LU-24-027 Staff Report to Benton County Planning Commission

Benton County Exhibit 1 (BC1)
Compiled County Engineering and Public Works Comments

Contents:

- Maul Foster Alongi (MFA) and sub-consultants - engineering comments
- Kellar Engineering – transportation comments
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April 17, 2025
Project No. M0732.02.001

Petra Schuetz, Interim Director
Benton County Community Development Department
4500 Research Way
Corvallis, OR 97333

Sent only electronically to: petra_schuetz@bentoncountyor.gov

Re: Third-Party Review: Coffin Butte Landfill Submittal

Dear Petra Schuetz:

Maul Foster & Alongi, Inc. (MFA) is contracted with Benton County (County) to perform third-party engineering review of the land use application for the proposed Coffin Butte Landfill expansion. This letter provides a summary of our review of the correspondence and exhibits prepared by Valley Landfills, Inc. (Applicant), and submitted to the County in support of their application for a Conditional Use Permit (CUP) to expand the Coffin Butte Landfill. This review is intended to be an assessment of the engineering and other related elements of the submitted documents to establish their adequacy and feasibility for the County to make a land use determination. MFA's scope of review is limited to Exhibits 2, 5, 6, 11 through 14, 16 through 18, 20 through 22, 27 through 30, and 33.

Review of Submitted Exhibits

Exhibit 2: Engineering Plans

Exhibit Description: Exhibit 2 contains the revised engineering plans prepared by Civil and Environmental Consultants, Inc. (CEC) dated January 2025.

Comments: While the plan is preliminary in nature, meaning that it describes the intended site development without all the details that will be necessary for final construction, Exhibit 2 appears to adequately show the appropriate level of detail for the expansion of the landfill for a land use decision. MFA acknowledges the Applicant's proposed plan to defer the detailed engineering design, analysis, and calculations for the landfill expansion to the solid waste permitting application for Oregon Department of Environmental Quality (ODEQ) review.

Findings: If the CUP is approved by Benton County, the future plans submitted to ODEQ and the County will need to include additional design and detail for more in-depth review as mentioned in the Applicant's Response to Comments letter dated January 15, 2025.

Recommended Conditions for Approval:

2.1 The Applicant shall provide the County with copies of all documents submitted to the ODEQ for approval of this landfill expansion, including but not limited to, reports, design/construction drawings, specifications, and operations plan.

2.2 Prior to submitting a building application that will include human occupancy (i.e., Employee Building), the Applicant shall demonstrate that they satisfy the relevant portions of Benton County Code (BCC), including BCC 99.70 Sewage Disposal and obtain a site evaluation as outlined in BCC 99.710.

Reviewers: Cem Gokcora, Erik Bakkom

Exhibits 5, 6, 16, and 30

Exhibit Description:

Exhibit 5 is the Phase II Geotechnical Exploration Report and addendum to the South Expansion Area prepared by Wallace Group dated July 15, 2024.

Exhibit 6 contains the well logs for PW-2 and the Berkland Well.

Exhibit 16 initially included a July 3, 2024, technical memorandum regarding the "Environmental and Operational Considerations" of the landfill prepared by Tuppan Consultants LLC. This exhibit was revised and resubmitted by the Applicant on March 14, 2025, with an updated technical memorandum by Tuppan Consultants LLC dated February 25, 2025.

Exhibit 30 is the Proposed Coffin Butte Landfill Seismic Design prepared by CEC dated July 9,2024.

Comments: A review of this group of documents was provided by Columbia West Engineering, Inc. (CWE), as a geotechnical subconsultant to MFA. CWE's comments are summarized below, while the entire CWE letter is provided as Attachment A.

Findings: In general, the scope of the field exploration, laboratory testing program, and analysis methods are appropriate for the geologic complexity and nature of the proposed development. The geotechnical report provides a thorough discussion of regional geology, local subsurface conditions, and relevant seismically-induced geologic hazards, as required by the Oregon Structural Specialty Code.

Strain-based compression index values used in the settlement analysis are generally supported by the results of one-dimensional consolidation tests included in the geotechnical report. Similarly, soil/rock properties and strength parameters used in the slope stability analyses are supported by laboratory test results and generally fall within the ranges found in typically found in published literature for similar soil types.

Our sole comment requiring potential further analysis or clarification from Wallace Group concerns the slope stability analysis along Section B-B'. While the analyses generally address the more critical portions (i.e., larger cuts) of the cross-section, the north end of Section B-B' may require explicit consideration due to the proximity of the cut slope crest to the public right-of-way. Aerial imagery indicates utilities at the surface in this area are approximately 25 feet south of the roadway edge, and it is unclear whether additional buried utilities are present. While we expect the slope to be stable under static conditions, the potential for slope movement under pseudo-static loading may impact the right-of-way. We recommend an explicit analysis of the subject slope, including the computation of factors of safety and, if necessary, the estimation of earthquake-induced horizontal deformation.

We also completed a review of the discussion of future geotechnical evaluations outlined in the "Geotechnical Issues and Seismic Stability" section of Exhibit 16. We conclude that the existing geotechnical data and analysis presented in the geotechnical report (Exhibit 5) do not indicate that there are any geotechnical or geologic constraints that would adversely impact landfill development.

We note that additional geotechnical evaluation related to design of the landfill itself will be provided before landfill construction.

Recommended Conditions for Approval:

5.1 At the time of submittal of the grading or site plan submittal to the County, the Applicant shall provide further geotechnical analysis or clarification related to the slope stability analysis along the north end of Section B-B'. Due to the proximity of the cut slope crest to the public right-of-way and existing utilities, an explicit analysis of the subject slope, including the computation of factors of safety and, if necessary, the estimation of earthquake-induced horizontal deformation is recommended.

Reviewers: Columbia West Engineering, Inc.

Exhibit 11: Noise Study

Exhibit Description: Exhibit 11 is the Noise Study prepared by The Greenbusch Group (Greenbusch) dated September 25, 2023

Comments: The Noise Study summarizes existing sound levels measured near the proposed expansion area, sound levels produced by equipment currently being used at the landfill and predicted sound levels for both beginning and maximum future grade conditions. The report concludes that noise mitigation is not required to comply with regulatory limits. However, Greenbusch recommended that all backup alarms used on the site be replaced with ambient sensing broadband backup alarms if permitted by safety regulations.

MFA understands that the Applicant provided the following Operating Approval Conditions:

OA-1. Hours of Operation. Operating hours for disposal of waste in the landfill shall be as follows:

(A) Monday through Saturday, the site may open to vehicles using the commercial tipping area starting at 5 a.m. and to all other customers starting at 8 a.m. The site shall close to both commercial and other customers at 5 p.m. Internal operations, including but not limited to leachate hauling, infrastructure construction, disposal area activities and site maintenance is permitted to occur prior to and after these hours.

(B) On Sunday, the site will not open before 12 p.m. and will close no later than 5:00 p.pm. Internal operations, including but not limited to leachate hauling, infrastructure construction, disposal area activities and site maintenance is permitted to occur prior to and after these hours.

(C) During an emergency or when requested by a State, Federal, or County agency, Applicant may open the landfill outside of these hours.

OA-2. Vehicle Noise. All Applicant vehicles being used for operations on the new site shall be outfitted with white noise back up alarms.

OA-3. Noise Study Updates. Applicant shall provide an updated noise study prepared by Applicant's noise consultants once every three years. Applicant will implement mitigation measures to bring any non-compliant noise levels into compliance with ODEQ noise regulations.

Findings: Greenbusch used the median instead of the lowest measurement when establishing ambient noise levels. Greenbusch collected several hourly readings of existing sound levels, and they presented a low, high, and median value in Table 5.2 of the Noise Study. Greenbusch correctly states that Oregon Administrative Rules (OAR) 340-035-0035(1)(B) prohibits ambient sound levels

from being exceeded by more than 10 decibels on the A-weighted scale (dBA). Specifically, the rule states:

> No person owning or controlling a new industrial or commercial noise source located on a previously unused industrial or commercial site shall cause or permit the operation of that noise source if the noise levels generated or indirectly caused by that noise source increase the ambient statistical noise levels, L10 or L50, by more than 10 dBA in any one hour…

MFA is not aware of anything in the ODEQ rules that states facilities are allowed to use the median noise value instead of the lowest noise value when establishing ambient noise levels. The inclusion of the phrase "in any one hour" implies that ODEQ rules require using the lowest measured value. If Greenbusch had selected the lowest measured noise levels, the predicted sound levels presented in Tables 7.1 would show that three of the four locations exceeded the allowable L50 noise level, while the fourth location approached the limit.

MFA finds that the noise study demonstrates that the applicable ODEQ noise standard will be exceeded at neighboring properties if Greenbusch used the lowest hourly noise value as MFA believes is required by DEQ rules. Even if the median value was considered as suggested by Greenbusch, the predicated sound level at location four is exactly equal to the ODEQ limit.

MFA believes that the noise study indicates that the proposed use may seriously interfere with uses on adjacent property or with the character of the area.

Recommended Conditions for Approval:

If the Applicant provides additional information demonstrating compliance with the ODEQ noise standards, MFA recommends that the County considers the following permit conditions in addition to the Operating Approval Conditions proposed by the Applicant:

11.1 The Applicant shall develop and implement a program to periodically (e.g., weekly) measure equipment sound levels and compare results to levels in Table 5.3. If results exceed the levels in Table 5.3 by more than 2 dBA, the Applicant shall remove the equipment from service and complete repairs to reduce sound pressure levels. The Applicant shall maintain records of measurements and provide a summary of results and subsequent repairs (if applicable) with the updated noise study provided every three years consistent with OA-3.

The Applicant should be allowed to use a mobile application, such as the National Institute for Occupational Safety and Health (NIOSH) Sound Level Meter, to make periodic sound level measurements if the Applicant can demonstrate results are not more than 2 dBA lower than measurements with a Type II sound level meter. Side-by-side measurements with a calibrated Type II sound level meter at least once every three years is an adequate method to demonstrate the sufficiency of measurements with a mobile application.

Reviewers: Bill Beadie

Exhibit 12: Findings on Odor

Exhibit Description: Exhibit 12 is the Findings on Odor memorandum prepared by Weaver Consultants Group dated April 26, 2024

Comments: MFA has no further comments on this exhibit. Refer to the odor-related comments and findings presented under Exhibit 33.

Reviewers: Chad Darby

Exhibit 13: Memo Regarding Odor, Methane, and Hydrogen Sulfide Control

Exhibit Description: Exhibit 13 is letter regarding odor, methane, and hydrogen sulfide control prepared by Ian Macnab (of Coffin Butte Landfill) dated November 19, 2021.

Comments: MFA has no further comments on this exhibit. Refer to the odor-related comments and findings presented under Exhibit 33.

Reviewers: Chad Darby

Exhibit 14: Odor Dispersion Modeling Study for Landfill Expansion

Exhibit Description: Exhibit 14 contains the Odor Dispersion Modeling Study (2024 Odor Study) prepared by SCS Engineers and dated October 22, 2024. This exhibit was initially reviewed for completeness by MFA and noted several issues related to the assumptions and findings outlined in this study in a letter dated November 27, 2024. The Applicant submitted an additional odor dispersion study and report on March 14, 2025 (Exhibit 33). MFA did not provide the subsequent technical review of Exhibit 14 per the County's direction but instead completed a review of Exhibit 33.

Exhibit 16: Environmental and Operational Considerations

Exhibit Description: Exhibit 16 initially included a July 3, 2024, technical memorandum titled Environmental and Operational Considerations of the landfill prepared by Tuppan Consultants LLC. This exhibit was revised and resubmitted by the Applicant on March 14, 2025, with an updated technical memorandum by Tuppan Consultants LLC dated February 25, 2025.

Comments: MFA has no further comments on this exhibit. Refer to other prior sections of this letter for Columbia West's comments on a portion of this exhibit.

Reviewers: Derek Heitz, Cem Gokcora, Columbia West Engineering, Inc.

Exhibit 17 Preliminary Drainage Report

Exhibit Description: Exhibit 17 is the Preliminary Drainage Report prepared by CEC dated January 2025, and updated March 2025

Comments: MFA recommends the Applicant follow the Benton County Stormwater Support Documents, instead of the Corvallis Stormwater Standards, to finalize the stormwater calculations and design components for the ODEQ submittal. Based on MFA's review of the information provided, the proposed stormwater detention facilities appear to be conservatively sized, and despite the use of a different standard, the overall design of the stormwater facilities appears adequate from a land use perspective.

Recommended Conditions for Approval

17.1 Prior to the ODEQ solid waste permitting submittal, the Applicant shall prepare the stormwater report and all related designs for the detention and conveyance features utilizing the most recent version of the Benton County Stormwater Support Documents.

Reviewers: Cem Gokcora

Exhibit 18: Aerial Renderings of Coffin Butte Landfill

Exhibit Description: Exhibit 18 contains the aerial renderings of Coffin Butte Landfill prepared by CEC dated July 2024.

Comments: MFA has no comments on this exhibit.

Reviewers: Cem Gokcora

Exhibit 20: Fire Risk Assessment of Coffin Butte Landfill

Exhibit Description: Exhibit 20 initially included the Fire Risk Assessment of Coffin Butte Landfill, Corvallis, Oregon prepared by SCS Engineers dated November 29, 2023. MFA reviewed its content for completeness in their letter dated November 27, 2024. However, on December 11, 2023, the Applicant submitted a more recent fire risk assessment dated September 24, 2024. This exhibit was later amended with an addendum memorandum prepared by SCS Engineers on January 14, 2025, addressing the completeness review comments.

Comments: MFA and our subconsultant, Dr. Tony Sperling of Landfill Fire Control Inc. (LFCI), have the following comments on this exhibit:

The Coffin Butte Landfill should continue to employ best industry practices for fire risk management, including but not limited to:

- Temperature and landfill gas (LFG) monitoring
  - Routine temperature monitoring via a thermal camera to confirm that temperature in affected areas remains below 50°C (122°F), after removal of hot materials.
  - Monitoring carbon monoxide (CO) in addition to the primary LFGs (methane, and carbon dioxide), as CO levels are good indicators of the presence of incomplete combustion.
- Maintain firefighting supplies on site, such as full water trucks and soil stockpiles
  - Sufficient soil should be kept near the working face to fully cover the active area with a minimum thickness of one foot.
- Proper acceptance and disposal of battery and electronic waste
- Periodic maintenance of the landfill gas (LFG) management system

LFCI agrees with the Applicant's statement that excessive extraction of LFG can lead to increased temperatures and the potential for subsurface fires. However, LFCI notes that a review of data from several major landfill fire incidents indicates that there are documented cases where subsurface fire has breached the surface. Given the associated risks of surface fires, it is strongly recommended that landfill operations prioritize the proper maintenance of LFG management systems and closely monitor for subsurface fire activity, particularly in cases of system failure or interruption.

Reviewers: Landfill Fire Control Inc.

Exhibit 21: Conditions of Approval

Exhibit Description: Exhibit 21 contains the Proposed Conditions of Approval prepared by the Applicant and dated January 15, 2025

Comments: The Applicant's proposed OA-7 states that the final grade of the new landfill cell shall not exceed 500 feet in elevation. MFA notes that the highest elevation for the final grade of the

proposed landfill cell is shown as 450 feet on the revised engineering plan set. It is our recommendation that the operating approval conditions should reflect the 450 feet maximum elevation.

Recommended Conditions for Approval

21.1 The Applicant shall ensure the final grade of the new landfill cell does not exceed 450 feet in elevation.

Reviewers: Erik Bakkom, Cem Gokcora, Ellery Howard

Exhibit 22: Reclamation Plan for Expansion Area

Exhibit Description: Exhibit 22 contains the Reclamation Plan for Expansion Area prepared by CEC dated April 2022.

Comments: MFA has no comments on this exhibit.

Reviewers: Cem Gokcora

Exhibit 27: Leachate Management Summary

Exhibit Description: Exhibit 27 contains the Leachate Management Summary prepared by CEC dated March 2024 and updated January 15, 2025

Comments: MFA acknowledges that the detailed calculations regarding leachate quantities and collection system components will be developed and submitted to the ODEQ during the solid waste permitting process and recommends County to be copied with the ODEQ submittal, as noted in the prior section of this letter under Exhibit 2.

MFA noted that Coffin Butte Landfill has an agreement with the Corvallis wastewater treatment plant (CWWTP) to dispose of its leachate at their plant. The landfill currently disposes of 50% of their leachate at CWWTP. The permit for this operation expires December 31, 2025. The remaining 50% of the leachate is currently disposed of at the Salem wastewater treatment plant (SWWTP). Coffin Butte Landfill's discharge agreement with SWWTP expires December 31, 2027.

Reviewers: Cem Gokcora

Exhibit 28: Letter to County Regarding Methane Emissions

Exhibit Description: Exhibit 28 initially contained a letter to the County regarding methane emissions prepared by Ginger Rough dated February 23, 2024. MFA reviewed this for completeness in their letter dated November 27, 2024. This exhibit was later amended by the Applicant with an addendum prepared by Ginger Richardson dated January 15, 2025, addressing the completeness review comments.

Comments: MFA has no further comments on this exhibit. Refer to the odor-related comments and findings presented under Exhibit 33.

Reviewers: Chad Darby, Derek Heitz

Exhibit 29: Letter to County Related to Arsenic

Exhibit Description: Exhibit 29 initially contained a letter to the County regarding arsenic prepared by Ginger Rough dated February 15, 2024. MFA reviewed this for completeness in their letter dated

November 27, 2024. This exhibit was later amended by the Applicant with an addendum prepared by Ginger Richardson dated January 15, 2025, addressing the completeness review comments.

Comments: MFA has no further comments on this exhibit.

Reviewer: Derek Heitz

Exhibit 33: Updated Odor Dispersion Modeling Study

Exhibit Description: Exhibit 33 contains the updated Odor Dispersion Modeling Study (2025 Odor Study) prepared by SCS Engineers dated March 2025. The report portion of this exhibit was submitted by the Applicant on March 14, 2025. The Applicant provided additional submittals on March 20, 2025, and April 10, 2025, to include the odor modeling files that were originally requested by MFA in their completeness review letter dated November 27, 2024.

Comments: As noted previously, the 2025 Odor Study follows a 2024 Odor Study (Exhibit 14). MFA previously found that the 2024 Odor Study did not incorporate emission rates, in units of grams per second, in the dispersion model representation of the landfill. For that reason, MFA does not feel the 2024 Odor Study can be relied upon. Overall, the 2025 Odor Study addressed the primary concerns MFA identified in the 2024 Odor Study.

The below comments follow a review of Exhibit 33 (2025 Odor Study) along with a cover letter from Miller Nash and the First Addendum to the Burden of Proof (BOP) dated March 14, 2025.

Comment 1: The BOP refers to the 2024 Odor Study on page 1 and in the conclusions on page 3, and it makes assertions from that study about the project odor impacts. MFA does not believe that the 2024 Odor Study should be cited as it does not rely on actual emissions from the landfill to draw conclusions. MFA submitted comments on the 2024 Odor Study pointing out several issues, which have largely been addressed in the 2025 Odor Study.

Comment 2: Per Item C in the BOP and section 5.2 of the 2025 Odor Study, Scenario #1 (2023 actual operations) was not expected to cause detectable nuisance odors since the [dilution-to-odor threshold] (D/T) ratio for each pollutant modeled was well below one. MFA recommends that the 2025 Odor Study include a section on model uncertainties and refer to these uncertainties when making concluding statements. For instance, the model is able to predict offsite odor pollutant concentrations for the majority of hours included in the modeled meteorological dataset. However, the model is unable to accurately predict impacts during low wind speeds, inversions, and very short-term meteorological conditions (less than 1 hour) that may result in less dispersion and, therefore, higher concentrations of odor-causing pollutants on neighboring properties. However, some of these same conditions are also likely to result in higher concentrations of odor-causing pollutants from other neighboring sources as well.

Comment 3: Per Item C in the BOP and section 5.2 of the 2025 Odor Study, Scenario #2 (2052 proposed operations) D/T ratios increased by 2 to 2.5 times as compared to Scenario #1 (2023 actual operation) for all pollutants except [total oxides of nitrogen] (NOX). The above statement alludes to the possibility that either the odor detected will be of higher intensity or the odor will be noticed by more people with greater frequency. If odors are primarily detected during calm periods, it is possible it will be more noticeable, but not necessarily more frequently noticed. MFA

recommends that the Applicant includes a discussion about what the change in model results between Scenario #1 and Scenario #2 likely indicates.

Comment 4: MFA recommends that the Applicant clarify what emission units are included in the aggregate insignificant model identified in Section 3.3.

Comment 5: MFA recommends that the Applicant confirm if the November 2024 Modeling Report was reviewed and approved by the ODEQ. If not, the Applicant should provide supporting justification for the following modeled release parameters:

- The modeled release height (262.5-feet) and initial vertical dimension (122.1-feet) for the current landfill fugitive surface (Model ID: FUG). MFA is concerned that setting the entire waste-containing area for the current landfill fugitive emissions unit to the north of Coffin Butte Road at a single release height, plus the additive vertical dimension, is unrealistic and will result in a less conservative assessment.
- It is unclear from Table 3 whether the modeled release parameters for the current landfill fugitive surface (Model ID: FUG) are the same for Scenario #1 (2023) and Scenario #2 (2052). However, based on a review of the dispersion model output files for Scenario #1 and Scenario #2, MFA understands the modeled release parameters are unchanged between either scenario. The effective release heights appear to be nearly 100 feet above the highest point of the current landfill footprint based on a review of Google Earth terrain data (current as of July 2024) and would be inappropriate to represent existing conditions for 2023. Given the surface heights vary for waste-containing areas on the landfill, and it appears that emissions are being spread evenly over the entire landfill surface area, it would seem more appropriate to assume an average effective release height equal to half of the height of the landfill above the base elevation.
- The modeled release height (154-feet) and initial vertical dimension (71.6-feet) for the expanded landfill fugitive surface (Model ID: FUG_EXP).
- The modeled extents for the current landfill fugitive surface area (Model ID: FUG) and the expanded landfill fugitive surface area (Model ID: FUG_EXP). Modeled emission rates are divided by the modeled area, meaning the larger the modeled extents, the lower the corresponding modeled emission rate which results in a less conservative assessment.

MFA recommends separate release parameters for 2023 and 2052, as the landfill heights will be different. Separate tables for the release parameters should be provided and labeled in the 2025 Odor Study. MFA recommends that the modeled surface area be set at half the height of the landfill to account for areas that are both above and below this height unless other values are justified. MFA further recommends that the model include no initial vertical dimension. The landfill gas being released as fugitives from the landfill surface will be slow moving and may only be thermally buoyant a portion of the year. To be conservative, MFA does not recommend an initial vertical dimension for Scenario #1 or Scenario #2.

Comment 6: The Applicant should clarify the following statement from Section 3.6: Note, wind data in Figure 7 was measured during a different time period and at a different location than the on-site wind data used for the odor complaint analysis. Therefore, the wind data in Figure 7 was not used in the odor complaint analysis. The Applicant

should also confirm that the onsite meteorological dataset collected from November 1, 2004 to October 30, 2005 was used for each odor model run.

Comment 7: An outdated version of the AERMET program executable (v18081) was used to process the meteorological dataset included in the AERMOD model runs. The selected AERMET executable is outdated and was originally issued in 2018. There have been several new executables issued by the EPA since 2018 that incorporate a wide variety of changes to preprocessing meteorological data. The potential impacts to offsite modeled concentrations may be significantly impacted by using the latest AERMET executable version. MFA recommends that each AEMROD model iteration use the most recent version of the AERMET program executable (v24142).

Comment 8: Each dispersion model was executed using the 1-hour averaging period. Odors are generally considered a nuisance if they recur over longer periods of time. Modeling for one-hour impacts may not accurately reflect the potential impacts from longer exposure. As a result, MFA recommends the AERMOD model iterations assume the 24-hour averaging period to more accurately represent exposure to emissions from the landfill and to local weather patterns.

Comment 9: As noted above, each dispersion model was executed using the 1-hour averaging period, but annual emission estimates were used as the basis for modeled emission rates. Annual emission rates in units of pounds per year were converted to grams per second (g/s) by dividing by 31,536,000 seconds (e.g., the number of seconds in a calendar year) and multiplying by 453.592 grams as shown in Appendix C and D of the 2025 Odor Study. Modeling annual-based emission rates with 1-hour averaging periods is inconsistent and may not accurately reflect short-term emission rates that tend to bias high for a wide variety of factors. MFA recommends that the Applicant add clarifying justification for modeled emission rates or conservatively incorporate a short-term variability factor (e.g., 20% or 30% contingency factor) to better represent potential short-term surges to emission rates.

Comment 10: Per Section 3.9, the total landfill fugitive surface area is 1,011,815 square meters, with 81% of this being in the current area, and 19% in the southern proposed expansion. Total fugitive emissions were split between FUG and FUG_EXP based on this area percentage. However, the modeled emission rates for the current and expanded landfill fugitive source representations (Model IDs: FUG and FUG_EXP, respectively) are equal as shown in the dispersion modeling output (*.ADO) files for each Scenario #2 model run, except for the NOX models. The Applicant should review, clarify, and update modeled emission rates.

Comment 11: The 1-hour nitrogen dioxide (NO2) National Ambient Air Quality Standard (NAAQS) is 188 micrograms per cubic meter (ug/m3). As shown in Tables 6 and 7, Scenario #1 and Scenario #2 result in maximum predicted offsite concentrations of 769 and 512 ug/m3, respectively, which are well above the NAAQS. Although this is not an odor-related issue, presenting a NAAQS exceedance may represent a larger issue for the Coffin Butte Landfill.

