SCS ENGINEERS

Transmittal

West Des Moines, IA

PROJECT:	SEMCO,2025 LF Permit Renewal,IA 27225496.00	DATE:	10/13/2025
SUBJECT:	Southeast Iowa Multi-County Landfill - 54-SDP-01-75P - 2025 Permit Renewal Application 10.13.2025	TRANSMITTAL ID:	00003
PURPOSE:	For your approval	VIA:	Info Exchange

FROM

NAME	COMPANY	EMAIL	PHONE
Kasi Province West Des Moines, IA	SCS Engineers	KProvince@scsengineers.com	

TO

NAME	COMPANY	EMAIL	PHONE
Mike Smith 502 East 9th Street Des Moines IA 50319-0034 United States	Iowa, State of	mike.smith@dnr.iowa.gov	515-725-8200
Becky Jolly		becky.jolly@dnr.iowa.gov	

REMARKS:

Please find enclosed for your review the Southeast Iowa Multi-County Landfill 2025 Permit Renewal Application.
Let us know if you have any questions or need additional information.

Thank you,
Kasi Province, P.E.
SCS Engineers
West Des Moines, Iowa
(515) 779-2227 (C)
kprovince@scsengineers.com

www.scsengineers.com

DESCRIPTION OF CONTENTS

QTY	DATED	TITLE	NOTES
1	10/13/2025	Southeast Iowa Multi-County Landfill_54-SDP-01-75P_2025 Permit Renewal 10.13.2025.pdf	

COPIES:

Transmittal

DATE: 10/13/2025
TRANSMITTAL ID: 00003

Bill Sloop	(Southeast Multi-County Solid Waste Agency)
Christine Collier	(SCS Engineers)
Nathan Ohrt	(SCS Engineers)

October 13, 2025
File No. 27225496.00

Mr. Michael Smith
Iowa Department of Natural Resources
Land Quality Bureau
6200 Park Avenue, Suite 200
Des Moines, Iowa 50321

Subject: 2025 Permit Renewal Application
Southeast Multi-County Sanitary Landfill
Permit No. 54-SDP-01-75P

Dear Mr. Smith:

On behalf of the Southeast Iowa Multi-County (SEMCO) Solid Waste Agency (Agency), SCS Engineers (SCS) is pleased to submit this Permit Renewal Application for the SEMCO Sanitary Landfill for your review.

Following standard practice, the permittee and SCS have reviewed the current permit and planning documents. Form 50 for permit renewal applications has been completed. Section 1 has been reviewed and updated. Section 2 has been prepared as required with the Executive Summary. Referenced documents are either included in this submittal if updates occurred or the DocDNA number of the current approved plans has been included. Upon review of this documentation and attachments, the Agency representative has provided signature in Section 3.

Please feel free to contact us if you have any questions, require additional information, or need any further clarification.

Sincerely,

Kasi Province, P.E.
Project Professional
SCS Engineers

Christine L. Collier, P.E.
Senior Project Manager
SCS Engineers

KDP/CLC

cc: Bill Sloop, Manager

2025 Permit Renewal Application Southeast Iowa Multi-County Sanitary Landfill

Southeast Iowa Multi-County (SEMCO) Sanitary Landfill
Richland, Keokuk County, Iowa
Permit No. 54-SDP-01-75P

Prepared For:
Southeast Iowa Multi-County Solid Waste Agency

I hereby certify that this document was prepared by me or under my direct supervision and that I am a duly licensed Professional Engineer under the laws of the state of Iowa.

Christine L. Collier

Christine L. Collier, P.E.

Digitally signed by Christine L. Collier, P.E.
Date: 2025.10.13 15:50:38 -05'00'

Christine L. Collier Date

My license renewal date is: December 31, 2025
Pages or sheets covered by this seal:
Reviewed for compliance purposes only.

SCS ENGINEERS

Project No. 27225496.00 | October 2025

1690 All-State Court, Suite 100
West Des Moines, IA 50265
515-631-6160

Table of Contents

Section Page

Figures

Appendices

1.0 IOWA DEPARTMENT OF NATURAL RESOURCES FORM 50

IOWA DEPARTMENT OF NATURAL RESOURCES

Municipal Solid Waste Landfill

PERMIT APPLICATION FORM 50

☐ **New Permit**

☒ **Permit Renewal (permit number)** 54 **- SDP -** 01 **-** 75P **MLF**

☐ **Closure Permit**

SECTION 1: PERMIT APPLICATION REQUIREMENTS

Owner of site

Name: Southeast Iowa Multi-County Solid Waste Agency Phone: 319-456-6171

Address: 29997 Highway 78 Fax: 319-456-6171

City, State, Zip: Richland, Iowa 52585 E-mail: semcolandfill@gmail.com

Certified Operator Responsible for Operation at Facility

Name: Bill Sloop, Manager Phone: 319-456-6171

Address: 29997 Highway 78 Fax: 319-456-6171

City, State, Zip: Richland, Iowa 52585 E-mail: semcolandfill@gmail.com

Permit Applicant

Name: Southeast Iowa Multi-County Solid Waste Agency Phone: 319-456-6171

Address: 29997 Highway 78 Fax: 319-456-6171

City, State, Zip: Richland, Iowa 52585 E-mail: semcolandfill@gmail.com

Design Engineer (PE)

Name: Christine L. Collier, P.E. Phone: 515-631-6160

Address: 1690 All-State Court, Suite 100 Fax: 913-681-0012

City, State, Zip: West Des Moines, Iowa 50265 E-mail: ccollier@scsengineers.com

Iowa Engineer License #: 17963 Expiration Date: 12/31/2025

Responsible Official for the Facility

Name: Bill Sloop, Manager, Manager; SEMCO Sanitary Landfill Phone: 319-456-6171

Address: 29997 Highway 78 Fax: 319-456-6171

City, State, Zip: Richland, Iowa 52585 E-mail: semcolandfill@gmail.com

Agency and Responsible Official of Agency Served (if any)

Name: Bill Sloop, Manager; SEMCO Sanitary Landfill Phone: 319-456-6171

Address: 29997 Highway 78 Fax: 319-456-6171

City, State, Zip: Richland, Iowa 52585 E-mail: semcolandfill@gmail.com

Facility

Name: SEMCO Sanitary Landfill

Address: 29997 Highway 78 City, State, Zip: Richland, Iowa 52585

Legal Description: The property consists of approximately 141 acres and is located in the NE ¼ of the SE ¼, the SE ¼ of the SE ¼, Auditor's Parcel "B" of the SE ¼ of the NE ¼, the eastern 300 feet of the SW ¼ of the SE ¼, the eastern 300 feet of the S ½ of the NW ¼ of the SE ¼, and Lot 3 of Auditor's Parcel "B" of the N ½ of the NW ¼ of the SE ¼; all in Section 29; and the SW ¼ of the SW ¼, Lot 3 in the NW ¼ of the SW ¼, the South half of the abandoned railroad right of way, Auditor's Parcel "A" in the NW ¼ of the SW ¼; all in Section 28; all in T74N, R10W, of the Fifth Principal Meridian, in Keokuk County, Iowa.

Landfill is part of the following solid waste comprehensive planning area:

Planning Area Name: Southeast Iowa Multi-County Solid Waste Agency

Date of Last Approved Plan: August 14, 2023

Service area of the landfill (include unincorporated areas and out of state generators):

All cities and the unincorporated area in Jefferson County, all cities and the unincorporated area in Keokuk County; all cities, excluding Kalona and Riverside, and the unincorporated area in Washington County; and the cities of Coppock, Olds and Wayland in Henry County.

Population Served: 45,763 (Comp Plan)

SECTION 2: PERMIT APPLICATION SUPPORTING DOCUMENTATION

PLANS AND SPECIFICATIONS

Checking the appropriate boxes below certifies that the documents submitted in conjunction with this application form are complete and in compliance with the applicable chapters of the Iowa Administrative Code. While some of the documents below may have been submitted previously, updated copies of each are required to be provided with each permit renewal application, unless a prior document remains current and is identified by Doc ID#, Section, and Page.

Required Plans and Specifications

☒ Executive Summary

An executive summary shall address the following:

- Summary of modifications, if any, to the approved plans and specifications that occurred during the current permit cycle.
- Summary of each special provision of the current permit to determine if it is to remain the same, be revised or be removed.
- Provide documentation and certification as required for new permit amendment requests, if any.
- Provide documentation and certification as required for equivalency review requests, if any.
- Provide documentation and certification as required for new variance requests from Iowa Administrative Code requirements, if any.

☒ An organizational chart in accordance with Iowa Administrative Code 567 paragraph 113.5(1)"b".

No Revision Required - See Doc ID#, Section, and Page: _____

☐ A site exploration and characterization report for the facility that complies with the requirements of subrule 113.6(4).

No Revision Required - See Doc ID#, Section, and Page: DocDNA #57212, Appendix 2, page 31

☐ Design plans and specifications for the facility, and quality control and assurance plans, that comply with the requirements of rule 113.7(455B).

No Revision Required - See Doc ID#, Section, and Page: DocDNA #57212, Appendix 3, page 283 & DocDNA #100203, Appendix 5, page 49

☐ A development and operations (DOPS) plan for the facility, an emergency response and remedial action plan (ERRAP), and proof of MSWLF Operator Certification that comply with the requirements of rule 113.8(455B) .

No Revision Required - See Doc ID#, Section, and Page: DOPS - DocDNA #57212, Appendix 5, page 417

☒ An environmental monitoring plan that complies with the requirements of rules 113.9(455B) and 113.10(455B).

No Revision Required - See Doc ID#, Section, and Page: _____

☐ The project goals and time lines, and other documentation as necessary to comply with subrule 113.4(10) and other requirements of the Department if an RD&D permit is being requested or renewed.

No Revision Required - See Doc ID#, Section, and Page: N/A

☒ Proof of financial assurance in compliance with rule 113.14(455B).

No Revision Required - See Doc ID#, Section, and Page: _____

☐ A closure and postclosure plan that complies with the requirements of rules 113.12(455B) and 113.13(455B).

No Revision Required - See Doc ID#, Section, and Page: DocDNA #57212, Appendix 11 & 12, 555 & 610

☒ Comprehensive plan requirements. Attach a copy of the most recent comprehensive plan approval or amendment letter.

No Revision Required - See Doc ID#, Section, and Page: _____

In addition to the documents required above, the permit holder shall comply with the implementation plan requirements of subrule 113.2(9), the public notice requirements of subrule 113.4(12), and the record-keeping and reporting requirements of rule 113.11(455B).

If the department finds the permit application information to be incomplete, the department shall notify the applicant of that fact and of the specific deficiencies. If the applicant fails to correct the noted deficiencies within 30 days, the department may reject the application and return the application materials to the applicant. The applicant may reapply without prejudice.

SECTION 3: APPLICANT SIGNATURE

Signature of Permit Applicant: W.L. Sloop **Date:** October 10, 2025

Printed Name: W.L. Sloop **Title:** Manager

Applications for sanitary disposal projects must be accompanied by the plans, specifications and additional information required by the applicable solid waste rules under Iowa Administrative Code.

Send completed applications with attached information to the DNR project officer via email or file sharing platform.

For questions concerning this application contact Brian Rath at 515-537-4051, brian.rath@dnr.iowa.gov

2.0 EXECUTIVE SUMMARY

2.1 INTRODUCTION

SCS Engineers, on behalf of the Southeast Iowa Multi-County (SEMCO) Solid Waste Agency (Agency), has prepared the permit renewal application for the Southeast Iowa Multi-County Sanitary Landfill (Landfill). The information required in the Executive Summary is listed in Section 2.0 of the Permit Application Form 50 and includes a summary of modifications, special provisions, permit amendments, and documentation and certification as required for new permit amendment requests and new waiver requests.

2.2 SUMMARY OF MODIFICATIONS

Modifications to the current plans and specifications during the current permit cycle (January 11, 2021 to October 13, 2025) are summarized in Table 1.

Table 1. Permit Modifications History

Date	Permit Modification
1/11/2021	Permit Renewal
4/10/2023	Permit Revision #7, leachate measurement frequency reduction (Special Provision #2b) and leachate recirculation approvals (Special Provision #6).
10/11/2023	Permit Revision #8, added wood chips as an allowable ADC (Special Provision #8).
7/15/2024	Permit Revision #9, modified the HMSP to reflect completion of corrective actions.

2.3 SPECIAL PROVISIONS OF CURRENT PERMIT

Following is a summary of each special provision (Section X. Special Provisions) of the current permit in addition to a brief discussion about if it is to remain the same, be revised, or be removed.

Special Provision #1.

The permit holder is authorized to accept solid waste for disposal in accordance with the approved Southeast Multi-County Solid Wate Agency Comprehensive Plan. The Comprehensive Plan as approved by the DNR on September 4, 2018; any approved amendments to the plan; and the latest plan update, are hereby incorporated into the permit.

The permitted service area includes: all cities and the unincorporated area in Jefferson County, all cities and the unincorporated area in Keokuk County, all cities, excluding Kalona and Riverside, and the unincorporated area in Washington County; and the cities of Coppock, Olds and Wayland in Henry County.

In accordance with subrule 101.13(2), the permit holder shall submit an updated Comprehensive Solid Waste Management Plan compliant with the DNR's schedule.

The Agency requests Special Provision #1 be changed to update the Comprehensive Plan approval date to August 14, 2023 (see **Appendix A**). There are no other changes required or requested to Special Provision #1.

Special Provision #2.

The permit holder shall develop and operate the site in accordance with the Development and Operations Plan, as contained in Appendix 5 of the Permit Renewal Application (doc #98601), dated October 2, 2020, as submitted by Barker Lemar Engineering Consultants and approved on January 11, 2021; the updated Emergency Response and Remedial Action Plan (ERRAP, doc #103202) dated May 12, 2022 as submitted by Evora Consulting; and the following:

a. *Waste disposal is limited to the Phase 0 Cell, the Phase 0 Abutment Area, the Phase 1 Cell, the Phase 1 Abutment Area, the Phase 2 Cell, the Phases 3 and 4 Cell. The site vertical height shall not exceed a maximum waste elevation of 830 feet near 4250 E and 11250 N. Any further expansion beyond these cells shall require prior DNR approval.*

b. *The permit holder shall collect from the leachate control system and properly dispose of the leachate either by treatment in an on-site facility, discharge with an NPDES permit; or by discharge to the City of Hedrick publicly owned treatment works (POTW). If the discharge is to a POTW with a pretreatment program approved by the DNR, the discharge must comply with the terms and conditions of a local permit issues for the discharge by the POTW. If the discharge is to a POTW without an approved pretreatment program a completed treatment agreement form shall be submitted to the DNR's Wastewater Section. Copies of the local permit or treatment agreement shall be provided to the DNR's Solid Waste Section and the local Field Office. The treatment agreement must be on DNR Form 31 (542-3221) and must comply with the requirements of subrule 64.3 (5).*

   In addition, the permit holder shall measure leachate head levels and elevations at all piezometers on a monthly basis for piezometers located in the lined areas of the landfill and on a semiannual basis for piezometers located in the unlined area, and record the volume of leachate collected and transported to the treatment works. Records of leachate contaminants testing required by the treatment works and any NPDES permit for on-site treated leachate discharges shall be maintained.

   The permit holder shall annually submit a Leachate Control System Performance Evaluation (LCSPE) Report pursuant to subparagraph 113.7(5)"b"(14) as a supplement to the facility Annual Water Quality Report, as defined in subrule 113.10(10).

c. *Leachate extraction from Trench 1A shall continue as proposed in the Trench 1A Trial Leachate Control System proposed by HRG (doc #51135), dated June 27, 1995. The plan was approved by the DNR August 8, 1995 and subsequently implemented.*

d. *The following shall be recorded by the permit holder and reported in the LCSPER for each leachate thickness measurement that equals or exceeds 12 inches:*

   1) *Date of original and any verification measurement.*
   2) *If 12 inch or greater leachate column is verified, specific actions taken by the certified operator to lower leachate thickness, or an explanation why specific actions were not necessary.*

3) *Date and results of follow-up measurement.*
4) *Repeat steps 2 and 3 as necessary until a compliant measurement is collected.*

e. *The permit holder shall follow the approved Emergency Response and Remedial Action Plan (ERRAP) procedures during all emergencies pursuant to subrule 113.8(5). An updated ERRAP shall be submitted at the time of each permit renewable application. An undated ERRAP shall be included with any request for permit modification to incorporate a facility expansion or significant changes in facility operation that require modification of the currently approved ERRAP.*

Please update the introductory paragraph to note the updated ERRAP included in **Appendix B**. There are no other changes required or requested to Special Provision #2.

Special Provision #3

Liner and leachate collection system construction shall take place in accordance with the Plans and Specifications included as Appendix 3 in the 2010 Permit Renewal application (doc #57212), dated March 25, 2010 and approved on October 4, 2010; and the Request for Phase 3 and 4 Permit Revisions (doc #94047), dated December 20, 2018 and approved on January 3, 3019; both submitted by Barker Lemar Engineering Consultants; and the following:

a. *The permit holder is not authorized to construct any new disposal areas.*

b. *The Construction Certification Report for the Phase 0 Cell and Leachate Storage Lagoon (doc #51295), dated October 26, 2006, as submitted by Barker Lemar Engineering Consultants, and approved on November 1, 2006, is incorporated into the permit.*

c. *The Construction Certification Report for the Phase 2 Cell Construction (doc #30667), dated September 5, 2008, and the email amendment dated September 12, 2008, both submitted by Barker Lemar Engineering Consultants and approved on September 12, 2008, is incorporated into the permit.*

d. *The Construction Certification Report, Phase 0 Abutment and Phase 1 Abutment Temporary Cover Construction (doc #47178), dated August 20, 2009, as submitted by Barker Lemar Engineering Consultants and approved on September 16, 2009, is incorporated into the permit.*

e. *The Leachate Loadout System construction documentation (doc #60742), dated October 12, 2010, as submitted by Barker Lemar Engineering Consultants and approved on November 16, 2010, is incorporated into the permit.*

f. *The Construction Observation Report, Phase 1 Cell Construction (doc #65729), dated July 5, 2011, as submitted by Barker Lemar Engineering Consultants and approved on July 13, 2011, is incorporated into the permit.*

g. *The Construction Observation Report – Phase 1 Abutment Cell Construction (doc #80771), dated July 14, 2014, as submitted by Barker Lemar Engineering Consultants and approved on July 18, 2014, is incorporated into the permit.*

h. *The Construction Observation Report – Phases 3 and 4 Cell (doc #101748), dated November 24, 2021, as submitted by Evora Consultants and approved on November 30, 2021, is incorporated into the permit.*

There are no changes required or requested to Special Provision #3.

Special Provision #4

Hydrologic monitoring at the site shall be conducted in accordance with the Revised HMSP contained in Appendix 9 of the Permit Renewal Application (doc #98601), dated October 2, 2020 as submitted by Evora Consulting; and the following:

a. *The HMSP consists of the following:*

1) Background groundwater monitoring wells MW-19 and MW-28[1];
2) Downgradient compliant wells MW-5, MW-7, MW-9R, MW-13, MW-14, MW-20, MW-21, MW-23, MW-25, MW-26, MW-27, MW-28[1], MW-29, MW-30;
3) Downgradient attenuation zone compliance well MW-34;
4) Supplemental attenuation zone source wells MW-24[2];
5) Groundwater underdrain monitoring points UD-1[3], UD-2, UD-3.

[1] Data from MW-28 are approved for usage in the background dataset provided impacts are not evident at the well, as determined by having no intrawell statistically significant exceedances of the prediction limit.

[2] Samples from the supplemental attenuation zone source well shall be analyzed semiannually for the Appendix 1 parameters and biennially for nitrate, manganese, iron, and sulfate until the DNR approves otherwise. Since this well is not a compliance point, it is not subject to the requirements of 567 IAC 113.10(5)"c" and 113.10(6). Contaminant concentration trends shall be evaluated annually and reported in the AWQR.

[3] Samples are required from this point if noncompliant waste=groundwater separation measurements are measured from either GWPZ-1 or GWPZ-2 as described in the compliance plan described in document #107024, dated June 21, 2023.

b. *Groundwater monitoring points not used for water quality monitoring may be retained as water level measuring points.*

c. *The permit holder shall collect semiannual groundwater elevation measurements from the Phase 0 and Phase 2 groundwater head piezometers in order to measure the separation of the base of the MSWLF unit from the groundwater table as required in paragraph 113.6(2)"l". This data shall be included in the facilities' AWQR.*

d. *DNR construction documentation for 542-1277 and boring logs for all monitoring wells and piezometers shall be submitted within 30 days of installation. DNR construction documentation form 542-1323 shall be submitted within 30 days of establishing surface water monitoring points.*

e. *The permit holder shall conduct background and routine semiannual groundwater sampling and analysis; as well as perform statistical tests for the approved monitoring points for*

Appendix I and total suspended solids (TSS) in accordance with rule 113.10(455B). Groundwater samples shall not be field-filtered prior to laboratory analysis and total suspended solids shall be analyzed using Method 1376585, with a reporting limit goal of <= 2 mg/l. Turbidity measurement may be approved by the DNR in lieu of TSS, provided a correlation between the two is established.

f. *The permit holder shall include in each AWQR an evaluation of TSS/turbidity data and other pertinent sampling and analytical results, to determine if representative samples of groundwater have been collected. If samples are not representative, the permit holder may be required to utilize low flow or no-purge sampling methods, consider new well construction with an optimized filter pack design, and/or additional well development. If sample quality does not improve with improved well construction, well development, and/or sampling methods, the DNR will consider higher TSS/turbidity levels as representative of site groundwater conditions.*

g. *The frequency for full Appendix II analysis at monitoring points that are in assessment monitoring and have had at least two (2) rounds of analysis using the entire Appendix II list may be decreased to once every five (5) years. If monitoring points exit assessment monitoring and later return to assessment monitoring an additional two (2) rounds of analysis using the entire Appendix II list is required.*

h. *The permit holder shall semiannually measure groundwater elevations within 1/100 of a foot in each well and immediately prior to purging, each time groundwater is sampled.*

i. *An Annual Water Quality Report (AWQR) summarizing the effects the facility is having on groundwater quality shall be submitted to the DNR's Solid Waste Section by January 31 each year. This report shall be prepared in accordance with subrule 113.10(10) by a qualified groundwater specialist pursuant to paragraph 113.10(1)"d" and by using the DNR Annual Water Quality Report Format.*

j. *The documentation form for the construction of monitoring point MW-9R, as contained in the 1998 Annual Water Quality Report (doc #63342) prepared by Barker, Lemar & Associates is incorporated into the permit.*

k. *The Groundwater Monitoring Well Installation Documentation report (doc #51345) dated August 2, 2004, as submitted by Barker Lemar Engineering Consultants regarding the construction of wells MW-16 and MW-17, is incorporated into the permit.*

l. *The Monitoring Well Installation report (doc #51337) dated February 15, 2005, as submitted by Barker Lemar Engineering Consultants regarding the construction of monitoring wells MW-18 and MW-19, is incorporated into the permit.*

m. *The abandonment forms for monitoring wells MW-10, MW-11, and MW-12, all dated April 3, 2005 and attached to the April 11, 2005 correspondence (doc #51333) from Barker Lemar Engineering Consultants, are incorporated into the permit.*

n. *The monitoring well construction documentation for MW-25, MW-26, MW-27, MW-28, MW-29, and LFGW-W1 (doc #52549), dated January 5, 2010, as submitted by Barker Lemar Engineering Consultants is incorporated into the permit.*

o. *The boring logs/monitoring well construction details and monitoring well construction forms for MW-20, MW-21, MW-22, MW-23, MW-24, contained in Appendix 3 of the Revised 2005 Lateral Expansion Plan (doc #51307), dated June 7, 2006 as prepared by Barker Lemar Engineering Consultants are incorporated into the permit.*

p. *The construction documentation for temporary groundwater piezometers GWPZ-T1, GWPZ-T2, and GWPZ-T3 (doc #60558), dated September 17, 2010, as submitted by Barker Lemar Engineering Consultants is incorporated into the permit.*

q. *The Groundwater & Methane Monitoring Well Installation containing documentation of the installation of monitoring points MW-31, MW-32, MW-33 and LFGW-T5 (doc #75204); dated December 10, 2012; as submitted by Barker Lemar Engineering Consultants; and approved on June 10, 2013, is incorporated into the permit.*

r. *The construction documentation for MW-34 (doc #89708), dated June 13, 2017, as submitted by Barker Lemar Engineering Consultants, is incorporated into the permit.*

s. *The construction documentation for MW-35 and MW-36 (doc #907010), dated November 2, 2017, as submitted by Barker Lemar Engineering Consultants, is incorporated into the permit.*

Please update the submittal date, document number, and preparer in the opening paragraph to reflect approval of the updated HMSP included in **Appendix C**. Please replace "compliant" with "compliance" in Special Provision #4.a.2. Please also remove monitoring well MW-30 in Special Provision #4.a.2 as the well was removed during the construction of the Phases 3 & 4 cells. Footnote 1 under Special Provision #4.a. should also be updated to read "[1] Historical data from MW-28 through October 12, 2021 are approved for usage in the background dataset."

There are no other changes required or requested to Special Provision #4.

Special Provision #5

The permit holder shall conduct subsurface gas monitoring in accordance with the Revised Landfill Gas Monitoring Plan contained in Appendix 8 of the Permit Renewal Application (doc #98601), dated October 2, 2020 as submitted by Evora Consulting; and the following:

a. *The permit holder shall quarterly monitor and annually report site methane concentrations in accordance with rule 113.9(455B). Specific actions, as defined in the rules, shall be taken in the event of methane gas level limit exceedances.".*

b. *The permit holder shall annually submit a report by January 31 summarizing the methane gas monitoring results and any action taken resulting from gas levels exceeding the specified limits during the previous 12 months as a supplement to the facility Annual Water Quality Report, as defined in subrule 113.10(10).*

c. *The construction documentation for landfill gas monitoring points LFGW-T2, LFGW-T3, and LFGW-T4 (doc #60559), dated September 17, 2010, as submitted by Barker Lemar Engineering Consultants, and approved on October 4, 2010, is incorporated into the permit.*

d. *The construction documentation for passive landfill gas vent wells GV-1 through GV-9 (doc #95391), dated June 11, 2019, as submitted by Barker Lemar Engineering Consultants is*

incorporated into the permit. Methane concentrations within the headspace of each vent well shall be measured quarterly, with the results included in the annual gas monitoring report.

e. *The construction documentation for landfill gas monitoring points LFGW-E1 and LFGW-E2 (doc #98876), dated November 6, 2020, as submitted by Evora Consulting, is incorporated into the permit.*

f. *The construction documentation for passive landfill gas vents GV-10 to GV-14 (doc #100992), dated July 27, 2021, as submitted by Evora Consulting, is incorporated into the permit.*

Please update the submittal date, document number, and preparer in the opening paragraph to reflect approval of the updated LFG Plan included in **Appendix D**. Please incorporate the construction documentation for landfill gas monitoring well LFGW-T6 submitted on April 12, 2024 (Doc #109809).

There are no other changes required or requested to Special Provision #5.

Special Provision #6

The permit holder is authorized to recirculate leachate in accordance with the Permit Revision Request- Leachate Recirculation (doc#106267), dated April 5, 2023, as submitted by SCS Engineers; and the following:

a. *Leachate application is restricted to only those MSWLF units with a composite liner constructed in accordance with paragraph 113.7(5)"a".*

b. *The leachate recirculation system shall not contaminate waters of the state, contribute to erosion, damage cover material, harm vegetation, or spray persons at the MSWLF facility, pursuant to paragraph 113.8(2)"h".*

c. *Leachate shall not be applied on user vehicle access areas.*

d. *Leachate shall not be applied to vegetated areas or frozen waste cover. A means of frost protection must be provided for all leachate control elements.*

e. *Leachate shall be applied evenly on the working area.*

f. *Leachate recirculation shall be conducted only during hours of operation and when an operator is on duty.*

g. *Leachate shall be applied in a manner such that ponding or runoff will not occur.*

h. *Leachate recirculation shall be controlled such that not more than one foot of leachate head will be allowed to accumulate above the MSWLF unit liner.*

i. *Records shall be maintained as to the time and quantities of leachate application and be submitted with the facility Annual Leachate Control System Performance Evaluation Report (LCSPER).*

j. *Leachate recirculation shall be immediately terminated if it causes ponding, runoff, excessive odor, vector control problems, vapor drift, ice formation, or operational problems. The DNR's location Field Office shall be immediately notified if any of the above events occur.*

There are no changes required or requested to Special Provision #6.

Special Provision #7

The permit holder is authorized to collect, process, grind, or chip trees, limbs, brush, and clean wood wastes free of coatings and preservatives, for the purposes of reuse as bedding material, mulch, soil conditioner, compost bulking material; or for other beneficial reuses, in accordance with the following:

a. *Trees, limbs, brush, and clean wood wastes shall not be stored for a period exceeding twelve (12) months before processing.*

b. *Ground or chipped materials shall not be allowed to accumulate such that the stockpiles are not completely reused within twelve (12) months of initial stockpiling.*

c. *The processed materials may be used as mulch or soil conditioner for off-site purposes and on landfill areas with intermediate and final cover and on soil borrow areas.*

d. *Mulch or soil conditioner applied to existing vegetated landfill areas shall be applied at a rate such that established vegetation is not adversely impacted by its use.*

There are no changes required or requested to Special Provision #7.

Special Provision #8

The permit holder is authorized to use wood debris that has been ground (wood chips) as an alternative daily cover material, subject to the following:

a. *The wood chips may be used in lieu of the 6-inch daily cover requirement but shall not be used as a substitute for intermediate or final soil cover.*

b. *The waste must be compacted before the wood chips are applied, to provide an even surface to minimize ponding, prevent pockets, and to maximize uniform surface drainage.*

c. *The wood chips shall be applied to the active waste face at the end of each day of operations and more frequently if necessary to control fire or fire hazards, blowing litter, scavenging, odors, insects, and rodents.*

d. *If the wood chips is found by the DNR not to be performing satisfactorily, its use shall be discontinued.*

There are no changes required or requested to Special Provision #8.

Special Provision #9

The permit holder is authorized to use an alternative daily cover by the trade names Topcoat, Finn Waste Cover, or Concover as a substitute for the six-inch daily soil cover requirement. Use of this material is subject to the following:

a. *This product shall not be used as a substitute for intermediate or final soil cover.*

b. *All landfill operations personnel shall be trained by the alternative cover material manufacturer, or by an operator that has been trained by the manufacturer. The operator shall ensure that the product slurry is prepared according to the manufacturer's nominal slurry mix specifications.*

c. *The waste shall be compacted, before this product is applied, to provide an even surface to minimize ponding, prevent pockets, and to maximize uniform surface drainage.*

d. *This product shall be applied to the active waste face at the end of each day of operations and more frequently if necessary to control fire or fire hazards, blowing litter, scavenging, odors, insects, rodents, birds, and other vectors. This product shall be cross applied when necessary to provide effective cover.*

e. *If this product does not set within one hour of application, the workface shall be covered with six inches of compacted soil or a fresh application of this product. The term set means form a cohesive barrier layer that adheres to the waste and resists washing off by precipitation. This product shall not be exposed for more than five (5) days. After five days, any area exposed with this product shall be either covered with a new lift of waste, a fresh application of this product, or six inches of compacted soil.*

f. *The operator shall inspect each application of this product for thorough coverage and cover integrity. If operational problems arise from the use of this product or its method of application, the use of this product shall be suspended until proper corrections are made by the operator, with six inches of compacted daily cover being utilized during this interim period.*

g. *If, at any time, the DNR or permit holder deems this product to be ineffective or otherwise satisfactory, the permit holder shall immediately revert to soil or another previously approved alternative daily cover. The permit holder shall immediately notify the DNR's Main and local Field Office through both written and verbal notification of this action. This notification is not necessary if use of this product ceases only on a temporary basis, such as during adverse operational or weather conditions.*

h. *Nothing in this provision shall be construed to authorize any waiver from the requirements of any other applicable state solid waste laws or regulations, or any deviations from permit provisions.*

i. *This provision shall not be interpreted to release the permit holder from responsibility under the Groundwater Protection Act for remedying conditions resulting from any release of contaminants to the environment.*

The Agency requests an additional alternative daily cover by the trade name Posi-Shell to be added to Special Provision #9. There are no additional changes required or requested to Special Provision #9.

Special Provision #10

The permit holder is authorized to use a geotextile by the trade name Fabrisoil as an alternative cover material for the active MSWLF unit, subject to the following:

a. *This product shall not be used as a substitute for intermediate or final soil cover.*

b. *This product shall only be used as a daily alternative cover material and shall not be utilized as a replacement for soil cover if application performance in terms of litter, vector, odor, and precipitation entry control is not provided.*

c. *This product shall be applied so as not to promote water ponding, or drainage run-on from adjacent upper and side MSWLF unit areas beneath the installed geotextile.*

d. *This product shall be weighted at the close of each working day to prevent displacement by wind through the use of soil or tires.*

e. *This product shall not be exposed for longer than seven (7) consecutive days. For any waste covered with this product beyond the stipulated time frame, the product shall be removed and the underlying waste shall be immediately covered with soil in accordance with the applicable IAC rules.*

f. *This product shall not be used if it becomes damaged or worn, or if the intended performance is breached. In such instances, this product shall be disposed of as a part of the waste fill.*

g. *The operator shall inspect each application of this product for thorough coverage and cover integrity. If operational problems arise from the use of this product or its method of application, the use of this product shall be suspended until proper corrections are made by the operator, with six inches of compacted daily cover being utilized during this interim period.*

h. *If, at any time, the DNR or permit holder deems this product to be ineffective or otherwise unsatisfactory, the permit holder shall immediately revert to soil or another previously approved alternative daily cover. The permit holder shall immediately notify the DNR's Main and local Field office through both written and verbal notification of this action. This notification is not necessary if use of this product ceases only on a temporary basis, such as during adverse operational or weather conditions.*

Please remove Special Provision #10 from the permit as this ADC material is not being utilized.

Special Provision #11

The permit holder is authorized to accept and temporarily store a maximum of 1500 waste tire equivalents for the purpose of reclamation processing or disposal. Tire storage and processing shall be conducted at approved plan locations. The tires shall be removed at least once every 120 days and transported to the appropriate reclaimer/processor, or disposed of at the site. All operations shall be in accordance with subrule 109.10(3), IAC 567 Chapter 117 and the current local fire code.

There are no changes required or requested to Special Provision #11.

Special Provision #12

The permit holder is authorized to temporarily store white goods and scrap metal in an area designated by the operator. No discarded appliance may be stored for more than 270 days without being demanufactured. No scrap metal or discarded appliance may be stored for more than a total of twelve (12) months, including demanufacturing processing, prior to being recycled/salvaged. The operator and salvaging contractor shall comply with applicable provisions of IAC 567 Chapter 118 and the General Provisions of this permit. No scavenging shall be allowed.

There are no changes required or requested to Special Provision #12.

Special Provision #13

The permit holder is authorized to accept and temporarily store lead acid batteries for recycling purposes. Lead acid batteries must be stored in a designated area which will curtail movement of acids and provide proper ventilation of gases from the batteries. The maximum length of time for storage is twelve (12) months.

There are no changes required or requested to Special Provision #13.

Special Provision #14

The permit holder is authorized to collect and temporarily store rigid recyclable wastes (e.g., metal cans, glass bottles and plastic bottles) and fiber recyclable wastes (e.g., magazines, catalogs, books, envelopes and paper) in segregated recycling boxes located near the landfill entrance. The following conditions and procedures shall apply:

a. *The recyclables shall not be stored for a period exceeding six (6) months.*

b. *The recycle boxes shall have lids to prevent precipitation entry and to control litter.*

c. *Separate boxes should be provided to segregate metals and plastics to facilitate recycling recovery.*

d. *Recycling boxes shall be labeled to facilitate public use.*

e. *Records shall be maintained to document amounts of waste recycled for quarterly Solid Waste Fee reporting and the dates that each box content is removed from the site for recycling to confirm storage time limitations.*

f. *Recycling activities shall be monitored to insure that no other disposable wastes are stored in recycle boxes.*

g. *Farm chemical containers shall not be stored in recycling boxes. Separate authorization for this purpose shall be secured by permit amendment.*

There are no changes required or requested to Special Provision #14.

