

Benton County Planning Commission
c/o Community Development Dept.
4500 SW Research Way
Corvallis, OR 9733

DATE RECEIVED: 7/8/25

FROM: Tremaine + Gail Arkley

PHONE OR EMAIL: _____

July 6, 2025

Re: LU-24-027 application to expand the Coffin Butte Landfill

Dear Chair Fowler, Vice-chair Hamann and members of the Benton County Planning Commission,

My wife Gail and I live on 24 acres in Polk County. 15 of those acres are a fruit and vegetable farm, Arkley Farm, and we have owned this property since 1975. My farmland is zoned EFU, and has Class 1 soil, i.e. the best (and to keep it that way I have always farmed organically; no chemical inputs, no sprays).

My farm is in Independence - about 2 miles north of the Buena Vista Ferry, if you know where that is. If you don't: we're a little over 7.5 miles *as the crow flies* from Republic Service's Coffin Butte Landfill (over 10 miles by road).

I keep hearing that Republic Services' odor consultant claims it is highly unlikely that anyone would smell the dump from such a distance.

Well I am writing to tell you for a fact I can smell the stench from here, over 7 miles away. And I know it is dump stench I am smelling, because I know what the dump smells like up close whenever I drive by it - and that is definitely what I smell here on my farm at times. There is a dairy a few miles Southwest of us that we sometimes smell too, but there is no comparison. A dairy just smells like cows and manure... whereas the dump stench is indescribably bad.

We used to smell it only intermittently, but lately we have been smelling it more often.

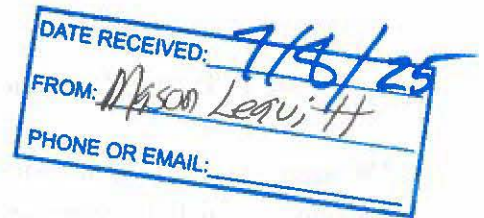
At times, the stench is very strong at our farm. It's so strong at times that we are afraid to go out and plant vegetables in our raised beds, or do our harvesting, or go out and mow, for fear of what's in that stench mixed with the air we are breathing. How many toxins are we absorbing through our skin? The smell even gets into our clothing and hair. What is coating our fruits and vegetables? We don't know, but the more we learn about what all is in the landfill gas that leaks out of the Coffin Butte dump, the greater is our fear. We are concerned on behalf of the people who work for us too. They should not be subject to these unknowns either.

This is an undue burden and definitely interferes with our farming operation. It is a problem that is bad enough with the dump as it exists already, but it will only get worse if you allow this landfill to expand. Please do not let that happen.

Please deny LU-24-027.

Sincerely,

Tremaine and Gail Arkley
9775 Hultman Rd
Independence, OR 97351



Benton County Planning Commission
4500 SW Research Way
Corvallis, OR 97333

Submitted in person on July 8th, 2025

Subject: Public Comment for LU-24-027

To the Benton County Planning Commission,

Beyond Toxics, an environmental justice organization that works to address air quality concerns throughout the state of Oregon, and one that has been long involved in the community concerns surrounding the Coffin Butte landfill, strongly urges you to deny the proposed expansion of the landfill. This Planning Commission is tasked with ensuring that this landfill does not seriously interfere with uses of adjacent property to the site. Based on this County's findings, evidence in the record, and strong community input, an approval of this expansion would not meet that task.

The expansion project should be denied because it does not comply with the Benton County Code. The expansion development area extends to lots zoned Landfill Site (LS) and Forest Conservation (FC). The expansion was first proposed in 2021, and was denied by the Benton County Planning Commission.¹ Landfill expansions are conditional uses in the LS zone and the FC zone.² The proposed uses must meet both the general conditional use criteria under BCC 53.215 and the additional criteria for each respective zone. It fails to do so for the reasons included below, and those provided by other commenters.

Please include this comment in the record for this application and please provide Beyond Toxics with notice of any further hearings or processes related to this application.

¹ LU-21-047 Planning Commission Findings, Benton County Community Development Department, December 7, 2021.

² BCC 77.305 (Any proposal to expand the area approved for a landfill within the Landfill Site Zone is allowed by conditional use permit. . .); BCC 60.215(11) (Conditional uses include disposal site for solid waste approved by the Benton County Board of Commissioners and the Oregon Department of Environmental Quality together with equipment, facilities, or buildings necessary for its operation).

A. BCC 53.215: Conditional Use Criteria

The approval of a conditional use permit must be based on findings that (1) the proposed use does not seriously interfere with uses on adjacent property, with the character of the area, or with the purpose of the zone; (2) the proposed use does not impose an undue burden on any public improvements, facilities, utilities, or services available to the area; and (3) the proposed use complies with any additional criteria which may be required for the specific use by the code.

The County's findings and the evidence in the record do not support that the proposed use will not seriously interfere with uses on adjacent property, the character of the area, or the purpose of the zone. As the record shows and as other commenters have highlighted and provided evidence in support of, the expansion of the landfill, which also extends the life of the landfill, seriously interferes with uses on adjacent property and the character of the area.³ As discussed in greater detail below, Beyond Toxics is deeply concerned about noise, odor, traffic, soil/water quality and air quality impacts, in addition to climate and public health concerns, from the proposed use.

The evidence in the record also does not support that the proposed use does not impose undue burden on public improvements, facilities, utilities, and other services available to the area. As the record shows and as other commenters have highlighted and provided evidence in support of, the expansion of the landfill, which also extends the life of the landfill, imposed an undue burden in conflict with BCC 53.215(2).⁴ Beyond Toxics is particularly concerned about recreation, traffic, and fire risk.

Finally, as discussed below, the proposed use does not comply with the additional criteria required for the use FC zone. Because the proposed use does not comply with the BCC's criteria for conditional uses, it should be denied.

B. BCC 60.220: Forest Conservation Zone Conditional Use Criteria

The findings and evidence in the record do not support that the proposed use meets the conditional use criteria for the FC zone.

- 60.215(11) Conditional Uses: Disposal site for solid waste approved by the Benton County Board of Commissioners and the Oregon Department of Environmental Quality together with equipment, facilities, or buildings necessary for its operation.

It is not clear based on the record that this threshold criterion has been met. It is not clear whether the expansion has been or needs to be approved by DEQ based on the supplemental staff

³ See, e.g., VNEQS comment (BC8.2).

⁴ See, e.g., VNEQS comment (BC8.2).

report or the BOP and its exhibits.⁵ DEQ Permit #306 expressly requires approval of a work plan for any expansion beyond the current footprint of the landfill.⁶ Exhibits 24 and 25 indicate that the Applicant received DEQ approval of a work plan in 2021 related to a potential expansion, but it is not clear that subsequent DEQ approval of the site characterization was received.⁷ The Applicant appears to suggest that whether or not the expansion requires additional DEQ approval is not relevant to this section of the code because “Whether serving the existing or proposed disposal site, the proposed Project elements on the FC-zoned land fall into the category of equipment, facilities, or buildings necessary” for the operation of either the existing or proposed site. But the Applicant has not supported that displacing the current buildings and leachate ponds, or building the maintenance area onto FC-zoned land would be necessary but for the expansion of the landfill site. Therefore, the County should ensure that all required DEQ approval has been obtained before approving the expansion.

- 60.220: A use allowed under 60.215 may be approved only upon finding that the use: (a) will not force a significant change in, or significantly increase the cost of, accepted farming or forest practices on agriculture or forest lands;

The proposed use involves building an 1,800-square-foot employee building and parking, modifying access roads, relocating leachate ponds and infrastructure, cut activities, and a shop/maintenance area (at least 10,000 square feet).⁸ The staff report also does not consider or describe in detail the size of the parking lot or road modifications. The Applicant has not supported how these developments, which involve cut activities and displacement of buildings, parking, and leachate management infrastructure towards the perimeters of the development area,⁹ will not seriously interfere with the purpose of the zone or force a significant change in accepted farming or forest practices. Evidence in the record supports the contrary conclusion that these developments, particularly the replacement of leachate ponds further towards the south, will significantly affect surrounding agricultural and forest uses.¹⁰

- (b) will not significantly increase fire hazard or significantly increase fire suppression costs or significantly increase risks to fire suppression personnel; and

The findings and evidence in the record do not support that the proposed use will not significantly increase fire hazard or fire suppression costs and risks.¹¹ The findings do not

⁵ Supplemental Staff Report at 101.

⁶ Exhibit 23 at 16.

⁷ Exhibit 23 at 16.

⁸ Supplemental Staff Report at 104 indicates that Applicant clarified the proposal includes a 10,000 square-foot maintenance building and a 400-gallon septic tank, but the BOP at Exhibit 2 notates a 28,000 square-foot area.

⁹ Supplemental Staff Report at 104.

¹⁰ See, e.g., Supplemental Staff Report at 102-103.

¹¹ Supplemental Staff Report at 104-105.

sufficiently address the Adair Rural Fire Protection District's recommendation to deny the application, including because the proposal may increase traffic and associated emergency response demands and present elevated fire risk, burdening the volunteer-based fire department.¹² Exhibit 20 is primarily based on landfill staff interviews, not a systematic review or record of fire events at the landfill site. Even so, the report indicates that the frequency of both landfill face and grass fires has increased in the past several years. Additionally, the assessment does not appear to provide an analysis of how the expansion project itself (i.e., its new location to the south of Coffin Butte Road, and the new position of the leachate system and buildings adjacent to, rather than across the road from, the working face) has changed the fire risk of the use.¹³

- (c) complies with criteria set forth in BCC 53.215 and 53.220.

The proposed use does not comply with the code's general conditional use criteria as discussed above. Most significantly, the record supports that the proposed use will seriously interfere with the purpose of the FC zone in violation of BCC 53.215(1). BCC 60.005(1) states that "[t]he purpose of the zone is to The Forest Conservation Zone shall conserve forest lands, promote the management and growing of trees, support the harvesting of trees and primary processing of wood products, and protect the air, water, and wildlife resources in the zone." The development of built infrastructure and the placement of leachate ponds and systems, and a 400 gallon septic tank on FC land seriously interferes with and conflicts with the conservation purpose of the zone.

Based on the County's findings and the evidence in the record, the expansion project does not comply with the County Code's requirements for conditional uses and should be denied.

Beyond the project's conflicts with the County's land use code, Coffin Butte is a site with a long history of mismanagement and environmental concerns. This site has been emitting dangerously high levels of methane for years, with the United States EPA concluding after two recent compliance inspections that the landfill has "wide spread shortcomings" in the site's monitoring practices. Landfills, which produce methane as bacteria decompose waste, are the third largest source of human-related methane emissions in the United States. Methane plumes created at landfills also release health-harming pollutants that are present in the trash as it breaks down over time.¹⁴ These toxins, such as nitrogen oxides, sulfur dioxide, hydrogen sulfide, toluene and PFAS, or "forever chemicals," escape with the methane. Some estimates indicate that volatile organic compound (VOC) emissions from landfills account for 10% of total VOC emissions in

¹² Supplemental Staff Report at 18, 70-71, 104.

¹³ See Exhibit 20 (historic review).

¹⁴ <https://rmi.org/methane-a-threat-to-people-and-planet/#:~:text=Methane%20is%20a%20risk%20to,shortens%20lives%20in%20affected%20regions>

the United States.¹⁵ These compounds are associated with many negative public health impacts to workers and neighboring residents, including smog formation and release of particulate matter and carcinogens. Additionally, methane emissions, and the additional toxins they contain, are still understudied and often go undetected.

Recent studies by federal agencies such as the EPA and NASA have shown that landfill methane emissions far exceed previous estimates, in some places by as much as 100 times the regulatory limit. EPA inspections have uncovered these kinds of methane exceedances at Oregon landfills, including “explosive” levels at Benton County’s Coffin Butte landfill.¹⁶

Furthermore, Coffin Butte’s excessive methane emissions is also a significant climate change driver for the area. Methane is a powerful greenhouse gas that is 80 times more potent than carbon dioxide in short-term climate warming. Landfills, which produce methane as bacteria decompose waste, are the third largest source of human-related methane emissions in the United States. In 2022 alone, Oregon landfills emitted methane equal to an estimated 2 million metric tons of carbon dioxide. That is the same as 466,000 cars on the road for one-year.

It would be extremely irresponsible to approve the expansion of a landfill that is already struggling to keep up with its environmental requirements. Community members already experience these impacts, smelling gases that they have no knowledge of the contents or the short and long term effects on their health. This Commission must consider the current, ongoing impacts of the site before allowing these issues to only be further exacerbated by an expansion.

Sincerely,

Mason Leavitt GIS Analyst & Programs Coordinator
Beyond Toxics
120 Shelton McMurphy Blvd Suite 280
Eugene, OR 97403

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<https://www.sciencedirect.com/science/article/abs/pii/S0957582018307572#:~:text=It%20is%20estimated%20that%20VOC,et%20al.%2C%202009>

¹⁶ <https://www.documentcloud.org/documents/24040319-coffin-butte-epa-inspection-06-23-22/>

July 8, 2025



Dear Petra, and BC Planning Commission,

Should Petra not respond this email. I will submit this comment to the record in case Planning Dept. does not respond to questions about Conditions of Approval for LU24-027 CUP.

I am opposed to LU24-027.

Please hold the Record Open.

I have questions for the BC Planning Dept. about the Conditions of Approval for LU24-027.

For Condition enforcement what are the time frame's for each condition to be implemented and when does each condition expire? What are the penalties to the applicant when they do not implement conditions in the time they know they are directed in this CUP to implement?

With a prior history of no conditions of approval being implemented by the applicant, the CUP process is seriously wasting the public's time over two decades of CUP applications and BC savings(general fund) to pay Winterbrook Planning and to pay for Staff time to process public comments, hold public hearing's and for volunteers on the PCommission who spend countless hours reviewing the application's, requested support materials that the public does not see, reading reems of public comments and searching for referencing scientific literature, to learn more about issues they are interested in understanding where the application falls short or fails to inform this decision body adequately enough.

By historically no implementing conditions of approval, has lets this applicant continue to do business together with Benton County legal council and BOC to run and plan for Host County to generate tipping fees and get the bonus million dollars a year gift from Republic Service, to fund the general fund.

Unlimited dumping clause in the '2022-2040 Franchise Operation Agreement' is clear example of the applicant working together with BC County legal council who represents the tax payers, not the BOC or the General fund operation over time.

The Host County has legal responsibility to the BC tax payers, and to work as funded by State of Oregon, and BC tax payments, to support area businesses, and assist rural residential landowners to maintain a healthy and sustainable Benton County.

Which Benton County Department Staff will be assigned to see that all the Conditions of Approval are being implemented and maintained and fines or penalties are levied to this applicant for not following or implementing any condition of approval for this application?

Closure clauses are missing from the conditions of approval at the end of 4 -5 years the site will fill and close. What occurs for permanent closure and where/what are the closure steps and conditions? The applicant briefly notes generalized closure procedures in this application.

The North landfill has for x date, been exceeding the Conditioned height limit from it's CUP on x date. How will Benton County enforce the conditioned 450 feet height limit, when the north landfill's conditioned height limit was not and is not being enforced?

Benton County Emergency Management radio equipment installation is also at a NW Coffin Butte location together with other private line of sight radio equipment.

Benton County Public Safety group has not provided clear and factual information to LU24-027, for the loss of this site when trash exceeds 450 feet elevation from Tampico Ridge landfill should Benton County Planning or Public Works Dept. directors again, not enforce the 450 feet limit as Conditioned, for trash as set as a clear condition of approval with no penalty for exceeding 450 feet. Does this 450 foot height limit Condition have an expiration date?

Phase 1 Condition P1-2 Site Map Required

Fill locations are missing for storage of excavation materials from the Site Map. New roads are also, not include in this Site Map.

P1-4 Care instructions for and replanting requirements for the 40 foot tall live tree screening are not described in the conditions. How many years after planting does the applicant have to guarantee that the living tree row as a visual buffer, on the east property boundary, will still be alive?

Does the applicant have to create a visual screen on the West boundary of their property for LU24-027?

When does this P1-4 condition expire? So that the applicant might let this condition expire, then not be responsible for what they shared they would do under a CUP application for screening on the East side of the parcel.

What are the penalties from BC to the Applicant, if P1-4 Condition will not being implemented by x date? What are the penalties to the applicant for not replanting x number's of dead or dying, 40 foot trees within the eastern planted screening area by x date?

P1-5 Other permits needed: For excavation from Army Corps of Engineers, Nationwide Fill and Removal Permit, DEQ Solid Waste Management Permit- 306 issued for a new landfill or an expansion, DEQ Leachate treatment NPDES, NPDES Stormwater, TitleV-Air Contamination Discharge Permit, a Site Development Plan...

P2-1 (E) Seismic Study fails to define magnitude.

(H) Is missing any mention/Condition about building of a Public Bike Path with stripping and paid for Signage for this bike path, and information detailing if this path is on both sides of Coffin butte Road?

Applicant shared they where interested in bike path construction on CBR as part of this application.

Will turn lane pockets in 99W be long enough when Unlimited dumping continues and operational hours potentially could increase for more volume to exceed the current daily volume totals?

P2-2 Construction Phase:

What will occur with the current two leachate ponds? These leachate pond area's are not defined in the Conditions. I assume one or both leachate storage pond's have leaked into the ground in the past, and the soil in and around of these two leachate ponds may have highly contaminated or hazardous chemical laden soil pollution at this time.

What will the DEQ say for the renewal or for the new Solid Waste Management Permit-306 for this expansion, about the Leachate storage lagoon's and building a landfill right on top of one or both of these historic leachate storage lagoon's, when these leachate storage lagoons need to be closed and become part of the expansion site?

Soil under and around these old leachate lagoon's may need to be excavated and moved to a hazardous storage landfill. I assume Republic can not use this soil as daily cover, and should not put this soil from the leachate pond area, into the clean excavation materials from North slope of Tampico Ridge.

If Republic Services at Coffin Butte RLFill can except leachate pond closure and decommissioning soils containing, identified known to science, toxic or hazardous "special waste", then this needs to be clearly stated in the application, and in Conditions of Approval.

DEQ and BC Planning should not let Republic Service bury these two historic leachate ponds and construct the expansion landfill over top of both historic leachate ponds without first studying the area soil, and sharing where and how long leachate leaked from both ponds.

The applicant needs to provide a closure plan for the clean up of both the leachate pond's area soil's and proceed environmentally correctly and responsibly, to close these two leachate storage ponds.

Leachate pond closure was not detailed within the application that I saw, or defined in the Conditions of Approval.

(C) Blasting notification is not in the COA. Notices for blasting should to be given to area residents: EE Wilson Wildlife Refuge, Adair Village, area schools, ODOT and Adair Rural Fire Dept.

Blasting for Knife River Quarry Cell 6(a) up to Cell 6 (i), should be also be clearly noticed to the area public. Blasting should be conditioned to not occur after x time, and stop at x time and possibly be subject to some stoppage for holidays.

(E) Applicant needs a Federal fill and removal permit from Army Corps of Engineers for fill volume over x amount, and with this permit, the location(s) of overburden/removed ridge rock, sand, mud, trees, soil from North Tampico Ridge excavation and this permit will identify the removed material's storage area's as this is not been conditioned or discussed in this application that I could find.

Fill truck traffic on Coffin Butte Road may have impacts to trash delivery and bikers. The fill storage pile location have not been clearly discussed in the application or must be a safety condition from Benton County Transportation Dept. in their conditions for Traffic Safety.

BC Transportation Dept. discussion as Conditions should clearly share and show how traffic safety will be implemented from fill removal and storage traffic and by what route on both County and State Road systems fill and removal traffic will be using and at one time of the day or night.

If this application allows for the closure of CBRoad, the applicant should be clear about their future landfill build out plan, that comes after this application and this site is filled in 5 years or less with unlimited dumping, to continue and or expand intake with possibly new customers.

BC Permitting Dept. will allow CBRoad to close on paper. If this applications implementation to allows for CBRoad to close, the public needs to be ready for this and Adair Rural Fire Dept. can comment accordingly to this application.

Will the applicant have to file a new CUP application to allow for the closure of CBRoad, in 4-5 years at this location, to connect to the mothballed unvegetated North Landfill to Tampico expansion landfill?

Is the closure of CBRoad to occur because of LU24-027 location, as was the case for LU24-25 in 2023 and Coffin Butte Road closure?

The applicant is selecting to not close the North Landfill at this time, and no vegetation is being put onto the north landfill slopes supporting the applicant planning, for additional trash storage expansion sites.

If VLF Inc applies on paper to BC Transportation Dept. to close CBRoad, and then begins without a CUP to fill the CBRoad gap to the north to connect Tampico Ridge at 650 feet to the current 650+ feet elevation trash in the mothballed, but not closed, North Landfill. The public needs to hear about this in this set of conditions, or about the potential for Road closure on paper without any public involvement, should be clearly stated in the supplemental Staff Report. Coffin Butte Road is subject to closure on paper, without any public hearing and LU24-027 will be connected to the North Landfill site.

If CBRoad is closed, does the applicant have to file a new CUP to fill the airspace in between Tampico Ridge expansion and the North Landfill?

Possibly a Condition should be made in this application stating that any closure of CBRoad in 4-5 years, for a new or expansion landfill linking Tampico Ridge Expansion to the North landfill that is not closing, and which is currently in 2025 is mothballed, with no closure vegetative coverings being constructed at this time, and no closure plans submitted to BC possibly.

The County should require in a Condition in LU24-027, that the applicant go through a land use development application or a CUP for this second expansion in 4-5 years to potentially, be placing trash over top CBRoad. BC could Condition in LU24-027 for the applicant to not be allowed to close CBRoad on paper and continue to fill this area with trash as they are filling the quarry with trash at this time without public notice of this trash cell operation from: DEQ, BC Public Works as the HOST of this landfill in BC, or from the owner/ applicant.

LU24-027 may be being constructed to physically connect to the landfill storage area to the North landfill in five years or less.

CB Road is a commercial transport route for commercial freight used for State, Federal transportation, and by private businesses, by area landowners, and BC taxes these Agricultural products from the EFU Zone. CBRoad is used by recreational users and for access to rural residences for emergency vehicles. BC may lose EFU directed tax revenue when BC has to allow on paper, for the permanent closure of CBRoad by this applicant in four or five years at full up to 450 feet stage for LU24-027.

Area businesses as EFU revenue generators will not be involved in being party to the closure paper/form by BC for Cbroad and of BC selling or giving this ROWay to VLF Inc in five or less year's time when LU24-027 is full to 450 feet or higher.

Currently the public will not be involved in this applicant potentially planning to close CB Road, as was the plan in LU24-025 CUP in 2023.

All area residents, EFU businesses will loose this BC road access when it closes on paper.

A condition could be created in LU24-027, stating that CBRoad will not be closed for any future expansion to the north,west, east or south, for the purpose of using this as a planned airspace connector, to bridge to the North Landfill, from the Tampico Ridge Expansion landfill.

P2-3 Rookery

Is the new landfill haul road within 300 feet of the east rookery?

Are any part of both Rookeries, inside any primary or secondary 'Fire Break Tree Removal area'? If so, this needs to be clearly stated as tree removals inside Rookery forests will decrease forest density and create gaps that will add heat into these cool forest covered areas, and will allow avian predators to see into and have flight line access into these Rookery areas quicker and more often, night and day.

Operation

OP-1 Currently work is starting at 4a.m. at CBRL. The 4 a.m start/opening for opening up the landfill for business operations is not clarified within OP-1.

Will 2 landfills will be running at the same time? If so, the public needs to know this for their safety and odor reporting to DEQ.

(D) There is no discussion in the application about gas facility construction, noted to possibly occur within the time frame of this CUP by the applicant. Gas facility construction may not have been discussed in the LU24-027 application materials? Gas Faculty construction is noted in Conditions of

Approval and VLF Inc is assumed to be the developer, not Pacific Power at some time period during LU24-027 application. Any VLF Inc, Gas Plant build out should be clearly discussed in this application, and as a Conditioned use if there is no deadline for expiration of this condition, the applicant under this application may be able to build a methane pump to tank gas plant, or their own co generation energy plant without any public process at the County level.

Noise

OP-2 What will occur if sound levels are not reduced to 10dB, below levels as shown in Supplemental Staff Report Appended Noise Study- Greenbusch?

Who does what about Noise exceedence(s) if these noise levels above 10dB are not identified by Rep Service reporting to BC Staff?

Should a third party be required to monitor noise, so that daily noise level report to BC Planning or Public Works is factual? Should noise be recorded and this date saved, to track noise levels over time and be accessible to DEQ and to BC Planning Dept. to determine noise pollution occurrence, at what location and at what time, to link this noise pollution to time of day recorded, Scale Data for incoming waste transfer traffic?

What penalties will occur when noise goes above 10dB in A.M or P.M. during opening and operating hours?

Noise Conditions have no enforceable clause, or state any penalty such as: a implementation of a landfill wide stop work order, an x day shut down of the facility, fines, or a warranted several hour per violation, decrease in hours of operation, until noise levels are controlled to the Condition of Approval stated level?

OP-5 Maximum elevation 450 feet as conditioned. Currently the closed (mothballed) North landfill is above it's conditioned elevation height. How long does OP-5 apply and when it is disregarded by the applicant, as it was in the North Landfill, what recourse tools will be applied to stop this expansion from going above 450 feet? OP-5 has no tool by which to stop the applicant for exceeding 450 Feet. Closure of CBR on paper may trigger the reopening of the North Landfill, and allow trash to start to fill CBR area and connect both North mothballed, but not closed landfill, to the south expansion landfill area, without any new CUP hearing process, or new permits from DEQ, or notification of the public to a road abandonment, and sale of the entire CB Road Right of Way to VLF Inc with just the BOC approval.

A Condition to not allow CB Road to close and be sold to VLF Inc, when this expansion is filled should be created for LU25-027. Reflecting on LU24-025 – 2023 show that the future is near by less then 5 years for the closure of CBRoad.

ODOR

If odor emission levels are exceeded, what are the penalties? Closure, fines, reduced hours of operation? Will what amount of landfill gas odor come from operation of the new leachate delivery pipeline system or gas Odors from the higher elevation deep possibly not covered, leachate storage lagoon, above Coffin Butte valley floor?

OP-12 Fire Protection

What fire control resources does the applicant have for this new area, for the overburden waste storage area(s), and all the new locations proposed in this application? Top of the landfill, leachate pond and pump, leachate transfer lines and vents on this pipeline, road system, new office, new scale, queuing areas for truck on CB Road ect? What wells are here at the expansion site, and what is their pressure and cubic feet volume per second?

How far are water wells from this expansion landfill's location and will well water need to be pumped x 1000s of meters, up to this location from x well(s)?

With two landfills running who monitors these landfills after hours?

Fire could occur and no Rep Service staff will be on site as has occurred multiple times in the past. Neighbors and passers by have been reporting landfill and Gas Flare fires. A Condition to place a Rep. Service's staff on all three landfill site's, around the clock monitoring these landfills for fire will protect homes and properties on: Tampico Ridge, Tampico Road, Soap Creek Valley, in the Coffin Butte area and E.E. Wilson Wildlife Refuge and Adair Village.

Well Condition and lack of Condition to protect State of Oregon Waters, and all Rural Residential Wells.

OP-13 Test sentinel wells for chemicals. A Republic Service well water control is not discussed. Well water control samples should be taken before construction starts at the sentinel wells and from all private wells for Rural Residential zone homes around the development site.

(iv) This condition needs more discussion in the Staff Report to what VLF INC is responsible legally.

Rural Residential wells on Tampico Ridge depend on area water tables and these water tables possibly are all hydrologically interconnected.

Condition development should direct VLF Inc to provide the same amount of well water to residents who could in the future, have Rural Residential Zone or the State of Oregon owned water wells which have been polluted from/by LU24-027 development at the North end of Tampico Ridge, when well tests show pollution from landfill operation in Tampico Ridge or at other wells, such as at E.E. Wilson, and regional in an identified WV aquifer noted in testimony, in May 2025 testimony.

This regional aquifer should also be tested to establish a Control data set, to compare this to all future water testing data sets done by VLF Inc or the State of Oregon and for private landowners who own wells around this expansion area.

Testing Rural Residential Zone and the State of Oregon owned wells to the south/east/north/west should include more chemical panels other than just arsenic, and state that the applicant will pay for these well water tests and give the results to the State of Oregon DEQ, Oregon Water Resources Dept., to well water landowners and to Benton County Public Works Dept.

Well water testing at Rural Residential wells around this expansion, should be discussed in the Staff Report if this issue, is only detailed as a Condition of approval for the sentinel wells below the expansion, and that the applicant will deal with polluted Rural Residential and State of Oregon owned, water wells in the future.

There is no discussion in the first and supplemental Staff Report's, or in the application about the applicant honoring rural residential well safety when well water is compromised by new chemicals coming into these wells from Tampico Ridge being blasted away, and area water tables directly and right away, upon blasting, become impacted due to sudden losses in well water pressure, or from new sediment clogging well pump screens, and pollution incoming to these pristine wells, from new never before seen landfill linked chemicals pollutants found in x number's of rural residential wells over y months time, and repeating occurrence over time/years of prior working documented cubic feet per second wells, becoming dry wells.

Well water loss decreases the value of a rural residual properties and takes away fire fighting potential with well pressure loss and dry wells.

Landfill chemicals leaching into Tampico Ridge water tables, could end up polluting area wells and create health issues for humans, crops and animal and wildlife use.

Developed RR Tax lot land which have no wells are possibly harder to sell and Republic Service may buy up these rural residential tax lots to create more area for landfill and buffers from each successive landfill expansion.

BC Planning can provide in the Conditions of Approval, and in the Supplemental Staff Report, discussion about the care of area wells and how this applicant should be held responsible for destroying well water assets on State of Oregon and RR ownerships.

Trash liners will get ripped or torn at this location on steep wet slopes/during earthquakes, or during blasting, and from liners which are damaged by sharp objects, floating rocks that rise up into this area possibly by pressure and earth movement, and damage trash liners. Damage from man made sharps in medical waste that are not being burnt at Covanta Waste To Energy(Reworld), and is all being compacted into this landfill.

acids or bases may be without oxygen, be able to burn holes into plastic liners from tossed out: herbicides, batteries, and other toxic materials which combine to form liquid or gas acidic waste or basic gas or waste liquids, or other corrosive chemistry that does occur in airless environments, which will damage and destroy plastic liners which do not have bentonite clay lining on these steep wet slopes.

Landfill leachate will drain through holes in these plastic liners, and by gravity move down slope/downhill into the excavated Tampico Ridge and into this ridgelines water tables that are in broken up rock, or along flat Basalt flows, or along flat sandstone/mud-stone layers which are horizontal and which possibly connect to the south and north Tampico Ridge area along this Ridgeline.

Rural Residential Zone Well logs in this ridgeline possibly can be looked at to create a profile of what this ridge looks like subsurface.

The applicant has not done an analysis to show how Tampico Ridge rural residential wells are hydrologically connected to the North Expansion area/

Any excavation of the north Tampico Ridge line slope's may cause dewatering of x numbers of working rural residential wells in a short period of time, during excavation of this very large and deep holed excavation area.

The excavation of the leachate storage pond at elevation could lead to leakage problems of the leachate pond liner, which have failed in the old leachate pond's.

Liner failures or other issues with plastics and chemicals may lead to drainage of landfill leachate into the ground from the leachate storage pond and landfill, allowing x millions of gallons of raw landfill leachate to drain downward, into exposed/excavated area water tables in Tampico Ridge and eastward, into E.E. Wilson with global warming caused, yearly, 100 year rainfall event's.

Historic Slope failures have not been evaluated for this landfill expansion site.

The Condition of approval for the two below the landfill, early warning test wells, does not reflect the long term generational wealth of land ownership, and the very important property assets, that are area wells. Conditions do not describe in detail, what the applicant is responsible for and should offer to do to mitigate well losses when this expansion damages and will eventually destroy area wells on Tampico Ridge, and will damage and destroy The State of Oregon's E.E.Wilson surface storage water's and the area aquifer at E.E. Wilson, and E.E. Wilson's

ponds, wetlands, and area aquifer to the east of 99W, eastern drinking water wells will receive surface drainage/run off which will in time, contain landfill leachate pollution and expansion road run off and Drainage of landfill leaking leachate from failed trash liners, or from failed leachate

pond liner at elevation, and from no clay lining built under this landfill or underneath the leachate pond at elevation.

As this landfill and leachate pond both age, and trash storage liners begin to fracture, rot or rip under tons of pressure, or from sharp basalt rocks floating up into the liners and puncturing them, or liners which over time, under anarobic chemical pressure from landfill contents, chemically combining to dissolve trash an leachate liners.

Leachate pond liners leak as has occurred at the two leachate facilities south of CBRoad.

In the event of x magnitude earthquake, the upper deep leachate pond may leak, rip or physically be able to slosh leachate out, and draining leachate could drain x millions of gallons of leachate into area wells, and into E.E.Wilson Wildlife Refuge.

The leachate pipeline's may break and need to be shut down in the event of an earthquake. Does operation of the leachate pipe system need to be conditioned?

Who is responsible to E.E. Wilson ecosystem, BC or the applicant? E. E. Wilson staff are not participating in this application and they should be to best defend and protect this wildlife area as a State of Oregon wildlife asset.

BC should reach out to E.E. Wilson HQ if they have not done so already, as one of this landfills largest neighbors and State of Oregon landowner, and invite the wildlife refuge's staff to become involved this in this landfill expansion application.

The public should not have to work to protect E.E. Wilson Wildlife Refuge from damage brought to this site by the mothballed North Landfill, operation of the landfill in Quarry Cell 6, or from the pending Tampico Ridge expansion Landfill, from hazardous, toxic materials which have been and will be placed and compacted into this hillside, and will continue on into the

future for 100s of years, to be directly impacted from landfill generated soil, water and air pollution over time inside E.E Wilson.

The applicant will not be held responsible, due to no legal agreements, or LU24-027 CUP application conditions that hold them responsible for area wells safety and mitigation of damages to State of Oregon or any Rural Residential Zone wells by this application's passage into law.

BC will not have funds to mitigate damage to E.E. Wilson ecology or for replacement of contaminated area wells which can not be used due to landfill derived leachate contamination on into the future, creating a drain of area property abandonment's by people who can not longer use their wells and have zero recourse for who is responsible for destroying their wells when this landfill with all it's expansion, closes, and Republic Services leaves, and each landowner with condemned wells could try to sell their land at a loss and move.

The County is not protecting the current or future value of these landowners land and protecting area State of Oregon or BC Rural Residential Zone wells, surface waters or the safety of the vast area E.E.Wilson aquifer, identified to the east of this landfill, by allowing this applicant to build a landfill into the north face of Tampico Ridge.

Well water condemnation due to hazardous chemical pollution (trespass) from this expansion, and this expansion's possible potential, to connect this expansion area to the North landfill over Coffin Butte Road, could in a short time frame, directly damage Rural Residential Zone wells from dump derived leachate pollutants. Dump derived pollutants are physically at this time, not found in the control samples take by each Rural Residential Zone well owner, of individualize water testing results to be filed with the Oregon Dept.of Water Resources to prove these wells have been chemically trespassed by Republic Services from this, and the next expansion.

The applicant is unable to clearly show what will occur here for Rural Residential and the State of Oregon owned well water safety, and to show how area wells are deemed safe from leachate pollution trespass, over time. The County is allowing this applicant to trespass onto Rural Residential Zone through area water tables which due to layered geology, are connected to the

expansion's excavation site, and to the very deep leachate storage pond at elevation on Tampico Ridge.

Tampico Ridge has springs which are not discussed in this application and this ridge area is extremely wet so that excavation will drain rain water which is stored up in subsurface water tables/water pocket hydrology from the North slope of Tampico Ridge. With rain, excavated North Tampico Ridgeline will be severed of this ridgeline's flat water tables and possibly drain more water from this site than is normal due to fracturing and opening of area water tables at this massive excavation.

Dump liquids as leachate, may be able to move down under and into all areas on the Tampico Ridge landfill expansion's massive slope pit, from all future ripped Trash Cell liners that will be leaning up against this slope, and trash layers will be in direct connect to Tampico Ridge water tables which lay horizontal to the landfill waste cells and leachate storage pond excavation site's.

Placing no clay lining on this slope increases the chance for ripped trash liners to fail, and drain directly into area water tables which are open at this trash pit. Concrete/plastic spray seals under pressure on steep wet, moving and break over time.

OP-15 Litter control

(E) entire property enclosed in Fence will create movement problems for migrating/moving seasonally, large game and function to move these large game onto CBRoad/north landfill, quarry landfill and possibly onto 99W and other area roadway.

Fence gaps in expansion landfill site will be nice to have to allow animals to move across this historic area and not get trapped inside this fenced enclosure and be shot.

Safe less deadly, entanglement free Jumpable/scaleable fencing with gaps could be used for big game and a host of small mammals which historically

call this area home and on a daily basis, move through this area to find water, forage and shelter.

Thanks, R. Foster
9805E Main Pl
CORVALLIS, OR

Good evening, I'm Bill Gellatly, an eleven-year resident of Corvallis. My wife and I live at 2923 NW 13th Place, just North of Walnut. This will be my fifth testimony related to the Landfill, and the items that led me to speak in front of both the Planning Commission and the Board of Commissioners. I also prepared a testimony submission to the Oregon DEQ regarding Air Quality, and regardless of the content of testimony, Oregon now has a signed bill on Air Quality.

While my career as a mechanical engineer was primarily was a technical one, I'm the child of depression-era parents with few means and at born a time when a war on two fronts was still going on.

I learned on the job and left Tektronix with the title of **Principal Engineer** and led **Mechanical Engineering Quality Management** for what was then a \$1.5 Billion-a-year company.

Bill Gellatly
Manager
ME Quality & Sustaining
24" Display Team Leader

Tektronix, Inc.
Measurement Business Division
Howard Vollum Park
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Tektronix

SAVE - CHINESE →

I want to leave everyone with three **Ideas** and a **PLAN**. Not just you as a Planning Commission, but also Staff, Staff Counsel, Republic and their representatives. I respect each of your roles.

First, the **ideas**, because they can be so simply stated.

- **Quality** is qualitative and quantitative. Numbers have meaning!
- **Character** can be the attribute or nature of a place, and that is how it is defined in the "character of the Coffin Butte, Soap Creek, Adair Village. Character also related to integrity in people, and that leads me to...
- **Trust** – It is built on credible assurances, clear actions, and long-term consistency.

Now, let me cut to the chase - Republic Services and their wholly owned subsidiary Valley Landfills are in three businesses in our region. By region I also imply Linn, Lane and Lincoln counties to acknowledge the 1982 regional agreement. Republic should be seen as a partner and not an adversary.

I requested time as a neutral party to amplify the need for collaboration, but the registry portal does not offer that option. Pro or Con is the favorite place of negotiators, so I ask that you take my position in that light despite an assignment made through the county's portal.

That's the "why," and because of time limits I have attached another several pages that outline "how," from a high elevation, what in my corporate world was a Feasibility Proposal. What I've assembled reflects years on Project Management, and leading several Projects of my own. Synthesis is faster than trying to drive perfect answers at this point, so I beg your indulgence, and call for any questions on any of the charts and diagrams that outline my **Alternative Plan**.

APPENDIX

Including all Following Sheets in the Packet

How?

- Acquire property near existing North-South lines (adjacent to Yard Debris & Food Waste processing on Camp Adair Road is but ONE example.
- Make that property an excellent TRANSFER STATION TO RAIL.
- Build a quality LEACHATE TREATMENT OR CONTAINMENT FACILITY in the west end of the recently terminated quarrying site.
- Be transparent! Acknowledge the problems, embrace them fully, and apply pressure to solve them.
 - Develop low-energy biological processes. Support research already in progress at OSU and other labs, partner over to have at least a pilot operation by 2027. Other risk reduction measures are arriving, so tracking and following their process is crucial.
 - Use energy from current air pollutants to heat the best current process to remove water, distill and fractionate regulated chemicals, and then contain the resulting sludge.
 - Spend equivalents to rail-savings on diesel to provide more heat/energy required to run the treatment processes. These are common processes, to date they're being overlooked.
- In the meantime, control the losses in the permanent and daily-cover membranes.

Please now move to the attached sheets that give high level "feasibility level" guidance.

Domain Experts

Barbara Balen	Retired Forester	US Forest Service
Bob Lillie, PhD	Geologist	Emeritus OSU
Chris Goldfinger, PhD	Geologist - .	Emeritus OSU
Chris Orum	Chemistry & Mathematics	OSU Staff
Daniel Shafer	Water Treatment Specialist	CEO Nikkua Training Center
Dick Waring	Professor Emeritus - Forestry	
Lew Semprine	Project to neutralize PFAS	OSU Staff
Mary Kentula	Forensic Accountant	EPA
Phil Sollins, PhD	Botanist, Soils Science (Foresstry)	Emeritus OSU
Robert Kokenyesi, M.S.	Physics & Busness Management	OSU Staff
Todd Harder	Chemical Engineer	Retired - Hewlett Packard
Gregg Olson	Champion of Travel/Freight by Rail	Retiree
Bob Hansen	ME Brooks Incinerator Operations	State of Oregon/Marion Cty.

Direct Personal Experience w/Landfill, Water or Air Quality

Bill Brisky	Neighbor on N side of CB	Electrical Engineer (Retired)
Erin Bradley	Horse therapy business	BitbyBitHorseTherapy.com
Mark Yeager	Process Design Specialist	Water Treatment Professional
Steve Peters	Project Manager - HaxMat & Sharps	Retired - Republic Svcs
Anita Ragan	Environmenta Health & Safety Mgr.	Hollingsworth & Vose
Cindy Frost	Operations Manager	Hollingsworth & Vose
Joel Geier, PhD -	Consulting Hydrogeologist	

July 8, 2025

Good evening Chairman Fowler, Planning Commissioners and staff,

I'm Camille Hall and I live at 7175 NW Mountain View Drive, Corvallis.

I oppose LU-24-027, expansion of Coffin Butte Landfill.

Thank you for the long hours and effort you have put into this review.

This land use hearing is the only place where residents have standing in decisions made about the use of this property, through these requirements:

BCC 53.215 (1) "The proposed use does not seriously interfere with uses on adjacent property, with the character of the area, or with the purpose of the zone;

(2) The proposed use does not impose an undue burden on any public improvements, facilities, utilities, or services available to the area"

Much of the testimony in opposition to the expansion has been brought up before. What is new today is the decision by staff to accept the applicant responses to our concerns without effectively addressing those concerns. This is the only time Benton County has the chance to stand up for the rights of residents whose properties and lives are impacted by this expansion. Once the CUP is approved, not only will the tonnage cap be lifted, but Valley Landfill will be free to operate Coffin Butte Landfill within the letter of the law, which is insufficient to protect the land use rights specifically protected through the CUP approval process.

We as citizens, County administration, staff and volunteers are overmatched by the resources of this \$75-billion dollar corporation with 200+ active landfill sites nationwide and the ability to hire consultants on retainer to show up for them in situations like this. Coffin Butte Landfill is a very profitable operation for Republic Services. As a small county with a very large landfill, the CUP process is the only place the County, staff and Planning Commission have the power and authority to protect adjacent property owners with regard to their ability to live and work on their property.



Engineering models, such as those used here by Republic Services, are based on assumptions and use data that exist in historical record. Especially in regard to odor and noise, which are transmitted through interactions between the physical landfill site and atmospheric conditions, the continued presence of methane plumes, propelling landfill toxins and odors, along with equipment noise, hundreds of feet in the air. These serious problems call for site-specific air flow studies rather than historical models.

Likewise, the applicant's supplemental responses to our groundwater concerns state that a "focused hydrogeologic investigation of the proposed development" will occur AFTER the CUP as part of the site development permit. We need to look at data regarding the exact nature of the site now, prior to approval, in order to anticipate how the proposed development will affect adjacent properties. We need to know in site-specific terms, how the blasting and excavation might affect the groundwater and wells on those properties. The applicant's plan relies on test wells and mitigation in response to perceived damage. The expansion will have serious irreversible adverse impact on the use of adjacent property if groundwater is diverted, well levels drop or wells are contaminated.

Other examples of the use of inadequate data, or historical data and modeling in the applicant response include: the map on p. 56 showing groundwater at Coffin Butte Landfill flowing away from adjacent properties, but no information for the direction of groundwater flow on adjacent properties south of the proposed expansion; and the statement on p. 57 of the supplemental staff report re: effect of Development on Dewatering: "VLI's evaluation of the impacts to local water supply wells considers the relative consistency of the groundwater flow conditions to support a conservative assumption that fractured bedrock behaves similarly to a porous media. Under this assumption, all fractures are interconnected, allowing the analytical solution to evaluate the most widespread effect of the proposed project..." The applicant does not provide evidence to convince us of factual basis of this assumption.

We also request the Oregon Water Resources Department be notified of the application and issues raised by the community. As the state agency most knowledgeable and with the broadest authority over groundwater use in Oregon, they should be invited to comment and refer us to other agencies if appropriate.

With regard to onsite grass fire, larger scale wildfire, disaster/emergency response and emergency evacuation, we would like to see appropriate state and county agencies involved in reviewing and commenting on the application and concerns we have raised. The local volunteer department at Adair commented as to their limitations. This is an undue burden on local resources which might be needed to protect and defend the residents of Adair Village during the time they are responding to fires at Coffin Butte. We want to see how these agencies will be able to respond under the conditions of the expansion, in order to determine the burden on public services and how this will affect our safety and use of our property.

An overarching problem is the highly technical nature of this application, involving many specialized fields of study. Republic Services has called on the experts who have supported and defended their actions and applications nationwide. These consultants rely on generalized data and models to defend the application. The county does not have staff or consultants to match that expertise in all the areas necessary to evaluate the relevance of the applicant's response. County and state agency reports also specifically defer to the applicant on several topics where, in the course of their regular duties, they do not have the authority or expertise to comment. In these cases, we ask that the appropriate agencies and unbiased topic experts be called on to evaluate the applicant's work.

From 2010-2016, Coffin Butte took in 500-600,000 tons of trash a year. Beginning in 2017, annual tonnage doubled. We know the impacts of these tonnage and activity increases. This expansion is a turning point in the future of Benton County. A decision to approve this CUP enables VLI to pursue further landfill expansion here in the relatively damp, residential and

agricultural Willamette Valley. Republic Services owns Roosevelt landfill, just across the Oregon/Washington state line from Columbia Ridge landfill which is operated by Waste Management. Waste Management ships trash by rail to their facility and offers a model that could be pursued by Republic Services if they weren't free to continually expand here at Coffin Butte at much lower cost.

I urge you to deny this application to protect land use rights of adjacent properties, and to encourage Republic Services to develop more responsive and responsible waste management practices here at Coffin Butte, rather than committing Benton County to more of the same problems you have heard about in this hearing.

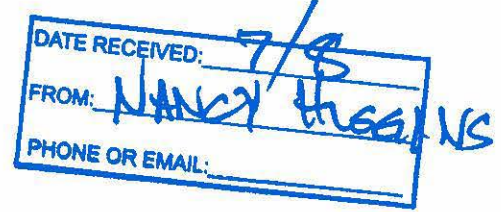
Thank you.

I am Speaker #10

Two people ceded their time to me

Marge Popp #13 and Josh Dodson #25

Intro.....



I am reading a letter from my husband, Kevin Higgins. Kevin is a retired fire captain. He served over 20 years at the Adair Rural Fire Dept., retiring in 2022.

He also is the former Emergency Manager for Benton County. He moved on to become the Special Services Manager for the Sheriffs Office and due to a schedule conflict he is unable to be in person tonight. Kevin was asked to share his experiences with fires at the dump. The following letter is from Kevin.

When I first started at Adair Fire, we were still having routine fires at the dump, some of them very big, multiple alarm, and many agencies needed to fight.

One particular fire was big enough to make the Associated Press as National news in 1999. Some of those fires took all night to get out since the fire would be deep into the trash and would often require us to bring a dozer in to move the trash around to get to the fire.

These fires used a HUGE amount of water to fight. The landfill folks always hated it when we started dumping thousands of gallons of water on the fire because it would throw off the leachate.

I know the fuel load in the landfill is huge, and that is why a fire there requires so many resources. Fighting a fire there is one of the worst locations to fight a fire due to all the unknown substances burning. It is so toxic that you basically have to fight the fire on air the whole time. You're wearing a SCBA pack and on air for hours, but if you don't go on air, you usually cough and feel sick for days afterwards. Who knows what that has done to each of us that have fought those fires while not being on air. I have often wondered what kind of toxins were released into the air that not only we were breathing but may have affected the environment also.

My son Levi and I both wanted to communicate to you the physical effects of fighting the fire on the dump. We both experienced that our eyes got sticky and goopy and we both had burning in our lungs if we didn't stay on the SCBA air. Our lungs would burn for days after and we would feel lethargic and sick. Levi also experienced the explosions under the tarp and said that it was terrifying watching the fire hitting so many hazardous materials and seeing the fire color changes as it hit car parts, plastic and even petroleum products. The smoke was thick, black and heavy.

I imagine a scenario where we had a large wildland fire that included the dump here. We would have a toxic mess on our hands. A typical wildland crew wouldn't have the equipment to fight the fire at the dump. The structure firefighters would prioritize working exposure protection of homes and buildings. That doesn't leave many resources to fight the fire in the dump with all of it's toxins.

Over the years, they started doing something different, because the fires started to decrease in frequency. The last few I went to started in equipment operating at the dump but then would spread to the noxious trash so we had and equipment fire and a trash fire to deal with at the same time. This often required mutual aid from Corvallis Fire, Albany Fire and Polk County Fire to assist.

In the early days of tarping, I can personally remember fires that were under the tarp and feeling the methane explosions under my feet. Back then, I had to personally make large cuts in the tarps themselves to release the methane buildup so it didn't explode on our crew. I have heard representatives from the dump say that never happened. I can tell you that I was there. I did cut the tarps, and our crew felt the explosions!! It most definitely happened. It was an eerie sensation to feel the weight of the dump exploding under your feet.

I have heard testimony from supposed experts that say that since 1999 there have only been a very few fires at the dump. I am also reporting that is not true. I don't remember seeing those experts up there and I have no idea where they are getting their information. We had no less than two fires per year for many years, and every fire is dangerous because you have no idea what is burning and what is going to be burning next. Now granted, there were fires that were in the equipment that didn't spread to the trash in the dump itself. That was mostly because we were able to be timely in our response and quickly contain the fire to the equipment.

The Higgins family moved to the Soap Creek Valley in the early 70's. This is where I was raised and I have memories of going to the dump as a kid looking for treasures. I was a young inventor, and the dump looked a lot different then. My wife and I decided to move back to the Soap Creek Valley in the late 90's to raise our family. Our son and his wife are considering this as well. That would be 4 generations and so for our family, the stakes are high. We want to protect and preserve the beauty and health of the Soap Creek Valley and of Benton County.

The whole landfill issue is frustrating, and the expansion is all about greed.

I hope the commissioners are smart enough to fulfill the commitment made by previous commissioners to wind down the landfill, not expand it...yet again,. What a disaster it would be for them to overrule basically 100% opposition to the landfill, with only 3 supportive voices, and those three are all money driven the Republic Services, and the county itself, and trash hauling company in an outside county . NOBODY else was in support.

In closing, two things. To be clear, I am 100% opposed to any expansion of the dump. And second, I looked online for Benton Counties commitment to the environment, this is what I found. It should help in your decision making process:

"Benton County, Oregon, demonstrates a strong commitment to environmental sustainability through various initiatives and plans. The county aims to reduce greenhouse gas emissions, protect natural resources, and promote sustainable practices in areas like waste management and land use. "

DATE RECEIVED: 7/8/25
FROM: MARGE ROOP
PHONE OR EMAIL:

The Big Take Americas Hot Garbage Problem BusinessWeek 2025 07 01

[Businessweek](#) The Big Take

US Edition

Bulldozers compact and cover trash at Chiquita Canyon Landfill in Los Angeles County. Source: Shutterstock

Beneath layers of waste, landfills around the US have been reaching scorching temperatures, and neighbors have been getting sick.

By Laura Bliss Rachael Dottle July 1, 2025

Last year, Brandi Howse's annual mammogram returned a grim diagnosis: Stage 3 breast cancer. To save her life, she had her breasts removed, then her ovaries. She's free of the disease now and continues to take medication. It was all a particular shock, says Howse, who is 50, because her mammogram the year before had been clean. Several of her neighbors on Lincoln Avenue in Val Verde, California, have similar stories of cancers, autoimmune disorders or heart problems that seemed to come out of nowhere. She and her neighbors say they can't be sure of the cause, but given the number of people who are sick in their community of about 3,000, they have a guess.

Hidden behind a foothill about 500 yards from Howse's front door, on the northwest edge of Los Angeles County, sits Chiquita Canyon Landfill, one of America's largest repositories of municipal waste. While the landfill has often seemed on the verge of closure, it's grown by more than 200% over the quarter-century Howse has lived nearby. For a lot of those years, things seemed OK. The truck traffic could be annoying, pungent odors would sometimes waft into town. But that felt like more of a nuisance than a crisis until the spring of 2023, when a new level of smell settled in.

Part of the landfill has been topped with a plastic cover to limit smells and toxic gases escaping into the community.



Chiquita Canyon Landfill

The smell changes from day to day. Sometimes it's like rotten eggs in the sun. Other times it's more of a mysterious chemical sweetness. No matter what, it stinks. Like many of their

neighbors, Howse and her family gradually stopped using their yard or going outside much at all, but the stench has continued to haunt them inside too, even with windows shut and air filters running. And it's not just a matter of reeking garbage. By the summer, Howse says, she was taking pills to deal with an unrelenting headache. Her husband, Steven, who almost never got sick, was fighting chronic sinus problems. The youngest of their four kids, then 11, developed nosebleeds that gushed uncontrollably.

Howse and her husband considered selling, but on top of the financial barriers, they struggled with the ethics of putting another family in the same situation. "We kind of feel trapped," Brandi says.

The family filed a report with the local regulator, the South Coast Air Quality Management District. At that point, in mid-2023, their complaint was one of 900 or so. By the time Howse got her diagnosis in March 2024, that number had topped 9,500. Since then, the regulator has slapped Chiquita Canyon LLC, a subsidiary of Waste Connections Inc., with [hundreds of air-quality and health-code violations](#) and ordered it to fix the place up. Yet the smell has persisted with no simple solution, because what's driving it is something buried beneath the waste: a complex and dangerous chemical reaction whose very nature is in dispute. The state suspects garbage is smoldering underground as a result of the company's actions. But Waste Connections—like much of the waste industry—says that nothing is on fire and calls it something else, leaving locals like Howse not only physically ill but also feeling gaslit about what's happening in their backyards.



The Howses with the Chiquita Canyon Landfill in the background. Photographer: Philip Cheung for Bloomberg Businessweek

Here's the assessment from California's Environmental Protection Agency: In early 2022 a closed section in the landfill's northwest corner began overheating, eventually reaching temperatures above 200F (93C). That's nearly 40% hotter than the federal EPA's standard for landfill operations. As the waste slowly cooked, it belched out toxic gases, elevating nearby levels of hydrogen sulfide, carbon monoxide and benzene, which can damage DNA and [cause leukemia after enough exposure](#). Large amounts of leachate (basically, trash juice) built up and bubbled, boiled and even shot into the air like geysers.

One such geyser appeared to [gush from a landfill gas well](#) that exceeded the legal limit for benzene, as did several other samples of leachate, according to CalEPA. Other officials cited Waste Connections for allowing [the leachate to seep into waterways](#), an allegation the operator has [disputed](#). Cracks and fissures have worn away at the landfill's surface, [state regulators say](#), threatening to rupture storage tanks of toxic leachate, which the company also denies. Health

officials are investigating a possible cancer cluster because of the number of residents who've fallen ill. Pets have inexplicably dropped dead. Val Verde resident Erin Wakefield says she's arrived home more than once to whole swarms of insect carcasses strewn around her property. "This is so much bigger than a trash fire," she said at a press conference in April. "This is a state of emergency."

Leachate emanating from a gas well at Chiquita Canyon Landfill in November 2023. Source: South Coast AQMD

For about a year, Waste Connections went about business as usual, accepting trash deliveries from around LA and [sucking methane out of the landfill to convert into sellable energy](#). After receiving several violations from air-quality officials, the company publicly acknowledged that something was wrong. (The company says it was already taking actions internally to understand and address the atypical conditions.) In an August 2023 statement [on its website](#), it attributed the issue "to an abnormal biotic or abiotic process (also known as a landfill reaction) taking place within a portion of the Landfill waste mass." The company emphasized one claim in particular: "This reaction is not the result of a fire or other combustion." Waste Connections repeated this claim in a report the South Coast AQMD ordered it to produce that fall.

At the very least, though, the phrase "garbage fire," as in the online cliché for a bad situation, is an apt metaphor for the situation in Val Verde and towns like it. At least 10 other US landfills have overheated in similar fashion since 2006, and experts say there are likely far more that haven't been reported. Chronic headaches, nosebleeds and nausea are common near these sites. At one in Virginia, [steaming chimneys of gas](#) and leachate led locals to wear gas masks and tape shut their windows to survive what they called "the beast." At another, in St. Louis, [responders](#) once drafted evacuation plans for fear that the hot temperatures would spark a nuclear disaster at an adjoining landfill with buried radioactive waste near a community that now has [dozens of cancer cases](#).

Benzene Emissions from Chiquita Canyon Landfill Have Surged

Source: South Coast Air Quality Management District

Note: Data not available for 2012 and 2013. 2022 is the latest available annual data reported.

For affected communities, part of the challenge is getting all parties to agree on what's driving these meltdowns, or even what to call them. Nobody has the full measure of what it looks like, exactly, in the depths of the Chiquita landfill, because most of what's happening is many feet below the surface of the garbage pile. And the range of chemical reactions that arguably constitute fire makes "fire" a slippery term.

In most cases, the industry's preferred phrase is "elevated temperature landfill," or ETLF, which operators say has nothing to do with fire. Regulators often use technical terms like "subsurface oxidations" or "smoldering events," what the less technically minded might call fires without the flames. The neighbors tend to just say fire. "The waste industry does not want to call it burning, even though it smells like burning," says Becky Evenden, a former chemical engineer who lives a few miles from Bristol Landfill in Virginia. "Even though you see smoke." The distinction isn't

trivial. Federal regulations explicitly forbid operators from running landfills in a way that starts fires. By classifying these ailing waste piles as something else, several scientists say, the industry points the finger away from their own management practices.

Waste Connections disputes that characterization and many of the claims in this article. “Chiquita uses the term ‘ETLF’ to be precise, not to obfuscate,” a spokesperson for Waste Connections’ Chiquita Canyon subsidiary said in a detailed statement that cited several academic publications and an industry white paper using the phrase. “Precision in how the event is understood and described is crucial to ensuring that the appropriate response and mitigation measures are taken.” Waste Connections and other industry groups, as well as the EPA, say that the steps for stopping a landfill fire are different from those used to manage an ETLF. “There is no fire at CCL and it would greatly exacerbate conditions if Chiquita responded as if there were,” the spokesperson said.

In recent years, the industry has pushed back on protections that advocates say are designed to prevent fires before they’re too late to stop. The EPA has unraveled at least one rule described as critical by environmental engineers, and court battles have only occasionally yielded [significant victim settlements](#). In the course of reporting this article, *Bloomberg Businessweek* found that regulatory responsibility for enforcing even the most basic landfill rules varies widely depending on the region and state. Much of the data that might predict subterranean reactions—fires or otherwise—remains buried in monthly operating logs or reports filed to a patchwork of agencies, with no centralized system to track it.

For many of the more than 2 million Americans who live within a mile of a landfill, what all of this means is that they’re living within a mile of a potential time bomb, with little way to know when it might go off. Without better data and stronger efforts to understand and contain crises like the one at Chiquita Canyon, it’s almost impossible to know, as Brandi Howse asks, “how much trouble are we in?”

Strap on a pair of goggles for a lesson in chemistry. In a municipal landfill, solid waste—full of food scraps, paper, metal and glass, plus errant bits of e-waste and other hazards—is dumped into a giant pit in layers several feet thick, which are then capped with soil. Bacteria eat away at the organic matter, mostly tooting out carbon dioxide so long as oxygen is available. This aerobic process also generates heat. Eventually, under ideal settings, the microorganisms will consume all the oxygen. They’ll continue decomposing the waste and creating heat, but now they release methane and other gases. Such anaerobic decomposition is the best way known to break down waste and keep landfills fire-free.

However, methane is terrible for the planet, so to trap some of those emissions before they seep out, the EPA requires operators of large landfills to install gas collection systems, vertical and horizontal wells scaffolded between the layers of trash. In recent years, federal and state tax credits have incentivized operators to install systems for converting that collected gas into energy, a lucrative side business that brought [the US waste industry \\$12 billion in revenue in 2023](#), according to one analysis. If the operators aren’t careful, though, these systems can let in too much oxygen and upset the landfill’s delicate chemical balance.

Pulling too hard on the **gas wells** to suck out **methane and other gas** can create a vacuum effect that draws in **air**, which reacts and heats up the waste and can set off spontaneous ignition below the surface, creating even hotter temperatures.

Think of the classic fire triangle: heat, oxygen and fuel. In landfill fires, garbage is the fuel, and while it's possible to set off certain types of hazardous waste without oxygen, a fire can't spread without it.

For decades, the waste management industry has known that "these 'hot spots' can become excellent candidates for subsurface fires with the addition of an air supply," as Robert Stearns, **the co-founder of SCS Engineers, an industry consultant**, and his colleague Galen Petoyan wrote in a 1984 paper published in the journal *Waste Management & Research*. With enough ventilation, these buried fires could emit large amounts of smoke, but under the right, super-low-oxygen conditions, you might never see any. Among other recommendations, Stearns and Petoyan urged landfill operators of the era to keep air out of their waste mass to stop any level of combustion.

If you weren't around in the early 1980s, keep in mind that the US was still getting used to the idea that burning garbage was bad. For most of the 20th century, open burning was largely how sanitation companies dealt with it, area residents be damned. [This started to change after the passage of the Clean Air Act of 1970](#) and other EPA rules tightened standards around burning. A new generation of landfills sprang up, many of them shamefully [near communities of color](#), including Chiquita Canyon in 1972. (Val Verde, founded as a resort town a half-century earlier by LA's Black business leaders, was once known as the Black Palm Springs.) But by the time Stearns and Petoyan published their paper, the industry was struggling to deal with unwanted waste fires.

For one example of how badly it could go, take PJP Landfill in New Jersey, where buried drums of hazardous waste spontaneously combusted and burned throughout the 1970s and '80s, sickening locals and periodically shutting down the nearby Pulaski Skyway. In 1985 the Jersey City Fire Department tried blasting water onto the billowing towers of smoke, but that only made things worse. "What they didn't realize was that by hitting the surface of the landfill with these high-powered jets, they were stirring it up," an environmental engineer who worked on the fire told the [Jersey City Times](#) years later. "They were thus allowing oxygen to get down to the deep fires. So, while the fire seemed to be squelched on the surface, only a few days later with the additional oxygen, the fires were back worse than ever."

