EXHIBIT 12
WEAVER CONSULTING GROUP FINDINGS ON ODOR

Weaver Consultants Group

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MEMORANDUM

To:	Ian Macnab Valley Landfills, Inc.	**Date:**	April 26, 2024
From:	Melissa Green Matt Stutz, P.E. Weaver Consultants Group	**Project No:**	0120-174-50-47-00
Re:	Findings on Odor Coffin Butte Landfill		

On December 7, 2021, the Planning Commission of the Benton County Community Development Department issued findings with respect to the proposed Coffin Butte Landfill (CBLF) Expansion. Valley Landfills, Inc. requested Weaver Consultants Group (WCG) to respond to the Planning Commission findings related to odor as it relates to air quality. WCG provides professional services to the solid waste industry across the nation, including the pacific northwest. WCG provides regulatory permitting and regulatory compliance services specific to air quality regulations at CBLF. CBLF is regulated under the US Environmental Protection Agency (USEPA) and the Oregon Department of Environmental Quality (ODEQ) and operates under an air quality permit issued by ODEQ. The purpose of this memorandum is to respond to the findings related to odor. WCG has provided the specific finding in ***italic bold*** font followed by WCG's response.

Planning Commission Findings:

Odor: Methane emission rules do not capture the impacts to the character and use of the area because many people testified that the smell inhibits them from going outside and enjoying the use of their property. Property owners within miles of the site stated they could smell the landfill. The current mitigation of an earthen cap over cells does not mitigate smell and smell reflects emissions of other gases such as Volatile Organic Compounds (VOCs) and hydrogen sulfide. The same mitigation is proposed for the expansion and if it currently does not mitigate the odor then it cannot be used as a mitigation for the future and be expected to minimize the concern.

Weaver Consultants Group offers the following to address landfill odors in general as well as providing site-specific data and information for CBLF, which documents metrics and submittals provided to the ODEQ.

Landfilling of solid waste is a generally accepted practice in the US. The practice is such that as waste is received at CBLF, it is immediately placed in the active area of the landfill. A landfill in total may have an area of 100 acres or more in overall size, but the area where the waste is placed

on a given day is much smaller. For CBLF, this day-to-day active area is less than ½-acre. Through the daily landfilling process, odors can be present in the active area and are similar to the odors of waste disposed of from residential households. To manage this, a 6-inch layer of soil or alternative daily cover (ADC) is spread at the end of each day over the top of the ½-acre active area. Typically, the active areas do not change in size with an expansion; rather, the active area will move depending on the operational need of the landfill. Therefore, the expansion should not increase the odor impacts of the active area as compared to the existing operation.

The reference to the use of "earthen cap over cells", also known as daily and intermediate soil cover, to mitigate odors has been proven in all climatic regions to be an effective means in mitigating odor. This 6-inch soil layer is found in the USEPA regulations, the ODEQ regulations, and is also referenced in the Solid Waste Association of North America (SWANA) Technical Policies Manual. SWANA is a non-profit organization who utilizes experts across North America to develop best practices for landfills. Additional information will be provided surrounding this soil cover layer later in this document.

