FIFTH FIVE-YEAR REVIEW REPORT FOR
HERCULES 009 LANDFILL SUPERFUND SITE
GLYNN COUNTY, GEORGIA



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Prepared by

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Region 4
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Date

Table of Contents

LIST OF ABBREVIATIONS AND ACRONYMS iv
I. INTRODUCTION 1
Site Background 1
FIVE-YEAR REVIEW SUMMARY FORM 2
II. RESPONSE ACTION SUMMARY 4
Basis for Taking Action 4
Response Actions 4
Status of Implementation 8
Systems Operations/Operation and Maintenance (O&M) 12
III. PROGRESS SINCE THE PREVIOUS REVIEW 12
IV. FIVE-YEAR REVIEW PROCESS 13
Community Notification, Community Involvement and Site Interviews 13
Data Review 13
Site Inspection 17
V. TECHNICAL ASSESSMENT 17
QUESTION A: Is the remedy functioning as intended by the decision documents? 17
QUESTION B: Are the exposure assumptions, toxicity data, cleanup levels and RAOs used at the time of the remedy selection still valid? 18
QUESTION C: Has any other information come to light that could call into question the protectiveness of the remedy? 19
VI. ISSUES/RECOMMENDATIONS 19
VII. PROTECTIVENESS STATEMENT 19
VIII. NEXT REVIEW 20
APPENDIX A – REFERENCE LIST A-1
APPENDIX B – CURRENT SITE STATUS B-1
APPENDIX C – SITE CHRONOLOGY C-1
APPENDIX D – SITE MAPS D-1
APPENDIX E – PRESS NOTICE E-1
APPENDIX F – INTERVIEW FORMS F-1
APPENDIX G – SITE INSPECTION CHECKLIST G-1
APPENDIX H – SITE INSPECTION PHOTOS H-1
APPENDIX I – DATA TABLES AND FIGURES I-1
APPENDIX J – SCREENING-LEVEL RISK REVIEW J-1
APPENDIX K – 2020 ENVIRONMENTAL COVENANT K-1
APPENDIX L – GAEPD MEMORANDUM L-1

Tables

Table 1: Surface and Subsurface Remedial Action Target Concentrations 6
Table 2: Groundwater COC Cleanup Goals 8
Table 3: Summary of Planned and/or Implemented Institutional Controls (ICs) 10
Table 4: Protectiveness Determinations/Statements from the 2016 FYR Report 12
Table 5: Status of Recommendations from the 2016 FYR Report 13
Table C-1: Site Chronology C-1

Table I-1: Groundwater Data, 2011 to 2020 ..... I-1
Table J-1: Screening-Level Vapor Intrusion Evaluation J-1
Table J-2: Surface Soil Screening-Level Risk Evaluation J-1
Table J-3: Subsurface Soil Screening-Level Risk Evaluation – Industrial Use J-2
Table J-4: Subsurface Soil Screening-Level Risk Evaluation – Residential Use J-2

Figures

Figure 1: Site Vicinity Map 3
Figure 2: Institutional Control Map 11
Figure 3: N-5 Benzene Trend Graph, 2011 to 2020 15
Figure 4: Detailed Site Map 16
Figure D-1: Extent of Soil Impacts, Pre-Remedial Action D-1
Figure D-2: 1993 ROD Remedial Components D-2
Figure D-3: 2010 Benzene Investigation, Shallow Aquifer D-3
Figure D-4: 2010 Benzene Investigation, Deep Aquifer D-4
Figure I-1: Potentiometric Surface Map, 2020 ..... I-4

LIST OF ABBREVIATIONS AND ACRONYMS

ARAR	Applicable or Relevant and Appropriate Requirement
bgs	Below Ground Surface
BHC	Hexachlorocyclohexane
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
ESD	Explanation of Significant Differences
FYR	Five-Year Review
GAEPD	Georgia Environmental Protection Division
HI	Hazard Index
HQ	Hazard Quotient
IC	Institutional Control
IROD	Interim Record of Decision
MCL	Maximum Contaminant Level
µg/L	Micrograms Per Liter
mg/kg	Milligrams Per Kilogram
mg/L	Milligrams Per Liter
µg/L	Micrograms Per Liter
NCP	National Contingency Plan
NPL	National Priorities List
O&M	Operation and Maintenance
OU	Operable Unit
PRP	Potentially Responsible Party
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RPM	Remedial Project Manager
RSL	Regional Screening Level
UU/UE	Unlimited Use and Unrestricted Exposure
VISL	Vapor Intrusion Screening Level

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 is preparing this FYR pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121, consistent with the National Contingency Plan (NCP) (40 Code of Federal Regulations (CFR) Section 300.430(f)(4)(ii)) and considering EPA policy.

This is the fifth FYR for the Hercules 009 Landfill Superfund site (the Site). The triggering action for this statutory review is the completion date of the previous FYR. The 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 two operable units (OUs). This FYR addresses both OUs. OU-1 addresses surface water and groundwater contamination and source areas at the Site. OU-2 addresses the threat of potential groundwater contamination at private residential wells.

EPA remedial project manager (RPM) Scott Martin led the FYR. Participants included Kirby Webster and Alison Cattani from EPA support contractor Skeo. The potentially responsible party (PRP) was notified of the initiation of the FYR. The review began on October 8, 2020.

Site Background

The 16.5-acre Site is in a commercial and residential area in Brunswick in eastern Glynn County, Georgia (Figure 1). Beginning in 1948, Hercules, Inc. (Hercules) made toxaphene at a facility about three miles from the Site. From 1976 to 1980, Hercules operated a permitted industrial landfill on 7 acres at the northern end of the Site to dispose of wastewater sludge from the manufacturing process. It was known as the 009 Landfill. The landfill consisted of six lined cells. These disposal practices at the Site resulted in soil, surface water and groundwater contamination.

The Site currently consists of several fields and a paved monolith overlying the former landfill area. The paved monolith is used by an adjacent car dealership for parking. In addition, a pond is located on the southern tip of the property (Figure 1). The Site is bordered by the car dealership to the north, Golden Isles Parkway to the west, a juvenile slash pine forest to the east, and several homes, a church, a school and a strip shopping center to the south/southeast.

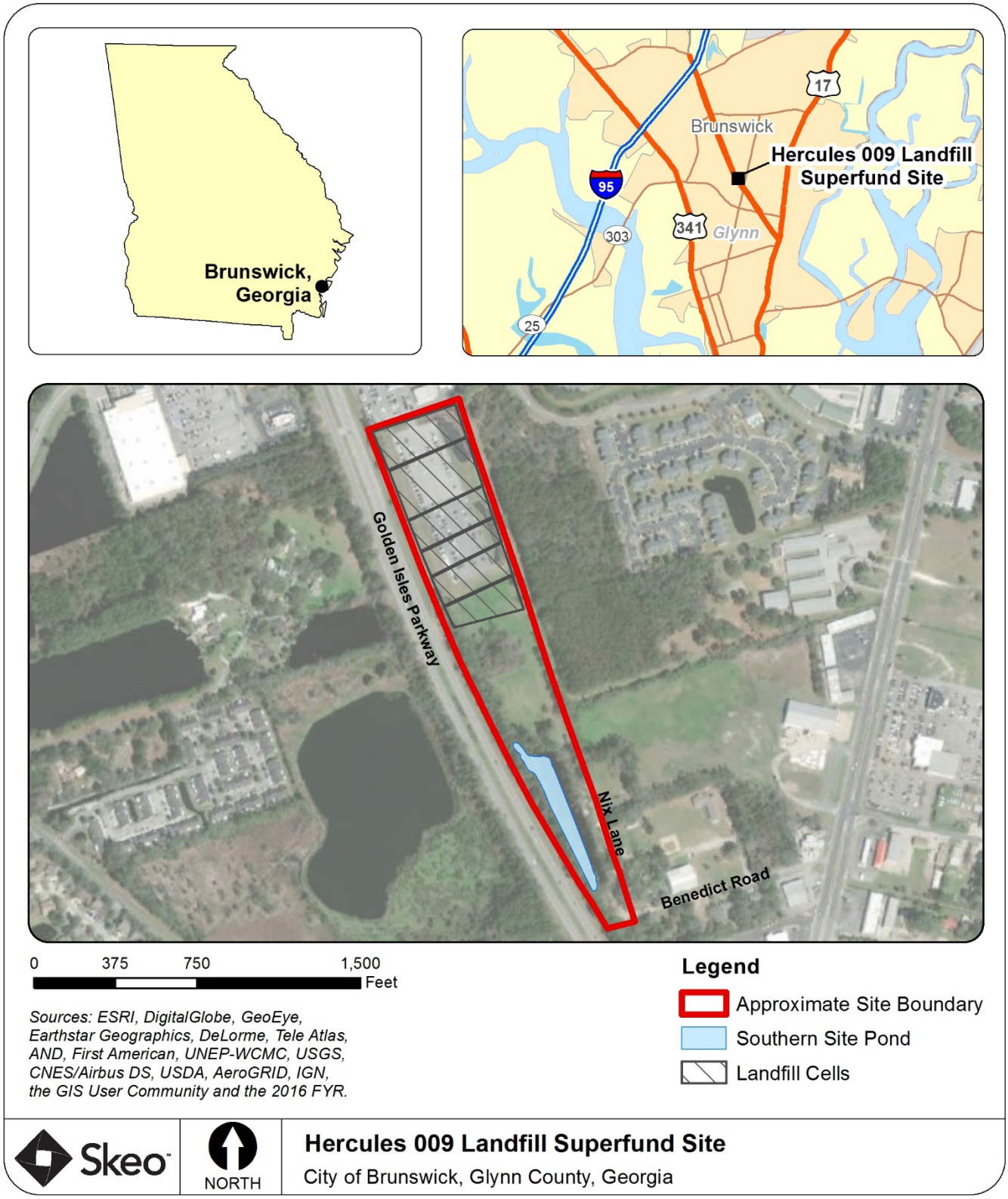
The landfill is about a mile west of coastal wetlands, within the Atlantic Coastal Plain province of Georgia. Groundwater beneath the Site occurs in the surficial aquifer and the underlying Floridan Aquifer. The surficial aquifer consists of a shallow zone which extends from about eight feet below ground surface (bgs) to 35 feet bgs (flowing east) and a deep zone which occurs from 60 feet bgs to 100 feet bgs (flowing southeast). A semi-confining layer is present between the shallow and deep zone of the surficial aquifer. The Floridan Aquifer, which is not impacted by the Site, is the primary aquifer for irrigation and municipal supplies in the area. Groundwater contamination is limited to the surficial

aquifer beneath the Site. Appendix A lists the documents used to prepare this FYR Report. Appendix B includes site status information. Appendix C provides a brief site chronology.

FIVE-YEAR REVIEW SUMMARY FORM

SITE IDENTIFICATION		
Site Name: Hercules 009 Landfill		
EPA ID: GAD980556906		
Region: 4	**State: Georgia**	**City/County: Brunswick/Glynn**
SITE STATUS		
NPL Status: Final		
Multiple OUs? Yes	**Has the Site achieved construction completion?** Yes	
REVIEW STATUS		
Lead agency: EPA		
Author name: Scott Martin		
Author affiliation: EPA with support provided by Skeo		
Review period: 10/8/2020 – 7/13/2021		
Date of site inspection: 6/9/2021		
Type of review: Statutory		
Review number: 5		
Triggering action date: 9/6/2016		
Due date *(five years after triggering action date)*: 9/6/2021		

Figure 1: Site Vicinity 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 the EPA's response actions at the Site.

II. RESPONSE ACTION SUMMARY

Basis for Taking Action

In March 1980, sampling by GAEPD found contamination on site. As a result, GAEPD canceled Hercules' permit to operate the landfill. Hercules closed the landfill in 1980 and in 1982, the EPA banned the use and manufacture of toxaphene. The EPA proposed listing the Site on the Superfund program's National Priorities List (NPL) in September 1983. The EPA finalized the Site's listing on the NPL in September 1984.

The EPA entered into an Administrative Order on Consent with Hercules in July 1988 for Hercules to perform the Site's remedial investigation and feasibility study (RI/FS). During the RI, the EPA discovered toxaphene contamination in the groundwater. Residents on Benedict Road and Nix Lane near the Site used groundwater from the deeper zone of the surficial aquifer for their drinking water source. Due to time required to complete the RI/FS and the immediate nature of the threat posed by potentially contaminated groundwater to nearby residents, the EPA moved ahead with an interim action for OU-2 (discussed below) in 1991. This interim action required the provision of alternate water supplies to local residences and a nearby church.

In early 1993, Hercules finalized the RI/FS for site soils and contaminated groundwater. The results indicated that toxaphene was detected in sludge, soil, and sediment in the immediate vicinity of the landfill and groundwater. Toxaphene in surface soils at the Site was the primary contributor to excess risk at the Site. Toxaphene concentrations in surface soil were highest in the vicinity of the landfill. Toxaphene was also detected near the entrance to the Site off Benedict Road due to sludge transportation activities to the landfill, in a soil pile left on site and along a drainage ditch that ran along the east side of the landfill. Toxaphene concentrations generally decreased with depth with only a few localized areas with subsurface contamination in the landfill area. Figure D-1 in Appendix D shows the historical areas of impacted soil.

The RI/FS identified other contaminants of concern (COCs) besides toxaphene. The RI identified toxaphene, benzene and nickel in groundwater. Other potential COCs were identified for groundwater but only benzene, toxaphene and nickel were chosen for remedial action based on toxicity, mobility and frequency of detection throughout the Site. The RI identified the flow of groundwater from the landfill cell area toward several private drinking water wells nearby as a potential threat.

During the RI, toxaphene was not detected in any surface water samples in the on-site pond or drainage ditch. However, toxaphene was detected in two sediment samples next to the Site. Investigations found that site contamination had not adversely affected the tested animal communities in the drainage ditch or the estuary. The risk assessment indicated that wildlife using the on-site pond, adjacent drainage ditch or downstream estuary are not exposed to concentrations of constituents that result in excessive levels of risk.

Response Actions

To manage the cleanup, the EPA divided the Site into two OUs. This FYR Report discusses the OUs in chronological order. OU-2, established in the 1991 interim Record of Decision (IROD), addressed the threat of potential groundwater contamination at private residential wells. OU-1, established in the 1993 ROD, addressed surface water and groundwater contamination and source areas at the Site.

OU-2

In June 1991, due to the length of time required to complete the RI/FS and the immediate nature of the threat posed by contaminated groundwater, the EPA issued an IROD for OU-2 to provide an alternate water supply to residences and a church served by private groundwater wells. The 1991 IROD required the connection of area residents to the municipal water supply to mitigate the potential future risk to human health. The remedial action objective (RAO) established in the 1991 IROD was:

- To protect people from exposure to toxaphene and other possible contamination in the surficial aquifer.

The remedial components for OU-2 included:

- Extend municipal water lines from the Brunswick water system along Benedict Road and Nix Lane.
- Connect all residences and the Beverly Shores Baptist Church (now Grace Baptist Church) to the municipal water system.
- Replace private wells immediately downgradient of the landfill by the municipal water system.

Because OU-2 only addressed potential future contamination through an interim action, the IROD identified no COCs. The EPA planned subsequent actions through a separate OU (OU-1) to fully address the principal threats posed by conditions at the Site. The 1993 OU-1 Record of Decision (ROD) further established that the abandonment of private wells was contingent on the owners' approval and was not required (see below).

OU-1

In March 1993, the EPA issued the OU-1 ROD. The purpose of the remedy was to contain contamination on site and to reduce potential risks to human health and the environment. The RAOs established in the 1993 ROD are:

- To prevent the infiltration of precipitation through wastes and affected soils and the percolation of the resulting leachate into subsurface soils and groundwater, followed by groundwater transport.
- To prevent the release of affected surface soil through surface water runoff.
- To prevent the release of affected soil through wind erosion.
- To prevent the release of volatile compounds from soils and waste to the atmosphere.

The 1993 ROD initially outlined the OU-1 remedy, which the EPA updated in the Site’s 1998 Explanation of Significant Differences (ESD). The major components of the final remedy, as determined by the 1993 ROD and updated by the 1998 ESD, include:

- Conduct a treatability study to evaluate in-situ stabilization of on-site source materials, including the landfill, the staging area, the drainage ditch, and contiguous soils southeast of the Site.

- Delineate and remove surface soil contamination from residential areas.[1]
- Implement in-situ stabilization of subsurface soils and sludge, and consolidated surface soils.
- Treat contaminated sludge and soil until the performance standard is met or the regional groundwater table is reached, whichever comes first.
- Treat the surface soils from outside the landfill in an on-site treatment unit in the landfill.
- Mix Portland cement with additional stockpiled treated soils, which contain toxaphene at a concentration consistent with the treatment standards for hazardous wastes contained in Subpart D of Resource Conservation and Recovery Act (RCRA) Land Disposal Restrictions at 40 CFR Part 268.
- Place the treated soil and cement mixture in the landfill area and then grade the mixture to one to three feet in thickness as the cap. Establish a vegetative cover over the cap to reduce erosion.
- Monitor groundwater, as well as surface water and sediment in the on-site pond and the adjacent drainage ditch, over the long term. Sampling of specific wells may be discontinued at the discretion of the EPA after cleanup goals are met for two consecutive annual monitoring periods.
- Implement a groundwater pump-and-treat system if the EPA believes that the groundwater contaminants will not naturally attenuate below performance standards over time.
- Operate and maintain the cover for a minimum of 30 years.
- Implement institutional controls to restrict excavation and restrict groundwater use until cleanup levels are achieved.

Figure D-2 in Appendix D shows the remedial components. The 1993 ROD provided remedial action target concentrations for all constituents at the Site. While the ROD identified remedial action target concentrations for all constituents, toxaphene is the only constituent that exceeded surface and subsurface cleanup goals (Table 1). Table 1 lists the remedial target concentrations and maximum detected concentrations for identified constituents.

