

**From:** [Roxana Kaferly](#)  
**To:** [Benton Public Comment](#)  
**Subject:** FW: Oppose/Deny LU-24-027 - resubmit  
**Date:** Thursday, April 24, 2025 4:28:24 PM  
**Attachments:** [Roxana Kaferly CB Expansion Oposition Testimony.PDF](#)

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**CAUTION:** This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

**FROM:**

Roxana Kaferly  
8811 NE Cori Court  
Adair Village, OR. 97330  
[roxanakaf@gmail.com](mailto:roxanakaf@gmail.com)  
Cell: 847-209-8173

I am resubmitting my email submitted on Sunday, April 20, 2025 at 2:50 PM with my testimony attached on Oppose/Deny LU-24-027 because my email and testimony did not appear in the packet.

Dear Benton County Planning Commissioners:

Please accept my attached testimony regarding Coffin Butte Landfill Expansion.  
Thank you for this opportunity to submit my testimony.

Roxana Kaferly

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**From:** Roxana Kaferly <[roxanakaf@gmail.com](mailto:roxanakaf@gmail.com)>  
**Date:** Sunday, April 20, 2025 at 2:50 PM  
**To:** [publiccomment@bentoncountyor.gov](mailto:publiccomment@bentoncountyor.gov) <[publiccomment@bentoncountyor.gov](mailto:publiccomment@bentoncountyor.gov)>  
**Subject:** Oppose/Deny LU-24-027 - resubmit  
Roxana Kaferly  
8811 NE Cori Court  
Adair Village, OR. 97330  
[roxanakaf@gmail.com](mailto:roxanakaf@gmail.com)  
Cell: 847-209-8173

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I am resubmitting my email with my testimony on Oppose/Deny LU-24-027 because I checked the prior email and could not open the attachment which said it was corrupted. Sorry for the inconvenience. Thank you.

Dear Benton County Planning Commissioners:

Please accept my testimony regarding Coffin Butte Landfill Expansion. Thank you for this opportunity to submit my testimony.

Roxana Kaferly

8811 NE Cori Court

Adair Village, OR. 97330

[roxanakaf@gmail.com](mailto:roxanakaf@gmail.com)

Cell: 847-209-8173

**Testimony of Roxana Kaferly**  
**Strongly Opposing Coffin Butte Landfill Expansion**  
**File Number LU-24-027**

I strongly oppose any expansion of the Coffin Butte Landfill and urge the Planning Commission to reject this application.

I came to Adair Village/Corvallis area 3 years ago from a Chicago suburb to retire in this beautiful area. I was drawn to the bountiful nature, Willamette River, open green fields, the ridges of conifers, the forward-thinking conservation and recreational areas as well as the unique and trendy downtown shops and restaurants.

Last year I bought a home in Adair Village which is my biggest investment for retirement. I worry about plummeting property values due to the negative effects of the Coffin Butte Landfill and if I will be able to sell my home once I need to cover the cost of my long-term care.

The mountain of trash dominates the view north of me rather than the scenic natural areas of Adair Village, Corvallis and surrounding cities and counties. Instead, there is the sound of earth moving equipment, the big trucks grinding up the hill, and the clouds of dust and ash floating through the air carrying pollutants created by the Coffin Butte Landfill.

Frequently rotten odors from Coffin Butte Landfill permeate both cities and the entire surrounding areas. It hangs over the areas like a deep dense fog. There is no way to avoid it on some days which forces me to stay inside in violation of BCC 53.215(1).

In violation of BCC 53.215(1) and (2), 25-30 million gallons of leachate liquid from Coffin Butte Landfill per year is dumped into the Corvallis wastewater treatment plant. This means every day 15-20 large tanker trucks go to and from the landfill to the water treatment plant. This leachate from the landfill contains heavy metals - arsenic, lead, mercury, cadmium, etc., pesticides, personal care products, pharmaceuticals, and high concentrations of PFAS (forever chemicals). The Corvallis wastewater treatment plant is not designed for, nor do they have the technology to remove this complex suite of chemical pollutants in the leachate. These chemicals are dumped in the Willamette River and are in the water we drink. This is also in violation of Benton County Comprehensive Plan policy 6.5.5 (*Benton County shall strive for the safe storage, collection, reduction, reuse, recover and appropriate disposal of hazardous waste materials.*).

The proposed expansion of Coffin Butte Landfill will place an undue burden on public facilities violating BCC 53.215(2). There will be more truck traffic on local roads hauling garbage and more trucks hauling leachate away to locations unspecified. Already I have several small round dents on the front of my car that have come from having heavy Republic Services trucks on the roads in front of me traveling at high speeds with debris falling from their trucks and shooting up rocks from the road.

I am greatly concerned about the risk of wildfires from the Coffin Butte Landfill from the methane release levels and frequent landfill fires being in these moderate wildfire risk lands adjacent to residential homes. There is no one monitoring the flames from methane after 5:00pm. To introduce

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the accelerant of high methane levels, flames can easily ignite wildfires in this area. In 2022, the EPA documented a massive number of methane leak violations with some measured methane levels higher than their equipment would register – explosive levels in some cases. See attached EPA Report signed 9/19/2022 p. 8 Daniel Heins, Environmental Scientist Air Toxics Enforcement Section of the EPA expressed his concerns “with the areas of tarp that were inflated with and leaking out landfill gas, as detected during the SEM, noting that in addition to compliance concerns with the surface methane standard that such an accumulation of flammable gas creates a potential safety concern.” See also attached EPA Report Appendix B: Field Measurement Data pp 12-14 yellow highlighted readings. “F/O” refers to instrument flame out which is a safety feature of the methane detector which has a tiny flame in it which gets snuffed out when it senses the methane concentration is getting high enough that the flame might ignite it. This concentration is called the “lower explosive limit,” indicating readings above 5% that have exceeded the TVA measurement range.

Expanding the Coffin Butte Landfill could only exacerbate these issues and create further detrimental damage and risks to the area and the health of the residents living in the surrounding cities and counties. Expanding the Coffin Butte landfill will be detrimental to the statewide goals promoted in the Benton County Comprehensive Plan such as “maintaining and improving the quality of the air, water and land resources of the state,” “[v]ibrant, livable communities,” “health considerations in all actions,” Expansion will also be detrimental to the County’s Core Values adopted in its 2040 Thriving Communities Initiative. Any attempt to increase a current harm is a significant and dismaying departure from the County’s core value of protecting all its residents. The applicant has not proved by their current operation that the expansion will be any different.