Comment 12: In Section 4.0 it is stated, “A D/T ratio of less than one indicates that the predicted impact would not cause a detectable nuisance odor impact. Detectable, nuisance, and impact all have arguably different thresholds and meaning. While a D/T ratio of less than 1 would not result in a detectable odor for the average person, there will be some people that are more sensitive and would still smell something. A nuisance is

typically assumed to be a D/T value greater than or equal to 7 for state agencies that rely on this measurement method. Oregon does not utilize a technology-based method, choosing to rely instead on documenting frequency, duration, intensity and offensiveness of an odor. Because Oregon does not establish a numeric threshold based on D/T measurement, the predicted impact is subject to legal interpretation. It may be more appropriate to state that "the average person is not expected to detect a nuisance odor at the predicted concentration where the calculated D/T value is less than one."

Comment 13: The 2025 Odor Study does not present an uncertainty analysis, so it does not consider the potential impacts from more or less conservative assumptions. For instance, several of the pollutants with the highest measured concentration are all sulfur-based compounds. While it has been assumed that a D/T value less than 1 will not result in a detectable odor by the average person, several of these compounds could have an additive effect. MFA recommends the Applicant provide discussion to address potential additive effects relating to a nuisance condition. It should also be acknowledged that dispersion modeling has many limitations that may potentially result in predicted offsite concentrations not aligning with actual real-life concentrations. Known model limitations include low wind speeds, inversions, and short duration meteorological events, and their potential impacts should be discussed further.

Comment 14: On page 20, it is stated, This middle scenario would show results in between Scenario #1 and #2 with slight differences based on landfill mound height in the expansion area and would certainly show D/T values less than 1 for all pollutants. MFA notes that with lower release heights, dispersion characteristics will be different, which may potentially result in higher predicted offsite concentrations. MFA recommends a middle height scenario be included or that more technical discussion be included to justify that statement.

Comment 15: MFA believes that there are several statements in Section 5.2 that require further explanation.

It is stated that: Scenario #1 (2023 actual operations) was not expected to cause detectable nuisance odors since the D/T ratio for each pollutant modeled was well below one. Due to limitations of the dispersion model, it is possible to have periods of odor that are detectable by those who are sensitive to particular odors.

It is also stated that: Scenario #2 (2052 proposed operations) D/T ratios increased by 2 to 2.5 times as compared to Scenario #1 (2023 actual operation) for all pollutants except NOx. The Applicant should provide a statement about what this means in terms of increases to the frequency or intensity of odors.

Findings: While the findings of the Applicant's odor model predict that odors generally would not be considered an odor nuisance (where D/T values are below 1), MFA has observed several inconsistencies in the model setup that could significantly affect the predicted values. Specifically, these are without limitation:

- There is insufficient supporting justification for the modeled release height and initial vertical dimension for the current landfill fugitive surface. The effective release heights appear to be nearly 100 feet above the highest point of the current landfill footprint based on a review of

Google Earth terrain data (current as of July 2024) and would be inappropriate to represent existing conditions for 2023.

- There is insufficient justification for the modeled release height and initial vertical dimension for the expanded landfill fugitive surface.
- An outdated version of the AERMET program executable (v18081) was used to process the meteorological dataset included in the AERMOD model runs and the potential impacts to offsite modeled concentrations may be significantly impacted by using the latest AERMET executable version.
- There is insufficient justification for the modeled emission rates where 81% of the total landfill surface area is in the current area, and 19% is in the southern proposed expansion, but the modeled emission rates for the current and expanded landfill fugitive source representations are equal.

Due to these noted inconsistencies, MFA believes that the odor study does not adequately demonstrate that the proposed use would not seriously interfere with uses on adjacent properties or with the character of the area.

Reviewer: Chad Darby, Brian Snuffer Zukas

General Observations

MFA understands that the Applicant will prepare a new Operations Plan for ODEQ's review and approval at the time of the solid waste permit application. This document will include critical information to determine operational compatibility with the proposed conditional use, such as hours of operation, haul routes, waste handling procedures, odor, dust, litter and noise control measures, safety and security protocols, and environmental protection measures (especially stormwater and groundwater).

In our completeness review letter dated November 27, 2024, MFA recommended that the Applicant submit a narrative description summarizing the proposed changes to the current Operations Plan instead of a draft Operations Plan, which has not yet been prepared. MFA still believes that this narrative description of planned changes to the Operation Plan or a draft Operations Plan would provide the County with information to determine if landfill operations will comply with applicable local codes and the proposed conditions of approval.

Summary of Review

The information presented above represents the summary of MFA and our subconsultants' technical review of a portion of the exhibits submitted by the Applicant in support of their land use request to expand Coffin Butte Landfill.

Please contact MFA if you have any questions or need any additional information regarding this review.

Sincerely,

Maul Foster & Alongi, Inc.

Erik Bakkom, PE
Principal Engineer

Cem Gokcora, PE
Senior Engineer

Attachments

Limitations

A—Review Letter from Columbia West Engineering, Inc.

Limitations

The services undertaken in completing this report were performed consistent with generally accepted professional consulting principles and practices. No other warranty, express or implied, is made. These services were performed consistent with our agreement with our client. This report is solely for the use and information of our client unless otherwise noted. Any reliance on this report by a third party is at such party's sole risk.

Opinions and recommendations contained in this report apply to conditions existing when services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. We do not warrant the accuracy of information supplied by others, or the use of segregated portions of this report.

Attachment A

Review Letter from Columbia West Engineering, Inc.

MAUL FOSTER ALONGI

Geotechnical ■ Environmental ■ Special Inspections
Columbia West Engineering, Inc

Vancouver, Washington • Phone: 360-823-2900
Portland, Oregon • Phone: 971-384-1666
www.columbia-west.com

April 11, 2025

Maul Foster & Alongi, Inc.
601 East Front Avenue, Suite 202
Coeur d' Alene, ID 83814

Attn: Ellery Howard, PE

Re: Geotechnical Pre-Design Review
Coffin Butte Landfill Application Review
28972 Coffin Butte Road
Corvallis, Oregon
CWE Project: MFA-7-01-1

INTRODUCTION

Columbia West Engineering, Inc. (Columbia West) is pleased to submit this letter summarizing our pre-design geotechnical engineering review for the Coffin Butte Landfill expansion in Corvallis, Oregon. The purpose of our review was to provide technical advice regarding the geotechnical data and analysis included in the geotechnical engineering report (GER) prepared for the project. Our objective was to identify data gaps, inconsistencies, and/or incomplete analyses that could hinder landfill design and analysis that will be completed prior to construction. We reviewed the following provided documents:

- Exhibit 5: Phase II Geotechnical Exploration Report and Addendum to the South Expansion Area, including the Narrative Report and Appendices A through F
- Exhibit 29: Updated Technical Memorandum: Environmental and Operational Considerations

A summary of our review and conclusions are provided below.

REVIEW

EXHIBIT 5

We completed a high-level review of the geotechnical engineering analyses presented in Exhibit 5: Phase II Geotechnical Exploration Report. Our review focused on the discussion and analysis inputs related to key design elements in the GER, including the field exploration program, laboratory testing, seismic hazard, seismically-induced geologic hazards, slope stability, and settlement.

In general, the scope of the field exploration, laboratory testing program, and analysis methods are appropriate for the geologic complexity and nature of the proposed development. The GER provides a thorough discussion of regional geology, local subsurface conditions, and relevant seismically-induced geologic hazards, as required by the Oregon Structural Specialty Code.

Strain-based compression index values used in the settlement analysis are generally supported by the results of one-dimensional consolidation tests included in the GER. Similarly, soil/rock properties and strength parameters used in the slope stability analyses are supported by laboratory test results, and generally fall within the ranges typically found in published literature for similar soil types.

We note that the GER recommends a Site Class D designation for the site, with a peak ground acceleration (PGA) of 0.61 based on ASCE 7-22. The slope stability analyses employ a horizontal seismic coefficient of 0.25g, approximately 41 percent of the recommended PGA. This is consistent with the range of 33 to 50 percent typically used in pseudostatic slope stability analyses.

Our sole comment requiring potential further analysis or clarification from Wallace Group concerns the slope stability analysis along Section B-B'. While the analyses generally address the more critical (i.e., larger cuts) portions of the cross-section, the north end of Section B-B' may require explicit consideration due to the proximity of the cut slope crest to the Coffin Butte Road and public right-of-way. Aerial imagery indicates utilities at the surface in this area, approximately 25 feet south of the roadway edge and it is unclear whether additional buried utilities are present. While we expect the slope to be stable under static conditions, the potential for slope movement under pseudostatic loading may impact the right-of-way. We recommend an explicit analysis of the subject slope, including the computation of factors of safety and, if necessary, the estimation of earthquake-induced horizontal deformation.

EXHIBIT 29

We also competed a review of the discussion of future geotechnical evaluations outlined in the "Geotechnical Issues and Seismic Stability" section of Exhibit 29. We concur that the existing geotechnical data and analyses presented in the GER (Exhibit 5) do not indicate that there are any geotechnical or geologic constraints that would adversely impact landfill development. We note that additional geotechnical evaluation related to design of the landfill itself will be provided before landfill construction.

CONCLUSIONS AND RECOMMENDATIONS

Based on our review of the provided documents, we conclude that scope of the subsurface exploration, laboratory testing program, and rigor of analysis described in Exhibit 5 is generally aligned with nature of the proposed development. However, we recommend completing additional slope stability analysis at the north side of cross-section B-B' to evaluate for slope instability to impact Coffin Butte Road or utilities within the adjacent right-of-way. We would be happy to discuss this recommendation further at your convenience.

♦ ♦ ♦

We appreciate the opportunity to be of service to you. Please call if you have questions concerning this letter or if we can provide additional services.

Sincerely,

Jonathan A. Nasr, PE
Project Engineer

Shawn M. Dimke, PE, GE
Principal Engineer

cc: Cem Gokcora, Maul Foster & Alongi, Inc.

JAN:SMD:slt
Document ID: MFA-7-01-1-041125-geol

KELLAR ENGINEERING

April 17, 2025

Coffin Butte Landfill Expansion Transportation Impact Analysis (TIA) Review:

Kellar Engineering (KE) has reviewed the submitted Coffin Butte Landfill Expansion Traffic Impact Analysis (TIA) dated February 26, 2024 by Transight Consulting, LLC. The submitted TIA demonstrates the project has the ability meet Benton County's requirements for traffic.

If you have any questions, please do not hesitate to contact me at (970) 219-1602 or skellar@kellarengineering.com.

Respectfully,

Kellar Engineering LLC

Sean K. Kellar, PE, PTOE

Engineering & Survey Division

Office: (541) 766-6821
Fax: (541) 766-6891

360 SW Avery Avenue.
Corvallis, OR 97333

co.benton.or.us

Benton County
PUBLIC WORKS DEPARTMENT

DATE: **April 9, 2025**

TO: Petra Schuetz – Acting Director
Benton County Community Development

FROM: Laurel Byer – Benton County Engineer
Gordon Kurtz – Associate Engineer
Benton County Public Works

RE: **LU-24-027 – Coffin Butte Landfill Expansion**
Property Owner: Valley Landfills, Inc.
Applicant: Republic Services
28972 Coffin Butte Road
Coffin Butte Road – County Road # 04451 – MP 0.00 – MP 0.38
Soap Creek Road – County Road # 05450
T10S – R5W – Sections 13 & 24
T10S – R5W – Sections 18 & 19

Public Works staff have reviewed the application noted above and have comments and conditions as follow.

FINDINGS OF FACT

The application proposes an expansion of the Coffin Butte Landfill, located on the west side of Oregon Highway 99W (Hwy 99W) northwest of the City of Adair Village. The landfill has been in operation for more than 70 years and currently serves Benton County and several additional nearby counties. To maintain operation of the quarry and continue mining rock resources, the Applicant proposes an expansion of the landfill to the south of Coffin Butte Road.

The landfill complex is comprised of numerous properties and tax lots used for several purposes. Those purposes include agriculture, forestry, waste disposal, quarry operations, sludge processing, and administrative offices. The properties and tax lots that comprise the landfill complex fall within multiple Benton County zoning designations including Landfill Site (LS), Forest Conservation (FC), Exclusive Farm Use (EFU), Rural Residential 10-Acre (RR-10), and Rural Residential 5-Acre (RR-5). The complex is bounded on the south by RR-10 properties, and to the south, west and north by EFU and FC properties, and to the east by the Finley Wildlife Refuge zoned Open Space (OS). The easterly boundaries of the complex border the Hwy 99W right of way which separates the landfill complex from the OS Zoned properties. Hwy 99W falls under the jurisdiction of the Oregon Department of Transportation (ODOT).

The proposed expansion directly affects two roads in the County system: Coffin Butte Road and Soap Creek Road. Coffin Butte and Soap Creek Roads carry the functional classification of major collector as defined by the current Benton County Transportation System Plan

(TSP). Neither of these roads meet current standards for a major collector.

Average daily traffic (ADT) on Coffin Butte Road east of the quarry entrance is approximately 243 vehicles per day (vpd), based on data collected in January of 2021. Roughly one-third of this volume is truck traffic. The ADT on Soap Creek to the west of the quarry entrance is approximately 136 vpd. The speed limit on Coffin Butte and Soap Creek is governed by Oregon's Basic Rule (ORS 811.100 – 811.108).

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.

The project's disturbed area footprint exceeds one acre.

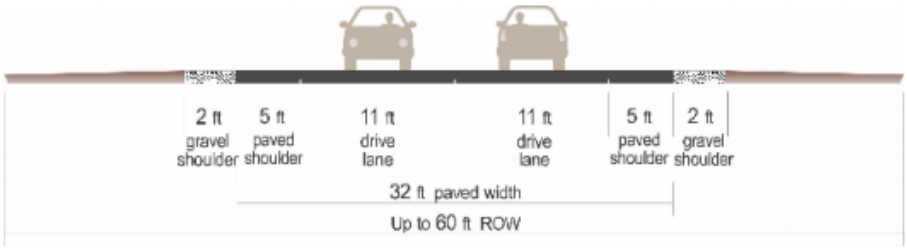
The Applicant's intent is to initiate the proposed developments and improvements within two (2) years of Conditional Use Permit approval.

ANALYSIS & CONCLUSIONS

The applicant has been in communication with Public Works staff since November of 2020.

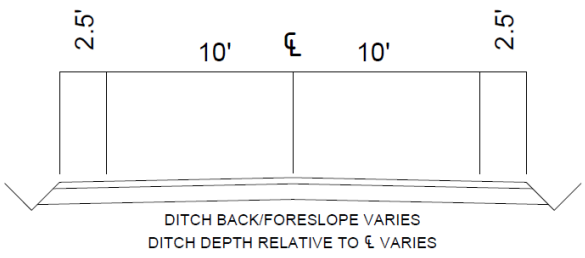
Coffin Butte Road, and the easterly segment of Soap Creek Road carry the functional classification of Major Collector. Neither facility meets current standards for this classification as specified in the TSP. The typical proposed section for a Major Collector is illustrated below.

Figure 16. Major Collector Standard Cross-Section



Improvement of Coffin Butte Road to this standard will provide additional lane width and wide shoulders for vehicle stops and to accommodate bicycle, pedestrian, and emergency access where this function is currently very limited. The approximate typical existing section of Coffin Butte Road and Soap Creek Road is illustrated below. Existing shoulder widths vary from 2.5 feet to less than one foot.

EXISTING SECTION



Construction of the proposed improvements may require permitting through regulatory agencies including, but not limited to, the Oregon Department of State Lands (DSL), the Oregon Department of Environmental Quality (DEQ), the Oregon Department of Fish & Wildlife (ODFW), the Oregon State Historic Preservation Office (SHPO), the Oregon Department of Geology and Mineral Industries (DOGAMI), U.S. Fish & Wildlife (USFW), the U.S. Army Corps of Engineers (COE), and the National Oceanic and Atmospheric Administration-National Marine Fisheries Service (NOAA-NMFS).

Benton County staff have cooperated with Kellar Engineering in this review process, and we concur with their findings and conditions regarding the Traffic Impact Analysis.

Final engineering design for any public infrastructure improvements will be required after Conditional Use approval. Review and approval of those calculations, drawings, right of way adjustments, and specifications will be completed prior to start of construction.

RECOMMENDED CONDITIONS OF APPROVAL

Public Works recommends the applicant meet the following conditions of approval:

1) The applicant shall survey, design, and construct improvements to Coffin Butte Road between Hwy 99W and milepost 0.377 to, at minimum, a Major Collector standard.
2) To accommodate westbound left turns into the new facility the applicant shall construct a center turn lane with a turn pocket storage capacity of four (4) standard semi-trailer trucks (~180 feet) with islands and 30:1 tapers to match existing.
3) Historically, Benton County has employed a section of 5” of HMAC over 17” of CAB for facilities that receive heavy truck traffic. Given the large volume of heavy truck traffic additional analysis will be required to determine if this section is sufficient for the proposed facility.
4) The applicant shall design and construct Coffin Butte Road drainage ditches, stormwater conveyances, connections to off-right of way conveyances, and detention facilities to accommodate runoff using ODOT standards, details and methodologies.
5) Construction and post-construction storm drainage discharge shall conform to the standards and tenets established by Oregon Drainage Law and shall conform to all Oregon Department of Environmental Quality and Benton County Stormwater Support Documents, erosion and sediment control details, and best management practices.
6) The applicant, the County and ODOT must work cooperatively to analyze and address requirements for modification of the Coffin Butte Road/Hwy 99W intersection, if deemed necessary.
7) The applicant shall provide calculations, design, and specifications for all proposed public infrastructure to Benton County Public Works staff for review and approval.
8) The applicant shall apply and obtain approval for a Permit to Perform Work in the County Right of Way. The permit will be issued when construction drawings are approved, and all supporting documentation has been provided to the County.
9) The applicant shall provide the County with a unit price cost estimate for the work to be performed within the Benton County rights of way. This estimate shall include trenching, backfilling, paving, striping, signing, grading/restoration, seeding, mulching, fence replacement, and any required landscaping. Permit fees will be 4.0% of the estimate provided.

10) The applicant shall obtain a DEQ 1200-C permit, and a Benton County ESC permit prior to start of land disturbing activities. (The applicant may wish to consider including the work within the Benton County right of way in the 1200-C application.)
11) The applicant shall obtain approval for all required local, state and federal permits prior to start of road improvements.
12) Prior to final approval of this conditional use permit, the applicant shall fulfill **ONE** of the following **TWO** options to meet the conditions for improvements noted above:
    a. The applicant shall construct the improvements noted above as required. **OR**
    b. The applicant shall enter into an Agreement for Improvements (AFI) with the County. The AFI will require security for the full amount of the work to be performed plus a 20% contingency. The security may take the form of a bond, a conditional irrevocable line of credit, or a cash deposit. The security serves to assure faithful performance of the required improvements, as outlined above, within 18 months of execution of the AFI.
13) The applicant shall provide the County with a detailed construction and sequencing plan for accomplishment of the conditions of approval. The conditions listed here involve a series of construction requirements and quasi-judicial actions that must be achieved in a manner to protect the interests of the applicant, the travelling public and the County's transportation system.

ADVISORIES

1) Existing survey monuments must be preserved and protected. Any survey monuments disturbed during construction of this project must be replaced at the expense of the applicant or the contractor.
2) All public improvements shall be subject to a 3-year warranty period. At the start of the 3-year warranty period the applicant shall provide Public Works with a warranty bond in the amount of 15% of the value of the work performed within the Benton County right of way.

Please contact me if you have questions.

LU-24-027 Staff Report to Benton County Planning Commission

Benton County Exhibit 2 (BC2)
Compiled Agency Comments

Contents:

- Oregon Department of Geology and Mineral Industries (DOGAMI) email response
- Oregon Department of Fish and Wildlife (ODFW) supplementary email response and original response letter
- Benton County Environmental and Natural Resources Advisory Committee (ENRAC) recommendation letter to Planning Commission

From:	SCHUETZ Petra
To:	Larissa Gladding
Cc:	Jesse Winterowd
Subject:	FW: Land Use Application Agency Referral for Coffin Butte Landfill Expansion | Conditional Use Permit | LU-24-27
Date:	Wednesday, April 9, 2025 1:40:01 PM
Attachments:	image007.png image008.png image009.png image011.png

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From: CARLEY Melissa * DGMI <Melissa.CARLEY@dogami.oregon.gov>
Sent: Wednesday, April 9, 2025 10:29 AM
To: SCHUETZ Petra <petra.schuetz@bentoncountyor.gov>
Subject: RE: Land Use Application Agency Referral for Coffin Butte Landfill Expansion | Conditional Use Permit | LU-24-27

DOGAMI has no comments on the proposed Land Use Application.

Melissa Carley | Aggregate Permitting Reclamationist
Oregon Department of Geology and Mineral Industries - MLRR
Cell: (541) 520-8333 | e-mail: melissa.carley@dogami.oregon.gov

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From: SCHUETZ Petra <petra.schuetz@bentoncountyor.gov>
Sent: Thursday, March 20, 2025 5:32 PM
To: WEAVER Brianna * DGMI <Brianna.WEAVER@dogami.oregon.gov>
Subject: FW: Land Use Application Agency Referral for Coffin Butte Landfill Expansion | Conditional Use Permit | LU-24-27

From: STACK Joseph P * ODFW <joseph.p.stack@odfw.oregon.gov>
Sent: Friday, April 18, 2025 2:42 PM
To: Jesse Winterowd <jesse@winterbrookplanning.com>
Cc: REED Gregory C * ODFW <Gregory.C.REED@odfw.oregon.gov>
Subject: RE: Benton County Application No. LU-24-27 (email 2 of 2)

Hi Jesse,

Thanks for sharing the survey information and results. I only have one minor concern and that is related to the eastern rookery. Turnstone observed active nesting in the eastern rookery in 2022 during the first three consecutive visits, while those nests were not successful, the rookery itself would still be considered active for that year. Within the Forest Practices Act, a rookery is deemed abandoned only after three consecutive years of surveys with no nesting. It is good that the applicant plans to provide protection to this site and some sort of buffering, but an additional survey effort to show the rookery is not being used may be needed. Turnstone can consult with ODF to see if they concur.

Feel free to reach out if you have any questions.

Cheers,
Joe

Joe Stack
Regional Habitat Biologist
Oregon Dept of Fish and Wildlife
South Willamette Watershed District
Office: 541-757-5301/ Cell: 541-650-2840

From: Jesse Winterowd <jesse@winterbrookplanning.com>
Sent: Monday, April 14, 2025 3:29 PM
To: STACK Joseph P * ODFW <joseph.p.stack@odfw.oregon.gov>
Cc: SCHUETZ Petra <petra.schuetz@bentoncountyor.gov>; Melissa Ryan <mryan@batemanseidel.com>
Subject: Benton County Application No. LU-24-27 (email 2 of 2)

Good afternoon Joe,

Second email with addendum to applicant's Habitat Assessment.

Jesse Winterowd, AICP, PMP | Managing Principal
610 SW Alder St. | Suite 810 | Portland, OR, 97205
503.827.4422 ext. 109 | winterbrookplanning.com

Oregon
Tina Kotek, Governor

Department of Fish and Wildlife
South Willamette Watershed District Office
7118 NE Vandenberg Ave
Corvallis, 97330
(541) 757-4186
(541) 757-4252

April 11, 2025

Petra Schuetz
Planning Director
Benton County Community Development Dept.
4500 SW Research Way
Corvallis, OR 97333

RE: Benton County Application No. LU-24-27

Dear Petra Schuetz,

Thank you for providing the Oregon Department of Fish and Wildlife (department) with the opportunity to review LU-24-27. The applicant seeks a conditional use permit to expand the current footprint of the Coffin Butte Landfill. It is the policy of the state to protect and enhance Oregon's fish and wildlife and their habitats for use and enjoyment by present and future generations (ORS 496.012). The department reviewed the application and provides the following comments and recommendations for the County's consideration.

The department understands the need to expand the existing landfill and the public good this can provide to the community; however, sensitive wildlife habitat should be considered when making this decision. The department is aware of two historic Great Blue Heron rookeries on the property. There was a rookery documented on tax lot 1107 in 2018 (hereafter the western rookery) during a site visit performed by the department, the Oregon Department of Forestry (ODF), and a consultant hired by the applicant. A new rookery to the east (hereafter the eastern rookery) was documented in the spring of 2021 by ODF on tax lot 1200, although there was probably use in years prior. Approximate locations of both sites were sent to the Planning Department on September 1, 2021. The County identifies Great Blue Heron rookeries as a Goal 5 resource and outlines habitat protections by BCC 87.200 through 87.230[2]. While these particular rookeries may not be currently mapped by the County, they have been identified by both the department and ODF. Therefore, the department believes they should be afforded the same protections and BCC 87 should be considered. Great Blue Heron rookeries are nesting colonies of herons that can consist of a small number of nests up to multiple hundreds of nests. They are susceptible to human disturbance and if a rookery is abandoned it can negatively impact multiple pair of herons. Rookeries provide habitat for a number of critical life history behaviors including courtship displays, pair bonding, breeding, nesting, feeding, and fledgling. Rookeries are most always located near important foraging habitat and suitable places to nest can be limited.

[1] Benton County, Chapter 60
[2] Benton County, Chapter 87

Great Blue Heron rookeries are categorized as Habitat Category 2 per the department's Fish and Wildlife Habitat Mitigation Policy (OAR 635-415-0000 through 0025)[3] because they are both essential habitat for the species and limited on the landscape. The mitigation goal for Habitat Category 2, if impacts are unavoidable, is no net loss of either habitat quantity or quality and to provide a net benefit of habitat quantity or quality (OAR 635-415-0025(2)(a)). If either rookery is determined to be active, we recommend the applicant coordinate with the department to determine an appropriate mitigation plan. Additionally, the department recommends working with the Oregon Department of Forestry to ensure compliance with the Forest Practices Act.

Per OAR 629-665- 0120(1)(a), an active rookery is one that has been used by one or more pairs of Great Blue Herons in the past three years. The department recommends using this as a guide to determine whether these rookeries are active or if they have been abandoned. For active sites, the department recommends that a buffer of 300 feet around the primary nest zone be provided which will serve to maintain alternate nest trees, allow for growth of the colony, protect against windthrow, and prevent harassment. To further limit disturbance, it is recommended that during the critical nesting period from February 15 through July 31, major construction within a quarter mile of the rookery does not take place.

