

From: [Ken Eklund](#)
To: [Coffin Butte Landfill Appeals](#)
Subject: Explainer 2 of 12: Carbon Mapper and methane detection
Date: Monday, October 20, 2025 4:12:01 PM
Attachments: [explainer - Carbon Mapper methane detection.pdf](#)

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Dear Chair Wyse and Commissioners Malone and Shepherd:

I've developed a set of "explainers" first for myself, to try to make sense of these complex subjects (and to get all the things learned into one place) and to pass this info along to others. And now I'm sending them along to you.

The one attached here is all about Carbon Mapper – an awardwinning climate science nonprofit that's been quietly gathering key emissions information about Coffin Butte Landfill. Commissioners Malone and Wyse have heard VNEQS talk about Carbon Mapper before, but Commissioner Shepherd, this may be new info for you. Carbon Mapper's data is groundbreaking, really, because it enables us for the first time to actually "look" at what an individual landfill's emissions really are, as opposed to estimating it from mathematical models or formulas. Which is key to understand what's going on at Coffin Butte, because statistically it is an outlier, and it's a mistake to assume that it's like other landfills. It's not.

I hope you find this Explainer useful –

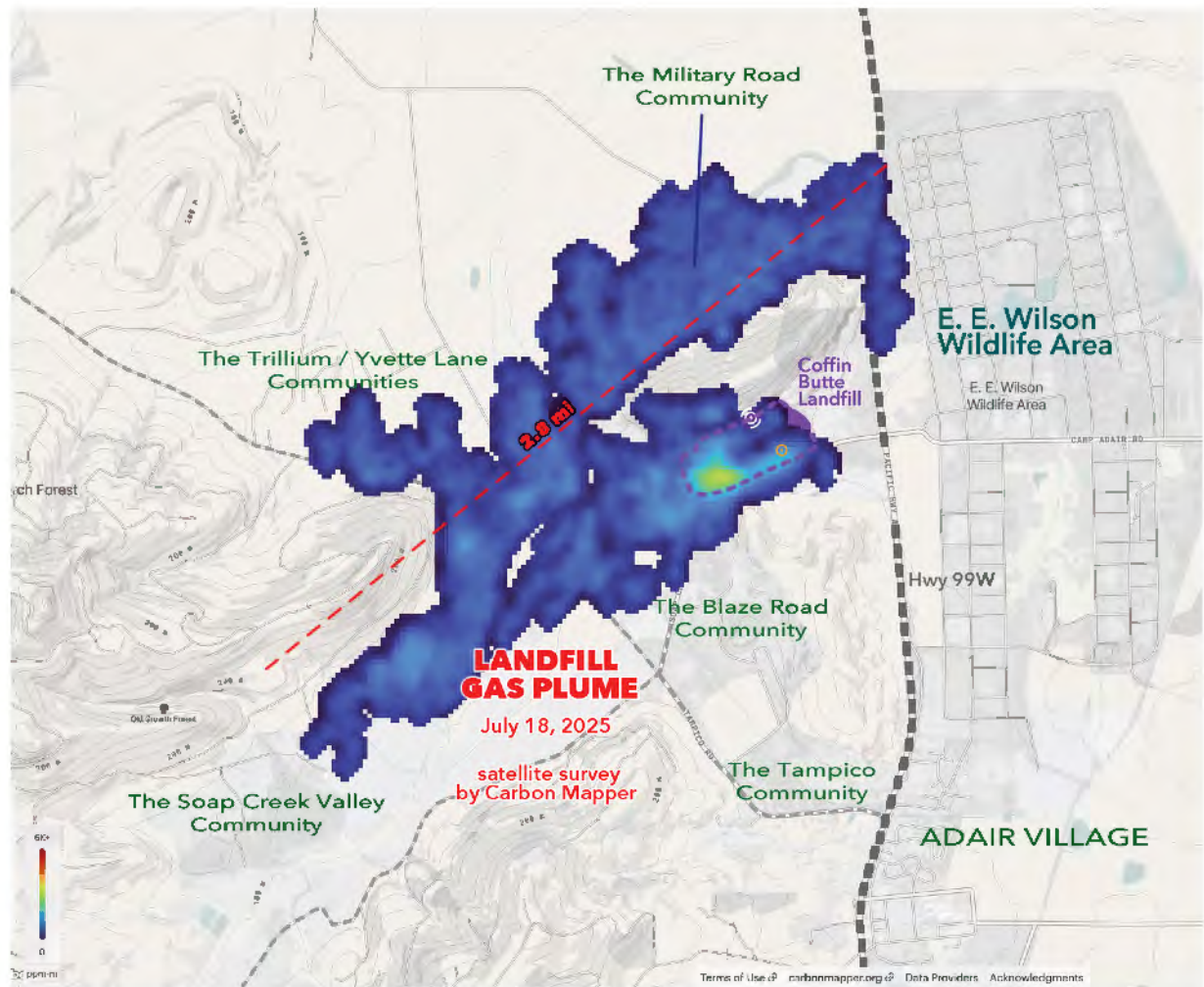
Ken Eklund

#explainer

Ken Eklund, writerguy

37340 Moss Rock Dr
Corvallis OR 97330
408.623.8372

Creator of
World Without Oil
Ed Zed Omega
FutureCoast
and other storymaking games



CARBON MAPPER AND LANDFILL GAS

AERIAL METHANE GAS DETECTION AT COFFIN BUTTE LANDFILL

— An Explainer —
Updated October 14, 2025

#methaneplumes • #CarbonMapper • #explainer

Takeaways from this document:

Carbon Mapper is an important independent resource for assessing the landfill gas emissions at Coffin Butte Landfill.

Carbon Mapper uses airborne and satellite sensors to plot and quantify plumes of landfill gas originating at the landfill.

Every time Carbon Mapper has observed Coffin Butte Landfill, there has been at least one plume of landfill gas leaking out above EPA super-emission levels. Carbon Mapper has plotted 28 of these plumes to date.

The Carbon Mapper data indicates that Republic's self-estimations of its "fugitive" landfill gas are much too low. Republic uses its estimations to model the impacts of landfill gas in its odor, greenhouse gas, and toxics emissions reports, and to self-assess its compliance in these areas. It has used them in its "odor study" for its application, to the detriment of that study.

Carbon Mapper's plume imaging and quantifications support public reports of intrusive landfill odor miles from Coffin Butte.

Oregon Senate Bill SB726 requires landfill owners by law to use advanced emissions detection technology (such as Carbon Mapper's) to more quickly detect and remediate large point source leaks, and better protect humans and the environment. The rules for this requirement have not yet been set.

As per the land use criteria, your concern as Commissioner are the actual impacts of a proposed land use, and not merely compliance with regulation. The applicant's Burden of Proof attends only to regulatory compliance, and so fails to address the actual impacts of dump emissions.

Carbon Mapper's assessments are based on rigorous science that's getting smarter all the time, as it learns from continually monitoring real-world conditions at hundreds of landfills all across the world. Its findings contrast sharply with the applicant's, which derived its findings via a mathematical model.

