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*Protecting People and the Environment*

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# **Environmental Impact Statement for the Dewey-Burdock Project in Custer and Fall River Counties, South Dakota**

## **Supplement to the Generic Environmental Impact Statement for *In-Situ* Leach Uranium Milling Facilities**

Final Report

Chapters 6 to 11 and Appendices

Office of Federal and State Materials and  
Environmental Management Programs

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## ABSTRACT

The U.S. Nuclear Regulatory Commission (NRC) issues licenses for the possession and use of source material provided that proposed facilities meet NRC regulatory requirements and will be operated in a manner that is protective of public health and safety and the environment. Under the NRC environmental protection regulations in 10 CFR Part 51, which implement the National Environmental Policy Act of 1969 (NEPA), issuance of a license to possess and use source material for uranium milling, as defined in 10 CFR Part 40, requires an environmental impact statement (EIS) or a supplement to an EIS.

In May 2009, NRC issued NUREG–1910, the Generic Environmental Impact Statement for *In-Situ* Leach Uranium Facilities (GEIS) (NRC, 2009). In the GEIS, NRC assessed the potential environmental impacts from the construction, operation, aquifer restoration, and decommissioning of an *in-situ* leach uranium recovery facility [also known as an *in-situ* recovery (ISR) facility] located in four specified geographic regions of the western United States. As part of this assessment, NRC determined which potential impacts will be essentially the same for all ISR facilities and which will result in varying levels of impact for different facilities, thus requiring further site-specific information to determine potential impacts. The GEIS provides a starting point for NRC NEPA analyses for site-specific license applications for new ISR facilities, as well as for applications to amend or renew existing ISR licenses.

By letter dated August 10, 2009, Powertech (USA), Inc. (Powertech, referred to herein as the applicant) submitted a license application to NRC for a new source material license for the Dewey-Burdock ISR Project. The proposed Dewey-Burdock ISR Project will be located in Fall River and Custer Counties, South Dakota, which is in the Nebraska-South Dakota-Wyoming Uranium Milling Region identified in the GEIS. The NRC staff prepared this Supplemental Environmental Impact Statement (SEIS) to evaluate the potential environmental impacts from the applicant's proposal to construct, operate, conduct aquifer restoration, and decommission an ISR uranium facility at the proposed Dewey-Burdock ISR Project. This SEIS describes the environment potentially affected by the proposed site activities, presents the potential environmental impacts resulting from reasonable alternatives to the proposed action, and describes the applicant's environmental monitoring program and proposed mitigation measures. In conducting its analysis in this SEIS, the NRC staff evaluated site-specific data and information to determine whether the applicant's proposed activities and site characteristics were consistent with those evaluated in the GEIS. NRC staff then determined relevant sections, findings, and conclusions in the GEIS that could be incorporated by reference and areas that required additional analysis. Based on its environmental review, the NRC staff recommendation is that a source material license for the proposed action be issued as requested, unless safety issues mandate otherwise.

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### References

10 CFR Part 40. Code of Federal Regulations, Title 10, *Energy*, Part 40. “*Domestic Licensing of Source Material.*” Washington, DC: U.S. Government Printing Office.

10 CFR Part 51. Code of Federal Regulations, Title 10, *Energy*, Part 51. “*Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions.*” Washington, DC: U.S. Government Printing Office.

NRC. NUREG–1910, “Generic Environmental Impact Statement for *In-Situ* Leach Uranium Milling Facilities.” ML091480244, ML091480188. Washington, DC: NRC. May 2009.

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## EXECUTIVE SUMMARY

### BACKGROUND

By letter dated August 10, 2009, Powertech (USA), Inc. (Powertech) submitted an application to the U.S. Nuclear Regulatory Commission (NRC) for a new source material license for the Dewey-Burdock *In-Situ* Uranium Recovery Project, located in Fall River and Custer Counties, South Dakota. The applicant is proposing to recover uranium using the *in-situ* leach (ISL) [also known as *in-situ* recovery (ISR)] process. The proposed Dewey-Burdock ISR Project will include processing facilities and sequentially developed wellfields sited in two contiguous areas, the Burdock area and the Dewey area. Proposed facilities include a central processing plant in the Burdock area, a satellite facility in the Dewey area, wellfields, Class V deep injection wells and/or land application areas for disposal of liquid wastes, and the attendant infrastructure (e.g., pipelines and surface impoundments).

The Atomic Energy Act of 1954 (AEA), as amended by the Uranium Mill Tailings Radiation Control Act of 1978, authorizes NRC to issue licenses for the possession and use of source material and byproduct material. These statutes require NRC to license facilities, including ISR operations, in accordance with NRC regulatory requirements to protect public health and safety from radiological hazards. Under the NRC environmental protection regulations in 10 CFR Part 51, which implement the National Environmental Policy Act of 1969 (NEPA), preparation of an environmental impact statement (EIS) or supplement to an EIS is required for issuance of a license to possess and use source material for uranium milling [10 CFR 51.20(b)(8)].

In May 2009, the NRC staff issued NUREG–1910, the Generic Environmental Impact Statement for *In-Situ* Leach Uranium Milling Facilities (herein referred to as the GEIS) (NRC, 2009). In the GEIS, NRC assessed potential environmental impacts from the construction, operation, aquifer restoration, and decommissioning of an ISR facility located in four specified geographic regions of the western United States. The proposed Dewey-Burdock ISR Project is located within the Nebraska-South Dakota-Wyoming Uranium Milling Region identified in the GEIS. The GEIS provides a starting point for NRC NEPA analyses for site-specific license applications for new ISR facilities, as well as for applications that amend or renew existing ISR licenses. This Supplemental EIS (SEIS) incorporates by reference information from the GEIS and also uses information from the applicant's license application and other independent sources to fulfill the requirements set forth in 10 CFR 51.20(b)(8).

This SEIS includes the NRC staff analysis that considers and weighs the environmental effects of the proposed action, the environmental impacts of alternatives to the proposed action, and mitigation measures to either reduce or avoid adverse effects. It also includes the NRC staff's recommendation regarding the proposed action.

This SEIS was prepared in cooperation with the U.S. Bureau of Land Management (BLM). BLM has requested to be and is acting as a cooperating agency with NRC to evaluate the impacts of Powertech's Plan of Operations in accordance with the National Memorandum of Understanding with NRC. BLM manages 97 ha [240 ac] of land within the proposed Dewey-Burdock ISR Project area. Under 43 CFR Part 3809, BLM is required to review the environmental impacts of federal actions on surface lands to assure that there is no "unnecessary or undue degradation of public lands." To fulfill this requirement, the applicant submitted a Plan of Operations to BLM for the Dewey-Burdock ISR Project on August 26, 2009. Powertech modified the Plan of Operations and resubmitted it to BLM on January 28, 2011.

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## **PURPOSE AND NEED FOR THE PROPOSED ACTION**

NRC regulates uranium milling, as defined in 10 CFR 40.4, including the ISR process, under 10 CFR Part 40, "Domestic Licensing of Source Material." The applicant is seeking an NRC source material license to authorize commercial-scale ISR uranium recovery at the proposed Dewey-Burdock ISR Project. The purpose and need for the proposed federal action is to either grant or deny the applicant a license to use ISR technology to recover uranium and produce yellowcake at the proposed project site. Yellowcake is the uranium oxide product of the ISR milling process used to produce various products including fuel for commercially operated nuclear power reactors.

This definition of purpose and need reflects the Commission's recognition that, unless there are findings in either the AEA-required safety review or in the NEPA environmental analysis that would lead NRC to reject a license application, NRC has no role in a company's business decision to submit a license application to operate an ISR facility at a particular location.

The BLM purpose and need for the proposed action is to provide for orderly, efficient, and environmentally responsible mining of the uranium resource. The uranium resource is needed to fulfill market demands for this product for power generation and other needs. These public lands are open to mineral entry, and the applicant has filed mining claims on them. Within the proposed project area, Powertech maintains the mining claims associated with 1,708 ha [4,220 ac] of federal land that the U.S. Government reserved under the Stock-Raising Homestead Act. The BLM federal decision is to either approve the Powertech-modified Plan of Operations subject to mitigation included in the license application and this SEIS, or deny approval of the Plan of Operations. BLM's responsibility to respond to the Plan of Operations establishes the need for the action. The mining claimant has the right to mine and develop the mining claims as long as it can be done without causing unnecessary or undue degradation of the public lands and follows pertinent laws and regulations under 43 CFR Part 3800.

## **THE PROJECT AREA**

The proposed Dewey-Burdock ISR Project is located in Custer and Fall River Counties, South Dakota, within the Great Plains physiographic province on the edge of the Black Hills uplift. The proposed site is located approximately 21 km [13 mi] north-northwest of the city of Edgemont, approximately 64 km [40 mi] west of the city of Hot Springs, and approximately 80 km [50 mi] southwest of the city of Custer. The total land area of the proposed Dewey-Burdock Project is 4,282 ha [10,580 ac]. Sections within the proposed project area are split estate, in which two or more parties own the surface and subsurface mineral rights. The surface rights are both publicly and privately owned. Approximately 4,185 ha [10,340 ac] of land is privately owned, and the remaining 97 ha [240 ac] of surface rights are owned by the U.S. Government and administered by BLM. The subsurface mineral rights are owned by various private entities and federally reserved by the U.S. Government.

The proposed Dewey-Burdock ISR Project will consist of processing facilities and sequentially developed wellfields in two contiguous areas: the Burdock area and the Dewey area. Planned facilities associated with the proposed project include buildings associated with a central processing plant in the Burdock area and a satellite facility in the Dewey area; surface impoundments; wellfields and their associated infrastructure (e.g., wells, header houses, and pipelines); Class V deep injection wells and/or land application areas for disposal of liquid wastes; and access roads. The applicant estimated that the land surface area that will be

affected by proposed ISR operations will be approximately 98 ha [243 ac] if Class V deep injection wells alone are used to dispose of process-related liquid wastes and approximately 566 ha [1,398 ac] if land application alone is used to dispose of liquid wastes.

### **IN-SITU RECOVERY PROCESS**

During the ISR process, an oxidant-charged solution, called a lixiviant, is injected into the production zone aquifer (uranium orebody) through injection wells. 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.

During production, the uranium recovery solution continually moves through the aquifer from injection wells to recovery wells. These wells can be arranged in a variety of geometric patterns depending on the location and orientation of the orebody, aquifer permeability, and operator preference. Wellfields are typically designed in a five-spot or seven-spot pattern, with each recovery (i.e., production) well located inside a ring of injection wells. Monitoring wells are installed in the production zone aquifer and surround the wellfield pattern area. Monitoring wells are screened (i.e., open to allow water to enter) in the appropriate stratigraphic horizon to detect the potential migration of lixiviant away from the production zone. Monitor wells are also installed in the overlying and underlying aquifers to detect the potential vertical migration of lixiviant outside the production zone. The uranium that is recovered from the solution is processed, dried into yellowcake, packaged into NRC- and U.S. Department of Transportation (USDOT)-approved 208-L [55-gal] steel drums, and trucked offsite to a licensed conversion facility.

An underground injection control (UIC) program regulates the design, construction, testing, operation, and closure of injection wells at ISR facilities. Before ISR operations begin, the portion of the aquifer(s) designated for uranium recovery must be exempted from the underground source of drinking water (USDW) designation, in accordance with the Safe Drinking Water Act (SDWA). Once production is complete, the production zone groundwater is restored to NRC-approved groundwater protection standards, which are protective of the surrounding groundwater. The site is decommissioned according to an NRC-approved decommissioning plan and in accordance with NRC-approved standards. Once decommissioning is approved, the site may be released for public use.

### **ALTERNATIVES**

The NRC environmental review regulations that implement NEPA in 10 CFR Part 51 require NRC to consider reasonable alternatives, including the No-Action alternative, to a proposed action. The NRC staff considered a range of alternatives that would fulfill the underlying purpose and need for the proposed action. From this analysis, a set of reasonable alternatives was developed, and the impacts of the proposed action were compared with the impacts that would result if a given alternative was implemented. This SEIS evaluates the potential environmental impacts of the proposed action and the No-Action alternative and also considers

alternative wastewater disposal options to the proposed action. Under the No-Action alternative, the applicant would not construct and operate ISR facilities at the proposed site. Other alternatives considered at the proposed Dewey-Burdock ISR Project site but eliminated from detailed analysis include conventional mining and milling, conventional mining and heap leach processing, alternative lixiviants, alternative site locations, and alternative well completion methods. These alternatives were eliminated from detailed study because they either would not meet the purpose and need of the proposed project or would cause greater environmental impacts than the proposed action. This SEIS also discusses alternative wastewater disposal options (evaporation ponds and surface water discharge) that were not included in the proposed action.

## **SUMMARY OF ENVIRONMENTAL IMPACTS**

This SEIS includes the NRC staff analysis that considers and weighs the environmental impacts from the construction, operation, aquifer restoration, and decommissioning of ISR operations at the proposed Dewey-Burdock ISR Project site and the No-Action alternative. This SEIS also describes mitigation measures for the reduction or avoidance of potential adverse impacts that (i) the applicant has committed to in its NRC license application, (ii) will be required under other federal and state permits or processes, or (iii) are additional measures NRC staff identified as having the potential to reduce environmental impacts but that the applicant did not commit to in its application. The SEIS uses the assessments and conclusions reached in the GEIS in combination with site-specific information to assess and categorize impacts.

As discussed in the GEIS and consistent with NUREG-1748 (NRC, 2003), the significance of potential environmental impacts is categorized as follows:

- 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.
- MODERATE:** The environmental effects are sufficient to alter noticeably, but not destabilize, important attributes of the resource.
- LARGE:** The environmental effects are clearly noticeable and are sufficient to destabilize important attributes of the resource.

Chapter 4 of this SEIS provides the NRC evaluation of the potential environmental impacts from the construction, operation, aquifer restoration, and decommissioning of the proposed Dewey-Burdock ISR Project. The significance of impacts from the ISR facility lifecycle is listed next, followed by a summary of impacts by environmental resource area and ISR phase for the proposed action.

### **Impacts by Resource Area and *In-Situ* Recovery Facility Phase**

#### **Land Use**

**Construction:** Impacts will be SMALL. If deep well disposal via Class V injection wells alone is used to dispose of liquid wastes, approximately 98 ha [243 ac] or 2.3 percent of the proposed project area will be disturbed by the construction phase. If land application alone is used to dispose of liquid wastes, the construction phase will disturb approximately 566 ha [1,398 ac] or 13.2 percent of the proposed project area. Topsoil will be stripped and stockpiled prior to



building surface facilities, developing initial wellfields and attendant infrastructure, and constructing access roads. Livestock grazing and recreational activities will be excluded from fenced areas surrounding the central plant, satellite facility, surface impoundments, and wellfields.

Operation: Impacts will be SMALL. Land use impacts during the operations phase will be limited to the wellfields and will be similar to, or less than, those during the construction phase. Wellfields will be developed sequentially resulting in disturbance of approximately 57 ha [140ac]. Land disturbance and access restrictions will result from drilling new wells and constructing additional header houses and pipelines. Livestock grazing and recreational activities will continue to be restricted from the central plant, satellite facility, surface impoundments, and wellfields. Potential land application areas may also be fenced to control livestock access.

Aquifer Restoration: Impacts will be SMALL. Land use impacts will be similar to, or less than those described for the operations phase. Land use impacts will decrease as fewer wells and pump houses are used and overall equipment traffic and use diminish. Access to wellfields and surface facilities will continue to be restricted. No additional land will be disturbed to construct facilities.

Decommissioning: Impacts will be SMALL to MODERATE. Decommissioning the buildings, wellfields, storage ponds, and access roads and removing potentially contaminated soil will result in a temporary, short-term increase in land-disturbing activities. Upon completion of the plugging and abandonment of wells, the soil will be returned to areas in the wellfield where it had been removed and reseeded. At the end of decommissioning, because the reclaimed land will be released for other uses and no longer restricted, the land use impact in disturbed areas will be MODERATE until vegetation becomes reestablished. After vegetation is reestablished in reclaimed areas, the land will be returned to a condition that can support a variety of land uses; therefore, the impact will be SMALL.

### **Transportation**

Construction: Impacts will be SMALL. Dewey Road, the unpaved gravel road nearest the proposed site, will experience a 42 percent increase over existing traffic considering both autos and trucks during the ISR construction phase. This increase in traffic will incrementally accelerate degradation of road surfaces, increase the generation of dust, and increase the potential for traffic accidents and wildlife or livestock kills. The well-traveled regional roads will not be impacted significantly by construction traffic.

Operation: Impacts will be SMALL. Dewey Road, the road nearest the proposed site, will experience a 24 percent increase in daily vehicle traffic during the ISR operations phase. This increase in traffic will incrementally accelerate degradation of road surfaces, increase the generation of dust, and increase the potential for traffic accidents and wildlife or livestock kills. Additionally, the transport of yellowcake product, hazardous materials, uranium-loaded resins from the Dewey Unit to the Burdock Unit, and wastes could result in spills or leakage if an accident occurred; however, this risk was determined to be low and will be further limited by compliance with existing NRC and USDOT transportation regulations and the implementation of best management practices (BMPs) for containing leakage and spills.

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**Aquifer Restoration:** Impacts will be SMALL. Transportation impacts will be less than those estimated for the construction and operation phases because the need to transport yellowcake product, hazardous materials, and uranium-loaded resins between units will decrease as aquifer restoration progresses. The decrease in supply shipments, waste shipments, and employee commuting (because fewer workers will be involved) will reduce the potential for accidents and therefore for any spills or leakage.

**Decommissioning:** Impacts will be SMALL. Transportation impacts will be less than those during the construction and operation phases because the transport of yellowcake product and processing chemicals will end during decommissioning. Access roads will either be reclaimed or left in place for future use. Waste shipments will increase temporarily, but will still represent a small contribution to daily traffic. Fewer workers will be employed, further reducing the potential transportation impact during this phase.

### **Geology and Soils**

**Construction:** Impacts will be SMALL. Earthmoving activities associated with construction of the Burdock central plant and Dewey satellite plant facilities, access roads, wellfields, pipelines, and surface impoundments will include topsoil clearing and land grading. Topsoil removed during these activities will be stored and reused later to restore disturbed areas. The limited areal extent of the construction area, the soil stockpiling procedures, the implementation of BMPs, the short duration of the construction phase, and mitigative measures such as reestablishment of native vegetation will further minimize the potential impact on soils.

