U.S. Department of Energy
Grand Junction Office
2597 B¾ Road
Grand Junction, CO 81503

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Mr. Dan Gillen, Chief
U.S. Nuclear Regulatory Commission
Fuel Cycle Facilities Branch
Division of Fuel Cycle Safety & Safeguards
Mail Stop T-8A33
Washington, DC 20555-0001

Subject: June 13, 2002, Visit to the Church Rock, New Mexico, UMTRCA Title II Site

Dear Mr. Gillen:

Thank you for allowing a member of my contractor staff, Carl L. Jacobson, to accompany NRC project managers on the June 13, 2002, to visit the UNC Church Rock site. I appreciate the opportunities that you gave us to observe the Title II sites as you and the licensees work through issues leading to the transfer to Department of Energy. Following the visit, Mr. Jacobson expressed concerns to me that I would like to share with you.

Enclosed is the information with Figures 1–9 of the visit to the Church Rock, New Mexico, UMTRCA Title II sites.

If you have any questions, please do not hesitate to contact me at 248-6037.

Sincerely,

John Gilmore
for Art Kleinrath
Program Manager

Enclosure

cc w/enclosure:
T. Johnson, NRC
R.VonTill, NRC
J. Gilmore, GJO DOE
C. Jacobson, MACTEC-ERS
M. Plessinger, MACTEC-ERS

File LCRK 4.6 (Record thru A. Garcia)

NMSS01Public

June 13, 2002, Visit to the Church Rock, New Mexico, UMTRCA Title II Site

Several areas on the northeast portion of the cell have settled differentially creating low spots where water apparently collects following storm events, Figure 1. Mr. Larry Bush, Manager & Senior Geologist for UNC, stated that the largest and deepest settled area was due to dewatering of slimes in the disposed tailings. He intends to fill the depression and regrade the area. Other depressed areas were discernable because vegetation (grass, tamarisk, rabbit brush) had established in the places where water collected. The 1.5-inch riprap was also visible in some of these depressed areas and vegetation was rooting in the radon barrier, Figure 2. It was not clear whether the 4 inches of soil placed on the riprap had blown away or had been washed into the drainage channels.

