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ENVIRONMENT DEPARTMENT  
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Gene Turner, OLASO  
AIP Point of Contact  
U.S. Department of Energy  
Los Alamos Area Office  
528 35th Street, MS A316  
Los Alamos, NM 87544

RE: Well-Head Protection Issues at Los Alamos National Laboratory, New Mexico TA-16418

Dear Mr. Turner:

The DOE Oversight Bureau has several concerns regarding the well-head management of many of the subsurface penetrations (boreholes, wells, etc.) at the Laboratory. Key concerns pertaining to well-head performance standards at Los Alamos National Laboratory were brought to our attention during the most recent round of EPA sampling during late October and November 2001. Please refer to the attached narrative regarding SHB-3 and SHB-4 for details. Acceptable well-head management practices and their importance can be found in **RCRA Groundwater Monitoring: Draft Technical Guidance (EPA/530-R-93-0021)**, Nov. 1992, and are outlined below:

- 1) Proper surface completion of wells, boreholes, etc. is meant to protect the well from accidental damage, to protect the well from vandalism, and to prevent groundwater contamination.
- 2) The surface seal (well pad) in above-ground well completions should be made of neat cement or concrete and should form at least a two-foot wide, four-inch thick apron at the land surface.
- 3) A protective casing should be installed around the well casing to prevent unauthorized entry into the well and to prevent vehicular damage. A utility vault or meter box (well housing) may also be warranted.
- 4) The protective casing should be fitted with a locking cap to provide security by preventing interference with the well or the introduction of foreign materials into the well.
- 5) Concrete or steel protective posts should be installed around the edge of the well apron to shield the well against accidental damage from facility traffic. These should be painted orange or fitted with reflectors.

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The Technical Guidance (EPA/530-R-93-0021) goes on to state that existing monitoring wells should be evaluated to see if they meet the performance standards outlined in 40 CFR Part 264 Subpart F, and that there are two situations specifically in which wells may not meet the performance standards: (1) where existing wells are physically damaged; and (2) where the owner/operator can produce little or no documentation of how the existing wells were designed and installed.

We recommend that the Laboratory perform a well-head (condition) assessment of all boreholes at the Laboratory, specifically boreholes with depths greater than 100 feet. The DOE Oversight Bureau believes that the issues mentioned above (i.e. damaged wells, potential threat to groundwater quality, integrity of chemical analysis results, physical hazards, etc.) far out-weigh the need to keep wells such as SHB-3 and SHB-4 on an active status. Therefore, it is recommended that the Laboratory video and neutron log the boreholes failing to meet EPA well-head protection guidelines as soon as possible and determine whether they can be used for any additional data-acquisition activities, such as cross-hole geophysics, tracer tests, etc. If the wells are deemed unusable, then plugging and abandoning may be warranted.

Thank you for your attention to this matter,



Steve Yanicak, LANL POC  
Natural Sciences Manager-2

SY:kpg

Enclosure

cc:    J. Parker, NMED, Chief, DOE Oversight Bureau  
      M. Johansen, DOE, OLASO, A316  
      S. Rea, LANL, Group Leader, ESH-18, MS K497

## Case Narrative

### SHB-3

In early October and prior to EPA sampling, Laboratory personnel recorded water level at approximately 650 feet and removed a transducer from SHB-3. We questioned them concerning the removal of the transducer and condition of the well, and they informed us that no problems occurred during the removal of the transducer. They did, however, note that the well cover was lying a number of feet off to the side of the concrete pad and that there was no locking cap on top of the protective surface casing. During the EPA sampling of SHB-3 on October 31, a water-level indicator probe was lowered down the well but encountered an obstruction at approximately 250 feet. Numerous attempts to move past the obstruction proved unsuccessful and a decision was made to forego sampling the well. It is assumed that sometime between early October and October 31 either one of two scenarios occurred: 1) that an object was dropped down the well causing the obstruction, confirming rumors we have heard of foreign objects making their way down the hole, or 2) the well casing collapsed. DOE OB personnel subsequently inspected the well on November 17, 2001. The following observations were made: 1) we used the construction entrance to access the well location and encountered no security checks prior to arriving at SHB-3, 2) there were numerous construction workers in the area, 3) there were no protective posts on the corners of the concrete well pad, 4) the well cover was not bolted to the pad and had no lock on the door (the door was secured shut by duct tape), and 5) there was a simple metal cover lying on top of the surface casing (not a locking cap). The specific DOE Oversight Bureau concerns with regards to SHB-3 are listed below:

- 1) The ease of accessibility to both the well site location and the well itself poses a potential threat to the water quality of the regional aquifer. In addition, we feel that the results of the chemical analysis of water sampled at SHB-3 could potentially be compromised due to the ease of access to the borehole. (Additional Information: Total cased depth is 860 feet, and the water encountered in the well is groundwater, although its exact relationship to the regional aquifer remains to be determined [Gardner et al. 1993, ER ID 12582]. While we know that the well was perforated, we can find no documentation of the perforation depths).
- 2) The lack of protective corner posts around the well pad increases the potential of damage to the well by construction personnel operating heavy equipment in the area.

### SHB-4

This well is located on the perimeter of the parking lot at TA-18, was drilled to a total depth of 200 feet, and completed with blank PVC. Saturation was encountered at a depth of 125 to 145 feet, however, it is our understanding that no standing water has ever been present in the borehole. Over the summer of 2001 the DOE Oversight Bureau observed that the protective surface casing was damaged (it appeared to have been hit by a vehicle), there was no well pad, no well covering and no locking cap (i.e., open to the environment). The well opening was covered with duct tape when we inspected the site on November 17, 2001. As with SHB-3, the condition of SHB-4 needs attention.