and/or groundwater. The electron donor is introduced into the subsurface via injection points. The microorganisms (i.e., dechlorinating bacteria) use the electron donor, ultimately replacing chlorine atoms with hydrogen atoms in a process known as reductive dechlorination. Reductive dechlorination results in the step-by-step biological degradation of chlorinated contaminants such as tetrachloroethene (PCE) and its breakdown products. Several reductive dechlorination reagents are commercially available. For the purposes of this discussion, emulsified vegetable oil (EVO) will be the electron donor evaluated.

Alternatives 2a and 2b apply enhanced in-situ biodegradation reagents in limited areas of OU2 to treat contaminated groundwater within these areas. Alternative 2a includes injection along the southern fenced boundary of the Gent Uniform property, and Alternative 2b adds injection along Roosevelt Boulevard.

Pre-design field and laboratory testing are used to refine the full-scale injection design. However, the conceptual full-scale injection design includes injection of substrate at 4 (Alternative 2a) to 27 (Alternative 2b) injection locations arranged in barriers across the width of the contaminant plume, with injection points spaced 20 feet apart. Although this approach initially addresses a limited area of contamination, it is anticipated that the active ingredients added in the injection locations will travel downgradient with groundwater flow and accelerate degradation of OU2 contamination. Injection of the amendment will occur from the water table depth to between 25 to 30 feet deep, depending on the depth of the contamination plume at the point of injection.

Long-term monitoring will consist of the sampling and analysis of groundwater monitoring wells for VOCs in order to identify the effectiveness of the degradation alternative and identify if additional applications are required. Long term monitoring will be conducted on a periodic basis for the duration of the remedy and continuing until OU2 remediation objectives are met.

Alternative 2a - enhanced biodegradation, south of Gent property
Present Worth: *$1,671,000*
Capital Cost: *$590,000*
Annual Costs: *$36,000*

Alternative 2b - enhanced biodegradation, including Roosevelt Blvd
Present Worth: *$3,356,000*

Capital Cost:.....*$1,305,000*
Annual Costs:.....*$65,000*

Alternatives 3a and 3b: Permeable Reactive Barrier

These alternatives would include, a permeable reactive barrier utilizing in-situ chemical reduction (ISCR) to treat chlorinated volatile organic compounds (CVOCs) in groundwater. A chemical reducing agent will be injected into the subsurface to destroy the contaminants in groundwater. The injected material forms a permeable reactive barrier and remains active as groundwater passes through it. Additional injections may be required in estimated 10 year intervals and will continue until the remedial objectives have been achieved, or until the Department determines that they are technically impracticable or not feasible. The method and depth of injection will be determined during the remedial design.

Alternative 3a may utilize approximately 30 injection points in 2 offset lines (15 points per line) and Alternative 3b may incorporate an additional 210 injection points. These injection points will be installed along the fence line or along the public right of way south of the Gent Property in Alternative 3a. Additionally, Alternative 3b will include injection points in public right of ways downgradient, between the Gent property and Carmans Creek. Injection points will be located in the limits of the 100 ppb PCE isoconcentration. By destroying the VOCs in areas of highest concentration, the resulting segmented plume would be readily attenuated via degradation, dispersion, and adsorption processes within the plume. Long term monitoring will be conducted on a periodic basis for the duration of the remedy and continuing until OU2 remediation is complete.

Alternative 3a - permeable reactive barrier, south of Gent property
Present Worth:.....*$548,000*
Capital Cost:.....*$172,000*
Annual Costs:.....*$13,000*

Alternative 3b - permeable reactive barrier, including Roosevelt Blvd
Present Worth:.....*$1,391,000*
Capital Cost:.....*$616,000*
Annual Costs:.....*$26,000*

Alternative 4: In-situ Chemical Oxidation

In-situ chemical oxidation is a technology used to treat chlorinated compounds in 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 compounds such as carbon dioxide and water. Due to the likely necessity of multiple injection events, permanent injection wells will be used. Long-term monitoring will begin following the first injection and would occur on a periodic basis.