If the applicant does not convince you that it knows the true level and character of its landfill gas leaks, it also does not know their harms. The applicant has thus failed their Burden of Proof and so the application should be denied.

What's happening?

Carbon Mapper, a climate science nonprofit, has been observing Coffin Butte Landfill since July 13, 2023. Using its advanced methane detection technology, it has gathered data about landfill gas being emitted by the landfill.

What kind of data is being collected?

This data focuses on point-source emissions at super-polluting levels (above 100 kilograms of methane released an hour). Carbon Mapper processes its data to:

- pinpoint the origin points of leaks;
- produce images of the plumes caused by the leaks;
- characterize the persistence of leaks at the facility;
- if possible, quantify how large a leak is (its emissions rate) when observed;
- if possible, quantify a characteristic overall emissions rate for the facility – its Source Emissions Rate.

Why is Carbon Mapper collecting this data?

Because point-source, super-emitting leaks are the “low-hanging fruit” of climate damage reduction. Leaks such as these create most of the climate damage, yet once identified, are easily found and can be quickly remediated by facility operators. Carbon Mapper is focused on using data to facilitate climate action.

How reliable is this data?

Carbon Mapper only publishes results above an appropriate confidence threshold. Emissions rate quantifications typically have a “confidence window” as well, expressed as a “+/-” range from a given number that is the midpoint of the range. The scientists at Carbon Mapper are continually refining their process; it’s been very successful in California at gaining emissions reductions.

How does Carbon Mapper collect this data?

To date Carbon Mapper has surveyed Coffin Butte Landfill on fifteen occasions – six times by aircraft during an intensive 10-day period in July 2023, and nine times by satellite, beginning in September 2024. These surveys revealed five different origin point clusters, yielded 28 unique plume images, a Persistence Rating of 100% for the landfill (“there were always super-emissions present”) and an overall Source Emissions Rate of 1.9 metric tons of methane per hour for Coffin Butte Landfill, plus or minus 0.6 metric ton per hour.

How do I convert this methane emissions data to landfill gas?

Carbon Mapper focuses on methane, because methane is a very harmful greenhouse gas: a metric ton of methane leaked into the atmosphere will do as much damage as 86 tons of carbon dioxide, over a 20-year period. At Coffin Butte Landfill, 53% of the landfill gas is methane; the rest is carbon dioxide and a wide range of other chemical gases, some of them toxic and odorific. To (roughly) convert the Carbon Mapper methane emissions to landfill gas emissions, multiply by 1.9. To get the landfill's Source Emissions Rate for landfill gas (as opposed to just methane), for example, take the methane rate of 1.9 metric tons $\times 1.9 = \underline{3.6}$ metric tons of landfill gas per hour, based on Carbon Mapper's current quantifications for Coffin Butte Landfill.

What cautions apply to this data?

The main caution is a gap in monitoring, between the end of aerial overflights in July 2023 and the beginning of satellite surveillance, in September 2024. There are reasons, however, to have confidence that the landfill was super-emitting approximately 3.6 mt of landfill gas for that entire interval:

1. The Carbon Mapper observations are supported by EPA inspections of the landfill, which have also always found multiple high-volume leaks, and by hundreds of widespread community reports of landfill odor over the years, some of them from locations many miles from the landfill, which would suggest large plumes of landfill gas regularly being released.
2. Carbon Mapper has observed hundreds of landfills, some of them regularly, and they note in their findings that super-emitting leaks at landfills often go unremediated for months or years.
3. The plume origin points are in areas not monitored by the landfill operator.

Most importantly, the steady feed of satellite images collected since September 2024 show that the landfill's normal state is to have large, persistent leaks.

How does Coffin Butte Landfill compare to other landfills, according to this data? Is Coffin Butte exceptional?

Yes. Other Oregon landfills such as Columbia Ridge and Short Mountain do not have persistent methane plumes at all. As part of its national survey, Carbon Mapper looked at super-emitting landfills as a group, and on average a super-emitting landfill was releasing 0.9 metric tons of methane per hour (was a super-emitter nine times over). At 1.9 metric tons per hour of methane, Coffin Butte

Landfill is over twice that average, and is a super-emitter 19 times over. You can find out more at carbonmapper.org.

Enough discussion – I would like to see some plumes and data.

Certainly. Go to page 7!

Does the Carbon Mapper data represent all the landfill gas that is leaking from Coffin Butte Landfill?

No. Carbon Mapper publishes data on point-source emissions from large leaks. It doesn't include point-source emissions from small leaks, or diffuse or area leaks. Republic has estimated their operational methane emissions rate to be about 1.07 metric tons each hour, and it's clear that some of that is small-scale or diffuse leakage that's in addition to what Carbon Mapper is detecting, but it's unclear at this time how much. If a lot of Republic's estimated methane emissions are from myriad small-scale leaks, then the landfill's total methane emissions rate may approach 2.9 metric tons per hour, which would be a landfill gas emissions rate of roughly 5.5 metric tons per hour.

How is Carbon Mapper's data relevant to the landfill's application to expand?

The landfill tried to expand in 2021, and at that time, the Benton County Planning Commission cited concerns about methane as a reason to deny the application. The 2021 Planning Commission could not make a finding that expanding the landfill would not significantly impact the area, the character of the area, the burden of services to the area, etc. because of signs that the landfill had large emissions of landfill gas and the effects of those emissions were not known.

Republic's 2024 application to expand met the same questions as in 2021, but now it was readily apparent to the Planning Commission that the landfill has oversize emissions of landfill gas. The Planning Commissioners were presented with images of landfill gas plumes over a mile long, one estimated to be emitting over 10 metric tons of landfill gas every hour, and so on. And the questions about the impacts of those large-scale landfill gas releases have intensified. Odor has emerged as a major factor in quality of life. There is evidence now that PFAS, the "forever chemicals," leave landfills in aerosolized form, i.e. as part of landfill gas, for example, and accumulate in the surrounding environment. As in 2021, the 2024 Planning Commission unanimously denied the application.

Republic Services says in its application that Oregon DEQ regulates environmental matters; this is irrelevant, however, because denying a land use application is not a regulatory action. Republic Services also asserts in its application that it is (or will be) in compliance with state and federal regulations,

but that is irrelevant also. The land use code does not mention regulatory compliance, but significant impacts.

You County Commissioners have discretionary power to deny the application based on your findings that the proposed land use will significantly impact other land uses, the character of the area, public facilities and services, etc. Your focus is on actual impacts, not on compliance/non-compliance, and if the applicant has not convincingly demonstrated that it knows what the actual impacts are, then the applicant has failed their Burden of Proof and the application should be denied.

1. CARBON MAPPER FINDINGS AT COFFIN BUTTE LANDFILL, JULY 2023: A WALKTHROUGH

Carbon Mapper included Coffin Butte Landfill, outside Corvallis in Oregon, as a target landfill in its nationwide survey of U.S. landfills in 2023, performed in partnership with the EPA. Coffin Butte Landfill may have been chosen because it was found to be out of compliance by an EPA inspection the year before, and that inspection in turn had been triggered by many community complaints in 2021.

