



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**  
WASHINGTON, D.C. 20555-0001

August 15, 2018

Mr. Walter Nelson  
Coordinator, Safety, Health,  
Environment & Quality  
Cameco Resources  
Crow Butte Operation  
86 Crow Butte Road  
Post Office Box 169  
Crawford, NE 69339-0169

SUBJECT: U.S. NUCLEAR REGULATORY COMMISSION VERIFICATION REGARDING  
LICENSE CONDITION 12.2, CROW BUTTE RESOURCES, INC., CRAWFORD,  
NEBRASKA

Dear Mr. Nelson:

By letters dated July 18, 2018 and July 25, 2018 (Agencywide Documents Access and Management System (ADAMS) Accession Nos. ML18206A475 and ML18219A752, respectively), Cameco Resources Crow Butte Operation (Cameco) submitted to the U.S. Nuclear Regulatory Commission (NRC) staff, responses to license condition (LC) 12.2 of license SUA-1534 providing information on the results of its preoperational soil and crop sampling program for its Marsland Expansion Area (MEA) for NRC written verification. The NRC staff has completed its technical review of Cameco's submittals. This letter transmits the NRC staff's review and verification that the requirements of LC 12.2 have been met.

The NRC staff's review of Cameco's responses to LC 12.2 is documented in the enclosed evaluation. The evaluation documents the NRC staff's conclusion that the results of Cameco's preoperational soil and crop sampling program for the MEA meet the requirement of LC 12.2.

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 ADAMS. ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>.

W. Nelson

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If you have any questions, please contact me at 301-415-6443, or by e-mail at [Ronald.Burrows@nrc.gov](mailto:Ronald.Burrows@nrc.gov).

Sincerely,

**/RA/**

Ronald A. Burrows, Project Manager  
Uranium Recovery Licensing Branch  
Division of Decommissioning, Uranium Recovery,  
and Waste Programs  
Office of Nuclear Material Safety  
and Safeguards

Docket No.: 40-8943  
License No.: SUA-1534

Enclosure:  
Verification of Preoperational Sampling

cc: D. Miesbach, NDEQ  
D. Pavlick, CBR

W. Nelson

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LICENSE CONDITION 12.2, CROW BUTTE RESOURCES, INC., CRAWFORD,  
NEBRASKA **DATE August 15, 2018**

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**ADAMS Accession No.: ML18221A427**

**via email**

<b>OFFICE</b>	NMSS/DUWP	NMSS/DUWP	NMSS/DUWP	NMSS/DUWP
<b>NAME</b>	RBurrows	SAchten	BVonTill	RBurrows
<b>DATE</b>	8/14/18	8/14/18	8/15/18	8/15/18

**OFFICIAL RECORD COPY**

**U.S. Nuclear Regulatory Commission  
Staff Verification of Preoperational Soil and Crop Samples  
Cameco Resources Crow Butte Operation  
License Condition 12.2  
Source Material License SUA-1534**

**BACKGROUND**

By letter dated May 23, 2018 (NRC, 2018a), the U.S. Nuclear Regulatory Commission (NRC) staff amended Crow Butte Resources, Inc.'s (CBR's or the licensee's) Source and Byproduct Materials License SUA-1534 (license) to include the extraction and recovery of uranium source material at its Marsland Expansion Area (MEA). License Condition (LC) 12.2 of the amended license requires CBR to collect and submit the results of preoperational soil and crop samples, previously described by CBR in a letter dated June 27, 2017 (Cameco, 2017), for the NRC staff's written verification. Specifically, LC 12.2 requires the licensee to submit the following information for its licensed activities at the MEA:

At least 90 days prior to the commencement of construction related to NRC-licensed activities at the MEA, the licensee shall collect and submit the results of preoperational soil and crop samples as described in the licensee's submittal dated June 27, 2017 (ML17193A311) to the NRC staff for review and written verification. Following NRC verification, the results of the preoperational soil samples shall be added to Appendix BB of the Marsland Technical Report, and the results of the preoperational crop samples shall be added to Appendix Q of the Marsland Technical Report, as described in the licensee's submittal dated June 27, 2017 (ML17193A311).

By letters dated July 18, 2018 (Cameco, 2018a) and July 25, 2018 (Cameco, 2018b), the licensee submitted to the NRC staff a response to LC 12.2, providing information on preoperational soil and crop samples for its licensed activities at the MEA.

