Cayuga County Groundwater Contamination Superfund Site Operable Unit 2 – Area 3 Cayuga County, New York

July 2019

EPA ANNOUNCES PROPOSED PLAN

This Proposed Plan addresses groundwater contamination in Area 3, an area that was previously delineated in a July 2012 Proposed Plan for the Cayuga County Groundwater Superfund Site (the Site). The July 2012 Proposed Plan identified the preferred remedial alternatives to address the entire groundwater plume at the Site extending from a facility formerly operated by Powerex, Inc, (Facility), located at 2181 West Genessee Street in the City of Auburn, New York to the Village of Union Springs, a distance of approximately seven miles. The March 2013 Record of Decision (ROD) selected a remedy that actively addressed drinking water and groundwater in two other areas identified for remediation as Area 1 and Area 2 and drinking water only in Area 3.[1] As a result of comments received during the public comment period, a remedy for groundwater in Area 3 was deferred pending further investigation. This Proposed Plan describes the results of the supplemental investigation conducted of surface water and groundwater in Area 3 and identifies the preferred remedial alternative for Area 3 of the Site with the rationale for this preference.

This Proposed Plan was developed by the U.S. Environmental Protection Agency (EPA), the lead agency for the Site, in consultation with the New York State Department of Environmental Conservation (NYSDEC). EPA is issuing this Proposed Plan as part of its public participation responsibilities under Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA), and Sections 300.430(f) and 300.435(c) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The results of the supplemental investigation in Area 3 of the Site summarized in this Proposed Plan are described in the *Investigation Study Report*, dated June 2019. The nature and extent of contamination at the Site, including the results of previous investigations, and the remedial alternatives summarized in this Proposed Plan are described in the *Remedial Investigation (RI) Report* and the *Feasibility Study (FS) Report*, both issued in 2012, as well as other documents contained in the Administrative Record for the March 2013 ROD. EPA encourages the public to review these documents to gain a more comprehensive understanding of the Site and the Superfund activities that have been conducted.

This Proposed Plan informs the public of the supplemental investigation results and solicits public comments on EPA's preferred remedy for groundwater in Area 3 of the Site. The preferred remedial alternative in this Proposed Plan for Area 3 of the Site remains the same as the preferred remedial alternative identified in the 2012 Proposed Plan: monitored natural attenuation (MNA) of groundwater. Changes to the preferred remedy may be made if public comments or additional data indicate that such a change will result in a more appropriate remedial action. The final decision regarding the selected remedy will be made after EPA has taken into consideration all public comments.

1 For remedial planning purposes, Area 1 consists of the impacted area immediately south of the Facility and extends approximately 700 to 900 feet south of West Genesee Street. Area 2 consists of the impacted area immediately south-southwest of Area 1 and extends southwest to the Town of Aurelius. Area 3 consists of the impacted area immediately southwest of Area 2

568945

extending to and including Union Springs. Refer to Figure 1 for a Site Location Map.

MARK YOUR CALENDAR

PUBLIC COMMENT PERIOD:
July 29, 2019 – August 27, 2019
EPA will accept written comments on the Proposed Plan during the public comment period.

PUBLIC MEETING: August 8, 2019 at 6:30 pm
EPA will hold a public meeting to explain the Proposed Plan. Oral and written comments will also be accepted at the meeting. The meeting will be held at the Union Springs High School, located at 239 Cayuga Street, Union Springs, New York.

COMMUNITY ROLE IN SELECTION PROCESS

EPA and NYSDEC rely on public input to ensure that the concerns of the community are considered in selecting an effective remedy for each Superfund site. To this end, the supplemental *Investigation Study Report* and this Proposed Plan have been made available to the public for a public comment period which begins on July 29, 2019 and concludes on August 27, 2019.

A public meeting will be held during the public comment period at the Union Springs High School on August 8, 2019 at 6:30 p.m. to present the conclusions of the supplemental *Investigation Study Report*, to elaborate further on the reasons for recommending the preferred alternative, and to receive public comments.

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

Written comments on the Proposed Plan should be addressed to:

Isabel R. Fredricks
Remedial Project Manager
Western New York Remediation Section
U.S. Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866
Telephone: (212) 637-4248
e-mail: rodrigues.isabel@epa.gov

INFORMATION REPOSITORIES

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

Seymour Public Library
Auburn, New York
Telephone: (315) 252-2571
Hours of operation:
Mon. - Wed.: 10 AM to 9 PM
Thurs., Fri.: 10 AM to 6 PM
Sat.: 10 AM to 4 PM

USEPA – Region II
Superfund Records Center
290 Broadway, 18th Floor
New York, New York 10007-1866
(212) 637-4308
Hours: Monday – Friday: 9:00 AM to 5:00 PM

EPA's website for the Cayuga County Groundwater Contamination Site:
https://www.epa.gov/superfund/cayuga-county-groundwater

