PROPOSED REMEDIAL ACTION PLAN

Smart Set Cleaners
State Superfund Project
Oceanside, Nassau County
Site No. 130194
February 2015

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

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SECTION 1: SUMMARY AND PURPOSE OF THE PROPOSED PLAN

The New York State Department of Environmental Conservation (the Department), in consultation with the New York State Department of Health (NYSDOH), is proposing a remedy for the above referenced site. The disposal of 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:

Oceanside Library
Attn: Marcia Ratcliff
30 Davison Ave
Oceanside, NY 11572
Phone: (516) 766-2360

A public comment period has been set from:

to February 27, 2015 until March 30, 2015

A public meeting is scheduled for the following date:

3/10/2015 at 7:00 PM

Public meeting location:

Oceanside Middle School Auditorium

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 to:

Melissa Sweet
NYS Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway
Albany, NY 12233
melissa.sweet@dec.ny.gov

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 Smart Set Cleaners Site is located in a mixed commercial and residential area at

16 Atlantic Ave in Oceanside, NY in Nassau County. It is one tenant unit within a small shopping center and sidewalk behind the tenant unit. The strip mall is bounded by Smith St to the north, Atlantic Ave to the south, Lincoln Ave to the west and Long Beach Rd to the east.

Site Features: The Site is one tenant unit with a basement and occupies approximately 0.090 acres. It is located in a small strip mall shopping center. The shopping center property is approximately 3.9 acres and is covered in building or pavement. The property has 2 buildings, one with 15 tenant units including the site and the other with 2 tenant units. The strip mall was built in 1955.

Current Zoning/Use(s): The site is zoned commercial. It is currently an active nail salon and spa. The surrounding building is commercial space leased for commercial purposes. The nearest residential area is 0.1 mile to the east.

Past Use of the Site: The dates of operation of the dry cleaner are approximately 1956 through 2005. A routine inspection of the Smart Set Cleaners facility by the Nassau County Department of Health (NCDOH) in the mid 1990's revealed the existence of interior floor drains. These drains were considered injection wells by the USEPA. In 1998, a groundwater sample was collected from a floor drain that showed the presence of the dry cleaning solvent tetrachloroethylene (PCE). The NCDOH in conjunction with the USEPA pursued the investigation of the source of groundwater contamination. In 2001, the EPA oversaw removal of contaminated soils from the rear of the facility by the owner. The owner's consultant, with oversight by the EPA proceeded with a subsurface investigation that was completed in May 2001. Based on the 2001 investigation, a Soil Vapor Extraction/Air Sparge (SVE/AS) system was installed by the owner and started in 2002. That system is still in operation and reports are submitted quarterly on its performance. This site was added to the NYS Registry of Inactive Hazardous Waste Disposal Sites in November 2008 with USEPA maintaining the lead role in regulating the owner. The lead was transferred to the Department in August 2009 at the request of USEPA.

Site Geology and Hydrogeology: Groundwater flow is to the west-southwest, towards the nearby Powell Creek located approximately 0.4 miles from the site. No public or private wells have been identified downgradient of the site. Depth to groundwater is approximately 10 ft below ground surface.
There appears to be no clear delineation between the Upper Glacial and Magothy aquifers. The geology of the area consists predominantly of thick unconsolidated sediments.

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) 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:

Great Lincoln, LLC

The PRPs for the site declined to implement a remedial program when requested by the Department. After the remedy is selected, the PRPs will again be contacted to assume responsibility for the remedial program. If an agreement cannot be reached with the PRPs, the Department will evaluate the site for further action under the State Superfund. The PRPs are subject to legal actions by the state for recovery of all response costs the state has incurred.

SECTION 6: SITE CONTAMINATION

6.1: Summary of the Remedial Investigation

A Remedial Investigation (RI) has been conducted. The purpose of the RI was to define the nature and extent of any contamination resulting from previous activities at the site. The field activities and findings of the investigation are described in the RI Report.

The following general activities are conducted during an RI:

- Research of historical information,
- Geophysical survey to determine the lateral extent of wastes,
- Test pits, soil borings, and monitoring well installations,
- Sampling of waste, surface and subsurface soils, groundwater, and soil vapor,
- Sampling of surface water and sediment,
- Ecological and Human Health Exposure Assessments.

The analytical data collected on this site includes data for:

- groundwater
- 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 at this site is/are:

TETRACHLOROETHYLENE (PCE)	TRICHLOROETHENE (TCE)
Dichloroethene (cis-1,2-)	1,2-DICHLOROETHANE

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

- groundwater
- surface water
- soil
- soil vapor intrusion

6.2: Interim Remedial Measures

An interim remedial measure (IRM) is conducted at a site when a source of contamination or exposure pathway can be effectively addressed before issuance of the Record of Decision.

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

Chemical Oxidation

In 2010 the owner undertook In-situ Chemical Oxidation injection program in the subsurface below the basement of the Former Smart Set Cleaners to treat groundwater contamination on-site. Chemical oxidant was injected through six injection wells located in the basement of the former Smart Set Cleaners. This was highly effective and concentrations of PCE, TCE, and cis-1,2-DCE dropped by an order of magnitude in groundwater from 1900 ppb of PCE to 200 ppb.

6.3: Summary of Environmental Assessment

This section summarizes the assessment of existing and potential future environmental impacts presented by the site. Environmental impacts may include existing and potential future exposure pathways to fish and wildlife receptors, wetlands, groundwater resources, and surface water.

Based upon the resources and pathways identified and the toxicity of the contaminants of ecological concern at this site, a Fish and Wildlife Resources Impact Analysis (FWRIA) was deemed not necessary for OU 01.

Nature and Extent of Contamination: Based upon prior investigations only volatile organic compounds were sampled fro as part of the Remedial Investigation and the primary constituent of concern is tetrachloroethene (PCE) and its breakdown products, trichloroethene (TCE) and cis-1,2-dichlorothene (DCE).

Groundwater: PCE and its daughter compounds are found in the groundwater on the property and off-site to the west of the site. The latest sampling of groundwater on the property(analyzed for VOCs) found PCE at approximately 56 parts per billion (ppb) which exceeds the groundwater standard (5 ppb).

PCE and its breakdown products TCE and DCE have been detected up to 800 yards to the west of the site. PCE has been observed in the off-site groundwater at a maximum concentration of 4100 ppb, approximately 87 ft below ground surface near the intersection of Lincoln Avenue and Atlantic Avenue.

During the Remedial Investigation, the off-site plume was investigated and sampled only for VOCs, compounds related to dry-cleaning activities. This investigation found a maximum of 5105 ppb of chlorinated VOCs located approximately 1550 ft to the west of the site.

Soil: In January 2001, the PRP excavated eight cubic yards of contaminated soil from behind the building, at the source location behind Smart Set Cleaners. Soil samples were collected from the sides and bottom of the excavation when the excavation was finished, and the soil sample collected from the east side of the excavation contained PCE at 2.9 parts per million (ppm) and the bottom contained PCE at 8.5 ppm. The excavation was backfilled with clean fill and covered with a cement sidewalk which acts as a cover for the site.

Soil samples were collected from beneth the floor slab of the basements of the stores adjacent to Smart Set Cleaners, and residual contamination was found beneath those stores to the east and

west. In the east store's basement PCE contamination was found to be 0.280 ppm and in the store to the west's basement contamination was found to be 0.011 ppm.

Soil Samples were also collected from the leeching pools and cesspools and results were below unrestricted standard for all contaminants.

A soil sample was collected from the beneath the sidewalk (0.5-1 ft bgs) during the RI. It was analyzed for VOCs, SVOCs, pesticides, PCBs, and metals and no contamination was found in this sample. However, there is still the potential for suspected inaccessible source areas beneath the existing building.

Soil Vapor Intrusion: In early 2001, as part of the subsurface investigation, sub-slab vapor samples were collected from all vacant stores in the strip mall. None of the vapor samples indicated the presence of chlorinated solvents above detection limits.

