U.S. Department of the Interior
Bureau of Land Management

**April 2026**

# Dewey-Burdock Uranium In-Situ Recovery Plan of Operations: Initial Infrastructure Development

Environmental Assessment DOI-BLM-MT-C040-2026-0009-EA

Looking east across the Burdock portion of the project area. (BLM, 7/30/2025)

*I have considered the factors mandated by the National Environmental Policy Act (NEPA). This environmental assessment represents the Bureau of Land Management's (BLM's) good-faith effort to fulfill NEPA's requirements by prioritizing documentation of the most important relevant considerations within the statutorily mandated page limits and timeline. This prioritization reflects the BLM's expert judgment; and any considerations addressed briefly or left unaddressed are, in the BLM's judgment, comparatively non-substantive and would not meaningfully inform the BLM's consideration of environmental effects and the decision to be made. The EA is substantially complete, considers the factors mandated by NEPA, and, in my judgment, contains analysis adequate to inform the BLM's decision regarding the Proposed Action.*

Responsible Official: _____ Date: _____
Name & Title

**U.S. Department of the Interior**
**Bureau of Land Management**
**Eastern Montana and Dakotas District**
**South Dakota Field Office**
**309 Bonanza Street**
**Belle Fourche, SD 57717**

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# 1 Introduction

On November 19, 2020, Powertech (USA) Inc. (Powertech) submitted a Plan of Operations to the Bureau of Land Management (BLM) South Dakota Field Office to develop initial infrastructure and monitoring wells associated with the Dewey-Burdock Uranium In-Situ Recovery (ISR) Project in Custer and Fall River Counties, South Dakota. The BLM-administered portion is located in Fall River County and entirely within the Burdock area of the project (see Map 1, Appendix E). In conformance with 43 CFR Subpart 3809, the 2020 Plan of Operations (Plan) was originally submitted in August 2009 and has since incorporated revisions from January 2011, November 2014, and November 2020 and has addressed comments submitted by the South Dakota Department of Agriculture and Natural Resources (SD DANR).

The ISR method is the in-place recovery of a mineral resource without removing overburden or ore. This method of mining is typically accomplished by installing injection/production wells and recovering the resource directly from the natural deposit by exposing it to the injection of the lixiviant that causes leaching, dissolution, and recovery of the mineral. No injection/production wells are proposed on public lands administered by the BLM under the initial development phase.

The proposed Dewey-Burdock Project boundary is comprised of approximately 10,580 acres of mostly private surface, of which 160 acres (1.5%) are public lands parcels that are administered by the BLM and have proposed project development. Under the initial phase of development, Powertech estimates a total of 68 acres of surface land will be disturbed on primarily private lands. As proposed under the Plan, the surface disturbance on the public lands portion of the initial phase of development would be about 4.20 acres resulting from infrastructure construction of the primary access road, light use access routes (two-track road), power line, and perimiter groundwater monitoring wells. No exploration, resource delineation, or production/injection well drilling activities would be conducted on public lands under the initial development phase of the Plan and are not analyzed under this Environmental Assessment (EA). See Maps 1 and 2 in Appendix E.

The start date for the public lands portion of the project is dependent on the approval of other federal and state permits, however it is expected within five years of the BLM decision for the EA and Plan of Operations. Completion of the proposed infrastructure and monitoring well construction is expected within three years of the start date of initial construction. The infrastructure would remain in place and be maintained for the life of the Dewey-Burdock Uranium ISR Project (about 20 years).

## 1.0 Background

In August 2009, Azarga Uranium Corp. submitted the original Plan of Operations to the BLM for the public lands portion of Dewey-Burdock Uranium ISR Project. In 2014, Powertech Uranium Corp. merged with Azarga Uranium Corp. and the merged companies were subsequently acquired by enCore Energy Corp. in 2022. The current operator and mining claimant for the filed Plan is Powertech (USA) Inc., a wholly owned subsidiary of enCore Energy Corp. For the remainder of this document, these companies will be referred to as Powertech regardless of the timing of various proposals and the name of the operator at that time.

Within the project boundary, Powertech holds 367 mining claims over approximately 4,570 acres. The public lands portion of surface estate that is held by unpatended mining claims total approximately 240 acres. The remaning lands associated with mining claims (approximately 4,330 acres) are split estate lands where the proposed operation is on private surface patented under the Stock Raising Homestead Act (SRHA); these lands overlay subsurface mineral estate that is reserved by the United States. When the operator has surface owner consent to operate on these lands, the operator does not need to obtain BLM authorization under the surface management regulations, but must still provide the BLM with a copy of the surface use agreement (43 CFR § 3809.31(d)). As such, the BLM will not be analyzing the patented privately owned lands in this EA; only the federal surface totaling 160 acres will require analysis. On June 10, 2020, Powertech submitted to the BLM the confidential land agreements the company has with the various owners of the surface overlying mineral estate owned by the United States.

Though this EA focuses analysis on the public lands portion of the Dewey-Burdock project that is subject to the Plan of Operations, the project is subject to various federal and state authorities that require permits/licenses and their approval prior to implementation (see Table 1).

**Table 1. Summary of Other Needed Federal and State Approvals**

| Issuing Agency | Description | Status |
|---|---|---|
| **South Dakota Department of Agricultural and Natural Resources** | Uranium Exploration Permit | Approved by the State of South Dakota's Board of Minerals and Environment in November 2008. |
| | Determination of Special, Exceptional, Critical, or Unique Lands | In April 2009, the State of South Dakota's Board of Minerals and Environment determined the proposed mine area did not have special, exceptional, critical, or unique characteristics. |
| | Large-Scale Mine Permit | Recommended for conditional approval in April 2013; hearing postponed. * |
| | Water Appropriation Permits (Madison and Inyan Kara aquifers) | Recommended for approval November 2012.* |
| | Air Quality Permit | The State of South Dakota determined that an air permit would not be required, and the project would not be subject to Prevention of Significant Deterioration requirements. |
| | Groundwater Discharge Plan (for land application of treated wastewater) | Conditionally approved in December 2012.* |
| | National Pollutant Discharge Elimination System Water Discharge Permit | Powertech anticipates seeking construction and industrial stormwater permits via the South Dakota stormwater permitting program. The State of South Dakota determined that a 401 Certification under the Clean Water Act is not required for Powertech's license renewal application. |
| **U.S. Environmental Protection Agency** | Aquifer Exemption under the Safe Drinking Water Act | EPA issued and aquifer exemption in November 2020. |

| Issuing Agency | Description | Status |
|---|---|---|
| | Underground Injection Control Class III and Class V Area Permits | EPA issued underground injection control (UIC) Class III and Class V Area Permits in November 2020 and reissued the permits on March 14, 2025. |
| **U.S. Nuclear Regulatory Commission** | Source and Byproduct Materials License | NRC is reviewing Powertech's 10-year renewal for the SUA-1600 license. |
| **U.S. Army Corps of Engineers** | Permit under Section 404 of the Clean Water Act | On January 14, 2009, Powertech obtained jurisdictional wetlands determinations from USACE. Because these determinations are only good for five years, Powertech plans to wait to submit a jurisdictional determination request and a 404 permit application, if necessary, to USACE prior to the start of construction. |
| **Custer County** | Building Permits | Pending major permit approvals. |
| **Fall River County** | Building Permits | Pending major permit approvals. |
| * Per the licensee, the State of South Dakota will not advance permitting or schedule hearings until all federal permitting, approvals, and challenges are resolved. (SD DANR 2026) | | |

#### 1.0.1.1 Nuclear Regulatory Commission Permit Background

Displayed in Table 1, the U.S. Nuclear Regulatory Commission (NRC) is responsible for the Source and Byproduct License under the Atomic Energy Act of 1954, as amended, and the Energy Reorganization Act of 1974, as amended. In 2009, Powertech applied to the NRC for a source material license to construct and operate an ISR facility at the proposed Dewey-Burdock project site.

The NRC prepared a General Environmental Impact Statement (GEIS) for ISR Uranium Milling Facilities in 2009. In response to the application received by the NRC a Supplemental Environmental Impact Statement (SEIS) was prepared for this project. BLM was a cooperating agency in the preparation of the SEIS which was published in January 2014. See more information on the 2009 GEIS and 2014 SEIS under Section 1.4.3.

On April 8, 2014, the NRC issued the Source and Byproduct Materials License (SUA-1600) authorizing Powertech to possess and use source material and byproduct material and produce yellowcake at the Dewey-Burdock ISR site (79 FR 21302) for a 10-year term. The NRC license was subject to litigation until the United States Court of Appeals for the District of Columbia Circuit ruled to uphold the issuance of the license in December 2022. On March 4, 2024, Powertech submitted a license renewal application to the NRC. If granted as requested, NRC would renew Powertech's license SUA-1600 for an additional 20 years.

#### 1.0.1.2 Environmental Protection Agency Background

Displayed in Table 1, the U.S. Environmental Protection Agency (EPA) is responsible for the aquifer exemption (AE) under the provisions of the Safe Drinking Water Act of 1974 through their Underground Injection Control (UIC) program. In South Dakota, EPA also has primacy for UIC Class III (underground injection well used for solution mining) and Class V (injection well used to place non-hazardous fluids into or above underground sources of drinking water) Area permits under the Safe Drinking Water Act of 1974.

In January 2013, the EPA issued a Record of Decision (ROD) for the EPA's AE for the Dewey-Burdock Uranium ISR project in Custer and Fall River Counties in South Dakota. In the ROD

the EPA finds that exemption criteria 40 CFR § 146.4(a) and (b)(1) have been met. The EPA approved the AE request as a minor/non-substantial program revision for the AE area.

On November 24, 2020, the EPA issued the Final UIC Class III Area Permit (Permit SD31231-00000) and the Class V Deep Injection Well Area Permit (Permit SD52713-00000) under the authority of the Safe Drinking Water Act and UIC Program regulations of the EPA, codified at 40 CFR Parts 124, 144, 146, and 147.

On March 14, 2025, the EPA reissued both the AE and UIC Class III and Class V UIC permits.

#### 1.0.1.3 South Dakota Department of Agriculture and Natural Resources (SD DANR) Background

In 2007, the South Dakota Board of Minerals and Environment (BME) issued Powertech a uranium exploration permit for the area. Powertech submitted an additional uranium exploration application in July 2008. In August 2008, Powertech submitted a Request for Determination of Special, Exceptional, Critical, or Unique Lands and Notice of Intent to Mine, which is the first step in the mine permit process. In April 2009, the BME determined the proposed mine area did not have special, exceptional, critical, or unique characteristics.

Powertech submitted a large scale mine permit application on October 1, 2012. The SD DANR completed its review of Powertech's mine permit application and supplemental information and determined it was procedurally complete on January 16, 2013. On April 15, 2013, the SD DANR recommended conditional approval of Powertech's permit application. A contested case hearing on Powertech's mine permit application was held before the Board of Minerals and Environment from September 23-27, 2013, in Rapid City, South Dakota.

The hearing was continued to the week of November 11-15, 2013. However, the BME issued an Order (SD DANR 2026) postponing the hearing until the NRC and the EPA have ruled and set the federal surety, and the state Water Management Board has decided the water rights. The Order further states that until those areas are completed, “the BME cannot conditionally approve the permit and fulfill its statutory duties.”

As indicated by Powertech, SD DANR will not advance permitting or schedule further hearings until all federal permitting, approvals, and challenges have been resolved.

## 1.1 Purpose and Need

The need for the action is established by the BLM’s responsibility under the General Mining Act of 1872, the Federal Land Policy and Management Act of 1976 (FLPMA), and the BLM’s surface management regulations at 43 CFR § 3809. Under these statutes and regulations, the BLM is required to review the proposed Plan of Operations to ensure that mining and mining-related activities include appropriate reclamation and do not result in unnecessary or undue degradation[1] (UUD) of public lands.

[1] Under 43 CFR 3809.5, unnecessary or undue degradation is defined to mean conditions, activities, or practices that: (1) Fail to comply with one or more of the following: the performance standards found at 43 CFR 3809.420, the terms and conditions of an approved plan of operations, operations described in a complete notice, and other Federal and state laws related to environmental protection and the protection of cultural resources; (2) Are not “reasonably incident” to prospecting, mining, or processing operations as defined in 43 CFR 3715.0-5; or (3) Fail to

The BLM's purpose is to consider and analyze the reasonably foreseeable environmental effects associated with approving, denying, or conditionally approving Powertech's Plan of Operations to develop infrastructure (roads and powerlines) and water monitoring wells associated with the Dewey-Burdock Uranium ISR Project.

## 1.2 Decision to be Made

The BLM's decision is to determine whether the Plan of Operations would or would not result in unnecessary and undue degradation of public lands and whether any conditions of approval would be required.

Pursuant to 43 CFR § 3809.411(d), upon review of a Plan of Operations, the BLM decision is to consider the following:

1. Approve the Plan of Operations, as submitted;
2. Approve the Plan of Operations, subject to design changes or conditions of approval that are necessary to meet the performance standards of 43 CFR § 3809.420 and to prevent unnecessary or undue degradation; or
3. Withhold approval of the Plan of Operations because the proposed operations would result in unnecessary or undue degradation of public lands.

## 1.3 Land Use Plan Conformance

This EA is in conformance with the South Dakota Field Office (SDFO) Resource Management Plan (DOI-BLM-MT-C040-2015-0004-RMP-EIS) approved September 2015, as amended.