Eventually the [EPA declared PJP a Superfund site](#), and the New Jersey Department of Environmental Protection [managed to](#) stop the fire by removing the waste drums, capping the burn area and digging a trench around it to prevent it from spreading. This mitigation effort was [estimated to cost \\$25 million](#)—about \$74 million today, adjusted for inflation—and took years to pull off.

Beneath layers of waste, landfills around the US have been reaching scorching temperatures, and neighbors have been getting sick. Bloomberg's Laura Bliss explains.

Initially the EPA's oversight of the waste industry focused on such postindustrial [toxic dumps](#). But over time the agency also set rules to keep everyday garbage from polluting the environment, requiring operators of large municipal solid waste landfills to install liners and gas wells to trap leaks and emissions. The EPA also took steps to prevent landfills from spontaneously combusting: In the late 1990s, it established [a maximum oxygen standard](#) of 5%, limiting how much air was allowed to swirl around inside the waste in proportion to other gases, as well as a temperature standard of 131F. These standards could be exceeded only with the permission of regulators and as long as the operator took care to ensure the landfill didn't burn up.

Over the decades, the EPA has added more requirements, and operators have built landfills steadily bigger to improve their economies of scale: The average open landfill tracked by EPA's Landfill Methane Outreach Program has roughly doubled in size since the start of this century. That means there's more fuel if the conditions are right. "The larger the landfill, the larger potential reaction you're going to have, which has health implications for people who might be living nearby," says Navid Jafari, a geotechnical engineering professor at Texas A&M University.

US Landfills Have Consolidated, Exploding in Size

Landfill waste, in tons

Sources: EPA Landfill Methane Outreach Program, Waste Connections

Note: Includes only landfills with waste estimates available in both 2001 and 2024 through the EPA LMOP database. Chiquita Canyon Landfill estimates from Waste Connections reports.

Given the objections to putting a landfill someplace new, it's also been easier for local governments to keep cramming garbage into the existing sites rather than find alternatives. When the Howses moved to Val Verde in 1998, charmed by the rural town with a tiny grocery store, a couple of one-room churches and lots of hiking trails, part of what sold them was the belief that Chiquita Canyon would soon be closed. The landfill was a little ways past the end of its original permit, and [their neighbors-to-be had been fighting a renewal](#). But [experts were projecting a huge increase in garbage](#) in Southern California, based on a booming economy and the public's slow adoption of recycling, and Chiquita was one of [several LA-area landfills](#) that got their extensions after all.

Sources: United States Geological Survey, Waste Connections, CalRecycle, Planet Labs

Chiquita's lifespan was extended yet again in 2017. By then, waste management had come a long way. In the landfill's early years, there were few restrictions about what people could put in their trash: "aerosol cans, electronics, whatever," recalls Tim Williams, who's lived in Val Verde on and off since 1959 and remembers watching workers bulldoze over the growing waste mound back in the '80s. But as at PJP in New Jersey, out of sight, out of mind isn't a foolproof strategy. "You have to imagine that's 53 years of stuff that's been buried," Williams says. "Just the thought of it scares me, what was created underneath those things."

In the fall of 2023, when the smell had been hanging over the Val Verde area for many months, the LA County Department of Public Health started digging into what exactly was behind Chiquita Canyon's plight. The county called in Todd Thalhamer, a senior waste management engineer at CalRecycle, a division of the state's environmental authority, who's fought trash fires in California for 33 years. Thalhamer also consults for other states throughout the US. CalRecycle declined to make him available for an interview, citing his involvement in ongoing regulatory actions with Chiquita Canyon. But in hundreds of pages of public records covering the past year and a half of his work, his analysis of the Chiquita mess comes through.

The fire triangle was on Thalhamer's mind as he visited the canyon, snapped photos using cameras and thermal imaging devices, inspected core samples of the landfill's roasted innards and reviewed eight years of Waste Connections' operating reports. He found that as far back as the mid-2010s, Waste Connections had routinely sought and received regulatory permission to operate gas wells at higher temperatures and at oxygen levels exceeding the EPA threshold. In its statement, Waste Connections said such requests are normal for the industry and that it has never sought to violate federal or state safety standards.

Three wells in particular (CV-109-55, CV-1418 and CV-1419) might be where the landfill's troubles began, Thalhamer wrote in one of his assessments. There, in February 2022, temperatures rapidly jumped, in one case from 101F to 140F in a matter of minutes. If you touched garbage that hot, you'd go to the hospital with a third-degree burn. Dozens of gas wells throughout the landfill were pulling in high levels of oxygen, and several PVC well casings showed signs of melting. Between then and April 2025, the heat continued to spread, eventually searing through 90 acres of garbage, or about 20% of Chiquita Canyon, according to [state estimates](#) that Waste Connections disputes.

Sources: Waste Connections, South Coast AQMD, CalRecycle, Planet Labs, USGS

As the months wore on, Waste Connections tried to remove some of the heat by pulling harder on their gas wells, but this only sucked more oxygen into the waste, according to Thalhamer's public testimony. "This gets into a little bit of a doom loop," he said at a South Coast AQMD hearing in June. In its statement, Waste Connections said removing gas is critical for controlling the reaction and limiting emissions and odors. The company added flares, drains and layers of soil to stanch the flow of gases and liquids; capped part of the landfill with a cover to seal in the fumes; and set up a community fund to pay for air filters and hotel rooms for neighbors.

In April 2024, the on-site biogas company that was turning Chiquita's methane into energy [suspended its operations](#). In January 2025, the landfill stopped accepting garbage, with the operator stating that "due to the regulatory environment, maintaining ongoing operations at Chiquita is no longer economically viable." But none of these efforts would stop the entire landfill from being cooked, Thalhamer concluded. "The reaction area is expanding, and the current containment strategy has failed," he wrote in a March letter to LA County.

State officials say the landfill's deterioration is threatening one of its tank farms, a collection of containers storing millions of gallons of hazardous leachate that, if breached, [could spill into local waterways](#). In April the California Department of Toxic Substances Control called Chiquita

an “[imminent and substantial](#) danger” and ordered Waste Connections to move the tanks or face steep fines. Regulators also ordered the company to dig a trench, essentially a fire break, to stop the reaction, but so far it hasn’t been built. (In its statement, Waste Connections said it has moved some of its leachate tanks, that they aren’t at risk of spilling, and that digging such a barrier would likely make things more dangerous.) At this point, the state says, Chiquita is expected to keep reacting for years to come.

Thalhamer’s reports never quite call Chiquita Canyon by the F-word. Instead of “fire,” he writes things like “heating/smoldering event” and “potential subsurface oxidation.” But in the way a burning ember can start a flame, all of these terms describe different points on the fire spectrum. Timothy Stark, a professor of civil and environmental engineering at the University of Illinois at Urbana-Champaign, consulted for CalRecycle on Chiquita Canyon and has worked with Thalhamer to diagnose other ailing landfills. He says Chiquita is smoldering: “The oxygen went up, and that kicked off the spontaneous combustion.” Guillermo Rein, a professor of fire science at Imperial College London who has no involvement with any of the aforementioned landfills, read reports from both CalRecycle and Waste Connections at *Businessweek*’s request and says he considers what’s happening to be a barely smoldering, flameless fire.

Among its reasons for why what’s happening at Chiquita is not a fire but rather an elevated temperature landfill, Waste Connections said in its statement that it has found no evidence of combustion and that the sheer volume of leachate saturating the landfill makes a fire impossible. It said far fewer than 90 acres have been affected and that the reaction “appears to have reached a state of equilibrium.” Pointing to air sensor data, it also said Chiquita Canyon’s emissions have improved. It [stopped providing assistance payments](#) to community members in February.

Some of the most prominent voices in waste have made similar arguments about ETLFs. In a 2022 blog post, SCS Engineers, the industry consultant, described ETLFs as a “new” and “curious” phenomenon first documented in 2006. That’s when Ohio regulators investigated a spate of resident complaints about awful smells emanating from Countywide Landfill in East Sparta. The regulators found [a familiar pattern](#) of high temperatures—eventually surpassing 300F—spreading throughout the landfill, along with toxic emissions and what they described as fire-charred waste. A string of similar events followed: [first in 2009, at the Rumpke Sanitary Landfill in Cincinnati](#), and then in 2011, at the Bridgeton Landfill outside St. Louis, where odors were so bad that nearby residents could barely leave their homes. (The latter incident also threatened to [collide with an adjacent landfill packed with radioactive waste](#).) In 2011, [Middle Point Landfill in Tennessee started baking](#). So did Stony Hollow Landfill in Ohio, in 2015, and [American Landfill, also in Ohio, in 2016](#). In 2020, the overheating Bristol Landfill in Virginia started to generate aromas that locals have compared to [rotten produce, feces and death](#).

When the Ohio Environmental Protection Agency investigated both Countywide and Rumpke, officials [said they believed](#) the landfills were experiencing [underground fires](#). In the case of Countywide, they found the meltdown was sparked by a chemical reaction involving buried aluminum dross, a byproduct of smelting. [But to call it a fire was incorrect, according to SCS Engineers](#). There was no way air could get down that deep, SCS wrote in its 2022 blog post, and

no air meant no fire. (SCS declined to comment for this article, citing its involvement in ongoing litigation at Chiquita Canyon.) The Environmental Research & Education Foundation, an industry-funded nonprofit that provides academic grants to universities across the US, has advanced similar arguments about ETLFs. Yet other landfill researchers say that the no-air explanation has been rebutted by data from several affected sites.

“Without oxygen, it’s sort of obvious that no reaction can take place,” says Patrick Foss-Smith, a fire engineer based in the UK who consulted for the landfill operator’s insurance company on the Bridgeton event. Jafari, the Texas A&M professor, has published papers on landfill management with both Stark and Thalhamer, as well as with landfill operators, and says: “The terminology is a distraction.” Even Thalhamer drew a pointed distinction between flames and smolders when he assessed Bridgeton’s problems for the Missouri Department of Natural Resources. “While the first type of combustion is usually obvious,” he wrote, “the second type of combustion can cause investigative errors or lead to creative terminology to avoid using the term fire.”

In its statement, Waste Connections defended its use of the term ETLF for Chiquita Canyon, noting that some overheating events have been linked to reactive waste such as aluminum dross. It added that conditions at Chiquita “are entirely consistent with pyrolysis, which is not a fire.” Not everyone would agree, though. Rein, the Imperial College London professor says pyrolysis, which is where heat breaks down material without oxygen, is an aspect of fire that precedes combustion.

Many neighbors of these roasting landfills have been outraged by the insistence on technicalities. “We hated the term ‘subsurface reaction,’ because we felt like it was denying the fact that we could smell burning,” says Evenden, who lives near the “beast” of Bristol. “My eyes are burning, my skin is burning, I can’t breathe. This is beyond, ‘Oh, the trash smells.’” Dawn Chapman, who lives near the Bridgeton Landfill in Missouri, calls the industry’s tactics gaslighting. “We know it’s a fire, because we could see it come to the surface a couple of times,” she says. “When they went in there to fill in an area or fix the well, smoke would come billowing out.”

Yet waste operators have been effective at shaping the narrative, says Jane Williams, executive director of California Communities Against Toxics, an environmental justice nonprofit. Even the federal EPA, she notes, has adopted the ETLF terminology. In 2022 the agency published a tipsheet that grouped Countywide and Bridgeton among several other overheating US landfills and stressed: “ETLFs are NOT landfills that have experienced a fire.” And remember the 5% oxygen standard, one of the key federal rules designed to prevent trash fires in the first place? In 2021 the EPA eliminated it after urging by landfill operators, who no longer need to ask for permission to pull in oxygen at levels known to be dangerously high. The agency didn’t respond to *Businessweek*’s questions about this rule change, but said it’s working to prevent landfill fires by increasing the number of batteries that are properly collected and recycled.

Williams says Chiquita Canyon is one of the longest-running chemical disasters in US history and one of several landfills ailing from blatant violations of industry safety standards. (She points to another California example: El Sobrante Landfill in Riverside County has been [struggling to get a handle on broiling temperatures](#) since last year. Waste Management Inc.,

which operates El Sobrante, said in a statement it is working with federal and state officials to address these conditions.) Meanwhile, thanks to vape pens, smartphones, electric toothbrushes and the like, fires at [recycling and waste-sorting facilities](#) have more than doubled since 2016, according to an industry tracker.

Williams predicts the US will have to deal with more garbage fires now that the EPA's oxygen rule is gone. "Landfills across the country are not complying with the regulations," Williams says. "States, you're the enforcement authority. You need to get your shit together and do something."

Cracking down on landfill emissions was a stated priority for the Biden administration, which aimed to release a draft of new methane rules in 2025. That process would have given Williams and other activists a chance to push for the return of the oxygen standard, among other fire safety provisions. Well, oops. Instead, in March, a Trump EPA memo stated that the agency's oversight of landfill emissions would "return to the core enforcement program." This announcement was part of a larger wave of [dozens of deregulatory actions](#) that weakened rules around air quality, power plant emissions, oil and gas development, and other heavy polluters. The EPA has also deleted existing data from its website, including [maps that show the health costs to the disproportionately Black, Brown and low-income communities](#) living near those sites. Joseph Goffman, who led the EPA's Office of Air and Radiation under Biden, says he regrets running out of time to update the landfill rules.

EPA Administrator Lee Zeldin, who's promised to focus on "real threats to water and air," recently pledged to expedite the agency's cleanup of West Lake Landfill outside St. Louis, a Superfund site that still holds nuclear waste left over from the Manhattan Project. Next door is Bridgeton Landfill, where sickening odors still flare up when gas wells go out of commission, according to Chapman, who lives nearby. EPA declined *Businessweek's* request for an interview with Zeldin, and instead of addressing written questions, it referred *Businessweek* to a proposed rule on recycling of lithium-ion batteries and a series of primers on safe disposal of used batteries and e-cigarettes. Republic Services Inc., which operates Bridgeton, said in a statement that the landfill reaction is not a fire and has subsided.

Most advocates and lawmakers who aim to reduce the environmental harms of landfills are focused on methane, the potent planet-warming gas. Landfills are America's No. 3 source of methane, and EPA rules on trapping the gas fall badly short of what's needed to help limit global warming, [researchers say](#). (Scientists have also found that the real landfill emissions numbers are [51% higher than the EPA estimates](#).) Over the past few years, Maryland, Michigan, Oregon and Washington have passed laws or regulations to tamp down on methane escaping from these sites. As part of sweeping reforms underway, California and Colorado are considering forcing operators to use drones, sensors and other 21st century monitoring tools rather than manual readings of gas wells.

Yet tighter standards on methane could prompt operators to overdraw wells, potentially letting in more oxygen. The irony that efforts to curb greenhouse gases may be helping to fuel local disasters isn't lost on environmental advocates, but they say society doesn't have to choose

between burning landfills and a burning planet: technological upgrades could also strengthen oversight of air and temperature levels and other fire-risk indicators. “This is a maddeningly easy problem to solve,” says Katherine Blauvelt, a campaign director at the environmental lobbyist Industrious Labs. “We just need these commonsense fixes that are cheaper and easier than trying to put out a subsurface fire.”

Landfills With Gas Collection Systems More Likely to Experience Fires

Source: Bloomberg analysis of National Fire Incident Reporting System and EPA LMOP

Note: Includes only landfills in the LMOP database with fire incidents to which a fire department responded between 2001 and 2023, according to NFIRS. Includes any incident at the landfill, either on the surface or otherwise. Landfill fires most commonly occur at the surface, where there’s plenty of fuel and oxygen.

Among the new state methane laws, only a few include oxygen standards or mention the risk of fire associated with managing the pipes and wells that suck out the gas. And so far, none requires changing the basic needle-in-a-haystack approach to fire monitoring. But Pilar Schiavo, the California state assemblywoman who represents Val Verde, is working on a bill that would address the problem directly. Her Landfill Fire Safety Act would require operators to alert residents and enforcement agencies when subsurface temperatures exceed 146F for more than 60 consecutive days and to assess the impact on the health of the community. The act also stipulates fines of as much as \$1 million per fiery week if the operator fails to address the problem. Those penalties would fund relocations and other assistance for neighbors sickened by the fumes.

While whipping support for the bill, Schiavo negotiated for the state budget to include tax breaks for any compensation the residents receive from relief funds or legal settlements. **Two dozen mass torts representing about 7,000 individuals against Waste Connections are pending as well as the lawsuit from LA County, which has filed for injunctive relief for the landfill to relocate residents. Waste Connections declined to comment on the litigation.**

Curiously, some of the opponents of Schiavo’s bill have put their criticism in plain language, including the F-word. “We do not believe a single subterranean landfill fire should be the foundation for a blanket law applying to all landfills,” Veronica Pardo, executive director of the Resource Recovery Coalition of California, an industry group that includes Waste Connections as a member, wrote in a letter against the bill, which passed an assembly vote and is awaiting a hearing in the state senate.



Schiavo has also been calling on Governor Gavin Newsom to declare a state of emergency for the communities around Chiquita Canyon, which could help fund the relocation of affected residents. In 2015 a gas leak in Aliso Canyon prompted SoCalGas to temporarily relocate about 8,000 households after Newsom’s predecessor, Jerry Brown, issued an emergency order. So far,

Newsom has taken no such step. Out of sight, out of mind, Schiavo [said at an April press conference](#): “It’s an invisible fire underground, and so everybody’s suffering is now invisible.” Newsom’s office referred *Businessweek*’s inquiries to CalEPA, which said it has been actively coordinating with local and federal responders on the incident since late 2023.

At the local level, though, agencies with limited resources have found themselves ill-equipped to spot a smoldering gun. At Chiquita Canyon, though studies have shown a link between respiratory and neurological symptoms and the kinds of emissions coming out of the landfill, an analysis from earlier this year by the Los Angeles Cancer Surveillance Program at the University of Southern California “did not result in detection of statistically significant excess in cancer incidence,” the program’s epidemiologists wrote in a letter to the county officials who’d called for the analysis. The letter, however, also noted that, given Val Verde’s sparse population, the analysis had limited statistical power, reducing its ability to detect true risk. But also, the researchers used cancer data that ended in 2021, the year before Chiquita Canyon began to bake. A re-analysis using data from 2022 is underway, according to the California Department of Public Health.

This spring, Brandi Howse joined a [vanful of Val Verde residents to speak in support of Schiavo’s bill](#) in Sacramento. Carrying signs and photos, the residents stood at a lectern on the lawn of the state Capitol and testified to the nightmare they’ve been living. One woman described having multiple pets die suddenly in her yard and home. Others spoke of late miscarriages, hand tremors, vision loss, chest pain and nosebleeds that last hours. Howse called for stronger oversight of landfills from all levels of government. “We just want everyone to be OK,” she said, “and for nobody else to have to experience this ever again.”

But as the years press on, the political gridlock and what she views as apathy toward her community’s wellbeing have been almost as heartbreaking for Howse as the losses her family has suffered. The community’s symptoms are real, and the odors are unmistakable. Still, Val Verde’s fate seems to be in the hands of a company that’s speaking a different language. “We kind of feel like a science experiment, you know what I mean?” Howse says. “Because we have no idea what’s happening to us.”

With assistance from Raedah Wahid Edited by Jeff Muskus Yue Qiu

Methodology

Semi-annual landfill reports by Chiquita Canyon Landfill to regulatory agencies were used to track gas wells across the landfill that recorded temperatures above 131F. A kernel density estimation was used to generate the heatmaps, weighted by location and temperature.

To estimate fire incidents at landfills, NFIRS data was filtered to only incidents that occurred at sanitary landfills. Those incidents were matched up to landfills using the EPA LMOP database and duplicate incidents were removed.



To: The Benton County Planning Commission

July 8, 2025

Subject: Oppose/Deny LU-24-027

Dear Benton County Planning Commissioners,

My name is Jenny Saarloos and I live at 390 NW Maxine Ave. Corvallis, OR 97330.

I urge the planning commission to deny the landfill expansion. The proposed expansion would seriously interfere with the character of the surrounding area in violation of Benton County Code 53.215. It would jeopardize the air and water quality. Traffic will increase. Odor and noise will increase. There will be potential long term climate and environmental consequences. This alone is a solid basis for denying the expansion.

I would like to add that this expansion would cause a serious burden on the many properties that surround the landfill. For miles. I am aware that the potential harm will not be limited to these areas but I do feel that these residents of our county face an even more terrible burden if this expansion is passed. It is bad enough to smell an odor. But then one wonders what kind of toxins they might be breathing in. Wonders if the leachate will reach the well water. Wonders what will happen to the property value.

Promises can be made to keep the leachate from getting to the ground water. But there is no way to *guarantee that*. Promises can be made to contain odors. But that is also not always possible. Garbage stinks. Accidents happen—even under the best of circumstances. Fires happen. And a fire at the landfill site would have a terrible impact (to say the least) on the surrounding properties.

The Benton County 2040 Thriving Communities Core Values Initiative has at its very center equity & health. Please uphold these values and deny the landfill expansion. We can not have equity if our neighbors surrounding the landfill are left to suffer even greater threats from toxins, smells, garbage blowing in the wind and potential ground water pollution and fires.

The Benton County Core Values goes on to state that "We recognize & will address the well-being of our people by including health considerations in all policies, practices, activities, & operation." The burden imposed by the expansion of the landfill to residents of the surrounding area are a threat to their mental and physical health. Please uphold our core values and deny the landfill expansion for the sake of all residents of Benton County.

Thank you,

Jenny Saarloos

Thompson
NW Greenbriar Place
allis, OR 97330
8, 2025

DATE RECEIVED:	7/4/25
FROM:	Vernice Thompson
PHONE OR EMAIL:	

Planning Commission
Holmes & Shipley room
Kalapuya Bldg
4500 SW Research Way 973

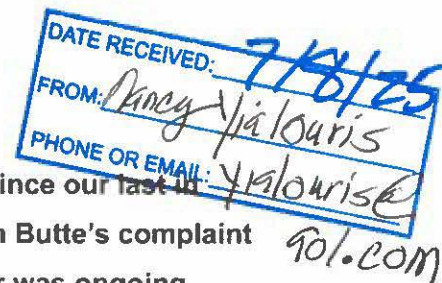
LU-24-021

Written testimony against the expansion of the Coffin Butte Landfill. Our family has been enjoying recreational opportunities in the Dunn and McDonald forests for over 20 years. The local NW winds bring hazardous air pollutants toward the local hiking and MTB trails from the landfill, causing sore eyes and headaches, especially when they are combined with smoke from our frequent wildfires during summer. The nearby small business owners will lose their customers in these already financially challenging times. My blueberries from the Andersons Blues Blueberries, we pick up the berries ourselves. The expansion of the landfill further risking contamination of groundwater with Leachate. The hazardous air pollutants, methane and sulfides can be detected as of 4s of today our Benton County's waste management sends for a large portion of all waste to be delivered to the neighboring counties. The proposed expansion will only increase the unfair burden on Benton County taxpayers.

The community of a nearby ADAIR Village has already exposed to the methane emissions, gases, breaking down organic compounds. The health of the entire community is apparently overlooked in favor of the outside businesses' interests. The groundwater contamination is very likely to reach nearby Willamette River, which is already polluted with commercial pollutants, agricultural fertilizers, mudslides. The Wild Life Habitat is shrinking as it is due to the logging and development in the area close to McDonalds Dunn forests. The expansion with its increased activity will cause more air and noise pollution. We want to stop any expansion of the Coffin Butte

Oppose/Deny LU24-027

July 8, 2025



I am strongly opposed to the expansion of the Coffin Butte Landfill. Since our last person public meeting, I have filed 3 odor complaints directly to Coffin Butte's complaint website, as well as DEQ. Two of them were filed as the pervasive odor was ongoing, specifically because the manager said they get reports after the fact and can't really respond directly to the odor issue. I expected some kind of response from someone at Coffin Butte but never heard from anyone. I did hear from DEQ, who called and listened to my concerns and assured me that Coffin Butte is required to keep a log of complaints even though no one contacted me from the landfill.

The complaint form on Coffin Butte's website states that they "...will get back to you," however, in the two months since the last public meeting, not even a phone call. This underscores how unresponsive Republic Services/Coffin Butte management is to community complaints and should alert the present committee regarding any followup from the landfill. It won't happen! They just don't care about public opinion.

The third odor complaint I mentioned woke us up at 3 AM because the stench was so pervasive. I didn't expect a response to that one due to the same excuse given at the first landfill presentation ("We get complaints after the fact..") but since the other two complaints were sent as the pervasive odor was flooding the neighborhood and it continued for some time, I thought someone would at least call to let me know what was taking place at the landfill to cause it.

Piling garbage 150 feet above the lip of the pit only exacerbates these odor issues and directly affects our property value, not to mention environmental concerns that have previously been mention during other public testimony. If expansion is allowed, Benton County will have no recourse to address any public concerns related to this landfill.

I therefore strongly oppose the expansion.

Nancy Yialouris

2717 Quince St NW

Albany OR 97321-0344

Benton County OR

Ph: (707) 227-0753

Email: Yialouris@aol.com



DATE RECEIVED:	7/19/25
FROM:	Mason Leavitt
PHONE OR EMAIL:	

120 Shelton McMurphy Blvd Suite 280
Eugene Oregon 97403
Mason Leavitt, GIS Analyst & Programs Coordinator

Chair Fowler, Vice Chair Haiman and Members of the Planning Commission,

Thank you for making time for members of the community to speak here again and we all appreciate your continued service through this thoroughly complex application. My name is Mason Leavitt and I am a GIS analyst and programs coordinator for Beyond Toxics an environmental justice organization that works to address air, water, and soil quality concerns throughout the state of Oregon. We have worked with the residents of Soap Creek Valley and Adair Village for 3 years now regarding the operations of the applicant.

I would like to speak to two items generally this evening. First, I wish to briefly raise novel concerns over the applicants ability to meet CUP criteria for Forest Conservation zones. Second, I wish to respond to Republic Services supplement odor study and some of the discussion points raised last night as well as the related conditions of approval.

Benton County code 60.220 B states that a CUP must be found that it "will not significantly increase fire hazard or significantly increase fire suppression costs or significantly increase risks to fire suppression personnel"

The findings and evidence in the record do not support that the proposed use will not significantly increase fire hazard or fire suppression costs and risks. The findings do not sufficiently address the Adair Rural Fire Protection District's recommendation to deny the application, including because the proposal may increase traffic and associated emergency response demands and present elevated fire risk, burdening the volunteer-based fire department. As discussed in detail last evening, exhibit 20 is primarily based on landfill staff interviews, not a systematic review or record of fire events at the landfill site. The applicant's consultant stated last night that the landfill operators do not and have not kept a record of site incidents related to fire. While the COAs related to fire would not require them to do so, this is allowing the applicant to build the plane as they fly it. Benton County code clearly states that they must show the new operations would not increase a fire risk, and the applicant has stated they have failed to construct an accurate, complete, and representative database of fire incidents at the landfill.

In May I began my testimony on odor with the quote "All models are wrong, but some are useful" but today I will begin with two quotes from the applicant's odor consultants. "Models are not great at modeling surfaces that have complex topography" They also stated "Models like this - in reference to AERMOD- are not such that they track perfectly what we measure". All three of these quotes nail a fundamental limitation of models- they do not reflect reality. Hence why the saying all models are wrong is important to remember tonight.

Last night both county staff and the applicant's consultant suggested their revised model is a substantial improvement from the first study since it now demonstrates levels of hydrogen sulfide that would constitute a nuisance at the fenceline of the applicant's property. I agree with their assessment that this is an improvement, but I would assert here tonight that the model still does not reflect what hundreds of residents in the soap, Creek Valley and Adair Village experience. You have seen and heard numerous testimonies that clearly demonstrate folks smell levels of landfill gas that constitutes a nuisance much farther away than just the fence line at the facility. This means that the applicant's model is still not an adequate reflection of reality and does not meet the burden of proof to demonstrate that a significant burden is not occurring on adjacent properties. Remember, it is their burden of proof, and if they cannot prove that then the application should be rejected.

Recall, the applicant's model is based on weather inputs, an assumed input of 930,000 tons of organic waste, and a fugitive emissions rate of 25%. Based on third party satellite data and an ongoing investigation from the EPA, it is more than likely Coffin Butte has a fugitive emissions rate higher than 25%. In a hearing in late May on Coffin Butte's Title V air permit conducted by ODEQ, DEQ outright stated they do not have the expertise or staff capacity to evaluate if that 25% assumption is valid or invalid. The expertise to validate this assumption does not exist in the state of Oregon, and we have many reasons to doubt that assumption that the applicant has not responded to.

Next, I would like to address the input rate of 930,000 tons of organic waste. Last night consultants hired by the Benton county planning staff stated that annual reports submitted to Oregon DEQ corroborate the applicant assumption of 930,000 tons of organic waste. I have submitted to the record tonight one of those annual reports. They do not distinguish between inorganic and organic waste intake. Instead, they distinguish between municipal solid waste and construction and demolition waste. Based on the statements from planning staff and the applicant, it appears that there is an equation of municipal solid waste and organic waste. However, the conditions of approval put forth by county staff and the applicant state there ought to be a limit of 930,000 tons of organic waste as a COA. I want to note that there was no clear definition put forth by the applicant of what constituted organic waste, and that seemed to differ from the earlier discussion of what went in the model input.

Second, in the same hearing for a title five air contamination discharge permit with Oregon department of environmental quality I mentioned earlier and in the planning documents submitted to Benton County, the applicant stated they estimate they will have an intake of 1.5 million tons per year. Note this contradicts what we heard in May when the applicant stated they

did not plan to increase waste intake beyond the current 1.1 million ton limit. The applicant has offered no clarity on how they plan to document organic versus inorganic waste, they have offered no explanation on how the 930,000 ton input for the model is corroborated by annual reports submitted to Benton County, and there was a complete conflation of these terms during last night's hearing. The lack of clarity obfuscates the parameters of the odor model and how they plan to comply with conditions of approval.

Finally, I want to observe again that the applicant has chosen not to deploy air monitoring as a technique for corroborating the findings of their odor study. The applicant has even submitted other odor studies done at landfills experiencing similar problems, but they have declined to do so for this landfill. SCS engineers, one of the consultants hired by the applicant, even strongly suggests using air monitors and drones as an assured method to prevent odor nuisances.¹

Ironically, one of the conditions of approval requires that the applicant deploy a hydrogen sulfide monitor as part of their operations. Additionally, as discussed last night, SB 726 might require the use of drones depending on how DEQ structures the rules, but this would only start in 2027. This seems to be placing the cart before the horse. Instead of the applicant clearly demonstrating that they are keeping hydrogen sulfide levels at adequate concentrations to prevent odor nuisances, they are allowed to expand their operations and then do so. Additionally, the applicant and county staff made it very clear last evening that these conditions of approval are only related to the new landfill. How will we know if the hydrogen sulfide measured on these air monitors comes from the old landfill versus the new landfill? Beyond Toxics has decades of experience with this exact conundrum, and I can tell you, it is next to impossible to meet an evidentiary standard a multi billion corporation wouldn't be able to have dismissed.

This means the applicant will have the ability to blame high levels of hydrogen sulfide on the old landfill and claim they are still operating within conditions of approval. This conundrum makes many of these conditions unenforceable, and this problem extends beyond odor. Additionally, the other conditions related to odor are based on someone smelling the air and then smelling a high concentration of hydrogen sulfide before making a subjective determination if the air constitutes a nuisance. This means we will be stuck in a he smells/ She smells conundrum constantly. Even if the county chose to invest in COA enforcement, meeting the evidentiary standard of definitive proof that the new landfill is the source of these odor problems would be next to impossible.

As one last note on odor, I want to remind the planning committee that testimony has shown the applicant is failing to use best practices to prevent odor issues. Multiple satellite images have demonstrated a failure of the applicant to fully cover their working face with soil or tarps, one of their alternative daily covers. The applicant has also stated in a rebuttal to my

testimony that tarps are not intended to prevent landfill gas from escaping, which raised the question of why they are using it for daily cover. Additionally, the EPA has found the applicant's intermediate cover to be inflated with methane gas, which means holes in that intermediate cover would seem to likely be belching gas.

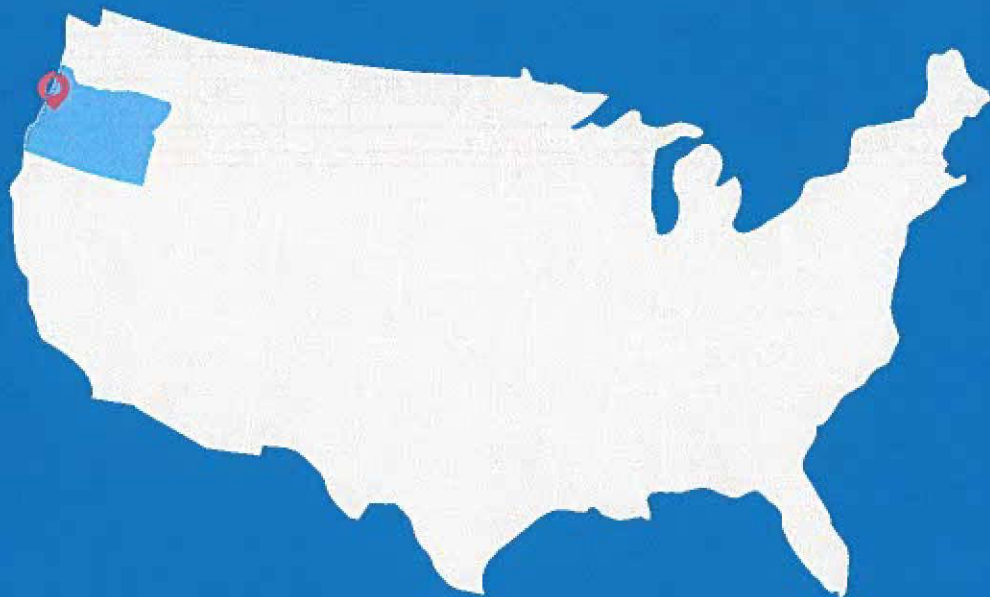
The planning commission has two different sets of data in front of them that lead to different conclusions on the issue of odor. On one hand, the applicant has proposed an odor model, whose underlying parameters are in serious question. On the other hand, there are hundreds of public testimonies pointing to odor as an existing serious interference that will be exacerbated both through an increase in waste and an extended duration of landfill operations. The applicant has dismissed these experiences as anecdotal, but they are also trying to use them to validate their model. Benton County code clearly states the planning commission can approve or deny an application at their discretionary interpretation. It is up to your discretion, which set of data you find to be more valid as you make your decision.



Sustainability in Action

Coffin Butte Landfill and Pacific Region Compost Annual Report

Benton County
2023



Summary of Landfill Users

(By County of Origin)

SUMMARY OF LANDFILL USERS BY COUNTY OF ORIGIN

Coffin Butte Landfill Tonnage by Type and County - Total for Year 2023

County	Vehicles	Commercial							Public			Alternate Daily Cover				Compost	
		MSW	C&D	Asbestos	Agricultural Waste	Industrial Waste	Sludge	Totals	MSW	Other	Totals	Contaminated Soil	Covanta Ash	Shaker Fines	Totals	Yard Waste Received	Compost Sales (Yds)
Benton	23,310	50,791.66	7,672.54	12,190	2,211	18,025.69	-	76,617.00	9,432.29	-	9,432.29	16,024.73	-	-	16,024.73	2,636.70	7,153.30
Linn	31,644	79,294.20	4,209.07	159.41	95.77	32,139.44	12,504.38	128,402.27	6,021.67	-	6,021.67	5,179.93	-	-	5,179.93	923.15	50.00
Polk	16,626	40,383.34	1,567.19	122.61	392.71	2,402.03	6,218.74	51,591.62	3,367.85	-	3,367.85	2,236.80	-	-	2,236.80	250.00	63.25
Marion	12,094	213,992.44	519.86	276.56	168.43	5,616.25	-0.66	220,564.30	973.48	-	973.48	6,445.39	25,199.96	-	31,645.35	76.90	12.00
Lane	2,307	4,184.63	150.20	3.50	-	23,781.64	-	28,119.97	50.56	-	50.56	16,343.03	-	-	16,343.03	0.56	4.00
Tillamook	1,609	29,373.43	-	0.02	1,695.73	727.94	7,335.06	39,137.23	71.14	-	71.14	-	-	-	-	-	-
Yamhill	4,518	95,502.05	259.41	20.87	1,251.94	416.28	-	97,450.55	474.37	-	474.37	35.07	-	-	35.07	3.12	-
Lincoln	5,264	44,661.45	111.82	67.04	-	42,394.51	63,932.31	151,157.23	30.03	-	30.03	719.39	-	-	719.39	1.31	-
Coos	7	-	-	-	-	-	4.57	4.57	-	-	-	43.96	-	-	43.96	-	-
Pierce, WA	21	1.11	-	-	314.81	17.31	-	333.23	-	-	-	-	-	-	-	-	-
Washington	6,956	178,437.10	0.47	45.82	171.72	231.70	-	178,936.81	1.26	-	1.26	-	-	2,783.72	2,783.72	-	-
Jackson	5	0.62	-	-	-	0.07	-	0.69	-	-	-	5.11	-	-	5.11	-	-
Multnomah	221	2,555.81	-	52.75	-	394.60	-	3,004.16	-	-	-	414.55	-	-	414.55	-	-
Douglas	396	10,969.37	-	5.17	-	1.90	-	10,976.44	47.4	-	47.4	149.99	-	-	149.99	-	-
Clackamas	1,053	13,503.89	2.78	175.59	1,656.56	2,382.62	2,245.84	19,967.25	5.97	-	5.97	3.54	-	-	3.54	-	-
Columbia	7	-	-	6.73	-	-	-	6.73	-	-	-	-	-	-	-	-	-
Curry	1	-	-	-	-	-	-	-	-	-	-	9.11	-	-	9.11	-	-
Jefferson	1	-	-	-	1.42	-	-	1.42	-	-	-	-	-	-	-	-	-
Clatsop	21	0.05	-	-	-	592.00	-	592.05	-	-	-	0.20	-	-	0.20	-	-
Lake	5	0.57	-	-	-	-	-	0.57	-	-	-	-	-	-	-	-	-
Cowlitz, WA	11	-	-	-	-	231.14	-	231.14	-	-	-	-	-	-	-	-	-
Deschutes	7	0.30	-	15.43	-	-	-	16.23	-	-	-	1.01	-	-	1.01	-	-
Baker	269	3.92	-	412.29	-	1,731.63	2.50	2,200.44	-	-	-	1,101.17	-	-	1,101.17	1.70	-
Malheur	2	1.19	-	-	-	-	-	1.19	-	-	-	-	-	-	-	-	-
Josephine	2	0.26	-	-	-	-	-	0.26	-	-	-	5.33	-	-	5.33	-	-
Misc. County	20	-	-	-	-	0.27	-	0.27	576.39	-	576.39	0.15	-	-	0.15	-	-
Clark, WA	135	0.13	-	-	-	1,794.64	-	1,794.74	-	-	-	-	-	-	-	-	-
Totals	126,306							1,011,154.39			21,059.73				76,753.49		

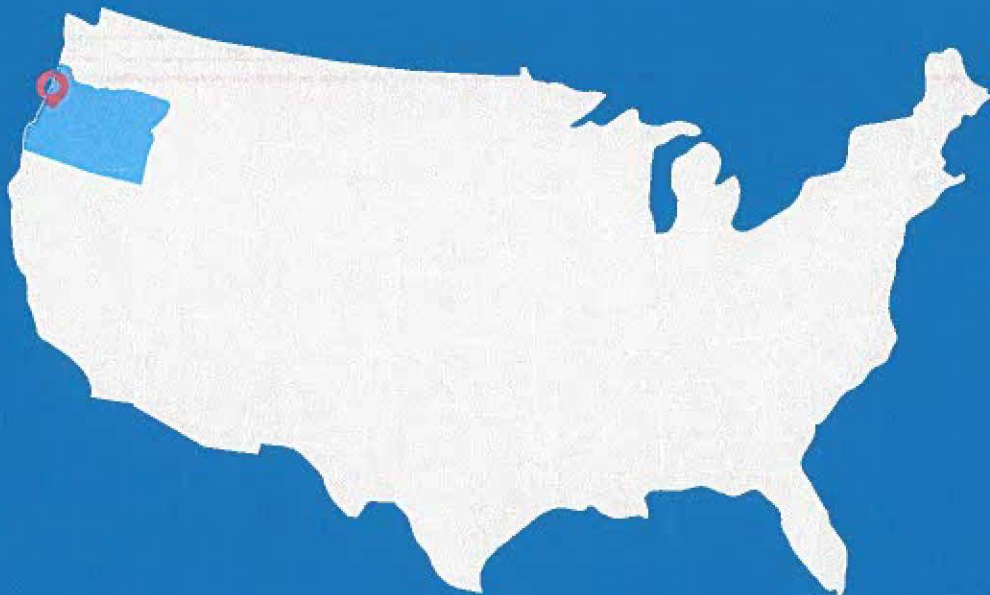


Sustainability in Action

Coffin Butte Landfill and Pacific Region Compost Annual Report

Benton County

2022



Summary of Landfill Users

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Coffin Butte Landfill Tonnage by Type and County - Total for Year 2022

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Benton	41,207	66,357.92	13,486.17	555.11	15.20	14,580.15		75,124.55	10,629.73		10,629.73	3,318.43			2,318.43	2,277.60	245.65
Linn	33,575	74,122.51	6,190.54	302.50	110.17	32,561.15	14,224.64	137,511.51	6,107.15		6,107.15	3,408.37			1,608.37	949.77	50.00
Polk	17,461	42,585.05	2,433.01	25.07	1,021.08	7,066.44	175.11	48,790.77	1,330.31		1,330.31	4,436.31	877.37		877.37	550.76	16.60
Marion	11,848	197,190.64	1,683.28	467.84	1.63	5,279.31		204,642.10	1,463.95		1,463.95	7,607.42	25,289.81		32,892.23	8.89	2.90
Lane	2,136	4,855.30	51.16	347.55	46.69	34,140.81		39,481.51	42.57		42.57	3,423.28			3,423.28	8.01	
Tillamook	1,646	30,193.46	5.83	0.10	2,074.10	96.14	5,943.89	39,193.57	81.52		81.52						
Yamhill	4,499	95,060.47	3,045.04	40.36	156.62	896.53		99,191.62	264.07		264.07	945.02			945.02	0.38	
Lincoln	5,927	44,744.79	146.97	42.26		122,088.32	4,480.33	171,454.67	87.66		87.66	318.97			318.97	1.27	
Coos	54	6.10		54.83				54.92				354.61			354.61	0.48	
Pierce, WA	12				193.28	0.31		193.62									
Washington	7,510	194,964.48	7.29		197.24	192.31		195,362.32	184.0		184.0	8.57		1943.77	2,952.29		
Jackson	8											7.92			7.92		
Multnomah	79	868.91	3.63	65.20		42.01		979.61				44.11			44.11		
Douglas	394	10,476.86		0.33		207.43		10,684.62				299.69			299.69		
Clackamas	1,035	15,815.12	195.56	54.48	235.51	3,135.39	1,899.28	21,327.34	19.84		19.82	58.58			46.58	8.01	
Columbia	4	0.22	1.39					1.52	0.43		0.43						
Umatilla	1	0.20						0.20									
Jefferson	2											0.55			0.55		
Clatsop	43		4.95			581.64		586.59	2.82		2.82	13.31			13.31		
Klamath	4	0.51						0.51				23.47			23.47		
Crook	2	0.10						0.10									
Deschutes	2	0.16		8.29				9.05									
Baker	45	30.1	17.51					26.55							2.10	8.94	
Malheur	3	11.97	6.76					12.73								0.21	
Josephine	4					0.37		0.37				1.08			1.08		
Misc. County	21		6.64	5.90		0.04		11.98	12.16	330.94	343.10	30.54			373.64		0.96
Clark, WA	22	2.40				291.92		294.32				10.95			10.95		
Totals	128,045							1,043,154.55			23,597.93				48,389.29		



Mason Leavitt <mleavitt@beyondtoxics.org>

Fwd: Coffin Butte Title V Air Quality Permit

3 messages

N Whitcombe <nwhitcombe@gmail.com>
To: Mason Leavitt <mleavitt@beyondtoxics.org>

Wed, Jul 9, 2025 at 4:00 PM

All I have is this email from Mike

----- Forwarded message -----

From: **EISELE Michael * DEQ** <Michael.EISELE@deq.oregon.gov>
Date: Mon, Jun 30, 2025 at 1:37 PM
Subject: RE: Coffin Butte Title V Air Quality Permit
To: N Whitcombe <nwhitcombe@gmail.com>

In their permit application they requested to be permitted at a rate of 1,500,000 tons/yr.

Mike

From: N Whitcombe <nwhitcombe@gmail.com>
Sent: Monday, June 30, 2025 1:10 PM
To: EISELE Michael * DEQ <Michael.EISELE@deq.oregon.gov>
Subject: Re: Coffin Butte Title V Air Quality Permit

Have they made any future projections of waste acceptance rates for 2026 onward?

On Mon, Jun 30, 2025 at 12:44 PM EISELE Michael * DEQ <Michael.EISELE@deq.oregon.gov> wrote:

Yes. Hopefully the attached waste in place report is not too big for your system.

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--



Mason Leavitt <mleavitt@beyondtoxics.org>

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COFFIN BUTTE LANDFILL & PACIFIC REGION COMPOST

Annual Report
2021

SUMMARY OF LANDFILL USERS BY COUNTY OF ORIGIN

Coffin Butte Landfill Vehicles by Class and Tons Disposed - Total for Year 2021					
	Commercial Vehicles Intercompany Franchised & Third Party Franchised		Private Vehicles	Total Vehicles	Total Tons
	MSW	C&D	(Includes Special Waste, Asbestos, & Public)		
County	Tons	Tons	Tons		
Benton	42,452.83	12,900.97	59,398.96	41,843	114,752.76
Linn	76,778.56	5,425.95	60,576.27	35,053	142,780.78
Polk	42,377.41	2,399.56	28,032.97	20,107	72,809.94
Marion	171,226.30	1,418.02	153,079.05	17,478	325,723.37
Lane	5,037.03	100.83	32,866.18	1,903	38,004.04
Tillamook	30,061.68	0.57	8,897.47	1,662	38,959.72
Yamhill	49,328.85	1,570.74	1,225.23	2,304	52,124.82
Lincoln	50,310.49	499.92	63,775.99	4,396	114,586.40
Coos	5.85	2.58	495.46	41	503.89
Pierce, WA	0.76	1.12	0.00	3	1.88
Washington	35,315.78	219.51	570.56	1,466	36,105.85
Jackson	0.00	0.00	6.19	7	6.19
Multnomah	0.08	0.00	20.21	7	20.29
Douglas	4,264.52	0.83	106.21	170	4,371.56
Clackamas	13,173.34	5.31	2,294.90	707	15,473.55
Columbia	6,015.42	1.62	0.00	212	6,017.04
Clatsop	0.21	0.00	560.32	41	560.53
Klamath	1.78	0.00	5.55	6	7.33
Deschutes	1.11	0.00	39.76	7	40.87
Baker	24.23	9.59	4.07	120	37.89
Josephine	0.00	0.00	94.06	17	94.06
Misc. County	2.02	2.13	11.85	18	16.00
M-Clackamas	0.20	0.00	4,903.62	290	4,903.82
M-Multnomah	0.00	0.00	597.40	34	597.40
M-Washington	76,526.58	0.00	1,040.40	3,468	77,566.98
Totals	602,905.03	24,559.25	418,602.68	131,360	1,046,066.96

To: Benton County Planning Commission
RE: Opposition to LU-24-027 Land Use Application

DATE RECEIVED:	7/19/2025
FROM:	Erin Bradley
PHONE OR EMAIL:	

Dear Commissioners,

We, the Board of Directors of Bit by Bit, a 501(c)(3) adaptive and therapeutic horseback riding program ask you to deny LU-24-027. We are located south of Coffin Butte Road on Highway 99W, east of Tampico Ridge. Our rural farm property shares two direct borders with Republic Services' forestland and is among the closest neighbors to the proposed expansion site. Our future as a rural farm and as a community resource is at stake.

Since 2015, Bit by Bit has offered individually tailored equine sessions to children and adults with various medical health diagnoses and physical and psychological limitations. More recently, we have expanded to include equine-assisted physical therapy which studies have documented does improve clients' health.

Increasingly, our work has been severely compromised by the existing landfill operations. In the past five years, we have endured a significant increase in off-hours industrial noise, overwhelming odors, airborne pollution, and fire hazards. Plastic and debris frequently blow into our pastures, arena and barn area posing fatal risks to our animals and forcing us to patrol for trash daily. The ridge no longer offers any protection.

Recently, the blasting from the clearing of cell 6B has become a concern. Despite our expectation, the blasting has startled our volunteers and caused stress in the animals. Several blasts have occurred during sessions, startling clients. On June 10th, we received a call just a few hours before the blast, leaving us unable to prepare clients and volunteers.

Expanding the landfill would bring these dangers to an even closer proximity to our rural farm animals, with significantly reduced buffering compared to the current situation. If the expansion of the landfill were to occur it would place immense stress on our animals, riders, and staff, potentially leading to further risks and hindering our ability to continue to provide our unique service to suffering clients. With our farm's well-being compromised and our water source at risk, putting our farm, the animals, and the clients who depend on it at risk, this would violate County Code. 53.215(1), seriously interfering with our use of the property as adjacent landowners.

The proposed facility cannot be operated without noise and odors that will affect our business and other agricultural activities. There are no conditions of approval or

other mitigation measures that will resolve these issues. The proposed landfill is a massive industrial complex that cannot be mitigated and must not be approved.

If approved, we may lose our ability to operate entirely. The land would become uninhabitable for our programs and animals, and due to property value loss, we would be unable to relocate. We request that you reject LU-24-027 to ensure our continued service to the community. The proposed expansion of the landfill would seriously interfere with uses on our adjacent property and violate Section 53.215(1) of the Development Code.


Kirsten Starkey

Rod Holmquist

Sarah Goode

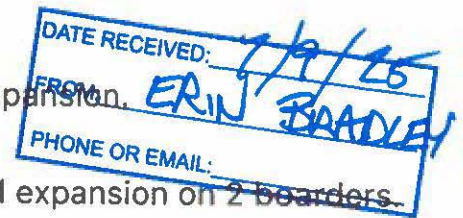

Don Studier

Bruce Thomson MS,MD

Erin Bradley

Erin Bradley

38578 Hwy 99w Corvallis 97330 I am in opposition of the proposed expansion.



Our farm is one of the closest neighbors to republic Services proposed expansion on 2 borders.

Since we last gathered here there is a few things I think you should be aware of.
mc Caulim rock drilling called on May 28th at 10:49 am from an unknown and blocked number to let us know of the blast that would would occur on the May 29 th between 12 and 4 . If we had any questions or concerns please call Republic Services. We were not given a number to call if we had questions or and issues. I was very surprised as I thought the blasting was done.

I was unable to find a phone number online where someone would answer. I left a voicemail at Valley Landfills and hoped for the best.

The following am I had to drive around at 8 am and go to office to get someone to return my call. I received a call back from the environmental staff member. he did answer my questions about location and why. . He said that we would most likely not feel or hear the blast. I explained what we did and the stress it could cause on the animals and clients. I requested to change the blast days to Fridays as they are more flexible for us. He said he would ask. He offered to follow up the following day to see how everything was. I did not hear back from from him the following day or even the following week.

On June 10th at 9:20 in the am I received a voicemail from Emily at Mccolum Rock drilling . The voicemail said they would be blasting that day between 12pm and 5pm. She mentioned that she had tried to reach out the day before. I called her back and let her know I did not receive a call and there was no record of the call on the caller ID. She nicely apologized and said there may have been issues on their end. I asked for the blasting day to be changed to Fridays. She checked and then said they could do Fridays but it was up to Republic Services.

I then called Republic Services and left a vm. He did return my call promptly and apologized for not following back up with me. I let him know we did not receive a 24 hr notice call and we definitely felt and heard the blast on May 29th and June 4th. The blast cause stress on our animals, startled clients and scared a volunteer. I mentioned the drilling company could change to Fridays. He said he would ask his people again. The blasts were never changed to Fridays.

I did manage to record a blast on June 10th in the Nw Corner of my property. I have printed it out for you to see. The first slide is a semi truck going south on 99w and passing in front of our property .The second is the blast . Quite a noticeable difference in decibels. The first blast on May 29th was much bigger than this.

Republic Services has increasingly affected the use of my land. Placed stress on my livestock, volunteers,clients and has affected a service to the community. Last testimony I mentioned the groups we serve. I failed to mention we are a provider for the State of Oregon DHS Child Services. We are

Service! Farm-Service- and an adjacent property on two borders.

The proposed facility can not be operated without noise and odor that will affect our business and other agricultural activities. There are no conditions of approval or other mitigation measures that will resolve these issues. The proposed landfill is a massive industrial complex that can not be mitigated and must not be approved.

If approved we may lose our ability to operate entirely. The land would become uninhabitable, for our programs and our animals. After seeing the last staff report and the recommendations for approval with conditions, I talked to a real estate broker. She said due to everything we are currently experiencing and location it would be a hard sell. We looked at properties comparable to what we had and none were affordable. We request that you reject LU-24-027 to ensure our continued service to the community. The proposed expansion would seriously interfere with uses on our adjacent property and Violates section 53.215(1)

6/10/2025



New Recording 5



1:21PM 39:26

DATE RECEIVED:	
FROM	Erin Bradley
PHONE OR EMAIL:	541-908-3293

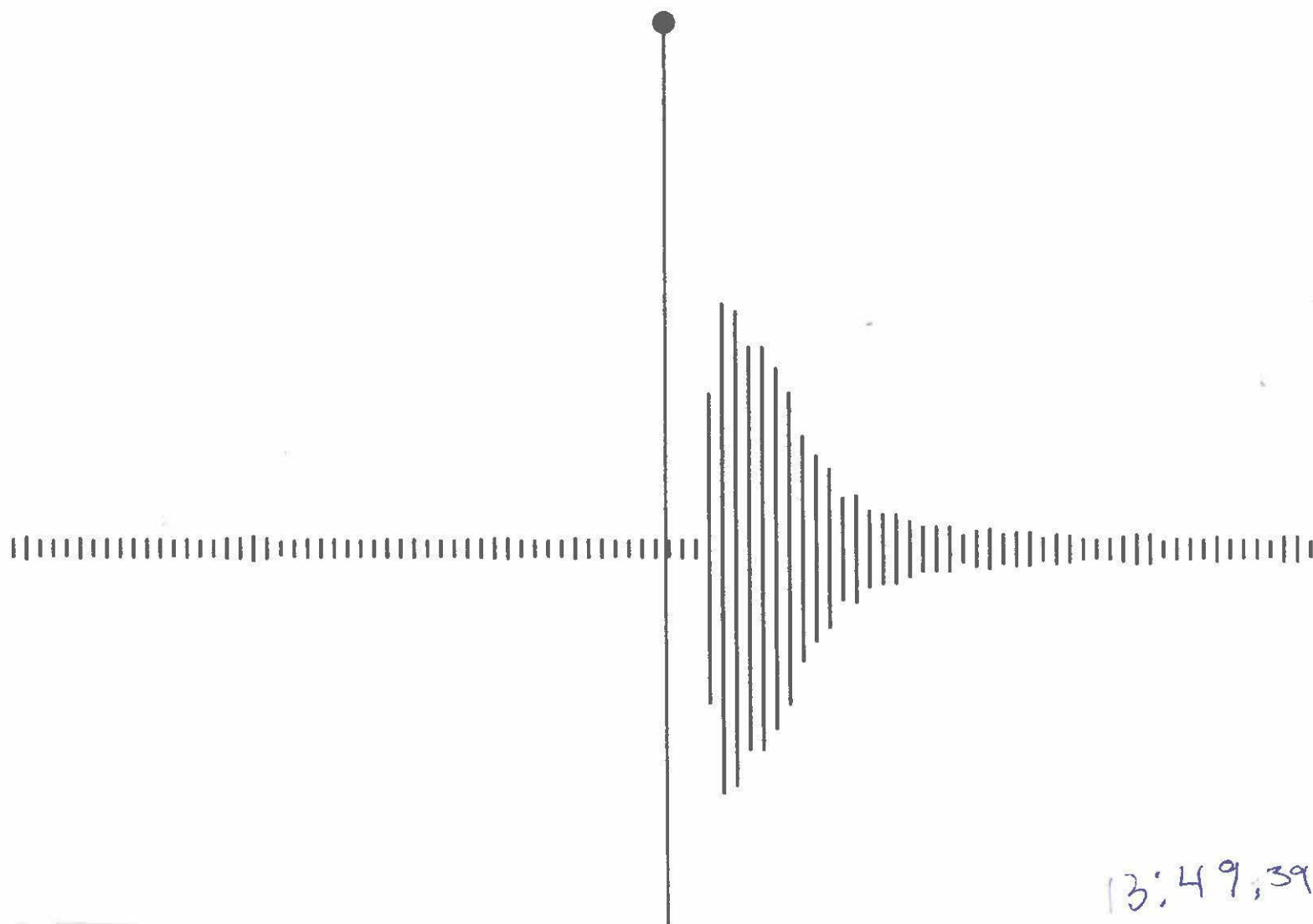


12.17.28



New Recording 5

1:21 PM 39:26



13:49:39

DATE RECEIVED:	3/19/2025
FROM:	Mckenna Bradley
PHONE OR EMAIL:	

My name is Mckenna Bradley and I live at 38578 Hwy 99w Corvallis 97330 and I oppose the land use application Lu-24-026

My home is south of Coffin Butte Road and it shares two borders with the proposed expansion.

I am 17 years old and a senior at Crescent Valley High School, I am also entering my freshman year at LBCC to complete college credits during high school.

I'm also highly involved in 4-h and am in 3 different 4h clubs as well as the president of two of those clubs for the second year in a row. I also host 2 practice pre fairs for my club at my house.

I competitively high dollar show cattle at the state and Regional level. I have a cow Potato that has won multiple Supreme Championships when she was a heifer. Her calf paisley that I bred and raised is now 11 months old and beginning her jackpot career. On top of all that I breed and show Nigerian Dwarf goats and show and care for my horses.

I want to share with you my lived experience of living by the land fill for 17 years of my life. and present you with bags of trash collected from our property. This trash doesn't belong to us but it still ends up scattered along my fields! This trash belongs to Republic landfill. This trash has been gathered after falling down from the sky, onto my property or flying into my pastures from republic trucks. On the back is labeled contents and what the items can do to my livestock. Our land is currently polluted every single day the landfill is open. It's not just the trucks polluting, it's also trash blowing over the trees onto our property.

From years of this trash accumulating It's now imbedded below the grass and a hazard when the roots are pulled up by my grazing livestock. No matter how hard I try I just can't get rid of it. For years I have walked my pastures picking up these pieces, but they never stop coming...

Did you know it doesn't take a whole plastic bag to kill a horse, cow or goat? Did you know plastic can affect the reproduction of livestock and their fertility rates? If not then I will provide three different studies that are peer reviewed. I wanted to provide these studies because studies without peer review are often false information.

My cattle have been purchased all by myself from profits earned by my hard work of raising and selling my livestock. The feed and medical bills are paid for by myself. I put in over 3,000 hours into raising my livestock each year let that sink in.

I can't use my pastures anymore to put my livestock out to roam right now because I can't risk my animals dying. Because of this I have to hand-walk cattle daily instead of letting them roam happily outside. This also increases the cost of my hay bill and has my fields having to be manually cut which increases fire risks in the summer.

Another reason I can't put out my livestock is If I lose my livestock or they remain un-bred due to fertility problems caused by this affects my funds set away for college.

I plan to join the LBCC nationally ranked livestock judging team next year after I graduate high school. I also plan to go onto a 4 year university and get my degree and ultimately receive my masters and PHD in Animal nutrition. If I miss one piece of the debris similar to what is in those bags I may lose an animal. This would be a big loss for my schooling fund and a loss of a friend.

The cattle have also been stressed With the current blasting

All and all the Lu-24-027 land use application needs to be denied entirely not just on conditions. Not just for the future safety of my animals but for the next generation of kids that will inherit this land near the landfill from their families just like myself.

Review

Impact of Microplastics and Nanoplastics on Livestock Health: An Emerging Risk for Reproductive Efficiency

Susy Urli ¹, Francesca Corte Pause ¹, Martina Crociati ^{2,3,*}, Anja Baufeld ⁴, Maurizio Monaci ^{2,3} and Giuseppe Stradaoli ^{1,*}

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check for updates

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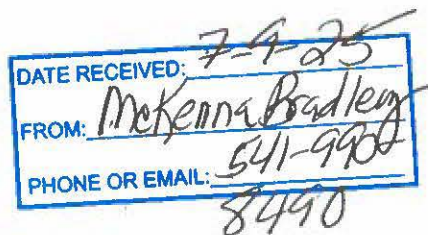
Simple Summary: Due to its multiple properties, such as stability, hardness and economic prices, the application of plastics has gradually increased, becoming essential in every industry. Since 1950, the worldwide plastic distribution has progressively created a serious pollution issue caused by difficulties in proper recycling, which has led to the presence of plastic fragments, called microplastics and nanoplastics (MPs/NPs), in the environment. The majority of the research has focused on the aquatic pollution, while studies regarding soil contamination are still poor, with the necessity to better understand how MPs/NPs can enter the food chain and reach humans passing through both crops and animals. Therefore, there is a need for evaluation, and the present work will provide an overview of the sources and distribution of MPs/NPs in farms; different mammalian exposure (digestion, inhalation and dermal contact) and associated risks and health problems caused by these fragments. In particular, this review aims to provide information on the effects, mainly from additives (such as Bisphenol A-BPA), on livestock reproduction and fertility.

Abstract: Pollution due to microplastics and nanoplastics is one of the major environmental issues of the last decade and represents a growing threat to human and animal health. In aquatic species, there is a large amount of information regarding the perturbation of marine organisms; instead, there are only a few studies focusing on the pathophysiological consequences of an acute and chronic exposure to micro- and nanoplastics in mammalian systems, especially on the reproductive system. There are several studies that have described the damage caused by plastic particles, including oxidative stress, apoptosis, inflammatory response, dysregulation of the endocrine system and accumulation in various organs. In addition to this, microplastics have recently been found to influence the evolution of microbial communities and increase the gene exchange, including antibiotic and metal resistance genes. Special attention must be paid to farm animals, because they produce food such as milk, eggs and meat, with the consequent risk of biological amplification along the food chain. The results of several studies indicate that there is an accumulation of microplastics and nanoplastics in human and animal tissues, with several negative effects, but all the effects in the body have not been ascertained, especially considering the long-term consequences. This review provides an overview of the possible adverse effects of the exposure of livestock to micro- and nanoplastics and assesses the potential risks for the disruption of reproductive physiological functions.

