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Subject: This testimony regards LU-24-027, the application to expand the landfill
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Testimony for the Benton County Board of Commissioners

Purpose: This testimony regards LU-24-027, the application to expand the landfill

From: Bruce Cowger, 37194 Helm Drive, Corvallis, OR 97330 (since 1985)

On May 6, 2025, during my verbal testimony before Benton County's Planning Commission, I was asked if I had evidence of PFA's (forever chemicals) being emitted from Coffin Butte Landfill (CBL). While PFA sampling and detection is beyond the means of most citizens, my experience in ink-jet printing has given me a perspective on how the chemicals and particulates discarded into CBL are able to find their way back into our air.

Here, I want to overturn the notion that whatever is dropped off at CBL is forever sequestered. I will also explain how the closure of Coffin Butte will significantly lessen if not eliminate the escape of chemicals and particulates into our air. Please deny Republic's request for expansion.

I have a Physics degree (Willamette University, Salem, 1978) and a Mechanical Engineering degree (Stanford, Palo Alto, 1978) and hold over 60 patents, most of which pertain to ink-jet printing. One cannot develop ink-jet products without a thorough appreciation of how water-based liquids interact with gases and microscopic solids across a range of environmental factors.

To begin, we will imagine ourselves peering at a small piece of waste, buried somewhere in CBL (Figure 1). This might be some industrial waste, trucked down from Wilsonville. Or perhaps some yard debris from Salem.

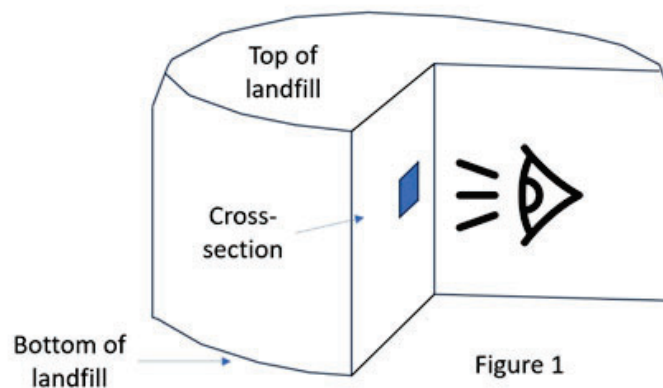




Figure 2

This far down in the compacted waste, the temperature is cool but never freezes.

Figure 2 is a magnified view of one edge of this bit of waste. As with most objects under magnification, its edges aren't smooth and exhibit irregularities.

The waste at Coffin Butte is wet. We know this because of the 40-some inches of annual rainfall here in western Oregon. This rainfall percolates down through the deposited waste, dissolving chemicals and entraining particulate solids from whatever it contacts.

PFAs from stain resistant carpets, hospital waste, consumer herbicides and pesticides: Traces of all these and much more are in the leachate. This percolation leads to the endless loading of leachate into the tanker trucks I see when driving past the landfill.

This leachate coats nearly every surface of every bit of waste at CBL (Figure 3). This leachate layer is held in place by surface tension, the attraction of water-based liquids toward most solids.

So, this bit of waste is thoroughly wetted by leachate trickling down from above. We also need to note that gases of decomposing organic matter are flowing upward (Figure 4).

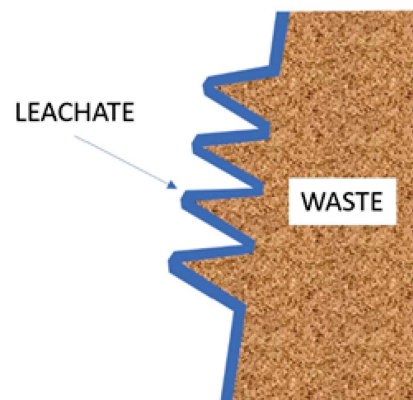


Figure 3

This upward flow of decomposition gases isn't rapid but it is steady. All the yard waste, food waste, paper and wood products, wetted by rain and leachate, are slowly breaking down into water, CO₂ and methane. These gases can't flow downward so they pass our bit of waste on their way upward.

Low molecular weight compounds in the leachate, like water, methanol and ethanol, are able to evaporate into decomposition gas, at least until the gas is

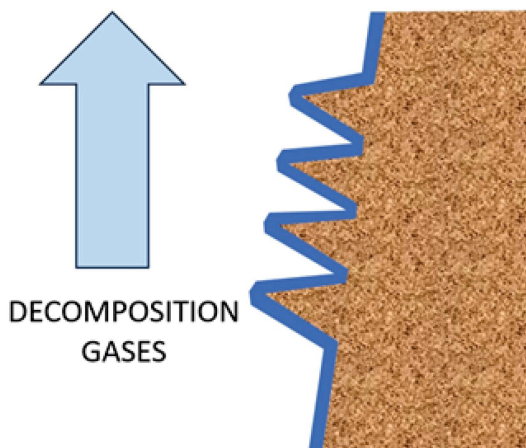


Figure 4

saturated. However, higher molecular weight species such as herbicides, pesticides, radioactive zirconium waste, and PFA forever chemicals cannot enter the gas stream by evaporation and this will be the state of the CBL once it stops accepting waste and the heavy equipment leaves.

This is an important point: Once Coffin Butte Landfill closes, there is no mechanism for the toxins in the leachate to become aerosolized and escape the landfill. Why? Because of all the heavy equipment racing around daily at the dump.

Indeed, it is the **vibration** caused by this heavy equipment that allows any of the toxins in Coffin Butte to make their escape (Figure 5). As various heavy trucks, bulldozers and earthmovers pass over the waste, vibrations of the wetted waste dislodge fine droplets of leachate into the gas flow. The decomposition gas flow carries this aerosol upward.

While surface tension causes the leachate to cling to solids, this force can be overcome by the liquid's inertia, induced by vibration of the solid substrate. This is the same phenomenon medical grade nebulizers use to create aerosols.

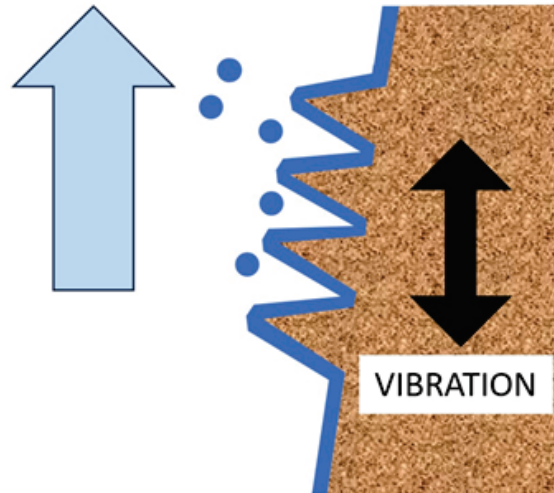


Figure 5

Some of these upward-flowing aerosols will be burned in CBL's flares which will break down some but not all of the toxin payload. But any fugitive gas emissions, which Republic's own experts concede is happening, will be picked up by the prevailing winds to be spread over much of Benton, Polk and Linn counties.

In conclusion:

1. A mechanism is explained for the production and escape of aerosols containing a cocktail of toxins from Coffin Butte Landfill. This is *prima facie* evidence for PFAs and other toxins being carried by the wind to many parts of Benton County and beyond.
2. As long as Coffin Butte Landfill is accepting waste, such aerosols will be produced and dispersed over the surrounding areas.
3. Closing and capping CBL will substantially reduce if not eliminate the production of these aerosols. Denying Republic's expansion will hasten this closure with long-term benefits to the health of thousands.

