RECORD OF DECISION

Old Roosevelt Field Contaminated Groundwater Area Superfund Site
Garden City, Nassau County, New York

United States Environmental Protection Agency
Region 2
New York, New York
September 2007

DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

Old Roosevelt Field Contaminated Groundwater Area Superfund Site
Garden City, Town of Hempstead, Nassau County, New York

Superfund Site Identification Number: NYSFN0204234

STATEMENT OF BASIS AND PURPOSE

This Record of Decision (ROD) documents the U.S. Environmental Protection Agency's selection of a remedy for the Old Roosevelt Field Contaminated Groundwater Area Superfund Site (Site), which is chosen in accordance with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA), 42 U.S.C. Section 9601, *et seq.*, and the National Oil and Hazardous Substances Pollution Contingency Plan, 40 CFR Part 300. This decision document explains the factual and legal basis for selecting the remedy for the Site. The attached index (see Appendix III) identifies the items that comprise the Administrative Record upon which the selection of the remedy is based.

The New York State Department of Environmental Conservation (NYSDEC) was consulted on the planned remedy in accordance with CERCLA Section 121(f), 42 U.S.C. Section 9621(f), and it does not concur at this time with the Record of Decision pending review of the environmental easement requirements (see Appendix IV).

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from the Site, if not addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to public health, welfare, or the environment.

DESCRIPTION OF THE SELECTED REMEDY

The selected remedy includes the following components:

- Pre-Design Investigation of the Contaminant Plume: A pre-design investigation will be conducted to collect information for the remedial design. The pre-design investigation will include: installation of at least three multiport monitoring wells; a pumping test; and infiltration tests at the Nassau County recharge basin #124.

- Groundwater Modeling: The preliminary three-dimensional groundwater model will be updated for the remedial design. Up-to-date contaminant distribution data will be collected from the pre-design investigation, and used to update the contaminant plume maps. The lithology and Site-specific hydraulic conductivity obtained during literature review and the pumping test will be incorporated into the model.

  The improved groundwater model with up-to-date contaminant data will be used to select the final location(s) of groundwater extraction well(s) and discharge options for treated groundwater for the remedial design.

- Stage II Cultural Resource Survey: If ground intrusion such as well drilling or pipe routing are planned in any areas specified as sensitive for archeological resources during the Stage 1A cultural resource survey, a Stage II survey will be conducted.

- Groundwater Extraction Well: To reduce the contaminant concentrations reaching the two supply wells GWP-10 and GWP-11, a groundwater extraction well(s) will be installed south of SVP/GWM-4. A new remedial extraction well SVP-4E will capture the contaminant plume upgradient of SVP/GWM-4, while ensuring that the pumping capacity of supply wells GWP-10 and GWP-11 is not affected. The final location and number of extraction wells required will be determined after the pre-design investigation is completed and the groundwater model is updated.

- Ex-Situ Groundwater Treatment: A low profile air stripper will remove the volatile organic compound (VOC) contaminants. During the remedial design, additional treatment technologies (including liquid phase carbon adsorption) may be considered if additional information suggests the need for treatment following air stripping. The treated water will meet groundwater and surface water discharge standards.

- Discharge of Treated Groundwater: The treated groundwater will be discharged to the local Nassau County recharge basin #124. During the remedial design, results of infiltration tests will be used to calculate the capacity of the recharge basin. Run-off from a representative rain event will also be calculated to verify the available capacity for treated groundwater discharge.

- Evaluation and Upgrade of the Air Strippers at Supply Wells GWP-10 and GWP-11: An evaluation of the conditions of the air strippers will be conducted. Any necessary upgrade or replacement of the air strippers will be evaluated. The upgrade or replacement costs of the air strippers will be estimated based on the condition of the existing treatment system.

- Vapor Intrusion Sampling: There is concern, based on previous sampling results, that Site-related vapor may migrate into the commercial buildings to the west of the mall. Vapor intrusion sampling will be conducted at six buildings during the winter heating season. Vapor mitigation systems will be installed, if further sampling indicates the need for such systems.

- Institutional Controls: Institutional controls will be relied upon to restrict the future use of groundwater at the Site. Specifically, the New York State Department of Health State Sanitary Code regulates installation of private potable water supply wells in Nassau County. In addition, EPA will rely on the current zoning in the area including and surrounding the mall to restrict the land use to commercial industrial uses. If a change in land use is proposed, additional investigation of soils in this area will be necessary to support the land use change. Regulatory requirements under the State's Superfund program may result in NYSDEC seeking to obtain easements/covenants on various properties within the Site.

- Site Management Plan: A SMP will be developed and will provide for the proper management of all Site remedy components post-construction, such as institutional controls, and shall also include: (a) monitoring of Site groundwater to ensure that, following remedy implementation, the groundwater quality improves; (b) conducting an evaluation of the potential for vapor intrusion, and mitigation, if necessary, in the event of future construction at or in the vicinity of the Site; (c) provision for any operation and maintenance required of the components of the remedy; and (d) periodic certifications by the owner/operator or other person implementing the remedy that any institutional and engineering controls are in place.

- Long-term Monitoring: The contaminant plume will be monitored through annual sampling and analysis of groundwater. The results of the long-term monitoring program will be used to evaluate changes in the contaminant plume over time and to ensure achievement of Maximum Contaminant Levels (MCL)s.

- Contingency Plan: In the event that public supply wells GWP-10 and GWP-11 are taken out of service permanently or are operated at a significant reduction of their current pumping rates, a contingency plan would be implemented to capture and treat the contaminant plume in that area. The contingency plan would include the installation of a new well or wells in the vicinity of supply wells GWP-10 and GWP-11 and an ex-situ treatment system.

- Five-Year Review: Because MCLs will take longer than five years to achieve, it is EPA's policy to conduct a review of Site conditions no less often than once every five years.

DECLARATION OF STATUTORY DETERMINATIONS

The selected remedy meets the requirements for remedial actions set forth in CERCLA Section 121, 42 U.S.C. Section 9621, because it: 1) is protective of human health and the environment; 2) meets a level or standard of control of the hazardous substances, pollutants and contaminants, which at least attains the legally applicable or relevant and appropriate requirements under federal and state laws; 3) is cost-effective; and 4) utilizes permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable. In keeping with the statutory preference for treatment that reduces toxicity, mobility, or volume of contaminated media as a principal element of the remedy, the contaminated groundwater will be treated.

Because this remedy will result in hazardous substances, pollutants, or contaminants remaining on-Site above levels that allow for unlimited use and unrestricted exposure, a statutory review will be conducted within five years after initiation of the remedial action to ensure that the remedy is, or will be, protective of human health and the environment.

ROD DATA CERTIFICATION CHECKLIST

The ROD contains the remedy selection information noted below. More details may be found in the Administrative Record file for this Site.

- Contaminants of concern and their respective concentrations (see ROD, pages 7-11 and Appendix II, Tables 1-6);
- Baseline risk represented by the contaminants of concern (see ROD, pages 12-18);
- Cleanup levels established for contaminants of concern and the basis for these levels (see ROD, Appendix II, Table 1);
- Manner of addressing source materials constituting principal threats (see ROD, page 27);
- Current and reasonably-anticipated future land use assumptions and current and potential future beneficial uses of groundwater used in the baseline risk assessment and ROD (see ROD, pages 12-18);
- Potential land and groundwater use that will be available at the Site as a result of the selected remedy (see ROD, page 32);

- Estimated capital, annual operation and maintenance, and present-worth costs; discount rate; and the number of years over which the remedy cost estimates are projected (see ROD, page 31); and

- Key factors used in selecting the remedy (*i.e.*, how the selected remedy provides the best balance of tradeoffs with respect to the balancing and modifying criteria, highlighting criteria key to the decision)(see ROD, pages 32-35).

AUTHORIZING SIGNATURE

George Pavlou, Director
Emergency and Remedial Response Division

9/28/07
Date

RECORD OF DECISION FACT SHEET
EPA REGION 2

Site

Site name:	Old Roosevelt Field Contaminated Groundwater Area Site
Site location:	Garden City, Nassau County, New York
HRS score:	100.00
Listed on the NPL:	May 11, 2000

Record of Decision

Date signed:	September 28, 2007
Selected remedy:	Extraction of contaminated groundwater with ex-situ treatment and discharge of the treated water to a nearby recharge basin, installation of vapor mitigation systems at commercial buildings, if necessary, evaluation of the wellhead treatment at two Garden City supply wells, institutional controls, a site management plan, and long-term monitoring.
Capital cost:	$6,240,000
Annual operation and maintenance cost:	$850,000 for years 1 through 10, $175,000 for years 10 through 25 and $111,000 for years 26 through 35.
Present-worth cost:	$13,160,000

Lead	EPA
Primary Contact:	Caroline Kwan, Remedial Project Manager, (212) 637-4275
Secondary Contact:	Angela Carpenter, Chief, Eastern New York Remediation Section, (212) 637-4263

Main PRPs	None identified to date

Waste

Waste type:	Chlorinated Volatile Organic Compounds in Groundwater

Waste origin: On-Site spills/discharges

Contaminated media: Groundwater, Air

DECISION SUMMARY

Old Roosevelt Field Contaminated Groundwater Area Superfund Site
Garden City, Nassau County, New York

United States Environmental Protection Agency
Region 2
New York, New York
September 2007

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ATTACHMENTS

SITE NAME, LOCATION, AND DESCRIPTION

The Old Roosevelt Field Contaminated Groundwater Area Superfund Site (Site) is an area of groundwater contamination within the Village of Garden City, Town of Hempstead, in central Nassau County, New York. Figures 1 and 2 provide a Site location and a Site map, respectively. The Site is located on the eastern side of Clinton Road, south of the intersection with Old Country Road, and includes the area of the former Roosevelt Field airfield. The former Roosevelt Field airfield area is currently developed as a large retail shopping mall with a number of restaurants, and a movie theater. Several office buildings (including Garden City Plaza) are on the western perimeter of the mall and share parking space with the mall. A thin strip of open space along Clinton Road (known as Hazelhurst Park) serves as designated parkland and a buffer between the residential community and the mall complex. Two recharge basins are directly east and south of the mall area. The eastern basin is known as Pembrook Basin and is on property owned by the mall. The basin situated to the south is Nassau County Recharge Basin number 124.

Two municipal supply well fields are located south (downgradient) of the former airfield. The Village of Garden City public supply wells (designated as Wells 10 and 11) are located just south of the airfield boundary, on the eastern side of Clinton Road. The Village of Hempstead Wellfield is located approximately 1 mile south of the Garden City supply wells.

SITE HISTORY AND ENFORCEMENT ACTIVITIES

Site History

The Site was used for aviation activities from 1911 to 1951. The original airfield was known as the Hempstead Plains Aerodrome and encompassed 900 to 1,000 acres east of Clinton Road and south of Old Country Road. By the time the field opened in July 1912, there were 5 cement and 30 wooden hangars along Old Country Road, 4 grandstands along Clinton Road, and several flying schools. At least two aviators built aircraft at the field in 1912, including the first all-metal monoplane in America. During its first three years, activities at the airfield included civilian flight training, equipment testing, and aerial stunt shows.

The United States (U. S.) military began using the Hempstead Plains field prior to World War I. The New York National Guard First Aero Company began training at the airfield in 1915, and in 1916 the U.S. Army used the field to train Army and Navy officers. When the U. S. entered World War I in April 1917, the airfield was taken over as a training center for military pilots and renamed Hazelhurst Field. The Army removed the grandstands, built barracks along Clinton Road, and built larger hangars along Old Country Road. In 1918, the Army changed the name of the airfield to Roosevelt Field in honor of Quentin Roosevelt, a son of Theodore Roosevelt who had trained there and was killed during the war. Roosevelt Field was used throughout the war to train aviators.

After the war, the U. S. Air Service authorized aviation-related companies to operate from Roosevelt Field, but maintained control until July 1, 1920, at which time the Government sold its improvements on the airfield and relinquished control of the field. Subsequently, the property owners sold portions along the southern edge of the field and split the remainder of the property into two flying fields with an incline between them. The eastern half, with sod runways and only two hangars, continued as Roosevelt Field. The western half, which had many hangars, flying schools, and aviation maintenance shops, became known as Curtiss Field.

By 1929, the eastern field (Roosevelt) had served as the starting point or terminus of many notable flights, including Lindbergh's takeoff for his historic trans-Atlantic flight in May 1927. The western field (Curtiss) was used for flying circuses, a flying school, aircraft sales and service, and flight tests. Both fields were bought in 1929 by Roosevelt Field, Inc., and the property was once again called Roosevelt Field. Improvements were quickly made, including the installation of several large steel and concrete buildings for hangars, shops, and office space along Old Country Road. As of November 1929, numerous aviation-related businesses operated in the hangars and other buildings surrounding the western field. By 1932, paved runways and 50 buildings made Roosevelt Field the country's largest and busiest civil airfield. While the western field developed into the large aviation center that continued to operate throughout the 1930s, the eastern field remained unpaved, with few buildings, until it was leased in 1935 and became a racetrack.

Roosevelt Field was used by the Navy and Army during World War II. In July 1939, the Army Air Corps contracted Roosevelt Field, Inc. to provide airplane and engine mechanics training to Army personnel at their school. In early 1941, there were more than 200 Army students and approximately 600 other students at the Roosevelt Aviation School. At the beginning of 1942, after the U.S. had entered the war, civilian flying and private hangar rental had ceased at Roosevelt Field due to a ban on private flying in defense areas.

As of March 1942, there were 6 steel/concrete hangars, 14 wooden hangars, and several other buildings at Roosevelt Field. The Army training school was concentrated in buildings located along Clinton Road. In addition to the training activities, the Roosevelt Field facilities were used to receive, refuel, crate, and ship Army aircraft.

The Navy also used Roosevelt Field during World War II. In November 1942, the Navy Bureau of Aeronautics established a modification center at Roosevelt Field to install British equipment into U.S. aircraft for the British Royal Navy. The Navy leased five steel/concrete hangars along Old Country Road and built a barracks, mess hall, and sick bay and designated this installation as the U.S. Naval Air Facility (NAF) Roosevelt Field by February 1943. By September 1943, the Navy had built wooden buildings between four of the hangars, and in October 1943 leased six additional hangars. NAF Roosevelt Field was responsible for aircraft repair and maintenance, equipment installation, preparation and flight delivery of lend-lease aircraft, and metal work required for the installation of British modifications. The metal work constituted a substantial portion of the facility's work load. The facility also performed salvage work of crashed Royal Navy planes. The Navy vacated all but six hangars shortly after the war ended, and removed their temporary buildings by the time their lease expired on June 30, 1946. Restoration of buildings and grounds was completed by August 1946, and Roosevelt Field operated as a commercial airport until it closed in May 1951.

Soon after the airfield closed, the large Roosevelt Field Shopping Center was constructed at the Site and opened in 1957. The old field is currently the Site of the shopping mall and office building complexes, the Meadowbrook Parkway and is surrounded by commercial areas and light industry. Three of the old Navy hangars remained standing until some time after June 1971, with various occupants, including a moving/storage firm, discotheque, amusement center, and bus garage.

It is likely that chlorinated solvents were used at Roosevelt Field during and after World War II. Chlorinated solvents such as tetrachloroethene (PCE) and trichloroethene (TCE) have been widely used for aircraft manufacturing, maintenance, and repair operations since about the 1930s. Beginning in the late 1930s, the U.S. military issued protocols for use of solvents such as TCE for cleaning airplane parts and for de-icing. The types of airplanes designated for solvent use were present at Roosevelt Field during World War II. The finish specifications for at least one type of plane that the Navy modified at Roosevelt (eight of which were on Site in April 1943) called for aluminum alloy to be cleaned with TCE. An aircraft engine overhaul manual issued in January 1945 specified TCE as a degreasing agent.

Wells 10 and 11 were installed by the Village of Garden City in 1952 and were put into service in 1953. Well 10 is screened from 377 to 417 feet below the ground surface (bgs) and well 11 is screened from 370 to 410 feet bgs. Both wells have shown the presence of PCE and TCE since they were first sampled in the late 1970s and early 1980s, and concentrations increased significantly until 1987, when an air-stripping treatment system was installed to treat the water from the wells. Sampling results of treated well water from May 1993, September 1995, and June/July 1999 indicated that breakthrough of the treatment system had occurred. The highest levels of volatile organic compound (VOC) contamination were noted during the mid-to late 1990s, and have steadily declined since then, although the levels remain above EPA and New York State (NYS) drinking water standards.

In addition to the Village of Garden City supply wells, seven cooling water wells in the mall area pumped contaminated groundwater from the Magothy aquifer for use in the air conditioning systems of the mall building and the office buildings west of the mall. Cooling water wells pumped variable amounts of water, with greater extraction rates during the hot summer months. These wells operated from approximately 1960 to 1985. After the contaminated groundwater was used in air conditioning systems, the untreated water was returned to the aquifer system via surface recharge, first to the Pembrook recharge basin and later to a drain field west of 100 Garden City Plaza and 200 Garden City Plaza.

The discharge of contaminated water into the recharge basin and drain field continued up to 1985 when the cooling water wells were taken out of service due to the presence of VOCs in the groundwater. Surface discharge of contaminated groundwater spread contamination through the Upper Glacial and Magothy aquifers. The recharge basin and drain field also created localized groundwater mounding, which may have spread contamination at the water table. However, the sandy nature of the recharge basin soils likely did not result in retention of VOCs within the soils. In addition, the zone below the recharge basin has been flushed with stormwater runoff for 20 years; residual contamination from Roosevelt Field is not likely to remain in the area. The Pembrook recharge basin currently only receives surficial stormwater runoff from parking lots surrounding the mall and the office buildings. The drain field/diffusion wells near 100 Garden City Plaza are under the paved parking lot west of 100 Garden City Plaza and 200 Garden City Plaza and are not currently identifiable in the field. Significant groundwater contamination is present at depth at SVP/GWM-4, which is located near the general area of the diffusion wells/drain field.

Enforcement Activities

EPA's search for potentially responsible parties (PRPs) is ongoing. EPA has not yet identified any financially viable parties that would be responsible under CERCLA for the Site. If PRPs are identified, EPA will seek to have them perform or pay the cost of EPA's investigation and cleanup.

HIGHLIGHTS OF COMMUNITY PARTICIPATION

EPA conducted an RI/FS at the Site from 2001-2007. The findings are presented in a remedial investigation (RI) report[1] and feasibility study (FS) report[2]. EPA's preferred remedy and the basis for the preferred remedy was identified in a Proposed Plan. These documents were made available to the public in information repositories maintained at the following locations: (1) EPA Docket Room in the Region 2 offices at 290 Broadway in Manhattan; (2) at the Garden City Library located at 60 Seventh Street, Garden City, New York; and, (3) the Hempstead Library located at 115 Nichols Court, Hempstead, New York. A notice of the commencement of the public comment period, the public meeting date, a summary of the preferred remedy, EPA contact information, and the availability of the above-referenced documents was published in the *Garden City News* and *Garden City Life*

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1 *Final Remedial Investigation Report, Old Roosevelt Field Contaminated Groundwater Area Site, Remedial Investigation/Feasibility Study, Garden City, New York*, Volumes I and II, CDM Federal Programs Corporation, July 24, 2007.

2 *Final Feasibility Study Report, Old Roosevelt Field Contaminated Groundwater Area Site, Remedial Investigation/Feasibility Study, Garden City, New York*, Volumes I and II, CDM Federal Programs Corporation, August 20, 2007.

on August 20, 2007 and in the *Garden City News* on August 24, 2007 and in *Garden City Life* on August 31, 2007. The public comment period ran from August 22, 2007 to September 20, 2007. EPA held a public meeting on September 11, 2007, at 7:00 P.M. at the Village of Garden City Village Hall to present the findings of the RI/FS and to answer questions from the public about the Site and the remedial alternatives under consideration. Approximately 25 people, including residents, local business people, and state and local government officials, attended the public meeting. On the basis of comments received during the public comment period, the public generally supports the selected remedy. Public comments were related to remedy details, cost recovery by the Village of Garden City for past treatment of contaminated groundwater and a schedule for implementation of the remedy. Responses to written comments that were received during the public comment period and to comments received at the public meeting are included in the Responsiveness Summary (see Appendix V).

SCOPE AND ROLE OF THE OPERABLE UNIT

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR Section 300.5, defines an operable unit as a discrete action that comprises an incremental step toward comprehensively addressing Site problems. A discrete portion of a remedial response eliminates or mitigates a release, threat of a release, or pathway of exposure. The cleanup of a site can be divided into a number of operable units, depending on the complexity of the problems associated with the site. This response action applies a comprehensive approach to the Site; therefore, only one operable unit is required to remediate the Site.

The primary objectives of this action are to remediate the groundwater contamination at the Site, to reduce and minimize the potential for migration of contaminants, and to minimize any potential future health and environmental impacts.

SUMMARY OF SITE CHARACTERISTICS

RI-related field investigation activities included the collection of groundwater through multi-port monitoring wells installed during the RI, existing monitoring wells, municipal supply wells, and collection of soil gas, air/vapors, and soil samples. Associated activities included synoptic water level measurements, an ecological assessment, and a cultural resources survey. The results of the RI are summarized below.

The Site lies within the Atlantic Coastal Plain. The topography of the central portion of Nassau County is characterized by a gently southward-sloping glacial outwash plain. Two linear chains of hills, the remnants of two glacial terminal moraines, border the outwash plain to the north. The southern limit of the outwash plain is defined by the low-lying salt marshes, tidal inlets and creeks, and beach-barrier islands along the Atlantic coast of southern Long Island. The southern chain of morainal hills, the Ronkonkoma moraine, extends from Queens eastward to form the South Fork of Long Island. The northern chain of hills, the Harbor Hill moraine, extends eastward to form the North Fork of Long Island. The moraines converge to the west of Nassau County. The Ronkonkoma moraine reaches elevations of up to 400 feet above mean sea level (msl).

The Site is flat to gently undulating. The Site slopes from approximately 100 feet above msl along Old Country Road down to approximately 70 feet above msl about 4,000 feet south-southwest of Roosevelt Field, along Clinton Road. The Roosevelt Field shopping center is located on a flat area originally called Hempstead Plains, which is at an elevation of approximately 90 feet above msl.

No naturally-occurring surface water bodies are present in the vicinity of the Site. The closest stream is East Meadow Brook, which is about 1.5 miles southeast of the Site and flows south towards Great South Bay and the Atlantic Ocean. The largest body of freshwater near the Site is Hempstead Lake, located at the head of Millbrook Creek, approximately four miles south of the Site. In general, the sandy nature of natural soils on Long Island promotes fast infiltration of precipitation (rainwater) from the ground surface. Almost the entire Site area is paved or is occupied by buildings; therefore, any surface rainwater runoff is routed into storm water collection systems and commonly is discharged directly to either dry wells or recharge/detention basins.

The Pembrook recharge basin and two Nassau County recharge basins are man-made water table recharge basins located at the Site. One of the Nassau County basins is located immediately south of the Pembrook Basin, approximately 1,500 feet southwest of the Roosevelt Field Shopping Center; the other county recharge basin is located about 1,000 feet southeast of the shopping center. The privately-owned Pembrook Basin receives surface water runoff during storm events. The Nassau County basins receive storm runoff from the municipal storm water collection system.

The Site is located within the Atlantic Coastal Plain Physiographic Province. The geology of Long Island is characterized by a southeastward-thickening wedge of unconsolidated sediments unconformably overlying a gently-dipping basement bedrock surface. The wedge ranges in thickness from zero feet beneath Long Island Sound to the north, on the submerged western margin of the Coastal Plain, to more than 2,000 feet under the southern shores of Long Island. In the vicinity of the Site the sedimentary units thicken from about 800 feet at the northern edge of the Town of Hempstead to approximately 1,500 feet thick beneath the barrier islands.

The geologic units consist of:

- Basement - Precambrian to Early Paleozoic igneous or metamorphic bedrock
- Raritan Formation - Cretaceous Lloyd Sand Member (sand and gravel) and the overlying Raritan Clay Member (clay and silt)

- Magothy Formation - Cretaceous fine to medium quartz sand, interbedded clayey sand with silt, clay, and gravel interbeds or lenses
- Pleistocene Deposits - the fluvial Jameco Gravel, the marine Gardiners Clay, and the Upper Glacial deposits

The Upper Glacial Pleistocene sediments and the Magothy Formation are the geologic units of interest for the Site.

The Upper Glacial and Magothy aquifers are unconfined and form a single aquifer unit, albeit with different properties. They are the most productive and heavily utilized groundwater resources on Long Island. The depth to the water table ranges from 25 to 50 feet bgs. Average transmissivities are 32,160 square feet per day (ft^2/d) for the Magothy aquifer and 26,800 ft^2/d in the Upper Glacial aquifer. Average hydraulic conductivities are 228 feet per day (ft/d) in the Upper Glacial and 174 in the Magothy.

Horizontal velocity in the Upper Glacial aquifer generally ranges from 1 to 2 feet per day (ft/d). Based on Site-specific values, the average horizontal flow rate for the Magothy is 1.8 ft/d, although literature values are estimated to be 0.3 ft/d. Based on measurements in the eight multi-port wells and the existing wells, groundwater flow is to the south/southwest. Pressure measurements in the ports indicate the vertical groundwater flow is downward. The five multi-port wells in the mall area have similar vertical gradients, with the differences between water levels in the shallow and deep ports within each well ranging from 1.8 to 2.9 feet. Further to the south, the vertical gradients become larger: 3.2 feet in SVP/GWM-7; 8.2 feet in SVP/GWM-8, and 9.7 in SVP/GWM-6. The higher vertical gradients in SVP/GWM-8 and SVP/GWM-6 are most likely caused by pumping at the Village of Hempstead public supply wells, about a block from multi-port wells SVP/GWM-6 and SVP/GWM-8.

SUMMARY OF REMEDIAL INVESTIGATION RESULTS

Chlorinated volatile organic compounds (VOCs) are the predominant contaminants in the groundwater at the Site. Although a number of organic compounds related to gasoline were detected in the Site groundwater, they could not be attributed to operations at the Site. The chemicals of concern (COCs) identified for the Site are TCE, PCE, 1,1-dichloroethene, cis-1,2-dichloroethene, and carbon tetrachloride.

The sample results for the various media are summarized below.

Groundwater

EPA and the New York State Department of Health have promulgated health-based protective Maximum Contaminant Levels (MCLs), which are enforceable standards for various drinking water contaminants. MCLs ensure that drinking water does not pose either a short- or long-term health risk to the public. Table 1 summarizes the MCLs for the COCs.

Eight multi-port monitoring wells were drilled during the RI (see Figure 3). Four wells, each with ten ports, were installed in the Roosevelt Field mall area. One upgradient (background) well with ten ports is located on the north side of Old Country Road and three wells, each with six ports, are located in the downgradient area, south of two Village of Garden City supply wells. Two rounds of groundwater samples were collected from the eight multi-port wells (64 ports), ten existing monitoring wells and the two Garden City supply wells (see Figure 3). The concentrations for each of the COCs detected in the sampled wells are summarized in Tables 2 through 5.

The highest levels of PCE and TCE (350 and 280 micrograms per litre (µg/L), respectively) are concentrated at SVP/GWM-4 at approximately 250 to 310 feet deep. It should be noted that the SVP/GWM-4 location was selected for monitoring because of the well/drain field that was operated in the area during the 1980s, to dispose of cooling water contaminated with the Site-related VOCs. The next highest levels occur downgradient (to the south) of SVP/GWM-4 in existing well GWX-10019, at a slightly shallower depth at approximately 223 to 228 feet below ground surface (bgs), and at the two supply wells GWP-10 and GWP-11, at approximately 370 to 417 feet deep. Figures 4 and 5 show the TCE and PCE groundwater contamination in the mall area. Multi-port well SVP/GWM-7, located southwest of the supply wells, showed 20 µg/L of TCE and 7.7 µg/L of PCE at approximately 310 to 315 feet. Further downgradient, monitoring well SVP/GWM-8, installed during the RI, showed 34 µg/L of PCE at approximately 100 to 105 feet and 57 µg/L of PCE at the same depth from round 1 and round 2 sampling, respectively. TCE was detected at levels below the MCL in both rounds. Monitoring well SVP/GWM-6 showed a detection of 8.2 µg/L of TCE at 245 to 250 feet in round 1 and 2.3 µg/L in round 2 at the same depth. PCE was detected in several depths during both sampling rounds, but at levels below the MCL.

GWP-10 and GWP-11 each have a capacity to pump approximately one million gallons per day (mgd) of groundwater from the Magothy aquifer. Groundwater flow and contaminant movement is downward and south from the mall area to the Garden City supply wells. Contamination was observed south (downgradient) of the Garden City supply wells, as observed in the wells sampled.

Further downgradient of the supply wells, PCE and TCE contaminant levels in the most downgradient multi-port well (SVP/GWM-8) are seen at shallower depths than in the mall area. Other sources of VOC contamination in the area south of the Site may have contributed to the contamination of SVP/GWM-8 and therefore are not Site-related.

The Village of Hempstead Water Supply Wellfield, approximately one block south (downgradient) of multi-port monitoring wells SVP-6 and SVP-8, has been contaminated with VOCs since the 1980s. Two of the wells in the Village of Hempstead Wellfield showed detections of 11.8 µg/L (well screened from 390-542 feet bgs) and 9.2 µg/L (well screened from 344 - 444 feet bgs) of TCE early this year through their routine monitoring. The source of this contamination is currently unknown since several potential sources are located in the vicinity of the Hempstead Wellfield.

Soil Gas

Two types of soil gas samples were collected: a screening survey on a 100-foot grid on the northern and western sides of the mall parking lot (see Figure 6) and laboratory samples collected around Garden City Plaza Buildings 100 and 200, 100 Ring Road, and in Hazelhurst Park (see Figure 7). A total of 34 samples were collected for laboratory analysis. EPA also collected soil samples at soil gas screening locations that exceeded 100 parts per billion per volume (ppbv) and at selected locations in Hazelhurst Park adjacent to Clinton Road (summarized below).

Soil gas screening criteria were selected from the EPA 2002 document titled "*Draft Document for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soil*". This document provides potential screening criteria for VOCs based on risk levels and the depth of the sample. The Site-specific soil gas screening criteria shown on Table 6.

Soil Gas Screening Results: Soil gas screening samples were collected at the nodes of a 100-foot by 100-foot grid from 158 locations in a large portion of the paved and unpaved areas of the Site bordering Old Country Road and Clinton Road. Soil gas screening results from approximately 15 feet bgs and 35 feet bgs are summarized below and shown on Figures 8 and 9.

<u>15 Feet bgs</u>: Five of the samples collected at approximately 15 feet bgs had total VOC readings above 100 ppbv.

- Location A0 - This location is at the corner of Old Country Road and Clinton Road. The total VOC reading was 106 ppbv.
- Location A11 - This location borders Clinton Road in Hazelhurst Park. The total VOC reading was 136 ppbv.
- Location D17 - This location is just west of 100 Garden City Plaza. The total VOC reading was 531 ppbv.
- Location D19 - This location is west of 200 Garden City Plaza. The total VOC reading was 534 ppbv.
- Location F20 - This location is south of 200 Garden City Plaza. The total VOC reading was 163 ppbv.

Of the soil gas readings collected at approximately 15 feet bgs, 85 percent were at or below 10 ppbv; 8 percent were between 11 and 50 ppbv, and 4 percent were between 51 and 100 ppbv.

35 Feet bgs: Seven of the samples collected at approximately 35 feet bgs had total VOC readings above 100 ppbv, as described below.

- Locations A9, A10, and A11 - These locations border Clinton Road in Hazelhurst Park. The total VOC readings were 245 ppbv, 233 ppbv, and 148 ppbv, respectively.
- Location D17 - This location is just west of 100 Garden City Plaza. The total VOC reading was 494 ppbv.
- Location E14 - This location is north of the northeast corner of 100 Garden City Plaza. The total VOC reading was 211 ppbv.
- Location H1 - This location is southeast of the Citibank building, near the entrance road to the mall. The total VOC reading was 152 ppbv.
- Location K0 - This location is on the eastern side of the mall entrance road. The total VOC reading was 185 ppbv.

Of the soil gas readings collected at approximately 35 feet bgs, 83 percent were at or below 10 ppbv; 9 percent were between 11 and 50 ppbv, and 2.5 percent were between 51 and 100 ppbv.

Soil Gas Analytical Results: Soil gas samples were collected in Summa canisters for laboratory analysis at 15 feet bgs at 30 locations adjacent to 100 Garden City Plaza, 200 Garden City Plaza, and at 100 Ring Road. In addition, six canister samples (from four different locations) were collected from Hazelhurst Park (the grassy strip along Clinton Road) where the screening survey results were elevated. Detections of COC VOCs are shown on Figure 10 and are summarized below.

TCE detections exceeded the screening criterion for deep soil gas of 2.2 micrograms per cubic meter ($\mu g/m^3$) (see Table 6) in one sample near 200 Garden City Plaza (SGRF-25 at 23$\mu g/m^3$). Three samples collected in Hazelhurst Park had TCE detections that exceeded the criterion (SGHP-2 at 3.9J, SGHP-3 at 12, and SGHP-4 at 3J $\mu g/m^3$). PCE did not exceed the screening criterion shown on Table 6.

Numerous other VOCs were detected at very low levels in the soil gas samples collected near the buildings and along Hazelhurst Park. None exceeded the screening criteria and most are associated with gasoline.

Vapor Intrusion

Based on the results of the soil gas screening, EPA is conducting an investigation of indoor air of structures within the area that could potentially be affected by intrusion of vapors from the groundwater contamination plume (summarized below). EPA would implement an appropriate remedy (such as subslab ventilation systems) based on the investigation results.

EPA collected two rounds of vapor samples in April and June 2007. The first round of sampling in April included subslab samples collected underneath the concrete slabs at four commercial buildings on the west side of the Roosevelt Field mall complex.

Based on the Round 1 results, in June 2007 EPA collected a second round of subslab and indoor air samples at six commercial buildings at the Site. No indoor samples were above levels of concern in any of the buildings. Also in June 2007, EPA collected subslab samples at seven homes located west of Clinton Road adjacent to the Roosevelt Field mall/office complex.

Additional evaluation of the residential and commercial buildings will take place to determine the extent of the vapor intrusion impacts.

Soils

A total of 41 subsurface soil samples were collected from 12 soil borings at locations with soil gas screening results above 100 ppbv and at 7 additional locations in Hazelhurst Park.[3] Soil samples were generally collected at 2 depths, 15 and 40 feet bgs, although the actual depths of samples were adjusted slightly because the drilling rig occasionally encountered obstacles in the subsurface.

No VOCs exceeding the detection limit of 5 micrograms per kilogram (µg/kg) were detected in any of the soil samples collected. While it is believed that airfield activities were the source of the groundwater contamination identified in the RI, based on the results of the soil gas and soil borings, there do not appear to be any continuing sources in the soil in the areas that were sampled.

Contamination Fate and Transport

The persistence of contaminants is determined by the rate of degradation, velocity of the groundwater, the geochemical conditions in the aquifer, and the retardation coefficient (Kd) of the individual compounds. The Kd values for the COC VOCs show that they will have low adsorption to the materials in the aquifer. No residual sources in the unsaturated zone were identified.

The COCs are mobile and are expected to move with the groundwater, although at a slower rate. Natural attenuation via biodegradation appears to be limited, and due to the high oxygen levels found in the aquifer, is not likely to sufficiently reduce contaminant levels. Limited natural attenuation, however, is expected to occur through dilution and dispersion.

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[3]Analytical Report prepared by Lockheed Martin, Inc. (Air Results), June 2007; Analytical Report prepared by Lockheed Martin, Inc. (Air Results), August 2007; Analytical Report prepared by Lockheed Martin, Inc., (Soil Results), August 2007.

CURRENT AND POTENTIAL FUTURE SITE AND RESOURCE USES

The Site includes a large shopping mall, numerous restaurants, a movie theater, and office buildings which ring the shopping mall. Most of the open space at the Site is asphalt parking areas for the shopping mall and office buildings. Other parts of the Site include the two Village of Garden City supply wells, two recharge basins and a small strip of open space known as Hazelhurst Park just east of Clinton Road. The use of the Site in the future is unlikely to change.

SUMMARY OF SITE RISKS

As part of the RI/FS, EPA conducted a baseline risk assessment to estimate the current and future effects of contaminants on human health and the environment. A baseline risk assessment is an analysis of the potential adverse human health and ecological effects of releases of hazardous substances from a site in the absence of any actions or controls to mitigate such releases, under current and future land uses. The baseline risk assessment includes a human health risk assessment and an ecological risk assessment. It provides the basis for taking action and identifies the contaminants and exposure pathways that need to be addressed by the remedial action. This section of the ROD summarizes the results of the baseline risk assessments for this Site.