Table 1: Surface and Subsurface Remedial Action Target Concentrations

Soil COC	Remedial Action Target Concentrations (mg/kg)		Maximum Observed Soil Concentration (Surface and Subsurface) (mg/kg)
	Surface Soil[a]	Subsurface Soil[b]	
Arsenic	5	3,400	1.0
Beryllium	0.15	61	0.28
Cadmium	41	11,000	3.6
Chromium III	56	1,000,000	30.9
Copper	3,300[c]	420,000[c]	73.9
Lead	500[d]	500[d]	238
Manganese	4,900	1,000,000	1,740
Mercury	26	3,400	0.26
Nickel	310	220,000	24

[1] The EPA approved an Off-Site Soils and Groundwater Investigation Workplan in April 1994 to investigate the extent of contamination outside the landfill property. The work included the collection of surface and subsurface soil samples from the residential area along Benedict Road and Nix Lane. Surface soil analytical results indicated toxaphene concentrations were present above the soil performance standards.

Soil COC	Remedial Action Target Concentrations (mg/kg)		Maximum Observed Soil Concentration (Surface and Subsurface) (mg/kg)
	Surface Soil[a]	Subsurface Soil[b]	
Vanadium	600	79,000	33.3
Zinc	17,000	1,000,000	273
Acetone	360	1.0	0.43
bis(3-ethylhexyl)phthalate	20	46	0.63
Benzene	10	0.06	0.011
Carbon tetrachloride	2.1	0.07	ND
Chlorobenzene	720	1.7	0.014
Chloroform	45	0.4	ND
Ethylbenzene	3,600	13	0.46
Methylene chloride	37	0.03	0.026
Toluene	7,200	30	0.025
Trichloroethylene	25	0.08	0.01
Xylenes (total)	70,000	80	4.4
Alpha-Hexachlorocyclohexane (BHC)	0.044	0.01	ND
Endosulfan II	1.8	0.29	0.022
Toxaphene	0.25	76	4,900
Dioxans/Furans	0.001[e]	0.14	0.00039

Notes:
Source: 1993 ROD, Table 6-4.

a. Surface soil remediation target concentrations are based on future residential land use (i.e., unlimited exposure). Surface soils are defined as those soils that extend to 12 inches below the surface. Remedial action target concentrations are based on a carcinogenic risk of 1×10^{6} or a hazard index (HI) of 1.0.
b. Subsurface soil remediation target concentrations are based on future commercial land use (i.e., limited exposure) for inorganic constituents, and are based on a carcinogenic risk of 1×10^{-6} or an HI of 1.0. Organic constituent target concentrations are based on leaching potential.
c. Copper target concentrations are based on a reference dose calculated from the maximum contaminant level (MCL) goal of 1.3 milligrams per liter (mg/L).
d. Lead target concentration based on OSWER directive 9355.4-02.
e. Dioxins/furans target concentration is from the EPA Dioxin Disposal Advisory Group.

mg/kg = milligrams per kilogram
ND = not detected

At the time of the 1993 ROD, only three contaminants exceeded MCLs: nickel, benzene, and toxaphene. The 1993 ROD indicated that if groundwater does not attenuate to below MCLs, the MCLs would be the cleanup target (shown in Table 2).

Table 2: Groundwater COC Cleanup Goals

Groundwater COC	MCL listed in ROD (µg/L)[a]
Benzene	5
Toxaphene	3
Nickel	100[b]
Notes: *Source:* 1993 ROD, Section 6.6. µg/L = micrograms per liter a = Based on federal MCLs. b = During the remedial design, it was determined that the groundwater no longer had to be tested for nickel because concentrations were no longer detected.	

Status of Implementation

OU-2

Hercules connected municipal drinking water lines to the residential properties and the church east and southeast of the Site in December 1992. Specifically, Hercules extended water lines along Benedict Road and Nix Lane. At that time, residents were informed of the need to cease using their wells as a potable water source. However, disabling or abandoning wells was not required. Hercules completed the work in December 1992. Hercules submitted a Remedial Action Report for this part of the remedy to the EPA in 1993.

OU-1

In a Consent Decree signed with EPA, the PRPs agreed to perform the remedial design/remedial action. The remedial design started in 1993. The EPA approved the remedial design in 1998.

The EPA approved an Off-Site Soils and Groundwater Investigation Workplan in April 1994 to investigate the extent of contamination outside the landfill property. The work included the collection of surface and subsurface soil samples from the residential area along Benedict Road and Nix Lane. Surface soil analytical results indicated toxaphene concentrations were present above the soil performance standards. Based on these results, a workplan was prepared for excavation of affected soils in and around the residential areas. The workplan was implemented in October 1994, resulting in the excavation and transport of about 8,000 cubic yards of affected soils to a staging area within the Hercules 009 Landfill site security fencing. Confirmation sampling and site restoration took place after the excavation activities.

In October 1995, a Drainage Ditch Area Remediation Workplan was submitted to the EPA to identify the extent of soils affected by toxaphene because of ditch-dredging activities by county maintenance teams. Excavation of affected surface soils (about 6,000 cubic yards) finished in June 1996.

In August 1998, the EPA issued an ESD to change the type of cover for the treated landfill soil and sludge from a clay cover to one constructed from consolidated soils from the residential and drainage ditch excavation activities. The consolidated soils were mixed with at least 3% cement and spread over the treated landfill area. The EPA also determined that contaminated sludge and soil would be treated until the performance standard is met or the regional groundwater table is reached, whichever came first.

Mobilization for the remedial action occurred in June 1998. Construction began in June 1998. It involved in-situ treatment by solidification/stabilization of contaminated soil. Excavation standards for toxaphene in soil are 0.25 milligrams per kilogram (mg/kg) for surface soil and 76 mg/kg for subsurface soil. Following the in-situ stabilization activities, the landfill cover was constructed using the stockpiled soils from the residential and drainage ditch areas, as well as contaminated soils from the sludge staging area adjacent to the landfill. The soils were treated using ex-situ stabilization by placing them on the treated landfill area, mixing with a minimum 3% cement, and compacting.

Site restoration activities involved the grading and seeding of the treated area and the former stockpile area. Clean fill was placed over the landfill cover. The fill was graded to promote adequate drainage and seeded with coastal Bermuda grass.

In 2005, Nalley Automotive leased part of the capped landfill to extend its new car lot. Construction of the car lot was done with EPA oversight and involved the addition of crushed stone and asphalt cover to the top of the northernmost part of the landfill. The solidified contents of the landfill were not disturbed by these activities. The collective efforts of Hercules, the EPA and Nalley Automotive resulted in a productive reuse of the capped landfill that adds more layers of protectiveness to the original remedy. Hercules also began working with Wildlife Habitat Council to obtain a Conservation Certification for the on-site pond. The company installed wildlife cameras to document wildlife, positioned basking logs and added cover boards to attract insects and reptiles.

The 1993 ROD required regular groundwater monitoring for nickel, toxaphene and benzene. However, the EPA and Hercules determined during the remedial design that continued groundwater monitoring sampling for nickel was not necessary because nickel was no longer detected in any groundwater samples.

Historically, the benzene concentrations at the easternmost (downgradient) permanent groundwater monitoring well N-5 have fluctuated above the MCL. To determine the eastern perimeter of the benzene plume detected at monitoring well N-5, the EPA requested that Hercules conduct more investigations on a downgradient property. In September 2010, Hercules installed temporary wells and collected 26 ground-water samples from shallow temporary wells and 12 samples from deep temporary wells. Sampling results found benzene concentrations exceeding the MCL in six shallow wells and four deep wells (Figures D-3 and D-4 in Appendix D). The extent of benzene in the downgradient property was delineated. Hercules provided a sampling report and recommended installing permanent confirmatory monitoring wells east of N-5 to monitor benzene levels and any potential migration. Hercules pursued obtaining access from the owner for permanent wells and was unsuccessful in this effort. Hercules notified the EPA that it was unable to reach an agreement to install these wells. The EPA agreed that Hercules could continue with the current monitoring program.

In 2019, Hercules was granted access to the eastern adjoining property downgradient of well N-5. Hercules' contractor AnteaGroup submitted a workplan for delineation of benzene impacts to the EPA in August 2019. The EPA provided comments and the final workplan was submitted in January 2020. The objective of the work is to delineate horizontal and vertical benzene concentrations downgradient of well N-5 to below the MCL of 5 micrograms per liter (µg/L). See Data Review section of this FYR report for details of the delineation work.

Institutional Control (IC) Review

The 1993 ROD required institutional controls for the monolith and site groundwater. In 2020, an environmental covenant was filed for the two parcels associated with the Site (Figure 1). The covenant

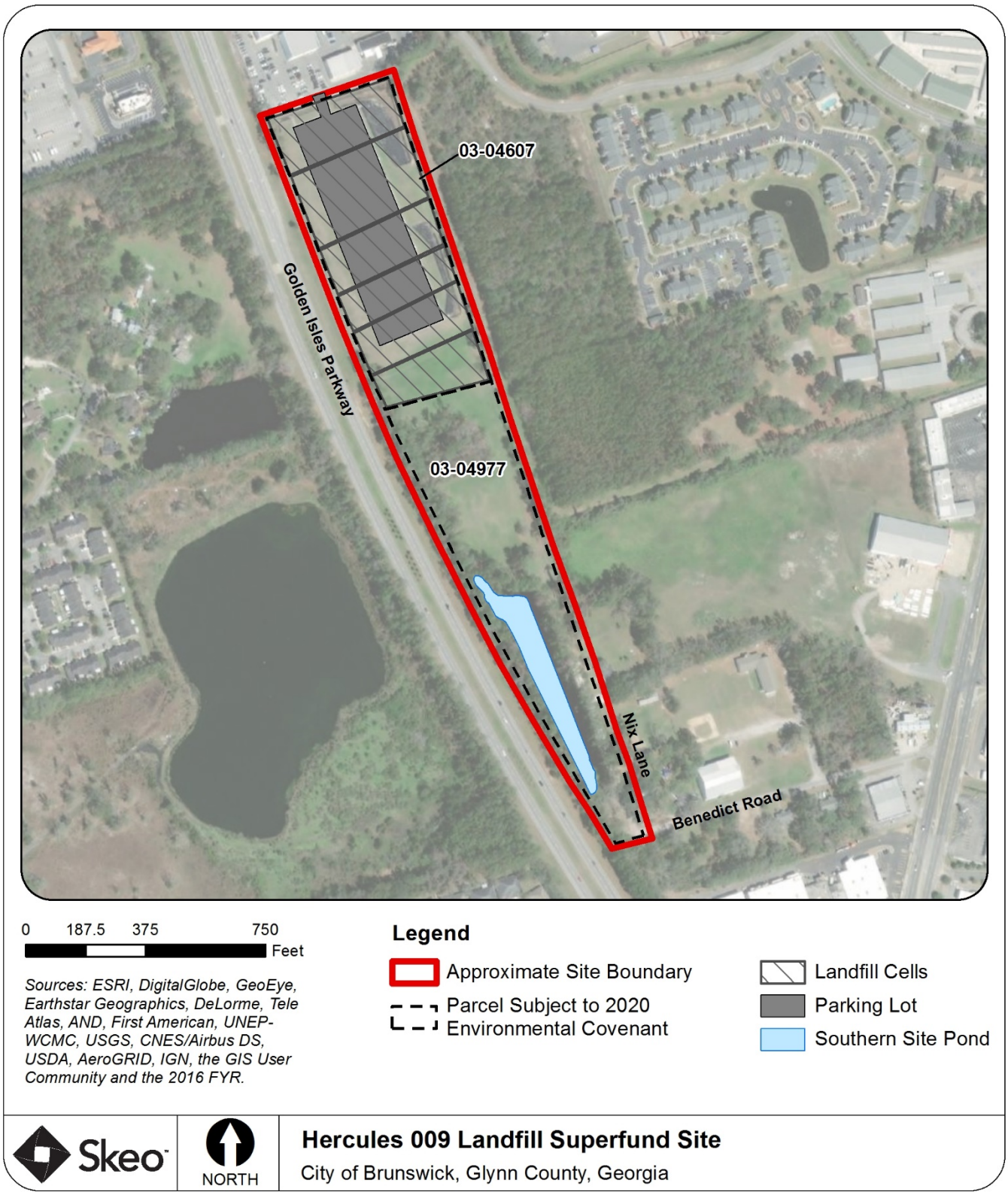
prohibits the use or extraction of groundwater from beneath the Site for any non-remedial purpose, requires maintenance of the cap (including the parking lot and vegetative cover along the edges) and restricts any use of the capped area that would cause damage to the cap.

Sampling results found benzene concentrations exceeding the MCL in groundwater east of the Site. Investigations are ongoing. Pending the results of these investigations, the EPA will determine if off-site groundwater institutional controls are needed. Table 3 provides a summary of the institutional controls.

Table 3: Summary of Planned and/or Implemented Institutional Controls (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)
Groundwater	Yes	Yes	03-04607 03-04977	Prohibit use or extraction of groundwater for any use.	Environmental Covenant (Recorded on September 23, 2020, Book 4285, Page 249)
Monolith and Cap	Yes	Yes	Monolith and Cap	Restrict land use on the monolith and required maintenance of the cap.	Environmental Covenant (Recorded on September 23, 2020, Book 4285, Page 249)

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 the EPA's response actions at the Site.

Systems Operations/Operation and Maintenance (O&M)

Hercules began site O&M activities in 1999 following the construction of the monolith and the installation of the monitoring wells. Hercules has sampled the monitoring wells annually since 1995. Seven monitoring wells remain in operation. O&M activities related to the maintenance of routinely sampled monitoring wells include general well repair and keeping wells locked and functioning. The 1998 O&M Plan requires annual sampling of monitoring wells and repair on an "as needed" basis.

The monolith cover requires occasional restorative maintenance. O&M activities for the monolith include maintaining the cover and perimeter fencing through inspections and repair. The slopes of the monolith are mowed regularly, and the top is covered with pavement and used as the automobile dealership parking lot. The top of the monolith is kept clean and is free from cracks. Although this reuse is protective of the remedy, the current O&M Plan has not been updated to reflect the monolith's updated status as a parking lot. At the time of this review, Hercules' contractor, AnteaGroup, provides on-site O&M services. AnteaGroup inspects the Site monthly.

AnteaGroup conducts groundwater sampling activities in accordance with the 1998 O&M Plan. Hercules compiles results annually and presents them in a monitoring and inspection report. During these reporting periods, AnteaGroup also performs more physical inspections and takes photographs documenting the landfill cover.

III. PROGRESS SINCE THE PREVIOUS REVIEW

This section includes the protectiveness determinations and statements from the previous FYR Report as well as the recommendations from the previous FYR Report and the status of those recommendations.

Table 4: Protectiveness Determinations/Statements from the 2016 FYR Report

OU #	Protectiveness Determination	Protectiveness Statement
1	Short-term Protective	The remedy for OU-1 currently protects human health and the environment because contaminated source material and soil contamination have been excavated, stabilized and contained on the Site within a monolith, and there are no current exposures to contaminated groundwater. In order for the OU-1 remedy to be protective in the long term, institutional controls should be implemented, data downgradient of monitoring well N-5 should be collected and assessed.
2	Protective	The interim remedy for OU-2 is protective of human health and the environment because municipal water lines from the Brunswick water system were extended to well users in the area and samples from monitoring wells upgradient of the residential area meet the Safe Drinking Water Act Standards.
Sitewide	Short-term Protective	Because the remedial actions at all OUs are protective in the short term, the Site's remedy is protective of human health and the environment in the short term. In order for the remedy to be protective in the long term, institutional controls should be implemented, data downgradient of monitoring well N-5 should be collected and assessed.

Table 5: Status of Recommendations from the 2016 FYR Report

OU #	Issue	Recommendations	Current Status	Current Implementation Status Description	Completion Date (if applicable)
1	Benzene levels continue to exceed MCLs at monitoring well N-5.	Collect data downgradient of N-5 to refine the extent of groundwater contamination.	Ongoing	Additional off-site sampling efforts were conducted after access agreements were obtained in June 2020. Details of the off-site assessment will be submitted in a report in late 2021.	Not applicable
1	Institutional controls to restrict land use and groundwater use until cleanup levels are achieved are not in place.	Site stakeholders should finalize and implement institutional controls that restrict land use and groundwater use until cleanup goals are met.	Completed	Environmental covenant put in place on both site parcels in September 2020.	9/23/2020

IV. FIVE-YEAR REVIEW PROCESS

Community Notification, Community Involvement and Site Interviews

A public notice was made available by a newspaper posting in the *Brunswick News*, on 11/18/2020 (Appendix E). It stated that the FYR was underway and invited the public to submit any comments to the EPA. The results of the review and the report will be made available at the Site's information repository, Brunswick-Glynn County Library, located at 208 Gloucester Street in Brunswick, Georgia. The EPA will also place it on the website: https://www.epa.gov/superfund/hercules-landfill-landfill.

During the FYR process, GAEPD participated in an interview to document any perceived problems or successes with the remedy that has been implemented to date. The interview is summarized below.

GAEPD indicated the remedy is performing as designed and the cap is in good condition. GAEPD is not aware of any complaints about the Site and there are no changes to state laws that might affect the protectiveness of the Site's remedy. GAEPD commented on the inconsistent toxaphene groundwater detection limit which occasionally exceeds the MCL (see Data Review section below). They also commented that institutional controls may need to be updated based on the delineation of the off-site benzene plume. The interview form is included in Appendix F. GAEPD also provided a memorandum about the Site which is included in Appendix L.

Data Review

Hercules' contractor conducted annual groundwater sampling activities during this FYR period. This FYR report reviewed groundwater data from 2015 through 2020. Depth to groundwater is measured at all wells and groundwater samples are collected annually from seven wells (N-5, N-6DR, N-7, N-10, N-12, N-15S and N-15D, Figure 4). Samples are analyzed for benzene and toxaphene. During this FYR period, toxaphene was not detected above the cleanup goal of 3 µg/L, however, detection limits were above the cleanup goal from 2016 through 2018. Benzene was detected above its cleanup goal of 5 µg/L at a single well in the regular monitoring network, N-5. Additional investigations were conducted to determine the extent of benzene contamination surrounding N-5.

Based on the depth to groundwater measurements in 2020, groundwater flows horizontally to the east and vertically downward, which is consistent with inferred flow directions from previous events (Figure I-1 in Appendix I). Analytical results from the 2020 sampling events indicate that benzene was detected in monitoring well N-5 at a concentration of 19 µg/L (MCL of 5 µg/L) in April 2020, 83 µg/L in September 2020 and 36 µg/L in October 2020. As shown in Figure 3, benzene concentrations have continued to fluctuate in this well but show an overall downward trend. Since 2011, benzene concentrations in well N-5 have fluctuated between 710 µg/L in 2012 and 9.2 µg/L in 2014.