Alternative 4 (in-situ chemical oxidation) is eliminated due to implementability and cost concerns and will not be evaluated further.

Alternatives 5a and 5b: Groundwater Extraction and Treatment

Groundwater extraction and treatment would be used to remediate contaminated groundwater as part of these alternatives. A facility would be constructed to provide treatment of the extracted groundwater. Contaminated groundwater would be pumped to an aboveground treatment system using submersible pumps. An air stripper would treat the groundwater by transferring the contaminants from the groundwater to an air stream. Depending on the contaminant levels in the air stream, the air stream may be treated using activated carbon before being discharged to the atmosphere. Activated carbon may also be used to treat the water leaving the air stripper. It is assumed that the treated groundwater could be discharged to a publicly owned treatment facility via a sewer manhole in the near vicinity. Groundwater extraction wells will be installed across the width of the plume downgradient of the Gent Property to reduce migration of contaminated groundwater into OU2.

Alternative 5a consists of 4 overburden extraction wells and Alternative 5b consists of 14 overburden extraction wells spaced 40 feet apart, with the final design to be refined by pumping test results. These extraction wells will be installed along the south side of the Gent Property in Alternative 5a as well as along Roosevelt Blvd in Alternative 5b. The extraction wells will typically be installed to a depth of 30 feet below ground surface. Groundwater monitoring will be implemented to monitor the effectiveness of the remedy.

Alternative 5a - Groundwater extraction and treatment, south of Gent property
Present Worth: *$1,723,000*
Capital Cost: *$477,000*
Annual Costs: *$42,000*

Alternative 5b - Groundwater extraction and treatment, including Roosevelt Blvd
Present Worth: *$2,460,000*
Capital Cost: *$814,000*
Annual Costs: *$55,000*

Exhibit C

Remedial Alternative Costs

Remedial Alternative	Capital Cost ($)	Annual Costs ($)	Total Present Worth ($)
No Action	0	0	0
Alternative 2a - enhanced biodegradation, south of Gent property	590,000	36,000	1,671,000
Alternative 2b - enhanced biodegradation, including Roosevelt Blvd	1,305,000	65,000	3,256,000
Alternative 3a - permeable reactive barrier, south of Gent property	172,000	13,000	548,000
Alternative 3b - permeable reactive barrier, including Major Rd, Carman Blvd and Roosevelt Blvd	616,000	26,000	1,391,000
Alternative 5a - Groundwater extraction and treatment, south of Gent property	477,000	42,000	1,723,000
Alternative 5b - Groundwater extraction and treatment, including Roosevelt Blvd	814,000	55,000	2,460,000

Exhibit D

SUMMARY OF THE PROPOSED REMEDY

The Department is proposing Alternative 3a, Permeable Reactive Barrier as the remedy for this site. Alternative 3a would achieve the remediation goals for the site by injecting a chemical reducing agent into the subsurface to destroy the contaminants in groundwater. The injected material forms a permeable reactive barrier and remains active as groundwater passes through it. The elements of this remedy are described in Section 7. The proposed remedy is depicted in Figure 5.

Basis for Selection

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

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

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

The proposed remedy Alternative 3a would satisfy this criterion by installing a permeable reactive barrier utilizing in-situ chemical reduction (ISCR) to treat chlorinated volatile organic compounds (CVOCs) in groundwater. A permeable reactive barrier is a reliable technology that requires little maintenance and will provide consistent, substantial reduction in contamination in the groundwater plume. Alternative 1 would not include actions to address contaminated groundwater in OU2. Alternatives 2a, 2b, 3a, 3b, 5a and 5b would all satisfy SCGs in the long term for groundwater.

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

Alternative 1 would not include actions to address contaminated groundwater in OU2. Alternatives 2a, 2b, 3a, 3b, 5a and 5b would not meet chemical specific SCGs in the short term, but by passive in-situ or active ex-situ treatment they would satisfy SCGs in the long term for groundwater. By actively pumping groundwater, Alternative 5b may have the greatest potential for immediate reduction of contamination within OU2.