Human Health Risk Assessment

A four-step process is utilized for assessing site-related human health risks for a reasonable maximum exposure scenario: *Hazard Identification* – uses the analytical data collected to identify the contaminants of potential concern at the Site for each medium, with consideration of a number of factors explained below; *Exposure Assessment* - estimates the magnitude of actual and/or potential human exposures, the frequency and duration of these exposures, and the pathways (e.g., ingesting contaminated well-water) by which humans are potentially exposed; *Toxicity Assessment* - determines the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure (dose) and severity of adverse effects (response); and *Risk Characterization* - summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of Site-related risks. The risk characterization also identifies contamination with concentrations which exceed acceptable levels, defined by the NCP as an excess lifetime cancer risk greater than 1×10^{-4} - 1×10^{-6} or a Hazard Index (HI) greater than 1.0. The goal of protection is 10^{-6} for cancer risk and an HI of 1 for a noncancer health hazard. Chemicals that exceed a 10^{-4} cancer risk or an HI of 1 are typically those that will require remedial action at the site and are referred to as COCs in the final remedial decision or Record of Decision. This section also includes a discussion of the uncertainties associated with these risks.

Hazard Identification: In this step, the chemicals of potential concern (COPCs) at the Site in each medium were identified based on such factors as toxicity, frequency of occurrence, fate and transport of the contaminants in the environment, concentrations, mobility, persistence, and bioaccumulation. Analytical information that was collected to determine the nature and extent of contamination revealed the presence of a number of constituents, such as PCE, TCE, carbon tetrachloride, chloroform and benzene in groundwater at concentrations of potential concern. Based on this information, the risk assessment focused on groundwater and the contaminants which may pose significant risk to human health. A comprehensive list of all COPCs can be found in the baseline human health risk assessment (BHHRA) in the administrative record. PCE and TCE, which are the COCs whose concentrations pose a significant risk or hazard at the Site, are listed in Table 7.

Exposure Assessment: Consistent with Superfund policy and guidance, the BHHRA is a baseline human health risk assessment and therefore assumes no remediation or institutional controls to mitigate or remove hazardous substance releases. Cancer risks and noncancer hazard indices are calculated based on an estimate of the reasonable maximum exposure (RME) expected to occur under current and future conditions at the Site. The RME is defined as the highest exposure that is reasonably expected to occur at a site. For those contaminants for which the risk or hazard exceeds acceptable levels, the central tendency estimate (CTE), or the average exposure, was also evaluated.

Current Site land use is primarily commercial, including office buildings and a shopping mall. The neighboring properties are mixed-use (commercial and residential) in nature. Future land use is expected to remain the same, although the unlikely possibility that the mall and office buildings would be developed into a residential area was considered in the BHHRA. Although residents and businesses in the area are served by municipal water, groundwater is designated by the State as a potable water supply, meaning it could be used for drinking in the future. Therefore, potential exposure to groundwater was evaluated. The BHHRA evaluated potential risks to populations associated with both current and potential future land uses.

Exposure pathways were identified for each potentially exposed population and each potential exposure scenario for the groundwater at the Site. Exposure pathways assessed in the BHHRA for the groundwater included ingestion of and dermal contact with tap water. Inhalation of volatile contaminants while showering and bathing was also evaluated for the hypothetical future resident. Based on current and anticipated future use of the Site, the BHHRA considered a variety of possible receptors: the current and future on-site worker and the potential future on-site resident (adult and child). A summary of the exposure pathways included in the baseline human health risk assessments can be found in Table 8.

Typically, exposures are evaluated using a statistical estimate of the exposure point concentration (EPC), which is usually an upperbound estimate of the average concentration for each contaminant, but in some cases may be the maximum detected concentration. A summary of the exposure point concentrations for the COCs in groundwater can be found in Table 7, while a comprehensive list of the exposure point concentrations for all COPCs can be found in the BHHRA.

Toxicity Assessment: Under current EPA guidelines, the likelihood of carcinogenic risks and noncancer hazards due to exposure to Site chemicals are considered separately. Consistent with current EPA policy, it was assumed that the toxic effects of the Site-related chemicals would be additive. Thus, cancer and noncancer risks associated with exposures to individual COPCs were summed to indicate the potential risks and hazards associated with mixtures of potential carcinogens and noncarcinogens, respectively.

Toxicity data for the human health risk assessment were provided by the Integrated Risk Information System (IRIS) database, the Provisional Peer Reviewed Toxicity Database (PPRTV), or other sources that are identified as appropriate references for toxicity values consistent with EPA's directive on toxicity values. This information is presented in Table 9 (noncancer toxicity data summary) and Table 10 (cancer toxicity data summary).

Risk Characterization: Noncarcinogenic (systemic) risks were assessed using a hazard index (HI) approach, based on a comparison of expected contaminant intakes and benchmark comparison levels of intake (reference doses [RfDs], reference concentrations [RfCs]). RfDs and RfCs are estimates of daily exposure levels for humans (including sensitive individuals) which are thought to be safe over a lifetime of exposure. The estimated intake of chemicals identified in environmental media (*e.g.*, the amount of a chemical in soil incidentally ingested) is compared to the RfD or the RfC to derive the hazard quotient (HQ) for the contaminant in the particular medium. The HI is obtained by adding the hazard quotients for all compounds within a particular medium that impact a particular receptor population.

The HQs for oral and dermal exposures are calculated as below. The HQ for inhalation exposures is calculated using a similar model that incorporates the RfC rather than the RfD.

HQ = Intake/RfD

Where: HQ = hazard quotient
Intake = estimated intake for a chemical (mg/kg-day)
RfD = reference dose (mg/kg-day)

The intake and the RfD represent the same exposure period (i.e., chronic, subchronic, or acute).

As previously stated, the HI is calculated by summing the HQs for all chemicals for likely exposure scenarios for a specific population. An HI greater than 1.0 indicates that the potential exists for noncarcinogenic health effects to occur as a result of Site-related exposures, with the potential for health effects increasing as the HI increases. When the HI calculated for all chemicals for a specific population exceeds 1.0, separate HI values are then calculated for those chemicals which are known to act on the same target organ. These discrete HI values are then compared to the acceptable limit of 1.0 to evaluate the potential for noncancer health effects on a specific target organ. The HI provides a useful reference point for gauging the potential significance of multiple contaminant exposures within a single medium or across several media. A summary of the noncarcinogenic risks associated with these chemicals for each exposure pathway is contained in Table 11.

As seen in Table 11, noncancer hazards for the on-site worker, adult on-site resident, and on-site child resident exceed EPA's HI threshold of 1, at 3, 10 and 35, respectively. Therefore, noncarcinogenic risks may occur from exposure routes evaluated in the risk assessment. The noncarcinogenic risks were attributable primarily to ingestion of TCE in groundwater.

For carcinogens, risks are generally expressed as the incremental probability of an individual developing cancer over a lifetime as a result of exposure to a carcinogen, using the cancer slope factor (SF) for oral and dermal exposures and the inhalation unit risk (IUR) for inhalation exposures. Excess lifetime cancer risk for oral and dermal exposures is calculated from the following equation, while the equation for inhalation exposures uses the IUR, rather than the SF:

Risk = LADD x SF

Where: Risk = a unitless probability (1×10^{-6}) of an individual developing cancer
LADD = lifetime average daily dose averaged over 70 years (mg/kg-day)
SF = cancer slope factor, expressed as [1/(mg/kg-day)]

These risks are probabilities that are usually expressed in scientific notation (such as 1×10^{-4}). An excess lifetime cancer risk of 1×10^{-4} indicates that one additional incidence of cancer may occur in a population of 10,000 people who are exposed under the conditions identified in the assessment. As stated in the NCP, the acceptable risk range for Site-related exposure is 10^{-6} to 10^{-4}, with 10^{-6} being the goal of protection.

As shown in BHHRA and summarized in Table 12, in the unlikely event that untreated Site groundwater were to be used as drinking water, exposure to groundwater contaminated with PCE and TCE would be associated with combined excess lifetime cancer risks of 2×10^{-4} for the future on-site worker, 2×10^{-3} for the future on-site adult resident, and 6×10^{-3} for the future on-site child resident.

These cancer risks and noncancer health hazards indicate that there is significant potential risk from direct exposure to groundwater to potentially exposed populations. For these receptors, exposure to PCE and TCE in groundwater results in both an excess lifetime cancer risk that exceeds EPA's target risk range of 10^{-4} to 10^{-6} and an HI above the threshold of 1. Concentrations of PCE and TCE are also in excess of the Federal and State MCL of 5µg/L for these contaminants. 1,1-Dichloroethene and cis-1,2-dichloroethene are also site-related contaminants that exceeded the MCL of 5µg/L and are therefore considered COCs. Carbon tetrachloride is considered a site-related contaminant, but concentrations did not exceed the MCL of 5 µg/L. However, a cleanup goal has been established (5µg/L) should future sampling indicate that carbon tetrachloride exceeds MCLs.

Based on the soil gas data collected, EPA conducted an investigation of indoor air/vapor intrusion into commercial structures within the area that could potentially be affected by the groundwater contamination plume. EPA is currently planning a further investigation of vapor intrusion into these structures. More information about the vapor intrusion investigation can be found in a separate report in the information repository for the Site. If the results of the investigations indicate that there is concern with Site-related vapors migrating into buildings, EPA would perform mitigation as necessary.

The response action selected in the Record of Decision is necessary to protect the public health or welfare of the environment from actual or threatened releases of contaminants into the environment.

Uncertainties: The procedures and inputs used to assess risks in this evaluation, as in all such assessments, are subject to a wide variety of uncertainties. In general, the main sources of uncertainty include:

- environmental chemistry sampling and analysis;
- environmental parameter measurement;
- fate and transport modeling;
- exposure parameter estimation; and
- toxicological data.

Uncertainty in environmental sampling arises in part from the potentially uneven distribution of chemicals in the media sampled. Consequently, there is significant uncertainty as to the actual levels present. Environmental chemistry-analysis error can stem from several sources including the errors inherent in the analytical methods and characteristics of the matrix being sampled.

Uncertainties in the exposure assessment are related to estimates of how often an individual would actually come in contact with the chemicals of concern, the period of time over which such exposure would occur, and in the models used to estimate the concentrations of the chemicals of concern at the point of exposure.

Uncertainties in toxicological data occur in extrapolating both from animals to humans and from high to low doses of exposure, as well as from the difficulties in assessing the toxicity of a mixture of chemicals. These uncertainties are addressed by making conservative assumptions concerning risk and exposure parameters throughout the assessment. As a result, the risk assessment provides upper-bound estimates of the risks to populations near the Site, and is highly unlikely to underestimate actual risks related to the Site.

More specific information concerning public health risks, including a quantitative evaluation of the degree of risk associated with various exposure pathways, is presented in the BHHRA report.

Summary of Ecological Risks

The initial activities associated with a Screening Level Ecological Risk Assessment (SLERA) were completed for this investigation. The first step was to obtain information regarding the environmental setting and chemical contamination at the Site by compiling information from the Site history and other reports related to the Site. This was followed by collecting additional information related to the ecological resources at the Site regarding threatened and endangered species, as well as utilizing topographical maps and aerial photographs. Finally, a Site visit was performed to obtain detailed information relating to the habitat types present at the Site and to identify the flora and fauna at the Site.

An evaluation of the information and data that was collected was then performed, and the results of the evaluation indicated that a scientific/management decision point (SMDP) was reached. During the SLERA process, there are three possible outcomes that can be reached at the SMDP:

> (1) There is adequate information to conclude that ecological risks are negligible and therefore there is no need for remediation on the basis of ecological risk;
>
> (2) The information is not adequate to make a decision at this point, and the ecological risk assessment process will continue;
>
> (3) The information indicates a potential for adverse ecological effects, and a more thorough assessment is warranted.

As described in preceding sections, VOCs in the groundwater are the primary contaminants, and groundwater is the primary medium of concern at the Site. Given that groundwater does not discharge to a surface water body or any surface features (i.e., the recharge basins) at the Site, which prevents exposure to any potential ecological receptor at the Site, a conclusion can be reached that there are no completed pathways present at the Site for ecological receptors. In addition, most of the land area is paved and there do not appear to be any continuing sources of contamination in the areas sampled, which prevents any potential exposure for ecological receptors. Based on this information, there is adequate information to conclude that ecological risks are negligible and therefore there is no need for remediation on the basis of ecological risk.

Summary of Human Health and Ecological Risks

The results of the risk assessment indicate that exposure of future receptors to untreated Site groundwater presents unacceptable increased cancer risks and noncancer hazards. In addition, groundwater COC concentrations exceed their respective MCLs, thereby posing a potential human health risk.

EPA determined that ecological risks are negligible. VOCs in the groundwater are the primary contaminants and groundwater is the primary medium of concern for the Site. Groundwater does not discharge to a surface water body or surface feature (i.e., recharge basins) at the Site, which prevents exposure to any potential ecological receptors at the Site.

Basis for Action

Based upon the results of the RI and human health risk assessment, EPA has determined that the response action selected in this ROD is necessary to protect the public health or welfare of the environment from actual or threatened releases of hazardous substances into the environment.

REMEDIAL ACTION OBJECTIVES

Remedial action objectives are specific goals to protect human health and the environment. These objectives are based on available information and standards, such as applicable or relevant and appropriate requirements (ARARs), to-be-considered guidance, and Site-specific risk-based levels.

The following remedial action objectives were established for the Site:

- Prevent or minimize potential, current, and future human exposures including inhalation, ingestion, and dermal contact with VOC-contaminated groundwater that exceeds MCLs;
- Minimize the potential for off-site migration of groundwater with VOC contaminant concentrations greater than MCLs;
- Restore groundwater to beneficial use levels within a reasonable time frame, as specified in the National Contingency Plan (NCP); and
- Mitigate, if necessary, Site-related vapor migrating into the commercial buildings.

Groundwater cleanup goals will be the more stringent of the New York State or federal MCLs, which are summarized on Table 1.

SUMMARY OF REMEDIAL ALTERNATIVES

Section 121(b)(1) of CERCLA, 42 U.S.C. §9621(b)(1) mandates that remedial actions must be protective of human health and the environment, cost-effective, comply with ARARS, and utilize permanent solutions and alternative treatment technologies and resource recovery alternatives to the maximum extent practicable. Section 121(b)(1) also establishes a preference for remedial actions which employ, as a principal element, treatment to permanently and significantly reduce the volume, toxicity, or mobility of the hazardous substances, pollutants and contaminants at a site. Section 121(d) of CERCLA, 42 U.S.C. §9621(d) further specifies that a remedial action must attain a level or standard of control of the hazardous substances, pollutants, and contaminants, which at least attains ARARs under federal and state laws, unless a waiver can be justified pursuant to Section 121(d)(4) of CERCLA, 42 U.S.C. §9621(d)(4).

Detailed descriptions of the remedial alternatives for addressing the contamination associated with the Site can be found in the FS report. The FS report presents the three groundwater alternatives summarized below.

The duration time for each alternative reflects the estimated time required for the contaminant levels in the entire groundwater contaminant plume associated with the Site to be reduced below MCLs.

The remedial alternatives are:

Alternative 1: No Action

Capital Cost:	$0
Annual Operation and Maintenance (O&M) Cost:	$0
Present-Worth Cost:	$0
Duration:	46 years

The Superfund program requires that the "no-action" alternative be considered as a baseline for comparison with the other alternatives. The no-action remedial alternative would not include any physical remedial measures to address the groundwater contamination at the Site. The preliminary groundwater model predicted it would take 46 years for the contaminant concentrations in the plume to decrease below the MCLs via natural attenuation processes.

Because this alternative would result in contaminants remaining on-site above levels that allow for unrestricted use and unlimited exposure, CERCLA requires that the Site be reviewed at least once every five years.

Alternative 2: Monitoring and Institutional Controls

Capital Cost:	\$300,000
Annual O&M Cost (4):	\$150,000/\$110,000(5)
Present-Worth Cost:	\$2,290,000
Duration:	46 years

(4) Includes long-term monitoring costs only
(5) The long-term monitoring program would be reduced after 25 years due to the reduction in the size of the plume.

Alternative 2 includes long-term monitoring of the contaminant plume through annual sampling and analysis of 7 existing multi-port wells and 2 existing single-screen monitoring wells (GWX-10019 and GWX-10020).

The results of the long-term monitoring program would be used to evaluate the migration and changes in the contaminant plume over time to ensure attainment of the MCLs. The preliminary groundwater model predicted it would take 46 years for the contaminant concentrations in the plume to decrease below the MCLs via natural attenuation processes. This alternative would also include future vapor intrusion sampling to determine if there is a concern with Site-related vapor migrating into the buildings.

In addition, this alternative would include institutional controls that restrict future use of groundwater at the Site. Specifically, the New York State Department of Health State Sanitary Code regulates installation of private potable water supply wells in Nassau County. In addition, EPA would rely on the current zoning in the area including and surrounding the mall to restrict the land use to commercial industrial uses. If a change in land use is proposed, additional investigation of soils in this area would be necessary to support the land use change. Regulatory requirements under the State's Superfund program may result in NYSDEC seeking to obtain easements/covenants on various properties within the Site.

A site management plan (SMP) would also be developed and would provide for the proper management of all Site remedy components post-construction, such as institutional controls, and shall also include: (a) monitoring of Site groundwater to ensure that, following remedy implementation, the groundwater quality improves; (b) conducting an evaluation of the potential for vapor intrusion, and mitigation, if necessary, in the event of future construction; (c) provision for any operation and maintenance required of the components of the remedy; and (d) periodic certifications by the owner/operator or other person implementing the remedy that any institutional and engineering controls are in place.

Because this alternative would result in contaminants remaining on-site above levels that allow for unrestricted use and unlimited exposure, CERCLA requires that the Site be reviewed at least once every five years.

Alternative 3: Groundwater Extraction and Ex-situ Treatment (Pump and Treat)

Capital Cost:	$6,240,000
Annual O&M Cost:	$850,000/$175,000/111,000[(6)]
Present-Worth Cost:	$13,160,000
Duration:	35 years

(6) O&M and long-term monitoring for years 1-10/long-term monitoring for years 10-25/reduced long-term monitoring for years 25-35.

Alternative 3 includes a groundwater extraction well(s) which would be installed downgradient from monitoring well SVP/GWM-4 (see Figure 11), to capture the portion of the contaminant plume with high PCE and TCE concentrations without impacting the pumping capacity of supply wells GWP-10 and GWP-11, which have a pumping zone of influence radius of approximately 1,000 feet. The number of extraction wells needed would be determined after the completion of the pre-design investigation described below. Extracted groundwater would be treated via air strippers for approximately 10 years, with the treated water expected to be discharged to Nassau County recharge basin #124. Figure 12 shows the approximate location of the treatment facility. Based on the preliminary groundwater model, it is estimated that MCLs would be achieved in the zone of influence of the new pumping well in approximately 10 years, at which time the contamination in the extracted groundwater would have reached drinking water standards (MCLs). It is also noted that at the end of the same 10-year period, the supply wells GWP-10 and 11 would withdraw groundwater, before wellhead treatment, with contamination at or close to MCLs. It would take another 25 years for contaminant residuals in the aquifer to reach MCLs through natural attenuation processes. In summary, the preliminary model estimated that complete restoration of the aquifer to levels below the MCLs would require a total of 35 (10 + 25) years.

Alternative 3 includes a pre-design investigation which would include installation of at least 3 new multi-port wells: one well to the north of existing well GWX-9953 to confirm the northern boundary of the plume, a second well to the west of GWX-9953 to confirm the total depth of the plume, and a third well to the south of the Village of Garden City supply wells to better define the leading edge of the plume. Figure 13 shows the locations of the proposed multi-port wells.

Alternative 3 would also include evaluation and future upgrading, if necessary, of the wellhead treatment at the Garden City supply wells 10 and 11, which have been impacted by Site-related contamination. This wellhead treatment system would be needed until it has been determined that these public supply wells are no longer being impacted by the Site-related contaminants above MCLs.

In addition, if future vapor intrusion investigations indicate that there is a concern with Site-related vapors migrating into the commercial buildings, EPA would perform mitigation, as necessary.

This alternative would also include institutional controls that restrict future use of groundwater at the Site. Specifically, the New York State Department of Health State Sanitary Code regulates installation of private potable water supply wells in Nassau County. In addition, EPA would rely on the current zoning in the area including and surrounding the mall to restrict the land use to commercial industrial uses. If a change in land use is proposed, additional investigation of soils in this area would be necessary to support the land use change. Regulatory requirements under the State's Superfund program may result in NYSDEC seeking to obtain easements/covenants on various properties within the Site.

An SMP would also be developed and would provide for the proper management of all Site remedy components post-construction, such as institutional controls, and shall also include: (a) monitoring of Site groundwater to ensure that, following remedy implementation, the groundwater quality improves; (b) conducting an evaluation of the potential for vapor intrusion, and mitigation, if necessary, in the event of future construction; (c) provision for any operation and maintenance required of the components of the remedy; and (d) periodic certifications by the owner/operator or other person implementing the remedy that any institutional and engineering controls are in place.

Alternative 3 would also include long-term monitoring of the contaminant plume through annual sampling and analysis. For cost estimating purposes, 7 existing multi-port wells, 2 existing single-screen monitoring wells (GWX-10019 and GWX-10020), and the new multi-port wells to be installed as part of the pre-design investigation would be monitored. The results of the long-term monitoring program would be used to evaluate changes in the contaminant plume over time and to ensure achievement of MCLs.

In the event that public supply wells GWP-10 and GWP-11 were to be taken out of service permanently or were to be operated at a significant reduction of their current pumping rates, a contingency plan would be implemented to capture and treat the contaminant plume in that area. The contingency plan would include the installation of a new well or wells in the vicinity of supply wells GWP-10 and GWP-11 and an ex-situ treatment system.

Because MCLs will take longer than five years to achieve, a review of Site conditions will be conducted no less often than once every five years.

Contingency Plan

Capital Cost:	$5,660,000
Annual O&M Cost:	$680,000

As a potential element of Alternatives 3, in the event that public supply wells GWP-10 and GWP-11 were to be taken out of service permanently or were to be operated at a significant reduction of their current pumping rates, a contingency plan would be implemented to capture and treat the contaminant plume in that area. The contingency plan would include the installation of a new well or wells in the vicinity of supply wells GWP-10 and GWP-11 and an ex-situ treatment system.

COMPARATIVE ANALYSIS OF ALTERNATIVES

In selecting a remedy, EPA considers the factors set out in Section 121 of CERCLA, 42 U.S.C. § 9261, by conducting a detailed analysis of the remedial alternatives pursuant to the NCP, 40 CFR §300.430(e)(9) and Office of Solid Waste and Emergency Response (OSWER) Directive 9355.3-01. The detailed analysis consists of an assessment of the alternatives against each of nine evaluation criteria and comparative analysis focusing upon the relative performance of each alternative against those criteria.

The following "threshold" criteria are the most important and must be satisfied by any alternative in order to be eligible for selection:

1. Overall protection of human health and the environment addresses whether or not a remedy provides adequate protection and describes how risks posed through each exposure pathway (based on a reasonable maximum exposure scenario) are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

2. Compliance with ARARs addresses whether or not a remedy would meet all of the applicable or relevant and appropriate requirements of other federal and state environmental statutes and regulations or provide grounds for invoking a waiver. Other federal or state advisories, criteria, or guidance are To-Be-Considered (TBCs). TBCs are not required by the NCP, but may be very useful in determining what is protective of a Site or how to carry out certain actions or requirements.

The following "primary balancing" criteria are used to make comparisons and to identify the major tradeoffs between alternatives:

3. Long-term effectiveness and permanence refers to the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup goals have been met. It also addresses the magnitude and effectiveness of the measures that may be required to manage the risk posed by treatment residuals and/or untreated wastes.

4. Reduction of toxicity, mobility, or volume through treatment is the anticipated performance of the treatment technologies, with respect to these parameters, a remedy may employ.

5. Short-term effectiveness addresses the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period until cleanup goals are achieved.

6. Implementability is the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.

7. Cost includes estimated capital and O&M costs, and net present-worth costs.

The following "modifying" criteria are used in the final evaluation of the remedial alternatives after the formal comment period, and may prompt modification of the preferred remedy that was presented in the Proposed Plan:

8. State acceptance indicates whether, based on its review of the RI/FS reports and Proposed Plan, the State concurs with, opposes, or has no comments on the selected remedy.

9. Community acceptance refers to the public's general response to the alternatives described in the RI/FS reports and Proposed Plan.

A comparative analysis of these alternatives based upon the evaluation criteria noted above follows.

1. Overall Protection of Human Health and the Environment

The HHRA for the Site indicated the potential for risks associated with ingestion of contaminated groundwater by future on-site workers and future on-site adult and child residents. Alternative 1 would not include any monitoring or remedial measures, and as such, would not be protective of public health and the environment. Alternative 2 would only require long-term monitoring of the groundwater plume and institutional controls. As such, Alternative 2 would only be marginally more protective of human health and the environment than Alternative 1 because the groundwater plume would be monitored. Alternative 3 would provide overall protection of human health and the environment through implementation of a pump and treat system to extract and treat the groundwater contamination and natural attenuation processes. Alternatives 1 and 2 would rely solely upon natural processes to restore groundwater quality to drinking water standards. Although more costly than the other two alternatives, Alternative 3, which would include extraction and ex-situ treatment of contaminated groundwater, would result in the restoration of water quality in the aquifer approximately 11 years sooner than natural processes alone.

2. Compliance with ARARs

EPA and NYSDOH have promulgated health-based protective MCLs (40 CFR Part 141, and 10 NYCRR, Chapter 1), which are enforceable standards for various drinking water contaminants. Alternatives 1 and 2 would not comply with chemical-specific ARARs because no groundwater treatment would be undertaken and the groundwater model predicts it would take 46 years for the contaminant levels to drop below MCLs. Alternative 3 would comply with chemical-specific ARARs through active removal and treatment of groundwater contamination. Alternative 3 would also comply with location- and action-specific ARARs that may be applicable to the treatment plant location, any necessary piping to the plant from the extraction well or from the plant to the recharge basin. All work would comply with health and safety ARARs.

3. Long-Term Effectiveness and Permanence

Alternatives 1, 2 and 3 would provide long-term effectiveness and permanence, but in different time frames. Alternatives 2 and 3 would require 46 years for the groundwater contaminant levels to be reduced to levels below the MCLs. Alternative 2 would provide slighter greater long-term effectiveness than Alternative 1 because institutional controls would be employed. Alternative 3 would achieve long-term effectiveness and permanence in 35 years by extracting contaminated groundwater from the aquifer and treating it to remove the contaminants. Alternatives 2 and 3 also would include vapor intrusion sampling and mitigation, if necessary, in six commercial buildings at the Site.

4. Reduction in Toxicity, Mobility, or Volume Through Treatment

Alternatives 1 and 2 would not reduce toxicity, mobility, or volume through treatment since no treatment would be implemented. Alternative 3 would reduce the mobility and volume of the contaminant plume through groundwater extraction and reduce the toxicity through ex-situ treatment using air strippers. Alternative 3 would prevent the contaminant plume with concentrations above the MCLs from migrating downgradient. Alternatives 2 and 3 would also provide for mitigation due to vapor intrusion in the commercial buildings, if deemed necessary.

5. Short-Term Effectiveness

Alternative 1 would not have any short-term impact. Alternative 2 would have minimal short-term impact to the community and the environment due to the annual sampling of wells. Alternative 3 would have some additional impact to the community due to the drilling of wells and the construction of the groundwater extraction well(s) and treatment systems, but the duration would be short and the disturbance would be minimal.

6. Implementability

All three alternatives are implementable. Alternative 1 would be the easiest to implement, since it involves no action. Alternative 2 would be the next easiest to implement, since it only involves annual sampling of monitoring wells and would not have any ground intrusion activities. Alternative 3 would be also be easy to implement but more involved. Access for installation of extraction well(s) and construction of a treatment facility would be required and various contractors would need to be procured. Construction activities could be readily conducted using standard equipment and procedures.

7. Cost

Alternative 1 would not involve any costs. Alternative 2 would have relatively low costs since it only includes annual sampling of monitoring wells and vapor intrusion investigation of the commercial buildings. The costs associated with Alternative 3 primarily reflect the installation and operation of a groundwater extraction and treatment system and vapor intrusion mitigation systems in the commercial buildings, if deemed necessary. Although more costly than the other two Alternatives, Alternative 3 would result in the restoration of water quality in the aquifer approximately 11 years sooner than the natural processes relied on in Alternatives 1 and 2 alone.

Alternative	Capital Cost	Annual O&M	Total Present Worth
1	$0	$0	$0
2	$300,000	$150,000/$110,000(7)	$2,290,000
3*	$6,240,000	$850,000/175,000/110,000(8)	$13,160,000

* If the Contingency Plan is necessary, the capital costs for these alternatives would increase by $5,660,000 and the annual O & M costs would increase by $680,000. The actual present worth value of the contingency plan cannot be calculated, however, if it were to be implemented, the contingency plan would only operate until the MCLs are achieved.
(7) Includes long-term monitoring costs only. The monitoring program would be reduced after 25 years.
(8) O&M and long-term monitoring for years 1-10/long-term monitoring for years 10-25/reduced long-term monitoring for years 25-35.

8. State Acceptance

NYSDEC does not concur with the Record of Decision at this time pending review of the environmental easement requirements (see Appendix IV).

9. Community Acceptance

Comments received during the public comment period indicate that the public generally supports the selected remedy. These comments are summarized and addressed in the Responsiveness Summary, which is attached as Appendix V to this document.

PRINCIPAL THREAT WASTE

No materials which meet the definition of "principal threat wastes" were identified during the RI/FS. Nevertheless, the EPA mandate (NCP Section 300.430 (a)(1)(iii)(F)) which requires that a contaminated sole-source drinking water aquifer be restored to beneficial use is met through treatment of the TCE and PCE groundwater contamination. No evidence was found during the RI that dense nonaqueous phase liquids (DNAPLs) are present within the saturated zone of the aquifer. Soil sample results indicated no VOCs remain in the unsaturated zone in the areas of the former airfield that were sampled. Therefore, no principal threat wastes are present at the Site.

SELECTED REMEDY

Summary of the Rationale for the Selected Remedy

Based upon consideration of the requirements of CERCLA, the detailed analysis of the alternatives, and public comments, EPA has determined that Alternative 3 (groundwater extraction and ex-situ treatment) best satisfies the requirements of CERCLA Section 121, 42 U.S.C. Section 9621, and provides the best balance of tradeoffs among the remedial alternatives with respect to the NCP's nine evaluation criteria listed at 40 CFR Section 300.430(e)(9).

Through groundwater extraction and ex-situ treatment, Alternative 3 will satisfy CERCLA's preference for remedial actions which employ, as a principal element, treatment to permanently and significantly reduce the volume, toxicity, or mobility of the hazardous substances, pollutants and contaminants at a site.

Alternative 3, which includes extraction and ex-situ treatment of contaminated groundwater, will result in the restoration of water quality in the aquifer more quickly than natural processes alone and provide for vapor intrusion mitigation, if deemed necessary.

EPA believes that the preferred remedy will remove contaminated groundwater from the aquifer, be protective of human health and the environment, comply with ARARs, be cost-effective, and utilize permanent solutions to the maximum extent practicable. The preferred remedy also will meet the statutory preference for the use of treatment as a principal element.

Description of the Selected Remedy

The selected remedy includes the following components:

Pre-Design Investigation of the Contaminant Plume: A pre-design investigation will be conducted to collect information for the remedial design. The pre-design investigation will include: installation of three multiport monitoring wells; a pumping test; a literature review; and infiltration tests at the Nassau County recharge basin #124.

The northern boundary and the vertical extent of the contaminant plume will be refined atwell locations SVP/GWM-2 and SVP/GWM-4. A new well, SVP/GWM-9, will be installed to the north of well GWX-9953 to confirm the northern boundary of the plume. A new well, SVP/GWM-10, will be installed to the west of well GWX-10019 to confirm the total depth, the contaminant levels, and the vertical distribution of the contaminant plume at this area. A new well, SVP/GWM-11, will be installed to the south of the two supply wells GWP-10 and GWP-11 to monitor whether contaminants are migrating downgradient from the area directly south of the supply wells (see map at Figure 13). The new multi-port monitoring wells will be installed 40 feet deeper than SVP/GWM-4. The installation of the three new wells will be similar to the multi-port monitoring well installation conducted during the RI. In addition, gamma logs will be run in all new wells to determine lithology.

A pumping test will be conducted to improve the accuracy of the groundwater model. A literature review will be conducted to obtain all available lithology logs of existing wells near the Site. The lithology data obtained from this review and the pre-design investigation gamma logs at the new multiport wells will be used to further refine the groundwater model's Site-specific conditions.

Infiltration tests will also be conducted at the Nassau County recharge basin #124 to obtain information on its current capacity in order to calibrate the groundwater model.

Groundwater Modeling: The preliminary three-dimensional groundwater model will be updated for the remedial design. Up-to-date contaminant distribution data will be collected from the pre-design investigation, and used to update the contaminant plume maps. The lithology and Site-specific hydraulic conductivity obtained during literature review and the pumping test will be incorporated into the model. During the remedial design, the most recent available pumping data and water level data will be used and the model will be re-calibrated accordingly.

The improved groundwater model with up-to-date contaminant data will be used to select the final location(s) of groundwater extraction well(s) and discharge options for treated groundwater for the remedial design.

Stage II Cultural Resource Survey: If ground intrusion such as well drilling or pipe routing are planned in any areas specified as sensitive for archeological resources during the Stage 1A cultural resource survey, a Stage II survey will be conducted.

Groundwater Extraction Well: To reduce the contaminant concentrations reaching the two supply wells GWP-10 and GWP-11, a groundwater extraction well(s) will be installed south of SVP/GWM-4 as shown in Figure 11. A new remedial extraction well SVP-4E will capture the contaminant plume upgradient of SVP/GWM-4, including the 200 µg/L contour of the PCE plume, while ensuring that the pumping capacity of supply wells GWP-10 and GWP-11 is not affected. The final location and number of extraction wells required will be determined after the pre-design investigation is completed and the groundwater model is updated.

The location, screen interval, and pumping rate of new SVP-4E were estimated using the preliminary groundwater model. The proposed pumping rate is 150 gpm with the screened interval from 175 to 275 below msl. The preliminary groundwater model indicated that after

10 years of pumping at SVP-4E, most of the contaminant plume upgradient of this extraction well will be removed. A very small portion of the contaminant plume near SVP-4E will still have concentrations above the MCLs. However, continuous operation of SVP-4E after 10 years was not recommended in the model, because it will not improve the overall cleanup time of the entire plume. As the preliminary groundwater model indicated, the drawdown caused by operation of both the new extraction well (SVP-4E) and the supply wells GWP-10 and GWP-11 may create a low flow zone between the two pumping areas. To the north of this low flow zone, groundwater flows toward SVP-4E; to the south of this low flow zone, groundwater flows toward the two supply wells. However, contaminants within the low flow zone may be held in place until extraction well SVP-4E is shut down. Once the extraction well SVP-4E is shut down, the low flow zone would disappear.

To minimize the low flow zone, several model simulations were conducted. Simulations included: a) one extraction well sequentially at different locations, b) three extraction wells running simultaneously at a lower flow rate and perpendicular to the groundwater flow, and c) three extraction wells running simultaneously at a lower flow rate and parallel to the groundwater flow. The results indicated that in order to capture the contaminant plume upgradient of new extraction wells, it is difficult to avoid creating a low flow zone.

<u>Ex-Situ Groundwater Treatment</u>: A low profile air stripper will remove the VOC contaminants. During the remedial design, additional treatment technologies (including liquid phase carbon adsorption) may be considered if additional information suggests the need for treatment following air stripping. The treated water will meet groundwater and surface water discharge standards.

Based on the maximum concentrations of PCE and TCE detected in SVP/GWM-4 during the RI, the maximum total VOCs (PCE and TCE) generated in the off-gas from the air stripper would be 1.5 pounds per day (lbs/day). According to the OSWER Directive 9355.0-28, *Control of Air Emissions from Superfund Air Strippers and Superfund Sites* (EPA 1989), off-gas treatment will not be necessary since the total VOC emissions are below 15 lbs/day. For New York State, according to air emission regulation 6NYCRR Part 212, the off-gas treatment required for VOC emission less than 1 pound per hour (lb/hr) is determined by the commissioner on a case by case basis. The emission rate at this Site is expected to be significantly below 1 lb/hr.