This expansion would be creating a *de facto* “sacrifice zone” in Benton County: a piece of land and the areas around it that the County is allowing to be ruined for the gain of other areas. This is directly contrary to my values and the character and values of Benton County.

In January, EPA Enforcement initiated an action against Coffin Butte Landfill. This action has significant implications: it indicates the EPA has cause to believe the applicant is misrepresenting their environmental compliance. Given the serious nature of this action, I feel the Planning Commission must reject the applicant’s Burden of Proof, which relies on the same representations of the applicant’s environmental record that the EPA is investigating.

I thank you for the opportunity to submit my testimony and greatly appreciate your great care in deciding these issues.

Roxana Kaferly





**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**  
**REGION 10**  
**1200 6<sup>TH</sup> AVENUE**  
**SEATTLE, WASHINGTON 98101**

**DATE:** See date of Section Chief signature

**SUBJECT:** CLEAN AIR ACT INSPECTION REPORT  
Republic Services Coffin Butte Landfill, Corvallis, OR

**FROM:** Daniel Heins, Environmental Scientist  
Air Toxics Enforcement Section, EPA Region 10

**THRU:** Derrick Terada, Acting Section Chief  
Air Toxics Enforcement Section, EPA Region 10

**TO:** File

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**BASIC INFORMATION**

**Facility Name:** Republic Services Coffin Butte Landfill

**Facility Location:** 28972 Coffin Butte Road, Corvallis, OR 97330

**Date of Inspection:** On Site Inspection: June 23, 2022  
Virtual Conference: July 11, 2022

**EPA Inspector(s):**

1. Daniel Heins, Environmental Scientist <sup>a,b</sup>

**Other Attendees:**

1. Ian MacNab, Environmental Manager – Republic Services <sup>a,c</sup>
2. Phil Caruso, Environmental Specialist – Republic Services <sup>a,b</sup>
3. Brock Kienholz, Operations Manager – Republic Services <sup>c</sup>
4. Nikki Wuestenberg, Operations Support (Nationwide) – Republic Services <sup>a</sup>
5. Melissa Green, Environmental Consultant – Weaver Consultants <sup>a</sup>
6. Yuki Puram, Air Inspector & Permit Engineer – Oregon Department of Environmental Quality <sup>a,b</sup>

<sup>a</sup> Attended virtual conference

<sup>b</sup> Present for all of on-site, including SEM

<sup>c</sup> Present during on site conferences but not during SEM

**Contact Email Address:** imacnab@republicservices.com

**Facility Type:** Municipal solid waste (MSW) landfill

**Purpose of Inspection:** Surface emissions monitoring (SEM) and evaluating compliance with landfill air rules.

**Regulations Central to Inspection:** 40 C.F.R. Part 60, Subpart WWW; Oregon State Plan for 40 C.F.R. Part 60, Subpart Cf; 40 C.F.R. Part 63, Subpart AAAA

**On Site (6/23) Arrival Time:** 09:00

**On Site (6/23) Departure Time:** 17:50

**Virtual Conference (7/11) Start Time:** 13:00

**Virtual Conference (7/11) End Time:** 15:00

**Inspection Type:**

- ☐ Unannounced Inspection
- ☒ Announced Inspection

**SITE OVERVIEW**

The following information was obtained verbally from Republic Services representatives, including their consultants, during the virtual conference, unless otherwise stated.

**Operations Overview:**

The Coffin Butte Landfill (the "Landfill") is owned and operated by Republic Services ("Republic"). Republic acquired the Landfill in 2008. Republic representatives were uncertain of exactly how old the Landfill is, stating that they believed it began as a military dump site in the 1940s. Daniel Heins confirmed this via information online from DEQ, which stated that landfilling began in the 1940s in association with Camp Adair. The areas that predate the Resource Conservation and Recovery Act of 1976 (RCRA) have a clay foundation. Some historic waste that predates the 1970s has been re-located from these unlined sections to the post-RCRA lined areas to facilitate construction of future lined cells in those areas.

The Landfill is permitted for 178 acres and has a permitted capacity of 35,514,471 according to the Landfill's 2020 Part 98 Greenhouse Gas Report. The Facility receives approximately 3,500 to 4,500 tons per day of waste. Wastes received include MSW, petroleum contaminated soils, construction and demolition (C&D) waste, C&D material recovery facility (MRF) residuals, and other industrial wastes. Based on current waste acceptance rate, the Landfill has approximately 20 years left under its current permit. Republic has room to expand the site on its property beyond the current permitted footprint.

Final cover on the Landfill is compacted soils with a synthetic membrane, with penetrations booted and plastic welded. Interim cover is at least 24 inches of soils. Much of the interim cover area is covered in tarps or, in areas without work planned for a few years, a thicker layer of EPDM. In both cases, this is with the primarily goal of reducing water infiltration into the



Landfill. Daily cover is 6 inches of soil or approved alternative daily cover (ADC). Republic uses C&D MRF shaker fines, MSW incinerator ash, and tarps as ADC at the Landfill.

Leachate flows by gravity to sumps and is pumped to covered storage ponds. Leachate collected varies by year based on the weather but typically is around 25 to 30 million gallons. Condensate is routed to the leachate system. Leachate is trucked to local publicly owned treatment works (POTWs). No leachate is recirculated, and no liquid wastes are added to the Landfill.

The gas collection and control system (GCCS) contains over 300 landfill gas (LFG) collection points, including horizontal wells, vertical wells, and parts of the leachate system with gas collection. Collected landfill gas partially routed to a separately owned/operated gas to energy plant run by PNGC Power. The energy plant has five Caterpillar gas engines – three 3516s and two 3520s. Excess gas not routed to the energy plant is controlled via flares at the Landfill. The landfill has two open flares, with capacities of 1000 standard cubic feet per minute (scfm) and 2000 scfm. Recently the Landfill has been collecting 2600 scfm for the full site, with 1600 scfm going to the energy plant and 1000 scfm to the flares.

