



**Benton
County**
OREGON

Benton County Disposal Site Advisory Committee

Packet for meeting on September 3, 2026

Contents:

1. Agenda
2. Draft meeting minutes from 5/27/26
3. Letters and emails to share with DSAC
4. Community concerns received from 3/21/26 – 8/27/26
5. Relevant news articles and additional information

January '26						
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Disposal Site Advisory Committee (DSAC)

AGENDA

September 3, 2026

6:00 p.m. – 8:00 p.m.

4500 SW Research Way, Corvallis, OR 97333

This meeting will be held in-person. The meeting will be accessible online for those unable to attend.

<https://us06web.zoom.us/j/88247921911?pwd=EQw4Ofo6VVJNGuVr9KMWWhTx96R6LKs.1>

Meeting ID: **882 4792 1911**

Passcode: **680718**

DSAC website with meeting materials, including the meeting packet:

<https://cd.bentoncountyor.gov/disposal-site-advisory-committee-dsac>

Agenda Item #	Start Time	Duration	Topic	Speaker(s)
1	6:00 p.m.	5 min.	Call to Order and welcome members	Chair
2	6:05 p.m.	5 min.	Review and approve the draft of the last meeting's minutes and action items.	Committee
3	6:10 p.m.	20 min.	Public comment – your comments welcome. Each commenter is generally limited to 3 minutes.	Public
4	6:30 p.m.	15 min.	Greenhouse gas emissions at the Coffin Butte Landfill • Paul Nietfeld • Ken Eklund	Paul N., Ken E., Committee
5	6:45 p.m.	5 min.	• Actions being taken by Republic regarding DEQ Pre-Enforcement Notice • Status of new Title V permit application	Paul K.
6	6:50 p.m.	10 min.	Significant operational actions and changes taken by Republic Services since last BCDSAC meeting	Paul K.
7	7:00 p.m.	10 min.	Fire safety update – Actions taken during red-flag days	Paul K.
8	7:10 p.m.	5 min.	Break	
9	7:15 p.m.	20 min.	Updates from Sub-Committees • Odors, Methane • Groundwater, Leachate • Community Engagement	Committee



COMMUNITY DEVELOPMENT DEPARTMENT
4500 SW Research Way
Corvallis, OR 97333-1192
(541) 766-6819

10	7:35 p.m.	5 min.	Request Agenda Items, staff requests for next meeting	Committee
11	7:40 p.m.	15 min.	Staff presentation about the State Joint Task Force on Municipal Solid Waste and plans for a Benton County Solid Waste Management Plan	Bailey P.
12	7:55p.m.	5 min.	Next meeting/wrap up/adjourn	Chair

Disposal Site Advisory Committee (DSAC) Membership

Name	Term	Name	Term
David Hackleman, Chair	1/1/26 - 12/31/27	Paul Koster, Landfill Representative	1/1/26 - 12/31/27
Robert Kipper, Vice-Chair	1/1/26 - 12/31/27	Peter Petersen	1/1/25 - 12/31/26
Jennifer Field	1/1/26 - 12/31/27	Dianne Cassidy	1/1/26 - 12/31/27
Brent Pawlowski	1/1/26 - 12/31/27	Vacant Position	
David Livesay	1/1/26 - 12/31/27	Vacant Position	
Charlene Carroll	10/1/24 - 12/31/26		
Benton County Staff			
Bailey Payne, Solid Waste Program Coordinator			

DSAC Members Excused:

Sub-committees:

- **Odors, Methane, Title V permit** – David H., Jennifer F.
- **Groundwater, Leachate** – David L., Charli C., Peter P.
- **Community Engagement** – Dianne C., Robert K.

Next DSAC Meetings: November 4th

1) Draft meeting minutes from
5/27/26

MEETING MINUTES
Disposal Site Advisory Committee (DSAC)
May 27, 2026

Benton County DSAC Chair, David Hackleman, called the meeting to order at 6:00 P.M. The meeting was open to the public virtually via a published Zoom link. These minutes were made with the assistance of artificial intelligence.

COMMITTEE MEMBERS ATTENDING

David Hackleman, Chair
Robert Kipper
Jennifer Field (Excused)
Brent Pawlowski
Charlene Carroll
David Livesay
Paul Koster, Republic Services
Peter Petersen
Diane Cassidy

GUESTS

Julie Jackson, Republic Services
Bret Davis, Republic Services
Sarah Steen, Republic Services
Patricia Wheeler - Online
Catherine Stearns - Online
Debbie Palmer - Online
Faye Yoshihara - Online
Camille - Online

STAFF

Bailey Payne, Solid Waste Program Coordinator
Bob Richardson, Community Development Director

1. Welcome and Introductions

- Bob Richardson introduced himself as the newly appointed Community Development Director for Benton County (commenced role approximately one month prior). He provided a brief professional background (10 years with City of Corvallis Planning, Planning Manager for Albany, and 7 years as Land Planning Manager for Oregon State University).
- Attendance: Roll call confirmed a quorum. Charlene Carroll and Dave Livesay attended virtually. Member Brent Pawlowski was noted as absent.

2. Public Comments

- Paul Nietfeld (Soap Creek Valley Resident / Engineer): Presented findings from EPA's Landfill Gas Emissions Model ([LandGEM](#)) spreadsheet modeling runs conducted in October 2025 regarding the Coffin Butte Landfill.
 - Data Summary: The model showed an estimated total landfill gas generation of 103 million cubic meters (~3.6 billion cubic feet) per year. Data indicated only 1.6 billion cubic feet was captured, leaving roughly 2 billion cubic feet per year escaping as fugitive landfill gas (a calculated collection efficiency of approximately 45%).

- Corroboration: Nietfeld stated these figures align with historic testimony from Gary Andes (retired DEQ Air Quality Manager), who calculated that fugitive emissions from the site have exceeded 1 billion cubic feet annually since 2019.
- Action Item: Nietfeld agreed to coordinate with Payne to submit a formal technical paper and copies of the LandGEM modeling data to the committee.
- Republic Services Response (Paul): Challenged the absolute accuracy of the LandGEM spreadsheet model, noting peer-reviewed research papers indicate LandGEM can exhibit margins of error ranging from 35% to 40%.

3. Review and Approval of Previous Minutes

- Approval: The draft minutes and action items from the previous meeting were reviewed (p. 10). A motion to approve was made by Kipper, seconded by Petersen, and passed unanimously via voice vote.
- Feedback: Charlene Carroll requested that draft minutes be distributed closer to the actual meeting dates to ensure better recollection of complex discussions. Bailey acknowledged the request and agreed to aim for quicker turnaround.

4. DEQ Enforcement Notice & Permit Application Status

- DEQ Pre-Enforcement / Appeals: Paul (Republic Services) reported that Republic is actively in talks with the DEQ to resolve outstanding issues raised in the pre-enforcement notice. Because Republic filed an official appeal, all associated regulatory deadlines are currently stayed.
- Title V Air Quality Permit: The public comment period was extended to mid-June (noted as tentatively June 14) [NOTE: THIS IS INCORRECT. THE DEADLINE IS MAY 29th]. Once closed, DEQ must respond to all comments before the permit undergoes a mandatory 45-day EPA review. Payne agreed to email the exact Title V comment link out to all committee members.
- Land Use Appeal: Confirmed that an expansion appeal has been filed with the Land Use Board of Appeals (LUBA). Public Information Officer posted a summary tracking document on the county website which Payne will forward to the DSAC.

5. Landfill Operational Updates (Republic Services)

- Cell Construction: Excavation of Cell 6C in the quarry is complete. Crews are laying down gravel and preparing to install the protective liner over the next two weeks. Fluff lifts (10-foot layers of protective waste) are being distributed via light dozer in Cell 6B to protect its liner framework.
- Site Capacity & Capping: Top deck operations on the active sliver fill are within 20 feet of maximum vertical limits. Operations will transition west into the new cell over the next few months. Republic plans to apply final capping/cover layers between next year and 2028.
- Gas Infrastructure: Gas well construction commenced late last month. Crews are drilling 43–45 new or replacement gas wells to address pinched/collapsed infrastructure and manage liquid percolation. A 30-inch main header pipe is being installed along Coffin Butte Road to prep for a

new 6,000 standard cubic foot per minute (scfm) flare slated for next year, designed for a 98% volatile organic compound destruction efficiency.

- **Leachate & Biosolids:** Following the termination of the City of Corvallis wastewater contract last December, all hauled leachate is being trucked to the City of Salem treatment plant under an active agreement running through 2027.

6. Fire Safety Update

- **Resource Sharing:** Payne sent follow-up links on April 17 detailing local fire risk metrics, including an Oregon Department of Forestry GIS application mapping real-time hazard zones.
- **Risk Assessment:** The committee noted an upcoming severe fire season driven by El Niño patterns, low regional snowpack, and active severe droughts in neighboring eastern counties.
- **Paul (Republic Services)** noted that because the expansion application was denied, the specific emergency protocols embedded in the conditional use permit are not legally binding. However, Republic continues standard internal monitoring to mitigate adjacent wildfire liabilities.

7. Subcommittee Updates

A. Odors and Methane Subcommittee

- **Air Fingerprinting Study:** Jennifer presented a single-slide proof-of-concept overview utilizing commercial thermal desorption tubes to capture chemical mass profiles at three area sites: Coffin Butte Landfill, the Pacific Regional Compost Facility (PRC), and Pacific Pulp in Halsey.
- **Findings:** The baseline analysis distinguished specific source indicators. The PRC profile showed heavy concentrations of limonene (citrus notes). The Coffin Butte boundary profile revealed pentanoic and valeric short-chain fatty acids (stagnant/sweaty notes). Universal common compounds like phthalates were excluded from sourcing.
- **Funding:** An expansion grant application submitted to the Environmental Research and Education Fund (EREF) to scale up machine learning source apportionment was unsuccessful, as the fund favors remediation over discovery.

B. Groundwater and Leachate Subcommittee

- **DEQ Communication Stagnation:** The subcommittee is awaiting a response from the DEQ regarding a letter submitted over two months ago.
- **Action Item:** Dave Livesay raised concerns that DEQ's requests for additional information (e.g., well construction logs) were sent to a former contact (Ian) and never reached Paul (pp. 30-31). The subcommittee voted and approved a motion for Dave Livesay and a county representative to directly contact Mary Camerata at the DEQ to discuss outstanding information requests.

C. Community Engagement Team

- **Soap Creek Meeting Summary:** Members met with 10 local residents on April 13 at the Soap Creek Schoolhouse. Residents expressed profound frustration regarding odor tracking; complaints filed

after business hours or over weekends result in massive investigative time lags, leading to a "no odor detected" response from operators. Consequently, citizens are bypassing Republic's portal and filing exclusively with the DEQ.

- **Proposed Technical Solutions:** Residents suggested utilizing independent instrumentation such as a [Nasal Ranger Field Olfactometer](#) (noted as costing ~\$420) to remove subjective human bias from field assessments. Members also demonstrated tracking localized air mass directions utilizing the Weather Underground "Windstream" interactive mapping layers (pp. 39-40).
- **Action Item:** The Community Engagement Team and the Odors Subcommittee will jointly draft a formal proposal to improve the odor reporting program.

Summary of New Action Items

1. Paul Nietfeld / Bailey: Submit the detailed LandGEM engineering calculations and spreadsheet data into the official committee record.
2. Bailey Payne: Circulate the direct link for the extended DEQ Title V public comment registry to all members.
3. Dave Livesay: Partner with county staff to place a coordinating call to DEQ's Mary Camerata regarding missing well data queries.
4. Community Engagement & Odors Subcommittees: Draft a comprehensive joint proposal to restructure the citizen odor reporting protocol.

Meeting Adjournment: The meeting was adjourned at 7:45pm (Robert K., Dianne C.)

1) Letters and emails to share with
DSAC

Dear Commissioners & DSAC,

Here's a concerning example of current fire threat within the county. *No actual threat noted at this time.*

We are in a Red Flag warning & the county fire departments are operating under the "Extreme Fire Behavior Response Plan". I've seen the Red Flag warning numerous places, despite not trying to look for it.

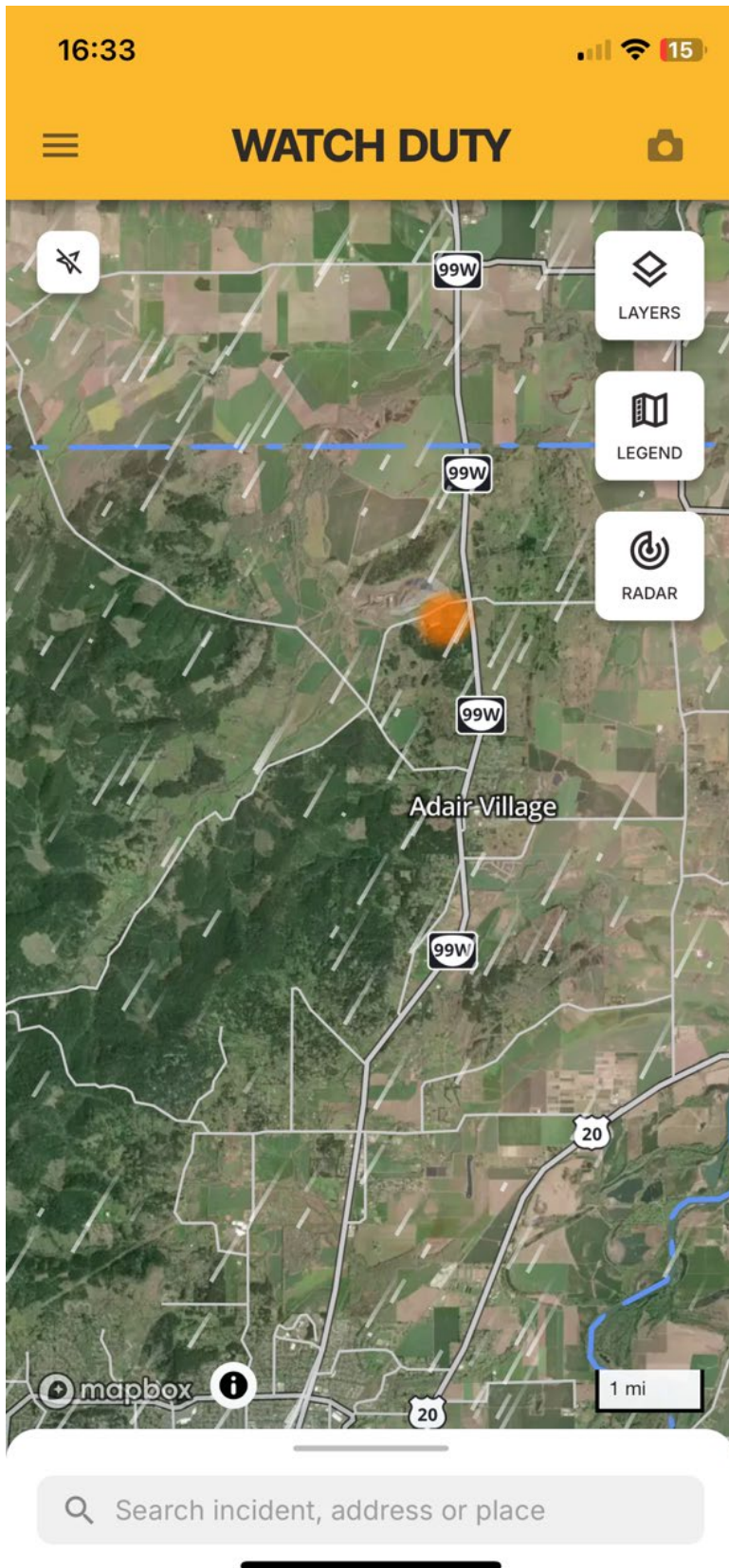
I am curious if leadership at the landfill is aware of the current threat level. Perhaps the strong smoke smell in the area from the fires in Eastern Oregon or the high winds and high heat would give them an idea that they should go look for that warning. Perhaps an employee of the landfill could make it part of their morning checklist, to check to see if there are any current weather warnings issued by the National Weather Service. I have to wonder if Coffin Butte and/or the PRC are planning on having a firewatch after closing or overnight this week, until the weather improves later this week. One firewatch could likely cover both the landfill and the PRC.

The winds are currently moving directly from the landfill towards Poison Oak Hill timber & farm fields SW of the quarry (where the tippers are currently stationed). If something at the landfill were to catch fire, it would be very easy for those embers to be thrown into the trees or the farm fields.

It doesn't take a lot of imagination to see that if either of those caught, fire could easily progress into Peavy, Soap Creek Valley, or the Trillium area, and could run for miles in the fields & heavy timber.

During a week where a lot of resources are already tied up around the state, and dealing with other local fires (one was threatening the city of Falls City just a couple of hours ago & Lebanon had a fire yesterday), local fire departments would likely prioritize health and safety of homes and citizens, potentially leaving the landfill to fend for itself. Benton County has a task force deployed with the Oregon State Fire Marshal's office in Eastern Oregon, working active fires, but also reducing capabilities locally if a fire were to start here.

Is new management at Coffin Butte and the PRC taking precautions to reduce the fire risks to the surrounding area, by enacting a firewatch or some other method of fire prevention and/or early detection?



Respectfully,

[REDACTED]

Benton County Disposal Site Advisor Committee members:

As we discussed at our Meeting of 27 May, this letter is to offer you the opportunity to include your comments and questions regarding our function and duties as a committee. The target audience is first ourselves, then the board of Commissioners after review by the Benton County Solid Waste Program Coordinator and the Benton County Community Development Coordinator.

Please view this as an opportunity to perform self-evaluation of our committee and assess our effectiveness. We are the voice of the community. Kindly offer any areas of improvement you believe appropriate as well. We may wish to incorporate ideas into the next meeting.

So, in order to expedite matters, let us perform this process on-line during the time prior to our next meeting as a whole which is to take place in August.

1. I (the chair) send to you (all members of the committee) this note.
2. You reply to me with any comments you wish to provide **by Friday, 12 June 2026**.
3. I assemble all responses, combining those similar and send it out to our committee for review.
4. You reply upon reading the review, offering any edits you deem significant and necessary.
5. I edit if necessary and submit the final set for committee review and approval by email "vote".
6. The final set will be then communicated to Bailey P. (Solid Waste Program Coordinator) and Bob R. (Community Development Director) and a meeting time will be established to enable Robert K and David H to meet with the County Commissioners and present the materials.

I have included what I believe to be the exact wording of ORS 459.320, 325 and 330 below for your aid. I believe we comply with the majority of ORS 459.320's description, however we may need to include a few more members to comply fully.

Sincerely, David Hackleman, Chair

DSAC Landfill Gas Survey

August 25, 2026

Paul Nietfeld

Purpose

This report is intended to provide DSAC with detail on Coffin Butte fugitive landfill gas emission volumes, specifically in comparison to other landfills in the region, as requested by DSAC in the May 27, 2026 regular meeting.

Summary / Overview

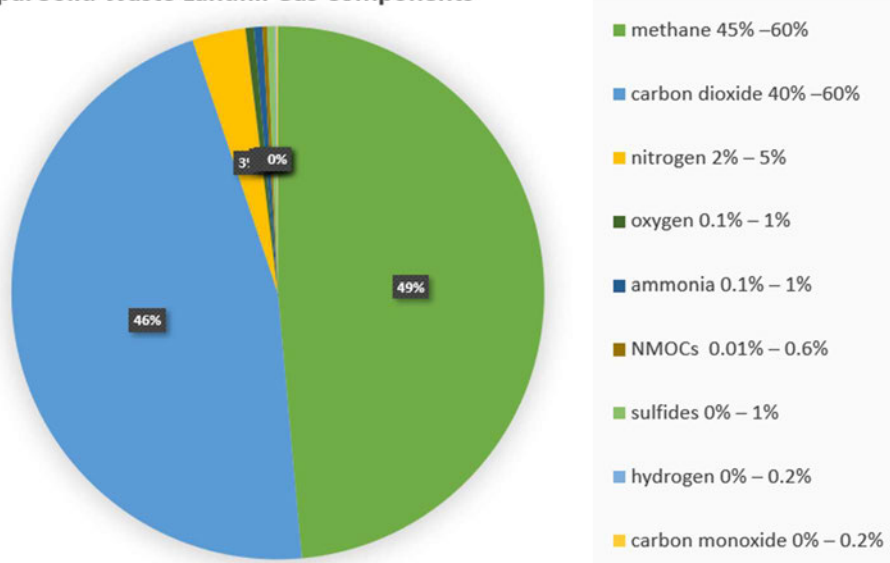
Data compiled from US Environmental Protection Agency (EPA) records, in conjunction with methane emission measurements provided by Carbon Mapper, are used to estimate the total fugitive landfill gas emissions from multiple (7) landfills in the Pacific northwest area, including Coffin Butte. Analysis indicates Coffin Butte fugitive landfill gas releases rank at or near the top of all landfills considered in this survey, despite its relatively moderate size in terms of Waste In Place and Waste Intake volume.

Context / Background

Landfill Gas Basics

Typical landfill gas is made up of around 50% methane. Methane is a very strong greenhouse gas, more than 80 times as potent as carbon dioxide in the short-term (from ODEQ, <https://www.oregon.gov/deq/ghgp/Pages/Landfill-Methane-Emissions-Reduction.aspx>).

Municipal Solid Waste Landfill Gas Components



Methane Component

Methane is produced primarily from decay of organic waste. Of organic waste, the vast majority that goes into landfills is food waste. A US EPA report from 2023 estimated that 24% of MSW disposed of in landfills is food waste.

The same report concludes that 58% of all fugitive landfill emissions comes from rotting food waste; .86 tons of CO₂ equivalent is released for every metric ton of landfilled food waste (GWP-20 -- 20-year time horizon).

This report also concluded that “An estimated 61% of methane generated by landfilled food waste is not captured by landfill gas collection systems and is released to the atmosphere. Because food waste decays relatively quickly, its emissions often occur before landfill gas collection systems are installed or expanded.”

The best solution is to generate less food waste; the next best solution is to divert food waste from landfills. When food waste is composted aerobically (as in a home composting system), it basically completes the carbon cycle; the carbon that the organic material sequestered from the atmosphere when it was living is released back into the environment as CO₂. When food waste is composted anaerobically, however, it ends up producing much more CO₂-equivalent-gas than the material took from the environment while living. That is because of the interaction of anaerobic bacteria that in the absence of oxygen create methane as a by-product from decomposition of organic waste (one bacteria type digests organics and produces alcohol and acids, the second bacteria type digests alcohol and acids and produces methane).

Source: Quantifying Methane Emissions from Landfilled Food Waste, EPA, October 2023

Hazardous Components

Landfill gas contains Hazardous Air Pollutants at low levels in terms of percent composition, but at large absolute values due to the quantities of landfill gas involved. From the Oregon Department of Environmental Quality Title V public comment package (*Public Notice Request for Comments 02-9502.pdf*, apparently no longer available on the ODEQ web site, P. 106):

HAZARDOUS AIR POLLUTANTS

29. A table showing estimated hazardous air pollutants (HAPs) from Coffin Butte Landfill is attached to this review, and a summary of the highest pollutants included below. The calculation is based on the maximum emissions in the permitting period through 2035, and assuming the collection efficiency of the GCCS is 65%, although calculated collection efficiency has been greater than 80%. The facility is a major source of HAPs, with total HAP emissions greater than 25 tons/year, but the highest single HAP emissions are less than 10 tons/year.

HAP Pollutant	Potential Emissions (tons/year)
Hydrogen Chloride	3.4
Ethylbenzene	1.2
Dichloromethane	2.9
Formaldehyde	1.5
Hexane	1.4
Perchloroethylene	1.5
Toluene	8.5
Vinyl chloride	1.1
Xylene	3.0
All Others	5.0
Total	29.5

Source Data

Landfills Analyzed

Seven landfills (including Coffin Butte) are analyzed. All are located in the Pacific Northwest area (Oregon and southern Washington state).

1. **Coffin Butte**, operated by Republic Services in Benton County, Oregon, approximately 2 miles NNW of Adair Village.
2. **Short Mountain**, operated by Lane County in Lane County, Oregon, approximately 2.5 miles SSE of Goshen.
3. **Wasco County**, operated by Waste Connections in Wasco County, Oregon, approximately 2.5 miles SSE of The Dalles.
4. **Finley Buttes**, operated by Waste Connections in Morrow County, Oregon, approximately 11 miles SSE of Boardman.
5. **Columbia Ridge**, operated by Waste Management in Gilliam County, Oregon, approximately 7 miles SSW of Arlington.
6. **Roosevelt**, operated by Republic Services in Klickitat County, Washington, approximately 4 miles NNE of Roosevelt.
7. **Headquarters**, operated by Cowlitz County in Cowlitz County, Washington, approximately 5.7 miles SE of Castle Rock.

All of the comparison landfills could be considered either rough equivalents to Coffin Butte in terms of Waste In Place tonnage and/or Waste Intake volume (Short Mountain, Wasco County, Finley Buttes, and Headquarters), or as large-scale alternatives for waste currently routed to Coffin Butte (Columbia Ridge, Roosevelt).

All landfills in this survey filed reports in 2023 with the EPA, and all landfills were assessed for methane emissions by the Carbon Mapper tool (see following sections).

Note: Although the Riverbend Landfill in Yamhill County Oregon was operating in CY2023, it is not included in this survey because ODEQ issued a final closure permit for this facility on Aug. 31, 2022 and Carbon Mapper has not recorded emissions levels at this facility.

In terms of climate, two broad classes exist for these 7 landfills:

Dry (generally less than 20 inches of precipitation per year): Wasco County, Finley Buttes, Columbia Ridge, Roosevelt.

Wet (generally 40+ inches of precipitation per year): Coffin Butte, Short Mountain, Headquarters.

EPA Data

Landfills are required to report data to the EPA under 40 CFR Part 98 Subpart HH [eCFR :: 40 CFR Part 98 Subpart HH -- Municipal Solid Waste Landfills, <https://www.ecfr.gov/current/title-40/chapter-I/subchapter-C/part-98/subpart-HH>].

Data used in this analysis was obtained from the EPA Greenhouse Gas Reporting site (<https://ghgdata.epa.gov/ghgp/html/2023.do?id=1007054&et=undefined>) for the Coffin Butte

landfill; for reports on other landfills shown replace the “ID” value in the URL above with the GHGRP ID number shown in the spreadsheet of Appendix A). The CY2023 GHG Summary Reports were utilized as these are the latest posted. For additional information, including the use of several gas calculation equations required by the EPA, see Appendix B. In particular, the values reported from Equation HH-1 (Modeled Methane Generation) are used in the spreadsheet of Appendix A to calculate the Total Generated LFG volumes; these volumes are used in subsequent calculations of Fugitive CH₄ and Fugitive LFG for those landfills for which raw LandGEM values were not reported.

Additional EPA figures were obtained from the Landfill Methane Outreach Program (LMOP) site at <https://www.epa.gov/lmop/landfill-technical-data>.

Oregon Department of Environmental Quality permitting (Title V)

The Oregon Department of Environmental Quality (ODEQ) Title V (air quality) permitting process collects information on landfill airborne emissions. This data is available at <https://deqonline.deq.state.or.us/aq/aqpermitonline/SearchFilter.asp>; use the “ODEQ Title V #” values shown in the table of Appendix A as the Source Number to obtain the reports for individual landfills in this survey. Data in these reports was used to cross-check the EPA GHG data, and in the case of Findley Butte the LandGEM reported value was used as the LandGEM 3.1 Total Generated LFG quantity.

LandGEM tool

The Landfill Gas Emissions Model (LandGEM) spreadsheet tool is used to estimate emission rates for total landfill gas, methane, carbon dioxide, nonmethane organic compounds, and individual air pollutants from municipal solid waste (MSW) landfills, based on annual waste intake history and several parameters which are entered by the user. See <https://www.epa.gov/land-research/landfill-gas-emissions-model-landgem> for details and a link to this tool. The LandGEM spreadsheet implements the first-order decay equation that is used in EPA Equation HH-1 (see above).

In the case of Coffin Butte, in October 2025 the Oregon Department of Environmental Quality (ODEQ) required the landfill operator to provide LandGEM results in preparation for a Title V (Air Quality) permit renewal application. This LandGEM exercise was carefully directed by ODEQ to include corrections to the intake history and waste type (i.e. “inert” waste not to be subtracted from the intake annual volumes as it is automatically factored into the LandGEM calculations). For Coffin Butte, the October 2025 LandGEM runs are assumed to provide the most accurate estimate of the LFG generation for CY2023, and provide a carefully considered benchmark for this landfill.

Carbon Mapper tool

Carbon Mapper is a 501c3 organization focused on improving global monitoring of methane and CO₂, using aircraft and satellite sensors to quantify methane and CO₂ at the scale of individual facilities. The data collected and processed by Carbon Mapper provides an independent quantification of methane emissions for the landfills considered in this survey. See <https://carbonmapper.org/> for more information.

Data Analysis

Fugitive CH₄ (Methane) Emissions

Derived from the spreadsheet of Appendix A:

Landfill	Waste In Place (US Short Tons)	Waste Intake (US Short Tons / yr)	Fugitive CH ₄ (Metric Tons / yr)			
			Calculated (LandGEM - Captured)	Calculated (EPA Eqn. HH-1 - Captured)	Reported (EPA GHG Report)	Measured Carbon Mapper
Coffin Butte Republic Services Corvallis OR	19,735,188	1,006,019	18,092	23,915	916	15,779
Short Mountain Lane County OR Eugene OR	10,644,346	289,354		6,926	7,585	4,576
Wasco County Waste Connections The Dalles OR	13,054,041	923,389		5,082	1,262	9,643
Finley Buttes Waste Connections Boardman OR	15,860,331	820,692	6,610	6,626	1,198	1,069
Columbia Ridge Waste Management Arlington OR	66,976,355	2,436,853		3,219	10,258	2,665
Roosevelt Republic Services Roosevelt WA	64,964,161	2,012,094		18,484	9,393	4,409
Headquarters Cowlitz County WA Castle Rock WA	11,186,328	728,505		13,592	3,947	16,655

Table 1: Fugitive CH₄ Calculated / Reported / Measured

Table 1 Notes

1. "Waste In Place" values are for CY2022 from EPA LMOP data.
2. "Waste Intake" values are for CY2023 from the 2023 EPA GHG Summary reports.
3. "Calculated (LandGEM - Calculated)" values are for CY2023. For Coffin Butte the LandGEM total Generated LFG volume from the Title V LandGEM runs of October 2025, provided by ODEQ to Benton County, is used, less annual total of captured gas, as reported in the GHG Summary Report, with the result derated per the percentage composition of CH₄ in the landfill gas. For Finley Buttes the LandGEM Total generated LFG volume are from the 2023 ODEQ Title V Annual Report *FinleyButtes_25-0001-TV-01_AR_2023.pdf* available at <https://deqonline.deq.state.or.us/aq/aqpermitsonline/SearchResult.asp?sourcenum=25-0001&sourcenam=&streetaddress=&city=&zip=&county=°reion=&permitnumber=&permitttype=&documenttype=&yearissued=¤tdocumentsonly=1> is used, less the annual total

captured gas, as reported in the GHG Summary report, with the result derated per the percentage of CH₄ in the landfill gas.

4. “Calculated (EPA Eqn. HH-1 - Calculated)” values are from 2023 EPA GHG Summary reports. Value is determined by scaling up the reported Annual Modeled Methane Generation figure from Equation HH-1 to yield total generated LFG, subtracting the reported value for Annual Volume FG Collected Gas (i.e. “captured”), and then derating the result per the percentage composition of CH₄ in the landfill gas.
5. “Reported” values are from 2023 EPA GHG Summary reports, Gas Quantity figures for Methane. This is the value reported by the operator to best represent the operator’s estimate of the total fugitive methane released by the landfill into the environment.
6. “Measured” values are derived from Carbon Mapper source emission rate data [Retrieved from <https://data.carbonmapper.org> 15 August 2026] converted to annual metric tons using a factor of 8766 hours per year.

Table 1 data In chart format, for visual comparison:

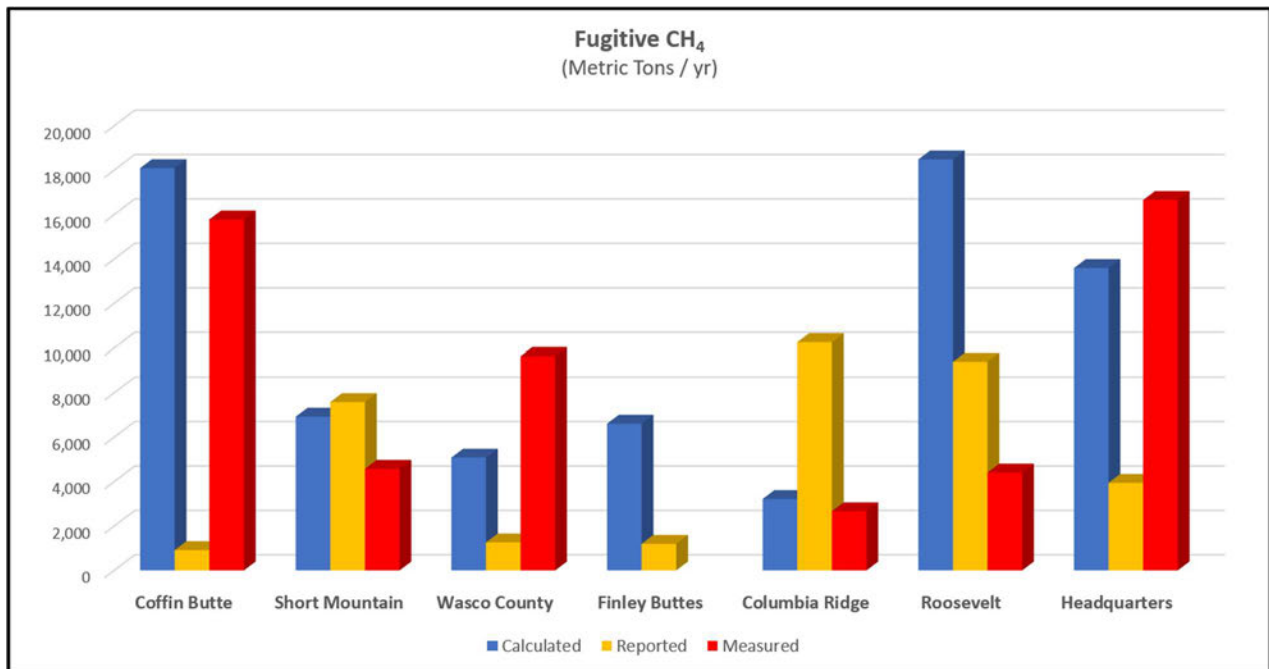


Figure 1: Fugitive CH₄ Bar Graph

Table 1 & Figure 1 Comments

1. It is unclear why the Coffin Butte HH-1 calculated value significantly exceeds the LandGEM calculated value, where both values are calculated for CY2023. Numerous adjustments were made for the Coffin Butte 2025 LandGEM run, including corrections of waste intake volume for multiple years, but the 32% discrepancy is puzzling. For the remainder of this document, the 2023 figure calculated via the 2025 LandGEM run will be used as the Coffin Butte “Calculated” value as it correlates more closely to the Carbon Mapper “Measured” value.
2. It is unclear why the “Measured” Carbon Mapper value for Roosevelt is significantly below the “Calculated” value. In general, it may be expected that Carbon Mapper could underreport

emissions for large landfills with well-dispersed fugitive emissions over the landfill surface; see for example the results for Columbia Ridge. The magnitude of the discrepancy for Roosevelt suggests incorrect data entry or parameters for EPA Equation HH-1, or perhaps some measurement error in Carbon Mapper.

3. For Finley Buttes, Carbon Mapper reports “**CAUTION: LOW NUMBER OF SAMPLES**” with only 2 days observed, so the “Measured” value shown is of dubious value. For all further analysis the Finley Butte “Measured” value will be considered invalid and not used.
4. Conversely to Comment 3 above, it is unclear why the “Measured” value for Headquarters is significantly above the “Calculated” value. As will be shown by further analysis, Headquarters appears to be emitting significant volumes of LFG relative to its Waste In Place and surface area, which may be an indication of an inadequate and/or improperly functioning gas collection system; a wet ambient climate may also contribute to relatively high volumes of total generated LFG and resultant high volumes of fugitive LFG.

