Region 2 Caribbean Environmental Protection Division
Multimedia Permits and Compliance Branch
Air Protection Team

CAA Inspection Report

Inspection Date: April 30, 2024

Facility Name: Municipality of Arecibo Landfill

Facility Address: PR-682 Interior, Bo. Factor, Garrochales Sector, Arecibo, Puerto Rico

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José González, Operations Manager, 787-273-7639, jcgonzalez@conwastepr.com

This report is a summary of observations and information gathered from the facility at the time of the inspection. The information provided does not constitute a final decision on compliance with Clean Air Act ("CAA") regulations or applicable permits, nor is it meant to be a comprehensive summary of all activities and processes conducted at the facility.

Summary of Onsite Observations

A. Opening Conference

The representatives of the United States Environmental Protection Agency (USEPA), Alex Rivera, Gloria Diaz-Galarza, Victor Tu, Katherine Marmanides, Maria Malave, Steven Rapp, and Daniel Heins arrived at the Municipality of Arecibo Landfill ("MAL" or "facility") located in PR-682 Interior, Factor Ward, Garrochales Sector in Arecibo, PR. at approximately 10:40 am. The EPA representatives ("the inspectors") were met upon arrival by Mr. José González, Operations Manager, showed credentials and explained the purpose of the inspection. Mr. González contacted Mr. Hermes Camis, Facility Manager, via phone. Mr. Camis informed the inspectors that he was driving back to the facility, as he was at Conwaste's operated landfill located in

Mayagüez, PR. However. Mr. Camis agreed on addressing questions from the inspectors. The following is a summary of the conversation with Mr. Camis:

1. Daily cover material – Mr. Camis informed that two types of cover material are being used, including dirt that is acquired from a nearby quarry and Posi-Shell®[1]. Mr. Camis added that approximately 1 foot of cover is applied.
2. Safety – Mr. Camis and Mr. González both confirmed that they were not aware of any dangerous areas that could affect the SEM inspection, and informed that the only challenge would be related to slippery areas and forecast of rain throughout the day.
3. Active waste dump areas – Mr. Camis informed that the south portion of the landfill is being used as active waste dump area.
4. Areas where waste has been in place fewer than 5 years – Mr. Camis indicated that around all landfill there is a possibility that the facility gas collection and control system (GCCS) could be collecting gas from waste in place fewer than 5 years.
5. Type of landfill gas monitoring wells – Mr. Camis informed that the landfill has 85 landfill gas monitoring wells, all regulatory and vertical.
6. Type of waste - Mr. Camis indicated that the facility receives construction debris mixed with municipal solid waste.
7. GCCS status – Mr. Camis informed that the facility GCCS was in operation at the time of the inspection and that around 6 gas monitoring wells were disconnected to allow activities in the active dump area. Mr. Camis stated that these wells are located within the south facing area of the landfill and have been disconnected since the beginning of April.
8. SEM – Mr. Camis indicated that SEM is conducted in-house, and that the facility technician in charge of conducting SEM was going to be available for joining the inspectors around 12 PM. Mr. Camis confirmed that regularly no SEM exceedances are found and that a Landtec SEM 5000 instrument is used for conducting SEM.

B. Walkthrough/SEM

After completing the discussion, the inspectors agreed with Mr. Camis on providing a detailed summary of the SEM inspection observations during the inspection closing meeting. Mr. Carlos Fernández, GCCS Operator and SEM technician agreed on assisting the inspectors during the monitoring. The SEM started around 11:40 AM. During the SEM, inspectors asked Mr. Fernández questions about his monitoring practice. In response to these questions, he stated that he monitors penetrations by just placing the probe tip near the wellhead for twice the response time but does not check fully around each penetration point. When asked if he would check areas of exposed waste off of his monitoring path, he stated that he would not. He stated that he was performing his SEM in the manner in which he was trained. EPA inspectors provided feedback on compliant SEM practices. The inspectors concluded the SEM around 4:00 PM. See Appendix A (SEM Data), Appendix B (SEM Map), Appendix C (Photo Log), Appendix D (Instrument & Calibration Data) and closing meeting discussion summary for details about the SEM findings and observations.

