

**Second Five-Year Review Report
Peter Cooper Superfund Site
Cattaraugus, New York**

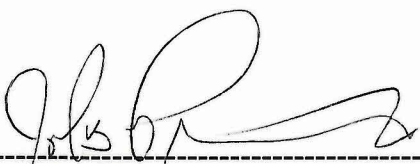


Prepared by

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

Approved by:

Date:

For 

**Pat Evangelista, Acting Director
Superfund and Emergency Management Division**

12/20/19

598740



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LIST OF ABBREVIATIONS & ACRONYMS

bgs	below ground surface
CD	Consent Decree
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
<i>cis</i> -1,2-DCE	<i>cis</i> -1,2-dichloroethene
COC	Contaminants of Concern
EPA	United States Environmental Protection Agency
FMPA	Former Manufacturing Plant Area
FYR	Five-Year Review
GARC	Gowanda Area Redevelopment Corporation
GWQS	Groundwater Quality Standards
HHRA	Human Health Risk Assessment
HI	Hazard Index
ICs	Institutional Controls
ILA	Inactive Landfill Area
IRIS	Integrated Risk Information System
MCL	Maximum Contaminant Level
mg/L	Milligrams/Liter
NPL	National Priorities List
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
O&M	Operation and Management
OM&M	Operation, Maintenance and Monitoring Manual
PCC	Peter Cooper Corporation
PCE	tetrachloroethene
PSDs	Performing Settling Defendants
PFAS	Per and Polyfluoroalkyl Substances
RAOs	Remedial Action Objectives
RAR	Remedial Action Report
RD	Remedial Design
RPM	Remedial Project Manager
ROD	Record of Decision
RI/FS	Remedial Investigation/Feasibility Study
SIU	Significant Industrial User
SLERA	Screening Level Ecological Risk Assessment
SMP	Site Management Plan
SWQS	Surface Water Quality Standards
UAO	Unilateral Administrative Order
ug/L	micrograms/liter
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 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 pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121, consistent with the National Contingency Plan (40 Code of Federal Regulations Section 300.430(f)(4)(ii)), and considering EPA policy. A FYR is required at this site since hazardous substances, pollutants or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure (UU/UE).

This is the second FYR for the Peter Cooper Superfund site (also known as the Peter Cooper Landfill site) located in the Village of Gowanda, Cattaraugus County, New York. The triggering action for this statutory review is the signing date of the previous FYR, April 1, 2015.

The site consists of one operable unit, which is addressed in this FYR.

The Peter Cooper Superfund Site FYR was led by Sherrel Henry, EPA Remedial Project Manager. Participants included: David Edgerton, EPA hydrogeologist, Michael Clemetson, EPA ecological risk assessor, Marian Olsen, EPA human health risk assessor, Mike Basile, EPA community involvement coordinator and Maurice Moore, New York State Department of Environmental Conservation (NYSDEC) Project Manager.

Site Background

The site is located off Palmer Street, in the Village of Gowanda, Cattaraugus County, New York (see Figure 1). The site consists of an inactive landfill and land associated with the former Peter Cooper Corporation (PCC) animal glue and adhesives manufacturing plant. The site is bounded to the north by Cattaraugus Creek (Creek), to the south by Palmer Street, to the west by a former hydroelectric dam and wetland area, and to the east by residential properties. Regionally, the Village of Gowanda is located both in Erie County and Cattaraugus County and is separated by the Creek. In Erie County, the Village of Gowanda is included in the Town of Collins. In Cattaraugus County, the Village of Gowanda is located in the Town of Persia. For purposes of the remedial investigation and feasibility study (RI/FS), the site was divided into two sections. The western section, called the inactive landfill area (ILA), is approximately 15.6 acres in size, and includes an additional five acres referred to as the "elevated fill subarea." The westernmost portion of the elevated fill subarea is located on property owned by the New York State Electric & Gas Corporation. The eastern section of the site, the former manufacturing plant area (FMPA), is approximately 10.4 acres. The site was deleted from the National Priorities List in September 2019.

Regional groundwater is a sole source of potable water and is designated as a drinking water source by NYSDEC, i.e., a "GA" classification. Industries, businesses, and residences obtain their drinking water from the Village of Gowanda municipal water supply.

The site is located in an area characterized by mixed industrial-commercial/residential usage. Residential zoning is the dominant parcel designation within the Village. Industrialized zones are primarily concentrated in the southeast portion of the Village, primarily along the Creek. The Creek is a surface water body suitable for fishing and secondary recreation (not primary contact recreation such as swimming) but not as a drinking water supply. The site is located in an area zoned industrial.

From 1904 to 1972, the PCC and its predecessor, Eastern Tanners Glue Company, manufactured animal glue at the site. When the animal glue product line was terminated, PCC continued to produce synthetic industrial adhesives until the plant closed in 1985. The wastes from PCC's glue production were disposed of on the elevated fill subarea. Between 1925 and October 1970, PCC used the northwest portion of the property to pile sludge remaining after the animal glue manufacturing process. These wastes, known as "cookhouse sludge" because of a cooking cycle that occurred just prior to extraction of the glue, are derived primarily from chrome-tanned hides obtained from tanneries. The waste material has been shown to contain elevated levels of chromium, arsenic, zinc, and several organic compounds.