As stated above, the new extraction well SVP-4E will be operated for approximately 10 years, at which time it is estimated that contaminant levels in the majority of the zone of influence upgradient of the new pumping well would approach or achieve the MCLs, although the contamination in the groundwater near SVP-4E may be slightly above MCLs. It is also noted that at the end of the same 10-year period, the contamination in extracted groundwater in supply wells GWP-10 and 11 would, before wellhead treatment, be at or near the MCLs since the wells pump water from both contaminated and clean parts of the Magothy aquifer. The preliminary groundwater model indicated that after SVP-4E is shut down, it will take approximately another 25 years for the PCE and TCE contaminant residuals in the aquifer to achieve MCLs through natural processes. The residual contamination is expected to remain within the capture zone of the two supply wells until levels are reduced to below the MCLs. The overall duration for this alternative is estimated to be 35 years.

The proposed location of the ex-situ treatment system is shown in Figure 12.

Discharge of Treated Groundwater: The treated groundwater will be discharged to the local Nassau County recharge basin #124. The basin was constructed in 1940 and was designed for an estimated tributary area of 162 acres. The estimated available capacity is approximately 1,124,960 cubic feet. This basin has a 36-inch overflow pipe located in the southeast corner. The overflow eventually leads to Hempstead Lake and ultimately to tidal waters. With a 150 gpm discharge rate from the new groundwater extraction well SVP-4E, the daily loading to the recharge basin will be 28,944 cubic feet, significantly lower than the basin's capacity. However, during a storm event, the run-off would reduce the available capacity of the basin for groundwater discharge. During the remedial design, results of infiltration tests will be used to calculate the capacity of the recharge basin. Run-off from a representative rain event will also be calculated to verify the available capacity for treated groundwater discharge.

Evaluation and Upgrade of the Air Strippers at supply wells GWP-10 and GWP-11: The two packed tower air strippers at the supply wells were installed in 1987, and have been in operation for approximately 20 years. During the years of operation, the Village has upgraded the stripper capacity several times. An evaluation of the conditions of the air strippers will be conducted. Any necessary upgrade or replacement of the air strippers will be evaluated. The upgrade or replacement costs of the air strippers will be estimated based on the condition of the existing treatment system.

Vapor Intrusion Sampling: There is concern, based on previous sampling results, that Site-related vapor may migrate into the commercial buildings to the west of the mall. Vapor intrusion sampling will be conducted at six buildings during the winter heating season. Vapor mitigation systems will be installed, if further sampling indicates the need for such systems.

Institutional Controls: Institutional controls will be relied upon to restrict the future use of groundwater at the Site. Specifically, the New York State Department of Health State Sanitary Code regulates installation of private potable water supply wells in Nassau County. In addition, EPA will rely on the current zoning in the area including and surrounding the mall to restrict the land use to commercial industrial uses. If a change in land use is proposed, additional investigation of soils in this area will be necessary to support the land use change. Regulatory requirements under the State's Superfund program may result in NYSDEC seeking to obtain easements/covenants on various properties within the Site.

Site Management Plan: A SMP will be developed and will provide for the proper management of all Site remedy components post-construction, such as institutional controls, and shall also include: (a) monitoring of Site groundwater to ensure that, following remedy implementation, the groundwater quality improves; (b) conducting an evaluation of the potential for vapor intrusion, and mitigation, if necessary, in the event of future construction at or in the vicinity of the Site; (c) provision for any operation and maintenance required of the components of the remedy; and (d) periodic certifications by the owner/operator or other person implementing the remedy that any institutional and engineering controls are in place.

Long-term Monitoring: The contaminant plume will be monitored through annual sampling and analysis of groundwater. The results of the long-term monitoring program will be used to evaluate changes in the contaminant plume over time and to ensure achievement of MCLs. Approximately 14 wells will be included in the long-term monitoring program, including seven multi-port wells installed during the RI (SVP/GWM-2 through SVP/GWM-8), three new multi-port wells, two single screen monitoring wells (GWX-10019 and GWX-10020), two supply wells, and annual groundwater sampling reports. Each new multi-port monitoring well was assumed to have 10 sampling ports.

Contingency Plan: In the event that public supply wells GWP-10 and GWP-11 are taken out of service permanently or area operated at a significant reduction of their current pumping rates, a contingency plan would be implemented to capture and treat the contaminant plume in that area. The contingency plan would include the installation of a new well or wells in the vicinity of supply wells GWP-10 and GWP-11 and an ex-situ treatment system.

Five Year Review: Because MCLs will take longer than five years to achieve, a review of Site conditions will be conducted no less often than once every five years.

Summary of the Estimated Remedy Costs

The estimated capital, annual O&M, and total present-worth cost for the selected groundwater remedy are $6,240,000, $850,000 (for O&M and long-term monitoring for the first 10 years), $175,000 (long-term monitoring for years 10 through 25 and $111,000 for years 26 through 35), and $13,160,000, respectively. Table 13 provides the basis for the cost estimates for Alternative 3. As stated earlier, if the Contingency Plan is implemented, it would result in additional estimated costs of $5,660,000 and $680,000, for capital costs and O&M costs, respectively.

It should be noted that these cost estimates are order-of-magnitude engineering cost estimates that are expected to be within +50 to -30 percent of the actual project cost. These cost estimates are based on the best available information regarding the anticipated scope of the selected remedy. Changes in the cost elements are likely to occur as a result of new information and data collected during the engineering design of the remedy.

Expected Outcomes of the Selected Remedy

The results of the risk assessment indicate that there is an unacceptable future cancer risk from exposure to contaminated groundwater through ingestion, inhalation and dermal contact to future residents if the Site were ever developed as a residential area, and through ingestion to future on-site workers.

The selected remedy will allow for the following potential land and groundwater use.

Land Use

The land use at the Site is not expected to change in the future. The mall area is developed as commercial and office facilities and the residential areas are also fully developed, with very little vacant land available for development.

Groundwater Use

Under the selected remedy, contaminated groundwater will be treated and returned to productive use. The use of remediation well(s) will accelerate the cleanup of the groundwater and prevent the most highly contaminated groundwater from reaching the two Village of Garden City supply wells. EPA does not anticipate that groundwater usage at the two supply wells will change in the future, but a Contingency Plan will ensure that contaminated groundwater does not migrate downgradient should the two supply wells be shut down or their level of pumping be severely reduced.

STATUTORY DETERMINATIONS

Under CERCLA Section 121 and the NCP, the lead agency must select remedies that are protective of human health and the environment, comply with ARARs (unless a statutory waiver is justified), are cost-effective, and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. Section 121(b)(1) also establishes a preference for remedial actions which employ treatment to permanently and significantly reduce the volume, toxicity, or mobility of the hazardous substances, pollutants, or contaminants at a site.

For the reasons discussed below, EPA has determined that the selected remedy meets these statutory requirements.

Protection of Human Health and the Environment

Groundwater concentrations of several chlorinated VOCs in the aquifer exceed their respective MCLs, thereby posing a potential human health risk.

The selected remedy will be protective of human health and the environment through implementation of a remedial pump and treat system to extract and treat the groundwater contamination. The remedy will restore the groundwater to levels below the MCLs more rapidly than relying on natural attenuation processes alone.

Compliance with ARARs and Other Environmental Criteria, Advisories or Guidance

A summary of the ARARs and other federal or state advisories, criteria, or guidance and To-Be-Considered (TBCs) is presented below. TBCs may be very useful in determining what is protective of a Site or how to carry out certain actions or requirements.

- National Primary Drinking Water Standards-Maximum Contaminant Levels (MCLs) and Maximum Contaminant Level Goals (MCLGs) (40 CFR Part 141)
- OSWER Draft guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils
- New York Surface Water and Groundwater Quality Standards and Groundwater Effluent Limitations (6 NYCRR Part 703)
- New York State Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations (Technical and Operational Guidance Series 1.1.1)
- New York State Department of Health Drinking Water Standards (10 NYCRR Part 5)
- National Historic Preservation Act (40 CFR 6.301)
- RCRA Identification and Listing of Hazardous Wastes (40 CFR 261)
- RCRA Standards Applicable to Generators of Hazardous Wastes (40 CFR 262)
- RCRA—Standards for Owners/Operators of Permitted Hazardous Waste Facilities (40 CFR 264.10–164.18)
- RCRA—Preparedness and Prevention (40 CFR 264.30–264.31)
- RCRA—Contingency Plan and Emergency Procedures (40 CFR 264.50–264.56)
- New York Hazardous Waste Management System – General (6 NYCRR Part 370)
- New York Identification and Listing of Hazardous Waste (6 NYCRR Part 371)
- Department of Transportation (DOT) Rules for Transportation of hazardous materials (49 CFR Parts 107, 171, 172, 177 to 179)
- RCRA Standards Applicable to Transporters of Hazardous Waste (40 CFR 263)
- New York Hazardous Waste Manifest System and Related Standards for Generators, Transporters and Facilities (6 NYCRR Part 372)
- New York Waste Transporter Permit Program (6 NYCRR Part 364)
- RCRA Land Disposal Restrictions (40 CFR 268)
- New York Standards for Universal Waste (6 NYCRR Part 374-3) and Land Disposal Restrictions (6 NYCRR Part 376)
- Clean Water Act (40 CFR 122, 125)
- Clean Water Act Water Quality Criteria (Federal Ambient Water Quality Criteria and Guidance Values [40 CFR 131.36])
- Safe Drinking Water Act - Underground Injection Control (40 CFR 144, 146)
- New York Regulations on State Pollution Discharge Elimination System (SPDES) (6 NYCRR Parts 750-757)

- New York Surface Water and Groundwater Quality Standards and Groundwater Effluent Limitations (6 NYCRR Part 703)
- New York State Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations (Technical and Operational Guidance Series 1.1.1)
- New York State Regulations on Environmental Remediation 6 NYCRR part 375-1.8(a)(5)
- Clean Air Act, National Ambient Air Quality Standards (40 CFR 50)
- Federal Directive - Control of Air Emissions from Superfund Air Strippers (OSWER Directive 9355.0-28)
- New York State Air Regulations (6 NYCRR Part 200, et seq.)
- New York State Department of Environmental Conservation (6 NYCRR Part 602) Applications for Long Island Wells
- New York State Department of Health State Sanitary Code Appendix 5-B Standards for Water Wells

Cost-Effectiveness

A cost-effective remedy is one whose costs are proportional to the remedy's overall effectiveness (NCP Section 300.430(f)(1)(ii)(D)). Overall effectiveness is based on the evaluations of: long-term effectiveness and permanence; reduction in toxicity, mobility, and volume through treatment; and short-term effectiveness. Based on the comparison of overall effectiveness to cost, the selected remedy meets the statutory requirement that Superfund remedies be cost-effective in that it will achieve the remediation goals more rapidly than solely relying on natural processes within the aquifer.

Each of the alternatives has undergone a detailed cost analysis. In that analysis, capital and annual O&M costs have been estimated and used to develop present-worth costs. In the present-worth cost analysis, annual O&M costs were calculated for the estimated life of an alternative using a 7% discount rate. The estimated present-worth cost of the selected groundwater remedy is $13,160,000. EPA believes that the cost of the selected alternative is proportional to its overall effectiveness because it reduces the time required to achieve MCLs within the aquifer.[9]

Utilization of Permanent Solutions and Alternative Treatment Technologies to the Maximum Extent Practicable

The selected remedy provides the best balance of tradeoffs among the alternatives with respect to the balancing criteria set forth in NCP Section 300.430(f)(1)(i)(B), such that it represents the maximum extent to which permanent solutions and treatment technologies can be utilized for the groundwater at the Site. In addition, the selected remedy provides significant protection of human health and the environment, provides long-term effectiveness, is able to achieve the ARARs more quickly than the other alternatives, and is therefore cost-effective.

The selected groundwater remedy is considered a permanent remedy and will employ a treatment technology to reduce the toxicity, mobility, and volume of the contaminants in the groundwater.

Preference for Treatment as a Principal Element

The statutory preference for remedies that employ treatment as a principal element is satisfied under the selected remedy in that contaminated groundwater will be treated and treatment will be used to reduce the toxicity, mobility, and volume of contamination and achieve cleanup levels.

Five-Year Review Requirements

Under EPA policy, since MCLs will take longer than five years to achieve, a review of Site conditions will be conducted no less often than once every five years.

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[9] As stated earlier, the actual present worth value of the contingency plan cannot be calculated. However, if implemented, the contingency plan would only operate until MCLs are achieved. Even if the contingency plan were to be implemented, the selected remedy would still be cost-effective because it would ensure treatment of the contaminant plume in the area of GWP-10 and GWP-11.

DOCUMENTATION OF SIGNIFICANT CHANGES

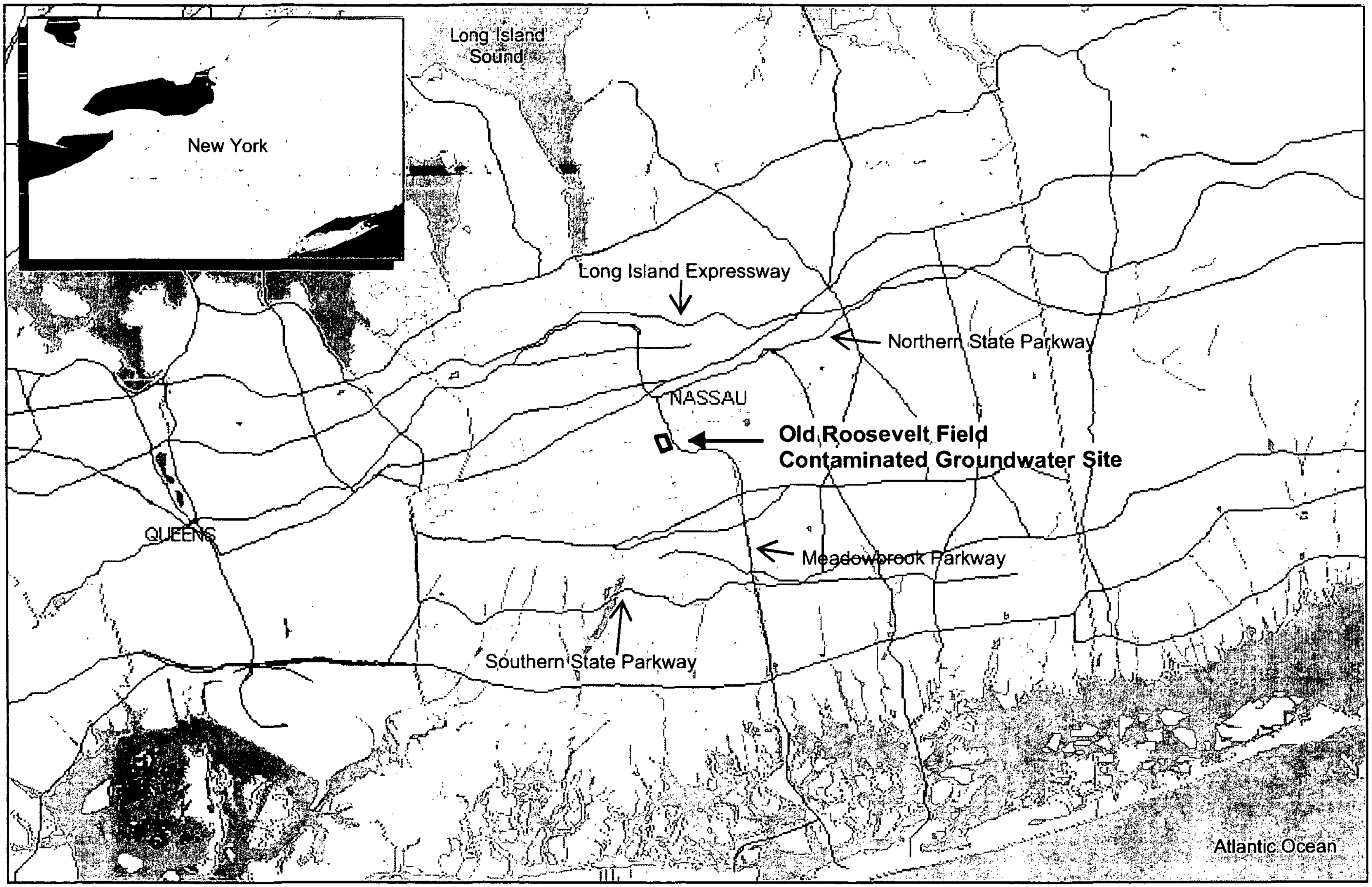
The Proposed Plan, released for public comment on August 22, 2007, identified Alternative 3 (groundwater extraction and treatment). Based upon its review of the written and oral comments submitted during the public comment period, EPA determined that no significant changes to the remedy, as originally identified in the Proposed Plan, were necessary or appropriate. However, a typographical error was noted in the Proposed Plan; O&M costs for the preferred alternative were reported as $850,000 for the first 10 years and $790,000 for the remaining 25 years. The correct O&M costs are $850,000 (O&M and long-term monitoring for years 1-10), $175,000 (long-term monitoring for years 10-25) and $111,000 (reduced long-term monitoring for years 25-35). As there was no impact on the overall remedy cost this change is not considered significant.

OLD ROOSEVELT FIELD CONTAMINATED GROUNDWATER AREA SUPERFUND SITE RECORD OF DECISION

APPENDIX I

FIGURES

SUMMARY OF FIGURES



adapted from NYSDEC Interactive Mapping Gateway: http://www.nygis.state.ny.us/gateway/index.html

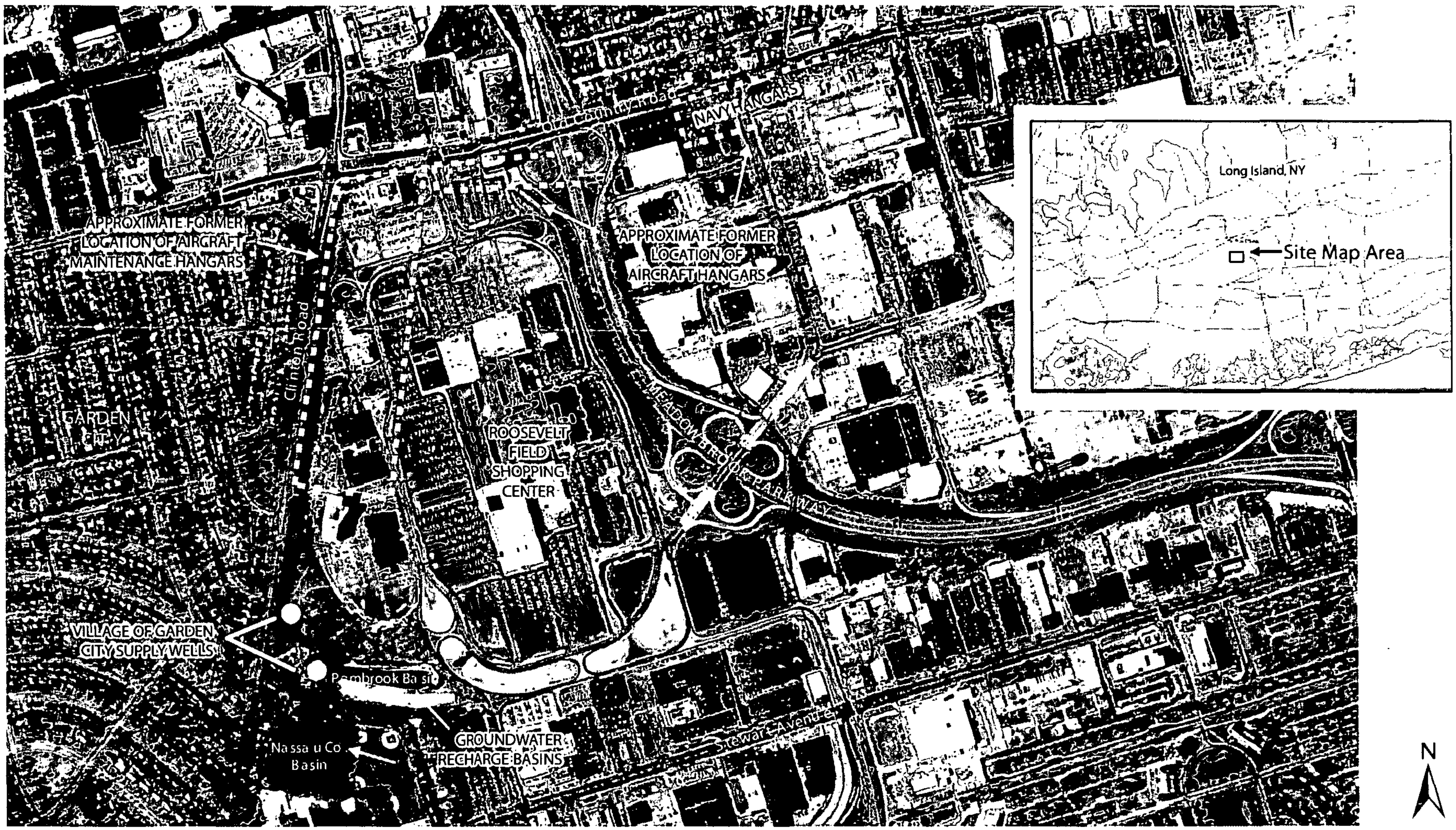
CDM

Figure 1

Site Location Map

Old Roosevelt Field Contaminated Groundwater Site
Garden City, New York

500050



adapted from NY SDEC Interactive Mapping Gateway: http://www.nygis.state.ny.us/gateway/index.html

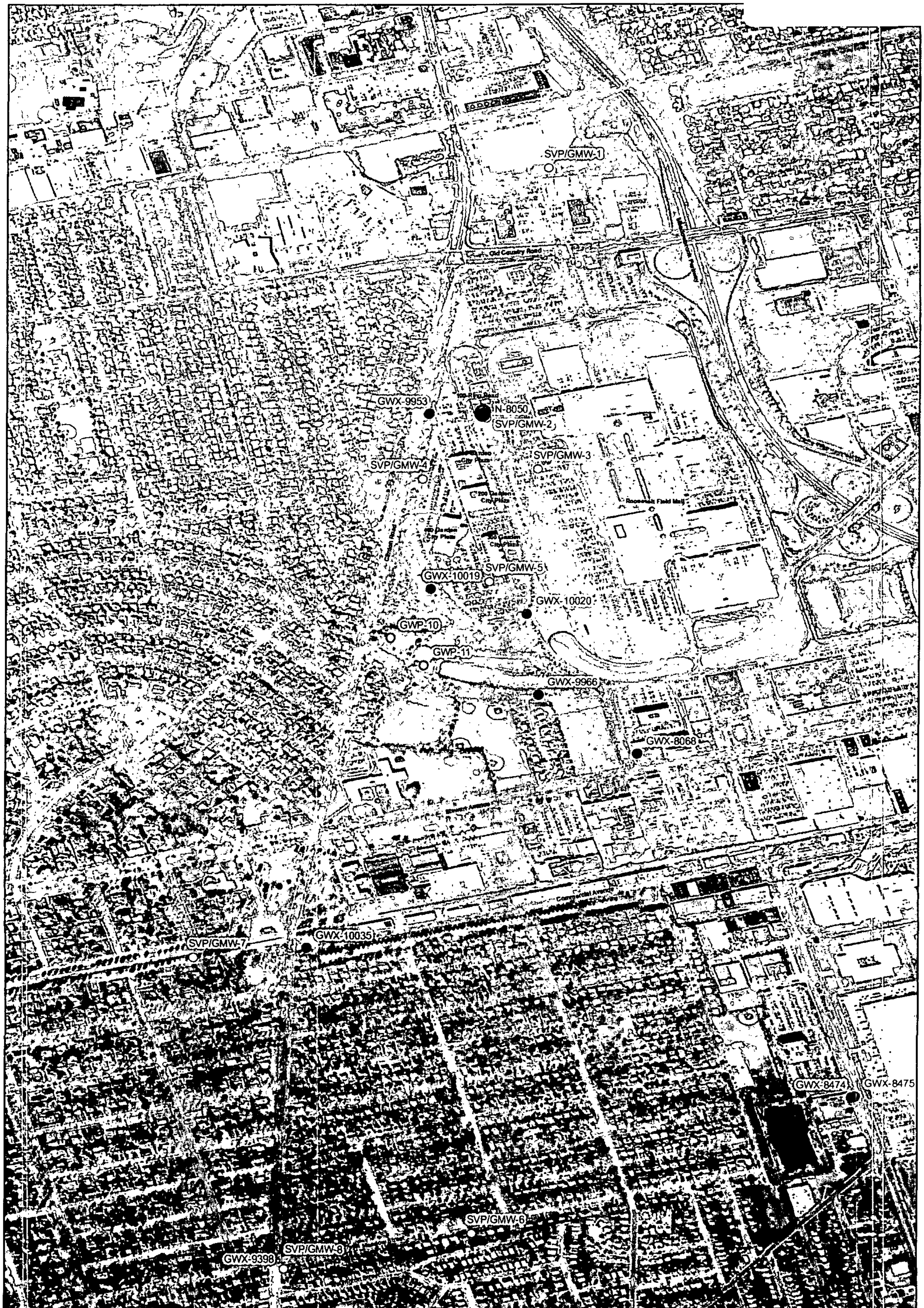
CDM

0.25 0.125 0 0.25 Miles

Figure 2
Site Map
Old Roosevelt Field Contaminated Groundwater Site
Garden City, New York

500051

C:\MS\GIS\Roosevelt Field\ArcMap_projects\Well_locations_PP.mxd



- Existing Monitoring Wells
- Multi-port Wells
- Village of Garden City Supply Wells
- N-8050 - A former cooling water well in which the highest concentrations were historically detected; the well is no longer active

N

Feet
0 375 750 1,500

Figure 3

Multi-port Well, Existing Monitoring Well, and Supply Well Locations

Old Roosevelt Field Contaminated Groundwater Site
Garden City, New York

CDM

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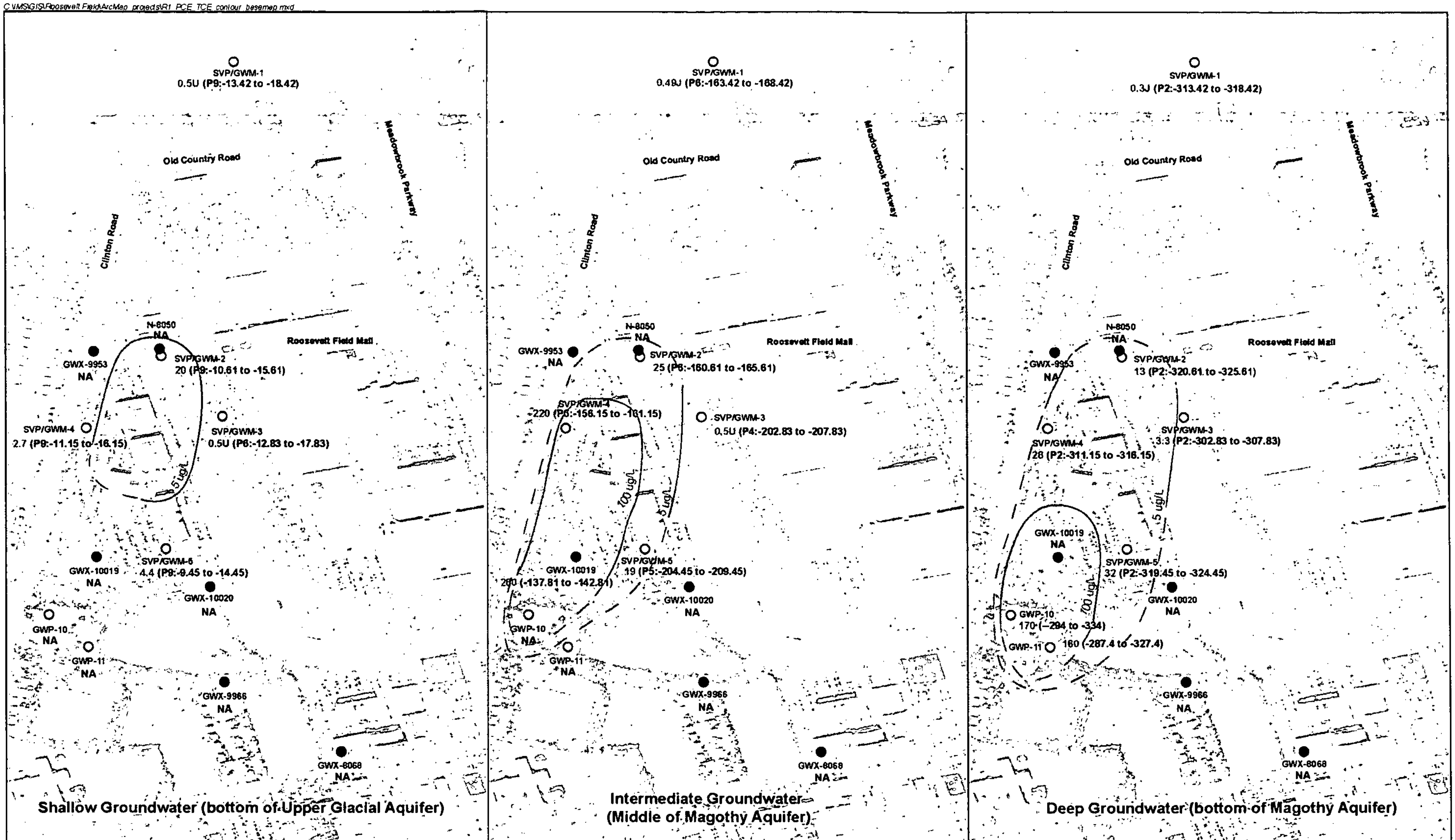

- Existing Wells
- Multiport Wells
- Supply Wells
- PCE Contour (µg/L), dashed where inferred.

TCE value (Port #: screen interval in feet AMSL)

All posted values are in micrograms per liter (µg/L)
PCE = Tetrachloroethene
NA = Not applicable - no data exists at elevation range
MCL = 5 µg/L

N

0 500 1,000 2,000 Feet

Figure 4
March 2006 (Round 1) TCE Isocontours at Select Elevations
Old Roosevelt Field Contaminated Groundwater Site
Garden City, New York

CDM

500053

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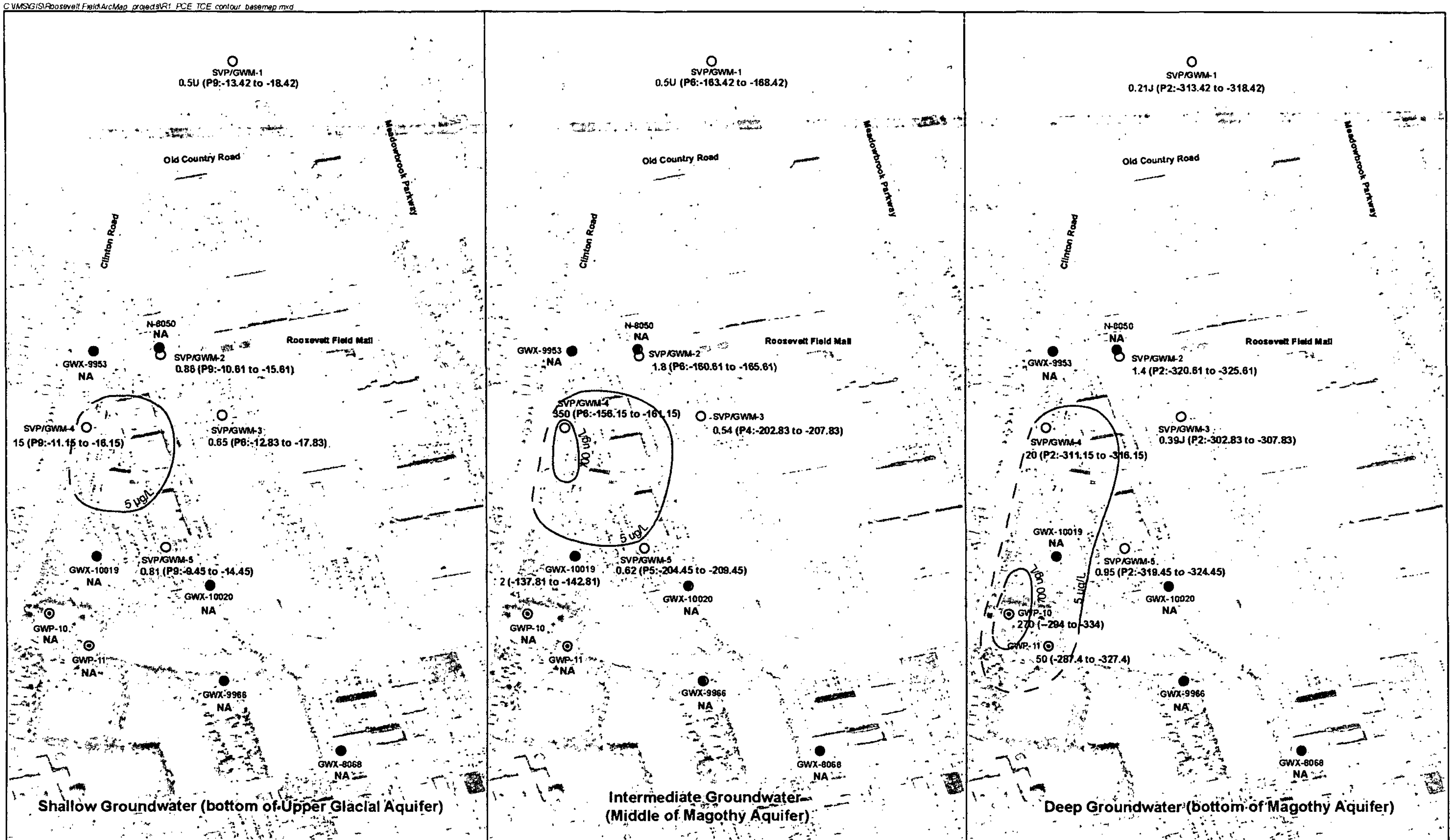

● Existing Wells
○ Multiport Wells
⊙ Supply Wells
—— PCE Contour (µg/L), dashed where inferred
PCE value (Port #: screen interval in feet AMSL)

All posted values are in micrograms per liter (µg/L)
PCE = Tetrachloroethene
NA = Not applicable - no data exists at elevation range
MCL = 5 µg/L

N

0 500 1,000 2,000 Feet

Figure 5
March 2006 (Round 1) PCE Isocontours at Select Elevations
Old Roosevelt Field Contaminated Groundwater Site
Garden City, New York

CDM

500054

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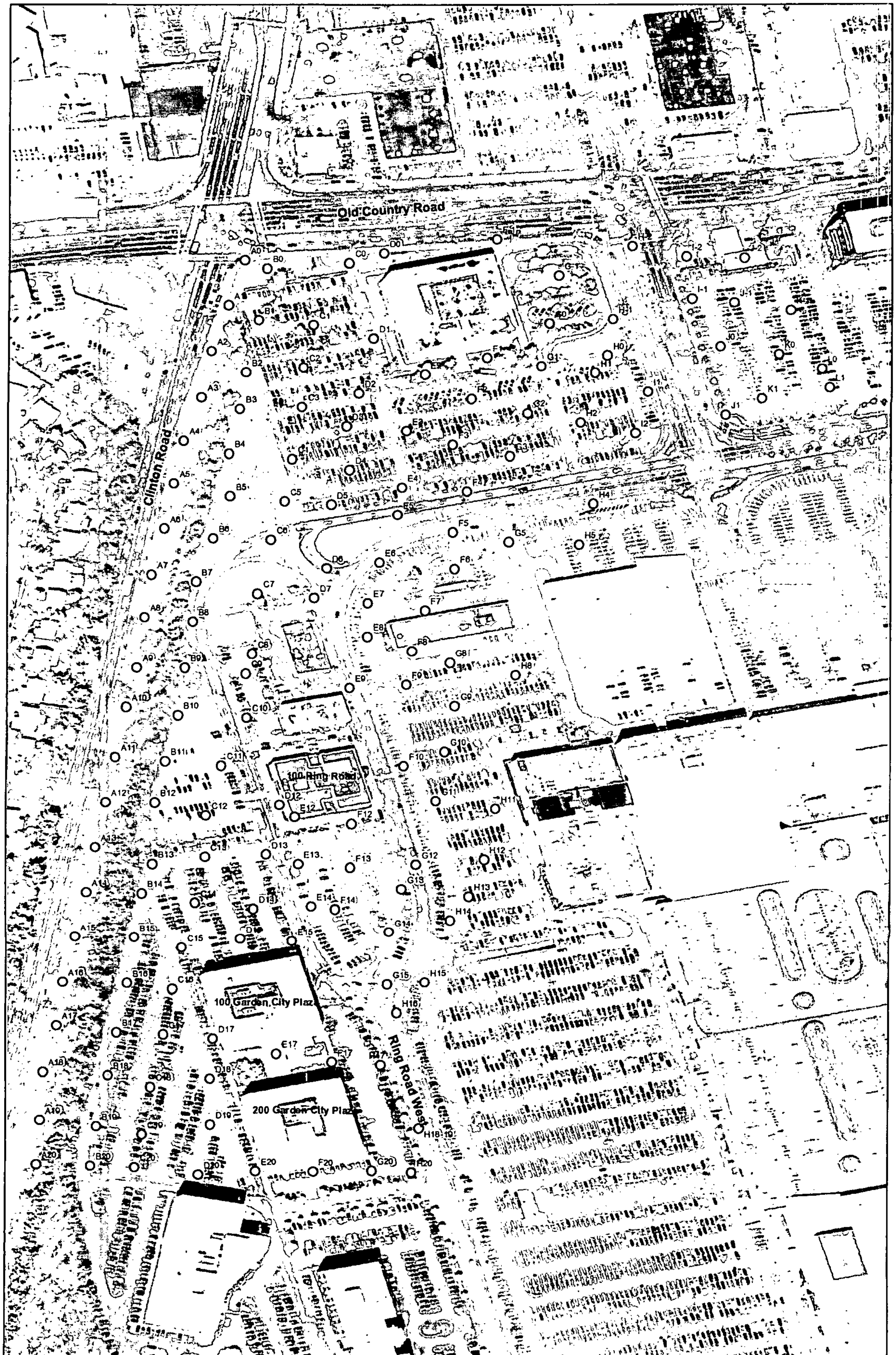