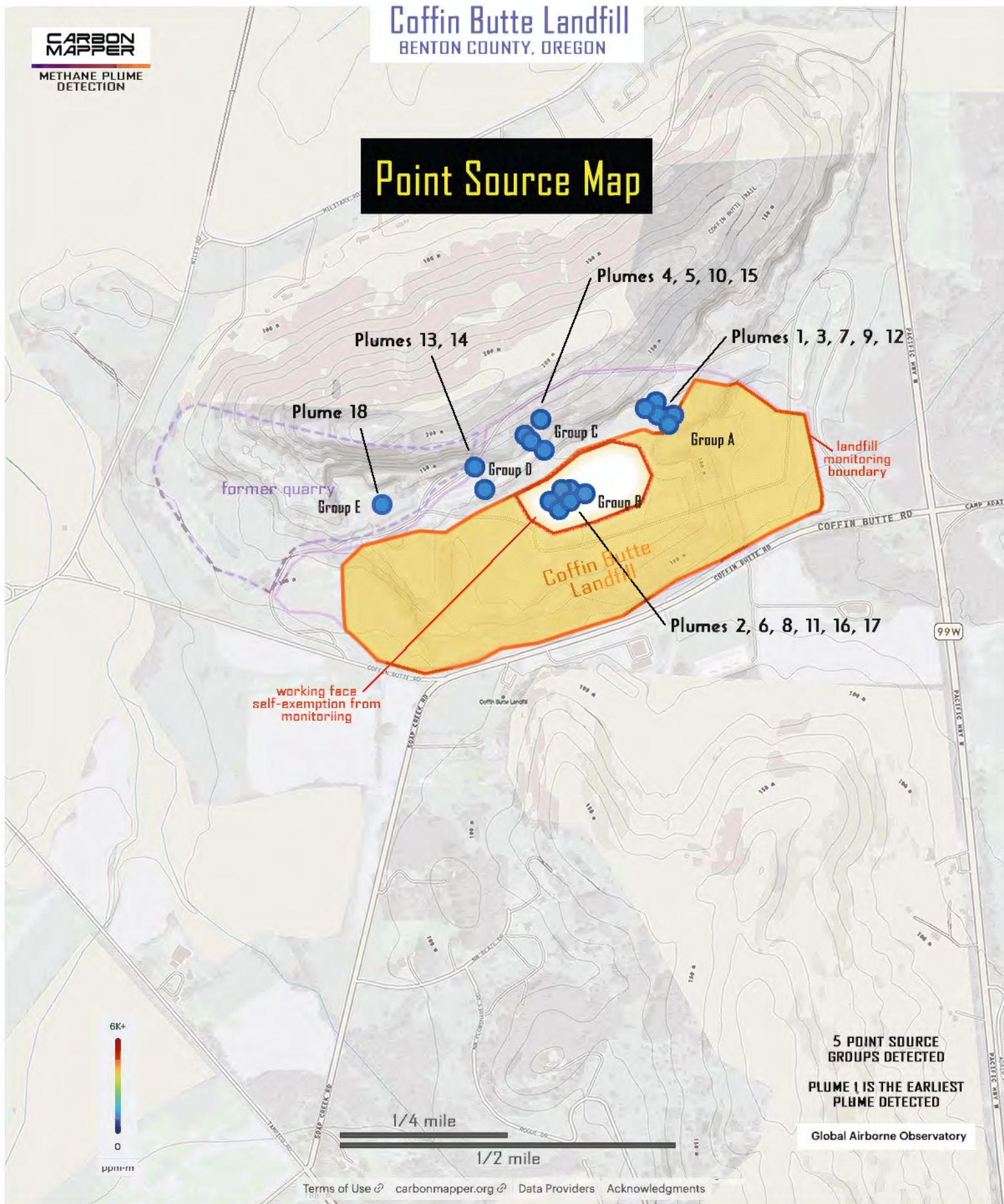
Carbon Mapper flew over Coffin Butte Landfill on three separate days in July 2023 – July 13, 18 and 22. It overflew the landfill twice on each day, about two hours apart, for a total of six overflights.

Observations from these overflights showed there were four origin points all emitting high levels of methane at the same time. Super-emitting plumes of landfill gas were detected on the first overflight, throughout the survey period, and still present when the survey ended.

Five graphics follow:

1. POINT SOURCE MAP: THE FIVE ORIGIN POINT GROUPS. Carbon Mapper imaged 16 plumes, each with a specific origin point; these origin points fell into groups as shown in Figure 1. Plumes 17 and 18 were imaged later.
2. REPRESENTATIVE PLUME, ORIGIN POINT GROUP A: Plume 1, 1.4 metric tons CH₄ per hour. This image shows methane still at super-emission levels over a mile away from the landfill.
3. REPRESENTATIVE PLUME, ORIGIN POINT GROUP B: Plume 11, 1.4 metric tons CH₄ per hour.
4. REPRESENTATIVE PLUME, ORIGIN POINT GROUP C: Plume 10, 5.3 metric tons CH₄ per hour.
5. REPRESENTATIVE PLUME, ORIGIN POINT GROUP D: Plume 13, not yet quantified.

Figure 1



CARBON
MAPPER

METHANE PLUME
DETECTION

Coffin Butte Landfill

BENTON COUNTY, OREGON

Figure 2

Plume 1
ORIGIN GROUP: A

6K+
0
ppm-m

1/4 mile

1/2 mile

QUANTIFIED:
1.4 metric tons/hr
methane
(+/- 0.3 mt)

Global Airborne Observatory

JUL 13, 2023, 17:16:50 UTC

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Figure 3

CARBON
MAPPER

METHANE PLUME
DETECTION

Coffin Butte Landfill
BENTON COUNTY, OREGON

Plume 11
ORIGIN GROUP: B

current
landfill

QUANTIFIED:
1.4 metric tons/hr
methane
(+/- 0.9 mt)

6K+
0
ppm-m

1/4 mile

1/2 mile

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Global Airborne Observatory

JUL 22, 2023, 19:15:26 UTC

**CARBON
MAPPER**

METHANE PLUME
DETECTION

Coffin Butte Landfill

BENTON COUNTY, OREGON

Figure 4

Plume 10
ORIGIN GROUP: C

6K+
0
ppm-m

1/4 mile

1/2 mile

QUANTIFIED:
5.3 metric tons/hr
methane
(+/- 1.6 mt)

