

Docket 40-8907

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**Date:** 6/24/05 7:38PM  
**Subject:** comments on SFS

Attached are the comments I sent to UNC on the supplemental feasibility study.

Hard copy coming next week

Mark

(See attached file: EPA cmts 061405.wpd)(See attached file: epa cmt ltr 062405.wpd)

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June 24, 2005

## USEPA COMMENTS

on the

United Nuclear Corporation's  
SUPPLEMENTAL FEASIBILITY STUDY  
Zone 3 Hydrostratigraphic Unit  
Church Rock Uranium Mill Tailing Site

Dated: October 2004

### GENERAL COMMENTS:

1. Overall, the United Nuclear Corporation's (UNC's) draft Supplemental Feasibility Study (SFS) presented a fairly detailed evaluation of remedial alternatives for Zone 3 at the UNC Superfund site (Site). However, the SFS needs to be a comprehensive study that examines the Site ground water problem as a whole. The SFS must focus on all three zones of ground water contamination (Zone 1 and Zone 3 of the Upper Gallup Sandstone and the Southwest Alluvium) that the original remedy set forth in the U.S. Environmental Protection Agency's (EPA's) 1988 Record of Decision (ROD) was selected to mitigate. Currently, for various technical reasons, active remediation has been discontinued in all three zones without achieving the cleanup standards set forth in the ROD. Further, much work has been done to date by the UNC on documenting technical issues/problems and possible alternatives for the three zones, including natural attenuation, hydraulic fracturing for enhancing ground water recovery, technical impracticability (TI) and request for (TI) waivers, and institutional controls (ICs).

The EPA documented such technical issues/problems and the actions needed to ensure protectiveness in the Second Five-Year Review Report (Report), dated September 2003. The Report called for a SFS to be implemented to identify further remedial alternative(s) in support of future CERCLA response action decision making in light of the technical issues, including potential ICs, potential TI Waivers, newly promulgated MCLs, and potential state Applicable or Relevant and Appropriate Requirement (ARAR) revisions for certain contaminants. The Report also called for an evaluation of ICs as a part of the SFS process in order to restrict the use of seepage-impacted ground water at the Site.

In light of the above, please revised the SFS to include a more comprehensive Site-wide study that evaluates remedial alternatives for all three zones of ground-water contamination. In doing so, UNC should review the Report, especially Sections 9.0 and 10.0, to ensure that all of the technical issues and problems raised by the EPA in the

Report are adequately addressed to support EPA's future decision making under CERCLA at this Site.

2. The draft SFS does not follow the National Oil and Hazardous Substances Pollution Contingency Plan (The NCP) requirements for a Feasibility Study under CERCLA. These FS requirements start at 40 CFR 300.430(e). They include, but are not limited to, the following:
  - (e)(2)(i) — establishment of Remedial Action Objectives (RAOs) specifying contaminants and media of concern, potential exposure pathways, and remediation goals;
  - (e)(2)(i)(A) thru (G) — remediation goals shall be established by considering, amongst other things, ARARs, Maximum contaminant level goals (MCLGs) and MCLs;
  - (e)(6) — develop the “no-action” alternative;
  - (e)(9)(ii) and (iii)(A) thru (H) — conduct a detailed analysis of alternatives using nine evaluation criteria.

Please follow the NCP requirements and consult EPA's FS Guidance when preparing the SFS.

3. The evaluation of remedial alternatives should follow the NCP and the EPA's *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA* (EPA/540/G-89/004 - OSWER Directive 9355.3-01). The RI/FS Guidance specifies a detailed analysis of the individual alternatives with respect to nine criteria. Additionally, remedial action alternatives should be compared to the expectations stated in the NCP Section 300.430.
4. There is some concern that each of the alternatives for Zone 3 was simulated using one ground-water model for evaluation. If the model fails, so does the assessment or evaluation. The ground-water model may very well be valid, but what are the actual ground water data compared to what is used in the model? The alternatives should be evaluated following the NCP and the FS Guidance, and if one or more ground-water models fit into that process as a legitimate tool, it will be acceptable.
5. For all mapping efforts of empirical data, please depict the actual values of the mapping parameters adjacent to the wells on the maps.
6. Include a map of the entire site with the SFS.
7. Several of the Zone 3 remedial alternatives may result in the spreading of the contaminant plume or contaminants escaping the capture zone. Please include an evaluation of the