Keywords: microplastics; nanoplastics; reproductive system; health; bovine; cow; cattle; BPA; granulosa cells; steroid hormone



ELSEVIER



Small Ruminant Research 30 (1998) 77–83

Small Ruminant
Research

Pathology of the rumen in goats caused by plastic foreign bodies with reference to its prevalence in Jordan

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Abstract

The lesions in rumens of goats with soft foreign bodies (SFB), namely plastics, and its prevalence in Jordan are investigated. In cases where hard masses of plastics were seen, congestion, erosions, focally denuded areas and focal thickening of nodular- and proliferative-type were seen in the mucosal wall of the rumen. Shortening and stunting of the papillae with irregular distribution, and in some cases thinning of the walls were also observed. Histopathologic examination revealed the presence of rumenitis and prolonged rete pegs with a papillary or frond-like downward growths. This hyperplastic growth also took the shape of numerous epithelial islands of variable thickness, approaching the muscularis mucosae. These revealed differentiated stratified squamous epithelium with intercellular bridges, keratin formation and with several mitotic figures as seen under a high-power field (40×). In cases where floating plastic was found, the changes were less prominent. These findings suggest that plastics play an important role in the pathogenesis of rumenitis and ruminal hyperplasia. This could be the consequence of partial degradation and/or chronic irritation of plastics. Out of 347 rumens examined in the summer of 1996, 39 (11%); 10/136 (7%) rumens at Ajloun and 29/311 (7%) at Irbid slaughterhouses contained plastics. Out of the 888 goats brought to the Veterinary Health Centre (VHC) from January 1993 to September 1997 for treatment of different conditions, 32 (3.6%) had plastic impaction and were treated by rumenotomy of which 32/722 (4.5%) were older than one year. Out of 28 goats brought dead to VHC for routine necropsy examinations, three goats had plastic impaction. No significant differences were found in the prevalence of plastic among Shami, local and mixed-breed goats. These results suggest that subclinical cases exceed clinical ones. The prevalence, although when compared with our previous results in sheep, is low, yet it is still considered quite high and public awareness and anti-littering laws and a clean-up of the environment would substantially reduce this problem in Jordan. © 1998 Elsevier Science B.V. All rights reserved.

Keywords: Goats; Plastics; Rumen; Hyperplasia; Prevalence

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RESEARCH ARTICLE

PLASTIC BAGS - THREAT TO ENVIRONMENT AND CATTLE HEALTH: A RETROSPECTIVE STUDY FROM GONDAR CITY OF ETHIOPIA

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ABSTRACT

A retrospective study was conducted in Gondar city of Ethiopia for six years (2004/05 to 2009/10) to observe the impact of plastic bags usage on environment and cattle health. Paper packaging is vanishing slowly in the city and limited to small shops only. Open dumping of plastic bags containing wastes is observed commonly near road side, open plots, river side, in drains and public places however, it is prohibited under Ethiopian law. Winds carry bags to distant areas sometimes found entangled on the trees and shrubs create nuisance. During rainy season, the blockage of drains and overflowing of water was observed in some areas of the city. During study period, out of 711 rumenotomies done, in 111 (15.61%) and 600 (84.39%) animals, emergency rumenotomy and elective rumenotomy was performed, respectively. The quantity of the foreign bodies (FB's) collected from the rumen was ranging from 0.75 to 2.0 kg in 28 animals (3.94%); 2.0 to 5.0 kg in 116 animals (16.32%); 5.0 to 9.0 kg in 217 animals (30.52%) and above 9.0 kg in 350 animals (49.23%). Due to absence of plastic recycling unit in the Gondar city or in nearby areas, there is no practice of collecting and selling these products to junk dealers. Use of reusable bags made of cloths, jute and other natural fibers must be encouraged. In order to save the life of animals, residents should not pack and throw the food items in plastic bags. The cattle owners may be advised not to allow their cattle to freely wander in streets especially in the cities. They should see that the grazing lands are not polluted with the polythene and other wastes. Awareness may be created on careless disposal of plastic bags and as well as the periodical cleaning of these wastes in the grazing area.

Keywords: plastic bags; cattle health; environmental effects; rumenotomy; reuse; Gondar

[1] INTRODUCTION

Every year trillions of polythene bags are used in the World. They persist on this earth to haunt us and our generations for centuries. Polythene chokes the drains and the water bodies, pollutes the land and poisons us slowly but surely. Even mowed grass cannot escape the polythene menace [1]. Polythene has been recovered from the rumen of countless cattle and is a major threat to animals also. Polythene pollution is an epidemic now.

Polythene is indestructible. One particle of polythene is further made of many particles. If we continue to use polythene, the earth would become polluted on an alarming rate [2].

The word plastic has its origin from the Greek word "plastikos", which means 'able to be molded into different shapes' [3]. They are made up of long chain polymeric molecules [4] and basic materials used for their manufacturing is extracted from oil, coal and natural gas [5]. Plastic or polythene bags commonly known as festal in Amharic language are in common use as shopping

bags for packaging food, and other items in Gondar city as well as other parts of Ethiopia. In addition to polythene bags, plastics are used in bottling of mineral water, cold drinks and liquid soap, which become part of waste after use. Majority of the residents collect their household wastes in plastic sacks and place them roadside on every Friday until it is carried away by private waste collectors in the city. Their better physical and chemical properties of being strong, light in weight, resistance to water and most water-borne microorganisms make them preferable choice over paper and reusable cloth and jute bags. Plastic consumption is growing at a rate of approximately 5% annually, and the global production reaching about 150 million tons per year [6].

After their entry to environment, plastics resist biodegradation and pollute for decades and centuries [7], and pose risk to human health and environment [8]. They are resistant to moisture, travel long distances because of their light weight, block drains during rains, and may also trap birds. Plastics cause "visible pollution" as they contribute to large volume of total municipal solid wastes and are major threat to air [9], oceans [10], soil [11], livestock [12,13], wildlife [14] and marine life [15]. Approximately, 95% of urban stray cattle in India are suffering from various ailments due to hazardous materials, mostly plastic bags inside their abdomen [13]. These plastics reduce the rain water percolation, affecting the ground water recharge and level. Soil fertility and seed germination is also affected when these plastic bags become part of manure and reaches agricultural fields. Presently there is no recycling unit of plastic bags in Gondar city so most of these plastics become part of municipal waste. As per literature survey limited work is done on this aspect in Ethiopia [16], so this study was designed to assess the impacts of plastic usage on environment and cattle health and to put forward some alternatives about plastic bags usage. The data obtained would be a baseline for the further research.

[II] MATERIALS AND METHODS

2.1. Study area

Gondar city, the capital of North Gondar zone in Amhara regional state, is located 750km North-west of capital city of Addis Ababa [Figure-1]. It is situated between 12°36'N and 33°28'E at an altitude of about 2300 m above mean sea level with an average temperature of 20°C and an average annual rainfall of 1800 mm. Being a highland area, the city is spread on different mountains, slopes and in valleys and has three small rivers, many streams and a lake. The city with a population of 186,077 [17], has 21 kebeles (wards), one hospital, three health stations, two health centers, one university, three veterinary clinics, four colleges, six secondary schools, one preparatory school (Senior Secondary School), one technical and vocational school, 27 primary schools, 13 kindergartens and an airport. The city has historical importance of being the capital of Ethiopia from 1635 to 1855 G.C. and has many medieval castles and churches.

2.2. Methodology

The retrospective study period was six years (2004/05 to 2009/10) and the data was collected by:

1. Personal observation.

2. Case study analysis i.e. by observation of cases registered under three veterinary clinics.
3. Key informant interview i.e. by conducting interviews of animal health assistants working in veterinary health service and private veterinary practitioners of Gondar city.
4. Transect walk observation.

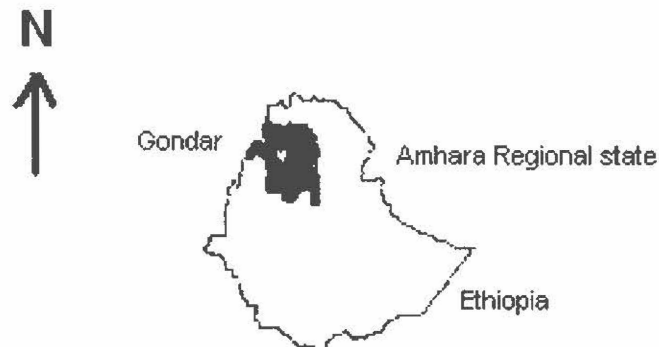


Fig. 1. Map of the study area

[III] RESULTS AND DISCUSSION

3.1. Increasing trend of plastic bags use

During the study period, authors observed an increasing trend of using plastic bags among Gondar city residents. A developing trend of "use and throw-away" towards these polythene bags is the main cause of the problem. During 2004-2008, shopkeepers sell these bags and provide the bags to those customers purchasing more items. The trend changed slowly and up to 2009, these plastic bags were given free of charge to shoppers. In some years residents of the city will be accustomed to plastic bags use that they find it difficult to change their habits. Paper packaging is vanishing slowly in the city and limited to small shops only. Locally made bags from big empty plastic sacks are in use on Saturday market day in the city but they are also losing their charm in the race of modernization. These plastic bags do not contribute much in terms of volume and weight to municipal solid waste (MSW), but the main problem is the disposal of these bags after use. Presence of used bags causes aesthetic disturbance of the city's hilly landscape.

3.2. Current practices of plastic bags use and their environmental impacts

Open dumping of residential wastes including plastic is observed commonly in almost all wards of the city. Dumping is commonly observed near road side, open plots, river side, in drains and public places however, it is prohibited under Ethiopian law [18]. Residents used commonly plastic sacks and polythene bags for storing their wastes, which ultimately become part of MSW. From the temporary and final waste disposal sites, the stray and other domestic animals like cattle and donkeys engulf these

plastic bags containing food materials inside. Sometimes the street boys were also found to sort large size and good quality bags for their use. Winds carry away these bags to distant areas which were sometimes found entangled on the trees and shrubs and creates nuisance. During rainy season, the blockage of drains and overflowing of water was also observed in some areas of the city. Sometimes residents pack and throw the food items in the plastic bags. The stray and other animals were unable to open these bags and were found to consume whole plastic bags. In due course of time, the amount of plastic bags got accumulated in the stomach of these animals and create health problem for these animals. Intentional open burning of waste along with plastic bags is also a commonly observed practice in the city leading to problem of local air pollution with harmful gases.

As per the section 8 of Ethiopian Government Proclamation, passed in February 2007, any unlabeled plastic bag will be treated as unlawful and also bans the manufacture and import of plastic bags less than 0.03 mm in thickness [18]. Authors observed different colors of unlabelled plastic bags available and provided commonly in Gondar city, which are against the government law and need to be controlled.

3.3. Effects on cattle health

The plastic bags along with other foreign bodies in cattle affect the health and cause economic loss to the owner. The cattle have three non-glandular fore-stomach compartments - the rumen, reticulum and omasum. These are the sites for fermentative digestion. The fourth glandular compartment, the abomasum is the "true stomach" which is responsible for the next phase of enzymatic digestion. The indiscriminate eating habits and mineral deficiency make them susceptible to inadvertent ingestion of foreign materials [19, 20]. The various pathological conditions that are encountered due to ingestion of plastic and polythene materials in animals are indigestion, impaction, tympany, polybezoars, and immunosuppression [13]. The most common symptoms observed in the affected animal were bloat and were exhibited by the abnormal bulging of the paralumbar fossa on the left side of the abdominal wall. The other clinical symptoms were depression, complete or partial anorexia followed by loss of weight, ruminal impaction, reduction of milk yield, and suspended rumination. Milk and weight reduction in the affected animals was variable according to the stage of lactation, quantities of foreign bodies ingested and severity of the bloat. However accurate data in this regard was not maintained properly by the respective clinics. Acute bloat causes more pressure over the diaphragm and ribs which limits the respiratory movements, leading to hypoventilation and decreased venous return to the heart [19]. Lack of emergency and timely treatment of acute bloat may lead to cattle mortality. When the conservative line of treatment fails to correct these ailments of rumen, the only alternative is rumenotomy, which is surgically opening the rumen for treating its various ailments and to remove a variety of foreign bodies. A total of 711 rumenotomies were

performed in the Gondar city area during the study period [Table- 1].

The bloat or tympanites may occur in different forms like acute, chronic recurrent, simple or frothy bloat. Out of the 711 rumenotomies done, in 111 (15.61%) and 600 (84.39%) animals, emergency rumenotomy and elective rumenotomy were performed, respectively. The ruminal tympany occurs during obstruction due to foreign bodies occluding the passage of eructing gases [26]. Farmers who could not arrange timely treatment used to lose their animals. The acute bloat was due to the complete obstruction of the rumino-reticular orifice and the ingesta could not be moved to the next compartment and the stasis resulted in accumulation of the fermented gas in the rumen.

In the cases of recurrent bloat the distension of the rumen reduced subsequent to conservative line of treatment. In these cases the obstructing foreign bodies were shifted to other parts of rumen resulting in temporary relief of bloat which recurred after few days. Ruminal impaction is due to the obstruction caused to the movement of the ingesta to the next compartment and it was noticed in 148 (20.83%) animals. It has been observed that cows with polythene materials in their stomach suffer from immunosuppression that leads to increased sensitivity to various infections [13].

Table: 1. Details of rumenotomies performed in the Gondar city during 2004-2010

Sl. No.	Place of surgery	Number of cattle operated
1.	Gondar university veterinary clinic	85
2.	Gondar woreda veterinary clinic	99
3.	Animal health assistants (private practice)	502
4.	Private veterinary clinic, Gondar	25
Total		711

Table: 2. The details of quantity of the foreign bodies (FB's) collected during rumenotomy

Sl. No	Quantities of FB's recovered (Kg)	No of animals	%
1.	0.75 - 2.0	28	3.94
2.	2.0 - 5.0	116	16.31
3.	5.0 - 9.0	217	30.52
4.	> 9.0	350	49.23
Total		711	100

The foreign bodies recovered by transruminal exploration during rumenotomy are broadly classified into penetrating (nails, wires) and non- penetrating foreign bodies (polythene bags, plastic materials, rubber articles, leather pieces, and cloths) as found in the cattle [Figure- 2 and - 3]. Other workers in different part of World encountered metallic objects [21], cloths [22] and

polythene bags [23] in the gastrointestinal tract of ruminants, causing ruminal obstruction and occlusion. The foreign bodies were mostly dark black in color and their shapes modified into ball-like and other shapes and their texture was also altered to be tougher than original. The above changes in foreign bodies were



Fig: 2. Large quantity of foreign bodies recovered after rumenotomy.



Fig: 3. Varieties of foreign bodies removed from a cow

due to churning action by the contraction of the rumen and reticulum and also by the action of the micro flora population inside. These large tight balls inside the rumen cause impaction. In some animals the churned up masses get fused together and make it difficult to remove through the rumenotomy opening and have to be cut into pieces and removed. The quantity of the foreign bodies collected from the rumen were ranging from 0.75

to 2.0 kg in 28 animals (3.94%); 2.0 to 5.0 kg in 116 animals (16.31%); 5.0 to 9.0 kg in 217 animals (30.52%) and > 9.0 kg in 350 animals (49.23%) [Table-2]. The items rarely recovered were a small boy's trouser, belt and screw driver. In some unusual cases about 70% of the rumen was impacted with the foreign bodies. On exploratory rumenotomy twenty-two hair balls were recovered from the rumen and reticulum of a goat [24]. In an unusual case of rumenotomy in a cow revealed a large empty cement bag with its part embedded in the reticulo-omasal orifice obstructing the ingesta [25].

In all the cases the animals showed symptoms of pain exhibited by depression, arched back and grunting. Apart from this there was sudden drop in milk yield and 75% reduction was noticed incurring a heavy economic loss to the farmer. Losses or costs of several kinds occur like losses by death and by culling of bloat prone animals, losses of production from animals which suffer from bloat and survive, losses due to the disruption of normal farm work and management programs, losses due to the use of less productive but safer pastures, and the cost of preventive measures and treatment. Not measurable in monetary terms is the mental and physical strain on the farmer and his family when an outbreak occurs. Other costs those of research and extension services must be added [27].

3.4. Reuse and recycling

It's very difficult to impose complete ban on plastic bags use and plastic packing until there is fully equitable alternative available. The four R's as feasible options for achieving reduced material use and waste generation are Reduction, Reuse, Recycling and Recovery. Presently only reduce and reuse option are feasible in Gondar. As there are no recycling units for plastics in the Gondar city or in nearby areas, there is no practice of collecting and selling these products to junk dealers. However, the residents were found to reuse good quality of big size plastic bags. The reuse of these bags was observed among small shopkeepers and rural people, who sell vegetable in Saturday market. The residents had a good practice of reusing mineral water and cold drinks plastic bottles for pouring milk, oil, and "tella", a local beverage therefore contributing in reducing the amount of waste. In our previous study, the respondents were agreed to participate in segregating and storing the wastes provided there is some recycling unit which can buy their segregated wastes [28].

3.5. Options

Reusable bags made of cloths, jute and other natural fibers are durable, having long life span, biodegradable and above all environment friendly. Further reusable bags are washable, easy to carry and handle, will not break under the weight of heavy shopping items, reduce use of plastic bags, and do not pose a threat to environment and wildlife. Such types of bags are already in use in Addis Ababa, the capital city of Ethiopia and also seen occasionally in Gondar. Even plastic bags can be reused again and again so that threat to environment and life can be reduced. If possible we can refuse unnecessary packing of

purchased item in plastics. In order to save the life of cattle, residents should not pack and throw the food items in plastic bags. The cattle owners may be advised not to allow their cattle to freely wander in streets especially in the cities. They should see that the grazing lands are not polluted with the polythene and other wastes. Awareness may be created on careless disposal of plastic bags and as well as the periodical cleaning of these wastes in the grazing area. Creating awareness among city residents regarding indiscriminate use and disposal of plastic bags will be a good option to overcome the problem in future. The non-governmental organization named "SOS Addis Tefetron Bemalimat Bikletin Masweged Mahiber" in Addis Ababa is engaged in generating awareness among Addis Ababa residents [29]; however such types of activities are needed in other parts of Ethiopia.

ACKNOWLEDGEMENT

Authors are thankful to Dr. Desalegne Mengesha, Vice President for Academic, Research and Community Service, University of Gondar, Dr. Hassen Kebede and Dr. Haileleul Negussie of the Unit of Clinical Studies and to Dr. Wudu Tamasgan, Dean, Faculty of Veterinary Medicine, University of Gondar for their help and constant support.

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Ceded time from:

#33 Illya Szilak
#34 Mathew Evans
#40 Zach Staads
#42 Jon Armstrong
#43 Annette Mees
#44 John Nelson
#45 Rin Ball

DATE RECEIVED:	2-9-25
FROM:	Ken Eklund
PHONE OR EMAIL:	408-633-8372

Good evening Chair Fowler and Planning Commissioners. I'm Ken Eklund, I live at Three Seven Three Four Zero Moss Rock Drive in Benton County.

Thank you, Illya, Mathew, Zach, Jon, Annette, JP and Rin, for gifting me more time to speak.

I want to speak first to a concern that you have, Chair Fowler, and try to give an answer that you tried to get from the Applicant, I think in vain. You asked them, does an input of a limit of 930,000 tons a year of organic waste into the odor model validate that model? Does it make it work at mitigating the harms of that waste? Now, I'm just a guy with a computer and motivation to use it, but let me tell you how I break that down.

The 930K limit helps, but doesn't mitigate, the odor harm. Because a lot of odors come from organic waste, but by no means all of them. Plastics, for example, produce VOCs – volatile organic compounds – as they break down. And a lot of odors result from organic and inorganic waste interacting – and as Commissioner Lee established, approving the expansion would remove the cap for non-organic waste, so then,

there could be a lot of inorganics for the organics to interact with. You could see yearly intake volumes of non-organic waste go up sharply, since the sky's now the limit. And of course, since there's no limit to any waste that Republic self-identifies as not "organic waste," you would likely see a sharp rise in intake of inherently stinky things – anything contaminated with chemicals, for example.

The other thing to remember is that the odor is landfill gas, and the odor consultant told you flat out that landfill gas generation is going to just keep going up and up, through the year 2052. That's because it's an additive thing – you're not smelling just this year's garbage, but last year's and the year before that, and so on. If landfill gas is going up, then odors are going up. We're seeing this phenomenon at landfills across the country, where more and more

waste goes to fewer and fewer landfills and the additive effect means rapidly escalating odor impacts for the communities around those landfills.

Another thing to note about the model is that it has other inputs, not just organic waste. You input gas collection efficiency, for example. We see the odor consultant has finally abandoned using an “industry standard” input and now claims to have based it on the landfill’s “actual emissions” – which, I have to pause right there and question, why didn’t they do that from the start? – But the thing about “actual emissions” is, those are numbers that Republic generates, and they are suspect and sharply contested. I think the EPA served them a Section 114 on exactly that question: how much landfill gas is leaking out of Coffin Butte? I for one have no faith in Republic’s self-generated number.

So that's my attempt at answering your odor model validation question. The answer is no, for those three reasons at least.

And then there's a fourth reason, which is this.

This is Coffin Butte Landfill on April 18 of this year, at 7:47 and 18 seconds in the evening. This is a plume of landfill gas at super-emissions levels that extends for almost two miles, from the back of the top of the landfill into homes along Highway 99W and across 99 into EE Wilson and then into more homes in Adair Village. I think it's fair to say that it's very difficult to reconcile the odor consultant's representation to you of odor travel around Coffin Butte with this real-world plot of landfill gas streaming out into the surrounding community. And remember: the plume you're

seeing is landfill gas at super-emissions levels. The odor plume is much bigger than this.

This is from a survey of Coffin Butte done by satellite by Carbon Mapper, a climate science nonprofit. Carbon Mapper just got a 2025 World Changing Idea award from Fast Company for their methane data transparency innovations, i.e., for this. Which is indeed a world-changing service. It's certainly made the odor modeling industry obsolete. Why model it when you can just look at it.

Commissioners, there are people's houses in this plume. Some of those people are here in this room.

Carbon Mapper can also quantify how much gas the landfill is leaking; they estimate this one is leaking 2.4 metric tons of landfill gas an hour,

plus or minus .4 metric tons. I don't know what number the model used for "actual emissions," but I'm guessing it's a fraction of this.

(6:00) This plume image is not an outlier. Carbon Mapper surveyed Coffin Butte three times in April and found it mega-leaking each time. In fact, for about two years now, Carbon Mapper has never surveyed Coffin Butte Landfill and found it not mega-leaking. The bad news is, their latest survey, on May 30, found that Coffin Butte is now mega-leaking from two different mega-leaks at the same time. Things are visibly getting worse.

I hope, Commissioners, that gives you some clarity into the odor model and its limitations as proof of Republic's claims of no serious interference due to odor.

Chair Fowler, and Commissioners, I haven't been able to get on paper the evidence and related material I'm citing, but I sure want to. I'm requesting a 7-day extension to do that. I really want you to see these plumes for yourselves.

So – what Carbon Mapper has done from the air, the EPA has done with boots on the ground. Which leads us into my next TED Talk, on compliance.

Legally speaking, a “burden of proof” has two parts. The first is, “Burden of Production” – that is, the burdened party has to produce evidence to support their claims.

Their “Burden of Proof” also is “Burden of Persuasion,” that is, the burdened party must provide you with a narrative that convinces you

that their evidence is valid and their claims are true. So, they can't just dump documents on you and burden you to make sense of them all. They have to explain them. And, really, they have to convince you. That's their Burden of Persuasion.

So, to jump back up to the odor study: the Applicant has provided a new odor study, which is the latest in a long line of odor studies, under their Burden of Production. And they've made representations about it, under their Burden of Persuasion. And you collectively had questions about their evidence, and maybe more now that you've heard more public testimony and seen that plume rolling into Adair Village. And so the question is: is the Applicant's narrative about their odor study convincing to you.

OK, back to compliance – by which I mean, Republic's representation of themselves as cooperative partners in environmental stewardship of the land, and the many questions that you have, and the public has, about that representation and the proof of that narrative. It's a key question, because trying to get a non-cooperative party to adhere to 86-and-counting Conditions of Approval is a hellscape.

We've heard from Missy Ryan that we have no hard evidence, only anecdotal evidence, of Republic's non-compliance with past Conditions of Approval. Well, anecdotal evidence is still evidence. But that's not really what we're looking for anyway. We're looking for Republic fulfilling its Burden of Production on this issue. We're looking for the list of past Conditions of Approval, and Republic's

documentation of fulfilling those Conditions. Very simple and straightforward. But Republic has not done this simple and straightforward thing. As Commissioner Biscoe mentioned earlier, they didn't do it during BCTT either. So Republic has failed their Burden of Production on compliance.

Let's imagine for a moment a different landfill operator, one that embodies Republic's claims of being Environmental, Neighborly and Cooperative. Let's call it ENC for short. ENC would have no problem supplying you documentation about past Conditions of Approval, because they would have been keeping track of them. So Republic seem to diverge here from being Environmental, Neighborly and Cooperative.

Let's look for other instances where Republic's attitude toward compliance has been put to the test. Yesterday, Bret Davis mentioned that the landfill is safer now, firewise, because the open flares it used to have, have been replaced with an enclosed flare. What he didn't mention is that, if Republic had actually complied with DEQ environmental regulations, the enclosed flare would have already been installed and at least one of the grass fires would never have happened. Republic learned they had to install and certify an enclosed flare in September 2021. They didn't actually comply with that regulation until November of 2024, over three years later and a year and a half after deadline, and only after DEQ issued them a Class I Notice of Violation.

And this to me is the kicker about that story: the grass fire damaged the flare equipment. So

Republic asked for an extension of complying with their Class I Violation due to the fire that their Class I Violation caused.

Commissioners, you have been given testimony by Erin Bradley, who was downwind from that fire. She runs a horse therapy non-profit, so when she saw the fire starting she had to load up her horses and otherwise begin to evacuate. Luckily, Adair Rural got the call and arrived on scene and put out the fire. All because of Republic's lack of compliance with DEQ regulations. Something they should have disclosed to you, but didn't. Pretty big crack in their Environmental, Neighborly and Cooperative narrative.

Let's look at another instance where Republic's attitude toward compliance has been put to the

test. Let's look at Coffin Butte's compliance history with the EPA.

Republic's Burden of Production: if you ask the EPA, and I have, Republic should have provided you with at least three key documents: they should have handed over the 2022 EPA Inspection Report, the follow-up 2024 EPA Inspection Report, and the 2025 Clean Air Act Section 114 Information Request, EPA Enforcement's legal notice in January. They've given you none of those, so Republic has clearly failed their Burden of Production. They've made various representations to you about those EPA actions, but they have not provided you with the documents to prove their representations.

Republic's Burden of Persuasion: well, you tell me. What narrative has Republic told you about the EPA actions? I think it's been "nothing to see here, move along." If you ask the EPA, and we have, they will tell you Coffin Butte is an

active enforcement situation. The VNEQS lawyer says the same. I don't think Republic has admitted even to that. Has Republic convinced you that "there's nothing to see here, move along"?

I can give you a narrative about the dump's recent compliance history with the EPA, and you decide for yourselves if it clicks. I've already documented every step – just search the public record for the word "explainer."

According to Senator Jeff Merkley, his staff received a lot of constituent complaints about the dump in 2021, so he put pressure on the EPA to look into it, and the EPA made an announced inspection that July and found 61 leaks at reportable levels and higher, including 4 at explosive levels. While the EPA inspector, Daniel Heinz, was finding all these methane leaks, Phil Caruso, Environmental Technician for Republic Services, was with him. Caruso didn't dispute the findings, but said he would not have checked many of the leak locations,

that he would have spent less time monitoring, and otherwise would have carried out the inspection using interpretations of the testing protocol that would have enabled him to not find the leaks and therefore not have to report them.

Time passes. It's 2024. Republic started up this application to expand the landfill. They set the wheels in motion – and then EPA made their unannounced inspection in June last year. Another embarrassment.

And then that unannounced inspection and its findings triggered the Section 114 legal action, which is basically an audit of all the dump's environmental records.

At which point Republic had a choice. They could have come clean with you – they could have said, “Here's what happened, here's what's happening, here are the reports, let's talk about this.” That's what their Burden of Proof obligates them to do. Instead, Republic

chose to pretend, as much as possible, that “there’s nothing to see here” – that this bad compliance history with the EPA should just be ignored. They dealt themselves a bad hand and now they’re trying to bluff it out.

Republic often asserts that environmental regulation is something DEQ and EPA do, not the County. But this isn’t regulation – this is information about regulation. You on the Planning Commission require the history of the regulatory process so you can better understand what is likely to happen in the real world if that process were to expand, along with the landfill area. This information is directly relevant to your criteria and deliberations.

– So, my dear overworked Planning Commissioners, you can sit back and take a breath. The hard part is over. Your decision has been made for you, and Republic made it. This is a matter of key importance to this application, and Republic has totally whiffed it. Good compliance is something they need to

prove, and they have not. In fact, by their silence and evasions, they've created strong evidence of the opposite. Without this proof, Conditions of Approval are a non-starter. Game over.

“Hmmm,” you say, “it seems unlikely that some old guy with a ponytail and overalls can torpedo the entire Republic application.” Ah – but it’s not me. I’m just the messenger. What happened was, the public out-roar over the last expansion application activated our Congresspeople, who pressured the EPA to inspect, and that went poorly for Republic, as detailed in the report that Republic did not give you, so the EPA followed up with another unannounced inspection, which went even more poorly for Republic, as detailed in the second report that Republic did not give you, which escalated into the Section 114 legal action, which Republic did not tell anybody about; but the County’s Disposal Site Advisory Committee dug it up with a Freedom Of Information Act request, and this legal action,

which Republic definitely has not showed you, got passed along to Benton County's Environment and Natural Resources Advisory Committee, ENRAC, who as you know are charged to advise you on this application, and ENRAC cited the EPA's legal action as a key element in their recommendation to you to deny Republic's application. Like I said, I'm just the messenger. It took a village.

Now, the escalation of the EPA's investigation into Republic's compliance history is one thing. One bad thing. But my key point here is that what Republic chose to do with those developments is entirely another. They chose to keep them from you.

So Commissioners, I think you can realize what this means for your deliberations, and your decision. An Approval with Conditions would essentially be telling the public, "Yes, I know for sure that Republic is bad about complying, because they refused to comply with our requirements to be truthful about compliance,

but I feel sure that Republic will be honest and forthright with you going forward. After all, you have a piece of paper with Conditions of Approval written on it.” Maybe it’s just me, but I feel that would be a low thing for you to do to the public.

As attorney Kleinman has laid out for you: legally, this has to be feasible. It has to be “possible, likely and reasonably certain to succeed.” You have zero proof of that. All the proof before you, especially Republic’s evasion, indicates the opposite. At the very least, it signals strongly that trying to enforce the Conditions of Approval is going to be an undue burden on public facilities and services. As I said, a hellscape.

To be more dispassionate about it: given that Republic knowingly kept important information about their non-compliance from you, it seems you cannot rely on their compliance for any part of any Approval. So you would have to find that the proposed use would not seriously

interfere with uses on adjacent property or with the character of the area, nor impose an undue burden on any public facilities or services, etcetera, even if none of the Conditions of Approval are met. Because, if you look at the proposed Conditions of Approval, all of them depend on Republic divulging information about landfill operations, not hiding that information at the first sign of trouble.

Because that's the issue here: trouble. I'm sure the Republic guys feel that I'm being very unfair. They have tons of successful compliance they can point to, and say, "see, this, here? We complied. And this? We complied. And this? We complied." And that's all very true.

But the core issue is, especially with the proposed Conditions of Approval, is: What happens when there's trouble? When the test wells show a severe impact to groundwater? Or when those smell-ometers start lighting up like crazy? What happens then? I think the

answer to that is pretty clear. “Nothing to see here, please move along.” All the evidence points to this.

(20:00) Respectfully, I don’t think you could or should make any finding that supports a Condition of Approval. Especially because I think we all know, this situation is just going to escalate. Republic certainly thinks so: they’ve brought a veteran Environmental Manager, Paul Koster, to Coffin Butte; Paul is fresh from Republic’s Sunshine Canyon Landfill, which last year received over 2 thousand complaints and 65 Notices of Violations. But his skills are wasted there now, as the state has finally stepped in with an abatement order, and so he’s here. I’ve put an LA Public article about Sunshine Canyon into the record, Commissioners; be sure to give it a read. It’s not hard to find; the headline is, “**A stinky landfill torments its neighbors in the northern Valley.**”

I have to point something out. If we were dealing with a landfill with a good compliance record, they would have sent their EPA inspection report to you. And a good landfill would only have that one inspection. It wouldn't have a follow-up unannounced EPA Inspection by an Air Enforcement officer – like Coffin Butte had. And a good landfill wouldn't have that second inspection escalate into a Clean Air Act legal enforcement action. But Coffin Butte did. Which I believe is unique for all comparable landfills in Oregon, Washington and Idaho – based upon the results so far from my FOIA request about it. So far, it looks like Coffin Butte is the only municipal landfill in EPA Region 10 to have gotten a Section 114 in the past three years or more.

If we were dealing with a good landfill, a cooperative landfill, they could prove it to your satisfaction. They would have proved it to your satisfaction. But we're not, and they didn't, and that's a serious thing, so please take it seriously. Deny this application.

WHY REPUBLIC DIDN'T HAND OVER DOCUMENTS

2022: EPA inspector Daniel Heinz, in his report:

"Along the top of this section of tarp, from flag #52 to #54, every post or tarp hole Daniel Heins monitored exceeded the surface methane standard, with readings of up to 7% shown before the instrument maxed out. Phil Caruso did not dispute any of the readings, though he noted that he would not have checked many of the exceedance locations, that he would have spent less time monitoring, or that he would have considered a higher location to be "the ground" when placing his probe 5 to 10 centimeters (cm) above the ground per the SEM regulations."

So now we have an insight into what Republic's compliance attitude is, and a handy shorthand word for it: "Caruso." What happened to all those past Conditions of Approval? What happened to the mitigation wetlands? They got Carusoed.

I hope you can follow what's going on here. The EPA guy is finding all these methane leaks, including ones at explosive levels, and Caruso, the Republic guy, doesn't dispute the findings, but says he would not have checked many of the leak locations, that he would have spent less time monitoring, and otherwise would have carried out the inspection using interpretations of the testing protocol that would have enabled him to not find the leaks and therefore not have to report them.

THE CONDITIONS OF APPROVAL THEMSELVES ARE AN UNDUE BURDEN

The Planning Commissioners would have to find that the Conditions of Approval themselves would not impose an undue burden on County government's public services and facilities. Can you really say that? It seems to me that Conditions of Approval would basically normalize and make permanent the tension and strain that we all have lived with for a year now. Which has undeniably put a great burden on County government's resources and its goodwill with the public. If you look at the proposed

Conditions of Approval, they're all driven by complaints, and it would be County government fielding all those complaints, and expected to do something about them.

MAYBE USEFUL NOTES

Kleinman (1747):

One characteristic that can be drawn from the preexisting operation, though, is the applicant's manner of operating a landfill. In this regard, please be aware that the voluminous application materials on file do not disclose that Republic's Pollyanna-ish description of its methane emissions overlooks an ongoing action by the US Environmental Protection Agency.

(Please see the recap attached as Exhibit B – EPA Timeline-Explainer.) **Simply stated, the EPA does not believe Republic's numbers and has the dump under investigation.**

This reflects the way this operator operates. Leaking malodorous, unhealthy methane (that also contains airborne PFAS and many other air pollutants as described by the applicant during its May 1 testimony) onto adjacent properties will interfere with all uses on those properties, and with the character of the area (however "area" is defined).

My notes

The thing is, the hot water that Republic is in with the EPA over compliance isn't the main issue. The main issue is *honesty* and *transparency* – two things that are absolutely necessary to have with Conditions of Approval, as Republic has proposed them and as Planning Staff have proposed them. Without honesty and transparency, that's just a recipe for the chaos and tumult and financial drain of this application process to continue and to continue ratcheting upwards.

I suggest that it's going to be impossible for you as a Planning Commissioner to arrive at a finding where **you credit Republic for something they certainly did not do** – meet their burden of proof about compliance. And more than that, you have to admit, **the situation is a little like you found out that someone cheated on their honesty exam. That's just so many levels of wrong.**

"BEST STEWARDS OF THE ENVIRONMENT"

Brian Rupe ~

Meeting #2 2:04:10

I know a lot of the major topics of conversation have centered around environmental concerns of the landfill, and there's no doubt about it, we agree, and those are the kind of complicated and important issues that we manage every day regardless of the outcome of this hearing. However, maybe I just flip the frame a little bit in terms of perspective and think about it this way: if **the commitment here is to be the best**

stewards of the environment as possible, then maybe doesn't it make sense for Benton County to keep some of this volume here in Benton County, where you not only have a very concerned and educated citizen group, you have a county that's very involved, and [puts hand to chest] somebody who's willing to partner with you at the landfill, as opposed to that volume being pushed out of Benton County where that may not happen.

BACKGROUND

Understanding Burden of Proof

The burden of proof is a legal standard that determines which party is responsible for proving the facts in a legal dispute. In this case, Republic has the burden of proof.

Key Concepts

Burden of Production: This is the obligation to present enough evidence to support a claim. Republic must provide evidence in the form of documents, witness testimony, or physical evidence.

Burden of Persuasion: This refers to the obligation to convince the judge or jury of the truth of the claims made. Republic has this burden as well.

Ken Eklund
37340 Moss Rock Dr
Corvallis OR 97330

DATE RECEIVED: 7-9-25
FROM: Kent Lund
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**PLUME
ORIGIN
POINT**



**COFFIN
BUTTE
LANDFILL**

HIGHWAY 99W

E. E. Wilson
Wildlife Area

**E. E. WILSON
WILDLIFE AREA**

**LANDFILL
GAS PLUME**

April 18, 2025

**1.8 mi long
0.5 mi wide**

ADAIR VILLAGE

6K+



ppm-m

DATE RECEIVED:	7/9/25
FROM:	KEN EKLUND
PHONE OR EMAIL:	

July 9, 2025

To: Benton County Planning Commission
Nicholas Fowler, Chair

From: Ken Eklund

Testimony in Opposition to LU-24-027, the application to expand Coffin Butte Landfill

Dear Chair Fowler and honorable Planning Commission members,

I'm attaching a recent article that I think you will find very instructive, as it details the situation with a landfill that's very similar to the situation with Coffin Butte Landfill. In fact, it's uncanny how little cut-pasting you would have to do to make this article about Coffin Butte.

As such, this story offers a sort of roadmap to our County's future.

As a side note, the Environmental Manager for Sunshine Canyon Landfill, Paul Koster, has been transferred to be the Environmental Manager of Coffin Butte Landfill. I wish I could say I was reassured by that, but I am not.

Don't let this be our future – Please deny LU-24-027.

Many blessings for all you do,

Ken Eklund

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attachment: "A stinky landfill torments its neighbors"

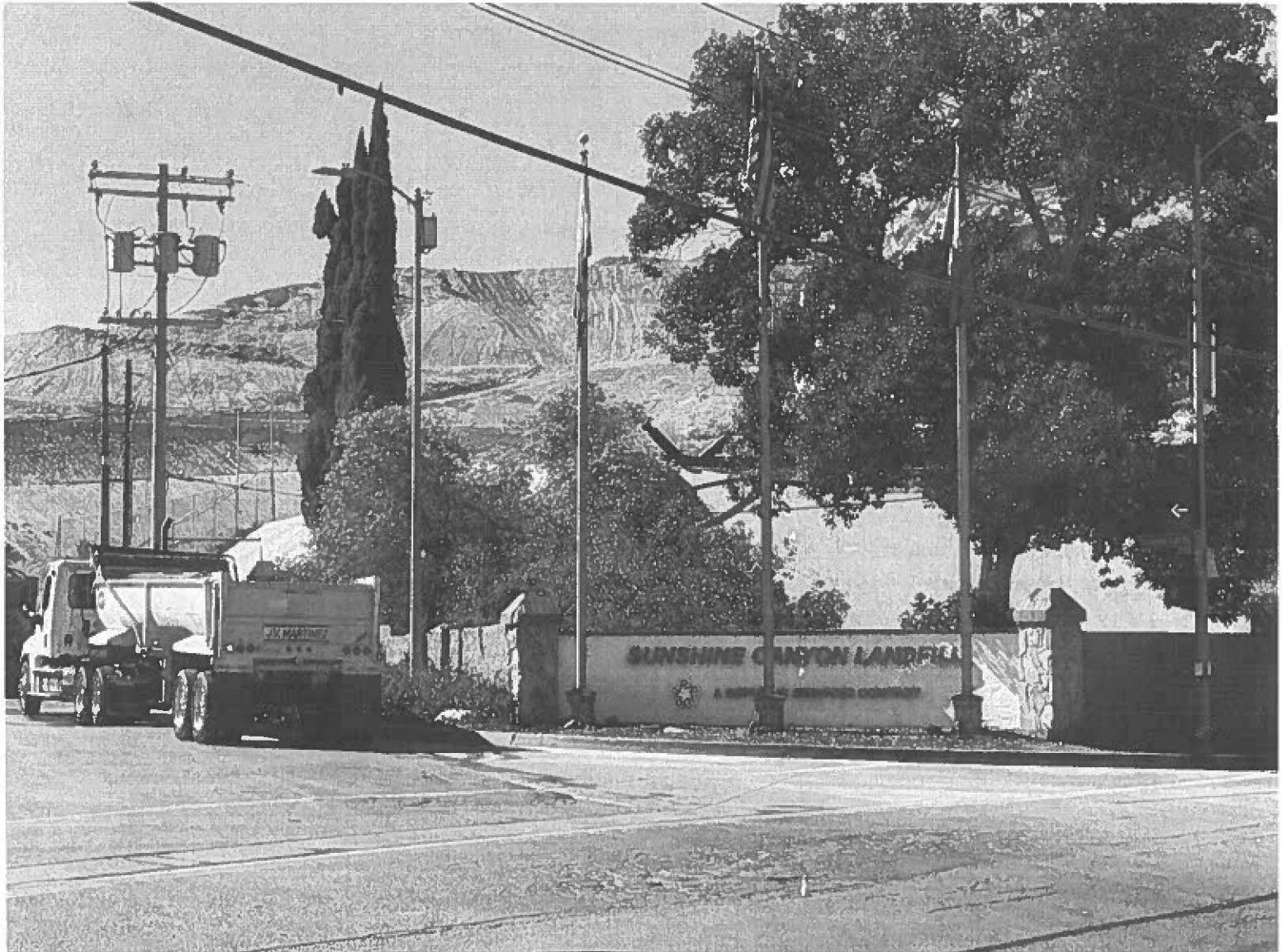
NEWS

A stinky landfill torments its neighbors in the northern Valley

Residents say the smell can sometimes be unbearable, and irritates throats, noses, and eyes.

by Ashley Orona and Dan Ross

03/11/2025 11:28 am



Last year, 2,187 complaints — a 20-year record — translated into 65 notices of violation at Sunshine Canyon Landfill. Credit: Ashley Orona / LA Public Press

In Granada Hills, at the northern tip of the San Fernando Valley, residents are surrounded by mountains, walking trails, and parks. But they can't seem to enjoy all the natural beauty because the neighborhood's other major defining feature is a giant, stinky landfill.

"It's just rotten trash. It's really distinctive. You can't miss it," said Jacqui Cunz, who for nine years, has lived about a mile from Sunshine Canyon Landfill in Sylmar.

Some days the smell is simply an annoyance. Other days it is strong enough to burn people's nostrils and make their eyes water and throats itch. When that happens, Cunz prefers to stay inside. But even when she seals all of her doors and windows shut, she said the smell can still creep in.

In the summer, residents said the smell worsens. And on windy days, plastic bags and paper trash blow onto their manicured lawns. Others said they have to clean up layers of dirt in their yards from the landfill operator constantly **importing soil**, and using it to cover the trash.

"It's a bummer because everybody loves living here, everybody loves the area," said Cunz. "Not when you wake up to smells almost everyday."

The strong odors inundate the neighborhood as frequently as a few times a week. Meg Volk, who has lived in the area for 33 years, said in the past month she has made 11 calls to the South Coast Air Quality Management District, or AQMD, the region's air regulatory agency, to report strong odors from the landfill.

There's been a few times where Volk has taken a chance and slept with the window open in her bedroom but was awoken by putrid smells early in the morning. Even if it's 2 a.m., she said she gets up to call AQMD because she's "so pissed."

In January, AQMD received **118 complaints** from locals about odor and issued three notices of violation. Jan. 6 looked like a particularly smelly morning, with **27 complaints just minutes apart**, with many coming from addresses nearby Van Gogh Charter School.

The community's frustrations aren't new — the landfill has been a nuisance neighbor for decades, and not just for Granada Hills, but other nearby neighborhoods. But the problems appear to have accelerated over the past couple of years. **The landfill is also slated to take in fire ash and debris from January's devastating Palisades and Eaton fires** — putting a renewed focus on decades of complaints from local residents.

Last year, regulators issued 65 separate notices of violation for a record annual number of public odor complaints for the facility. According to publicly available data, this number is significantly higher than for the other three solid waste landfills in LA and Simi Valley taking in ash and debris from January's fires in Altadena and Pacific Palisades. AQMD has filed a petition for an abatement order against the landfill operator, Phoenix-based Republic Services, to try to force it to comply with state and local rules on nuisance odors. A **hearing for the** order is scheduled for later this month.

In response to questions about Sunshine Canyon's compliance history and the complaints by local residents, a Republic Services media representative wrote that the company has "comprehensive safety and environmental programs in place," including a "state-of-the-art liner system," and "robust gas collection system to help ensure material is managed safely and responsibly."

Jane Williams, executive director of California Communities Against Toxics, an environmental advocacy organization, said she doesn't believe the operators are doing nearly enough to protect the community. "Everyone knows that this landfill is completely out of control," she said.

"It never should have been put there in the first place"

The Sunshine Canyon Landfill started life back in the 1950s as an illegal dump. People would pull up to the edge of the canyon and tip into it all sorts of garbage and waste.

In 1958, the city of Los Angeles issued to Republic Services a permit for a 40-acre landfill. Since then, it has grown into the largest dump site in the county, said Wayde Hunter, president of the North Valley Coalition of Concerned Citizens, a nonprofit that has historically opposed any expansion to the landfill and has advocated for action by local authorities on years of odor complaints by community members. And he's not happy about it.

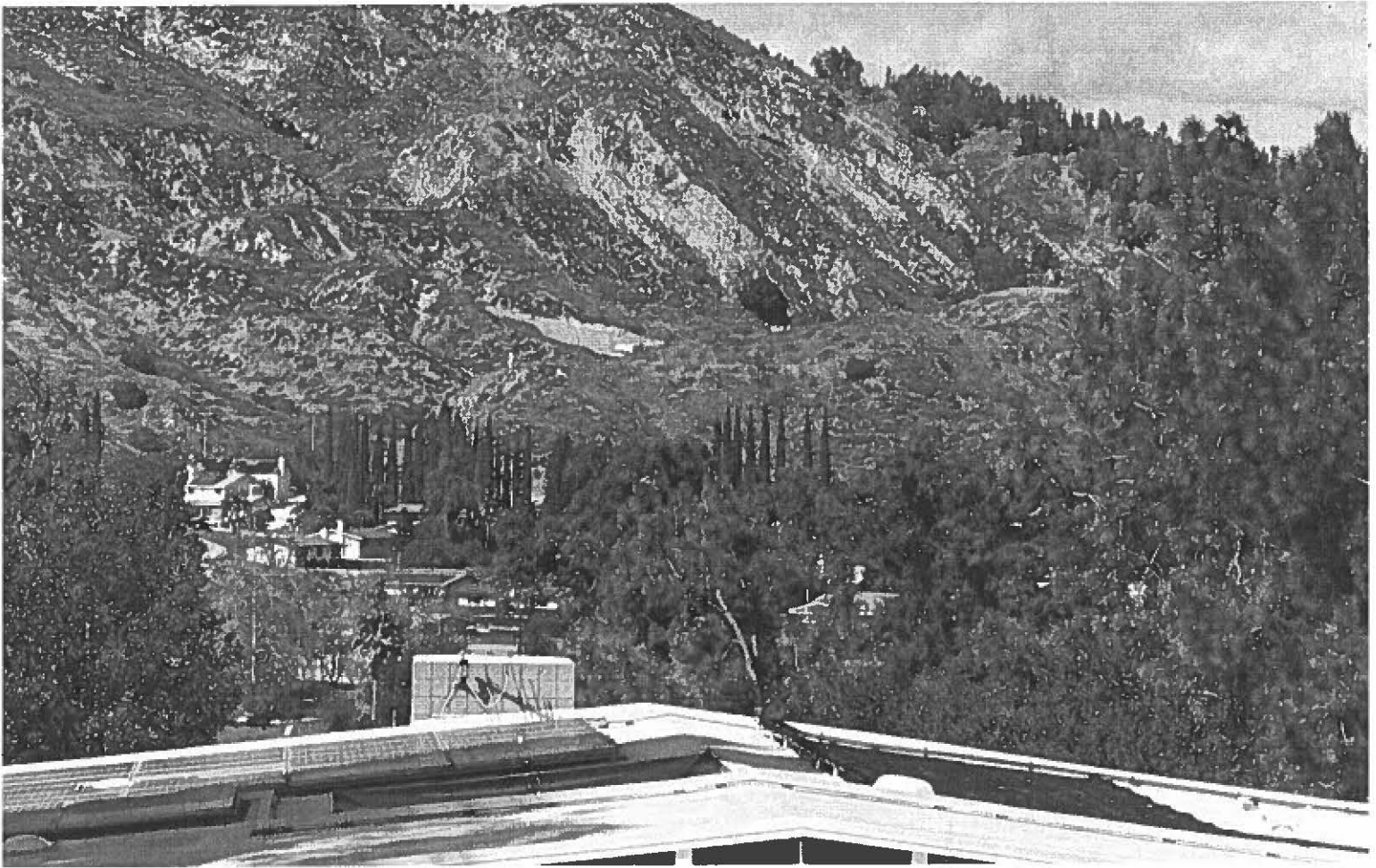
"It never should have been put there in the first place," said Hunter, who explained that the canyon is in the notoriously windy Newhall Pass. "What happens in the landfill happens in our houses. And we're stuck with this stinking landfill until 2037," he added, highlighting its planned closure date, when it's expected to reach capacity.

Compared to other states, California's solid waste landfills are among the most strictly regulated, said Craig Benson, a member of the National Academy of Engineering with decades of experience on the topic. "They're really very careful and very thoughtful about the way they regulate landfills," he said.

But that doesn't mean landfills are necessarily safe or pleasant to live near, said Nick Lapis, director of advocacy with **Californians Against Waste**, a nonprofit pushing for better waste management practices and an overall reduction in waste-streams. He pointed to LA County's Chiquita Canyon Landfill, **which recently closed** due to a hard-to-quench chemical reaction within the body of the trash causing it to heat up, at the same time exacerbating air emissions and odors stemming from the facility.

"The El Sobrante Landfill [in Riverside County] **is also having a subsurface fire**, which I didn't even know about until this morning," said Lapis, recently. "It's pretty clear that our requirements aren't especially protective, even if they're stricter than the federal rules. It's a pretty low bar."





Sunshine Canyon Landfill is tucked into the hills. Credit: Ashley Orona / LA Public Press

2,187 complaints in one year

The AQMD issues notices of violations to landfills in its region when inspectors can confirm that public nuisance complaints are directly attributed to the facility — typically from at least six separate households, or from a school when children are present.

After Sunshine Canyon took additional steps around 2014 to **better manage** odors and **air emissions**, public complaints dropped off precipitously. But they've spiked again over the past two years. In 2023, 1,721 odor complaints resulted in 61 notices of violation. Last year, 2,187 complaints — a 20-year record — translated into 65 notices of violation.

Though notices of violation can come with a fine, no financial penalties have been issued to Sunshine Canyon since the start of 2023. An AQMD spokesperson explained that the agency is still in the process of negotiating potential penalties, with delays due in part to disruptions from the January fires.

The facility also faces regulatory actions for the way it has managed rainwater runoff over the past two years, exacerbated by two unusually wet winters.

In May 2023, the Regional Water Quality Control Board issued Sunshine Canyon a **notice of violation** for 11 separate water discharge and stormwater violations requiring corrective actions, like allowing waste to wash into water drainage facilities or watercourses.

The growing criticism against operations at Sunshine Canyon in recent years provides a backdrop to the more recent public outcry over plans to deliver fire ash debris to the facility, with serious questions over exactly what's in the ash.

During a recent **virtual townhall**, Dr. Muntu Davis, the county health officer at the LA County Department of Public Health, said the ash "can be toxic and dangerous, depending on what burned." **Officials in Hawaii** tested the wildfire ash left after the 2023 fires and found elevated levels of potentially toxic lead, arsenic, cobalt, and copper.

Sanjay Mohanty, an associate professor at UCLA's Samueli School of Engineering, said he's not unduly concerned about the ash going to the landfill provided extra monitoring is performed as a precaution, and the findings are made accessible to the public to assuage concerns.

"There should be a high frequency of monitoring, and monitoring at more locations around the community," said Mohanty. "I think transparency is key here."

Will this be done at Sunshine Canyon? Not exactly. There will be no additional air monitors positioned at and around Sunshine Canyon, according to AQMD spokesperson Rainbow Yeung.

The agency, however, has begun conducting "field activities" at landfills set to receive the fire ash, Yeung added, including unannounced on-site inspections and community surveillance. It also plans to respond "to public complaints submitted by local residents, emphasizing schools and other locations that may have vulnerable populations."

But critics say that's not enough.

"Those are not just odors the nearby residents are smelling," said Williams, the anti-pollution advocate with California Communities Against Toxics, referencing federal air emissions data from 2020. These "**dangerous air pollutants**," she said, include almost 45 tons of sulphur dioxide (which is responsible for the odor complaints), 16 tons of particulate pollution, 33 tons of nitrogen oxide, and almost six tons of volatile organic compounds.

Sunshine Canyon has also long been a **massive emitter** of methane — more than 17 thousand tons of it in 2020 alone, according to federal data. Methane is a potent greenhouse gas and primary contributor to the formation of ground-level ozone, a dangerous air pollutant. Landfills in general are **one of the biggest emitters of methane** in California. Typically, **methane is extracted** through a series of wells and pipes before being flared off or recycled as a fuel. The state, however, could be doing a much better job at making landfill operators plug the problem, said Lapis with Californians Against Waste.

The California Air Resources Board is **considering an update** to its 2010 "**Landfill Methane Regulation**," in part

because the current approach to methane monitoring is ineffective and inefficient, experts say. The updates come as new research shows emissions are significantly higher than previously estimated, according to the board.

Methane isn't the only problem chemical at Sunshine Canyon. In 2019, leachate (the liquid that seeps through landfills) and non-drinking water groundwater testing at the facility found **per- and polyfluoroalkyl substances, or PFAS**, a vast class of chemicals found in everyday products, from non-stick cookware to clothes to carpets. Some of the most ubiquitous PFAS are known to be toxic to humans.

A subsequent **report** found that the PFAS concentrations in the leachate at Sunshine Canyon was within the expected range, and no further sampling was recommended. But as our understanding of PFAS grows, so does the problem. A **recent study** found that PFAS are potentially leaving landfills at a greater rate through the air than through water. Limited testing means it's wholly unclear the extent of PFAS pollution leaving Sunshine Canyon, and how.

Veronica Herrera, a UCLA associate professor of urban planning and political science, said that while safe disposal technologies exist, landfills typically have "just so many associated problems."

Herrera was part of a team that **last year found** residents living around landfills — often in low-income, vulnerable communities — are overburdened by the risks from plastic pollution, like inhaling and ingesting microplastics.

"It's important to think about who can distance themselves from waste, and who can't," she said

To address changing weather patterns, Republic Services has regraded certain areas of the landfill to prevent ponding, modified berms to prevent erosion and better manage more rainfall alongside other erosion controls, and improved the permanent drainage structures, according to the company's spokesperson. It has also installed 100 vertical gas extraction wells within the last year to better manage odors, with 100 more scheduled for installation this year.

"We've also installed more than 10,000 linear feet of horizontal or slope collectors to help enhance gas collection. We have deployed new vapor and misting systems throughout the landfill, and a dedicated Odor Patrol Team patrols the site and nearby neighborhoods every day," the spokesperson said in an email.

These steps have not appeased the residents living in the landfill's shadow.

A showdown is coming

Meg Volk's backyard in Granada Hills with a grassy lawn, pool, and spa looks like the kind pictured in home improvement magazines. She used to enjoy hosting friends and barbecues. But she has stopped inviting guests over to visit.

"It's just so annoying that you just cannot enjoy your own personal property," said Volk.

Jacqui Cunz can see the landfill from her backyard. That wasn't always the case — but the landfill has grown and become more visible over the nearly 20 years she's lived there. When the mountain vegetation is dry and brown, the landfill blends in with the mountain ranges. When the mountains are green, Cunz said, the dump looks like a "scar" along the hillside.

Granada Hills resident Tiffany Sayaphupha does not consider Republic Services to be "good stewards" of the neighborhood. She said the company is not doing enough to contain and handle the smells from the regular household trash it handles. And she's not confident the operator will do its due diligence in handling **the additional fire debris going to the landfill.**

"We're at their mercy," said Sayaphupha.

Sayaphupha has children who attend Van Gogh Charter School, located about two miles away from the landfill. She and other parents are especially concerned about the possible long-term health consequences of odors and incoming fire debris on their children.

At the school's dismissal time last Tuesday, it was warm enough to not wear a jacket. But there was a breeze, especially in the shade. Neighbors walked their dogs at Bee Canyon Park, and a few teenage boys were skateboarding nearby in a dried up reservoir.

Asked about the landfill, some parents said they'd been notified about smells in the past, others said no.

A spokesperson for the Los Angeles Unified School District said in an email that if odors are present at levels that are determined to be "strong" or "disruptive" during school hours, the Van Gogh principal is expected to implement an "indoor activity" schedule until odors disappear. The Van Gogh administration should also submit a complaint to AQMD and the district's Office of Environmental Health and Safety.

Eric Fefferman, a former Van Gogh parent and Granada Hills North Neighborhood Council member, said at a meeting last month that he recently pulled his son from the school because the odor was "so strong."

On a recent morning, Leonardo Muñoz, another Van Gogh parent, said a putrid trash smell was coming from the landfill as he dropped off his child at school, which is not uncommon.

He immediately called AQMD to report it.

"I think it does affect our health at least to some degree, whether you have kids or not," said Muñoz.

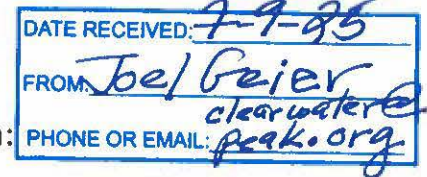
The community's growing chorus of criticism will come to a head at the AQMD's offices in Diamond Bar on March 19, when the hearing on the petitioned abatement order is scheduled to go ahead. Disillusioned community members aren't holding their breath the hearing will result in action. "Don't expect miracles but these are the only people who

can make them do anything like reduce tonnage or reduce hours if only temporarily until the odors are abated,” wrote Wayde Hunter, in an email to the community last week.

“[Residents] don’t want to take it anymore,” said Cunz. “It’s like nobody is doing anything in the political realm to listen to our problems or help us.”

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Dear Chair Fowler and Members of the Planning Commission:

Thank you for this opportunity to provide new testimony based on information and claims that have emerged since the start of the hearing process for LU-24-027.

My address is 38566 Hwy 99W, Corvallis OR 97330. I work internationally as a recognized expert with a specialization in fractured rock hydrogeology¹, with a Ph.D. in geology plus undergraduate degree and graduate studies in mining engineering and rock mechanics.

In this memorandum I focus mainly on the issues of groundwater availability and groundwater quality. I will set forth the following series of numbered points, just briefly stated here, but elaborated further in Annex 1 of this memo.

1. Benton County staff acknowledge that groundwater impacts "have been and continue to be a controversial topic in landfill expansion applications in Benton County."
2. Both County staff and the applicant acknowledge that access to groundwater is part of the existing residential and agricultural use of adjacent properties, and important to the character of the area.
3. County staff acknowledge a lack of internal technical expertise on the topic of groundwater.
4. Despite the acknowledged relevance of groundwater issues and their own lack of expertise in the subject, County staff have neither sought nor obtained evaluation of groundwater impacts by independent experts.

1 Titles of recent contracts include, for example: (1) Hydrogeological expert support (Swedish Radiation Safety Authority); (2) Expert services regarding the hydrogeology of natural barrier system in nuclear waste disposal, (Radiation and Nuclear Safety Authority, Finland), Analyse critique et synthèse des travaux du modèle hydrogéologique intégré région (French National Radioactive Waste Management Agency), Foreign consultant (Korea Institute of Nuclear Safety).

5. Benton County staff have furthermore failed to make use of groundwater expertise that was available to them, both within the Disposal Site Advisory Committee (DSAC) and within their roster of third-party consultants.

6. Staff suggest that groundwater impacts will be addressed by "multiple levels of state and federal regulation" but they have not identified any specific regulatory steps in which risks of impacts on nearby wells will be assessed, nor have they even contacted the most appropriate state agency (Oregon Water Resources Department).

7. Despite their acknowledged lack of expertise on groundwater issues, and failure to seek opinions from qualified independent experts, Benton County staff chose to endorse the applicant's claim that the proposal is unlikely to "seriously interfere" with the reliability of wells on neighboring properties.

8. Similarly, despite their lack of expertise and failure to obtain qualified independent expertise, Benton County staff chose to endorse the applicant's claim that the proposal is unlikely to "seriously interfere" with adjacent uses in terms of groundwater quality impacts, including potential contamination of aquifers by arsenic.

9. Information presented by the applicant on groundwater topics is misleading on numerous counts, possibly deliberately so. It is also inadequate to support the applicant's claim that groundwater resources will not be adversely affected, either in terms of quantity or quality.

10. Information presented by the applicant is not adequate to support their claim that their proposed conditions of approval are adequate to protect groundwater resources in terms of both quantity and quality.

11. Despite their acknowledged lack of expertise and failure to utilize independent expertise regarding groundwater, Benton County staff have uncritically endorsed and adopted the conditions of approval suggested by the applicant.

12. Benton County's proposed conditions of approval regarding groundwater protection, adopted wholesale from the applicant, are stated in such terms as to not be legally binding, and hence will be ineffectual even if Benton County had a mechanism for enforcement of said conditions (which it does not).

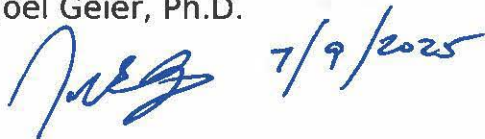
As a second general topic, my comments based on new information regarding wildlife (including Great Blue Herons) are given in Annex 2.