During the RI, sub-slab vapor and indoor air samples were collected from the on-site tenant unit and off-site buildings in the strip mall, downgradient of the site. PCE was found to exceed the mitigation guidance values in most of the tenant units within the same building as Smart Set Cleaners. The on-site tenant unit did not exceed monitoring or mitigation guidance values due to the presence of the SVE system on-site.
Soil vapor samples were collected from near the property boundaries to the north and west of the property to evaluate potential for soil vapor intrusion off-site. These sampling points showed there was the potential for soil vapor intrusion in the nearest buildings.

Surface Water: During the RI, surface water was sampled from five locations upstream to downstream of the off-site plume in Powell Creek which is located 2100 ft to the west of the site. Samples upstream of the plume intersection with the creek exceeded the standard for PCE (1 ppb) with 4 ppb. Samples collected in the creek near the plume exhibited the same PCE concentration as upstream, while samples collected downstream of the plume were non-detect.

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 site is covered with buildings and pavement. People are not coming into contact with 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 soil and/or groundwater may move into the soil vapor (air spaces within the soil), which in turn may move into overlying buildings and affect the indoor air quality. This process, which is similar to the movement of radon gas from the subsurface into the indoor air of buildings, is referred to as soil vapor intrusion. A soil vapor extraction system (a system that removes soil vapor from beneath the building) has been installed on-site and prevents the indoor air quality from being affected via soil vapor intrusion in the on-site tenant unit and the two adjacent off-site tenant units immediately east and west of the site. Sampling indicates

the potential for soil vapor intrusion to impact indoor air quality of the rest of the tenant spaces in the strip mall and an adjacent building. Soil vapor intrusion is a concern for additional off-site buildings, however access was not granted to evaluate the potential for soil vapor intrusion to affect the indoor air of these structures

6.5: Summary of the Remediation Objectives

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

The remedial action objectives for this site are:

Groundwater

RAOs for Public Health Protection

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

RAOs for Environmental Protection

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

Soil

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.

Surface Water

RAOs for Environmental Protection

- Restore surface water to ambient water quality criteria for the contaminant of concern.

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 Groundwater Hot Zone In-Situ Chemical Oxidation remedy.

The estimated present worth cost to implement the remedy is $3,779,000. The cost to construct the remedy is estimated to be $2,332,000 and the estimated average annual cost is $63,000.

The elements of the proposed remedy are as follows:

1. Remedial Design

A remedial design program will be implemented for the area shown in Figure 2 to provide the details necessary for the construction, operation, optimization, maintenance, and monitoring of the remedial program. Green remediation principles and techniques will be implemented to the extent feasible in the design, implementation, and site management of the remedy as per DER-31. The major green remediation components are as follows;

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

2. Groundwater Hot zone In-Situ Chemical Oxidation

In-situ chemical oxidation (ISCO) will be implemented to treat chlorinated volatile organic compounds (CVOCs) over 1000 ppb in the groundwater plume. A chemical oxidant will be injected into the subsurface to destroy the contaminants in an approximately 25,000-square foot area located west of the site where drycleaner-related compounds were elevated in the groundwater above 1000 ppb via injection wells as shown on Figure 3. The details of injections will be determined during the remedial design. Prior to the full implementation of this technology, laboratory and on-site pilot scale studies will be conducted to more clearly define design parameters.

3. Continued operation and maintenance of the existing Soil Vapor Extraction system to continue treatment of soil in the source area.

4. On-Site Cover System

A site cover currently exists and will be maintained to allow for commercial use of the site. Any site redevelopment will maintain a site cover, which may consist either of the structures such as buildings, pavement, sidewalks comprising the site development or a soil cover in areas where the upper one foot of exposed surface soil will exceed the applicable soil cleanup objectives (SCOs). Where a soil cover is required it will be a minimum of one foot of soil, meeting the SCOs for cover material as set forth in 6 NYCRR Part 375-6.7(d) for commercial use. The soil cover will be placed over a demarcation layer, with the upper six inches of the soil of sufficient quality to maintain a vegetation layer. Any fill material brought to the site will meet the requirements for the identified site use as set forth in 6 NYCRR Part 375-6.7(d).

5. Soil Vapor Intrusion Mitigation

A sub-slab depressurization system (SSDS) will be installed within each of the three 100 ft long by 80 ft wide buildings consisting of a fan-powered vent and piping system to draw vapors from the soil beneath the building slabs and emit the vapors to the atmosphere.

The existing soil vapor extraction system (Element #3) will also function in place of the SSDS, as a vapor mitigation system, within the established radius of influence of that system.

6. Institutional Control

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

- requires the remedial party or site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3);
- allows the use and development of the controlled property for commercial and industrial uses as defined by Part 375-1.8(g), although land use is subject to local zoning laws;
- restricts the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or County DOH;
- requires compliance with the Department approved Site Management Plan.

7. Site Management Plan

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

a. an Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to ensure the following institutional and/or engineering controls remain in place and effective:

Institutional Controls: The Environmental Easement discussed in Paragraph 6 above.

Engineering Controls: The groundwater hot zone ISCO program discussed in paragraph 2, Soil vapor extraction system discussed in paragraph 3 above, the soil cover discussed in Paragraph 4, and the sub-slab depressurization system discussed in Paragraph 5.
This plan includes, but may not be limited to:

- an Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination;
- descriptions of the provisions of the environmental easement including any land use, and groundwater use restrictions;
- a provision for investigation beneath the existing on-site building and off-site buildings if the buildings are demolished to determine if further remedial action is warranted;
- a provision for evaluation of the potential for soil vapor intrusion for any buildings developed on the affected off-site areas, 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.
- Soil vapor intrusion sampling (sub-slab vapor and indoor air) was offered to property owners of two off-site buildings in 2013/14 by the NYSDOH. The owners did not grant an access. Should the owners request to have their property sampled in the future, the NYSDEC, in consultation with the NYSDOH, shall determine whether soil vapor intrusion sampling is still appropriate. If appropriate, soil vapor intrusion sampling will be completed and actions recommended to address exposures related to soil vapor intrusion will be implemented.

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 and soil vapor intrusion to assess the performance and effectiveness of the remedy;
- a schedule of monitoring and frequency of submittals to the Department;
- monitoring for vapor intrusion for any buildings developed on the affected off-site areas, as may be required by the Institutional and Engineering Control Plan discussed above, as well as the separate building on the property.

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

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

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 categories; volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides/ polychlorinated biphenyls (PCBs), and inorganics (metals and cyanide). 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, surface water, 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 where substantial quantities of contaminants are found which can migrate and release significant levels of contaminants to another environmental medium.

Prior to this Remedial Investigation, (2000-2002) the Smart Set Cleaners suspected source areas, a window well and Underground Injection Control (UIC) wells were investigated and found to have high concentrations of tetrachloroethene (PCE), trichloroethene (TCE), and cis-1,2-dichloroethene (DCE) in the soil and groundwater. An excavation of the window well yielded eight cubic yards of dense non-aqueous phase liquid- (DNAPL) contaminated soils which was disposed of properly. The endpoint sample exhibited 8.5 ppm PCE, however the excavation could not continue further due to the groundwater table being reached.

A Soil Vapor Extraction/Air Sparge (SVE/AS) system was installed in 2002 to address contaminated groundwater and soils on-site from the UIC wells and former window well soils. In 2010 an In-situ Chemical Oxidation (ISCO) injection was completed to address the continuing high levels of contamination seen in the on-property groundwater. This was highly effective and concentrations of PCE, TCE, and cis-1,2-DCE dropped by an order of magnitude in groundwater. The air sparge system was shutdown at that time. As of now, the SVE system continues to operate to treat the soil contamination. The PCE in the groundwater in the source area has decreased from a high of 2,800 ppb to 3.4 ppb.

The waste/source areas identified at the site were addressed by the IRM(s) described in Section 6.2 and the Past Sses section of the Site Description.

