From: Ken Eklund
To: Benton Public Comment
Subject: Response to Republic Presentation, p. 26 – Wet vs. Dry Addendum
Date: Monday, July 14, 2025 12:26:48 PM
Attachments: Taking Care of Landfill Leachate.pdf
writerguy-cube2.png

RE: LU-24-027, the application to expand Coffin Butte Landfill
REC: Please deny this application
ID: This is the "Wet vs. Dry Landfill" Addendum.

Dear Chair Fowler, Vice Chair Hamann, and Planning Commissioners Biscoe, Cash, Fulford, Lee, Struthers, and Wilson:

This is testimony in response to the July 8, 2025, slide presentation made by Republic Services. It may also refer to evidence and testimonies previously submitted, and provide links to articles of evidence and testimonies in the Munidocs record, to help you locate them. This testimony also contains material that responds to the presentation cited above; you will find such material attached to this email (double-click each link in the Attachments section in the header of this email.)

WET vs. DRY LANDFILLS
Republic presentation, p. 26
Staff presentation by reference
Pawlowski by reference

In their presentation, Republic frames Public Comment as saying this:

> *Landfills in 'dry climates' are more suitable for landfill construction and waste disposal.*

Republic responds by saying this, in part:

> *Landfills that take in similar tonnage and waste profiles will produce the same amount of gas, regardless of their location.*

This is misdirection bordering on misinformation. Republic's response leaves out vital context.

1. **The timeframes for landfill gas production in the two instances are typically very different. A wet landfill produces landfill gas much more quickly – which is important context to include to actually respond to the public comment.**
    a. The rate at which a climate pollutant enters the atmosphere is a vital consideration in the efforts to address the climate crisis, and methane, the prime pollutant in landfill gas, is the focus of climate mitigation efforts. A wet landfill, with a high

rate of gas production, is much worse than a dry landfill in the context of climate damage.

b. Dry landfills recirculate leachate to catalyze landfill gas production (attachment). The gas is thus produced in a slow, controlled way – unlike wet landfills, where gas is produced quickly and everywhere and therefore difficult to control and collect.

2. **The public comment was actually focused more on leachate production than landfill gas production. The difference in leachate production is dramatic. An example would be: Coffin Butte Landfill, near Corvallis: 32-40 million gallons of leachate that has to be trucked from the dump. Columbia Ridge Landfill, near Arlington: no leachate leaves the site.**

   The main issues of the public comment were that the excessive leachate would spill over at Coffin Butte Landfill, and presented disposal problems, and that a dry landfill was therefore a better option. The main issues were therefore not addressed by Republic in their Response.

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Hazardous Waste Leachate

Taking Care of Landfill Leachate

Leachate can be handled with a range of techniques. Which one is right for your landfill?

May 1, 2011 9 Min Read

By Michael Fickes

Managing landfill leachate is both an art and a science. Selecting a method of treatment that satisfies local and state regulations at a reasonable cost can be a complex undertaking. Fortunately, landfill operators have a host of treatment techniques from which to choose; their options range from the traditional — such as taking the leachate to a local sewage treatment plant — to more cutting-edge techniques, such as running the liquid through an engineered wetlands system or taking advantage of leachate-consuming trees.

In the end, the best option for a particular site depends upon the location of the landfill, the composition of the leachate, the volumes of leachate being generated and available on-site space.

The Basics

U.S. Environmental Protection Agency (EPA) regulations require municipal solid waste (MSW) landfills to install and maintain leachate collection systems. “You build the leachate collection system when you build the liner system,” says Leonard (Butch) Joyce, president and CEO of Richmond, Va.-based Joyce Engineering Inc. “As you expand the landfill, you add on to the collection system.”

In a landfill cell, a network of leachate collection pipes rests on top of the liner. As the cell grows in height, leachate drains to the piping system at the bottom. The piping system feeds a three- to six-foot deep sump. “Leachate is pumped out of the sump to a gravity pipe that flows into a collection tank,” Joyce says.

Once the leachate has been collected, it has to be managed. Broadly speaking, there are three basic ways to manage leachate, according to Ed Repa, director of environmental programs for the Washington-based National Solid Wastes Management Association (NSWMA).

