Old Roosevelt Field Contaminated Groundwater Area Superfund Site Operable Unit 2 Nassau County, New York

February 2018

EPA ANNOUNCES PROPOSED PLAN FOR REMEDY FOR OPERABLE UNIT TWO AT THE OLD ROOSEVELT FIELD CONTAMINATED GROUNDWATER AREA SITE

This Proposed Plan describes the remedial alternatives considered to address the groundwater contamination for Operable Unit Two (OU2) at the Old Roosevelt Field Contaminated Groundwater Area Superfund Site (Site), identifies the preferred remedial alternative, and provides the rationale for this preference.

This Proposed Plan was developed by the United States (U.S.) Environmental Protection Agency (EPA), the lead agency for the Site, in consultation with the New York State Department of Environmental Conservation (NYSDEC). EPA is issuing this Proposed Plan as part of its public participation responsibilities in accordance with Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. §117(a) (CERCLA) (also known as Superfund), 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 for OU2 at the Site and the remedial alternatives summarized in this Proposed Plan are described in EPA's Remedial Investigation (RI) Report, dated February 2018; EPA's Feasibility Study (FS) Report, dated February 2018; as well as other documents that are contained in the Administrative Record for this action. EPA encourages the public to review these reports to gain a more comprehensive understanding of the Site and the Superfund activities that have been conducted.

The purpose of this Proposed Plan is 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 remedy. Based on EPA's investigation, EPA has identified an additional area of groundwater contamination in the eastern portion of the former Roosevelt Field airfield[1]. This area of the Site is referred to herein as OU2. The preferred remedy for OU2 consists of extraction and on-Site treatment of additional contaminated groundwater, long-term monitoring, and institutional controls. The treated groundwater effluent would be discharged to a recharge basin or re-injected to the aquifer.

MARK YOUR CALENDAR

PUBLIC COMMENT PERIOD:
February 23, 2018 – March 26, 2018
EPA will accept written comments on the Proposed Plan during the public comment period.

PUBLIC MEETING: March 7, 2018 at 7:00 pm
EPA will hold a public meeting to explain the Proposed Plan and all of the alternatives presented in the Feasibility Study. Oral and written comments will also be accepted at the meeting. The meeting will be held at the Village of Garden City Village Hall, 351 Stewart Avenue, Garden City, New York.

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, this Proposed Plan is available to the public for a public comment period that begins on February 23, 2018 and concludes on March 26, 2018.

Changes to the preferred remedial alternative, or a change from the preferred remedial alternative to another remedial alternative 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 EPA's FS Report because EPA may select a remedy other than the preferred alternative in this Proposed Plan.

A public meeting will be held during the public comment period at the Village of Garden City Village Hall, Garden

[1] The area of the former Roosevelt Field airfield that is the subject of this Proposed Plan, includes an area east of Clinton Road, south of Old Country Road, and extends beyond the Meadowbrook Parkway to the east. This area currently includes the Roosevelt Field Mall, office building complexes, and other small shopping centers.

City on March 7, 2018 at 7 pm to present the conclusions of the RI/FS, to elaborate further on the reasons for recommending the preferred alternative, and to receive public comments.

Comments received at the public meeting, as well as written comments received during the public comment period, will be documented in the Responsiveness Summary section of a Record of Decision (ROD), the document that formalizes the selection of the remedy.

Written comments on the Proposed Plan should be addressed to:

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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
(516) 374-1967
www.gardencitypl.org
Hours of operation:
Mon-Thurs 9:30 am – 9:00 pm
Fri-Sat 9:30 am – 5:00 pm, Sun 1:00 pm – 5 pm

Hempstead Public Library
115 Nichols Court
Hempstead, New York 11550
(516) 481-6990
www.nassaulibrary.org/hempstd/
Hours of operation:
Mon-Thurs 10 am – 9 pm
Fri 10:00 am – 5:00 pm, Sat 9:00 am-5:00 pm

USEPA – Region II
Superfund Records Center
290 Broadway, 18th Floor
New York, New York 10007-1866
(212) 637-4308
Hours: Monday – Friday: 9 am to 5 pm

EPA's website for the Old Roosevelt Contaminated Groundwater Area Site:
www.epa.gov/superfund/roosevelt-field-groundwater

SCOPE AND ROLE OF ACTION

EPA is addressing the Site in discrete phases, or operable units (OUs). An operable unit represents a portion of the site remedy that for technical or administrative purposes can be addressed separately to eliminate or mitigate a release, threat of release or exposure pathway resulting from site contamination.

EPA has designated two OUs for the Site. OU1 addressed groundwater contamination predominantly in the western portion of the Site, while OU2, the subject of this Proposed Plan, is the final planned phase of response activities at the Site, and addresses that portion of the contaminated groundwater that is in the eastern portion of the Site.

A remedy for OU1 was selected in 2007, and consisted of extraction of contaminated groundwater, ex-situ treatment, discharge of the treated groundwater to a nearby recharge basin, and institutional controls. The primary objectives of this action are to remediate the additional groundwater contamination, minimize the migration of the contaminants in groundwater, and minimize any potential future health impacts. This action, in conjunction with the OU1 remedy, will restore the aquifer to its most beneficial use (a source of drinking water).

SITE BACKGROUND

Site Description

The Site includes an area of groundwater contamination in the Village of Garden City, in central Nassau County, New York. The area of groundwater contamination is associated with the former Roosevelt Field airfield which includes an area east of Clinton Road, south of Old Country Road, and extends beyond the Meadowbrook Parkway to the east. A Site location map is provided as Figure 1.

The former Roosevelt Field airfield currently includes a large retail shopping mall and other shopping centers. Office building complexes (including Garden City Plaza) are situated on the western perimeter of the shopping mall and the Meadowbrook Parkway is located on the eastern perimeter of the shopping mall. A thin strip of open space along Clinton Road (known as Hazelhurst Park) serves as designated parkland and a buffer between a residential community and the mall complex. Two recharge basins, the Pembrook Basin and Nassau County Storm Water Basin number 124, are located directly east and south, respectively, of the mall complex. Two municipal supply well fields are located south (downgradient) of the former Roosevelt Field airfield hangers. The Village of Garden City public supply wells (designated as Wells 10 and 11) are located just south of the former hanger area along Clinton Road. The Village of Hempstead Wellfield is located approximately 1 mile south of the Village of Garden City Wells 10 and 11.

Site History

Roosevelt Field was used for aviation activities from approximately 1911 to 1951.

Prior to World War I, the U.S. military used the airfield as a training center for Army and Navy officers and military pilots. After World War I, the U.S. Air Service maintained control of the airfield but authorized aviation-related companies to operate from Roosevelt Field. On July 1, 1920, the U.S. Government sold the buildings and relinquished control of the air field for commercial aviation uses.