Groundwater

Groundwater was analyzed for volatile organic compounds (VOCs). The primary volatile organic compound on and off site is tetrachloroethene (PCE), a dry-cleaning chemical and its daughter compounds trichloroethene (TCE) and cis-1,2-Dichloroethene (DCE).

As part of the Remedial Investigation, groundwater samples were collected to assess groundwater conditions off-site at shallow, intermediate, and deep depths within the aquifer. Monitoring wells and groundwater profile samples were installed throughout the investigation area (Figure 2) to determine the extents of the PCE plume both areally and vertically.

The results indicate that in the shallow, 0 to 40 ft below ground surface (bgs) groundwater contamination is traveling on a straight path to the west towards Powell Creek, but tends to decrease the further it travels from the site. The highest concentration of PCE was exhibited at 600 ppb at CMT-2 at the 35.4 ft to 38.4ft bgs range. Groundwater collected from the shallow zone also contained TCE and DCE above the NYS Standard of 5 ppb in the location closest to the site. Groundwater elevations collected at this shallow range indicated that groundwater and contamination are diving downward.

The highest concentrations of PCE collected in the intermediate zone (between 40 and 75 ft bgs) was observed at GWP-05 at the 71 to 75 ft range with 4100 ppb. GWP-05 exhibited the next greatest concentrations of PCE with 1000 ppb at the 56 to 60ft bgs and 780 ppb at the 41 to 45. This is the same location that exhibited the highest concentration for PCE in the shallow zone. Groundwater collected from the intermediate zone also contained TCE and DCE above the standard with the highest being 570 ppb and 430 ppb respectively. Groundwater elevations in the intermediate zone indicate that the contamination in the groundwater is diving downward.

The highest concentration of PCE collected in the deep zone (greater than 75 ft bgs) was observed at GWP-5 at the 83 to 87 ft bgs range with 610 ppb. The next greatest concentration of PCE with 270 ppb at 101 to 105 ft bgs is GWP-07 which is southwest of the site. Groundwater collected from the deep zone also contained TCE and DCE above the standard with 110 ppb and 85 ppb respectively. Groundwater elevation in this zone indicate that the contamination in the groundwater is not traveling downward, but staying relatively flat.

The areal extent of the contamination can be seen in Figure 3 and the vertical extent can be seen in Figure 4. The flow of groundwater in the region can be seen in Figure 5.

Table 1 - Groundwater

Detected Constituents	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)	Frequency Exceeding SCG
VOCs			
PCE	ND – 4100	5 ppb	38/102
TCE	ND - 570	5 ppb	23/102
DCE	ND – 430	5 ppb	18/102
Tert-Butyl Methyl Ether	ND - 200	10 ppb	15/102
Acetone	ND - 87	50 ppb	1/102
1,2-Dichloroethane	ND - 190	0.6 ppb	13/102
chloroform	ND - 8	7 ppb	1/102

a - ppb: parts per billion, which is equivalent to micrograms per liter, ug/L, in water.

b- SCG: Standard Criteria or Guidance - Ambient Water Quality Standards and Guidance Values (TOGs 1.1.1), 6 NYCRR Part 703, Surface water and Groundwater Quality Standards, and Part 5 of the New York State Sanitary Code (10 NYCRR Part 5).

The primary contaminants are PCE, TCE, and DCE associated with the operation of the former dry-cleaners. The 1,2-DCA although not a contaminant associated with the breakdown of PCE, will be remediated by the proposed treatment system. The MTBE found in the monitoring wells and intermediate borings was also seen in the upgradient monitoring well and are considered to represent site background conditions. Therefore the MTBE found in the groundwater is not considered a site specific contaminant of concern.

Based on the findings of the RI, the past disposal of hazardous waste has resulted in the contamination of groundwater. The site contaminants that are considered to be the primary contaminants of concern which will drive the remediation of groundwater to be addressed by the remedy selection process are: PCE, TCE, DCE, and 1,2-DCA.

Soil

During previous investigation, soil samples were collected from the basements of the tenant unit to the east and to the west. The soil samples collected beneath the basement slab of the tenant unit to the east exhibited a PCE concentration of 0.280 ppm. The maximum PCE concentration in the tenant unit to the west was 0.011 ppm of PCE.

During the Remedial Investigation, a subsurface soil sample was collected from behind the former Smart Set Cleaners on the north side of the building beneath the sidewalk between 0 and 1 ft bgs. This is near the location of the source area. It was analyzed for VOCs, SVOCs, metals, PCBs, and pesticides. The concentrations of some analytes were above non-detect however none exceeded commercial or unrestricted soil cleanup objectives (SCOs). However, some contaminated soil may still be beneath the buildings or pavement in locations that are not reachable for characterization.

No surficial soil samples were collected at the site due to there being no surface soil exposed.

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					
Tetrachloroethene	0.014	1.300	0/1	150	0/1
Acetone	0.005	0.050	0/1	500	0/1
Methylene chloride	0.002	NA	0/1	NA	0/1
SVOCs					
No Exceedances					
Inorganics					
No Exceedances					
Pesticides/PCBs					

Detected Constituents	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b] (ppm)	Frequency Exceeding Unrestricted SCG	Restricted Use SCG[c] (ppm)	Frequency Exceeding Restricted SCG
No Exceedances					

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 Public Health for Use, unless otherwise noted.
d - SCG: Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Groundwater

Soil contamination identified during the RI was addressed during the IRM described in Section 6.2 and the historical uses section of the Site Description.

Surface Water

Surface water samples were collected in two rounds of sampling events. PCE, TCE, and DCE were evaluated at five locations along the course of the Powell Creek. PCE exceeded the surface water standard (1 ppb) in all but two samples. During the first sampling event three samples were collected with the two samples in the area of the plume being the greatest (5 ppb PCE) concentrations and decreasing downstream. During the second sampling event five samples were collected. The sample upstream of the plume exceeded the standard (with 3 ppb). The PCE concentration increased in the area of the plume but then decreased to non-detect downstream of the plume. This decreasing trend may be a factor of dilution. Powell Creek is a gaining stream. Figure 6 shows the location of the surface water samples obtained.

Table 3 - Surface Water

Detected Constituents	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)	Frequency Exceeding SCG
VOCs			
MTBE	ND – 2J	NS	NA
PCE	ND – 5 J	1 ppb	7/9
TCE	ND – 3 J	NS	NA
DCE	ND – 7 Z	NS	NA

a - ppb: parts per billion, which is equivalent to micrograms per liter, ug/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.
ND – Non-Detect, NS – No Standard, Z – Blank contamination

The primary surface water contaminants are chlorinated volatile organic compounds associated with historical disposal of dry-cleaning chemicals at the former Smart Set Cleaners. MTBE was also seen in surface water samples downstream of the plume. MTBE was an oxygenate that was a component of gasoline and is not considered a site specific contaminant of concern.

Based on the findings of the Remedial Investigation, the disposal of hazardous waste has resulted in the contamination of surface 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 are, PCE, TCE, and 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 soil vapor, 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 actions are needed to address exposures related to soil vapor intrusion.

The soil vapor and indoor air at the former Smart Set Cleaners has been addressed by the installation of the SVE system.

Indoor air and sub-slab vapor samples were collected from six of the tenant units west of the former Smart Set Cleaners as shown on Figure 7 as well as the former Smart Set Cleaners. The SVE system is mitigating the spaces that are east and west of the site. PCE, the primary VOC present in the sub-slab vapor and indoor air samples, was detected in sub-slab vapors at concentrations as high as 3,400 ug/m^3 downgradient of the site. The PCE concentration in sub-slab vapor was greater than 1,000 ug/m3 in three tenant units and greater than 100 ug/m3 in two tenant unit. Indoor air concentrations did not exceed guidelines in offsite tenant spaces.