SCOPE AND ROLE OF ACTION

Site remediation activities are sometimes separated into different phases, or Operable Units (OUs), so that a portion of the site remedy for technical or administrative purposes can be addressed separately. EPA has designated two OUs for the Cayuga County Groundwater Contamination Site. OU1 addresses drinking water and groundwater contamination in Area 1 and Area 2 of the Site, as well as drinking water in Area 3. In July 2012, EPA issued a Proposed Plan describing the remedial alternatives considered for the entire Site (Area 1, Area 2, and Area 3). On March 29, 2013, EPA signed a ROD for OU1, which called for, among other things, the in-situ treatment of contaminated groundwater in Area 1, monitored natural attenuation of contaminated groundwater in Area 2, the implementation of measures to ensure that the Village of Union Springs public water supply treatment system in Area 3 is adequately equipped to protect users of its supply from Site-related contamination, maintenance of existing groundwater treatment systems at three dairy farms, and connection of impacted residences to municipal water for their future potable water needs. The 2013 ROD identified contingency remedies for Area 1 and Area 2 should the selected response action not achieve remedial goals in a reasonable timeframe. At this time, the contingencies for Area 1 and 2 have not

needed to be implemented. In response to public comments, the 2013 ROD deferred final remedy selection in Area 3, except for activities that ensure protection of drinking water, and called for further investigations of the groundwater and surface water in Area 3.

This Proposed Plan addresses OU2, the final planned phase of response activities at the Site. The primary objectives of this action are to minimize any potential future health and environmental impacts from the groundwater contamination in Area 3.

The major source of the groundwater contamination at the Site is the Facility, formerly operated by Powerex, Inc., located at 2181 West Genessee Street, in the City of Auburn, New York. Remediation of the Facility is being addressed under the NYSDEC Superfund program. Remedial actions at the Facility are not the focus of this decision document, although successful completion (i.e., source control or remediation) of the source area(s) at the Facility is important to the full realization of the benefits of the preferred alternative in this Proposed Plan. The source investigation and response actions for the Facility are being addressed by General Electric Company (GE) with NYSDEC oversight. EPA has identified GE as a potentially responsible party under CERCLA for the Site. The effectiveness of the remedy in this Proposed Plan requires coordination between actions to address contaminant sources at the Facility, the remedial actions selected in EPA's 2013 ROD for Area 1 and Area 2, and the proposed remedy for Area 3. EPA is coordinating with NYSDEC on the remediation of the source area at the Facility, the implementation of EPA's 2013 ROD for Area 1 and Area 2, and the remedy proposed in this Proposed Plan. In the event that source control is not successfully implemented pursuant to New York State law, EPA may elect to evaluate additional options at the Facility pursuant to CERCLA to ensure the effectiveness of the preferred alternative.

SITE BACKGROUND

The Site includes a groundwater plume located in Cayuga County, New York. Groundwater contaminated with volatile organic compounds (VOCs) extends from the City of Auburn to the Village of Union Springs, a distance of approximately seven miles, and includes the Towns of Aurelius, Fleming, and Springport. A Site location map is provided as Figure 1 and an overview of Area 3 is provided as Figure 2. The conceptual site model regarding groundwater contamination at the Site indicates that contaminants entered the shallow hydrogeologic unit, identified as the overburden, at the Facility. Contaminants moved downward via vertical fractures or karst features, and then moved laterally from the Facility and downgradient via groundwater flow, primarily in the deep zone, a unit approximately 200 feet below ground surface. Much of the groundwater flow in this deep hydrogeologic unit at the Site migrates and flows to the streams, springs, and seeps located near and along Cayuga Lake, as well as to the lake bed itself. For additional information on the Site background, history, hydrogeology, conceptual model, results of the OU1 remedial investigation, and the investigation of the soil vapor intrusion pathway, refer to EPA's 2012 Proposed Plan.

Subsequent to the issuance of the 2013 ROD, on September 30, 2013, an administrative order on consent (Index No. CERCLA 02-2013-2021) (September 30, 2013) (2013 Consent Order) was entered into between EPA and GE for performance of the remedial design related to Areas 1 and 2 and the supplemental investigation of Area 3 of the Site. Pursuant to the 2013 Consent Order, GE is currently performing the remedial design for Area 1 and 2. As part of the remedial design, an enhanced in-situ bioremediation treatment pilot test is underway in the deep bedrock zone along the southern boundary of the Facility (Area 1) to collect data needed to design the selected remedy. On September 25. 2015, EPA issued an administrative order (Index No. CERCLA 02-2015-2036) (2015 Order) to GE to design and implement a backup power and backup treatment system for the Village of Union Springs' public water supply. The remedial action report for this work was completed by GE in September 2017.

In March 2016, NYSDEC selected a remedy under its State authorities to address groundwater contamination at the Facility. The remedy includes enhanced in-situ bioremediation in the overburden and shallow bedrock in the source areas and enhanced in-situ bioremediation in the deep bedrock upgradient (north-northeast) of the two main source areas. In

October 2017, NYSDEC approved the remedial design/remedial action work plan prepared by GE. Pre-design investigation activities for the first phase of the NYSDEC remedy at the Facility were completed by GE in January 2019. GE has performed additional delineation of VOC contamination in the overburden soils, and preparation of a remedial action work plan for this phase is underway.

RESULTS OF THE SUPPLEMENTAL INVESTIGATION IN AREA 3

Groundwater Investigation

As part of the OU2 supplemental investigation, GE evaluated residential wells in Area 3 that were no longer in use, to determine if they were suitable for conversion to deep bedrock wells that could be used for long-term monitoring. GE divided Area 3 into geographic zones to assist in the identification of residential wells that were spatially distributed within Area 3. After conducting additional geophysical evaluations of existing unused residential wells three of these former water supply wells were converted into groundwater monitoring wells. Semi-annual groundwater sampling was conducted from the fall 2016 through the fall 2018 from the three converted groundwater monitoring wells. In addition, pursuant to the 2015 Order groundwater from the inlets to three of the agricultural Point of Entry Treatment (POET) systems are sampled on a quarterly basis and wells at one of the dairy farms are sampled on a semi-annual basis.