Appendix I, Table I-1 presents the historical analytical results for all monitoring wells. Toxaphene concentrations are generally below detection limits since prior to 2011. Starting in 2016, the laboratory detection limits have been above the MCL of 3 µg/L. Prior to 2016, laboratory detection limits for toxaphene were below 1 µg/L. Beginning in 2020, toxaphene detection limits are below the MCL of 3 µg/L.

Additional off-site sampling efforts were conducted after access agreements were obtained in June 2020. Figure I-1 in Appendix I shows the newly installed monitoring wells. Efforts included:

- Advancement of eight temporary monitoring wells.
    - TW-N5D, and TW-27 through TW-33
- Field analysis of 32 groundwater samples for benzene using a portable gas chromatograph.
- Conversion of seven temporary monitoring wells to conventional monitoring wells, with an additional two shallow water table wells installed at the downgradient edge of the area assessed.
- Sampling monitoring wells N-5D, N-16D, N-17, N-18, N-19, N-20S, N-20, N-21 and N-21S.
- Sampling of the nine newly installed conventional monitoring wells and monitoring well N-5 on September 2 and 3, 2020, and sampling of the nine newly installed conventional monitoring wells and seven pre-existing monitoring wells on October 28 and 29, 2020.

Details of the off-site assessment will be submitted in a report in late 2021. Groundwater sampling results from 2020 are included in Appendix I. Benzene concentrations detected in the off-site monitoring wells ranged from 3.6 µg/L (below the MCL of 5 µg/L) in monitoring well N-19 at the downgradient extent of the expanded well network, to 210 µg/L in monitoring well N-18 in September 2020 located closer to the landfill. Hercules is preparing a work plan for additional off-site investigation and additional pilot scale treatment options that would focus on the area of monitoring well N-18.

Figure 3: N-5 Benzene Trend Graph, 2011 to 2020

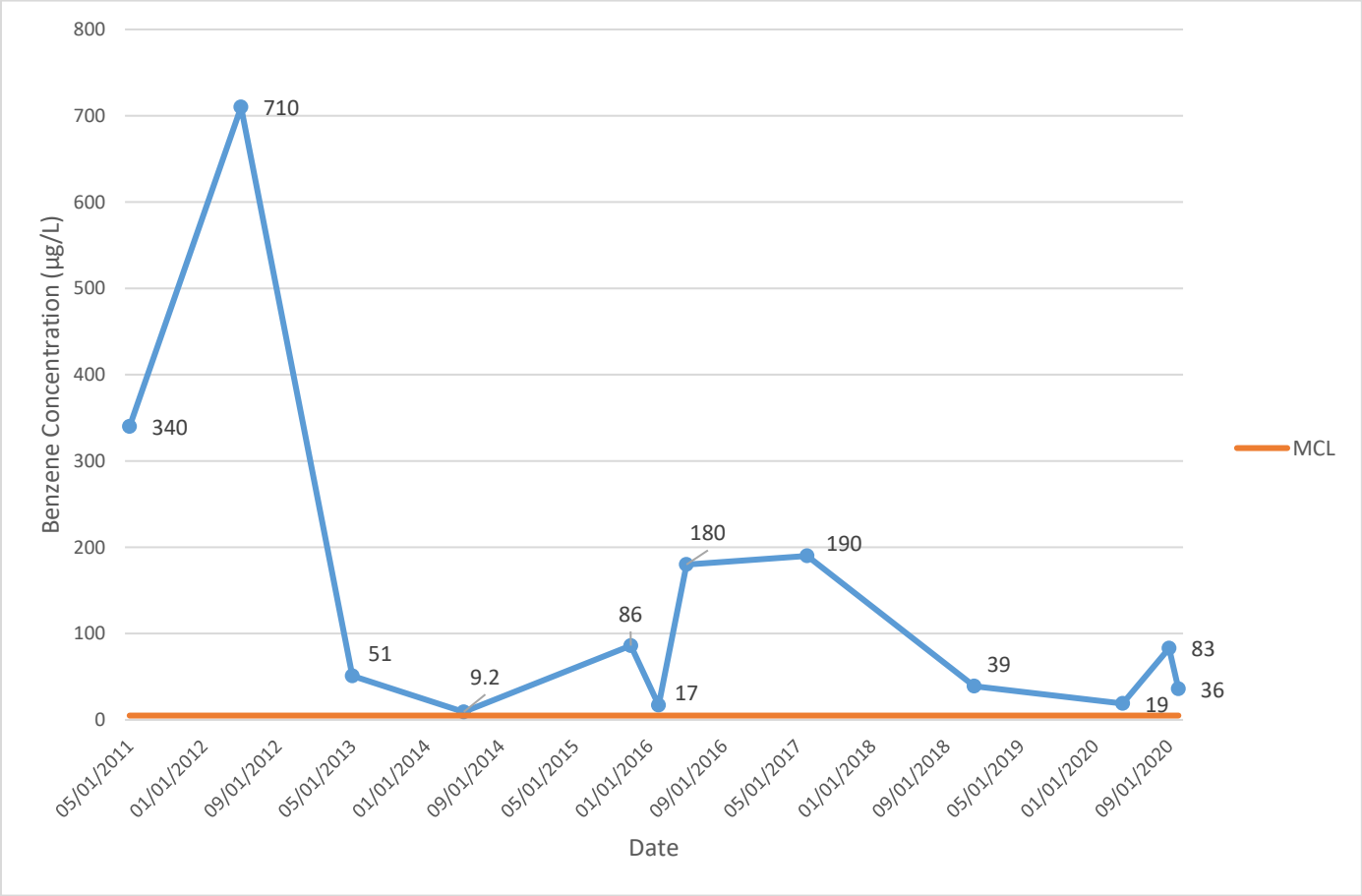
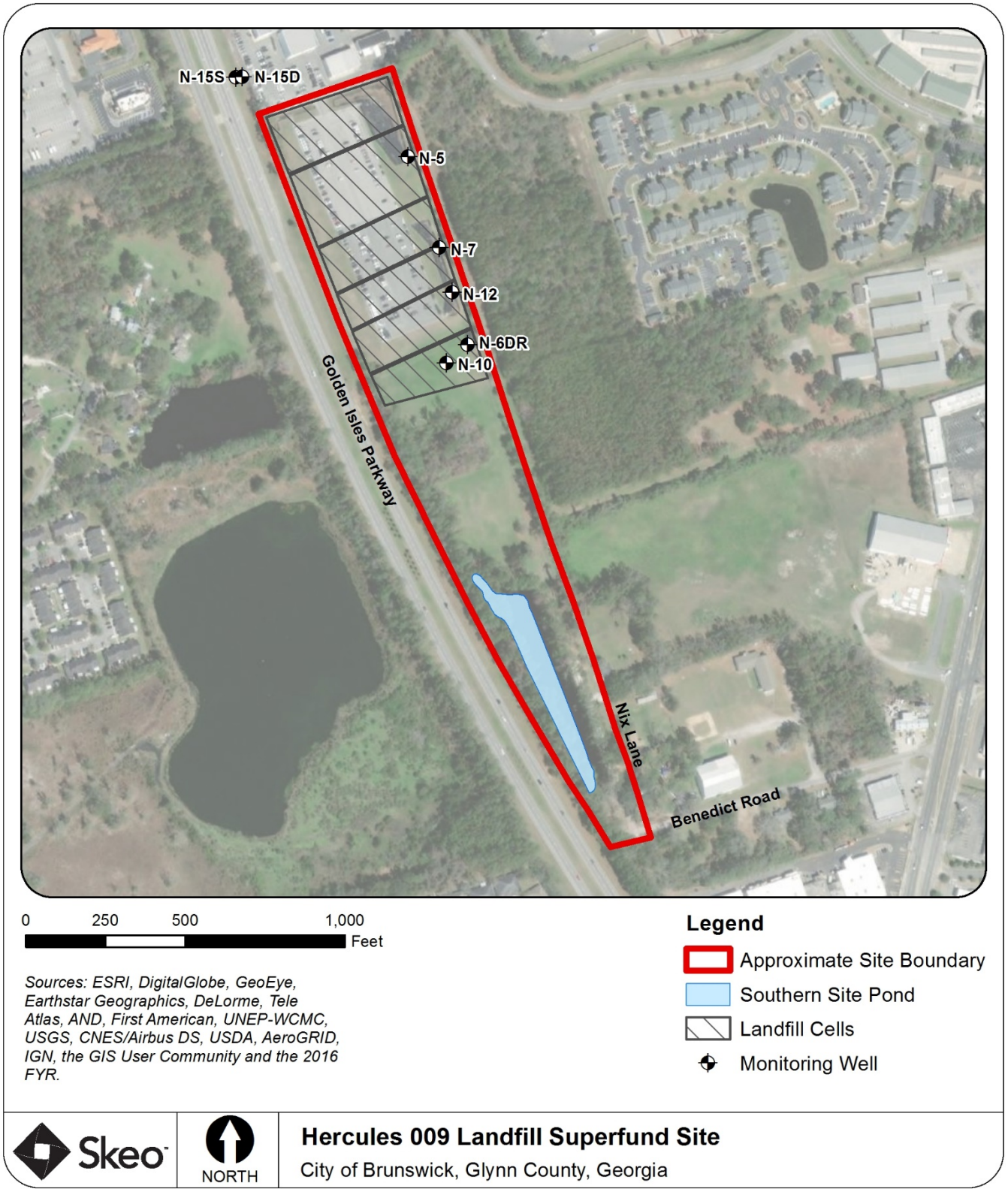


Figure 4: Detailed Site Map



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 the EPA's response actions at the Site.

Site Inspection

The site inspection took place on 6/9/2021. Participants included Alison Cattani from EPA support contractor Skeo and Daniel Pile from PRP support contractor AnteaGroup. The purpose of the inspection was to assess the protectiveness of the remedy. Site inspection participants observed the security fencing and the capped landfill cells, as well as rip rapped drainage swales. Drainage along the eastern side of the landfill had recently been repaired with additional rip rap. Drainage along the southern side of the landfill showed some erosion and repairs are planned. The monitoring wells were observed in good condition and all were locked. The fence surrounding the landfill cells and the fence around the southern portion of the Site were both secure and in good condition.

Site inspection participants observed the pond on the Site and the surrounding wildlife conservation area which consists of bird boxes, pollinator boxes and an area that is no longer mowed to allow for natural growth. Site inspection participants observed a new residential development under construction and stormwater pond adjacent to the eastern boundary of the Site near the northern end of the Site pond along Nix Lane. The area east of N-5 remains undeveloped. Site inspection checklist and photos are included in Appendix G and H, respectively.

Skeo staff called the Brunswick-Glynn County Library, located at 208 Gloucester Street in Brunswick, Georgia on June 10, 2021. The library has multiple binders related to the Site.

V. TECHNICAL ASSESSMENT

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

The review of documents and the site inspection indicate most remedial components are functioning as intended by the Site's decision documents. The OU-2 remedy was implemented with the extension of the municipal water line. There is no further action required. The OU-1 remedy was implemented according to the decision documents and included the installation of a monolith and groundwater monitoring. Based on the inspection records for the Site, the vegetative cover of the landfill has been maintained and is in good condition. Hercules continues to implement O&M activities outlined in the 1993 ROD. Historically, the benzene concentrations at the easternmost (downgradient) permanent groundwater monitoring well N-5 have fluctuated above the MCL. In 2010, temporary wells were installed and more sampling was conducted off site to the east of N-5 that found benzene contamination. Additional off-site groundwater sampling efforts were conducted after access agreements were obtained in June 2020. Benzene concentrations detected in the off-site monitoring wells ranged from 3.6 µg/L (below the MCL of 5 µg/L) in monitoring well N-19 at the downgradient extent of the expanded well network, to 190 µg/L in monitoring well N-18 located closer to the landfill. Hercules is preparing a work plan for additional off-site investigation and additional pilot scale treatment options that would focus on the area of monitoring well N-18. There are no institutional controls at the off-site property. However, there is no pathway of exposure to groundwater since OU-2 connected nearby residences to the municipal water supply and the neighboring property east of the Site is not in use.

The remedy requires long-term monitoring of groundwater to ensure that source material has been contained effectively. Toxaphene was not detected above cleanup goals in any of the seven monitoring wells sampled over the past five years, however, detection limits were above the cleanup goal from 2016 through 2018.

In 2020, an environmental covenant was filed for the two parcels associated with the Site. The covenant prohibits the use or extraction of groundwater from beneath the Site for any non-remedial or monitoring

purpose, requires maintenance of the soil cap and restricts any use of the capped area that would cause damage to the cap. The covenant includes a notice that the owner must notify the EPA and GAEPD of intent to sell the property or change the use of the property. Appendix J provides a copy of the environmental covenant that covers the two site parcels.

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

The groundwater cleanup goals established in the 1993 ROD and 1998 ESD, based on federal drinking water standards for benzene and toxaphene, remain valid. There have been no changes to these MCLs since 1993. The Site's RAOs and exposure assumptions remain valid. Under the current exposure scenario, it has not been necessary to assess the possibility of soil vapor intrusion because the remaining groundwater benzene contamination around well N-5 is not under any enclosed buildings and there are no buildings on the neighboring property to the east. This FYR conducted a residential risk-based, screening-level vapor intrusion evaluation to determine if vapor intrusion would be a concern if a building were built onsite or offsite above remaining groundwater contamination. The maximum on-site and off-site concentrations of benzene over the past five years were used in the EPA's Vapor Intrusion Screening Level (VISL) calculator for this screening-level risk-based analysis (Table J-1 in Appendix J). The screening-level analysis indicates that the maximum concentrations of benzene on and off-site slightly exceed EPA's cancer risk management range of 1×10^{-4} to 1×10^{-6} and the EPA's noncancer threshold HQ of 1.0. There are no buildings above the groundwater contamination on or off-site and no development is planned or anticipated. This information indicates that the vapor intrusion exposure pathway does not pose any current health concerns. However, if any future development were to occur in this area, a vapor intrusion evaluation is recommended to determine if the risks associated with this pathway remain within acceptable limits.

While the 1993 ROD established remedial goals for all COCs, toxaphene was the only COC that exceeded the soil and subsurface soil cleanup goals at the Site prior to remediation. The residential-based surface soil performance standards established in the 1993 ROD remain valid for toxaphene based on a residential screening-level risk evaluation using the most current toxicity values (Table J-2 in Appendix J).

The industrial-based subsurface soil target concentration for toxaphene established in the 1993 ROD remains valid based on an industrial screening-level risk evaluation using the most current toxicity values (Table J-3 in Appendix J). The evaluation shows that the subsurface target concentration equates to an industrial cancer risk that is below the lower bound of EPA's risk management range of 1×10^{-4} to 1×10^{-6} and a noncancer hazard quotient (HQ) that is less than 1. Under a residential scenario, the subsurface soil target concentration for toxaphene exceeded the EPA's acceptable cancer risk range of 1×10^{-4} to 1×10^{-6} and noncancer HQ of 1 (Table J-4 in Appendix J).

Toxaphene was not the only COC at the Site. The soil remedy focused on this COC based on toxicity, mobility, and frequency of detection, and assumed that other COCs would be reduced to acceptable levels when the cleanup level was met for toxaphene. To determine if this assumption is still correct, based on toxicity data since the 1993 ROD, a screening-level risk comparison was conducted as part of the 2016 FYR and reviewed during this FYR. When analyzing the maximum detected concentrations in both surface and subsurface soil prior to the remedial activities, dioxin/furan was the only COC with concentrations that fell outside of the EPA's acceptable risk range of 1×10^{-4} to 1×10^{-6} and noncancer HQ of 1 under a residential risk scenario. The EPA confirmed in the 2016 FYR Report that dioxin was

only present in landfill waste that was solidified and capped as part of the on-site monolith. The 2020 Environmental Covenant prohibits activities that will disturb the monolith or the cap.

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 calls into question the protectiveness of the remedy.

VI. ISSUES/RECOMMENDATIONS

Issues/Recommendations
OU(s) without Issues/Recommendations Identified in the FYR:
OU-2

Issues and Recommendations Identified in the FYR:

OU(s): 1	Issue Category: Monitoring			
	Issue: The benzene concentrations at the easternmost (downgradient) permanent groundwater monitoring well N-5 have fluctuated above the MCL. Extended investigations identified off-site benzene groundwater contamination.			
	Recommendation: Conduct additional off-site investigations and evaluate additional pilot scale treatment options, as appropriate.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	PRP	EPA	9/6/2023

VII. PROTECTIVENESS STATEMENT

Protectiveness Statement(s)	
Operable Unit: 1	*Protectiveness Determination:* Short-term Protective
Protectiveness Statement: The remedy at OU-1 currently protects human health and the environment because contamination has been solidified into an on-site monolith that is capped with a parking lot and a vegetative cover, and institutional controls are in place restricting land use of the capped area and on-site groundwater use. For the remedy to be protective over the long term, additional off-site groundwater investigations and an evaluation of additional pilot scale treatment options is appropriate.	

Protectiveness Statement(s)	
Operable Unit: 2	*Protectiveness Determination:* Protective
Protectiveness Statement: The remedy at OU-2 is protective of human health and the environment because municipal water lines from the Brunswick water system were extended to well users in the area.	

Sitewide Protectiveness Statement
Protectiveness Determination: Short-term Protective
Protectiveness Statement: Because the remedial actions at OU-1 are protective in the short term, the Site's remedy is protective of human health and the environment in the short term. For the remedy to be protective over the long term, additional off-site groundwater investigations and an evaluation of additional pilot scale treatment options is appropriate.

VIII. NEXT REVIEW

The next FYR Report for the Hercules 009 Landfill Superfund site is required five years from the completion date of this review.

APPENDIX A – REFERENCE LIST

2018 Annual Groundwater Monitoring and Inspection Report. Hercules 009 Landfill. Brunswick, Glynn County, Georgia. Antea Group. November 21, 2019.

2020 Annual Groundwater Monitoring and Inspection Report. Hercules 009 Landfill. Brunswick, Glynn County, Georgia. Antea Group. April 9, 2021.

Explanation of Significant Differences, Hercules 009 Landfill Site, Operable Unit One, Brunswick, Glynn County, Georgia, EPA, Atlanta, Georgia. August 1998.