Soil vapor samples were collected from the northern and western boundaries of the property to assess the extent of soil vapor contamination and determine whether sampling of buildings downgradient and side-gradient of the site was warranted. PCE was found to be generally low to the west. A soil vapor sample point located northwest of the site collected had 380 ug/m3 of PCE showing the potential for high concentrations of PCE in the sub-slab vapor. However, the adjacent property owner refused access to sample the property for soil vapor intrusion. The groundwater elevations demonstrated that the contamination was diving the further west it traveled within the plume. The groundwater at the top of the water table was non-detect or low as far as 850 ft downgradient of the site. There is a low potential for soil vapor intrusion where this is the case.

Based on the concentration detected, and in comparison with the State's Soil Vapor Intrusion Guidance (NYSDOH 2006), the primary soil vapor contaminant is tetrachloroethene (PCE) which is associated with dry-cleaning operations at the former Smart Set Cleaners. As noted on Figure 7, the primary soil vapor contamination is found underneath the tenant units downgradient of the Smart Set Cleaners. Mitigation is necessary for the tenant units west of the former Smart Set Cleaners and monitoring is necessary for the separate building on the property.

Based on the findings of the Remedial Investigation, the disposal of hazardous waste 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.

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 Further Action

The No Further Action Alternative recognizes the remediation of the site completed by the IRM(s) described in Section 6.2. This alternative leaves the site in its present condition and does not provide any additional protection of the environment.

Alternative 2: No Further Action with Site Management

The No Further Action with Site Management Alternative recognizes the remediation of the site completed by the IRM(s) described in Section 6.2 and the SVE system addressed in the historical uses of the Site Description. Site Management and Institutional Controls and Engineering Controls are necessary to confirm the effectiveness of the IRM. This alternative maintains engineering controls which were part of the IRM and includes institutional controls, in the form of an environmental easement and site management plan, necessary to protect public health and the environment from contamination remaining at and near the site after the IRMs and continues to operate the SVE system.

Present Worth: *$773,000*
Capital Cost: *$50,000*
Annual Costs: *$47,000*

Alternative 3: 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 will meets the unrestricted soil clean objectives listed in Part 375-6.8 (a). This alternative would include: a groundwater extraction system to capture and treat groundwater impacted by CVOCs at concentrations greater than SCGs, long term monitoring of groundwater within and downgradient of the plume outside the active remediation zone, and installation of SSDS systems in tenant units in the strip mall which are downgradient of the former Smart Set Cleaners unit. For costing purposes a line of delineation of 50 ppb cVOCs was used to determine the starting point of the treatment area. Also continued operation of the SVE system to treat soil contamination in the source area.

Present Worth: *$10,961,000*
Capital Cost: *$3,515,000*
Annual Costs: *$240,000*

Alternative 4: Groundwater Hot Zone Extraction and Treatment

This alternative would include, groundwater extraction and ex-situ treatment where CVOC concentrations exceed 500 ppb. Long-term Monitoring will be implemented outside the active remediation zone and installation of SSDS systems in tenant units downgradient of the former Smart Set Cleaners unit would be implemented. An on-site

cover system would be implemented. This alternative maintains engineering controls which were part of the IRM and includes institutional controls, in the form of an environmental easement and site management plan, necessary to protect public health and the environment from contamination remaining at the site after the IRMs and continues to operate the SVE system.

Present Worth: *$8,089,000*
Capital Cost: *$2,589,000*
Annual Costs: *$186,000*

Alternative 5: In-Situ Chemical Oxidation in Area with >500 ppb CVOCs in groundwater

This alternative would include implementation of in-situ chemical oxidation program within the remediation area where CVOC concentrations exceed 500 ppb. Long-term monitoring will be implemented outside the active remediation zone and installation of SSDS systems in tenant units downgradient of the former Smart Set Cleaners unit would be implemented. This alternative maintains engineering controls which were part of the IRM and includes institutional controls, in the form of an environmental easement and site management plan, necessary to protect public health and the environment from contamination remaining at the site after the IRMs and continues to operate the SVE system.

Present Worth: *$21,976,000*
Capital Cost: *$19,791,000*
Annual Costs: *$89,000*

Alternative 6: In-Situ Chemical Oxidation in Area with >1000 ppb CVOCs in groundwater

This alternative would include implementation of in-situ chemical oxidation (ISCO) program within the remediation area where CVOC concentrations exceed 1000 ppb. Long-term Monitoring will be implemented outside the active remediation zone and installation of SSDS systems in tenant units downgradient of the former Smart Set Cleaners unit would be implemented. This alternative maintains engineering controls which were part of the IRM and includes institutional controls, in the form of an environmental easement and site management plan, necessary to protect public health and the environment from contamination remaining at the site after the IRMs and continues to operate the SVE system.

Present Worth: *$3,779,000*
Capital Cost: *$2,332,000*
Annual Costs: *$63,000*

Exhibit C

Remedial Alternative Costs

Remedial Alternative	Capital Cost ($)	Annual Costs ($)	Total Present Worth ($)
Alternative 1: No Action	$0	$0	$0
Alternative 2: No Further Action with Site Management	$50,000	$47,000	$773,000
Alternative 3: Restoration to Pre-Disposal Conditions	$3,515,000	$240,000	$10,961,000
Alternative 4: Groundwater Extraction and Treatment	$2,589,000	$186,000	$8,089,000
Alternative 5: In-Situ Chemical Oxidation of area with >500 ppb CVOCs	$19,791,000	$89,000	$21,976,000
Alternative 6: In-Situ Chemical Oxidation of area with >1000 ppb CVOCs	$2,332,000	$63,000	$3,779,000

Exhibit D

SUMMARY OF THE PROPOSED REMEDY

The Department is proposing Alternative 6, In-Situ Chemical Oxidation (ISCO) treatment of the groundwater plume with greater than 1000 ppb of chlorinated volatile organic compounds (CVOCs) as the remedy for this site. Alternative 6 would achieve the remediation goals for the site by implementation of a groundwater treatment by ISCO, long-term monitoring outside the active remediation area, implementation of a cover system, and installation of Sub-Slab Depressurization Systems (SSDS) at tenant units west of the former Smart Set Cleaners unit. The elements of this remedy are described in Section 7. The proposed remedy is depicted in Figure 8 and 9.

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 6, would satisfy this criterion by reducing the contaminant concentrations at the hot zone of the plume with over 1000 ppb of CVOCs via ISCO. The contaminants would be transformed into less toxic contaminants within a short period of time. The remainder of the plume would be monitored for the contamination in the groundwater and surface water at Powell Creek.

A benefit of Alternatives 3 and 4 is that they will provide hydraulic control over a large portion of the impacted groundwater plume and will mitigate the migration of contaminated groundwater from the source to down gradient areas including Powell Creek.

Alternative 5 is protective since contaminants will be chemically transformed to less toxic contaminants within a relatively short time period (1 – 2 years). Alternative 1 and 2 do not provide additional protection to human health or environment. They are not treating or removing contaminant from the groundwater nor are they mitigating exposures from soil vapor intrusion into the on-site and off-site buildings.

Alternative 1 is not protective of human health because it does nothing. Alternative 2 monitors the contamination in the groundwater but provides no remediation. Alterative 3 is protective because it removes all the contaminated groundwater and treats it. Alternative 4 and 5 are equally protective because they both will treat the groundwater with more than 500 ppb of CVOCs.

Alternative 1 and 2 are not protective of human health or the environment and will be removed from further consideration.

2. Compliance with New York State Standards, Criteria, and Guidance (SCGs). Compliance with SCGs addresses whether a remedy will meet environmental laws, regulations, and other standards and criteria. In

addition, this criterion includes the consideration of guidance which the Department has determined to be applicable on a case-specific basis.

Alternatives 5 and 6 will reduce the concentrations of VOCs in groundwater within the remediation area allowing natural processes to attenuate remaining contamination over time to comply with the SCGs. Alternatives 3 and 4 should meet SCGs over time and will provide hydraulic control to prevent further migration of contaminated groundwater from the remediation area. Contaminated groundwater will be removed from the aquifer and therefore groundwater will meet SCGs.