FIVE-YEAR REVIEW SUMMARY FORM

SITE IDENTIFICATION		
Site Name: Peter Cooper		
EPA ID: NYD980530265		
Region: 2	State: NY	City/County: Gowanda/Cattaraugus County
SITE STATUS		
NPL Status: Deleted		
Multiple OUs? No	Has the Site achieved construction completion? Yes	
REVIEW STATUS		
Lead agency: EPA <i>[If "Other Federal Agency", enter Agency name]:</i>		
Author name (Federal or State Project Manager): Sherrel Henry		
Author affiliation: EPA		
Review period: 4/1/2015 - 11/26/2019		
Date of Site inspection: 11/7/2019		
Type of review: Statutory		
Review number: 2		
Triggering action date: 4/1/2015		
Due date (five years after triggering action date): 4/1/2020		

II. RESPONSE ACTION SUMMARY

Basis for Taking Action

In April 2000, EPA issued a unilateral administrative order (UAO) to fourteen respondents to perform the RI/FS of the site, subject to EPA oversight. Media sampled during the RI included landfill gas, groundwater, surface water, sediment, soil, waste material, and seepage emanating from the landfill.

The RI determined site soils to be contaminated with the following contaminants of concern (COCs), metals, particularly arsenic, and chromium, and volatile organic compounds (VOCs) including carbon tetrachloride, chloroform and tetrachloroethene (PCE). Groundwater was found to be contaminated with arsenic. A baseline human health risk assessment (HHRA) and a screening level ecological risk assessment (SLERA) were conducted to provide a quantitative assessment of the human health risks and a qualitative assessment of risk to ecological receptors under current and future land use scenarios. The assessments assumed no remedial actions or institutional controls (ICs) to prevent exposure.

The HHRA evaluated exposures to various reasonable maximally exposed individuals to all contaminants identified in the groundwater, soils, sediment, landfill gas and surface water. The conclusions of the risk assessment are summarized below.

- *Future Outdoor Worker at ILA.* Cancer risks and noncancer health hazards associated with exposures to the ILA from future ingestion of groundwater and soil. The cancer risks were 4×10^{-4} (4 in 10,000) and a noncancer hazard index (HI) = 2.3. The main contaminant was arsenic.
- *Future Industrial Worker at FMP.* Cancer risks and noncancer health hazards from ingestion of groundwater and surface soils. The cancer risks were 4×10^{-4} (4 in 10,000) and an HI = 2 from future ingestion of arsenic in the groundwater and carbon tetrachloride, chloroform, and arsenic in surface soils.
- *Future Commercial Worker at FMFA.* Cancer risks from exposures to carbon tetrachloride and chloroform and other VOCs were approximately 3×10^{-3} (3 in 100,000) and, for noncancer health effects, an HI = 2.3, with arsenic in groundwater, the primary risk driver.
- *Construction Worker Exposed to Hot Spots.* The hot-spot analysis found exposures to soil fugitive dust was an HI = 7.6. The noncancer HI to construction workers in the FMFA from soil fugitive dust exposure was an HI = 1.4.

The SLERA indicated the potential for ecological risk to site terrestrial receptors from organic and inorganic contaminants in soils. The food web model used in the SLERA indicated potential ecological risk from exposure to semi-volatile organic compounds (SVOCs) in soil, in particular polynuclear aromatic hydrocarbons, which are SVOCs, for terrestrial mammalian species. The SLERA also indicated potential risk to terrestrial receptors including terrestrial invertebrates and mammals from one or more inorganic chemicals in soil including arsenic, chromium, lead, and zinc.

Response Actions

Remedy Selection

For this site, remedial action objectives (RAOs) were only established for soil. The RAOs for soil are (1) to reduce or eliminate any direct contact threat associated with the contaminant soils/fill, (2) to minimize

or eliminate contaminant migration from contaminated soils to the groundwater and surface water, and (3) to minimize or eliminate contaminant migration from groundwater to the Creek

Based upon the results of the RI/FS, the Record of Decision (ROD) issued on September 30, 2005, called for the following remedial measures:

- Excavating three hot spot areas and consolidating waste from these areas within the elevated fill subarea, capping the five-acre elevated fill subarea of the inactive landfill area with a low permeability equivalent design barrier cap, consistent with the requirements of 6 New York Codes, Rules and Regulations Part 360;
- Seeding with a mixture of seeds to foster natural habitat;
- Conducting post-excavation confirmatory soil sampling;
- Backfilling the excavated areas with clean fill;
- Collecting the leachate seeps, pretreating the leachate as necessary, then discharging the leachate to the Publicly Owned Treatment Works collection system for further treatment and discharge;
- Performing long-term operation and maintenance including inspections and repairs of the landfill cap, gas venting, and leachate systems;
- Performing air monitoring, surface water and groundwater quality monitoring; and
- Evaluating site conditions at least once every five years to determine if the remedy remains protective.

To control risks posed by direct contact with soil in the ILA and the FMFA areas, the ROD identified soil cleanup levels for arsenic, chloroform, and carbon tetrachloride of 120 parts per million (ppm), 0.05 ppm and 0.33 ppm, respectively.

The remedy also included institutional controls (ICs) such as restrictive covenants and environmental easements for limiting future use of the site and the groundwater to ensure that the implemented remedial measures will not be disturbed and that the site will not be used for purposes incompatible with the completed remedial action. The ICs are being managed, in part, through a Site Management Plan (SMP) to ensure appropriate handling of subsurface soils during redevelopment.

