# FIFTH FIVE-YEAR REVIEW REPORT FOR ENDICOTT VILLAGE WELL FIELD SUPERFUND SITE BROOME COUNTY, NEW YORK

**Prepared by**

**U.S. Environmental Protection Agency**
**Region 2**
**New York, New York**

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## LIST OF ABBREVIATIONS & ACRONYMS

| | |
|---|---|
| ARAR | Applicable or Relevant and Appropriate Requirement |
| CAA | Controlled Activity Area |
| CD | Consent Decree |
| CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act |
| CFR | Code of Federal Regulations |
| CIC | Community Involvement Coordinator |
| cm/sec | centimeters/second |
| COCs | Contaminants of Concern |
| DCA | 1,1-dichloroethane |
| DCE | 1, 2-Dichloroethene |
| EPA | United States Environmental Protection Agency |
| ESD | Explanation of Significant Differences |
| FAA | Federal Aviation Administration |
| FYR | Five-Year Review |
| gpm | gallons per minute |
| HI | Hazard Index |
| IBM | International Business Machines |
| ICs | Institutional Controls |
| IRMs | Interim Remedial Measures |
| MCLs | Maximum Contaminant Levels |
| NCP | National Oil and Hazardous Substances Pollution Contingency Plan |
| NPL | National Priorities List |
| NYSDEC | New York State Department of Environmental Conservation |
| NYSDOH | New York State Department of Health |
| NYSWQS | New York State Water Quality Standards |
| OM&M | Operation, Maintenance, and Monitoring |
| OU | Operable Unit |
| PAHs | Polynuclear Aromatic Hydrocarbons |
| PCBs | Polychlorinated biphenyls |
| ppb | parts per billion |
| PRP | Potentially Responsible Party |
| RAO | Remedial Action Objective |
| RD | Remedial Design |
| RD/RA | Remedial Design/Remedial Action |
| RI/FS | Remedial Investigation and Feasibility Study |
| ROD | Record of Decision |
| RPM | Remedial Project Manager |
| SEMD | Superfund and Emergency Management Division |
| SPW | Supplemental Purge Well |
| STP | Sewage Treatment Plant |
| TCE | Trichloroethene |
| UU/UE | Unlimited Use and Unrestricted Exposure |
| VOCs | Volatile Organic Compounds |

# I. INTRODUCTION

The purpose of a five-year review (FYR) is to evaluate the implementation and performance of a remedy in order to determine if the remedy is and will continue to be protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in FYR reports such as this one. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The U.S. Environmental Protection Agency (EPA) is preparing this FYR review pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121, consistent with the National Contingency Plan (NCP)(40 CFR Section 300.430(f)(4)(ii)), and considering EPA policy.

This is the Fifth FYR for the Endicott Village Well Field Superfund site. The triggering action for this statutory review is the completion date of the previous FYR. The FYR has been prepared due to the fact that hazardous substances, pollutants, or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure (UU/UE).

The site consists of three separate phases called operable units (OUs). OU1 addresses contamination in the Village of Endicott Ranney drinking water well through the installation of an air stripper. OU2 focuses on the identification and remediation of the source of contamination to the groundwater (i.e., the Endicott Landfill). OU3 addresses the remediation of the groundwater by a supplemental purge well (SPW) to expedite cleanup of the aquifer and to reduce the potential threat to the Ranney well, as necessary. OU1 has been completed. OU2 and OU3 are in the operation and maintenance phase and are the subject of this review.

The Endicott Village Well Field Superfund site FYR was led by Sherrel Henry, EPA Remedial Project Manager (RPM). Participants included Pete Mannino (EPA Western New York Remediation Section Chief), Paul Zarella (EPA Hydrogeologist), Marian Olsen (EPA Human Health Risk Assessor), Charles Nace (EPA Ecological Risk Assessor), and Larisa Romanowski (EPA Community Involvement Coordinator (CIC)). Payson Long, representative for the New York State Department of Environmental Conservation (NYSDEC) also assisted in the preparation of this report. The Potential Responsible Parties (PRPs) were notified of the initiation of the FYR. The review began on 5/12/2020.

## Site Background

The site is located on South Grippen Street at the western end of the Village of Endicott (the Village), New York (see Site Map, Appendix B). It consists of the Ranney well, which is a municipal drinking water supply well, and its zone of influence on area groundwater. The site is composed primarily of flat to gently rolling open land associated with the En-Joie Golf Course, facilities of the Village's Sewage Treatment Plant (STP), and the Endicott Landfill. A portion of the landfill adjacent to the Tri-Cities Airport extends into an approximately 8-acre area designated by the Federal Aviation Administration (FAA) as the Controlled Activity Area (CAA), which includes the Runway Object Free Area. A six-acre parcel on the landfill near the entrance to the STP is currently permitted for use by the Village to compost yard waste; approximately two acres of the composting area are paved. Private homes are not located within the site. These or similar uses are expected to continue well into the future.

The Endicott Landfill accepted municipal refuse and industrial waste from approximately the late 1950s until 1977. The Ranney well operated without major problems until May 1981, when during a routine inspection, EPA detected vinyl chloride and trace amounts of other volatile organic compounds (VOCs) in the Ranney well, which provides approximately 47 percent of the total water supply to the Village of Endicott municipal water supply system. Subsequent sampling conducted by EPA and the New York State Department of Health (NYSDOH) confirmed EPA's initial findings and, as a result, four of the lateral supply lines to the well were closed and diffused air aeration equipment was installed to reduce the levels of VOCs.