#### **SITE TOUR — JUNE 23, 2022**

- ☒ 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

#### **Data Collected and Observations:**

Daniel Heins arrived on site and met with the site staff for introductions and a brief site orientation/safety briefing at the Landfill's office. During this meeting, Ian MacNab stated that while there was a Method 21 instrument available and that Phil Caruso is their monitoring technician, that he would not take the opportunity to check EPA readings / provide confirmation readings, as a matter of Republic Services corporate policy. Daniel Heins explained that facilities typically prefer to check and confirm EPA readings and he gave advance notice to provide Republic the opportunity to confirm his TVA readings. Ian MacNab re-iterated that as a corporate policy that they would not provide confirmation readings.

After that brief meeting, Daniel Heins began the SEM. Phil Caruso accompanied EPA for the Surface Emission Monitoring (SEM). EPA showed all readings to Phil Caruso for visual confirmation of the readings and instructed him to state if he had any concerns with EPA's monitoring methods at any point. EPA used a ThermoFisher Toxic Vapor Analyzer 2020 (TVA) to perform EPA Reference Method 21 for the SEM.

In the morning (9:50 - 12:45), Daniel Heins conducted the monitoring with the TVA, covering a loop on the western portion of the Landfill. In the afternoon (13:30 - 17:15), he continued monitoring with the TVA, covering a loop on the eastern portion of the Landfill. Over the course of the day, Daniel Heins identified 61 points in exceedance of 500 parts per million (ppm), exhausting his supply of marking flags. Of these, 21 flagged exceedances were above 10,000

ppm. Many flagged exceedances represented clusters of exceedances at multiple points or broad areas of exceedances. Of the flagged exceedances, 26 were at or partially at gas collection wells (including both active and abandoned or decommissioned). Eight exceedances were at leachate cleanouts. Daniel Heins focused monitoring on areas under intermediate cover, though the first six exceedances were in final cover areas. During the afternoon monitoring, Daniel Heins measured multiple exceedances that continued to be above 500 ppm multiple feet in the air, with multiple feet lateral distance from the emission source, indicating substantial landfill gas plumes (flag #26, 46, and 51).

Flag #51 was by a broad area where the tarp was visibly inflated with gas. The tarp was not moving in the wind, it looked to be being pushed out steadily over a wide area towards the top of the south slope on the central area of the landfill, being held down by straps, cover anchors, and sandbags. Neither Daniel Heins nor Phil Caruso could identify any place where the wind could be lifting under the tarps, as the tarp edges were sandbagged and staked down. Daniel Heins measured a concentration of 2% at flag #51 before pulling away to avoid maxing out his instrument. He measured the methane concentration to be 2000 ppm at 3' in the air at this location, indicating a plume of gas coming out from the inflated tarp area. Along the top of this section of tarp, from flag #52 to #54, every post or tarp hole Daniel Heins monitored exceeded the surface methane standard, with readings of up to 7% shown before the instrument maxed out.

Phil Caruso did not dispute any of the readings, though noted that he would not have checked many of the exceedance locations, that he would have spent less time monitoring, or that he would have considered a higher location to be "the ground" when placing his probe 5 to 10 centimeters (cm) above the ground per the SEM regulations.

At an exceedance (flag #1) with a hole in the ground from an animal burrow, Phil Caruso stated that he would have considered the "ground" to be where the ground would have been if an animal didn't dig a hole into it at that location, rather than the ground at the base of the hole, and thus measured from a significantly higher location than Daniel Heins. At an exceedance (flag #2) between overlapped tarp material, with one piece of tarp raised above the other with a gap of air in between, Phil Caruso stated that he would have monitored with his probe above the upper tarp, rather than measuring the 5 to 10 cm from the tarp against the ground.

When Daniel Heins was monitoring a cluster of decommissioned wells with a patch of distressed soil (flag #3), Phil Caruso stated that he would have moved on after not directly getting above 500 ppm within twice his instrument response time even if there was an increase in reading, rather than moving around the penetration points slowly to find maximum reading point and then waiting twice the response time at this maximum reading location.

When Daniel Heins was monitoring at leachate cleanouts, Phil Caruso stated that he does not monitor at these and that they are not fully penetrating the cover. Daniel Heins responded that it was likely that many of these ultimately did penetrate the cover, especially in areas of thinner intermediate cover, and that regardless he recommended checking these as they were proving to be repeated sources of extremely elevated emissions, many over an order of magnitude above the surface methane standard. Phil Caruso stated that he was not required to monitor these. Daniel Heins and Phil Caruso had a similar discussion at the valve box dug into the cover with a reading



of 4% methane (flag #37), with Phil Caruso stating that this was not a penetration and thus he did not have to monitor this.

When Daniel Heins was monitoring at a horizontal penetration of the cover associated with a well (flag #16), Phil Caruso stated that he would not have monitored this as a penetration.

Phil Caruso stated that he would not have monitored the Cell 5 leachate riser that Daniel Heins measured multiple exceedances at, as it was outside of the waste mass.

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

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

### **INSPECTION CONFERENCE — JULY 11, 2022**

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

#### **Staff Interview:**

The Landfill is subject to the Oregon State Plan implementing the Part 60 Subpart Cf Emission Guidelines, having previously been subject to Part 60 Subpart WWW. The Landfill is also subject to Part 63, Subpart AAAA, and has opted-in to demonstrating compliance with the Oregon State Plan through the Subpart AAAA requirements where allowed.

Republic stated that they were unsure if they were excluding non-degradable waste from their maximum gas generation rate calculations in their Design Plan or any other gas modeling runs they have done to size their GCCS. Republic stated that as the operations personnel were not present, they were unable to speak to what types of industrial wastes are received in any further detail. The Landfill does not accept refrigerants. The Landfill receives asbestos. It packages asbestos waste and deposits it in a dedicated asbestos mono-fill that is the only area excluded from the GCCS.

Leachate system components are connected for LFG collection on a case-by-case basis per recommendations of the engineer(s) involved in designing the GCCS.

Republic is aware of a one-off test of the sulfur content of the LFG requested by DEQ and stated that it read at non-detectable levels.