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

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

Alternative 1 would not include actions to address contaminated groundwater in OU2. While Alternative 1 may meet SCGs due to natural attenuation processes, this would not be expected in the near future due to the magnitude of contamination at the Gent Property and the extent of the existing plume.

Alternatives 2, 3, and 5 would all achieve groundwater SCGs in the long-term. Alternative 5 requires constant operation and monitoring and Alternative 2 requires regular injection of biostimulation agent on a three to five year interval to maintain SCGs and plume isolation from contamination on the Gent Property. Alternative 3 would potentially require infrequent cleaning, recharge, or replacement of barrier material, on the order of once every 10 years, but otherwise requires no operation or maintenance to maintain SCGs and plume isolation from contamination on the Gent Property.

Alternative 5 may have the greatest potential for immediate reduction of contamination within OU2, but requires continuous operation and maintenance. Alternatives 2 and 3 both achieve SCGs and require less monitoring and maintenance than Alternative 5.

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.

Alternative 1 would not result in the reduction of toxicity, mobility, or volume of groundwater contamination through treatment. Alternative 5 would result in the reduction of toxicity, mobility, and volume of groundwater contamination in OU2 through extraction and ex-situ treatment of VOC contaminated groundwater in OU2. Alternatives 2 and 3 would result in the reduction of toxicity, mobility, and volume of groundwater contamination through in-situ treatment of groundwater. None of these alternatives would reduce the toxicity, mobility, or volume of contaminated water in the OU2 plume downgradient of the installation location of the remedy; the downgradient contaminants are expected to diffuse or dilute to concentrations less than SCGs and eventually discharge beyond OU2.

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.

Because no actions would be taken, Alternative 1 would not result in short-term adverse impacts and risks to the community, site workers, and the environment. Alternatives 2, 3, and 5 include remedial activities which would result in potential short-term risks to the community, site workers, and the environment. However, the risks could be addressed through: coordination and communication with the affected property owner(s); erosion, sedimentation and dust control where applicable; and preparation and implementation of a comprehensive contractor health and safety plan. It is estimated that these alternatives could be fully implemented in less than one year.

Alternatives 2 and 3 consist of low impact construction that would least disturb OU2 and therefore present the least potential short-term adverse impacts and risks to the community, site workers, and the environment. Construction activities consist primarily of drilling, installation of monitoring and injection wells, and in-situ treatment via injection. Alternative 5 includes installation of a treatment system and associated piping and utilities and therefore presents a greater potential short-term risk.

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.

No actions would be conducted under Alternative 1, therefore there are no technical difficulties associated with this alternative. Alternative 3 is more easily implementable as it only requires installation of injection points, and monitoring of the treatment can be performed through the existing monitor well network. Alternative 2 is more difficult to implementable as it requires re-injections more often. Alternative 5 requires significant infrastructure and operation and maintenance (O&M), and is technically and administratively more difficult to implement.

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. The most cost effective alternative is Alternative 3a. In-situ treatment treats the groundwater in place with only the installation of injection points. Alternative 3b is more than twice as expensive as 3a due to a larger number of injection points. Alternatives 2a and 2b are even more expensive that Alternative 3b, due to the number of injection points and the greater frequency of re-applications. Alternatives 5a and 5b require infrastructure and long term O&M, which extends the costs over many years.

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.

Soils off site of the Gent property have not been impacted and no soil remedy is required. The current and reasonably anticipated future land use of OU2 is for commercial and/or residential purposes. All alternatives are compatible with current land use and with reasonable anticipated future land use.

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

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

Alternative 3a is being proposed because, as described above, it satisfies the threshold criteria and provides the best balance of the balancing criterion.

