



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF ENFORCEMENT AND COMPLIANCE ASSURANCE

DATE: See date of Section Chief signature

SUBJECT: CLEAN AIR ACT INSPECTION REPORT
Waste Management Atascocita Landfill, Humble, TX

FROM: Daniel Heins, Environmental Scientist
Stationary Source Enforcement Branch, EPA OECA

THRU: Gregory Fried, Branch Chief
Stationary Source Enforcement Branch, EPA OECA

TO: File

BASIC INFORMATION

Facility Name: Waste Management Atascocita Landfill

Facility Location: 3623 Wilson Road, Humble, TX 77396

Date of Inspection: On Site Inspection: March 15, 2023
Virtual Conference: April 25, 2023

EPA Inspector(s):

1. Daniel Heins, Environmental Scientist, EPA OECA ^{a,b}
2. Daniel Hoyt, Environmental Engineer, EPA OECA ^{a,b}
3. Colleen McCarthy, Air Inspector, EPA Region 6 ^{a,b}
4. Kenneth McPherson, Life Scientist, EPA Region 6 ^b
5. Benjamin Rosenthal, Air Inspector, EPA Region 6 ^{a,b}

Other Attendees:

1. Keith Sharon, Area Gas Operations Manager for TX/OK, WM ^{a,b}
2. Heather Lehrmann, Director of Environmental Protection & Compliance for TX/OK, WM ^{a,b}
3. Dave Thorley, Director of Air Compliance, WM ^{a,b}
4. Joseph Tommaso, Gas Operations Supervisor, WM ^{a,b}
5. Andrew Berry, Environmental Compliance Manager, WM ^a
6. Justin Posey, Environmental Specialist, WM ^{a,b}

^a Attended conference

^b Attended surface emissions monitoring (SEM)

Contact Email Address: ksharon@wm.com

Purpose of Inspection: Surface monitoring and partial compliance evaluation for the Clean Air Act

Facility Type: Municipal solid waste (MSW) landfill

Regulations Central to Inspection: 40 C.F.R. Part 60, Subpart WWW; 40 C.F.R. Part 62, Subpart OOO; 40 C.F.R. Part 63, Subpart AAAA; 40 C.F.R. Part 98, Subpart HH

On Site (3/15) Arrival Time: 09:00 Central

On Site (3/15) Departure Time: 17:00 Central

Virtual Conference (4/25) Start Time: 14:30 Central

Virtual Conference (4/25) End Time: 16:00 Central

Inspection Type:

- ☒ Unannounced Inspection
☐ Announced Inspection

SITE OVERVIEW

The following information was obtained verbally from Waste Management representatives during the virtual conference.

Company Ownership:

Waste Management's Atascocita Landfill ("the Landfill") is permitted to and owned/operated by WM of Texas, Inc., along with other Texas landfills under Waste Management, Inc. The site has always been operated by Waste Management.

Operations Overview:

The Landfill began permitting in 1982 and started accepting waste in 1983. Its design capacity is approximately 50.6 million megagrams (Mg). The most recent expansion of its permitted design capacity was in 2010. The site is roughly divided into two areas, the "North Hill" on the northwest side of the site, and the "South Hill" on the southeast side of the site (see Overview Map in Appendix C). The present active area is on the far eastern end of the South Hill, all in areas that have had waste in place for less than five years. None of the Landfill is at final elevation, so the active area may at some times in the past and future be over areas with waste in place for longer than five years.

Approximately 306 acres of the site are under intermediate cover, 10 acres under final cover, and 2 under daily cover. Intermediate cover is a minimum of 18 inches of soils. Tarps are approved for daily cover. The Landfill operates 24/7, so soils are added when moving the working face away from an area.

The Landfill receives approximately 5000 tons per day of waste, with approximately 20 years of capacity left pending market conditions. Waste includes MSW, construction & demolition (C&D) waste, sludges (primarily wastewater treatment plant), and class 2 and 3 industrial wastes. The Landfill accepts asbestos waste and does not accept potentially refrigerant-containing appliances.

The gas collection and control system presently contains approximately 415 gas collection points. As of 2022, approximately 266 were vertical, 32 were horizontal, and 79 were alternative collectors, including leachate risers with gas collection and collectors outside of the waste mass for migration control. Vertical well construction typically is a 36" borehole drilled into the waste mass with PVC or HDPE pipe with aggregate backfill. Some wells have dewatering pumps. Condensate and leachate are collected separately but come in storage tanks from which they are trucked off site for disposal.