Under Alternatives 3, 4, 5, and 6 long-term monitoring will be implemented outside the source remediation area. These areas will degrade naturally over a longer period of time and eventually will achieve the NYS Class GA GWQS. For all the alternatives it was assumed that natural degradation of contaminants would take at least 30 years. Institutional controls will also be implemented which will prevent the use of groundwater at the site until the SCGs are met.

Under Alternatives 3, 4, 5, and 6 SSDSs will be installed in the neighboring buildings to prevent soil vapor intrusion into the buildings. Emissions from the SSDS installed in the buildings will comply with the State and Federal ambient air quality regulations. If emissions exceed applicable air quality standards vapor will be treated using vapor phase granular activated carbon (GAC) prior to emitting vapors to the atmosphere.

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 3, 4, 5, and 6 will provide significant mass removal of contaminants, with Alternative 5 providing the greatest mass removal over the shortest time period. Alternative 5 and 6 are expected to meet the RAOs in the remediation area in one year or less, while Alternatives 3 and 4 will take 20 years or longer. Both Alternatives 3 and 4 require the use of the effective and continued operation of treatment equipment which is dependent on the overall operation and routine maintenance of the treatment systems. Periodic repairs and equipment replacement will be needed to maintain the treatment system’s effectiveness.

All the alternatives will rely on institutional controls to restrict groundwater use until SCGs are met. All the alternatives will rely on long-term monitoring for areas of groundwater contamination outside the active remediation zone to monitor the natural degradation of contaminants.

Under Alternatives 3, 4, 5 and 6 SSDSs will be installed in the neighboring units at the shopping center. The long-term effectiveness and permanence of the SSDS will depend on the routine maintenance and operation of the systems. Periodic repairs and equipment replacement will be necessary for the systems to work effectively.

In terms of long-term effectiveness all alternatives will be equal in effectiveness and permanence.

4. Reduction of Toxicity, Mobility or Volume. Preference is given to alternatives that permanently and significantly reduce the toxicity, mobility or volume of the wastes at the site.

Alternatives 5 and 6 use a chemical oxidation process to destroy contaminants and eliminate them from the aquifer within and downgradient of the treatment zone. Alternatives 3 and 4 use pump and treat to extract VOC mass in the source area and provide mass removal and hydraulic control of the contaminated groundwater. Extracted groundwater is then treated and spent GAC under Alternatives 3 and 4 will be reactivated or destroyed which will permanently destroy VOC contaminants.

Alternatives 3, 4, 5 and 6 rely on long-term monitoring for areas outside for remediation area. There will be minimal reduction in the toxicity, mobility or volume of contaminants outside the source area, and remediation of this area will require a long period of time to reduce the toxicity, mobility and volume of contaminants through natural processes.

5. Short-term Impacts and Effectiveness. The potential short-term adverse impacts of the remedial action upon the community, the workers, and the environment during the construction and/or implementation are evaluated. The length of time needed to achieve the remedial objectives is also estimated and compared against the other alternatives.

Alternatives 3, 4, 5, and 6 will have short-term impacts to remediation workers, the public, and the environment during implementation, although engineering controls would minimize these impacts. Alternative 5 will have the highest degree of short-term impacts due to the large number of estimated injection wells (approximately 350) required for this alternative. Equipment and vehicles in the vicinity of the source area will need to be temporarily relocated during installation and during the second injection event under Alternative 5. Alternative 6 will pose similar logistical problems as 5 with the relocation of equipment or vehicles within the source treatment zone, although this will be on a much smaller scale with the estimated number of injection wells at 35. Alternative 5 and 6 pose the greatest potential risk to remediation workers due to the quantity of hazardous chemicals used. Construction during all the alternatives will create noise. The potential for remediation workers to have direct contact with contaminants in groundwater occurs when the wells are installed for all the alternatives and when the groundwater remediation system is operating under Alternatives 3 and 4. Alternatives 3 and 4 will require additional space for the construction of the transmission piping, pumping station and treatment building.

RAOs should be achieved under Alternatives 5 and 6 in a relatively short time-frame and under alternatives 3 and 4 within a longer timeframe. ISCO is expected to achieve groundwater RAOs within one year under Alternatives 5 and 6 with LTM for 30 years. Alternatives 3 and 4, Extraction and Treatment, are each expected to achieve RAOs in 20 years with LTM for 30 years.

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.

Alternatives 3, 4, 5, and 6 all pose challenges in their implementability. The technology for each is readily available. However, the highest concentration on contaminants within the plume are located beneath Atlantic Avenue, a heavily trafficked road. The approximate location for the placement of the ISCO wells for Alternatives 5 and 6 and the extraction wells for Alternatives 3 and 4 lie along this busy road, necessitating closure of the road in the case of Alternative 5 or rerouting of a lane of traffic in the case of Alternatives 3 and 4. In the case of Alternative 6 wells may be placed along the side of the road necessitating rerouting of traffic or closure of a lane.

Alterative 6 is the most easily implementable alternatives, followed by alternative 4, then 3 with the least implementable being alternative 5.

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 Alternative 3 and 4 are very similar with high capital costs for the installation of piping, wells, and a treatment facility and moderate annual costs for the upkeep and operation of that facility. However, the present worth cost of Alternative 3 is higher than the Alternative 4 cost by approximately $3 million mostly due to the cost of additional extractions wells and a higher capacity pumping system. The capital cost of Alterative 5 is very high compared to Alternatives 3 and 4 with the cost of drilling hundreds of wells and the material costs for injection at three times the cost of Alternatives 3 and 4. The capital cost of Alternative 6 is the lowest of the remaining alternatives at $2.3 million due to fewer injection wells and materials.

All four alternatives have moderate annual costs due to the long-term monitoring of the groundwater outside the active remediation area, although the annual cost of Alternative 5 and 6 is much lower due to reaching the SCGs for groundwater quickly.

Alternative 6 is the most cost-effective alternative, followed by alternative 4, then 3, then the least cost-effective is 5.

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.

Alternatives 3, 4, 5, and 6 will likely achieve SCGs for the remediation area. There are no potable water supply sources in the vicinity of the study area down gradient from the site. Therefore, future restrictions on groundwater use will not have an impact on the existing land use of the site. These four alternatives are equal in on-site land use as they all employ a cover system.

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

NYSDEC SMART SET CLEANERS (SITE No. 130194)
16 Atlantic Avenue
Oceanside, Nassau County, New York

Site Location

DATE 06/02/2014

FIGURE 1

Document Path: \\Prl-srv3\gis_projects\069678_NYSDEC\178626_NYSDEC_D007625_WA2_Smart_Set\GIS\Map_Docs\Draft\Figure 1 - Site Location.mxd