[1] https://www.lscenv.com/landfill-cover-systems-pg.html - Posi-Shell®

Closing Meeting

At approximately 4:15 PM, the inspectors returned to the facility office trailer for a closing conference with Mr. Camis. As agreed during the inspection opening meeting, the inspectors discussed with Mr. Camis the main findings and observations during the SEM. The following is a summary of the conversation:

1. Significant number of uncapped GCCS wellheads found. The inspectors noted that it appeared to be a consistent practice for fully offline wells to be directly venting to atmosphere.
2. Offline wells. The inspectors noted the wells that were fully offline, resulting in a lack of gas collection and elevated surface methane readings in areas subject to gas collection requirements.
3. Although the monitoring activity did not cover the entire extent of the facility SEM plan, the inspectors were able to find over 70 different locations with surface concentrations of methane over 500 ppm.
4. Significant leachate breakouts observed throughout the walkthrough. Mr. Camis was informed that although cover integrity issues were the common denominator for most of these breakouts, leachate breakouts could also be observed in areas without erosion issues too. The inspectors noted that the number of leachate breakthroughs could also indicate that numerous wells are watered-in and therefore not able to carry the quantity of gas as designed.
5. Significant vegetation growth at the edges of the landfill presents a challenge to properly conduct SEM.
6. Disparity between the inspectors SEM findings and what it is being reported in the facility SEM quarterly reports. The SEM reports EPA reviewed from 2021 and 2022 prior to inspection reported 0 exceedances in every quarter, and the opening conference confirmed that facility still does not find SEM exceedances.
7. Lack of knowledge about how to properly conduct SEM. In example, not monitoring the entire well circumference as required by EPA Method 21[2]. The inspectors encouraged Mr. Camis to provide proper training or refreshers to Mr. Fernández and more resources since Mr. Fernández is the only technician conducting SEM and also operating the GCCS.
8. Exposed waste, lack of adequate cover issues observed throughout the walkthrough. Mr. Camis indicated that the facility is planning to use hydroseeding at several areas to improve the cover issues.
9. Cover integrity issues generating avenues for gases to migrate through the landfill surface into the atmosphere.
10. Wells venting to the atmosphere - The inspectors provided examples such as wellhead #20, that according to Mr. Fernández it was allegedly broken by a cow that got access to the landfill, the wellhead was venting to the atmosphere with methane concentrations at the top of over 300,000 ppm and 30,000 ppm from its base. The inspectors also mentioned several wellheads that were found under positive pressure. Mr. Camis

[2] https://www.epa.gov/sites/default/files/2017-08/documents/method_21.pdf

acknowledge that they have a few wellheads experiencing positive pressure and explained that some wellheads were showing an increment in oxygen concentrations, and they restricted its flow to mitigate the issue. The inspectors indicated to Mr. Camis that such condition could be a result of having vacuum leaks, which was also part of the issues observed at some wellheads, and that such condition will indeed allow oxygen levels to be increased. The inspectors recommended that rather than restricting the wellhead flow, the facility can try to find and resolve the vacuum leaks and that as found during the SEM, some of these vacuum leaks can be easily heard.

11. The inspectors asked Mr. Camis about the gas volume that is being processed at the facility flares. Mr. Camis indicated that they are currently managing around 310 scfm. The inspectors told Mr. Camis that such amount is low for the landfill size, but consistent with the number of methane found migrating through the landfill surface.
12. The inspectors informed Mr. Camis that the SEM data along with other supplement documentation such as maps will be shared via email with him and Ms. Cynthia Otero as soon as possible[3]. The inspectors also informed Mr. Camis that corrective actions should be coordinated as soon as the SEM data becomes available to the facility[4]. Also Mr. Camis was informed that the SEM findings along with the respective corrective actions should be included in the corresponding SEM quarterly report.
13. The inspectors also informed Mr. Camis that an inspection report will be prepared and shared with him and Ms. Cynthia Otero within approximately 60 days.

The inspectors expressed gratitude for all the assistance provided during the inspection and all the cooperation to provide the information needed to complete the inspection. The inspectors concluded the inspection at 5:00 PM.

Appendices

Appendix A - SEM Data

Appendix B - SEM Map

Appendix C - Photo Log

Appendix D - Instrument & Calibration Data

[3] On May 2, 2024, EPA's Daniel Heins sent the SEM documentation to Conwaste's Hermes Camis and Cynthia Otero via email.