## FIVE-YEAR REVIEW SUMMARY FORM

| SITE IDENTIFICATION | | |
|---|---|---|
| **Site Name:** Endicott Well Field Superfund site | | |
| **EPA ID:** NYD980780746 | | |
| **Region:** 2 | **State:** NY | **City/County:** Endicott/Broome |

| SITE STATUS | |
|---|---|
| **NPL Status:** Final | |
| **Multiple OUs?**<br>Yes | **Has the site achieved construction completion?**<br>Yes |

| REVIEW STATUS |
|---|
| **Lead agency:** EPA<br>***[If "Other Federal Agency", enter Agency name]*:** |
| **Author name (Federal or State Project Manager):** Sherrel D. Henry |
| **Author affiliation:** EPA |
| **Review period:** 7/22/2016 - 1/15/2021 |
| **Date of site inspection:** 11/19/2020 |
| **Type of review:** Statutory |
| **Review number:** 5 |
| **Triggering action date:** 7/22/2016 |
| **Due date *(five years after triggering action date)*:** 7/22/2021 |

## II. RESPONSE ACTION SUMMARY

### Basis for Taking Action

After listing on the National Priorities List (NPL), in July 1987, contractors for NYSDEC, pursuant to a cooperative agreement with EPA, completed the OU1 Remedial Investigation and Feasibility Study (RI/FS) at the site that was intended to define the nature and extent of contamination and to identify the source(s) of contamination to the Ranney well. The RI indicated that the most probable source of contamination was the Endicott Landfill. However, additional data were required to evaluate further contaminant distribution and conclusively identify the source of contamination. Trichloroethene (TCE), 1,2-dichloroethene (DCE), vinyl chloride, and chloroethane were identified as the primary contaminants of concern (COCs) in groundwater exceeding maximum contaminant levels (MCLs).

The results of the risk assessment conducted during the RI indicated that ingestion of contaminated groundwater at the site is the primary pathway of concern. The carcinogenic risk to adult residents from ingestion of contaminated groundwater is greater than EPA's acceptable risk range of $10^{-4}$ to $10^{-6}$ (1 in ten thousand to 1 in a million). The cancer risks were $1 \times 10^{-3}$ (1 in a thousand) for resident adults and $4 \times 10^{-4}$ (4 in 10,000) for children for the present and future use scenario. The Hazard Index (HI) for non-carcinogenic effects from ingestion of groundwater under a Reasonable Maximum Exposure scenario to residents was 14 for the adult, 28 for the child, and 5 for future construction workers. The HI exceeds the goal of protection of a HI = 1 established under the NCP. The excess cancer risk and non-cancer HI at the site are primarily due to vinyl chloride in groundwater and carcinogenic polynuclear aromatic hydrocarbon (PAHs), total polychlorinated biphenyls (PCBs), arsenic and beryllium in soil.

Ecological assessments of the adverse effects of the COCs on ecosystems was conducted during the RI using exposure and toxicity data to estimate the potential impact on the ecosystem. Surface water and sediment samples collected from the Susquehanna River, Nanticoke Creek, and Dead Creek showed no significant concentrations of VOCs. Therefore, it was determined that the site is not adversely impacting ecological receptors.

### Response Actions

Based on the results of investigations conducted by NYSDEC, in July 1984, an existing purge well designed to pump approximately 600 gallons per minute (gpm) and three additional monitoring wells were installed on the En-Joie Golf Course to intercept and monitor groundwater contamination before it reached the Ranney well. Water from this purge well was pumped to the golf course pond system where it was aerated before it was ultimately discharged to Nanticoke Creek. In accordance with an Explanation of Significant Differences (ESD), operation of the existing purge well was discontinued on December 15, 1995.

The RI for OU1 did not determine the source(s) of the VOCs in the groundwater at the Ranney well. Therefore, in accordance with the 1987 Record of Decision (ROD), a supplemental RI/FS was initiated to investigate further the nature and extent of contamination in suspected source areas and to evaluate possible source control measures. On September 19, 1988, EPA, the International Business Machines Corporation (IBM), the Village, and the Town of Union (the Town) signed an Administrative Order on Consent for performance of the supplemental RI/FS. The supplemental RI/FS activities were undertaken in two phases and were performed by IBM through its consultants, Lozier/Groundwater Associates, Inc.

The RI Report for the Phase I study was designated as OU2 and indicated that additional remedial measures were needed to control the plume of contaminated groundwater emanating from the Endicott Landfill. During the OU2 investigations intended to identify the source(s) of contamination to the Ranney Well, it was determined that an interim action be implemented to expedite cleanup of the groundwater and was designated as OU3.

