



REGION 4

ATLANTA, GA 30303

ELECTRONIC MAIL

CONFIRMATION OF EMAIL RECEIPT REQUESTED

Brady Stewart
Regional Engineer
Anderson Regional Landfill
13146 Ballantyne Corporate Pl, Suite 150
Charlotte, North Carolina 28277
brady.stewart@wasteconnections.com

Dear Brady Stewart:

Enclosed is a copy of the final report generated by the U.S. Environmental Protection Agency's Region 4, North Air Enforcement Section, for the inspection conducted at Anderson Regional Landfill, located in Belton, South Carolina, on June 5, 2024.

If you have any questions, please contact me at 404-562-8134, or by email at Zhong.Baichen@epa.gov.

Sincerely,

BAICHEN ZHONG

Digitally signed by BAICHEN
ZHONG
Date: 2024.08.14 11:24:24 -04'00'

Baichen Zhong
Environmental Engineer
North Air Enforcement Section

cc: Michael D Shroup
Director, Compliance Management Division
South Carolina Department of Environmental Services
Michael.Shroup@des.sc.gov

**United States Environmental Protection Agency (EPA) Region 4
Air Enforcement Branch
FINAL INSPECTION REPORT**

I. GENERAL INFORMATION

Facility Name: Anderson Regional Landfill

Location (Address): 203 Landfill Rd., Belton, SC 29627

Inspection Dates: June 5, 2024

Type of Inspection (Full or Partial Compliance Evaluation):
Clean Air Act Partial Compliance Evaluation

ICIS-Air Number: SC00002000149

EPA Investigator(s)/Inspector(s): Baichen Zhong – Environmental Engineer
Andrew Mills – Environmental Engineer
Daniel Slade – Environmental Engineer
Justin Stark – Physical Scientist
Sarah Rowell – Environmental Engineer

State/Local Investigator(s)/Inspector(s): N/A

**Person(s) Contacted at Facility
(Name and Title):** Dustin Towne, Site Manager,
Brady Stewart, Region Engineer, Waste
Connections

Report Prepared by: Baichen Zhong

II. FACILITY INFORMATION

A. Facility and Permit Information

Facility and Permit Information	Comments
1. Type of facility (e.g., chemical plant, refinery, cement manufacturer, etc.).	Municipal Solid Waste Landfill
2. Air permit number(s) and type of permit (e.g., Title V, PSD, Synthetic Minor, etc.).	Title V permit GTV-0200-0149
3. Air permit issuance date.	November 1, 2021
4. Air permit expiration date.	October 31, 2026
5. Facility classification (Major, Synthetic Minor/Conditional Major, Minor).	Major Source
6. Major source pollutants (if applicable).	HAPs
7. Applicable regulations (e.g., State Implementation Plan, MACT Subpart FFFF, NSPS Subpart EEEE, etc.).	40 C.F.R. Part 62, Subpart OOO 40 C.F.R. Part 63, Subpart AAAA
8. Types of air emission points (e.g., tanks, process vents, boilers, etc.).	Gas collection and control system (GCCS), landfill surface emissions.
9. Types of air pollution control equipment (e.g., baghouse, scrubber, afterburner, etc.).	Single Flare

B. Process Description (provide narrative or attach description provided by the company or excerpts from the permit)

The Anderson Regional Landfill receives municipal and industrial solid waste. The waste is deposited into the landfill, compacted, and covered with fill dirt or other suitable cover, on a daily basis. Landfill gas (LFG) is produced from the decomposition of the buried waste. It is composed primarily of methane and carbon dioxide and contains a small percentage of non-methane organic compounds (NMOC). The landfill operates a single flare for the control of landfill gas.

III. INSPECTION ACTIVITIES

Activity	Yes No NA	Comments
Opening Meeting		
1. Date and time entered the facility.	Y	June 5, 2024, at approximately 9:10 a.m.
2. Credentials presented to facility personnel (include name and title).	Y	The EPA inspectors presented their credentials to Dustin Towne (Site Manager).
3. Conducted an opening meeting to explain the purpose and objectives of the inspection.	Y	An opening meeting was held in the parking lot during which EPA explained that the Agency would be conducting an inspection under the Clean Air Act and that monitoring for methane emissions from the facility would be conducted.
4. Discussed safety issues.	Y	The EPA inspectors wore the appropriate PPE as well as the standard yellow vest required by the facility. The EPA inspectors were accompanied by the facility staff listed above while walking and driving around the facility.

