

# Carbon Mapper Explainer

# **AIRBORNE LANDFILL GAS DETECTION AT COFFIN BUTTE LANDFILL, July 2023**

- An Explainer -

- (1) A specially equipped airplane flew over Coffin Butte Landfill six times in July 2023, and gathered data and images that are publicly available at [carbonmapper.org](https://carbonmapper.org). This explainer tells the story of those overflights and what they saw.**
  
- (2) That airplane also flew over Columbia Ridge Landfill (“Arlington”) during the same time period and mapped what it found there. This explainer tells that story as a point of comparison to what was mapped at Coffin Butte Landfill.**
  
- (3) Carbon Mapper recently quantified the leakage rate from one of the sources found by the overflights at Coffin Butte Landfill. Carbon Mapper found this source to be *100% persistent* – i.e., it was leaking when first detected, continued leaking throughout the 10-day survey period, and presumably kept on leaking thereafter. This explainer will put this quantified leak at Coffin Butte Landfill into context with other greenhouse gas emissions sources in Oregon – in plain language, it will show why U.S. Senators Merkley and Wyden and U.S. Representative Hoyle are urging the EPA to take immediate action, including enforcement as necessary, on the landfill’s large-scale climate-damaging and locally toxic emissions.**

# 1. METHANE PLUME IMAGES FROM COFFIN BUTTE LANDFILL: A WALKTHROUGH

Carbon Mapper included Coffin Butte Landfill, outside Corvallis in Oregon, as a target landfill in its survey of a thousand U.S. landfills in 2023 – probably because Coffin Butte Landfill had been found to be out of compliance by an EPA inspection in June 2022, and that inspection in turn had apparently been triggered by many community complaints in 2021.

Carbon Mapper flew over Coffin Butte Landfill on three separate days in July 2023 – July 13, 18 and 22. It overflew the landfill twice on each day, about two hours apart, for a total of six overflights. Let's walk through that process and look at the images generated.

Before we begin, let me note this image series can be confusing – to me, anyway – because it contains plume images that look pretty much the same yet are attributed to different sources. After much research, my working assumption is this: this is how the technology handles situations where there are several sources close together and all leaking methane at the same time, creating a co-mingled plume. Carbon Mapper developed its imaging technology specifically to be useful for tracing escaped methane back to its source – i.e., to be a tool that people on the ground can use to identify where big leaks are, and prioritize fixing them. So for each contributing source, the technology identifies a single “plume origin point” (small orange bullseye) and creates a plume map. For co-mingled plumes, these plume maps can look similar or the same. So, caveat: I haven't verified this assumption yet with Carbon Mapper (working on it). Okay, on to the images!

OVERFLIGHT 1: July 13, 2023, at 17:16. The airplane flew over Coffin Butte Landfill, and detected two sources, each with its own plume. Plume 1 is the plume from (attributed to) Source 1, and Plume 2 is the plume from Source 2. Note that both of these plumes are leaking landfill gas simultaneously, and the plumes appear to have some overlap. Right away we notice the dark red area in the plume maps; this is methane in concentrations too high for the technology to measure accurately; the EPA ground inspection of Coffin Butte Landfill in 2022 found 28 leaks at these high concentrations, including some at ignitable levels.

OVERFLIGHT 2: The airplane returned at 19:10 the same day. Again it found two plumes. Plume 3 is from (attributed to) a new source, Source 3. Plume 4 is again the plume from Source 1. We're beginning to see a pattern, which is that plumes associated with Source 1 are very large plumes: the detected areas are over a mile long and nearly as wide, although the plume itself presumably extends much farther (at concentrations below the detector's threshold).

OVERFLIGHT 3: July 18, 2023, at 17:17. The airplane flew over Coffin Butte Landfill again five days later, and now it detected three discrete sources leaking at the same time: Sources 1, 2, and 3. You'll notice that these three plumes – Plumes 6, 5, and 7, respectively – all look very similar, which I interpret to mean the technology was able to identify contributing sources but unable to differentiate individual plumes. These plumes all show deep red areas of high methane concentration.

OVERFLIGHT 4: The airplane returned at 19:10, about 2 hours later, and again detected the same three sources leaking at the same time: Source 1 (Plume 9), Source 2 (Plume 10), and Source 3 (plume 8). Plumes 8 and 9 look like they overlap, but Plume 10 is distinctive.

In its Data Portal, Carbon Mapper associates its quantification of Source 1 methane leakage with Plume 9. The leak rate determined by Carbon Mapper is significant:

**1200 kg (1.2 metric tons) of methane an hour.**

This leak rate is explored more fully in Section 3 of this paper.

OVERFLIGHT 5: July 22, 2023, at 19:15. The airplane returned to Coffin Butte Landfill four days later, and again found three sources active – but now has identified a new leak source, Source 4. The technology mapped three plumes for the three sources: Plume 11 (Source 4), Plume 12 (Source 2) and Plume 13 (Source 1). Again, all three of these sources are leaking methane at the same time. And again, these plumes show extensive areas of higher methane concentration (the light blue - green - yellow - orange areas) and the areas of deep red, which can signify methane concentrations too high to be displayed accurately by this technology.

OVERFLIGHT 6: The airplane passed over Coffin Butte Landfill for the last time about 75 minutes later, and again detected three sources, which it identified as Sources 2, 3 and 4 (Plumes 16, 14 and 15, respectively). Plumes 14 and 15 look very similar, which again may indicate the technology was able to identify the contributing sources but unable to differentiate their individual plumes.

It can be useful to look at each plume that the technology has associated with a particular source, to get an idea of that source's emissions over time. Please see the Source Map (page 20), which shows which plumes are associated with each source.

It's significant that in its quantification of Source 1, Carbon Mapper rated it 100% Persistent – meaning that it was already leaking when first detected, continued leaking throughout the survey, and was still leaking at survey end. That means that the source might have been leaking for a long time before the survey and / or kept leaking for a long time afterward. Note that Source 2 appears to also be 100% persistent, and Sources 3 and 4 seem highly persistent if viewed together (the sources are not far apart).

The Source Map also shows how the source points identified by Carbon Mapper fall into groups and where they are on the landfill – notably, that they all are in and around what was then the working face of the landfill. This is significant, because the landfill operators at Coffin Butte Landfill exclude inspectors from taking air quality measurements on the working face by declaring it a hazardous area. In plainer language, the way that Coffin Butte Landfill self-identifies methane leaks are by having a technician walk over the landfill holding a methane-detecting wand close to the ground every three months, but since the landfill operator excludes the working face from these walkovers, no regular inspection would have detected the methane leaks shown here by Carbon Mapper.

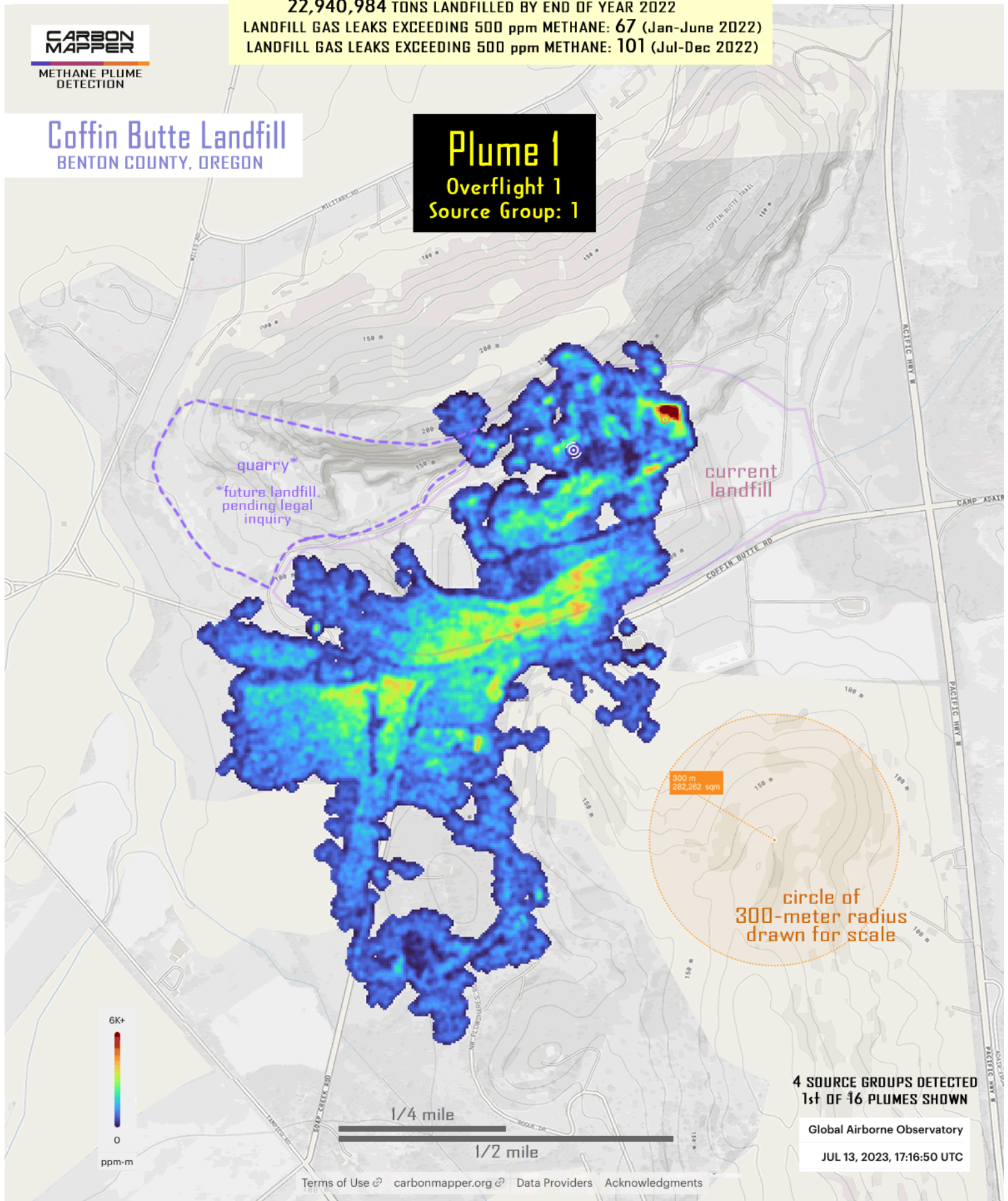
*Please turn to Page 21 to begin Section 2 of this paper, a comparison with the landfill near Arlington.*

TONS OF SOLID WASTE PROCESSED ANNUALLY: 995,000 (2021)  
 22,940,984 TONS LANDFILLED BY END OF YEAR 2022  
 LANDFILL GAS LEAKS EXCEEDING 500 ppm METHANE: 67 (Jan-June 2022)  
 LANDFILL GAS LEAKS EXCEEDING 500 ppm METHANE: 101 (Jul-Dec 2022)



**Coffin Butte Landfill**  
 BENTON COUNTY, OREGON

**Plume 1**  
 Overflight 1  
 Source Group: 1



300 m  
 282,262 sqm  
 circle of 300-meter radius drawn for scale

6K+  
 0  
 ppm-m

1/4 mile  
 1/2 mile

**4 SOURCE GROUPS DETECTED**  
**1st OF 16 PLUMES SHOWN**  
 Global Airborne Observatory  
 JUL 13, 2023, 17:16:50 UTC

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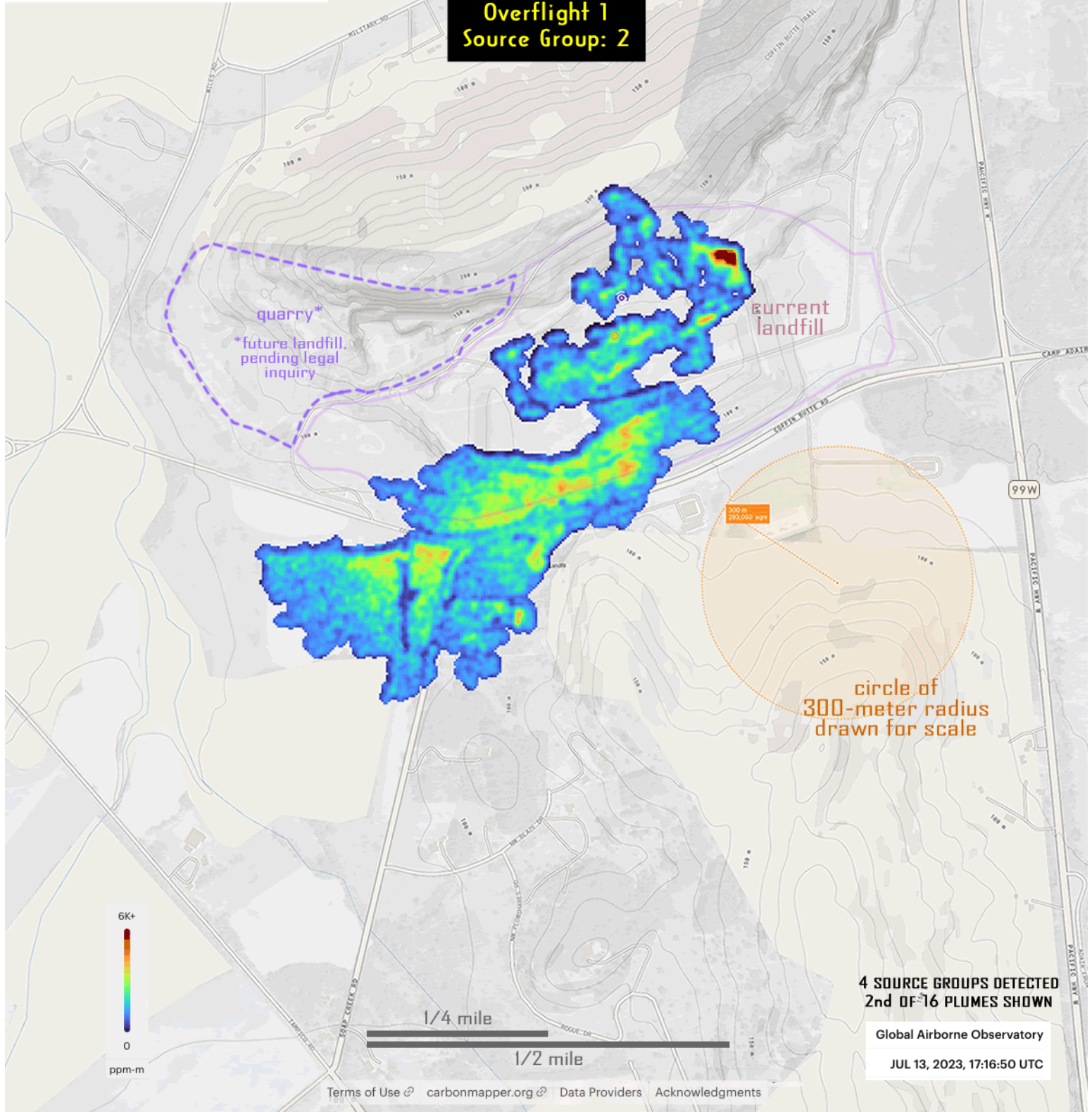
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# Coffin Butte Landfill

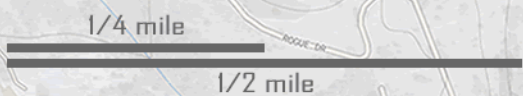
BENTON COUNTY, OREGON

**Plume 2**  
Overflight 1  
Source Group: 2



circle of 300-meter radius drawn for scale

300 m 283,050 ppm



**4 SOURCE GROUPS DETECTED**  
**2nd OF 16 PLUMES SHOWN**  
Global Airborne Observatory  
JUL 13, 2023, 17:16:50 UTC

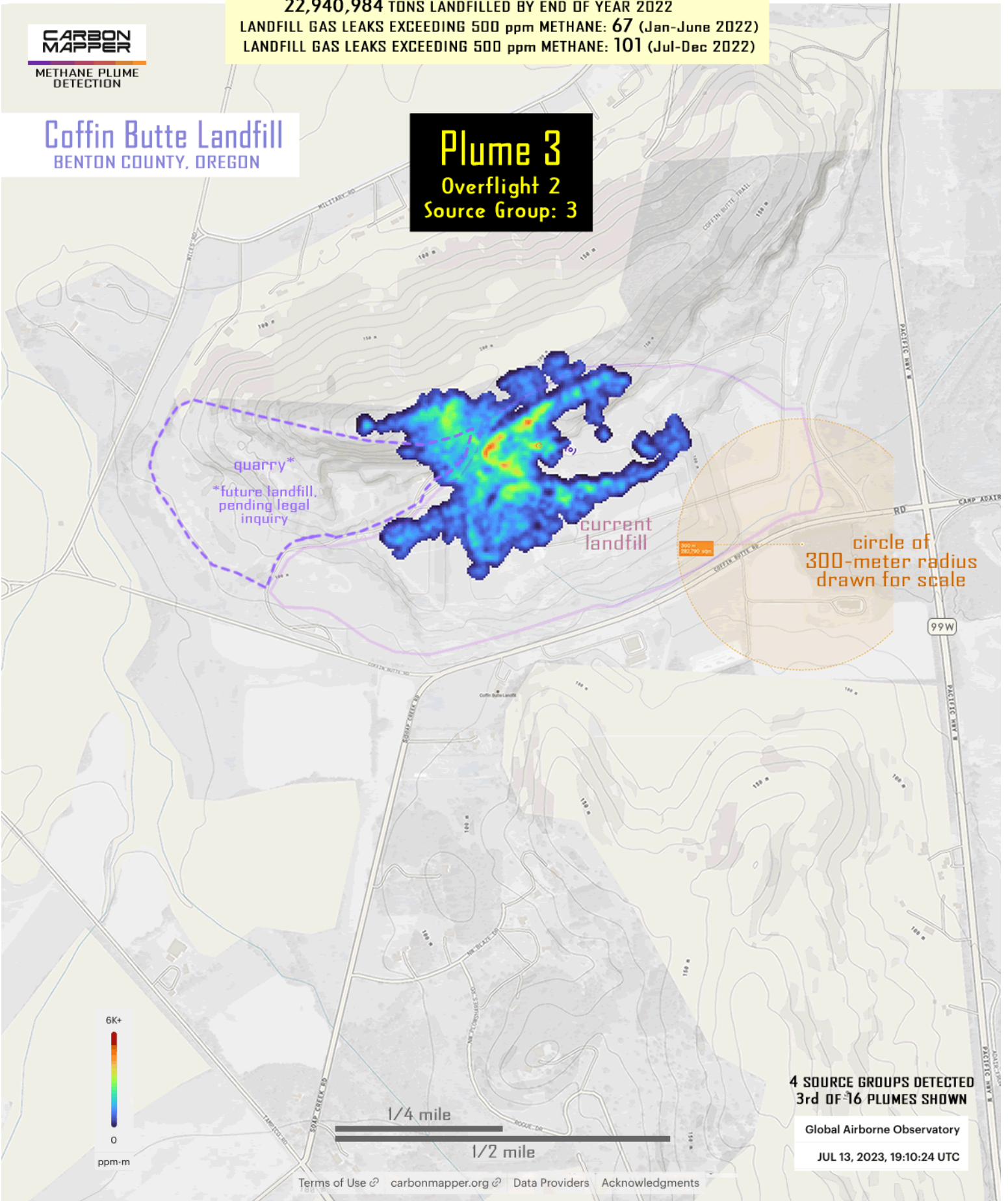
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TONS OF SOLID WASTE PROCESSED ANNUALLY: 995,000 (2021)  
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 LANDFILL GAS LEAKS EXCEEDING 500 ppm METHANE: 101 (Jul-Dec 2022)