Lastly, in response to claims by proponents that there are no examples of highly engineered modern landfills with geosynthetic liner systems that leak, as Annex 3 I'm appending a European study that assesses the long-term risk of failure for various types of landfills. Please note the statement on p. 4: "*retrospectively, highly engineered landfills were not supposed to leak when they were designed, but some of them nevertheless leaked soon after they were constructed.*" Also note the statement on p. 5: "*Operating landfills situated directly above an aquifer are rarely found anywhere in the world today.*" As I've previously noted, Coffin Butte Landfill is located very close to the main Willamette Basin aquifer.

Thank you for considering these additional comments. I apologize for the somewhat rough condition, as I've had to assemble these quickly.

Yours sincerely,

Joel Geier, Ph.D.

A handwritten signature in blue ink, appearing to read 'Joel Geier', followed by the date '7/9/2025' written in a similar cursive style.

Annex 1: Detailed information regarding groundwater issues

1. Benton County staff acknowledge that groundwater impacts "have been and continue to be a controversial topic in landfill expansion applications."

This is acknowledged directly on p. 60 of the Supplemental Staff Report, which notes that concerns about groundwater were raised not just by residents but also by the county's own Environmental and Natural Resource Advisory Committee, which was set up specifically to advise the county on environmental issues.

2. Both Benton County staff and the applicant acknowledge that access to groundwater is part of the existing residential and agricultural use of adjacent properties, and important to the character of the area.

County staff acknowledge this explicitly on p. 19 of the original Staff Report, where groundwater is listed as one of five key categories of impacts (the other four being noise, odor, traffic, and visual aesthetics). They further note that the five categories of impacts including groundwater "are typical direct impacts related to landfill uses" and furthermore "were identified by the applicant as potential off-site impacts."

VLI (according to their consultants' statement submitted by VLI as Exhibit 49) "recognizes that our neighbors rely on well water, and that springs are part of the appealing natural landscape. We will work closely with the community to monitor and address changes in local water supply wells and springs that may be affected by our operations." Further on, "VLI acknowledges the community's concern regarding local arsenic concentrations and potential water quality changes associated with the proposed development."

3. Benton County staff acknowledge a lack of technical expertise on the topic of groundwater.

Benton County staff, in both the initial staff report and in the supplemental staff report, acknowledge that they lack expertise on groundwater issues. As stated in the Supplemental Staff Report:

.... the county is limited in its ability to evaluate and regulate groundwater impacts beyond the multiple levels of state and federal regulation applicable to the proposed landfill expansion. Those regulatory agencies provide a more appropriate venue to address groundwater impacts.

The county's lack of expertise on the issue of water resources in general is further illustrated by this inaccurate statement from Benton County Public Works:

"Drainage for the landfill complex flows roughly from west to east. The E.E. Wilson Wildlife Area, a network of ponds and wetlands east of the subject property are the direct receiving waters for drainage from the landfill. The E.E. Wilson Wildlife Area functions as one of the headwaters of Bowers Slough, a tributary of the Willamette River."

In fact surface drainage from the landfill complex flows both eastward and westward, because the landfill is located in a topographic saddle between Coffin Butte and Tampico Ridge. Drainage from portions of the landfill complex on the east side of the saddle does flow out onto E.E. Wilson Wildlife Area, but onto the portion that belongs to the Luckiamute River Watershed. Only a few acres of E.E. Wilson Wildlife Area, namely wetlands in the far south end adjacent to Adair Village, drain toward Bowers Slough, but those are on the other side of the surface water divide from Coffin Butte (Figure 1).

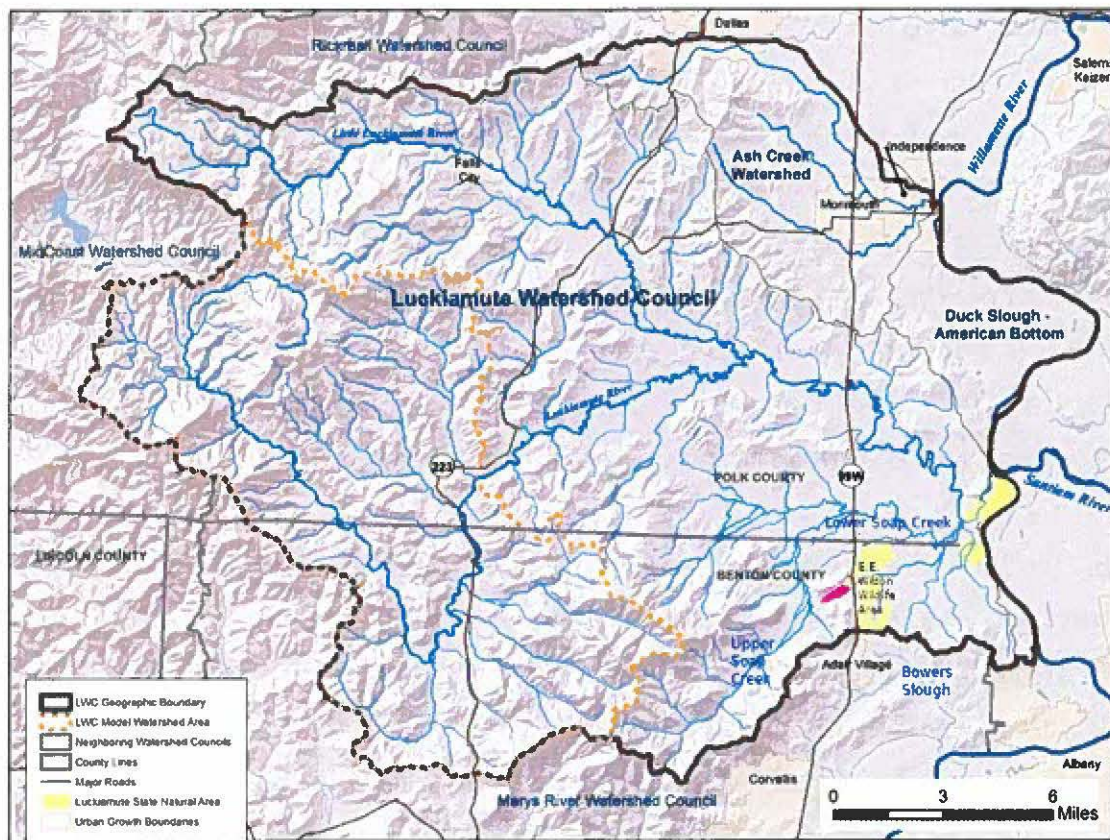


Figure 1. Map showing landfill complex area (hot pink) and E.E. Wildlife Area (yellow, labeled) in relation to boundary between the Luckiamute Watershed (which includes the Soap Creek sub-watershed) and Bowers Slough watershed boundaries. Luckiamute State Natural Area (yellow, unlabeled) is also shown to the northeast of E.E. Wilson Wildlife Area, where Soap Creek flows into the Luckiamute River just above the confluence of the Luckiamute with the Willamette River. Map adapted from the Luckiamute Watershed Council website (www.luckiamutelwc.org). Note that the service area of LWC as mapped here also includes the Ash Creek Watershed, to the north of the Luckiamute Watershed.

4. Despite the acknowledged relevance of groundwater issues and their own lack of expertise in the subject, County staff have neither sought nor obtained evaluation of groundwater impacts by independent experts.

Rather than dedicate resources to independent review, as they have done for other key issues raised in this land-use process, County staff frankly chose to punt on groundwater issues. They hired consultants to assess the application on issues of fire, odor and noise, but not on groundwater impacts.

This leaves you in an unfortunate position of having to decide on this application, without any technical support on an issue that everyone agrees is important.

5. Benton County staff have furthermore failed to make use of groundwater expertise that was available to them, both within the Disposal Site Advisory Committee (DSAC) and within their roster of third-party consultants.

The County's roster of third-party consultants includes Dr. Tony Sperling. Per his CV included as an annex of the Staff Report, his professional experience includes hydrogeological assessment of landfills, including an evaluation of the potential for groundwater contamination from the City of Vancouver's municipal landfill in British Columbia. However County staff have only utilized Dr. Sperling as a subcontractor for their primary contractor that was tasked with evaluation of issues related to landfill fires.

DSAC is under the direction of Community Development staff. Its membership includes David Livesay, former president of GSI Water Solutions and currently leading a DSAC subcommittee which is charged with an independent evaluation of the applicant's groundwater monitoring network at Coffin Butte. Mr. Livesay's findings would be highly relevant for your evaluation of groundwater issues

related to this application. However staff have not shared his report, nor made the proceedings of that subcommittee's meetings public.

According to Benton County Code, this application should have been reviewed by Benton County's Solid Waste Advisory Council (SWAC), who would have given you their recommendation. If not for the county's ill-advised dissolution of SWAC, by statute this would have included all members of DSAC except for the landfill's representative (currently Paul Koster).

This would have given you access to the expertise of Mr. Livesay and other highly qualified current members of DSAC, independent of the landfill's representative (who was present along with Bret Davis, during the meeting when DSAC discussed whether and how to formulate input for your decision; the recording of that meeting shows that Mr. Koster abstained from the discussion but Mr. Davis did not abstain from interjecting his opinions during DSAC's deliberations).

Instead SWAC's statutory role in this process was assigned to the Environmental and Natural Resource Advisory Committee (ENRAC) by Benton County Board of Commissioners Order #D2024-048 in July of 2024. Although ENRAC members did their best to come up to speed on the issues, they acknowledged that many aspects of landfill operations were new to them. In his personal statement appended to ENRAC's recommendation to deny this application, the chair of ENRAC expressed frustration that they were also hindered by County staff. I urge you to read his statement to give you further insight into the process.

All of these factors combine to leave you with less qualified support to make your decision, than you should have had if County staff had made better use of the resources and expertise available to them, including community expertise.

6. Staff suggest that groundwater impacts will be addressed by "multiple levels of state and federal regulation" but they have not identified any specific regulatory steps in which risks of impacts on nearby wells will be assessed, nor have they even contacted the most appropriate state agency.

Of the agencies listed by Public Works (as cited in the Staff Report) no agencies with jurisdiction over groundwater resources are identified, except for Oregon Department of Environmental Quality (ODEQ) which did not respond.

County staff did not seek or obtain comments from the Oregon Water Resources Department (OWRD), which is the state-level authority responsible for assessing groundwater supply issues.

The Department of Geology and Mineral Industries (DOGAMI) were invited to comment but responded that they have no comments. Benton County staff mistakenly cite this lack of comment as evidence:

Additionally, DOGAMI had no comments on the proposal (see Exhibit BC2). Staff therefore concurs with the applicant's analysis and engineering comments. For purposes of county review, and in the LU-24-027 Coffin Butte Landfill CUP Supplemental Staff Report context of additional required regulatory frameworks, the proposal is unlikely to "seriously interfere" with adjacent uses concerning groundwater impacts.

DOGAMI has no regulatory authority over groundwater resources, although they do have a role in regulating surface-water discharges from mining operations. Their lack of comment on this application has no significance for the issue with regard to which it is cited by staff.

County staff did not obtain comments from the Luckiamute Watershed Council (LWC), which has a mandate for watershed health in the watershed that contains the site of the proposed new landfill. LWC is not listed among the entities from

which county staff sought comments, and it is not clear whether they were even notified.

Staff mention Oregon DEQ as an agency that may play a role in the landfill permitting process, but they do not identify any specific process in which ODEQ can be expected to evaluate risk of impacts to reliability of nearby wells.

Oregon Department of Environmental Quality does not evaluate impacts on groundwater availability or water rights in their permitting decisions, nor do they have any particular expertise in this area. Their mandate is limited to the issue water quality (whether water is safe to drink), not whether the sufficiency of water supplies for established uses will be impacted by a new development that affects groundwater.

7. Despite their acknowledged lack of expertise on groundwater issues, and failure to seek opinions from qualified independent experts, Benton County staff chose to endorse the applicant's claim that the proposal is unlikely to “seriously interfere” with the reliability of wells on neighboring properties.

As stated in the initial Staff Report:

Staff concurs with the applicant’s analysis and engineering comments. For purposes of county review, and in the context of additional required regulatory frameworks, the proposal is unlikely to “seriously interfere” with adjacent uses with regard to any groundwater impacts.

County staff would have been more prudent simply to state that they did not evaluate the question of whether the proposed development could impact the reliability of wells on adjacent properties.

Staff statements on this issue lack credibility, and should be disregarded unless or until they can be supported by independent experts.

8. Similarly, despite their lack of expertise and failure to utilize qualified independent expertise, Benton County staff chose to endorse the applicant's claim that the proposal is unlikely to “seriously interfere” with adjacent uses in terms of groundwater quality impacts, including potential contamination of aquifers by arsenic.

Again, County staff would have been more prudent to state simply that they did not evaluate the risk of impacts to groundwater quality, due to lack of technical expertise.

9. Information presented by the applicant on groundwater topics is misleading on numerous counts, possibly deliberately so. It is also inadequate to support the applicant's claim that groundwater resources will not be adversely affected, either in terms of quantity or quality.

9.a. Seismic disturbances from blasting

Applicant's attorney, in his cover letter for Exhibit 49, inaccurately states that the memo addresses whether blasting will impact nearby wells:

Groundwater Interruption. The memorandum analyzes whether the blasting and excavation on the new cell in the expansion area will impact wells on surrounding properties. The analysis concludes that these activities should not have any material impact on surrounding wells but proposes ongoing monitoring and mitigation if necessary.

In fact the section of the memo titled "Seismic disturbances" only addresses (as its title clearly implies) whether blasting during construction of the new landfill is likely to cause seismic disturbances (such as window-rattling or foundation damage).

The memo doesn't do a very good job on that topic either. The discussion of the extent of fractures induced around a blast hole is not relevant to the question of how far and how strongly seismic waves propagate from a blast hole. Seismic waves are an elastic response of the rock, while fracturing around a borehole is anelastic. So this is really a "red herring" as raised by the applicant.

The third paragraph of this section is the only one relevant to the question of seismic wave propagation:

Even with the short distance of rock fragmentation from the blasting hole, as a precaution, the contractor deployed seismographs to monitor ground vibration caused by the blasting at several locations along Military and Wiles roads on the north side of Coffin Butte near existing homes, at distances of approximately 1,100 to 2,300 feet from the excavation. The seismic wave velocities at those distances were all far below the criteria used for assessing ground vibration associated with building damage.

However the applicant has not presented the seismographic data alluded to in this paragraph (or even named the contractor), as part of the evidentiary record for this land-use proceeding.

This paragraph also contains a glaring technical error, in the last sentence, which calls into question the VLI consultants' understanding of the topic. **Seismic wave velocities** are a material property of the rock, not something that depends on the intensity of a blast (see for example this page maintained by the Society of Engineering Geophysicists: https://wiki.seg.org/wiki/Seismic_velocity which lists typical values of seismic velocity for different rock types, and notes the fundamental relationship between seismic velocities and elastic properties of the rock). Stating that "these are all far below the criteria used for assessing ground vibration associated with building damage" is pure nonsense.

What matters for building damage (in severe cases) or lesser disturbances (such as window-rattling) is the **seismic wave amplitude**. Presumably this is what the

contractor was trying to measure by deploying seismographs. Either the contractor misunderstood what they were measuring, or VLI's hydrogeological consultants misunderstood (granted they are geologists, not geophysicists).

Turning to the legitimate question of whether blasting can affect groundwater wells on neighboring properties, the applicant has not addressed whether the natural fracture system could be affected by blast-induced seismicity.

Among geoscientists it is well-known that large earthquakes can cause long-term impacts on local groundwater levels. The classic example is the 1964 Alaska Earthquake. See for example Waller (1966), which you may note is a very old paper, but still 4 years younger than the blasting reference cited by VLI (Duvall and Fogelson, 1962).

More recent research shows that groundwater systems can be influenced by much smaller seismic events. For example, Lee et al. (2024) showed that earthquakes as small as M 2.0 can influence groundwater levels.² The mechanism by which very small seismic events influence groundwater in fractured bedrock is generally thought to be localized slip along fractures, rather than formation of new fractures such as considered in VLI's 1962 reference.

Ongoing monitoring and mitigation in the event of impacts on nearby farms and residences is certainly a good idea, if this can be made binding.

² I happen to know of the Korean research from meeting one of the authors to discuss her work, while I was visiting Daejeon in 2019 to give a series of lectures on the more topic of fractured rock hydrogeology. But this is a very active field of research which has developed enormously since 1962. Relying on this very old Bureau of Mines document to dismiss community concerns about blasting impacts is simply not credible. As a matter of due diligence, this should not be accepted.

9.b. Dewatering effects on neighboring wells

Applicant claims (Exhibit 49) to have recently applied an "analytical solution" for calculations to estimate risk of impacts of construction on local wells. However they have presented neither the mathematical formula used, nor the results, nor the parameter values that they assumed as input for their calculation.

Taking the applicant's self-reported results at face value, this statement is cause for concern:

the analyses indicated that the change in water levels associated with the proposed development would be similar to changes in water levels associated with seasonal precipitation patterns.

This could be a significant impact on existing uses, if the impacts of excavation occur during the season when groundwater levels are seasonally low, and these effects are additive. Indeed, that seems likely given statements by VLI given in oral testimony on July 8, 2025, that construction would generally occur over 6 to 8 months in the warmer/drier part of the year.

But without documentation of their calculations and independent review by competent experts, other claims of no impact cannot be accepted as evidence.

The applicant describes their method only in general terms:

VLI's evaluation of the impacts to local water supply wells considers the relative consistency of the groundwater flow conditions to support a conservative assumption that fractured bedrock behave similarly to a porous media. Under this assumption, all fractures are interconnected, allowing the analytical solution to evaluate the most widespread effect of the proposed project.

In such a model, normally a key parameter is the **effective hydraulic conductivity** of the fractured bedrock. The degree of drawdown of water in the bedrock, as a function of distance from the excavation, will depend on what value is assumed for this parameter. Given data on the hydraulic properties of water-

conducting fractures under Tampico Ridge, and their frequency in the bedrock, a range of plausible values could be calculated. But VLI has not provided any documentation of their assumed parameter values, or their basis in terms of data from Tampico Ridge.

Applicant claims without evidence that the hydrogeological conditions under Tampico Ridge are similar to those under Coffin Butte. In fact they have neither obtained nor presented data on the bedrock hydrogeological properties, nor have they demonstrated hydrogeological understanding of the bedrock south of the proposed new landfill.

Applicant implicitly acknowledges this lack of information, by suggesting that they will undertake hydrogeological investigations if the CUP is approved. But they give no guarantee that this work will be performed beyond whatever VLI deems necessary for obtaining a permit from ODEQ.

If this investigation is limited to the areas indicated on the applicant's filings, with a few monitoring wells and "sentinel wells" located just outside the perimeter of the planned excavations, it will not be sufficient to provide an understanding of the hydrogeology of Tampico Ridge farther south. This is self-evident because without data from the area of interest, you cannot develop an understanding. It follows that risks to wells on neighboring properties will not be possible to fully assess, even after completion of the ODEQ-required investigations.

As further indication of the applicant's poor state of knowledge regarding groundwater under Tampico Ridge, note that the new Figure purporting to show groundwater directions under Tampico Ridge contradicts Figure 1 of the "Environmental and Operational Considerations" memo provided by Mr. Tuppan on February 25th. Both figures are schematic in nature and are not supported by any actual investigations of groundwater flow directions south of the proposed development area.

9.c. Arsenic

Applicant's arguments in Exhibit 49 regarding the occurrence of arsenic are misleading to the point of deceptiveness. They rely on "cherry-picking" information selectively from the USGS study by Hinkle and Polette (1999), while omitting mention of contradictory evidence. Specifically:

- They misconstrue statements about data sparseness in the mountainous portions of eastern Linn and Lane counties, as if they apply to the Willamette Valley as a whole;
- They misleadingly suggest that, because the study included specific datasets from Linn and Lane counties, that data are lacking from the vicinity of Coffin Butte;
- They misconstrue statements about "volcanic rock of rhyolitic to intermediate composition," as if they apply to volcanic rock in general.

In fact, the dataset used in the USGS study included 9 domestic wells and 1 natural spring within 5 miles of Coffin Butte Landfill, plus 40 additional wells that were within 10 miles (Figure 1). Only one of those 50 data sources showed arsenic levels above 10 µg/L (the EPA maximum contaminant limit for drinking water). One of those points is adjacent to the Springhill Golf Course in North Albany, and the other is adjacent to OSU's experimental farms near Peoria Road, both locations where arsenic-based weed-killers from past decades are a plausible source. None showed arsenic levels above 50 µg/L, in stark contrast to what has been observed at Coffin Butte.

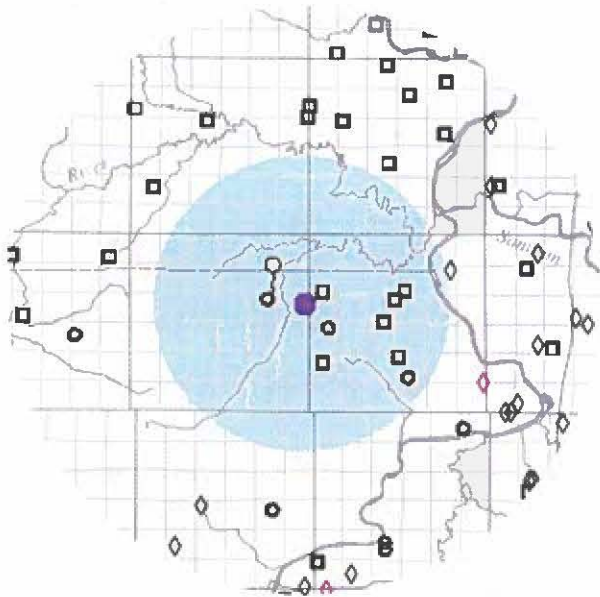


Figure 1. Detail of Plate 1 from Hinkle and Polette (1999) showing wells and springs within a 10 mile radius of the Coffin Butte Landfill site (purple dot). The blue shaded circle highlight wells and springs within 5 miles. Black symbols show sampled wells and springs where the measured arsenic concentrations were less than 10 µg/L. The two red symbols show wells where arsenic concentrations above 10 µg/L (but less than 50 µg/L) were found.

The statements by Hinkle and Polette (1999) about data sparseness referred specifically to sparsely populated part of the Willamette Basin, to wit:

*Large portions of the area covered by the Fisher and Eugene Formations and correlative rocks, and the undifferentiated tuffaceous sedimentary rocks, tuffs, and basalt, are not represented by data collected and compiled for this report. **Although most of the unsampled areas underlain by these rocks are not densely populated, they are not uninhabited,** and the potential for impacts to human health are not insignificant.*

Their meaning is further made clear by their Plate 1, which has been submitted as part of the record. The areas lacking data are mainly in the Cascades portion of the basin, or the deeper parts of the Coast Range.

Basalt, as found at Coffin Butte (Allison, 1953), is on the opposite end of the spectrum from rhyolite, in standard classifications of volcanic rock based on silica content. This is basic information taught in introductory-level courses in geology, so VLI's geological consultants ought to know the difference.

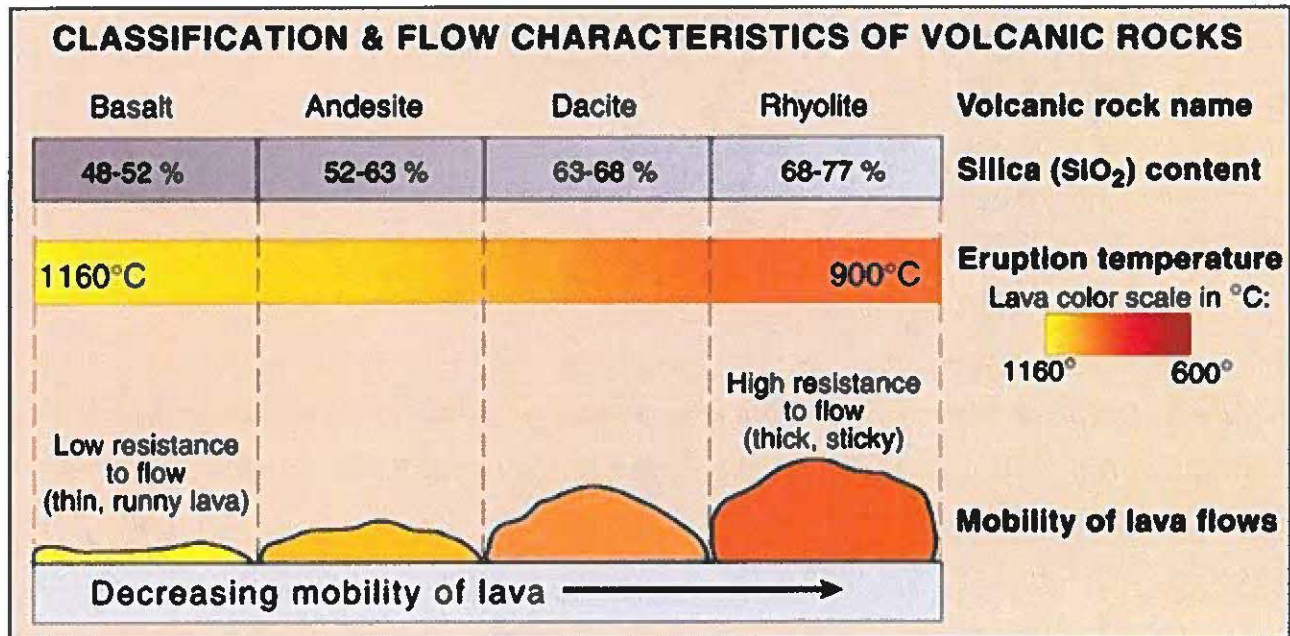


Figure 2. Volcanic rock compositions classified by silica content, ranging from basalt to rhyolite.

Hinkle and Polette (1999) state specifically:

*High arsenic concentrations in Lane and Linn Counties appear to be associated with two regionally extensive associations of rocks, (1) the Fisher and Eugene Formations and correlative rocks, and (2) the undifferentiated tuffaceous sedimentary rocks, tuffs, and basalt. At land surface, these two rock associations cover 24 percent of the Willamette Basin. **These associations of rocks include extensive volumes of silicic (rhyolitic) volcanic rocks**, which are commonly associated with high concentrations of arsenic. ...*

*Arsenic can be a component of volcanic glass in volcanic rocks of **rhyolitic to intermediate composition**, adsorbed to and coprecipitated with metal*

oxides (especially iron oxides), adsorbed to clay-mineral surfaces, and associated with sulfide minerals and organic carbon.

*[A]lthough high concentrations of arsenic often occur in water within the Fisher and Eugene Formations and correlative rocks, Goldblatt and others (1963) suggest that the Fisher Formation, and not the Eugene Formation, is the source of most of the arsenic in that area. Similarly, **water within basalt flows in the undifferentiated tuffaceous sedimentary rocks, tuffs, and basalt is not a likely candidate for high concentrations of arsenic because basalt typically yields water low in arsenic (Welch and others, 1988).***

VLI's presentation of data from monitoring wells at Coffin Butte is also misleading. In presenting historical data on arsenic at Coffin Butte, they misleadingly plot data on a strangely chosen scale, with a maximum 10 times the range of the data (Figure 3). The effect is to conceal the strong fluctuations over time which are evident in a more scientifically reasonable presentation of the same data, as used in their Annual Environmental Monitoring Reports (Figure 4).

Note that the first plot in Exhibit 49 shows no arsenic measurements above 50 micrograms per liter ($\mu\text{g/L}$), but values up to 68 $\mu\text{g/L}$ have been measured in a nearby well more recently. VLI's consultants are certainly aware of those recent high values.

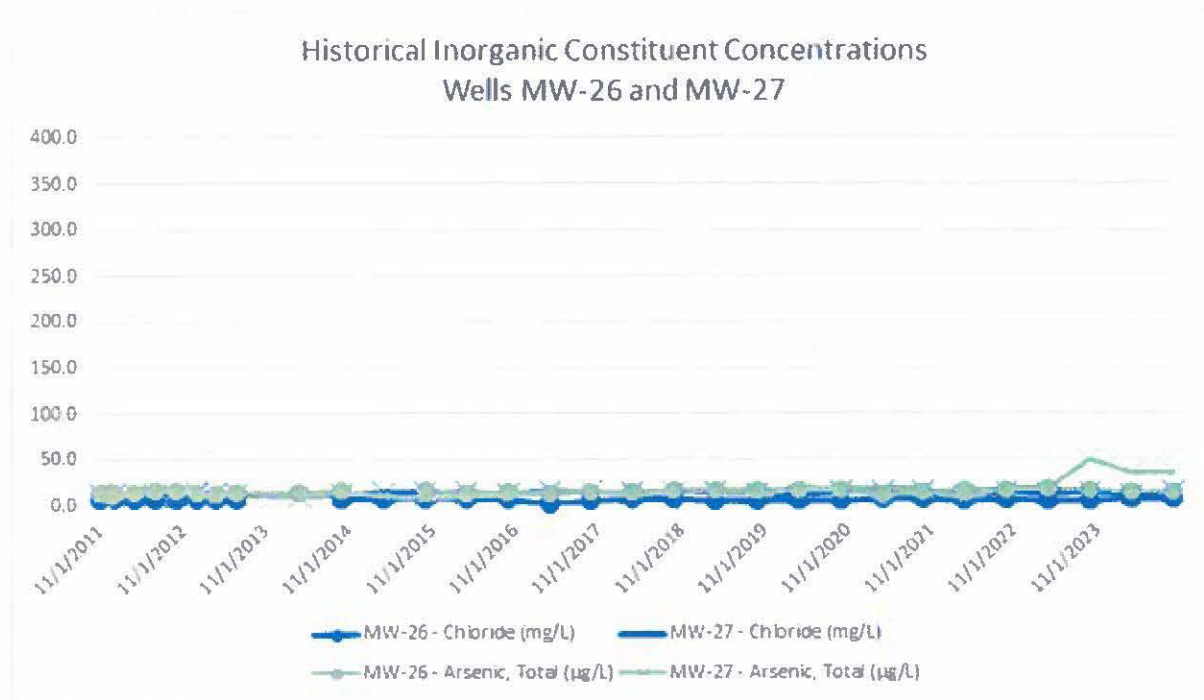


Figure 3. Arsenic and chloride levels in compliance-boundary wells MW-26 and MW-27 as plotted by VLI's consultants in Exhibit 49. Note that chloride is plotted in milligrams per liter (parts per million) while arsenic is plotted in micrograms per liter (parts per billion).

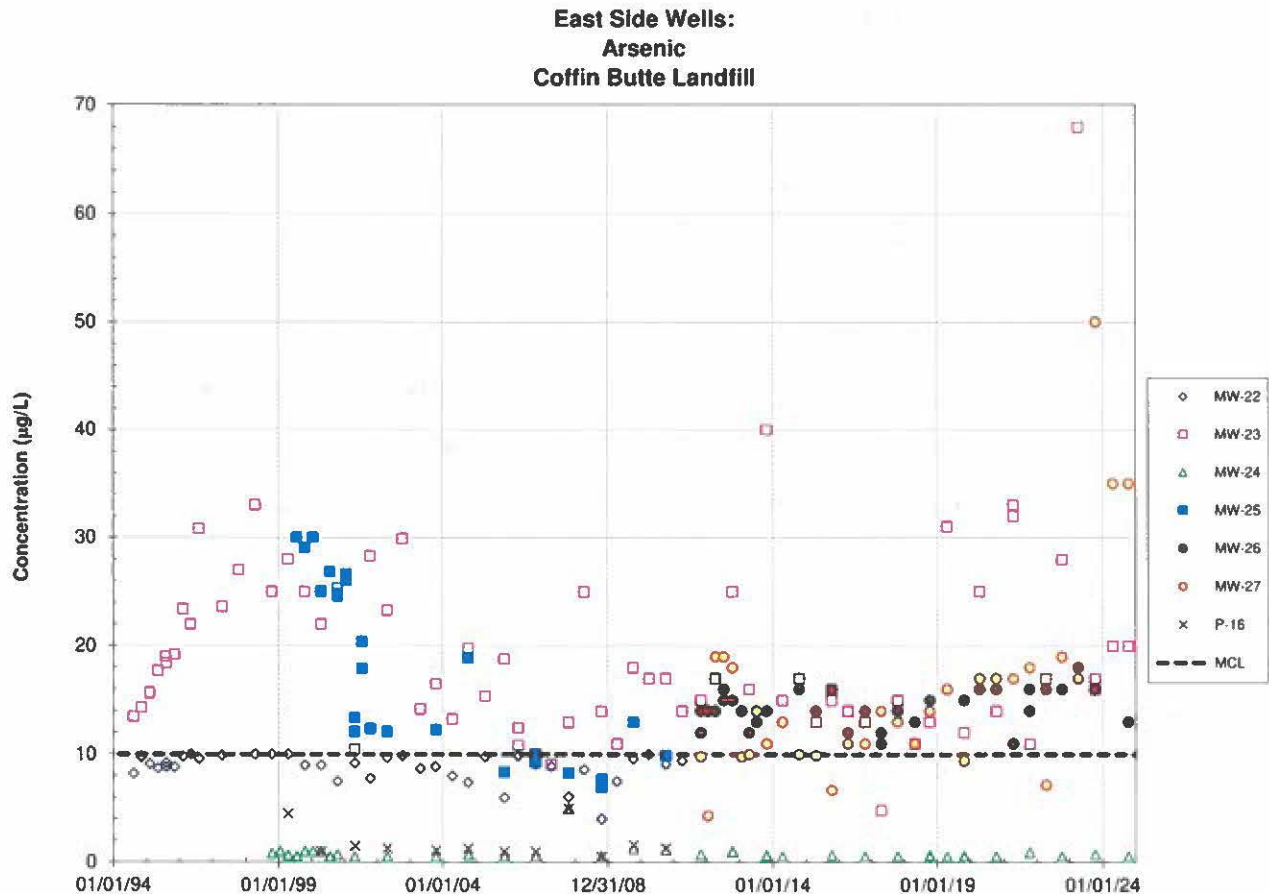


Figure 4. Arsenic concentrations in east-side monitoring wells as plotted in the 2024 Annual Environmental Monitoring Report for Coffin Butte Landfill (obtained by a public-records request from ODEQ).

Returning to Exhibit 49, in this statement VLI's consultants also carefully avoid mention of an east-side well (MW-23):

VLI acknowledges that since arsenic was first detected at well MW-9S, elevated arsenic concentrations have been detected in wells that monitor the east side of the facility; namely, wells MW-26, MW-27, and MW-9S; however, no monitoring results indicate that these arsenic concentrations are attributed to a leachate discharge.

VLI has previously acknowledged (in their past AEMRs submitted to DEQ) that high arsenic in MW-23 resulted from seepage of landfill leachate. For example, this was

the description given in the 2023 AEMR which was produced by one of the same two consultants who signed Exhibit 49:

Cell 2 - Detection Well MW-23. Early in its history, detection well MW-23 had shown increases for bicarbonate alkalinity, chloride, hardness, total dissolved solids (TDS), for five of the major dissolved metals, and for arsenic. This had been attributed to localized seepage of leachate from the south side of the landfill.

Note that this seepage was attributed to Cell 2. **This directly contradicts VLI's statement in oral testimony on July 8th, that there has never been a seepage event from any of the lined cells at Coffin Butte.**

In the applicant's attempt to defray concerns about arsenic, they suggest that chloride is a better indicator. The second plot in Exhibit 49 (reproduced here as Figure 5) shows that the initial measurement of chloride in MW-9S was about 50 mg/L, but soon afterward the concentration jumped by nearly a factor of 6.

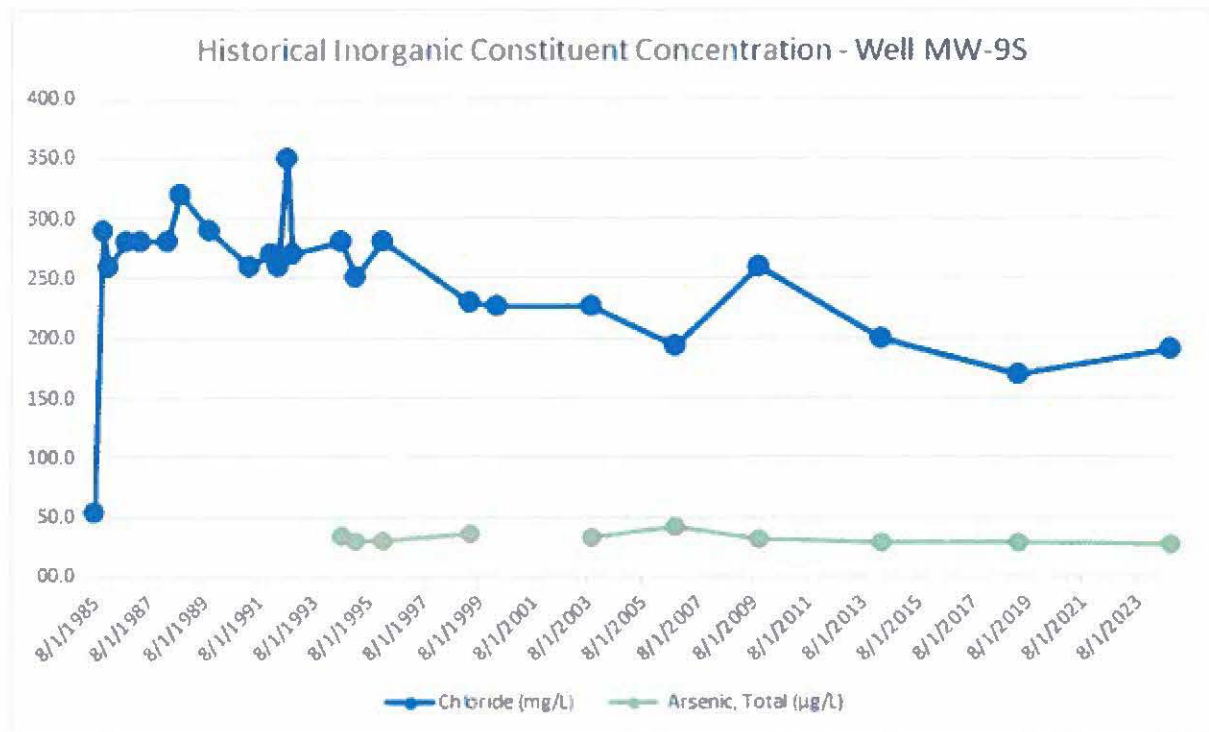


Figure 5. Arsenic and chloride levels in MW-9S as plotted by VLI's consultants in Exhibit 49.

Though this declined somewhat after the seepage problem was discovered in the mid-1990s, and corrective actions were taken, chloride in MW-9S has remained more than a factor of 3 above the initial baseline value, ever since. Far from alleviating concerns about leakage from Cell 2, this plot elevates concerns about potential for ongoing contamination of the Willamette Basin aquifer.

VLI notes that lower chloride levels are seen in the two compliance-boundary wells, MW-26 and MW-27, but this does not necessarily rule out that the high levels of arsenic observed in those wells could come from ongoing or past leaks.

As discussed by Cherry (1990), plumes from a localized leak in a landfill liner could be narrow due to weak lateral dispersion (Figure 6); Cherry noted that this problem is especially acute for monitoring wells located close to the landfill, which is currently the situation for MW-26 and MW-27. Since the conditions controlling flow from underneath a landfill may change over time as various cells are developed, the groundwater flow direction and position of the leachate plume can also shift over time.

As noted by VLI's consultants, chloride and arsenic have different mobility in the subsurface environment:

As groundwater migrates beyond areas of low dissolved oxygen, the iron oxide and arsenic precipitate back to the soil, reducing the concentrations in groundwater.

This means, for example, that arsenic released by seepage from a zone of anoxic conditions below the landfill could precipitate in soil as a leachate plume emerges from under the landfill, even as chloride is carried onward by the groundwater.

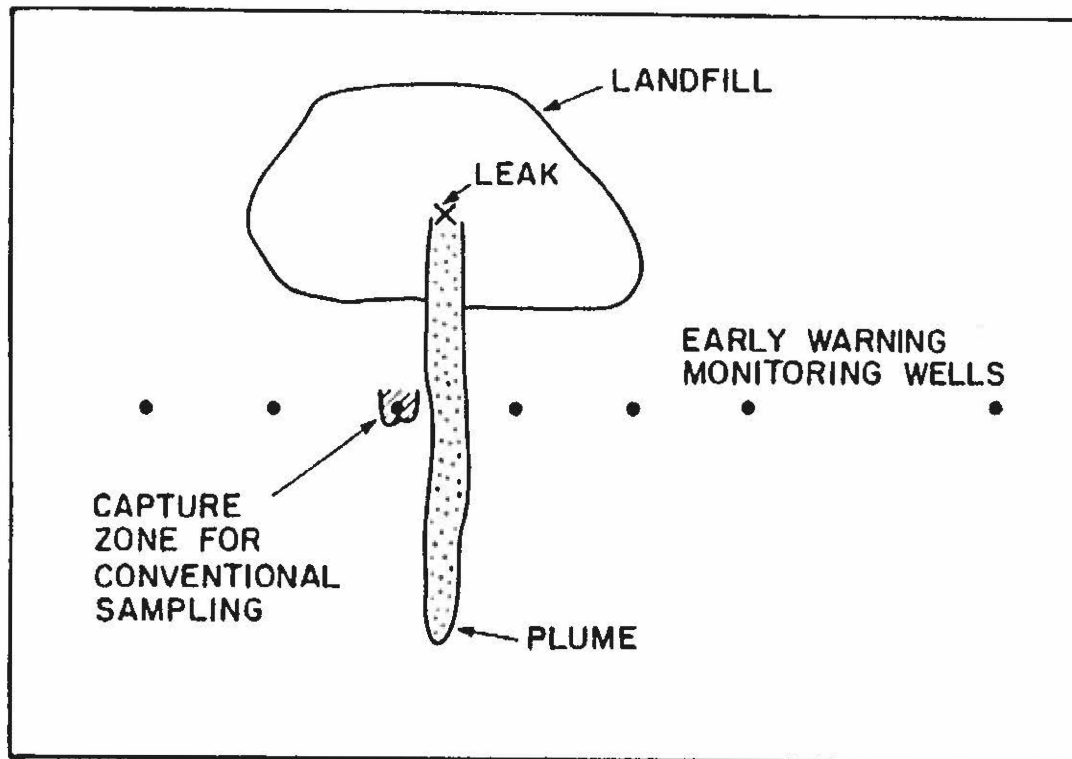


Figure 6. Schematic illustration of a narrow leachate plume originating from a liner leak, depicting how this may result in the plume bypassing monitoring wells that are located close to the landfill (Cherry, 1990).

If the position of the plume then shifts, in tight formations such as around MW-27 the accumulated arsenic could remain as a source that leaches out again depending on seasonal changes in oxygen levels, even while the main plume passes between the wells. In this scenario, a monitoring well located farther from the landfill (such as MW-9S) could have a better chance of picking up the main plume. Other contaminants have their own issues, for example the tendency of VOCs to sorb (bond) to organic matter in soils.

Other scenarios and other hypotheses could no doubt be proposed that match up with this sparse dataset. Preferably the alternatives should be tested by a combination of computer modeling and additional monitoring wells, if the existing network of wells is too sparse to discriminate between alternatives.

The AEMRs for 2020 through 2024, at least, do not present any such models, nor any examples of new monitoring wells being added to address this issue.

The last leg of VLI's argument is that "ODEQ has found this rationale sound in approving the detection monitoring program for the east side of the landfill."

The level of attention by ODEQ is questionable. When I asked ODEQ's responsible hydrogeologist about this issue in 2023, he responded (e-mail dated November 16, 2023) in part:

You are correct that MW-23 appears to have been impacted by early releases believed to have arisen from Cell 2, prior to the construction of cell 3. Most parameters have declined to inferred background concentrations (as seen in the AEMR figures) and arsenic remains somewhat elevated at this well. If arsenic at MW-26 and 27 is a relic of past leaks as seen in MW-23 then we would not expect to see higher levels in MW-9s than in MW-26 and MW-27.

For MW-26 and MW-27 which are compliance wells, we use the historic database to derive a permit specific concentration limit. If that limit is exceeded, the change in groundwater would require some explanation or investigation to assess the cause.

However it turned out that VLI's permit did not list any "permit-specific concentration limits" for arsenic in these wells.

Likewise when I requested documentation of what he described as "a comprehensive review of the data [] used to distinguish naturally occurring levels of arsenic from impacts of landfill leaching," it turned out that this just meant that DEQ had read the VLI's report and accepted it, with no record of any comments.

Data on mercury were missing from all AEMRs from 2020 through 2023, despite that these reports listed protocols for sampling for mercury (after I brought this gap to ODEQ's attention, all mention of mercury was removed from the 2024 AEMR).

County staff should have these AEMRs on file if needed for the record (they are very large documents).

10. Information presented by the applicant is not adequate to support their claim that their proposed conditions of approval are adequate to protect groundwater resources in terms of both quantity and quality.

Applicant proposes adding a handful of "sentinel wells" (also referred to as "sentry wells in some places) but provides no model results or other calculations to justify the position of these wells, or why just two or three wells just outside the landfill footprint should be sufficient.

As noted above, and discussed further by Cherry (1990), sentinel wells located close to the edge of a landfill might not be effective for detecting leachate plumes that originate from narrow liner leaks.

11. Despite their acknowledged lack of expertise and failure to utilize independent expertise regarding groundwater, Benton County staff have uncritically endorsed and adopted the conditions of approval suggested by the applicant.

Staff have not provided any coherent reasoning as to why they believe the applicant's proposed conditions of approval will be adequate for protecting groundwater and protecting adjacent land from adverse consequences.

Again, staff should just admit that they lack expertise to judge whether the applicant's proposed mitigation measures are adequate to prevent impacts on adjacent properties. It is irresponsible of them to express an opinion in support of the applicant on a topic where they admit they have no technical expertise.

12. Benton County's proposed conditions of approval regarding groundwater protection, adopted wholesale from the applicant, are stated in such terms as to not be legally binding, and hence will be ineffectual even if Benton County had a mechanism for enforcement of said conditions (which it does not).

VLI's geological consultants (notably not VLI themselves) have offered the possibility that they will do "focused hydrogeologic investigation of the proposed development," but only after VLI receives approval for the CUP. We note that one of these consultants recently retired from practice, and the other one who signed the memo was not registered to practice in Oregon, at the time of this memo. However sincere they might be in their offers to conduct such work, VLI has not given its own assurance.

County staff, in recommending these consultants' proposals as Conditions of Approval, have used language that can best be described as wishful thinking ("VLI will do ...") rather than legally binding language ("VLI shall do ...").

Staff have not identified any clear process for review of the proposed investigations (recall their lack of internal technical expertise), nor any mechanism for public involvement or reconsideration of the CUP, once granted. As such, these proposed conditions are both toothless and meaningless.

References

Cherry, J.A., 1990. Groundwater Monitoring: Some Deficiencies and Opportunities. Hazardous Waste Site Investigations; Towards Better Decisions, Lewis Publishers, B.A. Berven & R.B. Gammage, Editors. Proceedings of the 10th ORNL Life Sciences Symposium, Gatlinburg, Tennessee, May 21-24 (1990).

Hinkle and Polette, 1999 (USGS study of arsenic in the Willamette Valley, submitted in full for the record).

Lee et al., 2024 (Gahyeon Lee, Jae Min Lee, Dongkyu Park, Dong-Hun Kim, Jaehoon Jung, and Soo-Hyoung Lee). Groundwater Level Responses due to Moderate-Small Magnitude Earthquakes Using 1Hz groundwater Data. J. Soil Groundwater Environ. Vol. 29(4), p. 32~43, 2024. <https://doi.org/10.7857/JSGE.2024.29.4.032>

Waller, R.M., 1966. Effects of the March 1964 Alaska Earthquake on the hydrology of the Anchorage area. U.S. Geological Survey Professional Paper 544-B, U.S. Department of the Interior, Washington, D.C.

Annex 2. Comments regarding wildlife impacts:

Impact of county-recommended conditions on wildlife

Conditions of approval recommended by Benton County are poorly considered and are likely to exacerbate impacts on wildlife and adjacent properties. In particular OP-15 (E) (which calls for the entire landfill property including portions zoned as Forest Conservation to be enclosed with a chain link fence) will block movement of elk, deer and other wildlife through Forest Conservation lands, in direct conflict with the purpose of the FC zone.

This condition, proposed by the County to mitigate one demonstrated impact of the landfill (windblown trash), will foreseeably create its own impacts, as elk, deer and the predators which follow them (in particular cougars) will be diverted through agricultural and residential properties. This is also unlikely to be effective for its stated purpose of controlling wind-blown trash, which will simply sail over the top.

Impacts to Great Blue Herons

OP-16 Active Rookery Protection is wholly inadequate for its stated purpose of protecting active heron rookeries. The record from the past 4 years shows that biologists hired as consultants by the applicant have either failed to notice or failed to report accurate numbers and locations of heron nesting activity. The abysmal track record of the applicant on this issue, together with circumstantial indications that the applicant's activities have repeatedly caused nesting locations to shift, clearly points toward a need for a more robust inspection protocol, for example, independent monitoring by ODFW or by qualified biologists hired by ODFW, with oversight by recognized experts on Great Blue Heron nesting colonies.

In Exhibit 43, the applicant's wildlife consultant acknowledges "the landfill can attract a high density of eagles" and that "the high density of eagles and large flocks of other predatory birds" may pose a threat to heron rookeries near the landfill.

We agree that the concentrations of eagles and other predatory birds drawn to the landfill pose a risk not just to herons but also to other bird species of concern, in particular Oregon vesper sparrows (candidate for federal listing) and Streaked horned lark (federally listed as Threatened), which are documented to nest within 2 miles and 4 miles of the landfill, respectively.

Starting a new landfill south of Coffin Butte Road will increase the impact on these bird populations, by extending the risk of nest predation over an additional time, beyond the scheduled closure of the existing landfill. In other words, the risk is cumulative.

On other matters related to the nesting herons, the applicant's wildlife consultant has demonstrated a poor record. To wit:

- In 2021 this same consultant undercounted the number of active nests in the poplar grove ("east rookery") by more than a factor of two, as documented by community members.
- During 2022 this consultant did not record a visit during the month of May when the colony underwent a nesting failure; again, community members noticed and investigated the failure before the applicant's consultant.
- During 2023 through May 2025, the same consultant failed to notice or document heron nesting activity in the Oregon ash grove just across Hwy 99W from one of their observation points.
- In their most recent opinion responding to VNEQS concerns (Exhibit 53), the consultant suggests that the new rookery location that they previously

failed to notice might be more favorable for heron colony survival because "it is in a mixed conifer/deciduous stand."

In fact there are no canopy-forming conifers in the stand (Figure 7). The new nests are located entirely in Oregon ash trees, which are among the last native tree species in our area to leaf out in spring (contravening the consultant's claim that they provide better cover in early spring months).



Figure 7. Deciduous stand SW of Coffin Butte Rd. x Hwy 99W where Great Blue Herons have nested in 2023 through 2025. Note the absence of conifers. Trees are mainly Oregon ash with minor cottonwood component.

Oregon ash trees are also known to be highly susceptible to the Emerald Ash Borer beetle (see <https://www.oregon.gov/oda/ippm/survey-treatment/Pages/emerald-ash-borer.aspx> for further information from the Oregon Department of Agriculture). Thus these trees are at risk from a known threat which could, in a few years, require the herons to shift locations.

The applicant's wildlife consultant also fails to address the impact that a new landfill would have, as a major new topographic obstruction in the herons' flight paths to documented foraging areas in Soap Creek Valley. Heron experts including Dr. Ann Eissinger (cited in previous testimony) have identified flight paths to multiple foraging areas as a critical factor in heron rookery success.



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Method Article

Long-term groundwater protection efficiency of different types of sanitary landfills: Model description

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A B S T R A C T

A new risk assessment method intended for comparing long-term environmental performance of different types of sanitary landfills was customized. Processes occurring within the hydrogeological environment were excluded from modeling, because they can be addressed separately. Only parameters directly related to leachate composition at the bottom of the landfill and leachate losses into the subsoil after landfill closure which can be reliably determined by evaluating already available information from the scientific literature were considered as necessary inputs for quantitative modeling. Once the simulated outcomes for a primary output "fugitive emissions of a reference pollutant into the subsoil" are acquired, more complex outputs can be derived, too. Commercially available risk assessment software which operates within an Excel environment was used to fulfill the task.

- Uncertainty of data as well as heterogeneity and complexity of landfill systems was considered by attributing the selected input parameters with adequate probability density functions
- Probability density functions attributed to the inputs differ considerably between the antagonistic landfill types
- Risk assessments related outputs were defined as probabilities that an aquifer would be polluted due to landfill derived emissions into the subsoil

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A R T I C L E I N F O

Method name: Long-term risk assessment model for sanitary landfills**Keywords:** Risk assessment, Sanitary landfills, Groundwater protection, Pollutant emissions, Leachate leakage**Article history:** Received 27 December 2019; Accepted 5 February 2020; Available online 21 February 2020DOI of original article: [10.1016/j.mex.2019.07.001](https://doi.org/10.1016/j.mex.2019.07.001)

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Specification Table

Subject Area	Environmental Science
More specific subject area	Waste disposal Groundwater protection
Method name	Long-term risk assessment model for sanitary landfills
Name and reference of original method	LandSim 2.5 (Environment agency, 2004) Life cycle assessment (e.g., Turner et al., 2017)
Resource availability	• https://doi.org/10.1016/j.wasman.2019.07.001 • https://doi.org/10.1016/j.dib.2019.104488

Method details

Background

The article is closely related to a research article "Long-term risk assessments comparing environmental performance of different types of sanitary landfills" [1] and Data in Brief article "Long-term groundwater protection efficiency of different types of sanitary landfills: data description" [2].

Accurate modeling of leachate derived pollutant emissions from sanitary landfills into the surrounding hydrogeological environment is an extremely difficult task to be accomplished as the number of factors which affect contaminant migration is too high and need to be limited when making a model [3]. Probabilistic methodology is usually applied to landfill risk assessment models because it allows quantification of ubiquitous uncertainty when specifying hydro-geological environment, landfill leachate chemistry and/or performance of landfill lining systems. The most known software in use today is LandSim 2.5 [4], which was primarily designed to calculate environmental permit- related outputs such as leachate head at the bottom of landfills and concentration of pollutants at the correspondent compliance points. However, deterministic models are sometimes used, too. For example, Turner et al. [5] developed a specific model for evaluation of different landfill aftercare strategies based on "Life Cycle Assessment" (LCA) approach.

None of the already known models seemed to be adequate for performing long-term risk assessments comparing groundwater protection effectiveness of landfills of different types, which was the objective of the related research article [1]. Consequently, a specific risk-assessment model was designed for the purpose, which is presented in this article.

Types of sanitary landfills

Suitable categorization of sanitary landfills into different types is very important in order to understand the concept upon which the presented risk assessment model was developed.

Sanitary landfills are facilities for disposal of untreated, mixed municipal solid waste (MSW) as a principal waste stream. Landfills for disposal of mechanically-biologically pre-treated residual MSW or for disposal of waste-to-energy derived bottom ash do not comply with such definition.

Sanitary landfills can be divided into opposite groups from many different aspects, e.g.

- "modern" vs. "old", "highly-engineered-" vs. "poorly-engineered", "high-cost-" vs. "low-cost-", "uncontained" vs. "contained" facilities
- "dry-type" vs. "wet-type" facilities (the later category includes bioreactor landfills)
- "anaerobic" vs. "semi-aerobic" landfills (aerobic also exist)
- "above-ground" vs. "pit and mound" facilities (the later category includes "below-ground" landfills)
- "active" vs. "closed", "non-compartmentalized" vs. "compartmentalized" landfills, etc.

Borderlines which separate sanitary landfills into opposite categories appear to be vague. For example, landfills which were considered to be modern in 1980s may not be considered to be modern from a present-day perspective. A particular landfill can be at the same time poorly-engineered, wet-type, semi-aerobic, above-ground, compartmentalized, etc.

When separating landfills into antagonistic types specifically to quantitatively compare their long-term groundwater-protection efficiency after landfill closure, the most important characteristics to be scrutinized appear to be -

- the design of bottom liner- and capping systems
- landfilling methods which are/were applied and
- approaches eventually employed to stabilize the buried waste

Many types of sanitary landfills can be defined based on these criteria, however, in the related research article [1] only four categories of landfills were distinguished. Categorization was performed in a way that

- landfills which broadly demonstrate similar long-term environmental characteristics were grouped together to form one landfill type
- high-cost and low-cost facilities were classified as separate types

Two high-cost- and two low-cost landfill types were predisposed. Landfills bottom-lined with composite liner systems were automatically considered to be "modern" in the research article. Closed modern landfills covered only with soil located in humid climate environments were considered to be of a wet-type, since leachate generation can sometimes amount up to 60% of annual precipitation [6]. Such landfills generally stabilize fast when compared to thoroughly sealed landfills where composite liners were implemented for capping (the later were considered to be modern landfills of a dry-type).

Low-cost landfill types were also divided into two broad categories: (1) uncontained dumpsites and (2) contained, clay-only lined waste deposits. Each of these two categories includes subtypes which affect the environment extremely differently. For instance, dumpsites constructed as above ground waste piles generally emit much less pollutants into the subsoil than dumpsites located in abandoned pits or natural depressions. It would be senseless to group them together as a common type in order to perform comparative risk assessments. Consequently, low-cost landfill types were represented only by the subtypes which perform the best from the long-term groundwater vulnerability point of view (i.e., represented by those which on average stabilize the fastest and emit the smallest amounts of pollutants into the subsoil). These sub-types are represented by the "above-ground semiaerobic dumpsite" (subgroup appertaining to the uncontained landfills category) and "high-permeability landraise" (subgroup appertaining to the contained, clay-only lined landfills). Other subtypes of low-cost landfills were not considered since it is obvious that they behave environmentally much worse than the two mentioned above within their categories. However, it has to be taken in mind that large number of landfills operating today in low-income developing countries belong to environmentally "bad subtypes", such as

- below-ground and "pit and mound" dumpsites
- below-ground and "pit and mound", clay-only lined anaerobic waste deposits
- above-ground, anaerobic, clay-only lined waste deposits (these landfills may look similar to high-permeability landraises, however, they appear to be inherently of a "non-flushing-" instead of a "flushing" type and conditions within their interior to be anaerobic rather than semiaerobic, which is due to higher in-place densities of the buried waste, impermeable final cover design, etc.)

Characterization of the four types/subtypes which were compared [1] is outlined below:

1. Dry-type modern landfills: (a) composite bottom liner- and composite cover systems are installed; (b) highly engineered systems for leachate and landfill gas capture, collection, and treatment are provided; (c) buried waste is heavily compacted; (d) leachate recirculation is not implemented.
2. Wet-type modern landfills: (a) composite bottom liner and mineral or composite cover systems are installed; (b) highly engineered systems for leachate and landfill gas capture, extraction, collection, and treatment are provided; (c) buried waste is heavily compacted; (d) water recirculation and other waste stabilization activities start after landfill closure, which may include controlled air injection; (e) landfills that were not capped with composite liners and are located in humid regions are also considered to be of a wet-type even if not practicing leachate circulation

3. Above-ground semiaerobic dumpsites: (a) erected as relatively narrow above-ground waste piles, (b) contain no liner at the bottom of the landfill, (c) has buried waste that is loosely compacted, (d) minimal sanitary covering is provided during the time the dumpsite receives waste; waste soils and/or construction and demolition (C&D) waste are used for this purpose, (e) some soil is provided as a final cover.
4. High-permeability landraises (HPL's): (a) above-ground waste pile is designed in a way that passive aeration of the landfill interior is provided; (b) clayey barrier and low-cost leachate drainage system are provided at the bottom of the landfill; (c) buried waste is loosely compacted using only a bulldozer; (d) multi-branched recirculation system for in-situ treatment of leachate and other facility-derived wastewaters is installed, which includes a landfill body flushing component activated immediately after landfill closure.

Modern dry- and wet-type landfills could be divided into smaller groups (e.g., by introducing "state-of-the-art waste disposal facilities" as separate dry- and wet- branches of modern landfills), however, older and newer modern landfills are not antagonistic to one another but rather represent continuums of conceptually equal landfills as described in Section "Approaches used to calculate leakings when referring to the companion research article".

Reasons for introducing "high-permeability landraise" (HPL) as a specific subtype of a contained, low-cost landfill

In 1999, so called "Landfill Directive" [7] was issued in the EU. Actively operating sanitary landfills were already gradually disappearing in Germany and other highly industrialized EU countries. These facilities were progressively supplanted with landfills for disposal of mechanically-biologically pre-treated residual MSW or landfills for disposal of MSW-to-energy derived bottom ash. EU Landfill Directive has not addressed the issue of using alternative, more sustainable sanitary landfilling concepts for bridging transitional time until integrative waste management (WM) systems would be established in other parts of the EU, too [8]. Although it was already known that disposal strategy involving waste encapsulation does not bring the buried waste closer to final storage quality and implies acceptance of an indefinite responsibility for a potential environmental risk on behalf of future generations, modern dry type landfill remained to be considered as a reference type of facility in many national regulations within the EU. On the other hand, Final Report for the Swedish EPA in 2000 [8] explicitly recommended new landfill concepts to be developed and implemented rather than using old ones, such as avoiding below ground landfilling, identifying critical components in defining "final storage quality", employing strategies to minimize short and long term impacts on the environment, providing passive environmental protection systems in the final stage of landfill life, developing methods and technologies to ensure uniform distribution of water across the volume of the landfill, investigating possibilities for accelerated flushing of the landfill interior, etc.. "High permeability landraise" type of landfill [1] was largely developed on basis of these recommendations at the same time seeking to find low-cost waste- disposal solutions [9,10]. This type of landfill seems to be especially suitable for purposes of flexibly bridging the needed transitional time in low-budget environments where local authorities seek to gradually transform their former dumpsites into safe disposal facilities and further into integrative WM sites.

In the related research article [1], HPL's were represented as a heterogeneous group of landfills in order the performed comparative risk assessments evaluating environmental effectiveness of different landfill types would be based on the same premise. Probability distributions for the inputs required for modeling were selected in a way to consider probable differences which would occur in real-world environment if HPL's were constructed in large numbers. E.g., if such kind of a low-cost facility had to be implemented in some less developed country today, the capacity and waste composition would certainly differ from the one which was involved in performing the research. It is also unlikely the facility would be constructed and operated exactly in a way as intended. Human factors and errors have to be integrated into risk analyses as is inherently the case with other landfill types, too. E.g., looking retrospectively, highly engineered landfills were not supposed to leak when they were designed, but some of them nevertheless leaked soon after they were constructed. Therefore, among

other differences, decadic orders of magnitude different hydraulic conductivities " k_{sat} " were selected as probable values in order to perform simulations using the proposed model (Fig. 4).

