Five-Year Review Report
Stanton Cleaners Area Groundwater Contamination Site
Town of Hempstead, Village of Great Neck
Nassau County, New York

Prepared by
U.S. Environmental Protection Agency

December 2008

EXECUTIVE SUMMARY

This is the first five-year review for the Stanton Cleaners Area Groundwater Contamination site (Site), located in the Town of Hempstead, Village of Great Neck, Nassau County, New York. The selected remedy for the Site includes the following: 1) enhanced groundwater plume capture via pumping of contaminated groundwater from extraction wells and treatment through the use of air stripping of volatile organic compounds; 2) continued operation of the soil vapor extraction (SVE) system, including treatment of contaminated vapors using a vapor phase granular activated carbon treatment system; 3) treatment of off-gasses for both the air stripper and the SVE system with granular activated carbon; 4) indoor air monitoring of affected buildings, near the Stanton Cleaners Property (SCP), with interventions, if necessary; 5) long-term groundwater monitoring; and, 6) groundwater use restrictions. Tetrachloroethene or PCE is the contaminant of concern at the Site.

Based upon the results of this review, the U.S. Environmental Protection Agency concludes that the remedies implemented at this Site adequately control exposures of Site contaminants to human and environmental receptors to the extent necessary for the protection of human health and the environment. The continued operations, maintenance and monitoring of the Site ensures that there are no exposures of site-related hazardous materials to human or environmental receptors.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site name *(from WasteLAN)*: Stanton Cleaners Area Groundwater Contamination		
EPA ID *(from WasteLAN)*: NYD047650197		
Region: 2	**State:** NY	**City/County:** Great Neck/Nassau

SITE STATUS	
NPL status: ■ Final ☐ Deleted ☐ Other (specify)	
Remediation status (choose all that apply): ☐ Under Construction ■ Constructed ■ Operating	
Multiple OUs?* ■ YES ☐ NO	**Construction completion date:** 12/11/2003
Are portions of the site and/or investigated adjacent properties in use or suitable for reuse? ■ YES ☐ NO ☐ N/A (site involves groundwater plume and not real property)	

REVIEW STATUS	
Lead agency: ■ EPA ☐ State ☐ Tribe ☐ Other Federal Agency	
Author name: Damian Duda	
Author title: Remedial Project Manager	**Author affiliation:** EPA
Review period:** 12/11/2003 to 12/11/2008	
Date of site inspection: October 23, 2008	
Type of review: ■ Post-SARA ☐ Pre-SARA ☐ NPL-Removal only ☐ Non-NPL Remedial Action Site ☐ NPL State/Tribe-lead ☐ Regional Discretion	
Review number: ■ 1 (first) ☐ 2 (second) ☐ 3 (third) ☐ Other (specify)	
Triggering action: ☐ Actual RA Onsite Construction at OU# ___ ☐ Actual RA Start at OU#____ ■ Construction Completion ☐ Previous Five-Year Review Report ☐ Other (specify)	
Triggering action date *(from CERCLIS)*: 12/11/2003	
Is the site protective of public health? ■ yes ☐ no ☐ not yet determined **Does the report include recommendation(s) and follow-up action(s)?** ☐ yes ■ no ☐ not yet determined **Is human exposure under control?** ■ yes ☐ no ☐ not yet determined **Is contaminated groundwater under control?** ■ yes ☐ no ☐ not yet determined **Is the remedy protective of the environment?** ■ yes ☐ no ☐ not yet determined	

* ["OU" refers to operable unit.]
** [Review period should correspond to the actual start and end dates of the Five-Year Review in WasteLAN.]

Five-Year Review Summary Form (continued)

Issues, Recommendations and Follow-Up Actions

The remedy has been implemented and is functioning well, as intended by the Site decision documents. There are no additional remedial actions required. The ongoing monitoring program is part of the selected remedy. This review did not identify any significant issues that warrant attention, at this time. However, there are some suggestions included in this report which may enhance the operation and monitoring of the remedy (see Table 3).

Protectiveness Statement

The implemented remedy for the Stanton Cleaners Area Groundwater Contamination Site protects human health and the environment. There are no exposure pathways that could result in unacceptable risks and none expected as long as the site and groundwater uses remain consistent with the remedy and that the remedy is properly operated, monitored and maintained.

LIST OF IMPORTANT ACRONYMS

CERCLA ..... Comprehensive Environmental Response, Compensation, and Liability Act
ECC ..... Environmental Chemical Corporation
ESD ..... Explanation of Significant Differences
EPA ..... U.S. Environmental Protection Agency
ETI ..... Earth Tech, Inc.
ICs ..... Institutional Controls
IRM ..... Interim Remedial Measure
ISR ..... Investigation Summary Report
NCDOH ..... Nassau County Department of Health
NPL ..... National Priorities List
NYS ..... New York State
NYSDEC ..... New York State Department of Environmental Conservation
NYSDOH ..... New York State Department of Health
O&M ..... Operation and Maintenance
OM&M ..... Operations, Maintenance and Monitoring
P&T ..... Pump and Treatment
PCE ..... Tetrachloroethene
PCOR ..... Preliminary Close-Out Report
PLC ..... Programmable Logic Control
PRP ..... Potentially Responsible Party
IRAR ..... Interim Remedial Action Report
RPM ..... Remedial Project Manager
ROD ..... Record of Decision
SARA ..... Superfund Amendments and Reauthorization Act
SCP ..... Stanton Cleaners Property
SVE ..... Soil Vapor Extraction
UST ..... Underground Storage Tank
WAGNN ..... Water Authority of Great Neck North