**Coffin Butte Landfill**  
 BENTON COUNTY, OREGON

**Plume 3**  
 Overflight 2  
 Source Group: 3



**4 SOURCE GROUPS DETECTED**  
**3rd OF 16 PLUMES SHOWN**

Global Airborne Observatory  
 JUL 13, 2023, 19:10:24 UTC

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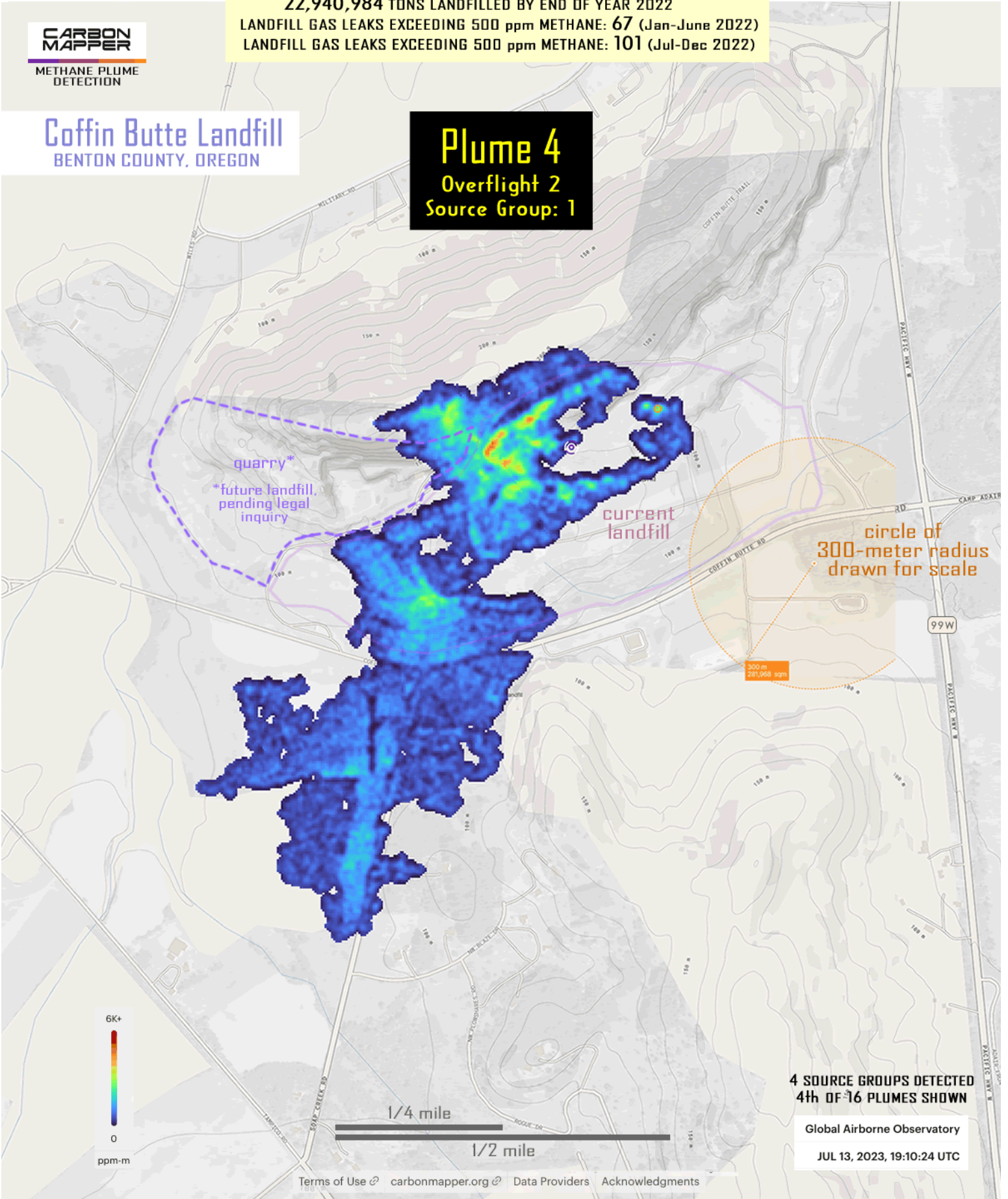
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LANDFILL GAS LEAKS EXCEEDING 500 ppm METHANE: 101 (Jul-Dec 2022)

**CARBON MAPPER**  
METHANE PLUME  
DETECTION

# Coffin Butte Landfill

BENTON COUNTY, OREGON

**Plume 4**  
Overflight 2  
Source Group: 1



circle of 300-meter radius drawn for scale

300 m  
200,999 ppm

**4 SOURCE GROUPS DETECTED**  
**4th OF 16 PLUMES SHOWN**

Global Airborne Observatory  
JUL 13, 2023, 19:10:24 UTC

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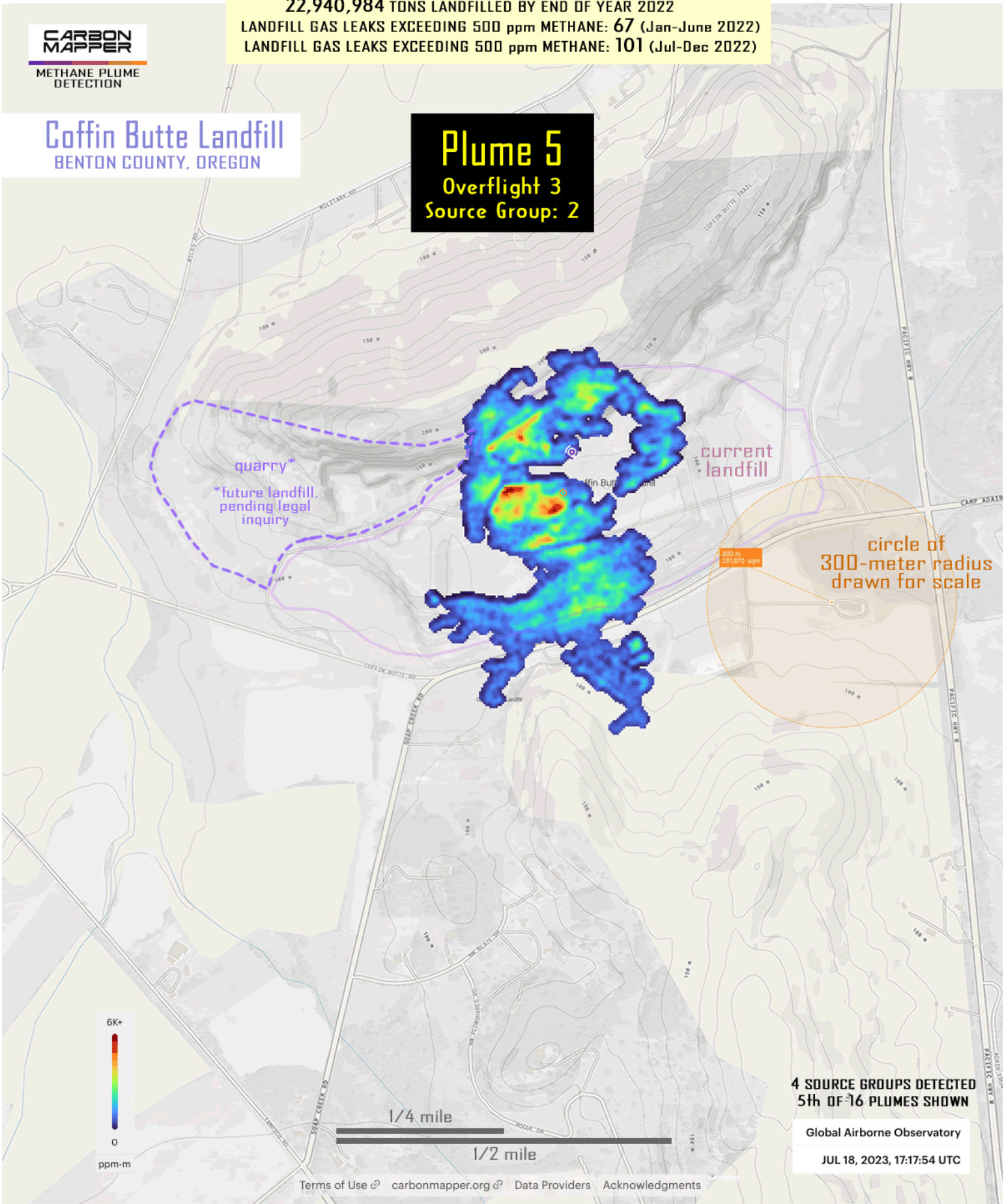


TONS OF SOLID WASTE PROCESSED ANNUALLY: 995,000 (2021)  
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 LANDFILL GAS LEAKS EXCEEDING 500 ppm METHANE: 67 (Jan-June 2022)  
 LANDFILL GAS LEAKS EXCEEDING 500 ppm METHANE: 101 (Jul-Dec 2022)

**CARBON MAPPER**  
 METHANE PLUME  
 DETECTION

**Coffin Butte Landfill**  
 BENTON COUNTY, OREGON

**Plume 5**  
 Overflight 3  
 Source Group: 2



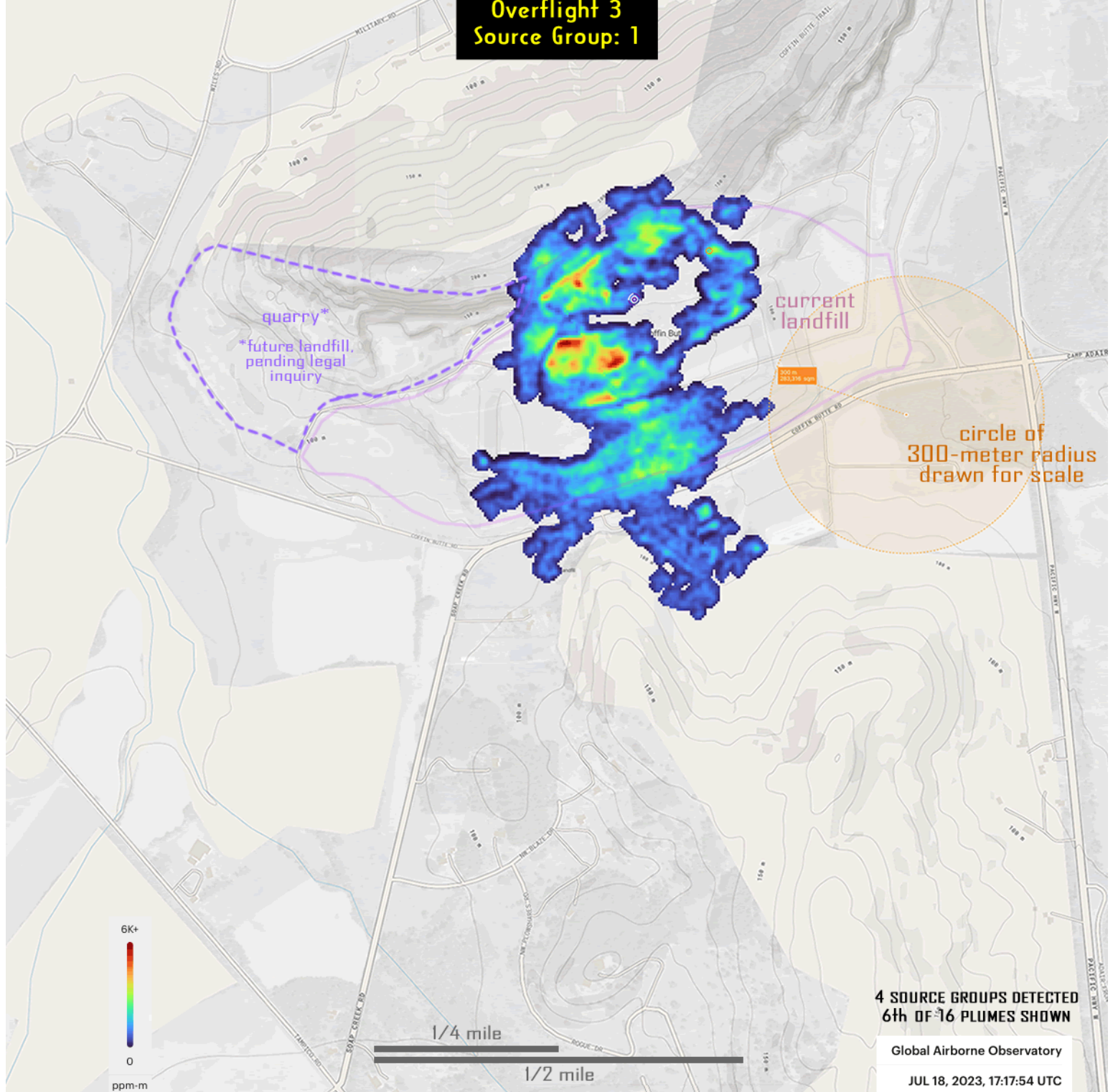
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LANDFILL GAS LEAKS EXCEEDING 500 ppm METHANE: 101 (Jul-Dec 2022)



# Coffin Butte Landfill

BENTON COUNTY, OREGON

**Plume 6**  
Overflight 3  
Source Group: 1



**4 SOURCE GROUPS DETECTED**  
**6th OF 16 PLUMES SHOWN**  
Global Airborne Observatory  
JUL 18, 2023, 17:17:54 UTC

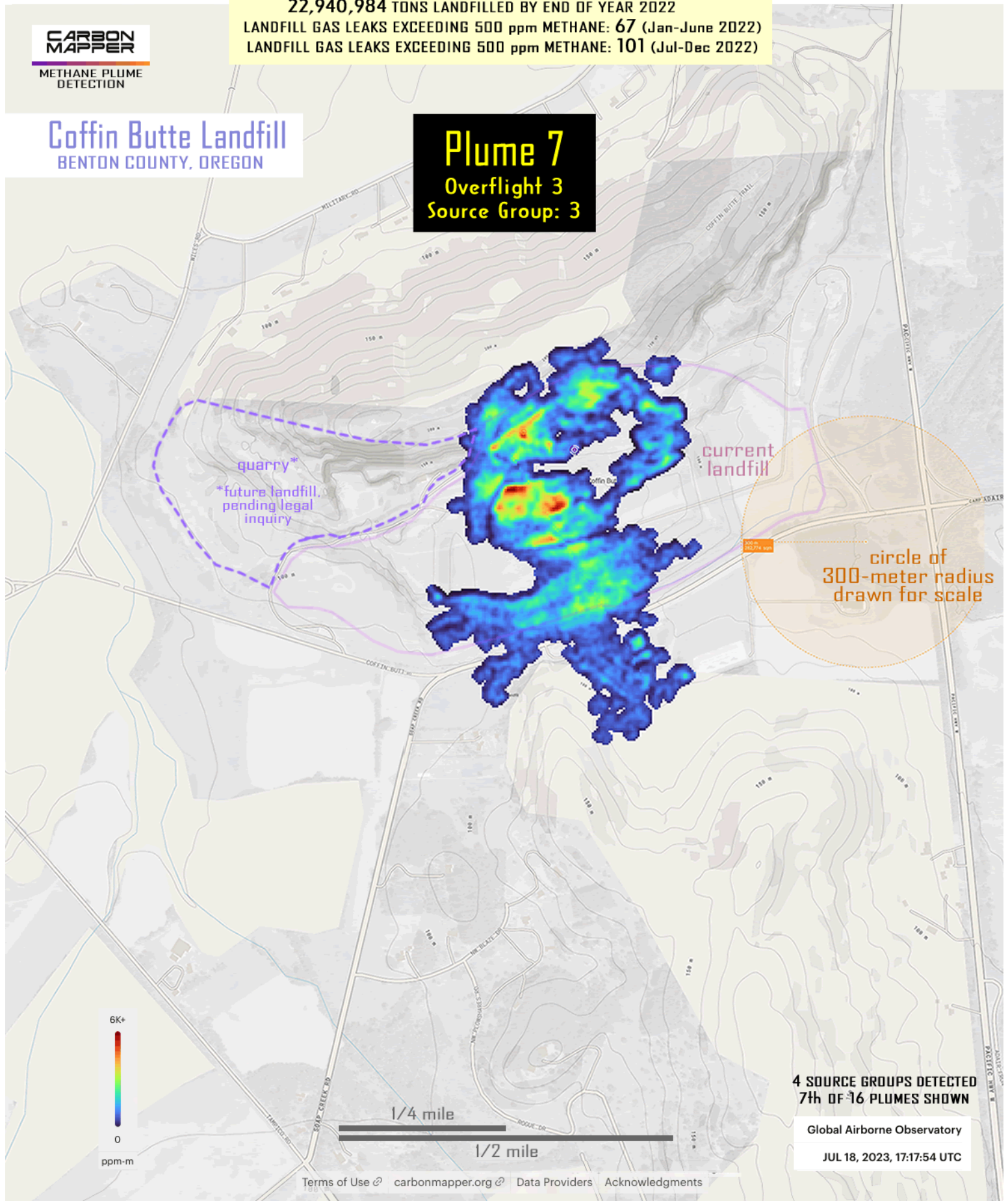
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LANDFILL GAS LEAKS EXCEEDING 500 ppm METHANE: 101 (Jul-Dec 2022)

**CARBON MAPPER**  
METHANE PLUME  
DETECTION

# Coffin Butte Landfill

BENTON COUNTY, OREGON

**Plume 7**  
Overflight 3  
Source Group: 3



circle of 300-meter radius drawn for scale

6K+  
0  
ppm-m

1/4 mile  
1/2 mile

**4 SOURCE GROUPS DETECTED**  
**7th OF 16 PLUMES SHOWN**  
Global Airborne Observatory  
JUL 18, 2023, 17:17:54 UTC

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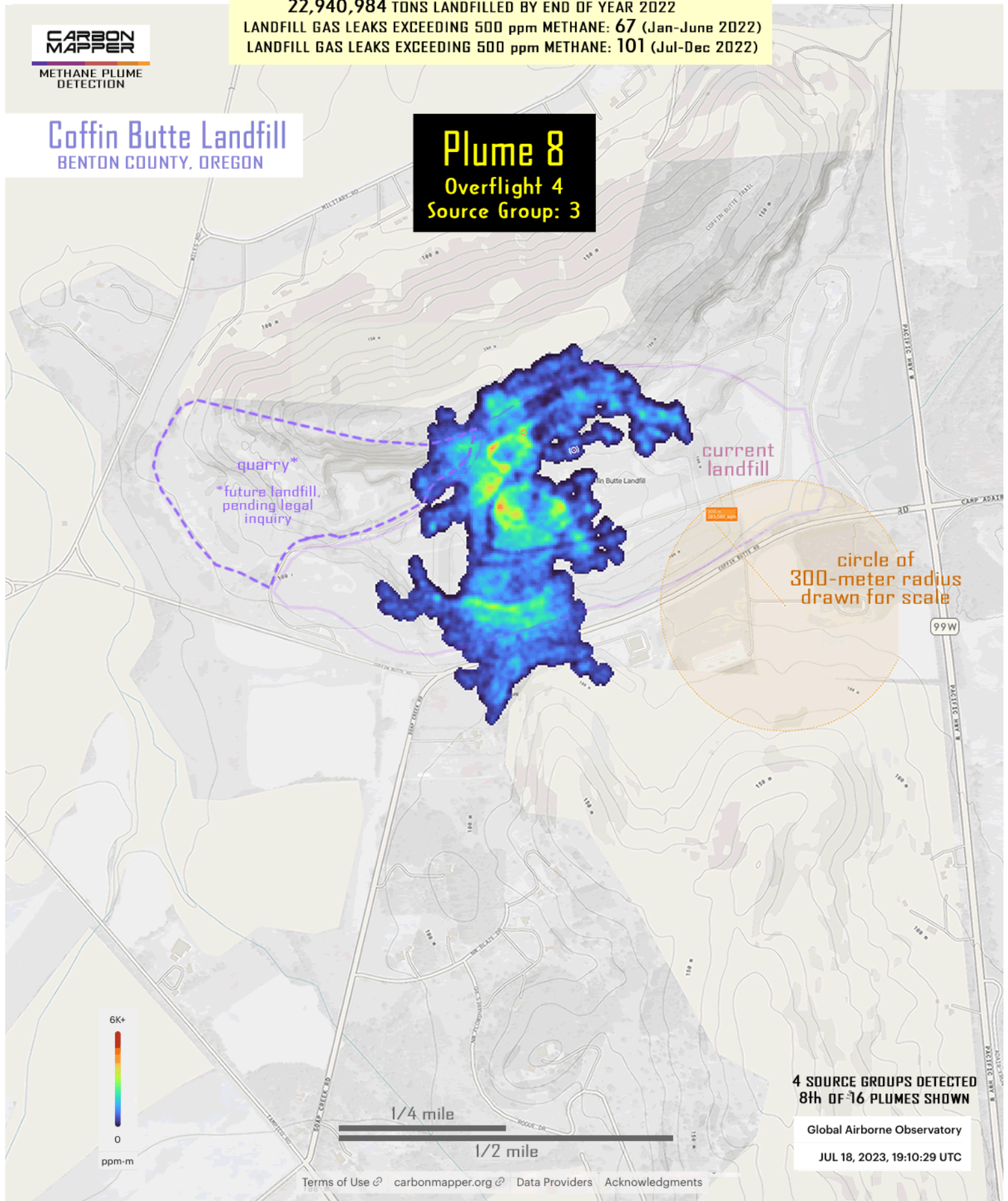
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LANDFILL GAS LEAKS EXCEEDING 500 ppm METHANE: 67 (Jan-June 2022)  
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**CARBON MAPPER**  
METHANE PLUME  
DETECTION