The Landfill has typically been collecting approximately 5,500 to 6,500 scfm of gas over the past few years. The landfill has three 150 horsepower blowers, typically running two at a time. Gas is routed either to on-site flares or to a renewable natural gas (RNG) plant owned/operated by Montauk Energy. The current flares on site are a 3,200 standard cubic feet per minute (scfm) open flare and a 6,000 scfm open flare. These are being replaced by what will ultimately be an arrangement of four 3,000 scfm low-NOx enclosed flares with one small utility flare. Most gas is routed to the RNG plant. All gas is routed to a common header, some percent of the gas may be routed to flares if the RNG plant cannot take all the gas. The RNG plant typically takes all collected gas, with an approximate capacity of 7,000 – 7,500 scfm.

SITE TOUR — MARCH 15, 2023

- ☒ 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
- ☒ Asked the company to identify CBI, none identified

Data Collected and Observations:

EPA conducted an abbreviated SEM survey of the facility. EPA used three ThermoFisher Toxic Vapor Analyzers 2020 (TVA2020) to perform EPA Reference Method 21 for the SEM. EPA monitored in two teams, with the third instrument moving between the two teams to provide confirmation readings for each exceedance point. GPS tracks were recorded for the confirmation instrument.

EPA monitored exclusively on the North Hill, an area that had not seen any recent construction or waste deposition activity. In the morning, the survey was focused on the southern slope of the North Hill. In the afternoon, the survey focused on the western north slope of the North Hill. See Appendix C for maps of coverage. Total EPA coverage was less than 40% of the North Hill.

The EPA inspectors flagged 75 points above 500 ppm methane. 44 exceedances were at penetrations, 31 exceedances were not in association with penetrations. All but two of the exceedances had confirmation measurements and included measurements within 5 to 10 centimeters of the landfill surface. The two remaining locations were points of intermittent venting of landfill gas from the tops of wells: in one case a sump missing a cover cap, and the other from the pneumatic dewatering pump. The bulk of the exceedances were found at wellheads, areas of erosion, exposed waste, or leachate risers. Multiple exceedances were in bubbling ponded liquids. Some of the leachate risers appeared to be the source of relatively large amounts of leaking landfill gas, with significant odors and high readings measured at multiple feet away from the risers. The exceedances at the risers were all measured within 5-10 cm of the surface in addition to from the risers directly. EPA observed erosion gulleys, leachate breakouts, and exposed waste on the North Hill.

WM staff accompanied the EPA inspectors, observed the EPA monitoring, and were given the opportunity to view all EPA readings. EPA asked the WM staff to identify any concerns that they had with any of the EPA monitoring. WM indicated that the exceedances EPA measured from pneumatic pumps or other points on top of the wellheads were not “surface exceedances” subject to monitoring. EPA highlighted that regardless of whether these were subject to SEM requirements, the measurements indicated venting of collected gas that would need correction. WM stated that they believed that the leachate risers were only subject to monitoring at the point where it penetrated the cover. EPA highlighted that the exceedances were detected at those locations as well as from leaking gaskets, and that the quantities of leaking gas appeared significant.

Photos and/or Videos: were taken during the inspection. See Appendix A.

Field Measurements: were taken during this inspection. See Appendix B.

INSPECTION CONFERENCE — APRIL 25, 2023

- ☒ Provided U.S. EPA point of contact to the facility
- ☒ Asked the company to identify CBI, none identified

EPA showed facility representatives a map of the path walked during the on-site SEM survey and the exceedances detected.

Staff Interview:

The Landfill operates under Federal Plan Part 62 Subpart OOO, having previously operated under NSPS Part 60 Subpart WWW. It began using NESHAP Part 63 Subpart AAAA requirements on the effective date of Subpart AAAA in September 2021. The Landfill has an uncontrolled non-methane organic compound generation rate of greater than 50 megagrams and has been subject to gas collection and control requirements for longer than the past five years.

It is to be determined if there could be potential expansion beyond the current capacity. Storm debris was highlighted as a source of irregular large amounts of waste, with the aftermath of Hurricane Harvey resulting in one year using up airspace that would normally take six years to fill.

WM uses Weaver for their emissions estimates and reporting, providing them the waste data to run the calculations.

The Landfill has gas migration probes which WM checks quarterly. No probes are currently showing gas at the lower explosive limit.

Wellheads are checked monthly, but all additional tuning and monitoring is tracked on a database. Liquid levels in wells are surveyed annually. The decision to install a dewatering pump is based off of well performance and would not necessarily be done just based off the liquids survey results.