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Five-Year Review

Stanton Cleaners Area Groundwater Contamination Site
Town of North Hempstead, Village of Great Neck, Nassau County, New York

I. INTRODUCTION

This is the first five-year review for the Stanton Cleaners Area Groundwater Contamination Site (Site) (see Figure 1), located in the Town of North Hempstead, Village of Great Neck, Nassau County, New York. The selected remedy for the Site includes the following: 1) enhanced groundwater plume capture via pumping of contaminated groundwater from extraction wells and treatment through the use of air stripping of volatile organic compounds; 2) continued operation of the soil vapor extraction (SVE) system, including treatment of contaminated vapors using a vapor phase granular activated carbon treatment system; 3) treatment of off-gasses for both the air stripper and the SVE system with granular activated carbon; 4) indoor air monitoring of affected buildings near the Stanton Cleaners Property (SCP), with interventions, if necessary; 5) long-term groundwater monitoring; and, 6) groundwater use restrictions. Tetrachloroethene or PCE is the contaminant of concern at the Site.

This review was conducted by Damian Duda, the U.S. Environmental Protection Agency (EPA) Region II, Remedial Project Manager (RPM) for the Site, in accordance with the Comprehensive Five-Year Review Guidance, OSWER Directive 9355.7-02B-P (June 2001). The purpose of a five-year review is to ensure that the implemented remedies protect human health and the environment and that they function as intended by the Site decision documents. This report will become part of the Site file.

A five-year review is being done because it is EPA policy to conduct five-year reviews when remedial actions will take longer than five years to reach cleanup levels that provide for unlimited use and unrestricted exposure. This policy five-year review is triggered from the construction completion date (12/11/2003) and covers the period from December 11, 2003 to December 11, 2008.

The lead agency for the Site is EPA Region II.

II. SITE CHRONOLOGY

Chronology of Site Events	
Event	**Date**
New York State Department of Environmental Conservation (NYSDEC) requests EPA to address volatile organic compounds (VOCs) in soils and indoor air.	March 1998
EPA authorized Time-Critical Removal Action	September 1998
EPA installed sub-slab ventilation system on Tennis Center	September 1998
NYSDEC issues Remedial Investigation/Feasibility Study	November 1998
Proposed for National Priorities List (NPL)	January 19, 1999
NYSDEC issues Draft Focused Feasibility Study and Interim Remedial Measure/Presumptive Remedy Selection	January 1999
Interim soil vapor extraction system installed	February 1999
Final listing on the NPL	May 6, 1999
Record of Decision (ROD) for Operable Unit One (OU-1)	March 31, 1999
OU-1 Remedial Design completed	November 2000
Indoor Air Quality Summary Report	July 2002
Final Inspection of completed pump and treatment and soil vapor extraction operations	August 13, 2002
Pump and Treatment System determined to be operational and functional	August 2002
Interim Remedial Action Report for Groundwater	September 2002
Operation and Maintenance (O&M) Manual	March 2003
Hydrogeological Investigation Report – OU-1	June 2003
Operable Unit Two - Investigation Summary Report	September 2003
Explanation of Significant Differences – Operable Unit Two	September 2003
Preliminary Close-Out Report	December 2003
Capture Zone Analysis Report	April 2004
Operations, Maintenance and Monitoring	Ongoing

III. BACKGROUND

Site Location and Physical Descriptions

The Site includes an active dry-cleaning business, Stanton Cleaners, located at 110 Cutter Mill Road in the Village of Great Neck, Nassau County, New York (see Figure 2). The Stanton Cleaners Property (SCP) is approximately 0.25 acres and includes a one-story building in which the dry-cleaning business operates and an adjacent one-story boiler/storage building. Most of the SCP has been paved with asphalt except for a narrow strip at the rear of the property. Adjoining properties include: a vacant property [a former indoor tennis facility]; a synagogue and Hebrew school facility; a condominium; a service station; and, across the street from the Site, another Hebrew academy.

Geology/Hydrogeology

Three distinct aquifers underlie the Site: 1) the Upper Glacial Aquifer is the most shallow and is an unconfined aquifer, highly susceptible to contamination from domestic septic systems and other manmade pollution sources;[The Site monitoring wells are set in the shallow, intermediate and deep zones of this aquifer]; 2) the Magothy Aquifer lies atop the Raritan Confining Unit and is widely used for water supply purposes; and, 3) the Lloyd Aquifer exists under highly confined conditions between the relatively impervious bedrock below and the Raritan Confining Unit above. The depth to groundwater across the Site ranges from approximately sixty to seventy feet. The direction of groundwater flow from the Site is south, in the direction of the Water Authority of Great Neck North (WAGNN) wellfield.