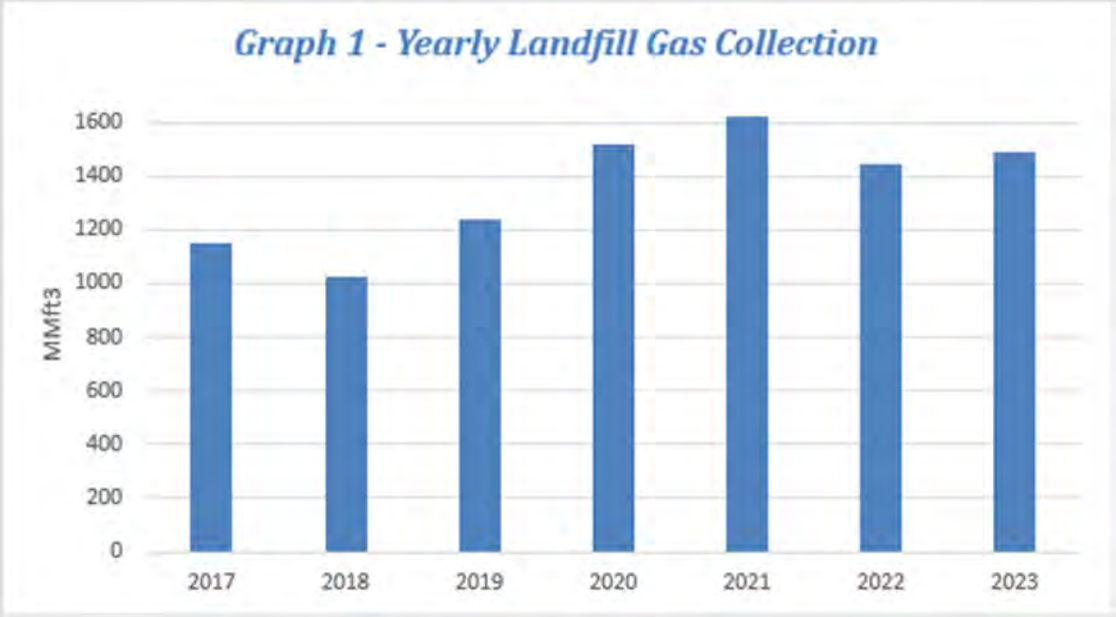
Landfill Gas Collection and Control

CBLF actively extracts landfill gas (LFG) out of the landfill in an effort to assist in controlling the mitigation of LFG. The following sections outline site-specific data related to this in addition to other odor control measures used at the landfill.

Over time, the waste placed in a landfill begins to decompose. One of the bi-products of this decomposition is a biogas referred to as LFG. LFG gas is generally considered to be 50% methane and 50% carbon dioxide. However, there are some trace compounds like hydrogen sulfide and VOCs generated within the landfill. To collect the LFG, the CBLF has a landfill gas collection and control system (GCCS). The GCCS is the main component and in conjunction with daily and intermediate soil cover is used for mitigating the potential odors. The installation of the GCCS is regulated by both the USEPA and the ODEQ. As outlined in the landfill expansion, the GCCS will continue to be used and expanded with the landfill.

Oregon currently has one of the most stringent landfill emissions standards in the United States. The current GCCS at the site includes over 350 collection points. Under the USEPA and ODEQ air regulations, landfills are required to install LFG extraction wells where waste is in place more than 5 years. However, CBLF installs LFG extraction wells every year typically in waste that is at most 1 year old to minimize off-site odors.

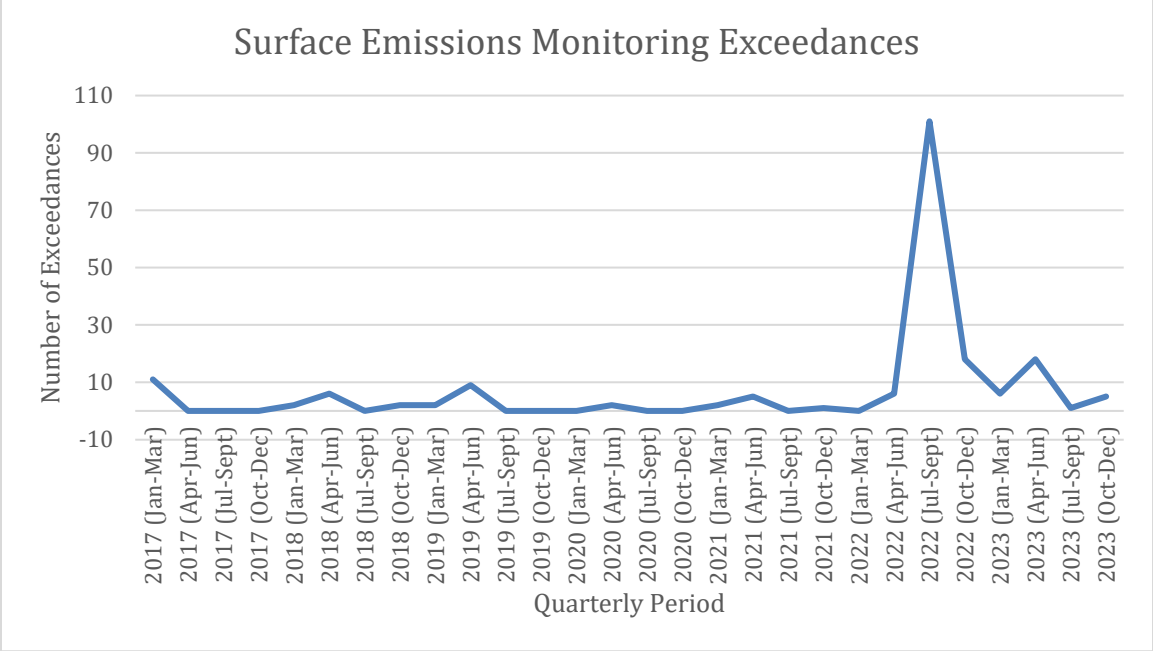
In an effort to understand the impact of the GCCS collection system on the landfill, WCG reviewed the LFG collection rates to look for trends. The following graph shows annual collected LFG.