Global Airborne Observatory

JUL 18, 2023, 17:17:54 UTC

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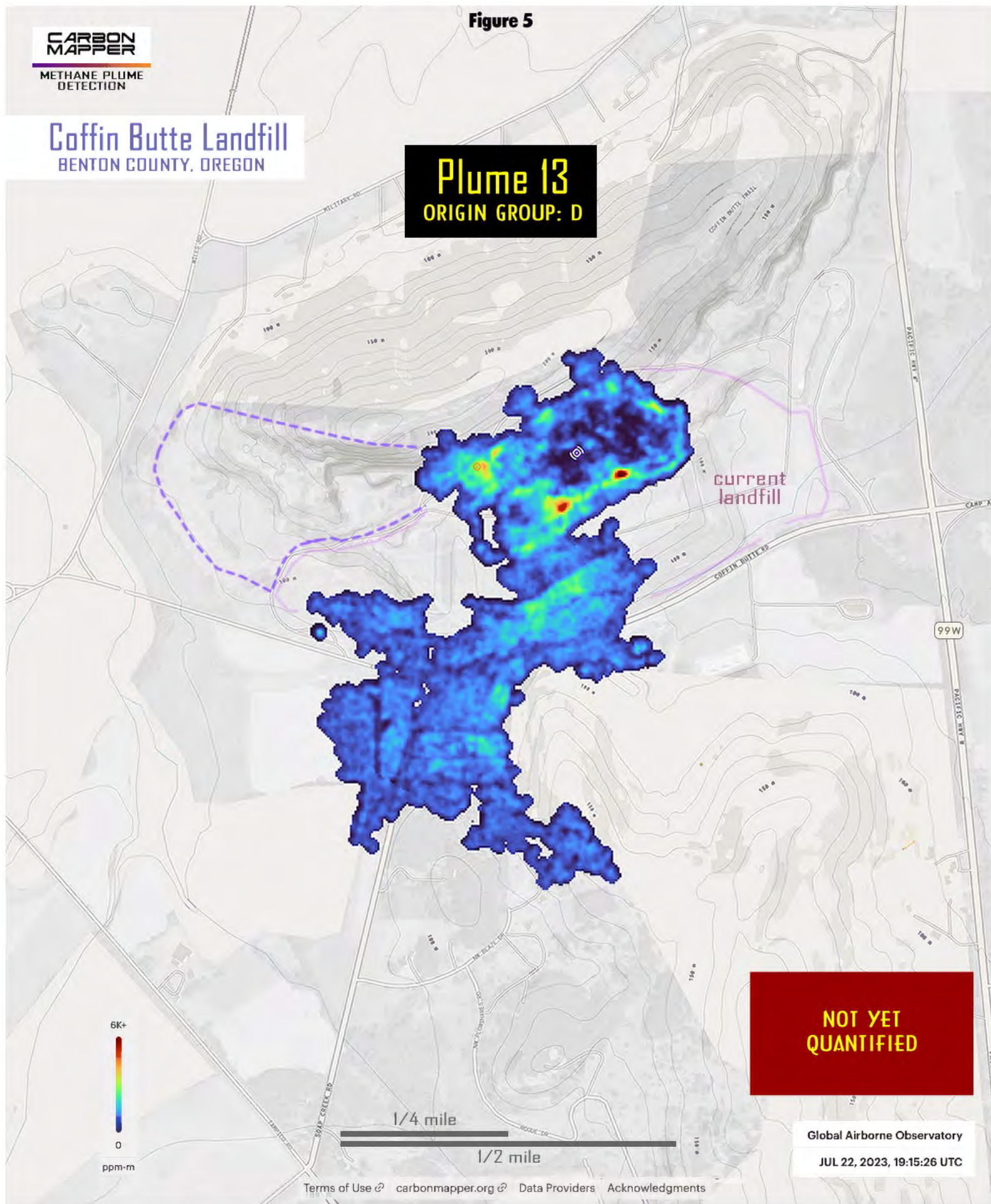
Figure 5

CARBON
MAPPER

METHANE PLUME
DETECTION

Coffin Butte Landfill
BENTON COUNTY, OREGON

Plume 13
ORIGIN GROUP: D



NOT YET
QUANTIFIED

Global Airborne Observatory

JUL 22, 2023, 19:15:26 UTC

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2. CARBON MAPPER FINDINGS AT COFFIN BUTTE LANDFILL: SATELLITE SURVEYS, SEPTEMBER 2024 – AUGUST 2025; SOURCE EMISSION RATE

Fourteen months later, Carbon Mapper began surveying Coffin Butte Landfill again, this time by satellite. Being a significant methane source, Coffin Butte Landfill is a high-surveillance target and has been surveyed 9 times in 11 months, for a total of 12 new plume images. The surveys indicate that leaks persist at Coffin Butte Landfill; in Figure 6, we can see that new plumes originate in the same areas that old plumes did (Groups B through E), with one new origin area appearing (Group F) and one discontinuing (Group A). Taking all observations into account, Carbon Mapper has updated the Source Emission Rate for Coffin Butte Landfill to be 1.9 metric tons of methane an hour, plus or minus 0.6 metric tons, which is roughly 3.6 metric tons of landfill gas an hour, plus or minus 1.1 metric tons.

The dump's Persistence Rating continues to be 100%, indicating that in over two years of surveillance, Carbon Mapper has never observed the dump and found no super-emitting plume present. Columbia Ridge Landfill, by comparison, has Persistence Ratings below 50%, and plume-making leaks appear to be of short duration. Columbia Ridge Landfill claims to have a methane-sniffing drone to expedite monitoring (see below) but this has not been confirmed.

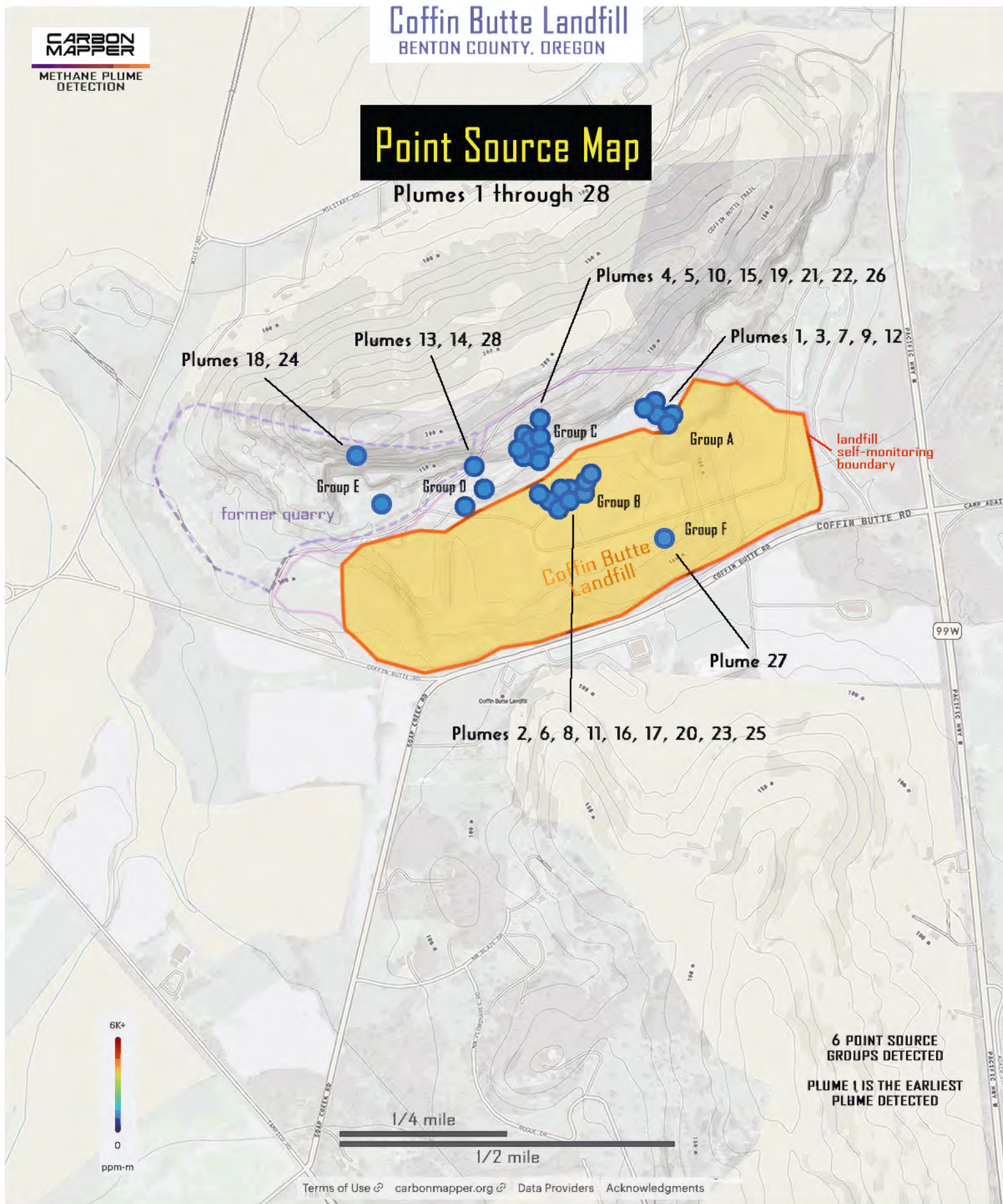
Innovation: renewable energy and drones at Columbia Ridge

