

General



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April 11, 2007

Mr. Gene Turner, DOE/AIP/POC  
Department of Energy  
Los Alamos Site Office, MS A316  
Los Alamos, NM 87545

**RE: REPORT REVIEW - NMED DOE Oversight Bureau Comments concerning LANL's  
*Groundwater Background Investigation Report, Revision 2, LA-UR-07-0755, February  
2007, EP2006-1078***

Dear Mr. Turner:

The New Mexico Environment Department DOE Oversight Bureau (DOE OB) is submitting its review comments addressing the *Groundwater Background Investigation Report, Revision 2, LA-UR-07-0755, February 2007, EP2006-1078*. These independent comments were forwarded to NMED's Hazardous Waste Bureau in March 2007 so that they would be considered as part of their review and reply to LANL. The Bureau's intention of submitting comments to HWB in advance of DOE stems from a concern by the Los Alamos Site Office that DOE receive one official response from NMED rather than many. Please also note that not all DOE OB comments were incorporated by HWB in their response to LANL.

The comments presented here are intended solely as recommendations or discussion points for DOE, LANL and NMED, not as an official NMED Regulatory Bureau response concerning legal requirements. The reader should be aware that this commentary is better suited to an audience having prior technical knowledge of LANL's Regional Aquifer monitoring program.

Please address any technical questions to Michael Dale in our White Rock office at 672-0449 ([mdale@lanl.gov](mailto:mdale@lanl.gov)). If you have any other questions please feel free to contact me at (505) 672-0448 ([syanicak@lanl.gov](mailto:syanicak@lanl.gov)).

Sincerely;

A handwritten signature in cursive script that reads "Stephen Yanicak".

Steve Yanicak  
POC/Manager

Enclosure



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Gms

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**SY/sy**

cc w/enclosure: **Mat Johansen, DOE LASO, MS A316**  
**Jean Dewart, LANL, ENV-ERS, MS M992**  
**Tom Skibitski, NMED, Bureau Chief, DOE OB**  
**Ralph Ford-Schmid, NMED, DOE OB**  
**John Young, NMED, HWB**  
**File, NMED DOE OB, White Rock/Santa Fe**

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**General Comments:**

Be aware of the elevated (9-11 ppb) dissolved Mn for single completion well R-21. For most single completion wells, the dissolved Mn is high during the first few sampling rounds but then gradually decreases to the 2 - 5 ppb level. Not the case at R-21.

The treatment of non-filtered data for the production wells as filtered may not be appropriate, especially for the trace elements.

Data for Doe Spring, as presented in the original report (Rev. 0), was not used in the Rev. 2. The problem is that this condition or change is not mentioned in Rev. 2 (see page 4). What is more confusing is that Doe Spring is referenced in later appendices in Rev. 2 such as Table A-1 and Table F-1.1-2. In Table F-1.1-2, Doe Spring is shown as "Perched Intermediate" but shouldn't it be "Regional" as documented in Rev. 0 (page 94).

On pages 2 and 27, Spring 9B is described as being a regional station but on Table F-1.1-2 the station is categorized as being "Perched Intermediate"?

Excluding the 1997 - 2000 data may not be appropriate, especially for many of the constituents of concern such as nitrate, chloride, bromide, boron, and sodium.

Tables A-1 and A-2 should be merged into one single table showing only the stations used for Rev 2.

Two of the most critical field parameters for evaluating/assessing (e.g., water quality, sample quality per the WSAR) hydrochemical data are dissolved oxygen and ORP. These data need to be included or state as to why they were not included.

Station identifications need to be consistent throughout the document, e.g., Cañon de Valle-5.0 Spring versus CDV-5.0 Spring or LAOI(A)-1.1 versus LAOI(a)-1.1.

It appears that many of the more important data qualifiers (e.g., quality control) are missing from the data tables.

Trend analyses on such a small data set may not be appropriate, especially when assessing data from background sampling points.

Samples, and associated data, for Ancho Spring collected in 2000 and 2001 (and prior to 2000) were derived from a pool located about 1000 feet upstream of the samples collected in 2005 and 2006. Samples collected in 2005 and 2006 were collected from a flowing discharge point along an outcrop of Puye. On page 28, the document states that Ancho Spring as discharging within the mouth of Ancho Canyon when in reality it

discharges about 3/4 mile up the canyon from the Rio Grande. The document also states that the spring discharges from basaltic rock of Chino Mesa (Totavi Lentil). They're partially correct in that the spring discharges from the Puye Fm or the Totavi Lentil as described by Griggs, 1964, **but not from Chino Mesa basalts.**

**Specific Comments:**

Page 4, first paragraph - Water Canyon was left out of the watersheds that were burned.