Activity	Yes No NA	Comments
5. Discussed which records to be reviewed.	Y	See item 10
6. Discussed the facility walk-through and the areas to be observed in the facility.	Y	The EPA inspectors explained that the purpose of the inspection was to conduct a walk-through of the facility and to sample methane emissions at the landfill to assess the effectiveness of the landfill GCCS.
7. Discussed facility policy regarding photographs or video (if applicable).	Y	EPA inspectors indicated that videos may be taken with the infrared camera. If a video was taken, EPA would give the facility prior notice of the recording and ask that the facility identify any proprietary/CBI concerns before any video was taken to help EPA assess the need for the video. All videos taken during the inspection would be sent to the facility.
8. Discussed the use of the infrared camera, TVA, PID, and any other equipment.	Y	Discussed the use of a FLIR camera, an Inficon IRwin infrared methane monitor device (IRwin), and a TVA.
9. Discussed CBI.	Y	The EPA inspectors indicated that any documents claimed to be Confidential Business Information (CBI) would be treated in accordance with the regulations.
Records Reviewed at the Facility		

Activity	Yes No NA	Comments
10. The types of records reviewed and the time period reviewed.	N	Records were not reviewed at the facility. EPA will send a 114 letter to discuss any documents or records that are needed.
Facility Walk-Through Observations		
11. The process equipment observed and the associated operational rate observed (e.g., Furnace 1 production rate was 5 lbs/hr on 1/1/15, at 2:00 pm – permit requires max rate at 6 lbs/hr). Provide the date and time the information was recorded by the inspector. Identify the permit limit (if applicable). An attachment may be used for a large amount of information.	Y	Observations made during the inspection are recorded in Attachment A of this report. Descriptions of photographs and videos taken during the inspection are recorded in Attachment B of this report.

12. The type of process parametric monitoring observed and the associated value observed (e.g., Furnace 1 flux injection rate was 200 lbs/batch at 1/1/15, at 2:00 pm – permit requires max rate at 225 lbs/batch). Provide the date and time the information was recorded by the inspector. Identify the permit limit (if applicable). An attachment may be used for a large amount of information.	N/A	
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Project Name: Anderson Regional Landfill Belton, SC
ICIS/Project No.: SC00002000149

Activity	Yes No NA	Comments
13. If process equipment or parametric monitoring equipment was not operating, state the reason by facility personnel why the equipment was not operating.	N/A	

14. The type of air pollution control equipment, the process equipment it is controlling, and the associated parametric monitoring value observed (e.g., baghouse pressure drop, temperature, scrubber flow rate, etc.). (For example - RTO 1 controlling furnace 1, 1,500 degrees F on 1/1/15, at 2:00 pm – permit requires 1,400 degree F or higher). Provide the date and time the information was recorded	Y	Waste gas generated from the decomposition of waste in the landfill is collected by a GCCS. The waste gas is sent to a flare for destruction.
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Activity	Yes No NA	Comments
by the inspector. Identify the permit limit (if applicable). An attachment may be used for a large amount of information.		

Activity	Yes No NA	Comments
15. Continuous emissions monitoring devices and values observed. (e.g., CEMS, COMs, etc.). Provide the date and time the information was recorded by the inspector. Identify the permit limit (if applicable). An attachment may be used for a large amount of information.	N/A	

Activity	Yes No NA	Comments
16. If air pollution control equipment was not operating, state the reason by facility personnel why the equipment was not operating.	N/A	
17. Capture and collection system (enclosures and hoods) observations, if applicable (e.g., the magnitude and duration of emission escaping capture from the hood).	Y	Waste gas generated from the decomposition of waste in the landfill is collected by a GCCS. During the inspection, there were recorded instances of methane emissions above the leak definition of 500 ppm using the IRwin and confirmed by the TVA, as well as seen with the infrared camera. See Attachments B and C.