During World War II, Roosevelt Field was again used by the Army and the Navy. The Army used the field to train personnel on airplane and engine mechanics. As of March 1942, Roosevelt Field accommodated six steel/concrete hangars, 14 wooden hangars, and several other buildings 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 under the Lend/Lease Program. The U.S. Navy was responsible for aircraft repair and maintenance, equipment installation, preparation and flight delivery of aircrafts, and metalwork required for the installation of British modifications. The facility also performed salvage work on crashed British Royal Navy planes.

The U.S. Navy vacated all but six hangars shortly after the war ended. Roosevelt Field resumed operations as a commercial airport from August 1946 until its closure in May 1951. In 1952, the Village of Garden City installed two public supply wells (Wells 10 and 11) just south of the former hangar area along Clinton Road. These supply wells were put into service in 1953. Over the subsequent years, several other private supply and cooling water wells were installed and operated on the former Roosevelt Field airfield. The Roosevelt Field Mall was constructed and opened in 1957.

The former Avis headquarters property, located at 900 Old Country Road, (south side of Old Country Road west of Zeckendorf Boulevard) is in the northeastern portion of the former Roosevelt Field airfield. Avis leased the property from 1980 until 2001. Prior to that period, the property was used for various defense and civilian related manufacturing. Previous investigations conducted at this property under NYSDEC oversight revealed the presence of soil and groundwater contamination. As a result, this property was addressed under NYSDEC's Brownfield program. This Proposed Plan assumes there is no ongoing contamination from the former Avis property. If, during implementation of the EPA remedy, EPA determines that the property is a continuing source, then EPA may elect to evaluate additional options pursuant to CERCLA to ensure the effectiveness of any remedy selected by EPA for this Site.

In the late 1970s and early 1980s, investigations conducted by Nassau County discovered tetrachloroethene (PCE) and trichloroethene (TCE) contamination in Wells 10 and 11, and concentrations increased significantly until 1987, when an air-stripping treatment system was installed to treat the water from the supply wells. Elevated levels of contamination were also found in cooling water wells used in building air conditioning systems at the Site.

The Site was listed on the National Priorities List (NPL) on May 11, 2000. EPA conducted an RI/FS at the Site from 2001 to 2007. A number of Site-related contaminants were identified in groundwater on the western portion of the former Roosevelt Field airfield during the RI, including PCE, TCE, *cis*-1,2-dichloroethene (*cis*-1,2-DCE), 1,1-DCE, and carbon tetrachloride. It is likely that chlorinated solvents were used at Roosevelt Field during and after World War II. Chlorinated solvents such as PCE and 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 the 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 Field (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 degreaser agent.

In 2007, EPA issued a ROD to address the identified groundwater contamination (OU1) which called for the extraction of contaminated groundwater, ex-situ treatment, discharge of the treated groundwater to a nearby recharge basin, and institutional controls.

EPA completed construction of the treatment plant and three groundwater extraction wells (EW-1S, EW-1I, and EW-1D) as part of the remedy selected in 2007 and operation of the treatment system started in 2012. Subsequent to startup of the treatment system, elevated concentrations of Site-related contaminants were detected in a groundwater monitoring well located to the south of the former Roosevelt Field airfield, and outside the influence, of the treatment system. To address the contamination, three additional groundwater extraction wells (SEW-1S, SEW-1I, and SEW-1D) were installed immediately south of Stewart Avenue and piped to the same groundwater treatment plant. These extraction wells are referred to as the southern groundwater extraction wells. To accommodate the additional volume of groundwater requiring treatment, modifications to components of the treatment system within the plant were made in 2015.

As part of the long-term monitoring program for the 2007 remedy, groundwater samples are collected from a network of wells to track and monitor changes in groundwater contamination. In addition, a capture zone analysis was conducted for the groundwater extraction well network to verify remedy effectiveness and to monitor remedial progress. This analysis revealed elevated concentration of Site-related contamination in a cluster of monitoring wells installed in the eastern area of the Site. This contamination, which is adjacent to the area addressed by OU1, resulted in the need for further investigation of groundwater contamination in the eastern area of the former Roosevelt Field airfield, identified as OU2.

The results of the OU2 RI are discussed below.

Site Hydrogeology

No naturally occurring surface water bodies are present in the vicinity of the Site. Most of the Site area is paved or occupied by buildings. Runoff is routed into stormwater collection systems and is generally discharged directly to dry wells or recharge/retention basins. There are three man-made water table recharge basins located at or near the Site, including the privately owned Pembrook recharge basin and a Nassau County recharge basin. In approximately 1960, the Pembrook Basin began receiving untreated cooling water discharge from air conditioning systems of the mall building and the office buildings west of the mall. Seven cooling water wells pumped contaminated groundwater from the Magothy Aquifer for use in the air conditioning systems. The untreated cooling water was later discharged to a drain field west of 100 Garden City Plaza and 200 Garden City Plaza until approximately 1985. Currently, the Pembrook recharge basin receives surface water runoff from an area near Garden City Plaza during storm events. The Nassau County recharge basin receives stormwater runoff from the municipal stormwater collection system and treated groundwater from the OU1 treatment plant, as described above.

The principal hydrogeologic units underlying the Site are the Upper Pleistocene Deposits, which form the Upper Glacial Aquifer (UGA) hydrogeologic unit, and the underlying Magothy Formation, which forms the Magothy Aquifer hydrogeologic unit. Beneath these two units are the clay member and the Lloyd Sand member of the Raritan Formation.

The UGA is estimated to be 80 to 100 feet thick and consists predominantly of coarse-grained sands and gravels which are fairly uniform in grain size distribution and lithology. The depth of the water table ranges from approximately 17 to 35 feet below ground surface (bgs).

At the majority of the Site, the top of the Magothy Formation is at an average depth range of 80 to 100 feet bgs and is approximately 525 feet thick. Gravel-rich zones were encountered at the boreholes located south of the Roosevelt Field Mall.

Groundwater flow is downward and horizontal groundwater flow in the UGA and the Magothy is generally to the south/southwest. Groundwater flow in the immediate vicinity of the Site is influenced by multiple pumping wells in the area including supply wells for the Villages of Garden City and Uniondale. The Village of Hempstead Wellfield to the south has the greatest impact on groundwater flow.

RESULTS OF THE REMEDIAL INVESTIGATION

The RI Report, dated February 2018, provides the analytical results of sampling conducted from 2014 to 2016 to delineate the extent of groundwater contamination in the eastern portion of the Site. The investigation, conducted in two phases, included drilling vertical profile boreholes, installing monitoring well clusters, and sampling groundwater. As part of the OU2 RI, a total of six vertical profile boreholes were drilled. The purpose of drilling the vertical profile boreholes was to aid in the selection of the depths and screen intervals for permanent monitoring well installation. Based on the data collected during the installation of these vertical profile boreholes, 12 clustered monitoring wells were subsequently installed. Each monitoring well cluster is comprised of three depth zones, the shallow zone (<250 feet bgs), the intermediate zone (250-400 feet bgs), and the deep zone (>400 feet bgs).

