



REGION 5

CHICAGO, IL 60604

MEMORANDUM

SUBJECT: CLEAN AIR ACT INSPECTION REPORT
WM Autumn Hills RDF Landfill, Zeeland, MI

FROM: Emma Leeds, Environmental Engineer
AECAB (IL/IN)

THRU: Nathan Frank, Section Supervisor
AECAB (IL/IN)

TO: File

BASIC INFORMATION

Facility Name: WM Autumn Hills RDF Landfill, Zeeland, MI

Facility Location: 700 56th Avenue, Zeeland, MI 49464

Date of Inspection: September 13, 2024

EPA Inspector(s):

1. Emma Leeds, Environmental Engineer
2. Sasa Dunovic, Environmental Engineer
3. Giles Chickering, Environmental Engineer
4. Karina Kuc, Environmental Engineer
5. Jacob Herbers, Environmental Engineer

Other Attendees:

1. Matt Rosser, District Manager – WM
2. Chris El-Cassabgui – Environmental Protection Specialist - WM
3. Joshua Wells, LFG Technician – Diversified Technologies, Inc. (DTI) (only in field)
4. Eric Ahrnes, LFG Technician – Diversified Technologies, Inc. (only in field)
5. Jim Mohny, Gas Operations Manager – WM (only in field)
6. Bob Pliska, Regional Engineer – WM (only in field)
7. Chris Robinson, Environmental Quality Analyst – Michigan Department of Environment, Great Lakes, and Energy (EGLE)
8. Jeff Benya, Environmental Quality Analyst – Michigan EGLE

Facility Name: WM Autumn Hills Landfill
Facility Location: 700 56th Avenue, Zeeland, MI
Date of Inspection: September 13, 2024

Contact Email Address: bpliska@wm.com ; mrosser@wm.com

Purpose of Inspection: To determine compliance with the Clean Air Act (CAA) and to perform a comparative Surface Emissions Monitoring (SEM) survey

Facility Type: Municipal solid waste landfill

Regulations Central to Inspection: 40 C.F.R. Part 62 Subpart OOO – Federal Plan Requirements for Municipal Solid Waste Landfills; 40 C.F.R. Part 63 Subpart AAAA – National Emissions Standards for Hazardous Air Pollutants (NESHAP) for Municipal Solid Waste Landfills

Arrival Time: 8:45 AM ET

Departure Time: 2:20 PM ET

Inspection Type:

- ☒ Unannounced Inspection
- ☐ Announced Inspection

OPENING CONFERENCE

- ☒ Presented Credentials
- ☒ Stated authority and purpose of inspection
- ☐ Provided Small Business Resource Information Sheet
- ☒ Small Business Resource Information Sheet not provided. Reason: not a small business
- ☒ Provided CBI warning to facility

The following information was obtained verbally from WM and DTI personnel unless otherwise noted.

Process Description:

Autumn Hills Landfill (“the Landfill” or “the Facility”) is an MSW landfill that has operated since 1992 and has an estimated 35 years until closing. Most of the landfill was under intermediate cover and no parts were under final cover at the time of the inspection. The facility typically accepts approximately 35% special waste, 45% MSW, and 20% construction and demolition waste. Special waste includes, but is not limited to, spent paint, powder coat (residue from painting cars), sludges, and contaminated soils. All waste is comingled.

The landfill gas (LFG) collection system has 171 vertical and horizontal extraction wells in total (facility personnel was not sure how many were vertical versus horizontal). All new wells are installed with a dewatering pump. In recent years the facility has been installing wells by “rock drilling”, which involves adding stone pads at various vertical levels as waste is added, and then drilling a well down through the pads when the landfill reaches final grade. This method is intended to prevent heat accumulation in the landfill. SEM and monthly cover integrity checks are performed by a third-party contractor, Diversified Technologies, Inc.

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LFG from the Landfill is predominately sent to the Kinder Morgan facility for treatment and is then sent to Zeeland Farm Services (ZFS) where it is used to produce heat and steam for their process. The only treatment for LFG at the Landfill itself is a knock-out pot for removing moisture. A 3,000 standard cubic feet per minute (scfm) capacity utility flare is used at the Landfill as a back-up if Kinder Morgan has a shutdown and for any excess gas. The Landfill uses the LGMS well tracking system to extract and collect only LFG that contains methane in concentration between 50-52%

A solidification process is performed in an area located on the southwestern side of the top of the Landfill, where WM mixes autofluff, ash, liquid caster slag, and other fine wastes with sludges that contain more than 10% liquids. The fines and liquid wastes are mixed in a steel pit in the Landfill using an excavator, and then dried in an oven, before being deposited onto the Landfill.

