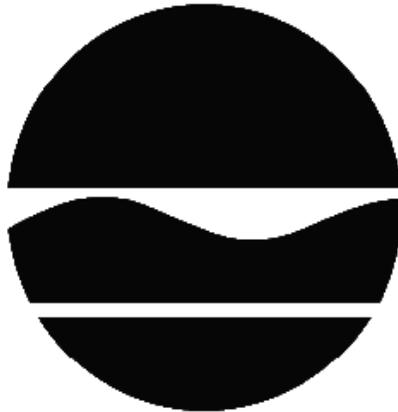


RECORD OF DECISION

Former IBM Endicott Facility
Operable Unit Number 07: NORTHWEST AREA
State Superfund Project
Endicott, Broome County
Site No. 704014
March 2018



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

DECLARATION STATEMENT - RECORD OF DECISION

Former IBM Endicott Facility
Operable Unit Number: 07
State Superfund Project
Endicott, Broome County
Site No. 704014
March 2018

Statement of Purpose and Basis

This document presents the remedy for Operable Unit Number: 07: NORTHWEST AREA of the Former IBM Endicott Facility site, a Class 2 inactive hazardous waste disposal site. The remedial program was chosen in accordance with the 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, and is not inconsistent with the National Oil and Hazardous Substances Pollution Contingency Plan of March 8, 1990 (40CFR300), as amended.

This decision is based on the Administrative Record of the New York State Department of Environmental Conservation (the Department) for Operable Unit Number: 07 of the Former IBM Endicott Facility site and the public's input to the proposed remedy presented by the Department. A listing of the documents included as a part of the Administrative Record is included in Appendix B of the ROD.

Description of Selected Remedy

The elements of the selected remedy are as follows:

Groundwater contamination (remaining after active remediation) will be addressed with monitored natural attenuation (MNA) through natural processes and flushing. Groundwater will continue to be monitored for site related contamination. It is anticipated that contamination will decrease and meet drinking water standards. An assessment of the attenuation will be provided every 5 years. As a contingency remedial action, a Remedial Site Optimization will depend on the information collected from the monitoring program. If the groundwater concentrations do not reach standards in 10 years, a Remedial Site Optimization will be performed to evaluate the potential for further source control in Operable Unit 07 if determined necessary by the Department. This remedy will also maintain engineering controls which were part of the groundwater IRM and include institutional controls, in the form of a consent order, environmental easement and site management plan including a groundwater monitoring plan.

New York State Department of Health Acceptance

The New York State Department of Health (NYSDOH) concurs that the remedy for this site is

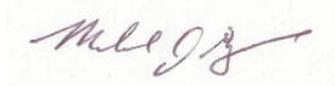
protective of human health.

Declaration

The selected remedy is protective of human health and the environment, complies with State and Federal requirements that are legally applicable or relevant and appropriate to the remedial action to the extent practicable, and is cost effective. This remedy utilizes permanent solutions and alternative treatment or resource recovery technologies, to the maximum extent practicable, and satisfies the preference for remedies that reduce toxicity, mobility, or volume as a principal element.

March 30, 2018

Date



Michael J. Ryan, P.E., Director
Division of Environmental Remediation

RECORD OF DECISION

Former IBM Endicott Facility
Endicott, Broome County
Site No. 704014
March 2018

SECTION 1: SUMMARY AND PURPOSE

The New York State Department of Environmental Conservation (the Department), in consultation with the New York State Department of Health (NYSDOH), has selected 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. The disposal or release of hazardous wastes at this site, as more fully described in this document, has contaminated various environmental media. The remedy is intended to attain the remedial action objectives identified for this site for the protection of public health and the environment. This Record of Decision (ROD) identifies the selected remedy, summarizes the other alternatives considered, and discusses the reasons for selecting the 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 6 NYCRR Part 375. This document is a summary of the information that can be found in the site-related reports and documents.

SECTION 2: CITIZEN PARTICIPATION

The Department seeks input from the community on all remedies. A public comment period was held, during which the public was encouraged to submit comment on the proposed remedy. All comments on the remedy received during the comment period were considered by the Department in selecting a remedy for the site. Site-related reports and documents were made available for review by the public at the following document repositories:

George F. Johnson Memorial Library
Attn: Reference Librarian
1001 Park Street
Endicott, NY 13760
Phone: (607) 757-5350

NYSDEC

Attn: Jessica LaClair
625 Broadway
Albany, NY 12233-7017
Phone: (518) 402-9821

NYSDEC - Region 7
Attn: Stephanie Webb
615 Erie Blvd. West
Syracuse, NY 13204
Phone: (315) 426-7400

A public meeting was also conducted. At the meeting, the groundwater data and the findings of the Extraction Well EN-154R Shutdown Test Report were presented along with a summary of the proposed remedy. After the presentation, a question-and-answer period was held, during which verbal or written comments were accepted on the proposed remedy.

Comments on the remedy received during the comment period are summarized and addressed in the responsiveness summary section of the ROD.

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 IBM Endicott facility is located in the Village of Endicott and in the Town of Union in Broome County, New York. The 135-acre facility lies along and on either side of a railroad corridor in the village and in the town. The central portion of the facility is near the intersection of McKinley Avenue and the railroad in the village. Portions of the facility extend westward to Robble Avenue, northward to Watson Boulevard, eastward to Harding Avenue, and southward to south of North Street. Operable Unit 7 (OU7) the Northwestern Area, the subject of this document, is located west of Oak Hill Avenue and north of the railroad tracks.

Site Features:

The site includes numerous current and former manufacturing buildings, office buildings, and ancillary support facilities. Paved parking areas are generally located around the periphery of the site buildings. An east-west railroad corridor bisects the facility and several public and private roadways intersect or transect the facility. Commercial, industrial, and residential areas surround

the facility on all sides. The former Endicott-Johnson (EJ) rubber cement plant, a State Superfund site, is adjacent to the northwest portion of the former IBM facility. The former Keytronics, Superfund site, along with the Voluntary Cleanup Site Schapiro's Dry Cleaners surround the southern portion of the former IBM facility. The Susquehanna River is approximately one mile south of the facility. Brixius Creek, a small tributary to the Susquehanna, passes along the eastern edge of the facility. The facility is served by municipal water supply, sanitary sewers and storm sewers. OU7 site features includes the Clark Street Campus, the Wastewater Treatment Plant, the former Lagoon/Surface Impoundment and two small buildings (Building 261 and 265) between Robble Avenue and Franklin Street.

Current Zoning and Land Use:

The former IBM Endicott facility property is currently zoned Commercial Industrial. The facility is currently owned by Huron Real Estate Associates, LLC, a real estate leasing and property management company. Huron leases manufacturing and office space in the facility to a variety of tenants. Occupancy and use of the facility changes from time to time as tenant needs and availability of leasable space changes. Most of the facility footprint is currently occupied or available for occupancy. An exception is the group of buildings in the oldest portion of the facility (informally known as the Old Group buildings) located along the north side of North Street east of McKinley Avenue.

Past Use of the Site:

The site was first developed by the Erie-Lackawanna Railroad around 1850. Additional development occurred beginning in 1901 by predecessors to the Endicott-Johnson Corporation, and beginning in 1904 by predecessors to the IBM Corporation. The site has a history of manufacturing and research and development beginning in the early 1900s.

Early industrial activity was associated primarily with shoe manufacturing by Endicott-Johnson and its predecessors in the western portion of the site. Associated on-site industries related to shoe manufacturing included leather tanning, box container manufacturing, chemical manufacturing, and an iron foundry. The railroad transported raw materials (including chemicals) to the site and finished products from the site. Solvents reportedly used by Endicott-Johnson as a part of its operations included carbon tetrachloride, trichloroethene (TCE), tetrachloroethene (PCE), 1,1,1-trichloroethane (TCA), methylene chloride, methyl ethyl ketone, toluene, xylene, and mixtures containing aromatics (gasoline, rubber solvent and mineral spirits). Endicott-Johnson ceased manufacturing operations in the village by about 1980.

