

**FOURTH FIVE-YEAR REVIEW REPORT FOR
NOVAK SANITARY LANDFILL SUPERFUND SITE
LEHIGH COUNTY, PENNSYLVANIA**



Prepared by

**U.S. Environmental Protection Agency
Region 3
Philadelphia, Pennsylvania**

May 11, 2021

**Linda Dietz, Acting Director
Superfund and Emergency Management Division
U.S. EPA, Region 3**

Date

Table of Contents

LIST OF ABBREVIATIONS AND ACRONYMS	2
I. INTRODUCTION.....	3
Site Background.....	3
Five-Year Review Summary Form	4
II. RESPONSE ACTION SUMMARY.....	6
Basis for Taking Action	6
Response Actions.....	6
Status of Implementation	8
Institutional Control (IC) Review	11
Systems Operations/Operation and Maintenance (O&M)	13
III. PROGRESS SINCE THE PREVIOUS REVIEW.....	14
Protectiveness Summary from the 2016 FYR.....	14
Status of Recommendations from the 2016 FYR.....	14
IV. FIVE-YEAR REVIEW PROCESS.....	15
Community Notification, Community Involvement and Site Interviews	15
Data Review.....	15
Site Inspection.....	18
V. TECHNICAL ASSESSMENT	19
QUESTION A: Is the remedy functioning as intended by the decision documents?	19
QUESTION B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still valid?.....	19
QUESTION C: Has any other information come to light that could call into question the protectiveness of the remedy?.....	20
VI. ISSUES/RECOMMENDATIONS	21
Other Findings.....	21
VII. GOVERNMENT PERFORMANCE AND RESULTS ACT MEASURES.....	21
III. PROTECTIVENESS STATEMENT	22
IX. NEXT REVIEW	22
APPENDIX A – REFERENCE LIST	1
APPENDIX B – SITE CHRONOLOGY	1
APPENDIX C – SITE MAPS	1
APPENDIX D – PUBLIC NOTIFICATION	1
APPENDIX E – DATA REVIEW SUPPORTING DOCUMENTATION.....	1
APPENDIX F – SITE INSPECTION PHOTOGRAPHS	1
APPENDIX G – APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARS) REVIEW	1

LIST OF ABBREVIATIONS AND ACRONYMS

ARAR	Applicable or Relevant and Appropriate Requirement
BTAG	Biological Technical Assistance Group
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CIC	Community Involvement Coordinator
COC	Contaminant of Concern
EPA	United States Environmental Protection Agency
ERA	Environmental Restriction Area
ESD	Explanation of Significant Differences
FYR	Five-Year Review
GMP	Gas Monitoring Point
GPRA	Government Performance Results Act
HHRA	Human Health Risk Assessment
HI	Hazard Index
IC	Institutional Control
LEL	Lower Explosive Limit
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
µg/L	Micrograms per Liter
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
O&M	Operation and Maintenance
OU	Operable Unit
PADEP	Pennsylvania Department of Environmental Protection
PRP	Potentially Responsible Party
RAO	Remedial Action Objective
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RPM	Remedial Project Manager
RSL	Regional Screening Level
SWRAU	Sitewide Ready for Anticipated Use
TVOC	Total Volatile Organic Compounds
UECA	Uniform Environmental Covenant Act
UU/UE	Unlimited Use and Unrestricted Exposure
VOC	Volatile Organic Compound
WQC	Water Quality Criteria

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 Oil and Hazardous Substances Pollution Contingency Plan (NCP), (40 Code of Federal Regulations (CFR) Section 300.430(f)(4)(ii)), and considering EPA policy.

This is the fourth FYR for the Novak Sanitary Landfill Superfund Site (the Site). The triggering action for this statutory review is the completion date of the previous FYR, May 16, 2016. This FYR has been prepared because 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 one sitewide operable unit (OU1) for the landfill and all affected environmental media. This FYR Report addresses OU1.

EPA's remedial project manager (RPM) Rombel Arquines led the FYR. Additional participants included other members of EPA as the lead agency and the Pennsylvania Department of Environmental Protection (PADEP) as the support agency. Skeo provided EPA contractor support for this FYR. Table 1 summarizes the FYR team participants. The potentially responsible parties (PRPs) and PADEP were notified of the initiation of the FYR. The review began on September 10, 2020.

Table 1: FYR Team

Name	Position	Agency / Company
Rombel Arquines	RPM	EPA
Gina Soscia	Community Involvement Coordinator (CIC)	EPA
Jose Redmond	CIC	EPA
Ryan Bower	Hydrogeologist	EPA
Jeff Tuttle	Toxicologist	EPA
Bruce Pluta	Biological Technical Assistance Group (BTAG)	EPA
Matthew Taynor	BTAG	EPA
Yvette Hamilton-Best	Attorney	EPA
Meg Boyer	Project Officer	PADEP

Appendix A lists the resources referenced during development of this FYR Report. Appendix B provides the Site's chronology of events.

Site Background

The Site is a former landfill located in South Whitehall Township in Lehigh County, Pennsylvania (Figure 1). The privately-owned landfill received municipal, commercial, and industrial wastes from the mid-1950s to 1990. Wastes were deposited in different areas of the landfill known as the Former Mine Area, Former Quarry Area, Surface Fill Area, and Trench Fill Area (Figure C-1, Appendix C). Historical disposal practices contaminated groundwater, soil, and leachate with hazardous chemicals.

The 65-acre landfill property is situated on a hillside south of Orefield Road. Current site features include the 40-acre capped landfill, stormwater management features, a groundwater and landfill gas monitoring network, a landfill perimeter fence, and an equipment storage building (formerly part of a leachate extraction system). Two residences are located on the northernmost part of the landfill property, outside of the fenced and capped landfill

area. Land use near the Site is residential and agricultural, with minor industrial and commercial uses. The Site borders residential houses to the north, south, and east. A township park and Jordan Creek are about 700 feet south of the landfill property. PADEP classifies the creek as a protected use stream for trout stocking and migratory fish. Future land use at and near the Site is not expected to change substantially. New owners purchased the landfill property in 2020 and reside in one of the homes on site.

A steep drop in elevation to the south and southwest separates the Site from neighboring properties; this change in elevation is partially due to natural topography and partially due to the buildup of the landfill disposal areas and stormwater management features. Site hydrology includes the Beekmantown and Allentown formations. Groundwater occurs within bedrock beneath the Site. For monitoring purposes, groundwater was divided into a shallow bedrock groundwater zone and deep bedrock groundwater zone. During a recent groundwater monitoring event in 2019, groundwater flow in the shallow bedrock was radially to the east, north, and south (Figure C-2, Appendix C). Groundwater flow in the deep bedrock was from the west in a radial pattern toward the east, north, and south (Figure C-3, Appendix C).

The residential community north of the Site receives their drinking water from a municipal water line. Some residents and businesses in the area still rely on individual groundwater wells for their drinking water. Ongoing monitoring of private wells and a nearby community supply well indicate that the wells are not affected by site-related contamination. Residents of the two houses within the Site boundary rely on public water for their drinking water.

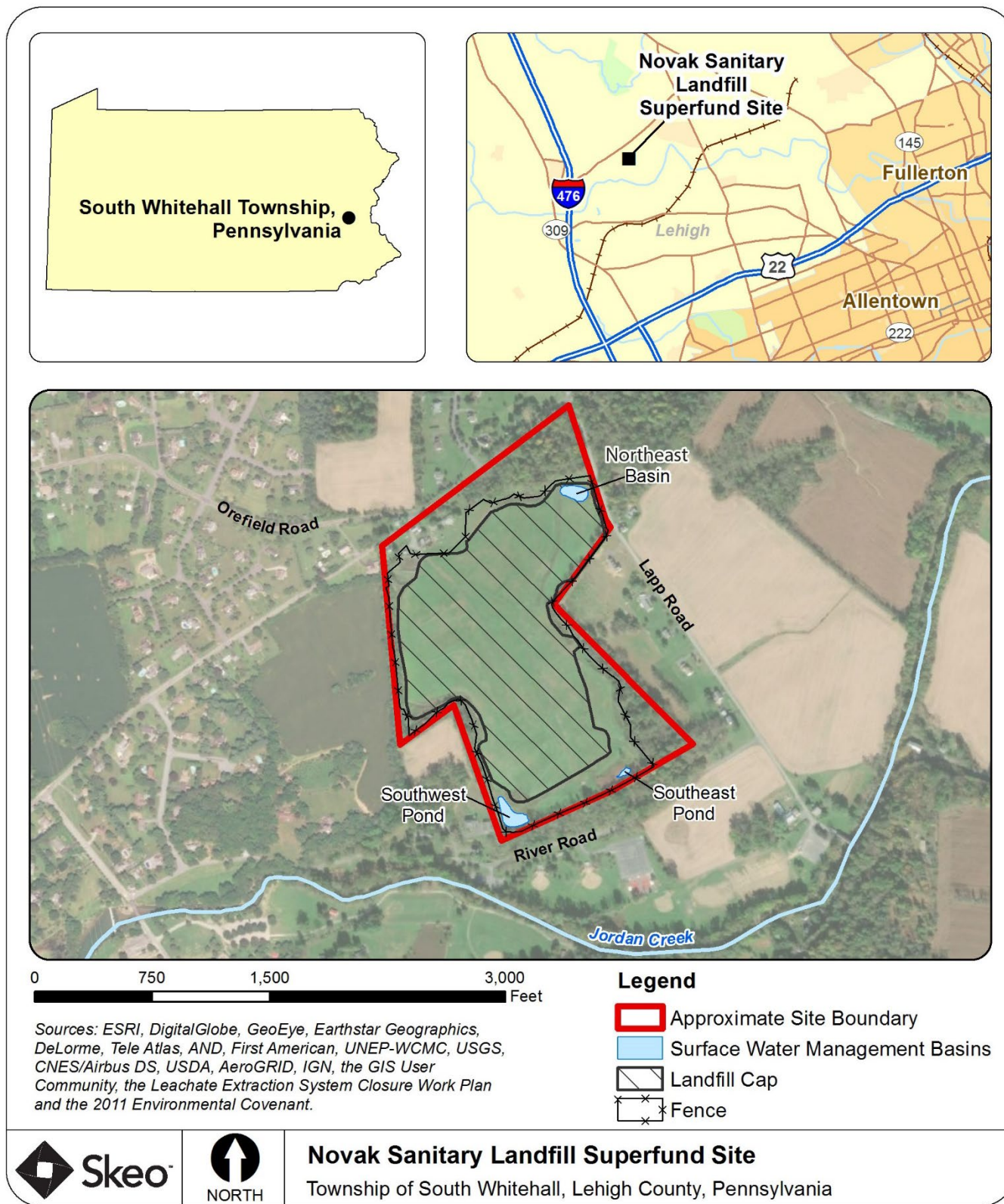
The 1993 Remedial Investigation Report provides a more detailed description of the Site background, history of contamination, and physical characteristics (Appendix A).

Five-Year Review Summary Form

The FYR Summary Form provides administration information about the Site and its FYR.

SITE IDENTIFICATION		
Site Name: Novak Sanitary Landfill		
EPA ID: PAD079160842		
Region: 3	State: PA	City/County: South Whitehall Township / Lehigh
SITE STATUS		
NPL Status: Final		
Multiple OUs? No	Has the Site achieved construction completion? Yes	
REVIEW STATUS		
Lead agency: EPA		
Author name: Rombel Arquines, with additional support provided by Skeo		
Author affiliation: EPA Region 3		
Review period: 9/10/2020 – 5/16/2021		
Date of site inspection: 10/29/2020		
Type of review: Statutory		
Review number: 4		
Triggering action date: 5/16/2016		
Due date (five years after triggering action date): 5/16/2021		

Figure 1: Site Location Maps



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site.