Leachate is collected from the Landfill using 8 sump pumps and is stored in a 250,000 gallon tank before being injected into an on-site deep injection well. About 56,000 gallons of leachate per day have been injected into the well for the past year and a half.

Staff Interview:

The waste acceptance rate has been doubling for the past few years, up to 3,500 tons per day at the time of the inspection, after the Landfill entered a contract with the Kent County waste to energy (WTE) facility. The Kent County WTE facility sends the Landfill any excess solid waste it receives and doesn't have the capacity to burn.

The Facility is in the process of building a renewable natural gas (RNG) plant, where it plans to send LFG gas when complete rather than to ZFS. At the time of the inspection, about 2,100 scfm of LFG was being sent to Kinder Morgan/ZFS, and 140 scfm of LFG was being sent to the on-site flare. Hydrogen sulfide at the flare was reading around 300 parts per billion.

The most recent construction on the GCCS included installing 8 new LFG extraction wells in cell 16.

TOUR INFORMATION

EPA Toured the Facility: Yes

Data Collected and Observations:

EPA began their SEM inspection at 10:07 AM on the southwest corner of the landfill accompanied by Josh Wells from DTI, while Jeff Benya from EGLE began his SEM inspection on the eastern portion of the landfill accompanied by Eric Ahrnes. EPA took measurements with two Inficon IRwins (IRwin) and two Thermo Fischer Toxic Vapor Analyzer 2020 devices (TVA). Inspectors split into two groups, each equipped with one IRwin to record exceedances of methane above 500 ppm and one TVA to provide confirmation readings for any exceedances. The IRwin and TVA probe inlets were held 10 centimeters (cm) from the ground during SEM, with the probe inlet taped 10 cm from the bottom of the walking sticks on the Irwins.

About 20 minutes into performing SEM, WM instructed EPA and EGLE to get off the landfill for safety reasons but couldn't elaborate on what exactly the concerns were when asked. WM instructed EPA and EGLE to drive back to the main office, where they were told that personnel from the corporate WM office requested that no one return back onto the landfill until the Gas Operations Manager Jim Mohny, who was more than an hour away, arrived at the facility with Blackline Safety devices. EPA questioned what had changed since they were initially allowed out with Josh Wells and Eric Ahrnes who traverse the landfill regularly. Matt Rosser called corporate WM again, and then informed EPA that the two Blackline Safety devices that were already on-site were actually sufficient, and they were allowed back out.

EPA resumed their SEM inspection in the northeast portion of the Landfill at 11:15 AM, moving up the northern slope towards the top plateau of the landfill. EPA approached the flat top area, which appeared sandy and had sparse vegetation throughout, but was told they were not allowed onto the actual plateau because it was an active area for the solidification process. EPA asked why this area was considered active if there were no trucks or construction nearby and vegetation growing on the waste piles, but WM personnel stated they were repeating orders from above. EPA also stated that maps in the facility's quarterly SEM reports show that SEM is performed in this area, but Josh Wells stated that the maps must be incorrect because he knows the technicians who perform SEM have never monitoring in this flat top area. Monthly wellhead monitoring for the wells in this area is still performed. EPA requested several times to perform SEM in this area but were continuously denied.

In summary, EPA logged 29 separate exceedances, many of which represented multiple penetrations or broader areas of exceedance. Six exceedances were located at wellhead penetrations, while the remaining 23 exceedances were located in areas where poor cover had lead to elevated emissions, including areas with distressed to no vegetation, cracks or erosion gullies. A majority of exceedances were more than double the surface methane standard, and 11 exceedances were at least 4 times the surface methane standard. Additionally, EPA identified two marker pipes protruding from the landfill's cover that were releasing LFG containing 8,000 and 10,000 ppm of methane (Images #38 and #45).

Jeff Benya from Michigan EGLE performed a separate concurrent SEM survey on the eastern part of the landfill, finding 15 exceedances above 500 ppm methane. Jeff Benya used a LandTec SEM5000 device to perform SEM.

Furthermore, EPA identified and documented several locations with cover integrity issues. Several areas with distressed vegetation, different-sized bare patches, and exposed waste were also noticed. See Notes About Cover Integrity, Appendix D, for more notes on these locations.

Photos and/or Videos: were taken during the inspection and are listed in Appendix A.

Field Measurements: were taken during this inspection and are listed in Appendix B.

- EPA performed surface emissions monitoring of methane emissions at the landfill using 2 Irwin devices and 2 TVAs.