Gas routed to the RNG plant is supposed to be a minimum of 50% methane. If oxygen was above around 1.5% then Montauk would communicate to WM and technicians would start investigating to see if there are obvious maintenance issues and otherwise retune wells as needed. There is a nitrogen removal unit at the RNG plant. The RNG plant is separately permitted.

No wells are currently operating above 145 degrees Fahrenheit. Some alternative collectors have approved positive pressure allowances.

H/ET has been conducting the SEM surveys for WM for the past several years, using a SEM5000. They are continuously monitoring with that instrument. When the working face is within the 5-year limit that would be identified as a dangerous area. WM cannot recall identifying any slopes as too steep to safely monitor. WM/HET would not exclude areas from monitoring due to high vegetation. WM has a third party contracted to do routine mowing, if there was high vegetation obstructing monitoring than WM would schedule mowing and monitoring to cover that area. WM has a best management practice/protocol they share with H/ET, and provide them a list of penetrations and a path to walk.

Cover integrity surveys are done by site staff monthly, with issues and corrections documented.

The site has approximately 35 employees.

Reviewed documents:

On site:

- 2022 Q4 SEM Survey Report
 - Performed by H/ET with a SEM 5000
 - 15 total exceedances
 - 12 at penetrations
 - 2 on the South Hill
 - 10 on the North Hill
 - 3 other exceedances (all on the North Hill)
 - Fewer than 5 total exceedances in the approximate area of EPA survey

Prior to inspection (available publicly online):

- November 2022 Semi-Annual Report, including 2022 Q2 & Q3 SEM results
 - Q2 SEM
 - 67 exceedances total
 - Approximately 37 from the North Hill
 - Fewer than 20 in the approximate area of EPA survey
 - Q3 SEM
 - 34 exceedances total
 - Approximately 19 from the North Hill
 - Fewer than 12 in the approximate area of EPA survey

Via email / for conference:

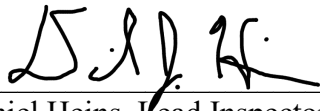
- SEM re-monitoring and corrective actions in response to EPA identified exceedances
 - All penetrations were identified as being corrected with added cover and bentonite seals, five of which required additional soils and or seals
 - Verbally stated during the conference: Regarding the pneumatic pumps that EPA found to be venting landfill gas, WM stated that they redirected the pump exhaust into the system, but stated that they do not do this by default because that would add oxygen to the gas stream. WM stated that some of the leachate risers may have been retuned or had automated collectors added in addition to the bentonite/soils work highlighted in the followup document.
 - All non-penetration exceedances were identified as being corrected with added cover soils and were less than 500 ppm at the 10-day and 1-month re monitoring

Requested documents:

After discussing preference between a Section 114 Request For Information Letter and an emailed list of documents associated with the inspection, WM expressed a preference for the latter.

Concerns:

- EPA noted a significant disparity between the number of exceedances they had found compared with recent SEM surveys, indicating possible concerns with the quality of the SEM surveys
- EPA noted that they observed points of erosion, leachate breakouts, and exposed waste throughout the day
- EPA noted that the venting of landfill gas from the pneumatic pumps appeared to be a recurring problem
- EPA noted that the leachate risers particularly seemed to be large sources of leaking landfill gas

DIGITAL SIGNATURES

Daniel Heins, Lead Inspector

on behalf of
Gregory Fried, Supervisor

APPENDICES AND ATTACHMENTS

Appendix A: Digital Image Log

Appendix B: Field Measurement

Appendix C: Maps

APPENDIX A: DIGITAL IMAGE LOG**Inspector Names:** Daniel Heins, Daniel Hoyt, Benjamin Rosenthal**Archival Record Location:** US EPA SharePoint**Image Log (1/3)**