[4]On May 1, 2024, Conwaste's Hermes Camis sent to EPA's Alex Rivera an email containing a series of pictures documenting a series of corrective actions to resolve or mitigate some of the issues found during EPA's SEM inspection.

End of Report

Lead Inspector's Name: Alex Rivera

ALEX RIVERA

Digitally signed by ALEX RIVERA
Date: 2024.06.03 14:59:14 -04'00'

Supervisor's Name: Nancy Rodríguez

NANCY RODRIGUEZ

Digitally signed by NANCY RODRIGUEZ
Date: 2024.06.03 17:09:32 -04'00'

Appendix A: SEM Data

SEM Exceedances

ID	Description	Time	Reading ppm	Latitude	Longitude
A1	Pipe horizontal	12:00	6449	18.46638	-66.62420
A2	Pipe horizontal	12:04	7500	18.46629	-66.62372
A3	Well 33	12:09	1175	18.46647	-66.62380
A4	Well 34	12:12	107223	18.46654	-66.62350
A5	Well 35	12:15	818	18.46670	-66.62308
A6	Exposed waste	12:19	1033	18.46650	-66.62275
A7	well	12:25	25164	18.46664	-66.62199
A8	Exposed waste/rill	12:31	690	18.46644	-66.62148
A9	Well 38	12:34	72977	18.46641	-66.62139
A10	Exposed waste	12:36	520	18.46639	-66.62119
A11	Exposed waste	12:39	761	18.46641	-66.62116
A12	Well with #79160	12:43	3502	18.46650	-66.62080
A13	Well with #73039	12:47	1117	18.46647	-66.62035
A14	Exposed waste/erosion	12:57	1609	18.46669	-66.62017
A15	Pipe sticking out	13:01	20282	18.46642	-66.62002
A16	Well 41	13:03	4899	18.46654	-66.61971
A17	Well 42	13:07	1115	18.46649	-66.61914
A18	Well 43	13:10	3373	18.46646	-66.61854
A19	Well 30	13:12	43195	18.46676	-66.61872
A20	Erosion	13:15	2718	18.46668	-66.61869
A21	Well 44	13:18	12075	18.46639	-66.61799
A22	Well 13	13:24	2941	18.46666	-66.61748
A23	Well 14	13:26	1367	18.46673	-66.61702
A24	Well 15	13:28	1830	18.46648	-66.61701
A25	Well 16	13:31	977	18.46614	-66.61709
A26	Well with #79170	13:37	8946	18.46589	-66.61770
A27	Well 18	13:42	1155	18.46536	-66.61784
A28	Well 64	13:45	1009	18.46546	-66.61802
A29	Well 19 + waste	13:51	10895	18.46485	-66.61805
A30	Well 20 (base and venting at top)	13:53	311877 at top; 3000 at base	18.46455	-66.61824
A31	Well 21	13:59	1037	18.46421	-66.61871
A32	Well 22	14:03	4274	18.46385	-66.61931
A33	Well 23	14:05	1140	18.46371	-66.61968
A34	Well 24	14:07	10052	18.46378	-66.62009
A35	Well 25	14:09	8305	18.46395	-66.62064
A36	Well with #79033, out sampling port and base	14:11	200000 at top; 2099 at base	18.46410	-66.62069
A37	Exposed waste and erosion	14:15	810	18.46408	-66.62045
A38	Unknown well - coming out top and base	14:16	240000 at top; 46515 at base	18.46400	-66.62017

