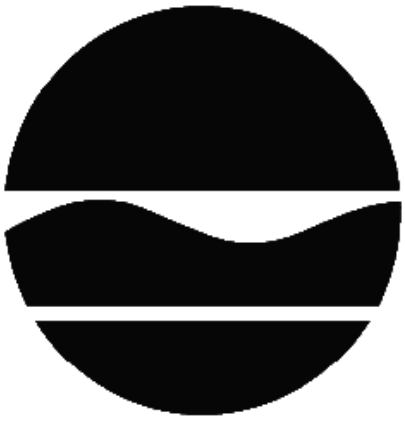
PROPOSED REMEDIAL ACTION PLAN

Former Garden Photoengraving Co., Inc.
Operable Unit Number 02: Off Site Groundwater and Soil Vapor
State Superfund Project
Mineola, Nassau County
Site No. 130174
February 2019



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

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Site No. 130174
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SECTION 1: SUMMARY AND PURPOSE OF THE PROPOSED PLAN

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

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

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

SECTION 2: CITIZEN PARTICIPATION

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

Mineola Memorial Library
Attn: Reference Department
195 Marcellus Road
Mineola, NY 11501
Phone: (516) 746-8488

A public comment period has been set from:

2/26/2019 to 3/28/2019

A public meeting is scheduled for the following date:

3/6/2019 at 7:00 PM

Public meeting location:

Mineola Memorial Library, 195 Marcellus Rd, Mineola, NY 11501

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

Written comments may also be sent through 3/28/2019 to:

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

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

Receive Site Citizen Participation Information By Email

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

SECTION 3: SITE DESCRIPTION AND HISTORY

Location: The Former Garden Photoengraving Site is located in a light industrial area at 40

Roselle Street, Mineola, NY in Nassau County.

Site Features: The site consists of a two-story commercial building and a parking lot to the east and west. The site is 0.394 acres. Roselle Street is south of the property and a county recharge basin to the north. The surrounding parcels are used for mixed residential/commercial, and light industrial activities.

Current Zoning/Use(s): The site is currently active. It is zoned industrial. Currently, the building is occupied by a dental implants fabrication business and warehouse space. The closest residences are located in an apartment complex 200 feet to the east.

Past Use(s) of the Site: The building was built in 1953 and has been used as office and warehouse space, pesticide storage, and as a photoengraving facility. Fumex Pest Control reportedly stored pesticides and herbicides in cargo containers within the building and in sheds in the parking lot from 1992 until 1997. The photoengraving facility, Garden Photoengraving Co., Inc. operated here from 1955 until at least 1977.

A 2001 Phase II subsurface soil and groundwater investigation found three cesspools in the western parking lot, two in the eastern parking lot, and two floor drains within the building, one which led to the recharge basin. Groundwater in the western parking lot did not exceed the groundwater standards, however trichloroethene (TCE), naphthalene, and silver exceeded the groundwater standard in groundwater south of the building on-site, downgradient of the eastern parking lot.

An environmental audit performed in May 2002 detected elevated levels of total petroleum hydrocarbons (TPH), chromium, and mercury in the eastern cesspools. A cleanup was performed under the oversight of Nassau County Department of Health (NCDH) which resulted in the five cesspools with removal of 149.81 tons of contaminated sediments and soils from five cesspools at the site. The endpoint samples showed exceedances of the standards (TAGM 4046) for silver, chromium, and mercury, and TPH including naphthalene.

A 2004 Site Investigation was performed of the eastern parking lot cesspools. The investigation found petroleum hydrocarbons and chlorinated volatile organic compounds (VOCs) exceeding the standards in soil near and within two of the previously cleaned out cesspools. A "smear zone" of petroleum contamination resulting from fluctuating water levels, and evidence of petroleum compounds were present in the groundwater. Monitoring wells were installed within the eastern parking lot which showed exceedances for naphthalene, TPH, tetrachloroethene (PCE), and TCE in the groundwater.

The Department completed a Site Characterization (SC) on this site and the adjacent 50 Roselle Street property in 2009. The results of the investigation indicated that there were low concentrations of PCE and TPH in soil, and PCE, TCE, and naphthalene exceeded the standard for groundwater. The most likely sources of these contaminants were the former cesspools in the eastern parking lot with the source material continuing to impact the groundwater.

In November 2009, 40 Roselle Street was added to the New York State Registry of Inactive

Hazardous Waste Disposal Sites as Class 2 (i.e., poses a significant threat to public health and/or the environment) due to the results of the SC.

Operable Units: The site was divided into two operable units.

An operable unit represents a portion of a remedial program for a site that for technical or administrative reasons can be addressed separately to investigate, eliminate or mitigate a release, threat of release or exposure pathway resulting from the site contamination.

Operable Unit 1 (OU1) includes the on-site source area - the building and eastern parking lot including the soil vapor in the adjacent off-site building.

Operable Unit 2 (OU2) includes the off-site groundwater plume resulting from historical operations in OU1, as well as, soil vapor for properties potentially impacted by the plume.

Site Geology and Hydrogeology: Depth to groundwater is approximately 45 ft below ground surface (bgs). The wells screened at the top of the water table are within the upper glacial aquifer. Groundwater flow direction is to the south-southwest. Soil is composed mostly of sand and some gravel. Public supply wells N0097 and N08576 are located approximately 2,500 feet downgradient of the site.

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

A Record of Decision was issued previously for OU 01.

A site location map is attached as Figure 1.

SECTION 4: LAND USE AND PHYSICAL SETTING

The Department may consider the current, intended, and reasonably anticipated future land use of the site and its surroundings when evaluating a remedy for soil remediation. For this site, alternatives (or an alternative) that restrict(s) the use of the site to commercial use (which allows for industrial use) as described in Part 375-1.8(g) are/is being evaluated in addition to an alternative which would allow for unrestricted use of the site.

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

SECTION 5: ENFORCEMENT STATUS

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

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

Garden Photo-Engraving Co., Inc.

Re-Ko Enterprises, Ltd.

Komar Products Corp.

The Department and Re-Ko Enterprises, Ltd. entered into a Consent Order on July 16, 2018, in which Re-Ko Enterprises, Ltd. resolved its liability to the Department for contamination at and emanating from the site. The Department was unsuccessful in identifying representatives or successors-in-interest of Garden Photo-Engraving Co., Inc.

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

SECTION 6: SITE CONTAMINATION

6.1: Summary of the Remedial Investigation

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

The following general activities are conducted during an RI:

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

The analytical data collected on this site includes data for:

- groundwater
- soil
- soil vapor
- indoor air
- sub-slab vapor

6.1.1: Standards, Criteria, and Guidance (SCGs)

The remedy must conform to promulgated standards and criteria that are directly applicable or that are relevant and appropriate. The selection of a remedy must also take into consideration guidance, as appropriate. Standards, Criteria and Guidance are hereafter called SCGs.