○ Soil Gas Screening Grid Point Location

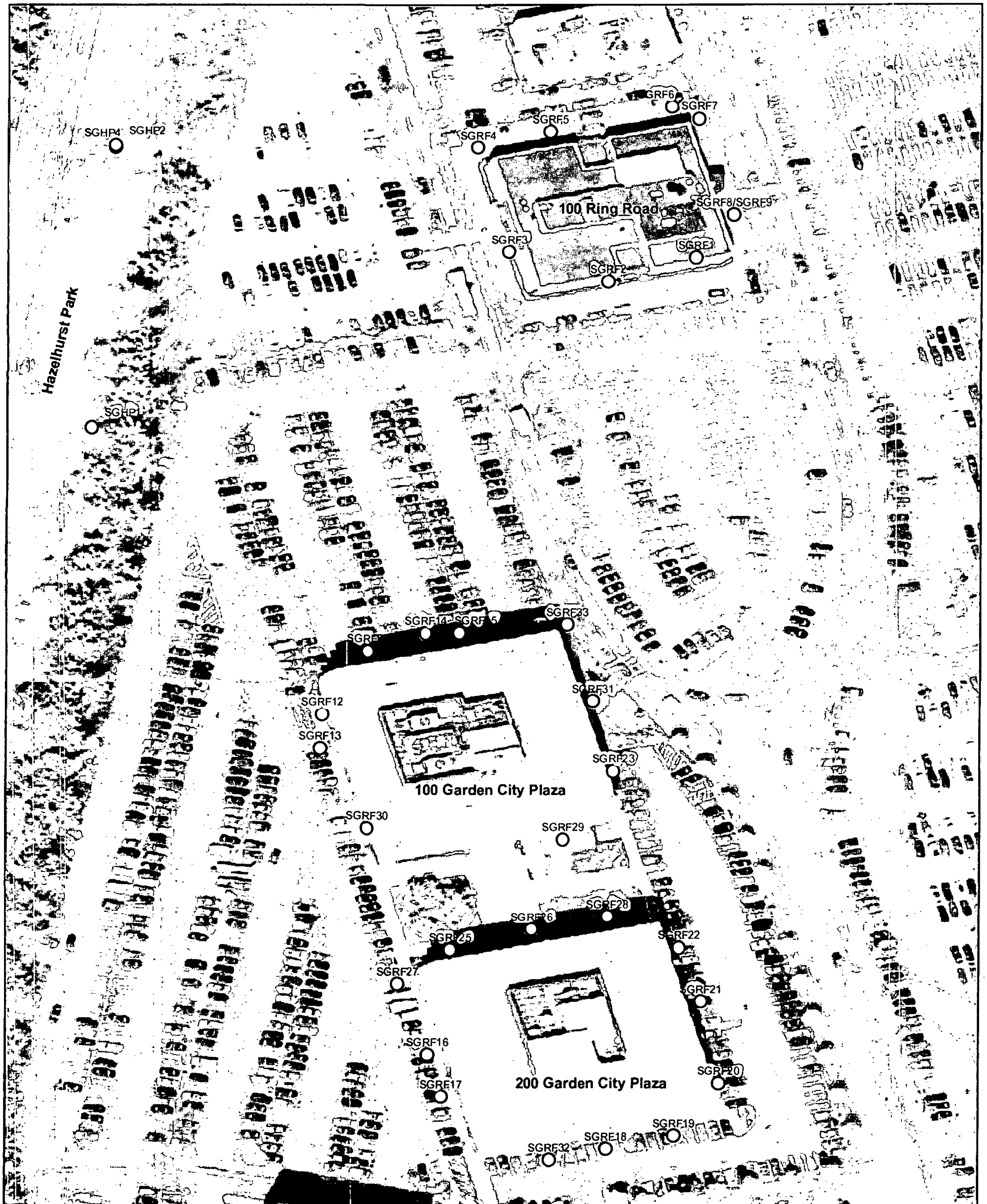
N

Feet
0 100 200 400

Figure 6
Soil Gas Screening Locations
Old Roosevelt Field Contaminated Groundwater Site
Garden City, New York

CDM

C:\IMS\GIS\Roosevelt Field\ArcMap_projects\Fig2-2B_soil gas analytical.mxd



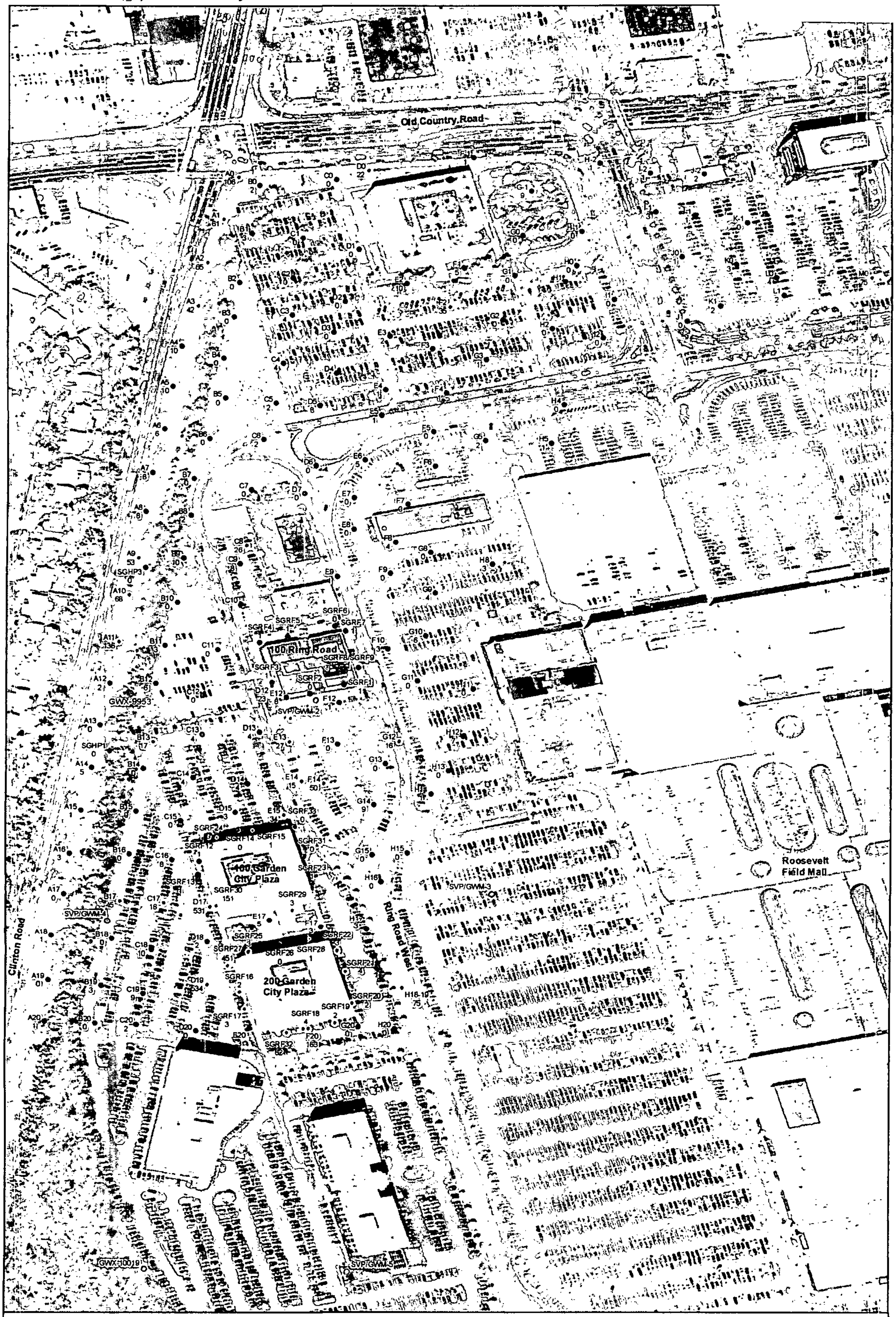
○ Soil Gas Boring Location
for VOC Analysis via method TO-15

Note: SGRF10 and SGRF11 were not collected due to underground utilities.

Feet
0 30 60 120

Figure 7
Soil Gas Analytical Sample Locations
Old Roosevelt Field Contaminated Groundwater Site
Garden City, New York

C:\MS\GIS\Roosevelt Field\ArcMap_projects\Roosevelt 15 ft Screening Results.mxd



● Soil gas screening point with grid point number and screening reading in parts per billion per volume (ppbv)

O Soil gas screening point with outdoor building boring location number

Screening results at location exceed 10 ppbv

O Existing Wells and Multi-port Wells included for Spatial Reference

Notes: H19 and H18 were combined at location H-19
bgs = below ground surface
All soil gas measurements were made with a ppbRAE

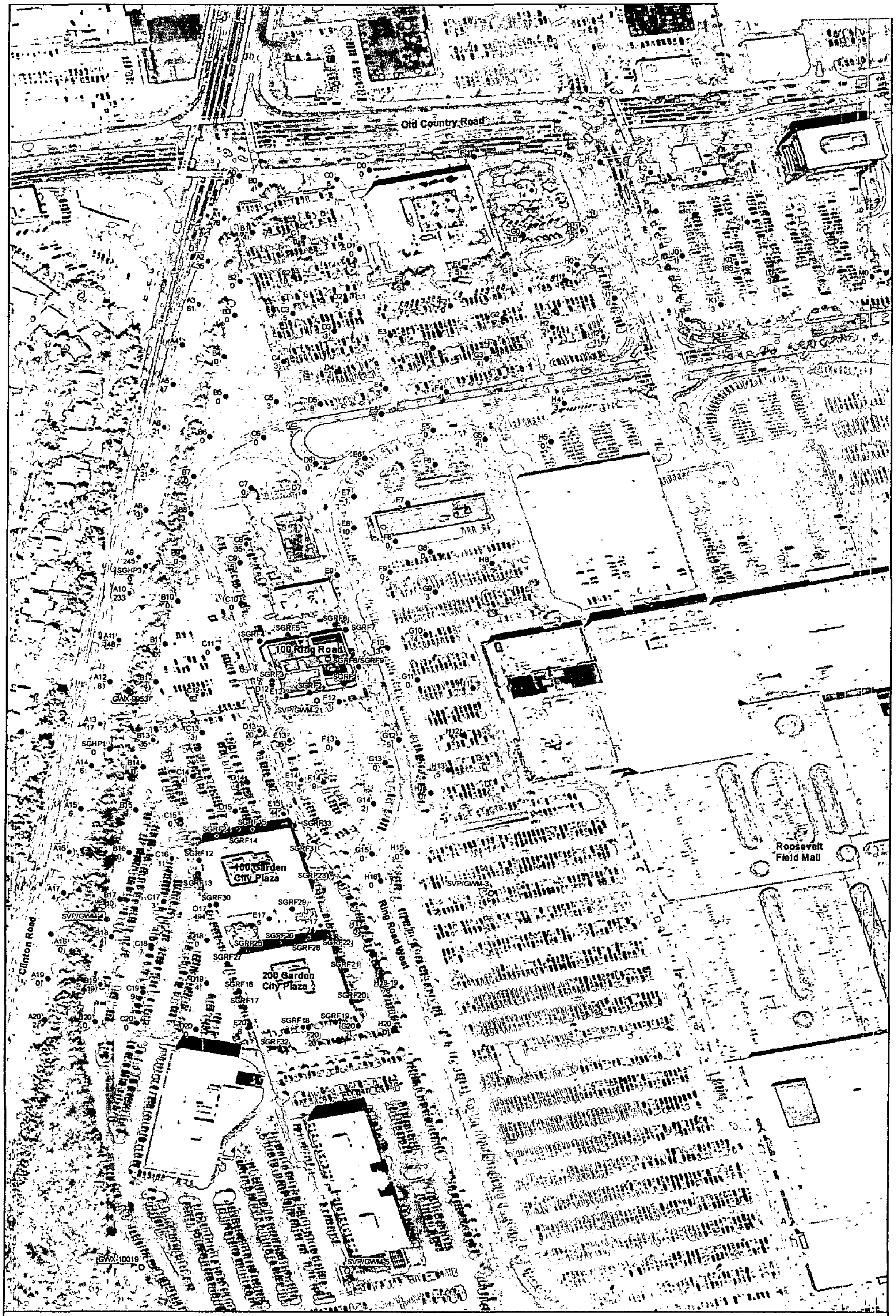
N

0 125 250 500 Feet

Figure 8
Soil Gas Total VOC Screening Results - 15 feet bgs
Old Roosevelt Field Contaminated Groundwater Site
Garden City, New York

CDM

C:\MSIGIS\Roosevelt Field\ArcMap_projects\Roosevelt 35 ft Screening Results_revised.mxd



● Soil gas screening point with grid point number and screening reading in parts per billion per volume (ppbv)

○ Soil gas screening point with outdoor building boring location number

Screening results at location exceed 10 ppbv

○ Existing Wells and Multi-port Wells include for Spatial Reference

Notes: H19 and H18 were combined at location H-19
bgs = below ground surface
All soil gas measurements were made with a ppbRAE

N

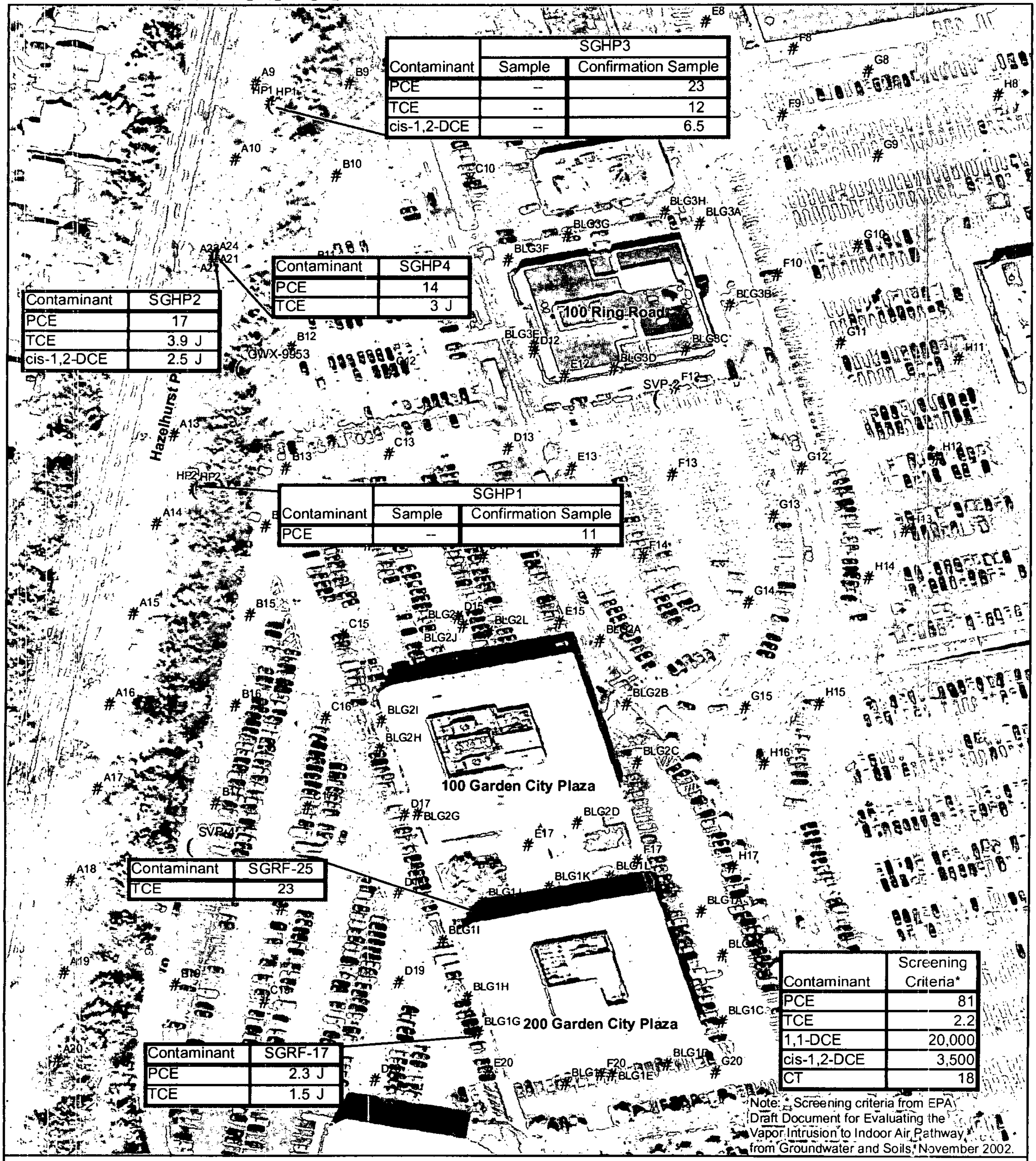
0 140 280 560 Feet

Figure 9

Soil Gas Total VOC Screening Results - 35 feet bgs

Old Roosevelt Field Contaminated Groundwater Site
Garden City, New York

CDM



Contaminant	SGHP3 Sample	SGHP3 Confirmation Sample
PCE	--	23
TCE	--	12
cis-1,2-DCE	--	6.5

Contaminant	SGHP4
PCE	14
TCE	3 J

Contaminant	SGHP2
PCE	17
TCE	3.9 J
cis-1,2-DCE	2.5 J

Contaminant	SGHP1 Sample	SGHP1 Confirmation Sample
PCE	--	11

Contaminant	SGRF-25
TCE	23

Contaminant	SGRF-17
PCE	2.3 J
TCE	1.5 J

Contaminant	Screening Criteria*
PCE	81
TCE	2.2
1,1-DCE	20,000
cis-1,2-DCE	3,500
CT	18

○ Soil Gas Boring Location, collected at 15 feet bgs,for VOC Analysis via method TO-15

(Existing Monitoring Wells and Multi-port Wells Included for Spatial Reference

Soil gas screening locations provided for reference.

Notes

SGRF10 and SGRF11 were not collected due to underground utilities.

All values are in micrograms per cubic meter (µg/m3)

J = Estimated Value
U = Non Detect
CT = Carbon Tetrachloride
PCE = Tetrachloroethene

TCE = Trichloroethene
1,1-DCE = 1,1 Dichloroethene
cis-1,2-DCE = cis-1,2-Dichloroethene

Feet: 0 75 150 300

Figure 10
Soil Gas Analytical Results

Old Roosevelt Field Contaminated Groundwater Site
Garden City, New York

- Public Supply Well
- Multiport Well
- Existing Well
- Extraction Well
- Proposed Multiport Well
- Potentiometric Surface (ft, msl)

Figure 11
Alternative 3 Extraction Well Location
Old Roosevelt Field Contaminated Groundwater Site
Garden City, New York
CDM

Figure 12
Proposed Location for Treatment System
Pump and Treat Alternative
Old Roosevelt Field Contaminated Groundwater Site
Garden City, New York
CDM

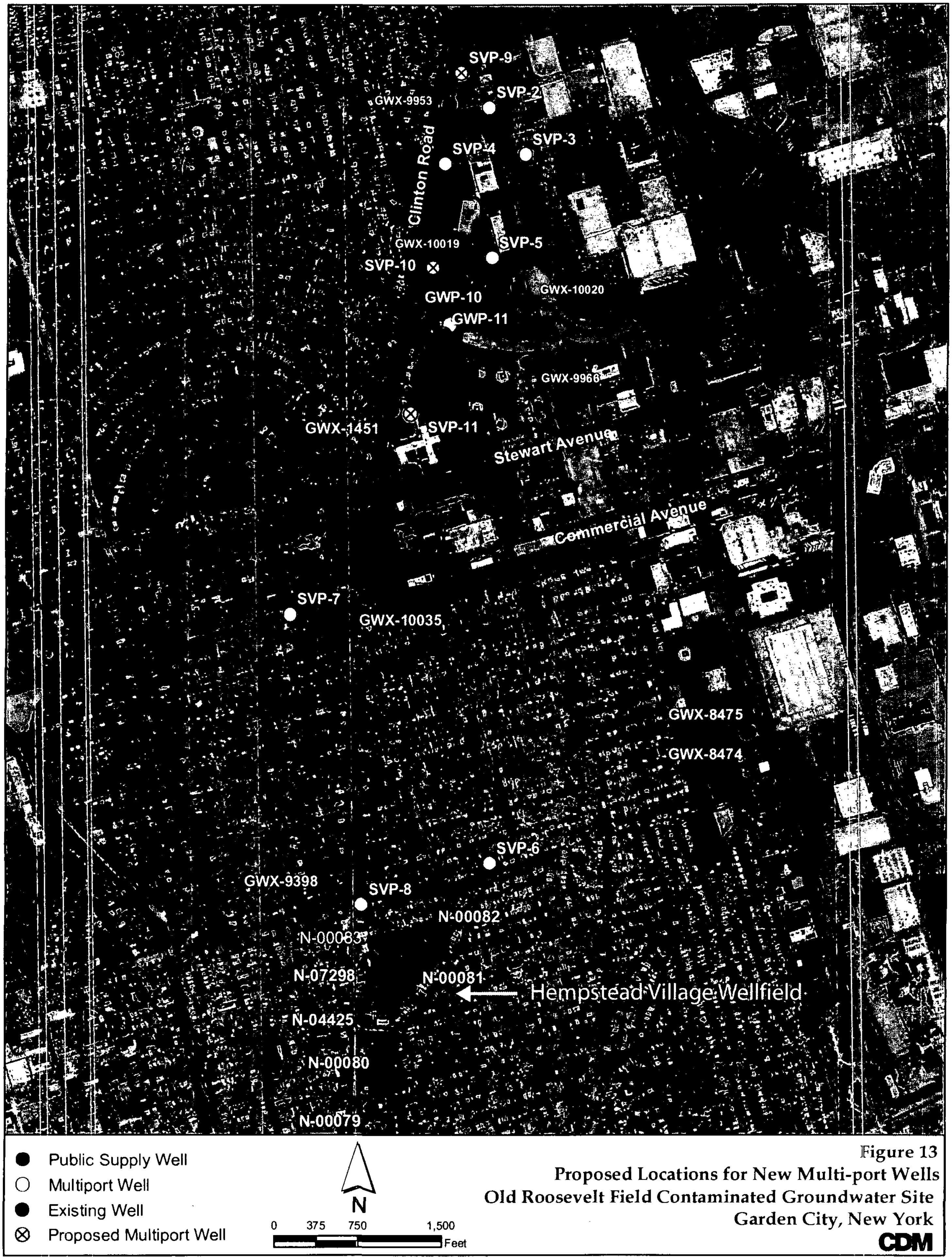


Figure 13
Proposed Locations for New Multi-port Wells
Old Roosevelt Field Contaminated Groundwater Site
Garden City, New York
CDM

SUMMARY OF TABLES

Table 1 **Maximum Contaminant Levels for Contaminants of Concern**	
Chemical	Groundwater MCL (μg/L)[1]
Tetrachloroethene	5
Trichloroethene	5
1,1-Dichloroethene	5
cis-1,2-Dichloroethene	5
Carbon tetrachloride	5

μg/L = microgram per liter
[1] New York State Department of Health Drinking Water Standards, NYCRR Title 10, Part 5, Subpart 5-1 Public Water Systems, Effective November 23, 2005 (Statutory authority: Public Health Law 225, Effective May 26, 2004).
(http://www.health.state.ny.us/environmental/water/drinking/part5/subpart5.htm)

Table 2
Multi-Port Well COC Results - Round 1

Chemical	SVP/GWM-1								
	Port 2 400-405 ft	Port 3 370-375 ft	Port 4 315-320 ft	Port 5 290-295 ft	Port 6 250-255 ft	Port 7 200-205 ft	Port 8 150-155 ft	Port 9 100-105 ft	Port 10 50-55 ft
Tetrachloroethene	0.21 J	0.24 J	0.38 J	0.28 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Trichloroethene	0.3 J	0.77	0.5	0.32 J	0.49 J	0.5 U	0.5 U	0.5 U	0.5 U
1,1-Dichloroethene	0.32 J	0.32 J	0.64	0.55 J	0.61	0.12 J	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	0.5 U	0.5 U	0.5 U	1.3 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Carbon tetrachloride	0.5 U	0.5 U	0.5 U	1.3 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

Chemical	SVP/GWM-2									
	Port 1 450-455 ft	Port 2 410-415 ft	Port 3 370-375 ft	Port 4 330-335 ft	Port 5 290-295 ft	Port 6 250-255 ft	Port 7 190-195 ft	Port 8 150-155 ft	Port 9 100-105 ft	Port 10 50-55 ft
Tetrachloroethene	2.4	1.4	1.6	2.8	5.8	1.8	3.2	2.8	0.86	0.68
Trichloroethene	22	13	16	23	24	25	18	25	20	4.9
1,1-Dichloroethene	0.5 U	0.46 J	0.41 J	0.5 U	0.5 U	1 U	0.5 U	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	0.97	0.86	2.7	5.2	4.9	8.4	0.29 J	0.36 J	0.8	0.69
Carbon tetrachloride	0.14 J	0.13 J	0.5 U	0.5 U	0.1 J	1 U	0.16 J	0.5 U	0.5 U	0.5 U

Chemical	SVP/GWM-3						
	Port 1 450-455 ft	Port 2 390-395 ft	Port 3 370-375 ft	Port 4 290-295	Port 5 170-175 ft	Port 6 100-105 ft	Port 7 50-55 ft
Tetrachloroethene	0.2 J	0.39 J	0.25 J	0.54	0.39 J	0.65	0.72
Trichloroethene	1.9	3.3	8.9	0.5 U	0.4 J	0.5 U	0.5 U
1,1-Dichloroethene	0.11 J	0.84	0.27 J	0.12 J	0.15 J	0.23 J	0.5 U
cis-1,2-Dichloroethene	0.5 U	0.25 J	0.39 J	0.5 U	0.5 U	0.5 U	0.5 U
Carbon tetrachloride	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

Table 2
Multi-Port Well COC Results - Round 1

Chemical	SVP/GWM-4									
	Port 1 420-425 ft	Port 2 400-405 ft	Port 3 350-355 ft	Port 4 305-310 ft	Port 5 285-290 ft	Port 6 245-250 ft	Port 7 185-190 ft	Port 8 145-150 ft	Port 9 100-105 ft	Port 10 45-50 ft
Tetrachloroethene	7.3	20	21	180	220	350	14	41	15	0.37 J
Trichloroethene	30	26	64	280	260	220	260	90	2.7	1.3
1,1-Dichloroethene	1.2	1.7	1.3 J	8.9	7.8	5.5 J	2.2 J	0.57	0.5 U	0.5 U
cis-1,2-Dichloroethene	0.41 J	0.82 J	1.4 J	3.9 J	3.6 J	5.3 J	2.2 J	2.3	0.89	0.1 J
Carbon tetrachloride	0.4 J	1.3	2.5 U	8.4 U	6.3 U	13 U	6.3 U	0.1 J	0.5 U	0.5 U

Chemical	SVP/GWM-5									
	Port 1 430-435 ft	Port 2 405-410 ft	Port 3 355-360 ft	Port 4 310-315 ft	Port 5 290-295 ft	Port 6 250-255 ft	Port 7 190-195 ft	Port 8 150-155 ft	Port 9 95-100 ft	Port 10 45-50 ft
Tetrachloroethene	0.5	0.95	0.55	0.72	0.62	0.31 J	0.5	0.33 J	0.81	0.11 J
Trichloroethene	6.6	32	12	14	19	5	2.6	0.91	4.4	0.11 J
1,1-Dichloroethene	1	1	0.37 J	0.4 J	0.44 J	0.5 U	2.7	2.8	1.2	0.5 U
cis-1,2-Dichloroethene	0.56	1.8	0.97	1.1	1.7	0.58	0.23 J	0.12 J	0.34 J	0.5 U
Carbon tetrachloride	0.18 J	0.25 J	0.17 J	0.5 U	0.12 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

Chemical	SVP/GWM-6					
	Port 1 445-450 ft	Port 2 365-370 ft	Port 3 245-250 ft	Port 4 175-180 ft	Port 5 100-105 ft	Port 6 45-50 ft
Tetrachloroethene	0.23 J	0.5 U	0.7	0.52	1.1	0.5 U
Trichloroethene	1.7	0.33 J	8.2	2.1	4.3	0.26 J
1,1-Dichloroethene	6.6	3.7	13	14	22	1.5
cis-1,2-Dichloroethene	1.8	0.69	4.8 J	41. J	22 J	0.26 J
Carbon tetrachloride	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

Table 2
Multi-Port Well COC Results - Round 1

Chemical	SVP/GWM-7					
	Port 1 445-450 ft	Port 2 425-430 ft	Port 3 310-315 ft	Port 4 205-210 ft	Port 5 100-105 ft	Port 6 45-50 ft
Tetrachloroethene	0.5 U	0.11 J	2.2	0.21 J	0.45 J	0.5 U
Trichloroethene	0.18 J	0.66	9.4	0.38 J	1.2	0.5 U
1,1-Dichloroethene	0.18 J	1.4	0.5 U	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	0.5 U	0.5 U	1	0.5 U	0.5 U	0.5 U
Carbon tetrachloride	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

Chemical	SVP/GWM-8					
	Port 1 435-440 ft	Port 2 370-375 ft	Port 3 235-240 ft	Port 4 155-160 ft	Port 5 100-105 ft	Port 6 45-50 ft
Tetrachloroethene	1.9	1.9	15	17	34	0.92
Trichloroethene	1.9	1.5	1.2	1	1.6	0.5 U
1,1-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	0.21 J	0.18 J	0.5 U	0.5 U	0.18 J	0.5 U
Carbon tetrachloride	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

All results in micrograms per liter (µg/L)
ft = feet
U = Not detected
J = Result is estimated due to exceeded quality control criteria

Table 3
Multi-Port Well COC Results - Round 2

Chemical	SVP/GWM-1								
	Port 2 400-405 ft	Port 3 370-375 ft	Port 4 315-320 ft	Port 5 290-295 ft	Port 6 250-255 ft	Port 7 200-205 ft	Port 8 150-155 ft	Port 9 100-105 ft	Port 10 50-55 ft
Tetrachloroethene	0.7	0.8	0.8	0.21 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Trichloroethene	0.99	2.4	0.92	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1-Dichloroethene	0.5 U	4	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	0.13 J	0.22 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Carbon tetrachloride	0.5 U	0.49 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

Chemical	SVP/GWM-2									
	Port 1 450-455 ft	Port 2 410-415 ft	Port 3 370-375 ft	Port 4 330-335 ft	Port 5 290-295 ft	Port 6 250-255 ft	Port 7 190-195 ft	Port 8 150-155 ft	Port 9 100-105 ft	Port 10 50-55 ft
Tetrachloroethene	1.8	2.3	4.4	2.6	2.2	4.3	2.3	2.3	0.38 J	0.14 J
Trichloroethene	15	17	38 J	21	23 J	17	12	18	18	1
1,1-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	0.74	4.1	10	5.8	5.7	10	0.34 J	0.48 J	0.76	0.14 J
Carbon tetrachloride	0.03 J	0.5 U	0.5 U	0.06 J	0.07 J	0.13 J	0.1 J	0.06 J	0.5 U	0.5 U

Chemical	SVP/GWM-3						
	Port 1 450-455 ft	Port 2 390-395 ft	Port 3 370-375 ft	Port 4 290-295	Port 5 170-175 ft	Port 6 100-105 ft	Port 7 50-55 ft
Tetrachloroethene	0.5 U	0.5 U	0.3 J	0.24 J	0.46 J	0.64	0.54
Trichloroethene	6.1	14	13	0.51	1	0.5 U	0.5 U
1,1-Dichloroethene	0.5 U	1	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	0.12J	0.8	0.61	0.5 U	0.5 U	0.5 U	0.5 U
Carbon tetrachloride	0.5 U	0.21 J	0.5 U	0.5 U	0.5 U	0.12 J	0.07 J

Table 3
Multi-Port Well COC Results - Round 2

Chemical	SVP/GWM-4									
	Port 1 420-425 ft	Port 2 400-405 ft	Port 3 350-355 ft	Port 4 305-310 ft	Port 5 285-290 ft	Port 6 245-250 ft	Port 7 185-190 ft	Port 8 145-150 ft	Port 9 100-105 ft	Port 10 45-50 ft
Tetrachloroethene	21 J	29	210	200	100	94	25	16	14	0.31 J
Trichloroethene	21 J	22	180	200	130	94	120	16	2.9	1.6
1,1-Dichloroethene	5.8	4	9.7	4.8	3.4	2	0.5 U	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	2.2 J	2.9	11 J	5	4.7	7.8	2.7	1.4	0.62	0.13 J
Carbon tetrachloride	1.8	2.9	0.29 J	0.12 J	0.08 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

Chemical	SVP/GWM-5									
	Port 1 430-435 ft	Port 2 405-410 ft	Port 3 355-360 ft	Port 4 310-315 ft	Port 5 290-295 ft	Port 6 250-255 ft	Port 7 190-195 ft	Port 8 150-155 ft	Port 9 95-100 ft	Port 10 45-50 ft
Tetrachloroethene	0.35 J	0.92	0.63	0.73	0.6	0.72	0.4 J	0.49 J	0.11 J	0.37 J
Trichloroethene	9.3	28	14	18	18	12	2.1	1.7	0.19 J	1.6
1,1-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1.4	0.5 U	0.5 U
cis-1,2-Dichloroethene	1.1	2.9	1.8	2	2	1.8	0.26 J	0.25 J	0.5 U	0.18 J
Carbon tetrachloride	0.43 J	0.87	0.19J	0.11 J	0.12 J	0.5 U	0.12 J	0.16 J	0.5 U	0.5 U

Chemical	SVP/GWM-6					
	Port 1 445-450 ft	Port 2 365-370 ft	Port 3 245-250 ft	Port 4 175-180 ft	Port 5 100-105 ft	Port 6 45-50 ft
Tetrachloroethene	0.5 U	0.5 U	0.29 J	0.24 J	0.54	0.087 J
Trichloroethene	1.4	0.5 U	2.3	1	2.5	0.5 U
1,1-Dichloroethene	0.5 U	0.5 U	9.7	6.7	16	0.5 U
cis-1,2-Dichloroethene	0.67	0.19 J	5.9 J	3.7 J	17 J	0.5 U
Carbon tetrachloride	0.06 J	0.5 U	0.5 U	0.29 J	1	0.5 U

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Table 3
Multi-Port Well COC Results - Round 2

Chemical	SVP/GWM-7					
	Port 1 445-450 ft	Port 2 425-430 ft	Port 3 310-315 ft	Port 4 205-210 ft	Port 5 100-105 ft	Port 6 45-50 ft
Tetrachloroethene	0.5 U	0.5 U	7.7	0.56	0.69	0.5 U
Trichloroethene	0.24 J	6.2	20	0.81	1.8	0.5 U
1,1-Dichloroethene	0.5 U	5.2	0.5 U	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	0.5 U	0.76	3.9	0.5 U	0.5 U	0.5 U
Carbon tetrachloride	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

Chemical	SVP/GWM-8					
	Port 1 435-440 ft	Port 2 370-375 ft	Port 3 235-240 ft	Port 4 155-160 ft	Port 5 100-105 ft	Port 6 45-50 ft
Tetrachloroethene	6.7	13	23	23	57	0.35 J
Trichloroethene	1.4	3.2	1.1	1.6	2	0.5 U
1,1-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	0.5 U	0.46 J	0.5 U	0.5 U	0.3 J	0.5 U
Carbon tetrachloride	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

All results in micrograms per liter (μg/L)
ft = feet
U = Not detected
J = Result is estimated due to exceeded quality control criteria

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Table 4
Existing Well and Supply Well Results - Round 1

Well	GWP-10	GWP-11	10019	10020	10035	8474	8475	9398	9966	9953
Chemical/Depth	377-417 ft	370-410 ft	223-228 ft	185-190 ft	48-53 ft	485-556 ft	409-481 ft	21-22 ft	38-51 ft	35-40 ft
Tetrachloroethene	270	50	2	1.3	0.5 U	5.8	5.5	0.16 J	0.5 U	0.5 U
Trichloroethene	170	160	260	1.6	1.2	29	24	0.5 U	0.5 U	0.5 U
1,1-Dichloroethene	5.5	4	0.5 U	0.5 U	0.5 U	0.5 U	17	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	13	13	21	0.19 J	0.5 U	0.76	1.2	0.5 U	0.5 U	0.5 U
Carbon tetrachloride	0.85	0.42 J	0.2 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

All results in micrograms per liter (µg/L)
ft = feet
U = Not detected
J = Result is estimated due to exceeded quality control criteria

Table 5
Existing Well and Supply Well Results - Round 2

Well	GWP-10	GWP-11	10019	10020	10035	8086	8474	8475	9398	9966	9953
Chemical/Depth	377-417 ft	370-410 ft	223-228 ft	185-190 ft	48-53 ft	265-291 ft	485-556 ft	409-481 ft	21-22 ft	38-51 ft	35-40 ft
Tetrachloroethene	230	58	2.2	0.5 U	0.5 U	170	6.3	3.7	0.5 U	0.5 U	0.5 U
Trichloroethene	220	160	170	0.14 J	0.31 J	54	25	16	0.5 U	0.5 U	0.5 U
1,1-Dichloroethene	12	3.7	0.5 U	0.5 U	0.5 U	17	7.4	20 J	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	26 J	10	23	0.5 U	0.5 U	5.3 J	1.4 J	0.79 J	0.5 U	0.5 U	0.5 U
Carbon tetrachloride	1.2	0.46 J	0.28 J	0.5 U	0.5 U	0.44 J	0.42 J	0.5 U	0.5 U	0.5 U	0.5 U

All results in micrograms per liter (µg/L)
ft = feet
U = Not detected
J = Result is estimated due to exceeded quality control criteria

Table 6 Soil Gas Screening Criteria for Chemicals of Concern[1]	
Chemical	Screening Criteria (µg/m^3)
Tetrachloroethene	81
Trichloroethene	2.2
1,1-Dichloroethene	20,000
cis-1,2-Dichloroethene	3,500
Carbon tetrachloride	16

µg/m^3 = micrograms per cubic meter

[1] Target Deep Soil Gas Concentrations from Table 2c of the EPA 2002, Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (EPA 530-D-02-04).