## Remedy Selection

### OU1 ROD

The goal of the remedial action for the OU1 ROD, issued on March 31, 1987, was to provide a safe and reliable supply of drinking water to residents by requiring the installation of an air stripper at the Ranney well to prevent ingestion of contaminated groundwater. The major components of the selected remedy included the following:

- Constructing an air stripper at the Ranney well designed to treat the current use flow rate of approximately 3,700 gpm;
- Treatment of the contaminated Ranney well water to drinking water quality standards (i.e., MCLs) under the Safe Drinking Water Act;
- Continuing operation of the existing purge well system;
- Continuing the monitoring program designed to detect the presence of VOCs in the Ranney well water; and
- Performing a supplemental RI/FS to further investigate the nature and extent of contamination in suspected source areas, to evaluate possible source control measures for such areas, and to evaluate further the extent of aquifer contamination together with alternatives for aquifer restoration.

### OU3 ROD

The goal of the interim remedial action for the OU3 ROD, issued on March 29, 1991, was to expedite the cleanup of the groundwater aquifer and to reduce the potential threat to the Ranney well. The major components of the selected remedy included the following:

- Upgrading the existing purge well system with the installation of a supplemental purge well (SPW);
- Implementing a SPW monitoring program;
- Continuing operation and maintenance of the existing purge well system; and
- Conducting an aquifer pump test to determine treatment requirements.

### OU2 ROD

The following RAOs were established for the OU2 ROD issued on September 30, 1992:

- Groundwater control to prevent migration of the VOC-contaminated plume;
- Remediation of contaminated groundwater emanating from the Endicott Landfill to drinkable

levels;
- Landfill waste containment and control of associated landfill gas; and
- Control and treatment of the leachate seep to levels acceptable for proper disposal[1].

The major components of the selected remedy included the following:

- Capping the majority of the landfill surface with a low permeability barrier cap;
- Capping with bituminous (asphalt) the 6-acre parcel of the landfill where the Village has a permitted yard waste composting facility and the 8-acre CAA of the Tri-Cities Airport regulated by the FAA;
- Performing an explosive gas investigation and installing a passive gas-venting system;
- Collecting, treating, and disposing of the leachate seep;
- Recommending that institutional controls (ICs) in the form of deed restrictions be established on future uses of the landfill;
- Implementing site access restrictions;
- Performing long-term operation and maintenance of the landfill cap, gas-venting, and leachate systems;
- Performing long-term air and water quality monitoring;
- Continuing operation and maintenance of the groundwater collection and treatment measures already selected for the site; and
- Continuing groundwater monitoring.

ESD

All three RODs selected the continued operation of the existing purge well as a component of the remedies. Once the OU3 ROD was implemented, an aquifer pump test was conducted. Based on the results of the aquifer pump test, the Village notified EPA that it believed that the SPW alone, without the existing purge well, could achieve containment and capture of contaminated groundwater.

Subsequently, EPA gave approval to the Village to perform a pilot study to evaluate if pumping of the existing purge well could be discontinued when the SPW was fully operational. Based on the results of the pilot study, EPA issued an ESD on December 11, 1995 which allowed for discontinuing the operation of the existing purge well. EPA gave permission to the Village to discontinue operation of the existing purge well on December 15, 1995.

## Status of Implementation

OU1 Remedial Actions

In 1988, EPA concluded consent decree (CD) negotiations with the Town and the Village related to the performance of the remedial design (RD), remedial construction, operation, maintenance, and monitoring of the remedy selected in the OU1 ROD. On January 10, 1989, the CD was entered in United States District Court for the Northern District of New York.

[1] After installation of the cap, leachate seeps were no longer present at the site. Therefore, collection of leachate was not warranted.

The remedial action (RA) was formally initiated on December 10, 1989 when the Village awarded the RA contract. The remedy was implemented in a manner consistent with the 1987 ROD and in accordance with the plans and specifications of the remedial design. Construction of the air stripping unit at the Ranney well was completed by the Village in the fall of 1991 and the air stripper has been in continuous operation since that time.

In a letter dated September 26, 1996, the Village requested that EPA allow it to discontinue operation of the air stripper. After a review of all available data, EPA determined that water from the Ranney well was meeting MCLs prior to treatment. Therefore, EPA gave permission to discontinue operation of the air stripper with the understanding that the Village will maintain the air stripper so that it can be restarted immediately in the event that MCLs are exceeded in the future. However, as a precautionary measure, the air stripper is still being operated by the Village.

OU3 Remedial Actions

Pursuant to a second CD entered in United States District Court for the Northern District of New York on March 25, 1992, the Village, the Town, Endicott Johnson Corporation (EJ), IBM and George Industries, Inc., agreed to perform the OU3 Remedial Design/Remedial Action (RD/RA).

To determine if the water pumped from the SPW could be treated by the STP, a temporary SPW pumping system and a discharge pipeline were constructed. Pumping of the SPW, with discharge to the STP, was initiated in August 1993. The permanent hook-up to the STP was completed in June 1995. EPA and NYSDEC determined that the remedy was implemented in a manner consistent with the 1991 ROD and in accordance with the plans and specifications of the RD. Groundwater level monitoring demonstrates that the SPW system is achieving containment and capture of contaminated groundwater.

The SPW Monitoring Plan was approved by EPA in March 1993. The approved monitoring plan includes flow readings and sampling and analyses of effluent from the SPW along with water elevation measurements in 25 monitoring wells to document the capture zone of the SPW. The monitoring results indicate that the SPW is performing as designed.