IBM and its predecessors also operated at the site beginning in the early 1900s in the Old Group buildings east of McKinley Avenue. IBM gradually expanded into areas previously occupied by Endicott-Johnson as the latter company reduced its manufacturing capacity. Mechanical business machines were manufactured by IBM and its predecessors until the 1950s. From the 1950s to the early 1980s, the facility was engaged primarily in the manufacture of mid-range, mainframe computers. In the early 1980s, operations at the facility primarily shifted to the manufacture of components (circuit cards, circuit panels, and ceramic substrates) in support of other IBM electronics manufacturing activities. The primary solvents used by IBM as part of its mainframe computer and electronic component manufacturing operations included TCE, PCE, TCA, methylene chloride, and Freon 113. The site was sold to Huron Real Estate Associates, LLC in

2002.

Operable Units:

The former IBM Endicott site is divided into seven 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. Boundaries of the operable units at the Endicott site are generally defined by the limits of hydraulic capture in the various components of the groundwater remediation program or by convenient geographical features.

The various Operable Units at the former IBM Endicott facility are identified in the Consent Order and are described below. A site location map is attached as Figure 1. An area designation map is attached as Figure 2.

Operable Unit 1 (OU1), also known as the Railroad Corridor Source Area, is the on-site source area in the main plant area where the bulk of contaminant releases occurred. OU1 generally incorporates the central portion of the facility from the railroad corridor northward.

Operable Unit 2 (OU2), also known as the North Street Area, is the on-site portion of the main plant area south of the railroad and generally north of North Street.

For purposes of investigation and remediation, OU1 and OU2 are usually considered together because they are both on-site areas separated only by the railroad.

Operable Unit 3 (OU3), also known as the Southern Area, is the southern portion of the groundwater plume associated with the OU1 and OU2 source areas. OU3 extends approximately from Monroe Street southward to the Susquehanna River, and from just west of McKinley Avenue to just east of Arthur Avenue.

For purposes of investigation and remediation, OU3 is generally considered together with an area identified in the Consent Order as Off-Site Capture Zone A because the two areas are contiguous and together represent the off-site plume area south of the main plant area. Off-Site Capture Zone A is the northern portion of the off-site groundwater plume associated with the OU1 and OU2 on-site source areas. Off-Site Capture Zone A extends approximately from North Street southward to north of Broad Street, and from just west of Jefferson Avenue to just east of McKinley Avenue.

Operable Unit 4 (OU4), also known as the Ideal Cleaners Area, is the onsite source area and groundwater plume associated with the former dry cleaning operation. Operable Unit 4 lies east of Off-Site Capture Zone A and extends southward from North Street to approximately Monroe Street. An area identified in the Consent Order as Off-Site Capture Zone B is part of OU4. Off-Site Capture Zone B is the plume area associated with the former Ideal Cleaners and extends from the source area to a line of extraction wells located along Monroe Street between Adams Avenue and the alley east of McKinley Avenue.

Operable Unit 5 (OU5), also known as the Building 57 Area, is the source area and

groundwater plume associated with Building 57/57A which is separate from and east of the main facility. OU5 includes Building 57/57A east of Hayes Avenue and north of the railroad tracks, as well as a former parking lot (known as Parking Lot 26) south of the railroad tracks.

Operable Unit 6 (OU6) is the bedrock groundwater plume and includes all facility-related contamination in the bedrock aquifer.

Operable Unit 7 (OU7), also known as the Northwestern Area, is the onsite source area and groundwater plume associated with historic releases in this area. OU7 includes the portion of the former IBM facility northwest of the main facility and located west of Oak Hill Avenue and north of the railroad tracks.

Site Geology and Hydrogeology:

The geology of the site is characterized by a sequence of unconsolidated glacial and post-glacial sediments overlying a buried bedrock valley. The unconsolidated sediments occur in a vertically downward sequence consisting of (1) post-glacial alluvium, localized to the margins of the Susquehanna River valley in the northern portion of OU7, (2) glacial outwash sand and gravel, (3) glaciolacustrine silt and clay, locally grading to silty very fine sand, and (4) glacial till. Ice-contact sand and gravel may also be present in isolated areas. Where the outwash sand and gravel is below the water table, it constitutes an unconfined water table aquifer (the Upper Aquifer) while the underlying lacustrine silt and clay serves as an aquitard. Three separate water-bearing units are defined in the vicinity of the site: the Upper Aquifer, the Lower Aquifer, and the Bedrock Aquifer. The Upper Aquifer extends beneath the site and is the water-bearing unit most impacted by site-related contamination. Natural groundwater flow in all three units is to the south, ultimately discharging to the Susquehanna River. Groundwater withdrawals and injections for water supply or remediation purposes have altered the natural flow regime by creating artificial discharge and recharge points. Depth to groundwater in the vicinity of the site varies from about 10 to 40 feet below ground surface under pumping conditions.

Operable Unit (OU) Number 07 is the subject of this document. References to “site” in the remainder of this document pertain to this operable unit.

A Record of Decision was issued previously for OUs 03, 04, 05, and 06. A Record of Decision will be issued for OU 01 and 02 in the future.

A site location map is attached as Figure 1, the OU boundary map is attached as Figure 2 and the detailed description of OU7 is attached as Figure 3.

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) were/was evaluated in addition to an alternative which would allow for unrestricted use of the site.

A comparison of the results of the RI 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:

IBM Corporate Environmental Affairs

The Department and IBM entered into a Consent Order on August 4, 2004 (Administrative Order on Consent No. A7-0502-0104). The Consent Order superseded a Part 373 Resource Conservation and Recovery Act (RCRA) Permit that IBM held for the facility. The Consent Order effectively continues the corrective action requirements of the RCRA Permit and obligates the responsible parties to implement a Site-Wide Source Area Evaluation, as well as Supplemental Remedial Investigations (SRIs), Focused Feasibility Studies (FFSs), and/or Interim Remedial Measures (IRMs) for each Operable Unit as described in the Consent Order. The Order also requires Remedial Design/Remedial Action Work Plans for implementing the selected remedies. The Order also requires Remedial Design/Remedial Action Work Plans for implementing the selected remedies.

SECTION 6: SITE CONTAMINATION

6.1: Summary of the Remedial Investigation and Subsequent Activities

Major milestones in remedial investigations and operations implemented by IBM in OU7 following the discovery of VOCs in Upper Aquifer groundwater include (reference Figure 3 for OU7 and surrounding area features of interest):

- 1988 - Closure of the former wastewater treatment lagoon/surface impoundment. Phase I subsoil samples were collected and analyzed for parameters listed in the Federal Appendix IX (1987). A contingency sampling program, based on the results of Phase I sampling was not required since no contamination was found in the Phase I subsoil samples. Sampling of the leak detection system (LDS) identified elevated concentrations of copper and chromium. Phase II subsoil sampling was performed as indicated in the Closure Plan and analyzed for total metals and VOCs. Perimeter soil borings were completed and extended to the water table. The liner materials were removed and disposed of at a licensed hazardous waste disposal facility. Based on sample analyses, the leak detections system (LDS) material was allowed to remain in place. Review of the subsoil and LDS analytical data indicated that no metals contamination was present above restricted residential soil cleanup objectives. There were no detections of PCBs or pesticides in the soils. Closure completion consisted of regrading the impoundment area to promote drainage, covering with topsoil, seeding and fertilizing and mulching to

prevent erosion. The three years of groundwater sampling after the closure had no detections of metals. The Department determined the surface impoundment to be clean closed 5/10/1989.

- 2005 – Completion of a Supplemental Remedial Investigation (SRI) of vertical migration potential in the northwestern area of the Site.
- 2006 – Completion of a Source Area Evaluation and an SRI consisting of an assessment of sewers in the northwestern area of the Site.