Special Provision #15

The permit holder shall close the landfill site in accordance with the Closure and Post Closure Plans contained in Appendices 11 and 12, respectively, of the 2010 Permit Renewal application (doc #57212), dated March 25, 2010, as submitted by Barker Lemar Engineering Consultants and approved on October 4, 2010; and the following:

a. *The Final Closure Request consisting of the verification of closure of 17.8 acres of the unlined MSWLF unit (doc #3484), dated January 5, 2007, as submitted by Barker Lemar Engineering Consultants; and the revisions (doc #2472) dated May 17, 2007, as submitted by Ray Griffin, both approved on June 8, 2007, are incorporated into the permit. Compliant final cover placement was verified below the 780-foot contour along the eastern, western, and northern slopes of the unlined portion of the landfill.*

b. *The request for final closure including the closure verification of 6 acres of the unlined MSWLF unit (doc #11833), dated October 15, 2007, as submitted by Christy VanBuskirk, P.E., Keokuk County Engineer and approved on November 15, 2007, is incorporated into the permit.*

c. *The Construction Certification Report, Phase 0 Abutment and Phase 1 Abutment Temporary Cover Construction (doc #47178), dated August 20, 2009, as submitted by Barker Lemar Engineering Consultants and approved on September 16, 2009, is incorporated into the permit. With this approval, final cover has been placed over the entirety of the unlined portion of the MSWLF unit.*

d. *Effective control of leachate in unlined units shall be evaluated on a case-by-case basis to determine how to achieve the lowest possible leachate head; and by complying with the environmental monitoring and corrective action requirements for groundwater and surface water.*

There are no changes required or requested to Special Provision #15.

2.4 NEW PERMIT AMENDMENTS REQUESTS

On September 29, 2025, the Agency submitted a Petition for Waiver requesting exemption from the pretreatment requirements for petroleum-contaminated soils (PCS). The basis for this request is that the disposal of PCS within Subtitle D-compliant lined cells will ensure effective containment of PCS constituents within the Landfill's leachate collection system, thereby minimizing the potential for groundwater impacts. Furthermore, once placed, the PCS will be covered with either additional waste or daily cover material, significantly reducing exposure to precipitation and minimizing the potential for surface water runoff.

The Agency does not have any additional permit amendment requests to be made at this time.

2.5 EQUIVALENCY REVIEW REQUESTS

The Agency does not have any current equivalency review requests to be made at this time.

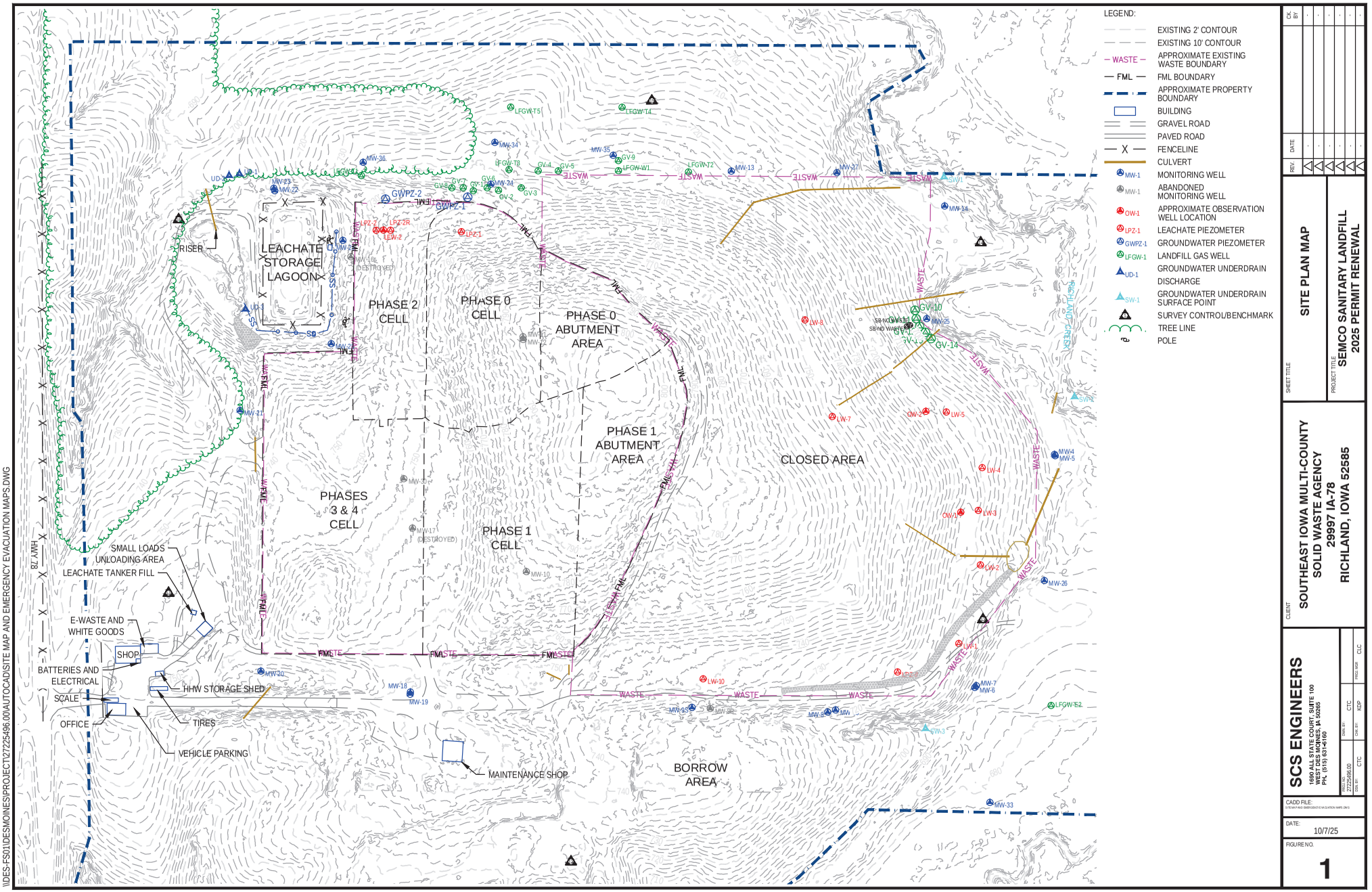
2.6 NEW VARIANCE REQUESTS

The Agency does not have any new variance requests from Iowa Administrative Code requirements to be made at this time.

2.7 REQUIRED PLANS AND SPECIFICATIONS

Appendices are included to address the updates as noted in Section 2 of Form 50 (included in Section 1 of this document). Updated plans, documentation, and information are found as follows:

- Appendix A Comprehensive Plan Approval
- Appendix B Emergency Response and Remedial Action Plan
- Appendix C Environmental Monitoring Plan - HMSP Update
- Appendix D Environmental Monitoring Plan – LFG Plan Update
- Appendix E Organizational Chart and Certified Operators
- Appendix F Proof of Financial Assurance



\\DES-FS01\DESMOINES\PROJECT\27225496.00\AUTOCAD\SITE MAP AND EMERGENCY EVACUATION MAPS.DWG

Appendix A

Comprehensive Plan Approval

iowa.gov

Rasmus, Laurie <laurie.rasmus@dnr.iowa.gov>

CP appr div rate drop

1 message

Rasmus, Laurie <laurie.rasmus@dnr.iowa.gov> Mon, Aug 14, 2023 at 12:58 PM
To: Bill Sloop <semcolandfill@gmail.com>, hadleymichaelc@yahoo.com, Hannah Sperfslage <hsperfslage@scsengineers.com>
Cc: Jeff Phillips <JDPhillips@scsengineers.com>, Jennifer Wright <jennifer.wright@dnr.iowa.gov>, Michael Sullivan <michael.sullivan@dnr.iowa.gov>, Kurt Levetzow <kurt.levetzow@dnr.iowa.gov>, Julie Plummer <Julie.plummer@wastecom.com>, "Jolly, Becky" <becky.jolly@dnr.iowa.gov>

IOWA DEPARTMENT OF NATURAL RESOURCES

GOVERNOR KIM REYNOLDS
LT. GOVERNOR ADAM GREGG
DIRECTOR KAYLA LYON

DIGITAL LETTER ONLY - VIA EMAIL

Mr. Bill Sloop
Southeast Multi-County Solid Waste Agency

Dear Mr. Sloop:

SOUTHEAST MULTI-COUNTY SOLID WASTE AGENCY
9th Round Solid Waste Comprehensive Plan Update
NOTICE OF APPROVAL

The above-referenced agency submitted their plan update regarding integrated solid waste programs and activities. Information was included regarding proposed activities that represent an action plan for the next five years.

The official planning area Goal Progress determination is 9.62% for Fiscal Year 2022. This figure was determined using the Base-Year Adjustment Method. Goal Progress may be recalculated annually, once new data is available and upon request by the planning area.

The planning area's tonnage fees will change due to the drop in the diversion rate to less than 25%. The new fee structure, as outlined in the attached Tonnage Fee Distribution Fact Sheet, will begin on October 1, 2023. Questions regarding tonnage fee submittal may be directed to Becky Jolly at 515-249-1482 or becky.jolly@dnr.iowa.gov.

The DNR's Financial and Business Assistance (FABA) Section has resources available to assist communities, businesses, and solid waste planning areas with programs. The webpage may be found at http://www.iowadnr.gov/faba. Waste reduction, pollution prevention and financial assistance are all areas of emphasis. In addition, the voluntary Environmental Management System (EMS) program provides benefits beyond waste reduction.

Should you have any questions or concerns, please do not hesitate to contact me at Laurie.Rasmus@dnr.iowa.gov or 515-474-4921.

Sincerely,

Laurie Rasmus
Land Quality Bureau, Financial and Business Assistance

4 attachments

- **Tonnage Fee Distribution_Fact Sheet(3)_rev June 2020.pdf**
  433K
- **Cklst2_SEMCO.pdf**
  142K
- **Rnd9PlanUpdate_SEMCO_recvd 08-14-2023.pdf**
  19862K
- **GP_FY2022_SEMCO.pdf**
  196K

BASE-YEAR ADJUSTMENT METHOD REPORT TABLE

NAME OF PLANNING AREA: Southeast Multi-County Solid Waste Agency (SEMCO)

CURRENT YEAR (CY): FY2022_Completed 02-28-2023
BASE YEAR: FY1988

	FACTORS	DATA	TIME-PERIOD / SOURCE
STEP 1: Basic Information			
1	Base Year Residential Waste Disposal	14,901.42	A
2	Base Year Commercial/Industrial Waste Disposal	15,018.00	B
3	Base Year Total Waste Disposal	29,919.42	
4	CY Waste Disposal	30,536.01	G
5	Base Year Population	46,280.00	C
6	CY Population	45,763	H
7	Base Year Employment	13,669.00	D
8	CY Employment	21,667.00	I
9	Base Year Taxable Sales	$198,256,561	E
10	CY Taxable Sales	$369,926,769	J
11	Base Year Consumer Price Index	115.8417	F
12	CY Consumer Price Index	282.0250	K, FY2022
STEP 2: CY Taxable Sales Corrected for Inflation			
13	Inflation Correction Factor	0.4107498	F/K
14	CY Corrected Taxable Sales	$151,947,330	J*(F/K)
STEP 3: Base Year and Current Year Ratios			
15	Population Ratio (PR)	0.9888289	H/C
16	Employment Ratio (ER)	1.5851194	I/D
17	Taxable Sales Ratio (TR)	0.7664177	(J*F/K)/E
STEP 4: Adjustment Factors			
18	Base Year Commercial/Industrial Adjustment Factor	1.1757685	Average of Lines 16 & 17
19	Base Year Residential Adjustment Factor	1.0822987	Average of Lines 15 & 18
STEP 5: Adjusted Base Year Disposal Tonnages			
20	Base Year Adjusted Residential Waste Disposal	16,128	A * Line 19
21	Base Year Adjusted Commercial/Industrial Waste Disposal	17,658	B * Line 18
22	Base Year Adjusted Total Waste Disposal	33,785	
STEP 6: Goal Progress and Reduction Percentage Results			
23	CY Waste Disposal (from line #4)	30,536	G
24	Maximum Allowable Disposal to Attain 25 Percent Goal	25,339	Line 22*0.75
25	Actual Tonnage Over (or Under) 25 Percent Goal	5,197	Line 23 minus Line 24
26	Maximum Allowable Disposal to Attain 50 Percent Goal	16,893	Line 22*0.5
27	Actual Tonnage Over (or Under) 50 Percent Goal	13,643	Line 23 minus Line 26
28	**CURRENT DISPOSAL REDUCTION (PERCENTAGE)**	**9.62%**	**(Line 22 minus Line 23)/Line 22**

Planning Area (PA)	County	City	2020 Census	PA Pop. (H)	Pop. % in PA	FY2022 Non-Farm Jobs	Non-Farm Jobs in PA (I)	FY2021 Taxable Sales (J)
SEMCO	Henry	Coppock	36	36				$0
GRRWA	Henry	Hillsboro	163					
DM County	Henry	Mount Pleasant	9,274					
DM County	Henry	New London	1,910					
SEMCO	Henry	Olds	192	192				$1,687,736
DM County	Henry	Rome	114					
DM County	Henry	Salem	394					
SEMCO	Henry	Wayland	964	964				$8,006,193
DM County	Henry	Westwood	101					
DM County	Henry	Winfield	1,033					
GRRWA	Henry	zz.Uninc area	6,301					
			20,482	**1,192**	**5.82%**	**9,364**	**545**	**$ 9,693,929**
SEMCO	Jefferson	Batavia	430	430				$24,967,919
SEMCO	Jefferson	Fairfield	9,416	9,416				$137,408,490
SEMCO	Jefferson	Libertyville	274	274				$2,072,656
SEMCO	Jefferson	Lockridge	244	244				$1,349,528
SEMCO	Jefferson	Maharishi Vedic	277	277				$0
SEMCO	Jefferson	Packwood	183	183				$287,927
SEMCO	Jefferson	Pleasant Plain	84	84				$0
SEMCO	Jefferson	zz.Uninc area	4,755	4,755				$781,030
			15,663	**15,663**	**100.00%**	**8,393**	**8,393**	**$ 166,867,550**
SEMCO	Keokuk	Delta	264	264				$455,725
SEMCO	Keokuk	Gibson	63	63				$0
SEMCO	Keokuk	Harper	118	118				$1,272,554
SEMCO	Keokuk	Hayesville	41	41				$0
SEMCO	Keokuk	Hedrick	728	728				$4,688,270
SEMCO	Keokuk	Keota	897	897				$7,106,554
SEMCO	Keokuk	Keswick	242	242				$2,079,147
SEMCO	Keokuk	Kinross	80	80				$0
SEMCO	Keokuk	Martinsburg	110	110				$0
SEMCO	Keokuk	Ollie	201	201				$826,813
SEMCO	Keokuk	Richland	542	542				$2,013,873
SEMCO	Keokuk	Sigourney	2,004	2,004				$29,916,375
SEMCO	Keokuk	South English	202	202				$795,099
SEMCO	Keokuk	Thornburg	45	45				$0
SEMCO	Keokuk	Webster	94	94				$0
SEMCO	Keokuk	What Cheer	607	607				$1,979,519
SEMCO	Keokuk	zz.Uninc area	3,795	3,795				$3,599,207
			10,033	**10,033**	**100.00%**	**2,105**	**2,105**	**$ 54,733,136**
SEMCO	Washington	Ainsworth	511	511				$3,516,601
SEMCO	Washington	Brighton	600	600				$3,076,366
SEMCO	Washington	Crawfordsville	277	277				$570,618
ECICOG	Washington	Kalona	2,630					
ECICOG	Washington	Riverside	1,060					
SEMCO	Washington	Washington	7,352	7,352				$113,667,616
SEMCO	Washington	Wellman	1,524	1,524				$14,045,722
SEMCO	Washington	West Chester	144	144				$1,357,444
SEMCO	Washington	zz.Uninc area	8,467	8,467				$2,397,787
			22,565	**18,875**	**83.65%**	**12,701**	**10,624**	**$ 138,632,154**
SEMCO	**All**	**All**		**H**			**I**	**J**
				45,763			**21,667**	**$ 369,926,769**

PA	Permit #	Facility	FY2022 Tons, Non Exempt	Released (non HF399) ton another IA PA (+)	From another IA PA (non HF 399) (-)	Generated Out of Iowa (-)	Diposed out of Iowa (+)	Exceptional Event (-)	FY2022 PA Tons (G)
SEMCO	54-SDP-01-75	SEMCO,Southeast Multi-County Sanitary Landfill	30,536		-	-	-		30,536
									-
									-
									30,536

Note: ???What was generated in PA but disposed of out-of-state?

Appendix B

Emergency Response and Remedial Action Plan

Emergency Response and Remedial Action Plan (ERRAP)

Southeast Iowa Multi-County (SEMCO) Sanitary Landfill
Richland, Keokuk County, Iowa
Permit No. 54-SDP-01-75P

Prepared For:

Southeast Iowa Multi-County Solid Waste Agency

SCS ENGINEERS

Project No. 27225496.00 | October 2025

1690 All State Court, Suite 100
West Des Moines, IA 50265
(515) 631-6160

Table of Contents

Attachments

1.0 EMERGENCY RESPONSE AND REMEDIAL ACTION PLANS [567 IAC – 113.8(5)(455B)]

113.8(5)b(1) Facility Information

The Southeast Iowa Multi-County (SEMCO) Solid Waste Agency (Agency) owns and operates the Southeast Iowa Multi-County Sanitary Landfill (Landfill). The overall site (facility) includes the closed municipal solid waste landfill (MSWLF) unit, the active MWSLF unit, the scale, office, maintenance shop, household hazardous waste (HHW) storage shed, and e-waste and white goods storage area.

The Landfill receives municipal solid waste (MSW) from the Agency's service area.

113.8(5)"b"(1)1 Permitted Agency

Southeast Iowa Multi-County Solid Waste Agency

113.8(5)"b"(1)2 DNR Permit Number

54-SDP-01-75P

113.8(5)"b"(1)3 Responsible Official and Contact Information

Southeast Iowa Multi-County Solid Waste Agency
29997 Highway 78
Richland, IA 52585
Contact: Bill Sloop, Manager
Phone: (319) 456-6171

113.8(5)"b"(1)4 Certified Operator and Contact Information

Southeast Iowa Multi-County Solid Waste Agency
29997 Highway 78
Richland, IA 52585
Contact: Bill Sloop, Manager
Phone: (319) 456-6171

113.8(5)"b"(1)5 Facility Description

Municipal solid waste landfill.

113.8(5)"b"(1)6 Site and Environs Map

See Attachment 1 for Site Plan Map.

113.8(5)b(2) Regulatory Requirements

113.8(5)"b"(2)1 Iowa Code Section 455B.306(6)"d" Criteria Citation

This Emergency Response and Remedial Action Plan (ERRAP) is designed to meet the requirements of Iowa Administrative Code (IAC) 567 Chapter 113.8(5) that requires the submission of an ERRAP by all sanitary disposal projects.

This ERRAP is intended to:

- Identify possible occurrences that may endanger human health and the environment;
- Establish provisions to minimize the possibility of fire or explosion; and
- Establish provisions to minimize any releases to air, land, or water of pollutants that could threaten human health and the environment.

113.8(5)"b"(2)2 Reference to Provisions of the Permit

An updated ERRAP will be submitted at the time of each permit renewal application if a review indicates that revisions are required. The ERRAP is intended to be flexible and to meet contingencies arising at the facility. Requests for changes to the ERRAP may be submitted to the Manager.

113.8(5)b(3) Emergency Conditions, Response Activities and Remedial Action

113.8(5)"b"(3)1 Failure of Utilities

Utilities include propane, electricity, and water.

Propane Gas

Propane Gas Supply Failure – Short-Term and Long-Term

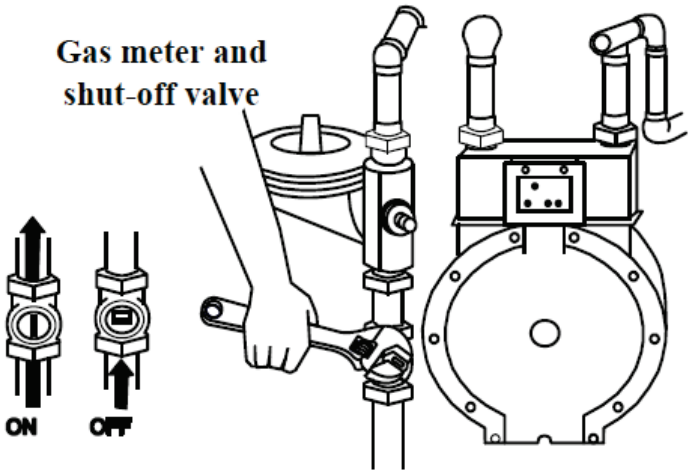
In the event Landfill facilities are without propane gas supply and propane gas odor is not present, contact the following:

- Manager – See Attachment 2 for telephone and mobile numbers.
- Propane Gas Company – See Attachment 2 for telephone numbers.

Propane Gas Leak

If a gas odor is present and it is strong, take immediate action:

- Propane gas is an asphyxiate. In proper concentrations, it can suffocate a person – use caution if a gas odor is present.
- Try to shut off the propane gas by turning the shut-off valve to the horizontal position.
- Leave the building where odor is identified. Go to the Emergency Assembly Point. Account for Landfill personnel, guests, contractors, etc.
- Do not attempt to locate gas leaks.
- Open doors and windows.
- Do not turn on or off or unplug electrical appliances.
- Do not use telephones in or around the building or office.
- Do not position or operate vehicles or powered equipment.
- Do not attempt any other repairs to the propane gas systems.
- If you turn off the gas for any reason, it must be turned back on by a professional.



Have wrench stored in a specific location where it will be immediately available

Electricity

Electricity Failure – Short-Term and Long-Term

In case of electrical failure, the following individuals must be contacted:

- Manager – See **Attachment 2** for telephone and mobile numbers.
- Electricity Supply Company – See **Attachment 2** for telephone number.

Scale Failure Due to Electricity Supply Failure

Scale weights may be estimated based on vehicle size (volume of waste) and converted to tons, or historical scale weights may be used for representative loads from particular vehicles or companies. Note each load for which the weight was estimated.

Buildings

Although the facility is primarily open during daylight hours, twilight and dusk operations may require supplemental light and heat if the electricity fails. Non-electrical space heaters may be used for supplemental heat; however, manufacturer's recommendations for ventilation must be observed.

- Keep portable and space heaters at least 3 feet from combustible materials.
- Electric flashlights and electric lanterns should be used for supplemental light.
- Use extreme caution if candles must be used, candles should only be used temporarily, on a limited basis until a safer form of light can be located such as flashlights, electric lanterns, etc. Candles within glass containers are preferred over those with open/exposed flame.
- Never leave a burning candle unattended. Extinguish all candles when leaving a room.
- Never use a candle for light when fueling equipment.

Water

Water Failure – Short-Term and Long-Term

In case of water failure, the following individuals must be contacted:

- Manager – See **Attachment 2** for telephone and mobile numbers.
- Water Supply Company – See **Attachment 2** for telephone number.

113.8(5)"b"(3)2 Evacuation Procedures During Emergency Conditions

- See the Site Plan Map (**Attachment 1**) for evacuation meeting locations and evacuation routes.

113.8(5)"b"(3)3 Weather-Related Events

Use battery-operated radios/televisions to receive the most updated information on local conditions.

Tornado and Wind Events

Tornado Terminology

- Tornado Watch – The weather conditions are possible for a tornado.
- Tornado Warning – A tornado has been sighted or indicated by weather radar.

Tornado Watch Procedures

- Listen to the radio or television for more information.
- Locate emergency supplies such as battery-powered radio, mobile telephone, and spare batteries.
- Be prepared to take shelter in the designated tornado shelter (see **Attachment 1**).
- If you see any revolving funnel-shaped clouds, report them immediately by telephone to your local law enforcement agency.
- If you are in a trailer or similar structure, move to a more secure structure.

Tornado Warning Procedures

- Take shelter with a battery-operated radio. Take shelter in area(s) designated as a tornado shelter or an interior room or hallway.
- The facility's Tornado Shelter Location is shown on the Site Plan Map (See **Attachment 1**).
- If you cannot reach the Tornado Shelter, go to a crawlspace under the scales or to an inside hallway on the lowest level. Avoid places with wide-span roofs. Stay away from windows and open spaces. Get under a piece of sturdy furniture such as a workbench, heavy table, or desk and hold on to it.
- Turn on a battery-operated radio or television and wait for the "all clear" announcement by the authorities.

Tornado Safety – Outdoors

- During tornado warning, Landfill staff and supervisors proceeding to a shelter by vehicle should keep an eye out for any other employees or customers along the way and pick them up for transport.
- If possible, get inside a substantial building.
- If shelter is not available or there is no time to get indoors, lie in a ditch, culvert, or low-lying area or crouch near a strong building. Use your arms to protect your head and neck. Be alert for potential flash flooding.

Tornado Safety – In a Vehicle

- Never try to outrun a tornado in a vehicle. Heavy rain, hail, and traffic may impede your movement. Tornadoes can change directions quickly and can easily lift up a vehicle and toss it through the air.
- Pull to the side of the road avoiding trees, power lines, and other objects that could fall or be hazardous.
- Get out of the vehicle immediately and try to take shelter in a nearby building.
- If there is not time to get indoors, get out of the vehicle and lie in a ditch, culvert, or low-lying area away from the vehicle. Use your arms to protect your head and neck.

After a Tornado

- Try to get out of damaged buildings. Once out, do not re-enter the damaged building unless necessary and use great caution.
- Extinguish all smoking and small fires.
- Monitor the radio or television for emergency information or instructions.
- Account for Landfill personnel, known guests/customers/contractors, and check on neighbors who may require special assistance.
- Check for injured victims. Render first aid if necessary. Call the necessary emergency responders such as ambulance services or fire/rescue services.
- Do not attempt to move severely injured victims unless necessary. Wait for emergency medical assistance to arrive.
- Watch out for broken glass and downed power lines.
- Report any downed power lines.
- Use the telephone only for emergency calls. Telephone lines may be down. Mobile telephone services may be used for emergency calls.
- Take photos or videotape of the damage to the property.
- If driving, be alert for hazards in the roadway.
- If unaffected by the tornado, stay out of the damaged area until allowed in by officials. Your presence may hamper emergency operations.

After a Tornado – Gas Leaks

- Check for gas leaks. If you smell gas or hear a blowing or hissing noise, open a window and quickly leave the area.
- Call the Propane Gas Company from a mobile telephone or a telephone away from the affected property.

After a Tornado – Electrical System Damage

- Look for electrical system damage.
- If you see sparks, broken or frayed wires, or if you smell hot insulation, turn off the electricity at the main fuse box or circuit breaker.
- If you have to step in water to get to the fuse box or circuit breaker, call an electrician first for advice.
- See **Attachment 2** for emergency contacts.

After a Tornado – Sewage and Water Line Damage

- Check for sewage and water line damage.
- If you suspect sewage lines are damaged, avoid using the toilets and call a plumber.
- If water pipes are damaged, contact Water Company and avoid using water from tap.

After a Tornado – Methane Collection and Venting Systems

- Check methane collection/venting systems.
- If the collection/venting system lines are malfunctioning, contact a professional engineer for repair assistance.
- Monitor methane gas soon after the incident to check for hazardous methane levels. Remember that methane (by itself) is an odorless gas.

After a Tornado – Leachate Transportation and Leachate Storage Systems

- Check leachate transportation and storage systems including tanks, lagoons, and lines.
- If leachate is leaking into the environment, attempt to shut the leachate line valve, stopping the flow.
- If leachate is leaking into the environment from a lagoon, take immediate steps to limit flow into drainage ways by constructing an earthen berm.
- Report leachate spills to the Iowa Department of Natural Resources (See **Attachment 2** for emergency contacts).

After a Tornado – Bulk Fuel/Solvent Storage Systems

- Extinguish all smoking and small flames.
- If a spill/leak exists, attempt to stop the leak/spill or absorb fuel with inert materials.
- If bulk fuel is leaking into the environment from a storage system, take immediate steps to limit flow into drainage ways by constructing an earthen berm.
- Report spills or leaks to the Iowa Department of Natural Resources (See **Attachment 2** for emergency contacts).

Wind Storm Terminology

- Derecho – A line of intense, widespread, and fast-moving windstorms and sometimes thunderstorms that moves across a great distance and is characterized by damaging winds.

- Down Burst – A strong out rush of wind formed by rain cooled air. Strong down bursts, which produce extensive damage, are often mistaken for tornadoes. A downburst can easily overturn a mobile home, tear roofs off houses, and topple trees.

Winter Storm Terminology

- Winter Storm Watch – Indicates that severe winter weather may affect your area.
- Winter Storm Warning – Indicates that severe winter weather conditions are definitely on the way.
- Blizzard Warning – Indicates that large amounts of falling or blowing snow and sustained winds of at least 35 miles per hour are expected for several hours.

Winter Storm Procedures

- Listen to the radio or television for more information.
- Locate emergency supplies such as battery-powered radio, mobile telephone, and spare batteries.
- Be prepared to take shelter in the designated tornado shelter (see **Attachment 1**).
- If you are in a trailer or similar structure, move to a more secure structure.
- Proceed with caution as snow can hinder vision and ice can cause vehicles and people to slide.

Intense Rainstorms, Mud, and Erosion

Thunderstorm Terminology

- Severe Thunderstorm Watch – A severe thunderstorm (damaging winds 58 miles per hour or more, or hail three-fourths of an inch in diameter or greater) is likely to develop.
- Severe Thunderstorm Warning – A severe thunderstorm has been sighted or indicated by weather radar.

Thunderstorm Watch Procedures

- Locate a safe place, such as the designated tornado shelter.
- Assign someone to listen to a battery-powered radio or television for more information.

Thunderstorm Warning Procedures

- Go to a safe place, such as the designated tornado shelter.
- Turn on a battery-operated radio or television and wait for the “all clear” by the authorities.
- Tornadoes are spawned by thunderstorms and flash flooding can occur with thunderstorms. When a “severe thunderstorm warning” is issued, review what actions to take under a “tornado warning” or a “flash flood warning.”

Procedures After a Thunderstorm

- Check personnel, guests, clients, and contractors for injuries.
- Report downed utility wires.
- Check scale for proper operation. If the electricity is out, see Section113.8(5)“b”(3)1.

- Continue to listen to the radio for flash flood and/or tornado watches and warnings and other instructions and advice.

Check Leachate Transportation and Leachate Storage Systems

- Check leachate transportation and storage systems including tank and lines.
- If leachate is leaking into the environment, attempt to shut the leachate line valve, stopping the flow of leachate.
- Report leachate spills to the Iowa Department of Natural Resources (DNR). See **Attachment 2** for Emergency Contacts.

Check Bulk Fuel Storage Systems

- Extinguish all smoking and small flames.
- If a spill/leak exists, attend to stop the spill/leak or absorb fuel with inert materials.
- See **Attachment 2** for DNR Emergency Contacts.
- See **Attachment 3** for DNR guidelines for reporting hazardous conditions and a copy of Iowa Administrative Code Chapter 131 (Section 457).

Lightning Strikes

There are relatively safe places from lightning strikes, however no location is free of risk. Large, enclosed structures are generally safer than small or open structures. The risk for lightning injury depends on whether the structure incorporates appropriate lightning protection.

Enclosed vehicles, fully enclosed farm vehicles, etc. with the windows rolled up generally provide good shelter from lightning. Avoid contact with metal or conducting surfaces outside or inside the vehicle.

Avoid being in or near:

- High places and open fields, isolated trees, unprotected sheds, communication towers, flagpoles, light poles, metal fences, and water.
- When inside, avoid the use of the telephone, contact with water or conductive surfaces with exposure to the outside such as metal door or window frames, electrical wiring, telephone wiring, cable TV wiring, and plumbing, etc.

Lightning Strike Victim

- A person who has been struck by lightning does not carry an electrical charge that can shock other people.
- A nearby strike may also cause medical problems, check personnel and call emergency medical assistance (911) if necessary.
- Provide first aid and call emergency medical assistance (911) immediately. Look for burns where lightning entered and exited the body.

Flooding

Flood Terminology

- Flash Flood Watch – A flood is possible, be alert to signs of flash flooding, and be ready to evacuate. Know the local terrain; flash floods can happen more quickly in hilly terrain or low-lying areas.
- Flash Flood warning – A flood is already occurring and will occur soon in your area. Listen to local radio and television for local information and advice.

Flood Damage Prevention Procedures

- Move key documents, electronic files, computers, etc. to higher ground or take them with you if you must evacuate.
- Review evacuation procedures with employees.
- If necessary, attempt to build earthen dams to protect buildings and property.
- Turn on battery-operated radio or television to get the latest emergency information.
- If told to leave, do so immediately.

Procedures During a Flood

- Evacuation may be necessary. If advised to evacuate, do so immediately.
- Never drive into a flooded area.
- Never drive around road barricades.
- In case employees are separated from one another during floods or flash floods, each employee shall contact the Manager so all employees can be accounted for.
- Evacuation is much simpler and safer before floodwaters become too deep for ordinary vehicles to drive through.
- Listen to a battery-operated radio or television for evacuation instructions.
- Follow recommended evacuation routes – shortcuts may be blocked.
- Leave early enough to avoid being marooned by flooded roads.

Procedures During a Flood – If Outdoors

- Climb to high ground and stay there.
- Avoid walking through any floodwaters. If it is moving swiftly, even water 6 inches deep can sweep you off your feet.

Procedures During a Flood – If in a Car

- Never drive into a flooded area.
- Never drive around road barricades.
- If you come to a flooded area, turn around and go another way.
- If your car stalls, abandon it immediately and climb to higher ground. Many deaths have resulted from attempts to move stalled vehicles.

Procedures After a Flood

- Return to the area only after it has been declared safe by local emergency management officials. Follow all emergency rules, laws, and regulations.
- Report and stay clear from loose power lines or damaged utilities.
- Report downed power lines to your utility company or local emergency manager.
- Some appliances, such as television sets, can shock you even after they have been unplugged. Do not use appliances or motors that have gotten wet unless they have been taken apart, cleaned, and dried.
- Be alert for gas leaks. Use a flashlight to inspect for damages. Do not smoke or use candles, lanterns, or open flames unless you are sure that the gas has been turned off and the area has been aired out.
- Look for fire hazards - broken or leaking gas lines, flooded electrical circuits, submerged furnaces, or electrical appliances, or flammable or explosive materials coming from upstream.
- Service damaged septic tanks, cesspools, pits, and leachate systems as soon as possible. Damaged sewage systems are health hazards.
- Document the damage for insurance purposes by taking notes and photographs.

Structural Stabilization: Temporary Measures

- Identify potential deficiencies and provide temporary shoring to protect life and property while the water levels are receding. All shoring measures should be planned with the assistance of qualified structural engineers or contractors.
- Support unstable or leaning structures or features with temporary bracing and reinforcement.
- Strengthen exposed foundations or brace areas of undermining by following engineer's recommendations.
- Brace and strengthen decayed or damaged floor and ceiling structure. Check bearing locations for movement or settlement.

Check Methane Collection and Venting Systems

- Check methane collection/venting systems..
- Monitor methane gas soon after the incident to check for hazardous methane levels.

Check Leachate Transportation and Storage Systems

- Check leachate transportation and storage systems including tanks, lagoons, and lines.
- If leachate is leaking into the environment, attempt to shut the leachate line valve, stopping the flow.
- If leachate is leaking into the environment from a lagoon, take immediate steps to limit flow into drainage ways by constructing an earthen berm.
- Report leachate spills to the Iowa Department of Natural Resources (See **Attachment 2** for emergency contacts).

Check Bulk Fuel Systems

- Extinguish all smoking and small flames.
- If a spill/leak exists, attend to stop the spill/leak or absorb fuel with inert materials.
- See **Attachment 2** for DNR Emergency Contacts.
- See **Attachment 3** for DNR guidelines for reporting hazardous conditions and a copy of Iowa Administrative Code Chapter 131 (Section 457).

Check for Large Scale Erosion

- Immediately cover any eroded areas exposing waste.
- Identify and repair access roads, approach ramps, and internal roads that were affected by erosion.
- Identify and repair let-down structures, berms, and terraces affected by erosion.

Acceptance of Flood Related Wastes

- Do not accept hazardous material for landfilling, even if it is flood related debris.
- Do not accept free flowing liquids, even if the container is thought to contain only flood-related liquid.
- Do not accept containers that contain unknown materials, especially drums and similar containers that "floated" to the current owner.
- Document all flood-related debris for possible credit/reimbursement from city, county or state government.
- Prepare a request to DNR to exempt exceptional event debris from goal progress and tonnage fee with the next Quarterly Solid Waste Fee Schedule & Retained Fees Report.

Event and Post Event Conditions

See Sections under Section 113.8(5)"b"(3)3 Weather Related Events.

113.8(5)"b"(3)4 Fire and Explosions

In case of any size fire, the following individual must be contacted:

- Manager – See **Attachment 2** for telephone number.