Last Saved: 6/2/2014 5:37:19 PM

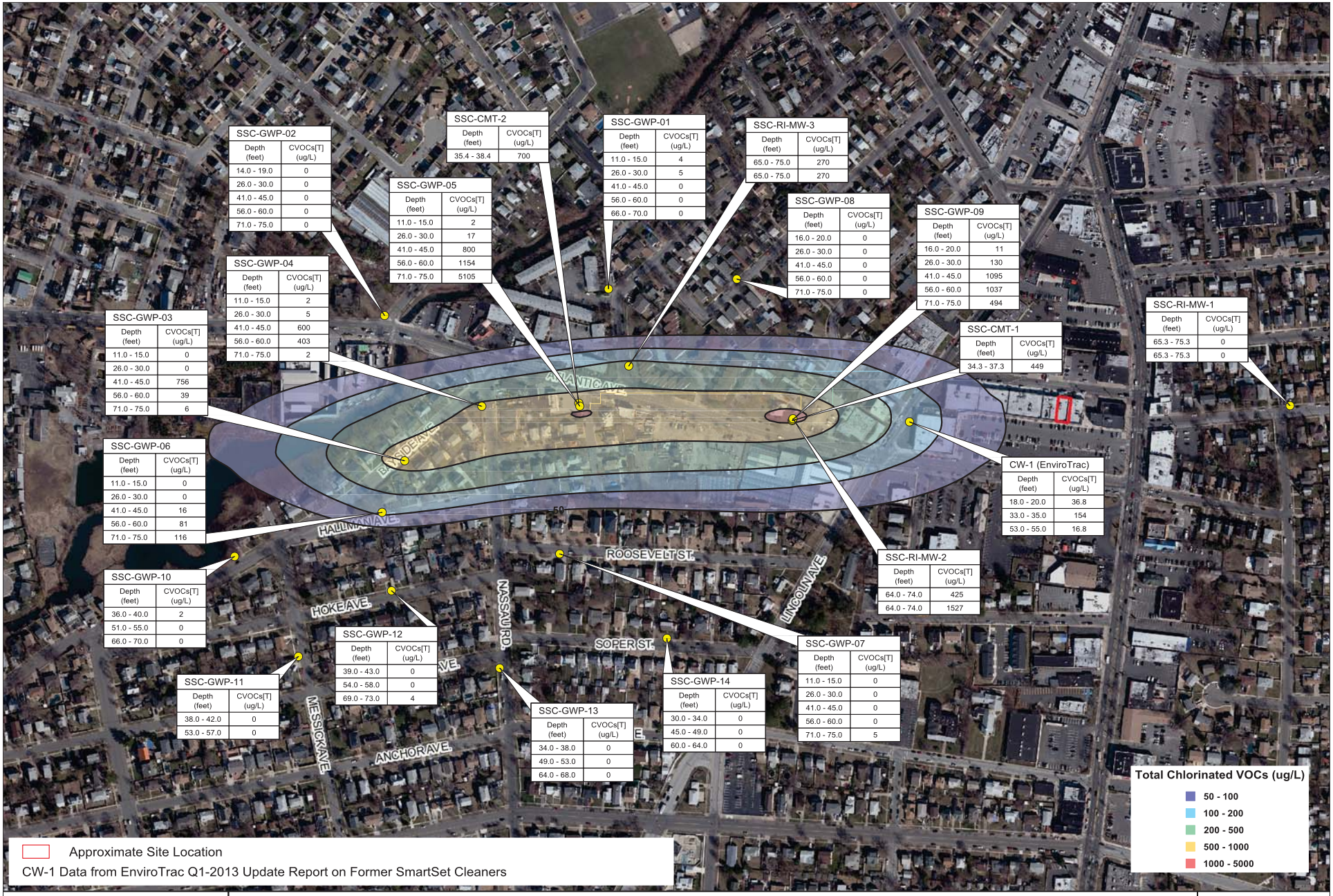
NYSDEC SMART SET CLEANERS (SITE NO. 130194)

16 ATLANTIC AVENUE
OCEANSIDE, NASSAU COUNTY, NEW YORK

MONITORING WELL AND SURFACE WATER SAMPLE LOCATIONS

DATE 11/2014

FIGURE 2



Approximate Extent of Chlorinated Volatile Organic Compounds (ug/L)

SmartSet Cleaners Remedial Investigation - NYSDEC Site #130194

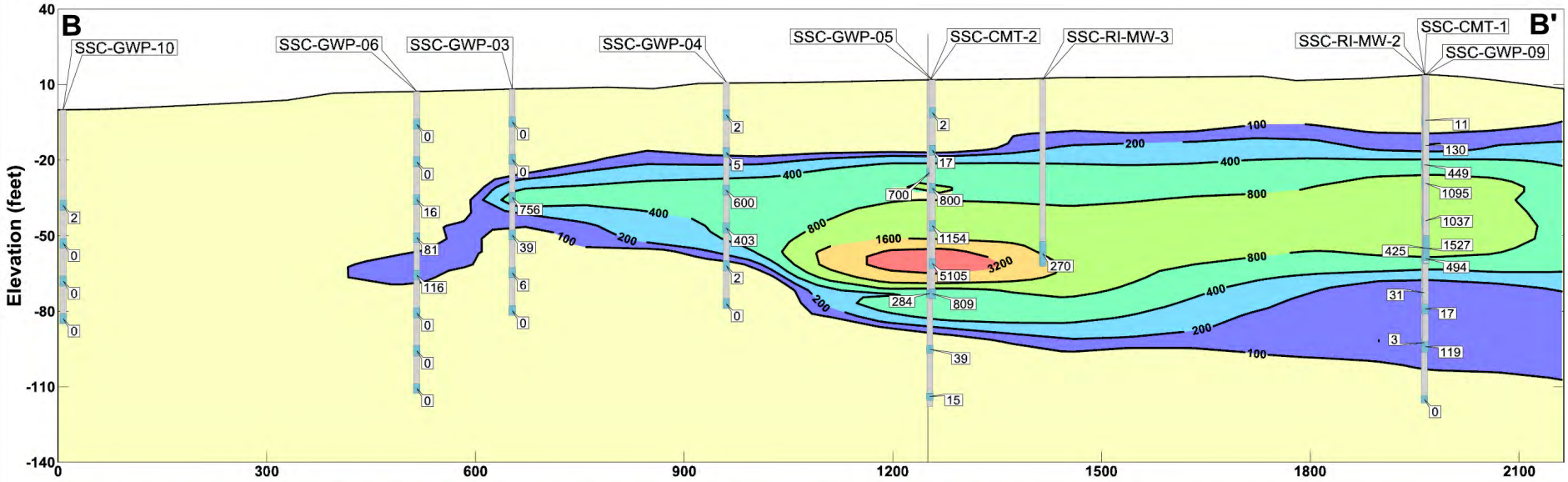
Oceanside, Nassau County, New York

Figure based on sample data collected between June 2012 and August 2013. Maximum result from each location used in contouring.

0 250 500 feet

DATE **06/10/2013**

FIGURE 3



Total Chlorinated VOCs (ug/L)

- 100 - 200
- 200 - 400
- 400 - 800
- 800 - 1600
- 1600 - 3200
- 3200 - 5105

Monitoring Well Casing or Groundwater Profile Borehole

Monitoring Well Screen or Groundwater Profile Sample Interval

Site Location

Figure based on sample data collected between June 2012 and August 2013.