II. RESPONSE ACTION SUMMARY

Basis for Taking Action

A 1993 human health risk assessment (HHRA) prepared by the Novak PRP Group, a group of 16 PRPs, identified potentially unacceptable human health risks for an on-site resident, primarily due to drinking contaminated groundwater. Several volatile organic compounds (VOCs) in groundwater exceeded maximum contaminant levels (MCLs) established by the Safe Drinking Water Act. Leachate seeps also posed risks to site visitors and trespassers.

A 1993 ecological risk assessment found that adverse effects are likely for migratory birds consuming contaminated water and sediments at the Site. Sampling results indicated that leachate seeps, stormwater retention ponds, and isolated ponded water areas on the Site contained metals exceeding the EPA acute and/or chronic water quality criteria. Table 3 in the Response Actions section of this FYR Report summarizes the groundwater contaminants of concern (COCs) and performance standards selected in the Site's 1993 Record of Decision (ROD), as modified. The ROD only selected COCs for groundwater because the remedial action was expected to eliminate the leachate seeps and reduce constituent migration pathways to the underlying aquifer and surface water.

Response Actions

This section presents a summary of response actions at the Site. Refer to the Site's 1993 ROD for a more detailed description of response actions (Appendix A).

Initial Response

The Pennsylvania Department of Environmental Resources (now the PADEP) identified permit violations at the landfill in 1984. Following a site investigation, EPA issued an Administrative Order on Consent in January 1989, which ordered the PRPs to conduct a remedial investigation and feasibility study (RI/FS). EPA listed the Site on the National Priorities List (NPL) in October 1989.

Remedy Selection

EPA selected a remedy for the Site in a September 1993 ROD and modified the remedy with a March 2015 Explanation of Significant Differences (ESD). The primary objective of the remedial action was to address the principal threat and reduce risk to human health and the environment caused by the unlined landfill. Table 2 summarizes other media and target-specific remedial action objectives (RAOs) identified in the 1993 ROD, as modified.

Table 2: Media and Target-specific RAOs

Medium / Target	RAO
Landfill contents	<ul style="list-style-type: none">• Prevent direct contact to exposed landfill contents.
Leachate	<ul style="list-style-type: none">• Prevent direct contact to the leachate seeps on the landfill surface.• Reduce the leaching of constituents from the landfill contents to the groundwater.
Landfill gas	<ul style="list-style-type: none">• Control subsurface off-site migration of landfill gas.• Control combustible gas concentrations.

Medium / Target	RAO
Groundwater	<ul style="list-style-type: none"> Prevent human ingestion and inhalation of groundwater containing site-related constituents in excess of federal MCLs or Pennsylvania water quality criteria (WQC).¹ Prevent human ingestion and inhalation of groundwater, which would present excess lifetime cancer risks greater than 1×10^{-4} or hazard indices (HIs) greater than 1. Remediate groundwater to federal drinking water standards.²
On-site surface water	<ul style="list-style-type: none"> Remediate altered surface water quality exhibiting excess lifetime cancer risks greater than 1×10^{-4} and HIs greater than 1. Prevent contact of surface water with landfill contents. Control surface water runoff and erosion.
On-site sediment	<ul style="list-style-type: none"> Remediate altered sediment quality presenting/posting excess lifetime cancer risks greater than 1×10^{-4} and HIs greater than 1.
Ecological receptors	<ul style="list-style-type: none"> Conduct chronic toxicity studies (through environmental risk assessments) to determine if low levels of contamination may cause ecological impairment.
Jordan Creek	Based on the analytical results of sediment samples taken from Jordan Creek, and an evaluation of groundwater and surface flow characteristics, it was determined that the conditions of Jordan Creek downstream of the landfill are consistent with conditions upstream of the landfill, or background conditions. Since inorganic sediment samples did not indicate that the creek was altered by surface water run-off from the Site, a determination was made that no further investigation of the creek was necessary.
<i>Source:</i> Table 8 of the 1993 ROD	

The 1993 ROD identified the following major remedy components:

- Installation of a fence around the site perimeter.
- Implementation of deed restrictions on the property within the site boundaries.
- Removal of contaminated landfill surface water and sediments based on results of additional sampling and an environmental risk assessment.
- Installation of landfill surface water control systems to provide drainage and to minimize soil erosion.
- Containment of the landfill contents by construction of a cap over the entire waste area, including the Surface Fill, Trench Fill, Old Mine, and Demolition Fill Areas.
- Site restoration to promote wildlife habitat diversity.
- Installation and monitoring of a landfill gas venting system that is compatible with an active gas collection and treatment system.
- Leachate collection and monitoring and transport of leachate to an approved wastewater treatment facility via tanker for disposal.
- Contingency for on-site leachate treatment and discharge to surface water if necessary.
- Long-term groundwater monitoring.
- Operation and maintenance (O&M) of the vegetative soil cover, cap, and on-site treatment systems.

The 1993 ROD required continuous removal of leachate from the landfill. With EPA approval, the PRPs conducted optimization pilot tests in 2007 and 2009, which identified no adverse effects to leachate levels or groundwater quality when pumping of the leachate was halted. The 2015 ESD therefore eliminated the ROD requirement to continuously remove leachate from the landfill. The ESD also eliminated a performance standard for leachate and modified the performance standards for groundwater, as described further below.

¹ The Pennsylvania WQCs selected in the 1993 ROD predate the promulgation of Pennsylvania Medium Specific Concentrations.

² The 1993 ROD called for remediation to background levels, but the 2015 ESD modified the groundwater performance standards as described in the Performance Standards section of this FYR Report.

Performance Standards

The 1993 ROD originally required continuous removal of leachate from the landfill to a depth of 1 foot. The 2015 ESD removed this performance standard as EPA determined that sufficient evidence existed to discontinue pumping of leachate from the Site.³

The 1993 ROD also identified the groundwater performance standards as the lower of the background concentration, non-zero maximum contaminant level goal (MCLG), or the federal or state MCL. The 2015 ESD removed the background concentration requirement and modified the groundwater performance standards to the lower of the non-zero MCLG or the federal MCL for each groundwater COC identified in the 1993 ROD. The ESD also required that, in addition to meeting MCLs and non-zero MCLGs, the cumulative risk presented by all remaining site-related compounds in the groundwater at the conclusion of the remedy must be at or below the 1×10^{-4} cancer risk level, and the non-cancer hazard index (HI) must be less than or equal to 1 for four consecutive quarters. Table 3 summarizes numeric performance standards for groundwater COCs.

Table 3: Groundwater Performance Standards for Site COCs

COC	Performance Standard (micrograms per liter, µg/L)	Basis
Benzene	5	MCL
Bromodichloromethane	80	MCL
Chlorobenzene	100	MCL
Chloroform	70	non-zero MCLG
Dibromochloromethane	60	non-zero MCLG
1,4-Dichlorobenzene	75	MCL
1,1-Dichloroethane	**	**
1,2-Dichloroethane	5	MCL
1,1-Dichloroethene	7	MCL
1,2-Dichloroethene (cis)	70	MCL
1,2-Dichloroethene (trans)	100	MCL
1,2-Dichloropropane	5	MCL
1,3-Dichloropropene (trans)	**	**
Ethylbenzene	700	MCL
Toluene	1,000	MCL
Tetrachloroethene	5	MCL
1,1,1-Trichloroethane	200	MCL
Trichloroethene	5	MCL
Vinyl chloride	2	MCL
Xylene (total)	10,000	MCL
Cadmium	5	MCL
Beryllium	4	MCL

Source: Table 2 of the 2015 ESD

**These site-related compounds do not have MCLs or non-zero MCLGs but will be included in the overall risk assessment described as a component of the groundwater performance standard set forth in the 2015 ESD.

Status of Implementation

The PRPs agreed to conduct the remedial design and remedial action pursuant to a June 1995 Administrative Order. The PRPs completed the remedial design in March 1999 and implemented the remedy between July 1999 and September 2002. EPA issued a Preliminary Close Out Report in September 2002.

³ Data collected and evaluated since 2002 demonstrated that it was not technically practical to achieve the performance standard of removal to a depth of one foot across the entire landfill because the influx or perched groundwater into the northern areas of the landfill. The groundwater monitoring program also demonstrated that the landfill is not having an adverse effect on groundwater quality in the area.

The PRPs completed the following remedial action activities according to approved remedial design specifications:

- Installation of a perimeter fence around the site boundaries.
- Removal of contaminated sediments presenting/posing excess lifetime cancer risks greater than 1×10^{-4} and hazard indices greater than 1 from the northwest pond, placement of contaminated sediments beneath the cap, and replacement of soil in the bottom of the pond.
- Installation of a multi-layered soil and synthetic material impermeable landfill cap, with a vegetated final cover.
- Installation of a landfill surface water control system that included conversion of three existing sedimentation ponds into stormwater management basins (the Southeast Pond, the Southwest Pond, and the Northeast Basin); spillways, diversion berms, and rip-rap lined drainage swales.
- Installation of a passive landfill gas venting and monitoring system that is compatible with an active gas collection and treatment system.
- Installation of a leachate extraction, collection, and storage system.

Following construction, O&M of the remedial system(s) and long-term leachate, landfill gas, and groundwater monitoring activities began in 2002. The institutional controls required by the ROD, as modified, were implemented in 2011. The Institutional Controls Review section of this FYR Report provides additional information about institutional controls.

Over time, the PRPs implemented additional investigations and activities at the Site in response to monitoring results, remediation system assessments, and other changing site conditions. The following paragraphs describe the implemented activities:

Surface Water Control System

After construction of the Southeast Pond in 2002, stormwater unexpectedly left the basin through its emergency spillway. As a result, the PRPs, with EPA approval, raised the berm and emergency spillway elevations by 2 feet.

In January 2009, the PRPs identified significant erosion along the northeastern edge of the cap. The PRPs repaired the damage by stabilizing the berm with gabion cages and backfilling the eroded area with clean soil. Within two years, erosion was observed at the end of the row of gabion cages; therefore, the PRPs installed additional gabion cages in November 2011.

In April 2012, significant slumping was observed with evidence of transverse cracks and mass movement of soil slipping downhill along the cap's lining. To correct the issue, the PRPs installed a trenching system to redirect surface water flow to the stormwater management basins. EPA and PADEP inspections conducted after the construction determined the trenching system was working effectively.

Landfill Gas Monitoring System

Ongoing monitoring of the basements in nearby residences adjacent to the Site identified occasional minor detections of VOCs. From 2007 to 2008, the PRPs conducted a three-phase investigation to address the concern that total VOC (TVOC) detections in the monitoring results could be caused by gas migration from the Site. The investigation included soil vapor and indoor air sampling at two residences adjacent to the Site. The soil vapor sampling was conducted exterior of the residences utilizing a vapor probe technique to sample two feet below the level of the basement slab. Indoor air sampling was conducted using Summa canisters. Results were compared to results from the landfill gas vents and monitoring points. The percent methane field readings in the soil vapor probes at both houses were 0% of the lower explosive limit (LEL). VOCs in indoor air samples were either non-detect or below screening levels. EPA concluded that the occasional TVOC results in the residential monitoring were not site-related and that further vapor intrusion mitigation action was not warranted at the Site. Over the last five years, three perimeter gas monitoring points (GMPs) had measurements above the LEL of methane. The Data Review section of this FYR Report presents results from recent landfill gas monitoring.

Leachate Collection and Monitoring System

The 1993 ROD required leachate be collected and removed from the waste disposal areas as expeditiously as practicable prior to construction of the cap. The leachate collection system included 21 extraction/gas venting wells, nine leachate level monitoring wells, collection lines and a 100,000-gallon aboveground storage tank. Extracted leachate was temporarily stored in the tank, which was located within a lined containment berm, prior to transfer to the local publicly owned treatment works for treatment.