If a fire cannot be controlled by site personnel, report to the fire department by dialing 911 using cellular phones or the phone in the site office.

Basic Fire Safety

- Stockpile soil near the working face to assist with hot loads.
- Site will comply with local and state fire codes, including the placement and maintenance of fire extinguishers, smoke detectors, etc.
- See the Site Map (**Attachment 1**), identify Evacuation Routes, Fire Escape Routes, and Emergency Assembly Locations.
- Keep exit routes clear and well-marked.

- Cigarette, cigar, and/or pipe smoking are not allowed indoors in public places in Iowa. Make sure smoking materials are completely extinguished before entering the building. Never leave hot ashes or burning tobacco products unattended.
- Avoid using extension cords wherever possible, especially small-wired cords used with high-wattage appliances.
- Extension cords should not be run under rugs or hooked over nails.
- If a fuse blows (or a breaker "trips"), find the cause. Remove excess appliances (lamps, stereo components, space heaters, etc.) from a breaker circuit that frequently "trips."
- Discard food that has been exposed to heat, smoke, or soot.
- Do not discard damaged goods until after an inventory has been taken.
- Give first aid where appropriate.
- Stay out of damaged buildings.
- Return to the facility only when local fire authorities say it is safe.

Waste Materials

For materials that may become ignited:

- Call the Manager. See **Attachment 2** for telephone number.
- If materials are in the working face and can be safely removed, remove and place near but not on, the working face, and extinguish. Use extreme caution if any attempt is made to control the fire.
- For small fires located outside of the working face, a fire extinguisher may be used.
- If a fire cannot be controlled by site personnel, report to the local Fire Department. See **Attachment 2** for telephone number.

Buildings and Site

Small Localized Fire – Building or Office

- Caution: A small-localized fire can engulf a room in less than 60 seconds.
- Act quickly. Smoke can be dangerous.
- Use a fire extinguisher to extinguish the flame; aim at the base of the flame.
- Remove nearby flammable materials such as paper, drapes, rags, etc.
- Evacuate all unnecessary personnel – go to the Emergency Assembly Location. In the event the Emergency Assembly Location is dangerous or inaccessible, proceed to the Secondary Emergency Assembly Location (See **Attachment 1**).
- If a fire cannot be controlled by site personnel, report to the local Fire Department. See **Attachment 2** for telephone number.

Out of Control Fire – Building or Office

- Get out of the building. Familiarize yourself with at least two exits from each room; for example, one window and one door.
- Go to the Emergency Assembly Location. In the event the Emergency Assembly Location is dangerous or inaccessible, proceed to the Secondary Emergency Assembly Location (See **Attachment 1**).
- Contact the local Fire Department from a mobile phone. See **Attachment 2** for telephone number.
- Never go back inside a building for any reason.

Equipment

Engine Fires

- Immediately turn off the ignition to shut down the fuel pump and the flow of fuel.
- Putting out an engine fire safely and efficiently takes two people. One holds the fire extinguisher and the other opens the hood. The fire will flare up as the fresh air hits it. Immediately spray the fire extinguisher across the base of the flames until the fire is out.
- It is important to get the hood open fast. If the fire burns through the hood release cable before you can get it open, there will be no way to get at the fire.
- Do not try to put out an engine fire by spraying the extinguisher through the radiator or through the wheel wells, this method will not work and will waste time and the fire extinguisher contents. Get at the base of the flames.
- If a fire cannot be controlled by site personnel, report to the local Fire Department. See **Attachment 2** for telephone number.
- The equipment will be thoroughly inspected and repaired, if necessary, prior to reuse.

Fuels

General Safety

- Vapors from fuels can be more flammable than liquid, always use caution when filling vehicles or containers.
- Equipment shall be refueled only at designated locations.
- In case of spillage, filler caps shall be replaced, and spillage disposed of before engines are started.
- Engines shall be stopped and operators shall not be on the equipment during refueling operations.
- Only designated persons shall conduct fueling operations.
- Smoking and open flames shall be prohibited in areas used for fueling, fuel storage, or enclosed storage of equipment containing fuel.
- Liquid fuels not handled by pump shall be handled and transported only in portable containers or equivalent means designed for that purpose. Portable containers shall be plastic, have tight closures with screw or spring covers and shall be equipped with spouts or other means to allow pouring without spilling. Leaking containers shall not be used.

Fire Event

- If possible, turn off the pump or the nozzle distributing flammable liquid.
- Evacuate the area. Stay well clear of the above ground storage tank in case of explosion. Go to the Emergency Assembly Location (See **Attachment 1**).
- Call the Fire Department. See **Attachment 2** for telephone number.
- Call the Manager. See **Attachment 2** for telephone number.

Utilities

Propane Gas

- Call the Fire Department. See **Attachment 2** for telephone number.
- If the Emergency Assembly Point is a safe distance away, go to that site or go to the Secondary Emergency Assembly Point.
- Caution: Exploding tanks may eject pieces of the tank several hundred feet. These pieces can be lethal.
- The Fire Department may allow the tank to burn itself out.
- Call the Manager (See **Attachment 2** for telephone and mobile phone numbers).

Electrical – Small Localized Fires

- Use a fire extinguisher rated Class C: Energized Electrical Equipment including Wiring, Fuse Boxes, Circuit Breakers, Machinery, and Appliances.
- Caution: A small-localized fire can engulf a room in less than 60 seconds.
- Act quickly.
- Remove nearby flammable materials such as paper, drapes, rags, etc.
- Evacuate all unnecessary personnel – go to the Emergency Assembly Location. In the event the Emergency Assembly Location is dangerous or inaccessible, proceed to the Secondary Emergency Assembly Location (See **Attachment 1**).

Electrical – Larger Uncontrolled Fires

- Get out of the building. Familiarize yourself with at least two exits from each room; for example, one window and one door.
- Go to the Emergency Assembly Location (See **Attachment 1**).
- Contact the Fire Department from a mobile phone. See **Attachment 2** for telephone number.
- Never go back inside a building for any reason.

Facilities

See Section 113.8(5)“b”(3)4 Buildings and Site. There are no additional facilities that have not been previously covered.

Working Area

Landfill fires can be started from several causes: spontaneous combustion, careless smoking, methane flash, and arson.

- Understand and be aware of warning signs.
- Always report any visible smoke to the Manager.
- If in doubt about a possible fire or signs of fire call the Fire Department. See **Attachment 2** for telephone number.

Once a Fire is Identified

- Control access and site security.
- All persons must be required to sign in and out.
- Establish radio communications with firefighting, public safety, and Landfill personnel.
- First aid should be available on-site.
- Warning fences should be placed around any trenches dug as fire breaks.
- Safety meetings should be held daily.
- Spotters should be used to assist equipment operators.

Controlling a landfill fire may be accomplished through local firefighting equipment, or landfill firefighting experts may need to be contacted. Follow the instructions of the firefighting professionals on site.

- Excavated waste may require a hot pad where it can be spread and soaked with water or other fire extinguishing media.
- Soaked materials may require a cool pad storage area.
- Earthmoving equipment may be required to dig firebreaks down to bare earth or to build earthen dams.

Landfill stockpile fires can be started from several causes: spontaneous combustion, careless smoking, methane flash, lightning, and arson.

- Understand and be aware of warning signs.
- Always report any visible smoke to the Manager. Some steam from composting piles and some other stockpiles may be normal due to the natural decomposition process. Report unusual levels of steam to the Manager.
- If in doubt about a possible fire, call the Fire Department (See Attachment 2 for emergency telephone numbers).
- Use caution while excavating "hot" materials, exposure to the air may create flames.
- Before attempting to excavate the "hot spot" within a stockpile, a spotter should watch equipment operators.
- Move "hot" materials to a hot pad so the materials can be sprayed with water or fire extinguishing media.

Unaffected stockpile materials and soaked stockpile materials should be moved to a cool pad while the remaining materials are excavated.

Hot Loads

Smoldering or ignited fires in a vehicle.

- "Hot loads" are loads of waste or vehicles that are smoking, smoldering, or are on fire. Hot loads may arrive at the facility without the driver aware of the risk.
- Do not dump hot loads on top of exposed waste of any kind.
- Do not stop a truck on fire or containing a hot load near a building.
- Quickly alert the driver and direct the truck toward a safe area.
- Call the Fire Department. See Attachment 2 for telephone numbers.

- If the load can be dumped without harming the driver or others, dump the load in a safe area. Caution: A fire may spread quickly or “flash” as air is introduced.
- Use soil to place over smoldering or burning loads.
- Stay out of the "zone of danger," which is the cone-shaped area directly behind a vehicle with the gas tank located in the usual position at the back. If a gas tank explodes, it sends a tremendous blast out from the rear of the vehicle. This can be lethal for 50 to 100 feet behind the vehicle.

Waste Gases

- If you witness a flash fire potentially caused by methane, leave the area immediately. If the Emergency Assembly Location is a safe distance away, go to that site or go to the Secondary Emergency Assembly Location.
- See the Site Map (**Attachment 1**) with Evacuation Routes, Fire Escape Routes, and Emergency Assembly Locations.
- Call the Fire Department. See **Attachment 2** for telephone numbers.
- Contact the Manager. See **Attachment 2** for telephone numbers.

Explosive Devices

- Use the alarm system and leave the area immediately. If the Emergency Assembly Point is a safe distance away, go to that site or go to the Secondary Emergency Assembly Point.
- See the Site Map (**Attachment 1**) with Evacuation Routes, Fire Escape Routes, and Emergency Assembly Locations.
- Call the Fire Department. See **Attachment 2** for telephone numbers.
- Contact the Manager. See **Attachment 2** for telephone numbers.

113.8(5)“b”(3)5 Regulated Waste Spills and Releases

Waste Spills and Releases Terminology

- Regulated Waste – Generally includes non-hazardous material such as leachate, municipal solid waste, and petroleum contaminated soils.
- Spill – A spill primarily involves liquids or solids that are deposited accidentally on the facility’s property in an incorrect location but remain within the facility’s property boundary. Spills include quantities of 100 gallons or less, or two tons or less.
- Release – A release may involve spills of solids or liquids greater than 100 gallons or greater than two tons that enter lagoons, sedimentation ponds, drainage ways, etc., but stay on-site.
- Off-site Release – An off-site release is a release or spill that leaves the facility’s property boundary. This section includes groundwater releases.

Waste Materials

Waste Materials Terminology

- Waste Materials – Waste materials are materials normally accepted at a landfill. Waste materials are also regulated wastes.
- On-Site Spill or Release – Use caution and remove the waste, placing it in an acceptable location, such as the working face, for proper disposal.

- Off-Site Spill or Release – If waste materials are identified beyond the property and/or waste materials are observed to be in a waterway, see Section 113.9(5)“b”(3)5.

Leachate

Lagoons

Leachate should not overflow the rim of the lined leachate collection lagoon or leak from a puncture or tear. If leachate should be observed overflowing or leaking from the leachate lagoon, actions should be taken to pump leachate into a tanker truck or other vehicle for transport to a Publicly Owned Treatment Works (POTW).

Generally, the leachate must be sampled and tested before the POTW will accept the material. Sampling and testing may take 24 to 72 hours or more.

- Contact the Manager (See **Attachment 2** for telephone and mobile phone numbers).
- Call the State of Iowa (See **Attachment 2** for telephone numbers).

Drainage Systems

- Leachate should not overflow into a non-leachate designated drainage system from a seep or other event such as overflow from a leachate lagoon.
- If leachate is observed overflowing into a drainage system actions should be taken to stop the flow of leachate.
- Earthen dams could be constructed to divert the leachate.
- Contact the Manager (See **Attachment 2** for telephone and mobile phone numbers).

Tanker Spills/Seeps/Miscellaneous Spills

Leachate from seeps and spills should not be allowed to flow beyond the Landfill property boundary and should not be allowed to enter a creek, river, or stream.

Leachate flows from seeps can often be temporarily diverted if the seep is excavated and recompacted.

Small leachate spills from tankers or other sources should be observed so they do not leave the property boundary. Absorbent materials, such as yard waste or compost, could be placed on the spill to minimize tracking.

Waste Gases

Methane gas is a by-product of waste decomposition and can be explosive in specific concentrations. Methane gas is colorless and odorless; odor emanates from other gases mixed with the methane.

- Methane gas can migrate and accumulate in enclosed buildings, under scales, crawl spaces, and other confined spaces.
- Methane gas concentration levels are often detected using an electronic meter.

If methane gas is detected within explosive limits:

- Extinguish all smoking.
- Attempt to ventilate the area by opening windows/doors.
- If the methane is detected in a scale house or other building regularly occupied, evacuate immediately and go to the Emergency Assembly Point (See **Attachment 1**).
- Contact the Manager (See **Attachment 2** for telephone and mobile phone numbers).
- Contact the Fire Department (See **Attachment 2** for telephone and mobile phone numbers).
- Contact the DNR Field Office (See **Attachment 2** for telephone and mobile phone numbers).
- Do not return to the building until it has been properly ventilated and the concentrations have been checked with an electronic meter.

Waste Stockpiles and Storage Facilities

- Tipped waste can be stockpiled and managed for up to 48 hours before the material must be bailed or removed for final disposal.
- The stacking of baled waste higher than three horizontally placed bails high, is prohibited. This restriction helps reduce the potential threat of waste collapsing on personnel or equipment.
- Staff must always wear safety belts while operating heavy equipment.
- Extreme caution must be used while pushing material into and around bale pile.
- All personnel must maintain a safe distance from baler pit and operational heavy equipment while materials are being pushed into and around the bale pit.
- Pushing of material with heavy equipment is prohibited if personnel are operating in close proximity to the bale pit area.

Waste Transport Systems

This site does not have waste transport systems.

Litter and Airborne Particulate

Litter and airborne particulates will be controlled according to the sanitary disposal project permit.

Site Drainage System

If drainage systems are observed to be functioning improperly, contact the Manager. See **Attachment 2** for telephone number.

Flood or Heavy Rain/Wet Situations:

- If regulated wastes enter drainage systems, use great caution removing the wastes – flowing water can have extreme force.
- Wet weather can cause embankments to become weakened and fail.

Non-Flood and Non-Heavy Rain/Wet Situations:

- Prevent the waste from washing away beyond the property boundary.
- Remove the wastes as soon as possible.

Off-Site Releases

Leachate

Leachate must be kept from entering creeks, rivers, streams, or other waterways. Leachate should not be allowed to leave the property boundaries.

If leachate is observed leaving the property boundary and/or entering a creek, river, stream, or other waterway, immediately contact the following:

- Contact the Manager. See **Attachment 2** for telephone number.
- Contact the State of Iowa. See **Attachment 2** for telephone numbers.

Earthen dams, excavation, compaction, and other techniques can be applied to stop the flow of leachate from leaving the property boundary or traveling further from the property boundary.

Permanent drainage systems can be installed after the leachate flow has been diverted or stopped if a lagoon and leachate collection system is available.

Waste Gases

- If waste gases are detected outside of the property boundary, contact the Manager.
- A second check of gas concentration levels with newly calibrated equipment may be required.
- If waste gases are detected a second time outside of the property boundary, then contact the DNR immediately (See **Attachment 2** for telephone numbers).

Regulated Waste

- Prevent the waste from traveling further off site. Earthen dams, excavation, compaction, and other techniques can be applied to stop the flow of regulated waste from traveling further from the property boundary.
- If the regulated waste is in a waterway, attempt to stop the flow of waste and if possible, stop the flow of waste downstream. Use caution working near steep banks or wet embankments.
- Contact the Manager. See **Attachment 2** for telephone number.
- Contact the State of Iowa. See **Attachment 2** for telephone numbers.

Household Hazardous Materials

Household hazardous materials (especially material that has been bulked) must be kept from entering creeks, rivers, streams, or other waterways. Household hazardous materials should not be allowed to improperly leave the property boundaries.

Household hazardous materials that are released beyond the property and/or are observed to be in a waterway must be managed immediately.

- If possible, safely stop the source of the leak.
- Use absorbent material to stop material from entering the waterway or leaving the site.

- If household hazardous material is observed leaving the property boundary and/or entering a creek, river, stream, or other water, immediately contact the Manager – See **Attachment 2** for telephone numbers.
- See **Attachment 3** – IDNR Spill Release as the type of spill will determine if the DNR must be contacted.

113.8(5)"b"(3)6 Hazardous Material Spills and Releases

- See **Attachment 3** for State Guidelines for Reporting Hazardous Conditions.
- Do not smoke. Do not create sparks.
- Be aware of the wind and avoid inhaling hazardous fumes.
- Use caution operating near hazardous materials. The material should be considered hazardous, even if the suspected material has not yet been confirmed hazardous by a professional.
- Do not let people or equipment make contact with liquids, dusts, or fumes of hazardous materials.
- Only trained professionals should attempt to clean up the hazardous materials.
- Do not come into contact with the hazardous material.
- Some hazardous materials can react violently with other chemicals and other materials - use extreme caution.

Load-Check Control Points

Load checking is performed periodically by landfills to identify banned materials, hazardous materials, and wastes that may have been generated from areas outside the solid waste planning boundaries.

If a solid waste load is identified as containing hazardous materials or hazardous markings on containers are identified, contact the following:

- See **Attachment 3** for reporting hazardous conditions to the State of Iowa.
- Manager - See **Attachment 2** for telephone numbers.
- Observe the safety precautions outlined in Section 113.8(5)"b"(3)6 Hazardous Material Spill & Releases.

Mixed Waste Deliveries

See Section 113.8(5)"b"(3)6 Load-Check Control Points, above.

Fuels

Fuels and oils that are spilled can be absorbed with specific material designed for this purpose – they are often called "snakes," "booms," or "pillows." These materials, after use, are moved in drums to a used oil containment area until suitable transport to an off-site disposal location can be arranged.

If a fuel/oil spill occurs:

- Stop the flow of material if possible using valves or switches.
- Do not smoke.

- Do not pass vehicles over the spilled material, as these could be a spark/ignition source hazard.
- If possible, construct an earthen dam or similar structure to contain the spill.

Waste Gases

- If waste gases are detected outside of the property boundary, contact the Manager. See **Attachment 2** for telephone numbers.
- A second check of gas concentration levels with newly calibrated equipment may be required.
- If waste gases are detected a second time outside of the property boundary, then contact the DNR immediately. See **Attachment 2** for telephone numbers.
- If waste gases are detected indoors, ventilate and evacuate the area.

Site Drainage Systems

This generally occurs during flood or heavy rain/flash flood situations.

If hazardous wastes enter drainage systems during flood/heavy rain/wet conditions:

- Contact 911.
- Contact the Manager – See **Attachment 2** for telephone numbers.
- Contact the State of Iowa – See **Attachment 2** for telephone numbers.
- Emergency/Hazardous Material professionals will aid minimize the risk downstream.

If hazardous wastes enter drainage systems during non-flood/heavy rain/wet conditions:

- Prevent the waste from washing beyond the property boundary.
- Get assistance before attempting to remove the wastes.
- Assistance should be obtained from trained professionals.

Off-Site Releases

- Contact 911.
- If possible, construct an earthen dam or similar structure to reduce the spread of contamination. Do not contact the material, contaminated dust, fumes, or gases.
- Should a spill leave the property, staff will notify a hazardous material professional. The trained hazardous material professional will supply needed resources and take charge of the response effort.

In case of an off-site release, the following individuals must be contacted:

- Manager - See **Attachment 2** for telephone and mobile phone numbers.
- Contact the State of Iowa - See **Attachment 2** for telephone numbers.
- See **Attachment 3** for reporting hazardous conditions to the State.

113.8(5)“b”(3)7 Mass Movement of Land and Waste

Earthquakes

During an Earthquake

- Duck, cover, and hold. If you are inside, crawl under a heavy piece of furniture and hold on or get under a doorframe.
- If you are outside, stay in an open area.
- If you are in your car or equipment, stop driving.

After an Earthquake

- Check for injuries.
- Get out of the building if it appears to be structurally unsound – do not re-enter the building. If the building is evacuated, go to the Emergency Assembly Point and account for Landfill personnel, contractors, guests, etc.
- Listen to a battery powered radio for further instructions.
- Be aware of broken glass and other sharp objects on the floor.
- Be aware of material above your head that might fall.
- Check water, gas, and electric lines for damage (natural gas odor) then see **Attachment 2** for information on utilities.
- Check leachate lagoons for leaks.
- Check stability of stockpiles and slopes. See Section 3.8.1.
- Check methane collection/venting systems.
- Do not use matches or smoke.
- Avoid the telephone.
- Do not go sightseeing.
- Expect aftershocks.
- Have the scale checked and re-certified by a qualified technician.

In case of earthquake, the following individuals must be contacted:

- Manager – See **Attachment 2** for telephone and mobile phone numbers.

Check Fuel/Solvent Storage Systems Extinguish all smoking and small flames.

- If a spill/leak exists, attempt to stop the leak/spill or absorb fuel/solvent with inert materials.
- If bulk fuel or solvent is leaking into the environment from a storage system, take immediate steps to limit flow into drainage ways by constructing an earthen dam.
- Report spills or leaks to the DNR. See **Attachment 2** for emergency contacts.

Slope Failure

Several dangers exist with slope failures including: exposing waste, leachate, bacteria, and other materials to the environment, allowing wastes to leave the site property, allowing wastes to enter wetlands or other regulated environments, and allowing wastes to overrun roads and buildings.

- Perform a head count of employees, contractors, and guests.
- Stay away from other nearby areas that may also be at risk.

Contact the following:

- Manager – See **Attachment 2** for telephone numbers.
- Call 911 if there are any injuries or if someone may be buried under the failed slope.

Waste Shifts

- Because of the instability of some stockpiles such as compost, some soils, and yard waste, the stockpile face should never be allowed to get higher than 15-20 feet. Borrow pits should also be constructed to ensure side slope stability.
- A professional engineer should be consulted to control side slope and stability.
- Use caution when excavating the "toe" of stockpile. Removing too much material may destabilize the upper portion of stockpile causing it to "slide" or fall down.
- In case of any stockpile slide, the following individuals/companies must be contacted: Manager – See **Attachment 2** for telephone and mobile phone numbers.
- The DNR should be contacted for large slope failures when waste is exposed or if waste leaves the property boundary.

Waste Subsidence

Settling of large or small areas of the Landfill is a natural occurrence; however, sudden settling may cause changes in slope stability.

Waste subsidence is generally gradual. If a large sinkhole or other large depression is created from subsidence, stay away from the area as additional subsidence may occur.

Large depressions or holes should be reported to the Manager.

113.8(5)"b"(3)8 Emergency and Release Notification and Reporting

Emergency reporting and notifications will be provided as needed by state, federal, and local authorities.

Federal Agencies

See **Attachment 2** for Emergency Contacts.

State Agencies

See **Attachment 2** for Emergency Contacts.

See **Attachment 3** for Reporting Hazardous Conditions.

County and City Agencies Including Emergency Management Services

See **Attachment 2** for Emergency Contacts.

News Media

See **Attachment 2** for Emergency Contacts.

Public and Private Facilities with Special Populations within Five Miles

See **Attachment 2** for a list of facilities and phone numbers.

Reporting Requirements and Forms

Emergency reporting requirements and forms will be provided as needed by the state, federal, and local authorities.

113.8(5)"b"(3)9 Emergency Waste Management Procedures

Communications

Communication between Landfill staff and any emergency personnel will be at the direction of the Manager if possible. The Manager will also advise emergency personnel of factors that may influence the evacuation efforts or response procedures.

The following systems of communication may be used in an emergency.

- A telephone is available at the scale house.
- Cellular/digital telephones are not provided by the facility; however, personal cellular/digital telephones may be available.
- Two-way radios are available at some facilities.
- Honking horns can be used to indicate an emergency.
- Personal communication can also be used to communicate an emergency situation.

Alarm System

- The employer shall establish and educate employees regarding any proposed alarm system.
- An air horn or an automobile horn can be used to alert employees about a dangerous situation.
- Two-way or C.B. radios can be used to alert employees regarding a dangerous situation.
- If possible, person-to-person contact can be used to alert landfill guests, contractors, employees, etc. regarding the dangerous situation.

Temporary Discontinuation of Services – Short-Term and Long-Term

- If telephone service is discontinued, cellular or digital telephones can be used.
- The Manager can dispatch messengers to deliver emergency messages in case of a discontinuation of normal communication systems.
- If the facility's transportation, processing, or landfilling services must be discontinued, the Manager will contact member municipalities, county governments, and hauling companies as soon as possible to communicate rerouting instructions.

Facilities Access and Rerouting

- The Manager will facilitate emergency rerouting.
- If access to the facility is blocked, telephone, radio, and person to person contact at the Landfill will be used to communicate new directions and rerouting.

- The Manager will contact alternate disposal sites and arrange for disposal. After the emergency, normal disposal or transportation systems should resume as soon as possible.

Waste Acceptance

- The Manager will contact alternate disposal sites and arrange for disposal if needed.
- After the emergency, normal disposal or transportation systems should resume as soon as possible.
- If wastes must be diverted for more than one day, contact the DNR; see **Attachment 2** for telephone numbers.

Waste in Process

- During an emergency, safety to human life is a priority.
- Wastes being tipped, processed, or handled must be left in place until the threat to human life is greatly reduced.
- If an emergency does not threaten human life, the Manager will decide how best to manage wastes in process depending on the emergency circumstances.
- When the threat to human life is reduced, the waste should be processed according to the facility's permit.

113.8(5)"b"(3)10 Primary Emergency Equipment Inventory

Major Equipment

A bulldozer and an earth scraper are available on site. Private vehicles are also available.

Fire Hydrants and Water Sources

Fire hydrants and water sources, if available, are located on the Site Plan Map (See **Attachment 1**).

Off-Site Equipment Resources

The facility may contact other municipal and county governments to borrow machinery until replacements can be acquired.

113.8(5)"b"(3)11 Emergency Aid

A commercial first-aid kit will be maintained at the Landfill office. The site supervisor or the staff will administer minor first-aid treatment when required. Serious injuries will be handled through 911 Emergency Services (See **Attachment 2**).

- In case of accidents occurring outside normal operating hours, it will be the responsibility of the senior staff person to provide first-aid treatment and to arrange for professional assistance if required.
- Call 911, professional emergency aid workers should be notified for injuries needing immediate first aid care.
- See **Attachment 2** for Emergency Contacts.
- Manager should be notified of any injury (See **Attachment 2** for Emergency Contacts).

Responder Contacts

- Contact local 911 Emergency Services – See **Attachment 2** for telephone numbers.
- Contact the Manager if any injury occurs – see **Attachment 2** for telephone numbers.

Medical Services

- Contact 911 before transporting sick or injured individuals in a personal vehicle or non-emergency vehicle.
- Directions to the Hospital are located in **Attachment 4**.

Contracts and Agreements

- The facility does not have any contracts or agreements for emergency aid.
- 911 service is provided to county businesses and businesses of incorporated cities.

113.8(5)"b"(3)12 ERRAP Training Requirements

During the first year, after the plan is approved by the DNR, existing and new employees will review the contents of the approved ERRAP with the training provider.

The Manager should identify hazardous waste contractors that can service the facility in case hazardous materials are accidentally received.

Training Providers

The Manager will serve as the training provider, will review the ERRAP with existing and new employees, and will provide any additional training required fulfilling the roles outlined in the ERRAP.

Employee Orientation

New employees are required to review the ERRAP and become familiar with the contents of ERRAP. **Attachment 2** (Emergency Contacts) will be provided to each employee.

Annual Training Updates

The Manager will provide an annual review of the ERRAP with new and existing employees once per year. New information will be reviewed at that time.

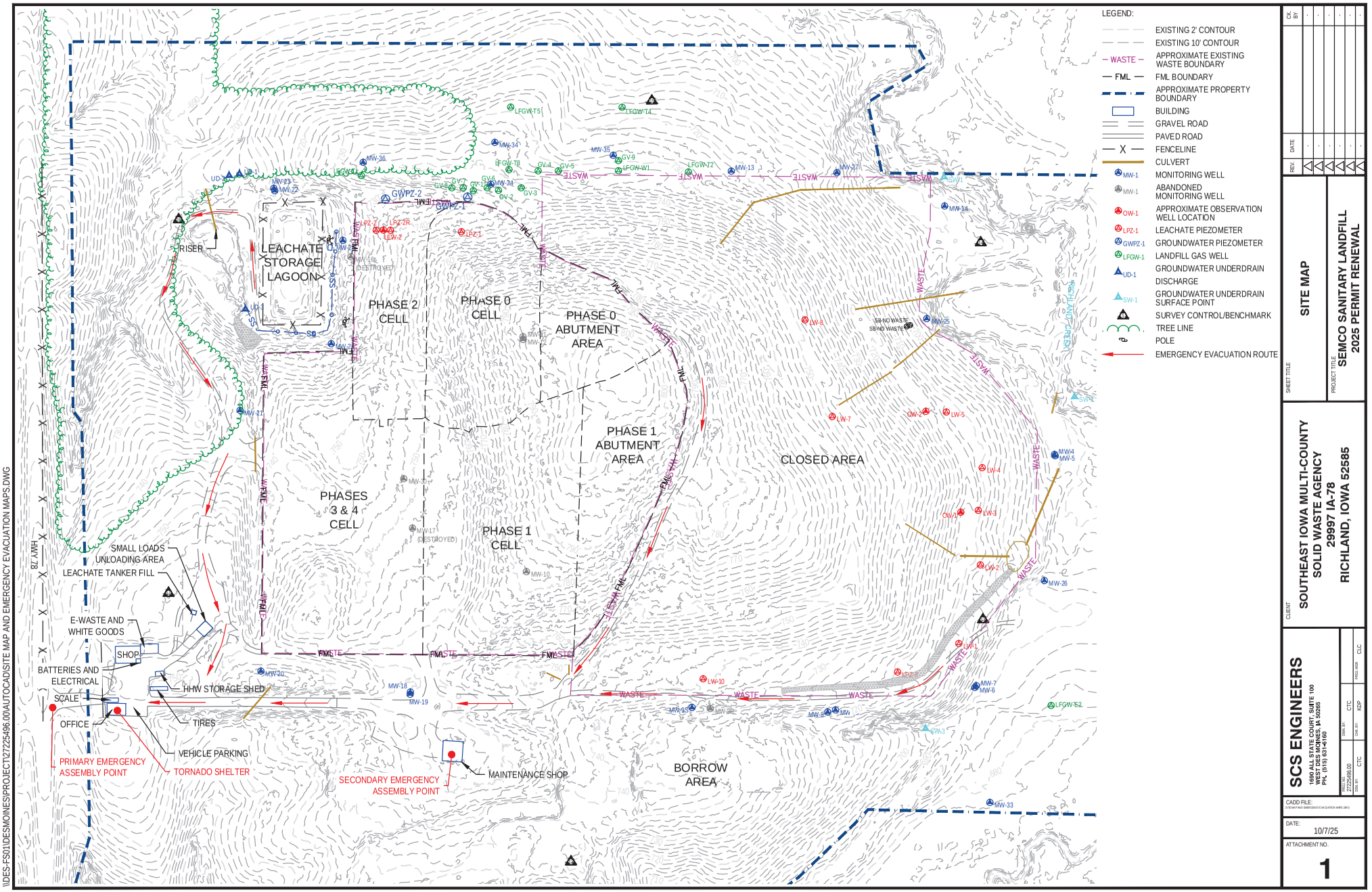
Training Completion and Record Keeping

Records of annual employee ERRAP training will be kept on file at the facility's offices.

Attachment 1

Site Plan Map

Emergency Evacuation Routes
Fire Escape Routes
Tornado Shelter
Emergency Assembly Point
Secondary Emergency Assembly Point



REV.	DATE	DR. BY
	-	-
	-	-
	-	-
	-	-
	-	-
	-	-

SHEET TITLE: SITE MAP

PROJECT TITLE: SEMCO SANITARY LANDFILL
2025 PERMIT RENEWAL

CLIENT: SOUTHEAST IOWA MULTI-COUNTY SOLID WASTE AGENCY
29997 IA-78
RICHLAND, IOWA 52585

SCS ENGINEERS
1690 ALL STATE COURT, SUITE 100
WEST DES MOINES, IA 50265
PH: (515) 657-4100

PROJ.NO. 27225496.00
DSN. BY: CTC
DWN. BY: KDP
CHK. BY: PROG. MGR.
CLC
CTC

CADD FILE: SITEMAP AND EMERGENCY EVACUATION MAPS.DWG

DATE: 10/7/25

ATTACHMENT NO. 1

\\DES-FS01\DESMOINES\PROJECT\27225496.00\AUTOCAD\SITE MAP AND EMERGENCY EVACUATION MAPS.DWG

Attachment 2

Emergency Phone Numbers

Telephone Locations
Fire
Medical
Landfill Management Notification
Media
State of Iowa
EPA
Utilities

EMERGENCY PHONE NUMBERS

TELEPHONE LOCATIONS:
Location of Nearest Telephones .....Scale House/Office

FIRE:

Fire Department / Rescue 911

MEDICAL / DOCTOR:

Ambulance 911

Hospital: Keokuk County Hospital and Clinics ..... (641) 622-2720

Estimated Drive Time..... 23 minutes (20.2 mi)

JCHC Richland Clinic..... (319) 456-2058

Estimated Drive Time..... 3 minutes (2.1 miles)

Directions to Hospital .....Route Directions: See **Attachment 4**

LANDFILL MANAGEMENT - NOTIFICATION LIST:

Manager

Bill Sloop ..... (319) 210-6457 Mobile

.....(319) 456-6171 Office

COUNTY EMERGENCY MANAGEMENT AGENCY:

Keokuk County Emergency Coordinator

Richard Fortney ..... (641) 932-0090

MEDIA:

Television

KCCI – Des Moines ..... (515) 247-8808

WHO – Des Moines ..... (515) 457-1026

KYOU - Ottuwma ..... (641) 684-5415

Radio

KMCD - AM ..... (712) 243-3920

KCII - FM ..... (712) 243-6885

STATE OF IOWA:

Water Quality Bureau ..... (515) 725-5029

Environmental Protection Division ..... (515) 725-8694

IDNR Field Office 6 in Washington, Iowa ..... (319) 653-2135

Iowa Emergency Management Division ..... (515) 725-3231

IDNR Spill Response ....(515) 725-8694 24-hour

EPA:

Region 7 ..... (800) 223-0425

....(913) 551-7003 24-hour

UTILITIES:

Telephone

Iowa Telecom ..... (800) 954-1211

Water

Wapello Rural Water Association ..... .(641) 682-8351

Electricity and Gas

TIP Electric & Gas ..... (800) 677-5659

One Call (prior to digging)..... (800) 292-8989

ENGINEER OF RECORD:

SCS Engineers..... (515) 631-6160

Attachment 3

Iowa Department of Natural Resources

Guidelines for Reporting Hazardous Conditions

Including Iowa Administrative Code Chapter 131

"Notification of Hazardous Conditions"

IOWA DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL SERVICES DIVISION
FIELD SERVICES & COMPLIANCE BUREAU

Iowa Administrative Code Chapter 131
Notification of Hazardous Conditions

24 hour number for release reporting
515/725-8694

Summary of Key Points and Definitions

Definitions

"Hazardous Condition" means any situation involving the actual, imminent or probable spillage, leakage, or release of a hazardous substance onto the land, into a water of the state or into the atmosphere which, because of quantity, strength and toxicity of the hazardous substance, its mobility in the environment and its persistence, creates an immediate or potential danger to the public health or safety or to the environment.

"Hazardous Substance" means any substance or mixture of substance that presents a danger to the public health or safety and includes, but is not limited to, a substance that is toxic, corrosive, or flammable, or that is an irritant or that, in confinement, generates pressure through decomposition, heat, or other means. The following are examples of substances which, in sufficient quantity, may be hazardous: acids; alkalis; explosives; fertilizers; heavy metals such as chromium, arsenic, mercury, lead, and cadmium; industrial chemicals; paint thinners; paints; pesticides; petroleum products; poisons; radioactive materials; sludges; and organic solvents. "Hazardous substances" may include any hazardous waste identified or listed by the administrator of the United States Environmental Protection Agency under the Solid Waste Disposal Act as amended by the Resource Conservation and Recovery Act of 1976, or any toxic pollutant listed under Section 307 of the federal Water Pollution Control Act as amended to January 1, 1977, or any hazardous substance designated under Section 311 of the federal Water Pollution Control Act as amended to January 1, 1977, or any hazardous material designated by the secretary of transportation under the Hazardous Materials Transportation Act (49 CFR 172.101)

Key Points

Who is Required to Report Hazardous Conditions. Any person manufacturing, storing, handling, transporting, or disposing of a hazardous substance shall notify the department at (515) 725-8694 and the local police department or the office of the sheriff of the affected county of the occurrence of a hazardous condition as soon as possible but not later than six hours after the onset of the hazardous condition or the discovery of the hazardous condition. A sheriff or police chief who has been notified of a hazardous condition shall immediately notify the department. Reports made pursuant to this rule shall be confirmed in writing as provided in 131.2(2).