Vertical Cross Section of Total Chlorinated Volatile Organic Compounds

SmartSet Cleaners Remedial Investigation - NYSDEC Site #130194

Oceanside, Nassau County, New York

DATE 06/11/2014

FIGURE 4

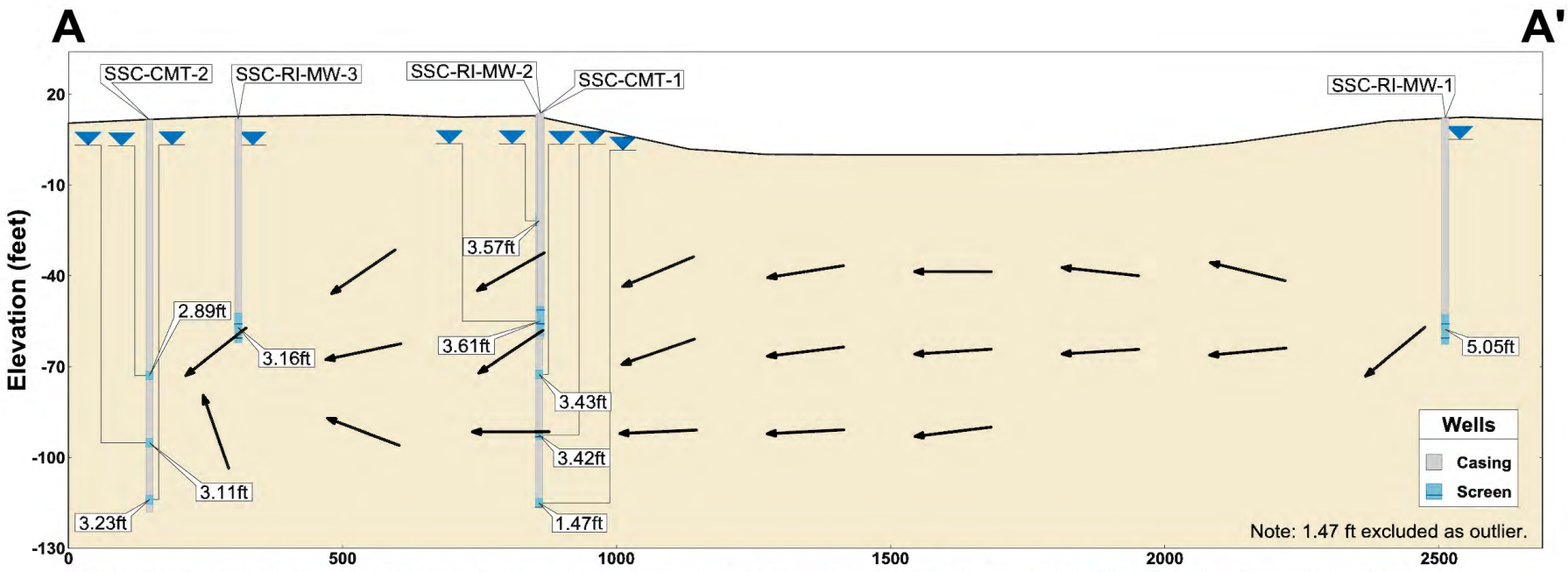


Figure based on sample data collected between June 2012 and August 2013.

Approximate Site Location

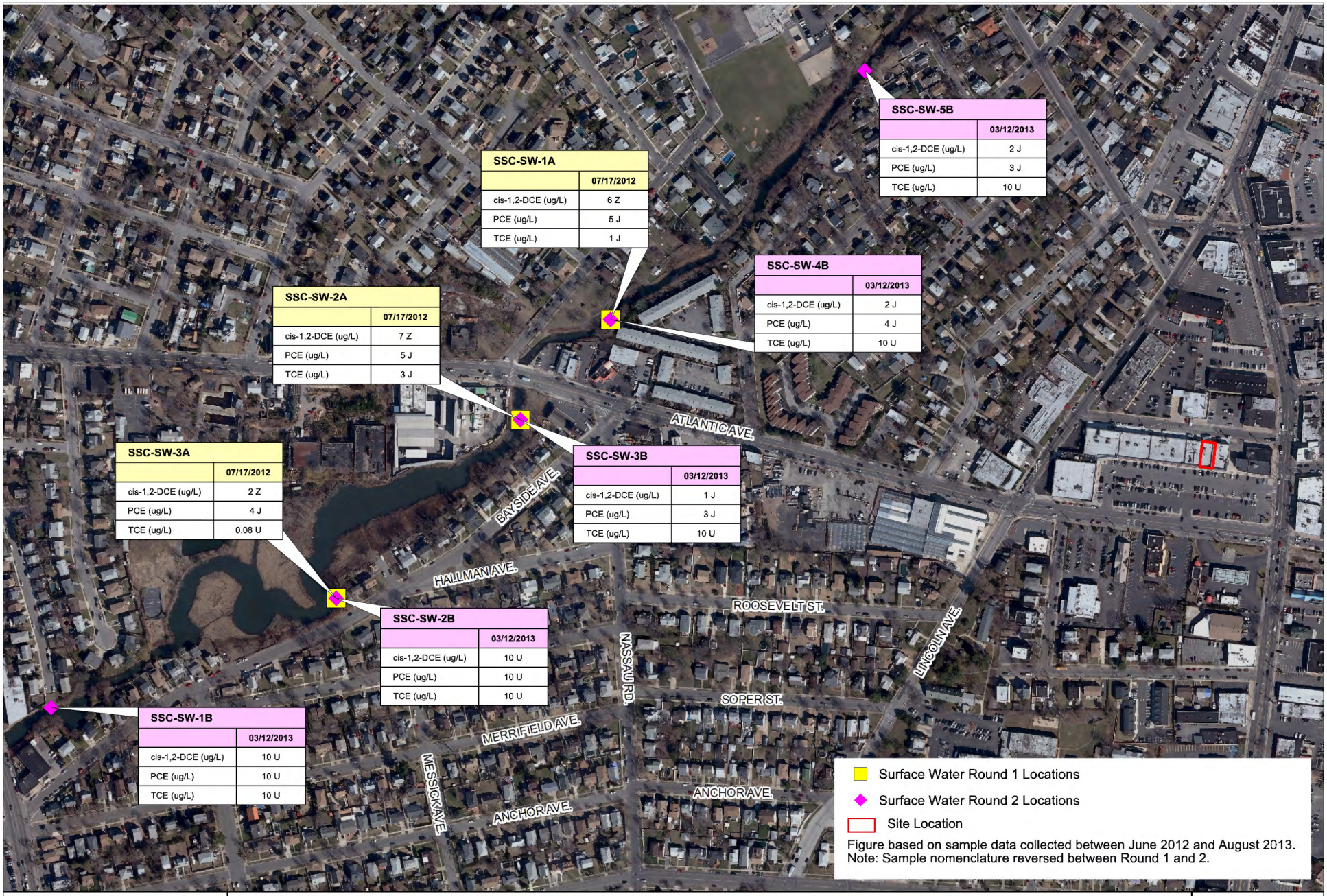
Water Table Elevations in Feet Above Mean Sea Level

SmartSet Cleaners Remedial Investigation - NYSDEC Site #130194

Oceanside, Nassau County, New York

DATE 06/03/2014

FIGURE 5



HDR

Surface Water Sample Results (Detected Analytes Only) (ug/L)