Consolidated Fugitive CH₄ Estimate

In preparation for other comparison calculations, the multiple Fugitive CH₄ emissions values of Table 1 are reduced to a single “Average” Fugitive CH₄ value by determining the mathematical average of Calculated¹ and Measured Fugitive CH₄ emissions from Table 1, as detailed in Table 2 below.

Landfill	Fugitive CH ₄ (Metric Tons / yr)				
	Calculated (LandGEM)	Calculated (EPA Eqn. HH-1)	Selected Calculated Value	Measured Carbon Mapper	Average (Meas + Calc)/2
Coffin Butte Republic Services Corvallis OR	18,092	23,915	18,092	15,779	16,936
Short Mountain Lane County OR Eugene OR		6,926	6,926	4,576	5,751
Wasco County Waste Connections The Dalles OR		5,082	5,082	9,643	7,362
Finley Buttes Waste Connections Boardman OR	6,610	6,626	6,610		6,610
Columbia Ridge Waste Management Arlington OR		3,219	3,219	2,665	2,942
Roosevelt Republic Services Roosevelt WA		18,484	18,484	4,409	11,447
Headquarters Cowlitz County WA Castle Rock WA		13,592	13,592	16,655	15,123

Table 2: Computation of Average Fugitive CH₄ Value

¹ LandGEM values for Coffin Butte and Finley Buttes, EPA Equation HH-1 values for all others; for Finley Buttes, only the Calculated value is used since the Measured value reported by Carbon Mapper is unreliable.

Fugitive CH₄ Conclusions

- Coffin Butte emits more methane than any other area landfill in this survey, based on the “Average” Fugitive CH₄ values from Table 2.
- By the “Measured” (Carbon Mapper) readings, Coffin Butte is second only to Headquarters in Fugitive CH₄ emissions.
- The high emission levels of Coffin Butte support the findings of the ODEQ Pre-Enforcement Notice of November 6, 2025 which documented “a significant number of exceedances of the 500 ppm standard”, SEM monitoring deficiencies, inadequate maintenance of the landfill cover, and inadequate sizing and improper operation of the landfill gas collection system.
- The relatively high level of methane emissions from the moderate-sized Wasco County and Headquarters landfills indicate that these landfills likely suffer from operational problems such as inadequate or improperly operated gas collection systems and/or inadequate cover.
- Coffin Butte, Wasco County and Headquarters report GHG emission volumes of methane far below their calculated and measured values.
- Both the Measured and “Average” Fugitive CH₄ volumes reveal a significant disparity in fugitive methane emissions, with Coffin Butte and Headquarters emitting large methane volumes while Columbia Ridge, with much greater Waste in Place and Waste Intake volumes emits a small fraction (< 20%) of the fugitive methane of these two landfills.

Estimated Fugitive Landfill Gas Emissions

The methane emission values documented above can be used to estimate Fugitive Landfill Gas Emission volumes by converting the Fugitive CH₄ mass values to volume², then dividing by the nominal volumetric methane fraction in the landfill gas (0.5 is used to be consistent with EPA default practices; the actual figure ranges from 0.4900 to 0.5337 for the landfills listed, as detailed in Appendix A). Applying this formula to the Average Fugitive CH₄ value calculated above yields the following Estimated Fugitive Landfill Gas Emission values, measured in 10⁹ ft³ per year (i.e. billions of cubic feet per year). These figures represent the annual volume of landfill gas released into the local environment for each of these landfills.

Landfill	Waste In Place (US Short Tons)	Waste Intake (US Short Tons / yr)	Landfill Surface Area (Acres)	Estimated Fugitive Landfill Gas Emissions (10 ⁹ ft ³ / yr)
Coffin Butte Republic Services Corvallis OR	19,735,188	1,006,019	115	1.759
Short Mountain Lane County OR Eugene OR	10,644,346	289,354	100	0.597
Wasco County Waste Connections The Dalles OR	13,054,041	923,389	102	0.765
Finley Buttes Waste Connections Boardman OR	15,860,331	820,692	134	0.686
Columbia Ridge Waste Management Arlington OR	66,976,355	2,436,853	331	0.306
Roosevelt Republic Services Roosevelt WA	64,964,161	2,012,094	430	1.189
Headquarters Cowlitz County WA Castle Rock WA	11,186,328	728,505	106	1.570

Table 3: Estimated Fugitive Landfill Gas Emissions

In chart format, for visual comparison:

² 51,921 ft³ per metric ton, per <https://www.epa.gov/cmop/updated-coal-mine-methane-units-converter#metricTons>

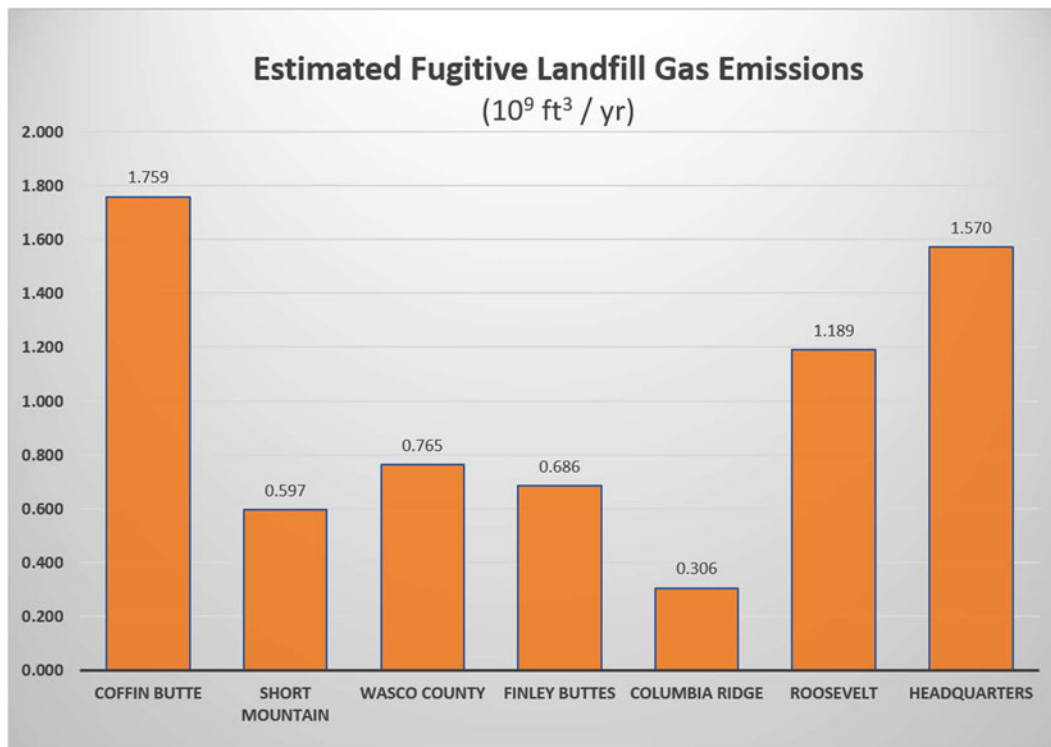


Figure 2: Estimated Fugitive Landfill Gas Emissions

As with Fugitive methane emissions, Coffin Butte exhibits the highest volume of total fugitive landfill gas among the 7 landfills analyzed here.

Fugitive Landfill Gas Derivative Metrics

Using the landfill surface area (“Total surface area of the landfill containing waste” as documented in the EPA GHG Summary Reports), the Estimated Fugitive Landfill Gas values can be derated by landfill area to provide an estimate of the density or concentration of the fugitive landfill gas per acre. See Figure 3 below, and note that these values are expressed as millions of cubic feet per year per acre.

As discussed in the odor study presented as part of the LU-24-027 land use decision, the concentration of fugitive landfill gas is important in terms of odor perception, and the concentration will provide guidance on the relative density of Hazardous Air Pollutants (HAPs) released into the environment. Note that this concentration figure assumes uniform dispersal of all fugitive landfill gas over the entire waste-containing surface area; point-source leaks of high concentration (such as documented in 2022 and 2024 for Coffin Butte) are not reflected in the gross values reported in this chart.

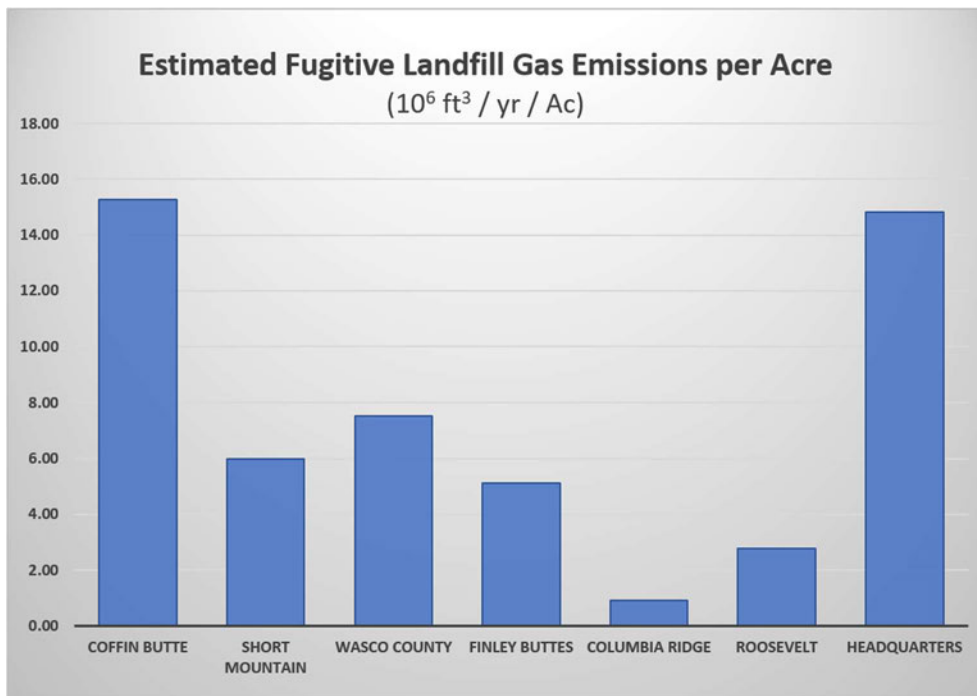


Figure 3: Estimated Fugitive Landfill Gas Emissions per Acre

When expressed in terms of gas volume per acre, it is clear that large landfills in arid climates (e.g. Columbia Ridge, Roosevelt) dramatically outperform moderate-sized landfills in wet climates (e.g. Coffin Butte, Headquarters).

The Estimated Fugitive Landfill Gas volume can also be scaled by the landfill “size” (Waste In Place tonnage) and intake rate (Waste Intake tonnage). These plots are provided below.

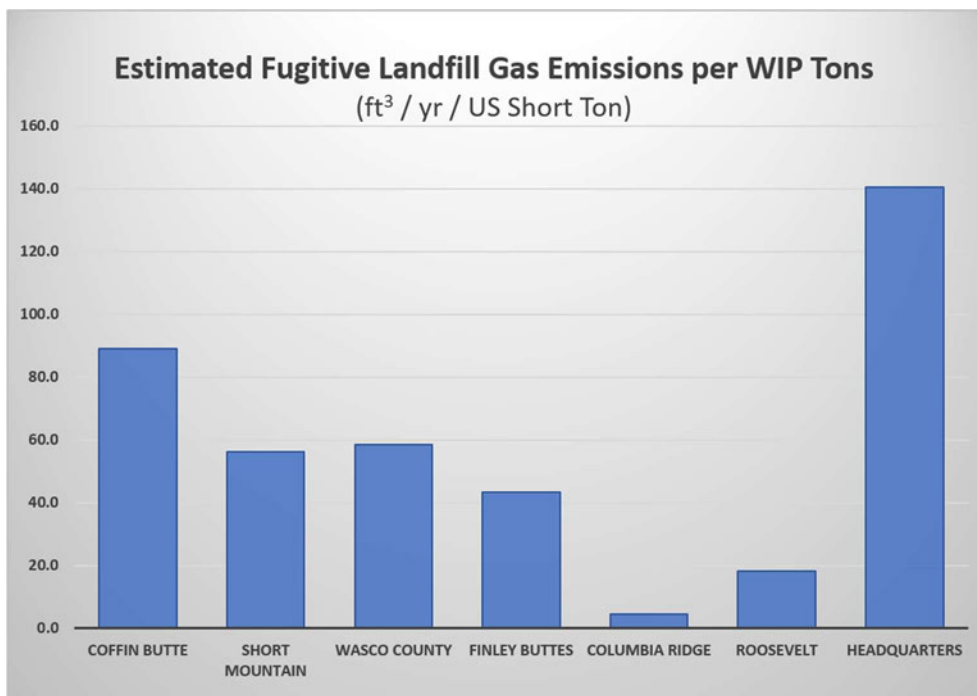


Figure 4: Estimated Fugitive Landfill Gas Emissions per WIP Tons

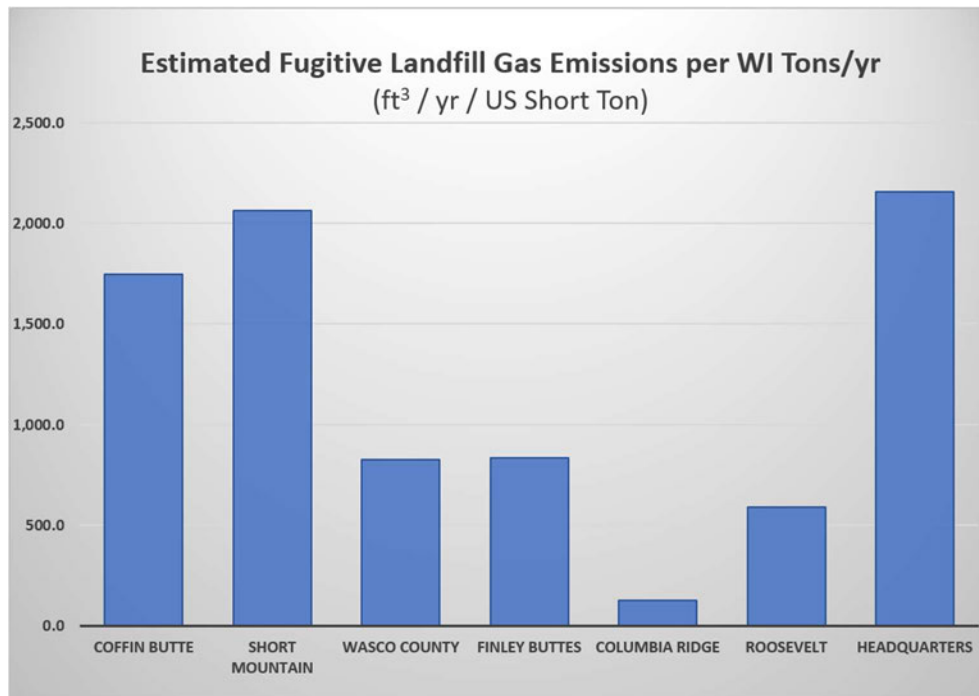


Figure 5: Estimated Landfill Gas Emissions per WI Tons/yr

Collection Efficiency

The “Collection Efficiency” (CE) of a landfill gas collection and control system (GCCS) is a measure of the landfill gas collected and destroyed as a fraction of the total landfill gas produced, adjusted for soil oxidation. CE values range from 0.00 (no GCCS present or operational) to 1.00 (theoretically perfect CGGS):

$$\text{CE} = (\text{Gas collected}) / (\text{Total gas produced})$$

Landfill gas is either captured (by the GCCS and oxidation) or released (i.e. gas produced by the landfill but *not* captured by the GCCS escapes into the environment), so

$$\text{Total gas produced} = \text{Gas collected} + \text{Gas released}$$

Thus

$$\text{CE} = (\text{Gas collected}) / (\text{Gas collected} + \text{Gas released})$$

Gas released can be determined by CE and the Total gas produced

$$\text{Gas released} = (1 - \text{CE}) \times \text{Total gas produced}$$

Thus, the value of CE for a given landfill under a certain set of conditions is the key metric for quantifying the volume of gas released into the environment as a function of the total landfill gas produced.

The total annual volume of gas collected at each landfill is documented in the EPA GHG Reports, as is a reported CE value. The reported Collected Gas volume and Estimated Fugitive

Gas Volume values derived above can be used to calculate the Estimated Actual CE value for each landfill (Reported CE values in blue, Estimated Actual CE values in red):



Figure 6: Collection Efficiency

Conclusions

1. **Methane emissions:** Using an average of Carbon Mapper measured values and calculated values, Coffin Butte emits the highest volume of methane of all 7 landfills analyzed in this survey. On a pure Carbon Mapper measurement basis, Coffin Butte emits the second-highest methane volume. By either metric, Coffin Butte methane emissions greatly exceed those of Columbia Ridge, the largest landfill in the survey.
2. **Landfill gas emissions:** Coffin Butte emitted an estimated 1.759 million cubic feet of landfill gas in CY2023, the highest volume of total fugitive landfill gas among the 7 landfills analyzed.
3. **Collection efficiency:** the calculated actual CY2023 CE for Coffin Butte is 0.46, which is in the mid-range of similar-sized landfills (Short Mountain, Wasco, Finley Buttes, Headquarters) but considerably lower than the figure for the large landfills (Columbia Ridge, Roosevelt).

Appendix A: Master Data Table

Landfill	GHGRP ID / ODEQ Title V #	Waste In Place (US Short Tons)	Waste Intake (US Short Tons / yr)	Landfill Surface Area (m ²)	Total Generated LFG (10 ⁹ ft ³ /yr)		GCCS Capacity (10 ⁹ ft ³ /yr)	LFG Captured (10 ⁹ ft ³ /yr)	Fugitive LFG (10 ⁹ ft ³ /yr)					Avg. Methane Concentration (Annual, % by vol.)	Fugitive CH4 (Metric Tons / yr)						Gas Capture Efficiency [CE] Captured/HH-1
					LandGEM 3.1	EPA GHG HH-1			LG - Captured	HH-1 - Captured	EPA GHG HH-6	EPA GHG HH-8	Extrapolated from CM CH4 meas.		LG - Captured	HH-1 - Captured	EPA GHG HH-6	EPA GHG HH-8	Carbon Mapper	Harvard Paper	
Coffin Butte Republic Services Corvallis OR	1007054 02-9502	19,735,188	1,006,019	466,001	3.2797	3.8532	2.6298	1.4975	1.7821	2.3557	2.1299	0.0903	1.6385	52.71	18,092	23,915	21,622	916	15,779	-	0.46
Comments		CY2022 Per 2024 LMOP	CY2023 EPA GHG Rpt	CY2023 EPA GHG Rpt	92,869,894 m ³ per Oct 2025 LG CY2023 value	CY2023 Per EPA GHG Rpt	5000 CFM claimed; Actual = 3*1500 per G. Andes	CY2023 Per EPA GHG Rpt			Calculated from HH-6 & HH-8 reported values and CH4 conc.			CY2023 Per EPA GHG Rpt	CY2023 value @CH4 Conc.		CY2023 Per EPA GHG Rpt	CY2023 Per EPA GHG Rpt	Running estimate as of 8/15/2026		Captured / LG
Short Mountain Lane County OR Eugene OR	1007001	10,644,346	289,354	404,185		1.3959	0.8310	0.6620		0.7339	0.8037	0.1063	0.4752	49.00		6,926	7,585	1,004	4,576		0.47
Comments	Pacific NW	CY2022 Per 2024 LMOP	CY2023 EPA GHG Rpt	CY2023 EPA GHG Rpt		CY2023 Per EPA GHG Rpt	1580 cfm 2023 EPA GHG Rpt	CY2023 Per EPA GHG Rpt			Calculated from HH-6 & HH-8 reported values and CH4 conc.			CY2023 Per EPA GHG Rpt			CY2023 Per EPA GHG Rpt	CY2023 Per EPA GHG Rpt	Running estimate as of 8/15/2026		Captured / HH-1
Wasco County Waste Connections The Dalles OR	1004515 33-0007	13,054,041	923,389	411,165		0.7013	0.5786	0.1784		0.5228	0.3943	0.1298	1.0013	50.47		5,082	3,833	1,262	9,643		0.25
Comments	Pacific NW	CY2022 Per 2024 LMOP	CY2023 EPA GHG Rpt	CY2023 EPA GHG Rpt		CY2023 Per EPA GHG Rpt	1100 cfm 2023 EPA GHG Rpt	CY2023 Per EPA GHG Rpt			Calculated from HH-6 & HH-8 reported values and CH4 conc.			CY2023 Per EPA GHG Rpt			CY2023 Per EPA GHG Rpt	CY2023 Per EPA GHG Rpt	Running estimate as of 8/15/2026		Captured / HH-1
Finley Buttes Waste Connections Boardman OR	1004516 25-0001	15,860,331	820,692	543,094	1.4000	1.4257	1.0519	0.7136	0.6864	0.7121	0.5356	0.1287	0.1111	48.31	6,610	6,626	4,984	1,198	1,069		0.51
Comments	Pacific NW	CY2022 Per 2024 LMOP	CY2023 EPA GHG Rpt	CY2023 EPA GHG Rpt	2023 ODEQ Title V Rpt P. 93	CY2023 Per EPA GHG Rpt	2000 cfm 2023 EPA GHG Rpt	CY2023 Per EPA GHG Rpt	2023 ODEQ Title V Rpt P. 93		Calculated from HH-6 & HH-8 reported values and CH4 conc.			CY2023 Per EPA GHG Rpt	CY2023 value @50% Conc.		CY2023 Per EPA GHG Rpt	CY2023 Per EPA GHG Rpt	Low number of samples		Captured / LG
Columbia Ridge Waste Management Arlington OR	1007989 11-0001	66,976,355	2,436,853	1,341,130		4.7002	9.3621	4.3759		0.3244	0.2627	1.0335	0.2767	51.53		3,219	2,607	10,258	2,665		0.93
Comments	Pacific NW	CY2022 Per 2024 LMOP	CY2023 EPA GHG Rpt	CY2023 EPA GHG Rpt		CY2023 Per EPA GHG Rpt	17800 cfm 2023 EPA GHG Rpt	CY2023 Per EPA GHG Rpt			Calculated from HH-6 & HH-8 reported values and CH4 conc.			CY2023 Per EPA GHG Rpt			CY2023 Per EPA GHG Rpt	CY2023 Per EPA GHG Rpt	Running estimate as of 8/15/2026		Captured / HH-1
Roosevelt Republic Services Roosevelt WA	1003676	64,964,161	2,012,094	1,740,167		5.1669	10.2562	3.3687		1.7982	1.3565	0.9138	0.4579	53.37		18,484	13,944	9,393	4,409		0.65
Comments	Pacific NW	CY2022 Per 2024 LMOP	CY2023 EPA GHG Rpt	CY2023 EPA GHG Rpt		CY2023 Per EPA GHG Rpt	19500 cfm 2023 EPA GHG Rpt				Calculated from HH-6 & HH-8 reported values and CH4 conc.			CY2023 Per EPA GHG Rpt			CY2023 Per EPA GHG Rpt	CY2023 Per EPA GHG Rpt	Running estimate as of 8/15/2026		Captured / HH-1
Headquarters Cowlitz County WA Castle Rock WA	1008180	11,186,328	728,505	428,422		2.0704	1.5779	0.6003		1.4702	1.3740	0.4269	1.7295	48.00		13,592	12,703	3,947	16,655		0.29
Comments	Pacific NW	CY2022 Per 2024 LMOP	CY2023 EPA GHG Rpt	CY2023 EPA GHG Rpt		CY2023 Per EPA GHG Rpt	3000 cfm 2023 EPA GHG Rpt				Calculated from HH-6 & HH-8 reported values and CH4 conc.			CY2023 Per EPA GHG Rpt			CY2023 Per EPA GHG Rpt	CY2023 Per EPA GHG Rpt	Running estimate as of 8/15/2026		Captured / HH-1
Keller Canyon Republic Services Pittsburg CA	1004011	24,405,474	1,076,388	597,322		1.9900	3.2189	1.8338		0.1562	0.1169	0.5512	0.8220	51.13		1,538	1,152	5,428	7,916	8,000 - 13,000	0.92
Comments	California	CY2022 Per 2024 LMOP	CY2023 EPA GHG Rpt	CY2023 EPA GHG Rpt		CY2023 Per EPA GHG Rpt	6120 cfm 2023 EPA GHG Rpt	CY2023 Per EPA GHG Rpt			Calculated from HH-6 & HH-8 reported values and CH4 conc.			CY2023 Per EPA GHG Rpt			CY2023 Per EPA GHG Rpt	CY2023 Per EPA GHG Rpt	Running estimate as of 6/10/2026		Captured / HH-1
Sunshine Canyon Republic Services Sylmar CA	1003679	72,985,822	2,984,444	1,953,843		6.1671	16.4804	8.5231		-2.3560	0.0495	1.7593	1.0013	46.11		-20,923	440	15,624	9,643		1.38
Comments	California	CY2022 Per 2024 LMOP	CY2023 EPA GHG Rpt	CY2023 EPA GHG Rpt		CY2023 Per EPA GHG Rpt	31334 cfm 2023 EPA GHG Rpt	CY2023 Per EPA GHG Rpt			Calculated from HH-6 & HH-8 reported values and CH4 conc.			CY2023 Per EPA GHG Rpt			CY2023 Per EPA GHG Rpt	CY2023 Per EPA GHG Rpt	Running estimate as of 6/15/2026		Captured / HH-1

Atascocita Waste Management Humble TX	1007800	41,607,927	1,439,523	1,327,371		5.1186	11.1504	3.4389		1.6796	1.2688	0.9671	2.2757	55.53		17,964	13,570	10,344	21,915	16,000 - 26,000	0.67
Comments		CY2022 Per 2024 LMOP	CY2023 EPA GHG Rpt	CY2023 EPA GHG Rpt		CY2023 Per EPA GHG Rpt	21200 cfm 2023 EPA GHG Rpt	CY2023 Per EPA GHG Rpt			Calculated from HH-6 & HH-8 reported values and CH4 conc.			CY2023 Per EPA GHG Rpt			CY2023 Per EPA GHG Rpt	CY2023 Per EPA GHG Rpt	Running estimate as of 6/10/2026		Captured / HH-1
South Shelby Republic Services Memphis TN	1002466	35,116,360	380,306	1,297,031		3.7150	5.8908	2.2724		1.4426	1.0879	0.5004	2.7308	52.65		14,628	11,031	5,075	26,298	30,000 - 56,000	0.61
Comments		CY2022 Per 2024 LMOP	CY2023 EPA GHG Rpt	CY2023 EPA GHG Rpt		CY2023 Per EPA GHG Rpt	11200 cfm 2023 EPA GHG Rpt	CY2023 Per EPA GHG Rpt			Calculated from HH-6 & HH-8 reported values and CH4 conc.			CY2023 Per EPA GHG Rpt			CY2023 Per EPA GHG Rpt	CY2023 Per EPA GHG Rpt	Running estimate as of 6/15/2026		Captured / HH-1

- Notes:**
- Coffin Buttelandfill reports only 916.45 MT CH4 generated in 2023 (22,911.25 MTCO2e) in their EPA GHG Reporting filing.
 - Carbon Mapper values as of capture date shown, generally approx. 3 years after the reported EPA and ODEQ values.
 - Official reported values for Fugitive CH4 and the derived estimate for Fugitive LFG are shown in **bold**.

Conversion Factors:

m3_to_ft3	35.31467	ft³/m³
CH4_ft3_to_MT	1.926E-05	MT/ft³ (CH4)
year_to_hour	8766	hr/yr

Appendix B: EPA GHG Reporting

EPA GHG Reporting Requirements

From <https://www.epa.gov/ghgreporting/subpart-hh-municipal-solid-waste-landfills> [highlight added]:

How are MSW facilities with a gas collection and control system (GCCS) required to calculate annual methane emissions?

Under subpart HH of the GHGRP, MSW landfills with active landfill gas collection systems must calculate and report GHG emissions in two ways: using Equation HH-6 and Equation HH-8.

- **Equation HH-6 (modeled methane emissions)** estimates emissions using the modeled CH₄ generation rate based on the quantity and types of waste historically disposed in the landfill using the first order decay model ([see 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 5](#)). Methane generation is then corrected for the measured amount of CH₄ recovered and destroyed. CH₄ generated in excess of the measured CH₄ recovery is corrected to account for CH₄ oxidation in the landfill cover material.
- **Equation HH-8 (measured methane emissions)** estimates emissions based on the measured quantity of methane that was recovered for destruction and **an estimated landfill gas collection efficiency**. This “back-calculated” quantity of the uncollected gas is then corrected for methane oxidation near the soil surface. Emissions from the quantity of methane recovered for destruction are estimated based on the destruction efficiency.

If a landfill has a gas collection system, which equation should it use to calculate its total methane emissions?

Facilities report data to EPA using the electronic Greenhouse Gas Reporting Tool (e-GGRT). In [e-GGRT](#), a facility should pick the calculated result of Equation HH-6 (modeled methane emissions) or Equation HH-8 (measured methane emissions) that best represents the emissions from the landfill considering the **site-specific conditions**. Per [40 CFR 98.346\(i\)\(13\)](#), for methane emissions from the landfill (i.e., the subpart HH total methane emissions), the reporter is to "choose the methane emissions from either Equation HH-6 or Equation HH-8 of this subpart that best represents the emissions from the landfill. If the quantity of recovered CH₄ from Equation HH-4 of this subpart is used as the value of GCH₄ in Equation HH-6, use the methane emissions calculated using Equation HH-8 as the methane emissions for the landfill."

If a facility does not select an equation to roll up into their total CO₂ emissions, e-GGRT will automatically select the larger of the two rounded results of Equation HH-6 or Equation HH-8.

See <https://www.ecfr.gov/current/title-40/chapter-I/subchapter-C/part-98/subpart-HH> for details on Equations HH-6 and HH-8.

The EPA GHG reporting for the Coffin Butte landfill (Data Year 2023, the latest currently available) includes the result of both the HH-6 and the HH-8 calculations, expressed in metric tons CO₂ equivalent) per year (<https://ghgdata.epa.gov/flight/details/1007054/2023/E>):

Landfill emissions estimated from modeled methane generation and other factors 540559 MTCO₂e/yr

Landfill emissions estimated from methane recovery, destruction and other factors 22911.3 MTCO₂e/yr

Expressed in Megagrams (Mg, 10⁶ Grams, also known as metric tons) of methane, these emissions are

Landfill emissions estimated from modeled methane generation and other factors 21622.36 Mg/yr

Landfill emissions estimated from methane recovery, destruction and other factors 916.45 Mg/yr

[The EPA assumes a conversion factor of 1 metric ton methane = 25 MTCO₂e]

Note that the emission value calculated from modeling the methane generation (Eqn. HH-6) is approximately 23.6 times the figure derived when using the operator's estimated gas collection efficiency (Eqn. HH-8).

The operator has chosen to present the result of the HH-8 calculation as representative of the methane emissions for this landfill despite the considerable discrepancy between the two results.

Details of the operator's 2023 EPA GHG submission, including the calculated results for equations HH-6 and HH-8, can be found at <https://ghgdata.epa.gov/ghgp/html/2023.do?id=1007054&et=undefined>; this is the operator's *2023 Coffin Butte GHG Summary Report*. See Page 19 for HH-6 and HH-8 results, and Page 1 for the resultant total GHG volume estimate of 916.45 metric tons (equivalent to 0.91645 Gg, where 1 Gg = 10⁹ grams, or 1000 metric tons).

Note on Equation HH-8 and the Coffin Butte CE Estimate

The HH-8 calculation allows the operator to specify the CE value for use in Eqn. HH-8 based on factors such as presence or absence of a GCCS and cover type adjusted as a fraction of total waste area.

This is done via Equation HH-3, which prorates defined CE values according to the percentage area of cover type. A worksheet exists to assist in this calculation (see spreadsheet and instructions at <https://uat.ccdsupport.com/help/Using%20Subpart%20HH%20Calculation%20Spreadsheets>). Populating this spreadsheet with the cover area values from Page 20 of the *2023 Coffin Butte GHG Summary Report* yields

28	Input Data for Calculating Weighted Average for CE (if multiple cover systems are present)		
29	If area by soil cover type information is not available, use default value of 0.75 (CE4 in table HH-3 of this subpart) for all areas under active influence		
30	of the collection system by entering the total area under active influence of the collection system in the input area for [A4]		
31	Surface Area, square meters		Landfill gas collection efficiency (Value from Table HH-3)
32	[A1] = Area with no waste in-place		Not applicable; do not use this area in the calculation
33	[A2] = Area without active gas collection, regardless of cover type	0.	CE2: 0%
34	[A3] = Area with daily soil cover and active gas collection	16,187.6	CE3: 60%
35	[A4] = Area with an intermediate soil cover, or a final soil cover not meeting the criteria for A5 below, and active gas collection	40,469.	CE4: 75%
36	[A5] = Area with a final soil cover of 3 feet or thicker of clay and/or geomembrane cover system and active gas collection	409,343.935	CE5: 95%
37			
38	Area weighted average collection efficiency for landfills	0.9204733	
39			
40			

Use this value as CE for Eqns HH-7 and HH-8

Comments:

- The calculated CE value of 0.9204733 agrees with the value reported on Page 19 of the *2023 Coffin Butte GHG Summary Report*.
- The vast majority (87.8%) of landfill area with waste in place is reported by the operator to conform to cover type A5: Area with final soil cover of 3 feet or thicker of clay and/or geomembrane cover system and active gas collection.
 - It is not clear that 87.8% of the current landfill is in fact covered with geomembrane or 3+ feet of clay soil. The operator should be asked to provide GIS or Site Plan drawings documenting this claim. Note the description on Page 7 of the Nov. 6 PEN:

The Coffin Butte landfill uses soil, which is at least 12 inches thick, as interim cover in areas where waste has been placed but is not at final grade. Some areas are also covered on an interim basis with plastic to reduce leachate generation.
 - The extensive deficiencies and failures in the geomembrane as documented in the Nov. 6 PEN very likely reduce its effectiveness as a gas barrier, rendering even the areas covered in geomembrane as questionable in terms of the A5 classification (equivalent to 3+ feet of clay).

Overview of Equation HH-1

Equation HH-1 is a critical component of the Greenhouse Gas Reporting Program (GHGRP) for municipal solid waste (MSW) landfills. It is used to calculate the modeled methane generation rate, which is essential for understanding the methane emissions produced by landfills.

(Equation HH-1)	$G_{CH_4} = \left[\sum_{x=S}^{T-1} \left\{ W_x \times MCF \times DOC \times DOC_F \times F \times \frac{16}{12} \times \left(e^{-k(T-x-1)} - e^{-k(T-x)} \right) \right\} \right]$
------------------------	--

Purpose of Equation HH-1

- Modeling Methane Generation:** This equation estimates the amount of methane generated based on the quantity and types of waste disposed of in the landfill.

- Regulatory Compliance: Facilities must use this equation to report their methane emissions accurately to the Environmental Protection Agency (EPA).

Key Components of Equation HH-1

The equation incorporates several variables to determine the methane generation rate:

- GCH4: Modeled methane generation rate in the reporting year (metric tons CH₄).
- WX: Quantity of waste disposed in the landfill in a specific year (metric tons, wet weight).
- MCF: Methane correction factor, typically set to a default value unless active aeration is present.
- DOC: Degradable organic carbon, which varies by waste type.
- DOC F: Fraction of DOC that is dissimilated.
- F: Fraction by volume of CH₄ in landfill gas.
- k: Rate constant, which is selected based on the landfill's operational history.

