



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

August 9, 2017

Mr. Larry Teahon
Manager of 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
THE 2017 SURETY UPDATE, CROW BUTTE RESOURCES, INC.,
CRAWFORD, NEBRASKA, SOURCE MATERIALS LICENSE SUA-1534 (CAC
L00830)

Dear Mr. Teahon:

By letters dated September 30, 2013, September 30, 2014, September 28, 2015, and September 28, 2016 (Agencywide Documents Access and Management System (ADAMS) Accession Nos. ML13277A310, ML14282A184, ML15279A139, and ML16278A642 respectively), Crow Butte Resources, Inc. (CBR) submitted its 2014, 2015, 2016, and 2017 surety updates to the U.S. Nuclear Regulatory Commission (NRC) staff. As a result of these submittals, the overall effect of these surety updates is to increase the 2013 surety amount by \$3,651,842 to a total of \$46,875,122.

Based on the information provided in CBR's aforementioned surety update submittals, the NRC staff has determined that the surety estimate is acceptable as documented in the NRC staff's verification (enclosed). License Condition 9.5 of Materials License SUA-1534 will be revised to reflect the current updated surety amount during a future licensing action.

If you have any questions, please contact Mr. Ronald Burrows, Project Manager, at 301-415-6443 or, by email at ronald.burrows@nrc.gov.

As a result of this verification, the NRC staff has completed its work on Cost Activity Code (CAC) L00830. Therefore, this CAC will be closed with no further charges against it.

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

Larry Teahon

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Document Room or from the Publicly Available Records component of NRC's ADAMS. ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>.

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: NRC Staff Verification of 2017 Surety Estimate

cc: D. Pavlick, Cameco Resources

D. Miesback, NDEQ

L. Teahon

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CRAWFORD, NEBRASKA, SOURCE MATERIALS LICENSE SUA-1534 (CAC
L00830) DATED AUGUST 9, 2017

cc: D. Pavlick, Cameco Resources
D. Miesback, NDEQ

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ADAMS Accession No.: ML17213A182

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NAME	RBurrows	TLancaster via e-mail	RAugustus via e-mail	Sachten	BVonTill	RBurrows
DATE	07/28/2017	07/31/2017	07/28/2017	08/01/2017	08/05/2017	08/09/2017

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**U.S. Nuclear Regulatory Commission
Staff Verification of 2017 Surety Estimate
Crow Butte Resources, Inc.
Source Material License SUA-1534**

DATE: August 9, 2017

DOCKET: 040-08943

LICENSE NO.: SUA-1534

LICENSEE: Crow Butte Resources, Inc.

SITE: Crow Butte Project

PROJECT MANAGER: Ronald A. Burrows

TECHNICAL REVIEWERS: Tom Lancaster, Reginald Augustus

Background

By letter dated September 30, 2014, CBR submitted its Crow Butte 2015 annual surety update (CBR, 2014) to the NRC. The NRC staff reviewed the surety update and identified a request for additional information (RAI). However, the licensee and NRC staff agreed that the issues would be addressed in the licensee's next (2016) surety submission.

By letter dated September 28, 2015, CBR submitted its Crow Butte 2016 annual surety update (CBR, 2015) to the NRC. The NRC staff reviewed the surety and issued an RAI on April 14, 2016, (NRC, 2016b). The licensee responded to the RAI in its submission of the Crow Butte 2017 surety update (CBR, 2016b).

By letter dated September 28, 2016, CBR submitted its Crow Butte 2017 annual surety update (CBR, 2016b) to the NRC. The NRC staff reviewed the surety and determined that the surety update was acceptable.

Staff Review and Analysis

This report includes the results of the NRC staff's review of the 2014, 2015, 2016, and 2017 annual surety updates (CBR, 2013, 2014, 2015, 2016b). The NRC staff reviewed CBR's Crow Butte surety estimate in accordance with requirements in 10 CFR Part 40, Appendix A, Criterion 9, "Financial Criteria" and in License Condition 9.5 of Materials License SUA-1534. Additionally, the NRC staff used NUREG-1569, "Standard Review Plan for In Situ Leach Uranium Extraction License Applications" (SRP) as guidance in determining elements to be included in a surety review. Specifically, the NRC staff used the review procedures and acceptance criteria guidance in Section 6.0 and in Appendix C of the SRP. The NRC staff also used Nebraska Department of Labor, Office of Labor Market Information, Occupational Employment Statistics

Program (NDOL, 2016) when applicable, to verify that reasonable unit costs were included in the surety calculations.