**Operation:** Impacts will be SMALL. The uranium mobilization and recovery process will not remove rock matrix from production zone sandstones and will not dewater production zone aquifers. Therefore, no significant matrix compression or ground subsidence is expected. The occurrence of potential spills during transfer of uranium-bearing lixiviant to and from the Burdock central plant and Dewey satellite facility will be mitigated by implementing onsite standard procedures and by complying with NRC requirements for spill response and reporting of surface releases and cleanup of any contaminated soils. The U.S. Environmental Protection Agency (EPA) will determine the suitability of deep geologic formations for deep Class V disposal of liquid waste before issuing an UIC permit for Class V injection wells. Treated wastewater disposed of in Class V injection wells will be required to meet release standards as referenced in 10 CFR Part 20, Subparts D and K and Appendix B, Table 2, Column 2. Potential soil contamination in proposed land application areas will be monitored by implementing soil collection and sampling procedures. Treated wastewater applied to land application areas will be required to meet NRC release limit criteria, as referenced in 10 CFR Part 20, Appendix B, and applicable state groundwater quality standards under a Groundwater Discharge Plan (GDP) approved by South Dakota Department of Environment and Natural Resources (SDDENR).

**Aquifer Restoration:** Impacts will be SMALL. During aquifer restoration, the processes of groundwater sweep and groundwater transfer will not remove rock matrix from production zone sandstones. The formation groundwater pressure within the extraction zone will be decreased during restoration as groundwater is removed to ensure the direction of groundwater flow is into the wellfields to reduce the potential for offsite migration of constituents. However, the change in groundwater pressure will not result in collapse of overlying rock strata as it is supported by the rock matrix of the formation. The potential impact to soils from spills, leaks, and land application of treated wastewater will be comparable to that described for the operations phase.

The NRC requirements for spill response and recovery and routine monitoring programs will also apply.

Decommissioning: Impacts will be SMALL. Disruption or displacement of soils will occur during dismantling of the facilities and reclamation of the land; however, the disturbed lands will be restored to their preextraction land use. Topsoil will be reclaimed and the surface regraded to the original topography.

### **Surface Waters and Wetlands**

Construction: Impacts will be SMALL. The occurrence of surface water at the proposed Dewey-Burdock site is limited, and surface water flow in channels is ephemeral except for perennial Beaver Creek. The applicant will construct ISR processing and support facilities on level areas and outside the 100-year floodplain. National Pollutant Discharge Elimination System (NPDES) permits issued by SDDENR will set limits to control the amount of pollutants that can enter surface water bodies. Implementation of a stormwater pollution management plan (SWMP) will control stormwater runoff during construction and ensure that surface water runoff from disturbed areas meets NPDES permit limits. U.S. Army Corps of Engineers permits under Section 404 of the Clean Water Act will be required before conducting work in jurisdictional wetlands identified in the project area.

Operation: Impacts will be SMALL. The applicant's SDDENR-approved NPDES permit and SWMP will be in place to mitigate impacts to surface water from erosion, runoff, and sedimentation. The applicant will implement an emergency response plan to identify and clean up accidental spills and leaks. Processing facilities and chemical and fuel storage tanks will have secondary containment to contain potential spills. Operations will create liquid wastes that will be contained in radium-settling and storage ponds for eventual Class V injection well disposal and/or land application. Radium settling ponds will be constructed with liners, underdrains, and leak detection systems and storage ponds that contain treated wastewater will be constructed with geosynthetic and clay liners. Liquid waste applied to land application areas will be required to meet NRC release limit criteria for radiological contaminants, as referenced in 10 CFR Part 20, Appendix B. SDDENR will require liquid waste applied to land application areas to meet applicable state discharge requirements under a GDP.

Aquifer Restoration: Impacts will be SMALL. Impacts will be similar to those during the operations phase because the same infrastructure will be used and the same activities will be conducted. The applicant's SDDENR-approved NPDES permit and SWMP will be in place to mitigate impacts to surface water from erosion, runoff, and sedimentation. Restoration of groundwater aquifers will create wastewater that will be contained in radium settling and storage ponds for eventual Class V injection well disposal and/or land application. Radium settling ponds will be constructed with liners, underdrains, and leak detection systems and storage ponds that contain treated wastewater will be constructed with geosynthetic and clay liners. Treated wastewater applied to land application areas will be required to meet NRC release limit criteria for radiological contaminants, as referenced in 10 CFR Part 20, Appendix B. SDDENR will require wastewater applied to land application areas to meet applicable state discharge requirements under a GDP.

Decommissioning: Impacts will be SMALL. The impacts will be similar to those during the construction phase. Activities to clean up, recontour, and reclaim the land surface during decommissioning will mitigate long-term impacts to surface water. The applicant's

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SDDENR-approved NPDES permit and SWMP will be in place to mitigate impacts to surface water from erosion, runoff, and sedimentation.

### **Groundwater**

Construction: Impacts will be SMALL. The primary impact to groundwater during the construction phase will be from the consumptive use of groundwater, introduction of drilling fluids into the environment during well installation, and from surface spills of fuels and lubricants. The applicant is required to obtain water appropriation use permits from SDDENR prior to withdrawing water from aquifers. During well installation, drilling fluids (mud) will have the potential to impact surficial aquifers; however, all wells will undergo mechanical integrity tests of the casing and therefore ensure against well leakage prior to entering service. Impacts to groundwater from surface spills of fuels and lubricants will be mitigated by the applicant's implementation of BMPs and by following a spill prevention program that will require an immediate cleanup response to prevent soil contamination or infiltration to groundwater.

Operation: Impacts will be SMALL. The operations phase may impact near-surface (alluvial) aquifers, production zone aquifers containing the orebodies and surrounding aquifers, and deep aquifers below the ore production zone used for the disposal of liquid wastes.

Alluvial aquifers are separated from production zone and surrounding aquifers by thick aquitards (confining units) and, therefore, are not hydraulically connected to production zone and surrounding aquifers. In addition, alluvial aquifers do not serve as a water supply for domestic use or livestock. The impacts from spills and leaks will be SMALL. The applicant's leak detection and cleanup program will include rapid response and remediation to minimize impacts to soils and groundwater. Liquid waste applied to land application areas will be required to meet NRC release limit criteria for radiological contaminants, as referenced in 10 CFR Part 20, Appendix B and applicable state discharge requirements under a GDP issued by SDDENR.

The applicant has committed to removing and replacing existing domestic wells drawing water from production zone aquifers within the project area from private use prior to ISR operations. In addition, the applicant will monitor all domestic wells within 2 km [1.2 mi] of the wellfields during operations and replace these wells in the event of significant drawdown or degradation of water quality. Water levels in affected wells will recover with time after ISR operations and aquifer restoration activities are complete.

The establishment of an inward hydraulic gradient during wellfield operations along with the applicant-installed groundwater monitoring network to detect potential vertical and horizontal excursions will limit the potential for undetected lixiviant excursions that could degrade groundwater quality. Because the ore production zones are overlain and underlain by impermeable shale layers, this further ensures the hydraulic isolation of the ore production zones, which helps to limit potential groundwater contamination in surrounding aquifers.

Liquid wastes generated from operation of the proposed Dewey-Burdock ISR Project will be disposed of via Class V deep well injection, land application, or a combination of Class V deep well injection and land application. The groundwater in deep formations targeted for Class V deep well injection must not be a potential underground source of drinking water. Class V injection wells will be permitted in accordance with the EPA Underground Injection Control Program. Liquid wastes injected into Class V injection wells may not be classified as hazardous under the Resource Conservation and Recovery Act. NRC will require the liquid waste pumped

into Class V injection wells to be treated and monitored to verify it meets NRC release standards in 10 CFR Part 20, Subparts D and K and Appendix B, Table 2, Column 2.

**Aquifer Restoration:** Impacts will be SMALL. Groundwater restoration will be initiated once a wellfield is no longer being used to produce uranium. Larger withdrawals will produce larger drawdowns in production aquifers during aquifer restoration, resulting in a greater impact on yields of nearby wells. As with operations, the applicant will monitor all domestic wells within 2 km [1.2 mi] of the wellfields during aquifer restoration and replace these wells in the event of significant drawdown or degradation of water quality. Water levels in affected wells will recover with time after ISR operations and aquifer restoration activities are complete. Natural recovery and the well monitoring measures established by the applicant will reduce impacts to nearby wells, ensuring the long-term environmental impact from consumptive use will be SMALL.

During aquifer restoration, hydraulic control for the former production zone will be maintained; this will be accomplished by maintaining an inward hydraulic gradient through a production bleed. During aquifer restoration activities, water will be pumped from the wellfield (without reinjection), resulting in an influx of “fresh” groundwater into the affected (mined) portion of the aquifer. Disposal of liquid wastes via Class V injection wells, land application, or a combination of Class V injection wells and land application will occur as described for ISR operations. The goal of aquifer restoration will be to restore groundwater quality in the ore production zone to Commission-approved background conditions under 10 CFR Part 40, Appendix A, Criterion 5B(5). If the aquifer cannot be restored to background conditions, then NRC will require that either the production zone be returned to maximum contaminant levels in 10 CFR Part 40, Appendix A, Table 5C or to NRC-approved alternate concentration limits. Post-restoration groundwater quality will be protective of public health and the environment.

**Decommissioning:** Impacts will be SMALL. The potential impact to groundwater quality during decommissioning and reclamation is comparable to that described in the construction phase. Groundwater consumptive use will be less than that of the operation and restoration phases. All monitoring, injection, and production wells will be plugged and abandoned in accordance with UIC program requirements. Wells will be filled with cement and clay to ensure groundwater does not flow through the abandoned wells. Abandoned wells will be properly isolated from the flow domain. NRC will review and approve the wellfield restoration efforts to ensure that restoration standards were followed and public health and safety is protected.

### **Ecological Resources**

**Construction:** Impacts will be SMALL to MODERATE. Construction disturbance under current development plans, which require vegetative removal, will affect approximately 98 ha [243 ac] if deep well injection is used to dispose of treated wastewater or approximately 566 ha [1,398 ac] if land application or a combination of deep well injection and land application is used to dispose of treated wastewater. Some habitat loss or alteration, displacement of wildlife, and mortality due to encounters with vehicles or heavy equipment will occur, though wildlife species will likely disperse from the area once construction commences. Following recommended fencing and power line construction designs will minimize impediments to game and avian movement. Mitigation will control the introduction and spread of undesirable and invasive, nonnative plants; reduce the likelihood of injury or mortality to wildlife; and ensure no loss of aquatic habitat. Impacts to wildlife and habitat will be minimized with mitigation measures and the timely reseeded of disturbed areas following construction. Any trees with raptor nests will not be removed, and following U.S. Fish and Wildlife Service (FWS) and South Dakota Game, Fish,

and Parks (SDGFP) seasonal noise, vehicular traffic, and human proximity guidelines will help to ensure the continued nesting success of area raptors. No federally threatened or endangered species are known to occur within the proposed project area. Impacts to state-protected species will not noticeably affect species' populations within the vicinity of the proposed project site.

Operation: Impacts will be SMALL to MODERATE. Ecological impacts due to noise, vehicles, structures, and the presence of humans will be similar to, but less than, those experienced during construction for either disposal option because fewer earthmoving activities will occur. However, larger areas of habitat will be converted to crops and animals will be disturbed with irrigation activities during the land application disposal option. Wastewater solutions include levels of chemical constituents that are potentially harmful to wildlife; however, proposed practices and state regulatory controls including permit conditions, monitoring requirements, and action levels would limit direct contact and potential impacts. Monitoring and action levels for environmental concentrations of wastewater constituents in land application areas will allow regulators to impose mitigations if constituents accumulate above levels of concern. The applicant will reseed disturbed areas with SDDENR- or BLM-approved seed mixtures to restore habitat. Spill detection and response plans will reduce the potential impact to terrestrial and aquatic species. Fencing would further limit wildlife access to liquid waste holding ponds. Potential conflicts between active raptor nest sites and project-related activities will continue to be mitigated by annual raptor monitoring and mitigation plans.

Aquifer Restoration: Impacts will be SMALL to MODERATE. Impacts will be similar to those experienced during the operations phase with no major differences in type or degree of impact. The existing infrastructure will be used during this phase, and mitigation measures will continue to apply from the construction and operations phases.

Decommissioning: Impacts will be SMALL to MODERATE. Temporary disturbances to land and soils during decommissioning could displace vegetation and wildlife species that had recolonized the proposed project area since initiation of ISR activities. Shrubland vegetative communities will be more difficult to reestablish and achieve full site recovery. The applicant commits to vegetation reestablishment efforts to be ongoing throughout the ISR facility life cycle. However, new vegetative growth could be affected by future grazing, droughts, or intense winters, thus reducing the rate of plant productivity and delaying full recovery. Revegetation and recontouring will restore habitat previously altered during construction and operations.

## Air Quality

Construction: Impacts will be SMALL to MODERATE. The proposed Dewey-Burdock ISR Project is located in the Black Hills-Rapid City Intrastate Air Quality Control Region, which is classified as being in attainment for all National Ambient Air Quality Standards (NAAQS) primary pollutants. Air emissions during the construction phase of the proposed project will consist primarily of combustion emissions from drill rigs and fugitive road dust. The magnitude of the pollutant concentrations from the construction phase combustion emissions are below NAAQS and Prevention of Significant Deterioration (PSD) Class II regulatory thresholds except for the particulate matter PM<sub>10</sub> 24-hour PSD Class II allowable increment. This also holds true for the peak year pollutant emission levels. The peak year refers to periods during which all four phases occur simultaneously and represents the highest level of emissions the proposed action will generate in any one project year. Fugitive dust emissions, the primary source for the

particulate matter PM<sub>10</sub>, are spread out over a large area and tend to generate emissions sporadically. Due to the level and nature of these fugitive emissions, there is potential for short-term, intermittent impacts to localized areas in and around the site particularly when vehicles travel on unpaved roads. Wind Cave National Park, a Class I area located about 47 km [29 mi] northeast of the proposed project area, has experienced visibility impacts from air pollution. However, project specific modeling results for the Wind Cave National Park (e.g., Class I PSD, visibility, and acid deposition) are below applicable thresholds.

The deep Class V injection well disposal option has more combustion emissions than the land application option due to the contribution of the deep well drill rig. The land application option has more fugitive emissions due to the greater area of land disturbed. However, these differences are relatively small and appreciable differences in the overall air emission levels between the two disposal options are not expected. Therefore, the impact magnitudes are expected to be similar.

Operation: Impacts will be SMALL. Fugitive dust emission pollutant levels will be less than those experienced during construction. ISR facilities are not major point source emitters of regulated pollutants. Combustion emissions in this phase are basically evenly divided between light duty vehicles and construction and field equipment. The combustion and fugitive dust emissions will be below NAAQS and PSD Class II regulatory thresholds. Project specific modeling results for the Wind Cave National Park (e.g., Class I PSD, visibility, and acid deposition) are below applicable thresholds.

The land application disposal option has more fugitive emissions than the Class V injection well option due to the greater area of land disturbed. However, this difference is relatively small and appreciable differences in the overall air emission levels between the two disposal options are not expected. Therefore, the impact magnitudes are expected to be similar.

Aquifer Restoration: Impacts will be SMALL. Combustion emission and fugitive emission levels for the aquifer restoration phases are the lowest relative to the other three phases. For the aquifer restoration phase, combustion emissions are primarily from light duty vehicles; wind erosion can generate more fugitive emissions than travel on unpaved roads. The combustion and fugitive dust emissions will be below NAAQS and PSD Class II regulatory thresholds. Project specific modeling results for the Wind Cave National Park (e.g., Class I PSD, visibility, and acid deposition) are below applicable thresholds. The proposed project can contribute to visibility impacts at Wind Cave National Park, but the impact magnitude will be minimal.

The land application disposal option can generate up to approximately two times the amount of fugitive emissions compared to the Class V injection well disposal option. Although there is some difference in the overall fugitive dust emissions levels between the two disposal options, the impact magnitude is expected to be similar.

Decommissioning: Impacts will be SMALL. The decommissioning phase pollutant sources and emission levels closely match those from the operation phase. Therefore, the decommissioning phase will produce a similar impact magnitude as the operation phase. As in the operation phase described previously, appreciable differences in the overall decommissioning phase air emission levels between the Class V injection well and land application disposal options are not expected.

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## **Noise**

**Construction:** Impacts will be SMALL. Increased traffic, as well as use of drill rigs, heavy trucks, bulldozers, and other equipment to construct and operate the wellfields, drill wells, access roads, and build the central plant and satellite facility, will generate noise audible above ambient (background) levels. The sound from construction activities will be indistinguishable from background levels at a distance of approximately 305 m [1,000 ft]. Two onsite dwellings will be impacted by noise above background levels from heavy equipment use. The Daniel residence is within 305 m [1,000 ft] of wellfields B-WF6 and B-WF7 in the Burdock area, and the Beaver Creek Ranch Headquarters is within 305 m [1,000 ft] of land application areas in the Dewey area. Increased noise levels at these residences during construction will be short term (1 to 2 years) and mitigated by using sound abatement controls on operating equipment. Administrative and engineering controls will be expected to maintain noise levels in work areas below Occupational Safety and Health Administration (OSHA) regulatory limits and be mitigated by use of personal hearing protection. Noise impacts to raptors will be mitigated by adhering to timing and spatial restrictions within specified distances of active raptor nests as determined by appropriate regulatory agencies (e.g., FWS, SDGFP, and BLM).

**Operation:** Impacts will be SMALL. Impacts from traffic-related noise will be similar to those during construction. Because wellfields will be developed and operated sequentially, potential noise impacts at the Daniels residence will be short term (1 to 2 years each for wellfields B-WF6 and B-WF7). In addition, the Daniel residence will not be occupied year round. Residents at the Beaver Creek Ranch Headquarters will only be exposed to noise from nearby land application areas during the growing season (May 11 to September 24). Noise impacts will be mitigated by using sound abatement controls on operating equipment. The central plant and satellite facility will generate indoor noise audible to workers. OSHA regulatory limits will be maintained and mitigated by use of personal hearing protection. Potential noise-related impacts to active raptor nest sites will continue to be mitigated by adherence to timing and spatial restrictions within specified distances of active raptor nests as determined by appropriate regulatory agencies (e.g., FWS, SDGFP, and BLM).

**Aquifer Restoration:** Impacts will be SMALL. Noise impacts will be similar to, or less than, those experienced during the operations phase. Pumps and other wellfield equipment contained in buildings would reduce the potential sound impact to an offsite individual. Because the aquifers in wellfields will be restored sequentially, potential noise impacts at the Daniel residence will be short term (1 to 2 years each for wellfields B-WF6 and B-WF7). In addition, the Daniel residence will not be occupied year round. During aquifer restoration, residents at the Beaver Creek Ranch Headquarters will only be exposed to noise from nearby land application areas during the growing season (May 11 to September 24). Noise impacts will be mitigated by using sound abatement controls on operating equipment. Noise impacts from traffic will be SMALL because there will be fewer vehicular trips than during the operations phase. Potential noise-related impacts to active raptor nest sites will continue to be mitigated by adherence to timing and spatial restrictions within specified distances of active raptor nests as determined by appropriate regulatory agencies (e.g., FWS, SDGFP, and BLM).

**Decommissioning:** Impacts will be SMALL. Noise impacts will either be similar to, or less than, those experienced during the construction phase. Noise during this phase will be temporary, and when decommissioning and reclamation activities are complete, the noise levels will return to baseline. Noise impacts from traffic will be SMALL because there will be fewer shipments to and from the proposed site as decommissioning progresses. Potential noise-related impacts to



active raptor nest sites will continue to be mitigated by adherence to timing and spatial restrictions within specified distances of active raptor nests as determined by appropriate regulatory agencies (e.g., FWS, SDGFP, and BLM).