Sampling results from the three converted groundwater monitoring wells revealed trichloroethene (TCE) concentrations ranging from non-detect to a maximum concentration of 0.89 parts per billion (ppb) and *cis*-1,2-dichloroethene (*cis*-1,2-DCE) concentrations ranging from 1.3 ppb to 9.6 ppb.

Prior to their conversion to permanent monitoring wells, two of the three wells were among the eight unused residential wells sampled as part of the 2012 RI. Sample results in 2006 for those eight unused residential wells revealed TCE and *cis*-1,2-DCE concentrations ranging from non-detect to 7.1 ppb to 96 ppb, respectively.

During the 2012 RI, EPA sampled eight existing unused residential wells and installed three groundwater monitoring wells in Area 3. Sampling of the eight existing unused residential wells conducted during the 2012 RI revealed maximum concentrations of TCE, *cis*-1,2-DCE, and trans-1,2-DCE of 7.1 ppb, 96 ppb, and 1.3 ppb, respectively. Sampling of the three groundwater monitoring wells installed during the 2012 RI did not reveal detectable concentrations of Site-related VOCs. As result these wells were not sampled during the supplemental investigation.

Sampling results from 2016 through 2019 of the untreated water at the influents to each POET system at the dairy farms revealed maximum concentrations of TCE, *cis*-1,2-DCE, trans-1,2-DCE, and vinyl chloride of 12.8 ppb, 414 ppb, 9.4 ppb, and 24 ppb, respectively. These results are comparable to the periodic sampling results evaluated collected during the timeframe of the 2012 RI. Data collected of the treated water demonstrates that each the POET systems is effectively treating the water to below federal and state drinking water standards prior to use at the properties.

Sampling results from 2014 through 2018 for the raw water from the two Village of Union Springs supply wells revealed maximum concentrations of TCE and *cis*-1,2-DCE at 4 ppb and 10 ppb, respectively. A review of Village of Union Springs water quality data indicates that the concentrations of TCE and *cis*-1,2-DCE have been decreasing in recent years and the existing treatment system, which was upgraded pursuant to the 2013 ROD, effectively treats groundwater prior to distribution.

The results of the supplemental groundwater investigation in Area 3 are consistent with the results collected as part of the 2012 RI and in some instances show a decreasing trend in the concentrations of contaminants.

Specialty Analysis

Groundwater samples were also collected and analyzed for additional parameters to provide information on geochemical conditions, which can impact natural attenuation processes. Samples from select locations were analyzed for carbon isotopes (known as carbon-specific isotope analysis or CSIA), microbiological targets, and MNA parameters. Microbiological analyses were performed to evaluate

the presence of microbes responsible for, and enzymes associated with, the reductive dechlorination and aerobic metabolic/co-metabolic degradation processes in groundwater at the Site. The results revealed the presence of several important enzymes for co-metabolic biodegradation, suggesting that the hydrogeologic conditions are generally supportive of bacterial growth.

During the fall 2016 groundwater and surface water sampling event, certain samples were analyzed for CSIA for the carbon isotopes associated with TCE, *cis*-1,2-DCE, and vinyl chloride. The carbon isotopes on TCE, *cis*-1,2-DCE, and vinyl chloride were analyzed to assess the impact of biotic and/or abiotic degradation processes on Site-related contaminants. The analysis of the sampling results confirmed that biodegradation is occurring at the Site.

Surface Water Investigation

As part of the supplemental investigation, from December 2014 through November 2018, surface water samples were collected from 18 stream and tributary locations flowing to Cayuga Lake. These include within and at the outlet of Howland Pond, the outlet of Mill Pond (a small spring fed pond that flows to Cayuga Lake), a stream that discharges to Cayuga Lake near Springport Cove, five locations within Cayuga Lake, and one unused, flowing artesian well. In addition, surface water samples were collected from four lakebed seeps that are exposed during periods of low lake level and one stream that was observed to be flowing into Springport Cove.

The supplemental investigation confirmed that groundwater flow in the deep bedrock hydrogeologic unit at the Site migrates and flows to the streams, springs, and seeps located near and along Cayuga Lake, including the lake bed itself. The surface water sampling results revealed low-level concentrations of Site-related VOCs (TCE, *cis*-1,2-DCE, and trans-1,2-DCE) in some locations. Three of the four lake bed seeps surface water sampling results from Cayuga Lake did not reveal detectable concentrations of Site-related contaminants. The fourth sample revealed a *cis*-1,2-DCE concentration of 0.27 ppb. Surface water samples from Cayuga Lake, streams, springs and tributaries revealed trichloroethene (TCE) concentrations ranging from non-detect to a maximum concentration of 0.94 ppb and *cis*-1,2-DCE concentrations ranging from non-detect to 11 ppb compared to maximum results of 1.9 and 18, respectively from the 2012 RI. The sampling results from the supplemental investigation were compared to the appropriate NYSDEC Technical and Operational Guidelines Series (TOGS) standards and guidance values. One of the surface water samples collected from 2014 through 2018 contained concentrations of VOCs that exceeded their applicable TOGS.