A39	Well and exposed waste	14:22	11825	18.46399	-66.61958
A40	Leaks on sides drain	14:23	3477	18.46409	-66.61959
A41	Capped PVC pipe (offline well 77)	14:29	3300	18.46441	-66.61959
A42	Well 70	14:32	2035	18.46494	-66.61934
A43	Tire (exposed waste)	14:33	780	18.46495	-66.61924
A44	Unknown well	14:39	4878	18.46549	-66.61905
A45	Well 53	14:42	9492	18.46596	-66.61880
A46	Unknown well	14:49	58983	18.46504	-66.61987
A47	Well 61	14:51	8616	18.46552	-66.62022
A48	Exposed waste (cushion)	14:52	735	18.46557	-66.62048
A49	Well 60	14:55	12434	18.46561	-66.62077
A50	Well with #78187	14:57	62465	18.46563	-66.62131
A51	Venting uncapped disconnected well (exceedance at base and top)	15:03	205000 at top; 86705 at base	18.46613	-66.62217
A52	Venting uncapped disconnected well (exceedance at base and top)	15:05	150000 at top; 7479 at base	18.46567	-66.62188
A53	Venting uncapped disconnected well	15:18	205864 at top	18.46622	-66.62274
A54	Unknown well	15:21	41781	18.46613	-66.62310
A55	Exposed waste	15:26	2067	18.46633	-66.62365
B1	Well 72	13:52	4691	18.46503	-66.61830
B2	Leachate breakout near well 72	13:55	621	18.46502	-66.61837
B3	Uncovered pipe	14:00	5863	18.46455	-66.61863
B4/B5	Well 78, also open vent out of monitoring reach and pipe not attached to cap	14:11	5736 at wellhead; 1634 at pipe	18.46453	-66.61903
B6/B7	Well 85 at well and uncapped pipe	14:20	73025 at pipe; 38000 at base	18.46420	-66.61909
B8/B9	Well 72 head disconnected from header - hole of wellhead	14:33	6294 wellhead; 2612 at hole	18.46491	-66.61877
B10	Well 63	14:38	6920	18.46545	-66.61850
B11	Well 54 - extended with no cap	14:41	85540	18.46589	-66.61825
B12/13	Well 52 base + connector leak	14:46	7843 at base; 956 at connector leak	18.46602	-66.61933
B14	Well 51	14:50	4731	18.46606	-66.61999
B15	Well 50	14:52	27687	18.46601	-66.62051
B16	Well 49	14:55	1807	18.46604	-66.62102
B17	Well 48	14:59	4042	18.46609	-66.62162
B18	Open wellhead	15:18	52022	18.46576	-66.62249
B19	Wellhead	15:22	4712	18.46552	-66.62271
B20	Wellhead	15:24	24628	18.46571	-66.62288
B21	Header exiting landfill	15:27	3554	18.46600	-66.62328
B22	Dirt under header pipe	15:29	3369	18.46621	-66.62352
B23	Valve and header coming out of ground	15:34	507	18.46638	-66.62413

Exceedances in the A survey were detected using the AED IRwin by Daniel Heins. Exceedances in the B survey were detected using the R2 IRwin by Victor Tu and Katherine Marmanides.

Probe tips were fixed on hiking poles 8 cm from the base of the pole, all readings taken from 8 to 10 cm from the ground with the exception of secondary readings noted from venting collection infrastructure. A53 is the only reading not associated with a confirmed surface exceedance.

Note: Some co-located exceedances were condensed into single points for the above table and the below map.

