



Mike DeWine, Governor
Jon Husted, Lt. Governor
Laurie A. Stevenson, Director

October 6, 2020

Morgan County Commissioners
19 East Main Street
McConnelsville, OH 43756

Charity Gas, Inc.
9844 Meathouse Fork Road
Salem, WV 26426-5553

**Re: Morgan County Landfill
Director's Final Findings and Orders (DFFO)
DFFOs
Municipal Solid Waste Landfills
Morgan County
MSWL019864**

Subject: Final Findings and Orders

Dear Sir or Madam:

Transmitted herewith are the Final Findings and Orders of the Director concerning the matter indicated for **Morgan County Landfill**.

You are hereby notified that this action of the Director of Ohio EPA (Director) is final and may be appealed to the Environmental Review Appeals Commission pursuant to Section 3745.04 of the Ohio Revised Code. The appeal must be in writing and set forth the action complained of and the grounds upon which the appeal is based. The appeal must be filed with the Commission within thirty (30) days after notice of the Director's action. The appeal must be accompanied by a filing fee of \$70.00 made payable to "Treasurer, State of Ohio." The Commission, in its discretion, may reduce the fee if by affidavit it is demonstrated that payment of the full amount of the fee would cause extreme hardship. Notice of the filing of the appeal shall be filed with the Director within three (3) days of filing with the Commission. Ohio EPA requests that a copy of the appeal be served upon the Ohio Attorney General's Office, Environmental Enforcement Section. An appeal may be filed with the Environmental Review Appeals Commission at the following address:

Environmental Review Appeals Commission
30 E. Broad St., 4th Floor
Columbus, Ohio 43215

If you have any questions, please contact Teri Finrock at (614) 644-3037.

Sincerely,

Jeri Main

Jeri Main
Division of Materials & Waste Management

cc: Teri Finrock, Legal, CO
Joe Goicochea, DMWM, SEDO

**BEFORE THE
OHIO ENVIRONMENTAL PROTECTION AGENCY**

In the Matter Of:

Morgan County Commissioners	:	<u>Director's Final Findings</u>
19 East Main Street	:	<u>and Orders</u>
McConnelsville, OH 43756	:	
	:	
Charity Gas, Inc.	:	
9844 Meathouse Fork Road	:	
Salem, WV 26426-5553	:	

Respondents

PREAMBLE

It is agreed by the parties hereto as follows:

I. JURISDICTION

These amended Director's Final Findings and Orders ("Orders") are issued to the Morgan County Commissioners and Charity Gas, Inc. (collectively the "Respondents") pursuant to the authority vested in the Director of the Ohio Environmental Protection Agency ("Ohio EPA") under Ohio Revised Code ("ORC") Sections 3734.13 and 3745.01.

II. PARTIES BOUND

These Orders shall apply to and be binding upon Respondents. No change in ownership of the Facility as hereinafter defined shall in any way alter Respondents' obligations under these Orders.

III. DEFINITIONS

Unless otherwise stated, all terms used in these Orders shall have the same meaning as defined in ORC Chapter 3734 and the rules promulgated thereunder.

IV. FINDINGS

The Director of Ohio EPA has determined the following findings:

1. The Morgan County Commissioners ("Respondent Commissioners") are the Lessees and original applicants for the plan approval of the Morgan County Landfill ("Facility") located on Route 60, McConnelsville, Ohio in Morgan County. Respondent Commissioners leased the land owned at the time by F.E. (Gene) and Eileen Haines for the purpose of establishing and operating a solid waste disposal

facility.

2. Charity Gas Inc. ("Respondent Charity Gas") is the current owner of the property, which encompasses the limits of waste placement identified as Morgan County parcel No. 130-001-393-4 ("Property").
3. The Facility was in operation from about 1971 to September 1, 1988, at which time it was declared closed by letter dated June 30, 1988, pursuant to OAC Rule 3745-27-10(A)(1) as that rule was effective July 29, 1976.
4. Following cessation of waste acceptance at the Facility, Respondent Commissioners failed to properly close the Facility in violation of the State's environmental laws and regulations.
5. Subsequently, Respondent Commissioners and F.E. (Gene) and Eileen Haines entered into negotiations with Ohio EPA and agreed to a compliance schedule to address the violations. This compliance schedule was memorialized in Director's Final Findings and Orders issued on February 13, 1995 ("1995 DFF&Os"), which required Respondent Commissioners to, among other things, delineate waste placement and install a final cap in compliance with OAC Rule 3745-27-10 as effective July 29, 1976, conduct post-closure care at the Facility for 30 years following the installation of the final cap, and submit and follow plans for ground water and explosive gas monitoring as those plans were approved by Ohio EPA.
6. Order 6 of the 1995 DFF&Os required submission of a Ground Water Monitoring Program in accordance with OAC Rule 3745-27-10 by September 1, 1995, and implementation of the Program within 15 days of Ohio EPA approval.
7. On May 13, 1997, Respondent Commissioners completed capping of the Facility and began the post-closure care period. The scheduled end date of the 30 year post-closure care period will be reached on May 13, 2027.
8. The 1995 DFF&Os were subsequently modified in 2002 and 2018 to address leachate concerns, capping upgrades, and maintenance at the Facility throughout the post-closure care period.
9. In April 1996, Respondent Commissioners commenced ground water detection monitoring at the Facility in accordance with the approved Ground Water Monitoring Program.
10. In April 1997, following a determination that a release of contaminants to ground water had occurred, Respondent Commissioners commenced a ground water assessment monitoring program, which included semiannual ground water monitoring to define the rate, extent, and concentrations of contaminants. Assessment monitoring has continued on a semiannual schedule since this time.
11. Data collected from the ground water assessment monitoring program indicated

that the primary constituents of concern (COCs) at the Facility were tetrachloroethylene (PCE), trichloroethylene (TCE), Cis-1,2-Dichloroethylene (Cis-1,2-DCE), and vinyl chloride.

12. Since the installation of the soil cap in 1997, the COC levels in the ground water have decreased significantly and the COCs are naturally degrading through anaerobic reductive dechlorination processes.
13. OAC Rule 3745-27-10(F)(7)(b) states that a corrective measures plan shall propose concentration levels for each waste-derived constituent that has been detected in the ground water at a statistically significant level. For constituents for which maximum contaminant levels (MCLs) have been promulgated under OAC Chapter 3745-81, the proposed concentration level in the corrective measures plan shall be the maximum contaminant level for each respective contaminant.
14. Each of the COCs detected at the Facility and listed in Finding No. 11 above have a corresponding MCL promulgated under OAC Chapter 3745-81.
15. Data from the last 10 years indicate that COC levels are stable or gradually decreasing, but are unlikely to decrease below applicable MCLs at all affected monitoring wells prior to the end of the post-closure care period.
16. Respondent Commissioners proposed to implement a Corrective Measures Plan (CMP). The original CMP was submitted on November 9, 1999 and later revised in October, 2000. Technical discussions occurred regarding the initial CMP, but it was never approved.
17. In response to conversations with Respondent Commissioners regarding ground water conditions at the closed Facility, Ohio EPA conducted an ecological stream survey near the Property in June and July 2014. The results indicated that the Facility is not measurably impacting streams on and near the Property.
18. Following the stream survey, Respondent Commissioners through their contractor presented an updated Corrective Measures Plan dated December 17, 2015 (CMP-2015).
19. The CMP-2015 included information submitted pursuant to OAC Rule 3745-27-10(F)(8) to demonstrate that remediation of the waste-derived constituents is not necessary.
20. OAC Rule 3745-27-10(F)(8)(b) and (c) state:

"The Director may determine that remediation of a release of waste-derived constituents from a sanitary landfill facility is not necessary if the owner or operator demonstrates the one of the following:

(b) The constituents [are] present in ground water that:

(i) Is not currently or reasonably expected to be a source of drinking water.

(ii) Is not hydraulically connected with waters to which the waste-derived constituents are migrating or are likely to migrate in concentrations that would exceed the ground water remediation standards established under paragraph (F)(7) of this rule.

(c) Remediation of releases is technically impractical.”

21. OAC Rule 3745-27-10(F)(9) states “[a] determination by the director pursuant to paragraph (F)(8) of this rule shall not affect the director's authority to require the owner or operator to undertake source control measures or other measures that may be necessary to eliminate or minimize further releases to ground water, to prevent exposure to ground water, or to remediate ground water to concentrations that are technically practicable and significantly reduce threats to human health and the environment.”
22. The CMP-2015 proposed that in place of active remediation, Respondent Commissioners would continue post-closure care of the Facility and implement a Post-Closure Groundwater & Surface Water Monitoring Plan (GSWMP), which was included as an attachment to the CMP-2015.
23. The information submitted in the CMP-2015 satisfies the requirements of OAC Rule 3745-27-10(F)(8) because the constituents are present in ground water that is not currently or reasonably expected to be a source of drinking water, and it is unlikely that these constituents will migrate to another ground water zone or surface water body in concentrations that would exceed the ground water remediation standards established in OAC Rule 3745-27-10(F)(7). Further, remediation of the release is technically impracticable.
24. Based on the information contained in the CMP-2015, including the demonstration submitted pursuant to OAC Rule 3745-27-10(F)(8), Ohio EPA has determined that remediation of the above-described release of waste-derived constituents from the Facility is not necessary.
25. On July 29, 2020, the respondent Commissioners through their contractor submitted a revised CMP (CMP-2020), including a revised GSWMP (GSWMP-2020). Pursuant to OAC Rule 3745-27-10(F)(9), the GSWMP-2020 proposes ground water re-evaluation levels for each COC, as well as criteria through which ground water monitoring may be terminated at the end of the post-closure care period. The narrative portion, figures, and tables of the CMP-2020 is attached as Exhibit 1 hereto and the narrative portion, figures, and tables of the GSWMP-2020 is attached as Exhibit 2 hereto.
26. Respondent Charity Gas acquired the current parcel constituting the Property on April 19, 2019, following a transaction in which the Property was split from a larger parcel which had been owned by the Haines family and leased by Respondent

Commissioners during the time the Facility was in operation.

27. Respondents and Ohio EPA have agreed to record an Environmental Covenant with activity and use limitations that prohibit:
 - a. The use of the Property or any portion thereof in a manner that would adversely affect the integrity of any engineered components at the closed Facility that constitute the constructed cap, ground water monitoring network;
 - b. The extraction and use of ground water on the Property for any purpose except sampling or remediation of the ground water, or dewatering during construction or subsurface utility repair; and
 - c. The construction of occupied structures on the Property without prior authorization from Ohio EPA.
28. The Environmental Covenant for the Property is drafted in accordance with ORC Sections 5301.80 through 5301.92 in order to impose activity and use limitations on the Property, and must be recorded with the Morgan County Recorder's Office. A copy of the Environmental Covenant including attachments is attached as Exhibit 3 hereto and incorporated herein.

V. ORDERS

Respondents shall achieve compliance with Chapter 3734. of the Ohio Revised Code and the rules promulgated thereunder, according to the compliance schedule provided in the following Orders. These Orders do not supersede the Director's Final Findings and Orders issued to Respondents on February 13, 1995, and as modified in 2002 and 2018.

1. Respondent Commissioners shall implement the Corrective Measures Plan dated July 29, 2020 (CMP-2020). The narrative portion of the CMP-2020 is attached as Exhibit 1 hereto. The entirety of the CMP-2020 is incorporated herein as if fully rewritten, and can be viewed via Ohio EPA's eDocument database under Document ID 1383224.
2. Respondent Commissioners shall sample and analyze ground water annually at the Facility as described in the CMP-2020. After each sampling event, Respondent Commissioners shall evaluate the resulting data to determine if additional source controls are required. Sampling and analysis of ground water shall continue throughout the remainder of the post-closure care period.
3. Respondent Commissioners may discontinue the ground water monitoring program if, at the end of the post-closure care period, data from sampling and analysis of ground water indicates that the conditions for finalization of ground water monitoring as specified in the GSWMP-2020 have been met. The GSWMP-

2020 is attached as Exhibit 2 hereto and incorporated herein as if fully rewritten.

4. Respondent Charity Gas shall make access to the Property available to Respondent Commissioners and its agents, employees, contractors, and essential personnel to perform ground water monitoring and other post-closure care obligations. Respondent Charity Gas shall not interfere with the performance of post-closure care and ground water monitoring obligations of Respondent Commissioners.
5. Respondents Commissioners and Charity Gas shall execute and record the Environmental Covenant attached as Exhibit 3 hereto and incorporated herein as if fully rewritten. The parties agree that the Environmental Covenant was prepared in accordance with ORC Sections 5301.80 through 5301.92 as an equitable servitude on the land to impose activity and use limitations on the Property owned by Respondent Charity Gas and its successor(s) in interest as described in the Environmental Covenant.
6. No later than thirty (30) days after the effective date of these Orders, Respondent Commissioners shall record with the Morgan County Recorder's Office the Environmental Covenant including exhibits in the same manner as a deed to the property in accordance with 5301.88. No later than thirty (30) days after recording the Environmental Covenant, Respondent Commissioners shall submit to Ohio EPA and Respondent Charity Gas a file stamped copy of the recorded Environmental Covenant including exhibits.

VI. TERMINATION

Respondents' obligations under these Orders shall terminate when Respondents certify in writing and demonstrate to the satisfaction of Ohio EPA that Respondents have performed all obligations under these Orders and the Chief of Ohio EPA's Division of Materials and Waste Management acknowledges, in writing, the termination of these Orders. If Ohio EPA does not agree that all obligations have been performed, then Ohio EPA will notify Respondents of the obligations that have not been performed, in which case Respondents shall have an opportunity to address any such deficiencies and seek termination as described above.

The certification shall contain the following attestation: "I certify that the information contained in or accompanying this certification is true, accurate and complete."

This certification shall be submitted by Respondents to Ohio EPA and shall be signed by a responsible official of Respondents. For purposes of these Orders, a responsible official is any person identified in OAC Rule 3745-500-50.

VII. OTHER CLAIMS

Nothing in these Orders shall constitute or be construed as a release from any claim, cause of action or demand in law or equity against any person, firm, partnership or

corporation, not a party to these Orders, for any liability arising from, or related to, the operation of the Facility.

VIII. OTHER APPLICABLE LAWS

All actions required to be taken pursuant to these Orders shall be undertaken in accordance with the requirements of all applicable local, state and federal laws and regulations. These Orders do not waive or compromise the applicability and enforcement of any other statutes or regulations applicable to Respondents.

IX. MODIFICATIONS

These Orders may be modified by agreement of the parties hereto. Modifications shall be in writing and shall be effective on the date entered in the journal of the Director of Ohio EPA. Any proposed modification to the approved CMP-2020 attached hereto as Exhibit 1 to these Orders shall be submitted in writing and shall not be effective until approved in writing by the Ohio EPA and will not require a modification to the Order.

X. NOTICE

All documents required to be submitted by Respondent pursuant to these Orders shall be addressed to:

Ohio Environmental Protection Agency
Southeast District Office
Division of Materials and Waste Management
2195 Front Street
Logan, Ohio 43138
Attn: Supervisor, Division of Materials and Waste Management

or to such persons and addresses as may hereafter be otherwise specified in writing by Ohio EPA.

XI. RESERVATION OF RIGHTS

Ohio EPA and Respondents each reserve all rights, privileges and causes of action, except as specifically waived in Section XII of these Orders.

XII. WAIVER

In order to resolve disputed claims, without admission of fact, violation or liability, and in lieu of further enforcement action by Ohio EPA for only the violations specifically cited in these Orders, Respondents consent to the issuance of these Orders and agree to comply with these Orders. Compliance with these Orders shall be a full accord and

satisfaction for Respondents' liability for any violations specifically cited herein.

Respondents hereby waive the right to appeal the issuance, terms and conditions, and service of these Orders, and Respondents hereby waive any and all rights Respondents may have to seek administrative or judicial review of these Orders either in law or equity.

Notwithstanding the preceding, Ohio EPA and Respondents agree that if these Orders are appealed by any other party to the Environmental Review Appeals Commission, or any court, Respondents retain the right to intervene and participate in such appeal. In such an event, Respondents shall continue to comply with these Orders notwithstanding such appeal and intervention unless these Orders are stayed, vacated or modified.

XIII. EFFECTIVE DATE

The effective date of these Orders is the date these Orders are entered into the Ohio EPA Director's journal.

XIV. SIGNATORY AUTHORITY

Each undersigned representative of a party to these Orders certifies that he or she is fully authorized to enter into these Orders and to legally bind such party to these Orders.

IT IS SO ORDERED AND AGREED:

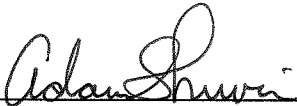
Ohio Environmental Protection Agency



Laurie A. Stevenson
Director

IT IS SO AGREED:

Morgan County Commissioners



Adam Shriver, Commissioner

8-31-20

Date



Tom Bragg, Commissioner

8-31-20

Date



Mike Reed, Commissioner

8-31-2020

Date

IT IS SO AGREED:

Owner


Charity Oil and Gas

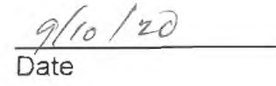

Date

Exhibit 1 – Corrective Measures Plan

**CORRECTIVE MEASURES PLAN
MORGAN COUNTY LANDFILL
Morgan County, Ohio**

Submitted on Behalf of the:

**MORGAN COUNTY COMMISSIONERS
Morgan County, Ohio**

Prepared By:



**1055 Andrew Drive, Suite A
West Chester, Pennsylvania**

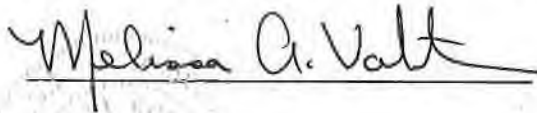
**Revised July 29, 2020
Revised November 16, 2016
(December 17, 2015)
95-154-03**


I hereby certify that I am a qualified groundwater scientist as defined by OAC 3745-400 (HH), and to the best of my knowledge the contents of the submitted 2020 Corrective Measures Plan are true and complete and are intended to comply with the requirements of the Ohio Administrative Code 3745-27-10.

Bernard B. Beegle., CPG.
Senior Project Professional

The undersigned hereby affirms that the statements made in the forgoing affidavit are true, under penalty or perjury.

Subscribed and affirmed to before me this 29th of July, 2020, by





Commonwealth of Pennsylvania

Notarial Seal
MELISSA A VALENTIN – Notary Public
WEST GOSHEN TWP, CHESTER COUNTY
My Commission Expires Jun 9, 2021

TABLE OF CONTENTS

PAGE NO.:

1.0	Introduction	1-1
1.1	Purpose and Scope	1-1
1.2	Overview of Regulatory Process	1-2
1.2.1	Detection Monitoring Program	1-2
1.2.2	Groundwater Quality Assessment Program	1-3
1.2.3	Corrective Measures Program	1-3
1.2.3.1	Notification of Persons Owning Land Above the Contaminant Plume	1-3
1.2.3.2	Public Meeting	1-4
1.3	Report Organization	1-4
2.0	Site Background.....	2-1
2.1	Location and Description.....	2-1
2.1.1	Location	2-1
2.1.2	Description of Significant Site Features.....	2-1
2.1.3	Surrounding Land Use Types	2-2
2.2	Ownership and Operational History	2-2
2.2.1	Landfill History	2-2
2.2.2	Landfill History	2-3
2.3	Landfill Capping	2-3
3.0	Geology and Hydrogeology.....	3-1
3.1	Regional Geology	3-1
3.2	Regional Hydrogeology.....	3-1
3.3	Site Geology	3-2
3.4	Site Hydrogeology.....	3-2
3.5	Groundwater Monitoring Program	3-4
3.6	Summary of Conceptual Site Model and Current Conditions.....	3-4
3.6.1	Conceptual Site Model.....	3-4
3.6.2	Groundwater Impacts Within the SZS are Limited	3-5

TABLE OF CONTENTS (Continued)

	<u>PAGE NO.:</u>
4.0 Current Potential Pathways Evaluation	4-1
4.1 Exposure Setting and Media	4-1
4.2 [Deleted]	4-2
4.3 Evaluation of Potential Exposure Routes	4-3
4.3.1 Ingestion	4-3
4.3.2 Inhalation	4-3
4.3.3 Direct Contact	4-4
4.3.4 Potential Receptors	4-4
4.4 Exposure Evaluation Summary	4-5
4.5 Area-Specific Exposure Summary	4-6
4.5.1 Northern Municipal Waste Disposal Area	4-6
4.5.2 Drum Disposal Area	4-7
4.5.3 Northern Sludge Disposal Area	4-8
4.5.4 Southern Sludge Disposal Area	4-9
4.5.5 Southern Municipal Waste Disposal Area	4-10
5.0 Screening of Corrective Measures Alternatives	5-1
6.0 Determination that Remediation is not Necessary	6-1
6.1 Re-Evaluation Levels for Contaminants	6-2
7.0 Conclusions and Recommendations	7-1
8.0 References	8-1

LIST OF TABLES

TABLE

4-1	Detected Constituents of Concern in Groundwater Summary
4-2	Detected Constituents of Concern in Surface Water Summary
6-1	Summary of Re-Evaluation Levels for Groundwater and Surface Water

LIST OF FIGURES

FIGURE

- 2-1 Site Location Map
- 2-2 Site Plan
- 3-1 Significant Zone of Saturation Inferred Water Table Map May 18, 2015

LIST OF APPENDICES

APPENDIX

- A Advanced GeoServices letter dated April 11, 2003
- B Ohio EPA's letter Dated January 28, 2014
- C Ecological Stream Survey Results
- D Post-Closure Groundwater and Surface Water Monitoring Plan

1.0 INTRODUCTION

1.1 PURPOSE AND SCOPE

This Corrective Measures Plan (CMP) is submitted to the Ohio Environmental Protection Agency (Ohio EPA), on behalf of the Morgan County Commissioners (MCCs) under an agreement with the MCCs and Gould Electronics Inc. (Gould) for the Morgan County Landfill (MCLF, MCLF Property or the Site), located in McConnelsville, Morgan County, Ohio. Advanced GeoServices Corp. (Advanced GeoServices) prepared this CMP on behalf of the MCCs to supplement the initial CMP submitted on November 9, 1999, and revised on October, 2000 (hereafter referred to as the 2000 CMP) and further revised on December 17, 2015 and November 16, 2016.

