

Memo



State of Oregon
Department of
Environmental
Quality

To: Lissa Druback, Manager, Solid Waste, Eastern Region
Bob Schwarz, Project Manager, Eastern Region

From: Tim Spencer

Date: Feb. 20, 2014

Subject: Investigation of Riverbend Landfill leachate spill of Feb. 9-10, 2014

Background.

In recent years Module 8 area has been a significant odor source at the landfill. Waste Management has enhanced the Landfill gas collection system to reduce odor emissions. However, many of the extraction wells have watered in because of leachate and landfill-gas-condensate accumulation within Module 8. During the past two years WM has pumped select gas extraction wells to remove those excess fluids. The leachate is stored in three onsite portable holding tanks each with a capacity of 21,000 gallons and hauled to an off-site wastewater treatment plant for treatment. The Module 8 leachate/condensate mix is managed separately from other site leachate sources because it is more concentrated than typical site leachate.

A significant snowstorm affected this region of Oregon from the evening of Thursday February 7th until the morning of Monday, February 10th and hampered local and regional travel during this timeframe.

Summary of Spill Incident.

WM provided the following summary of the chain of events preceding and following the spill incident.

- 1) **Friday, February 7**, the haul trucks provided by WM's leachate treatment contractor, Bravo, could not access the Landfill to haul away the leachate storage tanks. In response WM's site manager decided it was necessary to shutdown operation of the pump-out system for the Module 8 gas extraction wells to prevent overtopping of the leachate holding tanks.
- 2) **Saturday, February 8**, highways impassible to large trucks due to snow and ice, no leachate hauling possible. WM personnel inspected the Module 8 gas-well pump-out system and did not observe any leachate discharges from Module 8 to the environment.
- 3) **Sunday, February 9**, no leachate hauling due to snow and ice. At 6:00 pm WM personnel inspected the Module 8 gas-well pump-out system and observed no discharge of leachate to the environment.
- 4) **Monday, February 10**, at 7:00am, WM personnel observed a leachate discharge from Module 8 that had overtopped the perimeter landfill berm and appeared to be pooling in a swale below and north of the berm. WM had a vactor-truck onsite and began to recover spilled leachate that had pooled north of the landfill berm. When WM personnel realized that the spill had reached McPhillips Creek they expanded vactor-truck collection efforts further north-northeast of the landfill perimeter and constructed soil berms and sumps at two locations along the spill flow-path to contain the spill and limit discharges to the creek. By 8:00 am, Monday February 10th, WM had stopped all leachate leakage from the Module 8 seep area.

At approximately 3:45 pm, WM's consultants, SCS Engineers, sampled McPhillips Creek. They obtained one sample upstream and one downstream of the spill discharge into the creek.

- 5) **Tuesday, February 11**, WM used a vactor-truck all day to mop up and collect residual fluids from along the spill flow path.
- 6) **Wednesday, February 12**, WM consultants, CH2M HILL, conducted a field assessment of the leachate spill incident. WM connected the Module 8 gas well pump-out system to the main onsite leachate lagoon.

DEQ Field Investigation.

DEQ inspectors arrived at the Riverbend Landfill site at approximately 11:20 pm on February 12, 2014 and departed the site at approximately 2:00 pm on February 12, 2014. The purpose of our site visit was to investigate a reported spill of landfill leachate that occurred along the north side of the landfill involving the landfill area known as Module 8. Upon arrival at the site DEQ Inspectors met with Waste Management representatives Jeff O' Leary and Larry Pierce at the landfill office and they provided a briefing about the spill incident. Jeff O'Leary is WM's environmental compliance specialist for Riverbend Landfill and Larry Pierce is WM's district manager for Riverbend Landfill.

By February 12, 2014 the snow cover at the site was completely gone. During DEQ's investigation the weather was moderate and did not constrain our access to any locations of interest at the landfill site. Specifically, it was cloudy, with slight intermittent drizzle, and temperatures in the high 40s (Fahrenheit).

DEQ staff took photos of any significant features that appeared related to or potentially affected by the spill. Following is a brief step-by-step summary of DEQ's field investigation:

- After WM's initial briefing Jeff O'Leary accompanied DEQ staff during the entire field investigation. First, we drove to the Module 8 area to inspect the leachate spill source area.
- We inspected the leachate seep source area, the leachate storage tanks, and other Module 8 infrastructure. Several important environmental-control features are located in this immediate area including landfill gas control system piping and the leachate collection system sump riser for Module 8.
- From the perimeter landfill road we observed the reported flow path of the leachate spill where it overtopped the Module 8 perimeter berm and followed gently sloping terrain in a north-northeast direction, toward McPhillips Creek.
- We walked along the reported flow path of the leachate spill to look for any visible signs of environmental impact between Module 8 and McPhillips Creek.
- We observed the stormwater discharge into McPhillips Creek to look for visible signs of environmental impacts and any signs of scouring or erosion that would suggest high flows associated with a large spill event.
- We then proceeded eastward on foot, toward the easternmost boundary of the landfill, near the large litter fence, to observe additional downstream points along McPhillips Creek and to inspect the confluence of the creek and the Yamhill River (if visible through the dense stream-side vegetation).
- After observing the apparent confluence of the two streams (a large backwater area) we returned to the eastern edge of the landfill and walked along the perimeter access road back to the spill source area at Module 8.