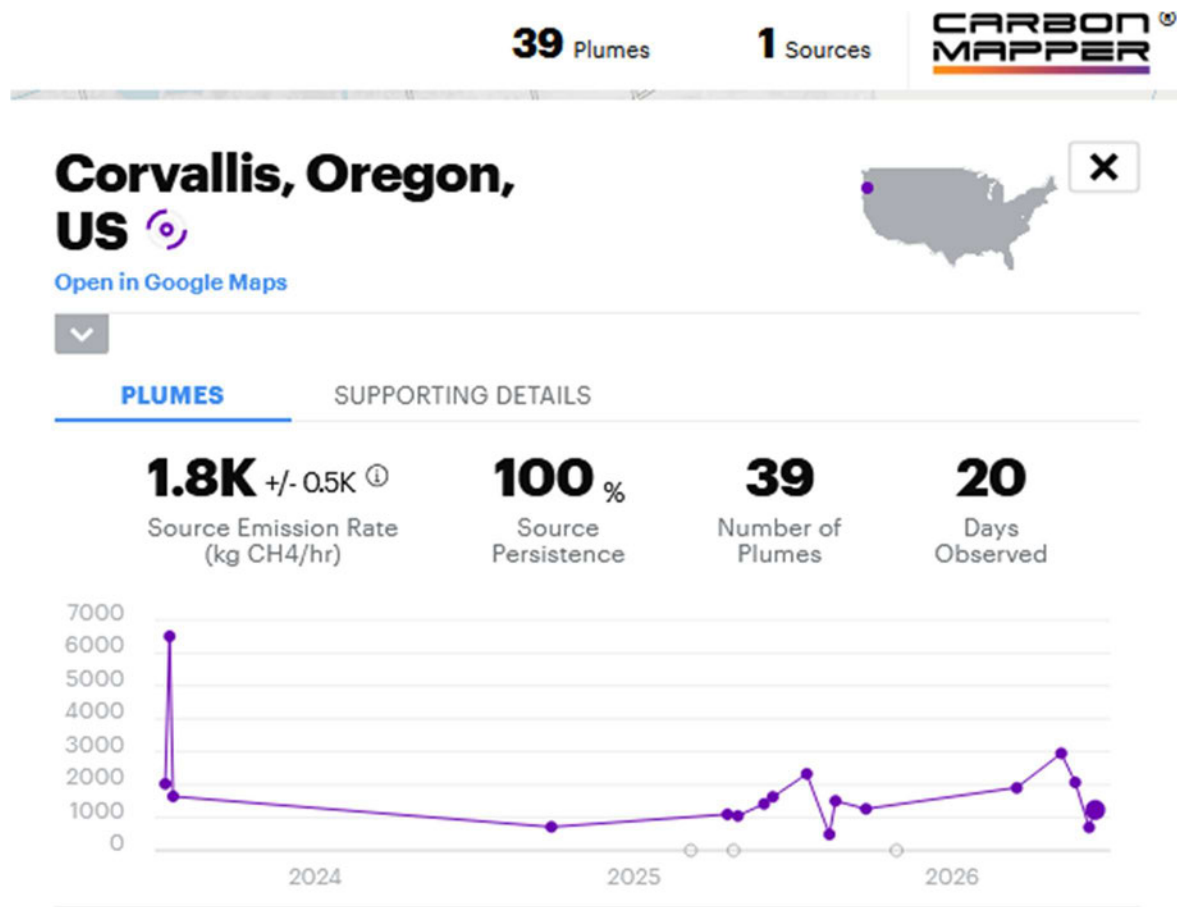
Calculation Process

1. Determine Waste Quantity: Use historical data or measurements to find the total waste disposed of in the landfill.
2. Apply Parameters: Input the appropriate values for MCF, DOC, DOC F, and k based on the landfill's specific conditions.
3. Calculate GCH4: Use the equation to compute the modeled methane generation rate for the reporting year.

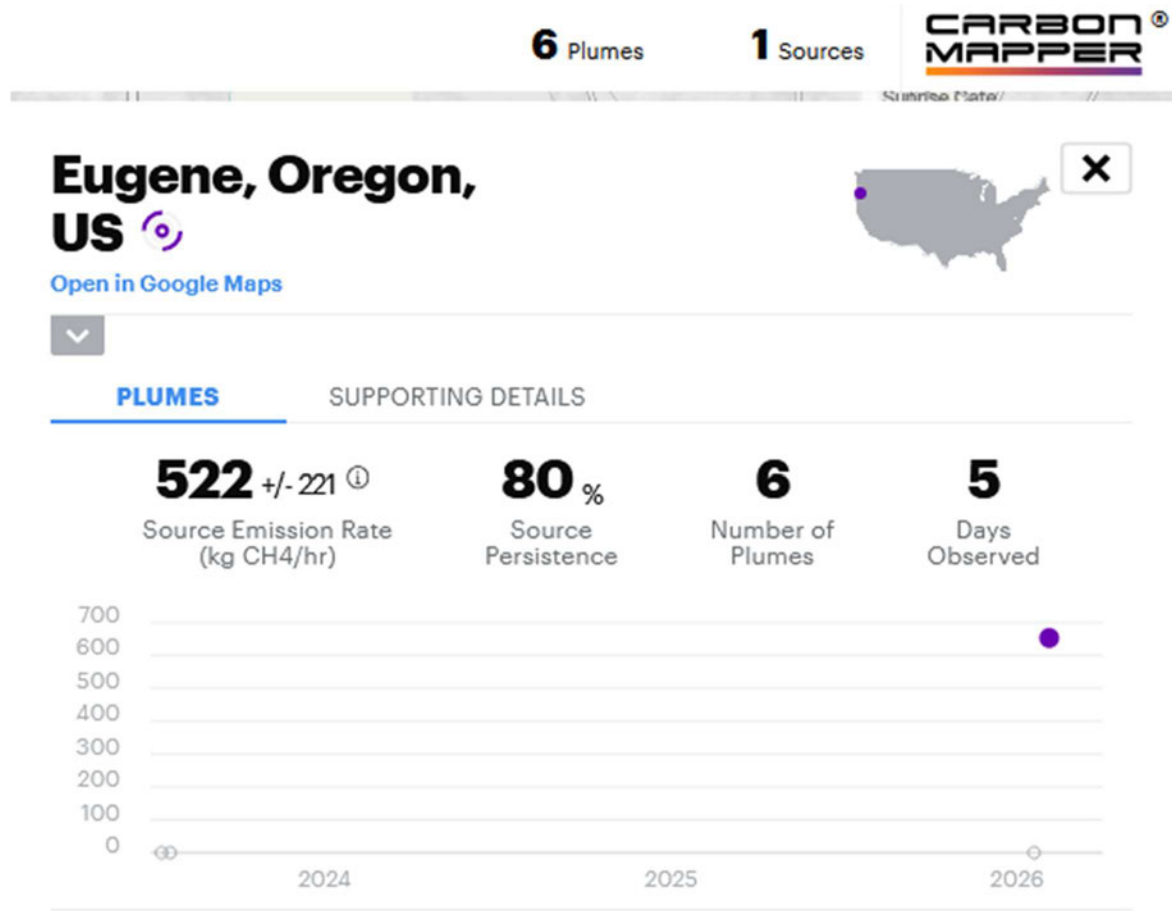
Appendix C: Carbon Mapper Snapshots

Carbon Mapper data [year(s) of data acquisition vary]. Retrieved from <https://data.carbonmapper.org> 15 August 2026.

Coffin Butte



Short Mountain



35 Plumes

1 Sources



The Dalles, Oregon, US

[Open in Google Maps](#)



PLUMES

SUPPORTING DETAILS

1.1K $\pm 0.3K$ ⓘ

Source Emission Rate
(kg CH₄/hr)

100 %

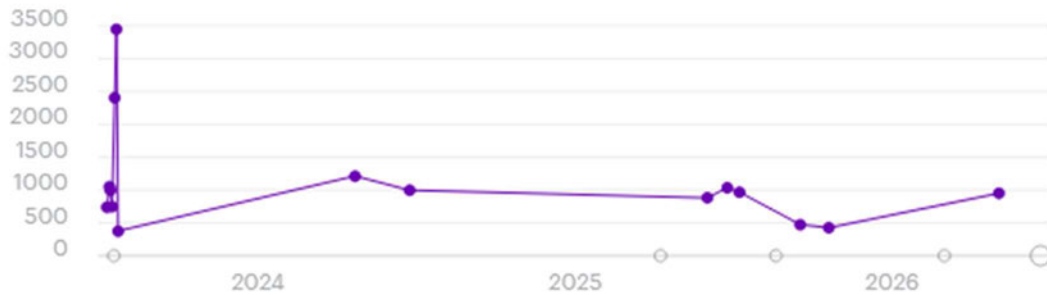
Source
Persistence

35

Number of
Plumes

20

Days
Observed



2 Plumes

1 Sources



Lexington, Oregon, US

[Open in Google Maps](#)



Source name CH4_6A_1000m_-119.59504_45.68638 ⓘ
Sector Solid Waste
Gas type CH4

OBSERVATIONS

SUPPORTING DETAILS

122 +/- 22 ⓘ

Source Emission Rate
(kg CH₄/hr)

50 %

Source
Persistence

3

Number of
Observations

2

Days
Observed

CAUTION: LOW NUMBER OF SAMPLES



18 Plumes

2 Sources



Arlington, Oregon, US

[Open in Google Maps](#)



PLUMES

SUPPORTING DETAILS

304 +/- 64 ⓘ

Source Emission Rate
(kg CH₄/hr)

78 %

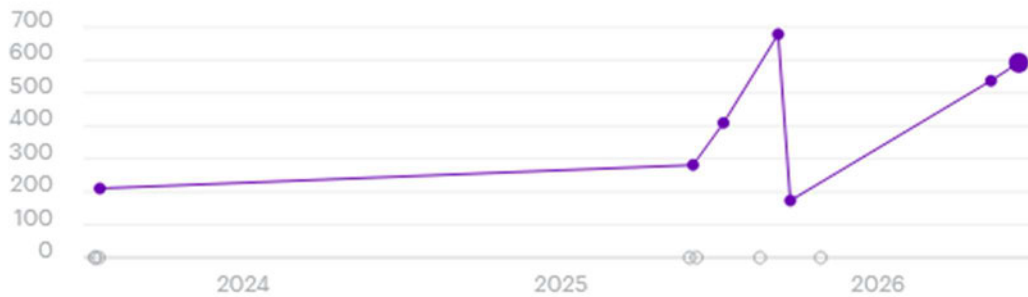
Source
Persistence

17

Number of
Plumes

18

Days
Observed



20 Plumes

1 Sources



Bickleton, Washington, US

[Open in Google Maps](#)



PLUMES

SUPPORTING DETAILS

503 +/- 127 ⓘ

Source Emission Rate
(kg CH₄/hr)

84 %

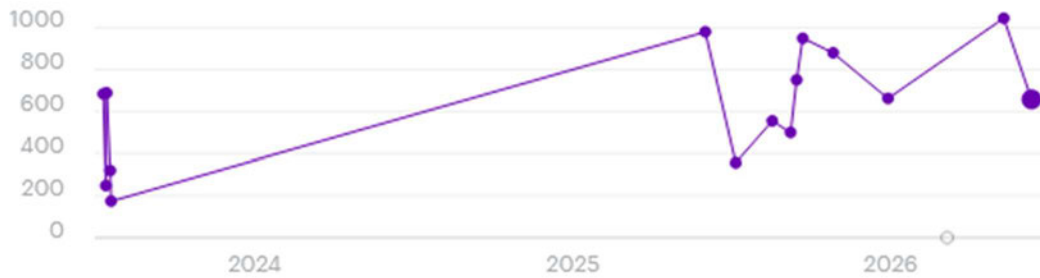
Source
Persistence

20

Number of
Plumes

19

Days
Observed



Headquarters

28 Plumes

2 Sources

CARBON
MAPPER[®]

Castle Rock, Washington, US

[Open in Google Maps](#)



PLUMES

SUPPORTING DETAILS

1.9K +/- 0.5K ⓘ

Source Emission Rate
(kg CH₄/hr)

100 %

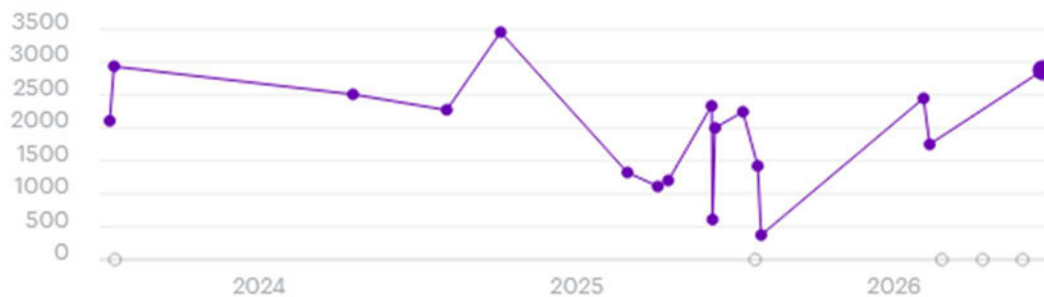
Source
Persistence

27

Number of
Plumes

22

Days
Observed



28 Plumes

2 Sources

CARBON
MAPPER[®]

Castle Rock, Washington, US

[Open in Google Maps](#)



PLUMES

SUPPORTING DETAILS

126 +/- 24 ⓘ

Source Emission Rate
(kg CH₄/hr)

6 %

Source
Persistence

1

Number of
Plumes

18

Days
Observed

Using Carbon Mapper's observation-based landfill gas emissions data to assess conditions at Coffin Butte Landfill and inform decisions by Benton County government

Ken Eklund
July 31, 2026

Executive Summary

The extensive observational data published by Carbon Mapper (CM) supports the conclusion that Coffin Butte Landfill is a large-scale air and climate polluter and the worst of the alternatives available for waste disposal in the region by a significant margin.

The CM data substantiates enforcement actions against the landfill, because it corroborates the findings of EPA and DEQ inspections and makes plain that Republic Services has mischaracterized landfill operations and compliance.

The CM data shows emissions levels at the landfill have not been decreasing, but instead have been increasing dramatically (about a 50% increase) over the past three years.

Coffin Butte's emissions performance compares poorly to alternative landfills in Oregon. Wasco emits around 40% less landfill gas from super-emitting leaks, and Columbia Ridge roughly 82% less, according to CM. Coffin Butte's excessive methane emissions far outweigh the emissions cost of additional waste transport.

The CM data establishes that significant environmental injustice is occurring at the landfill, as Republic Services and people elsewhere benefit economically from causing harms to those that live and visit North Benton County, and from causing long-term harms to the land itself.

One of these harms is PFAS exposure and bio-accumulation. Recent studies have shown landfill gas carries PFAS at hazardous levels.

The CM data establishes that the County is assuming large-scale economic risk and liability for inaction. CM's data is the most accurate and comprehensive characterization available for the landfill's impacts on air quality. CM data makes untenable any narrative that Coffin Butte's emissions are or are likely to be under control and human and environmental health are not at risk. Once you see CM's Leak 27 (pages 36 & 37), it cannot be unseen.

The CM data presented here calls on Benton County government to respond appropriately, with concrete actions and leadership that transform waste habits and break our dependency on the landfill.



+ Our mission

Our mission is to drive greenhouse gas emission reductions by making methane and carbon dioxide data accessible and actionable.



Background: Carbon Mapper

Carbon Mapper (CM) is a climate science nonprofit that uses sophisticated remote sensing to generate actionable data to use in mitigating emissions. Its partners include state environmental agencies in California and Pennsylvania. CM gives open access to its data expressly so that decisionmakers such as Benton County's Commissioners can benefit from it; you may verify the data presented here at carbonmapper.org.

CM first began surveying Coffin Butte Landfill in July 2023, as part of national research on landfill emissions. As of July 31, 2026, CM has published 22 surveys of Coffin Butte with images and data of 39 super-emitting methane leaks.

Carbon Mapper's first surveys were done from aircraft, but since October 2024 CM's Tanager-1 satellite gathers the data. CM has made Coffin Butte Landfill a priority target and surveys the landfill often, as conditions permit; most recently, CM has published two observations a month. CM intends to increase data-gathering with more sophisticated Tanager-2 and Tanager-3 satellites, which will enable even more frequent and detailed surveys in the near future.

Background: Coffin Butte Landfill

Coffin Butte Landfill (CBL) began as a military dump for Camp Adair in WWII; it did not undergo a formal siting procedure. After the war, CBL transitioned incrementally from local to national corporate ownership, and from local focus to regional service, despite concerns about its unsuitability. (Environmental concerns such as high precipitation have closed most other landfills west of the Cascades.)

This transition accelerated in 2017-20 as Riverbend Landfill reached capacity, was denied expansion due to environmental impacts, and its users largely shifted to CBL. Today only about 8% of CBL's intake comes from Benton County; CBL mostly serves Marion County (30%), Washington County (15%), Lincoln County (13%), Linn County (12%) and Yamhill County (10%). CBL receives about 30% of the municipal solid waste generated in Oregon. Disposal fees are unequal: Benton County households are charged about 30% more than other households. Attempts to expand CBL failed, most recently in 2021 and 2024. Republic is now under a DEQ Enforcement Order with \$3M fine for environmental mismanagement at CBL.

CM Data: Source and Leak

CM data has two parts: *source data* and *leak data*. Leak data is obtained from observations of individual super-emitting leaks; leak data is then aggregated to form source data, which characterizes the whole site's performance over time.

Part 1: CM Source Data

CM has identified Coffin Butte Landfill as a source of greenhouse gases and published estimates for the source as a whole over time. These estimates are calculated from CM observations of the landfill, informed by patterns derived from observations and “ground truthing” at similar landfills. CM's Source Data for Coffin Butte is summarized in [Figure 1](#), taken from carbonmapper.org.

CM estimates that Coffin Butte Landfill has been leaking 1,800 kg of methane an hour on average from point-source leaks throughout the observation period. CM also calculates a confidence window for its estimates; in this case, the confidence window is plus or minus 500 kg. This is the landfill's **Source Emission Rate for methane (1)**. 1,800 kg can also be expressed as 1.8 metric tons. Since landfill gas is about 50% methane by volume, the landfill's Source Emission Rate for landfill gas is roughly 2x the rate for methane, or 3.6 metric tons per hour (+/- 1 mt).

CM has assigned Coffin Butte Landfill a **Source Persistence of 100% (2)**, meaning that every time CM has surveyed the landfill, at least

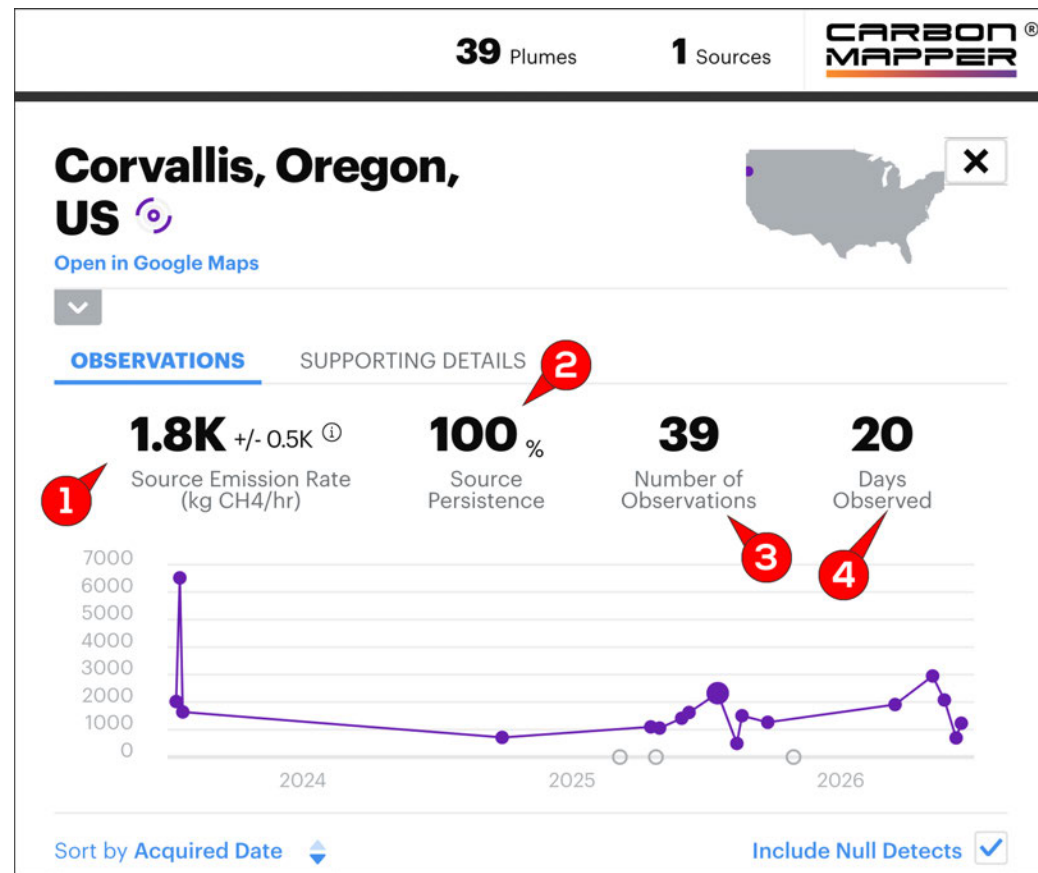


Figure 1: Source Data Summary for Coffin Butte Landfill.

one plume from a super-emitting leak has been observed (often there are two or three such leaks). In the three-year period ending July 31, 2026, CM mapped the plumes from **39 such leaks (3)**, and surveyed the landfill on **20 separate days (4)**, which is nearly twice as often as the landfill monitored itself for emissions over the same time period (12).

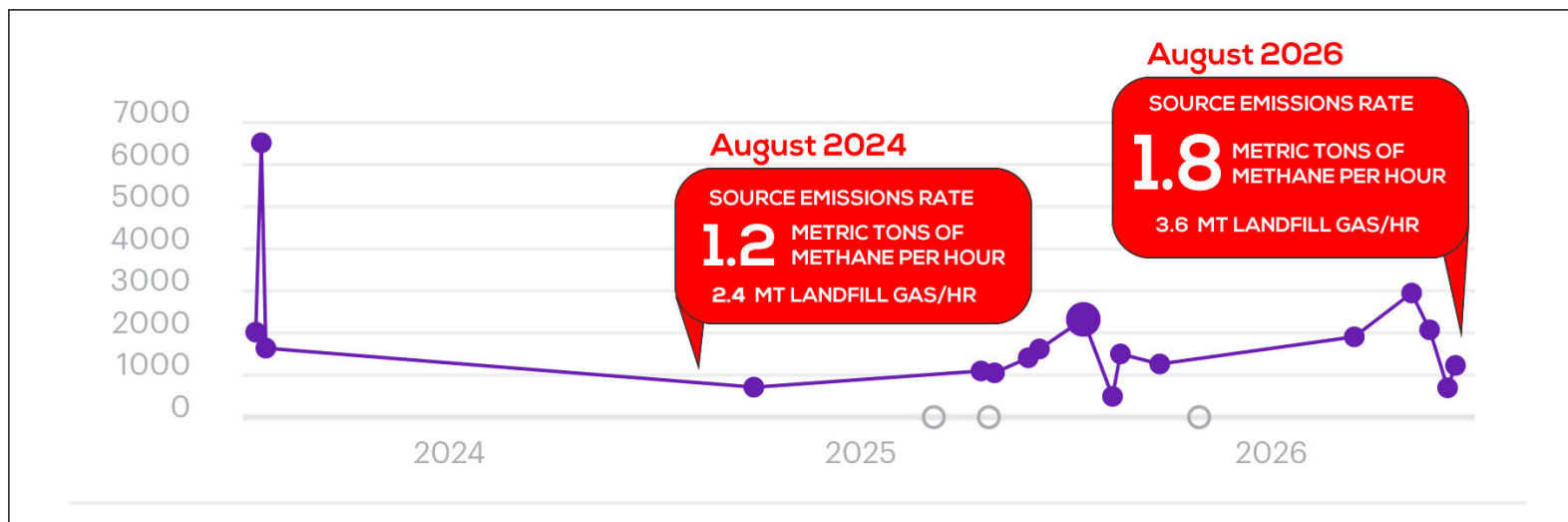


Figure 2: Source Data Summary – Observations and Average Source Emissions Rates Over Time

Figure 2 graphs the quantifications of leak rates in a timeline. In August 2024, CM estimated the landfill was emitting 1.2 metric tons of methane every hour on average; two years later, that estimate had risen by 50%, to 1.8 metric tons of methane every hour. **Total emissions rose accordingly, from roughly 2.4 to 3.6 metric tons of landfill gas per hour**, with a confidence window that widened from 0.2 mt/hr to 1.0 mt/hr.

Coffin Butte’s emissions performance compares poorly to landfills that are alternatives to it. According to CM and Waste Impact Tracker, Wasco Landfill is not high-performing, yet it takes in about 8% less waste per year and emits 40% less landfill gas from super-emitting leaks (2.2 metric tons per hour). Columbia Ridge Landfill takes in about 2.4x *more* waste per year than Coffin Butte, and has over 3x as much waste in

place, but emits 82% less landfill gas from leaks (0.66 metric tons per hour), according to CM.

Location matters. Short Mountain Landfill (near Eugene), also suffers from “the Willamette Valley curse,” with performance per ton now as low as Coffin Butte’s in preliminary data. Lane County has launched Clean Lane, a facility to aggressively divert organics from being landfilled.

The environmental damage done by emplacing a ton of waste in Coffin Butte Landfill far outweighs the environmental costs of transporting that waste to alternatives such as Columbia Ridge. Back-of-envelope calculations suggest a 4x reduction in total greenhouse gas emissions if waste is trucked, 6x if sent by rail – plus additional benefits from leachate reduction, and yet more from incentivizing diverting waste, especially organics, from our wastestream.

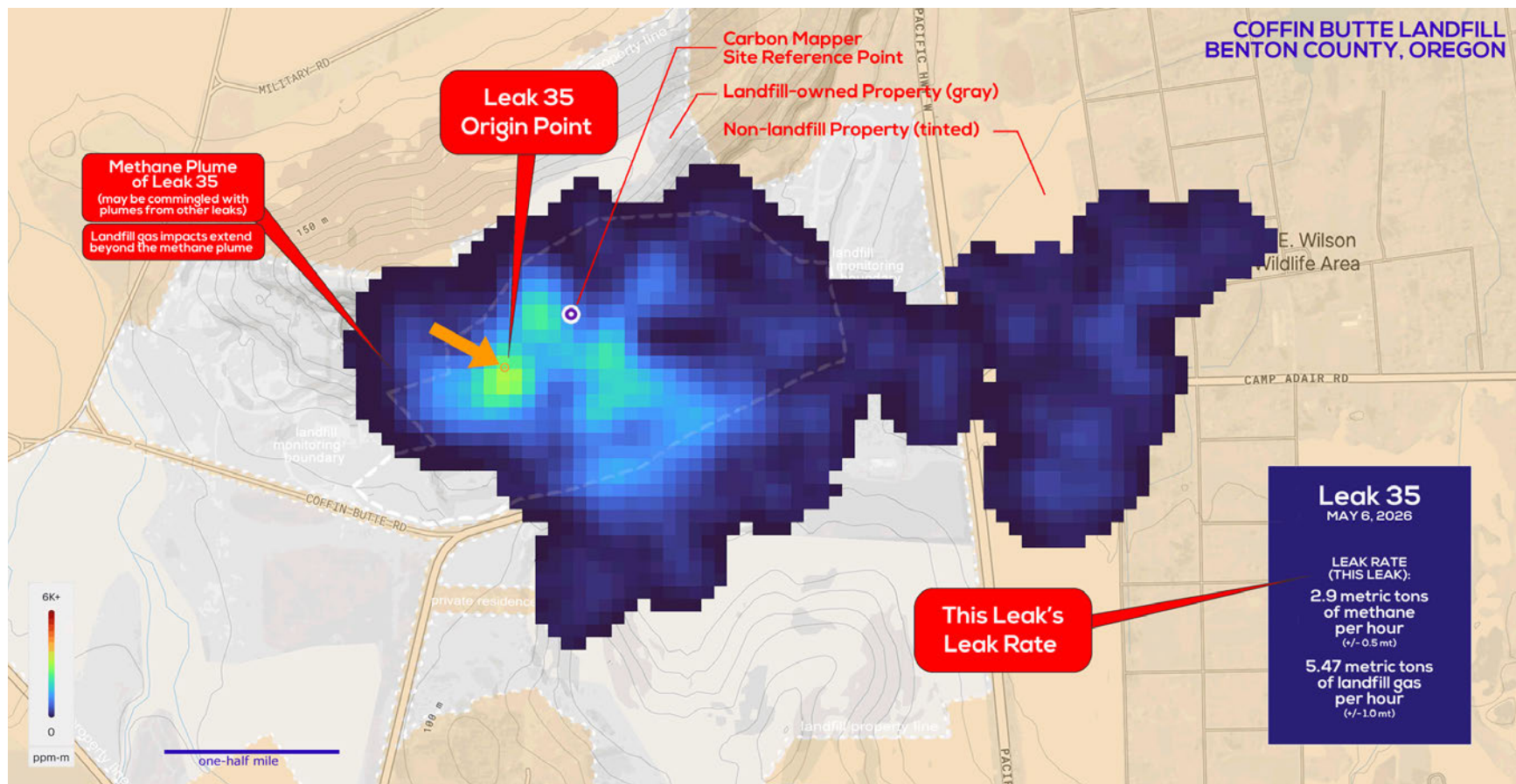


Figure 3: Example Leak Image (Leak 35) with Common Features

Part 2: CM Leak Data

CM's priority is to identify origin points of methane leaks, so facility operators can act to rectify them. When a plume is observed, its data is first processed to delimit the area where its point source leak or leaks could possibly be; that's what a plume map shows, not the full extent of where the gas travels. CM then processes the data further to mark the leak or leaks with an orange bulls-eye. See [Figure 3](#). CM's mapping focuses on

leaks, i.e., where plumes *start*, not on where they go; they are not odor maps, for example. Odors and toxics dispersal can extend for miles more beyond the plume mapped by CM.

Once a leak and its plume have been imaged and published, CM works to quantify how much the leak is leaking, expressed in thousands of kilograms of methane emitted every hour. CM has successfully quantified the leak rates for 24 of the 39 leaks observed so far at Coffin Butte.

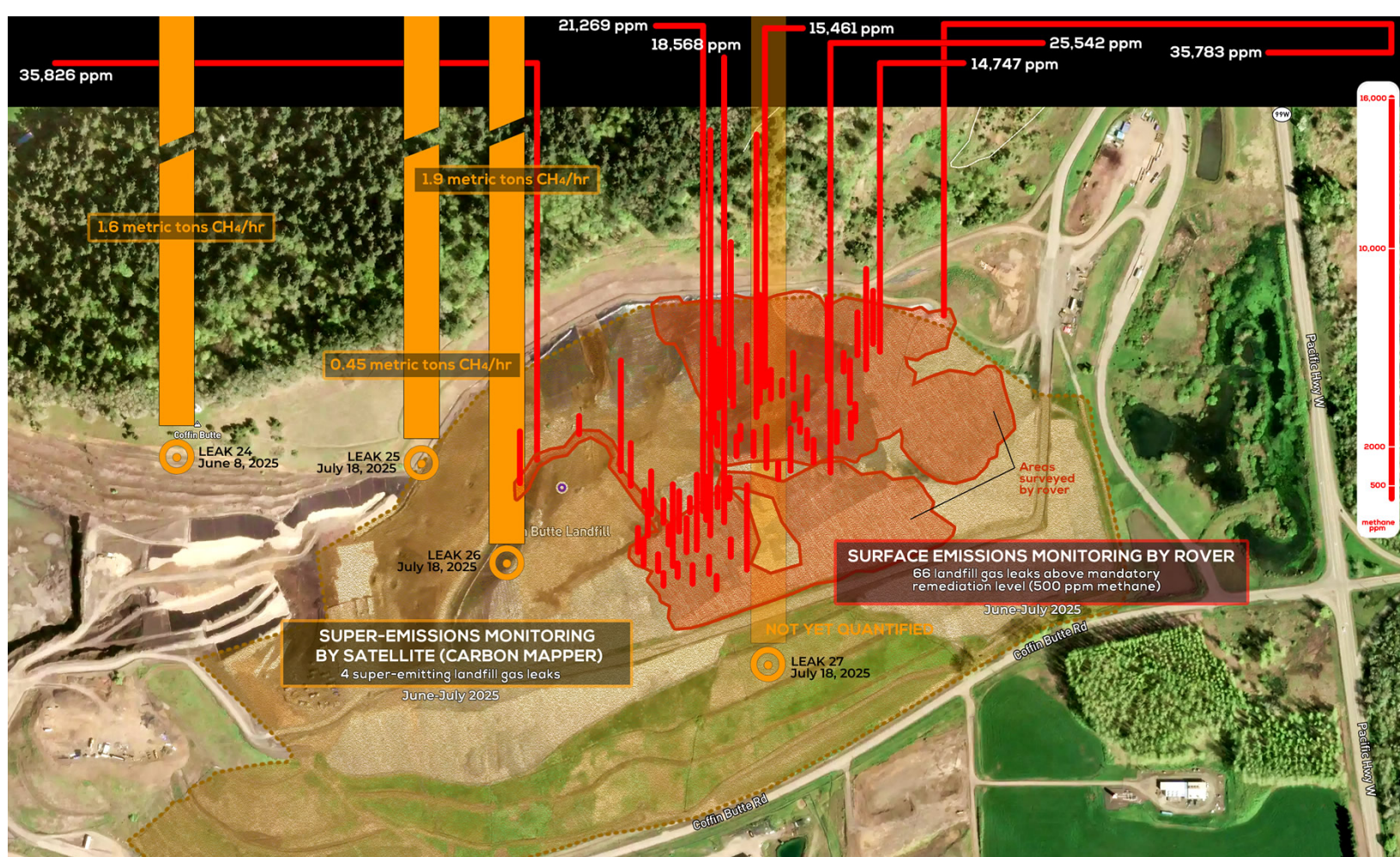


Figure 4: Emissions and Super-Emissions. Results of quarterly surface emissions monitoring by surface rover (not by CM) in red; super-emission leak detection by Carbon Mapper during the same time period in orange

Note that CM focuses on super-emitting leaks only, not a landfill's overall emissions. This distinction is graphically portrayed in Figure 4. Coffin Butte is now required by state law to begin implementing advanced surface monitoring, and the red vertical bars indicate 66 significant landfill gas leaks detected during a test survey using a remote-control rover by a third-party consultant in June-July 2025. This test survey found methane

concentrations that range from 500 parts per million (the threshold for mandatory remediation) to over 35,000 ppm. These myriad "emitter" leaks are large but are not the "super-emitters" found in CM surveys, which are orders of magnitude larger (orange bulls-eyes). CM uses super-emitter leaks to form its estimates of Coffin Butte's emissions.

Republic's surface monitoring did not find any of the super-emitting leaks that CM found.