The Ohio EPA submitted comments regarding the October 2000 CMP on March 1, 2002. Advanced GeoServices, on behalf of the MCCs, submitted a letter dated April 11, 2003 (see Appendix A) to the Ohio EPA containing information to initiate further discussions regarding technical issues presented in the Ohio EPA March 1, 2002 comments on the 2000 CMP. The next Ohio EPA response regarding the 2000 CMP came during November 2013 when the Ohio EPA requested a meeting to be held with the MCCs and Gould to discuss closure of the 2000 CMP.

A meeting was held with the Ohio EPA, Gould and the MCCs on January 13, 2014 at the MCCs office to discuss closure of the 2000 CMP. Presented in Appendix B is an Ohio EPA Letter dated January 28, 2014 that provides the Ohio EPA summary of the January 13, 2014 meeting. During the meeting, the Ohio EPA stated that the MCLF semi-annual groundwater and surface water monitoring results over the last 10 years could be used to develop an approvable CMP and demonstrate the landfill cap at the MCLF is effective. The Ohio EPA offered to conduct an ecological stream survey at the Site to ensure the waters of the State are not negatively impacted by the MCLF.

Ohio EPA conducted the ecological stream survey at the Site on June 30, and July 3, 2014. During a telephone conference call with the Ohio EPA and Gould on June 4, 2015, the Ohio EPA stated the ecological stream survey results show the MCLF is not measurably impacting the Site

streams. During the June 4, 2015 telephone conference call, the Ohio EPA requested submission of an updated CMP and agreed that the “No Further Action” Alternative, as recommended in the 2000 CMP, was appropriate to bring closure to the MCLF. The “No Further Action” Alternative includes deed restrictions on groundwater and land use, post-closure care of the MCLF and a post-closure groundwater and surface water monitoring plan.

This CMP was developed on behalf of the MCCs in accordance with Ohio Administrative Code (OAC) 3745-27-10(F) dated August 15, 2003 to satisfy the Final Findings and Orders issued to the MCCs and effective February 13, 1995 and May 22, 2002 (Order) for the MCLF and supplements the 2000 CMP.

This CMP contains the post-closure groundwater and surface water monitoring plan. It is our understanding that the Ohio EPA is in discussions with the owner of the Site to obtain the deed restrictions on groundwater and land use requirements of the “No Further Action” Alternative. Also it is our understanding that the Ohio EPA has requested the MCCs submit to the Ohio EPA their own closure care plan under separate cover to address the MCLF long-term care (operations and maintenance) in accordance with OAC 3745-27-14.

1.2 OVERVIEW OF REGULATORY PROCESS

A requirement of the Order was to implement a Groundwater Monitoring Program in accordance with OAC Rule 3745-27-10. The components of OAC 3745-27-10 include the following:

- Groundwater Detection Monitoring Program;
- Groundwater Quality Assessment Monitoring Program; and,
- Corrective Measures Program.

1.2.1 Detection Monitoring Program

The objective of the Groundwater Detection Monitoring Program is to determine if a release of landfill leachate or leachate-derived constituents into groundwater has occurred. This program was implemented in April 1996 by conducting a Hydrogeologic Site Investigation (HSI). The HSI

determined that a release of landfill leachate or leachate-derived constituents to groundwater had occurred. More details regarding the HSI are provided in Section 3.5.1 of the 2000 CMP.

1.2.2 Groundwater Quality Assessment Program

In accordance with OAC 3745-27-10, once it is determined through the Groundwater Detection Monitoring Program, that a release to groundwater has occurred, a Groundwater Quality Assessment Monitoring Program (GWQAP) and a Corrective Measures Program are required to be implemented. The GWQAP was implemented to determine the rate, extent, and concentrations of leachate or leachate-derived constituents detected in groundwater. The GWQAP was initiated from April 1997 through November 1998 by the implementation of four rounds of semiannual monitoring that defined the rate, extent, and concentrations of contaminants. In accordance with OAC 3745-27-10(E)(8) and (10), the semiannual monitoring has continued from May 1999 through November 2019 (total of 45 semiannual monitoring events).

1.2.3 Corrective Measures Program

Under OAC 3745-27-10, once the rate, extent, and concentrations of contaminants have been determined, a CMP is developed. The objective of the CMP is to evaluate practicable groundwater remediation procedures that will:

- Attain the concentration levels per OAC 3745-27-10 (F) (7) for each leachate or leachate-derived constituent;
- Control the source of the release; and
- Eliminate further releases.

1.2.3.1 **Notification of Persons Owning Land above the Contaminant Plume**

In accordance with OAC 3745-27-10(E)(9), the US Army National Guard was notified, by a certified letter dated September 15, 1998, of the presence of benzene in one piezometer (PZ-7) located on their property (see Appendix A of 2000 CMP). Benzene was detected at a concentration of 1.7 micrograms per liter ($\mu\text{g/l}$) during the May 1998 sampling event. The concentration was below the USEPA Maximum Contaminant Level (MCL) of 5 $\mu\text{g/l}$. Benzene

had not been detected in piezometer PZ-7 during the November 1998 sampling event and sampling at piezometer PZ-7 was discontinued. With Ohio EPA approval, PZ-7 was decommissioned in August 2015.

1.2.3.2 Public Meeting

Copies of the reports completed in accordance with OAC 3745-27-10 were placed in a public repository (public library) in McConnelsville, Ohio. Within 30 days of submitting the November 9, 1999 CMP to the Director, copies of the Ground Water Quality Assessment Report and the November 9, 1999 CMP were placed in the McConnelsville Public Library.

Within 60 days of submitting the November 9, 1999 CMP to the Director, a public meeting was held with interested and affected parties in accordance with OAC 3745-27-10(F)(4). A notice of the public meeting was placed in the Morgan County Herald at least 30 days before the public meeting. The public meeting was held at the Morgan County Courthouse on January 6, 2000. Comments were recorded and sent for transcription. The transcript was submitted to the Southeastern District Office of the Ohio EPA and the Morgan County Department of Health.

1.3 REPORT ORGANIZATION

The remainder of this report is formatted into the following Sections:

- Section 2.0 Site Background
- Section 3.0 Geology and Hydrogeology
- Section 4.0 Current Potential Pathways Evaluation
- Section 5.0 Screening of Corrective Measures Alternatives
- Section 6.0 Determination that Remediation is not Necessary
- Section 7.0 Conclusions and Recommendations
- Section 8.0 References

2.0 SITE BACKGROUND

2.1 LOCATION AND DESCRIPTION

2.1.1 Location

The Site is located in the central portion of Morgan County, about 1 mile east of McConnelsville, Ohio as shown on Figure 2-1. Specifically, the Site is located in the northern half of Section 12, Township 10N, Range 12W of Morgan County, Ohio. Geographically, the Site is located within the Kanauha Section of the Allegheny Plateau province in the Appalachian Highlands (Norling, 1958).

2.1.2 Description of Significant Site Features

The portion of the property leased to the MCC's for the MCLF (the Site), consists of approximately 70 acres; the original property consisted of approximately 202 acres in total. There are five separate landfill disposal areas that comprise approximately 9 acres of the Site as shown on Figure 2-2. The waste disposal areas depicted on Figure 2-2 are based primarily on Dodson-Lindblom Associates, Inc.'s waste delineation study in their Interim Report No. 1, Closure of Morgan County Landfill, February 14, 1995. The extent of the Southern Municipal Waste Disposal Area was further defined using the results of a geophysical survey conducted by Bay Geophysical Associates, Inc. and by observations of debris at the ground surface during the HSI.

Topographic relief on the Site is high, with up to 200 feet variation in elevation across the Site. The Site is highly dissected by streams. Drainage at the Site has been altered by quarrying activities, resulting in the development of several on-Site ponds. The ponds are drained by an unnamed tributary to Bell Creek, which flows in a southerly direction to its confluence with Bell Creek (0.5 mile downstream), and then on to the Muskingum River just south of McConnelsville (0.75 mile downstream).

2.1.3 Surrounding Land Use Types

The Site is bordered by Route 60 to the south, a military reserve base to the north, a residential property to the east, and an undeveloped portion of land to the west (Figure 2-2). Residential properties are located across Route 60 from the Site, and are situated at elevations higher than surface elevations at the Site.

2.2 OWNERSHIP AND OPERATIONAL HISTORY

2.2.1 Landfill History

The property that contains the MCLF was owned by the late Francis Eugene Haines (deceased November 7, 2013) and Ruth Eileen Haines (deceased February 6, 2015). The property was used as a farm until 1963. Haines Industrial Stone Company began a quarrying operation at the property in 1963 which continued until approximately 1975. The MCCs leased a 70-acre portion of Haines's property in 1971 for use as a landfill. Only about 9 acres were actually used as landfill disposal cells. Elwood Roberts operated the landfill from 1971 to 1974. William R. Miller was the operator and license holder for the MCLF from 1974 to 1988. Charity Gas acquired the current parcel constituting of the MCLF Property on April 19, 2019, following a transaction in which the MCLF Property was split from a larger parcel which had been owned by the Haines family. The MCLF Property (the Site) consists of an approximately 134.7280 acre tract of land, tax parcel # 130-001-393-4, located on Route 60, McConnelsville, Morgan County, Ohio, being part of Range No. 12, Township 10, Section 12. The closed MCLP limits of municipal solid waste placement are wholly located within the boundaries of the MCLF Property. The Ohio EPA is working with the present owner, Charity Gas, to implement the Site deed restrictions on groundwater and land use as part of the recommended "No Further Action" Alternative.

Gas wells are or have been in operation at the property. Three to five gas wells were drilled at the property into the Berea Sand (1,502 to 1,584 ft below ground surface (bgs) or the Medina Sand (4,741 to 4,772 ft bgs) in the early 1980s. According to the previous owner, three gas wells were active and owned by Consort Energy of Canton, Ohio as of December 2015.

2.2.2 Landfill History

The plans for the MCLF were approved by the Ohio EPA and a permit to install (PTI) was issued to the MCCs in late 1971. Morgan County began formal landfilling of municipal waste between late 1971 and early 1972 in the Northern Municipal Waste Disposal Area (NMWDA). Landfill materials reportedly consisted entirely of municipal waste until 1974 when the MCLF began accepting metal hydroxide sludges at the Site. Metal hydroxide sludges were mixed with municipal waste and placed in the NMWDA.

In 1979, a PTI was issued for the placement of the metal sludges in segregated trenches within two portions of the Site. These areas, identified as the Northern Sludge Disposal Area (NSDA) and the Southern Sludge Disposal Area (SSDA), were used for sludge disposal until 1981.

The Southern Municipal Waste Disposal Area (SMWDA) reportedly operated as a municipal waste landfill in the early to mid-1980s.

In 1984, Ohio EPA discovered several rusty drums protruding from the ground to the north of the NSDA. This area has been identified as the Drum Disposal Area (DDA). William Miller, the landfill operator reported that these drums contained paint residues.

The landfill stopped receiving municipal waste in September 1988 and a soil cover was placed over the disposal cells.

2.3 LANDFILL CAPPING

Verification of the adequacy of the soil cover over the disposal cells was conducted by Dodson-Lindblom Associates Inc. for the MCCs. The results were provided in their Interim Report No. 1, Closure of Morgan County Landfill February 14, 1995 (DLA, 1995). A total of eight test pits and 41 test holes were completed to evaluate the existing cap material. The cap was required by the Order to be in accordance with the June 9, 1993 Guidance Document "Standards for Current Construction of a 1976 Cap System". Those requirements are as follows (DLA, 1995):

- 100% of the material particles must pass a 10-inch screen with no more than two percent (2%) particles from a 50 cubic-foot sample retained on a 6-inch screen;
- 95% of the material must pass a 3-inch sieve;
- 70% of the material must pass a #10 sieve; and
- The material that passes the #10 sieve must be classified using the USDA textural classification chart, and be a soil type listed in OAC 3745-27-09(F)(4) as effective July 29, 1976.

The MCCs contracted Petro Environmental to install a compressed soil cap over the landfill disposal areas where the DLA study determined it was needed to comply with the Order, issued and effective February 13, 1995. The cap was installed in the spring of 1997. As stated in Section 2.2.2, prior to installation of the cap, the waste materials had only been covered with soil as was required during municipal landfill operations. The compressed soil cap (permeability of 1×10^{-5} cm/sec) was installed to prevent direct exposure to waste materials and to reduce infiltration of precipitation through the waste materials. Also, per the Order, the disposal areas were seeded to produce a dense vegetative cover. Cap upgrades to improve the vegetative cover have been performed by the MCCs as requested by the Ohio EPA. Oversight of the capping was conducted by the Ohio EPA.

3.0 GEOLOGY AND HYDROGEOLOGY

3.1 REGIONAL GEOLOGY

The McConnelsville area is underlain by Pennsylvania Age rocks consisting of the Monongahela Series. The Monongahela Series consist predominantly of shale, limestone, clay, sandstone, and coal. The shales and sandstones show strong regional and local lithologic variations. The rocks outcrop in bands that trend south-southwest to north-northeast, and dip gently to the southeast at a slope of 30 feet per mile (Norling, 1958).

The formations encountered regionally from youngest to oldest are as follows:

1. Arnoldsburg Limestones and shales;
2. Fulton Green Shale;
3. Benwood Limestone and Shales;
4. Upper Sewickley Sandstone and Shale;
5. Meigs Creek (No. 9) Coal;
6. Lower Sewickley Sandstone; and
7. Fishpot Limestone.

The Fulton Green Shale and the Upper Sewickley Sandstone and Shales are typically absent in the eastern portion of Morgan Township (i.e., in the area of MCLF).

3.2 REGIONAL HYDROGEOLOGY

Groundwater resource characteristics in the region vary greatly and are developed in the bedrock in the upland areas and in the sand and gravel deposits along the Muskingum River in the lowlands. Wells completed in the bedrock produce an average of 2 gallons per minute (gpm) and dry holes are common (Walker, 1962). Wells completed in the sand and gravel deposits along the Muskingum River can yield up to 500 gpm. Groundwater flow in the area is typically from the hilltops to springs, ponds, and streams in the valleys.

3.3 SITE GEOLOGY

The Site geology is characterized by 10 to 18 feet of overburden overlying the bedrock of the Monongahela Series. The overburden over most of the Site consists of 10 to 18 feet of highly disturbed native soils which have been placed as fill in the areas of quarrying and mining. The soils are classified as gray to red silts and clays with some gravel and coal.

Geologic cross-sections were developed using the data collected during the HIS and are presented in the 2000 CMP. Figure 3-1 of the 2000 CMP shows the locations of the cross-sections on a Site plan. Figures 3-2 through 3-5 of the 2000 CMP depict the Site in cross-sectional view.

The Monongahela Series Bedrock underlying the overburden at the Site consists of the Arnoldsburg Limestone and Shale, the Benwood Limestone and Shale, the Meigs Creek (No. 9) Coal, the Lower Sewickley Sandstone and Shale, and the Fishpot Limestone. Much of the Arnoldsburg and Benwood have been removed by quarrying and mining activities on the eastern portion of the Site. The rocks are generally flat-lying and bedding is nearly horizontal.

The Meigs Creek (No. 9) Coal is encountered at an elevation of approximately 920 feet mean sea level (MSL) throughout the Site and is the most continuous strata at the Site. Where encountered, it ranges in thickness from 2.5 to 5.0 feet.

The Lower Sewickley, identified as a gray to green shale, was encountered in the northeastern portion of the Site and ranged from 8 to 10 feet in thickness. The Lower Sewickley apparently pinches out to the south where the Fishpot Limestone was encountered directly in contact with the Meigs Creek (No. 9) Coal.

3.4 SITE HYDROGEOLOGY

The uppermost aquifer at the Site and regionally is defined as the saturated zone used by area residents for drinking water supplies. As part of the 2000 CMP, a one-mile radius well survey was completed through the Ohio Department of Natural Resources (ODNR) and the Ohio

Geological Survey. Typical yields of wells completed in the uppermost aquifer near the Site average approximately 3.7 gpm. The wells encountered water at approximately 900 to 975 feet MSL.

Based on this regional well information, the uppermost aquifer at the Site is determined by zones of saturation between about 900 to 975 feet MSL, yielding approximately 3 to 4 gpm. The hydrogeology of the Site has been altered by the quarrying and mining activities that have been conducted. The uppermost aquifer is now present in only the northwest portion of the Site where surface elevations are greater than approximately 970 feet MSL. The area of the Site where the uppermost aquifer is present is shown on Figure 3-6 of the 2000 CMP. The monitoring points installed in the uppermost aquifer were completed at elevations ranging from 957 to 968 feet MSL, and yielded 1 to 5 gpm. Groundwater flow in this unit can only be generally predicted because only two wells could be installed in this aquifer at the Site due to its limited presence. In general, it appears as though the uppermost aquifer is highly dissected by stream valleys and discharges to surface waters. Because the aquifer is highly dissected and the uppermost aquifer at the Site exists only in the northwestern portion, the uppermost aquifer is not hydraulically connected to the zone from which residents obtain drinking water.

Since the uppermost aquifer is absent over the majority of the Site (including the areas around the waste disposal cells), the first significant zone of saturation (SZS)¹ that was encountered beneath the removed uppermost aquifer was identified as the zone to be monitored for Site-related constituents. The SZS is characterized as multiple, thin perched groundwater horizons. This interpretation is supported by the unsustainable yields and low storage features as determined by slug tests conducted during the HSI, which is discussed in Section 3.5.1 of the 2000 CMP. The SZS exists along bedding planes at an elevation of approximately 870 to 890 ft MSL across most of the Site.

¹A significant zone of saturation is defined as “a hydrogeologic unit in a zone of saturation that possesses certain hydraulic properties that allow it to transmit groundwater and contaminants at a faster rate than surrounding geologic units”. These zones do not have to be capable of yielding a significant amount of water to a well or developed spring (Ohio EPA, 1991).

The apparent extremely high hydraulic gradient (approximately 0.18 ft./ft.) further indicates that the SZS is comprised of a series of unconnected, perched, flow zones with low transmissivity. The SZS inferred water table map dated May 18, 2015 (Figure 3-1) depicts a generalized pattern of groundwater movement. However, the SZS is not a hydraulically connected or spatially continuous flow system and should not be characterized as an areally extensive porous medium. Water contained within these zones is prevented from significant downward movement by the nearly horizontal sedimentary bedding which restricts flow creating steep hydraulic gradients.

Since the groundwater is unable to move vertically to any significant extent, it is forced out of the ground where the flow zones (i.e., bedding planes) intersect the ground surface as seeps and springs. An estimated zone of discharge for the SZS at the Site is depicted on Figure 3-1. This zone of discharge approximates where the SZS would discharge along bedding planes at the ground surface as seeps or springs and shows that the groundwater is discharging at the Site and not flowing off-Site. Based on the results of the HSI and subsequent studies, the volume of water that would discharge is expected to be very low, and is likely not observable except during periods of extremely high precipitation. The water that would typically discharge is likely absorbed into the soil cover or evapotranspired by vegetation.

3.5 GROUNDWATER MONITORING PROGRAM

The Hydrogeologic Site Investigation, the Groundwater Quality Assessment Monitoring Program and the Semiannual Determinations of Rate, Extent and Concentration discussions are presented in sections 3.5.1, 3.5.2 and 3.5.3, respectively, of the 2000 CMP.

3.6 SUMMARY OF CONCEPTUAL SITE MODEL AND CURRENT CONDITIONS

3.6.1 Conceptual Site Model

The groundwater impacts in excess of drinking water maximum contaminant levels (MCLs) for contaminants in the SZS at the Site are limited to areas immediately downgradient of waste disposal areas. The depth to groundwater near these disposal cells is approximately 20 feet below ground surface in the non-fractured bedrock. Groundwater flow is controlled

predominantly by secondary porosity of the bedrock (i.e., along bedding planes). Since the bedding is nearly horizontal, vertical groundwater movement is impeded such that groundwater moves laterally along bedding planes and discharges at seeps and springs. Low storage and unsustainable yields are typical of the SZS. Assuming a fully saturated section for the SZS (20') and a 750' length (distance between MW-2 and MW-8) and using the hydraulic conductivity and gradient values presented in the HSI and Section 3 of the 2000 CMP, the SZS is capable of transmitting 0.034 gallons per minute. This would be an extremely low discharge rate for an individual well and, since it represents discharge from a 750 foot length of the significant zone, demonstrates the extremely small volume of water present in this zone. Although this zone contains volatile organic compounds (VOCs) in excess of MCLs, the total volume of water present in this zone is likely only several thousand gallons. The volume of water in the SZS is so small that water is not observed discharging as seeps or springs except during periods of high precipitation. This low volume is consistent with the surface water quality results, which show that the surface water concentrations have not exceeded the outside mixing zone averages (OMZA) for the protection of aquatic life at any location. Even though individual wells, which monitor small local volumes of water, show that MCLs have been exceeded, these exceedances do not extend beyond the localized occurrence of the SZS.

3.6.2 Groundwater Impacts within the SZS Are Limited

The MCCs have been monitoring Site groundwater within the SZS and surface water quality semi-annually since the spring of 1997. Sample analyses include VOCs, semi-volatile organic compounds (SVOCS), metals, herbicides, pesticides and polychlorinated biphenyls (PCBs). Based on the analytical results from the first 36 semi-annual groundwater and surface water sampling events (April 1997 through November 2014), the Ohio EPA agreed that SVOCS, metals, herbicides, pesticides and PCBs are not constituents of concern (COCs) in Site groundwater and surface water.

The primary COCs in the SZS are four chlorinated VOCs: Tetrachloroethylene (PCE), Trichloroethylene (TCE), Cis-1,2-Dichloroethylene (Cis-1,2-DCE) and Vinyl Chloride. The VOC-impacted groundwater in the SZS in excess of OMZA surface water criteria for protection of aquatic life (January 12, 2015) at the Site is currently limited to one parameter (PCE) in PZ-6.