Reporting Subsequent Findings. All subsequent finding and laboratory results should be reported and submitted in writing to the department as soon as they become available.

Reminder ~ VERBAL REPORTS ARE REQUIRED WITHIN 6 HOURS OF INCIDENCE OCCURRENCE OR DISCOVERY.

REV. 5/2024

IOWA DNR EMERGENCY RESPONSE UNIT
6200 Park Avenue, Ste 200 / DES MOINES, IOWA 50321
515-725-8694 TDD 515-242-5967 www.iowadnr.gov

IOWA DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL SERVICES DIVISION
FIELD SERVICES & COMPLIANCE BUREAU

Guidelines for Reporting Hazardous Conditions
Verbal Reporting

24 hour number for release reporting
515/725-8694

Report the Condition if:

- ☐ The hazardous substance has the potential to leave the property by run-off, sewers, tile lines, culverts, drains, utility lines, or some other conduit, or,
- ☐ The hazardous substance has the potential to reach a water of the state – either surface water or groundwater or,
- ☐ The hazardous substance can be detected in the air at the boundaries of the facility property by the senses (sight and smell) or by monitoring equipment or,
- ☐ There is a potential threat to the public health and safety or,
- ☐ Local officials (Fire department, law enforcement, Hazmat, public health, and emergency management) respond to the incident or,
- ☐ The release exceeds a Federal Reportable Quantity (RQ).

~ If in Doubt, Report It ~

IDNR REQUIRES VERBAL REPORTS WITHIN 6 HOURS OF INCIDENCE OCCURRENCE OR DISCOVERY

- It is recommended that all spills be cleaned up although a particular spill may not be reportable. A series of small spills over time can result in one big cleanup.
- Department rules stress the immediate or <u>potential</u> danger that a spill may cause.
- A written report of the Hazardous Condition is required within 30 days of the verbal notification.

*In general, Iowa reporting requirements are more stringent than Federal reporting requirements. However, the **time limit** for reporting at the Federal level is more immediate.*

IOWA DNR EMERGENCY RESPONSE UNIT
6200 Park Avenue, Ste 200 / Des Moines, IOWA 50321
515-725-8694 TDD 515-242-5967 www.iowadnr.gov

IOWA DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL SERVICES DIVISION
FIELD SERVICES & COMPLIANCE BUREAU

Guidelines for Reporting Hazardous Conditions Written Report Requirements

24 hour number for release reporting
515/725-8694

The Iowa Department of Natural Resources
Requires a written report of any Hazardous Condition.
(VERBAL REPORT REQUIRED WITHIN 6 HOURS)

Written Report. The written report of such a hazardous condition shall be submitted to the department within 30 days and contain the following information:

a. The exact location of the hazardous condition.
b. The time and date of onset or discovery of the hazardous condition.
c. The name of the material, the manufacturer's name, and the volume of each material involved in the hazardous condition in addition to contaminants within the material if they by themselves could cause a hazardous condition.
d. The medium (land, water, or air) in which the hazardous condition occurred or exists.
e. The name, address, and telephone number of the party responsible for the hazardous condition.
f. The time and date of the verbal report to the department of the hazardous condition.
g. The weather conditions at the time of the hazardous condition onset of discovery.
h. The name, mailing address, and telephone number of the person reporting the hazardous condition.
i. The name and telephone of the person closest to the scene of the hazardous condition who can be contacted for further information and action.
j. Any other information, such as the circumstances leading to the hazardous condition, visible effects, and containment measures taken that may assist in the proper evaluation by the department.

The written report should include the IDNR Spill Number (assigned at the time of the verbal report) and be addressed to the duty officer responding to the spill. Reports can be sent via mail, fax, or electronic mail to the addresses listed below.

Mail	Fax	E-Mail
Iowa DNR Field Services Emergency Response 6200 Park Ave. Ste 200 Des Moines, IA 50321	515/725-8201	Emergency_Response@dnr.iowa.gov

CHAPTER 131
NOTIFICATION OF HAZARDOUS CONDITIONS

[Prior to 7/1/83, DEQ Ch 41]
[Prior to 12/3/86, Water, Air and Waste Management[900]]

Chapter rescission date pursuant to Iowa Code section 17A.7: 1/1/28

567—131.1(455B) Definitions. For purposes of this chapter:

"Corrosive" means causing or producing visible destruction or irreversible alterations in human skin tissue at the site of contact, or in the case of leakage of a hazardous substance from its packaging, causing or producing a severe destruction or erosion of other materials through chemical processes.

"Department" means the department of natural resources.

"Hazardous condition" means any situation involving the actual, imminent or probable spillage, leakage, or release of a hazardous substance onto the land, into a water of the state or into the atmosphere which, because of the quantity, strength and toxicity of the hazardous substance, its mobility in the environment and its persistence, creates an immediate or potential danger to the public health or safety or to the environment.

"Hazardous substance" means any substance or mixture of substances that presents a danger to the public health or safety and includes, but is not limited to, a substance that is toxic, corrosive, or flammable, or that is an irritant or that, in confinement, generates pressure through decomposition, heat, or other means. The following are examples of substances which, in sufficient quantity, may be hazardous: acids; alkalis; explosives; fertilizers; heavy metals such as chromium, arsenic, mercury, lead and cadmium; industrial chemicals; paint thinners; paints; pesticides; petroleum products; poisons; radioactive materials; sludges; and organic solvents. "Hazardous substances" may include any hazardous waste identified or listed by the administrator of the United States Environmental Protection Agency under the Solid Waste Disposal Act as amended by the Resource Conservation and Recovery Act of 1976, or any toxic pollutant listed under Section 307 of the federal Water Pollution Control Act as amended to January 1, 1977, or any hazardous substance designated under Section 311 of the federal Water Pollution Control Act as amended to January 1, 1977, or any hazardous material designated by the secretary of transportation under the Hazardous Materials Transportation Act (49 CFR §172.101).

"Irritant" means a substance causing or producing dangerous or intensely irritating fumes upon contact with fire or when exposed to air.

"Toxic" means causing or producing a dangerous physiological, anatomic or biochemical change in a biological system.

567—131.2(455B) Report of hazardous conditions. Any person manufacturing, storing, handling, transporting, or disposing of a hazardous substance shall notify the department at (515)281-8694 and the local police department or the office of the sheriff of the affected county of the occurrence of a hazardous condition as soon as possible but not later than six hours after the onset of the hazardous condition or discovery of the hazardous condition. A sheriff or police chief who has been notified of a hazardous condition shall immediately notify the department. Reports made pursuant to this rule shall be confirmed in writing as provided in 131.2(2).

131.2(1) *Verbal report.* The verbal report of such a hazardous condition should provide information on as many items listed in 131.2(2) as available data will allow.

131.2(2) *Written report.* The written report of such a hazardous condition shall be submitted to the department within 30 days and contain the following information:

a. The exact location of the hazardous condition.

b. The time and date of onset or discovery of the hazardous condition.

c. The name of the material, the manufacturer's name and the volume of each material involved in the hazardous condition in addition to contaminants within the material if they by themselves could cause a hazardous condition.

d. The medium (land, water or air) in which the hazardous condition occurred or exists.

e. The name, address and telephone number of the party responsible for the hazardous condition.

f. The time and date of the verbal report to the department of the hazardous condition.

g. The weather conditions at the time of the hazardous condition onset or discovery.

h. The name, mailing address and telephone number of the person reporting the hazardous condition.

i. The name and telephone number of the person closest to the scene of the hazardous condition who can be contacted for further information and action.

j. Any other information, such as the circumstances leading to the hazardous condition, visible effects and containment measures taken that may assist in proper evaluation by the department.

131.2(3) *Reporting of subsequent findings.* All subsequent finding and laboratory results should be reported and submitted in writing to the department as soon as they become available.

These rules are intended to implement Iowa Code section 455B.115.

[Filed 2/3/78, Notice 10/5/77—published 2/22/78, effective 3/29/78]
[Filed emergency 10/31/80—published 11/26/80, effective 10/31/80]
[Filed emergency 6/3/83—published 6/22/83, effective 7/1/83]
[Filed emergency 11/14/86—published 12/3/86, effective 12/3/86]
[Filed 12/30/93, Notice 10/13/93—published 1/19/94, effective 2/23/94]

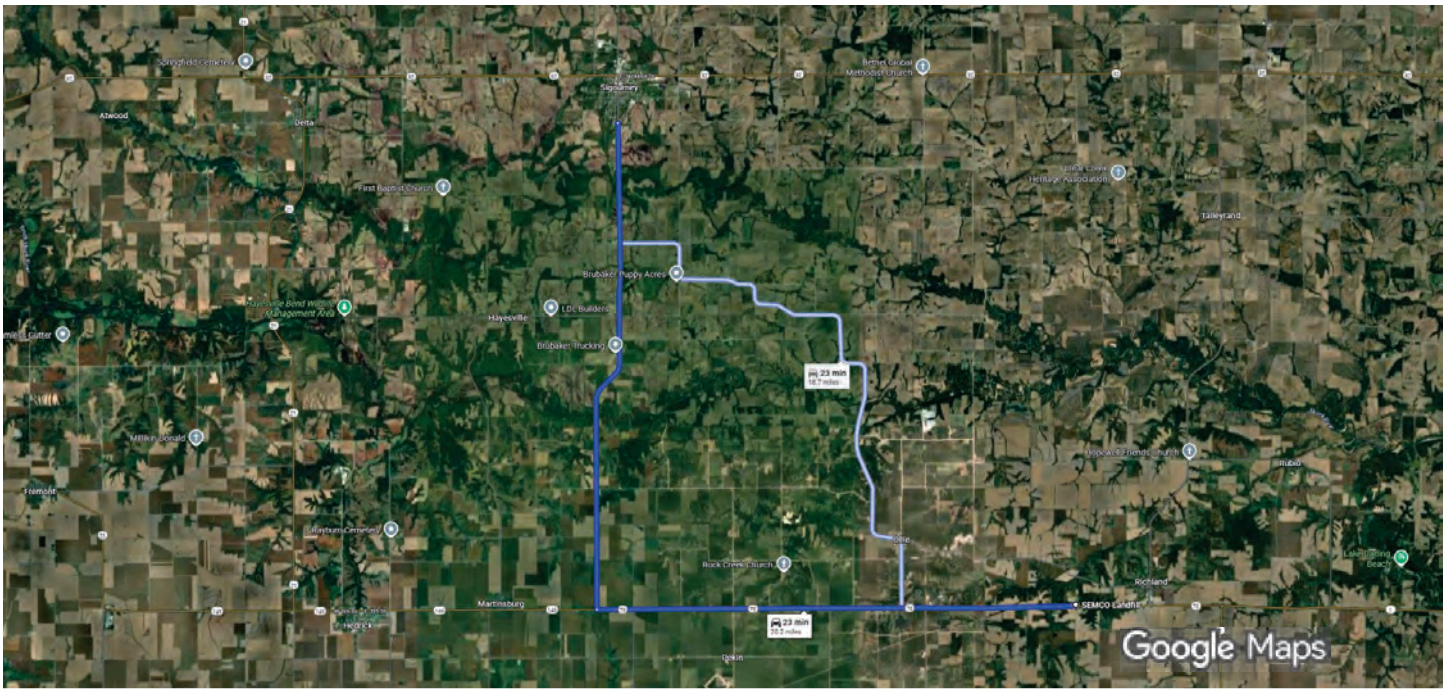
Attachment 4

Directions to Hospital

Google Maps

SEMCO Landfill to Keokuk County Hospital & Clinics

Drive 20.2 miles, 23 min



Map data ©2025 , Map data ©2025 Google 1 mi

SEMCO Landfill
29997 IA-78, Richland, IA 52585

1. Head south toward IA-78 W — 164 ft
2. Turn right onto IA-78 W — 9.9 mi
3. Turn right onto IA-149 N — 10.2 mi
4. Turn left — 95 ft

Keokuk Cnty Hospital & Clinics
23019 IA-149, Sigourney, IA 52591

Attachment 5

Special Populations Within Five Mile Radius

AT-RISK POPULATIONS WITHIN A 5-MILE RADIUS

HOSPITALS/CLINICS:

JCHC Richland Clinic, 107 W Harrison St, Richland, IA ..... (319) 456-2058

SCHOOLS:

None within a 5-mile radius of the SEMCO Sanitary Landfill.

NURSING HOMES/ASSISTED LIVING:

None within a 5-mile radius of the SEMCO Sanitary Landfill.

DAY CARE CENTERS:

Richland Area Child Care Organization, 101 S Walnut St. Richland, IA ..... (319) 456-5660

Appendix C

Environmental Monitoring Plan

HMSP Update

Revised Hydrologic Monitoring System Plan

Southeast Iowa Multi-County (SEMCO) Sanitary Landfill
Richland, Keokuk County, Iowa
Permit No. 54-SDP-01-75P

Submittal Date: January 2009
Revision date: October 2025

Prepared For:

Southeast Iowa Multi-County Solid Waste Agency

SCS ENGINEERS

27225496.00 | October 2025

1690 All State Court, Suite 100
West Des Moines, IA 50265

Table of Contents

Tables

Figures

Attachments

Section 1.0
INTRODUCTION

1.1 Purpose

The purpose of this document is to update the design, operation, and maintenance of the groundwater monitoring system for the municipal solid waste landfill unit (MSWLF unit) at the Southeast Iowa Multi-County (SEMCO) Sanitary Landfill (Landfill). The SEMCO Sanitary Landfill comprises the Closed Area and the open Subtitle D Area, including the Phase 0 Cell, Phase 0 Abutment, Phase 1 Cell, Phase 1 Abutment, Phase 2 Cell, and the Phases 3 & 4 Cell. These areas are labeled in **Figure 1**. Although the Closed Area ceased receiving waste before October 1, 2007, it remains contiguous with the Subtitle D Area that continued to receive waste after October 1, 2007; therefore, the entire facility is subject to the current 567 Iowa Administrative Code (IAC) Chapter 113. The groundwater monitoring system established for the Landfill is designed to assess the potential impact, if any, that landfilling activities have on adjacent groundwater and to enable early detection of a release from the MSWLF unit.

1.2 Approach

The approach used to revise the groundwater monitoring system for the Landfill involved a review of the hydrogeology beneath and in the vicinity of the Landfill, with specific interest in potential routes of contaminant migration as would result from a theoretical release to the water-bearing unit considered the uppermost aquifer. Revisions and/or additions were then made to the groundwater monitoring well network. This same information, along with development activities that have occurred on-site associated with the MSWLF unit, was reviewed for this update. Groundwater monitoring at the Landfill is accomplished via the sampling of groundwater monitoring wells and groundwater underdrain outlets associated with the leachate lagoon and the Phases 0, 1, 2, and 3 & 4 cells. With the groundwater monitoring well network revised, revisions were then made to the HMSP provisions for monitoring point installation and abandonment, operation, maintenance, monitoring, and response in the event of a release, to comply with the requirements of 567 Iowa Administrative Code (IAC) 113.10.

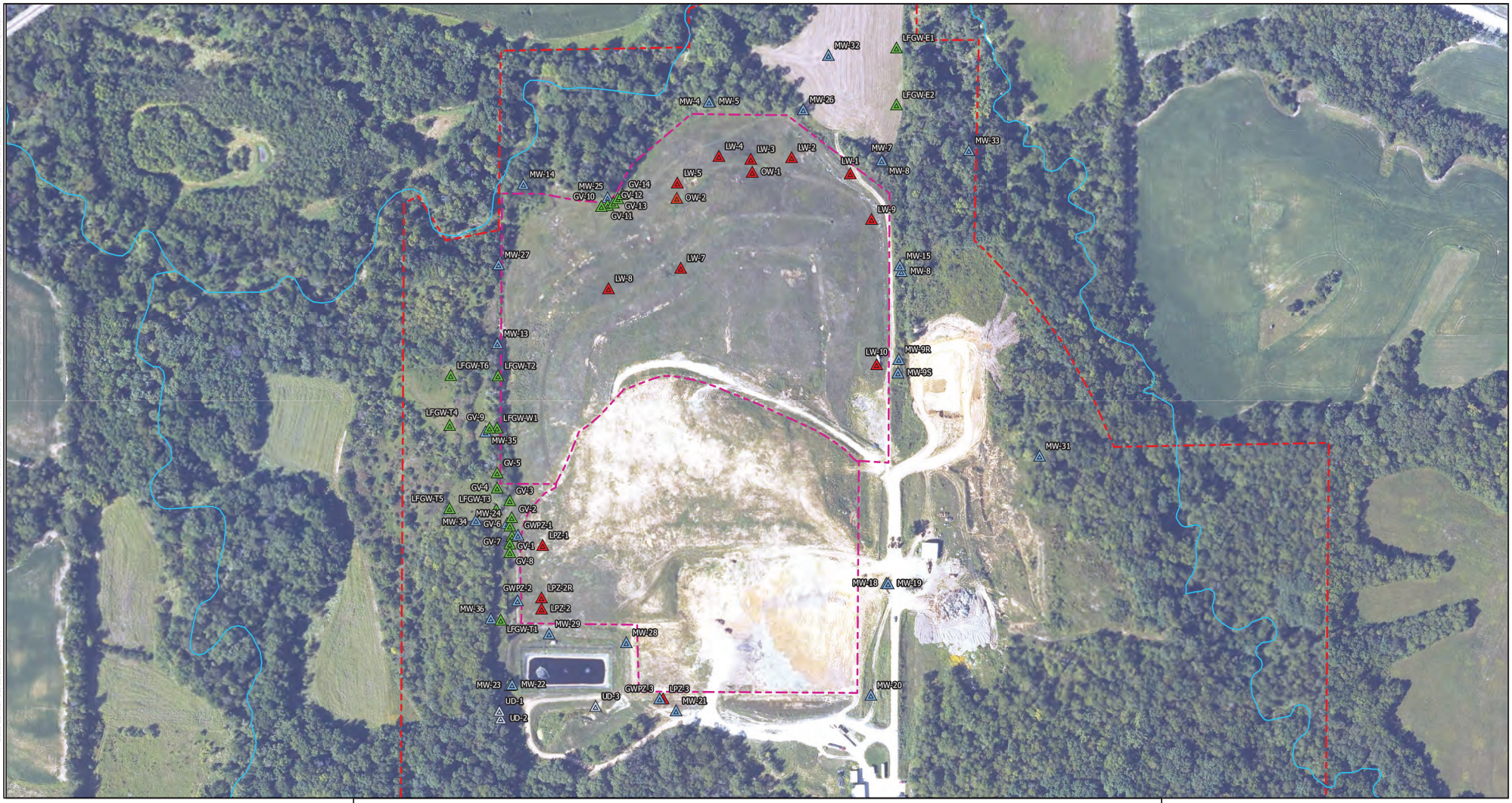
1.3 Site Location

The Landfill property is depicted on **Figure 1, Site Map**. The Landfill consists of approximately 70 acres and is located within Lot 3 or the Irregular Survey of the W ½, NW ¼, SW ¼ of Section 28; the SE ¼, SE ¼ of Section 29; Lot 2 of the Irregular Survey of the NE ¼, SE ¼ of Section 29; and a strip of land 50 feet in width on the south side of the original center line of the main track of the Minneapolis and St. Louis Railroad Company within the NW ¼, SW ¼, of Section 28 and the E ¼ of Section 29, all in T74N, R10W, Keokuk County, Iowa.

1.4 Report Contents

The Hydrologic Monitoring System Plan (HMSP) for the Landfill units includes the following:

- Section 1.0 Introduction – Purpose and approach for monitoring the Landfill;
- Section 2.0 Hydrogeologic Assessment Summary – Summary of hydrogeologic information used to update the monitoring system network;
- Section 3.0 HMSP – Discussion, justification, and 567 IAC Chapter 113 compliance response/documentation comprising the HMSP for the Landfill.



Site Map

Legend

- Monitoring Well
- Groundwater Underdrain
- Approximate Landfill Gas Monitoring Location
- Approximate Observation Well Location
- Approximate Leachate Piezometer Location
- Approximate Existing Waste Boundary
- Approximate Property Boundary
- Stream

Southeast Multi-County
Sanitary Landfill
Richland, Iowa
Project No: 27225496.00
Drawing Date: October 2025

N
W E
S

0 237.5 475 950 Feet

Figure 1

SCS ENGINEERS
environmental consultants and contractors

Section 2.0
Hydrogeologic Assessment Summary

The "Risk Assessment for the Southeast Multi-County Sanitary Landfill," dated June 1995, prepared by Howard R. Green Company (1995 Risk Assessment), described the geology of the site. Excerpts from this report are included below. The referenced cross sections by James M. Montgomery Consulting Engineers, Inc. (JMM 1990) and Montgomery Watson are not included herein, but are available in the permit renewal application dated October 2, 2020 (Doc #98601).

The soil layers above the limestone and shale bedrock within the currently permitted area are described by the following, as referenced in the 1995 Risk Assessment:

> *Glacial till is present above the limestone* [bedrock]*. This was described by JMM (1990) as sandy silty clay with gravel. The cross sections portray approximately 30 to 70 feet of till under and near the waste disposal area. Sand lenses are present within the glacial till. Loess (windblown silt) is present in the upland area. Alluvium is present in the Richland Creek valley north of the site. The boring for MW-4 penetrated 19 feet of alluvial silt over 3 feet of silty sand and gravel. The boring for MW-6 penetrated 18 feet of alluvial silt over 6 feet of silty sand and gravel. The boring for MW-14 penetrated 9.5 feet of fill material (disturbed soil) over 8.5 feet of alluvial silt, over a transitional silty sandy unit 4 feet in thickness, over 3 feet of sand. The bottom of the sand was not reached by the boring. The glacial till between the alluvium and the shale is 5 feet thick at MW-4 and 6.5 feet thick at MW-6. MW-4, MW-6, and MW-11 were screened in the Mississippian Limestone.*

The limestone and shale bedrock within the currently permitted area were described as follows, as referenced in the 1995 Risk Assessment:

> *The upper bedrock in the vicinity of the SEMCO Sanitary Landfill is the Pennsylvanian-aged Des Moines Series, Cherokee Group, which consists of shale with thin interbedded limestones. Cross sections in JMM (1990) portray the top of the Pennsylvanian shale at elevations of approximately 640 to 680 feet msl. Mississippian limestone underlies the Pennsylvanian rocks. The top of the limestone is portrayed at approximately 625 to 635 feet msl. However, the boring for MW-15 penetrated shale with thin limestones without encountering the thicker Mississippian limestone down to an elevation of 585 feet msl. The groundwater flow direction in the limestone is to the northeast. Water levels in these wells are higher than the top of the limestone, showing confined or artesian conditions which prevent downward percolation of shallow groundwater into the aquifer.*

Monitoring well MW-18 was drilled in 2004 and penetrated the limestone about 160 feet below ground surface (bgs). The water level, however, rose to approximately 92 feet bgs once the lower aquifer was penetrated. Likewise, in 2005, MW-22 was drilled into limestone, which occurred about 92 feet bgs. Upon penetrating the limestone layer, the water level rose to approximately 28 feet bgs.

In summary, the Mississippian bedrock limestone is overlain by Pennsylvanian shale, which is overlain by dark gray (unoxidized) lean to fat sandy clay, the upper surface of which follows the surface terrain. The upper soil layer is brown (oxidized) to brown-gray, sandy, lean clays, which become thinner toward the southwest. The referenced risk assessment report provides information on the direction of the water table flow. The primary flow direction of the shallow water table is northward toward the Richland Creek valley. In the western part of the site, the flow may be directed toward the intermittent drainage way

situated west of Trench 4. Shallow groundwater contours appear to approximate the existing terrain of the ground surface. According to the contours, groundwater flows toward the north from a high point ridge aligned along the northern portion of the Subtitle D cells. Groundwater also flows towards the southwest from this high ridge in the vicinity of the Landfill.

The original site topography (Attachment B, Sheet 3) shows a hill top in the approximate east-central portion of the Subtitle D Area from which four primary ravines flow and form. One ravine slopes northwest, then north toward Richland Creek between monitoring wells MW-14 and MW-5. Another ravine slopes northward toward Richland Creek along the eastern boundary of the MSWLF unit; the mouth of the ravine is in the vicinity of monitoring well MW-7. A third ravine slopes southwest away from the southwest corner of the Subtitle D cells. A fourth ravine begins in the vicinity of monitoring well MW-20 and exits the site to the southeast.

Section 3.0
HMSP

The hydrologic monitoring system was designed to intercept the groundwater flow paths from the Landfill in compliance with the requirements of rule 113.10. The implementation and justification for the HMSP monitoring network for the Landfill are provided in Section 3.2.1.

Groundwater monitoring will include sampling of the monitoring wells specified in this HMSP and the groundwater underdrain outlets. The locations of the proposed monitoring points for the Landfill are shown in **Figure 2**.

The following subsections comprise the compliance demonstration of the HMSP, presented in the form of a dialogue between rule 113.10 and the response or HMSP content.

3.1 General Requirements

113.10(1) *General requirements for environmental monitoring and corrective action for groundwater and surface water. The following general requirements apply to all provisions of this rule.*

3.1.1 Surface Water Requirements

a. Surface water requirements. MSWLF units shall not:

(1) Cause a discharge of pollutants into waters of the United States, including wetlands, that violates any requirements of the Clean Water Act, including, but not limited to, the National Pollutant Discharge Elimination System (NPDES) requirements, pursuant to Section 402 of the Clean Water Act.

Operation of the Landfill will not cause a discharge of pollutants into waters of the United States, including wetlands, that violates any requirements of the Clean Water Act, including the NPDES requirements, pursuant to Section 402 of the Clean Water Act.

(2) Cause the discharge of a nonpoint source of pollution into waters of the United States, including wetlands, that violates any requirement of an areawide or statewide water quality management plan that has been approved under Section 208 or 319 of the Clean Water Act.

Operation of the Landfill will not cause the discharge of a nonpoint source of pollution into waters of the United States, including wetlands, that violates any requirement of an area wide or statewide water quality management plan that has been approved under Section 208 or 319 of the Clean Water Act.

3.1.2 Pre-Waste Placement Compliance

b. A new MSWLF unit must be in compliance with the groundwater monitoring requirements specified in subrules 113.10(2), 113.10(4), 113.10(5) and 113.10(6) before waste can be placed in the unit.

Table 3-1
Background Sampling Completion

Monitoring Point	Background Completion Date
MW-5	December 2008
MW-7	December 2008

Monitoring Point	Background Completion Date
MW-9R	December 2008
MW-13	September 2008
MW-14	December 2008
MW-19	December 2008
MW-20	November 2023
MW-21	November 2023
MW-23	October 2010
MW-25	October 2010
MW-26	October 2010
MW-27	October 2010
MW-28	October 2010
MW-29	July 2010
MW-34	May 2023
UD-1	March 2021
UD-2	August 2015
UD-3	May 2024

Background groundwater sampling for the majority of the monitoring wells and groundwater underdrain outlets UD-1 and UD-2 began in January 2008. It should be noted that inorganic data collected in background monitoring wells MW-19 and MW-28/MW-28BGR prior to the implementation of low-flow sampling, which began with the 2015 sampling events, was removed from the dataset beginning with the 2nd 2018 semi-annual statistical evaluation, as the analytical data was considered not representative. The five background sampling events for inorganic parameters in the background wells were completed in February 2017. Monitoring wells MW-20, MW-21, and MW-34, and groundwater underdrain outlet UD-3, were added to the monitoring network at a later time. Prior to placing waste in new cells at the Landfill, sampling will be conducted to ensure compliance with the groundwater monitoring requirements specified in subrules 113.10(2) and 113.10(4) through 113.10(6).

3.1.3 Monitoring Period

c. Once established at an MSWLF unit, groundwater monitoring shall be conducted throughout the active life and postclosure care period of that MSWLF unit as specified in rule 113.13(455B).

Groundwater monitoring at the Landfill will be conducted throughout the active life and postclosure care period.

3.1.4 Qualified Groundwater Scientist

d. For the purposes of this rule, a "qualified groundwater scientist" means a scientist or an engineer who has received a baccalaureate or postgraduate degree in the natural sciences or engineering and has sufficient training and experience in groundwater hydrology and related fields demonstrated by state registration, professional certifications, or completion of accredited university programs that enable that individual to make sound professional judgments regarding groundwater monitoring, contaminant fate and transport, and corrective action.

The SEMCO Solid Waste Agency (Agency) will ensure that a qualified groundwater scientist, as defined in 113.10(1) "d," is utilized to evaluate modifications to the groundwater monitoring network and will oversee the evaluation of data derived from it.

3.2 Groundwater Monitoring System

113.10(2) Groundwater monitoring systems. All MSWLFs shall have a groundwater monitoring system that complies with the following requirements:

3.2.1 Groundwater Monitoring System Objectives

a. A groundwater monitoring system must be installed that meets the following objectives:

(1) Yields groundwater samples from the uppermost aquifer that represent the quality of background groundwater that has not been affected by leakage from a unit. A determination of background quality may include sampling of wells that are not hydraulically upgradient of the waste management area where either:

1. Hydrogeologic conditions do not allow the owner or operator to determine which wells are hydraulically upgradient; or

2. Sampling at other wells will provide an indication of background groundwater quality that is as representative as or more representative than that provided by the upgradient wells.

Interwell statistical evaluations are used to analyze the groundwater analytical data for the monitoring wells associated with the Landfill. The data from the appropriate monitoring points not affected by leakage from the MSWLF unit will be used to represent the background quality groundwater for interwell methods. For groundwater underdrain discharge points, the data from the individual monitoring points will be used to represent background water quality. The groundwater underdrain discharge points will be evaluated using intrawell statistical methods. The selected statistical methods are discussed in Section 3.4. The background dataset will be updated periodically as described in Section 3.5.

(2) Yields groundwater samples from the uppermost aquifer that represent the quality of groundwater passing the relevant point of compliance specified by the department under numbered paragraph 113.7(5)"a"(2)"2." The downgradient monitoring system must be installed at the relevant point of compliance specified by the department under numbered paragraph 113.7(5)"a"(2)"2" that ensures detection of groundwater contamination in the uppermost aquifer. When physical obstacles preclude installation of groundwater monitoring wells at the relevant point of compliance at existing units, the downgradient monitoring system may be installed at the closest practicable distance, hydraulically downgradient from the relevant point of compliance specified by the department under numbered paragraph 113.7(5)"a"(2)"2," that ensures detection of groundwater contamination in the uppermost aquifer.

The groundwater subject to regular sampling and analysis will be the first encountered groundwater at the site. Monitoring will be via the groundwater monitoring wells and the groundwater underdrain system. New groundwater monitoring wells, if required, will be installed at the relevant point of compliance specified by the Iowa Department of Natural Resources (DNR) under numbered paragraph 113.7(5)"a"(2)"2" or the closest practicable distance hydraulically down-gradient from the relevant point of compliance specified by the DNR under numbered paragraph 113.7(5)"a"(2)"2". Existing monitoring wells installed for previous HMSPs will remain at their current locations. The locations of the monitoring system points are discussed in Section 3.3.2.

(3) Provides a high level of certainty that releases of contaminants from the site can be promptly detected. Downgradient monitoring wells shall be placed along the site perimeter, within 50 feet of the planned liner or waste boundary unless site conditions dictate otherwise,

downgradient of the facility with respect to the hydrologic unit being monitored. Each groundwater underdrain system shall be included in the groundwater detection monitoring under subrule 113.10(5). The maximum drainage area routed through each outfall shall not exceed 10 acres, unless it can be demonstrated that site-specific factors, such as drain flow capacity or site development sequencing, require an alternative drainage area. If contamination is identified in the groundwater underdrain system pursuant to subrule 113.10(5), the owner or operator shall manage the underdrain discharge as leachate in place of assessment monitoring and corrective action.

The groundwater monitoring network for the Landfill will provide a high level of certainty that a release from the Landfill would be promptly detected. Likely migration pathways from the Landfill were evaluated as part of the theoretical release analysis discussed in subparagraph 4 of this rule subsection.

The groundwater monitoring well network for the Landfill consists of monitoring wells installed within 50 feet of the waste boundary in the Closed Area of the MSWLF unit, unless site conditions dictate otherwise, and spaced at 300-foot intervals along the downgradient boundary of the unit. The Phase 0, 1, 2, and 3 & 4 cells have the added monitoring enhancement of a groundwater underdrain collection layer. The groundwater underdrain collection layer is located within 4 feet of the waste. It is expected to draw groundwater into the system, creating an inward gradient in the vicinity of this portion of the MSWLF unit boundary. The groundwater underdrain system comprises a continuous geocomposite layer beneath specific sections of the Subtitle D Area of the MSWLF unit, as well as a series of pipes that mirror the leachate piping system.

The drainage areas routed through each groundwater underdrain upon completion of the Landfill are as follows:

Underdrain Outlet	Outlet Drainage Area
UD-1 (Phase 0, 1, and 2 Cells):	6.2 acres
UD-2 (Leachate Lagoon):	0.7 acres
UD-3 (Phase 3 and 4 Cells)	5.7 acres

If groundwater impact is identified in the groundwater underdrain system pursuant to subrule 113.10(5), the underdrain discharge will be treated with the leachate in place of assessment monitoring and corrective action. For the groundwater underdrain outlet UD-1, samples are required only if noncompliant waste-groundwater separation measurements are detected from either GWPZ-1 or GWPZ-2, as described in the compliance plan dated June 21, 2023(Doc #107024). Samples have not been required for UD-1 since April 2022.

(4) Be designed and constructed with the theoretical release evaluation pursuant to subparagraph 113.6(3)"e"(6) taken into consideration.

A theoretical release analysis is a process to determine where pollutants released from the Landfill would likely migrate. This analysis provides the basis for the design of the hydrologic monitoring system. The theoretical release evaluation for the Landfill consisted of reviewing the historic water levels and groundwater flow directions surrounding the unit, the site hydrogeology surrounding the waste boundary, the leachate levels measured within the unit, and the pre-development ground surface elevation contours. Based on this information, more likely pathways of migration of a theoretical release from the Landfill were evaluated. Below is a discussion of the theoretical release

analysis. The figures and attachments referenced in this discussion are not included herein, but are available in the permit renewal application dated October 2, 2020 (Doc #98601).

Attachment B, Sheet 1, shows the groundwater contours at the Landfill based on water level measurements taken at the perimeter wells on September 19, 2019. Attachment B, Sheet 2, shows groundwater contours based on perimeter wells and fluid level measurements taken at leachate piezometers inside the waste boundary. The thick blue line drawn around a portion of the landfill's perimeter, as shown on Sheets 1 and 2, is identical and represents the areas where higher permeability soils are located within the screened interval of the groundwater monitoring wells.

The groundwater contours, as shown on Attachment B, Sheet 1, indicate that groundwater flow is generally in a north and slightly northwest direction beneath the unlined area. Within the western portion of the Subtitle D Area, the groundwater indicates a southerly flow as influenced by the groundwater underdrains beneath the Phases 0, 1, 2, and 3 & 4 cells. The groundwater within the eastern portion of the Subtitle D Area appears to form a ridge from which groundwater flows to the north-northwest. As can be seen on the original ravine map (Attachment B, Sheet 3), the groundwater table contours approximate the original topography. Although the leachate levels based on September 2019 measurements are higher than the groundwater levels based on perimeter monitoring wells only, it can be seen that the flow direction is similar, with the exception that the groundwater flow within the western portion of the unlined area shifts to a more northwesterly direction and to a more northeasterly direction along the extreme northeastern portion of the unlined area. It should be noted, however, that the groundwater and leachate contours were derived from point data and may not account for interior ravine topography or higher conductivity materials.

The hydrogeology of the Landfill was characterized by identifying the existing and historical wells and borings along the perimeter area of the MSWLF unit, obtaining the boring logs that characterize the geology of each well and boring, and arranging the boring log information in cross-sections to allow analysis of the soil and strata around the perimeter of the MSWLF unit. The cross-sections were generated from the data provided on the boring logs for each well or boring. The soil types reported on the boring logs were standardized to the Unified Soil Classification System classifications.

Attachment B, Sheet 3, shows the cross-section location, and Sheet 4 shows the soil profile for cross-sections A-A'. These profiles were generated from the soil boring logs for the wells and borings shown.