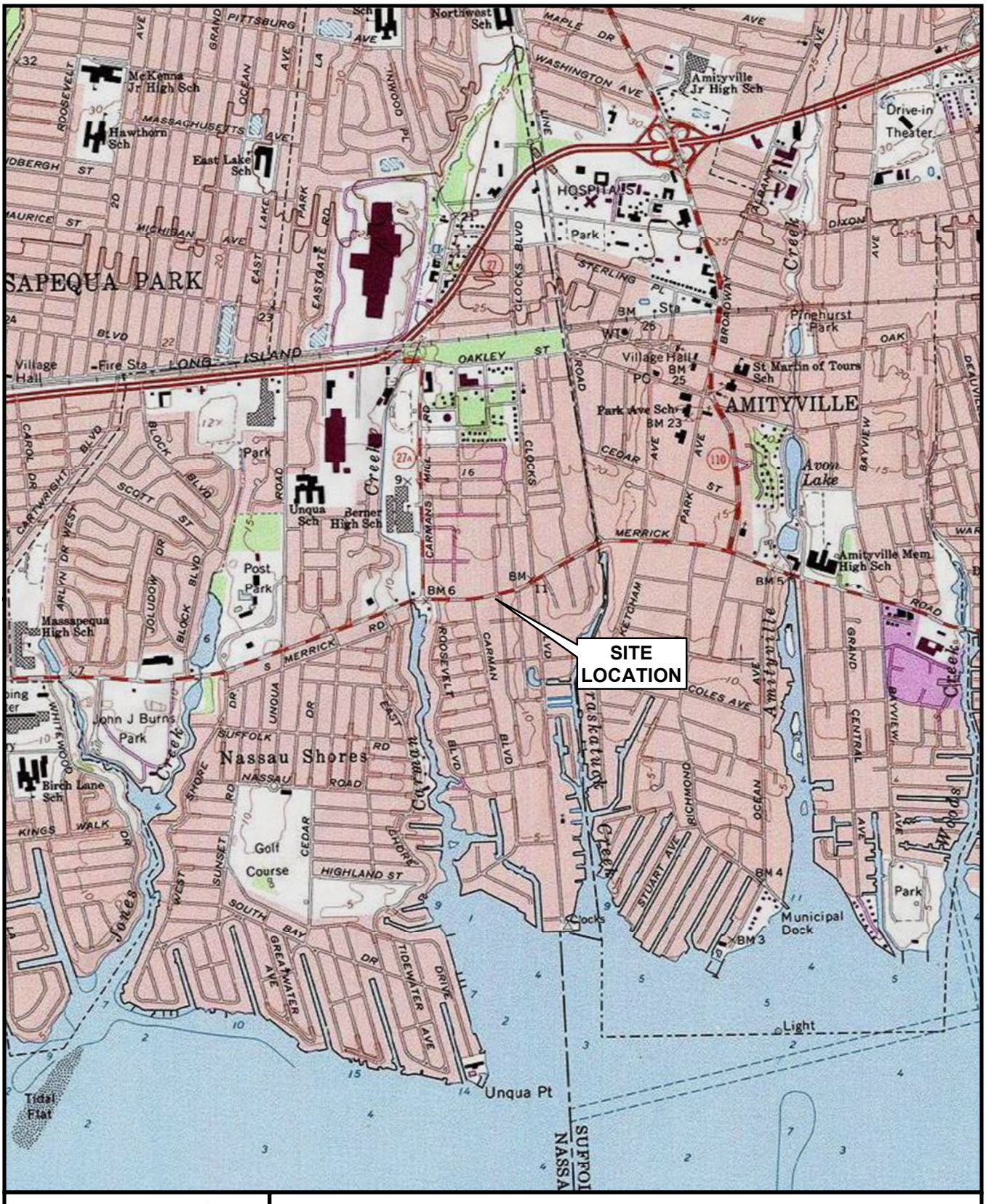


Figure 1

Site Location Map

Gent Uniform

Town of Oyster Bay, Nassau County

Site No. 130056

DEPARTMENT OF ENVIRONMENTAL CONSERVATION • NEW YORK STATE •