Activity	Yes No NA	Comments
18. Ductwork transferring the emissions to the air pollution control device observations, if applicable (e.g., the magnitude and duration of emission escaping from the ductwork, holes or deterioration in ductwork, no deterioration observed, etc.).	N/A	

Activity	Yes No NA	Comments
19. Any existing unpermitted emission points, new unpermitted emission points, or non-permitted construction activities observed. (if yes, describe in the comments field).	N/A	
20. Were any visible emissions observed? (if yes, identify the location and equipment).	N	

Activity	Yes No NA	Comments
21. Was a Method 9 reading performed? (if yes, identify the location and equipment).	N	
22. Was the cause of the visible emissions investigated and the information documented?	N/A	
23. Was a Method 22 performed for visible emissions? (if yes, identify the location and equipment).	N	

Activity	Yes No NA	Comments
24. Identify the cause of the visible emissions as explained by facility personnel, if applicable.	N/A	
25. Was the infrared camera used? If so, attach the video log (which includes the equipment ID, and the date and time the video was recorded) and videos to this report.	Y	See Attachment B for a list of video files.

Activity	Yes No NA	Comments
26. Was the TVA used? If so, identify the equipment monitored and the results. Provide the date and time the information was recorded by the inspector. Include actual instrument readings for each piece of equipment monitored above the leak definition and/or where the infrared camera identified a release. An attachment may be used for a large amount of information.	Y	Two Inficon IRwin IR monitor was used to quantify methane concentrations near the surface of the landfill. See Attachment C for a description/schematic of the results/readings greater than the leak definition of 500 ppm. Two TVAs were used for confirmation readings to confirm IRwin readings of methane concentrations near the surface of the landfill that exceeded 500 ppm.

Project Name: Anderson Regional Landfill Belton, SC
ICIS/Project No.: SC00002000149

Activity	Yes No NA	Comments
27. Was the PID used? If so, identify how the PID was used and the results. Provide the date and time the information was recorded by the inspector. An attachment may be used for a large amount of information.	N	
Closing Meeting		
28. Conducted a closing meeting.	Y	EPA Region 4 inspectors conducted a brief closing meeting on June 5, 2024, at around 3:47 PM with the facility personnel to discuss what occurred during the inspection and what will happen going forward.
29. Summarize any additional information needed, if applicable?	Y	EPA will send a 114 letter, to request any documents or records that are needed.

Activity	Yes No NA	Comments
30. Accept a declaration of CBI, if applicable?	N/A	
31. Discussed observations.	Y	EPA inspectors discussed the observations made during the inspection. This included the specific areas of elevated IRwin and TVA readings, and/or infrared video recordings at the extraction well sites, leachate collection and clean out areas, and the emissions recorded along the surface of the landfill cover. Condition of the landfill's cover integrity and issues observed with erosion and exposed waste were also discussed.
32. Discussed next steps, if applicable?	Y	The EPA inspectors stated that an inspection report and the submission of all recorded videos and pictures would be the next step in the process. A follow-up conference was scheduled to discuss any documents or records that are needed.
33. Date and time inspection concluded.	Y	June 5, 2024, 4:30 p.m.
Miscellaneous		
34. Include any additional observations, if applicable.	N/A	

EPA Investigator/Inspector Signature:

BAICHEN ZHONG
Digitally signed by BAICHEN
ZHONG
Date: 2024.08.14 11:25:01 -04'00'

EPA Supervisor Signature & Title

JASON DRESSLER
Digitally signed by JASON
DRESSLER
Date: 2024.08.14 11:38:16 -04'00'

Chief, North Air Enforcement Section

Project Name: Anderson Regional Landfill Belton, SC
ICIS/Project No.: SC00002000149

Document Number: AEBFORM-012-R0
Title: Inspection Report Template
Effective Date: May 6, 2019

Attachment A – Inspection Activities and Observations

Opening Meeting, June 5, 2024

The inspection team arrived at the facility at around 9:10 AM and proceeded to conduct a brief opening meeting with Dustin Towne, the Site Manager after equipment calibration was done around 9:30 AM. EPA explained that the Agency would be conducting an inspection under the Clean Air Act and that monitoring for methane emissions from the facility would be conducted. A brief overview of the equipment used (IRwin, TVA, FLIR camera) was provided, and it was explained that the inspection team will primarily be conducting Surface Emission Monitoring (SEM) over the landfill.