Final Remedial Design Report, Hercules 009 Landfill Site, Brunswick, Georgia, RMT, Inc., Greenville, South Carolina, February 1998.

Fourth Five-Year Review Report for Hercules 009 Landfill, Brunswick, Georgia. EPA Region 4. September 6, 2016.

Final Report for the Hercules 009 Off-Site Excavation in Brunswick, Georgia, OHM Remediation Services Corp, Norcross, Georgia, 12 July 1995.

Interim Action Record of Decision, Hercules 009 Landfill Site, Brunswick, Glynn County, Georgia, EPA, Atlanta, Georgia. June 1991.

Operations and Maintenance Plan, Hercules 009 Landfill Site, Brunswick, Georgia. Prepared by RMT. April 1997.

Preliminary Close-Out Report, Hercules 009 Landfill Superfund Site, Brunswick, Glynn County, Georgia. EPA. September 1999.

Preliminary Remedial Design Report, Hercules 009 Landfill Site, Brunswick, Georgia, RMT, Inc., Greenville, South Carolina, January 1997.

Record of Decision: Hercules 009 Landfill, OU-1. EPA Region 4. March 25, 1993.

Remedial Action Construction Completion Report, Hercules 009 Landfill Site, Brunswick, Georgia, RMT, Inc., Greenville, South Carolina, May 1999.

Remedial Action Performance Standards Verification Plan, Hercules 009 Landfill Site, Brunswick, Glynn County Georgia, RMT, Inc., Greenville, South Carolina, January 1998.

Remedial Action Workplan Hercules 009 Landfill NPL Site, Brunswick, Glynn County Georgia, RMT, Inc., Greenville, South Carolina, January 1998.

Remedial Investigation/Feasibility Study Work Plan, Hercules 009 Landfill, Brunswick, Georgia, October 1998.

Second Five-Year Review Report, Hercules 009 Landfill Site, Brunswick, Glynn County, Georgia. US Army Corps. of Engineers, June 13, 2006.

Third Five-Year Review Report, Hercules 009 Landfill Site, Brunswick, Glynn County, Georgia. EPA. July 6, 2011.

Work Plan: Off-site Delineation, Revision No. 1, Hercules 009 Landfill Site, Brunswick, Glynn County, Georgia. AnteaGroup. January 23, 2020.

APPENDIX B – CURRENT SITE STATUS

Environmental Indicators

- Current human exposures at the Site are under control.
- Current groundwater migration is under control.

Are Necessary Institutional Controls in Place?

☐ All ☒ Some ☐ None

The Site needs further evaluation to determine whether additional institutional controls are required for offsite groundwater and subsurface soil.

Has the EPA Designated the Site as Sitewide Ready for Anticipated Use?

☒ Yes ☐ No

The adjacent automobile dealership worked with Hercules and the EPA to return part of the Site to safe and productive use by paving the top and installing runoff retention ponds. The dealership fenced and paved the top of the monolith and is reusing it as a parking lot to display cars. This reuse has helped to further preserve the integrity of the monolith beneath the paved cap. In the past few years, Hercules began working with Wildlife Habitat Council to obtain a Conservation Certification for the on-site pond. The company installed wildlife cameras to document wildlife, positioned basking logs, and added cover boards to attract insects and reptiles.

Has the Site Been Put into Reuse?

☒ Yes ☐ No

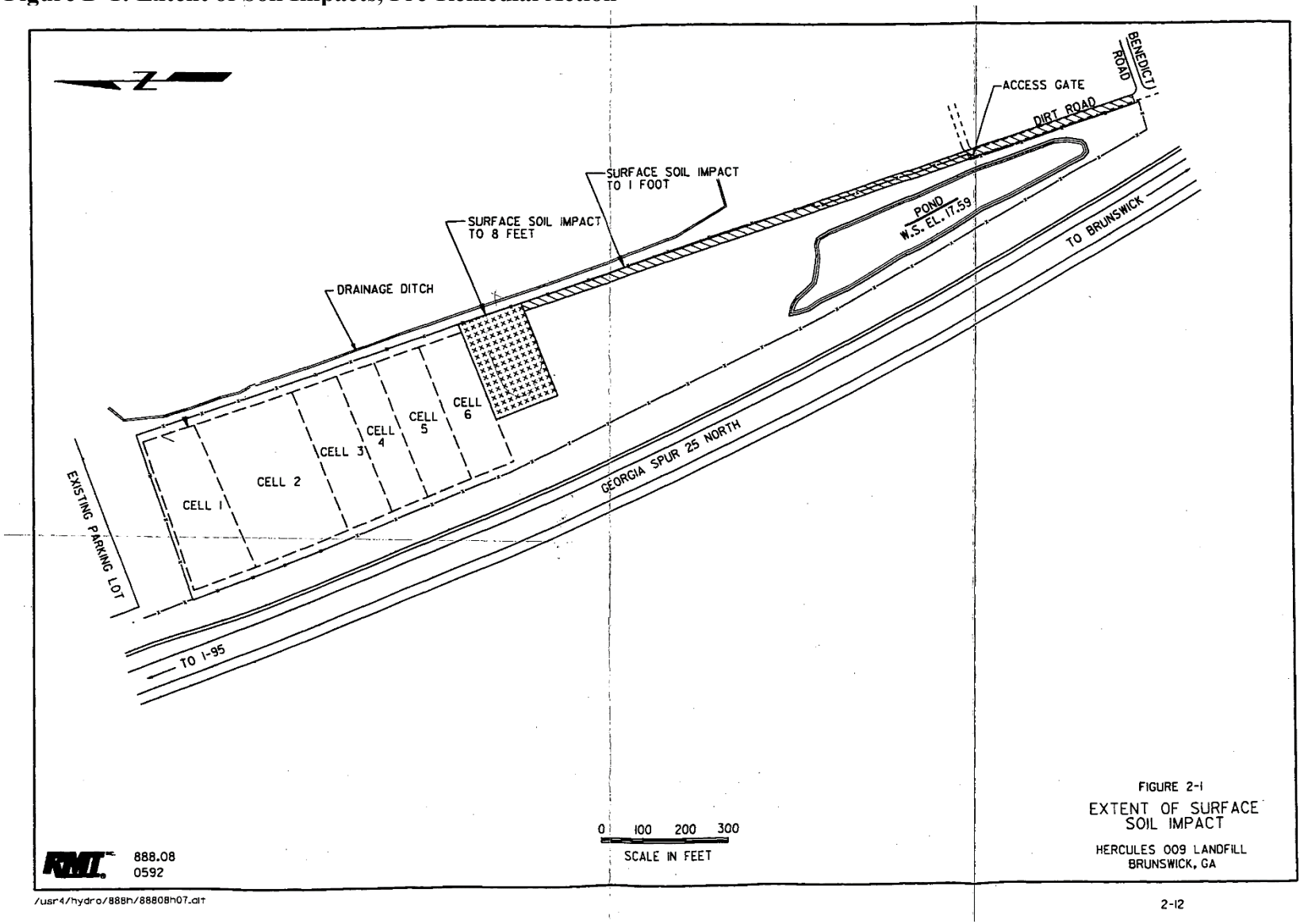
APPENDIX C – SITE CHRONOLOGY

Table C-1: Site Chronology

Event	Date
GAEPD issued a permit for the Site and Hercules began operations	1976
State inspectors discovered site contamination	November 1, 1979
GAEPD revoked the permit and Hercules stopped disposal and closed the landfill	1980
The EPA conducted a site inspection The EPA and the state conducted a preliminary assessment	January l, 1980
The EPA proposed listing the Site on the NPL	September 8, 1983
The EPA finalized the Site's listing on the NPL	September 21, 1984
PRP initiated the RI/FS for OU-1 and OU-2	July 15, 1988
PRP completed the RI/FS for OU-2 The EPA issued an IROD for groundwater (OU-2)	June 27, 1991
PRP initiated the remedial design for OU-2	November 1, 1991
PRP completed the remedial design for OU-2 PRP began the remedial action for the interim groundwater remedy	January 7, 1992
Hercules extended municipal water lines along Benedict Road and Nix Lane	December 1992
PRP completed the remedial action for OU-2 and submitted the Remedial Action Report for OU-2 PRP began O&M activities for OU-2	March 3, 1993
PRP completed the RI/FS for OU-1 The EPA signed the ROD for OU-1	March 25, 1993
PRP initiated the remedial design for OU-1	October 7, 1993
PRP initiated off-site and residential soil excavation	October 1994
PRP completed off-site and residential soil excavation	July 1995
PRP completed the remedial design for OU-1 PRP began stabilization remedial action for soils and sediment	March 2, 1998
The EPA issued an ESD for OU-1	August 14, 1998
The EPA issued the first FYR Report for OU-2	September 21, 1998
PRP completed the stabilization remedial action for OU-1	March 30, 1999
PRP initiated O&M activities for OU-1	June 30, 1999
The EPA prepared the Site's Preliminary Close-Out Report	September 24, 1999
The EPA issued the Site's second FYR Report	June 13, 2006
Hercules initiated a groundwater assessment to determine the extent of the benzene plume	September 8, 2010
The EPA issued the Site's third FYR Report	July 6, 2011
The EPA issued the Site's fourth FYR Report	September 6, 2016
Site deemed ready for reuse and redevelopment	September 30, 2020

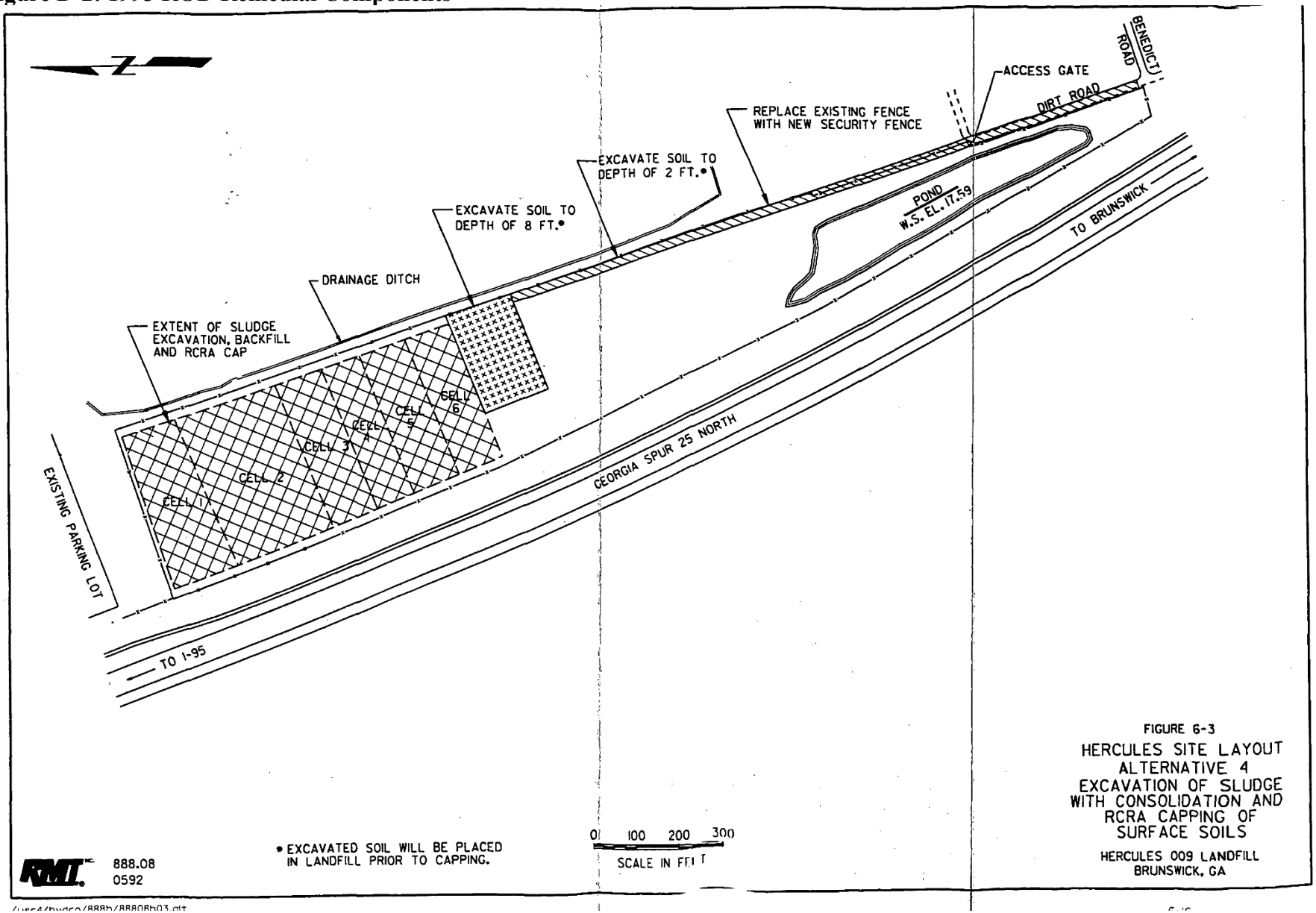
APPENDIX D – SITE MAPS

Figure D-1: Extent of Soil Impacts, Pre-Remedial Action[2]



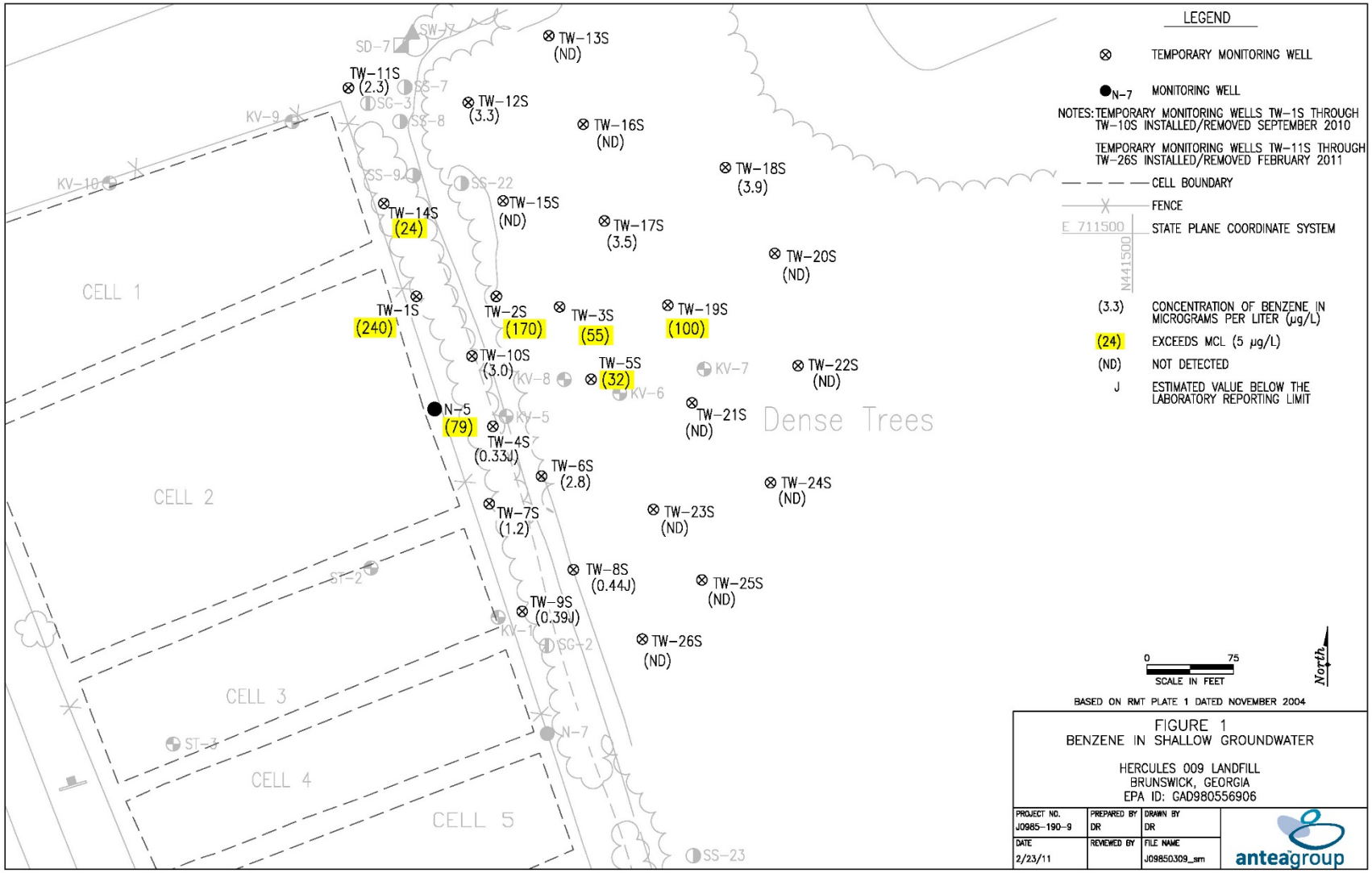
[2] *Source:* 1992 Feasibility Study Report.

