


**PERMIT REVIEW REPORT**

Lakeside Reclamation Landfill  
SW Permit No. 214  
Washington County

Report By: Tim Spencer 

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**Background**

Lakeside Reclamation Landfill (Lakeside) has operated at the current site since 1957. Lakeside accepts construction and demolition (C&D) waste, land clearing debris, and a variety of construction-site cleanup wastes. Lakeside receives an average of about 80,000 tons of waste per year. Previously authorized waste types are listed in the current permit. Lakeside is a Metro designated facility for C&D waste in the Portland region. Lakeside's status as a designated facility is under review.

The current permit was issued on January 30, 1998 and expired on January 30, 2008. Lakeside is allowed to continue operation and must continue to comply with the expired permit until DEQ takes final action on the renewal application because DEQ received Lakeside's permit renewal application for a closure permit in a timely manner (on August 3, 2007).

**Compliance History**

During the time that DEQ has regulated this facility under a solid waste disposal permit, DEQ compliance inspectors have cited Lakeside several times for accepting prohibited waste materials for disposal, including auto tires, a smashed auto body, cafeteria wastes, household garbage, a substance used for heat-treating metals, closed paint cans, oil filters and jugs of used motor oil, electric fans, and mattresses. DEQ has approved of sending casting sands, baghouse dust, and slag from Western Foundry (ECSI #185), and chromium-containing sludge ash from the USA Durham STP to Lakeside Landfill in the past.

DEQ issued a Notice of Non-Compliance (NON) to Lakeside Landfill in 2002 for unauthorized disposal of 630 tons of contaminated soils and chromium-treated animal hide splits originating at the Frontier Leather site (ECSI #116). The soils and hide splits were subsequently removed and sent to Hillsboro Landfill for disposal.

On July 27, 2006, DEQ issued a warning letter to Lakeside for accepting friable asbestos.

On October 2, 2007 DEQ inspectors observed a green sand-like material and a white glass fiber-like material that had been deposited at the landfill working face. At first Lakeside landfill personnel could not identify the material. Subsequent to the inspection Lakeside indicated that the green sand material was glass manufacturing material from the Owens-Illinois plant. DEQ's investigation indicated that these materials were industrial wastes. Industrial wastes are not authorized by Lakeside's permit. DEQ's inspection also noted that the landfill working face was too large, a violation of permit conditions. On October 23, 2007 DEQ issued a Pre-Enforcement notice for these violations and deficiencies in Lakeside's financial assurance funding.

### **Landfill Site Characteristics**

The landfill is bordered by the Tualatin River to the south, the Ponzi Winery to the east, residential properties to the west and the landfill owner's agricultural land to the north. Available hydrogeologic data indicate that groundwater flow in uppermost water bearing materials is generally southward toward the Tualatin River and away from the area's domestic wells. Groundwater movement is quite slow in the fine-grained sediments that underlie the landfill. As a consequence, the volume of groundwater discharged to the Tualatin River is very small relative to the total volume of flow in the Tualatin. The low permeability sediments under the landfill also may retard the subsurface movement of landfill gas.

Surface water runoff flows toward the Tualatin, surface water drainage is diffuse and, at present, the landfill site lacks any defined drainage channels. Stormwater discharges have been identified flowing into the ponds on the property and the ponds are waters of the state.

Elevated levels of methane gas have been detected within the landfill waste materials. Methane can be a significant safety concern when there is potential for landfill gas to migrate through subsurface soils into enclosed structures or poorly ventilated confined spaces. Methane is flammable and explosive at certain concentrations in confined spaces. The principal driving force for subsurface methane movement is pressure buildup within the landfill. So far, Lakeside's monitoring results show relatively high gas concentrations but gas pressures within the landfill are very low to negative. These low pressures coupled with the low permeability of the soil materials that underlie the landfill suggest that offsite migration of methane gas is unlikely. However, this preliminary conclusion must be confirmed with an expanded monitoring program including perimeter monitoring probes and probes near on-site structures.

