

December 29, 2025
File No. 27224515.26

Mr. Mike Smith, P.E.
Iowa Department of Natural Resources
Land Quality Bureau
6200 Park Avenue
Des Moines, Iowa 50321

Subject: Methane Mitigation Plan
Henry County Sanitary Landfill
Permit No. 44-SDP-01-75C

Dear Mike:

SCS Engineers (SCS), on behalf of the Henry County Solid Waste Commission (Commission), proposes this methane mitigation plan for the Henry County Sanitary Landfill (Landfill).

Background

In email correspondence dated September 5, 2024 (Doc #110838), the Iowa Department of Natural Resources (DNR) was notified of an exceedance of the action level of greater than 25% of the lower explosive limit (LEL) for methane measured in the on-site office building (not owned by the Commission) on September 5, 2024. The gas exceedance was measured in a storage closet used to store business records next to the building's kitchen. The initial reading was 43% of the LEL and a recheck was 39% of the LEL. During the September 5, 2024, monitoring event, monitoring throughout the rest of the building, including areas near the closet, did not detect methane. Subsequent monitoring events detected methane in the closet and the void space beneath the closet, but not in the rest of the building.

A summary of methane measurements in the closet and the void space beneath the floor of the closet since September 5, 2024 is shown below. The void space beneath the closet floor was unknown during the September 2024 monitoring event.

Date	Closet % LEL	Void % LEL
September 5, 2024	43	NM
December 18, 2024	2	23
March 11, 2025	33	>99
May 7, 2025	10	77
July 16, 2025	11	>99
November 25, 2025	0	>99

In response to the methane exceedance, the DNR required a mitigation plan as noted in correspondence dated September 24, 2024 (Doc #110923). To identify the source of the gas in the void space, a gas sample was collected on March 11, 2025. The results of the first sample were



inconclusive as to the source of the gas, as discussed in correspondence dated May 13, 2025 (Doc #113049). The May 13 correspondence included a picture of the warning signs posted on the closet door, notifying building users to keep out due to flammable gas. The closet door is kept locked other than when being accessed for monitoring purposes. The closet is currently not used, including no longer used for the storage of business records.

To allow time for additional gas sampling to identify the source of the gas in the void space and prepare the mitigation plan, a submittal date of December 31, 2025, was established for the mitigation plan (Doc #113062). On July 16, 2025, gas samples were collected from the void space beneath the closet and from a leachate piezometer to obtain a gas sample directly from the waste mass. A tritium analysis was completed on the July 16 sample from the closet void area. The March 11 sample from the closet void space and the July 16 sample from the leachate piezometer did not contain sufficient methane concentrations to perform tritium analysis.

An interpretative report from the laboratory, dated September 4, 2024, concluded that the source of the gas in the void space below the closet was the Landfill, as stated below:

The tritium concentration of the methane from the Office Closet sample was significantly greater than expected for normal surface water or shallow groundwater and fell within the range expected for municipal landfills. Thus, the molecular and isotopic results of the FOMW2-LE and Office Closet gas samples indicate the source of the gas in the void space of the closet area is consistent with landfill gas originating from the Henry County Sanitary Landfill.

The analytical results and interpretive report for the July 16, 2025, sampling event are attached.

Comment Letter Response

The items from the DNR comment letter dated September 24, 2024 (Doc #110923), are addressed by number below.

1. An understanding of local geology and groundwater levels that impact gas migration pathways,

The local geology at the Landfill is well understood and is described in the *Groundwater Quality Assessment Plan*, dated February 14, 2013 (Doc #75791), prepared by Barker Lemar Engineering Consultants. In summary, the geology in the western part of the Landfill is weathered glacial till with sand seams underlain by an extensive sand layer. The boring log for monitoring well MW-27, located adjacent to the building, indicates that both the weathered till and the deeper sand layers were encountered in the boring. Water levels measured in monitoring well MW-27 from 2020 through 2025, relative to the ground surface, indicate a vadose zone approximately 18 to 22 feet thick.

2. The necessity of the installation and management of a gas collection system under the affected building,

The proposed remedy is to install a passive gas venting system that includes sealing the floor of the closet above the void space and venting the void space to the exterior. The floor above the void space will be sealed with 8-mil plastic sheeting, a layer of underlayment, and HDPE sheeting, with the layers fastened by adhesive and/or screws, as appropriate. A hole will be drilled through the floor and plastic layers to install a 3-inch HDPE exhaust pipe. The edges of the closet and screw holes will be sealed with caulk, and flanging will be installed around the pipe to make the seal as airtight as practical.

The exhaust pipe will extend up through the ceiling, exit through the side of the building, and be sealed with a flange. The pipe above the ceiling will be attached with a slight drop so that condensate flows back down the pipe rather than to the outside of the building. The end of the pipe outside the building will be covered with a screen to prevent material from entering the pipe.