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

6.1.2: RI Results

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

tetrachloroethene (PCE)	cis-1,2-dichloroethene
trichloroethene (TCE)	naphthalene

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

- groundwater
- soil vapor intrusion
- indoor air

6.2: Interim Remedial Measures

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

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

IRM - Soil Vapor Intrusion Mitigation

In 2018, eight off-site structures were evaluated for soil vapor intrusion. The concentrations of PCE in the sub-slab vapor ranged from 14 micrograms per cubic meter (ug/m3) to 3000 ug/m3 and indoor air from non-detect to 1700 ug/m3. The indoor air guideline value is 30 ug/m3. Due to the potential for soil vapor intrusion actions to reduce potential exposures were necessary. Four downgradient structures impacted by vapors attributed to the site had sub-slab

depressurization systems (SSDSs) installed to mitigate the migration of vapors from contaminated groundwater.

6.3: Summary of Environmental Assessment

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

Based upon the resources and pathways identified and the toxicity of the contaminants of ecological concern at this site, a Fish and Wildlife Resources Impact Analysis (FWRIA) was deemed not necessary for OU 02.

OU 1: Source Areas and 40 and 50 Roselle Street Soil Vapor Intrusion

Soil and groundwater were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, polychlorinated biphenyls (PCBs), and pesticides. Based upon investigations conducted to date, the primary contaminants of concern for OU-1 include the VOCs, tetrachloroethene (PCE), trichloroethene (TCE), cis-1,2-dichloroethene (cis-1,2-DCE), SVOC, naphthalene, and the pesticides, Aldrin, Heptachlor, and Dieldrin. A Record of Decision was issued in 2017 for OU-1.

OU 2: Downgradient Off-site Groundwater and Soil Vapor Intrusion

Groundwater was analyzed for VOCs, SVOCs, metals, polychlorinated biphenyls (PCBs), and pesticides. The primary contaminants of concern for OU2 are TCE, PCE, cis-1,2-DCE, and naphthalene. The groundwater contamination originates from OU1 and extends from the site into off-site areas.

Soil: Soil contamination was not identified in OU2.

Groundwater: The chlorinated VOCs (CVOCs) PCE, TCE, and cis-1,2-DCE are present in the aquifer at concentrations exceeding the groundwater standards. Additional contaminants exceeding the groundwater standard are fuel oil components - ethylbenzene, toluene, and isopropylbenzene - which not related to the site due to the distance from the site these contaminants were seen without detections between those locations and the OU-1. CVOCs and naphthalene were seen immediately downgradient of the site (50 feet southwest) with a maximum concentration of 65 parts per billion (ppb) PCE (standard 5 ppb), 170 ppb of TCE (standard 5 ppb), 2400 ppb of DCE (standard 5 ppb), and 1800 ppb of naphthalene (standard 10 ppb) at the top of the water table. Naphthalene was not detected above standards further downgradient of the site during any phase of investigation. Approximately 300 feet (ft) downgradient of the site, the maximum concentration of DCE was 77 ppb at a depth of 55 ft below ground surface (bgs) and 1400 ft downgradient DCE was 270 ppb at a depth of 85 ft bgs. During latter phases of investigation, DCE was detected at 680 ppb 50 ft downgradient of the site and 180 ppb 300 ft downgradient of the site. However, CVOCs were not observed deeper than 85 ft bgs, except for one detection of 10 ppb PCE 2500 ft south of the site at a depth of 100 ft

bgs, while the supply well is screened 300-355 ft bgs. The concentrations of CVOCs generally decrease with increasing distance and depth from the site. However, over time the concentrations of CVOCs have migrated off-site with the highest concentrations being observed immediately downgradient of the site. The Village of Mineola public supply wells No. 1 (N-00097) and No. 7 (N-8576),are located approximately 2500 feet downgradient from the site. Well No. 7 has detected CVOC impacts, however those impacts cannot be definitively attributed to the site.

Sub-Slab Soil Vapor and Indoor Air: Eight structures were sampled for sub-slab soil vapor and indoor air. PCE, TCE, and carbon tetrachloride were detected in soil vapor at elevated concentrations. PCE was detected in sub-slab soil vapor up to 3000 ug/m3 and in indoor air at concentrations up to 2000 ug/m3. TCE was detected in sub-slab soil vapor up to 2800 ug/m3 and in indoor air up to 2100 ug/m3. Carbon tetrachloride was detected in sub-slab soil vapor up to 39,000 ug/m3 and in indoor air up to 140 ug/m3. Based on the data, measures have been taken to address exposures in four downgradient structures and re-sampling will be conducted in the remaining four structures. An additional action will be implemented as warranted.

6.4: Summary of Human Exposure Pathways

This human exposure assessment identifies ways in which people may be exposed to site-related contaminants. Chemicals can enter the body through three major pathways (breathing, touching or swallowing). This is referred to as *exposure.*

The majority of the site is covered by a building or pavement. However, people may directly contact soil contaminants in unpaved areas. A down-gradient public water supply well has been affected by contaminants but the source of the contaminants has not been identified. However, municipal water suppliers have taken appropriate actions (such as removing the well from service) to ensure that the public water supply continues to meet drinking water standards. Volatile organic compounds in contaminated soils or contaminated groundwater may move into the soil vapor (air spaces within the soil), which in turn may move into overlying buildings and affect the indoor air quality. This process, which is similar to the movement of radon gas from the subsurface into the indoor air of buildings, is referred to as soil vapor intrusion. Soil vapor intrusion sampling identified impacts to indoor air quality in the on-site structure and one building adjacent to the site. Additional off-site soil vapor intrusion evaluations are recommended.

6.5: Summary of the Remediation Objectives

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

The remedial action objectives for this site are:

Groundwater

RAOs for Public Health Protection

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

RAOs for Environmental Protection

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

Soil Vapor

RAOs for Public Health Protection

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

SECTION 7: SUMMARY OF THE PROPOSED REMEDY

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

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

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

The proposed remedy is referred to as the In-Situ Enhanced Biodegradation with Monitored Natural Attenuation remedy.

The estimated present worth cost to implement the remedy is $1,044,000. The cost to construct the remedy is estimated to be $290,000 and the estimated average annual cost is $101,000.

The elements of the proposed remedy are as follows:

1. Remedial Design

A remedial design program will be implemented to provide the details necessary for the construction, operation, optimization, maintenance, and monitoring of the remedial program.

Green remediation principles and techniques will be implemented to the extent feasible in the design, implementation, and site management of the remedy as per DER-31. The major green remediation components are as follows;

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

2. Enhanced Bioremediation

In-situ enhanced biodegradation will be employed to treat PCE, TCE, and DCE in groundwater in the OU-2 in an area to be determined following the treatment of the source area as described in Record of Decision for Former Garden Photoengraving OU-1. The biological breakdown of contaminants through anaerobic reductive dechlorination will be enhanced by injecting a molasses and water solution into the subsurface to promote microbe growth via several biobarrier walls.