Future management of this site could be improved by monitoring active rookeries throughout the nesting season to determine site-specific nesting chronology, nest productivity, the degree of habituation to disturbance, and nearby foraging habitat.

Thank you for the opportunity to comment on this application. If you have any questions or need additional information, please contact me at (541) 757-5301 or joseph.p.stack@odfw.oregon.gov.

Sincerely,

Joe Stack
Regional Habitat Biologist
South Willamette Watershed
Oregon Department of Fish and Wildlife

[3] https://www.dfw.state.or.us/lands/mitigation_policy.asp

Board of Commissioners

Office: (541) 766-6800
Fax: (541) 766-6893

4500 SW Research Way
Corvallis, OR 97333

bentoncountyor.gov

April 16, 2025

To: Benton County Planning Commission
From: Benton County Environment and Natural Resources Advisory Committee

The members of the Benton County Environment and Natural Resources Advisory Committee (ENRAC) voted on April 9, 2025, to recommend to the Benton County Planning Commission to **deny** the Conditional Use Permit requested by Republic Services to expand Coffin Butte Landfill (CBL).

The following major topics, which are discussed in greater detail in the accompanying Report, were key considerations that informed ENRAC's recommendation. Each reflects a significant impact that was identified and assessed in whatever event of the Planning Commission's final landfill expansion decision.

- Air Pollution
  - Volatile organic compounds and odor contaminants still cause unknown issues; air quality permitting has not been consistent and CBL is currently on a DEQ Title V expired permit.
- Methane Emissions
  - Methane emissions have resulted in several EPA inspection infractions. Ongoing state and legislative efforts towards monitoring and an EPA subpoena recommend denial of the CUP to allow full analysis of what is happening with methane emissions.
- Water Pollution
  - Arsenic, other heavy metals, and organic pollutants (especially Polyfluorinated Alkyl Substances (PFAs)) have been problematic and remain unsettled; further comprehensive groundwater and toxicological analysis should be conducted.
- Leachate
  - Leachate has further complex toxicants that may be leaking, but primarily a more clear plan of how leachate is remediated and delocalized must be considered.
- Impact to Local Residents and Community
  - Residents near landfills experience higher rates of health issues, such as birth defects and cancers. New construction introduces new opportunities for contaminant spread and destruction of local wetland ecology. Environmental justice asks that those impacted have a significant voice.

- Economics
  - Denial for CUP will likely increase rates for local rate-payers.
  - Removal of the intake cap means CBL can increase waste intake coming from other municipalities, thus shortening the longevity of the CBL.
  - Low-income communities are targeted for landfill locations, or become so due to their location, driving housing & land value down by around 13%.
- Regional Impacts and Coordination
  - Impacts to road wear and increased traffic, need for increased consolidation of waste and to minimize the use of trucks requires infrastructure investment.
  - With its lifespan already overestimated by 30-50 years, considerations of CBL end-of-life & closing should be clearly stated.

For more detailed reporting, referenced documentation, and individual member statements and comments, please see the further Report below.

Thank you,

Jason Schindler, ENRAC Chair

ENRAC Deliberations on CUP Expansion Application

FINAL REPORT – April 16, 2025

The following Report was created by ENRAC based on a worksheet that each member completed. Topics were identified at the March 12 meeting, and each row within the "Topic/Issue" is from an individual ENRAC member. No effort was made to aggregate language or find consensus per topic.

Overview

The following are resources, considerations, potential impacts to consider, and a general framework for ENRAC Members to evaluate Republic Services' application for a Conditional Use Permit (CUP) to expand the Coffin Butte landfill. ENRAC will develop a recommendation to be submitted to the Benton County Planning Commission to reject, accept, or accept the application with conditions. There is no legal or formal required length, content, or structure for the recommendation. The recommendation must be voted on and approved by ENRAC by April 22.

CUP Application Materials

The following are links to the CUP application & related materials:

- Landfill expansion application (submitted July 19, 2024)
- Revised application (submitted Oct. 30, 2024)
- Additional information (submitted Jan. 15, 2025)
- First Addendum to Burden of Proof (submitted March 14, 2025)
- To learn more about the decision process visit bentoncountyor.gov/coffin-butte-landfill

What to Consider Per Code

Per Code 53.215, the following are the considerations, but not limited to, when evaluating the CUP:

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 Benton County Development Code. [Ord 90-0069]

The following are additional Codes as reference:

- Chapter 23 – Solid Waste Management
- Chapter 77 – Landfill Site (LS)

The following should be kept in mind when evaluating the application:

- Your analysis must focus only on the expansion area, NOT the landfill itself or its history
- The definition of “area” can be interpreted by you and/or by issue; such as, impacts to neighboring communities, impacts that go beyond the landfill, impacts on other jurisdictions, etc.
- You can consider & evaluate short-, mid- &/or long-term Impacts
- Benton County cannot control where the waste that is received at the landfill originates
- If the application is approved, the current cap of 1.1 million tons accepted per year will cease
- If the application is approved, Metro (Portland area’s disposal district) will not be able to send materials to Coffin Butte per existing policy

ENRAC Deliberations Framework for CUP Application

The following is a framework to organize topics to be analyzed and feedback to be captured. The objective is for ENRAC Members to agree on a recommendation to the Planning Commission via either consensus or by majority vote. The 'Topics & Issues' were captured from the March 12 ENRAC meeting. For 'Potential Impacts', include your thoughts, research links, and/or any items for ENRAC to consider. For 'Thoughts on Recommendation', include your positions or perspectives on whether the Topic/Issue leans you to recommend approval, denial, or approval with conditions for the application. Staff will compile all comments as sent for discussion at the next ENRAC meeting. Lastly, please identify any additional topics you want included and/or thoughts on reorganizing the current framework.

Abbreviations noted, if not extensive:

- BC — Benton County (though usually as Benton County Governance)
- BCC — Benton County Commission (& Commissioners)
- BC PC — Benton County Planning Commission
- CUP — Conditional Use Permit (application in consideration; assumed to be most recent unless noted)
- CBL & CB — Coffin Butte Landfill, also Coffin Butte, but implies and implicates ownership by Valley Landfills, Inc. and Republic Services Operations
- EPA — Federal Environmental Protection Agency
- DEQ — Oregon Department of Environmental Quality, assumed to be Oregon chapter unless otherwise noted
- GHG — Greenhouse Gas Emissions, typically CO2 and methane, though others exist
- ENRAC — Environmental and Natural Resources Advisory Committee
- DSAC — Disposal Site Advisory Committee
- SWAC — Solid Waste Advisory Committee
- VOC — Volatile Organic Compound

All recommendations and documentation below assumes the inclusion of the above CUP Application documents already outlined in this letter.
All documents cited in this letter are shared here: https://drive.google.com/drive/folders/1K2eYDx56-TTG-xx_LOCHjr0iOagkuwSV?usp=sharing

ENVIRONMENTAL IMPACTS		
Topic/Issue	**Potential Impacts**	**Thoughts on Recommendation**
Air Pollution		Methane is released from landfills, so if expanded there is potential for increased methane GHG emissions. On the other hand, if the landfill were to not expand, there will be increased air pollution elsewhere as the region may have to truck our waste further to dispose of it.
		Approve with conditions, such as increased monitoring and stronger sorting of organics.
	Increased particulate matter and odor emissions during construction and expanded landfill operations. Possible worsening of local air quality for nearby communities	approval with conditions: Require air quality monitoring stations and dust suppression strategies during construction and operation
	local smell; methane leaks	
	❖ Odor Issues – see below Odor section ❖ VOC Emissions	
	• Oregon warns Coffin Butte Landfill over methane emissions • DEQ - Landfill Methane Emissions Reduction • Oregon regulators pause Coffin Butte Landfill air quality permit process • Coffin Butte Landfill • EPA Coffin Butte Inspection Report Summary – Beyond Toxics • EPA Inspection Report	Methane leaks seem to be a continuous issue for the landfill. After DEQ and EPA inspections, CB did not meet the guidelines for a methane flare, for methane leaks, and for methane reduction. As of Jan 2025, the DEQ had to pause its air quality public comment period and permitting review process for the landfill. CB's air quality permit has not been updated since 2009. This update has not happened yet because Republic Services claims to not be able to find their paperwork. The DEQ is currently letting them run the landfill with an expired permit until they can find this paperwork. This seems suspicious to me, especially because the EPA announced how CB was violating limits for as how much methane is leaking from the landfill. **Application should be denied, as their air quality permit is not up to date and CB is violating federal methane regulations.**

ENVIRONMENTAL IMPACTS		
Topic/Issue	**Potential Impacts**	**Thoughts on Recommendation**
Greenhouse Gas Emissions	Methane emissions are a huge concern.	Recommend requiring the most stringent applicable standards for monitoring and ameliorating, with independent monitoring of that monitoring. See Row 2 above.
	Additional methane and CO_2 emissions from increased waste volume	approval with conditions: Ensure strong GHG mitigation plans (e.g., expanded gas capture system, renewable energy utilization) and regular reporting
	methane no smell, but cited for leaks in June 2024 with ruptured plastic covers full report 8/24	
	• Methane Emissions Considering the extensive documentation below, with some focus on the "CBL and EPA - timeline.pdf," and its supporting documents. See documents available: • CBL and EPA - timeline.pdf • ENRAC - EPA Jun 2022 CBL Inspection Report - Heinz.pdf • ENRAC - EPA Jun 2024 CBL Inspection Report - Conley.pdf • ENRAC - EPA Subpoena CBL January 2025.pdf • ENRAC - Planning Commission Findings and Decision 2021.pdf • EPA landfill area demographics 1 mile radius exp.png • EPA landfill area demographics 3 mile radius exp.png • EPA landfill area demographics 5 mile radius exp.png • The Hidden Costs of Landfills.pdf • 5.3 Delegation of BCC 77 Duties from SWAC to ENRAC - 240702 - Order D2024-048.pdf • 133902.pdf • A huge landfill in Oregon is spewing methane. Its… _ Canary Media.pdf • Benton County News July 112024.pdf • Benton Cty Land Use Appl Process Map.pdf	• Methane Emissions Considering the extensive documentation provided, with some focus on the "CBL and EPA - timeline.pdf," and supporting documents, a general pattern of institutional negligence is observed that needs important inculcation. CBL was monitored by the EPA on at least two separate occasions, 2022 and 2024, both times finding significant methane emission events at various sites at the CBL site inspected. It is noted in the CUP that the events from 2022 inspection events were deemed addressed. The 2024 inspection, to my reading, did not include official DEQ or EPA action items merely from their reporting, so no action was required from CBL. However, within the further documentation provided, between a faulty and slow regulation and observation process between OR DEQ and EPA (my reading on jurisdictions are complicated and not always fully understood), a narrative suggesting that methane is not adequately and immediately addressed on site still remains. By my reading, had the spot inspection in 2024 been more successful and redress of previous infractions were more consistent, the need for Sen. Merkley, state officials, and local efforts by SGB to suggest further institutional and regulatory oversight may have been unnecessary. Instead, it can be observed that an incomplete and inadequate regulatory framework has led to at least a learned and

	• CB Aerial Map.pdf • CB Basic Facts.pdf • CB CUP Process Flow Chart.pdf • CB Ex. Summary.pdf • CB Expansion Overview.pdf • Coffin Butte Online Resources.docx • Email August 2024 Wyden Merkley Hoyle Urge EPA to Investigate Landfill Concerns in Benton County.pdf • Email June 2024 - URGENT Methane Leaks at Coffin Butte What You Need to Know.pdf • ENRAC Collab OneNote.pdf • EPA Inspection of Coffin Butte Landfill Accumulation of Flammable Methane.pdf • FAQs Benton Cty. June26.pdf • FAQs Coffin Butte.pdf • FINAL SGB Letter to Sen. Merkley - Coffin Butte Landfill.pdf • Gmail - Coffin Butte Resubmits 2023 Annual Landfill Report.pdf • July 10 ENRAC Meeting Video Recording.pdf • OPB Interview How much methane seeps out of Oregon landfills.pdf • SWACRecommendation.pdf • Testimony in support of SB 726 133902.pdf • Landfill Methane - Moms Clean Air Force.pdf • Benton County Talks Trash Final Report: bctt_final_report_4-11-2023.pdf • ENRAC Section 114 Info Request subpoena memo.pdf • Carbon Mapper explainer 3.pdf • Corvallis to stop accepting leachate from Republic Services.pdf	institutional lack of a culture of caring for the landfill and assuring methane security has been consistently met. Other details in the supporting documents (business info subpoena, resignations at CBL environmental lead) lend shade, if not fully realized or corroborated, that the system is not stable. The very recent activity of the EPA and DEQ suggest they are still in the process of understanding what to do about recent inspections and how to approach CBL in their infractions. As such, this is clearly an in-progress issue. Other details in the supporting documents and encapsulated in the "ENRAC Section 114 Info Request subpoena memo.pdf" timeline suggest that an ongoing legal and regulatory activity may be in progress (business info subpoena, resignations at CBL environmental lead) and lend shade, if not fully realized or corroborated, that the more information, insight, and response from EPA is forthcoming. The very recent activity of the EPA and DEQ suggest they are still in the process of understanding what to do about recent inspections and how to approach CBL in their infractions. As such, this is clearly an in-progress issue—and then timing is still key to understand whether the CUP should be approved as written and at present. Further, that the State of Oregon is currently considering SB 729 (with further supporting documentation included), suggests that a further need for improved and increased monitoring and regulation is required before the current institution of methane security can be achieved. It is also noted that methane is the largest factor in consideration here for GHG emissions, and while power co-generation and plume burning is present, the emissions from leakage is the biggest problematic part of that. It is also noted that methane leaks should also be associated with odor, VOC, and other volatile pollution emission as methane itself acts as increased carrier gas for those pollutants. Monitoring and testing of those leaks should be better understood. Further testimony and reporting in the Benton County Talks Trash documentation should be fully considered, of course. The history of

		SWAC, DSAC, ENRAC, BC PC, and BCC are all complicated in the assessment of methane emissions alone. **Therefore**, it is recommended that until further and fully demonstrable progress can be made to have site inspections be more successful and consistent, that methane can be assured to be secure upon random inspection, in-progress EPA considerations fully resolved, and the case for SB 729 and improved methane regulation and monitoring is resolved, **the present CUP application should be denied.** These progressions may constitute need for further consideration and redress in a further CUP, but because of the lack of real enforcement within a "recommendation with conditions," at this time, a full denial is the safest route.
Leachate	Leachate is quite dangerous and after learning from Beyond Toxics that landfills liners do not last forever, it is scary to know that toxins are leaking into the soil and groundwater.	Approve with conditions, such as increased groundwater and river monitoring.
	Increased waste volume could produce more leachate, potentially posing risk to groundwater and surface water if not managed properly	approval with conditions: Strengthen leachate collection and treatment infrastructure; require third-party audits of system capacity
	will never be free of PFAS, endocrine disruptors in humans (and likely other creatures)	
	• Potential toxicity of leachate from the municipal landfill in view of the possibility of their migration to the environment through infiltration into groundwater • Requirements for Municipal Solid Waste Landfills (MSWLFs)	According to Benton County's Environmental Assessment for 2022-2023, CB released about 30 billion gallons of leachate. CBL is alongside Soap Creek, a tributary of the Luckiamute River that flows directly into the Willamette. This means that toxins are flowing into our water. The Environmental Assessment claims that all this leachate is within drinking water standards but that does not necessarily mean that this isn't harmful to the ecosystem. The landfill is also built on previous wetlands, meaning there is a direct connection to the ground water. The plan for the expansion also shows the creation of new wetlands right beside the landfill. The EPA has requirements against siting and expanding landfills on or near wetlands. **Expansion of the landfill should be denied so we are not supporting further environmental degradation and pollution from leachate toxins.**

ENVIRONMENTAL IMPACTS		
Topic/Issue	**Potential Impacts**	**Thoughts on Recommendation**
Soil	Risk of contamination from accidental leachate release	approval with conditions: Require soil testing and protective barriers; implement best practices for soil erosion control
	possible toxins on site, soil contents will leach into local wetlands and eventually our waterways, which all connect to oceans	
Toxicology	Potential long-term exposure to hazardous materials or pollutants through air, water, or soil pathways if not properly managed	Require a toxicological risk assessment and mitigation plan
	arsenic, heavy metals	
	Comprehensive toxicological analysis of leachate, groundwater, airspace, plume, flaring, and network effects is complex.	With the complexity of all of the environmental testing posted elsewhere, merely taking any one of the signs of environmental and human impact may yet still paint an incomplete picture. Toxicological effects may not actually be seen unless comprehensive testing within the ecological matrix is observed, as synergistic effects from various pollutants may not be observed from individual contaminants observed. This is a difficult testing space to evaluate, but current technology is building to accommodate air and water combined testing. Some effort should be made to consider that toxicological space as that effort has not been adequately seen in the CUP. **Therefore**, it is strongly recommended that a vetted, comprehensive toxicological analysis approach become a requirement for any approved CUP and indeed continued monitoring at CBL. Without systemic understanding of the toxicological effects, individually considered contaminants may not show the full impact of the proposed changes.

ENVIRONMENTAL IMPACTS		
Topic/Issue	**Potential Impacts**	**Thoughts on Recommendation**
Water Pollution ***(surface &/or ground)***	Huge concern. Not sure how to separate out leachate, soil, toxicology that all seem to relate to the nasty stuff in the water coming from the landfill.	Recommend requiring the most stringent applicable standards for monitoring and ameliorating, with independent monitoring of that monitoring.
	Leachate seepage could contaminate groundwater or nearby surface water bodies, especially during extreme weather events	approval with conditions: Strengthen barriers and conduct hydrogeologic studies to guide water protection
	post waste water treatment of leachate, it will go into our waterways with unfilterable PFAs and other potential toxins. This will eventually be in our oceans. Landfills are not allowed to be built currently on wetlands. Coffin Butte was sited well before EPA developed guidelines for safer citing of landfills, see attached guidelines. It is sited on wetlands and a tributary of? Soap Creek runs right by it. • EPA landfill siting recommendations: • Oregon Wetlands Map • Oregon USA Water/Wetlands	
	• See also Leachate discussion • Arsenic Issues & Groundwater • PFAS pollution Documents available: ❖ LandfillRelatedWaterQualityIssues.pdf ❖ J Geier to BoC groundwater arsenic Aug 2024.pdf	• Arsenic Issues & Groundwater Numerous documents, with focus on the "LandfillRelatedWaterQualityIssues.pdf" report suggest that the situation with Arsenic contamination is not fully settled. My reading of the material suggests that there could be potential leak issues or contamination from the landfill infrastructure, though indeed better evidence is needed and evidence to the contrary is presented. **Therefore**, without additional evidence, the BC PC is recommended to take particularly close look at whether combined evidence here or elsewhere can constitute a clear and present danger to local environment and groundwater. **It is not currently clear that the CUP presents a danger to environmental impact and several important gaps in testing and knowledge seem to remain.**
	Those who rely on well water and live around the landfill or Soap Creek may be exposed to the leachate toxins.	

ENVIRONMENTAL IMPACTS		
Topic/Issue	**Potential Impacts**	**Thoughts on Recommendation**
Monitoring ***(general &/or specific)***	Huge concern. Based on press reports, Republic has been less than stellar in monitoring and ameliorating methane emissions	I think strong monitoring is super important.
	Need for expanded and more frequent monitoring of air, water, and soil quality due to the scale of the proposed expansion	approval with conditions: Set mandatory monitoring frequency, real-time data access for the public, and independent oversight of monitoring results
		There has clearly been issues with CBL's monitoring standards as the EPA and DEQ continue to show CB's violations. **Due to these violations, the expansion request should be denied because there CB is not showing trustworthy information or sharing about the air and water quality data.**
Regulations ***(general &/or specific)***	Expansion must comply with state and federal regulations regarding landfill operation, emissions, water protection, etc.	CUP approval contingent upon full regulatory compliance with DEQ, EPA, and county requirements, and routine compliance verification
Other?	Climate resilience concerns	
	My understanding is that Coffin Butte, because of local geology/soil, is not a sight that would be selected for a start-from-scratch landfill. The landfill is there only because of the old Camp Adair dump.	If the expansion is granted, specify that no further expansion will be allowed. After the 5 or 6 years "bought" by the expansion, shut the place down. Permanently. Begin planning now for a new appropriate site.
	Consideration of the "natural" ecology of the landspace to have its own voice.	See below comments within Nework/Systemic effects.

Links to be included above under "Air Pollution" & "Greenhouse Gas Emissions":
https://cdn.sanity.io/files/xdjws328/production/657706be7f29a20fe54692a03dbedce8809721e8.pdf
https://www.opb.org/article/2025/01/18/epa-inspection-coffin-butte-methane-leak/#:~:text=An%20Environmental%20Protection%20Agency%20inspection,the%20town%20of%20Adair%20Village.
Recent report that includes CB. Methane emissions are an issue here:
https://cdn.sanity.io/files/xdjws328/production/b562620948374268b8c6da61ec1c44960a8d5879.pdf

HUMAN IMPACTS		
Topic/Issue	**Potential Impacts**	**Thoughts on Recommendation**
Local Residents / Community		Vocal residents are quite opposed to the expansion. If we do not expand, the county is yet to come up with options for where our waste will go.
	Increased traffic, noise, and perceived risks may affect quality of life. Expansion could raise long-term concerns about property values and environmental health	approval with strong community engagement: Require a community liaison, grievance mechanism, and public outreach before and after expansion
	local smell complaints are common among local residents	
	Local Residents & Community documents available • Benton County Talks Trash Final Report: bctt_final_report_4-11-2023.pdf -	• Local Residents & Community The Benton County Talks Trash initiative, spurred by the original 2021 CBL CUP and general public outcry, is an important summary of the local, historic, and community perspectives related to this CUP. As public comment will likely corroborate, there is a very mixed and vocal community, especially those within close proximity to the landfill, that have concerns. NIMBYism is a constant issue with any large project, though indeed the backyard being a landfill is more dramatic than many. There is important consideration and network effects with the consideration of local residents. Shall the concerns of a vocal minority lead the discussion, even when they are the ones most impacted by those changes? Generally, it would be the assumption from the ENRAC Board that this is true—externalized pollution has been a classical and on-going environmental justice issue, especially when that minority, however vocal, is denied its rights and due process—and even then—to resist a distant majority willing to sacrifice a portion of health and well being elsewhere. **Therefore**, it is **extremely important** that any evidence that the above environmental impacts to local residents be considered with the greatest of weight towards the recommendation or denial of this present CUP. The planning commission needs to carefully incorporate all those voices, views, and evidences of impact.

		Therefore, due to numerous concerns within the BCTT report and issues raised about further expansion of the CBL, **the present CUP application should be denied.**
Odor	Landfill expansion may lead to intensified odors, particularly during warmer months or operational changes	approval with conditions: Install additional odor control systems and require real-time odor monitoring with public reporting
	• Odor Issues Odor is a complex metric. What can be smelt by humans is not linearly associated with what may be present in air and air samples, even if testing were possible at every instance. Perhaps similarly, a variety of VOCs and various airborne pollutants are not detectable at all by scent and constitute a difficult monitoring and regulation problem.	• Odor Issues Odors may be considered a carrier metric for various other pollutants, VOCs, and quality of life around an undesirable infrastructure.

HUMAN IMPACTS		
Topic/Issue	**Potential Impacts**	**Thoughts on Recommendation**
Social/Societal	I am curious about the future impacts of the landfill on society. 10, 25, 50 years from now?	
	Risk of inequitable burden on low-income or marginalized communities; perception of being a 'dumping ground.'	approval with equity assessment: Conduct a social equity impact analysis and engage directly with impacted residents.
	• Targeting minority, low-income neighborhoods for hazardous waste sites • Environmental and socio-economic impacts of landfills • The Hidden Damage of Landfills • Which came first, people or pollution? Assessing the disparate siting and post-siting demographic change hypotheses of environmental injustice	Those living around landfills are seen to experience high rates of cancers, birth defects, and other health issues due to the toxins released into the soil, air, and water. Aside from health issues, landfills also decrease property values which could make it difficult or near impossible for residents near the landfill to sell their homes and move away. In addition, all the news and controversy surrounding CBL may lower home values even more and even deter people from moving to the area. Landfill siting and regulating processes seem to follow "the path of least resistance" (Mohai and Saha 2015) which is how CBL and Republic Services has been exerting its power. This means that when there are little resources being dedicated to the opposition, the landfill owners have a stronger voice in the matter. Low income and communities of color have been seen to be targeted for landfills and other toxic sites. Rural landowners near CB are being targeted here. **The landfill expansion request should be denied, as it is causing many harmful impacts to Benton County residents and has the possibility to cause health issues like cancer and birth defects.**
Other?	Mental well-being concerns among community members	
	• Chronic stress puts your health at risk	The stress of this toxic landfill is not doing good for community members and residents around CBL. Stress in combination with the other issues of the landfill can drive health problems for our locals.