VOCs in groundwater at the Site beyond the SZS appear to be naturally attenuating between the disposal areas and the perimeter monitoring points. Reductive dechlorination is an important process for natural biodegradation of the highly chlorinated solvents (Wiedemeir, 1996). In general, reductive dechlorination occurs by the sequential dechlorination from PCE to TCE to cis-1,2-DCE to vinyl chloride to ethene. The presence of PCE and TCE in the monitoring wells near the disposal areas and the absence of these compounds in the monitoring wells (with the presence of the degradation products cis-1,2-DCE and vinyl chloride) near the Site perimeter indicates that these compounds are naturally degrading through anaerobic biodegradation processes.

Additionally, methane has been detected in the groundwater and surface water at the Site. Methane has been demonstrated in field studies to act as a cometabolite to aerobically biodegrade TCE, cis-1,2-DCE, and vinyl chloride to carbon dioxide, chloride, and water (Semprini et al., 1990; Hazen et al., 1994). This aerobic biodegradation will enhance biodegradation of the chlorinated compounds as the groundwater is discharged at the on-Site seeps, springs, and ponds.

In summary, of the small volume of water that exists in the SZS, very little if any migrates to the extent that it can be detected beyond that zone.

4.0 CURRENT POTENTIAL PATHWAYS EVALUATION

4.1 EXPOSURE SETTING AND MEDIA

The Site is located in a predominantly rural area of Morgan County, one mile east of McConnellsville, Ohio. There are five separate waste disposal areas comprising approximately 9 acres of the Site.

The Site is bordered by an Army National Guard military base to the north, the residential property of the late Haines to the east, Route 60 to the south, and U.S. Army-owned undeveloped land to the west. The Site has substantial topographic relief and is highly dissected by streams. Several ponds also exist on-Site as a result of past mining activities.

Individual waste disposal areas are not fenced but have been capped with a 2-foot compressed soil cover (permeability of 1×10^{-5} cm/sec) and a vegetative cover as required by and in accordance with the Order.

As described in Section 3.2 of the 2000 CMP, the City of McConnellsville obtains its water supply from wells completed in the alluvial sediments along the Muskingum River which are not connected to the water bearing units on the MCLF Site. The uppermost aquifer in the surrounding McConnellsville area is used for residential water supply. The uppermost aquifer, where it exists on-Site, is not hydraulically connected to the uppermost aquifer off-Site. The aquifer occurs along bedding planes that are approximately flat-lying, and is essentially isolated by valleys such that it discharges to on-site streams that surround the topographic highs.

The SZS is not used at the Site or reasonably expected to be capable of being used in the future as a water supply resource. The SZS is limited in areally extent on Site and is not hydraulically connected to off-Site water supply sources. The SZS discharges on-Site to the ground surface as seeps, springs and/or into ponds. The SZS is not an aquifer and is not viable or capable of being used as a water supply due to its hydrogeologic characteristics (i.e., very low yield, low storativity and limited areal extent).

Site-related COCs (i.e., VOCs) concentrations in groundwater are highest adjacent to the waste disposal areas, with concentrations decreasing significantly near the Site boundary. The detected COCs in groundwater (SZS) from November 2000 through May 2015 (30 semi-annual sampling events) are presented in Table 4-1.

The detected COCs in Site surface water from November 2000 through May 2015 (30 semi-annual sampling events) are presented in Table 4-2. VOCs have been detected at surface water sampling locations: the Middle Pond (SW-3), the Lower Pond (SW-4), and the Southwest Pond (SW-6) and in one on-Site tributary stream at location SW-8. However, the detected VOC concentrations for constituents are between one and two orders of magnitude below their respective surface water OMZA. In addition, VOC surface water results have not exceeded drinking water MCLs. Surface water OMZAs have not been exceeded at the Site except for SVOC bis(2-ethylhexyl) phthalate at SW-3, SW-4 and SW-8. Historically, low-level bis(2-ethylhexyl)phthalate has been occasionally detected in groundwater and surface water samples at up to 89 µg/L, and its presence is likely attributable to laboratory contamination.

There does not appear to be human or environmental receptors associated with the Site waste disposal areas. As discussed in Section 1.1, the Ohio EPA conducted an ecological stream survey at the Site on June 30, 2014 and July 3, 2014. In an email dated April 20, 2015 (see Appendix C), the Ohio EPA provided results of the ecological stream survey. During a telephone conference call with the Ohio EPA and Gould on June 4, 2015 (see Appendix C), the Ohio EPA stated the ecological stream survey results show the MCLF is not measurably impacting the Site streams. Therefore, there are no potential human health or ecological impacts due to surface water at the Site. The post-closure groundwater and surface water monitoring plan will include re-evaluation criteria to make sure corrective measures continue to protect human health and the environment.

4.2 [DELETED]

4.3 EVALUATION OF POTENTIAL EXPOSURE ROUTES

4.3.1 Ingestion

Currently, there are no complete pathways for exposure through ingestion of Site-related constituents. The groundwater and surface waters are not used for drinking water at the Site and there is no hydraulic connection to off-Site water supply resources. Further, surface water is not impacted above the OMZAs established by the Ohio EPA. Although unlikely, incidental ingestion of surface water may occur if trespassers come in contact with surface water at the Site. VOC concentrations in surface water are below both the OMZAs for surface water (see Section 6.1) and drinking water MCLs, and therefore pose no risk to trespassers.

Site soils which may have been impacted by past disposal activities have been capped with a 2-foot compressed soil cover (permeability of 1×10^{-5} cm/sec) and a vegetative cover as required by and in accordance with the Order with the exception of the slopes of the DDA. Cap upgrades have been performed in the fall and winter of 1999 in the NMWDA, NSDA, SSDA and SMWDA. Consequently, ingestion of potential impacted soil is prevented by the existing cap.

4.3.2 Inhalation

As of the fall of 1999, the MCCs have established a complete vegetative cover over the NWMDA, NSDA, SSDA, DDA (except sideslopes) and SMWDA. There is no complete exposure pathway via inhalation to Site-related VOCs. Groundwater discharges at the ground surface as seeps and springs. VOCs detected in stream samples and VOC concentrations in pond samples have been below their respective OMZAs. If leachate seeps are observed during Site inspections, the seeps will be plugged by the MCCs as requested by the Ohio EPA. Based on the above, this pathway is considered incomplete.

4.3.3 Direct Contact

The existing caps prevent direct contact with the waste in the disposal areas. The MCCs have established a vegetative cover and if there continues to be no additional seeps, there will be no current complete pathway for exposure to the leachate seeps and/or any landfill contents in these areas. If leachate seeps are observed during Site inspections, the seeps will be plugged by the MCCs as requested by the Ohio EPA.

Only three (3) times in 45 semiannual monitoring events (May 2001, May 2002 and May 2003) over the last 22 years (and not at all over the past 17 years) has adequate flow been observed and sampling performed at the three man-made springs, SP-1, SP-2 and SP-3 (See Figure 3-1). In May 2001, May 2002 and May 2003, man-made spring SP-3, located northwest of the Lower Pond, contained detectable levels of PCE, TCE and cis-1,2-DCE, while VOCs have never been detected in springs SP-1 and SP-2. Springs have not been observed during the last 17 years of Site-related activities; therefore, no unacceptable exposure via springs exists.

Although the surface of the DDA is covered, the slopes remain uncovered and, as such, may present some opportunity for direct contact. However, there is no evidence that the soils in this area are contaminated or that the remnants of drums in this area contain chemicals or contaminated media.

4.3.4 Potential Receptors

There are no receptors for the Site groundwater. Potential receptors for contaminants in on-Site surface water bodies include ecological receptors, Site maintenance workers, and potential trespassers. Since VOCs detected in Site surface water are either not present or are at concentrations below the Ohio EPA OMZAs, there is no current or anticipated future risk of exposure to potential ecological or human receptors. An evaluation of ecological receptors is not necessary.

4.4 EXPOSURE EVALUATION SUMMARY

Based on the exposure evaluation, and considering that repairs to the cap have been made as necessary (i.e., established vegetative cover and plugging of seeps), the following conclusions can be made:

- Direct Contact: Complete pathways for direct contact exist for soils and drum material on the slopes of the DDA, and surface water throughout the Site. Though a complete pathway exists for surface water, the surface water concentrations are below the Ohio EPA OMZAs for the Site, and therefore, no unacceptable direct contact exposure exists. The potential exposure to seeps is controlled by the MCCs, who locate and plug seeps. Quarterly (at a minimum) inspections of the Site by the MCCs and maintenance of the soil cover and vegetative cover will protect against exposure in the future.
- Ingestion: There is no complete exposure pathway for groundwater via ingestion since the SZS at the Site is not used nor is it capable of being used as a drinking water source. Similarly, the SZS is not hydraulically connected to drinking water supplies off-Site.

There is no complete ingestion pathway for Site soils or landfill contents in the NMWDA, SMWDA, NSDA and SSDA since the contents are capped and the cap is maintained by the MCCs. Therefore, there is no potential for unacceptable exposure.

The only complete exposure pathways are for ingestion of Site soils at the DDA and incidental ingestion of Site surface water in ponds and springs by trespassers or maintenance workers. Although a complete pathway exists for surface water, the surface water concentrations are below the Ohio EPA OMZAs for the Site, and therefore, no unacceptable ingestion exposure exists for surface water. Quarterly (at a minimum) inspections of the Site by the MCCs and maintenance of the soil cover and vegetative cover will protect against exposure in the future.

- Inhalation: There is no complete exposure pathway for inhalation to Site-related compounds.

4.5 AREA-SPECIFIC EXPOSURE SUMMARY

4.5.1 Northern Municipal Waste Disposal Area

There is no current potential for exposure to contaminants associated with the NMWDA for the following reasons:

- The landfill area has been capped in accordance with the Orders, and the cap is maintained by the MCCs;
- Leachate outbreaks which are observed do not contain contaminants above the Ohio EPA established OMZAs. The landfill area is inspected quarterly by the MCCs, and any leachate seeps observed are eliminated;
- Groundwater which may be impacted by the NMWDA is not connected to any usable sources of drinking water and is not capable of being developed as a potable source of water based on its low yield, low storativity and limited areal extent (the affected zone only exists on-Site);
- Although impacted groundwater is hydraulically connected with surface waters to which leachate-related constituents may migrate, concentration of the constituents of concern have not exceeded their respective OMZAs in these waters; and,
- Surface water downgradient of the NMWDA (SW-2) is not impacted by this landfill area.

Corrective measures for this area were evaluated at the direction of Ohio EPA as discussed in the 2000 CMP. Based on the above information, further consideration of corrective measures for this area of the Site is not warranted. The current landfill cap and inspection program

conducted by the MCCS provide sufficient controls for the management of the Site, and the Post-Closure Groundwater and Surface Water Monitoring Plan (contained in Appendix D) describes the groundwater monitoring activities associated with this part of the Site.

4.5.2 Drum Disposal Area

The current potential for exposure to contaminants associated with the DDA includes direct contact or ingestion of soils which may contain contaminants related to the DDA. There is no other current potential for exposure to contaminants associated with the DDA for the following reasons:

- Groundwater which may be impacted by the DDA is not connected to any usable sources of drinking water and is not capable of being developed as a potable source of water based on its low yield, low storativity and limited areal extent (the affected zone only exists on-Site);
- Although impacted groundwater is hydraulically connected with surface waters to which leachate-related constituents may migrate, concentration of the constituents of concern have not exceeded their respective OMZAs in these waters; and,
- Surface water downgradient of the DDA (SW-3) is not impacted by this landfill area above the Ohio EPA OMZAs.

Based on the above information, as discussed in the 2000 CMP, the current landfill cap and inspection program conducted by the MCCs provide sufficient controls for the management of the Site, and the Post-Closure Groundwater and Surface Water Monitoring Plan (contained in Appendix D) describes the groundwater monitoring activities associated with this part of the Site.

4.5.3 Northern Sludge Disposal Area

There is no current potential for exposure to contaminants associated with the NSDA for the following reasons:

- The landfill area has been capped in accordance with the Orders, and the cap is maintained by the MCCs;
- Groundwater which may be impacted by the NSDA is not connected to any usable sources of drinking water and is not capable of being developed as a potable source of water based on its low yield, low storativity and limited areal extent (the affected zone only exists on-Site);
- Although impacted groundwater is hydraulically connected with surface waters to which leachate-related constituents may migrate, concentration of the constituents of concern have not exceeded their respective OMZAs in these waters; and,
- Surface water downgradient of the NSDA (Springs 1, 2 and 3 and SW-4) is not impacted. The springs have not been observed to flow in the past 12 years and the only COCs detected periodically in the Lower Pond (SW-4) are Cis-1,2-DCE at concentrations several orders of magnitude below the Ohio EPA OMZAs and PCE and TCE about one order of magnitude below the Ohio EPA OMZAs.

Corrective measures for this area were evaluated at the direction of Ohio EPA as discussed in the 2000 CMP. Based on the above information, further consideration of corrective measures for this area of the Site is not warranted. The current landfill cap and inspection program provide sufficient controls for the management of the Site, and the Post-Closure Groundwater and Surface Water Monitoring Plan (contained in Appendix D) describes the groundwater and surface water monitoring activities associated with this part of the Site.

4.5.4 Southern Sludge Disposal Area

There is no current potential for exposure to contaminants associated with the SSDA for the following reasons:

- The landfill area has been capped in accordance with the Orders and the cap is maintained by the MCCs;
- Groundwater which may be impacted by the SSDA is not connected to any usable sources of drinking water and is not capable of being developed as a potable source of water based on its low yield, low storativity and limited areal extent (the affected zone only exists on-Site);
- Although impacted groundwater is hydraulically connected with surface waters to which leachate-related constituents may migrate, concentration of the constituents of concern have not exceeded their respective OMZAs in these waters; and,
- Surface water downgradient of the SSDA (SW-4 and SW-8) is not impacted. The only COCs detected in the Lower Pond (SW-4) is Cis-1,2-DCE at concentrations several orders of magnitude below the Ohio EPA OMZA and PCE one order of magnitude below the Ohio EPA OMZA.
- The only contaminant detected in the SW-8 location over the last 15 years was Cis-1,2-DCE at concentrations several orders of magnitude below the Ohio EPA OMZA.

Corrective measures for this area were evaluated at the direction of Ohio EPA as discussed in the 2000 CMP. Based on the above information, further consideration of corrective measures for this area of the Site is not warranted. The current landfill cap and inspection program provide sufficient controls for the management of the Site, and the Post-Closure Groundwater and Surface Water Monitoring Plan (contained in Appendix D) describes the groundwater and surface water monitoring activities associated with this part of the Site.

4.5.5 Southern Municipal Waste Disposal Area

There is no current potential for exposure to contaminants associated with the SMWDA for the following reasons:

- The landfill area has been capped in accordance with the Orders and the cap is maintained by the MCCs;
- Groundwater which may be impacted by the SMWDA is not connected to any usable sources of drinking water and is not capable of being developed as a potable source of water based on its low yield, low storativity and limited areal extent (the affected zone only exists on-Site);
- Although impacted groundwater is hydraulically connected with surface waters to which leachate-related constituents may migrate, concentration of the constituents of concern have not exceeded their respective OMZAs in these waters; and,
- Surface water downgradient of the SMWDA (SW-6 and SW-7) is not impacted by this landfill area above Ohio EPA OMZAs.

Corrective measures for this area were evaluated at the direction of Ohio EPA as discussed in the 2000 CMP. Based on the above information, further consideration of corrective measures for this area of the Site is not warranted. The current landfill cap and inspection program provide sufficient controls for the management of the Site, and the Post-Closure Groundwater and Surface Water Monitoring Plan (contained in Appendix D) describes the groundwater and surface water monitoring activities associated with this part of the Site.

5.0 SCREENING OF CORRECTIVE MEASURES ALTERNATIVES

The objectives, the corrective measures alternatives and the results of the remedial alternatives screening process is presented in Sections 5.1, 5.2 and 5.3, respectively, of the 2000 CMP. The corrective measures that were screened were as follows:

- “No Further Action” with Deed Restrictions;
- Composite cap;
- Excavation and Off-site Disposal;
- Monitored Natural Attenuation;
- Reactive Wall;
- Air Sparging;
- Barrier Walls; and,
- Hydraulic Containment.

Remedial alternatives that were retained for further evaluation included:

- “No Further Action” with Deed Restrictions;
- Monitored Natural Attenuation;
- Composite Cap;
- Excavation with Off-Site Disposal;
- Interceptor Trench; and
- Reactive Wall.

Each of the above alternatives is evaluated in detail in Section 6.0 of the 2000 CMP. A comparative analysis of the alternatives is presented in Section 7.0 of the 2000 CMP.

6.0 DETERMINATION THAT REMEDIATION IS NOT NECESSARY

According to OAC 3745-27-10(F)(8), the Director may determine that remediation of a release of leachate or leachate-derived constituents from the sanitary landfill facility is not necessary if the owner or operator demonstrates that the groundwater is not currently or reasonably expected to be a source of drinking water and is not hydraulically connected to a source of drinking water.

Based on the results of the Groundwater Monitoring Program and the exposure evaluation of the Site, remediation is not necessary. The HSI and GWQA concluded that the SZS is not capable of being used as an aquifer and is not hydraulically connected to a source of drinking water. A well survey was done through the ODNR and the Ohio Geological Survey. The wells in the area are completed in the uppermost aquifer, which overlies the SZS. The uppermost aquifer, where encountered on the Site, is not impacted by the Site and is not hydraulically connected to the aquifer used by the area residents because it discharges to surface waters that have highly dissected the landscape. The wells located south of the Site are receiving water from saturated units that occur beneath the SZS, and these wells have not been impacted by historic waste disposal at the Site. The SZS discharges to the surface as seeps and springs only during periods of very high precipitation; typically seeps and springs are not observed at the Site. The SZS has very low storage and transmissivity and often purges dry during sampling at low flow rates (100 to 300 mls/min). Often samples cannot be collected for all analyses because the zone does not produce enough water over 24 hours to fill all of the sample bottles. There is no practical way to become exposed to this water, and it is not capable of being developed as a source of water for any purpose.

The water quality data indicates that no COCs in groundwater or surface water exceed drinking water MCLs or OMZAs at the Site boundary or point of groundwater discharge. There are no exceedances of surface water OMZAs in any surface water body on- or off-Site except for SVOC bis(2-ethylhexyl) phthalate at SW-3, SW-4, SW-6 and SW-8 (its presence is likely attributable to laboratory contamination). Therefore, based on the fact that the hydrogeologic characteristics at the Site meet the criteria set forth in OAC 3745-27-10(F)(8), no remediation is warranted.

6.1 RE-EVALUATION LEVELS FOR CONTAMINANTS

As discussed in the Post-Closure Groundwater and Surface Water Monitoring Plan in Appendix D, groundwater and surface water data will be collected and evaluated during the remainder of the post-closure monitoring period. The data collected will be compared to re-evaluation levels (RLs) for Site groundwater and surface water, which have been approved by Ohio EPA in accordance with OAC 3745-27-10(F)(8) and (9), as follows:

The 12 COCs in groundwater at the MCLF are benzene, ethylbenzene, TCE, 1,1-dichloroethylene, PCE, vinyl chloride, cis-1,2-DCE, toluene, chlorobenzene, 1,4-dichlorobenzene, methylene chloride and xylene. The groundwater RLs for the 12 COCs are established using their respective OMZA surface water criteria for aquatic life (January 12, 2015) with the exception of PCE. With the concurrence of Ohio EPA, the PCE RL has been established as the 95th percentile of the PCE concentrations obtained during the ten (10) sampling events conducted between November 2010 and May 2015. Table 6-1 summarizes the above 12 COCs and their respective RLs. These RLs are protective of human health and the environment.

7.0 CONCLUSIONS AND RECOMMENDATIONS

The following provides a summary of conditions at the Site. Currently, there is no exposure to Site-related constituents.

- Groundwater from the SZS is not used or capable of being used as a drinking water source and is not hydraulically connected to a drinking water source. Hydrogeologic conditions (discontinuous perched zones of saturation along bedding planes with extremely low storage and transmissivity) preclude the zone of saturation from consideration as a future use of potable supply.
- Groundwater from the SZS is discharged to the surface as seeps and springs only during periods of high precipitation. As part of the MCCs Post-Closure Care Plan, any leachate seeps observed during scheduled inspections by the MCCs will be plugged to prevent potential exposure at the ground surface. Surface water bodies that would indirectly receive this discharge do not have Site-related constituents in excess of surface water RLs. Therefore, there is no unacceptable environmental or human health risk related to groundwater or surface water at the Site.
- Site-related constituents are not detected above RLs in groundwater samples collected from perimeter wells.
- The existing cap that was completed in the spring of 1997 and upgraded in 1999 will continue to decrease leachate generation by reducing infiltration of precipitation. It will also continue to prevent direct exposure to wastes in the landfill.

Based on the analysis presented in this report, the following conclusions can be made regarding the evaluation of the practicable corrective measures alternatives for groundwater:

- Since there is no current exposure to groundwater at the Site, and since surface water VOC RLs are not exceeded, each remedial alternative provides equal protection to human health in relation to groundwater and surface water. However, implementation of institutional controls will provide additional assurances that no exposure to Site-related constituents will occur in the future. Deed restrictions will prohibit intrusive activities in the disposal areas as well as prohibit groundwater use at the Site.
- Post-closure groundwater monitoring will provide data with which to continue to assess groundwater quality. The existing cap over the disposal areas will reduce infiltration through the waste materials, and thereby the flux of contaminants to the groundwater.
- Previous Site reports have documented that natural attenuation processes (MNA) are currently reducing contaminant concentrations in groundwater. Monitoring these processes would not provide additional protection to human health and the environment above the “No Further Action” alternative, it would merely provide data with which to identify the degradation processes and track the degradation of contaminants.
- There is currently no threat to human health and the environment as determined in the exposure assessment.