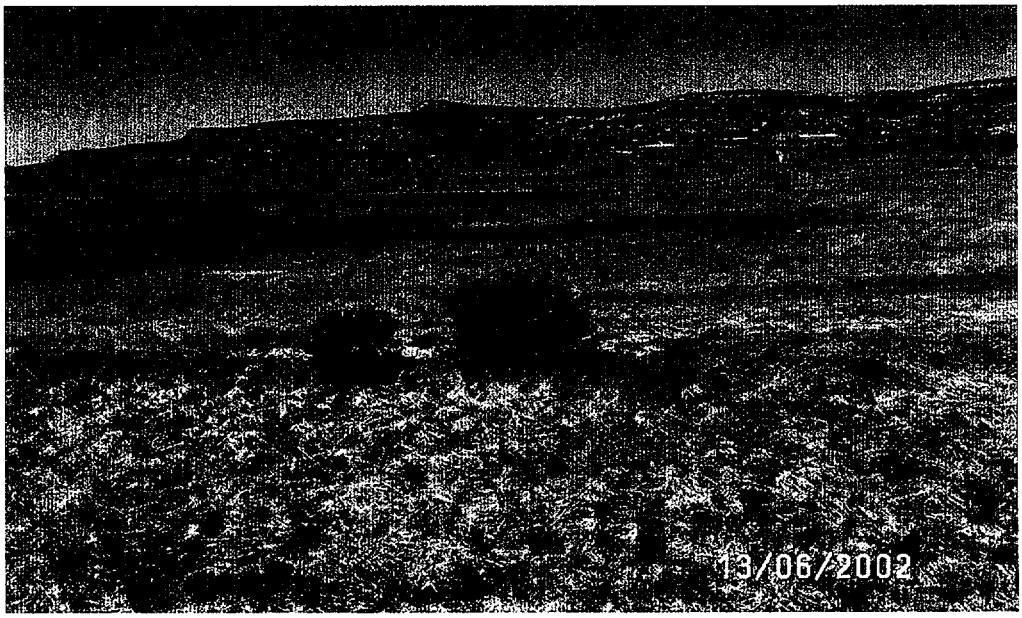

Figure 1

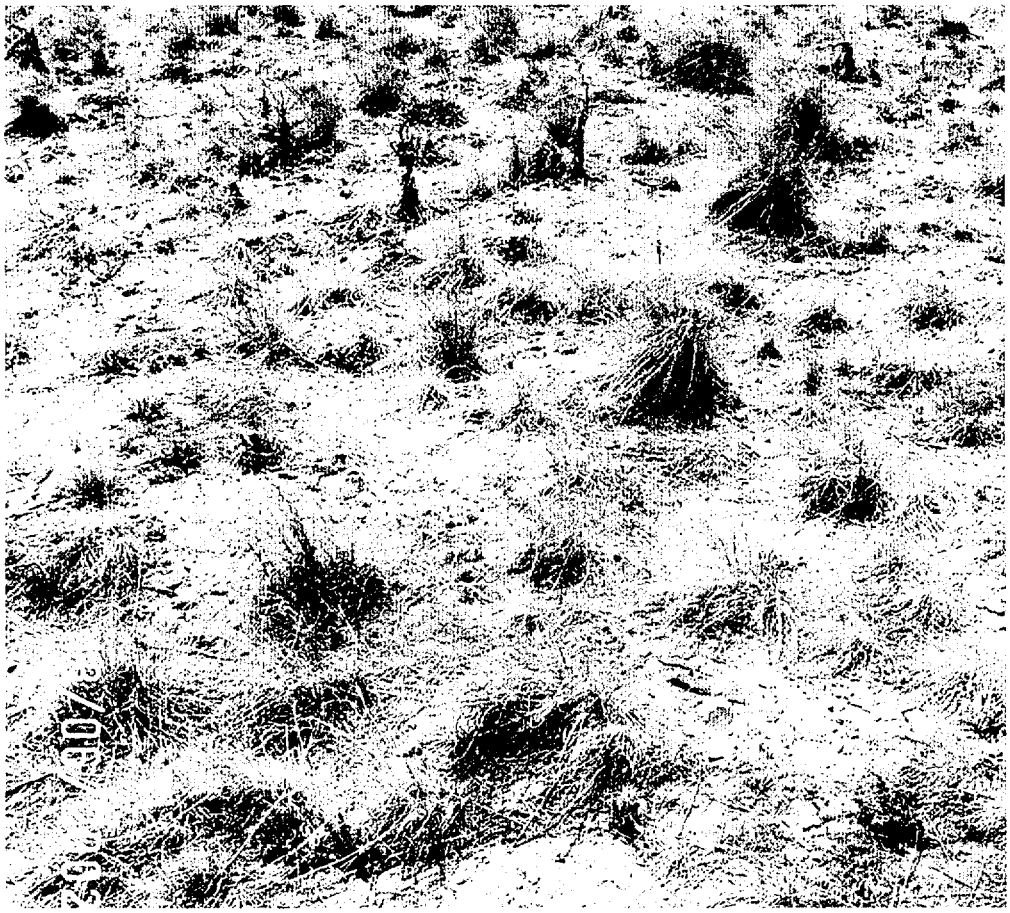

Figure 2

The drainage channels on the cover are shallow u-shaped features that slope gradually to the northwest. Soil has filled the channels in some areas so that about 2/3 of the cross-section has been lost, Figure 3. Flushing of the soil from the channel by a storm event is unlikely because of the minimal channel slope and the soil stability provided by vegetation growing in the soil. The source of the soil appears to be both wind-blown as well as cover runoff. As the channels are dammed with sediment or dunes, concentrated flows may divert across the top of the cell causing gullying through the riprap, radon barrier and tailings. Failure of the channel walls may occur when sheet flow from the cover runs down the side slope of the channel and begins moving the 1.5-inch riprap. Headcutting through the radon barrier into the tailings could result.

Biointrusion of the cell cover was visible. Deep rooted plants such as tamarisk and rabbit are rooting in the radon barrier and likely in the tailings, Figure 4. Gophers have made burrows in the cover soil but probably have not penetrated the 3-inch thick layer of riprap, Figure 5. Prairie dogs are present in the area according to Mr. Bush but no evidence of them was seen on the cell.