The Landfill has an alternative monitoring plan (AMP) approved by DEQ dating to when the Landfill operated under Subpart WWW. The AMP has allowances for positive pressure, temperatures above 145 degrees Fahrenheit, and elevated oxygen readings. No wells currently are above 145 degrees Fahrenheit. Republic does make use of the positive pressure allowances for wells with high oxygen levels.

Republic stated that they do not consistently check water levels in wells but has done so in the past. All new (at least since 10 years ago) wells are constructed with dewatering pumps, as a best

practice for a landfill in a wet climate. Republic does not typically add pumps to old wells. As wells are typically constructed with steel casings at the Landfill, redrills are rarely needed.

The Landfill has gas migration probes placed outside the area without synthetic liner but has typically seen readings at gas non-detect levels.

For cover integrity monitoring, Republic stated that they look for holes and cracks in the soils and wind damage on the tarps, but that there was no set answer for what degree of tarp damage would necessitate repair.

For surface emissions monitoring, Republic only excludes active filling areas and other areas with active heavy equipment as "dangerous." When Daniel Heins noted that the drawn paths in the submitted SEM reports went straight through the drawn "dangerous areas," Republic stated that the paths on the maps are general and do not reflect the actual walked paths. Republic monitors penetration points during its serpentine path. Phil Caruso stated that in addition to penetrations, he would go off the serpentine path if he saw distressed vegetation or cracks in the cover, and that those were the only examples of places where visual observations indicate elevated concentrations of landfill gas that he considered. Republic was unable to speak to the what the historic SEM exceedance rate had been in past surveys.

Daniel Heins asked if the GCCS was operational on the day of the SEM inspection or if there was anything different from standard operations that could have impacted the results of the monitoring. Republic stated that nothing was operating differently than normal, with all wells in operation and collection running. Republic did note that construction above exceedance flags #48 through 58 would have impacted the cover in the construction area.

Daniel Heins asked if Republic viewed the inflated tarps as a concern or something to acted on. Republic disputed that the tarps were inflated with landfill gas, claiming that the wind has blown them up. Daniel Heins noted the extremely elevated methane concentrations detected by the inflated tarps and that the tarps appeared to be in a static inflated state without any steady wind or apparent way for the wind to lift the tarps.

Republic noted that construction of additional gas collection on the top of the Landfill is in progress and will be completed this summer.

**Requested documents:**

The following documents were requested and supplied ahead of the inspection:

- Two most recent semi-annual NSPS reports
- Results of any cover integrity reports and quarterly SEM monitoring events that have been occurred since the most recent semi-annual
- GCCS map
- Map of cover by type in place (final vs intermediate vs daily cover)



The following documents were requested during the conference and confirmed via subsequent email:

- Constructed acres and acreages by cover type
- Past 5 years of flare monitoring data
- Flare/blower design specs and any performance tests on file for it
- Past year of migration probe data and a map of the probe locations
- Current GCCS Design Plan, along with any versions that have been active in the past 5 years and them most recent LandGEM run used for GCCS sizing (if not in the Design Plan)
- A map of the GCCS showing extent of any horizontal collectors if these are utilized to demonstrate a sufficient density of gas collection
- Landfill cell map and year of first waste placement for each cell
- 2021 Part 98 Greenhouse Gas Report
- Annual waste deposited tonnages by type from 2016 to present
  - Include a list of the primary sources of industrial wastes and a description for any special wastes listed
  - Outline of what wastes (if any) are classified as non-degradable for LandGEM maximum expected gas generation (Design Plan) along with the basis for this classification
  - Outline of what wastes are classified as “inert” for Part 98 reporting along with the basis for this classification
- Rest of the past 5 years of Annual/Semi-Annual Reports
  - Include all NSPS/NESHAP/EG reports, SSM reports, and air permit reports as applicable
  - If the full SEM reports are not included in the above, please include those for the past 5 years
  - Include the most recent SEM reports, or at least as much of it as has been completed by the end of July, even if they are not a part of any final semi-annual
- Any versions of the SSM plan that have been in place in the past 5 years
- Past 5 years of wellhead parameter monitoring
- Past 5 years of gas flow to the energy plant
- Any H<sub>2</sub>S or sulfur gas testing results from the past 5 years, or most recent if not within the past 5 years
- Map of wells being added this summer since the inspection
- The Alternative Monitoring Plan and approval letter
- Identification of which wells have dewatering pumps
- General description of final cover construction

### **Concerns;**

Daniel Heins expressed potential concerns with Republic's SEM/Method 21 procedures. Despite Republic having seen no more than 6 exceedances in the recent SEM reports supplied ahead of the inspection that included penetration monitoring, including reports with 0 exceedances, he identified 61 points in exceedance of 500 ppm, including 21 points above 10,000 ppm, with 26 exceedances at gas collection wells that Republic should have specifically been monitoring on a quarterly basis since the Oregon State Plan became effective in November 2020.

Daniel Heins expressed concerns with the areas of tarp that were inflated with and leaking out landfill gas, as detected during the SEM, noting that in additions to compliance concerns with the surface methane standard that such an accumulation of flammable gas creates a potential safety concern.

### **DIGITAL SIGNATURES**

**DANIEL  
HEINS**

Digitally signed by  
DANIEL HEINS  
Date: 2022.09.19 14:26:56  
-07'00'

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Daniel Heins, Report Author

**DERRICK  
TERADA**

Digitally signed by  
DERRICK TERADA  
Date: 2022.09.19  
14:51:00 -07'00'

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Derrick Terada, Acting Section Chief