potential of each remedial alternative for Zone 3 to spread the contaminant plume as part of the detailed analysis of alternatives. The spreading of the contaminant plume may best be assessed through contaminant transport modeling. UNC should include such modeling efforts in the evaluation of effectiveness for those alternatives.

8. In light of the hydraulic fracturing and full-scale testing performed at the Site and its relevance to some of the alternatives in the SFS, UNC shall present the results and conclusions of the hydraulic fracturing program performed in 2004 in a report to EPA and the other state, federal and tribal authorities. The EPA recognizes that an oral presentation on the status of the pilot program was made during the April 2005 meeting. Nevertheless, a report that documents the pilot program and results needs to be submitted to the regulatory agencies. This report should be submitted with the revised SFS.
9. A more thorough evaluation of the directional drilling alternative needs to be performed for the revised SFS. It is noted that only one well is considered for the directional drilling remedial alternative. UNC should consider other directional drilling scenarios, including the use of multiple directional wells with shorter lengths, and a combination of directional wells and vertical wells, when evaluating the effectiveness of this remedial alternative.
10. UNC installed two alluvial wells (for pump testing) to design an alluvial de-watering system for the Zone 3 recharge area should the EPA select Alternative 5. The wells alone may not show with certainty whether seepage from the tailings impoundment into the underlying ground water recharge area for Zone 3 is continuing. Additional means of evaluating a possible continuing source from the tailings include (1) the use of a tracer in the tailings impoundment water, or (2) modeling. Please address how de-watering the alluvium is going to affect ground-water flow and contaminant transport in the Southwest Alluvium.
11. UNC should take into account that the model was calibrated on data from dry years. There may be future years when higher recharge rates occur.

#### SPECIFIC COMMENTS:

1. Section 2.0 - Conceptual Hydrogeologic Model, page 4, paragraph 4:

Delete the term "Artificial System" from this paragraph and anywhere else in the SFS. The EPA agrees with UNC that mine water significantly recharged the alluvium and Zone 1 and Zone 3 of the Upper Gallup sandstone units beneath the Site. However, EPA does not agree that these stratigraphic units were completely unsaturated prior to mining and milling. Therefore, the term Artificial System is inappropriate. Please revise the paragraph as follows:

- a. Delete the first sentence that reads *"Prior to mining and milling, none of the stratigraphic units discussed above was saturated."*
  - b. Delete the third sentence that reads *"This water created an artificial hydrologic system referred to as the Artificial System."*
  - c. Revise the fourth sentence to read as follows: *"Tailings seepage also recharged the Artificial System hydrostratigraphic units."*
  - d. Delete the last sentence of the paragraph that reads: "Early studies concluded that the Artificial System would not migrate...."
2. Section 2.0 - Conceptual Hydrogeologic Model, page 4, paragraph 6:
- Revise the last sentence to read as follows: *"....the geologic setting of the site and the relationship of geologic units to water levels within the Artificial System those units."*
3. Figure 6 - Cross Sections A and B
- The cross sections do not depict the subsurface data used to complete the sections. Please depict the borehole/well locations on the cross sections that were used for the hydrogeologic information.
4. Section 3.8.1 - Results from Modeling, Alternative 6 Cut-off/Containment Wells, page 14:
- Include a figure showing the location of the 32 wells.
5. FIGURES - Figure 3, Surface Geology
- The texture/shading used for the coal member and Zone 3 cannot be distinguished on the map.
6. FIGURES - Figure 4, Top of Zone 3 Unit Contours
- Depict values of the mapped parameter on the map for each well (data point). This comment applies to all the contour maps contained in the SFS.
7. FIGURES - Figures 7, 8 and 9, Cross Sections
- See Specific Comment No. 3, above.
8. FIGURES - Figure 10, Potentiometric Surface, October 2001
- Please expand the contouring effort to include the entire Zone 3 where well data are

available (not just the area mimicked by the modeling effort). Depict the water levels used for mapping at each drill hole/well. If a well is dry, then state so on the map..