Due to several issues during remedy construction, which included contractor and off-site access issues and expansion of the cap, leachate extraction did not begin until after completion of the cap. Full scale-operation began in 2002 with 12 extraction wells, which were the only wells with a sufficient column of leachate needed to operate the pumps. In 2003 it became apparent that the volume of leachate being removed was significantly less than anticipated. With EPA approval in 2004, the PRPs reduced the number of operating extraction wells.

In 2007, the PRPs conducted a limited optimization pilot program to test the effects of shutting down extraction wells B-1 and C-1, which were the two leachate wells with the greatest column of leachate within the landfill. The PRPs conducted a full-scale optimization pilot program between 2009 and 2011 to study the effects of shutting down the entire leachate extraction system. The assessment established that the continuous influx of upgradient perched groundwater was artificially increasing the depth of the leachate. Sampling the remaining leachate also determined that it did not contain COCs above MCLs. In October 2011, EPA determined that the pilot study provided sufficient evidence to discontinue pumping at all wells. The PRPs decommissioned the leachate extraction system in December 2011. All pumps were removed from the extraction wells and placed in storage. The on-site leachate storage tank was also emptied and dismantled. In 2014, the PRPs updated the Site's O&M Plan to reflect the changes, including steps to be taken if the leachate extraction system is required to be returned to service, if necessary.

The total cumulative volume of leachate removed from the landfill during operation of the leachate collection system was 304,481 gallons. No additional leachate has been removed from the Site since 2011.

Long-term Groundwater Monitoring and Partial NPL Deletion

The groundwater monitoring program included evaluation of groundwater in shallow and deep bedrock monitoring wells as well as residential wells near the landfill, which represent potential downgradient receptors, and one community supply well (see Figure C-4, Appendix C). The monitoring program was modified over time to improve the program based on additional site information.

Annual groundwater sampling results showed a downward trend in COC concentrations in groundwater. As further detailed in the Data Review section of this FYR Report, between 2015 and 2018, no COCs were detected above their performance standards in the on-site or off-site groundwater monitoring wells, in the residential wells, or the community supply well.

EPA performed a risk evaluation in 2019 to assess the groundwater data against the performance standards set forth in the 2015 ESD. The 2015 through 2018 data for monitoring wells, residential wells and the community supply well were screened against the MCLs, MCLGs, and EPA's regional screening levels (RSLs). Any chemicals failing the risk-based screening were subjected to a more detailed assessment to quantify the risk for comparison with the 2015 ESD's total risk performance standard. None of the COCs exceeded current MCLs for the 2015 to 2018 rounds. A few of the chemicals exceeded RSLs. However, when risks were estimated for these chemicals assuming default future residential exposure (ingestion, dermal exposure, and inhalation from showering), the HIs were below 1 and the cancer risks were below 1×10^{-4} . Therefore, groundwater COCs met the performance standards set forth in the 2015 ESD.

In September 2019, EPA deleted the groundwater portion of the Site from the NPL. EPA and PADEP determined that all appropriate response actions to address the groundwater portion of the Site, other than monitoring, O&M

and FYRs, have been completed. The landfill and landfill gas components of the Site remain on the NPL. Annual groundwater monitoring continues.

Institutional Control (IC) Review

All ICs required by the decision documents have been implemented. Table 4 summarizes the ICs' objectives, as well as a description of the ICs implemented to meet those objectives.

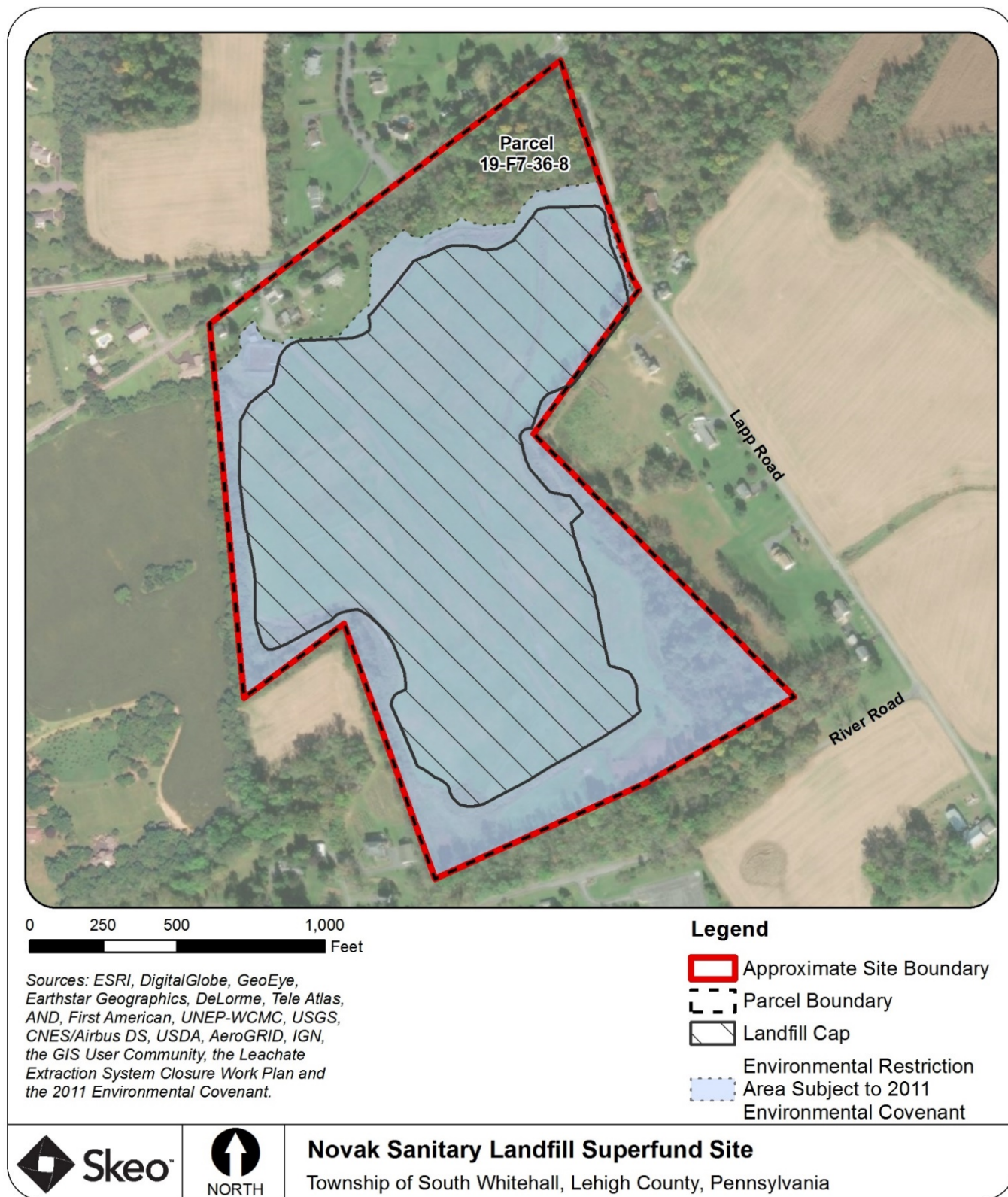
Table 4: Summary of Implemented Institutional Controls

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 (Date)
Landfill contents, leachate	Yes	Yes	Portions of Lehigh County parcel 19-F7-36-8 ^a (referred to as the Environmental Restriction Area or ERA)	<ul style="list-style-type: none"> • Prohibit use of the land for residential or agricultural purposes. • Prohibit use of on-site groundwater for domestic purposes, including drinking water.^b • Prevent excavation or construction on the capped and closed landfill. • Prevent risks associated with exposure to landfill contents, leachate, and groundwater. 	Environmental Covenant (July 2011)
<p><i>Notes:</i></p> <p>a) The 2011 Environmental Covenant refers to the parcel ID as 19-F7-36-8. Lehigh County has updated its parcel IDs, and now refers to the property as pin number 547861012094 (https://lehighgis.maps.arcgis.com/apps/webappviewer/index.html?id=42536953612d4526b62805bb7e2782a4, accessed 11/3/2020).</p> <p>b) EPA determined that the Site has met the groundwater performance standards specified in the 2015 ESD. EPA deleted the groundwater portion of the Site from the NPL in 2019.</p>					

An environmental covenant pursuant to the Pennsylvania Uniform Environmental Covenant Act (UECA) was recorded with the Lehigh County Recorder of Deeds in July 2011. The covenant specified restrictions for a portion of the landfill property, known as the Environmental Restriction Area (ERA). The ERA is about 57 acres and includes the landfill cap area (Figure 2). The covenant specified the following restrictions for the ERA:

- No use shall be made that disturbs the integrity or performance of the perimeter fence, any of the layers of the cap, any surface water diversion systems or swales, the landfill gas collection system, the leachate collection system, or any other structure or system for maintaining the effectiveness of the remedial action. No use shall be made that disturbs the function of any monitoring well or other system for monitoring any response action or any remedial action.
- Groundwater within or from the ERA shall not be used in any manner, including, but not limited to, use as a drinking water supply, and no water supply or other groundwater well shall be installed, except for groundwater monitoring wells installed pursuant to plans approved in writing in advance by EPA.
- No excavation, digging, drilling, or other intrusive activity into or disturbance of the soil may occur in, on or under the ERA, unless approved in writing in advance by EPA.
- The ERA, and any portion thereof, shall not be used for residential, commercial, industrial, recreational, or agricultural purposes.

- **Figure 2: Institutional Control Map**



-
- *Disclaimer:* This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site.

- No activities except access, inspection, repair, remediation, and restoration shall occur on the landfill cap area or the ERA, except as authorized or required under the remedial action, the Administrative Order, the ROD, as modified, or the O&M Plan for the Site, as approved by EPA, as may be modified from time to time.

The 2011 environmental covenant also required the Novak PRP Group to submit to EPA, by the end of every January, written documentation stating whether the activity and use limitations set forth in the covenant are being observed. EPA has received documentation of the annual certification for 2020 from the Novak PRP Group.

In 2020, ownership of the landfill property was transferred from the Novak estate to private individuals. The restrictions set forth in the environmental covenant remain in effect. EPA issued a comfort letter to the new owners in December 2019. EPA requested a copy of the deed with attached environmental covenant and other documents confirming the transfer of ownership, but EPA has not yet received it.

Systems Operations/Operation and Maintenance (O&M)

The PRPs' contractor performs O&M and monitoring activities at the Site in accordance with a December 2014 O&M Plan. The PRPs decommissioned the leachate extraction system in December 2011; therefore, O&M associated with the extraction system is no longer needed.

During this FYR period, O&M and monitoring activities have included monthly leachate level monitoring, landfill cap and stormwater management system maintenance, landfill gas monitoring, and groundwater and residential well monitoring. The PRPs submit monthly O&M reports as well as quarterly and annual groundwater and landfill gas monitoring reports to EPA documenting activities conducted at the Site.

Leachate Level Monitoring

The PRP contractor monitors leachate levels in the extraction wells and GMP-13 either monthly or quarterly, depending on the monitoring location. All 30 wells that are part of the well network are also gauged annually for depth to leachate/groundwater and total well depth. The purpose of the monitoring is to confirm that landfill conditions do not change significantly, which could suggest a change in the leachate environment. The PRP submits the monitoring results to EPA as an attachment to the annual groundwater reports. The Data Review section of this FYR Report presents additional discussion of recent leachate level monitoring results.

Landfill Cap and Stormwater Management System Maintenance

The PRP contractor conducts quarterly inspections of the landfill cap, passive gas vent system, well network, and stormwater management features, and mows the vegetative cap four times a year, or as needed. The PRP contractor also inspects the Site after significant rain events. During this FYR period, the PRP contractor repaired wells as needed and repaired erosion observed west of GMP-9 in June 2018 and near C-5 and two depressions in the Southwest Pond in January 2020.

