

Submitted: 8/25/2014

**CROW BUTTE RESOURCES, INC.**

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January 14, 2000

Mr. John Surmeier, Chief  
Uranium Recovery Branch  
Division of Waste Management  
Office of Nuclear Material Safety and Safeguards  
Mail Stop T-7-J-8  
U.S. Nuclear Regulatory Commission  
11545 Rockville Pike  
Rockville, Maryland 20850

Re: Source Materials License SUA-1534  
Docket No. 40-8943  
Mine Unit 1 Restoration Report Submittal and Request for License Amendment

Dear Mr. Surmeier:

In accordance with the approved Crow Butte Resources, Inc. (CBR) Groundwater Restoration Plan and the requirements of the Source Materials License SUA-1534 issued by the US Nuclear Regulatory Commission (NRC), CBR is herewith submitting the results of the Mine Unit 1 groundwater restoration stabilization period. These results are included in the attached Mine Unit 1 Restoration Report.

The monitoring data from the stabilization period indicates that restoration efforts have been successful in returning the majority of monitored parameters in Mine Unit 1 to baseline concentrations. All other parameters successfully achieved the class-of-use standards established by the Nebraska Department of Environmental Quality (NDEQ) in CBR's Underground Injection Control (UIC) permit. There were no significant trends in any monitored parameters during the stabilization period.

License Condition 10.3 of SUA-1534 contains NRC requirements for determination of preoperational baseline water quality and the goals for subsequent groundwater restoration following mining activities. CBR requests that NRC amend two portions of this License Condition.

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**License Condition 10.3B**

License Condition 10.3B contains requirements for the analysis of 35 groundwater constituents in order to determine preoperational groundwater quality. License Condition 10.3B currently reads:

*10.3B The samples shall be analyzed for alkalinity, ammonia, arsenic, barium, bicarbonate, boron, cadmium, calcium, carbonate, chloride, chromium, copper, fluoride, iron, lead, magnesium, manganese, mercury, molybdenum, nickel, nitrate, nitrite, pH, potassium, radium-226, selenium, silica, sodium, specific conductivity, sulfate, temperature, total dissolved solids, uranium, vanadium, and zinc.*

The approved CBR Groundwater Restoration Plan contains a table that identifies 26 parameters that will be used to judge the success of restoration. Nine of the baseline parameters contained in License Condition 10.3B are not included in the approved restoration list. These parameters are alkalinity, bicarbonate, boron, carbonate, chromium, specific conductivity, nitrite, silica and temperature. Three of these parameters (nitrite, silica, and temperature) are not affected by mining activities using a sodium bicarbonate lixiviant. Five of these parameters (alkalinity, bicarbonate, carbonate, specific conductivity and nitrite) are included in the analysis of other water quality parameters.

Boron has no established drinking water standards and is a parameter of concern for potential impact on the growth of crops. As noted in Section 2.2 of the License Renewal Application (LRA)<sup>1</sup>, the water well survey conducted by Wyoming Fuel Company indicated that the majority of the groundwater pumped from the 123 wells surveyed within 2 ¼ miles of the commercial permit area are used for livestock or for domestic purposes. There is virtually no current groundwater use for irrigation purposes within this area. Due to the shortage of existing irrigation-quality water, it is very unlikely that any additional irrigation development will occur in the foreseeable future. Therefore, boron is not a parameter of concern for the Crow Butte mine.

The remaining parameter, chromium has health-based standards established by the NDEQ in state groundwater standards. However, NDEQ did not include this parameter in CBR's UIC permit due to the low background concentrations and minimal affect of mining operations. This conclusion by NDEQ is supported by the fact that the post-

<sup>1</sup> Crow Butte Resources, Inc., *Application for Renewal of USNRC Radioactive Source Materials License SUA-1534*, December 1995.



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mining water quality analysis from Mine Units 1, 2 and 3 has resulted in chromium levels below the detection limit.