To ensure that engineering controls and ICs remain in place and effective for the protection of public health and the environment, an annual certification, commencing from the date of implementation, has been required to be performed by the parties responsible for implementing the remediation.

Status of Implementation

In 2009, EPA concluded consent decree (CD) negotiations with a subgroup of the UAO recipients, identified as the performing settling defendants (PSDs), related to the performance of the design and implementation of the remedy called for in the ROD. On February 12, 2009, the CD was entered in United States District Court. The ROD included provisions for the evaluation of the construction of a diversion wall around the elevated fill area in the event the wall would affect the planned remedial actions. In accordance with the ROD, EPA and NYSDEC concurred with the findings of an analysis performed by the PSDs, prior to the entry of the CD, that the installation of an upgradient groundwater diversion wall around the elevated fill subarea would not materially alter the effectiveness of the planned remedial measures; therefore, the diversion wall was not implemented.

In 2009, the remedial design (RD) report and design plans and specifications were implemented under a design build contract for site remediation. The RD report identified materials to be employed for major

remedial components, construction requirements, quality control requirements, and measures to protect workers, the surrounding community, and the environment during the remedial work.

The excavation of the three "hotspot" areas of contaminated soil/fill was completed in August 2009. Soil excavated from these impacted areas was hauled to the elevated fill subarea of the ILA for placement and compaction prior to placing the soil cover system. The excavated areas were then backfilled with clean soil. Confirmatory sampling of the excavation sidewalls and bottom indicated arsenic and VOC concentrations that remained were below the site cleanup goals. Construction of the seep/groundwater collection system was substantially completed in November 2009. The construction of the collection system included the Creek bank regrading and bedrock channel excavation, the pump station installation, the pretreatment building construction, the force main piping, and the sanitary sewer tie-in. The seep/groundwater collection system was placed into full-time operation in May 2010, with operation and maintenance duties transferred to GARC.

The final cap system was installed from August 2009 to July 2010. Containment/isolation with soil cover enhancement involved the following: clearing and grubbing the approximate five-acre elevated fill subarea; moderate regrading and/or filling of low spots across the five-acre area to facilitate runoff; supplementing existing cover to provide for a minimum 18-inch thickness of a recompacted soil barrier layer and placement of six inches of topsoil over the five-acre area; and reseeding of the elevated fill subarea cover to provide for a good stand of grass that will foster natural habitat. Cover soils were tested to assure conformance with contaminant levels established under New York state law. Following construction of the cap, five passive gas vents were installed through the sludge fill in the elevated fill subarea to relieve gas buildup beneath the cover system. The vents were constructed with individual risers that extend to a sufficient height above ground surface to promote atmospheric dispersion of odor-causing constituents and prevent direct inhalation of vented gases by trespassers or future recreational site users.

EPA and NYSDEC conducted a final inspection of the constructed remedy on September 9, 2010. Based on the results of the inspection, it was determined that the site construction was complete and that the remedy was implemented consistent with the ROD. The PSDs and GARC are sharing responsibilities for management of the site in accordance with the SMP. The ROD called for the development of a SMP to provide for the proper management of all post-construction remedy components including an environmental easement that describes the ICs incorporated into the remedy and the requirement for certification that the ICs remain effective and in place.

Concurrent with completion of the RI/FS activities, the Village of Gowanda in association with the University at Buffalo Center for Integrated Waste Management developed a Reuse Assessment and Concept Plan for the site, in which it was concluded that the "highest and best use" of the property would be as a multi-use recreational facility. The Reuse Assessment and Concept Plan, funded in part by the EPA through its Superfund Redevelopment Initiative, envisions a publicly-available site incorporating elements such as a walking/biking trail, fishing access, outdoor picnic areas, small boat launch, and other related recreational features. No redevelopment of the site has occurred thus far.

IC Summary Table

Table 2: Summary of Planned and/or Implemented ICs.

Media, engineered controls, and areas that do not support UU/UE based on current conditions	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcel(s)	IC Objective	Title of IC Instrument Implemented and Date (or planned)
ILA	Yes	Yes	Elevated fill subarea	Establishing ICs in the form of deed restrictions on future uses of the elevated fill subarea	Environmental Easement/ Restrictive Covenants, placed on the real property in March 2009.
Groundwater	Yes	Yes	Groundwater	Restrict future groundwater use at the site	ICs in the form of existing state and local regulations will be relied upon to restrict future groundwater use at the site. Specifically, the New York State Department of Health (NYSDOH) State Sanitary Code regulates the installation of wells.

Systems Operations/Operation & Maintenance

Consistent with the future use of the property, following issuance of the ROD, the Village of Gowanda and the UAO recipients entered into discussions concerning the Village's redevelopment goals. An agreement was reached, and Gowanda Area Redevelopment Corporation (GARC) took ownership of the site and agreed to perform certain post-remedial operation and maintenance and monitoring activities in exchange for provisions of specific, non-remedial construction activities and funding by the respondents to facilitate park redevelopment.

