

General (HWP, GW)



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**CERTIFIED MAIL  
RETURN RECEIPT REQUESTED**

April 18, 2003

Mr. G. Pete Nanos, Interim Director  
Los Alamos National Laboratory  
P.O. Box 1663, Mail Stop A100  
Los Alamos, New Mexico 87545

Mr. Mat Johansen, Groundwater Program  
Compliance Manager  
DOE-OLASO  
Mail Stop A316  
Los Alamos, New Mexico 87544

**SUBJECT: WELL DESIGN AND CONSTRUCTION CONCERNS IN  
CHARACTERIZATION AND MONITORING WELLS AT LOS ALAMOS  
NATIONAL LABORATORY  
EPA ID# NM0890010515**

Dear Messrs. Nanos and Johansen:

The New Mexico Environment Department (NMED) takes this opportunity to express its concern that improper well construction may be affecting the quality of the groundwater data being obtained from several of the characterization and monitoring wells at the Los Alamos National Laboratory (LANL). As you know, proper well design and construction are essential for collecting representative samples of acceptable quality. NMED has discussed our concerns regarding well design and construction with LANL and the Department of Energy (the Permittees) numerous times over the past three years through letters, email correspondence, and in meetings and telephone conversations.

Our concerns regarding well design arise from the use of excessive filter pack and screen intervals in several wells. Construction concerns include stuck casing, unusable or bent screens, bentonite adjacent to screens, and tremie pipe or other materials left in the borehole. Well screens and filter packs should be designed to accurately sample the aquifer zone that the well is intended to sample, minimize the passage of formation materials into the well, and ensure sufficient structural integrity to prevent the collapse of the intake structure. Screen lengths in monitoring wells should be kept to the minimum length appropriate to intercept the targeted zone of saturation and eliminate the possibility of correspondence between separated zones of



13777

Messrs. Nanos and Johansen  
April 18, 2003  
Page 2

saturation.

NMED acknowledges the Permittees' recent efforts to improve well construction. Wells constructed since July 2002 were completed with filter pack and screen lengths that are acceptable to NMED. We note that well R-23 is an exception in that it was completed with an excessively long screened interval of 57 feet with 34 feet of filter pack above the screen. NMED and the Permittees discussed the issue of the screen's length at the time of well construction. Our understanding is that the Permittees were unwilling to shorten the screen length to NMED's specifications because of concerns about drawdown during the projected lifespan of the well. The intent of the well drilling program at LANL is to install RCRA-compliant (Resource Conservation and Recovery Act) wells that provide accurate and defensible characterization information and facilitate detection of any potential contaminants. Just as production wells are not particularly useful for detecting contaminants (in large part because of their long screened intervals and attendant enhanced dilution) monitoring wells with excessive screen lengths may also hinder contaminant detection. Data derived from well R-23 may therefore be suspect throughout the useful life of the well. Additionally, NMED is concerned about the top screen in R-16 that was isolated behind stuck drill casing. Potential contaminants at the top of the regional aquifer cannot be detected or monitored, and the data from the well for the Permittees' water table map cannot be reproduced.

Although recent well completions are generally acceptable, some lingering problems with several of the older wells remain. Screen 5 in well R-31 is an appropriate length of 10 feet, but the filter pack interval is excessive at 198 feet in length. The filter pack around the screened interval in the perched intermediate zone in R-12 may cross two separate zones of saturation. Screened intervals in wells R-15 and R-9 are also longer than necessary, each over 60 feet long. Again, NMED is concerned about the accuracy of samples obtained from long screened intervals. The concerns regarding well R-19 are described in the following paragraph.

LANL's recently published report, "Hydrologic Tests at Characterization Wells R-9i, R-13, R-19, R-22, and R-31" (LA-13987-MS), recommends that LANL avoid constructing wells with oversized filter packs, because "it is not only misleading but also counterproductive to have a 7-ft screen and a 100-ft filter pack (as at R-19, screen 6)." The report also notes, "oversized filter packs permit the mixing of water over long intervals. It is not possible to characterize the quality of water associated with a material behind a 7-ft screen if the water sample actually came from a bracketing 100-ft interval." NMED agrees with the report's recommendation and adds that there is an increased potential for adverse consequences, including poor data quality (e.g. pressure head and geochemical data) from improperly designed wells and cross-contamination between saturated zones.

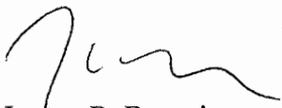
NMED believes that it is in the best interest of all parties that the wells constructed at LANL are

Messrs. Nanos and Johansen  
April 18, 2003  
Page 3

designed properly to ensure that cross-contamination between saturated zones does not occur and that groundwater data are reliable and accurate for monitoring, characterization, and contaminant detection. Wells that produce questionable data are not useful for characterization, compliance, or decision-making purposes. Further work, including the potential for replacement and plugging and abandonment of wells, may be required if NMED determines that cross-contamination is occurring in monitoring wells. Real-time communication between the Department of Energy, LANL, and NMED staff during well drilling and installation is essential to avoid costly additional work to fill data gaps and to eliminate problems arising from unintended connections between zones of saturation.

If you have any questions regarding these comments, please contact Carolyn Cooper of my staff at (505) 428-2539.

Sincerely,



James P. Bearzi  
Chief  
Hazardous Waste Bureau

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