The shutdown test of extraction well EN-154R was conducted to determine the effects on VOC concentrations with discontinuing the groundwater extraction in OU7. The extraction well had been operating since 1984. During the first twenty years of operation there was a decline in VOC concentrations between 10 and 100 magnitudes. However, during the last ten years there was little change in VOC contaminant concentrations. The results of the shutdown test indicate that termination of EN-154R groundwater withdrawals has resulted in some slight increases in concentrations of certain VOC constituents in a few wells as the plume shifts to the West under non-pumping conditions.

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 Operable Unit includes data for:

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

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 and Extraction Well EN-154R Shutdown 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)	1,1,1-TCA
trichloroethene (TCE)	1,1-dichloroethane
vinyl chloride	Freon 113
cis-1,2-dichloroethene	Freon 123a

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

groundwater

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 Removal

In 1984, based on sampling of the "Clark Street Campus" in OU7, IBM determined there was soil contaminated with chromium and several VOCs (PCE, TCE, 1,1,1-TCA, methylene chloride and toluene). IBM performed a soil removal action before occupying the property and removed and disposed of nearly 780 tons of contaminated soil. The area was approximately 37,000 square feet. The surface impoundment located south of Building 95 was certified clean closed in 1988.

IRM Groundwater Extraction and Treatment

As an interim remedial measure (IRM) beginning in 1984, IBM has been operating a system of extraction wells and treatment facilities in the OU7 Area. The system is commonly referred to as a pump-and-treat system and is designed to extract contaminated groundwater and treat for removal of site-related contaminants. The purpose of the system was to shrink the size of the groundwater plume, reduce contaminant concentrations to below applicable groundwater standards to the extent practicable, and prevent further migration of site-related contaminants to off-site areas.

The extraction system creates a depression of the water table so that contaminated groundwater is directed toward the extraction well within the plume area. Groundwater was extracted from the subsurface from the area of the groundwater contaminant plume via a well that withdraws contaminated water from the Upper Aquifer. Extracted groundwater was then transferred via double-walled underground pipes to Robble Groundwater Treatment Facilities (GTF). At the treatment facility, contaminated groundwater was passed through a shallow tray air stripper and discharged to the municipal storm sewer system and, ultimately, to the Susquehanna River. This system operated for 30 years before the shut-down test was initiated in 2014.

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 07.

Nature and Extent of Contamination

Operable Unit 7 (Northwest Area), Soil:

Soil samples were collected and analyzed for SVOCs, PCBs and Pesticides and the results were non-detect. The concentrations of detected VOCs were below the unrestricted use SCOs. There were two locations that had detections of cadmium and chromium that were above the unrestricted use SCOs but below the commercial use SCOs. The location with the detection of chromium above the unrestricted used SCO is in subsurface soils between 4-5 feet and does not pose a risk to human health. The location with the detection of cadmium is an isolated location and would not prevent unrestricted use of the soils. For OU7, soils meet unrestricted use SCOs across the site except this one location. With the exception of a couple of isolated exceedances, on-site soil meets unrestricted use soil cleanup objectives. This indicates that soil at the site is suitable for unrestricted, residential, restricted-residential, commercial, and industrial uses, consistent with the site's current zoning.

Operable Unit 7 (Northwest Area), Groundwater:

The primary contaminants of concern in OU7 groundwater are TCE, TCA, and their breakdown products. The monitoring wells in the southern portion of OU7 are below or approaching the

groundwater standards except for two onsite wells, EN96 and EN150. The offsite area to the south has two monitoring wells, MW5 and MW6, with concentrations of 1,1,1-TCA and PCE above drinking water standards. The offsite PCE plume to the south of OU7 is not associated with the former IBM Endicott facility. Other contaminants are generally near the groundwater standards.

Operable Unit 7 (Northwest Area), Sub-slab Vapor and Indoor Air

Huron conducted a Preliminary Site Assessment (PSA) in 2005. The PSA was designed to provide an onsite assessment of soil vapor intrusion. This included sampling of indoor air, sub-slab vapor and outdoor air for five buildings in OU7. Indoor air results were within background ranges in all of the buildings sampled in OU7. VOCs were found in sub-slab vapor samples beneath each building tested, with the highest concentration found being PCE at an estimated concentration of 15 micrograms per cubic meter (mcg/m³). VOCs were found to be within background ranges in outdoor air samples. Overall, these results and the results of environmental sampling in OU7, indicate that there are no concerns for soil vapor intrusion in OU7.

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*.

People are not drinking the groundwater because the area is served by a public water supply that is not affected by this contamination.

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.

SECTION 7: SUMMARY OF THE SELECTED 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 based on the results of remedial investigations and the implementation of over three decades of interim remedial measures.

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 selected remedy is set forth at Exhibit D.

The selected remedy is referred to as the Monitored Natural Attenuation remedy.

The estimated present worth cost to implement the remedy is \$182,000. The cost to construct the remedy is estimated to be \$0 and the estimated average annual cost is \$11,800.

The elements of the selected remedy, including the IRMs already completed, are as follows:

Institutional Control

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

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

Site Management Plan

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

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

Institutional Controls: The Environmental Easement discussed above and consent order.

Engineering Controls: monitoring wells

This plan includes, but may not be limited to:

- descriptions of the provisions of the environmental easement including any land use and groundwater use restrictions;
 - provisions for the management and inspection of the identified engineering controls;
 - maintaining site access controls and Department notification; and
 - the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.
2. As a contingency remedial action, a Remedial Site Optimization will be performed to evaluate the potential for further source control for sources in Operable Unit 07 if determined necessary by the Department such as, if the groundwater concentrations do not reach standards in 10 years.
 3. A Monitoring 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; and
 - a schedule of monitoring and frequency of submittals to the Department.

Exhibit A

Nature and Extent of Contamination

This section describes the findings of the Extraction Well EN-154R Shutdown Test Report and the Surface Impoundment Closure Certification Report for all environmental media that were evaluated. As described in Section 6.1, samples were collected from groundwater, soil, sub-slab soil vapor and indoor air 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 table presents 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 volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides/ polychlorinated biphenyls (PCBs), and inorganics (metals and cyanide) for soils and VOCs for groundwater. 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 from the upper aquifer onsite and offsite monitoring wells for site related contaminants. The samples were collected to assess the extent of site-related groundwater contamination on and off-site following the shutdown of extraction well EN154R. The results indicate that there is residual contamination in shallow groundwater at the site that exceeds the SCGs for volatile organic compounds. Wells EN-96 and EN-154R had an abrupt change in concentrations of several constituents shortly after the EN-154R shutdown. The abrupt rise in concentrations for well EN-96 and the abrupt decline in concentrations for well EN-154R is likely due to a westward shift in the residual plume once EN-154R groundwater withdrawals were terminated. The more gradual upward trend in concentrations during the initial two years of post-shutdown monitoring, followed by a leveling off or a slight decline in concentrations is also observed with the concentration data for wells EN-150 and EN-152. The two years after the shutdown showed a gradual increase in contaminant concentrations in Well EN-96. The last round of sampling showed all contaminants except 1,1,1-TCA declining.

Table #1 - Groundwater

Detected Constituents	Concentration Range Detected (ppb) ^a	SCG ^b (ppb)	Frequency Exceeding SCG
VOCs			
1,1-Dichloroethane	ND - 34	5	3/12
1,1-Dichloroethene	ND - 4.9	5	0/12
1,1,1-Trichloroethane	ND - 95	5	3/12
Cis-1,2-Dichloroethene	ND - 31	5	3/12
Trans-1,2-Dichloroethene	ND - .5	5	0/12
Freon 113	ND - 23	5	1/12
Freon 123a	ND - 5.6	5	1/12

Detected Constituents	Concentration Range Detected (ppb) ^a	SCG ^b (ppb)	Frequency Exceeding SCG
Tetrachloroethene	ND - 30	5	3/12
Trichloroethene	ND - 3.4	5	0/12
Vinyl Chloride	ND - 4.5	2	2/12

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, cis-DCE, VC, 1,1,1-TCA, 1,1-DCA, Freon113 and Freon123a. The majority of ethane compounds detected in the southern portion of OU#7 appear to come from the former tank area of the former Endicott Johnson Rubber Cement Plant, located northwest of Franklin Street. The 1,1,1-TCA plume extends to the south onto the RMJ Realty LLC property and does not appear to be related to OU7. PCE is also present on the RMJ Realty LLC property between the Norfolk Southern railroad tracks and the North Street and is associated with former dry cleaning operations.