3. Monitored Natural Attenuation

Groundwater impacts will be addressed with monitored natural attenuation (MNA). Groundwater will be monitored for site-related contamination prior to, during, and after remediation of OU-1 and OU-2 for MNA indicators. They will provide an understanding of the biological activity and measure the performance of the selected remedy. Reports of the attenuation will be provided at 2, 5, and 10 years.

4. Installation and sampling of additional water table wells in the OU-2 to evaluate the conditions of the groundwater for MNA parameters and COC concentrations.

5. Installation and sampling of sentinel wells to evaluate conditions of the groundwater in advance of the Village of Mineola public supply wells. Groundwater will be sampled from select monitoring wells, sentinel wells and the public water supply wells every year for a period of five years. Each year the Department will consult with the Water District to review the groundwater data obtained to ensure that the groundwater concentrations do not impact the groundwater water supply. The data would be periodically reviewed, evaluated and would be included in a report that makes recommendations for future activities and any necessary actions. At any time during this monitoring and data review, if sentinel wells show a significant increase in groundwater contamination appropriate measures would be implemented to protect the public supply wells prior to the periodic review period. The evaluation of periodic year review will also

include whether to continue or discontinue monitoring. The periodic monitoring of the groundwater will continue until the remedial objectives have been achieved.

6. Site Management Plan

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

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

Engineering Controls: the sub-slab depressurization systems discussed in Section 6.2, Interim Remedial Measures and Paragraph 5.

This plan includes, but may not be limited to:

o a provision for further investigation and remediation should large scale redevelopment occur, if any of the existing structures are demolished, or if the subsurface is otherwise made accessible. The nature and extent of contamination in areas where access was previously limited or unavailable will be immediately and thoroughly investigated pursuant to a plan approved by the Department. Based on the investigation results and the Department determination of the need for a remedy, a Remedial Action Work Plan (RAWP) will be developed for the final remedy for the site, including removal and/or treatment of any source areas to the extent feasible. Citizen Participation Plan (CPP) activities will continue through this process. Any necessary remediation will be completed prior to, or in association with, redevelopment. This includes the on-site, OU-1.

o a provision for evaluation of the potential for soil vapor intrusion for any occupied buildings in the OU-2 study area east of the railroad tracks and north of Jericho Turnpike, including provision for implementing actions recommended to address exposures related to soil vapor intrusion;

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

o the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.

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

- monitoring of groundwater to assess the performance and effectiveness of the remedy;
- evaluation of shallow groundwater to determine the potential for vapor intrusion in areas not yet evaluated;
- a schedule of monitoring and frequency of submittals to the Department; and
- monitoring for vapor intrusion for structures in the OU-2 study area, as may be required by the Institutional and Engineering Control Plan discussed above.

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

- procedures for operating and maintaining the system(s); and
- compliance inspection of the system(s) to ensure proper O&M as well as providing the data for any necessary reporting.

Exhibit A

Nature and Extent of Contamination

This section describes the findings of the Remedial Investigation for all environmental media that were evaluated. As described in Section 6.1, samples were collected from various environmental media to characterize the nature and extent of contamination.

For each medium for which contamination was identified, a table summarizes the findings of the investigation. The tables present the range of contamination found at the site in the media and compares the data with the applicable SCGs for the site. The contaminants are arranged into categories; volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides/ polychlorinated biphenyls (PCBs), and inorganics (metals and cyanide). For comparison purposes, the SCGs are provided for each medium that allows for unrestricted use. For soil, if applicable, the Restricted Use SCGs identified in Section 4 and Section 6.1.1 are also presented.

Groundwater

Groundwater samples were collected as part of the OU2 investigation to evaluate the nature and extent of the contamination off-site. The results indicate that contamination in the groundwater exceeds SCGs for volatile organic compounds (VOCs) – chlorinated solvents and gasoline components, several metals, and one pesticide - Dieldrin in the off-site area.

The chlorinated solvent contamination in the groundwater extends off-site 1,500 ft to the southwest. This contamination consists primarily of PCE, TCE, and DCE, with DCE as the main component of the plume. The original on-site contaminants are PCE and TCE, but the gasoline component, naphthalene, has enhanced the biodegradation of the chlorinated solvents to DCE. Immediately downgradient of the site, the contamination is located at the top of the water table (depth of 45 ft below ground surface) and as the plume migrates southwest as far as 1,500 ft, it dives to a depth of 85 ft below ground surface. Groundwater generally flows towards the Village of Mineola public supply wells No. 1 and No. 7, located approximately 2,500 ft due south and southwest, respectively. Investigations further to the south and southwest (greater than 1,500 ft) and deeper did not discover chlorinated solvents, except 150 feet east of the Mineola public supply well 1, close enough for the groundwater to be influenced by the supply well. Chlorinated solvents were found within both Mineola Wells 1 and 7 and the monitoring well closest to Mineola Well 1. The ratios of chlorinated solvents within those wells were found to have the greatest concentrations of PCE, then TCE, and finally DCE, which varies from the concentration ratios found in the plume upgradient. The lack of site-related contamination beyond 1,500 feet from the site and different chemical mixture in proximity to the Mineola supply wells suggests that the supply well contamination may be from another source.

Naphthalene, a gasoline component, and Dieldrin, a pesticide, exceed SCGs in the OU1, on-site area, and extend as far as the south side of Roselle Street, but no further. Figure 2 - Vertical Groundwater Profile Sample Exceedances – Phase II, June 2014 and August 2015 shows the concentrations furthest downgradient of the site (within the OU-2 study area) where exceedances were found. Figure 3, Low Flow Groundwater Sample Exceedances- Phase IV, April 2018 shows the latest groundwater sampling results within the OU-2 study area.

Metals that exceed SCGs immediately downgradient of the site are aluminum, iron, manganese, and sodium, all naturally occurring metals in Long Island groundwater. Arsenic and chromium exceeded SCGs in one sample located 600 feet downgradient within the plume, but did not exceed SCGs in on-site or immediately downgradient groundwater. Therefore, they most likely do not originate from the site.

Table 1 - Groundwater

Detected Constituents	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)	Frequency Exceeding SCG
VOCs			
PCE	<1.0 U - 65	5	34/189
TCE	<1.0 U - 400	5	32/189
Cis-1,2-DCE	<1.0 U - 2400	5	25/189
1,1,1- TCA	<1.0 U - 15	5	1/189
Ethylbenzene	<1.0 U - 11	5	2/189
Isopropylbenzene	<1.0 U - 7.3	5	2/189
Toluene	<1.0 U - 54	5	9/189
Acetone	<1.0 U - 100	50	2/189
Benzene	<1.0 U - 4.6	1	5/189
SVOCs			
Naphthalene	<0.7 U - 2400	10	6/19
Inorganics			
Aluminum	220 – 30,600	100	3/3
Arsenic	6.4 J - 29	25	1/3
Chromium	20-470	50	1/3
Iron	1,100-118,000	300	3/3
Manganese	370-3,400	300	3/3
Nickel	3.2-150	100	1/3
Sodium	4,800-45,300	20,000	2/3
Pesticides/PCBs			
Dieldrin	0.050 ND - 0.014 J	0.004	1/3

a - ppb: parts per billion, which is equivalent to micrograms per liter, ug/L, in water.
b - SCG: Standard Criteria or Guidance - Ambient Water Quality Standards and Guidance Values (TOGs 1.1.1), 6 NYCRR Part 703, Surface water and Groundwater Quality Standards, and Part 5 of the New York State Sanitary Code (10 NYCRR Part 5).