OU2 Remedial Actions

Pursuant to a third CD entered in United States District Court for the Northern District of New York on January 18, 1994, EJ, the Village, the Town and IBM agreed to perform the OU2 RD/RA.

The implemented remedy consists of a landfill cover system, a gas venting system, a leachate seep collection system, long-term Operation and Maintenance (O&M) and Institutional Cs.

The purpose of the cover system is to reduce the vertical migration of water through the landfill, to minimize the potential for leaching of site contaminants into the groundwater. Two types of covers were constructed on the landfill, bituminous and soil. In July 1996 construction was completed for a bituminous cover on approximately 10 acres of the landfill which lie primarily in the FAA controlled Activities Area and beneath the Village's yard waste composting facility. In addition, in September 1996, construction of a low-permeability soil cover on approximately 62 acres of the landfill was completed with placement of the topsoil material. The soil cap was placed on the area which lies predominantly within 1,000 feet of the Susquehanna River. To address potential post-closure issues associated with the presence of landfill gases, including the possibility of migration, a passive gas

collection and venting system was completed at the site in June 1996. The gas collection system is comprised of a 12-inch layer of sand and gravel with a permeability of 1 x $10^{-3}$ cm/sec. The passive venting was installed beneath the barrier material and asphalt cap over the entire extent of the landfill. The purpose of the gas vent layer is to prevent the local buildup and migration of landfill gasses, by conveying them to a venting location.

Between April 18, 1996 and April 22, 1996, a groundwater/leachate interception trench measuring 100-feet long by 20- feet wide by 28- feet deep was installed five feet west of the leachate seep limit along the Susquehanna River bank. A 44-foot wide by 100-foot long, factory-seamed barrier of geomembrane was installed into the trench. However, once the cap was installed, no more leachate was being generated. Therefore, the operation of the leachate management portion of the remedy was never implemented.

The O&M plan, approved by EPA in August 1995, provides for long-term maintenance of the landfill cap and gas venting system.

Table 1: Summary of Planned and/or Implemented ICs

| Media, engineered controls, and areas that do not support UU/UE based on current conditions | ICs Needed[2] | ICs Called for in the Decision Documents | Impacted Parcel(s) | IC Objective | Title of IC Instrument Implemented and Date (or planned) |
|---|---|---|---|---|---|
| Landfill | No | No | Endicott Landfill | Rely on Village's ownership of landfill and participation in the CD to ensure potential future uses of the landfill are protective of the remedy. | N/A |
| Groundwater | No | No | Groundwater between the Endicott Landfill and the Ranney Well | Rely on state and local laws to help limit future groundwater use by regulating the installation of water wells at the site. | N/A |

[2] The OU2 ROD recommended, but did not require, that the Village implement ICs in the form of deed restrictions on future uses of the landfill. As recommended in the previous FYR, EPA requested that the Village address this recommendation by placing a deed restriction in the form of an environmental easement on the landfill property. In a letter dated October 13, 2020, the Village declined to implement the ROD recommendation. As discussed further in the IC Implementation section on Page 13 below, as of this FYR, EPA believes that effective IC measures are in place that continue to serve as acceptable controls on future uses of the landfill. The OU2 ROD did not provide for ICs for groundwater but there are existing state and local laws that serve to limit access to the groundwater.

**Systems Operations/Operation & Maintenance**

Operation, maintenance, and monitoring (OM&M) activities are currently carried out by the Village on behalf of the PRPs in accordance with the O&M Plan. Pursuant to the three RODs, as amended by the ESD and as otherwise approved by EPA, the necessary O&M activities currently include:

- Quarterly groundwater quality monitoring at the SPW to determine if the levels of contamination are at or below MCLs;
- Sampling of effluent from the SPW;
- Sampling of groundwater monitoring once every five years;
- Groundwater elevation monitoring at 27 monitoring wells to determine if changes occur in the direction of groundwater flow;
- Inspection of the landfill to insure that no erosion damage has occurred; and
- Submittal of quarterly reports.

The OM&M program also includes routine inspections of the capped area and maintenance of the established vegetation cover within the capped area.

In July 2019 EPA approved the Village's request for a reduction in the frequencies of the OM&M requirements. Sampling of the SPW effluent and water level measurements was changed from quarterly to semi- annually and submittal of summary reports was changed from quarterly to annually.

Potential site impacts from climate change have been assessed, and the performance of the remedy is currently not at risk due to the expected effects of climate change in the region and near the site.

# III. PROGRESS SINCE THE LAST REVIEW

This section includes the protectiveness determinations and statements from the **last** FYR as well as the recommendations from the **last** FYR and the current status of those recommendations.

**Table 2**: Protectiveness Determinations/Statements from the 2016 FYR (Fourth FYR)

| OU # | Protectiveness Determination | Protectiveness Statement |
|---|---|---|
| 2 | Protective | The remedy at OU2 is protective of human health and the environment. |
| 3 | Protective | The remedy at OU3 is protective of human health and the environment. |
| Sitewide | Protective | The remedies implemented for the site are protective of human health and the environment. |

There were no issues and recommendations identified in the last FYR. However, there were suggested modifications pertaining to OM&M at the site. Specifically, the following suggestions were included in the last FYR:

- Update monitoring plan to ensure that:
    - For at least one water level measurement event per year, potentiometric data are contoured to confirm that there is hydraulic containment;
    - Appropriate analytical data is collected between the landfill and the SPW to evaluate plume extent and progress towards restoration;

- Develop a permanent solution to address potholes and subsided areas; and
- Implement an Environmental Easement/ Restrictive Covenants to control future use of the landfill.