Landfill Gas Monitoring

The PRP contractor performs quarterly gas monitoring at fourteen GMPs located outside the perimeter of the landfill cap and at up to 15 nearby residences for the LEL of methane. Basements of the residences are also monitored for TVOCs. The PRP submits monitoring results to EPA quarterly and annually.

At PRP request and with EPA approval, quarterly residential gas monitoring was not performed in the first and second quarters of 2020 due to the COVID-19 pandemic. With the easing of local restrictions during the third quarter of 2020, the third quarter residential gas monitoring was performed at residences comfortable with granting access for the sampling. The option to have their residences sampled or not has been offered to members of the voluntary monitoring program for all subsequent residential sampling events. The Data Review section of this FYR Report presents results from recent landfill gas monitoring.

Groundwater and Residential Well Water Monitoring

The PRP contractor samples site monitoring wells, nearby residential wells, and a community supply well annually. The Data Review section of this FYR Report presents results from recent groundwater and residential well monitoring.

III. PROGRESS SINCE THE PREVIOUS REVIEW

Protectiveness Summary from the 2016 FYR

Table 5 includes the protectiveness determination and statement from the 2016 FYR.

Table 5: Protectiveness Determination/Statement from the 2016 FYR

OU #	Protectiveness Determination	Protectiveness Statement
Sitewide (OU1)	Protective	This third Five-Year Review has determined that the remedy at the Novak Sanitary Landfill Superfund Site is protective of human health and the environment. The Site remedy was constructed in accordance with the ROD and the design documents. The current vegetative cover of the landfill cap does not promote wildlife habitat diversity but does not affect protectiveness. The groundwater and residential monitoring programs are in place and operating as intended. The measured concentrations for COCs in the on-site and off-site groundwater and residential wells are meeting the performance standards. An ESD has been issued to modify some performance standards and to require a cumulative risk assessment at the conclusion of the remedy. The landfill gas venting and monitoring programs are effective at ensuring there is no buildup of harmful gases. The leachate collection system was decommissioned following an EPA determination that there is sufficient evidence to discontinue the extraction of leachate from the Site. The institutional controls required by the ROD have been implemented by a protective UECA covenant.

Status of Recommendations from the 2016 FYR

Table 6 includes the recommendation from the 2016 FYR and the status of that recommendation.

Table 6: Status of Recommendations from the 2016 FYR

OU #	Issue	Recommendation	Current Status	Current Implementation Status Description	Completion Date (if applicable)
Sitewide (OU1)	Although current cover does not affect current or future protectiveness, it also does not promote wildlife habitat diversity without jeopardizing the integrity of the cap, as specified in the 1993 ROD, as modified.	Conduct an ecological investigation of the Site with the consultation of BTAG; use results of the investigation to make adjustments to the O&M Plan that will meet the 1993 ROD's stated goal of promoting wildlife habitat diversity.	Completed	EPA BTAG assessed the ground cover at the Site and determined that invasive species were outcompeting native species. Although the landfill cover is not fulfilling the goal of wildlife enhancement, the current vegetation is effectively preventing erosion. EPA determined that replacing the ground cover would create too much risk of another slope failure.	6/12/2017

IV. FIVE-YEAR REVIEW PROCESS

Community Notification, Community Involvement and Site Interviews

EPA published a public notice in the *Lehigh Valley Press* newspaper on October 1, 2020 (Appendix D), which stated that the FYR was underway and invited the public to submit any comments to EPA. The results of the review and the report will be made available at the Site's information repository, the Parkland Community Library, 4422 Walbert Avenue, Allentown, Pennsylvania 18104, and will be available online at EPA's website: www.epa.gov/superfund/novak.

During the FYR process, the EPA CIC conducted interviews with the PADEP project officer and a local township official to document any perceived problems or successes with the remedy that has been implemented to date. The interviews are summarized below.

The PADEP project officer has been involved with the Site for about 25 years. She noted that there have been issues over the years with erosion at the Site, but those issues have been addressed. PADEP remains concerned about the landfill gas. PADEP noted that the state regulations require installation of gas monitoring probes at the property boundary. Gas monitoring probe GMP-8 results at the site perimeter still exceed the LEL. PADEP is unaware of any complaints about the Site or any reported violations.

South Whitehall Township is aware of the Site and is aware that the property is maintained by the responsible parties. There have been no community concerns about the Site. The township is not aware of vandalism or break ins at the Site. The township noted multiple ways to inform the community about site activities, including a township newsletter that is mailed to residents twice a year, the township website, direct mailings to residents, and notices placed in the local newspaper (the Parkland Press). EPA also answered the township's questions regarding reuse of the Site considering the institutional controls in place and the township's permitting process. The township also clarified that a new water line installed near the Site was for development purposes and was unrelated to the Site.

Data Review

EPA reviewed the quarterly and annual performance monitoring reports prepared by the PRP contractor. These reports contain leachate level monitoring data, landfill gas monitoring data, and groundwater and residential well data for the FYR period (2016 to 2020). The data are evaluated to assess the effectiveness and protectiveness of the remedy. Appendix C includes figures that show the monitoring locations.

Leachate Level Monitoring

The 2014 O&M Plan requires that PRP contractors gauge the leachate extraction wells monthly. The data are used to determine if there are any significant changes in leachate levels that may require restarting the leachate extraction system. The O&M Plan does not include metrics to determine when a significant change has occurred.

Extraction wells B-1 and C-1 historically had the greatest column of leachate within the landfill; therefore, they are the focus of this review. More detailed monitoring data for all extraction wells is presented in the annual groundwater reports (Appendix A). To evaluate the leachate monitoring data qualitatively, the average annual depth to leachate was calculated for extraction wells B-1 and C-1 for 2017, 2018, and 2019. The yearly averages were compared to historic average depth to leachate measurements presented in the 2014 Leachate Extraction System Closure Plan (Table 7). Average depth to leachate varied over time during this FYR period. Average depth to leachate in B-1 during this FYR period was greater than the historic average depth to leachate (2009 to 2014), indicating an average decrease in leachate level of three feet in B-1. Depth to leachate in C-1 during this FYR period was less than the average depth to leachate (2009 to 2014), indicating an average increase in leachate level of seven feet in C-1. It is recommended that the O&M Plan be updated to include more specific criteria and procedures for determining when the extraction system may need to be restarted.

Table 7: Average Depth to Leachate in Extraction Wells B-1 and C-1

Extraction Well	Historic Average Depth to Leachate (ft) (6/2003 to 3/30/2009) ^a	Historic Average Depth to Leachate (ft) (4/6/2009 to 2014) ^a	Average Depth to Leachate (ft) 2017 ^b	Average Depth to Leachate (ft) 2018 ^c	Average Depth to Leachate (ft) 2019 ^d
B-1	71.85	68.44	75.14	70.31	68.48
C-1	78.36	74.70	70.27	69.96	64.28
<i>Notes:</i> a) Source of historic average depth to leachate is Table 2 (Leachate Level Data During Sampling Collection) in the 2014 Leachate Extraction System Closure Plan b) Calculated using data presented in Attachment B of the 2017 Annual Groundwater Monitoring Report c) Calculated using data presented in Attachment B of the 2018 Annual Groundwater Monitoring Report d) Calculated using data presented in Attachment B of the 2019 Annual Groundwater Monitoring Report ft = feet					

Landfill Gas Monitoring

As part of the remedial action, the PRPs installed a gas collection system comprising thirty-four vents (A1-A12, B1-B8, C1-C14) within the landfill limits to collect and vent accumulated gases in the Surface Fill, Trench Fill, Demolition Fill, and Old Mine areas and to control gas migration. (Figure C-5, Appendix C) In addition, fourteen GMPs (GMP-1 through GMP-14) were installed along the perimeter of the landfill boundary (Figure C-5, Appendix C) and are sampled quarterly by the PRP. The sampling of the passive gas monitoring probe vents serves two purposes: 1) to intercept the potential migration of subsurface landfill gas off site, and 2) to monitor the effectiveness of the original on-site gas collection system network. The PRP contractor monitors the GMPs quarterly, per the 1993 ROD, as modified. Residential indoor air monitoring is also performed quarterly by the PRP.

The ROD, as modified, states that the allowable level of methane at the property boundary (landfill perimeter) is below the LEL (i.e., below 100% of the LEL). The LEL of methane is 50,000 parts per million by volume in air or 5% by volume in air. For adjacent areas, such as the nearby residences, the allowable level is below 25% of the LEL.

During this FYR period, two perimeter GMPs (GMP-7 and GMP-8) had multiple measurements above the LEL of methane and one perimeter GMP (GMP-3) had a single measurement above the LEL (Table 8). In Table 8 below, the “OR” designation indicates the measurement was outside the range of instrumentation and is interpreted to mean the measurement is above the methane LEL (100% of the LEL). Table 8 below summarizes the methane

LEL results for GMP-3, GMP-7, and GMP-8 during this FYR period. All other perimeter GMPs reported methane below the LEL during all quarterly monitoring events, with most GMPs reporting 0% of the LEL.

Table 8: Methane – % LEL at GMP-3, GMP-7 and GMP-8, June 2016 to October 2020

Monitoring Date	Methane - Percent (%) LEL		
	GMP-3	GMP-7	GMP-8
June 2016	0	0	OR
September 2016	0	0	7
December 2016	9	0	OR
March 2017	0	0	0
June 2017	3	0	OR
September 2017	0	0	OR
December 2017	2	OR	OR
March 2018	0	OR	OR
June 2018	5	0	OR
September 2018	3	OR	OR
December 2018	0	0	0
March 2019	OR	0	23
June 2019	0	0	OR
September 2019	0	0	0
December 2019	9	0	0
March 2020	0	0	OR
July 2020	0	OR	OR
October 2020	0	0	OR
<p><i>Notes:</i> Source: Monitoring results presented in quarterly and annual landfill gas monitoring reports, 2016 through 2020. OR – Outside range of instrumentation. Range for LEL is 0-100%. OR results interpreted to be above the methane LEL and not in compliance with the ROD standard.</p>			

Elevated LEL measurements have occurred most often at GMP-8. Figure E-1 in Appendix E depicts LEL measurements at GMP-8 since 2005. Figure E-1 shows that elevated LEL measurements have been detected in GMP-8 since 2005. In 2007, the PRP installed gas vents C-13 and C-14 near GMP-8 to help vent accumulated gases. Despite the additional vents, most LEL measurements collected from GMP-8 remain above the ROD requirement to maintain combustible gas levels below the LEL at the property boundary, specifically for methane.

Monitoring of the basements of up to 15 nearby residences occurred during this FYR period. There were no detections above 25% of the LEL of methane in any residence. There were sporadic detections of TVOCs in a few of the residences. EPA previously investigated the potential for vapor intrusion to indoor air of the residences and determined that the occasional TVOC results in the residential sampling were not site related. Landfill gases do not appear to be migrating to the nearby residences.

Groundwater, Residential Well, and Community Supply Well Monitoring

The PRP contractor samples groundwater from eight shallow bedrock monitoring wells and five deep bedrock monitoring wells annually for VOCs and select metals (aluminum, beryllium, cadmium, iron, manganese, and thallium). The PRP contractor also samples up to 13 residential wells and one community supply well (CCS-Well) annually for VOCs, inorganics, and general chemistry. Figure C-4 in Appendix C shows the monitoring locations.

Data collected between 2016 and 2019 were reviewed for this FYR (validated data from 2020 were not yet available). No COCs exceeded the numeric groundwater performance standards listed in Table 3 in any site monitoring well, residential well, or the community supply well. During the 2019 sampling event, only two wells (MW-24 and MW-25) reported site-related VOCs above detection limits at low concentration (i.e., <3 µg/L); all

other VOCs were not detected. The 2019 annual groundwater sampling report includes a summary of groundwater sampling results through 2019.