Based on the evaluation of the practicable alternatives, the hydrogeologic characteristics at the Site, and the absence of risk, the following alternative is proposed:

- The “No Further Action” Alternative includes deed restrictions on groundwater and land use, Post-Closure Care of the MCLF and a Post-Closure Groundwater and Surface Water Monitoring Plan. The Post-Closure Groundwater and Surface

Water Monitoring Plan is provided in Appendix D. It is our understanding that the Ohio EPA is currently in discussions with the current property owner to obtain the deed restrictions on groundwater and land use requirements of the “No Further Action” Alternative. The deed restrictions will provide additional protection against exposure to Site-related constituents and will maintain current exposure scenarios (i.e., no exposure). Also it is our understanding that the Ohio EPA has requested the MCCs submit to the Ohio EPA their own closure care plan under separate cover to address the MCLF long-term care (operations and maintenance) in accordance with OAC 3745-27-14.

8.0 REFERENCES

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TABLES

TABLE 4-1
DETECTED CONSTITUENTS OF CONCERN IN GROUNDWATER SUMMARY
November 2000 through May 2015 Corrective Measures Plan
Morgan County Landfill
Morgan County, Ohio

Well ID	Date	1,1-Dichloroethene	1,4-Dichlorobenzene	Acetone	Benzene	Bis(2-ethylhexyl) phthalate	Butyl Benzyl Phthalate	Chlorobenzene	cis-1,2-Dichloroethene	Di-n-butyl Phthalate	Ethylbenzene	Methylene Chloride	Naphthalene	Tetrachloroethene	Toluene	Trichloroethene	Vinyl Chloride	Xylene (Total)
		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
MW-11	Nov-00	--	--	--	--	5	--	--	--	--	--	--	--	--	--	--	--	--
	May-01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-01	--	--	64	--	15	--	--	--	--	--	--	--	--	--	5	--	--
	May-02	--	--	--	--	6	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-02	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.4	--	--
	May-05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-06	--	--	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-07	--	--	--	--	7.1	--	--	--	--	--	--	--	--	--	--	--	--
	May-08	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-08	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.6	--	--
	May-09	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-09	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	24	--	--
	Nov-10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-13	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-13	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-1D	Nov-00	--	--	--	--	*	*	--	--	*	--	--	*	--	--	--	--	--
	May-01	--	--	--	--	*	*	--	--	*	--	--	*	--	--	--	--	--
	Nov-01	--	--	--	--	*	*	--	--	*	--	--	*	--	--	--	--	--
	May-02	--	--	--	--	*	*	--	--	*	--	--	*	--	--	--	--	--
	Nov-02	--	--	--	--	*	*	--	--	*	--	--	*	--	--	--	--	--
	May-03	--	--	--	--	*	*	--	--	*	--	--	*	--	--	--	--	--
	Nov-03	--	--	--	--	*	*	--	--	*	--	--	*	--	--	--	--	--
	May-04	--	--	--	--	*	*	--	--	*	--	--	*	--	--	--	--	--
	Nov-04	--	--	--	--	*	*	--	--	*	--	--	*	--	--	--	--	--
	May-05	--	--	--	--	*	*	--	1.4	*	--	--	*	--	--	--	--	--
	Dec-05	--	--	--	--	*	*	--	--	*	--	--	*	--	--	--	--	--
	May-06	--	--	--	--	*	*	--	--	*	--	--	*	--	--	--	--	--
	Nov-06	--	--	--	--	*	*	--	--	*	--	--	*	--	--	--	--	--
	May-07	--	--	--	--	*	*	--	--	*	--	--	*	--	--	--	--	--
	Nov-07	--	--	--	--	*	*	--	--	*	--	--	*	--	--	--	--	--
	May-08	--	--	--	--	*	*	--	--	*	--	--	*	--	--	--	--	--
	Nov-08	--	--	--	--	*	*	--	--	*	--	--	*	--	--	--	--	--
	May-09	--	--	--	--	*	*	--	--	*	--	--	*	--	--	--	--	--
	Nov-09	--	--	--	--	*	*	--	--	*	--	--	*	--	--	--	--	--
	May-10	--	--	--	--	*	*	--	--	*	--	--	*	--	--	--	--	--
	Nov-10	--	--	--	--	*	*	--	--	*	--	--	*	--	--	--	--	--
	May-11	--	--	--	--	*	*	--	--	*	--	--	*	--	--	--	--	--
	Nov-11	--	--	--	--	*	*	--	--	*	--	--	*	--	--	--	--	--
	May-12	--	--	--	--	*	*	--	--	*	--	--	*	--	--	--	--	--
	Nov-12	--	--	--	--	*	*	--	--	*	--	--	*	--	--	--	--	--
	May-14	--	--	--	--	*	*	--	--	*	--	--	*	--	--	--	--	--
	Nov-14	--	--	--	--	*	*	--	--	*	--	--	*	--	--	--	--	--
	May-15	--	--	--	--	*	*	--	--	*	--	--	*	--	--	--	--	--

TABLE 4-1
DETECTED CONSTITUENTS OF CONCERN IN GROUNDWATER SUMMARY
November 2000 through May 2015 Corrective Measures Plan
Morgan County Landfill
Morgan County, Ohio

		1,1-Dichloroethene	1,4-Dichlorobenzene	Acetone	Benzene	Bis(2-ethylhexyl) phthalate	Butyl Benzyl Phthalate	Chlorobenzene	cis-1,2-Dichloroethene	Di-n-butyl Phthalate	Ethylbenzene	Methylene Chloride	Naphthalene	Tetrachloroethene	Toluene	Trichloroethene	Vinyl Chloride	Xylene (Total)
Well ID	Date	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
MW-2	Nov-00	--	1.8	--	--	8	--	1.3	42	--	--	--	--	--	--	--	20	--
	May-01	--	1.7	--	2.5	--	--	1.3	33	--	--	--	--	--	--	--	9.4	--
	Nov-01	--	1.4	--	--	--	--	1.2	32	--	--	--	--	--	--	13	27 J	--
	May-02	--	--	--	--	--	--	1.2	27	--	--	--	--	--	--	--	13	--
	Nov-02	--	1.3	72	--	--	--	1.2	25	--	--	--	--	--	--	--	12	--
	May-03	--	1.2	--	--	--	--	1	27	5.9	--	--	--	--	--	--	13	--
	Nov-03	--	1.5	--	--	7.7	--	1.2	41	--	--	--	--	--	--	--	28	--
	May-04	--	1	--	--	--	--	1.1	30	--	--	--	--	--	--	--	17	--
	Nov-04	--	1.1	69	--	--	--	1.2	24	--	--	--	--	--	--	4.6	10	--
	May-05	--	--	--	--	--	--	1	20	--	--	--	--	--	--	--	11	--
	Dec-05	--	--	--	--	--	--	--	15	--	--	--	--	--	--	--	8.2	--
	May-06	--	--	--	--	--	--	1	16	--	--	--	--	--	--	--	7.5	--
	Nov-06	--	--	--	--	--	--	1.1	18	--	--	--	--	--	--	--	9.8	--
	May-07	--	--	--	--	--	--	--	27 J	--	--	--	--	--	--	--	15 J	--
	Nov-07	--	--	--	--	--	--	1	20	6.6	--	--	--	--	--	--	9.7	--
	May-08	--	1	--	--	--	--	1	29	--	--	--	--	--	--	--	11	--
	Nov-08	--	--	--	--	7.1	--	1.1	21	--	--	--	--	--	--	2.1	7.5	--
	May-09	--	--	--	--	5.4 J	--	1	27	--	--	--	--	--	--	--	12	--
	Nov-09	--	--	--	--	16 J	--	1.1	24	--	--	--	--	--	--	--	12	--
	May-10	--	1	--	--	--	--	1.1	30	--	--	--	--	--	--	--	16	--
	Nov-10	--	--	--	--	--	--	1.1	25	--	--	--	--	--	--	--	13	--
	May-11	--	--	--	--	--	--	--	17	--	--	--	--	--	--	--	8.7	--
	Nov-11	--	--	--	--	--	--	1	14	--	--	--	--	--	--	--	5.6	--
	May-12	--	--	--	--	--	--	1	12	--	--	--	--	--	--	--	5.3	--
	Nov-12	--	--	--	--	--	--	--	10	--	--	--	--	--	--	--	3.7	--
	May-13	--	--	--	--	--	--	1.1	14	--	--	--	--	--	--	--	5.2	--
	Nov-13	--	--	--	--	--	--	1.1	15	--	--	--	--	--	--	--	5.9	--
	May-14	--	--	--	--	--	--	1	15	--	--	--	--	--	--	--	8.5	--
	Nov-14	--	--	--	--	--	--	1.2	23	--	--	--	--	--	--	--	13	--
	May-15	--	--	--	--	--	--	1.2	26	--	--	--	--	--	--	--	12	--
MW-3D	Nov-00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-01	--	--	--	--	23	--	--	--	--	--	--	--	--	--	7.2	--	--
	May-02	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-02	--	--	--	--	--	--	--	--	7 J	--	--	--	0.6	--	--	--	--
	May-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-03	--	--	--	--	5.3	--	--	--	--	--	--	--	--	--	--	--	--
	May-04	--	--	--	--	31	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Dec-05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-08	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-08	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.1	--	--
	May-09	--	--	--	--	6.1	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-09	--	--	--	--	11	--	--	--	--	--	--	--	--	--	--	--	--
	May-10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5.1	--	--
	Nov-10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-11	--	--	--	--	18	--	--	--	--	--	--	--	--	--	--	--	--
	May-12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-13	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-13	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-15	--	--	--	--	5	--	--	--	--	--	--	--	--	--	--	--	--

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Morgan County, Ohio

		1,1-Dichloroethene	1,4-Dichlorobenzene	Acetone	Benzene	Bis(2-ethylhexyl) phthalate	Butyl Benzyl Phthalate	Chlorobenzene	cis-1,2-Dichloroethene	Di-n-butyl Phthalate	Ethylbenzene	Methylene Chloride	Naphthalene	Tetrachloroethene	Toluene	Trichloroethene	Vinyl Chloride	Xylene (Total)
Well ID	Date	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
MW-5	Nov-00	--	4.2	--	2.6	--	--	18	--	--	--	--	--	--	--	--	--	--
	May-01	--	--	--	--	--	--	--	--	--	--	--	12	--	--	--	--	--
	Nov-01	--	3.7	--	2.5	6	--	16	--	--	--	--	--	--	--	14	--	--
	May-02	--	--	--	3.5	--	--	18	--	--	--	--	10	--	--	--	--	14
	Nov-02	--	4.1	140	2.6	--	--	15	--	--	--	--	--	--	--	--	--	--
	May-03	--	2.4	--	2	--	--	11	--	--	--	--	--	--	--	--	--	--
	Nov-03	--	3.8	--	2.8	34	--	17	--	--	--	--	--	--	--	--	--	--
	May-04	--	2.6	--	2	--	--	10	--	--	--	--	--	--	--	--	--	--
	Nov-04	--	3	100	2.2	--	--	12	--	--	--	--	--	--	--	5.3	--	--
	May-05	--	2.2	--	2	--	--	9.7	--	--	--	--	--	--	--	--	--	--
	Dec-05	--	3.2	--	1.9	14	--	13	--	5.1	--	--	--	--	1.1	--	--	--
	May-06	--	2.2	--	1.2	--	--	7.1	--	--	--	--	--	--	--	--	--	--
	Nov-06	--	2.6	--	1.4	--	--	9.6	--	--	--	--	--	--	--	--	--	--
	May-07	--	2 J	--	1.3 J	--	--	7.2 J	--	--	--	--	--	--	--	--	--	--
	Nov-07	--	2.4	--	1.6	--	--	11	--	11	--	--	--	0.56	--	--	--	--
	May-08	--	1.7	--	1.2	--	--	6.5	--	--	--	--	--	--	--	--	--	--
	Nov-08	--	2.2	--	1.4	--	--	9.7	--	--	--	--	--	--	--	3	--	--
	May-09	--	1.8	--	--	9.9	--	5	--	--	--	--	--	--	--	--	--	--
	Nov-09	--	2.4	--	1.2	6.8	--	9.6	--	--	--	--	--	--	--	--	--	--
	May-10	--	2.1	--	1.1	--	--	6.9	--	--	--	--	--	--	--	--	--	--
	Nov-10	--	2.1	--	1.3	--	--	7.8	--	--	--	--	--	--	--	--	--	--
	May-11	--	1.4	--	--	--	--	4.2	--	--	--	--	--	--	--	--	--	--
	Nov-11	--	2.2	--	--	--	--	7.1	--	--	--	--	--	--	--	--	--	--
	May-12	--	1.7	--	--	--	--	4.9	--	--	--	--	--	--	--	--	--	--
	Nov-12	--	2.4	--	1.3	--	--	11	--	--	--	--	--	--	--	--	--	--
	May-13	--	1.7	--	--	--	--	5.3	--	--	--	--	--	--	--	--	--	--
	Nov-13	--	2.6	--	1.7	5.1	--	11	--	--	--	--	--	--	--	--	--	--
	May-14	--	1.6	--	--	--	--	5.5	--	--	--	--	--	--	--	--	--	--
	Nov-14	--	2.4	--	1.4	--	--	10	--	--	--	--	--	--	--	--	--	--
	May-15	--	1.7	--	--	42	--	4.7	--	--	--	--	--	--	--	--	--	--
MW-6	Nov-00	--	--	--	--	--	--	--	450	--	--	68 J	--	1400	--	780	--	--
	May-01	--	--	--	--	--	--	--	430	--	--	--	--	1300	--	610	--	--
	Nov-01	--	--	--	--	5	--	--	380	--	--	--	--	970	--	510	--	--
	May-02	--	--	--	--	5	--	--	330	--	--	--	--	760	--	500 J	--	--
	Nov-02	--	--	--	--	--	--	--	440	--	--	--	--	1200	--	640	--	--
	May-03	--	--	--	--	--	--	--	390	--	--	--	--	710	--	440 J	--	--
	Nov-03	--	--	--	--	40	--	--	440	--	--	--	--	970	--	560	--	--
	May-04	--	--	--	--	--	--	--	370	--	--	--	--	780	--	360	--	--
	Nov-04	--	--	--	--	--	--	--	350	--	--	--	--	490	--	380	--	--
	May-05	--	--	--	--	--	--	--	210	--	--	--	--	320	--	250	--	--
	Dec-05	--	--	--	--	15	--	--	450	--	--	--	--	960	--	530	--	--
	May-06	--	--	--	--	--	--	--	360	--	--	--	--	770	--	440	--	--
	Nov-06	--	--	--	--	--	--	--	340	--	--	--	--	460	--	330	--	--
	May-07	--	--	--	--	--	--	--	260	--	--	--	--	240	--	230	--	--
	Nov-07	--	--	--	--	--	--	--	270	--	--	--	--	240	--	210	--	--
	May-08	--	--	--	--	--	--	--	220	--	--	--	--	150	--	160	--	--
	Nov-08	--	--	--	--	--	--	--	240	--	--	--	--	190	--	210	--	--
	May-09	--	--	--	--	10	--	--	200	--	--	--	--	140	--	170	--	--
	Nov-09	--	--	--	--	9.3	--	--	230	--	--	--	--	150	--	170	--	--
	May-10	--	--	--	--	15	--	--	240	--	--	--	--	120	--	140	--	--
	Nov-10	--	--	--	--	--	--	--	230	--	--	--	--	110	--	150	--	--
	May-11	--	--	--	--	--	--	--	170	--	--	--	--	91	--	120	--	--
	Nov-11	--	--	--	--	--	--	--	200 D	--	--	--	--	120	--	140	--	--
	May-12	--	--	--	--	--	--	--	210	--	--	--	--	81	--	110	--	--
	Nov-12	--	--	--	--	--	--	--	250	--	--	--	--	96	--	130	--	--
	May-13	--	--	--	--	--	--	--	210	--	--	--	--	83	--	120	--	--
	Nov-13	--	--	--	--	--	--	--	230	--	--	--	--	80	--	110	--	--
	May-14	--	--	--	--	--	--	--	180	--	--	--	--	78	--	110	--	--
	Nov-14	--	--	--	--	--	--	--	220	--	--	--	--	87	--	140	--	--
	May-15	--	--	--	--	--	--	--	190	--	--	--	--	66	--	120	--	--

TABLE 4-1
DETECTED CONSTITUENTS OF CONCERN IN GROUNDWATER SUMMARY
November 2000 through May 2015 Corrective Measures Plan
Morgan County Landfill
Morgan County, Ohio

		1,1-Dichloroethene	1,4-Dichlorobenzene	Acetone	Benzene	Bis(2-ethylhexyl) phthalate	Butyl Benzyl Phthalate	Chlorobenzene	cis-1,2-Dichloroethene	Di-n-butyl Phthalate	Ethylbenzene	Methylene Chloride	Naphthalene	Tetrachloroethene	Toluene	Trichloroethene	Vinyl Chloride	Xylene (Total)
Well ID	Date	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
MW-7	Nov-00	4.5	--	--	--	--	--	--	340	--	--	--	--	18	--	73	6	--
	May-01	6.6	--	--	--	--	--	--	340	--	--	--	--	27	--	66	3.5	--
	Nov-01	--	--	--	--	12	--	--	220	--	--	--	--	4.4	--	17 J	2	--
	May-02	2.7	--	--	--	--	--	--	200	--	--	--	--	8.7	--	61 J	3.6	--
	Nov-02	2.5	--	--	--	--	--	--	200	--	--	--	--	32	--	50	2.3	--
	May-03	3.3	--	--	--	--	--	--	210 J	--	--	--	--	58	--	79	3.5	--
	Nov-03	2.7	--	--	--	14	--	--	160	--	--	--	--	87	--	78	3.7	--
	May-04	2.6	--	--	--	--	--	--	180	--	--	--	--	45	--	53	3	--
	Nov-04	5.5	--	--	--	--	--	--	230	--	--	--	--	53	--	120	7.4	--
	May-05	3.9	--	--	--	--	--	--	160	--	--	--	--	55	--	120	3.5	--
	Dec-05	5	--	--	--	22	--	--	440	--	--	--	--	14	--	77	--	--
	May-06	3.2	--	--	--	--	--	--	230	--	--	--	--	84	--	130	3.3	--
	Nov-06	4.6	--	--	--	--	--	--	330	--	--	--	--	22	--	95	4.5	--
	May-07	4	--	--	--	--	--	--	310	--	--	--	--	35	--	94	4.7	--
	Nov-07	3.5	--	--	--	--	--	--	320	--	--	--	--	4	--	79	2.7	--
	May-08	3.8	--	--	--	--	--	--	310	--	--	--	--	14	--	68	3.5	--
	Nov-08	3.5	--	--	--	--	--	--	300	--	--	--	--	25	--	94	2.8	--
	May-09	5	--	--	--	--	--	--	380	--	--	--	--	36	--	130	4.6	--
	Nov-09	2.7	--	--	--	19	--	--	260	--	--	--	--	20	--	66	2.8	--
	May-10	3.8	--	--	--	19	--	--	390	--	--	--	--	9.9	--	75	4.5	--
	Nov-10	3.8	--	--	--	--	--	--	370	--	--	--	--	2.8	--	44	3.7	--
	May-11	4.2	--	--	--	--	--	--	350	--	--	--	--	22	--	68	4.6	--
	Nov-11	4	--	--	--	53	--	--	340 D	--	--	--	--	65	--	150	4.3	--
	May-12	3	--	--	--	--	--	--	300	--	--	--	--	79	--	130	2.8	--
	Nov-12	--	--	--	--	--	--	--	390	--	--	--	--	42	--	190	--	--
	May-13	5	--	--	--	--	--	--	400	--	--	--	--	40	--	210	5.3	--
	Nov-13	--	--	--	--	--	--	--	430	--	--	--	--	70	--	170	--	--
	May-14	5.2	--	--	--	--	--	--	500	--	--	--	--	73	--	130	9.1	--
	Nov-14	6.2	--	--	--	--	--	--	700	--	--	--	--	11	--	61	13	--
	May-15	5	--	--	--	--	--	--	440	--	--	--	--	40	--	190	5.6	--
MW-8	Nov-00	--	--	--	--	--	--	--	27	--	--	--	--	2.9	--	5.8	--	--
	May-01	--	--	--	--	--	--	--	26	--	--	--	--	4.2	--	7.4	--	--
	Nov-01	--	--	160 J	--	--	--	--	22	--	--	--	--	3.2	--	19	--	--
	May-02	--	--	--	--	--	--	--	34	--	--	--	--	--	--	7 J	--	--
	Nov-02	--	--	85	--	--	--	--	34	--	--	--	--	--	--	3.5	--	--
	May-03	--	--	--	--	--	--	--	38	--	--	--	--	--	--	4.9 J	--	--
	Nov-03	--	--	--	--	41	--	--	44	--	--	--	--	--	--	1	--	--
	May-04	--	--	--	--	--	--	--	33	--	--	--	--	--	--	3.2	--	--
	Nov-04	--	--	--	--	--	--	--	30	--	--	--	--	--	--	1.5	--	--
	May-05	--	--	--	--	--	--	--	29	--	--	--	--	0.74	--	3.5	--	--
	Dec-05	--	--	--	--	--	--	--	31	--	--	--	--	--	--	1	--	--
	May-06	--	--	--	--	--	--	--	27	--	--	--	--	0.75	--	2.2	--	--
	Nov-06	--	--	--	--	--	--	--	33	--	--	--	--	1.1	--	3.2	--	--
	May-07	--	--	--	--	--	--	--	29 J	--	--	--	--	0.88 J	--	3.2 J	--	--
	Nov-07	--	--	--	--	--	--	--	29	--	--	--	--	--	--	2.6	--	--
	May-08	--	--	--	--	--	--	--	34	--	--	--	--	0.56	--	3.1	--	--
	Nov-08	--	--	--	--	--	--	--	27	--	--	--	--	--	--	4.3	--	--
	May-09	--	--	--	--	21	--	--	26	--	--	--	--	1	--	2.9	--	--
	Nov-09	--	--	--	--	13	--	--	20	--	--	--	--	0.81	--	2.1	--	--
	May-10	--	--	--	--	--	--	--	25	--	--	--	--	1	--	6.1	--	--
	Nov-10	--	--	--	--	--	--	--	23	--	--	--	--	1.1	--	3.6	--	--
	May-11	--	--	--	--	--	--	--	21	--	--	--	--	0.66	--	2.6	--	--
	Nov-11	--	--	--	--	11	--	--	20	--	--	--	--	0.97	--	2.8	--	--
	May-12	--	--	--	--	--	--	--	21	--	--	--	--	0.77	--	3.1	--	--
	Nov-12	--	--	--	--	--	--	--	22	--	--	--	--	1	--	3.2	--	--
	May-13	--	--	--	--	--	--	--	23	--	--	--	--	1.3	--	3.5	--	--
	Nov-13	--	--	--	--	--	--	--	23	--	--	--	--	0.8	--	2.8	--	--
	May-14	--	--	--	--	--	--	--	21	--	--	--	--	0.72	--	2.8	--	--
	Nov-14	--	--	--	--	--	--	--	22	--	--	--	--	0.78	--	2.4	--	--
	May-15	--	--	--	--	13	--	--	21	--	--	--	--	0.61	--	2.7	--	--