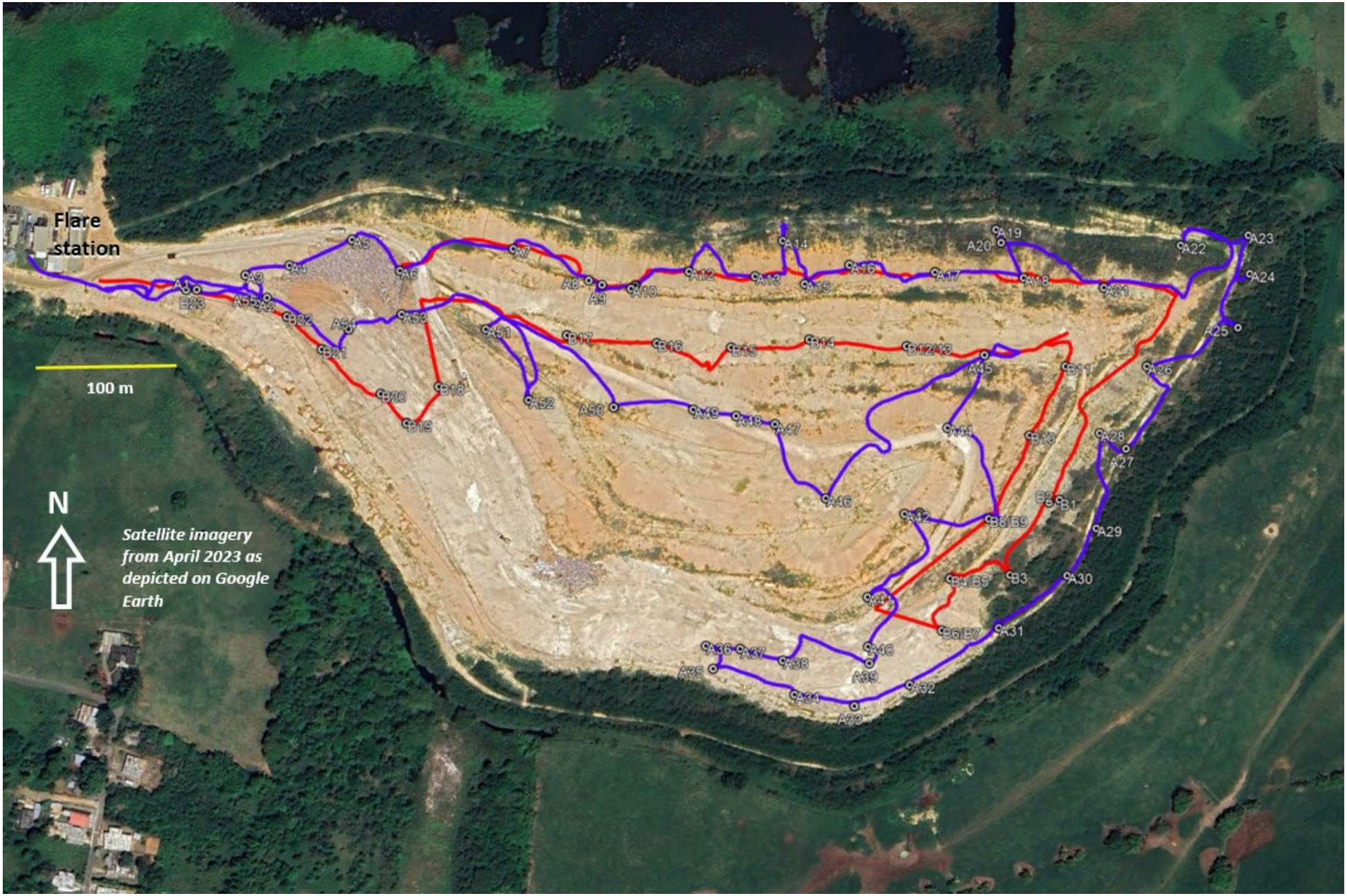
Background readings:

Upwind: 0 ppm
Downwind: 2 ppm

74 exceedances total:

500 – 1,000 ppm: 10
1,000 – 5,000: 29
5,000 – 10,000: 11
10,000 – 50,000: 11
50,000 – 100,000: 6
> 100,000: 7

Appendix B: SEM Map



Blue and red lines trace each team's monitoring path. Exceedances are plotted and labeled as described in Appendix A.

The survey covered less 32 acres of the landfill.

Appendix C: Photo Log for Municipality of Arecibo Landfill, Arecibo, PR

Facility Address:	EPA Inspectors:	Image numbers:
PR-682 Interior, Bo. Factor, Garrochales Sector, Arecibo, Puerto Rico	Alex Rivera, Gloria Diaz-Galarza, Daniel Heins, Steven Rapp, Maria Malave, Katherine Marmanides, and Victor Tu	P4300046 through P4300123 **Camera Used:** Olympus TG-6 Digital Camera (EPA Decal # S63861)

Image Number	File Name	Description	Date Taken	Time taken
1	P4300046.JPG	 Wide shot of the landfill from parking lot. ***Note:*** *Time stamp reflect Pacific Time*	4/30/2024	1121
2	P4300047.JPG		4/30/2024	1124

3	P4300048.JPG	 Enclosed flare stack (right)	4/30/2024	1135
4	P4300049.JPG	 Enclosed flare stack (left)	4/30/2024	1135

5	P4300050.JPG	 GCCS system scrubber	4/30/2024	1136
6	P4300051.JPG	 GCCS condensate tank	4/30/2024	1150

7	P4300052.JPG	 Horizontal pipe penetrating ground	4/30/2024	1202
8	P4300053.JPG	 Horizontal pipe penetrating ground	4/30/2024	1205

