March 29, 2011

Mr. Mark Moxley
LQD District Supervisor
Department of Environmental Quality
Lander Field Office
510 Meadowview Drive
Lander, WY 82520

SUBJECT: RESPONSE TO REQUEST TO REVIEW TAILINGS POND #1 MONUMENT SETTLEMENT DATA, DOCKET NO. 40-4492

Dear Mr. Moxley:

By email dated February 23, 2011 (See ADAMS ML110601232), the Wyoming Department of Environmental Quality (WDEQ) submitted a request to the U.S. Nuclear Regulatory Commission (NRC) to review the tailings pond #1 monument settlement data for the American Nuclear Corporation (ANC) Gas Hills site. In late 1995 and early 1996, WDEQ placed the Bullrush heap leach material on top of tailings pond #1 at the ANC site. This material was intended to pre-load the portion of pond #1 with the greatest thickness of tailings prior to construction of the final cover system. Approximately 10 ft of fill was placed by January 1996. WDEQ has taken measurements at four locations since 1996 to track the settlement, and the associated consolidation, of the tailings in the pre-load area.

The staff reviewed the tailings pond #1 monument settlement data to determine if primary consolidation of the tailings has occurred. Typically, the staff considers primary consolidation completed when 90 percent of the consolidation has occurred. Waiting until primary consolidation is complete minimizes the potential for excessive settlement of the final cover system when it is constructed.

The staff reviewed the data from January 1996 to August 2010 and evaluated the percentage of consolidation using the square root of time method proposed by Taylor (Fundamentals of Soil Mechanics, Wiley, 1948). In this method, data is plotted on a graph with settlement on the y-axis and the square root of time on the x-axis. A best fit line to the initial portion of the data is plotted and the slope of this line is calculated. Then a second line is drawn with a slope that is 1.15 times the slope of the best fit line. The observed data crossing the second line is an indication that 90 percent of the consolidation has occurred.

A figure for each of the settlement monitoring locations is included in the enclosure. In these figures, the first data point corresponds to the January 1996 measurement and the last data point corresponds to the August 2010 measurement. For three of the four monitoring locations, it appears that 90 percent of the consolidation has occurred. However, at the remaining location (Monument 15, Old Monument DS2), it does not appear that 90 percent of the consolidation has occurred as the observed data has not crossed the line with a slope of 1.15 times the best fit line. This is shown in Figure 2. In reviewing Appendix D, Settlement Analysis, of the April 1996 WDEQ submittal, it appears that tailings are thickest in the vicinity of Monument 15. The staff notes that the time required for consolidation is dependent on thickness of material. For a given material, a 10 ft thick layer will consolidate faster than a 20 ft thick layer. Therefore, it is

possible that 90 percent of the consolidation has occurred at the other settlement monitoring locations, but not at DS2.

At this point, the staff recommends continuing to monitor settlement at the four locations until 90 percent of the consolidation has occurred at DS2. Based on the observed rate of settlement to date, it appears that the consolidation at Monument 15 may exceed 90 percent within the next two years. It may be possible to proceed with reclamation activities on other portions of Pond 1 that have not been subjected to the preload conditions.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice for Domestic Licensing Proceedings and Issuance of Orders," a copy of this letter will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of ADAMS. ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html.

If you have any questions, please contact Tom McLaughlin, the Project Manager for the site, at Thomas.McLaughlin@nrc.gov or (301) 415-5869.

Sincerely,

/RA/

Paul Michalak, Branch Chief
Materials Decommissioning Branch
Decommissioning and Uranium Recovery
Licensing Directorate
Division of Waste Management
and Environmental Protection
Office of Federal and State Materials
and Environmental Management Programs

Enclosure:
Analysis of Tailings Pond #1 Monument
Settlement Data

Docket No.: 04004492

cc: D. McKenzie, WDEQ

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