RISK SUMMARY

As part of the OU1 ROD, EPA conducted a baseline human health risk assessment (HHRA) and a screening level ecological risk assessment (SLERA) to estimate the current and future effects of contaminants on human health and the environment. The baseline risk assessment estimated the human health and ecological risk which could result from the contamination at the Site if no remedial actions were taken.

Human Health Risk Assessment

Based on the data collected and evaluated as part of the supplemental investigation of Area 3, the results of the baseline risk assessment contained in the OU1 ROD have not substantially changed. The baseline risk assessment evaluated the health effects which would result from exposure to groundwater contamination through three pathways, namely, ingestion, dermal contact and inhalation of volatilized contaminants during showering. Groundwater sampling conducted for the entire Site (Area 1, Area 2, and Area 3) as part of the 2012 RI revealed maximum concentrations of TCE, *cis*-1,2-DCE, and vinyl chloride of 329 ppb, 47,900 ppb, and 2,790 ppb, respectively. The results of the baseline risk assessment performed as part of the OU1 ROD indicated that ingestion of and dermal contact with untreated groundwater at the Site poses unacceptable risks to human health.

The HHRA documented that these concentrations are associated with an excess lifetime cancer risk of 2×10^{-4} for the future Site worker, 5×10^{-4} for the future adult resident, and 4×10^{-3} for the future child resident. The calculated non-carcinogenic hazard

quotients (HQs) are: future Site worker HQ=7, future adult resident HQ=21, and future child resident HQ=51.

The supplemental investigation conducted in Area 3 subsequent to the OU1 ROD revealed maximum concentrations of TCE, *cis*-1,2-DCE, and vinyl chloride in the three converted monitoring wells of 0.89 ppb, 9.6 ppb and non-detect, respectively. These concentrations are comparable to the concentrations detected in the eight unused residential wells and the three groundwater monitoring wells sampled in Area 3 during the 2012 RI.

In addition, an evaluation was conducted to determine whether any new EPA risk assessment guidance, exposure factors, and/or toxicity values which became available subsequent to the 2013 ROD would impact the results of the previously completed human health risk assessment. EPA's evaluation found that the elevated human health risks associated with potential exposures to VOCs in groundwater would be similar and therefore, the results of the baseline human health risk assessment remain valid.

Vapors from VOCs in groundwater can move through the bedrock and potentially enter structures at the surface, resulting in occupants being exposed to the vapors. The 2012 Proposed Plan and 2013 ROD addressed the vapor intrusion pathway. As described in those documents, VOCs at the Site generally are in the deep bedrock units at depths greater than 100 feet below ground surface and there are some confining bedrock units and uncontaminated groundwater between the VOCs in the deep bedrock and the ground surface. These conditions tend to limit the potential for vapor migration to any surface buildings. In April and November 2009 EPA collected air samples from below building slabs (subslab samples) and from indoor spaces of residences in areas where groundwater is present at depths less than 100 feet. Results of the sampling indicate that subslab and indoor air concentrations were well below EPA screening levels and below NYS Department of Health screening and action levels at the time of the 2013 ROD as well as those currently in place. Therefore, the vapor intrusion pathway is not a concern under current or future use scenarios.

Ecological Risk Assessment

EPA also evaluated whether the conclusions of the ecological risk assessment in the 2013 ROD remain valid. The ecological risk assessment found that the contaminants in surface water and sediment did not pose unacceptable risk to aquatic or terrestrial ecological receptors. In 2018, EPA evaluated the new Site data collected as part of the supplemental investigation that became available after the 2011 ecological risk assessment was complete and reviewed whether changes in published ecological screening levels (ESLs) would result in any significant change in the conclusions of the 2011 ecological risk assessment. EPA's evaluation found that the conclusions of the 2011 ecological risk assessment remained valid.

For further details regarding the 2011 human health and ecological risk assessments, refer to the Human Health Risk Assessment Report and the Screening Level Ecological Risk Assessment Report in the Administrative Record.

Summary of Human Health and Ecological Risks

The results of the HHRA indicate that the contaminated groundwater presents an unacceptable human health exposure risk. The SLERA indicated that the Site does not pose any unacceptable risks to aquatic or terrestrial ecological receptors.

Based upon the results of the RI and the risk assessment, EPA has determined that actual or threatened releases of hazardous substances from Area 3 of the Site, if not addressed by the preferred remedy, may present a current or potential threat to human health or welfare or the environment. EPA has determined that the Preferred Alternative identified in the Proposed Plan is necessary to protect public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

REMEDIAL ACTION OBJECTIVES

Remedial action objectives (RAOs) are specific goals to protect human health and the environment. These objectives are based on available information and

WHAT IS RISK AND HOW IS IT CALCULATED?

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

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

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

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

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

standards, such as applicable or relevant and appropriate requirements (ARARs), to-be-considered (TBC) guidance, and Site-specific risk-based levels. The following RAOs for contaminated groundwater, developed for OU1 of the Site, will also address the human health risks and environmental concerns at Area 3 for OU2:

- Reduce or eliminate exposure (via ingestion and dermal contact) to VOCs in groundwater at concentrations in excess of federal maximum contaminant levels (MCLs) and State standards;

- Restore the impacted aquifer to its most beneficial use as a source of drinking water by reducing contaminant levels to the more stringent of federal MCLs and State standards; and,

- Reduce or eliminate the potential for migration of contaminants towards the Village of Union Springs public water supply wells.