# Coffin Butte Landfill

BENTON COUNTY, OREGON

**Plume 8**  
Overflight 4  
Source Group: 3



current landfill

quarry\*  
\*future landfill, pending legal inquiry

circle of 300-meter radius drawn for scale



**4 SOURCE GROUPS DETECTED**  
**8th OF 16 PLUMES SHOWN**

Global Airborne Observatory  
JUL 18, 2023, 19:10:29 UTC

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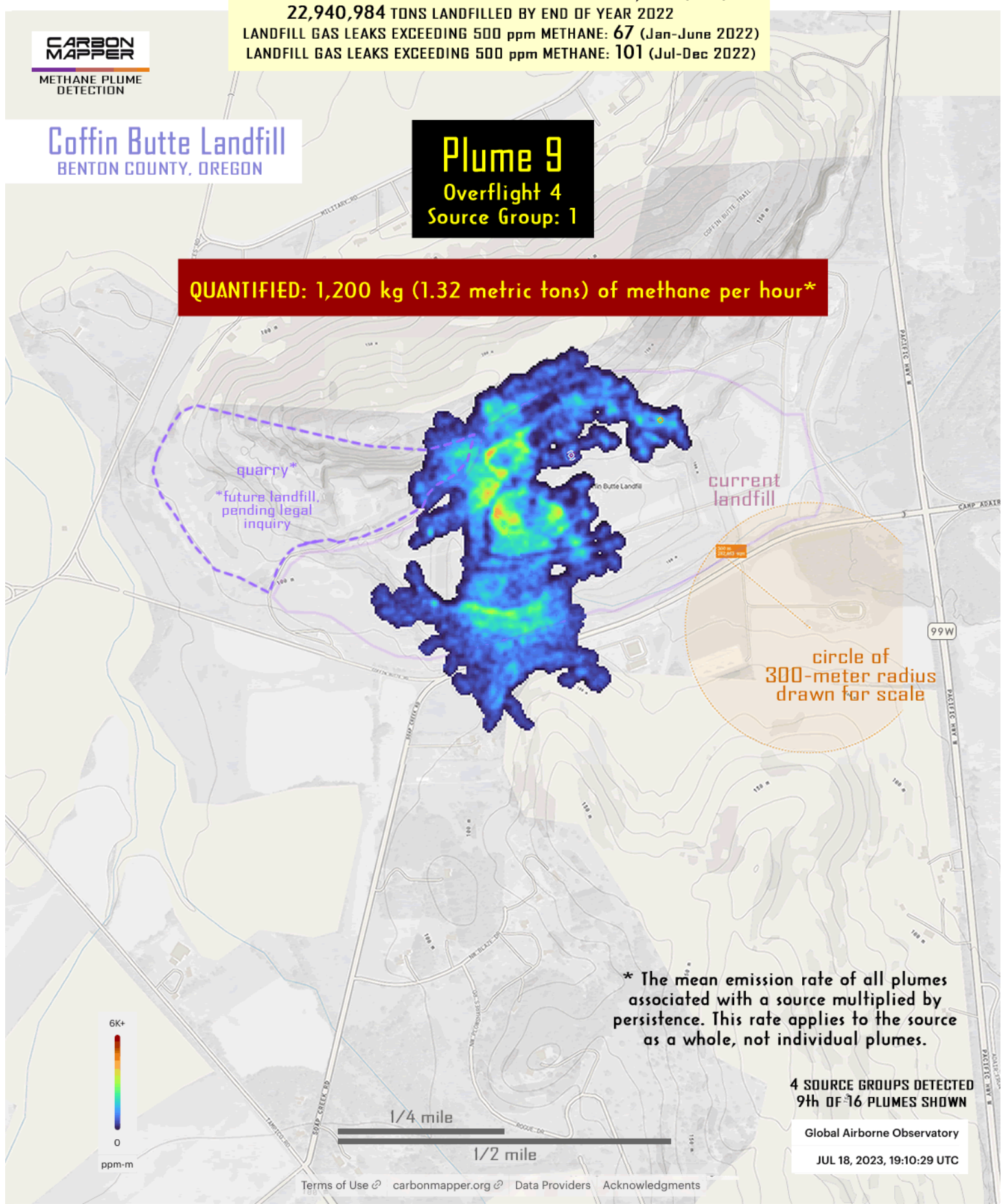
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Coffin Butte Landfill  
BENTON COUNTY, OREGON

Plume 9  
Overflight 4  
Source Group: 1

QUANTIFIED: 1,200 kg (1.32 metric tons) of methane per hour\*



\* The mean emission rate of all plumes associated with a source multiplied by persistence. This rate applies to the source as a whole, not individual plumes.

4 SOURCE GROUPS DETECTED  
9th OF 16 PLUMES SHOWN

Global Airborne Observatory  
JUL 18, 2023, 19:10:29 UTC

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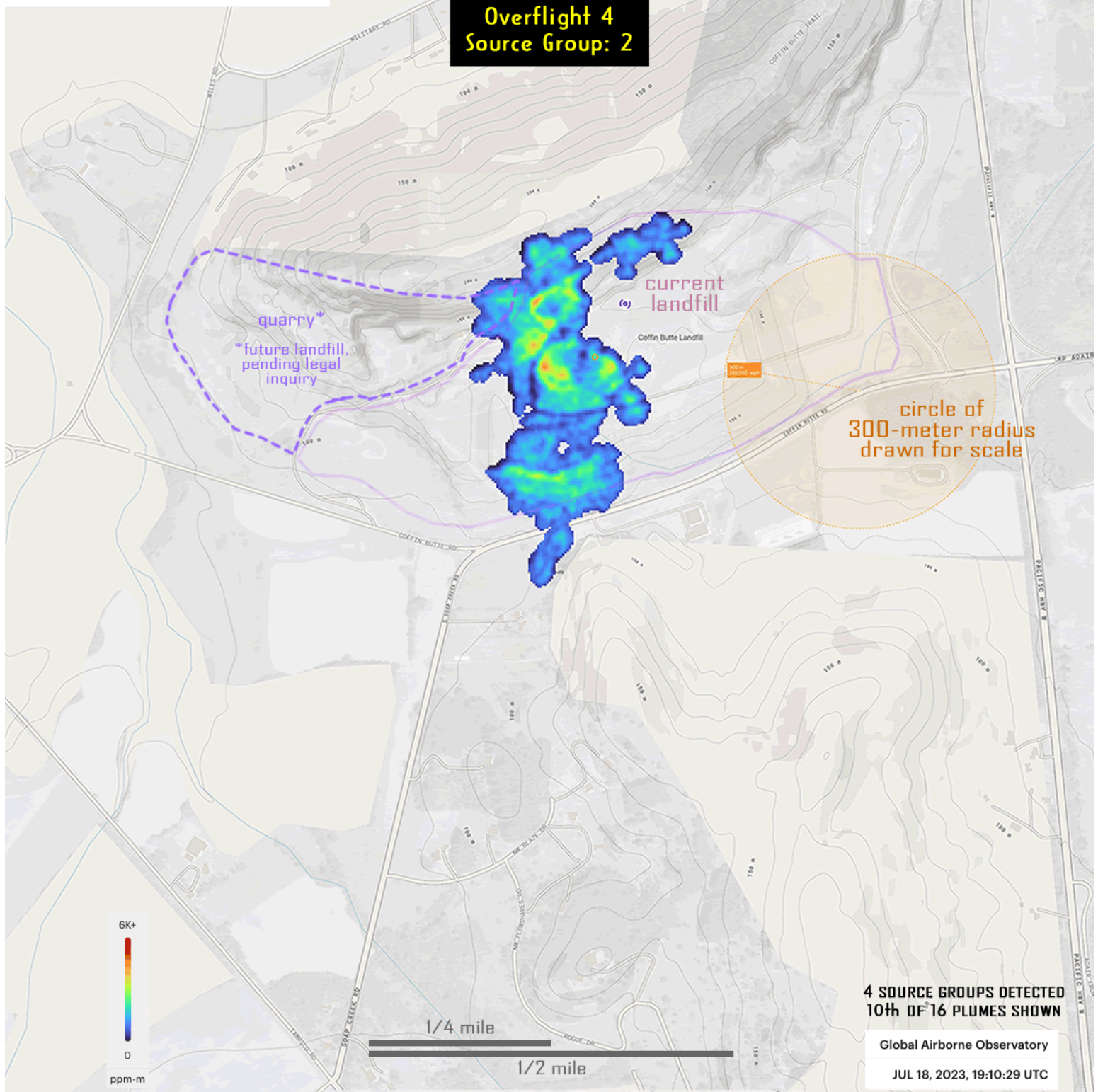
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# Coffin Butte Landfill

BENTON COUNTY, OREGON

**Plume 10**  
Overflight 4  
Source Group: 2



circle of 300-meter radius drawn for scale

4 SOURCE GROUPS DETECTED  
10th OF 16 PLUMES SHOWN

Global Airborne Observatory  
JUL 18, 2023, 19:10:29 UTC

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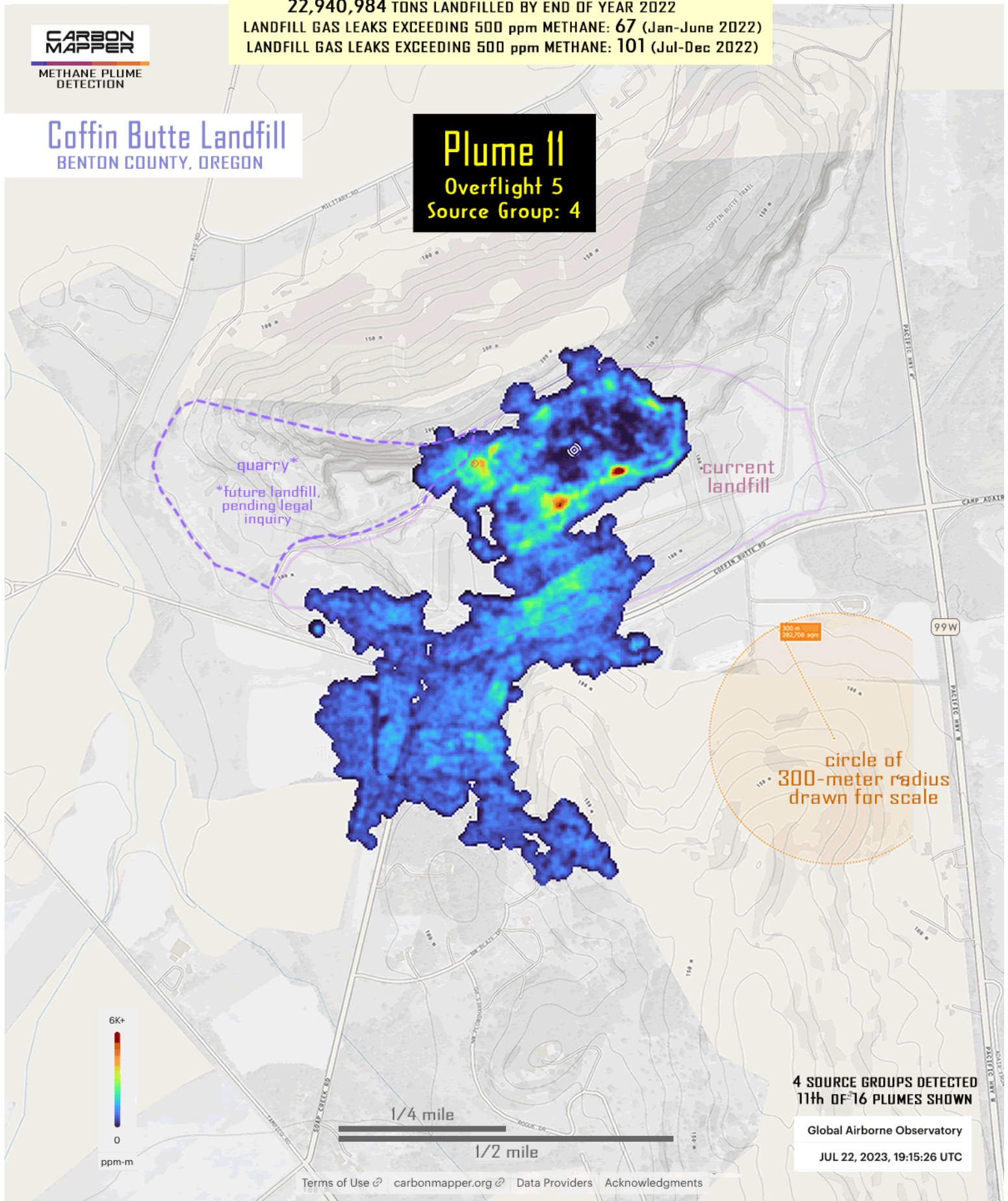
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# Coffin Butte Landfill

BENTON COUNTY, OREGON

**Plume 11**  
Overflight 5  
Source Group: 4



**4 SOURCE GROUPS DETECTED**  
11th OF 16 PLUMES SHOWN

Global Airborne Observatory  
JUL 22, 2023, 19:15:26 UTC

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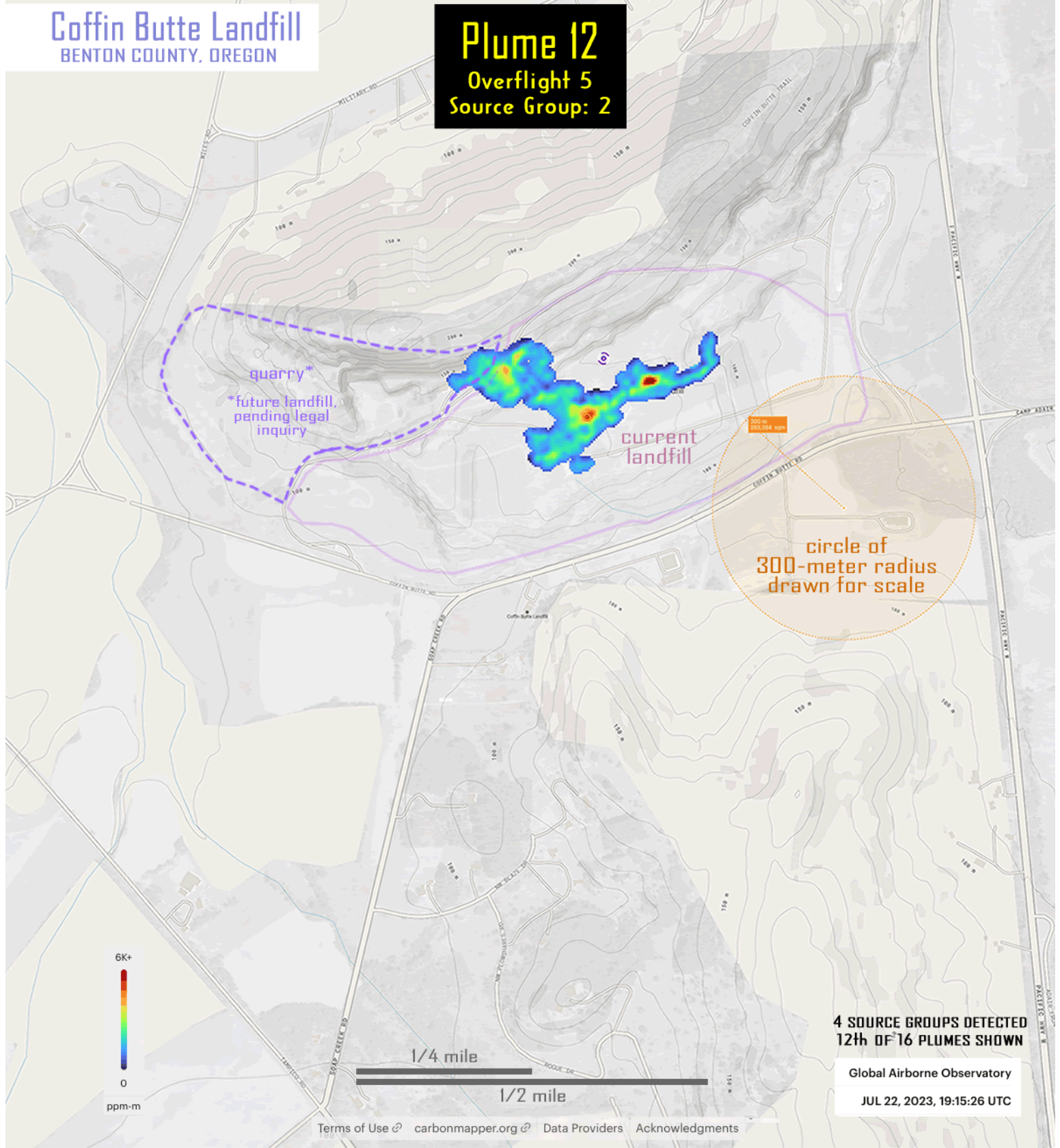
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# Coffin Butte Landfill