ECONOMIC IMPACTS		
Topic/Issue	**Potential Impacts**	**Thoughts on Recommendation**
Economics		If the landfill does expand, it can help to maintain the jobs that are already employing those who work at the landfill and the waste haulers.
	Could result in job creation, increased tax revenue, and economic growth locally, but also pose long-term infrastructure costs	approval with conditions: Request an economic cost-benefit analysis and transparent budgeting for public infrastructure use
	county will have decreased income if landfill does not expand Human health value must be considered.	
	• Benton County Economics documents available: Supporting Documents: ❖ Basic_Economics_of_Coffin_Butte_Landfill.pdf ❖ Benton County Talks Trash Final Report: bctt_final_report_4-11-2023.pdf ❖ SPLG_Waste.pdf	• Benton County Economics Of note in the provided report, BC stands to continue and increase benefit fairly significantly in the associated costs and use fees of hosting CBL within Benton County. While there is nothing necessarily wrong with that, it is important to make clear and transparent that this is happening. Economics and politics always make corroborations, but to understand them and their implications is key. However, of greater note in this report and as raised in BCTT reports and commentary, the elimination of intake caps is most concerning. With a noted recent pattern from 2019 onward and changes in the regional landfill options, CBL has increased to near present intake capacity. The CUP, if approved, would eliminate any cap on intake, allowing significant increases in waste intake from regional outlets. While it is acceptable to assess the longevity of the present intake and fill rates as stated in the CUP, my reading is that it is not mandated or regulated how long that capacity need remain as stated. The pending SMMP and further changes in local and regional solid waste and material processing is encouraging. However, it is consistently noted that Republic and other waste management corporations have consistently dragged and prevented in providing actionable alternatives to landfill use—it being cheaper and easer to continue with old practices than spurn new activity, collaborations,

		real and demonstrable recycling and composting options, and creative solutions within the current system of waste management. As such, extending the CBL and approving the CUP does not put due economic pressure on BC, infrastructure, and cultural practices in order to instigate better SMMP and waste management practices. It only extends the inevitable need to do so, and worryingly so. It bears repeating, Republic Services is a for-profit, publicly traded corporation. They stand to continue to extract wealth from our local trash infrastructure and culture. **Therefore**, without better consideration, coordination, and pressure to change current waste management practices, **the present CUP application should be denied.**
Ratepayers & Fees		If the landfill does expand, fees may not change. Maybe a different rate style could help to alter how much waste is entering the landfill.
	may increase if landfill is farther away	
	Residents in Benton County do not have an equitable choice in its decision for waste disposal. The provided options constitute a local monopoly and should be redressed.	Changes to the CUP and CBL functioning will likely change operation rates as expected in future system management. That said, creative solutions to equitable and sustainable distributions of the costs of CBL and CUP activity is recommended. E.g., income based cost burden, community, city, and county partnership and subsidy in that cost, and other environmental justice based solutions should be included. As Republic Services is a for-profit corporation, Benton County, City of Corvallis, and the residents should not merely be supporting the profits of said corporation when there is little to no competition for residents to choose from for waste and recycling options.
Other?	City of Corvallis already stopped taking leachate for wastewater treatment, which was financial loss	

SYSTEMIC/NETWORK EFFECTS		
Topic/Issue	**Potential Impacts**	**Thoughts on Recommendation**
Regional Impacts		If the landfill doesn't expand, I am not sure where our trash will go.
	Could shift regional waste dynamics; some counties may become more reliant on Benton County for disposal (?)	approval with regional coordination: Encourage regional waste planning and develop an inter-jurisdictional framework for impact management
	• History of Coffin Butte • What is the Typical Lifecycle of a Sanitary Landfill? • Coffin Butte Site Life Working Group Report	With the SMMP and future mandated task force, the region is trying to scramble to create a waste reduction plan in preparation for the closure of CBL. While the expansion may provide more time for a stronger material management plan, it comes at the detriment to the community and the environment. There are already major impacts to the region, since the landfill is set to close in the near future, with and without the expansion. A normal lifespan of a landfill is 30 to 50 years and CB has been used since the 1940s with Camp Adair. Benton County shares that the lifespan of CB has been "historically overestimated". **The expansion should be denied so the landfill can close at its expected date in 2038. It is well past the average lifespan of landfills, and we have other options instead of expanding.**
		As with other mentions in the document (see waste transport below), the coordination of waste management and options therein should be led more at the state and industry level to come into accord with the needs and desires of residents. While jurisdictions are in place, further state and local mandates for that sharing of the load and buy-in from regional interests for better outlets (see Eugene/Springfield recycling efforts) would be important to see.

SYSTEMIC/NETWORK EFFECTS		
Topic/Issue	**Potential Impacts**	**Thoughts on Recommendation**
Sustainable Materials Mngt.		This section is crucial to consider.
	Expansion may disincentivize upstream waste reduction, reuse, and recycling if capacity is too easily available	approval with conditions: Require landfill operator to invest in or support waste diversion programs and tracking of material flow
	"Recycling" has long been touted as a solution to waste management, but between industry producers and waste-handlers, has been a façade of disinformation from many angles.	Real recycling options would be encouraging, and the new Eugene/Springfield management system access agreement or similar proposed local deployment would go a long way to encourage and engender confidence in Republic Services / CBL waste streams, and in consideration with the SMMP. Since Republic is a for profit corporation, I think increased investment would improve their image dramatically. That's outside of the realm of this CUP directly, but as systems connect, it would be nice to see those. Without seeing those examples of industry led improvements, the status quo operations are not recommended.
Waste Transport ***(additional mileage, GHG emissions, traffic, roads, etc.)***		I think this is important to consider. The landfill is already here, so expanding means that another one will not have to be built yet. If it is not expanded, we will have to truck our waste further. Is there potential to use the trains?
	Increased truck traffic could worsen road conditions and contribute to emissions, especially if haul distances increase	approval with conditions: Include traffic impact analysis, road maintenance agreements, and transportation-related emission offset programs
	It seems like this is something that Benton County is currently working out and they have more details than ENRAC.	
	Some kind of waste transport is guaranteed; minimizing that with more efficient and lower carbon options is helpful. Consolidation and shipping is often a better solution than pick-up truck transport. All of which depends on where trash is coming from.	While GHG emissions from carbon based transport are key, consolidation and location of waste pick-up is a large portion of that calculus. Corvallis and Benton County are relatively close, but if more trash (without a intake cap) comes from further away, there may be less of a conservation of carbon footprint unless those further waste regions are consolidating their transport. This is a tricky analysis, and further examination is warranted depending on variables of intake cap, locations of accepted waste-streams, impacts of other waste disposal opening and closing, improved recycling, composting, and SMMP efforts, etc.

	Risk of future inter-county political tensions or resistance to further expansion proposals	approval with planning safeguards: Establish a landfill lifecycle strategy
Other?	Exit Strategies Rights of land spaces and ecologies to exist. See Toxicology above as a Systemic/Network Effect	Agreed, in any future solution, a clear and public CBL exit strategy seems vital and necessary. Even if this CUP is approved, that approval will likely continue to wane, and everyone wants a better solution with more options and SMMP solutions to prevent need for landfill at any location. Idealistic, but still important to consider in the long term. While an "environmental" consideration, I put this consideration of the rights of ecologies to exist without the direct need for human utilization. Indeed, a nod towards the proposed land use within the CUP will change the ecology of that land significantly and there is both building if nascent recognition and understanding that ecologies should have their own voice and independence in that relationship to humans and the built environment. That said, a stewardship model of the landspace would be an important consideration of the wetlands that will be destroyed in the current CUP. Is stewardship of our lands, respectful of those lands, consider the CUP a good use case for its destruction? See Toxicology comments above; noted that they are systemic issues.

Additional Comments from ENRAC Members

As ENRAC members, our voices are diverse and intend to hold the follow space for our individual comment. That said, not all ENRAC members will fully agree with these personal statements, but agree that they should have that space here over individually submitted commentary.

From Charlene Carroll, M.D. – March 21, 2025

Overall recommend not expanding landfill. it was a poor initial siting, and there are local wetlands that cannot be protected from the leaching toxins and PFAS due to landfill contents. The landfill and repercussions that result will effect the area and our water for a long time, possible forever. (PFAS are considered forever chemicals). Expanding the landfill will only worsen this issue.

Yes, this will increase the cost of getting rid of garbage, and decrease income to the county.
Human health is invaluable, and this cost cannot be overstated.

From Jason Schindler, current ENRAC chair – 2025-04-14

Dear Planning Commission, Benton County Commissioners, Staff, et al.,

I have to write this piece because our process necessitated its reflection. It is not complete, though it would be difficult to say any part of this decision-making process could or would be, even at time of writing.

As with most things, what most of environmental action and consideration really requires is a good story that can conceptualize and narrativize the data, facts, experiences, and influences that play upon the complicated task at hand. Our process in ENRAC does not encourage that well, in fact eludes it quite intentionally I believe. But as I have been appointed its chair and have the background to accommodate this task, it is also my need to encapsulate and present what I have experienced.

Therefore, our mission, from the Benton County Commissioners (BC PC) and BC Planning Commission:

From: “5.3 Delegation of BCC 77 Duties from SWAC to ENRAC - 240702 - Order D2024-048.pdf”

> *NOW THEREFORE IT IS HEREBY ORDERED, the Environment & Natural Resources Advisory Committee is delegated the duties and responsibilities formerly assigned to SWAC in BCC 77.305 without further action by the Board. This delegation is limited to “review and make recommendations through the Planning Official to the Planning Commission regarding the Site Development Map Plan and narrative.”*

But this mandate has taken on a variety of articulated forms, largely from BC staff, from apparently needing to assess the CUP on ENRAC’s base of expertise, to considering what documents and resources we were interested and willing to find (many included above), to a consensual and binding vote, to merely providing

some commentary and recommended reviews to the BC PC, many overlapping with varying degrees of clarity. To point, we are all variously qualified volunteers with extremely limited direct expertise and available time to do so, nor was much time given for such a task.

While every opportunity to allow ENRAC to make its own decisions and assessments has been voiced by BC staff, and they have taken every opportunity to be supportive and helpful, additional concerns are noted below. They are noted in difference to the voicing of BC staff since the functionality of meetings, conducting our meetings, and patterns of interaction constitute a different and indirect level of interference and BC preference.

Relationship to VNEQS (https://www.coffinbuttefacts.org/), the online portal and vocal discussion community to deny the landfill expansion, has understandably been straining between BC. However, VNEQS activists have been directly vilified by staff in meetings (e.g., "they're not good people"). Similar sentiment was levied against the outgoing and dissolved SWAC board as well. While this is taken with a grain of salt, as well as an obfuscation about what exactly happened within SWAC and the complicated history (some of which is piecable by BC Talks Trash reporting), it is still clear that BC staff have a clear and present preference and some chips that may not evidence a level playing field.

Most recently, and demonstrably to the operation of the ENRAC board, only now, under more direct scrutiny, are public meetings laws and regulations, active and enforceable for over a year, being clearly articulated and enforced to ENRAC meetings and practices (though, indeed, other boards seem similarly complicated and confused in how their carry their activity and public meetings practices, e.g., DSAC). The laid-back culture of ENRAC has generally allowed for a sense, if underutilized, that collaboration and communication was easily allowable. Understandably and problematically, present public meeting laws, as articulated by BC staff, were articulated to **not allow** for direct communication between board members on any aspect of deliberation, most communications synchronous or asynchronous assumed to contain deliberative aspects, resulting in communications being constantly filtered, documentation sharing constrained, and all meetings and contents required to be made public while the process of making them public has been curtailed or impossible. While this has not been the functional operation of ENRAC since its reformulation in 2020, the recent scrutiny with the CUP mandate has activated this application of public meeting laws and made our process even more onerous, especially that we do not have the processes or practices in place before needed to allow good board functioning. Nor do these public meeting laws seem applied regularly or accurately as I don't believe that this is fully true in every case. It is recognized that the legislative thrust for these public meetings laws engender transparent and accountable deliberations, and that is important, but the ability to function as ENRAC desired or was led to believe seems curtailed by both the mandate to now abide by those rules and few practiced solutions to allow for that activity.

Additionally, in the process of ENRAC's deliberations as the CUP has been approved and deemed complete for ENRAC's assessment, with the above changes to process, the expedited nature of that assessment has been further encouraged by BC staff, suggesting too numerously in options that a simple vote, whatever assessment of documents and process ENRAC desired, could be done quickly and easily—moving on to next projects of the ENRAC board. This has generated a deleterious function of ENRAC to serve the original mandate above, devaluing and expediting our perspective, however distributed in the Planning Commission's purview. While it is understandable that our timeframe was short, a certain amount of rushing the process and lip service paid to our important role in assessing the CUP is noted. The additional speediness and willingness to skip the

laborious part of assessing the entirety of the CUP (1200+ pages) and any amount of introduced documentation, has been notedly present.

As such, it is difficult to get a sense that ENRAC is particularly enabled or empowered to do the best job it can do to assess the particularly important activity we have been tasked with. Perhaps this is by a certain kind of bureaucratic design, and while no sense of that is directly perceivable from BC staff—there remains a bureaucratic and institutional inertia against a sense of ideal functioning, adequate review, and democratic thriving.

At time of writing, ENRAC has made their decision and done the best it could to provide a summary and detailed assessment of the CUP and important concerns for that recommendation. I hope that the Planning Commission considers closely what level of actionable precaution and consideration of data should be included to assess the CUP Application. There will always be more data and more opinions, more arguments and important vital considerations to every aspect of BC, community, residents, region, and environment. ENRAC understands the BC PC to have a more regimented and policy angle on its approval process, will be assessing and accumulating copious public comment and existing documentation, and we hope to support that endeavor. But, to point, ENRAC makes its assessment without those regimented needs and hopes to encapsulate a different and environmentally driven perspective herein.

Thank you for considering our recommendation,
Jason Schindler

LU-24-027 Staff Report to Benton County Planning Commission

Benton County Exhibit 3 (BC3)
Compiled Written Public Comments through April 22, 2025

LU-24-027 Staff Report to Benton County Planning Commission

Benton County Exhibit 4 (BC4)
Benton County Notice to Outside Agencies

Contents:

- Agency Referral email from Benton County Community Development Director

From: SCHUETZ Petra <petra.schuetz@bentoncountyor.gov>
Sent: Thursday, March 20, 2025 5:03 PM
To: Benton Public Comment <PublicComment@bentoncountyor.gov>

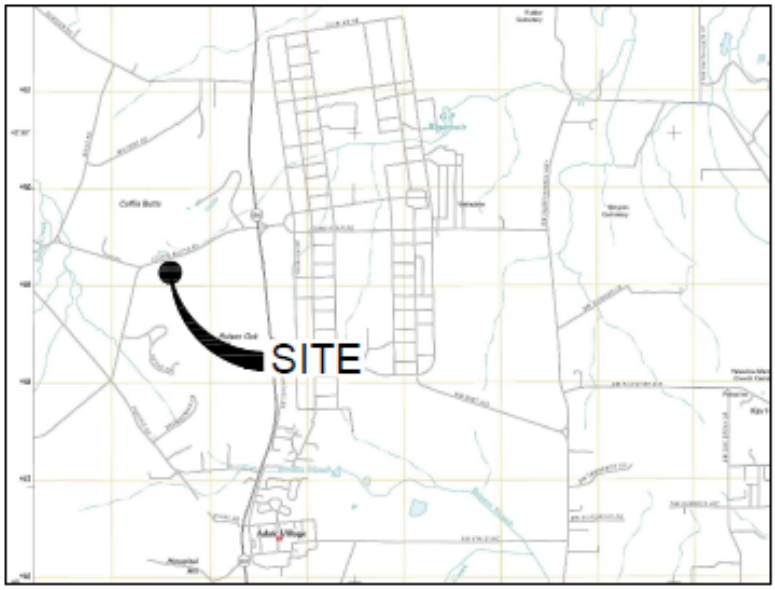
Cc: STACK Joseph P * ODFW <joseph.p.stack@odfw.oregon.gov>; WINGARD Patrick * DLCD <patrick.wingard@dlcd.oregon.gov>; FOOTE Hilary * DLCD <hilary.foote@dlcd.oregon.gov>; jarod_jebousek@fws.gov; Kruger Scott <scott.kruger@bentoncountyor.gov>; BYER Laurel <Laurel.Byer@bentoncountyor.gov>; odotr2planmgr@odot.oregon.gov; CAMARATA Mary * DEQ
Subject: Land Use Application Agency Referral for Coffin Butte Landfill Expansion | Conditional Use Permit | LU-24-27

Agency Referral

Agency Referral partner comments are an essential part of a successful land use application process. Benton County appreciates your time and attention to this review. Comments are due no later than **Friday, April 11, 2025**.

Request: Expansion of Coffin Butte Landfill
Application identifier: LU-24-27
Type of land use application: Conditional Use Permit
Applicant: Jeff Condit on behalf of Valley Landfills, Inc a.k.a. Republic Services
Application Details: Please use this link to the **application materials**. The application and all documents and evidence used by the applicant are available are also available for inspection at the Benton County Planning Division located at 4500 SW Research Way, Corvallis OR 97333.
Please upload your formal comments to **publiccomment@bentonor.gov**. If your organization chooses *not* to comment, please reply to this email with that intent.
Contact: Petra Schuetz | Planning Director | petraschuetz@bentoncounty.or.gov

Site location:
29175 COFFIN BUTTE ROAD
CORVALLIS, BENTON COUNTY, OREGON 97330



U.S.G.S. MAP

U.S.G.S 7.5 MIN. TOPOGRAPHY MAP,
LEWISBURG QUADRANGLE, OR, DATED 2011

SCALE IN FEET

0 5000 10000

SITE MAP

SCALE IN FEET

0 600 1200

Petra Schuetz
Interim Community Development Director
Email: petra.schuetz@bentoncountyor.gov
bentoncountyor.gov

LU-24-027 Staff Report to Benton County Planning Commission

Benton County Exhibit 5 (BC5)
Benton County Reviewing Consultants' Credentials

Contents:

- Winterbrook Planning firm bio and resume
- Maul Foster Alongi (MFA) and sub-consultants firm bios and resumes
- Kellar Engineering – firm bio and resume

WINTERBROOK PLANNING

Firm Bio - Contract Planning

Winterbrook Planning has provided land use, environmental planning, and permitting services for public and private clients throughout the Northwest for over twenty years. Winterbrook's expertise is concentrated in planning and land use permitting for municipalities. We also help cities with current and long-range land use planning, environmental assessments, and other services such as comprehensive plan and zoning code revisions. We have an extensive working knowledge of applicable statutes, goals, administrative rules, framework and functional plans, and case law applicable to permit approvals.

Winterbrook has provided on-call planning services to dozens of Oregon cities and counties throughout the state. The staff at Winterbrook have decades of experience collaborating with state and local officials to resolve complex land use and environmental problems. We work closely with other allied disciplines in land use field: civil and hydrological engineers, landscape architects and architects, economists, land use lawyers, surveyors and specialized environmental scientists.

In all its work, Winterbrook advances the planning goals and requirements of each jurisdiction, while maintaining the highest standards of professionalism and integrity. Winterbrook understands public sector work increases the need for transparency and communication and has been able to work effectively with all project stakeholders, including applicants, neighbors, and city and county planning officials.

JESSE WINTEROWD, AICP

PROFESSIONAL EMPLOYMENT

Managing Principal
Winterbrook Planning, Portland, OR 2019-present.

Project Manager
Winterbrook Planning, Portland, OR, 1998-2019.

Intern
Wallis Engineering, Vancouver, WA, 1997.

EDUCATION

Master of Urban and Regional Planning
Portland State University, 2006.

Bachelor of Arts
Wesleyan University, 1997.

PROFESSIONAL MEMBERSHIP

American Planning Association

Project Management Institute

PROFESSIONAL CERTIFICATIONS

AICP #026890

PMP #5470189

Jesse Winterowd has over 26 years of experience covering hundreds of projects – managing project teams in long-range planning analyses for cities and counties, preparing development and permit applications for private and public clients, and serving as a contract planner for several jurisdictions.

He has extensive experience working with municipal and regional plans and development codes, in cities and counties throughout the Metro region, the Pacific Coast, the Willamette Valley, and Southern and Eastern Oregon.

The brief list below highlights a selection of Jesse's recent contract planning and temporary staff augmentation projects.

SELECTED PROJECTS:

- **Columbia County:** Application intake, completeness review,prepare staff reports and hearings presentations, agency coordination for major projects; Comprehensive Plan and Development Code updates including Goal 5 program restructuring; staffing assistance for remand review; multiple presentations to Planning Commission and County Board (2021-present)
- **City of Turner:** Prepare staff reports and hearings presentations for multiple development code updates, zone changes, and development applications; ongoing contract planning services for application review, code interpretation; multiple presentations to City Council (2021-present)
- **City of Aumsville:** Prepare comprehensive plan text amendment, staff report and findings for UGB expansion; presentations to Planning Commission, City Council and County Board of Commissioners; application intake, completeness review and applicant coordination for a major conditional use development; annexation review (2022-present)
- **City of Sublimity:** Prepare staff reports and findings for UGB expansion for public facility; code amendment; presentations to City Council (2021-2024)
- **City of Astoria:** Prepare staff reports, findings, development code and comprehensive plan amendments, and zone change to facilitate development of a region-serving hospital designed to survive a Cascadia event within the tsunami inundation zone; extensive coordination with City and project team engineers and architects; multiple presentations to Planning Commission and City Council (2022-2023)
- **City of Wilsonville:** Manage staff augmentation and application intake, completeness reviews, staff reports for multiple Type I-II land use applications (2021-2023)
- **City of Island City:** Prepare dozens of staff reports, hearing presentations, and coordinate with citizens for Type I-IV land use reviews including conditional uses, multiple UGB amendments, updates to comprehensive plan and development code, and annexations (2001-2023)

April 18, 2025

Benton County, Oregon

Third-party Review – Proposed Expansion of Coffin Butte Landfill

From: Ellery Howard
3140 NE Broadway
Portland, OR 97232
971-544-2139

To: Petra Schuetz
Interim Director
Benton County Community Development Department
4500 Research Way
Corvallis, OR 97333

Re: Third-party Review – Proposed Expansion of Coffin Butte Landfill

Dear Petra Schuetz:

Maul Foster & Alongi, Inc. (MFA) is pleased to submit this team overview letter for the third-party review of the conditional use permit application submitted by Valley Landfills, Inc. for the Coffin Butte Landfill Expansion. MFA has been contracted by Benton County to provide a comprehensive review of the application, leveraging our local expertise in solid waste and related environmental issues in Oregon and throughout the Pacific Northwest.

MFA is an established consulting firm offering integrated services in engineering, environmental science, planning, Geographic Information Systems (GIS), environmental data management, communications and public outreach, and health and safety. With offices located in Seattle, Vancouver, and Bellingham, Washington; Portland, Lake Oswego, The Dalles, and Bend, Oregon; and Coeur d'Alene and Kellogg, Idaho, MFA delivers innovative and award-winning professional services to a diverse range of industry and municipal sectors.

Our multidisciplinary team, comprising engineers, environmental professionals, planners, construction managers, and industrial hygienists, routinely provides high-quality consulting services to municipal clients. These services include solid waste engineering, permit compliance, stormwater management and design, environmental monitoring and reporting, air permitting and Title V compliance, methane monitoring and mitigation, and infrastructure support.

MFA is presently engaged in offering engineering services and permitting assistance for several solid waste facilities in Oregon, including a solid waste transfer station proposed to be located in Polk County. We have no prior engagements with the applicant and there are no conflicts of interest.

In reviewing the application package, MFA brings the following expertise to this project:

- Solid Waste Engineering: Our solid waste engineers and environmental specialists reviewed the landfill expansion application documents for consistency with local and state regulations.
- Stormwater Management: MFA's stormwater experts evaluated the proposed stormwater systems and associated calculations relative to the applicable local standards.
- Noise Assessment: MFA's industrial hygienist conducted a detailed review of the noise assessment describing how the proposed expansion would impact the surrounding community with consideration to allowable noise standards.
- Air/Odor Modeling and Permitting: Our air quality experts evaluated odor documentation, including odor dispersion model study, to confirm if the potential impacts to the nearby properties are accurately identified.

MAUL FOSTER ALONGI

In addition to our in-house expertise, we partnered with the following firms to provide specialized reviews:

- Columbia West Engineering (CWE) reviewed the geotechnical approach in the applicant's submittal to determine the stability and safety of the proposed landfill expansion.
- Landfill Fire Control Inc. (LFCI) conducted a review of the fire risk assessment information submitted by the applicant, providing critical insights into fire prevention and control measures based on real world experience derived from responding to landfill fires around the world.

Attachment A contains resumes for team members, including those of our subconsultant partners.

Please contact us if you have any questions.

Sincerely,

Maul Foster & Alongi, Inc.

Ellery Howard
Project Manager

Erik Bakkom, PE
Principal Engineer

Attachment

Resumes

Ellery Howard PE

Senior Engineer

ehoward@maulfoster.com | 208.664.7884

Ellery Howard is a skilled professional engineer with over 30 years of experience in engineering design, as well as construction observation and coordination. He excels at assembling and managing diverse teams to accomplish multifaceted projects for local governments or private entities. Clients appreciate Ellery's focus on understanding their goals and his leadership of project teams that address those goals.

Ellery's broad design experience includes landfills and transfer station planning, water storage and distribution systems, water source design and development, as well as sanitary and storm sewer systems. His planning experience includes water and sewer master plans and hydraulic water model development and calibration. He has also been involved in project management for a number of projects, both large and small, throughout Idaho, Washington, Oregon, and Montana.

Education

- BS, Civil Engineering: University of Idaho

License/Registration

- Professional Civil Engineer: Idaho, No. 10004

Certifications

- 40-Hour HAZWOPER Training
- OSHA 30-Hour Construction Training

Relevant Projects

Solid Waste Design and Analysis

Landfill Analysis and Operations, Boundary County, Idaho

Ellery has worked with this facility for over 20 years. He was project manager for a landfill lifetime analysis and the development of a landfill site operating plan. He assisted the facility with landfill closure cost estimates and updates, site surveys, cell and cover material volume analysis, preliminary transfer station planning, permit updates, and coordination with regulatory agencies. He also designed and coordinated the permitting and construction of gas-extraction wells and a unique solar-powered gas-venting system. A recent project includes siting and permitting an air curtain incinerator to dispose of natural wood debris.

Infrastructure Planning and Construction

Confidential Client, The Dalles, Oregon

Ellery led a design-build team in assessing existing infrastructure and the successful segregation and construction of several natural gas, sewer, and water infrastructure projects to serve a large private facility on over 100 redeveloped acres. The design-build approach saved the client a significant amount of time and money as MFA served as the general contractor.