Based on the findings of the Extraction Well EN-154R Shutdown Test there is some remaining contamination in the groundwater. The site contaminants that require evaluation for remediation will be: PCE, cis-DCE, VC, 1,1,1-TCA, 1,1-DCA, Freon113 and Freon123a.

Soil

Soil samples were collected during the closure of the surface impoundment in 1988 in accordance with the approved closure plan. The results were non-detect for SVOCs, PCBs and Pesticides. The concentrations of detected VOCs were below the unrestricted use SCOs. There were two detections of metals, cadmium and chromium, above the unrestricted use SCOs but below the commercial use SCOs.

Table #2

Detected Constituents	Concentration Range Detected (ppm) ^a	Unrestricted SCG ^b (ppm)	Frequency Exceeding Unrestricted	Commercial Restricted Use SCG ^c (ppm)	Frequency Exceeding Commercial Restricted SCG
VOCs					
1,1,1-Trichloroethane	ND	100	0/32	500	0/32
1,1-Dichloroethane	ND	19	0/32	240	0/32
1,1-Dichloroethene	ND	100	0/32	500	0/32
1,2-Dichloroethane	ND	2.3	0/32	30	0/32
Acetone	ND-70	100	0/32	500	0/32
Carbon tetrachloride	ND	1.4	0/32	22	0/32
cis-1,2-Dichloroethene	ND	59	0/32	500	0/32
Ethylbenzene	ND	30	0/32	390	0/32
Methylene chloride	ND-57	100	0/32	500	0/32
Tetrachloroethene	ND	5.5	0/32	150	0/32
Toluene	ND	100	0/32	500	0/32
Trans-1,2-Dichloroethane	ND	100	0/32	500	0/32
Trichloroethene	ND	10	0/32	200	0/32
Vinyl chloride	ND	.21	0/32	13	0/32
Xylenes (total)	ND	100	0/32	500	0/32

Metals					
Cadmium	ND-4	2.5	1/30	9.3	0/30
Chromium, hexavalent	ND	22	0/30	400	0/30
Chromium, trivalent	ND-180	36	1/30	1,500	0/30
Copper	2-83	270	0/30	270	0/30
Total Cyanide	ND-15.9	27	0/36	27	0/36
Lead	ND-72	400	0/30	400	0/30
Nickel	ND-29	140	0/30	310	0/30
Silver	ND-2	36	0/30	1,500	0/30
PCBs/Pesticides					
2,4,5-TP Acid	ND	58	0/6	500	0/6
4,4'-DDE	ND	1.8	0/6	62	0/6
4,4'-DDT	ND	1.7	0/6	47	0/6
4,4'-DDD	ND	2.6	0/6	92	0/6
Aldrin	ND	0.019	0/6	0.68	0/6
Alpha-BHC	ND	0.097	0/6	3.4	0/6
Beta-BHC	ND	0.072	0/6	3	0/6
Chlordane (alpha)	ND	.91	0/6	24	0/6
Delta-BHC	ND	100	0/6	500	0/6
Dibenzofuran	ND	14	0/6	350	0/6
Dieldrin	ND	.039	0/6	1.4	0/6
Endosulfan I	ND	4.8	0/6	200	0/6
Endofulfan II	ND	4.8	0/6	200	0/6
Endoculfan sulfate	ND	4.8	0/6	200	0/6
Endrin	ND	2.2	0/6	89	0/6
Heptachlor	ND	.42	0/6	15	0/6
Lindane	ND	.28	0/6	9.2	0/6
Polychlorinated Biphenyls	ND	1	0/6	1	0/6
Semi volatiles					
Acenaphthene	ND	100	0/6	500	0/6
Acenaphthylene	ND	100	0/6	500	0/6
Anthracene	ND	100	0/6	500	0/6
Benz(a)anthracene	ND	1	0/6	5.6	0/6
Benzo(a)pyrene	ND	1	0/6	1	0/6
Benzo(b)fluoranthene	ND	1	0/6	5.6	0/6
Benzo(g,h,i)perylene	ND	100	0/6	500	0/6
Benzo(k)fluoranthene	ND	1	0/6	56	0/6
Chrysene	ND	1	0/6	56	0/6
Dibenz(a,h)anthracene	ND	.33	0/6	5.6	0/6
Fluoranthene	ND	100	0/6	500	0/6
Indeno(1,2,3-cf)pyrene	ND	.5	0/6	5.6	0/6
Naphthalene	ND	100	0/6	500	0/6
Phenol	ND	100	0/6	500	0/6

a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;

b - SCG: Part 375-6.8(a), Unrestricted Soil Cleanup Objectives.

c - SCG: Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Public Health for {Insert Allowable Use} Use, unless otherwise noted.

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

The site is zoned for commercial use and the soils meet the commercial use SCOs. The surface impoundment was certified clean closed by the Department on May 10, 1989.

Sub-slab Vapor and Indoor Air

To determine whether actions are needed to address exposures related to soil vapor intrusion in OU7, indoor air, sub-slab vapor, and outdoor air samples were collected at several on-site buildings. Indoor air results were within background ranges in all of the buildings sampled in OU7. VOCs were found in sub-slab vapor samples beneath each building tested, with the highest concentration found being PCE at an estimated concentration of 15 micrograms per cubic meter (mcg/m³). VOCs were found to be within background ranges in outdoor air samples. Overall, these results and the results of environmental sampling in OU7, indicate that there are no concerns for soil vapor intrusion in OU7.

Exhibit B

Description of Remedial Alternatives

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

Alternative 1: No Further Action

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

Alternative 2: No Further Action with Site Management

The No Further Action with Site Management Alternative recognizes the remediation of the site completed by the IRM(s) described in Section 6.2 and Site Management and Institutional Controls and Engineering Controls are necessary to confirm the effectiveness of the IRM. This alternative maintains engineering controls which were part of the groundwater IRM and includes institutional controls, in the form of a consent order, environmental easement and site management plan, including a groundwater monitoring plan, necessary to protect public health and the environment from contamination remaining at the site after completion of the IRMs.

Present Worth: \$154,000
Capital Cost: \$0
Annual Costs: \$10,000

Alternative 3: Monitored Natural Attenuation

Groundwater contamination (remaining after active remediation) will be addressed with monitored natural attenuation (MNA). Groundwater will be monitored for site related contamination. It is anticipated that contamination will decrease by an order of magnitude in a reasonable period of 10 years. Reports of the attenuation will be provided at 5 and 10 years, and active remediation will be proposed if it appears that natural processes alone will not address the contamination associated with OU7 and if determined necessary by the Department. The contingency remedial action will depend on the information collected, but it is currently anticipated that a Remedial Site Optimization to evaluate the potential for further source control for sources in OU7 would be the expected contingency remedial action. This alternative also includes the elements of Alternative # 2.

Present Worth: \$182,000
Capital Cost: \$0
Annual Costs: \$11,800

Alternative 4: GW Extraction & Treatment

The groundwater extraction and treatment system that was shut down in 2014 will be restarted and resume treatment of contaminated groundwater. The groundwater extraction system will be restarted so that the capture zone is sufficient to pull the groundwater contaminant plume onto the site and to stop further migration through the site. The extraction system will create a depression of the water table so that contaminated groundwater is directed toward the extraction well within the plume area. Groundwater will be extracted from the subsurface using the existing extraction well (EN154R) in the southern portion of OU7.