Land and Resource Use

The surrounding community from the Site is zoned commercial/residential and is serviced by public water supply and sewerage. Public drinking water is supplied by WAGNN, which services an area of approximately 10 square miles and over 34,000 residents. Three WAGNN public water supply wells are located approximately 1000 feet south of the SCP. Two of these wells are approximately 145 feet deep and the third well is 434 feet deep. The two shallow wells are equipped with an air stripper to remove volatile organic compounds (VOCs), primarily tetrachlorothene or PCE (a solvent commonly used by dry cleaners), which have contaminated the shallow groundwater.

History of Contamination

According to property ownership records, as early as 1958, a dry cleaner has operated on the SCP. Over the course of years, the property changed ownership; the current owner acquired the property in November 1967. Records from the Nassau County Department of Health (NCDOH) indicate that in the late 1970's and early 1980's, the Citizen's Water Supply Company, the previous owner of these water supply wells, noted low levels of PCE in these wells.

In 1983, WAGNN solicited help from NCDOH to assist them in identifying potential sources of PCE. As a result, the Site was inspected in 1983 by NCDOH. At that time, NCDOH noted that a discharge pipe led directly from the dry cleaning fluid separator to the grassy sloped area at the rear of the building. Shortly afterward, the discharge ceased.

Initial Response

In 1983, following the discovery of elevated levels of PCE contamination in soils [up to 8000 micrograms per kilogram (µg/kg)] by NCDOH at the rear of the SCP, approximately 20 cubic yards of soil was removed by a potentially responsible party (PRP) to an off-site disposal facility. Because further sampling revealed high levels of PCE in the soil, NCDOH ordered additional investigations and, in January 1984, referred the Site to the New York State Department of Environmental Conservation (NYSDEC). At that time, the PRP's consultant conducted additional investigations, including the installation of seven groundwater monitoring wells: MW-1, MW-5, MW-6, MW-7, MW-8, MW-9 and MW-10. An additional well (MW-2) was installed, in 1985, by the Nassau County Department of Public Works (NCDPW). Total VOCs (primarily PCE) were found at levels up to 11,700 parts per billion (ppb). At this time, the most highly contaminated wells were MW-1, MW-2, MW-5 and MW-6. The highest levels were found in MW-6, located 100 feet south of the SCP.

From September 1997 through January 1999, NYSDEC conducted a remedial investigation and feasibility study (RI/FS), using Dvirka and Bartilucci, NYSDEC's contractor. The purpose of the RI/FS was to define the nature and extent of any contamination resulting from previous activities at the Site. The RI report was issued in November 1998. The FS, identifying appropriate remedial alternatives, was issued in January 1999. The primary contaminant of concern at the Site was found to be PCE. Soils, groundwater and indoor air were all affected by the VOC-contamination.

In March 1998, NYSDEC requested the assistance of EPA to conduct an emergency response action to address indoor air quality in buildings adjacent to the SCP. In September 1998, EPA and its contractor, EarthTech, Inc. (ETI), performed indoor air sampling to confirm indoor PCE levels above NYSDOH guidelines and to target where PCE vapors entered those affected structures adjacent to the SCP. The sampling confirmed the elevated concentrations of PCE in the tennis facility and revealed elevated concentrations of PCE in the parking garage of the condominium. In particular, indoor air levels at the adjacent Tennis Center were found to be in excess of 1000 ug/l which exceeded the NYSDOH action level.

In September 1998, during the RI/FS process, EPA, under its removal authority, authorized a Time-Critical Removal Action to reduce threats to public health and the environment by reducing indoor air contamination in adjacent affected structures. EPA and ETI conducted a number of interim remedial measures (IRMs) at the Site in order to address indoor air contamination and soils contamination which impacted adjacent buildings and groundwater contamination which impacted area drinking water supplies.

In September 1998, EPA and ETI installed an outdoor sub-slab ventilation system, adjacent to the impacted tennis facility. Indoor air levels were reduced 78% by November 1998.

In March 1998, NYSDEC agreed to fund the construction and installation of a new air stripper at the WAGNN location to treat the high VOC-contaminant concentrations in two of the WAGNN wells. The new air stripper, with a design capacity of 3400 ppb @ 2,000 gallons per minute, was constructed and put on-line in the summer 1998 at the WAGNN Watermill Lane location.

Basis for Taking Action

The Site was proposed for inclusion on the National Priorities List (NPL) in January 1999 and was listed final on the NPL in May 1999.

Based on a review of results from NYSDEC's RI/FS and EPA's removal work, EPA, in consultation with NYSDEC, issued its March 1999 Record of Decision (ROD) to remediate the Site, using an extraction and treatment process for the groundwater and an SVE system for the soils.

The remedial activities selected in the OU-1 ROD were necessary in order to reach the remedial action objectives (RAOs):

- to reduce, control or eliminate contaminants in soil and groundwater to the maximum extent practicable;
- to restore the aquifer to its best beneficial use, *i.e.*, a source of drinking water; and,
- to eliminate the potential for human exposure to contaminated Site groundwater, soil and indoor air.

The cleanup goal for groundwater is maximum contaminant levels (MCLs) or below. The cleanup goal for soils is the New York State (NYS) Technical and Administrative Guidance Memorandums (TAGMs). Indoor air monitoring was included, but no specific cleanup goal was established.