Figure 2

Site Map

Gent Uniform

Town of Oyster Bay, Nassau County

Site No. 130056

DEPARTMENT OF ENVIRONMENTAL CONSERVATION • NEW YORK STATE •

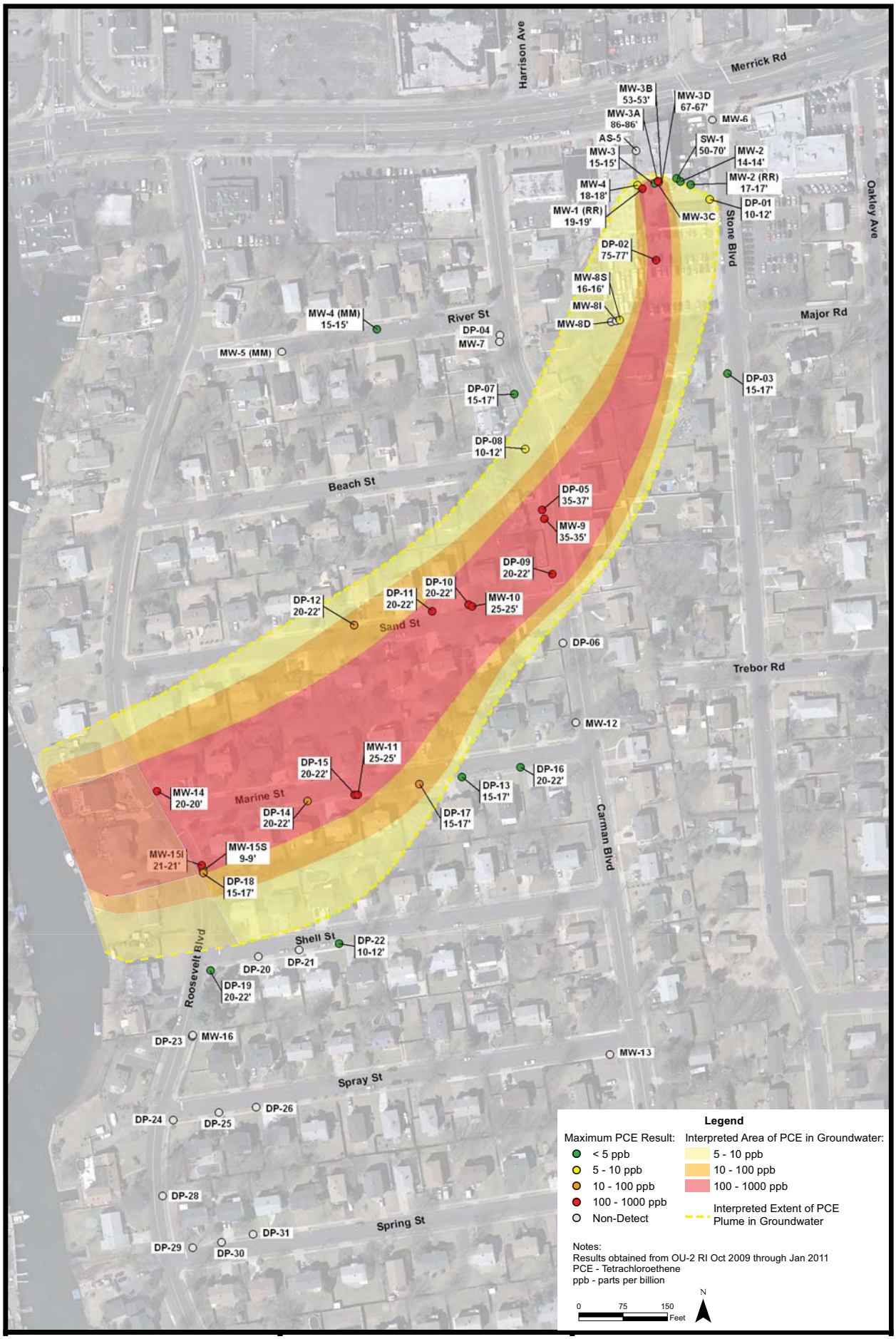


Figure 3
Gent Uniform, Town of Oyster Bay, Nassau County Site No.130056

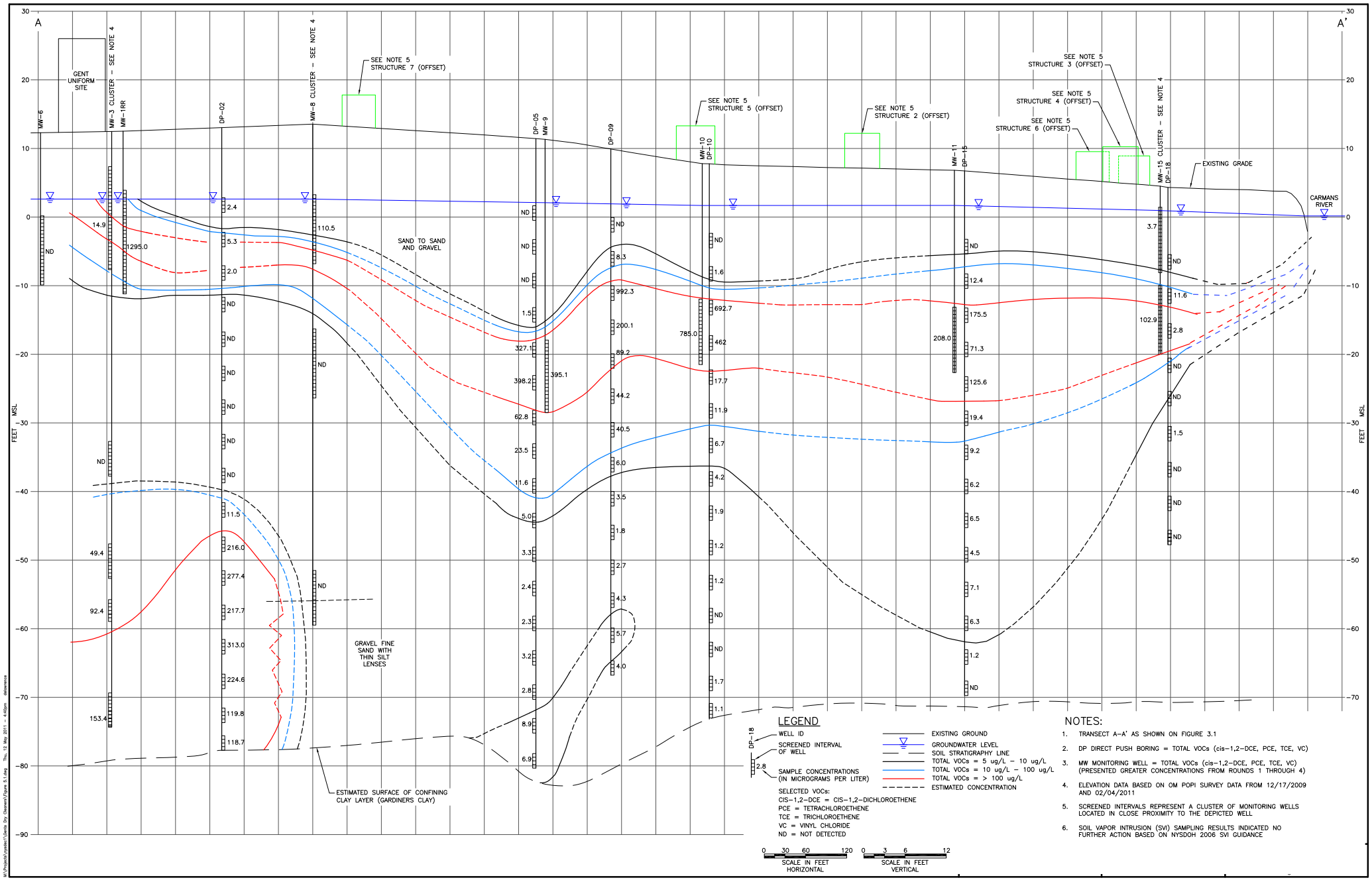


Figure 4