Site-related contaminants identified for OU2 include PCE, TCE, *cis*-1,2-DCE, 1,1-DCE, and vinyl chloride. Based on analytical data, PCE and TCE were the most persistent contaminants and were detected at the highest concentrations; therefore, PCE and TCE will be the focus of the discussions in this section.

As mentioned previously, EPA completed an RI for OU1 in 2007. As part of the OU1 RI, EPA collected soil gas, soil, and groundwater samples for analysis. The results are contained in the Administrative Record for OU1.

Groundwater Sampling Results

Shallow Zone (<250 feet bgs)

Groundwater samples collected from the shallow zone revealed PCE and TCE at concentrations up to 210 micrograms per liter (μg/L) and 41 μg/L, respectively. The PCE and TCE contamination have a similar shape and trajectory in the shallow zone and move downward as they travel south/southwest with groundwater flow.

The contamination in the shallow zone extends approximately 3,100 feet to the south/southwest. The widest area of the contamination is estimated to be approximately 1,000 feet wide near Ring Road South.

Intermediate Zone (250-400 feet bgs)

The highest concentrations of PCE and TCE were found within the intermediate zone. Groundwater samples collected from the intermediate zone revealed PCE and TCE at concentrations up to 600 μg/L and 120 μg/L, respectively. The PCE and TCE contamination have a similar shape and trajectory and migrate downward as they travel south/southwest with groundwater flow.

The contamination in the intermediate zone extends approximately 7,100 feet to the south/southwest. The widest area of the contamination is estimated to be approximately 1,900 feet wide.

Deep Zone (>400 feet bgs)

The lowest total concentrations of PCE and TCE were found within the deep zone. Groundwater samples collected from the deep zone revealed PCE and TCE at concentrations up to 15 μg/L and 7 μg/L, respectively.

The contamination in the deep zone extends approximately 1,900 feet to the south/southwest. The widest area of the contamination is estimated to be approximately 3,100 feet wide.

Principal Threat Wastes

Principal threat wastes are considered source materials, i.e., materials that include or contain hazardous substances, pollutants or contaminants that act as a reservoir for migration of contamination to groundwater, surface water, or as a source for direct exposure. Contaminated groundwater is generally not considered to be source material; however, nonaqueous phase liquid (NAPL) in groundwater may be viewed as potential source material. Analytical results from the OU1 and OU2 investigations did not reveal concentrations of contaminants in groundwater indicative of the presence of NAPL.

Vapor Intrusion

VOC vapors released from contaminated groundwater and/or soil have the potential to move through the soil and seep through cracks in basements, foundations, sewer lines, and other openings. As part of OU1, EPA conducted a vapor intrusion evaluation at the Site. In April and June 2007, EPA collected two rounds of vapor samples. The first round of sampling in April included sub-slab samples collected underneath the concrete slabs at four commercial buildings on the west side of the Roosevelt Field Mall.

Based on the first round of results, in June 2007 EPA collected a second round of sub-slab and indoor air samples at six commercial buildings at the Site. Also in June 2007, EPA collected sub-slab samples at seven homes located west of Clinton Road adjacent to the Roosevelt Field Mall.

The OU1 ROD called for additional evaluation of residential and commercial buildings to determine the extent of the vapor intrusion impacts. To address this component of the OU1 ROD, in December 2007, EPA collected sub-slab and indoor air samples at four commercial properties. At two additional commercial properties, only indoor air samples were collected. In addition, sub-slab and indoor air samples were collected at seven residential locations; five previously sampled and two new locations, with a collocated sub-slab sample collected in one of these two residential properties. Based upon EPA and New York State Department of Health (NYSDOH) guidance in existence at that time, none of the indoor air samples in any of the structures were above levels of concern. In 2017, NYSDOH issued revised vapor intrusion guidance for both TCE and PCE, however this did not change the determination that soil vapor intrusion has not resulted in impacts to indoor air.

Human Health Risk Assessment

EPA conducted a four-step baseline human health risk assessment (HHRA) as part of OU2 to assess Site-related cancer risks and non-cancer health hazards in the absence of any remedial action. The four-step process is comprised of: Hazard Identification, Exposure Assessment, Toxicity Assessment, and Risk Characterization (refer to the text box on the next page “What is Risk and How is it Calculated”).

WHAT IS RISK AND HOW IS IT CALCULATED?

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 releases under current- and anticipated 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 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 that 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 non-cancer 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 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 a site and are referred to as chemicals of concern, or COCs, in the final remedial decision document or Record of Decision.

The HHRA began with selecting chemicals of potential concern (COPCs) in groundwater that could potentially cause adverse health effects in exposed populations. The baseline risk assessment evaluated health effects that could result from exposure to contaminated groundwater through the ingestion of, dermal contact with, and inhalation of volatile contaminants while showering/bathing. Although residents and businesses in the area are served by municipal water, the aquifer at the Site is classified as Class GA (6 NYCRR § 701.18), meaning that it is designated as a potable drinking water supply that could be used for drinking in the future. Therefore, potential future exposure to groundwater was evaluated. Based on the current zoning and anticipated future use, the risk assessment focused on future Site workers and residents. In the unlikely event that untreated Site groundwater is used as drinking water, exposure to groundwater contaminated with TCE and PCE from ingestion, dermal contact, and inhalation would be associated with combined excess lifetime cancer risks that exceed EPA's target risk range of 10^{-4} to 10^{-6} and noncancer health hazard indices above the threshold of 1 as summarized in the table below. These cancer risks and noncancer health hazards indicate that there is significant potential risk from direct exposure to groundwater for future residents and Site workers. A more detailed discussion of the exposure pathways and estimates of risk can be found in the HHRA for OU2 in the Administrative Record of this action.

Future receptor	Cancer Risk*	Noncancer Hazard*
Resident (Adult/Child)	4E-04	65
Site Worker (Adult)	1E-04	7

*Cancer risks and noncancer hazards are the sum of TCE and PCE.

Ecological Risk Assessment

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 contaminated groundwater discharges to surface water, exposure pathways are not complete and ecological receptors are not exposed to contamination.

Conclusion

The results of the HHRA indicate that the contaminated groundwater presents an unacceptable exposure risk. Based on the results of the RI and the HHRA, EPA has determined that the actual or threatened releases of hazardous substances from the Site, if not addressed by the preferred remedy or one of the other active measures considered, may present a threat to human health or welfare or the environment. It is EPA's judgment that the Preferred Alternative identified in this Proposed Plan is necessary to limit potential human health risks from exposure to hazardous substances in the future.

REMEDIAL ACTION OBJECTIVES

Remedial action objectives (RAOs) 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 RAOs have been established for contaminated groundwater for OU2:

- Prevent or minimize potential future human exposure to VOCs in groundwater through ingestion, dermal contact, and inhalation above levels that are protective of beneficial use (i.e. drinking water use);
- Restore the impacted aquifer to its most beneficial use as a source of drinking water; and,
- Minimize the potential for further migration of groundwater containing VOC concentrations above levels that are protective of beneficial use (i.e. drinking water use).