The primary groundwater contaminants are PCE, TCE, DCE, and naphthalene associated with disposal through the cesspool in the eastern parking lot on-site.

Based on the findings of the RI, the presence of chlorinated solvents has resulted in the contamination of groundwater. The site contaminants that are considered to be the primary contaminants of concern which will drive the remediation of groundwater to be addressed by the remedy selection process are: PCE, TCE, and DCE.

Soil Vapor

The evaluation of the potential for soil vapor intrusion resulting from the presence of site related soil or groundwater contamination was evaluated by the sampling of soil vapor, sub-slab soil vapor under structures, and

indoor air inside structures. Within the OU2 study area, due to the presence of buildings in the impacted area, a full suite of samples were collected to evaluate whether soil vapor intrusion was occurring.

Soil vapor samples were collected from the OU2 study area to evaluate the potential impacts to surrounding buildings by soil vapor intrusion. Soil vapor samples exhibited concentrations that were indicative of potential impacts. Figure 4 shows the results of the soil vapor samples collected. Following up on the soil vapor samples, soil vapor intrusion samples consisting of sub-slab, indoor air, and ambient air samples were collected in the OU-2 area from eight structures. The results indicated that PCE, TCE, 1,1,1-TCA, and/or carbon tetrachloride were present at several OU2 buildings in the sub-slab soil vapor and indoor air samples at levels requiring actions to reduce potential exposures in four OU2 structures. Those mitigation measures were performed as an Interim Remedial Measure.

Based on the concentrations detected, and in comparison with the NYSDOH Soil Vapor Intrusion Guidance, soil vapor contamination identified during the RI was addressed during the IRM described in Section 6.2.

Exhibit B

Description of Remedial Alternatives

The following alternatives were considered based on the remedial action objectives (see Section 6.5) to address the contaminated media identified at the site as described in Exhibit A.

Alternative 1: No Further Action

The No Further Action Alternative recognizes the remediation of the site completed by the IRM(s) described in Section 6.2 and completed as part of the Former Garden Photoengraving OU-1 Record of Decision. This alternative leaves the site in its present condition and does not provide any additional protection of the environment.

Alternative 2: Monitored Natural Attenuation with Contingency

Alternative 2 recognizes that the remediation of the on-site area by in-situ chemical oxidation removes a significant portion of the source contamination that is feeding the OU-2 plume. This alternative maintains engineering controls and includes institutional controls, in the form of the site management plan, necessary to protect public health and the environment from contamination remaining at the on-site remediation and after the IRMs.

OU-2 groundwater contamination will be addressed with monitored natural attenuation (MNA). Groundwater will be monitored for site related contamination and also for MNA indicators which will provide an understanding of the (biological activity) breaking down the contamination. It is anticipated that contamination will decrease by an order of magnitude in a reasonable period of time (5 to 10 years). Reports of the attenuation will be provided at 2, 5 and 10 years, and active remediation will be proposed if it appears that natural processes alone will not address the contamination. The contingency remedial action will depend on the information collected, but it is currently anticipated that In-Situ Enhanced Biodegradation as described in Alternative 3 would be the expected contingency remedial action.

Present Worth: *$1,044,000*
Capital Cost: *$290,000*
Annual Costs: *$101,000*

Alternative 3: In-Situ Treatment with Monitored Natural Attenuation

Alternative 3 recognizes the remediation of the on-site area by in-situ chemical oxidation and treats contaminants in groundwater in the area downgradient of the source area by enhanced biodegradation, as depicted in Figure 5. The biological breakdown of contaminants through aerobic respiration will be enhanced by injecting a molasses and water solution or similar material into the subsurface to promote microbe growth via several biobarriers perpendicular to the groundwater flow direction. Performance monitoring of the effectiveness of the treatment will be done by sampling monitoring wells within the network for MNA parameters.

Present Worth: *$2,732,000*
Capital Cost: *$2,415,000*
Annual Costs: *$45,000*

Alternative 4: Hydraulic Control with Ex-Situ Treatment

This alternative would include groundwater extraction and treatment to treat contaminants in groundwater. The groundwater extraction system will be designed and installed so that the capture zone is sufficient to cover the areal and vertical extent of the area of concern. The extraction system will create a depression of the water table so that contaminated groundwater is directed toward the extraction wells within the plume area. Groundwater will be extracted from the subsurface from the area of the groundwater contaminant plume shown on Figure 6. Further details of the extraction system will be determined during the remedial design.

Prior to the full implementation of this technology, studies will be conducted to more clearly define design parameters, including extraction well spacing.

Air stripping will be implemented to remove volatile contaminants from the extracted groundwater. The groundwater will be contacted with an air stream to volatilize contaminants from groundwater to air. The extracted air stream containing the volatile contaminants will be treated prior to discharge to the atmosphere using vapor phase granular activated carbon. Liquid phase granular active carbon (GAC) will be used to remove remaining dissolved contaminants from extracted groundwater by adsorption. The GAC system will consist of one or more vessels filled with carbon connected in series and/or parallel. Following treatment, the groundwater will be discharged to the storm sewer.

Present Worth: *$14,618,000*
Capital Cost: *$5,597,000*
Annual Costs: *$727,000*

Exhibit C

Remedial Alternative Costs

Remedial Alternative	Capital Cost ($)	Annual Costs ($)	Total Present Worth ($)
1. No Further Action	0	0	0
2. Monitored Natural Attenuation with Contingency	290,000	101,000	1,044,000
3. In-Situ Treatment with Monitored Natural Attenuation	2,415,000	45,000	2,732,000
4. Hydraulic Control with Ex-Situ Treatment	5,597,000	727,000	14,618,000

Exhibit D

SUMMARY OF THE PROPOSED REMEDY

The Department is proposing Alternative 3, In-Situ Treatment and Monitored Natural Attenuation as the remedy for this site. Alternative 3 would achieve the remediation goals for the site by adding off-site treatment of groundwater to the groundwater treatment remedy for OU-1 that together will reduce contamination in the aquifer and protect potentially threatened water supplies. Low levels of contamination not addressed by the treatment systems will naturally attenuate with the expectation that levels will achieve ambient quality standards within a reasonable time frame. The elements of this remedy are described in Section 7. The proposed remedy is depicted in Figure 5.

Basis for Selection

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

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

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

The proposed remedy Alternative 3 would satisfy this criterion by treating higher levels of contamination and naturally attenuating the lower levels in the OU-2 area. Alternative 2 would also meet this criterion, but with less certainty and in a longer time frame. Alternative 1 (No Further Action) does not provide any protection to public health and the environment and will not be evaluated further. Alternatives 2, 3, and 4 meet this threshold criterion because each is effective at reducing contaminant mass within the OU-2 groundwater area and protecting the environment.