The Proposed Action is in conformance with the applicable LUP because it is specifically provided for in the following LUP management decisions (section 3.2.23 Minerals, pages 3-51 to 3-60):

> **MD-10 Locatable Minerals**: Locatable Federal Minerals will be open and available for mineral exploration and development subject to special considerations needed to protect other resource values while conducting activities under the operation of the mining laws. Locatable federal minerals under Fort Meade ACEC (6,574 acres), Fossil Cycad ACEC (320 acres), and Bear Butte NHL (410 acres of mineral estate) will be recommended for withdrawal from further consideration for locatable mineral development.
>
> **MD-11 Standard mineral restrictions**: Within the limits of the mining laws, applicable management actions or practices, including the leasable mineral Stipulations, COAs, Lease Notices, RDFs, BMPs and Guidelines, soil and water mitigation guidelines, COA, Lease notices, and Reclamation Guidelines (Appendices B, C,G, J, K, and L) of this ARMP may be applied to all mineral uses including a locatable mineral Plan of Operation or Notice as needed to protect resources or limit conflicts with other users. In addition to the guidance in these Appendices, other site specific evaluation, mitigation, monitoring and reclamation practices may be required. A phased approach may be required to limit the numbers of acres disturbed at any one given time. Application of these stipulations or

attain a stated level of protection or reclamation required under specific laws in areas such as the California Desert Conservation Area, Wild and Scenic Rivers, BLM-administered portions of the National Wilderness System, and BLM-administered National Monuments and National Conservation Areas.

practices would be determined through implementation level (project level) planning in coordination with the project proponent and the public.

**MD-14 Consistency with State mineral laws**: Minerals are managed with consideration of state laws.

**MD-15 Access to minerals**: Allow for needed road access, including new roads for mineral extraction operations with consideration of impacts on other resources.

**MD-17 Mitigation**: Mitigation of mineral development and exploration activities will be applied where needed to minimize impacts of mineral development consistent with the management actions and restrictions and stipulations found in this section and the Guidelines and BMPs listed in Appendix J. Mitigation measures will be applied on a case-by-case basis during activity level planning if review of the project area indicates resources would be affected.

## 1.4 Relationship to Statutes, Regulations, Orders, and Other NEPA Documents

The following laws, regulations, policies, and orders are directly related to the Proposed Action and alternatives.

### *1.4.1 Statutes*

**Federal Land Policy and Management Act** requires the Secretary of the Interior to manage public lands under principles of multiple use and sustained yield and authorizes the Secretary to regulate the use of public land for the prevention of unnecessary or undue degradation.

**General Mining Act, as amended,** allows private U.S. citizens and businesses to prospect for, discover, locate, and extract certain valuable minerals on federal public domain lands that are open for that purpose. Later amendments, including the Hard Rock Mining Act, withdrew particular public lands from mining.

**Clean Air Act** establishes National Ambient Air Quality Standards to control air pollution. Impacts to air quality from mineral development are controlled by mitigation measures developed on a case-by-case basis. The South Dakota DANR oversees air quality regulations and standards for stationary sources of air pollution.

**Endangered Species Act** mandates protection for plants and animals that are federally listed as threatened with or in danger of extinction. Concurrence or biological opinion from the U.S. Fish and Wildlife Service (USFWS) would be required were the Proposed Action to potentially or adversely affect any threatened, endangered, or candidate species, as determined by the authorizing agency.

**Federal Water Pollution Control Act (Clean Water Act)** directs standards to be set for surface water quality and for controlling discharges to waters of the U.S. Under Section 402 of the Clean Water Act (as amended), the EPA is directed to develop a phased approach to regulate stormwater discharges under the National Pollutant Discharge Elimination System (NPDES) program. Industrial activities disturbing more than 1 acre of land may require an NPDES permit for stormwater discharge. Depending on the acreage disturbed, either a Phase I industrial activity (5

or more acres of disturbance) or a Phase II small construction activities (between 1 and 5 acres of disturbance) permit may be required.

**National Historic Preservation Act** requires federal agencies to inventory and protect historic and archaeological resources. Concurrence from the State Historic Preservation Officer (SHPO) is required, if any historic properties may be affected by an undertaking.

### *1.4.2 Regulations*

**43 CFR Subpart 3809, Surface Management** (Under the General Mining Laws)**,** requires proper permits and authorizations for mineral exploration, mining, and reclamation actions on the public lands administered by the BLM and sets performance standards for preventing undue and unnecessary degradation of federal lands.

### *1.4.3 Executive and Secretarial Orders*

**Executive Order 14241 Immediate Measures to Increase American Mineral Production, March 20, 2025**, accelerates uranium projects by designating uranium as a priority critical mineral, mandating faster federal permitting (e.g., the FAST-41 Permitting Dashboard), and prioritizing mining on federal lands to boost domestic fuel for nuclear energy. The Dewey-Burdock Uranium ISR Project was posted on the FAST-41 Permitting Dashboard on August 28, 2025.

**Executive Order 14154 Unleashing American Energy, January 20, 2025**, accelerates uranium projects by streamlining federal processing, prioritizing domestic mining, and boosting nuclear fuel production to reduce foreign dependence. It directs federal agencies to expedite permits for uranium mining on federal land.

**Executive Order 14156 Declaring a National Energy Emergency, January 20, 2025**, declares a national energy emergency to accelerate domestic energy production, specifically identifying uranium and critical minerals as priority resources. The order can streamline uranium projects by reducing permitting timelines through emergency procedures.

**Secretarial Order 3417 Addressing the National Energy Emergency, February 3, 2025**, could accelerate uranium projects on federal lands by mandating streamlined permitting and environmental reviews, reducing timelines from years to weeks to address the national energy emergency. It allows for 14-day environmental assessments for qualified projects.

**Secretarial Order 3438 Managing Federal Energy Resources and Protecting the Environment, August 1, 2025**, facilitates expedited environmental reviews and NEPA compliance for critical minerals and energy projects like uranium, including shortened timelines for environmental assessments.

### *1.4.4 Other NEPA Documents*

Two Environmental Impact Statements documents related to the construction and operation of the Dewey-Burdock ISR project have been developed. To limit redundancy in this EA, the BLM will tier and incorporate these documents by reference:

1. U.S. NRC (2009), Generic Environmental Impact Statement for In-Situ leach Uranium Milling Facilities; U.S. Nuclear Regulatory Commission Office of Federal and State Materials and Environmental Management Programs, Wyoming Department of Environmental Quality Land Quality Division, 2 volumes

The Generic Environmental Impact Statement (GEIS) assesses the potential environmental impacts associated with the construction, operation, aquifer restoration, and decommissioning of an ISR uranium facility in four specified regions in the western United States. The intent of the GEIS is to determine which impacts would be essentially the same for all ISR facilities and which ones would result in varying levels of impacts for different facilities, thus requiring further site-specific information to determine the potential impacts. As such, the GEIS provides a starting point for NRC's NEPA analyses for site-specific license applications for new ISR facilities, as well as for applications to amend or renew existing ISR licenses. The Proposed Action occurs within the Nebraska-South Dakota-Wyoming Milling Region identified in the GEIS.

2. U.S. NRC (2014), Environmental Impact Statement for the Dewey-Burdock project in the Custer and Fall River Counties Supplement to the Generic Environmental Impact Statement for In-Situ Leach Uranium Milling Facilities, South Dakota; U. S. Nuclear Regulatory Commission Office of Federal and State Materials and Environmental Management Programs, 2 Volumes

   The Supplemental Environmental Impact Statement (SEIS) evaluates potential impacts from Powertech's proposed construction, operation, aquifer restoration and decommissioning of an ISR uranium facility at the proposed Dewey-Burdock Project. The BLM was a cooperating agency in the preparation of this EIS. This document describes in detail the proposed operations for the Dewey-Burdock.

## 1.5 Issues Identified for Analysis

The Proposed Action derived from the Powertech Plan of Operations was presented to the BLM Interdisciplinary Team on June 26, 2025, to initiate internal scoping. The BLM visited the public lands portion of the project site on July 30, 2025. The project was listed on the BLM National NEPA Register on April 14, 2026. The following issues were identified through internal scoping as requiring further analysis in the EA.

### *1.5.1 Issue 1 – How would implementation of the Proposed Action impact groundwater use and quality?*

## 1.6 Issues Identified but Eliminated from Further Analysis

BLM identified an additional 11 issues and determined a detailed analysis was not warranted. These issues are listed below and analyzed in brief in Appendix B with a concise discussion regarding the affected area and degree of impacts related to each issue.

- AIB-1 (Paleontological Resources): How would paleontological resources be affected by Proposed Action?
- AIB-2 (Cultural Resources): How would the Proposed Action impact cultural resources?
- AIB-3 (Recreation): How would the Proposed Action impact recreation?
- AIB-4 (Wildlife – Big game, and non-designated species): How would the Proposed Action impact wildlife – Big game and non-designated species?
- AIB-5 (Wildlife – Migratory birds including raptors): How would the Proposed

Action impact wildlife – Migratory birds including raptors?

- AIB-6 (Soil Resources): How would implementation of the Proposed Action impact soil resources?
- AIB-7 (Vegetation – Invasive Species/Noxious Weeds): How would the Proposed Action impact vegetation – Invasive Species/Noxious Weeds?
- AIB-8 (Grazing): How would the Proposed Action impact livestock rangeland management and grazing?
- AIB-9 (Mineral Resources): How would implementation of the Proposed Action impact mineral development?
- AIB-10 (Wildlife – Federally listed, proposed, and other special status species): How would implementation of the Proposed Action impact federally listed or proposed species and other special status species?
- AIB-11 (Socioeconomics): How would the Proposed Action impact the economic conditions and quality of life of the local community?

# 2 Alternatives

## 2.0 Alternative 1 – No Action Alternative

Under the No Action Alternative, the infrastructure and water monitoring wells proposed on public lands under the Plan of Operations would not be developed. This alternative would not preclude development or uranium production on adjacent private lands, including moving the proposed development of infrastructure and groundwater monitoring wells to private lands. This alternative would not prevent future uranium development on public lands; however, a new Plan of Operations filing would be needed.

## 2.1 Alternative 2 – Proposed Action

The public lands portion of the proposed Dewey-Burdock Uranium ISR Plan of Operations is approximately 13 miles north-northwest of Edgemont, South Dakota, in northern Fall River County (Map 1, Appendix E). The project area is within the Nebraska-South Dakota-Wyoming Uranium Milling Region described in the 2009 GEIS. The entire proposed Dewey-Burdock Project boundary is comprised of approximately 10,580 acres of mostly private surface, of which 160 acres (1.5%) are the public lands parcels that are administered by the BLM and located in:

T. 7 S., R. 1 E., Black Hills Meridian
sec. 10, NE¼SE¼
sec. 11, W½ NW¼ and NW¼SW¼

Infrastructure proposed on BLM administered public lands during initial development of the Dewey-Burdock Uranium ISR project includes a portion of the primary access road leading to the Central Processing Plant on private land, associated culverts and a road drainage ditch, secondary access roads, light-use roads (native surface, two-track routes), powerlines, and four groundwater monitoring wells. The locations of this planned infrastructure are displayed on Map

2 (Appendix E). A summary of the anticipated surface disturbance on the public lands portion of the project is displayed in Table 2 below.

**Table 2. Summary of Estimated Surface Disturbance on Public Lands**

| Development Feature | Surface Disturbance (Acres) | Description |
|---|---|---|
| Primary Access Roads | 3.31 | In place for the life of the mine. |
| Secondary Access Roads | 0.24 | In place for the life of the mine. |
| Light-use Access Roads[1] | 0.24 | In place until monitoring well reclamation. |
| Monitoring Wells | 0.23 | In place until private production wells are out of operation and reclaimed. |
| Power lines (Overhead) | 0.18 | Overland installation with up to 20 poles. In place for the life of the mine. |
| **Total:** | 4.20 | |

[1] New construction. Approximately 1.1 acres of disturbance is associated with existing two-track routes that are proposed to be used by the operator.

The SEIS Section 2.1.1 describes the proposed ISR uranium mining proposal in its entirety, which classifies the Dewey-Burdock project into four phases: (1) construction, (2) operations, (3) aquifer restoration, and (4) decommissioning. The scope of this EA focuses on those portions of the Proposed Action which would occur on BLM administered public lands, which would include the initial infrastructure development under the construction phase and groundwater monitoring under operations and aquifer restoration.

As described in the 2009 GEIS Section 2.3 and 2014 SEIS 2.1.1, the general construction activities associated with ISR facilities, as they relate to the public lands portion of the project, are drilling wells; clearing and grading associated with road construction; powerline construction; and laying pipelines. Surface infrastructure such as the access roads, overhead power lines, and monitoring wells at the proposed Dewey-Burdock site would be designed and built using standard construction techniques. Construction vehicles would include bulldozers, drilling rigs, water trucks, forklifts, pump hoist trucks, pickup and flatbed trucks, and other support vehicles.

The following are not proposed on BLM administered surface: processing facilities and support facilities including the Central Processing Plant, a satellite facility, wastewater storage and treatment impoundments, Madison formation aquifer water supply wells, deep disposal wells, and land application center pivot circles. No uranium exploration, resource delineation, or production/injection well drilling activities would be conducted on BLM administered lands during the initial project development.