Long-term monitoring and maintenance activities, including an annual inspection, are being performed by the PSDs and GARC in accordance with the post-remedial operation, maintenance, and monitoring (OM&M) Plan, Part I of the SMP. The primary activities associated with OM&M include the following:

- visual inspection of the elevated fill subarea cover system with regard to vegetative cover, settlement, stability and any need for corrective action;
- inspection of the gas vents;
- inspection of the creek bank stabilization system;
- inspection of the groundwater/seep collection and pretreatment systems;¹
- inspection of the condition of monitoring wells, including but not limited to working locks, adequate surface seals and protective casings, and sediment intrusion;
- monitoring of groundwater and surface water (semi-annually first three years, annually

¹ The leachate seep and groundwater collection and pretreatment system are monitored by GARC, the current property owner.

- thereafter), and groundwater elevation; and
- submission of annual reports to EPA and NYSDEC summarizing the results of the OM&M activities.

In addition to media monitoring, O&M activities include periodic certification that the ICs established in the environmental easement attached to the site property are unchanged and that nothing has occurred that would impair the ability to protect human health and the environment or otherwise constitute a violation or failure to comply with site controls. This certification is provided in the Periodic Review Report, submitted annually to EPA by the site owner.

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.

Per- and Polyfluoroalkyl Substances (PFAS) and 1,4-Dioxane Groundwater Sampling

Groundwater sampling for 1,4-dioxane and PFAS was conducted at the request of NYSDEC to evaluate the presence/absence of PFAS and 1,4-dioxane at the site. To evaluate conditions, three downgradient monitoring wells (MW-5S, MWFP-2S and MWFP-3S) and two upgradient monitoring wells (MW-1SR and MW-7SR) were selected for sampling.

1,4-dioxane was not detected (ND < 0.01 micrograms/liter (ug/L)). PFAS were detected in samples collected from each well, however, none of the samples had combined concentrations above the EPA Office of Water Lifetime Health Advisory Level of 70 parts per trillion for both PFOA and PFOS.

The State of New York is in the process of finalizing Maximum Contaminant Levels (MCLs) for 1,4-dioxane, PFOA and PFOS. EPA will continue to work with NYSDEC to determine whether further sampling at this site is necessary.

III. PROGRESS SINCE THE LAST REVIEW

Table 2: Protectiveness Determinations/Statements from the 2015 FYR

OU #	Protectiveness Determination	Protectiveness Statement
1	Protective	The implemented remedy for the Peter Cooper Superfund site protects human health and the environment. There are no exposure pathways that could result in unacceptable risks and none are expected, as long as the site use does not change, and the implemented engineered and institutional controls are properly operated, monitored, and maintained.
Site wide	Protective	The implemented remedy for the Peter Cooper Superfund site protects human health and the environment. There are no exposure pathways that could result in unacceptable risks and none are expected, as long as the site use does not change and the implemented engineered and institutional controls are properly operated, monitored, and maintained.

There were no issues and recommendations identified in the last FYR.

IV. FIVE-YEAR REVIEW PROCESS

Community Notification, Involvement & Site Interviews

On October 1, 2019, EPA Region 2 posted a notice on its website indicating that it would be reviewing site cleanups and remedies at 43 Superfund sites in New York, New Jersey and Puerto Rico, including the Peter Cooper site. The announcement can be found at the following web address:

<https://www.epa.gov/aboutepa/fiscal-year-2020-five-year-reviews>.

In addition, to this notification, a notice of the commencement of the FYR was sent to local public officials. The notice was provided to the Village of Gowanda by email on December 9, 2019, with a request that the notice be posted in municipal offices and on the village webpages. The purpose of the public notice was to inform the community that EPA would be conducting a FYR to ensure that the remedy implemented at the site remains protective of public health and and the environmental is functioning as designed. 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 results will be made available on EPA's Peter Cooper site webpage (www.epa.gov/superfund/peter-cooper). Information will also be made available at the following information repository:

Village of Gowanda,
Village Hall
27 East Main Street
Gowanda, New York 14070

Data Review

The primary objectives of the implemented remedy are to control the source of contamination at the site, to reduce and minimize the migration of contaminants into the groundwater and the Creek and to minimize any potential human health and environmental impacts resulting from exposure to contamination at the site. These objectives were accomplished by the construction of a containment system and the removal of hotspots. A long-term monitoring program was designed to ensure the implemented remedy remains effective.

The long-term monitoring program activities being implemented by the PSDs include the annual inspection of the landfill cover system; monitoring of the gas venting system; groundwater level monitoring; collection of groundwater samples from selected wells; monitoring status of the ICs; and providing annual reports on these activities to NYSDEC and EPA. GARC is responsible for monitoring of the leachate and groundwater collection and pretreatment systems.

In the 2018 Annual Report, Benchmark requested a reduction in the frequencies of the post-closure groundwater monitoring and water level measurements from annually to ever 15 months to allow for evaluation of seasonal variability in the data. EPA approved the request in July 2019.

Cover System Inspection

The landfill cover system is inspected for loss of slope, surface material erosion, insufficient vegetative cover growth, erosion of vegetative cover, and areas of surface settlement. The bank stabilization system is inspected to ensure the erosion control remains in place. The results of the inspections are reported in annual post-closure field inspection reports. The most recent inspection report, dated October 2018,

indicated the cover system is in good condition, with well-established, vegetative cover; and the riprap remains in place with no visual or olfactory evidence of leachate breakout.

Gas-Venting System Inspection

Gas vents are inspected annually for physical integrity, as well as monitored for explosive gases and hydrogen sulfide at the point of vent discharge. The most recent inspection report, dated October 2018, indicated the gas-vent monitoring system is intact and operational with no objectionable odors noted.