Present Worth: \$922,000
Capital Cost: \$0
Annual Costs: \$60,000

Exhibit C**Remedial Alternative Costs**

Remedial Alternative	Capital Cost (\$)	Annual Costs (\$)	Total Present Worth (\$)
No Further Action	0	0	0
No Further Action with Site Management	0	\$10,000	\$154,000
Monitored Natural Attenuation	0	\$11,800	\$182,000
GW Extraction & Treatment	0	\$60,000	\$922,000

Exhibit D

SUMMARY OF THE SELECTED REMEDY

The Department selected Alternative 3, Monitored Natural Attenuation as the remedy for this site. Alternative 3 would achieve the remediation goals for the site by monitoring the groundwater for any meaningful change that would adversely affect human health or the environment. The elements of this remedy are described in Section 7.

Basis for Selection

The selected remedy is based on the results of the Annual Groundwater Reports and the Extraction Well EN-154R Shutdown Test Report. The criteria to which potential remedial alternatives are compared are defined in 6 NYCRR Part 375.

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.

All of the Alternatives with the except of Alternative 1 are protective of human health and the environment. Potential exposure pathways associated with the remaining contamination in OU7 are limited to ingestion of or direct contact with contaminated groundwater. This is unlikely because people are not drinking water from this aquifer because the area is served by a public water supply that is routinely tested to ensure that it meets drinking water standards. A potential exposure pathway exists for workers who may come in contact with groundwater while drilling or sampling. Alternative 1 (No Action) does not require any monitoring to ensure the protection of public health and the environment if circumstances change and will not be evaluated further. The selected remedy (Alternative 3) would satisfy this criterion by continuing to monitor the groundwater to determine if natural attenuation will achieve applicable standards or if further offsite investigation is necessary.

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 3 would rely on natural attenuation to achieve the protection of groundwater SCOs with a contingency for a Remedial Site Optimization to evaluate the potential for further source control if there is an increase in concentrations. Alternative 4 would restart and continue pumping and treating groundwater from an extraction well EN-154R in OU7 and would also comply with this criterion. Alternative 2 does not provide for a Remedial Site Optimization if the review of the data indicates that there may be other contamination sources.

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.

Currently the levels of contamination in OU7 are low and the potential exposure pathways are limited to coming into contact with groundwater during sampling efforts. The magnitude of risks for Alternative 3 and Alternative 4 are similar. Alternative 4 operated for 30 years, prior to shut down in 2014. The first 20 years showed a dramatic decrease in contaminant concentrations, however the last 10 years of operation indicated minimal changes to the contaminant concentrations. Both Alternatives would require use restrictions and long-term monitoring of the groundwater until the drinking water standards have been met.

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 3 would control potential exposures with institutional controls only and would reduce the toxicity, mobility or volume of contaminants remaining by natural attenuation. Alternative 4 would control potential exposures with institutional controls and by continuing to extract and treat the surrounding groundwater. However, based on the concentrations observed over the last ten years and during the three-year shutdown test the contamination levels have not changed significantly and are not expected to have any meaningful decreases with the continued operation of the extraction system.

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

Alternatives 3 and 4 both have minimal short-term impacts on the community (noise, increased traffic, air emissions) since all the infrastructure is already in place. Alternative 3 would have lower greenhouse gas emissions and fuel/energy use than Alternatives 4. Risks to remedial workers would be comparable between the two alternatives.

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

Alternatives 3 and 4 are each implementable. Both Alternatives would require monitoring and maintenance of the monitoring wells. Alternative 4 would also require operation and maintenance of the extraction well and treatment system.

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.

Alternative 3 has a low cost and the contaminated groundwater will be addressed through monitored natural attenuation and institutional controls. Alternative 4 is the more expensive alternative due to the expense of running the extraction well and treatment system. The operation of the pump and treat system will continue to draw non-site related contaminated groundwater onto the site from surrounding superfund site.

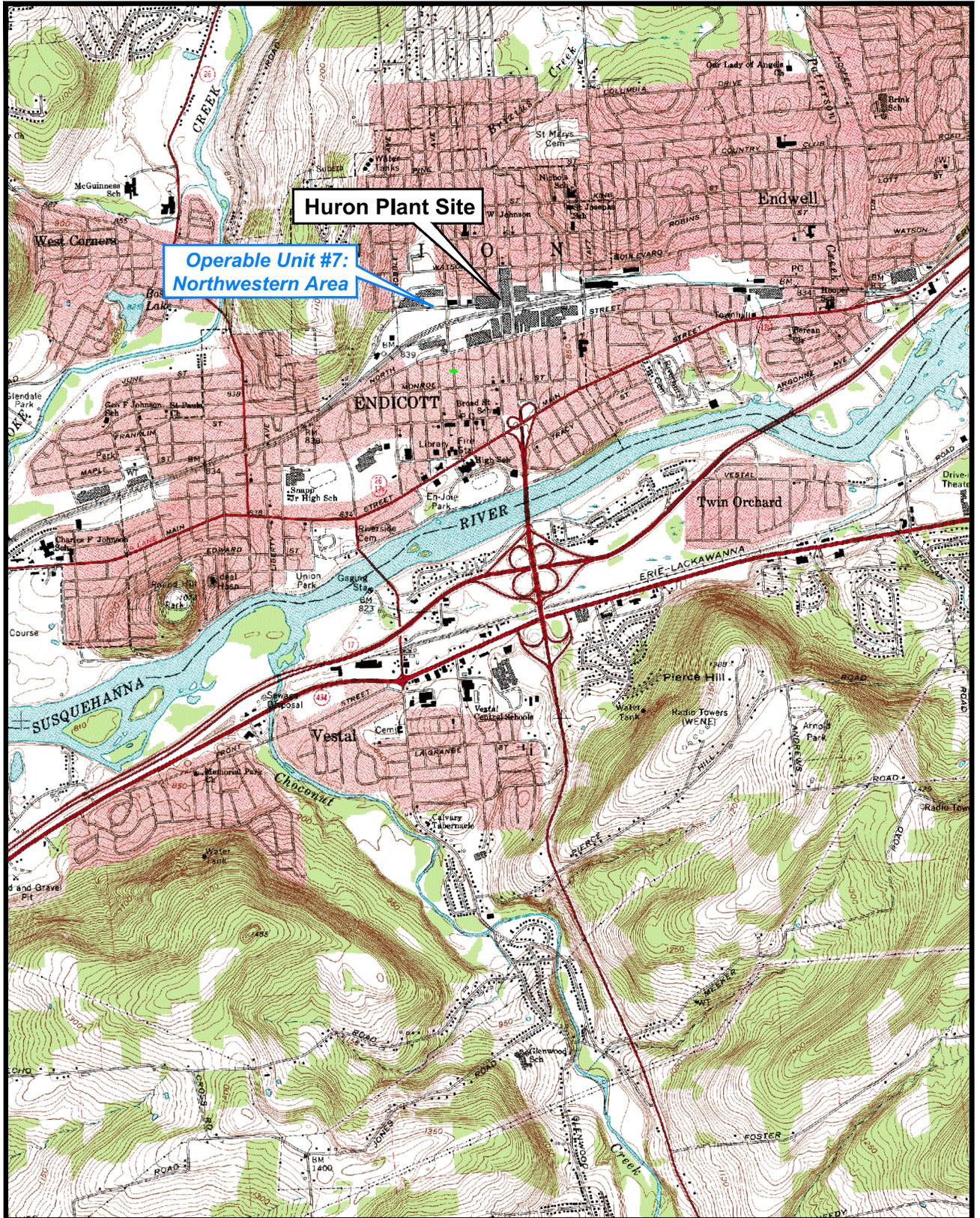
8. Land Use. When cleanup to pre-disposal conditions is determined to be infeasible, the Department may consider the current, intended, and reasonable anticipated future land use of the site and its surroundings in the selection of the soil remedy.