Facility “Walk Through” and Surface Methane Monitoring

The inspection team set out in vehicles to view the facility. The team followed facility personnel, who rode in a separate vehicle, to the top of the landfill where the team disembarked and proceeded to conduct the SEM. Calibration for the IRwin and TVA was performed upon arrival at the facility. The inspection team split up into two groups to cover as much ground as possible, each with one IRwin and one TVA. Sarah Rowell used an IRwin to take measurements with Daniel Slade using a TVA for confirmation readings in the first group, while Justin Stark used an IRwin with Andrew Mills using the TVA in the second group. Baichen Zhong followed the first group with the FLIR camera to take images and videos of the landfill.

The results of the surface monitoring can be seen on Attachment C. Surface monitoring activities were focused primarily on penetrations of the landfill cap, including gas collection wells and other penetrations like risers. The air intake for the sampling device was attached to an extender probe, so that it would sample gas approximately 3 inches (7.5 cm) above the surface of the landfill. The probe was positioned along the circumference of each penetration monitored at several locations and allowed to stand at least 10 seconds which is twice the response time of the instrument. The maximum reading was then recorded along with the location of each reading. Overall, a large amount of surface emissions was detected, and the amount detected was a lot higher than what the facility had reported on their SEM reports. The inspection team witnessed large areas of poor cover integrity and exposed waste. Large gullies and other surface erosions were also seen, and images of them can be found on Attachment B. In addition, much of the slopes of the landfill are covered in dense vegetation, making traversal through the area difficult. The facility mentioned that from the second quarter onward, Sniffer Robotics will be contracted to perform SEM using drones instead of Oasis which is their former SEM contractor.

Closing Meeting

Following the conclusion of surface monitoring, a brief closing meeting was held in the parking lot with facility representatives Dustin Towne (Site Manager) and Brady Stewart (Region Engineer). It was explained that it is not EPA’s policy to make definitive compliance determinations during an

inspection. However, EPA did voice concerns that, based on sampling results showing numerous locations where methane was detected at concentrations above 500 ppm, the landfill GCCS may be functioning poorly. Additional concerns regarding cover integrity and surface erosion were also voiced. EPA discussed the next steps, including that the facility would receive a draft inspection report in order to conduct a review for potential CBI. In addition, the facility was informed that a follow-up 114 letter would be sent to request any records or answers EPA might require. The inspection was concluded at approximately 4:30 p.m. on June 5, 2024.

Attachment B – Video and Photo Log

Img #	File Name	Date	Time	Description
P1	DC_0110	6/5/2024	10:44	Poor cover integrity and exposed waste (western slope)
P2	DC_0111	6/5/2024	10:50	Poor cover integrity and exposed waste (western slope)
P3	DC_0112	6/5/2024	10:51	Poor cover integrity and exposed waste (western slope)
P4	DC_0113	6/5/2024	10:52	Poor cover integrity and exposed waste (western slope)
P5	DC_0116	6/5/2024	~11:15	Area of erosion and leachate filled gulley (western slope)
P6	DC_0118	6/5/2024	11:29	Large area of erosion/gulley (western slope)
P7	DC_0119	6/5/2024	13:33	Riser #4
P8	DC_0121	6/5/2024	13:55	Exposed waste (eastern Slope)
P9	DC_0122	6/5/2024	14:00	Surveying pole between Wells 702 and 504R (Over 10% methane)
P10	DC_0124	6/5/2024	~14:15	Well 402
P11	DC_0126	6/5/2024	~14:10	Exposed waste (eastern Slope)
P12	DC_0127	6/5/2024	~14:15	Large area of erosion/gulley (eastern slope)
P13	WIN_20240605_10_43_37	6/5/2024	10:43	Extraction Well
P14	WIN_20240605_10_47_05	6/5/2024	10:47	Area of distressed vegetation
P15	WIN_20240605_10_51_14	6/5/2024	10:51	Exposed waste
P16	WIN_20240605_10_54_03	6/5/2024	10:54	Exposed waste
P17	WIN_20240605_10_54_06	6/5/2024	10:54	Exposed waste
P18	WIN_20240605_11_02_27	6/5/2024	11:02	Well 153
P19	WIN_20240605_11_02_43	6/5/2024	11:02	Exposed waste
P20	WIN_20240605_11_02_54	6/5/2024	11:02	Exposed waste
P21	WIN_20240605_11_02_58	6/5/2024	11:02	Exposed waste
P22	WIN_20240605_11_05_42	6/5/2024	11:05	Exposed waste
P23	WIN_20240605_11_05_48	6/5/2024	11:05	Exposed waste
P24	WIN_20240605_11_09_55	6/5/2024	11:09	Well 114R
P25	WIN_20240605_11_13_55	6/5/2024	11:13	Exposed waste
P26	WIN_20240605_11_18_33	6/5/2024	11:18	Capped penetration with flag
P27	WIN_20240605_11_21_18	6/5/2024	11:21	Extraction Well
P28	WIN_20240605_11_25_57	6/5/2024	11:25	Well 154R