Groundwater Elevation Level Monitoring

Static water level measurements were collected from seven shallow monitoring wells (MW-7S, MWFP-2S, MWFP-3S, MW-2SR, MW-5, MW-6, MW-1SR) between October 2015 and October 2018 and were reviewed to determine if any changes in the direction of groundwater flow occurred over this time period. Based on the results of the groundwater elevation monitoring performed from 2015 to 2018, the inferred groundwater flow directions indicate that shallow groundwater migrates north westerly towards Cattaraugus Creek, which is consistent with observations recorded during the site RI. There are no significant changes in the direction of groundwater flow and the monitoring well network is adequate for determining the groundwater gradient.

Leachate Seep/Groundwater Collection and Pretreatment System

The Village of Gowanda, on behalf of GARC, submits annual reports and all reports indicate that all effluent samples collected per the Significant Industrial User (SIU) discharge permit have been in conformance with permit limits since the collection system was implemented in 2010. In addition, the ROD identified the possible use of pretreatment with oxidant but introduction of this chemical has not been required to achieve sulfide discharge limits. Consequently, the Village of Gowanda issued a revised permit reducing the requirement for pretreatment.

Groundwater Quality Monitoring

Groundwater samples were collected from five monitoring wells (MWs) at the site. Samples were analyzed for inorganic parameters (total metals), VOCs (chlorinated aliphatics only), and water quality parameters (ammonia, hardness, chloride, total sulfide). Total metals analyses included hexavalent chromium, total chromium, arsenic, and manganese. Groundwater results were compared to the more stringent of the state Groundwater Quality Standards (GWQS) or federal Maximum Contaminant Levels (MCLs).

The sample results are discussed below.

Results of total metal, VOC analyses and water quality parameters

VOCs. VOC concentrations were either not detected (non-detect) or below the state GWQS at all monitoring well locations, with the exception of PCE and *cis*-1,2-dichloroethene (*cis*-1,2-DCE). PCE was detected above the GWQS of 5 ug/L, with concentrations ranging from 5.9 ug/L to 13 ug/L. *Cis*-1,2-DCE was detected above the GWQS of 5 ug/L with concentrations ranging from 5.4 ug/L to 8.5 ug/L. These sporadic, slight VOC exceedances of GWQS criteria are not considered significant.

Metals. Concentrations reported for hexavalent chromium were non-detect or below GWQS at all monitoring locations. Total chromium was reported as non-detect or below the GWQS of 0.05 milligrams/liter (mg/L) at all monitored locations, with the exception of two minor exceedances of 0.056

mg/L and 0.054 mg/L. These sporadic, slight exceedances of total chromium GWQS criteria are not considered significant.

Arsenic was reported above the federal MCLs of 0.010 mg/L, with concentrations ranging from 0.011 mg/L to 0.043 mg/L. Arsenic was also detected in the upgradient well, so the exceedances in on-site wells are not considered to be site-related. Manganese was detected above the GWQS of 0.03 mg/L with concentrations ranging from 0.37 mg/L to 6.6 mg/L. The manganese screening criteria is a secondary MCL. Secondary MCLs do not require regulatory actions since they represent aesthetic parameters. These parameters will continue to be monitored.

Sulfide, Chloride and Ammonia. The water quality parameters reported for all sampling events were non-detect or below the GWQS for sulfide and chloride at all sampling locations. Ammonia was detected above the GWQS of 2 mg/L during all monitoring events at concentrations ranging from 3.5 mg/L to 10.8 mg/L. However, ammonia was also detected in the upgradient monitoring well, so the exceedances are not considered to be site-related. The groundwater data review indicates that the low levels of contamination in site groundwater are attenuating and groundwater quality has improved compared to baseline levels measured prior to commencement of remedial activities. In general, the data indicate minor/seasonal changes in concentration for the monitored parameters at each of the sample locations with no upward trending.

These data support the assumption set forth in the ROD that the groundwater contamination is localized and the decrease in frequency and concentration indicates that limited residual groundwater contamination is attenuating

The environmental easement placed on the site property restricts the use of groundwater as a source of potable or process water unless groundwater quality standards are met. Groundwater quality will continue to be monitored in accordance with the SMP.

Results of Surface Water Samples

Surface water samples were collected from three locations along the Creek at the same time as the groundwater samples were obtained from June 2011 through October 2018. Samples were also analyzed for inorganic parameters (total metals), VOCs (chlorinated aliphatics only) and water quality parameters (ammonia, hardness, chloride, total sulfide). Total metals analyses include hexavalent chromium, total chromium, arsenic, and manganese.

VOCs, sulfide, and chloride were not detected during any surface water sampling event conducted during this FYR period. Ammonia was detected above the Surface Water Quality Standards (SWQS) of 0.035 mg/L and iron and manganese were detected above the SWQS of 0.30 mg/L. Although ammonia, iron and manganese concentrations were reported above standards, this appears attributable to naturally occurring conditions as evidenced by their presence at concentrations above the standards in the upstream surface water sample. In addition, iron is not considered a contaminant of concern for the site.

The surface water data review indicates few exceedances of the standards with no observed impact from the site to the Creek. This indicates that there is no contaminated groundwater plume emanating from the landfill area. Surface water quality will continue to be monitored in accordance with the SMP.