EPA performed a cumulative risk assessment in 2019 to assess groundwater data collected from 2015 through 2018 against the performance standards set forth in the 2015 ESD. Data from site monitoring wells, residential wells, and the community supply well were included in the evaluation. The cumulative risk assessment found that none of the COCs exceeded current MCLs. EPA evaluated cumulative risk presented by site-related compounds in groundwater in 2019, using updated toxicity values, and determined there were no unacceptable risks under a residential exposure scenario. Based on the results of the annual groundwater monitoring and the 2019 cumulative risk assessment, the groundwater cleanup levels and performance standards have been achieved.

Site Inspection

The FYR Site Inspection was performed on October 29, 2020. Participants included the EPA RPM, EPA CICs, a representative from Skeo (EPA FYR contractor), PRP contractors, and the property owner. The purpose of the inspection was to assess the protectiveness of the remedy. Appendix F includes photographs from the site inspection. The Site inspection was conducted during a time of COVID-19 restrictions. All recommended CDC, State and local required precautionary measures were taken in conducting the Site inspection including social distancing, masks, and use of sanitizer, etc.

The landfill area is secured with a locked fence (Photo 1). Approximately six months prior to the FYR inspection, the property owner observed that someone had forced open the small gate in the perimeter fence in the southeast part of the Site. The PRP contractors have subsequently locked this gate using a heavy chain and padlock. The PRP contractors stated that there have been no other signs of trespassing or vandalism at the Site in the past five years.

Site inspection participants observed the storage building that formerly housed the leachate extraction system pump house (Photo 2) and the concrete containment area for the former leachate storage tank (Photo 3). No issues were noted.

The landfill cap is well vegetated with no holes or damage observed (Photo 4). The PRP contractors mow the Site about four times per year, as needed. Landfill gas vents are in place and in good condition (Photo 5). Site inspection participants observed the area of the landfill cover (above the Southwest Pond) where an interceptor trench was installed to prevent another slope failure from occurring (Photos 6 and 7). Site inspection participants also observed the gabion walls that were installed along the western slope of the landfill to stabilize the slope (Photo 8). Both areas appeared to be in good condition.

Site inspection participants observed an area where a riprap ditch was installed to address erosion near gas vent C-5 (Photo 9). Erosion repair was also noted in two areas of the Southwest Pond. However, two holes, about 8 to 10 inches in diameter, with rainwater flowing into one of the holes, were also observed near the repaired areas in a low part of the Southwest Pond (Photo 10).

At the time of the site inspection, there was heavy vegetation growing on the site fence, including trees growing through the fence (Photo 11). Thick vegetation and small trees were also growing in the Site's riprap-lined drainage ditches. PRP contractors had recently cut some of the small trees in the ditches, but the cut trees were still present in the ditches. The EPA RPM requested that the PRP contractors submit a proposed schedule for addressing the vegetation on the fence and in the ditches, and the holes in the Southwest Pond. The requested schedule to address the minor O&M issues identified during the FYR Inspection has been received by EPA.

V. TECHNICAL ASSESSMENT

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

Question A Summary:

Yes. The remedy is functioning as intended by the decision documents. The landfill cap prevents direct contact with landfill contents and reduces the leaching of COCs from the landfill contents to groundwater. COC concentrations in on-site and off-site monitoring wells and nearby residential wells are below MCLs. Based on the results of the annual groundwater monitoring and the 2019 cumulative risk assessment, the groundwater cleanup levels and performance standards specified in the 2015 ESD have been achieved. In 2019, EPA deleted the groundwater portion of the Site from the NPL.

The landfill gas venting system is effective at reducing buildup of harmful gases in most areas of the Site. During this FYR period, two perimeter monitoring points (GMP-7 and GMP-8) had multiple measurements above the LEL of methane. Despite the installation of additional gas vents in 2007, most LEL measurements collected from GMP-8 remain above the ROD requirement to maintain combustible gas levels below the LEL at the property boundary, specifically for methane. However, none of the nearby residences had elevated levels of methane or TVOCs, which indicates that landfill gases are not migrating off site at unacceptable levels. However, additional measures are needed to determine if the ROD performance standard that the level of methane at the property boundary (landfill perimeter) is below the LEL (i.e., below 100% of the LEL) is being achieved near GMP-7 and GMP-8 in the southeastern part of the Site and, if not, take appropriate actions to achieve the ROD performance standard. .

The leachate collection system was decommissioned following an EPA determination that there is sufficient evidence to discontinue the extraction of leachate from the Site. Monitoring of leachate levels continues quarterly. The current O&M Plan notes that the leachate extraction system may require restarting in the future due to significant changes in leachate elevations, but it does not include metrics for determining how or when a significant change has occurred.

Although the landfill's current vegetative cover does not promote wildlife habitat diversity, as originally specified in the 1993 ROD, it is effectively preventing erosion. EPA determined that activities associated with replacing the ground cover could increase the risk of slope failure.

O&M and monitoring of the landfill, landfill gas system, and groundwater are ongoing. ICs in the form of a UECA and access controls in the form of the gated fence specified in the 1993 ROD are effectively reducing exposures to contaminated media. The comfort letter issued by EPA to the new property owners confirmed the owners are aware of the ICs attached to the deed. The PRPs have submitted the required annual Letter of Certification of Institutional Controls.

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

No. There have been changes in toxicity values, exposure pathways, and methods of evaluating risk since the 1993 ROD and 2015 ESD were issued. However, the changes as described below are not expected to alter the protectiveness of the remedy because there are source controls and institutional controls in place that prevent direct contact with the landfill contents and restrict groundwater and land use.

Question B Summary:

Changes in Standards and To-Be-Considered Criteria

The 2015 ESD selected the lower of the non-zero MCLG or the federal MCL as the numeric groundwater cleanup levels for COCs. The numeric cleanup levels have not changed since the 2015 ESD and remain valid (Table G-1, Appendix G).

The 1993 ROD, as modified, clarified that landfill gas emissions are subject to the requirements for gas control and monitoring included in the Pennsylvania Residual Waste Management Regulations (25 PA Code § 288.262). The provisions under Section 288.262 were amended in January 2001. The current provisions state that combustible gas levels may not equal or exceed 25% of the LEL in a structure within the Site and the LEL at boundaries of the Site. These monitoring standards have not changed since the 1993 ROD and remain valid.

Changes in Toxicity and Other Contaminant Characteristics

The 2015 ESD required that, in addition to meeting MCLs and non-zero MCLGs, the cumulative risk presented by all remaining site-related compounds in the groundwater at the conclusion of the remedy must be at or below the 1×10^{-4} cancer risk level, and the non-cancer HI must be less than or equal to 1 for four consecutive quarters. EPA evaluated cumulative risk presented by site-related compounds in groundwater in 2019, using updated toxicity values, and determined there were no unacceptable risks under a residential exposure scenario. If COC concentrations in groundwater increase, EPA may re-evaluate cumulative risk using the most current toxicity values.

Changes in Contaminants of Concern

1,4-Dioxane is a chemical often associated with VOCs, particularly 1,1,1-trichloroethane. Some 1,1,1-trichloroethane was detected at the Site during the RI but is no longer detected. PRPs sampled groundwater for 1,4-dioxane in 2005, but the data were rejected by EPA during the data quality review. The PRPs conducted a second sampling event in 2006 and this dataset passed EPA's data quality review. 1,4-Dioxane was not detected above the laboratory detection limit. EPA determined that 1,4-dioxane was not a COC at the Site.

Changes in Exposure Pathways

The vapor intrusion pathway, although not originally assessed in the RI, was evaluated from 2007 to 2008 and found not to be a concern. COC groundwater concentrations have decreased since that time; therefore, further evaluation of vapor intrusion associated with groundwater contamination is not warranted. PRPs regularly monitor for landfill gas in nearby residences and have identified no issues of concern.

Expected Progress Towards Meeting RAOs

The remedial action has met RAOs specific to the landfill contents, leachate, groundwater, surface water, sediment, and ecological receptors, as presented in Table 2 of this FYR Report. Source controls and institutional controls in place limit potential exposures to these media. COCs in groundwater have met the performance standards specified in the 2015 ESD.

The RAOs for landfill gas – to control subsurface off-site migration of landfill gas and to control combustible gas concentrations – have not yet been met. Landfill gas periodically exceeds the LEL of methane at the perimeter of the Site as reported in the GMPs, although it is below the performance standard of 25% of the LEL in nearby residences.

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 could call into question the protectiveness of the remedy.

VI. ISSUES/RECOMMENDATIONS

Table 9: Issues and Recommendations Identified in the FYR

Issues/Recommendations				
OU(s) without Issues/Recommendations Identified in the FYR:				
None				
Issues and Recommendations Identified in the FYR:				
OU(s): OU1 (Sitewide)	Issue Category: Remedy Performance			
	Issue: The ROD, as modified, states that the gas monitoring system will be required to maintain combustible gas levels below the LEL at the property boundary and below twenty-five percent of the LEL in adjacent areas. Two perimeter monitoring points (GMP-7 and GMP-8) in the southwestern part of the Site continue to report multiple detections above the LEL of methane.			
	Recommendation: Take additional measures to determine if the ROD performance standard that the level of methane is below 100% of the LEL at the property boundary (landfill perimeter) and below 25% of the LEL in adjacent areas is being achieved near GMP-7 and GMP-8 and, if not, take appropriate actions to achieve the ROD performance standard.			
Affect Current Protectiveness	Affect Future Protectiveness	Party Responsible	Oversight Party	Milestone Date
No	Yes	PRP	EPA/State	5/16/2023

Other Findings

Several additional findings were identified during the FYR. The findings and recommendations to address them do not affect current and/or future protectiveness.

- The 2014 O&M Plan states that the leachate extraction system may require restarting in the future due to significant changes in leachate elevations, but it does not include procedures for determining how or when a significant change has occurred. The O&M Plan should be updated to reflect these metrics.
- EPA issued a comfort letter to the new property owner in December 2019, which provided the status of the cleanup at the Site as well as outlined the reasonable steps the owner must take, among other things to stop continuing releases, prevent future releases, and prevent or limit any human exposure to previously released contamination at the Site. The property owner has not yet forwarded a copy of the new deed and purchase documentation to EPA, as required by the comfort letter. During the site inspection, the EPA RPM reminded the property owner of this request. EPA will send a follow-up letter formalizing the request.

VII. GOVERNMENT PERFORMANCE AND RESULTS ACT MEASURES

As part of this FYR, the Government Performance Results Act (GPRA) Measures were reviewed. The GPRA Measures and their status are as follows:

Environmental Indicators

Human Health: Current Human Exposure Controlled and Protective Remedy In-Place

Groundwater Migration: Groundwater Migration Under Control

Sitewide Ready for Anticipated Use (SWRAU)

The Site achieved the SWRAU measure on September 9, 2011.

III. PROTECTIVENESS STATEMENT

Table 10: Sitewide Protectiveness Statement

Sitewide Protectiveness Statement
<i>Protectiveness Determination:</i> Short-term Protective
<i>Protectiveness Statement:</i> The Site's remedy is currently protective of human health and the environment, in the short term. The landfill cap restricts exposure to waste material and limits migration of contaminants to groundwater. The gas venting system is reducing the buildup of harmful landfill gases. Institutional controls and access controls are in place and are effectively reducing exposures to contaminated media. All groundwater performance standards were met during this FYR period. O&M and monitoring are ongoing. For the remedy to be protective over the long term, the PRP shall take additional measures to determine if the ROD performance standard that the level of methane is below 100% of the LEL at the property boundary (landfill perimeter) and below 25% of the LEL in adjacent areas is being achieved near GMP-7 and GMP-8 and, if not, take appropriate actions to achieve the ROD performance standard..