Image #	File Name	Date/Time (Central)	Description
1	20230315_162405.jpg	2023:03:15 16:24:05	B30. Landfill gas bubbling through liquids
2	IMG_3934.JPG	2023:03:15 10:48:27	A6. pipe penetrations IV-4/5/6
3	IMG_3935.JPG	2023:03:15 10:59:58	A7. Bare ground/distressed vegetation
4	IMG_3936.JPG	2023:03:15 11:12:42	A9. Pneumatic pump outlet leaking LFG, H265
5	IMG_3937.JPG	2023:03:15 11:32:33	A11. Bare patch of earth.
6	IMG_3938.JPG	2023:03:15 11:38:41	A12. GW656.
7	IMG_3939.JPG	2023:03:15 11:44:32	A13. Bare earth and exposed waste
8	IMG_3941.JPG	2023:03:15 11:46:12	A14. Mattresses exposed at GW-656A
9	IMG_3942.JPG	2023:03:15 11:47:20	A14. Mattresses exposed at GW-656A
10	IMG_3943.JPG	2023:03:15 11:49:40	A15. Bare ground.
11	IMG_3944.JPG	2023:03:15 11:51:42	A15. Bare ground.
12	IMG_3945.JPG	2023:03:15 11:53:20	A16. Flagging foam in bare ground.
13	IMG_3946.JPG	2023:03:15 11:53:32	Additional exposed waste and bare ground
14	IMG_3947.JPG	2023:03:15 11:58:07	A17. GW664
15	IMG_3948.JPG	2023:03:15 12:07:19	A18 Exposed waste/distressed vegetation
16	IMG_3949.JPG	2023:03:15 12:09:20	A19 capped well
17	IMG_3950.JPG	2023:03:15 12:12:17	A20 bare ground
18	IMG_3952.JPG	2023:03:15 12:17:36	A20 erosion/rivulet
19	IMG_3953.JPG	2023:03:15 12:17:43	A20 erosion/rivulet
20	IMG_3954.JPG	2023:03:15 12:20:45	Bubbling leachate breakout
21	IMG_3955.JPG	2023:03:15 12:20:52	Bubbling leachate breakout
22	IMG_3959.JPG	2023:03:15 12:26:27	A22 Erosion gulley
23	IMG_3960.JPG	2023:03:15 12:31:21	A23 venting LFG from taped connector on welhead ATP2-0001
24	IMG_3961.JPG	2023:03:15 12:31:43	A23 venting LFG from taped connector on welhead ATP2-0001
25	IMG_3962.JPG	2023:03:15 14:38:14	A27 discolored soils at base of penetration
26	IMG_3963.JPG	2023:03:15 14:41:56	Exposed waste
27	IMG_3964.JPG	2023:03:15 14:45:45	A28 erosion/discolored soils
28	IMG_3965.JPG	2023:03:15 14:45:47	A28 erosion/discolored soils
29	IMG_3966.JPG	2023:03:15 14:48:36	A29 GW338 with erosion gulleys
30	IMG_3967.JPG	2023:03:15 14:50:15	A30 exposed waste and erosion
31	IMG_3968.JPG	2023:03:15 14:54:48	A32 exposed waste
32	IMG_3969.JPG	2023:03:15 14:59:11	A32 exposed waste and bare ground
33	IMG_3970.JPG	2023:03:15 14:59:22	Erosion/exposed waste/bare ground
34	IMG_3971.JPG	2023:03:15 14:59:25	Erosion rivulets and bare ground
35	IMG_3972.JPG	2023:03:15 15:02:48	A33 erosion
36	IMG_3973.JPG	2023:03:15 15:02:51	A33 erosion
37	IMG_3974.JPG	2023:03:15 15:04:36	A34 GW-336-R2 with exposed waste
38	IMG_3975.JPG	2023:03:15 15:06:51	Ponded liquids and discolored soils/distressed vegetation
39	IMG_3976.JPG	2023:03:15 15:10:59	A35 erosion gulleys/bare soil

Image Log continued (2/3)