BENTON COUNTY, OREGON

**Plume 12**  
Overflight 5  
Source Group: 2



circle of 300-meter radius drawn for scale

4 SOURCE GROUPS DETECTED  
12th OF 16 PLUMES SHOWN

Global Airborne Observatory  
JUL 22, 2023, 19:15:26 UTC



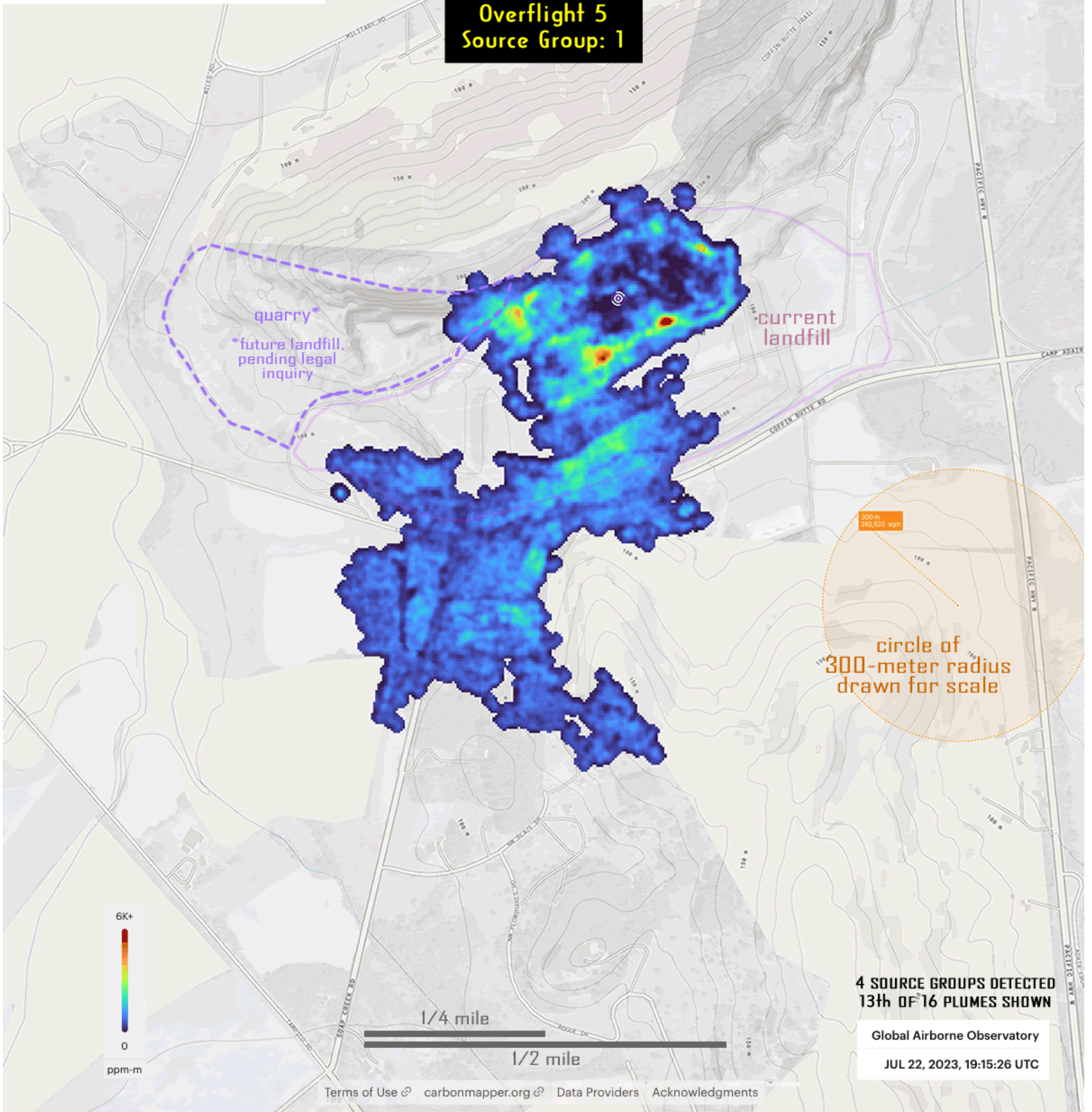
TONS OF SOLID WASTE PROCESSED ANNUALLY: 995,000 (2021)  
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# Coffin Butte Landfill

BENTON COUNTY, OREGON

**Plume 13**  
Overflight 5  
Source Group: 1



circle of 300-meter radius drawn for scale

4 SOURCE GROUPS DETECTED  
13th OF 16 PLUMES SHOWN

Global Airborne Observatory  
JUL 22, 2023, 19:15:26 UTC

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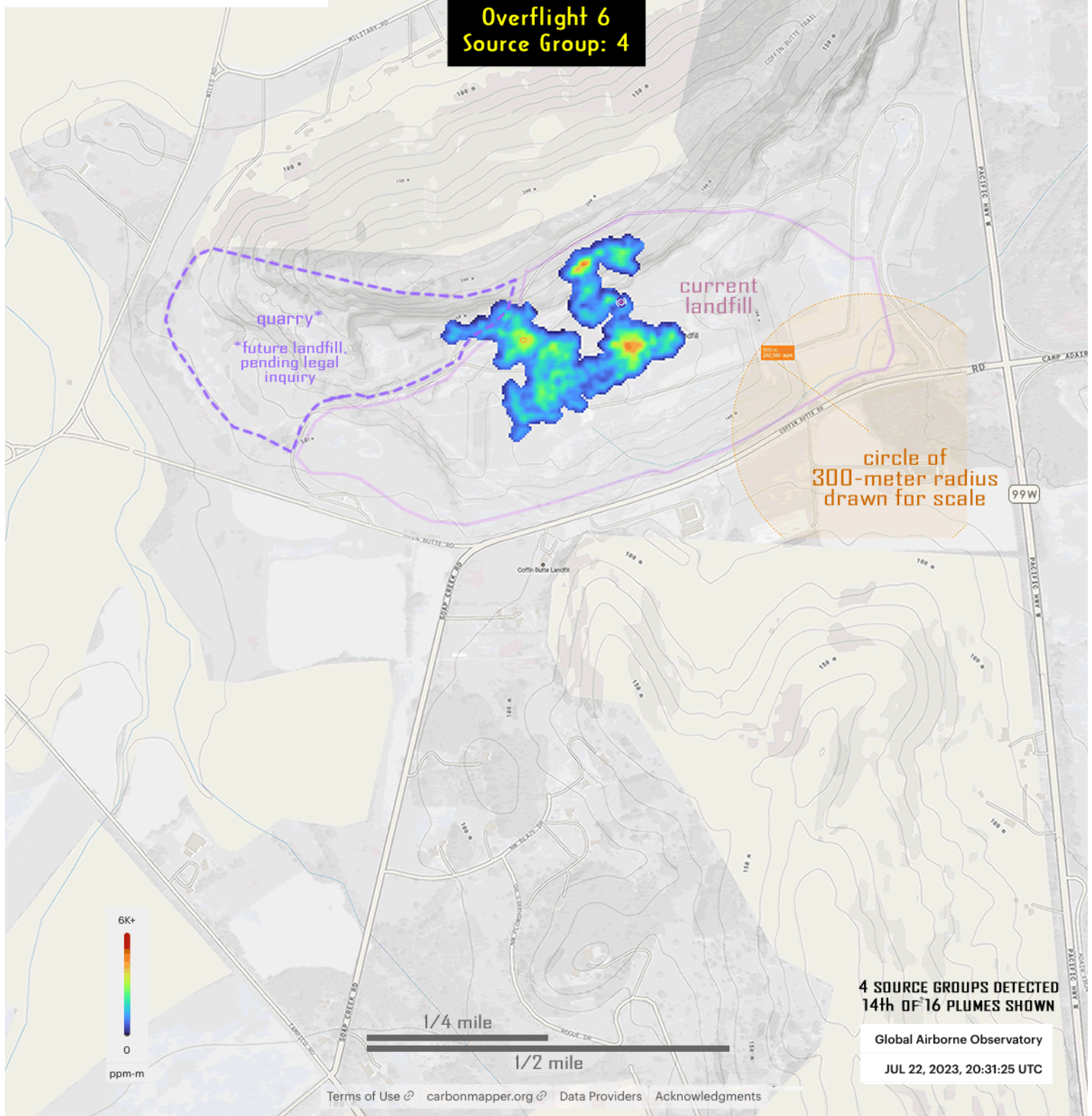
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# Coffin Butte Landfill

BENTON COUNTY, OREGON

**Plume 14**  
Overflight 6  
Source Group: 4



circle of 300-meter radius drawn for scale

**4 SOURCE GROUPS DETECTED**  
**14th OF 16 PLUMES SHOWN**

Global Airborne Observatory  
JUL 22, 2023, 20:31:25 UTC

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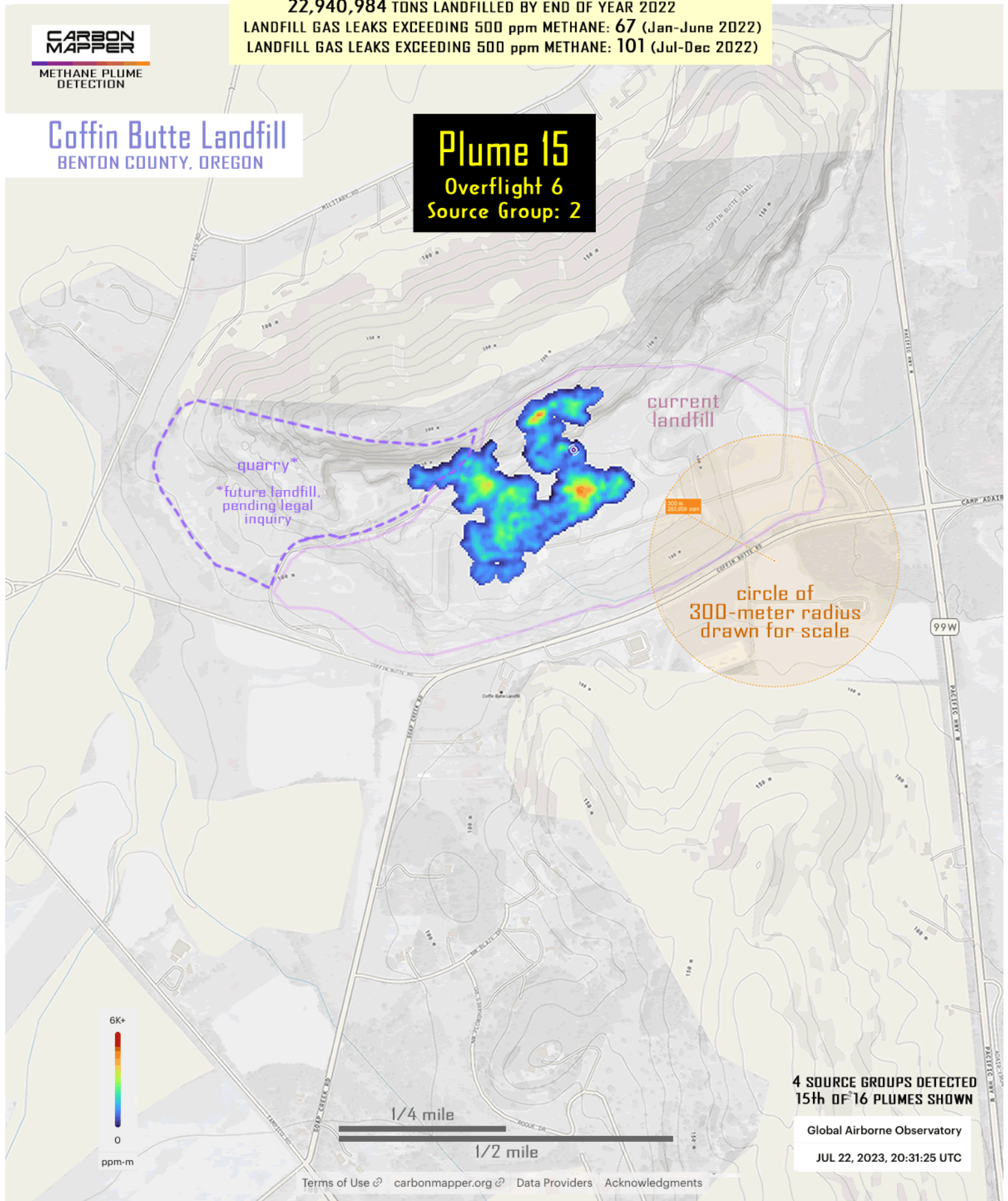
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**CARBON MAPPER**  
METHANE PLUME  
DETECTION

# Coffin Butte Landfill

BENTON COUNTY, OREGON

**Plume 15**  
Overflight 6  
Source Group: 2



current landfill

quarry\*  
\*future landfill, pending legal inquiry

circle of 300-meter radius drawn for scale



**4 SOURCE GROUPS DETECTED**  
**15th OF 16 PLUMES SHOWN**

Global Airborne Observatory  
JUL 22, 2023, 20:31:25 UTC

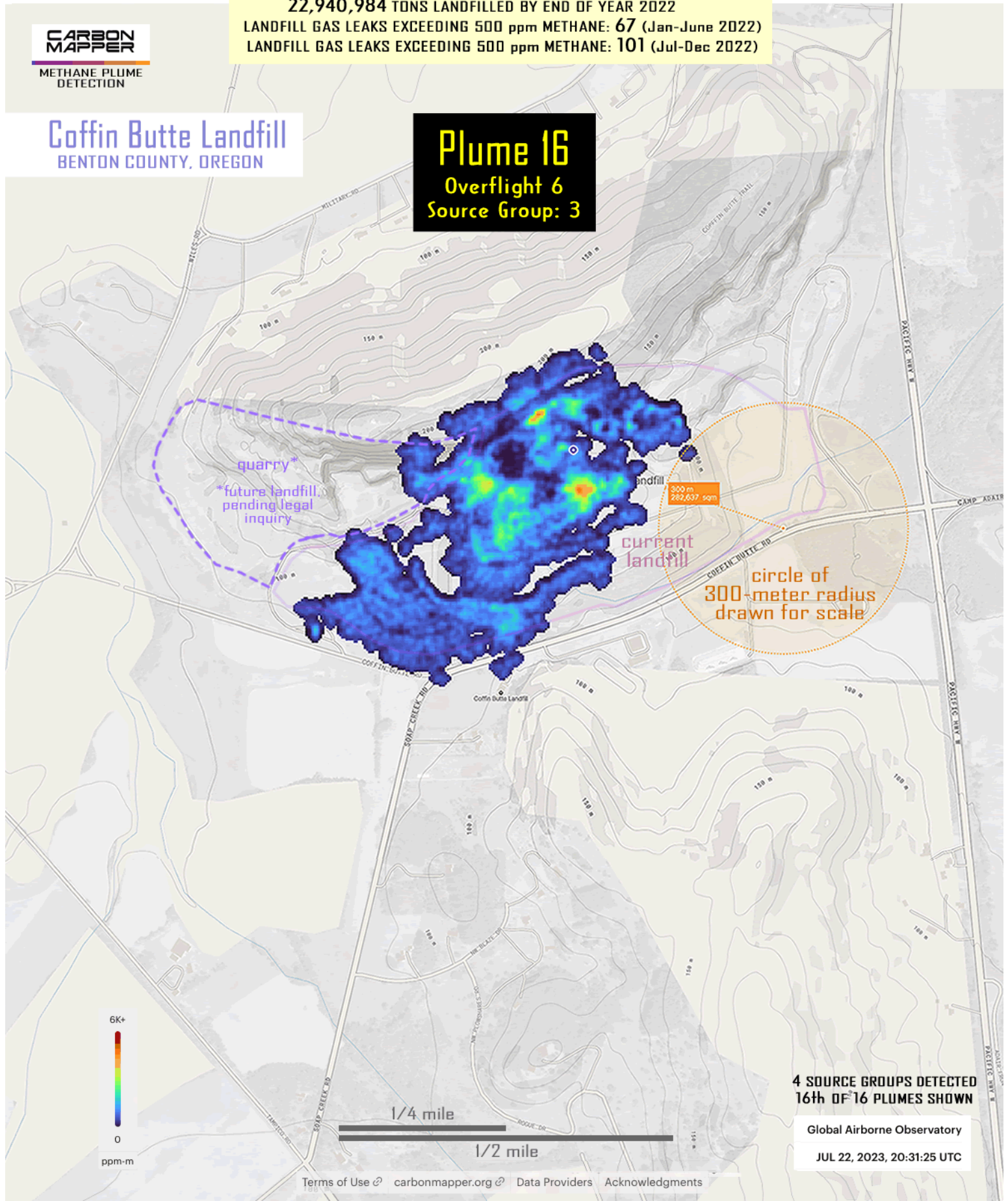
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**Coffin Butte Landfill**  
 BENTON COUNTY, OREGON

**Plume 16**  
 Overflight 6  
 Source Group: 3



**4 SOURCE GROUPS DETECTED**  
**16th OF 16 PLUMES SHOWN**

Global Airborne Observatory  
 JUL 22, 2023, 20:31:25 UTC

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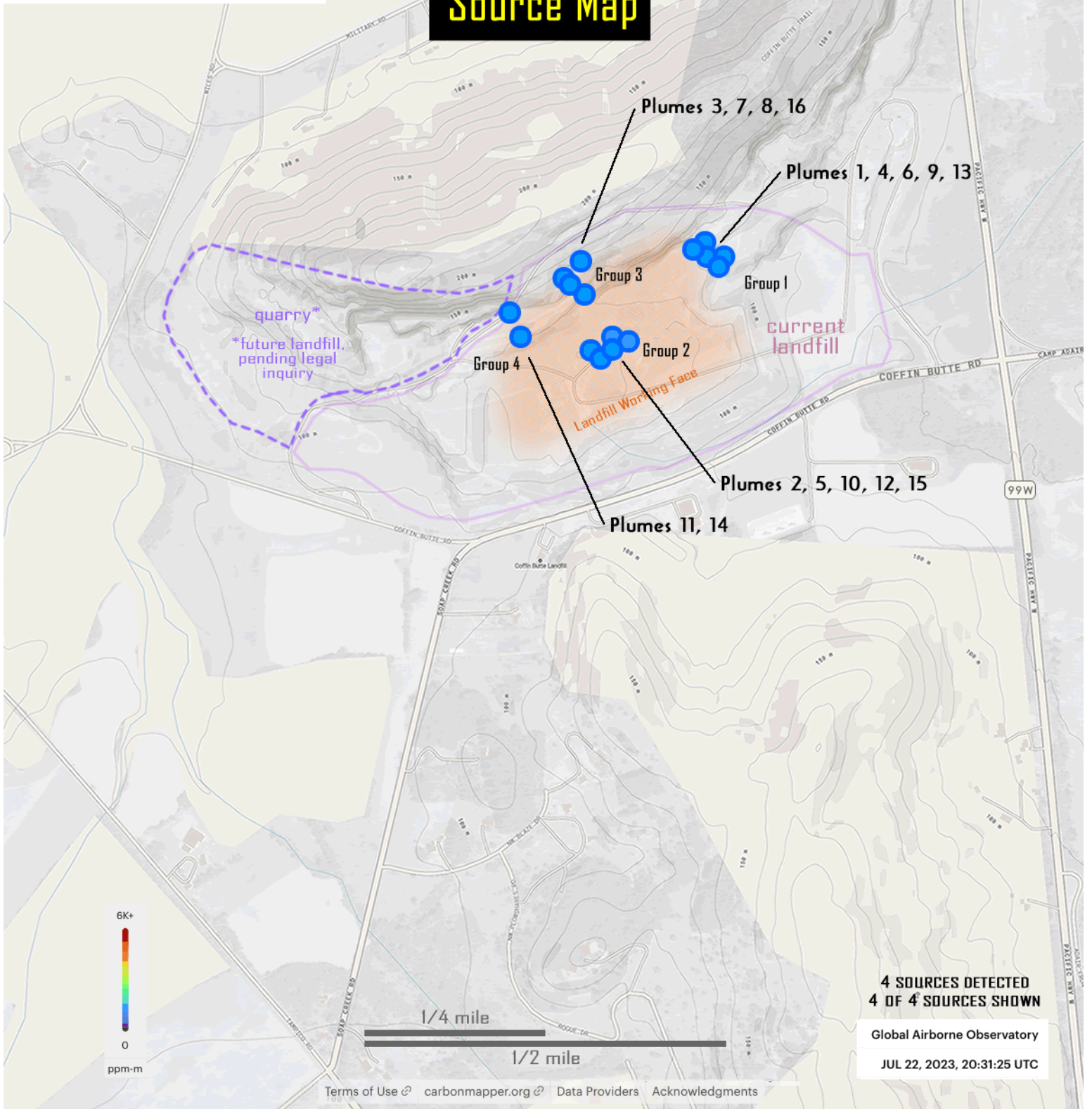
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# Coffin Butte Landfill

BENTON COUNTY, OREGON

## Source Map



**4 SOURCES DETECTED**  
**4 OF 4 SOURCES SHOWN**  
Global Airborne Observatory  
JUL 22, 2023, 20:31:25 UTC

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## **2. METHANE PLUME IMAGES FROM A DIFFERENT LANDFILL: CARBON MAPPER OVER COLUMBIA RIDGE LANDFILL ("ARLINGTON") AS A POINT OF COMPARISON**

In addition to Coffin Butte Landfill, as part of its national survey Carbon Mapper flew over several other landfills in Oregon. Let's look at Columbia Ridge Landfill, more commonly known as "Arlington" which is the closest town. Arlington is the Willamette Valley's alternative to Coffin Butte Landfill, and indeed much of the trash generated in the Lower Willamette Valley goes to Arlington, which receives approximately three times as much trash as Coffin Butte Landfill every year. Unlike Coffin Butte Landfill, Arlington can receive trash sent by rail, which makes it a lower-cost option for many.