To satisfy these RAOs, preliminary remediation goals for groundwater in Area 3 are identified in Table 1:

Table 1: Groundwater Preliminary Remediation Goals for Area 3

Contaminants of Concern	National Primary Drinking Water Standards (ppb)	NYS Groundwater Quality Standards (ppb)	NYSDOH Drinking Water Quality Standards (ppb)	Preliminary Remediation Goals (ppb)
cis-1,2-Dichloroethene	70	5	5	5
trans-1,2-Dichloroethene	100	5	5	5
Trichloroethene	5	5	5	5
Vinyl Chloride	2	2	2	2

SUMMARY OF REMEDIAL ALTERNATIVES

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

least attains ARARs under federal and state laws, unless a waiver can be justified pursuant to CERCLA §121(d)(4), 42 U.S.C. §9621(d)(4).

Since the supplemental investigation revealed comparable results to the data collected as part of the 2012 RI in Area 3, the conceptual site model did not change. As a result, this Proposed Plan relies on the 2012 FS Report for the screening and evaluation of alternatives to address groundwater contamination in Area 3, as amended to provide updated cost estimate information for the MNA alternative (Alternative 4 in the 2012 Proposed Plan and identified as Alternative 2 below).

Alternative 1: No Action

The NCP requires that a "No Action" alternative be developed as a baseline for comparing other remedial alternatives. Under this alternative, there would be no remedial actions conducted at the Site to control or remove groundwater contaminants. This alternative does not include monitoring or informational institutional controls.

Capital Cost:	$0
Annual Operations & Maintenance (O&M) Costs:	$0
Present-Worth Cost:	$0
Construction Time:	Not Applicable

Alternative 2: Monitored Natural Attenuation (MNA) (Identified as Alternative 4 in the 2012 Proposed Plan)

This remedial alternative relies on monitored natural attenuation to address the groundwater contamination. Natural attenuation is the process by which contaminant concentrations are reduced by various naturally occurring physical, chemical, and biological processes. The main processes include biodegradation, dispersion, dilution, sorption, volatilization, and chemical or biological stabilization, transformation, or destruction of contaminants. These processes occur naturally, in-situ, and act to decrease the mass or concentration of contaminants in the subsurface. Only non-augmented natural processes are relied upon under this alternative. Augmentation through addition of electron acceptors or nutrients is considered an in-situ technology. Since this alternative does not involve active remediation, the effectiveness of this alternative in Area 3 depends on the effectiveness of the selected remedy in Area 1 and Area 2 and remediation at the Facility in preventing migration of contamination downgradient from these areas. Implementation of this alternative includes the periodic sample collection and analysis, data evaluation, and contaminant concentration trend analysis. While there are some uncertainties, it is expected to take approximately 30 years to meet groundwater RAOs in Area 3.

A site management plan would be developed to provide for the proper management of the Site remedy, including the use of institutional controls, until RAOs are met, and will also include long-term groundwater monitoring, periodic reviews and certifications. Institutional controls are anticipated to include existing governmental controls, such as well permit requirements, and informational devices, such as publishing advisories in local newspapers and issuing advisory letters to local governmental agencies, regarding the need to refrain from untreated groundwater use in the impacted area.

Area 3

Capital Cost:	$ 25,000
Annual O&M Costs:	$ 131,900
Present-Worth Cost:	*$* 1,776,800
Construction Time:	3 months

EVALUATION OF ALTERNATIVES

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

Refer to the table on the next page for a description of the evaluation criteria.

This section of the Proposed Plan profiles the relative performance of each alternative against the nine criteria, noting how each compare to the other options under consideration. A detailed analysis of the action

alternative can be found in the 2012 Feasibility Study (FS) Report.

Overall Protection of Human Health and the Environment

Alternative 1 (No Action) is not protective of human health and the environment since it does not include active monitoring of the groundwater contamination in Area 3. Alternative 2 would provide protectiveness of human health and the environment by relying on certain natural processes to restore groundwater to below MCLs over the long term. Alternative 2 would achieve protectiveness through a combination of reducing contaminant concentrations in groundwater via naturally occurring processes and limiting exposure to residual contaminants through the implementation of governmental and informational institutional controls. Institutional controls would help limit exposure by restricting the use of, and access to, contaminated groundwater. Alternative 2 also assumes the control of contaminant migration from the Facility.

A long-term monitoring program for groundwater would monitor the migration and fate of the contaminants and ensure that human health is protected. Combined with long-term monitoring and institutional controls, Alternative 2 would meet the RAOs.

Compliance with Applicable or relevant and Appropriate Requirements (ARARs)

EPA and NYSDOH have promulgated health-based protective MCLs (40 CFR Part 141, and 10 NYCRR § 5-1.51 Chapter 1), which are enforceable standards for various drinking water contaminants (chemical-specific ARARs). If more than one such requirement applies to a contaminant, compliance with the more stringent ARAR is required.