The anticipated future use of the site is commercial. Alternatives 3 and 4 would both allow for commercial site use and the implementation of a Groundwater Management Plan. OU7 is suitable for unrestricted or residential use, which allows for restricted-residential, commercial, and industrial uses.

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 would be issued describing the differences and reasons for the changes.

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

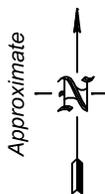


Portion of the Endicott, New York
7.5-minute USGS Quadrangle
(1969; Photoinspected 1976)

Figure 1

*Former IBM Endicott Site
Site #704014*

Site Location Map



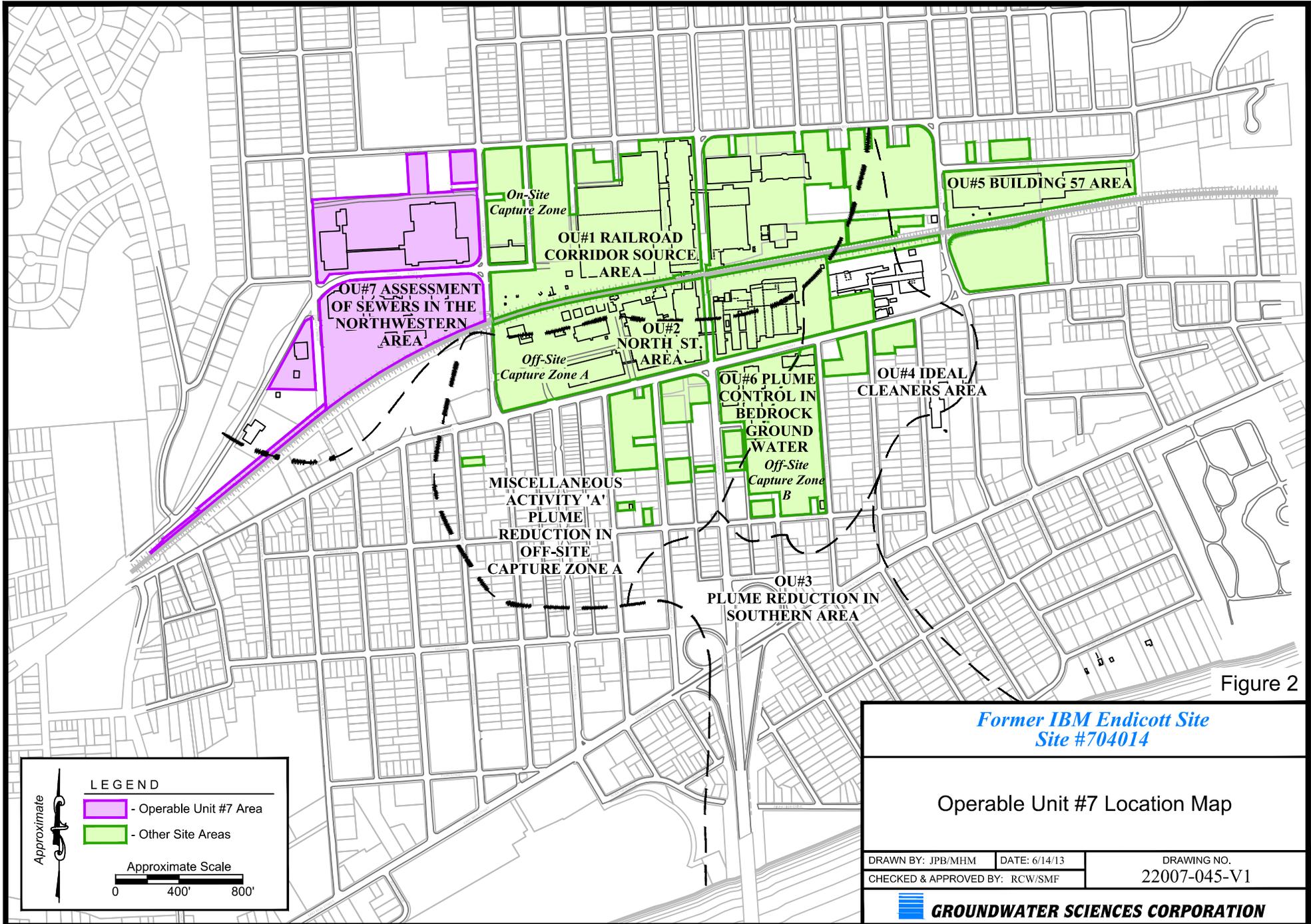


Figure 2

*Former IBM Endicott Site
Site #704014*

Operable Unit #7 Location Map

DRAWN BY: JPB/MHM	DATE: 6/14/13	DRAWING NO.
CHECKED & APPROVED BY: RCW/SMF		22007-045-V1

LEGEND

Approximate

- ▲ - Upper Aquifer Monitoring Well
- ▲ (purple) - RMJ Realty, LLC (Schapiro's) Monitoring Well
- ★ (red) - Upper Aquifer Extraction Well
- ★ (red) - Upper Aquifer Extraction Test Well
- - - - - Approximate Limits of OU#7

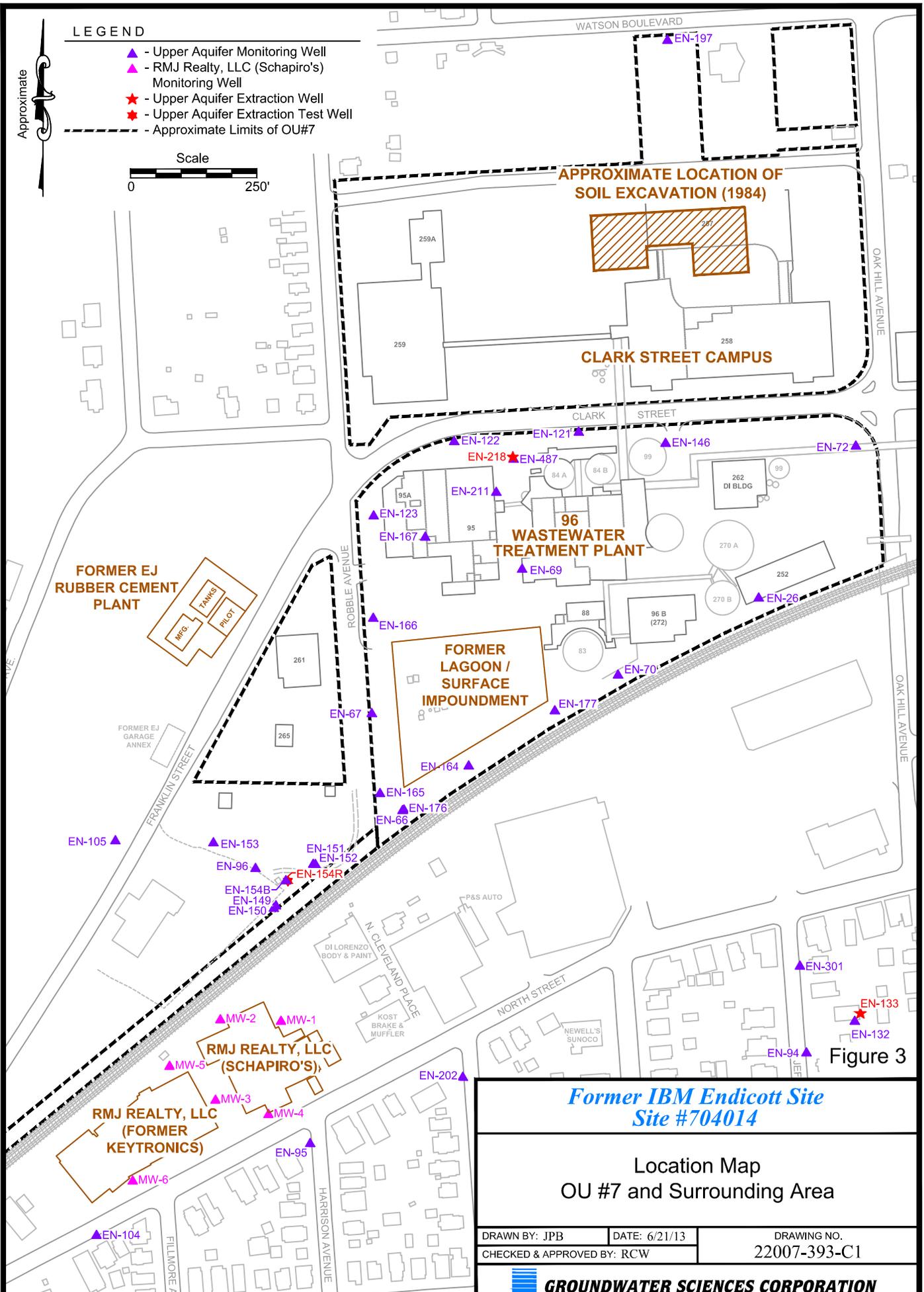
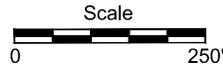