9	P4300054.JPG	 Exposed waste	4/30/2024	1207
10	P4300055.JPG	 Landfill gas monitoring well #33	4/30/2024	1208

11	P4300056.JPG	 Landfill gas monitoring well #34	4/30/2024	1213
12	P4300057.JPG	 Woody shrub	4/30/2024	1214

13	P4300058.JPG	 Landfill gas monitoring well #35	4/30/2024	1216
14	P4300059.JPG	 Exposed waste	4/30/2024	1219

15	P4300060.JPG	 Exposed waste	4/30/2024	1224
16	P4300061.JPG	 Unidentified landfill gas monitoring well	4/30/2024	1226

17	P4300062.JPG	 Erosion rill	4/30/2024	1231
18	P4300063.JPG	 Landfill gas monitoring well #79	4/30/2024	1235

19	P4300064.JPG	 Exposed waste	4/30/2024	1237
20	P4300065.JPG	 Exposed waste	4/30/2024	1240

21	P4300066.JPG	 Vegetation at bottom of the slope near adjacent waterbody	4/30/2024	1241
22	P4300067.JPG	 Landfill gas monitoring well #38 (tag # 79179)	4/30/2024	1243

23	P4300068.JPG	 EPA inspector conducting SEM in vegetated area near adjacent waterbody	4/30/2024	1245
24	P4300069.JPG	 Landfill gas monitoring well (tag # 73039)	4/30/2024	1247

25	P4300070.JPG	 EPA inspector next to a fully grown papaya tree	4/30/2024	1256
26	P4300071.JPG	 Erosion exposed waste and vegetation	4/30/2024	1258

27	P4300072.JPG	 Pipe sticking out of ground	4/30/2024	1302
28	P4300073.JPG	 Landfill gas monitoring well #41	4/30/2024	1304

29	P4300074.JPG	 Leachate seep on hill of landfill	4/30/2024	1306
30	P4300075.JPG	 Leachate discoloration	4/30/2024	1306

31	P4300076.JPG	 Landfill gas monitoring well #42	4/30/2024	1308
32	P4300077.JPG	 Landfill gas monitoring well #43	4/30/2024	1311

33	P4300078.JPG	 Landfill gas monitoring well #30	4/30/2024	1313
34	P4300079.JPG	 Erosion exposed waste and vegetation	4/30/2024	1316

35	P4300080.JPG	 Leachate breakout and open pipe	4/30/2024	1318
36	P4300081.JPG	 Landfill gas monitoring well #44	4/30/2024	1320

37	P4300082.JPG	 Landfill gas monitoring well #13 surrounded by thick vegetation of >4 feet.	4/30/2024	1325
38	P4300083.JPG	 Landfill gas monitoring well #14 surrounded by vegetation	4/30/2024	1327

39	P4300084.JPG	 Landfill gas monitoring well #15	4/30/2024	1329
40	P4300085.JPG	 Landfill gas monitoring well #16	4/30/2024	1331

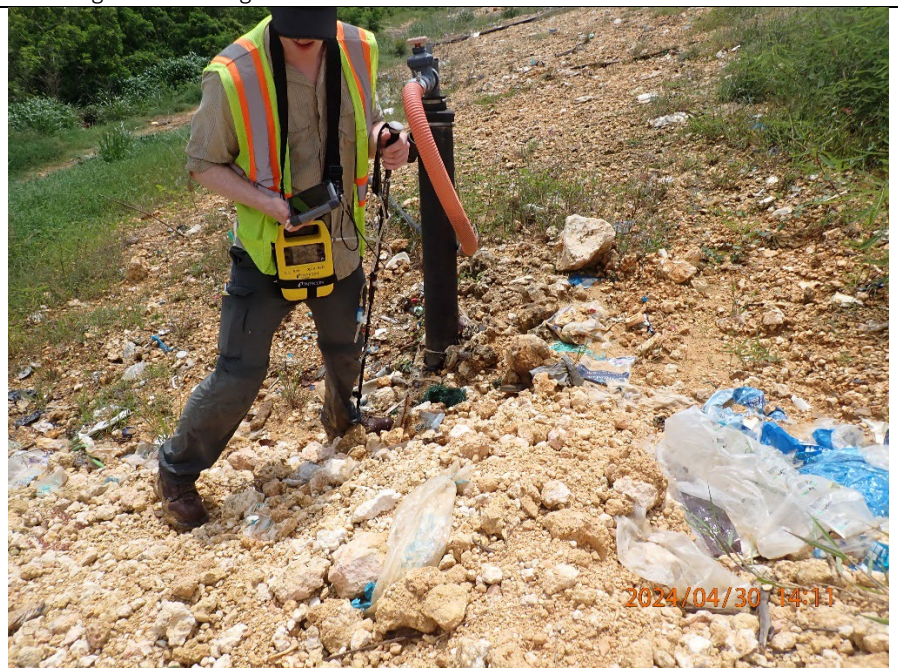
41	P4300086.JPG	 Landfill gas monitoring well (tag #79170)	4/30/2024	1336
42	P4300087.JPG	 Landfill gas monitoring well #18	4/30/2024	1343