Land Planning and Annexation

Private Clients, Spokane, Washington and Amity, Oregon

Ellery provided the infrastructure assessment and planning for over 600 acres that included a technology park, shopping center, and light and heavy industrial areas. Project accomplishments included the development of a new land use category and zone (Technology Mixed Zone), creation of urban renewal districts, and a unique and specialized method for reuse of industrial wastewater.

Ellery Howard PE

Stormwater

Stormwater Management Alternatives, Hillyard Industrial Area, City of Spokane, Washington

Ellery was project manager for the investigation and analysis of a potential regional stormwater system in the Hillyard Industrial Area to catalyze development. The analysis was developed in coordination with the City and Northeast Public Development Authority and was intended to inform the decision makers as they develop the framework and policies for creating a regional stormwater utility in this area.

Water Supply and Treatment

Water System Facility Planning, Bayview Water and Sewer District, Bayview, Idaho

As project manager, Ellery led the water system facility planning effort to investigate and evaluate aging infrastructure in the Bayview Water and Sewer District's existing water system. Tasks associated with the project included preparation of construction cost estimates for recommended improvements. The project also included significant public involvement and community outreach.

New Water System, Coeur d'Alene, Idaho

Ellery supported permitting, design, and construction management for a new private water system that included wells, transmission and distribution lines, a booster pump station, a fire pump, and a 175k-gallon welded steel reservoir. The project included development and implementation of several unique methods to reduce the naturally occurring arsenic in one of the wells to avoid treatment.

Potable Water and Wastewater System Design, USDA Forest Service, Idaho and Montana

Ellery served as project engineer for the design of new potable water and wastewater systems for Forest Service facilities, including a unique solar-powered well pump system. This project included the repair/rehabilitation design of existing systems and general civil engineering work at remote campgrounds, work centers, and ranger stations.

Wastewater Collection and Treatment

Water and Wastewater Facility Construction, Hayden, Idaho

Ellery was project manager for the permitting, design, and construction of multiple projects for water and wastewater facilities for a church camp, including a 1-million-gallon lagoon and Class C reuse system with treatment on a forested site, water system upgrades, play field design and construction, permitting and siting of cabins in steep locations, and source well development.

Construction Wastewater Design and Permitting, Coeur d'Alene, Idaho

Ellery supported the design and coordination of a unique collection system and permitting for the treatment of wastewater from a concrete resurfacing project for a construction company on an interstate highway bridge over Blue Creek Bay on Lake Coeur d'Alene, Idaho.

Unique Projects

Contract Engineering Services, City of Hayden, Idaho

Ellery was project manager providing contract engineering services to the City of Hayden. Work included preapplication meetings and review and approval of site plans, plats, construction plans, and other documents.

Water Rights Permitting and Engineering Design, Hauser, Idaho

Ellery supported U.S. Army Corps of Engineers permitting and water rights permitting as well as civil engineering design for the mass excavation and lining of a 5-acre private pond (18 feet deep) that is aerated and capable of supporting aquatic life. The project also involved diverting adjacent streams into the impoundment and then returning them to their natural downstream course.

Erik I. Bakkom PE

Principal Engineer
ebakkom@maulfoster.com | 503.501.5217

Erik Bakkom has 27 years of experience in environmental engineering, with expertise in the areas of solid waste facility planning and design, brownfield/industrial site cleanup, and sediment remediation. Erik routinely works with diverse groups of engineers, scientists, planners, ecologists, and regulatory specialists. Erik has led the design and construction efforts for landfills and complex remediation projects in Oregon, Washington, and Idaho. Solid waste experience includes preparing solid waste management plans; design and construction quality assurance oversight for landfill systems and transfer stations; waste acceptance plans; evaluation of compost and recycling facilities; landfill acquisition due diligence; environmental support for landfill operations; and hazardous waste management. Erik is a civil engineer licensed in Oregon, Washington, and Idaho.

Education

- BS, Environmental Engineering: New Mexico Institute of Mining and Technology

Licenses/Registrations

- Civil Engineer:
  Oregon, No. 72200
- Washington, No. 43788
- Idaho, No. 15529

Certifications

- 40-Hour Hazardous Waste Operation Training and 8-Hour Hazardous Waste Operation Refresher Training
- Asbestos Awareness Training

Professional Associations

- American Society of Civil Engineers
- Western Dredging Association

Relevant Projects

Solid Waste

Solid Waste Landfill Cell Construction, Washington

Erik was principal in charge for the construction oversight of subgrade preparation for two new cells totaling approximately 20 acres. MFA worked closely with the client, design engineer, and construction contractor to clear existing wooded vegetation, extend run-on control and diversion structures, install hydraulic gradient controls to manage multiple springs below the proposed liner, and then prepare subgrade soils to receive the liner in future years. The scope of work included public bid assistance, full-time contractor oversight and documentation, coordination with the design engineer, and coordination of geotechnical testing for subgrade soils and imported materials in order to certify construction of two cells prior to installation of the liner.

Waste Acceptance and Plan Preparation, Washington

Erik is the principal engineer for the preparation of a comprehensive waste acceptance plan and review of waste-disposal applications received by the County for nonroutine wastes, including contaminated soils, contaminated sediments, and various industrial wastes. When the client requested assistance with their waste acceptance program because of staffing changes, MFA reviewed the existing program and identified areas with ambiguous instructions or where solid waste regulations were not being consistently implemented. MFA worked closely with the landfill manager and solid waste transfer company to develop an update to the waste acceptance plan that would provide consistency for implementation by both entities. Along with the development of the plan update, MFA provides technical review of solid-waste-disposal applications for nonroutine wastes to be disposed at the landfill.

Solid Waste Landfill Closure, Washington

Erik managed the design, permitting, and construction for the final closure of a 25-acre landfill. MFA designed an alternative landfill cover system that includes a vegetated soil cover, surface water drainage layer, impermeable plastic liner, impermeable clay geocomposite liner, and landfill gas collection layers with a horizontal gas collection system. The comprehensive design includes improvements to facility stormwater

management and the refurbishment of an existing landfill gas flare. The scope of work included public bid assistance, full-time oversight of construction activities, implementation of the geomembrane/geocomposite liner quality assurance program, and construction documentation to certify closure.

Solid Waste Landfill Closure and Redevelopment, Oregon

Erik was responsible for the preparation of documentation and details for closure of this former city landfill as part of redevelopment as a multi-use sports complex. He oversees annual environmental monitoring for landfill gas and groundwater to comply with permit requirements and to demonstrate that engineering controls remain effective for the high school sports complex. Erik worked closely with the MFA site development lead engineer to integrate the landfill closure features (soil cap, membrane liners, venting systems) to maximize the synergistic benefits for both the property owner and the site developer, leading to the closure of this previously abandoned landfill and its reenergized use as a state-of-the-art high school sports complex with significant community value. MFA's grading and surface water management design for the sports complex was tailored to address Oregon's landfill final cover requirements. Erik oversaw the design for the methane gas control systems to prevent intrusion into occupied spaces in the locker room and the concessions area.

Solid Waste Landfill Mapping, Washington

Erik is the principal in charge for semiannual aerial mapping services in support of semiannual volume assessment of landfill waste placement within the 150-acre developed footprint. MFA uses unmanned aerial aircraft and photogrammetry to document conditions at the active and inactive areas of the landfill. Mapping deliverables include a high-resolution orthoimage and high-density ground elevations. Aerial images are collected with a half-day effort, and then processed with surveyed ground targets and client-specified checkpoints. Quality control calculations typically result in an error of less than 0.5 feet.

Municipal Solid Waste Landfill and Planning Support, Washington

Erik oversaw services that were provided to the County in support of their solid waste program and landfills. Services included engineering design and construction services for maintenance and closure of the County Landfills; development and administration of the County's waste acceptance program to ensure that prohibited wastes (Washington dangerous waste and federal hazardous waste) were not inadvertently placed in the landfill; facility stormwater assistance, and solid waste management plan development and maintenance.

Solid Waste Management Plan for Municipalities, Oregon and Washington

Erik is the principal in charge for the preparation of solid waste management plans for municipalities in Oregon and Washington. The updates periodically address document structure changes to address changes to the state guidelines These plans address detailed evaluation of local conditions (physical conditions and demographics), solid waste collection, recycling, organic materials management, special waste handling, to satisfy state guidelines. In preparing the solid waste management plan, MFA works closely with local solid waste managers, waste and recycling facilities, and solid waste advisory committees, to develop a detailed description of the local system, management requirements, a projection of solid waste generation over a 20-year planning period, and then establishes goals and actions that are necessary to maintain system capacity over the planning period.

Waste Acceptance Assistance, Landfill Facility, Oregon

Erik manages requests from an Oregon landfill for assistance with the regulatory review of wastes that are proposed for disposal in the landfill. Assistance is typically requested when non-routine contaminated and out-of-state waste streams are under consideration. MFA provides an evaluation of waste acceptability with consideration to federal and state regulations. A detailed understanding of Oregon and California solid and hazardous waste regulations is required.

Solid Waste Landfill Postclosure Assistance, Oregon

Erik is the principal in charge for assistance with the management of two closed municipal landfills, following its formal closure and redevelopment as a high school sports complex. Activities include general environmental consulting services, environmental assessment of groundwater and landfill gas conditions, annual update of financial assurance, and assistance with long-term management plans.

Erik Bakkom PE

Solid Waste Landfill Entrance Scales, Washington

Erik managed the design of and oversaw construction of a new inbound and outbound scales complex at this operating landfill. The project required that the scales be incorporated into the existing entrance layout and that access to the administrative office be maintained. The bid package was developed to incorporate the requirements for a new scales hardware and software system that had been procured separately by the municipality. MFA assisted the municipality with obtaining permits and supported the municipal bid process. MFA also provided special inspection services during construction, as well as expert opinion regarding a defective concrete pour that had resulted in a suspected cold-joint.

Solid Waste Landfill Postclosure Facility Use Assessment, Washington

Erik developed the postclosure facility use assessment to document various conditions at a county-owned property containing a former landfill. The document is intended to record institutional knowledge of property assets, liabilities, easements, and various deed conditions for reference by the county in evaluating options for long-term use.

Solid Waste System Assessment for Municipality, Washington

Erik was project manager for the assessment of solid waste facilities, programs, and policies to aid this county with long-term capital funds planning. The assessment also provided an evaluation of needs in the county to include in the update of its solid waste management plan. Information regarding the county's current solid waste system was prepared and reviewed, after which patterns of waste generation and population growth were evaluated to enable the identification of strategic solutions for future solid waste issues. Concepts for future programs and facilities for solid waste management were developed and considered with an advisory committee. The study presents recommendations for modifications to existing facilities, proposes new facilities, and identifies opportunities to enhance diversion and recycling in the county.

Landfill Permit Renewal for Municipal Landfill, Washington

Erik prepared a renewal of a landfill permit. The permit renewal included a request to allow the use of ash, which currently must be landfilled, as an alternative daily cover material at the landfill.

Landfill Development and Closure Planning for Municipality, Oregon

Erik assisted with the preparation and revision of a landfill development and closure plan. Tasks included revising the landfill capacity estimates and grading plan and designing a stormwater diversion channel. During a subsequent task, Erik assisted with the preparation of documents and drawings for the closure of a 10 acre portion of the landfill. He also designed the stormwater drainage plan to convey runoff away from the slope and to minimize erosion.

Woodwaste Landfill Design, Oregon

Erik was the principal in charge for the design of a new woodwaste landfill cell at this remote facility. Erik worked with the client and the Oregon DEQ to prepare a design report and engineered plans that satisfy current regulatory requirements for lined industrial-waste-disposal cells. MFA collaborated with the environmental consultant in preparing an update to the environmental site characterization report and surface water conditions.

Cem Gokcora PE

Senior Engineer
cgokcora@maulfoster.com | 971.713.3573

Cem Gokcora has over 20 years of experience in civil engineering, including site development, utility design, stormwater conveyance and treatment design, water systems design, solid waste facility design, and compliance assistance. His areas of expertise include project management, site development design (residential, commercial, and industrial), land-use entitlement, site development planning and permitting, stormwater management, and construction cost estimating. Cem understands how to develop site plans that optimize client objectives relative to site and regulatory constraints and has successfully permitted projects within numerous jurisdictions in Washington and Oregon. He is proficient at preparing accurate development budgets and cost estimates, and detailed schedules covering design, permitting, and construction activities. He has adeptly led and managed multidisciplinary teams, ensuring successful project delivery.

Education

MS, Engineering and Technology Management:
Portland State University

- BS, Civil Engineering:
Middle East Technical University

Licenses/Registrations

- Professional Civil Engineer:
California, No. C 88736
- Professional Civil Engineer:
Idaho, No. 17290
- Professional Civil Engineer:
Oregon, No. 70867 PE
- Professional Civil Engineer:
Washington, No. 54676

Certifications

- 40-Hour HAZWOPER Training
- First Aid, CPR, and AED Training

Relevant Projects

Brownfield Site Redevelopment for Large Industrial Warehouse Facility, Portland, Oregon

Cem led the design and permitting (with multiple agencies) effort for redevelopment of a former concrete structure manufacturing facility, a portion of which overlaid a former closed construction and demolition debris landfill, to a large-scale industrial warehouse complex (approximately 675,000 square feet of building area in total). The former facility, located along Columbia Slough and with a permitted outfall, is a registered DEQ environmental cleanup site. Cem assisted the design team with preparation of the remediation design submittal package, and coordinated with the DEQ's Cleanup Division for review and approval of the selected remedy. He prepared site civil components of City of Portland building permit application. These included design drawing sets for on-site features including landfill gas mitigation systems, and stormwater report Cem led the construction quality assurance program and provided the DEQ with periodic remediation construction progress updates.

Industrial Stormwater Permit Compliance, Treatment/Infiltration System Design and Permitting, and a Level 3 Engineering Report, Industrial Park, Vancouver, Washington

Cem assisted the design team with on-call NPDES stormwater permit compliance services to a large waterfront industrial park with over 100 tenants. He has designed and permitted several stormwater infiltration facilities as well as Level 3 stormwater treatment measures required to meet NPDES permit benchmarks. Cem also provided construction assistance services during implementation of the first-phase improvements.

Design for Public Water System Improvements, The Dalles, Oregon

Cem has led the engineering effort for a privately funded public water system improvement project in the City of The Dalles, which includes construction of two production wells, two 1.2-million-gallon welded steel tanks, a booster pump station with up to 9,000 gallon-per-minute pumping capacity. Cem coordinated the design of the well

houses, booster pump station, reservoirs and electrical system design. He is currently managing engineer of record services including construction oversight.

Design Review for East Fork Nine Mile Creek Initial Waste Consolidation Area and Infrastructure Construction, Kellogg, Idaho

Cem assisted the design review team with their review of the 90% design report, hydrological calculations, and the associated plan set for haul roads, the surface and base drainage system, and the quarry plan. He also reviewed the engineer's estimate of probable costs.

Bailing Facility Design and Permitting for a Private Solid Waste Transfer/Recycling Station, Toledo, Oregon

Cem assisted a private solid waste transfer/recycling facility with a temporary bailing facility design and permitting. The permitting effort included coordination with the City of Toledo and the Lincoln County Building Department to obtain a Conditional Use Permit, an Excavation/Fill Permit, and a Building Permit. Cem managed the design team, which included a geotechnical consultant, a structural consultant, a surveyor, and the membrane structure supplier, and coordinated with the contractor for site planning, earthwork, building layout, slab design, and evacuation plan (for life safety and wind protection of the membrane structure).

Tennant Way Landfill Closure, Cell 3, Longview, Washington

Cem coordinated with a geotechnical subconsultant and the Cowlitz County Building and Planning Department to prepare an alternative cap evaluation report. He was part of the design team that prepared an engineering report for the proposed closure, and also drafted the engineering plan set for construction, including the subgrade, stormwater, and landfill gas collection plan, along with associated landfill stormwater/gas collection details. Cem assisted the client with remaining capacity calculations for the active landfill cell and coordinated with the Washington State Department of Ecology on estimating the postclosure period timeframe, based on landfill gas generation modeling results. Cem prepared bid documents for closure construction, and assisted the county during the bid and construction period. He managed the construction quality assurance team overseeing the construction of the closure project, ran weekly construction meetings, and coordinated resolution of the contractor's requests for information. Cem authored the postconstruction report and coordinated with the County for jurisdictional postclosure requirements.

Nespelem Transfer/Recycling Station, Nespelem, Washington

Cem helped the design team to put together the bid documents for Nespelem Transfer/Recycling Station. He edited the contract form provided by the client, to address the project-specific components. Cem was involved in the site, grading, and utility design (including an on-site septic system) for the subject site. He assisted the design team with the preparation of technical specifications for structural fill construction and compaction below the proposed transfer station building, a package sanitary pump station, on-site sanitary and water systems, a pre-engineered steel building, access road construction, a modular scale house, and a truck scale.

Landfill Remediation Planning, Bend, Oregon

Cem assisted the design team with construction cost estimates (landfill mining, waste sorting, re-landfilling, backfilling of remediated landfill areas) in an effort to develop a phasing plan consistent with available funding.

Construction Oversight and Contract Administration for Municipal Solid Waste Landfill Cell Earthwork, Castle Rock, Washington

Cem led construction quality assurance services for earthwork construction for a new cell at the municipal landfill. His responsibilities included coordination with the design engineer, field CQA officer, contractor, and county construction manager regarding field questions, submittal reviews, change orders, and payment application reviews; conducting weekly meetings to report progress to all stakeholders, including the county solid waste manager, Ecology, the county public health department; completing periodic inspections; and certification of the completed construction with a construction certification report.

Derek Heitz CPSWQ

Project Environmental Scientist
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Derek Heitz has nearly a decade of experience working with industrial clients on environmental compliance and due diligence efforts. His expertise includes providing clients with NPDES compliance support; performing pollutant source evaluation and control studies; identifying current and legacy contamination sources; identifying data gaps in prior due diligence efforts; designing, installing, and maintaining treatment systems for stormwater, process water, and ex situ groundwater treatment; characterizing and disposing of hazardous and dangerous wastes; and conducting Phase I and II ESAs. He has a strong working knowledge of industrial facilities and processes and their potential on-site and off-site impacts. Derek has expertise in developing site-specific plans for pollution prevention and spill prevention, control, and countermeasures; performing facility inspections; determining and abating pollutant point sources; and providing permitting assistance, proof-of-concept testing, and contractor oversight; and he frequently serves as project manager on various environmental compliance and cleanup projects. Derek also has experience in providing clients support in litigation matters ranging from responding to third-party Clean Water Act claims to responsible party research and contaminant source identification and fingerprinting for environmental cleanup allocations.

Education

- BS, Environmental Geology: University of Washington

Certifications

- CESCL and CPSWQ
- 40-Hour HAZWOPER Training
- TSA TWIC
- DOT and IATA HAZMAT Transport

Professional Associations

- Northwest Environmental Business Council—Conference Planning Committee Member
- Solid Waste Association of North America
- Washington Public Ports Association
- Tacoma-Pierce County Chamber
- Manufacturing Industrial Council of South Sound
- Tacoma Propeller Club
- Northwest Association of Environmental Professionals

Relevant Projects

Compliance Support

Metal-Recycling Facility Stormwater Compliance Support, Seattle, Washington

Derek is providing long-term support and facility oversight for a metal-recycling facility that has been operating for over 100 years. Services include coordination with regulatory authorities, oversight of a monthly self-monitoring program, source control evaluations, and subcontractor oversight for a retrofit of a stormwater treatment system. Recent project work includes a source evaluation study using a PCB-detection dog to identify potential contamination in metal scrap source materials and on-site areas, an update of their Permit to add an additional discharge point, multiple updates to structural source control Best Management Practices (BMPs), characterization and disposal of multiple waste streams, completion of Washington State Dangerous Waste Annual Reporting, updates to their Slug and Spill Control Plan and Compliance Calendar, and assistance with vendor coordination and contracting

Woodwaste Landfill Solid Waste Permit Compliance Support, Ketchikan, Alaska

Derek is providing long-term solid waste permit compliance assistance for a woodwaste landfill that has been in post-closure monitoring since the late 1990s. He has acted as the compliance program manager for the facility since 2021, working with the client, other consultants and service providers, and acting as a negotiating lead with regulatory agencies. Services have included permit renewal assistance, long-term monitoring of stormwater and leachate discharges, management and update of facility's BMP and Comprehensive Landfill Monitoring Plans, landfill cap maintenance, oversight of multiple mixing zone analyses, and annual program auditing, and quarterly and annual compliance reporting to state and federal agencies.

Derek Heitz CPSWQ

Municipal Solid Waste Landfill Permit Compliance Support, Ketchikan Alaska

Derek is providing long-term solid waste permit compliance assistance for Deer Mountain Landfill, a municipal solid waste landfill owned and operated by the City of Ketchikan. He has acted as the compliance program manager for the facility since 2021. During this time, he has coordinated with the client to complete annual reporting of stormwater discharges, cap maintenance for closed cells, BMP maintenance and monitoring for operational spaces, permit renewals, and expansion of Permit coverage to include landfilling of municipal wastewater biosolids.

Metal-Shredding/-Recycling Facility Stormwater Treatment Retrofit, Washington State

Derek assisted a metal-shredding and -recycling facility with troubleshooting and optimization of their existing stormwater treatment system. Troubleshooting and optimization efforts provided greater capture of total PCB concentrations in the facility's stormwater discharges. Derek completed multiple rounds of bench- and field-scale pilot testing to evaluate appropriate inline chemical treatment doses and appropriate adsorptive media contact times.

Construction Waste Transfer Facility Stormwater Treatment Optimization, Tacoma, Washington

Derek assisted a client with startup and troubleshooting of an existing stormwater treatment system at their construction materials recycling facility. The client had acquired a competing business, and the staff responsible for system O&M left during the acquisition. He worked with the facility to test functionality of existing equipment, develop a stopgap O&M plan for the system, and determine appropriate chemical doses to allow for appropriate system operations. Derek created a long-term O&M budget, including costs and levels of effort for retrofit or replacement of outdated and unreliable equipment, before project closeout.

Glass-Recycling Facility Stormwater Compliance Support, Seattle, Washington

Derek provided subcontractor support for a glass-recycling facility that required treatment for TSS and metals at multiple stormwater outfalls covered by an industrial stormwater general permit. Derek coordinated with multiple parties to combine all outfalls into two separate treatment facilities, allowing for different treatment of the two stormwater discharges. A gravity filtration treatment was implemented on the outfall for basins with lower pollutant loading, and flocculant-enhanced sand filtration was implemented on the basins with elevated TSS and metal concentrations. Additional support included equipment wet weight estimations, media lifespan calculations, long-term O&M cost calculations, and construction permitting support.

Meat Processing Plant Regulatory and Compliance Support (Confidential Facility)

Derek is assisting a meat processing plant with updating multiple regulatory and compliance programs that are required of their facility. The Client acquired a business that had historically not met monitoring, reporting, and recordkeeping requirements. These gaps and liabilities led the Client to terminate the contract with their previous consulting agency and rebuild much of their environmental program. Derek worked with the Client's staff and counsel to update multiple internal and permit-required documents associated with discharges of their process and stormwater, as well as assisting with employee exposure risk assessments, updates to documentation associated with onsite water wells, changes to waste disposal recordkeeping practices and procedures. All efforts were completed to decrease risk and liability associated with site operations, and many of the actions were fast-tracked to quickly bring the facility into compliance with regulatory requirements. Bulk Fueling Facility Stormwater Compliance Support, Seattle, Washington

Derek assisted a facility with updating their stormwater program to comply with requirements outlined in a Clean Water Act settlement. Work performed included revising the facility SWPPP and on-site recordkeeping associated with stormwater sampling. Additionally, Derek coordinated the design and installation of a multistage stormwater treatment system that targeted suspended solids, turbidity, and dissolved zinc concentrations. Proof of concept on treatment design included bench-scale testing of facility stormwater runoff, and final system design included particulate filtration and adsorptive polishing with a proprietary media. Procurement and installation of treatment equipment were expedited to meet the timeline required by the order.

Trucking and Warehousing Facility Environmental Compliance Support and Lease Termination Assistance, Portland Oregon

Derek assisted a client with a client with compliance with their 1200-Z Permit for multiple years. The client operated on a property that was a listed orphan site maintained by Oregon Department of Environmental Quality (DEQ), and existing contamination

remained in the subsurface in multiple areas of the property. Derek coordinated with the client to ensure that their operations would not disturb or contribute to the subsurface contamination. As part of this work, Derek updated their existing SWPPP and BMPs, trained business staff on site-specific environmental practices, developed a stormwater sampling training document for their system operator, and assisted with development and submittals of Discharge Monitoring Reports, and Tier I and Tier II corrective actions. After facility closure, Derek assisted the client with completion of a termination of a lease they held for a rail spur they held on the property. This included excavation of stained surface soils, contaminant fingerprinting to compare any potential petroleum staining to the remaining coking coal contamination from the orphan site, and multiple rounds of reporting and communications with the property owner and their environmental representatives.

Due Diligence and Environmental Auditing of Tenant Facilities, Auburn and Shelton, Washington

Derek assisted a client with due diligence prior to a business acquisition. The client intended to acquire a timber product processing and wholesaling business and requested that the assessments of each of the business's two facilities were fast-tracked to meet purchase contracting requirements. Both facilities were leaseholds, and the client was interested in determining existing conditions at each, including potential current or legacy environmental impacts and existing regulatory compliance issues, if any. Derek conducted the Phase I ESAs and compliance auditing for both facilities. Recognized environmental conditions and compliance gaps were identified at both facilities, including potential groundwater and drinking water contamination, missing environmental documentation. Other issues discovered during the assessments included health and safety issues associated with indoor air particulate concentrations, lack of Industrial Stormwater General Permit coverage at either facility, lack of an SPCC Plan at a facility that met the petroleum storage volume threshold requirements. Findings were reported to the client to allow for planning for corrective actions prior to completion of the business acquisition.