### **Historic and Cultural Resources**

**Construction:** Impacts will be SMALL to LARGE. Archaeological and historic sites have the potential to be disturbed during construction of ISR facilities and infrastructure. NRC's environmental review of historic and cultural resources included evaluating the results of (i) archaeological field investigations, (ii) tribal cultural surveys, and (iii) visual and auditory impacts assessments.

Archaeological field investigations identified 18 historic sites that are listed in the National Register of Historic Places (NRHP) or are eligible for listing in the NRHP. Six of these sites could experience LARGE potential impacts due to their location within the area of potential effect (APE) for facility construction and operations. Avoidance and mitigation measures, such as data recovery excavations and fencing, are recommended for these six NRHP-eligible sites. Avoidance of the remaining 12 sites during the construction phase is anticipated and for this reason no impacts are expected. Avoidance is also recommended for 15 unevaluated historic sites within or in close proximity to the APE for facility construction and operations, pending NRHP eligibility determination.

Tribal cultural surveys recommended 17 known archaeological sites as eligible for listing in the NRHP. Three of these sites could experience LARGE potential impacts due to their location within the APE for facility construction and operations. Avoidance is recommended for these three known archaeological sites. Avoidance of the remaining 14 sites during the construction phase is anticipated and for this reason no impacts are expected. Tribal cultural surveys recommended 12 newly discovered sites as eligible for listing in the NRHP. Four of these new discoveries could experience LARGE potential impacts due to their location within the APE for facility construction and operations. Avoidance of the remaining 8 new tribal sites during the construction phase is anticipated and therefore no impacts are expected.

NRC staff compiled a list of 31 historic properties that are either listed on the NRHP or considered eligible for listing on the NRHP under criteria A and/or C due in part to their integrity of setting. These sites are located within a 4.8-km [3-mi] radius of the Dewey satellite facility or the Burdock central processing plant. Based on a line-of-sight analysis which considered the site's significance and existing environmental factors and conditions, NRC determined that 19 historic properties could experience MODERATE potential visual impacts. All of the 31 historic properties are located more than 640 m [2,100 ft] from the nearest processing facility, which exceeds the estimated 305 m [1,000 ft] zone for potential auditory impacts. Therefore, NRC staff conclude that potential auditory impacts on historic properties during the construction phase will be SMALL.

Prior to construction, an agreement between NRC, South Dakota State Historic Preservation Office (SD SHPO), BLM, interested Native American tribes, the applicant, and other interested parties will be established outlining the mitigation process for each affected resource. By NRC license condition, the applicant is required to stop any work if historical or cultural resources are encountered during construction activities. All newly discovered artifacts will be inventoried and evaluated in accordance with 36 CFR Part 800. Work will not restart without authorization from the NRC, SD SHPO, and BLM to proceed.

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**Operation:** Impacts will be SMALL to MODERATE. Minimal impacts will result during the operations phase because impacts to cultural resources will have been mitigated before facility construction and identified resources will be avoided. Potential visual and auditory impacts on historic properties will be the same as described for the construction phase (potential visual impacts will range from SMALL to MODERATE and potential auditory impacts will be SMALL). If historical or cultural resources are encountered during operations, the applicant is required by license condition to stop work. The discovered artifacts will be inventoried and evaluated in accordance with 36 CFR Part 800. Work will not restart without authorization from the NRC, SD SHPO, and BLM to proceed.

**Aquifer Restoration:** Impacts will be SMALL to MODERATE. Impacts to historical and cultural resources during the aquifer restoration phase will be similar to operational impacts. Potential impacts to identified historic and cultural resources will have been mitigated prior to facility construction. Potential visual and auditory impacts on historic properties will be the same as described for the construction and operations phases (potential visual impacts will range from SMALL to MODERATE and potential auditory impacts will be SMALL). If historical or cultural resources are encountered during operations, the applicant is required by license condition to stop work. The discovered artifacts will be inventoried and evaluated in accordance with 36 CFR Part 800. Work will not restart without authorization from the NRC, SD SHPO, and BLM to proceed.

**Decommissioning:** Impacts will be SMALL. Minimal impacts are expected during the decommissioning phase because impacts to cultural resources will have been mitigated prior to facility construction. Potential visual impacts will be reduced to SMALL after processing facilities are dismantled and removed. If historical or cultural resources are encountered during operations, the applicant is required by license condition to stop work. The discovered artifacts will be inventoried and evaluated in accordance with 36 CFR Part 800. Work will not restart without authorization from the NRC, SD SHPO, and BLM to proceed.

### **Visual/Scenic Resources**

**Construction:** Impacts will be SMALL. During facilities construction, short-term (1 to 2 years) visual and scenic impacts will result from construction equipment and fugitive dust emissions. Temporary and short-term visual impacts during the construction period in each wellfield will result from header house construction, well drilling, and construction of access roads and electrical distribution lines. Dust suppression and selecting building materials and paint that complement the natural environment will reduce overall visual and scenic impacts of project construction. Center pivot irrigation systems in proposed land application areas in the Dewey area will be visible to travelers on Dewey Road; however, Dewey Road is a lightly traveled county road with few residences. Proposed activities at the project will be consistent with the BLM visual classification of this area.

**Operation:** Impacts will be SMALL. Visual impacts will be similar to, or less than, those experienced during construction. Less heavy machinery will be used, and standard dust control measures (e.g., water application and speed limits) will be implemented to reduce visual impacts from fugitive dust. Wellfields will be developed sequentially, and there will be no large expanse of land undergoing development at one time. Buildings and other structures will be painted so they blend in to the natural landscape, and power lines and pipelines will be buried where appropriate. Center pivot irrigation systems in proposed land application areas in the Dewey area will be visible to travelers on Dewey Road; however, Dewey Road is a lightly

traveled county road with few residences. Proposed activities at the project will be consistent with the BLM visual classification of this area.

Aquifer Restoration: Impacts will be SMALL. Visual impacts will be similar to, or less than, those experienced during the operations phase. Aquifer restoration activities will use in-place infrastructure; therefore, no modifications to either scenery or topography will occur. There will be less vehicular traffic, creating less of a visual impact. The applicant identified mitigation measures, such as dust suppression, which will be used to further reduce visual impacts.

Decommissioning: Impacts will be SMALL. Temporary impacts to the visual landscape will be comparable to those during the construction phase. Reclamation will return the visual landscape to baseline contours and will reduce the visual impact by removing buildings and the associated infrastructure. Implementation of mitigation measures (e.g., dust suppression) will further reduce the visual impacts from decommissioning.

### **Socioeconomics**

Construction: Impacts will be SMALL. Because of the small size of the construction workforce (86 workers) and because of the short duration of the ISR construction phase (1 to 2 years), the overall potential socioeconomic impact, including the effects of ISR facility construction on demographic conditions, income, housing, employment rate, local finance, education, and health and social services, will be SMALL.

Operation: Impacts will be SMALL. Because of the small size of the operations workforce (84 workers), the migration of workers and their families to nearby towns will have a SMALL impact on demographics. Although wage rates will be higher for Dewey-Burdock employees than for workers in similar skilled positions in Fall River, Custer, and Weston Counties, the operations workforce will be small in comparison to the combined labor force in the counties; therefore, income impacts will be SMALL. The impact on housing will be SMALL because of available housing in the immediate area surrounding the proposed ISR facility. Operation of the proposed Dewey-Burdock ISR Project will create new jobs, but because of the small workforce size and because most skilled workers will be drawn from areas outside of the region of influence, impacts on employment will not be noticeable. The local economy will experience a SMALL to MODERATE beneficial impact from the purchasing of local goods and services and an increase in sales and income tax revenues. An increased demand for schools will have a SMALL impact on education because the current school systems are not at full capacity and can accommodate more students. Increased demand for health and social services will have a SMALL impact.

Aquifer Restoration: Impacts will be SMALL. Impacts will be less than those experienced during the operations phase. Fewer workers will be required, which will reduce pressure on housing, education, and health and social services.

Decommissioning: Impacts will be SMALL. Impacts will be less than those during the construction and operations phases because fewer workers will be required. Demand for housing, education, and health and social services will also be reduced.

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## **Environmental Justice**

**All Phases:** The percentage of minority populations living in affected block groups in the vicinity of the proposed Dewey-Burdock ISR Project site in Custer and Fall River Counties in South Dakota and Weston County in Wyoming does not significantly exceed the percentage of minority populations recorded at the state and county level and is well below the national level. Furthermore, the percentage of low-income populations living in affected census tracts in the vicinity of the proposed project site in Custer, Fall River, and Weston Counties does not significantly exceed the percentage of low-income populations recorded at the state or county level. Therefore, there will be no disproportionately high and adverse impacts to minority and low-income populations from the construction, operation, aquifer restoration, and decommissioning of the proposed Dewey-Burdock ISR facility.

The population closest to the proposed Dewey-Burdock ISR Project that could be impacted by environmental justice concerns is the Pine Ridge Indian Reservation located approximately 80 km [50 mi] east in Shannon County, South Dakota. Based on 2010 United States Census Bureau data, this reservation has both minority {greater than 95 percent Native American (Oglala Sioux Tribe)} and low-income populations. Environmental justice impacts to Native American tribes living in the vicinity of the proposed project are not expected to differ from those experienced by other populations. The proposed action has the potential to affect certain sites of religious and cultural significance to Native American tribes; however, the impacts to such sites are expected to be reduced through mitigation strategies developed through the National Historic Preservation Act Section 106 consultation process.

## **Public and Occupational Health**

**Construction:** Impacts will be SMALL. Construction activities, including the use of construction equipment and vehicles, will disturb the topsoil and create fugitive dust emissions. Fugitive dust generated from construction activities will be short term (1 to 2 years), and the levels of radioactivity in soils at the proposed project site are low; therefore direct exposure, inhalation, and ingestion of fugitive dust will not result in a radiological dose to workers and the public. Construction equipment will be diesel powered and will exhaust particulate diesel emissions. The potential impacts and potential human exposures from these emissions will be SMALL, because of the short duration of the release and because the emissions will be readily dispersed into the atmosphere.

**Operation:** The radiological impacts from normal operations will be SMALL. Public and occupational exposure rates at ISR facilities during normal operations have historically been well below regulatory limits. Dose assessments using the MILDOS computer code indicate that the 10 CFR Part 20 public dose limit of 1 mSv/yr [100 mrem/yr] will not be exceeded at any property boundary. The remote location of the proposed Dewey-Burdock site and the use of the proposed ISR technology coupled with the applicant procedures to minimize exposure demonstrate that the potential impact on public and occupational health and safety from facility operation will be SMALL. The radiological impacts from accidents will be SMALL for workers (if the applicant's radiation safety and incident response procedures in an NRC-approved radiation protection plan are followed) and SMALL for the public because of the facility's remote location. The nonradiological public and occupational health and safety impacts from normal operations and accidents, due primarily to risk of chemical exposure, will be SMALL if handling and storage procedures are followed.

Aquifer Restoration: Impacts will be SMALL. Impacts will be similar to, but less than, those during the operations phase. The reduction or elimination of some operational activities will further reduce the magnitude of potential worker and public health impacts and safety hazards.

Decommissioning: Impacts will be SMALL. Impacts will be similar to those experienced during construction. Soil and facility structures will be decontaminated, and lands will be restored to preoperational conditions.

### **Waste Management**

Construction: Impacts will be SMALL. Small-scale and incremental wellfield development will generate small volumes of construction waste. Waste will primarily consist of building materials, piping, and other solid wastes. No byproduct material will be generated during construction. Nonhazardous solid waste will be disposed of at a nearby municipal solid waste landfill with available capacity to accommodate estimated construction-phase waste volumes.

Operation: Impacts will be SMALL. Liquid byproduct material, including production bleed, waste brine streams from elution and precipitation, resin transfer wash, laundry water, plant wash-down water, and laboratory chemicals will be treated and disposed using Class V injection wells. If a permit cannot be obtained from EPA for Class V injection, the applicant would pursue land application of treated liquid effluent. If the capacity of either method is limited, the applicant will pursue a combination of both Class V injection and land application. Deep well injection in a Class V well requires an EPA permit, and wastes will have to meet EPA permit conditions and NRC effluent discharge limits in 10 CFR Part 20, Appendix B (both would limit potential impacts). Land application will require SDDENR-permitting of discharge water, and the land application area would be monitored to assess compliance with NRC and SDDENR requirements that would limit impacts. Solids classified as byproduct material will be sent to a licensed facility for disposal. A preoperational agreement with a licensed facility to accept wastes the proposed action generates will avoid capacity impacts. Capacity is available for disposal of nonradiological, nonhazardous wastes at regional municipal landfills. Capacity will be sufficient for disposal of low volumes of generated hazardous wastes.

Aquifer Restoration: Impacts will be SMALL based on the type and quantity of waste expected to be generated and the available capacity for disposal. Waste disposal procedures will be the same as those during the operations phase, resulting in similar impacts. One exception is the addition of reverse osmosis treatment of aquifer restoration water if a Class V deep disposal well is used. The applicant proposal includes adequate disposal capacity, and the applicant is required to comply with EPA Class V disposal permit conditions, NRC effluent limits, and other NRC safety regulations. Although the wastewater volume could increase during aquifer restoration activities, this will be offset by the reduction in production capacity from completion of wellfield production and removal from service.

Decommissioning: Impacts will be SMALL to MODERATE. Safe handling, storage, and disposal of decommissioning wastes will be described in a required decommissioning plan for NRC review before decommissioning activities begin. A preoperational agreement with a licensed disposal facility to accept solid byproduct material will ensure that sufficient disposal capacity will be available at the time of decommissioning. Equipment and building materials that meet release criteria will be reused, recycled, or disposed as construction waste at a landfill. The available local landfill capacity may be insufficient to accommodate all decommissioning nonhazardous solid waste from the proposed Dewey Burdock ISR Project.

The potential impacts on waste management resources will depend on the long-term status of the existing local landfill resources. If the capacity of the Newcastle or Custer-Fall River landfills is expanded prior to project decommissioning, the impacts to local landfills will be SMALL. If capacity at either landfill is not expanded prior to the Dewey-Burdock decommissioning, the NRC staff conclude the Newcastle landfill will have no disposal capacity at the time of decommissioning. Impacts to the Custer-Fall River landfill are expected to be MODERATE because the increase in solid waste disposal will more rapidly consume storage capacity during the last years of the landfill's projected operational life. The disposal of any waste from the Dewey-Burdock facility in the Rapid City landfill will have a SMALL impact due to the projected operational life and available capacity of that landfill.

## **CUMULATIVE IMPACTS**

Chapter 5 of this SEIS provides the NRC evaluation of potential cumulative impacts from the construction, operations, aquifer restoration, and decommissioning of the proposed Dewey-Burdock ISR Project considering other past, present, and reasonably foreseeable future actions. Cumulative impacts from past, present, and reasonably foreseeable future actions were considered and evaluated in this SEIS, regardless of what agency (federal or nonfederal) or person undertook the action. The NRC staff determined that the SMALL to MODERATE impacts from the proposed Dewey-Burdock ISR Project are not expected to contribute perceptible increases to the SMALL to LARGE cumulative impacts, due primarily to ongoing uranium and oil and gas exploration activities, potential wind energy projects, and proposed infrastructure and transportation projects.

## **SUMMARY OF COSTS AND BENEFITS OF THE PROPOSED ACTION**

The implementation of the proposed action will generate primarily regional and local costs and benefits. The regional benefits of building the proposed project will be increased employment, economic activity, and tax revenues in the region around the proposed site. Costs associated with the proposed Dewey-Burdock ISR Project are, for the most part, limited to the immediate area surrounding the site. The NRC staff determined the benefit from constructing and operating the facility will outweigh the economic, environmental, and social costs.

## **COMPARISON OF ALTERNATIVES**

For the No-Action alternative, the applicant will not construct or operate ISR facilities at the proposed Dewey-Burdock ISR Project site. As a result, no uranium ore will be recovered from the proposed site. This alternative will result in neither positive nor negative impacts to any resource area.

## **FINAL RECOMMENDATION**

After weighing the impacts of the proposed action and comparing the alternatives, the NRC staff, in accordance with 10 CFR 51.91(d), sets forth its NEPA recommendation regarding the proposed action (issuing a source material license for the proposed Dewey-Burdock ISR Project). Unless safety issues mandate otherwise, the NRC staff recommendation to the Commission related to the environmental aspects of the proposed action is that a source material license for the proposed action be issued as requested. This recommendation is based on (i) the license application, including the ER and supplemental documents the applicant submitted and responses to NRC staff requests for additional information; (ii) consultation with

federal, state, tribal, and local agencies; (iii) NRC staff independent review; (iv) NRC staff consideration of comments received on the draft SEIS; and (v) the assessments summarized in this SEIS.

## References

10 CFR Part 40. Code of Federal Regulations, Title 10, *Energy*, Part 40. “*Domestic Licensing of Source Material.*” Washington, DC: U.S. Government Printing Office.

10 CFR Part 51. Code of Federal Regulations, Title 10, *Energy*, Part 51. “*Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions.*” Washington, DC: U.S. Government Printing Office.

36 CFR Part 800. Code of Federal Regulations, Title 36, *Parks, Forests, and Public Property*, Part 800. “Protection of Historic Properties.” Washington, DC: U.S. Government Printing Office.

43 CFR Part 3800. Code of Federal Regulations, Title 43, *Public Lands: Interior*, Part 3800. “*Mining Claims Under the General Mining Laws.*” Washington, DC: U.S. Government Printing Office.

43 CFR Subpart 3809. Code of Federal Regulations, Title 43, *Public Lands: Interior*, Subpart 3809. “*Subsurface Management.*” Washington, DC: U.S. Government Printing Office.

NRC. NUREG–1910, “Generic Environmental Impact Statement for *In-Situ* Leach Uranium Milling Facilities.” ML091480244, ML091480188. Washington, DC: NRC. May 2009.

NRC. NUREG–1748, “Environmental Review Guidance for Licensing Actions Associated With NMSS Programs.” Washington, DC: NRC. August 2003.