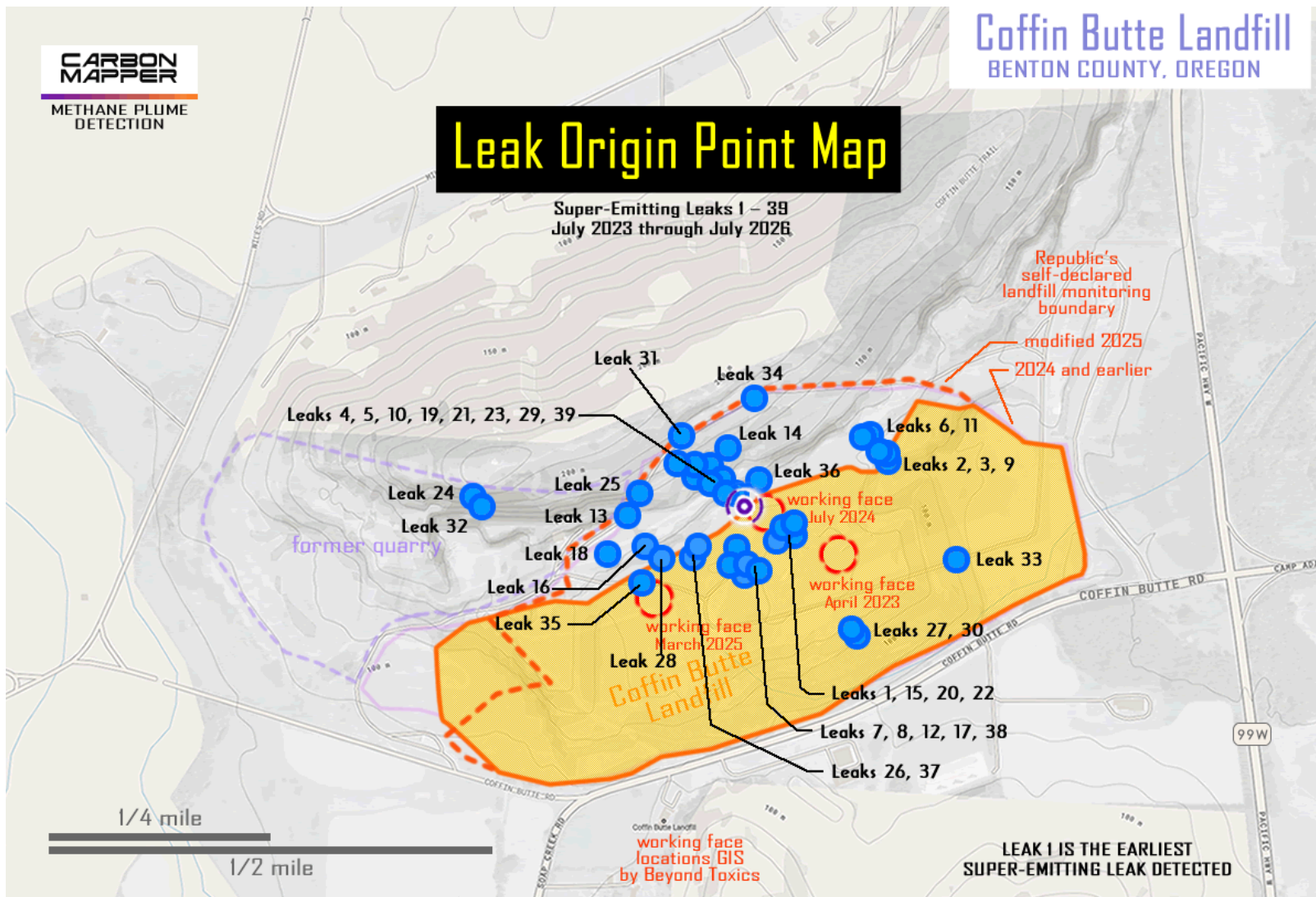
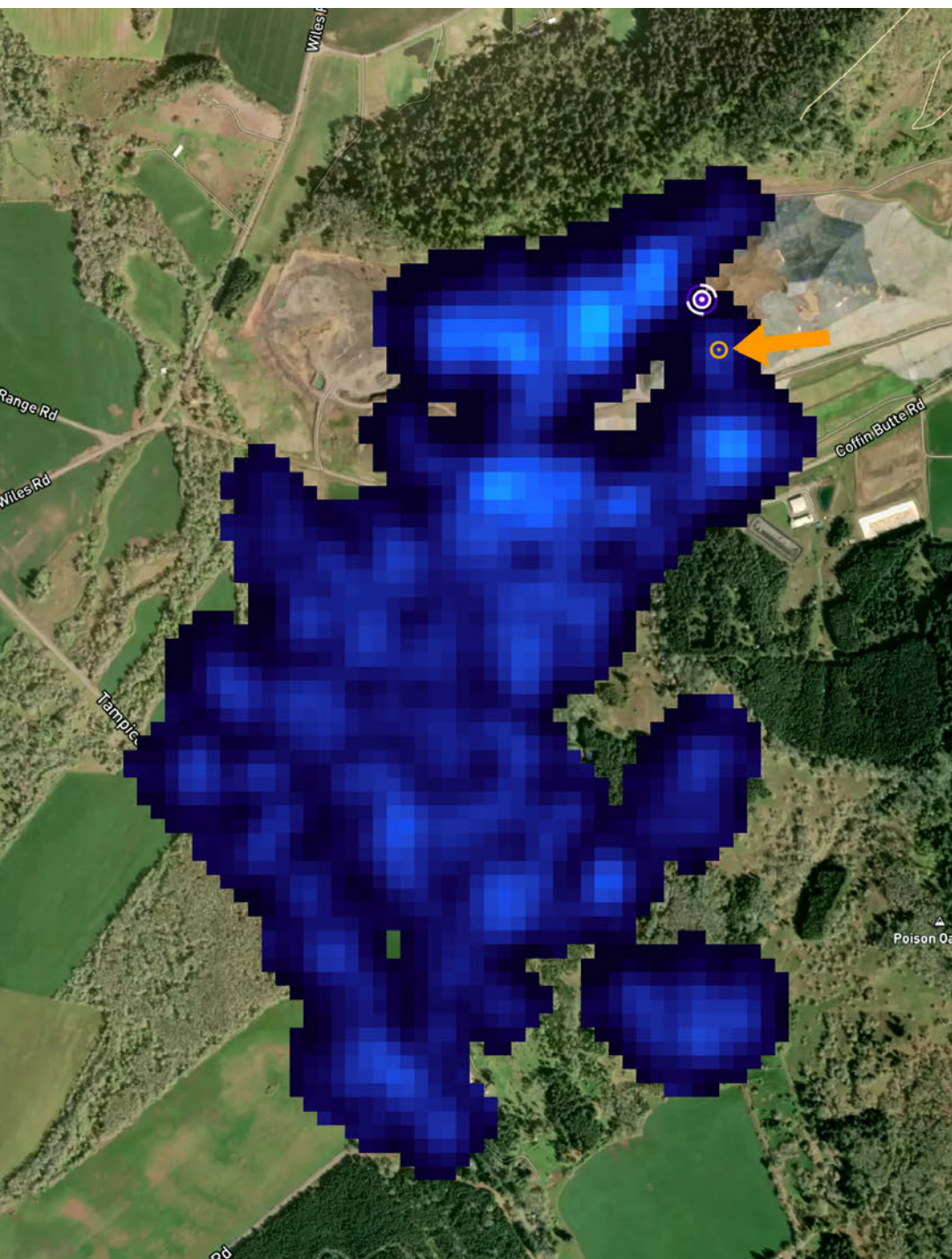


Figure 5:
Leak Point Map,
from Leak 1
(earliest)
through
Leak 39
(latest)

Republic self-exempted most of the area not covered by the rover from any surface monitoring.

CM's leak data enables us to build a characterization of landfill operations over time that's independent of surface monitoring bias and flaws. Mapping the origin points (Figure 5) reveals problem areas with persistent or recurring leaks – the 7/8/12/17/38 leak, for example, seems to have

persisted for at least three years. The majority of super-emitting leaks (and the largest leak cluster) is located in the north area that Republic declared was “not landfill surface” and therefore did not monitor at all until mid-2025. As noted in its Enforcement Order, DEQ requires Republic to monitor “the entire landfill surface” that has waste under it.



The 39 Super-Emitting Leaks (with Individual Data and Plume Images)

CM's 39 leaks and their data appear on succeeding pages, in chronological order from oldest to newest. They are all at the same scale except where noted. The data is current as of July 31, 2026, as published at carbonmapper.org.

CM plumes delineate where the leak could possibly be. They therefore represent the spread of emissions levels similar to those encountered on the landfill surface itself. In cases like the one shown at right (Leak 38), conditions similar to those on the landfill surface are occurring in private properties miles from the landfill. Landfill gas impacts themselves extend still further, well beyond the plume shown.

When there are multiple leaks leaking at once, each leak has its own page showing its individual origin point, and that page is marked as part of a set (1 of 2, 2 of 3, etc.). When plumes are commingled, they will seem similar from page to page, but the leak origin points will be different; each of the leaks is contributing to the plume.

Leaks 1-16 are from surveillance by aircraft, and have higher resolution than 17-39, which were observed by satellite.

An aerial photograph of the Coffin Butte Landfill in Benton County, Oregon. The landfill is characterized by large, irregularly shaped mounds of waste material, some of which are covered with blue and white plastic liners. The surrounding landscape is a mix of brown, dry earth and patches of green vegetation. A road or highway runs along the bottom right of the image, with several vehicles visible. The text "LANDFILL GAS LEAKS" is prominently displayed in large, bold, yellow capital letters. Below it, in smaller yellow capital letters, is "AND THEIR ASSOCIATED EMISSIONS PLUMES". Further down, in even smaller yellow capital letters, is "COFFIN BUTTE LANDFILL". Below that, in smaller yellow capital letters, is "BENTON COUNTY, OREGON". At the bottom of the text block, in smaller yellow capital letters, is "July 2024 through July 2026".

LANDFILL GAS LEAKS

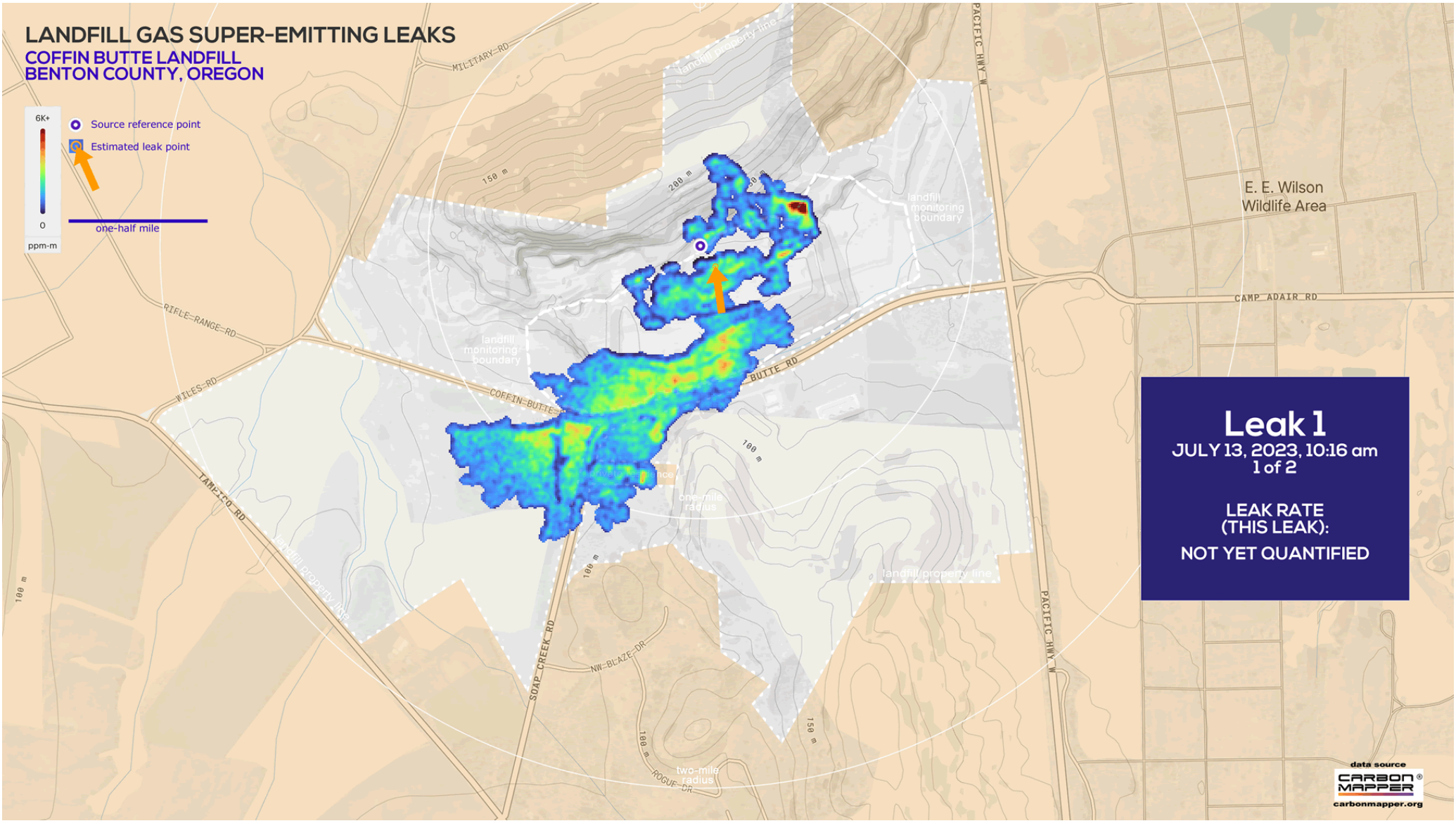
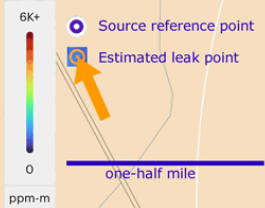
AND THEIR ASSOCIATED EMISSIONS PLUMES

COFFIN BUTTE LANDFILL

BENTON COUNTY, OREGON

July 2024 through July 2026

LANDFILL GAS SUPER-EMITTING LEAKS
COFFIN BUTTE LANDFILL
BENTON COUNTY, OREGON

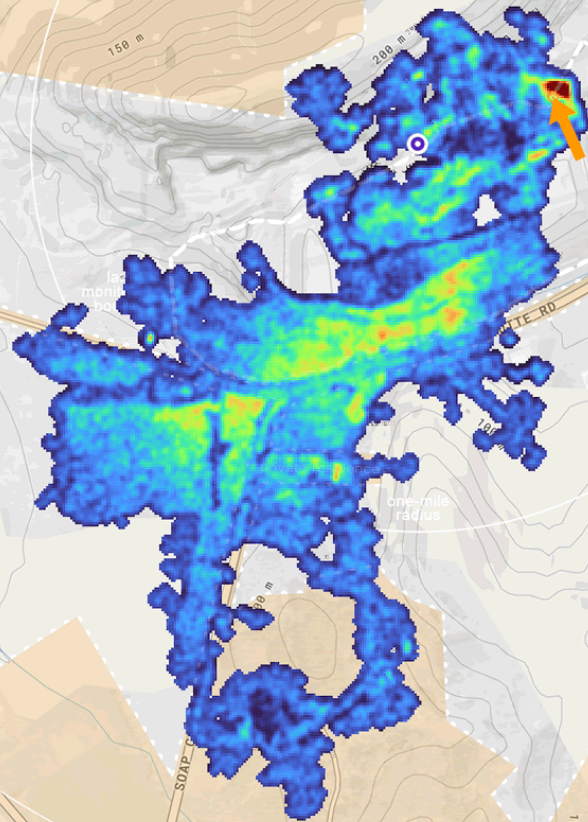
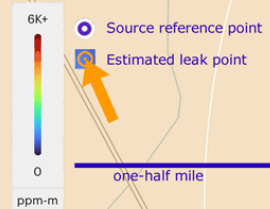


Leak 1
JULY 13, 2023, 10:16 am
1 of 2

LEAK RATE
(THIS LEAK):
NOT YET QUANTIFIED

LANDFILL GAS SUPER-EMITTING LEAKS

COFFIN BUTTE LANDFILL BENTON COUNTY, OREGON



E. E. Wilson
Wildlife Area

CAMP ADAIR RD

Leak 2

JULY 13, 2023, 10:16 am
2 of 2

LEAK RATE
(THIS LEAK):

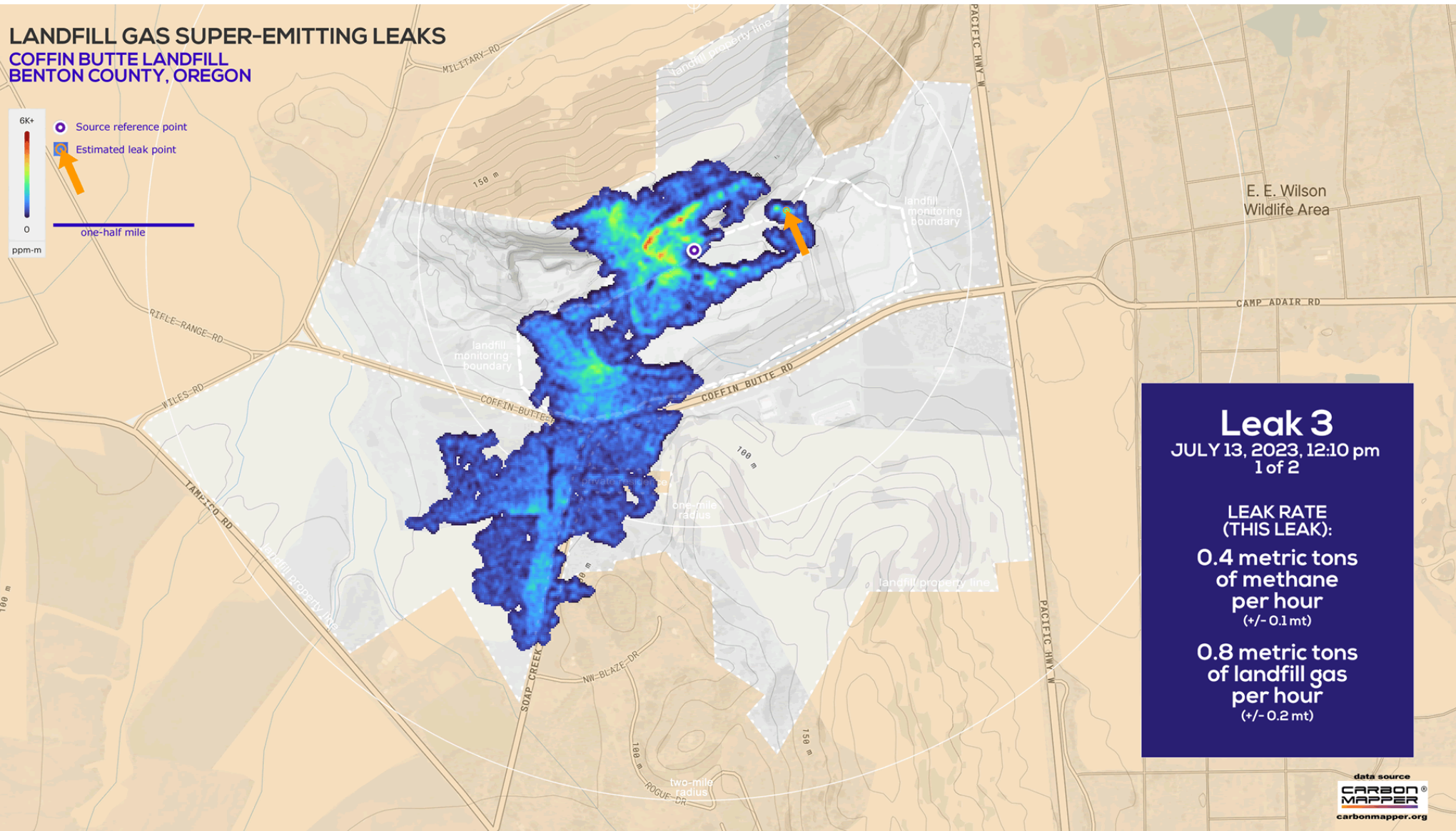
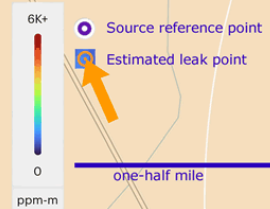
1.4 metric tons
of methane
per hour
(+/- 0.3 mt)

2.64 metric tons
of landfill gas
per hour
(+/- 0.6 mt)

data source
**CARBON
MAPPER**
carbonmapper.org

LANDFILL GAS SUPER-EMITTING LEAKS

COFFIN BUTTE LANDFILL BENTON COUNTY, OREGON



Leak 3

JULY 13, 2023, 12:10 pm
1 of 2

LEAK RATE
(THIS LEAK):

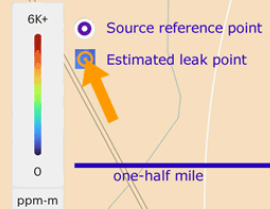
0.4 metric tons
of methane
per hour
(+/- 0.1mt)

0.8 metric tons
of landfill gas
per hour
(+/- 0.2 mt)

data source
**CARBON
MAPPER**
carbonmapper.org

LANDFILL GAS SUPER-EMITTING LEAKS

COFFIN BUTTE LANDFILL BENTON COUNTY, OREGON



Leak 4
JULY 13, 2023, 12:10 pm
2 of 2

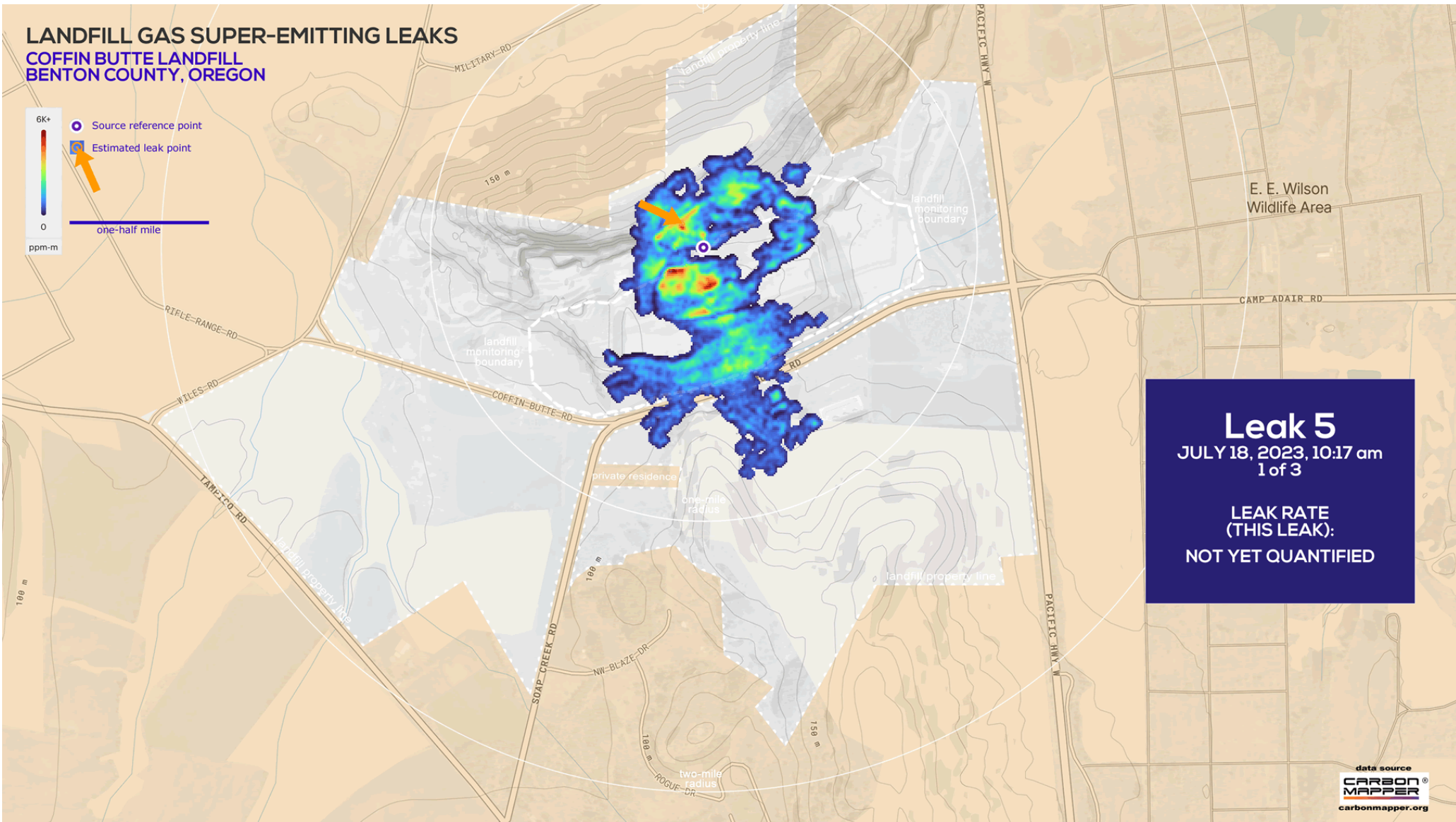
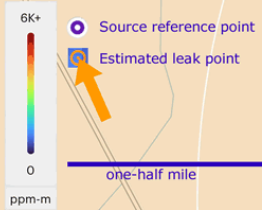
LEAK RATE
(THIS LEAK):
**2.2 metric tons
of methane
per hour**
(+/- 0.9 mt)

**4.15 metric tons
of landfill gas
per hour**
(+/- 0.6 mt)

data source
**CARBON
MAPPER**
carbonmapper.org

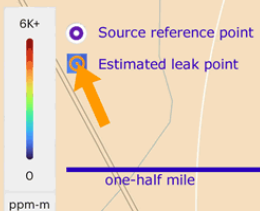
LANDFILL GAS SUPER-EMITTING LEAKS

COFFIN BUTTE LANDFILL
BENTON COUNTY, OREGON



LANDFILL GAS SUPER-EMITTING LEAKS

COFFIN BUTTE LANDFILL BENTON COUNTY, OREGON



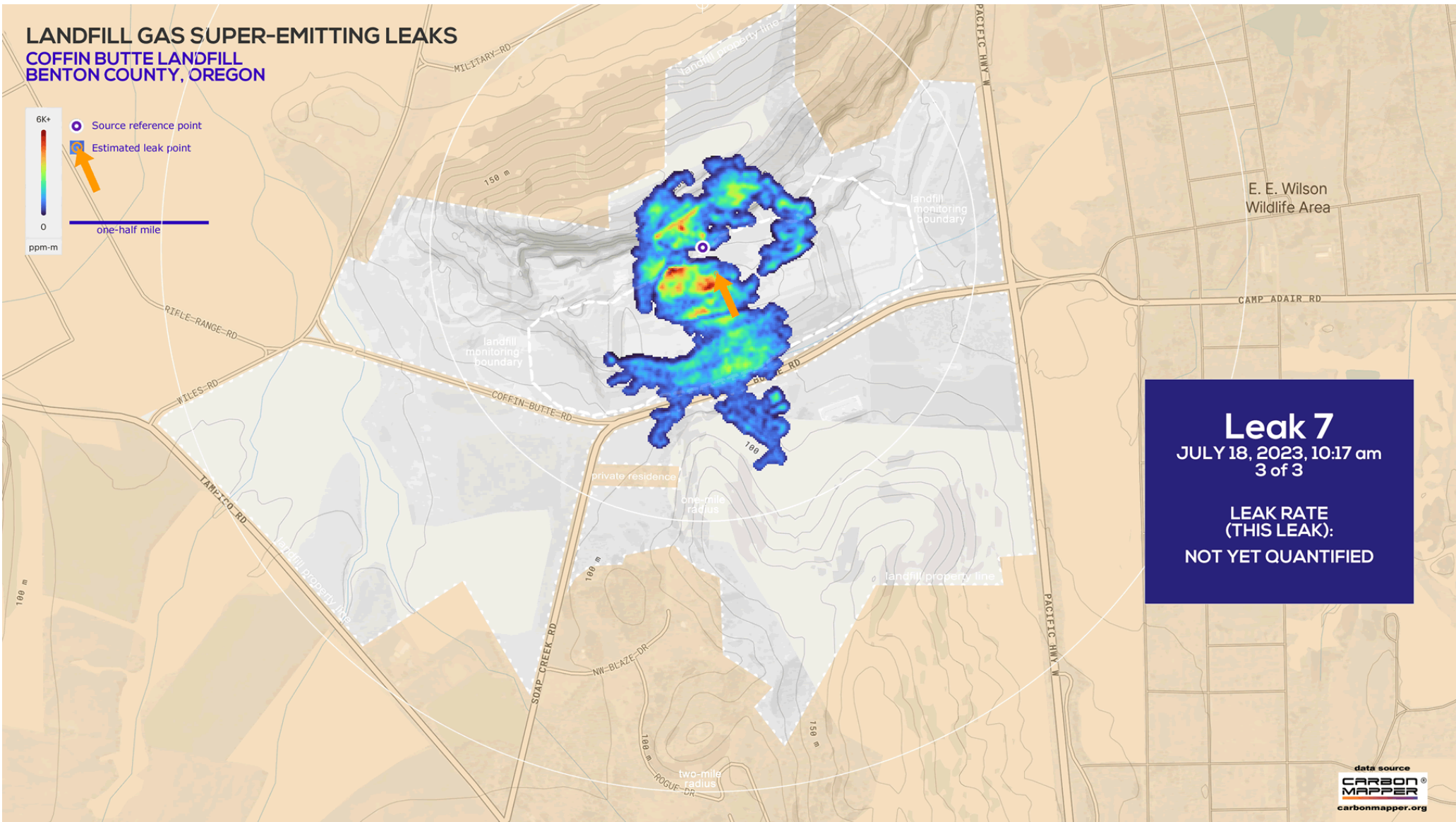
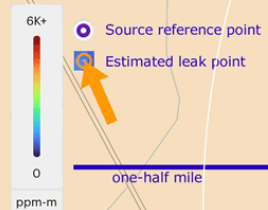
Leak 6
JULY 18, 2023, 10:17 am
2 of 3

LEAK RATE
(THIS LEAK):
NOT YET QUANTIFIED

data source
**CARBON
MAPPER**
carbonmapper.org

LANDFILL GAS SUPER-EMITTING LEAKS

COFFIN BUTTE LANDFILL
BENTON COUNTY, OREGON

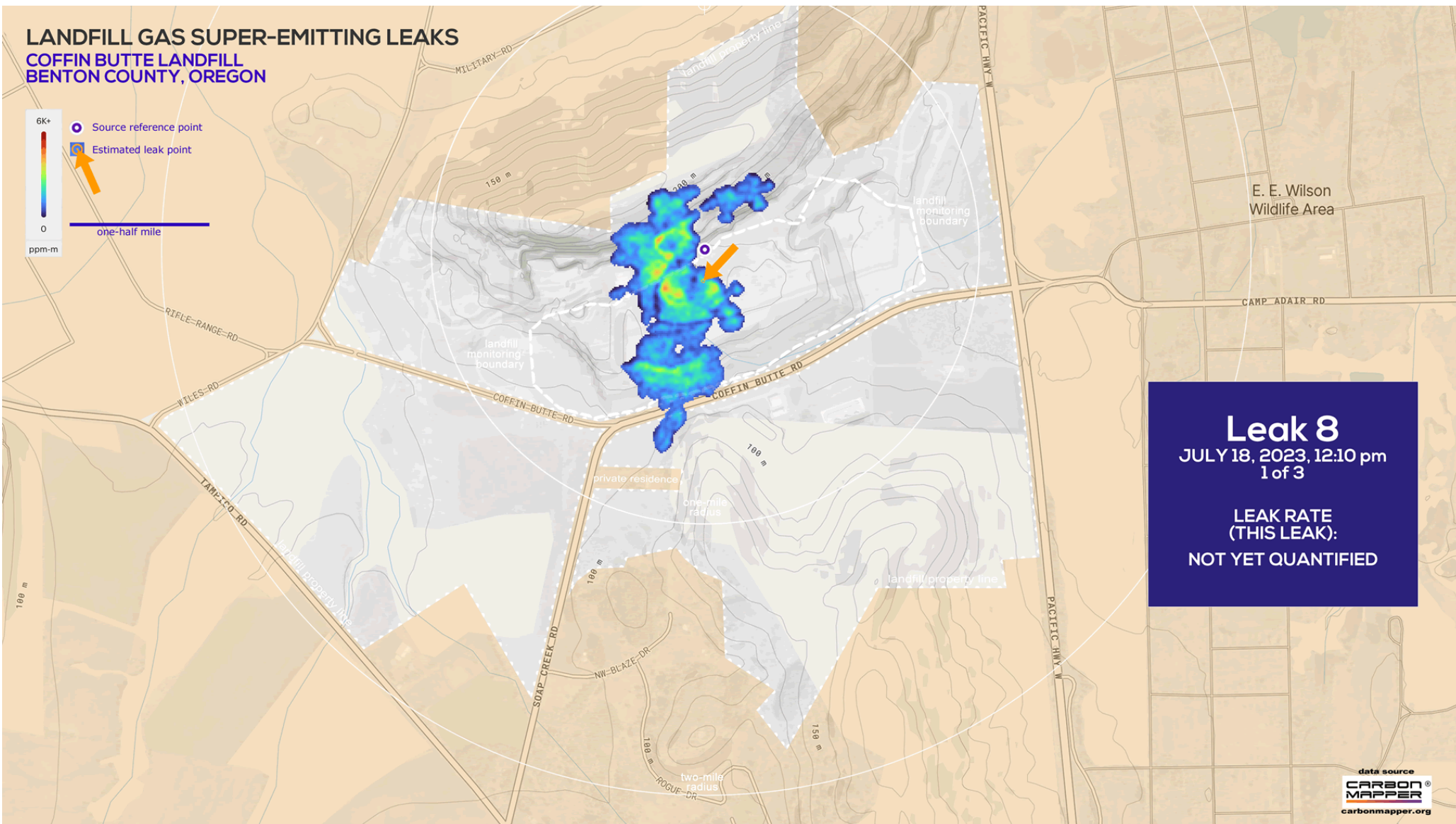
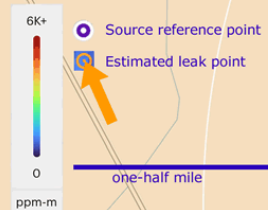


Leak 7
JULY 18, 2023, 10:17 am
3 of 3

LEAK RATE
(THIS LEAK):
NOT YET QUANTIFIED

LANDFILL GAS SUPER-EMITTING LEAKS

COFFIN BUTTE LANDFILL BENTON COUNTY, OREGON

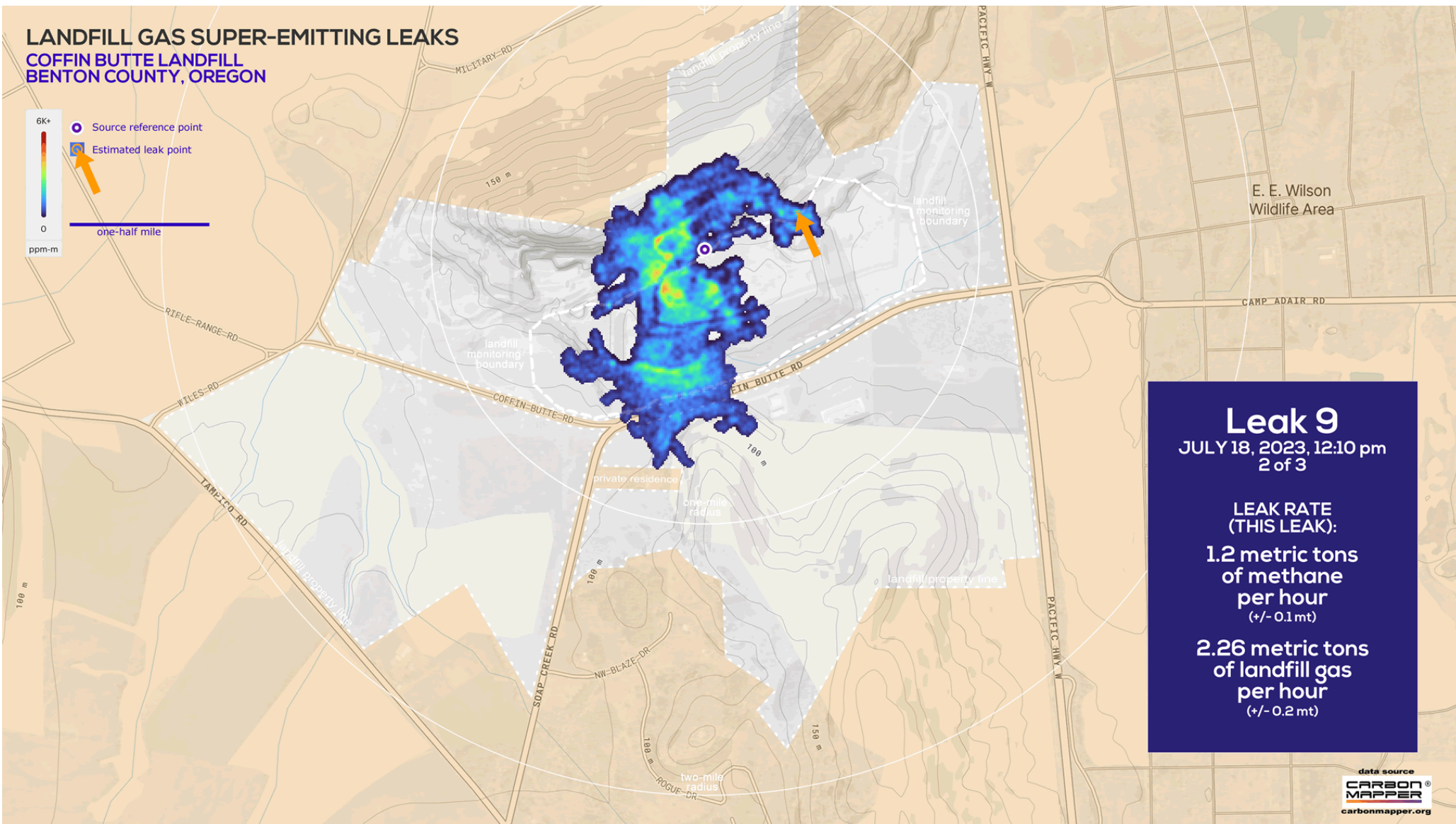
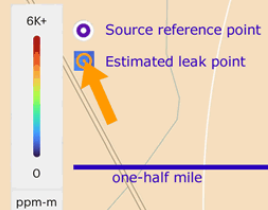