Arlington currently has approximately three times as much trash in it as Coffin Butte Landfill. But it is situated in a much drier climate, which has a large effect on its rate of methane generation. Unlike Coffin Butte Landfill, which is so wet that it must pump around 32 million gallons of liquid out of the landfill every year (as toxic leachate), Arlington has a system that recirculates its leachate. So methane generation is more controlled at Arlington.

Carbon Mapper flew over Arlington ten times, in the same general time period as its overflights of Coffin Butte Landfill: July 11 through July 24, 2023. Each overflight produced one plume map, so there are 10 Plume maps for Arlington, which you can find on succeeding pages. Note that these Plume maps are at the same scale as the Plume maps for Coffin Butte Landfill.

Spoiler: the Arlington maps show a much different story. Even though Arlington holds three times as much garbage as Coffin Butte Landfill, and receives three times as much garbage every year, it had only one source of methane emissions detected, and that source was non-persistent: it appeared while the survey was underway and ended before the survey was over. Although that source has not been officially quantified by Carbon Mapper, visually its plume is much smaller than any of the plumes we've seen at Coffin Butte Landfill.

A walkthrough:

OVERFLIGHT 1. July 11, 2023, at 17:57. No methane plume detected.

OVERFLIGHT 2. July 14, 2023, at 17:59. No methane plume detected.

OVERFLIGHT 3. July 14, 2023, at 21:42. The airplane returns about four hours later, and now a source is detected. Its methane plume is visually very small.

OVERFLIGHT 4. July 15, 2023, at 17:13. The source is now emitting a much larger methane plume. Concentrations are low, however (dark blue).

OVERFLIGHT 5. July 19, 2023, at 17:30. The airplane returns four days later. The source's methane plume is now much smaller. Concentrations remain low throughout.

OVERFLIGHT 6. July 20, 2023, at 17:29. The source's methane plume is now small.

OVERFLIGHT 7. July 20, 2023, at 21:30. The airplane returns that same day, 4 hours later. The source's methane plume is now very small.

OVERFLIGHT 8. July 22, 2023, at 17:18. The airplane returns two days later. No methane plume detected.

OVERFLIGHT 9. July 22, 2023, at 18:01. The airplane flies over again about 40 minutes later. No methane plume detected.

OVERFLIGHT 10. July 24, 2023, at 17:42. Two days later. No methane plume detected.

*Please turn to Page 33 to begin Section 3 of this paper, context for the quantified leak rate of 1200 kg of methane per hour for Source 1 at Coffin Butte Landfill.*

TONS OF SOLID WASTE PROCESSED ANNUALLY: 2,900,000 (2021)  
66,964,892 TONS LANDFILLED BY END OF YEAR 2022  
LANDFILL GAS LEAKS EXCEEDING 500 ppm METHANE: 4 (Jan-June 2022)  
LANDFILL GAS LEAKS EXCEEDING 500 ppm METHANE: 8 (Jul-Dec 2022)

**CARBON  
MAPPER**  
METHANE PLUME  
DETECTION

# Columbia Ridge Landfill (Arlington)

GILLIAM COUNTY, OREGON

**No Plume  
OVERFLIGHT 1**

current  
landfill  
(appx)



1/4 mile

1/2 mile

**1 SOURCE DETECTED  
NO PLUME DETECTED**

Global Airborne Observatory

JUL 11, 2023, 17:57:45 UTC

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TONS OF SOLID WASTE PROCESSED ANNUALLY: 2,900,000 (2021)  
66,964,892 TONS LANDFILLED BY END OF YEAR 2022  
LANDFILL GAS LEAKS EXCEEDING 500 ppm METHANE: 4 (Jan-June 2022)  
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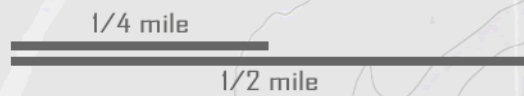
**CARBON  
MAPPER**  
METHANE PLUME  
DETECTION

# Columbia Ridge Landfill (Arlington)

GILLIAM COUNTY, OREGON

**No Plume  
OVERFLIGHT 2**

current  
landfill  
(appx)



**1 SOURCE DETECTED  
NO PLUME DETECTED**

Global Airborne Observatory  
JUL 14, 2023, 17:59:06 UTC

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TONS OF SOLID WASTE PROCESSED ANNUALLY: 2,900,000 (2021)  
66,964,892 TONS LANDFILLED BY END OF YEAR 2022  
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**CARBON  
MAPPER**

METHANE PLUME  
DETECTION

# Columbia Ridge Landfill (Arlington)

GILLIAM COUNTY, OREGON

**Plume 3  
OVERFLIGHT 3**

current  
landfill  
(appx)

circle of  
300-meter radius  
drawn for scale

6K+



0  
ppm-m

1/4 mile

1/2 mile

**1 SOURCE DETECTED  
1st OF 5 PLUMES SHOWN**

Global Airborne Observatory

JUL 14, 2023, 21:42:56 UTC

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TONS OF SOLID WASTE PROCESSED ANNUALLY: 2,900,000 (2021)  
66,964,892 TONS LANDFILLED BY END OF YEAR 2022  
LANDFILL GAS LEAKS EXCEEDING 500 ppm METHANE: 4 (Jan-June 2022)  
LANDFILL GAS LEAKS EXCEEDING 500 ppm METHANE: 8 (Jul-Dec 2022)

CARBON MAPPER

METHANE PLUME DETECTION

# Columbia Ridge Landfill (Arlington)

GILLIAM COUNTY, OREGON

Plume 4  
OVERFLIGHT 4

current  
landfill  
(appx)

circle of  
300-meter radius  
drawn for scale

6K+



0  
ppm-m

1/4 mile

1/2 mile

1 SOURCE DETECTED  
2nd OF 5 PLUMES SHOWN

Global Airborne Observatory

JUL 15, 2023, 17:13:26 UTC

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TONS OF SOLID WASTE PROCESSED ANNUALLY: 2,900,000 (2021)  
66,964,892 TONS LANDFILLED BY END OF YEAR 2022  
LANDFILL GAS LEAKS EXCEEDING 500 ppm METHANE: 4 (Jan-June 2022)  
LANDFILL GAS LEAKS EXCEEDING 500 ppm METHANE: 8 (Jul-Dec 2022)

**CARBON  
MAPPER**

METHANE PLUME  
DETECTION

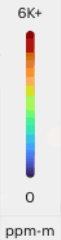
# Columbia Ridge Landfill (Arlington)

GILLIAM COUNTY, OREGON

**Plume 5  
OVERFLIGHT 5**

current  
landfill  
(appx)

circle of  
300-meter radius  
drawn for scale



1/4 mile

1/2 mile

**1 SOURCE DETECTED  
3rd OF 5 PLUMES SHOWN**

Global Airborne Observatory

JUL 19, 2023, 17:30:40 UTC

Terms of Use [carbonmapper.org](#) [Data Providers](#) [Acknowledgments](#)

TONS OF SOLID WASTE PROCESSED ANNUALLY: 2,900,000 (2021)  
66,964,892 TONS LANDFILLED BY END OF YEAR 2022  
LANDFILL GAS LEAKS EXCEEDING 500 ppm METHANE: 4 (Jan-June 2022)  
LANDFILL GAS LEAKS EXCEEDING 500 ppm METHANE: 8 (Jul-Dec 2022)

**CARBON  
MAPPER**

METHANE PLUME  
DETECTION

# Columbia Ridge Landfill (Arlington)

GILLIAM COUNTY, OREGON

**Plume 6  
OVERFLIGHT 6**

current  
landfill  
(appx)

circle of  
300-meter radius  
drawn for scale



1/4 mile

1/2 mile

**1 SOURCE DETECTED  
4th OF 5 PLUMES SHOWN**

Global Airborne Observatory

JUL 20, 2023, 17:29:08 UTC

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TONS OF SOLID WASTE PROCESSED ANNUALLY: 2,900,000 (2021)  
66,964,892 TONS LANDFILLED BY END OF YEAR 2022  
LANDFILL GAS LEAKS EXCEEDING 500 ppm METHANE: 4 (Jan-June 2022)  
LANDFILL GAS LEAKS EXCEEDING 500 ppm METHANE: 8 (Jul-Dec 2022)

**CARBON  
MAPPER**

METHANE PLUME  
DETECTION

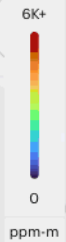
# Columbia Ridge Landfill (Arlington)

GILLIAM COUNTY, OREGON

**Plume 7  
OVERFLIGHT 7**

current  
landfill  
(appx)

circle of  
300-meter radius  
drawn for scale



1/4 mile

1/2 mile

**1 SOURCE DETECTED  
5th OF 5 PLUMES SHOWN**

Global Airborne Observatory

JUL 20, 2023, 21:30:13 UTC

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TONS OF SOLID WASTE PROCESSED ANNUALLY: 2,900,000 (2021)  
66,964,892 TONS LANDFILLED BY END OF YEAR 2022  
LANDFILL GAS LEAKS EXCEEDING 500 ppm METHANE: 4 (Jan-June 2022)  
LANDFILL GAS LEAKS EXCEEDING 500 ppm METHANE: 8 (Jul-Dec 2022)

**CARBON  
MAPPER**  
METHANE PLUME  
DETECTION

# Columbia Ridge Landfill (Arlington)

GILLIAM COUNTY, OREGON

**No Plume  
OVERFLIGHT 8**

current  
landfill  
(appx)



1/4 mile

1/2 mile

**1 SOURCE DETECTED  
NO PLUME DETECTED**

Global Airborne Observatory

JUL 22, 2023, 17:18:19 UTC

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TONS OF SOLID WASTE PROCESSED ANNUALLY: 2,900,000 (2021)  
66,964,892 TONS LANDFILLED BY END OF YEAR 2022  
LANDFILL GAS LEAKS EXCEEDING 500 ppm METHANE: 4 (Jan-June 2022)  
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**CARBON  
MAPPER**  
METHANE PLUME  
DETECTION

# Columbia Ridge Landfill (Arlington)

GILLIAM COUNTY, OREGON

**No Plume  
OVERFLIGHT 9**

current  
landfill  
(appx)



**1 SOURCE DETECTED  
NO PLUME DETECTED**

Global Airborne Observatory  
JUL 22, 2023, 18:01:59 UTC

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TONS OF SOLID WASTE PROCESSED ANNUALLY: 2,900,000 (2021)  
66,964,892 TONS LANDFILLED BY END OF YEAR 2022  
LANDFILL GAS LEAKS EXCEEDING 500 ppm METHANE: 4 (Jan-June 2022)  
LANDFILL GAS LEAKS EXCEEDING 500 ppm METHANE: 8 (Jul-Dec 2022)

**CARBON  
MAPPER**

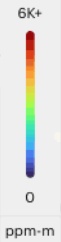
METHANE PLUME  
DETECTION

# Columbia Ridge Landfill (Arlington)

GILLIAM COUNTY, OREGON

**No Plume  
OVERFLIGHT 10**

current  
landfill  
(appx)



1/4 mile

1/2 mile

**1 SOURCE DETECTED  
NO PLUME DETECTED**

Global Airborne Observatory

JUL 24, 2023, 17:42:43 UTC

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### **3a. HOW A LEAK RATE OF 1200 KG METHANE PER HOUR COMPARES TO OTHER GREENHOUSE GAS EMITTERS IN OREGON**

Methane is a potent greenhouse gas, and does 84 times as much harm to the climate balance than the same amount of carbon dioxide in the short term (the first 20 years after release). So methane is the current focus of greenhouse gas reduction in the U.S., because of this high damage multiplying effect.

By converting 1200 kg to metric tons, we get 1.2 metric tons per hour; by multiplying this by 84, we get 100.8 metric tons of carbon dioxide equivalent, or mtCO<sub>2</sub>e, which is the standard unit of measurement for the climate damage of greenhouse gas emissions. Landfill gas also contains carbon dioxide itself, in approximately the same amount as the methane, so we add another 1.2 mtCO<sub>2</sub>e to account for it. So this one source at Coffin Butte Landfill had a damage rate of approximately:

**102 mtCO<sub>2</sub>e per hour.**

We can now compare this to the damage rate per hour that we can derive from other major greenhouse gas emitters in Oregon, which we can find at <https://ghgdata.epa.gov>. If we do that for the Ash Grove Cement Company plant in Durkee, Oregon, for example, its damage rate of 680,159 mtCO<sub>2</sub>e yearly equates to **77.6 mtCO<sub>2</sub>e per hour**. The Ash Grove cement plant therefore had a lower climate damage rate per hour than this one source at Coffin Butte Landfill. (The Ash Grove plant burns natural gas, a fossil fuel, and produces carbon dioxide; when operating at capacity, it produces 1,084,100 tons of clinker a year (clinker is an ingredient in cement).

When we perform this damage rate calculation for the top ten greenhouse gas emitters in Oregon per the EPA, we find that, for as long as the leak was active:

**the source of this leak on Coffin Butte Landfill was the 7th largest known point source of greenhouse gas emissions in the state of Oregon. (Numbers 1 through 6 are the state's largest fossil-fuel-burning power plants.)**

For however long it was active, this one leak at Coffin Butte Landfill emitted almost twice as much climate damage as the Beaver Power Plant in Clatskanie, Oregon. Beaver is a 511-megawatt facility with a damage rating of **53.7 mtCO<sub>2</sub>e per hour**. By contrast, the PNGC Plant at Coffin Butte Landfill generates 5.66 megawatts. So Coffin Butte Landfill generated 1.1% of the power that Beaver did, while doing nearly twice as much climate damage.

Methane is a pollutant, and for the oil and gas industry, the EPA fines a company \$900 for releasing a ton of this pollutant into the air. If that fine were applied to this leak, Coffin Butte Landfill would rack up a fine of over a quarter of a million dollars for its climate damage in just 9 days.

## **3b. HOW MUCH A LEAK RATE OF 1200 KG METHANE PER HOUR AFFECTS LOCAL AIR QUALITY, FIRE RISK; “DUMP DAYS”**

The damage from excessive landfill gas emissions isn't limited to the climate damage of methane. Methane is also a pollutant in itself, posing unknown health risks to those living around the landfill but especially to the people who work atop the landfill. (If you look at Plume 1, for example, there are people's homes in or underneath that plume. And the working face of the landfill is obscured by plume in almost all the maps.)

Methane is also flammable and poses a fire risk, especially because some of the leaks found at Coffin Butte Landfill have been at ignitable methane concentrations – i.e., high enough that any spark or combustion could ignite the gas and set the landfill on fire. Some notes on that:

- There is no fire detection system at Coffin Butte Landfill. There have been two fires that we know of at the landfill in 2024, and both were called in by passersby.
- Once on fire, a landfill requires specially equipped fire teams to fight it, as the burning plastic and other materials in the landfill create toxic fumes.
- Fighting a fire fed by methane from below creates unique challenges and risks for firefighters.

Methane isn't the only thing in landfill gas at Coffin Butte. Its landfill gas is typically a little more than half methane, a little more than a third carbon dioxide, and the rest (9%) other gases, both elemental gases such as nitrogen and compound gases such as toluene, hydrogen sulfide, acetone and so on. Many of these latter gases are toxic.

Over the ten-day period of the Carbon Mapper survey, based on Carbon Mapper's source quantification, this one source leaked roughly:

**317 tons of methane**

**228 tons of carbon dioxide**

**57-60 tons nitrogen, carbon monoxide, ammonia**

**3-6 tons of various organic compounds**

According to its Air Toxics Emissions Inventory, the organic compounds emitted by Coffin Butte Landfill are primarily toluene, isopropyl alcohol, xylene compounds, hydrogen sulfide, methylene chloride, perchloroethylene, hexane, and so on, all of which are either classified as Hazardous Air Pollutants or otherwise known to pose risks to human health.

These 3 to 6 tons of gases constitute roughly 200,000 cubic feet of volume. This is what area residents are smelling during “dump days” when they can smell the landfill from miles away. I can say from experience that it's a chemical smell, like if every cleaner under your sink were mixed together, but with unfamiliar chemicals in there as well. You don't want to breathe it, but on dump days it's everywhere.

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### 3c. TAKEAWAYS: CALLS FOR SWIFT ACTION EXPLAINED

Carbon Mapper made direct measurements of methane emissions at Coffin Butte Landfill for one ten-day period, which doesn't seem like much time. And in many ways it isn't. But you should understand that this was the first time ever that there were direct measurements made of the entire landfill. Prior to these overflights, the landfill gas emissions at Coffin Butte Landfill were estimated by a mathematical model widely acknowledged to be inadequate and outdated, and methane detection was done by a technician walking over parts of the landfill holding a wand close to the surface, four times a year. Neither of those methods have the capacity to generate actionable real-world knowledge the way that Carbon Mapper overflights are able to do with their direct visualizations and quantification.

The handheld wand method of methane detection, although primitive, sporadic, and prone to human error, nevertheless signaled what Carbon Mapper's airborne methane detector would reveal. Those walkovers found methane leaks at concentrations twice the actionable level and above in every Surface Air Quality monitoring report for the landfill that I have been able to obtain. The September 2022 walkover was a low point: 30 methane leaks were detected at concentrations high enough to be dark red on a plume map. The EPA inspection three months earlier found 27. And none of these walkovers include the working face, which is where Carbon Mapper found its four methane leaks. In short, it was likely that direct detection would confirm that Coffin Butte Landfill was a methane super-emitter.

As mentioned earlier, U.S. Senators Merkley and Wyden and U.S. Representative Hoyle, all from Oregon, are urging the EPA to take immediate action to expeditiously complete its enforcement investigation into the climate-damaging and locally toxic emissions at Coffin Butte Landfill. Their letter to EPA Administrator Michael Regan can be found [here](#). They note that "surrounding communities have long been concerned about methane leakage that contributes to fire risk and climate change, strong odors, and ultimately jeopardizes worker safety and public health," and urge EPA's "continued attention to concerns raised by our constituents." And this: "As Republic Services and Benton County consider the potential for expansion of the landfill, it is more important than ever to have all the facts." I hope this explainer has brought forward some of the facts that underlie the urgent calls for action. I also hope this explainer has acquainted you the reader with what is known so far about the air quality impacts of Coffin Butte Landfill, what their implications are, and what questions must be answered as we go forward.



