

**U.S. NUCLEAR REGULATORY COMMISSION  
RECORD OF DECISION  
FOR THE DEWEY-BURDOCK URANIUM IN-SITU RECOVERY PROJECT  
IN CUSTER AND FALL RIVER COUNTIES, SOUTH DAKOTA**

**Introduction:**

The U.S. Nuclear Regulatory Commission (NRC) staff prepared this record of decision (ROD) for the proposed Dewey-Burdock Uranium In-Situ Recovery (ISR) Project in Custer and Fall River Counties, South Dakota. This ROD satisfies Section 51.102(a) of Title 10 of the *Code of Federal Regulations* (10 CFR), which states that “a Commission decision on any action for which a final environmental impact statement has been prepared shall be accompanied by or include a concise public record of decision.”

In January 2014, the NRC staff issued a Final Supplemental Environmental Impact Statement (Final SEIS) (NRC, 2014a-b) in support of the NRC’s review of the Powertech (USA) Inc. (Powertech or “applicant”) license application. Powertech’s application, which it submitted in 2009 and later amended, is for a new source materials license for the Dewey-Burdock ISR Project (Powertech, 2009a-c). The Dewey-Burdock Final SEIS is Supplement 4 to the NRC staff’s *Generic Environmental Impact Statement for In-Situ Leach Uranium Milling Facilities* (NUREG-1910) (known as the GEIS) (NRC, 2009).

This ROD has been prepared pursuant to NRC regulations at 10 CFR § 51.102(b) and § 51.103(a)(1)-(4). Additionally, pursuant to 10 CFR § 51.103(c), this ROD incorporates by reference materials contained in the Final SEIS.

On January 5, 2010, the NRC staff notified the public of Powertech’s application for a materials license. The NRC staff also informed members of the public that they could request a hearing in connection with Powertech’s application. *Notice of Opportunity for Hearing, License Application Request of Powertech (USA) Inc. Dewey-Burdock In Situ Uranium Recovery Facility in Fall River and Custer Counties, SD*, 75 Fed. Reg. 467. The NRC’s Atomic Safety and Licensing Board Panel (ASLBP), an independent, trial-level adjudicatory body, granted hearing requests from the Oglala Sioux Tribe and a group that is now referred to as the Consolidated Intervenor (ASLBP, 2010). The ASLBP has scheduled an oral hearing for August 2014, and the hearing may involve environmental issues. This ROD may be revised in accordance with any ASLBP decision on those issues.

**The Decision:**

This ROD documents the NRC staff’s decision to issue a materials license to Powertech for its proposed Dewey-Burdock ISR Project in Custer and Fall River Counties, South Dakota (Materials License SUA-1600; NRC, 2014c). The license will authorize Powertech to possess uranium source and byproduct materials at the Dewey-Burdock facility. Under its license, Powertech will be able to construct and operate its facilities as proposed in its license application and under the conditions in its NRC license.

The proposed Dewey-Burdock ISR Project will be located approximately 21 kilometers (13 miles) north-northwest of Edgemont, South Dakota, in southern Custer and northern Fall River Counties. The proposed facility will encompass approximately 4,282 hectares (10,580 acres), which consists of two contiguous mining units, the Burdock Unit and the Dewey Unit. Powertech intends to recover uranium and produce yellowcake at the Dewey-Burdock site. Powertech’s proposed activities include construction, operation, aquifer restoration, and decommissioning of its ISR facility. In addition, Powertech has proposed that liquid wastewater

## RECORD OF DECISION: DEWEY-BURDOCK IN-SITU RECOVERY PROJECT

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generated during uranium recovery be disposed of through one of the following methods: (i) deep well disposal via Class V injection wells, (ii) land application, or (iii) a combination of deep well disposal and land application. Together, these actions represent the “proposed action” evaluated in the Final SEIS.

During the ISR process, an oxidant-charged solution, called a lixiviant, will be injected into the production zone aquifer (uranium orebody) through injection wells. The lixiviant will be composed of native groundwater (from the production zone aquifer) and a combination of carbon dioxide and gaseous oxygen. As the lixiviant circulates through the production zone, it will oxidize and dissolve the mineralized uranium, which is present in a reduced chemical state. The resulting uranium-rich solution will be drawn to recovery wells by pumping and then transferred to a processing facility via a network of underground pipelines. At the processing facility, the uranium will be removed from solution via ion exchange. The resulting barren solution will then be recharged with the oxidant and reinjected to recover more uranium.

### **Alternatives Considered in Reaching the Decision:**

The NRC staff analyzed a number of alternatives in detail before deciding to issue Powertech a license. These alternatives included the proposed action in the license application (including the three alternative wastewater disposal options) and the no-action alternative. Under the no-action alternative, the NRC staff would not approve Powertech’s license application and, as a result, Powertech would not construct or operate the proposed Dewey-Burdock ISR Project. The no-action alternative served as a baseline for comparing the potential environmental impacts of the proposed action. In Volume 1 of the Final SEIS (NRC, 2014a), the NRC staff describes both the proposed action and the no-action alternative (Section 2.1) and compares their potential environmental impacts (Section 2.3).

The NRC staff considered several other alternatives when evaluating the proposed action. The staff eliminated these alternatives from detailed analysis, however, for reasons discussed in Volume 1, Section 2.2, of the Final SEIS (NRC, 2014a). These alternatives included conventional uranium mining techniques and associated uranium milling alternatives (conventional milling and heap leaching) for the proposed project site, the use of alternative lixiviants (acid- or ammonia-based lixiviants), alternative project sites, and alternative well completion methods at the proposed project site.