No overburden or tailings piles would be generated at any time during Powertech's proposed uranium ISR operations at the Dewey-Burdock Project.

The start date for the public lands portion of the project is dependent on other federal and state permits, but it would be expected within five years of the BLM decision for the EA and Plan of Operations if approved. Completion of the proposed infrastructure and initial monitoring well construction would be expected within three years of the start date. The infrastructure would

remain in place and be maintained for the life of the Dewey-Burdock Uranium ISR Project (up to 20 years from completion of the initial infrastructure).

### *2.1.1 Access Roads*

The operator has proposed three types of roads: primary, secondary, and light use. Currently, there are approximately 9,800 feet (1.9 miles) of existing two-track roads on BLM administered lands within the area of the Plan of Operations. To the extent practicable, these existing two-track roads would be established as light use roads or developed to serve as primary access or secondary access roads. Road construction would be consistent with the BLM Road Construction Handbook, H-9113-1 (BLM 2011). Total surface disturbance associated with primary, secondary, and light-use access roads is about 3.80 acres.

Access roads are further described under Section 2.1.1.1.2.2 of the SEIS.

#### 2.1.1.1 Primary Road

During the initial development that has been proposed, the operator plans to construct approximately 3,200 feet of primary access road on BLM-administered lands as shown on Map 2 (Appendix E). Of this primary access road construction, about 1,000 feet is over existing two-track roads. The top width of the graveled primary access road would be approximately 28 to 32 feet (two twelve-foot lanes and two shoulders). With the road drainage ditch dimension included, the total disturbed width of the primary access road would be approximately 45 feet. The surface disturbance associated with the primary access road is about 3.31 acres.

Construction of the road would comply with the SD DANR requirements as specified in the operator's large scale mine permit application. Topsoil would be salvaged from the roadbed area prior to construction and placed in designated stockpiles near the primary access road (refer to Soil Management below for additional information on topsoil handling procedures). The road would be surfaced with gravel and include a centerline crown of approximately two percent.

The use of water bars is not planned for cross drainage. Road surfacing, ditching and culverts would be designed to provide adequate drainage and cross drainage. Culverts would be sized and constructed in accordance with SD DANR requirements as specified in the operator's large scale mine permit application to avoid plugging and collapsing as well as to minimize erosion at the culvert inlets and outlets. Map 2 (Appendix E) depicts the approximate location of the three anticipated culverts along the primary access road on BLM administered lands.

Sediment control for the primary access road would include seeding side slopes and disturbed areas with the seed mixture approved by BLM with SD DANR concurrence in addition to implementing erosion control measures such as silt fence and check dams. As a condition of the large scale mine permit, the operator would be required to submit a final sediment and erosion control plan to SD DANR prior to commencing construction.

#### 2.1.1.2 Secondary Roads

Initial development on BLM-administered lands would include the addition of approximately 450 feet of secondary access roads as shown on Map 2 (Appendix E). All 450 feet of this proposed secondary road would be constructed over existing two-track road. Secondary access road construction, topsoil handling, drainage, and surfacing will be the same as the primary access road, except that the top width will be narrower (typically 15 to 24 feet) due to the lower traffic demands of the road compared to the primary access road. No culvert installation is

anticipated on public lands for the secondary road. The surface disturbance associated with the secondary access road is about 0.24 acres.

#### 2.1.1.3 Light-Use Roads

In addition to the primary and secondary access road, the operator plans to install approximately 1,300 feet of light use road on BLM administered lands during the initial year of project development. The light use road would be a native surface two-track road that is approximately eight feet wide. For use of light duty pickups, other passenger vehicles, and mobilization of equipment, the light use roads would be to access the perimeter monitoring wells planned on BLM administered lands and facilities on adjacent private land. Surface disturbance associated with these light use roads is estimated to be 0.24 acres. The remainder of existing two-track roads (about 5,800 ft) not developed as primary or secondary access roads would also be used as light use roads. This existing disturbance is about 1.1 acres.

#### 2.1.1.4 Road Maintenance and Dust Control

Maintenance of the primary and secondary access roads would be performed routinely and as needed, including grading, gravel replacement, and watering for dust control (water source is not on public lands administered by BLM). Light use roads would be maintained as necessary, and travel on light use roads would be restricted during adverse weather conditions to minimize erosion and rutting.

Powertech plans to apply water to control dust on primary access roads, including those located on lands administered by BLM. Use of water for dust suppression was incorporated into the project fugitive dust modeling, which was completed in cooperation with BLM, presented to NRC as part of Powertech's source and byproduct materials license application (ADAMS Accession Nos. ML13196A061, ML13196A097 and ML13196A118), and addressed in the 2014 SEIS (ADAMS Accession Nos. ML14024A477 and ML14024A478).

The locations of planned primary access roads on BLM administered lands where water may be applied are depicted on Map 2 (Appendix E). The operator does not plan to use other dust abatement agents such as magnesium chloride within the project area.

### *2.1.2 Groundwater Monitoring Wells*

The operator has proposed installing groundwater monitoring wells at the periphery of each production area. This perimeter monitoring well "ring" would be used for early detection of horizontal excursions (contaminants) from within the sand unit or aquifer where production is occurring on adjacent private land. An excursion at a monitoring well is declared when the concentrations of certain indicator parameters exceed upper control limits established by the license and verified by NRC, EPA, or the SD DANR. The purpose of the monitoring well ring is to ensure that groundwater quality in aquifers outside exempted zones are not impacted by ISR operations.

During initial development, a total of four monitoring wells are proposed. Construction of the well pad would result in surface disturbance of about 2,500 $ft^2$, totaling approximately 0.23 acres for all four monitoring wells. The resulting well feature would be a 6 ft by 15 ft with a cement base for the 2-ft high steel wellhead that would remain for the life of the production well field (about 20 years after initial infrastructure construction). A mud pit would be included in this 6-ft

by 15-ft area. The remaining area of disturbance would have topsoil respread and be reseeded with native seed mix within the same season of initial construction.

The proposed monitoring wells are 4.5-inches in diameter and 300-400 feet in depth below surface. During operations, groundwater monitoring would typically be conducted on a two-week schedule, year-round. For this monitoring, the well would be purged of 200-300 gallons of water. The purpose of purging the water prior to sampling is to remove stagnant water from the well casing, ensuring that the collected sample accurately represents the surrounding aquifer's chemistry.

The groundwater monitoring wells, including pumping tests; hydrologic data packages; construction, development, and testing, are further described in Sections 2.1.1.1.2.3.2 through 2.1.1.1.2.3.5 in the 2014 SEIS.

### *2.1.3 Overhead Power Lines*

Approximately 3,900 feet of four-wire power line would cross BLM-administered land as depicted on Map 2 (Appendix E). It would have a voltage capacity of 14.4/24.9 kV and be constructed of wooden single poles with cross arms. Power poles would be spaced approximately 250 to 275 feet apart, so up to 20 poles would be placed on BLM. Installation would require overland access with equipment along the route of the power line (see Map 2, Appendix E) and 1-foot diameter holes up to 8 feet in depth. No transformers or switches would be installed on the power lines on BLM administered lands within the project area. The approximate surface disturbance is estimated to be about 400 $ft^2$ for each pole installation, so total disturbance from the overhead power line development is about 0.18 acres. The power line would remain for the life of operations (about 20 years after initial infrastructure construction).

The power line would be constructed to conform to APLIC (Avian Power Line Interaction Committee) recommendations for overhead power line construction by, among other things, providing distances between wires that are adequate to avoid phase to phase wingspan contact.

Power lines are further described in Section 2.1.1.1.2.3.7 of the 2014 SEIS.

### *2.1.4 Soil Management*

Topsoil would be salvaged in advance of construction from primary access roads, secondary access roads, and facility sites. Salvaged topsoil would be stored and tackified in designated stockpiles in accordance with BLM SD ARMP Appendix L and SD DANR requirements as specified in the large scale mine permit application to minimize erosion. Topsoil that would remain stockpiled for longer than 30 days would be protected from erosion by using a mulch or cover crop, and any topsoil that would remain stockpiled for greater than one growing season would be seeded with a BLM approved native seed mix to maintain viability. Topsoil would be salvaged using earth moving equipment such as rubber-tired scrapers, front-end loaders, backhoes, and excavators.

The topsoil salvage depth is estimated from the baseline soil survey to range between zero and five feet across the project area and average less than two feet. Final salvage depths and cutoff criteria would be determined based on construction level designs and additional soil testing in accordance with SD DANR requirements specified in the large scale mine permit application.

Topsoil salvaged from the primary access roadbed would be placed in a wind row or piled adjacent to the access road construction, including on BLM administered lands. Final stockpile locations and volumes would be determined based on construction level road designs.

All topsoil and spoil stockpiles within the project area would be designed to avoid erosion and preserve soil viability. Windrows would be tackified to prevent erosion from occurring. All soil piles would conform to BLM appendix L and SD DANR requirements, which are described in the large scale mine permit application.

### *2.1.5 Interim Management Plan*

The Interim Management Plan was developed in compliance with 43 CFR § 3809.401. The plan addresses management upon temporary closure and prevention of undue and/or unnecessary deterioration of facilities.

#### 2.1.5.1 Reasons and Causes of Temporary Closure

The Proposed Action has an expected mine life of about 20 years. Various reasons may exist for temporary closures throughout the life of the project:

1. Uneconomical mining environment i.e. uranium price drop and/or mining costs increase.
2. Lack of adequate manpower to operate the mine safely and efficiently.
3. Road closures due to weather or other causes.

If for any reason a temporary closure results, the following will be implemented.

##### *2.1.5.1.1 Measures to Stabilize Excavations and Workings*

There are no underground workings associated with an ISR operation. The surface area will be maintained according to the project's Storm Water Management Plan (SWMP). Areas experiencing erosion and/or runoff will be monitored periodically in accordance with the SWMP and Plan. All drainage features will be inspected periodically, cleaned and maintained as necessary. Reclamation will proceed as weather permits.

##### *2.1.5.1.2 Measures to Isolate or Control Toxic or Deleterious Materials*

Potentially toxic materials on site are limited to fuel and oil, water treatment chemicals, and possibly a solvent cleaning station in one or two maintenance shops. Primary fuel and oil in vehicles as well as chemicals needed for maintenance of wells would be present on BLM administered surface. All toxic chemicals would be stored off BLM surface. Measures for isolating or controlling each of these materials during temporary closure are described below.

As discussed above, reclamation and restoration would continue during a short-term closure.

During short-term closure, fuel tanks, oils and other petroleum products will be secured in a locked area not located on BLM administered surface. Solvents would be gathered and disposed of by a licensed vendor. These areas would be maintained in such a manner so operations could resume as soon as practicable.

However, if a closure were to extend into a six-month time frame, Powertech would evaluate other control methods, such as implementation of an alternative treatment system and/or adjusting surface reclamation efforts. Based on previous experience, there are several options available to operators with regard to conducting reclamation and restoration safely and

efficiently in a manner that is protective of health and environment. All fuels and oils will be removed from the site upon a long-term closure.

#### *2.1.5.1.3 Provisions for the Storage or Removal of Equipment, Supplies and Structures*

Equipment and supplies will be maintained on site in secure areas during a short-term closure period. Vehicles associated with onsite work will be locked and parked within a secure gated area. Most supplies and equipment would be stockpiled in the yard area (on private surface) or under lock and key in the maintenance shops, and the warehouse. A security guard will be present on site as needed to deter theft and vandalism.

If the period of closure extends to six months, Powertech may gradually remove some or all equipment, supplies, and both mobile and modular structures from the site to minimize potential for vandalism and theft; this measure would also reduce the need for full-time security personnel. The equipment and supplies would be moved to other property under Powertech's control.

#### *2.1.5.1.4 Measures to Maintain the Project Area in a Safe and Clean Condition*

The Safety and Environmental Review Panel (SERP) will conduct a review every quarter during a temporary closure to ensure safety and environmental procedures are conducted appropriately and demonstrate compliance with applicable license and permit requirements.

Good housekeeping standards and practices will be applied in all areas of the site. This requires areas to be kept clean and free of litter and debris. Trash, used tires, old equipment parts, empty barrels, and other miscellaneous materials will be removed from the site and either recycled or disposed of properly as general housekeeping and surface reclamation continue throughout the temporary closure. Site safety will be maintained by discouraging unauthorized access through the use of locked gates, fences, warning signs, and security personnel. All buildings and trailers will be kept locked when not in use. The gates to the main facilities area, CPP and SF areas will also be locked.

#### *2.1.5.1.5 Plans for Monitoring Site Conditions during Periods of Non-Operation*

During temporary closure, environmental monitoring will continue as required by the various licenses and permits. This will include monitoring of:

a) Discharges of treated water
b) Monitoring wells
c) Personnel
d) Storm water

All surface areas will be monitored by the operator at least weekly during a closure of six months or less. If the site remains relatively stable and the closure period extends beyond six months, the frequency of surface inspections may be reduced.