### **Groundwater quality Impacts**

Groundwater quality has been impacted by landfill leachate. Observed contaminants and general water quality impacts are predominantly non-hazardous in nature with respect to human health. The most notable impacts are elevated levels of total dissolved solids (TDS), chloride, iron, manganese, and zinc and the depletion of oxygen. Low levels of several human carcinogens including tetrahydrofuran, benzene, and arsenic have also been intermittently detected in groundwater at river front monitoring wells. Based on available data, the areal extent of groundwater impacts associated with the landfill is confined to the Lakeside facility property, although shallow groundwater contamination may also affect a relatively small area of a private property located immediately west of the landfill and adjacent to the Tualatin. Lakeside is completing a remedial investigation and DEQ is requiring that Lakeside conduct a feasibility study to determine the appropriate clean up remedy to address contaminated groundwater.

### **Landfill Operations**

The landfill's operating hours are 7:00am to 5:00pm Monday through Friday. DEQ has received numerous complaints about Lakeside operating outside of these specified limits. DEQ's review

of Lakeside's operating records indicates that Lakeside has been accepting some incoming loads before 7:00am.

The main access gate is electronically controlled. Access to the site is via Vandermost Road, a two-lane asphalt road that connects to Scholls Ferry Road. Paving extends to the weight scales. Internal haul roads beyond the scale are constructed of either crushed rock, recycled concrete or recycled asphalt. Most of the landfill site is fenced to control access. The Tualatin River provides a natural barrier to the south.

Lakeside landfill is not open to the public and most incoming haulers have established accounts with Lakeside. Other (non-established customers) must stop at the office for questioning about their loads. Despite these administrative controls and Lakeside's recent attempts to improve waste screening and acceptance procedures, DEQ has serious concerns about this aspect of the operation. Accordingly the proposed permit includes much greater restrictions on what materials Lakeside can accept for disposal at the landfill, requirements for better training of operating staff, and detailed waste screening and acceptance procedures.

DEQ is also concerned about the adequacy of Lakeside's health and safety procedures. On a number of occasions DEQ inspectors have observed Lakeside staff wearing improper clothing, footwear and safety equipment while in areas of active landfill operation and construction. The permit provides specific health and safety procedures as well.

### **Landfill Design and Development**

The existing landfill footprint is approximately 37 acres in size. The 1997 site development plan envisioned a final completed landfill footprint of 43 acres. The landfill does not have a bottom liner or leachate collection system. Consequently, the landfill relies completely on the final cover's performance, grading of the landfill and cover to promote stormwater runoff, and the properties of the native soils under the landfill to prevent groundwater contamination. To date Lakeside has installed the final cover on approximately 27 acres of landfill. The existing cover system is a soil cap ranging from 18 inches to 12 feet with most areas meeting design requirements of 4 feet of soil, hydraulic conductivity ranging from  $10^{-3}$  to  $10^{-6}$  cm/s with most conductivity meeting design requirements of  $10^{-5}$  cm/s and an experimental tree cover. The tree cover's performance depends on the tree canopy's capacity to trap and utilize (uptake for evapotranspiration) precipitation at a sufficient rate to prevent rainfall from percolating into the landfill and generating leachate.

Construction and preparation of disposal areas along with the landfill's acceptance of off-site clean soil and concrete has created material surpluses. To manage these excess materials Lakeside has created soil stockpiles at a number of locations including along the landfill's western boundary and north western boundaries near neighboring residential properties and a large concrete stockpile near the site's eastern boundary. Neighbors have filed numerous complaints to DEQ about these stockpiles. The neighbor's main concerns have been visibility, lack of adequate setbacks from property lines, and noncompliance with Washington County height restrictions and minimum property-line setback requirements.

### **Final Cover System Evaluation**

DEQ is evaluating the adequacy of Lakeside's tree cover system on multiple fronts. DEQ required Lakeside to install four gas monitoring probes within the landfill footprint to depths of about 40 feet. These probes and their installation were also designed to evaluate the tree cover system by providing additional information in the following critical areas:

- The thickness of the cover soil
- The depth and density of tree roots
- Moisture content in the cover soil and in the waste materials (leachate)
- Liquid levels at 40 foot depth (hydraulic pressure in the landfill)

In addition, the gas probes provide a means to obtain representative leachate samples in old closed portions of the landfill.