As depicted in the graph, the gas collection has increased from 2018 to 2021. In 2022 the gas collection slightly decreased but then increased in 2023. These slight variances in gas collection are to be expected as gas generation and gas collection are dependent on several variables that include environmental and biological conditions.

Surface Emission Monitoring

To document the performance of the GCCS efficiency, CBLF has a comprehensive surface emissions monitoring (SEM) program. This SEM program consists of walking the surface of the landfill each quarter with a handheld meter which is held 2-4 inches from the landfill's surface. The meter continuously samples the air from the landfill surface to determine areas where LFG might be emitted. Should LFG be detected at 500 parts per million (ppm) methane above background, corrective action is taken, and the area is repaired and re-monitored. This method allows verification of how well CBLF is collecting and controlling LFG and reducing the potential of off-site odors. A review of the SEM data for CBLF shows that there have been very few instances where LFG was detected coming from the landfill's surface. The following graph provides data for each quarter since 2017 with the associated number of exceedances that occurred during the SEM. In the third quarter of 2022, the landfill commenced compiling with the new Oregon Administrative Rule Chapter 340 Division 239 for Landfill Gas Emissions that implemented new SEM requirements such as integrated monitoring. CBLF implemented corrective action on the exceedance locations and the quarterly exceedances have decreased in the SEM events since third quarter 2022.



Soil Cover

As mentioned previously, the landfill soil cover acts as a filter for LFG that are not collected by the GCCS. The portion of uncollected gas must first pass through the landfill's cover soils before being emitted. As it passes through these cover soils, the gases are reduced by oxidative and biological processes. Numerous studies have shown that a significant portion of the hydrogen sulfide (H_2S) in the uncollected gas is converted to sulfide minerals within the cover soils and therefore not released. [1]

USEPA has recognized the effects of methane oxidation in determining LFG emissions and has incorporated cover soil oxidation into calculations. These USEPA regulations recognize that up to 35% of methane in LFG that reaches the soil may be oxidized and therefore not emitted. A review of the soil cover logs for the facility indicate that soil covers or ADCs have been in continual use at the site.

[1] Cristine Plaza, Qiyong Xu, Timothy Townsend, Gabriel Bitton, Matthew Booth, *Evaluation of alternative landfill cover soils for attenuating hydrogen sulfide from construction and demolition (C&D) debris landfills*, Journal of Environmental Management, Volume 84, Issue 3(2007).

Y. Ding, Chaun Yu Cai, J. Xiong, A. Qian, J. Wei, B. Hu, W. Wu, Z. Han, H. Zhang, W. Ni, *Evaluation of Alternative Cover Materials for Reducing Hydrogen Sulfide Emission from Municipal Solid Waste (MSW) Landfills*, Transactions of the ASABE. 59. 949-957. 10.13031/trans.59.11711 (2016).

Ruo He , Fang-Fang Xia, Yun Bai, Jing Wang, Dong-Sheng Shen, *Mechanism of H2S removal during landfill stabilization in waste biocover soil, an alternative landfill cover*, Journal of Hazardous Materials, 217–218:67–75 (March 2012).

As an added measure, CBLF incorporates the use of a plastic liner over the top of various landfill areas which are not in use. The plastic liner provides an added measure of barrier against potential migrating odors.

CBLF has installed final cover in addition to the soil cover on nearly 40% of the landfill surface to assist in reducing off-site odors. Final cover is a multilayered system of various materials which are primarily used to reduce the amount of stormwater that will enter a landfill after closing and control the migrations of LFGs. Landfills are not required to install final cover until the landfill is no longer accepting waste. However, CBLF has installed final cover well before it is required regulatorily.