IV. REMEDIAL ACTIONS

Remedy Selection

In March 1999, EPA issued a ROD. The selected a remedy included: 1) upgrade of the existing groundwater air stripper treatment system on the Stanton Cleaners Property to allow for an increased pumping rate if groundwater modeling indicates that the increased pumping would benefit the comprehensive groundwater cleanup at the Site; 2) enhanced groundwater plume capture via pumping of contaminated groundwater from extraction wells, to be installed off the SCP, and treatment through the use of air stripping of volatile organic compounds and, if necessary, treatment of off-gasses with granular activated carbon and pre-treatment of the groundwater with chemical precipitation and filtering for metals as well as discharge of treated groundwater to a storm sewer unless studies indicate that it can be re-injected; 3) continued operation of the soil vapor extraction system on the SCP for soils contaminated with volatile organic compounds, including treatment of contaminated vapors using a vapor phase granular activated carbon treatment system; 4) indoor air monitoring of affected buildings near the SCP, with interventions, if necessary; 5) long-term groundwater monitoring; and, 6) groundwater use restrictions. The contaminant of concern is PCE.

After further investigations of the existing on-site air stripper, EPA determined that it could not be upgraded and was abandoned as a remedial action. As a result, the enhanced P&T system became the primary groundwater treatment remedial action. Pre-treatment was investigated and found to be unnecessary. With respect to discharge of treated groundwater, reinjection was not implementable due to hydrogeologic conditions.

Remedy Implementation

Soils and Indoor Air

After the initial IRMs, EPA's further study of the Site area indicated that a soil vapor extraction (SVE) system was warranted. In December 1998, EPA completed the installation of four vapor extraction/monitoring wells to be used for the SVE operation. In February 1999, EPA began SVE operations at the Site. An interim SVE system (200 cfm) was utilized until a full-scale trailer-mounted unit was installed. In May 1999, the full-scale trailer-mounted SVE (500 cfm) system was placed on-line for operation. The full-scale SVE system was in continuous operation until late October 2000 when construction of the groundwater pump and treatment (P&T) system building began. The full-scale SVE system was returned to operation upon completion of the building construction. In February 2001, the full-scale 500 cfm SVE system was replaced with a smaller and more efficient 250 cfm SVE system and was installed in the operations buildings. This system was integrated into the overall treatment process train and is the operating system. EPA estimates that approximately 20,000 pounds of PCE have been removed from the soils to date. As a result of the operating SVE system, ongoing indoor air sampling at affected adjacent structures show that PCE concentrations have been reduced to below NYSDOH guidelines or EPA's health-based levels.

Underground Storage Tanks

In 2001, as a result of a review of historic information at the Site and a geophysical investigation, EPA concluded that there were underground storage tanks (USTs) on the SCP. In August 2001, EPA initiated a removal action to delineate, excavate and remove these buried USTs and the contents therein that had been located on the SCP.

In January 2002, field operations for the removal of the buried tanks included the removal of two 250-gallon PCE USTs and one 500-gallon heating oil UST. These tanks were cut up and disposed of at an appropriate disposal facility. Any residual sludges which were found within the tanks were also sampled and disposed of at an appropriate disposal facility.

In order to target any potential residual VOC vapors that may have been in the soils surrounding the buried tanks, an SVE manifold extraction system was installed at the UST location and connected to the existing on-site SVE system. Since no further action on the buried tanks and associated soils was necessary after the excavation and removal of the USTs and the subsequent connection of the immediate area to the SVE system, the UST cleanup was deemed complete.

Groundwater

In September 1999, EPA and ETI initiated the design of the P&T system [installation of extraction wells and treatment unit, treatability studies, pre-treatment studies, installation and

sampling of monitoring wells, performance of a pump test, evaluation of the existing SCP air stripper and the performance of a re-injection study, including groundwater modeling] and the design of the staging area and the treatment unit building. The monitoring well network is shown on Figure 3.

In November 2000, design specifications for the P&T system and treatment building were approved. In January 2001, ETI completed the exterior shell of building to house P&T system and completed a third round of groundwater sampling of all monitoring wells on-site and off-site of the SCP.

In April 2001, with the installation of insulation, interior walls, electrical and control offices, construction on the P&T system building was completed.

During May and June 2001, ETI completed the installation of the various P&T system components, including the air stripper, the blowers and the aqueous and vapor phase carbon tanks, with manual operation of the P&T system for testing.

In September 2001, ETI completed the programmable logic control (PLC) system automation portion of the overall P&T system. The PLC system was in a shake-down period for three months in order to finalize the P&T system's pumping rates.

From September 2001 to September 2002, the P&T system operated during the shake-down phase. The P&T system currently operates at around 65 gallons per minute (gpm) and has been operating smoothly since September 2001. To date, the system has treated and discharged approximately 193 million gallons of contaminated groundwater.

On December 12, 2001, a pre-final construction inspection was conducted by Lou DiGuardia, the EPA On-Scene Coordinator, and Tom Williams and Francisco Metcalf of ETI. On August 13, 2002, a final inspection was conducted. The P&T system was found to be operational and functional, and the State agreed to this designation. The remedial systems will be operated for up to ten years of long-term response action (LTRA).