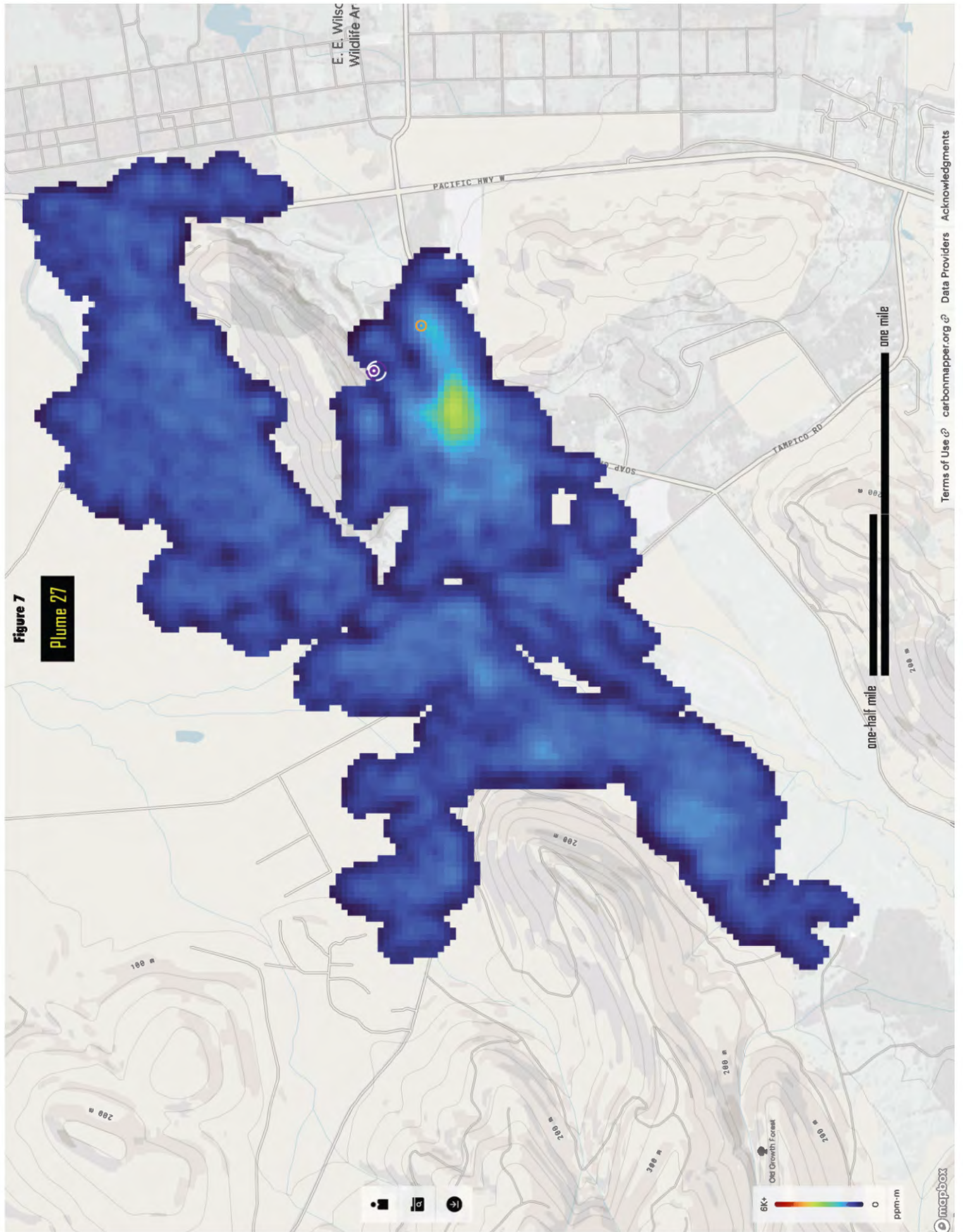
Columbia Ridge is also an innovation leader — a platform for renewable energy and next-generation drone technology. We use landfill gas to power homes and businesses, and we use drones to capture real-time data to ensure safe and complaint operations.



This group of plumes contains one extraordinary image – Plume 27 (see Figure 7). Since Carbon Mapper focuses on determining origin points, not extent of spread, its images do not normally track plumes far beyond their point sources. Plume 27, however, shows in detail how landfill gas can flow into the surrounding environment and around landforms, persisting in measurable concentrations miles away from their origin points.

Figure 6





3. CARBON MAPPER, SB 726 AND THE FUTURE OF COFFIN BUTTE LANDFILL

Beginning about 8 years ago, Carbon Mapper was part of a strong action program against climate polluters in California; Carbon Mapper worked hand in hand with the California Air Resources Board (CARB) to identify the major sources of greenhouse gas emissions in the state and secure action to remediate their pollution. Earlier this year, Carbon Mapper announced a new program with CARB to detect and curtail California's greenhouse gas emissions, leveraging Carbon Mapper's partnership with the Planet Labs PBC network of observation platforms on satellites. Observation by satellite enables much more frequent monitoring, as satellites pass over a landfill several times a day. By precisely attributing emissions to a specific facility and tracking them over time, Carbon Mapper's data supports direct mitigation action on the ground – either by voluntary or enforcement action.