### *2.1.6 Closure Schedule and Reporting*

No seasonal or maintenance shutdowns of the project are anticipated at this time. In the event that market conditions or other circumstances require a temporary shutdown of mine operations, Powertech will provide notice to the BLM within 30 days after such suspension in compliance with 43 CFR §3802.4-7. This notice will include:

a) Verification of intent to maintain structures, equipment, and other facilities

b) The expected reopening date

c) Current mine contact information

d) Any revisions to this Interim Management Plan

### *2.1.7 Final Closure Reclamation*

Reclamation (decommissioning) activities are described in Section 2.1.1.1.5 of the 2014 SEIS and Section 2.6 of the 2009 GEIS. Relevant to the public lands portion of the project being analyzed under this EA, the operator will: plug and abandon the groundwater monitoring wells; remove overhead power lines; restore land to blend with adjoining topography; replace topsoil; seed and restore native vegetation; restore acceptable physical and chemical properties to affected soils; and control weeds.

Powertech will be required to provide a land reclamation plan to NRC for review and approval within 12 months before wellfield reclamation begins. The plan will include descriptions of the areas to be reclaimed, the planned reclamation activities, and methods to protect workers and the environment against potential radiation hazards. Any portions of the plan that adjust the final closure reclamation on public lands as described below, will be reviewed as a modification to the Plan of Operations.

#### 2.1.7.1 Groundwater Monitoring Well Plugging and Abandonment

To prevent adverse impacts to groundwater quality, all four monitoring wells will be abandoned in place according to SD DANR regulations established in ARSD 74:02:04:67 and 74:11:08. Well abandonment will require plugging wells with bentonite or cement grout. Prior to abandonment wells must be opened to remove debris and equipment (e.g., tubing, pumps, and screens) to prevent obstacles from interfering with plugging operations. Wellhead casing will be removed to a depth of 3 ft below the ground surface and set in a cement plug 6 ft below ground surface on each well that is plugged and abandoned.

#### 2.1.7.2 Access Road Reclamation

After final reclamation of monitoring wells, removal of power lines, and decontamination/decommissioning of facilities on adjacent private has been completed, access roads will be reclaimed. BLM requires complete reclamation of roads on BLM-managed public lands. Where the access roads are reclaimed, they will be ripped up and/or disked to relieve compaction, and gravel will be removed from road surfaces. Culverts will also be removed, and pre-mining drainage patterns will be reestablished. In addition to being graded, all roads and ditches will be recontoured to blend in with the surrounding terrain; topsoil will be reapplied in conformance to the requirements found in the SDFO ARMP back onto road surfaces prior to seeding and revegetation.

#### 2.1.7.3 Final Contouring and Revegetation

Once the proposed Dewey-Burdock Project is complete, all disturbed lands will be returned to their preproduction uses for livestock grazing and as wildlife habitat. Surface reclamation and decommissioning efforts will be conducted to return the disturbed lands to their original or better condition. Disturbed lands will be restored to blend with the contour of adjoining topography.

Topsoil removed and stored during construction will be reapplied during the reclamation process. Revegetation of the project area is the final state of reclamation and will involve seeding the area with a seed mixture approved by BLM (see Table 3 under operator committed project design feature item number 2). The operator will follow the requirements set forth in the SDFO ARMP for seed bed preparation, seeding, and monitoring.

### *2.1.8 Operator Committed Project Design Features*

During environmental scoping and analysis, the interdisciplinary team identified project design features to apply to the operator's proposed Plan of Operations that would prevent unnecessary or undue degradation (UUD) to other resources and uses. Consistent with performance standards under 43 CFR § 3809.420, the project design features have been reviewed by the operator for feasibility in design, cost, and implementation.

1. Preparing and reclaiming surface disturbance:

   Layers of soil will be stored separately and in the same order they are removed from the ground. Topsoil should be stored at a depth of no more than 12 inches (30.5 cm) and should be replaced last in the replacement process so that viable topsoil remains on the soil surface. For the monitoring well drilling pit, groundwater purge facility pit, and final road prism reclamation, the overburden will be replaced and recontoured prior to subsoil and topsoil replacement (if applicable). The site should be recontoured to match the approximate surface contour prior to surface disturbing activity. Soil compaction, which can occur during the replacement and recontour process, should be kept to a minimum. This means that heavy equipment, vehicle, and off-highway vehicle traffic should be minimized across the site during construction and reclamation activity.

   Topsoil conditions will vary depending on how soil was stored/replaced in the ground as well as the amount of equipment and vehicle traffic across the site. As such, discing or ripping in two perpendicular passes to a minimum depth of 18 inches would be required to reduce subsoil compaction. After ripping, it is possible that soil may be too loose or uncompacted to create a firm seed bed that will foster desirable plant seed germination. In this event, soil would be lightly rolled and gently compacted to firm the seed bed prior to seeding. However, in cases where soils need to be rolled or "smoothed" prior to seeding, rolling or "smoothing" should be done no more than two days prior to seeding.

2. Seeding native species and seed bed preparation:

   In most cases native species should be seeded in the fall after the growing season and prior to soil freeze-up. Across most of South Dakota, fall seeding events should occur between November 1 and December 15, depending on soil conditions. If site conditions do not allow for fall seeding, alternative spring seeding events should occur between April 1st and June 1st. Prior to seeding, some preparation of the soil bed will be needed.

**Table 3. Summary of Seed Mix and Rates**

| Seed rate application PLS/acre | Primary Species | Alternative Species |
|---|---|---|
| 5 ½ lbs | Slender Wheatgrass | Montana Wheatgrass |
| 5 lbs | Western Wheatgrass | Thickspike Wheatgrass |
| 5 lbs | Canadian Wildrye | Mountain Brome, Hairy Wildrye |
| 5 lbs | Sideoats Grama | Canadian Bluegrass, Little Bluestem |
| ½ lbs | American Vetch | Hairy Vetch |
| ¼ lbs | Purple Prairie Clover | White Prairie Clover |

If broadcast seeding the site, seed (Table 3) should be applied at about 20 lbs pure live seed per acre (lbs PLS/acre). At the very least, a hand-turned seed spreader should be used to disperse seed across the site as opposed to broadcasting seed by hand. Seed spreaders should be calibrated prior to seeding to ensure the target seeding rate (i.e. lbs PLS/acre) is achieved. Seed-to-soil contact is essential for desirable plant germination following broadcast seeding. To enhance seed-to-soil contact post-broadcast, hand raking, harrowing, rolling, or other methods should be used. Do not "over-roll" or "over-harrow" the site as this could lead to soil compaction or push seed below 1/8 in (0.3 cm), which will diminish germination rates.

When using a drill to seed, the mix should be applied at 50-75% the rate shown in Table 3 (about 10-15 lbs PLS/acre). Try to minimize the number of passes equipment and seeding implements make over the site to minimize soil compaction. Be sure to calibrate seeding equipment prior to seeding the site to ensure the appropriate seeding rate is achieved. Seed the headlands (area at the end of the planting area) first in a direction counter to the rest of the field. For sloped seedings, first seed the headlands, next seed perpendicular to the slope, and then parallel to the slope. Seeding depth should not exceed 1/8 in (0.3 cm) depth as deeper seeding will inhibit germination of most native species. When seeding a nurse or cover crop, like sterile wheat, seeding depth should be 1 in (2.5 cm).

3. Erosion control:

   Erosion can significantly impair reclamation efforts and could result in UUD. As such, erosion control measures may need to be installed at points or across the site to reduce erosion potential. Erosion control measures may include water bars, straw wattles, rock check dams, seeding, mulching, etc.

4. Groundwater monitoring well purged water disposal facility:

   If initial sample results of the groundwater monitoring well indicate that the salinity levels (concentration of total dissolved salts such as sodium, chloride, calcium, and magnesium) in the water are above the salinity of the adjacent soil, this project design feature would apply. New pits will be constructed or the mud pits associated with monitoring well construction would be repurposed as purged water disposal facilities to prevent UUD to surface vegetation and soil that could result from routine exposure to water with higher salinity. The pits would be lined with coarse rock to prevent erosion during the biweekly well purge and groundwater sampling process. During reclamation, the pit would be

backfilled and recontoured (see Section 2.1.7.3), burying the area of elevated saline with at least two feet (2 ft) of clean subsoil and topsoil.

The pits will be appropriately covered with mesh or other material to exclude entry by birds, bats, or other wildlife.

If initial sample results (Well Field Data Package submitted to the NRC) of the groundwater monitoring well verify that the salinity levels in the water are at or below the salinity of the adjacent soil, this data will be provided to the BLM. After BLM acknowledgement and concurrence of the provided data, this project design feature would not apply and the pits would be reclaimed as part of the interim reclamation.

5. Noxious and undesirable plant control

   The operator will be required to treat and control all state of South Dakota listed noxious weeds and any Fall River county listed noxious weeds. A list of state and county noxious weeds can be found on the South Dakota DANR website or from the BLM by request.

   Treatment areas would be any surface disturbed locations within the 4.20 acres of BLM-administered public lands. This would include primary, secondary, light-use roads, monitoring wells and overhead lines all mentioned in Table 2. Treatments would consist primarily of "spot" treatments. It will be required that whoever does the herbicide treatments is a current and valid South Dakota general pesticide applicator.

   The Operator will also be required to develop their own PUP (Pesticide Use Proposal.) This is a requirement on all BLM where herbicide treatments occur. Once developed, the operator will submit the PUP to the BLM Noxious weeds coordinator for review and signature for approval. BLM will provide the operator a list of herbicides that are allowed for use. Any treatments done on the 68 acres of public surface will need to have appropriate Pesticide Applicator Records and be submitted to the BLM SDFO by September 1st of that calendar year.

   *Other Best Management Practices to follow and implement:*

   - If a staging area for supplies and equipment is used, make sure that area is clear of any state or county listed noxious weeds. Or pre-treat area if possible.
   - Stay on primary, secondary and light-use roads with vehicles and equipment.
   - All operating vehicles and equipment will be power washed prior to entering the project area (including private land portions).
   - If gravel is stockpiled, the gravel pile will be monitored for any noxious weed growth. If a noxious weed is identified, the plant and stockpile will be treated immediately to prevent the noxious weed from going to seed.
   - Monitor and treat road edges as needed. Primary weed seed movement will be wind, and vehicles.
   - Any pesticide/herbicide spills need to be immediately reported to the BLM SDFO agency administrator and Noxious Weeds Coordinator.

6. Hunter Safety Zone

Operator will work with the South Dakota Game, Fish, and Parks to develop and sign a "hunter safety zone" that will prohibit hunting within 660 feet of certain occupied buildings and facilities that are associated with the ISR operations.

7. Cultural and Paleontological Resources

    - The BLM and Powertech are invited signatories on the Programmatic Agreement (PA) pursuant to 36 CFR § 800.4(b)(2). The PA must be executed prior to construction activities, and all applicable stipulations and provisions therein must be followed.
    - If the BLM or operator discovers previously unknown cultural/historic features or paleontological resources, the operator must immediately cease surface disturbing activities near the find and notify the BLM SDFO. The operator must leave such discovery intact until receiving written notice to proceed from the BLM.

8. Wildlife conservation measures

    *Federally listed and proposed species*

    - BLM SDFO must be notified within 48 hours of the detection of an ESA listed or proposed species in the action area.

    *Federally listed and sensitive bat species (measures in conformance with those included in the NRC's 2025 Biological Assessment for the Dewey-Burdock Uranium ISR project:*

    - Tree removal would not occur from April 15 through October 31 to protect the federally endangered northern long-eared bat (*Myotis septentrionalis*) during their active and pup-rearing seasons.
    - If supplemental lighting is used at night during construction or operation activities, lights must be directed and/or sheltered to minimize the amount of light escaping the work or project site, and to minimize the amount of light escaping vertically.
    - In the event that construction is planned during the active season (April 15 through October 31), within five days prior to the initiation of any construction activities, a qualified biologist must conduct pre-construction surveys for northern long-eared bat and training for workers to assist with the identification of all listed species during construction and operation.
    - If a listed bat species is sighted within 0.5 mi of well sites or associated facilities during construction or operation, the operator must contact EPA and FWS immediately and all construction work within 0.5 mi of the species' location must cease. Powertech will work with the FWS and a qualified biologist to minimize surface operation activities within 0.5 mi of the species' location. In coordination with FWS, work may resume after the species leave the area. For this measure and other ESA-related measures, Powertech must contact FWS and EPA by both phone and email.
    - Any open vertical pipes or vents will be covered in mesh or other appropriate material to exclude entry by bats, birds, or other animals.

*Federally proposed and sensitive pollinators:*

- Employ spot treatment methods for addressing invasive species; avoid broadcast methods that may affect non-target native floral resources.
- Avoid removal of flowering plants, especially large patches, during the bloom window when bumble bees and other sensitive pollinators are foraging and provisioning offspring (May-August)

*Migratory birds:*

- Surface disturbing actions would not be conducted from April 15-July 15 to protect breeding and nesting migratory birds.
- For migratory periods (Mar 1-Jun 15; Aug 15-Nov 30), reduce lighting by dimming or turning off any lights not strictly necessary for the ongoing action. Within these periods, tools such as BirdCast Migration Tools - bird migration forecast map (birdcast.org) may be used to tailor light reduction to high bird volume nights.
- To the extent practicable, use lights with an amber, orange, or red color temperature (<3000 K) for nighttime lighting.
- Powerlines would be constructed following the most current guidance from the Avian Power Line Interaction Committee (APLIC) to prevent collision and electrocution risk to migratory birds, including eagles and other raptors.