An investigation of the cover system was also conducted as part of the ongoing remedial investigation. This part of the cover assessment included shallow probes to determine cover thickness and permeability (hydraulic conductivity). The results indicated that there are a few areas where the cover is not meeting design criteria. The permit requires that as the landfill continues to close, the cover meet the approved design standards for soil (four feet of soil) and hydraulic conductivity ( $10^{-5}$  cm/s). The presence or absence of leachate seeps is another indicator of cover performance. Surface leachate seeps are common at landfills in western Oregon and are another important consideration in DEQ's ongoing investigation of the cover system. DEQ has identified a few seeps and a landslide on the western side of the landfill that the permit requires be corrected. However, DEQ does not consider these seeps to indicate cover failure. DEQ is continuing to evaluate cover performance through the ongoing remedial investigation and feasibility study. If the cover's performance is found to be inadequate based on any of the factors discussed above, DEQ will require a standard engineered cover system for key areas of the landfill or for the entire landfill footprint depending the environmental risk involved.

### **Financial Assurance**

DEQ's recent pre-enforcement notice cited Lakeside for deficiencies in their financial assurance program, most notably, a substantial shortfall in the post-closure fund. On February 29, 2008 Lakeside submitted a revised financial assurance plan. This plan incorporates major changes including: 1) purchase of an annuity, and 2) assumes a July 1, 2009 date for cessation of waste acceptance as prescribed in the closure permit. DEQ is currently reviewing the revised plan to determine if Lakeside has adequately addressed the post-closure fund deficit and other issues of concern.

### **Remedial Investigation**

Lakeside currently is performing a remedial investigation to evaluate the nature and extent of human health and environmental impacts. This investigation includes: 1) locating and evaluating the vulnerability of domestic and irrigation wells in the area, 2) determining the concentration

and rate of contaminant migration into the Tualatin River, 3) evaluating impacts to aquatic biota in Tualatin River (benthic survey), 4) determining the effectiveness of the landfill cover. DEQ has determined that the benthic survey portion is inconclusive and that contaminant levels in compliance wells near the Tualatin River exceed a number of ecological screening values and ambient water quality criteria (AWQC) established for protection of aquatic organisms. In addition, DEQ has identified data gaps in the RI related to: 1) contaminant loading to the Tualatin River, 2) compliance with the River's established TMDLs, and 3) landfill releases that may impact Lakeside' irrigation ponds and the adjacent, unnamed creek.

Because of these environmental concerns, DEQ is requiring Lakeside to conduct a feasibility study to evaluate options for controlling or treating groundwater contamination.

### **Environmental Monitoring**

Lakeside landfill has a groundwater monitoring network consisting of six (6) compliance wells and an up-gradient background well. These wells are sampled on a quarterly basis for a comprehensive list of leachate indicator parameters and specific compounds targeted under the remedial investigation. The general parameter groups include: field indicator parameters, laboratory indicator parameters, common anions and cations, trace metals, volatile organic constituents, semi volatile organic constituents, mercury, cyanide, nitrite and various surface water and leachate including total nitrogen, phosphorous, BOD, total halogenated organics, total coliform, fecal coliform, and enterococcus bacteria.

In addition, Lakeside is conducting landfill gas monitoring at four (4) deep gas probes installed within the landfill footprint and six (6) shallow cover probes that were installed as part of the cover system evaluation. Initially these probes were monitored on a biweekly schedule as outlined in Lakeside's DEQ-approved workplan. After four monitoring events the frequency was reduced to monthly monitoring. As previously discussed, high concentrations of methane have been detected inside the landfill itself, but to date, the gas pressures have been extremely low. DEQ conducted methane testing at many of the neighboring properties to determine if methane was migrating off site. DEQ did not detect any methane on the properties tested. Nevertheless, DEQ believes that a more comprehensive gas monitoring program is necessary at Lakeside landfill to augment previous testing and confirm that landfill gas is not migrating toward onsite or off-site structures.

### **Summary of Proposed Permit**

The closure permit contains many substantive changes designed to reduce the potential for future environmental impacts, including the following new requirements and conditions.

- Cessation of waste acceptance at Lakeside by July 1, 2009
- Increased restriction on the types of waste that Lakeside can accept
- Detailed waste screening and acceptance procedures
- Improved management of on-site material stockpiles
- Improved health and safety procedures
- Expanded groundwater and landfill gas monitoring program, including installation of perimeter gas monitoring probes and an additional groundwater monitoring well.

- Leachate monitoring (collection lysimeters)
- Improved methods for installation and maintenance of the tree cover system
- A fully funded financial assurance program

DEQ provided opportunity for public comment from November 29, 2007 through January 15, 2008. DEQ held a public hearing on January 8, 2008. 29 people provided oral comments and numerous people submitted written comments on the draft permit and remedial investigation. DEQ has prepared a hearings officer report and response to comments received.