The potential for soil vapor intrusion will be significantly reduced by Alternatives 2, 3, and 4; however Alternative 2 will take more time than Alternatives 3 or 4. Soil vapor intrusion mitigation, as initiated under the IRM as described in section 6.2, is required under all alternatives in order to protect human health.

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

Alternative 2, 3 and 4 comply with SCGs to the extent practicable. The OU-1 remedy addresses source areas of contamination. Alternatives 2, 3 and 4 create the conditions necessary to restore groundwater quality to the extent practicable. Because Alternatives 2, 3, and 4 satisfy the threshold criteria, the remaining criteria are particularly important in selecting a final remedy for the site. It is expected Alternative 3 would achieve groundwater SCGs in the shortest time period. Alternative 2, if the contingency is enacted, will take the second longest time, while groundwater contamination above SCGs will remain in the OU-2 area under Alternative 4 for the longest time period.

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

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

Long-term effectiveness is achieved by all the alternatives. Alternative 2, MNA, reduces contaminant mass and breaks down chlorinated VOCs through natural processes, while Alternative 3 enhances those processes to break down the contamination more quickly. Alternative 4 meets this criterion as contaminant is removed from the aquifer and treated. All three alternatives will require groundwater use restrictions until SCGs are met. Alternatives 3 and 4 will rely on long-term monitoring outside of active treatment to evaluate the effectiveness of the remedy. Alternative 4 requires the effective and continued operation of remedial equipment which is dependent on the overall operation and routine maintenance of the treatment systems. Periodic repairs and equipment replacement will be needed to maintain the treatment system's effectiveness.

There is the potential for soil vapor intrusion in the OU-2 area; however the IRM mitigates the soil vapor intrusion immediately downgradient of the site in the OU-2 area . Further soil vapor intrusion evaluation in the OU-2 area will be carried out if necessary.

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

Alternative 2 would reduce the toxicity and mobility of the dissolved-phase plume with natural processes such as dilution, dispersion and natural attenuation but would take longer to achieve compared to alternative 3. Alternatives 3 and 4 would reduce the toxicity and mobility of the plume by treating the groundwater within the treatment area. Alternative 4 would limit plume migration and reduce contaminant concentrations in the treatment area, thereby reducing the toxicity and mobility of the plume. Alternative 4 would reduce the mobility, toxicity or volume but has the potential to impact operations or water quality at the Mineola public supply wells.

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

All Alternatives will have short-term impacts to remediation workers, the public, and the environment during implementation, although engineering controls would minimize these impacts.

Alternative 2 would have the smallest impact to the public. Alternative 3 has short-term impacts which may be disruptive to the public and local business for short periods of time when drilling is performed for installation of biobarrier walls and injection of amendments occurs along Roselle Street, Windsor Avenue, and Sagamore Avenue. All three are busy streets with on-street parking and many businesses, which poses significant logistical problems. Alternative 4 would involve significant short-term impacts due to the installation of piping for groundwater conveyance to the treatment facility requiring trenching in the street. The logistical problems would be the greatest with Alternative 4.

In the short term, the most effective treatment would be Alternative 3. It would take the least time to initially reduce the mass of contaminants in the aquifer. Alternative 2 would be immediately effective although it would be reducing the contaminant mass at a slower rate than Alternative 3. Alternative 4 would take the longest to be effective due to the long installation and start-up time.

6. Implementability. The technical and administrative feasibility of implementing each alternative are evaluated. Technical feasibility includes the difficulties associated with the construction of the remedy and the ability to monitor its effectiveness. For administrative feasibility, the availability of the necessary personnel and materials is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, institutional controls, and so forth.

Alternative 2 is readily implementable, although it does require additional wells to be installed in the OU-2. Alternative 3 is technically and administratively feasible but may require road closures and interruptions to local traffic due to installation of the biobarrier walls. Alternative 4 is also technically implementable, but administratively may not be feasible. The access for construction of the remedial building and installation of the conveyance piping must be obtained. The construction would necessitate increased truck traffic and road closure on local roads for a period of time.

7. Cost-Effectiveness. Capital costs and annual operation, maintenance, and monitoring costs are estimated for each alternative and compared on a present worth basis. Although cost-effectiveness is the last balancing criterion evaluated, where two or more alternatives have met the requirements of the other criteria, it can be used as the basis for the final decision.

The costs of the alternatives vary significantly. Alternative 2 (MNA) has the lowest present worth costs and would be effective in the long-term, but would not reduce contaminant mass as quickly as Alternative 3 (Enhanced Biodegradation).

Alternative 4 (Hydraulic Control) would have the highest present worth cost due to the capital costs to build a treatment building and piping and the high annual O&M costs. Alternative 3 (in-situ treatment) would be significantly less expensive than Alternative 4.

Alternative 2 is the most cost-effective alternative, followed by Alternative 3, while the least cost-effective is Alternative 4.

8. Land Use. When cleanup to pre-disposal conditions is determined to be infeasible, the Department may consider the current, intended, and reasonable anticipated future land use of the site and its surroundings in the selection of the soil remedy.

The groundwater is not used in this area and public water supply is available. The implementation of any of the remedial alternatives would have no impact on the current and future use of the site or the off-site properties. Based on the indoor air sampling conducted, four sub-slab depressurization systems were installed to address the contamination in indoor air in the OU-2. The impact on the current and future use of the off-site properties from soil vapor intrusion have been addressed with the implementation of the IRM.

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

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

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

Detail A
20 ROSELLE-IAB
20 ROSELLE-SS
20 ROSELLE-IA1
20 ROSELLE-IA2
OU-1 Boundary
OU-2 Boundary
MW-10
TP-18
SV-05
MW-11
SV-04
TP-19
SV-03
MW-12
35 ROSELLE-IAO
39 ROSELLE-IAO
43 ROSELLE-IAO
43 ROSELLE-IAM
43 ROSELLE-SS
35 ROSELLE-IAW
35 ROSELLE-SS
39 ROSELLE-IAM
39 ROSELLE-SS
47 ROSELLE-IAN
47 ROSELLE-SSN
OU-1 Boundary
Roselle St
47 ROSELLE-IAS
47 ROSELLE-SSS
80 WINDSOR-IAO
80 WINDSOR-IAB
80 WINDSOR-SS
TP-22
MW-21 S/D
TP-21
SV-07
TP-24
TP-20
MW-24 S/D
SV-06
GARDEN-OA
51 WINDSOR-IAO
SV-08
TP-25
SV-09
51 WINDSOR-IAB
51 WINDSOR-SS
55 WINDSOR-IA
55 WINDSOR-SS
Windsor Ave
MW-25 S/D
IA-08
TP-29
MW-29
GP-11
GP-14
TP-30
GP-15
Sagamore Ave
OU-2 Boundary
GP-12
GP-16
MW-31
GP-13
Pennsylvania Ave
Nassau Blvd
Willis Ave
MW-32
Jericho Turnpike
MW-33
Washington Ave
Roslyn Rd
Elm Pl
Maple Pl
Jefferson Ave
MW-35
N-09942
Washington Ave
Jackson Ave
City Supply Well No. 7, N-08576
Willis Ave
Jefferson Ave
Elm Pl
MW-36
Jackson Ave
City Supply Well No. 1, N-00097
MW-37B
MW-37
Lincoln Ave