TABLE 4-1
DETECTED CONSTITUENTS OF CONCERN IN GROUNDWATER SUMMARY
November 2000 through May 2015 Corrective Measures Plan
Morgan County Landfill
Morgan County, Ohio

Well ID	Date	1,1-Dichloroethene	1,4-Dichlorobenzene	Acetone	Benzene	Bis(2-ethylhexyl) phthalate	Butyl Benzyl Phthalate	Chlorobenzene	cis-1,2-Dichloroethene	Di-n-butyl Phthalate	Ethylbenzene	Methylene Chloride	Naphthalene	Tetrachloroethene	Toluene	Trichloroethene	Vinyl Chloride	Xylene (Total)
		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
MW-9	Nov-00	--	--	--	--	8	--	--	--	--	--	--	--	--	--	--	--	--
	May-01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	7.3	--	--
	May-02	--	--	--	--	10	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-02	--	--	70	--	--	--	--	--	6 J	--	--	--	0.7	--	--	--	--
	May-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-03	--	--	--	--	34	--	--	--	--	--	--	--	--	--	--	--	--
	May-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Dec-05	--	--	--	--	11	--	--	--	--	--	--	--	--	--	--	--	--
	May-06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-07	--	--	--	--	--	--	--	--	6.3	--	--	--	--	--	--	--	--
	May-08	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-08	--	--	--	--	5.1	--	--	--	--	--	--	--	--	--	1.2	--	--
	May-09	--	--	--	--	23	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-09	--	--	--	--	12	--	--	--	--	--	--	--	--	--	--	--	--
	May-10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.2	--	--
	Nov-10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-11	--	--	--	--	7.1	--	--	--	--	--	--	--	--	--	--	--	--
	May-12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-13	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-13	--	--	--	--	5.3	--	--	--	--	--	--	--	--	--	--	--	--
	May-14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PZ-4D	Nov-00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-01	--	--	--	--	27	--	--	--	--	--	--	--	--	--	9.8	--	--
	May-02	--	--	--	--	10	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-02	--	--	--	--	--	--	--	--	8 J	--	--	--	--	--	--	--	--
	May-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-04	--	--	64	--	--	--	--	--	--	--	--	--	--	--	5	--	--
	May-05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Dec-05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-08	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-08	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.9	--	--
	May-09	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-09	--	--	--	--	6.6	--	--	--	--	--	--	--	--	--	--	--	--
	May-10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-11	--	--	--	--	6	--	--	--	--	--	--	--	--	--	--	--	--
	May-12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-13	--	--	--	--	--	--	--	--	--	--	--	--	--	--	17	--	--
	Nov-13	--	--	--	--	55	--	--	--	--	--	--	--	--	--	--	--	--
	May-14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-15	--	--	--	--	14	--	--	--	--	--	--	--	--	--	--	--	--

TABLE 4-1
DETECTED CONSTITUENTS OF CONCERN IN GROUNDWATER SUMMARY
November 2000 through May 2015 Corrective Measures Plan
Morgan County Landfill
Morgan County, Ohio

		1,1-Dichloroethene	1,4-Dichlorobenzene	Acetone	Benzene	Bis(2-ethylhexyl) phthalate	Butyl Benzyl Phthalate	Chlorobenzene	cis-1,2-Dichloroethene	Di-n-butyl Phthalate	Ethylbenzene	Methylene Chloride	Naphthalene	Tetrachloroethene	Toluene	Trichloroethene	Vinyl Chloride	Xylene (Total)
Well ID	Date	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
PZ-6	Nov-00	--	--	--	--	--	--	--	58	--	--	--	--	170	--	43	--	--
	May-01	--	--	--	--	--	--	--	40 J	--	--	--	--	160	--	32 J	--	--
	Nov-01	--	--	--	--	15	--	--	54	--	--	--	--	170	--	47	--	--
	May-02	--	--	--	--	--	--	--	41	--	--	--	--	160	--	36	--	--
	Nov-02	--	--	79	--	--	--	--	62	10 J	--	--	--	200	--	41	--	--
	May-03	--	--	--	--	--	--	--	46	--	--	--	--	160	--	27 J	--	--
	Nov-03	--	--	--	--	58	--	--	38	--	--	--	--	120	--	29	--	--
	May-04	--	--	--	--	9.1	--	--	59	--	--	--	--	200	--	50	--	--
	Nov-04	--	--	69	--	14	--	--	56	6.4	--	--	--	130	--	58	--	--
	May-05	--	--	--	--	--	--	--	66	--	--	--	--	180	--	81	--	--
	Dec-05	--	--	--	--	--	--	--	46	--	--	--	--	160	--	42	--	--
	May-06	--	--	--	--	--	--	--	39	--	--	--	--	150	--	45	--	--
	Nov-06	--	--	--	--	--	--	--	29	--	--	--	--	91	--	29	--	--
	May-07	--	--	--	--	--	--	--	33 J	--	--	--	--	97 J	--	36 J	--	--
	Nov-07	--	--	--	--	--	--	--	31	--	--	--	--	98	--	29	--	--
	May-08	--	--	--	--	--	--	--	29	--	--	--	--	78	--	28	--	--
	Nov-08	--	--	--	--	--	--	--	26	--	--	--	--	74	--	22	--	--
	May-09	--	--	--	--	43	--	--	20	--	--	--	--	66	--	20	--	--
	Nov-09	--	--	--	--	--	--	--	24	--	--	--	--	76	--	21	--	--
	May-10	--	--	--	--	--	--	--	20	--	--	--	--	67	--	20	--	--
	Nov-10	--	--	--	--	--	--	--	21	--	--	--	--	62	--	20	--	--
	May-11	--	--	--	--	--	--	--	21	--	--	--	--	59	--	20	--	--
	Nov-11	--	--	--	--	12	--	--	14	--	--	--	--	43	--	14	--	--
	May-12	--	--	--	--	--	--	--	23	--	--	--	--	61	--	22	--	--
	Nov-12	--	--	--	--	--	--	--	17	--	--	--	--	59	--	18	--	--
	May-13	--	--	--	--	--	--	--	14	--	--	--	--	43	--	14	--	--
	Nov-13	--	--	--	--	--	--	--	15	--	--	--	--	49	--	15	--	--
	May-14	--	--	--	--	--	--	--	17	--	--	--	--	46	--	17	--	--
	Nov-14	--	--	--	--	--	--	--	24	--	--	--	--	66	--	27	--	--
	May-15	--	--	--	--	--	--	--	17	--	--	--	--	43	--	18	--	--
PZ-9	May-01	--	--	--	--	*	*	--	--	*	--	--	*	--	--	--	--	--
	Nov-01	--	--	--	--	*	*	--	--	*	--	--	*	--	--	--	--	--
	May-02	--	--	--	--	*	*	--	--	*	--	--	*	--	--	--	--	--
	Nov-02	--	--	--	--	*	*	--	--	*	--	--	*	--	--	--	--	--
	May-03	--	--	--	--	*	*	--	--	*	--	--	*	--	--	--	--	--
	Nov-03	--	--	--	--	*	*	--	--	*	--	--	*	--	--	--	--	--
	May-04	--	--	--	--	*	*	--	--	*	--	--	*	--	--	--	--	--
	Nov-04	--	--	--	7.4	*	*	--	--	*	--	--	*	--	--	--	--	--
	May-05	--	--	--	--	*	*	--	--	*	--	--	*	--	--	--	--	--
	Dec-05	--	--	--	--	*	*	--	2	*	--	--	*	0.76	2.1	1.5	--	--
	May-06	--	--	--	--	*	*	--	--	*	--	--	*	--	--	--	--	--
	Nov-06	--	--	--	--	*	*	--	--	*	--	--	*	--	--	--	--	--
	May-07	--	--	--	--	*	*	--	--	*	--	--	*	--	--	--	--	--
	Nov-07	--	--	--	1.6	*	*	--	--	*	--	--	*	--	--	--	--	--
	May-08	--	--	--	--	*	*	--	--	*	--	--	*	--	--	--	--	--
	Nov-08	--	--	--	--	*	*	--	--	*	--	--	*	--	--	--	--	--
	May-09	--	--	--	--	*	*	--	--	*	--	--	*	--	--	--	--	--
	Nov-09	--	--	--	--	*	*	--	--	*	--	--	*	--	--	--	--	--
	May-10	--	--	--	--	*	*	--	--	*	--	--	*	--	--	--	--	--
	May-11	--	--	--	--	*	*	--	--	*	--	--	*	--	--	--	--	--
	Nov-11	--	--	--	--	*	*	--	--	*	--	--	*	--	--	--	--	--
	May-12	--	--	--	--	*	*	--	--	*	--	--	*	--	--	--	--	--
	Nov-12	--	--	--	--	*	*	--	--	*	--	--	*	--	--	--	--	--
	Nov-13	--	--	--	--	*	*	--	--	*	--	--	*	--	--	--	--	--
	May-14	--	--	--	--	*	*	--	--	*	--	--	*	--	--	--	--	--
	Nov-14	--	--	--	--	*	*	--	--	*	--	--	*	--	--	--	--	--
	May-15	--	--	--	--	*	*	--	--	*	--	--	*	--	--	--	--	--

Notes

-- = Not detected

* = Not sampled due to insufficient groundwater volume

J = Estimated

D = Sample diluted by laboratory prior to analysis

TABLE 4-2
DETECTED CONSTITUENTS OF CONCERN IN SURFACE WATER SUMMARY
November 2000 through May 2015 Corrective Measures Plan
Morgan County Landfill
Morgan County, Ohio

Well ID	Date	1,1-Dichloroethene	1,4-Dichlorobenzene	Acetone	Benzene	Bis(2-ethylhexyl) Phthalate	Butyl Benzyl Phthalate	Chlorobenzene	cis-1,2-Dichloroethene	Di-n-butyl Phthalate	Ethylbenzene	Methylene Chloride	Naphthalene	Tetrachloroethene	Toluene	Trichloroethene	Vinyl Chloride	Xylene (Total)
		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
SW-1	Nov-00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-02	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-02	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-03	--	--	--	--	--	--	--	--	7.8	--	--	--	--	--	--	--	--
	Nov-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-08	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-08	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-09	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Apr-12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-13	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-13	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SW-2	Nov-00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-02	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-02	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Notes:

-- = Not detected

TABLE 4-2
DETECTED CONSTITUENTS OF CONCERN IN SURFACE WATER SUMMARY
November 2000 through May 2015 Corrective Measures Plan
Morgan County Landfill
Morgan County, Ohio

Well ID	Date	1,1-Dichloroethene	1,4-Dichlorobenzene	Acetone	Benzene	Bis(2-ethylhexyl) Phthalate	Butyl Benzyl Phthalate	Chlorobenzene	cis-1,2-Dichloroethene	Di-n-butyl Phthalate	Ethylbenzene	Methylene Chloride	Naphthalene	Tetrachloroethene	Toluene	Trichloroethene	Vinyl Chloride	Xylene (Total)
		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
SW-2	Nov-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-08	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-08	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-09	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-09	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-13	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-13	--	--	--	--	--	--	--	--	6.5	--	--	--	--	--	--	--	--
	May-14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-15	--	--	--	--	--	--	--	--	5.4	--	--	--	--	--	--	--	--
SW-3	Nov-00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-02	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-02	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-08	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-08	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-09	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-09	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-11	--	--	--	--	--	--	--	1.6	--	--	--	--	--	--	--	--	--
	Nov-11	--	--	--	--	--	--	--	2.9	--	--	--	--	--	--	--	--	--
	May-12	--	--	--	--	--	--	--	3.9	--	--	--	--	--	--	--	--	--

Notes:

-- = Not detected

TABLE 4-2
DETECTED CONSTITUENTS OF CONCERN IN SURFACE WATER SUMMARY
November 2000 through May 2015 Corrective Measures Plan
Morgan County Landfill
Morgan County, Ohio

Well ID	Date	1,1-Dichloroethene	1,4-Dichlorobenzene	Acetone	Benzene	Bis(2-ethylhexyl) Phthalate	Butyl Benzyl Phthalate	Chlorobenzene	cis-1,2-Dichloroethene	Di-n-butyl Phthalate	Ethylbenzene	Methylene Chloride	Naphthalene	Tetrachloroethene	Toluene	Trichloroethene	Vinyl Chloride	Xylene (Total)
		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
SW-3	Nov-12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-13	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-13	--	--	--	--	44	--	--	--	--	--	--	--	--	--	--	--	--
	May-14	--	--	--	--	--	--	--	3.1	--	--	--	--	--	--	--	--	--
	Nov-14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SW-4	Nov-00	--	--	--	--	--	--	--	5.5	--	--	--	--	--	--	--	--	--
	May-01	--	--	--	--	--	--	--	2.4	--	--	--	--	--	--	--	--	--
	Nov-01	--	--	--	--	36	--	--	--	--	--	--	--	--	--	--	--	--
	May-02	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-02	--	--	--	--	--	--	--	2.1	--	--	--	--	--	--	--	--	--
	May-03	--	--	--	--	--	--	--	1.8	--	--	--	--	--	--	--	--	--
	Nov-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-04	--	--	--	--	--	--	--	2.1	--	--	--	--	--	--	--	--	--
	Nov-04	--	--	--	--	17	--	--	5.9	--	--	--	--	--	--	--	--	--
	May-05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-06	--	--	--	--	--	--	--	3.6	--	--	--	--	--	--	--	--	--
	Nov-06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-07	--	--	--	--	6.9	--	--	--	--	--	--	--	--	--	--	--	--
	May-08	--	--	--	--	--	--	--	3.6	--	--	--	--	0.55	--	--	--	--
	Nov-08	--	--	--	--	--	--	--	1.3	--	--	--	--	--	--	--	--	--
	May-09	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-09	--	--	--	--	--	--	--	1.2	--	--	--	--	--	--	--	--	--
	May-10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-10	--	--	--	--	--	--	--	1.3	--	--	--	--	--	--	--	--	--
	May-11	--	--	--	--	--	--	--	1.4	--	--	--	--	--	--	--	--	--
	Nov-11	--	--	--	--	--	--	--	3.5	--	--	--	--	--	--	--	--	--
	May-12	--	--	--	--	--	--	--	2.1	--	--	--	--	--	--	--	--	--
	Nov-12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-13	--	--	--	--	--	--	--	5.7	--	--	--	--	0.83	--	1.4	--	--
	Nov-13	--	--	--	--	--	--	--	2.6	--	--	--	--	--	--	--	--	--
	May-14	--	--	--	--	--	--	--	1.1	--	--	--	--	--	--	--	--	--
	Nov-14	--	--	--	--	--	--	--	1.6	--	--	--	--	--	--	--	--	--
	May-15	--	--	--	--	--	--	--	1.1	--	--	--	--	--	--	--	--	--
SW-5	Nov-00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-02	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Notes:

-- = Not detected

TABLE 4-2
DETECTED CONSTITUENTS OF CONCERN IN SURFACE WATER SUMMARY
November 2000 through May 2015 Corrective Measures Plan
Morgan County Landfill
Morgan County, Ohio

Well ID	Date	1,1-Dichloroethene	1,4-Dichlorobenzene	Acetone	Benzene	Bis(2-ethylhexyl) Phthalate	Butyl Benzyl Phthalate	Chlorobenzene	cis-1,2-Dichloroethene	Di-n-butyl Phthalate	Ethylbenzene	Methylene Chloride	Naphthalene	Tetrachloroethene	Toluene	Trichloroethene	Vinyl Chloride	Xylene (Total)
		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
SW-5	Nov-02	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-08	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-08	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-09	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-09	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
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	May-12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
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	Nov-13	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
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	Nov-14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-15	--	--	--	--	--	--	--	--	6.2	--	--	--	--	--	--	--	--
SW-6	Nov-00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-02	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-02	--	--	--	--	--	--	--	1.8	--	--	--	--	--	--	--	1	--
	May-03	--	--	--	--	--	--	--	3.2	8.4	--	--	--	--	--	--	1	--
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	May-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
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	May-05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Notes:

-- = Not detected

TABLE 4-2
DETECTED CONSTITUENTS OF CONCERN IN SURFACE WATER SUMMARY
November 2000 through May 2015 Corrective Measures Plan
Morgan County Landfill
Morgan County, Ohio

Well ID	Date	1,1-Dichloroethene	1,4-Dichlorobenzene	Acetone	Benzene	Bis(2-ethylhexyl) Phthalate	Butyl Benzyl Phthalate	Chlorobenzene	cis-1,2-Dichloroethene	Di-n-butyl Phthalate	Ethylbenzene	Methylene Chloride	Naphthalene	Tetrachloroethene	Toluene	Trichloroethene	Vinyl Chloride	Xylene (Total)
		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
SW-6	Nov-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-08	--	--	--	--	--	--	--	--	6.9	--	--	--	--	--	--	--	--
	Nov-08	--	--	--	--	--	--	--	2	--	--	--	--	--	--	--	1	--
	May-09	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-09	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-10	--	--	--	--	--	--	--	1	--	--	--	--	--	3	--	--	--
	May-11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-13	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-13	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SW-7	Nov-00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-02	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-02	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-08	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-08	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-09	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-09	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Notes:

-- = Not detected

TABLE 4-2
DETECTED CONSTITUENTS OF CONCERN IN SURFACE WATER SUMMARY
November 2000 through May 2015 Corrective Measures Plan
Morgan County Landfill
Morgan County, Ohio

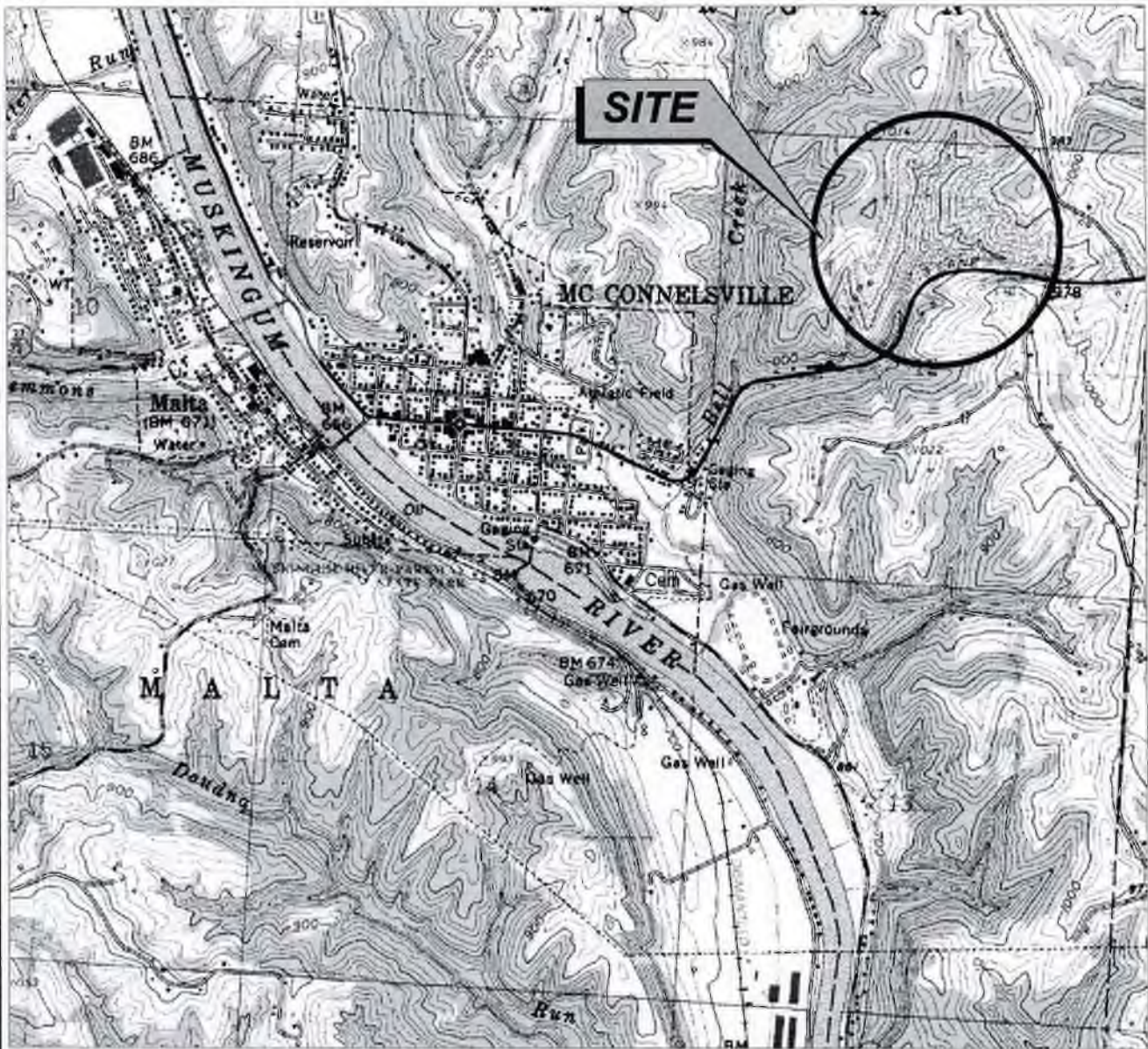
		1,1-Dichloroethene	1,4-Dichlorobenzene	Acetone	Benzene	Bis(2-ethylhexyl) Phthalate	Butyl Benzyl Phthalate	Chlorobenzene	cis-1,2-Dichloroethene	Di-n-butyl Phthalate	Ethylbenzene	Methylene Chloride	Naphthalene	Tetrachloroethene	Toluene	Trichloroethene	Vinyl Chloride	Xylene (Total)
Well ID	Date	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
SW-7	May-13	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-13	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SW-8	Nov-00	--	--	--	--	--	--	--	1	--	--	--	--	--	--	--	--	--
	May-01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-02	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-02	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-03	--	--	--	--	--	--	--	1.2	--	--	--	--	--	--	--	--	--
	Nov-03	--	--	--	--	--	--	--	1.2	--	--	--	--	--	--	--	--	--
	May-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-04	--	--	--	--	--	--	--	2.7	--	--	--	--	--	--	--	--	--
	May-05	--	--	--	--	--	--	--	1.1	--	--	--	--	--	--	--	--	--
	Nov-05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-08	--	--	--	--	--	--	--	1.6	--	--	--	--	--	--	--	--	--
	Nov-08	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-09	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-09	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-11	--	--	--	--	--	--	--	1.2	--	--	--	--	--	--	--	--	--
	May-12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-13	--	--	--	--	--	--	--	1.2	--	--	--	--	--	--	--	--	--
	May-14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Nov-14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	May-15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Notes:

-- = Not detected

Table 1	
Year	Value
2010	100
2011	105
2012	110
2013	115
2014	120
2015	125
2016	130
2017	135
2018	140
2019	145
2020	150

FIGURES



MORGAN COUNTY LANDFILL

MORGAN COUNTY, OHIO

Base Map Source: U.S.G.S. 7 1/2 minute topographical quadrangle map of McConnellsville, Ohio, 1961, photorevised 1987.