P29	WIN_20240605_11_28_33	6/5/2024	11:28	Exposed waste
P30	WIN_20240605_13_41_06	6/5/2024	13:41	Well 701
P31	WIN_20240605_13_44_03	6/5/2024	13:44	Well 701
P32	WIN_20240605_13_50_28	6/5/2024	13:50	Extraction Well
P33	WIN_20240605_13_56_10	6/5/2024	13:56	Tarp cover
P34	WIN_20240605_13_56_40	6/5/2024	13:56	Opened Extraction Well
P35	WIN_20240605_14_01_16	6/5/2024	14:01	Closed Extraction Well
P36	WIN_20240605_14_05_35	6/5/2024	14:05	Extraction Well
P37	WIN_20240605_14_09_10	6/5/2024	14:09	Extraction Well
P38	WIN_20240605_14_14_12	6/5/2024	14:14	Tarp cover
P39	WIN_20240605_14_16_27	6/5/2024	14:16	Area of erosion
P40	WIN_20240605_14_20_42	6/5/2024	14:20	Well 115R
P41	WIN_20240605_14_27_39	6/5/2024	14:27	Large cavernous erosion from side
P42	WIN_20240605_14_27_56	6/5/2024	14:27	Large cavernous erosion
P43	WIN_20240605_14_28_38	6/5/2024	14:28	Area of erosion
P44	WIN_20240605_14_28_48	6/5/2024	14:28	Area of erosion
P45	WIN_20240605_14_32_58	6/5/2024	14:32	Area of erosion
P46	WIN_20240605_14_38_04	6/5/2024	14:38	Well 602R
P47	WIN_20240605_14_45_32	6/5/2024	14:45	Extraction Well
P48	WIN_20240605_14_50_40	6/5/2024	14:50	Area of erosion
P49	WIN_20240605_15_27_12	6/5/2024	15:27	Extraction Well
V1	MOV_0114	6/5/2024	11:00	Landfill gas bubbling up
V2	MOV_0115	6/5/2024	11:03	Poor cover integrity and exposed waste
V3	MOV_0117	6/5/2024	11:21	Unnamed well with orange flag (western slope)
V5	MOV_0120	6/5/2024	13:50	Surveying pole north of Well 702
V6	MOV_0123	6/5/2024	14:00	Surveying pole between Wells 702 and 504R (Over 10% methane)
V7	MOV_0125	6/5/2024	14:08	Well 402
V8	WIN_20240605_13_41_17	6/5/2024	13:41	Well 701

Attachment C – IRwin Recorded Readings Log

Table 1: IRwin 1 Recorded Readings Log

ID	Reading (ppmv)	Description	LAT	LON	Timestamp
1	842	SSW of 1st well	34.57836	-82.4577	6/5/2024 10:35
2	3461	EW160. TVA Y	34.57859	-82.4575	6/5/2024 10:41
3	4056	NE of EW160	34.57865	-82.4574	6/5/2024 10:45
4	1103	NE of EW601. TVA Y	34.579	-82.4573	6/5/2024 10:49
5	589	NE of EW601. TVA Y	34.57909	-82.4571	6/5/2024 10:52
6	55474	Ew153. TVA Y	34.57973	-82.4571	6/5/2024 11:01
7	982	Ew114r. TVA Y	34.57975	-82.4563	6/5/2024 11:08
8	7997	Capped well NE of EW301f. TVA Y	34.58024	-82.4558	6/5/2024 11:15
9	1464	EW164r2. TVA Y	34.58042	-82.4555	6/5/2024 11:20
10	1434	EW154r2. TVA Y	34.58052	-82.4559	6/5/2024 11:24
11	1876	Auto fluff cover. TVA Y	34.58034	-82.4562	6/5/2024 11:28
12	10828	EW701. TVA Y	34.58154	-82.4546	6/5/2024 13:38
13	15600	EW201b. TVA Y	34.58075	-82.4552	6/5/2024 13:49
14	0	60mm cover. TVA Y	34.57995	-82.4556	6/5/2024 13:54
15	100832	EW501r	34.57992	-82.4554	6/5/2024 13:58
16	86050	EW300. TVA Y	34.57927	-82.4557	6/5/2024 14:04
17	5358	EW155r. TVA Y	34.57918	-82.4559	6/5/2024 14:07