Page 9, first paragraph, last sentence - The document states that some springs (Spring 1 as an example) are probably artesian. What is this based on in terms of being artesian?

Page 12, *Geochemistry Element 1* - The primary "natural" recharge component for alluvial ground water is perennial surface water derived from perennial springs (e.g. Homestead and Water Canyon Gallery Springs) located in the mountain block and front areas of the Sierra de Los Valles.

Page 12, *Geochemistry Element 2*, first paragraph - The baseline cosmogenic or atmospheric derived tritium baseline for the Los Alamos area is higher than 17 pCi/L reported by Clark and Fritz 1997. In the Los Alamos area, 3H in the precipitation is probably in the 40 - 60 pCi/L range.

Page 12, *Geochemistry Element 2*, second paragraph, second sentence - The "regional aquifer" should be replaced with "perched aquifer" or "intermediate aquifer".

Page 12, *Geochemistry Element 2*, third paragraph, last sentence - For the statement "Uranium concentrations in the regional aquifer beneath the Pajarito Plateau rarely exceed 0.1 mg/L" - shouldn't this be "0.001 mg/L or 1 ppb?"

Page 14, 2.2.2.1, second paragraph - Both recharge and discharge occurs in the Sierra de Los Valles. Some fraction of subsurface inflow (recharge) in the Sierra de Los Valles discharges as springs within the mountain block itself, and some fraction of this spring water recharges to canyon-bottom alluvial.

Page 14, 2.2.2.1, second paragraph - Note that Ancho Spring, Spring 6, and Spring 9A have TDS values similar to the perched aquifers in the Sierra de Los Valles. This may suggest that these waters contain some "low TDS" recharge water from the nearby Frijoles Canyon and/or Water Canyon, mixing with regional ground-water flow from the west.

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Page 16, fourth paragraph, first sentence - Residence time and solute concentrations do not always increase with both depth and from west to east such as noted at Ancho Spring, Spring 6, Spring 9A.

Page 16, fourth paragraph, fourth sentence - The 4 Series and 3 Series Springs, perched water at R-10, Pine Rock Spring, and Spring 2B and probably others need to be added to the list of regional and intermediate stations that contain elevated 3H.

Page 19, 2.2.2.5, second paragraph, first sentence - With respect to source(s) of recharge, the use of "strongly suggest" and "most" may not be appropriate.

Page 19, 2.2.2.5, third paragraph - Contradiction in these statements with respect to tritium activities in the Sierra de Los Valles versus the White Rock Canyon Springs. For example, several of the 4 Series springs contain a lot more tritium than the Sierra de Los Valles springs.

Page 19, 2.2.2.5, fourth paragraph - Could the higher HCO<sub>3</sub> concentrations in the eastern portion of the Laboratory reflect calcite dissolution along the flow path, especially where regional ground water (undersaturated with respect to calcite) makes contact with the Santa Fe Group sediments that contain calcite? Exchange Mg for Ca?

Page 21, 3.1.2, first bullet - Note that Campsite and Barbara Springs located in the Sierra de Los Valles contain mostly submodern water with a small fraction of modern water as noted by the low 3H activities of 1 -3 pCi/L.

Page 21, 3.1.2, last bullet - Using the Well Screen Analysis Report as a criteria?????

Page 24, 3.2.1, first paragraph - Please double check that all data in Rev. 2 were derived from purging "three bore volumes". We contend that some were and some were not.

Page 24, 3.2.1, third paragraph - The samples were filtered "during" the sampling process, not immediately after collection. Filtering was performed via in-line filter through the sampling system.

Page 24, 3.2.1, fourth paragraph - Please explain how the use of ice at 4 degrees C reflects on preservation. It is our understanding that pre-preserved bottles were used for samples collected during 2000/2001 - 2006 period, not by dropwise addition of acid in the field.

Page 28, fourth paragraph - Sacred Spring was sampled at the pool from way back when through 1999. Data collected since about 2000 at Sacred Spring were from a small drainage containing flowing water located approximately 100 ft west of the pool. The water

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discharges from an area of about 30 feet in length along the channel and from upper Santa Fe Group sediments.

Page 75, Figure 4.6-1 - The Pine Spring data collected on June 2000, as shown on the plot, cannot be found in the Rev 2 or Rev 0 reports nor from the WQDB. Where do these data reside?