## **APPENDICES AND ATTACHMENTS**

Appendix A: Digital Image Log

Appendix B: Field Measurement

### **APPENDIX A: DIGITAL IMAGE LOG**

**Inspector Name:** Daniel Heins

**Archival Record Location:** US EPA SharePoint

#### **2022-06-23 Images**

| Image # | File Name           | Time (PDT) | Flag # | Description   |
|---------|---------------------|------------|--------|---|
| 1       | 20220623_100838.jpg | 10:08:38   | 1      | Animal burrow by cleanout   |
| 2       | 20220623_101327.jpg | 10:13:27   | 2      | Overlapping tarps   |
| 3       | 20220623_101816.jpg | 10:18:16   | 3      | Discolored soil/distressed vegetation by INE9, multiple decommissioned wells            |
| 4       | 20220623_102219.jpg | 10:22:19   | 3      | Discolored soil/distressed vegetation by INE9, multiple decommissioned wells            |
| 5       | 20220623_102231.jpg | 10:22:31   | 3      | Discolored soil/distressed vegetation by INE9, multiple decommissioned wells            |
| 6       | 20220623_102717.jpg | 10:27:17   | 4      | Cleanout  |
| 7       | 20220623_103235.jpg | 10:32:35   | 5      | Decommissioned well and surrounding wells by RE8 manifold                               |
| 8       | 20220623_103515.jpg | 10:35:15   | 5      | Decommissioned well and surrounding wells by RE8 manifold                               |
| 9       | 20220623_104050.jpg | 10:40:50   | 6      | Decommissioned PVC well (W9?)   |
| 10      | 20220623_105243.jpg | 10:52:43   | 7      | Hole in liner   |
| 11      | 20220623_110338.jpg | 11:03:38   | 8      | cleanout with gap in liner  |
| 12      | 20220623_111123.jpg | 11:11:23   | 9      | Unmarked well with gap in liner and gap between well and dirt, plus nearby holes        |
| 13      | 20220623_111129.jpg | 11:11:29   | 9      | Close up on gap on liner and in dirt  |
| 14      | 20220623_111216.jpg | 11:12:16   | 9      | Hole in liner near unmarked well  |
| 15      | 20220623_111452.jpg | 11:14:52   | 10     | Liner tear and adjacent hole  |
| 16      | 20220623_112408.jpg | 11:24:08   | 11     | 3V91 Manifold, both at tarp edge and at multiple penetrations                           |
| 17      | 20220623_113216.jpg | 11:32:16   | 12     | Hole in liner   |
| 18      | 20220623_113733.jpg | 11:37:33   | 13     | 3V92 wells with tarp gap  |
| 19      | 20220623_114521.jpg | 11:45:21   | 14     | 3B0V0351 bad liner seal at base   |
| 20      | 20220623_115250.jpg | 11:52:50   | 15     | Decommissioned well with tarp tear/gap  |
| 21      | 20220623_115912.jpg | 11:59:12   | 16     | 3H94 where horizontal intersects tarp   |
| 22      | 20220623_120314.jpg | 12:03:14   | 16     | 3H94 penetration cluster  |
| 23      | 20220623_120746.jpg | 12:07:46   | 17     | Cleanout by unknown well out of liner   |
| 24      | 20220623_121307.jpg | 12:13:07   | 18     | Liner that had been pulled back from unknown well by chopped off pipe segment on ground |
| 25      | 20220623_122009.jpg | 12:20:09   | 19     | Unknown well at liner seam  |

## 2022-06-23 Images, continued

| Image # | File Name           | Time (PDT) | Flag # | Description  |
|---------|---------------------|------------|--------|--|
| 26      | 20220623 122332.jpg | 12:23:32   | 20     | Riser with bad liner seal                                      |
| 27      | 20220623 123220.jpg | 12:32:20   | 21     | Well 3COV3 with liner gap                                      |
| 28      | 20220623 140422.jpg | 14:04:22   | 22     | Cell 5 leachate riser complex                                  |
| 29      | 20220623 140538.jpg | 14:05:38   | 22     | Cell 5 leachate riser complex                                  |
| 30      | 20220623 140921.jpg | 14:09:21   | 22     | Cell 5 leachate riser complex - pipe connector                 |
| 31      | 20220623 140924.jpg | 14:09:24   | 22     | Cell 5 leachate riser complex - pipe connector                 |
| 32      | 20220623 140927.jpg | 14:09:27   | 22     | Cell 5 leachate riser complex                                  |
| 33      | 20220623 141045.jpg | 14:10:45   | 22     | Cell 5 leachate riser complex                                  |
| 34      | 20220623 142020.jpg | 14:20:20   | 23     | Well 5V40 in liner   |
| 35      | 20220623 143317.jpg | 14:33:17   | 24     | Tarp anchor  |
| 36      | 20220623 143735.jpg | 14:37:35   | 25     | Tarp anchor  |
| 37      | 20220623 144405.jpg | 14:44:05   | 26     | 4B55 well cluster  |
| 38      | 20220623 144407.jpg | 14:44:07   | 26     | Mystery pipe with improvised cap with folded plastic wrap      |
| 39      | 20220623 144923.jpg | 14:49:23   | 27     | 2V114 at base in dirt  |
| 40      | 20220623 145332.jpg | 14:53:32   | 28     | Hole near edge of liner, and in neighboring hole               |
| 41      | 20220623 145705.jpg | 14:57:05   | 29     | Tarp edge  |
| 42      | 20220623 150256.jpg | 15:02:56   | 30     | Tarp hole and neighboring holes                                |
| 43      | 20220623 150616.jpg | 15:06:16   | 31     | Hole at tarp anchor  |
| 44      | 20220623 150954.jpg | 15:09:54   | 32     | Abandoned well   |
| 45      | 20220623 150957.jpg | 15:09:57   | 32     | Liner hole near abandoned well                                 |
| 46      | 20220623 151520.jpg | 15:15:20   | 33     | 4V53 - well surrounded by sandbags in lined area               |
| 47      | 20220623 151822.jpg | 15:18:22   | 34     | Anchor and nearby liner hole                                   |
| 48      | 20220623 154015.jpg | 15:40:15   | 35     | Cleanout coming out of dirt                                    |
| 49      | 20220623 154916.jpg | 15:49:16   | 36     | Vertical cleanout in dirt                                      |
| 50      | 20220623 155053.jpg | 15:50:53   | 37     | Circular valve box   |
| 51      | 20220623 155522.jpg | 15:55:22   | 38     | Hole in liner  |
| 52      | 20220623 160008.jpg | 16:00:08   | 39     | Cleanout / hole in liner                                       |
| 53      | 20220623 160336.jpg | 16:03:36   | 40     | Tarp hole and neighboring holes                                |
| 54      | 20220623 160711.jpg | 16:07:11   | 41     | PH2101, 2H101 - whole cluster of wells (some tarp gaps)        |
| 55      | 20220623 160900.jpg | 16:09:00   | 41     | PH2101, 2H101 - whole cluster of wells (some tarp gaps)        |
| 56      | 20220623 161111.jpg | 16:11:11   | 42     | 3AV68 and nearby hole in liner                                 |
| 57      | 20220623 161551.jpg | 16:15:51   | 43     | 2V100 well in tarp area  |
| 58      | 20220623 161847.jpg | 16:18:47   | 44     | 3V73 well in tarp gap  |
| 59      | 20220623 162101.jpg | 16:21:01   | 45     | Tarp stake   |
| 60      | 20220623 162525.jpg | 16:25:25   | 46     | Hole in tarp   |
| 61      | 20220623 162743.jpg | 16:27:43   | 47     | Tarp edge  |
| 62      | 20220623 163203.jpg | 16:32:03   | 49     | tarp edge  |
| 63      | 20220623 163313.jpg | 16:33:13   | 50     | 2H86 cluster in tarp   |
| 64      | 20220623 163646.jpg | 16:36:45   | 51     | Series of tarp tears near inflated tarp area                   |
| 65      | 20220623 163710.jpg | 16:37:10   | -      | Tarped slope showing buildup of gas inflating tarps over slope |
| 66      | 20220623 163718.jpg | 16:37:18   | -      | Tarped slope showing buildup of gas inflating tarps over slope |