RECORDS REVIEW

EPA briefly reviewed the facility's cover integrity monitoring plan "BMP-LFG-123", cover monitoring reports from January to May 2024, and the most recent quarterly SEM reports. As shown in Images 1 and 2, the cover integrity monitoring plan includes a list and photos of specific cover integrity issues that should be recorded and addressed, including surface cracking, leachate breakouts and developing leachate breakouts, and flagging waste. No cover integrity issues had been noted in any of the monthly reports, and one photo of the cover was taken per month. The most recent SEM reports showed few to no exceedances in each quarter.

CLOSING CONFERENCE

☒ Provided U.S. EPA point of contact to the facility.

Requested documents:

- Quarterly SEM reports from 2023 Q1 to the present
- NESHAP Semi-Annual reports from 2023 H1 to the present
- Monthly cover integrity logs from January 2023 to the present
- Most recent phase map of the Landfill displaying active (both the solidification and filling areas), intermediate, and final cover
- Most recent as-built map of the GCCS
- LFG flow rate records (scfm) from main header, and also separate flow rates to ZFS and the flare, since January 1, 2023

Concerns: EPA expressed concerns that WM had been finding little to no SEM exceedances during their quarterly surveys when EPA found 29 exceedances in less than 3 hours of monitoring. EPA also expressed concern that no SEM is being conducted on the top of the landfill when only a small portion involves the active solidification process.

DIGITAL SIGNATURES

Report Author: Leeds,
Emma  Digitally signed by Leeds,
Emma
Date: 2024.11.08
13:06:53 -06'00'

Section Supervisor: Frank,
Nathan  Digitally signed by Frank,
Nathan
Date: 2024.11.08
14:04:40 -06'00'

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APPENDICES

1. Appendix A: Digital Image Log and Digital Video Log
2. Appendix B: Field Measurement Data
3. Appendix C: SEM Maps
4. Appendix D: Cover Integrity Descriptions

APPENDIX A: DIGITAL IMAGE LOG AND DIGITAL VIDEO LOG

Inspector Name: Emma Leeds

Archival Record Location: [Autumn Hills Digital Media Log](#)

DIGITAL IMAGE LOG:

Image Number	File Name	Date and Time	Description of Image
1	IMG_0799.JPG	9/13/2024 9:39	Cover Integrity Monitoring SOP
2	IMG_0800.JPG	9/13/2024 9:40	Cover Integrity Monitoring SOP
3	IMG_0801.JPG	9/13/2024 9:40	Cover Integrity Monitoring SOP
4	IMG_0802.JPG	9/13/2024 9:59	Flare control panel
5	IMG_0803.JPG	9/13/2024 10:00	Flare indicator lights
6	IMG_0804.JPG	9/13/2024 10:00	Flare and blower
7	IMG_0805.JPG	9/13/2024 10:00	Flare and blower
8	IMG_0806.JPG	9/13/2024 10:22	Location of exceedance J1
9	IMG_0807.JPG	9/13/2024 10:22	Location of exceedance J1
10	IMG_0808.JPG	9/13/2024 10:29	Location of exceedance K1
11	IMG_0809.JPG	9/13/2024 10:29	Location of exceedance K1
12	IMG_0810.JPG	9/13/2024 11:57	Part of the area where WM prevented EPA from conducting SEM for "safety" reasons, claiming it was active
13	IMG_0812.JPG	9/13/2024 12:42	Location of exceedance K8
14	IMG_0813.JPG	9/13/2024 12:45	Location of exceedance J10
15	IMG_0816.JPG	9/13/2024 12:52	Location of exceedance J11
16	IMG_0817.JPG	9/13/2024 12:55	Location of exceedance K9
17	IMG_0818.JPG	9/13/2024 12:57	Location of exceedance J12
18	IMG_0819.JPG	9/13/2024 13:02	Location of exceedance K10
19	IMG_0820.JPG	9/13/2024 13:06	Location of exceedance K11
20	IMG_0821.JPG	9/13/2024 13:11	Location of exceedance K12
21	IMG_0822.JPG	9/13/2024 13:15	Location of exceedance J13
22	IMG_0823.JPG	9/13/2024 13:19	Location of exceedance K13
23	IMG_0824.JPG	9/13/2024 13:20	Location of exceedance K14
24	IMG_0825.JPG	9/13/2024 13:27	Location of exceedance J14
25	RIMG0001.JPG	9/13/2024 10:40	Horizontal collector
26	RIMG0002.JPG	9/13/2024 10:44	East slope of landfill - active filling area
27	RIMG0003.JPG	9/13/2024 10:44	Passive flare, no longer operating
28	RIMG0004.JPG	9/13/2024 11:20	Location of exceedance J2
29	RIMG0005.JPG	9/13/2024 11:24	Location of exceedance J3
30	RIMG0006.JPG	9/13/2024 11:27	Location of exceedance K2
31	RIMG0007.JPG	9/13/2024 11:32	Location of exceedance J4
32	RIMG0008.JPG	9/13/2024 11:32	Location of exceedance J4
33	RIMG0009.JPG	9/13/2024 11:38	Location of exceedance J6
34	RIMG0010.JPG	9/13/2024 11:40	Location of exceedance J5
35	RIMG0011.JPG	9/13/2024 11:46	Location of exceedance K3