Remedial Investigation Samples

- Indoor Air
- Monitoring Well
- Soil Vapor
- Vertical Groundwater Profile
- Outdoor Air
- Sub-Slab Vapor
- Village of Mineola Supply Well
- OU-1 Boundary
- OU-2 Boundary

N

OU-2 Phase I, II, III and IV Sample Location Plan

1 inch = 208 feet

0 208 416 Feet

Former Garden Photoengraving
Mineola, NY
Figure 1

CDM Smith

HARROLDAM \\ALBSVR2\Alb2_Projects\NYSDEC D007621\WA#19 - Former Garden Photoengraving\03 Reports and Studies\05 Environmental Reports\RI-FS GIS Files\OU2 RIFS Figure\Fig1-2b_Phase_I-IV_SampleLoc_OU2.mxd 12/6/2018

GP-11	Depth (ft bgs)			
Analyte (µg/L)	55	65	75	85
Cis-1,2-Dichloroethylene	ND	**2.7**	ND	ND
Tetrachloroethene (PCE)	ND	**0.79 J**	**36**	**0.75 J**
Trichloroethene (TCE)	ND	ND	**6.7**	ND

GP-14	Depth (ft bgs)				
Analyte (µg/L)	45	55	65	75	85
Cis-1,2-Dichloroethylene	ND	ND	ND	ND	ND
Tetrachloroethene (PCE)	ND	**1.5**	**0.95 J**	**0.51 J**	ND
Trichloroethene (TCE)	ND	ND	**0.88 J**	**0.49 J**	ND

GP-15	Depth (ft bgs)				
Analyte (µg/L)	55	65	75	85	85*
Cis-1,2-Dichloroethylene	ND	ND	ND	ND	ND
Tetrachloroethene (PCE)	**0.9 J**	ND	**0.51**	**0.58**	**0.66**
Trichloroethene (TCE)	**1.6**	ND	**0.54**	**0.64**	**0.59**

GP-12	Depth (ft bgs)			
Analyte (µg/L)	55	65	75	85
Cis-1,2-Dichloroethylene	ND	ND	ND	ND
Tetrachloroethene (PCE)	**0.56 J**	ND	ND	ND
Trichloroethene (TCE)	**1.5**	**0.71 J**	**1**	ND

GP-16	Depth (ft bgs)				
Analyte (µg/L)	50	55	65	75	85
Cis-1,2-Dichloroethylene	**1.9**	**30**	**120**	**160**	**230**
Tetrachloroethene (PCE)	**0.5 J**	**17**	**22**	**33**	**27**
Trichloroethene (TCE)	**2.3**	**54**	**86**	**120**	**95**

GP-13	Depth (ft bgs)				
Analyte (µg/L)	50	55	65	75	85
Cis-1,2-Dichloroethylene	**15**	**140**	**190**	**170**	**270**
Tetrachloroethene (PCE)	**0.71 J**	**4.9**	**5.1**	**13**	**15**
Trichloroethene (TCE)	**2.3**	**19**	**26**	**58**	**72**

TP-25	Depth (ft bgs)				
Analyte (µg/L)	48	55	65	75	85
Cis-1,2-Dichloroethylene	ND	ND	ND	ND	ND
Tetrachloroethene	**2.8**	**15**	**2.9**	ND	ND
Trichloroethene	ND	ND	ND	ND	ND

TP-29	Depth (ft bgs)				
Analyte (µg/L)	45	55	65	75	85
Cis-1,2-Dichloroethylene	NS	**660**	**8.4**	**7**	**5.5**
Ethylbenzene	NS	**11**	ND	ND	ND
Isopropylbenzene	NS	**7.3**	ND	ND	ND
Tetrachloroethene	NS	**5**	**1.9**	ND	ND
Trichloroethene	NS	**29**	**8.9**	ND	ND

TP-30	Depth (ft bgs)				
Analyte (µg/L)	45	55	65	75	85
Cis-1,2-Dichloroethylene	NS	ND	**25**	ND	ND
Tetrachloroethene	NS	**0.54J**	**7.2**	**0.36J**	ND
Toluene	NS	**8.9**	**1.4**	ND	**0.51J**
Trichloroethene	NS	**2.3**	**57**	**2.9**	**0.7J**

Ambient Water Quality Standards	
Analyte Name	*Concentration (µg/L)*
1,1,1-Trichloroethane	5
Cis-1,2-Dichloroethylene	5
Ethylbenzene	5
Isopropylbenzene	5
Tetrachloroethene (PCE)	5
Toluene	5
Trichloroethene (TCE)	5

N

Legend

- Vertical Groundwater Profile Location
- OU-2 Boundary

Notes

1. Depths refer to the bottom of the 5' screened interval.
2. Results with light red fill have exceeded AWQS.
3. ND - Non-Detect
4. NS - Not Sampled
5. *Field duplicate of SO-GP-15-81-85-20150804

Vertical Groundwater Profile Sample Exceedances – Phase II
June 2014 and August 2015

1 inch = 125 feet

0 125 250 Feet

Former Garden Photoengraving
Mineola, NY

Figure 2

CDM Smith

HARROLDAM \\ALBSVR2\Alb2_Projects\NYSDEC D007621\WA#19 - Former Garden Photoengraving\03 Reports and Studies\05 Environmental Reports\RI-FS GIS Files\OU2 RIFS Figure\Fig4-2_GWvertprof_Results_PhaseII.mxd 12/6/2018

MW-09	MW-09-20180417
Cis-1,2-Dichloroethene	ND
Tetrachloroethene	ND
Trichloroethene	ND

Well Cluster MW-13 through MW-17	MW-14-20180419	MW-15-20180419	MW-16-20180418	MW-17-20180419
Cis-1,2-Dichloroethene	ND	ND	ND	ND
Tetrachloroethene	ND	ND	6.3	ND
Trichloroethene	ND	ND	ND	ND
Naphthalene	ND	ND	1300	ND

MW-04	MW-04-20180417
Cis-1,2-Dichloroethene	97
Tetrachloroethene	36
Trichloroethene	95
Naphthalene	1700

MW-03	MW-03-20180417
Cis-1,2-Dichloroethene	ND
Tetrachloroethene	10
Trichloroethene	400
Naphthalene	610

MW-10	MW-10-20180418
Cis-1,2-Dichloroethene	1.6
Tetrachloroethene	31
Trichloroethene	45