Table 7
Summary of Chemicals of Concern and
Medium-Specific Exposure Point Concentrations

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Point	Chemical of Concern [2]	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration (EPC)	EPC Units	Statistical Measure
		Min	Max					
Tap Water[1]	Tetrachloroethene	0.09	350	µg/L	108/127	60	µg/L	99% Cheb
	Trichloroethene	0.11	280	µg/L	110/127	77	µg/L	99% Cheb

[1] Exposure to volatilizing chemicals during showering was evaluated using the Andelman shower model, as modified by Shaum, et al. The modeled EPCs for the adult resident were 900 ug/m^3 for PCE and 1,200 ug/m^3 for TCE. The modeled EPCs for the child resident were 1,600 ug/m^3 for PCE and 2,200 ug/m^3 for TCE.
[2] 1,1-dichloroethene, cis-1,2-dichloroethene and carbon tetrachloride are site-related contaminants that are considered COCs because they exceed or have the potential to exceed their MCLs.
99% Chebyshev UCL (99% Cheb)

Summary of Chemicals of Concern and Medium-Specific Exposure Point Concentrations

This table presents the chemicals of concern (COCs) and exposure point concentrations (EPCs) for each of the COCs detected in groundwater (i.e., the concentration that will be used to estimate the exposure and risk from each COC in groundwater). The table includes the range of concentrations detected for each COC, as well as the frequency of detection (i.e., the number of times the chemical was detected in the samples collected at the site), the EPC and how it was derived.

Table 8
Selection of Exposure Pathways

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site /Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current	Ground-water	Groundwater	Tap Water	Resident	Adult	Dermal	Off-Site	None	Current nearby residents are connected to the public water supply.
						Ingestion	Off-Site	None	Current nearby residents are connected to the public water supply.
					Child (0-6 yrs)	Dermal	Off-Site	None	Current nearby residents are connected to the public water supply.
						Ingestion	Off-Site	None	Current nearby residents are connected to the public water supply.
				Site Worker	Adult	Ingestion	On-Site	None	Current nearby residents are connected to the public water supply.
		Air	Water Vapors at Shower-head	Resident	Adult	Inhalation	Off-Site	None	Current nearby residents are connected to the public water supply.
					Child (0-6 yrs)	Inhalation	Off-Site	None	Current nearby residents are connected to the public water supply.
	Air	Vapors	Indoor Air Vapors from Subsurface	Resident	Adult	Inhalation	Off-Site	None	Nearby residents could be exposed via inhalation of vapors from subsurface intrusion. More information about the vapor intrusion investigation at the site can be found in a separate report in the administrative record.
					Child (0-6 yrs)	Inhalation	Off-Site	None	
				Site Worker	Adult	Inhalation	On-Site	None	Site workers may be exposed via inhalation of vapors from subsurface intrusion. More information about the vapor intrusion investigation at the site can be found in a separate report in the administrative record.
Future	Ground-water	Groundwater	Tap Water	Resident	Adult	Dermal	On-Site	Quant	Private wells could be installed in the future for residents.
						Ingestion	On-Site	Quant	Private wells could be installed in the future for residents.
					Child (0-6 yrs)	Dermal	On-Site	Quant	Private wells could be installed in the future for residents.
						Ingestion	On-Site	Quant	Private wells could be installed in the future for residents.
				Site Worker	Adult	Ingestion	On-Site	Quant	Private wells could be installed in the future for residents.
		Air	Water Vapors at Shower-head	Resident	Adult	Inhalation	On-Site	Quant	Private wells could be installed in the future for residents.
					Child (0-6 yrs)	Inhalation	On-Site	Quant	Private wells could be installed in the future for residents.
	Air	Vapors	Indoor Air Vapors from Subsurface	Resident	Adult	Inhalation	On-Site	None	Residential homes could be located on the site in the future and residents could be exposed via inhalation of vapors from subsurface intrusion. More information about the vapor intrusion investigation at the site can be found in a separate report in the administrative record.
					Child (0-6 yrs)	Inhalation	On-Site	None	
				Site Worker	Adult	Inhalation	On-Site	None	

Table 8
Selection of Exposure Pathways

Quant = Quantitative risk analysis performed.

Summary of Selection of Exposure Pathways

The table describes the exposure pathways associated with the groundwater that were evaluated for the risk assessment, and the rationale for the inclusion of each pathway. Exposure media, exposure points, and the characteristics of receptor populations are included.

Table 9
Non-Cancer Toxicity Data Summary

Pathway: Oral/Dermal

Chemical of Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Absorp. Efficiency (Dermal)	Adjusted RfD (Dermal)	Adjusted Dermal RfD Units	Primary Target Organ	Combined Uncertainty Modifying Factors	Sources of RfD Target Organ	Dates of RfD
Tetrachloroethene	Chronic	1.0E-2	mg/kg-day	NA	1.0E-2	mg/kg-day	Liver	1000	IRIS	11/01/06
Trichloroethene	Chronic	3.0E-4	mg/kg-day	NA	3.0E-4	mg/kg-day	Liver, kidney, fetus	3000	NCEA	4/15/03

Pathway: Inhalation

Chemical of Concern	Chronic/ Subchronic	Inhalation RfC	Inhalation RfC Units	Inhalation RfD	Inhalation RfD Units	Primary Target Organ	Combined Uncertainty/ Modifying Factors	Sources of RfD: Target Organ	Dates
Tetrachloroethene	NA	NA	mg/m3	NA	mg/kg-day	NA	NA	NA	11/17/07
Trichloroethene	Chronic	4.0E-2	mg/m3	1.1E-2	mg/kg-day	CNS	1000	NCEA	04/14/03

Key
NA: No information available
IRIS: Integrated Risk Information System, U.S. EPA
NCEA: National Center for Environmental Assessment

Summary of Toxicity Assessment

This table provides non-carcinogenic risk information which is relevant to the contaminants of concern in groundwater. When available, the chronic toxicity data have been used to develop oral reference doses (RfDs) and inhalation reference doses (RfDi).

Table 10
Cancer Toxicity Data Summary

Pathway: Oral/Dermal

Chemical of Concern	Oral Cancer Slope Factor	Units	Adjusted Cancer Slope Factor (for Dermal)	Slope Factor Units	Weight of Evidence/Cancer Guideline Description	Source	Date
Tetrachloroethene	5.4E-1	$(mg/kg/day)^{-1}$	5.4E-1	$(mg/kg/day)^{-1}$	2B	CalEPA	03/03/07
Trichloroethene	4.0E-1	$(mg/kg/day)^{-1}$	4.0E-1	$(mg/kg/day)^{-1}$	B2-C	NCEA	01/22/03

Pathway: Inhalation

Chemical of Concern	Unit Risk	Units	Inhalation Slope Factor	Slope Factor Units	Weight of Evidence/ Cancer Guideline Description	Source	Date
Tetrachloroethene	5.9E-6	$(mg/m^3)^{-1}$	2.1E-2	$(mg/kg\text{-}day)^{-1}$	2B	CalEPA	12/13/04
Trichloroethene	1.1E-4	$(mg/m^3)^{-1}$	4.0E-1	$(mg/kg\text{-}day)^{-1}$	B2-C	NCEA	01/17/07

Key:
CalEPA: California Environmental Protection Agency
NA: No information available
NCEA: National Center for Environmental Assessment

EPA Weight of Evidence:
A - Human carcinogen
B1 - Probable Human Carcinogen-Indicates that limited human data are available
B2 - Probable Human Carcinogen-Indicates sufficient evidence in animals associated with the site and inadequate or no evidence in humans
C - Possible human carcinogen
D - Not classifiable as a human carcinogen
E- Evidence of noncarcinogenicity

California Weight of Evidence:
2B - The agent is possibly carcinogenic to humans

Summary of Toxicity Assessment

This table provides carcinogenic risk information which is relevant to the contaminants of concern in groundwater. Toxicity data are provided for both the oral and inhalation routes of exposure.

Table 11
Risk Characterization Summary - Noncarcinogens

Scenario Timeframe: Future
Receptor Population: Site Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Risk			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Tap Water	Tetrachloroethene	Liver	0.06			0.06
			Trichloroethene	Liver, Kidney, Fetus, CNS	2.5			2.5
							Groundwater Hazard Index Total[1] =	3.0
							Total Liver HI =	3.0
							Total Kidney HI =	3.0
							Total Fetus HI =	3.0
							Total CNS HI =	3.0

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non Carcinogenic Risk			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Tap Water	Tetrachloroethene	Liver	0.2		0.01	0.2
			Trichloroethene	Liver, Kidney, Fetus, CNS	7.0	0.9	0.2	8.0
							Groundwater Hazard Index Total[1] =	10
							Total Liver HI =	9.0
							Total Kidney HI =	8.0
							Total Fetus HI =	8.0
							Total CNS HI =	8.0

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

500077

Table 11
Risk Characterization Summary - Noncarcinogens

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Risk			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Tap Water	Tetrachloroethene	Liver	0.4		0.04	0.4
			Trichloroethene	Liver, Kidney, Fetus, CNS	16	12	0.6	29
							Groundwater Hazard Index Total[1] =	35
							Total Liver HI =	32
							Total Kidney HI =	29
							Total Fetus =	29
							Total CNS HI =	29

[1] The HI represents the summed HQs for all chemicals of potential concern at the site, not just those chemicals requiring remedial action which are shown here.
CNS = Central Nervous System

Summary of Risk Characterization - Non-Carcinogens

The table presents hazard quotients (HQs) for each route of exposure and the hazard index (sum of hazard quotients) for all routes of exposure. The Risk Assessment Guidance for Superfund states that, generally, a hazard index (HI) greater than 1 indicates the potential for adverse non-cancer effects.

Table 12
Risk Characterization Summary - Carcinogens

Scenario Timeframe: Future
Receptor Population: Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Tap Water	Tetrachloroethene	1E-04			1E-04
			Trichloroethene	1E-04			1E-04
						Total Risk =	2E-04

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Tap Water	Tetrachloroethene	3E-04	5E-05	2E-05	4E-04
			Trichloroethene	3E-04	1E-03	8E-06	2E-03
						Total Risk =	2E-03

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Tap Water	Tetrachloroethene	2E-04	2E-04	2E-05	4E-04
			Trichloroethene	2E-04	5E-03	2E-06	5E-03
						Total Risk =	6E-03

Summary of Risk Characterization - Carcinogens

The table presents cancer risks for each route of exposure and for all routes of exposure combined. As stated in the National Contingency Plan, the acceptable risk range for site-related exposure is 10^{-6} to 10^{-4}.

Table 13
Alternative 3: Pump and Treat - Cost Estimate Summary

Item Description		Extended Cost
CAPITAL COSTS		
1.	Pre-Design Investigation	$1,110,440
2.	Work Plan for Long-term Monitoring Program and Site Management Plan	$69,120
3.	Baseline Groundwater Sampling	$174,756
4.	Groundwater Modeling	$72,000
5.	Engineering Design	$750,000
6.	Groundwater Pump and Treat System Construction	$3,203,963
7.	Evaluation and Replacement of Supply Well Air Strippers	$799,700
8.	Soil Vapor Sampling	$84,114
TOTAL CAPITAL COSTS		**$6,239,000**
OPERATION & MAINTENANCE (O&M) COSTS		
Annual O&M Costs		
9.	Groundwater Treatment Plant O&M	$675,152
10.	Long-term Monitoring (Annual Groundwater Sampling (Year 1 to Year 25)	$174,756
11.	Reduced Long-term Monitoring (Annual Groundwater Sampling (Year 26 to Year 35)	$111,000
PRESENT WORTH OF 35 YEAR COSTS (with discounting)		
12.	Total Capital Costs	$6,239,000
13.	Pump-and-Treat O&M Costs (for 10 years)	$4,741,998
14.	Long-term Monitoring Costs (for 35 years)	$2,180,142

Table 13

Alternative 3: Pump and Treat - Cost Estimate Summary

Item Description	Extended Cost
TOTAL PRESENT WORTH COST	$13,160,000

Present worth cost calculations assume no inflation.

The pump-and-treat system downgradient of SVP/GWM-4 will operate for 10 years.

It will take 35 years for contaminant concentrations in the plume to be reduced below MCLs. However, because the size of the plume would be reduced after 25 years, the scale of long-term monitoring will be reduced after 25 years.

OLD ROOSEVELT FIELD CONTAMINATED GROUNDWATER AREA
SUPERFUND SITE
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APPENDIX III

ADMINISTRATIVE RECORD INDEX

OLD ROOSEVELT FIELD CONTAMINATED GROUNDWATER AREA SUPERFUND SITE RECORD OF DECISION

APPENDIX III

ADMINISTRATIVE RECORD INDEX

Data are summarized in several of the documents that comprise the Administrative Record. The actual data, quality assurance/quality control, chain of custody, etc. are compiled at various EPA offices and can be made available at the record repository upon request. Bibliographies in the documents and in the references cited in this Record of Decision are incorporated by reference in the Administrative Record. Many of the documents referenced in the bibliographies and cited in this Record of Decision are publically available and readily accessible. Most of the referenced guidance documents are available on the EPA website (www.epa.gov). If copies of the documents cannot be located, contact the EPA Project Manager Caroline Kwan at (212) 637-4275. Copies of the Administrative Record documents that are not available in the Administrative Record repository file at the Village of Garden City Library or Village of Hempstead Library can be made available at this location upon request.

OLD ROOSEVELT FIELD CONTAMINATED GW AREA
ADMINISTRATIVE RECORD FILE
INDEX OF DOCUMENTS

1.0 SITE IDENTIFICATION

1.3 Preliminary Assessment Reports

P. 100001 - 100528 Report: Hazard Ranking System Documentation Package, Old Roosevelt Field Contaminated GW Area, Garden City, Nassau County, New York, CERCLIS ID No. NYSFN0204234, Volume 1 of 1, prepared by Region II Superfund Technical Assessment and Response Team, Roy F. Weston, Inc., Federal Programs Division, prepared for United States Environmental Protection Agency, January 2000.

3.0 REMEDIAL INVESTIGATION

3.2 Sampling and Analysis Data/Chain of Custody Forms

P. 300001 - 300017 Letter to Ms. Amelia Jackson, EPA QA Officer for RAC II, U.S. Environmental Protection Agency, from Ms. Jeniffer Oxford, RAC II QA Coordinator, CDM Federal Programs Corporation, re: QA Field Technical Systems Audit Report, Old Roosevelt Field Contaminated Groundwater Superfund Site, Remedial Investigation/Feasibility Study, Nassau County, New York, October 19, 2005.

P. 300018 - 300065 Letter to Mr. Adly Michael, US EPA Region 2, from Mr. Scott Kirchner, RAC II Analytical Services Coordinator, CDM Federal Programs Corporation, re: Sampling Trip Report for RAS Case Number 35187, Old Roosevelt Field Groundwater Contamination Site, Groundwater Sampling Event-Round One, prepared by CDM Federal Programs Corporation, prepared for U.S. Environmental Protection Agency, Region II, April 20, 2006.

P. 300066 - 300118 - Letter to Mr. Adly Michael, US EPA Region 2, from Mr. Scott Kirchner, RAC II Analytical Services Coordinator, CDM Federal Programs Corporation, July 26, 2006, re: Sampling Trip Report for RAS Case Number 35508, Old Roosevelt Field Groundwater Contamination Site, Groundwater Sampling Event-Round Two, prepared by CDM Federal Programs Corporation, prepared for U.S. Environmental Protection Agency, Region II, July 21, 2006.

3.3 Work Plans

P. 300119 - 300283 - Report: Final Work Plan, Volume I, Old Roosevelt Field Contaminated Groundwater Area Site, Remedial Investigation/Feasibility Study, Nassau County, New York, prepared by CDM Federal Programs Corporation, prepared for U.S. Environmental Protection Agency, December 10, 2004.

P. 300284 - 300292 - Letter to Mr. Fernando Rosado, Project Officer, and Ms. Caroline Kwan, Remedial Project Manager, U.S. Environmental Protection Agency, from Mr. Robert D. Goltz, P.E., RAC II Program Manager, CDM Federal Programs Corporation, re: Technical Work Plan Letter - Source Area Soil Gas Survey, Old Roosevelt Field Contaminated Groundwater Area Site, Nassau County, New York, April 12, 2005.

P. 300293 - 300618 - Report: Final Quality Assurance Project Plan, Old Roosevelt Field Contaminated Groundwater Area Site, Remedial Investigation/Feasibility Study, Nassau County, New York, prepared by CDM Federal Programs Corporation, prepared for U.S. Environmental Protection Agency, June 20, 2005.

P. 300619 - 300741 - Report: Revised Health and Safety Plan, Old Roosevelt Field Contaminated Groundwater Area Site, Remedial Investigation/Feasibility Study, Nassau County, New York, prepared by CDM Federal Programs Corporation, prepared for U.S. Environmental Protection Agency, June 20, 2005.

3.4 Remedial Investigation Reports

P. 300742 - 300798 - Report: Stage IA Cultural Resources Survey, Old Roosevelt Field Contaminated Groundwater Site, Village of Garden City, Town of Hempstead, Nassau

County, New York, prepared by John Milner Associates, Inc., prepared for CDM Federal Programs Corporation, May 2005.

P. 300799 - 300995 Report: Final Remedial Investigation Report, Old Roosevelt Field Contaminated Groundwater Site, Remedial Investigation/Feasibility Study, Garden City, New York, Volume 1, prepared by CDM Federal Programs Corporation, prepared for U.S. Environmental Protection Agency, July 24, 2007.

P. 300996 - 301929 Report: Final Remedial Investigation Report, Old Roosevelt Field Contaminated Groundwater Site, Remedial Investigation/Feasibility Study, Garden City, New York, Volume 2, prepared by CDM Federal Programs Corporation, prepared for U.S. Environmental Protection Agency, July 24, 2007.

P. 301930 - 302160 Report: Final Human Health Risk Assessment, Old Roosevelt Field Contaminated Groundwater Site, Remedial Investigation/Feasibility Study, Garden City, New York, prepared by CDM Federal Programs Corporation, prepared for U.S. Environmental Protection Agency, July 24, 2007.

8.0 HEALTH ASSESSMENTS

8.1 ATSDR Health Assessments

P. 800001 - 800045 Report: Public Health Assessment for Old Roosevelt Field Contaminated Groundwater Area, Garden City, Nassau County, New York, EPA Facility ID: NYSFN0204234, Final Release, prepared by New York State Department of Health Under a Cooperative Agreement with the Agency for Toxic Substances and Disease Registry, July 13, 2004.

9.0 NATURAL RESOURCE TRUSTEES

9.3 Reports

P. 900001 - 900070 Report: Chlorinated Organic Compounds in Ground Water at Roosevelt Field, Nassau County, Long Island, New York, prepared by U.S. Geological Survey, Water-Resources Investigations, Report 86-4333, prepared in cooperation with the Nassau County Department of Public Works, Syosset, New York, 1989.

10.0 PUBLIC PARTICIPATION

10.2 Community Relations Plans

P. 10.00001- 10.00049 Report: Community Involvement Plan, Old Roosevelt Field Contaminated Groundwater Area Site, Garden City, Nassau County, NY, prepared by CDM Federal Programs Corporation, prepared for U.S. Environmental Protection Agency, October 11, 2005.

10.6 Facts Sheets and Press Releases

P. 10.00050- 10.00053 Environmental Update, Old Roosevelt Field Superfund Site, Garden City, New York, prepared by EPA, Region II, June 2005.

OLD ROOSEVELT FIELD CONTAMINATED GW AREA
ADMINISTRATIVE RECORD FILE UPDATE
INDEX OF DOCUMENTS

3.0 REMEDIAL INVESTIGATION

3.2 Sampling and Analysis Data/Chain of Custody Forms

P. 302161 - 302194 Report: Analytical Report, Roosevelt Field Ground Water Contamination Superfund Site, Garden City, NY, prepared by Lockheed Martin, Inc., prepared for U.S. EPA, Region 2, August 9, 2007.

P. 302195 - 302233 Memorandum to Mr. Jeff Catanzarita, U.S. EPA, Region 2, from Mr. Tim Macaluso, REAC Geologist, Lockheed Martin Technology Services, re: Roosevelt Field Soil Boring Event July 2007, Work Assignment No. 0-254.1 - Trip Report, August 10, 2007.

P. 302234 - 302283 Memorandum (with attachment) to R. Singhvi, EPA/ERT Analytical Work Assignment Manager, from V. Kansal, REAC Analytical Section Leader, Lockheed Martin Technology Services, re: Document transmittal under Work Assignment #0-254, August 20, 2007.

4.0 FEASIBILITY STUDY

4.3 Feasibility Study Reports

P. 400001 - 400218 Report: Final Feasibility Study Report, Old Roosevelt Field Contaminated Groundwater Site, Garden City, New York, prepared by CDM Federal Programs Corporation, prepared for U.S. EPA, Region 2, August 20, 2007.

10.0 PUBLIC PARTICIPATION

10.9 Proposed Plan

P. 10.00054- 10.00068 Superfund Proposed Plan, Old Roosevelt Field Contaminated Groundwater Area Superfund Site, Garden City, New York, prepared by U.S. EPA, Region 2, August 2007.

OLD ROOSEVELT FIELD CONTAMINATED GROUNDWATER AREA
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APPENDIX IV

STATE LETTER OF CONCURRENCE

New York State Department of Environmental Conservation
Division of Environmental Remediation, 12th Floor
625 Broadway, Albany, New York 12233-7011
Phone: (518) 402-9706 • **FAX:** (518) 402-9020
Website: www.dec.ny.gov

Alexander B. Grannis
Commissioner

September 28, 2007

Mr. George Pavlou, Director
United States Environmental Protection Agency
Emergency & Remedial Response Division
Floor 19-No. E-38
290 Broadway
New York, New York 10007-1866

RE: Old Roosevelt Field, Site # 130051
Contaminated Groundwater Area Superfund Site
Record of Decision (ROD)

Dear Mr. Pavlou:

The New York State Department of Environmental Conservation (Department) does not concur with the Old Roosevelt Field site Record of Decision at this time while the Department reviews the environmental easement requirements.

If you have any questions, please contact Dr. Chittibabu Vasudevan at (518) 402-9625.

Sincerely,

Dale A. Desnoyers
Director
Division of Environmental Remediation

cc: J. LaPadula, USEPA
A. Carpenter, USEPA
K. Willis, USEPA

bc: S. Ervolina
C. Vasudevan
J. Swartwout
S. Scharf
W. Parish, Region 1
D. Miles, NYSDOH
J. Nealon, NYSDOH
J. DeFranco, NCDH

OLD ROOSEVELT FIELD CONTAMINATED GROUNDWATER AREA SUPERFUND SITE
RECORD OF DECISION

APPENDIX V

RESPONSIVENESS SUMMARY

SUMMARY OF DOCUMENTS

Section V-A: August 2007 Proposed Plan

Section V-B: Public Notice

Section V-C: September 11, 2007 Public Meeting Sign-In Sheet

Section V-D: September 11, 2007 Public Meeting Transcript

Section V-E: Letters Received During the Comment Period

RESPONSIVENESS SUMMARY
FOR THE
RECORD OF DECISION
OLD ROOSEVELT FIELD CONTAMINATED GROUNDWATER AREA
SUPERFUND SITE
GARDEN CITY, NASSAU COUNTY, NEW YORK

INTRODUCTION

This Responsiveness Summary provides a summary of citizens' comments and concerns received during the public comment period related to the Old Roosevelt Field Contaminated Groundwater Area Superfund site (Site) Proposed Plan and provides the U.S. Environmental Protection Agency's (EPA's) responses to those comments and concerns. All comments summarized in this document have been considered in EPA's final decision in the selection of a remedy to address the contamination at the Site.

SUMMARY OF COMMUNITY RELATIONS ACTIVITIES

EPA conducted an remedial investigation and feasibility study (RI/FS) at the Site from 2001-2006. The findings are presented in an RI report[4] and FS report[5]. EPA and NYSDEC's preferred remedy and the basis for that preference was identified in a Proposed Plan. These documents were made available to the public in information repositories maintained at the EPA Docket Room in the Region 2 offices at 290 Broadway in Manhattan, at the Village of Garden City Public Library located at 60 Seventh Street, Garden City, New York, and at the Village of Hempstead Public Library, 115 Nichols Court, Hempstead, New York. Notices of the commencement of the public comment period, the public meeting date, a summary of the preferred remedy, EPA contact information, and the availability of the above-referenced documents were published in Garden City Life and Garden City News on August 17, 2007 and in Garden City News on August 24, 2007 and in Garden City Life on August 31, 2007. The public comment period ran from August 22, 2006 to September 20, 2007. EPA held a public meeting on September 11, 2007 at 7:00 P.M. at the Village of Garden City Village Hall to present the findings of the RI/FS and to answer questions from the public about the Site and the remedial alternatives under consideration. Approximately 25 people, including residents, local business people, and state and local government officials, attended the public meeting. On the basis of comments received during the public comment period, the public generally supports the selected remedy.

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[4] *Final Remedial Investigation Report, Old Roosevelt Field Contaminated Groundwater Site, Remedial Investigation/Feasibility Study, Garden City, New York*, Volumes I and II, CDM Federal Programs Corporation, July 24, 2007.

[5] *Final Feasibility Study Report, Old Roosevelt Field Contaminated Groundwater Site, Remedial Investigation/Feasibility Study, Garden City, New York*, CDM Federal Programs Corporation, August 20, 2007.

RESPONSIVENESS SUMMARY

APPENDIX V-a

AUGUST 2007 PROPOSED PLAN

Old Roosevelt Field Contaminated Groundwater Area Superfund Site

Garden City, New York

August 2007

PURPOSE OF THIS DOCUMENT

This document describes the remedial alternatives considered for the Old Roosevelt Field Contaminated Groundwater Area Superfund site and identifies the preferred remedy with the rationale for this preference. This Proposed Plan was developed by the U.S. Environmental Protection Agency (EPA) and EPA is issuing this Proposed Plan as part of its public participation responsibilities under Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended, and Sections 300.430(f) and 300.435(c) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The nature and extent of the contamination at the site and the remedial alternatives summarized in this Proposed Plan are described in the July 2007 Remedial Investigation (RI) report, August 2007 Feasibility Study (FS) report, and the soil vapor intrusion investigation report. EPA encourages the public to review these documents to gain a more comprehensive understanding of the site and the Superfund activities that have been conducted at the site.

This Proposed Plan is being provided as a supplement to the RI/FS reports to inform the public of EPA's preferred remedy and to solicit public comments pertaining to all of the remedial alternatives evaluated, including the preferred groundwater alternative. EPA's preferred remedy includes the installation of a groundwater extraction well to capture and treat the contaminant plume. The extraction well will be located near multi-port well SVP-4 and would capture and treat the contaminated groundwater with elevated concentrations of trichloroethene (TCE) and tetrachloroethene (PCE) to prevent further migration of the contaminant plume towards Garden City supply wells GWP-10 and GWP-11. Contaminated groundwater extracted from the new well will be treated using either air-strippers or carbon adsorption units. The treated groundwater will be discharged to a nearby recharge basin.

The remedy described in this Proposed Plan is the preferred remedy for the site. Changes to the preferred remedy, or a change from the preferred remedy to another remedy, may be made if public comments or additional data indicate that such a change will result in a more appropriate remedial action. The final decision regarding the selected remedy will be made after EPA has taken into consideration all public comments. EPA is soliciting public comment on all of the alternatives considered in the Proposed Plan and in the detailed analysis section of the RI/FS report because EPA may select a remedy other than the preferred remedy.

MARK YOUR CALENDAR

August 22, 2007 - September 20, 2007: Public comment period related to this Proposed Plan.

September 11, 2007 at 7:00 P.M.: Public meeting at the Village of Garden City Village Hall, 351 Stewart Avenue, Garden City, NY.

COMMUNITY ROLE IN SELECTION PROCESS

EPA relies on public input to ensure that the concerns of the community are considered in selecting an effective remedy for each Superfund site. To this end, the RI and FS reports and this Proposed Plan have been made available to the public for a public comment period which begins on August 22, 2007 and concludes on September 20, 2007.

A public meeting will be held during the public comment period at the Village of Garden City Village Hall on September 11, 2007 at 7:00 p.m. to present the conclusions of the RI/FS, to elaborate further on the reasons for recommending the preferred remedy, and to receive public comments.

Comments received at the public meeting, as well as written comments, will be documented in the Responsiveness Summary Section of the Record of Decision (ROD), the document which formalizes the selection of the remedy.

INFORMATION REPOSITORIES

Copies of the Proposed Plan and supporting documentation are available at the following information repositories:

Garden City Public Library
60 Seventh Street
Garden City, New York 11530
(516) 742-8405
www.nassaulibrary.org/gardenc/

Hours: Call or see website for summer hours.

Hempstead Public Library
115 Nichols Court
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SCOPE AND ROLE OF ACTION

Site remedial activities are sometimes segregated into different phases, or operable units, so that remediation of different environmental media or areas of a site can proceed separately in an appropriate manner. For the Old Roosevelt Field Contaminated Groundwater Area site, EPA decided to address all site contamination as one operable unit.

SITE BACKGROUND

Site Description

The Old Roosevelt Field Contaminated Groundwater Area Site (site) is an area of groundwater contamination within Garden City, in central Nassau County, New York. The site is located on the eastern side of Clinton Road at the intersection with Old Country Road. The site includes a thin strip of open space along Clinton Road (known as Hazelhurst Park), a large retail shopping mall with a number of restaurants, and a movie theater. Several office buildings (including Garden City Plaza) which share parking space with the shopping mall are situated around its perimeter. Public supply wells GWP-10 and GWP-11 are east of Clinton Road on the southwestern corner of the site. Two recharge basins are directly east and south of the public water supply wells. The eastern basin is known as Pembrook Basin and is on property owned by the shopping mall. The basin situated to the south is Nassau County Storm Water Basin number 124.

Site History

The site was used for aviation activities from 1911 to 1951. The original airfield encompassed 900 to 1,000 acres east of Clinton Road and south of Old Country Road. By the time the field opened in July 1912, there were 5 cement and 30 wooden hangars along Old Country Road, 4 grandstands along Clinton Road, and several flying schools.

The United States (U. S.) military began using the field prior to World War I. The New York National Guard First Aero Company began training at the airfield in 1915, and in 1916, the U.S. Army used the field to train Army and Navy officers. The Army removed the grandstands, built barracks along Clinton Road, and built larger hangars along Old Country Road. In 1918, the Army changed the name of the airfield to Roosevelt Field in honor of Quentin Roosevelt, a son of Theodore Roosevelt who had trained there and was killed during the war.

After World War I, the U. S. Air Service authorized aviation-related companies to operate from Roosevelt Field, but maintained control until July 1, 1920, at which time the Government relinquished control of the field. Subsequently, the property owners sold portions along the southern edge of the field and split the remainder of the property into two flying fields. The eastern half, with sod runways and only two hangars, continued as Roosevelt Field. The western half, which had many hangars, flying schools, and aviation maintenance shops, became known as Curtiss Field.

By 1929, the eastern field (Roosevelt) had served as the starting point or terminus of many notable flights, including Lindbergh's takeoff for his historic trans-Atlantic flight in May 1927. The western field (Curtiss) was used for flying circuses, a flying school, aircraft sales and service, and flight tests. Both fields were bought in 1929 by Roosevelt Field, Inc., and the entire property was once again called Roosevelt Field. Improvements were made, including the installation of several large steel and concrete buildings for hangars, shops, and office space along Old Country Road. As of November 1929, numerous aviation-related businesses operated in the hangars and other buildings surrounding the western field. By 1932, paved runways and 50 buildings made Roosevelt Field the country's largest and busiest civil airfield. While the western field developed into the large aviation center, the eastern field remained unpaved, with few buildings, until it was leased in 1935 and became a racetrack.

Roosevelt Field was used by the Navy and Army during World War II. In July 1939, the Army Air Corps contracted Roosevelt Field, Inc. to provide airplane and engine mechanics training to Army personnel at their school. In early 1941, there were more than 200 Army students and approximately 600 other students at the Roosevelt Aviation School. At the beginning of 1942, after the U.S. had entered the war, civilian flying and private hangar rental ceased at Roosevelt Field due to a ban on private flying in defense areas.

As of March 1942, there were 6 steel/concrete hangars, 14 wooden hangars, and several other buildings at Roosevelt Field. The Army training school was concentrated in the buildings located along Clinton Road. In addition to the training activities, the Roosevelt Field facilities were used to receive, refuel, crate, and ship Army aircraft.

In November 1942, the Navy Bureau of Aeronautics established a modification center at Roosevelt Field to install British equipment into U.S. aircraft for the British Royal Navy. The Navy leased five steel/concrete hangars along Old Country Road; built a barracks, mess hall, and sick bay; and commissioned the U.S. Naval Air Facility (NAF) Roosevelt Field by February 1943. By September 1943, the Navy had built wooden buildings between four of the hangars, and in October 1943 leased six additional hangars. NAF Roosevelt Field was responsible for aircraft repair and maintenance, equipment installation, preparation and flight delivery of lend-lease aircraft, and metal work required for the installation of British modifications. The metal work constituted a substantial portion of the facility's work load. The facility also performed salvage work of crashed Royal Navy planes. The Navy vacated all but six hangars shortly after the war ended, and removed their temporary buildings by the time their lease expired on June 30, 1946. Restoration of buildings and grounds was completed by August 1946, and Roosevelt Field operated as a commercial airport until it closed in May 1951.