Environmental Chemical Corporation (ECC), as part of an interagency agreement between EPA and the Army Corps of Engineers, performs the operations and monitoring of the systems. If the groundwater cleanup objectives have not been met by the end of ten-year period, the operations and maintenance (O&M) of the P&T will be turned over to the State at that time for continued operation until such time as cleanup objectives are reached.

To date, the SVE system has removed approximately 20,000 pounds of PCE. Sampling data indicates that NYS TAGM soil cleanup objectives for PCE have been achieved in the area of contamination. Currently, the SVE system continues to remove from a half-pound to a pound of PCE per day. Since the SVE system continues to capture VOCs, it will continue to operate.

In September 2002, EPA issued an Interim Remedial Action Report (RAR) for the P&T system, including the upgrade of the existing on-site treatment system. The RAR is based on the remedial construction completed at the Site by ETI, pursuant to the final remedial design (RD) for the Site, approved by EPA and NYSDEC.

Operable Unit Two - Additional Potential Sources of Groundwater Contamination

The March 1999 ROD indicated that EPA would address additional potential sources of groundwater contamination in the area around the SCP under a second operable unit (OU-2). At the time of the 1999 ROD, EPA expected that additional remedial investigation and potential remediation, under CERCLA authority, may be warranted.

EPA conducted an evaluation of potential off-site sources including a background review of pertinent NYS and NCDOH files on sites which could be potentially impacting the WAGNN public supply wells. EPA's off-site groundwater investigation is documented in the OU-2 Investigation Summary Report (IS Report). This evaluation revealed that five known petroleum hydrocarbons and/or hazardous materials spill sites were located within a one-mile radius of the WAGNN facility. These are: 1) the former Fenley Amoco Gas Station site (inactive), located at 500 Great Neck Road; 2) the Citizen's Development Company (CDC) site (inactive), located at 47 Northern Boulevard; 3) the Mayflower Cleaners site (active) located at 489 Great Neck Road; 4) the Amoco B Gas Station site (active); and, 5) Jonathan's Auto Repair Shop site (active) located at 133 Cutter Mill Road.

The results of EPA's OU-2 investigation indicated that additional Federal remedial measures, as identified under CERCLA, were not necessary. The IS Report's investigative information, recommendations and conclusions show that these off-site sources are being addressed or have been addressed under either NYSDEC or private-party programs. The IS Report also 1) identifies those reports and correspondence currently available that are related to the above-described sites, 2) includes maps, which identify all five sites, presents all analytical data, reports and other documents currently available on the five sites and 3) provides a summary analysis of that data and identifies the remedial actions being taken at each site, if any.

In September 2003, as a result of its off-site investigation, EPA issued an Explanation of Significant Differences (ESD) for OU-2 to the March 1999 ROD, specifying that no Federal action will be taken, under CERCLA, with respect to any potential follow-up remedial activities at these facilities.

Institutional Controls Implementation

Site access agreements are in place. EPA also currently has a lien on the property. As recommended by WAGNN, each of the villages within the Town of Great Neck adopted its own ordinance which prohibits the construction and use of private drinking water wells. No further institutional controls (ICs) are necessary to safeguard public health with respect to the Site.

The Village of Great Neck Municipal Code, Division 2, Chapter 549-2 also states the following:

> No person, firm or entity shall drill, dig or tap into any aquifer or other subsurface source of water within the Village without having first obtained a permit from the Board of Trustees. Notwithstanding the foregoing, no permit for such activity shall be required where such activity is conducted by the Water Authority of Great Neck North or the New York State Department of Environmental Conservation or such activity is subject to

> the permit jurisdiction of the New York State Department of Environmental Conservation under § 15-1527 of the Environmental Conservation Law.

The Village of Great Neck Plaza Municipal Code, Part 2, Chapter 5217-8 also states the following:

> No person, firm or entity shall drill, dig or tap into any aquifer or other subsurface source of water within the village without having first obtained a permit from the Board of Trustees.

Operations, Maintenance and Monitoring

Ongoing activities include periodic adjustments and/or modifications to the groundwater P&T remedy to maintain optimum performance.

Continued operation and monitoring of the groundwater extraction and treatment system, as well as the SVE system, as constructed on the SCP, is outlined in the O&M Plan. Activities identified in the O&M Plan include the following:

- Discharge sampling will be required in order to ensure compliance with discharge standards set in NYSDEC's discharge equivalency permit.
- Groundwater levels measurements and transducer (TROLL) readings will be performed once-a-month in approximately 15 monitoring wells in order to evaluate drawdown.
- Periodic maintenance of groundwater and SVE extraction wells; all pumps, meters and instrumentation and associated piping.
- Periodic inspection of all equipment as per the O&M Plan
- Monthly effluent monitoring (sampling) of the treated groundwater
- Monthly influent monitoring (sampling) of the raw water
- A variety of parameters are monitored, including pH, conductivity, VOC concentrations and any other parameters, as identified in the O&M plan.
- Quarterly air discharge monitoring
- Semiannual replacement of aqueous-phase spent carbon, including disposal of materials.
- Semiannual indoor air sampling
- Semiannual groundwater monitoring well sampling

The PLC system automatically measures and records the treatment system's pumping rates, the volume of groundwater pumped from the extraction wells and the general on-site system operations. All PLC records are maintained at the Site.

