



Closed Landfills Pose Limited Risk to Ground Water, But Need Monitoring

at a glance

Although the Department of Environmental Protection has assessed the ground water contamination risks posed by older closed unlined landfills as being generally low, the full extent of this risk is unknown. The department indicates that its current resources are adequate to address the risks posed by unlined closed landfills. As resources allow, the department needs to investigate the sites for potential ground water problems.

Purpose

In accordance with state law, this progress report informs the Legislature of actions taken by the Department of Environmental Protection (DEP) in response to prior OPPAGA reports.^{1,2} This report presents our assessment of the extent to which the department has addressed the findings and

recommendations included in our previous reports.

Background

Currently, 254 landfills operate in Florida to handle solid waste.³ These modern landfills must comply with several regulations designed to safeguard public health and prevent contamination of ground water. For example, the landfills must have barriers between the solid waste and ground water to prevent leachate from flowing into ground water.⁴ Landfills must also operate monitoring wells to detect whether ground water contamination is occurring.

However, there are approximately 410 older, closed landfills in Florida that were operated without these safeguards.⁵ This is

¹ Section 11.45(7)(f), F.S.

² OPPAGA has published two previous reports on solid waste management, *Review of Solid Waste Management Landfill Regulations*, OPPAGA [Report No. 96-04](#), September 9, 1996, and the *Performance Audit of the Solid Waste Program Administered by the Department of Environmental Protection*, Report No. 11198, April 5, 1989.

³ These landfills include municipal, construction and demolition disposal, and land clearing disposal landfills.

⁴ Leachate is liquid that has passed through or emerged from solid waste and may contain soluble, suspended or miscible materials.

⁵ Landfills constructed or expanded after December 1985 must meet standards that require liners.

a concern because virtually all landfills in Florida are located over potable water aquifers. Florida's current population is over 15 million people, and is projected to increase to approximately 18 million by the year 2010, resulting in an increased demand for high quality water. Over 90% of Florida's residents rely on ground water for their drinking water.

The Solid Waste Management Section at the Department of Environmental Protection implements the state's solid waste program. The department's six district offices issue permits to landfills and monitor landfill operations to enforce compliance with regulatory requirements. Also, landfills constructed or expanded after January 1993 must sample and analyze ground water quality semi-annually and provide results to the department for review.

Prior Findings

Our previous reports found that while landfill regulation and department enforcement actions generally had improved over time, there has been a continuing problem with the reliability of ground water quality monitoring data provided by landfill facilities. We recommended that the department develop a stronger system of controls to assess handling, processing, and reporting ground water samples from monitoring wells.

However, we also reported that closed unlined landfills pose a continuing threat to ground water. We recommended that the department develop a predictive model for targeting which closed unlined landfills could pose a risk to ground water and public water supplies.

Current Status

Laboratory evaluations find some deficiencies

As we recommended, the department has begun to conduct field-sampling evaluations of certified laboratories that test ground water samples submitted by landfills.⁶ These evaluations are intended primarily to be instructive and should help improve the quality of sampling techniques and water quality data submitted to the department. While not considered to be an enforcement action by the department, these field evaluations were requested by district staff due to concerns about field-sampling techniques at certain facilities (in some cases, the laboratories also requested the evaluations to ensure that their procedures were correct).

As of May 2000, the department had conducted 16 field-sampling evaluations. Summaries of the department's evaluations indicate that staff found various sampling and procedural deficiencies that could affect sample results. Department staff indicated that all deficiencies were corrected.

District survey concluded closed landfills pose limited risk

The department has not implemented our recommendation to develop a predictive model for targeting the closed unlined landfills that pose a risk to ground water. Instead, the department indicated that it would continue to prioritize the use of its resources in favor of its permitting and compliance activities for active landfills.

⁶ There are approximately 200 laboratories in the state that are certified for sampling and testing for environmental purposes.

To determine the extent that the unlined landfills posed a threat of ground water contamination, we asked the department for additional information on 115 closed unlined landfills that had unknown ground water status.

The department surveyed its districts to answer the questions below.

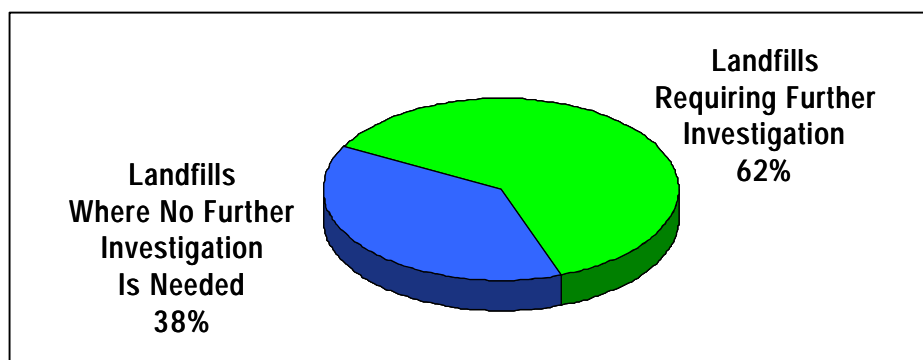
- Have the unlined landfills ever been tested for ground water contamination?
- Were district staff aware of ground water contamination problems at the landfills?
- Did district staff believe that additional ground water investigations were needed?

District staff reported that while no known ground water contamination problems existed at this time, 71 of the landfills were of continuing concern. Ground water testing had been conducted at 20 of the landfills, of which 10 (50% of those tested) had known problems. The districts have conducted contamination assessments at eight of these sites. The department indicated that as time and resources allowed it would conduct further investigations.

The department asserts that it would not be cost-effective to conduct ground water testing at closed landfills

The department asserted that the closed landfills posed relatively low risks for ground water contamination. This assessment was based on department staff knowledge of the sites and information from local governments and citizens. The department also asserted that that the costs to test for possible ground water contamination at these sites would not be cost-effective given this perceived low risk. The department estimated that the first-year cost to test ground water at these landfills would range from \$11,840 to \$17,340 per site. The estimated cost to conduct ground water testing at each of the 71 closed landfills that the department indicated were of continuing concern would thus range from \$840,640 to \$1,231,140. Testing in subsequent years testing would be less expensive since well construction would have already occurred.

Exhibit 1
Of the 115 Landfills Reviewed, 71 Need Further Investigation



Source: OPPAGA analysis of DEP survey data.

Progress Report

The department indicates that the closed landfills in Florida are remotely located, and contamination consists of very low concentrations of pollutants that will normally degrade over time. The department asserted that such contamination is usually best handled by natural attenuation with long-term monitoring.

Although the department assessed the potential risks at older unlined landfills as low, we believe that it should continue monitoring the sites for any changes that would indicate that the risk of ground water contamination is higher than now estimated. It is expensive to clean up ground water contamination after it has occurred at a landfill site. In Florida, the cost to cleanup the worst case Superfund landfills or hazardous waste landfills has ranged from \$0.3 million to \$9.9 million. Although the department believes that the pollution problems that could occur at the Florida sites are substantially lower than those found at Superfund sites and would likely have lower cleanup costs, it should seek to avoid such problems through long-term monitoring of the sites.

In the event that serious ground water contamination situations occur, such as those affecting potable water wells, and the department determines that the problem originates from these landfills, the department would locate the landfill owner and require the owner to take corrective action. However, if the owner cannot be located, the department would begin taking actions to remediate the pollution.

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