# 2022-06-23 Images, continued

| Image # | File Name           | Time (PDT) | Flag # | Description  |
|---------|---------------------|------------|--------|--|
| 67      | 20220623 163934.jpg | 16:39:34   | 52     | Tarp stake   |
| 68      | 20220623 164213.jpg | 16:42:13   | 53     | Tarp stake in area of continuously elevated readings           |
| 69      | 20220623 164217.jpg | 16:42:17   | -      | Tarped slope showing buildup of gas inflating tarps over slope |
| 70      | 20220623 164219.jpg | 16:42:19   | -      | Tarped slope showing buildup of gas inflating tarps over slope |
| 71      | 20220623 164221.jpg | 16:42:21   | -      | Tarped slope showing buildup of gas inflating tarps over slope |
| 72      | 20220623 164521.jpg | 16:45:21   | 54     | Tarp stake in area of continuously elevated readings           |
| 73      | 20220623 164718.jpg | 16:47:18   | 55     | Tarp edge, inflated tarps visible                              |
| 74      | 20220623 164914.jpg | 16:49:14   | 56     | Broad area of dirt/waste uphill of tarp area                   |
| 75      | 20220623 164917.jpg | 16:49:17   | 56     | Broad area of dirt/waste uphill of tarp area                   |
| 76      | 20220623 165102.jpg | 16:51:02   | 57     | 2H94 well cluster - all  |
| 77      | 20220623 165319.jpg | 16:53:19   | 58     | Tarp edge  |
| 78      | 20220623 165637.jpg | 16:56:37   | 59     | 3V89 well cluster in dirt                                      |
| 81      | 20220623 170040.jpg | 17:00:40   | 60     | 2V113 - well with some tarp wrapped in dirt area               |
| 82      | 20220623 170947.jpg | 17:09:47   | 61     | Valve with well at haul road above cell 5                      |

## **APPENDIX B: FIELD MEASUREMENT DATA**

### **Measured Exceedances**

| <b>Flag #</b> | <b>Reading</b> | <b>Description</b>  | <b>Latitude</b> | <b>Longitude</b> |
|---------------|----------------|---|-----------------|------------------|
| 1             | 1%             | Animal burrow by cleanout   | 44.69737457     | -123.2356198     |
| 2             | 1000 F/O       | Overlapping tarps   | 44.69745665     | -123.2357082     |
| 3             | 1000           | Discolored soil/distressed vegetation by INE9, multiple exceedances including multiple decommissioned wells | 44.69766687     | -123.2360485     |
| 4             | 2000           | Cleanout  | 44.69775127     | -123.2362152     |
| 5             | 1%             | Decommissioned well and surrounding wells by RE8 manifold   | 44.69786105     | -123.236267      |
| 6             | 700            | Decommissioned PVC well (W9?)   | 44.69782839     | -123.2365858     |
| 7             | 1500           | Hole in liner   | 44.69865701     | -123.2365257     |
| 8             | 1.20%          | cleanout with gap in liner  | 44.69790548     | -123.2358232     |
| 9             | 1.20%          | Unmarked well with gap in liner weld and gap between well and dirt, plus nearby holes                       | 44.69829911     | -123.2354937     |
| 10            | 2.70%          | Liner tear and adjacent hole  | 44.69842096     | -123.23558       |
| 11            | 3700           | 3V91 Manifold, both at tarp edge and at multiple penetrations   | 44.69885999     | -123.2350488     |
| 12            | 2.20%          | Hole in liner   | 44.69830399     | -123.2350079     |
| 13            | 5000           | 3V92 wells with tarp gap  | 44.69837287     | -123.2347328     |
| 14            | 1200           | 3B0V0351 bad liner seal at base   | 44.69822886     | -123.2340741     |
| 15            | 1200           | Decommissioned well with tarp tear/gap  | 44.69836899     | -123.2337448     |
| 16            | 9000           | 3H94 where horizontal intersects tarp, and multiple penetrations in cluster                                 | 44.698248       | -123.2334448     |
| 17            | 4700           | Cleanout by unknown well out of liner   | 44.69812972     | -123.2337702     |
| 18            | 5500           | Liner that had been pulled back from unknown well by chopped off pipe segment on ground                     | 44.69811411     | -123.2338379     |
| 19            | 2000           | Unknown well at liner seam  | 44.69804442     | -123.2344811     |
| 20            | 8000           | Riser with bad liner seal   | 44.69804447     | -123.2345951     |
| 21            | 1220           | Well 3COV3 with liner gap   | 44.69784857     | -123.2333245     |
| 22            | 2400           | Cell 5 leachate riser complex - multiple risers and at pipe connection                                      | 44.70181118     | -123.2257475     |
| 23            | 800            | Well 5V40 in liner  | 44.70167582     | -123.2273125     |
| 24            | 3000           | Tarp anchor   | 44.70101596     | -123.2273626     |
| 25            | 600            | Tarp anchor   | 44.70114084     | -123.2274474     |
| 26            | 1%             | 4B55 at base of cluster as well as top of mystery pipe with improvised cap with folded plastic wrap         | 44.70115072     | -123.2275846     |
| 27            | 4000           | 2V114 at base in dirt   | 44.70111214     | -123.2278246     |
| 28            | 1% F/O, 3%     | Hole near edge of liner, and in neighboring hole  | 44.70103128     | -123.2276965     |
| 29            | 4500           | Tarp edge   | 44.70082423     | -123.2275253     |
| 30            | 1%             | Tarp hole and neighboring holes   | 44.70072043     | -123.2273274     |
| 31            | 1500           | Hole at tarp anchor   | 44.70068672     | -123.227044      |