18	866	Slip and slide cover. TVA Y	34.57904	-82.4559	6/5/2024 14:12
19	971	By slip and slide. TVA Y	34.57891	-82.4559	6/5/2024 14:15
20	7402	EW115r. TVA Y	34.5785	-82.4557	6/5/2024 14:19
21	1257	Top of open hole inlf.	34.57893	-82.4554	6/5/2024 14:32
22	5298	EW602r. TVA Y	34.57849	-82.4551	6/5/2024 14:37
23	18992	EW707. TVA Y	34.57788	-82.4548	6/5/2024 14:43
24	3150	EW602.cell3e. TVA Y	34.5785	-82.4548	6/5/2024 14:49
25	1283	EW053.	34.57514	-82.4592	6/5/2024 15:26

Table 2: IRwin 2 Recorded Readings Log

ID	Reading (ppmv)	Description	LAT	LON	Timestamp
1	615	West of road S of well TVA Y	34.57837	-82.4577	6/5/2024 10:38
2	871	EW112 well TVA Y	34.57875	-82.4581	6/5/2024 10:44
3	1130	Rutt SE of well EW112 TVA Y	N/A	N/A	6/5/2024 10:47
4	1146	NW of EW112 TVA Y	34.57909	-82.4581	6/5/2024 10:53
5	5256	W of EW507 TVA Y	34.57906	-82.4586	6/5/2024 11:09
6	3156	Well bottom of W face-unnamed with orange flag TVA Y	34.57868	-82.4593	6/5/2024 11:25
7	556	NW of unnamed well TVA Y	34.57876	-82.4594	6/5/2024 11:27
8	3098	Riser 4 TVAY	34.58243	-82.4547	6/5/2024 13:34
9	2706	Clean out riser 4 TVAY	34.58243	-82.4546	6/5/2024 13:36
10	1318	SE Of riser 4 erosion TVA Y	34.58213	-82.4548	6/5/2024 13:42

11	1378	Pipe in ground SE Riser 4 TVA Y	34.58208	-82.4548	6/5/2024 13:44
12	2597	E of 506R erosion TVA Y	34.58111	-82.4546	6/5/2024 13:51
13	9522	Survey pipe next to 702	34.58099	-82.4546	6/5/2024 13:52
14	4645	Well 702 TVA Y	34.58077	-82.4546	6/5/2024 13:57
15	107230	Survey pipe between 504R and 702 TVA Y	34.58072	-82.4548	6/5/2024 14:00
16	829	Erosion E of 504R TVA Y	34.58062	-82.455	6/5/2024 14:06
17	27186	402 TVA Y ALL penetrations detect	34.5803	-82.4549	6/5/2024 14:12
18	1114	Well 703 TVA Y	34.58008	-82.4546	6/5/2024 14:18
19	1020	Erosion S of 703	34.57984	-82.4546	6/5/2024 14:21
20	10650	Survey pipe S of 702	34.57966	-82.4546	6/5/2024 14:22
21	1545	Vacuum riser of 504R previous 504R detects are 506R TVA Y	34.57963	-82.4547	6/5/2024 14:27
22	2670	SW of 704R TVA Y	34.57922	-82.4548	6/5/2024 14:30
23	2193	503R TVA Y	34.57915	-82.4552	6/5/2024 14:33
24	1311	Gully rutt erosion S of 503R TVA Y	N/A	N/A	6/5/2024 14:36
25	1681	Erosion W of 705 TVA Y	34.5787	-82.4549	6/5/2024 14:39
26	1251	EW 705 all penetrations TVA Y	34.57862	-82.4546	6/5/2024 14:42
27	2583	EW 47 both penetrations TVAY	34.57661	-82.4585	6/5/2024 15:27
28	15636	EW 050 flamed out TVA Y	34.57612	-82.4588	6/5/2024 15:31
29	793	NE of flag pole SE of EW 050 TVA Y	34.57593	-82.4585	6/5/2024 15:35