Site Inspection

The inspection of the site was conducted on November 7, 2019. In attendance were Sherrel Henry, EPA-Remedial Project Manager (RPM); Maurice Moore, NYSDEC Project Manager; and Michael Hutchinson

and John Walgus, GARC Board Members. Also, in attendance was a representative from Benchmark (PSD consultant), Tom Forbes. The purpose of the inspection was to assess the protectiveness of the remedy. No issues or adverse conditions were observed.

During the site inspection, there were no problems or deviations observed with respect to the ongoing operation and maintenance activities.

V. TECHNICAL ASSESSMENT

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

Question A Summary:

The remedy is functioning as intended by the 2005 ROD. COCs identified in the ROD include arsenic, chromium, zinc, chloroform and carbon tetrachloride. COC concentrations in groundwater and surface water samples over the past five years were either not detected or sporadically detected slightly above regulatory standards. Analysis of geochemical parameters such as ammonia, which has been consistently detected above regulatory standards in all wells, indicate that leachate may be impacting groundwater quality throughout the site. However, measurement of oxidation-reduction potential indicate that geochemical conditions have changed over time, from reducing conditions to oxidizing conditions, in two of the four wells that have been sampled during this five-year period. A tendency toward a more oxidizing (less reducing) environment would result from a decreasing volume of leachate entering the groundwater beneath the landfill. Also, the leachate collection system is designed to reduce leachate generation.

Overall groundwater sampling results have demonstrated an improvement in water quality since the RI/FS was conducted in 2004. During this FYR, COCs were not detected in the majority of the monitoring wells sampled and surface water samples did not reveal any observed impacts from the site to the Creek. The SMP for the site outlines the PSD OM&M and IC requirements. The ICs are in place and ensure that future land use is consistent with the SMP and that groundwater use as a drinking water supply is restricted.

QUESTION B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still valid?

Question B Summary:

There are no changes in the physical conditions of the site or site uses that would affect the protectiveness of the selected remedy. The exposure assumptions and toxicity values that were used to estimate the potential cancer risks and noncancer hazards in the HHRA supporting the 2005 ROD, and the hot spot analysis, followed the Risk Assessment Guidance for Superfund. The process that was used in the HHRA remains valid. In addition, given that soils are covered with a cap, and community residents receive drinking water from the Public Water Supply of the Village of Gowanda, a municipal drinking water supply, the human exposure pathways have been interrupted.

The following sections highlight determinations based on exposures to soils and groundwater under future site conditions.

a. Soil.

The industrial land use zoning for the site has not changed since the HHRA. The HHRA found that exposures to the future construction worker exposed to the hotspot areas in the FMPA and ILA and exposed to fugitive dust exceeded the goal of protection of a HI = 1, for arsenic. The remedial action

objectives to excavate the hot-spot areas, consolidate soil within the elevated fill subarea, and capping to prevent potential exposure to the five-acre elevated fill subarea of the ILA are consistent with anticipated future use of the property.

Exposures to soil at the site have been interrupted by the installation of the cap. ICs and environmental easements were placed on the property to ensure that no activities are conducted on the consolidated waste area that would disturb the cap. The cap prevents direct contact with the waste materials.

Overall, the remedial action to address soil contamination continues to interrupt exposures and the soil remedy is protective of human health.

b. Groundwater.

Currently, the groundwater under the landfill is classified by the State of New York as "GA" indicating a potential potable water supply. However, groundwater at the site is not presently used as a potable water supply and is not likely to be used as such in the future since community residents receive their drinking water from the Public Water Supply of the Village of Gowanda.

The Basis for Taking Action section, describes noncancer hazards greater than an HI = 1 and the risk range associated with future consumption of groundwater by the outdoor park worker and industrial worker. Arsenic was the main COC identified in groundwater.

Currently, the cancer and noncancer toxicity file for arsenic continues to be updated through the Integrated Risk Information System (IRIS) process that provides toxicity values that are used Agency-wide in the development of HHRAs. In addition, a relative bioavailability value was developed for arsenic, but this value does not significantly change the calculated cleanup goal for arsenic. The health hazards from exposure to these chemicals will need to be addressed when the IRIS toxicity values for arsenic are finalized in a subsequent five-year review.

There have been no changes in the toxicity values for chloroform.

The exposures to groundwater at the site have been interrupted since residences and business in the vicinity of the site obtain potable water from the Public Water Supply of the Village of Gowanda. Groundwater standards were not adopted for the site. Rather, ICs were placed on the property to ensure that the groundwater at the site is not used for any drinking or potable purposes and that no activities are conducted on the consolidated waste area that would disturb the cap.

c. Vapor Intrusion.

This pathway was not evaluated based on the nature of the contamination (i.e., metals) and consistent with the 2015 final Office of Solid Waste and Emergency Response (OSWER) *Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air* (EPA530-D-02-004). This guidance indicates evaluation of this pathway is not appropriate when the residence is more than 100 feet from the site and where the COCs are not volatile. The closest residence is over 100 feet from the site, the main COCs are metals that are not volatile, and therefore, vapor intrusion was not further evaluated.

d. Ecological risk.

The soil excavation and capping eliminate any potential risk from surface soil contaminants to terrestrial receptors. The surface water monitoring data indicated the concentrations are similar to those up gradient of the site and the exposure assumptions for aquatic receptors are still valid.

Although the ecological risk assessment screening and toxicity values used to support the 2005 ROD may not necessarily reflect the current values, the soil excavation and capping eliminate any potential risk from surface soil contaminants to terrestrial receptors. Since ammonia was found to exceed the surface water quality criteria, the surface water sampling should be continued.