First, you can re-circulate it in the landfill to accelerate waste decomposition; landfills that use this technique are called “bioreactors.” Second, with an appropriate National Pollutant Discharge Elimination System (NPDES) permit, you can treat the leachate on site and discharge it to a local stream. “Third, you can treat it partially to meet the standard set by your local municipal [wastewater] treatment plant and send it there for final treatment,” he says.

Within each of these broader management categories, any number of treatment techniques may be employed.

“We look at a lot of different treatment technologies,” says Brian Martz, senior manager of engineering with Phoenix-based Republic Services Inc. In some instances, a Republic landfill may truck the leachate to a nearby publicly owned treatment works (POTW) after treating it with a chemical process.

According to Tony Walker, Republic’s manager of engineering, two common chemical treatments for leachate are precipitation and oxidation. “Chemical precipitation is basically the removal of metal compounds from leachate [through the use of] precipitating chemicals such as lime, sodium hydroxide, soda ash, sodium sulfide and alum,” he says. Chemical oxidation can be used to remove ammonia, to oxidize cyanide, to reduce the concentration of residual organics, and to reduce the bacterial and viral content of wastewater, Walker adds.

The Natural Route

Landfill leachate also can be treated in more “natural” ways. In 2006, at its Jeffco Landfill near St. Louis, Republic Services was transporting leachate by truck to the local sanitary sewer, which carried it to the POTW.

Jeffco had closed several years before, and Republic was managing the 30-year, post-closure care period mandated by EPA. At the time, the firm was spending about $125,000 each year to dispose of the site’s leachate, an expense that was rising as the waste in the landfill aged and produced more and more leachate.

Working with Leggette, Brashears & Graham (LBG) Inc., a St. Paul, Minn.-based environmental engineering firm, Republic engineers implemented a leachate recirculation concept called “phytoremediation” at Jeffco. Phytoremediation is a sustainable concept that harnesses the ability of certain trees to absorb leachate and to use it as a nutrient.

At the end of 2007, LBG planted 2,100 hybrid poplar trees on six acres at the landfill. LBG also installed a system that pumps leachate from the landfill’s sump to a pretreatment tank for oxygenation. Next, the system injects the leachate into a surface drip irrigation system. During the winter, when the ground is frozen, another drip irrigation system buried beneath the frost line distributes the leachate.

Despite record-breaking precipitation in 2008, the tree roots absorbed all of the leachate produced by the landfill. Nothing was hauled away.

“It’s a cost-effective solution that we’ve used at several closed landfills,” Walker says. “It also improves safety by taking trucks off the road.”

Other landfills at which Republic uses the phytoremediation technique include the South Barrington Landfill in South Barrington, Ill., and the Watts Road Landfill in Atlanta.

Phytoremediation isn’t for every site, Walker cautions. It depends on the components and volume of the leachate, soil conditions and the trees. If the roots can’t absorb enough of the leachate, the area may become oversaturated and produce methane, which in turn will have to be managed.

Still, the technique has worked well at Jeffco. In fact, the project has earned two awards: the Grand Award in the Minnesota Chapter of the American Council of Engineering Companies’ (ACEC) Engineering Excellence Competition and the ACEC National Honor Award for Engineering Excellence.

There are variations on the theme of biological treatment. “One option we’re working with — so far on a small scale — involves constructing wetlands to treat leachate,” Joyce says. “It’s an on-site biological treatment system. The right plants will pick up heavy metals and other materials through their root systems. It’s possible to build a wetland that will treat leachate to the appropriate standards for discharge to a POTW or even a stream.”

Republic also has used wetlands to treat leachate at a landfill in southern Alabama, Martz says. The wetlands use “microorganisms — we call them ‘bugs’ — to decompose the organic matter in the leachate,” Martz says.

Big on Bioreactors

Bioreactors are gaining favor today for several reasons. By collecting and continually re-circulating leachate, it is possible to increase the rate of waste’s decay within the landfill. That, in turn, increases the production of landfill gas.

Of course, the methane in landfill gas can be cleaned and used to produce electricity that can be sold, which in turn creates another source of revenue for the landfill.