43	P4300088.JPG	 Exposed waste	4/30/2024	1344
44	P4300089.JPG	 Landfill gas monitoring well #64	4/30/2024	1346

45	P4300090.JPG	 Landfill gas monitoring well #19	4/30/2024	1351
46	P4300091.JPG	 Landfill gas monitoring well #20. Methane leak of >300,000 ppm at the top because top was missing. Exposed waste and 3,000 ppm methane concentration at its base.	4/30/2024	1354

47	P4300092.JPG	 Landfill gas monitoring well #21	4/30/2024	1400
48	P4300093.JPG	 Landfill gas monitoring well #22	4/30/2024	1404

49	P4300094.JPG	 Landfill gas monitoring well #23	4/30/2024	1406
50	P4300095.JPG	 Landfill gas monitoring well #24	4/30/2024	1408

51	P4300096.JPG	 Landfill gas monitoring well #25	4/30/2024	1410
52	P4300097.JPG	 Landfill gas monitoring well (tag #79033) venting through sampling port and base	4/30/2024	1411

53	P4300098.JPG	 Exposed waste and erosion	4/30/2024	1415
54	P4300099.JPG	 Unidentified landfill gas monitoring well venting through top and base	4/30/2024	1417

55	P4300100.JPG	 Exposed waste and rill	4/30/2024	1420
56	P4300101.JPG	 Exposed waste and rill	4/30/2024	1420

57	P4300102.JPG	 Unidentified landfill gas monitoring well and exposed well	4/30/2024	1423
58	P4300103.JPG	 Leaks found on side of drainage pipe	4/30/2024	1424

59	P4300104.JPG	 Capped PVC pipe, offline landfill gas monitoring well #77	4/30/2024	1430
60	P4300105.JPG	 Landfill gas monitoring well #70	4/30/2024	1433

61	P4300106.JPG	 Exposed waste	4/30/2024	1434
62	P4300107.JPG	 Unidentified landfill gas monitoring well	4/30/2024	1440

63	P4300108.JPG	 Landfill gas monitoring well #53	4/30/2024	1443
64	P4300109.JPG	 Unidentified landfill gas monitoring well	4/30/2024	1450