## ABBREVIATIONS/ACRONYMS

ACHP	Advisory Council on Historic Preservation
ACL	alternate concentration limit
ADAMS	Agencywide Documents Access and Management System
AEA	Atomic Energy Act
AET, Inc.	American Engineering Testing, Inc.
ALAC	Archaeology Laboratory Augustana College
ALARA	as low as is reasonably achievable
APE	area of potential effect
ARC	Archaeological Research Center
ARPA	Archaeological Resources Protection Act
ARSD	Administrative Rules of South Dakota
ASLBP	Atomic Safety and Licensing Board Panel
AUM	animal unit month
AWEA	American Wind Energy Association
BGEPA	Bald and Golden Eagle Protection Act
bgs	below ground surface
BHAD	Black Hills Army Depot
BHNF	Black Hills National Forest
BLM	U.S. Bureau of Land Management
BMP	best management practice
BNSF	Burlington Northern Santa Fe
CAA	Clean Air Act
CAB	Commission-approved background
CCSDWPC	Custer County, South Dakota, Weed and Pest Control
CFR	<i>U.S. Code of Federal Regulations</i>
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CESQC	conditionally exempt small quantity generator
CNWRA	Center for Nuclear Waste Regulatory Analyses
CO	carbon monoxide
cpm	counts per minute
CPP	central processing plant
CWA	Clean Water Act
dBA	decibels
DM&E	Dakota Minnesota and Eastern (Railroad)
DOE	U.S. Department of Energy
Eco SSL	ecological soil screening levels
EFRC	Energy Fuels Resources Corporation
EIA	Energy Information Administration
EIS	environmental impact statement
E.O.	Executive Order
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
ESRI	Environmental Systems Research Institute

FACU	facultative upland
FACW	facultative wet
FHWA	Federal Highway Administration
FR	<i>Federal Register</i>
FRA	Federal Railroad Administration
FWS	U.S. Fish and Wildlife Service
GCRP	U.S. Global Change Research Program
GDP	Groundwater Discharge Plan
GEIS	generic environmental impact statement
GHG	greenhouse gas
GIS	Geographic Information System
GPS	global positioning system
HABS	Historic American Buildings Survey
HDPE	high-density polyethylene
ID	well identification
IML	Inter-Mountain Laboratories, Inc.
IQR	interquartile range
ISL	<i>in-situ</i> leach
ISR	<i>in-situ</i> recovery
IX	ion exchange
KLJ	Kadramas, Lee, & Jackson
LA	Land Application
LOS	Line-of-Sight Analysis
MBTA	Migratory Bird Treaty Act
MCL	maximum contaminant level
MILDOS	computer code
MIT	mechanical integrity test
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MW	megawatts
mya	million years ago
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NAU	Rapid City Campus of the National American University
NCRP	National Council for Radiation Protection and Measurements
NEPA	National Environmental Policy Act
NESHAPS	National Emission Standards for Hazardous Air Pollutants
NHPA	National Historic Preservation Act of 1966, as amended
NOGCC	Nebraska Oil and Gas Conservation Commission
NO <sub>2</sub>	nitrogen dioxide
NO <sub>x</sub>	nitrogen oxides
NPDES	national pollutant discharge elimination system

NPWRC	Northern Prairie Wildlife Research Center
NRC	U.S. Nuclear Regulatory Commission
NRCS	Natural Resource Conservation Service
NRHP	National Register of Historic Places
OBL	obligate
OMB	Office of Management and Budget
OSHA	Occupational Safety and Health Administration
OTGR	Office of Tribal Government Relations
OW	Open Water
PA	Programmatic Agreement
PABJh	Palustrine Aquatic Bed Intermittently Flooded Diked
PEM	Palustrine Emergent
PEMC	Seasonally Flooded
POP	Perimeter of Operational Pollution
Powertech	Powertech (USA) Inc.
PRB	Powder River Basin
PSD	Prevention of Significant Deterioration
PUB	Palustrine Unconsolidated Bottom
PUS	Palustrine Unconsolidated Shore
PUSA	Palustrine Unconsolidated Shore Temporarily Flooded
R2EM	Riverine Lower Perennial Emergent
R4SB7	Riverine Intermittent Streambed Vegetated
R4US	Riverine Intermittent Unconsolidated Streambed
RCRA	Resource Conservation and Recovery Act
RMP	resource management plan
RO	reverse osmosis
ROI	region of influence
ROW	right of way
SARA	Superfund Amendments and Reauthorization Act
SDCL	South Dakota Codified Law
SDDA	South Dakota Department of Agriculture
SDDENR	South Dakota Department of Environment and Natural Resources
SDDLRL	South Dakota Department of Labor and Regulation
SDDOE	South Dakota Department of Education
SDDOH	South Dakota Department of Health
SDDOL	South Dakota Department of Labor
SDDOT	South Dakota Department of Transportation
SDDRR	South Dakota Department of Revenue and Regulation
SDGFP	South Dakota Game, Fish, and Parks
SDGS	South Dakota Geological Survey
SDNHP	South Dakota Natural Heritage Program
SDRMP	South Dakota Resource Management Plan
SD SHPO	South Dakota State Historic Preservation Office
SDSMT	South Dakota School of Mines and Technology
SDSU	South Dakota State University

SDWA	Safe Drinking Water Act
SEA	U.S. Department of Transportation Section of Environmental Analysis
SEIS	supplemental environmental impact statement
SER	safety evaluation report
SERP	safety and environmental review panel
SF	satellite facility
SHPO	State Historic Preservation Officer
SMCL	secondary maximum contaminant level
SNAP	Supplemental Nutrition Assistance Program
SO <sub>2</sub>	sulfur dioxide
SOW	statement of work
SPAW	soil-plant-atmosphere-water
SQR	scenic quality rating
SRI	SRI Foundation
STB	Surface Transportation Board
SUNSI	sensitive unclassified non-safeguards information
SWMP	stormwater pollution management plan
TANF	Temporary Assistance for Needy Families
TCP	traditional cultural property
TDS	total dissolved solids
TEDE	total effective dose equivalent
THPO	Tribal Historic Preservation Office
TLD	thermoluminescent dosimeter
TVA	Tennessee Valley Authority
UCL	upper control limit
UDEQ	Utah Department of Environmental Quality
UIC	underground injection control
UMTRCA	Uranium Mill Tailings Radiation Control Act
UPL	upland
USACE	U.S. Army Corps of Engineers
USCB	U.S. Census Bureau
USDA	U.S. Department of Agriculture
USDOT	U.S. Department of Transportation
USDW	underground source of drinking water
USFS	U.S. Forest Service
USGS	U.S. Geological Survey
UXC	The Ux Consulting Company
VOC	volatile organic compound
VRM	Visual Resource Management
WDAI	Wyoming Department of Administration and Information
WDEQ	Wyoming Department of Environmental Quality
WDTI	Western Dakota Technical Institute
WDWS	Wyoming Department of Workforce Services
WGFD	Wyoming Game and Fish Department
WIA	walk-in hunting area

WIC	Supplemental Nutrition Program for Women, Infants, and Children
WSDOT	Washington State Department of Transportation
WUS	waters of the United States
WYOGCC	Wyoming Oil and Gas Conservation Commission
WY SHPO	Wyoming State Historic Preservation Office



## SI\* (MODERN METRIC) CONVERSION FACTORS

<b>Approximate Conversions From SI Units</b>				
<b>Symbol</b>	<b>When You Know</b>	<b>Multiply By</b>	<b>To Find</b>	<b>Symbol</b>
<b>Length</b>				
<b>cm</b>	centimeters	0.39	inches	in
<b>m</b>	meters	3.28	feet	ft
<b>m</b>	meters	1.09	yards	yd
<b>km</b>	kilometers	0.621	miles	mi
<b>Area</b>				
<b>mm<sup>2</sup></b>	square millimeters	0.0016	square inches	in <sup>2</sup>
<b>cm<sup>2</sup></b>	square centimeters	0.155	square inches	in <sup>2</sup>
<b>m<sup>2</sup></b>	square meters	10.764	square feet	ft <sup>2</sup>
<b>m<sup>2</sup></b>	square meters	1.195	square yards	yd <sup>2</sup>
<b>ha</b>	hectares	2.47	acres	ac
<b>km<sup>2</sup></b>	square kilometers	0.386	square miles	mi <sup>2</sup>
<b>Volume</b>				
<b>mL</b>	milliliters	0.034	fluid ounces	fl oz
<b>L</b>	liters	0.264	gallons	gal
<b>m<sup>3</sup></b>	cubic meters	35.314	cubic feet	ft <sup>3</sup>
<b>m<sup>3</sup></b>	cubic meters	1.307	cubic yards	yd <sup>3</sup>
<b>m<sup>3</sup></b>	cubic meters	0.0008107	acre-feet	ac-ft
<b>ha-m</b>	hectare-meters	8.107	acre-feet	ac-ft
<b>Mass</b>				
<b>g</b>	grams	0.035	ounces	oz
<b>kg</b>	kilograms	2.202	pounds	lb
<b>t</b>	metric ton	1.103	short tons (2000 lb)	T
<b>Radiological Units</b>				
<b>Bq</b>	becquerels	27.03	picocuries	pCi
<b>GBq</b>	gigabecquerels	0.027	curies	Ci
<b>Sv</b>	sieverts	100	rems	rem
<b>mSv</b>	millisieverts	100	millirems	mrem
<b>Temperature (Exact Degrees)</b>				
<b>°C</b>	Celsius	1.8C + 32	Fahrenheit	°F
*SI is the symbol for the International System of Units. Appropriate rounding should be performed to comply with Section 4 of ASTM E380 (ASTM International. "Standard for Metric Practice Guide." West Conshohocken, Pennsylvania: ASTM International. Revised 2003).				





## 6 MITIGATION

### 6.1 Introduction

The Generic Environmental Impact Statement (GEIS) for *In-Situ* Leach Uranium Milling Facilities (NRC, 2009) described potential mitigation measures that a licensee or facility operator might use to reduce potential adverse impacts associated with construction, operation, aquifer restoration, and decommissioning of an *in-situ* recovery (ISR) milling facility. Under 40 CFR 1508.20, the Council on Environmental Quality defines mitigation to include activities that (i) avoid the impact altogether by not taking a certain action or parts of a certain action; (ii) minimize impacts by limiting the degree or magnitude of the action and its implementation; (iii) rectify the impact by repairing, rehabilitating, or restoring the affected environment; (iv) reduce or eliminate the impact over time by preservation and maintenance operations during the life of the action; and (v) compensate for the impact by replacing or providing substitute resources or environments.

Mitigation measures are those actions or processes that will be implemented to control and minimize potential adverse impacts from construction, operation, aquifer restoration, and decommissioning of the proposed Dewey-Burdock ISR Project. Potential mitigation measures can include general best management practices (BMPs) and more site-specific management actions.

BMPs are processes, techniques, procedures, or considerations that can be used to effectively avoid or reduce potential environmental impacts. While best management practices are not regulatory requirements, they can overlap and support such requirements. BMPs will not replace any U.S. Nuclear Regulatory Commission (NRC) requirements or other federal, state, or local regulations.

Management actions are active measures that a licensee or facility operator specifically implements to reduce potential adverse impacts to a specific resource area. These actions include compliance with applicable government agency stipulations or specific guidance, coordination with governmental agencies or interested parties, and monitoring of relevant ongoing and future activities. If appropriate, corrective actions could be implemented to limit the degree or magnitude of a specific action leading to an adverse impact (reducing or eliminating the impact over time by preservation and maintenance operations) and repairing, rehabilitating, or restoring the affected environment. The licensee may also minimize potential adverse impacts by implementing specific management actions such as programs, procedures, and controls for monitoring, measuring, and documenting specific goals or targets (for example, pollution prevention goals of reducing waste) and, if appropriate, instituting corrective actions. The management actions may be established through standard operating procedures that appropriate local, state, and federal agencies (including NRC) review and approve. NRC may also establish requirements for management actions by identifying license conditions. Standard license conditions for the proposed Dewey-Burdock ISR Project are listed in Appendix A of the safety evaluation report (SER) (NRC, 2013). These conditions are written specifically into the NRC source material license and then become commitments that are enforced through periodic NRC inspections.

The mitigation measures Powertech (USA) Inc. (Powertech) proposed to reduce and minimize adverse environmental impacts at the proposed Dewey-Burdock ISR Project are summarized in Section 6.2. Based on the potential impacts identified in Chapter 4 of this draft Supplemental

Environmental Impact Statement (SEIS), the NRC staff have identified additional potential mitigation measures for the proposed Dewey-Burdock ISR Project. These mitigation measures are summarized in Section 6.3. The proposed mitigation measures provided in this chapter do not include environmental monitoring activities. Environmental monitoring activities are described in Chapter 7 of this draft SEIS.

## 6.2 Mitigation Measures Proposed by Powertech

The applicant identified mitigation measures in its license application (Powertech, 2009a–c) as well as in response to NRC staff requests for additional information (Powertech, 2010a–c, 2011, 2012). Table 6.2-1 lists the mitigation measures proposed for each resource area. Because many of the applicant's proposed mitigation measures apply to all four phases of the ISR process, they are listed together in the table.

**Table 6.2-1. Summary of Mitigation Measures Proposed by Powertech**

Resource Area	Activity	Proposed Mitigation Measures
Land Use	Land disturbance	<p>Reclaim the surface and reestablish vegetation in areas disturbed by drilling, pipeline installation, and facility construction as soon as construction activities are completed.</p> <p>Minimize construction of new and secondary access roads.</p> <p>Restrict normal vehicular traffic to designated roads, and keep traffic in wellfields to a minimum.</p> <p>Develop wellfields sequentially, and restore and reclaim wellfields in interim steps to minimize land area impacted at any one time.</p>
	Access restrictions	<p>Construct fences and signage around processing facilities and radium settling and storage ponds, and, potentially, around land application areas.</p> <p>Construct temporary fencing around injection and production wellfield patterns (remove fencing after operations and reclamation of each wellfield is completed).</p> <p>Limit access to monitoring wells, Class V deep injection wells, and header houses by (i) covering each monitoring well with a locking device, (ii) securing the well head and pumping equipment for Class V injection wells within locked buildings, and (iii) securing header houses within the fenced area of the wellfield.</p> <p>Implement fencing construction techniques to minimize habitat alteration and impediments to large game migration.</p>



**Table 6.2-1. Summary of Mitigation Measures Proposed by Powertech (Cont'd)**

Resource Area	Activity	Proposed Mitigation Measures
		Notify NRC if a radiological accident occurs pursuant to requirements of 10 CFR Part 20 §2202 and §2203.
Geology and Soils	Soil disturbance and contamination	<p>Salvage and stockpile soil from disturbed areas.</p> <p>Reestablish temporary or permanent native vegetation as soon as possible after disturbance utilizing the most effective available technologies in reseeded and sprigging, such as hydroseeding.</p> <p>Decrease runoff from disturbed areas by using structures to temporarily divert and/or dissipate surface runoff from undisturbed areas.</p> <p>Retain sediment within the disturbed areas by using silt fencing, retention ponds, and hay bales.</p> <p>Fill pipeline and cable trenches with appropriate material, and regrade surface soon after completion.</p> <p>Design drainages to minimize potential for erosion by keeping slopes less than 4 to 1, and/or provide rip-rap or other soil stabilization controls.</p> <p>Construct roads using techniques that will minimize erosion, such as surfacing with a gravel road base, building stream crossings at right angles with adequate embankment protection and culvert installation.</p> <p>Use a spill prevention and cleanup plan to minimize soil contamination from vehicle accidents and/or wellfield spills or leaks.</p> <p>Collect and monitor soils and sediments for potential contamination including areas used for land application of treated wastewater, transport routes for yellowcake and ion exchange resins, and wellfield areas where spills or leaks are possible.</p> <p>Treat liquid wastes applied to land application areas to comply with release standards for radiological constituents in 10 CFR Part 20, Appendix B.</p> <p>Obtain an approved South Dakota Department of Environment and Natural Resources (SDDENR) groundwater discharge plan (GDP), and comply with</p>



**Table 6.2-1. Summary of Mitigation Measures Proposed by Powertech (Cont'd)**

Resource Area	Activity	Proposed Mitigation Measures
		<p>storage of untreated or partially treated water (i.e., radium settling ponds, spare ponds, and central plant pond), and place liners underneath ponds that contain treated water (i.e., storage ponds and spare storage ponds).</p> <p>Bury pipelines to avoid freezing, and monitor pipeline pressures for leak detection.</p> <p>In accordance with Administrative Rules of South Dakota (ARSD) 74:34:01:04, all regulated substance spills that occur at the site must be reported to SDDENR and remediated in accordance with state requirements.</p>
Groundwater Resources	Water use	<p>Obtain Class III UIC permit and aquifer exemption.</p> <p>Obtain Class V UIC permit for deep well disposal of treated liquid wastes, and monitor process effluents injected into Class V deep injections wells to comply with (i) release standards in 10 CFR Part 20, Subparts D and K and Appendix B and (ii) the drinking water standards, or contaminant-specific background concentrations for constituents regulated under the Safe Drinking Water Act, whichever is greater, if proposed injection zones are underground sources of drinking water (have total dissolved solids concentrations below 10,000 mg/L), unless the applicant applies for and is granted an aquifer exemption.</p> <p>Treat liquid wastes applied to land application areas to comply with release standards for radiological constituents in 10 CFR Part 20, Appendix B.</p> <p>Obtain an approved SDDENR GDP, and comply with applicable state discharge requirements for land application of treated liquid wastes.</p> <p>Obtain water appropriation permits to utilize groundwater from the Madison and Inyan Kara aquifers.</p> <p>Monitor private domestic, livestock, and agricultural wells as appropriate during operations, and provide alternative sources of water to landowners in the event of significant drawdown to wells within and adjacent to the proposed project area.</p> <p>Obtain construction and industrial NPDES permits from SDDENR, which require reporting of spills of petroleum products or hazardous chemicals.</p>

**Table 6.2-1. Summary of Mitigation Measures Proposed by Powertech (Cont'd)**

Resource Area	Activity	Proposed Mitigation Measures
	Spills and leaks	<p>Implement a spill prevention and cleanup plan to minimize impacts to soils and groundwater, including rapid response cleanup and remediation.</p> <p>Construct pond lining systems appropriate to the pond usage and contents to prevent potential infiltration of liquid waste into soil and shallow aquifers.</p> <p>Bury pipelines to avoid freezing, and monitor pipeline pressures to detect leaks.</p> <p>In accordance with ARSD 74:34:01:04, all regulated substance spills that occur at the site must be reported to SDDENR and remediated in accordance with state requirements.</p>
	Excursions	<p>Conduct precise and periodic mechanical integrity testing of all injection, production, and monitoring wells prior to and during their use to limit the likelihood of well integrity failure during operations.</p> <p>Collect detailed lithologic and hydrogeological data for each proposed wellfield prior to <i>in-situ</i> recovery (ISR) operations to ensure hydraulic control of the production zone.</p> <p>Plug and abandon or mitigate any of the following should they pose a potential to impact the control and containment of wellfield solutions within the proposed project area: (i) historical wells and exploration holes; (ii) holes drilled by the applicant for delineation and exploration; and (iii) any well failing mechanical integrity testing.</p> <p>Maintain production bleed rate at 0.5 to 3 percent to prevent lixiviant excursions.</p> <p>Conduct ISR operations only in confined portions of production aquifers.</p> <p>Install monitoring wells within and encircling the production zone for early detection of potential horizontal excursions.</p> <p>Install monitoring wells in aquifers above and below the production aquifer for early detection of potential vertical excursions.</p> <p>Implement corrective actions, and provide required</p>