The aquifer is classified as Class GA (6 NYCRR 701.18), meaning that it is designated as a potable water supply. Because area groundwater is a source of drinking water, achieving MCLs in the groundwater is an applicable or relevant and appropriate standard.

EVALUATION CRITERIA FOR SUPERFUND REMEDIALALTERNATIVES

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

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

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

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

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

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

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

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

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

In Area 3, chemical-specific ARARs are expected to be attained through certain natural processes. Due to the uncertainty in the mass diffused in the bedrock matrix, the remediation timeframe is estimated. However, results of modeling of the matrix diffusion process support a 30-year remediation time frame.

Alternative 1 (No Action) would not comply with chemical-specific ARARs, as no monitoring would occur. Alternative 2 would comply with chemical-, location- and action-specific ARARs.

Long-Term Effectiveness and Permanence

Alternative 1 would not provide long-term effectiveness and permanence since no action would

be taken. Specialty analyses conducted as part of the supplemental investigation assessed the impact of biotic and/or abiotic degradation processes on the Site-related contaminants. The results confirmed the hydrogeologic conditions are generally supportive of bacterial growth and that microbes responsible for, and enzymes associated with, the reductive dechlorination and aerobic metabolic/co-metabolic degradation processes are present and biodegradation is occurring at the Site. Daughter or break-down products of TCE degradation such as *cis*-1,2-dichlorethene, vinyl chloride, and ethane have been observed. Therefore, MNA (Alternative 2) would be a permanent solution and achieve long-term effectiveness.

Reduction of Toxicity, Mobility, or Volume Through Treatment

Alternative 1 would provide no reduction in toxicity, mobility or volume through treatment. Alternative 2 relies on natural processes to degrade contaminants and, hence, the reduction in toxicity, mobility, and volume could vary within Area 3. In the 2013 ROD, it was noted that in Area 1, TCE and *cis*-1,2-DCE could be transformed into the more toxic vinyl chloride under anaerobic conditions in the subsurface, prior to degradation to the less toxic ethane. Such a transformation, which also applies to Area 3, would be monitored and managed. Such management would include the institutional controls that are a component of Alternative 2.

Short-Term Effectiveness

There are no short-term effectiveness issues associated with the No Action Alternative. The short-term impacts due to Alternative 2 are minimal as it does not involve active remediation. Alternative 2 includes monitoring that would provide the data needed for proper management of the remedial processes and measures to address any potential impacts to the community, remediation workers, and the environment. Groundwater monitoring will have minimal impact on workers responsible for periodic sampling. The time frame to meet groundwater RAOs in Area 3 is difficult to predict but is expected to be approximately 30 years. The effectiveness of source control at the Facility and remediation in Areas 1 and 2 will reduce contaminants entering Area 3 and will affect the timeframe of the effectiveness remediation in Area 3.

Implementability

There are no implementability issues associated with the No Action Alternative. Alternative 2 is an easy alternative to implement since no active remediation would be performed. Alternative 2 would require routine groundwater quality, performance, administrative and institutional controls monitoring, as well as CERCLA five-year reviews for the life of the remedy.

Cost

The cost estimates are based on the best available information. Alternative 1: No Action has no cost because no activities are implemented. The estimated capital, operation and maintenance (O&M) and present worth cost for Alternative 2 are $25,000, $131,900, and $1,776,800, respectively.

State/Support Agency Acceptance

NYSDEC concurs with the preferred alternative.

Community Acceptance

Community acceptance of the Preferred Alternative will be evaluated after the public comment period ends and will be described in the ROD for OU2 of the Site. The ROD is the document that formalizes the selection of the remedy for a site.

PREFERRED REMEDY

EPA in consultation with NYSDEC, recommends Alternative 2: Monitored Natural Attenuation as the Preferred Alternative for Area 3. The total estimated present worth cost of Alternative 2 is $1,776,800. Alternative 2 has the following key components: monitoring of naturally occurring, in-situ processes, to decrease the concentration of contaminants in groundwater. Under this alternative, a monitoring program would consist of periodic monitoring for parameters such as VOCs, geochemical indicators and hydrogeologic parameters in the monitoring well network. Additional modeling to evaluate the attenuation processes would be performed and

institutional controls would be relied upon to limit exposure to contaminated groundwater.

The 2013 ROD calls for a site management plan to be developed to provide for the proper management of the Site remedy post-construction, including the use of institutional controls, until RAOs are met, and will also include long-term groundwater monitoring, periodic reviews and certifications. This site management plan would be expanded to include Area 3. Institutional controls are anticipated to include existing governmental controls, such as well permit requirements, and informational devices, such as publishing advisories in local newspapers and issuing advisory letters to local governmental agencies, regarding groundwater use in the impacted area.

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

While this alternative will ultimately result in reduction of contaminant levels in groundwater to levels that would allow for unlimited use and unrestricted exposure, it will take longer than five years to achieve these levels. As a result, in accordance with EPA policy, the Site is to be reviewed at least once every five years.

The Facility continues to be a source of VOC contamination to groundwater at this Site. As mentioned previously, the response actions for the Facility are being addressed by GE with NYSDEC oversight. Remedial actions for the Facility are not the focus of this decision document, although successful completion (i.e., source control or remediation) of the source area(s) at the Facility is important to the full realization of the benefits of the Preferred Alternative for Area 3 in this Proposed Plan for OU2. The remedy for Area 1, which addresses the deep groundwater contamination, is not yet underway, but a pilot test is being conducted. Once the pilot test is complete the remedial design for the deep groundwater for the Site will begin. In the event that source control is not successfully implemented pursuant to New York State law, EPA may elect to evaluate additional options at the Facility pursuant to CERCLA to ensure the effectiveness of the Preferred Alternative.