After the airfield closed, the large Roosevelt Field Shopping Center was constructed at the site and opened in 1957. The old field is currently the site of the shopping mall and office building complexes and is surrounded by commercial areas and light industry. Three of the old Navy hangars remained standing until some time after June 1971, with various occupants, including a moving/storage firm, discotheque, amusement center, and bus garage.

It is likely that chlorinated solvents were used at Roosevelt Field during and after World War II. Chlorinated solvents such as tetrachloroethene (PCE) and trichloroethene (TCE) have been widely used for aircraft manufacturing, maintenance, and repair operations since about the 1940s. By May 1938, the Bureau of Aeronautics had a specification covering TCE and had approved at least one company to supply TCE. The finish specifications for at least one type of plane that the Navy modified at Roosevelt (eight of which were on site in April 1943) called for aluminum alloy to be cleaned with TCE. An aircraft engine overhaul manual issued in January 1945 specified TCE as a degreasing agent.

In addition to the Village of Garden City supply wells, seven cooling water wells pumped groundwater from the Magothy for use in building air conditioning systems. Cooling water wells pumped variable amounts of water, with greater extraction rates during the hot summer months. These wells operated from approximately 1960 to 1985. After extracted groundwater was used in air conditioning systems, the untreated water was returned to the aquifer system via surface recharge in the Pembrook recharge basin or, after minimal treatment, to a drain field west of Buildings 100 and 200.

The discharge of contaminated water into the recharge basin and drain field continued until the mid-1980s when the cooling water wells were taken out of service. Surface discharge of contaminated groundwater spread contamination through the Upper Glacial and Magothy aquifers. The recharge basin and drain field also created localized groundwater mounding, which may have spread contamination at the water table. However, the sandy nature of the recharge basin soils likely did not result in retention of VOCs within the unsaturated zone. In addition, the zone below the recharge basin has been flushed with stormwater runoff for 20 years; residual contamination from Roosevelt Field is not likely to remain in the area. The Pembrook recharge basin currently only receives surficial stormwater runoff from parking lots surrounding the mall and the office buildings. The drain field/diffusion wells near Building 100 are under the paved parking lot west of Building 100 and 200 and are not currently identifiable in the field. Significant groundwater contamination is present at depth at SVP-4, which is located near the general area of the diffusion wells/drain field.

Supply wells 10 and 11 were installed by the Village of Garden City in 1952 and were put into service in 1953. Well 10 is screened from 377 to 417 feet below the ground surface (bgs) and well 11 is screened from 370 to 410 feet bgs. Both wells have shown the presence of PCE and TCE since they were first sampled in the late 1970s and early 1980s, and concentrations increased significantly until 1987, when an air-stripping treatment system was installed at the wells. Sample results of treated well water from May 1993, September 1995, and June/July 1999 indicated that breakthrough of the treatment system had occurred, and as a result, modifications to the air-stripping treatment system were made to improve its operation. The highest levels of volatile organic compound (VOC) contamination were noted in untreated groundwater during the mid-to late 1990s, and levels have steadily declined since, although the levels remain above EPA and NYS drinking water standards.

SITE HYDROLOGY/HYDROGEOLOGY

Site Hydrology

No naturally-occurring surface water bodies are present in the vicinity of the Roosevelt site. The closest stream is East Meadow Brook, which is about 1.5 miles southeast of the site and flows south towards Great South Bay and the Atlantic Ocean. The largest body of freshwater near the site is Hempstead Lake, located at the head of Millbrook Creek, approximately four miles southwest of the site. Overflow from Nassau County Recharge Basin #124 is directed to the Horse Brook Drain, which flows south to Hempstead Lake, and ultimately to tidal waters to the south.

In general, the sandy nature of natural soils on Long Island promotes fast infiltration of precipitation (rainwater) from the ground surface. Almost the entire area of the site, with the exception of Hazelhurst Park, is paved or is occupied by buildings; therefore, surface rainwater runoff is routed into storm water collection systems and commonly is discharged directly to either dry wells or recharge basins.

The Pembrook recharge basin and two Nassau County recharge basins are man-made water table recharge basins located on or near the site. One of the Nassau County basins is located immediately south of the Pembrook Basin, approximately 1,500 feet southwest of the Roosevelt Field Shopping Center; the other county recharge basin is located about 1,000 feet southeast of the shopping center. The privately-owned Pembrook Basin receives surface water runoff during storm events. The Nassau County basins receive storm water runoff from the municipal storm water collection system.

Site Geology

The site is located within the Atlantic Coastal Plain Physiographic Province. The geology of Long Island is characterized by a southeastward-thickening wedge of unconsolidated sediments unconformably overlying a gently-dipping basement bedrock surface.

The Upper Glacial deposits and the Magothy Formation are the geologic units of interest for the site.

Site Hydrogeology

Groundwater on Long Island is derived from precipitation. The volume of water that percolates down to the water table and recharges the groundwater is the residual of the total precipitation not returned to the atmosphere by evapotranspiration or lost by runoff. Due to the permeable nature of the soils and the generally gentle slope of the land surface, infiltration is high. At the Roosevelt site, which is mostly covered by impervious surfaces such as buildings, paved parking lots, and roads, surface runoff is directed to dry wells or the nearby recharge basins.

The aquifers of concern at the Roosevelt site are the Magothy aquifer and the Upper Glacial aquifer, which form a single, unconfined aquifer, although with different properties. They are the most productive and heavily utilized groundwater resource on Long Island. The depth to the water table ranges from 25 to 50 feet bgs (below ground surface).

Based on measurements in the 8 multi-port wells and 10 existing wells made as part of the Remedial Investigation, groundwater flow is to the south/southwest. Pressure measurements in the ports indicate the vertical groundwater flow is downward. The five multi-port wells in the mall area have similar vertical gradients, with the differences between water levels in the shallow and deep ports within each well ranging from 1.8 to 2.9 feet. Further to the south, the vertical gradients become larger: 3.2 feet in SVP-7; 8.2 feet in SVP-8, and 9.7 in SVP-6. The higher vertical gradients in SVP-8 and SVP-6 are most likely caused by pumping at the Village of Hempstead public supply wells, about a block from multi-port wells SVP-6 and SVP-8.

RESULTS OF THE REMEDIAL INVESTIGATION

The first step in evaluating the nature and extent of contamination at and emanating from the site was to identify regulatory standards and criteria to assess and screen detected constituents in groundwater and soil gas.

Groundwater

EPA and New York State Department of Health have promulgated health-based protective Maximum Contaminant Levels (MCLs), which are enforceable standards for various drinking water contaminants. MCLs, which ensure that drinking water does not pose either a short- or long-term health risk, were used as screening criteria for the groundwater. Table 1 summarizes the MCLs for the contaminants of concern (COCs).

Table 1	
Chemical	Groundwater MCL [1]
PCE	5
TCE	5

1,1-Dichloroethene	5
cis-1,2-Dichloroethene	5
Carbon tetrachloride	5

Units: (1) micrograms/liter (µg/L)

Groundwater

Eight multi-port monitoring wells were drilled during the remedial investigation (see Figure 1). Four wells, each with 10 ports, were installed in the Roosevelt Field mall area. One upgradient (background) well with 10 ports is located on the north side of Old Country Road and three wells, each with six ports, are located in the downgradient area, south of two Village of Garden City supply wells. Ten existing monitoring wells were also sampled (see Figure 1).

Site-related VOCs were selected based on historical data, since sampling of the Garden City supply wells has occurred on a regular basis for more than 20 years. The site-related VOCs are TCE, PCE, 1,1-dichloroethene (1,1-DCE), cis-1,2-dichloroethene (cis-1,2-DCE), and carbon tetrachloride.

Two rounds of VOC samples were collected from the eight multi-port monitoring wells and the 10 existing wells. The highest levels of PCE and TCE (350 and 280 µg/L, respectively) are concentrated at SVP/GWM-4 at approximately 250 to 310 feet deep. It should be noted that the SVP-4 location was selected for monitoring because a distilling well/drain field was operated in the area during the 1980s, to dispose of cooling water contaminated with the site-related VOCs. The next highest levels occur downgradient (to the south) of SVP/GWM-4 in existing well GWX-10019, at a slightly shallower depth at approximately 223 to 228 feet bgs, and at the two supply wells GWP-10 and GWP-11, at approximately 370 to 417 feet deep. Multi-port well SVP/GWM-7, located southwest of the supply wells, showed 20 µg/L of TCE and 7.7 µg/L of PCE at approximately 310 to 315 feet. Further downgradient, monitoring well SVP/GWM-8, installed during the RI, showed 34 µg/L of PCE at approximately 100 to 105 feet and 57 µg/L of PCE at the same depth from round 1 and round 2 sampling, respectively. TCE was detected at levels below the MCL in both rounds. Monitoring well SVP/GWM-6 showed a detection of 8.2 µg/L of TCE at 245 to 250 feet in round 1 and 2.3 µg/L in round 2 at the same depth. PCE was detected in several depths during both sampling rounds, but at levels below the MCL.

GWP-10 and GWP-11 each have a capacity to pump approximately one million gallons per day (mgd) of groundwater from the Magothy aquifer. Groundwater flow and contaminant movement is downward and south from the mall area to the Garden City supply wells. Contamination was observed south (downgradient) of the Garden City supply wells, as observed in the wells sampled.

Further downgradient of the supply wells, PCE and TCE contaminant levels in the most downgradient multi-port well (SVP/GWM-8) are seen at shallower depths than at the plume core in the mall area. Other sources of VOC contamination in the area south of the site may have contributed contamination.

The Village of Hempstead Water Supply Wellfield approximately one block south (downgradient) of multi-port monitoring wells SVP-6 and SVP-8, has been contaminated with VOCs since 1980s. Two of the wells in the Village of Hempstead Wellfield showed detections of 10.1 µg/L of TCE and 9.2 µg/L early this year through their routine monitoring. The source of this contamination is currently unknown since several potential sources are located in the vicinity of the Hempstead Wellfield.

Soil Gas

Two types of soil gas samples were collected: a screening survey on a 100-foot grid on the northern and western sides of the mall parking lot (see Figure 2) and laboratory samples collected around 100 and 200 Garden City Plaza and in Hazelhurst Park (see Figure 3). A total of 34 samples were collected for laboratory analysis. Based on the results of the soil gas screening, EPA conducted an investigation of vapor intrusion into structures within the area that could potentially be affected by the groundwater contamination plume. More information about the vapor intrusion investigation can be found in a separate report in the information repository for the site.

Soil gas screening results from approximately 15 feet bgs and 35 feet bgs are summarized below. The soil gas screening samples were measured in the field with an instrument called a ppbRAE meter. The results are in parts per billion per volume (ppbv).

15 Feet bgs: Five of the samples collected at approximately 15 feet bgs had total VOC readings above 100 ppbv: Location A0 at the corner of Old Country Road and Clinton Road (106 ppbv); location A11 in Hazelhurst Park east of Clinton Road (136 ppbv); location D17 west of Garden City Plaza Building 100 (531 ppbv); location D19 west of Garden City Plaza Building 200 (534 ppbv); and location F20 south of Garden City Plaza Building 200 (163 ppbv). Of all the soil gas readings collected at approximately 15 feet bgs, 85 percent were at or below 10 ppbv; 8 percent were between 11 and 50 ppbv, and 4 percent were between 51 and 100 ppbv.

35 Feet bgs: Nine of the samples collected at approximately 35 feet bgs had total VOC readings above 100 ppbv: Locations A9, A10, and A11 in Hazelhurst Park east of Clinton Road (245 ppbv, 233 ppbv, and 148 ppbv, respectively); location B15 west of the northwest corner of Garden City Plaza Building 100 (368 ppbv); location C20 one of the southern-most samples (112 ppbv); location D17 west of Garden City Plaza Building 100 (494 ppbv); location E14

north of the northeast corner of Garden City Plaza Building 100 (211 ppbv); location H1 southeast of the Citibank building, near the entrance road to the mall (152 ppbv); and location K0 on the eastern side of the mall entrance road (185 ppbv). Of all the soil gas readings collected at approximately 35 feet bgs, 83 percent were at or below 10 ppbv; 9 percent were between 11 and 50 ppbv, and 2.5 percent were between 51 and 100 ppbv.

Soil gas samples collected in canisters for laboratory analysis were compared to the soil gas screening criteria in Table 2c in the EPA 2002 document titled "*Draft Document for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soil*". TCE detections exceeded the screening criterion of 2.2 μg/m^3 in one sample near Garden City Plaza building 200 (SGRF-25 at 23 μg/m^3). Three samples collected along Hazelhurst Park (adjacent to Clinton Road) had TCE detections that exceeded the criterion (SGHP-2 at approximately 3.9, SGHP-3 at 12, and SGHP-4 at approximately 3 μg/m^3). No other results exceeded the screening criteria.

Soil

To complete the evaluation of potential residual source areas in the area of the old airfield, EPA collected 41 soil samples at locations with soil gas screening survey results above 100 ppbv and at selected additional locations in Hazelhurst Park along Clinton Road. Soil samples were generally collected at 2 depths, 15 and 40 feet bgs. The actual depths of samples were adjusted slightly because the drilling rig occasionally encountered obstacles in the subsurface. No VOCs were detected in any of the soil samples collected. While it is believed that airfield activities were the source of the groundwater contamination identified in the RI, based on the results of the soil gas and soil borings, there do not appear to be any continuing sources in the soil in the areas that were sampled.

SUMMARY OF SITE RISKS

As part of the RI/FS, EPA conducted a baseline risk assessment to estimate the current and future effects of contaminants on human health and the environment. A baseline risk assessment is an analysis of the potential adverse human health and ecological effects of releases of hazardous substances from a site in the absence of any actions or controls to mitigate such releases, under current and future land and groundwater uses. The baseline risk assessment includes a human health risk assessment (HHRA) and an ecological risk assessment.

The cancer risk and noncancer health hazard estimates in the HHRA are based on current reasonable maximum exposure scenarios and were developed by taking into account various health protective estimates about the frequency and duration of an individual's exposure to chemicals selected as chemicals of potential concern (COPCs), as well as the toxicity of these contaminants. Cancer risks and non-cancer health hazard indexes (HIs) are summarized below (please see the text box on the following page for an explanation of these terms).

A screening level ecological risk assessment (SLERA) was not conducted to assess the risk posed to ecological receptors because contaminated groundwater does not discharge to any surface water bodies within the area of the site. Since no groundwater discharges to surface water, exposure pathways are not complete and ecological receptors are not exposed to contaminants from the site. Therefore, ecological risks are negligible.

Human Health Risk Assessment

Current site land use is primarily commercial, including office buildings and a shopping mall. The neighboring properties are mixed-use (commercial and residential) in nature. Future land use is expected to remain the same, although the unlikely possibility that the mall and office buildings would be developed into a residential area was considered in the HHRA. The baseline risk assessment began by selecting COPCs in groundwater that would be representative of site risks. The COCs for the site are PCE and TCE in groundwater.

The baseline risk assessment evaluated health effects that could result from exposure to contaminated groundwater though ingestion of, dermal contact with, and inhalation of volatile organic compounds. Although residents and businesses in the area are served by municipal water, groundwater is designated by the State as a potable water supply, meaning it could be used for drinking in the future. Therefore, potential exposure to groundwater was evaluated.

Based on the current zoning and anticipated future use, the risk assessment focused on a variety of possible receptors, including current and future site workers and potential future residents (adult and child). A complete discussion of the exposure pathways and estimates of risk can be found in the *Human Health Risk Assessment* for the site in the information repository.

In the unlikely event that untreated site groundwater were to be used as drinking water, exposure to groundwater contaminated with PCE and TCE would be associated with combined excess lifetime cancer risks and noncancer health hazard indices of 2×10^{-3} and 10 for the future adult resident, 6×10^{-3} and 35 for the future child resident, and 2×10^{-4} and 3 for the future on-site worker.

These cancer risks and noncancer health hazards indicate that there is significant potential risk from direct exposure to groundwater to potentially exposed populations. For these receptors, exposure to PCE and TCE in groundwater results in either an excess lifetime cancer risk that exceeds EPA's target risk range of 10^{-4} to 10^{-6} or an HI above the threshold of 1, or both. Concentrations of PCE and TCE are also in

WHAT IS RISK AND HOW IS IT CALCULATED?

Human Health Risk Assessment:

A Superfund baseline human health risk assessment is an analysis of the potential adverse health effects caused by hazardous substance releases from a site in the absence of any actions to control or mitigate these under current- and future-land uses. A four-step process is utilized for assessing site-related human health risks for reasonable maximum exposure scenarios.

Hazard Identification: In this step, the chemicals of potential concern (COPCs) at the site in various media (*i.e.*, soil, groundwater, surface water, and air) are identified based on such factors as toxicity, frequency of occurrence, and fate and transport of the contaminants in the environment, concentrations of the contaminants in specific media, mobility, persistence, and bioaccumulation.

Exposure Assessment: In this step, the different exposure pathways through which people might be exposed to the contaminants in air, water, soil, etc. identified in the previous step are evaluated. Examples of exposure pathways include incidental ingestion of and dermal contact with contaminated soil and ingestion of and dermal contact with contaminated groundwater. Factors relating to the exposure assessment include, but are not limited to, the concentrations in specific media that people might be exposed to and the frequency and duration of that exposure. Using these factors, a "reasonable maximum exposure" scenario, which portrays the highest level of human exposure that could reasonably be expected to occur, is calculated.

Toxicity Assessment: In this step, the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure and severity of adverse effects are determined. Potential health effects are chemical-specific and may include the risk of developing cancer over a lifetime or other noncancer health hazards, such as changes in the normal functions of organs within the body (*e.g.*, changes in the effectiveness of the immune system). Some chemicals are capable of causing both cancer and non-cancer health hazards.

Risk Characterization: This step summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of site risks for all COPCs. Exposures are evaluated based on the potential risk of developing cancer and the potential for non-cancer health hazards. The likelihood of an individual developing cancer is expressed as a probability. For example, a 10^{-4} cancer risk means a "one in ten thousand excess cancer risk"; or one additional cancer may be seen in a population of 10,000 people as a result of exposure to site contaminants under the conditions identified in the Exposure Assessment. Current Superfund regulations for exposures identify the range for determining whether remedial action is necessary as an individual excess lifetime cancer risk of 10^{-4} to 10^{-6}, corresponding to a one in ten thousand to a one in a million excess cancer risk. For non-cancer health effects, a "hazard index" (HI) is calculated. The key concept for a non-cancer HI is that a "threshold" (measured as an HI of less than or equal to 1) exists below which non-cancer health hazards are not expected to occur. The goal of protection is 10^{-6} for cancer risk and an HI of 1 for a non-cancer health hazard. Chemicals that exceed a 10^{-4} cancer risk or an HI of 1 are typically those that will require remedial action at the site and are referred to as Chemicals of Concern or COCs in the final remedial decision or Record of Decision.

excess of the Federal and State MCLs of 5 µg/l for both PCE and TCE.

EPA is currently planning a further investigation of vapor intrusion into structures within the area that could be potentially affected by the groundwater contamination plume. More information about the vapor intrusion investigation can be found in a separate report in the information repository for the site. If the results of the investigations indicate that there is concern with site-related vapors migrating into buildings, EPA would perform mitigation as necessary.

It is the lead agency's current judgment that the Preferred Alternative identified in the Proposed Plan is necessary to protect public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

REMEDIAL ACTION OBJECTIVES

Remedial action objectives are specific goals to protect human health and the environment. These objectives are based on available information and standards, such as applicable or relevant and appropriate requirements (ARARs), to-be-considered guidance, and site-specific risk-based levels. The remediation goals for the site are the groundwater MCLs.

The following remedial action objectives were established for the site:

- Prevent or minimize potential, current, and future human exposures including inhalation, ingestion and dermal contact with VOC-contaminated groundwater that exceeds the MCLs;
- Minimize the potential for off-site migration of groundwater with VOC contaminant concentrations greater than MCLs;
- Restore groundwater to beneficial use levels as specified in the National Contingency Plan (NCP) and
- Mitigate site-related vapor migrating into the commercial buildings, if necessary.

Table 1 summarizes the groundwater cleanup standards.

SUMMARY OF REMEDIAL ALTERNATIVES

CERCLA Section 121(b)(1) of 42 U.S.C. §9621(b)(1), mandates that remedial actions must be protective of human health and the environment, cost-effective, comply with ARARS, and utilize permanent solutions and alternative treatment technologies and resource recovery alternatives to the maximum extent practicable. Section 121(b)(1) also establishes a preference for remedial actions which employ, as a principal element, treatment to permanently and significantly reduce the volume, toxicity, or mobility of the hazardous substances, pollutants and contaminants at a site. CERCLA Section 121(d) of 42 U.S.C. §9621(d), further specifies that a remedial action must attain a level or standard of control of the hazardous substances, pollutants, and contaminants, which at least attains ARARs under federal and state laws, unless a waiver can be justified pursuant to CERCLA Section 121(d)(4) of 42 U.S.C. §9621(d)(4).

Detailed descriptions of the remedial alternatives for addressing the contamination associated with the site can be found in the FS report. The FS report presents three groundwater alternatives described below.

The duration time for each alternative reflects the estimated time required for the entire groundwater contaminant plume associated with the site to be reduced to levels below the MCLs.

The remedial alternatives are:

Alternative 1: No Action

Capital Cost:	$0
Annual Operation & Maintenance (O&M) Cost:	$0
Present-Worth Cost:	$0
Duration:	46 years

The Superfund program requires that the "no-action" alternative be considered as a baseline for comparison with the other alternatives. The no-action remedial alternative would not include any physical remedial measures to address the contamination at the site. The preliminary groundwater model predicted it would take 46 years for the contaminant concentrations in the plume to decrease below the MCLs via natural attenuation processes.

Because this alternative would result in contaminants remaining on-site above levels that allow for unrestricted use and unlimited exposure, CERCLA requires that the site be reviewed at least once every five years.

Alternative 2: Monitoring and Institutional Controls

Capital Cost:	$300,000
Annual O&M Cost(2):	$150,000/$110,000(3)
Present-Worth Cost:	$2,290,000
Duration:	46 years

(2) Includes long-term monitoring costs only

(3) The long-term monitoring program would be reduced after 25 years due to the reduction in the size of the plume.

Alternative 2 includes long-term monitoring of the contaminant plume through annual sampling and analysis of 7 existing multi-port wells and 2 existing single-screen monitoring wells (GWX-10019 and GWX-10020).

The results of the long-term monitoring program would be used to evaluate the migration and changes in the contaminant plume over time to ensure attainment of the MCLs. The preliminary groundwater model predicted it would take 46 years for the contaminant concentrations in the plume to decrease below the MCLs via natural attenuation processes. This alternative would also include future vapor intrusion sampling, if deemed necessary to determine if there is a concern with site-related vapor migrating into the buildings.

In addition, this alternative would include institutional controls that restrict future use of groundwater at the site. Specifically, the New York State Department of Health State Sanitary Code regulates installation of private potable water supply wells in Nassau County. In addition, EPA would rely on the current zoning in the area including and surrounding the mall to restrict the land use to commercial industrial uses. If a change in land use is proposed, additional investigation of soils in this area would be necessary to support the land use change.

A site management plan (SMP) would also be developed and would provide for the proper management of all site remedy components post-construction, such as institutional controls, and shall also include: (a) monitoring of site groundwater to ensure that, following remedy implementation, the groundwater quality improves; (b) conducting an evaluation of the potential for vapor intrusion, and mitigation, if necessary, in the event of future construction; (c) provision for any operation and maintenance required of the components of the remedy; and (d) periodic certifications by the owner/operator or other person implementing the remedy that any institutional and engineering controls are in place.

Because MCLs will take longer than five years to achieve, a review of site conditions will be conducted no less often than once every five years.

Alternative 3: Groundwater Extraction and Ex-situ Treatment (Pump and Treat)

Capital Cost:	$6,240,000
Annual O&M Cost:	$850,000/$790,000(4)
Present-Worth Cost:	$13,160,000
Duration:	35 years

(4) The long-term monitoring program would be reduced after 25 years due to the reduction in the size of the plume.

Alternative 3 includes a groundwater extraction well(s) which would be installed downgradient from monitoring well SVP-4, to capture the portion of the contaminant plume with high PCE and TCE concentrations without impacting the pumping capacity of supply wells GWP-10 and GWP-11, which have a pumping zone of influence radius of approximately 1,000 feet. The number of extraction wells needed would be determined after the completion of the pre-design investigation described below. Extracted groundwater would be treated via air strippers for approximately 10 years, with the treated water discharged to Nassau County recharge basin #124. Based on the preliminary groundwater model, it is estimated that MCLs would be achieved in the zone of influence of the new pumping well in approximately 10 years, at which time the contamination in the extracted groundwater would have reached drinking water standards (MCLs). It is also noted that at the end of the same 10-year period, the supply wells GWP-10 and 11 would withdraw groundwater, before wellhead treatment, with contamination at or close to MCLs. It would take another 25 years for contaminant residuals in the aquifer to reach MCLs through natural attenuation processes. In summary, the preliminary model estimated that complete restoration of the aquifer to levels below the MCLs would require a total of 35 (10 + 25) years.

Alternative 3 includes a pre-design investigation which would include installation of at least 3 new multi-port wells: one well to the north of existing well GWX-9953 to confirm the northern boundary of the plume, a second well to the west of GWX-9953 to confirm the total depth of the plume, and a third well to the south of the Village of Garden City supply wells to better define the leading edge of the plume. Figure 1 shows the locations of existing wells.

Alternative 3 would also include evaluation and future upgrading, if necessary, of the wellhead treatment at the Garden City supply wells 10 and 11, which have been impacted by site-related contamination. This wellhead treatment system would be needed until it has been determined that these public supply wells are no longer being impacted by the site-related contaminants above health-based standards.

In addition, if future vapor intrusion investigations indicate that there is a concern with site-related vapors migrating into the commercial buildings, EPA would perform mitigation, as necessary.

In addition, this alternative would include institutional controls that restrict future use of groundwater at the site. Specifically, the New York State Department of Health State Sanitary Code regulates installation of private potable water supply wells in Nassau County. In addition, EPA would rely on the current zoning in the area including and surrounding the mall to restrict the land use to commercial industrial uses. If a change in land use is proposed, additional investigation of soils in this area would be necessary to support the land use change.

A site management plan (SMP) would also be developed and would provide for the proper management of all site remedy components post-construction, such as institutional controls, and shall also include: (a) monitoring of site groundwater to ensure that, following remedy implementation, the groundwater quality improves; (b) conducting an evaluation of the potential for vapor intrusion, and mitigation, if necessary, in the event of future construction; (c) provision for any operation and maintenance required of the components of the remedy; and (d) periodic certifications by the owner/operator or other person implementing the remedy that any institutional and engineering controls are in place.

Alternative 3 would also include long-term monitoring of the contaminant plume through annual sampling and analysis. For cost estimating purposes, 7 existing multi-port wells, 2 existing single-screen monitoring wells (GWX-10019 and GWX-10020), and the new multi-port wells to be installed as part of the pre-design investigation would be monitored. The results of the long-term monitoring program would be used to evaluate changes in the contaminant plume over time and to ensure achievement of MCLs.

Because MCLs will take longer than five years to achieve, a review of site conditions will be conducted no less often than once every five years.

Contingency Plan

Capital Cost:	$5,660,000
Annual O&M Cost:	$680,000

In the event that public supply wells GWP-10 and GWP-11 were to be taken out of service permanently or were to be operated at a significant reduction of their current pumping rates, a contingency plan would be implemented to capture and treat the contaminant plume in that area. The contingency plan would include the installation of a new well or wells in the vicinity of supply wells GWP-10 and GWP-11 and an ex-situ treatment system.

COMPARATIVE ANALYSIS OF ALTERNATIVES

During the detailed evaluation of remedial alternatives, each alternative is assessed against nine evaluation criteria, namely, overall protection of human health and the environment, compliance with applicable or relevant and appropriate requirements, long-term effectiveness and permanence, reduction of toxicity, mobility, or volume through treatment, short-term effectiveness, implementability, cost, and state and community acceptance.

The evaluation criteria are described below.

- <u>Overall protection of human health and the environment</u> addresses whether or not a remedy provides adequate protection and describes how risks posed through each exposure pathway (based on a reasonable maximum exposure scenario) are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

- Compliance with ARARs addresses whether or not a remedy would meet all of the applicable or relevant and appropriate requirements of other federal and state environmental statutes and requirements or provide grounds for invoking a waiver.

- Long-term effectiveness and permanence refers to the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup goals have been met. It also addresses the magnitude and effectiveness of the measures that may be required to manage the risk posed by treatment residuals and/or untreated wastes.

- Reduction of toxicity, mobility, or volume through treatment is the anticipated performance of the treatment technologies, with respect to these parameters, a remedy may employ.

- Short-term effectiveness addresses the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period until cleanup goals are achieved.

- Implementability is the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.

- Cost includes estimated capital and O&M costs, and net present-worth costs.

- State acceptance indicates if, based on its review of the RI/FS and Proposed Plan, the state concurs with the preferred remedy at the present time.

- Community acceptance will be assessed in the ROD and refers to the public's general response to the alternatives described in the Proposed Plan and the RI/FS reports.

A summary of the comparative analysis of these alternatives based upon the evaluation criteria noted above follows.

Overall Protection of Human Health and the Environment

Alternative 1 would not include any monitoring or remedial measures, and as such, would not be protective of public health and the environment. Alternative 2 would only require long-term monitoring of the groundwater plume, institutional controls and would provide for future vapor intrusion investigation(s). As such, Alternative 2 would only be marginally protective of human health and the environment. Alternative 3 would provide overall protection of human health and the environment through implementation of a remedial pump and treat system to extract and treat the groundwater contamination and vapor intrusion mitigation in the commercial buildings, if deemed necessary.

Compliance with ARARs

EPA and NYSDOH have promulgated health-based protective MCLs (40 CFR Part 141, and 10 NYCRR, Chapter 1), which are enforceable standards for various drinking water contaminants. Only Alternative 3 would meet drinking water standards.

Long-Term Effectiveness and Permanence

Alternatives 1 and 2 would not provide any long-term effectiveness and permanence. Alternative 2 would provide a small degree of long-term effectiveness and permanence through institutional controls. Alternative 3 would provide long-term effectiveness and permanence by extracting contaminated groundwater from the aquifer and treating it to remove the contaminants and provide for vapor intrusion mitigation in the commercial buildings, if deemed necessary.

Reduction in Toxicity, Mobility, or Volume Through Treatment

Alternatives 1 and 2 would not reduce Toxicity/Mobility/Volume through treatment since no treatment would be implemented. Alternative 3 would reduce the mobility and volume of the contaminant plume through groundwater extraction and reduce the toxicity of water through ex-situ treatment using air strippers. Alternative 3 would prevent the contaminant plume with concentrations above the MCLs from migrating downgradient. Alternative 3 would also provide for mitigation due to vapor intrusion in the commercial buildings, if deemed necessary.

Short-Term Effectiveness

Alternative 1 would not have any short-term impact. Alternative 2 would have minimal short-term impact to the community and the environment due to the sampling of wells. Alternative 3 would have some additional impact to the community due to the drilling of wells and the construction of the groundwater extraction well(s) and treatment systems, but the duration would be short and the disturbance would be minimal.

Implementability

All three alternatives are implementable. Alternative 1 would be the easiest to implement, since it involves no action. Alternative 2 would be the next easiest to implement, since it only involves annual sampling of monitoring wells and would not have any ground intrusion activities. Alternative 3 would be also be easy to implement. Access for installation of extraction well(s) and construction of a treatment facility would be required and various contractors would need to be procured. Construction activities could be conducted using standard equipment and procedures.

Cost

Alternative 1 would not involve any costs. Alternative 2 would have relatively lowt costs since it only includes annual sampling of monitoring wells and vapor intrusion investigation of the commercial buildings. The costs associated with Alternative 3 primarily reflect the installation and operation of a groundwater extraction and treatment system and vapor intrusion mitigation systems in the commercial buildings, if deemed necessary.

Alternative	Capital Cost	Annual O&M	Total Present-Worth
1	$0	$0	$0
2	$300,000	$150,000/ $110,000(5)	$2,290,000
3	$6,240,000(6)	$850,000/ $790,000(7)	$13,160,000

(5) Includes long-term monitoring costs only. The monitoring program would be reduced after 25 years.
(6) If the contingency plan is necessary, the capital costs would increase by $5,660,000.
(7) The monitoring program would be reduced after 25 years.

State Acceptance

The New York State Department of Environmental Conservation is currently reviewing this Proposed Plan.

Community Acceptance

Community acceptance of the preferred alternative will be assessed in the ROD following review of the public comments received on the Proposed Plan.

PROPOSED REMEDY

Based upon an evaluation of the various alternatives, EPA recommends Alternative 3 (Groundwater Extraction and Ex-situ Treatment [Pump and Treat]) as the preferred remedy for groundwater and installation of vapor intrusion mitigation systems, if deemed necessary. Specifically, the proposed remedy would include the following:

To reduce the contaminant concentrations reaching the two Garden City supply wells GWP-10 and GWP-11, a groundwater extraction well(s) would be installed south of SVP-4. This well(s) would capture and treat the portion of the contaminant plume identified at SVP-4, while ensuring that the pumping capacity of supply wells GWP-10 and GWP-11 is not affected. Extracted groundwater would be treated to remove contaminants. Under this alternative, a low profile air stripper would be envisioned as the representative process option to remove the VOC contaminants. During the remedial design, other treatment technologies would be considered as more information becomes available. Based on the maximum concentrations of PCE and TCE detected in SVP-4 during the RI, the maximum combined amount of VOCs (PCE and TCE) generated in the off-gas from the air stripper is estimated to be 1.5 pounds per day. As a result, off-gas treatment should not be necessary. The treated water would meet the discharge standards for groundwater. The treated groundwater would be discharged to Nassau County recharge basin #124. This alternative assumes that the supply wells GWP-10 and GWP-11 continue pumping at the same rate as the past five years.

Evaluation of the current air strippers at supply wells GWP-10 and GWP-11 would be performed, if necessary. The upgrade or replacement costs of the air strippers would be estimated and upgrading or replacement of the strippers would be performed, as necessary.

A pre-design investigation to better define the contaminant plume would be conducted. The areal and the vertical extent of the contaminant plume in the areas of monitoring wells SVP-2 and SVP-4 would be better defined. As part of this effort, it is estimated that at least three new multiport monitoring wells would need to be installed.

Groundwater modeling would be conducted after the pre-design investigation and before the remedial design. The groundwater model used in the FS would be refined based on the new data. During the remedial design, the most recently available pumping data would be incorporated into the model and the optimal location and number of extraction wells would be determined.

If future vapor intrusion investigations indicate that there is concern with site-related vapor migrating into the commercial buildings, EPA would perform mitigation, as necessary.

In addition, this alternative would include institutional controls that restrict future use of groundwater at the site. Specifically, the New York State Department of Health State Sanitary Code regulates installation of private potable water supply wells in Nassau County. In addition, EPA would rely on the current zoning in the mall-complex area to restrict the land use to commercial/industrial uses. If a change in land use is proposed, additional investigation of soils in this area would be necessary to support the land use change.

A site management plan (SMP) would also be developed and would provide for the proper management of all site remedy components post-construction, such as institutional controls, and shall also include: (a) monitoring of site groundwater to ensure that, following remedy implementation, the groundwater quality improves; (b) conducting an evaluation of the potential for vapor intrusion, and mitigation, if necessary, in the event of future construction; (c) provision for any operation and maintenance required of the components of the remedy; and (d) periodic certifications by the owner/operator or other person implementing the remedy that any institutional and engineering controls are in place.

Long-term monitoring would be conducted which would involve annual groundwater sample collection and analysis from 12 monitoring wells (9 existing wells and 3 new wells), and preparation of annual groundwater sampling reports. The results from the long-term monitoring program would be used to evaluate the migration and changes in the contaminant plume over time.

In the event that public supply wells GWP-10 and GWP-11 were to be taken out of service permanently or were to be operated at a significant reduction of their current pumping rates, a contingency plan would be implemented to capture and treat the contaminant plume in that area. The contingency plan would include the installation of a new well or wells in the vicinity of supply wells GWP-10 and GWP-11 and an ex-situ treatment system.

Because MCLs will take longer than five years to achieve, a review of site conditions will be conducted no less often than once every five years using data obtained from the long-term monitoring program until the groundwater is restored to drinking water quality. The site review will typically include an evaluation of the extent of contamination and an assessment of contaminant migration and attenuation over time.

