

HOOD RIVER COUNTY PUBLIC WORKS



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ANNUAL LEACHATE IRRIGATION SYSTEM REPORT HOOD RIVER LANDFILL, PERMIT #168 2021-2022 SEASON

This report describes the 2021-2022 leachate spray irrigation season for the Hood River Landfill. The leachate spray irrigation season encompasses the period between July 1, 2021, and June 30, 2022. This report is required in accordance with Section 15.3 of Solid Waste Disposal Site Closure Permit No. 168, issued by the State of Oregon Department of Environmental Quality (DEQ) on May 29, 2013. The reporting period has been selected to coincide with the reporting period of the Annual Environmental Monitoring Report (AEMR), also required by the DEQ in accordance with Section 15.4 of the Permit.

Site Conditions

Grassy vegetation continued to be generally well established on the landfill cover and no standing water was observed. No re-grading of the landfill cover appears to be necessary. Surface runoff entering the leachate collection system continued to be minimal and no failures were noted in the surface water diversion structures.

Signage and gated access to the area continued to minimize trespassing and vandalism, however, evidence suggests occasional access by ATV or other off-road vehicles continues to occur. Measures have repeatedly been taken to negate ATV access to the area but have not eliminated it completely, however, no substantial damage or negative impacts to the site have resulted from it. Prior vandalism in the form of graffiti still exists at the upper pumphouse. All signs previously marked with graffiti were replaced in 2020 and several signs that were damaged with bullet holes were replaced in 2021. No further vandalism to the signs has occurred and no vandalism to the spray irrigation system has been observed.

Site inspections were performed periodically throughout the summer and fall months when runoff was minimal or non-existent, and performed more frequent during the winter and spring months when runoff was regular. Summer and fall inspections included observing the area for signs of trespassing, vandalism, evaluation of fire fuels (i.e., dry grass, dead trees, etc.), and water levels in the upper pond. Winter and spring inspections included the same general observations but also included inspecting the lower pond and sprinkler system for signs of activity, water/leachate levels, debris, repair needs, and to record the volume of leachate pumped.

Leachate Spray Irrigation

Similar to the 2020-2021 leachate irrigation season which began flowing in January 2020, the 2021-2022 season began flowing in late December 2021 and continued thru June 2022. Both the landfill site and the leachate spray irrigation system were inspected regularly during normal

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work hours and the system was maintained and kept in working order. Readings from the upper pumphouse flow meter indicate that during the 2021-2022 reporting season, a total of 13,666,158 gallons ¹ of leachate was collected and dispersed thru the sprinkler system. Rainfall totals during the same period measured 29.95 inches.² As shown in the chart below, annual rainfall for the season was approximately 40% greater than the previous three years while the volume of leachate pumped ranges from 40% to 70% greater than during the same three years. As noted in previous reports, the variance in pumping volumes in relation to rainfall totals can be attributed to a variety of factors and led to the installation of an analog flow meter in December 2019 and further modification in December 2020. When coupled with redefining of the irrigation reporting season, the changes are expected to result in a more accurate account of the volume of leachate distributed and better consistency regarding general reporting parameters. When compared with the 2020-2021 season only, the increase in rainfall is more closely proportionate to the amount of leachate pumped, further supporting the expectations.

Irrigation Season July 1 – June 30 ³	Month Pumping Began	Month Pumping Ended	Rainfall (in.) July 1 – June 30 ²	Total Gallons Pumped
2010-2011	N/A	N/A	37.0	14,200,000
2011-2012	N/A	N/A	30.6	12,000,000
2012-2013	November 2012	June 2013	24.3	5,600,000
2013-2014	November 2013	July 2014	29.5	12,700,000
2014-2015	December 2014	June 2015	23.4	12,600,000
2015-2016	November 2015	July 2016	32.5	25,700,000
2016-2017	November 2016	August 2017	33.2	20,100,000
2017-2018	November 2017	August 2018	30.2	22,700,000
2018-2019	December 2018	June 2019	21.7	6,300,000
2019-2020	December 2019	June 2020	22.7	5,900,000
2020-2021	January 2021	June 2021	21.51	9,035,525
2021-2022	December 2021	June 2022	29.95	13,666,158

Maintenance and Repairs

Dual pumps are in place at the lower pumphouse as well as the upper pumphouse that distributes leachate to the sprinkling system. The pumps are configured so one acts as an emergency backup in the event the other fails. During normal use, pump cycles alternate as to minimize wear and further extend pump life. In 2017 a replacement program was implemented so that one lower pump is replaced every year, thereby ensuring neither pump is more than two

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seasons old. This practice continued through 2022 and is expected to continue in the future. Additionally, a spare pump is kept at the County Public Works shop in the event of a pump failure and is part of the scheduled pump rotation program. Pumps are typically rotated at the end of the leachate collection season (i.e., summer-fall) and part of the annual maintenance schedule. Annual maintenance generally includes rotating one lower pump, cleaning pump components, cleaning the lower pumphouse piping and pond screenings, and completing any deferred repair work.

To increase monitoring capabilities, a wildlife game camera was installed near the lower pond in fall 2021. The camera collects an image of the lower pond level every six hours and emails it to three separate County employees. The camera is not intended to replace regular inspection schedules, but rather provide more frequent observations of potential issues and to provide visual documentation in the event a failure occurs.

During a significant snowstorm in January 2022, the float assembly in the upper pond froze solid and failed to start the pumps as intended. The issue was discovered and the assembly was cleaned and manually thawed before the pond was permitted to fill and overflow, and subsequently no leachate escaped the system. Other than the float assembly freezing and the need to replace several broken sprinkler-heads, no other repair work was necessary during the 2021-2022 season and all pumps and piping functioned as intended.