Figure D-2: 1993 ROD Remedial Components[3]



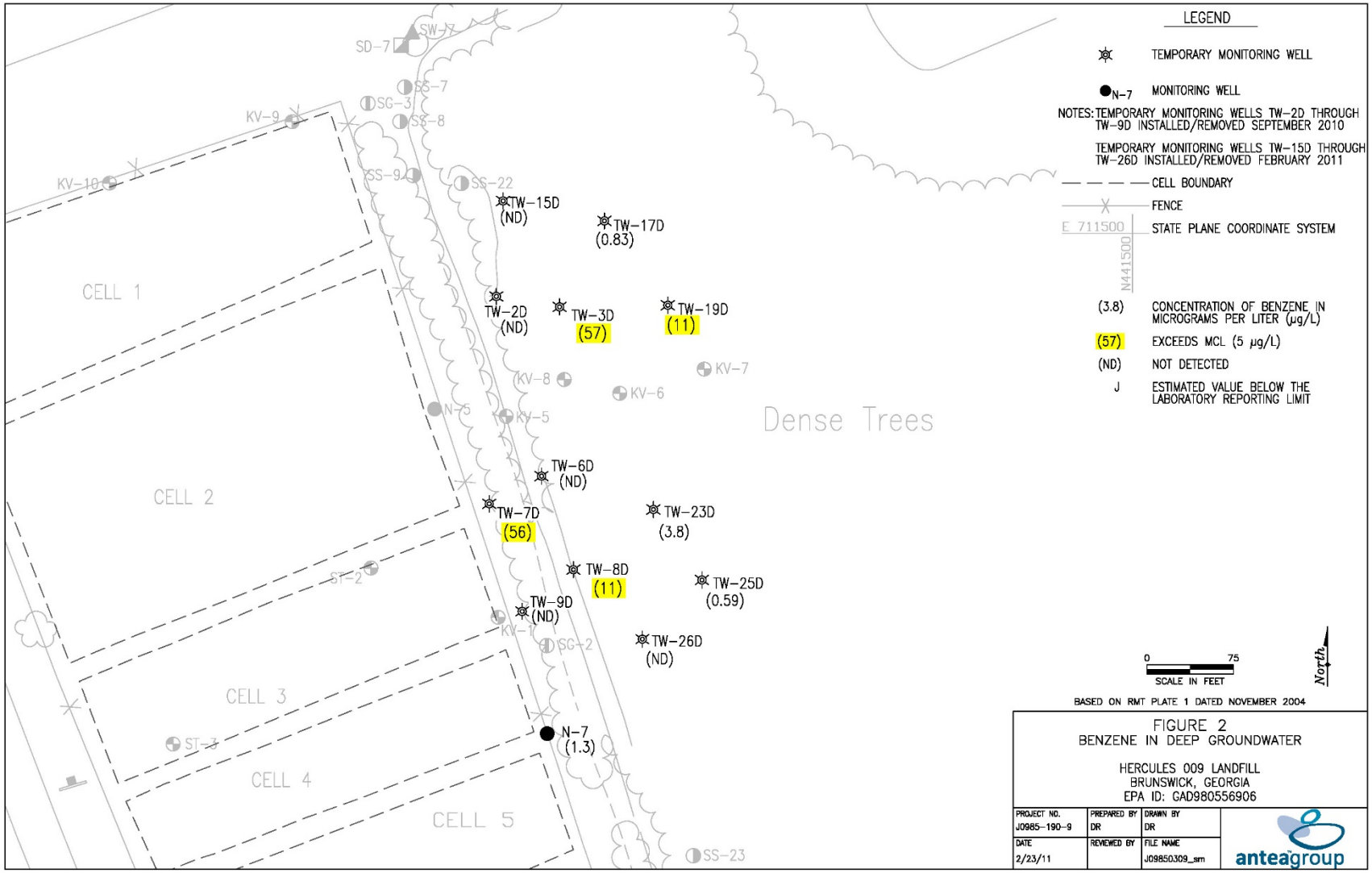
[3] *Source:* 1992 Feasibility Study Report.

Figure D-3: 2010 Benzene Investigation, Shallow Aquifer[4]



[4] *Source:* 2010 Groundwater Assessment Report.

Figure D-4: 2010 Benzene Investigation, Deep Aquifer[5]



[5] *Source:* 2010 Groundwater Assessment Report.

APPENDIX E – PRESS NOTICE

The U.S. Environmental Protection Agency, Region 4 Announces the Fifth Five-Year Review for the Hercules 009 Landfill Superfund Site, Brunswick, Glynn County, Georgia

Purpose/Objective: The EPA is conducting a Five-Year Review of the remedy for the Hercules 009 Landfill Superfund site (the Site) in Brunswick, Georgia. The purpose of the Five-Year Review is to make sure the selected cleanup actions effectively protect human health and the environment.

Site Background: The 16.5-acre area is a former industrial landfill. From 1948 to 1980, the Hercules Corporation (Hercules) made toxaphene, an agricultural pesticide used to control boll weevils, ticks and mites on cattle. Under a state permit, Hercules disposed of wastewater sludge from the production of toxaphene in the 009 Landfill. Toxaphene product drums and toxaphene-contaminated glassware, rubble and trash were also disposed of in the landfill. Waste disposal practices resulted in the contamination of soils, sediments and groundwater. In 1980, Hercules' waste disposal permit was canceled, and the State of Georgia ordered the landfill's closure. The EPA listed the Site on the Superfund program's National Priorities List (NPL) in September 1984. Contaminants of concern at the Site are volatile organic compounds (VOCs), including benzene, trichloroethylene, toluene and xylenes, other organic contaminants, including dioxin and pesticides, and metals such as arsenic, chromium and lead.

Cleanup Actions: The EPA designated two operable units (OUs) to address contaminated on-site soils, sediments and groundwater. The EPA selected the remedy for OU1 (on-site soils and sediments) in March 1993 and updated it in a 1998 Explanation of Significant Differences. The remedy included removal and treatment of contaminated soils and sludge and institutional controls. Materials with high toxaphene concentrations were added to landfill cells, treated, and then covered with cement and treated soil. The EPA selected the remedy for OU2 (groundwater) in June 1991. The remedy included the extension of municipal water lines and connecting residences to the municipal water system. Post-construction groundwater monitoring is ongoing.

Five-Year Review Schedule: The National Contingency Plan requires review of remedial actions that result in any hazardous substances, pollutants or contaminants remaining at the Site above levels that allow for unlimited use and unrestricted exposure every five years to ensure the protection of human health and the environment. The fifth of the Five-Year Reviews for the Site will be completed by September 2021. When the Five-Year Review is completed, it will be available online at: https://www.epa.gov/superfund/search-superfund-five-year-reviews.

The EPA Invites Community Participation in the Five-Year Review Process: The EPA is conducting this Five-Year Review to evaluate the effectiveness of the Site's remedy and to ensure that the remedy remains protective of human health and the environment. As part of the Five-Year Review process, EPA staff is available to answer any questions about the Site. Community members who have questions about the Site or the Five-Year Review process are asked to contact:

Scott Martin, EPA Remedial Project Manager	Angela Miller, EPA Community Involvement Coordinator
Phone: (404) 562-8916 Email: martin.scott@epa.gov	Phone: (678) 575-8132 Email: miller.angela@epa.gov

Mailing Address: U.S. EPA Region 4, 61 Forsyth Street, S.W., 11th Floor, Atlanta, GA 30303-8960

Additional information is available at the Site's local document repository, Brunswick/Glynn County Regional Library, located at 208 Gloucester Street in Brunswick, Georgia (consider contacting the library to confirm it is open), and online at www.epa.gov/superfund/hercules-landfill-landfill.

APPENDIX F – INTERVIEW FORMS

HERCULES 009 LANDFILL SUPERFUND SITE FIVE-YEAR REVIEW INTERVIEW FORM	
Site Name: Hercules 009 Landfill	
EPA ID: GAD980556906	
Interviewer name: EPA	**Interviewer affiliation:**
Subject name: Jocelyn Carver and John Williams	**Subject affiliation: GAEPD**
Subject contact information: Jocelyn.carver@dnr.ga.gov, John.williams1@dnr.ga.gov	
Interview date: 7/13/2021	**Interview time: Not applicable**
Interview location:	
Interview format (circle one): In Person Phone Mail Email Other:	
Interview category: State Agency	

1. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)?

   The remedy is performing as designed and the cap is in good condition. A portion of the property is currently being reused as a parking lot for an adjacent car dealership. Additional investigations are currently being conducted to determine the extent of a benzene plume near Well N-5 that appears to be moving off-site.

2. What is your assessment of the current performance of the remedy in place at the Site?

   Additional investigation activities near Well N-5 need to continue to define the current extent of the benzene plume moving off-site and to determine the need for remedial action.

   The cap is in good condition and is performing as designed.

3. Are you aware of any complaints or inquiries regarding site-related environmental issues or remedial activities from residents in the past five years?

   No.

4. Has your office conducted any site-related activities or communications in the past five years? If so, please describe the purpose and results of these activities.

   EPD has reviewed the annual monitoring reports used to evaluate the effectiveness of the remedy. EPD has commented and continues to be concerned that the detection limits for toxaphene (primary COC) have not been consistently below the remedial goal (MCL). In order to determine if the remedy is effective at preventing toxaphene migration to groundwater, all groundwater monitoring should have detection limits below the remedial goals.

5. Are you aware of any changes to state laws that might affect the protectiveness of the Site's remedy?
   No.

6. Are you comfortable with the status of the institutional controls at the Site? If not, what are the associated outstanding issues?

   Yes and no. An environmental covenant was signed in 2020 that prohibits the use or extraction of groundwater from the two parcels beneath the Site and requires routine maintenance of the cap and restricts use of the cap. Currently, benzene-contaminated groundwater above the MCL is moving off-site and needs to be addressed. Depending on what is found regarding the benzene plume additional parcel restrictions may be necessary.

7. Are you aware of any changes in projected land use(s) at the Site?

   Not as far as I know.

8. Do you have any comments, suggestions or recommendations regarding the management or operation of the Site's remedy?

   Benzene concentrations in the off-site plume have been above the MCL since 2011 and should be delineated. ICs need to be placed off-site, if necessary.

APPENDIX G – SITE INSPECTION CHECKLIST

FIVE-YEAR REVIEW SITE INSPECTION CHECKLIST

I. SITE INFORMATION

Site Name: Hercules 009 Landfill	**Date of Inspection:** 6/16/2021
Location and Region: Brunswick, Georgia, Region 4	**EPA ID: GAD980556906**
Agency, Office or Company Leading the Five-Year Review: EPA	**Weather/Temperature:** 80s, sunny

Remedy Includes: (Check all that apply)

- ☒ Landfill cover/containment
- ☒ Access controls
- ☒ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Surface water collection and treatment
- ☐ Other: _____
- ☒ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls

Attachments: ☒ Inspection team roster attached ☐ Site map attached

II. INTERVIEWS (check all that apply)

1. **O&M Site Manager** _____ (Name) _____ (Title) _____ (Date)
   Interviewed ☐ at site ☐ at office ☐ by phone Phone: _____
   Problems, suggestions ☐ Report attached: _____

2. **O&M Staff** _____ (Name) _____ (Title) _____ (Date)
   Interviewed ☐ at site ☐ at office ☐ by phone Phone: _____
   Problems/suggestions ☐ Report attached: _____

3. **Local Regulatory Authorities and Response Agencies** (i.e., state and tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices). Fill in all that apply.

   Agency _____
   Contact _____ (Name) _____ (Title) _____ (Date) _____ (Phone No.)
   Problems/suggestions ☐ Report attached: _____

   Agency _____
   Contact _____Name _____ (Title) _____ (Date) _____ (Phone No.)
   Problems/suggestions ☐ Report attached:_____

   Agency _____
   Contact _____ (Name) _____ (Title) _____ (Date) _____ (Phone No.)
   Problems/suggestions ☐ Report attached:_____

   Agency _____
   Contact _____ (Name) _____ (Title) _____ (Date) _____ (Phone No.)
   Problems/suggestions ☐ Report attached: _____

   Agency _____
   Contact _____ _____ _____ _____

	Name	Title	Date	Phone No.	
	Problems/suggestions ☐ Report attached:_____				
4.	**Other Interviews** (optional) ☐ Report attached: _____				
	III. ON-SITE DOCUMENTS AND RECORDS VERIFIED (check all that apply)				
1.	**O&M Documents**				
	☐ O&M manual	☒ Readily available	☐ Up to date	☐ N/A	
	☐ As-built drawings	☒ Readily available	☐ Up to date	☐ N/A	
	☐ Maintenance logs	☒ Readily available	☐ Up to date	☐ N/A	
	Remarks: _____				
2.	**Site-Specific Health and Safety Plan**	☒ Readily available	☐ Up to date	☐ N/A	
	☐ Contingency plan/emergency response plan	☒ Readily available	☐ Up to date	☐ N/A	
	Remarks: _____				
3.	**O&M and OSHA Training Records**	☐ Readily available	☐ Up to date	☒ N/A	
	Remarks: _____				
4.	**Permits and Service Agreements**				
	☐ Air discharge permit	☐ Readily available	☐ Up to date	☒ N/A	
	☐ Effluent discharge	☐ Readily available	☐ Up to date	☒ N/A	
	☐ Waste disposal, POTW	☐ Readily available	☐ Up to date	☒ N/A	
	☐ Other permits: _____	☐ Readily available	☐ Up to date	☒ N/A	
	Remarks: _____				
5.	**Gas Generation Records**	☐ Readily available	☐ Up to date	☒ N/A	
	Remarks: _____				
6.	**Settlement Monument Records**	☐ Readily available	☐ Up to date	☒ N/A	
	Remarks: _____				
7.	**Groundwater Monitoring Records**	☐ Readily available	☐ Up to date	☐ N/A	
	Remarks: _____				
8.	**Leachate Extraction Records**	☐ Readily available	☐ Up to date	☒ N/A	
	Remarks: _____				
9.	**Discharge Compliance Records**				
	☐ Air	☐ Readily available	☐ Up to date	☒ N/A	
	☐ Water (effluent)	☐ Readily available	☐ Up to date	☒ N/A	
	Remarks: _____				
10.	**Daily Access/Security Logs**	☐ Readily available	☐ Up to date	☒ N/A	
	Remarks: _____				

IV. O&M COSTS

1. **O&M Organization**

☐ State in-house ☐ Contractor for state

☐ PRP in-house ☒ Contractor for PRP

☐ Federal facility in-house ☐ Contractor for Federal facility

☐ _____

2. **O&M Cost Records**

☐ Readily available ☐ Up to date

☐ Funding mechanism/agreement in place ☒ Unavailable

Original O&M cost estimate: _____ ☐ Breakdown attached

Total annual cost by year for review period if available

From: _____ Date	To: _____ Date	_____ Total cost	☐ Breakdown attached
From: _____ Date	To: _____ Date	_____ Total cost	☐ Breakdown attached
From: _____ Date	To: _____ Date	_____ Total cost	☐ Breakdown attached
From: _____ Date	To: _____ Date	_____ Total cost	☐ Breakdown attached
From: _____ Date	To: _____ Date	_____ Total cost	☐ Breakdown attached

3. **Unanticipated or Unusually High O&M Costs during Review Period**

Describe costs and reasons: _____

V. ACCESS AND INSTITUTIONAL CONTROLS ☒ Applicable ☐ N/A

A. Fencing

1. **Fencing Damaged** ☐ Location shown on site map ☒ Gates secured ☐ N/A

Remarks: _____

B. Other Access Restrictions

1. **Signs and Other Security Measures** ☐ Location shown on site map ☐ N/A

Remarks: Signs present at regular intervals including the access to the car parking area.

C. Institutional Controls (ICs)

1. **Implementation and Enforcement**

Site conditions imply ICs not properly implemented ☐ Yes ☒ No ☐ N/A

Site conditions imply ICs not being fully enforced ☐ Yes ☒ No ☐ N/A

Type of monitoring (e.g., self-reporting, drive by): Inspection

Frequency: Monthly

Responsible party/agency: PRP

Contact _____ _____ _____ _____

Name Title Date Phone no.

Reporting is up to date ☒ Yes ☐ No ☐ N/A

Reports are verified by the lead agency ☒ Yes ☐ No ☐ N/A

Specific requirements in deed or decision documents have been met ☒ Yes ☐ No ☐ N/A

Violations have been reported ☐ Yes ☐ No ☒ N/A

Other problems or suggestions: ☐ Report attached

2. **Adequacy** ☒ ICs are adequate ☐ ICs are inadequate ☐ N/A

Remarks:

D. General

1. **Vandalism/Trespassing** ☐ Location shown on site map ☒ No vandalism evident

Remarks: _____

2. **Land Use Changes On Site** ☒ N/A

Remarks: _____

3. **Land Use Changes Off Site** ☐ N/A

Remarks: New residential development located off-site east of the on-site pond.

VI. GENERAL SITE CONDITIONS

A. Roads ☒ Applicable ☐ N/A

1. **Roads Damaged** ☐ Location shown on site map ☒ Roads adequate ☐ N/A

Remarks: _____

B. Other Site Conditions

Remarks: _____

VII. LANDFILL COVERS ☒ Applicable ☐ N/A

A. Landfill Surface

1. **Settlement** (low spots) ☐ Location shown on site map ☒ Settlement not evident

Area extent: _____ Depth: _____

Remarks: _____

2. **Cracks** ☐ Location shown on site map ☒ Cracking not evident

Lengths: _____ Widths: _____ Depths: _____

Remarks: _____

3. **Erosion** ☐ Location shown on site map ☒ Erosion not evident
Area extent: _____ Depth: _____
Remarks: _____

4. **Holes** ☐ Location shown on site map ☒ Holes not evident
Area extent: _____ Depth: _____
Remarks: _____

5. **Vegetative Cover** ☒ Grass ☒ Cover properly established
☐ No signs of stress ☐ Trees/shrubs (indicate size and locations on a diagram)
Remarks: _____

6. **Alternative Cover** (e.g., armored rock, concrete) ☐ N/A
Remarks: Paved parking lot on top of the landfill is in good condition.