The first two suggestions were implemented and are now part of the O&M activities at the site; the additions will be documented in an upcoming update to the monitoring plan. The Village has agreed to permanent solutions to address the potholes and subsided areas; these areas are expected to be addressed next spring. In a letter dated October 13, 2020, the PRPs declined to proceed with implementation of an Environmental Easement/Restrictive Covenant since it was only a recommendation in the ROD. However, ICs in the form of existing state and local regulations will be relied upon to protect the remedy and restrict future groundwater use at the site. Specifically, the NYSDOH State Sanitary Code regulates and prevents the installation of wells at a hazardous waste site in the state.

## IV. FIVE-YEAR REVIEW PROCESS

### Community Notification, Involvement & Site Interviews

On September 22, 2020, EPA Region 2 posted a notice on its website indicating that it would be reviewing site cleanups and remedies at Superfund sites in New York and New Jersey, Puerto Rico and the U.S. Virgin Islands, including the Endicott Well Field Superfund site. The announcement can be found at the following web address: https://www.epa.gov/superfund/R2-fiveyearreviews.

In addition to this notification, a notice of the commencement of the FYR was posted on the EPA's Region 2 website and sent to local public officials. The notice was provided to the Village of Endicott and the Town of Union on December 1, 2020, with a request that the notice be posted in the respective municipal offices and on the Village and Town webpages. The purpose of the public notice was to inform the community that the EPA would be conducting a FYR to ensure that the remedy implemented at the site remains protective of public health. In addition, the notice included contact information, including addresses and telephone numbers, for questions related to the FYR process or the site.

Once the FYR is completed, the FYR report will be made available online (www.epa.gov/superfund/endicott-village) and at the site information repositories. The information repositories are maintained at the EPA Region 2 Superfund Records Center, 290 Broadway, 18th Floor, New York, New York and the Village of Endicott Clerk's Office, Municipal Building, 1009 East Main Street, Endicott, New York.

### Data Review

Groundwater Quality Data

Long-term groundwater monitoring at the site has been conducted since 1997. Monitoring of the Ranney well is not part of the long-term monitoring for the site. The objective of monitoring the SPW is to determine concentrations of COCs (principally VOCs) relative to their respective MCLs. The long-term monitoring data indicate that VOC concentrations in the SPW, which is down-gradient of the landfill, have declined since 1995, and have generally remained stable over the last five years. Analysis of sampled SPW influent for the period between 2016 and 2019 indicates that most VOC constituents were either not detected or detected at low-level concentrations below the MCLs.

In the SPW, only vinyl chloride remains above the MCL and State standard of 2 parts per billion (ppb). Vinyl chloride concentrations ranged from 14.4 ppb in May 2016 to 23 ppb in June 2018 (Table 6). Compounds that were detected at concentrations below MCLs and state standards or do not have MCLs included trichloroethylene, cis-1,2-dichloroethylene, chlorobenzene, benzene, methylene chloride, 1,1-dichloroethane, and chloroform (Table 6).

Table 6: Maximum concentration of compounds detected in SPW 2016-2019

| **Compound** | **MCL (ppb)** | **Max (ppb) 2016-2019** | **Date of Max** |
|---|---|---|---|
| Vinyl Chloride | 2 | **23** | June 2018 |
| Trichloroethylene | 5 | 0.57 | Nov 2017 |
| cis-1,2-Dichloroethylene | 70 | 23.5 | Sept 2017 |
| Chlorobenzene | 100 | 2.9 | June 2018 |
| Benzene | 5 | 1.13 | Sep 2020 |
| Methylene Chloride | n/a | 0.5 | Dec 2018 |
| 1,1-Dichloroethane | n/a | 2.72 | Sept 2017 |
| Chloroform | n/a | 2.93 | Sept 2017 |
| Total VOCs | n/a | 53.4 | Sept 2017 |

**Notes**:
-bold: result exceeds federal MCL
-n/a: contaminants that do not have MCLs

Although not part of the regular sampling activities currently required at the site, a select grouping of wells were sampled in September 2020 to assess VOC concentrations in site monitoring wells compared to VOCs identified in the RI/FS. Monitoring wells SPW, EW-3D, EW-14, MW-6D, MW-13D, MW-22, MW-25D, and MW-29 (Figure 2) were analyzed for benzene, chloroethane, cis-1,2-Dichloroethylene, trichloroethene, and vinyl chloride.

The data demonstrated that the chlorinated plume which used to extend from the Endicott Landfill to the Ranney well has receded significantly. However, results indicated that there are still low levels of VOCs in a few monitoring wells. The select VOCs that were analyzed were non-detect in all of the wells sampled except for the SPW and EW-3D. Results from the SPW showed detections for benzene (1.13 ppb) and cis-1,2-Dichloroethylene (10.3 ppb) below the MCLs of 5 ppb and 70 ppb respectively. Results for vinyl chloride in the SPW were 22.3 ppb, above the standard of 2 ppb. These 2020 results are consistent with previous sampling events during this review period and the previous review periods.