Warehousing Stormwater Compliance Support and Property Subdivision Support, Milwaukie, Oregon

Derek has provided long-term support and facility oversight for multiple owners of a multi-tenant warehousing facility that has since been subdivided and sold to multiple parties. Services have included compliance with each owner's 1200-Z Industrial Stormwater Permit, maintaining the facility's SWPPP and SPCC plans, tenant SWPPP training, stormwater sampling and completion of Discharge Monitoring Reports, and Tier I and Tier II corrective actions. Additionally, Derek coordinated with Oregon Department of Environmental Quality, the client, and multiple prospective purchasers during the process of subdividing the parcel and selling the subparcels to multiple buyers. Derek retained multiple subparcel purchasers as clients after the completion of the property transactions, coordinating with each to ensure that no conflicts of interest existed in the contracting or work performed.

Sand and Gravel Stormwater Treatment Retrofits, Washington State

Derek assisted a client with retrofit of subbasin stormwater treatment systems at three facilities with coverage under the Washington State sand and gravel general permit. Retrofits were specific to each facility and included pH correction, flocculant pretreatment, increased solids settling capacities, and remote system supervisory control and data acquisition. Site-specific O&M plans and housekeeping schedules were developed.

Boatyard Facility NPDES Compliance Support, Washington State

Derek provided NPDES compliance support and facility oversight for a recreational marina facility permitted under Ecology's boatyard general permit. He updated the facility's SWPPP, prepared training materials, provided training to facility staff, and coordinated stormwater compliance sampling and reporting. Derek completed studies to evaluate current and legacy pollutant sources, including point source studies, runoff/run-on evaluations, and dye-tracing of existing subgrade stormwater and wastewater infrastructure.

Construction Material Supply Manufacturer Stormwater Treatment Budgeting, Seattle, Washington

Derek assisted a client in improving discharges to meet zinc benchmarks listed in the facility's industrial stormwater permit. Galvanized finished product was stored outdoors at the facility with no practical way to isolate it from rainfall. It is likely that truck and forklift traffic also contributed to zinc loading. Bench-scale testing of three treatment trains was performed, followed with a long-

term O&M cost study. Results from this testing and cost estimates for treatment provided the client information necessary to move forward with implementation of stormwater treatment.

Salvage Auto Auction Facility Stormwater Treatment Retrofit, Portland, Oregon

Derek designed and implemented a retrofit and startup of an existing stormwater treatment system for a business that was initiating operations at a new facility. The existing stormwater treatment had been designed for the typical pollutant loading from previous tenant operations, and the client's operations were expected to deliver higher loading of TSS, metals, and petroleum hydrocarbons. Derek's evaluation of the system's existing condition led to fast-tracking repairs and an update of the chemical delivery system. Following system updates, Derek delivered an updated O&M plan and coordinated with regulators to ensure that updates complied with NPDES permit requirements.

Fish-Processing Plant pH-Correction System Design/Build, Puget Sound Area, Washington

Derek worked with a fish-processing plant to design and install a pH-correction and monitoring system that would comply with their King County industrial wastewater permit discharge requirements. Process and wastewater flows were highly variable, including in pollutant loading, primarily because of cleaning practices and the use of lye in production of the plant's finished product. Derek developed a process water treatment train that batch treated the water, limiting the variability and simplifying the pH-correction process to require only a single acid dose. Additional fail-safes, monitoring, automation, and other features were incorporated into the system, greatly decreasing water treatment oversight requirements.

Roofing Product Manufacturer Stormwater Treatment System Installation, Portland, Oregon

Derek assisted a roofing product manufacturing facility that required treatment as part of a Tier II corrective action under their DEQ 1200-Z stormwater permit. Treatment included qualitative and quantitative analyses of untreated stormwater runoff quality, treatment alternative review, proof-of-concept testing, cost-benefit analyses, and design of the final treatment system. Following system design, Derek led costing and procurement efforts to support the client in final installation.

Environmental

Environmental Investigation of Former Sawmill and Plywood Manufacturer, Medford, Oregon

As project manager, Derek oversaw the completion of due diligence environmental site assessments and data gap investigations on a property neighboring a client's facility. Efforts began with a Phase I ESA that identified multiple recognized environmental conditions and data gaps associated with a historical site operation. Derek coordinated additional studies, including composite surface soil sampling across 34 acres, characterization of an on-site treated soil stockpile, and surficial and GPR surveys. Information obtained during these studies was used to coordinate with the DEQ to develop a prospective purchaser's agreement for the property.

Critical Aquifer Recharge Assessment BMP Analysis, Napavine, Washington

Derek assisted a client with portions of a critical aquifer recharge assessment report for a fueling station that is planning to infiltrate stormwater into an on-site shallow drinking water aquifer. As part of this work, he proposed facility-specific BMPs, evaluated efficiencies of proposed infiltration and pretreatment equipment, updated the facility's spill prevention and response plan, and completed quality control review of previous work conducted for the facility. Findings from this work were used as proof of concept to demonstrate that typical stormwater runoff from the fueling station posed no atypical risk to drinking water quality.

Petroleum Vapor Intrusion Assessment at a Semi-Trailer Repair Facility, Tacoma, Washington

Derek assisted with a vapor intrusion investigation at a large, multiparcel, contaminated site that has petroleum and volatile organic compound releases to soil and groundwater from historical industrial operations. The investigation is a component of work to be performed on the Tacoma waterfront under an agreed order administered by Ecology. Historically, free-product oil was disposed of in an unlined holding pond near the facility. The facility consists of two open-air Quonset huts and a shop building. Derek installed vapor pins in locations representative of occupant spaces and collected manometer pressure differential measurements between the sub-slab vapor and indoor air to assess vapor intrusion conditions. He assisted with the successful collection of 11 sub-slab

vapor samples at the property in the summer of 2022. Data evaluation efforts are ongoing and additional investigations are pending; these include the collection of additional sub-slab, indoor air, and ambient air samples planned for 2023.

Environmental Investigation of Former Pulp and Paper Mill, Steilacoom, Washington

Derek assisted with composite and discrete soil sampling at a former pulp and paper mill that is slated for redevelopment as a mixed-use property. This potential property redevelopment requires additional investigation to evaluate potential exposure pathways associated with future use. Regulatory authorities requested additional investigation for the potential presence of dioxins and furans in surface soil related to the former operation of a hog fuel boiler at the property. Additionally, the property is within the Tacoma Smelter Plume boundary, and surface soils may have been impacted by arsenic and lead contamination from the former operation of the Asarco Company copper smelter. Investigations at the property included multiple sampling protocols for the different contaminants of concern: using incremental sampling methodology and discrete sampling for analysis for dioxins and furans in two areas of interest; and using discrete and composite sampling for analysis of soil, forest duff, and sediments contaminated by Tacoma Smelter Plume metals in three areas of interest. Derek assisted in the development of a work plan for Ecology review, prepared for and conducted the field sampling, and provided analysis and reporting of the findings from the investigation.

Wastewater Reuse Permit Application, Brinnon, Washington

Derek assisted a client with the application process for a state permit for generation, distribution, and use of reclaimed water for a proposed recreation community on the Olympic Peninsula. This new community will serve up to 2,400 residents and staff and will include additional amenities such as a golf course, a hotel, convention space, and common areas. The project team planned to treat and reuse all wastewater generated in the community; the reuse would include irrigation of green spaces (including the golf course) and wildfire prevention in forested areas throughout the property. Derek worked with Statesman and members of their project team to compile information and complete an individual reclaimed water permit application with anticipated 100 percent reuse of their community wastewater. The permit application was approved by Ecology in 2023, and construction of the community is anticipated to begin in late 2025.

Bill Beadie CIH

Principal Industrial Hygienist
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Bill Beadie has 28 years of experience in health and safety consulting, with expertise in program development, exposure assessment, risk assessment, and training. Bill has helped clients develop other safety and health programs, such as hearing protection, respiratory protection, confined-space entry, lockout/tagout, emergency response, fall protection, hazard communication, lead compliance, and bloodborne-pathogen programs. He also has experience working with clients to resolve citations issued by regulatory agencies such as OSHA and EPA. Bill's industrial hygiene experience is an integral component of the overall risk assessment services provided by MFA.

Education

- BS, Chemistry/Philosophy: Bates College

Certifications

- Certified Industrial Hygienist: No. 9031 CP
- HAZOP and PHA Techniques for Process Safety and Risk Management
- AHERA Asbestos Supervisor
- NIOSH 582(E) Asbestos

Professional Associations

- American Industrial Hygiene Association (AIHA)
- AIHA Risk Committee—Chair, 2010 to 2011

Relevant Projects

Asbestos, Metals, and Noise Exposure Assessment near an Outdoor Remediation Site, Portland, Oregon

Bill managed the daily chemical exposure assessment tasks during remedial activities at a former shipbreaking site along the Willamette River. He also coordinated noise measurements to assess compliance with DEQ community noise requirements. The exposure data collected during the project were used to resolve concerns about chemical and noise exposure on and near the site.

Chemical and Noise Exposure Assessment for a Roofing Manufacturer, Oregon and California

Bill conducted chemical exposure assessments at multiple sites for a roofing manufacturer. The scope of the assessment included asphalt, silica, dust, fiberglass, formaldehyde, and noise. Data from the assessment were evaluated by a large industry trade group that was preparing comments in response to proposed OSHA standards.

Exposure Assessment during Activities on Historical Metallurgical Mine and Mill Sites, Idaho

Bill designed and coordinated a multiyear exposure assessment for lead, cadmium, arsenic, and total dust, while workers performed various activities on different sites. He defined similar exposure groups and developed an assessment strategy and sampling plan. The assessment included detailed observations, video recordings, real-time monitoring, and integrated sampling. Bill summarized the results in a written report.

Dust, Silica, Asbestos, and Metals Exposure Assessment during Wildfire Debris Cleanup, Oregon

Bill worked with state agencies to plan and conduct community exposure monitoring in populated areas during wildfire debris cleanup in Oregon. The exposure monitoring plan was developed for the Oregon Department of Transportation 2020 Wildfire Debris Removal and Operations Plan. The scope of exposure monitoring included dust, asbestos, and metals. Bill worked with GIS analysts to develop a process to prioritize sites for community monitoring based on demographic data. The prioritization tool

helped ensure that the sampling was conducted consistent with the priorities of state agencies.

Broad-Ranging Health and Safety Program Development for a Synthetic Crude Oil Manufacturing Facility, Portland, Oregon

Bill managed the development of several health and safety programs, including hearing conservation, industrial hygiene, lockout/tagout, personal protective equipment, respiratory protection, hazard communication, emergency planning, hot work, fall protection, and electrical safety.

Broad-Ranging Environmental, Health and Safety Audit for a Confidential Food Manufacturer

Bill collaborated with other MFA staff to audit a broad range of environmental, health, and safety programs for a confidential food manufacturer. The audit was coordinated by the company's legal counsel. The audit scope included approximately 20 health and safety topics, such as hearing conservation, hazard communication, machine guarding, walking and working surfaces, fall protection, means of egress, and fire prevention. The results were summarized in a written report in a format that allowed the client to assign and track follow-up actions for each recommendation.

Health and Safety Program Support for a Construction Company, Portland, Oregon

Bill worked with an interdisciplinary team to provide a wide range of environmental and health and safety support services to a construction company during a multiyear high school renovation project. Support services included the development of health and safety plans; tools for auditing compliance with health and safety requirements; chemical exposure monitoring for lead, dust, and crystalline silica; spill response support; and supplemental assessments for hazardous building materials such as lead and asbestos.

Confined-Space-Program Development for a City Public Works Department

Bill worked on a team auditing a city public works department's confined-space program. The team's responsibilities consisted of the following confined-space-related work: performing and documenting evaluations, providing equipment specifications, and providing training.

Spill Protocol Development, Chemical Manufacturing Company, Hillsboro, Oregon

Bill developed written protocols for responding to incidental spills and uncontrolled releases of hazardous chemicals at a company that manufactures chemicals for the semiconductor industry. Bill collaborated with the client to ensure that the protocols were user-friendly and easy to read in an emergency. Bill recommended grouping similar chemicals together, which allowed approximately 60 different chemicals to be covered in approximately ten protocols.

Chad Darby

Principal Air Quality Specialist

cdarby@maulfoster.com | 971.713.3574

Chad Darby has more than 30 years of professional experience in the air quality science and engineering field, with project management in 35 states and three Canadian provinces. This includes construction and operation permitting; field source testing with EPA, NIOSH, OSHA, and state methodologies; ambient sampling and meteorological station design and installation; pollution-control evaluation (BACT, RACT, LAER); historical compliance investigations (NSR, PSD); multimedia compliance auditing; risk management planning; compliance assurance monitoring planning; MACT applicability; strategy development; and compliance demonstration. Additionally, Chad has prepared numerous air quality and climate sections for environmental impact reports and statements under NEPA, SEPA, and CEQA. Chad regularly provides presentations on air quality topics, teaches classes, and provides expert testimony.

Education

- MS, Mechanical Engineering (environmental emphasis): University of Minnesota
- BS, Physics: Grinnell College

Relevant Projects

Air Toxics and Risk Assessment

Human Health Risk Assessment for a Municipal Landfill, Medford, Oregon

Chad was the principal-in-charge of a Level 3 HHRA for a municipal landfill in Oregon to prepare the facility for future Cleaner Air Oregon permitting compliance demonstrations. The HHRA was completed consistent with the Draft Recommended Procedures for Toxic Air Contaminant Health Risk Assessments published by the Oregon DEQ. TAC emissions were estimated using site-specific sampling data and the Landfill Gas Emissions Model developed by EPA. AERMOD was used to develop an air dispersion model of the facility, which was executed using unit emission rates. An automated spreadsheet-based tool was used to calculate excess cancer risk and chronic and acute noncancer risk estimates and conduct the corresponding culpability analysis. The culpability analysis revealed the toxic emission units and TACs contributing the most to the predicted risk estimates at each receptor location in the modeling domain. To support the analysis, Chad pioneered the use of a drone-mounted methane sensor to determine the source of fugitive emissions from the landfill. Using surface measurements of collected landfill gas to determine ratios of air toxics to methane, the location and concentrations of air toxic emissions could be estimated and modeled as fugitive releases.

Permitting and Human Health Risk Assessment for a Wood-Treatment Facility, The Dalles, Oregon

Chad was the principal-in-charge of a Level 3 HHRA for an existing wood-treatment facility called into the Cleaner Air Oregon program by the Oregon DEQ for purposes of compliance demonstration and permitting. The HHRA was completed consistent with the Draft Recommended Procedures for Toxic Air Contaminant Health Risk Assessments published by the DEQ. Chad provided senior review and oversight on the preparation of the TAC emissions inventory, dispersion modeling using AERMOD, and excess cancer risk and chronic and acute noncancer risk estimates. He also assisted with permitting a

thermal oxidizer and total enclosure to control retort and drip pad emissions. Chad supported public engagement and negotiations with regulatory agencies.

Human Health Risk Assessment for Multiple Wood-Products Facilities, Multiple Locations, Oregon

Chad was the principal-in-charge of the preparation of emissions inventories and performance of dispersion modeling for a wood-products manufacturer with several locations in eastern and southern Oregon for purposes of developing an HHRA for future Cleaner Air Oregon compliance demonstrations. Unit emission rates were modeled in AERMOD for process equipment typical of lumber sawmills and facilities manufacturing softwood and hardwood plywood, laminated veneer, medium-density fiberboard, and particleboard. Predicted ambient concentrations were multiplied by the applicable toxic air contaminant emission rates and divided by risk-based concentrations published by the CAO program. Google Earth was used to display risk isopleths along with the culpability analysis results for client review. For comparison, a risk analysis was also performed using the HARP2 software package, developed by the California Air Resources Board, prior to finalization of the CAO rulemaking. The HARP2 output files were presented to state regulators for discussion and analysis.

Human Health Risk Assessment for a Glass Fiber Manufacturer, Corvallis, Oregon

Chad was principal-in-charge of completion of several HHRA iterations (for purposes of future Cleaner Air Oregon compliance demonstrations) for a specialty glass fiber production facility in Oregon. AERMOD was utilized for air dispersion modeling, and the model was executed using unit emission rates. Predicted ambient concentrations were postprocessed with the toxic air contaminant emission rates and risk-based concentrations published by the CAO permitting program to estimate excess cancer risk and chronic and acute noncancer hazard indices. A corresponding risk analysis was also performed using the HARP2 software package, developed by the California Air Resources Board, for comparison purposes prior to finalization of the CAO rulemaking.

Human Health Risk Assessment for a Wood-Products Manufacturer, Multiple Locations, Oregon

Chad was principal-in-charge of conducting two Level 3 HHRAs for a wood-products manufacturer with two facilities in southern Oregon. Each HHRA was completed assuming the draft Cleaner Air Oregon rules and risk-based concentrations published on June 25, 2018, would apply. Each dispersion model was executed using AERMOD and unit emission rates (i.e., 1 gram per second for nonarea source types). Emission rates and predicted ambient concentrations for each modeled exposure location were postprocessed, using tools developed by MFA staff, to quickly estimate excess cancer risk and chronic and acute noncancer risk. Google Earth was used to display risk isopleths, along with the culpability analysis results, for client review.

Human Health Risk Assessment for an Ethanol Plant, Clatskanie, Oregon

Chad was principal-in-charge of an HHRA, conducted in preparation for the ongoing Cleaner Air Oregon rulemaking, for a biorefinery located in Oregon. Formatted hourly and annual emission estimates from the CAO air toxics submittal were prepared for use in the Hotspots Analysis and Reporting Program Version 2. The HARP2 tool was utilized, only in lieu of the final CAO regulations, to produce conservative overestimates of lifetime excess cancer risk and noncancer hazard indices from residential exposure. The AERMOD dispersion model was based on source exhaust under parameters and building height information obtained from the client. Figures depicting the LECR and hazard index isopleths were overlaid on aerial imagery for review.

Human Health Risk Assessment and Cleaner Air Oregon Permitting, Metal Foundry, Oregon

Chad was the principal-in-charge of evaluation of CAO compliance for a metal foundry in Oregon. An HHRA was completed following the Draft Recommended Procedures for Toxic Air Contaminant Health Risk Assessments published by the Oregon DEQ and included air dispersion modeling using AERMOD. Excess cancer risk and chronic and acute noncancer risk estimates for multiple operating scenarios were evaluated consistent with Level 3 risk assessment procedures. The basis of the HHRA results was an emissions inventory developed using baghouse dust sampling and research into foundry process emission factors for specific alloy combinations.

Chad Darby

Human Health Risk Assessment and Cleaner Air Oregon Permitting, Fish-Processing Facility, Warrenton, Oregon

Chad was the principal-in-charge responsible for the permitting of a new fish-processing facility. Emissions were estimated and pollution control devices were evaluated for odor control. The CAO and criteria pollutant permit applications required a detailed toxic air contaminant emissions inventory, regulatory review, a modeling protocol and report, and a Level 1 CAO HHRA.

Cleaner Air Oregon Air Toxics Support, Numerous Facilities throughout Oregon

Chad has supported dozens of Oregon industrial facilities in the CAO program, ranging from wood treating to aerospace parts manufacturing. He has provided compliance training, emission inventory development, dispersion modeling (AERMOD), and risk assessment. To assist clients by providing quicker in-house risk assessments, Chad managed the development of an automated Level 1 risk assessment tool that has been widely used by clients to determine sources and pollutants that could potentially lead to off-site risks. Chad has assisted clients in reassessing raw material choices and processes to reduce estimated risks. In several cases, Chad has helped clients reduce estimated risks to at or below levels that would trigger the requirement for Oregon permitting.

Selected Permitting and Enforcement Experience

Municipal Waste Landfill Permitting, Eagle Point, Oregon

Chad was the principal-in-charge responsible for a municipal waste landfill's significant permit modification to alter the amount of allowable truck traffic and to permit increased volatile organic compound emissions through the use of existing capacity. Additionally, new emission estimation methods were proposed for the Title V permit to consistently estimate fugitive emission flow rates between the greenhouse gas calculations and the VOC calculations. Emergency authorization through a minor permit modification was obtained to increase truck traffic to accommodate wildfire debris.

Regional Haze Analyses, Multiple Locations, Oregon

Chad was the principal-in-charge of regional haze analyses for eight facilities representing five different companies. Impacts were analyzed using screening criteria, then control-device options were analyzed. Cost estimates were developed for viable control devices and an analysis of the cost-effectiveness of each control was presented. Three facilities were screened out of the assessment. One facility chose to conduct dispersion modeling and visibility impact analyses to determine the impact to three Class I areas within 100 km.

Bark-Drying Operation Modeling and Permitting, Centralia, Washington

Chad was the principal-in-charge of an assessment of the volatile organic compound emissions of an aged bark-drying operation. Dispersion modeling was required under the Southwest Clean Air Agency air toxics rules. BACT and toxics BACT analyses were prepared to demonstrate the available cost-effective controls for emissions. A permit application was developed and submitted to the agency for approval. Based on experimentation with material-handling measures at the facility, operational controls used prior to drying significantly reduced emissions.

Morrow Pacific Project, Coyote Island Terminal LLC Permitting, Oregon

As project director, Chad prepared a complex emissions inventory that included trains, tugboats, oceangoing vessels, transloading equipment, and stationary sources. He calculated the decay rate for methane emitted from coal during the latter's transport and handling. He assisted with the air quality permitting and dispersion modeling for the proposed Coyote Island Terminal at the Port of Morrow, which is designed to handle 8.8 million tons of coal as a U.S. West Coast export terminal for Powder River Basin coal. Chad oversaw a toxicological literature review regarding coal in air and water; development of project recommendations for emission control systems; and public comment support to agencies involved in addressing public concerns, including coal dust, diesel exhaust, and train and tug impacts. Chad studied and evaluated greenhouse gases emitted during transport and handling of coal, spontaneous coal combustion hazards, and dispersion of coal dust to air and water. Parties involved included the Oregon DEQ, Oregon Department of State Lands, National Marine Fisheries Service, U.S. Army Corps of Engineers, State Historic Preservation Office, and four area tribes.

Chad Darby

BACT Analysis and Emissions Inventory, Membrane-Manufacturing Facility, Massachusetts

Chad performed a BACT analysis for the largest emitting sources at a membrane-manufacturing facility. He developed an emissions inventory to estimate emissions due to solvent evaporation losses and transfer losses. Cost-effectiveness values were calculated for wet scrubbing, oxidation (thermal and catalytic), carbon adsorption, and condensation-control technologies.

PSD Permit Application, Wood-Products Manufacturer, Kettle Falls, Washington

Chad completed a PSD permit application for an electrostatic precipitator and wood-fired thermal oxidizer designed to control emissions from direct-fired veneer dryers to achieve compliance with the Plywood and Composite Wood Products MACT and reduce opacity while minimizing greenhouse gas generation at the plant. The oxidizer exhaust system was designed to provide high-energy steam in a heat-recovery boiler to produce electricity in a steam turbine, and to provide low-energy steam for heating log vats and plywood presses.

Construction Permitting, Forest-Products Company, Newport, Vermont

Chad prepared a Permit to Construct application for a new hogged-fuel boiler with fuel oil backup capability. Emissions estimates for the new boiler, dispersion modeling, and a hazardous most stringent emission rate determination were included in the permit application.

Additional Related Landfill Experience

Meteorological Monitoring Station for a Landfill, Medford, Oregon

Chad is the principal-in-charge for the operation of a PSD ambient meteorological monitoring station located at a municipal solid waste landfill near Medford, Oregon. Chad oversees the monitoring program, providing senior review of data management and calibration, audit, and quarterly/annual data reporting.

Landfill Permitting, Idaho

Chad completed permitting for a boiler ash and wood debris landfill; this involved approval of the Idaho DEQ, Panhandle Health District, and Bonner County Planning Department. The permit application required fate and transport modeling based on existing monitoring well data; development of an operations plan; and assessment and planning for nuisance issues, signage, traffic flow, dust suppression, and fire hazards.

Recent Publications, Presentations, and Committee Participation

Darby, Chad. 2021. Regional Haze Fiscal Advisory Committee member. Participated in the analysis of fiscal impacts to business for the State of Oregon as a member of the DEQ advisory panel. May.

Darby, Chad. 2020–2021. Cleaner Air Oregon Rules Advisory Committee member. Participated in the development of new rulemaking for the State of Oregon as a member of the DEQ advisory panel, November 2020–February 2021.

Darby, Chad. 2020. Developer and instructor. Led a four-part training workshop over eight hours that featured lessons learned in assisting facilities with CAO emissions inventories, modeling, risk assessment, and permitting. MFA Cleaner Air Oregon Webinar Series. October–November.

Darby, Chad. 2017. Air Toxics Risk Assessment Workshop. Instructor. Half-day workshop covering topics such as the fundamentals of Oregon's proposed air toxics program, how to develop an emissions inventory, considerations in conducting dispersion modeling, and preparing a comprehensive risk assessment. NCASI West Coast Regional Meeting. September.

Brian Snuffer Zukas, PE

Senior Air Quality Engineer
bsnuffer@maulfoster.com | 971.254.8077

Brian Snuffer Zukas has over ten years of experience in air quality and consulting services, including experience performing technical work in civil and environmental engineering. His specialties include emissions inventory development, air dispersion modeling, human health risk assessments, industrial ventilation system design, AutoCAD design services, and building tools for data management and facility recordkeeping. Mr. Snuffer Zukas has managed or assisted with many projects in the forest products, aggregate mining, waste management, glass fiber, and metal and alloy production industries. He has a strong foundation of technical capabilities and significant experience in preparing air quality permit applications for compliance with federal, state, and local regulations.