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36	RIMG0012.JPG	9/13/2024 11:50	Location of exceedance K4
37	RIMG0013.JPG	9/13/2024 11:52	Part of the area where WM prevented EPA from conducting SEM for "safety" reasons, claiming it was active
38	RIMG0014.JPG	9/13/2024 11:53	Marker pipe on leaking 8,000 ppm methane
39	RIMG0015.JPG	9/13/2024 12:07	Location of exceedance K5
40	RIMG0016.JPG	9/13/2024 12:08	Location of exceedance K5
41	RIMG0017.JPG	9/13/2024 12:09	Location of exceedance J7
42	RIMG0018.JPG	9/13/2024 12:12	Tall vegetation/shrubbery bordering "active" area where WM prevented EPA from performing SEM
43	RIMG0019.JPG	9/13/2024 12:14	Location of exceedance J8
44	RIMG0020.JPG	9/13/2024 12:20	Location of exceedance J9
45	RIMG0021.JPG	9/13/2024 12:21	Marker pipe leaking 10,000 ppm methane
46	RIMG0022.JPG	9/13/2024 12:26	Location of exceedance K6
47	RIMG0023.JPG	9/13/2024 12:32	Location of exceedance K7

Video Number	File Name	Date and Time	Description of Video
1	MVI_0811.MP4	9/13/2024 11:57	Video of a portion of area claimed as "active face" by WM where EPA was prevented from monitoring, including at the extraction well. Vegetation throughout, including tall grass on storage piles.
2	MVI_0814.MP4	9/13/2024 12:45	Solidification operations on "active face"
3	MVI_0815.MP4	9/13/2024 12:45	Solidification operations on southern-most portion of top plateau of landfill, then videos pans north to remainder of area with

APPENDIX B: FIELD MEASUREMENT DATA

ID	Irwin reading (ppm CH ₄)	Confirmation TVA reading (ppm CH ₄)	Description	Date/Time (ET)	LAT WGS84	LON WGS84
K1	2,863	2,038	Large cracks in landfill surface	9/13/2024 10:30	42.776695	- 85.919139
K2	941	715	Dead area in vegetation, far from any wells	9/13/2024 11:28	42.780125	- 85.917058
K3	821	821	Deep erosion gully in otherwise grassy area	9/13/2024 11:47	42.779268	- 85.917578
K4	2,792	739	GW-130	9/13/2024 11:51	42.7792	- 85.917658
K5	2,342	1,910	GW-169 and 10 ft surrounding eroded area	9/13/2024 12:09	42.77864	- 85.918375
K6	713	11,000	Crack in surface	9/13/2024 12:22	42.778265	- 85.918461
K6.5	897		Eroded area	9/13/2024 12:28	42.778275	- 85.919092
K7	1,398	3,000	Penetration - electrical box	9/13/2024 12:35	42.777875	- 85.918967
K8	1,363	1,500	Small spot of distressed vegetation	9/13/2024 12:41	42.777524	- 85.918807
K9	1,026	1,100	Dead vegetation in grassy area	9/13/2024 12:54	42.776238	- 85.919269
K10	9,746	5,200	Patchy grass coverage, no close wells	9/13/2024 13:02	42.775886	- 85.919286
K11	1,146	1,400	Large area of distressed vegetation	9/13/2024 13:07	42.775764	- 85.919303
K12	5,711	1,400	Hole in large area of distressed vegetation	9/13/2024 13:10	42.775703	- 85.919382
K13	2,693	2,500	Hole in area with sparse grass coverage	9/13/2024 13:20	42.775498	- 85.919435
K14.5	2,621	3,100	Distressed vegetation	9/13/2024 13:21	42.775557	- 85.919346
K14	13,641	27,000	Multiple holes in a distressed vegetation area	9/13/2024 13:23	42.775551	- 85.919277
J1	1,222	1,037	AHHL0044. Nearby ~12" diameter hole also >500ppm	9/13/2024 10:15	42.777276	- 85.920135
J2	1,239	1,140	Dead patch in vegetation north of GW9R	9/13/2024 11:22	42.779949	- 85.917752
J3	826	30,000	Distressed vegetation south of GW9R	9/13/2024 11:24	42.779845	- 85.917711
J4	530	651	Deep erosion rills in clay surface	9/13/2024 11:34	42.77934	- 85.917785