**Table 6.2-1. Summary of Mitigation Measures Proposed by Powertech (Cont'd)**

Resource Area	Activity	Proposed Mitigation Measures
	<p>Transmission lines</p> <p>Reduce human disturbances</p>	<p>Use existing roads when possible, and limit construction of new primary and secondary roads to provide access to more than one drill site to minimize wildlife and habitat disturbance.</p> <p>Restore diverse landforms; direct topsoil replacement; and construct brush piles, snags, and/or rock piles to enhance habitat for wildlife.</p> <p>Prepare U.S. Fish and Wildlife Service (FWS)-approved raptor monitoring and mitigation plan to minimize conflicts between active nest sites and project-related activities if direct impacts to raptors occur.</p>
Air Quality	Fugitive dust and combustion emissions from construction equipment and vehicles	<p>Use drill rigs with engines no larger than 300 horsepower (except for deep well drill rig) to limit combustion emissions.</p> <p>Use Tier 1 or higher drill rig engines and Tier 3 or higher construction equipment engines (see Supplemental Environmental Impact Statement Section 4.7.1.1.1 for an explanation of "Tiers") to limit combustion emissions.</p> <p>Spray water to mitigate fugitive dust accounting for a 60 percent reduction in emissions generated from onsite unpaved roads.</p> <p>Impose speed limits for travel on unpaved roads and areas.</p> <p>Implement an employee carpooling policy.</p> <p>Restore or reseed disturbed areas promptly to limit the exposed/disturbed area at any given time.</p> <p>Coordinate construction and transportation activities to reduce maximum dust levels.</p> <p>Maintain vehicles to meet applicable U.S. Environmental Protection Agency (EPA) emission standards.</p>
Noise	Exposure of workers and public to noise	<p>Avoid construction activities during the night.</p> <p>Use sound abatement controls on operating equipment and facilities.</p> <p>Use personal hearing protection for workers in high noise areas.</p>

**Table 6.2-1. Summary of Mitigation Measures Proposed by Powertech (Cont'd)**

Resource Area	Activity	Proposed Mitigation Measures
		<p>Adhere to regulatory timing and spatial restrictions with regard to construction activities near raptor nests.</p> <p>Locate all planned facilities outside of BLM-recommended buffer zones of raptor nests identified within the project area.</p> <p>Follow an FWS-approved raptor monitoring and mitigation plan to reduce conflicts between active raptor nests and project-related activities.</p>
Cultural and Historic Resources	Disturbance of prehistoric archaeological sites and sites eligible for listing on the National Register of Historic Places	<p>Conduct appropriate historic and cultural resource surveys as part of precicensing application activities and eligibility evaluation of cultural resources for listing on the NRHP under criteria in 36 CFR 60.4(a)–(d).</p> <p>Conduct consultation under Section 106 of the National Historic Preservation Act (NHPA) with NRC, South Dakota State Historic Preservation Office, other government agencies (e.g., FWS, EPA, and BLM), and Native American tribes.</p> <p>Address any disturbances in compliance with any future agreements developed under the NHPA, including temporarily halting surface disturbance activities if historic or archaeological sites are discovered or unanticipated effects are found.</p>
Visual and Scenic	Potential visual intrusions in the existing landscape character	<p>Cover wellheads with low structures that present low contrast with existing landscape.</p> <p>Reclaim disturbed areas, and remove debris after construction is complete.</p> <p>Remove and reclaim roads and structures after operations are complete.</p> <p>Select building materials and paint that complement the natural environment.</p> <p>Consider landscape topography to conceal wellheads, plant facilities, access roads, potential land application areas, and other areas of disturbance from public vantage points.</p> <p>Use standard dust control measures including water application, speed limits, and coordinating dust-producing</p>

**Table 6.2-1. Summary of Mitigation Measures Proposed by Powertech (Cont'd)**

Resource Area	Activity	Proposed Mitigation Measures
		<p>activities to reduce fugitive dust impacts.</p> <p>Consider using exterior lighting only where needed, limiting the height of exterior lighting units, and using shielded or directional lighting to limit lighting to where it is needed and without jeopardizing site security and/or worker safety.</p>
Socioeconomics	Effects on surrounding communities	<p>Preferentially source the labor force from the surrounding region to reduce any burden on public services and community infrastructure (e.g., housing, schools) in nearby towns.</p>
Occupational and Public Health and Safety	<p>Effects from facility construction</p> <p>Effects from facility operation</p>	<p>Implement standard dust control measures, such as water application and speed limits, to reduce and control fugitive dust emissions.</p> <p>Comply with federal and state occupational safety regulations to limit nonradiological impacts of fugitive dust and diesel emissions to acceptable levels.</p> <p>Reduce radiological exposure to workers by (i) installing ventilation designed to limit worker exposure to radon; (ii) installing gamma exposure rate monitors, air particulate monitors, radon daughter product monitors to verify that expected radiation levels are not exceeded; and (iii) conducting work area radiation and contamination surveys.</p> <p>Use vacuum dryer technology during normal operations to limit radiological emissions other than radon gas.</p> <p>Comply with an NRC-approved Radiation Protection Program that would include routine radiation surveys, respiratory protection, standard operating procedures for spill response and cleanup, and worker training in radiological health and emergency response.</p> <p>Monitor radiation workers via use of dosimeters and area air sampling to ensure that radiological doses remain within regulatory limits and as low as is reasonably achievable.</p> <p>Implement engineering controls, such as concrete curbs and sumps, to contain process spills resulting from accidents.</p> <p>Comply with applicable EPA, OSHA, and SDDENR regulations concerning the use, inspection, and storage of hazardous and nonhazardous chemicals.</p>

**Table 6.2-1. Summary of Mitigation Measures Proposed by Powertech (Cont'd)**

Resource Area	Activity	Proposed Mitigation Measures
		Develop and implement standard operating procedures regarding receiving, storing, handling, and disposing of chemicals.
Waste Management	Disposal capacity	Establish a solid byproduct material disposal agreement with a licensed facility prior to the start of operations.
	Waste reduction	<p>Recycle wastewater to reduce the amount of water needed for facilities and the amount of wastewater that could require disposal.</p> <p>Use decontamination techniques that reduce waste generation.</p> <p>Institute preventative maintenance and inventory management programs to minimize waste from breakdowns and overstocking.</p> <p>Recycle nonradioactive materials where appropriate.</p> <p>Salvage extra materials, and use them for other construction activities.</p> <p>Encourage the reuse of materials and use of recycled materials.</p> <p>Avoid using hazardous materials when possible.</p>
	Waste storage and containment	<p>Store and properly label solid byproduct material onsite to prevent any potential release. Isolate byproduct material inside a restricted area until a full shipment can be transferred to an NRC-approved disposal site. Install curbs or berms on all waste storage areas.</p> <p>Install leak detection and warning systems in all liquid waste facilities.</p> <p>Develop a spill prevention plan for petroleum products and other hazardous materials.</p> <p>Ensure that equipment is available to respond to spills, and identify the location of such equipment. Inspect and replace worn or damaged components.</p>

### 6.3 Potential Mitigation Measures Identified by the U.S. Nuclear Regulatory Commission

The NRC staff has reviewed the mitigation measures the applicant proposed and has identified additional mitigation measures that could potentially reduce impacts (Table 6.3-1). NRC has the authority to address unique site-specific characteristics by identifying license conditions based on conclusions reached in the safety and environmental reviews. These license conditions could include additional mitigation measures, such as modifications to required monitoring programs. License conditions resulting from the safety review are documented in the NRC SER (NRC, 2013). While NRC cannot impose mitigation outside its regulatory authority under the Atomic Energy Act, the NRC staff has identified mitigation measures in Table 6.3-1 that could potentially reduce the impacts of the proposed Dewey-Burdock ISR Project. These additional mitigation measures are not requirements being imposed upon the applicant. For the purposes of the National environmental Policy Act, and consistent with 10 CFR 51.71(d) and 51.80(a), NRC is disclosing measures that could potentially reduce or avoid environmental impacts of the proposed project.

**Table 6.3-1. Summary of Mitigation Measures Identified by the U.S. Nuclear Regulatory Commission**

Resource Area	Activity	Proposed Mitigation Measures
Land Use	Land disturbance	<p>Monitor and control potential irrigation areas, if used, to maintain levels of radioactive constituents in treated liquid wastes applied to land application areas to within allowable release limits to protect the agricultural and recreational integrity of the land.</p> <p>Use best management practices (BMPs) to control waste disposal, erosion, and runoff to limit the effect of facility operation on surrounding land use.</p>
Transportation	Transportation safety	<p>Use accepted industry codes and standards for handling and transporting hazardous chemicals.</p> <p>Implement safe driving training for personnel and truck drivers.</p> <p>Use check-in/check-out or global positioning satellite technology to track shipments.</p> <p>Construct turn lanes in both directions on Dewey Road for vehicles turning onto the main access roads to the central and satellite processing plants.</p> <p>Provide means of advance warning to oncoming traffic that large trucks are entering Dewey Road from site access roads (e.g., signage, flashing light, flagman).</p>

**Table 6.3-1. Summary of Mitigation Measures Identified by the U.S. Nuclear Regulatory Commission (Cont'd)**

<b>Resource Area</b>	<b>Activity</b>	<b>Proposed Mitigation Measures</b>
Geology and Soils	Soils	<p>Maintain a log of all spills occurring at the site whether or not these spills are reportable to NRC per 10 CFR 40.60.</p> <p>Implement alternatives or mitigation measures to manage drilling fluid during well drilling operations including (i) lining mud pits with an impermeable membrane, (ii) disposing of potentially contaminated drilling mud and other fluids offsite, and (iii) using portable tanks or tubs to contain drilling mud and other fluids.</p>
Surface Water Resources	Water quality	Collect monthly preoperational water quality samples from streams and quarterly preoperational water quality samples from impoundments.
Groundwater Resources	Contamination and excursions	<p>Submit results of the hydrogeological characterization and aquifer pump tests (hydrologic test data packages) for NRC review and written verification or approval prior to development of any proposed wellfields.</p> <p>Prior to ISR operations in partially saturated portions of the Chilson aquifer, demonstrate the ability to detect and remediate excursions in partially saturated production zones.</p> <p>Monitor potential mobilization and migration of contaminants from abandoned open pit mines into production zones during aquifer restoration.</p>
Ecology	Restoration/reclamation	Use weed control techniques that incorporate BMPs approved by the U.S. Bureau of Land Management (BLM) and South Dakota Department of Environment and Natural Resources (SDDENR).
	Fencing and screening	Cover vent pipes with either netting or other devices to prevent bats, birds, or small mammals from being trapped.
	Transmission lines	<p>Follow the Avian Power Line Interaction Committee guidance to avoid impacts (electrocution and perching) to birds, especially prior to the fledging of young (Avian Power Line Interaction Committee, 2006).</p> <p>Bury transmission lines after (step-down) transforming to minimize risks to raptors and large birds.</p>

**Table 6.3-1. Summary of Mitigation Measures Identified by the U.S. Nuclear Regulatory Commission (Cont'd)**

Resource Area	Activity	Proposed Mitigation Measures
	Reduce human disturbances	<p>Adhere to timing and spatial restrictions within specified distances of active raptor nests as determined by appropriate regulatory agencies [e.g., U.S. Fish and Wildlife Service, South Dakota Game, Fish, and Parks, and BLM].</p> <p>Allow snakes and lizards that are encountered to retreat. Inform employees of applicable wildlife laws and penalties associated with unlawful taking and harassment of wildlife.</p> <p>Train employees on (i) the types of wildlife in the area susceptible to collisions with motor vehicles, (ii) the circumstances when collisions are most likely to occur, and (iii) measures that should be taken to avoid wildlife–vehicle collisions.</p> <p>Sign and gate as needed all new and improved roads related to the proposed project to minimize public traffic.</p> <p>Comply with applicable state and local requirements to design or treat mud pits and ponds to prevent the development of favorable mosquito habitat (to reduce possible transmission of West Nile virus).</p>
Air Quality	Fugitive dust and combustion emissions from construction equipment and vehicles	<p>Implement fuel saving practices such as minimizing vehicle and equipment idle time.</p> <p>Utilize fossil-fuel vehicles that meet the latest emission standards.</p> <p>Utilize newer, cleaner running equipment.</p> <p>Minimize unnecessary travel.</p> <p>Ensure that diesel-powered construction equipment and drill rigs are properly tuned and maintained.</p> <p>Limit access to construction sites, staging areas, and wellfields to authorized vehicles only, through designated treated roads.</p> <p>Pave or put gravel on dirt roads and parking lots if appropriate.</p>

**Table 6.3-1. Summary of Mitigation Measures Identified by the U.S. Nuclear Regulatory Commission (Cont'd)**

Resource Area	Activity	Proposed Mitigation Measures
		<p>Cover trucks carrying soil and debris to reduce dust emissions from the back of trucks.</p> <p>Burn low-sulfur fuels in all diesel engines and generators.</p> <p>Train workers to comply with speed limits, use good engineering practices, minimize disturbed areas, and employ other BMPs as appropriate.</p> <p>To the extent practicable, avoid conducting soil-disturbing activities and travel on unpaved roads during periods of unfavorable meteorological conditions (e.g., high winds).</p> <p>Implement any permit conditions identified in the SDDENR air permit, if applicable.</p> <p>Limit the numbers of hours in a day that effluent-generating activities can be conducted.</p> <p>Perform road maintenance (i.e., promptly remove earthen material on paved roads).</p> <p>Apply erosion mitigation methods on disturbed lands.</p>
Noise	Exposure of workers and the public to noise	<p>Maintain noise levels in work areas to below Occupational Safety and Health Administration regulatory limits.</p> <p>Reduce noise levels generated by irrigation equipment in potential land application areas by (i) installing exhaust and inlet silencers on engines, (ii) using electric motor drives instead of internal combustion engines, and (iii) erecting acoustic barriers to block the line of hearing from the exhaust engine and inlet toward human and wildlife receptors.</p>
Cultural and Historic Resources	Disturbance of prehistoric archaeological sites and sites eligible for listing on the National Register of Historic	<p>Stop work upon discovery of previously undocumented historic and cultural resources, and notify appropriate federal, tribal, and state agencies with regard to mitigation measures.</p> <p>Avoid historic properties within the project area that</p>



**Table 6.3-1. Summary of Mitigation Measures Identified by the U.S. Nuclear Regulatory Commission (Cont'd)**

<b>Resource Area</b>	<b>Activity</b>	<b>Proposed Mitigation Measures</b>
	Places (NRHP)	are currently listed or eligible for listing on the National Register of Historic Places.
		<p>Avoid identified sites within the project area with burial or cairn features.</p> <p>Develop an agreement outlining the mitigation process for each affected resource and why sites cannot be avoided, if required.</p> <p>Prior to construction, develop an Unexpected Discovery Plan that will outline the steps required in the event that unexpected historical and cultural resources are encountered at the site.</p> <p>Submit a decommissioning plan for NRC review to ensure compliance with Section 106 of the National Historic Preservation Act of 1966, as amended during the decommissioning phase.</p>
Visual and Scenic	Potential visual intrusions in the existing landscape character	<p>Limit the number of drill rigs operating during wellfield construction.</p> <p>To the extent possible, use existing secondary roads within the project area to access wellfields, potential irrigation areas, and other facility infrastructure.</p>
Socioeconomics	Effects on surrounding communities	Coordinate emergency response activities with local authorities, fire departments, medical facilities, and other emergency services before operations begin.
Occupational and Public Health and Safety	Effects from facility operation	<p>Use high-efficiency particulate air filters or similar controls for particulates.</p> <p>Design task procedures to reduce potential accidents.</p> <p>Develop contingency plans with county and municipal governments to ensure adequate medical, fire, and emergency services are available in case of a major accident.</p>
Waste Management	Disposal capacity	Dispose of decommissioning nonhazardous solid waste at the Rapid City landfill in the event that the disposal capacities of local landfills are limited or otherwise unavailable at the time of decommissioning.

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## 6.4 References

10 CFR Part 20. Code of Federal Regulations, Title 10, *Energy*, Part 20. “*Standards for Protection Against Radiation.*” Washington, DC: U.S. Government Printing Office.

10 CFR Part 40. Code of Federal Regulations, Title 10, *Energy*, Part 40. “*Domestic Licensing of Source Material.*” Washington, DC: U.S. Government Printing Office.

10 CFR Part 40. Appendix A. Code of Federal Regulations, Title 10, *Energy*, Part 40. Appendix A. “*Criteria Relating to the Operation of Uranium Mills and to the Disposition of Tailings or Wastes Produced by the Extraction and Concentration of Source Material from Ores Processed Primarily from their Source Material Content.*” Washington, DC: U.S. Government Printing Office.

10 CFR Part 51. Code of Federal Regulations, Title 10, *Energy*, Part 51. “*Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions.*” Washington, DC: U.S. Government Printing Office.

36 CFR Part 60. Code of Federal Regulations, Title 36, *Parks, Forests, and Public Property*, Part 60. “*National Register of Historic Places.*” Washington, DC: U.S. Government Printing Office.

40 CFR Part 1508. Code of Federal Regulations, Title 40, *Protection of the Environment*, Part 1508. “*Terminology and Index.*” Washington, DC: U.S. Government Printing Office.

ARSD (Administrative Rules of South Dakota). Section 74:34:01:04. “Reporting of Known Discharges -- Reportable Quantities.” South Dakota Legislature Administrative Rules.

Avian Power Line Interaction Committee. “Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006.” ML12243A391. Washington, DC: Edison Electric Institute and Sacramento, California: Avian Power Line Interaction Committee and the California Energy Commission. 2006.

NRC (U.S. Nuclear Regulatory Commission). “Safety Evaluation Report for the Dewey-Burdock Project Fall River and Custer Counties, South Dakota, Materials License No. SUA-1600.” ML13052A182. Washington, DC: NRC. March 2013.

NRC. NUREG-1910, “Generic Environmental Impact Statement for *In-Situ* Leach Uranium Milling Facilities.” ML091480244, ML091480188. Washington, DC: NRC. May 2009.

Powertech (Powertech (USA) Inc.). “Dewey-Burdock Project Emissions Inventory Revisions.” Email (July 31) from R. Blubaugh to Bradley Werling, Southwest Research Institute®. ML12216A220. South Dakota: Powertech. 2012.

Powertech. “Dewey-Burdock Project, Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota, Technical Report RAI Responses, June, 2011.” ML112071064. Greenwood Village, Colorado: Powertech. 2011.

Powertech. "Dewey-Burdock Project, Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota ER\_RAI Response August 11, 2010." ML102380516. Greenwood Village, Colorado: Powertech. 2010a.

Powertech. "Subject: Powertech (USA), Inc.'s Responses to the U.S. Nuclear Regulatory Commission (NRC) Staff's Verbal and Email Requests for Clarification of Selected Issues Related to the Dewey-Burdock Uranium Project Environmental Review Docket No. 40-9075; TAC No. J 00533." Letter (November 4) from R. Blubaugh, Vice President-Environmental Health and Safety Resources to R. Burrows, Project Manager, Office of Federal and State Materials and Environmental Management Programs, U.S. Nuclear Regulatory Commission. ML110820582. Greenwood Village, Colorado: Powertech. 2010b.