EPILOG. Today (August 16), as I write this, Carbon Mapper and coalition partners are sending an emissions-detecting satellite into space aboard a Space X launch out of Vandenberg Air Force Base. The new satellite, Tanager-1, "is joining a growing ecosystem of satellites in orbit to track emissions at different scales and will fill a unique observational gap. Tanager is specifically designed to detect, pinpoint, and quantify methane and CO<sub>2</sub> super-emitters from space. These are emissions events that often contribute disproportionately to regional emissions and therefore represent an outsized climate risk and opportunity for mitigation. By precisely attributing those emissions and tracking them over time, Carbon Mapper will be able to scale up its publicly-available data — currently available on its public online portal — at a level of granularity that fills gaps in society's current understanding of human-

caused emissions and support direct mitigation action.” Tanager-1 will pass over Coffin Butte Landfill several times a day. Just sayin’.

## NOTES

Carbon Mapper is a 501c3 nonprofit focused on using remote sensing technology to pinpoint and quantify methane and CO2 emissions of individual facilities, to enable science-based decision-making and direct mitigation. [carbonmapper.org](https://carbonmapper.org)

Since 2016 Carbon Mapper has done surveys to identify point sources of greenhouse gas emissions, including those at landfills, especially in California. And these facility-level surveys have gotten results. “Airborne surveys of methane plumes spewing from landfills, power plants and oil fields in California have led to palpable reductions in leaks of the potent greenhouse gas,” the state’s air regulator and a non-profit group said ([link](#)). “The results of the study are a sign that one of the first in a growing number of efforts to deploy space-age technology to locate big sources of methane, an odorless colorless gas, is succeeding.”

The direct measurements done by Carbon Mapper have also been instrumental in refocusing climate action on landfills as a priority, because they have shown that the EPA’s greenhouse gas reporting system was significantly underestimating these emissions ([link](#)), and that landfills are a bigger contributor to global climate change than was previously thought ([link](#)). Surveys in California showed that a relatively small number of landfills had an outsized impact: “The largest methane emitters in California are a subset of landfills, which exhibit persistent anomalous activity.” ([link](#))

According to the EPA, “super emitters” are sources that spew at least 100 kilograms of methane per hour. So Coffin Butte Landfill is a super emitter 12 times over. A super super emitter, if you will.

This document prepared by Ken Eklund, using Carbon Mapper and other data sources. I am the Chair of the Disposal Site Advisory Committee of Benton County, and a resident of North Benton County. I live approximately 5 miles from Coffin Butte Landfill. All errors are mine. Email: [futureeverything@writerguy.com](mailto:futureeverything@writerguy.com)

– version: August 16, 2024 –

# EPA letter Re. Coffin Butte



**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

---

**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](mailto: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 their 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**

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Daniel Heins, Report Author

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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

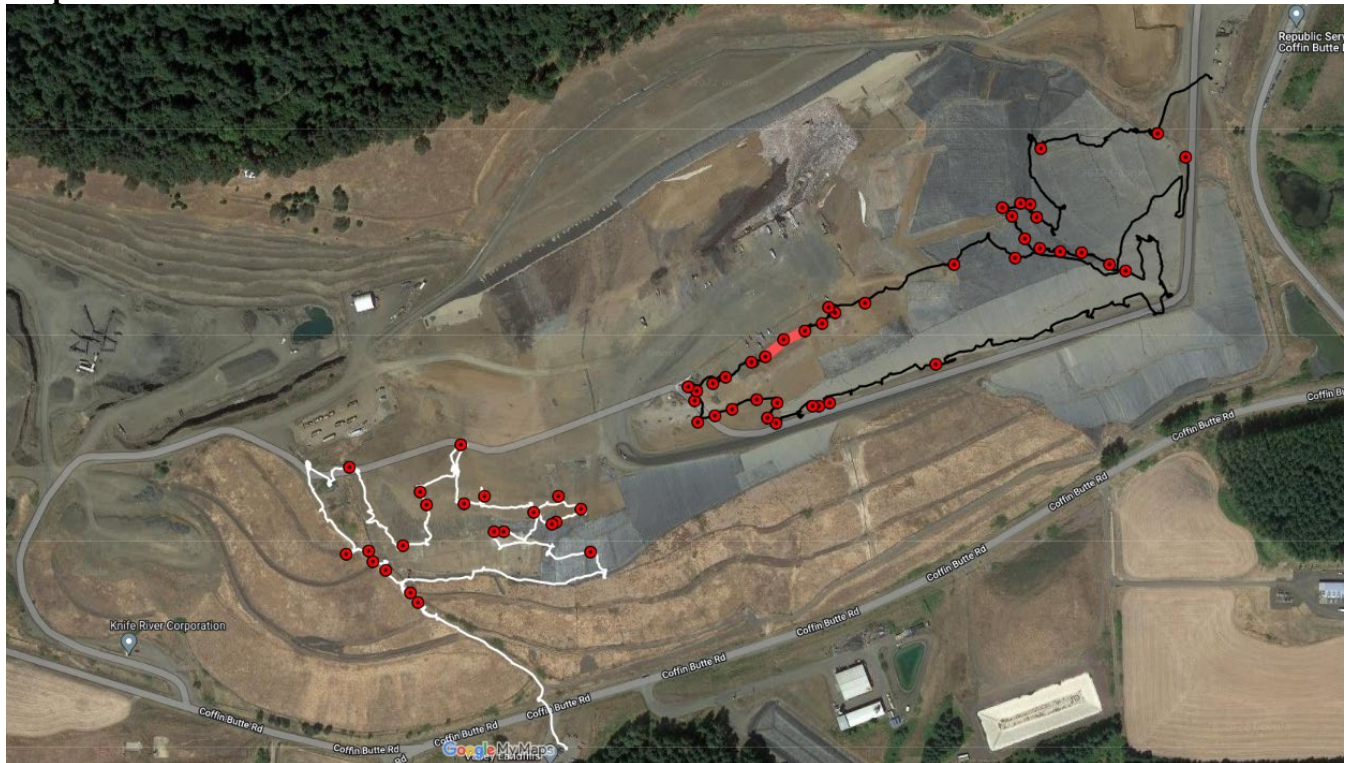
Composition	Lot #	Expiration
Air zero grade THC <1 ppm	DBJ-1-24	March 2023
Methane in air 500 ppm	1-167-64	June 2024

### 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.

# Community concerns received so far in 2024

## Relevant Links:

*If you cannot open these links in your browser, please copy and paste the link provided to view.*

### [Disposal Site Advisory Committee Bylaws](#)

<https://cd.bentoncountyor.gov/wp-content/uploads/2024/07/240319-Revised-DSAC-Bylaws-SIGNED.pdf>

### [Benton County Development Code](#)

<https://cd.bentoncountyor.gov/codes/county-development-code/>

### [Coffin Butte Landfill – 2023 Annual Report](#)

<https://cd.bentoncountyor.gov/documents/2023-landfill-annual-report/>

### [Landfill Franchise Agreement - 2020](#)

<https://cd.bentoncountyor.gov/documents/2020-franchise-agreement/>

### [DEQ – Plastic Pollution and Recycling Modernization Act](#)

<https://www.oregon.gov/deq/recycling/pages/modernizing-oregons-recycling-system.aspx>

### [Recycling Modernization Act Flyer](#)

<https://www.oregon.gov/deq/recycling/Documents/recModORflyer.pdf>

### [RMA Local Government Brochure](#)

<https://www.oregon.gov/deq/recycling/Documents/rmaLocalGovBroc.pdf>

### [ORS 459](#)

[https://www.oregonlegislature.gov/bills\\_laws/ors/ors459.html](https://www.oregonlegislature.gov/bills_laws/ors/ors459.html)

### [ORS Chapter 465](#)

[https://www.oregonlegislature.gov/bills\\_laws/ors/ors465.html](https://www.oregonlegislature.gov/bills_laws/ors/ors465.html)

### [ORS Chapter 466](#)

[https://www.oregonlegislature.gov/bills\\_laws/ors/ors466.html](https://www.oregonlegislature.gov/bills_laws/ors/ors466.html)

### [Robert's Rules](#)

<https://osba.org/roberts-rules-simplified-2/>

### Questions about the 2023 landfill annual report

Question, Leachate:

1. How many leachate trucks travel to Corvallis municipal treatment plant each day? What route do they take?
2. How many leachate trucks travel to Salem municipal treatment plant each day? What route do they take?
3. What is the weight of a leachate truck?
4. Leachate What will happen to the leachate if municipal treatment plants in Salem & Corvallis stop taking leachate? It would be good to have a specific answer to this question, not something like “we’ll deal with that if it happens” – there has to be a plan for this, what is it?
5. Leachate already is collected that had penetrated the first liner and is collected by the system in the second liner. How much leachate is collected by the second (and final) leachate collection system?

Comment, Odor Notices:

6. It is well known that DEQ does not investigate most odor complaints. Hugh Gao, employed at DEQ, explained how it works in a phone conversation with a resident. When asked how DEQ investigates odor complaints, Hugh explained that he “...calls Ian [McNabb], Ian usually says either that there is no odor, or it was PRC generating the odor” and DEQ closes out the complaint without recording it. Page 12, detailing DEQ complaints logged, is therefore an almost useless metric to accurately describe the lived experience of people who live withing an approximate 5-mile radius of the landfill.  
*Personal aside:* We went to look at the fire earlier in the week and the stench almost knocked us over, were there any odor complaints recorded for the date of that fire, Wednesday, July 24, either at DEQ or on the Republic odor complaint portal?

Question: Summary of Landfill Users:

7. Does the landfill charge less for people who say they trash origin is Benton County?
8. How does the landfill operator verify the county of origin?
9. What is “Industrial Waste”? Could we get a description and breakdown of the tonnage of “industrial waste” by nature?

Comments: Summary of Landfill Users seems to overweight MSW originating in Benton County:

10. The amount of waste that is shown originating in Benton County does not make sense. The chart on page 13 shows Commercial MSW at about 50,000 tons. But public hauled MSW is almost 1/5 of this total, 9,400 tons. All residents of municipalities (Corvallis, Albany, Adair, etc.) have franchise agreements for hauling, so this seems to suggest that 1/5 of Benton County’s population self-hauls MSW to the landfill. But most residents outside city limits also have curbside trash pickup. So it is hard to credit that 1/5 of Benton County’s households self-haul their weekly waste to the landfill.  
*Personal aside:* We live outside of city limits, and even here everybody has household waste trash pickup (by Republic). So this number, fully 1/5 of Benton County’s households self-hauling household waste to the landfill is difficult to credit. The numbers don’t make sense.

11. Why does Benton County have so much more contaminated soil than larger surrounding counties? Where is that contaminated soil coming from?

Comment & question: Revenue -- How can the county verify these totals?

12. The County gets paid for each ton that the landfill accepts, so it would seem reasonable for the County to conduct an audit of Republic's numbers, to catch errors and ensure that revenues received are correct. What would be the best way to do that? How do other counties audit tonnage totals?

Questions: Traffic:

13. What is the vehicle breakdown between Commercial/Public/ADC?
14. What is the vehicle breakdown in terms of the sized of trucks?
15. How much traffic is generated by the PRC?
16. How much traffic is generated by the gas collection infrastructure?
17. How much traffic is generated by leachate haulers?

Questions: Fire

18. How many fires have there been at the landfill in 2023?
19. How often does a Republic landfill catch on fire?

Questions: Summary of Customer Complaints

20. During 2023, DSAC was suspended, and unable to facilitate complaints from the public. The "one table" of BCTT replaced DSAC during that time, and many, many complaints about the landfill were expressed during that process. Presenting only complaints received at the landfill scale house (when many were still social distancing) is not useful information. In fact, it is deceptive.

Question: Methane

21. Has Republic conducted any flyovers at the landfill to track the methane plume?
22. How much methane, of all the methane produced as waste breaks down, is captured? How much is released into the air either on the working face, or via rips in the tarps?
23. How much of the total methane produced is captured?
24. How much of the captured methane is flared off?

Question: Ugliness

25. Prior to Republic's merger with Allied waste, cells that had reached capacity were typically closed, capped and seeded with landscape plants. Since Republic's merger with Allied waste, it seems that cells that have reached capacity are just covered with very very ugly plastic tarps. What is the timeline for when those cells will receive final cover? Is it possible to plant trees on a closed cell to screen the landfill face above? The landfill is hugely ugly and can be seen for miles around.

General question: Landfill Expansion

26. If it is industry standard to start preparing a new cell 10-12 years before it is needed, why wasn't the cell in the quarry started 10-12 years ago? Alternately, why didn't Republic reduce volumes accepted at the landfill to have time to prepare the quarry site for accepting waste?



Dear Disposal Site Advisory Committee members:

Thank you to the new and continuing members who have volunteered to serve on this important committee. I appreciate that you are bringing your considerable own knowledge, skills, and experience to this challenging role.

The landfill is a complex system that poses multiple hazards to the surrounding community, as well as global climate, and just to make things more difficult, there's quite a bit of jargon to get through. So I wish you luck in quickly coming up to speed so you're able to provide effective oversight, on behalf of all of us.

One of the key duties mandated by Oregon statute (see [https://oregon.public.law/statutes/ors\\_459.325](https://oregon.public.law/statutes/ors_459.325)) is:

*ORS 459.325(2) Providing a forum for citizen comments, questions and concerns about the regional disposal site and promoting a dialogue between the community in which the regional disposal site is to be located and the owner or operator of the regional disposal site.*

From the posted agenda, it appears that your meeting will not include time for community-member comments, questions, or concerns. So I am providing you with a short list here of concerns and questions.

### **Concern #1: Landfill-related fires**

In the past three months, two fires have been serious enough to require an emergency response by multiple trucks from Adair Rural Fire & Rescue (volunteers), plus backup from the Corvallis fire department.

The first such fire, in early May, was in the active tipping area up on top of the landfill. The fire flared up on a Saturday evening after tipping operations had shut down for the rest of the weekend, and Republic Services personnel had left the site. The fire was reported by passing motorists who noticed smoke and alertly called 9-1-1. According to firefighters who responded, the fire appeared to originate from smoldering trash in the tipping area, and then spread to the hydraulic systems for the two "tippers."

The second such fire, just last Wednesday (July 24th), was next to one of the two open flares that are still being used to burn off excess methane from the landfill. Again, the fire flared up after hours and was called in by passersby. Firefighters were delayed in their response by a locked gate. According to one of the volunteers who responded, the fire appeared to originate from something that flew out of one of the flares (speculatively, a hot flake of metal as these flares are deteriorating with age after many years of near-constant use). The fire spread as a grass fire but fortunately was contained before it could reach the dense, doghair Douglas-fir plantation to the south.

In neither case did the landfill operators provide any notification to neighbors, despite the highly flammable situation on Republic Services' adjacent buffer lands which could allow fires to spread very rapidly.

**Question 1:** What is Republic's protocol for monitoring the landfill site for fires after hours?

**Question 2:** What is Republic's protocol for notifying neighbors in the event of a fire?

**Question 3:** Does Republic have any documented plan to reduce fire hazards on buffer lands, and is that plan being followed?

**Concern #2: Obsolete methane flares**

The two open gas flares have been in use for many years, and as noted above, may be deteriorating. According to emergency responders, these flares also generate many false alarms for 9-1-1 operators and Adair Rural Fire & Rescue.

As of January 1st, use of such flares is out of compliance with Oregon state regulations, because they are less effective than enclosed flares at reducing greenhouse gas emissions, and possibly also less effective at reducing other hazardous emissions.

A third, enclosed flare has been on site since early this year and was supposed to be installed, but the two open flares are still being used.

**Question 4:** Why hasn't the system been switched over to the enclosed flare by now?

**Question 5:** Is the landfill producing too much gas to manage the problem with a single new flare, or is it just a matter of management priorities being focused on other things?

**Concern #3: Annual reporting gaps**

You are being asked to review the 2023 Annual Report for the landfill and composting facility. The last time DSAC reviewed such a report was in July 2022, when DSAC was asked to review the 2021 Annual Report. Numerous errors and inconsistencies were pointed out by DSAC members and a corrected version was requested.

**Question 6:** Was a corrected version of the 2021 Annual Report ever submitted?

**Question 7:** Was a 2022 Annual Report ever submitted, and if so, who reviewed it for acceptance?

**Question 8:** The 2023 Annual Report makes reference to the 2023 Annual Environmental Monitoring Report (AEMR), which Republic Services is required to submit to DEQ. Have DSAC members been provided with a copy of the 2023 AEMR?

**Question 9:** Similarly, has the 2022 AEMR been provided for DSAC as background?

**Concern #4 PFAS (popularly known as "forever chemicals")**

In their 2023 Annual Report, Republic asserts that the landfill does not "produce" PFAS, but rather receives them. However they implicitly acknowledge that PFAS is being leached out of solid waste and ends up in leachate. They suggest that the PFAS coming out as leachate could be reduced by future regulations on consumer use. They also claim that there is nothing that they can do about PFAS in leachate.

**Question 10:** Has Republic done their own analysis of PFAS in landfill leachate, and if so, why aren't they presenting those data here?

**Question 11:** Are Republic's representatives aware that both the City of Corvallis and the City of Salem have tested incoming leachate from Coffin Butte for PFAS, and if so, again, why aren't they providing those data?

**Question 12:** Is there any evidence that the wastewater treatment plants in either Corvallis or Salem/Keizer are effective in removing PFAS that comes in from landfill leachate, and preventing PFAS from going into the Willamette River and/or biosolids that get spread on agricultural land?

**Question 13:** How can hypothetical future regulations on consumer products affect leachate that will be generated for years to come from the existing landfill cells, which are already full or nearly full with "legacy" waste?

**Question 14:** Can Republic Services provide any evidence of design calculations to evaluate the feasibility of on-site treatment of leachate generated by their existing landfill?

**Question 15:** What is the status of the reverse-osmosis plant and why did the company choose to stop using it?

**Concern #5: Arsenic in excess of MCL in compliance boundary wells**

The 2023 Annual Report includes a memorandum signed by "Ginger Rough, Sr. Manager for Public Affairs" which makes a series of questionable statements about arsenic. The memo quotes values from the Portland Basin, and the Cascade Range, and the "South Willamette Valley," asserting that Coffin Butte is in the last (rather than in the mid-Willamette Valley). The units of measure quoted are also highly questionable (milligrams per liter i.e. parts per million or ppm, rather than micrograms per liter or parts per billion or ppb).

It is well-known that arsenic is a problem in the Eugene area (e.g. around Spencer Butte) but problems with arsenic in domestic wells are nearly unknown in north Benton County and neighboring Polk County. According to the 2021 AEMR, arsenic levels in the "east-side" compliance-boundary wells at Coffin Butte have regularly been in the range 10 ppb to 30 ppb, approaching 40 ppb in one sample from around 2014.

**Question 16:** Why doesn't this Annual Report include up-to-date data for arsenic, among the included plots?

**Question 17:** Can Republic Services point to any wells in the western mid-Willamette Valley, other than at Coffin Butte, that have documented arsenic concentrations above 10 ppb? Any wells above 20 ppb? Any wells above 30 ppb? If so, where are those wells located?