Site Odor Monitoring

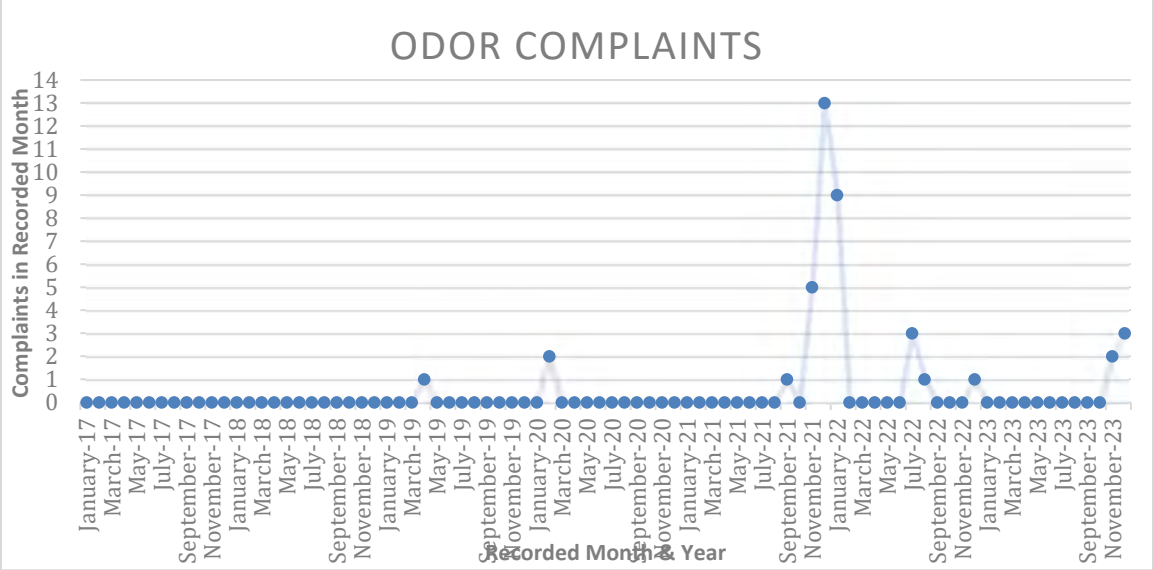
The site performs daily odor monitoring. This monitoring includes driving a loop starting at the office, travel west to Tampico, and then north of Coffin Butte Landfill, south on Highway 99, and then back to the site on Tampico. Landfill leaders complete an online Odor Management Training course and site employees complete annual training on odor monitoring. CBLF maintains a site-specific odor management plan that is updated annually or as needed. The plan includes, but is not limited to, information such as actions to take when odors are detected, identifying sources of odor, and methods for controlling odors at the site. A routine odor inspection is completed during every odor patrol. The inspections include, but are not limited to, information such as local weather data (temperature, wind direction, etc.), if any odors were detected, and odor details (such as location, type, distance from facility, possible sources, etc.). Complaints are documented and are investigated as soon as reasonably possible. Complaints and inspections are reviewed monthly by the Environmental Compliance Team.

In addition, the site also tracks and reports odor complaints it receives monthly. The following is a review of the odor complaints received at the site over time.

The following graph incorporates two sets of data:

1. Complaints received at the local level;
2. Complaints received at ODEQ.

One variable the graph does not show is the timing of the complaints.



Conclusion

Based on the review of the information above, CBLF's compliance with USEPA and ODEQ regulations, the implementation of industry best practices, and the data provided indicates that there has not been a significant impact to human health and environment related to LFGs or odors. An evaluation of key landfill control measures and data points do not indicate a widespread release of LFG or odors. The CBLF trends indicate the following:

- There was an increase in total gas collected from 2022 to 2023.
- Besides the spike that occurred in third quarter 2022 which appears to be related to the implementation of new SEM requirements, the surface emission exceedances are consistently low.
- The number of odor complaints from January 2017 until September 2021 was four, while there were 27 complaints from November 2021 until January 2022 which appear to be related to the public comment of the proposed landfill expansion From February 2022 through December 2023, the odor complaints once again ranged from 0 to 3 per month.
- The on-site data and the offsite data suggest that CBLF works to aggressively and actively implement measures to control potential off-site odors to the community.