EW-3D was the only other well that showed detections of COCs during the 2020 groundwater sampling event. EW-3D is located approximately 0.12 miles east of the SPW on the eastern side of the Susquehanna River and screened from 75 to 85 feet below ground surface (bgs). Vinyl chloride (1.90 ppb) and cis-1,2-dichloroethylene (10.3 ppb) were detected below their MCLs of 2 ppb and 70 ppb respectively. During the previous sampling event in 2014, all COCs were non-detect in EW-3D. Groundwater contours from May 2020, indicate that groundwater in EW-3D may be outside of the zone of influence of the SPW and therefore COCs detected in this well may not be fully captured. Continued monitoring of water levels and COCs at EW-3D is recommended. During the RI concentrations of vinyl chloride and cis-1,2-DCE in EW-3D ranged from 37 ppb to-200 ppb and 140 ppb to 250 ppb, respectively. Therefore, these fluctuations in EW-3D are not considered significant.

Groundwater Level Data

The objective of the groundwater elevation monitoring program is to assess whether changes have occurred in the direction of groundwater flow and identify the capture zone of the SPW. Maintaining a hydraulic cone-of-depression around the SPW is necessary to entrain contaminated groundwater that may still emanate from the landfill area and also to prevent groundwater from flowing toward the Ranney well. Since water levels within the aquifer fluctuate seasonally, the program includes quarterly data collection from 27 monitoring wells. The results of the groundwater level elevation monitoring indicate that the overall direction of groundwater flow has not changed since the RI, that a hydraulic cone-of-depression appears to be consistently maintained over the SPW regardless of seasonal water-level fluctuations, and that there is containment of the groundwater plume from the Endicott Landfill (Figure 2). Containment is also demonstrated by weekly groundwater-quality monitoring results, taken by the Village at the Ranney well, which continues to show readings below MCLs prior to treatment by the air stripper.

Landfill Cap Inspection

For inspections of the landfill, NYSDEC and EPA rely on the checklist post-closure reports which are submitted by the Village on a quarterly basis. Over the years, both NYSDEC and EPA have found these reports to be factually accurate. The Village's most recent quarterly checklist, dated June 5, 2019, indicates that several of the paved areas of the landfill cap have developed cracks and subsidence features and that pooling of water has or can occur. The Village indicated that they are planning to correct the issue.

**Site Inspection**

The inspection of the site was conducted on 11/19/2020. In attendance were Sherrel Henry, EPA RPM, Payson Long, NYSDEC Project Manager and Philip Grayson, Project Manager for the Village on behalf of the PRPs. The purpose of the inspection was to assess the protectiveness of the remedy. During the site inspection, it was observed that several areas of the paved landfill cap have settled, as evidenced by cracks and subsidence allowing pooling of water to occur. As indicated above, the Village has plans to address these areas.

## V. TECHNICAL ASSESSMENT

**QUESTION A:** Is the remedy functioning as intended by the decision documents?

According to the three RODs, the remedy for the site calls for the installation of an air stripper at the Ranney well (OU1) for the protection of the public water supply system, installation of an engineered landfill cap (OU2), and treatment of the groundwater plume (OU3) by the SPW. The objectives of the implemented remedies are to control the source of contamination at the site, to minimize the migration of contaminants into the groundwater and surface water, to minimize any potential human health impacts resulting from the exposure to contamination at the site, and to restore the aquifer.

The SPW continues to operate and based on groundwater level data, the SPW is effectively capturing the contaminants emanating from the landfill. Groundwater data collected from the SPW reveals that

VOC concentrations have decreased since the last FYR; however, vinyl chloride remains above the federal MCL and State standard of 2 ppb. Concentrations of other compounds detected have been reduced below MCLs and State standards and have remained relatively stable over the review period.

Groundwater samples from the site's monitoring wells for this FYR period were collected in September 2020. The select VOCs that were analyzed were non-detect in all of the wells sampled except for the SPW and EW-3D. Results from the SPW showed detections for benzene and cis-1,2-dichloroethylene below their respective federal MCLs. Vinyl chloride was detected in the SPW at 22.3 ppb, above the standard of 2 ppb. In EW-3D vinyl chloride and cis-1,2-dichloroethylene (cis-1,2-DCE) were detected below their MCLs. During the previous sampling event in 2014, all COCs were non-detect in EW-3D. Groundwater contours from May 2020, indicate that groundwater in EW-3D may be outside of the zone of influence of the SPW and therefore COCs detected in this well may not be fully captured. Continued monitoring of water levels and COCs at EW-3D is recommended. During the RI concentrations of vinyl chloride and cis-1,2-DCE in EW-3D ranged from 37 ppb to-200 ppb and 140 ppb to 250 ppb, respectively. Therefore, these fluctuations in EW-3D are not considered significant.

Groundwater sampling results from the site's monitoring wells collected in 2014, during the previous FYR period, showed elevated VOC concentrations between the landfill and the SPW, however water level measurements indicate that effective capture is occurring. The updated monitoring plan includes at least one water level measurement event per year where potentiometric data are contoured to confirm that there is hydraulic containment and the collection of analytical data between the landfill and the SPW to evaluate plume extent and progress towards restoration should continue.