**Question 18:** The memo states that "sampling first began in 1991" but in the 2021 AEMR no arsenic data are shown for east-side monitoring wells prior to late 1994 or early 1995. When were the east side wells first sampled for arsenic? If there are older (pre-1994) data, where are those reported?

**Question 19:** Can Republic Services show the complete time series for arsenic sampling in the east-side wells, as a basis for you (DSAC) to assess for yourselves whether the readings are "steady over time"?

**Question 20:** Mercury data were missing from the 2020 and 2021 AEMRs, despite that Republic has stated in past AEMRs that they sample for mercury as part of their standard monitoring. Can Republic present the mercury data?

**Concern #6: Roadside trash**

Roadside trash continues to be a problem on all roads used by Republic Services trucks and other commercial trash haulers. In 2021 local residents raised this issue in a DSAC meeting. The landfill's representative responded to the effect that all commercial trucks are required to stop and check to make sure their trailers are clean before they leave the landfill. Obviously this isn't happening on a consistent basis.


**Question 21:** What does Republic Services plan to do to make sure that their own truck drivers as well as other commercial haulers are stopping to check their trucks before they leave?

**Question 22:** There is a sign at the entrance asking truckers to do this, but it's facing outward toward trucks arriving at the landfill. Wouldn't it be more effective to have it facing in the other direction, together with a stop sign and a monitored station where drivers are required to get out and check?

**Question 23:** Roadside cleanup lately seems to be done only by inmate crews from Benton County Corrections. Why isn't Republic Services playing a role in cleaning up the mess created by their operation, and how are they compensating Benton County for this service?

Thank you for your attention to these questions and concerns.

Yours sincerely,  
xxxxxxxxxxxxxxxxxxx



In observing the DSAC meeting last night I noticed some uncertainty regarding the terms of the 2020 Landfill Franchise Agreement. During my involvement in the 2021 CUP discussions for LU21-047 and subsequent participation in the Solid Waste Process Workgroup ("BCTT") subcommittee A.1 I found the following to be helpful:

1. This document is the legal contract between Valley Landfills, Inc. (now a subsidiary of Republic Services, Inc.) and Benton County for issues regarding the Coffin Butte landfill. Residential trash pickup ("hauling") is governed by a different contract. [See first paragraph of the Agreement.]
2. The contract was signed on December 21, 2020. The contract term is January 1, 2021 through December 31, 2040 (20 years). [See Clauses 1 & 3.]
3. A detailed fee schedule is defined, consisting of a base Franchise Fee (minimum annual payment) plus, if applicable, a Host Fee that will pay an additional amount based on intake tonnage for a calendar year and the specified per-ton Host Fee rate, both of which are dependent on whether or not approval is granted for expansion onto the Expansion Parcel (e.g. the current CUP). [See Clause 4.] Under recent and anticipated future intake volumes, the total payout to the county is determined by the Host Fee, and exceeds the baseline Franchise Fee. This is expected, per the Republic Services volume projections documented in the BCTT Final Report, to continue to be the case even if no expansion is approved. Attached is recent testimony I provided to the Board of Commissioners on this subject, which notes that integrity of the county budget is not dependent on approval of a landfill expansion. In the past, even former SWAC/DSAC members have suggested that failure to approve an expansion (LU21-047) could cause the county to lose the entirety of its landfill revenue or otherwise endanger the county finances. Please be careful to address such concerns with the facts during the upcoming CUP discussions.
4. An intake limit ("shall not exceed") of 1,100,000 Tons per calendar year is defined, but this limit would no longer apply if expansion is approved onto the Expansion Parcel (again, e.g. the current CUP). [See Clause 5.] County Counsel Croney confirmed this to me in an email exchange in 2021. Thus, if expansion onto the Expansion Parcel is approved, there will be no legal limit on the volume of waste Republic Services can place in the landfill. A consequence of this is that any cell or landfill "lifetime" projections are meaningless, because the Coffin Butte intake volume will no longer be limited. Even in relation to the current CUP, Republic Services continues to claim lifetimes associated with certain cells; this occurred during the 7/31/2024 DSAC

meeting, for example. These projections are not valid given the contractual terms of the 2020 Landfill Franchise Agreement.

5. As long as the intake limit applies, Benton County is guaranteed up to 75,000 tons per year of intake allocation at the landfill. [See Clause 5.] From the contract language it appears this guarantee would no longer apply if expansion onto the Expansion Parcel is approved; this may be a good question for you to resolve with County Counsel. The interpretation may be that if intake is no longer limited there is no need for a Benton County allocation guarantee.

I am also attaching my copy of the 2020 Landfill Franchise Agreement. If you find this does not match the official copy please let me know.

Please contact me if you have any questions, comments or corrections on the statements above.

Regards,

A black rectangular redaction box covering the signature of the sender.

2024 Community Concerns about Coffin Butte Landfill (as of 8/22/24)

Count	Site Location	Date Received	Complaint
1	Soap Creek area (5 mi. south of Coffin Butte)	8-Mar	Coffin Butte odors
2	Coffin Butte Landfill	7-Mar	Coffin Butte water quality
3	Coffin Butte Landfill	8-Mar	Coffin Butte odors
4	Unknown	15-Mar	Republic Services Billing
5	Unknown	15-Mar	Website links don't work
6	Soap Creek area (5 mi. south of Coffin Butte)	18-Mar	Coffin Butte odors
7	Soap Creek area (5 mi. south of Coffin Butte)	1-Apr	Coffin Butte odors
8	27673 Writsman Creek Dr., Corvallis	1-Apr	Coffin Butte odors
9	Independence Hwy to Hwy 20	2-Apr	Road damage (potholes) causing hazard for traffic at posted speed limit. Inde hwy from landfill to Hwy 20
10	1.5 mi stretch between hwy 20 and Metge rd on Independence hwy	5-Apr	Numerous pot holes caused by the heavy truck traffic from Knife River.
11	Hwy. 99, near Coffin Butte	8-Apr	Coffin Butte Litter
12	Hwy. 99, near Coffin Butte	29-Feb	<p>For years I have witnessed garbage flying out of the Republic Services garbage trucks. Independence Hwy is disgusting, so does Hwy 99 and all adjacent roads. These used to be lovely roads with great views but it looks no better than a 3rd world country.</p> <p>This has been brought up in the Next Door Neighbor app and I am not alone. Please read. <a href="https://nextdoor.com/p/G6-H2FCk_5Kd?utm_source=share&amp;extras=NDk2ODc1MQ%3D%3D&amp;utm_campaign=1709261818824">https://nextdoor.com/p/G6-H2FCk_5Kd?utm_source=share&amp;extras=NDk2ODc1MQ%3D%3D&amp;utm_campaign=1709261818824</a></p>
13	27407 Writsman Creek Drive	23-May	<p>A beautiful morning in Soap Creek Valley with an overwhelming dump stench hanging in the air!</p> <p>Regards, Becky Merja</p>
14	Soap Creek area (5 mi. from Coffin Butte)	23-May	<p>Hi Bailey,</p> <p>Wanted to report this to you so you knew this goes on...</p> <p>For the first time (for me, anyway), I smelled the dump from right outside my own home. I live a good five miles away from the dump and am surrounded by a lot of trees which usually keep the air clean, but not this morning! My husband went out for a morning walk and texted me he smelled the dump. I hadn't been outside yet, so stepped out my front door and could smell it from my deck. This was at about 7:45am (Thurs 5/23/24). The smell actually began to make me feel queasy so I went back inside. I heard from a number of neighbors that they smelled it too. The landfill operators are supposed to keep odors in check but do not. It is truly scary smelling the dump (especially at your own home!) because we do not know what all pollutants we are taking into our bodies. And it is very disturbing that if you don't want to breathe those unknown things in, you feel like you have to avoid going outdoors until the "coast is clear."</p> <p>This is one of the many reasons a landfill like this should not be located so close to populated areas. When we moved here nine years ago we were given the impression that the landfill was almost full and so would be closing in the near future. On the landfill's own website in their FAQ they describe the process of how the landfill will be closed when it is "filled to capacity" so we were comforted by that. But clearly this is misleading, as they will continue to expand this dump forever if the County allows it to. I know this now, but did not when I moved here.</p> <p>I have made my complaint to DEQ on their form (about this morning's odor), but wanted to be sure you were aware as well.</p> <p>Do you keep a log of landfill complaints, by any chance?</p>
15	27407 Writsman Creek Drive	24-May	The smell this morning (8:15am) is not as intense as it was yesterday. But still noticeable
16	Coffin Butte Landfill	22-Jul	It is long past time to address the overuse of the Coffin Butte landfill by municipalities across Oregon and Washington. It should be designated and operated as a regional landfill. At its current intake rate it will become a Superfund site which is not the legacy you should be leaving. With the CUP application now on file, please make the call as elected leaders of Benton County to restrict any expansion to future use for Benton County only.
17	Coffin Butte Landfill		Upset that CB charged out-of-county rate because she came in a F350 truck with a u-haul back. Feels that this should have been charged the Benton County rate. She provided receipts documenting the "environmental fee" that should not be charged to Benton County residents.
18	Coffin Butte Landfill	4-Aug	Upset that CB charges "environmental fee" to in-County residents

# Republican Services and Methane

Stonewalling the facts since 2021

**Ken Eklund**

**[futureeverything@writerguy.com](mailto:futureeverything@writerguy.com)**

**August 20, 2024**





**How much methane is escaping?**

**“A very minimal amount.”**

*–Ian Macnab, Environmental Manager, Coffin Butte Landfill,  
to the Planning Commission, Nov. 19, 2021*

**November, 2021**

**The Planning Commission votes unanimously to deny the 2021 expansion application, and cites “questions about the impacts of landfill gas” as part of the rationale for its decision**

**June 2022**

**An EPA inspection discovers many large landfill gas leaks at Coffin Butte Landfill, and an EPA investigation begins.**

**Benton County Talks Trash:  
Scenarios are presented where action on  
methane pollution affects the life of the landfill**

**“Republic Services believes that this entire section and the scenarios that follow should be stricken from the record, as these issues are not within the scope or charge of the site life subcommittee.”**

*–Ginger Rough, Republic Services, December 22, 2022*

## The Climate Change Imperative, and Methane

People all over the world are growing increasingly concerned that the uncontrolled release of greenhouse gases poses a significant threat to the ecosystems and communities that depend upon them. The 27th Conference of the Parties to the United Nations Framework Convention on Climate Change (COP27) took place from 6 to 20 November this year, and hosted more than 100 Heads of State and Governments and over 35,000 participants who engaged in high-level meetings and key negotiations regarding climate action.<sup>i</sup> UN Secretary-General António Guterres said that more needs to be done to drastically reduce emissions now. “The world still needs a giant leap on climate ambition... we can and must win this battle for our lives.” He urged the world not to relent “in the fight for climate justice and climate ambition.”<sup>ii</sup>

In the United States, this fight is focused on the release of methane, a potent greenhouse gas. The US is one of the world’s top 10 methane emitters, and methane emissions are a major contributor to climate change, “which is why President Biden is taking critical, commonsense steps at home to reduce methane across the economy.” Last year the US announced that it was

Rough, Ginger

12/14/2022

Republic Services believes that this entire section and the scenarios that follow should be stricken from the record, as these issues are not within the scope or charge of the site life subcommittee. Further, the scenarios outlined below are based on speculative presumptions that have not yet occurred.

 Reply  Delete

**July 2023**

**Carbon Mapper overflights of Coffin Butte  
Landfill reveal four significant leaks,  
emitting methane plumes stretching more  
than a mile, extending into neighborhoods**

**July 2024**

**Carbon Mapper quantifies the emissions from one of the sources at Coffin Butte Landfill, and characterizes it as “100% persistent.” This one leak seems to be the 7th largest point source of greenhouse gases in the state of Oregon.**

**(Sources 1 through 6 are large fossil-fuel-burning power stations.)**

**August 2024**

**U.S. Senators Merkley and Wyden and Representative Hoyle urge the EPA to intensify its investigation of Coffin Butte Landfill, because**

**“As Republic Services and Benton County consider the potential for expansion of the landfill, it is more important than ever to have all the facts.”**



**Sent: Monday, August 5, 2024 4:57 PM**

**Subject:** Federal action underway regarding Coffin Butte Landfill, and its repercussions

Hello Commissioners,

I am writing to you as requested of me by Robert Orton, to make you aware of what is happening at the Federal level regarding environmental concerns about Coffin Butte Landfill. It seems that Commissioner Augerot at least has already been made aware of the EPA's active enforcement action regarding the landfill:

The Senator continues to be concerned about the Clean Air Act violations at Coffin Butte. He recently questioned the EPA Administrator at a public hearing regarding their investigation into Coffin Butte. You can find this [here](#) at approximately 1.53.20. In addition, the Senator brought up his concerns to Administrator Regan in a private meeting. The Senator also submitted an appropriations request for FY25 that would fund a pilot project to monitor methane at Coffin Butte. I recently spoke with County Commissioner Augerot regarding Coffin Butte and the County process for either accepting or denying the expansion proposal and I plan to attend a tour with Beyond Toxics at the end of the month to view the landfill as well as with Republic Services about taking an internal tour.

– *Sophia Francia, field representative to Senator Jeff Merkley, to Robert Orton, email July 11, 2024*

For your convenience I am attaching a transcript of the exchange that Ms. Francia is referring to, in the video of a Senate public hearing of the Appropriations Committee about the 2025 budget for the EPA. The conversation is between Senator Jeff Merkley (JM) and EPA Administrator Michael Regan (MR):

1:52:32

JM: [In my] home state: Coffin Butte Landfill. In June of 2022 the EPA sent out a team to measure the methane coming out of it, because of local concerns. The inspection resulted in recording 61 leaks, including three measurements that maxed out the instrumentation that was being used, at 70,000 parts per million. So: can you give me a short version of what action the EPA is taking? This is now 23 months ago that the field inspection occurred. If we need a longer discussion, I'd like to follow up with you to make sure that there is going to be action regarding landfills like this that are out of compliance.

1:53:10

MR: Well, I will say that our enforcement arm has been very aggressive at looking at these methane leaks and opportunities here. This is one that as you said was discovered in 2022. Unfortunately it is an active enforcement situation, so I can't speak to that without betraying the confidence or the legal obligations that I have. But I can tell you that we are coordinating with the State of Oregon – it's an active case, and we are laser-focused on this case.

1:53:43

JM: Great, because if you have a landfill which maxes out the instrumentation – which is I think quite rare? – it should probably rise to the top of the list of places to act on. I'll convey to the folks in Corvallis and nearby that you are on the case.

For Robert Orton, and for myself, there is no revelatory new information here. For him, working atop the landfill, and for us who live within five miles of the landfill, we have known for years that there were huge

amounts of landfill gas escaping, through direct experience with those leaks and that volume of gases. I gave testimony to the Planning Commission over three years ago, and to the BCTT two years ago, citing emerging new data about the greenhouse gas problem with landfills in general and the particular phenomenon of “super-emitter” landfills.

And central to these concerns has been the stonewalling behavior of Republic Services throughout. As you know, at every stage Republic Services has withheld notification of these developments, has minimized the significance of these developments when revealed, has refused to discuss these developments openly and honestly, and has assured us that they’re addressing the issues when they aren’t. They claim to be a sustainability company, but really they’re a stay-one-step-ahead-of-the-handcuffs company, taking action only when threatened with enforcement, and then doing the minimum to avoid serious enforcement rather than actually confronting the environmental harms at their root.

At last week’s DSAC meeting, I brought up with the Republic representatives the idea of using new methane detection technology to proactively deal with methane leaks. They made it absolutely clear that such an idea was out of the question anytime before it is required by the EPA.

As you know there is a public perception that the behavior of Benton County government has certain similarities to that of Republic – namely, that as the information about the environmental harms of the landfill has developed, Benton County government has obstructed them (and those who bring them forward), minimized their significance, has refused to discuss them openly and honestly, and will never act proactively regarding those harms. The evidence list that Benton County government is not objective with regard to the landfill’s environmental harms is long and well-documented. That means that Benton County government will be seen as a partner in what the landfill’s environmental harms turn out to be. If the landfill turns out to be a climate villain, Benton County government will be its henchman. Benton County government can change this – but change that sweeping would have to come from the top, and it would have to begin right now, today.

