



COUNTY OF ST. CLAIR



Smiths Creek Landfill

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scclandfill@stclaircounty.org

November 29, 2023

Mr. Iranna Konanahalli, Environmental Quality Analyst
EGLE - Air Quality Division
Southeast Michigan District Office
27700 Donald Court
Warren, Michigan 48092

Subject: Smiths Creek Landfill (SCL)
Response to November 7, 2023 AQD Violation Notice

Dear Mr. Konanahalli:

On October 10 and 18, 2023, staff of the Department of Environment, Great Lakes, and Energy (EGLE), Air Quality Division (AQD) conducted site visits at the Smiths Creek Landfill (SCL), Kimball Township, MI. Observations resulting from those visits, including the October 31, 2023 report documenting methane screening conducted by Mike Kovalchick on October 18, 2023, were cited as the basis for the Violation Notice (VN) dated November 7, 2023. The information below is provided in response to the VN as requested, and in accordance with the extension for response to November 29, 2023 authorized by Ms. Joyce Zhu, EGLE via email on November 28, 2023.

Background

Landfilling operations at SCL are subject to 40 CFR 62 Subpart OOO (Federal Plan). The operational standards, compliance provisions and monitoring requirements of the Federal Plan were superseded by their equivalent provisions in 40 CFR 63 Subpart AAAA (Landfill NESHAP) on September 27, 2021. Several of the Federal Plan citations in the November 7, 2023 VN are therefore obsolete. An active gas collection and control system (GCCS) is in-place and operational in all portions of the active landfill that are subject to the Landfill NESHAP. Extracted landfill gas (LFG) is primarily managed as a renewable energy resource by Blue Water Renewables, LLC at its gas to energy plant where it is combusted in two engines. The system is designed such that excess collected gas can be controlled by combustion in an open flare which is supplied by both a 3" and 10" gas line.

SCL was notified on September 5, 2023 that EGLE had received a complaint regarding off-site odors in the vicinity of the landfill. Since that time, intermittent odors have been detected off-site by residents and/or SCL staff. A comprehensive investigation of the issues contributing to the presence of odors has been conducted and significant ongoing efforts are being made to isolate and correct areas of off-site ambient gas detections.

The VN issued on November 7, 2023 is the second of two successive letters received from EGLE regarding observations resulting from the site visits on October 10 and 18, 2023 including an abbreviated methane screening

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conducted on October 18 by Mr. Kovalchick. A report dated October 31, 2023 documenting the screening has been referenced as significant basis for both the October 25 and November 7, 2023 VN letters.

This response is provided to address the specific citations defined in the table below. However, limitations associated with the screening process and conclusions related to the screening are detailed in our response to the October 25, 2023 VN response. Those clarifications are similarly pertinent to this response and we request they be considered in your review of this response.

Process Description	Rule/Permit Condition Violated	Comments
Smiths Creek Landfill	<p>NESHAP / MACT 4A 40 CFR 63.1958(d)(1)</p> <p>40 CFR 63.1958 Operational standards for collection and control systems.</p> <p>40 CFR, Part 62, Subpart OOO 40 CFR 62.16716(d)</p> <p>40 CFR 62.16716 Operational standards for collection and control systems.</p>	SCL failed to design and operate the collection system so that the methane concentration is less than 500 parts per million (ppm) above background at the surface of the landfill. ^β
Smiths Creek Landfill	<p>40 CFR, Part 62, Subpart OOO 40 CFR 62.16714(b)(2)(iii)</p> <p>40 CFR 62.16714 Standards for municipal solid waste landfill emissions.</p> <p>NESHAP / MACT 4A 40 CFR 63.1959(b)(2)(ii)(B)(3)</p> <p>40 CFR 63.1959 NMOC calculation procedures.</p>	SCL failed to collect landfill gas at a sufficient extraction rate. SCL failed to design an active collection system to handle the maximum expected gas flow rate from the entire area of the landfill. Inadequate vacuum was produced in the cells that the odorous landfill gas released to the neighborhood. ^β
Smiths Creek Landfill	<p>40 CFR, Part 62, Subpart OOO 40 CFR 62.16714(b)(2)(iv)</p> <p>40 CFR 62.16714 Standards for municipal solid waste landfill emissions.</p> <p>NESHAP – Subpart AAAA 40 CFR 63.1959(b)(2)(ii)(B)(4)</p> <p>40 CFR 63.1959 NMOC calculation procedures.</p>	SCL failed to design and operate the active collection system to minimize off-site migration of subsurface gas. ^β
<p>^β Please refer to the surface emission monitoring (SEM) inspection letter from Mike Kovalchick of EGLE-AQD. SCL failed to design and operate a system of vertical wells, horizontal collectors, or other collection devices, capable of controlling and extracting gas from all portions of the landfill sufficient to meet all operational and performance standards (40 CFR 63.1960 Compliance provisions). Inadequate vacuum was produced in the cells such that the odorous landfill gas was released to the neighborhood because of off-site migration of subsurface gas.</p>		





