

November 12, 2014

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Office of Legacy Management
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SUBJECT: FOLLOW-UP LETTER – LAKEVIEW ROCK DEGRADATION ANALYSIS

This letter is a follow-up to the U.S Department of Energy (DOE) letter dated December 23, 2010 (ML103620449), providing the 2010 rock riprap durability monitoring and gradation testing results for the Lakeview, Oregon, Uranium Mill Tailings Radiation Control Act (UMTRCA), Title I, Disposal Site. Since degradation of the riprap at the site has been observed since completion of the final cover system, the Long-Term Surveillance Plan (LTSP) requires DOE to annually demonstrate compliance with the median riprap diameter (D50) established to protect the disposal cell in the event of a major precipitation event.

In a letter dated March 25, 1998, that provided a proposed revision to LTSP Attachment 8 “Procedure for Gradation Testing of Riprap,” DOE committed to implementing an annual gradation testing procedure beginning in 1998 (ML14303A159). The letter states: “When the disposal cell was built, stones placed on the side slope of the disposal cell were of sufficient size to survive the design Probable Maximum Flood (PMF). Some of the stones have shown a tendency to break into smaller pieces after several years of surface weathering. If a sufficient number of these stones weather into smaller pieces, the riprap may no longer meet the design specification. Therefore, beginning in 1998, DOE will implement an annual gradation testing procedure. Annual gradation testing will permit DOE to gauge the rate of weathering and to demonstrate that the size of the rock remains sufficient to meet the design specification. Testing will usually be performed during the annual site inspection. Results of the testing will be included in DOE’s annual inspection report.”

Additionally, as a result of suggestions by the U. S. Nuclear Regulatory Commission (NRC) staff, in October 2008 DOE committed to performing annual rock durability monitoring during DOE’s annual site inspections to quantify the durability of the existing rock cover (ML083050260). This will be accomplished by identifying the rock types and their durability classes so that the percentage of rocks that are durable, susceptible to near-term degradation, or nondurable (that have already crumbled) could be estimated. This rock durability monitoring has been implemented at gradation monitoring locations that are randomly selected prior to each monitoring event. This durability information along with the gradation data is important for evaluating how protective the existing rock cover is now and will be in the future. This information can then be used to evaluate an appropriate long-term solution to observed rock degradation. The new procedure was implemented for the first time during the July 2009 inspection and has been conducted each year through 2014.

In the last sentence of the December 23, 2010 letter it states: "DOE is in the process of evaluating this data to assist in determining a long-term and cost effective solution at the site." During the past several years the NRC staff has had discussions with DOE about how the gradation and rock durability monitoring data could be analyzed, NRC's staff observations about the initial data, and options for DOE to consider for determining a path forward to resolve this issue and propose changes to the LTSP. However, to date, DOE has not provided NRC with any formal analyses of the monitoring data or its proposed solution other than the data summary provided in the Annual Site Inspection and Monitoring Reports Data Validation Reports and the Groundwater Compliance Action Plan.

Since 1998, DOE's gradation monitoring data shows that the annual average D50 has decreased to below the original design D50 of 2.7 inches established in the LTSP, except for the average D50 calculated in 2012 and 2013 which were 2.74 inches and 2.7 inches, respectively. Furthermore, the table on page A-5 of the 2011 Annual Site Inspection Report shows that three of the monitoring locations had calculated D50s that were much lower than the design D50, and ranged from 1.7 to 1.93 inches. These results could indicate localized areas on the cover where rocks are not large enough to protect the disposal cell in the event of a major precipitation event and are out of compliance with the LTSP. Without an analysis of all the detailed gradation data and D50s, the locations and full extent of these vulnerable areas are unknown. In contrast, some sampling locations had D50s of 3.04 to 3.36 inches that are well above the design D50 and indicate areas of effective protection. Analyses and mapping of the past 17 years of annual gradation data for each of the 20 sampling locations could identify areas on the rock cover that are either protective or not protective.

Therefore, the NRC staff continues to have concerns related to the long term degradation of the rock riprap, areas of the cover that might not be protective now and areas that could be vulnerable to degradation and not protective in the future. The staff also believes that the 17 years of gradation data and 6 years of rock durability monitoring data are sufficient for DOE to evaluate the information and propose a solution.

The staff requests that DOE provide the following information:

1. The results of the analyses of the gradation and rock durability monitoring data discussed in your December 23, 2010 letter, including data from each of the 20 monitoring locations similar to what DOE provided NRC for the 2011 Annual Site Inspection and Monitoring Report. In your analysis we suggest you consider mapping the data from the sampling locations to identify areas that might not be protective (i.e., areas below the design D50) and areas with more durable rock types and less durable rock types. Specific plans could be discussed with the NRC staff. Analysis of the variability of the data by monitoring location may show where locations of small rock are generally located and if they are all in one area of the cover or scattered over the cover. This information could lead to the identification of areas where the cover is vulnerable now or could become vulnerable in the future which could justify where future maintenance/ repair should be considered or where future monitoring could be targeted.
2. Any evaluations and conclusions developed by DOE of the rock cover protection now and in the future. Specifically, include an explanation of the significance of the D50 values below the design D50 specification in the LTSP to protection and the consequences of not repairing these areas.

3. Data from each sampling location as it was provided in the 2011 Annual Report, including the new data from the monitoring conducted in 2014.
4. Global Positioning System data for each sampling location for each year of monitoring.

Items 3 and 4 should be provided in the near term so that NRC can continue its independent analyses.

NRC recognizes that DOE has conducted extensive monitoring over the past 17 years and, as a result, has gained important experience and knowledge of the rock degradation issue and options for resolution. The NRC staff has followed the results of DOE's monitoring for many years, discussed the data with DOE and will continue to be available for discussions of this unique issue.

In accordance with 10 CFR 2.390 of the NRC's "Agency Rules of Practice and Procedure," 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 NRC's Agencywide Documents Access and Management System (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 Ms. Zahira Cruz at (301) 415-3808, or by e-mail, at Zahira.Cruz@nrc.gov.

Sincerely,

/RA/
Zahira Cruz, Project Manager
Reactor Decommissioning Branch
Division of Decommissioning, Uranium Recovery,
and Waste Programs
Office of Nuclear Material Safety
and Safeguards

Docket No.: WM-64

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