*Big game and general wildlife:*

- Limit noisy construction activities to daylight hours (eg, after 30 minutes past sunrise to before 30 minutes before sunset) to reduce impacts to species most active during crepuscular periods.
- To the extent practicable, use lights with an amber, orange, or red color temperature (<3000 K) for nighttime lighting.
- Aim lights used for nighttime activities to illuminate the ground/work surface with limited side cast (horizontal orientation); avoid direct lighting of the sky (uplighting) at dusk, dawn, and night. Light emission should not extend more than 90% (or perpendicular) from the light source (ie, light should not be cast above the light source). See pg 42 of IB2023-038 for diagram (Sullivan *et. al*. 2023). Shielding may be installed on existing lights to reduce uplighting and horizontal lighting.
- Any open vertical pipes or vents will be covered in mesh or other appropriate material to exclude entry by bats, birds, or other animals.

## 2.2 Alternatives Considered but not Analyzed in Detail

Under the Plan of Operations, Powertech originally proposed a route for the Primary Access Road that, after cultural survey was conducted, was determined to be within a 200-ft avoidance buffer surrounding a surveyed cultural resource site. In the revised 2020 Plan, the operator willingly moved the proposed road to be constructed outside of the avoidance area, which is

captured in the Proposed Action under Alternative 2. Because cultural resource site avoidance was incorporated into the Plan of Operations, an alternative did not need to be developed by the BLM in order to avoid unnecessary and undue degradation to cultural resources.

The SEIS Section 2.2 also addresses several alternatives that were eliminated from detailed analysis. Sections 2.2.1 and 2.2.2. describe different surface and underground mining techniques and associated milling alternatives for the Dewey-Burdock project site. Section 2.2.3 discusses the use of different lixiviant chemistry. Section 2.2.4 describes alternative site locations for the central processing plant and satellite facility within the proposed project area. Section 2.2.5 details the use of alternative well completion methods at the proposed project site.

# 3 Affected Environment and Environmental Impacts

This chapter defines the scope of analysis contained in this EA, describes the existing conditions relevant to the resource issue presented in Section 1.5, and discloses the potential impacts of the Proposed Action and No Action alternatives.

## 3.0 General Setting

The Dewey-Burdock Uranium ISR Plan of Operations area is located along the southwestern margin of the Black Hills uplift within the Great Plains physiographic province. About 160 acres of public lands parcels that are administered by the BLM are being considered for analysis. Elevation of the analysis area, entirely within the Burdock boundary of the project, is around 3,650 feet above sea level. Precipitation in the Burdock area of South Dakota is characterized by semi-arid patterns common in the southern Black Hills region, which often occur as high intensity, short duration, and convective thunderstorms during the summer and fall that can produce high peak flows in the tributaries that drain the project area. Winter snowfall is highly variable, often averaging close to 30-40 inches annually. The average annual precipitation is approximately 16 inches. The proposed project area lies within the Beaver Creek (HUC 10120107) subbasin and is drained by its tributaries. Beaver Creek is a perennial stream, but all other streams and tributaries are intermittent or ephemeral. The nearest ephemeral stream is Pass Creek, just to the northwest of the public lands parcels. No wetlands are delineated within or adjacent to the public lands portion of the Dewey-Burdock project.

Present land uses within the analysis area are primarily cattle grazing and hunting. The existing two-track roads in the Proposed Action area support these uses. Regarding range resources and grazing, the Proposed Action activity would fall within the Burdock Allotment (no. 01776) where cattle graze based on a deferred grazing rotation through several pastures. Hunting occurs in and around the public lands parcels and are mostly focused on big game, such as pronghorn, mule deer, white-tailed deer, and elk. As described in Section 1.6 and addressed in Appendix B, cattle grazing (range management) and hunting (recreation management) were identified as potential issues but not brought forward for further analysis under this EA.

The geologic units underlying analysis area consists primarily of sedimentary sequences of limestone/dolostone, mudstone, sandstone, and shale. The Inyan Kara Group is host to the uranium mineralization that is the target of ISR production/injection wells that are currently proposed on private lands. The geologic units are described in further detail under Section 3.1.2.1 of this EA.

An extensive description of the affected environment for the entire project area is provided in Chapter 3 of the 2014 SEIS.

## 3.1 Resource Issue 1: How would implementation of the Proposed Action impact groundwater use and quality?

### *3.1.1 Methodology and Assumptions*

Stated under Section 2.1 of this EA, the scope of this analysis focuses on those portions of the Proposed Action which would occur on BLM administered public lands, which would include the initial infrastructure development under the construction phase and groundwater monitoring under operations and aquifer restoration.

As discussed in 2009 GEIS Section 4.4.4.1, potential environmental impacts to groundwater could occur during all phases of an ISR facility's lifecycle, although impacts are more likely to occur during operations and aquifer restoration. At ISR sites, ore-bearing aquifers are typically separated from adjacent aquifers at varying depths by confining layers. If the confining layers do not effectively isolate the ore-bearing aquifer from the hydrogeological system, the aquifers above and below the uranium-bearing aquifer can be adversely affected during ISR operations.

Powertech proposes to use an oxidant-charge solution, called a lixiviant, during the ISR process. Typically, a lixiviant uses native groundwater (from the production zone aquifer), carbon dioxide, and sodium carbonate/bicarbonate, with an oxygen or hydrogen peroxide oxidant. As the lixiviant circulates through the production zone, it oxidizes and dissolves the mineralized uranium, which is present in a reduced chemical state. The resulting uranium-rich solution is drawn to recovery wells by pumping and then transferred to a processing facility via a network of pipelines, which may be buried just below the ground surface. At the processing facility, the uranium is removed from solution (typically via ion exchange). The resulting barren solution is then recharged with the oxidant and reinjected to recover more uranium (2014 SEIS Executive Summary).

The 2009 GEIS reported that ISR operations impacts on groundwater resources can result from surface spills, leaks from buried piping, consumptive water use (i.e., water removed from available supplies without return to a water resource system), horizontal and vertical excursions of lixiviant from production aquifers, degradation of water quality from changes in production zone aquifer chemistry, and waste management practices involving land application and/or deep well injection.

This environmental analysis is focused on the BLM-administered public lands portion of the project, which does not include production well fields, water source wells, or waste management facilities (land application areas or injection wells). During the construction phase, impact-causing elements for groundwater resources would potentially result from surface spills, consumption, and injection of fluids and mud during monitoring well drilling. Surface construction is quantified by acres of surface disturbance. For private lands within the project area, Section 3.6 of the 2014 SEIS further describes the groundwater resources and Section 4.5.2 of the 2014 SEIS discloses groundwater impacts resulting from the proposed Dewey-Burdock ISR operations.

Groundwater is monitored for meeting SD DENR water quality standards for the maximum contaminant levels (MCLs) for pH, dissolved oxygen, specific conductance, total dissolved

solids (TDS), sulfate, Chloride, Arsenic, and Selenium, and key radionuclides and hazardous constituents (e.g., gross alpha, uranium Ra-226, Pb-210, arsenic, and selenium. Monitoring for secondary maximum contaminant levels (SMCLs) for constituents that alter the color, taste, and odor of water are also monitored. See section 3.5.3.5 of the 2014 SEIS for further discussion of groundwater quality.

### *3.1.2 Affected Environment*

Section 3.6 of the 2014 SEIS describes the groundwater resources within and around the Dewey-Burdock project area. The discussion that follows summarizes and updates this description, which is incorporated here by reference.

#### 3.1.2.1 Regional Aquifers

The major aquifers in the Black Hills area include (from top to bottom) the Inyan Kara Group, Minnekahta, Minnelusa, Madison, and Deadwood aquifers. These aquifers are separated by confining layers with low permeability except at their outcrop areas. The hydrologic setting in the Black Hills area also involves minor aquifers, which include the Sundance/Unkpapa and alluvial aquifers. Regionally, groundwater flows radially away from the Black Hills toward the surrounding plains. However, groundwater flow in the major regional Paleozoic aquifers, such as the Deadwood, Madison, and Minnelusa aquifers, is east-northeast from recharge areas in the Bighorn Mountains, Black Hills, and areas of central Montana. Groundwater in the western Black Hills area, on the other hand, will briefly flow in a westerly direction before being overtaken by regional groundwater flow patterns and flow northeasterly. Regarding the Inyan Kara, regional groundwater flow is easterly and northeasterly from the Bighorn Mountains and areas in western Montana toward South Dakota and North Dakota.

Groundwater recharge paths for aquifers in the Black Hills include precipitation, streamflow losses, and water flow across aquifers where confining layers are absent or ineffective. In general, streamflow recharge to groundwater is limited to aquifer outcrops or relatively shallow aquifers beneath stream valleys. Regionally, water elevations increase with depth, which provides an upward hydraulic gradient for groundwater flow across the major aquifers and limits the potential for downward recharge.

Description of the relevant geologic formations and layers is provided below from youngest to oldest:

Alluvial aquifers with thicknesses of zero to 50 feet are observed in the vicinity of the proposed project area along Beaver Creek, Pass Creek, and the Cheyenne River. They are typically unconfined but may be confined locally. Alluvial aquifers are separated from the underlying Inyan Kara Group aquifer by the Graneros Group (the combined Skull Creek–Mowry–Belle Fourche shales) except at outcrop areas. Seven wells are completed in alluvial aquifers within 1.2 miles of the proposed project area. They are used solely for monitoring purposes.

The Inyan Kara Group aquifer, the uranium extraction zone, is the first major aquifer below the ground surface. It ranges from 250 to 500 feet in thickness and contains two subaquifers: the Fall River aquifer and Chilson aquifer, which are separated by the Fuson Shale confining unit. The Inyan Kara Group aquifers are highly heterogeneous and are capable of yielding high volumes of water. The Inyan Kara aquifer is recharged primarily by precipitation at the outcrop and is separated from the underlying Minnekahta aquifer by the Morrison Formation, Sundance/Unkpapa aquifer, and the Gypsum Spring Formation. Thirty-three (33) wells are

completed in the Fall River aquifer, 41 wells are completed within the Chilson aquifer, and 17 wells are completed in an unknown component of the Inyan Kara aquifer within 1.2 miles of the proposed project area. They serve as water supplies for livestock, domestic purposes, and monitoring.

The Minnekahta aquifer is a major aquifer in the Black Hills area and ranges in thickness from 25 to 65 feet. It is a thin to medium-bedded, fine-grained laminated limestone, and is typically very permeable; however, due to its limited thickness, well yields can be small. The Minnekahta aquifer does not supply water for domestic, livestock, agricultural uses in the proposed project area.

The Minnelusa aquifer ranges in thickness from 375 to 1,175 feet and is composed of layers of sandstone, dolomite, and anhydrite in the Minnelusa Formation. It is separated from the Minnekahta aquifer by the Opeche Shale. The Minnelusa aquifer appears to be hydraulically separated from the underlying Madison aquifer in the proposed project area by intervening confining layers.

The Madison Formation, which ranges in thickness from 200 to 1,000 feet, is mainly a dolomite unit characterized by extensive secondary porosity resulting from fractures and karst features. It is the source of municipal water for numerous communities, including Rapid City and Edgemont. The Englewood Formation underlies the Madison Formation and acts as the upper confining unit to the Deadwood aquifer.

The Deadwood aquifer is zero to 500 feet thick and consists of basal conglomerate, sandstone, limestone, and mudstone. It is used mainly by domestic and municipal users near its outcrop area.

#### 3.1.2.2 Baseline Groundwater Quality

To establish baseline groundwater quality conditions, Powertech sampled groundwater wells, domestic wells, and stock watering wells. Baseline water quality parameters are listed under the appendices at 5.2 (C, D, and E) of the Plan of Operations (Powertech 2020). In summary, Powertech found that 28 out of 31 groundwater samples exceeded the MCLs[2] for primary drinking water standards (i.e., arsenic, lead, uranium, Ra-226, and gross alpha). Of the 25 groundwater samples collected from the proposed ore-bearing aquifer, 23 exceeded the MCLs for primary drinking water standards. Therefore, groundwater from the proposed ore-bearing aquifer within the license boundary would not be used in public water systems and is unsuitable for private domestic use without treatment. Within the Chilson aquifer, samples exceeded the MCL for arsenic, lead, and uranium. In the Fall River aquifer and in alluvial aquifers along Pass Creek, samples exceeded the MCL for arsenic and lead. The MCL for uranium was exceeded in samples obtained from four of five wells in the alluvial aquifers. The MCL for other metals, such as selenium, was not exceeded in any of the groundwater samples. More than 60 percent of the samples in both the Fall River and Chilson aquifers exceeded the MCL for dissolved Ra-226.

Approximately 75 percent of the wells sampled in the Fall River, Chilson, and alluvial aquifers

[2] The EPA regulations in 40 CFR Part 141, "National Primary Drinking Water Regulations," establish the SMCLs for constituents that alter the color, taste, and odor of water (e.g., TDS, sulfate, and chloride) and the MCLs for radionuclides and hazardous constituents (e.g., gross alpha, uranium, Ra-226, Pb-210, arsenic, and selenium) in drinking water. The State of South Dakota drinking water standards (ARSD, Chapter 74:04:12) are the same as the SMCLs and MCLs established in 40 CFR Part 141.

exceeded the MCL for gross alpha (2014 SEIS). Table 3.5-4 of the 2014 SEIS, incorporated here by reference, identifies the wells and well locations for which samples exceeded the MCLs. Baseline groundwater samples also measured levels that exceeded the Secondary MCLs for bulk water quality properties including pH, TDS, and other constituents such as sodium and sulfate (2014 SEIS).