Leak 8
JULY 18, 2023, 12:10 pm
1 of 3

LEAK RATE
(THIS LEAK):
NOT YET QUANTIFIED

LANDFILL GAS SUPER-EMITTING LEAKS

COFFIN BUTTE LANDFILL BENTON COUNTY, OREGON



Leak 9

JULY 18, 2023, 12:10 pm
2 of 3

LEAK RATE
(THIS LEAK):

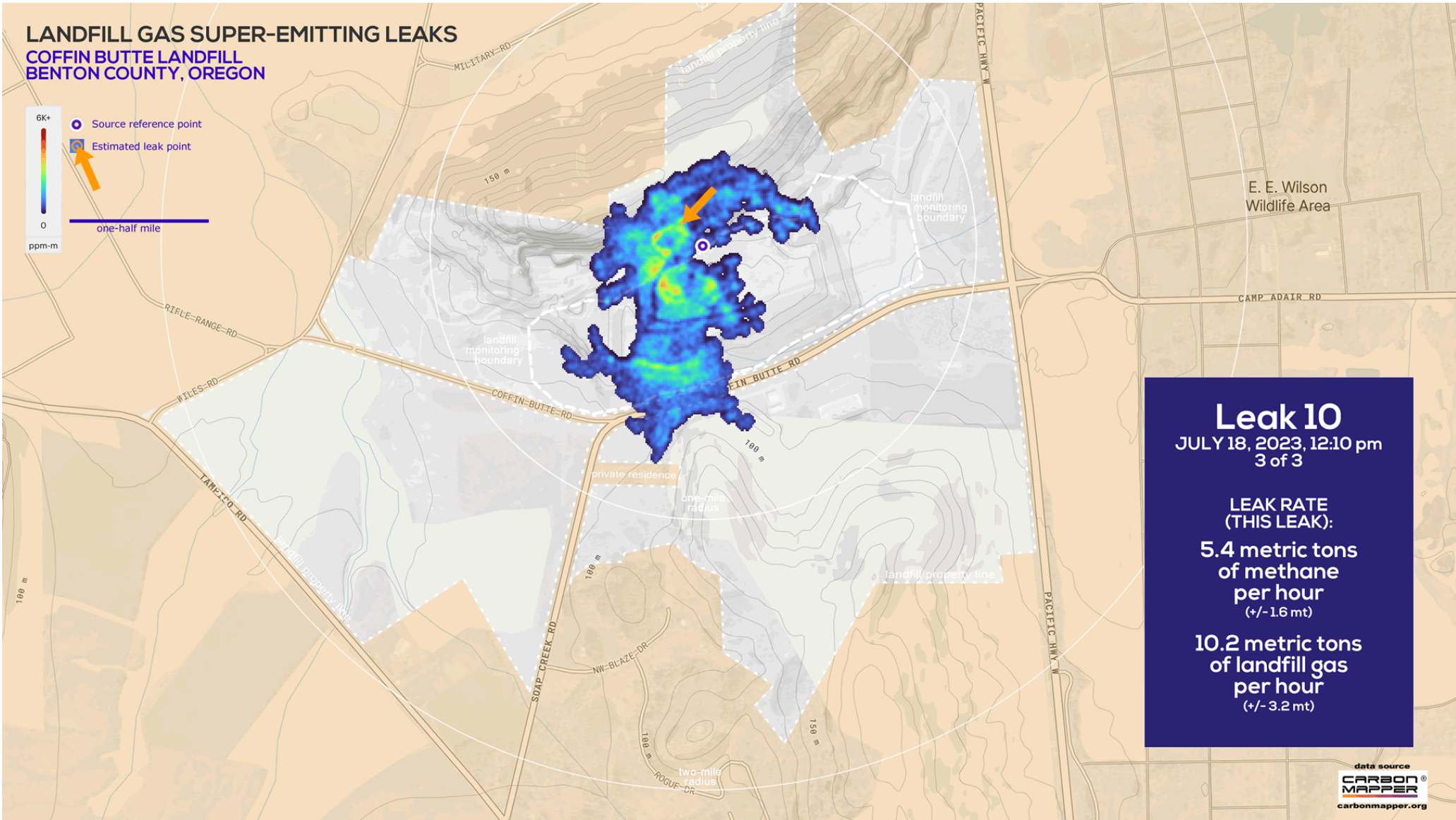
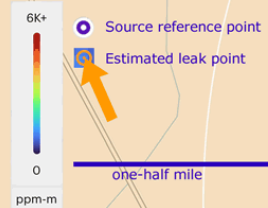
1.2 metric tons
of methane
per hour
(+/- 0.1 mt)

2.26 metric tons
of landfill gas
per hour
(+/- 0.2 mt)

data source
**CARBON
MAPPER**
carbonmapper.org

LANDFILL GAS SUPER-EMITTING LEAKS

COFFIN BUTTE LANDFILL BENTON COUNTY, OREGON



Leak 10

JULY 18, 2023, 12:10 pm
3 of 3

LEAK RATE
(THIS LEAK):

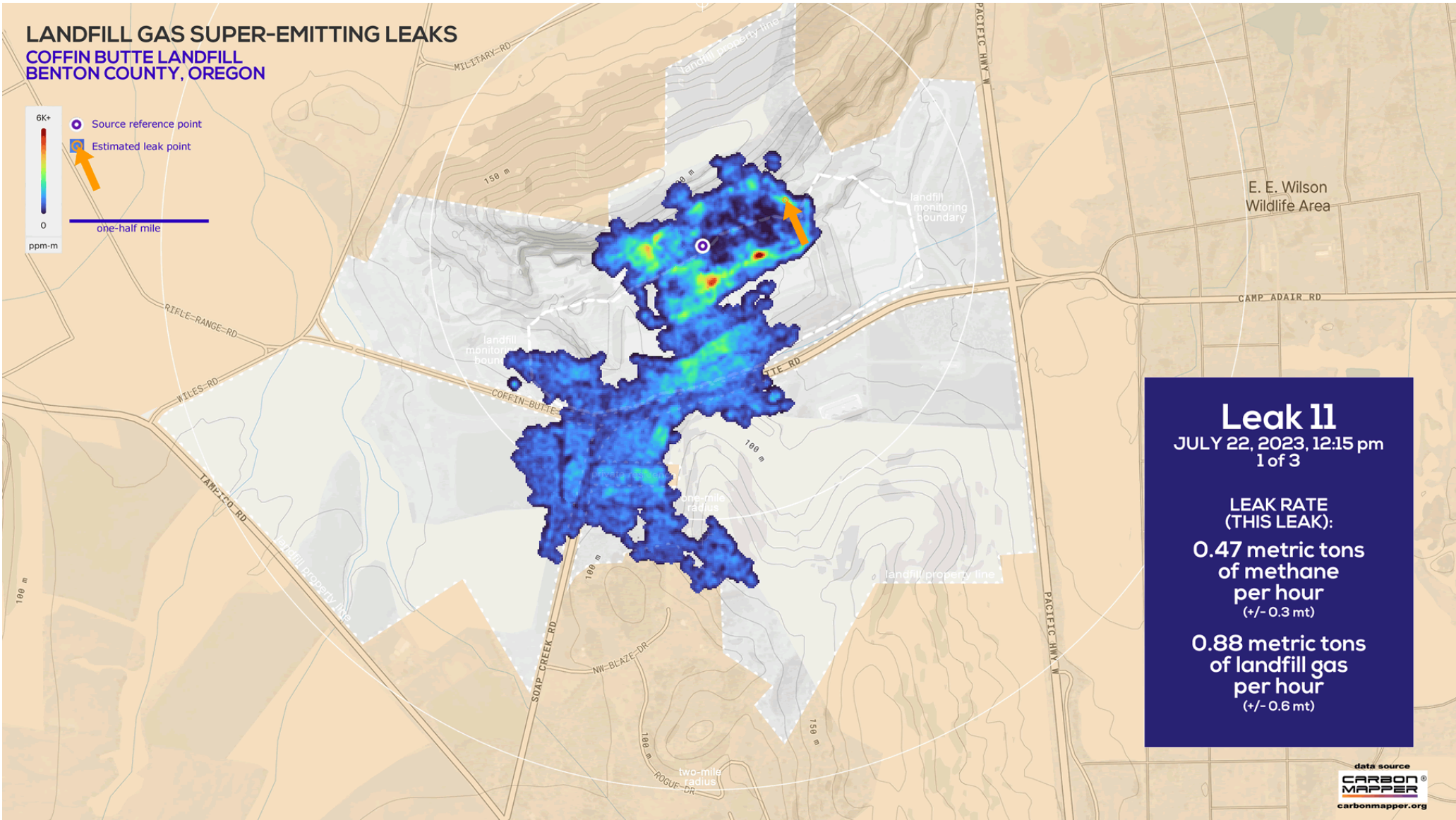
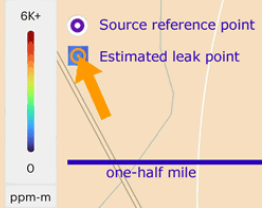
**5.4 metric tons
of methane
per hour**
(+/- 1.6 mt)

**10.2 metric tons
of landfill gas
per hour**
(+/- 3.2 mt)

data source
**CARBON
MAPPER**
carbonmapper.org

LANDFILL GAS SUPER-EMITTING LEAKS

COFFIN BUTTE LANDFILL
BENTON COUNTY, OREGON



Leak 11

JULY 22, 2023, 12:15 pm
1 of 3

LEAK RATE
(THIS LEAK):

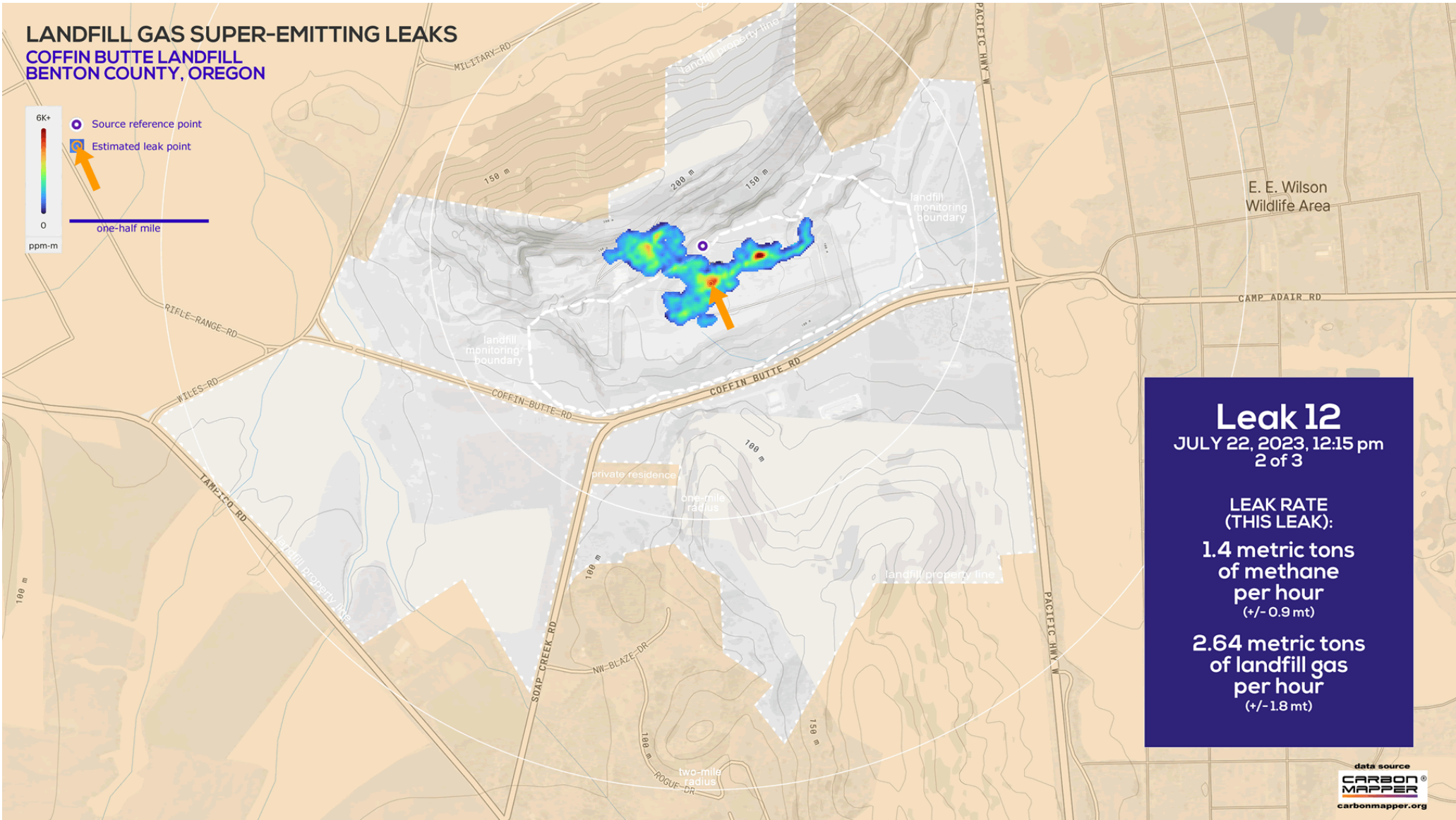
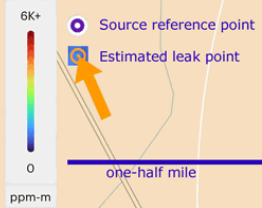
0.47 metric tons
of methane
per hour
(+/- 0.3 mt)

0.88 metric tons
of landfill gas
per hour
(+/- 0.6 mt)

data source
**CARBON
MAPPER**
carbonmapper.org

LANDFILL GAS SUPER-EMITTING LEAKS

COFFIN BUTTE LANDFILL BENTON COUNTY, OREGON



Leak 12

JULY 22, 2023, 12:15 pm
2 of 3

LEAK RATE
(THIS LEAK):

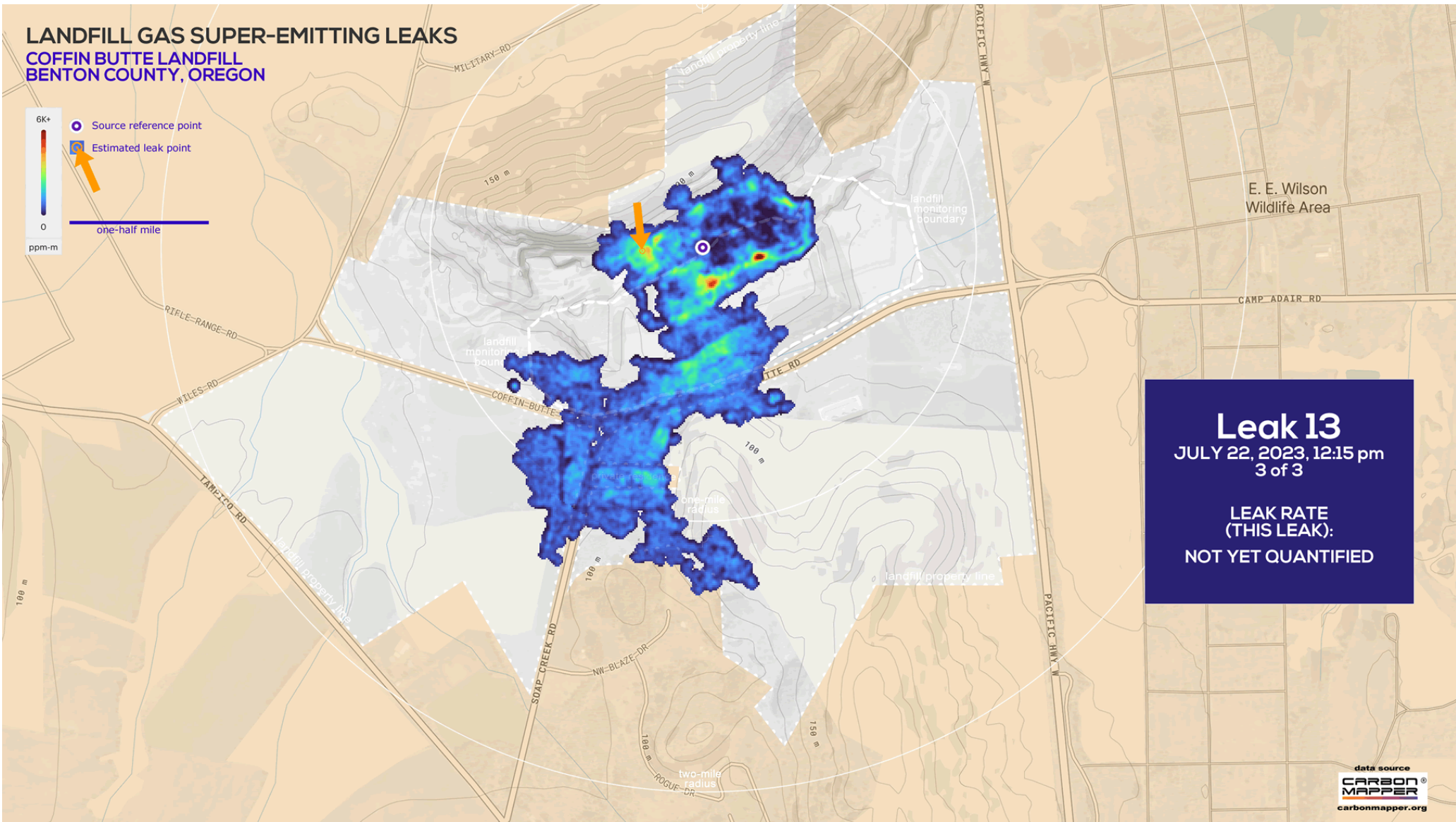
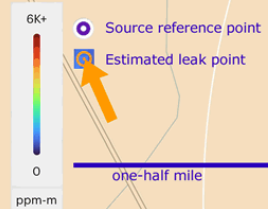
1.4 metric tons
of methane
per hour
(+/- 0.9 mt)

2.64 metric tons
of landfill gas
per hour
(+/- 1.8 mt)

data source
**CARBON
MAPPER**
carbonmapper.org

LANDFILL GAS SUPER-EMITTING LEAKS

COFFIN BUTTE LANDFILL
BENTON COUNTY, OREGON

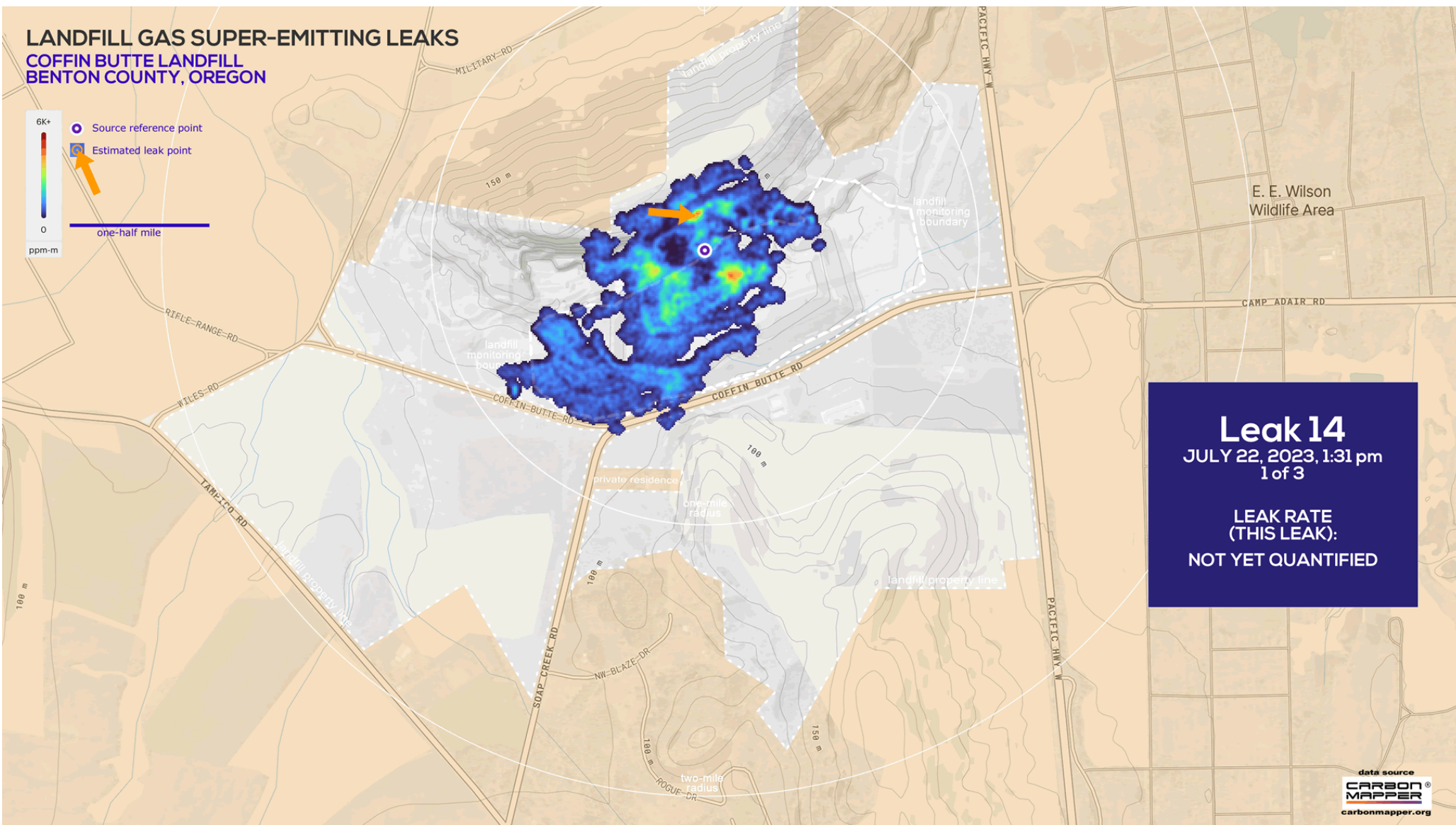
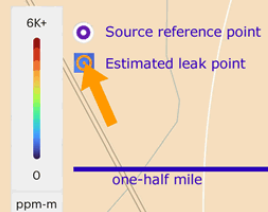


Leak 13
JULY 22, 2023, 12:15 pm
3 of 3

LEAK RATE
(THIS LEAK):
NOT YET QUANTIFIED

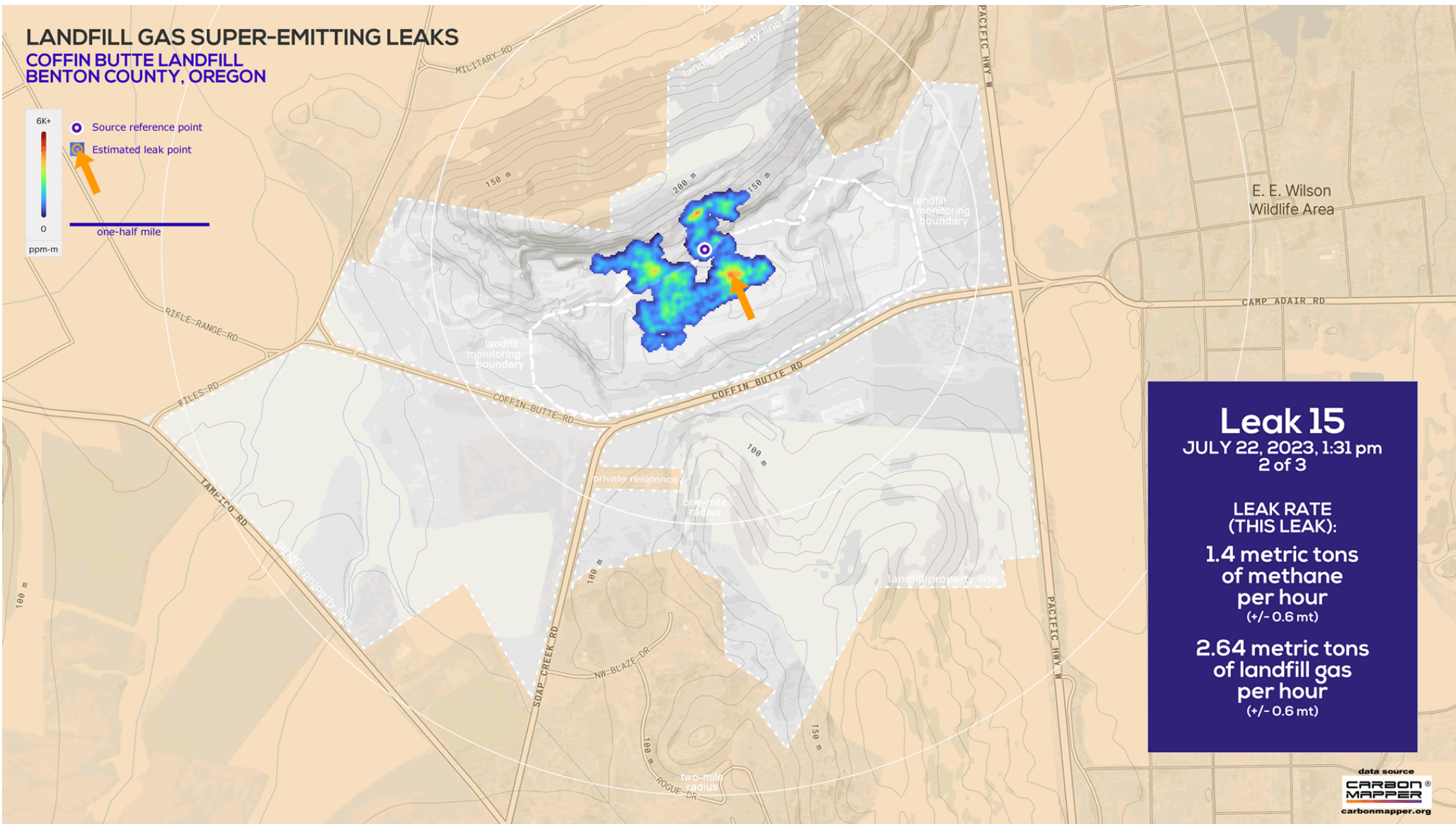
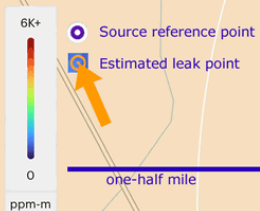
LANDFILL GAS SUPER-EMITTING LEAKS

COFFIN BUTTE LANDFILL
BENTON COUNTY, OREGON



LANDFILL GAS SUPER-EMITTING LEAKS

COFFIN BUTTE LANDFILL BENTON COUNTY, OREGON



Leak 15
JULY 22, 2023, 1:31 pm
2 of 3

LEAK RATE
(THIS LEAK):

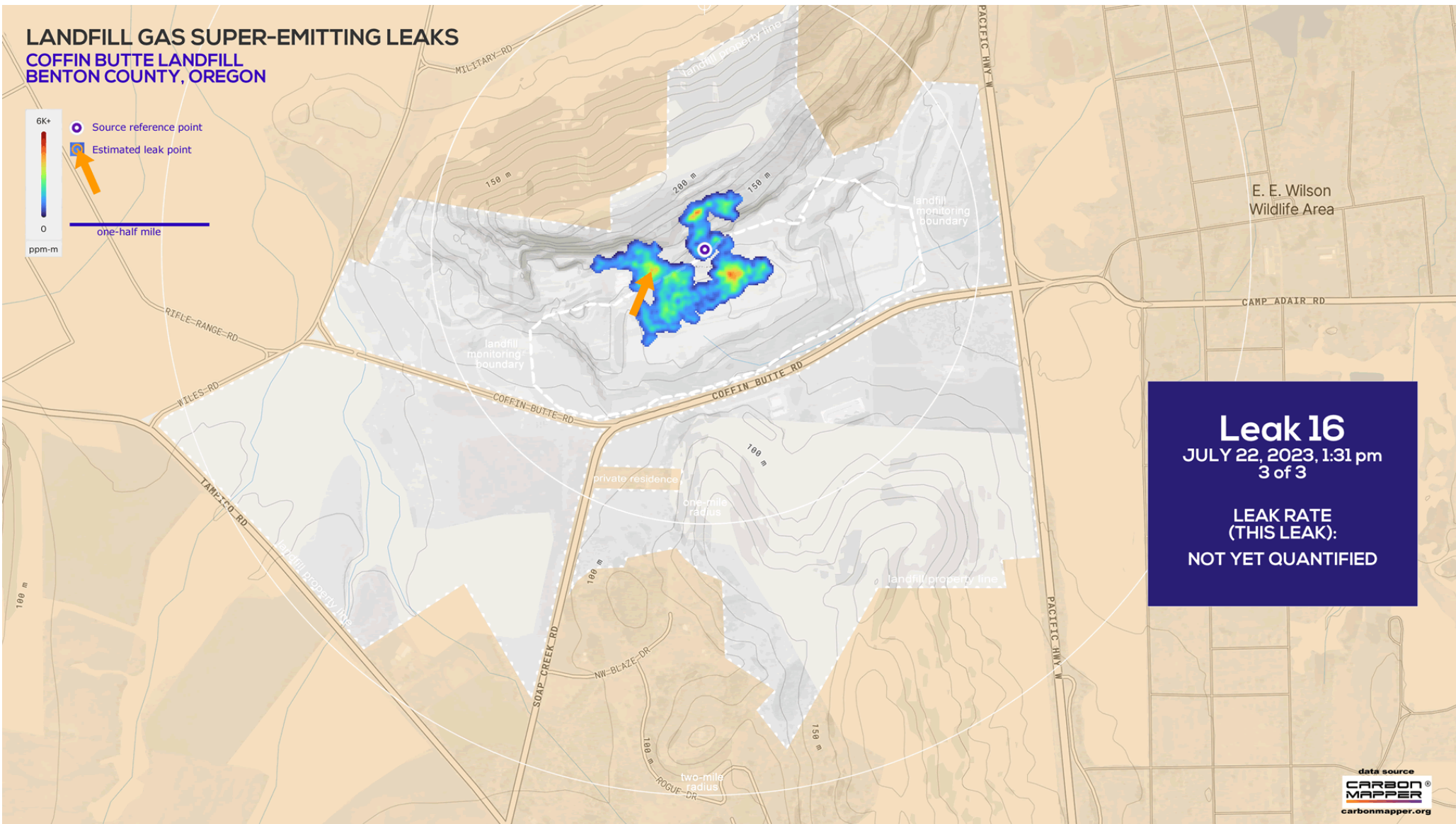
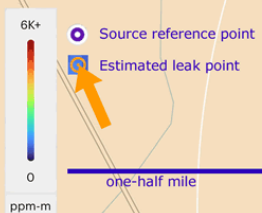
**1.4 metric tons
of methane
per hour**
(+/- 0.6 mt)

**2.64 metric tons
of landfill gas
per hour**
(+/- 0.6 mt)

data source
**CARBON
MAPPER**
carbonmapper.org

LANDFILL GAS SUPER-EMITTING LEAKS

COFFIN BUTTE LANDFILL BENTON COUNTY, OREGON



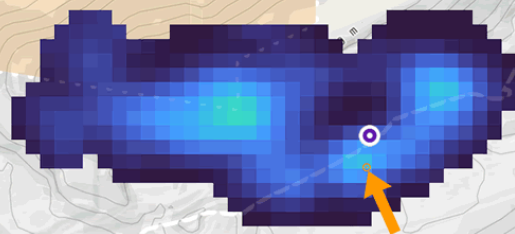
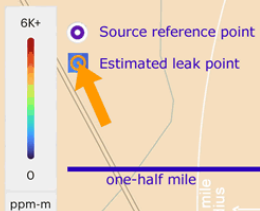
Leak 16
JULY 22, 2023, 1:31 pm
3 of 3

LEAK RATE
(THIS LEAK):
NOT YET QUANTIFIED

data source
**CARBON
MAPPER**
carbonmapper.org

LANDFILL GAS SUPER-EMITTING LEAKS

COFFIN BUTTE LANDFILL BENTON COUNTY, OREGON



Leak 17
SEPTEMBER 28, 2024

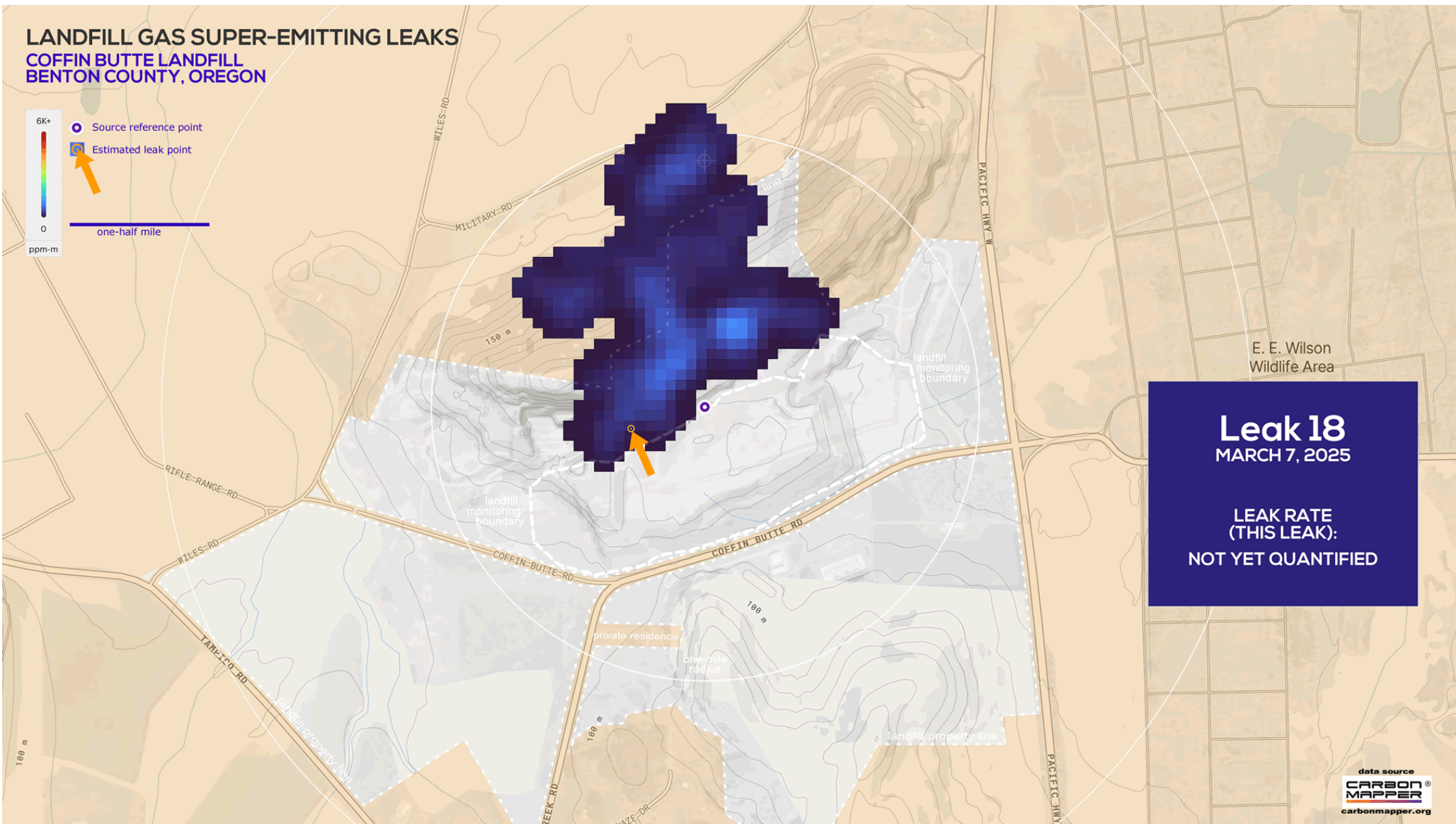
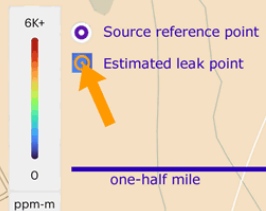
LEAK RATE
(THIS LEAK):
**0.7 metric tons
of methane
per hour**
(+/- 0.4 mt)