Gent Uniform, Town of Oyster Bay, Nassau County Site No. 130056

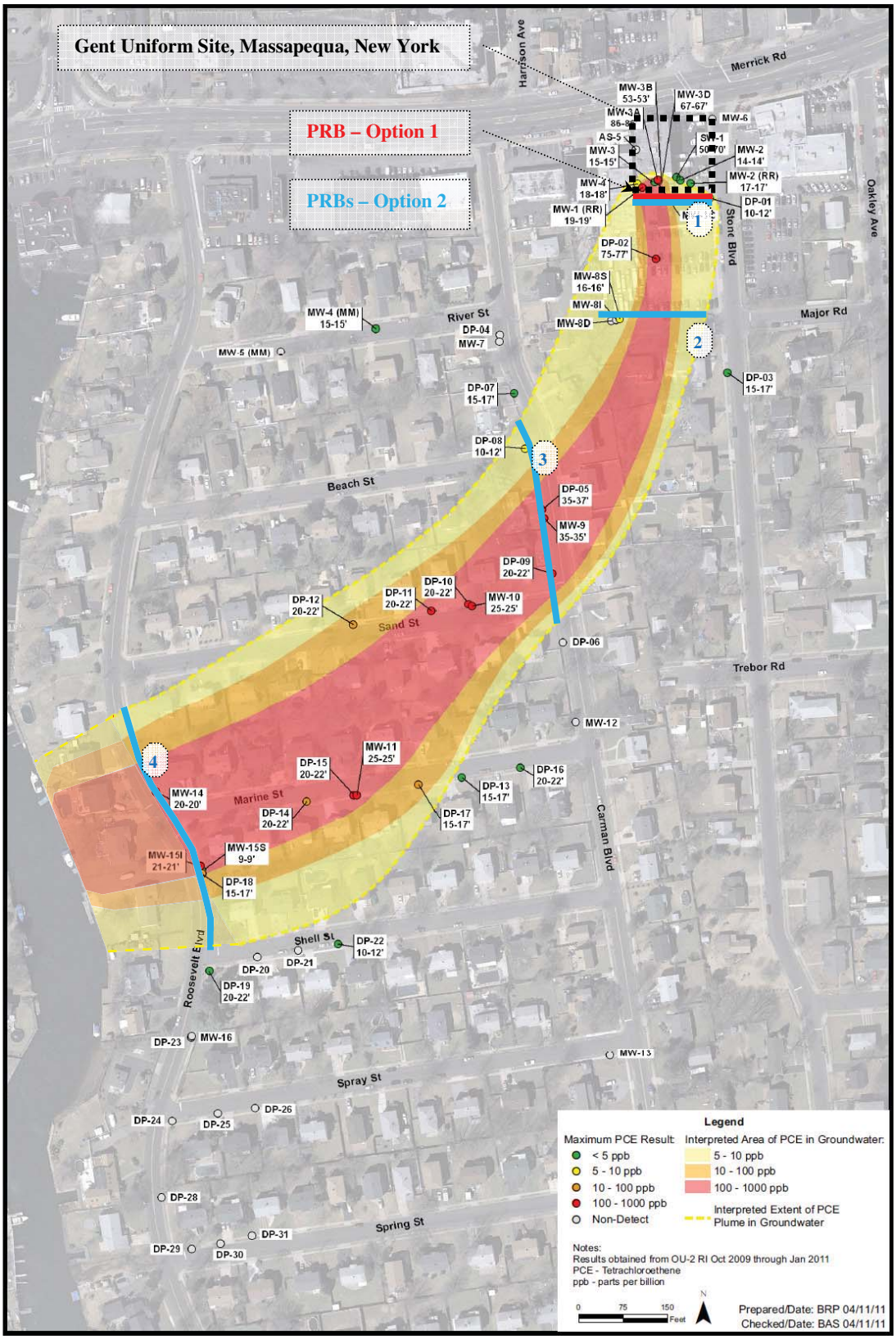


Figure 5
Gent Uniform, Town of Oyster Bay, Nassau County
Site No. 130056