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J5	910	800	Gully in distressed vegetation area	9/13/2024 11:38	42.779275	- 85.917837
J6	1,276	1,931	GW-136	9/13/2024 11:39	42.779315	- 85.917647
J7	688	776	Eroded patch within vegetation	9/13/2024 12:10	42.778578	- 85.918457
J8	865	1,011	Cracked surface within vegetation	9/13/2024 12:14	42.778489	- 85.918473
J9	644	1,312	Distressed vegetation	9/13/2024 12:38	42.777408	- 85.918495
J10	195,282	22,000	GW-116	9/13/2024 12:45	42.776975	- 85.918498
J11	701	943	Cracks in grassy area	9/13/2024 12:53	42.776029	- 85.918829
J12	21,835	7,500	Crack in area with patchy grass coverage	9/13/2024 12:59	42.775587	- 85.918801
J13	3,366	4,500	GW-67	9/13/2024 13:11	42.775515	- 85.917424
J14	521	4,000	Distressed vegetation patch in grassy area	9/13/2024 13:26	42.774939	- 85.918631

Calibration Data and Instrument Information

IRwin 1 (S/N: 92004352) Calibration at 10:00 AM

Measurement	Reading for 503.1 ppm gas	Response Time
#1	493	1
#2	490	2
#3	494	2

IRwin 2 (S/N: 92004350) Calibration at 10:00 AM

Measurement	Reading for 503.1 ppm gas	Response Time
#1	489	1
#2	489	2
#3	487	3

TVA Bump Check Post Calibration at 9:45 AM

TVA	Reading for 550 ppm gas	Reading for 1960 ppm gas	Reading for 10000 ppm gas
TVA # B39303	541	1961	9900
TVA # B39302	522	1920	9720

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Bump Check after SEM at 2:03 PM:

Instrument	Reading for 503.1 ppm gas
Inficon IRwin #1 (S/N:92004352)	460
Inficon IRwin #2 (S/N:92004350)	460

Background Concentrations:

Upwind	Downwind
0 ppm	0.8 ppm

APPENDIX C: SEM EXCEEDANCE MAP

Map of EPA and EGLE SEM Exceedances and Leaking Marker Pipes



Key	
	USEPA SEM Exceedances
	MI EGLE SEM Exceedances
	Marker pipes leaking >500 ppm methane from top

APPENDIX D: COVER INTEGRITY DESCRIPTIONS

Number	Description	Image Number (s)	Latitude	Longitude
1	Large cracks in landfill surface	10, 11	42.776695	-85.919139
2	Small spot of distressed vegetation	13	42.777524	-85.918807
3	Cracks in grassy area	15	42.776029	-85.918829
4	Dead vegetation in grassy area	16	42.776238	-85.919269
5	Crack in area with patchy grass coverage	17	42.775587	-85.918801
6	Patchy grass coverage, no close wells	18	42.775886	-85.919286
7	Large area of distressed vegetation	19	42.775764	-85.919303
8	Hole in large area of distressed vegetation	20	42.775703	-85.919382
9	Hole in area with sparse grass coverage	22	42.775498	-85.919435
10	Distressed vegetation	Location of exceedance K14.5	42.775557	-85.919346
11	Multiple holes in a distressed vegetation area	23	42.775551	-85.919277
12	Distressed vegetation patch in grassy area	24	42.774939	-85.918631
13	Dead patch in vegetation north of GW9R	28	42.779949	-85.917752
14	Distressed vegetation south of GW9R	29	42.779845	-85.917711
15	Dead area in vegetation, far from any wells	30	42.780125	-85.917058
16	Deep erosion rills in clay surface	31, 32	42.77934	-85.917785
17	Gully in distressed vegetation area	34	42.779275	-85.917837
18	Marker pipe on leaking 8,000 ppm methane	38		
19	Deep erosion gully in otherwise grassy area	35	42.779268	-85.917578
20	Eroded area	39, 40	42.77864	-85.918375
21	Eroded patch within vegetation	41	42.778578	-85.918457
22	Cracked surface within vegetation	43	42.778489	-85.918473
23	Distressed vegetation	44	42.777408	-85.918495
24	Marker pipe leaking 10,000 ppm methane	45		
25	Crack in surface	46	42.778265	-85.918461