7. **Bulges** ☐ Location shown on site map ☒ Bulges not evident
Area extent: _____ Height: _____
Remarks: _____

8. **Wet Areas/Water Damage** ☒ Wet areas/water damage not evident

☐ Wet areas	☐ Location shown on site map	Area extent: _____
☐ Ponding	☐ Location shown on site map	Area extent: _____
☐ Seeps	☐ Location shown on site map	Area extent: _____
☐ Soft subgrade	☐ Location shown on site map	Area extent: _____

Remarks: _____

9. **Slope Instability** ☐ Slides ☐ Location shown on site map
☒ No evidence of slope instability
Area extent: _____
Remarks: _____

B. Benches ☐ Applicable ☒ N/A
(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

C. Letdown Channels ☐ Applicable ☒ N/A
(Channel lined with erosion control mats, riprap, grout bags or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

D. Cover Penetrations ☒ Applicable ☐ N/A

1. **Gas Vents** ☐ Active ☐ Passive
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs maintenance ☒ N/A
Remarks: _____

2. **Gas Monitoring Probes**

☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs maintenance ☒ N/A
Remarks: _____

3. **Monitoring Wells** (within surface area of landfill)
☒ Properly secured/locked ☒ Functioning ☒ Routinely sampled ☒ Good condition
☐ Evidence of leakage at penetration ☐ Needs maintenance ☐ N/A
Remarks: _____

4. **Extraction Wells Leachate**
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs maintenance ☒ N/A
Remarks: _____

5. **Settlement Monuments** ☐ Located ☐ Routinely surveyed ☒ N/A
Remarks: _____

E. Gas Collection and Treatment ☐ Applicable ☒ N/A

F. Cover Drainage Layer ☐ Applicable ☒ N/A

G. Detention/Sedimentation Ponds ☒ Applicable ☐ N/A

1. **Siltation** Area extent: _____ Depth: _____ ☐ N/A
☒ Siltation not evident
Remarks: _____

2. **Erosion** Area extent: _____ Depth: _____
☒ Erosion not evident
Remarks: _____

3. **Outlet Works** ☒ Functioning ☐ N/A
Remarks: _____

4. **Dam** ☐ Functioning ☒ N/A
Remarks: _____

H. Retaining Walls ☐ Applicable ☒ N/A

I. Perimeter Ditches/Off-Site Discharge ☐ Applicable ☒ N/A

VIII. VERTICAL BARRIER WALLS ☐ Applicable ☒ N/A

IX. GROUNDWATER/SURFACE WATER REMEDIES ☒ Applicable ☐ N/A

A. Groundwater Extraction Wells, Pumps and Pipelines ☐ Applicable ☒ N/A

B. Surface Water Collection Structures, Pumps and Pipelines ☐ Applicable ☒ N/A

C. Treatment System ☐ Applicable ☒ N/A

D. Monitoring Data

1. **Monitoring Data**
☒ Is routinely submitted on time ☒ Is of acceptable quality

2. **Monitoring Data Suggests:**

☒ Groundwater plume is effectively contained ☒ Contaminant concentrations are declining

E. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)

☒ Properly secured/locked ☒ Functioning ☒ Routinely sampled ☒ Good condition

☒ All required wells located ☐ Needs maintenance ☐ N/A

Remarks: _____

X. OTHER REMEDIES

If there are remedies applied at the site and not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is designed to accomplish (e.g., to contain contaminant plume, minimize infiltration and gas emissions).

The OU-2 remedy was implemented with the extension of the municipal water line. There is no further action required. The OU-1 remedy was implemented according to the decision documents and included the installation of a monolith and groundwater monitoring. Based on the inspection records for the Site, the vegetative cover of the landfill has been maintained and is in good condition. Hercules continues to implement O&M activities outlined in the 1993 ROD. In 2020, the off-site benzene contamination was delineated with the installation of additional wells. Hercules is preparing a work plan for additional off-site investigation and additional pilot scale treatment options that would focus on the off-site area.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

O&M appears adequate. Some drainage features off the top of the capped area are eroding and some areas have been repaired with additional riprap. Additional repairs are planned.

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future.

None.

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

None.

APPENDIX H – SITE INSPECTION PHOTOS



Entrance with signage to capped area from the car dealership



Paved capped area



Stormwater basin



Recently repaired stormwater drain near N-5



Erosion gully southeast area of landfill cap



Southern area of the Site with fence and signage



Residential development near southeast portion of the Site.



On-site pond



Pollinator meadow



Pollinator box



Drums containing waste from 2020 delineation activities

APPENDIX I –DATA TABLES AND FIGURES[6]

Table I-1: Groundwater Data, 2011 to 2020

	Chemical Name	Benzene	Toxaphene
	MCL	**5.0**	**3.0**
	Report Units:	µg/L	µg/L
N-5	05/11/2011	**340**	<0.56
	05/18/2012	**710**	<0.48
	05/17/2013	**51**	<0.20
	05/07/2014	**9.2**	<0.20
	11/16/2015	**86**	<1.5
	02/19/2016	**17**	--
	05/18/2016	**180**	*<5.0*
	06/07/2017	**190**	*<4.8*
	12/07/2018	**39**	*<4.8*
	4/29/2020	**19**	<0.019
	9/2/2020	**83**	--
	10/28/2020	**36**	<0.19
N-5D	9/2/2020	**22**	--
	10/28/2020	**9.9**	--
N-6DR	05/11/2011	<0.25	<0.56
	05/18/2012	<1.0	<0.49
	05/16/2013	<1.0	<0.20
	05/07/2014	<1.0	<0.20
	11/16/2015	<0.43	<1.5
	05/18/2016	<1.0	*<4.9*
	06/07/2017	<1.0	*<4.8*
	12/07/2018	<1.0	*<4.8*
	4/29/2020	<0.43	<0.19
	10/28/2020	<0.43	<0.19
N-7	05/11/2011	<0.25	<0.53
	05/18/2012	0.49J	<0.48
	05/17/2013	0.55J	<0.20
	05/07/2014	<1.0	<0.20
	11/16/2015	<1.0	<1.6
	05/18/2016	<1.0*	*<4.9*
	06/07/2017	<1.0	*<5.0*
	12/07/2018	<1.0	*<5.0*
	4/29/2020	0.66 J	<0.19
	10/28/2020	<0.43	<0.19
N-10	05/11/2011	<0.25	<0.55
	05/18/2012	<1.0	<0.47
	05/16/2013	<1.0	<0.20
	05/07/2014	<1.0	<0.20
	11/16/2015	<1.0	<1.6
	05/18/2016	<1.0	*<5.0*
	06/07/2017	<1.0	*<4.8*
	12/07/2018	<1.0	*<4.8*
	4/29/2020	<0.43	<0.19
	10/28/2020	<0.43	<0.19
N-12	05/11/2011	0.33J	<0.54
	05/18/2012	0.32J	<0.48

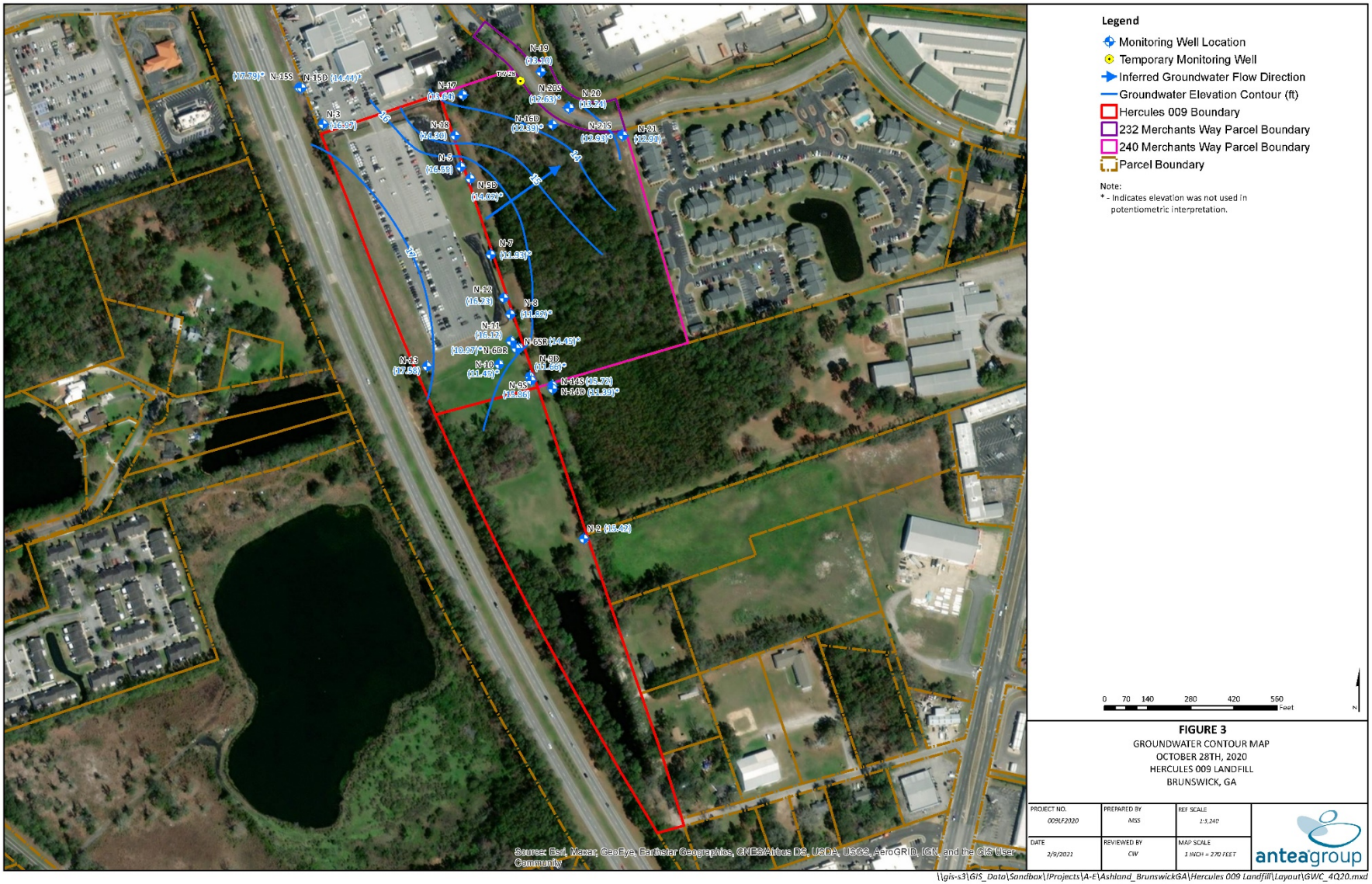
[6] *Source:* 2020 Annual Groundwater Monitoring and Inspection Report.

	Chemical Name	Benzene	Toxaphene
	MCL	**5.0**	**3.0**
	Report Units:	µg/L	µg/L
	05/17/2013	0.33J	<0.20
	05/07/2014	<1.0	0.34J
	11/16/2015	<1.0	<1.6
	05/18/2016	0.56J	*<4.9*
	06/07/2017	<1.0	*<4.8*
	12/06/2018	<1.0	*<5.0*
	4/29/2020	<0.43	<0.19
	10/29/2020	<0.43	<0.19
N-15S	05/11/2011	<0.25	<0.54
	05/18/2012	<1.0	<0.49
	05/16/2013	<1.1	<0.20
	05/07/2014	<1.0	<0.20
	11/16/2015	<1.0	2.5J
	05/18/2016	<1.0	*<4.8*
	06/07/2017	<1.0	*<5.0*
	12/06/2018	<1.0	*<5.0*
	4/29/2020	<0.43	<0.19
	10/29/2020	<0.43	<0.19
N-15D	05/11/2011	<0.25	<0.58
	05/18/2012	<1.0	<0.46
	05/16/2013	<1.1	<0.20
	05/07/2014	<1.0	<0.20
	11/16/2015	<1.0	<1.5
	05/18/2016	<1.0	*<4.8*
	06/07/2017	<1.0	*<5.1*
	12/07/2018	<1.0	*<5.0*
	4/29/2020	<0.43	<0.19
	10/29/2020	<0.43	<0.19
N-16D	9/2/2020	<0.43	--
	10/28/2020	<0.43	--
N-17	9/2/2020	**83**	--
	10/28/2020	**80**	--
N-18	9/2/2020	**210**	--
	10/29/2020	**190**	*<0.19*
N-19	9/2/2020	**8.3**	--
	10/28/2020	3.6	--
N-20	9/2/2020	**18**	--
	10/28/2020	**86**	--
N-20S	10/28/2020	<0.43	--
N-21	10/28/2020	**110**	--
N-21S	10/28/2020	<0.43	--
Duplicate (N-5)	05/11/2011	**320**	<0.58
	05/18/2012	**600**	<0.48
	05/17/2013	**71**	<0.20
	05/07/2014	**9.3**	<0.20
	11/16/2015	**82**	<1.5
	05/18/2016	**31**	*<4.8*
	06/07/2017	**190**	*<4.8*
	12/07/2018	**38**	*<4.8*
	4/29/2020	**22**	<0.19
	9/3/2020	**18**	--
	10/28/2020	**50**	<0.19 H

Chemical Name	Benzene	Toxaphene
MCL	**5.0**	**3.0**
Report Units:	µg/L	µg/L

Notes:
Bold = exceeds MCL.
Italics = detection limit exceeds MCL.
< = not detected at or above indicated laboratory reporting limit.
J = result is less than the reporting limit, but greater than or equal to the method detection limit and the concentration is an approximate value.
* = resampled on 8/11/16.
H = sample was prepped or analyzed beyond the specified holding time
-- = no data available.

Figure I-1: Potentiometric Surface Map in Shallow Aquifer, 2020



Source: Figure 3 of the 2020 Annual Groundwater Monitoring and Inspection Report.
Note: Deep monitoring wells were not used in contouring

APPENDIX J – SCREENING-LEVEL RISK REVIEW

A residential risk-based, screening-level vapor intrusion evaluation was conducted to determine if this potential exposure pathway would require more in-depth analysis if a building were built onsite or offsite above remaining groundwater contamination. The maximum on-site and off-site concentrations of benzene measured in a permanent well over the previous five years were used in the EPA's VISL calculator for this screening-level risk-based analysis.

As shown in Table J-1, during this FYR period, the maximum on-site concentration of benzene was 190 µg/L, observed in well N-5 in June 2017. The maximum off-site concentration of benzene was 210 µg/L, observed in N-18 in September 2020. The screening-level analysis indicates that the maximum concentrations of benzene on and offsite slightly exceed EPA's cancer risk management range of 1 x 10^{-4} to 1 x 10^{-6} and the EPA's noncancer threshold HQ of 1.0.

Table J-1: Screening-Level Vapor Intrusion Evaluation

COC	Benzene Concentration Detected in N-5 (µg/L)	2020 VISL Calculator Residential Exposure Scenario	
		Cancer Risk	Noncancer HQ
Maximum on-site benzene	190 (N-5/June 2017)	**1.2 x 10^{-4}**	**1.4**
Maximum off-site benzene	210 (N-18/September 2020)	**1.3 x 10^{-4}**	**1.5**
Notes: VISL calculator located here: https://www.epa.gov/vaporintrusion/vapor-intrusion-screening-level-calculator (accessed on 4/19//2021). **Bold** = exceeds the EPA's acceptable cancer risk range of 1 x 10^{-4} to 1 x 10^{-6} and noncancer HQ of 1.			

There are no buildings above the groundwater contamination on or off-site. This information indicates that the vapor intrusion exposure pathway does not pose any current health concerns. However, if any future development were to occur in this area, a vapor intrusion evaluation is recommended to determine if the risks associated with this pathway remain within acceptable limits.

While the 1993 ROD established remedial goals for all COCs, toxaphene was the only COC that exceeded the soil and subsurface soil cleanup goals at the Site prior to remediation. The residential-based surface soil performance standards established in the 1993 ROD remain valid for toxaphene based on a residential screening-level risk evaluation using the most current toxicity values (Table J-2). The evaluation shows that the ROD cleanup goal equates to a residential cancer risk that is below the lower bound of EPA's risk management range of 1 x 10^{-4} to 1 x 10^{-6} and a noncancer HQ that is less than 1.

Table J-2: Surface Soil Screening-Level Risk Evaluation

Soil COC	1993 ROD Surface Soil Remedial Goal (mg/kg)	EPA Residential Regional Screening Level (RSL)[a]		Residential Risk	
		1 x 10^{-6} Risk	HQ = 1	Cancer Risk[b]	Noncancer HQ[c]
Toxaphene	0.25	0.49	5.7	5 x 10^{-7}	0.04
a = Current RSLs. dated May 2021. are available at https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables (accessed 6/25/2021). b = Cancer risks were calculated using the following equation, based on the fact that RSLs are derived based on 1 x 10^{-6} risk: Cancer risk = (1993 ROD remedial goal/soil cancer RSL) x 10^{-6} c = Noncancer HQ = 1993 ROD remedial goal/soil noncancer RSL NA = the EPA has not established a non-cancer toxicity value for this compound.					

The industrial-based subsurface soil performance standards established in the 1993 ROD remain valid for toxaphene based on an industrial screening-level risk evaluation using the most current toxicity values (Table J-3). The evaluation shows that the ROD cleanup goal equates to an industrial cancer risk that is below the lower bound of EPA's risk management range of 1×10^{-4} to 1×10^{-6} and a noncancer hazard quotient (HQ) that is less than 1. Under a residential scenario, the subsurface soil performance standard is not protective and exceed the EPA's acceptable cancer risk range of 1×10^{-4} to 1×10^{-6} and noncancer HQ of 1 (Table J-4). The Site is not currently being used for residential use and is fenced.

Table J-3: Subsurface Soil Screening-Level Risk Evaluation – Industrial Use

Soil COC	1993 ROD Subsurface Soil Remedial Goal (mg/kg)	EPA Industrial RSL[a]		Industrial Risk	
		1×10^{-6} Risk	HQ = 1	Cancer Risk[b]	Noncancer HQ[c]
Toxaphene	76	2.1	74	4×10^{-5}	1

a = Current RSLs. dated May 2021. are available at https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables (accessed 6/25/2021).
b = Cancer risks were calculated using the following equation, based on the fact that RSLs are derived based on 1×10^{-6} risk:
Cancer risk = (1993 ROD remedial goal/ soil cancer RSL) x 10^{-6}
c = Noncancer HQ = 1993 ROD remedial goal/soil noncancer RSL
NA = the EPA has not established a non-cancer toxicity value for this compound.

Table J-4: Subsurface Soil Screening-Level Risk Evaluation – Residential Use

Soil COC	1993 ROD Subsurface Soil Remedial Goal (mg/kg)	EPA Residential RSL[a]		Residential Risk	
		1×10^{-6} Risk	HQ = 1	Cancer Risk[b]	Noncancer HQ[c]
Toxaphene	76	0.49	5.7	**2×10^{-4}**	**13**

a = Current RSLs. dated May 2021. are available at https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables (accessed 6/25/2021).
b = Cancer risks were calculated using the following equation, based on the fact that RSLs are derived based on 1×10^{-6} risk:
Cancer risk = (1993 ROD remedial goal - soil cancer RSL) x 10^{-6}.
Noncancer HQ = 1993 ROD remedial goal/soil noncancer RSL
NA = the EPA has not established a non-cancer toxicity value for this compound.
Bold = exceeds the EPA's acceptable cancer risk range of 1×10^{-4} to 1×10^{-6} and noncancer HQ of 1.