9. FIGURES - Figures 14 and 15, Saturated Thickness of Zone 3 Unit:

Depict the saturated thickness measured for each drill hole/well on the map. If a drill hole/well is dry, mark it as "Dry". Expand the contouring effort to cover the entire area of Zone 3 with saturation.

10. FIGURES - Figures 19 - 23

Please depict the cross-sectional profile of Zone 3 in plan view.

11. APPENDIX A

Please include Appendix A with the SFS. It was missing from the draft submitted to EPA

via Facsimile and Certified Mail  
Return Receipt Requested

June 24, 2005

Mr. Larry Bush, President  
United Nuclear Corporation  
State Highway 566  
21 miles northeast of Gallup  
P.O. Box 3077  
Gallup, NM 87305-3077

Re: Supplemental Feasibility Study - Zone 3 Hydrostratigraphic Unit  
UNC Superfund Site, Church Rock, NM  
Administrative Order (Docket No. CERCLA 6-11-89)

Dear Mr. Bush:

The U.S. Environmental Protection Agency (EPA) has completed its review of the United Nuclear Corporation's (UNC's) document entitled "Supplemental Feasibility Study, Zone 3 Hydrostratigraphic Unit, Church Rock Uranium Mill Tailings Site" (SFS), dated October 2004. Based on its review, the EPA has determined that the SFS is inadequate to evaluate remedial alternatives and support future EPA decision-making at the UNC Superfund site (Site), Church Rock, NM. Therefore, the draft SFS requires further revision before it will be approved by the EPA. Enclosed please find the EPA comments.

At the technical meeting and Site visit held in April 2005 UNC representatives raised a concern to the EPA and other regulatory agencies as to the usefulness of the SFS for selecting remedial alternatives for Zone 3 of the Upper Gallup Sandstone, given that efforts were already underway for full-scale testing of the approved hydraulic fracturing pilot program at Zone 3.

The EPA is encouraged by the work conducted to date on the hydraulic fracturing testing for Zone 3, especially in light of the need for prompt action to stop the continued migration of the Zone 3 contaminant plume. However, the purpose of the SFS was never to solely document or memorialize those recommendations. The purpose of the SFS was to support future EPA decision-making on the Site-wide ground-water remedy. As stated in the EPA's Second Five-Year Review Report, based on the findings of the Five Year Review, as well as the scheduled promulgation by the EPA of several new MCLs under the Safe Drinking Water Act, there is a



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question as to the long-term protectiveness of the Site ground-water remedy. Accordingly, the EPA determined that a SFS shall be implemented in order to investigate and evaluate possible remedial alternatives and to support a possible Amended Record of Decision or Explanation of Significant Differences as appropriate. The SFS must evaluate possible remedial alternatives for all three shallow ground-water units: Zone 1 and Zone 3 of the Upper Gallup Sandstone and the Southwest Alluvium.

Therefore, UNC is directed to submit a revised SFS that adequately addresses all of the EPA comments enclosed. It is also suggested that UNC closely review the EPA's Second Five-Year Review Report for the requirements needed to ensure protectiveness.

If you have any questions, please contact me by telephone at 214-665-6707 or via e-mail at [purcell.mark@epa.gov](mailto:purcell.mark@epa.gov).

Sincerely,

Mark D. Purcell  
Remedial Project Manager  
Superfund Division

Enclosure

cc: William von Till, NRC  
Robin Brown, NMED  
Diana Malone, Navajo EPA  
Roy Blickwedel, GE

Mr. Larry Bush  
Supplemental Feasibility Study  
UNC Superfund Site, Church Rock, NM  
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bcc: James Turner, 6RC-S