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Response #1

The first citation referenced in the table above which appeared in the VN dated November 7, 2023 asserts that the GCCS has not effectively captured and controlled landfill gas emissions and, as a result, on-site surface emissions with methane concentrations >500 ppm above background levels. The citation references measurements collected during the October 18 abbreviated screening conducted by Mike Kovalchick, as described in a summary letter dated October 31, 2023.

Irrespective of methodology differences outlined in our November 18, 2023 response to the VN dated October 25, 2023, we concur that methane was detected in numerous locations across the surface of the landfill in concentrations exceeding 50ppm. In response to the screening, corrective action was taken in areas subject to 40 CFR 63.1958 as well as Cell 8 which is not yet regulated under NESHAP. Two 10-day re-checks were completed in NESHAP subject areas consistent with SEM practices. A one-month re-check was performed at all locations on November 16, 2023 (including non-NESHAP areas in Cell 8) identified in the EGLE screening using equipment and methodology consistent with requirements for routine surface emission monitoring specified in §63.1958(d) and §63.1960(c).

Re-check measurements confirmed that the areas identified on the landfill surface during the October 18, 2023 screening had been effectively corrected. The outcome of the re-check measurements was communicated to EGLE on November 17, 2023 with the weekly progress update e-mail message. The parameters of temperature and negative pressure have been maintained and documented in accordance with §63.1958. As corrective measures were taken within the time constraints specified in §63.1960, the methane concentrations identified in the October 18, 2023 abbreviated screening do not constitute a violation of NESHAP requirements in accordance with §63.1958(g). SCL agrees that the presence of methane above the landfill surface requires significant action and continued focused efforts to regain full gas control, However, we respectfully contend that the corrective measures have been conducted in compliance with the specific regulatory citations in the VN.

Response #2

Citation number two references conditions which have resulted in the documented occurrence of off-site odors beyond the landfill property boundary. SCL agrees that the off-site odors experienced since the first odor complaint was lodged are the result of incomplete capture of gas by the GCCS. Since off-site odors were first identified as described above, the proper function of the extraction and collection system has been the focus of several prioritized tiers of investigation.

The first and most-time critical action has focused on maximizing gas collection and destruction by increasing vacuum and correcting impedances in the system which have been inhibiting normal gas flow through operational measures and re-establishing vacuum sufficient to control the gas to reduce off-site impacts. Individual efforts





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towards restoring vacuum have been documented previously in the response to the VN dated October 25, 2023 and in weekly progress updates to EGLE and include the following significant actions:

- Although not directly suspected as the cause of the issues based on a long history of successful operation, injection of septage was temporarily suspended by SCL in September as a precautionary measure pending resolution of the current gas management challenges;
- Detailed evaluation of gas wellfield data and correlations with DTE gas plant operation records;
- Vacuum at the engine plant was increased from 50 inches w.c. to 59 inches w.c.; and
- Connection of six vertical wells in Cell 7 with temporary lateral piping to facilitate gas flow;
- Connection of three new lateral gas extraction lines in Cell 8; and
- Increased the frequency of gas well monitoring in the critical Cell 8 area.

The second tier of response includes repairs and rehabilitation of under-performing portions of the system identified in the initial phase of the corrective actions, including:

- Addition of interim cover to outside slopes and other temporarily active areas including Cell 8;
- Removal of orifice plates and installation of new, larger wellheads to increase gas flow and reduce pressure drops across the wellheads to maximize flow in Cell 8;
- Operational changes to condensate knock-out sumps set points, reprogramming flare controls to re-establish design operating conditions; and
- Excavation and leveling of approximately 2,100 feet of the primary header collection pipe across the center of the landfill to reduce obstructions with the intent of restoring design gas flow.