## Measured Exceedances

| Flag # | Reading | Description   | Latitude    | Longitude    |
|--------|---------|---|-------------|--------------|
| 32     | 3200    | At abandoned well and nearby hole in liner              | 44.70068362 | -123.2267606 |
| 33     | 1200    | 4V53 - well surrounded by sandbags in lined area        | 44.70057706 | -123.2263945 |
| 34     | 1100    | Anchor and nearby liner hole                            | 44.7005098  | -123.2261782 |
| 35     | 1%      | Cleanout coming out of dirt                             | 44.69962827 | -123.2287076 |
| 36     | 1200    | Vertical cleanout in dirt                               | 44.69926032 | -123.2301237 |
| 37     | 4%      | Circular valve box                                      | 44.69922726 | -123.2302603 |
| 38     | 1500    | Hole in liner   | 44.69923732 | -123.2303614 |
| 39     | 1200    | Cleanout / hole in liner                                | 44.69906809 | -123.2308424 |
| 40     | 1600    | Tarp hole and neighboring holes                         | 44.69912191 | -123.2309496 |
| 41     | 1%      | PH2101, 2H101 - whole cluster of wells (some tarp gaps) | 44.69926451 | -123.230824  |
| 42     | 2%      | 3AV68 and nearby hole in liner                          | 44.69929347 | -123.2310994 |
| 43     | 3% F/O  | 2V100 well in tarp area                                 | 44.69920828 | -123.2314229 |
| 44     | 1200    | 3V73 well in tarp gap                                   | 44.69913826 | -123.2316593 |
| 45     | 2%      | Tarp stake  | 44.6990841  | -123.2318812 |
| 46     | 2%      | Hole in tarp  | 44.69927783 | -123.2319267 |
| 47     | 2500    | Tarp edge   | 44.69937083 | -123.2319    |
| 48     | 6000    | 3V74 - whole well cluster                               | 44.69942123 | -123.2320147 |
| 49     | 5000    | tarp edge   | 44.69944725 | -123.2316747 |
| 50     | 7000    | 2H86 cluster in tarp                                    | 44.69950461 | -123.2315035 |
| 51     | 2%      | Series of tarp tears near inflated tarp area            | 44.69964525 | -123.2311715 |
| 52     | 2000    | Tarp stake  | 44.69970317 | -123.2309795 |
| 53     | 2%      | Tarp stake (and every tarp stake between 52 and 53)     | 44.69985738 | -123.2307325 |
| 54     | 7%      | Tarp stake (and every tarp stake between 53 and 54)     | 44.69994174 | -123.2304609 |
| 55     | 3%      | Tarp edge   | 44.70001207 | -123.2302193 |
| 56     | 800     | Broad area of dirt/waste uphill of tarp area            | 44.70011566 | -123.2300539 |
| 57     | 8000    | 2H94 well cluster - all                                 | 44.7001631  | -123.2301332 |
| 58     | 2000    | Tarp edge   | 44.70021131 | -123.2296507 |
| 59     | 4000    | 3V89 well cluster in dirt                               | 44.7005688  | -123.2284677 |
| 60     | 4000    | 2V113 - well with some tarp wrapped in dirt area        | 44.70062987 | -123.2276513 |
| 61     | 800     | Valve with well at haul road above cell 5               | 44.70159276 | -123.2253808 |

All readings are given as methane parts per million, except for readings above 10,000 ppm which are given as percent methane. "F/O" refers to instrument flame out, indicating readings above 5% that have exceeded the TVA measurement range.



## Calibration and Instrument Information

Daniel Heins used a ThermoFisher Toxic Vapor Analyzer 2020 (TVA2020), designated as TVA A95732. The EPA TVA2020 response time is approximately 4.5 seconds.

|                        | Calibration gas ppm | A95732 ppm |
|------------------------|---------------------|------------|
| 9:15 calibration check | 500                 | 500        |
| 13:30 drift check      | 500                 | 464        |
| 17:50 drift check      | 500                 | 462        |