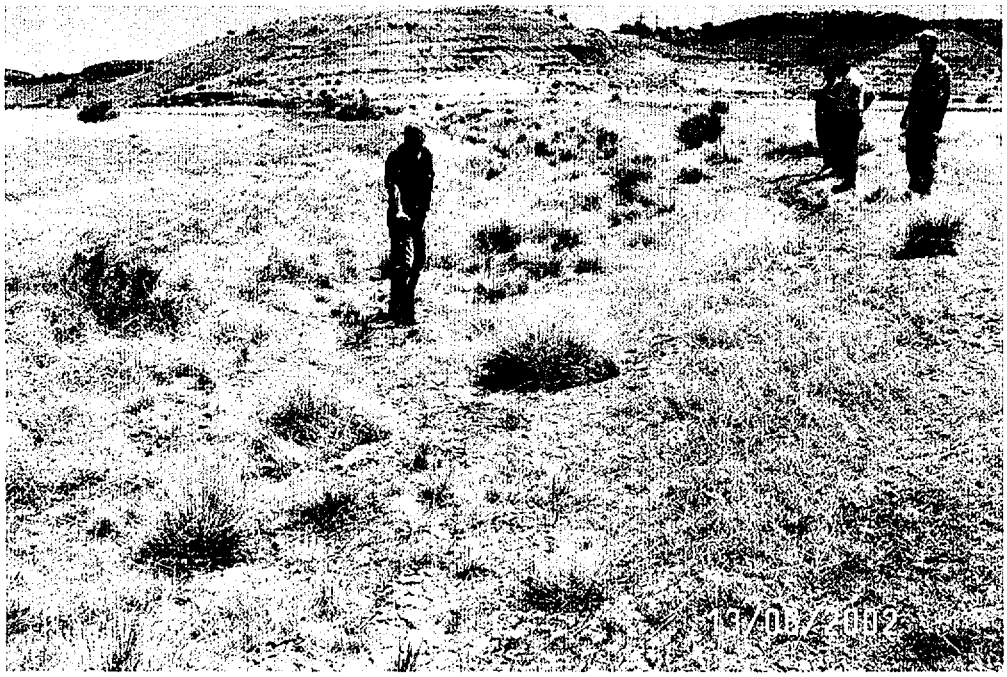

Figure 3

Figure 4

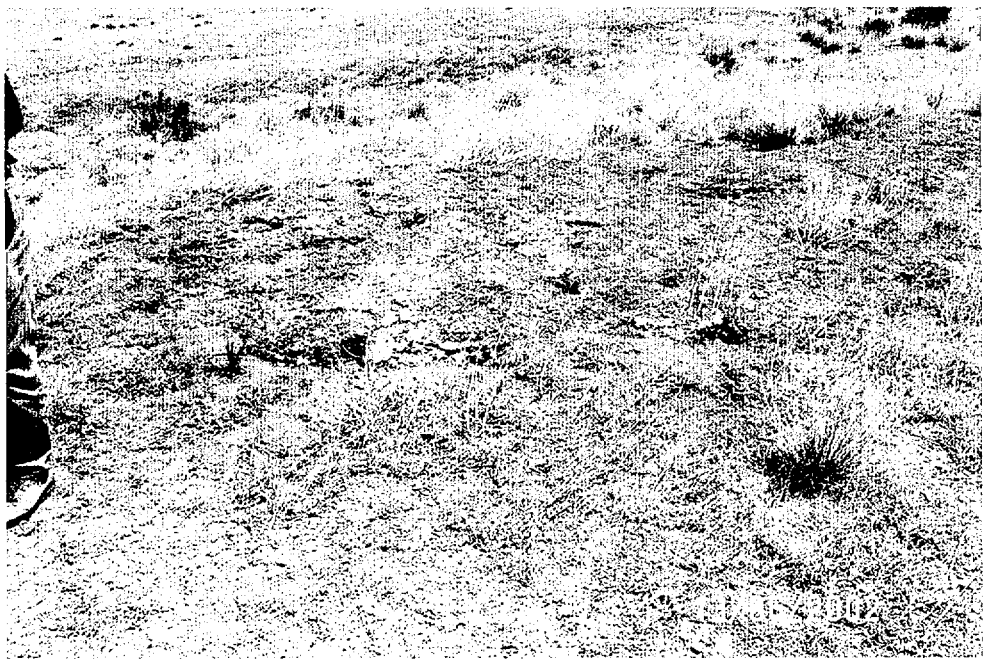

Figure 5

Sediment is filling the north diversion channel Figure 6. The channel captures water from a large drainage area north of the cell and diverts it around the upper end of the cell. The diversion channel has very little slope and the sediment is being stabilized by vegetation. An uncompacted roadway embankment forms the south bank of the diversion channel. The embankment slopes are very steep and are rilling, Figure 7.

