

From: [Richard Llewellyn](#)
To: [Benton Public Comment](#)
Subject: Re: Deny Coffin Butte CUP, LU-24-027 with respect to PFAS in Landfill Gas Emissions
Date: Friday, April 11, 2025 7:32:31 AM
Attachments: [Benton County Coffiin Butte CUP.pdf](#)

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Dear Benton County Commission,

Please submit the attached pdf document as my testimony regarding Coffin Butte CUP, LU-24-027 with respect to PFAS in Landfill Gas Emissions.

Thank you,

Richard Llewellyn

April 10, 2025

Re: Coffin Butte CUP, LU-24-027 with respect to PFAS in Landfill Gas Emissions

Dear Benton County Planning Commission,

I have family residing in Benton County, and have lived and worked in the Corvallis area. However, the experiences I wish to relate to you are those of having a landfill sited next to our family home near Boise, Idaho in 1972, and after it expanded in the 1990s into a major regional landfill.

The original cell did not use an impermeable liner, because, although it was widely understood at that time that unlined landfills were likely to contaminate groundwater, it was not until several years later that the federal Resource Conservation and Recovery Act (RCRA) of 1976 required the practice.

After that original cell received waste for twenty years, at least one neighbor's drinking water well was contaminated. Around that time the county decided it needed to either prepare to close the landfill, as it was approaching its expected life, or expand it. The latter was chosen, with plans to operate the landfill for another century.

However, the original cell still accepted most of the county's waste for another two decades, growing so large that the 'Hidden Hollow Cell' became the largest ridge in the area, blotting out our view of the Boise Mountains. By the time the cell closed several years ago, it had accepted more than a half century of waste perched, unlined, above our neighborhood aquifer – compounding a long term liability that would have been mitigated had common sense prevailed in 1972 rather than obeisance to outdated regulations.

I call attention to my neighborhood's experience because a similar situation has developed with respect to chemicals collectively known as per-and-polyfluoroalkyl substances (PFAS), or informally as 'forever chemicals,' due to the highly stable nature of the many carbon fluorine bonds that characterize this large group of chemicals – chemicals that we are increasingly finding toxic at minute exposure levels.¹

Industrial, medical, and consumer wastes that generally end up either in sewage treatment plants or landfills, often contain 'forever chemicals,' so that in many communities, these represent the major local repository of PFAS. Until recently, the primary risk of PFAS release from municipal solid waste landfills has been thought to be in the liquid leachate or 'garbage tea' that accumulates as water percolates through the landfill layers. Leachate now requires careful handling in part due to the PFAS risk – it is not uncommon for this to be shipped at considerable cost to hazardous waste facilities when onsite collection ponds fill.

¹ Human Health Toxicity Assessment for Perfluorooctanoic Acid (PFOA) and Related Salts. EPA.gov 2024. From <https://www.epa.gov/sdwa/human-health-toxicity-assessment-perfluorooctanoic-acid-pfoa>

Less attention has been given to the PFAS released in air emissions, either as uncontrolled 'fugitive' gases or upon being burned in flares or even upon combustion to drive electricity generation, as it is unlikely that the conditions in flares and engines are adequate to fully mineralize PFAS and prevent its escape into the local airshed.² Neighbors of landfills could tell the Commission much about the occurrence of odors from the fugitive gases, and although officials generally downplay the smell as a mere nuisance, these odors likely contain volatile PFAS as well.

Until a year ago, the general consensus was that the landfill gas emissions contained about a third as much PFAS as was found in the leachate.³ However, recent research that specifically measured the neutral, more volatile PFAS known as fluorotelomers found 'stunning' concentrations in three municipal solid waste landfills.⁴ The findings made headlines in the American Chemical Society,⁵ and science⁶ and industry newsletters.^{7,8}

The most prevalent type of fluorotelomer found in landfill gas is especially troubling due to its relationship to one of the two types of PFAS that are now federally classified as hazardous substances in drinking water. The 8:2 fluorotelomer has eight fully fluorinated carbons, and two that are not – so that these latter two are not protected by the shell of fluorine, and are readily lost either by metabolism upon inhalation of the fluorotelomer, or through environmental degradation. The result is often the highly stable and highly toxic eight carbon type of PFAS

² "Interim Guidance on the Destruction and Disposal of Perfluoroalkyl and Polyfluoroalkyl Substances and Materials Containing Perfluoroalkyl and Polyfluoroalkyl Substances— Version 2" EPA.gov. 2024. From <https://www.epa.gov/system/files/documents/2024-04/2024-interim-guidance-on-pfas-destruction-and-disposal.pdf>

³ Tolaymat T, et al. A critical review of perfluoroalkyl and polyfluoroalkyl substances (PFAS) landfill disposal in the United States. *Sci Total Environ*. 2023 Dec 20;905:167185.