IX. NEXT REVIEW

The next FYR Report for the Novak Sanitary Landfill Superfund site is required five years from the completion date of this review.

APPENDIX A – REFERENCE LIST

Annual Groundwater Monitoring Reports, Novak Sanitary Landfill. de maximis, inc. 2016 through 2019.

Annual Landfill Gas Monitoring Summary Reports, Novak Sanitary Landfill. HDR / de maximis, inc. 2016 through 2019.

Environmental Covenant, Novak Sanitary Landfill, Inc. to the Novak Site RD/RA PRP Group. Instrument Number 2011023090. Recorded July 29, 2011 with the Record of Deeds, Lehigh County, Pennsylvania.

Explanation of Significant Differences, Novak Sanitary Landfill Superfund Site. EPA Region 3. March 13, 2015.

First Five-Year Review Report for Novak Sanitary Landfill Site, South Whitehall Township, Lehigh County, Pennsylvania. EPA Region 3. March 2006.

Leachate Extraction System Closure Work Plan, Novak Sanitary Landfill, South Whitehall, Pennsylvania. HDR / de maximis inc. September 2014.

Monthly Progress Reports, Novak Sanitary Landfill RD/RA. de minimis, inc. January 2016 through October 2020.

National Oil and Hazardous Substances Pollution Contingency Plan; National Priorities List: Partial Deletion of the Novak Sanitary Landfill Superfund Site. Federal Register, Volume 84, Number 186. September 25, 2019.

Novak Updated Risk Evaluation 2015-2018. Email correspondence from Jennifer Hubbard, Toxicologist. EPA Region 3. April 8, 2019.

Notice of Intent to Delete, National Priorities List: Partial Deletion of the Novak Sanitary Landfill Superfund Site. EPA Region 3. August 8, 2019.

Operation and Maintenance Plan, Novak Sanitary Landfill, South Whitehall Township, Lehigh County, Pennsylvania. de maximis, inc. December 2014.

Preliminary Close Out Report, Novak Sanitary Landfill, South Whitehall Township, Pennsylvania. EPA Region 3. September 17, 2002.

Record of Decision, Novak Sanitary Landfill. EPA Region 3. September 30, 1993.

Remedial Investigation Report, Novak Sanitary Landfill, South Whitehall Township, Pennsylvania. Geraghty & Miller, Inc. for the Novak RI/FS PRP Group. June 1992, last revised January 21, 1993.

Second Five-Year Review Report for Novak Sanitary Landfill Site, South Whitehall Township, Lehigh County, Pennsylvania. EPA Region 3. May 2011.

Third Five-Year Review Report for Novak Sanitary Landfill Site, South Whitehall Township, Lehigh County, Pennsylvania. EPA Region 3. May 16, 2016.

APPENDIX B – SITE CHRONOLOGY

Table B-1: Site Chronology

Event	Date
Landfill operations took place	Mid-1950s to 1990
The Pennsylvania Department of Environmental Resources, predecessor to PADEP, issued a Solid Waste Management Permit to Novak Sanitary Landfill, Inc.	March 1972
EPA conducted a site inspection	June 1985
EPA proposed the Site for listing on the NPL	January 1987
EPA issued an Administrative Order on Consent for PRPs to conduct the RI/FS	January 1989
EPA listed the Site on the NPL	October 1989
The PRPs completed the RI/FS	January 1993
EPA issued the ROD	September 1993
The PRPs began the remedial design	July 1995
The PRPs finished the remedial design	March 1999
The PRPs began the remedial action	July 1999
The remedial action was complete; EPA finalized the preliminary close-out report	September 2002
EPA completed the first FYR Report	March 2006
The PRPs completed a limited pilot test to assess possible effects of shutting down two leachate extraction wells	October 2007
EPA completed the second FYR Report	May 2011
An environment covenant consistent with Pennsylvania's UECA was recorded for the site property	July 2011
The Site achieved the sitewide ready for reuse and redevelopment milestone	September 2011
The PRPs completed a full-scale pilot test to assess the effects of shutting down the leachate collection system; the leachate collection system was dismantled	December 2011
EPA issued an ESD to modify the continuous collection component of the leachate system, change a leachate collection performance standard, and change the groundwater performance standards	March 2015
EPA completed the third FYR Report	May 2016
EPA deleted the groundwater portion of the Site from the NPL	September 2019
Ownership of the landfill property transferred from the Novak estate to private individuals	January 2020

APPENDIX C – SITE MAPS

Figure C-1: Historic Fill Areas

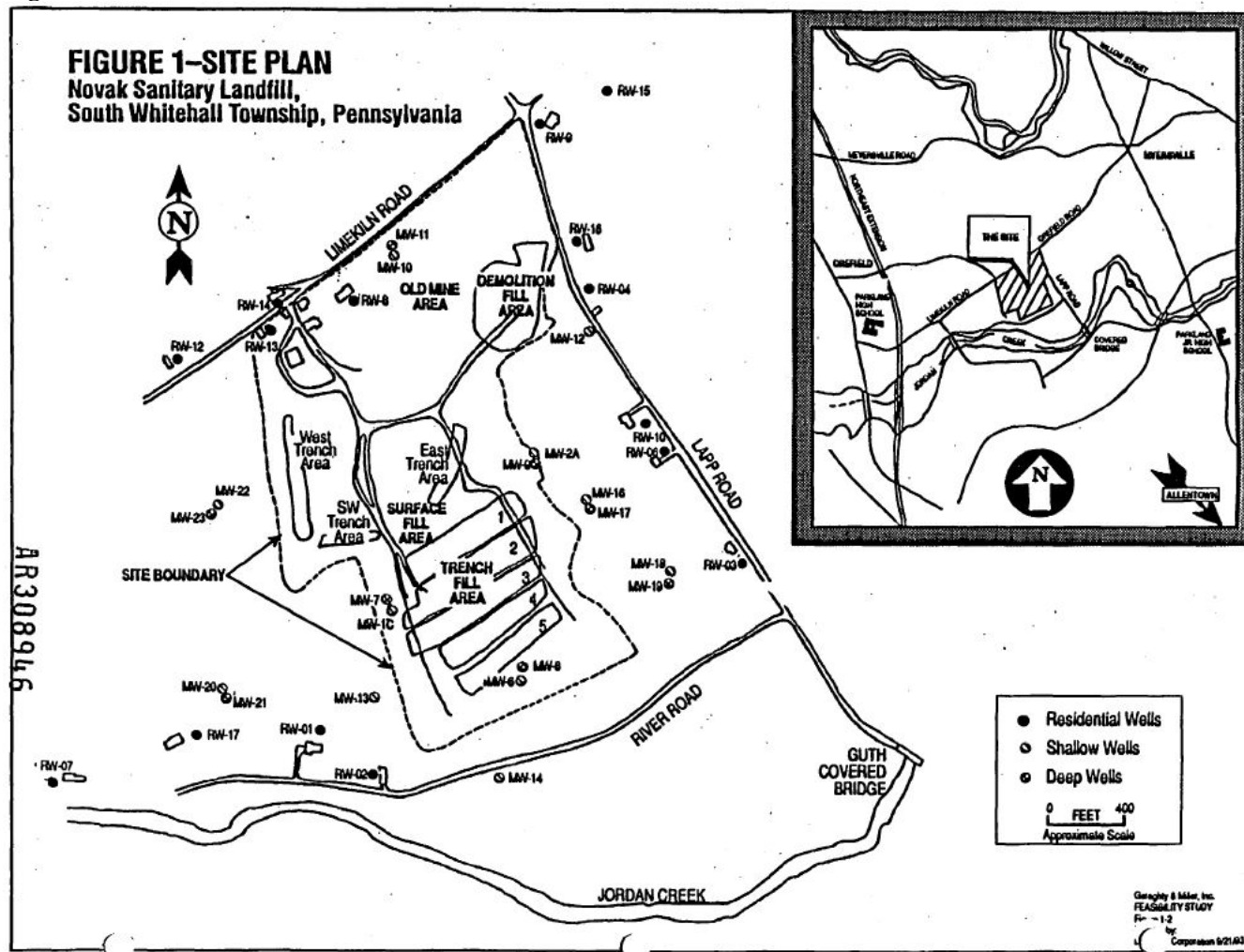
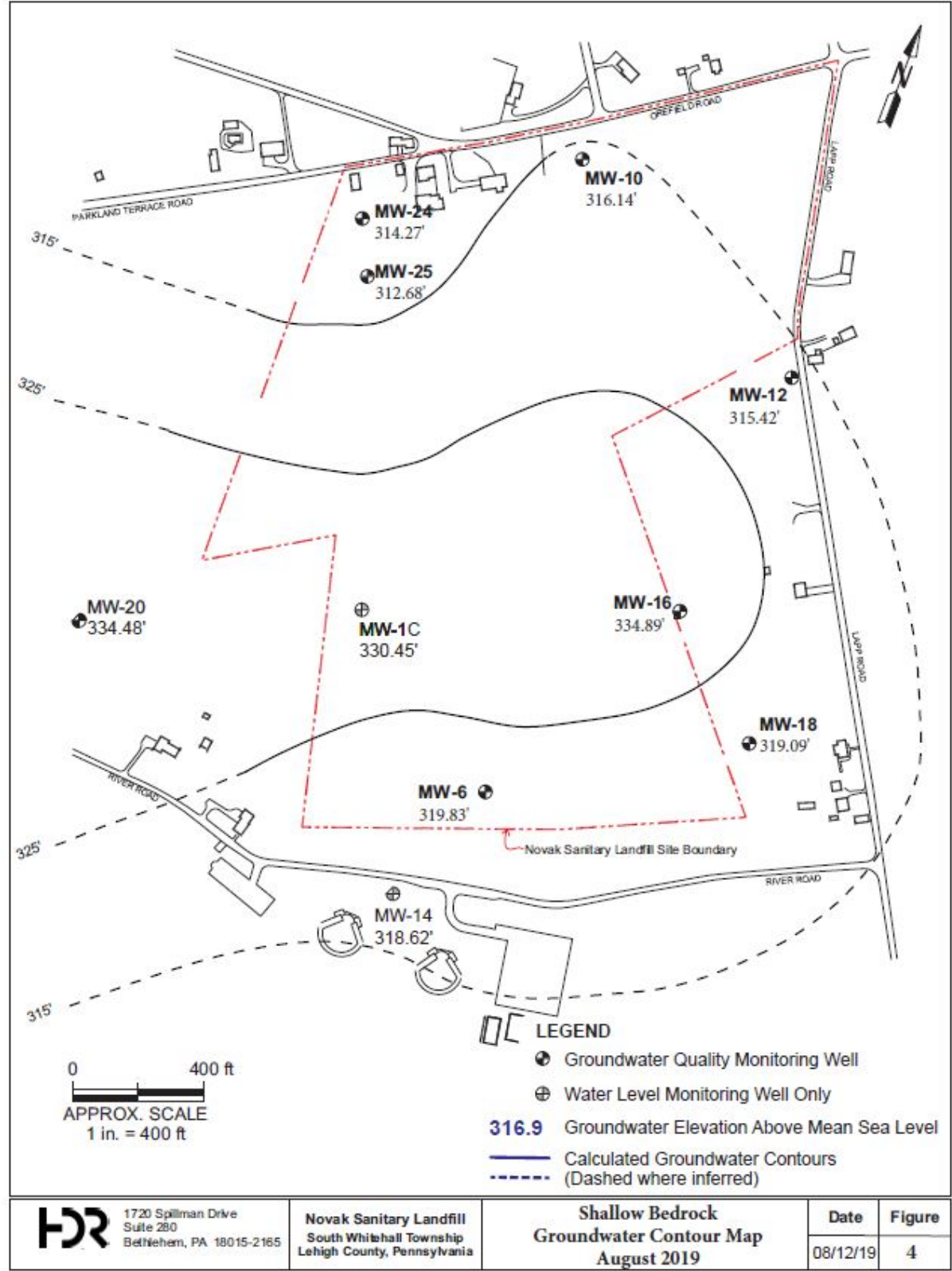
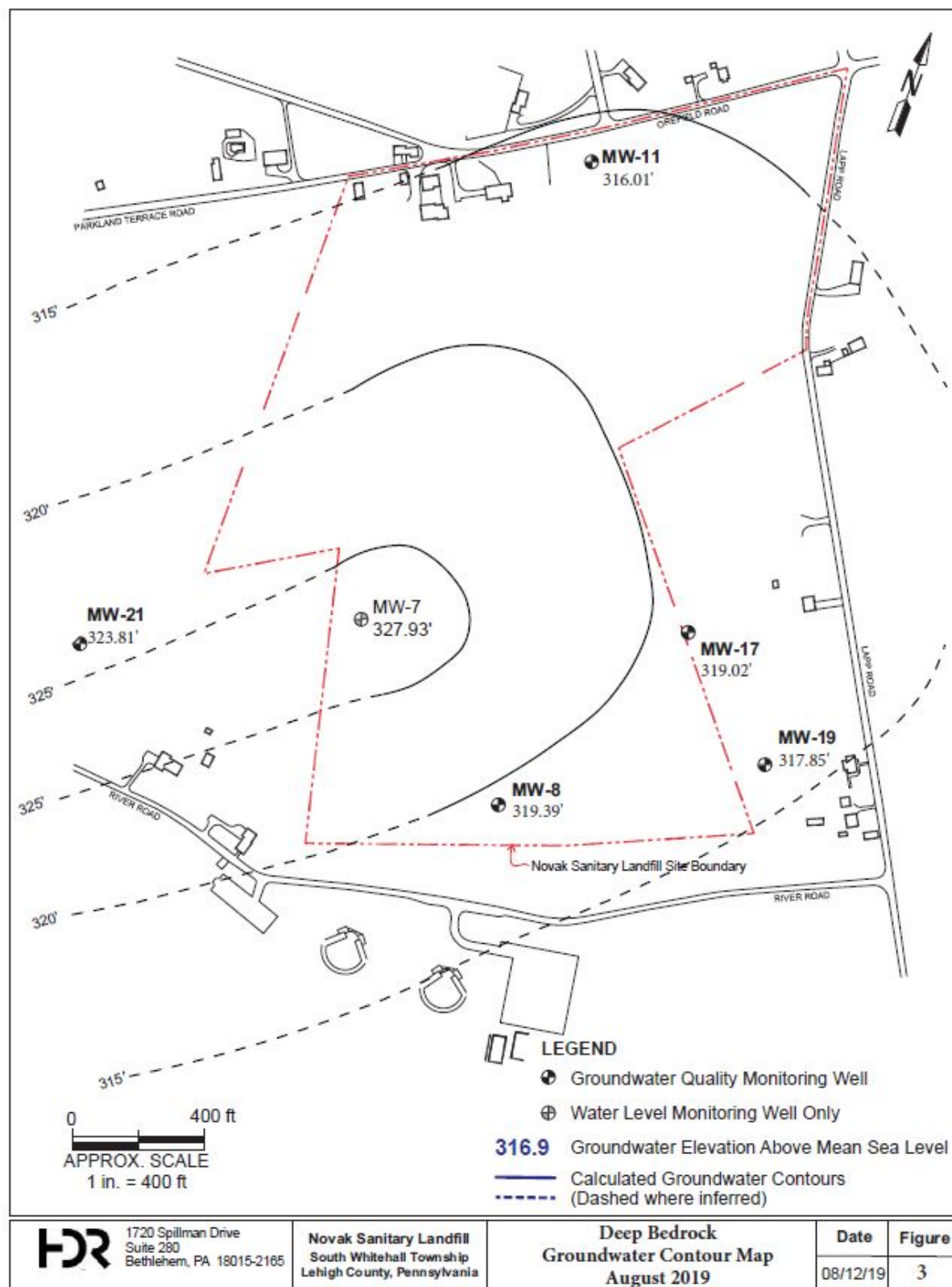