Basis for the Remedy Preference

The 2012 Proposed Plan identified a combination of technologies to address groundwater contamination in Area 1, Area 2, and Area 3 of the Site recognizing the different characteristics of the three areas, the importance of source control or remediation at the Facility, and active treatment for Area 1 of the Site. MNA as proposed in the 2012 Proposed Plan in Area 2 and Area 3 of the Site relied on reduced contaminant migration from upgradient areas and natural processes to achieve MCLs in the groundwater. The supplemental investigation of groundwater and surface water contamination in Area 3, subsequent to the issuance of the 2013 ROD whereby remedy selection for groundwater contamination in Area 3 was deferred, provides additional data supporting MNA for Area 3, as proposed in this Proposed Plan for OU2 of the Site. Although the precise timeframe to achieve MCLs in the groundwater is somewhat uncertain due to the continuing source to groundwater contamination at the Facility and given the impact of the mass diffused in the bedrock matrix, long-term groundwater monitoring would ensure that RAOs are achieved at the Site. Therefore, EPA and NYSDEC believe that Alternative 2: Monitored Natural Attenuation in Area 3 of the Site as proposed for OU2 of the Site would be protective of human health and the environment by effectively reducing the toxicity and volume of contaminated groundwater at the Site, while providing the best balance of tradeoffs among the alternatives with respect to the evaluation criteria.

The Preferred Alternative satisfies the threshold criteria and achieves the best combination of the five balancing criteria of the comparative analysis. EPA expects the Preferred Alternative to satisfy the following statutory requirements of CERCLA, section 121 (b): 1) be protective of human health and the environment; 2) comply with ARARs (or justify a waiver); 3) be cost-effective; 4) utilize permanent solutions and alternative treatment technologies or

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

resource recover technologies to the maximum extent practicable. Although the Preferred Alternative does not satisfy the preference for treatment as a principal element in Area 3, active treatment in Area 1 will reduce contaminants migrating to Area 3.