Education

BS, Environmental Engineering:
Florida Gulf Coast University, Fort Myers, Florida
BS, Civil Engineering:
Florida Gulf Coast University, Fort Myers, Florida

License/Registration

Professional Engineer, Oregon
No. 95661PE

Relevant Projects

Dispersion Modeling & Health Risk Assessment

Cleaner Air Oregon Permitting for a MDF Manufacturing Facility, Medford, OR

Mr. Snuffer Zukas managed the Cleaner Air Oregon permitting compliance demonstration for a medium-density fiberboard manufacturing facility located in Medford. He assisted with the development of the Oregon Department of Environmental Quality (DEQ) approved toxic air contaminant (TAC) emissions inventory, Modeling Protocol, Risk Assessment Work Plan, and the Risk Assessment Report. Prior to these submittals, Mr. Snuffer Zukas developed and executed several iterations of the dispersion model and Level 3 Health Risk Assessment (HRA) for the facility. Each iteration was based on an analysis of the culpability of the toxic emission units (TEU) and TACs contributing the most to the predicted risk estimates at each modeled exposure location. To support the communication of results to the Client, Mr. Snuffer Zukas assisted in the development of a Google Earth tool presenting the culpability analysis results at each modeled exposure location allowing for refinement of emission estimate assumptions or TEU representations in the dispersion model.

Cleaner Air Oregon Permitting for a Wood Treatment Facility, Eugene, OR

Mr. Snuffer Zukas managed the Cleaner Air Oregon permitting compliance demonstration for a wood treating facility located in Eugene. As project manager, Mr. Snuffer Zukas led the development of the preliminary TAC emissions inventory and dispersion model for the facility. The TAC emission inventory included emissions estimates for work tank/vacuum system, storage tank, dry kilns, natural gas-fired boiler, and the process water treatment system TEUs, among others. He also completed multiple site visits to construct a detailed process flow diagram of the wood treating operation, reviewed facility treatment record database spreadsheets, and drafted the Liquid Sampling Plan approved by the Lane Regional Air Protection Agency.

Brian Snuffer Zukas

Health Risk Assessment for a Municipal Landfill, Medford, OR

Mr. Snuffer Zukas conducted a Level 3 HRA for a municipal landfill in Oregon to prepare the facility for future Cleaner Air Oregon permitting compliance demonstrations. The HRA was completed consistent with the Draft Recommended Procedures for Toxic Air Contaminant Health Risk Assessments published by the Oregon DEQ. TAC emissions were estimated using site-specific sampling data and the EPA Landfill Gas Emissions Model. Mr. Snuffer Zukas used the AERMOD program to develop an air dispersion model representation of the landfill, which was executed using unit emission rates. An automated spreadsheet-based tool, developed by Mr. Snuffer Zukas, was used to calculate excess cancer risk and chronic and acute noncancer risk estimates and the corresponding culpability analysis. The culpability analysis revealed the TEUs and TACs contributing the most to the predicted risk estimates at each modeled exposure location.

Air Quality Permitting, Compliance Support, and Emissions Inventory

Air Quality Compliance and Permit Assistance for a Renewable Fuels Manufacturing Facility, Clatskanie, OR

Mr. Snuffer Zukas managed the Standard Air Contaminant Discharge (ACDP) application and Cleaner Air Oregon permitting process for a proposed renewable fuels manufacturing facility to be located in Clatskanie, Oregon. The proposed facility will receive and process raw oil feedstocks including vegetable oils and animal fats, among others, in order to produce renewable fuel products. To expedite the permitting process, a combined emissions inventory containing criteria pollutant and toxic air contaminant emission estimates was submitted to the Oregon DEQ for review. Mr. Snuffer Zukas assisted in the development of the combined Modeling Protocol and Risk Assessment Work Plan, required for new source review and the CAO compliance purposes. Numerous preliminary dispersion models were developed to demonstrate criteria pollutant emissions from the proposed facility are below the Significant Impact Level. The permit for the proposed facility was issued on August 30, 2022.

Air Quality Compliance and Permit Assistance for a Specialty Glass Fiber Manufacturer, Corvallis, OR

Mr. Snuffer Zukas supported the preparation of a comprehensive Prevention of Significant Deterioration permit application for a specialty glass fiber manufacturing facility located in Oregon. The PSD permit application included a complex process flow diagram of the exhaust routing configuration, a detailed emissions inventory for criteria pollutants and hazardous air pollutants, a Best Available Control Technology assessment, a regulatory applicability analysis, and air dispersion modeling. Mr. Snuffer Zukas also conducted oversight of the extensive source testing campaign undertaken by the facility, which included multiple USEPA Methods. After completion of the source test campaign, Mr. Snuffer Zukas led the development of a source test catalog detailing the source test results and production data for recordkeeping and comparison purposes.

Construction Air Contaminant Discharge Permit and Title V Modification Permit Application, Dillard, OR

Mr. Snuffer Zukas prepared the construction ACDP and Title V modification permit applications for a large wood-products manufacturing complex that produces lumber, plywood, and particleboard in Oregon. The permit applications were prepared in anticipation of converting the existing PB operation to the production of medium-density fiberboard. The permit applications required a detailed emissions inventory including before- and after-construction criteria and hazardous air pollutant emissions estimates, a broad state and federal regulatory applicability analysis, and preparation of state-required forms.

Level 1 Risk Assessment Tool Development, State of Oregon

Mr. Snuffer Zukas prepared a spreadsheet tool to automate Level 1 risk assessment calculations for cancer, chronic noncancer, and acute noncancer risk. The Level 1 tool includes an input page for stack height, distance to the nearest applicable receptor, and daily and annual emission estimates. Using the input data, the Level 1 tool performs all necessary calculations to produce risk estimates, as well as the contribution of each toxic air contaminant and source to the assessed cancer or noncancer risk. This allows facilities to determine which TACs and source assumptions may require further refinement based on the risk culpability. The Level 1 tool was requested and is being used by two universities, as well as numerous industrial facilities throughout Oregon.

Presentations

- Cleaner Air Oregon Program Update: Lessons Learned Webinar Series, November 6, 2023. Virtual (via Zoom).
- Case Study: Problems and Solutions for Air Quality Modeling Meteorology. Developments in NSR Air Permitting Workshop, Air & Waste Management Association, April 17, 2018. Seattle, WA.

Geotechnical ▪ Environmental ▪ Special Inspections
Columbia West Engineering, Inc

Vancouver, Washington • Phone: 360-823-2900
Portland, Oregon • Phone: 971-384-1666
www.columbiawestengineering.com

April 17, 2025

Maul Foster & Alongi, Inc.
601 East Front Avenue, Suite 202
Coeur d'Alene, ID 83814

ABOUT COLUMBIA WEST ENGINEERING, INC.

Founded in 1999, Columbia West Engineering, Inc. (Columbia West) is a locally owned and operated professional multi-disciplinary geotechnical engineering, environmental consulting, special inspections, and material testing services provider. Our dedicated team comprises 55 professionals, including engineers, geologists, technical personnel, and support staff, all driven by a commitment to delivering high-quality services and innovative, resourceful engineering solutions. Columbia West is proud to hold an A2LA (American Association for Laboratory Accreditation) accredited and ODOT (Oregon Department of Transportation) certified laboratory reinforcing our ability to support our geotechnical and special inspection services.

At the helm of Columbia West is President, Founder, and Majority Owner, **Lance Lehto.** Other key principals and owners of the company are **Shawn Dimke, Najib Kalas, Daniel Lehto, Jason Ordway, Nick Paveglio, and Brett Shipton.** Brett Shipton spearheads our geotechnical engineering services and Jason Ordway leads our special inspection services. Nick Paveglio heads our seismic engineering services. Notably, Brett Shipton, Najib Kalas, Nick Paveglio and Shawn Dimke recently joined Columbia West as principal engineers. Brett, Najib, Nick and Shawn have worked together for over 15 years and add more than 80 combined years of geotechnical consulting experience to bolster our geotechnical engineering team. In line with our growth and commitment to clients and projects in Oregon, we recently opened our Beaverton, Oregon office to enhance our capacity and service delivery.

Columbia West excels in delivering cost-effective geotechnical design options and construction recommendations. Our expertise is geared towards evaluating design options, drawing well-founded conclusions, and offering recommendations that reduce project costs. We are proactive collaborators, fostering open communication with project design and construction teams during construction to ensure projects remain on budget without compromising quality.

Sincerely,
COLUMBIA WEST ENGINEERING, INC.

Shawn M. Dimke, PE, GE
Principal

Geotechnical ▪ Environmental ▪ Special Inspections
Columbia West Engineering, Inc

EXPERIENCE

Over 21 Years

CONTACT

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503-880-5245

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ADDRESS
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Beaverton, Oregon 97008

EDUCATION

Bachelor of Science Civil Engineering
Oregon State University, 2000
Master of Science Geotechnical Engineering
Oregon State University, 2004

REGISTRATION AND CERTIFICATION

Registered Professional Engineer, California, Oregon, Washington
Registered Geotechnical Engineer, Oregon
American Society of Civil Engineers

BIOSKETCH

Shawn Dimke is a principal engineer at Columbia West Engineering, Inc. (Columbia West) with a wealth of experience throughout the Pacific Northwest and urban landscapes in California. Prior to joining Columbia West, Shawn worked at a private prominent Pacific Northwest geotechnical consulting firm for over 20 years as an intern, geotechnical engineer, associate, and principal. Shawn provides and manages geotechnical services on a wide range of projects. He enjoys finding practical solutions and options to best meet the needs of clients and development teams. Whether it is providing quality, reliable, day-to-day geotechnical services or finding innovative solutions to complex geotechnical design and construction challenges, Shawn enjoys collaborating and communicating to contribute to successful projects.

REPRESENTATIVE PROJECT EXPERIENCE

Shawn's project experience includes:

- Infrastructure
- Public Buildings and Facilities
- Education
- Hospitals and Medical Office Buildings
- Commercial
- Industrial
- Large-tract Residential
- High Rise Buildings
- Mixed-Use Developments
- Waterfront Buildings
- Landfills

Shawn's responsibilities include scoping geotechnical engineering projects, project management, client correspondence, project planning, geotechnical engineering and design calculations, report preparation and review, and project specifications preparation. Shawn's career experience includes:

- Geotechnical engineering studies
- Seismic hazard evaluations
- Seismic design for liquefaction and lateral spread hazards
- Slope stability analysis
- Landslide evaluation and mitigation
- Shoring and retaining wall design
- Shallow and deep foundation design
- Finite element modeling
- Geotechnical Instrumentation
- Seepage analysis

Shawn joined Columbia West's geotechnical engineering team in the summer of 2023. He spent the prior 3 years leading a team of senior geotechnical project engineers. At Columbia West, Shawn works as part of the senior management and ownership group to develop business and growth strategies and manages and collaborates with a talented team to provide geotechnical services.

Geotechnical ▪ Environmental ▪ Special Inspections
Columbia West Engineering, Inc

JONATHAN A. NASR

EXPERIENCE

9 years

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EDUCATION

Master of Science
Civil Engineering (Geotechnical)
Portland State University 2017

Bachelor of Science
Civil Engineering
Portland State University 2015

REGISTRATION AND CERTIFICATION

Registered Professional Engineer, Oregon

PUBLICATIONS

Nasr, J. and Khosravifar, A. (2018). "The Effects of Long-Duration Subduction Earthquakes on Inelastic Behavior of Bridge Pile Foundations Subjected to Liquefaction-Induced Lateral Spreading." Proc., Geotech. Earthquake Eng. and Soil Dyn. V.ASCE. Reston, Va., 617-625.

Khosravifar, A. and Nasr, J. (2018). "Modified design procedures for bridge pile foundations subjected to liquefaction-induced lateral spreading." DFI Journal - The Journal of the Deep Foundations Institute, DOI: 10.1080/19375247.2018.1436382

BIOSKETCH

Jonathan Nasr is a project engineer at Columbia West Engineering, Inc. (Columbia West). Jonathan has more than nine years of experience in the geotechnical engineering field. While earning his undergraduate degree in civil engineering at Portland State, he got an internship at a local geotechnical consulting company and discovered his passion for the field. He ended up completing his master's degree with an emphasis in geotechnical engineering and never looked back.

Jonathan's career has encompassed a diverse range of projects across multiple regions. He comes to Columbia West from the U.S. Army Corps of Engineers Portland District, where he worked as a geotechnical designer on projects in Oregon and Washington. Before that, he worked as a staff engineer and project engineer at a California-based geotechnical consulting firm with projects ranging from temporary trestle design to seismic site response analysis. Jonathan is known for his adaptable approach and curiosity, consistently applying these strengths to deliver cost-effective geotechnical solutions.

REPRESENTATIVE PROJECT EXPERIENCE

Jonathan's project experience includes:

- Ports and harbors
- Dams and levees
- Federal facilities
- Commercial structures
- Industrial facilities
- Schools
- Transportation infrastructure

Jonathan's young career has included a variety of different project types. Some key analytical skills that he has developed while working on these projects include:

- Seismic hazard analysis
- Site-specific site response analysis
- Ground motion selection for structural analysis
- Ground improvement design
- Shoring design
- Dewatering design
- Slope stability analysis
- Pavement design

Jonathan joined Columbia West's geotechnical engineering team in 2024. He is excited to add his unique skill set and experience to an already well-rounded team.

DR. TONY SPERLING, P.Eng.
President SHA / Landfill Design Engineer
Landfill Fire Control Specialist

PROFILE:

1978 - 1983	B.A.Sc. Geological Engineering, UBC, Geotechnical Option
1981 - 1982	(Summer) Engineering Student and Drill Inspector, B.C. Hydro
1983	(Summer) Mine Geologist, Brenda Mines Ltd.
1984 - 1985	M.A.Sc. Mining Engineering, UBC, Rock Mechanics
1984	(Summer) Geotechnical Engineer, Equity Silver Mines Ltd.
1985 - 1986	(Summer) Geological Engineer, Trigg, Woollett, Olson Consulting Ltd.
1986 - 1990	Ph.D., Geological Engineering, UBC, Ground Water Hydrogeology
1987 - 1988	(Summer) Geotechnical Engineer, Highland Valley Copper
1987 - 1989	Engineering Software Consultant, Sperling GeoComp Inc.
1989 - 1993	Geological Engineer, Gartner Lee Limited
1993 - 1995	Senior Geological Engineer, Gartner Lee Limited
1994 - Present	Lecturer in Solid Waste Management, B.C.I.T.
1995 - 1996	Senior Engineer / President Sperling Engineering Services Inc.
1996 - Present	President and Chief Engineer, Sperling Hansen Associates Inc.
2000 – Present	President Landfill Fire Control Inc.

EXPERIENCE:

Landfill Fire Suppression: Dr. Sperling is an internationally recognized subject matter expert on Landfill Fires. He has accumulated over nineteen years of practical experience in extinguishing landfill fires in North America and around the world. Most recently he served as Incident Commander during the extinguishment of the Vancouver Landfill Phase 4 Fire in June 2018 that required over three weeks to fully extinguish. That $2.5 million project was followed by a high intensity oxygen suppression extinguishment at Whitehorse Landfill where a major fire was fully extinguished in less than 24 hours.

In 2015 he developed a suppression plan for the successful extinguishment of the Iqaluit Landfill fire, a problematic fire that had been burning of many months and cost $3.6 million to extinguish. In 2013 he served as the Technical Advisor to Fire Chief Pablo Tunon and Site Commander in charge of extinguishing the massive Cerro Patacon Landfill Fire in Panama. In 2009, Sperling was tasked as Incident Commander during a three week, $1 million fire extinguishment at Vancouver Landfill. In 2005 Dr. Sperling and the LFCI team directed the extinguishment of the Brother's Recycling Fire in Duncan at a cost of $2 million. In 1999 Dr. Sperling served as Engineer in charge of fire extinguishment strategy for the Delta Shake and Shingle demolition waste fire. The Delta Shake and Shingle Landfill involved a $4 million fire fight and put back of a large DLC landfill with over 300,000 m^3 of waste on fire.

Other major projects in which Dr. Sperling played a key role have included a large DLC landfill in Minnesota, the Campbell Mountain Landfill in Penticton (1997), the Lakes County Landfill Fire in Montana (2014), Calgary Metals Auto Shredder Residue Fire in 2012, the 2004 Vancouver Landfill Fire in Delta, the Atlantic Waste Industries Fire in Maple Ridge and the Hesperia Landfill in Vernon, amongst others.

Landfill Fire Response and Risk Management Plans: Dr. Sperling and the LFCI team have developed fire response plans and prevention strategies for a number of municipal and industrial clients including Weyerhaeuser, Metro Waste in Des Moines, Iowa, the City of Penticton, the County of Colchester in Nova Scotia and the City of Kamloops, Bahamian Govt., Israel Ministry of Environment, Columbia Shuswap Regional District (3 landfills), City of Calgary (3 landfills),

Ecowaste Industries, amongst others. Plans typically include a site audit, preparation of the Incident Command structure, outline of actions and responsibilities of each team member, fire suppression strategies, compilation of required resources, and a contact list.

Landfill Fire Training: To disseminate LFCI's knowledge in landfill fire control and prevention, Dr. Sperling has prepared and delivered more than three dozen courses on fire management that have been presented in Edmonton, Saskatoon, Vancouver, Tel- Aviv, New York, Palm Springs, Calgary, Prince George, San Diego, Truro, Toronto, Halifax, Winnipeg, Comox, Tijuana, amongst many others. Most courses include a full day of class room presentations. Some have also included a practical live fire training exercise on Day 2.

Dr. Sperling has also delivered his Landfill Fire course on line through SWANA's E-Course program on numerous occassions. In 2010 Dr. Sperling was named SWANA's E-Course Instructor of the Year.

Landfill Fire Expert Testimony: In 2015 Dr. Sperling was retained as an expert witness to support the Missouri Attorney General's office in a major lawsuit against the landfill operator of Bridgeton Landfill. This landfill experienced a Self Sustaining Subsurface Exothermic Reaction (SSER). Dr. Sperling advanced the state of knowledge regarding the nature of these reactions and provided conclusive evidence that resulted in an out-of-court settlement of the case.

In 2000 he assisted the B.C. Government in cost recovery of damages on the Delta Shake and Shingle fire. Dr. Sperling and the LFCI team have prepared detailed technical reports documenting fire suppression efforts and costs on the Delta Shake and Shingle Fire ($4 million) and the Brother's Recycling Fire ($2 million). He has also provided professional advice to the province of Nova Scotia in cost recovery and permit litigation at the Colchester Landfill Fire. He has also provided opinions on cost recovery legal actions for the Calgary Metals Fire, Helotes Landfill Fire.

Solid Waste Management: As a landfill design specialist, in the past 28 years Dr. Sperling has concentrated on providing state-of-the-art engineering services relating to the design, operation, monitoring and closure at municipal landfills. He has completed over 1,000 geotechnical assessments, design and operations plans and closure plans for more than 150 landfills, including both large municipal sites such as the Vancouver Landfill in Burns Bog and the Hartland Landfill in Victoria, as well as numerous small rural sites in the Thompson Nicola Regional District, the Regional District of Bulkley Nechako, the Regional District of Okanagan Similkameen and the Regional District of Kitimat Stikine, amongst others. Flagship projects have included design of the Hartland Landfill PVC closure system, design of the Whistler Landfill Expansion lining and leachate collection system and design of slopes and landfill expansion for a large landfill expansion at the Bailey Road Landfill in Chilliwack. A complete list of projects is included overleaf.

Dr. Sperling is also very active in disseminating the art of landfill engineering in B.C. He is a Director of the B.C. SWANA Pacific Chapter and Chair of their Training Committee. He is also a member of SWANA's MOLO faculty. He has taught SWANA's flagship Manager of Landfill Operations (MOLO) course on four occasions. As well, he has specialty courses on landfill operations at Salmon Arm, Smithers, Kamloops and in Burns Lake B.C and three invited courses on groundwater issues to the MoELP waste managers throughout B.C. As well, he has developed and taught two courses on landfill design at the British Columbia Institute of Technology.

Mining: Projects completed in the mining industry include the design of the Valley Pit Dewatering System for Highland Valley Copper, pit design of the Main Zone Pit at Equity Silver Mines for Placer Dome Mines, a technical assessment of acid mine drainage control at Equity, a technical review of ground water control measures for the Lelydorp III bauxite mine in Suriname, South America for N.V. Billiton Maatschappij, a hydrogeological feasibility assessment of developing a diamond mine beneath a lake in Canada's Arctic for Canamera Resources, and most recently, a hydrogeologic review of ARD seepage from Island Copper's sub-marine waste dumps.

Ground Water Modeling: Dr. Sperling has been involved in the development of several computer models for assessing ground water flow. He has developed *COAST*, a sophisticated pre and post processor program for *MODFLOW*, with Dr. R. A. Freeze. Development of this software has resulted in numerous spin-off assignments including three successful modeling courses for nearly 100 regional staff at the B.C. Ministry of Environment, Lands and Parks. He has taught courses on ground water modeling at the University of British Columbia, University of Washington, the University of Wisconsin, and in house courses for ERM in Houston, Texas.

- **Hydrogeotechnical Studies**
  Port Clements Landfill, Queen Charlotte Islands
  Lillooet Landfill Hydrogeologic Investigation
  Hartland Landfill Hydrogeologic Investigation and Leachate Management Concepts
  Knockholt Sub-Regional Landfill Hydrogeotechnical Assessment, Houston
  Thornhill Landfill Hydrogeotechnical Study, Terrace
  Hydrogeological Assessment, City of Vancouver Landfill, Burns Bog, Delta
  Bailey Road Landfill, District of Chilliwack
  Crown Packaging Landfill, Vancouver

- **Design and Operations Plans**

Port Clements Landfill	Lower Nicola Landfill, TNRD
Campbell Mountain Landfill, Penticton	Chase Landfill, TNRD
Summerland Landfill	Clearwater Landfill, TNRD
Foothills Boulevard Landfill, Prince George	Heffley Creek Landfill, TNRD
Lillooet Landfill	Barriere Landfill, TNRD
Hartland Landfill, Victoria	Westwold Landfill, TNRD
Salmon Arm Landfill	Iskut Landfill, RDKS
Bailey Road Landfill, District of Chilliwack	Rosswood Landfill, RDKS
Hope Landfill	Fort St. James Landfill, RDBN
Burns Lake Landfill, RDBN	Smithers Landfill, RDBN
Granisle Landfill, RDBN	Fraser Lake Landfill, RDBN
Manson Creek Landfill, RDBN	Vanderhoof Landfill, RDBN

- **Closure Plans**

Squamish Landfill	Logan Lake Landfill, TNRD
Whistler Landfill	Clinton Landfill, TNRD
Final Cover Test Pad Program, Hartland Landfill	Lytton Landfill, TNRD
Premier Landfill, North Vancouver	Brookmere Landfill, TNRD
Toppley Landfill, RDBN	Clucluz Lake Landfill, RDBN
Old Smithers Landfill, RDBN	Tatalrose Landfill, RDBN
Perow Landfill, RDBN	Fort Fraser Landfill, RDBN
Ootsa Lake Landfill, RDBN	Old Houston Landfill, RDBN
Endako Landfill, RDBN	Palling Landfill, RDBN
Topley Landing Landfill, RDBN	City of Vancouver Landfill

- **Engineering Design and Construction**

South Face Closure Design, Hartland Landfill	North and East Face Closure, Hartland
Underdrain Design Concept, Hartland Landfill	North Ravine Closure Campbell Mountain
West Perimeter Diversion Ditch Design, Hartland	Bailey Road Phase II Expansion, Chilliwack

  Hope Landfill Leachate Collection System Detailed Design

- **Stability Assessments**

Fort Fraser Landfill Stability Assessment	Hope Landfill Stability Assessment

- **Environmental Monitoring**
  Annual Monitoring, Hartland Landfill, Victoria (1990-1994)
  Hope Landfill Annual Monitoring, (1995-1997)
  Thornhill Landfill Annual Monitoring (1996-1997)
  Transition Plan and Environmental Monitoring
  Landfill Gas Assessment, Campbell Mountain Landfill, Penticton

Geotechnical Engineering: Dr. Sperling has participated in a number of geotechnical investigations throughout western Canada and the Arctic. His experience includes geotechnical investigation of dam foundations, concrete aggregate resources and stream diversions on B.C. Hydro's Liard, Iskut and Stikine and Hat Creek projects, construction supervision of a rock fill tailings dam for Equity Silver Mines and slope stability studies for Equity Silver, Brenda Mines, Township of Langley, and Town of Hope. He was the geotechnical engineer responsible for an innovative project that involved excavation and drying of 150,000 m^3 of very wet lake bottom peat deposits in Heal Basin. He has also completed a number of stability assessments at landfill sites at Fort St. James, Hope and Chilliwack.

Environmental: Dr. Sperling has managed Phase II contaminated site investigations for B.C. Hydro, Fletcher Challenge and MacMillan-Bloedel. Typically, the work involves a field program consisting of drilling and sampling, laboratory testing, data interpretation and report preparation.

EDUCATION: Ph.D., Geological Engineering - Ground Water Hydrogeology, The University of British Columbia, 1990. Thesis Topic: A Risk-Cost-Benefit Framework for the Design of Dewatering Systems in Open Pit Mines.

Post Graduate Course Work, The University of Arizona, 1989. Courses in hydrogeology and risk based engineering design.

M.A.Sc., Mining Engineering, The University of British Columbia, 1985. Thesis topic: Slope Stability and Dewatering in Main Zone Pit at Equity Silver Mine.
B.A.Sc., Geological Engineering, Geotechnical Option, The University of British Columbia, 1983. Thesis Topic: Avalanche Control in Allison Pass.

Scholarships:
Placer Development Ltd. Scholarship, 1981
Victor A. Olacke Memorial Bursary, 1981
British Columbia Hydro Scholarship, 1982
Cy Keyes Memorial Scholarship, 1983, 1984
National Research Council Scholarship, 1985, 1986
University Graduate Research Fellowship, 1987

COMPUTER: Dr. Sperling routinely uses the latest computer software to carry out state-of-the-art technical analyses and enhance the quality of technical reports and presentations. Software that he routinely uses include the Microsoft Office Suite of applications, AutoCad 13, AutoCad Lite, Surfer, BOSS Groundwater Modeling System, TimeLine, ModView, ModFlow, and HELP.