The groundwater contours shown on Attachment B, Sheets 1 and 2, indicate a fairly uniform groundwater flow pattern toward the north and northwest within the unlined area; however, two areas of groundwater convergence likely occur along the northern (downgradient) landfill boundary based on the ravine contours shown on Attachment B, Sheet 3. In addition, the boring logs indicate a layer of higher permeability soils in the screened interval depths of monitoring wells MW-5, MW-7, MW-14, and MW-25. The ravine topography and the occurrence of higher permeability soils indicate a groundwater area of convergence between monitoring wells MW-5 and MW-14. Although the ravine topography does not indicate a groundwater convergence area between monitoring wells MW-5, MW-7, and MW-26 (Attachment B, Sheet 3), the groundwater appears to be downgradient (Attachment B, Sheet 1), and the borings indicate that higher permeability soils are likely in this area (Attachment B, Sheet 4).

The hydrogeologic conditions along the north portion of the east landfill boundary, in the vicinity of the existing monitoring well MW-8, indicate that this area is less likely to be a location for a theoretical release to occur. Attachment B, Sheet 3, shows that the elevated sideslope of the ravine is outside the waste boundary. In addition, Attachment B, Sheet 4-B, shows that the occurrence of higher permeability soils along the sideslope of this ravine is not well defined. Monitoring well MW-9R waretained as an HMSP monitoring well since impacts have been indicated. The southern portion of the east landfill boundary indicates upgradient groundwater conditions. Therefore, additional groundwater monitoring wells were not proposed along the eastern boundary of the MSWLF unit.

It also appears that an area of groundwater flow convergence may be present near the southeast corner of the Subtitle D Area; however, it is not well developed. It is anticipated that a theoretical release along the southern boundary of the MSWLF unit will be intercepted by the groundwater underdrain system and routed to one of the groundwater underdrain outfalls, where groundwater samples will be collected.

The sideslope of the west-central ravine in the unlined portion of the MSWLF unit would likely cause groundwater along the west boundary of the MSWLF unit to flow downgradient toward the center of the ravine and generally away from the west MSWLF unit boundary. As shown on the soil profiles in Attachment B, Sheet 4-C, and in Attachment B, Sheets 1 and 2, higher permeability soils were not encountered at the screened interval in the vicinity of MW-13; however, to approximate a 300-foot spacing, monitoring well MW-27 was installed between MW-13 and MW-14 on the northern portion of the west MSWLF unit boundary. The groundwater underdrain system at the Phase 0, 1, and 2 cells appears to indicate an inward gradient along the west side of the Phase 0 and 2 Cells, based on the September 2019 groundwater contours. The Phase 2 Cell groundwater underdrain may increase the inward gradient along the western MSWLF unit boundary. Two monitoring wells were installed along the southern boundary of the Phase 2 cell. Due to the uncertainty of groundwater levels in relation to the groundwater underdrain in this area, two wells, MW-28 and MW-29, were installed to verify whether an inward gradient was present. Attachment B, Sheet 1, shows the inward gradient of the groundwater near the groundwater underdrains of Phase 0, 1, and 2 Cells.

Based on recent groundwater underdrain measurements measured at GWPZ-1 and GWPZ-2, it does not appear that groundwater is appreciably accumulating in the underdrain system beneath the Phase 0 and 2 Cells. It appears that the Phases 3 & 4 Cells groundwater underdrain, installed deeper than originally designed, may be the primary influence on groundwater flow in the vicinity of the underdrains, potentially eliminating the need for the Phase 0 and Phase 2 Cell underdrains. In order to ensure the engineered waste/groundwater separation is maintained in the absence of the flowing discharge at UD-1, the fluid depth and elevation needed in order to maintain the separation was calculated. If the monthly measurements exceed 1.3 feet at GWPZ-1 or 3.5 feet at GWPZ-2, it indicates that fluid is accumulating in the UD-1 underdrain system and that draining and disposing of the fluid from the system should be performed. If the draining does not result in lower fluid depths, further evaluation to identify the cause of the increased depths will be performed. Monthly water level measurements at GWPZ-1 and GWPZ-2 will continue to be reported each year in the Annual Water Quality Report.

Table 3-2 provides a description of the existing HMSP monitoring points for the Landfill.

Table 3-2
Description of Landfill Monitoring Points

Monitoring Point	Comments
MW-5	This monitoring well is located along the north side and downgradient of the Closed Area.
MW-7	This monitoring well is located near the northeast corner and downgradient of the Closed Area.
MW-9R	This monitoring well is located along the east side and downgradient of the Closed Area.

Monitoring Point	Comments
MW-13	This monitoring well is located along the west side and downgradient of the Closed Area.
MW-14	This monitoring well is located in the northwest corner and downgradient of the Closed Area.
MW-19	This monitoring well is located east of the Subtitle D Area. This is the background monitoring well for the HMSP monitoring network.
MW-20	This monitoring well is located near the southeast corner of the Phase 3 & 4 cell.
MW-21	This monitoring well is located south of the Phase 3 & 4 cell.
MW-23	This monitoring well is located near the southwest corner and downgradient of the leachate lagoon.
MW-24	This monitoring well is located west of the Phase 0 Cell. This well is designated as a supplemental attenuation zone source well. Since this well is not a compliance point, it is not subject to the requirements of 567 IAC 113.10(5)"c" and 113.10(6).
MW-25	This monitoring well is located along the north and downgradient side of the Closed Area at a point of groundwater convergence between monitoring wells MW-5 and MW-14.
MW-26	This monitoring well is located along the north and downgradient side of the Closed Area between monitoring wells MW-5 and MW-7.
MW-27	This monitoring well is located near the northwest corner of the Closed Area between MW-13 and MW-14 to provide an approximate 300-foot well spacing.
MW-28	This monitoring well is located at the east-central end of the southern boundary of the Phase 2 cell.
MW-29	This monitoring well is located at the west end of the southern boundary of the Phase 2 cell.
MW-34	This monitoring well is located west of the composite-lined Phase 0 Cell, west of monitoring well MW-24, and is designated as a downgradient attenuation zone compliance well MW-34 due to the previous corrective action at MW-24.
UD-1	This monitoring point is the groundwater underdrain outfall for the current Phase 0, 1, and 2 cells. Groundwater is only sampled when groundwater underdrain measurements indicate fluid is likely accumulating in the underdrain system
UD-2	This monitoring point is the groundwater underdrain outfall for the leachate lagoon. Groundwater intercepted by the underdrain is routed to the collection pipes and to the UD-2 outfall, where the groundwater can be sampled.
UD-3	This monitoring point is the groundwater underdrain outfall for the Phases 3 & 4 Cells. Groundwater intercepted by the underdrain is routed to the collection pipes and to the UD-3 outfall, where the groundwater can be sampled.

3.2.2 Monitoring Point Installation Phasing

b. For those facilities which are long–term, multiphase operations, the department may establish temporary waste boundaries in order to define locations for monitoring wells. The convergence of groundwater paths to minimize the overall length of the downgradient dimension may be taken into consideration in the placement of downgradient monitoring wells provided that the multiphase unit groundwater monitoring system meets the requirements of paragraphs 113.10(2)"a," 113.10(2)"c," 113.10(2)"d" and 113.10(2)"e" and will be as protective of human

health and the environment as the individual monitoring systems for each MSWLF unit, based on the following factors:

(1) Number, spacing, and orientation of the MSWLF units;
(2) Hydrogeologic setting;
(3) Site history;
(4) Engineering design of the MSWLF units; and
(5) Type of waste accepted at the MSWLF units.

The Landfill is a multiphase development consisting of six Subtitle D Areas and a contiguous Closed Area. Groundwater flow is generally to the north toward Richland Creek from the Closed Area and toward the southwest from the Subtitle D Area. In general, the north boundary of the Closed Area exhibits downgradient groundwater flow conditions, and the southwestern corner of the Subtitle D Area exhibits downgradient groundwater flow conditions. The southwest corner of the Subtitle D Area indicates an area of groundwater flow convergence under pre-development conditions where a natural ravine exits the Subtitle D Area. The HMSP monitoring network is shown in **Figure 2**.

The hydrologic monitoring system network will be reviewed annually as part of the Annual Water Quality Report. The review will determine whether the installation of additional monitoring points is appropriate or if sufficient data has been collected to recommend altering the sampling frequency, discontinuing sampling, or abandoning one or more monitoring points.

3.2.3 Monitoring Well Construction Requirements

c. Monitoring wells must be constructed and cased by a well contractor certified pursuant to 567—Chapter 82 in a manner that maintains the integrity of the monitoring well borehole. This casing must be screened or perforated and packed with gravel or sand, as necessary, to facilitate the collection of groundwater samples. The annular space (i.e., the space between the borehole and well casing) above the sampling depth must be sealed to prevent contamination of samples and the groundwater. Monitoring wells constructed in accordance with the rules in effect at the time of construction shall not be required to be abandoned and re-constructed as a result of subsequent rule changes unless the department finds that the well is no longer providing representative groundwater samples. See Figure 1 [note: the monitoring well diagram is provided in Attachment D, Sheet D-1] *for a general diagram of a properly constructed monitoring well.*

(1) The owner or operator must notify the department that the design, installation, development, and decommission of any monitoring wells, piezometers and other measurement, sampling, and analytical devices documentation has been placed in the operating record.

Documentation of the design, installation, development, and decommission of monitoring wells, piezometers, and other measurement, sampling, and analytical devices associated with this HMSP will be placed in the operating record and the DNR will be notified when such placement has been made.

(2) The monitoring wells, piezometers, and other measurement, sampling, and analytical devices must be operated and maintained so that they perform to design specifications throughout the life of the monitoring program.

The monitoring wells, piezometers, and other measurement, sampling, and analytical devices associated with this HMSP will be operated and maintained in a manner such that they perform to design specifications throughout the life of the monitoring program.

(3) Each groundwater monitoring point must have a unique and permanent number, and that number must never change or be used again at the MSWLF. The types of groundwater monitoring points shall be identified as follows:

1. Monitoring wells by "MW# (Insert unique and permanent number)".

2. Piezometers by "PZ# (Insert unique and permanent number)".
3. Groundwater underdrain systems by "GU# (Insert unique and permanent number)".

Monitoring wells will be designated by MW-#, piezometers by PZ-#, and groundwater underdrains by UD-#. Each monitoring point will receive a unique and permanent number and that number designation will not be used again at the Landfill. Monitoring points designated before October 1, 2007, will retain their original designation.

(4) Monitoring well construction shall be performed by a certified well contractor (pursuant to 567—Chapter 82) and shall comply with the following requirements:
1. In all phases of drilling, well installation and completion, the methods and materials used shall not introduce substances or contaminants that may alter the results of water quality analyses.
2. Drilling equipment that comes into contact with contaminants in the borehole or aboveground shall be thoroughly cleaned to avoid spreading contamination to other depths or locations. Contaminated materials or leachate from wells must not be discharged onto the ground surface or into waters of the state so as to cause harm in the process of drilling or well development.
3. The owner or operator must ensure that, at a minimum, the well design and construction log information is maintained in the facility's permanent record using DNR Form 542–1277 and that a copy is sent to the department.

Monitoring well construction will be performed by a certified well contractor in accordance with Chapter 82. Drilling and well installation activities will be conducted in a manner that will not introduce substances or contaminants that may alter the results of water quality analysis. Monitoring well materials will be delivered to the site in the protective wrapping provided by the manufacturer and will not be removed until immediately before well installation. Monitoring wells will be constructed using PVC well screens and casings. PVC is not expected to absorb, desorb, react, or otherwise alter the screened soil stratum or the groundwater being sampled. Galvanized metal, glues, welding solvents, pipe thread lubricants, and other foreign substances of like material will not be used. Contaminated materials or leachate from wells will not be discharged onto the ground surface or into waters of the state so as to cause harm in the process of drilling or well development. Monitoring well design and construction log information will be recorded on IDNR Form 542-1277 and maintained in the facility's operating record. Copies will be sent to the DNR.

(5) Monitoring well casings shall comply with the following requirements:

1. The diameter of the inner well casing (see Figure 1) of a monitoring well shall be at least 2 inches.
2. Plastic–cased wells shall be constructed of materials with threaded and nonglued joints that do not allow water infiltration under the local subsurface pressure conditions and when the well is evacuated for sampling.
3. Well casing shall provide sufficient structural stability so that a borehole or well collapse does not occur. Flush joint casing is required for small diameter wells installed through hollow stem augers.

The monitoring well casings used to construct monitoring wells at the Landfill will be at least 2 inches in diameter and will be plastic (PVC). The PVC monitoring well casings will include flush-jointed, threaded, non-glued joints that prevent water infiltration under local subsurface pressure conditions and when the well is evacuated for sampling. The monitoring well casings will provide sufficient structural stability to prevent borehole or well collapse under normal conditions.

(6) Monitoring well screens shall comply with the following requirements:

1. Slot size shall be based on sieve analysis of the sand and gravel stratum or filter pack. The slot size must keep out at least 90 percent of the filter pack.
2. Slot configuration and open area must permit effective development of the well.

3. The screen shall be no longer than 10 feet in length, except for water table wells, in which case the screen shall be of sufficient length to accommodate normal seasonal fluctuations of the water table. The screen shall be placed 5 feet above and below the observed water table, unless local conditions are known to produce greater fluctuations. Screen length for piezometers shall be 2 feet or less. Multiple–screened, single–cased wells are prohibited.

The screen size for monitoring wells will be 0.010" (10-slot), which is consistent with monitoring well screens installed previously at the site and is compatible with the filter pack specified in 113.10(2)"c"(7). The screen slot configuration consists of three rows of slots, providing approximately 1.77 inches of open area per linear foot of screened section. Based on the previously measured hydraulic conductivities at the site, this area is expected to be sufficient to permit the effective development of the monitoring wells. The monitoring wells will have a minimum screen length of 5 feet and a maximum of 10 feet, unless expected water table fluctuations necessitate a longer screened interval. An attempt will be made, based on field observations, to place the screen of the water table monitoring wells such that the water table intersects the approximate midpoint of the screen length. Multiple-screened, single-cased monitoring wells will not be installed.

(7) Monitoring well filter packs shall comply with the following requirements:

1. The filter pack shall extend at least 18 inches above and 12 inches below the well screen.
2. The size of the filter pack material shall be based on sieve analysis when sand and gravel are screened. The filter pack material must be 2.5 to 3 times larger than the 50 percent grain size of the zone being monitored.
3. In stratum that is neither sand nor gravel, the size of the filter pack material shall be selected based on the particle size of the zone being monitored.

The monitoring well filter packs will extend at least 18 inches above and 12 inches below the well screen. The size of the filter pack material will be 2.5 to 3 times larger than the 50 percent grain size of the zone being monitored. In stratum that is neither sand nor gravel, the size of the filter pack material will be selected based on the particle size of the zone being monitored. Pre-packed monitoring well screens may be used as appropriate to fulfill the filter pack requirement.

(8) Monitoring well annular space shall comply with the following requirements:

1. Grouting materials must be installed from the top of the filter pack up in one continuous operation with a tremie tube.
2. The annular space between the filter pack and the frostline must be backfilled with bentonite grout.
3. The remaining annular space between the protective casing and the monitoring well casing must be sealed with bentonite grout from the frostline to the ground surface.

Grouting materials will be installed in the monitoring well annular spaces, from the top of the filter pack, in one continuous operation using a tremie tube. The annular space between the filter pack and the frostline will be backfilled with bentonite grout. The remaining annular space between the protective casing and the monitoring well casing will be sealed with bentonite grout from the frostline to the ground surface.

(9) Monitoring well heads shall be protected as follows:

1. Monitoring wells shall have a protective metal casing installed around the upper portion of the monitoring well casing as follows:
- *The inside diameter of the protective metal casing shall be at least 2 inches larger than the outer diameter of the monitoring well casing.*
- *The protective metal casing shall extend from a minimum of 1 foot below the frostline to slightly above the well casing top; however, the protective casing shall be shortened if such a depth would cover a portion of the well screen.*

- *The protective casing shall be sealed and immobilized with a concrete plug around the outside. The bottom of the concrete plug must extend at least 1 foot below the frostline; however, the concrete plug shall be shortened if such a depth would cover a portion of the well screen. The top of the concrete plug shall extend at least 3 inches above the ground surface and slope away from the well. Soil may be placed above the plug and shall be at least 6 inches below the cap to improve runoff.*
- *The inside of the protective casing shall be sealed with bentonite grout from the frostline to the ground surface.*
- *A vented cap shall be placed on the monitoring well casing.*
- *A vented, locking cap shall be placed on the protective metal casing. The cap must be kept locked when the well is not being sampled.*

2. All monitoring wells shall have a ring of brightly colored protective posts or other protective barriers to help prevent accidental damage.

3. All monitoring wells shall have a sign or permanent marking clearly identifying the permanent monitoring well number (MW#).

4. Run–on shall be directed away from all monitoring wells.

Monitoring well wellheads will be protected by installing protective metal casings around the upper portions of the monitoring wells. The inside diameter of the protective metal casings will be approximately 2 inches larger than the outside diameter of the monitoring well casings. The protective metal casings will be installed to extend from a minimum of 1 foot below the frost line to approximately 3 inches above the top of casing. The inside of the protective casing will be sealed with bentonite grout from the frost line to the ground surface. The protective casing will be sealed and immobilized with a concrete plug around the outside, the bottom of which will extend to at least 1 foot below the frost line and the top of which will extend at least 3 inches above the ground surface and slope away from the monitoring well to direct run-on away from the wellhead. Both the protective metal casing and the concrete plug will be shortened if the depths specified above would cover a portion of the monitoring well screen. A vented cap will be placed on the monitoring well casing, and a vented, locking cap will be placed on the protective metal casing. The cap will be kept locked when the well is not being accessed for groundwater sample collection or other measurements.

Brightly colored protective posts will be installed around the monitoring wells to help prevent accidental damage. Three protective posts will be installed at approximately 120-degree angles around single monitoring wells, and four protective posts will be installed at approximately 90-degree angles around well nests. The monitoring wells will each have a sign or permanent marking clearly identifying the permanent monitoring well designation (e.g., MW-#).

(10) Well development is required prior to the use of the monitoring well for water quality monitoring purposes. Well development must loosen and remove fines from the well screen and gravel pack. Any water utilized to stimulate well development must be of sufficient quality that future samples are not contaminated. Any gases utilized in well development must be inert gases that will not contaminate future samples. Following development, the well shall be pumped until the water does not contain significant amounts of suspended solids.

Monitoring well development will be conducted prior to using the monitoring well for water quality monitoring purposes. Monitoring wells will be developed using a dedicated pump or a clean disposable bailer until field measurements (pH, conductivity, and temperature) are within 10% of previous measurements or five well volumes have been removed, whichever occurs first. Following development, groundwater will be extracted from the monitoring wells until visual field observation of color and opacity indicates that the water does not contain a significant concentration of suspended solids. If water must be added to the monitoring well to facilitate its development, the water will be of sufficient quality to prevent future samples from being contaminated. If gases are used for

monitoring well development, they will be inert, ensuring that they do not contaminate future samples.

3.2.4 Groundwater Monitoring Point Abandonment

d. Groundwater monitoring points that are no longer functional must be sealed. Groundwater monitoring points that are to be sealed and are in a future waste disposal area shall be reviewed to determine if the method utilized to seal the monitoring point needs to be more protective than the following requirements. All abandoned groundwater–monitoring points (e.g., boreholes, monitoring wells, and piezometers) shall be sealed by a well contractor certified pursuant to 567—Chapter 82 and in accordance with the following requirements.

(1) The following information shall be placed in the operating record and a copy sent to the department:

1. *The unique, permanent monitoring point number.*
2. *The reasons for abandoning the monitoring point.*
3. *The date and time the monitoring point was sealed.*
4. *The method utilized to remove monitoring point materials.*
5. *The method utilized to seal the monitoring point.*
6. *Department Form 542–1226 for Water Well Abandonment Plugging Record.*

Groundwater monitoring points that are no longer functional will be abandoned. The methods for abandoning groundwater monitoring points in future waste disposal areas will be reviewed to determine if the sealing method used needs to be more protective than the requirements of 113.10(2)"d"(2-4). Abandoned groundwater monitoring points will be sealed by a well contractor certified pursuant to 567-Chapter 82. The information required by 113.10(2) "d"(1) will be placed in the operating record, and a copy will be submitted to the DNR.

(2) The monitoring point materials (e.g., protective casing, casing, screen) shall be removed. If drilling is utilized to remove the materials, then the drilling shall be to the maximum depth of the previously drilled monitoring point. All drilling debris shall be cleaned from the interior of the borehole.

Monitoring point abandonment will consist of removing the monitoring point materials (e.g., protective metal casing, casing, screen) from the borehole prior to drilling out the borehole. If the monitoring well casing and screen cannot be successfully removed prior to drilling, then the remaining materials will be removed via drilling to the maximum depth of the monitoring point. Drilling debris will be cleaned from the interior of the borehole before sealing.

(3) The cleared borehole shall be sealed with impermeable bentonite via a tremie tube. The end of the tremie tube shall be submerged in the grout while filling from the bottom of the borehole to the top of the ground surface. Uncontaminated water shall be added from the surface as needed to aid grout expansion.

The boreholes will be sealed with impermeable bentonite grout via a tremie tube. The end of the tremie tube will be submerged in the grout as it fills from the bottom of the borehole to the top of the ground surface. Uncontaminated water will be added from the surface as needed to aid grout expansion.

(4) After 24 hours, the bentonite shall be retopped if the bentonite has settled below the ground surface.

The abandoned monitoring point locations will be checked approximately 24 hours after sealing. The bentonite will be retopped if the bentonite has settled below the ground surface.

3.2.5 HMSP Monitoring Points

e. Hydrologic monitoring system plan (HMSP). Unless otherwise approved by the department in writing, the number, spacing, and depth of groundwater monitoring points shall be:

(1) Determined based upon site–specific technical information, including but not limited to the soil and hydrogeologic investigation pursuant to subrule 113.6(3) and the site exploration and characterization report pursuant to subrule 113.6(4), that must include thorough characterization of:

1. Aquifer thickness, groundwater flow rate, and groundwater flow direction, including seasonal and temporal fluctuations in groundwater flow; and

According to the "Revised 2005 Lateral Expansion Plan," June 2006 (Revised 2005 LEP), Appendix 3, the water table is the uppermost aquifer. The slug tests performed on water table wells indicated moderate to rapid recovery of groundwater. Additionally, based on the calculated velocity of flow of the water table interval, the uniformity of the flow direction, and the consistency of the depth of the water table surface relative to the land surface, the water table should be considered as the uppermost aquifer.

The depth to the water table across the site, as measured in previous assessments, varies from an average of 15 to 31 feet bgs in perimeter wells. The deepest water table depths of 31 feet below ground surface (BGS) measured during previous assessments were observed along the northeast boundary of the Closed Area. Groundwater flow rates and directions, including seasonal and temporal fluctuations in groundwater flow, were also discussed in detail in Appendix 3 of the Revised 2005 LEP for the Landfill. This site-specific technical information served as the basis for developing the monitoring HMSP network described in Section 3.1.2 of this document.

2. Saturated and unsaturated geologic units and fill materials overlying the uppermost aquifer, materials comprising the uppermost aquifer, and materials comprising the confining unit defining the lower boundary of the uppermost aquifer, including, but not limited to: thicknesses, stratigraphy, lithology, hydraulic conductivities, porosities and effective porosities; and

The first encountered saturated unit beneath the Landfill was considered the uppermost aquifer (see Revised 2005 LEP, Appendix 3). The unsaturated geologic units overlying the uppermost aquifer, the materials comprising the uppermost aquifer, and the materials comprising the confining unit defining the lower boundary of the uppermost aquifer were described in detail in Appendix 3 of the Revised 2005 LEP. This site-specific technical information served as the basis for developing the HMSP for the monitoring network described in Section 3.1.2 of this document.

3. Projected paths and rates of movement of contaminants found in leachate pursuant to subparagraph 113.6(3)"e"(6).

The projected paths and rates of movement of contaminants found in the leachate generated within the Subtitle D Area are simplified by the groundwater underdrain system. If an inward gradient is created by the underdrain system, the projected path of a release from the Subtitle D Area would be directed to and captured by the groundwater underdrain system. The release would then be detected in the samples collected regularly from the groundwater underdrain discharge points. If fluctuating groundwater levels create an outward gradient in the vicinity of the Subtitle D Area boundary, the HMSP monitoring wells are appropriately located to detect a release. Along the downgradient portion of the Closed Area of the Landfill, there is no apparent point of groundwater convergence; therefore, downgradient monitoring wells were installed at an approximate 300-foot spacing.

(2) Designed and constructed with a maximum of 300 feet between downgradient groundwater monitoring wells, unless it is demonstrated by site-specific analysis or modeling that an alternative well spacing is justified. The convergence of groundwater paths to minimize the overall length of the downgradient dimension may be taken into consideration in the placement of downgradient

monitoring wells provided that the groundwater monitoring system meets the requirements of paragraphs 113.10(2)"a", 113.10(2)"c", 113.10(2)"d", and 113.10(2)"e."

The groundwater monitoring system was designed based on site-specific analysis that justified an alternative well spacing. The groundwater underdrain system is the primary component of the groundwater monitoring system for the Subtitle D Area. The groundwater underdrain system provides a form of continuous spatial monitoring resulting from the continuous nature of the underdrain layer and the gradient created by the groundwater drawdown of the system. This monitoring system is not expected to have the gaps between monitoring points that would be present in a conventional monitoring system comprised only of monitoring wells, even at a 300-foot spacing. As a secondary monitoring measure, groundwater monitoring wells will be monitored in areas of groundwater convergence or in downgradient areas (notwithstanding the influence of groundwater underdrains).

(3) Certified by a qualified groundwater scientist, as defined in paragraph 113.10(1)"d," and approved by the department. Within 14 days of this certification and approval by the department, the owner or operator must notify the department that the certification has been placed in the operating record.

The monitoring network as described herein for the Landfill is hereby certified by Nathan Ohrt, who is considered a "qualified groundwater scientist" by the definition contained in 113.10(1)"d".

3.2.6 Monitoring Well Maintenance and Performance Reevaluation Plan

f. Monitoring well maintenance and performance reevaluation plan. A monitoring well maintenance and performance reevaluation plan shall be included as part of the hydrologic monitoring system plan. The plan shall ensure that all monitoring points remain reliable. The plan shall provide for the following:

(1) A biennial examination of high and low water levels accompanied by a discussion of the acceptability of well location (vertically and horizontally) and exposure of the screened interval to the atmosphere.

A biennial examination of high and low water levels, accompanied by a discussion of the applicability of well locations and other monitoring point locations (vertically and horizontally), and exposure of the screen interval to the atmosphere (as applicable), will be performed and presented in each AWQR due in odd-numbered years. Water level measurements will be conducted in accordance with the Standard Operating Procedure (SOP), Sanitary Landfill Groundwater Monitoring. A copy of this SOP is contained in Attachment A.

(2) A biennial evaluation of water level conditions in the monitoring wells to ensure that the effects of waste disposal or well operation have not resulted in changes in the hydrologic setting and resultant flow paths.

A biennial evaluation of water level conditions in the monitoring wells will be performed to ensure that the effects of waste disposal or well operation have not resulted in changes to the hydrologic setting and resultant flow paths. The biennial evaluation will include a review of the groundwater monitoring well static water levels in the Landfill and the influence of the groundwater underdrain system on water table elevations and flow paths. The results of the biennial evaluation will be presented in each AWQR, due in odd-numbered years. Water level measurements will be conducted in accordance with the requirements of the SOP contained in Attachment A.

(3) Measurements of well depths to ensure that wells are physically intact and not filling with sediment. Measurements shall be taken annually in wells which do not contain dedicated sampling pumps and every five years in wells containing dedicated sampling pumps.

The monitoring wells associated with the Landfill contain low-flow sampling systems. Measurement of well depths will be conducted annually to ensure that the wells remain physically intact and do not

fill with sediment. Well depth measurements will be conducted in accordance with the requirements of Section E-1 of the SOP. A copy of this SOP is contained in Attachment A.

(4) A biennial evaluation of well recharge rates and chemistry to determine if well deterioration is occurring.

A biennial evaluation of well recharge rates and chemistry will be performed to determine if well deterioration is occurring. An assessment will consist of reviewing the flow rate from the sampling events. Consistent groundwater yield between sampling events would indicate that well deterioration is not occurring. Data from indicator parameters (specific conductance, pH, and temperature) measurements, along with analysis of the required detection or assessment monitoring parameters, will be evaluated. Changes in chemistry that can be attributed to well deterioration and are not associated with a properly functioning well, detecting a possible release, will be considered an indication that well deterioration is occurring. Measurements of flow rate and indicator parameters will be conducted in accordance with the requirements of Section E of the SOP. A copy of this SOP is contained in Attachment A.

3.3 Surface Water Monitoring Systems

113.10(3) *Surface water monitoring systems. The department may require an MSWLF facility to implement a surface water monitoring program if there is reason to believe that a surface water of the state has been impacted as a result of facility operations (i.e., leachate seeps, sediment pond discharge) or a groundwater SSI over background has occurred.*

3.3.1 Surface Water Monitoring Points

a. A surface water monitoring program must be developed that consists of a sufficient number of monitoring points, designated at appropriate locations, to yield surface water samples that:

(1) Provide a representative sample of the upstream quality of a surface water of the state if the surface water being monitored is a flowing body of water.

(2) Provide a representative sample of the downstream quality of a surface water of the state if the surface water being monitored is a flowing body of water.

The DNR has not required the Agency to implement a surface water monitoring program for the Landfill.

3.3.2 Surface Water Measurements

b. Surface water levels must be measured at a frequency specified in the facility's permit, within 1/10 of a foot at each surface water monitoring point immediately prior to sampling, each time surface water is sampled. The owner or operator must determine the rate and direction of surface water flow, if any, each time surface water is sampled. Surface water level and flow measurements for the same surface water of the state must be measured on the same day to avoid temporal variations that could preclude accurate determination of surface water flow and direction.

The DNR has not required the Agency to implement a surface water monitoring program for the Landfill.

3.3.3 Monitoring Point Decommissioning

c. The owner or operator must notify and receive approval from the department for the designation or decommission of any surface water monitoring point, and must place that approval in the operating record.

The DNR has not required the Agency to implement a surface water monitoring program for the Landfill.

3.3.4 Monitoring Point Longevity

d. The surface water monitoring points shall be designated to maintain sampling at that monitoring point throughout the life of the surface water monitoring program.

The DNR has not required the Agency to implement a surface water monitoring program for the Landfill.

3.3.5 Monitoring Point Designation

e. Each surface water monitoring point must have a unique and permanent number, and that number must never change or be used again at the MSWLF. Surface water monitoring points shall be identified by "SW# (Insert unique and permanent number)".

The DNR has not required the Agency to implement a surface water monitoring program for the Landfill.

3.3.6 Monitoring Point Locations

f. The number, spacing, and location of the surface water monitoring points shall be determined based upon site–specific technical information, including:

(1) Water level, including seasonal and temporal fluctuations in water level; and

(2) Flow rate and flow direction, including seasonal and temporal fluctuations in flow.

The DNR has not required the Agency to implement a surface water monitoring program for the Landfill.

3.3.7 Discontinuing Monitoring

g. The MSWLF may discontinue the surface water monitoring program if monitoring data indicates that facility operations are not impacting surface water.

The DNR has not required the Agency to implement a surface water monitoring program for the Landfill.

3.4 Groundwater Sampling and Analysis Requirements

113.10(4) *Groundwater sampling and analysis requirements.*

3.4.1 Sampling and Analysis Procedures

a. The groundwater monitoring program must include consistent sampling and analysis procedures that are designed to ensure monitoring results that provide an accurate representation of groundwater quality at the background and downgradient wells installed in compliance with subrule 113.10(2). The groundwater monitoring program shall utilize a laboratory certified by the department. The owner or operator must notify the department that the sampling and analysis program documentation has been placed in the operating record, and the program must include procedures and techniques for:

(1) Sample collection;

Groundwater sample collection will be conducted in accordance with the requirements of Section E of the Standard Operating Procedure, Sanitary Landfill Groundwater Monitoring. A copy of this SOP is contained in Attachment A.

(2) Sample preservation and shipment;

Groundwater sample preservation and shipment will be conducted in accordance with the requirements outlined in Section E of the Standard Operating Procedure for Sanitary Landfill Groundwater Monitoring. A copy of this SOP is contained in Attachment A.

(3) Analytical procedures;

A laboratory certified by the DNR will be utilized for sample analyses.

(4) Chain of custody control; and

Chain of custody control will be prepared in accordance with the requirements of Section E-1h of the Standard Operating Procedure, Sanitary Landfill Groundwater Monitoring. A copy of this SOP is contained in Attachment A.

(5) Quality assurance and quality control.

Quality assurance and quality control procedures will be conducted in accordance with the SOP. A copy of the SOP is contained in Attachment A.

Data validation procedures will be performed on analytical results for laboratory quality control (QC) samples, and a quality assurance (QA) assessment of the data will be conducted as the data are generated. The QA review procedure will provide documentation of the accuracy and precision of the analytical data, confirming that the analyses are sufficiently sensitive to detect constituents at levels below regulatory standards, where such standards exist. It should be noted that the laboratory is unable to detect concentrations below regulatory limits for some parameters. QA/QC data validation of the produced data will be performed, which includes review of sample handling, analytical sensitivity and blanks, accuracy, and precision. An explanation of the laboratory QA/QC and data validation procedures is described in more detail below.

Sample Handling

Sample receipt forms will be reviewed and checked to verify that samples were received in good condition and within the acceptable temperature range. Chain of custody records for each sampling event will be reviewed to confirm that information is complete, custody is not breached, and samples are analyzed within the acceptable hold time.

Analytical Sensitivity and Blanks

Laboratory QA/QC procedures and post-analysis data validation assist in producing data of acceptable quality and reliability. The laboratory will perform QA/QC procedures, which will include analyzing laboratory method blanks in conjunction with samples collected for the project to check for contributions to the analytical results that may be attributable to laboratory-based contamination. Trip blanks will be submitted with groundwater samples for volatile organic compounds analysis to verify that cross-contamination does not occur during sample handling and transport.

Accuracy

Laboratory analytical accuracy can be assessed by evaluating the constituent recoveries from continuing calibration verification (CCV), laboratory control sample (LCS), and LCS duplicate (LCSD). LCS/LCSD samples assess the accuracy of analytical procedures by checking the ability to recover constituents added to clean aqueous matrices. In some cases, the laboratory spikes project samples as matrix spike (MS) and MS duplicate (MSD) samples to assess the ability to recover constituents from a matrix similar to that of project samples. The post-analysis data validation conducted will confirm that the laboratory has performed QA/QC of its laboratory control samples and will make recommendations on how to proceed with data that have possibly been compromised.

Precision

Duplicate samples will be collected during each sampling event to evaluate the precision of analytical measurements and the reproducibility of the sampling technique. The relative percent difference (RPD; difference between the sample and its field duplicate divided by the mean of the two) will be calculated to evaluate the precision of the data. The RPD can be evaluated only if the results of the analyses for both duplicates are detected quantitatively (above the reporting limit).

3.4.2 Sampling and Analytical Methods

b. The groundwater monitoring programs must include sampling and analytical methods that are appropriate for groundwater sampling and that accurately measure hazardous constituents and other monitoring parameters in groundwater samples. Groundwater samples shall not be field–filtered prior to laboratory analysis.

The groundwater sampling and analytical methods to be used for collecting and analyzing groundwater samples at the Landfill are discussed in the Standard Operating Procedure, "Sanitary Landfill Groundwater Monitoring." A copy of this SOP is contained in Attachment A. As indicated therein, groundwater samples will not be field-filtered prior to laboratory analysis.

3.4.3 Sampling Procedure Performance

c. The sampling procedures and frequency must be protective of human health and the environment, and consistent with subrule 113.10(5).

The sampling procedures described in the SOP are protective of human health and the environment and are consistent with subrule 113.10(5). A copy of the SOP is contained in Attachment A. The sampling frequency will be semi-annual unless the DNR approves an alternative schedule.

3.4.4 Groundwater Elevation Measurement

d. Groundwater elevations must be measured at a frequency specified in the facility's permit, within 1/100 of a foot in each well immediately prior to purging, each time groundwater is sampled. The owner or operator must determine the rate and direction of groundwater flow each time groundwater is sampled. Groundwater elevations in wells that monitor the same waste management area must be measured within a period of time short enough to avoid temporal variations in groundwater flow, which could preclude accurate determination of groundwater flow rate and direction.