Respectfully,

# Relevant news articles

## Sustainable Materials News & Resources

Date	Source	Website Link	Topic (i.e. Climate Change,	Comments
1/1/2000	SWANA	<a href="https://acrobat.adobe.com/id/">https://acrobat.adobe.com/id/</a>	Landfill Gasses	WEBSITE
1/1/2000	Carbon Tracker	<a href="https://carbontracker.org/engag">https://carbontracker.org/engag</a>	Landfill Gasses	WEBSITE
1/1/2000	Valley Neighbors for Envi	<a href="https://coffinbuttefacts.org/">https://coffinbuttefacts.org/</a>	Coffin Butte	WEBSITE - Local group (VNEQ) created this and distributed lawn signs
1/1/2000	DEQ	<a href="https://www.oregon.gov/deq/m">https://www.oregon.gov/deq/m</a>	GHG	WEBSITE - Consumption-based GHG Emissions Inventory for Oregon
1/1/2000	Don't Waste Our Future	<a href="https://dontwasteourfuture.org">https://dontwasteourfuture.org</a>	Landfill	WEBSITE - Anti-landfill organization
1/1/2001	Portland Metro	<a href="https://www.oregonmetro.gov/">https://www.oregonmetro.gov/</a>	Coffin Butte	Greater Portland garbage will no longer go to growing landfills
2/9/2015	Metro News	<a href="https://www.oregonmetro.gov/">https://www.oregonmetro.gov/</a>	Landfill	How landfills manage waste as a resource
6/9/2016	Columbia Insight	<a href="https://columbiainsight.org/lan">https://columbiainsight.org/lan</a>	Landfills	Landfills: Garbage, the New Gold
2/17/2021	EPA	<a href="https://www.epa.gov/sites/defe">https://www.epa.gov/sites/defe</a>	PFAS	EPA PFAS INNOVATIVE TREATMENT TEAM (PITT) FINDINGS ON PFAS DESTRUCTION TECHNOLOGIES
11/3/2021	Gazette-Times	<a href="https://gazettetimes.com/opini">https://gazettetimes.com/opini</a>	Coffin Butte	County staff has not been objective toward landfill expansion
11/17/2021	Gazette-Times	<a href="https://gazettetimes.com/news">https://gazettetimes.com/news</a>	Coffin Butte	Benton County hears more opposition to Coffin Butte Landfill expansion
11/23/2021	Gazette-Times	<a href="https://gazettetimes.com/opini">https://gazettetimes.com/opini</a>	Coffin Butte - Landfill Gasses	Let's see a plan for the emissions
11/26/2021	Gazette-Times	<a href="https://gazettetimes.com/news">https://gazettetimes.com/news</a>	Coffin Butte	Doing the math on the landfill scheme
12/3/2021	Gazette-Times	<a href="https://gazettetimes.com/opini">https://gazettetimes.com/opini</a>	Coffin Butte	Let your opinion on landfill be known
12/8/2021	Gazette-Times	<a href="https://gazettetimes.com/news">https://gazettetimes.com/news</a>	Coffin Butte	Benton County Planning Commission unanimously rejects Coffin Butte landfill expansion plan
1/27/2022	Gazette-Times	<a href="https://gazettetimes.com/opini">https://gazettetimes.com/opini</a>	Coffin Butte	Take the time to look into expansion
7/17/2022	Gazette-Times	<a href="https://gazettetimes.com/corve">https://gazettetimes.com/corve</a>	Coffin Butte	Assessing our trash future
10/25/2022	Gazette-Times	<a href="https://gazettetimes.com/corve">https://gazettetimes.com/corve</a>	DSAC	County awards more time, money to Coffin Butte workgroup; fires member
12/13/2022	Gazette-Times	<a href="https://gazettetimes.com/corve">https://gazettetimes.com/corve</a>	DSAC	Another one bites the dustbin in Benton County trash committee
2/8/2023	Central Oregon Daily New	<a href="https://www.centraloregondaily">https://www.centraloregondaily</a>	Landfill	Committee nixes 3 potential Deschutes County landfill sites
3/6/2023	Gazette-Times	<a href="https://gazettetimes.com/news">https://gazettetimes.com/news</a>	Coffin Butte	Benton County commission unanimously rejects Coffin Butte landfill expansion plan
3/21/2023	Gazette-Times	<a href="https://gazettetimes.com/news">https://gazettetimes.com/news</a>	DSAC	Benton County to advisers about landfill: 'Stop advising us'
4/6/2023	Gazette-Times	<a href="https://gazettetimes.com/news">https://gazettetimes.com/news</a>	Coffin Butte	Benton task force says Coffin Butte expansion should be tied to monitoring
4/25/2023	Gazette-Times	<a href="https://gazettetimes.com/news">https://gazettetimes.com/news</a>	Coffin Butte	Alarmed by proposed expansion of landfill
6/2/2023	Gazette-Times	<a href="https://gazettetimes.com/corve">https://gazettetimes.com/corve</a>	Coffin Butte - Leachate	Complex chemical stew': Leachate concerns in Corvallis
6/4/2023	Gazette-Times	<a href="https://gazettetimes.com/news">https://gazettetimes.com/news</a>	Coffin Butte	A bigger landfill is not the plan
7/1/2023	Gazette-Times	<a href="https://gazettetimes.com/news">https://gazettetimes.com/news</a>	Coffin Butte	Draw the line now on Coffin Butte Landfill
8/20/2023	Gazette-Times	<a href="https://gazettetimes.com/corve">https://gazettetimes.com/corve</a>	Coffin Butte	Kicking the (trash) can down the road
8/25/2023	Gazette-Times	<a href="https://gazettetimes.com/corve">https://gazettetimes.com/corve</a>	Coffin Butte	The situation with Coffin Butte Landfill, in a nutshell
9/14/2023	Gazette-Times	<a href="https://gazettetimes.com/news">https://gazettetimes.com/news</a>	Coffin Butte	Coffin Butte mechanics protest alleged unfair labor practices
9/26/2023	Gazette-Times	<a href="https://gazettetimes.com/news">https://gazettetimes.com/news</a>	Coffin Butte	Do county officials have the courage to move in right direction?
10/7/2023	Gazette-Times	<a href="https://gazettetimes.com/news">https://gazettetimes.com/news</a>	DSAC	Benton County acts again to silence all landfill critics
10/11/2023	League of Women Voters	<a href="https://www.google.com/searc">https://www.google.com/searc</a>	Coffin Butte	Presentation to League of Women Voters, "What's up with Coffin Butte Landfill?"
10/12/2023	Gazette-Times	<a href="https://gazettetimes.com/news">https://gazettetimes.com/news</a>	DSAC	Who repressed speech at Coffin Butte Landfill event?
10/13/2023	Gazette-Times	<a href="https://gazettetimes.com/news">https://gazettetimes.com/news</a>	Coffin Butte	Union leaders, House Speaker show support for Coffin Butte mechanics at rally
10/20/2023	Statesman Journal	<a href="https://www.statesmanjournal">https://www.statesmanjournal</a>	Coffin Butte - Landfill Gasses	Coffin Butte Landfill methane leaks exceed state, federal limits
10/23/2023	MIT Technology Review	<a href="https://www.technologyreview">https://www.technologyreview</a>	PFAS	The race to destroy PFAS, the forever chemicals
10/26/2023	Investigative West	<a href="https://www.invw.org/2023/10/">https://www.invw.org/2023/10/</a>	Coffin Butte - Landfill Gasses	Landfills in Washington and Oregon leaked 'explosive' levels of methane last year
10/26/2023	Gazette-Times	<a href="https://gazettetimes.com/none">https://gazettetimes.com/none</a>	DSAC	DSAC Chair asks why Benton County has fulfilled none of its requests for public records
11/2/2023	Gazette-Times	<a href="https://gazettetimes.com/news">https://gazettetimes.com/news</a>	Coffin Butte - Landfill Gasses	EPA says methane gas levels at Coffin Butte landfill are concerning
11/22/2023	Gazette-Times	<a href="https://gazettetimes.com/news">https://gazettetimes.com/news</a>	DSAC	Disposal site advisory committee says county staff stonewalling them
11/28/2023	Gazette-Times	<a href="https://gazettetimes.com/news">https://gazettetimes.com/news</a>	Coffin Butte	Benton County government says new Coffin Butte Landfill application is imminent
12/12/2023	Gazette-Times	<a href="https://gazettetimes.com/news">https://gazettetimes.com/news</a>	DSAC	DSAC is an agent of change
1/19/2024	Gazette-Times	<a href="https://gazettetimes.com/news">https://gazettetimes.com/news</a>	Coffin Butte	Republic Services pulls appeal on Coffin Butte landfill expansion
1/20/2024	Gazette-Times	<a href="https://gazettetimes.com/news">https://gazettetimes.com/news</a>	Coffin Butte	Benton County government says new Coffin Butte Landfill application is imminent
2/1/2024	Gazette-Times	<a href="https://gazettetimes.com/news">https://gazettetimes.com/news</a>	Coffin Butte	Coffin Butte mechanics still seeking adequate health care from Republic
2/1/2024	Gazette-Times	<a href="https://gazettetimes.com/news">https://gazettetimes.com/news</a>	DSAC	Disempowering community input
2/10/2024	Gazette-Times	<a href="https://gazettetimes.com/news">https://gazettetimes.com/news</a>	Coffin Butte	What can we do as part of the waste solution?
2/14/2024	Google	<a href="https://blog.google/outreach-in">https://blog.google/outreach-in</a>	Coffin Butte - Landfill Gasses	How satellites, algorithms and AI can help map and trace methane sources
2/15/2024	Gazette-Times	<a href="https://gazettetimes.com/news">https://gazettetimes.com/news</a>	Coffin Butte	Coffin Butte Landfill – costs, risks, benefits
2/28/2024	Hasso Herring	<a href="https://hh-today.com/rushing-t">https://hh-today.com/rushing-t</a>	Coffin Butte - Expansion	Rushing to get rock out of Coffin Butte
3/28/2024	New York Times	<a href="https://www.nytimes.com/202">https://www.nytimes.com/202</a>	Coffin Butte - Landfill Gasses	'Garbage Lasagna': Dumps Are a Big Driver of Warming, Study Says
4/1/2024	Barometer	<a href="https://dailybaro.orangemediar">https://dailybaro.orangemediar</a>	DSAC	County updates landfill committee bylaws: committee displeased
4/2/2024	Gazette-Times	<a href="https://gazettetimes.com/news">https://gazettetimes.com/news</a>	VNEQ	Conversation on landfill set for Tuesday in Adair Village
4/4/2024	Apple News	<a href="https://apple.news/AKxnLiKpQ">https://apple.news/AKxnLiKpQ</a>	Coffin Butte	Landfills bake the planet even more than we realized
4/9/2024	CBS News	<a href="https://www.cbsnews.com/new">https://www.cbsnews.com/new</a>	PFAS	Aerial monitoring finds they emit methane at levels at least 40 percent higher than previously reported to the EPA. 6:30 min. video - New technology to remove PFAS from leachate at landfills or water treatment plants
4/16/2024	Statesman Journal	<a href="https://www.statesmanjournal">https://www.statesmanjournal</a>	Coffin Butte	1 min. video about worker complaints
4/16/2024	Statesman Journal	<a href="https://archive.is/macFw">https://archive.is/macFw</a>	Coffin Butte	Coffin Butte Landfill workers allege safety and environmental violations
4/22/2024	KSTP	<a href="https://kstp.com/kstp-news/top">https://kstp.com/kstp-news/top</a>	PFAS	Homeowner's guide to filtering out PFAS from water supply
4/22/2024	The Guardian	<a href="https://www.theguardian.com/">https://www.theguardian.com/</a>	PFAS	Ocean spray emits more PFAS than industrial polluters, study finds
4/24/2024	WGME	<a href="https://wgme.com/news/local/">https://wgme.com/news/local/</a>	PFAS	Gov. Mills vetoes bill to hold Old Town landfill accountable for PFAS runoff
4/24/2024	MLive	<a href="https://www.mlive.com/public">https://www.mlive.com/public</a>	PFAS	EPA designates two PFAS chemicals as 'hazardous substances'
4/25/2024	The Source	<a href="https://www.bendsource.com/">https://www.bendsource.com/</a>	Landfills	Deschutes County Proposes Next Landfill Site A committee tasked with evaluating new landfill locations made its final recommendation
4/25/2024	KGW	<a href="https://www.kgw.com/article/n">https://www.kgw.com/article/n</a>	Litter	A lot of garbage': Regulation proposed to help tackling high trash level reported in Willamette River
4/25/2024	Corvallis Advocate	<a href="https://www.corvallisadvocate">https://www.corvallisadvocate</a>	Coffin Butte	ADVOCATE VIDEO DEBATE: COUNTY COMMISSIONER CANDIDATES IRISH AND SHEPHERD FIELD QUESTIONS Note: the Coffin Butte discussion begins at 33:39 and ends at 43 min. Environmental questions begin at 52 min. and ends at 1hr, 1 min.
4/27/2024	Gazette-Times	<a href="https://gazettetimes.com/eedit">https://gazettetimes.com/eedit</a>	Coffin Butte	Benton candidates discuss landfill
4/29/2024	Beyond Toxics	<a href="https://www.beyondtoxics.org/">https://www.beyondtoxics.org/</a>	Coffin Butte	What's Trash Got To Do With It? Toxics!
4/29/2024	ABC	<a href="https://www.wfaa.com/article/">https://www.wfaa.com/article/</a>	PFAS	'This is Chernobyl!': Texas ranchers say 'forever chemicals' in waste-based fertilizers ruined their land - 6 min. video
5/11/2024	Gazette Times	<a href="https://gazettetimes.com/eedit">https://gazettetimes.com/eedit</a>	Coffin Butte	As I See It: Action items for Commissioner Wyse
5/15/2024	Waste Today	<a href="https://www.wastetodaymagaz">https://www.wastetodaymagaz</a>	Landfills - Methane	Washington implements methane reduction regulations for landfills

5/16/2024	Battelle	<a href="https://www.battelle.org/marke">https://www.battelle.org/marke</a>	PFAS	Equipment that removes PFAS from water
5/20/2024	Environmental Defense F	<a href="https://blogs.edf.org/climate41">https://blogs.edf.org/climate41</a>	Landfills - Methane	Advanced methane technologies can strengthen new landfill pollution limits
5/20/2024	MethaneSAT	<a href="https://www.methanesat.org/pi">https://www.methanesat.org/pi</a>	Landfills - Methane	Google partnership will help turn MethaneSAT data into global methane action
5/21/2024	Grist	<a href="https://grist.org/regulation/lanc">https://grist.org/regulation/lanc</a>	Landfills - Methane	Landfills leak methane with impunity, new research shows
6/7/2024	Washington State Senat	<a href="https://washingtonstatestanda">https://washingtonstatestanda</a>	Landfills - Methane	WA cracks down on gassy garbage
6/11/2024	Waste Today	<a href="https://www.wastetodaymagaz">https://www.wastetodaymagaz</a>	Landfills	Oregon county explores new landfill site
				Commissioners in Deschutes County, Oregon, have scheduled a public hearing as its existing landfill counts down toward its closure date.
6/22/2024	Gazette-Times	<a href="https://gazettetimes.com/eedit">https://gazettetimes.com/eedit</a>	Coffin Butte - Expansion	Another attempt to expand the dump
6/22/2024	Gazette-Times	<a href="https://gazettetimes.com/eedit">https://gazettetimes.com/eedit</a>	Coffin Butte - Expansion	Corvallis, is this acceptable to you?
6/26/2024	Statesman Journal	<a href="https://www.statesmanjournal">https://www.statesmanjournal</a>	Coffin Butte - Expansion	Coffin Butte Landfill near Corvallis will again try to expand; info meetings scheduled
6/27/2024	Corvallis Advocate	<a href="https://www.corvallisadvocate">https://www.corvallisadvocate</a>	Coffin Butte - Expansion	EDITORIAL: LANDFILL DISCOURSE HAS MISSED THE BIGGER QUESTIONS
6/29/2024	Statesman Journal	<a href="https://www.statesmanjournal">https://www.statesmanjournal</a>	Coffin Butte - Expansion	Coffin Butte Landfill expansion plan in Benton County scaled down
6/29/2024	Hasso Herring	<a href="https://hh-today.com/new-coffi">https://hh-today.com/new-coffi</a>	Coffin Butte - Expansion	New Coffin Butte plan keeps road open
7/1/2024	Corvallis Advocate	<a href="https://www.corvallisadvocate">https://www.corvallisadvocate</a>	Coffin Butte - Expansion	HOW COUNTY OFFICIALS VIEW THE LANDFILL PROCESS
7/8/2024	Waste Dive	<a href="https://www.wastedive.com/ne">https://www.wastedive.com/ne</a>	PFAS	Superfund enforcement of PFAS started Monday. Where does waste and recycling go from here?
7/10/2024	Canary Media	<a href="https://www.canarymedia.com">https://www.canarymedia.com</a>	Landfills - Methane	Is the EPA about to get serious about methane pollution from landfills?
7/20/2024	Gazette Times	<a href="https://gazettetimes.com/news">https://gazettetimes.com/news</a>	Coffin Butte	Benton County takes dump expansion application
7/20/2024	Gazette Times	<a href="https://gazettetimes.com/eedit">https://gazettetimes.com/eedit</a>	Coffin Butte	As I See It: Expansion of landfill but only for Benton County
7/20/2024	Central Oregon Daily Ne	<a href="https://www.centraloregondail">https://www.centraloregondail</a>	Landfill	OSU gets \$2 million to clean up old landfill next to Bend campus
7/22/2024	Corvallis Advocate	<a href="https://www.corvallisadvocate">https://www.corvallisadvocate</a>	Coffin Butte	LANDFILL AGAIN: COUNTY GETS EXPANSION APPLICATION
7/25/2024	Gazette Times	<a href="https://gazettetimes.com/opini">https://gazettetimes.com/opini</a>	Coffin Butte	Letter: There are options for waste disposal
7/25/2024	Gazette Times	<a href="https://gazettetimes.com/opini">https://gazettetimes.com/opini</a>	Coffin Butte	Letter: There are options for waste disposal
8/1/2024	Gazette Times	<a href="https://gazettetimes.com/eedit">https://gazettetimes.com/eedit</a>	Coffin Butte	County biased on the landfill expansion
8/4/2024	OPB	<a href="https://www.opb.org/article/20">https://www.opb.org/article/20</a>	Coffin Butte	Benton County residents report odor and fire risks at Coffin Butte landfill
8/8/2024	Gazette Times	<a href="https://gazettetimes.com/eedit">https://gazettetimes.com/eedit</a>	Coffin Butte	Benton officials want landfill report to include methane concerns
8/8/2024	Gazette Times	<a href="https://gazettetimes.com/eedit">https://gazettetimes.com/eedit</a>	Coffin Butte	The 'gentlefolk' of the landfill, a modern parable
8/8/2024	Sen. Ron Wyden Press Re	<a href="https://www.wyden.senate.gov">https://www.wyden.senate.gov</a>	Coffin Butte	Wyden, Merkley, Hoyle Urge EPA to Investigate Landfill Concerns in Benton County
8/8/2024	Philomath News	<a href="https://philomathnews.com/wy">https://philomathnews.com/wy</a>	Coffin Butte	Wyden: 'We are not going to let the federal government bury the Coffin Butte Landfill'
8/8/2024	Gazette Times	<a href="https://gazettetimes.com/opini">https://gazettetimes.com/opini</a>	Coffin Butte	Letter: Two recent fires at landfill reported
8/8/2024	Waste Dive	<a href="https://www.wastedive.com/ne">https://www.wastedive.com/ne</a>	Coffin Butte	4 landfill stories to follow this summer
8/9/2024	Gazette Times	<a href="https://gazettetimes.com/eedit">https://gazettetimes.com/eedit</a>	Coffin Butte	Federal politicians want EPA response
8/9/2024	Statesman Journal	<a href="https://www.statesmanjournal">https://www.statesmanjournal</a>	Coffin Butte	Lawmakers call for investigating Coffin Butte Landfill - Wyden, Merkley, Hoyle call for EPA investigation into Coffin Butte Landfill
				US landfills are major source of toxic PFAS pollution, study finds
8/9/2024	The Guardian	<a href="https://www.theguardian.com/">https://www.theguardian.com/</a>	PFAS	Republic Services Omits Key Info in Benton County Report
8/9/2024	Corvallis Advocate	<a href="https://www.corvallisadvocate">https://www.corvallisadvocate</a>	Coffin Butte	Think Out Loud - Coffin Butte Landfill proposed expansion raises environmental and health concerns
8/12/2024	OPB	<a href="https://www.opb.org/article/20">https://www.opb.org/article/20</a>	Coffin Butte	
8/12/2024	KVAL	<a href="https://www.kval.com/news/lo">https://www.kval.com/news/lo</a>	Coffin Butte	As Coffin Butte Landfill looks to expand, nearby residents express concerns
8/12/2024	Statesman Journal	<a href="https://www.klcc.org/politics-g">https://www.klcc.org/politics-g</a>	Coffin Butte	Oregon senators call for faster investigation of Coffin Butte Landfill
8/12/2024	OPB	<a href="https://www.opb.org/article/20">https://www.opb.org/article/20</a>	Coffin Butte	Coffin Butte Landfill proposed expansion raises environmental and health concerns
8/13/2024	Columbia Gorge News	<a href="https://www.columbiagorgenev">https://www.columbiagorgenev</a>	Landfill	Long-haul trash traffic threatens residents near Wasco County Landfill
8/14/2024	Statesman Journal	<a href="https://www.statesmanjournal">https://www.statesmanjournal</a>	Coffin Butte	Oregon warns Coffin Butte Landfill over methane emissions
8/14/2024	Statesman Journal	<a href="https://www.statesmanjournal">https://www.statesmanjournal</a>	Coffin Butte	Oregon warns Coffin Butte Landfill over methane emissions
8/16/2024	KVAL	<a href="https://www.kval.com/news/lo">https://www.kval.com/news/lo</a>	Coffin Butte	Coffin Butte Landfill expansion hits a roadblock
8/19/2024	Canary Media	<a href="https://www.canarymedia.com">https://www.canarymedia.com</a>	Coffin Butte	Pressure mounts on methane-polluting Oregon landfill to clean up its act
8/19/2024	Gazette Times	<a href="https://gazettetimes.com/news">https://gazettetimes.com/news</a>	Coffin Butte	Benton: Coffin Butte Landfill expansion application incomplete
8/23/2024	Waste Today	<a href="https://www.wastetodaymagaz">https://www.wastetodaymagaz</a>	PFAS	InEnTec says its plasma technology effectively destroys PFAS
8/26/2024	KGW8	<a href="https://www.kgw.com/article/n">https://www.kgw.com/article/n</a>	Dumpster Diving	No, it's not legal to dig through someone else's trash in Oregon
9/23/2024	OSU Extension	<a href="https://extension.oregonstate.e">https://extension.oregonstate.e</a>	Pyrolysis	OSU engages with onion growers to demonstrate an alternative method for plastic waste reduction