Toxaphene was not the only COC at the Site. The soil remedy focused on this COC based on toxicity, mobility, and frequency of detection, and assumed that other COCs would be reduced to acceptable levels when the cleanup level was met for toxaphene. To determine if this assumption is still correct, based on toxicity data since the 1993 ROD, a screening-level risk comparison was conducted as part of the 2016 FYR to confirm that other the target concentrations for other COCs remain valid. Based on the additional review, the maximum detected concentration of dioxin exceeded the EPA's noncancer HQ of 1 under a residential use scenario. The EPA reviewed the dioxin soil data and confirmed that dioxin was only present in landfill waste but not surface soil or subsurface soil. The concentrations in landfill waste were below industrial screening levels for dioxin. Since the 2016 FYR, there have not been any changes to the regional screening levels (RSLs) that would further impact the COCs in surface or subsurface soil. In addition, the 2020 Environmental Covenant prohibits activities that will disturb the monolith or the cap.

APPENDIX K – 2020 ENVIRONMENTAL COVENANT

D: DEED B: 4285 P: 249 AGMTDE
09/23/2020 08:40:04 AM Total Pages: 15
Recording Fee: $ 25.00
Ronald M. Adams, Clerk of Court, Glynn County

When recorded, return to:
Hercules LLC
500 Hercules Road
Wilmington, DE 19808

Environmental Covenant

This instrument is an Environmental Covenant executed pursuant to the Georgia Uniform Environmental Covenants Act, O.C.G.A. § 44-16-1, *et seq.*, as may be amended from time to time (hereinafter the "Act"). This Environmental Covenant is entered into by the entities executing this Environmental Covenant and subjects the Property identified below to the activity and/or use limitations and other requirements specified in this document. The effective date of this Environmental Covenant shall be the date upon which the fully executed Environmental Covenant has been recorded in accordance with O.C.G.A. § 44-16-8(a).

Fee Owner of Property/Grantor:	Hercules LLC 500 Hercules Road Wilmington, DE 19808
Grantee/Holder with Power to Enforce:	Hercules LLC 500 Hercules Road Wilmington, DE 19808
Grantee/Entity with Express Power to Enforce:	State of Georgia Department of Natural Resources Environmental Protection Division 2 Martin Luther King Jr. Drive, SE Suite 1054 East Tower Atlanta, GA 30334
Additional Agency Overseer:	U.S. Environmental Protection Agency Region 4 61 Forsyth Street, S.W. Atlanta, GA 30303

Property:

The property subject to this Environmental Covenant is the approximately 16.7-acre property owned by Hercules LLC (hereinafter "Property"), located at 2540 Golden Isles Parkway and 139 Nix Lane in Brunswick, Glynn County, Georgia 31525. A complete legal description of the Property is attached as Exhibit A and a map of the Property is attached as Exhibit B. The Property consists of two contiguous parcels, as identified in the attached Exhibit B.

Tax Parcel Number(s):

The two contiguous parcels that make up the Property are associated with Tax ID No. 03-04607 and Tax ID No. 03-04977 of Glynn County, Georgia.

Environmental Covenant Runs with the Land and is Perpetual:

Pursuant to the Act, this Environmental Covenant shall run with the land and shall be perpetual unless terminated or amended pursuant to terms herein or in accordance with provisions of the Act. This Environmental Covenant shall be binding upon Hercules LLC and all successors, assigns and transferees of any interest in the Property or any portion thereof.

Name and Location of Administrative Records:

This Environmental Covenant imposes activity and/or use limitations and other requirements on the Property that arise under remedial action performed at the Property. The status of the remedial action is described in the following documents:

- U.S. Environmental Protection Agency (EPA) Interim Record of Decision for groundwater (OU2), issued on June 27, 1991;
- EPA Record of Decision, issued on March 25, 1993; and
- U.S. Environmental Protection Agency (EPA) Fourth Five-Year Review for the Hercules 009 Landfill, issued in September 2016.

Records pertaining to this remedial action are available at the following locations:

Superfund Records Center
U.S. EPA, Region 4
Atlanta, GA 30303

and

Brunswick/Glynn County Regional Library
208 Gloucester Street
Brunswick, GA 31520

and

Georgia Environmental Protection Division
Land Protection Branch
2 Martin Luther King Jr. Drive, SW
Suite 1054 East Tower
Atlanta, GA 30334

Description of Contamination and Remedial Action:

This Property has been listed on the State's Hazardous Site Inventory at HSI #10006 and has been designated as needing corrective action due to the presence of hazardous wastes, hazardous constituents, or hazardous substances regulated under state law. Contact the Property owner or the

Georgia Environmental Protection Division for further information concerning this Property. This notice is provided in compliance with the Georgia Hazardous Site Response Act.

This Environmental Covenant is made pursuant to the Georgia Uniform Environmental Covenants Act, O.C.G.A. § 44-16-1 *et seq.*, and the Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. § 9601 *et seq.* (hereinafter "CERCLA"), by Hercules LLC and its successors and assigns (hereinafter "Grantor") and the State of Georgia, Department of Natural Resources, Environmental Protection Division (hereinafter "EPD") and its successors and assigns. This Environmental Covenant is being recorded because a release of benzene and toxaphene occurred on the Property. These are "regulated substances" as defined under the Georgia Hazardous Site Response Act, O.C.G.A. § 12-8-90 *et seq.*, and the rules promulgated thereunder (hereinafter "HSRA" and "Rules," respectively) and are "hazardous substances" as defined in CERCLA. The remedy selected for this Property includes for groundwater: connecting nearby residences to the public water supply and restricting the use of on-site groundwater until cleanup goals are met; and for soil: on-site and off-site soil excavation and capping of impacted soils stockpiled on-site. Nearby residences have been connected to the public water supply, on-site and off-site soil excavation is complete, and impacted soils on-site have been stockpiled and capped, as required by the selected remedy. To complete implementation of the selected remedy for groundwater, groundwater use must be restricted until cleanup goals are met and the soil cap must continue to be maintained, as provided in the activity and use restrictions and other requirements provided herein.

Grantor hereby binds itself to the activity and use restriction(s) for the Property identified herein and grants such other rights under this Environmental Covenant in favor of EPD, EPA, and Holder. EPD, EPA, and Holder shall each have full right of enforcement of the rights conveyed under this Environmental Covenant pursuant to HSRA and the Rules. Failure to timely enforce compliance with this Environmental Covenant or the activity and use limitations contained herein by any person shall not bar subsequent enforcement by such person and shall not be deemed a waiver of the person's right to take action to enforce compliance. Nothing in this Environmental Covenant shall restrict EPD or EPA from exercising any authority under applicable law.

Grantor makes the following declarations as to limitations, restrictions, and uses to which the Property may be put and specifies that such declarations shall constitute covenants to run with the land, pursuant to O.C.G.A. § 44-16-5(a), are perpetual, unless modified or terminated pursuant to the terms of this Covenant or pursuant to O.C.G.A. § 44-16-9, and shall be binding on all parties and all persons claiming under them, including all current and future owners of any portion of or interest in the Property (hereinafter, collectively, "Owner"). The obligations under this Environmental Covenant relating to the use of the Property shall apply to the then current Owner of the Property, and its tenants, agents, employees, assigns, and other persons under its control.

The Environmental Covenant shall inure to the benefit of EPD, EPA, Grantor, Holder, and their respective successors and assigns and shall be enforceable by the Director of the EPD or his agents or assigns, EPA, Grantor, Holder, and other party(ies) as provided for in O.C.G.A. § 44-16-11 in a court of competent jurisdiction.

Activity and Use Limitation(s) and Other Requirements

1. Notice. The Owner of the Property must give thirty (30) days advance written notice to EPD and EPA of the Owner's intent to convey any interest in the Property. No conveyance of title, easement, lease, or other interest in the Property shall be consummated by the Owner without adequate and complete provision for continued monitoring, operation, and maintenance of the remedial action. The Owner of the Property must also give thirty (30) days advance written notice to EPD and EPA of the Owner's intent to change the use of the Property, apply for building permit(s), or perform any site work that would affect the remedial action at the Property.

2. Notice of Limitation in Future Conveyances. Each instrument hereafter conveying an interest in the Property subject to this Environmental Covenant shall contain a notice of the activity and use limitations set forth in this Environmental Covenant and shall provide the recorded location of the Environmental Covenant.

3. Groundwater Limitation. The use or extraction of groundwater from beneath the Property for drinking water or for any other non-remedial or monitoring purposes shall be prohibited.

4. Maintenance of soil cap. The cap on the Property, including the parking lot and vegetative cover along the edges of the capped area as shown in the attached Exhibit B, shall be maintained. With the exception of work necessary for the maintenance, repair, or replacement of engineering controls, Owner shall not engage in the following activities without obtaining prior written approval from EPA: (a) drilling or otherwise constructing any water wells on the Property; and (b) engaging in activities that could cause damage to the cap, including digging, excavation, drilling or construction activities which could compromise the integrity of the cap.

5. Right of Access. In addition to any rights already possessed by EPD and EPA, the Owner shall allow authorized representatives of EPD, EPA, and Holder the right to enter the Property at reasonable times for the purpose of evaluating the remedial action; to take samples, to monitor all groundwater monitoring wells, to inspect the remedial action conducted at the Property, to determine compliance with this Environmental Covenant, and to inspect records that are related to the remedial action.

6. Recording of Environmental Covenant and Proof of Notification. Within thirty (30) days after the date of the Director's signature, Hercules LLC or its authorized agent shall file this Environmental Covenant with the Recorders of Deeds for Glynn County, and send a file stamped copy of this Environmental Covenant to EPD and EPA within thirty (30) days of recording. Within that time period, Hercules LLC shall also send a file-stamped copy to each of the following: (1) each person holding a recorded interest in the Property subject to the Environmental Covenant, (2) each person in possession of the Property subject to the Environmental Covenant, (3) each municipality, county, consolidated government, or other unit of local government in which the Property subject to the Environmental Covenant is located, and (4) each owner in fee simple whose property abuts the Property subject to the Environmental Covenant.

7. Termination or Modification. This Environmental Covenant may not be modified without the express written consent of EPD, EPA, the then current Owner of the Property, and the Holder or its successors or assigns, unless such person has waived in a signed record the right to consent or a court finds that the person no longer exists or cannot be located or identified with the exercise of reasonable diligence.

8. No Property Interest Created in EPD or EPA. This Environmental Covenant does not in any way create any interest by EPD or EPA in the Property that is subject to the Environmental Covenant. Furthermore, the act of approving this Environmental Covenant does not in any way create any interest by EPD or EPA in the Property in accordance with O.C.G.A. § 44-16-3(b).

Environmental Covenant Does Not Authorize Use Otherwise Prohibited

Pursuant to the Act, this Environmental Covenant shall not be construed to authorize a use of the Property that is otherwise prohibited by zoning, ordinance, local law or general law or by a recorded instrument that has priority over this Environmental Covenant.

No Interest in Real Property in EPD

EPD's and EPA's rights under this Environmental Covenant and the Act shall not be considered an interest in real property.

EPD's Environmental Covenants Registry

This Environmental Covenant and any amendment thereto or termination thereof may be included in EPD's registry for environmental covenants.

Severability

Should any provision of this Environmental Covenant be found by a court of competent jurisdiction to be invalid and/or unenforceable in any respect, the remaining provisions shall continue in full force and effect.

[SIGNATURES ON FOLLOWING PAGES]

Representations and Warranties.

Grantor hereby represents and warrants to the other signatories hereto:

a) That the Grantor has the power and authority to enter into this Environmental Covenant, to grant the rights and interests herein provided and to carry out all obligations hereunder;
b) That the Grantor is fee simple owner of the Property;
c) That the Grantor has identified all other parties that hold any interest (e.g., encumbrance) in the Property and notified such parties of the Grantor's intention to enter into this Environmental Covenant;
d) That this Environmental Covenant will not materially violate, contravene, or constitute a material default under any other agreement, document or instrument to which Grantor is a party, or by which Grantor may be bound or affected;
e) That the Grantor has served each of the people or entities referenced in Activity and Use Limitation 7, above, with an identical copy of this Environmental Covenant in accordance with O.C.G.A. § 44-16-7.
f) That this Environmental Covenant will not materially violate or contravene any zoning law or other law regulating use of the Property; and
g) That this Environmental Covenant does not authorize a use of the Property that is otherwise prohibited by a recorded instrument that has priority over the Environmental Covenant.

Notices.

Any document or communication required to be sent to EPD, EPA, or Hercules LLC, respectively, pursuant to the terms of this Environmental Covenant shall be sent to the following persons:

EPD
Georgia Environmental Protection Division
Branch Chief
Land Protection Branch
2 Martin Luther King Jr. Drive SE
Suite 1054 East Tower
Atlanta, GA 30334

EPA
Director, Superfund Division
The United States Environmental Protection Agency
Region 4
61 Forsyth Street, SW
Atlanta, GA 30303

Hercules LLC
Hercules LLC
500 Hercules Road
Wilmington, DE 19808

IN WITNESS WHEREOF, Grantor HERCULES LLC has caused this Environmental Covenant to be executed pursuant to The Georgia Uniform Environmental Covenants Act, on the __24th___ day of ___April_____, 2020.

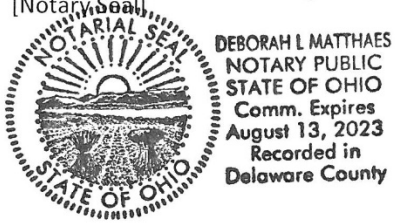
HERCULES LLC

By: Matthew K Spence
Its: VP / Assistant Secretary and Treasurer

Signed, sealed, and delivered
in the presence of:

Unofficial Witness

Deborah L. Matthaes
Notary Public
My Commission Expires: Aug. 13, 2023
[Notary Seal]



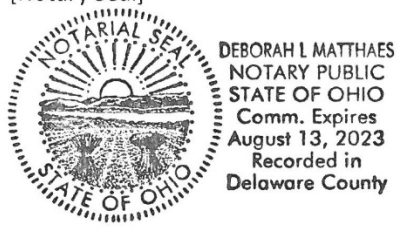
HERCULES LLC

By: Kraig A. Kunkemoeller
Its: Vice President

Signed, sealed, and delivered
in the presence of:

Unofficial Witness

Deborah L. Matthaes
Notary Public
My Commission Expires: Aug. 13, 2023
[Notary Seal]



ADDITIONAL AGENCY OVERSEER:

THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

This Environmental Covenant is hereby approved by the **United States Environmental Protection Agency** this 13th day of August, 2020.

By: Caroline Y. Freeman for

Franklin E. Hill
Director, Superfund Division
U.S. Environmental Protection Agency
Region 4

Date: 8/13/2020

Shannon L. Richardson

SHANNON L RICHARDSON
NOTARY PUBLIC
HENRY COUNTY, GEORGIA
MY COMMISSION EXPIRES AUGUST 15, 2023

My Commission Expires: August 15, 2023

For the **Environmental Protection Division, Department of Natural Resources, State of Georgia**, this 10th day of September, 2020:

(Signature)
Richard Dunn
Director, Environmental Protection Division

State of Georgia
County of Fulton

This instrument was signed or attested before me this 10 day of September, 2020,

by _____.

☑ Personally Known
☐ Produced Identification

Tamara C. Fischer
Notary Public *(Signature)*

My Commission Expires: 7-27-2022

(NOTARY SEAL)

Tamara C. Fischer
Notary Public
Coweta County, Georgia

2108432_2.docx

Exhibit A
Legal Description

PARCEL 'A' LEGAL DESCRIPTION

ALL THAT CERTAIN LOT, PARCEL OR TRACT OF LAND, SITUATE, LYING AND BEING IN G.M.D. 26, GLYNN COUNTY, GEORGIA AND SHOWN AS "PARCEL A" ON A PLAT BY GARY R. NEVILL, GEORGIA PLS# 2401, DATED 4/17/18, TITLED "BOUNDARY RETRACEMENT SURVEY OF: HERCULES LLC PROPERTY ON GOLDEN ISLES PARKWAY, A/K/A A PORTION OF THE BRUNSWICK PENINSULA TRACT H, A/K/A A PORTION OF LOTS 191-195, BRUNSWICK FARMS SUBDIVISION OF THE DAY AND BLOOM TRACT" AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