Statistical parameters used to define the presumed log-normal distribution of ' k_{sat} ' (mean = $5 \cdot 10^{-10}$ m/s, st. deviation = $7.19 \cdot 10^{-10}$ m/s) may be considered to be too unobjectionable for a low-cost type of landfill. However, hydraulic conductivity of a bottom clayey liner and its thickness are among the most essential parameters defining HPL as a landfill type. In the absence of an adequate clayey barrier such facility can be regarded as a conventional "above ground waste deposit". Considerable clay liner thickness of 1.1 m–1.5 m which was used in the comparative model (Fig. 4) was meant to be an appropriate measure for preventing contamination in extremely vulnerable hydrogeological settings (the aquifer was assumed to be situated directly underneath the landfill). In most of realistic settings clay liner of 1.0 m is all what is needed to effectively prevent excessive emissions from such a type of facility.

Description of the applied approach developing the model

Conception of the method

Logic used in developing the model was driven by the recognition that long-term leachate pollution-potential from sanitary landfills can be quantitatively established if post-closure time-dependent variable " QRP_t " (reference pollutant annually released into the subsoil) was known.

Just two quantities are needed to derive ' QRP_t ' according to the proposed model:

- 1: probability distribution of values for time- dependent variable ' C_t ' across the post-closure time period (reference pollutant concentration within the leachate at the bottom of the landfill)
- 2: probability distribution of values for time- dependent variable ' Q_t ' across the post-closure time period (annual leachate leakages into the subsoil)

The problem is that these variables already represent quantities on the output side of the model. However, an important point is that the outputs ' Q_t ' and ' C_t ' can be obtained by performing Monte Carlo simulations utilizing relatively small number of input variables which can be convincingly attributed with probability density functions processing already available data and information.

Once the simulated data for time-dependent variable ' QRP_t ' are known, they can be used to derive other, more complex outputs. The most valuable asset which can be potentially threatened by the landfill appears to be an aquifer utilized as a drinking water supply source. Groundwater threshold values are usually given in terms of pollutant concentrations at compliance- point wells and set according to the requirements imposed by the regulations. However, if the considered aquifer was well explored, these values can also be given directly in terms of threshold discharges of pollutants into the aquifer. Levels of possible landfill-derived pollution can be labelled e.g. as moderate-, severe- and/or "irreversible-".

If the aquifer was positioned directly underneath the landfill, separated just by a narrow, permeable vadose zone, yearly fugitive emissions into the subsoil would be equal to annual discharges into the aquifer. Separate hydrogeologic transport model would not be required in this case. Operating landfills situated directly above an aquifer are rarely found anywhere in the world today. However, the concept can be adequate for specific modeling purposes, such as for quantitatively comparing long-term groundwater-protection efficiency of different types of sanitary landfills. This was the objective when referring to the companion research- and data- description articles [1,2].

Identifying suitable modeling inputs

Sanitary landfills around the world dramatically differ among themselves not just from points of view of their capacities and waste composition, but also by their design, mode of operation, waste placement conditions, initial in-place densities of waste, climate in which they are located, etc., to mention just a few. Myriad of combinations exist in regard to how all of these factors may interact between themselves. Large differences exist also among the sanitary landfills appertaining to the very same type/category. Even when dealing with a single landfill and a lot of data is already available, it is still difficult to estimate probability and magnitude of threat the site imposes to adjacent groundwater

bodies in the long term. It seems to be impossible to perform quantitative risk assessments in a reasonable way trying to process so many indirectly and/or stochastically related elements, many of which are unknown. Better approach would be to simplify the complex system in order to exploit simplicities without deconstructing intricate complexities.

According to the applied approach, vast number of interrelated factors which influence long-term groundwater- protection performance of sanitary landfills can be reduced to few general determinants: 1) Overall hydrogeological setting; 2) Landfill footprint; 3) Landfill characteristics.

- 1) Overall hydrogeological setting is meant to be quantitatively evaluated only after the results regarding pollutant emissions into the immediate subsoil are already attained. The task regarding transport of pollutants and their fate in the subterranean environment is therefore meant to be tackled separately, using one of the already existing hydro-geo-environmental models.
- 2) Landfill footprint is one of the few input parameters which are already known or can be determinedly assumed, therefore quantified with a discrete value.
- 3) Ample amount of information which usually exists describing characteristics of a particular landfill (such as landfill-type, -design, -capacity, waste composition, quality of landfill construction, etc.) is meant to be filtered out in a way to find answers to essential questions regarding the –
 - a. reliability of implemented bottom liner systems:
 - i. Leakages from landfills are mostly related to hydraulic characteristics of natural and/or artificial barriers situated at their bottom and to different deterioration processes gradually affecting performance of composite leachate containment and conveyance systems eventually installed there.
 - ii. Long-term leachate losses into the subsoil are usually considered to be a stochastic phenomenon when referring to modern landfill types (which are inherently considered to be bottom lined with composite liner systems). Set of random variables which were employed as model inputs in order to perform simulations in the companion research article [1] consisted from ' $t_{failure}$ ', ' q_0 ', ' T_2 ' and ' q_{max} ' (Fig. 1). Other approaches can be implemented, though, which is touched in Section "Leakage through composite liner systems and the related affecting factors".
 - iii. Hydraulic systems at the bottom of clay-only lined landfills are considered to be deterministic. Long-term leakage rates are calculated using the Darcy law, nevertheless, values of the required inputs ' k_{sat} ', ' d ' and ' i ' (Fig. 1) usually appear to be uncertain, therefore, they have to be quantitatively characterized as random variables, making this part of the model to be probabilistic, too. When performing general risk assessments studying landfill types as groups, the spread of possible values for these variables is inherently larger in order to consider for diversity of landfills appartaining to particular landfill types.
 - iv. Data are usually very deficient when evaluating environmental impacts from uncontained landfills (dumpsites). Leachate infiltration into the subsoil is prevalently dependent on local hydrogeologic and climate conditions. If attributed with appropriate distributions of values and their probabilities, ' Q_{precip} ' and ' p_{undg} ' (Fig. 1) appear to be practical, reliable input parameters to be applied to estimate annual leachate discharges from dumpsites into the immediate underground.
 - b. groundwater- contamination- related pollution- potential accumulated at the site during the landfill pre-closure phases:
 - i. Usually, only a very small part of the overall pollution potential which was accumulated at the site before the landfill was closed ends up in the form of fugitive emissions of aqueous pollutants into the subsoil after the landfill was closed. Major part of the accumulated pollution potential rather ends up in the form of treated leachate and treated landfill gasses (which is something to be expected when referring to contained types of landfills, at least during the first 30 years after landfill closure) or as direct pollution fluxes into the surface waters and into the atmosphere (which are common circumstances when referring to uncontained landfills). When evaluating groundwater protection performance of landfills

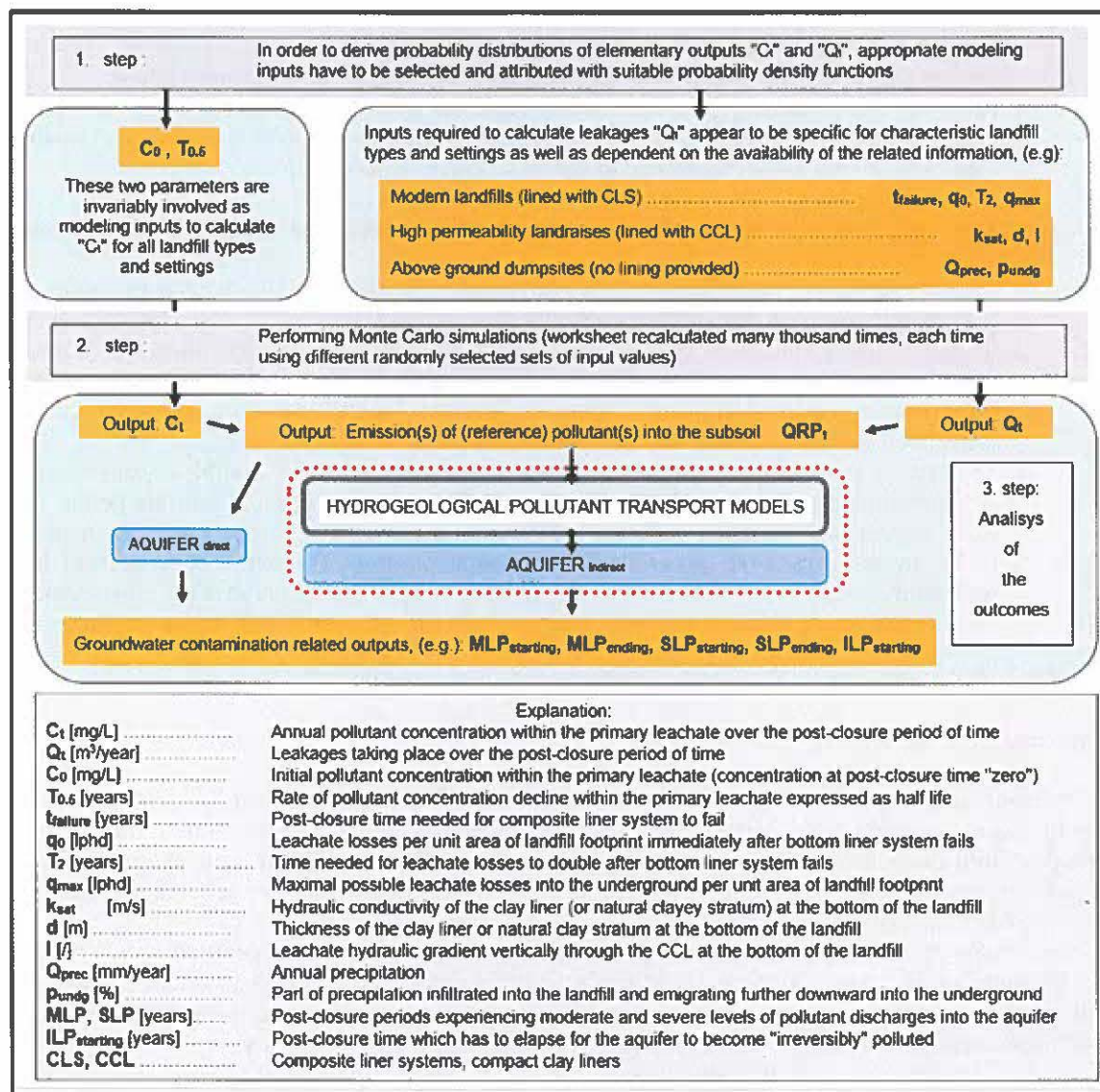


Fig. 1. Flowchart of the applied method concept.

of different types these other fluxes are in principle not important as long as they are not needed for calculation of emissions of pollutants into the subsoil. Landfill's potential to generate specific amounts of aqueous pollutants during the post-closure time is therefore not equal to groundwater- contamination- related pollution- potential according to the applied concept.

- ii. Only data regarding concentration of reference pollutants within the leachate at the bottom of the landfill and the related length of post-closure time that such potentially harmful leachate exists there appears to be indispensable information to evaluate possible pollutant discharges into the subsoil. Pollution potential is generally the greatest during the time a landfill ceases to receive new waste and the landfill is closed. According to the applied approach, this initial pollution potential is expressed by introducing the input parameter "initial reference pollutant concentration ' C_0 '". ' C_0 ' can be expressed as a discrete value only in cases when evaluating emissions from factual, already closed landfills where the parameter was actually measured. Otherwise, the input is considered to be a

- random variable quantified by a probability density function derived on basis of processing secondary data from scientific literature and other sources.
- c. expected rate of pollution-potential decline during the landfill post-closure phases:
- i. After closure, reference pollutant concentration values within the primary leachate at the bottom of the landfill generally start to drop. The faster this process proceeds, the smaller
 - 1 the probability for groundwater to become contaminated, and/or
 - 2 the magnitude of eventual groundwater contamination, and/or
 - 3 the length of time the threat is present at the site and/or the pollutants can be emitted into the subsoil
 - ii. Annual average concentration of reference pollutant(s) within the leachate at the bottom of the landfill are good indicators describing the acquired level of landfill stabilization and its remaining potential to pollute groundwater in the future. When reference pollutant concentration becomes so low that primary leachate cannot cause harm to the adjacent subterranean environment any more, the related landfill pollution potential can be considered to be exhausted and the particular landfill to be stabilized.
 - iii. The rate of pollutant concentration decline at the bottom of the landfill is considered to be approximately of the pseudo-first order rate, therefore expressed as half-life period ' $T_{0.5}$ ' (time needed for reference pollutant concentration to be reduced by 50%). This input has to be always considered uncertain for modeling purposes (therefore characterized by a probability density function) even if the value was acquired by performing measurements on a factual waste disposal site which was already closed over a long period of time.

Flowchart demonstrating the applied modeling concept is presented in Fig. 1.

Determination of inputs–outputs relationships

As mentioned in Section “*Conception of the method*”, there are just two decisive quantities which are ultimately important to perform the necessary calculations to evaluate long-term pollutant emissions into the subsoil ‘QRP_t’: 1) “primary leachate losses into the subsoil” and 2) “concentration of pollutants within the leachate at the bottom of the landfill”. Both quantities generally change over time after landfill closure (Q_t , C_t).

Since many of the modeling inputs are inherently quantified through probability density functions, the derived outputs, too, can be nothing but quantified with probability distributions of possible outcomes. The task can be comfortably accomplished utilizing appropriate software tool which uses established mathematical algorithms (such as Monte Carlo algorithm) to select random values in order to perform simulations in which many recalculations are required. When using @Risk [11], which is an add-in to Microsoft Excel, uncertain inputs are conveniently entered as probability density functions in cell formulas. The program is mostly used in economic sciences, however, it is frequently applied in environmental sciences, too. It allows extraction of meaningful statistics for the desired outputs.

Calculation of long-term pollutant concentration decline in primary leachate

Long-term decline in the concentration of primary leachate pollutants after landfill closure is satisfactorily described by pseudo-first-order rate kinetics: $C_t = C_0 \cdot e^{-kt}$ [12]. Values for the constant “ k ” are derived from the correspondent half-lives: $k = \ln 2 / T_{1/2}$. Therefore, concentration of pollutants within the primary leachate ‘ C_t ’ can be calculated if probability distributions of random variables ‘ C_0 ’ (initial concentration of the pollutant immediately after landfill closure) and ‘ $T_{0.5}$ ’ (half-life period characterizing rate of pollutant concentration decline) are entered into the model.

As outlined in Section “*Identifying suitable modeling inputs*”, ‘ C_0 ’ value appears to be one of the outcomes resulting from all those interconnected processes convoluting at a particular disposal site during the pre-closure phases. On the other hand, ‘ $T_{0.5}$ ’ is related to the nature and intensity of biological, chemical and physical processes occurring within the landfill during the period of time after the facility was closed. ‘ C_0 ’ and ‘ $T_{0.5}$ ’ values cannot be calculated by quantitatively considering all of the above mentioned processes many of which are unknown and/or stochastic in nature. However, these quantities can be measured (if dealing with the factual, already closed facilities) or can be

reliably estimated by landfill experts on basis of general knowledge they have in the field, namely, these values tend to cluster together around the averages which are characteristic for particular landfill types. Therefore, part of the work needs to be done qualitatively using sound professional judgment according to the proposed methodology. Such approach is common in other fields, too, when dealing with uncertain and stochastic inputs [11,13].

When loosely defined groups of landfills are to be compared, which was the objective of the related research article [1], probability distributions for the inputs ' C_0 ' and ' $T_{0.5}$ ' can be nothing but approximate and spread out. Approaches and techniques which were used to derive their averages and standard deviations are presented in Section "Derivation of probability distributions for the inputs ' C_0 ' and ' $T_{0.5}$ '".

Calculation of long-term leachate losses into the subsoil

As opposed to the parameter ' C_t ', calculation of leachate losses ' Q_t ' into the underground cannot be applied in a common manner when referring to different landfill types, landfill designs, etc., because the related hydraulical settings appear to be inherently diverse, as contemplated below:

- 1) Fugitive flow of leachate needs to be evaluated at an annual level for modeling purposes, therefore, quasi steady-state flow situations occurring at the bottom of already closed clay-lined landfills can be hardly assessed in the same way as transient flow situations occurring sporadically at the bottom of inadequately capped above ground dump sites.
- 2) While hydraulic properties of compact clay liners (CCL's) are not expected to change significantly through the decades (especially not for the worse), characteristics of composite liner systems (CLS's) are probabilistically expected to change [14,15]. Even CCL's which are constituent parts of CLS's do not behave in the same manner as CCL's acting as sole elements of bottom- liner sealing systems, at least not probabilistically (the later are inherently continually water-saturated, consequently, clay minerals remain in a maximally swollen condition all the time, which can not be claimed for CCL's that reside in the vadose zone below the synthetic geomembrane). While transport of pollutants through CCL's is dependent on hydraulic and chemical concentration gradients and permeability and diffusivity of the related compacted clays [15,16] leakages through CLS's appear to be dependent on a much larger number of known and unknown factors interacting between them in the short- as well as in the long-term.
- 3) Darcy's law describes flow of a fluid through a porous medium such as CCL. It is not intended to be used for calculating flow through synthetic geomembranes (although permeability through composite liner systems is sometimes given by an all-encompassing hydraulic coefficient value – e.g. [5]). Vice versa, when comparing environmental performance of different types of landfills, it would be factitious to ignore the fact that hydraulic conductivity is an essential property of clayey barriers just to show that equal probabilistic method was used to calculate long-term leakages considering both, clay-only-lined landfills and landfills equipped with composite liner systems.
- 4) Based on reasonings specified above, relations between leakages and input variables required to calculate these leakages can be deterministic in some settings (Darcy law can be applied in situations where hydraulic conductivity and thickness of the clayey barrier at the bottom of the landfill are approximately known) while stochastic in other settings (e.g., already constructed failure probability curves based on documented environmental performance of modern-type landfills can be used to evaluate timing and the related probabilities of composite liner system failure).

Leakage through composite liner systems and the related affecting factors. Reliability of composite liner systems and consequently of their failures depends on several events, each characterized by an actual probability. Analysis usually entails knowledge of failure probability of the individual elements (subsystems) and combines them with an appropriate probabilistic analysis to define the reliability of a more complex system [17,18]. A Fault Tree is widely used to assess the failure of a "technological system" [12].

Estimated landfill leakages through the geomembrane (GM) are often calculated using Bernoulli or Giroud equations if the hole size and frequency are known or presumed [19]. Leak frequency and size

statistics are normally generated from the results of geoelectric leak location methods [20]. Average hole size and frequency contributing to leakage depends heavily on the skill of the liner installer and the skill of the construction-quality-assurance (CQA) agency. GM/CCL composites are better in preventing leakage than GM's or CCL's alone if GM is in direct contact with CCL and temperatures at the landfill bottom are smaller than 40 °C in the long term [15]. For example, calculated leakage when considering 2.5 small holes/ha and 30 cm water head appears to be just 1 lphd. However, if that holes appear to be located within the GM system of interconnected wrinkles (waves) of length 200 m/ha (such circumstances are sometimes observed when performing liner integrity surveys before waste disposal operations begin), the calculated leakages rise to 120–170 lphd [15].

Mathematical models for advection-dispersion of pollutants through layered bottom liners (such as through a composite geosynthetic clay liner/ attenuation layer system) have usually been solved numerically or using analytical solutions [3].

According to the analysis which quantitatively scrutinized leakage performance of GM/CCL systems [21] and the importance of particular components involved by altering

- hydraulic head (from 0.3 m to 10 m)
- GM thickness (from 0.5 mm to 2.5 mm)
- number of GM defects (from 2 to 200 holes/ha)
- CCL thickness (from 0.5 m to 3 m) and
- hydraulic conductivity of CCL (from 1×10^{-8} m/s to 1×10^{-10} m/s),

CCL thickness appears to have the greatest impact on CLS performance. Other parameters being constant, numerically calculated critical time for reaching critical concentration of Cd^{2+} on the bottom part of the CCL was

- 11 to 80 years (by altering water head)
- 75 to 83 years (by altering GM thickness)
- 27 to 153 years (by altering number of holes/ha), however, as much as
- 44 to >1000 years (by altering CCL thickness) and
- 33 to 147 years (by altering k_{sat} of the CCL).

Modern landfills for disposal of untreated MSW are generally very anaerobic. Also, footprints of hydraulically separate compartments normally appear to be relatively small in order to be filled with waste as rapidly as possible, preventing excessive rainwater to enter the buried waste. Consequently, even if the amount of generated leachate is small, the generated leachate can be very loaded with both, organic and inorganic substances eventually causing heavy precipitation of calcite, iron colloids and humic material on locations wherever oxidation/reduction potential (ORP) suddenly increases. Subsequently, such conditions often result in cloggings and incrustations of leachate drainage and collection systems [22–24] and leachate mounds with excessive water heads can be induced potentially increasing the intensity of eventual leakings. Many other factors and mechanisms can provoke leakage increases in the short- as well as in the long term [15].

Bioreactor operation is not recommended by geotechnical experts because high leachate temperatures can induce water vapor movement and dessication cracking in clayey liners lying underneath geomembranes, especially if liner thickness was small. Estimated service life of GM is heavily dependent on landfill liner temperature-time hystory, too, which can range roughly from 20 to 3300 years in real life landfills [25].

All-encompassing way to assess performance of modern landfills and their CLS's is by obtaining data from monitoring wells lying downstream of as large number of modern-built landfills as possible. All the factors and interactions between them which could have caused the failure are in this manner factored in, including the fact that GM and CCL for some reason did not prevent the leak. However, groundwater- protection effectiveness cannot be acquired in this way when referring to the contemporary, state-of-the-art landfills, because too little or no post-closure time has expired so far in order to evaluate performance of this particular sub-group of modern landfills.

Approaches used to calculate leakings when referring to the companion research article. Approaches which were used to calculate long-term leakages 'Q_L' are described below:

Above-ground dump sites. Annual quantity of water infiltrating into the waste pile and further emigrating downwards into the underground was estimated as a percentage of precipitation based on the presumed hydrologic and hydrogeologic characteristics of the site and its surroundings.

$$Q_t = Q_{\text{precip}} \cdot A \cdot P_{\text{undg}}$$

Q_{precip} : annual precipitation [mm];

A : landfill footprint [m^2];

P_{undg} : part of annual precipitation which is infiltrated into the landfill generating landfill leachate, but only that portion which percolates further down into the subsoil [%]

High-permeability landraises (HPL's). Leachate flow through the saturated clayey barrier underneath the landfill was calculated according to the Darcy's law. Quantity of leachate released into the subsoil was considered to be zero until the time leachate pollutants penetrate the liner and break through on the other side of the liner.

$$Q_t = 0, \text{ if } t < t_{\text{breakthr}}; Q_t = k_{\text{sat}} \cdot A \cdot i, \text{ if } t > t_{\text{breakthr}}; t_{\text{breakthr}} = d / (k_{\text{sat}} \cdot i)$$

d : clayey liner thickness [m];

i : hydraulic gradient [1];

k_{sat} : hydraulic conductivity coefficient [m/s];

t_{breakthr} : post-closure time which has to pass for pollutant to penetrate the clay liner [years]

Probability density functions for parameters ' k_{sat} ' and ' d ' were selected according to the characteristics which define HPL as a landfill type.

Modern landfill types. Leachate losses into the subsoil were considered to be non-existent until the post-closure time when bottom liner system fails. General process which leads to landfill liner system failure was thought-out to be inherently stochastic. Probability distribution of values for the input ' t_{failure} ' (post-closure time which has to expire for bottom liner system to fail, i.e., for leakages to begin) can be derived in different ways, as presented in Section "*Leakage through composite liner systems and the related affecting factors*". Approach which was applied in the companion article [11] was to utilize already obtained 'failure probability curve' based on monitoring data derived from North Italian wells positioned downgradient of landfills bottom lined with CLS's [12]. Since the number of monitored landfills was relatively large, the related failure probability curve which was constructed could be considered to be quite representative for landfills lined with composite liner systems during the 1980s and 90 s.

Initial leakage flow rates into the underground per unit area of landfill footprint ' q_0 ' after the liner fails could only be very low for modern landfills. Exact measurements could have been historically performed only on real and pilot-scale landfills equipped with double bottom lined systems [14,26,27]. Already measured values mainly fell within the 0.1–10 lphd range, much less into 10–100 lphd range. There were also few cases which fell into (100–1000) lphd and 'no-leaching-detected' ranges. The highest measured value was 1410 lphd.

Leakage flow rates are likely to increase gradually in the long term [12], but only until reaching some upperbound limit ' q_{max} ' (maximal possible leachate losses into the subsoil per unit area of landfill footprint). This value (or probability distribution of possible values) can only be given arbitrarily, however, realistically: leakages could be hardly larger than they would be if compact clay liner was a sole element of composite liner system. The largest measured value for ' q_0 ' which was already measured on landfills equipped with double bottom liner systems [27] suggests such proposition to be reliable. Rate of increase in leachate flow rates can be conveniently described by first-order rate kinetics (e.g., values can be given by the parameter "time needed for leachate losses to double after the system fails" (T_2)). Since buried HDPE geomembranes are estimated to have service life of many hundreds of years in ideal circumstances [14] it is likely that eventual leachate losses on average grow in an extremely slow pace during the post-closure period of time. It was therefore supposed that centuries would pass on average for leakages to intensify from the smallest- to the highest possible ones which were already measured on double lined systems. Spread of possible

values for ' T_2 ' was chosen in a way that scenarios with decreasing leakages across the post-closure time were considered to be realistic, too, when performing simulations (average value and standard deviation were both estimated to be 30 years).

Relationships between the inputs and long-term leakages were mathematically expressed as follows:

$$Q_t = 0, \text{ if } t < t_{\text{failure}};$$

$$Q_t = Q_0 \cdot \exp[K(t - t_{\text{failure}})], \text{ if } Q_0 \cdot \exp[K(t - t_{\text{failure}})] \leq Q_{\text{max}} [\text{m}^3/\text{year}] \text{ and } t \geq t_{\text{failure}}; Q_0 = q_0 \cdot A;$$

$$Q_{\text{max}} = q_{\text{max}} \cdot A; K = \ln 2 / T_2$$

$$Q_t = Q_{\text{max}} [\text{m}^3/\text{year}], \text{ if } Q_0 \cdot \exp[K(t - t_{\text{failure}})] > Q_{\text{max}} [\text{m}^3/\text{year}]$$

t_{failure} [years]: post-closure time which has to pass for composite liner system to fail

Q_0 [m^3/year]: initial leachate losses into the underground soon after liner system fails

q_0 [lphd]: initial specific leachate losses into the underground soon after liner system fails (liters per hectare per day)

A [m^2]: landfill footprint area

K [year^{-1}]: first order rate constant describing increase of leachate losses after the system fails

T_2 [years]: time needed for leachate losses to double after the system fails

Q_{max} [m^3/year]: maximal possible leachate losses into the subsoil

q_{max} [lphd]: maximal possible leachate losses into the subsoil per unit area of landfill footprint

Wet-type landfills were assumed to leak twice as much as dry-types on average in order to consider greater possibility for leachate collection systems to clog (potentially inducing excessive water heads) and for high leachate temperatures to develop within the landfill interior (potentially inducing geomembrane failures and/or CCL cracking [25]).

Probability density distributions of values attributed to above mentioned inputs were presented in the companion articles [1,2]. It has to be taken in mind that input variables were quantified on basis of processed secondary data derived by performing monitoring and testing on landfills and experimental CLS systems which were considered to be "modern" in the recent past. In general, these values do not represent well the characteristics of contemporary modern landfills. In other words, state-of-the-art landfills constructed in highly developed countries today undoubtedly outperform landfills which were lined with composite liner systems during the 1980s and 90s, due to

- advances of knowledge related to factors that influence long-term performance of composite landfill liners [15]
- advances in installation quality and construction quality assurance (CQA) practices (leakage rates greater than 50 lphd have decreased significantly in the past 20 years [20]); best available technology for locating leaks in geomembranes before they become a problem is geoelectric leak location methods, also known as liner integrity surveys; ideally, a bare geomembrane method would be used after geomembrane installation, then the dipole method would be used after the placement of cover materials
- greater durability and chemical resistance of geomembranes; HDPE geomembranes produced nowadays are extremely durable products, designed with service lives up to several hundreds of years under ideal conditions [14,28,29]
- greater percentage of double-lined landfills built today than in the past
- improvements in waste acceptance procedures and criteria for wastes to be disposed in landfills (e.g., [29]), which means, pollution potential per ton of received waste is much lower now than it was years and decades ago

On the other hand, in-place densities of waste are much bigger nowadays on average than they were decades ago. Consequently, waste stabilization rates are generally lower in contemporary modern landfills than they were in the older ones. Also, it has to be taken in mind that quality of landfill capping systems improved over the decades, not just the quality of bottom-liner-systems. Although short-term environmental risks diminished tremendously because of the above mentioned advancements, the same cannot be claimed when evaluating long-term environmental performance of state-of-the art landfills. One paradox exists which is usually ignored and can be in short presented

as follows: (1) The better the long-term sealing efficiency of implemented cover systems → (2) the slower the rate of decline of the related pollution potential accumulated at these landfill sites → (3) the greater the long-term environmental risks. Consequently, not only average ' t_{failure} ' values would be estimated in terms of hundreds- rather than tens of years when referring to state-of-the-art conventional landfills, the same is true for ' $T_{0.5}$ ' values as well. The problem is that these two inputs adversely affect outputs results. Therefore, when performing long-term risk assessment simulations, eventual pollution "events" would be shifted few hundreds of years further into the future, but scenarios with excessive release of pollutants into the environment would still be calculated by the model.

As opposed to state-of-the-art conventional (i.e., dry-type-) landfills, state-of-the-art bioreactor landfills demonstrate high rates of pollutant concentration decline in primary leachate after landfill closure (which means, relatively low average values are characteristic for the input ' $T_{0.5}$ '), however, greater probability for CLS failure has to be considered, too, based on previous studies [15,25] (i.e., relatively low average values have to be attributed to the input ' t_{failure} ' as well).

Calculation of more complex outputs

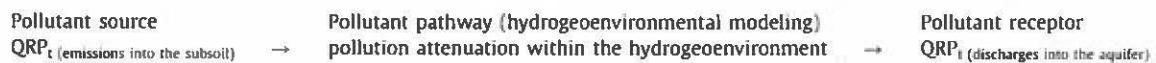
Once probability distributions for the outputs ' C_t ' and ' Q_t ' are known, fugitive emissions of pollutants into the subsoil and their probabilities ' QRP_t ' can be acquired by calculating the product of the two:

$$QRP_t = C_t \cdot Q_t$$

QRP_t [kg/year]: Quantity of a reference pollutant released into the subsoil during the post-closure year ' t '

All other outputs can be acquired by further processing already obtained simulated data for the parameter ' QRP_t '. If the aquifer existed directly underneath the landfill, separated just by a narrow, permeable vadose zone, yearly fugitive emissions into the subsoil would be equal to annual discharges into the aquifer. Environmental permits would not be given to operators of such sites, however, the considered concept is adequate for modeling purposes, especially for quantitatively comparing long-term groundwater-protection efficiency of different types of sanitary landfills, which was the objective of the related articles [1,2]. For solving such-a-task the common environmental setting has to be presumed, anyway: it has to be as simple and risky as possible in order the expected differences would be clearly revealed. More thresholds and related levels of aquifer contamination were determined (defined as moderate-, severe- and irreversible-) rather than just one in order to analyze differences in environmental performance between landfill types from various aspects. In flowchart Fig. 1 both modeling pathways are shown, i.e. considering possibilities of either direct or indirect release of landfill-derived pollutants into the aquifer.

In realistic hydro-geo-environmental settings pollutant emissions into the subsoil are not equal to the related discharges into the aquifer. Correlations between the two can be potentially acquired after performing hydro-geo-environmental modeling (i.e., evaluating transport of pollutants and their fate in the environment before they eventually reach the aquifer and discharge into it as depicted below:



Environmental conditions at given compliance points would be eventually determined in this way. However, if the problem in consideration does not seem to be very important and/or complicated, the correlation between the two can be simply expressed by introducing an attenuation factor

$$QRP_t \text{ (emissions into the subsoil)} \cdot A_F \approx QRP_t \text{ (discharges into the aquifer)}$$

A_F ...attenuation factor ($0 \leq A_F \leq 1$)

If the aquifer lies directly below the landfill, separated just by a thin vadose zone, the two quantities appear to be equal (i.e., $A_F \approx 1$). The equation also implies that in the case landfill hydrogeological setting was ideal (i.e., $A_F \approx 0$), the aquifer would not be affected even if landfill's environmental-protection performance was extremely bad.

Long-term environmental risk can be defined as the likelihood that an aquifer will be contaminated because of leakage from a landfill. Groundwater thresholds are normally expressed in pollutant concentration units. However, if the aquifer threatened by the landfill is already well researched, a hydrogeologist is in principle able to define threshold values directly in terms of required reference pollutant discharges into the aquifer which would invoke such already prescribed pollutant concentration levels within the groundwater, e.g.

$$\begin{aligned} \text{QRP}_{t(\text{threshold \#1})} \leq \text{MLP} \leq \text{QRP}_{t(\text{threshold \#2})} \leq \text{SLP} [\text{kg of reference pollutant / year}] \\ \text{CUMQRP}_{t(\text{threshold \#3})} \leq \text{ILP} [\text{kg of reference pollutant}] \end{aligned}$$

The above mathematical expressions can be articulated as delineated below:

- If/when the calculated quantity of reference pollutant discharged into the aquifer during the post-closure year 't' is greater than the lower threshold value but smaller than the higher threshold value, the acquired level of groundwater pollution is considered to be moderate during that particulate year (moderate level of pollution, or MLP).
- If/when the calculated quantity of reference pollutant discharged into the aquifer during the post-closure year 't' exceeds the higher threshold value, the acquired level of pollution is considered to be severe during that particular year (severe level of pollution, or SLP).
- If/when the overall amount of reference pollutant cumulatively discharged into the aquifer during the post-closure period of time until the year 't' exceeded the predisposed threshold, the aquifer itself can be considered to be polluted, not just the related groundwater (i.e., an 'irreversible' level of aquifer pollution was reached, or ILP).

Environmental risks can be quantitatively assessed by calculating the probabilities that a given aquifer will be moderately, severely or irreversibly polluted due to landfill-derived impacts (i.e., P_{MLP} , P_{SLP} and P_{ILP} have to be calculated). According to the definitions described above, moderate and severe levels of pollution are considered to be temporary, reversible conditions as opposed to irreversible level of pollution, which is considered to be indefinitely long lasting condition. Moderate level of pollution is reached during the post-closure year when annual pollutant discharges surpass the given lower threshold and lasts until the year when the pollutant discharges fall below that threshold once again.

Probability for an aquifer to become polluted is related to the considered length of time after landfill closure. The longer the time, the greater the probability. Therefore, time-lengths required for moderate-, severe- and irreversible levels of pollution to be reached and for moderate- and severe levels to end are calculated together with their probabilities. In the related research- and data-description articles [1,2] these outputs were labeled as $\text{MLP}_{\text{starting}}$, $\text{SLP}_{\text{starting}}$, $\text{ILP}_{\text{starting}}$, $\text{MLP}_{\text{ending}}$ and $\text{SLP}_{\text{ending}}$, respectively. Overall probability (i.e., P_{MLP} , P_{SLP} or P_{ILP}) can be calculated only when considering the entire duration of time until a residual threat appears to be present at the site, i.e., until the particular landfill exhibits sufficient pollution potential to harm the aquifer.

The output $\text{MLP}_{\text{starting}}$ gives probability distribution of values for a parameter "post-closure time needed for MLP to begin" (where time is given in years and probability in percents). Cumulative probability for MLP to start rises over the passage of time until reaching a plateau. It can not rise any more once the landfill is stabilized/ detoxified and poses no threat to the environment. $\text{MLP}_{\text{starting}}$ output results are best represented graphically by a cumulative probability curve as shown in Fig. 2. Therefore, by acquiring probability distribution of outcomes for the output $\text{MLP}_{\text{starting}}$, the overall (total) probability for MLP is also derived, where ' P_{MLP} ' is given as a discrete value expressed in%.

The output $\text{MLP}_{\text{ending}}$, on the other hand, gives probability distribution of outcomes for the parameter "post-closure time needed for MLP to end" as a result. ' $\text{MLP}_{\text{ending}}$ ' cumulative probability curve reaches the plateau at a later post-closure year than the related ' $\text{MLP}_{\text{starting}}$ ' curve does, however, the calculated overall probability is the same for both of the curves as it should be ($P_{\text{MLPstarting}} = P_{\text{MLPending}}$) – see Fig. 2. By analyzing ' $\text{MLP}_{\text{ending}}$ ' statistical data one can define the post-closure year when landfill does not pose reasonable threat to the aquifer any more with some high degree of probability, e.g. 90%. Duration of average time required for these conditions to be met can differ by several hundreds of years when comparing post-closure environmental performance of different types of sanitary landfills. Pollution potential of a landfill to contaminate the adjacent

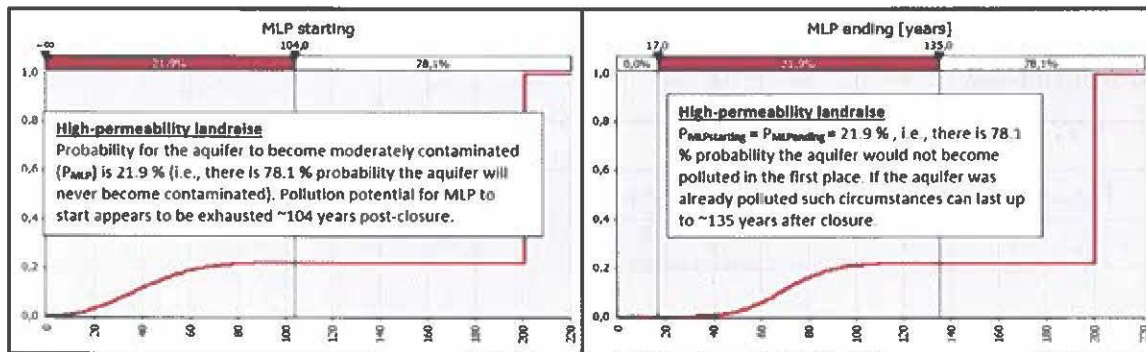


Fig. 2. Comparative demonstration of the related $MLP_{starting}$ and MLP_{ending} graphs (extracted from the companion data-description article [2]).

aquifer further in the future is therefore depleted at this point in time. In other words, calculated reference pollutant annual discharges fall below the levels which can potentially pose a threat to local groundwater resources, i.e.,

$$t_{QRPt} \geq MLP_{ending}(P = 90\%)$$

$$MLP_{ending} = t_{QRP \text{ threshold \# 1 reached during the post-closure period of time characterized by declining pollution discharges [years]}}$$

However, landfill can be considered to be fully stabilized/detoxified considering other criterions, too, e.g.

$$t_{QRPt} \geq SLP_{ending}(P = 99.5\%)$$

$$SLP_{ending} = t_{QRP \text{ threshold \#2 reached during the post-closure period of time characterized by declining pollution discharges [years]}}$$

Overall groundwater pollution potential which exists immediately after the landfill is closed can be retrospectively expressed in terms of cumulative quantity of a specific pollutant which can be potentially released into the aquifer considering infinite post-closure time:

$$CUMQRP_{max} = \sum QRP_t [kg]; 0 \leq t \leq \infty$$

As already explained above, this quantity can be acquired accurately enough when considering post-closure time which is at least equal to the time needed for calculated emissions to fall below the lower threshold:

$$CUMQRP_{max} \approx \sum QRP_t [kg]; 0 \leq t \leq MLP_{ending}(P = 90\%)$$

Spreadsheets which were designed to derive all of the above described outputs in order to compare environmental performance of different types of landfills based on premises outlined in the companion research article [1] are presented in Section "Construction of spreadsheet models". The related outcomes are graphically presented and compiled in the companion data-description article [2].

Derivation of probability distributions for the inputs 'C₀' and 'T_{0.5}'

Biodegradability of organic content of MSW and heavy compaction of waste after its placement makes the landfill an anaerobic environment, giving many similarities to generated leachates compositions among the sanitary anaerobic landfills in general; a strong relationship exists between the state of refuse decomposition and its associated leachate characteristics [30,31]. Semiaerobic landfill environment on the other hand generates leachates with their own distinct characteristics [32].

Likewise, strong relationship exists between the rate of decline in primary-leachate pollutants-concentrations during the post closure time and landfill type/subtype involved in generating this trend as written below:

1. $T_{0.5}$ dry-type landfill $\gg T_{0.5}$ wet-type landfill

The related factor: refuse moisture content [33]

2. $T_{0.5}$ non-flushing landfill $\gg T_{0.5}$ flushing landfill

The related factor: rate of the pollutants washout [34]

3. $T_{0.5}$ non-treated leachate recirculating landfill $\gg T_{0.5}$ ex-situ treated (e.g., nitrified) leachate recirculating landfill

The related factor: recirculated liquids composition [35]

4. $T_{0.5}$ anaerobic landfill $\gg T_{0.5}$ (semi)-aerobic landfill

The related factor: environmental conditions occurring within the landfill body [32]

In other words, ranges of probable values for typical pollutants are characteristic for landfills of particular types and ages. By acquiring general information regarding the history of a particular landfill one readily gets a clue about its primary leachate composition.

A particular landfill can be at the same time e.g. anaerobic, wet-type, non-flushing, etc. It can be a modern, highly engineered facility or a simple above ground waste deposit. Characteristic values for parameters ' C_0 ' and ' $T_{0.5}$ ' can be estimated based on this and other information. The problem of uncertain inputs is usually considered by assigning them with probability distributions of values. In general, the better the particular landfill or a landfill group is defined, the more precise these estimates can be. Values tend to cluster together around the averages which are typical for particular landfill types. Probability distributions for the inputs are more spread out when environmental performance of landfill types are evaluated (rather than environmental performance of particular landfills), because heterogeneity factor has to be considered, too, not just the uncertainty factor.

Therefore, selection of probability distributions is meant to be based on comprehensive knowledge related to characteristics of different types of landfills. Some experts will not agree with probability distributions estimates given by other experts or professionals, but not in any dramatic way, since basic facts cannot be changed.

Representativeness of ammonia nitrogen as a reference pollutant

The focus of the companion research study [1] was put on comparing long-term environmental performance of different types of sanitary landfills. For practical reasons, only the most representative aqueous pollutant was considered to perform comparisons, i.e. the one which is characteristic for sanitary landfills after their closure. Among other dissimilarities, leachate pollutants differ according to their characteristic timelines of occurrence in relation to the succession of characteristic phases of waste decomposition. If (for example) volatile fatty acids (VFA)'s were used as a representative parameter in order to compare long-term environmental performance of different landfill types, no differences would be detected, since these pollutants are generated during the acidogenetic phase, i.e., by degradation of freshly disposed MSW. These pollutants are almost not even present within the leachate after landfill closure. Similarly, the content of heavy metals in landfill leachates is in general already low during the stable methanogenic phase as a result of alkaline conditions occurring within the buried waste and attenuating processes (sorption and precipitation) that take place within the disposed waste [30]. Comparative landfill-simulating tests showed either no major differences in leachate heavy metals concentrations between anaerobic, semi-aerobic and aerobic bioreactors [36] or better performance of semi-aerobic reactors because they more readily act as a final sink for heavy

metals due to fast stabilization of organic matter into humic substances [37]. At high-permeability-landraise (HPL) research site [1], the concentration of heavy metals in primary leachate was always very low, too.

Leachate pollution index [38] or leachate toxicity could be better parameters for characterizing leachate pollution potential, however, for purposes of comparing environmental performance of different types of landfills in general these parameters seem to be too complex in order to convincingly attribute the related input variables ' C_0 ' and ' $T_{0.5}$ ' with probability distributions of values.

Ammonia nitrogen is a typical persistent pollutant, one of the most representative ones for purposes of analysing long term environmental performance of different types of landfills. Many renowned researchers acknowledged that (e.g., [30,31]). This pollutant does not seem to follow much faster decreasing trends characteristic for many other leachate pollutants, such as biological oxygen demand (BOD).

Derivation of ' C_0 ' and ' $T_{0.5}$ ' as modeling inputs in the related research study

When referring to the research article [1], probability distributions of ammonia-nitrogen values attributed to input variables ' C_0 ' and ' $T_{0.5}$ ' were obtained by qualitatively processing data related to real-world landfills but also by considering information derived from laboratory and pilot scale experiments. Different liquid-to-solid (L/S) ratios and different scales of heterogeneity which exist between laboratory-, pilot-scale- and realistic landfill- environments [39,40] were taken into account.

Explanation:

Literature specifically targeting ' C_0 ' and ' $T_{0.5}$ ' values does not exist. On the other hand, there is a vast body of literature which provides theoretical and practical information about the subject, especially with respect to $\text{NH}_4 - \text{N}$ characteristics as a reference pollutant (e.g., explaining why ammonia nitrogen is so persistent pollutant in anaerobic landfills but not in semiaerobic landfills and certain types of leachate-recirculating and/or flushing landfills). It is true, concepts of different types of sanitary landfills are vaguely defined, but the nature of the work is intrinsically based just on such kind of imprecise information. When gathering information regarding leachate composition from real life landfills one should be aware that these systems are almost never clearly defined, at least not from all of the relevant aspects. However, this does not mean such information is irrelevant. It is up to the researcher to select and interpret these data appropriately and to connect this information with findings obtained from laboratories and pilot-scale studies where systems were precisely defined (Table 1). Uncertainty is considered during the step when attributing inputs with probability density functions. Explaining how input data were acquired is an essential part of the applied approach. Similar approaches are used in other fields, too, when dealing with situations which are subject to uncertainty (e.g., [11,13]).

Leachate quality data is widely available from all around the world (sometimes describing particular landfills vaguely as young, mature or old, small or large, dry or wet, controlled or uncontrolled, etc.). Information about the spread of possible values for parameters ' C_0 ' and ' $T_{0.5}$ ' has largely derived from such kind of sources as presented in Table 2.

"Average/mean" or "most probable" values (i.e. values with greatest probabilities of occurrence within the selected probability distributions) were mostly estimated after processing large amounts of secondary data which are only indirectly related to parameters ' C_0 ' and ' $T_{0.5}$ '. The main sources were: Laner [6] for composite-bottom-lined landfills (aka "modern" landfills), Kjeldsen and Christophersen [49] for dumpsites and Madon [1,9] for HPL's as described in Table 3.

Construction of spreadsheet models

As an add-in to Microsoft Excel, @RISK software provides all the necessary tools for setting up, executing, and viewing the results of risk analyses [11]. Excel-style menus and functions are used to construct a spreadsheet model. Distribution functions can be added to any number of cells and formulas throughout worksheets. These distribution functions are invoked only during a simulation. In normal Excel operations, they show a single cell value, just as in Excel without @RISK. Both Monte

Table 1

Results from the literature performing nitrogen removal tests.

LSR (landfill-simulating reactors) and pilot scale tests (values in parentheses: NH_4^+ -N concentration in leachate [mg/L])	
Plexi glass reactors with 20 kg waste taken from Modena landfill. Leachate after ten weeks: anaerobic reactor (water addition, no recirculation): $\sim(800 \rightarrow 200)$; aerobic reactor (water addition, no recirculation): $\sim(800 \rightarrow 10)$ aerobic reactor (leachate recirculation): $\sim(1100 \rightarrow 10)$	[40]
Waste samples from Kuhstedt landfill before and after 6 years of low-pressure aeration. Leachate obtained from waste samples (L/S ratio = 0.12): Waste before aeration: 345; waste after aeration: 54	[32]
Experiment in 7 m ³ tanks, clean water added, no leachate recirculation. Anaerobic tank: 1300 $\rightarrow$ 700 in 3 y. Aerobic tank: 1300 $\rightarrow$ $\sim$ 0 in 1 year	[41]
Experiment in Φ 1.2 m, 7.5 m high lysimeters; clean water addition; 16 months period. Anaerobic: $\sim$ 1500 $\rightarrow$ 700; Semiaerobic: $\sim$ 1200 $\rightarrow$ 200	[42]
Experiment in two phases (dry and wet) simulating tropical climate conditions; 8 lysimeters (φ 0.24 m, H 1.0 m); 4 semiaerobic, 4 anaerobic (half of them with high% putrescible fraction waste); no recirculation. Anaerobic: (10th day $\rightarrow$ 95th day): $\sim$ 1200 $\rightarrow$ 1100 Semiaerobic: (10th day $\rightarrow$ 95th day): $\sim$ 800 $\rightarrow$ 0 Cumulative outflow of NH_4 - N with the leachate (190 days): Anaerobic: $\sim$ 25 g; semiaerobic: $\sim$ 3 g.	[43]
Lysimeters (Φ 0.9 m, H 2.7 m), simulating tropical climate; Semiaerobic 1 (density 640 kg/m ³), semiaerobic 2 (density 770 kg/m ³), anaerobic 1 (density 730 kg/m ³ , 50% flooded), anaerobic 2 (density 720 kg/m ³ , 100% flooded). No recirculation. Day 120 $\rightarrow$ day 650. TKN was measured. Anaerobic 1: $\sim$ (1250 $\rightarrow$ 750), anaerobic 2: $\sim$ (2450 $\rightarrow$ 1100) . Semiaerobic 1: $\sim$ (1250 $\rightarrow$ 50), semiaerobic 2: $\sim$ (2750 $\rightarrow$ 100) .	[44]

Table 2

Ammonia nitrogen concentration ranges characteristic for some landfills around the world.

NH_4^+ -N concentration of the primary leachate [mg/L] Waste is usually heavily compacted in modern landfills and the milieu in their interior appears to be very anaerobic. Higher values for NH_4^+ -N (higher than $\sim$ 1200 mg/L) gathered from waste disposal sites all around the world largely apply to anaerobic landfills during the time they were still young and/or if ammonium was not eluted out of their bodies in large enough quantities yet.	
Acidophilic phase landfills: 2–1030; Final maturation phase landfills: 6–430	[45]
Old landfill of Legnago: 900–3500 Calancoi closed landfill: 1500–1800	[46]
Bioreactor anaerobic landfills: 100–500, average 740	[47]
Landfills in Germany: 30–3000; mean 750	[48]
104 small, old unlined Danish landfills, on average closed for some 17–18 y: Generally below-ground piles ($\sim$ anaerobic): 17.5–83.9 Generally above-ground piles ($\sim$ semiaerobic): 1.3–5.9	[49]
Upper bound values: 5 y old landfill: 800; 10 y old: 700; 20 y old: 590; 30y old: 580; 40y old: 570	[50]
32 closed, lined Austrian/Swiss landfills; (on average, 16 y post-closure time has already expired): 1.1–6200; mean 1045	[6]
Ajdovščina high-permeability landraise (passive semiaerobic above ground landfill): 450 (immediately after closure of the 1. sector) $\rightarrow$ 75 (8 years post closure); decline continues to this day	[9]
Landfills: Montreal 179; Montevideo 1470; Thessaloniki 3100; Hong Kong 1190–2700; Kyungjoo (Korea) 1682; Shenzhen (2 y old) 2090	[51]
Shangai Laogang landfill, fresh leachate (operating landfill section): 4632; semi-mature leachate (5 years old landfill section): 2197; mature leachate (11 years old landfill section): 1388	[31]

Table 3
Derivation of ' C_0 ' and ' $T_{0.5}$ ' average inputs estimates.

' C_0 ': primary leachate ammonia-nitrogen concentration immediately after landfill/ landfill- compartment closure. ' $T_{0.5}$ ': Half-life period (refers to post-closure time required for leachate ammonia-nitrogen concentration to reduce to half of its initial value)	
Input parameter	The most expected (mean) value
' C_0 ' for modern landfills (dry and wet types)	$\mu = 1200 \text{ mg/L}$
Explanation: Data from Laner [6] refer to 32 closed Austrian and Swiss landfills which were bottom lined with composite liner systems (= modern landfills according to definition applied in this work). On average, these 32 landfills were already closed for 16 years in 2008. $\text{NH}_4^+ - \text{N}$ ranged from 1.1 to 6200 mg/L in 2008 (mean value = 1045 mg/L). Based on this information it seems to be reasonable to choose 1200 mg/L as a proper "average" value for the input parameter 'C_0'. Landfills (or landfill cells) normally do not operate as bioractors before their closure (in order to avoid excessive fugitive emissions of methane from the uncovered active areas, etc.). The same average value was therefore selected for all modern landfills, i.e. dry- and wet- ones. *The most common values for ammonia nitrogen concentrations in anaerobic landfills during the stable methanogenic phase (landfills are usually closed when they go through this phase) found in the literature appear to be within the range 450 mg/L – 800 mg/L rather than >1000 mg/L. However, ammonia nitrogen leachate concentrations tend to decline fast after landfill closure when the values are higher than 1000 mg/L (i.e., "half-lives" tend to be shorter than average) than later when the values are within the more common range between 450 and 800 mg/L ("half-lives" tend to be longer than average). Therefore, trying to find the right selection of average values for 'C_0' and '$T_{0.5}$' as a set is more important than trying to find the correct averages for 'C_0' and '$T_{0.5}$' separately.	
' $T_{0.5}$ ' for modern landfills, dry type.	$\mu = 40 \text{ years.}$
Explanation: Landfill- stabilization- progress after landfill closure manifests itself in different ways (decline in annual quantity of generated landfill gas, decline in respiration rates measured on solid waste samples taken from the landfill, decline in concentration of aqueous pollutants in primary-leachate samples taken at the bottom of the landfill, decline in settlements rates, etc.). All these phenomena are interrelated, but half-life periods are not equal and the related stabilization rates can be only vaguely approximated as being of the pseudo-first order rate. Historically, the concept was mostly used to model methane generation rates. E.g., US EPA in its document AP-42, fifth edition [52] set forth default values for first-order decay rate constant to be used in its LandGEM model for conventional landfills: $k = 0.04$ ($T_{0.5} \approx 17$ years) for wet climates and $k = 0.02$ ($T_{0.5} \approx 35$ years) for dry climates. Modern dry-type landfills are sealed at the top when the particular compartment is filled with waste, therefore, $T_{0.5} \approx 35$ years would be a good first estimate for characterizing rate of decline in the intensity of stabilization processes taking place in "dry-entombment" landfills. However, no major biological pathways for ammonia nitrogen removal exist within the anaerobic landfill ([53,35]), consequently, the related stabilization process is inherently very limited. The pollutant can be removed almost exclusively by the washout process, but leachate generation rate decreases rapidly after a dry-type landfill is capped. Therefore, half-life period tends to be much longer than 35 years when ammonia nitrogen is considered as a reference pollutant. However, in reality many composite-liner caps do leak a little bit immediately after the landfill was closed [54] and leakings rise slowly in the long term. The paradox is that leaky covers eventuate faster decline in concentrations of pollutants within the primary leachate (shorter '$T_{0.5}$') resulting in better long-term groundwater protection performance of landfills with defective final covers. Based on the contemplations outlined above the arbitrarily selected average value of 40 years for '$T_{0.5}$' does not seem to be conservative at all. Paradoxically, if the value was set to be 60 years instead of 40 years in the comparative study [1] (i.e., if landfill covers with better sealing characteristics were supposed to be installed on average), dry-type landfills would have environmentally performed even worse when compared to other landfill types executing long-term risk assessment simulations.	

(continued on next page)

Table 3 (continued)

$T_{0.5}$ for modern landfills, wet type.	$\mu = 7$ years.
Explanation: Gas decay constant value of $k = 0.1$ ($T_{0.5} \approx 7$ years) was proposed to EPA as a default value for predicting long-term gas generation rates in bioreactor landfills [55]. Research performed by Tolaymat et al. [56] confirmed such proposal to be reliable. However, similar rates of decline are not necessarily characteristic when predicting steady fall in concentrations of persistent aqueous pollutants within the primary leachate. For example, ammonium nitrogen concentration cannot be abated down just by performing recirculation within an ordinary anaerobic environment [53,35]. However, ammonia- as well as total- nitrogen can be readily removed by • recirculating <i>ex-situ</i> treated (nitrified) leachate before being inserted back into the landfill interior [35] • recirculating leachate within an aerated or hybrid (anaerobic/aerobic) bioreactor- landfill system [53] Rapid rates of pollutant concentration decline can be sometimes observed in non-bioreactor landfills, too. Persistent pollutants can be namely abated down just by washing them out of landfill. Conventional modern landfills which are situated in humid climate and are covered only with local earthen materials can be also considered to be wet-type landfills. According to statistical analysis by processing raw leachate parameters- data related to 32 Austrian and Swiss landfills already closed for a long-time [6] it was revealed that chloride and ammonium concentrations within the primary leachate on average decreased quite rapidly and at a similar rate ($T_{0.5} \approx 7$ years). Chloride is perhaps the most typical persistent aqueous pollutant characteristic for MSW landfills. This parameter can be abated down only by means of washing it out of the landfill unlike ammonium nitrogen, which behaves as a persistent pollutant only in strictly anaerobic environment as mentioned above. It has to be pointed out that the studied group of landfills • were bottom-lined with composite liner systems [6] (therefore characterized as modern landfills according to the categorization described in Section "Types of sanitary landfills") • did not practice post-closure leachate recirculation [6] (therefore, they were not operated as bioreactors) • were capped mostly with local earthen materials (which could not have prevented part of the precipitation to enter the landfill; this was a prevalent way of covering landfills during the 1980s and 90s, anyway) • were of an anaerobic type (otherwise, ammonium and chloride would not have demonstrated so similar long-term declining rates) Modern bioreactor landfills are likely much more densely built than the studied group of old Austrian landfills on average (therefore, in general, more difficult to be stabilized). Based on information presented above it is reasonable to select $T_{0.5} \approx 7$ years as an average value for wet-type landfills as a whole.	
C_{gr} for high-permeability landraises (HPL's)	$\mu = 450$ mg/L
Explanation: Semiaerobic milieu provides conditions for nitrification/ denitrification to occur simultaneously within one landfill cell rather than requiring two separate cells containing two different in-situ environments, i.e. anoxic and aerobic [53]. High permeability landfill is aerated passively already during the operational phase, that's the reason why ammonium can not build up to reach high concentrations within the primary leachate. The value of 450 mg/L was selected based on Ajdovščina "prototype landfill" data.	
$T_{0.5}$ for high-permeability landraises.	$\mu = 3.5$ years
Explanation: The value of 3.5 years was selected since it is characteristic for a "prototype HPL" where the corresponding author performs research. Half-life period could have been shortened even more by intensifying landfill flushing operations. Since no relevant groundwater bodies exist in the vicinity (the most vulnerable part of the environment appear to be natural surface waters) such measures would not be justifiable.	

(continued on next page)

Table 3 (continued)

'C ₀ ' and 'T _{0.5} ' for above-ground dump sites	$\mu_1 = 250 \text{ mg/L}; \mu_2 = 3 \text{ years}$
Explanation: An uncontained above- ground dump site (as defined in Section "Types of sanitary landfills") is basically an uncontrolled version of a HPL- type of landfill, on average even less compacted, sanitary covering more poorly applied, etc. (in other words, such type of "landfill" should be more aerobic than a HPL on average). Therefore, average 'C₀' and 'T_{0.5}' values should be somewhat lower when compared to those which are characteristic for HPL's. The rounded average value of 250 mg/L has been derived by analyzing data collected from 106 old unlined Danish landfills [49] assorted in four groups in regard to where leachate monitoring wells were screened (labeled as group A, B, C and D, respectively). Group A was largely represented by below-ground disposal sites with wells screened in the saturated waste layers - 65 of them) and Group C was mostly represented by above-ground waste piles with wells screened in the underlying saturated geological layers - 103 of them). Due to this fact the possibility of significant leachate dilution was expected to exist for the group C, but not for the group A. Comparing data of chloride concentrations (a typical non-degradable pollutant) between groups A and C the ratio appeared to be 1.52, probably representing the dilution effect. However, when comparing ammonium concentrations between these two groups of dumpsites (ammonium is a persistent pollutant at anaerobic sites but a decaying pollutant at semiaerobic sites), the ratio was 14.1. Even if we attribute factor 2 to the dilution effect, the factor of 7 still remains to be attributed to ammonium biodegradation effect in semi-aerobic landfills (therefore, on average, 7-times smaller ammonia concentrations appear to be present within the leachate derived from passively aerated above-ground piles than from below-ground, anaerobic waste piles). Eliminating dilution effect, the average value for ammonium-nitrogen in group C would be some 7.2 mg/L. From the graph demonstrating sodium concentration as a function of landfill age in old Danish landfills [49] the average half-time period due to wash-out effect can be roughly obtained: $T_{0.5} \approx 20$ years. Therefore, ammonium concentration half-time characteristic for above ground dumps should be ~seven times shorter (i.e., $T_{0.5} \approx 3$ years on average). Considering that the evaluated Danish landfills were already closed for 17–18 years on average, 'C₀' value of ~250 mg/L can be acquired (first order rate equation calculated backwards). The corresponding author took leachate samples from two small abandoned above-ground dumps situated on an impermeable terrain in Vipava Valley (Slovenia) years ago and acquired similar C₀ values.	

Carlo and Latin Hypercube sampling techniques are supported, and distributions of possible outcomes can be generated for any cell or range of cells in the spreadsheet model.

@RISK program graphs probability distributions of possible outcomes for each @RISK output cell. @RISK graphics include:

- Relative frequency distributions- and cumulative probability curves
- Summary graphs for multiple distributions across cell ranges (for example, a across a row of time series values)
- Statistical reports on output distributions
- Probabilities for target values in a distribution

All the necessary information related to software capabilities and usage is provided in the related User's Guide [11].

In order to assess long-term environmental risks characteristic to four types of sanitary landfills based on premises described in the companion research article [1], four spreadsheet models were constructed each one representing one landfill type (Figs. 3, , , -6).

The four landfill types were modeled as if being individual landfills occupying equal footprint areas in contact with the subsoil (5 hectares). During the initial phase (when attributing input variables with probability density functions) attempts were made to consider all the detected heterogeneities, complexities and uncertainties which are characteristic of different landfill types to be included into the model. Landfills were compared based on size-equivalence criterion (see Section "Functional-equivalence problem performing comparative risk assessments"), therefore, all landfills representing antagonistic types were considered to have approximately equal capacities (~500.000 t). All were placed in the same hydrogeological and hydrological setting (humid climate, thin semi-permeable vadose zone was considered to separate landfill subgrade from the water table). Consequently, large part of annual precipitation was supposed to be transformed into surface run-off, but weak leakages typical for lined landfills were supposed to result into an unmitigated transport of pollutants all the way down to the aquifer. Outputs- results are presented in the related research- and data description articles [1,2].