Groundwater elevation measurements will be collected from monitoring wells in the Landfill monitoring network with each sampling event. Point elevations will be used to indicate groundwater elevations for the groundwater underdrain system in the Subtitle D Area. The biennial evaluation will include a review of groundwater levels in the wells and the influence of the groundwater underdrain system on water table elevations and flow paths. The results of the biennial evaluation will be presented in each AWQR, due in odd-numbered years. Water level measurements will be conducted in accordance with the requirements outlined in Section E-1a of the Standard Operating Procedure for Sanitary Landfill Groundwater Monitoring. A copy of this SOP is contained in Attachment A.

3.4.5 Background Groundwater Quality

e. The owner or operator must establish background groundwater quality in a hydraulically upgradient or background well(s) for each of the monitoring parameters or constituents required in the particular groundwater monitoring program that applies to the MSWLF unit, as determined under paragraph 113.10(5)"a" or 113.10(6)"a." Background groundwater quality may be established at wells that are not located hydraulically upgradient from the MSWLF unit if the wells meet the requirements of subparagraph 113.10(2) "a"(1).

Monitoring well MW-19 is the designated background monitoring well for the Landfill. Historical data from monitoring well MW-28 through October 1, 2021 are also included in the background dataset. The selection of statistical methods is discussed in Section 3.4.7.

3.4.6 Number of Background Samples

f. The number of samples collected to establish groundwater quality data must be consistent with the appropriate statistical procedures determined pursuant to paragraph 113.10(4)"g." The sampling procedures shall be those specified under paragraphs 113.10(5)"b" for detection

monitoring, 113.10(6)"b" and 113.10(6)"d" for assessment monitoring, and 113.10(7)"b" for corrective action.

At least five background samples have been collected from the HMSP monitoring points. Five background samples will be collected within one year from future additional groundwater monitoring wells at times determined by the development phasing. If statistical evaluation methods require additional background data, appropriate statistical comparisons will be made between the background data and subsequently collected data to update the background data set with future sampling events, as needed. An interwell statistical evaluation is currently being used for the Landfill monitoring wells, and intrawell statistical methods will be used for groundwater underdrain discharge points.

3.4.7 Statistical Methods

g. The owner or operator must specify in the operating record which of the following statistical methods will be used in evaluating groundwater monitoring data for each hazardous constituent. The statistical test chosen shall be conducted separately for each hazardous constituent in each well.

(1) A parametric analysis of variance (ANOVA) followed by multiple comparisons procedures to identify statistically significant evidence of contamination. The method must include estimation and testing of the contrasts between each compliance well's mean and the background mean levels for each constituent.

(2) An analysis of variance (ANOVA) based on ranks followed by multiple comparisons procedures to identify statistically significant evidence of contamination. The method must include estimation and testing of the contrasts between each compliance well's median and the background median levels for each constituent.

(3) A tolerance or prediction interval procedure in which an interval for each constituent is established from the distribution of the background data, and the level of each constituent in each compliance well is compared to the upper tolerance or prediction limit.

(4) A control chart approach that gives control limits for each constituent.

(5) Another statistical test method that meets the performance standards of paragraph 113.10(4)"h." The owner or operator must place a justification for this alternative in the operating record and notify the department of the use of this alternative test. The justification must demonstrate that the alternative method meets the performance standards of paragraph 113.10(4)"h."

The statistical methods selected for the Landfill in accordance with IAC 567-113.10(4)"g" comply with the performance standards listed in IAC 567-113.10(4)"h"(1) through (6) when applicable.

Diagnostic and Exploratory Evaluations and Tests of Assumptions

The detection, assessment, and corrective action monitoring statistical programs include diagnostic and exploratory evaluations and statistical tests of assumptions, as appropriate, including the following:

- Time Series Plots
- Shapiro-Wilk test for normality
- Ohio Environmental Protection Agency (EPA) Method for identification of outliers
- Mann-Kendall/Sen's Slope trend test

Management of Non-Detect Data

Non-detect values in the dataset are managed using simple substitution or the Kaplan-Meier estimator. If less than 15% of the data are non-detects, simple substitution is used, where non-

detect values are assigned a concentration of one-half (½) of the practical quantification limit (PQL). If greater than 15% but less than 50% of the data are non-detects, the Kaplan-Meier estimator is used to define the distribution of the dataset. If non-detects comprise greater than 50% of the available data, non-parametric statistical methods are used.

Management of Outliers

Background datasets are evaluated for outliers using the Ohio EPA Method included in the Sanitas™ statistical software program and described below, which includes the use of Dixon's, Rosner's, and Tukey's outlier tests, as appropriate based on the diagnostic tests, for the datasets that contain less than 75% of the measured concentrations below the PQL. Outliers are not confirmed unless a physical cause or explanation for the outlier is determined.

Management of Data (ND data < 75%)

If less than 75% of the background dataset is below the PQL, outliers are statistically evaluated using the following guidelines.

- A parametric dataset with n < 20 is evaluated with the Dixon's outlier test.
- A parametric dataset with n ≥ 20 is evaluated with the Rosner's outlier test.
- A non-parametric dataset is evaluated with the Tukey's outlier test.

In accordance with the Ohio EPA Method, if a statistically significant outlier is not found using the above tests, but the highest value data point exceeds the second highest data point by an order of magnitude, the highest point is considered an outlier.

Management of Data (ND data ≥ 75%)

If greater than or equal to 75% of the background dataset is less than the PQL, outliers are statistically evaluated using the following guidelines.

- Single detection ≥ the PQL:
    - If ≥ 50% of the background dataset has detections ≥ the method detection limit (MDL), any value ≥ two times the PQL of background is considered an outlier.
    - If < 50% of the background dataset has detections ≥ the MDL, any value ≥ the PQL of background is considered an outlier.
- Two or more detections ≥ the PQL:
    - If ≥ 50% of the background dataset has detections ≥ the MDL, any value ≥ three times the PQL of background is considered an outlier.
    - If < 50% of the background dataset has detections ≥ the MDL, any value ≥ two times the PQL of background is considered an outlier.

Confirmed outliers, when identified, will be shown in the Summary of Groundwater Chemistry included in the Annual Water Quality Reports.

As directed by the DNR correspondence dated April 17, 2018 (Doc #92099), all inorganic data collected prior to the 1st 2015 semi-annual sampling event were removed from the background dataset prior to the 2nd 2018 semi-annual statistical evaluation.

3.4.8 Statistical Method Performance Standards

The statistical methods selected for the Landfill in accordance with IAC 567-113.10(4)"g" comply with the performance standards listed in IAC 567-113.10(4)"h"(1) through (6) when applicable.

h. The statistical method required pursuant to paragraph 113.10(4)"g" shall comply with the following performance standards:

(1) The statistical method used to evaluate groundwater monitoring data shall be appropriate for the distribution of chemical parameters or hazardous constituents. If the distribution of the chemical parameters or hazardous constituents is shown by the owner or operator to be inappropriate for a normal theory test, then the data shall be transformed or a distribution–free theory test shall be used. If the distributions for the constituents differ, more than one statistical method may be needed.

The test for normality will be performed prior to calculating prediction limits, constructing confidence intervals, determining if a well can be returned to detection monitoring, and conducting outlier analysis. The Shapiro-Wilk test for normality will determine whether parametric or non-parametric statistical methods are appropriate.

(2) If an individual well comparison procedure is used to compare an individual compliance well constituent concentration with background constituent concentrations or a groundwater protection standard, the test shall be done at a Type I error level not less than 0.01 for each testing period. If a multiple comparisons procedure is used, the Type I experimentwise error rate for each testing period shall be not less than 0.05; however, the Type I error level of not less than 0.01 for individual well comparisons must be maintained.

To be able to limit the annual site-wide false positive rate (SWFPR) to no more than 10% and to maintain the minimum statistical power at each contaminant-well pair, a minimum of eight background data points is required along with a retesting scheme (either 1-of-2, 1-of-3, or 1-of-4 on observations) when conducting prediction limit testing. A 1-of-3 retesting scheme will be utilized for the Landfill. The statistical power of the test will periodically be reviewed and the retesting scheme will be revised, if necessary, to achieve sufficient statistical power and maintain compliance with the annual site-wide false positive rate limit.

(3) If a control chart approach is used to evaluate groundwater monitoring data, the specific type of control chart and its associated parameter values shall be protective of human health and the environment. The parameters shall be determined after considering the number of samples in the background data base, the data distribution, and the range of the concentration values for each constituent of concern.

Not applicable since a control chart approach is not proposed as a statistical method for the Landfill.

(4) If a tolerance interval or a predictional interval is used to evaluate groundwater monitoring data, the levels of confidence and, for tolerance intervals, the percentage of the population that the interval must contain, shall be protective of human health and the environment. These parameters shall be determined after considering the number of samples in the background data base, the data distribution, and the range of the concentration values for each constituent of concern.

If an MCL or statewide standard does not exist for a parameter, a GWPS from the site background will be developed in accordance with IAC 567-113.10(6)"h"(3) based on recommendations from the Unified Guidance.

(5) The statistical method shall account for data below the limit of detection (LD) by recording such data at one–half the limit of detection (i.e., LD/2) or as prescribed by the statistical method. Any practical quantitation limit (pql) that is used in the statistical method shall be the lowest concentration level that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions that are available to the facility.

The practical quantitation limit (PQL) that is reported by a laboratory is the lowest concentration level that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions that are available to the facility. The selected statistical methods will account for data below the limit of detection by recording such data at one-half the limit of detection (simple substitution) or using the Kaplan-Meier estimator, as appropriate.

(6) If necessary, the statistical method shall include procedures to control or correct for seasonal and spatial variability as well as temporal correlation in the data.

The selected statistical methods will account for seasonal and spatial variability as well as temporal correlation in the data, if necessary, and will meet the performance standards required in IAC 567-113.10(4)"h".

3.4.9 SSI Over Background Determination

i. The owner or operator must determine whether or not there is an SSI over background values for each parameter or constituent required in the particular groundwater monitoring program that applies to the MSWLF unit, as determined under paragraph 113.10(5)"a" or 113.10(6)"a."

(1) In determining whether an SSI has occurred, the owner or operator must compare the groundwater quality of each parameter or constituent at each monitoring well designated pursuant to subrule 113.10(2) to the background value of that constituent, according to the statistical procedures and performance standards specified under paragraphs 113.10(4)"g" and 113.10(4)"h."

(2) Within 45 days after completing sampling and analysis, the owner or operator must determine whether there has been an SSI over background at each monitoring well.

The statistical methods selected in accordance with 567 IAC 113.10(4)"g" in compliance with the performance standards in 113.10(4)"h" will be used to determine whether an SSI has occurred. The determination of whether or not an SSI has occurred will be completed within 45 days of receipt of laboratory analytical data.

3.5 Detection Monitoring Program

113.10(5) *Detection monitoring program.*

3.5.1 Detection Monitoring Statistical Program

The detection monitoring statistical program for the Landfill is defined by Iowa Administrative Code (IAC) 567-113.10(4)"g". For monitoring wells, interwell prediction limits with retesting were selected as the appropriate statistical method for the determination of statistically significant increases (SSIs) over background for inorganic constituents with historical detections in background. Prediction limits are established using the process below. Data from the most recent sampling event is compared to the prediction limits for the determination of SSIs.

Interwell Prediction Limits with Retesting

- If the dataset has a normal distribution (or can be transformed to a normal distribution using Ladder of Powers), parametric interwell prediction limits are calculated if at least five datasets have been collected from the background monitoring point(s).
- If the dataset does not have a normal distribution (and cannot be transformed to a normal distribution using Ladder of Powers) or has greater than 50% non-detects, nonparametric interwell prediction limits are calculated if at least five datasets have been collected from the background monitoring point(s).
- If an SSI above the prediction limit is indicated, retesting samples using the 1-of-3 retesting scheme will be collected prior to the next regularly scheduled sampling event, with temporal sample spacing consideration to provide samples with greater independence. If each of the retesting results is above the prediction limit, the SSI is confirmed, and the monitoring point will be placed into the assessment monitoring program. If a retesting sample concentration is below the prediction limit, the SSI is not confirmed, and the monitoring point continues in the detection monitoring program.

Groundwater underdrain discharge points will utilize intrawell prediction limits with retesting once a sufficient number of samples have been collected.

Intrawell Prediction Limits with Retesting

- If the dataset has a normal distribution (or can be transformed to a normal distribution using Ladder of Powers), parametric intrawell prediction limits are calculated if at least six datasets have been collected from the background dataset.
- If the dataset does not have a normal distribution (and cannot be transformed to a normal distribution using Ladder of Powers) or has greater than 50% non-detects, non-parametric intrawell prediction limits are calculated if at least six datasets have been collected from the background dataset.
- If an SSI above the prediction limit is indicated, retesting samples using the 1-of-3 retesting scheme will be collected prior to the next regularly scheduled sampling event, with temporal sample spacing consideration to provide samples with greater independence. If any of the retesting results exceed the prediction limit, the SSI is confirmed, and the discharge will be treated with the leachate instead of undergoing assessment monitoring and corrective action.

Updating the Background Dataset for Intrawell Prediction Limits

Following the collection of four additional samples since the background was last updated, if no SSI is confirmed for any two-year period, the intrawell background dataset is updated using the following procedure:

- Test the new dataset for normal distribution either outright or through a transformation using Ladder of Powers using the Shapiro-Wilk test.
- Test the new dataset for statistically significant outliers using the Ohio EPA Method, and remove the confirmed outliers (see the "Management of Outliers" section).
- Test the new dataset for statistically significant trends using the Mann-Kendall/Sen's Slope trend test. If a statistically significant increasing trend is detected, the monitoring point will be placed into the assessment monitoring program or treated with the leachate, whichever is appropriate.
- If the dataset has a normal distribution and no statistically significant increasing trend is present, a two-sample Welch's t-test at a 0.01 significance level is performed to compare the current background to the most recent two years of detection monitoring data. If the Welch's t-test is significant and indicates that the most recent two years of concentration data appear to be increasing, the background will not be updated, and the monitoring point will be placed into the assessment monitoring program or treated with leachate, whichever is appropriate.
- If the dataset does not have a normal distribution and no statistically significant increasing trend is present, a two-sample non-parametric Wilcoxon rank-sum test (also known as the Mann-Whitney test) at a 0.01 significance level is performed to compare the current background to the most recent two years of detection monitoring data. If the Wilcoxon rank-sum test is significant and indicates that the most recent two years of concentration data appear to be increasing, the background will not be updated, and the monitoring point will be placed in the assessment monitoring program or treated with leachate, whichever is appropriate.
- If the Welch's t-test or the Wilcoxon rank-sum tests are not significant, the most recent two years of detection data will be added to the intrawell background dataset.

The process will repeat every two years if an SSI is not confirmed.

Double Quantification Method

The quasi-statistical "double quantification" method is used for constituents not detected in the background monitoring well. If a constituent is detected in the compliance dataset that has not been historically detected in the background dataset, that constituent must be retested before the next regularly scheduled sampling event. If the retesting results confirm the original detection with a quantifiable detection, the SSI is confirmed, and the monitoring well must be placed into the assessment monitoring program, or the discharge treated with the leachate for groundwater underdrain discharge points.

3.5.2 Monitoring Parameters

a. Detection monitoring is required at MSWLF units at all groundwater monitoring wells defined under subrule 113.10(2). At a minimum, a detection monitoring program must include the monitoring for the constituents listed in Appendix I and any additional parameters required by the department on a site–specific basis. An alternative list of constituents may be used if it can be demonstrated that the constituents removed are not reasonably expected to be in or derived from the waste contained in the unit and if the alternative list of constituents is expected to provide a reliable indication of leachate leakage or gas impact from the MSLWF unit.

(1) The department may establish an alternative list of inorganic indicator parameters for a MSWLF unit within Appendix I, in lieu of some or all of the heavy metals (constituents 1-15 in Appendix I), if the alternative parameters provide a reliable indication of inorganic releases from the MSWLF unit to the ground water. In determining alternative parameters, the department shall consider the following factors:

1. The types, quantities and concentrations of constituents in wastes managed at the MSWLF unit;

2. The mobility, stability and persistence of waste constituents or their reaction products in the unsaturated zone beneath the MSWLF unit;

3. The detectability of indicator parameters, waste constituents and reaction products in the ground water; and,

4. The concentration or values and coefficients of variation of monitoring parameters or constituents in the groundwater background.

An alternative list of inorganic indicator parameters in lieu of some or all of the heavy metals is not being requested at this time.

3.5.3 Monitoring Frequency

b. The monitoring frequency for all constituents listed in Appendix I or in the alternative list approved in accordance with subparagraph 113.10(5)"a"(1) shall be at least semiannual (i.e., every six months) during the active life of the facility (including closure) and the postclosure period. Where insufficient background data exists, a minimum of five independent samples from each well, collected at intervals to account for seasonal and temporal variation, must be analyzed for the Appendix I constituents or in the alternative list approved in accordance with subparagraph 113.10(5)"a"(1) during the first year. At least one sample from each well must be collected and analyzed during subsequent semiannual sampling events. The department may specify an appropriate alternative frequency for repeated sampling and analysis for Appendix I constituents or in the alternative list approved in accordance with subparagraph 113.10(5)"a"(1) during the active life (including closure) and the postclosure care period. The alternative frequency during the active life (including closure) shall be not less than annually. The alternative frequency shall be based on consideration of the following factors:

(1) Lithology of the aquifer and unsaturated zone;

(2) Hydraulic conductivity of the aquifer and unsaturated zone;

(3) Groundwater flow rates;
(4) Minimum distance between upgradient edge of the MSWLF unit and downgradient monitoring well screen (minimum distance of travel); and
(5) Resource value of the aquifer.

The monitoring frequency for all the constituents listed in Appendix I and total suspended solids will be semi-annually. An alternative frequency for repeated sampling and analysis for Appendix I constituents is not being requested at this time.

3.5.4 Response to SSI Over Background

c. If the owner or operator determines, pursuant to paragraph 113.10(4)"i," that there is an SSI over background for one or more of the constituents listed in Appendix I or in the alternative list approved in accordance with subparagraph 113.10(5)"a"(1) at any monitoring well specified under subrule 113.10(2), then the owner or operator:
(1) Must, within 14 days of this finding, place a notice in the operating record indicating which constituents have shown statistically significant changes from background levels, and notify the department that this notice was placed in the operating record.
(2) Must establish within 90 days an assessment monitoring program meeting the requirements of subrule 113.10(6) except as provided in subparagraph 113.10(5)"c"(3).
(3) The owner or operator may demonstrate that a source other than an MSWLF unit caused the contamination or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. A report documenting this demonstration must be certified by a qualified groundwater scientist, approved by the department, and placed in the operating record. If re-sampling is a part of the demonstration, re-sampling procedures shall be specified prior to initial sampling. If a successful demonstration to the department is made and documented, the owner or operator may continue detection monitoring as specified in subrule 113.10(5). If, after 90 days, a successful demonstration is not made, the owner or operator must initiate an assessment monitoring program as required in subrule 113.10(6).

If an SSI over background for one or more of the constituents listed in Appendix I is observed in any of the monitoring points included in the HMSP, a notice will be placed in the operating record within 14 days of the finding. The notice placed in the operating record will indicate which constituents have shown statistically significant changes from background levels. The DNR will be notified that this notice was placed in the operating record.

Within 90 days, an assessment monitoring program meeting the requirements of subrule 567 IAC 113.10(6) will be established unless it can be demonstrated that a source other than the MSWLF unit caused the contamination or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Verification sampling will be included, sampling procedures documented, and a statistical evaluation performed.

3.6 Assessment Monitoring Program

113.10(6) *Assessment monitoring program.*

3.6.1 Assessment/Corrective Action Monitoring Statistical Program

Confidence intervals or confidence bands, as appropriate, were selected as the appropriate statistical methods for comparison of the groundwater analytical data against a fixed groundwater protection standard (GWPS). The assessment/corrective action monitoring statistical evaluations are performed using the most recent eight samples or all samples if less than eight samples are available. The confidence intervals or confidence bands will be established using the process below. Transformation of the distribution is not considered.

Confidence Intervals or Confidence Bands

- A parametric confidence interval around a normal mean is calculated if the dataset has a normal distribution and no statistically significant trend is present.
- A non-parametric confidence interval around a median is calculated if the dataset does not have a normal distribution and no statistically significant trend is present.
- Non-parametric confidence bands around a Theil-Sen trend line are calculated if the dataset has a statistically significant trend.

If the lower confidence limit or any part of the lower confidence band, as appropriate, exceeds the GWPS, then the monitoring point will be declared out of compliance, and an Assessment of Corrective Measures will be required.

3.6.2 Assessment Monitoring Wells

a. Assessment monitoring is required whenever an SSI over background has been confirmed pursuant to paragraph 113.10(5)"c" to be the result of a release from the facility.

Monitoring wells will be placed into the assessment monitoring program when an SSI over background is confirmed through retesting.

3.6.3 Assessment Monitoring Parameters and Frequency

b. Within 90 days of triggering an assessment monitoring program, and annually thereafter, the owner or operator must sample and analyze the groundwater for all constituents identified in Appendix II. A minimum of one sample from each downgradient well shall be collected and analyzed during each sampling event. For any constituent detected in the downgradient wells as a result of the complete Appendix II analysis, a minimum of four independent samples from each well must be collected and analyzed to establish background for the constituents. The department may specify an appropriate subset of wells to be sampled and analyzed for Appendix II constituents during assessment monitoring. The department may delete any of the Appendix II monitoring parameters for an MSWLF unit if it can be shown that the removed constituents are not reasonably expected to be in or derived from the waste contained in the unit.

If an SSI over background is confirmed, an Appendix II sample will be collected within 90 days of triggering the assessment monitoring program. Background sampling will occur for detected constituents that do not have established background concentrations. If appropriate, an appropriate subset of Appendix II parameters for monitoring wells in the assessment monitoring program may be requested.

3.6.4 Alternative Appendix II Sampling Frequency

c. The department may specify an appropriate alternate frequency for repeated sampling and analysis for the full set of Appendix II constituents required by paragraph 113.10(6)"b" during the active life (including closure) and postclosure care period of the unit. The following factors shall be considered:

(1) Lithology of the aquifer and unsaturated zone;

(2) Hydraulic conductivity of the aquifer and unsaturated zone;

(3) Groundwater flow rates;

(4) Minimum distance between upgradient edge of the MSWLF unit and downgradient monitoring well screen (minimum distance of travel);

(5) Resource value of the aquifer; and

(6) Nature (fate and transport) of any constituents detected in response to this paragraph.

For monitoring wells in the assessment/corrective action monitoring program, following the analysis of two Appendix II samples taken in consecutive years, analysis for the full set of Appendix II samples is required once every five years.

3.6.5 Notification, Background, and GWPS Establishment

d. After obtaining the results from the initial or subsequent sampling events required in paragraph 113.10(6)"b," the owner or operator must:

> *(1) Within 14 days, place a notice in the operating record identifying the Appendix II constituents that have been detected and notify the department that this notice has been placed in the operating record*

Following the initial Appendix II sampling event, a notice will be placed in the operating record along with notification to the DNR.

> *(2) Within 90 days, and on at least a semiannual basis thereafter, resample all wells specified by subrule 113.10(2) and conduct analyses for all constituents in Appendix I or in the alternative list approved in accordance with subparagraph 113.10(5)"a"(1), and for those constituents in Appendix II that are detected in response to the requirements of paragraph 113.10(6)"b." Concentrations shall be recorded in the facility operating record. At least one sample from each well must be collected and analyzed during these sampling events. The department may specify an alternative monitoring frequency during the active life (including closure) and the postclosure period for the constituents referred to in this subparagraph. The alternative frequency for constituents in Appendix I or in the alternative list approved in accordance with subparagraph 113.10(5)"a"(1) during the active life (including closure) shall be no less than annual. The alternative frequency shall be based on consideration of the factors specified in paragraph 113.10(6)"c";*

Sampling will occur semi-annually and consist of Appendix I, TSS, and any non-Appendix I constituents detected during Appendix II sampling events.

> *(3) Establish background concentrations for any constituents detected pursuant to paragraph 113.10(6)"b" or subparagraph 113.10(6)"d"(2); and*

Background sampling will be conducted for detected Appendix II constituents that lack established background concentrations.

> *(4) Establish groundwater protection standards for all constituents detected pursuant to paragraph 113.10(6)"b" or 113.10(6)"d." The groundwater protection standards shall be established in accordance with paragraph 113.10(6)"h" or 113.10(6)"i."*

If appropriate, groundwater protection standards will be established for each constituent that does not have a statewide standard or an appropriate regulatory standard promulgated.

3.6.6 Return to Detection Monitoring Criteria

e. If the concentrations of all Appendix II constituents are shown to be at or below background values, using the statistical procedures in paragraph 113.10(4)"g" for two consecutive sampling events, the owner or operator must notify the department of this finding and may return to detection monitoring.

If the measured concentrations of Appendix II constituents are below background for two consecutive sampling events, the monitoring point may be returned to the detection monitoring program.

3.6.7 Remain in Assessment Monitoring Criteria

f. If the concentrations of any Appendix II constituents are above background values, but all concentrations are below the groundwater protection standard established under paragraph 113.10(6)"h" or 113.10(6)"i," using the statistical procedures in paragraph 113.10(4)"g," the owner or operator must continue assessment monitoring in accordance with this subrule.

Sampling will occur semi-annually while any Appendix II constituent concentrations remain above background values, as determined by statistical evaluation.

3.6.8 Progress to Corrective Action Criteria

g. If one or more Appendix II constituents are detected at statistically significant levels above the groundwater protection standard established under paragraph 113.10(6)"h" or 113.10(6)"i" in any sampling event, the owner or operator must, within 14 days of this finding, place a notice in the operating record identifying the Appendix II constituents that have exceeded the groundwater protection standard and notify the department and all other appropriate local government officials that the notice has been placed in the operating record. The owner or operator also:

> *(1) Must, within 90 days of this finding, comply with the following requirements or the requirements in subparagraph 113.10(6)"g"(2):*
>
> > *1. Characterize the nature and extent of the release by installing additional monitoring wells as necessary until the horizontal and vertical dimensions of the plume have been defined to background concentrations;*
> >
> > *2. Install at least one additional monitoring well at the facility boundary in the direction of contaminant migration and sample this well in accordance with subparagraph 113.10(6)"g"(2);*
> >
> > *3. Notify all persons who own the land or reside on the land that directly overlies any part of the plume of contamination if contaminants have migrated off site when indicated by sampling of wells in accordance with subparagraph 113.10(6)"g"(1); and*
> >
> > *4. Initiate an assessment of corrective measures as required by subrule 113.10(7).*

If an Appendix II constituent is measured at a statistically significant level (SSL) above the groundwater protection standard (GWPS), monitoring well installations and sampling will occur to characterize the nature and extent of the plume. A monitoring well will be installed at the downgradient facility boundary. Adjoining affected landowners will be notified of potential impacted groundwater, and an assessment of corrective measures (ACM) will be initiated.

> *(2) May demonstrate that a source other than an MSWLF unit caused the contamination, or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. A report documenting this demonstration must be certified by a qualified groundwater scientist, approved by the department, and placed in the operating record. If a successful demonstration is made, the owner or operator must continue monitoring in accordance with the assessment monitoring program pursuant to subrule 113.10(6), and may return to detection monitoring if the Appendix II constituents are at or below background as specified in paragraph 113.10(6)"e." Until a successful demonstration is made, the owner or operator must comply with paragraph 113.10(6)"g", including initiating an assessment of corrective measures.*

A demonstration that the SSL above the GWPS was from a source other than the Landfill may be submitted, if appropriate.

3.6.9 GWPS Criteria

h. The owner or operator must establish a groundwater protection standard for each Appendix II constituent detected in the groundwater. The groundwater protection standard shall be:

(1) For constituents for which a maximum contaminant level (MCL) has been promulgated under Section 1412 of the Safe Drinking Water Act (codified) under 40 CFR Part 141, the MCL for that constituent;

(2) For constituents for which MCLs have not been promulgated, the background concentration for the constituent established from wells in accordance with subrule 113.10(2); or

(3) For constituents for which the background concentration is higher than the MCL identified under subparagraph 113.10(6)"h"(1) or health-based concentrations identified under paragraph 113.10(6)"i," the background concentration.

A GWPS will be established for each constituent listed in Appendix II. MCLs and statewide standards will be utilized. If an MCL or statewide standard does not exist for a constituent, the background concentration will be established as the GWPS, based on recommendations from the Unified Guidance.

3.7 Assessment of Corrective Measures

In accordance with a schedule approved by the DNR, the Agency will comply with the requirements of 113.10(7). An Assessment of Corrective Measures report was submitted to the DNR on November 11, 2019 (Doc #96322) and approved on April 10, 2020 (Doc #97446).

3.8 Selection of Remedy

The remedy was selected following the completion of the public meeting, which occurred on August 19, 2020, as required under 113.10(7)"d". The minutes of the public meeting were submitted on September 14, 2020 (Doc #98453). The Selection of Remedy and Corrective Action Groundwater Monitoring Program was submitted on October 26, 2020 (Doc #98802) in accordance with IAC 113.10(8)"a" and approved on March 30, 2021 (Doc #100094).

3.9 Implementation of the Corrective Action Plan

Following the selection of a remedy, the corrective action plan was implemented in accordance with the schedules developed under 113.10(8) "d". The Agency complied with the requirements of 113.10(9). The corrective action remedy was determined to be complete as stated in correspondence dated July 15, 2024 (Doc #110470).

3.10 Reporting

There are numerous reporting requirements of varying degrees of effort associated with groundwater monitoring at an MSWLF unit. The requirements are ultimately summarized annually in the Annual Water Quality Report AWQR. The reporting requirements are delineated and addressed below.

Detection Monitoring

In compliance with 113.10(5)"c"(1), upon finding that there is an SSI over background for one or more of the constituents listed in Appendix I or in the alternative list approved in accordance with subparagraph 113.10(5)"a"(1) at any monitoring well specified under subrule 113.10(2), the owner or operator will place a notice in the operating record indicating which constituents have shown statistically significant changes from background levels and notify the DNR that this notice has been placed in the operating record.

Assessment Monitoring

If assessment monitoring is required and in compliance with 113.10(6)"d"(1), a notice will be placed in the operating record, identifying the Appendix II constituents that have been detected. The DNR will be notified that this notice has been placed in the operating record.

Assessment of Corrective Measures

If an assessment of corrective measures is required and in compliance with 113.10(7)"a", an assessment report documenting the results of activities performed in compliance with 113.10(6)"g" and 113.10(7)"c" will be completed and submitted to the DNR within 180 days of the initial finding that a groundwater protection standard had been exceeded. The DNR may approve an alternative schedule for completing assessment and reporting activities.

Selection of Remedy

If the selection of a remedy is required and in compliance with 113.10(8)"a", a remedy will be selected. The selection will occur within 60 days of the public meeting held with interested and affected parties. A report will be submitted to the DNR within 14 days of selecting a remedy. The report will describe the selected remedy, state that a copy of the report has been placed in the operating record, and will explain how the remedy meets the standards in paragraph 113.10(8)"b".

Implementation of the Corrective Action Plan

If implementation of the corrective action plan is required, the progress of ongoing corrective actions will be included in the AWQR. Within 14 days of achieving compliance with 113.10(9)"e", the DNR will be notified that a certification verifying that the remedy has been completed has been placed in the operating record. The certification will be signed by the owner or operator and by a qualified groundwater scientist and approved by the DNR.

Sem-Annual Sampling Notifications

Semi-annual sampling notifications will include a determination as to whether or not an SSI or SSL has occurred according to the statistical procedures and performance standards specified under paragraphs 113.10(4)"g" and 113.10(4)"h". T

Annual Water Quality Reports

113.10(10) *Annual water quality reports. The owner or operator shall submit an annual report to the department detailing the water quality monitoring sampling locations and results, assessments, selection of remedies, implementation of corrective action, and the results of corrective action remedies to address SSIs, if any, during the previous year. This report shall include a site map that delineates all monitoring points where water quality samples were taken, as well as any plumes of contamination. The report shall contain a narrative that explains and interprets all the data collected during the previous year. The report shall be due each year on a date set by the department in the facility's permit.*

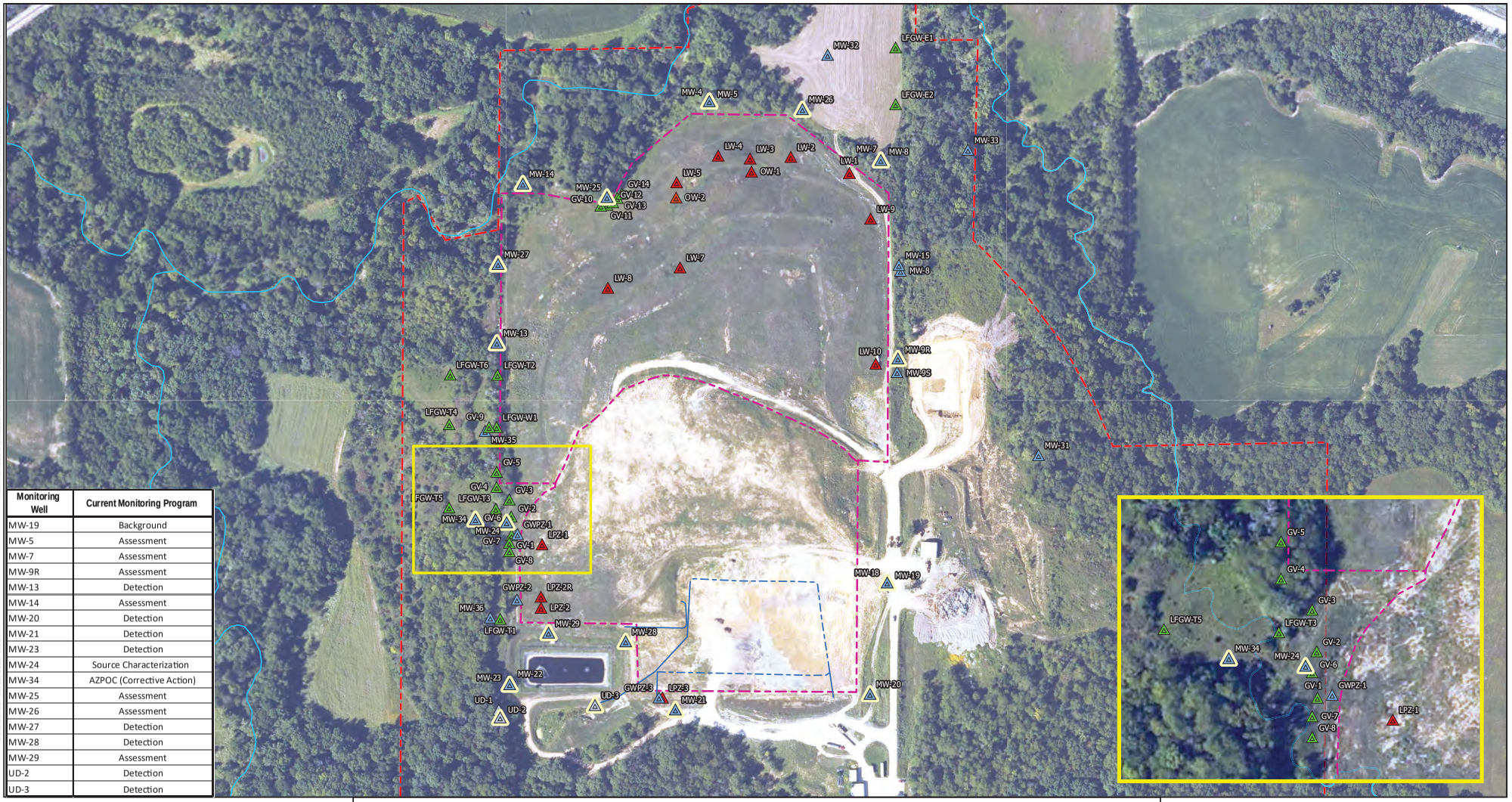
Annual Water Quality Reports will be prepared and submitted by January 31 of each year. The reports will detail the following for the previous calendar year:

- Water quality monitoring sampling locations and results,
- Assessments (if applicable),
- Selection of remedies (if applicable),
- Implementation of corrective action (if applicable), and
- Results of corrective action remedies to address SSIs (if applicable).

The Annual Water Quality Reports will include the following and will be prepared in accordance with the DNR required format:

- A site map that delineates the monitoring points where water quality samples were taken,
- A narrative explaining and interpreting the data collected during the previous year.

Evaluations that occur on a biennial frequency will be reported in the Annual Water Quality Reports due in the odd-numbered years.