- We observed the spill source area again, returned to the Riverbend Landfill office and, after a brief conversation with Jeff O'Leary, departed the landfill site.

Findings and Conclusions.

During the field investigation DEQ staff did not observe any visible or olfactory signs of leachate or leachate related impacts along the spill flow path between the landfill and McPhillips Creek or in the creek itself. In addition, DEQ staff did not observe signs of scouring or erosion along the spill flow path to the creek. The creek flow was high and muddy due to significant sediment load. Photos # 8 through # 22 show conditions along the overland flow path of the spill and within McPhillips Creek on February 12, 2014, two days after the leachate spill.

At the time of DEQ's site visit leachate seeps in the spill source area had an estimated flow rate of about 5 gallons per minute. Leading up to and during the spill the seep flow rate may have been higher because the gas well pump-out system had been turned off in response to the adverse weather and road conditions. WM restored the operation of the leachate pump-out system on Monday, February 10th. Attached Photos # 3 and 4 show the leachate holding tanks; Photos # 5, 6, and 7 show the leachate seepage area, the source of the leachate spill. The leachate seep area and ponded leachate were anaerobic and extremely odorous.

At this point, WM is uncertain about how much leachate discharged from the landfill, entered the creek, infiltrated into soils and groundwater, or was recovered by WM personnel. WM is developing estimates of these quantities. It is likely that the snow and ice cover influenced the spill's fate and transport downstream of the landfill perimeter.

Although the influence on this spill incident of the February- 2014 snow storm and the snow and ice-covered roads is clear, WM's site-wide approach to leachate-management and other factors contributed to this event and are problematic in other ways:

- WM has completed final closure on a relatively small portion of the total landfill footprint. The "close as you go" approach to site development is an effective way of minimizing leachate generation. Delaying final capping as WM has done can lead to excessive leachate generation, a saturated waste mass, increased odors, flooding of gas wells, poor gas-well performance, and leachate seeps .
- Construction activities at the site led WM to remove the intermediate geomembrane cover from a 4-5 acre portion of Module 8, further exacerbating the leachate-related problems cited above.
- Reliance on gas wells for removal of the excessive leachate led to greater mixing of gas-condensate and leachate and to a more concentrated form of leachate that requires special handling and treatment.
- WM did not tie in the large capacity of the on-site lagoon as backup storage before the spill, a step that could have prevented the incident. This was not done because of concerns about the leachate-condensate mixture in Module 8 which has elevated concentrations of some contaminants, including arsenic. WM is concerned that the Module 8 mixture may taint the other leachate and limit available options for its treatment and disposal.

Attachment

Photos



Photo # 1: View of Module 8 looking southeast from the administrative office area. Spill occurred near the green leachate storage tanks in the distance. Plastic tarps have been removed from this area in the last year to allow for construction of the north access road and relocation of waste to accommodate design slopes associated with the MSE berm.



Photo #2: Construction of new access road through part of Module 8, located directly up-slope of the leachate seep area.



Photo # 3: Leachate holding tank (one of three 21,000 gallon tanks)



Photo # 4: Three leachate holding tanks with combined capacity of 63,000 gallons.



Photo # 5: Module 8 leachate seep area (to the right of the yellow bollards) – source of the leachate spill.



Photo # 6: Leachate seeps and ponded leachate – source of the leachate spill.



Photo # 7: Leachate seeps around Module 8 sloped riser for main leachate collection system. Ponded leachate in the foreground.



Photo # 8: Toe of Module 8 landfill berm where spill occurred



Photo # 9: Heading north-northeast along the leachate spill flow path (the natural drainage route) toward McPhillips Creek.



Photo # 10: Wet area along spill flow path, approximately 200 feet northeast of the landfill perimeter. No visible signs of leachate noted in this area.



Photo # 11: Additional view of standing water approximately 200-feet north-northeast of the landfill.



Photo # 12: View of landfill looking southwest and standing water along the spill flow path.



Photo # 13: Bermed sump area constructed by WM to contain and collect leachate upstream of McPhillips Creek. Muddy water present but no visible or olfactory evidence of leachate noted.



Photo # 14: McPhillips Creek at Leachate discharge location.



Photo # 15: McPhillips Creek, just downstream of leachate discharge point.



Photo # 16: McPhillips Creek, Leachate discharge location. The smaller channel in the foreground was the spill flowpath.



Photo # 17: Leachate flow path to McPhillips Creek depicted in photo # 16. Flow occurred within this narrow defined channel near the creek, in contrast to the more diffuse drainage conditions near the landfill.



Photo # 18: Another view of the leachate flow path (stormwater drainage channel) near the creek.



Photo # 19: Leachate flow-path looking southwest, back at the landfill.



Photo # 20: View of McPhillips Creek downstream of the spill area. Note foam deposited on organic debris-s snag in the creek.



Photo # 21: McPhillips Creek downstream of landfill. Note high creek levels and small foam deposit on debris snag.



Photo # 22: McPhillips Creek , back-water area at the creek - Yamhill River confluence. Fine organic layer built up behind debris snag. No visible evidence of leachate noted.