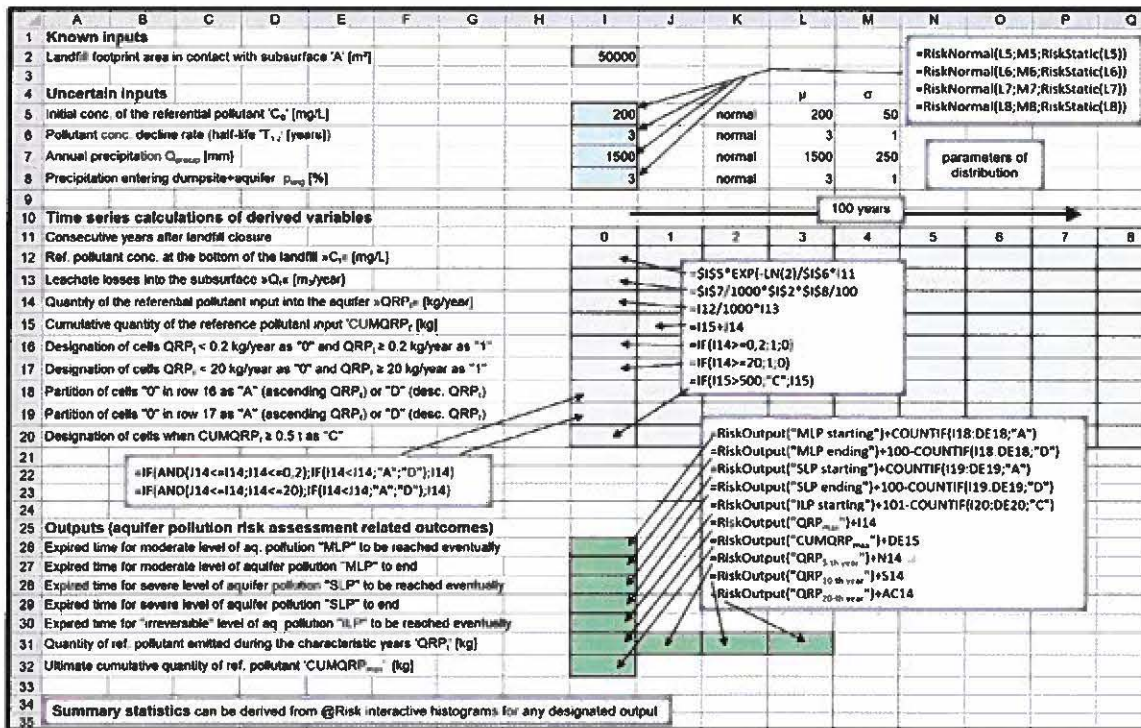


Fig. 3. Above-ground dump site spreadsheet model.

The method is not intended to be fixed once and for all. More sophisticated formulas can be build for distinctive purposes, etc.

Functional-equivalence problem performing comparative risk assessments

In general, overall risk assessment setting consists from three constituent parts, separately defining the source of a potential hazard, pathways by which the damage may occur and the receptor of a potential hazard. When referring to the case described in the research article [1], the

1. source was represented by a 5 ha, 500.000 t large closed sanitary landfill situated in a humid environment
2. pathway was represented by a semi-permeable vadose zone lying underneath the landfill, and
3. receptor was represented by a thoroughly researched aquifer lying underneath the landfill and the vadose zone

Great part of the eventual ambiguity related to functional equivalence problem stems from the fact that different ways are possible according to which the source of the potential hazard can be defined.

When performing any form of comparative analysis it is essential that technological alternatives are compared either based on functional- or size equivalence criterion. It has to be acknowledged that risk assessment settings are not supposed to be the same when performing -

- comparisons between the individual landfills of different types vs. performing comparisons between the presumed individual landfills representing landfill types as groups, taking into account overwhelming internal diversity which exists among the landfills appertaining to each particular group
- comparisons between the landfills of equal capacities sited over the same footprint area vs. performing comparisons of landfills of functionally realistic capacities sited over the same footprint area

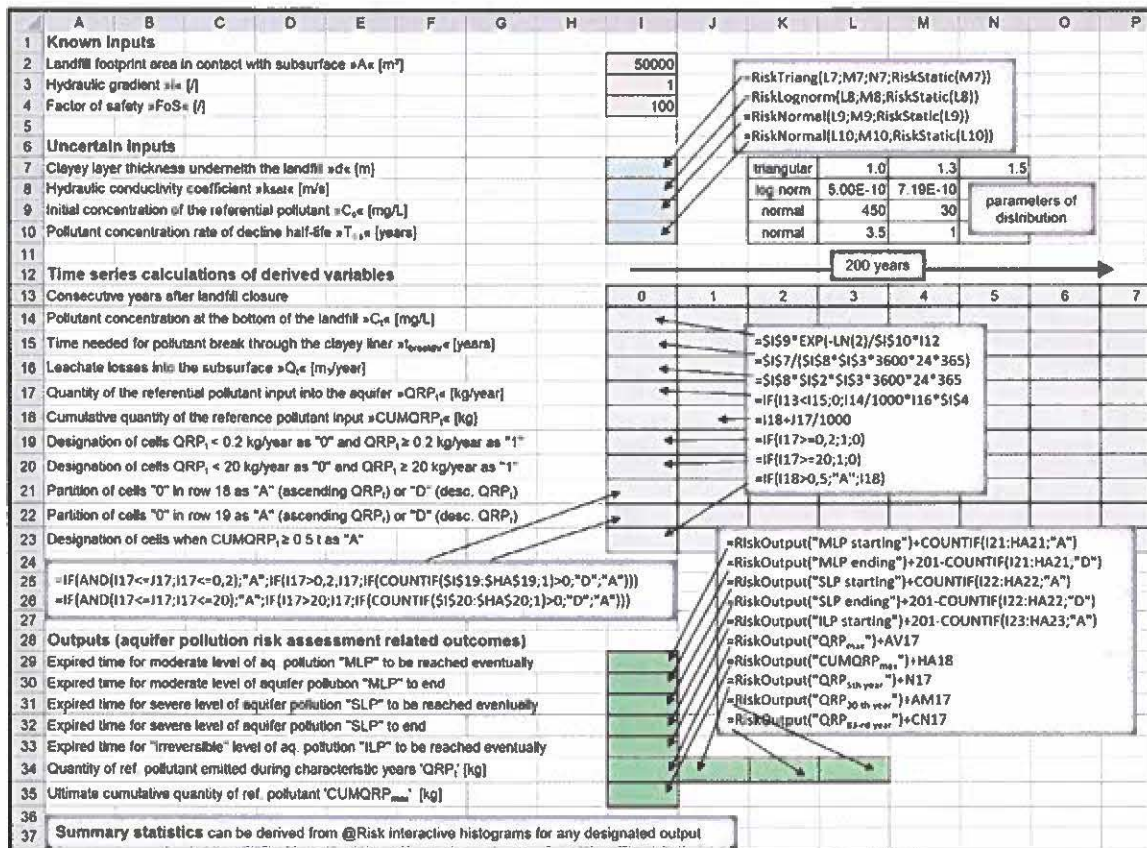


Fig. 4. High-permeability landraise spreadsheet model.

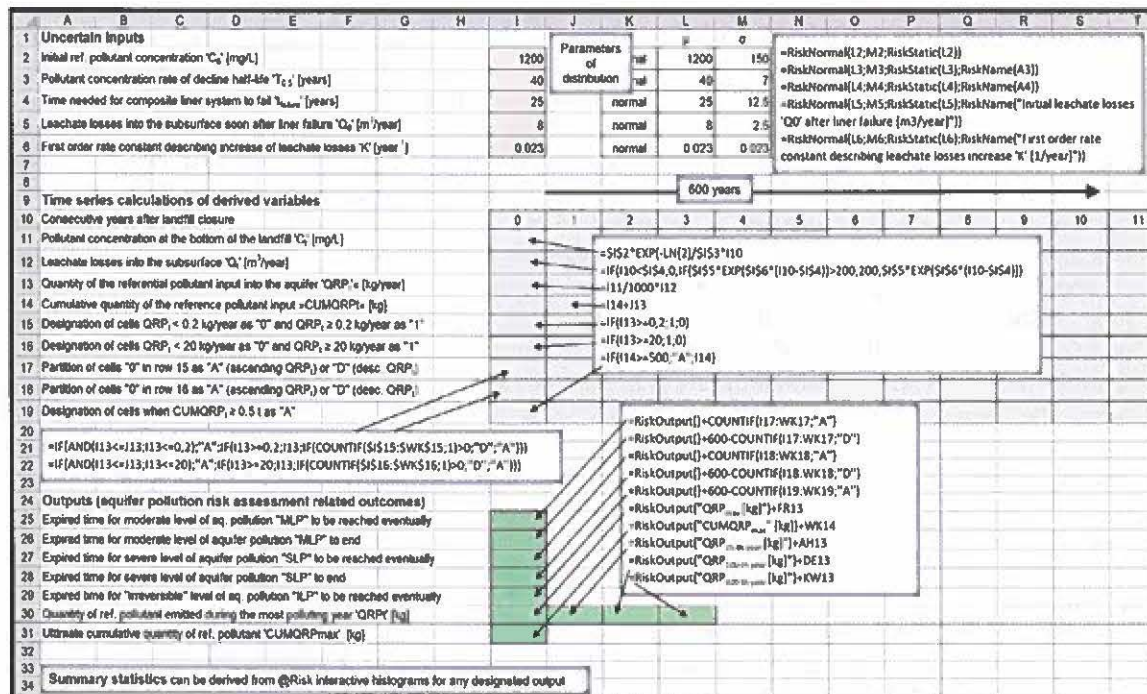


Fig. 5. Modern dry-type landfill spreadsheet model.

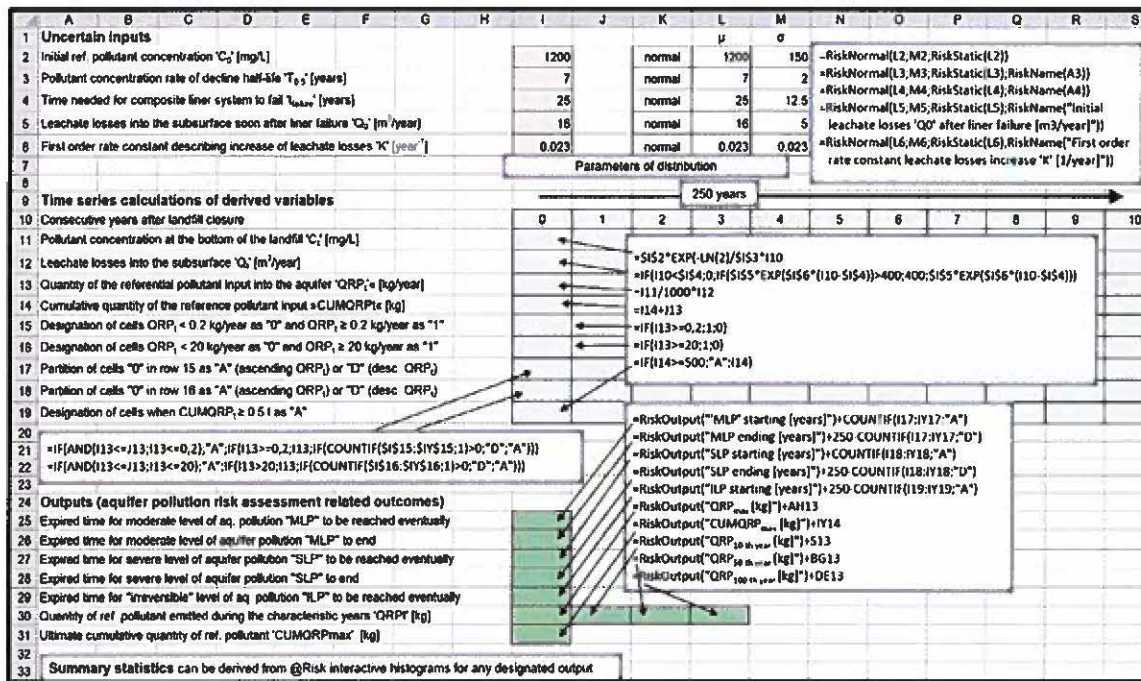


Fig. 6. Modern wet-type landfill spreadsheet model.

Therefore, different criteria could have been used to compare long-term groundwater protection efficiency of different types of sanitary landfills when referring to the research article [1]. Each of the four possibilities (which are graphically presented in Fig. 7) are contemplated below:

- The task of the study [1] was to compare environmental performance of four equally large sanitary landfills representing different landfill types in a wholistical way. *Size equivalence criterion #2* was therefore applied for the purpose. Characteristics of the presumed landfill included whole range of possible heterogeneities and complexities which exist among the landfills appertaining to a particular landfill type, resulting in a rather wide spread of possible values for the inputs.
- The purpose of the analysis presented in the research article [1] could have been 'slightly' different, e.g., intended to compare long-term groundwater protection performance of four clearly defined individual landfills of four different types after their closure. In this case the common source of hazard would have been defined as a singular 5 ha large sanitary landfill of 500.000 t capacity situated in a moderately humid environment which received waste with quite exactly known composition. Also, large quantity of historic monitoring data is assumed to exist for each of the four landfills (e.g., regarding quality and quantity of the primary leachate, composition and amount of the captured landfill gas, historic weather station data, etc.) as well as technical information (landfill design, mode of operation, etc.). In such a case *size equivalence criterion #1* (see Fig. 7) would be applied. However, even if the four landfills were so well defined, the problem still appears to be too complex to be solved deterministically. Inputs should still be attributed with probability distributions of possible values because of the uncertainty factor. By using the proposed method, both, #2 and #1 tasks can be assessed in the very same way, only that in the second case the selected distribution of possible values for particular uncertain inputs would be much less spread and the average values much more precise, dependent on the available amount of useful information.
- We could have been interested in comparing environmental performance of four sanitary landfills lying over the same footprint area as in the cases #1 and #2, which however did not receive the same amount of waste during their operational phases but rather received technically probable amounts of waste (therefore, functional differences which exist among different landfill types from the aspect of their probable landfill capacities over a particular landfill

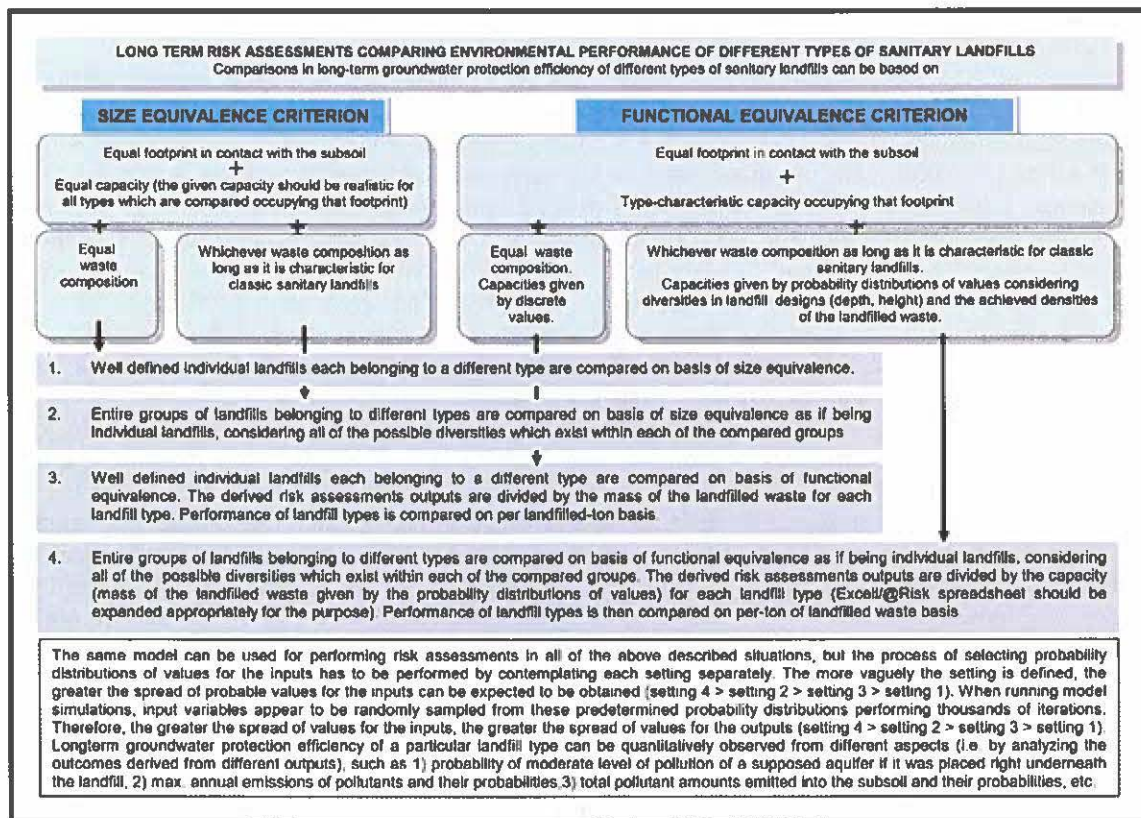


Fig. 7. Demonstration of possible criterions to perform comparative risk assessments analysing differences between landfill types.

footprint area would be taken into account). The same model can be used, but there are some important differences. For example, modern landfills (usually designed as combined pit-and-mound facilities) generally accommodate two- three- four times more waste over the same footprint area than the low- density above- ground waste deposits. Defining the task in this way, we would be ultimately comparing long-term environmental performance of different landfill types on per-ton basis of the landfilled waste (i.e., *functional equivalence criterions* #3 or #4 as presented in Fig. 7 would be applied). However, this does not mean that the related results solving problems #3 or #4 using the proposed methodology would be now shifted 2- 3 –4 times in favor of modern landfills comparing them to the results solving problems #1 or #2, although some shift in this direction is of course to be expected. It has to be taken in mind that risk assessment outcomes for a 5 ha large modern landfill with the capacity of e.g. 1.500.000 t would be worse than for a 5 ha large modern landfill with a capacity of 500.000 t. Probability distributions of some of the inputs would not be the same in both of cases. Specifically, the parameter “rate of reference pollutant concentration decline” expressed as half-life period ‘ $T_{0.5}$ ’ would be shifted upwards (average ‘ $T_{0.5}$ ’ value would be larger) if the landfill capacity over the same footprint area was larger. In other words, higher, deeper, denser landfills stabilize more slowly on average than lower, shallower, less dense landfills, triggering greater environmental risks.

Many questions can arise out of this explanation. For example:

Question 1: Why is ‘ $T_{0.5}$ ’ the most important input which has to change when dealing with differences in landfill capacities over the same footprint area and not e.g. the input ‘ C_0 ’ or the input ‘ t_{failure} ’ (time needed for composite liner system to fail)?

Question 2: The overall pollution potential accumulated over the 5 ha footprint is ~3 times larger if the capacity of the modern landfill was 1.500.000 t instead of 500.000 t. Should not the

calculated long term emissions into the subsoil or the acquired probabilities of aquifer contamination be approximately three times larger, too?

Answer 1a: ' C_0 ' is strongly related to factors such as (1) biodegradable matter content within the buried waste and (2) practice of sanitary covering used during the active waste disposal phases. These factors would remain basically the same if a 5 ha large modern landfill had the capacity of 500.000 t instead of 1.500.000 t. On the other hand, in the later case, the landfilled waste would be denser on average, initial aerobic phase shorter, liquid to solid ratio smaller and conditions in general more anaerobic. Therefore, the selected average ' C_0 ' value for a large capacity modern landfill would be generally greater than for a small capacity landfill of the same type stretching over the same footprint area. However, average ' C_0 ' values for $\text{NH}_4\text{-N}$ are not likely to be larger than 1200 mg/L, since this value is already high for anaerobic landfills undergoing stable methanogenic phase (e.g., [Table 2](#)). Therefore, trying to find the right selection of average values for ' C_0 ' and ' $T_{0.5}$ ' as a set is a better approach than trying to find the correct averages for ' C_0 ' and ' $T_{0.5}$ ' separately.

Answer 1b: Eventual argument that major differences in probabilities for the parameter "time needed for composite bottom liner system to fail" have to be considered when comparing a 5 ha modern landfill which received 1.500.000 t of waste to the one which received only 500.000 t can not be reasonably substantiated. It's true, if landfill capacity was greater the overburden pressure would be larger and the amount of pollutants conveyed through the leachate drainage and conveyance systems would be ultimately larger, too. However, the probabilities for leachate drainage layer to be thicker and tension properties of the implemented geomembrane to be better would also be greater, cancelling the opposing factors out. Therefore, in general, the same probability distribution for the input ' t_{failure} ' would be used for both of settings.

Answer 2: Due to 3 times larger overall pollution potential, the potential for generating reference aqueous pollutant within the landfill appears to be ~3 times larger, too. However, most of this additional pollutant would be ultimately pumped out with the leachate. For modern landfills it is inherently expected leachate withdrawal and treatment systems are installed and function properly most of the time for the duration of at least 30 years after landfill closure. Therefore, this additional amount of pollutant would not have much effect on emissions into the subsoil. However, post-closure time until the time the landfill becomes stabilized would last longer, consequently, longer time would be on disposal for aquifer to become polluted. If "mean value = 60 years" and "st.dev. = 10 years" were used to characterize probability distribution of the input ' $T_{0.5}$ ' representing 1.500.000 t large dry-type modern landfill instead of "mean = 40 years" and "st.dev. = 7 years" representing 500.000 t large landfill, the ultimate cumulative quantity of the reference pollutant released into the aquifer would increase to ~11.200 kg from ~7100 kg (both values given as 95 percentiles) by using spreadsheet model as presented in [Fig. 5](#). Therefore, 3 times larger pollution potential accumulated at a particular site does not imply the related groundwater pollution potential to be 3 times larger, too.

Theoretically, we could have been interested in comparing environmental performance of four types of landfills (as presented in the Section "*Types of sanitary landfills*") lying over an 5 ha large footprint area (as in the cases #1, #2, #3 and #4), this time implementing size-equivalence criterion considering common landfill capacity of 1.500.000 t for all landfill types. However, such comparison would have been null and void, because neither above-ground dumpsites nor HPL's can exist occupying a footprint area of just 5 ha. It is up to a environmental engineer/scientist who performs comparative assessments to use the model appropriately, avoiding making functionally disequivalent comparisons.

Modeling approach used to calculate contaminant transport through a HPL's compacted clay liner

Main points here are to explain

- why was advection the only transport mechanism considered to calculate migration of a reference pollutant through a CCL at the bottom of HPL-type of landfill as presented in Section "*Approaches used to calculate leakings when referring to the companion research article*".

- the reason for introducing FoS factor (i.e., Factor of Safety) into the HPL-related risk assessment mathematical model as presented in spreadsheet Fig. 4.

Once the CCL's hydraulic conductivity is lower than 1×10^{-9} m/s, molecular diffusion becomes more important pollutant transport mechanism than the simultaneously occurring advection mechanism [16]. Diffusion was not considered in the actual model which can be perceived as a deficiency. However, in contrast to conventional dry-type landfills, where concentration gradient through the clay liner situated underneath the (eventually) leaky geomembrane is large and lasts for centuries, this is not the case for HPL's. Concentration gradient in HPL's is low from the beginning and diminishes rapidly during the course of time after landfill closure because leachate quality improves fast through the years. After two decades, concentration gradient becomes too small to be considered as a relevant pollutant- transport- driving force any more even if high values for diffusion coefficient ($D \approx 10^{-9}$ m²/s) were considered for the calculation. Such condition develops decades before the pollutants manage to penetrate the CCL and break through on the other side of CCL.

As presented in the spreadsheet model (Fig. 4) fugitive flux of pollutants is acquired by multiplying time-dependent value ' C_t ' (reference pollutant concentration at the bottom of the landfill) with fugitive water flow through the clay liner ' Q_t ' driven by the hydraulic gradient which exists between the upper and lower CCL planes. Fugitive pollutant flux is therefore calculated at the upper CCL plane. However, leachate derived pollutants begin to be emitted into the subsoil only after the original, natural pore water was already largely pushed out of the CCL. ~80 years on average are needed for pollutants to penetrate the liner and break through on the other side (at the same time having in mind that a single simulation performing thousands of iterations consists of scenarios with calculated migration times as different as '35 years' and '120 years' post-closure (which is the consequence of the fact that the inputs 'hydraulic conductivity' and 'CCL thickness' were attributed with probability density functions, not with discrete values).

Once the breakthrough occurs, the pollutant fluxes on the upper and lower CCL planes would be equal only if pollutant concentrations were equal on both sides. This would be theoretically the case only if long-term rate of decline in pollutant concentration within the primary leachate (expressed as half life period) would be the same as long-term rate of decline in concentration of pollutants which already infiltrated into the CCL. Processes involved in pollutant concentration decrease are however different within the two environments: biodegradation and washout of pollutants are the important processes going on within the landfill interior, while dispersion (mixing/dilution), retardation, irreversible sorption and biodegradation are the related simultaneously occurring important processes taking place within the CCL.

It is likely that long-term decrease in pollutant concentration is faster in CCL than in the landfill interior due to pulse-like initial input of pollutants into the CCL, allowing rapid dilution of the concentration plume (i.e., large bulk of pollutants penetrate the CCL during the first ten post- closure years). For modeling purposes, however (in order to be on the conservative side when performing risk assessments referring to HPL as a low-cost landfill type), the product $C_0 \cdot \text{EXP}(-\ln 2/t_{0.5}) \cdot Q_t$ was multiplied with a "factor of safety" $\text{FoS} = 100$. The same result would be acquired by applying two times longer half-time for the parameter "reference pollutant decline in primary leachate" in the formula for calculating ' C_t ' (i.e., $t_{0.5} = 7$ years instead of $t_{0.5} = 3.5$ years).

Explanation from another perspective:

Concentration within the primary leachate decreases 100 times in 24 years when considering rate of decline employing half-time period $t_{0.5} = 3.5$ years (as used in the model). By multiplying the formula with the "factor of safety" value of $\text{FoS} = 100$, the calculated pollutant flux *out of CCL* (through the bottom plane) appears to be equal to the pollutant flux *into the CCL* (through the upper plane) 24 years before.

Model verification and validation

Risk derives from our inability to predict the future. Even though the outcome is uncertain, an objective risk can be described precisely based on theory or experiment. In contrast, describing the chance of a bottom liner to fail (defined as the chance that landfill- derived aqueous pollutants will

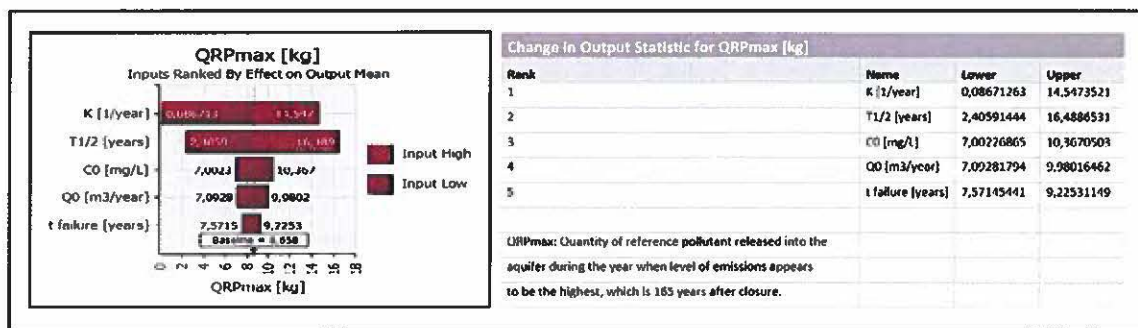


Fig. 8. Example of an @Risk sensitivity analysis report.

be detected in the downstream monitoring well) is not clear and this represents a subjective risk. Given the same information, expert A might conclude there is a 80% chance some kind of failure will happen during the first 100 years after landfill closure whereas expert B might conclude the chance is only 50%. Neither of the two is necessarily wrong. Describing a subjective risk is open-ended in the sense that anyone's assessment could be always refined with new information, further study, using different approach or by giving weight to the opinion of others [11].

Also, deciding that something is risky requires personal judgment, even for objective risks. For example, many experts know or feel that dry-type landfills are generally safe facilities in the short-term but risky in the long-term if situated in hydrogeologically vulnerable environments. However, most people weight short-term risks much more critically than long-term risks. That's probably the main reason why dry-type modern landfills appear to be favored in many parts of the world which manifests itself in environmental regulations, too.

So called “@Risk Output Reports” were included as a supplemental material to the companion data-description article [2]. Sensitivity analyses of some of the outputs (maximal annual emission rates and maximal cumulative amount of the reference pollutant released into the environment) were an integral part of these reports. Input variables were ranked according to the effect they have on the outputs for each of the four landfill types. Sensitivities were presented in graphical and tabular forms evaluating the effects on the output averages if input values given by probability distributions were low, high or anything in between (see Fig. 8). As expected, the most critical inputs are the ones which are the least accessible and validable: “time needed for bottom liner to fail” (wet-type modern landfills), “rate of leakage increases after the system fails” (dry-type modern landfills) and “percentage of annual precipitation transformed into a leachate flow down to the aquifer” (above-ground dump sites).

Validation of a model assumes that measurements performed in the real world would confirm or deny the outcomes derived by modeling. However, a probabilistic model gives a distribution of possible outcomes as a result and gives some measure of how likely each outcome is to occur. Therefore, it is not possible to deterministically calibrate or validate a probabilistic model by performing measurements in the field; measured values will comply with the model as long as they fit within the range of probable values derived by modeling. Also, realistic landfills are not placed in the same environmental setting as were those which were evaluated in the model for purposes of performing comparative risk assessments [1]. Last but not the least, long term events will happen in the future, they can not be assessed in a real time.

Nevertheless, already available monitoring data acquired from the real world should agree well with the modeling results presented in the related research article [1] on an area unit (e.g., hectare) basis, because input parameters were also attributed with probability distributions of values taken from the real world - the applied model is robust enough. Assume a conventional dry type landfill which was closed 10 years ago somewhere in the USA. If the assumed landfill does not leak (i.e., zero emissions into the subsoil were detected 10 years after closure), compliance with the model would be excellent. According to the model, it is 85% probable $\text{NH}_4\text{-N}$ emissions would be zero, 90% probable to be smaller than 1.1 kg/(ha-year), 95% probable to be smaller than 1.9 kg/(ha-year), 99%

probable to be smaller than 3 kg/(ha-year) and 100% probable $\text{NH}_4\text{-N}$ emissions would be smaller than 6.5 kg/(ha-year). Or, assume modern bioreactor landfill large 10 ha somewhere in developed world which was closed 5 years ago. If somehow fugitive emissions were detected and evaluated to be around 20 kg $\text{NH}_4\text{-N}$ /year, that would comply well with the given model, too (according to modeling results it is 90% probable emissions would be zero, 95% probable emissions would be smaller than 12 kg $\text{NH}_4\text{-N}$, 99% probable they would be smaller than 35 kg and 100% probable they would be smaller than 62 kg).

First sector of the pilot HPL (Ajdovščina, Slovenia) which was receiving waste from the early 1980s was closed in 2005. Two boreholes located just 3 m apart were drilled into the landfill and screened at that time. Leachate samples from the bottom of the landfill are occasionally taken and analysed as well as samples representing extremely small quantities of interstitial water which exists at the interface between the natural clayey stratum and marly flysch lying 4.5 m underneath the landfill bottom. The interstitial water is still found to be uncontaminated with the leachate-derived $\text{NH}_4\text{-N}$, which complies very well with the acquired modeling results.

Similarly to the outputs, probability distributions attributed to some inputs can not be deterministically validated, too. For example, technical life-times of landfill barrier systems in field-scale applications are largely unknown. Different models are used to assess long-term performance of bottom liner systems. Probability distribution provided by Pivato 2011 [12] appears to be exceptional since the related raw data were literally taken out of the real world. All of the myriad factors which could have been involved in landfill containment system failures were encompassed, which includes the impacts triggered by human factors, too. When looking from this standpoint, probability distribution used in the actual model was already validated in the field. Still, the degree to which the derived failure probability curve appears to be relevant for predicting events far into the future remains to be unknown.

Declaration of Competing Interest

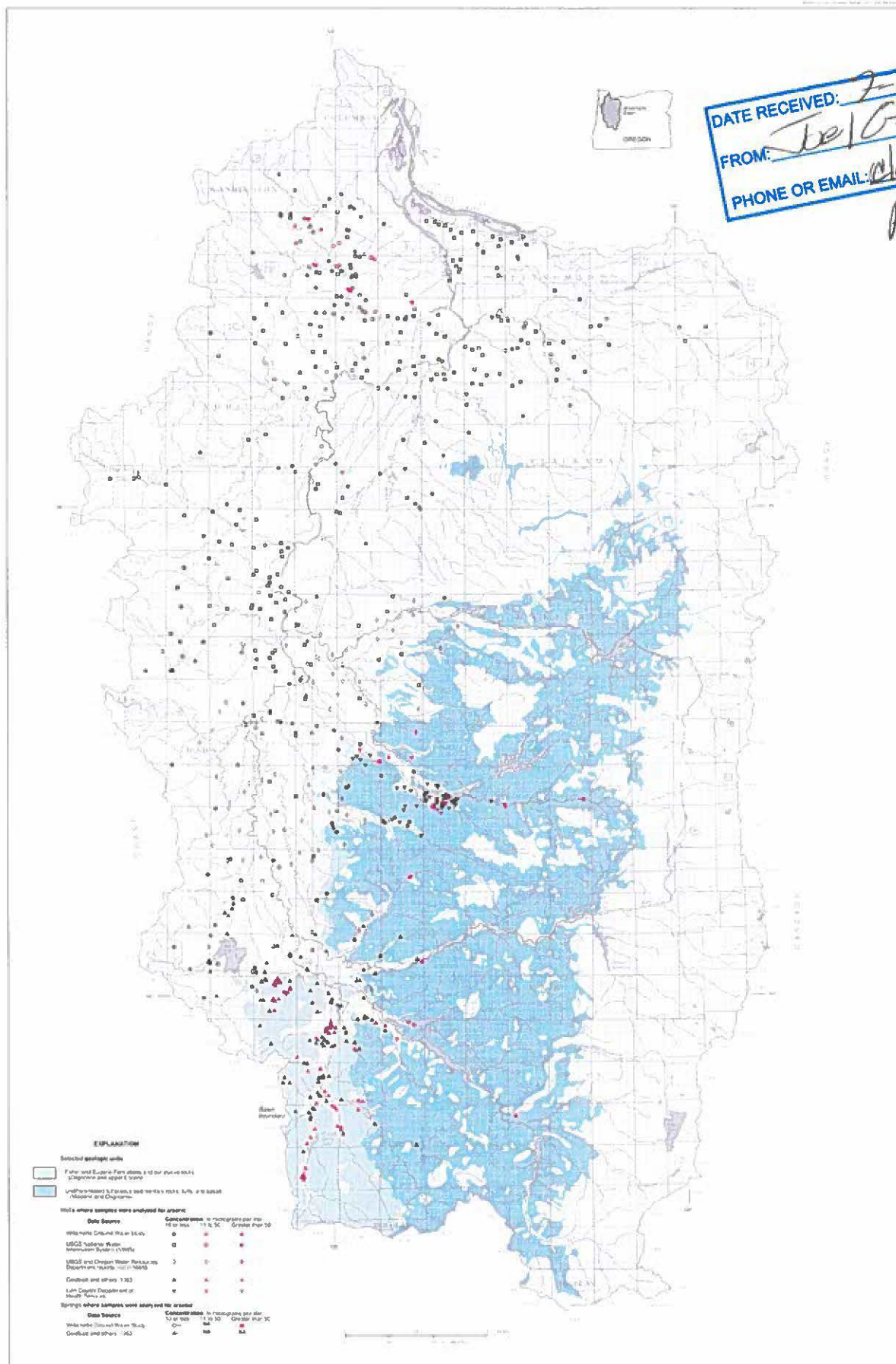
The Authors confirm that there are no conflicts of interest.

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DATE RECEIVED: 7-9-05
FROM: Ted Geier
PHONE OR EMAIL: clearwater@peak.org

DISTRIBUTION OF ARSENIC CONCENTRATIONS IN GROUND WATER, AND
SELECTED GEOLOGIC UNITS OF THE WILLAMETTE BASIN, OREGON
By
Daniel J. Polenc and Stephen R. Hinkle

U.S. GEOLOGICAL SURVEY
WATER RESOURCES DIVISION
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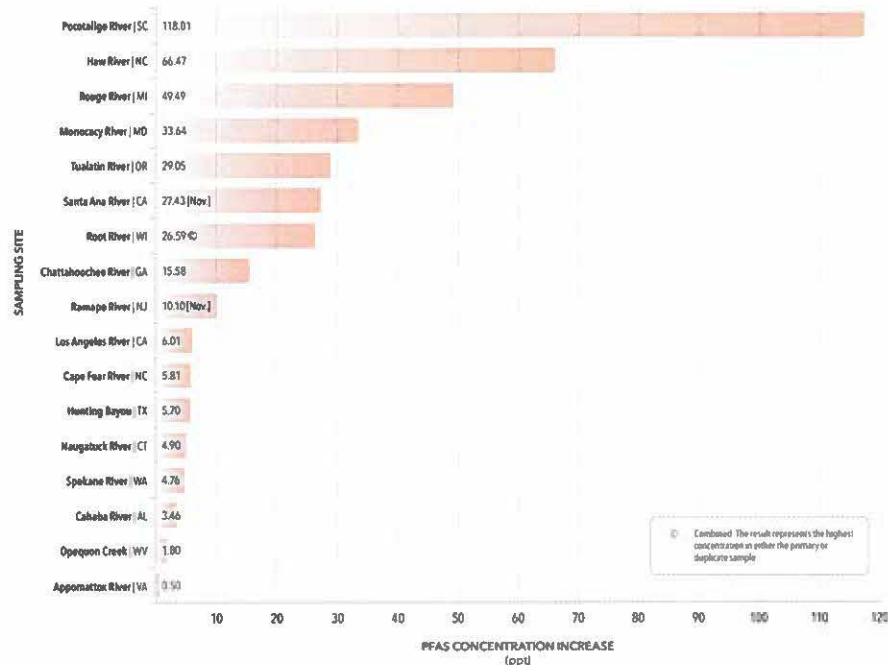
DEVELOPED FROM DATA BY DANIEL J. POLENC

Table 10 | Total PFAS Concentrations Upstream and Downstream from WWTPs

State	Waterbody	Waterkeeper	Total PFAS (ppt)		Increase or Decrease (ppt)	Percent Increase or Decrease
			Upstream	Downstream		
AL	Cahaba River	Cahaba Riverkeeper	38.07	41.53	3.46	9.09%
	Big Wills Creek	Coosa Riverkeeper	15.04	12.71	-2.33	-15.49%
CA	Santa Ana River [Nov.]	Inland Empire Waterkeeper	89.70	117.13	27.43	30.58%
	Los Angeles River	LA Waterkeeper	69.79	75.80	6.01	8.61%
CT	Naugatuck River	Long Island Soundkeeper	41.60	46.50	4.90	11.78%
FL	East Canal	Tampa Bay Waterkeeper	No Sample	58.91		
GA	Chattahoochee River	Chattahoochee Riverkeeper	17.52	33.10	15.58	88.93%
MD	Monocacy River	Potomac Riverkeeper	26.28	59.92	33.64	128.01%
MI	Rouge River	Detroit Riverkeeper	33.71	83.20	49.49	146.81%
MS	Pearl River	Pearl Riverkeeper	No Sample	20.71		
NC	Haw River	Haw Riverkeeper	78.07	144.54	66.47	85.14%
	Cape Fear River	Cape Fear Riverkeeper	51.93	57.74	5.81	11.19%
NY/NJ	Ramapo River [Nov.]	Hackensack Riverkeeper	22.10	32.20	10.10	45.70%
OR	Tualatin River	Tualatin Riverkeepers	0.97	30.02	29.05	2,994.85%
RI	Pawtuxet River	Narragansett Bay Riverkeeper	39.40	39.00	-0.40	-1.02%
SC	Pocotaligo River	Black-Sampit Riverkeeper	110.38	228.39	118.01	106.91%
TX	Hunting Bayou	Bayou City Waterkeeper	57.77	63.47	5.70	9.87%
VA	Appomattox River	James Riverkeeper	21.11	21.61	0.50	2.37%
WA	Spokane River	Spokane Riverkeeper	1.24	6.00	4.76	383.87%
WI	Root River	Milwaukee Riverkeeper	29.44	56.03	26.59	90.32%
WV	Opsequon Creek	Upper Potomac Riverkeeper	45.10	46.90	1.80	3.99%
	Ohio River	West Virginia Headwaters Waterkeeper	21.95	18.86	-3.09	-14.08%

Combined: The result represents the highest concentration in either the primary or duplicate sample

Figure 11 | Amount of Total PFAS Increase Downstream from WWTPs



As shown in Table 10 (p. 34) and Figure 11 (above), at WWTPs:

MICHIGAN

The Rouge River's total PFAS concentration increased from 33.71 ppt upstream to 83.20 ppt downstream from the GLWA WRRF—an increase of 49.49 ppt or 146.81%.

OREGON

The Tualatin River's total PFAS concentration increased from 0.97 ppt upstream to 30.02 ppt immediately downstream from the Rock Creek WRRF—an increase of 29.05 ppt or 2,994.85%.

SOUTH CAROLINA

The Pocotaligo River's total PFAS concentration increased from 110.38 ppt upstream to 228.39 ppt downstream from the Sumter Pocotaligo River Plant—an increase of 118.01 ppt or 106.91%.

NORTH CAROLINA

The Haw River's total PFAS concentration increased from 78.07 ppt upstream to 144.54 ppt downstream from the Graham WWTP—an increase of 66.47 ppt or 85.14%.



July 8, 2025

Good evening Chairman Fowler, Planning Commissioners and staff,

I'm Camille Hall and I live at 7175 NW Mountain View Drive, Corvallis.

I oppose LU-24-027, expansion of Coffin Butte Landfill.

Thank you for the long hours and effort you have put into this review.

This land use hearing is the only place where residents have standing in decisions made about the use of this property, through these requirements:

BCC 53.215 (1) "The proposed use does not seriously interfere with uses on adjacent property, with the character of the area, or with the purpose of the zone;

(2) The proposed use does not impose an undue burden on any public improvements, facilities, utilities, or services available to the area"

Much of the testimony in opposition to the expansion has been brought up before. What is new is the decision by staff to accept the applicant's responses to our concerns without effectively addressing those concerns. CUP approval or denial is the only chance Benton County has to stand up for the rights of residents whose properties and lives would be so profoundly impacted by this expansion. Once the CUP is approved, not only will the tonnage cap be lifted, but Valley Landfill will be free to operate Coffin Butte Landfill, with insufficient State & Federal regulatory support and lack of County resources to develop rules and expertise to effectively monitor this privately-owned landfill.

RS is a \$75-billion dollar corporation with 200+ active landfill sites nationwide. It is not focused on the needs of the community. That is our job, as a County. The CUP process is the only place the County has the power and authority to protect adjacent property owners with regard to their ability to live and work on their property.

The primary concern I will address here is groundwater protection for properties adjacent to the expansion site.

The applicant's supplemental response to our groundwater concerns state that a "focused hydrogeologic investigation of the proposed development" will occur AFTER the CUP as part of the site development permit. The Planning Commission needs to look at this data now, prior to approval, in order to anticipate how the proposed development will affect adjacent properties. We need to know in site-specific terms, how the blasting and excavation might affect the groundwater and wells on those properties. The applicant's plan relies on test wells and mitigation in response to perceived damage. This approach meets the needs of the landfill operator, but completely fails to protect adjacent property owners from the serious and irreversible damage that will occur if groundwater is diverted, well levels drop or wells are contaminated. Republic Services and the County have a history of negotiating mitigation of water contamination from the landfill by capping off contaminated wells, offering supplemental water, and in the worst case, buying the damaged property.

The applicant provides only that historical data and modeling which support their interests. For example, the discussion and map on p. 56 of the supplemental staff report only deal with internal groundwater flow into the expansion site. They assert there will be no crossover of groundwater from the landfill onto adjacent properties as a result of blasting and fail to discuss the direction of groundwater flow from the top of Tampico Ridge and the blasting zone onto those adjacent properties. The same is true of groundwater flow across the highway.

Their response to our concerns, addressing the effect of Development on Dewatering, on p. 57 of the staff report states: "VLI's evaluation of the impacts to local water supply wells considers the relative consistency of the groundwater flow conditions to support a conservative assumption that fractured bedrock behaves similarly to a porous media. Under this assumption, all fractures are interconnected, allowing the analytical solution to evaluate the most widespread effect of the proposed project..." The applicant does not provide evidence to convince us of the factual basis for this assumption.

The overarching problem is the highly technical nature of this application, involving many specialized fields of study. Republic Services has the financial advantage of being able to call on consultants and experts who have supported and defended their landfill operations and applications nationwide. Staff, county and state agencies, on the other hand, are hampered by lack of funding and broader public responsibilities. In several places throughout the review, staff and agency comments specifically defer to the applicant on topics where, in the course of their regular duties, they do not have the authority or expertise to comment. We cannot let these issues slide. In these cases, we ask that the appropriate agencies and unbiased topic experts be called on to evaluate the applicant's work.

In the case of groundwater protection, we specifically request that the Oregon Water Resources Department be notified of the landfill expansion application and water quality issues raised by the community. As the state agency most knowledgeable and with the broadest authority over water resources and rights in Oregon, the County should request them to review and comment prior to final CUP deliberations by the Planning Commission.

From 2010-2016, Coffin Butte took in 500-600,000 tons of trash per year. Beginning in 2017, annual tonnage doubled. We know first-hand the impacts of these tonnage and activity increases. A decision to approve this CUP enables Republic Services/VLI to continue its trend to fill space quickly and come back for another landfill expansion. It also allows Republic Services to remove trash from cell 6 in order to resume blasting and removal of valuable basalt from the old quarry before it resumes dumping in cell 6. As you heard in May from Bill Briskey who owns property adjacent to cell 6, blasting that occurred to expedite opening of cell 6 caused the loss of his livestock pond and cracks in an outbuilding foundation. The applicant chose not to address the loss of the livestock pond and dismissed the foundation cracks as not blast-related.

I urge you to deny this application. The applicant has finally offered remedies to some of the most egregious operational problems that have plagued this site. There is more work to do. Denial of the CUP is the only avenue you have to protect the land use rights of Benton County residents and ensure that you get the best possible proposal from Republic Services.

Benton County Planning Commissioners c/o Planning Division
4500 SW Research Way, Corvallis, OR 97333
July 9, 2025

DATE RECEIVED:	7/9/25
FROM:	Kate Harris
PHONE OR EMAIL:	

RE: LU-24-027 Conditional Use Permit Application Regarding Landfill Expansion:
Adair Village Drinking Water

Good Evening Chair Fowler & Commissioners,

My name is Kate Harris, I reside at 37268 Moss Rock Dr, 4 miles due south of Coffin Butte Landfill. I have a degree in Civil Engineering from the University of Portland, in which I studied water treatment plants, wastewater treatment plants, and solid waste management, including Coffin Butte Landfill specifically. Thank you for the long hours you've put into this process & for your thoughtful consideration of this matter, the future of our county & our neighbors rests upon your shoulders. I do not envy your current task.

Thank you to Virginia Scott for her time, please refer to her written testimony submitted today regarding a rebuttal about fire considerations, including this quote: "Self-monitoring by Republic Services is like the fox guarding the hen house. Thus approval with conditions is exactly the same as approval without conditions. These conditions will never be met, no monitoring will be done, no repercussions to Republic Services will occur, all bad current behavior will continue unabated on a larger scale, and the community, environment, businesses, forest, land, people, health, air, water, wildlife, etc., will suffer (dead hens in the hen house). This is the very the definition of undue burden."

I'm here this evening to discuss the impact of Coffin Butte's current and future operations on waterways, the environment & drinking water. My points are relevant to this expansion discussion, because any expansion will only exacerbate the issues I will raise.

To quote *The Brocovich Report* publication's article, "No Surprise: PFAS Found Near Wastewater Treatment Plants & Biosolid-Applied Lands":

"A new analysis from Waterkeeper Alliance warns that 98 percent of tested waterways across 19 states contain toxic per- and polyfluoroalkyl substances (PFAS), and in particular downstream from wastewater treatment plants (WWTPs) and sites where biosolids have been applied. The researchers connected this finding to the disproportionate siting of sources of environmental pollution including PFAS contamination such as major manufacturers, airports, military bases, wastewater treatment plants, and landfills that are typically located near watersheds serving these communities. Listen, we've known we have a huge PFAS problem, and now we have more data to prove it. That's a good thing. American communities are exposed daily, often unknowingly, and many face serious, disproportionate health risks. The tools to address this crisis exist, but the political will is lacking. We cannot afford more watered-down regulations and loopholes for industrial source

polluters. The science is clear: EPA and lawmakers must act decisively, and with urgency, in the public's interest. If you get your drinking water from a private well, you may want to test your water to find out exactly what's in it. You can contact a state-certified lab for professional analysis. Some counties may offer free or discounted tests, so check with local authorities first."

Does Republic or the County offer these free tests to residents?

Republic testimony yesterday stated that an official from Adair Village said there was not a problem with PFAS contamination.

That is most likely "true" as it has apparently never been tested, or the very least, **never been reported to the public**. The 2024 water test report is available <https://adairvillage.org/wp-content/uploads/2025/06/Adair-Village-CCR-2024.pdf>

To clarify discussion yesterday about Adair Village. Pat Hare is the City Administrator for the City of Adair Village, and I believe he may be the entity referenced by Petra yesterday, as the one who was contacted twice, but chose to give no input. I do not know if his City Council or Mayor was privy to that discussion or their ability to provide input. Adair Rural Fire Protection District is a separate and unrelated organization, which was never contacted by the county regarding this expansion application, although did voluntarily submit testimony in May. The county did not seek interested-party information from the fire district.

Back to the discussion of Adair Village's drinking water. Pat Hare and his family live in Scio and therefore he doesn't have any specific family safety concerns with the quality of water in Adair Village. He has done a lot of amazing work for the water system in recent years, and should be very proud of the work he's done, but that work does not guarantee safety. I personally sent an email to him, Adair's mayor, the head of their planning commission, and the superintendent for the school in Adair Village, in 2021, regarding concerns for drinking water safety and air quality. I received no replies. I was told third hand that Pat's method of dealing with concerns like that is to simply ignore the emails. Perhaps that is also what he did with any requests sent from the County.

When I lived on the Adair Village water system from 2014 to 2017, many of us had concerns of extremely high chlorine. Those concerns were dealt with inappropriately, by the same staff that is currently working the water system.

I would not rely on Republic's statement last night that Pat said "his water is fine". Where are the tests? If they wanted to prove it was fine, why did Republic not fund PFAS testing for Adair Village drinking water? Isn't that what a good neighborhood would do? What about all of the neighboring private wells? Where are those test results?

Adair water quality won't be a player in this discussion if Corvallis really stops taking leachate at the end of the year. But as we heard yesterday, Republic doesn't have a plan, so it's still worth discussing.

Pat Hare just received confirmation of \$4 million from the state for his new wastewater treatment plant. Past discussions have included Republic adding funding for that new plant so they could treat leachate there. That discharge is reported to be upstream of the Adair water intake in the Willamette, so Adair water quality really should be part of this discussion moving forward, until we have binding contracts in place stating leachate will not end up in local drinking water sources.

But where will it end up?

Perhaps the discussion should be redirected to what constitutes an undue burden. Any landfill in the Willamette Valley creates an undue burden on the population and waterways in the Valley, and thereby on the character of the area. Republic's own corporate website, discusses that landfills in arid locations produce very little leachate, often so little that it can be used for dust control, on top of the landfill, thereby containing the toxins to the lined cells themselves. Not impacting any population, nearby waterway, or character of the area.

So perhaps this discussion should be less about what drinking water or well tests have or have not been funded by Republic as a good neighbor, and whether or not this landfill should be here at all. Expanding the amount of leachate produced by Coffin Butte is in and of itself an UNDUE BURDEN to the character of the area, namely the environment and entire population of Western Oregon. While we're on that topic, why don't we ask the county to produce the documentation that shows that the expansion into Cell 6, the quarry, is actually approved by permit. Operations in the quarry may also be an unapproved undue burden to the local population and the population of Western Oregon. Republic has the ability to transport and dispose of this waste in arid locations east of the Cascades, via rail, ultimately reducing their truck trips and carbon footprint, counter to the testimony by Linda Brewer earlier this evening. We have seen examples in other counties of waste disposal costs going down with a loss of monopoly and introduction of alternative disposal options, also counter to Ms. Brewer's testimony.

This discussion of expansion here in the Willamette Valley needs to stop, and we need to start discussing how to move waste disposal out of the Willamette Valley.

Thank you for your time over these many months. We all appreciate your efforts.

No Surprise: PFAS Found Near Wastewater Treatment Plants & Biosolid-Applied Lands



ERIN BROCKOVICH AND SUZANNE BOOTHBY



A new analysis from [Waterkeeper Alliance](#) warns that 98 percent of tested waterways across 19 states contain toxic per- and polyfluoroalkyl substances (PFAS), and in particular downstream from wastewater treatment plants (WWTPs) and sites where biosolids have been applied.

Listen, we've known we have a huge PFAS problem, and now we have more data to prove it. That's a good thing.

The Brockovich Report is a reader-supported publication. To receive new posts and support my work, consider becoming a free or paid subscriber.

In fact, elevated levels of PFAS were detected at 95 percent of sites located downstream from WWTPs, while 80 percent of sampled sites downstream from biosolids application fields were also contaminated.

Land application of biosolids refers to the spraying, spreading, incorporation, or injection of sewage sludge (the EPA typically uses the term biosolids) into or onto the land to either condition the soil or fertilize crops or vegetation grown in the soil.

The new report, which was created in partnership with local Waterkeeper groups and the [Hispanic Access Foundation](#), builds on the [2022 Phase I report](#), which found PFAS contamination in 83 percent of tested U.S. rivers, lakes, and streams.

The more we test, the more we find....

The Phase II report looked specifically at sites downstream from permitted biosolids application fields and WWTPs in disproportionately impacted communities in 19

states.

"There is no denying that PFAS contamination is a national crisis," Marc Yaggi, CEO of Waterkeeper Alliance said in a [statement](#). "Our latest sampling confirms that it's widespread and persistent, threatening waterways and public health across the country."

Vanessa Muñoz, waterways program manager at Hispanic Access Foundation added in the statement that "what is often overlooked is who is being exposed to it and why, and unfortunately Latino and other communities of color are disproportionately faced to bear the burden."

These findings build upon a [2023 study](#) led by researchers from Harvard T.H. Chan School of Public Health, which found that people who live in communities with higher proportions of Black and Hispanic/Latino residents are more likely to be exposed to harmful levels of PFAS in their water supplies than people living in other communities. The researchers connected this finding to the disproportionate siting of sources of environmental pollution including PFAS contamination such as major manufacturers, airports, military bases, wastewater treatment plants, and landfills that are typically located near watersheds serving these communities.

The most detected PFAS found:

- WWTPs: PFOA, PFHxA, PFBS, PFPeA, PFHpA, PFHxS, PFOS.
- Biosolids: PFBA, PFBS, PFPeA, PFHxA, PFHpA.

While we do have national drinking water standards for the two main types of PFAS (PFOA and PFOS), we have a gap in federal limits for PFAS in biosolids despite the EPA knowing of its presence [since at least 2003](#). In 2023, EPA [estimated](#) that 60 percent of biosolids were land-applied for agriculture, reclamation, or other uses with [21 percent applied to U.S. agricultural land](#).

31 percent applied to U.S. agricultural land.

Some states like Maine, Connecticut, and Michigan have placed bans or limits on the use of land application of biosolids, but it's a motley mix of regulations.

In 2024, the EPA said it has [no obligation to regulate PFAS in biosolids](#) in a federal lawsuit brought by farmers in Texas, alleging they have been harmed by PFAS contamination from the spreading of biosolids on agricultural land.

"Currently, there is little accountability for PFAS entering our environment and water through poorly regulated pathways," Yaggi said. "American communities are exposed daily, often unknowingly, and many face serious, disproportionate health risks. The tools to address this crisis exist, but the political will is lacking. We cannot afford more watered-down regulations and loopholes for industrial source polluters. The science is clear: EPA and lawmakers must act decisively, and with urgency, in the public's interest."

This [new data](#) is on top of recent research that found PFAS in private wells throughout Pennsylvania.

Waterkeeper Alliance urges EPA and lawmakers at all levels to:

- Establish and enforce federal standards for PFAS in drinking water and surface water discharges under the Safe Drinking Water Act and the Clean Water Act
- Prohibit the land application of PFAS-contaminated biosolids
- Implement class-based regulation of PFAS instead of individual compounds to help address the health risks posed by exposure to multiple PFAS chemicals, prevent harmful substitutions, and streamline monitoring, treatment, and enforcement efforts
- Prioritize funding for PFAS monitoring and the deployment of treatment technologies to protect all communities, especially those disproportionately

impacted by forever chemicals and other forms of pollution.

The latest **Environmental Protection Agency data** show that more than 158 million Americans in all 50 states and the District of Columbia have PFAS in their drinking water.

You can use **EWG's Tap Water Database** and search by ZIP code to see reports from your water utility about contaminants they've detected or use this **interactive PFAS map** as another tool to see where these chemicals contaminate drinking water. Many locations exceed the **EPA's 2024 standards** of 4 parts per trillion for PFOA and PFOS, two of the most well-studied types of PFAS.

If you get your drinking water from a private well, you may want to test your water to find out exactly what's in it. You can contact a **state-certified lab** for professional analysis. Some counties may offer **free or discounted tests**, so check with local authorities first. We also like the test kits from **Tap Score**, if you have the means to work with them.

Both carbon-based and RO water filters can help reduce PFAS in your drinking water.

To read the full report from Waterkeeper Alliance, go **here**.

Gut Instincts

Scientists have discovered that certain species of microbe found in the human gut can absorb PFAS, and that boosting these species in our gut microbiome could help protect us from the harmful effects of PFAS.

The **new study**, conducted by scientists at the University of Cambridge, identified a family of bacterial species, found naturally in the human gut, that absorb various PFAS molecules from their surroundings.

This research shows the first evidence that our gut microbiome could play a helpful role in removing toxic PFAS chemicals from our body, but it hasn't been tested in humans.

That's the next step. Researchers want to use their discovery to create probiotic supplements that can boost the levels of these helpful microbes in the gut, to protect against the toxic effects of PFAS.

"Given the scale of the problem of PFAS 'forever chemicals,' particularly their effects on human health, it's concerning that so little is being done about removing these from our bodies," Dr Kiran Patil in the University of Cambridge's MRC Toxicology Unit and senior author of the report said in a **statement**.

"We found that certain species of human gut bacteria have a remarkably high capacity to soak up PFAS from their environment at a range of concentrations, and store these in clumps inside their cells. Due to aggregation of PFAS in these clumps, the bacteria themselves seem protected from the toxic effects."

This research offers new hope because as readers of this newsletter know: PFAS is in everything and already in us. From waterproof clothing and non-stick pans to lipsticks and food packaging, PFAS is hard to avoid and takes thousands of years to break down.

"The reality is that PFAS are already in the environment and in our bodies, and we need to try and mitigate their impact on our health now," said Dr Indra Roux, a researcher at the University of Cambridge's MRC Toxicology Unit and a co-author of the study. "We haven't found a way to destroy PFAS, but our findings open the possibility of developing ways to get them out of our bodies where they do the most harm."

It's good to know that researchers are approaching the PFAS problem from a new

angle. As we wait for regulations and enforcement to catch up, we may have more ways to protect ourselves.

Data Centers Continue To Strain Power & Water Resources

This massive industry is growing extremely fast, requiring huge amounts of energy, land, and water to operate. In Virginia, it's big business.

For local governments, attracting data centers to their municipalities means a financial boon. Virginia Gov. Glenn Youngkin said in 2024 that Virginia's existing data centers brought in **\$1 billion in tax revenue**.

When data centers are proposed in Virginia, their applications are approved by the county, city, or town they plan to build them.

But recently a rural community in Southern Virginia fought one of the country's biggest gas-powered **data centers**—and won.

“Northern Virginia has been **dubbed** the “Data Center Capital of the World,” with 507 data centers located north of Richmond, Virginia, a **higher concentration** than in any other state or country,” writes Julia Tilton for *The Daily Yonder*. “Artificial intelligence (AI) is driving a sharp increase in power demand from data centers, which are critical for powering the large language models on which the technology is built. These giant buildings house the computers and servers necessary to store and send information, and they can consume **millions** of gallons of water each day.”

She writes about the trend to develop data centers in rural areas across the country, particularly in the Southeast. Proposed data center campuses in **Bessemer, Alabama**, **Davis, West Virginia**, and **Oldham County, Kentucky** have all drawn local opposition: a common thread is developers limiting public access to information about the projects.

In Pittsylvania County, Virginia, residents said persistent engagement with local government was the key to pushing back on building a huge new data center in their area.

Read the full story [here](#).

Hidden Costs of the Cloud: Data Centers in Virginia



What do you think about this new PFAS research and a potential probiotic that could help your body shed some of these toxic compounds? Do you want us to keep covering data centers? Tell us what you think in the comments below:

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We are committed to ensuring the quality of your water. This report is designed to inform you about the quality of water and the services we deliver to you each day. Our constant goal is to provide you with a safe and dependable supply of drinking water resources.

Your water meets all state and federal regulations for safety.

This brochure is a snapshot of the quality of the water we provided last year. Included are details about where your water comes from, what it contains, and how it compares to Environmental Protection Agency (EPA) standards. We are committed to providing you with the information because we want you to be informed. For more information about your water call 541-745-5507 during business hours.

Drinking water sources

Your water comes from the Willamette River at Hyak Park. Source water assessment information may be obtained from your Public Works Department at 541-230-0039 during business hours.

Public participation opportunities

Adair Village city council meetings are held on the first Tuesday of the month at 6:00 pm at the Adair Community Building at 6030 William R. Carr Ave. Adair Village, OR. Please feel free to participate in these meetings.

Contaminants in water

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals, and can pick up substances resulting from the presence of animals or from human activity.

Contaminants that may be present in source water before we treat it include:

- **Microbial contaminants**, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- **Inorganic contaminants**, such as salts and metals, which can be naturally occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining or farming.
- **Pesticides & herbicides**, which may come from a variety of sources such as agriculture and residential use.
- **Radioactive contaminants**, which are naturally occurring.
- **Organic chemical contaminants**, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and also can come from gas stations, urban storm water runoff, and septic systems.
- **Lead**, if present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. The City of Adair Village is responsible for providing high quality drinking water but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at www.epa.gov/safewater/lead

Water quality monitoring

To ensure that tap water is safe to drink, EPA prescribes regulations that limit the amount of certain contaminants in water provided by public water systems. We treat our water according to EPA's regulations. Food and Drug Administration regulations establish limits for contaminants in bottled water, which must provide the same protection for public health.