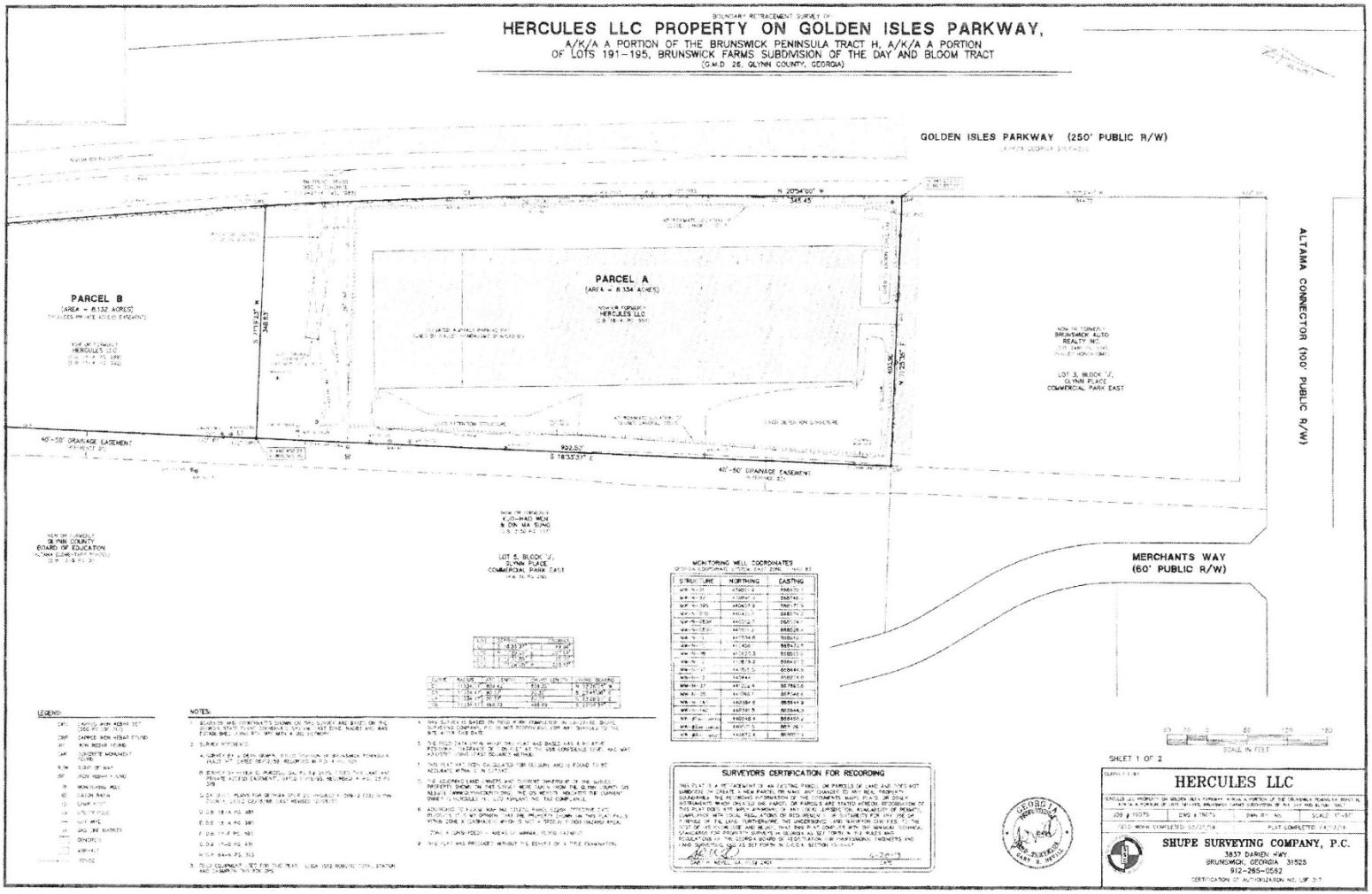
BEGINNING AT A CONCRETE MONUMENT ON THE EASTERLY RIGHT-OF-WAY OF GOLDEN ISLES PARKWAY, SAID MONUMENT BEING THE NORTHWEST CORNER OF SAID PARCEL 'A' AND THE SOUTHWESTERLY CORNER OF LOT 3, BLOCK 'J', GLYNN PLACE COMMERCIAL PARK EAST AND HAVING THE COORDINATES OF N: 441,232.57, E: 867,880.10, SAID MONUMENT BEING LOCATED SOUTH 20 DEGREES 52 MINUTES 48 SECONDS EAST FOR A DISTANCE OF 544.72' FROM THE INTERSECTION OF THE EASTERLY RIGHT-OF-WAY OF GOLDEN ISLES PARKWAY AND THE SOUTHERLY RIGHT-OF-WAY OF ALTAMA CONNECTOR; PROCEED ALONG THE LANDS OF BRUNSWICK AUTO REALTY, INC. NORTH 71 DEGREES 25 MINUTES 35 SECONDS EAST FOR A DISTANCE OF 403.96 FEET TO A CONCRETE MONUMENT; THENCE ALONG THE LANDS OF KUO-HAO WEN & DIM MA SUNG SOUTH 18 DEGREES 33 MINUTES 37 SECONDS EAST FOR A DISTANCE OF 952.50 FEET TO A CAPPED (SSC PC/LSF 317) ½" IRON REBAR; THENCE ALONG THE LANDS OF HERCULES LLC SOUTH 71 DEGREES 19 MINUTES 23 SECONDS WEST FOR A DISTANCE OF 348.63 FEET TO A CAPPED (SSC PC/LSF 317) ½" IRON REBAR ON SAID EASTERLY RIGHT-OF-WAY OF GOLDEN ISLES PARKWAY; THENCE ALONG SAID RIGHT-OF-WAY OF GOLDEN ISLES PARKWAY THE FOLLOWING COURSES AND DISTANCES: ALONG A CURVE TURNING TO THE RIGHT AN ARC LENGTH OF 609.42', (SAID CURVE HAVING A RADIUS OF 11,334.17', A CHORD BEARING OF NORTH 22 DEGREES 26 MINUTES 25 SECONDS WEST, AND A CHORD LENGTH OF 609.35') TO A CAPPED (SSC PC/LSF 317) ½" IRON REBAR, THENCE NORTH 20 DEGREES 54 MINUTES 00 SECONDS WEST FOR A DISTANCE OF 345.45 FEET TO A CONCRETE MONUMENT AND THE POINT OR PLACE OF BEGINNING. SAID PARCEL OR TRACT HAVING AN AREA OF 8.334 ACRES.

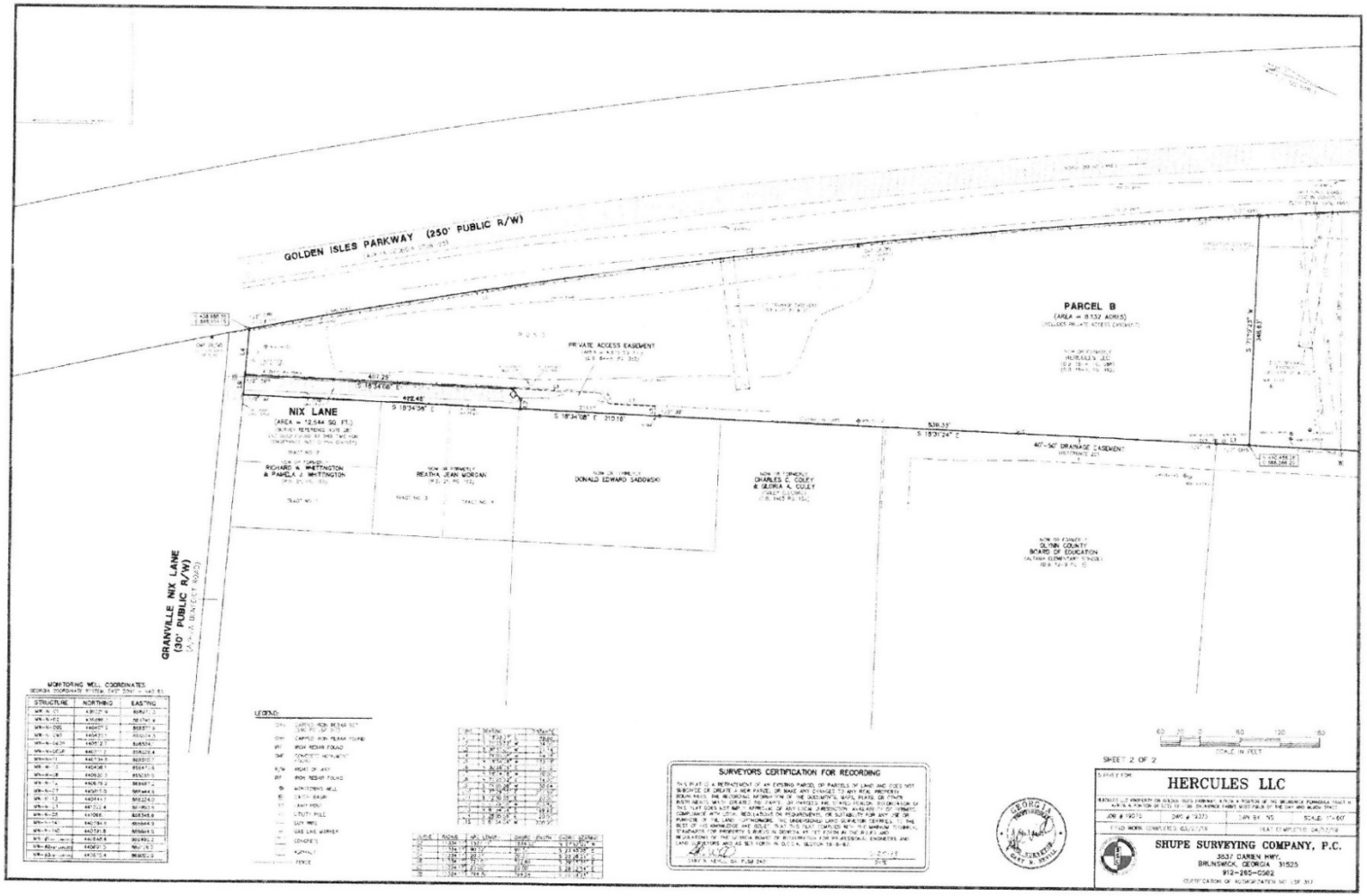
PARCEL 'B' LEGAL DESCRIPTION

ALL THAT CERTAIN LOT, PARCEL OR TRACT OF LAND, SITUATE, LYING AND BEING IN G.M.D. 26, GLYNN COUNTY, GEORGIA AND SHOWN AS "PARCEL B" ON A PLAT BY GARY R. NEVILL, GEORGIA PLS# 2401, DATED 4/17/19, TITLED "BOUNDARY RETRACEMENT SURVEY OF: HERCULES LLC PROPERTY ON GOLDEN ISLES PARKWAY, A/K/A A PORTION OF THE BRUNSWICK PENINSULA TRACT H, A/K/A A PORTION OF LOTS 191-195, BRUNSWICK FARMS SUBDIVISION OF THE DAY AND BLOOM TRACT" AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A CAPPED (P.L.S.# 1927) ½" IRON REBAR ON THE EASTERLY RIGHT-OF-WAY OF GOLDEN ISLES PARKWAY, SAID REBAR BEING THE SOUTHWEST CORNER OF SAID PARCEL 'B' AND MARKING THE INTERSECTION OF THE NORTHERLY RIGHT-OF-WAY OF GRANVILLE NIX LANE WITH THE EASTERLY RIGHT-OF-WAY OF GOLDEN ISLES PARKWAY AND HAVING THE COORDINATES OF N: 438,988.30, E: 868,954.15 (GEORGIA COORDINATE SYSTEM, EAST ZONE, NAD-83), PROCEED ALONG SAID RIGHT-OF-WAY OF GOLDEN ISLES PARKWAY ALONG A CURVE TURNING TO THE RIGHT AN ARC LENGTH OF 1,537.71', (SAID CURVE HAVING A RADIUS OF 11,334.17', A CHORD BEARING OF NORTH 27 DEGREES 52 MINUTES 02 SECONDS WEST, AND A CHORD LENGTH OF 1,536.53') TO A CAPPED (SSC PC/LSF 317) ½" IRON REBAR; THENCE ALONG THE LANDS OF HERCULES LLC NORTH 71 DEGREES 19 MINUTES 23 SECONDS EAST TO A CAPPED (SSC PC/LSF 317) ½" IRON REBAR; THENCE ALONG THE LANDS OF KUO-HAO WEN & DIM MA SUNG SOUTH 18 DEGREES 33 MINUTES 37 SECONDS EAST FOR A DISTANCE OF 49.68 FEET TO A ½" IRON REBAR; THENCE ALONG THE LANDS OF THE GLYNN COUNTY BOARD OF EDUCATION, CHARLES C. COLEY, GLORIA A. COLEY AND DONALD EDWARD SADOWSKI THE FOLLOWING COURSES AND DISTANCES: SOUTH 18 DEGREES 31 MINUTES 24 SECONDS EAST FOR A DISTANCE OF 839.33 FEET TO A ½" IRON REBAR; THENCE SOUTH 18 DEGREES 34 MINUTES 08 SECONDS EAST FOR A DISTANCE OF 210.16 FEET TO A CAPPED (SSC PC/LSF 317) ½" IRON REBAR; THENCE ALONG THE NORTHERLY AND WESTERLY RIGHT OF WAY OF NIX LANE THE FOLLOWING COURSES AND DISTANCES: SOUTH 71 DEGREES 25 MINUTES 52 SECONDS WEST FOR A DISTANCE OF 14.00 FEET TO A CAPPED (SSC PC/LSF 317) ½" IRON REBAR; THENCE SOUTH 30 DEGREES 37 MINUTES 07 SECONDS WEST FOR A DISTANCE OF 21.14 FEET TO A CAPPED (SSC PC/LSF 317) ½" IRON REBAR; THENCE SOUTH 18 DEGREES 34 MINUTES 08 SECONDS EAST FOR A DISTANCE OF 407.26 FEET TO A CAPPED (SSC PC/LSF 317) ½" IRON REBAR ON THE NORTHERLY RIGHT-OF-WAY OF GRANVILLE NIX LANE; THENCE ALONG SAID RIGHT-OF-WAY OF GRANVILLE NIX LANE SOUTH 74 DEGREES 05 MINUTES 58 SECONDS WEST FOR A DISTANCE OF 69.76 FEET TO A CAPPED (P.L.S.# 1927) ½" IRON REBAR AND THE POINT OR PLACE OF BEGINNING. SAID PARCEL OR TRACT HAVING AN AREA OF 8.132 ACRES.

Exhibit B
Property Map


BOUNDARY RETRACEMENT SURVEY OF
HERCULES LLC PROPERTY ON GOLDEN ISLES PARKWAY,
A/K/A A PORTION OF THE BRUNSWICK PENINSULA TRACT H, A/K/A A PORTION
OF LOTS 191–195, BRUNSWICK FARMS SUBDIVISION OF THE DAY AND BLOOM TRACT
(G.M.D. 26, GLYNN COUNTY, GEORGIA)
GOLDEN ISLES PARKWAY (250' PUBLIC R/W)
PARCEL A
(AREA = 8.334 ACRES)
PARCEL B
(AREA = 8.132 ACRES)
ALTAMA CONNECTOR (100' PUBLIC R/W)
MERCHANTS WAY
(60' PUBLIC R/W)
40'-50' DRAINAGE EASEMENT
LOT 3, BLOCK 'J',
GLYNN PLACE
COMMERCIAL PARK EAST
LOT 5, BLOCK 'J',
GLYNN PLACE
COMMERCIAL PARK EAST
MONITORING WELL COORDINATES
LEGEND:
NOTES:
SURVEYORS CERTIFICATION FOR RECORDING
SCALE IN FEET
SHEET 1 OF 2
HERCULES LLC
SHUPE SURVEYING COMPANY, P.C.
3837 DARIEN HWY
BRUNSWICK, GEORGIA 31525
912-265-0562


GOLDEN ISLES PARKWAY (250' PUBLIC R/W)
PARCEL B
(AREA = 8.132 ACRES)
PRIVATE ACCESS EASEMENT
NIX LANE
(AREA = 12,584 SQ. FT.)
RICHARD K. WHITTINGTON & PAMELA J. WHITTINGTON
BEATHA JEAN MORGAN
DONALD EDWARD SADOWSKI
CHARLES C. COLEY & GLORIA A. COLEY
QUINN COUNTY BOARD OF EDUCATION
40'-50' DRAINAGE EASEMENT
GRANVILLE NIX LANE
(30' PUBLIC R/W)
MONITORING WELL COORDINATES
LEGEND
SURVEYORS CERTIFICATION FOR RECORDING
SCALE IN FEET
SHEET 2 OF 2
HERCULES LLC
SHUPE SURVEYING COMPANY, P.C.
3537 DARIEN HWY.
BRUNSWICK, GEORGIA 31525
912-265-0562

APPENDIX L – GAEPD MEMORANDUM

GEORGIA
DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION

Richard E. Dunn, Director

Land Protection Branch
2 Martin Luther King, Jr. Drive
Suite 1054, East Tower
Atlanta, Georgia 30334
404-656-7802

June 30, 2021

MEMORANDUM

To: Scott Martin, RPM
USEPA

Through: Amy Potter, Program Manager
Risk Assessment Program

From: John Williams, Geologist
Jocelyn Carver, Engineer
Risk Assessment Program

Subject: **Hercules 009 Fifth Five-Year Review**

Per your request, a review of the Hercules 009 Fifth FYR has been completed. The following are comments:

1. **Table 1: Surface and Subsurface COC Target Concentrations**

    a. This table includes Chromium III (Cr^{3+}) as an analyte, but does not include Chromium VI (Cr^{6+}). Since the understanding of the relationship between Cr^{3+} and Cr^{6+} (Hexavalent Chromium) has changed[1], and the use of any ratio relationship (i.e., a 1:6 ratio) is no longer used for Cr^{6+} estimations, it is recommended that groundwater also be analyzed for Cr^{6+}. If it does not appear that Cr^{6+} is a CoC at the site based on analytical data, further analyses of the substance can be discontinued.

    b. The notes in this table state, "*Subsurface soil remediation target concentrations are based on future commercial land use (i.e., limited exposure) for inorganic constituents, and are based on a carcinogenic risk of 1 x 10^{-5} or an HI of 1.0. Organic constituent target concentrations are based on leaching potential.*" It is unclear as to why remediation target levels for organics are based on leachability, but for inorganics are based on the ELCR and HI. Please add language clarifying why this distinction between COCs was made.

2. **Section IV Five Year Review Process: Data Review**

    a. This section states, "*During this FYR period, toxaphene was not detected above the cleanup goal of 3 µg/L.*" The laboratory detection limit has been above the MCL (3 µg/L)

[1] https://semspub.epa.gov/work/HQ/128607.pdf

between 2016 and 2018. Toxaphene could have been detected above the cleanup goal during this period, but not detected due to the high detection limit. The laboratory detection limit recently decreased to below the MCL in 2020 where toxaphene was detected below the cleanup goal. Please revise this statement to address this comment.

b. This section also states, "*Based on the depth to groundwater measurements in 2020, groundwater flows east and downward…* ", but does not specify what "downward" refers to. Please clarify what direction is meant by 'downward'.

3. **Section V Technical Assessment**

a. This section states, "*Toxaphene was not detected above cleanup goals in any of the seven monitoring wells sampled over the past five years.*" The laboratory detection limit has been above the MCL (3 µg/L) between 2016 and 2018. Toxaphene could have been detected above the cleanup goal during this period but not detected due to the high detection limit. The laboratory detection limit recently decreased to below the MCL in 2020 where toxaphene was detected below the cleanup goal. Please revise this statement to address this comment.

4. Appendix B

a. This section states that "*Current groundwater migration is under control.*" It does not appear that migration is under control since analytical results indicate that benzene has migrated off-site near Well N-5 and an additional off-site investigation in this area is being conducted to determine the extent of Benzene. Please revise the statement above and amend this section to reflect the current groundwater investigation activities near Well N-5.

5. Figure I-1: Potentiometric Surface Map, 2020

a. This figure shows the location of 26 wells, with only 13 wells being used to derive the potentiometric map. The other 13 wells were not included in the development of the potentiometric surface (noted by asterisks), but no reason was given for their exclusion. Since each listed groundwater depth represents real data, please justify the exclusion of the 13 wells.