Because baseline water quality from the groundwater samples exceeded the MCLs for primary drinking water standards as provided by EPA regulations at 40 CFR Part 141 associated with arsenic, lead, uranium, Ra-226, and gross alpha (2014 SEIS Table 3.5-4), water from the ore-bearing aquifer within the permit boundaries will not be used in public water systems and is unsuitable for private domestic use without treatment.

### *3.1.3 Environmental Effects*

Described under Section 4.1 of the 2014 SEIS, the environmental impacts of construction, operations, aquifer restoration, and decommissioning activities were addressed through an established standard of significance. These standards of significance from impacts were categorized as:

SMALL: The environmental effects are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource considered.

MODERATE: The environmental effects are sufficient to alter noticeably, but not destabilize, important attributes of the resource considered.

LARGE: The environmental effects are clearly noticeable and are sufficient to destabilize important attributes of the resource considered.

Under the following effects analysis for the two alternatives, these categories of significance will be carried forward to summarize the analysis being incorporated by reference from the 2014 SEIS.

#### 3.1.3.1 Environmental Effects —No Action Alternative

Under the No Action Alternative, the infrastructure and water monitoring wells proposed on public lands under the Plan of Operations would not be developed. This alternative would not preclude development or uranium production on adjacent private lands, and the proposed access roads, overhead powerlines, and four groundwater monitoring wells would likely be moved to avoid the 160 acres of public lands parcels within the Dewey-Burdock project boundary (See Map 2, Appendix E). As a result, the proposed infrastructure being moved to private lands would likely increase surface disturbance from the estimated 3.97 acres that would occur from access roads and power lines going through public lands under the Proposed Action. Because monitoring wells are required under the other agency permits and licenses, not allowing well construction on public lands would not prevent the 0.23 acres of surface disturbance occurring on private lands.

The baseline water quality has been determined, through sampling, to exceed the MCLs for primary drinking water standards as provided by EPA regulations. The impacts to groundwater from ISR uranium mining could include degradation of water quality from changes in the production zone aquifer chemistry and excursions of lixiviant from the production aquifers.

Powertech has committed to removing and replacing existing domestic wells drawing water from the production zone aquifers within the project area from private use prior to ISR operations, as well as monitoring all domestic wells within 1.2 miles (2 km) of the wellfields.

The withdrawal of the lixiviant/water emulsion will lead to drawdown of water resources at the well field locations. This will affect the quantity of groundwater and is expected during production operations. Additional degradation of water quality could occur as the injection and use of the lixiviant reaches maximum levels needed for production. The applicant-installed groundwater monitoring network will allow for detection of potential vertical and horizontal migration of lixiviant. Because the ore production zones are confined, migration is unlikely. Therefore, contamination of aquifers outside of the ore production zones is also unlikely.

As part of aquifer attenuation and restoration, the aquifer is to be restored so as to enable its pre-mining use. Hydraulic control of the ore zone must be maintained during aquifer restoration and accomplished by maintaining an inward hydraulic gradient through a restoration bleed. Because the operator's groundwater treatment with reverse osmosis and permeate injection (Powertech 2020), measurable amounts of TDS are removed in the groundwater that is being restored. Once cleared of TDS and other undesirable chemical elements, the water is supplemented with makeup water from the Madison Formation and reinjected into the well field. Restoration bleeding and hydraulic drawdown will continue through the natural attenuation process. As stated in the affected environment (3.1.2.2 of this EA), baseline water quality from the groundwater samples exceeded the MCLs for primary drinking water standards as provided by EPA regulations at 40 CFR Part 141 (adopted by South Dakota). Powertech has the obligation to restore the aquifer to these standards. Further, as described in 2014 SEIS Sections 2.1.1.1.4 and 4.5.2.1.1.3, the primary goal of aquifer restoration is to return groundwater quality within the production zone to baseline standards or to standards consistent with NRC requirements at 10 CFR Part 40, Appendix A, Criterion 5B(5).

Because well fields will be developed and operated sequentially, the effects to groundwater could be small to moderate, depending on aquifer characteristics. Localized effects will be temporary and will last for the life of production (about 20 years) and aquifer restoration will be short term, extending 4-5 years after operations cease.

### 3.1.3.2 Environmental Effects—Alternative 2

Section 4.5.2 of the 2014 SEIS discusses potential groundwater impacts from the Dewey-Burdock ISR project. This section is incorporated into this EA by reference, and impacts analysis in these sections is summarized below as relevant to the public lands portion of the project that is administered by the BLM.

#### 3.1.3.2.1.1 Construction Phase: Infrastructure Development and Monitoring Well Installation

The 2009 GEIS Section 4.4.4.1 reports that potential impacts to groundwater during construction of an ISR facility are from the consumptive use of groundwater, injection of drilling fluids and mud during well drilling, and spills of fuels and lubricants from construction equipment. Surface activities that can introduce contaminants into soils are more likely to affect near-surface and shallow aquifers during construction. For the portion of the project situated on public lands, the proposed construction activities—which include the development of access roads, installation of power lines, and the construction of four groundwater monitoring wells—would result in

approximately 4.20 acres of surface disturbance. To provide additional context, this area represents about 2.6% of the total 160 acres of public lands parcels being evaluated in this EA.

Within the project area, the Inyan Kara Group is the principal source of water for livestock, domestic use, and other purposes (Powertech 2020). Consumptive water use during construction at the Dewey-Burdock site would be generally limited to dust control and monitoring well drilling. Initially, water for construction activities would be withdrawn from existing private wells in the Inyan Kara Group aquifer. It is anticipated to be of the same magnitude as withdrawals for domestic and livestock water use from the Inyan Kara group aquifers within a 1.2-mile (2-km) radius of the proposed project (2014 SEIS). Powertech would install wells in the deeper Madison aquifer and, once available, Madison water would be used for the Dewey-Burdock ISR project.

Powertech proposes standard mud rotary drilling techniques to construct the four groundwater monitoring wells on public lands, so drilling fluids could be introduced to surficial (alluvial) aquifers. This amount would be minor because drilling mud is designed to seal boreholes to set the casing (2014 SEIS). Stormwater runoff during construction would be managed in accordance with the state administered (SD DANR) NPDES permit. Spills could impact surficial and shallow aquifers, however, adherence to the NPDES requirements and the operator committed project design features (Section 2.1.8 of this EA) would minimize potential impacts.

Near-surface (alluvium) aquifers in the project area have limited occurrences near creeks, which do not intersect the public lands portion of the project. Shallow aquifers occur in the eastern part of the Burdock area, where the Fall River aquifer outcrops and/or is present in an unconfined condition. Powertech would not extract uranium from the shallow, unconfined Fall River aquifer in the Burdock area. The easternmost land application areas on private lands in the Burdock area would be located downdip of the outcrop area of the Fall River aquifer. Treated liquid waste applied to the easternmost land application areas is unlikely to recharge the Fall River aquifer because of the presence of the overlying Graneros Group shale. (2014 SEIS).

Considering the relatively small area of surface disturbance and the short-term period associated with construction on public lands (less than one season of construction with 2-3 years of revegetation), potential impacts to groundwater resources from consumption and spills would be negligible with the application of BMPs under the NRC, EPA, and SD DANR permits/licenses and operator committed project design features described in Section 2.1.8 of this EA, which include spill prevention and cleanup programs. In addition, the volume of drilling fluids and mud to be introduced into the environment during well installation is limited compared to the existing aquifer volume. During ISR operations on adjacent private lands, the need for monitoring groundwater quality by way of the four wells would offset the short-term impact from drilling and completing the monitoring wells. Therefore, implementation of the Proposed Action with the operator committed project design features would not result in significant impacts to groundwater use and quality during infrastructure development and installation of the four monitoring wells.

#### 3.1.3.2.1.2 Operations, Aquifer Restoration, and Decommissioning Phases: Groundwater Quality Monitoring

In Sections 4.5.2.1.1.2.2 and 4.5.2.1.2.2.2, the 2014 SEIS evaluated in detail lixiviant excursions and impacts to groundwater quality during operations. In summary, the SEIS concluded that the impact from excursions would be Small because (1) EPA exempted uranium-bearing production

aquifers from Underground Source of Drinking Water classification, (2) Powertech would be required to submit wellfield operational plans for NRC and EPA approval, (3) Powertech would maintain inward hydraulic gradients to ensure groundwater flow is toward the production zone, and (4) the operational groundwater monitoring plan (including the four groundwater monitoring wells on public lands).

If lixiviant excursions occur beyond the production zone, groundwater quality in the overlying, underlying, and adjacent aquifers could be degraded. Impacts from vertical excursions would be Small because (a) uranium-bearing production zones in the Fall River and Chilson aquifers are hydrologically isolated from adjacent aquifers by thick, low permeability shale layers (i.e., the overlying Graneros Group and underlying Morrison Formation); (b) a prevailing upward hydraulic gradient occurs across the major aquifers; (c) Mechanical Integrity Testing of wells, and (d) Powertech's commitment to properly plugging and abandoning or mitigating any previously drilled wells and exploration holes that may potentially impact the control and containment of wellfield solutions.

Potential environmental impacts to confined, deep aquifers below the production aquifers could occur from deep well injection of process-related liquid effluents. However, under the EPA Class V permit, the waste injected would not be classified as hazardous under RCRA. Also, based on water levels in Minnelusa and Madison observation wells in the area, SD DANR concluded that there is a significant difference in the potentiometric surfaces of the two aquifers suggesting that the aquifers are hydraulically separated in the vicinity of the site. The Englewood Formation underlies the Madison Formation and should provide a confining layer between the Madison Formation and the underlying Deadwood Formation (2014 SEIS).

Near-surface aquifers are hydrologically isolated from deep aquifers below the Chilson aquifer by the impermeable Morrison Formation. Groundwater impacts during operation would also be reduced by (a) implementation of leak detection and cleanup programs, (b) Mechanical Integrity Testing of wells, and (c) adherence to UIC permit and NPDES permit requirement (2014 SEIS).

During decommissioning, all wells would be plugged and abandoned in accordance with SD DANR and EPA UIC regulations, including the four groundwater monitoring wells on public lands. At the time of final reclamation and closure, Powertech would also need to submit decommissioning plans to NRC for review and approval, which may require modification to the Plan of Operations with BLM.

In summary, the potential for horizontal excursions would be mitigated through the use of a monitoring network to assist in early detection, followed by modification of wellfield operations to stop or reverse the excursion. The potential for vertical excursions would be mitigated through a delineation drilling and pump testing program that identifies and plugs improperly sealed boreholes and a mechanical integrity testing program that identifies leaks or cracks in a well casing. Impacts to production aquifers would be small and only last until restoration of the aquifer. After production is complete, production aquifers would be restored to background water quality, approved maximum contaminant levels, or NRC-approved alternate concentration limits (depending on restoration feasibility). If land application is used, process-related effluents applied to land application areas would undergo treatment to reduce radiological and hazardous constituents to levels that are protective of human health and the environment. BMPs would be used to prevent surface runoff of effluent, stormwater, and erosion from rain events. These design measures would minimize potential impacts to groundwater resources; therefore,

implementation of the Proposed Action with the operator committed project design features would not result in significant impacts to groundwater quality during operations and aquifer restoration phases.

# 4 Public Involvement, Consultation and Coordination

## 4.0 Summary of Consultation and Coordination

### *4.0.1 National Historic Preservation Act Section 106 Consultation*

Section 106 of the NHPA requires Federal agencies to consider the effects of their undertakings on historic properties and provide the Advisory Council on Historic Preservation (ACHP) an opportunity to comment on such undertakings. As defined in 36 CFR Part Part 800, "Protection of Historic Properties," historic properties are any prehistoric or historic district, site, building, structure, or object included in, or eligible for, inclusion in the National Register of Historic Places (NHRP). The proposed activities under the Powertech Dewey-Burdock Uranium ISR Plan of Operations constitute an undertaking that has the potential to cause effects on historic properties in accordance with 36 CFR § 800.3(a). Potential impacts on historic and cultural resources are discussed in Appendix B of this EA.

In a letter dated March 6, 2025, the BLM designated the NRC as lead agency for compliance under the NHPA and concurred with the NRC staff recommendation to execute a Programmatic Agreement (PA) pursuant to 36 CFR § 800.4(b)(2). The BLM is an invited signatory of the PA. By June 22, 2026, the NRC will execute the PA to resolve adverse effects historic and cultural resources identified within the area of potential effects for the Dewey-Burdock Uranium ISR project, which documents compliance with the Section 106 process. If approved, the Dewey-Burdock Uranium ISR Plan of Operations will enter the PA, including all applicable stipulations and provisions therein, as a condition (see operator committed project design feature under Section 2.1.8 of this EA).

### *4.0.2 Endangered Species Act Section 7 Consultation*

The Endangered Species Act of 1973, as amended (ESA), was enacted to protect and recover imperiled species and the ecosystems upon which they depend. The ESA provides a program for the conservation of endangered and threatened plants and animals (collectively, listed species) and the habitats in which they are found. The U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) jointly administer the ESA. The USFWS manages the protection of and recovery efforts for listed terrestrial and freshwater species, and the NMFS manages the protection of and recovery effort for listed marine and anadromous species. Under Section 7(a)(2) of the ESA, Federal agencies must consult with the Services for Federal actions that may affect listed species or designated critical habitats.