Sufficiency of the Cost Estimate

In the surety calculations, the licensee includes costs for decommissioning and decontamination (D&D), reclamation of sites, structures, and equipment used in conjunction with facility operations.

CBR estimated the cost to decommission and decontaminate the Crow Butte facility by an independent party at \$46,875,122. This constitutes an increase of \$1,214,556 above the previous year's surety estimate of \$45,660,566. The most significant categories that contributed to the surety estimate change include, contract administration (+\$97,165), contingency (+\$145,747), groundwater restoration (+\$268,731), and an additional cost for the request of an ACL (+\$418,870). The cost estimate is based on costs of a third-party contractor, does not take credit for any salvage value, and includes a 15 percent contingency factor. Chemical and electrical costs are based on actual invoices and are adjusted by the Consumer Price Index for inflation.

This surety estimate maintains 11 pore volumes (PVs) as a basis to complete restoration for each mine unit (MU) consisting of 3 ion exchange PVs, 6 reverse osmosis PVs, and 2 recirculation PVs. The NRC staff previously approved 11 PVs for restoration purposes during the 2009 surety update (NRC, 2009) based on the licensee's experience with restoring MU-1. The NRC staff finds nothing to invalidate the previous findings regarding the licensee's estimate of 11 PVs required for MU restoration and therefore the NRC staff's previous conclusions remain valid.

Based on staff's review of the 2016 Crow Butte surety estimate, The NRC staff issued an RAI to CBR on April 14, 2016, (NRC, 2016b). The RAI requested an update to the surety estimate to provide prospective estimates in the following areas:

- a. estimated submittal dates for requesting the removal of MU-2 and MU-3 from restoration,
- b. estimated submittal dates for requesting the removal of MUs 4, 5, and 6 from restoration as modeled using projected mine conditions at the time of the next Surety Estimate (i.e., 2017 Surety Estimate submittal) or provide justification for the estimated remediation periods as presented, and
- c. sufficient funds to cover any revisions to MU restoration periods and any associated work (e.g. development of an ACL application per Part 40, Appendix A, Criterion 5B(6)) by a third party.

CBR responded to the above-referenced RAI in their 2017 annual surety update (CBR, 2016b) and a subsequent e-mail dated June 21, 2017, addressing an alternate decommissioning schedule (CBR, 2017). According to the RAI response (CBR, 2016a) and the subsequent correspondence (CBR, 2017), CBR intends to submit ACL applications for MU-2 and MU-3 by

December 31, 2018. The costs provided in the 2017 surety update for the preparation of an ACL application consist of coring, sampling, and ACL application report preparation. The NRC staff found the costs for the development of an ACL application to be reasonably sufficient. Additionally, NRC staff observes that other groundwater restoration costs (other than the ACL application cost) for MU-2 and MU-3 is for work that has been completed. These other costs for MU-2 and MU-3 amount to \$472,355.44 and \$447,770, respectively. Staff finds that these other costs for completed work make the surety update a more conservative estimate of decommissioning (groundwater restoration) costs.

The NRC staff reviewed the updated cost estimate against requirements in LC 9.5 (NRC, 2016a) and for consistency with CBR's Wellfield Decommissioning Plan (CBR, 2004). The NRC staff observed that CBR increased the groundwater restoration stability monitoring period from 12 to 24 months in their 2014 surety update (CBR, 2013). The NRC staff reviewed the adequacy of the 24 restoration stabilization sampling events and associated costs in the 2014, 2015, 2016 surety updates (CBR, 2013, 2014, 2015). The NRC staff compared the number of restoration stability sampling events reflected in the surety estimate to restoration stability sampling events that have been demonstrated at Mine Unit 1 (MU-1) within CBR's operating facility. The NRC staff observes that MU-1 ground water restoration was completed and approved by the NRC on February 12, 2003, (NRC, 2003a). A total of 17 restoration stability sampling events between February 1999 to August 2002 demonstrated the stabilization of the restored groundwater constituents in MU-1 (CBR, 2002), which is less than the 24 stability sampling events provided in the in the surety estimate (CBR, 2013, 2014, and 2015). Thus, based on what has been demonstration at the Crow Butte project, The NRC staff finds the number of restoration stability sampling events in CBR's surety estimate to be acceptable.

