



**Via Email and U.S. Mail**

November 14, 2011

Mr. Steve Tarlton  
Manager  
Radiation Management Unit  
Hazardous Materials and Waste Management Division  
Colorado Department of Public Health and Environment  
4300 Cherry Creek Drive South  
Denver, Colorado 80246-1530

Subject: CDPHE Letter Dated September 28, 2011  
Conceptual Cover Design

Dear Mr. Tarlton:

Please find attached a response developed by our contractor, MWH Americas, Incorporated, concerning the above subject matter. In addition to the information contained in their letter, Cotter Corporation (N.S.L.) ("Cotter") would like to emphasize that it possess one of the eight previously approved reclamation plans. Nuclear Regulatory Commission staff and the Commission itself spent considerable time examining this issue, culminating in the issuance of SECY 95-155 ("SECY") providing policy, guidance and direction to staff and Agreement States on this important issue. Based on the SECY decision, Cotter understands that Colorado Department of Public Health and Environment cannot use current criteria to evaluate changes to a previously approved reclamation plan.

Cotter proposes that we meet to discuss and resolve issues raised in your letter.

If you have any questions, please contact me at 719-275-7413 (ext. 202).

Sincerely yours,

John S. Hamrick  
Vice President, Mill Operations



**BUILDING A BETTER WORLD**

November 14, 2011

Cotter Corporation  
Cañon City Milling Facility  
Cañon City, Colorado 81215 - 1750

**Attention: John Hamrick, Vice-President of Milling Operations**

**Subject: Cotter Cañon City Milling Facility –Tailings Impoundment Reclamation Plan Conceptual Cover Design**

John,

This letter addresses issues raised by the Radiation Management Unit of the Hazardous Materials and Waste Management Division of the Colorado Department of Public Health and Environment (“CDPHE”) in their September 28, 2011 letter on the conceptual cover design for the tailings impoundments at the Cotter Cañon City Milling Facility. The conceptual cover design was documented in the March 2011 reclamation plan update prepared by MWH Americas Inc. (“MWH”), with supporting analyses submitted as appendices to the plan in May, June, and July 2011.

This letter has been prepared by MWH for Cotter Corporation (N.S.L.) (“Cotter”) to clarify the technical issues associated with the reclamation plan for the Primary and Secondary Impoundments at the Cañon City Milling Facility. Key components of the reclamation plan are (1) the components of the cover to be placed over tailings and contaminated soils, and (2) the final slope of the cover. The differences in our interpretation of applicable regulations associated with these components from that outlined CDPHE’s September 28 letter are discussed below.

### **Background**

Previous reclamation plans that have been approved by CDPHE incorporated a multilayered cover and slopes less steep than 2 percent (WWL, 1990 and ESCI, 1995). The ESCI plan (for both the Primary and Secondary Impoundments) had a domed cover surface with cover slopes of 0.5 percent and a multilayered cover. The multilayered cover for the ESCI design was 4.5 feet thick, and was designed for radon attenuation throughout the entire cover profile (except for the 0.5 ft thick topsoil layer). Our understanding is that the cover design and reclamation plan outlined in ESCI (1995) is the most recent version of the reclamation plan approved by CDPHE.

The cover and overall reclamation plan in ESCI (1995) were designed to meet the performance standards in 6 CCR 1007-1, Part 18. Specific regulations for operation and reclamation are found in Appendix A to Part 18. Criteria in Appendix A for tailings reclamation include conditions for erosional stability (Criterion 4), groundwater protection (Criterion 5), and cover design for isolation and control of radiological hazards (Criterion 6).

The Criteria in Appendix A of the CDPHE regulations are consistent with performance criteria outlined in Appendix A of 10 CFR 40, administered by the U.S. Nuclear Regulatory Commission (NRC). The NRC has interpreted the long-term performance criteria to include acceptable performance of reclaimed facilities under the probable maximum precipitation (Johnson, 2002)

and the maximum credible earthquake. Guidance for cover design for radon emanation is provided in NRC (1989), and guidance for erosion protection is provided in NRC (1990) and Johnson (2002).