Furthermore, as the landfilled material's decay is accelerated, it settles and creates more airspace for disposal. Bioreactor operators have reported increases of up to 20 percent in available airspace, Joyce says.

In closed landfills, operators are testing the notion that a bioreactor might shorten the 30 years needed for post-closure care, according to Gary Hater, senior director of Waste Management.

While it sounds economical and even sustainable, bioreactors also pose complex engineering challenges. For instance, they require carefully engineered leachate collection and recirculation systems. "You don't want the leachate to build up as pockets of liquid inside the landfill," Joyce says.

Water saturation in certain areas can destabilize the landfill and cause uncontrolled settlement. "In addition, EPA regulations prohibit more than 12 inches of leachate from accumulating on the liner system," Joyce adds. "So the piping, gravel, spacing of the pipe, and the size of the pipe in the leachate collection system must be designed to match the amount of leachate being generated and re-circulated. If the landfill produces 10,000 gallons of leachate per day, you still have to collect and re-circulate it without allowing it to build up on the floor of the liner."

If leachate does build up, landfill owners will have to treat it or haul it away or both. In the end, though, bioreactors will cut the cost of leachate management because there will be less liquid or no liquid to dispose of.

Waste Management has worked closely with EPA to pioneer bioreactors. "We have had a cooperative research and development agreement with the EPA for a decade," Hater says.

Under that agreement, Waste Management has built a number of bioreactors. "We have five in Wisconsin … ," Hater says. "We also have one in California, [one in] Kentucky and [one in] Oregon, and we are permitting facilities elsewhere."

Currently, bioreactor landfills operate under special research and development permits issued by EPA. Hater believes that may change soon. "The EPA is moving to make bioreactors part of the solid waste regulations, and states will have the option of adopting those regulations," he says.

That would give operators another powerful leachate management tool.

Dust Control Through Leachate

The Candler Road Landfill in Hall County, Ga., spans 255 acres, with 94 acres permitted for the disposal of MSW. About 35 acres are built into cells.

Until 10 years ago, Candler Road used tanker trucks to haul leachate to a privately owned water treatment facility in Atlanta. "We hauled two tanker truckloads of leachate per day," says Kevin McInturff, an engineer with the Hall County Department of Public Works and Utilities. "Each carried 5,000 to 6,000 gallons."

At 10 cents per gallon for hauling, leachate disposal was costing the county hundreds of thousands of dollars annually. Seeking to cut those costs, county officials decided to research the possibility of piping leachate to Gainesville, Ga.

“We asked a consulting firm to help with the research,” McInturff says. “The consultant found that the city’s pretreatment standard would require us to build an extensive biological treatment system in addition to the pipeline. We decided it would be cheaper to treat the leachate on site.”

Hall County issued an open-ended request for proposal (RFP) indicating that the county would be open to any on-site treatment option. In the end, the county opted for a reverse osmosis installation supplied by Hermosa Beach, Calif.-based Rochem Membrane Systems Inc.

The system pumps leachate from the landfill into a 150,000-gallon tank, where it is aerated to remove odors. Then the leachate is moved to a second tank, where solids settle out. The solids are returned to the landfill.

“Next, the leachate goes into a 500–gallon tank with a stainless steel screen, a bag filter and a sand filter, which remove more solids,” McInturff says. “The reverse osmosis process separates [the leachate] into permeate — clean water — and concentrate. About 85 percent is clean water and 15 percent is the concentrate, which we return to the landfill.”

The system adjusts the pH of the clean water permeate — the landfill’s operating permit requires a pH between 6 and 9. “The permeate is clean,” McInturff says. “We use it on site to control dust. We also mix the water with seed and mulch and spray it onto finished cells to grow grass.”

Fluid Decision Making

Landfill operators have an array of leachate treatment techniques from which to choose. Some techniques allow landfill operators to reuse leachate on site in a beneficial way, or, at the very least, to dramatically reduce their leachate disposal expenses. By finding the right way to treat leachate at a particular facility, leachate can, in turn, treat a landfill owner right.

Michael Fickes is a Westminster, Md.-based contributing writer.

Source: https://www.waste360.com/hazardous-waste/taking-care-of-landfill-leachate