Attachment D – Instrument & Calibration Data

The survey was conducted using two Inficon IRwin devices using the Elkins Earthworks software. They are referred to throughout this report as the “IRwin 1” and the “IRwin 2”

Instrument Information

	Instrument Type	Formal Identifier
IRwin 1	Inficon IRwin	SK8185
IRwin 2	Inficon IRwin	B10406

Calibration Checks

Date/Time	Gas Concentration (ppm)	IRwin 1 Reading (ppm)	IRwin 2 Reading (ppm)
2024-06-05 09:18 AM	500	500	500
2024-06-05 01:05 PM	500	520	503
2024-06-05 04:03 PM	500	460	490

Both instruments were calibrated according to Method 21 and manufacturer instructions with zero gas and 500 ppm methane. Bump checks were conducted before survey, midday, and after the survey.

Pre-survey bump checks show successful calibration. Midday bump check shows slight upward drift potentially resulting in false positives. Post-survey bump check shows downward drift, possibly resulting in false negatives (i.e., missed exceedances) and potential underestimation of the severity of measured exceedances.

Calibration Gas

Composition	Calibration Gas Supplier	Lot Number	Expiration Date
Zero air <1 ppm total hydrocarbon	Pine Environmental	304-401830967-1	09/03/2024
500 ppm methane in air	Pine Environmental	304-401851836-1	07/10/2024

Response Time and Precision Check

		IRwin 1		IRwin 2	
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	500	4	500	5

Both instruments were calibrated and checked for response time and precision on 06/05/24 at 9:18 am using the 0 air and 500 ppm from the same cylinders as during the inspection. All readings are within 10% of the known calibration value. Response times are approximately 4-5 seconds, under the maximum of 30 seconds.

TVA Instrument & Calibration Data

Two Toxic Vapor Analyzer (TVA) were used for confirmation readings of the readings done by the IRwin devices. They are referred to throughout this report as the "TVA 1" and the "TVA 2". Readings for TVA were not recorded as they were used to confirm IRwin readings above 500 ppm.

Instrument Information

	Instrument Type	Formal Identifier
TVA-1	TVA	B10208
TVA-2	TVA	B10376

Calibration Log

TVA-1 Initial Accuracy Test				
Expected Reading (ppmv)	Zero	500	1000	10000
Span Reading	3025	140472	306784	2756864
Calibration/Concentration Check		500	1057	9800
Calibration Gas Supplier	Pine Environmental	Pine Environmental	Pine Environmental	Pine Environmental
Calibration Gas Expiration	9/3/2024	7/10/2024	12/2/2026	12/2/2026
Bump Check	N/A	N/A	N/A	N/A
Date/Time: N/A				

TVA-2 Initial Accuracy Test				
Expected Reading (ppmv)	Zero	500	1000	10000
Span Reading	4285	146936	319776	2848256
Calibration/Concentration Check		490	990	9900
Calibration Gas Supplier	Pine Environmental	Pine Environmental	Pine Environmental	Pine Environmental
Calibration Gas Expiration	9/3/2024	7/10/2024	12/2/2026	12/2/2026
Bump Check		489	1023	10800
Date/Time: 06/05/2024, 4:03PM				

Both instruments were calibrated according to Method 21 with zero gas, 500 ppm methane, 1,000 ppm methane, and 10,000 ppm methane. Bump check was conducted after the survey for TVA-2. TVA-1 suffered flameout due to lack of hydrogen and wasn't bump checked after the survey.

Post-survey bump check for TVA-2 shows downward drift, possibly resulting in false negatives (i.e., 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	304-401830967-1	09/03/2024
500 ppm methane in air	Airgas	304-401851836-1	07/10/2024
1,000 ppm methane in air	Airgas	304-402606646-1	12/02/2024
10,000 ppm methane in air	Airgas	304-402606645-1	12/02/2024