MW-12	MW-12-20180417
Cis-1,2-Dichloroethene	ND
Tetrachloroethene	17
Trichloroethene	41

MW-21 S/D	MW-21D-20180418
Cis-1,2-Dichloroethene	180
Ethylbenzene	5.6
Tetrachloroethene	ND
Trichloroethene	7.3

MW-25 S/D	MW-25D-20180418
Cis-1,2-Dichloroethene	ND
Tetrachloroethene	ND
Trichloroethene	ND

MW-24 S/D	MW-24S-20180418	MW-24D-20180418
Cis-1,2-Dichloroethene	ND	ND
Tetrachloroethene	4.4	24
Trichloroethene	ND	ND

MW-11	MW-11-20180418
Cis-1,2-Dichloroethene	680
Tetrachloroethene	ND
Trichloroethene	46 J
Naphthalene	2400

MW-37B	MW-37B-20180426
Cis-1,2-Dichloroethene	ND
Tetrachloroethene	3.5
Trichloroethene	0.81 J

Ambient Water Quality Standards	
Analyte Name	*Concentration (µg/L)*
Cis-1,2-Dichloroethene	5
Ethylbenzene	5
Tetrachloroethene	5
Trichloroethene	5
Naphthalene	10

MW-09
MW-08
Well Cluster MW-13 through MW-17
MW-04
MW-03
MW-10
MW-11
MW-12
MW-25 S/D
MW-21 S/D
MW-24 S/D
MW-37B
OU-1 Boundary
OU-2 Boundary
Roselle St
Windsor Ave
Sagamore Ave
Jericho Turnpike
Washington Ave
Roslyn Rd
Elm Pl
Jefferson Ave
Jackson Ave
Lincoln Ave

N

Legend

Monitoring Well

OU-1 Boundary

OU-2 Boundary

Notes

1. Depths refer to the bottom of the 5' screened interval.
2. ND - Non-Detect
3. Results with light red fill have exceeded AWQS.

Low Flow Groundwater Sample Exceedances - Phase IV April 2018

1 inch = 200 feet

0 200 400 Feet

Former Garden Photoengraving
Mineola, NY
Figure 3

CDM Smith

HARROLDAM \\ALBSVR2\Alb2_Projects\NYSDEC D007621\WA#19 - Former Garden Photoengraving\03 Reports and Studies\05 Environmental Reports\RI-FS GIS Files\OU2 RIFS Figure\Fig4-6_GW_LowFlow_Results_PhaseIV.mxd 12/6/2018

OU-1 Boundary

OU-2 Boundary

Roselle St

Windsor Ave

Sagamore Ave

SV-05	SV-5-20140602
1,1,1-Trichloroethane	**74**
Carbon tetrachloride	**150**
Trichloroethene	**710**
Tetrachloroethene	**1600**

SV-04	SV-4-20140602
1,1,1-Trichloroethane	**46**
Carbon tetrachloride	ND
Trichloroethene	**700**
Tetrachloroethene	**1700**

SV-03	SV-3-20140602
1,1,1-Trichloroethane	**210**
Carbon tetrachloride	ND
Trichloroethene	**770**
Tetrachloroethene	**8700**

SV-07	SV-7-20140604
1,1,1-Trichloroethane	**29**
Carbon tetrachloride	ND
Trichloroethene	**390**
Tetrachloroethene	**280**

SV-06	SV-6-20140603
1,1,1-Trichloroethane	**19**
Carbon tetrachloride	**1.4**
Trichloroethene	**9.1**
Tetrachloroethene	**250**

SV-09	SV-9-20140603
1,1,1-Trichloroethane	**53**
Carbon tetrachloride	ND
Trichloroethene	**21**
Tetrachloroethene	**860**

SV-08	SV-8-20140603
1,1,1-Trichloroethane	**63**
Carbon tetrachloride	**0.99**
Trichloroethene	**14**
Tetrachloroethene	**450**

IA-08

IA-8	IA-8-061814
1,1,1-Trichloroethane	ND
Carbon tetrachloride	**0.48**
Trichloroethene	**0.36**
Tetrachloroethene	**5.4**

Compound	Air Guideline Value (µg/m³)
Trichoroethene	5
Tetrachloroethene	30

N

Legend

- Indoor Air
- Soil Vapor
- OU-1 Boundary
- OU-2 Boundary

Notes

1. All sample results are in ug/m3.
2. ND - Non-Detect
2. Air Guideline Values are compared only to indoor air sample, IA-8.