Oregon is taking the first step to follow California, with the passage of Senate Bill 726 in state government. SB 726 calls on the Environmental Quality Commission to require landfills in Benton County to use advanced methane detection technology such as satellite monitoring, aircraft monitoring, drones or remote direct monitoring technology to yield emission rates and locations of their point sources for methane emissions. This law applies to Coffin Butte Landfill.

So one day, possibly as early as 2027, the people of Benton County may also begin to have frequent independent monitoring of Coffin Butte Landfill gas emissions, and begin to get a picture of the dump's impact on air quality and the global climate. Right now, we have no such picture. Especially for Coffin Butte Landfill, which has:

- an ongoing EPA investigation into its landfill gas emissions. The EPA issued a "Section 114 Information Request" for the landfill's records of environmental compliance in January; these requests are effectively subpoenas and are the first step in EPA environmental enforcement.
- no current Title V Air Quality Permit. DEQ took up the landfill's application for a new permit late last year, after sitting on it for many years, but that process stalled when the landfill's application was found to be incomplete, and it has not been rescheduled.
- received two Enforcement Alerts from the EPA, sent out widely to landfills warning them about infractions of monitoring and reporting regulations seen at landfills during recent EPA inspections.
- come under DEQ investigation due to its failure to provide the required rationale for self-declaring the majority of landfill surface as exempt from monitoring.
- lost the institutional knowledge to respond. The landfill's Environmental Manager, Ian Macnab, resigned last fall, shortly after the landfill received the EPA Enforcement Alerts in September.

The applicant is under a burden of proof to show you a convincing level of understanding regarding the landfill's gas emissions, and their myriad resultant impacts upon health, economics, and quality of life via odor, toxicity, climate damage, and so on. Carbon Mapper's assessments of the landfill's gas emissions are not under this burden of proof; if they only cast doubt on the applicant's assertions, then they cause the application to fail. I think that a single plume image such as Plume 27 undermines the applicant's assertions of what is real to the point of collapse. But Carbon Mapper doesn't depend on a single image, or a single study. Every day, those satellites come 'round again, and under their gaze the truth of the situation at Coffin Butte becomes clearer and clearer day by day.

4. CARBON MAPPER AND COFFIN BUTTE LANDFILL: CONCLUSION

Carbon Mapper has acquired a wealth of data and analysis about landfill gas emissions at Coffin Butte Landfill, through direct observation of the facility.

Carbon Mapper's science-based and observational assessments of the landfill's emissions are sharply different from the landfill's self-assessments of those emissions, which are not observational.

The credibility of Carbon Mapper's data and assessments is sufficient to raise serious questions about whether Republic's self-assessments meet their Burden of Proof regarding the impacts of landfill gas at the dump.

Several of Republic's Exhibits (most notably, PFAS and their various Odor Studies) depend on accurate characterizations of landfill gas emissions. Since the Carbon Mapper data raises serious questions about the validity of Republic's numbers, the validity of these Exhibits has not met the evidentiary standard and is not convincing. Which means Republic has failed both the evidence and the persuasion components of its Burden of Proof.

Carbon Mapper is open-source, and its data is freely available. The dump's Environmental Manager, Paul Koster, worked with Carbon Mapper in California in attempts to reduce the landfill gas emissions and odor impacts of Sunshine Canyon Landfill in 2022. So Republic knew about, and could have included, the Carbon Mapper data in its Odor Studies. It did not, which calls into question Republic's commitment to a complete and accurate study of odor impacts at Coffin Butte Landfill. This further undermines Republic's assertions about the completeness and accuracy of its many Exhibits that involve the impacts of landfill gas. Those Exhibits are not valid if Republic fed its consultants inaccurate or limited data to work from.

Commissioners, your citation for this is BCC 53.215(1) and (2): with no reliable Exhibits or convincing narratives about fugitive landfill gas levels, the Applicant has not shown that it can prevent SERIOUS INTERFERENCE with adjacent land uses and with the character of the area, due to landfill gas emissions. The Applicant also has not demonstrated that expanded landfilling would not be AN

UNDUE BURDEN on services available to the area – specifically, environmental monitoring and enforcement services provided by the EPA and Oregon DEQ.

In simple language, the plumes of landfill gas such as the one on page 15 refute the assertions of Republic's consultants that landfill gas dissipates quickly, and support the substantial testimony about their direct experience with Dump Days that affect their freedom to use the land. They notably raise serious concerns about PFAS contamination of the land around Coffin Butte. Republic's refusal to engage with such substantial and straightforward evidence (both here and in many other testimonies such as groundwater, fire safety, and so on) speaks volumes about how closed it is to any change in its status quo operations. Which in turn speaks volumes about how ineffective any Conditions of Approval will be, as they all rely on Republic to be very open to changing how it operates. And if Conditions of Approval will not actually guarantee NO SERIOUS INTERFERENCE and NO UNDUE BURDEN, then you must deny, Commissioners.