Image #	File Name	Date/Time (Central)	Description
40	IMG_3977.JPG	2023:03:15 15:15:26	A36 by stormwater channel with hole (exposed waste under)
41	IMG_3978.JPG	2023:03:15 15:22:18	Exposed waste
42	IMG_3979.JPG	2023:03:15 15:28:56	A37 erosion
43	IMG_3980.JPG	2023:03:15 15:29:24	A37 erosion
44	IMG_3981.JPG	2023:03:15 15:29:28	A37 erosion
45	IMG_3982.JPG	2023:03:15 15:37:36	A38 LC5
46	IMG_3983.JPG	2023:03:15 15:38:15	A39 AFV-1/IV-14, bare earth and waste
47	IMG_3984.JPG	2023:03:15 16:16:13	A41 GW-50R
48	IMG_3985.JPG	2023:03:15 16:21:34	A42 GW353 at exposed skirt
49	IMG_3986.JPG	2023:03:15 16:21:37	A42 GW353 at exposed skirt
50	IMG_3987.JPG	2023:03:15 16:26:35	A43 erosion
51	R0010009.JPG	2023:03:15 10:11:14	B1 bare earth
52	R0010010.JPG	2023:03:15 10:11:59	B1 bare earth
53	R0010011.JPG	2023:03:15 10:15:13	Leachate breakout with discolored soils and bare earth and exposed waste
54	R0010012.JPG	2023:03:15 10:21:41	B2 distressed vegetation
55	R0010013.JPG	2023:03:15 10:24:28	B3 broken pipe sticking out of cover / bare soils and distressed vegetation
56	R0010014.JPG	2023:03:15 10:24:30	B3 broken pipe sticking out of cover / bare soils and distressed vegetation
57	R0010015.JPG	2023:03:15 10:26:49	B4 GW113R
58	R0010016.JPG	2023:03:15 10:54:05	B5 GW102
59	R0010017.JPG	2023:03:15 11:00:04	B6 distressed vegetation
60	R0010018.JPG	2023:03:15 11:17:26	B7 sump missing cover cap
61	R0010019.JPG	2023:03:15 11:30:33	B8 GW512
62	R0010020.JPG	2023:03:15 11:33:55	B9 exposed waste
63	R0010021.JPG	2023:03:15 11:34:19	B9 bare earth
64	R0010022.JPG	2023:03:15 11:57:04	B10 GW529 exposed skirt
65	R0010023.JPG	2023:03:15 12:05:44	B11 GW235R with discolored soils
66	R0010024.JPG	2023:03:15 12:14:54	B12 distressed vegetation
67	R0010025.JPG	2023:03:15 12:20:03	B13 gully washout
68	R0010026.JPG	2023:03:15 12:23:31	B14 leachate sump, leachate breakout
69	R0010027.JPG	2023:03:15 12:23:58	B14 leachate sump, leachate breakout
70	R0010028.JPG	2023:03:15 12:26:36	B14 leachate sump, leachate breakout
71	R0010029.JPG	2023:03:15 14:28:34	B15 GW628 exposed skirt
72	R0010030.JPG	2023:03:15 14:34:27	B16 GW623 torn exposed skirt
73	R0010031.JPG	2023:03:15 14:39:12	B17 bare earth
74	R0010032.JPG	2023:03:15 14:47:43	B18 GW55R2
75	R0010033.JPG	2023:03:15 14:51:36	B19 bare earth/exposed waste
76	R0010034.JPG	2023:03:15 14:51:50	B19 bare earth/exposed waste
77	R0010035.JPG	2023:03:15 14:56:46	B20 GW334R
78	R0010036.JPG	2023:03:15 15:15:36	B21 Ponded leachate with bubbling, algae, and exposed waste
79	R0010037.JPG	2023:03:15 15:25:54	B22 bubbling through liquids and discolored soils
80	R0010039.JPG	2023:03:15 15:33:57	Large erosion gully

Image Log continued (3/3)

Image #	File Name	Date/Time (Central)	Description
81	R0010040.JPG	2023:03:15 15:44:50	B24 Leachate riser LCR3-1
82	R0010041.JPG	2023:03:15 15:50:42	B25 Leachate risder LCR3-2
83	R0010042.JPG	2023:03:15 15:51:06	B25 Leachate risder LCR3-2
84	R0010043.JPG	2023:03:15 15:56:45	B26 Leachate riser LCR 3-3, distressed vegetation
85	20230315_162337.mp4	2023:03:15 16:23:37	Video, B30 landfill gas bubbling through liquids
86	20230315_162355.mp4	2023:03:15 16:23:55	Video, B30 landfill gas bubbling through liquids
87	R0010038.MOV	2023:03:15 15:26:00	Video, B22 landfill gas bubbling through liquids / discolored soils

APPENDIX B: FIELD MEASUREMENT DATA

Measured Exceedances (1/4)