Basis for the Remedy Preference

EPA has identified Alternative 3 as the preferred alternative, since it would effectuate the groundwater cleanup while providing the best balance of tradeoffs among the alternatives with respect to the evaluation criteria. Alternative 3, which would include extraction and treatment of contaminated groundwater, would result in the restoration of water quality in the aquifer more quickly than natural processes alone and provide for vapor intrusion mitigation, if deemed necessary.

EPA believes that the preferred remedy would remove contaminated groundwater from the aquifer, be protective of human health and the environment, comply with ARARs, be cost-effective, and utilize permanent solutions to the maximum extent practicable. The preferred remedy also would meet the statutory preference for the use of treatment as a principal element.

RESPONSIVENESS SUMMARY

APPENDIX V-b

PUBLIC NOTICE PUBLISHED IN THE
GARDEN CITY NEWS AND *GARDEN CITY LIFE*
ON AUGUST 17, 2007, AUGUST 24, 2007 AND AUGUST 31, 2007

C:\IMS\GIS\Roosevelt Field\ArcMap_projects\Well_locations_PP.mxd

- Existing Monitoring Wells
- Multi-port Wells
- Village of Garden City Supply Wells
- N-8050 - A former cooling water well in which the highest concentrations were historically detected; the well is no longer active

N

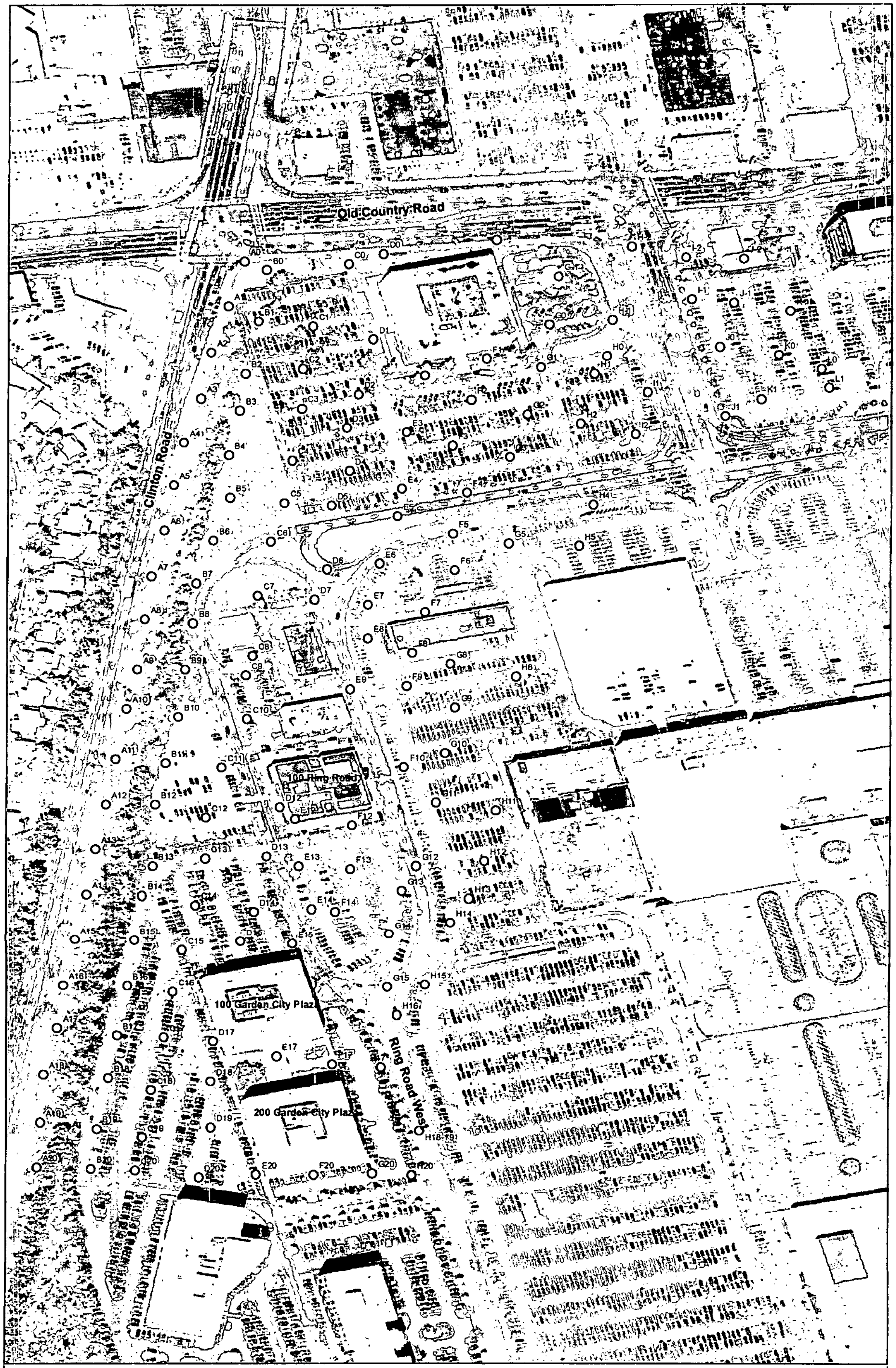
0 300 600 1,200 Feet

Figure 1
Multi-port Well, Existing Monitoring Well, and Supply Well Locations

Old Roosevelt Field Contaminated Groundwater Site
Garden City, New York

CDM

C:\IMS\GIS\Roosevelt Field\ArcMap_projects\Soil_gas_screening_locations_rev1.mxd



○ Soil Gas Screening Grid Point Location

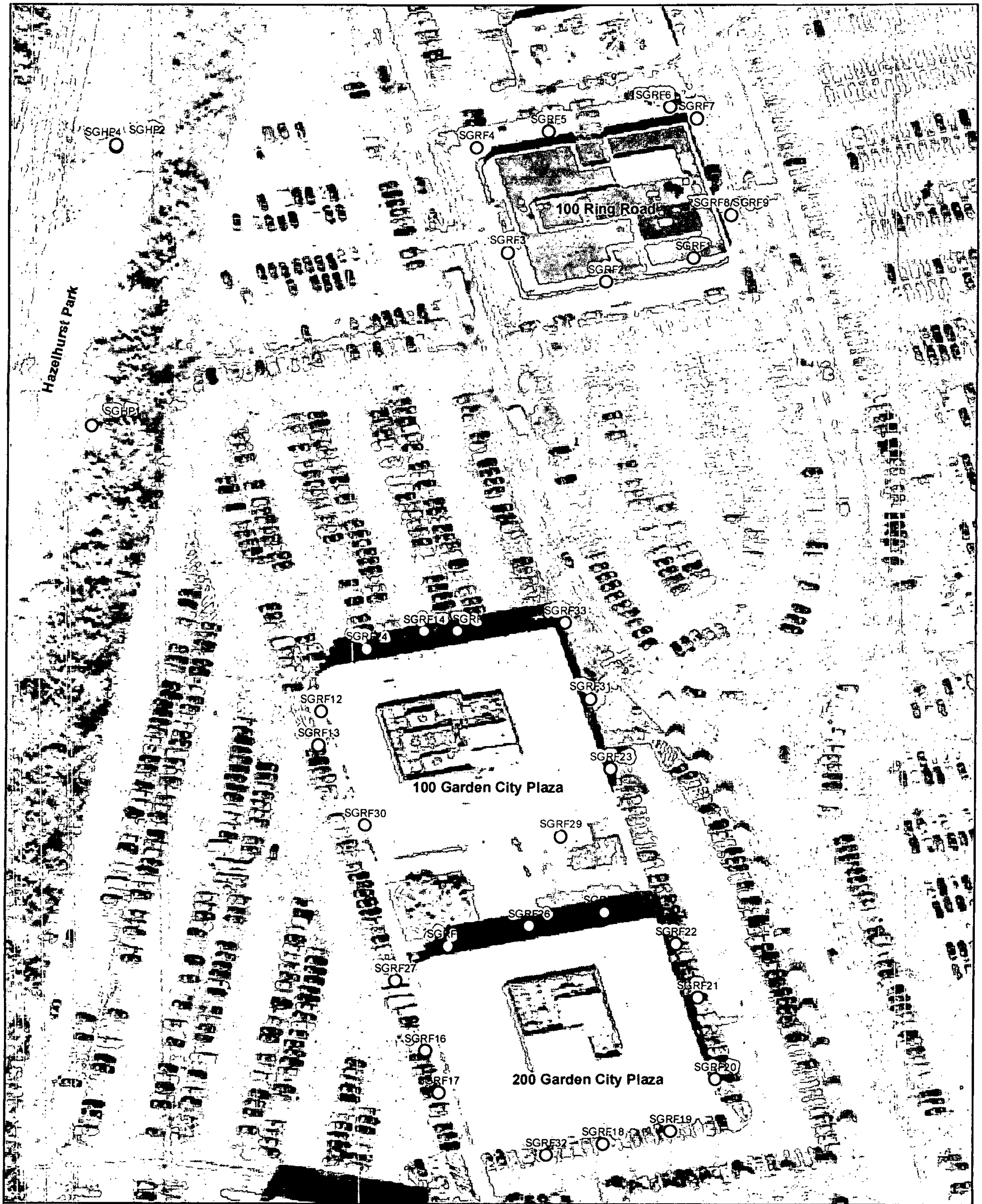
N

0 100 200 400 Feet

Figure 2
Soil Gas Screening Locations
Old Roosevelt Field Contaminated Groundwater Site
Garden City, New York

CDM

C:\MS\GIS\Roosevelt Field\ArcMap_projects\Fig2-2B_soil gas analytical.mxd



Soil Gas Boring Location for VOC Analysis via method TO-15

Note: SGRF10 and SGRF11 were not collected due to underground utilities.

N

Feet 0 30 60 120

Figure 3
Soil Gas Analytical Sample Locations
Old Roosevelt Field Contaminated Groundwater Site
Garden City, New York

CDM

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY INVITES PUBLIC COMMENT ON THE PROPOSED PLAN FOR THE OLD ROOSEVELT FIELD CONTAMINATED GROUNDWATER SITE VILLAGE OF GARDEN CITY, NASSAU COUNTY, NEW YORK

NOTICE FOR CHANGE OF MEETING DATE AND LOCATION

September 11, 2007
7:00 PM
Village Hall Board Room
351 Stewart Avenue
Garden City, NY 11530

The U.S. Environmental Protection Agency (EPA) announces the opening of a **30-day comment period** on the Proposed Plan and preferred alternative to address contamination at the Old Roosevelt Field Contaminated Groundwater site in Garden City, New York. The comment period **begins on August 22, 2007 and ends on September 20, 2007.** As part of the public comment period, EPA will hold a public meeting on **September 11, 2007** at 7:00 PM at the **Garden City Village Hall Board Room, 351 Stewart Avenue, Garden City, NY 11530.** To learn more about the meeting you can contact Ms. Cecilia Echols, EPA's Community Involvement Coordinator, at 212-637-3678 or 1-800-346-5009 or visit our website to receive a copy of the Proposed Plan at www.epa.gov/region02/superfund/npl/oldroosevelt.

The site is listed on the Superfund National Priorities List. EPA recently concluded a remedial investigation/feasibility study (RI/FS) for the site to assess the nature and extent of contamination in site media and to evaluate alternatives to cleanup the groundwater. Based upon the results of the RI/FS, EPA has prepared a Proposed Plan which describes the findings of the remedial investigation and potential remedy evaluations detailed in the feasibility study and provides the rationale for recommending the preferred remedy.

The preferred remedy is pump and treat of the contaminated groundwater in the area west of Garden City Plaza in the Roosevelt Field mall area. A groundwater extraction well would be installed to capture the portion of the contaminant plume with high tetrachloroethene (PCE) and trichloroethene (TCE) concentrations without impacting the pumping capacity of two nearby public water supply wells. In addition, a pre-design investigation would be conducted to better define several areas of the groundwater plume. The air strippers used to treat the water pumped at the two supply wells would be evaluated and upgraded, if deemed necessary. EPA would also put in place a contingency plan if for any reason the two supply wells are shut down or experience significant reduction in pumping rates. The contingency plan would be implemented to prevent downgradient migration of contaminants. Institutional controls, monitoring, vapor sampling and periodic reviews would also be part of the remedy to ensure that the remedy remains protective of public health and the environment. During the **September 10, 2007 public meeting,** EPA representatives will be available to further elaborate on the reasons for recommending the preferred remedy and public comments will be received.

The RI Report, FS Report, Risk Assessment, Proposed Plan and other site-related documents are available for public review at the information repositories established for the site at the following locations:

Garden City Public Library: 60 Seventh Street, Garden City, New York 11530 (516) 742-8405
Hours: Mon.- Thu. 9:30 AM - 9 PM; Fri. 9:30 AM - 5:30 PM; Sat. 9 AM - 5 PM; Sun. closed.

Hempstead Public Library: 116 Nichols Court, Hempstead, New York 11550 (516) 481-6990
Hours: Mon.- Thu. 10 AM - 9 PM; Fri. 10 AM - 6 PM; Sat., Sun. closed.

USEPA Region II: Superfund Records Center, 290 Broadway, 18th Floor, New York, NY 10007-1866, (212) 637-4308
Hours: Mon. - Fri. 9 AM - 5 PM

EPA relies on public input to ensure that the selected remedy for each Superfund site meets the needs and concerns of the local community. It is important to note that although EPA has identified a preferred remedy for the site, no final decision will be made until EPA has considered all public comments received during the public comment period. EPA will summarize these comments along with EPA's responses in a Responsiveness Summary, which will be included in the Administrative Record file as part of the Record of Decision. **Written comments and questions regarding the Old Roosevelt Field Contaminated Groundwater site, postmarked no later than September 20, 2007, may be sent to:**

Caroline Kwan, Project Manager
U.S. Environmental Protection Agency
290 Broadway, 20th Floor
New York, New York 10007-1866
Telefax: (212) 637-4284
email: kwan.caroline@epa.gov

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY INVITES PUBLIC COMMENT ON THE PROPOSED PLAN FOR THE OLD ROOSEVELT FIELD CONTAMINATED GROUNDWATER SITE VILLAGE OF GARDEN CITY, NASSAU COUNTY, NEW YORK

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The site is listed on the Superfund National Priorities List. EPA recently concluded a remedial investigation/feasibility study (RI/FS) for the site to assess the nature and extent of contamination in site media and to evaluate alternatives to cleanup the groundwater. Based upon the results of the RI/FS, EPA has prepared a Proposed Plan which describes the findings of the remedial investigation and potential remedy evaluations detailed in the feasibility study and provides the rationale for recommending the preferred remedy.

The preferred remedy is pump and treat of the contaminated groundwater in the area west of Garden City Plaza in the Roosevelt Field mall area. A groundwater extraction well would be installed to capture the portion of the contaminant plume with high tetrachloroethene (PCE) and trichloroethene (TCE) concentrations without impacting the pumping capacity of two nearby public water supply wells. In addition, a pre-design investigation would be conducted to better define several areas of the groundwater plume. The air strippers used to treat the water pumped at the two supply wells would be evaluated and upgraded, if deemed necessary. EPA would also put in place a contingency plan if for any reason the two supply wells are shut down or experience significant reduction in pumping rates. The contingency plan would be implemented to prevent downgradient migration of contaminants. Institutional controls, monitoring, vapor sampling and periodic reviews would also be part of the remedy to ensure that the remedy remains protective of public health and the environment. During the **September 10, 2007 public meeting,** EPA representatives will be available to further elaborate on the reasons for recommending the preferred remedy and public comments will be received.

The RI Report, FS Report, Risk Assessment, Proposed Plan and other site-related documents are available for public review at the information repositories established for the site at the following locations:

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U.S. Environmental Protection Agency
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New York, New York 10007-1866
Telefax: (212) 637-4284
email: kwan.caroline@epa.gov

LEGAL NOTICE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY INVITES PUBLIC COMMENT ON THE PROPOSED PLAN FOR THE OLD ROOSEVELT FIELD CONTAMINATED GROUNDWATER SITE VILLAGE OF GARDEN CITY, NASSAU COUNTY, NEW YORK

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The site is listed on the Superfund National Priorities List. EPA recently concluded a remedial investigation/feasibility study (RI/FS) for the site to assess the nature and extent of contamination in site media and to evaluate alternatives to [illegible] medial investigation and potential remedy evaluations detailed in the feasibility study and provides the rationale for recommending the preferred remedy.

The preferred remedy is pump and treat of the contaminated groundwater in the area west of Garden City Plaza in the Roosevelt Field mall area. A groundwater extraction well would be installed to capture the portion of the contaminant plume with high tetrachloroethene (PCE) and trichloroethene (TCE) concentrations without impacting the pumping capacity of two nearby public water supply wells. In addition, a predesign investigation would be conducted to better define several areas of the groundwater plume. The air strippers used to treat the water pumped at the two supply wells would be evaluated and upgraded, if deemed necessary. EPA would also put in place a contingency plan if for any reason the two supply wells are shut down or experience significant reduction in pumping rates. The contingency plan would be implemented to prevent downgradient migration of contaminants. Institutional controls, monitoring, vapor sampling and periodic reviews would also be part of the remedy to ensure that the remedy remains protective of public health and the environment. During the **September 10, 2007 public meeting,** EPA representatives will be available to further elaborate on the reasons for recommending the preferred remedy and public comments will be received.

The RI Report, FS Report, Risk Assessment, Proposed Plan and other site-related documents are available for public review at the information repositories established for the site at [illegible]

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deemed necessary. EPA would also put in place a contingency plan if for any reason the two supply wells are shut down or experience significant reduction in pumping rates. The contingency plan would be implemented to prevent downgradient migration of contaminants. Institutional controls, monitoring, vapor sampling and periodic reviews would also be part of the remedy to ensure that the remedy remains protective of public health and the environment. During the September 10, 2007 public meeting, EPA representatives will be available to further elaborate on the reasons for recommending the preferred remedy and public comments will be received.

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RESPONSIVENESS SUMMARY

APPENDIX V-c

SEPTEMBER 11, 2007 PUBLIC MEETING SIGN-IN SHEET

EPA
Region II

Old Roosevelt Contaminated Groundwater Area Superfund site
Garden City, New York
Garden City Village Hall Board Room

Tuesday, September 11, 2007 @ 7:00PM
ATTENDEES
(Please Print Clearly)

NAME	STREET	CITY	ZIP	PHONE	REPRESENTING	Are you currently on the mailing list?
Don Miles		Troy		518 402-7880	State Dept Health	
Kathleen Auro	4 Merillon Ave.	Garden City, NY	11530			
Heather Bishop	625 Broadway	Albany		(518) 402 9692	NYSDEC	
Simone Solz	~~320~~ 200 Garden City Plaza Suite 320	Garden City		739-3008	Congresswoman Carolyn McCarthy	
Carisa Giardino	—			(516) 747-8282, ext 164		

500118

EPA Region II

Old Roosevelt Contaminated Groundwater Area Superfund site
Garden City, New York
Garden City Village Hall Board Room

Tuesday, September 11, 2007 @ 7:00PM
ATTENDEES
(Please Print Clearly)

NAME	STREET	CITY	ZIP	PHONE	REPRESENTING	Are you currently on the mailing list?
Scarlett Messier	547 River Street	Troy	12180	(518) 402-7880	State DOH	
Stephanie Petrellese	82 Bayberry La	Levittown	11756	(516) 731-2235	GC News	
Jim Quigley	136B 117th St	Rockaway Pk	11694			
Claire Bardakian	100 Hilton Ave, 205E	GC				No
John Swartwout	625 Broadway	Albany, NY	12233		NYSDEC	No
Richard H. Drewitz	40 Adams St.	Garden City, New York	11530			
Barbara Ruggiero	176 Pine Street	Garden City NY	11530			no

500119

EPA
Region II

Old Roosevelt Contaminated Groundwater Area Superfund site
Garden City, New York
Garden City Village Hall Board Room

Tuesday, September 11, 2007 @ 7:00PM
ATTENDEES
(Please Print Clearly)

NAME	STREET	CITY	ZIP	PHONE	REPRESENTING	Are you currently on the mailing list?
KOCH, FRANK	351 STEWART AVE	GARDEN CITY	11530	5164654017	VIL OF GARDEN CITY	YES
ALPMANN, EVAN	643 W. PARK AVE	LONG BEACH NY	11561	5162426347	Clean Harbor	NO
Rae Dowling	100 Hilton Ave E 403	Garden City NY	11530			No
Walter Parish	NYSDEC 50 Circle Rd	Stony Brook NY	11790-3409			No
MULLER, ROBERT	76 RUSSELL ROAD	GARDEN CITY NY	11530			NO
ROGER REGAN	117 SECOND ST	GC	11530			NO
William Bellmor	156 Poplar St	GC	11530			NO

500120

RESPONSIVENESS SUMMARY

APPENDIX V-d

SEPTEMBER 11, 2007 PUBLIC MEETING TRANSCRIPT

OLD ROOSEVELT FIELD CONTAMINATED

GROUNDWATER SUPERFUND SITE

Public Meeting

September 11, 2007

Garden City, New York

Reporter:

Jeffrey Benz, RMR, CRR

A P P E A R A N C E S:

Cecilia Echols, EPA

Angela Carpenter, EPA

Susan E. Schofield, CDM

Lisa Campbell, CDM

Michael Sivak, EPA

Caroline Kwan-Appelman, EPA

Elizabeth Leilani Davis, EPA

Thomas Matthew, CDM

Peter Bee, Mayor, Garden City

Frank Koch, Superintendent, Garden City Water District

Dennis Kelleher, H2M Group

Donald Miles, Department of Health

Scarlett Messier, Department of Health

Joe DeFranco, Department of Health

John Swartwout, DEC

Heather Bishop, DEC

Walter Parish, DEC

MS. ECHOLS: Hello, everyone. Good evening. We are ready to begin our presentation regarding the Old Roosevelt Field contaminated groundwater Superfund site. We are here to discuss how the EPA plans on cleaning up the site.

There are -- I'm going to introduce everyone here. And so bear with me, there's a lot of different people who have some, you know, stake in helping to clean up this site.

As I said, I'm Cecilia Echols. I'm the community-involving coordinator with the site. We have with us Angela Carpenter. She is the chief of the Eastern New York section for EPA. We have Susan Schofield. She is our contractor with CDM. Lisa Campbell, contractor with CDM. Michael Sivak, EPA's risk assessor. Caroline Kwan, remedial project manager. Leilani Davis, assistant regional counsel. And we also have Thomas Matthew from CDM. Okay.

We also have with us Don Miles, DOH; Scarlett Messier, with DOH.

John Swartwout, DEC; Heather Bishop, DEC; Joe DeFranco, Nassau County Department of Health.

MS. CARPENTER: And Walter Parish with DEC.

MS. ECHOLS: Representing you all in your community is the mayor, Peter Bee.

Frank Koch, superintendent, Village of Garden City Water District, and their consultant, Dennis Kelleher.

Just wanted to let you know that community involvement is a very important part of the process for cleaning up Superfund sites. We look for the community's input in the decision-making process.

Before we get into the presentation, the mayor will speak. However, I just wanted to let you know that the public comment period began on August 22 and it ends on September 20. You have -- there are three information repositories related to this site, if you ever want information on this site. One is at the Garden City Public Library, the Hempstead Public Library, and our EPA office in New York City.

We do have a stenographer to the right of me. At the end of the presentation, for questions and answers, would you please stand, state your name clearly, so he can record it properly.

I hope everyone has the handouts. There's a lot of handouts. So as you can see, I hope everyone has had an opportunity to browse through them.

And on that note, I will let the mayor speak for a moment.

MAYOR BEE: Thank you very much. Thank you very much, and good evening to you all. My name is Peter Bee, and I'm the mayor of the Village of Garden City. As was already mentioned, the superintendent of our water district, Frank Koch, is here with us tonight, as is our consulting engineers, H2M Corporation, and they later this evening will be making brief comments as well.

We appreciate the opportunity to speak to the EPA this evening. Garden City prides itself in being able to deliver the highest quality water to our residents. As I have observed in the past, if we can't get clean water to the residents, we aren't worth a darn, no matter what else we do.

We've been monitoring the water quality at Well 10 and 11 at Clinton Road plant since the early 1970s. We've noted the presence of some level of contamination in the water for over 30 years. That contamination has unquestionably arisen outside of Garden City.

The Village has been providing water quality treatment to remove that outside contamination for well over 20 years.

Because of that, the water delivered to the public by us inside Garden City continues to meet all of the U.S. Environmental Protection Agency standards, as well as all New York State Health Department drinking water standards.

Over the past 20 years the Village has spent over $3.8 million in capital costs and O&M costs to treat the outside contaminants in Well 10 and 11. The mayor and board of trustees are tired of having the residents continue to pay that cost to clean up the outside contaminants. The Superfund program has been set up to protect the public health and the environment, and to provide a revenue source for exactly this kind of situation.

We need your agency's help in providing funding for the moneys that we have already expended and the moneys that will be needed for the Village to continue to provide wellhead treatment for the next 46 years, as projected in the report.

We have cooperated with the U.S. Environmental Protection Agency and their consultant in the preparation of this study. Now we suggest it is time for the agency to cooperate with the Village, and we are formally requesting that cooperation in the form of funding for wellhead treatment, either from the Superfund program, or the potentially responsible party, the U.S. Navy.

The Village is prepared to take legal action against the potentially responsible party, if necessary, to get the appropriate funds, and we look forward to your agency's cooperation in that venture. Thank you for that cooperation, and the ongoing cooperation, which I know you will give us in the time to come. Thank you very much, everyone.

MS. ECHOLS: Thank you, Mayor.

MS. CARPENTER: Thank you, Mayor.

Can I just ask, can you hear us without the microphone?

ATTENDEES: Yes, we can.

MS. CARPENTER: Okay. So that will make it a little easier.

Briefly, what we are going to be going over tonight, I'll do a brief introduction. The site description, the background, how we got to this point. Some of the technical information. It's not a lot. Geologic, hydrogeologic setting that we are working within.

The various aspects of the work that the EPA has been conducting out here; the remedial investigation, which is the actual collection of data; the feasibility study, where we look at that data and try to come up with alternatives to address that contamination, what we are proposing as the remedy tonight, and what we are here to get your feedback on.

We're also fortunate in that the Village of Garden City Water Department has agreed to give a bit of a presentation on what is the status of the water quality in this area, and at that point that we're going to open it up to general questions and comments from you folks. So our presentation is really quite short, because I know everyone wants to get to what's the remedy and your questions.

Briefly, very briefly, the statute that we operate under is the Comprehensive Environmental Response Compensation Liability Act. That's quite a mouthful, more commonly known as Superfund.

So when we say Superfund here, we are actual talking about a statute. There's an act by congress in 1980 to respond to such sites as the Love Canal. It provides federal funding to respond to hazardous waste site cleanup. We can also respond on an emergency basis.

We coordinate these activities with our state counterparts, and as everyone knows, this is a fairly mature program at this point. Superfund has been around now for nearly 30 years.

The statute does have a couple of things that it allows us to do in addition to taking actions. We can also compel the potentially responsible parties to pay for the cleanup actions and for our investigation course.

There are two types of actions that can be taken: Emergency actions and remedial actions. The actions that we're going to be taking here at this site come under the heading of remedial action. We're going to be here for a while. We've done the study necessary to support that.

The actual remedial process, it's long-winded, but very briefly there's a site discovery and a ranking. The sites are referred to EPA usually by our state or local counterparts. We look at all the information they've gathered. It goes through a formal scoring process and public notice, and the sites that score high enough are placed on the national priorities list, which is a national list of hazardous sites that are now under federal jurisdiction.

The next step for us is to actually go out and collect data. We collect data from various media, soil, air, water. It depends on the site. And that is what we call our remedial investigation. Once we finish collecting all of that data, it's evaluated. And we evaluate it as we go, but we formalize that in something called a feasibility study. That is where we take a look at all the information we have, the contaminated media that we're dealing with, is it air, is it soil, is it water, and we come up with potential alternatives to address that contamination.

So the feasibility study is a fairly large document. It is available, as Cecilia mentioned, in the libraries, and the proposed plan that we are discussing with you tonight is the summary of the information that you could get in the Roosevelt Field information and feasibility study.

What we are here for tonight is to comment on the proposed plan, which is not on that slide, but it comes between RI/FS -- you will hear us abbreviate that -- and the record of decision. After we get public comments, we will prepare a record of decision for the site, where we specify what the remedy is, the response to the public comments, and it will give a bit more detail on how we envision that remedy being enacted.

Like all things, if you do any major projects around your house, there's a little planning involved for us. That's called a remedial design. We know conceptually what we want to do, but now we actually give it to engineers and various specialties that are needed to come up with how are we actually physically going to do this. They provide a remedial design.

It is -- in often cases, it is actually drawings and specifications and lots of detailed information, which we will make available to the Village. And then we move forwarded with the remedial action.

So what we can do to keep this going forward, clearly there's a number of steps we have to get through. But tonight is a very important step for us because it's when we get to hear from all of you.

So at this point, I would like to turn this over to Susan Schofield from CDM, who is a contractor to EPA, and they were the folks who prepared the remedial investigation and the feasibility study for this site.

And Susan's going to go over the remedial investigation components.

MS. SCHOFIELD: Actually, I'm going to talk about the site, the site description and how the background of how the site got to be known and how it got listed on the NPL.

First of all, I'm sure you're all pretty familiar with the strategic parts of the site, and I'll show a figure in the -- in a few minutes that will show all that. The site that we're looking at, as the Old Roosevelt Field contaminated groundwater site, is bordered by Old Country Road on the north and Clinton Road to the west. And basically it's in the Roosevelt Field Mall area.

And it includes -- the site also includes several office buildings in the complex, and also Hazelhurst Park, which is the grassy strip that's along Clinton Road. To the south of the site are a couple of recharge basins, and also the -- the two Garden City supply wells that the mayor also mentioned.

The site background. The site was originally an air field, and it was an air field from approximately 1911, in the very early days of airplane flight, to 1951. And the site included a fairly large number of buildings over the years that were used as -- for various operations related to the air field: Flight schools, service places, hangars for the airplanes to be parked in.

And during the two world wars, World War I and World War II, the U.S. military used the site, and they did various operations with cleaning engines, repairing engines, maintenance of airplanes that were used during the war.

And following the war, especially World War II, but actually following each war, the airport area reverted to commercial use, and that lasted up until 1951. And at that point the area was developed, as it is currently now, with the office complexes and the mall.

Now, here is the figure that -- this is an air photo, and this is Old Country Road and this is Clinton Road. And the main hangar buildings for the air field days were along the two roads. So they were just adjacent in these areas that you see the yellow boxes around, and that's about the limits of where the buildings were in the air field days.

These two features right here are the two supply wells that we talked about and the recharge basins. This is one of the recharge basins. And the other recharge basin is right here, that I described. And of course this is the mall area, which I'm sure you're all familiar with that area.

Now, the contaminants that we see in the groundwater are called TCE, or trichloroethene, and tetrachloroethylene, which is known as PCE. And you'll be hearing these two terms for the rest of the presentation on and off. So they're terms that you should get used to hearing, TCE and PCE.

And those are chlorinated solvents that were created and invented for use in about the 1940s, maybe 1938, '39, they came into use, and they were very commonly used for things like degreasing and cleaning metal parts before they were painted or before they were put into -- for instance, probably in the air field, when they maintained the aircraft or they repaired them, they would clean the parts with some of these solvents.

And one of the interesting things is that we have no real idea where the solvents may have been used or disposed of from the air field days. We've not been able to pinpoint any source of those, but we'll talk about that a little bit more later.

So until 1951, we think the solvents were probably used, at least to a small extent -- we don't know exactly how much, because it's not really in the records, but we -- since the contaminants are in the groundwater, we have to presume that there was some disposal of them somewhere in the area.

From about 1960 to 1985, when these -- the office complexes and the mall were developed, they used what were called cooling water wells that extracted groundwater that was then put through their cooling systems that they used mainly in the summer to cool the buildings, and then this water that happened to be contaminated was then recharged in a couple of different places in the area, that actually we think spread the contamination somewhat.

So that was a factor, these cooling water wells, and they were used from about the mid 1960s until about 1985, when those wells were shut down and no longer used. As I said, we're not sure exactly where disposal of the chemicals happened or what the exact routes of transport of these chemicals were.

Next slide.

There were several previous investigations that we had evidence and data from when we started the remedial investigation, and those are at the bottom of the slide. There were a couple of significant studies that were done in the 1980s by both Nassau County Department of Health and the U.S. Geological Survey, and these studies confirm that there was these two chemicals, TCE and PCE, in the groundwater.

So we use the results from those studies in the basis to plan the investigation that Lisa will talk about in a couple minutes.

The Garden City supply wells that we talk about, they were put into service in 1953. So they were pumping, I think, pretty continuously since 1953, and they each had a capacity of about a million gallons a day. So they're large pumping wells. They pump a lot of water, and they have a big influence on how the groundwater flows within the area of where those wells are, which again we'll talk about in a few minutes.

And now Lisa is going to talk a little bit about the detail of the remedial investigation that we conducted and the specific work that we did out here, and I'm sure a lot of you probably saw the drilling rigs that we had out here for quite a while when we were doing the work.

MS. CAMPBELL: This slide -- going to have a couple slides showing the geology of the area. And this slide shows basically it's a cross-section of the site area with the north area being up by the Toys R Us, if you guys are familiar with that, and then the south section is down by Meadow Avenue.

And then the two Garden City pumping wells are right here in the middle.

So we -- there's three geologic units that are in this area: The upper glacial aquifer, which is approximately zero to 150 feet below-ground surface; the Magothy aquifer is approximately 150 to 450 feet below ground surface, and then the Raritan clay, which is what we are considering a hydrologic barrier.

And in the Magothy aquifer, we split up into two zones, the shallow, or the intermediate Magothy aquifer, and the deep Magothy aquifer.

These two figures show groundwater flow that was developed using a groundwater modeling program.

MS. CARPENTER: Just as a note, if you can't see these, these are actually in the handouts that were on your seats.

MS. CAMPBELL: There are a few of these that were in the handouts and some of them were in the proposed plan as well. So this first one over to the left shows the site, and it's basically north is to the top, and shows groundwater flow in the shallow aquifer flowing to the south.

And the one on the right, it shows that the groundwater flow in the Magothy aquifer, which is the deeper aquifer, and this -- where you see the bull's eye right in the middle, these are the two Garden City wells, 10 and 11.

So what this shows is that groundwater is flowing south, and then being pulled into this area over here, where the -- due to the heavy pumping in those areas.

The purpose of the remedial investigation was twofold. One was to look at the groundwater and do a groundwater investigation that determined the current atrium extent of contaminants within the groundwater aquifers. And the second reason was to look at whether there were any residual source of contaminants in the areas of those -- the hangars that we were showing earlier along Clinton Avenue and Old Country Road.

We did three types of activities during

that remedial investigation. The first one was what we call groundwater screening, where we collected discrete depth samples at approximately -- several intervals within each well zone, and those were collected anywhere from 30 feet below ground surface to 450 feet below ground surface. And we used these results to try to target where we were going to put our well zones.

And then the second part was to put in multi-port monitoring wells. And just a brief note on multi-port monitoring wells. It's basically a well that's installed and it's able to sample several different zones within one bore hole, without installing several different wells.

So, for instance, we have a total of 64 ports that we're able to sample with a total of eight wells, rather than 64 wells. So that was a significant cost savings. And then once we put the multi-port wells in, we did several rounds of groundwater sampling from those multi-port wells. We also sampled ten existing wells that belong to Nassau County. They were in the shallow zone, and also the two Garden City Wells 10 and 11.

And this is proposed plan figure Number 1. It's kind of hard to see up here, but it's -- it's in your proposed plan.

This is the mall area, again.

And we put in a background well up here, here, here, here, here, here -- oops, down there, and over here.

And so the extent is down. Up here is Old Country Road, and the background well is up above that, and then this down here is Old -- I'm sorry, Meadow Road.

For the source area of soil gas investigation, we made a grid throughout the whole site for the 158 screening locations. At each location we took samples, soil gas samples, at two depths: One at 15 feet and one at 35 feet. And that was in the area above the water table. And so that's a -- a total of 316 samples total.

And then we also collected soil gas sampling around the perimeter of two Garden City Plaza buildings, and also the building at 100 Ring Road, and also a couple in Hazelhurst Park.

And this is also in your proposed plan, Figures 2 and 3, these two figures. So they're kind of -- this shows the sampling. Each one of these dots is a sampling location where we took two different samples. And then the second one shows the locations around the -- the building. This is 100 Ring Road. And then these are the two Garden City Plaza buildings.