Monitoring Well	Current Monitoring Program
MW-19	Background
MW-5	Assessment
MW-7	Assessment
MW-9R	Assessment
MW-13	Detection
MW-14	Assessment
MW-20	Detection
MW-21	Detection
MW-23	Detection
MW-24	Source Characterization
MW-34	AZPOC (Corrective Action)
MW-25	Assessment
MW-26	Assessment
MW-27	Detection
MW-28	Detection
MW-29	Assessment
UD-2	Detection
UD-3	Detection

SCS ENGINEERS
environmental consultants and contractors

Monitoring Point Locations

Figure 2

Legend

- HMSP Monitoring Well
- HMSP Underdrain
- Monitoring Well
- Groundwater Underdrain
- Approximate Landfill Gas Monitoring Location
- Approximate Observation Well Location
- Approximate Leachate Piezometer Location
- Groundwater Underdrain Solid Piping
- Groundwater Underdrain Perforated Piping
- Approximate Existing Waste Boundary
- Approximate Property Boundary
- Stream

Southeast Multi-County Sanitary Landfill
Richland, Iowa
Project No: 27225496.00
Drawing Date: October 2025

N W E S

0 237.5 475 950 Feet

Esri, TomTom, Garmin, FAO, METI/NASA, USGS, Esri, CGIAR, USGS, USDA NAIP, Iowa State University GIS Facility

ATTACHMENT A

Standard Operating Procedure:
Sanitary Landfill Groundwater Monitoring

Standard Operating Procedure

Sanitary Landfill Groundwater Monitoring

SCS ENGINEERS

SOP | October 2025

1690 All State Court, Suite 100
West Des Moines, IA 50265
515-631-6160

Table of Contents

Section Page

Tables

Appendices

1.0 INTRODUCTION

This document provides guidelines regarding water sampling procedures for personnel responsible for sampling groundwater and/or surface water to comply with the requirements of 567 Iowa Administrative Code (IAC) 113.10. This document discusses sampling procedures, sampling equipment, laboratory procedures, analysis of sample data, record keeping, and recording for groundwater monitoring wells, surface water sampling points, and other water sampling points. This guideline stresses the importance of thorough pre-sampling preparation, consistent sampling procedures, and detailed documentation. The goal of the guidelines is to provide consistent sampling techniques that will ensure that all groundwater data collected is representative of actual groundwater quality and can be used to reliably evaluate the performance of a site. The person conducting the sample collection should be familiar with the monitoring well maintenance and performance re-evaluation requirements as specified in 567 IAC 113.10(2)"f".

2.0 SAMPLING EVENT

1. Equipment for Measuring Depth to Water and Total Well Depth

When reaching the site to be monitored, a field investigation begins by measuring water levels in the monitoring wells. The depth to water is measured with an electronic water level indicator. The electronic water level indicator locates the water surface by completing a circuit between two electrodes on a probe lowered down the well. When the electrodes contact the water, a light and a buzzer at the surface indicate a completed circuit. These instruments are occasionally subject to false readings due to water on the inside of the well casing or electrical problems and are of questionable accuracy due to wire kinking and inaccurate gradation. However, they do make repeated measurements over a short time easier. These probes should be re-calibrated for length at least quarterly.

2. Equipment for Well Purging and Sample Withdrawal

Most wells installed for groundwater quality monitoring are constructed with small diameter casings (less than 4.0 inch inside diameter, most commonly 2.0 inch inside diameter). Since groundwater is generally under different temperature, pressure, gas content, and oxidation-reduction (redox) potential conditions than water at the surface, precautions should be taken to ensure that sampling devices disturb the water in the well as little as possible and transport unaltered representative samples to appropriate storage containers.

Sampling methods include bottom-loading bailers, Waterra® pumps, and low-flow sampling devices. Each method has advantages and disadvantages. Low-flow sampling will be utilized when conditions allow it.

3. Equipment for In-Field Measurements

Several water quality parameters are subject to rapid change caused by aeration, oxidation, or degassing of a sample when the groundwater is removed from its natural environment and exposed to the atmosphere. These parameters, particularly temperature, specific conductance, and pH must be measured on an unfiltered sample at the time of collection,

i.e., in the field. Ideally, all in-field measurements should be taken either in situ or by use of a flow-through, closed cell so that the sample is not subjected to the chemical or physical changes caused by exposing it to the atmosphere. However, flow-through cells are not widely available, and the more conventional methods of measurement are most often used. Temperature, specific conductance, and pH will be measured in the field as an indication of well stability prior to sample collection and not for water quality analysis. (See Section E.1.f.)

a. Thermometer

The thermometer should be marked such as to indicate the temperature to the nearest 0.5°C.

b. Specific Conductivity and pH meter

Specific Conductance. Because the conductance is temperature dependent, it is necessary to standardize its measurement to 25°C so that all reported values can be compared. Therefore, the temperature of the sample must be measured at the same time as the conductivity in order to obtain an accurate measurement that can be corrected to 25°C. The specific conductance meter should provide measurements to the nearest whole number in microsiemens per centimeter (µS/cm).

The pH reading is a measurement of the concentration of hydrogen ions in solution. It is important to measure pH in the field. The meter should provide measurements in standard units (S.U.) to the nearest 0.01.

Although individual specific conductance meters and pH meters are available, in most instances, a meter that measures specific conductance, pH, and temperature is used in the field.

4. Sample Containers as provided by the Laboratory

a. Containers for Appendix I Parameters:

See Table 1 "Summary of Appendix I Parameters" in Attachment 1.

b. Containers for Appendix II Parameters:

See Table 2 "Summary of Appendix II Parameters" in Attachment 1.

5. Miscellaneous Sampling Equipment

a. Site Map with the location of monitoring points clearly identified.
b. Field Notebook to record all observations.
c. Chain of custody and field forms.
d. Well information forms.
e. Keys for locked well caps.
f. Plastic bags or plastic sheets to place on the ground around the well.
g. Calibrated bucket to measure the volume of water removed when purging the well.
h. Electronic water level indicator.
i. Pump and flow cell manuals.
j. Geotech™ Geopump (peristaltic pump), controller, and spare tubing.
k. Battery and battery charger.
l. 12V/120V inverter.
m. Spare submersible pump, tubing, and wellhead.

n. Flow-through cell.
o. Submersible pump power supply and controller.
p. Laboratory-prepared sampling containers.
q. Extra rope and tubing.
r. Cooler and ice.
s. Detergent for cleaning sampling equipment.
t. Deionized water for rinsing of equipment after cleaning.
u. Gloves, face shields, and other personal protective equipment as needed .
v. Any additional site-specific equipment.

3.0 SAMPLING POINTS

1. Groundwater Monitoring Wells

   Groundwater monitoring wells are installed to monitor the quality of groundwater at the site. Usually, monitoring wells are located upgradient and downgradient of the site. If more than one aquifer is monitored, several up and downgradient wells at distinct depths will be monitored. In this case, more than one well is installed at each location (well clusters).

   Depending on the permeability of the formation in which the screen of the well is installed, a monitoring well can be purged dry or not.

2. Surface Water Sampling Points

   Surface water sampling points may include ponds, surface impoundments, streams, seeps, or springs. They are sampled to determine the environmental impact of the landfill on the surrounding surface waters. If a stream is monitored, a sampling point upstream of the landfill and a location downstream of the landfill are usually chosen.

3. Underdrains, Tiles, Sumps, Manholes, and other Structures

   These sampling points are monitoring groundwater that may have come in contact with leachate released by the landfill and to determine the environmental impact on the surrounding surface waters.

4.0 PREPARATION FOR THE SAMPLING EVENT

For the sampling event to run smoothly in the field, the equipment should be checked and calibrated as necessary before leaving for the site. All information should be verified, and sufficient numbers of sampling containers and other supplies should be assembled and checked against a checklist for completeness.

1. Site Map

   The site map should indicate the location of the monitoring wells and other sampling points. If possible, it should also show access roads and other pertinent features of the site.

2. Field Sampling Sheets

   The field sampling sheets should list all the sampling points and the order in which they are to be sampled. Usually, water from upgradient sampling points is collected first to reduce the potential for cross-contamination. The sampling sheet may also indicate the installed well depth and the parameters to be analyzed for each water sample.

3. Sample Containers

   The laboratory that will perform the analyses usually provides sample containers. Different sample containers and different preservatives are required for the different parameters. See Attachment 1, Tables 1 and 2 for a list of sample containers, required preservatives, and volumes for various parameters.

   The purpose of sample preservation is to stabilize the constituents of interest to stop or retard any chemical or biological change. Improper preservation or allowing too much time to elapse between sampling and analysis can affect the quality of the final result. Correct preservation will help to ensure that the sample analyzed is representative of the sample collected.

4. Checklist of Necessary Equipment

   A checklist of all necessary equipment, tools, and supplies should be maintained to ensure that the field activity can be performed efficiently and professionally. See Section B-5.

5.0 ON-SITE ACTIVITIES

1. Groundwater Monitoring Well Sampling

   a. Measuring Groundwater Levels and Well Depths

      Before each sampling event, the area around the wellhead should be observed for indicators of inadequate surface seals, inadequate well seals, standing water, or other indicators of potential surface impact to groundwater. The presence of a secure wellhead seal and/or lock will also be noted.

      The water level and total depth of the well will then be measured using an electronic water level indicator from the top of the casing. Water level measurements are recorded to the nearest one-hundredth foot interval (0.01 ft) and well depth measurements are recorded to the nearest one-tenth foot (0.1 ft) interval. Water level data should be recorded in the field logbook.

   b. Determination of Flow Rates and Drawdown Data

      As specified in 567 IAC 113.10(2)”f”(4), a biennial evaluation of well recharge rates is required to determine if well deterioration is occurring. This will be accomplished by verifying the low-flow sampling rates are less than 0.5 liters per minute and that minimal drawdown is maintained. These conditions indicate the monitoring well is functioning properly.

c. Decontamination of Equipment between Sampling Points

Since detection levels of the compounds in water are at the nanogram and/or microgram per liter level, no contamination must be introduced to the well during the sampling process. If possible, sample from the least contaminated well to the most contaminated well. In practice, this means that upgradient sampling points should be sampled before any other well on-site.

Groundwater sampling and field measurement equipment will be cleaned before and after use. If dedicated water collection equipment is used, the equipment remains in the well and decontamination is not required. Otherwise, after the groundwater sample has been retrieved from the well and properly transferred to the sample container, the sampling equipment will be washed with non-phosphate detergent (Alconox) followed by rinsing with de-ionized water.

The level measuring equipment and the probe of the field measurement equipment must be decontaminated with the same procedures.

Clean nitrile gloves should be worn for each sampling point when handling field equipment and during the execution of field activities.

d. Purging Procedure

The groundwater standing in a well before sampling is usually not representative of the in-situ groundwater. The water quality can be affected by several processes: heavy metals can be depleted by bacterial activity in the water; metals can be dissolved due to the concentration of some gases such as oxygen or carbon dioxide in the water; foreign material could have entered through the top of the well.

The following procedures will be followed when collecting samples using low-flow sampling procedures:

i. Ensure that the equipment does not touch a contaminated surface. If necessary, place a clean plastic sheet or other protective covering around the base of the well to prevent the equipment from contacting a nearby contaminated area.
ii. Unlock the protective metal casing.
iii. Measure and record the static water level before any other activities are conducted within the well.
iv. Ensure that the pump tubing and/or dedicated pump are properly installed. Securely fasten the power cable and sample tubing at the top of the wellhead. Connect the power source and controller to the pumping equipment.
v. Connect the sample tubing to the water entry point of the flow-through cell. Make sure the probe sensors are completely submerged in water during use.
vi. Record the “time at start of purging,” and start purging the well at the pump’s lowest speed setting and slowly increase the speed until discharge occurs. Check the water level. Adjust pump speed until there is minimal water level drawdown and there is no turbidity increase. If the minimal drawdown that can be achieved remains stable, continue purging until indicator field

parameters are stable. Record the "purging flow rate" as an average. Use a calibrated bucket, graduated beaker, cylinder, or other device to measure the flow rate while purging.

vii. Purge the well until the readings for indicator parameters (temperature, dissolved oxygen, specific conductance, pH, and ORP) vary within ±10 percent over three or more consecutive readings, spaced approximately 2 to 5 minutes apart. The flow-through cell will indicate when stability has been achieved.

    1. Wells with insufficient recharge may run dry during purging. To avoid this, purging should stop before the water level drops below the top of the pump (submersible) or end of the tubing (peristaltic). Purging should continue once the water level has recovered enough to continue purging and sample collection.
    2. If one or more indicator parameters fail to stabilize within 12 minutes, one of two options should be considered as directed by the PM: 1) discontinue purging, do not collect samples and document attempt to reach stabilization or 2) secure well, then purge and collect samples later in the day, the following day, or soon afterward.
    3. If groundwater is highly turbid or colored, continue purging until water becomes clear; this can take a few minutes.
    4. If the peristaltic pump is unable to pump due to a static water level greater than 25 feet, the spare pump and tubing will then be installed, recorded on the field data sheet, and the well will not be sampled during that sampling event. Also, record the amount of time to prep and install the submersible pump and fill out the pump installation field form.

viii. Record the "volume purged," "time at end of purging," "purged dry (Y/N)," and any issues encountered during the purging process.

ix. Collect samples as described in "Collection of Groundwater Samples" on the following pages. Record pertinent information related to the sampling event.

When low-flow sampling procedures are not feasible, the water standing in and directly adjacent to the well must be purged using a bailer or a manual inertial pump (Waterra®) before sampling the well. The method of purging may vary depending on the hydrogeologic properties of the aquifer in which the well is screened. In general, wells will be purged until dry to remove stagnant water from the well. Then allow the well to recharge until at least two (2) feet of groundwater is present before collecting a water sample. To obtain a sample that is representative of the water in the aquifer, collect the sample as soon as there is a sufficient volume of water needed for the intended analyses. It is not necessary for the well to fully recover.

For monitoring wells that are screened in high permeability formations, complete evacuation of water is not possible or desirable. In this situation, a well will be purged of a volume equivalent to approximately three (3) standing well casing volumes. The volume to be removed can be calculated utilizing the following formula.

$$V = 0.816d^2h$$

where:

V = Total Volume of Water needed to purge (gallons)
d = Inside Diameter of Well Casings (inches)
h = Depth of standing water in well before pumping (feet)

Additional purging may be required if high sediment loads are encountered or if significant variations in field water quality measurements are observed. Regardless of the purging method used, equipment should be cleaned before and after contacting the groundwater.

When measurements of pH, specific conductivity, and temperature are taken before collection of groundwater samples, well purging should be considered adequate if consecutive measurements indicate less than ten percent (10%) variation.

e. Collection of Groundwater Samples

Samples should be collected shortly after purging is completed to reduce interaction of the water with the well casing material or contact with the atmosphere. Sample the least contaminated wells first to prevent cross-contamination. Samples will be collected with the purging devices described above.

The following procedures will be followed when collecting samples using low-flow sampling procedures:

i. Laboratory-prepared sample containers of the appropriate volume, material, and preservative will be used. These sample containers will be prepared in accordance with the United States Environmental Protection Agency quality assurance/quality control (QA/QC) procedures by the laboratory.
ii. The groundwater samples will be collected immediately after purge parameters indicate stability.
iii. When purging is complete, the flow-through cell will be disconnected and samples will be collected directly from the pump tubing.
iv. Record the parameter in the units indicated:

- pH (Standard Units)
- Conductivity (µS/cm)
- ORP (mV)
- Temperature (°C)
- Dissolved Oxygen (mg/L)
- Turbidity (NTU)

v. Samples for analysis of volatile organic compounds (VOCs) and alcohols require containment with zero headspace. To collect samples with zero headspace, sample vials or bottles will be filled to the point that they are slightly overflowing and a positive meniscus is formed, after which the vials or bottles will be capped immediately. Immediately after samples are collected, place all sample containers in a cooler with ice to ensure appropriate sample preservation. Record sampling date and time on the chain-of-custody.
vi. If sampling is performed using a peristaltic pump, the well depth should be measured following each sampling event. Well depths for wells with dedicated pumps are required once every five years; the mobe will indicate when well depths should be measured.
vii. Following sample collection, secure the well.

viii. Decontaminate equipment before continuing to the next sampling point. If using a peristaltic pump, the silicone tubing must be replaced after each sampling point.

When low-flow sampling procedures are not feasible, the following collection procedures will be followed:

i. Lower the bailer slowly into the water in the well to avoid agitation. Do not allow the bailer to touch the bottom of the well to prevent sediment from being incorporated into the sample. Retrieve the bailer smoothly, but do not allow the rope to touch the ground. Discard the first 0.5 feet of water in the bailer to reduce the oxidized portion of the sample.
ii. Laboratory-prepared sample containers of the appropriate volume and material will be used. These sample containers are usually provided by the laboratory conducting the analysis and are prepared in accordance with EPA QA/QC procedures.
iii. Samples for analysis of VOCs will be collected first, and efforts will be made to minimize sample agitation and contact with air. Fill the vials so that it is slightly overflowing and a positive meniscus is formed. Cap immediately.
iv. Pour an unfiltered portion into a sample container treated with preservative, as necessary for other unfiltered analyses, and cap quickly.

f. In-Field Measurements

Pour an unfiltered portion into a sample container for the field measurements of temperature, conductivity, and pH When measurements of pH, specific conductivity, and temperature are taken before collection of groundwater samples, well purging should be considered adequate if consecutive measurements indicate less than ten percent (10%) variation. It is important to measure conductivity and temperature at the same time because conductivity is affected by temperature.

This equipment must be cleaned before and after each well to prevent cross-contamination.

g. Record Keeping On-Site

It is important not only to use proper procedures to collect the water samples but also to document thoroughly the sampling procedures. The field data sheet should provide the following information:

1) Site Name, site location, facility type, license or permit number.
2) Record date and weather conditions.
3) Record the name of the person collecting the samples.
4) Record manufacturer name and model of equipment used for water level measurements.
5) Record manufacturer name and model of equipment used for field measurements.
6) Record sampling point identification number.
7) Record the initial water level, water level after purging, well depth, and water level at the time of sampling.

8) Record the type of purging equipment used.
9) Record the physical condition of the well.
10) Record time of purging and sample collection, volume purged.
11) Record temperature, conductivity, and pH.
12) Record the color, odor, and turbidity of the sample.
13) Mark the sample containers with the site name, well identification number, date, and time sampled.

h. Quality Assurance/Quality Control.

In many instances, quality control samples are collected to measure the quality of the water sampling procedures. QA/QC samples will be collected if specifically requested for the project. Use of trip blanks and equipment blanks may be used in a quality control program.

Trip blanks are supplied by the laboratory and contain carbon-filtered or helium-purged distilled water in a sealed container. Trip blanks, if required, are submitted in each cooler containing samples for VOC analysis and are used to indicate the presence of background chemicals during sampling.

Equipment blanks consist of a sample of de-ionized water that is poured or pumped through the sample and/or purging device and transferred to laboratory prepared container while at the site. If required, generally one equipment blank is collected and submitted after groundwater and surface water samples have been collected. Laboratory analysis of equipment blanks will be used to identify potential sources of cross-contamination of samples.

A field blank is a sample of the de-ionized water processed through the sampling equipment to determine if field cleaning procedures are adequate.

Field duplicates are two samples collected independently at a single sampling location during a single act of sampling. One duplicate sample will be submitted for each ten samples collected. Laboratory analysis of duplicate samples is used to indicate the reproducibility of analytical results.

i. Sample Container Handling, Storage, and Shipping

Laboratory-prepared sample containers of the appropriate volume and material will be used. These sample containers will be provided by the laboratory conducting the analyses and will be prepared in accordance with EPA quality assurance, IAC, and QA/QC procedures.

Once the sample container is filled with the water sample, it should be capped immediately and labeled with the site name, well identification number, date and time sampled, name of the collector, and method of preservation.

Samples will be preserved by the use of refrigeration and preservatives as specified by current EPA or state-approved methods. The sample containers will be placed in an insulated cooler on ice immediately after collection to maintain a temperature of approximately 4˚ C.

Sample containers will be packed with loose ice or re-freezable packs in insulated coolers. Filler material will be used to prevent breakage of containers. Plastic bags will be used to prevent samples from leaking out of the cooler in the event of breakage. In addition to sample temperature, the maximum holding time for each requested analysis will be observed.

j. Chain-of-Custody Procedures

Chain-of-custody records provide a means of tracing a sample from the time of collection through shipment and final analysis. Such documentation includes labeling to prevent mix-ups, container seals to prevent unauthorized tampering with the sample, secure custody, and the necessary records to support potential legal action. Following the collection of samples, the Chain-of-Custody document will be prepared. The document will include the information from each sampling point as referenced previously, and the following information:

1) Signature of Sampler.
2) Time Relinquished to Laboratory or Shipper.
3) Signature of Recipient.
4) Analysis and Methods Requested.

k. Equipment Cleaning

Besides cleaning the equipment after the collection of each sample, groundwater sampling and field measurement equipment will be cleaned before and after each field trip. The method of cleaning includes washing with Alconox detergent followed by rinsing with de-ionized water.

2. Surface Water Sampling

Many types of surface water can be sampled to determine the environmental impact of a particular facility. Surface water sampling points may include ponds, surface impoundments, streams, seeps, or springs.

The field logbook will be used to record field procedures and measurements at the time of sampling.

a. Sample Location

Describe the location from which the surface water sample is taken in enough detail so that subsequent samples will be collected from the same location. For a surface water body, include the distance and direction from shore, as well as the depth at which the sample is taken. Record the depth, width, and flow rate of the stream. If the water appears stagnant due to inadequate flow, or water is too shallow for sampling by the above means, a sample may not be collected at this location during the event.

Describe the condition of the sampling point and note in the field logbook if there is ponded water, litter, or waste near the site. Indicate the color if discolored and note

whether the surface water is turbid or has an odor.

b. Sample Collection Procedure

Proceed from sampling points least likely to be affected (upstream of the facility) to those most likely to be affected (downstream) to avoid cross-contamination of the samples. Do not stand in the surface water or stir up sediment, if possible.

Efforts should be made to obtain representative samples by sampling flowing water, if present, and by sampling water from the surface, mid-depth, and bottom depth of the stream or impoundment. Water samples may be collected using a disposable polyethylene bailer or by dipping a laboratory-cleaned glass container and transferring the sample to laboratory-prepared containers. Follow the same procedures for decontamination of equipment between sampling points as described previously.

c. In-Field Measurements

Use the same procedures as described for groundwater monitoring.

d. Record Keeping On-Site

Use the same procedures as described for groundwater monitoring.

e. Quality Assurance / Quality Control

Use the same procedures as described for groundwater monitoring.

f. Sample Container Handling, Storage, and Shipping

Use the same procedures as described for groundwater monitoring.

g. Chain-of-Custody Procedures

Use the same procedures as described for groundwater monitoring.

3. Underdrain and Tile Sampling

Groundwater underdrains and agricultural tiles may be sampled. These monitoring points shall be sampled only when the line is flowing and shall be sampled according to the Surface Water Sampling procedures above.

4. Sampling from Sumps, Manholes, and Other Structures

When sampling from sumps, manholes, and other structures, the following standard operating procedure shall be used.

a. Carefully remove the grate, cover, or lid.

   This may require a manhole pick, wrenches, crowbar, ladder, etc. Other equipment that will be required are a flashlight, tape measure, folding ruler, and a long-handled "dipper" that allows a sample bottle/jar to be attached and removed.

b. Note the measurements and information required on the sampling form.

   With the flashlight, confirm that water/fluid is flowing.

   i. If the fluid is flowing and no pump is present (i.e., this is a manhole vs. a lift station or sump), sample from the incoming flow using the dipper. If there is more than one incoming pipe/connection flowing, sample the flowing portion of the water/fluid near the outlet (i.e. self-compositing sample).
   ii. If the fluid is not flowing and no pump is present (i.e., this is a manhole vs. a lift station or sump), then do not sample.
   iii. If the fluid is not flowing but a pump is present, then note the measurements and information required on the sampling form.

      1. Override the pump controls by moving the switch to manual or as noted on the operating directions. If unfamiliar with the pump controls, please request assistance from the landfill operator. After sampling, return the switch to auto pump.
      2. Pump the fluid down below the bottom(s) of the incoming pipes. Note that at some times, this may take a considerable period of time. **Therefore, it is recommended this be initiated upon arrival at the facility.**
      3. If the fluid level began above the top of the incoming pipe after pumping has been completed, wait for the flow to stabilize (i.e., backed up fluid has run out).
      4. Once stabilized, sample from the incoming flow using the dipper. If there is more than one incoming pipe/connection flowing, create a time-weighted composite sample.

c. On the sampling form, note if the point was flowing, if there were any problems with operating the pump (where applicable), what incoming flow(s) were sampled, how far the fluid level was above the top of the incoming pipes before pumping (where applicable), the depth of flow that was sampled, the diameter of pipe sampled, and time-weighted composite information.

d. If the incoming pipe elevation is below the water surface, allow the pump to completely expose itself by pumping down the water level, then sample from the vicinity of the pipe after the pump shuts off.

APPENDIX A

Table 1. Summary of Appendix I Parameters

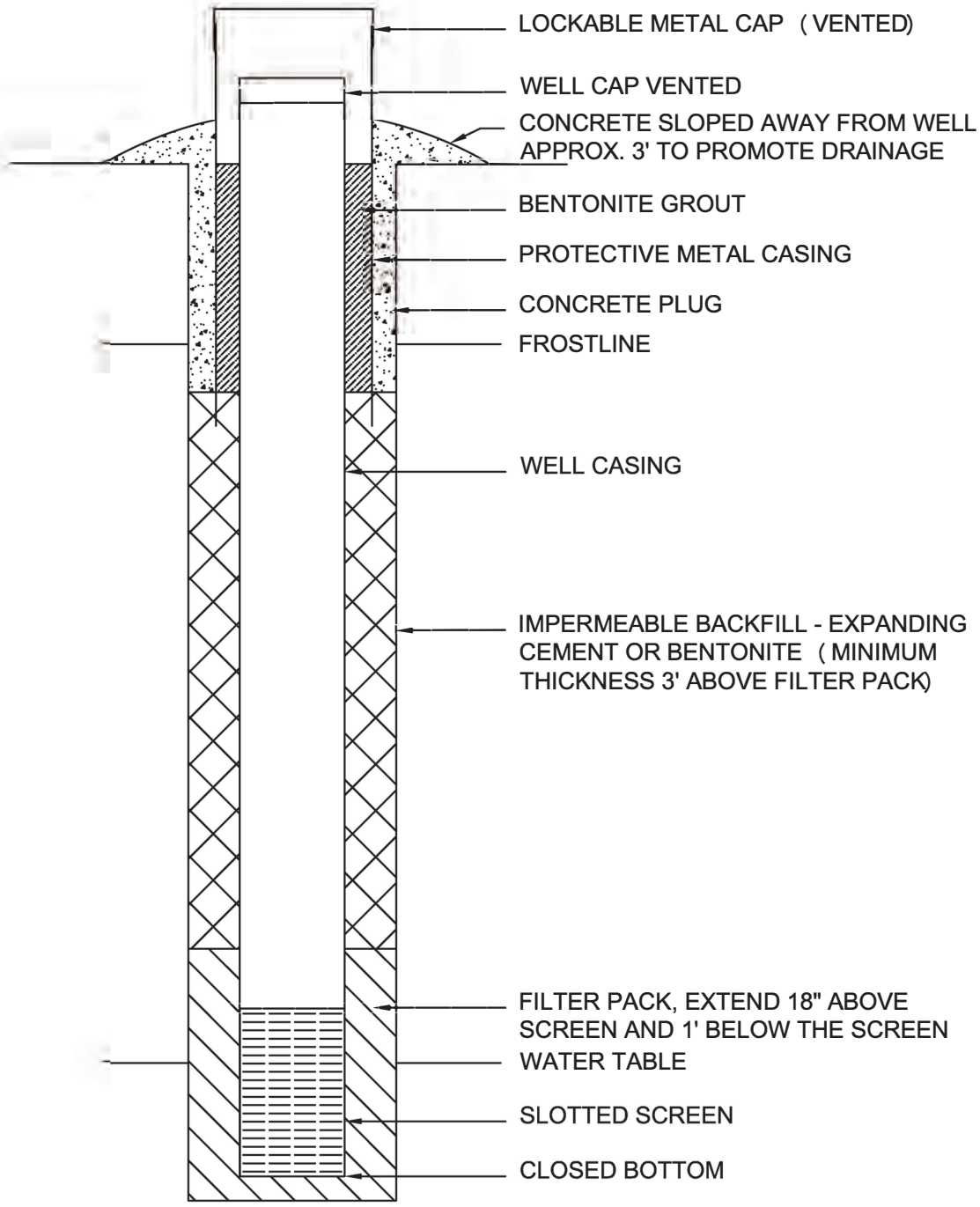
Container	Preservative	Qt	Analytes	Notes
500-ml Plastic Bottle	Nitric Acid	1	Total Metals	None
40-ml Purge Vial	Hydrochloric Acid	3	Volatile Organic Compounds	Cap with zero headspace

Table 2. Summary of Appendix II Parameters

Container	Preservative	Qt	Analytes	Notes
500-ml Plastic Bottle	Nitric Acid	2	Total Metals	None
40-ml Purge Vial	Hydrochloric Acid	3	Volatile Organic Compounds	Cap with zero headspace
40-ml Purge Vial	None	2	Alcohols	Cap with zero headspace
250-ml Plastic Bottle	Sodium Hydroxide	1	Cyanide	None
500-ml Plastic Bottle	Sodium Hydroxide/ Zinc Acetate	1	Sulfide	None
1,000-mL Amber Glass Bottle	None	6	Other Appendix II parameters	None

ATTACHMENT B

Sheet B-1:
Well Construction Diagram



PLASTIC CASED WELL CONSTRUCTION DETAIL

NOTE:
RECREATED FROM 567 IAC 113, FIGURE 1

- NOT TO SCALE -

TYPICAL MONITORING WELL CROSS-SECTION

DRAWING DATE: October 2025

SCS ENGINEERS
Environmental Consultants and Contractors

SHEET
B-1

Appendix D

Environmental Monitoring Plan

LFG Plan Update

Revised Landfill Gas Monitoring Plan

Southeast Iowa Multi-County (SEMCO) Sanitary Landfill
29997 Highway 78
Richland, IA 52585
Permit No. 54-SDP-01-75P

Submittal Date: September 2008
Revision date: October 2025

Prepared For:

Southeast Iowa Multi-County Solid Waste Agency

SCS ENGINEERS

27225496.00 | October 2025

1690 All State Court, Suite 100
West Des Moines, IA 50265

Table of Contents

List of Tables

List of Figures

List of Attachments

Section 1.0
Introduction

1.1 Purpose

The purpose of this document is to update the design, operation, and maintenance of the landfill gas monitoring network for the municipal solid waste landfill unit (MSWLF unit) at the Southeast Iowa Multi-County (SEMCO) Sanitary Landfill (Landfill). The Landfill consists of the Closed Area and open Subtitle D Area, which includes the Phase 0 Cell, Phase 0 Abutment, Phase 1 Cell, Phase 1 Abutment, Phase 2 Cell, and the Phases 3 & 4 Cells. These areas are shown in Figure 1. The Landfill Gas Monitoring Plan (Plan) for the Landfill is intended to monitor the facility's compliance status with 567 Iowa Administrative Code (IAC) 113.9(455B).

1.2 Approach

The approach used to revise the landfill gas monitoring system for the Landfill involved a review of the vadose zone geology beneath and in the vicinity of the MSWLF unit, with specific interest in potential routes of landfill gas migration and the proximity of structures near the outside of the facility to which or along which subsurface migration of landfill gas may occur. Facility structures are also included in the landfill gas monitoring system.

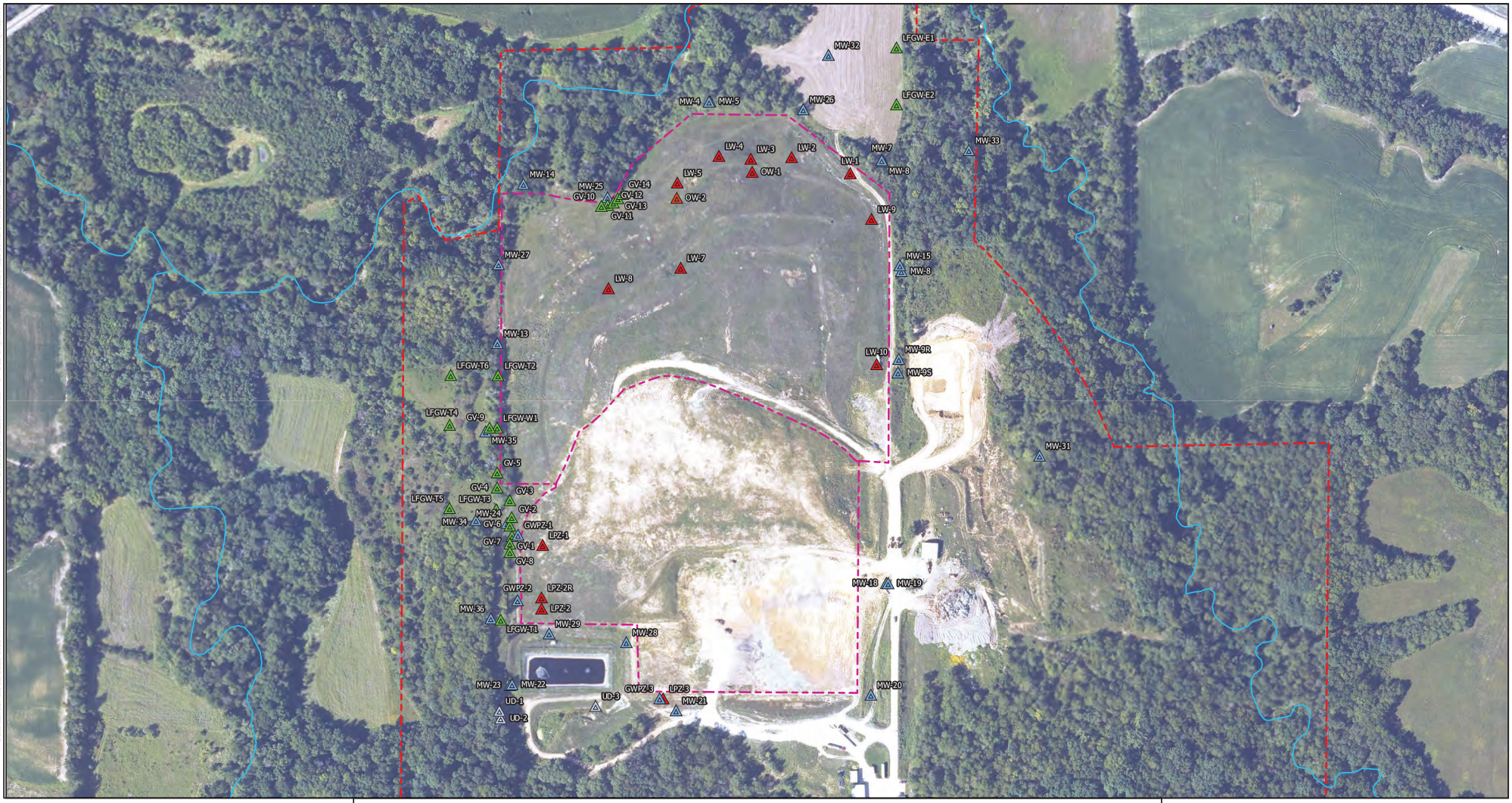
1.3 Site Location

The Landfill property is depicted on **Figure 1, Site Map**. The Landfill consists of approximately 70 acres and is located within Lot 3 or the Irregular Survey of the W ½, NW ¼, SW ¼ of Section 28; the SE ¼, SE ¼ of Section 29; Lot 2 of the Irregular Survey of the NE ¼, SE ¼ of Section 29; and a strip of land 50 feet in width on the south side of the original center line of the main track of the Minneapolis and St. Louis Railroad Company within the NW ¼, SW ¼, of Section 28 and the E ¼ of Section 29, all in T74N, R10W, Keokuk County, Iowa.

1.4 Report Contents

The Landfill Gas Monitoring Plan for the Landfill includes the following:

- Section 1.0 Introduction – Purpose and approach for landfill gas monitoring of the Landfill;
- Section 2.0 LFG Monitoring Plan – Discussion, justification, and IAC Chapter 113 compliance response/documentation comprising the Landfill Gas Monitoring Plan for the Landfill.