The BLM designated the NRC as lead agency for compliance under ESA. On September 29, 2025, the USFWS provided written concurrence with the NRC staff's effect determinations of "may affect but is not likely to adversely affect" for the northern long-eared bat, tricolored bat, monarch butterfly, and western regal fritillary (USFWS 2025). Following concurrence from USFWS, the BLM has satisfied its obligations under Section 7 of the ESA. Additional information can be found in Appendix B of this EA.

### *4.0.3 U.S. Nuclear Regulatory Commission*

BLM served as a cooperating agency in the NRC's preparation of 2014 Dewey-Burdock SEIS. This cooperation was carried out in accordance with the National Memorandum of Understanding between the two agencies (NRC 2013). Similarly, the NRC and BLM agreed to cooperate with each other on each agency's corresponding NEPA environmental review (BLM 2024). On April 3, 2026, the BLM provided the draft EA to NRC for review and comment (Reference). NRC responded on [DATE] with comments regarding [placeholder if applicable]. This EA addresses these comments.

This section will be completed after the consultation period.

### *4.0.4 U.S. Environmental Protection Agency*

The EPA regulates the construction, operation, permitting, and closure of injection wells used to place fluids underground for storage or disposal (EPA 2024a). Injection wells for uranium extraction are classified as Class III injection wells under EPA's UIC program.[3] These wells are in the aquifers containing the uranium that Powertech intends to recover. The portion of the aquifer defined for uranium recovery must be exempted from the underground source of drinking water (USDW) designation,[4] in accordance with the Safe Drinking Water Act (SWDA) and pursuant to 40 CFR Part 146, "Underground Injection Control Program: Criteria and Standards."

On November 24, 2020, EPA Region 8 issued an aquifer exemption and UIC permits to use Class III and Class V injection wells for the Dewey-Burdock ISR project (EPA 2020a, EPA 2020b, and EPA 2020c, respectively). EPA approved the aquifer exemption request as a minor/non-substantial program revision. On March 14, 2025, EPA reissued the final Dewey-Burdock Class III and Class V Injection Well Area Permits (EPA 2025a). In support of the Class III and Class V injection well area permits and aquifer exemption, EPA prepared a cumulative effects analysis consistent with 40 CFR § 144.33(c)(3) (EPA 2020d).

On April 3, 2026, the BLM provided the EA to EPA for review and comment (Reference). EPA responded on DATE with comments regarding…. (Reference). This EA addresses these comments.

This section will be completed after the consultation period.

## 4.1 Summary of Public Participation

This section will be completed after the public comment period.

[3] Under the UIC program, each well class is based on the type and depth of the injection activity and the potential for that injection activity to result in endangerment of a USDW. Class III wells are used to inject fluids to dissolve and extract minerals such as uranium, salt, copper, and sulfur. Class V wells are used to inject nonhazardous fluids underground (EPA 2024a).

[4] An aquifer is an underground body of rock that contains or can transmit groundwater (EPA 2024b). An USDW is defined, per 40 CFR 144.3, as an aquifer (or its portion) that (1) supplies a public water system, or contains a sufficient quantity of groundwater to supply a public water system; and currently supplies drinking water for human consumption; or contains fewer than 10,000 milligrams per liter (mg/L) (10,000 parts per million [ppm]) total dissolved solids; and (2) is not an exempted aquifer.

### *4.1.1 Public Comments Analysis*

This section will be completed after the public comment period.

# 5 List of Appendices

Appendix A—List of Preparers

Appendix B—Table of Issues and Resources Considered

Appendix C—Acronyms and Abbreviations

Appendix D—List of References

Appendix E—Maps

# 6 Appendix A: List of Preparers

| Name | Title | Resource Area |
|---|---|---|
| Chris Rye | Geologist | Document Completion |
| Josh Buckmaster | Soils Scientist | Soil Resources |
| Josh Chase | State Archaeologist | Cultural Resources |
| Carmen Drieling | Rangeland Management Specialist | Grazing and Vegetation |
| Carlie Grine | Rangeland Management Specialist | Grazing and Vegetation |
| Samantha Keeran | Geologist | Paleontological Resources |
| Ryan Larson | Outdoor Recreation Planner | Recreation, Travel Management, VRM |
| Chris Morris | Hydrologist | Hydrological Resources |
| Cory Neuharth | Noxious Weeds Coordinator | Noxious/Invasive Plants, Non-native, Vegetation |
| Rebecca Newton | Wildlife Program Lead | Threatened & Endangered, Special Status Species, general wildlife |
| Amy Stillings | Socioeconomic Specialist | Economics, quality of life |
| Christina Stuart | Fish Biologist | Aquatic Species |
| Daniel Velder | Realty Specialist | Lands and Realty |

# 7 Appendix B: Issues not Analyzed in Detail in this EA

BLM identified an additional 11 issues and determined a detailed analysis was not warranted. These issues are listed below and analyzed in brief with a concise discussion regarding the affected area and degree of impacts related to each issue.

**AIB-1 (Paleontological Resources)**: How would paleontological resources be affected by Proposed Action?

Several non-significant fossil localities were found during the survey on BLM-administered lands on September 8, 2025. The dominant fossil found was petrified wood. Petrified wood fossils discovered may be collected by the public without obtaining a permit and are not generally considered *significant*. Significant fossils generally include vertebrate fossils (e.g., bones, teeth, skulls of dinosaurs, mammals, reptiles, fish); rare or uncommon invertebrate or plant fossils (beyond "common" species); and fossils that provide scientific, educational, or interpretive value, such as those that help reconstruct past ecosystems, evolutionary history, or climate.

Based on the limited known fossils in the area, especially those that are considered significant, and the survey conducted by BLM personnel, no significant impacts to paleontological resources from the Proposed Action is anticipated, and further analysis is not warranted. The operator committed project design features (Section 2.1.8 of this EA) would sufficiently mitigate discovery of previously unknown fossil localities. The 2014 SEIS further describes geology under Section 3.4.1 but does not address potential impacts to paleontological resources.

**AIB-2 (Cultural Resources)**: How would the Proposed Action impact cultural resources?

To date, all of the BLM-administered lands has been adequately surveyed for cultural resources during the Cultural Resource Investigations in 2008, 2009, and 2012 as well as the Tribal Surveys completed in 2013 [(Kruse, et al., 2008); (Palmer, et al., 2008); (Palmer, 2008); (Palmer, 2009); (Palmer, et al., 2012)] and (Tribal Survey Summary Report, NRC SEIS, Volume 2, Appendix F 2014)].

Seven total sites were completely or partially recorded on the BLM administered lands. Of these sites, four are considered not eligible for the NRHP with no further work recommended.

The remaining three sites will be avoided, therefore a finding of "No Historic Properties Affected" specific to BLM managed lands is appropriate. The operator committed project design features (Section 2.1.8 of this EA) would sufficiently mitigate discovery of previously unknown cultural resources.

The 2014 SEIS further describes historic and cultural resources under Section 3.9 and discloses potential impacts to historic and cultural resources under Section 4.9.

**AIB-3 (Recreation):** How would the Proposed Action impact recreation?

The proposed surface disturbance of 4.20 acres will have little impact on recreation. The BLM parcel has limited public access through section line access only which is assumed to see little utilization by the public for recreation purposes. There is a general hunting walk in area to the northwest of the project that helps provide closer access to the BLM

parcel but is not considered a high use parcel. Due to the small BLM acreage associated with this project and the application of operator committed project design features, impacts to recreation are not being considered for further analysis.

The 2014 SEIS further describes land use under Section 3.2 and discloses potential impacts to land use under Section 4.2.

**AIB-4 (Wildlife – Big game, and non-designated species):** How would the Proposed Action impact wildlife – Big game and non-designated species?

The amount of proposed disturbance (4.20 acres) is relatively small and does not intersect any sensitive, limited, or limiting habitats for wildlife. BMPs and operator-committed project design features, including timing limits, would mitigate most direct effects to wildlife. Direct, indirect, and cumulative effects to wildlife are not expected to result in local or regional population declines, are expected to affect few individuals, and would not contribute to a need to list any species under the Endangered Species Act. Because of the relatively small footprint of disturbance, and low to intermittent intensity of activity during the operations phase, and implementation of conservation measures, wildlife (including big game and non-designated species) are not being carried forward for detailed analyses.

The 2014 SEIS further describes wildlife under Section 3.6.1.2 and discloses potential impacts to wildlife (ecological resources) under Section 4.6.

**AIB-5 (Wildlife – Migratory birds including raptors)**: How would the Proposed Action impact wildlife – Migratory birds including raptors?

The assessment for migratory birds (including raptors) is similar to that described under AIB-4. BMPs and operator-committed project design features, including timing limits, would prevent most instances of direct take of migratory birds from surface disturbing actions by limiting use of heavy equipment and surface disturbance during breeding and nesting season. Based on this and the reasons described under AIB-4, migratory birds and raptors are not being carried forward for detailed analyses.

The 2014 SEIS further describes wildlife under Section 3.6.1.2 and discloses potential impacts to wildlife (ecological resources) under Section 4.6.

**AIB-6 (Soil Resources):** How would implementation of the Proposed Action impact soil resources?

Soil resources would be protected through application of operator committed project design features (Section 2.1.8 of this EA), including stockpiling and protecting (seeding/tackifier) of topsoil from roads and well pads and the placement of erosion control measures such as water bars, silt fence, straw wattles, rock outflows, etc.. The proponent would be required to reclaim all disturbed areas upon final abandonment of wells. This includes recontouring and reseeding all disturbed areas such as roads, evaporation pits, and well pads. All disturbed areas would be expected to return to natural rates of erosion and sedimentation with the return of native vegetation. No significant impacts to soil resources from the Proposed Action is anticipated, and further analysis is not warranted.

The 2014 SEIS further describes soil resources under Section 3.4.2 and addresses

potential impacts to soil resources under Section 4.4.

**AIB-7 (Vegetation – Invasive Species/Noxious Weeds)**: How would the Proposed Action impact vegetation – Invasive Species/Noxious Weeds?

Vegetation, as it relates to invasive plant species and noxious weeds, would be protected through application of operator committed project design features (Section 2.1.8 of this EA), including the preventative measures under number 1, 2, and 5. All disturbance areas (4.2 acres) would be expected to return to native vegetation. No significant impacts to or from invasive plant species or noxious weeds are anticipated as a result of the Proposed Action. No further analysis is not warranted.

The 2014 SEIS further describes vegetation under Section 3.6.1.1 and discloses potential impacts to ecological resources (including flora) under Section 4.6.

**AIB-8 (Grazing):** How would the Proposed Action impact livestock rangeland management and grazing?

The Proposed Action is disturbing 4.20 surface acres and therefore, livestock grazing management is not being analyzed in detail for this project. The primary disturbance is associated with roads (primary, secondary and light use access roads) and powerline poles with no direct infrastructure on the BLM lands (approximately 4950 feet). The planning and reclaiming of surface disturbance mitigates the small portion of acres being disturbed with a seed mix native to the area that will allow the regrowth of vegetative species quicker thus the short-term disturbance will not affect livestock grazing. The Burdock Allotment is grazed by Peterson's and Sons, the lease contains 48 AUMs, and no reduction of Animal Unit Months would be necessary because 4.2 acres is incidental and adequate forage will remain available. No significant impacts to land health due to loss of forage are anticipated. Further analysis is not warranted.

The 2014 SEIS further describes land use (rangeland) under Section 3.2.1 and discloses potential impacts to land use under Section 4.2.

**AIB-9 (Mineral Resources)**: How would implementation of the Proposed Action impact mineral development?

A search of the BLM's Mineral and Land Record System on April 2, 2026, reports there are no active mineral material sites, any mineral leasing, or other locatable mineral Plans of Operations or Notices in the 160 acres of public lands parcels. In addition, Powertech (USA) Inc., the operator of the Plan of Operations subject to this EA, is the only active mining claimant in this area. Based on this information, there are no anticipated impacts to or from mineral resource development as a result of the Proposed Action. No further analysis is warranted.

The 2014 SEIS further describes land use (minerals and energy) under Section 3.2.3 and discloses potential impacts to land use under Section 4.2.

**AIB-10 (Wildlife – Federally listed, proposed, and other special status species)**: How would implementation of the Proposed Action impact federally listed or proposed species and other special status species?

Informal consultation has been completed by the NRC in 2025 (Table A-1). Concurrence on a revised biological assessment (BA) was received from USFWS on September 29,

2025. NRC and Powertech commit to monitoring for northern long-eared and tricolored bats at Triangle Mine, along with other conservation measures for bats and other species.

**Table A-1. Species addressed in NRC's BA for the entire affected area under the project (all lands) and effects determination by NRC.**

| Species | Federal Status | Determination[1] |
|---|---|---|
| Northern long-eared bat (*Myotis septentrionalis*) | Endangered | NLAA |
| Tricolored bat (*Perimyotis sublavus*) | Proposed Endangered | NLAA |
| Rufa Red Knot (*Calidris canutus rufa*) | Threatened | NE |
| Black-footed ferret (*Mustela nigripes*) | Endangered | NE |
| Monarch butterfly (*Danaus plexippus*) | Proposed Threatened | NLAA |
| Western regal fritillary (*Argynnis idalia occidentalis*) | Proposed Threatened | NLAA |
| Suckley's cuckoo bumble bee (*Bombus suckleyi*) | Proposed Endangered | NE |

[1]NLAA=Not likely to adversely affect; NE= No effect

A subset of the species included in the BA may occur on BLM lands (Table A-2). Effects of actions on BLM lands are covered by the NRC's consultation and no further consultation with USFWS is necessary by BLM to approve the Proposed Action.