Flag	Reading 1	Reading 2	Description	Latitude	Longitude
A1	2,242	1,100	Leachate Riser LCR-2-2, ground surrounding riser and at riser cover interface.	29.95393088	-95.24338648
A2	2,500	10,100	VC-14-3, ground around base of well.	29.95388494	-95.24271349
A3	700	1,100	Around edge of tarp.	29.95407413	-95.24211568
A4	9,000	3,900	Unidentified Riser upslope of A3 and A5.	29.95419534	-95.24219929
A5	7,000	5,000	GW-114R base of well. Possible previous corrective action observed.	29.95420071	-95.24233667
A6	2,800	1,400	IV-5; IV-4; IV-6. Multiple pipe-cover penetration interfaces.	29.9534413	-95.24228618
A7	2,800	4,500	Area in the vicinity of grid marker BB, bare ground surrounded by distressed veg.	29.95393461	-95.24099483
A8	2,500	2,200	GW 11-117 base around well.	29.95400226	-95.24084165
A9	-	Flame Out	Pneumatic pump venting uncontrolled LFG. Riser H265. No confirmation due to intermittent venting	29.9540614	-95.23930727
A10	2,200	2,900	H2-7S - base of well/riser.	29.95417891	-95.23902268
A11	870	1,300	Bare patch of eroded slope facing ESE.	29.95607202	-95.23964798
A12	3,500	4,800	DW-656 both riser penetrations.	29.95649218	-95.24050206
A13	880	1,800	Bare patch of ground.	29.95637869	-95.2404873
A14	2,400	1,800	Multiple mattresses penetrating cover near well GW-656A	29.95613738	-95.24105193
A15	1,100	1,300	bare ground	29.95605038	-95.2415046
A16	1,200	950	Mattresses and other proximate flagging.	29.95595503	-95.24142813
A17	9,000	1,100	GW-664 both riser and well-cover interfaces.	29.95618074	-95.24221027
A18	585	720	Area with exposed waste.	29.95657512	-95.24376021
A19	1,000	650	Around the base of a capped well.	29.95635372	-95.24374299
A20	699	1,000	Erosion/rivulet.	29.95578432	-95.24423093

Measured Exceedances, continued (2/4)

Flag	Reading 1	Reading 2	Description	Latitude	Longitude
A21	3,700	2,200	Erosion gulley. Leachate seep visible in area.	29.95530209	-95.24496742
A22	2,400	1,200	Erosion gulley.	29.95497964	-95.24423902
A23	600	1,200	ATP2-0001. Base. Also Vented LFG from taped connector on wellhead (2.6%)	29.95501617	-95.24392339
A24	1,100	6,000	GW-528 base of well and ground between well and lateral.	29.95503169	-95.2438455
A25	2,500	3,500	Base of leachate collector (undesignated).	29.95436407	-95.24428535
A26	3,900	3,500	LCR 2-3 broad area where leachate is leaking below the sump riser.	29.95429706	-95.24430373
A27	18,000	1,300	Around base of leachate collectors (undesignated).	29.96109487	-95.24155866
A28	3,400	1,200	Broad area of slope erosion.	29.96081441	-95.24099711
A29	8,700	12,000	GW-338 Two gullies bordering wellhead and lateral.	29.96087482	-95.24088261
A30	2,500	5,900	Gulley.	29.96096572	-95.24092616
A31	5,900	900	Gulley.	29.9609227	-95.24052087
A32	1,100	700	Erosion on slope.	29.96088216	-95.24060594
A33	8,000	1,000	Erosion on slope.	29.96089092	-95.24029912
A34	1,700	3,000	GW-336-R2 base of well.	29.96105169	-95.240087
A35	700	1,100	erosion/gulley	29.96140843	-95.24049209
A36	1,200	1,500	Stormwater BMP-hole in the middle of the poly.	29.96134753	-95.24071061
A37	900	1,800	erosion/gulley	29.96134948	-95.24127161
A38	1,300	1,000	LC-5	29.96138849	-95.24157732
A39	800	1,100	AFV-1/IV-14 base of header valves.	29.96139911	-95.24161363
A40	670	7,000	ATV WO43	29.96125128	-95.24199058
A41	864	740	GW-50R around base of well.	29.96041875	-95.24435817
A42	1,400	1,400	GW-353	29.9605312	-95.2442025
A43	1,080	580	Access road tire track erosion	29.96019947	-95.24386996

Measured Exceedances, continued (3/4)

Flag	Reading 1	Reading 2	Description	Latitude	Longitude
B1	950	1,058	Surface	29.95437869	-95.24335681
B2	936	800	Surface	29.95444949	-95.24288924
B3	1,348	8,000	Inside and outside of broken pipe	29.95447712	-95.242756
B4	714	1,300	GW113R	29.95434771	-95.24276179
B5	2,322	2,350	GW102	29.95457584	-95.24030923
B6	758	1,140	Surface near distressed vegetation	29.95456414	-95.23983519
B7	1,600	-	Sump missing cover cap, readings fluctuate with pump action. No confirmation due to intermittent venting.	29.95463602	-95.23900029
B8	1,386	700	GW512	29.95562508	-95.23943244
B9	1,182	800	Surface in rut caused by erosion/runoff (multiple points in area)	29.95573346	-95.2395326
B10	1,799	700	GW539 at end of skirt	29.95576623	-95.24318039
B11	1,289	630	GW235R	29.95563285	-95.24425103
B12	2,600	12,000	Surface area with no vegetation/washout	29.95552744	-95.24536191
B13	5,415	21,000	Gully washout with no vegetation (6000 ppm at knee level)	29.95540963	-95.24515706
B14	2,700	5,000	At leachate sump, leachate coming out of ground	29.95481793	-95.24547246
B15	1,561	2,500	GW628	29.96020154	-95.24129252
B16	3,300	800	GW623 at tear in skirt	29.96028578	-95.2404931
B17	600	800	Surface	29.96041781	-95.24018809
B18	1,700	800	GW55R2	29.96060631	-95.23966077
B19	743	4,000	Surface, exposed waste in area	29.96081152	-95.23975861
B20	1,675	800	GW334R	29.96110612	-95.23968922
B21	1,130	1,500	Low spot with ponded leachate, bubbling gas observed	29.96197606	-95.2412968