Site Map

Legend

- Monitoring Well
- Groundwater Underdrain
- Approximate Landfill Gas Monitoring Location
- Approximate Observation Well Location
- Approximate Leachate Piezometer Location
- Approximate Existing Waste Boundary
- Approximate Property Boundary
- Stream

Southeast Multi-County
Sanitary Landfill
Richland, Iowa
Project No: 27225496.00
Drawing Date: October 2025

N
W E
S

0 237.5 475 950 Feet

Figure 1

SCS ENGINEERS
environmental consultants and contractors

Section 2.0
LFG Monitoring Plan

The landfill gas monitoring network was designed to intercept potential routes of gas migration that could impact on-site structures and nearby off-site properties or structures. Structures were incorporated to comply with the requirements of 113.9(2)"a"(1). Subsurface landfill gas monitoring points were installed to comply with the requirements of 113.9(2)"b". The justification for subsurface landfill gas monitoring point locations and a description of the proposed monitoring point design are discussed in Section 2.2.2 (Routine Methane Monitoring Program). Subsurface landfill gas monitoring points for future cells will be installed or activated as applicable to the phased development of the unit.

Landfill gas monitoring will include collecting methane readings at the locations indicated in **Figure 2, LFG Monitoring Points**.

The following subsections constitute the compliance demonstration of the Plan, presented in the form of a dialogue between rule 113.9 and the response or content of the Landfill Gas Monitoring Plan.

2.1 Air Criteria

113.9(1) *Air criteria. Owners or operators of all MSWLFs must ensure that the units do not violate any applicable requirements developed under a state implementation plan (SIP) approved or promulgated by the department pursuant to Section 110 of the Clean Air Act.*

The SEMCO Solid Waste Agency (Agency) will ensure that the Landfill does not violate any applicable requirements developed under a state implementation plan (SIP) approved or promulgated by the Iowa Department of Natural Resources (DNR) pursuant to Section 110 of the Clean Air Act. Currently there are no SIPs applicable to the Landfill.

2.2 Landfill Gas

113.9(2) *Landfill gas. All MSWLFs shall comply with the following requirements for landfill gas. For purposes of this subrule, "lower explosive limit" means the lowest percent by volume of a mixture of explosive gases in air that will propagate a flame at 25°C and atmospheric pressure.*

2.2.1 Methane Gas Concentration Limitations

a. Owners or operators of all MSWLF units must ensure that:

(1) The concentration of methane gas generated by the facility does not exceed 25 percent of the lower explosive limit for methane in facility structures (excluding gas pipeline, control or recovery system components);

The Agency will ensure that methane gas generated from the MSWLF unit will not exceed 25 percent of the lower explosive limit (LEL) for methane in facility structures (excluding gas pipeline, control, or recovery system components). If methane gas generated by the MSWLF unit does exceed 25 percent of the LEL for methane in a MSWLF facility structure, landfill personnel will take the necessary steps to protect human health as required in subrule 113.9(2)"c".

(2) The concentration of methane gas does not exceed the lower explosive limit for methane at the facility property boundary; and

The Agency will ensure that the methane gas generated from the MSWLF unit does not exceed the LEL for methane at the facility's property boundary. If methane gas generated by the Landfill does

exceed the LEL for methane at a facility property boundary, landfill personnel will take the necessary steps to protect human health as required in subrule 113.9(2) paragraph "c".

2.2.2 Routine Methane Monitoring Program

b. Owners or operators of all MSWLF units must implement a routine methane–monitoring program to ensure that the standards of paragraph 113.9(2)"a" are met. Such a program shall include routine subsurface methane monitoring (e.g., at select groundwater wells, at gas monitoring wells).

(1) The type and frequency of monitoring must be determined based on the following factors:

1. Soil conditions;

2. The hydrogeologic conditions surrounding the facility;

3. The hydraulic conditions surrounding the facility;

4. The location of facility structures (including potential subsurface preferential pathways such as, but not limited to, pipes, utility conduits, drain tiles and sewers) and property boundaries; and

5. The locations of structures near the outside of the facility to, or along, which subsurface migration of methane gas may occur. Examples of such structures include, but are not limited to, houses, buildings, basements, crawl spaces, pipes, utility conduits, drain tiles and sewers.

2.2.3 Structure Monitoring

The permanent buildings and structures located on the Landfill's property that could reasonably be impacted by methane gas migration are identified in Table 2-1 and are shown in Figure 2.

Table 2-1
Structures Monitoring Network

Map Point No.	Monitoring Point No.	Structure
#2	B-1	Office/Scalehouse
#3	B-2	Shop
#4	B-3	HHW Shed
#5	B-4	Maintenance Shop

Monitoring for methane in these structures will be performed quarterly. Each building will be monitored until it is removed or monitoring is no longer required.

2.2.4 Subsurface Monitoring

Subsurface landfill gas monitoring points have been installed and are undergoing monitoring for the Landfill. Groundwater underdrain systems are considered preferential pathways and are covered by this Landfill Gas Monitoring Plan. Leachate lift stations and leachate collection system cleanouts, which are expected to contain methane, have been designed to accommodate methane and are therefore not included in the plan.

Subsurface landfill gas monitoring points are proposed for the closed and active areas of the Landfill. Subsurface monitoring point locations were selected based on geology and hydrogeology, potential subsurface conduits, and proximity to off-site structures. A review of the boring logs contained in the Revised 2005 Lateral Expansion Plan, Barker Lemar Engineering Consultants, June 2006 (Revised 2005 LEP), indicated that the soil stratigraphy along the north property boundary and portions of the east and west property boundaries included layers of potentially higher permeability material (sands and gravels) near the ground surface underlain with deeper layers of clayey soils,

which are less permeable to landfill gas. These soil profiles, based on the boring logs for the perimeter wells along the cross-sections, are shown in Doc #30669, Attachment A, Sheet 1, and Sheets 2-A through 2-D (not included herein).

The potential lateral migration pathway of landfill gas would likely be limited to within the vadose zone. As indicated in the Revised 2005 LEP, Appendix 3, the groundwater table at the site varies between 15 and 31 feet below ground surface and generally mimics the topographic ground surface, which limits the thickness of the vadose zone accordingly. Based on this information, the potential migration route of landfill gas would be above the groundwater table and within the more permeable soil layers near the ground surface. Sheet 2B, Attachment 1, Appendix 2 of the Revised 2005 LEP (not included herein) is an aerial map of the area and shows that there are no residences within 500 feet of the facility property boundary.

In Doc #30669, Attachment A, Sheet 2-A (not included herein) shows a layer of higher permeability material along the northern boundary of the MSWLF unit. Existing monitoring wells MW-7 and MW-25, both of which are groundwater monitoring wells, are utilized for landfill gas monitoring along the north boundary.

In Doc #30669, Attachment A, Sheet 2-B (not included herein) shows the location of higher permeability materials along the east boundary of the MSWLF unit, which indicates thin or disconnected layers in the northern portion of the east boundary. It appears that the preferential flow path for landfill gas will likely be toward the north boundary, which MW-7 will monitor. Additionally, two landfill gas monitoring wells, LFGW-E1 and LFGW-E2, were installed in September 2020 to monitor the property boundary in the northeastern portion of the site. For the southern portion of the east boundary, groundwater underdrain cleanouts will be monitored, which will cover a potentially larger area than a single point monitoring well.

Doc #30669, Attachment A, Sheet 2-C (not included herein) shows the location of higher permeability materials along the south boundary of the MSWLF unit. Since the southern boundary is adjacent to future cells that will have groundwater underdrains, the cleanouts will be monitored for landfill gas. Doc #30669, Attachment A, Sheet 2-D shows the layers of higher permeability soils along the west boundary of the MSWLF unit.

Table 2-2 discusses the rationale for the Landfill subsurface landfill gas monitoring points.

Table 2-2
SEMCO Sanitary Landfill Subsurface LFG Monitoring Points

Monitoring Point	Comments
MW-7 (Map Point #6)	This monitoring point is a groundwater monitoring well located at the northeast corner of the closed area. Based on historical groundwater levels measured at this well, the top of the screen is within the vadose zone.
MW-25 (Map Point #7)	This monitoring point is a groundwater monitoring well located along the west side of the northern boundary of the closed area. The upper portion of the screen is within the vadose zone.
MW-26 (Map Point #8)	This monitoring point is a groundwater monitoring well located along the east side of the northern boundary of the closed area. The upper portion of the screen is within the vadose zone.
MW-27 (Map Point #9)	This monitoring point is a groundwater monitoring well located along the west side of the northern boundary of the closed area. The screen is within the vadose zone.

Monitoring Point	Comments
LFGW-W1 (Map Point #10)	This monitoring point is a subsurface gas monitoring well located at the northern end of the western boundary of the closed area. The screen is within the vadose zone.
UD-2 (Map Point #12)	This monitoring point is the groundwater underdrain discharge point for the leachate lagoon.
LFG-GUCO-3W (Map Point #13)	This monitoring point is the groundwater underdrain cleanout for the Phase 2 Cell, located on the western boundary of the MSWLF unit, and has the potential to monitor from the basal extent of the cell.
LFG-GUCO-6 (Map Point #14)	This monitoring point is the groundwater underdrain located southeast of the Phases 3 & 4 Cells and has the potential to monitor from the basal extent of the cell.
LFG-GUCO-7 (Map Point #15)	This monitoring point is the groundwater underdrain cleanout located southwest of the Phases 3 & 4 Cells and has the potential to monitor from the basal extent of the cell.
LFGW-T1 (Map Point #16)	This monitoring point is a subsurface gas monitoring well located west of the Phase 2 Cell. The screen is within the vadose zone.
LFG-GUCO-3E (Map Point #17M)	This monitoring point is the groundwater underdrain cleanout for the Phase 2 Cell, located along the eastern interior boundary, and has the potential to monitor from the basal extent of the cell.
LFGW-T2 (Map Point #18)	This monitoring point is a subsurface gas monitoring well located off the central west boundary of the Closed Area. The screen is within the vadose zone.
LFGW-T3 (Map Point #19)	This monitoring point is a subsurface gas monitoring well located off the western boundary of the Phase 0 Cell. The screen is within the vadose zone.
LFG-T4 (Map Point #20)	This monitoring point is a subsurface gas monitoring well located approximately west of LFGW-T1. The screen is within the vadose zone.
LFGW-T5 (Map Point #21)	This monitoring point is a subsurface gas monitoring well located approximately west of LFGW-T3. The screen is within the vadose zone.
MW-32 (Map Point #22)	This monitoring point is an existing groundwater monitoring well located approximately 500 feet east-southeast of MW-26. The upper portion of the screen is within the vadose zone.
MW-33 (Map Point #23)	This monitoring point is a groundwater monitoring well located approximately 300 feet northeast of the NE corner of the Closed Area. The upper portion of the screen is within the vadose zone.
GV-1 (Map Point #24)	This monitoring point is a gas vent located west of the Phase 0 Cell. The screen is in the vadose zone.
GV-2 (Map Point #25)	This monitoring point is a gas vent located west of the Phase 0 Cell. The screen is in the vadose zone.
GV-3 (Map Point #26)	This monitoring point is a gas vent located west of the Phase 0 Cell. The screen is in the vadose zone.
GV-4 (Map Point #27)	This monitoring point is a gas vent located west of the Phase 0 Cell. The screen is in the vadose zone.
GV-5 (Map Point #28)	This monitoring point is a gas vent located west of the Phase 0 Abutment Cell. The screen is in the vadose zone.

Monitoring Point	Comments
GV-6 (Map Point #29)	This monitoring point is a gas vent located west of the Phase 0 Cell. The screen is in the vadose zone.
GV-7 (Map Point #30)	This monitoring point is a gas vent located west of the Phase 0 Cell. The screen is in the vadose zone.
GV-8 (Map Point #31)	This monitoring point is a gas vent located west of the Phase 0 Cell. The screen is in the vadose zone.
GV-9 (Map Point #32)	This monitoring point is a gas vent located west of the Phase 0 Abutment Cell. The screen is in the vadose zone.
LFGW-E1 (Map Point #33)	This monitoring point is a subsurface gas monitoring well located east of MW-32 along the property boundary. The well is screened in the vadose zone.
LFGW-E2 (Map Point #34)	This monitoring point is a subsurface gas monitoring well located east of MW-32 along the property boundary. The well is screened in the vadose zone.
GV-10 (Map Point #35)	This monitoring point is a gas vent located south of MW-25. The screen is in the vadose zone.
GV-11 (Map Point #36)	This monitoring point is a gas vent located south of MW-25. The screen is in the vadose zone.
GV-12 (Map Point #37)	This monitoring point is a gas vent located south of MW-25. The screen is in the vadose zone.
GV-13 (Map Point #38)	This monitoring point is a gas vent located south of MW-25. The screen is in the vadose zone.
GV-14 (Map Point #39)	This monitoring point is a gas vent located south of MW-25. The screen is in the vadose zone.
LFGW-T6 (Map Point #40)	This monitoring point is a subsurface gas monitoring well located approximately west of LFGW-T2. The screen is within the vadose zone.

The current subsurface landfill gas monitoring points will continue to undergo quarterly monitoring. Table 2-3 contains a summary of the landfill gas monitoring points for the facility.

Table 2-3
SEMCO Sanitary Landfill LFG Monitoring Points

Map Point No.	Monitoring Point	Type	Description
#1	Scale	Outdoor	Beneath the scale
#2	Office/scalehouse	Indoor	Inside the office building/scalehouse
#3	Shop	Indoor	Inside the shop building
#4	HHW shed	Indoor	Inside the household hazardous waste shed.
#5	Maintenance shop	Indoor	Inside the maintenance shop
#6	MW-7	Subsurface	Vadose zone off the northeast corner of the Closed Area.
#7	MW-25	Subsurface	Vadose zone off the west part of the north boundary of the Closed Area
#8	MW-26	Subsurface	Vadose zone off the east part of the north boundary of the Closed Area

Map Point No.	Monitoring Point	Type	Description
#9	MW-27	Subsurface	Vadose zone off the north part of the west boundary of the Closed Area
#10	LFGW-W1	Subsurface	Vadose zone off the south part of the west boundary of the Closed Area.
#12	UD-2	Subsurface	Vadose zone, groundwater underdrain beneath the Leachate Lagoon.
#13	LFG-GUCO3W	Subsurface	Vadose zone, groundwater underdrain beneath the Phase 2 Cell, west end.
#14	LFG-GUCO6	Subsurface	Vadose zone, groundwater underdrain southeast of Phases 3 & 4 Cells
#15	LFG-GUCO7	Subsurface	Vadose zone, groundwater underdrain southwest of Phases 3 & 4 Cells
#16	LFGW-T1	Subsurface	Vadose zone off the central west boundary of the Phase 2 Cell.
#17M	LFG-GUCO-3E	Subsurface	Groundwater underdrain beneath the Phase 2 Cell, east end.
#18	LFGW-T2	Subsurface	Vadose zone off the central west boundary of the Phase 0 Cell.
#19	LFGW-T3	Subsurface	Vadose zone off the western boundary of Phase 0 Cell.
#20	LFGW-T4	Subsurface	Vadose zone approximately 150 feet west of LFG-T1.
#21	LFGW-T5	Subsurface	Vadose zone approximately 150 feet west of LFG-T3.
#22	MW-32	Subsurface	Vadose zone approximately 500 feet east-southeast of MW-26.
#23	MW-33	Subsurface	Vadose zone approximately 300 feet northeast of the NE corner of the Closed Area.
#24	GV-1	Subsurface	Gas Vent
#25	GV-2	Subsurface	Gas Vent
#26	GV-3	Subsurface	Gas Vent
#27	GV-4	Subsurface	Gas Vent
#28	GV-5	Subsurface	Gas Vent
#29	GV-6	Subsurface	Gas Vent
#30	GV-7	Subsurface	Gas Vent
#31	GV-8	Subsurface	Gas Vent
#32	GV-9	Subsurface	Gas Vent
#33	LFGW-E1	Subsurface	Vadose zone east of MW-32 along the property boundary.
#34	LFGW-E2	Subsurface	Vadose zone east of MW-32 along the property boundary.
#35	GV-10	Subsurface	Gas Vent
#36	GV-11	Subsurface	Gas Vent
#37	GV-12	Subsurface	Gas Vent
#38	GV-13	Subsurface	Gas Vent
#39	GV-14	Subsurface	Gas Vent
#40	LFGW-T6	Subsurface	Vadose zone approximately 150 feet west of LFGW-T2.

If landfill gas monitoring wells (LFGWs) need to be installed, they will be designed similarly to the monitoring wells described in the HMSP for the Landfill, dated October 2025. The primary exception to the monitoring wells is that the LFGWs will be screened in the vadose zone. The LFGWs will be constructed using 2-inch diameter PVC screen and casing and will include a metal outer protective casing, bollards, and signage for identification. The LFGWs will be screened at the appropriate elevations. The LFGWs will be capped. Currently, some groundwater monitoring wells and groundwater underdrain cleanouts are used for subsurface monitoring of landfill gas. The groundwater monitoring wells and LFGWs that will be used for subsurface landfill gas monitoring are shown in Table 2-4 below. LFGWs without surveyed elevations are not included in Table 2-4.

Table 2-4
Landfill LFG Monitoring Well Elevation

Monitoring Point	Approx. Water Table Elevation	Ground Surface Elevation	Bottom of Screen Elevation	Top of Screen Elevation	Screen Length
MW-7	673	693	668	683	15
MW-25	671	692	660	675	15
MW-26	666	687	664	679	15
MW-27	723	733	715	725	10
LFGW-W1	710	734	705	720	15
LFGW-T1	724	739	724	734	10
LFGW-T2	724	729	707	722	15
LFGW-T3	722	735	712	727	15
LFGW-T4	711	715	699	709	10
LFGW-T5	725	732	708	720	15
MW-32	675	691	660	675	15
MW-33	676	680	662	674	12

The process of monitoring landfill gas from the monitoring wells will involve removing the vented cap and installing a special valved cap over the casing. A small negative pressure will be applied through the valved cap to draw gas from the subsurface soils through the well and through a methane detection/measuring instrument. The process of monitoring the groundwater underdrains will involve removing the access cap/lid and using tubing to monitor within the cleanout riser. The elapsed monitoring time for subsurface monitoring will be set to provide a representative sample of the subsurface soil gases, based on the type of equipment used for monitoring. A field data sheet will be used to record the date, time of day, weather related data, type of equipment used, elapsed time of monitoring, and the percent LEL detected during the elapsed monitoring time period. A copy of the field data sheet is included in Attachment A.

(2) The minimum frequency of monitoring shall be quarterly.

Monitoring of the indoor and subsurface landfill gas will occur quarterly.

2.2.5 Corrective Action Requirements

c. If methane gas levels exceeding the limits specified in paragraph 113.9(2)"a" are detected, the owner or operator must:

(1) Immediately take all necessary steps to ensure protection of human health and notify the department and department field office with jurisdiction over the MSWLF;

If methane gas levels exceeding the limits specified in paragraph 113.9(2)"a" are detected, Landfill personnel will take the necessary steps to ensure protection of human health and ensure that the DNR and the DNR field office with jurisdiction over the Landfill (Field Office #6) are notified. Steps to ensure protection of human health will include notifying on-site personnel and evacuating them to safe locations. The site operator will notify nearby residents if levels of methane are detected above the action level at the facility property boundary. If necessary, the site operator will enlist the aid of the County Sheriff's Department, State Highway Patrol, and the nearest fire department for assistance. For more specifics, please refer to the facility Emergency Response and Remedial Action Plan (ERRAP).

(2) Within 7 days of detection, place in the operating record and notify the department and department field office with jurisdiction over the MSWLF of the methane gas levels detected and a description of the steps taken to protect human health; and

Within 7 days of methane gas levels exceeding the limits specified in 113.9(2)"a" the DNR and the DNR field office with jurisdiction over the Landfill (Field Office #6) will be notified of the methane gas levels that were detected. A description of the steps taken to protect human health will also be provided. A listing of the methane gas levels detected, along with a description of the steps taken to protect human health, will be placed in the facility's operating record.

(3) Within 60 days of detection, implement a remediation plan for the methane gas releases, place a copy of the plan in the operating record, and notify the department and department field office with jurisdiction over the MSWLF that the plan has been implemented. The plan shall describe the nature and extent of the problem, as well as the proposed remedy.

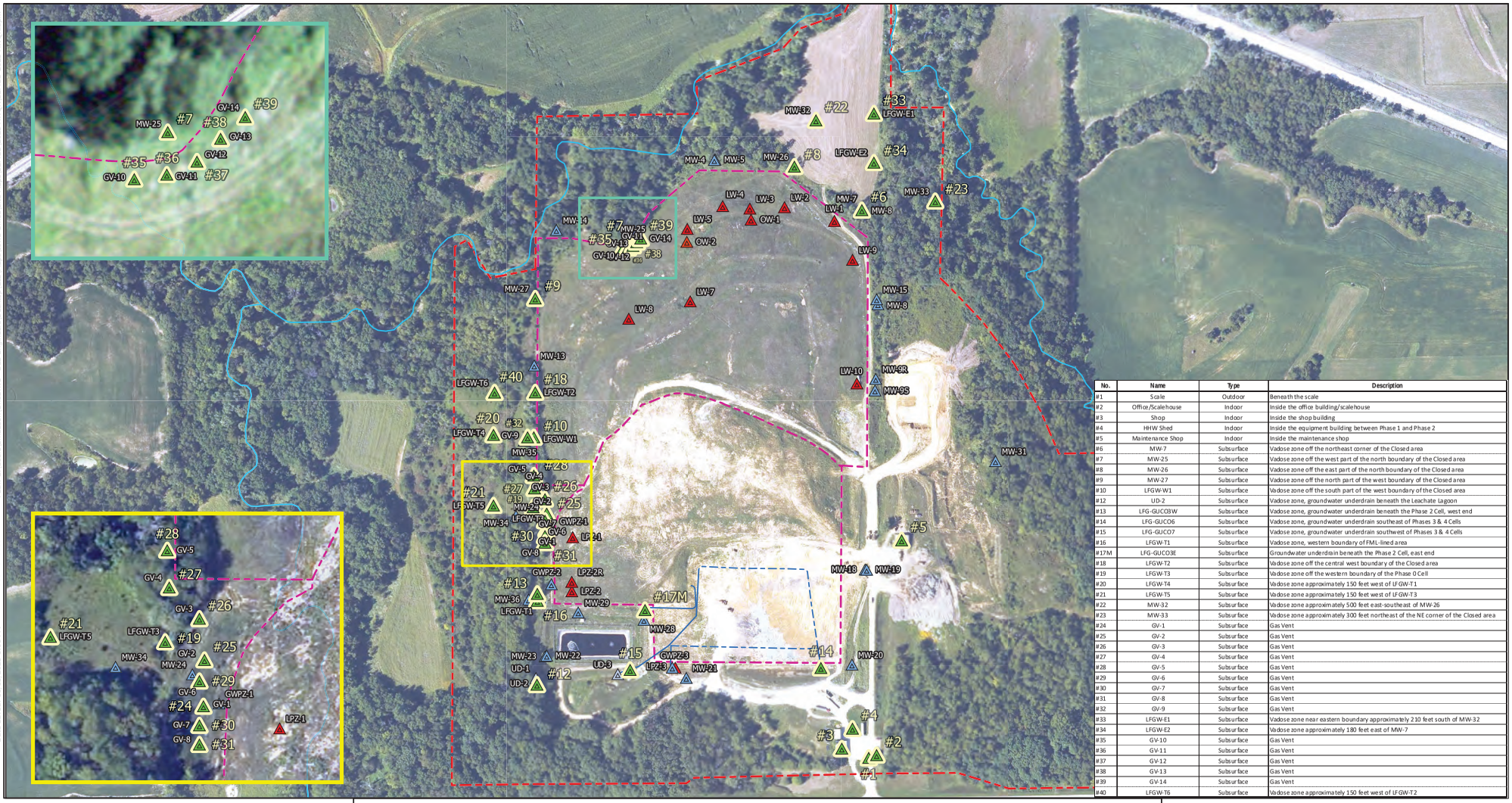
Within 60 days of an action level exceedance, a remediation plan for the methane gas release will be developed and implemented. The remediation plan will outline the nature and extent of the problem and propose a suitable remedy. A copy of the remediation plan will be provided to the DNR prior to implementation. Following implementation, a copy of the remediation plan will be placed in the facility's operating record, and the DNR and the DNR field office with jurisdiction over the Landfill (Field Office #6) will be notified that the plan has been implemented.

2.2.6 Reporting Requirements

d. The owner or operator shall submit an annual report to the department detailing the gas monitoring sampling locations and results, any action taken, and the results of steps taken to address gas levels exceeding the limits of paragraph 113.9(2)"a" during the previous year. This report shall include a site map that delineates all structures, perimeter boundary locations, and other monitoring points where gas readings were taken. The site map shall also delineate areas of landfill gas migration outside the MSWLF units, if any. The report shall contain a narrative that explains and interprets all the data collected during the previous year. The report shall be due each year at a date specified by the department in the facility's permit.

Landfill gas monitoring results will be submitted to the DNR in the Landfill Gas Annual Report submitted as an appendix to the Annual Water Quality Report each year. The report will contain the following:

1. Details of the landfill gas monitoring sampling locations and the monitoring results;
2. Whether the screen was submerged or exposed during monitoring events;
3. Any action taken with regard to the landfill gas monitoring system;
4. The results of steps taken to address gas levels exceeding the limits of paragraph 113.9(2)"a" during the reporting period;
5. A narrative explaining and interpreting the data collected during the reporting period; and
6. A site map depicting the following:
    - Structure monitoring locations
    - Subsurface monitoring locations
    - Other monitoring points where readings were taken
7. Delineation of landfill gas migration, if any, outside the Landfill.



No.	Name	Type	Description
#1	Scale	Outdoor	Beneath the scale
#2	Office/Scalehouse	Indoor	Inside the office building/scalehouse
#3	Shop	Indoor	Inside the shop building
#4	HHW Shed	Indoor	Inside the equipment building between Phase 1 and Phase 2
#5	Maintenance Shop	Indoor	Inside the maintenance shop
#6	MW-7	Subsurface	Vadose zone off the northeast corner of the Closed area
#7	MW-25	Subsurface	Vadose zone off the west part of the north boundary of the Closed area
#8	MW-26	Subsurface	Vadose zone off the east part of the north boundary of the Closed area
#9	MW-27	Subsurface	Vadose zone off the north part of the west boundary of the Closed area
#10	LFGW-W1	Subsurface	Vadose zone off the south part of the west boundary of the Closed area
#12	UD-2	Subsurface	Vadose zone, groundwater underdrain beneath the Leachate Lagoon
#13	LFG-GUCO8W	Subsurface	Vadose zone, groundwater underdrain beneath the Phase 2 Cell, west end
#14	LFG-GUCO6	Subsurface	Vadose zone, groundwater underdrain southeast of Phases 3 & 4 Cells
#15	LFG-GUCO7	Subsurface	Vadose zone, groundwater underdrain southwest of Phases 3 & 4 Cells
#16	LFGW-T1	Subsurface	Vadose zone, western boundary of FML-lined area
#17M	LFG-GUCO3E	Subsurface	Groundwater underdrain beneath the Phase 2 Cell, east end
#18	LFGW-T2	Subsurface	Vadose zone off the central west boundary of the Closed area
#19	LFGW-T3	Subsurface	Vadose zone off the western boundary of the Phase 0 Cell
#20	LFGW-T4	Subsurface	Vadose zone approximately 150 feet west of LFGW-T1
#21	LFGW-T5	Subsurface	Vadose zone approximately 150 feet west of LFGW-T3
#22	MW-32	Subsurface	Vadose zone approximately 500 feet east-southeast of MW-26
#23	MW-33	Subsurface	Vadose zone approximately 300 feet northeast of the NE corner of the Closed area
#24	GV-1	Subsurface	Gas Vent
#25	GV-2	Subsurface	Gas Vent
#26	GV-3	Subsurface	Gas Vent
#27	GV-4	Subsurface	Gas Vent
#28	GV-5	Subsurface	Gas Vent
#29	GV-6	Subsurface	Gas Vent
#30	GV-7	Subsurface	Gas Vent
#31	GV-8	Subsurface	Gas Vent
#32	GV-9	Subsurface	Gas Vent
#33	LFGW-E1	Subsurface	Vadose zone near eastern boundary approximately 210 feet south of MW-32
#34	LFGW-E2	Subsurface	Vadose zone approximately 180 feet east of MW-7
#35	GV-10	Subsurface	Gas Vent
#36	GV-11	Subsurface	Gas Vent
#37	GV-12	Subsurface	Gas Vent
#38	GV-13	Subsurface	Gas Vent
#39	GV-14	Subsurface	Gas Vent
#40	LFGW-T6	Subsurface	Vadose zone approximately 150 feet west of LFGW-T2

LFG Monitoring Points

Figure 2

Legend

- Methane Monitoring Point
- Monitoring Well
- Groundwater Underdrain
- Approximate Landfill Gas Monitoring Location
- Approximate Observation Well Location
- Approximate Leachate Piezometer Location
- Groundwater Underdrain Solid Piping
- Groundwater Underdrain Perforated Piping
- Approximate Existing Waste Boundary
- Approximate Property Boundary
- Stream

Southeast Multi-County Sanitary Landfill
Richland, Iowa
Project No: 27225496.00
Drawing Date: October 2025

N W E S

0 280 560 1,120 Feet

SCS ENGINEERS
environmental consultants and contractors

ATTACHMENT A
Sample Field Data Sheet

Landfill Gas Monitoring - Field Measurement Recording Sheet

Name of Facility: SEMCO Sanitary Landfill

Monitoring Equipment Used: _____

Date of Measurement: _____

Equipment Calibration Date: _____

Equipment Calibration Time: _____

Weather Conditions:

Name of Sampler: _____

Temperature: _____

Barometric Pressure: _____

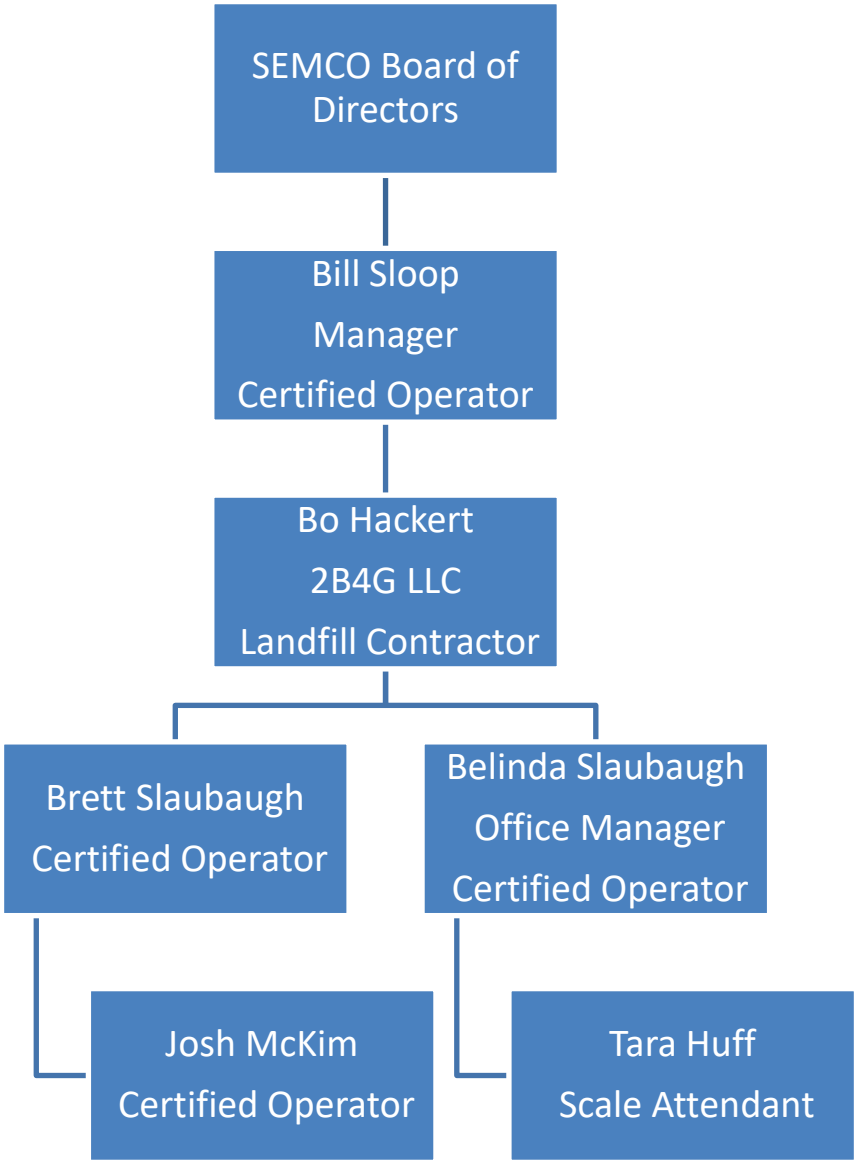
Other: _____

Point ID#	Sample Point	Type	Methane Concentration (% LEL)	Static Water Level (feet)	Total Depth (feet)	Comments
#1	Scale	Outdoor				
#2	Office/Scalehouse	Indoor				
#3	Shop	Indoor				
#4	HHW Shed	Indoor				
#5	Maintenance Shop	Indoor				
#6	MW-7	Subsurface				
#7	MW-25	Subsurface				
#8	MW-26	Subsurface				
#9	MW-27	Subsurface				
#10	LFGW-W1	Subsurface				
#12	UD-2	Subsurface				
#13	LFG-GUCO3W	Subsurface				
#14	LFG-GUCO6	Subsurface				
#15	LFG-GUCO7	Subsurface				
#16	LFGW-T1	Subsurface				
#17M	LFG-GUCO3E	Subsurface				
#18	LFGW-T2	Subsurface				
#19	LFGW-T3	Subsurface				
#20	LFGW-T4	Subsurface				
#21	LFGW-T5	Subsurface				
#22	MW-32	Subsurface				
#23	MW-33	Subsurface				
#24	GV-1	Subsurface				
#25	GV-2	Subsurface				
#26	GV-3	Subsurface				
#27	GV-4	Subsurface				
#28	GV-5	Subsurface				
#29	GV-6	Subsurface				
#30	GV-7	Subsurface				
#31	GV-8	Subsurface				
#32	GV-9	Subsurface				
#33	LFGW-E1	Subsurface				
#34	LFGW-E2	Subsurface				
#35	GV-10	Subsurface				
#36	GV-11	Subsurface				
#37	GV-12	Subsurface				
#38	GV-13	Subsurface				
#39	GV-14	Subsurface				
#40	LFGW-T6	Subsurface				

Appendix E

Organizational Chart and Operators Certifications

Southeast Iowa Multi-County Sanitary Landfill
Organizational Chart
October 2025



Notes:
1. The organizational chart is subject to change without prior notification to the DNR.

Operators Certificates

The Agency certified operators at the SEMCO Sanitary Landfill as of the date of this permit renewal application are listed below.

Operator	Certification Number
Bill Sloop	30649
Brett Slaubaugh	30526
Belinda Slaubaugh	30927
Josh McKim	30913

Appendix F

Proof of Financial Assurance

IOWA DEPARTMENT OF NATURAL RESOURCES

GOVERNOR, KIM REYNOLDS
LT. GOVERNOR, CHRIS COURNOYER
DIRECTOR, KAYLA LYON

May 29, 2025

BILL SLOOP
LANDFILL MANAGER
SOUTHEAST IOWA MULTI-COUNTY SOLID WASTE AGENCY
29997 HIGHWAY 78 WEST
RICHLAND IA 52585

Re: SEMCO Sanitary Landfill
Permit Number 54-SDP-01-75P
Approval of Financial Assurance

Dear Mr. Sloop:

This is notification by the Iowa Department of Natural Resources (DNR) that the Southeast Iowa Multi-County Solid Waste Agency (Agency) has adequately complied with the financial assurance requirements of rule 567—113.14(455B) for the SEMCO Sanitary Landfill. The Agency's financial assurance documentation (Doc #112583), received March 21, 2025, has been placed in the DNR's record files.

The projected deposit of **$103,802** to the Agency's closure and post-closure Local Government Dedicated Fund (LGDF) needs to be made by July 30, 2025. Those deposit amounts are as stated in the "Formula for Projected Deposits" component of Section 7 of the Agency's Financial Assurance Report Form.

Please note that the Agency may withdraw money from the LGDF account without DNR approval for the purpose of funding closure, including partial closure, or post-closure activities in accordance with 567 IAC 113.14(8)"d." As a reminder, compliance with rule 567—113.14(455B) is to be submitted annually, by April 1st, confirming that all applicable financial assurance documents are updated as required.

Please feel free to contact me with any questions. I can be reached at (515) 802-8835 or mary.klemesrud@dnr.iowa.gov.

Sincerely,

Mary Klemesrud
Program Planner
Land Quality Bureau

Cc: Chris Calhoun, Project Professional, SCS Engineers
Christine Collier, P.E., SCS Engineers
DNR Field Office #6, Washington