### EPA calibration gases

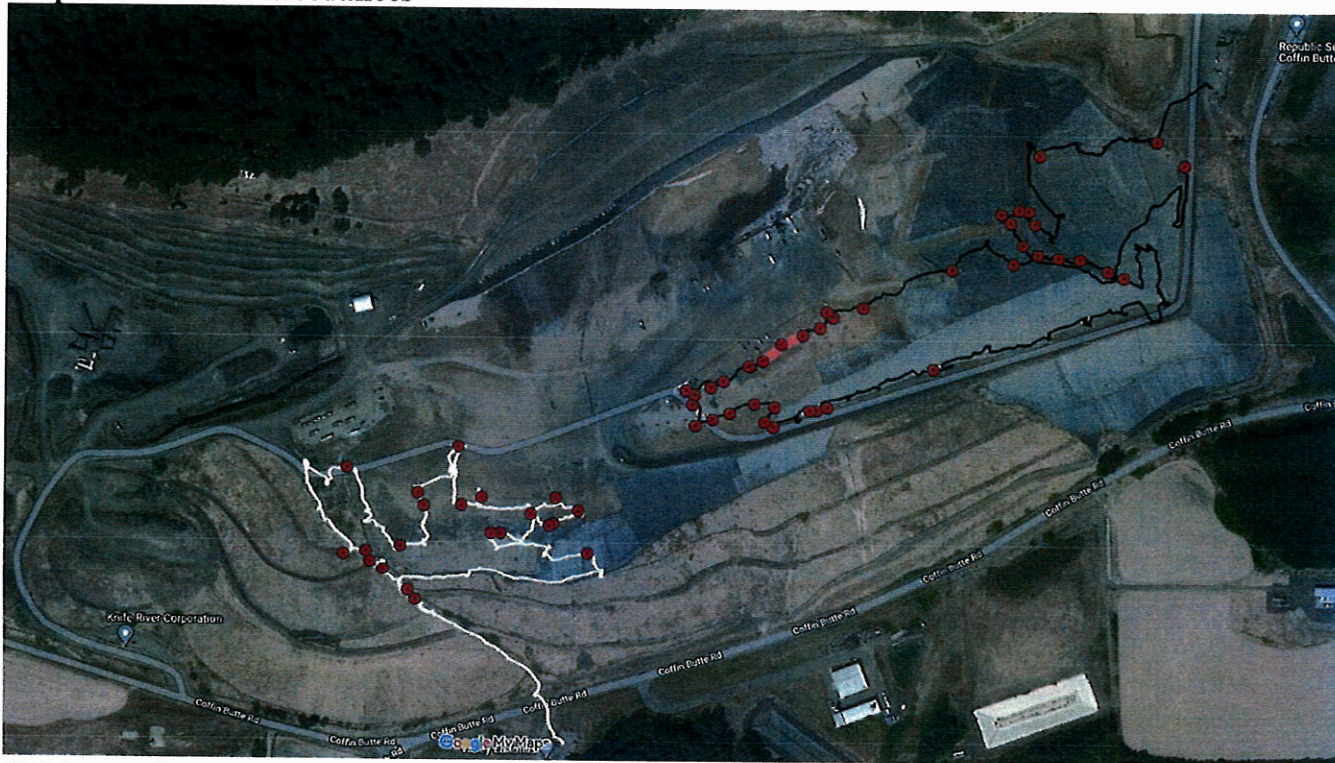
| Composition               | Lot #    | Expiration |
|---------------------------|----------|------------|
| Air zero grade THC <1 ppm | DBJ-1-24 | March 2023 |
| Methane in air 500 ppm    | 1-167-64 | June 2024  |

### Background readings:

Upwind: 0 ppm

Downwind: 3 ppm

## Map of Detected Exceedances

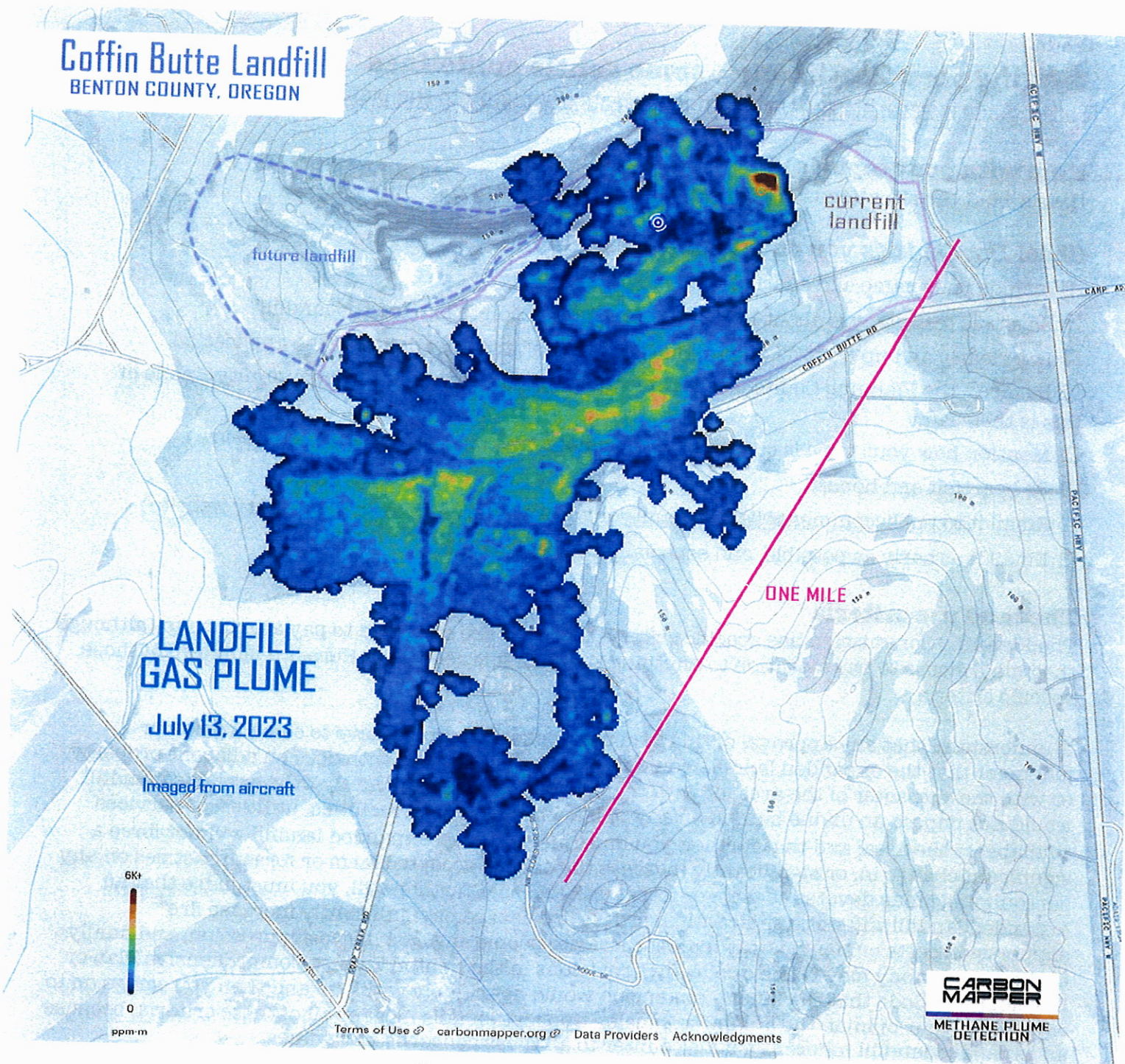


SEM exceedance locations plotted over Google Maps satellite imagery. Approximate monitoring paths included, derived from GPS data. Morning path shown in white, afternoon in black. Line of continuous exceedance at every tarp hole between flags 52 and 54 is highlighted in red.



# Coffin Butte Landfill

BENTON COUNTY, OREGON



Source: carbonmapper.org