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State of North Carolina  
 Department of Environment, Health, and Natural Resources  
 Division of Solid Waste Management  
 P.O. Box 27687 · Raleigh, North Carolina 27611-7687

James G. Martin, Governor  
 William W. Cobey, Jr., Secretary

William L. Meyer  
 Director

September 12, 1989

Mr. Ernest Perry  
 Alamance County Health Department  
 209 N. Graham-Hopedale Road  
 Burlington, N.C. 27215

Re: Well Completion Records for the Alamance County Landfill  
 (Permit #01-01)

Dear Mr. Perry,

Our office has received Well Completion Records for four monitoring wells recently installed at the Alamance County Landfill. Upon reviewing these records, we found that the monitoring wells were not constructed according to the design specifications required by our office. Three of the wells were not constructed in a manner consistent with the recommendations of the June 1, 1988, letter from our office, or in a manner conforming to the specifications of the "North Carolina Water Quality Monitoring Guidance Document For Solid Waste Facilities".

It is of critical importance that all monitoring wells be constructed in accordance with the approved specific monitoring well construction requirements found in the "Guidance Document". Our office generally requires that owner/operators of sanitary landfill facilities submit a "ground-water monitoring plan" to us for approval prior to well installation. This enables our staff to evaluate the monitoring plan and make modifications if they are needed. This procedure eliminates potential problems such as those that appear to have occurred at your facility.

If the Well Construction Records submitted to our office are correct, monitoring wells MW-2, MW-3, and MW-4 are not constructed in a manner that is approved for ground-water monitoring purposes. The wells constructed do not meet our design criteria for the following reasons:

1. The shallow well, MW-3, does not have a bentonite seal.
2. The deep wells, MW-2 and MW-4, do not have bentonite seals, **and** these wells are not completely cased. The deep wells should have been cased for the full length of the well, and screens, gravel packs, and bentonite seals installed as per The Typical Ground-water Monitoring Well Schematic on page 2 of the "North Carolina Water Quality Monitoring Guidance Document For Solid Waste Facilities." Proper placement of the screens is also of critical importance.

The lack of a bentonite seal in these wells may allow the migration of contaminants to the sampling zone from the surface or intermediate zones or allow cross contamination between strata. There is also the possibility of contamination from the grout itself. This raises the pH, which changes the ground-water chemistry, which changes the way metals and certain organic constituents react and move in the ground-water.

The lack of completely cased boreholes in the deep wells introduces a host of potential problems. In addition to the difficulties associated with the lack of a bentonite seal, it is difficult to sample the well. Contamination may enter from any part of the well, making it impossible to determine where the contamination is migrating from. Dilution and volatilization of the contaminants is also possible. If contamination is present, the open well provides an channel for the rapid spread of contamination to other zones, particularly deeper fracture zones.

Wells MW-2 , WM-3, and MW-4, as constructed, are **not** suitable for ground-water monitoring purposes. Even more importantly, wells MW-2 and MW-4 may provide a path for rapid migration of contaminants. Therefore, our office recommends that these wells be immediately abandoned according to approved well abandonment procedures (refer to NCAC T15: 02C .0113, except that wells should not be chlorinated).

The location and design of replacement wells should be approved by our office prior to well installation. If you have any questions or comments, please contact our office at (919) 733-0692.

Sincerely,

*Bobby Lutfy*

Bobby Lutfy  
Hydrogeological Technician  
Solid Waste Section  
Solid Waste Management Division

cc: Jim Coffey  
Terry Waddell

Attachments