Scale:
1"=2000'
Originated By:
B.B.S.
Drawn By:
C.E.P.
Checked By:
B.B.S.
Project Mgr:
B.B.S.
Dwg No.
95-154-01
ISSUED:

SITE LOCATION MAP



Advanced GeoServices Corp.
1055 Andrew Drive, Suite A
West Chester, Pennsylvania 19380
(610) 640-9100
FAX: (610) 640-9199

Project No.
95-154-03

FIGURE: 2-1

F:\Projects\1995\95154-Morgan County Landfill\Cad\DRAWINGS\9515403\95154-02.dwg

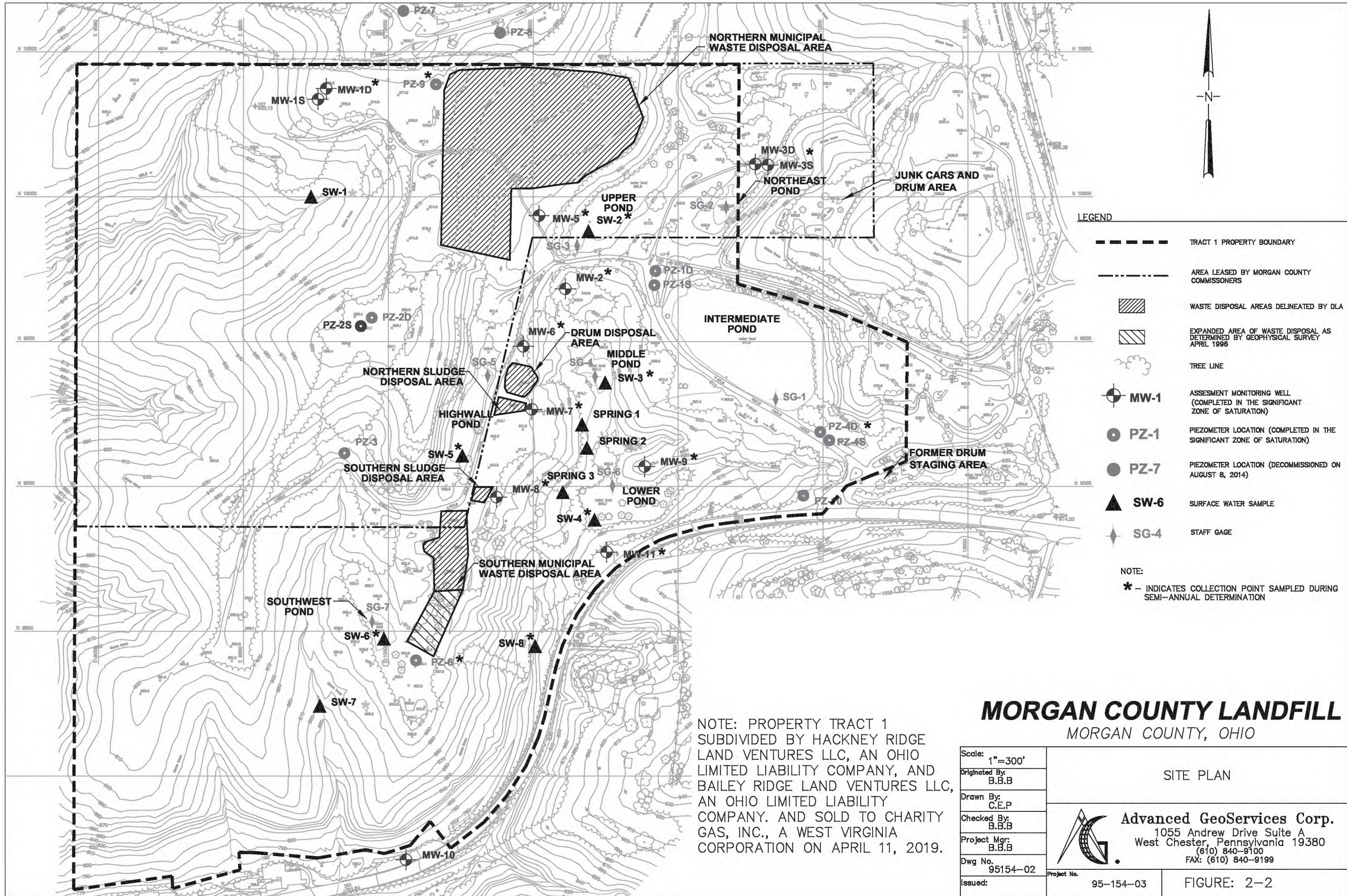


Exhibit 2 – Ground Water & Surface Water Monitoring Plan

APPENDIX D

Post-Closure Groundwater and Surface Water Monitoring Plan



**POST-CLOSURE
GROUNDWATER AND SURFACE WATER MONITORING
PLAN
MORGAN COUNTY LANDFILL
Morgan County, Ohio**

Submitted on Behalf of the:

**MORGAN COUNTY COMMISSIONERS
Morgan County, Ohio**

Prepared by:



**1055 Andrew Drive, Suite A
West Chester, Pennsylvania**

**Revised July 29, 2020
December 17, 2015
95-154-03**

TABLE OF CONTENTS

	<u>PAGE NO.</u>
1.0 Introduction	1-1
1.1 Purpose	1-1
1.2 Background.....	1-2
1.3 Ecological Stream Survey	1-2
1.4 Scope of Work	1-3
2.0 Groundwater and Surface Water Sampling	2-1
2.1 Annual Monitoring	2-1
2.1.1 Sampling Locations	2-1
2.1.2 Analytical and Field Parameters	2-2
2.1.3 Schedule	2-2
2.1.4 Water Level Measurements	2-3
2.2 Monitoring Well Decommissioning	2-3
2.3 Groundwater and Surface Water Sampling and Analysis Procedures	2-3
2.3.1 Synoptic Water Level Measurements	2-3
2.3.2 Groundwater Sample Collection	2-4
2.3.2.1 Well Evacuation.....	2-4
2.3.2.2 Sample Withdrawal.....	2-5
2.3.3 Surface Water Sample Collection	2-6
2.3.4 Sample Containers, Preservation and Handling.....	2-6
2.3.5 Sample Custody	2-6
2.3.6 Decontamination and Post-Sampling Procedures.....	2-7
2.3.7 Water Quality Field Parameters Measurements.....	2-8
2.3.8 Quality Assurance/Quality (QA/QC) Control Samples.....	2-8
2.3.9 Documentation	2-9
2.3.10 Laboratory Analyses.....	2-10
2.3.11 Data Validation	2-10
3.0 Data Assessment and Re-Evaluation	3-1
3.1 Overview of Groundwater Concentrations.....	3-1
3.2 Data Assessment.....	3-1
3.3 Re-Evaluation Criteria	3-2
3.4 Groundwater and Surface Water Monitoring Closure	3-2
4.0 Reporting	4-1

LIST OF TABLES

TABLE

- 2-1 Piezometer and Monitoring Well Construction Details
- 2-2 Sample Container, Preservation, and Holding Time Requirements
- 3-1 Summary of Re-Evaluation Levels (RLs) For Groundwater and Surface Water

LIST OF FIGURES

FIGURE

- 1-1 Site Location Map
- 2-1 Proposed Monitoring Well and Surface Water Locations for 2015 Corrective Measures Plan
- 2-2 Sample Label Examples
- 2-3 Chain-of-Custody Record Form
- 2-4 Example of Field Logbook
- 3-1 Groundwater Concentrations at MW-6
- 3-2 Groundwater Concentrations at MW-7
- 3-3 Groundwater Concentrations at PZ-6
- 3-4 Groundwater Concentrations at MW-2

LIST OF ATTACHMENTS

ATTACHMENT

- A Ohio EPA Ecological Stream Survey Data
- B Ohio EPA Letter Dated June 18, 2015
- C Appendix I of Ohio Administrative Code (OAC) 3745-27-10
- D Pace Analytical Quality Assurance Manual (Provided on CD)
- E Internal Ohio EPA Email Dated December 3, 2012

1.0 INTRODUCTION

1.1 PURPOSE

This Post-Closure Groundwater and Surface Water Monitoring Plan (GSWMP) has been prepared as part of the 2015 Corrective Measures Plan (CMP) on behalf of the Morgan County Commissioners (MCCs) for the Morgan County Landfill (MCLF or the Site) located in Morgan County, Ohio (Figure 1-1). The MCCs, under an agreement with Gould Electronics Inc. (Gould), have been monitoring Site groundwater within the Significant Zone of Saturation (SZS) and surface water quality semi-annually since the spring of 1997. Sample analyses have included volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCS), metals, herbicides, pesticides and polychlorinated biphenyls (PCBs). Based on the analytical results from 45 semi-annual groundwater and surface water sampling events over more than 22 years (April 1997 through November 2019), the Ohio Environmental Protection Agency (Ohio EPA) has agreed that SVOCS, metals, herbicides, pesticides and PCBs are not constituents of concern (COCs) in Site groundwater and surface water.

This GSWMP uses post-closure groundwater and surface water monitoring to evaluate and confirm the effectiveness of the recommended corrective measures remedy (“No Further Action” Alternative with long-term monitoring and deed restrictions) at the Site. The monitoring frequency and analytical parameters proposed are specific to the recommended corrective measures remedy presented in the 2015 CMP and based on 45 historical semi-annual groundwater and surface water sampling events (April 1997 through November 2019).

It is our understanding that the Ohio EPA is in discussions with the Site owners to obtain the deed restrictions on groundwater and land use requirements of the “No Further Action” Alternative. The deed restrictions will provide additional protection against exposure to Site-related constituents and will maintain current exposure scenarios (i.e., no exposure). Also it is our understanding that the Ohio EPA requested the MCCs submit to the Ohio EPA their own closure care plan under separate cover to address the MCLF long-term care (operations and maintenance) in accordance with OAC 3745-27-14.

1.2 BACKGROUND

The “No Further Action” Alternative with long-term monitoring and deed restrictions corrective measures remedy was recommended based on the lack of exposure to constituents in groundwater in the SZS at the Site. There is no potential for exposure to constituents in groundwater in the SZS at the Site since it is not being used as a potable water source or capable of being developed for such use, is not hydraulically connected to water supply aquifers off-site and is limited on-site in its areal extent. The results of the Hydrogeologic Site Investigation concluded that the SZS consists of discontinuous perched water zones with low storage and low transmissivity. Wells completed in this zone often purge dry even using low flow sampling methodology (100 to 300 milliliters per minute), and often sufficient water isn’t produced over 24 hours to fill all of the sample bottles. Additionally, since the MCLF disposal areas were closed and capped over 22 years ago, the concentrations of constituents in groundwater have already reached their highest concentrations and concentrations are decreasing. Groundwater in the SZS discharges to the surface as springs and seeps during periods of high precipitation. Only three (3) times in 45 semiannual monitoring events (May 2001, May 2002 and May 2003) over the last 22 years (and not at all over the past 17 years) has adequate flow been observed at the three (3) man-made springs, SP-1, SP-2 and SP-3. In most cases, surface water bodies that receive this discharge do not contain site-related constituents. When constituents are detected, they are at very low concentrations, typically several orders of magnitude below the applicable Ohio EPA Outside Mixing Zone Averages (OMZA) concentrations for such contaminants in surface water. Descriptions of the Site location and more detailed descriptions of the physical and hydrogeologic setting are provided in the CMP along with a summary of the Site history.

1.3 ECOLOGICAL STREAM SURVEY

Ohio EPA conducted an ecological stream survey at the Site on June 30 and July 3, 2014 utilizing the Ohio headwater habitat evaluation index (HHEI) and included a macroinvertebrate survey. The Ohio EPA ecological stream survey was conducted to determine if the MCLF was impacting the unnamed tributary to Bell Run. The headwater habitat evaluation was conducted at two (2) 100 foot stream reaches and the macroinvertebrate survey was conducted at one (1) location along the unnamed tributary to Bell Run as documented in Attachment A. In an email dated April

20, 2015, the Ohio EPA provided results of the ecological stream survey (see Attachment A). In the Ohio EPA letter dated June 18, 2015 (Attachment B), the Ohio EPA stated the Site scored a 66 for the headwater habitat evaluation index (HHEI) indicating that the habitat could support a diverse aquatic community.

1.4 SCOPE OF WORK

This GSWMP will provide data to monitor the concentrations of the 12 COCs that were detected in groundwater as shown in Table 6-1 of the CMP.

The parameters proposed in this GSWMP will be monitored to demonstrate the effectiveness of the selected remedy. Groundwater and surface water samples will be collected and analyzed annually from select sample locations to demonstrate a concentration reduction and/or steady state conditions of COCs downgradient of the disposal areas and upgradient of on-site surface water. The annual groundwater and surface water sampling network is discussed in Section 2.0.

2.0 GROUNDWATER AND SURFACE WATER SAMPLING

2.1 ANNUAL MONITORING

2.1.1 Sampling Locations

This plan is based on annual collection and analysis of groundwater samples from select monitoring wells and piezometers near the disposal cells. The sampling will be conducted to monitor constituents that are being discharged from the disposal cells to the SZS. Annual surface water collection and analysis of select surface water locations will also be conducted to monitor constituents that are being discharged from groundwater. The proposed monitoring locations are shown on Figure 2-1. Samples will be collected from 12 piezometer and monitoring wells and 5 surface water locations on an annual basis. Piezometer and monitoring well construction details are presented in Table 2-1. The 12 piezometer and monitoring wells and 5 surface water locations are as follows:

Piezometer and monitoring wells:

- MW-2
- MW-3D
- MW-5
- MW-6
- MW-7
- MW-8
- MW-9
- MW-10
- MW-11
- PZ-4D
- PZ-6
- PZ-9

Surface water locations:

- SW- 2 (Upper Pond)
- SW- 3 (Former Middle Pond – now a stream sample)
- SW- 4 (Lower Pond)
- SW- 6 (Southwest Pond)
- SW- 8 (downstream from Lower Pond)

2.1.2 Analytical and Field Parameters

Samples collected annually will be analyzed for the VOCs (Numbers 16 through 27 and 30 through 62) listed in Appendix I of Ohio Administrative Code (OAC) 3745-27-10 (August 15, 2003), which is provided in Attachment C. The parameters list is provided in Table 2-2. Samples will also be analyzed for the following field parameters:

- Temperature
- pH
- Specific conductivity
- Redox potential
- Dissolved oxygen
- Turbidity

Any changes will be documented in the Annual Groundwater and Surface Water Corrective Measures Activities Reports (see Section 5.0).

2.1.3 Schedule

Samples will be collected annually from the locations identified in Section 2.1.1.

2.1.4 Water Level Measurements

Water levels will be collected during each annual sampling event from the 12 piezometer and monitoring wells sampled. Water levels will also be collected at piezometers PZ-1D, PZ-2D, PZ-3D and PZ-10 as depicted on Figure 2-1.

2.2 MONITORING WELL DECOMMISSIONING

As approved by the Ohio EPA, piezometers PZ-7 and PZ-8 were decommissioned on August 8, 2014. The following monitoring wells and piezometers (see Table 2-1 and Figure 2-1) will be properly decommissioned:

- MW-1S
- MW-1D
- MW-3S
- PZ-1S
- PZ-2S
- PZ-4S

These monitoring wells and piezometers have not detected Site-related constituents above the MCLs and have defined the extent of contamination. Future data collected from these monitoring locations will not be useful in monitoring the effectiveness of the proposed corrective measures.

2.3 GROUNDWATER AND SURFACE WATER SAMPLING AND ANALYSIS PROCEDURES

2.3.1 Synoptic Water Level Measurements

Synoptic water level measurements will be conducted prior to all sampling events. The synoptic measurements will involve the measurement of water levels and the depth to bottom in 16 on-site monitoring wells/piezometers (see Table 2-1 and Figure 2-1) in as short a time frame as possible to determine the water level surface. The water level data will be used to develop a SZS water

table map to be included in the Annual Groundwater and Surface Water Corrective Measures Activity Report.

During the synoptic water level monitoring round, one or two field personnel will measure water levels in the piezometers/wells using battery-powered depth-to-water (DTW) meters. The piezometers/wells to be measured will be divided by area among the field personnel, if the measurements will be conducted by more than one person. At each piezometer/well, field personnel will measure the depth to water to the nearest 0.01 foot using the surveyed point at the top of the inner well casing for reference. Measurements will be repeated at each piezometer/well until two consecutive readings are within 0.01 foot. Total depths will also be measured in each piezometer/well prior to each sampling event to evaluate the integrity of each well. Purge volumes will be calculated and maintained for each well sampled. The meters will be thoroughly rinsed with deionized water prior to use in each well.

2.3.2 Groundwater Sample Collection

2.3.2.1 Well Evacuation

Piezometer/well purging will be accomplished using a low flow method. Low-flow purging involves removing water directly from the screened interval of a well without disturbing any stagnant water. This is done by pumping the well at a low enough rate to maintain minimal drawdown of the water column within the well. Pumping at low rates hydraulically isolates the column of stagnant water in the well so as to not disturb the water column. Typically, flow rates on the order of 0.1 to 0.5 liters per minute (L/min) are used; however, this is dependent on site-specific and well-specific factors as drawdown should not exceed 0.33 feet based upon the method of Puls and Barcelona (EPA/540/S-95/504).

Piezometers/wells will be purged and sampled from the suspected least contaminated piezometer/well to the most contaminated piezometer/well to minimize the potential to cross-contaminate samples. The piezometers/wells will be purged using a low-flow pump placed at the midpoint of the screen in each piezometer/well. The piezometers/wells will be purged at a flow rate ranging from 100 to 300 milliliters per minute (mls/min), depending on the yield of the piezometer/well. A flow-through cell with a combination instrument capable of measuring the

following water quality field parameters will be utilized; pH, temperature, conductivity, redox potential, and dissolved oxygen. These water quality field parameters will be collected at 3 to 5 minute intervals during purging. Turbidity will also be measured at the same time interval. The piezometers/wells will be purged until the water quality field parameters stabilize to within 10% over three readings and pH readings differ by less than 0.1 unit. The water quality field parameters will be recorded in the field book. Additional information regarding water quality field parameters measurements is presented in Section 2.3.7.

The low-flow pump was previously unsuccessful at purging water from several Site piezometers/wells due to the low volume of water in the piezometers/wells. If insufficient volume is available in any piezometer/well to purge using low flow techniques, a disposable bailer will be used to purge the well and sample.

The purge water will be treated by pumping the purge water through granular activated carbon. The treated purge water will be contained in 55-gallon drums at the Site until VOC analytical results of the treated purge water samples are evaluated. If purge water sample results are below the laboratory reporting limit, then the purge water may be discharged to the ground surface. Purge water will not be allowed to flow off-site. If purge water sample results indicate levels of contaminants above the laboratory reporting limits, the water will be retreated and re-sampled for VOCs prior to discharging to the ground surface. Drums will be labeled with the location and date of generation (i.e., purge water, MW-1, 5/25/16).

2.3.2.2 Sample Withdrawal

Once the water quality field parameters stabilize, the flow rate will be reduced to 100 mls/min. for collecting VOC samples. Samples will then be collected directly from the pump discharge line into properly labeled sample bottles containing the necessary preservatives.

Samples from any piezometer/well where the low flow pump is unsuccessful will be collected using a disposable Teflon® bailer if sufficient volume is not available to sample with the low-flow pump. The dedicated disposable bailer will be lowered slowly into the screened interval to collect the sample with minimal agitation to the water. The sample bottle will then be placed on ice.