**1.32 metric tons
of landfill gas
per hour**
(+/- 0.8 mt)

data source
**CARBON
MAPPER**
carbonmapper.org

LANDFILL GAS SUPER-EMITTING LEAKS

COFFIN BUTTE LANDFILL BENTON COUNTY, OREGON



Leak 18

MARCH 7, 2025

**LEAK RATE
(THIS LEAK):
NOT YET QUANTIFIED**

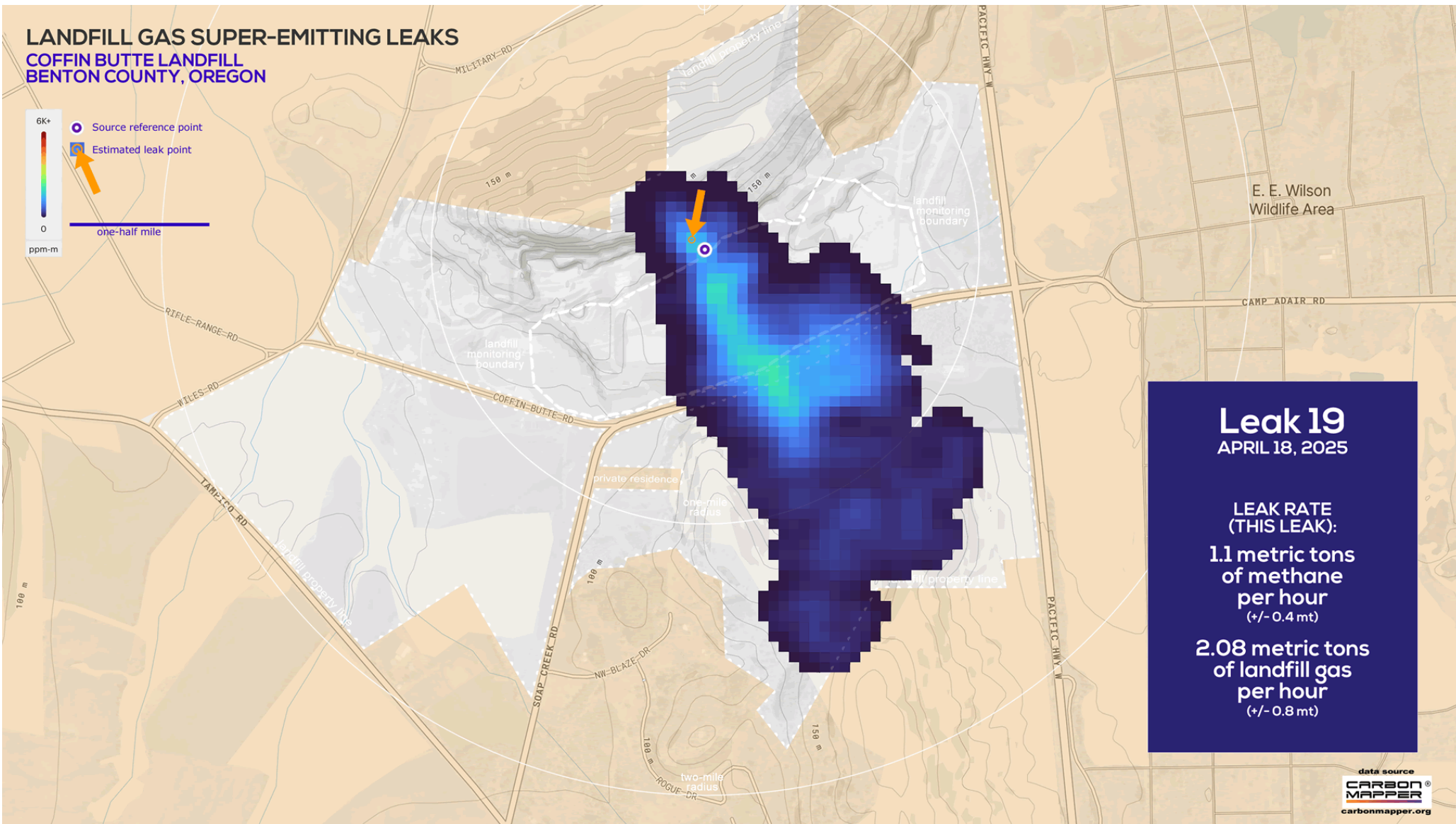
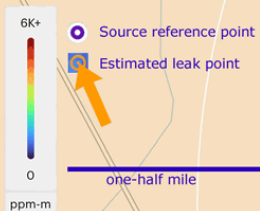
data source

**CARBON
MAPPER**

carbonmapper.org

LANDFILL GAS SUPER-EMITTING LEAKS

COFFIN BUTTE LANDFILL BENTON COUNTY, OREGON



Leak 19 APRIL 18, 2025

LEAK RATE (THIS LEAK):

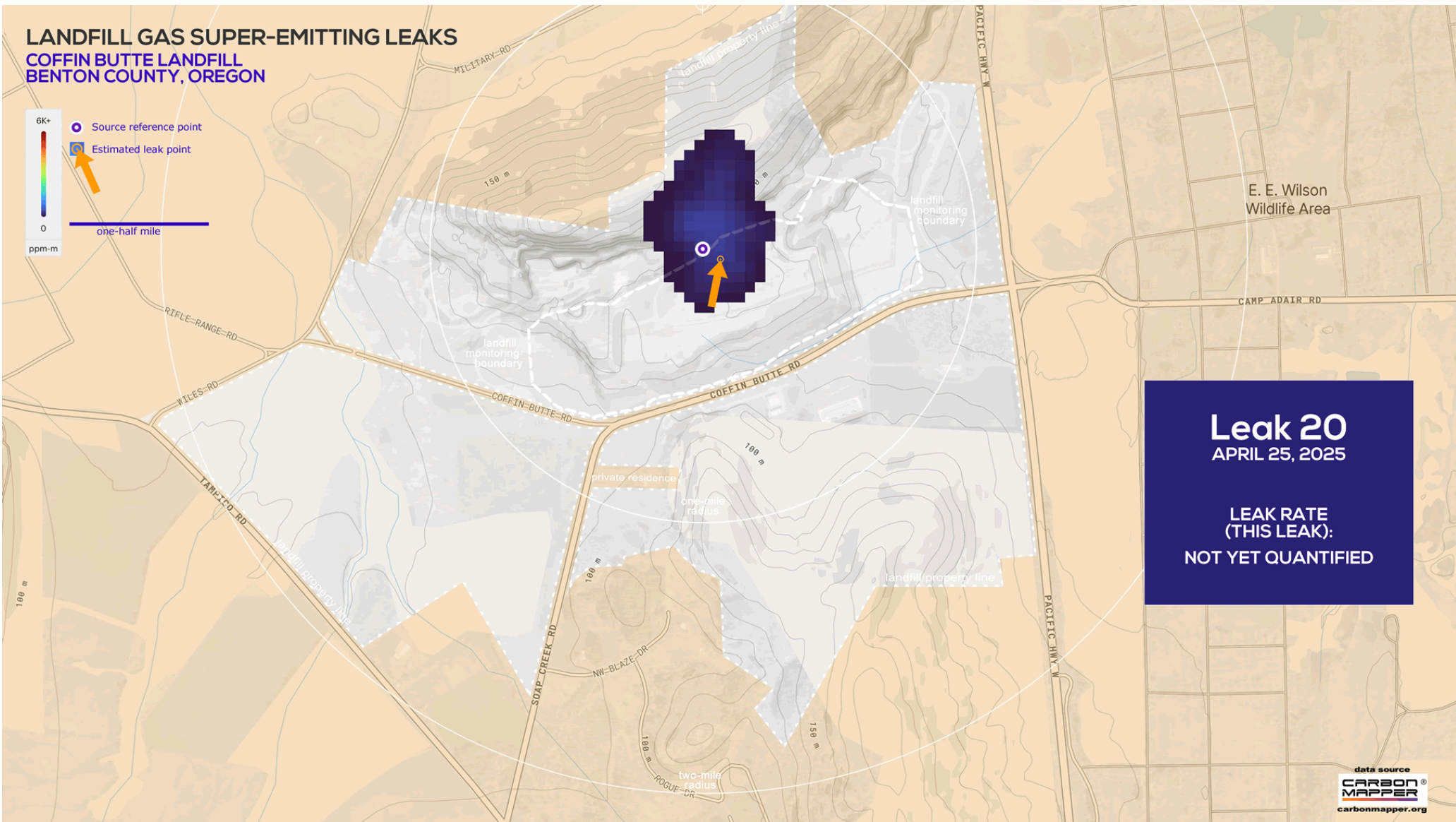
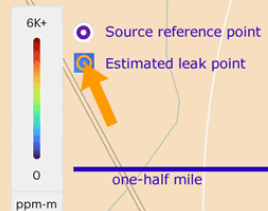
1.1 metric tons
of methane
per hour
(± 0.4 mt)

2.08 metric tons
of landfill gas
per hour
(± 0.8 mt)

data source
**CARBON
MAPPER**
carbonmapper.org

LANDFILL GAS SUPER-EMITTING LEAKS

COFFIN BUTTE LANDFILL BENTON COUNTY, OREGON



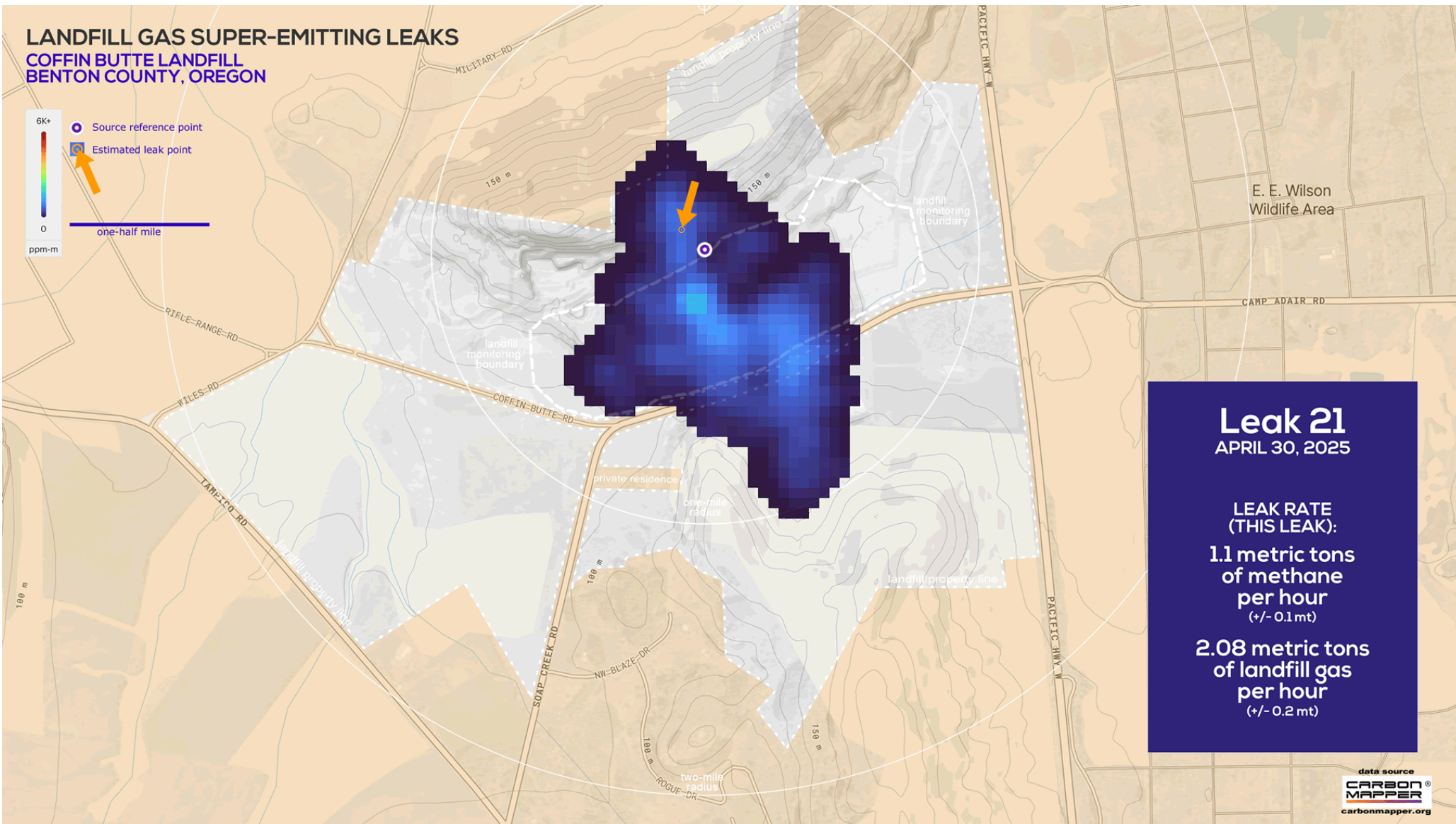
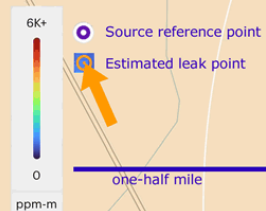
Leak 20
APRIL 25, 2025

LEAK RATE
(THIS LEAK):
NOT YET QUANTIFIED

data source
**CARBON
MAPPER**
carbonmapper.org

LANDFILL GAS SUPER-EMITTING LEAKS

COFFIN BUTTE LANDFILL BENTON COUNTY, OREGON



Leak 21 APRIL 30, 2025

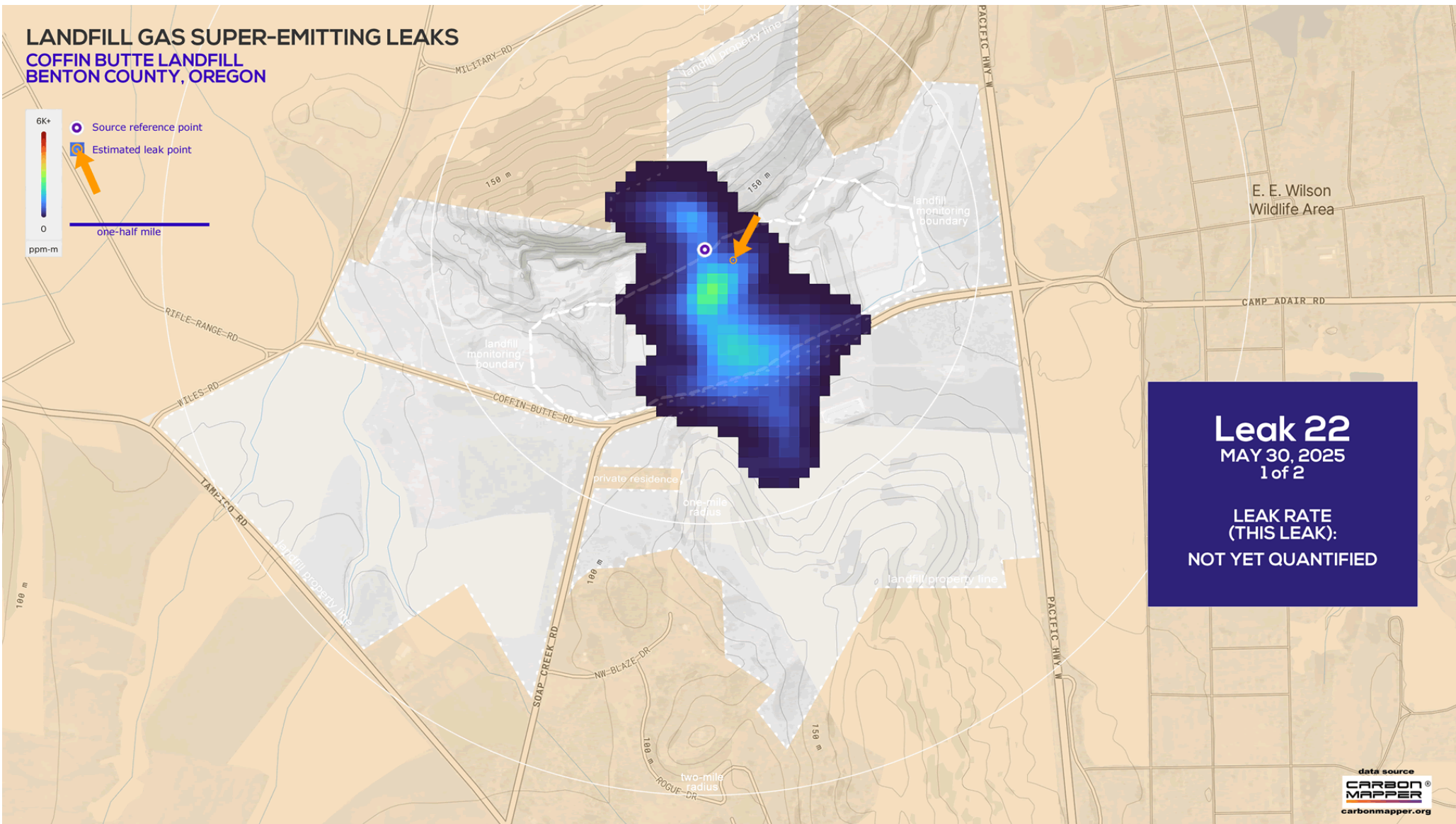
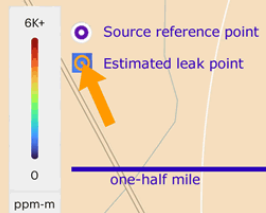
LEAK RATE
(THIS LEAK):

1.1 metric tons
of methane
per hour
(± 0.1 mt)

2.08 metric tons
of landfill gas
per hour
(± 0.2 mt)

data source
**CARBON
MAPPER**
carbonmapper.org

COFFIN BUTTE LANDFILL BENTON COUNTY, OREGON



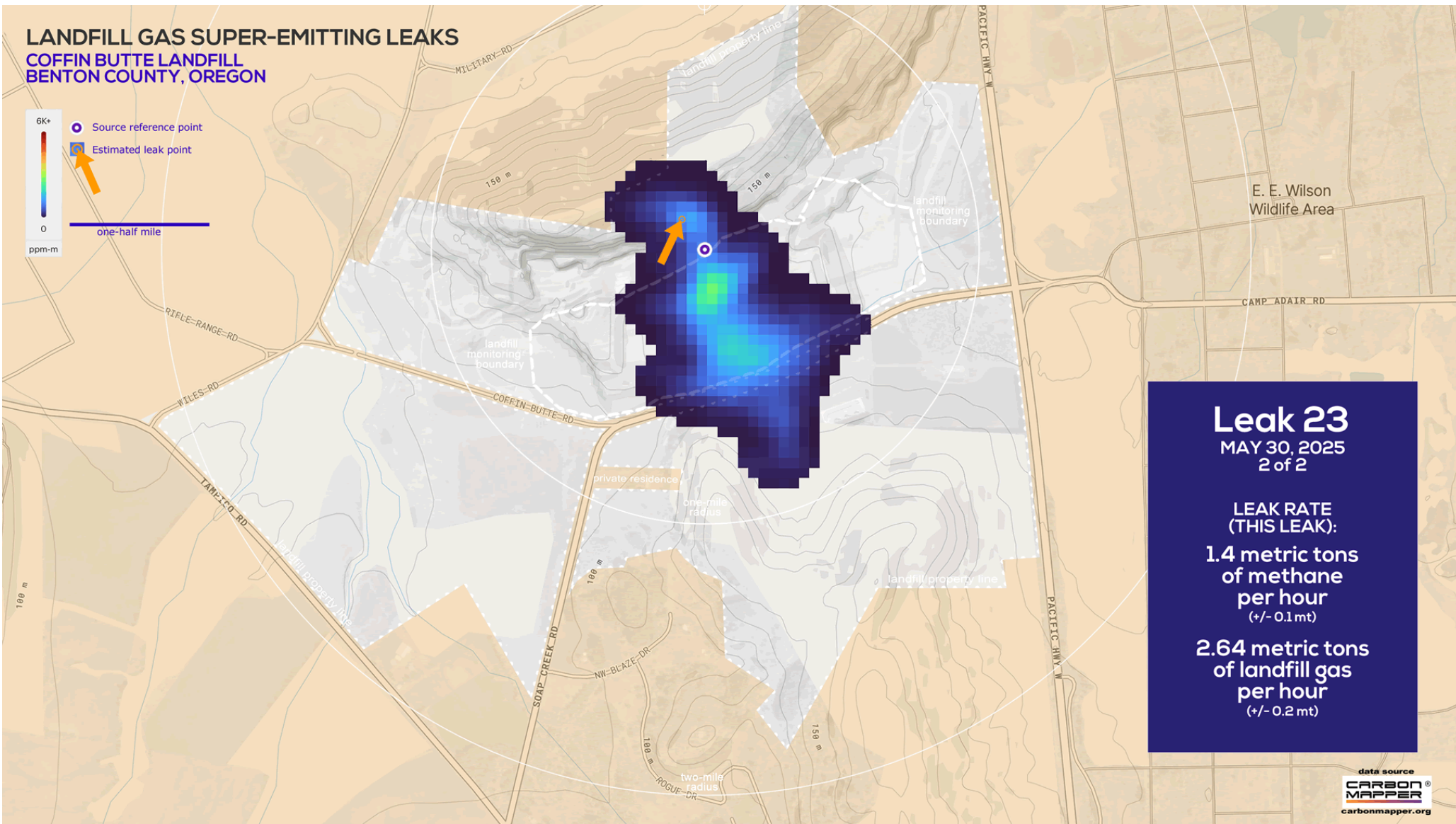
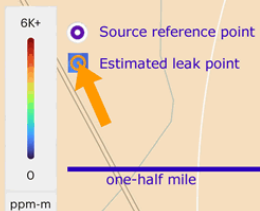
Leak 22
MAY 30, 2025
1 of 2

**LEAK RATE
(THIS LEAK):
NOT YET QUANTIFIED**

data source
**CARBON
MAPPER**
carbonmapper.org

LANDFILL GAS SUPER-EMITTING LEAKS

COFFIN BUTTE LANDFILL
BENTON COUNTY, OREGON



Leak 23

MAY 30, 2025
2 of 2

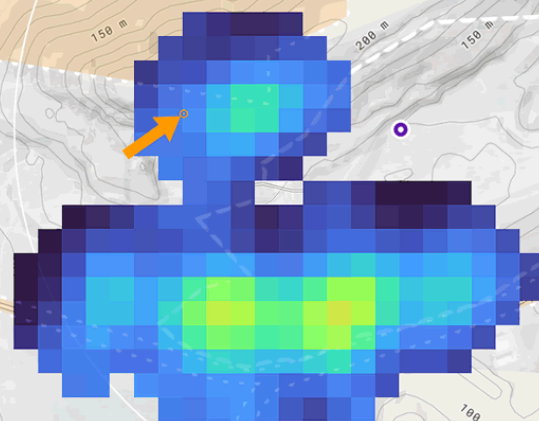
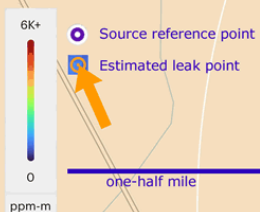
LEAK RATE
(THIS LEAK):

1.4 metric tons
of methane
per hour
(+/- 0.1 mt)

2.64 metric tons
of landfill gas
per hour
(+/- 0.2 mt)

data source
**CARBON
MAPPER**
carbonmapper.org

COFFIN BUTTE LANDFILL BENTON COUNTY, OREGON



Leak 24

JUNE 6, 2025

**LEAK RATE
(THIS LEAK):**

**1.6 metric tons
of methane
per hour
(+/- 1.1mt)**

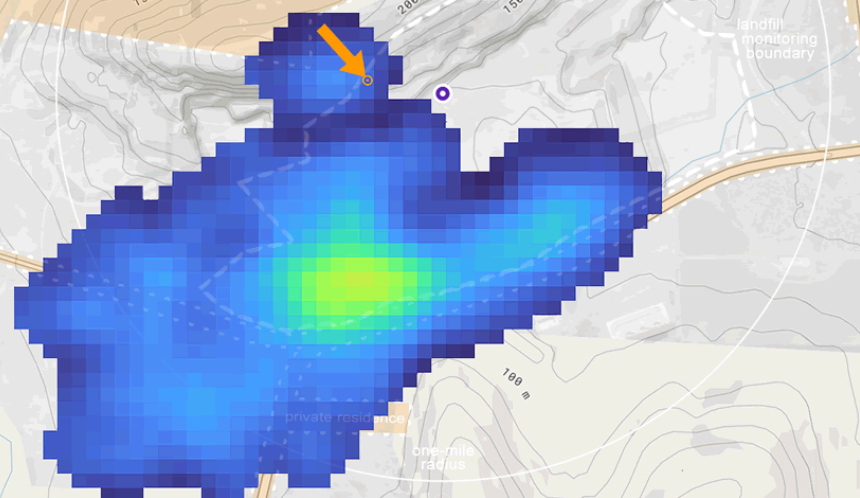
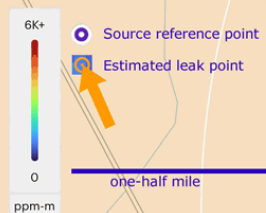
**3.02 metric tons
of landfill gas
per hour
(+/- 2.2 mt)**

data source

**CARBON
MAPPER**

carbonmapper.org

COFFIN BUTTE LANDFILL BENTON COUNTY, OREGON



Leak 25
JULY 18, 2025
1 of 3

**LEAK RATE
(THIS LEAK):**
**0.45 metric tons
of methane
per hour**
(+/- 0.14 mt)

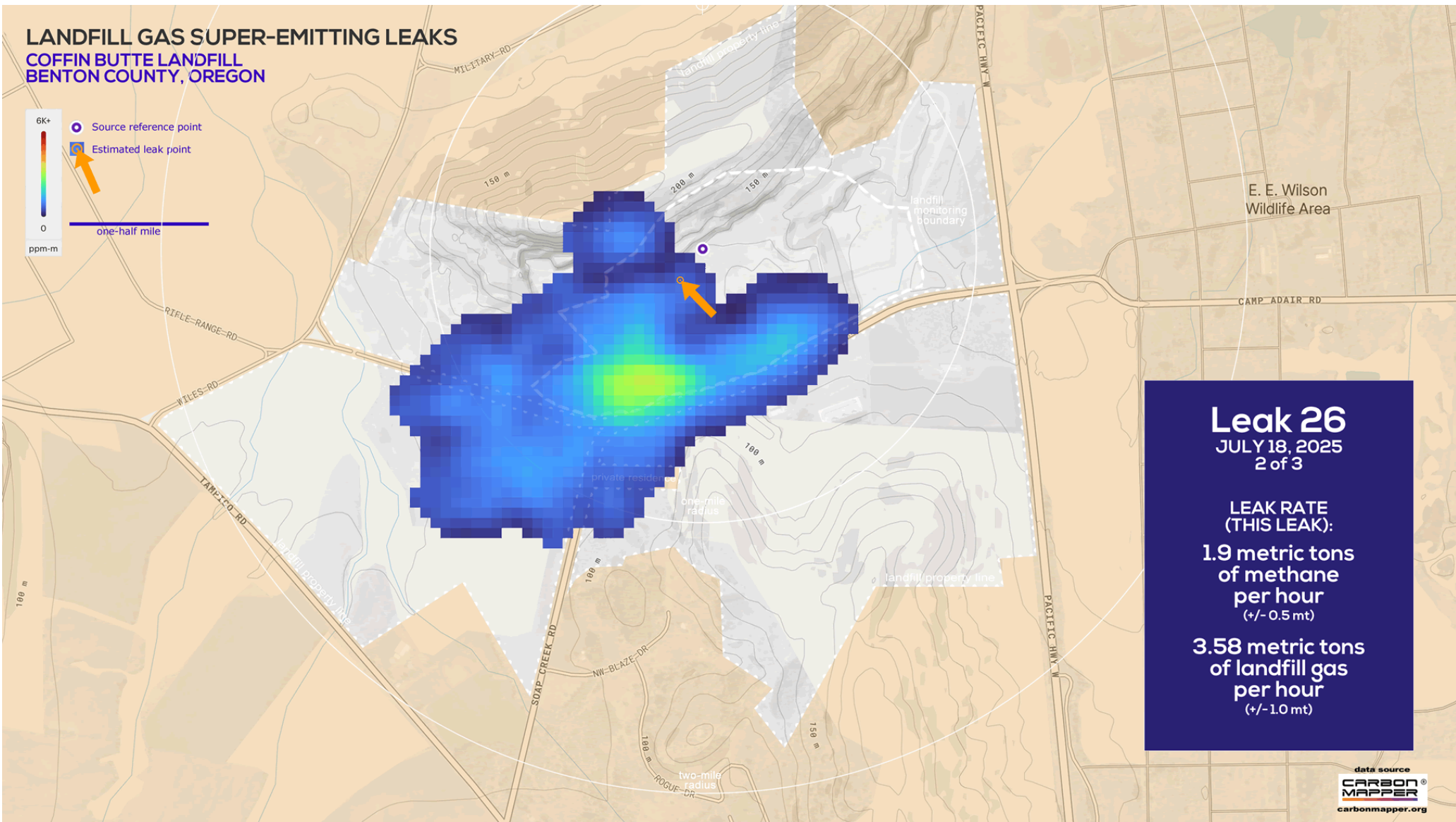
**0.85 metric tons
of landfill gas
per hour
(+/- 0.28 mt)**

data source

**CARBON
MAPPER**

carbonmapper.org

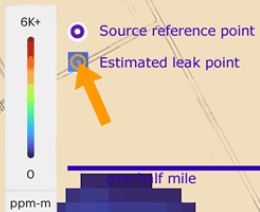
COFFIN BUTTE LANDFILL BENTON COUNTY, OREGON



**3.58 metric tons
of landfill gas
per hour
(+/- 1.0 mt)**

Eklund – Carbon Mapper – Page 35 of 55

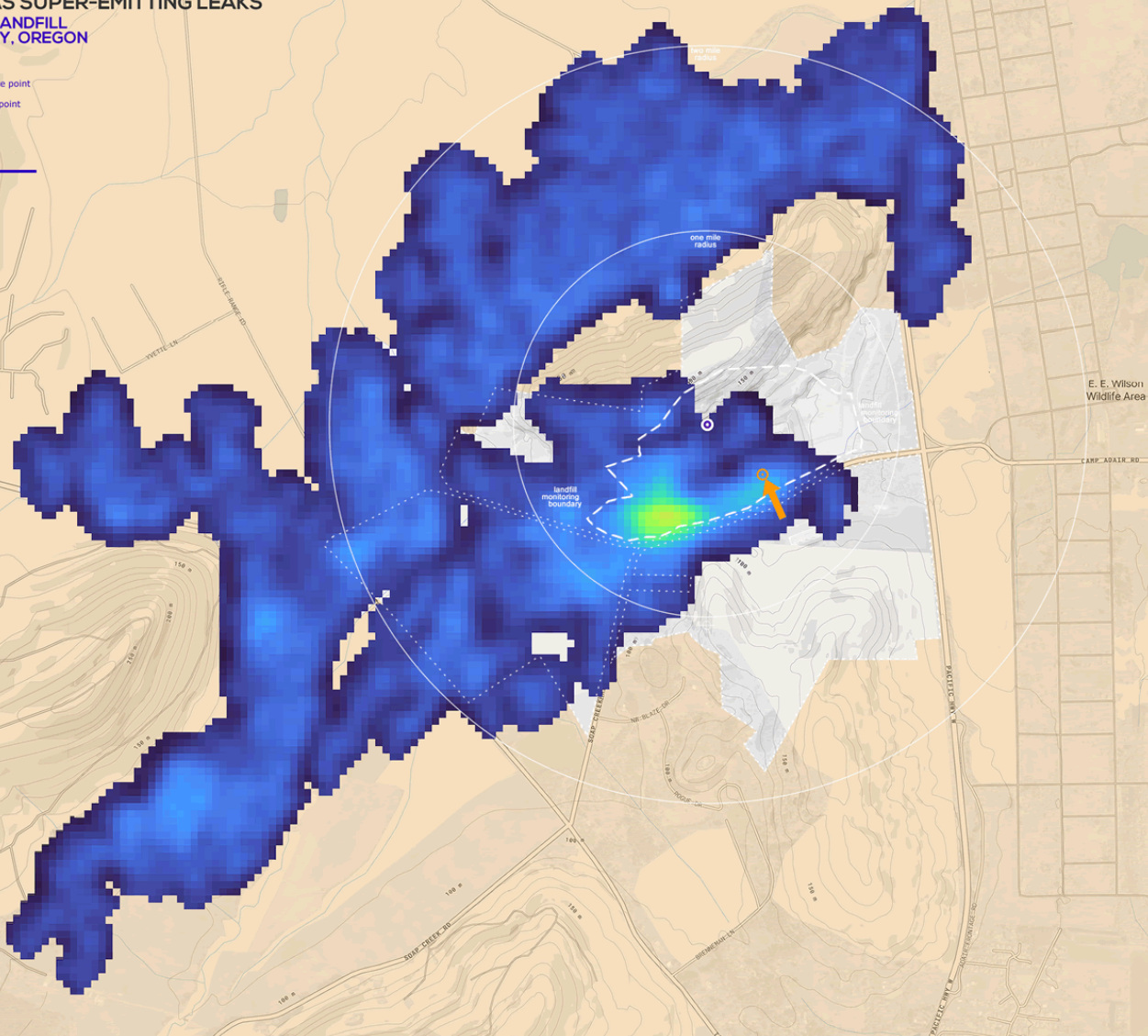
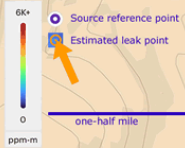
LANDFILL GAS SUPER-EMITTING LEAKS
COFFIN BUTTE LANDFILL
BENTON COUNTY, OREGON