Powertech. "Subject: Powertech (USA), Inc.'s Responses to the U.S. Nuclear Regulatory Commission (NRC) Staff's Verbal Request for Clarification of Response Regarding Inclusion of Emissions from Drilling Disposal Wells; Dewey-Burdock Uranium Project Environmental Review Docket No. 40-9075; TAC No. J 00533." Letter (November 17) from R. Blubaugh, Vice President-Environmental Health and Safety Resources to R. Burrows, Project Manager, Office of Federal and State Materials and Environmental Management Programs, U.S. Nuclear Regulatory Commission. ML103220208. Greenwood Village, Colorado: Powertech. 2010c.

Powertech. "Dewey-Burdock Project, Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota—Environmental Report." Docket No. 040-09075. ML092870160. Greenwood Village, Colorado: Powertech. August 2009a.

Powertech. "Dewey-Burdock Project, Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota—Technical Report." Docket No. 040-09075. ML092870160. Greenwood Village, Colorado: Powertech. August 2009b.

Powertech. "Dewey-Burdock Project, Supplement to Application for NRC Uranium Recovery License Dated February 2009." Docket No. 040-09075. ML092870160. Greenwood Village, Colorado: Powertech. August 2009c.



## 7 ENVIRONMENTAL MEASURES AND MONITORING PROGRAMS

### 7.1 Introduction

As discussed in Section 8.0 of NUREG–1910, Generic Environmental Impact Statement for *In-Situ* Leach Uranium Milling Facilities (GEIS) (NRC, 2009), monitoring programs are developed for *in-situ* uranium recovery (ISR) facilities to verify compliance with standards for the protection of worker health and safety in operational areas and for protection of the public and environment beyond the facility boundary. Monitoring programs provide data on operational and environmental conditions so prompt corrective actions can be implemented when adverse conditions are detected. In this regard, these programs help to limit potential environmental impacts at ISR facilities and the surrounding areas.

Required monitoring programs can be modified to address unique site-specific characteristics by adding license conditions resulting from the conclusions of the U.S. Nuclear Regulatory Commission (NRC) safety and environmental reviews. The NRC staff are conducting the safety review of the proposed Dewey-Burdock ISR Project, which will be documented in a Safety Evaluation Report, and license conditions resulting from the safety review will be included as part of the final supplemental environmental impact statement (SEIS). The discussion of the proposed monitoring programs for the proposed Dewey-Burdock ISR Project is organized as follows:

- Radiological Monitoring (Section 7.2)
- Physiochemical Monitoring (Section 7.3)
- Ecological Monitoring (Section 7.4)
- Land Application Monitoring (Section 7.5)
- Class V Deep Injection Well Monitoring (Section 7.6)

The occurrence of spills and leaks at ISR facilities is considered in Section 2.11.2 of the GEIS (NRC, 2009), and the management of spills and leaks is not part of the routine environmental monitoring program described herein. Spills and leaks, including the design of the infrastructure to detect leaks, are described in the NRC safety evaluation.

### 7.2 Radiological Monitoring

This section describes Powertech (USA) Inc.'s (Powertech, referred to herein as the applicant) proposed radiological monitoring program as described in its license application, supporting documents for the proposed Dewey-Burdock ISR Project, and subsequent responses to NRC requests for additional information (Powertech, 2009a–c, 2010, 2011). The purpose of the monitoring program is to (i) characterize and evaluate the radiological environment, (ii) provide data on measurable levels of radiation and radioactivity, and (iii) provide data on the principal pathways of radiological exposure to the public (NRC, 2003). Although not a requirement, NRC Regulatory Guide 4.14 (NRC, 1980) provides guidance for establishing a radioactive effluent and environmental monitoring program for uranium mills. Although created for conventional uranium mills, guidance in Regulatory Guide 4.14 applies to ISR facilities, as appropriate. In accordance with NRC regulations in 10 CFR Part 40, Appendix A, Criterion 7, a preoperational monitoring program is required to establish facility baseline conditions. After establishing the baseline program, ISR facility operators must conduct an operational monitoring program to measure or evaluate compliance with standards and to evaluate environmental impacts of an ISR facility under operational conditions. In accordance with 10 CFR 40.65, the applicant must

submit to NRC a semiannual effluent and environmental monitoring report (Powertech, 2009b). This report would specify the quantity of each of the principal radionuclides released to unrestricted areas in liquid and in gaseous effluents during the previous 6 months of operation. This report would also provide other NRC required information to estimate the maximum potential annual radiation doses to the public resulting from effluent releases.

The results of the applicant's baseline radiological monitoring program are presented in SEIS Section 3.12.1. The following sections briefly describe the applicant's proposed operational monitoring program.

### **7.2.1 Airborne Radiation Monitoring**

The applicant proposes to conduct continuous air particulate sampling at seven locations identified in Figure 7.2-1 (Powertech, 2011, 2012c). The filters from air samplers will be analyzed biweekly, or more frequently if required for dust loading, for natural uranium, Th-230, Ra-226, and Pb-210 in accordance with Regulatory Guide 4.14 (NRC, 1980; Powertech, 2011). Samplers will be equipped with sensors to measure total air flow within a sampling period and detect changes in air flow due to dust loading, barometric pressure, and temperature (Powertech, 2011).

Passive track-etch detectors will be deployed at 12 sample locations for monitoring Rn-222 on a monthly basis, consistent with Regulatory Guide 4.14 and NUREG-1569 (NRC, 1980, 2003; Powertech, 2011). Five of the Rn-222 sampling sites will be co-located with the air particulate samples.

Thermoluminescent dosimeters (TLDs) will be located with air particulate samplers at each station (Powertech, 2011). The TLDs will be exchanged quarterly and used to assess gamma exposure rates at each air monitoring station. Additionally, effluents from the yellowcake dryer and packaging stacks will be sampled quarterly. The effluent samples will be isokinetic in nature and would be analyzed for natural uranium, Th-230, Ra-226, and Pb-210 (Powertech, 2009a).

### **7.2.2 Soils and Sediment Monitoring**

Samples of surface soil from a 0–5 cm [0–2 in] depth will be collected annually at each of the air monitoring stations shown in Figure 7.2-1. The samples will be analyzed for natural uranium, Ra-226, and Pb-210 (Powertech, 2009a). Sediments will also be collected annually at each of the 24 impoundments and 10 stream sampling sites proposed for operational surface water monitoring (see SEIS Sections 7.2.4 and 7.3.3). The sediment samples will be analyzed for natural uranium, Th-230, Ra-226, and Pb-210 (Powertech, 2011). The maximum lower limits of detection for the analyses will be consistent with the recommendations of Regulatory Guide 4.14 (NRC, 1980) unless matrix interferences prohibit attainment of these low detection limit goals.

### **7.2.3 Vegetation, Food, and Fish Monitoring**

The applicant plans to annually collect samples of livestock raised within 3.2 km [2 mi] of the project area, consistent with the recommendations of Regulatory Guide 4.14 (NRC, 1980). The samples will include cattle, pigs, and other livestock present at the time of sampling. Currently, cattle and pigs are the only livestock within 3.2 km [2 mi] of the proposed project area. If other

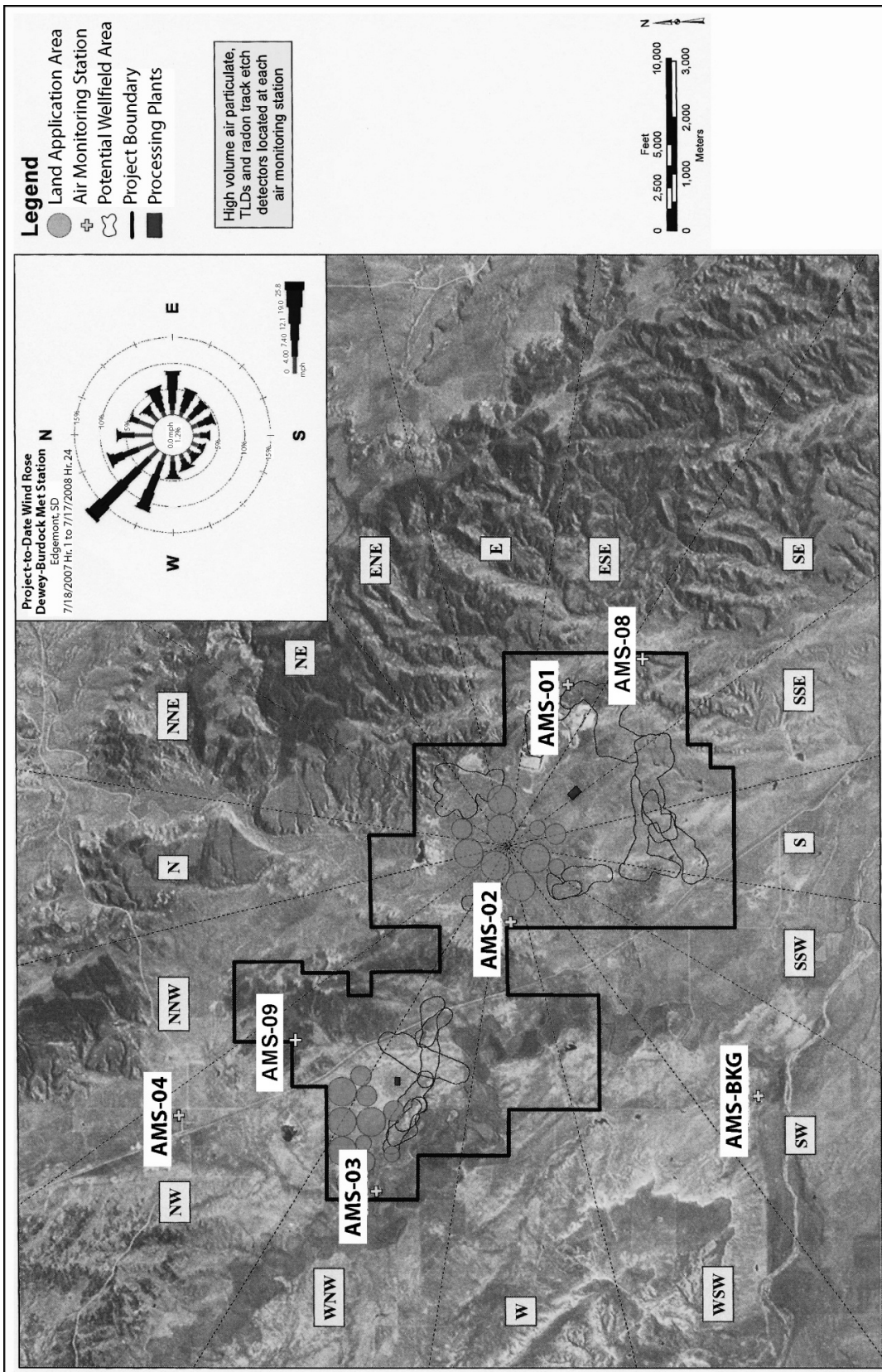


Figure 7.2-1. Locations of Operational Air Monitoring Stations at the Proposed Dewey-Burdock *In-Situ* Recovery Project Site  
 Source: Modified from Powertech (2011, 2012c)

livestock are found during annual land surveys, the applicant will seek the livestock owner's approval to collect tissue samples at the time of slaughter (Powertech, 2011). Consistent with Regulatory Guide 4.14 (NRC, 1980), fish will be collected semiannually provided they exist in water bodies that may be affected by seepage or surface drainage from potentially contaminated areas (Powertech, 2011). Livestock and fish samples will be analyzed for natural uranium, Th-230, Ra-226, Pb-210, and Po-210 (Powertech, 2011).

The applicant plans to collect samples of vegetation three times during the grazing season. The applicant will collect samples in the vicinity of each operational air monitoring station (Figure 7.2-1). The samples of vegetation will be analyzed for Ra-226 and Pb-210 (Powertech, 2009b). The applicant also plans to collect soil from vegetable gardens within 3.3 km [2 mi] of the project area (Powertech, 2011). The vegetable garden soil samples will be analyzed for natural uranium, Th-230, Ra-226, and Pb-210 (Powertech, 2011). The maximum lower limits of detection for the analyses will be consistent with the recommendations of Regulatory Guide 4.14 (NRC, 1980) unless matrix interferences prohibit attainment of these low detection limit goals (Powertech, 2009b).

#### **7.2.4 Surface Water Monitoring**

Operational surface water sampling will be conducted on (i) all surface impoundments located downgradient of proposed ISR facilities and activities and (ii) perennial and ephemeral streams passing through the site or located downgradient of proposed ISR activities (Powertech, 2011). The applicant plans to monitor 24 impoundments and 10 stream sampling sites as part of operational monitoring (Figure 7.2-2). Consistent with recommendations in Regulatory Guide 4.14 (NRC, 1980), grab samples will be collected quarterly from the impoundments and analyzed for dissolved and suspended natural uranium, Ra-226, Th-230, Pb-210, and Po-210. A grab sample is a sample of water, rock, or sediment taken randomly. Grab samples will also be collected quarterly from perennial stream sampling locations on Beaver Creek (BVC11 and BVC14) and the Cheyenne River (CHR01 and CHR05) (see Figure 7.2-2). Passive samplers will be installed at the six remaining stream sampling sites, which are located on ephemeral drainages (Pass Creek, Bennett Canyon, and unnamed tributaries), to automatically sample during flow events. All stream samples will be analyzed for dissolved and suspended uranium, Ra-226, Th-230, Pb-210, and Po-210 (Powertech, 2011).

#### **7.2.5 Groundwater Monitoring**

The operational groundwater monitoring program at the proposed Dewey-Burdock ISR Project site will sample domestic wells, stock wells, and monitoring wells located hydrologically upgradient and downgradient of proposed ISR facilities and wellfields (Powertech, 2011). Consistent with Regulatory Guide 4.14 (NRC, 1980), the applicant proposes to collect annual groundwater samples from all domestic wells within 2 km [1.2 mi] of the wellfields (Figure 7.2-3) (Powertech, 2011). Quarterly groundwater samples will be collected from stock wells within the project area (Figure 7.2-3) and from monitoring wells located hydrologically upgradient and downgradient of proposed ISR facilities and wellfields (Figure 7.2-4). The monitoring wells will be situated in the alluvium, Fall River Formation, Chilson Member of the Lakota Formation, and the Unkpapa Formation. Water samples collected from the domestic and monitoring wells will be analyzed for uranium and other radiological parameters, including gross alpha, gross beta, and Ra-226 (Powertech, 2011). SEIS Section 7.3.4 further details the applicant's preoperational and operational groundwater monitoring programs.



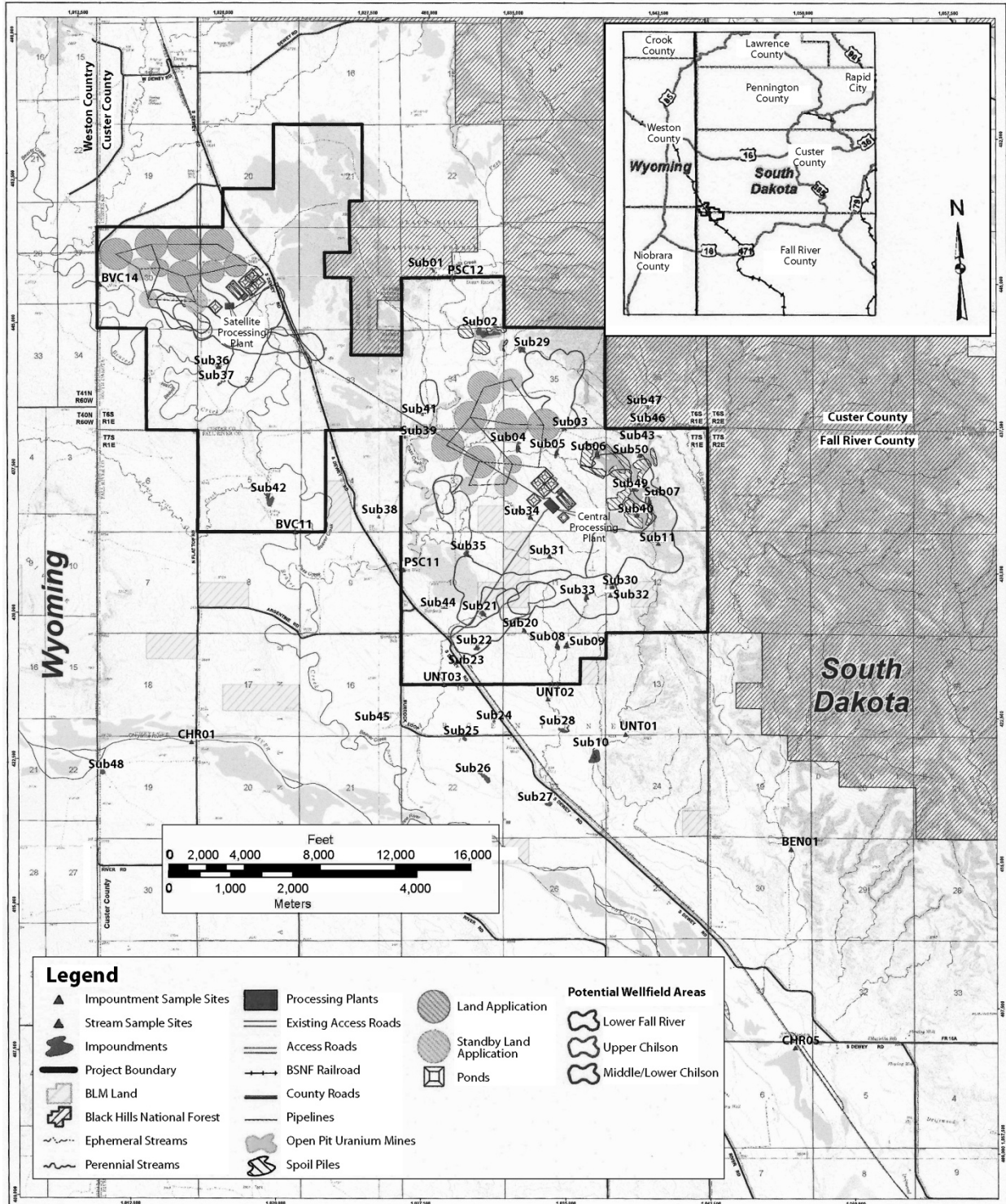


Figure 7.2-2. Locations of Operational Surface Water Monitoring Sites  
 Source: Modified From Powertech (2011)