Water quality data

The table in this report lists all the drinking water contaminants we detected during the 2024 calendar year. The presence of these contaminants in the water does not

necessarily indicate that the water poses a health risk. Unless otherwise noted, the data presented in this table are from testing done January 1 through December 31, 2024. The state requires us to monitor for certain contaminants less than once per year because the concentrations of these contaminants are not expected to vary significantly from year to year. Some of the data, though representative of the water quality, is more than one year old.

Notes for Immuno-compromised Individuals

The Environmental Protection Agency (EPA) has determined that your water is SAFE at these levels. Some people may be more vulnerable to contaminants in drinking water than the general population. Immune compromised persons such as people with cancer undergoing chemotherapy, people who have undergone organ transplants, and people with HIV/AIDS or other immune system disorders are at risk. Some elderly people and infants can also be particularly at risk from infections. These people should seek advice about their drinking water from the health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by cryptosporidium and other microbiological contaminants are available from the Safe Drinking Water Hotline at 1-800-426-4791.

Terms and Abbreviations

Action Levels

The concentration of a contaminant which, if exceeded, triggers a treatment technique or other requirement which a water system must follow.

MCL

Maximum Contaminant Level: The highest level of contaminant in drinking water that is allowed in drinking water. MCL's are set as close to the MCLG's as feasible using the best available treatment technology.

MCLG

Maximum Contaminant Level Goal: The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLG's allow for a margin of safety.

ppm

Parts per million: One ppm is roughly equivalent to 1 milligram per liter. A one part per million salt solution would be about one teaspoon of salt divided equally among two dozen 55-gallon drums of water. One part per million is equivalent to one penny in a thousand dollars.

ppb

Parts per billion: One ppb is roughly equivalent to 1 milligram per 1000 liters.

Primary Standard

Legally enforceable standards issued by the US EPA. Primary standards limit the level of specific contaminants that are allowed to be present in public drinking water supplies.

ND

No contaminant was detected in the test.

Sampling and Reporting of Compliance Violations

The state and EPA require us to test our water on a regular basis to ensure its safety.

If you have any questions regarding this report or concerning your water utility, please contact the City of Adair Village at (541)-745-5507. We want our valued customers to be informed about their water utility. If you would like to learn more, please attend our regular City Council Meetings.

Water Quality Monitoring Reports

The information below summarizes the most recent test results (2024) of detected levels of primary standards found in your drinking water. If you have any questions, please feel free to contact the City of Adair Village during business hours (541-745-5507).

Parameters	MCL	MCLG	Our Water	Sample Date ¹	Violation (Y or N)	Typical Source of Contamination
VOC	NA	NA	ND	2024	N	Volatile organic compounds- paints, paint strippers and other solvents such as aerosol sprays, cleansers, stored fuels and automotive products to name a few.
Nitrate as Nitrogen (ppm)	10	10	.47	2024	N	A metal found in natural deposits as ores containing other elements.
Total Organic Carbon	2.0	NA	1.02	2024	N	Naturally present in the environment
Turbidity (ntu)	1.0 95%<0.30	NA	0.123 max	2024	N	Soil runoff
TTHM (Total Trihalomethanes) (ppb)	.080	NA	0.0125	2024	N	Bi-product of disinfection
Haa5 (Halo acetic Acids) (ppb)	.060	NA	0.0119	2024	N	Bi-products of disinfection
SOC	Due 2026			2026	N	Synthetic organic compounds- herbicides, insecticides, pesticides, and or fungicides.
Lead (ppb)	Action Level 90% of homes tested must have tested < .015	.015		Due in 2025	N	Corrosion of household piping.
¹ Some testing is not required annually. This date is the year of the most recent test.						
Unregulated Contaminants						
Asbestos MFL	7.0 MFL	NA	ND	2019	N	Corrosion from piping

The EPA requires the following statements by all water providers regardless of whether there are contaminants in the water supply. Adair Village's water is safe and fulfills all EPA requirements.

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline (1-800-426-4791)

What areas are included in Adair Village water system's Drinking Water Protection Area?

The drinking water for Adair Village Water System is supplied by an intake on the Willamette River. This public water system serves approximately 650 residences. The intake is located in the Marys River/Muddy Creek Watershed in the Upper Willamette Sub basin of the Willamette Basin. The drinking water intakes for the City of Philomath, City of Corvallis, and Pope & Talbot, Inc. public water systems are also located on the Willamette River or its tributaries upstream of the Adair Village Intake. This assessment addressed the geographic area providing water to Adair Village's intake (Adair Village's portion of the drinking water protection area) between Adair Village's intake and the next upstream intakes for Philomath (on the Marys River) and Corvallis (on the Willamette River). The geographic area providing water to Adair Village's intake (Adair Village's portion of the drinking water protection area) extends upstream approximately 424 miles in a southerly direction and encompasses a total area of 366 square miles. Included in this area are a number of tributaries to the main stem, including Marys River and its tributaries, Muddy Creek and Little Muddy Creek. The protection area within an 8-hour travel time from the intake extends approximately 14 miles upstream of the Adair Village intake.

What are the potential sources of contamination to Adair Village Water System's public drinking water supply?

Potential contaminant sources identified include clear cuts, non-irrigated crops, non-irrigated crops, nurseries grazing animals, two unknown commercial operations, gas stations, a communication company, junk yard, fabrication/manufacture companies, lumber companies, hospitals, electronic manufacturer, DEQ cleanup sites, public works shops, gravel companies, high density housing, rural homesteads, two wastewater treatment plants, two water treatment plants, parks, schools, storm water outfalls, sewer lines, fire stations, a golf course, several research facilities, Oregon State University and five transportation corridors.

WHAT ARE THE RISKS FOR OUR SYSTEM?

A total of 47 potential contaminant sources were identified in Adair Village Water System's drinking water protection area. Of these, 40 are located in the sensitive areas and 37 are high- to moderate-risk sources within "sensitive areas". The sensitive areas within the Adair Village Water System drinking water protection area include areas with high soil permeability, high soil erosion potential, high runoff potential and areas within 1000' from the river/streams. The sensitive areas are those where the potential contamination sources, if present, have a greater potential to impact the water supply.

More information about contaminants and potential health effects can be obtained by calling the EPNs Safe Drinking Water Hotline (1-800-426- 4791).

This water quality report was prepared by the City of Adair Village. OR.

Testimony in Opposition to the Landfill Expansion, LU-24-027, July 9, 2025

**Mark Henkels, Ph.D.
7540 NE Pettibone Drive**

DATE RECEIVED:	7/9/25
FROM:	MARK HENKELS
PHONE OR EMAIL:	

Good evening, Commissioners. My name is Mark Henkels, and I'm a resident of Benton County. Thank you for your commitment to this long and difficult process.

I am speaking today in opposition to LU-24-027. Here are two concerns that I believe have not been addressed clearly enough in this process.

First: Waste Disposal Increases Will Shorten The Landfill's Life and Increase Impacts on the Community

Republic Services' own diagrams tell the story. Once the expansion occurs, they propose to raise the intake from the current cap of about 1.1 million tons per year, to 1.5 million in the first four years—a 36% jump—and then up to 1.86 million tons in years five and six. That's a 78% increase over what most capacity projections use.

The County's estimate of a 12-year life for this expansion is based on lower volumes. If you increase the flow, the space fills faster. At these levels, the quarry and expansion combined could hit capacity sooner than if we just kept filling the quarry at the current intake cap.

The higher the disposal volume, the greater the real impact. Repeatedly in this process we have heard how the doubling the annual dumping in the last decade has affected the surrounding area. This is no longer a small facility on the hill. It's an industrial-scale operation. Expansion means more trucks, more noise, more odor, and a more visible trash mountain dominating northeast Benton County.

Second: Conditions of Approval Won't Be Enough to Protect the Public

The staff report contains many, many conditions, 25 numbered items, many of which contain multiple points. There are maybe 87 total specifications ...

The sheer number of conditions raises a red flag. If this project truly fit our community and our landscape, why make so many special rules to try to contain its impacts? Instead of considering whether the impacts on adjacent lands, public facilities, and the area's character invalidate the proposal, the staff report assumes the proposal's risks, uncertainties, and known consequences have simple fixes.

Would you hire a contractor if you had to make such an extensive list of prohibitions and requirements because of your fears of their work?

And let's be honest: once a project like this is approved and construction begins, it is very hard to stop it, even if things go wrong. In economics and management, there's a term called 'sunk costs.' It means that once you've invested time and money into something, you become very reluctant to abandon it.

The staff report recommends a deadline for meeting the preliminary conditions of four years, with a one-year extension possible. But what planning official would say "no" when the applicant says, "We've already spent millions, we just need more time." So the four year deadline bold-faced in the report is probably superfluous.

The staff report's recommendation about what happens if the conditions are not met is even more troubling, stating: "Failure to comply with the Operational Approval Conditions may result in revocation of the Conditional Use Permit."

"May result in revocation" means little in practice. The concept of "sunk costs indicates that once that permit is granted, the operation will never be stopped. That's human nature—and it's public administration reality.

And some of these conditions simply don't solve the bigger problems. A few rows of trees won't hide a landfill that's visible for miles—from Tampico Road, from Independence Highway, from E.E. Wilson. Nor will it restore the views of the Coast Range lost to this industrial presence.

Finally, enforcement is a major concern. Republic's poor record on methane emissions shows what happens when we rely on the company's self-monitoring. The County may require compliance with state and federal standards, but it also admits it lacks the capacity to independently monitor or enforce the impacts on groundwater, methane and other air pollutants, leachate, or PFAs. Even for this report, staff noted it lacked the capacity to review the groundwater data.

Depending on state and federal agencies for monitoring and enforcement is simply inadequate. The EPA is spiraling downwards, especially in enforcement. The DEQ publicly admits that it cannot fulfill all its responsibilities. The County does not even pretend to have such capacities.

This is not the right path for our community. I respectfully urge you to deny this application. Thank you.

July 9, 2025

Testimony presented by Margaret Herring (34386 Colorado Lake Drive, Poncha Springs, CO)

DATE RECEIVED:	7/9/2025
FROM:	Margaret Herring
PHONE (AREA) ONLY:	5417602570

I wish to speak to the matter of undue burden and reasons to deny this proposal outright.

This proposed landfill expansion puts undue burden on the residents of Benton County, and beyond, currently and for years to come. And yet, any discussion of that burden has not been allowed within the narrow limits of these public hearings and within the extraordinarily lopsided restrictions from the county's legal counsel.

Committee Chair Nicholas Fowler asked the pointed question: when state and federal agencies responsible for environmental oversight, are not living up to those responsibilities, doesn't that put an undue burden on county government?

And when a county government is already short-staffed and unable to monitor and evaluate environmental impacts, doesn't that put an undue burden on county citizens?

And when county staff are advised to dismiss evidence collected by citizens from credible public sources (such as the EPA) as merely "anecdotal" because that evidence has not been tested in court, doesn't that put an undue burden on these hearings to fairly consider the facts at hand?

The evidence provided by the citizens of Benton County during public hearings in April provided far more verifiable, expert evidence than the selective self-reporting presented by Republic Services.

Why would Benton County commissioners choose to place layers of undue burden on their citizens by permitting this unwise and unwanted and apparently unregulated expansion, *when we have little or no capacity to monitor and regulate an expanding source of toxic pollution that reaches far beyond what we can see or smell.*

Whatever short-term windfall of money the county might receive from this deal will not cover the enormous and undue burden the citizens of Benton County face now and will face when this landfill eventually closes and requires an expensive environmental cleanup.

In summary: The restrictions put on this staff report have forced a narrow conversation on the immediate intrusion of odor and noise, and have dismissed broader concerns about air quality and water quality as merely "anecdotal."

This decision by the county staff is an insult to the citizens who have provided credible, verifiable, and incriminating evidence of the toxicity of this landfill and the expanding threat of its expansion. This proposal cannot be fixed by a smokescreen of conditions. I urge county leaders to protect the future of Benton County and reject this proposal outright.

JEFFREY L. KLEINMAN
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July 8, 2025



**SUPPLEMENTAL MEMORANDUM OF VALLEY NEIGHBORS
FOR ENVIRONMENTAL QUALITY AND SAFETY**

TO: Benton County Planning Commission
FROM: Jeffrey L. Kleinman
RE: File No. LU-24-027 (Republic Services/Valley Landfills Inc.)

I. INTRODUCTION

Sometimes, as the saying goes, the more things change, the more they remain the same. This is certainly true of post-hearing efforts of the applicant in this case. If Republic is to be believed, then the entire community surrounding its landfill must be suffering from a years-long mass hallucination. Wouldst that were true. It is not.

This Supplemental Memorandum is submitted on behalf of Valley Neighbors for Environmental Quality and Safety ("Valley Neighbors"). As previously stated, Valley Neighbors comprises a large group of property owners, farmers and residents in the area surrounding the proposed landfill expansion site, including but not limited to the Soap Creek Valley and Tampico communities. Its members will be directly and adversely affected by the proposed expansion. They have explained the impacts and will continue to do so in light of the supplemental staff report and further submissions by the applicant.

The applicant and various consultants have now burned through truckloads of money and time, and have employed (1) strained interpretations of the law and (2) unjustifiable applications of those strained interpretations, to try to fit the overwhelming evidence in this case into a tiny box of trash, easily covered by one of the applicant's tattered tarps. That effort fails nonetheless. You have received truckloads of paper, but it is not difficult to cut to the chase.

All other criteria aside, the applicant has not demonstrated compliance with BCC 53.215(1), which requires findings that the proposed use will not seriously interfere with uses on adjacent property, with the character of the area, or with the purpose of the zone. The record will not support such a finding. In particular, staff's initial findings regarding noise and odor impacts remain correct. The application must be denied.

II. GENERAL COMMENTS REGARDING SUPPLEMENTAL STAFF REPORT; ADDITIONAL CONSIDERATIONS

In light of the contents of the supplemental staff report, Valley Neighbors will reiterate certain of the major issues highlighted in their initial memorandum, and then add one more. (Please note that this memorandum is not intended to cover every relevant issue or to summarize all the relevant evidence. Other qualified witnesses complete the full picture.)

(1) It is not just the southward movement of Republic's operation that will cause the increased, adverse impacts in question. Rather, that movement will serve to sustain a major dump operation which would otherwise be greatly constrained in scope. Thus, this proposal cannot be characterized as one for a preexisting use, inherently accepted as part of the character

of the area. The character of the area entails a large operating landfill north of Coffin Butte Road that has shut down or is close to shutting down. Its past role in establishing the character of the area cannot be "grandfathered" into the present time, much less the future. To the extent that you may be advised to the contrary, we disagree. The application must be treated as one for a brand new landfill, because that is precisely what it is. The applicant's semantic acrobatics do not change that.

(2) This Commission can impose as many conditions of approval as it wishes.

Unfortunately, the applicant's existing operation has a solid track record of noncompliance with conditions, and the county has an unimpeachable record of failing to enforce conditions. There will be no compliance this time, and the county concedes that it does not enforce conditions. For all practical purposes, the county may as well adopt a condition requiring the applicant to move its operation to Mars within 60 days of approval.

(3) Valley Neighbors reiterates its initial comments concerning the work product which flowed from Benton County Talks Trash (BCTT), in a process we believe to have been paid for by the applicant:

(a) To be clear, BCTT's report was "accepted"—deemed received—by the county's board of commissioners. It was not adopted, much less in a manner which would make BCTT's proposed interpretations of the Benton County Code binding upon you, or upon the board itself in any appeal hearing.

(b) The legal subcommittee of BCTT, which recommended certain of those interpretations, included four attorneys. Three of those attorneys were not neutral participants,

but have consistently favored landfill expansion. Two work for Republic, its in-house attorney, Holly Doyle, and its local counsel, Mr. Condit. The other is the county counsel, Mr. Croncy.

(4) The applicant now argues that we have attempted to apply the “farm impacts test” of ORS 215.296(1) (for conditional uses proposed on EFU properties) to this application. That is incorrect. However, the reasoning of LUBA and the appellate courts in the *Stop the Dump Coalition v. Yamhill County* series of cases is instructive here for several reasons. As set out in Valley Neighbors’ May 5, 2025 memorandum, that reasoning includes useful guidance for interpreting non-legal terms. We explained in detail the relevance of such terms here.

In *Stop the Dump*, LUBA No. 2015-036 (Final Opinion and Order, November 10, 2015), LUBA also made clear how to address the impacts of an existing landfill operation moving to an adjacent area. In that case, Riverbend Landfill applied to expand its fill because parts of its existing site were filling up, just as is the case with Republic here. LUBA addressed the issue squarely, and held:

Initially, we note that in most cases where the significant change/cost test is applied to a proposed use, the nature and severity of the actual impacts are somewhat speculative, because the use does not yet exist. In the present case, the nature and severity of the future impacts of the expanded landfill are relatively well-known, because those impacts will likely be very similar to the impacts of the existing landfill. That is because, as the county explains, the volume of garbage processed at any one time and the operational aspects of the proposed expansion will be very similar to the existing landfill operation that the proposed expansion will effectively allow to continue.

As we understand it, a major difference between the existing and expanded landfill is the location of the “working face” of the landfill, the portion that is currently uncovered and accepting waste. Under the approved expansion, which approves a new module at the southwest corner of the property, the working face of the landfill will be located in module 11 much of the time, although some existing modules within the footprint of the existing landfill will be added to. Thus, at times, the working face will

be closer to farms south and west of the landfill than it has typically been in the past, and further from farms north and east of the landfill.

(Emphasis added.) Thus LUBA reviewed the expected impacts upon properties nearer to the new working face. The preexisting or prior use did not have the effect of exempting the new portion of the operation from having to comply with the relevant approval standards.

III. CONDITIONAL USE APPROVAL STANDARDS-BCC 53.215

The county's general Conditional Use approval criteria provide:

53.215 Criteria. The decision to approve a conditional use permit shall be based on findings that:

(1) The proposed use does not seriously interfere with uses on adjacent property, with the character of the area, or with the purpose of the zone;

(2) The proposed use does not impose an undue burden on any public improvements, facilities, utilities, or services available to the area; and

(3) The proposed use complies with any additional criteria which may be required for the specific use by this code.

IDENTIFIED IMPACTS

The supplemental staff report cites the applicant as identifying effects of the dump's move to the south of Coffin Butte Road which could seriously interfere with uses on adjacent property, or with the character of the area:

[T]he following off-site impacts from the Project may potentially affect the Adjacent Properties: (a) noise; (b) odor; (c) traffic; (d) water (well capacity/groundwater impacts); and (e) visual impacts. These impacts are primarily generated by the working face, which will move from north of Coffin Butte Road to the Project area south of Coffin Butte Road. * * *

Supp Rept 30.

The report then details the gymnastics carried out by the applicant and its consultants to justify findings of compliance with BCC 53.215(1). In each instance, those efforts are inadequate to support any such finding.

NOISE

The supplemental report relies heavily upon purported compliance with DEQ's outdated and unenforced noise standards. However as staff pointed out in its initial staff report:

As noted by the applicant, the cited DEQ Noise Rule does not appear to be directly and entirely applicable to the proposed application.

Staff Rept 26.

Moreover, based upon its clear and unambiguous language, the county code is not keyed to real or imagined DEQ compliance. It requires an applicant to prove that the proposed conditional use "does not seriously interfere with uses on adjacent property, [or] with the character of the area * * *." Regardless of what DEQ once determined, if the applicant has not proven that the dump's southward migration will not cause such interference, the application must fail. This is necessarily an evidence-based determination. All the actual evidence before you shows that serious interference exists, and will move southward along with the fill. Further, the applicant is not entitled to a free pass or "credit" for past interference to the north. (This is true not just as to noise, but as to other impacts as well.)

Referring to applicant's noise consultants, the supplemental report states that they "determined that the predicted sound levels from the Project will "comply with the applicable [DEQ] regulatory criteria without the inclusion of noise mitigation." Supp Rept 30. Compare

that conclusion to the evidence provided by owners of adjacent properties. Existing noise impacts disrupt and interfere with their lives and livelihoods. The further encroachment of the fill will seriously interfere with their use of their respective properties, no matter what the unenforced and unenforceable DEQ standards say, and no matter how they are interpreted and applied by Republic's paid consultants.

The supplemental report also accepts Republic's inappropriate reference to "character":

As noted by Greenbusch, the Project will not change the character of operations at the landfill. Accordingly, noise impacts from the Project will be similar in kind to current conditions * * *."

Supp Rept 30.

The code is not concerned with the "character of operations." It is concerned with the "character of the area," and the area in question will now lie to the south. No turn of a phrase can change this.

At pages 35-36, the supplemental report addresses compliance with the outdated DEQ noise regulations by means of conditions of approval, including "installing ambient-sensing broadband back-up alarms that use white noise that adjusts based upon ambient sound levels." We again point out that even if Republic were to suddenly "shape up" and comply with this condition, it has no control over the equipment of the numerous other haulers who make up its customers. Thus, taking at face value the matters set out in the supplemental report, Republic has not met its burden of proof in this case. This will be further addressed by the owners of "adjacent properties," supplementing their prior testimony before the Planning Commission.

As a final note, staff's finding of compliance is based upon its Conditions OP-2(A) and (B). Supp Rpt 145-46. These are listed under the following heading:

Operational Conditions of Approval.

Monitoring of operating COAs will be subject to BCC Title 31. Enforcement.

Of course, as has been readily acknowledged on the record, such county enforcement does not exist and has apparently never existed.

Regardless, we reiterate that on the face of these conditions, they apply only to the applicant's own "on-site equipment." With no applicant control whatsoever over incoming and outgoing garbage hauling trucks with their diesel engines and gears grinding upslope and jake brakes coming back down, back-up alarms, and clanging tailgates, the conditions utterly fail to demonstrate compliance (or the feasibility of future compliance) with BCC 53.215(1).

Proposed Finding: The applicant has not met the required burden of proof with respect to serious interference with uses on adjacent property, or serious interference with the character of the area with respect to the impacts of noise. It has not been demonstrated that noise impacts can or will be mitigated through conditions of approval to not "seriously interfere" with adjacent properties, or with the character of the area.

ODOR

The applicant submitted a new odor report and supplement for staff review. Among other things, the applicant's consultant states: "Landfill gas generation from the landfill is expected to significantly increase from 2023 to 2052, increasing odor pollutants, however the landfill will be higher in elevation at that time which helps with dispersion." Supp Rept 39 (Emphasis added.) The odor consultant is not able to accurately calibrate very much, but Valley Neighbors has precisely measured the level of reassurance provided. It totals -0-.

The consultant also states:

In addition, the odor detection thresholds for each pollutant are highly varied depending on the person. In general, these odor thresholds are based on a concentration where half of the general public is able to detect the smell at a specific time and location. Certain odorous chemicals can also have an additive effect * * *.

These limitations have the potential to underpredict odor concentrations. It is possible for odors to be detectable by people that are sensitive to particular odors, especially in low wind or thermal inversion conditions. Uncertainty is also present in the odor complaint review. * * *

Supp Rept 41.

The above provisos serve to reinforce the fact evidence on the record before you. Very few witnesses have the time or choose to take the time to communicate with you, or to wait their turn in a crowded hearing room, unless they have a very sound basis for complaints or expressions of concern. As stated, they are not living through a mass hallucination. The pontifications of consultants will not wash away the impacts of the expansion of this dump.

Your record is replete with evidence regarding the flow of serious odor-causing pollutants, including those carried frequently to the south. You will hear and read more on this subject from those most affected. The interference with use of "adjacent property" as defined by the county is profound, and will be dramatically increased if this application is approved.

MFA's comments regarding the applicant's handiwork (Supp Rept 45-47) beat around the bush; MFA is more gung ho about the applicant's work product than is the applicant. It is clear from the experts that no regulatory standards for odor exist. Republic can construct as elaborate an odor model as it wishes but, as folks used to say, the nose knows.

Frankly, all concerned should be embarrassed by their efforts to dispute or explain away landfill odors which seriously interfere with uses on adjacent property and with the character of the area, and which would now move southward. The failure by DEQ to act on complaints is irrelevant in this regard. (Of course, EPA is investigating methane leakage at this operation, which is both a health issue and an odor issue.)

Planning staff takes a far more sober view of the matter:

Staff notes that the updated odor study (Applicant Ex. 36) still does not provide an analysis of odor impacts on adjacent odor-sensitive uses. At the writing of this Supplemental Staff Report, expected D/T values were not provided for adjacent properties, and odor impacts from the proposed landfill expansion on those properties are not specifically addressed in the application materials.

Supp Rept 48. (Emphasis in original.)

Then, acknowledging “interference” with uses on adjacent properties, staff truly stretches in order to kind of, sort of conclude that this will not be “serious interference.” The members of the Planning Commission will have the evidentiary record before them. We believe that based upon that unambiguous, evidence-based record, you will draw the opposite conclusion.

Staff identifies certain “Operational Conditions” which will supposedly resolve odor conflicts, OP-7(A)-(D) and OP-5. (The latter only addresses fill height.) The conditions set out in OP-7, especially (C) and (D), are extraordinary. This is not because they are in any way likely to be effective, but in the ornateness of the window dressing. What they boil down to is the employment of ‘sniffers,’ human and electronic, to snort around for odor problems. If they find any, then what? Apparently, Republic would then mess around and figure out how to do

better. Of course, they've had years of practice at this in Benton County, and success always seems to elude them.

To put this in legal terms, the applicant has not demonstrated compliance with the relevant approval standards, or that such compliance would be "feasible" by means of an imposed condition. *Meyer v. City of Portland*, 7 Or LUBA 184 (1983), *aff'd*, 67 Or App 274, 678 P2d 741 (1984). In its review of LUBA's decision in *Meyer*, the Court of Appeals explained that feasibility means that "substantial evidence supports a finding that solutions to certain problems * * * are possible, likely and reasonably certain to succeed." 67 Or App at 280 n 5. That is certainly not the case here.

Proposed Finding: The applicant has not met the required burden of proof with respect to serious interference with uses on adjacent property, or serious interference with the character of the area with respect to the impacts of odor. It has not been demonstrated that odor impacts can or will be mitigated through conditions of approval to not "seriously interfere" with adjacent properties, or with the character of the area.

GROUNDWATER IMPACTS

There has been a substantial amount of testimony regarding the impacts of the proposed expansion upon the groundwater resource upon which the community relies. The supplemental report includes several pages in which staff attempts to get a handle on this issue. Supp Rept 52-61. Ultimately, staff concludes:

Staff understands that groundwater impacts have been and continue to be a controversial topic in landfill expansion applications in Benton County. This supplemental staff report includes neighbor, opponent, and ENRAC testimony above relating to water quality concerns. However, the county is limited in its ability to evaluate and regulate groundwater impacts beyond the multiple levels of state and

federal regulation applicable to the proposed landfill expansion. Those regulatory agencies provide a more appropriate venue to address groundwater impacts. * * *

Supp Rept. 60.

The key question here is, where are the evaluations of those regulators? Are excavation, dumping, and generation and transmission of leachate, to proceed in the hope that someone with expertise will look things over some time in the future? It was the applicant's obligation to carry out or procure the necessary research and studies and report the results as part of the burden of proof they have failed to meet here. They have been working on Tampico Ridge for the past four years and have had ample opportunity to get the job done.

Instead, we now have staff proffering "Conditions P1-5(B), P2-1(F), OP-8, OP-10, OP-11(A)-(G), and OP-13(A) and (B) to monitor and ensure compliance with local, state, and federal water quality requirements." Supp Rept. 61. We have reviewed those conditions. There is no evidence that they would in fact ensure compliance with all water quality standards. There is also no evidence that they can or will be truly enforceable, or would be effective even if enforced. A particularly remarkable example is Condition OP-13(A)(iv):

(iv) VLI will remain open to discussion with interested residents about their wells and water levels and will promptly respond to any concerns or complaints.

"Open to discussion" compels nothing, and the discussion itself, should there be any, would come far too late to help the affected property owner.

Proposed Finding: The applicant has not met the required burden of proof with respect to serious interference with uses on adjacent property, or serious interference with the character of the area with respect to the impacts on groundwater wells and natural springs, either in terms of quantity (availability) or quality of water. The applicant's consultants propose future studies to evaluate the possibility of significant

uncertainties on this issue, but only after granting of this application, and with no clear, legally binding process for evaluation of results or mitigation in the event of impacts that “seriously interfere” with adjacent properties, or with the character of the area. County staff acknowledge their lack of expertise to evaluate groundwater issues, and have not demonstrated the capacity for assessing or enforcing the applicant’s proposed conditions of approval to address potential impacts to groundwater. Thus, it has not been demonstrated that impacts upon groundwater wells and natural springs can or will be mitigated through conditions of approval to not “seriously interfere” with adjacent properties, or with the character of the area.

UNCONTROLLED LITTER (GARBAGE)

Affected farmers have testified and will testify as to serious interference with farm use of their property. Erin Bradley’s property is adjacent to the expansion site. At your prior hearing, she testified in part:

My daughter has to walk the pastures multiple times daily for plastic bags and debris her calf or our livestock could ingest. I have seen trash out of Republics trucks fly on 99 and into our pasture. This can be fatal to livestock. The proposed expansion can cause additional stress and health issues which can result in death of our animals. The landfill has already effected the enjoyment and use of our land. If the land use application is approved, this would make our land unusable * * *.

Planning Commission Recording, 5/8/25, at 2:02.

R. Wilson has provided the following evidence:

Due to our proximity to the landfill where we grass a herd of cattle for local food production, we have been finding a staggering increase of air blown trash coming from the dump. We get styrofoam, plastic bags, and metallic chip bag that become air born from the landfill and litter the pastures we use to raise livestock. This poses a significant risk to the animals. If a cow or calf were to eat a plastic bag or Styrofoam this would certainly mean their death. With an expansion to the landfill it can only be expected to intake more trash that will lead to more airborne plastics reaching susceptible animals, both wildlife and nearby associated livestock. * * *

Supp Rept 65.

The eight control measures already implemented by Republic (*Id.*, 67) have not mitigated this serious interference with the economic use of the Wilson property. The resulting economic harm is discussed at page 68 of the supplemental report, and includes the fact that cattle ingesting plastic may be killed by it. Now, the fill is proposed to commence operations closer to the Wilson farm.

In response, staff states that Mr. Wilson's problems in particular will be resolved by Conditions OP-5, OP-11(A)-(F), and OP-15(A-I). Condition OP-5 sets the maximum elevation of the expanded fill but does not purport to resolve the litter issues. Condition 11 would leave open a full two acres of the working face during working hours, generating windborne trash as daily dumping takes place. Condition 15 memorializes the existing litter control measures that do not work. It also calls for fencing around the working face, but there is not and has never been evidence that lightweight blowing trash like that described by Mr. Wilson can or will be contained by fences.

Proposed Finding: The applicant has not met the required burden of proof with respect to serious interference with uses on adjacent property, or serious interference with the character of the area with respect to the impacts of trash. It has not been demonstrated that impacts from uncontrolled or uncontained trash can or will be mitigated through conditions of approval to not "seriously interfere" with adjacent properties, or with the character of the area.

FIRE RISK

The discussion of fire risk and fire history on the site appears at pages 68-73 of the supplemental report. The history is quite astonishing. Nonetheless, it is suggested that the application can be approved with a condition requiring the applicant to "monitor and log, and

provide records relating to fires.” Supp Rept 73. This supposedly new requirement is largely in place already under the landfill’s existing permitting, and has been for many years. The proposed condition will not solve a problem with historic roots planted by the applicant at this fill.

Proposed Finding: The applicant has not met the required burden of proof with respect to serious interference with uses on adjacent property, or serious interference with the character of the area with respect to the impacts of fire. It has not been demonstrated that impacts of fire and the risks of fire can or will be mitigated through conditions of approval to not “seriously interfere” with adjacent properties, or with the character of the area.

CHARACTER OF THE AREA

Most if not all of the issues addressed above are equally directed at the “character of the area” under BCC 53.215(1). Thus, our proposed findings cover that element of the approval standard as well; the “adjacent property” lies within the affected “area.”

Please note that the drafters of the Code were careful to draw a distinction among the three components of this provision in ascending geographic scope, requiring a finding that:

(1) The proposed use does not seriously interfere with uses on adjacent property, with the character of the area, or with the purpose of the zone.

Determining the effect on area character thus draws one out beyond the confines of adjacent properties. Staff agrees that this is the case. Supp Rept 78. The applicant states that “the Analysis Area does not have a uniform character; it consists of almost 90 square miles and includes farm and forest lands, rural residential lands, the City of Adair Village, and small portions of Corvallis and North Albany.” *Id.*, 80. That area must also include the E.E. Wilson Wildlife Area, across Highway 99W to the east. The Wildlife Area comprises 1788 acres and,

per ODFW, is inhabited by “bald eagle, osprey, red-tailed hawk, great horned owl, turkey vulture, great blue heron, egret, bobcat, coyote, mink, beaver, river otter, black-tailed deer, Roosevelt elk, western pond turtle, pacific tree frog, western gray squirrel, dusky-footed woodrat, ring-necked pheasant, quail, mourning dove, band-tailed pigeon, snipe, killdeer, kingfisher, dunlin, sandpiper, hummingbirds, woodpecker, flycatcher, crow, nuthatch, wren, thrush, warbler, sparrow, red-winged blackbird, finch, and waterfowl.”

The supplemental report presents a multitude of words to address what should be a straightforward issue. We addressed that issue in our memorandum of May 5, 2025. With respect to interpretations propounded by Republic or staff which defy common sense, we would note two considerations:

(1) The conclusions of the BCTT do not have the force of law or serve as binding precedent.

(2) The projects that were subject to prior county Conditional Use applications were much more narrow in scope and effect than this one, affecting far fewer properties or members of the community. The difference is analogous to that between a small firecracker and an air-launched stink-missile with an exceedingly noisy motor.

The “area” and the “character of the area” are to be determined by the Planning Commission without blinders, based upon the evidence in the record and the commissioners’ common sense understanding of it. “Everything else is just commentary.”

The area is the site of Republic’s now-closed or closing fill along the highway, north of Coffin Butte Road. The character of the area is of one being restored to relative peace and

quiet, with considerably less odor and wind-blown trash, waiting patiently for Republic's characteristically lacking efforts at site restoration. Now, to the south along the highway, the applicant proposes to recreate that use, restoring those impacts and moving them significantly closer to properties to the south within unincorporated Benton County and Adair Village.

The character of the area includes not just the physical characteristics of the land but the human uses of the area and human experiences while in the area. These include agricultural uses adversely affected by blowing garbage and dump odors; the many recreational uses of the E.E. Wilson Wildlife Area; and Erin Bradley's public service equine operation directly adjacent to the expansion area, which would be devastated by the odors, noise and trash generated by the southbound fill.

Noise

With respect to noise, staff states:

Staff concurs with the applicant's reasoning that if the proposed change in noise does not seriously interfere with the closest noise-sensitive uses, it will not seriously interfere with the character of the area. As discussed under adjacent land uses, applicant's revised noise management proposal and recommended Conditions OP-2(A-B) and OP-5 reduce expected noise volumes sufficiently to not "seriously interfere" with adjacent uses. Therefore, staff also concludes that noise produced by the proposed expansion can be conditioned to not "seriously interfere" with the character of the area.

Supp Rept 83.

For the reasons explained by Valley Neighbors above with respect to serious interference with use of adjacent properties (whether or not especially noise-sensitive), staff's conclusion is not supported by the evidence or by a correct reading of the law. Based upon the

record before you, the character of the area will also suffer serious interference as a result of the fill's jump to the south.

Before moving on, we should take a moment to address the big picture here. As touched upon above, implicit in the proffered interpretation is the notion that since the fill has already seriously interfered with the character of the area north of Coffin Butte Road, Republic is entitled to a standing credit for that—a trump card or wild card—allowing it to carry out an equal measure of such interference further to the south. No such handy permission slip is contained in the language of the Code.

By Republic's reasoning, it could march relentlessly southward toward the Corvallis line, claiming that each mess it leaves behind has already ruined the character of the area, so it should be permitted to go further. This is precisely the argument you are faced with here.

Odor

Rather than recognizing the evidence of odors seriously interfering with life and work adduced by 140 witnesses (Supp Rept 83), staff chose to buy off on Republic's characterizations of the use and the conditions of approval regarding odor discussed above. For the reasons we have set out, the applicant has not met the requisite burden of proof regarding serious interference by odor with the character of the area.

Proposed Finding: The applicant has not met the required burden of proof with respect to serious interference with the character of the area with respect to the impacts of noise and odor. It has not been demonstrated that impacts of noise and odor can or will be mitigated through conditions of approval to not "seriously interfere" with the character of the area.

IV. FAILURE TO COMPLY WITH THE CONDITIONAL USE CRITERIA FOR THE FOREST CONSERVATION (FC) ZONE–BCC 60.220

The applicant proposes to site the following on its FC-zoned parcel: “leachate ponds, leachate loadout, leachate sump, an outbound scale, portions of the perimeter landfill road, cut activities for landfill, and a shop/maintenance area.” Approval of those uses is subject to the provisions of BCC 60.220(1):

60.220 Conditional Use Criteria.

(1) A use allowed under BCC 60.205 or 60.215 may be approved only upon findings that the use:

(a) Will not force a significant change in, or significantly increase the cost of, accepted farming or forest practices on agriculture or forest lands;

(b) Will not significantly increase fire hazard or significantly increase fire suppression costs or significantly increase risks to fire suppression personnel; and

(c) Complies with criteria set forth in BCC 53.215 and 53.220.

As the use proposed for the FC property is part and parcel of the landfill use, it fails for all the reasons set out above to comply with the county’s general conditional use criteria contained in BCC 53.215 and .220. Further, the evidence will show that leachate loading and storage facilities moving to this property will serve as a new odor source seriously interfering with the use of adjacent properties (as defined above). The proposed use of the FC site would thus violate BCC 60.220(1)(c).

Proposed Finding: The applicant has not met the required burden of proof with respect to the Forest Conservation Zone Conditional Use Criteria of BCC 60.220(1)(c). It has not been demonstrated that leachate odor impacts of leachate operations in the FC Zone can or will be mitigated through conditions of approval.

VI. SUPPLEMENTAL STAFF REPORT CONCLUSION–BCC 53.215(1)

Staff's conclusion regarding compliance with this critical approval standard appears at page 91 of its supplemental report. For all the reasons set out above, that conclusion misinterprets and misconstrues the applicable law, and is based upon inadequate findings unsupported by substantial evidence in the whole record.

VII. BCC 53.215(2)

BCC 53.215(2) sets out the following general Conditional Use approval standard:

(2) The proposed use does not impose an undue burden on any public improvements, facilities, utilities, or services available to the area; * * *

We incorporate by reference here the matters set out in Valley Neighbors' May 5 memorandum. The landfill's truck traffic has been proven to impose an undue burden upon the area's road system, and upon fire services from Adair Village as well. Opening this fill after the one north of Coffin Butte Road has closed will serve to impose such burdens when they would otherwise have lessened greatly or disappeared.

Conditions OP-6, OP-11(F), and OP-12(A)-(C) are not enforceable and, in the absence of a county enforcement mechanism, will not be enforced. These conditions fail to resolve the impacts of haul truck traffic upon the county's road system.

Proposed Finding: The applicant has not met the required burden of proof under BCC 53.215(2). It has not been demonstrated that the proposed use will not impose an undue burden on any public improvements, facilities, utilities, or services available to the area, or that such burden can or will be mitigated through conditions of approval.

VIII. CONDITIONS OF APPROVAL–BCC 53.220

We have addressed individual conditions of approval above. As specified, the conditions in question have not been proven to be “possible, likely and reasonably certain to succeed” in bringing about compliance with the county’s approval standards. This is true even without taking into account Republic’s history of noncompliance and the county’s history of nonenforcement.

Proposed Finding: The applicant has not met the required burden of proving that conditions of approval proposed for adoption under BCC 53.220 can or will achieve compliance with the relevant approval standards.

IX. FOREST CONSERVATION ZONE

We have addressed issues relating to the proposed development within the FC Zoning District above, as well as in our earlier memorandum. As explained, this application is not in compliance with the provisions of BCC Chapter 60 relating to the FC Zone, and will not achieve compliance through the proposed conditions of approval.

X. THE PLANNING COMMISSION’S 2021 FINDINGS

With the exception of those relating to the proposed closure of Coffin Butte Road, the findings the Planning Commission drafted and adopted in File No. LU-21-047 are directly relevant here. A complete copy is attached for your reference.

XI. CONCLUSION

All the king's horses and all the king's men cannot meet the applicant's burden of proof for the southward expansion of this landfill. For all the reasons set out above, in our May 5 memorandum, and in the written, oral and photographic evidence submitted by those with direct knowledge of the facts, this application must be denied.

Respectfully submitted,

Jeffrey L. Kleinman

Jeffrey L. Kleinman, OSB No. 74372

Attorney for Valley Neighbors
for Environmental Quality



PLANNING COMMISSION FINDINGS

NATURE OF REQUEST:	Conditional Use Permit to expand Coffin Butte Landfill. Republic Services is proposing: to create a new disposal cell for the Coffin Butte Landfill which will extend from the current cell south of Coffin Butte Road; close Coffin Butte Road to public traffic (vacate the right-of-way) so the new cell can cover the road; relocate a replacement roadway (for landfill and quarry traffic only) around the area of the new disposal cell; relocate the leachate ponds south of Coffin Butte Road, and move some other structures.
APPLICABLE CODE CRITERIA:	Benton County Code (BCC) Section 51.505, Sections 51.705 through 51.840, Sections 53.205 through 53.235, Section 60.215, Section 60.220, Chapter 77, Chapter 99. The Benton County Code can be found at this link: https://www.co.benton.or.us/planning/page/development-code
PROJECT LOCATION:	• 29000 Coffin Butte Road; Township 10 S, Range 4 W, Section 18, Tax Lot 1107 • 29160 Coffin Butte Road; Township 10 S, Range 4 W, Section 18, Tax Lot 1200 • 28972 Coffin Butte Road; Township 10 S, Range 4 W, Section 18, Tax Lot 1101 • Township 10 S, Range 4 W, Section 18, Tax Lot 1104 • Township 10 S, Range 4 W, Section 18, Tax Lot 1108 • 29175 Coffin Butte Road; Township 10 S, Range 4 W, Section 18, Tax Lot 801
APPLICANT:	Republic Services
PROPERTY OWNER:	Valley Landfills Inc.
ZONE DESIGNATION:	Landfill Site (LS), and Forest Conservation (FC)
COMPREHENSIVE PLAN DESIGNATION:	Landfill Site, Forestry
CAC PLANNING AREA:	North Benton (not active)
STAFF CONTACT:	Inga Williams, inga.williams@co.benton.or.us
FILE NUMBER:	LU-21-047

This matter came before the Planning Commission in public hearings held November 2 and November 16, 2021. At the November 16 meeting:

- the applicant was provided the opportunity to submit additional written evidence up to 5 PM on November 19th;
- per statute, the record was held open so that the public could to submit further written testimony until 5 PM on the 29th; and
- per statute, the applicant was allowed one additional week, until 5 PM on December 6, to submit final written argument.

On December 7, 2021, the Planning Commission returned to deliberate on the application. At the meeting on the 7th, the Planning Commission considered the record as a whole, then deliberated and reached a decision. The decision of the Planning Commission is to **DENY** the Applicant's request for a Conditional Use authorization to expand Coffin Butte Landfill based upon the following findings of fact.

FINDINGS

General Conditional Use Criteria - Chapter 53

53.215 Criteria. The decision to approve a conditional use permit shall be based on findings that:

(1) The proposed use does not seriously interfere with uses on adjacent property, with the character of the area, or with the purpose of the zone;

Uses on adjacent property:

Many residents of the area testified that the odor and noise has continually gotten worse over the years. Some testified that they have to seek shelter inside to avoid the noise and smell. They warn that the levels expected in the future will affect their rural residential uses. Some farmers have testified that getting workers to work in the stench has been an issue.

Odor: Methane emission rules do not capture the impacts to the character and use of the area because many people testified that the smell inhibits them from going outside and enjoying the use of their property. Property owners within miles of the site stated they could smell the landfill. The current mitigation of an earthen cap over cells does not mitigate smell and smell reflects emissions of other gases such as Volatile Organic Compounds (VOCs) and hydrogen sulfide. The same mitigation is proposed for the expansion and if it currently does not mitigate the odor then it cannot be used as a mitigation for the future and be expected to minimize the concern.

Bad air quality: People living in areas with poor air quality does pose serious interference with livability. Risk of health concerns is likely with the landfill expansion; enough so nearby residents speak out about it. Some residents point to increasing cancer clusters in their neighborhood and suggest that poor air quality may be responsible. One nearby resident pointed to studies in Europe that tied poor air quality in the proximity of landfills to bad health issues. The applicant noted they cannot control all of the releases of VOCs or hydrogen sulfide and these gases are understood to be potent carcinogens. The applicant did not address the long-term effects of those gases in varying concentrations in different weather situations but the Planning Commission certainly heard from people that they can smell these.

Noise: The noise study contracted by the applicant has been criticized as faulty and inadequate. Proposed mitigations do not seem feasible and such conditions couched as "whenever feasible" or "if permitted by safety conditions" are not stringent enough. Further concern of noise from banging truck gates, loud noises from unloading, was not addressed. Point noises are often the most debilitating and background noise is easier to live with. The proposed Condition of Approval PA-7 (A) is inadequate to address this concern. To base approval on the applicant's assurance that future studies will ensure compliance would be inappropriate.

Much of the applicant's response to these issues is to rely on subsequent review and approval by Oregon Dept. of Environmental Quality (DEQ); however, there is no ability for the Planning Commission to review the situation after DEQ's approval to ensure that DEQ's standards were adequate to prevent the proposed use from seriously interfering with uses on adjacent property.

Conclusion: The proposed use does seriously interfere with uses on adjacent property.

The character of the area:

Increase in landfill area

Residents of the area point to the change in the character of the area. The minimal footprint of the landfill in previous years has and will be changed to a dominant footprint. The proposed expansion

will increase that interference in a number of ways. A whole valley will be filled with garbage. Modification of the fundamental topography at this scale, turning a valley into a ridgeline and burying the valley under 100 feet of garbage seriously interferes with the character of the area. This level of impact could not have been reasonably anticipated by any existing resident or past prospective purchaser. No condition could mitigate this level of change to the character of the area; therefore, the application fails to meet this criterion.

Open space and views of the cascades will disappear. The agricultural production from fields have gone away. The livability of the area because of noise, odors, and the visibility of the garbage pile will continue to degrade. One resident testified that their view of the dump has steadily increased to the point that it is now noticed and commented on by her children, and it is expected to increase more if the expansion is allowed.

Closure of Coffin Butte Road

The closure of Coffin Butte Road seriously affects those that use this road and the proposed Conditions of Approval do not lower the impact below the level of serious. The proposed mitigations for a closure may not be feasible or, if implemented, may seriously interfere with uses on adjacent property or seriously interfere with the character of the area. Improvement to Tampico Road would drastically alter the character of the area. Traffic will increase on Tampico Rd, and no amount of leveling and grading will be sufficient to make Tampico Road a better egress route without substantially altering the character of the area. These improvements will also increase certain dangers on Tampico Road by enabling traffic to travel it faster and increase risks to non-motorized users.

Staff and the applicant conclude that the Tampico Rd corridor would be heavily impacted by the increased passenger traffic and changes to the nature of every day traffic to include freight, agriculture, and forestry heavy equipment. Increasing truck traffic on Tampico will negatively affect the area. It may be widened, but sight issues will remain. This will increase risks to non-motorized users of the road from increased traffic. No amount of widening will change the underlying topography and hazards inherent in it; yet widening would further damage the local community character with no guarantee of success.

Conclusion: The proposed use does seriously interfere with the character of the area.

The purpose of the zone:

Purpose of Conservation Zone

The applicant has not met the burden of proof that the proposal will not interfere with the purpose of the Forest Conservation zone for protection of the wildlife resources. The Conditions of Approval requiring further study of Great Blue Heron (GBH) rookeries do not provide us with timely information to determine if the criteria is met nor if mitigation is possible. Further, testimony regarding threatened Streaked Horn Lark populations, Oregon Vesper Sparrow populations, and wildlife movements in the area of the landfill expansion point to the need for more wildlife investigations before action is taken in this area.

Proposed Condition of Approval PA-4 only addresses GBH concerns. Either that condition should be expanded to include other wildlife or additional conditions should be added. There is also concern that the applicant has limited ability to hire qualified consultants. The inventory of GBH nesting activity by their hired consultant has been challenged by residents with compelling photographic evidence.

Buffering and Zoning

The proposed landfill expansion relies heavily on the buffering of noise, odor, sight, and other nuisances by adjacent property owned by the applicant. Some of this buffering is provided by properly zoned land. However, some of the adjacent land is zoned Rural Residential (tax lots 10419001600 and 104180001200). Rural Residential zoning has no provisions for landfill buffering or for the extension of the landfill's grading footprint. The buffering of the landfill site and proposed grading plan for the new haul road under this CUP shows the new haul road positioned on the lot boundary of tax lot 104180001107 (zoned LS) and tax lot 10419001600 (zoned RR-10) and the land graded in the RR-10 zone. If the landfill requires a buffer to operate and extend grading, that buffer becomes part of the landfill use. As such, it should require appropriate zoning; a zone change or Conditional Use Permit if necessary. If the landfill cannot operate without establishing an illegal use on residentially-zoned lands, then reconsideration of this expansion location is necessary.

Conclusion: The proposed use does seriously interfere with the purpose of the zone.

(2) The proposed use does not impose an undue burden on any public improvements, facilities, utilities, or services available to the area;

Closure of Coffin Butte Road

This is an undue burden because Coffin Butte Road is used as a bicycle and walking route, log truck and freight haul road, an emergency egress by the neighborhoods to the south and west, and is used by Adair Rural Fire Protection District for public safety and fire access. The closure of Coffin Butte Road seriously affects facilities and services.

Closure of Coffin Butte Road results in the loss of the most direct, safe evacuation route in case of inclement weather or wildfire; it eliminates the best (paved, flat, one curve) and shortest egress from the Soap Creek Valley. Closure of Coffin Butte Road results in the permanent loss of one of only three routes out of the Valley. In addition, the Coffin Butte Road closure results in the loss of the only locally available, direct east/west crossing of Hwy 99W, creating additional traffic conflicts on Hwy 99W at Camp Adair Road, Tampico Road, and Robison Road.

Based on community testimony, during the February 2021 ice storm Coffin Butte road was the only egress for several days. There is testimony dated November 23, 2021, from Chief Aaron Harris to Joe Bessmen and email from County Emergency Manager Bryan Lee dated Nov. 23, 2021, to Julie Jackson, and later that day forwarded to County staff, indicating that they both felt that the loss of Coffin Butte Road would be an impact on public safety.

The Adair Rural Fire Protection District Board advises, "this route should not be closed" and "closure of Coffin Butte Road would be detrimental to public safety". Proposed Conditions of Approval to mitigate this road's loss through improvement to the northern route will not be "superior to Coffin Butte Road with regards to evacuation routes and public safety".

Closing Coffin Butte Road for this conditional use would remove an important route, replacing it with a lesser, compromised route or routes.

Leachate

Leachate from the proposed expansion is planned to be hauled off-site and disposed at the Corvallis Wastewater Treatment Facility (CWTF). The increased volume of leachate hauled will increase tanker truck loads to Corvallis and burden the transportation corridor and create an undue burden on the CWTF. The treated leachate from CWTF is released into the Willamette River and poses water quality concerns. The applicant has presented no leachate plan to account for this increased volume and continued maintenance and disposal for the future.

Conclusion: The proposed use does impose an undue burden on public improvements, facilities, or services available to the area:

Conditional Use Criteria for the Forest Conservation Zone - Chapter 60

60.220 Conditional Use Criteria. (1) A use allowed under BCC 60.205 or 60.215 may be approved only upon findings that the use: (a) Will not force a significant change in, or significantly increase the cost of, accepted farming or forest practices on agriculture or forest lands; (b) Will not significantly increase fire hazard or significantly increase fire suppression costs or significantly increase risks to fire suppression personnel; and (c) Complies with criteria set forth in BCC 53.215 and 53.220.

There will be increased transportation costs to local farm and forestry operations from the closure of Coffin Butte Road. One commercial forester commented that their harvesting operations use Coffin Butte Road as a major haul route and that closure of the road would affect their forestry operation. "Closing Coffin Butte Road and replacing it with an alternative will add time and cost." Another commercial forester commented that closing Coffin Butte Road would create problems for them in increased costs and safety issues.

Adair Rural Fire and Rescue uses Coffin Butte Road for public safety and fire access. Alternative routes take more time for fire response and are narrower. "The closure of Coffin Butte Road will negatively impact the response time from the Substation to the northern/northeastern areas of our fire district and North Albany automatic aid response areas." It will also create an increase in fire suppression costs and increase risk to fire suppression personnel because of the increase in transportation time to reach a fire.

Conclusion: The proposed use will force a significant change in, or significantly increase the cost of, accepted farming or forest practices on agriculture or forest lands, and will significantly increase fire hazard or significantly increase fire suppression costs or significantly increase risks to fire suppression personnel.

Conditional Use Criteria for the Landfill Site Zone - Chapter 77

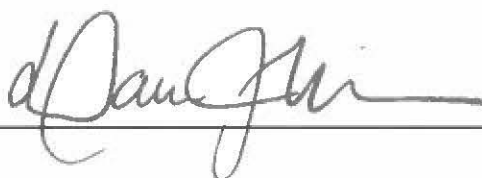
77.310 Conditional Use Review. (1) The applicant for a conditional use permit shall provide a narrative which describes:

(c) Provisions for screening of the site from public roads and adjacent property;

The staff discussion in the staff memorandum of November 29, 2021, concluded that screening is appropriate for this application. Pages 2-5 propose screening mitigation activities (tree planting), but even those would not be sufficient. Proposed condition of approval OA-6 and OA-7 for screening are not adequate to address screening of the site from public roads or adjacent property. It will be impossible to adequately screen the view of this mountain of garbage. Since no mitigation is possible, we must deny the application for non-compliance to the criteria.

Conclusion: Provisions for screening of the site from public roads and adjacent property is inadequate.

PLANNING OFFICIAL:



Date of Decision: December 7, 2021

July 7, 2025

Angela Krueger
Ryan Wilson
28903 Tampico Road
Corvallis, Oregon 97330

DATE RECEIVED:	7/9/25
FROM:	Angela Krueger
PHONE OR EMAIL:	

To: Benton County Planning Commission

RE: Opposition to LU-24-027 Land Use Application

Dear Commissioners,

We respectfully urge you to deny the proposed landfill expansion application LU-24-027. Our family lives on and operates a cattle ranch (dba Krueger West Cattle Company LLC). We graze cows on Exclusive Farm Use (EFU) land at 28903 Tampico Road, just south of the proposed landfill expansion site.

Currently, the existing landfill operation north of Coffin Butte Road seriously interferes with the use of our property and threatens the health of our livestock and the viability of our business, primarily due to trash blowing onto our grazing land, and through the frequent and persistent odors from the dump. The threat of groundwater becoming contaminated through leaks from the landfill is ever present. We water our cows almost exclusively from an under-ground spring and contamination could be extremely detrimental to our livestock's health.

The proposed expansion parcel will bring both these impacts much closer to our farm operation and therefore the proposed expansion cannot meet the conditional use review criteria. The proposed landfill expansion will seriously interfere with uses on our adjacent property (BCC 53.215(1)).

Cattle have been a part of my (Angela) life since I was in the third grade. As I was growing up showing cows in 4-H I decided that I wanted to have my own beef herd. Raising cattle on a property such as the one we live on now is literally a dream come true.

On our property we are continuously working to return the land back to its historic state by eradicating non-native vegetation, and encouraging the growth of oak trees and native plants. We use cattle to rotationally graze the pastures year-round. Since moving here, we have increased our herd to just shy of 30 cows. Our herd consists of mainly Purebred Herefords with some crossbred calves and two dairy heifers. Some

of the cattle we own now have genetic ties to my very first Hereford cow. These cows are not just cows to us this is a legacy we are creating.

Our steers and heifers raised for meat are born to mother cows on our land. They are raised their entire life on our pastures. We mainly sell beef in quarters, halves, and wholes to families in Benton and surrounding counties. In recent years we have started selling calves as 4-H steers and replacement heifers to other Oregon farmers.

Raising a beef herd is more than just an investment of money it is an investment of time and a lifestyle many would not be willing to participate in. We have spent the last 8 years building this herd from the ground up. Endless hours spent working for free and footing the bill for the business when it was not making a profit because the inputs like hay and grain were so expensive. Finally, we have found a groove that works. What scares us the most is the possibility of losing cattle because they consumed trash that has blown over from the landfill. If we have just one cow death it would put us financially in the red. How many years could we really continue if we started losing more cows because of this terrifying circumstance? The trash is not only harmful to our cow's welfare but also to the livelihood of our business. It would be heartbreaking to have to walk away from everything we have worked for because of the landfill expansion.

We are attaching a series of photos taken on our property over the past couple years and as recently as last week that document the trash being blown into our grazing pastures. There have been two instances where we have had to pull plastic out of the mouths of our calves to prevent them from eating it. It is nothing but sheer luck that we were in the right place at the right time. It is impossible to watch the herd constantly to prevent them from eating plastic blown in from the landfill. This cannot be allowed to continue and moving the landfill operation closer will only make the problem worse.

We ask you to reject LU-24-027 outright. There are no enforceable mitigation measures or conditions of approval that can be implemented to eliminate or reduce these impacts sufficiently to protect the uses on our property.

Sincerely,

Angela Krueger
Ryan Wilson
28903 Tampico Road
Corvallis, Oregon 97330



Gifts from the landfill

05/19/2024

11/26/2024



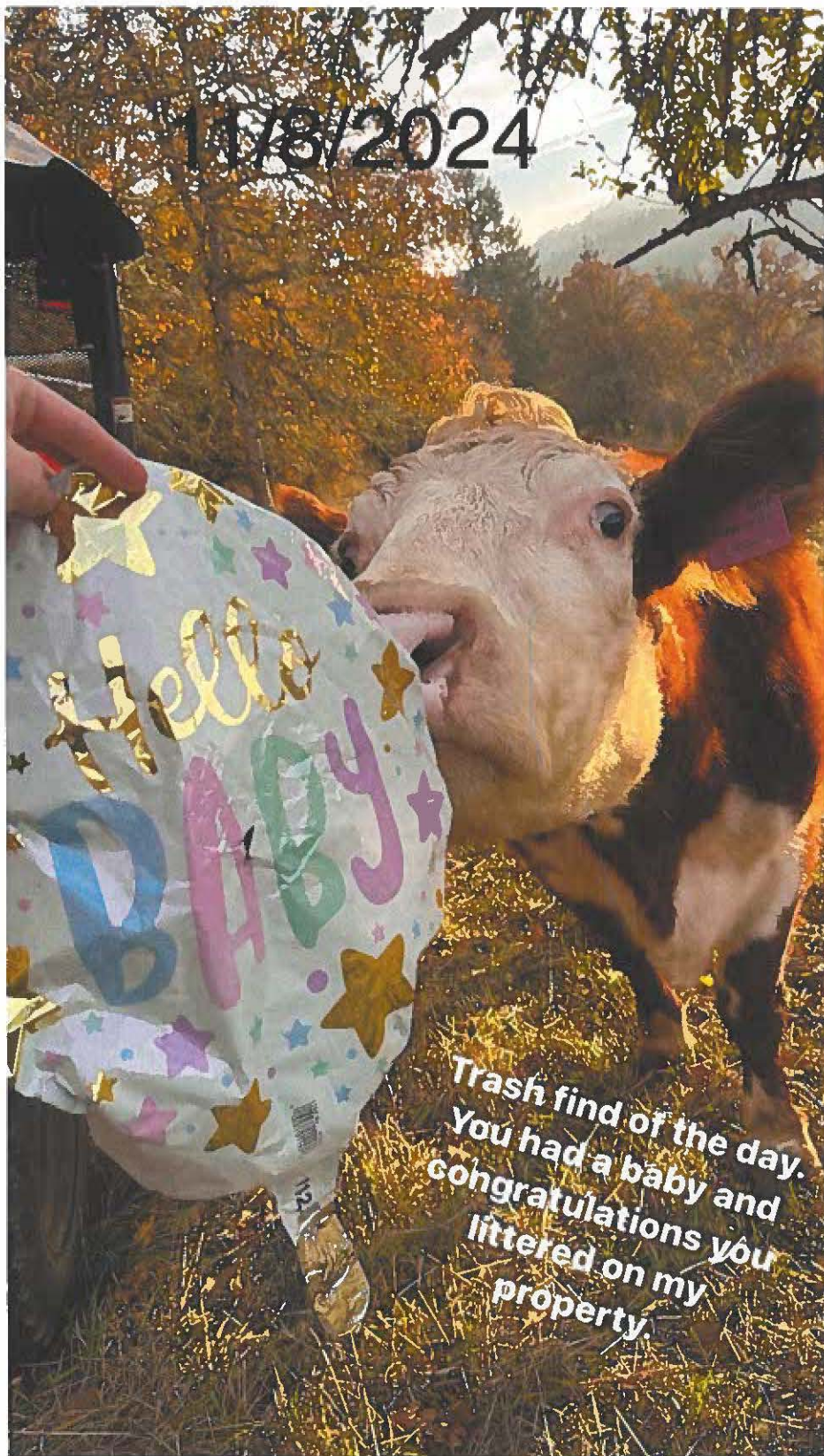
Would it be a trip out
to the pasture to
check cows without
finding dump trash?