Following site reclamation and prior to transfer of a designated area of the site to the U.S Department of Energy for institutional control and long-term care and maintenance, the reclamation of the tailings impoundments will be reviewed by the NRC (according to guidelines in NRC, 2003) for compliance with applicable design criteria and guidance (specifically Appendix A of 10 CFR 40).

### **Current Conceptual Cover Design**

The conceptual cover design presented in the March 2011 reclamation plan update is consistent with applicable CDPHE and NRC performance criteria. The conceptual cover design is also consistent with previous designs approved by CDPHE at the Cañon City Milling Facility (notably the WWL, 1990 and ESCI, 1995 plans).

In addition, the conceptual cover design is consistent with other approved reclamation plans in the non-arid and arid regions of the United States, where (1) the entire cover thickness (without the erosion protection or topsoil layer) is considered for radon attenuation, and (2) cover slopes are less than 2 percent. Permitted and completed sites with cover slopes less than 2 percent are listed below.

- Falls City Title I site in Texas (less than 1 percent cover slopes)
- Bluewater Title II site in New Mexico (0.5 – 4 percent cover slopes)
- Conquista Title II site in Texas (0.5 – 1 percent cover slopes)
- Highland Title II site in Wyoming (0.5 – 2 percent cover slopes)
- Panna Maria Title II site in Texas (0.5 percent cover slopes)
- Ray Point Title II site in Texas (0.5 – 1 percent cover slopes)
- Sherwood Title II site in Washington (0.25 percent cover slopes)
- L-Bar Title II site in New Mexico (0.1 percent cover slopes)
- Durango Title I site in Colorado (1.5 – 2 percent cover slopes)

Other sites in Colorado (Title I sites) have slopes steeper than 2 percent (Slick Rock, Grand Junction, Gunnison, Maybell, Naturita, and Rifle). These are sites where tailings and contaminated materials have been moved or consolidated, allowing construction of the top of the cell (and the overlying cover) at steeper slopes. The Crescent Junction Title I site in Utah (with a cover slope of 2.5 percent) consists of completely relocated Moab mill site tailings, allowing a steeper designed slope.

Of the sites listed above, the Conquista, Highland, Panna Maria, Ray Point, and Sherwood sites had covers that were designed with the entire cover thickness considered for radon attenuation.

### **Conceptual Cover Design Summary**

In our opinion, the requirement by CDPHE of (1) a cover slope of no less than 2 percent, and (2) a radon barrier within the cover that is separate from the remaining mass of the cover is not consistent with the performance criteria listed above, previous approved plans for the Cañon City Milling Facility, and other approved reclamation plans in the western US.

If the current interpretations of the cover design performance criteria are due to the water balance cover concept, a return to the previously approved, multilayered cover design for the Primary and Secondary Impoundments is recommended.

If you have questions about the information in this letter, please contact me.

Sincerely,

**MWH Americas, Inc.**



Clint Strachan  
Project Manager

**References cited in this letter**

Earth Science Consultants, Inc. (ESCI), 1995. "Decommissioning and Reclamation, Chapter 9," prepared for Cotter Corporation and included in the Cotter Application for Radioactive Materials License 369-01, December.

Johnson, T. L., 2002. "Design of Erosion Protection for Long-Term Stabilization," U.S. Nuclear Regulatory Commission, *NUREG 1623*, Final Report, September.

MFG, Inc., 2005. "2005 Update of the Mill Decommissioning and Tailings Reclamation Plan for the Cotter Corporation Cañon City Milling Facility," prepared for Cotter Corporation, August.

U.S. Nuclear Regulatory Commission (NRC), 2003. "Standard Review Plan for the Review of a Reclamation Plan for Mill Tailings Sites Under Title II of the Uranium Mill Tailings Remediation Control Act of 1978," *NUREG 1620*, Revision 1, June.

U.S. Nuclear Regulatory Commission (NRC), 1990. "Staff Technical Position, Design of Erosion Protection Covers for Stabilization of Uranium Mill Tailings Sites," August.

U.S. Nuclear Regulatory Commission (NRC), 1989. "Calculation of Radon Flux Attenuation by Earthen Uranium Mill Tailings Covers," *Regulatory Guide 3.64*, Office of Regulatory Research, June.

Water, Waste and Land, Inc. (WWL), 1990. "Cañon City Tailings Reclamation Plan," prepared for Cotter Corporation, January.