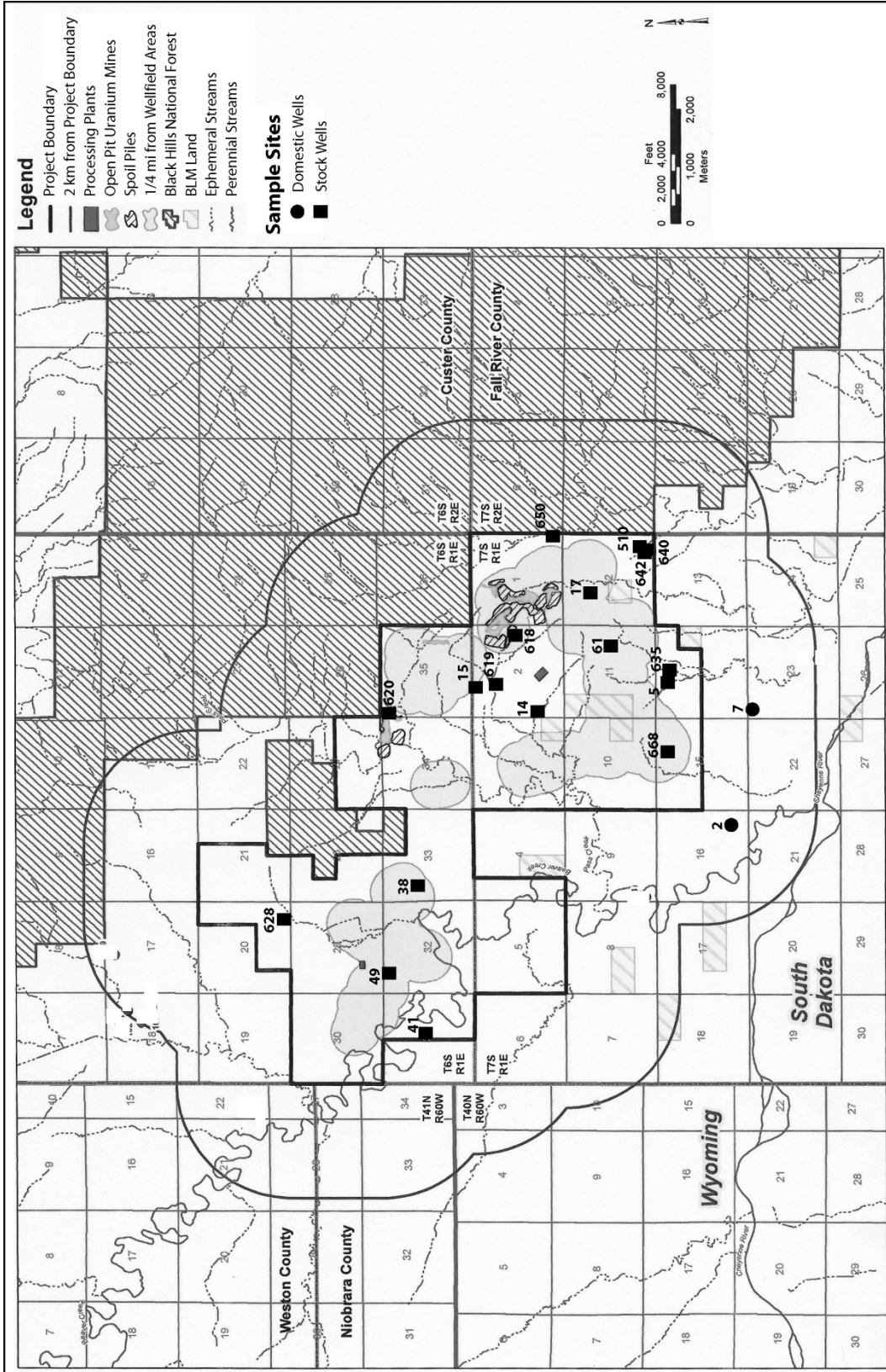


Figure 7.2-3. Locations of Operational Domestic and Stock Monitoring Wells  
Source: Modified from Powertech (2011, 2012b)

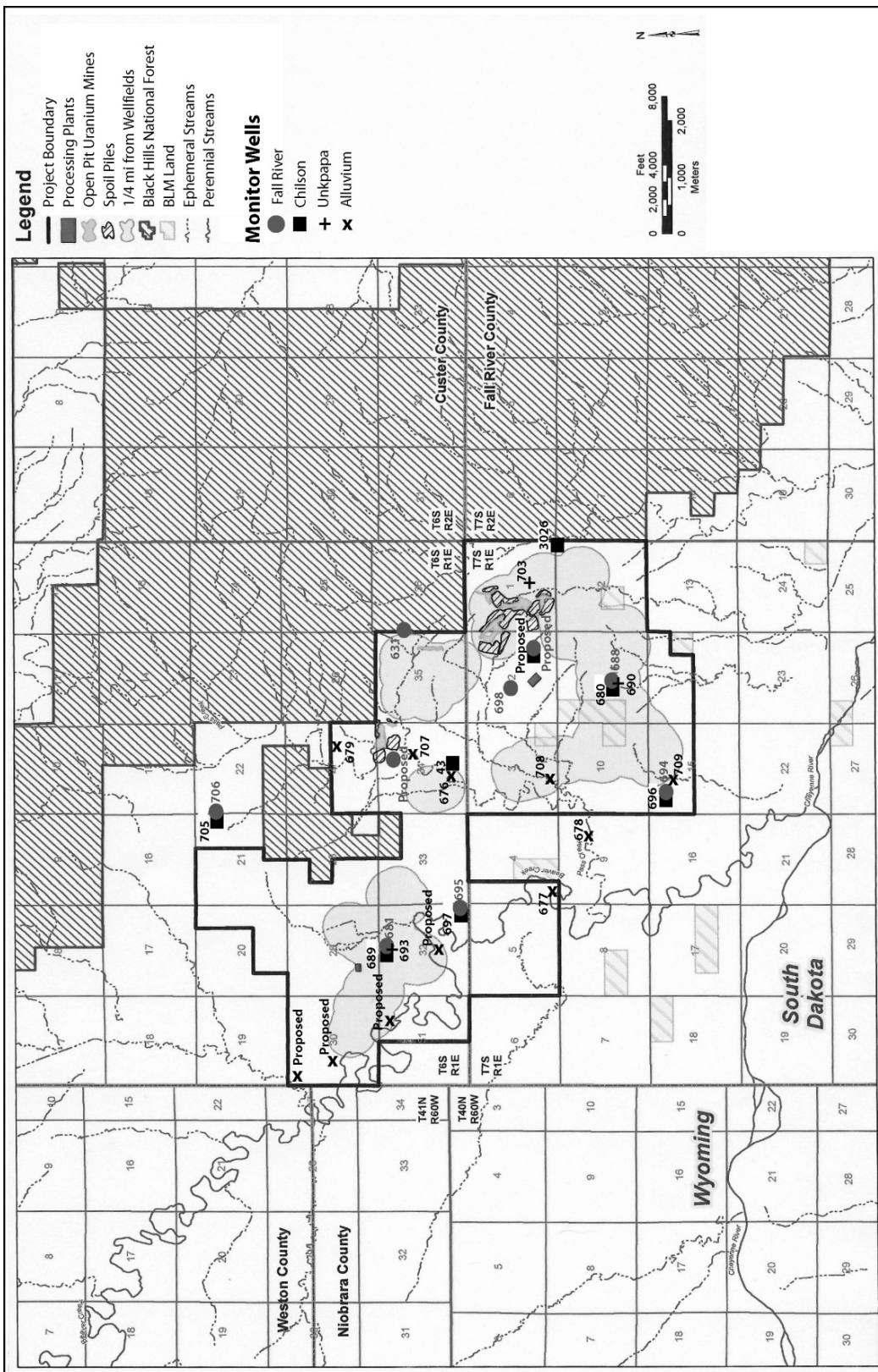


Figure 7.2.4. Locations of Operational Groundwater Monitoring Wells  
Source: Modified from Powertech (2011)

## **7.3 Physiochemical Monitoring**

This section describes the applicant's proposed physiochemical monitoring program as detailed in its license application and supporting documents (Powertech, 2009a–c, 2011). The purpose of this monitoring program is to (i) provide data on operational and environmental conditions so that prompt corrective actions can be taken when adverse conditions are detected and (ii) comply with environmental requirements or license conditions. In this regard, this monitoring program helps to limit potential environmental impacts at an ISR facility.

### **7.3.1 Wellfield Groundwater Monitoring**

As discussed in GEIS Section 8.3, the ISR production process directly affects the groundwater within the operating wellfield. For this reason, groundwater conditions are extensively monitored both before and during operations. The groundwater monitoring program includes production zone monitoring wells and wells monitoring aquifers overlying and underlying the production aquifer zone (NRC, 2009). The background groundwater monitoring that will occur as part of the proposed Dewey-Burdock ISR Project is discussed in Section 7.3.1.1. The groundwater quality monitoring that will occur during operations is discussed in Section 7.3.1.2. The applicant's restoration groundwater monitoring and stabilization plan is provided in SEIS Section 2.1.1.1.4.2.

In accordance with 10 CFR Part 40, Appendix A, Criterion 5B(5), Commission-approved background groundwater quality values must be established before beginning uranium production in a wellfield. This is done to characterize the water quality in monitoring wells that are used to detect lixiviant excursions from the production zone. This is also done to establish standards for aquifer restoration after uranium recovery is complete. The requirements and details of sampling programs to establish background groundwater quality are described in GEIS Section 8.3.1.1 (NRC, 2009). Background water quality can be established through examining records and reports for existing local water wells and/or by sampling wells developed for the ISR project before production begins.

#### **7.3.1.1 Commission-Approved Background—Production Zone**

The applicant will establish Commission-approved background groundwater quality before beginning operations by sampling a subset of wells that will later serve as injection or production wells installed in the uranium mineralization zones (Powertech, 2011). The subset of wells will include at least one well per 1.6 ha [4.0 ac] of wellfield pattern area, or six wells, whichever is greater. In cases of wellfields smaller than 2.4 ha [6 ac], wells will be spaced at one well per 0.4 ha [1.0 ac]. These wells will be sampled four times for background characterization, with a minimum of 14 days between sampling events (Powertech, 2011). Consistent with NUREG-1569, Section 5.7.8.3 (NRC, 2003), the applicant will be expected to sample wells over sufficiently spaced intervals to indicate seasonal variability. The water level in each well will also be measured and recorded prior to each sampling event (Powertech, 2009a). Samples will be analyzed for the parameters shown in Table 7.3-1. The applicant's proposed well spacing, sampling frequency, and parameters for Commission-approved background production zone sampling are consistent with NUREG-1569 (NRC, 2003). The staff has included a license condition that memorializes the methods for assessing Commission-approved background concentrations (NRC, 2013).

**Table 7.3-1. Background Water Quality Parameters and Indicators for Operational Groundwater Monitoring\***

Test Analyte/Parameter	
Bulk Properties	pH Total Dissolved Solids (TDS) Conductivity
Cations/Anions	Bicarbonate Alkalinity (as CaCO <sub>3</sub> ) Calcium, Ca Carbonate Alkalinity (as CaCO <sub>3</sub> ) Chloride, Cl Magnesium, Mg Nitrate, NO <sub>3</sub> <sup>-</sup> (as Nitrogen) Potassium, K Sodium, Na Sulfate, SO <sub>4</sub> Total Alkalinity (as CaCO <sub>3</sub> )
Trace Metals	Arsenic, As Barium, Ba Boron, B Cadmium, Cd Chromium, Cr Copper, Cu Fluoride, F Iron, Fe Lead, Pb Manganese, Mn Mercury, Hg Molybdenum, Mo Nickel, Ni Selenium, Se Silver, Ag Uranium, U Vanadium, V Zinc, Zn
Radionuclides	Gross Alpha=Alpha Particles Gross Beta=Beta Particles and Photons Radium, Ra-226
*All metals analyses are for dissolved metals. Source: NRC (2003); Powertech (2011).	

Prior to calculating background water quality statistics, the water quality data will be examined for differences between hydrogeologic units within each wellfield using visual screening, such as trilinear diagrams, and statistical analyses (Powertech, 2011). If heterogeneity exists in the data, then background water quality will be established for each hydrogeologic unit; otherwise, background water quality will be established for the entire production zone of the wellfield. After grouping the water quality data into hydrogeologic units and removing outliers (i.e., anomalously high or low values relative to other values) if necessary, the applicant will calculate background water quality as the arithmetic average for each sample parameter. Target restoration goals, which will be used to assess the effectiveness of groundwater restoration activities, will be

established as a function of the average background water quality and the variability in each parameter based on statistical methods. Before wellfield background evaluation, the applicant will consult with NRC for approval of the statistical methods used to determine target restoration goals (Powertech, 2011). NRC will consult with EPA before establishing water quality standards at the Dewey-Burdock site.

### **7.3.1.2 Excursion Monitoring**

As discussed in GEIS Section 8.3.1.2, monitoring wells are situated around the wellfields, in the aquifers overlying and underlying the ore-bearing production aquifers, and within the wellfields. Wells are placed in these locations to ensure the early detection of potential horizontal and vertical excursions of lixivants. Monitoring well placement is based on what is known about the nature and extent of the confining layer and the presence of drill holes, hydraulic gradient and aquifer transmissivity, and well abandonment procedures used in the region. The ability of a monitoring well to detect groundwater excursions is influenced by several factors, such as the thickness of the aquifer, the distance between the monitoring wells and the wellfield, the distance between the adjacent monitoring wells, the frequency of groundwater sampling, and the magnitude of changes in lixiviant migration indicator parameters. As a result, the spacing, distribution, and number of monitoring wells at a given ISR facility are site specific. The factors that control the spacing, distribution, and number of monitoring wells are detailed in GEIS Section 8.3.1.2 (NRC, 2009). The applicant's monitoring well design is described in SEIS Section 2.1.1.1.2.3.2 and summarized next.

The applicant proposes to install production and nonproduction zone monitoring wells to detect any horizontal or vertical lixiviant excursions at the proposed project site (Powertech, 2009a). The production zone monitoring wells will be located in the ore zone, in a ring around the perimeter of the production wellfields. They will be spaced at a maximum of 122 m [400 ft] outside the production wellfield and evenly spaced around the perimeter of the wellfield with (i) a minimum spacing of either 122 m [400 ft] or, (ii) the spacing that will ensure that no greater than a 70 degree angle exists between adjacent production zone monitoring wells and the nearest injection well (Mackin, et al., 2001; NRC, 2009, 2003; Powertech, 2009a, 2011). The applicant conducted numerical simulations using site-specific hydrologic data and proposed production flow rates to support the proposed spacing of monitoring wells (Powertech, 2011). Simulation results indicated that the proposed maximum monitoring well spacing of 122 m [400 ft] would be adequate to detect potential excursions (Powertech, 2011).

Nonproduction monitoring wells within the production area may consist of two types of monitoring wells: overlying and underlying (Mackin, et al., 2001; NRC, 2003, 2009). The screened intervals of overlying wells will be located in the sand unit or aquifer immediately above the ore-bearing stratum. The overlying nonproduction monitoring wells are designed to monitor any upward movement of leach fluids that may occur from the production zone and to guard against potential leakage from production and injection well casings into any overlying aquifer (Mackin, et al., 2001; NRC, 2003, 2009). The overlying wells are used to obtain background water quality data and to develop upper control limits (UCLs) for the overlying zones that will be used to determine whether vertical migration of leach fluids is occurring.

Vertical monitoring is generally set up with a density of wells ranging from one every 1.2 to 2 ha [3 to 5 ac]. However, where confining layers are very thick and permeabilities are negligible, requirements for vertical excursion monitoring can be relaxed or eliminated (Mackin, et al., 2001). The screened zone for the overlying wells is determined from electric logs by qualified geologists or hydrogeologists.



The applicant's nonproduction zone monitoring plan is described in SEIS Section 2.1.1.1.2.3.2. Following the previously outlined guidance, the applicant plans to design and install both overlying and underlying monitoring wells. The first layer of overlying nonproduction zone monitoring wells will be evenly distributed through the production area with a minimum of one well for every 1.6 ha [4.0 ac] of production area (Powertech, 2009a). Where additional aquifers exist above the first sand unit or aquifer above the ore-bearing sandstone, additional monitoring wells will be located in these aquifers, with a minimum placement of one well for every 3.2 ha [8 ac] of production area (Powertech, 2011). The overlying monitoring wells will be placed above the upper confining layer (the Graneros Group), where alluvium is present. As described in SEIS Section 4.5.2.1.1.2.1, the Graneros Group ranges in thickness from 61 to 168 m [200 to 550 ft], except where it has eroded in the eastern part of the proposed project area. Core samples collected from the lowermost unit in the Graneros Group, the Skull Creek Shale, demonstrate that the Skull Creek clays have extremely low vertical permeabilities. The thicknesses of the upper confining Graneros Group {approximately 61 to 168 m [200 to 550 ft]} and the lower confining Morrison Formation {approximately 30 m [100 ft]} minimize concerns about vertical excursions of lixiviant.

The monitoring ring and overlying and underlying monitoring wells will be designed for each wellfield according to site-specific lithology and processes of the production zone(s) of each wellfield. For administrative review, the applicant would present each wellfield monitoring well program and the results of hydrologic testing to NRC and the U.S. Environmental Protection Agency (EPA) before operating each wellfield (Powertech, 2009a). After the required hydrologic tests are complete, it may be necessary to revise the location and/or number of wells proposed. Each wellfield will be handled on a case-by-case basis in consultation with NRC and EPA.

UCLs are selected and set for chemical constituents or parameters that will be indicative of lixiviant migration from the wellfield (Mackin, et al., 2001; NRC, 2003, 2009). The constituents and parameters selected as lixiviant migration indicators and for which UCLs will be set at the proposed Dewey-Burdock ISR Project are chloride, conductivity, and total alkalinity (Powertech, 2011). Chloride is measured because the ion exchange process increases chloride concentrations in the lixiviant. In addition, chloride is highly mobile in groundwater and is not influenced by pH changes and oxidation-reduction reactions that occur in the production zone (Powertech, 2011). Conductivity is evaluated because it indicates changes in groundwater quality and is more reliably measured than parameters such as total dissolved solids. Total alkalinity will be examined because its concentration significantly increases during the ISR process and, therefore, provides a conservative indicator (Powertech, 2011).

The applicant followed guidance in NUREG-1569 (NRC, 2003) to establish and set UCLs in wellfields. All monitoring wells in the production zone aquifer and nonproduction zone aquifers (i.e., underlying and overlying aquifers) will be sampled 4 times with a minimum of 14 days between sampling events (Powertech, 2011). All samples will be analyzed for the parameters in Table 7.3-1. The mean concentration and standard deviation of the constituents or parameters selected as UCLs (i.e., chloride, conductivity, and total alkalinity) will be calculated for samples taken from the production zone aquifer and nonproduction zone aquifers. UCLs for each production zone monitoring well in a wellfield will be set at the mean concentration of the production zone aquifer plus five standard deviations for each excursion indicator. UCLs for each nonproduction zone monitoring well will be set at the mean concentration of the nonproduction zones aquifers plus five standard deviations for each excursion indicator. Some aquifers exhibit a low chloride concentration with an insignificant standard deviation (i.e., a narrow concentration range). Consistent with NUREG-1569 (NRC, 2003), when setting the

UCL for chloride the applicant will use either the mean plus five standard deviations or the mean plus 15 mg/L [15 ppm], whichever is greater (Powertech, 2011).