The third set of concurrent measures has focused on improvements and enhancements to the existing GCCS infrastructure to correct fugitive gas emissions and increase future system capabilities. The most notable features include the following:

- Start-up of a supplemental flare and blower system on November 9, 2023 to apply additional vacuum and gas control directly to the southwest side of the site (i.e., Cell 8);
- Supplemental perimeter gas collection trench system was designed for Cell 8 and construction began on November 20, 2023;
- A comprehensive engineering assessment of the current GCCS system is underway and potential upgrades and operational changes are being evaluated;
- A root cause analysis of gas accumulation considering all operational factors influencing gas production and collection is underway; and
- Development of comprehensive system operations checklists based on findings of engineering and operational evaluations.





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Response #3

The last citation in the table describes conditions related to sub-surface gas migration. This citation is unsupported based on data obtained from ongoing quarterly monitoring of probes near the property boundaries at SCL. The approved methane detection program at SCL is conducted in accordance with R299.4225 of Part 115 and has consistently confirmed compliance with the requirement to control subsurface gas migration. Therefore, we respectfully disagree with the assertion that subsurface gas migration is occurring beyond the landfill property boundary and request removal of the citation from the VN.

GCCS Design Considerations

Each of the citations identified in the VN has called the design basis of the GCCS into question as a potential root cause of the recent odor issues. The GCCS has been designed using good engineering practices, certified by qualified professional engineers, verified using industry standard software (KYPipe) and has been accepted in multiple EGLE review opportunities. The design of the system has been repeatedly demonstrated to be both adequately sized and appropriately designed to manage expected gas production throughout the life of the landfill using conservative gas production factors. Details of the design and associated calculations upon which the GCCS has been developed have been submitted for technical review, comment and approval by EGLE with each construction permit application package in accordance with statutory requirements of Part 115 (324.11511b(2) and (5)). Most recently, an RDDP permit modification package including gas system design modifications was submitted in 2019. Documented, design-related questions and comments posed by department engineers have been addressed and satisfactorily resolved during the above referenced construction permit issuance actions.

As with all landfill systems, engineering is an important part of establishing effective gas control systems; however, real-world conditions can significantly influence the functional capabilities of the extraction and transmission network. Our intensive evaluation has not revealed significant flaws in design/engineering or failure of the infrastructure. Rather, operational considerations including intermittent wellfield vacuum (due to flare programming issues) and settlement of primary header lines appear to have been significant factors in the reduced available vacuum to Cell 8, resulting in the development and persistence of the odor issue.

Other factors which may affect gas production are being evaluated including leachate production and collection. Based on current data including volume, methane concentrations and presence of balance gas, it appears likely that the gas pressure that has resulted in off-site odors is due to an accumulation of gas produced over time rather than a dramatic increase in gas production. Review of data during our recent evaluation noted declining flow measurements recorded at front of the landfill at the beginning of 2023. Further data review indicates that was likely related to a reduction in overall wellfield vacuum during this time. Routine monitoring measurements in 2023, however, consistently reflected compliance with requirements for negative pressure, temperature, and surface emissions detections. In retrospect, reliance on regulatory compliance indicators alone may have been a misleading indicator of adequate gas removal, resulting in an accumulation of excess gas. SCL has incorporated additional





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operational metrics into the routine system evaluation to minimize the potential for recurrence of a gas accumulation in the future once the current issues are resolved.

The original portion of the gas collection system (including the primary headers which convey gas to the flare and engine plant) was designed, constructed and has been in operation since late 2001. The lateral portion of the system was designed in phases as part of the septage bioreactor permitting process and has been in place and expanded since 2006. Since initial start-up, the gas collection and control system has effectively and adequately controlled gas generated at the facility until the third quarter of 2023 as documented by compliance monitoring results and absence of concerns expressed by off-site residents during most of its operational history.

The recent conditions deviate from historical performance, strongly suggesting that system effectiveness (i.e., available vacuum) has been compromised by physical constraints related to the age and condition of portions of the system and operational issues with programming of control features rather than any systematic failure of the design. Regardless, SCL has initiated a comprehensive review of the system design as part of the approach to resolving the issue and minimizing recurrence in the future. Both engineering and operational findings will be considered in determining necessary infrastructure and procedural enhancements necessary to minimize the potential for recurrence of off-site odors.

Finally, SCL and St. Clair County are fully committed to instituting additional controls and procedures as necessary to resolve the current issues and minimize off-site odor impacts in the future. Significant improvements to the gas collection and control systems are underway and results of the comprehensive system evaluation described above will guide further improvements as needed.

If you have any questions regarding this submittal, please contact me at (810) 989-6979.

Sincerely,

Smiths Creek Landfill

Matt Williams
Director, Smiths Creek Landfill

Cc/via e-mail:
Annette Switzer, EGLE
Christopher Ethridge, EGLE





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