2.3.3 Surface Water Sample Collection

Samples will be collected from the following surface water sample locations as shown on Figure 2-1:

- SW- 2 (Upper Pond);
- SW- 3 (Former Middle Pond – now a stream sample);
- SW- 4 (Lower Pond);
- SW- 6 (Southwest Pond); and
- SW- 8 (downstream from Lower Pond)

The sample bottles, which contain preservatives, will be filled by submerging a dedicated, laboratory-provided, certified clean sample container and then transferring the sample to the preserved container. The sample bottles will then be placed on ice. The water quality field parameters of a separate surface water sample will be collected immediately after each laboratory surface water sample and recorded in the field book. Field measurements of groundwater and surface water samples will be obtained using the flow-through cell as described in Section 2.3.7.

2.3.4 Sample Containers, Preservation and Handling

Samples will be collected directly into the properly labeled laboratory-supplied sample containers containing the necessary trace analysis grade preservatives. Container, preservation and holding time requirements for potential analyses are provided in Table 2-2. The samples will then be placed immediately into coolers and packed with ice or ice packs to maintain a temperature of approximately 4 degrees Celsius or less. A new pair of disposable sampling gloves will be used at each sample location by each member of the sampling team.

2.3.5 Sample Custody

Custody for samples collected during this program will be maintained by the field personnel collecting the samples. The field personnel will be responsible for documenting each sample transfer and maintaining custody of all samples until they are shipped to the laboratory.

A self-adhesive label (Figure 2-2) will be affixed to each sample container before sample collection. At a minimum, the sample label will contain the following information:

- Client - job name
- Sample identification
- Date and time collected
- Sampler's initials
- Testing required, and
- Preservatives added.

Immediately after sample collection, each sample bottle will be sealed in an individual plastic bag. Samples will then be placed immediately into an insulated cooler for shipment to the laboratory. Chain-of-Custody records completed at the time of sample collection will accompany the samples inside the cooler for shipment to the laboratory (Figure 2-3). The samples will be properly relinquished on the field Chain-of-Custody record by the sampling team. These record forms will be sealed in a ziplock plastic bag to protect them against moisture. Each cooler will contain sufficient ice and/or ice packs to ensure that the proper temperature is maintained (approximately 4 degrees Celsius) and will be packed in a manner to prevent damage to sample containers. The field personnel will then sign and custody seal each sample cooler. All coolers will be shipped by an overnight courier according to current US DOT regulations to the laboratory referenced in Section 2.3.10. Upon receiving the samples, the Laboratory Sample Custodian will inspect the condition of the samples, compare the information on the sample labels against the field Chain-of-Custody record, assign a laboratory control identification number, and log the control number into the computer sample inventory system.

2.3.6 Decontamination and Post-Sampling Procedures

Field decontamination will be performed before sampling at each location and prior to leaving the Site. The non-disposable sampling tools including the low-flow pump (which will be disassembled) will be cleaned using the following procedure:

- Alconox and water wash

- De-ionized water rise
- Isopropanol rinse
- De-ionized water rinse; and
- Air dry and wrap in clean plastic bag.

After decontamination of the pump and its components, the pump will be reassembled, and two pump and discharge tubing volumes of de-ionized water will be purged through the pump to ensure all decontamination fluids are removed.

2.3.7 Water Quality Field Parameters Measurements

Specific conductivity, water temperature, turbidity, pH, dissolved oxygen (DO) and ORP measurements are made during well purging activities and prior to groundwater sampling and during surface water sampling. Measurements are made using a flow through cell with a combination instrument capable of measuring the above field water quality parameters. A separate instrument will be used to measure turbidity. Water quality parameters are recorded in the field notebook. All instruments are calibrated according to the manufacturer's specifications. The values for conductivity standards and pH buffers used in calibration are recorded in the field notebook. All probes are thoroughly cleaned and rinsed with de-ionized water before and after measurements.

2.3.8 Quality Assurance/Quality (QA/QC) Control Samples

The following quality control samples will be collected during each sampling event.

Trip Blanks - Trip blanks supplied by the laboratory will accompany the samples during the sampling process and will serve as a Quality Control (QC) check on container cleanliness, external contamination, and the analytical method. Trip blanks will be submitted one per day per sample shipping container and will be analyzed for VOCs only.

Equipment Rinsate Blank - Equipment rinsate blanks will be collected to ensure that sampling equipment is clean and that the potential for cross-contamination has been

minimized. If dedicated equipment is not used, one equipment blank will be collected for every 20 samples from each media. This sample will be collected by pouring ultrapure deionized water (supplied by the laboratory) into a decontaminated pump bladder or surface water sampler and then transferring the rinsate sample from the sampler to the sample containers. The equipment rinsate blank will be analyzed for identical parameters as the samples.

Duplicate Samples - Blind duplicate samples will be collected to allow determination of analytical and sampling precision. One duplicate sample will be collected for every 20 samples of each media and submitted for analysis of the identical parameters as the true sample.

Matrix Spike Sample - Site specific matrix spike/matrix spike duplicates (MS/MSD) samples will also be submitted as further QC checks. These samples will be spiked at the laboratory. These samples will be collected at the frequency of one MS and MSD for every 20 samples (including trip blanks, field blanks, and blind duplicates) for each media. These MS/MSD QC samples will allow accuracy to be determined by the recovery rates of compounds (the matrix spike and/or surrogate spike compounds defined in the analytical methods). Precision will also be assessed by comparison of matrix spike duplicate recoveries. The purpose of these laboratory spikes is to monitor any possible matrix effects specific to samples collected from the Site. The addition of known concentration of compounds/constituents into the sample also monitors extraction/digestion efficiency.

Matrix spike/matrix spike duplicate sample aliquots will be acquired for groundwater and surface water by providing triple the necessary sample volume for the location identified for these QC samples.

2.3.9 Documentation

Field data generated during sample collection such as field measurements, observations and field instrument calibrations will be entered in indelible ink directly into a bound field logbook. Figure 2-4 shows the typical pages of a field logbook. Appropriate information will be entered into the

logbook to reconstruct the sampling event, including site name (top of page), sample identification sample description, date and time of sample collection, methodology, field measurements and observations and the sampler's initials and date (bottom of page).

2.3.10 Laboratory Analyses

Samples will be submitted to Pace Analytical (PACE) in Grand Rapids, Michigan. Samples will be analyzed using methods that result in meeting the Practical Quantitation Limit (PQL).presented in Table 2-2. Pace's QA/QC Plan dated February 3, 2020 is presented in Attachment D.

2.3.11 Data Validation

All analytical data generated during the sampling investigation will undergo data review to verify the compliance to the required analytical protocols and to determine the qualitative and quantitative reliability of the presented data. Validation of laboratory analytical data will determine the usability and method compliance by evaluating the data against specific methodologies employed, and the USEPA Contract Laboratory Program National Functional Guidelines for Organic Review.

The information examined during the data review process, will consist of chain-of-custody completeness, holding time limitation, blank contamination, instrument calibration, initial and continuing calibration, matrix spike recoveries, laboratory and field duplicate precision, and overall system performance. The data validation review verifies that all results were calculated and reported correctly. The data review also verifies that the proper quality assurance/ quality control samples were collected and analyzed.

Upon completing the validation, a brief quality assurance report consisting of a general introduction followed by qualifying statements that describe the usability of the data, the difficulties encountered, and the shortcomings of the deliverables will be provided. Data summary tables will be included with the quality assurance reports. Based on the quality assurance report, qualifier codes defining the qualitative and quantitative reliability of the sample will be presented alongside the sample results.

3.0 DATA ASSESSMENT AND RE-EVALUATION

3.1 OVERVIEW OF GROUNDWATER CONCENTRATIONS

The validated analytical data from the annual sampling events will be used to evaluate trends in the primary COCs (PCE, TCE, cis-1,2-DCE and vinyl chloride) in each monitoring well/piezometer and within flow paths at the Site. Data trends for the primary COCs at the wells where the groundwater concentrations have typically exceed MCLs (MW-2, MW-6, MW-7 and PZ-6) since May 2014 are shown in Figures 3-1 through 3-4.

3.2 DATA ASSESSMENT

In accordance with an internal Ohio EPA email dated December 3, 2012 (see Attachment E), that states:

If the ground water contamination from the solid waste landfill is not measurably impacting the stream and the ground water remedy is natural attenuation monitoring then:

Identify the constituents that exceed surface water standards for the stream in question in the ground water next to the stream and set re-evaluation limits for those constituents.

If a rise in constituents levels occur and these re-evaluation levels are exceeded redo the baseline survey of the stream and see if a measurable impact is occurring.

At the direction of the Ohio EPA, the annual groundwater and surface water data will be compared to the RLs approved by Ohio EPA in accordance with OAC 3745-27-10(F)(8) and (9) and presented in Table 3-1. For all COCs except PCE, the RLs are the Outside Mixing Zone Average (OMZAs) as published by the Ohio EPA for the protection of aquatic life (January 12, 2015). At the direction of the Ohio EPA, the RL for PCE was developed utilizing the 95 percentile PCE concentration at MW-6 over the sampling events from November 2010 and May 2015; the 95 percentile PCE concentration for that period is 116 µg/L.

3.3 RE-EVALUATION CRITERIA

If significant increases in VOC concentration trends occur and the groundwater and surface water RLs are exceeded during two (2) consecutive annual sampling events, an ecological stream survey will be conducted to determine if a measurably adverse impact to surface water is occurring. The ecological stream survey will be conducted at the Site utilizing the Ohio HHEI in general accordance with Section 5.0 of the guidance entitled "Field Evaluation Manual for Ohio's Primary Headwater Habitat Streams" dated January 2012. The ecological stream survey will also include a macroinvertebrate survey in general accordance with Section 6.3 of the guidance entitled "Field Evaluation Manual for Ohio's Primary Headwater Habitat Streams" dated January 2012. Based on the ecological stream survey results, the current source control may be reassessed in cooperation with the Ohio EPA. If significant trends continue, the chosen remedy may be re-evaluated. Additionally, if exposure scenarios change, the effectiveness of the remedy will be re-evaluated.

3.4 GROUNDWATER AND SURFACE WATER MONITORING CLOSURE

The Morgan County Landfill Groundwater Quality Assessment Program (GWQAP) was initiated in April 1997. The Ohio EPA post-closure care period for the Morgan County Landfill is 30 years from the start of the GWQAP. The end of the Morgan County Landfill post-closure care period will be after the annual sampling event in 2027. If no statistically significant increases in VOC concentration trends occur and the groundwater and surface water RLs are not exceeded during the next 8 consecutive annual sampling events, 2020 through 2027, the post-closure groundwater and surface water monitoring at the Site shall be considered complete.

4.0 REPORTING

The results of the annual monitoring events will be documented in an Annual Corrective Measures Activities Report, and submitted in September/October to the Ohio EPA as required in OAC 3745-27-10 (F)(14). The reports will describe the groundwater and surface water data generated as part of the corrective measures. The reports will include the following when appropriate:

- Data summary tables and data validation reports of analytical results for each sampling event;
- Trend charts of analytical results for the groundwater constituents PCE and TCE, cis-1,2-DCE, and vinyl chloride at each groundwater monitoring point that exceeds groundwater MCL. Trend charts will include historical results beginning in November 2010 for these compounds;
- A SZS inferred water table map for each sampling event;
- Discussion of the analytical results in regards to monitoring the remedy;
- Proposals for changes in parameters, schedule, or other aspect of the monitoring program; and
- Conclusions and recommendations.

TABLES

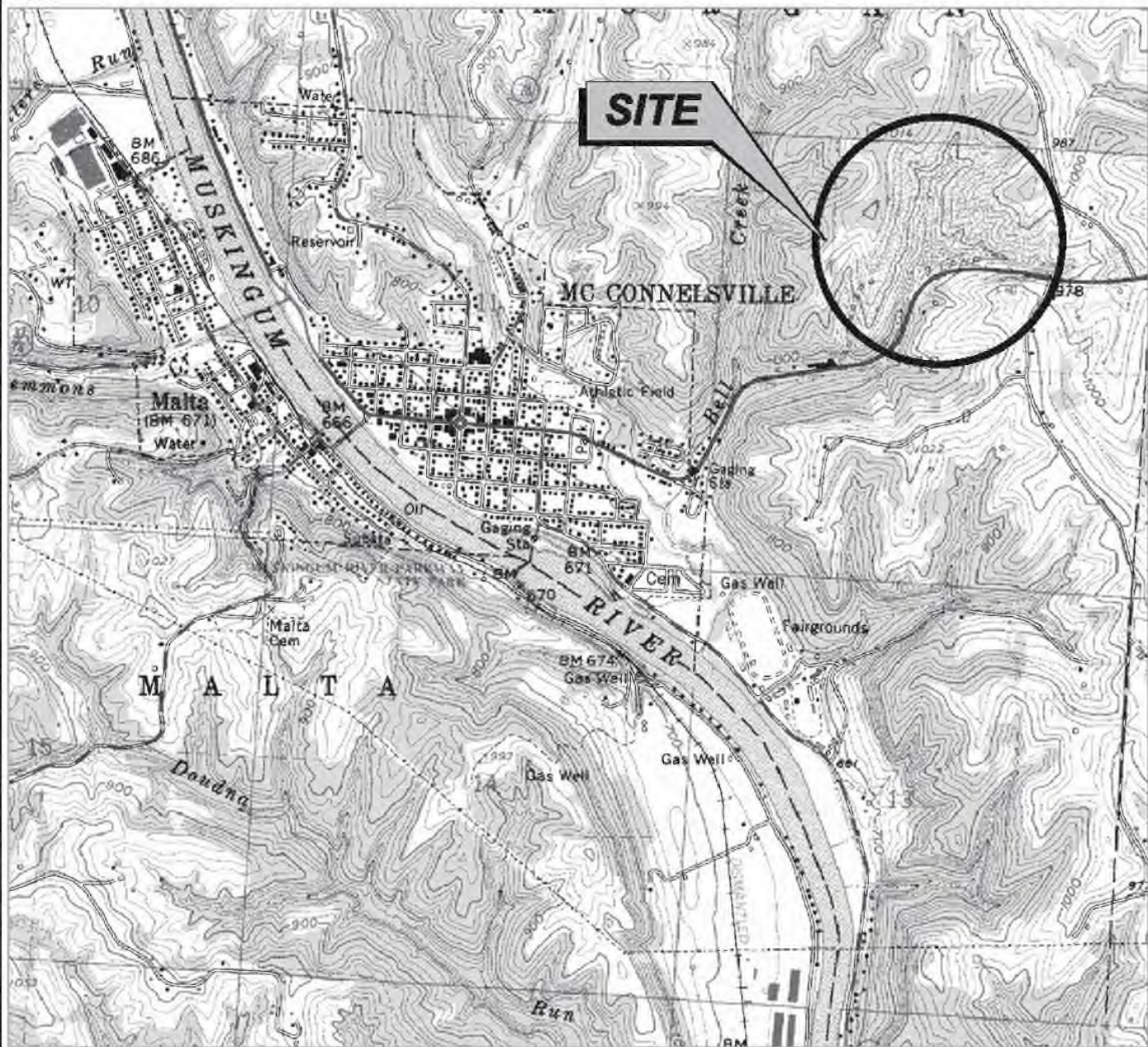
Parameter	Study 1	Study 2
Age
Sex
Education
Income
Occupation
Marital status
Health status
...

TABLE 2-2
SAMPLE CONTAINER, PRESERVATION, AND HOLDING TIME REQUIREMENTS
Post-Closure Groundwater and Surface Water Monitoring Plan
Morgan County Landfill
Morgan County, Ohio

CAS RN	PARAMETER	CONTAINER	PRESERVATIVE	MAXIMUM HOLDING TIME	Analytical Method	PQL (µg/L) for a Groundwater Matrix
630-20-6	1,1,1,2-Tetrachloroethane	3 40mL VOA vials	HCl, pH<2, Cool to 4°C	14 Days	8260B	1
71-55-6	1,1,1-Trichloroethane	3 40mL VOA vials	HCl, pH<2, Cool to 4°C	14 Days	8260B	1
79-34-5	1,1,2,2-Tetrachloroethane	3 40mL VOA vials	HCl, pH<2, Cool to 4°C	14 Days	8260B	1
79-00-5	1,1,2-Trichloroethane	3 40mL VOA vials	HCl, pH<2, Cool to 4°C	14 Days	8260B	0.2
75-34-3	1,1-Dichloroethane	3 40mL VOA vials	HCl, pH<2, Cool to 4°C	14 Days	8260B	1
75-35-4	1,1-Dichloroethene	3 40mL VOA vials	HCl, pH<2, Cool to 4°C	14 Days	8260B	1
96-18-4	1,2,3-Trichloropropane	3 40mL VOA vials	HCl, pH<2, Cool to 4°C	14 Days	8260B	1
95-50-1	1,2-Dichlorobenzene	3 40mL VOA vials	HCl, pH<2, Cool to 4°C	14 Days	8260B	1
107-06-2	1,2-Dichloroethane	3 40mL VOA vials	HCl, pH<2, Cool to 4°C	14 Days	8260B	0.5
78-87-5	1,2-Dichloropropane	3 40mL VOA vials	HCl, pH<2, Cool to 4°C	14 Days	8260B	0.5
106-46-7	1,4-Dichlorobenzene	3 40mL VOA vials	HCl, pH<2, Cool to 4°C	14 Days	8260B	1
78-93-3	2-Butanone (MEK)	3 40mL VOA vials	HCl, pH<2, Cool to 4°C	14 Days	8260B	50
591-78-6	2-Hexanone	3 40mL VOA vials	HCl, pH<2, Cool to 4°C	14 Days	8260B	50
108-10-1	4-Methyl-2-pentanone (MIBK)	3 40mL VOA vials	HCl, pH<2, Cool to 4°C	14 Days	8260B	50
67-64-1	Acetone	3 40mL VOA vials	HCl, pH<2, Cool to 4°C	14 Days	8260B	50
107-13-1	Acrylonitrile	3 40mL VOA vials	HCl, pH<2, Cool to 4°C	14 Days	8260B	1
71-43-2	Benzene	3 40mL VOA vials	HCl, pH<2, Cool to 4°C	14 Days	8260B	1
74-97-5	Bromochloromethane	3 40mL VOA vials	HCl, pH<2, Cool to 4°C	14 Days	8260B	1
75-27-4	Bromodichloromethane	3 40mL VOA vials	HCl, pH<2, Cool to 4°C	14 Days	8260B	1
75-25-2	Bromoform	3 40mL VOA vials	HCl, pH<2, Cool to 4°C	14 Days	8260B	1
74-83-9	Bromomethane	3 40mL VOA vials	HCl, pH<2, Cool to 4°C	14 Days	8260B	1
75-15-0	Carbon Disulfide	3 40mL VOA vials	HCl, pH<2, Cool to 4°C	14 Days	8260B	5
56-23-5	Carbon Tetrachloride	3 40mL VOA vials	HCl, pH<2, Cool to 4°C	14 Days	8260B	1
108-90-7	Chlorobenzene	3 40mL VOA vials	HCl, pH<2, Cool to 4°C	14 Days	8260B	1
75-00-3	Chloroethane	3 40mL VOA vials	HCl, pH<2, Cool to 4°C	14 Days	8260B	1
67-66-3	Chloroform	3 40mL VOA vials	HCl, pH<2, Cool to 4°C	14 Days	8260B	0.5
74-87-3	Chloromethane	3 40mL VOA vials	HCl, pH<2, Cool to 4°C	14 Days	8260B	1
156-59-2	cis-1,2-Dichloroethene	3 40mL VOA vials	HCl, pH<2, Cool to 4°C	14 Days	8260B	1
10061-01-5	cis-1,3-Dichloropropene	3 40mL VOA vials	HCl, pH<2, Cool to 4°C	14 Days	8260B	1
724-48-1	Dibromochloromethane	3 40mL VOA vials	HCl, pH<2, Cool to 4°C	14 Days	8260B	1
74-95-3	Dibromomethane	3 40mL VOA vials	HCl, pH<2, Cool to 4°C	14 Days	8260B	1
100-41-4	Ethylbenzene	3 40mL VOA vials	HCl, pH<2, Cool to 4°C	14 Days	8260B	1
74-88-4	Iodomethane	3 40mL VOA vials	HCl, pH<2, Cool to 4°C	14 Days	8260B	10
75-09-2	Methylene Chloride	3 40mL VOA vials	HCl, pH<2, Cool to 4°C	14 Days	8260B	5
100-42-5	Styrene	3 40mL VOA vials	HCl, pH<2, Cool to 4°C	14 Days	8260B	1
127-18-4	Tetrachloroethene	3 40mL VOA vials	HCl, pH<2, Cool to 4°C	14 Days	8260B	0.5
108-88-3	Toluene	3 40mL VOA vials	HCl, pH<2, Cool to 4°C	14 Days	8260B	1
156-60-5	trans-1,2-Dichloroethene	3 40mL VOA vials	HCl, pH<2, Cool to 4°C	14 Days	8260B	1
10061-02-6	trans-1,3-Dichloropropene	3 40mL VOA vials	HCl, pH<2, Cool to 4°C	14 Days	8260B	1
110-57-6	trans-1,4-Dichloro-2-butene	3 40mL VOA vials	HCl, pH<2, Cool to 4°C	14 Days	8260B	5
79-01-6	Trichloroethene	3 40mL VOA vials	HCl, pH<2, Cool to 4°C	14 Days	8260B	1
75-69-4	Trichlorofluoromethane	3 40mL VOA vials	HCl, pH<2, Cool to 4°C	14 Days	8260B	1
108-05-4	Vinyl Acetate	3 40mL VOA vials	HCl, pH<2, Cool to 4°C	14 Days	8260B	10
75-01-4	Vinyl Chloride	3 40mL VOA vials	HCl, pH<2, Cool to 4°C	14 Days	8260B	1
96-47-6 / 108-38-3 / 106-42-3 / 1330-20-7	Xylene (Total)	3 40mL VOA vials	HCl, pH<2, Cool to 4°C	14 Days	8260B	3

Table 1	
Year	Value
2010	100
2011	105
2012	110
2013	115
2014	120
2015	125
2016	130
2017	135
2018	140
2019	145
2020	150

FIGURES



MORGAN COUNTY LANDFILL

MORGAN COUNTY, OHIO

Base Map Source: U.S.G.S. 7 1/2 minute topographical quadrangle map of McConnelsville, Ohio, 1961, photorevised 1987.