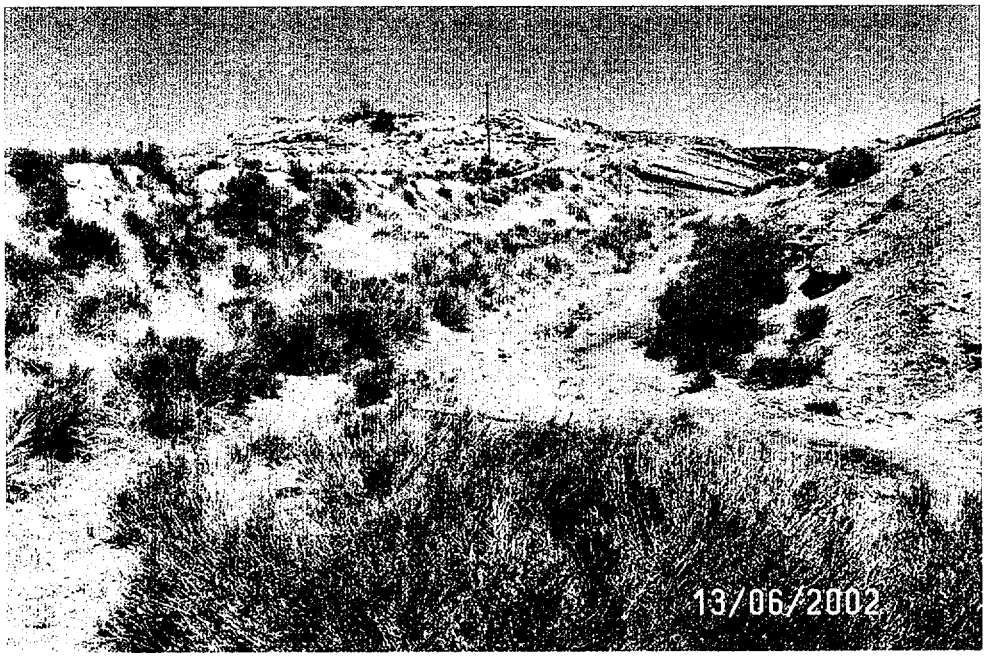

Figure 6

Figure 7

A rock jetty was constructed to prevent the main drainage west of the cell from migrating into the tailing impoundment. Some of the rock from the surface of the jetty has been moved downstream by a storm event, Figure 8. A large gully on the downstream side of the jetty is headcutting toward the jetty.