**Table A-2. BLM's determinations and justification for species with ranges overlapping Dewey-Burdock's mining related activities on BLM lands in SDFO**

| Species | Determination[1] | Justification |
|---|---|---|
| Northern long-eared bat | NLAA | Project may affect roosting behavior nearby if trees are removed or disturbed. Any tree removal should occur outside of active season to keep the determination at NLAA. |
| Rufa red knot | NE | There are no permanent wetlands, and habitat for the species does not exist at the project site. |
| Monarch butterfly | NLAA | Ground disturbing actions may affect nectar-producing species used by adult monarchs. It is unlikely that milkweeds would be affected. The Proposed Action would not jeopardize monarch butterfly. |
| Suckley's Cuckoo bumble bee | NE | South Dakota considers Suckley's Cuckoo bumble bee extirpated (Dan Kim, USFWS, communication via Teams 7/15/2025). The species has not been documented in SD since 1969. |

[1]NLAA=Not likely to adversely affect; NE= No effect

The assessment for non-federally listed or proposed special status species is similar to AIB-4 and AIB-5. There is low likelihood of occurrence and limited suitable habitat for federally listed and proposed species in the analysis area, and the operator has committed to conservation measures for listed species as described in their BA and referenced in this EA. Relatively small long-term disturbance footprint, lack of limited or limiting habitats, and inclusion of BMPs and conservation measures minimize effects to special status wildlife populations and would not contribute to need for listing or uplisting (ie, change in status from threatened to endangered) of any species. Federally listed, proposed, and other special status species are not carried forward for detailed analyses.

The 2014 SEIS further describes wildlife under Section 3.6.1.2 and discloses potential impacts to wildlife (ecological resources) under Section 4.6.

**AIB-11 (Socioeconomics)**: How would the Proposed Action impact the economic conditions and quality of life of the local community?

Socioeconomic impacts were not analyzed in detail for this project because the Proposed Action would proceed regardless of BLM's decision. The mine is located on private land and does not require BLM authorization for core operations; BLM's decision is limited to the placement of ancillary actions on BLM lands related to infrastructure (roads and powerlines) and water monitoring wells. Both the 2009 GEIS (Section 4.2.10) and 2014 SEIS (Section 4.11) disclose socioeconomic impacts for the entire uranium project, including construction and operational impacts to the economy such as job creation and tax revenue. These impacts would occur regardless of where the infrastructure is placed and not influenced by BLM's decision.

# 8 Appendix C: Acronyms and Abbreviations

| | |
|---|---|
| ACEC | Area of Critical Environmental Concern |
| AE | Aquifer Exemption |
| APE | Area of Potential Effect |
| ADAMS | Agencywide Documents Access and Management System |
| ARPA | Archeological Resources Protection Act |
| ARSD | Administrative Rules South Dakota |
| AUM | Animal Unit Month |
| BLM | Bureau of Land Management |
| BME | Board of Minerals and Environment |
| BMP | Best Management Practice |
| CFR | Code of Federal Regulations |
| DANR | Department of Agriculture and Natural Resources |
| DM | Departmental Manual |
| DR | Decision Record |
| EA | Environmental Assessment |
| EIS | Environmental Impact Statement |
| EO | Executive Order |
| EPA | Environmental Protection Agency |
| ESA | Endangered Species Act |
| FLPMA | Federal Land Policy Management Act of 1976, as amended |
| FONSI | Finding of No Significant Impact |
| GEIS | Generic Environmental Impact Statement |
| IB | Information Bulletin |
| IDT | Interdisciplinary Team |
| IM | Instruction Memorandum |
| MCL | Maximum Contaminant Level |
| MOU | Memorandum of Understanding |
| NAGPRA | Native American Graves Protection and Repatriation Act |
| NEPA | National Environmental Policy Act |
| NHPA | National Historic Preservation Act |
| NRC | Nuclear Regulatory Commission |
| NRCS | Natural Resources Conservation Service |
| NRHP | National Register of Historic Places |
| PLS | Pure Live Seed |
| RFFA | Reasonably Foreseeable Future Action |
| RMP | Resource Management Plan |

| | |
|---|---|
| ROD | Record of Decision |
| SD | South Dakota |
| SERP | Safety and Environmental Review Panel |
| SEIS | Supplemental Environmental Impact Statement |
| SHPO | State Historic Preservation Office |
| SMCL | Secondary Maximum Contaminant Levels |
| SRP | Special Recreation Permit |
| SWMP | Storm Water Management Plan |
| T&E | Threatened and Endangered |
| TDS | Total Dissolved Solids |
| U.S.C. | United States Code |
| USFWS | U.S. Fish and Wildlife Service |
| USGS | U.S. Geologic Survey |
| UIC | Underground Injection Control |
| UUD | Unnecessary or Undue Degradation |
| VRI | Visual Resource Inventory |
| VRM | Visual Resource Management |

# 9 Appendix D: List of References


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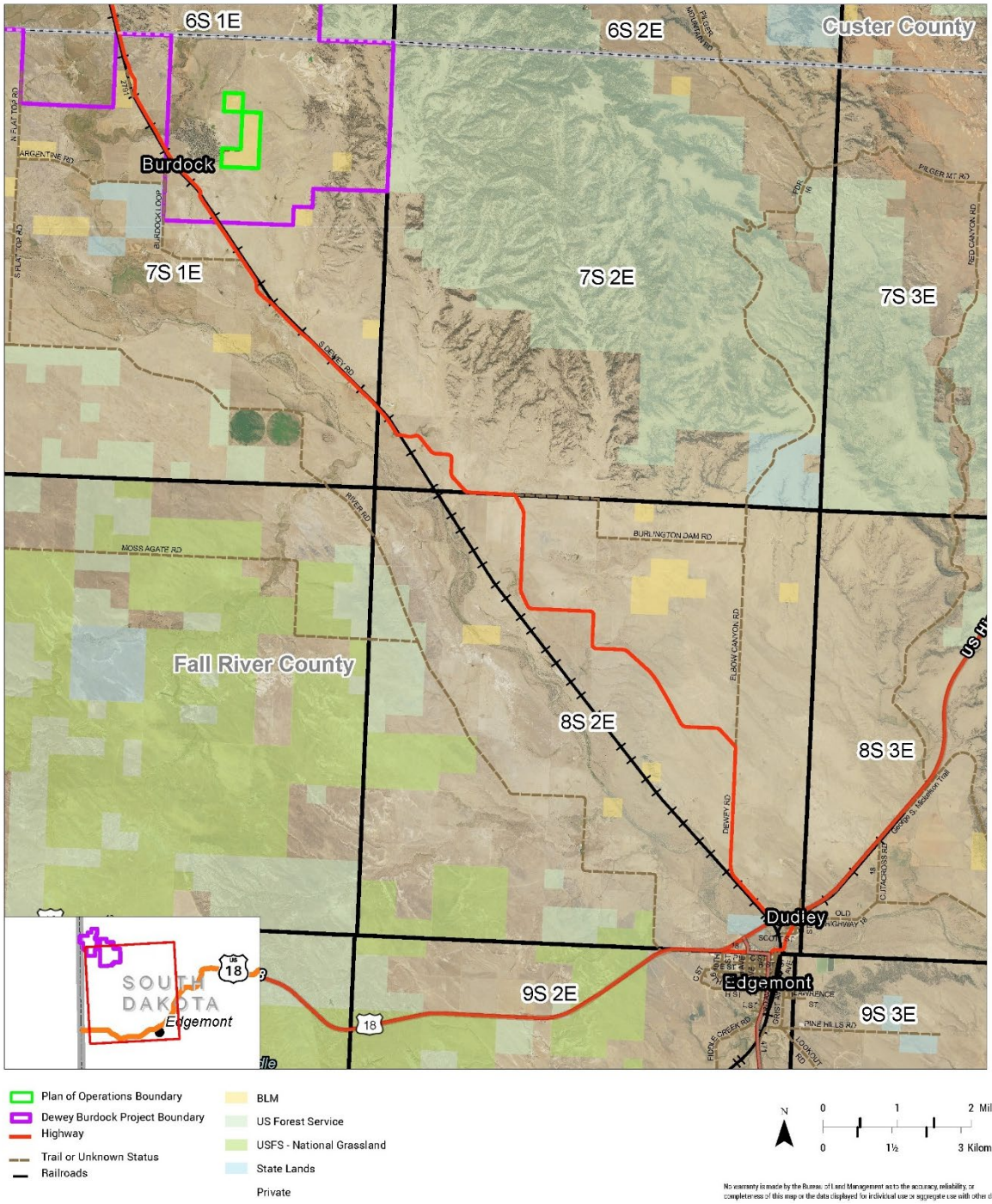
# 10 Appendix E: Maps


**Map 1. General Location**



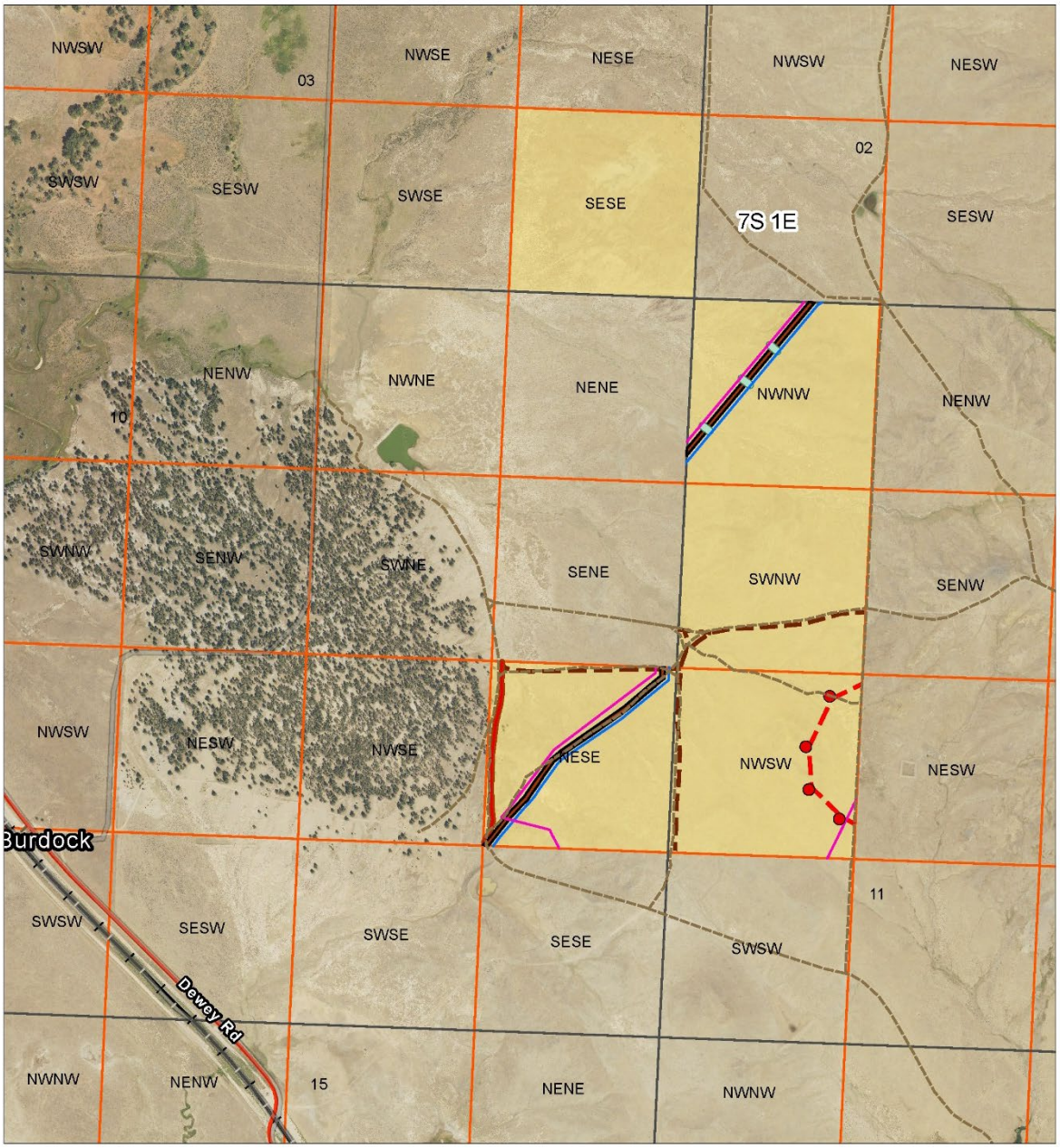
# Dewey-Burdock

Uranium ISR Plan of Operations

Bureau of Land Management
South Dakota Field Office
309 Bonanza St
Belle Fourche, SD 57717
605-892-7000

SOUTH DAKOTA

## Map 2. Project Area




Monitoring Wells
Overhead Power Line
Proposed Road Ditch
Proposed culvert
Primary Access Road Prism
Secondary Access Road
Existing
New
Township
Sections
Quarters
BLM
Private
Railroads
Highway
Trail or Unknown Status

N

0 0.1 0.2 Miles
0 0.15 0.3 Kilometers