Scale:
1"=2000'
Originated By:
B.S.B.
Drawn By:
C.E.P.
Checked By:
B.S.B.
Project Mgr:
B.S.B.
Dwg No.
95154-01
Issued:

SITE LOCATION MAP



Advanced GeoServices Corp.
1055 Andrew Drive, Suite A
West Chester, Pennsylvania 19380
(610) 840-9100
FAX: (610) 840-9199

Project No.
95-154-03

FIGURE: 1-1

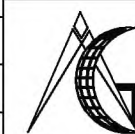
NOTE: PROPERTY TRACT 1
SUBDIVIDED BY HACKNEY RIDGE
LAND VENTURES LLC, AN OHIO
LIMITED LIABILITY COMPANY, AND
BAILEY RIDGE LAND VENTURES LLC,
AN OHIO LIMITED LIABILITY
COMPANY. AND SOLD TO CHARITY
GAS, INC., A WEST VIRGINIA
CORPORATION ON APRIL 11, 2019.

MORGAN COUNTY LANDFILL

LEGEND: MORGAN COUNTY, OHIO

Scale:	1"=300'
Originated By:	B.B.B
Drawn By:	C.E.P
Checked By:	B.B.B
Project Mgr:	B.B.B
Dwg No.	95154-0
Issued:	

PROPOSED GROUNDWATER AND SURFACE
WATER MONITORING LOCATIONS FOR
2015 CORRECTIVE MEASURES PLAN



Advanced GeoServices Corp.
1055 Andrew Drive Suite A
West Chester, Pennsylvania 19380
(610) 840-9100
FAX: (610) 840-9199

	Project No.
--	-------------

95-154-02

FIGURE: 2-1


SAMPLE CUSTODY SEAL

ADVANCED GEOSERVICES CORP	
CUSTODY SEAL	
_____ Signature	_____ Date

SAMPLE CONTAINER LABEL

Advanced GeoServices 1055 Andrew Drive, Ste. A West Chester, PA 19380-4293 Phone (610) 840-9100 Fax (610) 840-9199	_____ Composite <u> X </u> Grab Date / Time / /
SITE NAME: <i>Morgan Co Landfill</i> PROJECT NO: <i>95-154-03</i> SAMPLE ID:	BY: PRESERVATIVES: <i>HCl</i>
ANALYSIS: VOCs	

F:\Projects\1995\95154-Morgan County Landfill\Cart\DRAWINGS\9515401\95154-26.dwg

Scale: N.T.S. Originated By: B.B.B. Drawn By: C.E.P. Checked By: B.B.B. Project Mgr: B.B.B. Dwg No.	SAMPLE LABEL EXAMPLES	
Issued:	 Advanced GeoServices Corp. 1055 Andrew Drive, Suite A West Chester, Pennsylvania 19380 (610) 840-9100 FAX: (610) 840-9199	
Project No. 95-154-03	FIGURE: 2-2	

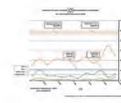


Exhibit 3 – Environmental Covenant

**To be recorded with Deed
Records - ORC § 317.08**

ENVIRONMENTAL COVENANT

This Environmental Covenant is entered into pursuant to Ohio Revised Code ("ORC") §§ 5301.80 to 5301.92 by Charity Gas, Inc., a West Virginia corporation ("Charity Gas" or "Owner"), located at 9844 Meathouse Fork Road, Salem, WV 26426-5554, the Morgan County Commissioners ("Commissioners" or "Holders"), having offices at 19 East Main Street, McConnelsville, OH 43756, and the Ohio Environmental Protection Agency ("Ohio EPA") as a non-holder agency. This Environmental Covenant concerns an approximately 134.7280 acre property that includes the closed Morgan County Landfill as depicted in the attached Exhibits. The purpose of this Environmental Covenant is to subject the closed Morgan County Landfill to activity and use limitations as set forth herein.

Whereas, Charity Gas is the current owner of the property containing closed Morgan County Landfill located on Route 60, McConnelsville, Morgan County, Ohio; and

Whereas, the Commissioners leased the property containing the closed Morgan County Landfill for the purpose of establishing and operating a solid waste disposal facility, which was in operation 1971 until September 1, 1988; and

Whereas, the Commissioners have ongoing post-closure care obligations at the closed Morgan County Landfill for the post-closure care period including, but not limited to, maintenance of the landfill cap and groundwater monitoring in accordance with pursuant to OAC Rule 3745-27-10; and

Whereas, volatile organic compounds (VOCs) have been identified as contaminants of concern (COCs) in the groundwater underlying the closed Morgan County Landfill; and

Whereas, some of the COCs identified or underlying the Closed Morgan County Landfill have been detected at concentrations above federal primary drinking water maximum contaminant levels (MCLs); and

Whereas, Charity Gas, the Commissioners, and Ohio EPA (collectively referred to as "the Parties") have determined to impose activity and use limitations on the closed Morgan County Landfill as described in this Environmental Covenant to protect the

engineered components of the closed landfill facility and prevent migration of COCs in the groundwater; and

Whereas, the area of the Property depicted in Exhibit 1 has a potential risk to human health through the inhalation of VOCs which may migrate from the ground water to indoor air should construction of occupied structures occur on this Property without appropriate engineering controls; and

Now therefore, the Parties agree to the following:

1. Intention of the Parties. This Environmental Covenant touches and concerns the described Property and is intended to limit the use of the described Property as identified in Exhibit 1 and restrict certain activities from occurring on the Property pursuant to ORC §§ 5301.80 to 5301.92. It is also the intent of the Parties that the covenants, terms, conditions and restrictions of this Environmental Covenant shall be binding upon and inure to the benefit of the Parties and continue as a servitude running in perpetuity with the Property, subject to ORC § 5301.89. It is the further intention of the Parties that the Environmental Covenant be enforceable at law pursuant to ORC § 5301.91.
2. Property. This Environmental Covenant concerns an approximately 134.7280 acre tract of land currently owned by Charity Gas, tax parcel # 130-001-393-4, located on Route 60, McConnelsville, Morgan County, Ohio, being part of Range No. 12, Township 10, Section 12, and depicted in Exhibit 1 attached hereto and incorporated by reference herein. The closed Morgan County Landfill limits of municipal solid waste placement are wholly located within the boundaries of the Property, and are depicted in Exhibit 2. The tract of land identified in Exhibit 1 shall be known as the "Property" for purposes of this Environmental Covenant.
3. Owner. Charity Gas, Inc., a West Virginia corporation, located at 9844 Meathouse Fork Road, Salem, WV 26426-5554 is the Owner of the Property.
4. Holders. the Morgan County Commissioners, having offices at 19 East Main Street, McConnelsville, OH 43756 are the holders of this Environmental Covenant.
5. Activity and Use Limitations. In accordance with ORC §§ 5301.80 through 5301.92, and to protect the engineered components of the municipal waste landfill, and to comply with Consensual Director's Final Findings and Orders, the Owner hereby imposes and agrees to comply with the following activity and use limitations for the Property:

A. *Limitation Prohibiting Ground Water Extraction and Use.*

Groundwater underlying the Property or any portion of the Property shall not be extracted or used for any purpose, potable or otherwise, except for the investigation, monitoring or remediation of the groundwater; or for dewatering during authorized construction or excavation activities, or during installation or maintenance of subsurface utilities. Holders and Ohio EPA retain the right to access the Property depicted in Exhibit 1 to install groundwater monitoring wells and conduct sampling, assessment and remediation activities as may be determined necessary by Ohio EPA.

B. *Limitation for Any Construction Activity.* To protect the integrity of the closed municipal solid waste landfill and its engineered components including the groundwater monitoring network, no person shall engage in any filling, grading, drilling, excavating, building, drilling or mining on the Property as depicted in Exhibit 1 without express prior authorization from Ohio EPA in accordance with OAC Chapter 3745-513 or other applicable authority.

C. *Limitation for Any Occupied Structures.* To prevent the potential inhalation of volatile organic compounds including, but not limited to, potential exposure to volatile emissions from groundwater to indoor air, no person shall construct any occupied structures on the Property depicted in Exhibit 1 without prior authorization from Ohio EPA.

D. *Limitation Prohibiting Division.* The Property shall not be divided or subdivided.

6. Running with the Land. This Environmental Covenant shall be binding upon the Owner during the time that the Owner owns the Property or any portion thereof, and upon all assigns and successors in interest, including any Transferee, and shall run with the land, pursuant to ORC § 5301.85, subject to amendment or termination as set forth herein. The term "Transferee," as used in this Environmental Covenant, shall mean any future owner of any interest in the described Property or any portion thereof, including, but not limited to, owners of an interest in fee simple, mortgagees, easement holders, and/or lessees.

7. Compliance Enforcement. Compliance with this Environmental Covenant may be enforced pursuant to ORC § 5301.91. Failure to timely enforce compliance with this Environmental Covenant or the use limitations contained herein by any

party shall not bar subsequent enforcement by such party and shall not be deemed a waiver of the party's right to take action to enforce any non-compliance. Nothing in this Environmental Covenant shall restrict the Director of Ohio EPA from exercising any authority under applicable law in order to protect public health or safety or the environment.

8. Rights of Access. Owner hereby grants to Ohio EPA, the Holders, and their respective employees, agents, and assigns, the right of access to the Property for implementation or enforcement of this Environmental Covenant.

9. Compliance Reporting. In addition to any other reporting requirements imposed by law or agreement, Owner and any Transferee shall submit to Ohio EPA annual written documentation verifying that the activity and use limitations on the Property remain in place and are being complied with. Said written documentation may be a statement submitted by the Owner or Transferee under affidavit or in conjunction with any other reporting requirements imposed by law or agreement, as long as said documentation is submitted no less than annually.

10. Notice of Activity and Use Limitations upon Conveyance. Each instrument hereafter conveying any interest in the Property or any portion of the Property shall contain a notice of the activity and use limitations set forth in paragraph 5 of this Environmental Covenant, and provide the recorded location of this Environmental Covenant. The notice shall be substantially in the following form:

THE INTEREST CONVEYED HEREBY IS SUBJECT TO AN ENVIRONMENTAL COVENANT, DATED_____, 2020, RECORDED IN THE DEED OR OFFICIAL RECORDS OF THE MORGAN COUNTY RECORDER ON _____, 2020, IN [DOCUMENT _____, or BOOK____, PAGE ____]. THE ENVIRONMENTAL COVENANT CONTAINS THE FOLLOWING ACTIVITY AND USE LIMITATIONS:

A. Limitation Prohibiting Ground Water Extraction and Use.

Groundwater underlying the Property or any portion of the Property shall not be extracted or used for any purpose, potable or otherwise, except for the investigation, monitoring or remediation of the groundwater; or for dewatering during authorized construction or excavation activities, or during installation or maintenance of subsurface utilities. Holders and Ohio EPA retain the right to access the Property depicted in Exhibit 1 to install groundwater monitoring wells and conduct sampling, assessment and remediation activities as may

be determined necessary by Ohio EPA.

- B. *Limitation for Any Construction Activity.*** To protect the integrity of the closed municipal solid waste landfill and its engineered components including the groundwater monitoring network, no person shall engage in any filling, grading, drilling, excavating, building, drilling or mining on the Property as depicted in Exhibit 1 without express prior authorization from Ohio EPA in accordance with OAC Chapter 3745-513 or other applicable authority.
- C. *Limitation for Any Occupied Structures.*** To prevent the potential inhalation of volatile organic compounds including, but not limited to, potential exposure to volatile emissions from groundwater to indoor air, no person shall construct any occupied structures on the Property depicted in Exhibit 1 without prior authorization from Ohio EPA.
- D. *Limitation Prohibiting Division.*** The Property shall not be divided or subdivided.

Owner or Transferee, if applicable, shall notify Ohio EPA and any Holders within thirty (30) days after each conveyance of an interest in any portion of the Property depicted in Exhibit 1. Owner's notice shall include the name, address, and telephone number of the Transferee, a copy of the deed or other documentation providing evidence of the conveyance, and a survey map that shows the boundaries of the restricted Property, or portion thereof, that is being transferred.

11. Representations and Warranties. Owner hereby represents and warrants to the other signatories hereto:

- A. that the Owner is the sole owner of the Property;
- B. that the Owner holds fee simple title to the Property;
- C. that the Owner 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;
- D. that the Owner has identified all other persons that have an interest in or hold an encumbrance on the Property and notified such persons of the Owner's intention to enter into this Environmental Covenant;
- E. that this Environmental Covenant will not materially violate or contravene or constitute a material default under any other agreement, document or instrument to which Owner is a party or by which Owner may be bound or

- affected; and
- F. to the extent that any other interests in or encumbrances on the Property conflict with the activity and use limitations set forth in this Environmental Covenant, the persons who own such interests or hold such encumbrances have agreed to subordinate such interests or encumbrances to the Environmental Covenant, pursuant to ORC § 5301.86 except for leases, right of ways or easements for public utilities or distribution lines above or below the surface.

12. Amendment or Termination. This Environmental Covenant may be amended or terminated only by written instrument executed by and documenting the consent of all of the following: the Owner or a Transferee; the Holders, and the Director of Ohio EPA, pursuant to ORC §§ 5301.89 or § 5301.90. The term, "Amendment," as used in this Environmental Covenant, shall mean any changes to the Environmental Covenant, including the activity and use limitations set forth herein, or the elimination of one or more activity and use limitations when there is at least one limitation remaining. The term, "Termination," as used in this Environmental Covenant, shall mean the elimination of all activity and use limitations set forth herein and all other obligations under this Environmental Covenant.

Within thirty (30) days of signature by all requisite parties on any amendment or termination of this Environmental Covenant, the Owner or Transferee shall file such instrument for recording with the Morgan County Recorder's Office, and shall provide a file- and date-stamped copy of the recorded instrument to Ohio EPA and Holders.

13. Severability. If any provision of this Environmental Covenant is found to be unenforceable in any respect, the validity, legality, and enforceability of the remaining provisions shall not in any way be affected or impaired. Owner expressly waives the ability to contest the legality and operation of this Environmental Covenant.

14. Governing Law. This Environmental Covenant shall be governed by and interpreted in accordance with the laws of the State of Ohio.

15. Recordation. Within thirty (30) days after the date of the final required signature upon this Environmental Covenant, Owner shall file this Environmental Covenant for recording, in the same manner as a deed to the Property, with the Morgan County Recorder's Office, in accordance with ORC § 5301.88.

16. Effective Date. The effective date of this Environmental Covenant shall be the date upon which the fully executed Environmental Covenant has been recorded as a deed record for the Property with the Morgan County Recorder.

17. Distribution of Environmental Covenant. The Owner shall distribute a file- and date-stamped copy of the recorded Environmental Covenant to the Ohio EPA, any other signatories to the Environmental Covenant in accordance with ORC § 5301.83.

18. Notice. Unless otherwise notified in writing by any party hereto or Ohio EPA, any document or communication required by this Environmental Covenant shall be submitted to:

Division of Materials and Waste Management
Ohio EPA
P.O. Box 1049
Columbus, Ohio 43216-1049

And

Division of Materials and Waste Management
Ohio EPA, Southeast District Office
2195 Front Street
Logan, Ohio 43138
Attn.: DMWM Supervisor

OHIO ENVIRONMENTAL PROTECTION AGENCY

Laurie A. Stevenson
Laurie A. Stevenson, Director

11/12/20
Date

State of Ohio)
)
County of Franklin) ss:

Before me, a notary public, in and for said county and state, personally appeared Laurie A. Stevenson, the Director of Ohio EPA, who acknowledged to me that he did execute the foregoing instrument on behalf of Ohio EPA.

IN TESTIMONY WHEREOF, I have subscribed my name and affixed my official seal this 12 day of November, 2020.

[Signature]
Notary Public

MARCUS J. GLASGOW
NOTARY PUBLIC, STATE OF OHIO
LIFETIME COMMISSION

The undersigned representative of the Owner represents and certifies that he/she is authorized to execute this Environmental Covenant.

IT IS SO AGREED:

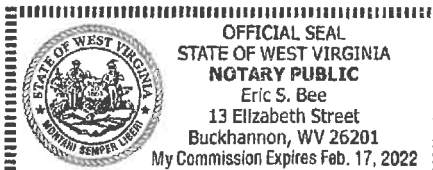
Lowell P. Bee
Signature of Owner

Lowell P. Bee
Printed Name and Title

9/10/20
Date

State of West Virginia)
County of Ritchie)

SS:



Before me, a notary public, in and for said county and state, personally appeared Lowell P. Bee the President and duly authorized representative of Charity Gas, Inc., who acknowledged to me that he/she did execute the foregoing instrument on behalf of Charity Gas, Inc.

IN TESTIMONY WHEREOF, I have subscribed my name and affixed my official seal this 10th day of September, 2020.

Eric S. Bee
Notary Public

My Commission Expires: February 17, 2022

The undersigned representatives of the Holders represent and certify that they are authorized to execute this Environmental Covenant.

IT IS SO AGREED:

Adam Shriver
Signature of Holder

ADAM SHRIVER County Commissioner
Printed Name and Title

8-31-20
Date

Tom Bragg
Signature of Holder

Tom Bragg
Printed Name and Title

8-31-20
Date

Michael Reed
Signature of Holder

MICHAEL REED
Printed Name and Title

8-31-2020
Date

State of OHIO)
County of MORGAN) ss:

Before me, a notary public, in and for said county and state, personally appeared Adam Shriver, Tom Bragg, and Michael Reed, the current Morgan County Commissioners, who acknowledged to me that they did execute the foregoing instrument on behalf of the Morgan County Commissioners.

IN TESTIMONY WHEREOF, I have subscribed my name and affixed my official seal this 31 day of AUGUST, 2020.



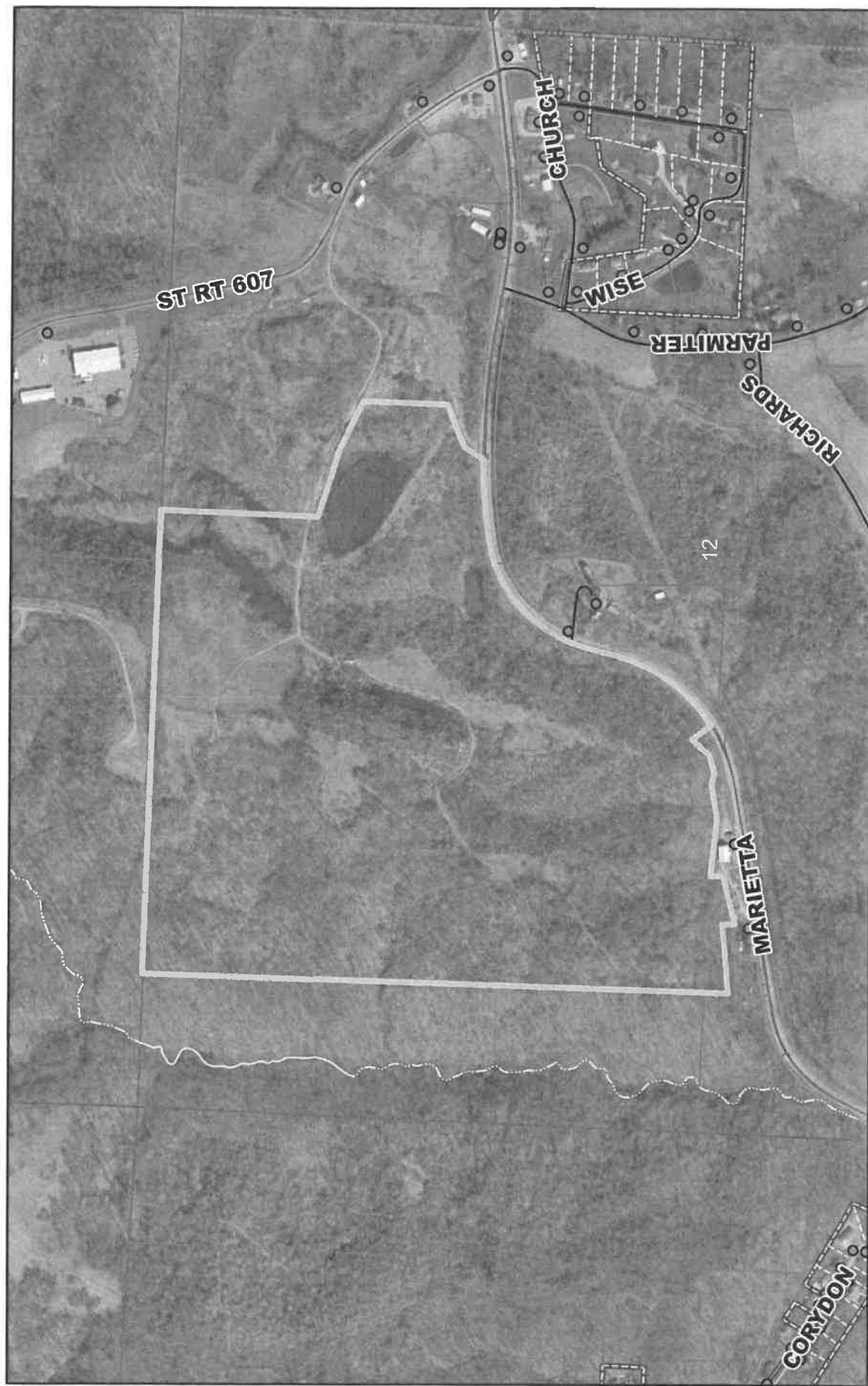
CATHERINE M. CHAPIN
Notary Public, State of Ohio
My Commission Expires
May 27, 2022

Catherine M. Chapin
Notary Public

Prepared by:

Troy M. Harter
Staff Attorney, EPA
50 West Town St., Ste. 700
Columbus, OH 43215

Exhibit 1 – Property Limits



April 24, 2020

1:8,000

0 365 730 1,460 ft

0 112.5 225 450 m

Bruce Harris & Associates, Inc.

Exhibit 2 – Limits of Waste Placement

Morgan County Landfill