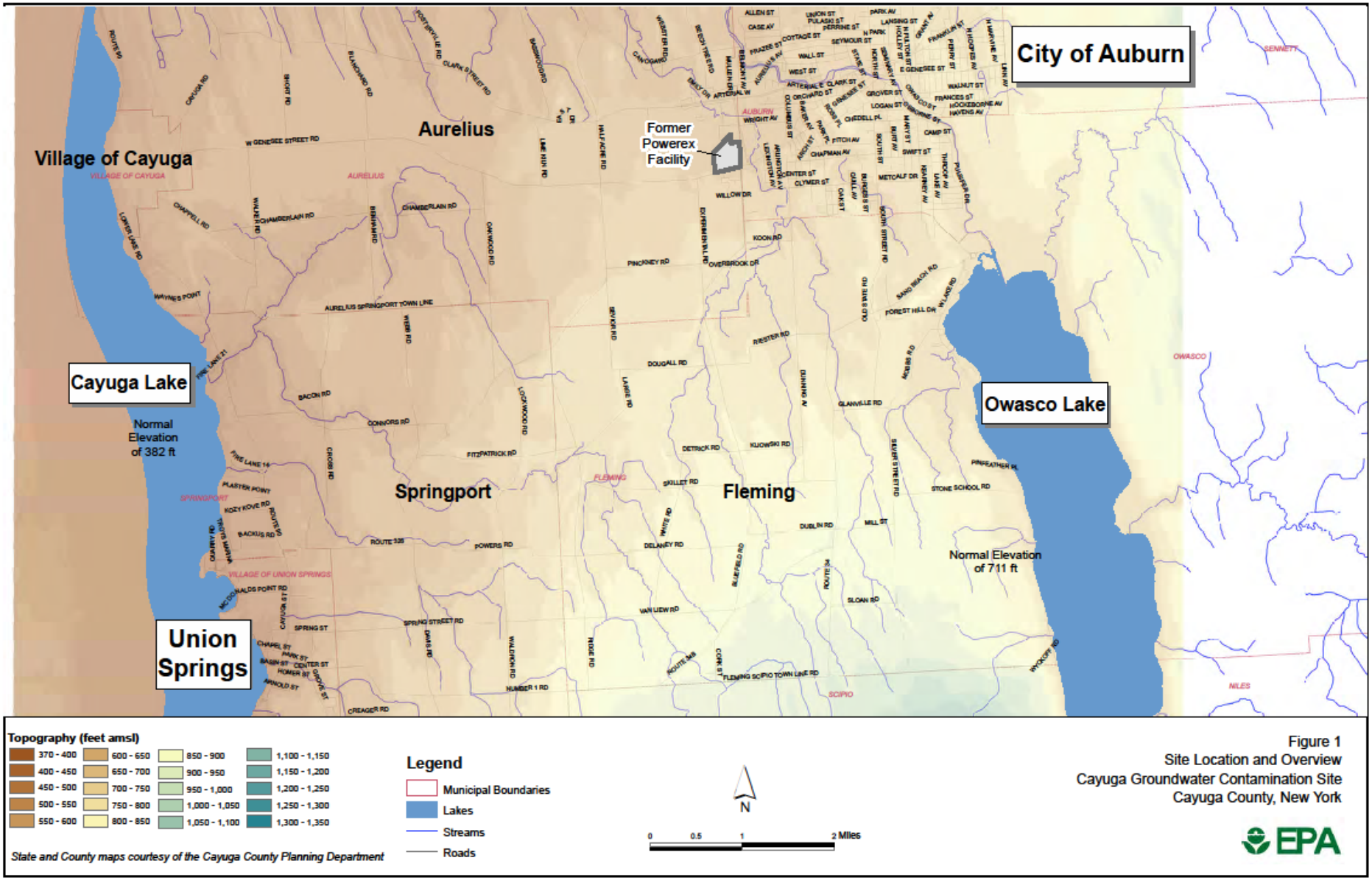
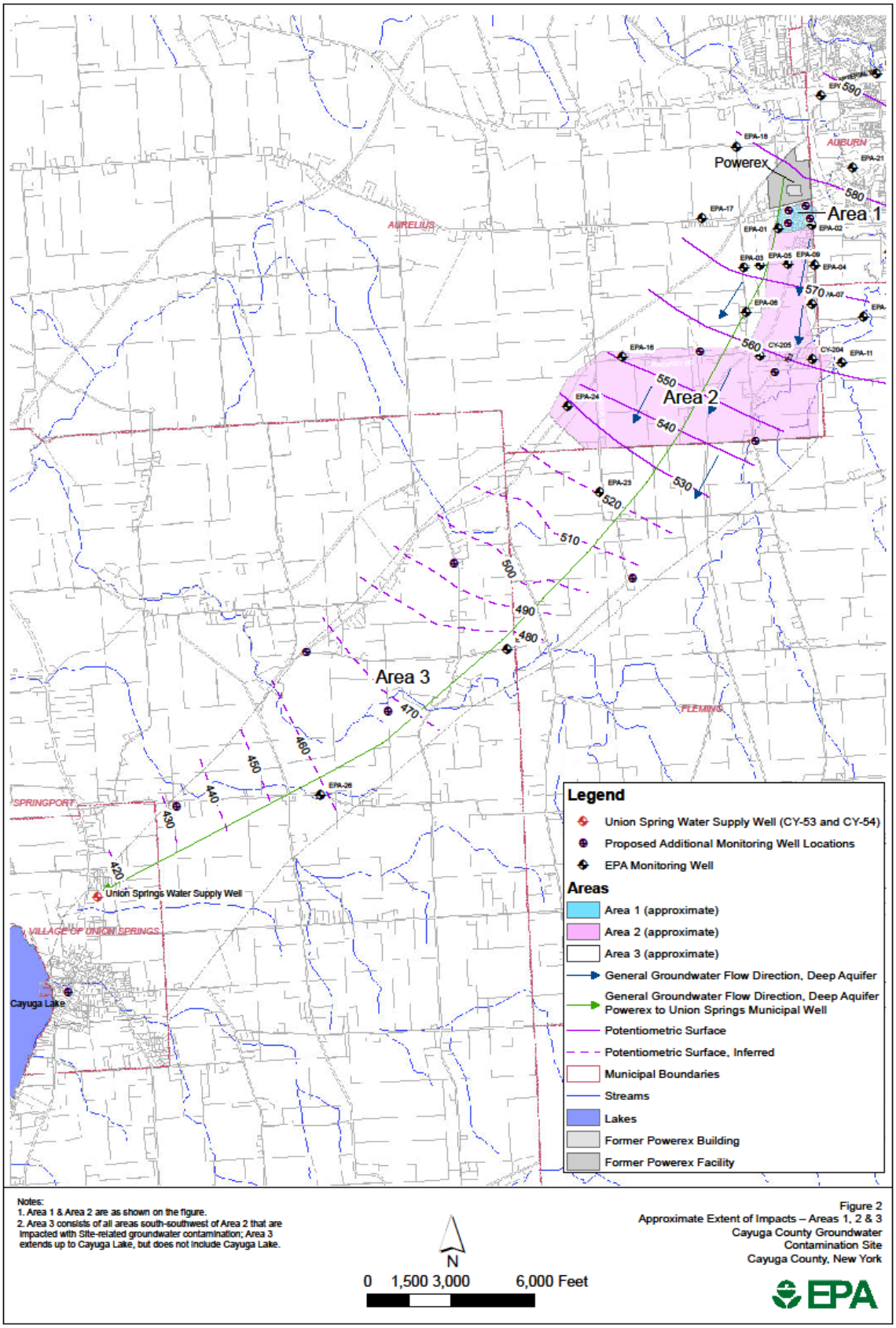


Figure 1
Site Location and Overview
Cayuga Groundwater Contamination Site
Cayuga County, New York

EPA



Notes:
1. Area 1 & Area 2 are as shown on the figure.
2. Area 3 consists of all areas south-southwest of Area 2 that are impacted with Site-related groundwater contamination; Area 3 extends up to Cayuga Lake, but does not include Cayuga Lake.

Figure 2
Approximate Extent of Impacts – Areas 1, 2 & 3
Cayuga County Groundwater Contamination Site
Cayuga County, New York

EPA