Leak 27
JULY 18, 2025
3 of 3

LEAK RATE
(THIS LEAK):
NOT YET QUANTIFIED

LANDFILL GAS SUPER-EMITTING LEAKS
COFFIN BUTTE LANDFILL
BENTON COUNTY, OREGON

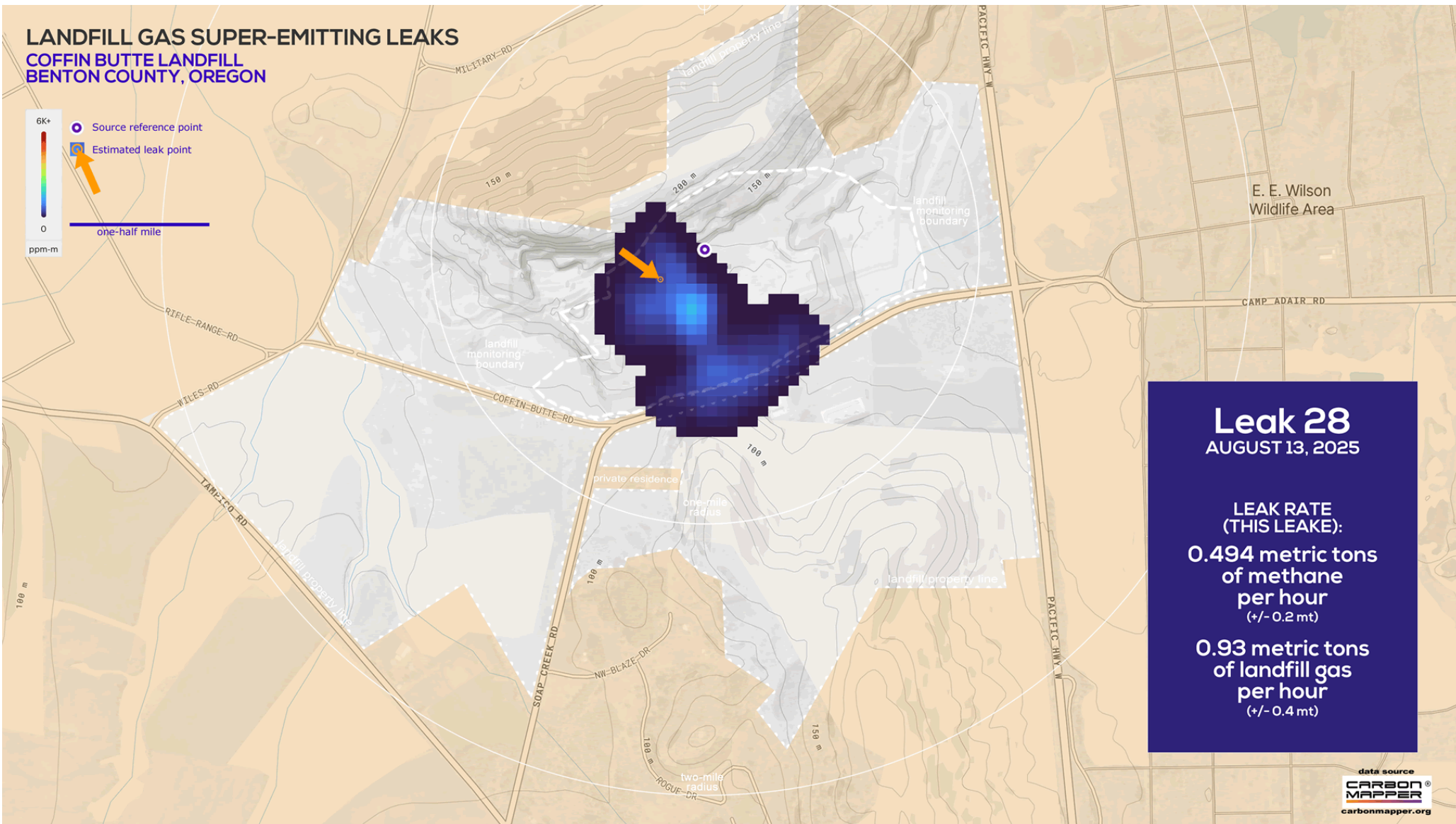
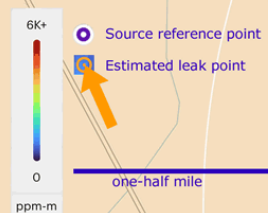


Leak 27
ZOOMED-OUT VIEW

(To show the entire plume, scale has been decreased to 53% of other plume images)

LANDFILL GAS SUPER-EMITTING LEAKS

COFFIN BUTTE LANDFILL BENTON COUNTY, OREGON



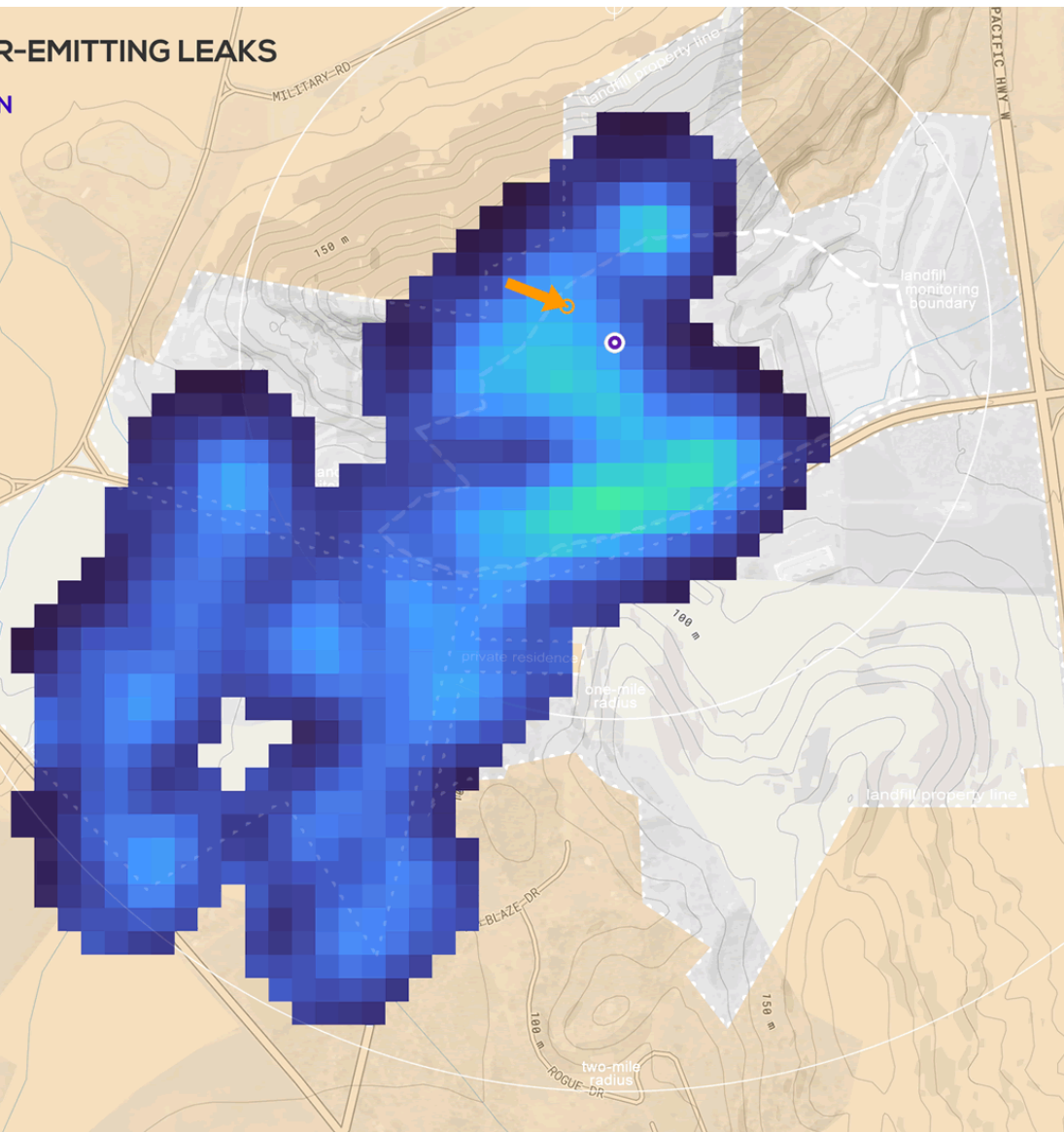
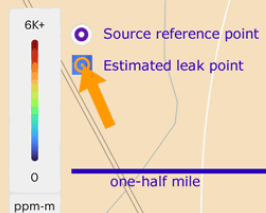
Leak 28 AUGUST 13, 2025

LEAK RATE
(THIS LEAK):
**0.494 metric tons
of methane
per hour**
(± 0.2 mt)

**0.93 metric tons
of landfill gas
per hour**
(± 0.4 mt)

data source
**CARBON
MAPPER**
carbonmapper.org

COFFIN BUTTE LANDFILL BENTON COUNTY, OREGON



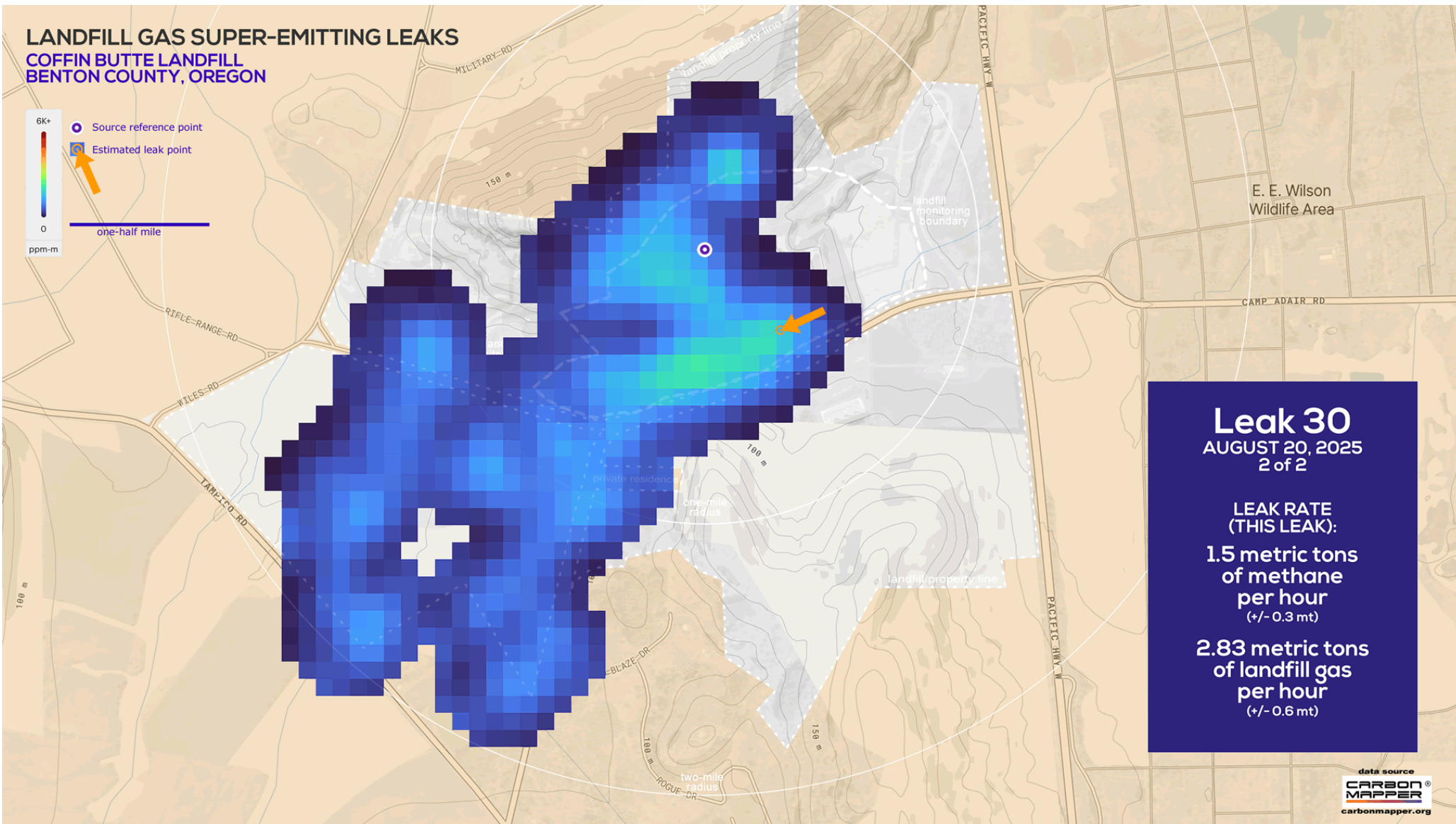
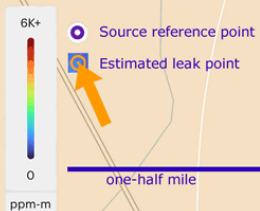
Leak 29
AUGUST 20, 2025
1 of 2

**LEAK RATE
(THIS LEAK):
NOT YET QUANTIFIED**

data source
CARBON MAPPER
carbonmapper.org

LANDFILL GAS SUPER-EMITTING LEAKS

COFFIN BUTTE LANDFILL
BENTON COUNTY, OREGON



Leak 30
AUGUST 20, 2025
2 of 2

LEAK RATE
(THIS LEAK):

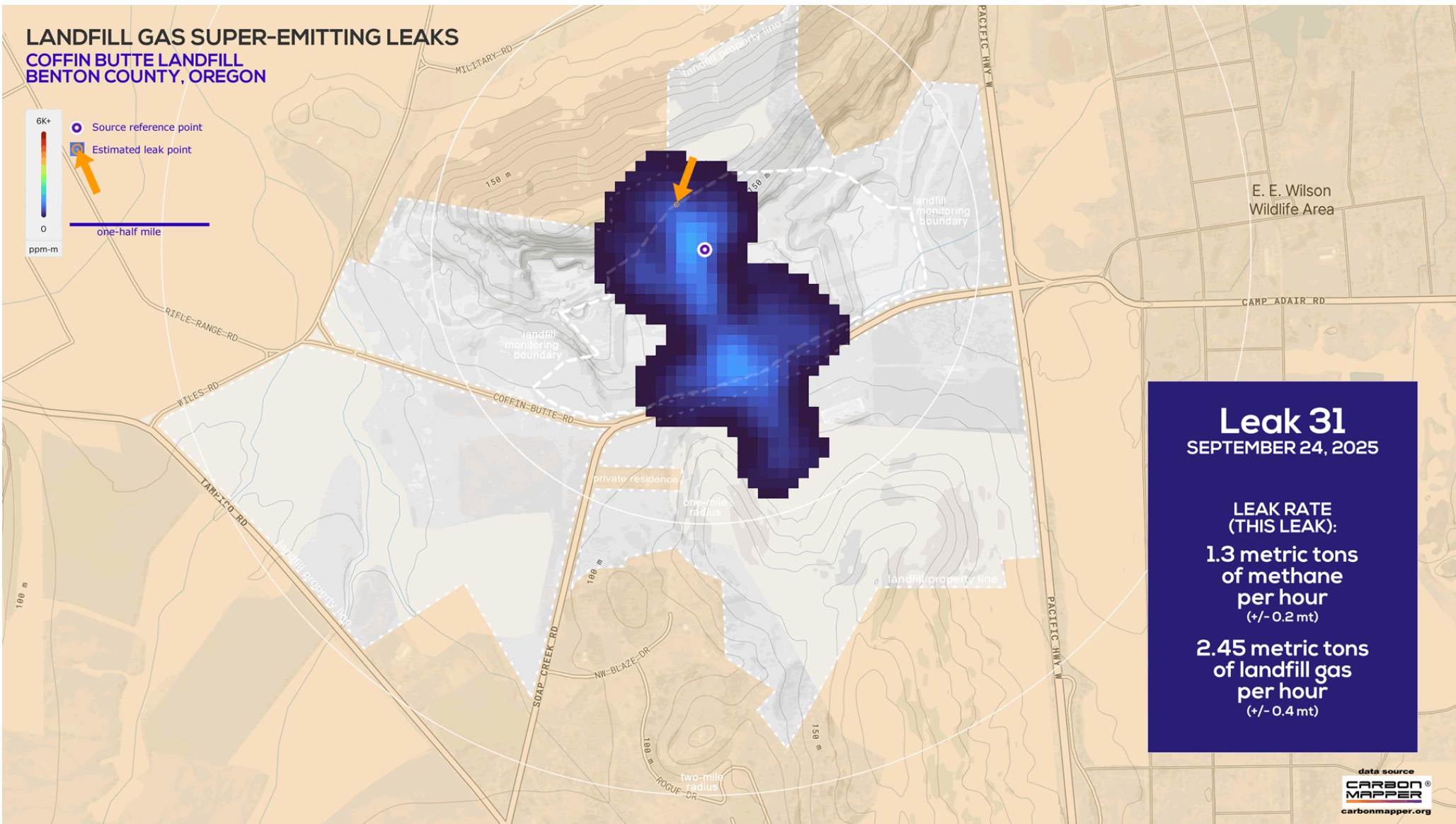
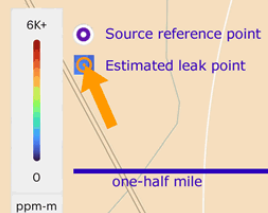
**1.5 metric tons
of methane
per hour**
(+/- 0.3 mt)

**2.83 metric tons
of landfill gas
per hour**
(+/- 0.6 mt)

data source
**CARBON
MAPPER**
carbonmapper.org

LANDFILL GAS SUPER-EMITTING LEAKS

COFFIN BUTTE LANDFILL BENTON COUNTY, OREGON



Leak 31
SEPTEMBER 24, 2025

LEAK RATE
(THIS LEAK):

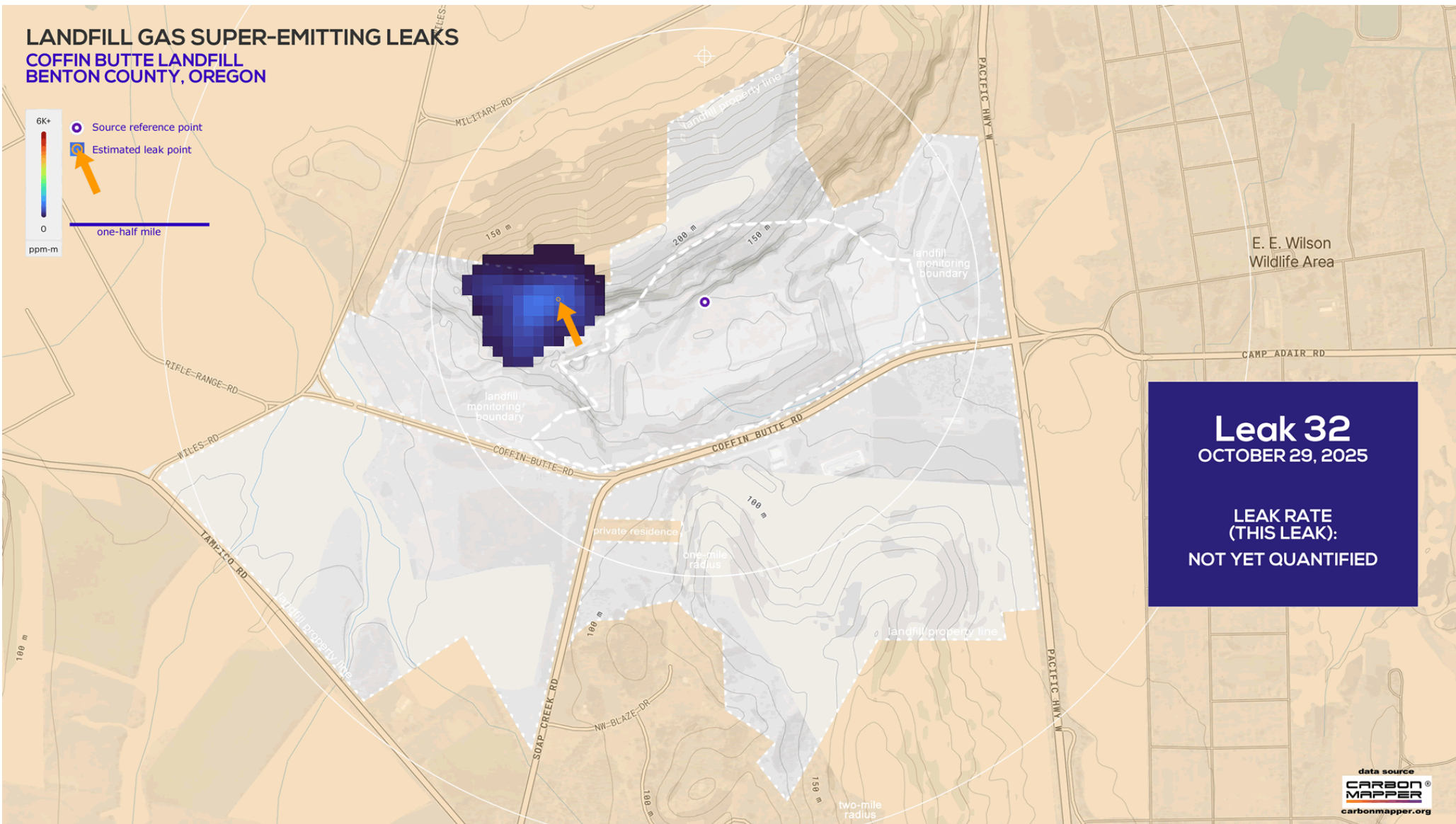
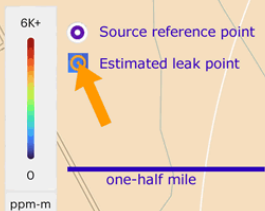
**1.3 metric tons
of methane
per hour**
(± 0.2 mt)

**2.45 metric tons
of landfill gas
per hour**
(± 0.4 mt)

data source
**CARBON
MAPPER**
carbonmapper.org

LANDFILL GAS SUPER-EMITTING LEAKS

COFFIN BUTTE LANDFILL BENTON COUNTY, OREGON

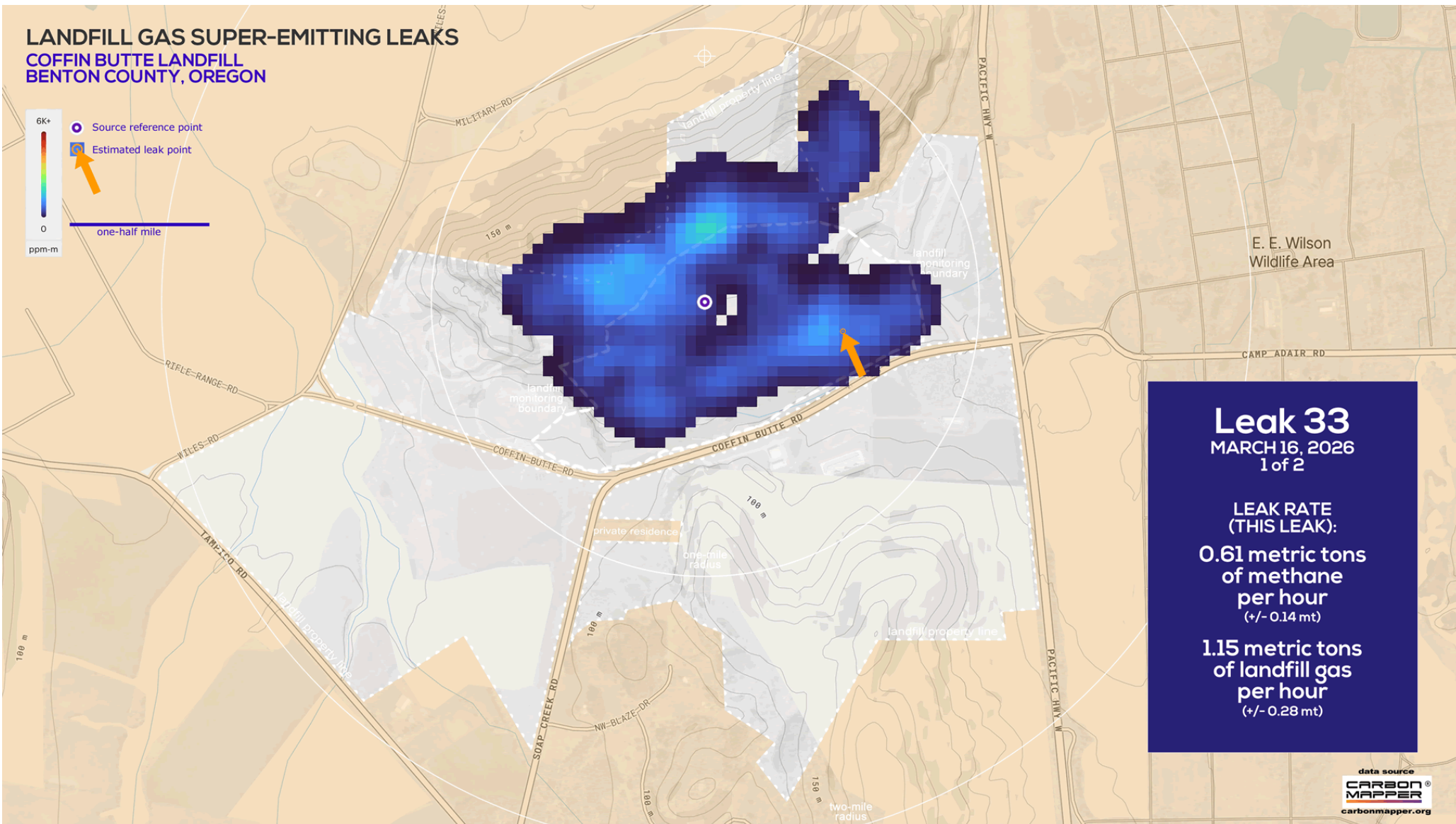
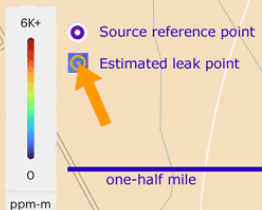


Leak 32
OCTOBER 29, 2025

LEAK RATE
(THIS LEAK):
NOT YET QUANTIFIED

LANDFILL GAS SUPER-EMITTING LEAKS

COFFIN BUTTE LANDFILL BENTON COUNTY, OREGON



Leak 33
MARCH 16, 2026
1 of 2

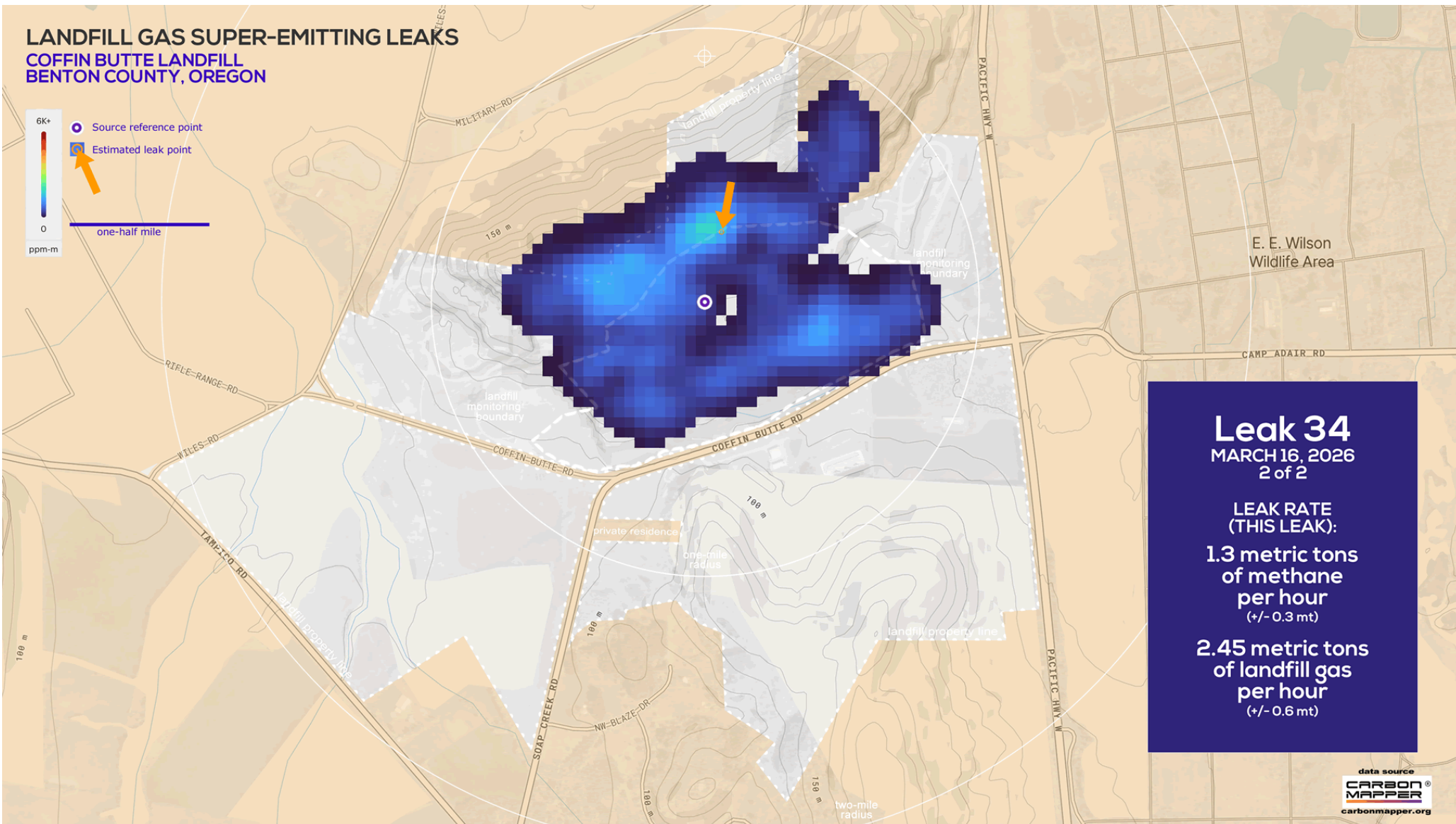
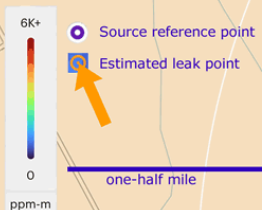
LEAK RATE
(THIS LEAK):
**0.61 metric tons
of methane
per hour**
(+/- 0.14 mt)

**1.15 metric tons
of landfill gas
per hour**
(+/- 0.28 mt)

data source
**CARBON
MAPPER**
carbonmapper.org

LANDFILL GAS SUPER-EMITTING LEAKS

COFFIN BUTTE LANDFILL BENTON COUNTY, OREGON



Leak 34
MARCH 16, 2026
2 of 2

LEAK RATE
(THIS LEAK):

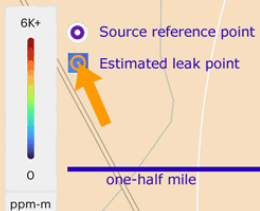
**1.3 metric tons
of methane
per hour**
(+/- 0.3 mt)

**2.45 metric tons
of landfill gas
per hour**
(+/- 0.6 mt)

data source
**CARBON
MAPPER**
carbonmapper.org

LANDFILL GAS SUPER-EMITTING LEAKS

COFFIN BUTTE LANDFILL
BENTON COUNTY, OREGON



Leak 35 MAY 6, 2026

LEAK RATE
(THIS LEAK):

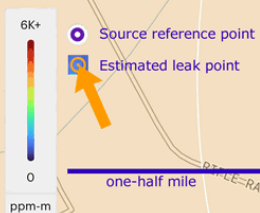
2.9 metric tons
of methane
per hour
(+/- 0.5 mt)

5.47 metric tons
of landfill gas
per hour
(+/- 1.0 mt)

data source
**CARBON
MAPPER**
carbonmapper.org

LANDFILL GAS SUPER-EMITTING LEAKS

COFFIN BUTTE LANDFILL BENTON COUNTY, OREGON



E. E. Wilson
Wildlife Area

CAMP ADAIR RD

150 m

landfill monitoring boundary

WILES RD

COFFIN-BUTTE RD

private residence

landfill property line

PACIFIC HWY 101

Leak 36
MAY 22, 2026

LEAK RATE
(THIS LEAK):

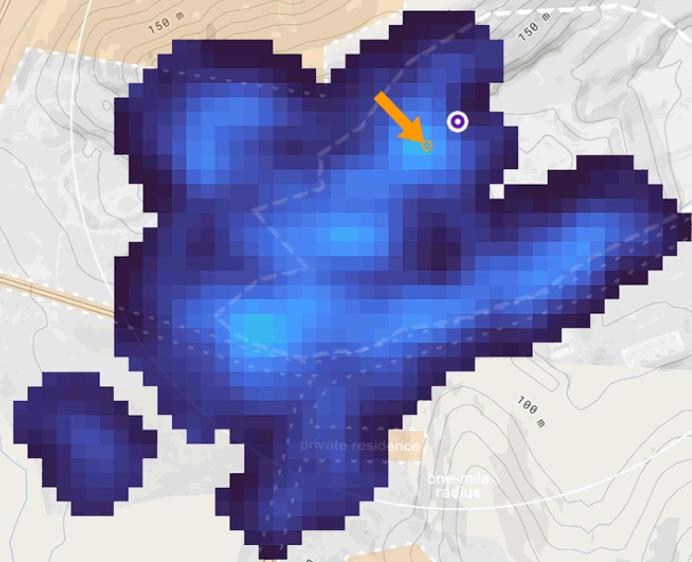
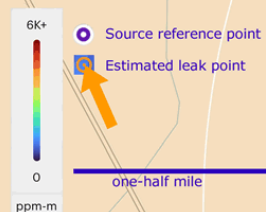
**2.1 metric tons
of methane
per hour**
(+/- 0.3 mt)

**3.96 metric tons
of landfill gas
per hour**
(+/- 0.6 mt)

data source
**CARBON
MAPPER**
carbonmapper.org

LANDFILL GAS SUPER-EMITTING LEAKS

COFFIN BUTTE LANDFILL BENTON COUNTY, OREGON



Leak 37 JUNE 6, 2026

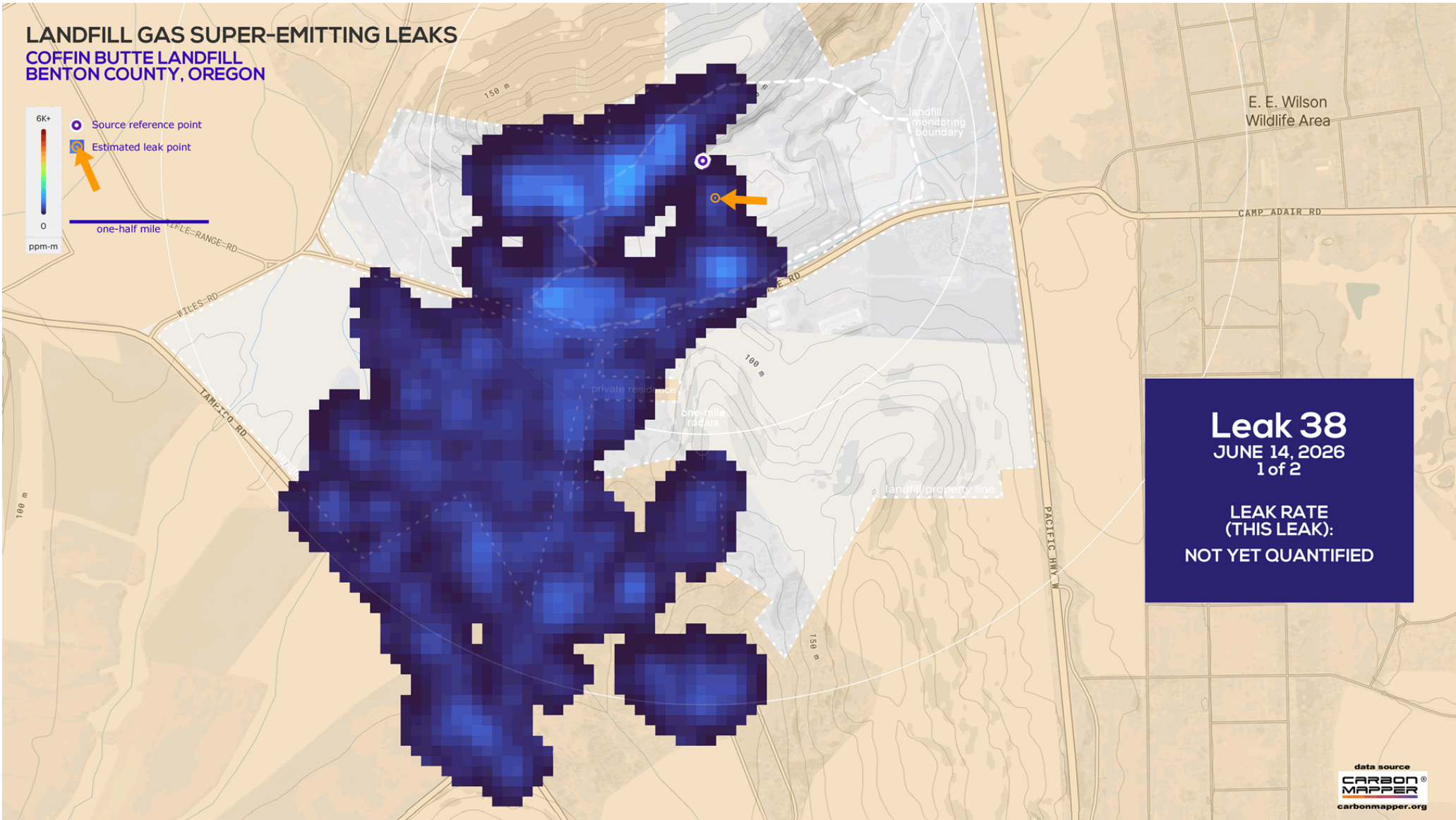
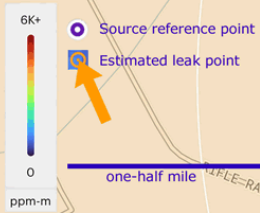
LEAK RATE
(THIS LEAK):
**0.7 metric tons
of methane
per hour**
(+/- 0.15 mt)