The purpose of this evaluation is limited to the NRC staff reviewing the results of the preoperational soil and crop samples as described in the licensee's submittal dated June 27, 2017 (Cameco, 2017) as stated above. The NRC staff previously evaluated other aspects of the MEA background radiological characteristics, including sampling locations, as documented in the Safety Evaluation Report for the amended license (refer to Section 2.6 of NRC, 2018b).

**REGULATORY REQUIREMENTS**

The requirements related to a preoperational monitoring program are found in 10 CFR Part 40, Appendix A, Criterion 7. The NRC staff evaluated CBR's submittals (Cameco, 2018a, 2018b) against the acceptance criteria in Section 2.9.3 of NUREG-1569, Standard Review Plan for In Situ Leach Uranium Extraction License Applications (NRC, 2003).

**TECHNICAL EVALUATION**

***Crop Samples***

Enclosure

The licensee submitted (Cameco, 2018a, 2018b) the results of three samples each of winter wheat, corn, and alfalfa that were taken at locations identified in Figure 2.7-4 of its application (Cameco, 2017). All crop samples were analyzed for natural uranium, radium-226, thorium-230, lead-210, and polonium-210.

The NRC staff finds the results of the preoperational crop samples consistent with Acceptance Criterion 2.9.3(1) of NUREG-1569 (NRC, 2003) and therefore acceptable.

### ***Soil Samples***

The licensee submitted (Cameco, 2018b) the results of 41 soil samples that were taken at locations identified in Figure 3 of Appendix BB of its application (Cameco, 2015). These soil samples were taken at a depth of 6 inches (15 centimeters). All soil samples were analyzed for radium-226. In addition, six samples (15 percent of total samples) were analyzed for lead-210, thorium-230, and natural uranium.

The NRC staff finds the results of the preoperational soil samples consistent with Acceptance Criterion 2.9.3(2) of NUREG-1569 (NRC, 2003) and therefore acceptable.

### **CONCLUSION**

The NRC staff concludes that the licensee has met the requirement of LC 12.2 for collecting and submitting the results of preoperational soil and crop samples as described in the licensee's submittal dated June 27, 2017 (Cameco, 2017).

### **REFERENCES**

Cameco, 2018a. Letter from W. Nelson, Cameco Resources, Crow Butte Operation, to T. Lancaster, U.S. Nuclear Regulatory Commission, Submittal of winter wheat and corn data for Marsland Exploration Area, July 18, 2018, ADAMS Accession No. ML18206A475.

Cameco, 2018b. Letter from W. Nelson, Cameco Resources, Crow Butte Operation, to T. Lancaster, U.S. Nuclear Regulatory Commission, Submittal of alfalfa and corn data for Marsland Exploration Area, July 25, 2018, ADAMS Accession No. ML18219A752.

Cameco, 2017. Letter from L. Teahon, Cameco Resources, Crow Butte Operation, to T. Lancaster, U.S. Nuclear Regulatory Commission, Response to Open Issues – Marsland Expansion Area Technical Report Teleconference on June 14, 2016, June 27, 2017, ADAMS Accession No. ML17193A311 (Package).

Cameco, 2015. Letter from L. Teahon, Cameco Resources, Crow Butte Operation, to T. Lancaster, U.S. Nuclear Regulatory Commission, Marsland Expansion Area Technical Report, Amendment to Source Material License - SUA-11534, Combined Revisions - May 2012 through September 2015, November 12, 2015, ADAMS Accession No. ML15328A422 (Package).

NRC, 2018a. Letter from M. Samson, U.S. Nuclear Regulatory Commission, to W. Nelson, Cameco Resources, Crow Butte Operation, License Amendment Number Three, Marsland Expansion Area, May 23, 2018, ADAMS Accession No. ML18117A293 (Package).

NRC, 2018b. Safety Evaluation Report, License Amendment for the Crow Butte Resources Marsland Expansion Area In-Situ Recovery Project, January 29, 2018, ADAMS Accession No. ML18009A976

NRC, 2003. NUREG-1569, "Standard Review Plan for In Situ Leach Uranium Extraction License Applications-Final Report," June, 2003, ADAMS Accession No. ML032250177.