Figure 3

**Former IBM Endicott Site
Site #704014**

**Location Map
OU #7 and Surrounding Area**

DRAWN BY: JPB	DATE: 6/21/13	DRAWING NO.
CHECKED & APPROVED BY: RCW		22007-393-C1

GROUNDWATER SCIENCES CORPORATION

APPENDIX A

Responsiveness Summary

RESPONSIVENESS SUMMARY

**Former IBM Endicott
Operable Unit Number 07: Northwest Area
State Superfund Project
Village of Endicott, Broome County, New York
Site No. 7-04-014**

The Proposed Remedial Action Plan (PRAP) for the former IBM Endicott OU7 site was prepared by the New York State Department of Environmental Conservation (the Department) in consultation with the New York State Department of Health (NYSDOH) and was issued to the document repositories on February 24, 2018. The PRAP outlined the remedial measure proposed for the contaminated groundwater at the former IBM Endicott OU7 site.

The release of the PRAP was announced by sending a notice to the public contact list, informing the public of the opportunity to comment on the proposed remedy.

A public meeting was held on March 8, 2018, which included a presentation of the results from the Extraction Well EN-154R Shutdown Test Report for the former IBM Endicott OU7 site as well as a discussion of the proposed remedy. The meeting provided an opportunity for citizens to discuss their concerns, ask questions and comment on the proposed remedy. These comments have become part of the Administrative Record for this site. The public comment period for the PRAP ended on March 26, 2018.

This responsiveness summary responds to all questions and comments raised during the public comment period. The following are the comments received, with the Department's responses:

Mitchell E. Meyers, Manager, Environmental Remediation, IBM Corporate Environmental Affairs, submitted a letter dated March 20, 2018 which included the following comments:

COMMENT 1:

We do not believe that the proposed remedy is appropriately limited to addressing the impacts specific to IBM's former ownership and operations in OU7.

The purpose of the Shutdown Test, during which IBM conducted more than three years of groundwater monitoring, was to determine if meaningful changes to groundwater conditions would occur in OU7. The Shutdown Test results did not indicate a meaningful change in groundwater quality conditions specific to IBM's ownership and operations at OU7. Shutdown Test monitoring indicated that the greatest increases in concentrations were for specific VOC constituents that originate from the former EJ rubber cement plant New York State (NYS) Inactive Hazardous Waste Site (IHWS) #74018). Furthermore, the findings of the Shutdown Test indicated that due to significant attenuation of the groundwater plume within OU7, none of the increases, despite the impacts from the upgradient, non-IBM source, resulted in meaningful changes to groundwater quality within the RMJ Realty, LLC property located downgradient of OU7.

It is important and relevant to note, the RMJ Realty, LLC property contains the former Keytronics site (NYS IHWS #704001) and the former Shapiros site (NYS Voluntary Cleanup Program Site #V006677-7), which are unrelated to IBM's former ownership and operations. Historical operations within the RMJ Realty, LLC property resulted in releases of VOCs and recent groundwater monitoring data indicates concentrations for tetrachloroethene (PCE) on this property are roughly an order of magnitude higher than those at OU7.

It is also important to note, the findings of the EN-154R Shutdown Test do not identify any remaining VOC sources within OU7 for which IBM is responsible.

RESPONSE 1:

See Response 4 below.

COMMENT 2:

We do not believe the proposed Monitored Natural Attenuation (MNA) remedy is technically applicable to the conditions in OU7.

Results of remedial investigations and groundwater monitoring at the Site indicate geochemical conditions for the unconfined water table aquifer (Upper Aquifer) are naturally oxidizing due to seasonal water level fluctuations and recharge of oxygenated water from the vadose zone. This condition is especially prominent in specific portions of OU7 due to exfiltration of oxygenated water from leaking storm sewers. The reducing conditions that are necessary for in-situ reductive dechlorination of VOC mass in groundwater are extremely localized to fine-grained soils where groundwater flow is less pronounced. The majority of the 1,1,1-trichloroethane (TCA), trichloroethene (TCE), and Freon 113 daughter products present in the groundwater within OU7 are primarily products of co-metabolic or abiotic degradation rather than reductive dechlorination. For these reasons, sampling for MNA indicators is unwarranted and unnecessary.

It is important to note, that none of the potential degradation pathways are expected to provide reductions in VOC concentrations sufficient to meet water quality standards within the proposed 10-year MNA remedy period due to contamination entering OU7 from an upgradient, non-IBM source (former EJ rubber cement plant).

It is also important to note, if a Focused Feasibility Study (FFS) had been required for OU7, IBM would have screened MNA from consideration for all of the technical reasons stated above.

Finally, NYSDEC and NYSDOH held meetings in 2013, both between the agencies and with IBM, to discuss the scope and intent of the proposed Shutdown Test and to clarify IBM's responsibilities were recognized to be applicable only to groundwater conditions associated with IBM's former ownership and operations in OU7.

RESPONSE 2:

See Response 4 below.

COMMENT 3:

We do not believe that the contingency remedial action and remedial site optimization portion of the proposed MNA remedy are either appropriate or applicable to IBM's responsibilities at OU7.

As stated above, results of the Shutdown Test identified no remaining sources of VOC contamination in groundwater specific to IBM's former ownership and operations in OU7. Instead, the findings of the test showed that the greatest VOC concentrations in OU7 groundwater were originating from an upgradient, non-IBM source (former EJ rubber cement plant). Therefore, the proposed five- and ten-year reporting programs followed by remediate site optimization and/or contingency remedial action should not be part of the remedy for OU7. The remedy for OU7 should be limited to addressing the VOC presence related to IBM's former ownership and operations in OU7 and not include potential remedial actions focused on addressing upgradient releases for which others are responsible.

RESPONSE 3:

See Response 4 below.

COMMENT 4:

We believe that the appropriate remedy for OU7 is No Further Action with Site Management.

In accordance with the remedy selection process stated in 6 NYCRR Part 374, a No Further Action (NFA) with Site Management remedy would be appropriate and effective to meet the PRAP's remedial objectives for OU7 and to mitigate all significant threats to public health and the environment presented by the presence of VOCs in groundwater at OU7 for which IBM is responsible. The NFA remedy would include the existing environmental easement for the Site that prevents ingestion, direct contact, and inhalation of volatiles from groundwater containing VOCs. The Site Management Plan would include on site monitoring of groundwater to confirm that there are no meaningful changes in VOC concentrations associated with IBM's former ownership and operations in OU7, along with reporting of the monitoring results in the annual report for the Site. Should monitoring show that there are meaningful changes in VOC concentrations associated with IBM's former ownership and operations in OU7, we are aware that the NYSDEC has mechanisms to re-open IBM's responsibilities at this Site.