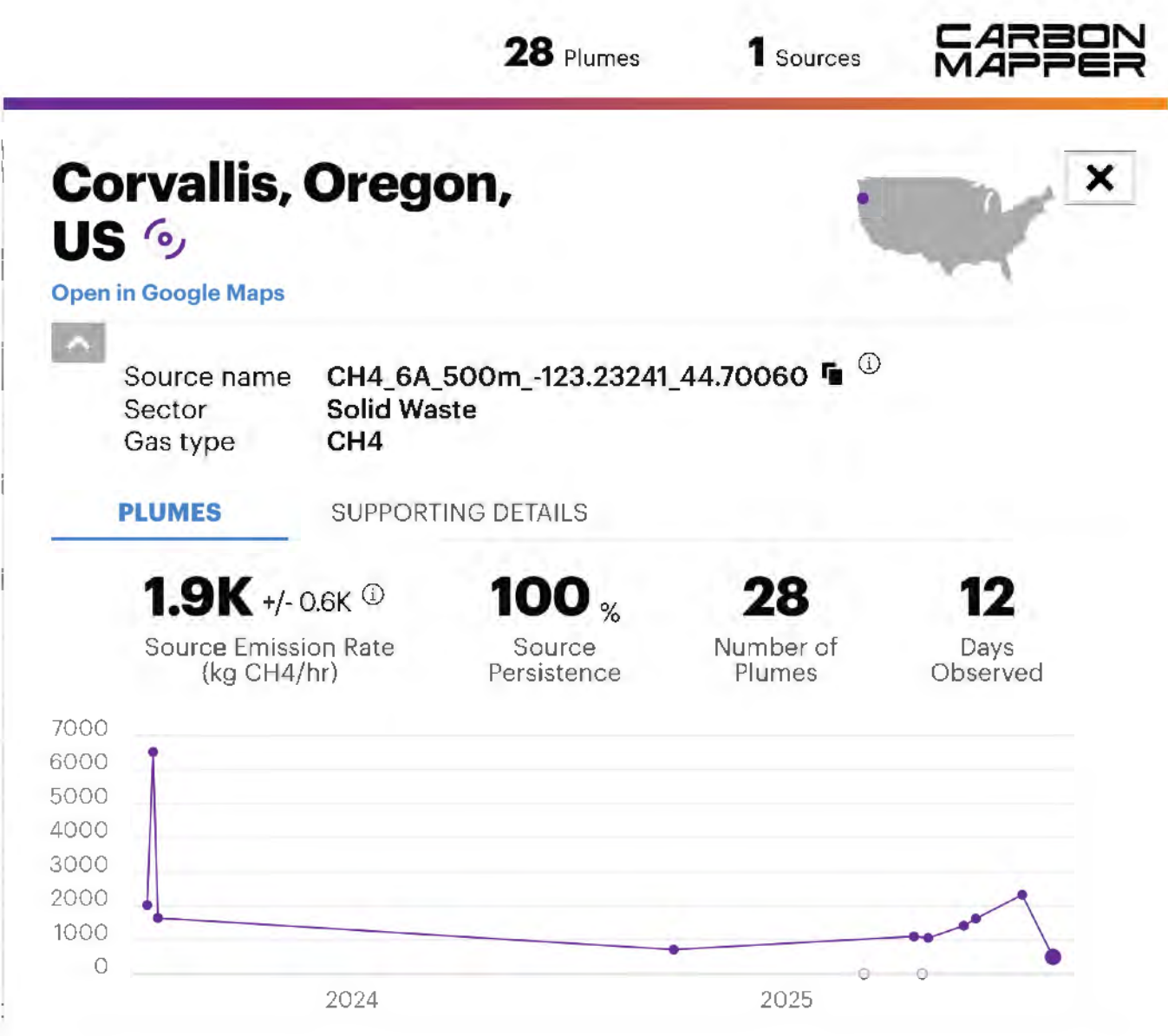
p.s. As an expert on narrative, I have to comment on Republic's narrative about odor: not their posturing, but the actual recounting of events. The narrative you would expect to find is a straightforward one: Republic hires a qualified consultant to do an odor study, that consultant does that odor study, Republic brings it forth, and if that study is solid, it stands. The actual narrative – what actually has happened, if you follow the long evidence trail – is that Republic has hired a string of odor consultants, whose studies either fail the sniff test of Staff's consultants (and Staff deems the Application incomplete), or whose studies presumably don't have the results that Republic wants, because Republic asks for months-long delays in the proceedings to "complete their odor study." Republic trying to get an odor study that works for them is why LU-24-027 took so long to be declared complete, and now is why LU-24-027 is nearing its maximum time limit.

The actual narrative being created here, for me at least, is one where the data needs to be tortured to get Republic's desired result, and Republic's consultants one by one hit the limit on how much they are willing to perform that torture, professionally speaking. This narrative is supported by the Frankensteinian nature of the odor studies themselves, which rely on parameters that increasingly seem to be cherry-picked: weather data from 2004, for example; industry-typical emissions rates rather than any actual rate from Coffin Butte, and so on. Something to keep in mind when it comes time to write up your Findings.

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

Summary panel on Coffin Butte Landfill, captured October 20, 2025:



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 19 times over. A super super emitter, if you will.

March 21, 2025: The non-profit organization [Carbon Mapper](#) and its partner [Planet Labs PBC](#) announce they will help the State of California leverage remote sensing technology to reduce methane emissions and tackle climate change. "Studies by Carbon Mapper and other research teams consistently show that high-emission events occurring at a subset of facilities in the energy, waste, and agriculture sectors contribute disproportionately to regional emissions. By precisely attributing those emissions to specific facilities or infrastructure and tracking them over time, Carbon Mapper's data can support direct mitigation action on the ground." ([link](#))

This document prepared by Ken Eklund, using Carbon Mapper and other data sources. I am past 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

– version: October 14, 2025 –

Read all the Explainers! Because I'm doing my best to pass on what I've learned in a clear, concise, readable narrative form.

Performance-testing the landfill gas flare: ODEQ's struggle to obtain compliance from Republic

DEQ made a rule in late 2021 and Coffin Butte Landfill complied with it in late 2024. Why did it take so long, and what about that Class 1 Notice of Violation from DEQ?

Explainer - DEQ gas flare compliance.pdf ○

Carbon Mapper and landfill gas: an explainer

An award-winning, innovative third-party source sharing data with us about the landfill's performance.

Explainer - Carbon Mapper and methane detection.pdf ✓

EPA Enforcement: a timeline and explainer

The EPA is investigating Coffin Butte Landfill – why? Is it serious? How did that start and what's happening with it?

Explainer - Coffin Butte and EPA Enforcement.pdf ○

Climate Damage and the Land Use Criteria

Evidence shows that Coffin Butte Landfill is large-scale producer of greenhouse gas emissions. How do the impacts from that relate to the land use criteria for LU-24-027?

Explainer - Climate Damage and land use criteria.pdf ○

Gas Wells At Coffin Butte: Why So Many?

Republic asserts that all those gas wells are a sign of environmental commitment. What's the true reason?

Explainer - Why so many landfill gas wells at Coffin Butte.pdf ○

Elevated Temperatures, Subsurface Landfill Fires

The way Coffin Butte Landfill is operated creates more risk of a dire event.

Explainer - elevated temperatures at Coffin Butte.pdf ○

Avoiding Compliance: six narratives

How Republic avoids monitoring at Coffin Butte Landfill: the paper trails.

Explainer - avoiding compliance at Coffin Butte 1.pdf ○

How to Find Things in the LU-24-027 Public Record

It's not easy, but here are some tips that may help.

Explainer - How to find things in Public Record.pdf ○

California says methane-spotting flights are helping stop leaks

By Reuters

June 8, 2022 5:20 AM PDT · Updated June 8, 2022



A pipeline that moves methane gas from the Frank R. Bowerman landfill to an onsite power plant is shown in Irvine, California, U.S., June 15, 2021. Picture taken June 15, 2021. REUTERS/Mike Blake/File Photo Purchase Licensing Rights

Companies



Semptra Energy

Follow

June 8 (Reuters) - Airborne surveys of methane plumes spewing from landfills, power plants and oil fields in California have lead to palpable reductions in leaks of the potent greenhouse gas, the state's air regulator and a non-profit group said on Wednesday.

Between 2017 and 2021, 44 California facilities voluntarily repaired methane leaks after they were notified about them as part of a pilot research program that used specially-equipped aircraft to detect and measure methane being released into the atmosphere.

Read about innovative ideas and the people working on solutions to global crises with the Reuters Beacon newsletter. Sign up [here](#).

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 fixes prevented the equivalent of 1.2 million metric tons of carbon dioxide from escaping into the atmosphere, the two groups said in a statement, which is equal to taking about 250,000 cars off the road for a year. The reductions were verified with follow-up observations.

The program is a partnership between the California Air Resources Board (CARB) and Carbon Mapper, a non-profit group that is an outgrowth of research that began in 2016 at NASA's Jet Propulsion Laboratory.

Methane is 80 times more potent than carbon dioxide in its first 20 years in the atmosphere, and scientists say identifying methane sources is crucial to making the drastic emissions cuts needed to avoid the worst impacts of climate change.