In addition, the NRC staff considered alternative methods for disposing of liquid waste. The staff discusses these alternatives in Volume 1, Section 2.1.1.2, of the Final SEIS (NRC, 2014a). Specifically, the NRC staff considered what would occur if the U.S. Environmental Protection Agency does not grant Powertech an underground injection control (UIC) permit for Class V injection wells. The staff determined that Powertech would in that case need to rely solely on land application for liquid wastewater disposal or seek an NRC license amendment approving another disposal option. Thus, in Final SEIS Section 2.1.1.2 the staff evaluates the use of evaporation ponds and surface water discharge, which have historically been used by ISR facilities to manage and dispose of liquid wastes. The staff also compares characteristics of these two methods with those of Class V well injection and land application. Further, in Section 4.14.1.4 of the Final SEIS (NRC, 2014a), the staff evaluates the potential environmental impacts of using evaporation ponds and surface water discharge.

The alternatives identified above were included in the range of alternatives analyzed in the Final SEIS.

### **Preferences Among Alternatives Based on Relevant Factors:**

In Volume 1, Chapters 4 and 5, of the Final SEIS (NRC, 2014a), the NRC staff assessed the potential environmental impacts from the construction, operation, aquifer restoration, and decommissioning of the proposed Dewey-Burdock ISR Project. The staff also assessed the potential impacts of three alternative wastewater disposal options and the no-action alternative. The NRC staff assessed the impacts of these alternatives on land use, transportation, geology and soils, water resources, ecological resources, air quality, noise, historical and cultural resources, visual and scenic resources, socioeconomics, environmental justice, public and occupational health and safety, and waste management. The staff compared the potential environmental impacts of the proposed action and the no-action alternative in Volume 1, Section 2.3, of the Final SEIS (NRC, 2014a). Additionally, in Volume 2, Chapter 8, of the Final SEIS (NRC, 2014b), the staff analyzed the benefits and costs of the proposed action and no-action alternative. In preparing the Final SEIS, the NRC staff also considered, evaluated, and addressed the public comments received on the Draft SEIS published on November 26, 2012 (77 Fed. Reg. 70,486).

After weighing the impacts of the proposed action and comparing the alternatives, the NRC staff determined that the proposed action is the preferred alternative and that the NRC should issue a source materials license for the proposed action. The NRC staff based its decision on: (i) the license application (including the applicant's environmental report) (Powertech, 2009a-c); (ii) the applicant's responses to NRC staff requests for additional information (Powertech, 2010a-c; 2011; 2012a-c; 2013); (iii) the NRC staff's consultations with Federal, State, and local agencies and with Native American Tribes; (iv) independent NRC staff review; (v) NRC staff consideration of comments received on the Draft SEIS (see Appendix E in Volume 2 of the Final SEIS (NRC, 2014b)); and (vi) the assessments in the NRC staff's Final SEIS (NRC, 2014a-b) and Safety Evaluation Report (NRC, 2014d) for the Dewey-Burdock ISR Project and in the GEIS (NRC, 2009).

### **Measures to Avoid or Minimize Environmental Harm from the Alternative Selected:**

As described below, the NRC has taken all practicable measures within its jurisdiction to avoid or minimize environmental harm from the alternative selected. In its license application (Powertech, 2009a-c) and in response to NRC staff requests for additional information (Powertech, 2010a-c; 2011; 2012a-c), the applicant identified mitigation measures to control and minimize potential adverse environmental impacts from construction, operation, aquifer restoration, and decommissioning of the Dewey-Burdock ISR Project. The applicant also identified environmental measures and monitoring programs to verify compliance with standards for the protection of worker health and safety in operational areas and for protection of the public and environment beyond the facility boundary. As discussed below, the applicant's mitigation measures and monitoring programs are included by the NRC staff as conditions in the materials license.

The mitigation measures identified by the applicant are listed for each resource area in Volume 2, Table 6.2-1, Section 6.2, of the Final SEIS (NRC, 2014b). Because many of the applicant's proposed mitigation measures apply to all four phases of the ISR process, they are listed together in the table. The applicant's environmental measures and monitoring programs for the Dewey-Burdock ISR Project are described in detail in Volume 2, Chapter 7, of the Final SEIS (NRC, 2014b), organized as follows: Radiological Monitoring (Section 7.2), Physicochemical Monitoring (Section 7.3), Ecological Monitoring (Section 7.4), Land Application Monitoring (Section 7.5), and Class V Deep Injection Well Monitoring (Section 7.6). These monitoring programs will provide data on operational and environmental conditions so that prompt corrective actions can be implemented when adverse conditions are detected. In this regard,

## RECORD OF DECISION: DEWEY-BURDOCK IN-SITU RECOVERY PROJECT

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these programs will help to limit potential environmental impacts at the Dewey-Burdock ISR Facility and the surrounding areas.

Administrative Condition 9.2 of Materials License SUA-1600 (NRC, 2014c) requires Powertech to conduct operations in accordance with the commitments, representations, and statements contained in its license application and supplementary submittals. License Condition 9.2 incorporates by reference Powertech's approved application and the supplements to its application. Powertech's commitments, representations, and statements include the mitigation measures and monitoring programs described above. Additional license conditions relevant to mitigation and monitoring include: mitigation of potential impacts to cultural resources (Administrative Condition 9.8); documentation in association with monitoring programs (Administrative Condition 9.10); and implementation of a preoperational and operational sampling plan if land application is utilized (Operations, Controls, Limits, and Restrictions – Standard Condition 10.12).

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## RECORD OF DECISION: DEWEY-BURDOCK IN-SITU RECOVERY PROJECT

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**RECORD OF DECISION: DEWEY-BURDOCK IN-SITU RECOVERY PROJECT**

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FOR THE NUCLEAR REGULATORY COMMISSION

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/RA/  
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