The preliminary remediation goals (PRGs) for groundwater are identified in Table 1.

Table 1: PRGs for Groundwater

Chemicals of Potential Concern (COPCs)	NYS Groundwater Quality Standards* (µg/L)	NYS Drinking Water Quality Standards **(µg/L)	National Primary Drinking Water Standards*** (µg/L)	**PRG** (µg/L)
cis-1,2-DCE	5	5	70	**5**
1,1-DCE	5	5	7	**5**
PCE	5	5	5	**5**
TCE	5	5	5	**5**
Vinyl Chloride	2	2	7	**2**

* 6 NYCRR § 703
** 6 NYCRR Part 5
*** 40 CFR 141

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) of CERCLA also establishes a preference for remedial actions that employ, as a principal element, treatment to reduce permanently and significantly 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 that 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 presented in this Proposed Plan for addressing the OU2 groundwater contamination are provided in the FS Report, dated February 2018.

The construction time for each alternative reflects only the actual time required to construct or implement the action and does not include the time required to design the remedy, negotiate the performance of the remedy with any potentially responsible parties, and procure the contracts for design and construction.

Common Elements

All of the alternatives, with the exception of the no action alternative, include common components.

Alternatives 2 through 4 include long-term monitoring to ensure that groundwater quality improves following implementation of these alternatives until clean up levels are achieved.

Alternatives 2 through 4 also include institutional controls that will rely on current groundwater use restrictions in the form of state and local laws. Specifically, Article IV of the Nassau County Public Health Ordinance prohibits the use of private wells where public water systems are available. The Site is serviced by public water systems. In addition, New York State Environmental Conservation Law Section 15-1527 prohibits the installation and use of public drinking water wells in Nassau County without a State permit. To ensure the remedy remains protective, the above State and County well restrictions will be relied upon until RAO's are achieved.

A Site management plan (SMP) would be developed to provide for the proper operation and maintenance (O & M) of the Site remedy post-construction, and would include long-term groundwater monitoring, institutional controls, periodic reviews, and certifications as applicable.

Additionally, because it will take longer than five years to achieve cleanup levels under any of the alternatives, CERCLA requires that a review of conditions at the site be conducted no less often than once every five years until such time as cleanup levels are achieved. Alternatives 2 through 4 will be subject to these five year reviews. These reviews are not considered part of the remedy; they are an independent requirement required by the Superfund law.

Alternative 1: No Action

Capital Cost:	$0
O&M Costs:	$0
Present-Worth Cost:	$0
Construction Time:	Not Applicable

The NCP requires that a "No Action" alternative be developed and considered as a baseline for comparing other remedial alternatives. Under this alternative, there would be no remedial action conducted at the Site. This alternative does not include any monitoring or institutional controls.

Because this alternative would result in contaminants remaining at the Site that are above levels that would otherwise allow for unrestricted use and unlimited exposure, CERCLA requires that the Site be reviewed at least once every five years. If justified by the review, additional response actions may be implemented.

Alternative 2: Groundwater Extraction and Ex-Situ Treatment (Pump and Treat)

Capital Cost:	$5,080,000
Annual O&M Costs:	$650,000
Present-Worth Cost:	$13,140,000
Construction Time:	*1 to 2* years

This remedial alternative consists of the extraction of groundwater via pumping wells and treatment prior to discharge. Groundwater is pumped and treated to remove contaminant mass from OU2 areas of the aquifer with elevated concentrations of VOCs.

For the conceptual design, it is estimated that one extraction well would be installed in the intermediate (250-400 feet bgs) interval, downgradient of the highest contaminant concentrations identified in the OU2 RI. The extraction well would target active treatment of groundwater contaminated with levels of total VOCs in excess of 100 µg/L.

Extracted groundwater with VOC contamination is typically treated with either liquid phase granular activated carbon (GAC) or air stripping, or both. During the remedial design the treatment processes necessary to treat Site-related contaminants would be evaluated further. Extracted groundwater would be pumped from the extraction well to a new treatment plant constructed near Grove Street with a capacity of approximately 300 gallons per minute (gpm). Treated groundwater would then be discharged to a nearby recharge basin or reinjected to groundwater.

For cost-estimating and planning purposes, an estimated remediation time frame of 30 years is used for developing costs associated with O&M activities. It is assumed that active remediation would be employed in the targeted treatment areas until the MCL for each of the COPCs is attained within the targeted treatment area. Natural processes, predominately dilution and dispersion, would be relied upon to achieve the maximum contaminant levels (MCLs) for areas not targeted for active remediation.

The conceptual design would be refined during the remedial design phase if this alternative is selected.

Alternative 3: In-Well Vapor Stripping

Capital Cost:	$5,260,000
Annual O&M Costs:	$678,000
Present-Worth Cost:	$13,670,000
Construction Time:	*1 to 2* years

This remedial alternative includes the installation of in-well vapor stripping systems in groundwater to provide contaminant mass removal and containment at OU2.

In-well stripping, also known as *in-situ* vapor or *in-situ* air stripping, is a technology for the *in-situ* remediation of groundwater contaminated by VOCs. In-well vapor stripping uses the principles of phase separation to transfer VOCs from the liquid to gas phase by aerating the contaminated water in the wellhead. Aeration can be accomplished by either injecting air into the water table or by using an air stripper mounted at the well head. Typically, extracted vapors are treated (if necessary) above grade and discharged to the atmosphere. Vapor treatment, if required, generally consists of vapor-phase granular activated carbon.

The in-well vapor stripping is a closed system where the contaminated groundwater is never exposed at the ground surface or the atmosphere. Typically impacted groundwater is pumped to the well head where it is treated and discharged or directly discharged back into the well. Once treated, the groundwater flows back into the aquifer through screens in the well that are typically located at the water table (unsaturated zone). In some in-well vapor stripping well configurations, the extraction and re-injection of groundwater from the aquifer induces a hydraulic circulation pattern that allows continuous cycling of groundwater through the treatment well. As groundwater circulates through the treatment system vapor is extracted and contaminant concentrations are reduced.

In-well vapor stripping can be implemented in different system configurations. For the purposes of developing a conceptual design and cost estimate for comparison with other technologies in the OU2 FS, a line of wells were configured at various depths along the median of Garden Street between Tremont Street and Grove Street, with a well spacing of approximately 400 feet to target groundwater contaminated with levels of total VOCs greater than 100 μg/L.

For cost-estimating and planning purposes, an estimated remediation time frame of 30 years is used for developing costs associated with O&M activities. It is assumed that active remediation would be employed in the targeted treatment areas until the MCL for each of the COPCs is attained within the targeted treatment area. Natural processes would be relied upon to achieve the MCLs for areas not targeted for active remediation.