In general, the landfill cap is well-maintained, mowed, and operating as designed. Several areas of the paved landfill cap, however, have settled, as evidenced by cracks and subsidence noted during an inspection conducted on November 19, 2020, allowing pooling of precipitation to occur. Some of these areas are associated with truck traffic and some are associated with the end of the eight-acre area designated by the FAA as the CAA, which includes the Runway Object Free Area. The Village indicated that they are planning to repair these areas.

IC Implementation

The OU2 ROD recommended, but did not require, that the Village implement ICs in the form of deed restrictions on future uses of the landfill. As recommended in the previous FYR, EPA requested that the Village address this recommendation by placing an environmental easement on the landfill property. In a letter dated October 13, 2020, the Village declined to implement the ROD recommendation. As of this FYR, EPA believes that the Village's ownership of the landfill and its legal obligations under the CD continue to serve as effective IC measures to control future uses of the landfill. The Village and the other PRP signatories to the CD are legally required by the CD to regularly maintain the landfill in accordance with the O&M Plan, to regularly report to EPA on the status of its work under the CD, and to advise EPA of any changes in any conditions, including ownership. Thus, the Village and the other parties to the CD are legally obligated to ensure the long-term protectiveness of the landfill remedy. The CD is legally enforceable against all signatories.

Institutional controls for groundwater were not identified in the OU2 ROD and CD. However, existing state and local laws limit future groundwater use by regulating the installation of water wells at the site. The Village of Endicott and Town of Union have adopted NYSDOH standards for individual or private

water supply wells in the Aquifer Recharge Zone (Zone II) and Wellhead Protection Zone (Zone 1), which limit the installation of wells at the site.

**QUESTION B:** Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?

There have been no changes in the physical conditions of the site over the past five years that would change the protectiveness of the remedy. The site has limited access based on its location within an industrial area, fencing, the presence of the Tri-Cities Airport and Airport Road that borders the site to the west, the eastern boundary of the En-Joie Golf Course to the east, and the Susquehanna River to the South. In addition, the caps placed over the landfill provide an additional barrier to exposure.

Soil and groundwater use at the site did not change during the past five years, the period of time considered in this review. Changes in the land use are not expected to change during the next five years. The risk assessment in 1987 identified ingestion of groundwater by area residents as the principle route of exposure. The main COCs identified at the site included: TCE, 1,2-DCE, vinyl chloride, and chloroethane in groundwater.

The ROD established the federal MCLs as the cleanup criteria for the contaminants of concern identified above. There have been no updates to the toxicity of the COCs since the last FYR. The federal MCLs remain protective.

In addition, due to the presence of 1,1,1-trichloroethane historically in the groundwater, the sampling parameters for each of the well locations in the 2014 sampling event were expanded to include 1,4-dioxane. Samples were collected from 10 wells including the SPW. The results did not reveal 1,4-dioxane in any of the wells sampled. Since the Fourth FYR, no additional analysis of 1, 4-dioxane has been conducted.

Soil vapor intrusion based on groundwater concentrations was evaluated during the previous FYR. Evaluation of the groundwater concentrations using the Vapor Intrusion Screening Level (VISL) Calculator to evaluate potential vapor intrusion based on various media including groundwater concentrations was conducted. Comparison of the maximum concentrations of TCE in groundwater to the calculated risk based concentration in groundwater using the VISL Calculator found that the concentration of TCE was below the calculated groundwater concentration based on risk (e.g., 1.19 ug/l associated with a cancer risk of $1 \times 10^{-6}$. *Cis*-1,2-DCE was not evaluated based on a lack of an inhalation toxicity value.

Ecological risk assumptions

An ecological assessment was conducted as part of the remedial investigation that focused on evaluating adverse effects on the ecosystem. The exposure pathways and toxicity data used to quantify ecological risk remain valid. The results of the ecological risk assessment, which used surface water and sediment samples collected from the Susquehanna River, Nanticoke Creek and Dead Creek showed no significant concentrations of VOCs and concluded that the site was not adversely impacting ecological receptors. Given that the contamination associated with the site is limited to groundwater contamination and waste material under the capped areas of the site, the primary concerns from an ecological perspective would be discharge of contaminated groundwater to surface water or exposure of ecological receptors to contaminated soil. These pathways are not complete, and there are no impacts to ecological receptors.

**QUESTION C:** Has any **other** information come to light that could call into question the protectiveness of the remedy?

No other information has come to light that would call into question the protectiveness of the remedy. There have been no changes at the site resulting from natural disasters or climate change impacts.

## VI. ISSUES/RECOMMENDATIONS

This report did not identify any issue or make any recommendation for the protection of public health or the environment which was not included or anticipated by the site decision documents.