**1.32 metric tons
of landfill gas
per hour**
(+/- 0.3 mt)

data source
**CARBON
MAPPER**
carbonmapper.org

LANDFILL GAS SUPER-EMITTING LEAKS

COFFIN BUTTE LANDFILL BENTON COUNTY, OREGON



Leak 38

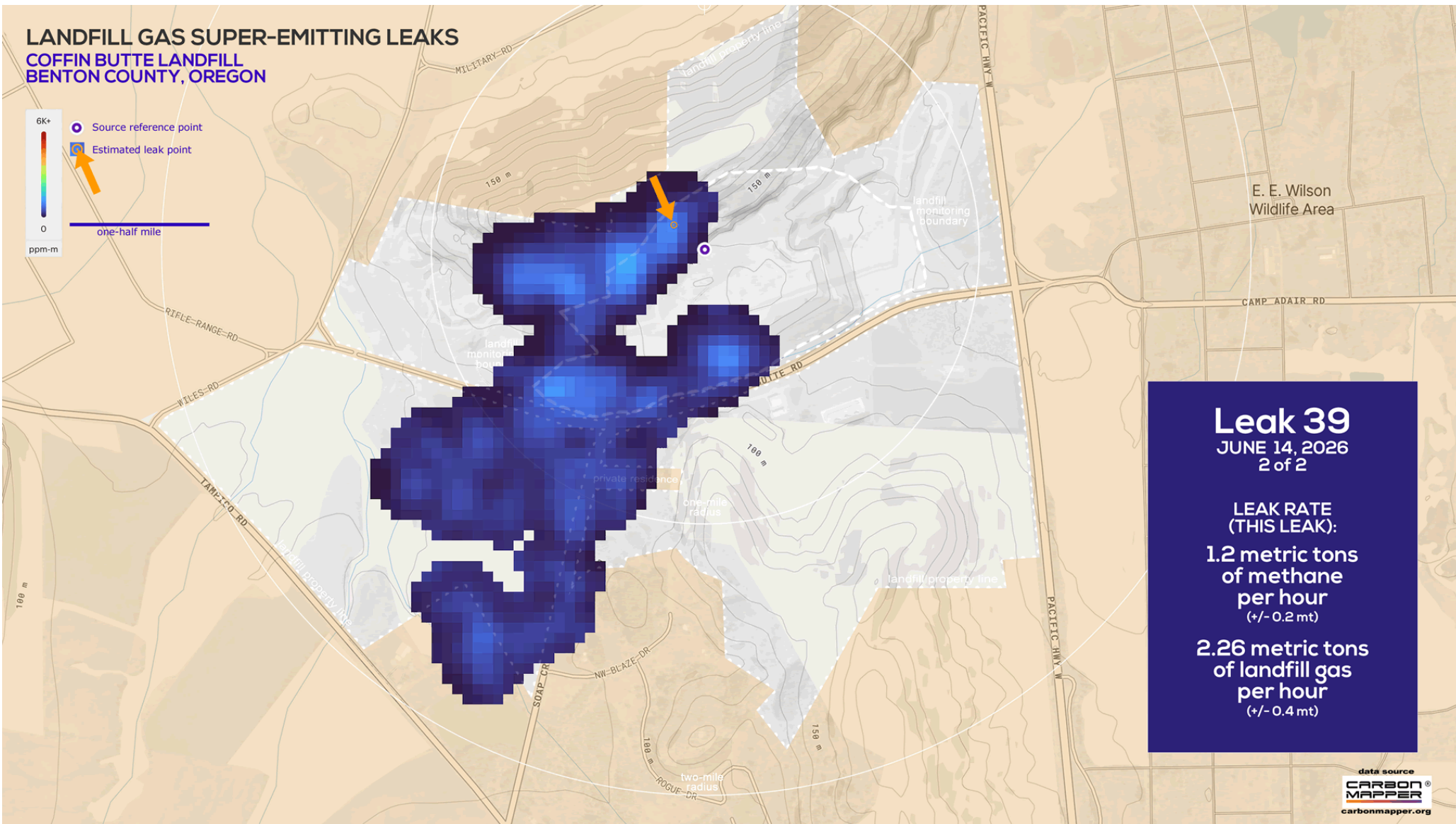
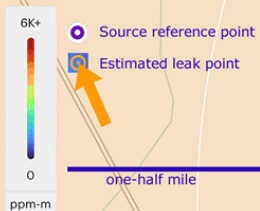
JUNE 14, 2026
1 of 2

LEAK RATE
(THIS LEAK):
NOT YET QUANTIFIED

data source
**CARBON
MAPPER**
carbonmapper.org

LANDFILL GAS SUPER-EMITTING LEAKS

COFFIN BUTTE LANDFILL
BENTON COUNTY, OREGON



Leak 39

JUNE 14, 2026
2 of 2

LEAK RATE
(THIS LEAK):

1.2 metric tons
of methane
per hour
(± 0.2 mt)

2.26 metric tons
of landfill gas
per hour
(± 0.4 mt)

data source
**CARBON
MAPPER**
carbonmapper.org

Takeaways

- ☼ CM's data makes plain what's happening at Coffin Butte Landfill. You can track the progression from the first set of leaks (1 & 2) to the last set of leaks (38 & 39) and see the 50% growth in average emissions.
- ☼ CM indicates that super-emissions of landfill gas are pervasive, if not ubiquitous, at Coffin Butte, often from multiple sources at once.
- ☼ CM establishes that it's a rare overflight that does not *directly show* a coherent plume of landfill gas infiltrating public space or impacting the private property of others. This is not what is observed at other Oregon landfills such as Columbia Ridge.
- ☼ CM's data affirms the public's reports about the presence, volume, and extent of landfill gas in the area. For years members of the public have described encounters with concentrated plumes of landfill gas that stretch miles from the landfill; CM confirms these plumes and harms exist.
- ☼ People miles away from the landfill are experiencing landfill gas as though leaks were

happening in their back yards.

- ☼ CM's data establishes that current emissions monitoring at the landfill is ineffectual, and emissions estimates based on it are inadequate.
- ☼ Carbon Mapper's extensive observational data is the best tool at our disposal for assessing the landfill's emissions history and performance.
- ☼ The landfill's current average source emissions of 1.8 metric tons of methane an hour establishes that Coffin Butte is in the top ten (perhaps the top five) of climate-damaging facilities in Oregon.
- ☼ As data-gathering improves, poorly performing facilities such as Coffin Butte Landfill will come under increasing pressure to change or suspend their business practices.

CM and Compliance

A multi-year investigation of Coffin Butte Landfill by the EPA and Oregon DEQ reached the level of an Enforcement Order in March 2026, with a record-breaking civil penalty of over \$3 million. The Order cited multiple violations of state and

This letter is to inform you that the Oregon Department of Environmental Quality (DEQ) has issued you a civil penalty of \$3,016,128 for multiple violations of state and federal air quality requirements at the Coffin Butte landfill located at Highway 99W and Coffin Butte Road north of Corvallis, Oregon... DEQ issued this penalty because the violations addressed in the Notice pose a risk of harm to human health and the environment. Coffin Butte landfill is subject to the National Emission Standards for Hazardous Air Pollutants (NESHAP), 40 CFR Part 63, subpart AAAA-federal regulations that generally require monitoring, capture, and control of landfill gas emissions. The NESHAP regulations were promulgated

by the federal government and adopted by Oregon to ensure that hazardous air pollutants are kept to minimum levels to protect public health and the environment. Landfill gas includes nonmethane organic compounds, some of which are known or suspected carcinogens and may cause other serious health effects. Landfill gas emissions also affect human welfare due to odor. Finally, landfill gas emissions are a significant contributor to climate change...

– Oregon Department of Environmental Quality,
Notice of Civil Penalty Assessment and Order,
Case No. AQN-WR-2025-582, March 11, 2026

federal air quality requirements which “pose a risk of harm to human health and the environment.” The Order listed immediate steps for Republic to take to begin remediations and further investigations that may result in more civil penalties. Republic Services has appealed the Order.

CM’s data indicates the Enforcement Order is on firm ground. The leak maps tell a story that confirm what EPA and DEQ investigators found, aligns with DEQ’s findings, and diverges widely from Republic’s official accounting of landfill operations.

CM and Gas Collection Efficiency

In 2021 and 2024, Republic filed land use applications to expand the footprint of Coffin Butte Landfill. Both applications failed (the 2024 one is still under appeal). In the 2024 application, Republic stated the landfill was successfully collecting and burning 90%–92% of the landfill gas created in the landfill, and asserted that to use 75% gas collection efficiency for its odor studies was to be “conservative.” Having a gas collection

efficiency as high as 75% helped Republic develop an odor study favorable to their application.

Concurrently, Republic filed for an air pollution discharge permit. For it, DEQ required updated “LANDGem” modeling to calculate a baseline amount of total landfill gas being generated by the landfill, based on its waste intake history and other factors. Republic supplied this LANDGem modeling to DEQ in October 2025. With this total gas generation number and the landfill’s records of gas collected in 2025, the landfill’s gas collection efficiency for 2025 can be calculated: Republic collected only about 45% of the total. In plain terms, according to this updated modeling, *Coffin Butte Landfill leaks more landfill gas than it collects.*

CM data supports this finding. Using the total gas generation number from LANDGem and CM’s observations of landfill gas *not* being collected for 2025, it can be calculated that 45% of the gas is leaking out from point-source super-emitting leaks alone ([Figure 2](#)). Since landfill gas also leaks from myriad smaller leaks ([Figure 4](#)), Coffin Butte’s total gas leakage will be even

...the estimated efficiency used in the approved modeling was 75%, a conservative default used by the U.S. EPA and numerous other air agencies.

Annual Greenhouse Gas (GHG) Reports from 2022, 2023, and 2024, submitted to and accepted by DEQ, demonstrate the calculated collection efficiency at Coffin Butte Landfill to be 92%, 92%, and 90%, respectively. While the calculated collection efficiency rates from the GHG Reports show a much higher collection efficiency than what has been historically used as a default for modeling purposes, for conservative assumptions, Coffin Butte elected to use the lesser value.

– Final Written Argument, LU-24-027

Steve Hultberg for Republic Services, February 10, 2026

higher. Both calculations converge on a real-world gas collection efficiency of around 45-50%.

In the future, as monitoring improves, it may be more definitively established that Coffin Butte Landfill leaks more landfill gas than it collects, and has been for some time. It is already difficult to understand how “90–92% efficiency” was ever put forward in good faith.

CM and Toxics in landfill gas, including PFAS

Impactful as they are, methane and the various odorifics in landfill gas are only part of the story. As you might guess based on what goes in, when landfills belch out gas, it is a complex stew of chemicals, many of which were never anticipated to be re-introduced to the environment and the sphere of human health.

One of these toxics is PFAS (the “forever chemicals”) which are of growing concern globally. PFAS are wholly human-made; they do not occur in nature, and so they represent a science experiment we are conducting upon our collective health and environment, starting with areas downstream or downwind from landfills.

Science has established that landfills concentrate PFAS, because they have been accepting them in waste for decades. Science has also established that, when released from the landfill, (a) PFAS accumulate in the environment and (b) are known to pose risks to health even in very low concentrations and (c) what we know now is just the tip of the iceberg. PFAS are known to be harmful; the questions surround the types of harms and how PFAS cause these harms.

Up to now, PFAS studies have focused on PFAS re-emerging from landfills in leachate, which landfill owners transport to wastewater treatment plants; there, the PFAS either pass through into waterways such as the Willamette River, or settle into biosolids (sewage sludge) which then are spread onto agricultural fields. A growing number of agricultural fields nationwide have been removed from production due to PFAS contamination in this way.

Recent studies, however, have established that landfills also release PFAS in landfill gas – at concentrations at or above those found in leachate. PFAS released this way accumulate in

Lane County Public Works Director Dan Hurley told the [state Senate Environment] committee he started his career doing methane monitoring at Short Mountain Landfill near Eugene.

“The current method is a joke. It was developed over 40 years ago,” Hurley said. “The method only requires someone to carry around a handheld monitor. There are lots of opportunities to game these measurements.”

– Tracy Loew, Salem Statesman-Journal, February 25, 2025

the environment around the landfill. The health and environmental effects of this pollution are just beginning to be studied.

All landfills receive PFAS in a similar way, based upon their waste streams. A particular landfill *emits* PFAS in a particular way, however, in proportion to its emissions of leachate and landfill gas. Needless to say, a landfill can be liable for its emissions.

As we have seen, CM data establishes that Coffin Butte Landfill has a high rate of gas emissions, and therefore a high likelihood of causing a high level of PFAS contamination in the surrounding environment. The landfill thus poses risk to the County, if County government fails to act responsibly to manage the harm.

CM Outlook: Increasing Transparency

By observing landfill operations from a “god’s-eye view,” CM is peeling back the opacity that has

historically shrouded those operations. Previously, Coffin Butte Landfill has been monitored by a technician periodically walking a limited path across a portion of dump surface holding a probe near the ground, a method which in plain language is a joke. This method can be easily manipulated to avoid leak detection, and use of such manipulative tactics at Coffin Butte are part of DEQ’s current multi-million-dollar Enforcement Order against Republic Services.

CM data enables anyone to build a more holistic understanding of the landfill. CM only publishes data that is above a confidence threshold. CM continually is collecting new data, which it uses to refine and upgrade its data processing, including retrospective refinements to published data (i.e., leaks marked “not yet quantified” later get quantified). CM adds new data features such as wind direction and velocity, to make conditions easier to understand.

Oregon Climate Action Roadmap to 2030 Background

Climate change is already having a measurable impact on Oregon's landscape, communities, and economy. Oregon is experiencing increased temperatures, changing precipitation patterns, reduced snowpack, drier summers, and more frequent and damaging wildfires. Extreme heat events, severe drought conditions, and high-intensity wildfires have inflicted significant damage on Oregonians, communities, the environment, and the economy. These impacts are projected to become more frequent and severe as temperatures increase and climate change is left unchecked...

At the same time, actions to mitigate climate change can significantly benefit Oregon's communities, economy, and environment. Well-designed climate mitigation actions can make Oregonians healthier and Oregon's communities more resilient, especially communities that have suffered the greatest impacts from climate change and many other social injustices.

- OREGON CLIMATE ACTION ROADMAP TO 2030. Committee Recommendations, March 2023

As we've seen, CM has already established a comprehensive and actionable dataset on Coffin Butte Landfill. The outlook is that CM data will continue to enhance public access to increasingly accurate, detailed, and fully featured characterizations of gas emissions at the landfill, and continue to better inform the waste disposal choices made by the public and the decisionmakers they elect.

Also as we've seen, CM data gives us insight into Coffin Butte's impacts on the area surrounding the landfill. In plain terms, the data tells us who we should believe (the EPA, Oregon DEQ, the community) and who we should not.

CM data also gives us insight into future trends. Claims that emissions will improve at the landfill are not supported by data. We can assume Republic made some good-faith effort to improve operations after their 2021 application to expand the landfill failed, to increase their chances for success with their 2024 application. The data establishes such efforts if any were insufficient.

As Carbon Mapper continues to increase transparency into Coffin Butte's operations, anyone will be able to:

- ✿ compare the landfill's environmental cost to other waste options;
- ✿ assess Republic's level of (non)compliance with regulations protecting human and environmental health and safety;
- ✿ gauge the elements and scale of pollution as it continues to occur in Benton County;
- ✿ communicate the reality of those impacts to regulators, the press, local and state government, and others throughout the Coffin Butte watershed;
- ✿ judge the quality of Benton County Government's response, in light of the data it has about landfill impacts and alternatives.

Suggested further reading

“Where the garbage goes” feature story by Jaclyn Moyer, High Country News. ([link](#))

“Trashtown USA: A paradigm shift in waste management” mini-documentary. ([link](#))

“Coffin Butte Landfill won’t answer Benton County’s questions” article by Tracy Loew, Salem Statesman Journal. ([link - paywall](#))

“Therapy ranch feels effects of nearby Coffin Butte Landfill” article/audio by Macy Moore, KLCC News. ([link](#))

“Benton County commissioners deny Coffin Butte landfill expansion in major reversal” article by Nathan Wilk, Oregon Public Broadcasting. ([link](#))

“Breaking down the record-setting DEQ fine on Coffin Butte” article by Cody Mann, Gazette-Times/Democrat-Herald. ([link](#))

“Coffin Butte Landfill owners fined \$3M for air quality violations, biggest in Oregon DEQ history” article by Cody Mann, Gazette-Times/Democrat-Herald. ([link](#))

“Benton County planners reject Coffin Butte Landfill expansion and don’t mince words” article by Tom Henderson, Gazette-Times/Democrat-Herald. ([link](#))

Ken Eklund’s credentials

I am a professional writer, futurist, game designer and narrative designer. I have led teams that have created educational and artistic work honored with a Legacy Peabody Award, two Webby nominations for Best of the Internet, a top award at SXSW, and others. I have worked with educational teams at Columbia University, Montana State University, the Open University at Oxford University, and Arizona State University, where I was a Resident Artist in Game Design at the School for the Future of Innovation in Society, part of ASU’s Center for Global Futures. I work with museums such as The Exploratorium and the San Diego museums in Balboa Park. I connect at a deep level with the forests and other natural places around my home north of Corvallis, Oregon.

37340 Moss Rock Drive
Corvallis, Oregon



Oregon

Tina Kotek, Governor

Department of Environmental Quality

Salem Administrative Office
4026 Fairview Industrial Drive SE
Salem, OR 97302
503-378-8240
TTY 711

June 4, 2026

Paul Koster, Environmental Manager
Coffin Butte Landfill
28972 Coffin Butte Road
Corvallis, OR 97330

RE: Coffin Butte Landfill; SW Permit 306
Revision of EMP 2025
Benton County, SW Project 10722

Dear Mr. Koster:

The Department of Environmental Quality has completed a review of the Environmental Monitoring Plan proposed for the Coffin Butte Landfill, received from Republic Services on April 29, 2025. The plan was prepared by GeoLogic Associates and stamped by DeEtta Fosbury, RG.

Based on our review, DEQ provisionally approves the plan, subject to the caveats outlined below, including revisions to the monitoring schedule at MW-9s, and further evaluation and/or modifications to wells MW-1d/s, MW-3d/s, and MW-26. We would like the permittee's hydrogeologist to review and evaluate the caveats prior to final approval of the plan.

- MW-1d/1s 3d/3s are deep and shallow well pairs that are within individual boreholes. This is not current practice in Oregon, and they should be evaluated carefully to show that they are truly sampling different aquifers and that there is no vertical water flow within the boreholes and this evidence added to the plan.
- MW-9s should be sampled more frequently. We request annual sampling for the same parameters as MW-26 and MW-27.
- MW-26 may not be fully representative of groundwater as it does not seem to respond to seasonal trends and may be too shallow. A deeper well may be appropriate at this location. Please either explain why MW-26 is fully adequate for its purpose or propose an additional well in the area (or deepening).

Paul Koster
Environmental Manager
Coffin Butte Landfill
June 4, 2026
Page 2

If you have questions regarding this review or would like to have a discussion in detail, please contact our solid waste hydrogeologist, Seth Sadofsky, at 541-687-7329 or seth.sadofsky@deq.oregon.gov. Thank you for your continued efforts to remain in compliance with your solid waste disposal permit.

Sincerely,

A handwritten signature in black ink, appearing to read "Hugh Gao", is positioned above the typed name.

Hugh Gao, P.E., Engineer
Western Region Solid Waste
Permitting and Compliance

cc: DeEtta Fosbury, GeoLogic Associates - dfosbury@geo-logic.com
Seth Sadofsky, Eugene-DEQ - seth.sadofsky@deq.oregon.gov
Mary Camarata, Eugene DEQ - mary.camarata@deq.oregon.gov
Becky Williams, Salem-DEQ - becky.williams@deq.oregon.gov

The Oregon Revised Statutes (ORS) address disposal site advisory committees primarily within ORS Chapter 459 (Solid Waste Management). Here's [a link](#) to the ORS language.

Regional Disposal Site Advisory Committees (ORS 459.320 & 459.325)

These local citizen panels act as the primary liaison between a community and the operator of a regional landfill.

Mandatory Formation & Terms: Under ORS 459.320, members of a local citizens advisory committee serve two-year terms. The committee must elect a chairperson and is required to meet at least four times each year for as long as the regional disposal site is proposed or operating.

Existing Committees: If a county board of commissioners already has an established local solid waste advisory committee, that group can fulfill these duties as long as its membership complies with the statute.

Core Duties: According to ORS 459.325, the committee's strict statutory obligations include:

- Reviewing the regional disposal site's siting, operation, closure, and long-term monitoring alongside the permit holder.
- Providing a dedicated forum for citizen comments, questions, and community concerns to promote dialogue with the owner/operator.
- Preparing an annual written report summarizing citizen concerns and how the operator is addressing them. This report must be officially considered by the Oregon Department of Environmental Quality (DEQ) when issuing or renewing solid waste permits. This is the annual Community Concerns Annual Report.

Permittee Requirements: Under ORS 459.330, the person or entity holding the disposal site permit is legally required to provide regular notifications and updates to the advisory committee.

Questions and comments
for
Benton County Oregon Board of Commissioners
from
Benton County Disposal Site Advisory Committee
June, 2026

Honorable Commissioners: As an advisory committee to you regarding what once was a local and now is a regional disposal site in Benton County, we understand our role as outlined in Oregon statutes include, but is not limited to:

- Reviewing with the permittee, the regional disposal site including but not limited to siting, operation, closure and long-term monitoring of the regional disposal site; and
- 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.

The committee then issues an annual written report which is to be submitted to the Oregon Department of Environmental Quality (ODEQ) summarizing the local citizens' concerns and the manner in which the owner or operator is addressing those concerns.

In performing these functions, we have become well versed in landfill operations and citizens' questions, suggestions, concerns and comments. Most of us have significant knowledge and professional experience in fields allied to the physical and environmental aspects of landfill operations.

1. May we present a brief synopsis of our annual report to your board annually?

In light of the complexity involved in our annual report, we feel that in addition to a written report submitted via the county representative on the board, we should present at a minimum a brief synopsis to highlight important points in the report and enable you, the Commissioners, and the ODEQ the opportunity to offer specific queries and for us to respond to such. This presentation should be performed by the chair and/or vice-chair with the county representative to the full board of commissioners at a regularly scheduled public meeting.

In particular, we believe that such a more direct channel to the Board of Commissioners will enable us to better fulfill our responsibility as a forum for citizen comments, questions and concerns about the regional landfill. This direct channel will demonstrate to the citizens of our county that the Commissioners are listening to their comments. Similarly, it will enable the permittee to offer to the Commissioners its proactive work toward continuous quality improvement of its operations. The commissioners can then be aware of advancements in the technology of waste management and how it is being practiced at our regional landfill.

2. May we suggest organizations that should have membership on our committee?

In the wording of ORS 459.320, we have neglected the following:

(e) Local organizations and citizen interest groups whose majority of members either:

(A) Are electors of the county in which the regional disposal site is located; or

(B) Own real property in the county in which the regional disposal site is located.

Organizations of this nature include, but are not limited to the Benton County Soil and Water Conservation District.

3. Are we responsible to review reports summarizing operations by the permittee?

Pursuant to ORS 459.325, we believe our duties include “reviewing with the permittee the regional disposal site including but not limited to siting, operation, closure and long term monitoring of the disposal site; ...”

As an example, the permittee is preparing a 2025 annual report, however upon inquiry at meetings, the permittee indicates that it will be available to the committee after it has been finalized and sent to ODEQ. This means our review is after the submission, and hence the committee is not in the position of offering amendments or adjustments to the content based on our mutual interactions during our meetings in 2025.

4. Are we encouraged to be proactive in solving issues raised by the community?

It is believed that the reason the State identified the expected membership of the DSAC to include the permittee was to enable us to work together cooperatively toward identifying and resolving issues identified by the public and our membership as they arise from the landfill or composting center operations. Examples are odor alerts and fire safety. Both of these have been identified as issues, discussed in the committee meetings for years and remain unresolved.

5. What is the role and responsibility of the permittee representative to the committee?

The role and responsibilities of the permittee representative to the committee seems unclear. In particular, when a question is presented to the representative, what responsibility does the representative have towards providing information pursuant to the question? Secondly, does the permittee have responsibility to provide a timely (within 30 days) response to the questions presented to their representative at committee meetings?

Recently, we have added the opportunity for the representative to present actions taken at the landfill and composting facility sites after the previous committee meeting, and each time the committee has received interesting and valuable information from the representative. We suspect more could be included and appreciate this demonstrates that the representative is aware of operations at the ground level.

6. Is there a direct line of communication between the County and ODEQ?

We believe such is important and have not discovered such. Landfills by their nature have odor emission and groundwater monitoring. Follow-up regarding details we observe need to be directly conveyed.

7. Does DSAC have any authority?

Currently, we have identified opportunities to monitor and assess emissions as well as means to reduce the impact on surrounding entities, yet without authority to require changes, progress is limited. Some members of the DSAC see it as a “paper tiger” which is not taken seriously and have stated they do not wish to continue on the committee. These are members with very relevant professional knowledge.

8. Does the County have any continuing authority regarding the landfill operations?

Since this is identified as a “regional Landfill”, it would seem appropriate that the County hosting the landfill have some overall, continuing authority regarding the operations, including for example to require actions to be taken should deficiencies be identified at any time during operation. Subsequently, who has authority regarding actions needed during the containment phase of sealed cells? It seems unclear with whom such authority resides, especially in the wording of the most recent agreements under consideration.

9. Does the County have liability for events that take place on the landfill and composting facility grounds?

It is unclear as to whether all liability regarding events at the facilities are solely borne by the permittee or if the County, in granting the permission to operate these essential facilities owns a degree of liability for events at the facilities that might have effects beyond the borders of the facilities.

10. As an extension, what entities have responsibility to maintain and repair the vehicular traffic corridors that are used by the landfill and composting facilities?

It is believed this responsibility falls upon the State and County, however as our committee may be made aware of needs for repairs and improvements due to the volume of heavy vehicular traffic and citizen observations, to whom should we address these needs?

Thank you for your consideration of our questions,

David Hackleman, Chair BCDSAC

Robert Kipper, Vice-chair BCDSAC

ORS 459.320

(1)

Except as provided in subsection (3) or (4) of this section, the board of county commissioners of a county in which a regional disposal site is proposed to be located shall establish a local citizens advisory committee when the Department of Environmental Quality receives an application for a regional disposal site within the county. The board shall select members of the committee from among at least each of the following groups, to the extent feasible:

(a)

Residents residing near or adjacent to the regional disposal site.

(b)

Owners of real property adjacent to or near the regional disposal site.

(c)

Persons who reside in or own real property within the county in which the regional disposal site is located.

(d)

Employees of the permittee.

(e)

Local organizations and citizen interest groups whose majority of members either:

(A)

Are electors of the county in which the regional disposal site is located; **or**

(B)

Own real property in the county in which the regional disposal site is located.

(2)

Unless determined otherwise by a board of county commissioners:

(a)

Members of the local citizens advisory committee shall serve a term of two years.

(b)

The committee shall elect from among its members a chairperson of the committee with such duties and powers as the committee imposes.

(c)

The committee shall meet at least four times each year for so long as the regional disposal site is proposed or operating.

(3)

If the regional disposal site is operated by a metropolitan service district, the local citizens advisory committee shall be established by the governing body of the metropolitan service district.

(4)

If the board of county commissioners of a county in which a regional disposal site is located or is proposed to be located has already established a local citizens advisory committee for solid waste issues in general, that committee may serve to fulfill the duties specified in [ORS 459.325 \(Duties of regional disposal site advisory committee\)](#) so long as the membership of the committee is consistent with this section. [1987 c.876 §9; subsection (4) enacted as 1987 c.876 §10; 1999 c.720 §1]

ORS 459.325:

The duties of the local citizens advisory committee established under [ORS 459.320 \(Regional disposal site advisory committee\)](#) shall include but need not be limited to:

(1)

Reviewing with the permittee, the regional disposal site including but not limited to siting, operation, closure and long-term monitoring of the regional disposal site; **and**

(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. The committee shall prepare an annual written report summarizing the local citizens' concerns and the manner in which the owner or operator is addressing those concerns. The report shall be considered by the Department of Environmental Quality in issuing and renewing a solid waste permit under [ORS 459.245 \(Issuance of permits\)](#). [1987 c.876 §11]

ORS 459.330:

The permittee shall notify the local citizens advisory committee established under [ORS 459.320 \(Regional disposal site advisory committee\)](#) when the permittee proposes to apply for a change to any state or local permit. [1987 c.876 §12]

2) Community concerns received from 5/20/26 – 8/27/26

No complaints received.

3) Relevant News Articles

6/8/2026

KLCC

<https://www.klcc.org/environment/2026-06-08/therapy-ranch-feels-effects-of-nearby-coffin-butte-landfill>

Coffin Butte

Therapy ranch feels effects of nearby Coffin Butte Landfill

6/25/2026

Statesman Journal

<https://www.statesmanjournal.com/story/news/local/2026/06/25/7-oregon-counties-may-join-to-control-garbage-recycling/90428364007/>

State Task Force

Marion County may join 6 other counties to control garbage, recycling

7/10/2026

Waste360

https://www.waste360.com/landfill/managing-hydrogen-sulfide-challenges-in-u-s-landfills?utm_campaign=IC_WST360DLYWRNWLR_News_Waste360%20Daily%20Wire_News_NL_20260710&utm_emailname=IC_WST360DLYWRNWLR_News_Waste360%20Daily%20Wire_News_NL_20260710&utm_medium=email&utm_source=eloqua&utm_MDMContactID=&utm_campaigntype=Newsletter&eM=8bb4c36492afe9b45479f31a358fc9d2621510791ae41e08fc10ad8852fe9f90&eventSeriesCode=ES_WASTE36&eventEditionCode=WST00WAT&sessionCode=S_WST360DLYWRNWLR&sp_eh=8bb4c36492afe9b45479f31a358fc9d2621510791ae41e08fc10ad8852fe9f90

Landfills - Odors

Managing Hydrogen Sulfide Challenges in U.S. Landfills

7/8/2026

Lincoln Chronicle

<https://lincolnchronicle.org/legislators-will-hear-proposal-friday-for-regional-garbage-system>

State Task Force

Legislators will hear proposal Friday for regional garbage system

7/10/2026

Statesman Journal

https://www.statesmanjournal.com/story/tech/science/environment/2026/07/10/coffin-butte-landfill-republic-services-wont-answer-benton-countys-questions/90428382007/?utm_source=psal-DailyBriefing&utm_medium=email&utm_campaign=daily-briefing&utm_term=Content%20List%20-%20Stacking%20-%20optimized&utm_content=1074SJ-E-NLETTER65

Coffin Butte - Annual Report

Coffin Butte Landfill won't answer Benton County's questions | Exclusive

7/10/2026

Corvallis Advocate

<https://corvallisadvocate.com/the-landfill-stinks-and-what-happens-after-its-full-has-become-a-discussion>

State Task Force

The Landfill Stinks, and What Happens After It's Full Has Become a Discussion

6/26/2026

Corvallis Inquirer

<https://www.corvallisnow.com/p/seven-oregon-counties-team-up-on>

State Task Force

Seven Oregon Counties Team Up On Garbage

8/4/2026

Portland Metro

<https://www.oregonmetro.gov/stories/local-artists-can-get-paid-turn-garbage-art>

Reuse

Local artists can get paid to turn garbage into art

7/24/2026

Statesman Journal

<https://www.statesmanjournal.com/story/tech/science/environment/2026/07/24/oregon-legislative-task-force-criticized-landfill-reliance/90948549007>

State Task Force

Solid waste task force biased toward landfills, critics say | Exclusive

7/15/2026

Yahoo News

https://www.yahoo.com/news/us/articles/oregon-landfill-wont-tell-county-044400373.html?guccounter=1&guce_referrer=aHR0cHM6Ly93d3cuZ29vZ2xlLnNvbS8&guce_referrer_sig=AQAAAHDIWr7lvGWHThiBncAfWNQAB3sGmrZ9uHr9hjoz_KjSEUsDjD6_BdMfVcXYEgUzRHeKixUGL3Lqwc0Nd-h5yfpI77IHx1CpunMpwyhSxej583k8TIJfE_vJ0H2TSLR_YnjtR6Tj-axUFejNON2_wXUKY-IIX-wgdvRLpECu0Ja

Coffin Butte Landfill

Oregon landfill won't tell county where its 'garbage juice' goes amid expansion push

7/15/2026

Corvallis Advocate

<https://corvallisadvocate.com/coffin-butte-landfills-bret-davis-rebuffs-county-questions-about-fires-capacity-and-garbage-juice>

Coffin Butte Landfill

Coffin Butte Landfill's Bret Davis Rebuffs County Questions about Fires, Capacity and Garbage Juice

7/16/2026

Waste 360

https://www.waste360.com/landfill/ensuring-landfills-are-cleaned-up-why-financial-assurance-matters?utm_campaign=IC_WST360DLYWRNWLR_News_Waste360%20Daily%20Wire_News_NL_20260717&utm_emailname=IC_WST360DLYWRNWLR_News_Waste360%20Daily%20Wire_News_NL_20260717&utm_medium=email&utm_source=eloqua&utm_MDMContactID=&utm_campaigntype=Newsletter&eM=8bb4c36492afe9b45479f31a358fc9d2621510791ae41e08fc10ad8852fe9f90&eventSeriesCode=ES_WASTE36&eventEditionCode=WST00WAT&sessionCode=S_WST360DLYWRNWLR&sp_eh=8bb4c36492afe9b45479f31a358fc9d2621510791ae41e08fc10ad8852fe9f90

Landfill Closure

Ensuring Landfills Are Cleaned Up: Why Financial Assurance Matters

7/15/2026

KEZI

https://www.kezi.com/news/local/recycle-on-opens-in-corvallis-with-free-drop-off-options/article_6907999f-8125-4dea-8ff3-a853fb04c73e.html

RMA

"Recycle On" opens in Corvallis with free drop-off options

8/7/2026

Lookout

<https://lookouteugene-springfield.com/story/environment/2026/08/07/lane-county-hearings-official-weighs-appeal-to-stop-cleanlane-site/>

CleanLane

Lane County hearings official weighs appeal to stop CleanLane site

8/7/2026

Tillamook Headlight Herald

https://www.tillamookheadlightherald.com/news/tillamook-county-leaders-contemplate-solid-waste-future/article_f1d4a738-b740-4c58-afa5-5d9ca8e39514.html

State Task Force

Tillamook County leaders contemplate solid waste future

8/8/2026

KOIN

<https://www.koin.com/local/washington-county/crews-battle-fire-at-hillsboro-area-waste-management-facility>

Landfill - Fire

Crews battle fire at Hillsboro-area waste management facility