The conceptual design would require further evaluation during the remedial design phase if this alternative is selected.

Alternative 4: In-Situ Adsorption

Capital Cost:	$10,700,000
Annual O&M Costs:	$232,800
Present-Worth Cost:	$14,560,000
Construction Time:	*1 to 3* years

This remedial alternative utilizes micron-size activated carbon injected through a series of injection wells to form permeable treatment barriers. The use of micron-size or colloidal activated carbon for *in-situ* adsorption is an innovative technology.

Under the conceptual design, micron-size activated carbon would be injected through a series of approximately 47 injection wells to intercept the contaminant plume along the open space south of Commercial Avenue and along the median of Garden Street between Tremont Street and Grove Street. Injection wells would be spaced approximately 35 feet apart and would target groundwater contaminated with levels of total VOCs greater than 100 μg/L. The injected activated carbon would form two permeable treatment barriers. As VOC-contaminated groundwater flows through the treatment barrier it would be adsorbed onto the activated carbon, which would minimize the migration of the OU2 contaminated groundwater. Other reagents, such as iron-based chemical reductant or slow release organic carbon could be injected with the micron-size activated carbon; promoting *in-situ* chemical or biological reaction within the treatment zone to regenerate the activated carbon.

For cost-estimating and planning purposes, an estimated remediation time frame of 30 years is used for developing costs associated with O&M activities. It is assumed that active remediation would be employed in the targeted treatment areas until the MCL for each of the COPCs is attained within the targeted treatment area. Natural processes would be relied upon to achieve the MCLs for areas not targeted for active remediation.

During the remedial design further evaluations would be conducted to determine the long-term adsorption capacity of the activated carbon.

EVALUATION OF ALTERNATIVES

In evaluating the remedial alternatives, each alternative is assessed against nine evaluation criteria set forth in the NCP, namely overall protection of human health and the environment; compliance with ARARs; long-term effectiveness and permanence; reduction of toxicity; mobility, or volume through treatment; short-term effectiveness; implementability; cost; and state and community acceptance. Refer to the text box on the next page for a more detailed description of these evaluation criteria.

This section of the Proposed Plan evaluates the relative performance of each alternative against the nine criteria, noting how each compares to the other options under consideration. A detailed analysis of alternatives can be found in EPA's FS Report, dated February 2018.

Overall Protection of Human Health and the Environment

Alternative 1 (No Action) would not meet the RAOs and would not be protective of human health and the environment since no action would be taken. Alternatives 2 through 4 are the active remedies that address groundwater contamination and would, in conjunction with the OU1 remedy, restore groundwater quality over the long-term. Alternatives 2 through 4, would also rely on certain natural processes to achieve the cleanup levels for areas not targeted for active remediation.

Protectiveness under Alternatives 2 through 4 requires a combination of actively reducing contaminant concentrations in groundwater and limiting exposure to residual contaminants through existing institutional controls for groundwater use restrictions until RAOs are met. Protectiveness under Alternatives 2 through 4 also relies upon the continued effective wellhead treatment at the supply wells impacted by the contamination to ensure that the water distributed by these wells continues to meet state and federal drinking water standards.

Institutional controls are anticipated to include existing governmental controls in the form of state and county well use laws prohibiting the use of groundwater for drinking purposes.

Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

EPA and NYSDOH have promulgated MCLs (40 CFR Part 141 and 10 NYCRR § 5-1.51, respectively), which are enforceable standards for various drinking water contaminants (and are chemical-specific ARARs). If any state standard is more stringent than the federal standard, then compliance with the more stringent ARAR is required.

The aquifer at the Site is classified as Class GA (6 NYCRR § 701.18), meaning that it is designated as a potable drinking water supply. As groundwater within OU2 is a source of drinking water, achieving MCLs in the groundwater is an ARAR.

Alternative 1 would not comply with ARARs. Action-specific ARARs do not apply to this alternative since no remedial action would be conducted.

Alternative 2 would achieve chemical-specific ARARs through extraction and *ex-situ* treatment of contaminated groundwater. Alternative 3 could achieve chemical-specific ARARs through in-well stripping of contaminants but would need to be demonstrated as successful in a pilot study. Alternative 4 would achieve chemical-specific ARARs through *in-situ* adsorption and potentially *in-situ* degradation processes; however, its long-term effectiveness needs to be verified in the field since it utilizes an innovative technology.

For Alternatives 2 to 4, location- and action-specific ARARs would be met through compliance with local construction codes, health and safety requirements, off-gas treatment requirements, if applicable, and water discharge criteria when applicable.

It is expected that the RAOs would be achieved in a time frame comparable to OU1 (35 years as identified in the OU1 ROD). Active remediation under Alternatives 2 through 4 would be employed in the targeted treatment areas until the MCL for each of the COPCs is attained within the targeted treatment area.

EVALUATION CRITERIA FOR SUPERFUND REMEDIAL ALTERNATIVES

Overall Protectiveness of Human Health and the Environment evaluates whether and how an alternative eliminates, reduces, or controls threats to public health and the environment through institutional controls, engineering controls, or treatment.

Compliance with Applicable or Relevant and Appropriate Requirements (ARARs) evaluates whether the alternative meets federal and state environmental statutes, regulations, and other requirements that pertain to the Site, or whether a waiver is justified.

Long-term Effectiveness and Permanence considers the ability of an alternative to maintain protection of human health and the environment over time.

Reduction of Toxicity, Mobility, or Volume (TMV) of Contaminants through Treatment evaluates an alternative's use of treatment to reduce the harmful effects of principal contaminants, their ability to move in the environment, and the amount of contamination present.

Short-term Effectiveness considers the length of time needed to implement an alternative and the risks the alternative poses to workers, the community, and the environment during implementation.

Implementability considers the technical and administrative feasibility of implementing the alternative, including factors such as the relative availability of goods and services.

Cost includes estimated capital and annual operations and maintenance costs, as well as present worth cost. Present worth cost is the total cost of an alternative over time in terms of today's dollar value. Cost estimates are expected to be accurate within a range of +50 to -30 percent.

State/Support Agency Acceptance considers whether the State agrees with EPA's analyses and recommendations, as described in the RI/FS and Proposed Plan.

Community Acceptance considers whether the local community agrees with EPA's analyses and preferred alternative. Comments received on the Proposed Plan are an important indicator of community acceptance.

Long-Term Effectiveness and Permanence

Alternative 1 would not provide long-term effectiveness and permanence since groundwater contamination would not be addressed. Alternatives 2 through 3 are considered effective technologies for treatment and/or containment of contaminated groundwater, if designed and constructed properly.

In conjunction with OU1, Alternatives 2 through 4 rely on a combination of treatment and institutional controls to achieve long-term effectiveness and permanence.

