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**Mr. Drew Persinko, Deputy Director**  
**Decommissioning and Uranium Recovery Licensing Directorate**  
**Division of Waste Management and Environmental Protection**  
**Office of Federal and State Materials and Environmental Management Programs**  
**Mailstop T8 F5, U.S. Nuclear Regulatory Commission**  
**11545 Rockville Pike**  
**Two White Flint North,**  
**Rockville, MD 20852-2738**

**RE: SOURCE MATERIAL LICENSE SUA-1548; Docket No. 408964, SMITH RANCH-HIGHLAND MINE UNIT B RESTORATION ACL LICENSE AMENDMENT.**

Dear Mr. Persinko:

Cameco Resources is submitting an Alternate Concentration Limit (ACL) license amendment for the completion of restoration of Mine Unit B at the Smith Ranch Highland Uranium Project.

The Smith Ranch Highland Uranium Project is located in Converse County Wyoming and produces uranium using the in-situ recovery mining method. Historically, ISR mine operators followed the guidance for restoration acceptance found in *Standard Review Plan for In Situ Leach Uranium Extraction License Application* (NUREG-1569). The review plan in NUREG-1569 provided for a "Class of Use" secondary standard for restoration based on the standards from the various Agreement States administration of the Underground Injection Control Program (UIC) and groundwater classifications under the Safe Drinking Water Act (SDWA).

NRC in RIS 2009-05 (ML083510622) stated that the State "Class of Use" standard is no longer applicable as restoration criteria and that the applicable standards for groundwater restoration is 10 CFR Part 40, Appendix A, Criterion 5B. Using the appendix as guidance the secondary standards for groundwater restoration at an ISR mine is 5B (5) of the Appendix. The standards outlined in 5B (5) are baseline water quality, the values given in the table in paragraph 5C, or an alternative concentration (ACL) approved by the commission. The Nuclear Regulatory Commission (NRC) currently only provides guidance for ACL applications for conventional mines. Cameco Resources has assembled this ACL application to comply with 10 CFR Part 40 Appendix A, Criterion 5B requirements that are applicable to an ISR mining project in the conventional ACL application format.

Mine Unit B was the second mine unit developed and mined at the Highland Uranium Project. Initial production began in January 1988 and continued until July 1991. Following in-

situ recovery (ISR), active groundwater restoration was performed from July 1991 to June 2004, followed by a six month stability period from June to December 2004. During the stability period there were four rounds of required samples taken from the MP wells. Groundwater restoration was completed in accordance with the approved Wyoming Department of Environmental Quality (WDEQ) Land Quality Division (LQD) permit No. 603, the ISR regulations in LQD Chapter 11, and the WDEQ Chapter 8 Rules and Regulations. On August 5, 2004, Cameco submitted the MU-B Groundwater Restoration report to WDEQ/LQD demonstrating that restoration was completed using “Best Practicable Technology”. WDEQ had an extended review of the Mine Unit B restoration and required additional discussions and water sampling of selected wells in the mine unit. The final groundwater samples were collected October 2006. The post-ISR groundwater quality met WDEQ criteria for “Class of Use” standard and WDEQ approved the MU-B restoration on March 31, 2008 (WDEQ, 2008).

Cameco submitted the Mine Unit B restoration report to NRC for review under cover letter dated June 26, 2009 (K. Wenzel, Cameco Resources to D.Manderville, NRC) (ML091831100). NRC did not accept the report for detailed technical review and requested additional information from Cameco in correspondence dated September 29, 2009, (ML092680122) relating to the excursion status of well BM-42 and pumping that occurred in the mine unit during the stability period.

Cameco has provided the additional information requested in the NRC RIS 2009-05 (ML083510622) and the Mine Unit B acceptance response from NRC in this Application.

Cameco informed NRC at a public meeting on October 18, 2011 (ML113080033) of the intent to pursue an ACL License Amendment for the restoration of Mine Unit B and describe the approach that would be taken for the application. Cameco had a follow up meeting with NRC on September 5, 2012 (ML12257A023) to discuss progress on the application and the path forward for submittal.

Included with this letter are the following items:

1. Executive summary of the ACL License Amendment Application.
2. Mine Unit B ACL License Amendment Application which includes:
  - a. ACL License Amendment application
  - b. Geochemical Modeling Report (Appendix A)
  - c. Hydrologic Modeling Report (Appendix B)
  - d. WDEQ Restoration Report and Responses to Comments from the September 29, 2009 (ML092680122) Correspondence (Appendix C)
  - e. BM-42 Data and Correspondence (Appendix D)
  - f. Supporting Data (Appendix E) that includes:
    - i. Analytical Data for MU-B Wells
    - ii. WDEQ Permit Chapter D6, Hydrology and Chapter D4, Climatology
    - iii. Aquifer Exemption Correspondence

As demonstrated in this Application, best practicable technology has been applied to Mine Unit B restoration. Furthermore, the “as low as is reasonably achievable” demonstration shows, it is not practicable or reasonably achievable to reduce the constituent concentrations at the POC to baseline levels. However, hydrologic and geochemical modeling have shown that naturally occurring geochemical and hydrologic processes will reduce constituent concentrations by removing constituents from groundwater along its flowpath, resulting in acceptable groundwater constituent concentrations that are protective of human health and the environment at the POE, which is located at the edge of the aquifer exemption boundary.

With this application Cameco is submitting this application to secure from NRC the final Mine Unit B restoration acceptance. Please contact Josh Leftwich at (307) 316-7588 or email [Josh\\_Leftwich@cameco.com](mailto:Josh_Leftwich@cameco.com) if you have any questions or need additional clarification.

Sincerely,  
CAMECO RESOURCES



Josh Leftwich  
**Director, Radiation Safety & Licensing**  
**Cameco Resources**

Enclosure:

- 1) 2 Copies Mine Unit B ACL License Amendment
- 2) 2 Disks, Appendix E Data

cc: Document Control Desk, NRC  
File NRC  
Cameco-Cheyenne