State of Oregon
Department of Environmental Quality Memorandum

Date: Jan. 16, 2013

To: Environmental Quality Commission

From: Dick Pedersen, Director

Subject: Agenda item B, Informational item: Key issues at Riverbend Landfill
Jan. 22, 2013, EQC special meeting

Why this is important

DEQ is currently considering an application to build a mechanically stabilized earthen berm at the Riverbend Landfill. The berm would provide additional landfill space. Neighbors of the landfill have expressed concern about the proposed berm and other actions at Riverbend Landfill. In December 2012, the commission requested that DEQ provide an informational item about the key issues at Riverbend Landfill prior to making any decision on the berm application.

Background and other information

Riverbend Landfill is a solid waste landfill located approximately three miles southwest of McMinnville, on Highway 18. The landfill receives municipal solid waste, industrial waste and commercial waste for disposal. It also operates a recycling center at the site. The waste comes from both inside and outside Yamhill County.

Riverbend Landfill was originally sited and approved by Yamhill County in 1982 and has expanded since that time. Its permitted capacity is approximately 13,300,000 cubic yards of waste under the current DEQ solid waste permit. Under that permit, the landfill is expected to reach capacity in 2014. The landfill owner, Waste Management, has applied for an expansion involving a mechanically stabilized earthen berm along the west side of the landfill. The berm is an earth structure reinforced with layers of plastic geogrid, which is a plastic sheet with openings used to reinforce soil structures. This berm would be a maximum of 40 feet high, with a steep outer face. It would allow an additional one million cubic yards of disposal capacity, equal to about two years of landfill life. The area of the landfill, currently 84 acres, would increase by four acres as a result of the new berm.

Seismic design

Opponents of the landfill are concerned about the effect of an earthquake on the landfill. Neighbors have raised questions about the adequacy of the seismic analysis of the berm's design, and noted that other agencies require designs based on a magnitude 9.0 earthquake.

Earthquake magnitude is one of several factors that DEQ must consider regarding the design of the berm. Based on research and findings from the agency's seismic consultant, DEQ is currently considering allowing a berm design based on a magnitude 8.5 earthquake. The 8.5 value was calculated using the federal regulations for seismic analysis for landfills, and based on the most recent available data on seismic events throughout the world, as well as specific Cascadia Subduction Zone research.

Because the initial assessment was conducted more than two years ago, DEQ requested that Waste Management's consultant provide an updated evaluation that takes into account the most recent seismic data, including the recent earthquakes in Chile and Japan. Based on review of this work, including this most recent update, DEQ's seismic consultant recommends approval of the design based on this site-specific seismic assessment.

To address the concern about earthquake magnitude used in its assessments, DEQ contacted DOGAMI, the Oregon Department of Geologic and Mining Industries and the State of Oregon's lead agency for earthquake information, and requested a written opinion regarding magnitude specifications. On Jan. 16, 2013, DOGAMI provided a written response, seen here as attachment A, recommending that DEQ consider a magnitude 9.0 Cascadia Subduction Zone earthquake for any proposed changes to the site. As this is new information, DEQ will assess how this information affects the seismic analysis already completed at the site.

Liquefaction

Certain soils, especially loose, sandy soils, can actually flow during earthquakes, causing significant damage to structures supported by them. Most of the soil underlying Riverbend Landfill is clay or silt and not prone to liquefaction. While there are some sand layers, field tests indicate the sand at the landfill site is quite dense. Given the limited amount of sandy soil and its density, DEQ's seismic consultant concludes that the amount of liquefaction would be limited and would not result in damage of the berm or the rest of the landfill during an earthquake.

Other key issues

In addition to the background information noted above, DEQ researched several direct inquiries from the commission and points raised by people opposed to the proposed berm at Riverbend Landfill. These other issues are presented here with the understanding that DEQ staff may not have sufficient time to provide a full update on these matters during the Jan. 22, 2013, special meeting.

Is the landfill in the floodplain?
Until recently, FEMA flood insurance maps showed the floodplain and floodway boundaries passing through the landfill. Waste Management maintained that the maps were incorrect. In May 2012, the company submitted an application to FEMA requesting a revision to these maps. Based on the technical information provided in that application, FEMA made these revisions in December 2012. The current maps show that the landfill is not within the floodplain or floodway.

Soil excavation in the floodplain
Waste Management was excavating soil on the Riverbend Landfill property for use at the landfill. The soil excavation areas are south of the landfill and are within the floodplain. People have expressed concern that this is in violation of the floodplain development permit issued by Yamhill County. DEQ defers to the county on this point, as DEQ neither permits nor prohibits excavation of soil in a floodplain. However, DEQ does require proper erosion and sediment control measures during excavation, whether in a floodplain or not. The facility's soil erosion and sediment control plan is part of its stormwater permit. The area is subject to soil runoff to the Yamhill River after flood events; however, inspections of these areas after flood events have not shown signs of significant erosion.