Are the Cleanup Levels and RAOs Selected in the ROD Still Valid?

The selected remedy was designed to prevent exposure to contaminated soil and reduce the migration of hazardous substances, pollutants and contamination from the soil to the surrounding soil or groundwater. Implementation of the selected remedy, including the excavation of the hotspot area, the construction of the cap and the placement of ICs on the property have effectively prevented exposures to COCs on the site. The RAOs and cleanup levels are still valid.

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.

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)		
<i>Operable Unit:</i> OU1	<i>Protectiveness Determination:</i> Protective	<i>Planned Addendum Completion Date:</i> Click here to enter a date
<i>Protectiveness Statement:</i> The remedy is protective of human health and the environment.		

Sitewide Protectiveness Statement	
<i>Protectiveness Determination:</i> Protective	<i>Planned Addendum Completion Date:</i> Click here to enter a date
<i>Protectiveness Statement:</i> The implemented remedy for the Peter Cooper Site is protective of human health and the environment.	

VIII. NEXT REVIEW

The next FYR for the Peter Cooper Site is required five years from the completion date of this review.

REFERENCE LIST

Table 1: Chronology of Site Events	
Event	Date(s)
Initial discovery of problem or contamination	1971
Pre-NPL responses	1972-1975, 1996
Final NPL listing	April 6, 1998
Unilateral administrative order issued	March 30, 2000
Remedial Investigation/Feasibility Study complete	October 4, 2006
ROD signature	October 4, 2006
Remedial design start	April 2008
Enforcement documents (Consent Decree entry by the Court)	February 2009
Remedial action start	July 6, 2009
Remedial design complete	October 2009
Remedial Action Construction completion	August 2010
Construction completion date	September 2010
Site Management Plan completion	October 2010
Final Remedial Action Report completion	March 2012
First FYR conducted by EPA	April 2015
Deleted from the NPL	September 2019

Table 2: Documents, Data and Information Reviewed in Completing the Five-Year Review	
Document Title	Date
Record of Decision, Peter Cooper Landfill Site	September 2005
Preliminary Site Close Out Report	September 2010
Site Management Plan	October 2010
Final Remedial Action Report	March 2012
Post-Remedial Groundwater Monitoring and Maintenance Summary Report, 2015 Annual Event	December 2015
Post-Remedial Groundwater Monitoring and Maintenance Summary Report, 2016 Annual Event	January 2017
Post-Remedial Groundwater Monitoring & Maintenance Summary Report June 2017 Semi-Annual Event	December 2017
Post-Remedial Groundwater Monitoring & Maintenance Summary Report June 2018 Annual Event	December 2018