As well, he is a proficient computer programmer in Quick Basic and Fortran languages. He specializes in the development of user-friendly, graphic intensive software that helps him carry out complex technical analyses efficiently. He has developed a comprehensive library of software for geotechnical, hydrogeological and mining applications as well as several custom software products for a number of corporate clients. These include:

COAST:	Pre and post-processor to Modflow ground water flow model.
SG-Slope:	Slope stability analysis via Sarma's method.
SG-Pump:	Software for analysis for pumping tests.
SG-Volmod:	Landfill Volume Terrain Modeling System
SG-Settle:	Landfill Settlement Model

SG-Veneer: Landfill Cover Stability Model

AFFILIATIONS:

Solid Waste Association of North America (SWANA) - Director of B.C. Chapter
COAST Waste Management Association
Northern Waste Management Association (NWMA) - Founding Member
Association of Professional Engineers and Geoscientists of British Columbia
Canadian Geotechnical Society
North American Geosynthetics Society (NAGS)
International Geosynthetics Society (IGS)

PUBLICATIONS AND PRESENTATIONS:

A Risk-Cost-Benefit Framework for the Design of Dewatering Systems in Open Pit Mines. 28th U.S. Symposium on Rock Mechanics, Tucson, Arizona, pp. 999-1007. T. Sperling and R.A. Freeze, 1987.

Ground Water Control at Highland Valley Copper. International Journal of Surface Mining. Vol. 3, No. 3, T. Sperling, W.K. Munro and R.A. Freeze, 1989.

Dewatering the Overburden at Highland Valley Copper. 41st Canadian Geotechnical Conference, Kitchener, Ontario, 1988, T. Sperling, W.K. Munro, R.A. Freeze, 1989.

Hydrogeological Decision Analysis: 1. A Framework. Ground Water, Vol. 28, No. 5, R.A. Freeze, J. Massmann, L. Smith, T. Sperling and B. James, Sept. 1990.

Using Risk-Cost-Benefit Analysis to Design a Dewatering System at Highland Valley Copper. 43rd Canadian Geotechnical Conference, Quebec City, Quebec, T. Sperling, 1990.

Hydrogeological Decision Analysis: 2. Applications to Ground-Water Contamination. Ground Water, Volume 29, Number 4, J. Massmann, R. A. Freeze, L. Smith, T. Sperling and B. James, 1991.

Hydrogeological Decision Analysis: 3. Application to Design of A Ground-Water Control System at an Open Pit Mine. Ground Water Volume 30, Number 3, T. Sperling, R. A. Freeze, J. Massmann, L. Smith and B. James, 1992.

Site Preparation at Hartland's Phase II Landfill, B.C. Water and Waste Annual Conference, Vernon, B.C., T. Sperling, A de Meulles, S. Pitt, 1993.

Controlling Leachate at Landfills without Costly Liners, GLOBE 94 Conference, Vancouver, B.C., T. Sperling, 1994

Design and Operations Plans for Municipal Landfills, B.C. Water and Waste Annual Conference, Victoria, B.C., T. Sperling and M. Budzik, 1994

The Application of Geosynthetics at Hartland Landfill, Geosynthetics 95, Nashville Tennessee, T. Sperling and A. Jones, 1995

New Trends in Landfill Design, 1995 Canadian Waste Management Conference, Quebec City, M. Sungalia and T. Sperling, 1995.

Leachate Management at Victoria's Hartland Landfill, Public Works and the Human Environment Conference, Seattle, Washington, M. Budzik and T. Sperling, 1995

Geosynthetics Pass the Test, Waste, Washington, D.C., T. Sperling and A. Jones, August, 1995.

Hydrogeological Assessment of the City of Vancouver Landfill, 12th Annual Northwest Regional Symposium, T. Sperling, R. Dickin and P. Henderson, April, 1996.

Landfill Closure in British Columbia, Solid Waste Association of North America, British Columbia Pacific Chapter Meeting, T. Sperling, October, 1996.

Landfill Siting, Operation and Closure, Southern Interior Waste Managers Association Meeting, T. Sperling, March 1997.

Final Closure at Hartland Landfill, 1997 Solid Waste Association of North America, Solid Waste Symposium, T. Sperling and B. Hansen, April 1997.

Land Reclamation at Municipal Landfill Sites, 21st Annual Mine Reclamation Symposium, Cranbrook, B.C. B. Hansen and T. Sperling, September, 1997.

From Dumps to Sanitary Landfills – Upgrading Solid Waste Management Systems in British Columbia. 1999 SWANA Northwest Regional Symposium, Portland, Oregon, April, 1999.

Extinguishing the Delta Shake and Shingle Landfill Fire. Waste Age Magazine, Atlanta, Ga. November, 2000.

Vancouver Landfill Demolition Fire. MSW Management Magazine Vol. 11, No. 4, Santa Barbara, California, July/August, 2001

Understanding and Controlling Landfill Fires. SWANA 6th Annual Landfill Symposium, San Diego, California, T. Sperling, June, 2001.

Issues to Remember when Dealing with Landfill Fires – Canadian Corner: MSW Solutions, SWANA, Silver Spring, Maryland, March, 2002.

When a Fire Occurs at your Facility will you be ready? SWANA Training Center, Palm Springs, CA, Dr. Tony Sperling, P.Eng., April, 2008.

Extinguishing the Vancouver Landfill Fire. SWANA Landfill Symposium and Planning & Management Conference, Reno, Nevada. | Dr. T. Sperling and S. McCracken, April 12-13, 2010.

Controlling the Cerro Patacon Landfill Inferno, Panama: SWANA's 19th Annual Landfill Symposium, New Orleans, LA, Dr. T. Sperling, 2015

FIRE FIGHTING STRATEGY AND MANAGEMENT

PROJECT DESCRIPTION	CONTACT NAME	PHONE NUMBER	LOCATION
Campbell Mountain Landfill	Dave Duckworth	250-492-4121	Penticton, B.C.
Delta Shake and Shingle	Randall Wolsey	708-496-3801	Delta, B.C.
Hespiria Landfill	Eric Jackson	250-545-1361	Vernon, B.C.
Israel Carmon Landfill	Nimrod Halamish		Ber Shiva, Israel
Vancouver DLC Fire	Paul Henderson	604-946-8049	Delta, B.C.
Queen Charlotte Islands	Shelley Higman	250-755-3421	McMillan Bloedel
Confidential Client	na	na	Burnsville, Minnesota
Atlantic Waste Systems	Peter Grootendorst	604-467-7397	Maple Ridge, B.C.
Gitwangak Sawmill 2003	Lisa Webster	604-666-5299	Kitwanga, B.C.
Cathcart Landfill	Karl Hufnagel	206-695-4509	Snohomish County, Wa.
Brother's Pit Fire	Jim Dias	250-746-3112	District of North Cowichan, B.C.
Metro Waste Gas Well Fire	Jeff Dworek	515-967-2076 Ext 102	Des Moines, Iowa
Monroe County Landfill Fire 2004	Tobias Schroeder	812-349-2865	Bloomington, Indiana
Bahamas Landfill Fire 2004	Judson Wilmott	242-356-0218	Nassau, Bahamas
McKelvey Creek Fire 2004	Raymond Gaudart	250-368-0232	Trail, B.C.
Highland Valley Mine Fire 2005	Bob Hamaguchi	250-523-3237	Logan Lake, B.C.
Hazelbrook DLC Landfill Fire 2006	Garth Simons	902-569-7746	Hazelbrook, P.E.I.
Pine Tree Landfill Fire, 2006	Jim Chabot	603 229-1919	Casella, Maine
Confidential Client 2006	na	na	Dalles, Oregon
Vancouver Landfill 2006 Fire	Lynn Belanger	604-940-3201	Vancouver, B.C.
Dawson Creek Fire 2007 Fire	George Kunz	250-784-2303	Dawson Creek, B.C.
Yellowknife Landfill 2007 Fire	Bruce Underhay		Yellowknife, NWT
Kona Hawaii Landfill Fire	Gary Siu		Kona, Hawaii
Vancouver Landfill Fire 2009	Lynn Belanger	604-940-3201	Vancouver, B.C.
Ciudad Del Carmen Landfill Fire 2010	Ricardo Lopez Loredo	52-81-1366-4600 Ext 1139	Monterey, Nuevo Leon, Mexico
Brady Landfill Fire Investigation	Trevor Sims	204-986-8043	Winnipeg, Manitoba
Calgary Metals Landfill Fire 2012	Chief Bruce Burrell	403-268 2489	Calagary, Alberta
Vernon Landfill Fire Investigation - 2013	Nicole Kohnert	250-550-3741	Vernon, B.C.
Pasco Landfill Fire - 2014	William Goodhue, Jr.	206-780-7714	Pasco, Washington
Lakes County Landfill Fire - 2014	Mark Nelson	406-883-7323	Polson, Montana
Cerro Patacon Landfill Fire - 2013	Enrique Ho		City of Panama, Panama
Iqaluit Landfill Fire - 2014	Luc Grandmaison	1 867 979-5650	City of Iqaluit, Nunavut
Sk'way Landfill - 2015	Scott Postma	604 775-0423	Tervita, Chilliwack, B.C.
Winnipeg Brady Landfill Fire - 2015	Irvin Slike	1 204 986-4103	City of Winnipeg, Manitoba
Bovoni Landfill, St. Thomas - 2015	Steven Aubin	1 340 715 9100	Virgin Islands Waste Authority
Aguilla Landfill, St. Croix - 2015	Steven Aubin	1 340 715 9100	Virgin Islands Waste Authority
Harvest Power Spontaneous Combustion 2016			Richmond, B.C.
Bailey Landfill Fire, 2017	Tara Friessen	1 604 793-2701	City of Chilliwack
Calgary DLC Train ROW 2017	Marie Pierre Carrigan	403 268-8269	City of Calgary
Watson Island DLC Fire Response	Bill Horne		City of Prince Rupert
Vancouver Landfill Fire - 2018	Lynn Belanger	1 604 606-2730	City of Vancouver Transfer and Landfill Ops.
Whitehorse Landfill Fire - 2018	Geoff Quinsey	1 867 668-8351	City of Whitehorse
Roatan Landfill Fire - 2018	Karen Ludlow	9458 1486	Alcaldia Municipal, Roatan
Edson Landfill Fire, 2019			Edson, Alberta
Glenmore Landfill Fire	Scott Hoekstra		City of Kelowna, B.C.
Larry's Scrap Yard Fire - 2021	Henry Dean	1 242 557-2547	Nassau, Bahamas

FIRE PREVENTION PLANNING AND AUDITS

PROJECT DESCRIPTION	CONTACT NAME	PHONE NUMBER	LOCATION
China Creek Landfill	Shelley Higman	250-755-3421	Weyerhaeuser , B.C.
City of Calgary	Dave Griffiths	403-230-6612	Calgary, Alberta
Hartland Landfill	Chris Riddell	604-727-3331	Victoria, B.C.
Brookhaven Landfill	Paul Roth	631-451-6222	Brookhaven, N.Y.
County of Colchester	Carl Shaw	902-897-3182	Truro, Nova Scotia
Metro Waste Authority	Jeff Dworek	515-967-2076	Metro Waste, Iowa
Ecowaste Industries 2010	Tom Land	604-249-1977	Richmond,B.C.
Columbia Shuswap Regional District	Darcy Mooney	1-888-248-2773	Salmon Arm, B.C.
Yellowknife Landfill	Bruce Underhay	na	Yellowknife, N.W.T.
Revelstoke Timber Fire Assessment	Chief Rob Girard	250-837-2884	Revelstoke, B.C.
Downie Mill Fire Assessmen	Chief Rob Girard	250-837-2884	Revelstoke, B.C

FIRE RESPONSE TRAINING

PROJECT DESCRIPTION	CONTACT NAME	PHONE NUMBER	LOCATION
China Creek Landfill 2003	Shelley Higman	250-755-3421	Weyerhaueser, B.C.
Metro Waste Authority 2004	Jeff Dworek	515-967-2076	Des Moines, Iowa
City of Calgary	Dave Griffiths	403-230-6612	Calgary, Alberta

PROJECT DESCRIPTION	CONTACT NAME	PHONE NUMBER	LOCATION
Hartland Landfill	Chris Riddell	604-727-3331	Victoria, B.C.
Vancouver Landfill	Paul Henderson	604-946-8049	Delta, B.C.
SWANA California Chapter			Sacramento, California
SWANA South Dakota			
Victoria Fire Chiefs Conference			Victoria, B.C.
North Carolina SWANA	Mark Pointdexter		
Ecowaste Industries	Stuart Sommerville	604-276-9511	Richmond, B.C.
Nanaimo Cedar Road	Dave Leitch	250-390-6546	Nanaimo, B.C.
County of Colchester	Carl Shaw	902-897-3182	Truro, Nova Scotia
Brookhaven	Paul Roth	631-451-6222	Brookhaven, N.Y.
Edmonton, Alberta	Sheri Praski	306-227-8183	Northern Lights Chapter
Saskatoon, Saskatchewan	Sheri Praski	306-227-8183	Northern Lights Chapter
Winnipeg, Manitoba	Sheri Praski	306-227-8183	Northern Lights Chapter
Solid Waste Association of N. Dakota	Carolyn Trautman	605-216-3256	Aberdeen, South Dakota
SWANA Palm Springs, California	Chris Hurwitz	518-593-0529	Palm Springs, California
Forester University	Ryan Graff	805 679-7625	Forester University.net
City of Moncton Fire Training, 2015			Moncton, New Brunswick
City of Halifax Fire Training, 2015			Halifax, Nova Scotia
City of Whitehorse Fire Training			City of Whitehorse
City of St. John's Newfoundland			St. John's Newfoundland
New Providence Ecology Park	Geoff Starin	1 206 719-6809	Nassau, Bahamas
Cayman Islands Fire Dept. Training	Paul Walker	345 949-2499	George Town, Grand Cayman Island
Whitehorse, Yukon	Jim McLeod	1-867-668-8351	Whitehorse, Yk.
SWANA Silver Spring	Bob Wolfe Jr.	240-494-2256	Silver Spring, Md.
PASA - Mexico	Ricardo Lopez Loredo	+52 (81) 1366-4600 EXT. 1139	Monterey, Nuevo Leon, Mexico
Tijuana Fire Department - Mexico	Carlos Gopar Uribe		Tijuana, Mexico
Comox Strathcona Regional District	Thomas Boatman, P.E.	250-334-6025	Comox, B.C.
Northern Lights SWANA Edmonton	Sheri Praski	306-227-8183	Edmonton, Alberta
Northern Lights SWANA Saskatoon	Sheri Praski	306-227-8183	Saskatoon, Saskatchewan
Northern Lights SWANA Winnipeg	Sheri Praski	306-227-8183	Winnipeg, Manitoba
Northern Lights SWANA Grande Prairie	Sheila Reithmayer	780-496-5614	Grande Prairie, Alberta
SWANA Ontario Chapter Barrie	John Lackie	705-835-3560	Barrie, Ontario
SWANA Ontario Chapter Peterborough	John Lackie	705-835-3560	Peterborough, Ontario
SWANA St. Johns Newfoundland	Nicole Haverkort	902-232-2563	St. Johns Newfoundland
SWANA Atlantic Canada Chapter	Nicole Haverkort	902-232-2563	Moncton, New Brunswick
Municipality of East Hants	Andrea Trask	902-883-7098	Halifax, Nova Scotia
Capital Regional District, Victoria, B.C.	Chris Robbins	250 360 3219	Victoria, B.C.
City of Winnipeg Fire Response Training	Trevor Sims	204-986-8043	Winnipeg, Manitoba
Regional District of Kitimat Stikine 2017	Roger Tooms	1 250 615-8370	Terrace, British Columbia
Vancouver Landfill Fire Training 2018	Lynn Belanger	1 604 606-2730	City of Vancouver Transfer and Landfill Ops.
Newfounland Eastern Reg. Service Boar	Christie Dean	1 709 579-7960	St. Johns, Newfoundlanc

CONSULTATIONS / EXPERT WITNESS

PROJECT DESCRIPTION	CONTACT NAME	PHONE NUMBER	LOCATION
Byram Industries	Ken Byram	780-542-4733	Drayton Valley, Alberta
Demolition Landfill Fire	David Harvey	na	Malta
Hunters Point Shipyards Fire	Confidential	na	San Francisco, Ca.
Fresno Industrial Landfill	Dave Griffiths	403-230-6612	Fresno, California
Calgary Metals Landfill Fire	Dennis Yassui	403-232-8300	Calgary, Alberta
Helotes Landfil Fire 2011	Thomas Edwards	512-475-4003	Helotes, Texas
Bridgeton Landfill SSSER 2014	Peggy Whipple	573-751-8864	St. Louis, Missouri
Bella Vista Stump Dump 2021	Robert Honea	479-651-9600	Bella Vista, Arkansas
Congress Landfill 2021	Jeffery D. Jeep	708-404-9092	Hinsdale, Illinois

TRAINING INTEREST - ACTIVE FILE

PROJECT DESCRIPTION	CONTACT NAME	PHONE NUMBER	LOCATION
Southbridge DLC Fire	Mark Paulino		South Bridge, Massachusets
Malta C&D Landfill Fire	Sarah Andrews		Malta
Woodlake Landfill Fire	Chris Bratsch		Minneapolis, Minnesota
Temporary C&D Landfill	Michael Dostillio		Philadelphia, Pa.
Stark County C&D Landfill	William Franks		Stark County, Ohio
Frederick County Landfill	Ron Kimble		Winchester Virginia
Cumberland County	Darrell Jones		Cumberland County, N.S.
Barrie, Ontario			

KELLAR ENGINEERING

Sean Kellar, PE, PTOE

Principal Engineer

Education
B.S., Civil Engineering, Arizona State University – Tempe, AZ

Registration
Colorado, Professional Engineer (PE)
Wyoming, Professional Engineer (PE)
Idaho, Professional Engineer (PE)
Arizona, Professional Engineer (PE)
Kansas, Professional Engineer (PE)
Missouri, Professional Engineer (PE)
Professional Traffic Operations Engineer (PTOE)

Professional Memberships
Institute of Transportation Engineers (ITE)

Industry Tenure
Over 25 Years

Sean's wide range of expertise includes: transportation planning, traffic modeling roadway design, bike and pedestrian facilities, traffic impact studies, traffic signal warrant analysis, parking studies, corridor planning and access management. Sean's experience in both the private and public sectors; passion for safety and excellence; and strong communication and collaboration skills can bring great value to any project. Prior to starting Kellar Engineering, Sean was employed at the Missouri Department of Transportation (MoDOT) as the District Traffic Engineer for the Kansas City District. Sean also worked for the City of Loveland, CO for over 10 years as a Senior Civil Engineer supervising a division of transportation/traffic engineers. While at the City of Loveland, Sean managed several capital improvement projects, presented several projects to the City Council and Planning Commission in public hearings, and managed the revisions to the City's Street Standards. Sean is also proficient in Highway Capacity Software, Synchro, PT Vissim, Rodel, GIS, and AutoCAD.

WORK EXPERIENCE:

Kellar Engineering, Principal Engineer/President – January 2016 – Present

Missouri Department of Transportation, District Traffic Engineer, Kansas City District – June 2015 – January 2016

City of Loveland, Colorado, Senior Civil Engineer, Public Works Department – February 2005 – June 2015

Kirkham Michael Consulting Engineers, Project Manager - February 2004 – February 2005

Dibble and Associates Consulting Engineers, Project Engineer – August 1999 – February 2004

General Information:

Kellar Engineering LLC
Attn: Sean Kellar, PE, PTOE
PO Box 8198, Prairie Village, KS 66208
Phone: 970.219.1602
skellar@kellarengineering.com

Kellar Engineering Firm History and Services:

Kellar Engineering LLC is a Transportation/Traffic Engineering consulting firm founded by Sean Kellar, PE, PTOE in January 2016. Prior to starting Kellar Engineering LLC, Sean had over sixteen years of work experience in transportation/traffic engineering in both the private and public sectors working for: Missouri Department of Transportation (MoDOT) as District Traffic Engineer; City of Loveland, Colorado; Kirkham Michael Consulting Engineers; and Dibble and Associates Consulting Engineers. Sean Kellar has worked in the industry for a total of over 25 years. Kellar Engineering LLC (KE) serves as a traffic and transportation engineering consultant for various municipal bodies. KE has completed over 500 traffic impact studies for multiple jurisdictions and states. Additionally, KE has worked with three Northern Colorado jurisdictions (City of Loveland, City of Fort Collins, and Larimer County) to write and codify the revisions to the Larimer County Urban Area Street Standards (LCUASS). Kellar Engineering LLC is dedicated to offering quality transportation and traffic engineering consulting services through great customer service to its clients. Each project presents a new opportunity to add value and for strengthening relationships with clients.

Sustainability:

Kellar Engineering LLC seeks to work toward providing a more sustainable transportation system in every project. This can be achieved through intersection and roadway improvements. However, it can also be achieved through Transportation System Management and Operations (TSMO) philosophies by improving the flow of traffic without adding pavement. Below are some of Kellar Engineering's TSMO philosophies that we look to implement on every project no matter the size or budget:

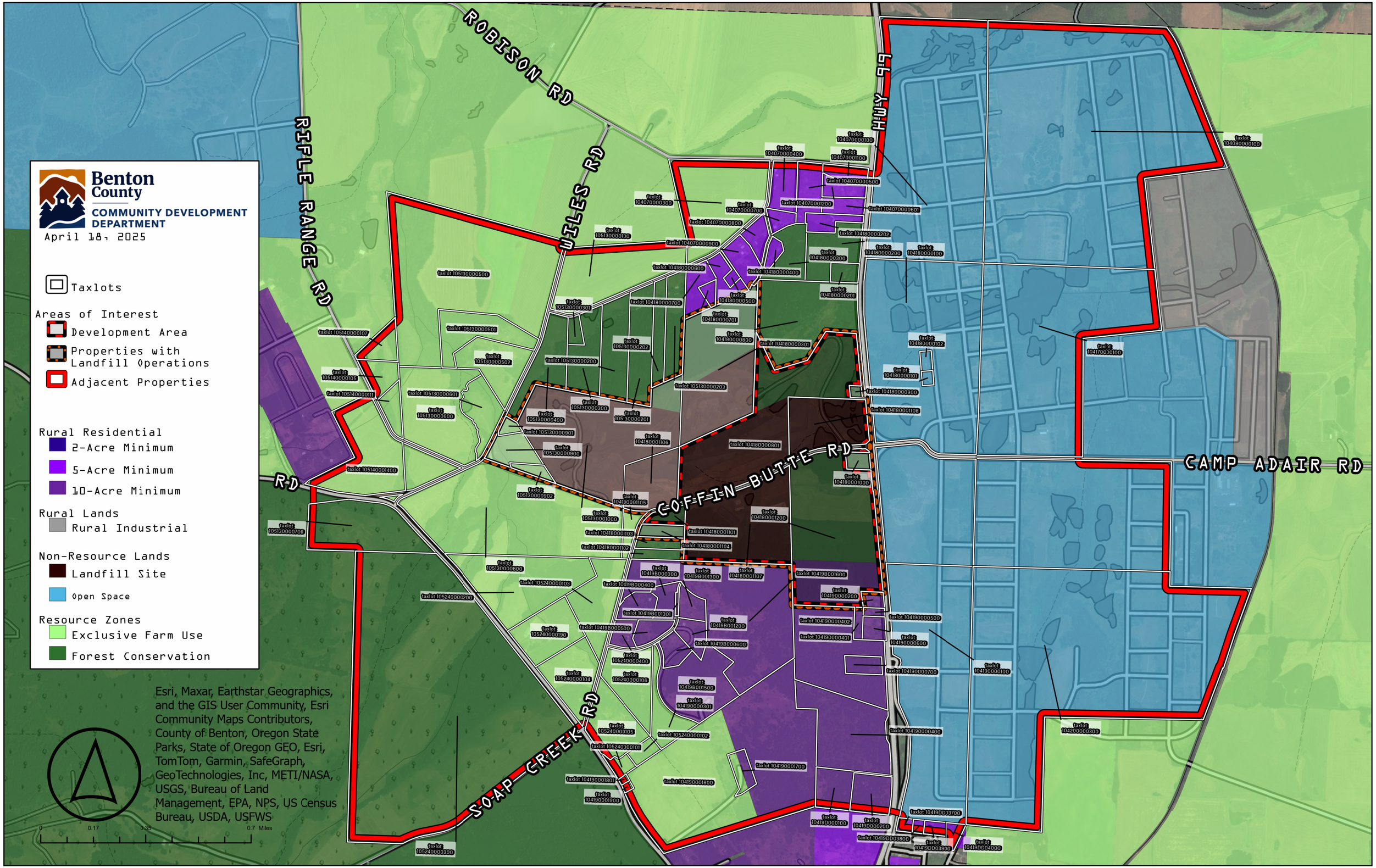
- Getting results without adding lanes
- Utilizing ITS technology to improve traffic flow and reduce vehicle emissions
- Regional traffic signal coordination
- Traffic incident management
- Multi-modal transportation infrastructure

LU-24-027 Staff Report to Benton County Planning Commission

Benton County Exhibit 6 (BC6)
Property Zoning Map

Contents:

- Zoning map of “subject property”, “development area”, and “adjacent properties”


Benton County
COMMUNITY DEVELOPMENT DEPARTMENT
April 18, 2025
Taxlots
Areas of Interest
Development Area
Properties with Landfill Operations
Adjacent Properties
Rural Residential
2-Acre Minimum
5-Acre Minimum
10-Acre Minimum
Rural Lands
Rural Industrial
Non-Resource Lands
Landfill Site
Open Space
Resource Zones
Exclusive Farm Use
Forest Conservation
Esri, Maxar, Earthstar Geographics, and the GIS User Community, Esri Community Maps Contributors, County of Benton, Oregon State Parks, State of Oregon GEO, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, US Census Bureau, USDA, USFWS
0
0.17
0.35
0.7 Miles
ROBISON RD
RIFLE RANGE RD
OILES RD
HWY 99W
COFFIN BUTTE RD
CAMP ADAIR RD
SOAP CREEK RD