Potential Health Risks

Attempts were made to collect groundwater samples from all three monitoring wells in March 2022, however, like previous years well No.1 (MW-1) and well No.2 (MW-2) were dry. Subsequently, samples were only collected from well No.3 (MW-3).

The analysis results from MW-3 samples were generally consistent with prior years with respect to Group 1a, 1b and 2a indicators with the exception of the pH (Group 1a) and nitrate (Group 2a). The detected pH value at 7.28 S.U. was above the previously recorded maximum of 7.22 but within the guidance level range of 6.5 to 8.5. The concentration of nitrate was the highest historic value (0.31 mg/l) but below its Maximum Containment Level (MCL). Additionally, no Group 2a MCL's were exceeded and no Group 3 VOC's were detected. Overall, the collected data does not indicate a substantial change in groundwater quality, nor an immediate or anticipated health risk.

Analysis results from the leachate samples were similar in that they do not indicate a change in leachate quality. Group 1a indicators were consistent with prior concentrations, except for Redox (-34 mV), which was lower than previously reported. Group 1b were also mostly consistent with prior concentrations, except for pH (6.88 S.U.) and hardness (219 mg/L), which were both at their highest historical concentrations. Group 2a parameters indicated the concentration of magnesium was the highest historical value (17.2 mg/L) and that both iron (28.4 mg/L) and manganese (6.18 mg/L) exceeded MCL values, which is consistent with sample data

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since 2009. All other Group 2a parameters were within historical concentration ranges. All Group 2b indicators were within historical concentration ranges and none exceeded MCL values. Three Group 3 VOC's, chlorobenzene (1.85 ug/L), 1,4-dichlorobenzene (0.59 ug/L), and carbon tetrachloride (1.65 ug/L) were detected in both the sample and duplicate samples at concentrations above the method reporting limit. All three VOC's have been detected at higher concentrations since 2009.

Analysis results from the surface water samples are only the second collected since 2017 and the second year collected consecutively, however, due to the lack of historical analysis the results are difficult to compare with previous years. All Group 1a parameters were within or below previous ranges, COD levels (Group 1b) were the highest on record at 28 mg/L, Sulfate levels (Group 2a) were the highest recorded concentration at 12.1 mg/L, all Group 2b concentrations were within prior concentration ranges, and no Group 3 VOC's were detected. Overall, surface water quality concentrations were either consistent with or lower than previous range values and do not indicate a substantial change in surface water quality.

Methane gas monitoring was performed in November 2021 and again in March 2022. Detection levels were consistent with previous sample years, in that methane was detected in the probes located within the waste boundary but not in the probes located outside the boundary. The data indicates that offsite methane migration is not occurring and that concentrations are not exceeding the lower explosive limit at the property boundary.

Please refer to the 2022 Annual Environmental Monitoring Report prepared by VISTA GeoEnvironmental Services for specific groundwater, surface water, leachate, and methane test results and analysis.

The risk of exposure to leachate continues to be minimized by security measures installed around the site. Security measures include: a locked gate at the landfill entrance, the display of "Unauthorized Entry Prohibited" signage around the irrigation system, and the installation of fencing around both the upper pond and across the top of the lower pond dam. Fencing at the upper pond also includes a locked gate to limit access to County personnel only, and measures are taken when appropriate to mitigate trespassing by ATV or other off-road vehicles.

Landfill Closure

Access to the site continues to be monitored and kept to a minimum. No dumping or open burning was observed at the site and onsite roads have been maintained to provide reasonable, all-weather vehicle access to monitoring and maintenance locations. Evidence of trespassing by ATV and other off-road vehicles has significantly decreased from prior years but still occurred during 2021-2022.

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Landfill Budget

The County expended a total of approximately \$33,212 on landfill monitoring and testing during its 2022 fiscal year (July 1, 2021 – June 30, 2022). This period coincides with the irrigation season and includes all funding expended on leachate evaluation, consultant services, maintenance and repair needs, general operations, and staff services. The County does not have a reserve fund for landfill monitoring, maintenance, or any other solid waste permit activities. All funding for landfill activities is appropriated on an annual basis from the County General Fund and subject to Budget Committee and County Board of Commissioner approval. While expenditures from a reserve fund would also be subject to the same Committee and Commission approvals, the lack of a dedicated reserve for landfill activities means that unanticipated costs, such as additional testing, re-testing, or high-dollar repair costs, may need to be deferred until the following fiscal year when additional funding can be appropriated. There are no staff employees dedicated for landfill activities. All staff time is either provided by the County Parks & Buildings Supervisor or contracted thru the County Public Works Department Administration Division. Any costs related to work performed by Public Works staff is reimbursed thru the Landfill Budget to account for the use of staff positions funding with restricted State Highway Fund dollars.

For the FY2023 budget year, the County has appropriated a total of \$63,600 for landfill maintenance activities. The substantial increase in funding is to provide for consulting services for preparing draft versions of the landfill's Environmental Monitoring Plan and Operation & Maintenance Plan, scheduled for completion in January 2023.

Acknowledgements

1. Meter readings in July 2021 at the end of the 2020-2021 irrigation season were recorded at 9,035,525 gallons and readings in July 2022 at the end of the 2021-2022 irrigation season were recorded at 22,701,683 gallons.
2. Source records for annual rainfall prior to the 2020-2021 season are unavailable. Rainfall data for the 2020-2021 season were provided by www.hoodriverweather.org and obtained from <https://www.usbr.gov/pn/agrimet/wxdata.html> for the 2021-2022 season.
3. The Irrigation and Rainfall reporting seasons have varied prior to 2020 and have typically coincided with the calendar year. The reporting season was changed in 2020 to coincide with the AEMR reporting season and to comply with the Closure Permit. However, the acknowledged dates have been added at the request of the DEQ and represent current reporting practices.