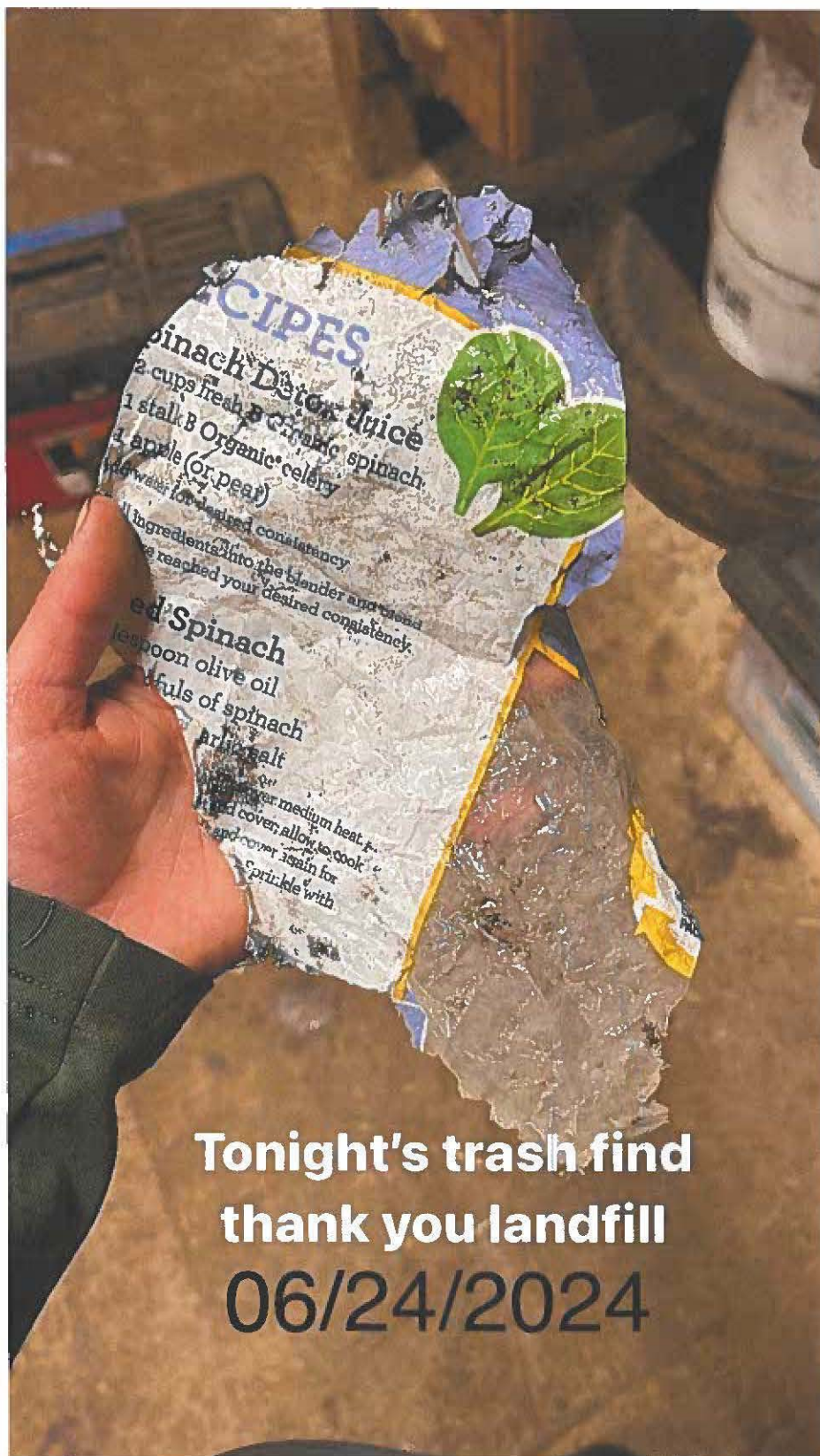
Trash find of the day. The
problem with living too close to
the Corvallis landfill.... 🤔

09/18/23

11/8/2024



Trash find of the day.
You had a baby and
congratulations you
littered on my
property.



Tonight's trash find
thank you landfill
06/24/2024



**Would it be trip out to feed the cows
without finding dump trash that's
floated over?**

02/08/2024



**Another trash find.
Thank you landfill**

07/02/2024

08/20/2024

Always trash, thanks

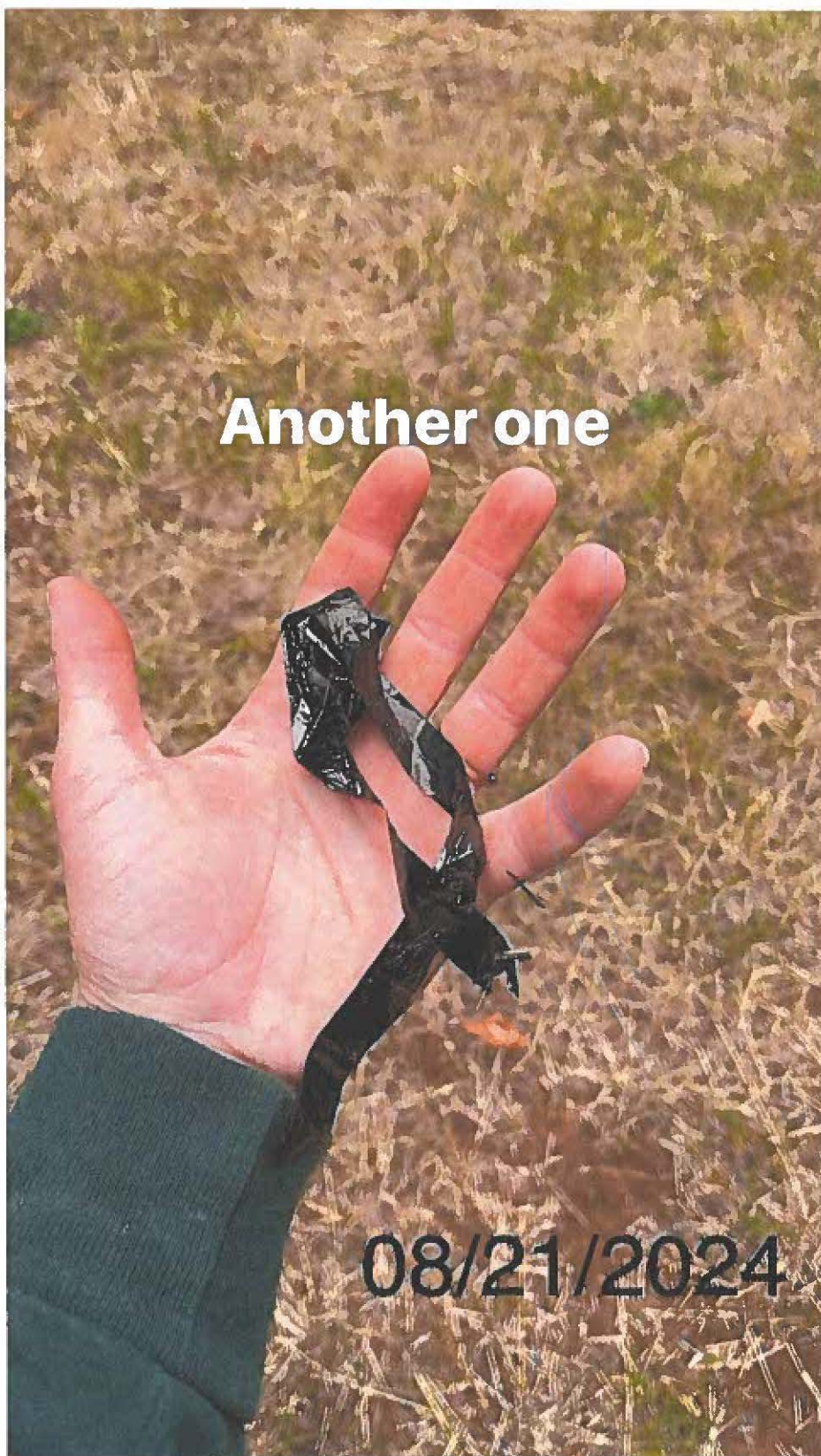
Coffin Butte Landfill



07/28/2024



Trash find of the day.



Another one

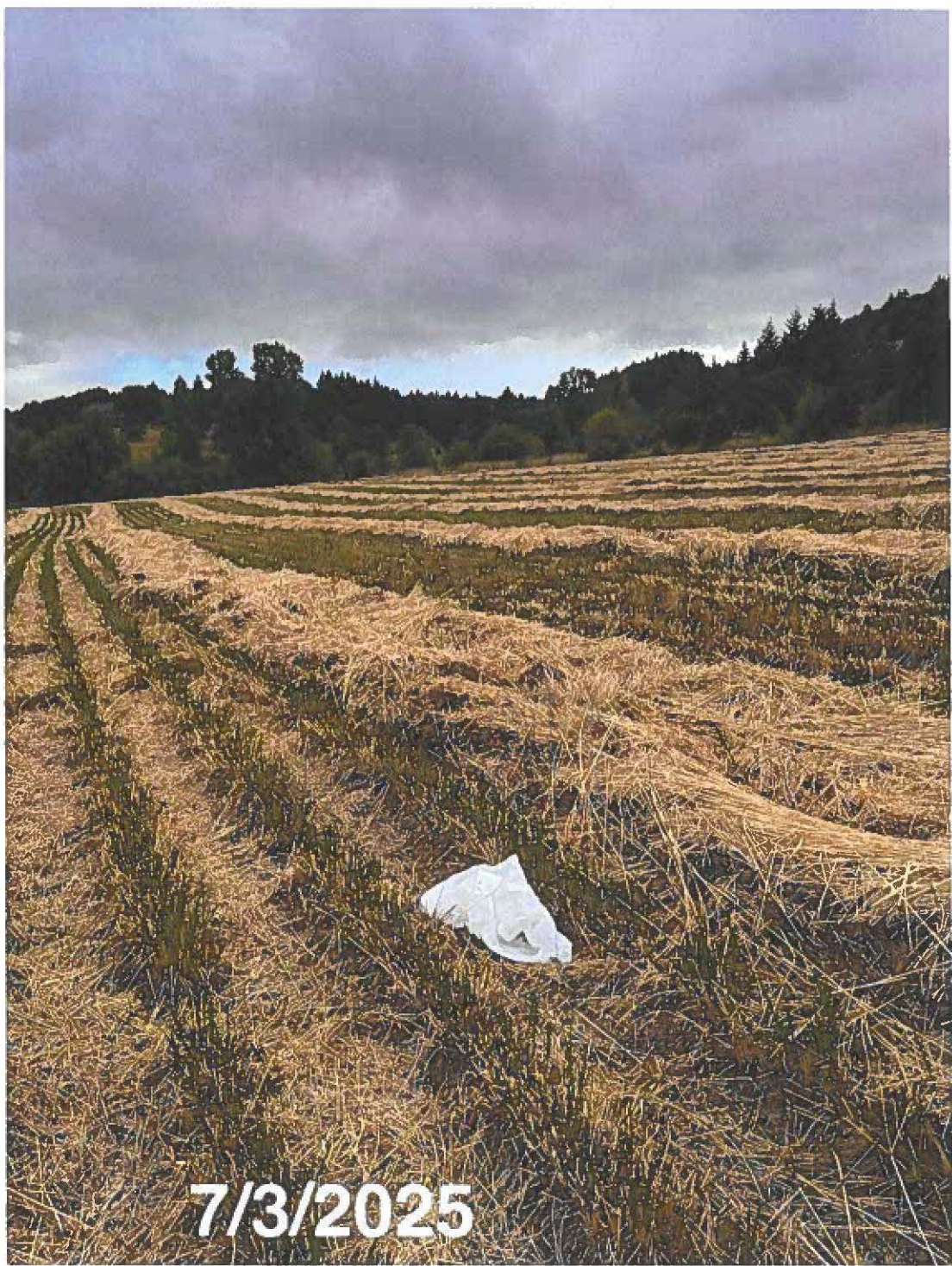
08/21/2024



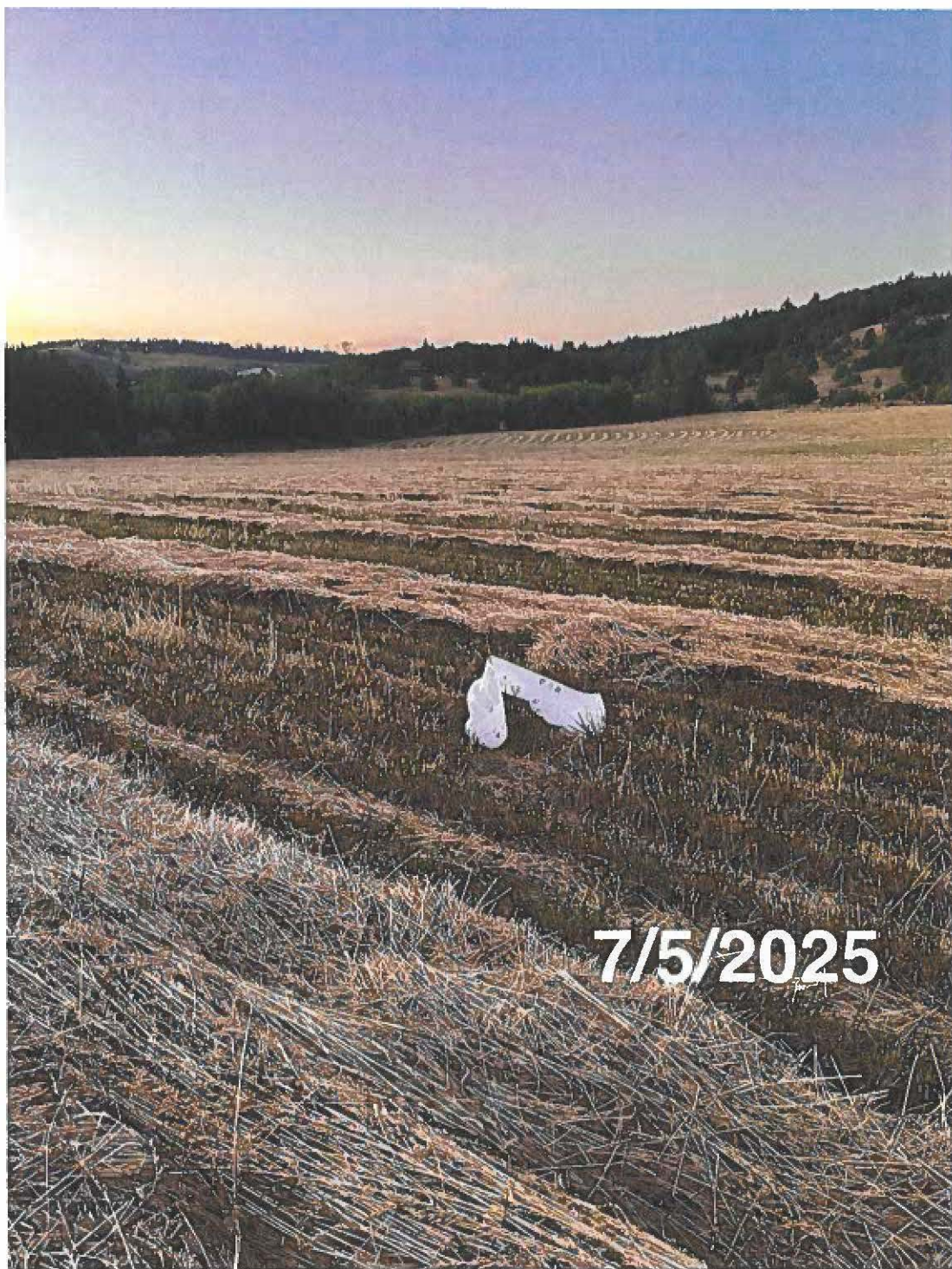
3/11/2025



Thank you! Coffin Butte Landfill







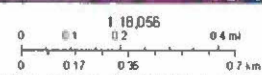
7/5/2025

Krueger Property



7/7/2025 9:10:13 AM

- | | | |
|---|--|--|
| <ul style="list-style-type: none"> Soil Water Boundary Zone A Zone B Zone C Zone D Zone E Zone F Zone G Zone H Zone I Zone J Zone K Zone L Zone M Zone N Zone O Zone P Zone Q Zone R Zone S Zone T Zone U Zone V Zone W Zone X Zone Y Zone Z | <ul style="list-style-type: none"> Zone A Zone B Zone C Zone D Zone E Zone F Zone G Zone H Zone I Zone J Zone K Zone L Zone M Zone N Zone O Zone P Zone Q Zone R Zone S Zone T Zone U Zone V Zone W Zone X Zone Y Zone Z | <ul style="list-style-type: none"> Zone A Zone B Zone C Zone D Zone E Zone F Zone G Zone H Zone I Zone J Zone K Zone L Zone M Zone N Zone O Zone P Zone Q Zone R Zone S Zone T Zone U Zone V Zone W Zone X Zone Y Zone Z |
|---|--|--|



City of Essex, County of Essex, State of Oregon
 Oregon State Department of Transportation
 Essex County, Oregon
 NOT BE SUITABLE FOR LEGAL, ENGINEERING, OR SURVEY PURPOSES



To: Chair Fowler and Benton County Planning Commission members

From: Paul Nietfeld, Benton County resident and former member BCTT A.1 Subcommittee
37049 Moss Rock Dr., Corvallis, OR 97330



Subject: Response to Commissioner Biscoe's question of 5/8/2025: Site Development Plan approval

Date: July 9, 2025

Chair Fowler and Planning Commissioners:

During my public testimony on LU-24-027 I noted that Benton County could not locate

- any record of a permit for placement of solid waste into Cell 6 (the former quarry cavity),
- any record of a review of the Site Development Plan for this cell,
- any record of an approved Site Development Plan document for this cell.

Following this testimony, Commissioner Biscoe asked for the Benton County Code section defining which county department is responsible for review and approval of the Site Development Plan.

Short Answer

The June 26, 2025 Supplemental Staff Report Page 113 documents the Section of Benton County Code (BCC 7.305) that assigns responsibility within the Benton County administration for review of the Site Development Plan for any proposed landfill area expansion within the Landfill Site Zone.

Complications

BCC 77.305 assigns this responsibility to the Benton County Environmental Health Division and the Solid Waste Advisory Council, both of which have been stripped of authority in this matter. Management of solid waste is now the responsibility of the Community Development Department, which presumably includes review and approval responsibility for the Site Development Plan. However, County Staff now take the position that "BCC 77.035 is a procedural requirement that was adapted in 1990. It does not contain substantive criteria for reviewing the Site Development Plan Map and narrative." [Supplemental Staff Report, Page 114.] While reducing the approval of the site development plan to a procedural formality, this still does not explain the absence of any Benton County approved Site Development Plan for Cell 6. Finally, note that per BCC 77.305, Benton County review of the Site Development Plan is distinct from any review and approval by ODEQ.

Relevance to LU-24-027

The review and approval process failures of Cell 6 are indicative of the extent to which the burdens of managing and overseeing the Coffin Butte landfill operation already overwhelm our county resources, and are a reasonable guide to the likely level of county oversight which would be applied to the new landfill cells which are the subject of LU-24-027. The unreviewed and unconstrained implementation of Cell 6, *the largest landfill cell by far in the history of Benton County*, is a clear warning that under Republic Services the Coffin Butte landfill has grown beyond the capability of our county government to limit and control harms and burdens caused by this landfill.

Lastly, I would like to express my appreciation for your significant personal time, effort and attention on this latest Coffin Butte land use request. The hearings have been conducted in a serious and respectful manner, with many thoughtful questions posed by Planning Commission members. Thank you.



Below is the script of my verbal testimony for Weds 7/9/25.

Debbie Palmer
37340 Moss Rock Dr
Corvallis, OR 97330-9355

Chair Fowler, vice-chair Haman, members of the Planning Commission,

My name is Debbie Palmer, and I live at 37340 Moss Rock Drive in Soap Creek Valley, about 4 and a half miles south of the landfill.

I second everyone else's gratitude for all the careful time and attention you are putting into this. And if I understand correctly, you plan on extending tonight's meeting time, if needed, in order to hear all our public comment, instead of cutting us off at 8:45pm like you could have. We really appreciate that! We appreciate your granting us the same consideration as you granted Republic Services and County staff. Thank you so much.

My testimony tonight will be in response to information presented at last night's meeting, from both staff and the applicant - and in no particular order.

For starters: this may seem a bit minor - but have you noticed how Republic's visual presentations *never actually show pictures of the dump itself*? They'll show you nice pictures of the surrounding area - beautiful grasslands, rolling hills etc; dare I say... pictures of the "character of the area"? I hope this is not lost upon you. They will never show you pictures of the dump because it is UGLY. Who would want to look at that? [pause] Exactly.

Another thing: this is regarding Fire.

Republic's fire consultant has never once mentioned evaluating the impact of wildfire in nearby forests. I.e. he has studiously avoided investigating how likely a major landfill fire could be started due to windblown embers from a wildfire landing on this methane super-emitter. Does that not sound to you like something that should have at least been *considered*? It sounds apocalyptic to me, frankly.

This is just another example of Republic's failing the "burden of proof" test.

Palmer script, p 1 of 3

Moving on: Chair Fowler, you were on the Planning Commission in 2021 when Republic's last expansion application was soundly and unanimously denied. Do you happen to notice how this current application is *uncannily similar* to the first phase of that one? Everything points to Republic's intention to continue to expand this monstrosity — that this is just the first step in what will be a series of applications to expand.

Why would they be spending all this money, and taking "3 to 4 years," to construct something that will only add "six more years" of landfill life? They're not going to stop there. Soon as this "phase" is largely underway — and as Cell 6 "the quarry" rapidly fills, thanks to the cap being lifted — they're gonna apply again.

In an email exchange between County Counsel Vance Croney and Republic's Julie Jackson during the 2020 Landfill Franchise Agreement negotiations (information we got via public records request), Mr. Croney says, "... I want to be sure I'm correct when I discuss with the BOC ramifications of lifting a tonnage cap," and Ms. Jackson replies, "... We have many acres that could hold waste and that will likely be a future discussion with the County."

So they're definitely intending to continue to expand.

Actually... I'll amend what I said about this being the first step in "a series of *applications* to expand": we are actually *extremely* concerned that — if you grant this expansion, and Republic now owns a landfill on both sides of Coffin Butte Road — *that they could, under Oregon statute [ORS 368.351 - "Vacation without hearing"], get Coffin Butte Road "vacated" by the County (i.e. permanently closed) and build their landfill across it... without a public hearing.* Possibly without even having to *notify* the public. Or, in other words: without having to be held accountable via a formal, public, application process like the one we're going through now. Because that is our biggest fear - and Republic's wet dream.

Moving on once more: regarding compliance with past conditions of approval.

Outside counsel Meg Ryan states, "It's the County's legal obligation to monitor the conditions and there is a legal process for enforcing conditions... should the County have the budget to do so."

And planning official Petra Schuetz says, "Until adjudicated, we don't have any evidence that those conditions were not followed."

So, apparently all our filed complaints and photographs and such are not "sufficient evidence"? What we all can see with the naked eye and smell with our noses is not "sufficient evidence"?

It sounds like they are saying someone would actually have to sue, in a court of law, in order to "prove" past conditions were not met? We know the County would not do that (even if they HAD the budget), so that means some member of the public or organization *would have to sue*?

Does that sound like a level playing field to you?

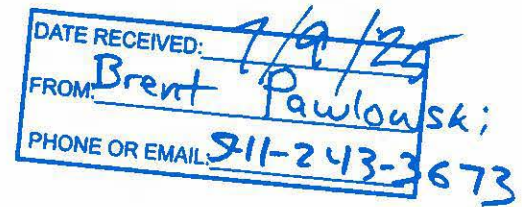
Next: Republic's Fire consultant's attempt to claim that because this dump has been around 70-80 years and hasn't impacted nearby property values thus far, it would somehow on a "go-forward basis" not diminish them, is feeble and specious. 15-20 years ago, let alone 70-80, the landfill *was a fraction of the size it is now*. Its collective impacts are a huge question mark on nearby property values going forward.

Lastly: I wish to remind you that your decision is ultimately *discretionary*. That's in the code. So under your quasi-judicial authority, you have the leeway to judge this application as you see fit. If you feel a concern is valid, then it is valid. I hear a number of you expressing concern about what you can and cannot consider when judging this application. Such as "past performance" of Republic at their landfill across the road from the proposed new dump. Past behavior is absolutely a valid consideration when judging future behavior.

Please. **Use your power of discretion and deny this application unconditionally.**

I thank you for your time, and relinquish any leftover time on my clock to the next speaker, or, if that is not allowed, let it expire.

Palmer script, p. 3 of 3



July 1, 2025

TO: Benton County Commissioners, Benton County Planning Commission

SUBJECT: Please support and approve Coffin Butte Landfill Expansion

FROM: Brent Pawlowski, 50+ year Corvallis resident. These opinions are my own and are completely separate from my involvement on the DSAC Committee.

Please support the Coffin Butte Landfill Expansion for the following reasons:

1. The owner-operator, Republic Services, has shown to be a responsible company both on operations and compliance.
 - Records show Republic Services has not had an environmental compliance violation.
 - The contentious methane "exceedances" are not violations. Republic Services has followed protocol for measuring and correcting exceedances per testing and correction protocol. This is well documented.
 - Republic Services has shown that they act quickly to information requests from both state and federal regulators and agencies. The Republic Services representatives continually affirm that they are willing to adopt new practices where they make sense.
 - Republic Services graciously participates in the solid waste advisory meetings and regularly participates in public hearings.
2. Republic Services is an example of an organized, well-run landfill manager.
 - Republic Services manages landfills across the nation and has developed modern best practices to minimize impact.
 - Everything we do in our daily life generates waste. A well-run landfill is an asset to deal with this waste.
 - Republic Services has a track record in landfill management. Across several states, Republic Services has bought many dump sites and modernized them into landfills with up-to-date liners, latest leachate treatment, and methane capture. Let us be thankful we have a responsible partner running Coffin Butte.
 - When landfill users are asked, a majority of the local users view the landfill as an asset. One just has to ask the users as well as simply look at the daily line of customers. These locals use this asset for needed waste disposal in their daily lives and business. Each day there is a long line of contractors / landscapers tipping waste each day.
 - Republic Services has improved ease of access for disposal. Locals using the landfill now are able to tip most small loads in a transfer area versus on the exposed face. This has improved time savings and safety.
 - Republic Services has a competent engineering team to design leachate and methane capture. Designs must follow design scrutiny for best practices. This and other landfill

sites already have oversight to protect the public. Capturing leachate and methane are an understood practice.

3. Benton County can show leadership in maintaining a waste management solution as Oregon seems to lack a vision of solid waste disposal.
 - Expanding the landfill makes sense until Oregon declares a long-term strategy for waste handling.
 - The closing of the Brooks incinerator, was short sighted which diverted waste to Coffin Butte. This is an inconvenient fact when counties attempt to push their waste “problem” to another county. Although “environmental” concerns are cited on any solid waste disposal, we (community, state, or nation) cannot “recycle” its way to zero waste.
 - When landfills are taken offline, it pushes the cost to the consumer. Let Benton County not fall into irrational activism. Simply phasing out or shutting down a landfill does not magically make trash or the concerns disappear; it only displaces the waste.
4. Alternate or disruptive alternatives takes years-to-decades to complete. An expansion is a good back-up plan until then.
 - Other than shipping waste out of state, there is no other option right now than to landfill waste in Oregon. Shutting down incinerators automatically put the burden on landfills.
 - If ever a new technology replaces landfills, an expansion makes sense until then.
 - Many alternative solutions may sound good on paper but implementation is not so easy. Many of these alternatives are cumbersome and expensive. Residential customers will not support expensive alternatives that provide little benefit.
5. Regionalized landfills are a fact of life.
 - Landfills are now regionalized because of regulation and barrier to entry.
 - Taking waste from other counties is an inconvenient fact of regulation and the barrier to entry of anyone who handles solid waste. Those who criticize this practice, simply ignore the effort and expense required for a business to simply haul waste and properly landfill it.
6. Republic Services follows regulation.
 - Benton County should trust the state and federal regulators for landfill safety and environmental impact. It should not be Benton County to add more regulation. If Republic Services is doing something unsafe, then our ire should be directed at the very agencies that were chartered oversee and protect us.
 - Who is to say we know more than the scientists and regulators who have written the rules? More rules based on emotion can shut down an operation, then the trickle-down cost effect ends up on the residents. Let Benton County rationally follow our nation’s regulatory agency rules for guidance.
 - There has been recent concern of PFAs or other “forever” chemicals that spawn from breakdown of synthetics and plastics. Although it is argued that these chemicals are ‘concentrated’ at a landfill operation, these compounds are in everything we touch.
 - PFAs are currently under research. Information on health affects are going through the scientific learning process.

- Let us trust our DEQ and EPA to take action when appropriate. How to regulate PFAs should be on the agencies chartered to do so.
- Why be in fear of what we do not know when average human lifespans are longer than they ever have been. Perhaps the invention of synthetics and plastics have benefited life more than we realize.

7. Landfills are commerce, like it or not.

- Benton County must make an informed decision on a major commerce industry in our economy.
- Tipping fees generate county revenue that more than offset the effort of county staff to oversee the operation.
- Pushing waste further away, increases costs and affects those most vulnerable to higher prices. This affects lower-income residents the most, which is not equitable.
- Waste has to be dealt with. Why cop out and push this off to other counties or states? This would be like “sweeping the solid waste issue under the rug” when the Coffin Butte site has run well for many years.
- The public does not understand what the loss of a local landfill would mean if the residents were to be told “drive your waste to the next town”. Just think of a 50 to 100-mile round trip to dispose of waste.

8. Republic Services manages landfill across the nation and has developed modern best practices to minimize impact as well as look to the future.

- Republic Services has been good stewards of methane capture and are willing to modernize.
- Recently, Republic Services announced plans to convert from methane power generation to a new methane scrubbing that will then be injected into the existing natural gas pipeline. This would allow the methane resource to be used more efficiently without “flaring off” the excess are currently done.
- Republic Services has removed all of the legacy unlined cells of Coffin Butte. Little known among many and ignored by opponents, Republic Services completely excavated and moved the legacy dump site to the modernized portion of the site. This was the final step of mitigating leachate drainage into the porous (unlined) zones. Reportedly, the newspapers dug up from the 1940s were still readable. How can anyone be against a company willing to absorb costs to modernize and reduce risk of leachate escape?

9. Odors and smells are expected and will not increase with an expansion.

- Many opponents to the landfill are those that live near the landfill site.
- Perhaps the smell at Coffin Butte has actually been reduced. Republic Services was committed to community input and their actions show. Republic Services made operational changes to reduce the open face to only a few acres and to cover or tarp the face during nighttime hours to reduce smell.
- The criticism of living near the landfill should go back to those who bought discounted property near a landfill. Shift in wind direction can make a landfill a bad experience to nearby neighbors. This landfill has been there since the 1940s. Smell from an active landfill

is obvious to neighbors. Nearby residents who bought land after 1940 were either in denial or simply assumed the daily adversity.

- One should not expect customers of several counties to yield to the few who had the option to buy property elsewhere. The responsibility of having one's property value affected should be pushed back to those who decided to buy residential land nearby. What were they thinking?
- I toured the landfill over 35 years ago and it was communicated even back then that the long-term plan was to expand the landfill. This was no secret to the public or to any real estate buyer. Those who bought property near the landfill should not be surprised at the expansion proposal.

10. Opponents to the landfill have purposely passed out misinformation.

- During 2024 a mass mailing from a group labeled as "Beyond Toxics" claimed the leachate was being "dumped directly in the Willamette River" which was untrue. An example of the mass mailer (postcard) was given to county staff. The county decision makers should note this and declare this as misinformation.
- A website claimed to be "Coffin Butte Facts" has falsely stated that Republic Services is currently "violating environmental laws". This is also false. There is no pending enforcement action nor has Republic Services been informed of pending enforcement.
- As much as opponents may not like aspects of a landfill, it is unproductive to mislead the public with purposeful, premeditated, false claims. Testimony from this and sponsor groups (Center for Environmental Justice, Corvallis Environmental Center, VNEQS) should be treated as "not credible".

To: The Benton County Planning Commission

July 9, 2025

Subject: Oppose/Deny LU-24-027

DATE RECEIVED:	7/9/2025
FROM:	Jenny Saarloos
PHONE OR EMAIL:	

Dear Benton County Planning Commissioners,

I have ceded time from Laura Hansen #27.

My name is Jenny Saarloos and I live at 390 NW Maxine Ave. Corvallis, OR 97330.

I urge the planning commission to deny the landfill expansion. The proposed expansion would seriously interfere with the character of the surrounding area in violation of Benton County Code 53.215. It would jeopardize the air and water quality. Traffic will increase. Odor and noise will increase. There will be potential long term climate and environmental consequences. This alone is a solid basis for denying the expansion.

We can't continue to bring garbage from all over Oregon and even other States and not change the character of the surrounding areas. We absolutely need to deal with our garbage but other places do also. When it comes to taking in Garbage Benton County has more than done its fair share under the current agreement. Please don't allow an expansion.

I would like to add that this expansion would cause a serious burden on the many properties that surround the landfill. For miles. I am aware that the potential harm will not be limited to these areas but I do feel that these residents of our county face an even more terrible burden if this expansion is passed. It is bad enough to smell an odor. But then one wonders what kind of toxins they might be breathing in. Wonders if the leachate will reach the well water. Wonders *what will happen to the property value. Wonders what way the wind will blow. This is no way to live.* Please put a cap on this problem. No amount of monitoring will make this expansion bearable.

Promises can be made to keep the leachate from getting to the ground water. But there is no way to guarantee that. Promises can be made to contain odors. And contain garbage. But that is also not always possible. Garbage stinks. Accidents happen—even under the best of circumstances. Fires happen. Can we really ask a volunteer fire department to be on the ready for a fire at an expanding landfill?

The Benton County 2040 Thriving Communities Core Values Initiative has at its very center equity & health. Please uphold these values and deny the landfill expansion. We can not have equity if the concerns of the surrounding area are invalidated. And by that I mean saying things like "that odor is not a nuisance it is a mere annoyance." Who gets to decide these things?

The Benton County Core Values goes on to state that "We recognize & will address the well-being of our people by including health considerations in all policies, practices, activities, & operations." The burden imposed by the expansion of the landfill to residents of the surrounding area are a threat to their mental and physical health. Please uphold our core values and preserve the character of this beautiful place and deny the landfill expansion.

Thank you,

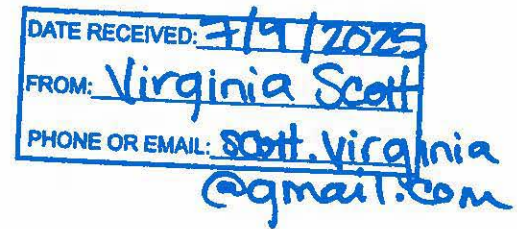


Jenny Saarloos

Benton County Planning Commissioners c/o Planning Division

4500 SW Research Way, Corvallis, OR 97333

July 9, 2025



RE: LU-24-027 Conditional Use Permit Application Regarding Landfill Expansion: Fire

Dear Chair Fowler and Members of the Benton County Planning Commission:

Thank you for the opportunity to comment on the Conditional Use Permit (CUP) application submitted by Valley Landfills Inc., which proposes to start what amounts to a new landfill on the north end of Tampico Ridge, south of Coffin Butte Road. I would like to respond to some of the comments in the applicant's rebuttals, both verbal and written, to fire risk.

Republic Services continues to define risk events to the community as "impossible". Every time Republic Services says "impossible" I hear Inigo Montoya in *The Princess Bride* say, "You keep using that word. I do not think it means what you think it means".

Several of our neighbors have testified that landfill refuse sails through the air to descend on their properties. A fence or series of fences will not contain flammable refuse that is airborne due to high winds or "dust devils".

We have documented two flare fires, at least one of which occurred after Republic Services claims to have fenced in the flares and surrounded them with gravel before declaring that a flare fire is "impossible".

Now let's consider wind driven flammable debris flying across the flares heat and flame, igniting and then the now flaming debris being blown into the nearby tree canopy, a dry field, dry berry cane clumps, or a neighbor's property. As we have learned from the Lahaina fire, the LA fires and several other fires in our own state, there is no fire break in the world that will stop a wind event with fire situation.

Republic Services states that the field around the flares was recently mowed before the fires. Shall we consider the scenario above with a hay devil in the hot dry field? Dust/hay devils can be more than 30 feet wide and more than half a mile tall. Are we saying that it is "impossible" for burning material from any source (dump surface fire, dump grass fire, a nearby fire, or flare fire of airborne refuse cannot get over a 12 foot fence, or fly into the canopy of forest conservation zone trees, or jump a fire break, or rain down embers on a neighbor's property?

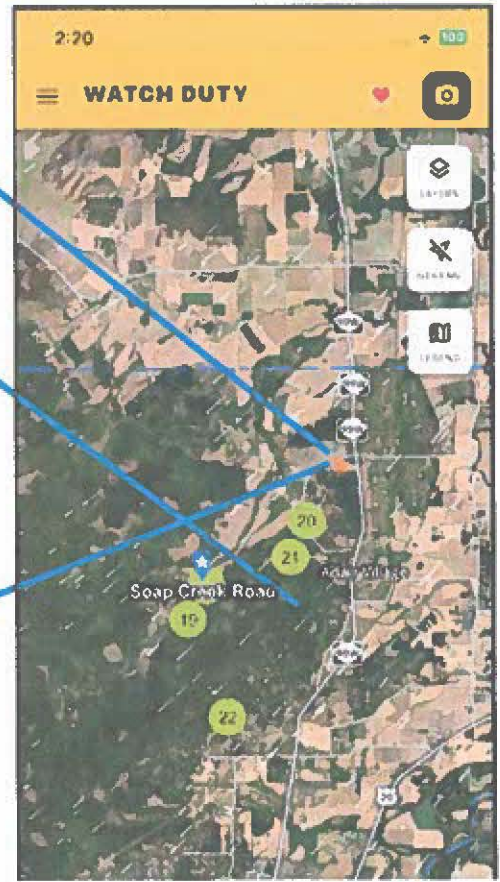
Shown below are two screen shots from the Watch Duty app with the Satellite Hotspots tracker layer turned on. These images clearly show that the heat from the flares is visible from space. The Wind Direction – Surface option is also activated in these images.



Note that heat signature is shifted SW of the flares by the prevailing winds.

Note that on this day the wind is blowing towards neighboring properties, trees, and the Soap Creek Valley

Flares



On a tangential note, refilling a 4,000 gallon water truck from a municipal water supply can take anywhere from 15 minutes to a few hours, depending on the water pressure and the size of the fill connection. With a good water pressure and a large fill hose, it could take as little as 15-20 minutes. However, if the pressure is low or the fill hose is small, it could take upwards of an hour or even longer. Republic Services stated that their hose is not “fire hose size”. So, how efficiently can Republic Services fight a grass fire, drive into Adair Village, refill their water truck, drive back to the landfill without flashing lights, and continue to fight a fire?

I will also remind you that per our Oregon State Fire Marshalls and the teams fighting the LA fires, in a wind event with fire, it is not a matter of “putting the wet stuff on the red stuff” because the water is blown away and evaporates before hitting the fire in these situations. Oregon is experiencing record Red Flag days with low humidity, high winds, and excessive heat. This, by the way, could not possibly be the result of excessive greenhouse gas emissions from sources like the Coffin Butte Landfill, she says facetiously.

A two year old 4,000 gallon water truck, that may or may not be full when a fire erupts, a fire break, fencing to capture flying liter, gravel around flares, etc., are not “conditions” that will save our service providers from toxic fumes, risk to their lives, long term health effects, utilities, businesses, properties, forest conservation land, wildlife, historic buildings, or the “unburnt” character of the area from the undue burden of fire from the Coffin Butte landfill expansion.

Counsel says that the current failure of Republic Services to meet current conditions cannot be considered because it is hearsay and not adjudicated. However, Republic Services is currently required to report all fires to the Oregon DEQ and a records request to ODEQ show only two of thirteen known fires between January 1, 2022 and June 2025. (See 2008_07012025_SCOTT_Virginia01 for full details). This is not hearsay; this is fact as provided by ODEQ. This is only one self-monitoring condition that is not hearsay. This does not need adjudicating because if Republic Services had done their reporting to ODEQ as required, the record of those reports would be at ODEQ, but they are not. Case closed.

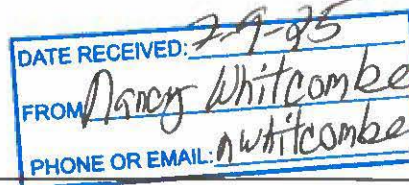
Self-monitoring by Republic Services is like the fox guarding the hen house. Thus approval with conditions is exactly the same as approval without conditions. These conditions will never be met, no monitoring will be done, no repercussions to Republic Services will occur, all bad current behavior will continue unabated on a larger scale, and the community, environment, businesses, forest, land, people, health, air, water, wildlife, etc., will suffer (dead hens in the hen house). This is the very the definition of undue burden.

Please do not approve this CUP application, with or without conditions. As we have heard, the county and the state lack the resources, people, expertise, and funding to monitor for conditions, there is no penalty for failure to meet conditions, and Republic Services has proved, beyond a shadow of a doubt, their inability or unwillingness to self-monitor.

Thank you for your time and consideration.

Best Regards,

Virginia Scott



CONCERNING THE LIKELIHOOD THAT ANY OF THIS WILL ACTUALLY WORK July 9, 2025

NANCY WHITCOMBE, ARCHITECT, LEED AP
37049 Moss Rock Drive
Corvallis Oregon 97330

HISTORY OF COFFIN BUTTE LANDFILL

The history of the landfill is one marked by repeated attempts on the part of the County to ensure that the landfill did not adversely impact surrounding properties.

It is a history of **repeated failure** on the part of the County to achieve this goal. As a result, acreage owned by the landfill has grown in size by 500 acres from 1983 to the present day.

Each of these 500 acres was owned by an individual person who valued what used to be a beautiful property in one of the most beautiful areas of the county.

Watching the ruination of lands that you've improved and cared for is heartrending. You want to hand it down to your children, or sell it to somebody who will care for it as much as you have. But when your property is next to a landfill, you can't do those things. You can't hand your house down to your kids because you don't want to make your grandchildren sick, and eventually you end up selling your property to the landfill itself because there are no other buyers.

There is no reason to think that the current expansion request end any differently that previous ones.

“BY-RIGHT” USE V. “CONDITIONAL” USE

If a use is “by right” that means no land use process is required.

You go right to the building department to submit your plans.

But a “conditional” use is one that may have adverse impacts.

An applicant for a “conditional” use can do one of two things, EITHER:

1. Demonstrate that the proposal will have no adverse impacts, or
2. Acknowledge that it WILL have adverse impacts, but that elements of the proposal are sufficient to eliminate those impacts

For the application before you, the County and the applicant agree that there ARE adverse impacts that WILL significantly impact adjacent uses if unmitigated.

So unless **each and every one** of those conditions is **strictly adhered to**, other property owners will be impacted. They’ll be impacted **significantly**, and the impact will be **adverse**.

COUNTY’S CONSULTANT COUNSEL SAYS:

County’s consultant counsel says that prior non-compliance with conditions of approval has not been adjudicated.

But you don’t need adjudication of something you can see with your own eyes.

And what you can see with your own eyes (and from property records) is that over the past fifty years, the landfill has grown. And it has grown at the expense of neighboring non-landfill uses.

Zoning is supposed to prevent what has happened over the past fifty years at the landfill.

It is not normal for one land use to so adversely impact all surrounding land uses that it engulfs and assimilates them. That’s the plot of a horror movie.

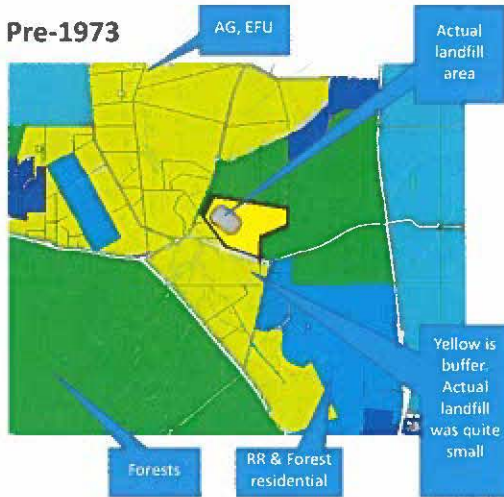
What does it mean that this has happened here?

It means that zoning has failed.

The landfill engages in Potemkin farming on some of the land that it has acquired, but the real purpose of that land is to rezone at some point in the future and turn into more landfill. How do we know this? There is an email.

LANDFILL EXPANSIONS OVER TIME

Pre-1973



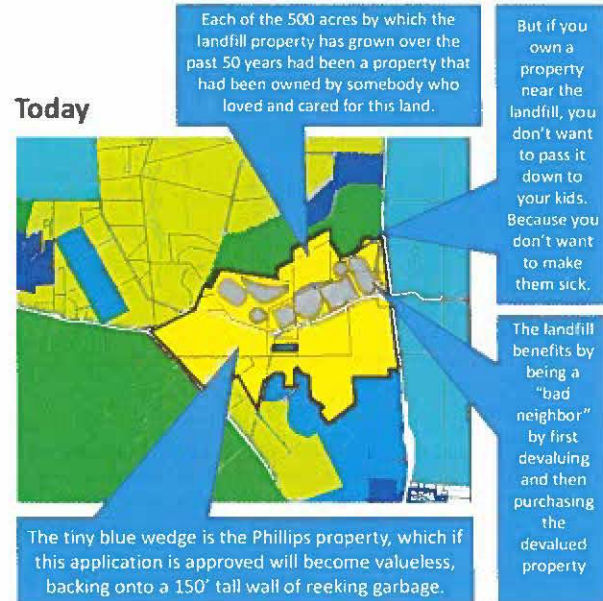
1977



1983: When the LS zone was created



Today



“WE HAVE MANY ACRES”

source: public records request for emails between County Counsel Vance Croney and Republic Services

Julie Jackson to Vance Croney, October 14, 2020, 11:23 am to 11:51 am:

“We have many acres that could hold waste and that will likely be a future discussion with the County.

Julie”

Vance Croney to Julie Jackson, October 14, 2020, 11:23 am to 11:51 am:

“Republic...has many acres of EFU-zoned land that certainly can be used for additional cells, but would require rezoning...”

Thanks. Vance.”

“WE HAVE MANY ACRES”

source: public records request for emails between County Counsel Vance Croney and Republic Services

Vance,

This is a very rough estimate, but we expect about 15-20 years of additional life with the new cell.

Julie

Ok, thanks Julie. I was way off, I thought the additional landfill-zoned acreage would get you 40-60 years of additional landfill life. Thanks

Vance

Vance,

This is just the estimate for the cell area we are asking to rezone. We have many acres that could hold waste and that will likely be a future discussion with the County.

Julie

Hmm. Republic has a chunk of land south of Coffin Butte that is already zoned Landfill which only requires conditional use approval to begin use as a landfill cell. It also has many acres of EFU-zoned land that certainly can be used for additional cells, but would require rezoning. Are we both talking about the Landfill zoned acreage as creating an additional 15-20 years of life?

Sorry for the questions but I want to be sure I'm correct when I discuss with the BOC ramifications of lifting a tonnage cap. Thanks. Vance.

STAFF'S HEROIC EFFORTS TO CRAFT CONDITIONS OF APPROVAL

Staff has crafted **84 requirements** to keep this proposal from significantly harming abutting, adjacent, and other uses within the 90-square-mile area.

But unless the applicant voluntarily complies, or unless the County has the means, the sophistication, and the appetite to enforce these conditions, they are meaningless.

First, let's address whether the applicant will voluntarily comply.

The applicant has never been more motivated to reduce odors than in the past four years, awaiting resubmittal of this application after the previous application was denied on the basis of odor (among other things)

WILL THE APPLICANT COMPLY VOLUNTARILY?

The applicant might want to comply if **it didn't cost any money**. Let's talk about odor: they know what would help: stop taking sewage sludge and rotting animal carcasses and construction debris (the County's odor expert says that construction debris doesn't contribute to odors, which is flat-out wrong, and I will be submitting written testimony to that effect if allowed).

The Applicant could have voluntarily reduced total garbage intake! But has any of this happened? **NO! FOUR YEARS AFTER** the applicant could have taken action to reduce odors, they are worse than ever. So, what action has the applicant taken to reduce odors?

NOTHING.

CAN THE APPLICANT COMPLY VOLUNTARILY?

Is compliance with the requirement that landfill odors not be nuisances even possible?

Probably not. The Applicant operates landfills all over the country, and if you google "Republic Services" AND "odors" AND "class action suit"

...let's just say...there are a lot of hits.

Odor lawsuits cost the Applicant money. A lot of money. I'm sure that if there were an easy solution to the odor problem at landfills, the applicant would have implemented it.

WILL BENTON COUNTY ENFORCE COMPLIANCE?

We love Benton County. We love Benton County staff. But let's face it, Benton County is a small county with a small staff, budget problems, and the Applicant is a 16-billion-dollar Fortune-500 company with a lot of lawyers.

Benton County knows that the landfill is hurting the people who live here. They heard about it in excruciating detail in 2021.

The county heard that people...:

1. ...**were afraid** the landfill **was making them sick**, AND
2. ...were having **quality of life impacts** as a result of landfill odors, that kept them from hiring and retaining farm workers, AND
3. ...**hated the eyesore** that the landfill had become.

What actions could the County have taken in response?

WHAT COULD BENTON COUNTY HAVE DONE?

In response to concerns,

1. ...that the landfill was **making them sick**, ...the County could have reached out to the Oregon Health Authority to investigate cancer clusters,

AND

In response to concerns,

2. ...about quality of life impacts as a result of landfill odors, ...the County could have reached out to DEQ and asked for a followup on nuisance complaints with

enforcement action and civil penalties,

AND

In response to concerns,

3. ...about the embarrassing eyesore that the landfill had become. ...the County could have asked the applicant to apply final cover to closed cells fronting the highway revegetate, and plant some damn trees already, as is required by the 1983 Zoning AND the 1965 Highway Beautification Act.

WHAT DID BENTON COUNTY DO?

BENTON COUNTY DID NOTHING!

NOTHING!

(just to be clear, we're not talking about CDD staff here, but for the most part about our elected representatives, who stuck their fingers in their ears and sang "lalalalala I can't HEAR you")

SO, THIS "ORGANIC" WASTE INTAKE LIMIT?

Let's not even get into the definition of "organic" or that the County's odor consultant believes that Construction and Demolition debris does not cause odors (when in fact drywall is a huge contributor to the generation of hydrogen sulfide).

We're not impressed. Why not? What happens if the Applicant exceeds the "organic" waste intake limit?

Does the County have the appetite to enforce this limit, or will the County do the same thing it did in 2017 when the Applicant exceeded contractual volume limits, which was

NOTHING.

WE'VE SEEN THIS MOVIE BEFORE. **WE KNOW HOW IT ENDS.**

DON'T WASTE YOUR TIME TRYING TO CRAFT THE PERFECT LANGUAGE FOR CONDITIONS OF APPROVAL. IT'S BEEN TRIED BEFORE AND IT HAS NEVER WORKED. IT WILL JUST GO DOWN THE MEMORY HOLE LIKE EVERYTHING ELSE (ask me about the 2003 BASELINE STUDY for example)

CONFIRMING THE MODEL

Chair Fowler asked if the model were confirmable. Starting at the 1:18 timestamp in the video of the 7/8/2025 hearing, Ellery Howard of Maul Foster addressed this issue by referring to the 2023 intake volumes cited in the 2023 Coffin Butte Annual Report.

Using the 2023 “actual emissions” provided by the Applicant in the Applicant’s model results in odors that, per Chad Darby, the County’s odor expert asserted that using the Applicant’s “actual emissions” at 2023 amounts of “organic” waste (however defined) using the Applicant’s model there were odors that were detectable, but which do not rise to the level of “nuisance”.

BUT THIS IS WHAT HAPPENED IN 2023



Polk County Itemizer-Observer:
Two weeks ago, they had their buyers.
Date of Article: **March 2, 2023**

"Two weeks ago, they had their buyers"

*"The day they decided to quit was the day a south wind
blew up from the dump. He was allergic to it and got
violent migraines"*

*"Tom said the buyers left behind 'a chunk of money'
after pulling out of the deal, so they're OK for now..."*

BELIEVE BENTON COUNTY WHEN IT SAYS THIS APPLICATION WILL RESULT IN ADVERSE IMPACTS

More people will finally give up and move away. Residents' wells and ponds will dry up. They will pick litter out of their fields and hope they get to it before their livestock does. More people will decide to sell out to the landfill. The Phillipses home may in fact become uninhabitable due to odor and noise. This application needs to be denied just to protect the Phillipses.

BUT DON'T BELIEVE THAT CONDITIONS OF APPROVAL WILL BE ENFORCED

...the Applicant has too many resources, too many lawyers, and too much money for the County to enforce anything the Applicant doesn't want enforced.

The map shows a route starting from Emerson Vineyards (marked with a red pin) and heading south-southwest. The route is marked with a black line and distances: 2.80 mi and 2.44 mi. Landmarks include Forest Peak Trailhead (marked with a green pin), Redders Pioneer Cem, and the EE Wilson Wildlife Area - Oregon Department of Wildlife. The map also shows major roads like Arla Rd, Arla Rd, and Super, and a river labeled 'rie'.

EMERSON VINEYARD, 3.84 MILES TO THE NORTH AND WEST (NOT SOUTH) OF THE LANDFILL, BUYER BACKED OUT IN THE YEAR THAT THE APPLICANT'S ODOR MODEL SAID THAT ODORS DON'T RISE TO THE LEVEL OF "NUISANCE"

DATE RECEIVED: 7/19/25
FROM: Mark Yeager
PHONE OR EMAIL:

Mark Yeager
37269 Helm Drive
Corvallis, OR 97330

July 9, 2025

Planning Commission:

Chair Fowler, members of the Commission:

Testimony in Opposition of LU-~~21-042~~ 24-027

I want to thank the members of the Planning Commission for their work on this application. I know that your work here has been difficult. We appreciate your service.

I also want to thank and express my gratitude to the community that has come out to engage in this process – a small group that was once characterized by the County as a bunch of NIMBYs has become a region-wide movement to demand a new way forward for waste management in Oregon.

The Figure 8 graphic in the staff report and the more than 1300 petition signatures show the broad base of support to stop this expansion.

PRIOR CONDITIONS OF APPROVAL

I served on the BCTT subcommittee that reviewed the entire record of every prior land use decision regarding the landfill site. At the conclusion of our review of all prior land use proceedings, the public members of our subcommittee developed key findings that can be found beginning on page 98 of the BCTT report which is included in the record.

The BCTT report that the applicant and staff rely on heavily for definitions to craft their proposal, also discusses landfill compliance with conditions of approval.

Key Finding CUP F-2 states, "Benton County has not and does not actively monitor compliance with many Conditions of Approval, nor does it proactively act to enforce compliance." This finding was adopted unanimously by the voting members of the BCTT Committee.

This wording is a watered-down version of what members of the committee wrote. The public members' much stronger statement was edited by the County without approval prior to publication of the document.

A thorough review of Coffin Butte Landfill's historical land use conditions, as documented in the BCTT Past Land Use Committee's report and appendices, reveals a pattern of noncompliance by landfill operators and a systemic failure by Benton County staff to enforce conditions of approval and ensure accountability.

The County readily admits that it does not have a system in place to monitor compliance with the Conditions of Approval and that they have no staff or other resources to enforce compliance.

More key findings from the BCTT report –

CUP F-3 Benton County relies on complaints to initiate action to enforce Conditions of Approval.

CUP F-10 Benton County did not and does not have a readily accessible, transparent complaint tracking system known to the public in place to receive and record land use complaints for documentation, investigation, and resolution.

Both were adopted unanimously. Has the County done anything toward implementing the recommendations of the BCTT in this area. NO.

Two specific and measurable examples of non-compliance with Conditions of Approval include the screening requirement in the Order for PC-83-07, Item 10: Screen the landfill operation with fencing or berms so it cannot be seen the County Road or adjacent properties. That is clearly not the case today, and as noted in Sen. Gelser Blouin's recent newsletter "Driving through the countryside, the mountain of waste is impossible to miss because it towers above the fields and trees that surround it."

A second example of explicit non-compliance comes from PC-02-07 wherein condition of approval #10 requires landfill activity to be limited to 600 ft contour elevation. The applicant's submittals and the drawings on page 64 of the supplemental staff report clearly show the elevation of the existing landfill at 625 ft, a clear violation of the condition of approval. The landfill operator unilaterally exceeded the height limitation on the existing dump, and the County has done nothing about it.

To my knowledge, the County has never taken any enforcement action against the landfill operators in response to non-compliance with conditions of approval. Based on staff testimony, the new code enforcement person will have no role in monitoring or enforcing landfill conditions of approval.

Conditions of Approval are required when a proposed development is incompatible with surrounding land uses and may have an adverse effect on nearby properties. Those conditions of approval have been determined to be NECESSARY to mitigate adverse impacts. BUT if the conditions are not implemented and not enforced, then they are worthless. You can wrap yourself up in this security blanket, but it won't keep you warm.

The landfill operators' consistent disregard for land use conditions, paired with Benton County's non-existent oversight, has undermined the integrity of the land use process. The

County's unwillingness to challenge noncompliance through penalties or corrective actions has allowed Republic Services to operate without meaningful accountability, contrary to the public interest and the intent of the conditional use permits.

COUNTY BIAS IN PROCEEDINGS

Since 2020, with the adoption of the renewed franchise agreement between the County and Valley Landfills, the history in this case is a sordid one where the County staff and the developer have been exclusive partners in attempting to force this expansion upon the residents of this County. Their efforts to disenfranchise residents have been numerous.

Yet, the understanding of the short and long-term impacts of becoming Oregon's trash depot has filtered throughout the community and the outrage has continued to grow. The NIMBY moniker applies to many residents of Benton County – we don't want to become western Oregon's trash can.

The County will be paid a minimum of \$1 million per year in exchange for approval of this conditional use permit. See Sections 4 generally, and Sections 4(c)(i) and 4(c)(ii) specifically in the 2020 franchise agreement that is part of the record.

We are told, "it's not about the money." But what else could it be? Do you know of any previous land use proceeding where the applicant guaranteed to pay the County money in exchange for approval of a development proposal?

Following the County's failure to get its Planning Commission to approve the 2021 expansion application (denied unanimously 6-0), 4 of the 6 Commission members left or were not invited back. Shortly thereafter, the County adopted a massive appeal fee increase that requires a \$5000 deposit and a signed blank check to cover all costs incurred by the County to handle an appeal. And it only applies to appeals of landfill decisions. Talk about disenfranchisement of the residents.

The evidence in this case clearly demonstrates that the proposed new landfill will seriously interfere with uses on adjacent property and the character of the area. In addition, public facilities such as EE Wilson Wildlife Area, the Willamette River and McDonald/Dunn forests will bear an undue burden from the impacts of this proposed development.

LITTER IMPACTS

You have received testimony from numerous commenters about the widespread presence and impacts of windblown trash from the dump on nearby properties. The proposed mitigation measures will have little to no effect on the litter situation and the moving of the new dump closer to impacted properties will make the problem worse.

I am entering testimony of Angela Krueger and Ryan Wilson into the record this evening – it contains many pictures of windblown trash on their property where they graze their cows. They also have a video of a cow munching on a piece of plastic, but I am prohibited from entering that into the record.

Like the Bradley's, the litter from the proposed dump operation will seriously interfere with the use of their adjacent property and threaten their livelihood.

STORMWATER AND WATER QUALITY IMPACTS

The proposed drainage plan submitted by the applicant (CEC) directs runoff from the LS property through an outfall from the southernmost stormwater basin onto rural residential property. That is not allowed.

The wheels on trucks exiting the dump site are often covered with contaminated mud from the working face area. That mud is tracked onto the surface of nearby paved roads (CBR, Hwy 99, Camp Adair Road) and either washes off into roadside ditches or the dump water truck is used to spray the mud off the road. This stormwater is contaminated, and the practice must be prohibited. A truck tire washing station should be installed just prior to the exit onto paved roads.

NOISE IMPACTS

The applicant proposed mitigation measures for noise reduction neglect the many instantaneous sharp sounds that come from activities near the working face. These include the clanging tracks from the bulldozers working in and around the working face, the banging garbage truck dump doors when drivers go forward and quickly stop to encourage all the trash out of the bed of the truck, and the horn blowing that is used to communicate between trucks on the working face.

Managing noise from on-site vehicles (meaning Republic-owned) touches a very small fraction of the vehicles entering the site and will do very little to reduce overall sound levels.

Noise levels from the proposed expansion will be closer to many properties and will seriously interfere with uses on adjacent properties.

The proposed hours of operation will allow the dump to start internal activities at 4:00 a.m. and extend until 6:00 p.m. 6 days a week. And now they are proposing to be open on Sundays as well. This is unacceptable and represents serious interference with uses on adjacent properties.

ODOR IMPACTS

Either the folks doing the odor studies don't actually get what is happening, or maybe they think the public is just naïve.

The odors from the dump do not emanate in a uniform fashion or get transported offsite in some simplified pattern. I live 5 miles south of the dump and I regularly smell it so strongly that I must limit my outdoor activities. Further, on numerous occasions I have smelled the landfill odor in north Corvallis on 9th street, more than 9 miles away.

Also, as a bicycle and motorcycle rider, I know how pockets of air settle in different areas and contain different temperatures and odors. This regularly happens with landfill odors.

Further, going out with their sniffer devices and logging instances of odor detection and measurement does nothing to control the odors.

The proposal for a self-established limit of 930,000 tons of organic waste annually is a non-starter. First, since organic waste generally makes up 40-50% of municipal solid waste, the 930,000 annual tons of organic waste means they will be bringing in more than 1.8 million tons overall. A dramatic increase over the current tonnage cap of 1.1 million tons.

Having spent many, many hours observing landfill activities at the working face, I have never seen a single instance of garbage truck content audit. And the pictures in the record of illegal material going into dumpsters around Albany and Corvallis, tell you that Republic does nothing to manage trash going into the dump. To assert that somehow, they are going to limit the amount of organic waste is not believable.

Also, the annual limit is meaningless in terms of consistent loading – they could bring in 750,000 tons of organic waste in 4 or 5 months in the summer causing massive increases in odor emissions.

The odor impacts from the existing facility seriously interfere with activities and property uses over a wide swath of Benton and Polk counties. Adding more waste by expanding the dump and increasing the annual tonnage will make matters worse.

REVIEW CRITERIA

After the lengthy and contentious expansion application process in 2021, the County moved quickly to erect a huge barrier to landfill-related appeals of any Planning Commission decision by members of the public.

And with all the handwringing about the qualitative nature of the conditional use permit review criteria – Benton County uses a one-size-fits-all review for any conditional use permit – they did nothing to modify the criteria as it applies to landfills.

So, they are using the same criteria for a landfill that they would use for a dog-grooming shop in a residential area. It doesn't make sense, and they have done that to allow themselves leeway to approve this application. They are not interested in protecting the people or the environment. It's a disgrace.

HISTORY

In 1974 there was significant resistance to the designation of Coffin Butte as a site to serve a small portion of a few adjacent counties. In 1983 during the rezoning process, County residents once again sounded the alarm about this dump and were steadfast that no trash should ever be placed south of Coffin Butte Road. Again in 1994, there were dozens of letters submitted against the proposal to expand the landfill site into the rural residential zone, and that expansion effort was defeated. But this effort will just not die. In 2021, a unanimous Planning Commission denied a similar expansion request to the one that is being proposed now. But here we are again in 2025.

With all that we now know about landfiling in general and this landfill's operations more specifically, we must have the courage to deny this application and demand a new way forward.

The evidence in the record to deny this application is overwhelming. The burden of proof has not been met. This proposal cannot and does not meet the review criteria for a conditional use permit.

Please deny this application.

Sincerely,

Mark Yeager