As part of the OM&M program, EPA also periodically reviews the groundwater data available from the WAGNN which services the area with public water supply. EPA has received assurances from the local village governments, as well as NCDOH, that the ICs, *i.e.*, groundwater use and well drilling restrictions, remain in place and adequately protect the groundwater in the area.

V. FIVE-YEAR REVIEW

Five-Year Review Team

EPA's five-year review team consists of Damian Duda (RPM), Lou DiGuardia (On-Scene Coordinator (OSC)), Mike Scorca (regional hydrogeologist), Chuck Nace (regional risk assessor), and Liliana Villatora (Site attorney).

Community Notification and Involvement

The EPA Community Relations Coordinator for the Site, Cecilia Echols, notified the community of the five-year review process by publishing a notice in the Great Neck News. The notice indicates that EPA is conducting a five-year review of the remedy for the Site in order to ensure that the implemented remedy remains protective of public health and the environment and is functioning as intended. The five-year review report will be made available in the local Site repositories. In addition, the notice includes the RPM's address, telephone number and e-mail address for questions related to the five-year review process for the Site.

EPA Region 2's experience indicates that there is relatively little public interest in five-year reviews. However, if serious public concerns are expressed about the remedy or this five-year review, EPA will consider all public concerns and, if appropriate, re-issue this five-year review addressing those concerns.

Document Review

A list of documents that were reviewed in the preparation of this report is included in Table 2 at the end of this report.

Monitoring and Data Review

Soils

Data indicate that soil cleanup objectives have been met. The SVE system continues to operate and had shown an overall removal level of up to a pound of PCE per day. To date, approximately 20,000 pounds of PCE have been removed.

Groundwater

Monthly O&M Reports show the data trends for the P&T and SVE treatment systems. The October 2003 O&M Report showed influent PCE concentration at 350 ug/l. The latest data from the June 2008 O&M report for the on-site P&T operations, as well as the SVE system, show that PCE concentrations are continuing to be reduced, since the construction completion of the Site. The June 2008 data shows an influent concentration of PCE of 41 ug/l. Table 1 shows the quarterly sampling of the P&T data from 2003-2008, including influent and effluent concentrations.

Semiannual Groundwater Summary Reports shows the data trends for both on-site and off-site monitoring wells. There are thirty on-site and off-site monitoring wells that have been sampled

since 2003. Currently, EPA samples 15 of those monitoring wells on a biannual basis. These wells were selected based on historic trends of VOC contamination. The monitoring well network includes both EPA-installed and New York State-installed wells.

During July 2008, groundwater sampling was conducted from 15 select monitoring wells, both on-site and off-site. Table 2 shows the data collected from the monitoring well network from 1999/2000 to 2008. Groundwater sampling activities are coordinated with WAGNN; attempts are made to schedule the event when local water supply drawdown conditions do not impact the water levels. The location and number of monitoring wells, as well as analytical parameters analyzed, are determined by the EPA and ECC. During the July 2008 groundwater sampling event, the 15 monitoring wells were sampled for target compound list VOCs, alkalinity, nitrate, sulfide, total organic carbon (TOC), and chloride analysis. These wells were also sampled for natural attenuation parameters, including methane, ethane, and ethene (MEE).

The following 8 shallow upper glacial wells were sampled: ST-MW-12, ST-MW-15, ST-MW-16, ST-MW-19, EPA-MW-21, EPA-MW-22, EPA-MW-23, and EPA-MW-26. PCE was detected above maximum contaminant levels (MCLs) in ST-MW-19 at 590 (J) ug/l (decreasing from 890 (J) ug/l in 2007) and MW-21 at 180 ug/l (similar concentration in 2007). TCE was detected above MCLs in ST-MW-19 at 5.6 ug/l.

The following 3 intermediate upper glacial wells were sampled: EPA-MW-11D, ST-MW-17 and EPA-MW-27. PCE was detected above MCLs in ST-MW-17 at 9.9 ug/l (similar concentration in 2007).

The following 4 deep upper glacial wells were sampled: EPA-CL-1D, EPA-CL-4D, ST-MW-14 and ST-MW-20. PCE was detected above MCLs in ST-MW-20 at 12 ug/l (decreasing from 17J ug/l in 2007).

In general, PCE concentrations are decreasing throughout the monitoring well network, with many wells showing non-detect or below MCLs, although some wells, mainly ST-MW-19 and MW-21, are continuing to show elevated levels of VOCs, namely PCE. Table 2 shows the data trends in some of these monitoring wells.

Figure 2 shows an area wide overview of the Site, as well as the off-site monitoring well locations. The figure identifies the locations of the select monitoring wells, as configured both inside and outside of the containment area. As discussed above, fifteen monitoring wells are sampled during the biannual sampling events.

Overall, for the years 2003-2008, both the groundwater and SVE remedies continue to remain effective. Various maintenance, repair and replacement corrective actions have been conducted during that period. In 2008, the outdoor PVC piping was replaced and the liquid carbon vessel was replaced, because of defective manufacturing. Some other minor repairs were made, including health and safety updates and O&M streamlining.

Indoor Air

Soil vapor intrusion (VI) is evaluated when soils and/or groundwater are known or suspected to contain VOCs. With respect to indoor air, EPA responds to VOC soil VI issues according to

health-based VI guidelines, as developed by EPA Region 2, using EPA's draft Evaluating the Vapor Intrusion Into Indoor Air guidance document (USEPA 2002).

