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**John Hopkins**

**From:** Patrick Longmire [plongmire@lanl.gov]  
**Sent:** Thursday, July 10, 2003 9:39 AM  
**To:** johnhopkins@lanl.gov; plongmire@lanl.gov  
**Subject:** Perched Zones and Geochemistry

email sent to Elizabeth Keating by Patrick Longmire on May 14, 2003:

Elizabeth:

I believe that in some situations, perched groundwater is continuous for certain distances beneath LA Canyon, Pueblo Canyon, Sandia Canyon, and Mortandad Canyon. My focus in the past 10 years has been on geochemistry of saturated zones in the wet canyons. This is based on similarities in aqueous chemistry, stable isotopes, and continued occurrences of mobile solutes. We do have chemical and moisture data collected from unsaturated core samples that show that there is not vertical saturated flow beneath the alluvium to the perched zones in Mortandad Canyon. We do not have enough wells to support or disprove the occurrence of continuous saturation in the Cerros del Rio basalt in Sandia Canyon and Mortandad Canyon. I am interested in looking at your write up for John Hopkins and to see what data you are using to base your ideas on. I appreciate the discussions. Thanks, Pat.

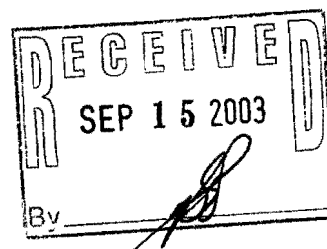
email sent to Elizabeth Keating by Patrick Longmire on May 14, 2003:

Elizabeth: I most definitely agree with you that there is a lack of data in most canyons regarding the continuity of perched zones. In Mortandad Canyon, Pueblo Canyon, and Los Alamos Canyon, however, there is evidence for this based on chemical data. Vertical recharge to the perched zones in the Cerros del Rio basalt in Mortandad Canyon is unlikely based on anion profiles and geometry of contaminant plumes in the Bandelier Tuff measured at MCOBT-4.4 and R-15. I have published these results in well completion reports for R-15, MCOBT-4.4, and R-9 and in geochemistry reports for R-15, R-9i-9, R-8, and in the work plan for Los Alamos Canyon and Pueblo Canyon. Please modify your language to include that "there is supporting data for Mortandad Canyon (Cerros del Rio basalts; MCOBT-4.4 and R-15), Pueblo Canyon (POI-4 and TW-1A), and Los Alamos Canyon (Guaje Pumice bed; LAOI-1.1, LADP-3, and R-7), however, more wells are needed to further define extent of saturation."

I was with DOE all day on Wednesday (05/14/03). Thanks, Pat.

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