The NRC staff observes that the licensee's surety estimates and the associated cost breakdowns were adequately summarized and calculated in accordance with Appendix C of NUREG-1569 (NRC, 2003b). The NRC staff spot-checked the calculations within cost breakdowns, using Microsoft Excel and found the calculations to be correct. The NRC staff observes that 10 CFR Part 40, Appendix A, Criterion 9 does not specify a specific contingency factor to be used in the surety calculations. Guidance in NUREG-1569 recommends a minimum 15 percent contingency as an acceptance criterion. The NRC staff finds that the contingency used by the licensee is consistent with that guidance.

The NRC staff's review of the cost adjustments were found to be consistent with proposed changes in the operations. The NRC staff found that the licensee has included in the update all activities: (1) listed in the reclamation plan or in Section 6.0 of NUREG-1569; and (2) conducted during the period covered by the estimate. The NRC staff found the licensee has based the assumptions for the financial surety analysis on site conditions, including experiences with generally accepted industry practices, research and development at the site, and previous operating experience.

Therefore, The NRC staff finds that the licensee has established an acceptable financial assurance cost estimate based on the requirements in 10 CFR Part 40, Appendix A, Criterion 9.

Conclusion

Based on the information provided in the application and the detailed review conducted of the surety estimate for CBR's Crow Butte Uranium Project, the NRC staff concludes that the 2017 surety estimate reasonably includes funds sufficient to cover the estimated current costs of the facility. The staff determined that the updated surety amount meets the requirements of 10 CFR Part 40, Appendix A, Criterion 9 and LC 9.5 (NRC, 2016a) and is therefore acceptable.

REFERENCES

10 CFR Part 40. *Code of Federal Regulations*, Title 10, Energy, Part 40, "Domestic Licensing of Source Material."

CBR, 2017. E-mail from L. Teahon, Cameco Resources Crow Butte Operation, to R. Burrows, US NRC, Alternate Decommissioning Schedule, June 21, 2017, ADAMS Accession No. ML17173A388.

CBR, 2016a. Letter from B. Tiensvold, Cameco Resources, Crow Butte Operations, to U.S. NRC, Request for Alternate Decommissioning (Groundwater Restoration) Schedule License SUA-1534 (November 2014), July 27, 2016, ADAMS Accession No. ML16222A356.

CBR, 2016b. 2017 Surety Estimate, Cameco Resources Crow Butte Operation, Source Materials License SUA-1534, September 28, 2016, ADAMS Accession No. ML16278A642.

CBR, 2015. 2016 Surety Estimate, Cameco Resources Crow Butte Operation, Source Materials License SUA-1534, September 28, 2015, ADAMS Accession No. ML15279A139.

CBR, 2014. 2015 Surety Estimate, Cameco Resources Crow Butte Operation, Source Materials License SUA-1534, September 30, 2014, ADAMS Accession No. ML14282A184.

CBR, 2013. 2014 Surety Estimate, Cameco Resources Crow Butte Operation, Source Materials License SUA-1534, September 30, 2013, ADAMS Accession No. ML13277A310.

CBR, 2004. Crow Butte Resources, Inc. Wellfield Decommissioning Plan for Crow Butte Uranium Project - NRC Source Material License SUA-1534, June 30, 2004, ADAMS Accession No. ML041980328.

CBR 2002, CBR Mine Unit 1 Groundwater Stability Data, October, 11 2002, ADAMS Accession No. ML022980095.

NDOL, 2016. Nebraska Department of Labor, Office of Labor Market Information, Occupational Employment Statistics Program, Accessed December 15, 2016, <https://networks.nebraska.gov/vosnet/lmi/default.aspx>.

NRC, 2016a. Crow Butte Resources, Inc. Material License SUA-1534, Amendment No. 1, December 5, 2016, ADAMS Accession No. ML16078A239.

NRC, 2016b. Letter from R. Burrows, US NRC, to L. Teahon, Cameco Resources Crow Butte Operation, Request for Additional Information, License Condition 9.5, Financial Assurance Update, Crow Butte Resources, Inc., April 14, 2016, ADAMS Accession No. ML16063A029.

NRC, 2009. Letter from K. McConnell, US NRC, to L. Teahon, Crow Butte Resources, Inc., License Amendment No. 24, 2009 Surety Update, October 21, 2009, ADAMS Accession No. ML092220124.

NRC, 2003a. License Amendment 15, Crow Butte Resources In Situ Leach Facility, License No. SUA-1534, Mine Unit #1 Restoration Acceptance, February 12, 2003, ADAMS Accession No. ML030440055.

NRC, 2003b. NUREG–1569, “Standard Review Plan for In Situ Leach Uranium Extraction License Applications—Final Report.” June 2003.