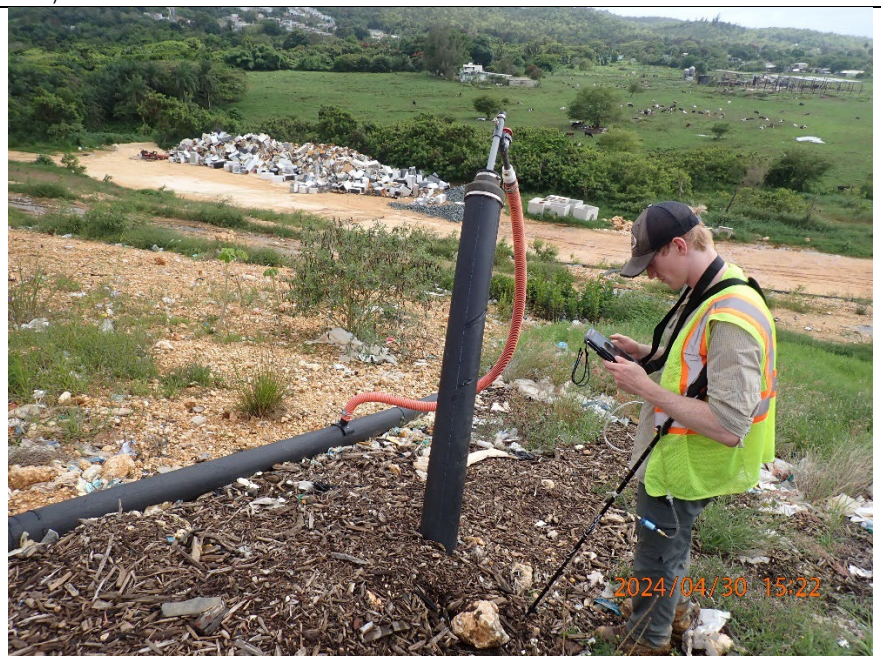
65	P4300110.JPG	 Landfill gas monitoring well #61	4/30/2024	1452
66	P4300111.JPG	 Exposed waste	4/30/2024	1454

67	P4300112.JPG	 Landfill gas monitoring well #60	4/30/2024	1455
68	P4300113.JPG	 Landfill gas monitoring well (tag # 78187)	4/30/2024	1458

69	P4300114.JPG	 Venting uncapped and disconnected landfill gas monitoring well (exceedance at base and top)	4/30/2024	1504
70	P4300115.JPG	 Venting uncapped and disconnected landfill gas monitoring well (exceedance at base and top)	4/30/2024	1506

71	P4300116.JPG	 Venting uncapped and disconnected landfill gas monitoring well (exceedance at base and top)	4/30/2024	1507
72	P4300117.JPG	 Venting uncapped and disconnected landfill gas monitoring well (exceedance at base and top), showing condensation and bubbles at edge of opening	4/30/2024	1507

73	P4300118.JPG	 Venting uncapped and disconnected landfill gas monitoring well (exceedance at base and top)	4/30/2024	1508
74	P4300119.JPG	 Venting uncapped landfill gas monitoring well	4/30/2024	1519

75	P4300120.JPG	 Venting uncapped landfill gas monitoring well with white goods pile in background (right side)	4/30/2024	1519
76	P4300121.JPG	 Unidentified landfill gas monitoring well	4/30/2024	1522

77	P4300122.JPG	 Exposed waste	4/30/2024	1527
78	P4300123.JPG	 South facing portion of the landfill and white good pile in background (upper right side)	4/30/2024	1527

Appendix D: Instrument and Calibration Data

The survey was conducted using two (2) Inficon IRwin devices using the Elkins Earthworks software. They are referred to throughout this report as the “AED IRwin” and the “R2 IRwin”

Instrument Information

	Instrument Type	Formal Identifier
AED IRwin	Inficon IRwin	SX # 580-01092006439
R2 IRwin	Inficon IRwin	SX # 580-01092005497

Calibration, Response Time and Precision Checks

		R2 IRwin		AED IRwin	
Trial	**Calibration Gas ppm**	**Reading (ppm)**	**Time (s)**	**Reading (ppm)**	**Time (s)**
1	500	500	5	500	5
2	500	500	5	500	4
3	500	490	4	500	5

Both instruments were calibrated and checked for response time and precision on April 30, 2024 at 10am using zero air and 500 ppm methane. All readings are within 10% of the known calibration value. Response times are approximately 4-5 seconds, under the maximum of 30 seconds.

This also served as the initial calibration pre-inspection bump check, showing successful calibration.

Post Survey Calibration Checks

Date/Time	Gas Concentration (ppm)	R2 IRwin Reading (ppm)	AED IRwin Reading (ppm)
2024-04-30 15:55	500	400	490

Post-survey bump check show maintenance of calibration for the AED IRwin and downward drift for the R2 IRwin, possibly resulting in false negatives (ie, missed exceedances) and potential underestimation of the severity of measured exceedances.

Calibration Gas

Composition	Manufacturer	Lot Number	Expiration Date
Zero air <1 ppm total hydrocarbon	Airgas	304-402941563-1	2/23/2028
500 ppm methane in air	Airgas	304-402960982-1	2/2/2028