Measured Exceedances, continued (4/4)

Flag	Reading 1	Reading 2	Description	Latitude	Longitude
B22	1,246	3,700	Surface with bubbling from hole	29.96184121	-95.24166222
B23	2,600	700	Near CS5 condensate sump, also detect at base of condensate sump	29.96161943	-95.24251008
B24	1,788	1,635	Leachate riser LCR 3-1	29.96181289	-95.24252112
B25	4,000	2,200	(2200 reading was 10 cm from ground) Leachate riser LCR 3-2 13,000 – 30,000 ppm coming from leachate riser piping, multiple points	29.96180631	-95.24326273
B26	16,000	10,000	LCR 3-3 leachate riser, 16,000 ppm 2 inches above ground, 10,000 ppm 3 ft away from pipe	29.96180802	-95.24417422
B27	4,600	9,000	Near Leachate riser 3-4 (15,000 ppm coming from pipe in ground)	29.96177827	-95.244968
B28	2,364	1,200	Surface 500 ppm 2 ft away	29.96179968	-95.24506524
B29	1,506	3,500	CS6 Condensate sump	29.9614741	-95.24553927
B30	1,591	604	Surface, liquids ponded and bubbling	29.95979127	-95.24489846
B31	3,500	12,000	Widespread area with erosion no vegetative cover (three separate flagged spots)	29.95991283	-95.24456571
B32	2,100	2,776	GW637 multiple penetration points with detects	29.9598359	-95.24369572

Calibration and Instrument Information

EPA used three ThermoFisher Toxic Vapor Analyzers 2020 (TVA2020), numbered 202017092712, 202023016408, and 202016081525 (and designated as TVAs “Green”, “Red” and “Black”). The EPA TVA2020 response times are approximately 4.5 seconds. EPA calibrated with 500 ppm methane in air and zero gas.

Bump Checks

	TVA Green	TVA Red	TVA Black
08:30 initial calibration	501	494	493
13:35 mid-day drift check	433	415	448
13:35 after re-calibration	520	501	500
16:50 end of day drift check	520	508	494

Background readings:

Upwind: 0 ppm

Downwind: 4 ppm

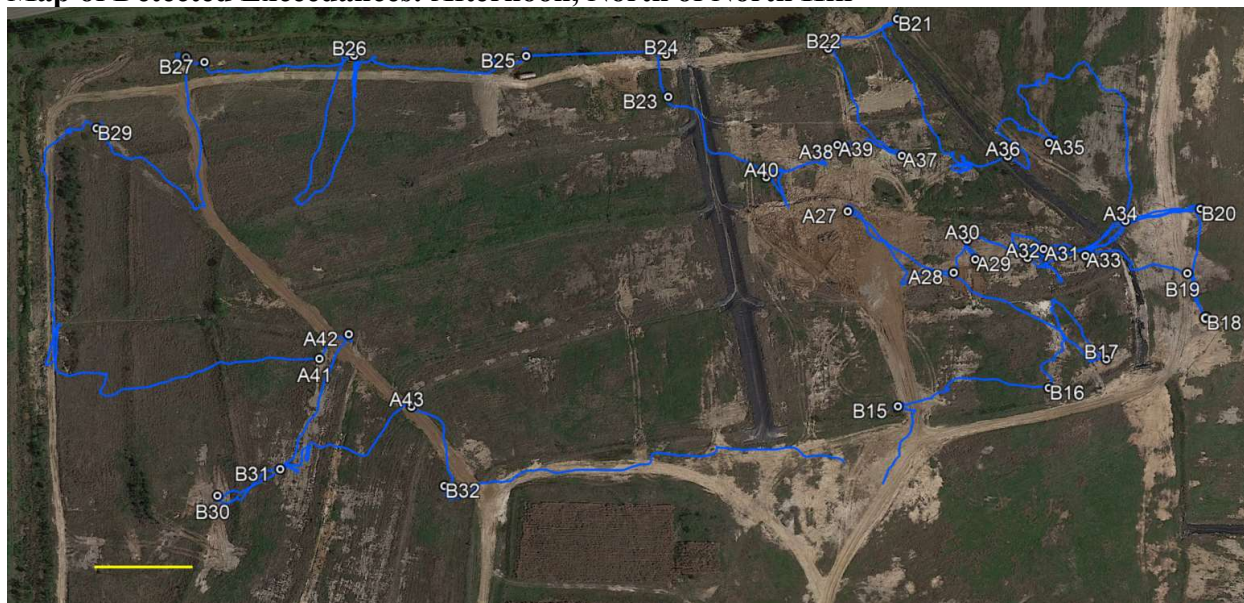
APPENDIX C: MAPS

Site Overview Map



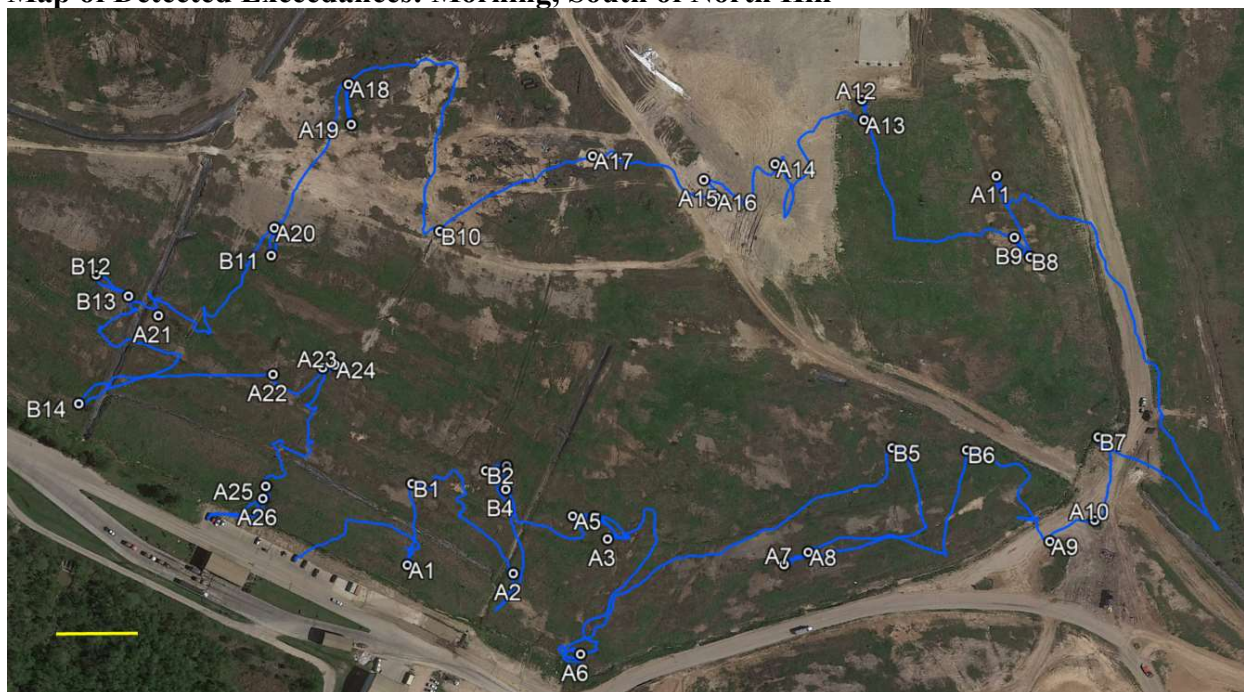
Blue line roughly shows EPA survey coverage, tracing the confirmation reading instrument. Active area at far eastern end of South Hill. Satellite imagery dated to April 2022 as shown on Google Earth.

Map of Detected Exceedances: Afternoon, North of North Hill



Blue line roughly shows EPA survey coverage, tracing the confirmation reading instrument. Exceedance locations labeled with their flag numbers. Yellow line is 50m, north is up. Satellite imagery dated to April 2022 as shown on Google Earth. Survey area covered less than 33 acres.

Map of Detected Exceedances: Morning, South of North Hill



Blue line roughly shows EPA survey coverage, tracing the confirmation reading instrument. Exceedance locations labeled with their flag numbers. Yellow line is 50m, north is up. Satellite imagery dated to April 2022 as shown on Google Earth. Survey area covered less than 52 acres.