If the passive vent is insufficient to reduce methane concentrations below action levels in the closet (25% of the LEL), a powered exhaust fan will be installed in the passive vent pipe to increase gas extraction.

As methane has not been detected in the office building outside the closet and the void space, a targeted approach of venting the void space is anticipated to mitigate methane accumulation sufficiently. The sealed floor of the closet would keep the methane from entering areas of the building that may be accessed or occupied. The closet will remain locked with the existing warning signs remaining in place.

Methane monitoring in the closet will be conducted within 24 hours of installing the venting system. Monthly monitoring of the closet will be conducted for 3 months, followed by the resumption of the routine quarterly monitoring schedule.

3. The necessity of source control in lieu of or in conjunction with a building collection system,

At this time, source control is not being pursued as the concern appears to be limited to the void space beneath the closet, which is being addressed by sealing the floor coupled with passive venting of the void space. Historical records indicate former surface water drain pipes along with up to two connected former septic system discharge pipes present in the area of the building, as described in the August 1994 *Groundwater Assessment Report* prepared by Shive-Hattery:

The building was constructed by Don Whaley, Sr., the contract operator for Phase I and Phase II fill areas and used for equipment maintenance and storage during Phase I and II operations. A septic tank which serves the building is reportedly located immediately west of the building. Effluent from the septic tank reportedly discharges into the upper portion of a gravel filled trench approximately 50 feet in length and 24 to 30 inches deep. A perforated collection pipe at the base of the trench is connected to the tile drain. The tile drain runs through the earthen berm separating the Phase I and Phase II fill areas and discharges northeast of the Phase I area. The tile drain is also connected to two drainage tiles located at the base of the depression immediately north of the old maintenance building. Septic tank effluent from an old farm house formerly located east of the maintenance building also reportedly discharged to this tile drain.

A topographic map (Figure 1) from the August 1994 Shive-Hattery report is attached.

The drainage pipes were used to drain the subgrade area on the north side of the Landfill building at the time of active landfilling where a dump truck could be parked, allowing for a public drop-off area from surface grade. This subgrade area was filled in (with the exception of at least the void space beneath the closet) in the 1990s when the building was expanded north under new ownership and use. Source control would entail either an interceptor trench intended to intercept and vent the gas migration pathway, which is likely the former stormwater drainage pipes and/or the subgrade backfill materials, or active gas control installed in the waste mass. Either of these actions remain options if adequate methane control within the building cannot be achieved by the passive system proposed herein or, if necessary, by the next step of adding active venting to the proposed passive system.

4. The need for continuous monitor(s), alarm settings and a monitor maintenance program,

A method for continuous monitoring of the building is currently under development and will be completed following an initial period of periodic monitoring following implementation of the actions proposed herein. Two options for continuous monitoring are being considered; 1) a system which will alarm at the building, both internal and external at appropriate building access points or 2) a system which alarms as indicated in Option 1 combined with external communication via text and/or email to select individuals including management personnel of the building occupant, the building owner, and the Commission. The continuous monitor(s) would be maintained in accordance with the manufacturer's recommendations.

5. And an emergency response plan if gas is detected in the affected building.

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

If methane gas is detected by electronic monitoring or by detecting an odor:

- Evacuate immediately.
- Contact the Fire Department (911).
- Contact the Henry County Solid Waste Commission representative. Mt. Pleasant City Hall will have contact information (319-385-1470).
- Contact the building owner. As of December 2025, this is Mr. Tim Batey (319-750-5525).
- Contact DNR Field Office #6 (319-653-2135).
- If directed by the Field Office, contact the DNR Emergency Reporting Hotline (515-725-8694).
- Do not return to the building until it has been properly ventilated and the gas concentrations have been checked with an electronic meter.
- A second check of gas concentration levels with newly calibrated equipment may be required.
- If the venting system lines are malfunctioning, contact a professional engineer for repair assistance.

After an incident such as fire, severe thunderstorm, tornado, flooding, etc.:

- Check methane venting systems.
- Monitor methane gas soon after the incident to check for hazardous methane levels.
- If you smell gas, evacuate immediately.
- Contact the representatives listed in the previous section.
- If the venting system lines are malfunctioning, contact a professional engineer for repair assistance.

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If you have any questions regarding this mitigation plan, please contact Nathan Ohrt at (319) 331-9613.

Sincerely,



Nathan Ohrt
Senior Project Professional
SCS Engineers

NPO/TCB



Timothy C. Buelow, P.E.
VP - Senior Project Advisor
SCS Engineers

Copies: Mr. Steve Brimhall, Henry County Solid Waste Commission