Indoor air sampling is conducted in the Long Island Hebrew Academy (LIHA), the Silverstein Hebrew Academy (SHA) and EPA's Stanton Cleaners operations building, as well as ambient air samples. Currently, there is a sub-slab mitigation system installed on the LIHA. A subslab mitigation system is also installed on the operating dry cleaners and connected to the SVE system.

The results of the April 2008 indoor air sampling event for the contaminant of concern, namely PCE, showed non-detect in all indoor air locations for the LIHA. For the SHA, the first floor location showed non-detect; the second floor showed 19 ug/m3. This level is within EPA guidelines for continued monitoring. The 2007 sampling results also showed non-detect levels for the first floor at SHA. Other VOC compounds were detected in the second floor of the SHA which are not site-related and may be the result of other activities being conducted at the facility or from the adjacent printing company. The 2008 results at the ambient location showed 4.1 ug/m3 PCE. EPA will continue to monitor all locations in order to ensure that the measured indoor air values remain below health-based levels.

Operable Unit Two – Additional Sources of Area Groundwater Contamination

As noted above, in the March 1999 ROD EPA indicated that it would address additional potential sources of groundwater contamination in the area around the SCP under a second operable unit. In September 2003, as a result of its off-site investigation, EPA issued an ESD to the March 1999 ROD, specifying that no Federal action will be taken, under CERCLA, with respect to any potential follow-up remedial activities at these facilities. Based on information provided by NYSDEC and the site groundwater monitoring results, the conclusion of the 2003 ESD remains valid, and no further Federal response is appropriate.

Site Inspection

A Site visit and inspection was conducted on October 23, 2008. EPA representatives included Damian Duda (RPM), Mike Scorca (hydrogeologist), Chuck Nace (regional risk assessor), Lou DiGuardia (On-Scene Coordinator) and Cecilia Echols (community involvement coordinator). ECC representatives included Dave Miller (project manager) and Tom Williams (operations manager). The Army Corps of Engineers representative was Rich Gajdek. The NCDOH representative was Joe DeFranco.

The team performed a walk-through of the property, which included an inspection of the groundwater extraction and treatment system and the SVE system and an inspection of the extraction wells and the SVE wells and piping system. The team also visited the WAGNN offices on Watermill Lane and conducted an interview with Mr. Robert Graziano, Superintendent of WAGNN. Mr. Graziano indicated that operations of the water supply wells have remained fairly stable over the last few years. The prior PCE contamination has been reduced to below MCLs. He also indicated that chloride levels in the groundwater have been dropping recently, as result of more efficient pumping regimens. The WAGNN wells extract up to 1.4 million gallons a day for the water supply usage. He and his staff provided an electronic version of the water quality data that has been collected at the wellfield in order to compare this with the historic data.

During the Site inspection, the team discovered that monitoring well MW-21 had been mistakenly abandoned by the adjacent gas station owner. A company which performs routine maintenance for the station had received a request for the abandonment of some its site wells. Since MW-21 is adjacent to the gas station, the company thought it was to be abandoned as well. EPA is working with the company to either replace the abandoned well with a new well or see if the old well can be salvaged and put back into use. The issue here is that MW-21 is one of the best indicator wells for securing data that shows the decrease in PCE concentrations, historically.

No other issues with respect to the Stanton Cleaners operations were noticed.

VI. TECHNICAL ASSESSMENT

Question A: Is the remedy functioning as intended by the decision documents?

The remedy identified in the 1999 ROD included upgrading the existing on-site air stripper, installing an extraction well to capture the plume, continued operation of the on-site SVE system, indoor air monitoring with intervention as needed, long term groundwater monitoring, and groundwater use restrictions.

Based on the Site inspection and the groundwater, soils and indoor air monitoring data over the last five years, the remedy is functioning effectively in removing PCE contamination.

Consequently, as intended by the decision documents, human health and ecological exposure pathways have been interrupted.

The SVE system continues to operate, in conjunction with the P&T system. While the TAGM goals appear to have been met, the SVE system remains an effective remedial action by continuing to successfully remove PCE-contamination which would otherwise need to be removed by the P&T system. The SVE system removes over approximately a pound a day of PCE. To date over 20,000 pounds of PCE have been removed. The SVE system will continue to operate until EPA believes it is no longer cost effective to do so.

A review of groundwater quality data indicates that the plume of groundwater contamination has decreased significantly in size and in magnitude in the Upper Glacial aquifer since the implementation of the remedy. This indicates that the P&T remedy is working. VOC concentrations and the generally stable trend at ST-MW-15 and ST-MW-19 (and perhaps ST-MW-17) indicate that the plume may not be fully defined in the area to the southwest of the property. Although the PCE concentrations are rather low in ST-MW-20, a deep well located about 450 feet southwest of the SCP, there appears to be an increasing trend in PCE, TCE, and cis-1,2-DCE concentrations. Also, there also appears to be a slight increasing trend in ST-MW-14, just south of the SC building, and ST-MW-18, a deep well about 770 feet southwest of the SCP, which show current PCE levels in the single digits.