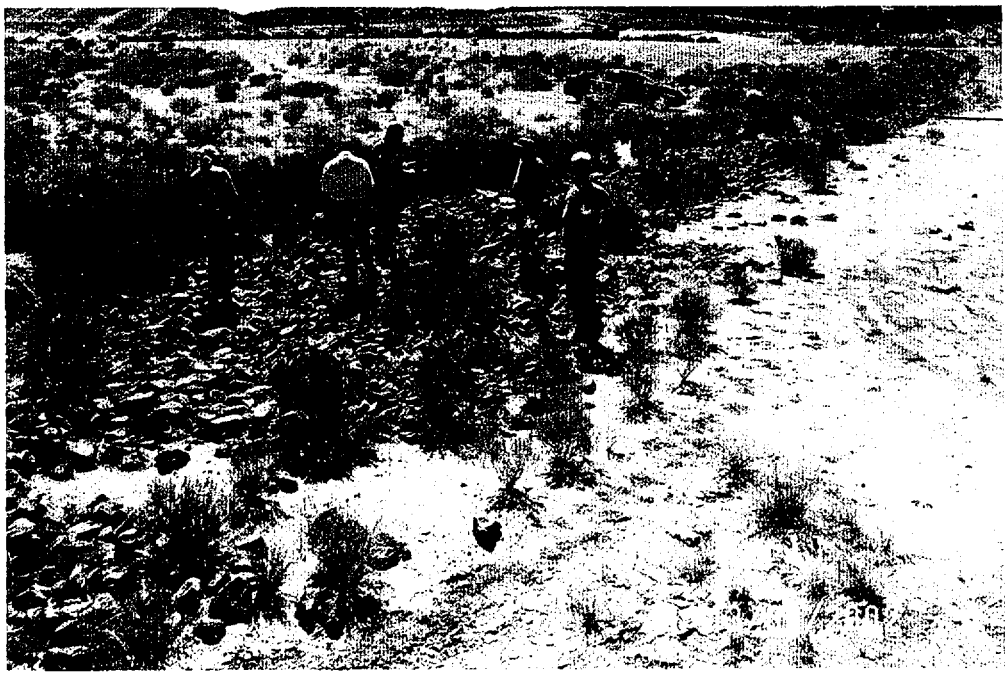

Figure 8

Erosion at the east end of the tailings dam has formed a 4'deep gully, Figure 9. The gully is beyond the riprap that protects the remainder of the dam face and is probably not threatening the integrity of the dam. However, the gully is indicative of an apparent lack of robustness in the site design.

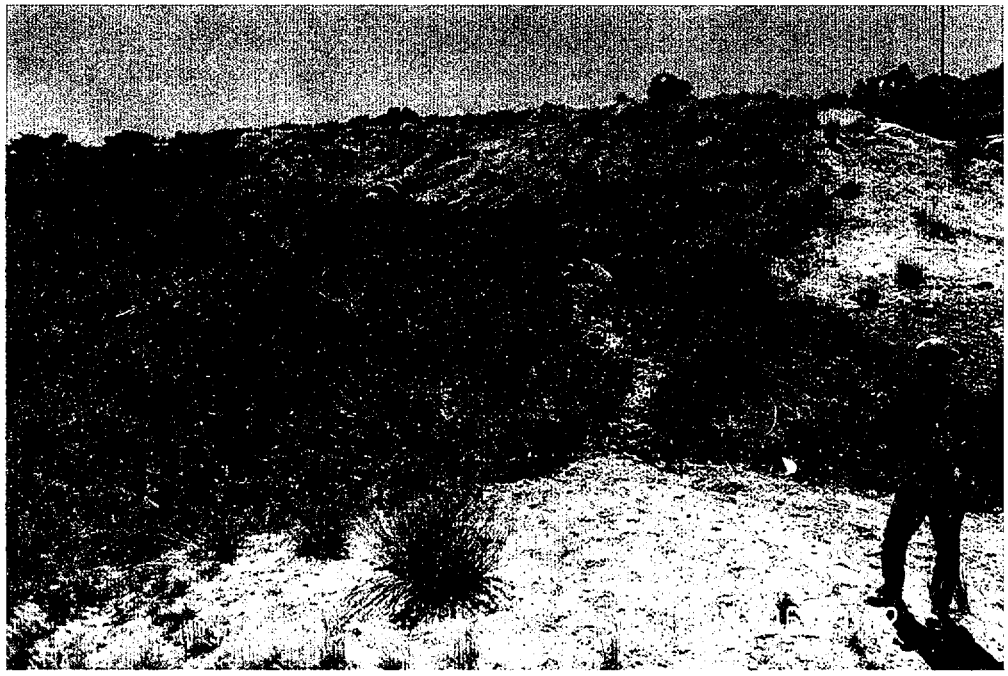

Figure 9

On the basis of this and previous visits, I feel that significant annual maintenance at the Church Rock site will be required. The primary costs will be associated with the removal of soil from the cell-top drainage channels and from the north diversion channel to provide sufficient capacity. Removal of material from the drainage channels will be a delicate, labor-intensive operation as the 1.5-inch riprap channel liner can be easily damaged by standard construction equipment. Cleaning of sediment from the north diversion channel and maintenance of the uncompacted roadway embankment will also be necessary after any significant storm event. Unless a risk analysis shows that biointrusion is not a concern, deep-rooted vegetation will be treated with herbicide and burrowing animals killed.

Annual costs cannot be easily forecast as the licensee may show that some of our projected maintenance tasks may not be necessary. However, given what I have seen and has been reported to me, annual maintenance costs will be in the $10,000 to 20,000 per year range. These costs will be above and beyond what is normally required to provide long-term care of a disposal site.