Alternative 2 would be more reliable than either Alternatives 3 or 4 as there is uncertainty whether in-well vapor stripping and *in-situ* adsorption could effectively remove contamination in areas where the contamination is at depths greater than 250 feet. Alternative 2 has been proven to be an effective technology in reducing the concentrations of VOC contaminated groundwater in the area addressed as part of OU1 based on EPA's sampling results.

Alternative 3, in-well stripping, is expected to be effective and reliable in significantly removing the VOC contamination in groundwater. However, the effectiveness of applying this technology at depths greater than 250 feet has not been demonstrated. The effectiveness of this alternative is limited by the radius of influence (ROI) of the treatment system. The ROI will depend on the pumping capacity of each stripping well and hydrogeologic characteristics of the aquifer in the OU2 area. The effectiveness of this alternative could also be limited due to the possibility that creation of a circulation cell may not be possible because of the potential influence from pumping of nearby public supply wells. Therefore, additional measures would be needed to provide multiple passes through the OU2 treatment system. A pilot study would be conducted to evaluate the ROI, to determine the effectiveness of in-well stripping and to obtain Site-specific design parameters prior to full-scale implementation.

The use of micron-size or colloidal activated carbon (Alternative 4) is an innovative technology that has the potential to significantly reduce contaminant concentrations in the *in-situ* treatment zones but has only limited application in the field. A pilot study would be conducted to collect site-specific implementation parameters. The distribution of activated carbon in the subsurface and the long-term adsorption capacity would have to be verified in the field through groundwater sampling and monitoring. Its permanence would need to be monitored and verified over time.

Alternatives 2 through 4 would control risk to human health through the implementation of institutional controls until RAOs are achieved.

Reduction of Toxicity, Mobility, or Volume (TMV) Through Treatment

Alternative 1, No Action, does not address the contamination through treatment, so there would be no reduction in TMV and the alternative does not include long-term monitoring of groundwater conditions. Alternative 2 would provide the greatest reduction of toxicity, mobility, and volume of contaminants through treatment of contaminated groundwater. Alternatives 3 and 4 would also reduce the toxicity and volume of contaminants through treatment, however would provide less reduction of mobility through treatment.

Alternative 2 removes contaminated groundwater via extraction and treats the contamination via air stripping at a treatment plant and is anticipated to be the most reliable at reducing TMV because it is a proven technology. Alternative 3 uses a system to remove the contaminants from groundwater *in-situ*, and provides chemical treatment for the collected vapor-phase contamination and is anticipated to be the next most reliable at reducing TMV because its effectiveness must be demonstrated and verified in a pilot study. Alternative 4 uses *in-situ* carbon adsorption to remove the contaminants from groundwater. Alternative 4 would be the least reliable at reducing TMV because it is less proven than even Alternative 3, the long-term adsorption capacity of the activated carbon is unknown and would have to be verified by long-term groundwater monitoring.

Short-Term Effectiveness

Alternative 1 would not have short-term impacts since no action would be implemented.

Alternatives 2 through 4 may have short-term impacts to remediation workers, the public, and the environment during implementation. Remedy-related construction (e.g., trench excavation) under Alternatives 2 (estimated construction timeframe of 1-2 years) and 4 (estimated construction timeframe of 2-3 years) would require disruptions in traffic and street closure permits. In addition, Alternative 2 and Alternative 3 (estimated construction timeframe of 1-2 years) have aboveground treatment components and infrastructure that may create a minor noise nuisance and inconvenience for local residents during construction.

Exposure of workers, the surrounding community, and the local environment to contaminants during the implementation of Alternatives 2, 3, and 4 is minimal.

Drilling activities, including the installation of wells for monitoring, extraction, and treatment for Alternatives 2, 3, and 4 could produce contaminated liquids that present some risk to remediation workers at the Site. The potential for remediation workers to have direct contact with contaminants in groundwater could also occur when groundwater remediation systems are operating under Alternative 2. Alternative 2 could increase the risks of exposure through ingestion, inhalation, and dermal contact of contaminants by workers because contaminated groundwater would be extracted to the surface for treatment. However, occupational health and safety controls would be implemented to mitigate exposure risks.

Among the active alternatives, Alternative 2 would have the lowest short-term impact to the community. Alternative 3 would have more short-term impacts to the community than Alternative 2 since more wells would be installed and the in-well stripping system would require more space for the installation of multiple well vaults to hold necessary equipment, valves, and fittings. Operation of the in-well stripping system might generate noise that could be harder to mitigate. Alternative 4 would have the greatest short-term impacts to the local community during construction due to the significant number of injection wells (47) to be installed; requiring traffic control over a longer period of time compared to Alternatives 2 and 3.

For Alternatives 2, 3, and 4, implementation of a health and safety plan, traffic controls, noise control and managing the hours of construction operation could minimize the impacts to the community. Health and safety measures would also be implemented during operation and maintenance activities to protect Site workers.

Implementability

Alternative 1 is no action, and therefore would be the easiest of all the alternatives to implement. Alternatives 2 through 4 are all implementable, although each present different challenges.

Groundwater extraction and treatment is a well-established technology that has commercially available equipment and is implementable. Because of the densely populated area there are limited locations for placement of a treatment plant. The conceptual design considered Town-owned property for the construction of the treatment plant and a nearby County-owned recharge basin for the discharge of the treated water.

Of the three active remediation alternatives, Alternative 2 would be the easiest alternative to construct since this technology has been implemented under OU1 and would require less disruption in residential areas. Because of the densely populated area there are limited options for the placement of the in-well stripping well network. The conceptual design considered installation of the wells in the median along Garden Street and curbside right-of-ways in the surrounding area. The final configuration of the in-well vapor stripping well network would be determined during the design.

The large hydraulic influence from public supply wells present in the area could potentially impact the ability to establish the necessary groundwater circulation cell across the treatment zone to successfully implement this alternative. Furthermore, under Alternative 3, at the depth of the deepest contamination (400 feet bgs) effective operation of in-well stripping systems has not been previously documented. Additionally, under Alternative 3, the depth of the contamination (estimated to be between approximately 250 to 400 feet bgs) increases the design challenges of the in-well vapor system. There are practical limitations to the depth that the compressed air can be injected into the aquifer which would result in vapor stripping being conducted effectively.

Alternative 4 would be the most difficult to implement as the technology is the least proven and construction activities would result in the greatest disruption in residential areas since this alternative would require installation of a significant number of wells (47) and associated infrastructures within roadway right-of-ways.

Alternatives 2 through 4 would require routine groundwater quality, performance and administrative monitoring including five-year CERCLA reviews.