## VII. PROTECTIVENESS STATEMENT

| **Protectiveness Statement(s)** | | |
|---|---|---|
| *Operable Unit: OU2* | *Protectiveness Determination:*<br>Protective | *Planned Addendum Completion Date:*<br>Click here to enter a date |
| *Protectiveness Statement:*<br>The remedy at OU2 is protective of human health and the environment. | | |

| **Protectiveness Statement(s)** | | |
|---|---|---|
| *Operable Unit:*<br>OU3 | *Protectiveness Determination:*<br>Protective | *Planned Addendum Completion Date:*<br>Click here to enter a date |
| *Protectiveness Statement:*<br>The remedy at OU3 is protective of human health and the environment. | | |

| **Sitewide Protectiveness Statement** | |
|---|---|
| *Protectiveness Determination:*<br>Protective | *Planned Addendum Completion Date:*<br>Click here to enter a date |
| *Protectiveness Statement:*<br>The remedies implemented for the site are protective of human health and the environment. | |

## VIII. NEXT REVIEW

The next FYR report for the Endicott Village Well Field Superfund site is required five years from the completion date of this review.

# APPENDIX A – REFERENCE LIST

**Documents, Data, and Information Reviewed in Completing the Five-Year Review:**

| Document Title, Author | Date |
|---|---|
| OU1 Record of Decision, Endicott Village Well Field site, EPA | March 31, 1987 |
| OU3 Record of Decision, Endicott Village Well Field site, EPA | March 29, 1991 |
| OU2 Record of Decision, Endicott Village Well Field site, EPA | September 30, 1992 |
| OU2 Remedial Action Report, PRP | May 1997 |
| Semi-Annual Report, Endicott Village Well Field site, PRP | August 2016 – June 2019 |

# APPENDIX B – FIGURES

Figure 1: Site Location Map

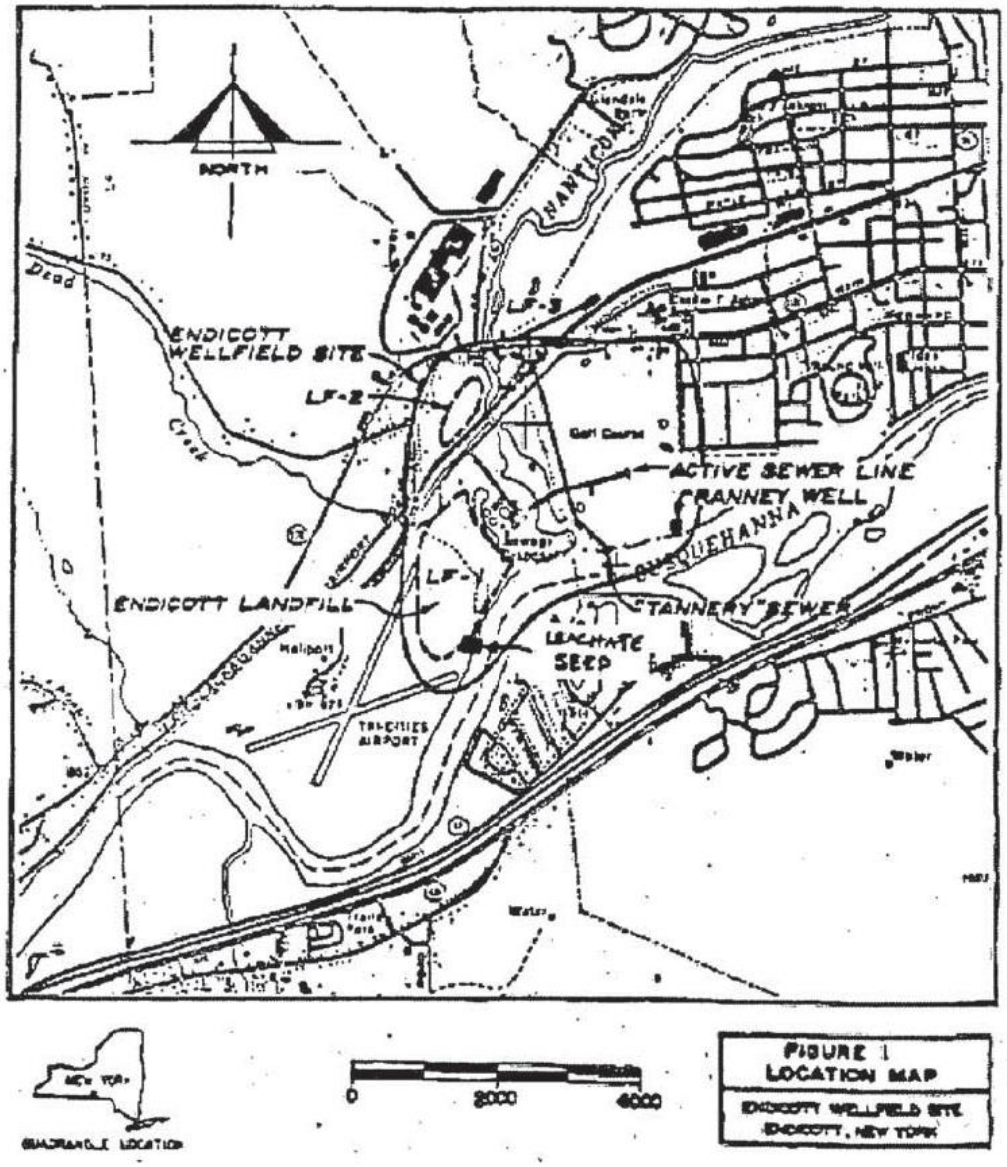

Figure 2: Monitoring Well Locations and May 2020 Groundwater Contours