"The simple truth about this super pollutant is that you can't stop methane leaks if you don't know where they're coming from. This research pilot provides a powerful example for how data generated from remote observations can find leaks and inform actions to quickly stop them," Richard Corey, CARB's executive officer, said.

Carbon Mapper will launch its first methane-spotting satellite next year.

The announcement did not identify all the facilities that mitigated their methane emissions, but said Sempra Energy (SRE.N) ☐ gas utility SoCalGas had responded to leaks identified in a pipeline by the airborne surveys.

Reporting by Nichola Groom; editing by Richard Pullin

Aerial surveys show US landfills are major source of methane emissions

Valerie Volcovici

Workers use heavy machinery to move trash and waste at the Frank R. Bowerman landfill on Irvine, California, U.S., June 15, 2021. Picture taken June 15, 2021. REUTERS/Mike Blake/File Photo [Purchase Licensing Rights, opens new tab](#)

WASHINGTON, March 28 (Reuters) - Over half of U.S. landfills observed by aerial surveys are super- emitting sources of methane, according to a new study in the journal Science published on Thursday.

The study is the largest assessment to date of methane from landfills, the third-largest source of U.S. methane emissions, and suggests an opportunity to tackle climate change by targeting a prevalent and potent greenhouse gas.

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It was led by research group Carbon Mapper, with researchers from NASA Jet Propulsion Laboratory, Arizona State University, University of Arizona, Scientific Aviation, and the Environmental Protection Agency.

Around 52% of landfills had observable methane emission point sources compared to the 0.2% to 1% of "super-emitter" sites in the oil and gas sector, the largest U.S. source of methane.

[Super emitters are sources](#) that spew at least 100 kilograms (100 lbs) of methane per hour, according to the EPA.

At large emitting landfills, 60% had methane leaks that persisted over months or years while the majority of leaks at super-emitting sites in the oil and gas sector were "short-duration events," the study said.



Dan Cusworth, scientist at Carbon Mapper and lead author of the study, said that pinpointing these leaks offers a quick way to target emissions.

“Addressing these high methane sources and mitigating persistent landfill emissions offers a strong potential for climate benefit,” he said in a statement.

So far, oil and gas has been the main target of emerging regulations and voluntary programs in the [United States](#), [Europe](#) and elsewhere.

But as more [aerial](#) and [satellite surveys](#) are launched, regulators will be able to measure, quantify and act on methane from landfills.

To date, companies and regulators have relied on model-based estimates of landfill emissions, as well as surveys with handheld methane sensors, which provide a less complete picture, the study said.

The EPA's own greenhouse gas reporting system has underestimated the scale of methane leaks in landfills, according to the study. Aerial

surveys showed emission rates were 1.4 times higher than the EPA's estimates.

The EPA said that in 2021, 12% of all U.S. greenhouse gas emissions from human activities came from methane.

Reporting by Valerie Volcovici; Editing by Stephen Coates

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Valerie Volcovici covers U.S. climate and energy policy from Washington, DC. She is focused on climate and environmental regulations at federal agencies and in Congress and how the energy transition is transforming the United States. Other areas of coverage include her award-winning reporting plastic pollution and the ins and outs of global climate diplomacy and United Nations climate negotiations.

‘Garbage Lasagna’: Dumps Are a Big Driver of Warming, Study Says

Decades of buried trash is releasing methane, a powerful greenhouse gas, at higher rates than previously estimated, the researchers said.



By Hiroko Tabuchi

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They’re vast expanses that can be as big as towns: open landfills where household waste ends up, whether it’s vegetable scraps or old appliances.

These landfills also belch methane, a powerful, planet-warming gas, on average at almost three times the rate reported to federal regulators, according to a study published Thursday in the journal Science.

The study measured methane emissions at roughly 20 percent of 1,200 or so large, operating landfills in the United States. It adds to a growing body of evidence that landfills are a significant driver of climate change, said Riley Duren, founder of the public- private partnership Carbon Mapper, who took part in the study.

“We’ve largely been in the dark, as a society, about actual emissions from landfills,” said Mr. Duren, a former NASA engineer and scientist. “This study pinpoints the gaps.”

Methane emissions from oil and gas production, as well as from livestock, have come under increasing scrutiny in recent years. Like carbon dioxide, the main greenhouse gas that’s warming the world, methane acts like a blanket in the sky, trapping the sun’s heat.

And though methane lasts for a shorter time in the atmosphere than carbon dioxide, it is more potent. Its warming effect is more than 80 times as powerful as the same amount of carbon dioxide over a 20-year period.

The Environmental Protection Agency estimates that landfills are the third largest source of human-caused methane emissions in the United States, emitting as much greenhouse gas as 23 million gasoline cars driven for a year.

But those estimates have been largely based on computer modeling, rather than direct measurements. A big reason: It can be difficult and even dangerous for workers with methane “sniffers” to measure emissions on-site, walking up steep slopes or near active dump sites.

Organic waste like food scraps can emit copious amounts of methane when they decompose under conditions lacking oxygen, which can happen deep in landfills. Composting, on the other hand, generally doesn’t produce methane, which is why experts say it can be effective in reducing methane emissions.

For the new study, scientists gathered data from airplane flyovers using a technology called imaging spectrometers designed to measure concentrations of methane in the air. Between 2018 and 2022, they flew planes over 250 sites across 18 states, about 20 percent of the nation’s open landfills.

At more than half the landfills they surveyed, researchers detected emissions hot spots, or sizable methane plumes that sometimes lasted months or years. That suggested something had gone awry at the site, like a big leak of trapped methane from layers of long-buried, decomposing trash, the researchers said.

“You can sometimes get decades of trash that’s sitting under the landfill,” said Daniel H. Cusworth, a climate scientist at Carbon Mapper and the University of Arizona, who led the study. “We call it a garbage lasagna.”

Many landfills are fitted with specialized wells and pipes that collect the methane gas that seeps out of rotting garbage in order to either burn it off or sometimes to use it to generate electricity or heat. But those wells and pipes can leak.

The researchers said pinpointing leaks doesn't just help scientists get a better picture of emissions, it also helps landfill operators fix leaks.

Overseas, the picture can be less clear, particularly in countries where landfills aren't strictly regulated. Previous surveys using satellite technology have estimated that globally, landfill methane makes up nearly 20 percent of human-linked methane emissions.

"The waste sector clearly is going to be a critical part of society's ambition to slash methane emissions," said Mr. Duren of Carbon Mapper. "We're not going to meet the global methane pledge targets just by slashing oil and gas emissions."

A growing constellation of methane-detecting satellites could provide a fuller picture. Last month, another nonprofit, the Environmental Defense Fund, launched MethaneSat, a satellite dedicated to tracking methane emissions around the world.

Carbon Mapper, with partners including NASA's Jet Propulsion Laboratory, Rocky Mountain Institute, and the University of Arizona, intends to launch the first of its own methane-tracking satellites later this year.

Hiroko Tabuchi covers the intersection of business and climate for The Times. She has been a journalist for more than 20 years in Tokyo and New York.

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