EPA and its contractors are reviewing ways to improve the efficiency of the P&T system, as well as ways to reduce costs. As such, current discussions, including those during the Site inspection, considered ways to enhance the removal of PCE from the groundwater, as well as reducing

operating costs. In the future, EPA will be considering air sparging as a possible mechanism for enhancing the removal of PCE from the groundwater. Over the next few months, EPA will be reviewing groundwater data, the current hydrogeologic flow conditions, the operational air sparging technical information available, as well as the current WAGNN operations, to see if such an enhancement of the P&T is feasible.

EPA and its contractors will also review groundwater data and consider ways to further define an apparent increasing trend of contamination in the deep Upper Glacial part of the plume. It may be that additional wells may be needed or that existing wells, not being sampled, need to be included in the existing monitoring network. This determination is expected to be made over the coming months. However, monitoring adjustments will continue to be made as appropriate.

As part of considering cost reduction measures, EPA and its contractors will consider the feasibility of using alternative sampling methods, such as passive diffusion bags. Until such a determination is made regarding potential alternative sampling methods, sampling will continue using low-flow sampling protocols.

The indoor air in adjacent buildings has been routinely monitored over the years, and the concentrations of PCE have decreased. EPA will continue monitoring the selected structures to ensure that indoor air levels remain below EPA's health-based guidelines.

ICs continue to remain in place and effective.

Question B: Are the exposure assumptions, toxicity data, cleanup levels and remedial action objectives used at the time of the remedy still valid?

The remedial activities selected in the OU-1 ROD were necessary in order to reach the remedial action objectives (RAOs):

- to reduce, control or eliminate contaminants in soil and groundwater to the maximum extent practicable;
- to restore the aquifer to its best beneficial use, *i.e.*, a source of drinking water; and,
- to eliminate the potential for human exposure to contaminated Site groundwater, soil and indoor air.

There have been no physical changes to the Site that would affect the protectiveness of the remedy.

Land use assumptions, exposure assumptions and pathways, cleanup levels and RAOs considered in the decision documents remain valid. Through source control via groundwater P&T system and the SVE treatment system, any direct contact exposure pathway has been interrupted through the implementation of the remedy.

Human Health

The exposure assumptions and toxicity data that were used to estimate the potential risks and hazards to human health followed the standard risk assessment paradigm in use at the time. Although specific values for exposure parameters and toxicity data may have changed since the

time the risk assessment was completed, the process that were used is still valid. The cleanup level for PCE of 5 ppb, which is the Federal Maximum Contaminant Level (MCL) is still applicable at this time. Based on the data that was reviewed, the remedial action objectives presented in the ROD are all still valid.

Vapor intrusion and indoor air pose a potential exposure pathway. Vapor intrusion is evaluated when soils and/or groundwater are known or suspected to contain VOCs. At the Site, vapor intrusion was evaluated in the 1999 ROD through indoor air sampling in buildings that were down-gradient of the Stanton Cleaners building. Several buildings had elevated concentrations of PCE in indoor air, and, as a result, remediation systems were installed. The indoor air in these buildings has been routinely monitored, and the concentrations of PCE have decreased. It is recommended that groundwater and indoor air monitoring continue.

Ecological

The 1999 ROD indicated that there were no adverse ecological impacts from site-related contaminants, because there is limited to no ecological habitat present at the Site, and the contaminated groundwater does not discharge to Little Neck Bay. Based on the groundwater data, it appears that the plume has not reached Little Neck Bay; therefore, there are no current exposures to ecological receptors. The evaluation as referenced in the 1999 ROD is still valid.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No.

Technical Assessment Summary

The implemented remedies at the Site continue to protect public health and the environment.

- The groundwater P&T system is working well, in good repair and in good operational order. The P&T system has reduced VOC-contamination in extracted water to non-detect levels and has, to date, discharged over 190 MG of clean groundwater.
- The SVE system is working efficiently, in good repair and in good operational order. To date, the SVE system has removed over 20,000 pounds of PCE from the VOC-contaminated soils.
- Indoor air actions have been implemented and are effective. Indoor air is sampled on a semi-annual basis to ensure compliance with EPA health-based guidelines.
- With respect to ICs, site access agreements are in place. Currently, EPA has secured a lien on the property. Groundwater use and private well-drilling restrictions remain in place and are effective. No further ICs are necessary to safeguard public health with respect to the Site.

VII. ISSUES, RECOMMENDATIONS AND FOLLOW-UP ACTIONS

The remedy has been implemented and is functioning well, as intended by the Site decision documents. There are no additional remedial actions required. The ongoing monitoring program is part of the selected remedy. This review did not identify any significant issues that warrant attention, at this time. However, there are some suggestions included in this report which may enhance the operation and monitoring of the remedy (see Table 3).

VIII. PROTECTIVENESS STATEMENT

The implemented remedy for the Stanton Cleaners Area Groundwater Contamination site protects human health and the environment. There are no exposure pathways that could result in unacceptable risks and none expected as long as the site and groundwater uses remain consistent with the remedy and that the remedy is properly operated, monitored and maintained.

IX. NEXT FIVE-YEAR REVIEW

The next five-year review for the Site should be completed before December 12, 2013.

Approved:

Walter E. Mugdan, Director
Emergency and Remedial response Division

12/12/08
Date