Soil Vapor and Indoor Air Sample Results – Phase II

June 2014

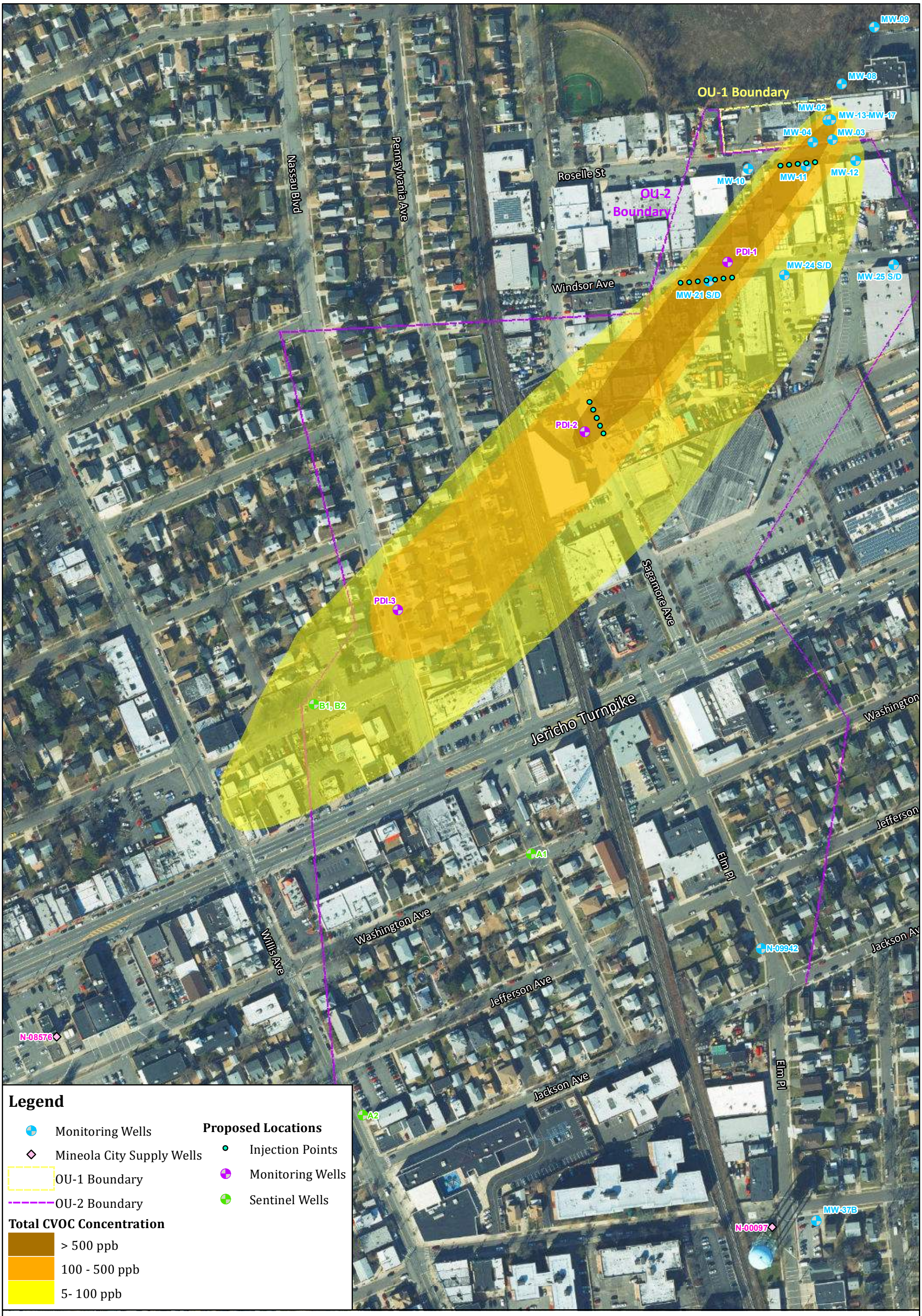
1 inch = 75 feet

0 75 150 Feet

Former Garden Photoengraving
Mineola, NY

Figure 4

CDM Smith



Note
All locations are approximate pending Pre-Design Investigation and Remedial Design.

Alternative 3:
In-Situ Treatment and MNA

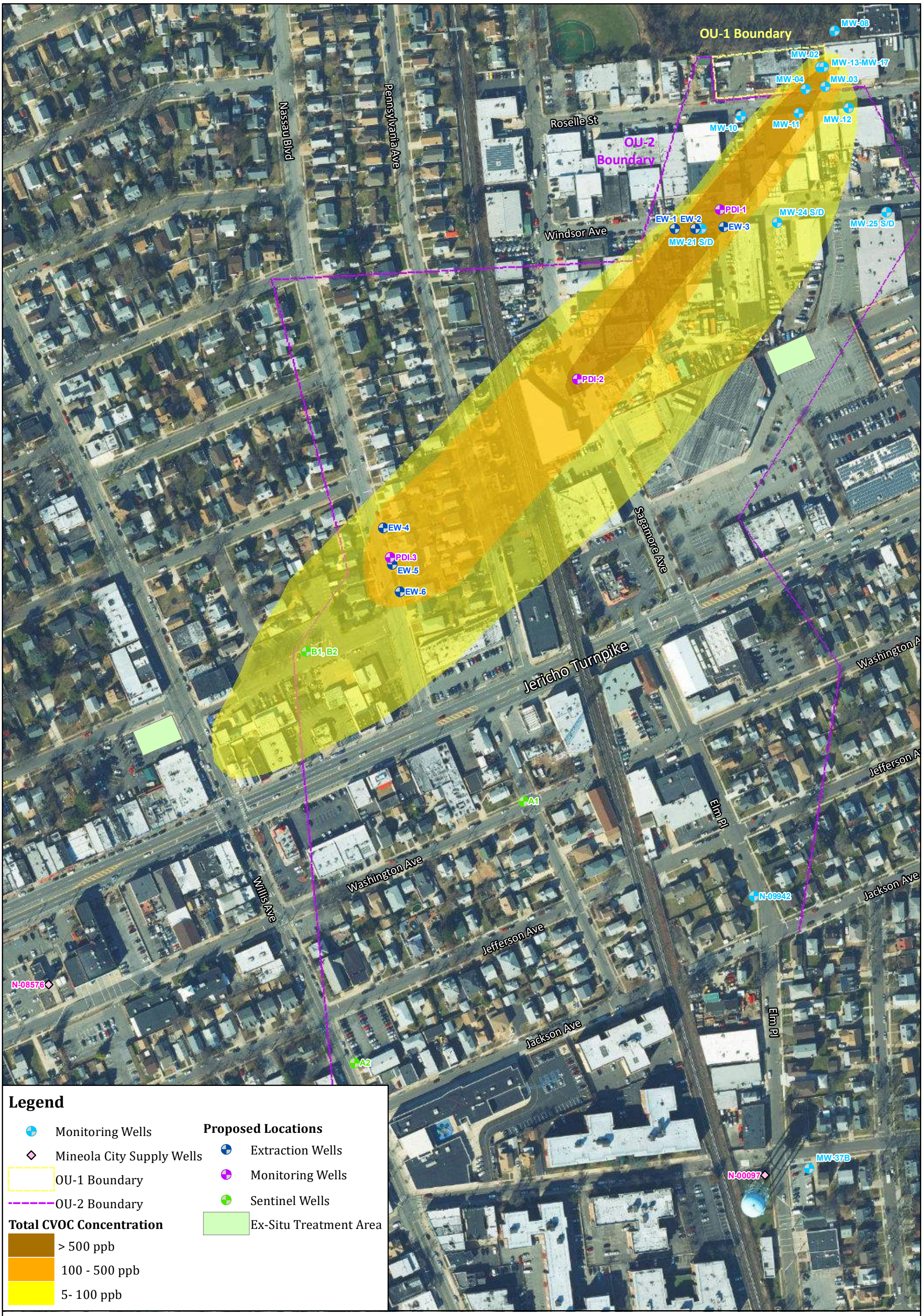
1 inch = 200 feet

0 200 400 Feet

Former Garden Photoengraving
Mineola, NY
Figure 5

CDM Smith

HARROLDAM \\ALBSVR2\Alb2_Projects\NYSDEC D007621\WA#19 - Former Garden Photoengraving\03 Reports and Studies\05 Environmental Reports\RI-FS GIS Files\OU2 RIFS Figure\Fig10-1_Alternative3_In-Situ.mxd 12/10/2018



Legend

- Monitoring Wells
- Mineola City Supply Wells
- OU-1 Boundary
- OU-2 Boundary

Total CVOC Concentration

- > 500 ppb
- 100 - 500 ppb
- 5- 100 ppb

Proposed Locations

- Extraction Wells
- Monitoring Wells
- Sentinel Wells
- Ex-Situ Treatment Area

N

Note
All locations are approximate pending Pre-Design Investigation and Remedial Design.

Alternative 4:
Hydraulic Control with Ex-Situ Treatment

1 inch = 200 feet

0 200 400 Feet

Former Garden Photoengraving
Mineola, NY
Figure 6

CDM Smith

HARROLDAM \\ALBSVR2\Alb2_Projects\NYSDEC D007621\WA#19 - Former Garden Photoengraving\03 Reports and Studies\05 Environmental Reports\RI-FS GIS Files\OU2 RIFS Figure\Fig10-2_Alternative4_Hydraulic_Control_with_Ex-Situ.mxd 12/10/2018