SmartSet Cleaners Remedial Investigation - NYSDEC Site #130194

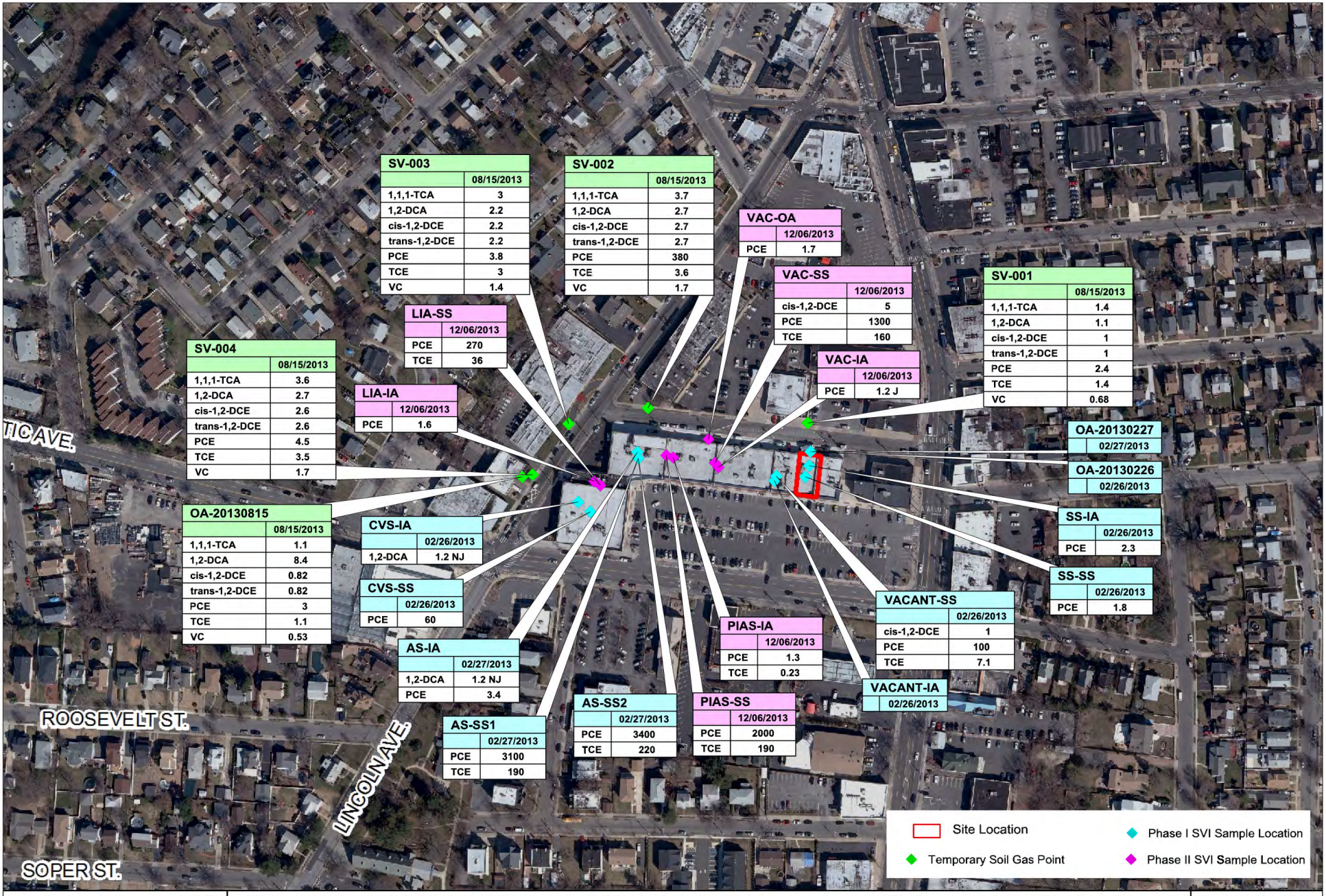
Oceanside, Nassau County, New York

0 250 500 feet

N

DATE
06/03/2014

FIGURE
6



HDR

Subslab Soil Vapor, Indoor Ambient Air, Soil Gas Selected VOC results (ug/m3)

SmartSet Cleaners Remedial Investigation - NYSDEC Site #130194

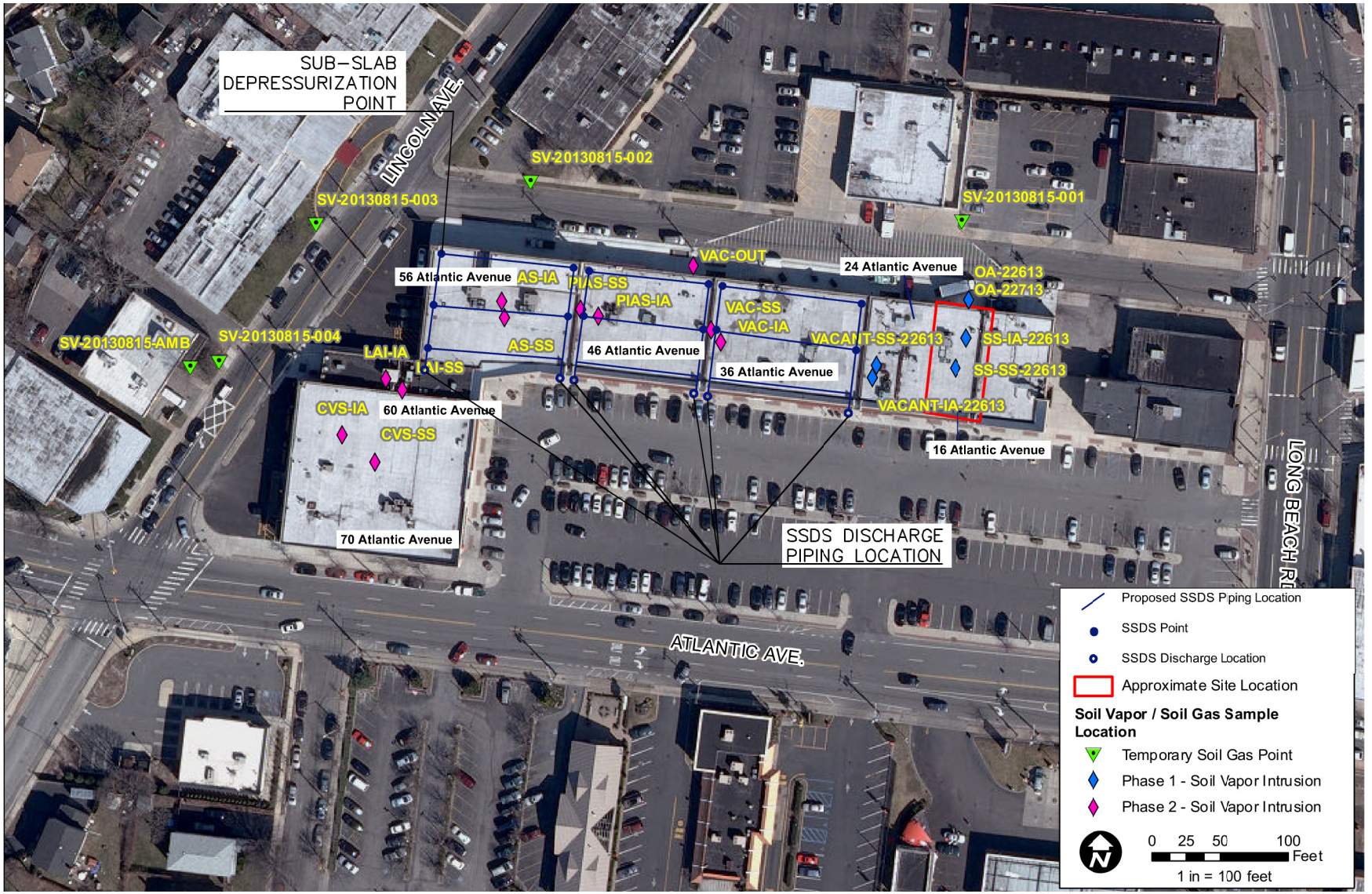
Oceanside, Nassau County, New York

0 100 200 feet

N

DATE
06/03/2014

FIGURE
7



N

100 50 0 100

SCALE IN FEET

NYSDEC SMART SET CLEANERS (SITE NO. 130194)

16 ATLANTIC AVENUE
OCEANSIDE, NASSAU COUNTY, NEW YORK

PROPOSED OFF SITE SSDS LOCATIONS

DATE 11/2014

FIGURE 8

NOTES:
1. THE APPROXIMATE AREA OF CVOC CONTAMINATION >1000 ug/L IS 21,482 SQ. FT.
2. PROPOSED SPACING BETWEEN INJECTION POINTS IS 30 FT. THE APPROXIMATE RADIUS OF INFLUENCE IS 15 FT.
3. THE ESTIMATED NUMBER OF INJECTION WELLS UNDER THIS APPROACH IS 31.

TOTAL CHLORINATED VOCs (ug/L) PER SAMPLE DATA COLLECTED BETWEEN JUNE 2012-AUGUST 2013

- 1000-5000
- 500-1000
- 200-500
- 100-200
- 50-100
- GROUNDWATER MONITORING WELL
- 5.80 GROUNDWATER ELEVATION (FT AMSL)
- PROPOSED SHALLOW, INTERMEDIATE AND DEEP INJECTION WELL POINTS (0-50 FT BGS, 0-70 FT BGS AND 0-90 FT BGS) WELLS WILL BE LOCATED IN THE FIELD TO MINIMIZE INTERFERENCE WITH STRUCTURES AND SUBSURFACE UTILITIES.

N

80 40 0 80

SCALE IN FEET

NYSDEC SMART SET CLEANERS (SITE NO. 130194)
16 ATLANTIC AVENUE
OCEANSIDE, NASSAU COUNTY, NEW YORK

PROPOSED TREATMENT AREA FOR ISCO INJECTION WHERE CHLORINATED VOLATILE ORGANIC COMPOUNDS CONTAMINATION > 1000 ug/L

DATE 11/2014

FIGURE 9