Cost

The estimated capital cost, O&M, and present worth cost are discussed in detail in the February 2018 OU2 FS Report. For cost estimating and planning purposes, a 30-year time frame and a discount rate of 7% was used for developing present worth costs under Alternatives 2, 3, and 4. The cost estimates are based on the available information. Alternative 1 (No Action) has no cost because no activities would be implemented. The highest present worth cost is Alternative 4 at $14.56 million. Of the three alternatives with active remedial components, Alternative 2 is the least expensive at $13.14 million. The estimated capital, O&M, and present-worth costs for each of the alternatives are as follows:

Alternative	Capital Cost ($)	Annual O&M Cost ($)	Present Worth Cost ($)
1 No Action	0	0	0
2 Pump & Treat	5,080,000	650,000	13,140,000
3 In-well Vapor Stripping	5,260,000	678,000	13,670,000
4 *In-situ* Adsorption	10,700,000	232,800	14,560,000

State/Support Agency Acceptance

NYSDEC has consulted with NYSDOH and concurs with the preferred alternative.

Community Acceptance

Community acceptance of the preferred alternative will be evaluated after the public comment period ends and all comments are reviewed. Comments received during the public comment period will be addressed in the Responsiveness Summary section of the ROD for OU2. The ROD is the document that will formalize the selection of the OU2 remedy for the Site.

PREFERRED REMEDY

Based upon an evaluation of the remedial alternatives, EPA, with the concurrence of NYSDEC, proposes Alternative 2 (Groundwater Extraction and Ex-situ Treatment (Pump and Treat)) as the preferred remedial alternative for OU2. Alternative 2 has the following key components:

- Extraction of groundwater via pumping and ex-situ treatment of extracted groundwater prior to discharge to a recharge basin or re-injection to the aquifer;
- Implementation of institutional controls; and
- Long-term groundwater monitoring.

Active remediation elements would be designed to achieve the RAOs in conjunction with OU1, by establishing containment and effectuate removal of contaminant mass where concentrations of total VOCs are greater than 100 µg/L. The extraction and treatment system would operate until remediation goals are attained in OU2. Natural processes would be relied upon to achieve the MCLs for areas not targeted for active remediation. Figure 2 provides the conceptual locations of the treatment plant, extraction wells, and discharge of the treated groundwater. The exact number and placement of extraction wells, the treatment processes, as well as the location of the treatment plant and discharge of the treated groundwater would be determined during the remedial design.

A long-term groundwater monitoring program would be implemented in conjunction with OU1, to track and monitor changes in the groundwater contamination to ensure the RAOs are attained. The results from the long-term monitoring program would be used to evaluate the migration and changes in VOC contaminants over time.

Institutional controls to ensure that the remedy remains protective until RAOs are achieved for protection of human health over the long term. Institutional controls are anticipated to include existing governmental controls in the form of state and county well use laws prohibiting the use of groundwater for drinking purposes.

A SMP would also be developed and would provide for the proper management of the Site remedy for OU2 post-construction, and would include long-term groundwater monitoring, institutional controls, periodic reviews, and certifications, as applicable.

The environmental benefits of the preferred alternative may be enhanced by giving consideration, during the design, to technologies and practices that are sustainable in accordance with EPA Region 2's Clean and Green Energy Policy.[2] This would include consideration of green remediation technologies and practices.

The total estimated, present-worth cost for the selected remedy is $13,140,000. Further detail of the cost is presented in Appendix A of the FS Report. This is an engineering cost estimate that is expected to be within the range of plus 50 percent to minus 30 percent of the actual project cost.

While this alternative would ultimately result in reduction of contaminant levels in groundwater such that levels would allow for unlimited use and unrestricted exposure, it is anticipated that it would take longer than five years to achieve these levels. As a result, in accordance with CERCLA, the Site remedy is to be reviewed at least once every five years until remediation goals are achieved and unrestricted use is achieved.

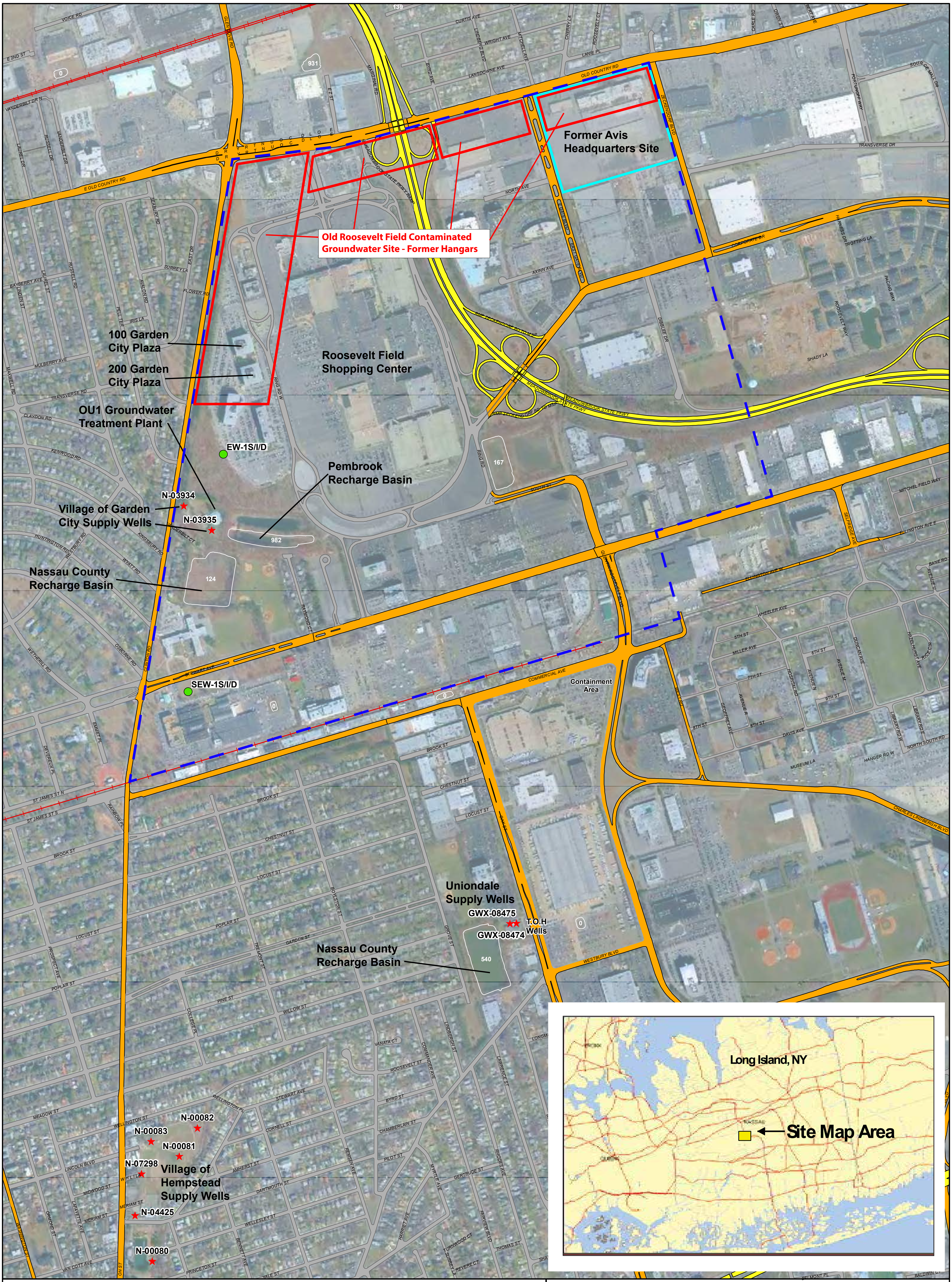
[2] See http://www.epa.gov/greenercleanups/epa-region-2-clean-and-green-policy and http://www.dec.ny.gov/docs/remediation_hudson_pdf/der31.pdf.