CBR requests that License Condition 10.3B be amended to read as follows:

*10.3B The samples shall be analyzed for ammonia, arsenic, barium, cadmium, calcium, chloride, copper, fluoride, iron, lead, magnesium, manganese, mercury, molybdenum, nickel, nitrate, pH, potassium, radium-226, selenium, sodium, sulfate, total carbonate, total dissolved solids, uranium, vanadium, and zinc.*

#### License Condition 10.3C

License Condition 10.3C requires that CBR conduct restoration activities in accordance with the NRC-approved Groundwater Restoration Plan. The License Condition states:

*10.3C Groundwater restoration goals shall be established on a parameter-by-parameter basis, and the primary goal of restoration shall be to return the groundwater quality, on a mine unit average, to baseline conditions. The licensee shall conduct ground-water restoration activities in accordance with the groundwater restoration plan submitted by letter dated November 26, 1996.*

License Condition 10.3C does not include provisions for secondary restoration goals. These secondary restoration goals were included in the CBR Groundwater Restoration Plan and were reviewed and approved in the Environmental Assessment (EA)<sup>2</sup> prepared by NRC in support of the renewal of SUA-1534 in 1998. Specifically, Section 4.1 of the EA states that "...*(I)f it is determined that a return to the pre-operational baseline is not reasonably achievable using best practicable technology, the secondary goal is to return the groundwater quality to a use consistent for which the water was suitable prior to the ISL operations, based on the class-of-use standards established by NDEQ*". Further, in Section 10.0 of the EA, Finding of No Significant Impact, conclusion E states that "...*(I)f baseline conditions cannot be reasonably achieved, the R&D operations have demonstrated that the groundwater can be restored to applicable class-of-use standards...*".

CBR believes that the secondary restoration goals assessed in the EA are the UIC permit standards established by the NDEQ. As such, these standards should be incorporated in

<sup>2</sup> USNRC, *Environmental Assessment for Renewal of Source Material License No. SUA-1534*, February 1998.



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License Condition 10.3C. Two factors support the conclusion that the UIC standards were the basis for the preparation of the EA:

- In Section 6.1.3 of the LRA submitted by CBR, it is stated that *"(t)he primary goal of the groundwater restoration program is to return groundwater affected by mining operations to baseline values on a mine unit average. A secondary goal is to return the groundwater to a quality consistent with premining use or uses. The restoration values set by the Nebraska Department of Environmental Quality are consistent with this secondary goal. Restoration values, secondary goal, for each mining unit have been specified by the Nebraska Department of Environmental Quality for groundwater restoration efforts"*. These specific restoration values from the UIC permit were then listed in Table 6.1-1 for Mine Units 1 through 5.
- The Introduction to the EA states that it was *"...based principally on information contained in the LRA and supplements..."* submitted by CBR. Section 1.3.2, Basis for NRC Review, clearly lists the LRA and additional submittals as a principal source of information considered. This section and Section 12.0, References, do not list any state or federal standards as providing information that was also considered in the assessment.

The EA recognized that returning affected groundwater to a quality consistent with class-of-use standards was protective of the public health and safety and the environment. Those class-of-use standards are set by the State of Nebraska under the authority of the Environmental Protection Agency (EPA) after consideration of the baseline groundwater quality and the potential future uses for the aquifer. Based upon the conclusions of the EA, CBR requests that NRC amend License Condition 10.3C of SUA-1534. CBR requests that License Condition 10.3B be amended to read as follows:

*10.3C Groundwater restoration goals shall be established on a parameter-by-parameter basis for the constituents identified in License Condition 10.3B. The primary goal of restoration shall be on a parameter-by-parameter basis to return the average mine unit concentration to baseline conditions. The secondary goal of groundwater restoration shall be on a parameter-by-parameter basis to return the average mine unit concentration to the class-of-use standards established by the Nebraska Department of Environmental Quality in Underground Injection Control Permit NE0122611. The licensee shall conduct ground-water restoration activities in accordance with the groundwater restoration plan submitted by letter dated November 26, 1996.*

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If you have any questions or require further information, please do not hesitate to contact me at (303) 226-5518.

Sincerely,  
CROW BUTTE RESOURCES, INC.

Stephen P. Collings  
President

Enclosures: As Stated

cc: William Ford – NRC (with 3 copies)