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May 20, 2009

Ms. Yolande Norman, Project Manager  
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Office of Federal and State Materials and Environmental Management Programs  
U.S. Nuclear Regulatory Commission  
Mail Stop T-8F5  
11545 Rockville Pike  
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Subject: Church Rock, Source Materials License no. SUA-1475

Dear Yolande:

Per your request, this letter submits a listing of the technical impediments to eventual site closure at the Church Rock mill. These include a lack of consensus to acknowledge that certain cleanup objectives are unattainable due to background conditions and/or natural geochemical processes. In addition, there is inconsistency between the agencies' standards and a hesitation to act on appropriate revisions to the standards. As you will see, the impediments are few; however, if they are not suitably resolved, they will preclude attainment of remedial goals.

This is a strong statement. UNC believes it to be true based upon nearly two decades of remedial monitoring and careful scientific analysis that are contained in the attached references. In addition, UNC has evaluated several alternative remedial approaches to attempt to achieve the current cleanup objectives and has piloted some of them, to no avail. This is because the processes controlling the few remaining constituent concentrations (that are listed as impediments to achieving cleanup goals) will continue to operate regardless of the remedial technology used.

Please bear in mind that some of the impediments are straightforward while others are rather complex (grounded in statistics and/or geochemistry). It is our understanding that NRC intends to convene working sessions with all stakeholders to tackle these issues one-by-one until they are resolved. UNC supports this approach, and is eager to participate. We will make ourselves available to help the

other stakeholders understand and appreciate the nuances of each impediment as well as to carefully listen to the ideas that others may offer toward their resolution.

We look forward to hearing from you soon.

Sincerely

A handwritten signature in black ink that reads "Roy Blickwedel". The signature is written in a cursive style with a large, prominent initial "R".

Roy Blickwedel, P.G.  
Remedial Project Manager

enc.

cc: Mark Purcell  
Larry Bush  
Mark Jancin

## Technical Impediments to Site Closure

### Church Rock Mill Site, New Mexico

- I. Long-term monitoring data and basic geochemical considerations reveal some cleanup objectives to be unattainable. They are ALARA in NRC terminology, and they should be waived as cleanup goals, or revised as appropriate, by the other agencies (see NRC, 1996; EarthTech, May 2000; EarthTech, November 2002; and Chester Engineers, 2009). Examples include,  $\text{SO}_4^{2-}$ , Mn, TDS and Ra. UNC does not understand the ~10 years of EPA inaction on moving to waive or revise these parameters. The geochemical arguments are straightforward and compelling, and while all agencies appear to agree with the reasons, there has been no action by EPA to express its agreement.

In the case of  $\text{SO}_4^{2-}$  (and by extension TDS), many years of observation and geochemical analysis demonstrate unequivocally that these constituents cannot attain the stated goals, no matter what technologies are applied, because they are buffered by natural processes. Any sample of water from the region, whether impacted by tailings seepage or not, produces a water in equilibrium with the naturally-occurring mineral gypsum. As the NRC (1996) concluded, these constituents are not a good measure of remedial progress or compliance. To the extent that the cleanup objectives for these constituents remain unchanged, they will remain an impediment to achieving compliance, and they will unnecessarily complicate the SWSFS process that EPA has directed UNC to complete.

- II. EPA is considering applying the uranium MCL as a cleanup objective. This is inconsequential for Zone 1 and Zone 3; however, as in No. I. and II. above, it is inconsistent with the NRC GWPS and it is unattainable in the Southwest Alluvium. The full explanation for this is contained in (Blickwedel, March 2006). Rather than summarize it here, it is recommended that the original document be consulted. EPA's *Third Five-year Review Report* (September 2008) also discusses this issue, which incorporates some of UNC's August 2008 comments on the draft Third Five-year Review Report. Adoption of the NRC's GWPS for the uranium cleanup goal is the proper value to account for background uranium and its geochemical behavior in the Southwest Alluvium.
- III. The review of UNC's ACL application for nickel and TTHMs in Zone 1 (N.A. Water Systems, 2008) should not be suspended until the SWSFS is completed. The reasons cited for postponing the review do not appear compelling in light of the following observations:
  - The ACL's being sought represent the only two hazardous constituents that remain in non-compliance with existing standards at only two of the onsite POC wells for Zone 1.
  - No hazardous constituents exceed the GWPSs in Zone 1 anywhere outside of UNC -owned property that will be turned over to DOE when the license is transferred, nor are any future exceedances anticipated.
  - Groundwater quality has consistently remained stable or improved since the active remedial operations were discontinued in 1999.
  - An ACL for radium has been established in Zone 1 (see license amendment no. 37; NRC, 2006).

Delaying the review constitutes a missed opportunity for all stakeholders because application of the proposed ACLs will result in full compliance with NRC standards in Zone 1. The site became in full compliance with the NRC GWPSs in the Southwest Alluvium upon the acceptance of ACLs in the southwest Alluvium for Ra and TTHMs; and thus, approval of the Zone 1 ACL application for nickel and TTHMs would facilitate closure of both of these hydrostratigraphic units within the context of the NRC license requirements, and it would greatly simplify the SWSFS if EPA were to agree.

## References

- Blickwedel, R.S., March 2006, Regulatory Significance of the Occurrence and Distribution of Dissolved Uranium in Groundwaters of the Southwest Alluvium, Church Rock Site, New Mexico.
- Chester Engineers, January 2009, Annual Review Report – 2008, Groundwater Corrective Action, Church Rock Site, Church Rock, New Mexico.
- Earth Tech, May 2000, Zone 1 Groundwater Geochemistry, Church Rock Site, Gallup, New Mexico, pp. 3-1 through 3-3.
- EarthTech, September 2002, Final Report and Technical Impracticability Evaluation, Southwest Alluvium Natural Attenuation Test, Church Rock Site, pp. 3-5 through 3-9.
- Environmental Protection Agency, September 2008, Third Five-year Review Report for the United Nuclear Corporation Groundwater Operable Unit, Church Rock, McKinley County, New Mexico, pp. 36-39.
- N.A. Water Systems, 2006, Technical Analysis Report in Support of License Amendment Request for Changing the Method of Determining Exceedances of the Combined Radium Groundwater Protection Standard in Source Materials License SUA-1375 (TAC LU0092), Groundwater Corrective Action Program, Church Rock Site, Church Rock, New Mexico. Revised February 2006.
- N.A. Water Systems, 2008, Alternate Concentration Limits Application, Zone 1 of the Lower Gallup Sandstone, UNC Church Rock Site, Church Rock, New Mexico. December 29, 2008.
- Nuclear Regulatory Commission, June 1996, Evaluation of the Statistical Basis for Establishing Background Levels and Remediation Standards at the United Nuclear Corporation Church Rock Uranium Mill Tailings Disposal Facility, Gallup, New Mexico.
- Nuclear Regulatory Commission, 2006, Amendment 37 to United Nuclear Corporation's Church Rock New Mexico Source Materials License No. SUA-1475 (TAC LU0117), August 9, 2006.
- UNC, August 15, 2008 letter to EPA, Comments on the Five-year Review, pp 7-9.