Basis for the Remedy Preference

Alternative 2, extraction and treatment, is a proven technology which has demonstrated effectiveness at reducing contaminant mass and providing containment to achieve cleanup standards for VOC-contaminated groundwater. While Alternative 3, in-well vapor stripping, is also a proven technology to actively remediate VOC-contaminated groundwater, the depths of the groundwater contamination targeted for remediation increase the design challenges of any in-well vapor stripping system. Alternative 4, *in-situ* adsorption, is an innovative technology that would require greater testing and evaluation to determine the long-term adsorption capacity 0f the activated carbon to treat the VOC-contaminated groundwater.

Although the densely populated residential area poses some logistical challenges to the implementation of each active remedial alternative, EPA believes that Alternative 2, which would require access to install extraction wells, construct a treatment plant, and discharge the treated water to a recharge basin, would be the least disruptive to local residents.

Based upon the information currently available, EPA believes the preferred alternative meets the threshold criteria and provides the best balance of tradeoffs among the other alternatives with respect to the balancing criteria. The preferred alternative satisfies the following statutory requirements of Section 121(b) of CERCLA: 1) the proposed remedy is protective of human health and the environment; 2) it complies with ARARs; 3) it is cost effective; 4) it utilizes permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and 5) it satisfies the preference for treatment. Long-term monitoring would be performed to assure the protectiveness of the remedy. With respect to the two modifying criteria of the comparative analysis, state acceptance and community acceptance, NYSDEC concurs with the preferred alternative, and community acceptance will be evaluated upon the close of the public comment period.



Legend

- Railroad
- Former Avis Headquarters Site
- Former Hangars
- Former Boundary of Roosevelt Field Airfield
- Public Supply Well
- Existing Extraction Well

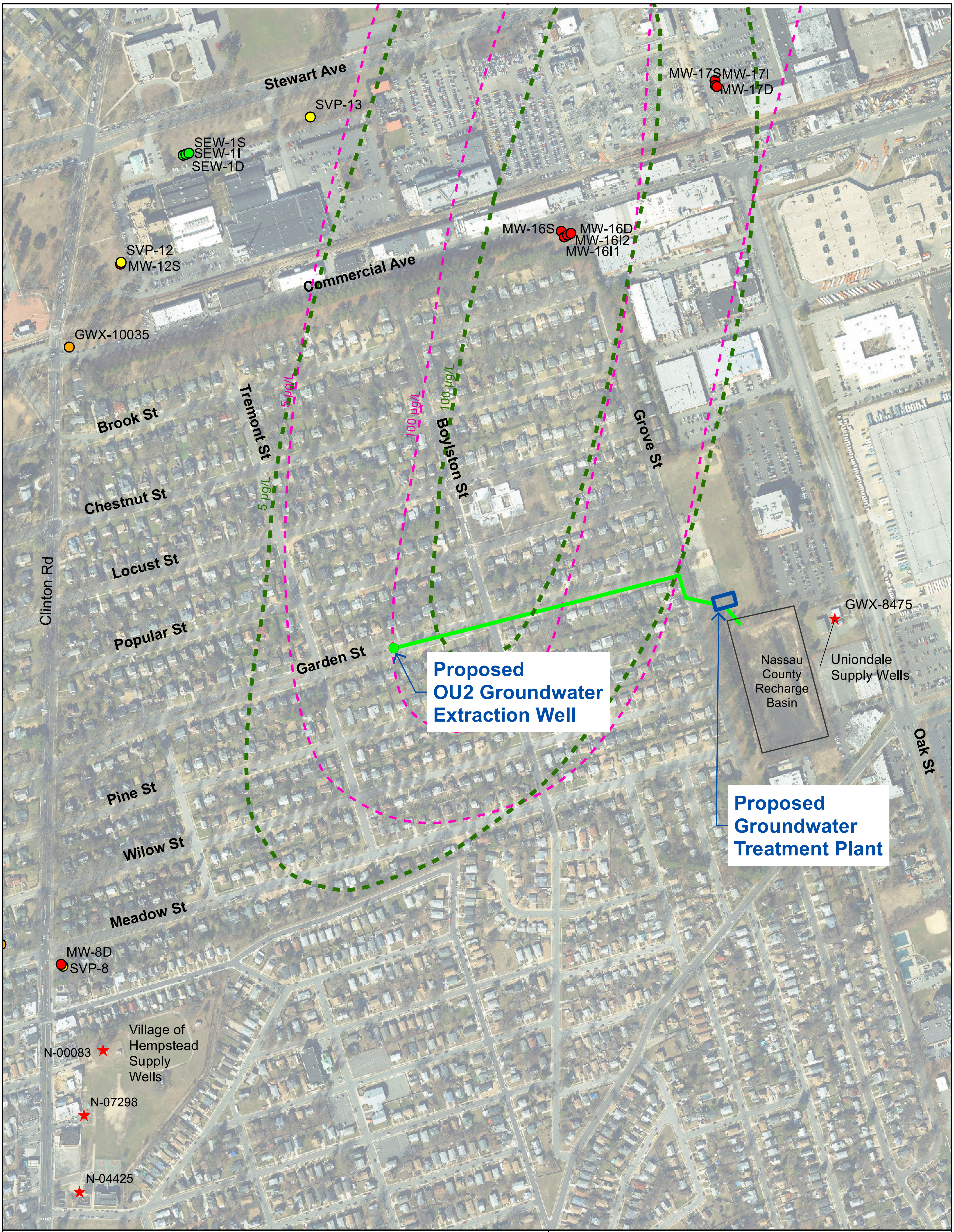
CDM Smith

Source: Nassau County Geographic Information System

N

0 80 160 320 480 640 800 Feet

Figure 1
Site Location Map
Old Roosevelt Field
Contaminated Groundwater Area Site, Operable Unit 2
Garden City, Nassau County, New York



Legend

- Monitoring Well
- Extraction Well
- Nassau County Monitoring Well
- Multi-port Well
- Municipal Supply Well
- PCE OU2 Isocontour Inferred
- TCE OU2 Isocontour Inferred

N

0 100 200 400 Feet

Figure 2
Conceptual Design for Alternative 2
Pump and Treat
Old Roosevelt Field Contaminated Groundwater
Area Site, Operable Unit 2
Garden City, Nassau County, New York

CDM Smith

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