⁴ Landfill Gas: A Major Pathway for Neutral Per- and Polyfluoroalkyl Substance (PFAS) Release Ashley M. Lin, Jake T. Thompson, Jeremy P. Koelmel, Yalan Liu, John A. Bowden, and Timothy G. Townsend. *Environmental Science & Technology Letters* 2024 11 (7), 730-737

⁵ Some landfill 'burps' contain airborne PFAS, study finds. American Chemical Society. 2024. From <https://www.acs.org/pressroom/presspacs/2024/june/some-landfill-burps-contain-airborne-pfas-study-finds.html>

⁶ Landfills belch toxic 'forever chemicals' into the air. *Science News*. 2024. From <https://www.sciencenews.org/article/landfills-toxic-forever-chemicals-pfas>

⁷ PFAS Emissions from U.S. Landfills Pose a Silent Environmental Crisis. 2024. From <https://www.environmentenergyleader.com/stories/pfas-emissions-from-us-landfills-pose-a-silent-environmental-crisis,48301>

⁸ Four Landfill Studies to Follow this Summer. *Waste Dive* 2024. From <https://www.wastedive.com/news/landfill-roundup-july-pfas-coffin-butte-oregon-brookhaven-new-york-landfill-scs-volusia-florida/723786/>

known as PFOA⁹ which accumulates in human blood upon repeated exposure due to its half life of longer than one year.^{10,11}

PFOA, is one of the two PFAS mentioned above now classified as hazardous. It was voluntarily phased out of production by industry more than a decade ago due to its known toxicity – the current federal standards in drinking water are 4 parts per trillion (4 ng/L). The precursor chemical, 8:2 FTOH, in one of the three landfills in this recent study, had a calculated concentration of 740,000 parts per trillion escaping in landfill gas (740,000 ng/cubic meter).

Common sense would suggest that landfills should also treat the gaseous component of PFAS, and prevent the contamination of local air, soils, and eventually, waterways. However, no such regulations enforce this common sense protection on the federal level, and Oregon's recent proposed expansion of its hazardous substance list to include PFAS will not extend to airborne emissions.¹²

Like the unlined cell near my family home, a landfill that expands today in Benton County may contribute another half century of toxic contamination and liability, even though today we too should know better. No major landfill, especially one near residential homes, organic farming, critical waterways, and a wildlife refuge should be allowed to expand without fully addressing this major pathway of PFAS contamination. If this common sense action is not taken before expansion, the problem may never be addressed.

Please deny the requested Conditional Use Permit.

Sincerely,

Richard Llewellyn
PhD Biochemistry

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⁹ Huang MC, et al. Toxicokinetics of 8:2 fluorotelomer alcohol (8:2-FTOH) in male and female Hsd:Sprague Dawley SD rats after intravenous and gavage administration. Toxicol Rep. 2019 Aug 20;6:924-932

¹⁰ Titaley, Ivan. (2024). Chemical transformation, exposure assessment, and policy implications of fluorotelomer alcohol partitioning from consumer products to the indoor and outdoor environment—from production to end-of-life. Environmental Science: Advances. 3. 1364-1384.

¹¹ Nilsson H, Kärrman A, Rotander A, van Bavel B, Lindström G, Westberg H. Biotransformation of fluorotelomer compound to perfluorocarboxylates in humans. Environ Int. 2013 Jan;51:8-12.

¹² State updates hazardous substances list to include harmful forever chemicals, begins rulemaking. Alex Baumhardt, Oregon Capital Chronicle. April 2, 2025.
<https://oregoncapitalchronicle.com/2025/04/02/state-updates-hazardous-substances-list-to-include-harmful-forever-chemicals-begins-rulemaking/>