To note, Waste Management has stopped excavation, and has also stopped some erosion control measures in response to concerns about potential archeological resources in its excavation area. DEQ has spoken with the State Historic Preservation Office, which confirmed that ground disturbance, including replacement of topsoil, is prohibited under state statute until the issue of archeological resources is resolved.

Potential for migration of the South Yamhill River
McMinnville residents have expressed a concern that soil excavation in the floodplain and floodway could result in migration of the South Yamhill River. DEQ has not evaluated this issue in detail. Waste Management plans to conduct more extensive soil excavation closer to the river and, at the same time, create wetlands to improve the site's ecological habitat. Before doing so, the company must first obtain permits from the U.S. Army Corps of Engineers and the Oregon Department of State Lands. DEQ intends to discuss the issue of channel change with those agencies at that time.

Nuisance odors
OAR 340-208-0310(1) lists seven factors that DEQ may consider in determining whether odors at a permitted facility are creating a nuisance. Waste Management has implemented odor abatement measures at Riverbend Landfill and meets DEQ's air quality permit requirements for reducing odors.

These actions fall under OAR 340-208-0310(1)(g), the source's ability to prevent or avoid harm.

In addition, the best management practices in Waste Management's permit related to reduction of odors currently meet the odor abatement standards under the federal New Source Performance Standards for Landfills. Due to these practices and actions taken, DEQ does not intend to declare the Riverbend Landfill a nuisance. DEQ will continue to investigate other possible odor abatement options for the site.

Property devaluation
Chair Blosser requested that DEQ look into the neighbors' concern that the presence of the landfill results in devaluation of neighboring properties. We have not evaluated this, though we have contacted Yamhill County to assess the availability of this type of information.

DEQ does enforce regulatory and permit requirements related to offsite impacts. DEQ is committed to maintaining a discussion with the landfill and its neighbors by phone, email and at public meetings to find ways that the landfill can go beyond permit-specific requirements to address neighbors' concerns.

Public outreach

DEQ is in frequent communication with Waste Management and concerned neighbors and attends most of the monthly public meetings held by Waste Management. In response to requests by the public, DEQ created a Riverbend Landfill-specific web page where people can view key documents and other information: http://www.deq.state.or.us/nwr/RiverbendLandfill.htm.

Next steps and commission involvement

There is no request for commission action at this time. DEQ anticipates making a decision on whether to approve the proposed berm after further study and evaluation is complete.

Attachments

A. Letter to DEQ from DOGAMI, Jan. 16, 2013

Approved:

Division: Linda Hayes-Doman

Report prepared by: Bob Schwarz

Oregon
John A. Kitzhaber, MD, Governor

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January 16, 2013

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RE: DOGAMI Opinion on Seismic Design for Riverbend Landfill Expansion

Dear Mr. Schwarz:

You recently asked for a "**written opinion from DOGAMI as to whether a magnitude 9.0 earthquake should be considered in designs for expansions to this landfill" (Riverbend).**" First let me state that DOGAMI expert staff have not conducted an in-depth review of the landfill expansion permit application or the several site specific geotechnical reports that have been generated nor do we have authority to direct Department of Environmental Quality's permitting process. DOGAMI expert staff has discussed the site and the seismic hazard issues with DEQ permitting staff and management. We recommend that DEQ consider in designs for expansion to this landfill the magnitude 9.0 Cascadia Subduction Zone earthquake.

We base our recommendation on several lines of thought:

1. It is the consensus of the scientific community that the Cascadia Subduction Zone has generated magnitude 9.0 earthquakes in the past, as recently as 313 years ago and that such an earthquake will probably cause damaging ground shaking as far inland as the Portland and the Willamette Valley, Vancouver and Seattle. (*Penrose Conference 2000: Great Cascadia Earthquake Tricentennial, DOGAMI SP 33, 2000*)
2. DOGAMI geoscientists use the magnitude 9.0 Cascadia Subduction Zone earthquake as the basis for earthquake and tsunami research.
3. The Oregon Resilience Plan for Cascadia Earthquakes currently being finalized by the Oregon State Seismic Policy Advisory Commission for the legislature is based on a magnitude 9.0 earthquake.
4. Magnitude 9.0 earthquakes, together with a range of other possible earthquakes, are included in the current U.S. Geological Survey probabilistic seismic hazard maps,

that are used in building design in Oregon. The probability for a magnitude 9.0 earthquake has been increased in the next generation of hazard maps due to be released in 2013.

5. It is DOGAMI's understanding that the state-of-practice in seismic engineering design of major structures in Oregon includes a magnitude 9.0 Cascadia earthquake. As an example, Oregon Department of Transportation's newer major bridges consider magnitude 9.0 earthquakes in their design and construction.

Regards,

Vicki S. McConnell, Ph.D., R.G.
Oregon State Geologist
DOGAMI Director

Cc:

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Andree Pollock, DOGAMI Assistant Director
Ian Madin, DOGAMI Chief Scientist
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