RESPONSE 4:

The Department understands that other sites may have contributed to the groundwater contamination that was detected in OU7. The contingent remedy is required if concentrations increase and the Department determines an investigation is necessary to locate potential source areas not previously addressed by IBM or other potentially responsible parties. Although the contaminant levels have decreased significantly during the 30 years of pumping and treating of the groundwater, there are still levels of contaminants in OU7 above the drinking water standard. Therefore, the Department does not believe that a No Further Action remedy is appropriate to be protective of human health and the environment. EPA considers all natural processes, not just biodegradation, as MNA, and the Department believes a MNA remedy is appropriate.

It appears that the Department and IBM both agree that shutting down the extraction well EN-154R and continuing to monitor and assess the groundwater in OU7 are appropriate. IBM also

recognizes that the Department has mechanisms to re-open IBM's responsibilities at the site. The contingency remedy will be implemented if the Department determines it is necessary to evaluate other potential source areas regardless of who the responsible party may be.

The Department agrees that monitoring for biologically driven MNA indicators is not appropriate for OU7 and the Record of Decision (ROD) has been revised to remove this requirement. The ROD has also been revised to clearly describe that any source control measures evaluated under this remedy would pertain only to OU7.

The following comments were received during the public meeting held March 8, 2018:

COMMENT 5:

Are there concerns with algae blooms associated with this groundwater contamination?

RESPONSE 5:

Blue-green algae are microscopic organisms that are naturally present in lakes and streams and generally only a concern in surface water and not in the groundwater such as is the focus of this remedy. However, this area is served by a public water system and drinking water is protected by the local water supplier to address possible contaminants, including blue-green algae and associated toxins.

COMMENT 6:

I understand there are no exposures concerns, but what about psychological effects?

RESPONSE 6:

Although psychological effects such as stress experienced by a community related to environmental contamination are hard to measure, DOH does recognize that this stress sometimes occurs and takes actions as needed to help minimize that stress to the extent that is possible.

COMMENT 7:

Can you explain where the storm sewer daylight and if any past investigations studied them?

RESPONSE 7:

The Assessment of Sewers report dated June 27, 2006 shows the storm sewer running through OU7 north of Clark Street, along the western side of Franklin Street and eventually to the Susquehanna River. Historical sampling performed by IBM from 1995 through 2002 showed no VOCs were detected in the storm sewer south of the site. In addition, a Department contractor sampled the sewers between the site and the Susquehanna River and the three grab samples did not indicate the presence of contaminants of concern.

COMMENT 8:

On Slide 10, when you are discussing EN-096 it appears that the groundwater concentrations are increasing. Please explain.

RESPONSE 8:

The abrupt rise in concentrations for well EN-96 and the abrupt decline in concentrations for well EN-154R is likely due to a westward shift in the VOC constituent plumes once EN-14R groundwater withdrawals were terminated. The more gradual upward trend followed by a leveling off in concentrations is attributed to greater VOC mass transfer from the outwash soils to groundwater due to slower groundwater flow velocities under non-pumping conditions.

COMMENT 9:

On Slide 24, why are there costs associated with Alternative 2 NFA with Site Management?

RESPONSE 9:

NFA with Site Management still has costs associated with the collection and analysis of the groundwater.

COMMENT 10:

Can someone make sure that the treatment system be kept in place and maintained in case we need to restart it?

RESPONSE 10:

The Department cannot require the continued maintenance of a treatment system that is no longer required as part of the selected remedy.

COMMENT 11:

What would prevent someone from pouring concrete down the well?

RESPONSE 11:

The wells are part of a remedial system and destroying a well without permission from the Department would be a violation of the Environmental Conservation Law (ECL).

COMMENT 12:

Is the NYSDOH concerned about asbestos?

RESPONSE 12:

The NYSDOH is concerned with asbestos contamination in general and concerned citizens can contact the NYSDOH for health effects information related to asbestos by calling (518) 402-7800, however, the NYS Department of Labor oversees the licensing of asbestos removal contractors and the certification of asbestos abatement workers. So any questions regarding asbestos abatement that might be necessary at the site in the future should be directed to the NYS Department of Labor.

COMMENT 13:

Where did the 780 tons of contaminated soil go?

RESPONSE 13:

The removal action was performed in 1984 under the Department supervision. The excavated soil was sent to the CECOS Landfill in Niagara Falls, NY.

COMMENT 14:

What is preventing soil from being removed from the site? Because I see trucks of soil is being removed from the site and I believe it is hazardous waste.

RESPONSE 14:

All the rules pertaining to hazardous waste management still apply to this facility. If hazardous wastes are being generated and shipped, the material must be properly manifested and the facility operator must report it to the State.

COMMENT 15:

If a new well is put in, will they need permission?

RESPONSE 15:

Replacing an existing monitoring well would not require additional permission since it is a part of the monitoring system. If a new extraction well is necessary, it would be installed under an approved work plan.

COMMENT 16:

What is the remedial status of OU 1 and OU 2?

RESPONSE 16:

The focused feasibility study for OU 1 and OU 2 is expected to be submitted to the Department by the end of 2018. Currently the groundwater is being extracted and treated as an Interim Remedial Measure.

COMMENT 17:

How is the leachate being handled and treated? How is that going?

RESPONSE 17:

I3 continues to receive landfill leachate from Seneca Meadows. The treatment train consists of: leachate being hauled to the site, off-loaded indoors to tanks (that are covered/indoors) and then the leachate is metered in to the biological treatment system at a rate that will NOT cause the biology to die from a shock load. The biologically treated wastewater is then sent to a metals removal system – metals are precipitated out using lime. From there, the treated water is further treated by sand filtration and activated carbon prior to being discharged to the Susquehanna River. The plant runs 24/7, however treated effluent may be stored in an effluent holding tank. They ONLY discharge during daytime, which is when there is a plant operator present at the wastewater treatment plant. They have the capacity to store at least 2 days' worth of effluent in the holding tank. The plant is operating very well and continues to meet all effluent limits.

COMMENT 18:

When will NYSDEC finalize the remedy?

RESPONSE 18:

The remedy is finalized after the Department reviews all of the comments received during the public comment period.

COMMENT 19:

Will there be enough money if IBM does not pay for the cleanup?

RESPONSE 19:

If IBM does not pay for the cleanup, the Department has options available such as the State Superfund.

COMMENT 20:

Are the indoor air results from Huron available?

RESPONSE 20:

The Department has sent the files for the Huron 2005 and 2016 indoor air data to the site repository at the George F. Johnson Memorial Library.

APPENDIX B

Administrative Record

Administrative Record

**Former IBM Endicott
Operable Unit Number 07: Northwest Area
State Superfund Project
Village of Endicott, Broome County, New York
Site No. 7-04-014**

1. Proposed Remedial Action Plan for the former IBM Endicott site, Operable Unit No. 07, dated February 2018, prepared by the Department.
2. Order on Consent, Index No. A7-0502-0104, between the Department and IBM Corporate Environmental Affairs, executed on August 4, 2004.
3. "Extraction well EN-154R Shutdown Test Report", dated August 2017, prepared by Groundwater Sciences Corporation.
4. "Combined Groundwater Report for 2016", dated April 2017, prepared by Groundwater Sciences Corporation.
5. "Draft Supplemental Remedial Investigation Report on Assessment of Sewers", dated June 2006, prepared by Groundwater Sciences Corporation.
6. "Draft Supplemental Remedial Investigation Report on Vertical Migration Potential In The Northwestern Area", dated July 2006, prepared by Groundwater Sciences Corporation.
7. "Preliminary site Assessment Data Report" (Huron), dated September 2005, prepared by ERM.
8. "Closure Certification General Rinse Wastewater Surface Impoundment Report", dated November 1988, prepared by O'Brien & Gere.

Correspondence

Letter dated March 20, 2018 from Mitchell E. Meyers, Manager, Environmental Remediation, IBM Corporate Environmental Affairs