Figure C-2: 2019 Shallow Bedrock Groundwater Contour Map



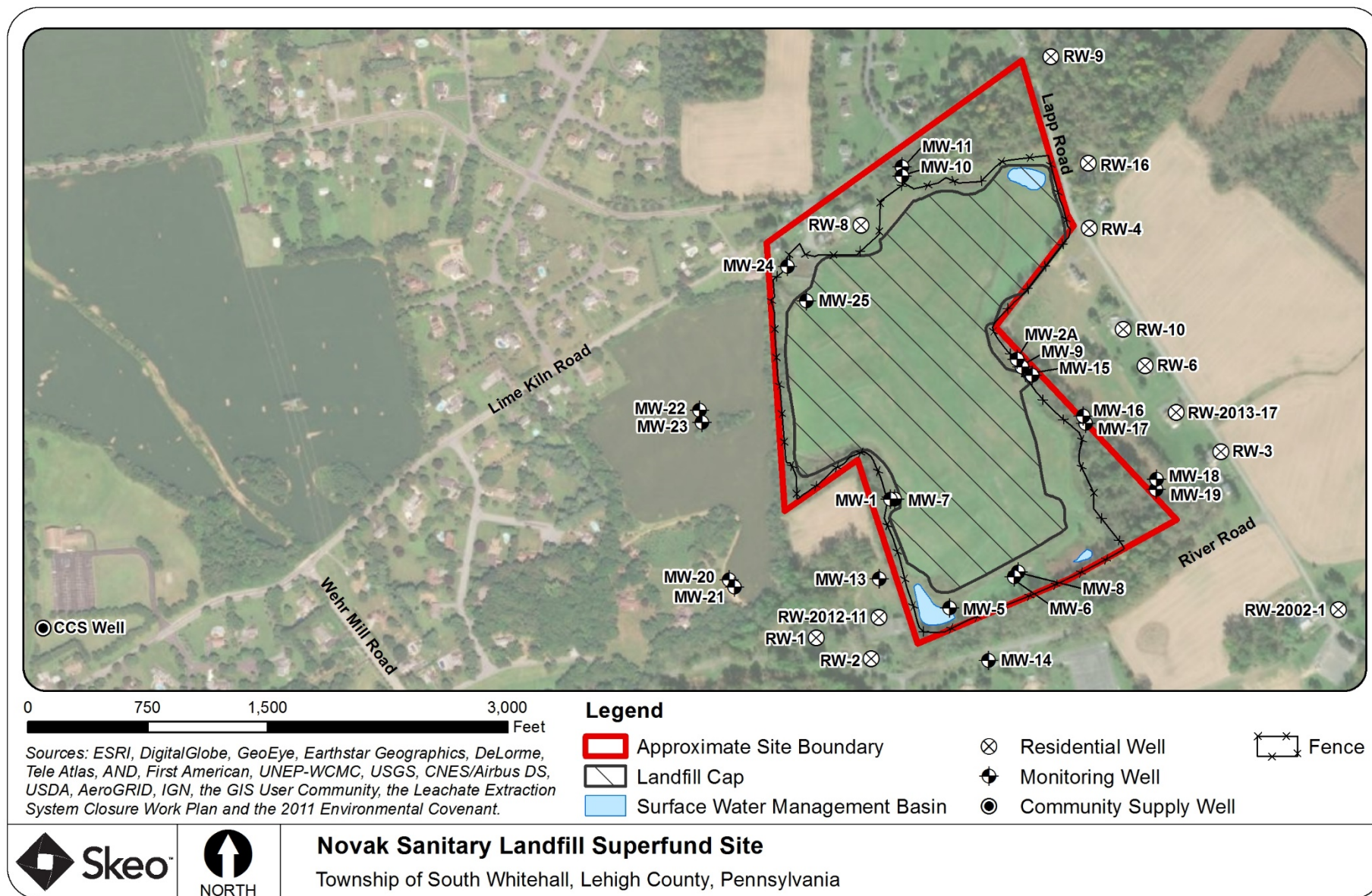
Source: Annual Groundwater Monitoring Report - 2019

Figure C-3: 2019 Deep Bedrock Groundwater Contour Map



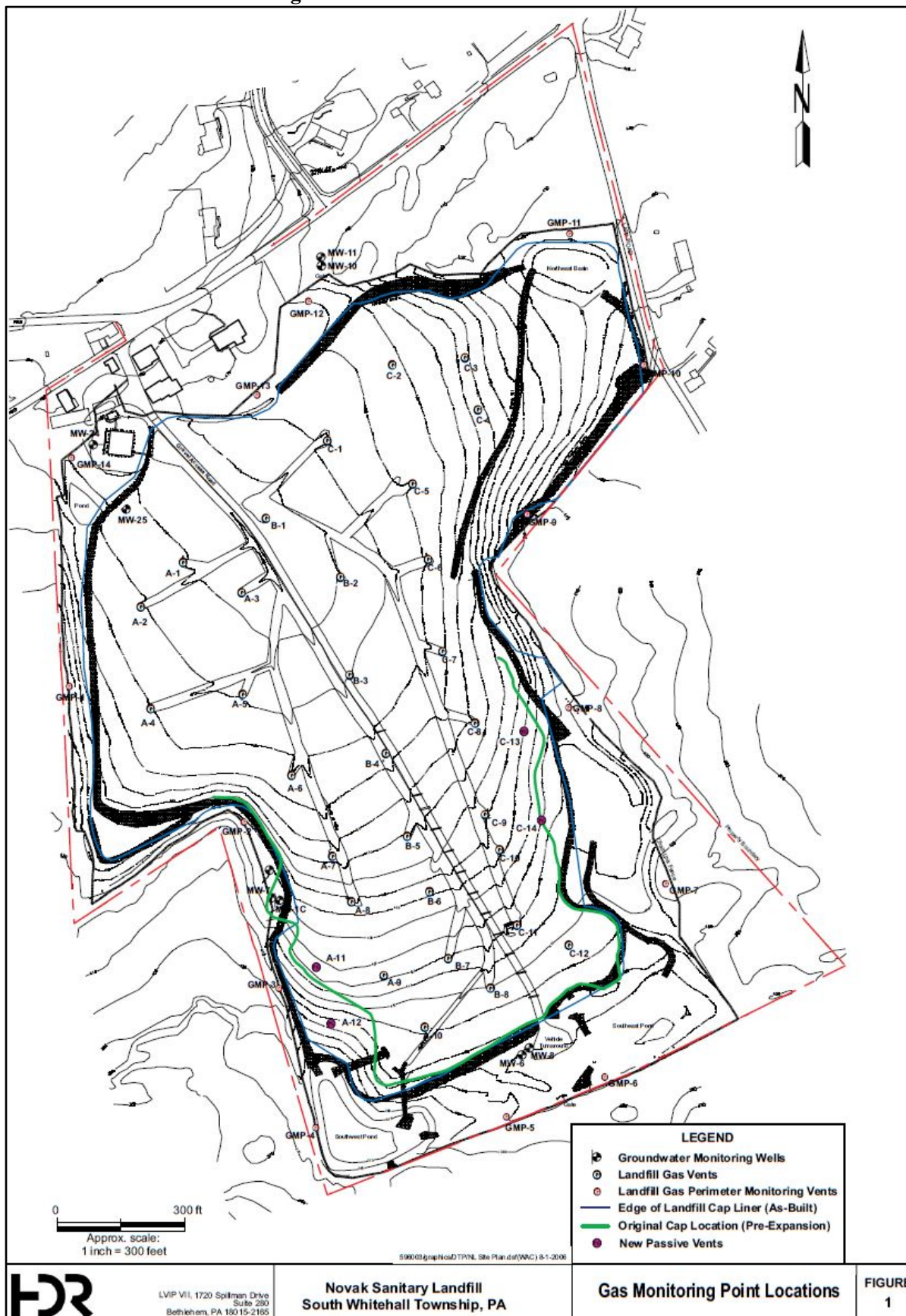
Source: Annual Groundwater Monitoring Report - 2019

Figure C-4: Groundwater Monitoring Locations



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site.