Figure 1: Site Location Map

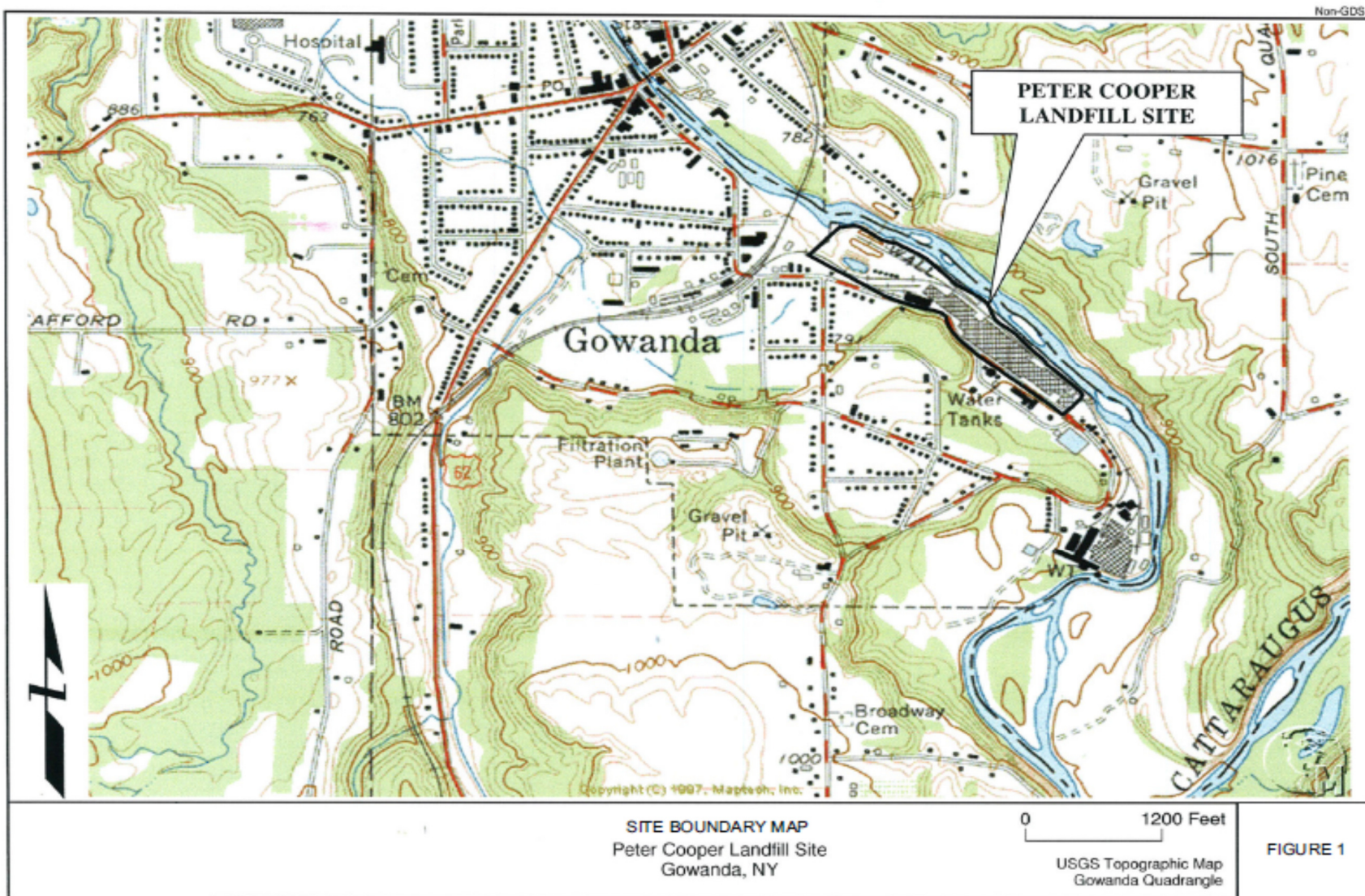
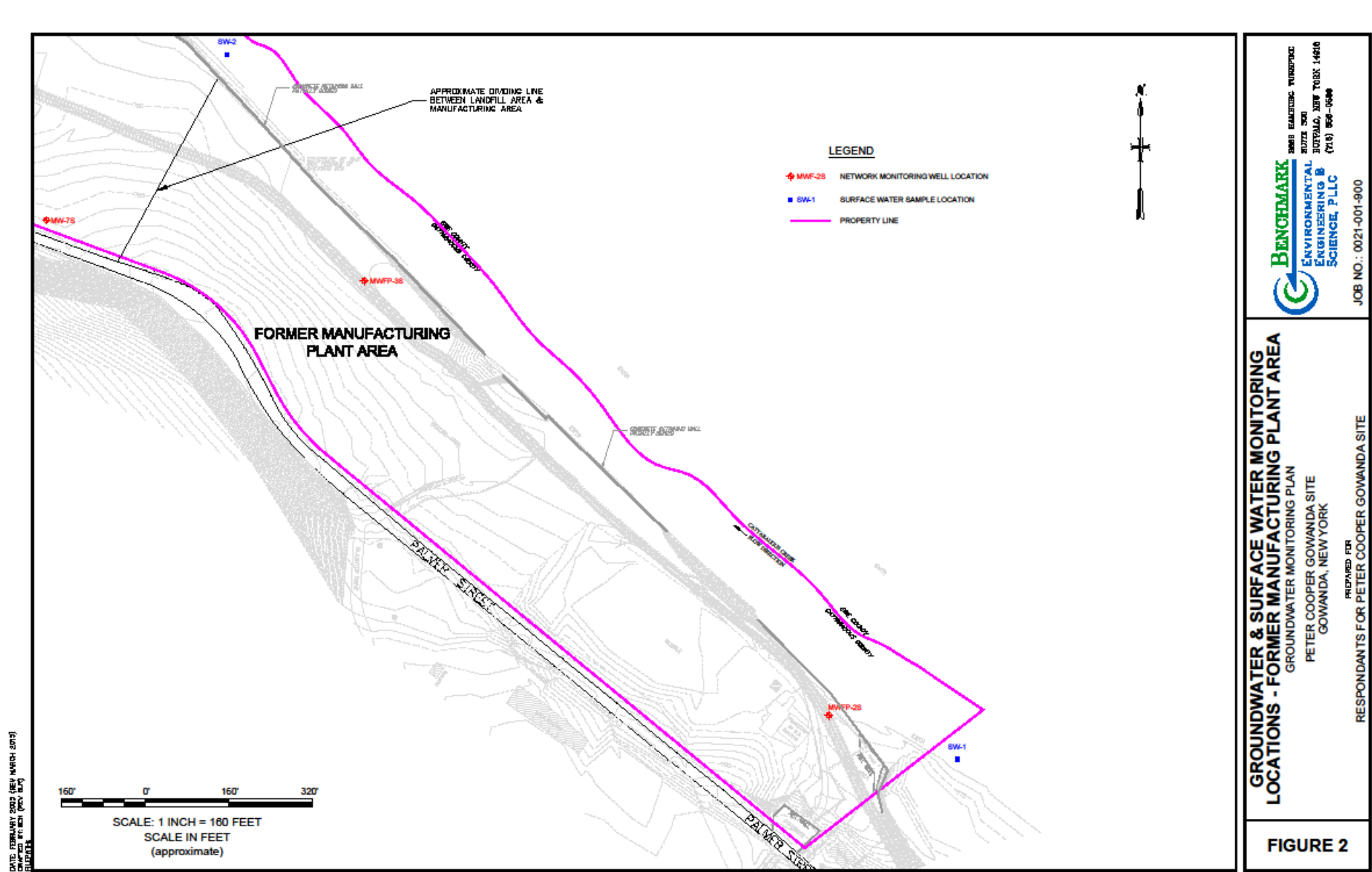


Figure 2: Groundwater and Surface Water Monitoring Location Map-FMPA



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