Once we got our results back, we looked at them and came up with some -- some contour maps, which I'll show in a minute. But basically for PCE, which is the tetrachloroethylene, concentrations range from non-detect, which is -- means that it -- there was none found at a certain level, up until -- up to 350 micrograms per liter.

And the TCE concentrations ranged from non-detect to 260 micrograms per liter.

And in general, the highest concentrations were found in one area. It's in what we call -- we're calling SVP/GWM 4, and that is located in between Hazelhurst Park and the -- the -- the office buildings. And I'll show that in the next slide.

Basically, the area of contamination that was the highest was in the intermediate aquifer zone, and that was anywhere from 250 to 310 feet deep. And this area was the area that was used as a drain field and the distilling well for disposal of the contaminated cooling water that Susan mentioned earlier.

Okay. This -- I've got to two slides, one that shows PCE and one that shows TCE. The EPA maximum contaminant level for both of these contaminants is 5 micrograms per liter. So what this also shows, and this is also in the handouts, it's kind of divided into three different areas. This is the shallow zone, the intermediate, Magothy zone, and the deep Magothy zone.

So these lines are -- the outer line is the 5 microgram per liter contour, so everything inside that line is above that reading. So this shows that the highest concentrations are in this Well 4. This is the mall area. And these are the Garden City Plaza area office buildings. This is Well 4.

So this right here is the highest

concentration of PCE of 350 micrograms per liter, and in the shallow zone the highest was 15 micrograms per liter, and in the deeper zone was 230 micrograms per liter. And that's in the deeper -- I'm sorry, in the wells. The Garden City supply wells.

This next figure shows the same thing, but it's showing the TCE concentrations. Again shows the shallow zone, the highest concentration was 20 micrograms per liter. The highest concentration, again, was in that intermediate zone. There are some high concentrations in 4, but the highest concentration was actually in one of the Garden City wells at 260 micrograms per liter. And in the deeper zone the highest concentration was at 170 micrograms per liter.

For the soil and gas screening results, again, of the 158 locations that we sampled, five of them exceeded the screen criteria, and that's at the 15-foot level, and seven of the locations exceeded screening criteria at the 35-feet level.

And if you can go to the next slide,

this is also a handout that's better seen in the handouts. There are -- again, this shows all the sampling grids, and all of the blue dots that you see are the locations that exceed the screening criteria.

So the -- the conclusions from the groundwater investigation that we did are that PCE and TCE and its related compounds are the site-related compounds of concern.

The majority of the plume core -- when I say the plume core, I mean the highest levels of concentration are located near Well SVP/GWM 4 at approximately 250 to 310 feet below ground surface. Again, this is the area that was formally used as drain field and distilling well.

The southern -- the natural southerly flow of groundwater and contaminants is to the south. And in the deep zone it's interrupted by the large-scale pumping at the two Garden City supply wells, 10 and 11.

And it basically, the -- also, the VOC contamination is shallower south of the Garden City supply wells, and this is likely related to contaminant sources located south of this area.

The conclusions for the source area investigation, again, as you can see from that figure with the blue dots, there is little evidence of residual sources left in the -- the subsurface. And basically, in order to look into that further, EPA conducted some additional samples at some of these select locations to confirm that the soil vapors were not indicative of a contaminant source.

And Michael Sivak is going to talk about that.

MR. SIVAK: Okay, I'm going to stand over here. Just to shift everybody's focus a little bit. I'm -- as Cecilia introduced me earlier, I'm EPA's risk assessor, who's helping out on this project.

So I'm going to talk about sort of some of the other sampling that we've done and how that sort of affects human health or what our conclusions from that might be. This slide here talks about the soil vapor sampling that we conducted.

As Lisa mentioned, we did do a lot of

soil gas sampling, and those are soil gas samples that are collected in sort of open areas that may not have buildings over them.

Once we -- incurred with that sort of investigation, we also started on an investigation to determine whether or not vapors were collecting in buildings, because that's an important factor as to whether or not these vapors could actually collect beneath buildings, percolate up through cracks in the building and the foundation, and then get into the indoor air environment in concentrations that we would be concerned about.

So EPA started its vapor intrusion sampling by collecting soil vapors. We collected soil vapors both from underneath several commercial buildings and then also across a number of residential properties to the west side of Clinton Road.

The soil vapor samplings on the commercial properties involved two phases. The first phase began with collecting just the vapors beneath the buildings. We got those results back, and down here you can see that we looked for both TCE and PCE. The TCE concentrations ranged from about 3.9 up to about 51 micrograms per cubic meter underneath these building slabs.

Some of these concentrations did exceed our screening criteria. In fact, all those results exceeded our screening criteria. And so that then prompted us to look at these data and say, what this means is that vapors are collecting beneath the slabs.

We don't really know what that means as far as the indoor air goes, but we know that the situations are such that the vapors are migrating up from beneath -- from a contaminated aquifer, and they are beginning to collect beneath the building at levels where we need to look at that a little more closely, and I'll get to that in second.

We also looked at PCE results, tetrachloroethylene, in this slab, and none of those concentrations exceeded screening criteria. So what we saw underneath the Garden City Plaza office buildings were just the TCE that was starting to collect beneath the slabs. That then triggered us to go into sort of this round 2, this second -- this second round of sub-slab vapor, where we then collected sub-slab and indoor air concentrations at the same time.

We wanted to see what was going on in the building at the same time that we could see what was going on beneath the building as well. So that's this result right here. The indoor air samples exceed the New York State Department of Health indoor air criteria for TCE or PCE.

So that's a very, very good piece of information for us to take away, which is, even though we're starting to see some vapors collect beneath the slab, we are not seeing any impact to indoor air at all. We are not even seeing detections of these chemicals in the indoor air in the commercial buildings.

As I said previously, we can also collect sub-slab soil gas samples from beneath some residential properties on the west side of Clinton Road.

In fact, some of you may remember Caroline from walking around the neighborhood in that area trying to get folks to volunteer for this effort. So we did collect some PCE and TCE samples. We did not have any exceeds, especially of TCE or PCE, above our screening values in the sub-slab.

Next slide.

So while we are collecting the soil gas samples and the sub-slab soil gas samples, we were also collecting soils from the commercial area as well. We collected 41 subsurface soil samples. The reason we did this was, Lisa mentioned before that we are -- we were at this point in the process, we were still trying to figure out, could there be residual source material that could continually be leaching some contamination to the groundwater.

We collected the soil gas samples. Some of these Lisa talked about. Some of those did suggest that we have -- we had some vapors that were above our screening concentrations.

We then went out and collected more soil gas samples that we actually analyzed in laboratories. We got those results back. We also collected 41 subsurface soil samples on the commercial property. And in those 41 subsurface soil samples, no VOCs were detected in any of the samples.

The results of this investigation, the results of the sub -- excuse me, the soil gas sample, the screen samples, the soil gas samples that we set out for analysis, and the subsurface soil samples, all lead us to believe that there is no residual sources left on the property that will continue to leach contaminant to groundwater.

As part of the remedial investigation, we also conducted a human health risk assessment.

The purpose of the human health risk assessment is to look at the data that we generated at the site, the groundwater data, primarily the groundwater data, because we didn't find it in the soil data -- primarily the groundwater data to look at this, to determine -- basically we are trying to answer two questions with this process.

Those questions are: What are the risks to people now if they're exposed to contamination, and what are the risks to people in the future, in the absence of any remediation, in the absence of any kind of controls.

Well, the good news is that there are no current exposures to contaminated groundwater. Nobody is currently drinking the contaminated groundwater. So under the way the site currently exists, there are no current exposures to groundwater.

The next question that we try to answer is what are the -- what might the risks be under potential future conditions if people would be exposed to groundwater. Well, what we -- what we are trying to do is, we're trying to look at how people would be exposed to the contamination under what we call really maximum exposures, and what's the highest exposure that someone is likely to get if they were to have an exposure.

So that's what we call a reasonable maximum exposure. For example, we can look at residential exposure to be every day of the year for approximately 30 years.

So you're drinking about two liters of water every day for 30 years. That is sort of our reasonable maximum exposure. For drinking groundwater. For drinking water.

So we look at ingestion. We also look at inhalation of these chemicals while we're showering, because that -- that may be a pathway that we need to look at. We also look at dermal contact with site groundwater. Your skin is exposed to this, what might the risks be for these chemicals upon dermal contact.

Basically, the conclusions of this was that under potential future exposures to TCE and PCE in the groundwater, these risks exceed EPA guidelines for acceptable levels of risk. So that then leads us to the next step in the process, which is the feasibility study, which Caroline will talk about.

MS. KWAN: Take all these back together with the remedial investigations that Lisa mentioned, the risk assessment that Mike and his staff have prepared, conducted. Next step is developing feasibility study, which Angela has mentioned before.

And the purpose of it is to come up with some cleanup alternative to meet some of the -- some of the action objectives that we have set aside, and these remedial action objectives is to prevent and minimize potential and current and future human exposure, including inhalation, ingestion, dermal contact with the contaminated groundwater that exceed the maximum contaminant level, minimize the potential for off-site migration of groundwater with the VOC contamination greater than that the drinking water and MCLs; to restore the groundwater to beneficial use within a reasonable time frame as specified by our law, and mitigate site-related vapor migrating into commercial buildings, if necessary.

The maximum contaminant level for these four chemicals, PCE, TCE, 1,1-dichloroethene, and cis-1,2-dichloroethene, are all 5 micrograms per liter.

Now, with this -- from the alternative that we're developing, the cleaner alternatives, we use criteria that's mandated by Superfund law, and these criteria are, first and foremost, overall protection of human health and the environment, compliance with applicable and relevant and appropriate requirements, ARARs. Long-term effectiveness and permanence, reduction of toxicity, and mobility and volume of waste and hazards -- and hazard.

Short-term effectiveness. How implementable this remedy is. The cost is a factor. The state concurrence, and of course the community acceptance of this remedy.

Now, EPA also mandated that we evaluate a no-action alternative. Under this no-action alternative is a baseline for comparison with other alternatives that we were -- we will, you know, present later on. And this is -- for this no-action alternative, no action is to be taken to prevent exposure to the contamination at the site.

As part of this no-action alternative, we will also conduct a five-year review, because contaminant is left on site for more than five years.

Now, under Alternative 2, we were monitoring institutional control. We will do some sort of long-term monitoring program to sample and to perform any new sampling of the seven existing multi-port wells that we install, and two of the Nassau County single screen well, to track the contaminated water over time, to make sure that the drinking water standards numbers are being met.

We will also institute a -- to restrict some future groundwater use for the site. And we will also prepare a site management plan to ensure that we have proper management of the monitoring programs, and the institutional controls and component of this remedy, of this alternative.

Again, five-year review will also be conducted at the end of five years, because contaminant will be left over, in or on site, for over five years.

Now, for Alternative 3, we have groundwater extraction and ex-situ treatment, pump and treat. First, a pre-design investigation to include at least -- to install three new multi-port wells and do some sort of groundwater modeling.

We will also, based on the result of

this design investigation for this new multi-port well -- we will also install, could be one extraction well, could be a number of extraction wells and a treatment system to treat the contaminant groundwater and discharge the recharge basin.

As part of this alternative, we will also evaluate the wellhead treatment at Garden City supply wells, 10 and 11. Again, we will conduct a -- we will institute control to restrict future groundwater use of this site.

Again, a site management plan will be prepared to manage all the components of this alternative.

Again, a long-term monitoring. We will also conduct sampling of the existing well and the newer -- newer wells. The monitoring -- the plume movement. Again, five-year review will also be conducted because contaminant will be left at site for over five years.

As part of this alternative, we will also continue to monitor for vapor intrusion by going back to commercial building, and do some -- a sub-slab and indoor air sampling.

As part of this Alternative 3, the pump and treat, we will also prepare a contingency plan. This contingency plan will be implemented in the event that Garden City Well 10 and 11 pumping rates are reduced or are permanently taken out of service. This contingency plan will include installation of a new well in the vicinity of Garden City wells, and an ex-situ treatment, treating contaminated water.

Now, the cost. With Alternative 1, which is of course no action, which we have zero cost, zero annual O&M cost, operation and maintenance cost.

For Alternative 2, our capital cost for the monitoring, the annual monitoring, is $300,000. And the annual operation and maintenance of this monitoring program for the first 25 years will be $150,000. After 25 years, since the plume -- based on our current modeling effort, plume size will be reduced, so our monitoring network will be reduced, so we got reduced to $110,000.

Alternative 3, the capital cost will be

$6.2 million. Again, the annual monitoring cost is increased to $850,000 from Alternative 2, because we have more monitoring wells that we are going to monitor, plus we will do a forced operation of the existing extraction well that we put in place in the treatment plant.

Again, monitoring network will be reduced after seven years to $790,000, because the plume size will be reduced after 25 years. Again, if we are going to do a contingency plan, $5.6 million will be added onto Alternative 3 if we need to implement the contingency plan. Another $5.6 million will be added to this 6.2 capital cost.

Again, like we explained, through the criteria evaluations and the assessments of the risk assessments and the inclusion of the remedial actions, remedial investigations, we have proposed, EPA proposed, we would -- you know, Alternative 3 will treat the contaminated water and pump it to the recharge basin. I mean, pump, you know, pump the discharge, the clean water to the recharge basin.

This alternative -- again, let me reiterate. We would start with a pre-design specification to include at least three new multi-port wells and do some sort of groundwater modeling to fine-tune the common influence of this extraction well that we're going to install to treat the contaminated groundwater.

Again, we're going to evaluate the wellhead treatment at two Garden City supply wells, and we will also institute control to restrict the future of groundwater use at the site. Again, the site management plan will be prepared to take -- to make sure we properly manage all the components of this a alternative.

Again, this long-term monitoring again is the annual monitoring of these wells that -- in the area, to assure that the plume is actually shrinking. Again, five-year review will be performed. At the end of five years, because the contaminant is still -- will be left, you know, still after five years.

Again, we will continue to monitor for

vapor intrusion at the commercial building, like doing an indoor air commercial buildings.

I would like to turn this over to the Garden City Water District for their presentation.

SUPERINTENDENT KOCH: Thank you, Caroline. Just want to see if anyone can see this picture right here. It's actually -- I'm Frank Koch, by the way, superintendent of water in the Village of Garden City. I'll be talking about treatment systems. And when we do, just want to emphasize -- the water, the tap water is safe to drink. Okay?

Now, we have provided safe drinking water to the people. We've tested it for 30 years. We've taken several samples, those collected for lab analysis thousands of gallons of water to make sure that the water meets our drinking standards.

We tested monthly. Several times we have tested weekly. For two years we tested daily, just to ensure that we provide a safe water.

Should any time the water exceed any

limit, the protocol would be to actually take the well as a system, provide proper treatment, and put it back in the system.

So, as the mayor stated, we've removed contaminants since 1987, 20 years, using our first VOC removal treatment. It's the tower on the left -- not that it matters, they both look the same -- to remove the VOCs, volatile organic compounds, the PCEs and the TCEs that these guys were talking about.

As levels slowly climbed, we had to upgrade our systems. We actually had to do three major upgrades in the '90s alone. Capital costs spent by the Village at Clinton Road is 2.24 million. Operation maintenance including lab analysis and plant monitorings and filter replacements, among power replacements, 1.5 million.

So you can see, even past 20 years, we've had -- we spent a lot of money already. Future looks very similar. We have 46 years, according to the report. We would have to replace our current system, our current treatment system, three more times, okay, and those capital costs will be $5.4 million, in today's present world, and the O&M would be $8.6 million.

The Village is committed to provide safe water to the public, but we need the USPA's help and we need the responsible party of the U.S. Navy to help us as well. Thank you.

MS. CARPENTER: I think we have got one more speaker. You? So this is Dennis Kelleher, who is consultant to the Water District.

MR. KELLEHER: Good evening. Dennis Kelleher, from H2M Corporation, vice president. We've been the consulting engineers for the Village Water Department for probably about 25 years. We reviewed the feasibility study, and we would like to make a couple comments tonight and maybe raise a couple questions that we would like the EPA to respond to, either tonight or in the future.

Each of the three alternatives that have been presented have assumed that the Village's water supply wells 10 and 11 and the stripping facility will be part of the remedial solution. In the past, New York

State DTC and New York State Health Department have stated that public water supplies cannot be part of the remedial strategy for cleaning up the groundwater contamination.

The Village disagrees, and we disagree with the EPA's approach at this point, and we would like the EPA to explain how they can allow the water supply to really be part of the remedial action.

The report also states that the EPA is requesting the Village to provide at least two years' advanced notice before the wells are shut down or the pumpage is reduced.

This will allow EPA to put in a pump and treat the system. The Village cannot do that. They're running a water treatment system. They have to provide public water to the community on a daily basis. They do not have the luxury of having a notice where they can say, Oh, we're going to have a problem two years from now. A problem may occur today and they will have to shut those wells down immediately. So there is no way they can give the EPA two years' notice.

We feel that the solution is that the EPA has to assume that those wells will not be used in the future. Again, the Village's main purpose is to provide a safe and reliable source of drinking water and water for firefighting to the community.

The report also included an evaluation of the three alternatives, and part of that evaluation included a cost effective analysis. The first alternative, which was just discussed, is the no-action alternative, and it -- in the report it's stated that this cost -- excuse me, this alternative will have no cost.

Well, that's no cost to the EPA. However, it's a significant cost to the Village of Garden City taxpayers, as Frank Koch has already explained.

So in addition to the money that has already been spent in the last 20 years, providing treatment at the wellhead, the report states that additional treatment will be needed for the next 46 years, and we estimate that the total cost to be over $14 million.

The question we're asking EPA is, who is going to reimburse the Village for the moneys that have already been spent? And the second part of the question is, who is going to pay for the cost of future treatment? So I just want that to be clarified.

Our firm has had the experience in dealing with projects where the U.S. Navy has contaminated the groundwater on Long Island, and there has been situations where the Department of Defense has paid for treatment. So the question is, you know, will the federal government reimburse the Village for their expenses.

And our final comment is, the report really had no schedule for implementation, and if a schedule for implementation could be provided to the Village. Thank you.

MS. ECHOLS: Thank you.

MS. CARPENTER: Is that everybody from the Village that wanted to speak?

MR. KELLEHER: Yes.

MS. CARPENTER: Before we get into the questions and answers, just so you know how you can contact us, on this slide, which will remain up, and information is always available in the proposed plan on how you can send us comments.

Caroline Kwan, who is the project manager, her phone number and her e-mail address is on this slide, as is Cecilia's. And we also have a Web site and the address is in the proposed plan that were part of the handouts, where we can get copies of tonight's presentation and the proposed plan.

And that Web address is at the bottom of the slide and it's also in the proposed plan.

So at this point I'd like to open up for any questions that you may have.

MS. ECHOLS: Please state your name again.

MR. KOCH: Frank Koch. Can you start with some of the questions that Ed has asked about providing funds?

MS. CARPENTER: The water system -- one of the comments that you made was that the water system is being used as part of the remedy. What we had to do was look at the current existing conditions, and currently, the fact of the matter is, the Village of

Garden City is pumping these two wells at somewhere between 800,000 to 2 million gallons a day, given seasonal variations. That is a -- that's a fact.

So we've had to look at that and try to see what we could do working around that fact, and not introduce anything that could negatively impact the water supply in this area.

If the Village were to take these two wells off line permanently, that would certainly allow us to extract water at a higher rate, potentially to other remedial alternatives, but we are looking at a site where groundwater contamination and the two supply wells are -- they're hand and glove.

And the remediation system that we put in, we don't want to negatively impact the Village's ability to use that groundwater as part of their distribution system.

So there's a careful balancing act that has to be accounted for.

We will be working very closely with the Village and their consultants during this process to assure that we are not causing a problem to the public water supply.

I understand the issue of not being able to provide two-year notice, a timely notice. Sometimes that is not possible on the shutdown. Where we envision that kind of notice is if the Village is considering taking these wells out of service on a permanent basis, it would be very helpful to us to have that information as early in the process as is possible, to try and accelerate our normal, somewhat lengthy design process.

We are looking at designing our contingency remedy concurrently with our proposed remedy, so that we have the design available and we do not have to go out and do that at the 11th hour, should it become necessary. So we will have that design available to us.

Reimbursement.

Under the Superfund statute, it was never envisioned -- that actually is in the preamble to the national contingency plan, and I know Leilani, who is our counsel, probably knows the statute, certainly knows the statute better than I do. The -- the

Superfund program was never intended to be a drinking water program. We are a hazardous waste site cleanup program.

As such, we have been unable to provide reimbursement to towns for costs that they have incurred in the past. What we can do is provide some assistance with, for example, upgrades to the wellhead treatment.

So we will be working, again, with the Village to identify what those needs are, what the capital costs are of those needs as they relate to the site contamination.

So for example, if there is a fuel oil spill, that is precluded from Superfund. But the TCE contamination and PCE contamination that we've identified as site related and of concern will certainly be a basis for EPA being able to work with the Village for future -- I don't know what the proper word is, upgrades, for lack of a better word, to the existing treatment system. So I think I covered the three major points.

Yes? No?

Oh, the schedule. Yes, as soon as -- we -- the next -- once we get a record of decision and we put together a remedial design work plan for our contractors, we'll be happy to provide sort of a schedule and set up meetings to discuss where we're going, because your input is going to be necessary for us to successfully put the remedial in place and have it operate with minimal impact to the community.

MR. KELLEHER: So you're saying that if the Village wants to be reimbursed for costs they've already outlaid, plus operational cost in the future, they have to sue the Department of Defense.

MS. CARPENTER: What I'm sort of saying is that EPA Superfund program cannot reimburse those costs, but I will turn it over to Leilani to add to that.

MS. DAVIS: There's an ongoing potential party -- responsible party search currently for the site, and I have been looking at some historical documents related to the air field. And if you certainly uncovered any documents that show evidence of the Navy using any of these contaminants of concern, TCE or PCE, at the air field, please give me your card, because I definitely would like to take a look at whatever documents you have. But we are still currently investigating and trying to do a responsible party search right now, but we have not officially named anyone yet at the site.

MR. KELLEHER: I'm just surprised, just with that last statement, just with some of the stuff. So you're saying that the Department of Defense --

MS. DAVIS: No, has not yet been notified, no. But if you have any, as I said, historical documents that show actual usage of those chemicals at the air field, please, I'll give you my card at the end of this meeting, and you can make copies and send them to me. That would -- I would be very interested in that.

SUPERINTENDENT KOCH: That might be the first place to look after the description of what they did there, and the cleaning.

MS. CARPENTER: We've been looking at all the existing --

MS. DAVIS: The problem is, there is circumstantial evidence and there is actual evidence, and the problem is a lot of what's out there is pretty circumstantial. And also, as anyone who knows any history of the Air Force -- excuse me, of the air field, it wasn't just the military. There were lots of private companies that did aircraft repair and maintenance all along the air strip. It operated between 1911 and 1951. There were several years when the military wasn't involved at all.

So if you have any information about those companies, too, we would absolutely love to look at it, and make copies and please send them to me.

MS. CARPENTER: Yes.

MR. SMITH: This request for information --

MS. ECHOLS: Would you state your name, please?

MR. SMITH: Cyril Smith, resident of Garden City. Does this information from the attorney deal with only going back to the 1920s and '30s as the air field and aviation situations existed?

MS. DAVIS: No. I mean, if you have any

information in your possession regarding
operations of the air field at all, I
would --

MR. SMITH: Well, this is prior to that. During the Spanish American War, that was a military base, and an enormous amount of munitions was put there before the troops left for Cuba. I don't know precisely where.

MS. DAVIS: The problem with that is, that might be very interesting, but PCE and TCE were not in usage during the Spanish American War. The earliest usage, I believe, is the '30s. The '30s.

MR. SMITH: Have there been any other contaminants been tested there on the ground? I don't know what happens with burnt gunpowder after the rain has passed into the soil.

MS. CARPENTER: The -- this site was listed on the national priorities list on the basis of the groundwater contamination that was being detected in the drinking water supply wells, and through the Nassau County Department of Health investigations into groundwater.

Now, these contaminants are volatile organic compounds, and those were tested for, including their degradation products. The other complicating factor at this site, and one of the reasons we suspect we have not found a distinct source area, is the amount of demolition and regrading, construction, that has occurred in this area, between taking down the old airfield barracks, turning those -- draining that area, turning it back into a mall or into an office building complex.

So this is not like some of our industrial sites, that if you've been to some our other meetings here where we have a dry well or an acid-leaching pit or cesspool, and we know the exact location.

So the odds of finding anything distinct in that soil is -- is pretty slim. What we would probably be able to find are the contaminants normally found with tarmac. You will find some of the fuel components from cars sitting on the parking lots.

So again, these -- groundwater contamination is the focus of this site. It is a groundwater contamination site. We did not see anything really untoward in the information we have on this site, and certainly nothing that -- that's news to us about the Spanish American War, but I'm not sure what would be left from that time period.

MR. SMITH: You're saying the spectrum of the testing dealt only with the chemical related?

MS. CARPENTER: The testing at this site predominantly dealt with the chlorinated solvents, because that is what got this site listed on the national priorities list. This is a groundwater contamination area site that we suspect is associated with the activities of the Old Roosevelt Field site.

MR. SMITH: I understand that. So the spectrum covered just the ranges you're discussing rather than outside of those parameters?

MR. MILES: Just as a side note, the public wells are tested for a large range of chemicals. It's a very large range of different chemicals and different times. So you would have seen -- if it was something that was really getting into the drinking water, we would have seen it.

MS. CARPENTER: Yes, sir.

MR. BELLMER: Bill Bellmer, Garden City resident.

50 years ago they stopped using the solvents, 1951, roughly, and for the last 50 years the Garden City wells have pumped a million gallons a day, possibly, not from the beginning, but now, and yet the contamination doesn't seem to be down, it seems to go up.

Can you explain that in a little more detail?

MS. CARPENTER: Actually, if you looked at the remedial investigation, the groundwater contamination in the -- say in the north end of the site back in the '80s was as high as, I believe, 28,000 parts per billion, or micrograms per liter.

And that migrated southward toward the Garden City supply wells, which is why you saw that the contaminant levels at the supply wells started to elevate. So as that water moved from that point down toward the wells, you will see that increase when you're testing the wells, which is why the Village has had to do these repeated upgrades.

So that was the natural progression, as Lisa pointed out, is in a southerly direction. But then when you come into the area of influence of those two pumping wells, because they are withdrawing so much water, they will attract, so to speak. They're going to pull that water in. So that's why you saw the numbers go up.

At the same time those numbers are going up, they're going down elsewhere.

MR. BELLMER: How much more water besides the million gallons a day that the Village is pumping would the remediation pump on top of that?

MS. CARPENTER: I'm going to turn that over to -- Susan?

MS. SCHOFIELD: 150.

MR. MATTHEW: 150 gallons per minute.

MR. BELLMER: What does that translate to? Just from portion of what we are pumping, what percent was that?

MR. KELLEHER: They would probably only

pump 10 percent.

MR. BELLMER: Then why bother even doing it, instead of letting the Village keep on pumping --

MS. CARPENTER: What we are trying to do is keep that one area that Lisa was pointing out in that Area 4 from impacting the Village wells. So it will -- it's a very valid point you're making. If we did nothing, that no-action, while the Village would continue to incur costs -- and I'm sensitive to that -- if we did nothing, it would eventually be drawn into those wells and it would be dealt with, because they have a really good track record in this village of dealing with this.

But that isn't the point of the Superfund program. We don't think that the drinking water supply wells should be used in this manner. So this remedy is trying to balance the need to withdraw the water for public use and not have that additional contamination get there.

So we are trying to draw that, create a sort of low flow zone in that area, and treat that water, and then put it back into the recharge basin, so that it isn't just lost to waste.

MR. BELLMER: Would you create another recharge basin or use one of the existing ones?

MS. CARPENTER: At the present time we are looking at using one of the existing ones.

MR. BELLMER: Lastly, one more thing, the cost of it. Is the cost of the electricity for pumping at all significant?

MS. CARPENTER: I believe it is pretty significant out here in Long Island.

It's in that O&M cost. It's part of that.

MR. BELLMER: Thank you.

MS. CARPENTER: Yes, sir.

MR. QUIGLEY: Can I talk about my product? Inappropriate?

MS. CARPENTER: You can -- no, you can --

MR. QUIGLEY: -- public record?

MS. CARPENTER: Absolutely.

MR. QUIGLEY: Do you mind? Briefly?

MS. CARPENTER: Yeah, because it might be a little more technical.

MR. QUIGLEY: It's not.

My names is James Quigley, and I'm with Barnes Environmental (phonetic), and we were chatting before about our technology. And I think the door is closed on the opportunity for this particular site, but I thought it would be good if everybody in the room know a little about how technology for future -- or perhaps to remediate some of the problems at this particular site, because it sounds like there's some need for some seamless operation between water and soil. And I think we may have a product that would be a solution.

I spoke to some people in the Water Department, may be avoiding me. I don't know.

SUPERINTENDENT KOCH: No, Jim, not at all.

MR. QUIGLEY: Our technology is now a technology that migrates to the soil and breaks down the VOCs that we discussed. Not by brand, but all. One of the issues that we might have is how do we get it to the contaminant, 400 feet below.

Well, I don't know, but it sounds like you have a hot spot. I think we could treat the hot spot. Our product, unlike the five-year review, when our product hits the contaminant, it remediates it. That might be interesting to you folks who are concerned about the contaminant and the treating. It sounds a little like something that was done a long time ago, going very far down in soil, trying to treat stuff and bring it up and do it every five years.

Just seems to me that utilizing nanotechnology, which sounds a little more what folks are going to do remediating, is more practical and more in line with what you might want to do on future sites, or maybe even treat part of the existing site that you haven't gotten with your pump-and-treat system, with our technology, which will treat the PCE and TCE, all the VOCs.

So I thought that might be interesting for whatever is here.

By the way, we have contracts with the army. We have contracts with the navy. We have contracts with TPA. And I'll refer that contact to you folks.

Thanks. My name is Jim Quigley.

MS. CARPENTER: Thank you, Mr. Quigley. We will be in touch with -- Mr. Quigley is going to give us some contact information.

Yes, ma'am.

MS. RUGGIERO: Hi. Barbara Ruggiero, Garden City resident, and as I'm looking at the handout in terms of a time frame -- because I noticed that you were [inaudible] but it's listing ten years from water extraction.

MS. SCHOFIELD: Yes. What we did to create that alternative was use the groundwater model, and the groundwater model was used to look at the contamination that we had mapped, that were from the figures that Lisa talked about. And the model then looked at what would happen if we put in extraction wells in different parts of the contamination and extracted water at different rates, and how long it would take to extract the water so that it was below EPA's MCL, or maximum contaminant level.

And the preliminary groundwater model showed that it would be about ten years of pumping of the extraction well that EPA would put in to bring the water in that area near that SVP 4 location near the Garden City Plaza parking lot, to bring that level down to within the MCL.

So that -- so that the -- the alternative was envisioned that pumping would occur at the extraction well for about ten years.

MS. RUGGIERO: Is there any way to shorten that time frame, out of curiosity?

MS. SCHOFIELD: That's what would be done as part of the design, part of the pre-design investigation that Caroline described, that we would put in a couple more wells so that we would have a little bit firmer idea of exactly where the contamination is, and then the groundwater model would be used again to determine what the best setup would be for extraction wells.

And one of the primary concerns that we had looked at this alternative was that we not put in an extraction well for the remedy that EPA's looking at that would impact the two supply wells.

So we were really constrained with where we could put wells and at what rate we could pump them so that we would not impact the water that was being extracted for the -- the use by the Village residents for their drinking water.

But that's one thing that would be really refined in the design stage, would be to determine what was the best arrangement of the number of extraction wells that EPA would use and whether they would be placed and how much they would pump.

MS. RUGGIERO: Would they only be placed on public land or anybody's private land, out of curiosity?

MS. CARPENTER: I think right now they have -- well, all those parcels are owned by -- by private entities, probably with the exception of Hazelhurst Park, which might be a municipal.

MS. KWAN: Village.

MS. CARPENTER: So it's more than likely that we will be putting at least some of this treatment system on privately owned property.

MS. RUGGIERO: How long does the design phase last? Did you do a study on that?

MS. KWAN: A year. Could be a year to do the -- to do the pre-design investigation and come up with a -- you know, a -- a design.

MS. RUGGIERO: Right.

MS. KWAN: A year, a year time frame.

MS. RUGGIERO: I noticed on the feasibility study cost analysis there was a contingency plan noted with an asterisk, and that made the numbers jump up another five. What is the contingency plan?

MS. CARPENTER: That was -- as Caroline was explaining, the contingency is should the two wells be taken out of service. That would be sort of a trigger.

And that would be to actually increase the extraction and the treatment system to kind of compensate as much as is possible for taking something that large out of. So that's why the costs jump drastically.

MS. RUGGIERO: If we take the wells out of service, where do they get the water from?

SUPERINTENDENT KOCH: It would be very difficult. You guys look at the map of the Village of Garden City, two dots all the way to the east, that's the wells we're talking about. Just in case not everyone knows.

The -- those two are kind of in an island of their own. If you look at how much they can -- it's one system, but let's face it, the water from those wells supply that eastern section. If we were to lose those wells, put two more wells somewhere else.

So, I guess the answer is, I guess maybe this can't be Superfund either, but if you really want those wells, we have no problem moving those wells down further.

Of course --

MS. CARPENTER: The difficulty in placing any wells is going to be ensuring that you're not in another area with a problem.

SUPERINTENDENT KOCH: Of course.

MS. CARPENTER: So there's a lot of homework to be done on that, but if there's -- if the Village decides that they are going to move those wells elsewhere, then yes, we would certainly like to talk to you about --

MR. KELLEHER: You can take that money and just give it to the Village.

MS. CARPENTER: Are you going to bake me that cake?

MR. KELLEHER: For five and a half million, I will.

MR. BELLMER: One more question. I always thought that the contaminants sort of floated on top of the groundwater. When the presentation for the Hempstead gas plant was given, the coal tar was said to ride on top of the groundwater, 35 feet. Do you know how this stuff ever got so deep?

MS. CARPENTER: Some ground contaminants are what you call floaters. They sit on top of the water. Some are sinkers. They go to the bottom. But the easiest explanation in this case is, they got so deep because the wells that are pumping, 10 and 11, are quite deep. They're drawing. So what happens is it pulls it down. So that's --

MS. SCHOFIELD: In addition, keeping in mind that throughout the '60s, '70s and half of the '80s, there were a lot of cooling water wells. I think we were about eight or nine cooling water wells in that office complex area that drew a lot of water. In fact, probably comparable amounts of water during the summer to what the supply wells pump, and they really pulled the contamination down.

MS. CARPENTER: Any other questions? For anybody who did not want to ask a question in this type of forum tonight, again, there are alternative ways of providing us with your comments. The public comment period does end September 20. So if you can get us your comments, we would greatly appreciate it.

And I would like to thank all of you for coming out tonight, and we appreciate your input. And we will be here for another few minutes, for a little bit, in case anybody has questions. Please feel free to come up and ask us. Thank you all for coming.

(Time noted: 8:45 p.m.)

C E R T I F I C A T E

STATE OF NEW YORK)
) ss.:
COUNTY OF NEW YORK)

I, JEFFREY BENZ, a Certified Realtime Reporter and Notary Public within the State of New York, do hereby certify that the foregoing transcription, taken at the time and place aforesaid, is a true and correct transcription of my shorthand notes.

IN WITNESS WHEREOF, I have hereunto set my hand this 15th day of September, 2007.

Jeffrey Benz

JEFFREY BENZ, CRR, RMR

500192

RESPONSIVENESS SUMMARY

APPENDIX V-e

LETTERS RECEIVED DURING THE COMMENT PERIOD

September 18, 2007

100 Hilton Avenue E403
Garden City, NY 11530

Ms. Caroline Kwan
Remedial Project Manager
NY Remediation Section
US Environmental Protection Agency
290 Broadway 20th Floor
New York, New York 10007-1866

Dear Ms. Kwan,

I attended the meeting at the Garden City Village Hall on Tuesday, September 11th, but had to leave after your excellent presentation and before the comment period.

However, any type of contamination to our ground water is very serious and not only impacts the health of many people but also endangers our precious water supply.

Since we, the residents of Garden City, did not cause this serious problem, we implore the EPA to clean this mess up for us. The owners of this property that is causing the contamination from the US Navy to the present owners should be held responsible. However, this should not stop immediate funding from the EPA to help your taxpayers in serious need.

Thank you for your kind attention to this matter.

Sincerely,

Rochelle Dowling

Rochelle Dowling