Figure C-5: Landfill Gas Monitoring Locations



Source: Annual Landfill Gas Monitoring Report - 2019

APPENDIX D – PUBLIC NOTIFICATION

OCTOBER 1, 2020

local

THE PRESS A5

Fire destroys ScreamPark barn in Lowhill Twp

BY SUSAN BRYANT
sbryant@tnonline.com

A two-alarm fire destroyed a barn Monday night which contained equipment for Lehigh Valley ScreamPark, 2951 Betz Court, Orefield.

According to a Fogelsville Fire Department's Facebook post, Fogelsville, Tri-Clover and Laurys Station fire departments, along with Cetronia Ambulance Corps personnel were dispatched 8:26 p.m. Sept. 28 for the fire at 7209 Kernsville Road, Lowhill Township.

A second alarm was called, bringing firefighters from Greenawalds, Woodlawn, Good Will Fire Co. No. 1, Trexertown, New Tripoli and Weisenberg to the scene.

The Facebook post further states, Tri-Clover Assistant Chief Brian Neas, who arrived on the scene declared it a working fire and asked for more tankers since there are no hydrants in the area.

A large backhoe was brought in to pull apart the walls.

One firefighter was treated for heat, the Fogelsville Facebook post states.

According to a post on the Nester Video Production Facebook page, multiple tankers were used for water supply including two Aqua Duck tankers from the nearby business.

ScreamPark owner Buddy Wessner spoke with The Press on Tuesday about the fire.

Wessner learned about the fire when an employee called him around 8:30 p.m.

"It was unexpected



Fogelsville firefighters use their aerial fire truck to hose down the fire at the barn.

and it went fast," Wessner said. "Before the fire trucks arrived, it went down."

He said the barn was used as a storage facility.

"Everything we had to run the shows, the sound system, light-

ing, fog machine, hay wagon and small equipment tools were lost in the fire," Wessner said. "There were no animals inside."

This Halloween would have been the sixth year for the Lehigh Valley ScreamPark,



PRESS PHOTOS BY NESTER VIDEO PRODUCTION

Flames and smoke can be seen shooting through the roof of the barn containing equipment for the Lehigh Valley ScreamPark, Lowhill Township.

since its opening in 2014.

Wessner said he was told by North Whitehall Fire Marshal Don Jacobs the fire originated from a boiler malfunction.

Wessner and his wife, Cheree, have owned the property since 2008.

EPA PUBLIC NOTICE

EPA REVIEWS CLEANUP NOVAK SANITARY LANDFILL SUPERFUND SITE

The U.S. Environmental Protection Agency (EPA) is reviewing the cleanup that was conducted at the Novak Sanitary Landfill Superfund Site located in South Whitehall Township, Pennsylvania. EPA conducts five-year reviews to ensure that cleanups continue to protect public health and the environment. EPA conducted the previous five-year review in 2016 and concluded that the remedy was working as designed and is protective. Findings from the current review will be available by May 2021.

To access site information, including the review report once finalized, visit:
www.epa.gov/superfund/novak

For questions or to provide site-related information for the review, contact:
Gina Soscia, EPA Community Involvement Coordinator
215-814-5538 or soscia.gina@epa.gov

GOGLE FARMS

U-PICK &
PRE-PICK



APPLES & PUMPKINS

Open Saturday & Sunday 9-5

BUY FRESH
BUY LOCAL

Now Accepting
Credit Cards! PA Preferred

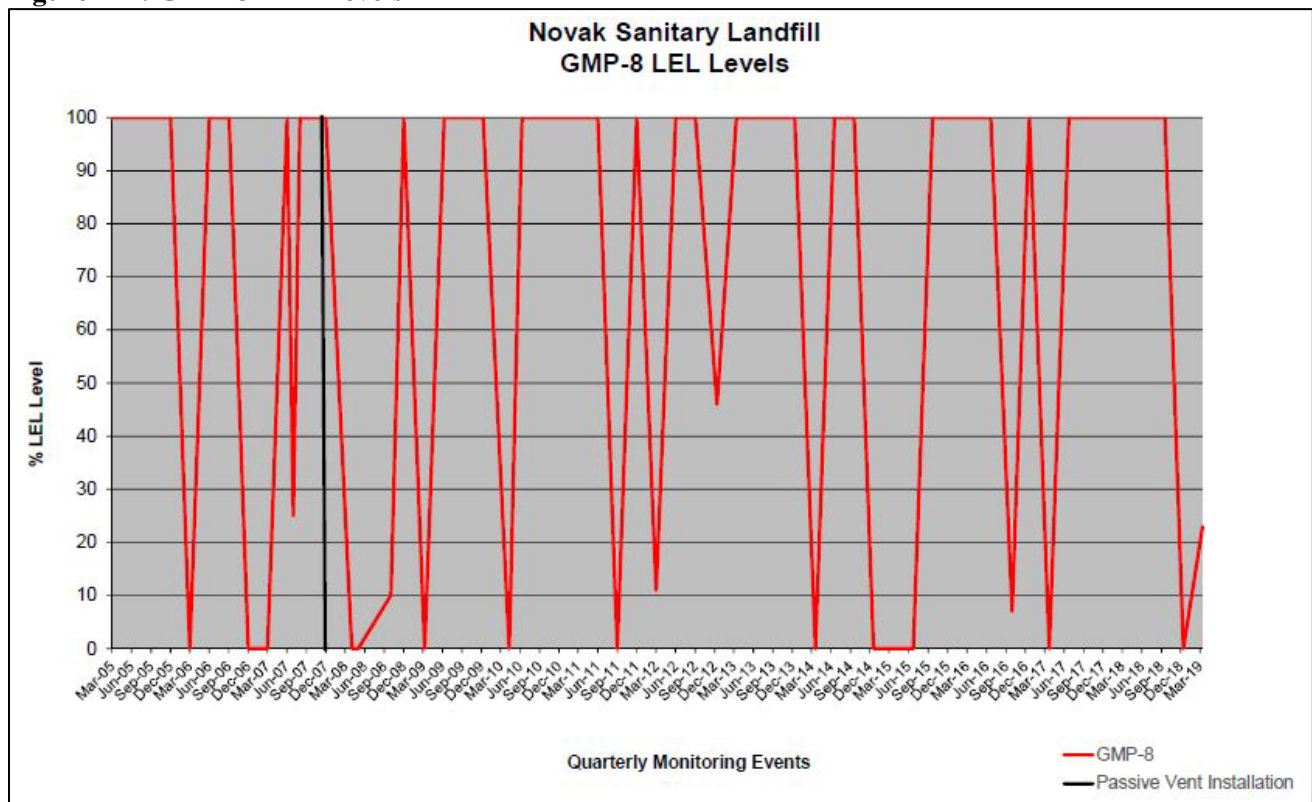
5017 Mulberry St • Coplay, PA
Directions: North on Rte 145, left on Clearview Rd,
after 1.7 miles turn right on Mulberry St
www.goglefarms.com

LEHIGH VALLEY PRESS
A Division of TIMES NEWS Media Group

YOUR SOURCE
OF LOCAL NEWS

APPENDIX E – DATA REVIEW SUPPORTING DOCUMENTATION

Figure E-1: GMP-8 LEL Levels



Source: Annual Landfill Gas Monitoring Report – 2018 to 2019

APPENDIX F – SITE INSPECTION PHOTOGRAPHS



Photo 1: Gated entrance to the landfill portion of the Site



Photo 2: Storage building formerly used as the leachate extraction system pump house



Photo 3: Concrete containment area for the former leachate storage tank; residence in the background



Photo 4: Vegetated landfill cap



Photo 5: Landfill gas vent B-1



Photo 6: Southwest Pond



Photo 7: Area above Southwest Pond where interceptor trench was installed



Photo 8: Gabion wall near GMP-2



Photo 9: Riprap ditch installed to address erosion near gas vent C-5



Photo 10: Area of Southwest Pond with evidence of old repairs and new erosion



Photo 11: Tree growing through perimeter fence

APPENDIX G – APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARS) REVIEW

CERCLA Section 121(d)(1) requires that Superfund remedial actions attain “a degree of cleanup of hazardous substance, pollutants, and contaminants released into the environment and of control of further release at a minimum which assures protection of human health and the environment.” The remedial action must achieve a level of cleanup that at least attains those requirements that are legally applicable or relevant and appropriate. Section VIII of the 1993 ROD, as modified, provides a complete list of applicable or relevant and appropriate requirements (ARARs) for the Site, many of which were applicable or relevant and appropriate during initial construction activities at the Site. This FYR evaluates only those chemical-specific ARARs that affect ongoing protectiveness of the remedy.

Groundwater

The 2015 ESD established the federal Safe Drinking Water Act MCLs and MCLGs as ARARs. Table G-1 compares the 2015 ESD performance standards to the current MCLs and MCLGs. There have been no changes to groundwater ARARs.

Table G-1: Comparison of ARARs in the 2015 ESD to Current ARARs

COC	Performance Standard ^a (µg/L)	Current ARAR		Change in ARAR
		MCL ^b (µg/L)	Non-zero MCLG ^b (µg/L)	
Benzene	5	5	**	None
Bromodichloromethane	80	80 ^c	**	None
Chlorobenzene	100	100	100	None
Chloroform	70 ^d	80 ^c	70	None
Dibromochloromethane	60 ^d	80 ^c	60	None
1,4-Dichlorobenzene	75	75	75	None
1,1-Dichloroethane	**	**	**	None
1,2-Dichloroethane	5	5	**	None
1,1-Dichloroethene	7	7	7	None
1,2-Dichloroethene (cis)	70	70	70	None
1,2-Dichloroethene (trans)	100	100	100	None
1,2-Dichloropropane	5	5	**	None
1,3-Dichloropropene (trans)	**	**	**	None
Ethylbenzene	700	700	700	None
Toluene	1,000	1,000	1,000	None
PCE	5	5	**	None
1,1,1-Trichloroethane	200	200	200	None
TCE	5	5	**	None
Vinyl chloride	2	2	**	None
Xylene (total)	10,000	10,000	10,000	None
Cadmium	5	5	5	None
Beryllium	4	4	4	None

Notes:

- a) Performance standards from Table 2 of the 2015 ESD; MCLs are the basis of the performance standards unless otherwise noted.
 - b) Current MCLs/MCLGs obtained from <https://www.epa.gov/ground-water-and-drinking-water/national-primary-drinking-water-regulations#six> (accessed 10/9/2020).
 - c) MCL for total trihalomethanes.
 - d) Basis of performance standard is an MCLG.
- ** MCL or MCLG not established.

Landfill Gas Emissions

The 1993 ROD, as modified, indicates that landfill gas emissions are subject to the requirements for gas control and monitoring included in the Pennsylvania Residual Waste Management Regulations (25 PA Code § 288.262). The provisions under Section 288.262 were amended and became effective in January 2001. The current provisions state that combustible gas levels may not equal or exceed 25% of the LEL in a structure within the Site and the LEL at boundaries of the Site. These monitoring standards have not changed since the 1993 ROD.

Surface Water

The 1993 ROD, as modified, identified several state and federal ARARs for surface water in the event the contingency remedy for leachate (on-site treatment prior to discharge to surface water) was implemented. These ARARs include the more stringent of the Clean Water Act and the Pennsylvania Clean Streams Law. On-site treatment of leachate has not been required at the Site; therefore, an evaluation of changes to these ARARs is not necessary for this FYR.