The applicant proposes to sample monitoring wells at the proposed Dewey-Burdock ISR Project at approximately 2-week intervals (at least 10 days apart) (Powertech, 2009a). The samples will be analyzed for and compared against the excursion parameter UCL values. The water level in each monitoring well will also be measured and recorded prior to each sampling event (Powertech, 2009a). Water level and analytical monitoring data for the UCL parameters will be reported to NRC quarterly and retained onsite for NRC review.

After operations are complete, the wellfields will be restored. As described in SEIS Section 2.1.1.1.4.2, as part of aquifer restoration the applicant will sample the same horizontal perimeter and overlying/underlying monitoring wells used during production. During restoration, lixiviant injection ceases, thereby reducing the potential for an excursion. The applicant will implement a reduced groundwater monitoring program during aquifer restoration because lixiviant injection will have ceased. During the aquifer restoration phase, wells located in the perimeter monitoring ring and completed in the overlying and underlying aquifers will be sampled every 60 days for chloride, alkalinity, and conductivity excursion parameters. An excursion will be defined in the same manner as during operations and subject to the same corrective action requirements.

### **7.3.2 Wellfield and Pipeline Flow and Pressure Monitoring**

As indicated in GEIS Section 8.3.2, the operator typically monitors injection and production well flow rates to manage water balance for the entire wellfield. Additionally, the pressure of each production well and the production trunk line in each wellfield header house is monitored. Unexpected losses of pressure may indicate equipment failure, a leak, or a problem with well integrity (NRC, 2009).

The applicant's program will include monitoring of the injection well and production well flow rates and pressures at each header house. Individual well flow readings will be recorded during each shift, and the overall wellfield flow rates will be balanced daily (Powertech, 2009a,b). Flow and total volume data will be transferred to and checked automatically at the Burdock central processing plant and Dewey satellite facility. The recovery and injection trunk lines will have electronic pressure gauges. Information from these gauges will be monitored from each unit's control room. The control system will have both high and low alarms for pressure and flow. If the pressure and/or flow are out of range, the alarms will sound, alerting personnel to make adjustments. Certain high or low readings will signal automatic shutoffs or shutdowns. Activation of the flow alarms will prompt the applicant to take corrective actions, which include inspections for leaks and spills.

### **7.3.3 Surface Water Monitoring**

The applicant will conduct surface water monitoring on all surface impoundments located downgradient from ISR activities. The applicant will also monitor surface waters passing through the site or located downgradient of ISR activities (Powertech, 2011). As described in SEIS Section 7.2.4, the applicant plans to monitor 24 impoundments and 10 stream sampling sites as part of the operational surface water monitoring program. The operational surface water sampling sites are shown in Figure 7.2-2 and listed in Table 7.3-2.



**Table 7.3-2. Impoundments and Stream Sampling Locations Proposed for Operational Monitoring**

Site ID	Type/Name
<b>Impoundments</b>	
Sub02	Triangle Mine Pit
Sub03	Mine Dam
Sub04	Stock Pond
Sub05	Mine Dam
Sub06	Darrow Mine Pit Northwest
Sub07	Stock Dam
Sub08	Stock Pond
Sub09	Stock Pond
Sub10	Stock Pond
Sub11	Stock Pond
Sub20	Stock Pond
Sub21	Stock Pond
Sub22	Stock Pond
Sub29	Stock Pond
Sub30	Stock Pond
Sub31	Stock Pond
Sub32	Stock Pond
Sub33	Stock Pond
Sub34	Stock Pond
Sub35	Stock Pond
Sub36	Stock Pond
Sub40	Darrow Mine Pit Southeast
Sub49	Darrow Mine Pit
Sub50	Darrow Mine Pit
<b>Streams</b>	
BVC11	Beaver Creek Downstream
BVC14	Beaver Creek Upstream
CHR01	Cheyenne River Upstream
CHR05	Cheyenne River Downstream
PSC11	Pass Creek Downstream
PSC12	Pass Creek Upstream
BEN01	Bennett Canyon
UNT01	Unnamed Tributary
UNT02	Unnamed Tributary
UNT03	Unnamed Tributary

Source: Powertech, 2011.

Prior to ISR operations, the applicant plans to sample each impoundment sampling site 4 times and each stream sampling site monthly for 12 consecutive months in accordance with preoperational monitoring recommendations in Regulatory Guide 4.14 (NRC, 1980). Water samples will be collected from the impoundments, when available, and analyzed for the constituents in Table 7.3-1. Grab samples will be collected from perennial stream sampling locations on Beaver Creek (BVC11 and BVC14) and the Cheyenne River (CHR01 and CHR05). Passive samplers will be installed at the remaining sites to collect samples during ephemeral flow events. All stream samples will be analyzed for the constituents listed in Table 7.3-1.

During ISR operations, water samples collected from the impoundment and stream sampling sites will be analyzed for pH, total and suspended solids, total hardness, chloride, sulfate, dissolved arsenic, cadmium, chromium, and selenium, and dissolved and suspended natural uranium, Ra-226, Th-230, Pb-210, and Po-210. In addition, the samples would be analyzed in the field for pH, conductivity, and temperature (Powertech, 2011).

### **7.3.4 Groundwater Monitoring (Project-Wide)**

The groundwater monitoring program will include domestic wells, stock wells, and monitoring wells located hydrologically upgradient and downgradient of proposed ISR activities (Powertech, 2011). Consistent with Regulatory Guide 4.14 (NRC, 1980), all domestic and stock wells within 2 km [1.2 mi] of the wellfields and all monitoring wells will be sampled quarterly over a 1-year period to establish baseline water quality before operations begin. All the preoperational groundwater samples will be analyzed for the constituents listed in Table 7.3-1.

Prior to operations, all domestic wells within the proposed project boundary will be removed from private use (Powertech, 2011). The applicant will work with the well owners to provide an alternative water source such as a replacement well or alternate water supply for domestic use (Powertech, 2011). Depending on well construction, location, and screen interval, the applicant could continue to use the well for monitoring or plug and abandon the well. During operations, the applicant will monitor all domestic wells within 2 km [1.2 mi] of the wellfields (Figure 7.2-3). Samples will be collected annually and analyzed for the constituents listed in Table 7.3-1.

Prior to operation of nearby wellfields, all stock wells within 0.4 km [0.25 mi] of wellfields will be removed from private use (Powertech, 2011). In addition, all nearby stock wells that have the potential to be adversely affected by ISR operations or to adversely affect ISR operations will be removed from private use (Powertech, 2011). Depending on well construction, location, and screen interval, the applicant could continue to use the stock well for monitoring or plug and abandon the well. During operations, the applicant must monitor all stock wells within the project area (Figure 7.2-3). Water samples will be collected quarterly and analyzed for three excursion indicators: chloride, total alkalinity, and conductivity (Powertech, 2011).

During operations, the monitoring wells located hydrologically upgradient and downgradient of ISR activities will be sampled quarterly and analyzed for the constituents listed in Table 7.3-1. The operational monitoring wells proposed will be in the alluvium, Fall River Formation, Chilson Member of the Lakota Formation, and the Unkpapa Formation. The position of each well relative to site facilities and features is shown in Figure 7.2-4 and listed in Table 7.3-3.

### **7.3.5 Meteorological Monitoring**

The applicant has committed to continue meteorological monitoring at the proposed project site during ISR operations (Powertech, 2012b). As part of the site characterization process, the applicant installed a weather station near the center of the proposed action area. This weather station was monitored from July 2007 through July 2008 to analyze and describe the long-term and site-specific meteorological conditions and trends. In addition, data sets from several regional weather stations were reviewed (see SEIS Section 3.7).

**Table 7.3-3. Monitoring Wells Proposed for Operational Monitoring**

<b>Well Identification(ID)</b>	<b>Aquifer</b>	<b>Relative Position</b>
676	Alluvium	Downgradient of Land Application
677	Alluvium	Downgradient
678	Alluvium	Downgradient
679	Alluvium	Upgradient
707	Alluvium	Downgradient of Triangle Pit
708	Alluvium	Downgradient of Land Application
Proposed	Alluvium	Downgradient of Wellfield
Proposed	Alluvium	Downgradient of Wellfield
Proposed	Alluvium	Downgradient of Land Application
709	Alluvium	Downgradient of Wellfield
Proposed	Alluvium	Upgradient
631	Fall River	Upgradient
681	Fall River	Production Zone
688	Fall River	Overlying Production Zone
694	Fall River	Upgradient
695	Fall River	Downgradient
698	Fall River	Downgradient
706	Fall River	Upgradient
Proposed	Fall River	Downgradient of Triangle Pit
Proposed	Fall River	Downgradient of Darrow Pit
43	Chilson	Downgradient of Triangle Pit
680	Chilson	Production Zone
689	Chilson	Production Zone
696	Chilson	Downgradient
697	Chilson	Downgradient
705	Chilson	Upgradient
3026	Chilson	Upgradient
Proposed	Chilson	Downgradient of Darrow Pit
690	Unkpapa	Production Zone
693	Unkpapa	Production Zone
703	Unkpapa	Production Zone

Source: Powertech, 2011

## 7.4 Ecological Monitoring

This section describes the applicant's proposed ecological monitoring program as described in its license application (Powertech, 2009a–c). As discussed in GEIS Section 8.4, ecological monitoring may include surveys of habitat, species counts, or other measures of the health of endangered, threatened, and sensitive species (NRC, 2009). Records of all sampling activities and analyses will be maintained onsite for NRC review, and periodic reports of all sampling and analyses will be submitted to NRC.

### 7.4.1 Vegetation Monitoring

Site characterization studies (Powertech, 2009a) indicate the proposed project area consists of five vegetation communities: Big Sagebrush Shrubland, Greasewood Shrubland, Ponderosa Pine Woodland, Upland Grassland, and Cottonwood Gallery. Each community was investigated for baseline vegetation information in support of an NRC source material license and the South Dakota Department of Environment and Natural Resources (SDDENR) large-scale mine permit application. No threatened or endangered species were encountered within the proposed project area. The applicant noted the presence of the state-designated weed Canada thistle (*Cirsium avense*) within the Cottonwood Gallery community and the presence of the Fall River County-designated weed field bindweed (*Convolvulus arvensis*) within the Greasewood Shrubland vegetation community. The applicant proposes weed control to mitigate further intrusion of invasive species in disturbed areas.

### 7.4.2 Wildlife Monitoring

The applicant will conduct annual wildlife monitoring at the project site during the lifespan of the project (Powertech, 2009a). The annual wildlife monitoring surveys will follow the same regimen as other ISR operations in the region (NRC, 2009). This will facilitate comparisons among survey results and impact assessments. As described in SEIS Section 3.6, no federally listed threatened or endangered species were documented within the project area during the baseline study. However, eight raptor nests were identified within the proposed project area, including one active bald eagle nest. The bald eagle is currently listed as threatened and endangered by the South Dakota Department of Game, Fish, and Parks (SDGFP). The applicant's annual monitoring surveys will include the following:

- (1) Early spring surveys for, and monitoring of, Greater sage-grouse leks {no sage-grouse leks were identified within 10 km [6 mi] of the proposed action area}; new and/or occupied raptor territories and/or nests; threatened and endangered species (federal and state); and species tracked by the South Dakota Natural Heritage Program, as directed, on and within 1.6 km [1 mi] of the proposed project area
- (2) Late spring and summer surveys for raptor production at occupied nests, and opportunistic observations of all wildlife species, including threatened and endangered species, and other species of management concern
- (3) Other surveys required by regulating agencies

The applicant will employ a number of possible mitigation strategies to reduce the impact of its activities on raptors in the project area (Powertech, 2009a). These strategies include possible relocation of raptor nests. In the unlikely event that the applicant determines it necessary to disturb a raptor nest, the applicant will develop a mitigation plan and consult with SDGFP and the U.S. Fish and Wildlife Service, at which time any applicable permits will be obtained from the appropriate agencies (Powertech, 2009a).

The applicant does not plan to sample aquatic species (Powertech, 2009a). As described in SEIS Section 3.6.2, aquatic species are limited within the proposed project area due to a lack of persistent aquatic resources (i.e., surface waters) and poor habitat conditions.

Because the proposed project area does not include any critical big game habitats (see SEIS Section 3.6) and is already included in SDGFP big game surveys, SDGFP did not require big

game surveys for the applicant's baseline wildlife surveys. Consequently, no long-term big game monitoring requirements are planned (Powertech, 2009a). A similar approach has been applied to other baseline projects (uranium, coal, bentonite, gold) in South Dakota and Wyoming and is the current policy of both states for annual monitoring at surface mines in the two-state region.

## **7.5 Land Application Monitoring**

This section describes the applicant's proposed land application monitoring program as described in the applicant's Groundwater Discharge Plan (GDP) submitted to SDDENR (Powertech, 2012a). As described in SEIS Section 2.1.1.1.2.4, the applicant is proposing options for liquid waste disposal at the proposed Dewey-Burdock ISR Project that include deep well disposal, land application, or combined deep well disposal and land application. If land application is used for liquid waste disposal at the proposed project, the applicant will implement this program in a manner that ensures beneficial uses will not be impaired and there will be no hazard to human health and the environment (Powertech, 2012a). Records of all sampling activities and analyses will be maintained onsite for NRC review, and periodic reports of all sampling and analyses will be submitted to SDDENR (Powertech, 2012a).

### **7.5.1 Groundwater**

The land application groundwater monitoring program will include alluvial monitoring wells within and hydrologically upgradient and downgradient of proposed land application systems. In addition, the shallowest bedrock aquifer, the Fall River Formation, will be monitored and suction lysimeters will be installed to monitor the vadose groundwater quality beneath the land application systems. The groundwater monitoring program is designed to provide a comprehensive evaluation of potentially affected groundwater quality within and near the proposed perimeter of operational pollution (POP) for proposed land application areas. Each land application area would include a designated POP zone, inside of which groundwater degradation would be permissible under a SDDENR water quality variance permit as long as South Dakota groundwater standards are met at the compliance points at the edges of the POP zones. Proposed POP zones in the Dewey and Burdock land application areas are shown in Figures 7.5-1 and 7.5-2, respectively.

#### **7.5.1.1 Alluvial Monitoring Wells**

Three types of alluvial monitoring wells are proposed to assess baseline conditions and impacts to alluvial water quality during operations: compliance wells, interior wells, and other wells. Proposed alluvial monitoring wells in the Dewey area are presented in Table 7.5-1 and depicted in Figure 7.5-1. Proposed alluvial monitoring wells in the Burdock area are presented in Table 7.5-2 and depicted in Figure 7.5-2. Compliance wells will be hydrologically downgradient from land application systems at the POP zone boundaries and will serve as compliance locations for potential impacts to alluvial water quality outside of the POP zone. Interior wells will be within each POP zone and will measure potential changes in alluvial water quality within the POP zones. Other wells are proposed to measure ambient alluvial water quality within the project area (see SEIS Section 7.2.5). These wells are outside of the POP zones both upgradient and downgradient of proposed land application systems.

Prior to operations of land application systems, all compliance, interior, and other wells will be sampled to determine baseline water quality. SDDENR's GDP permit will include a condition

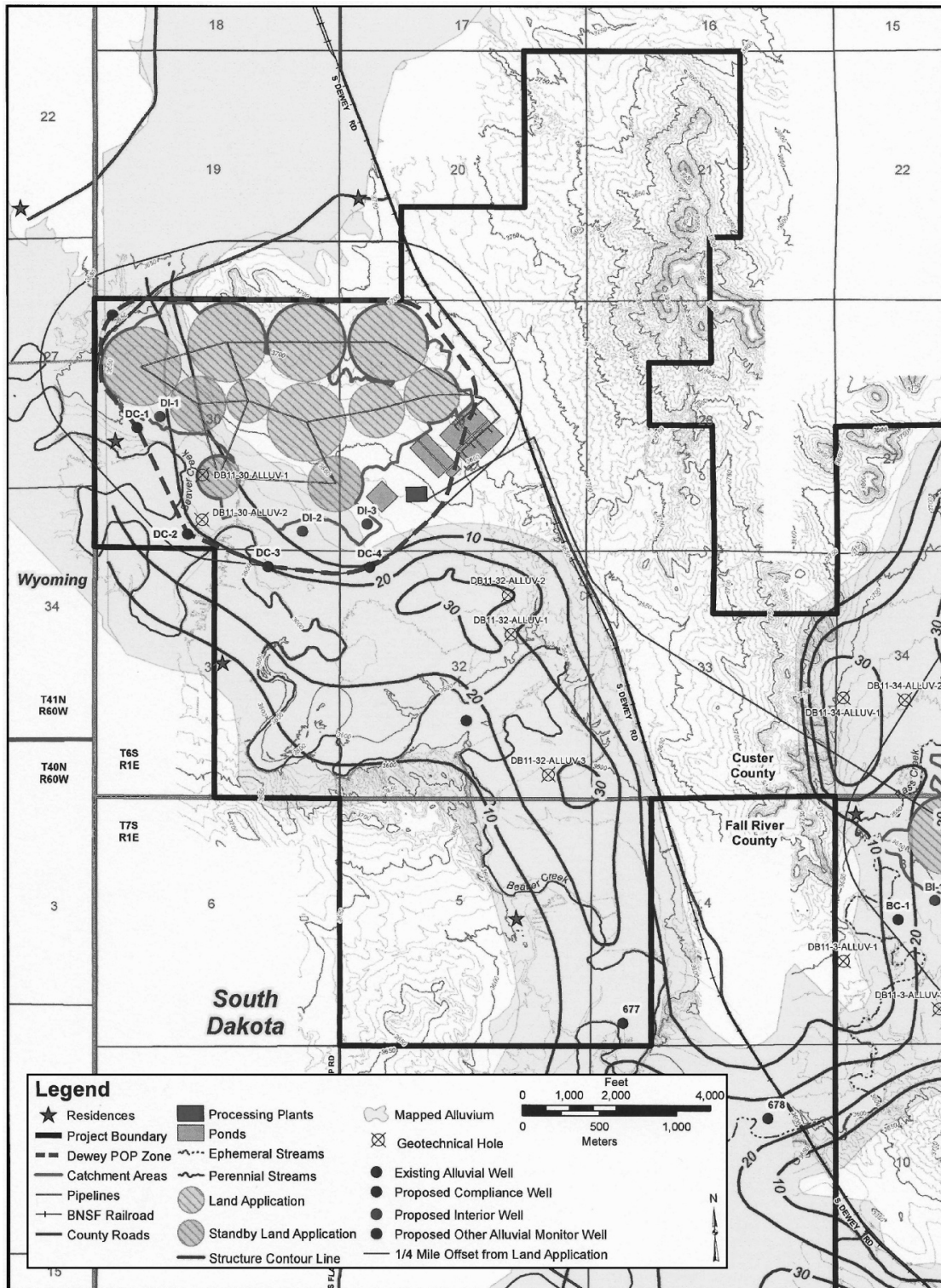
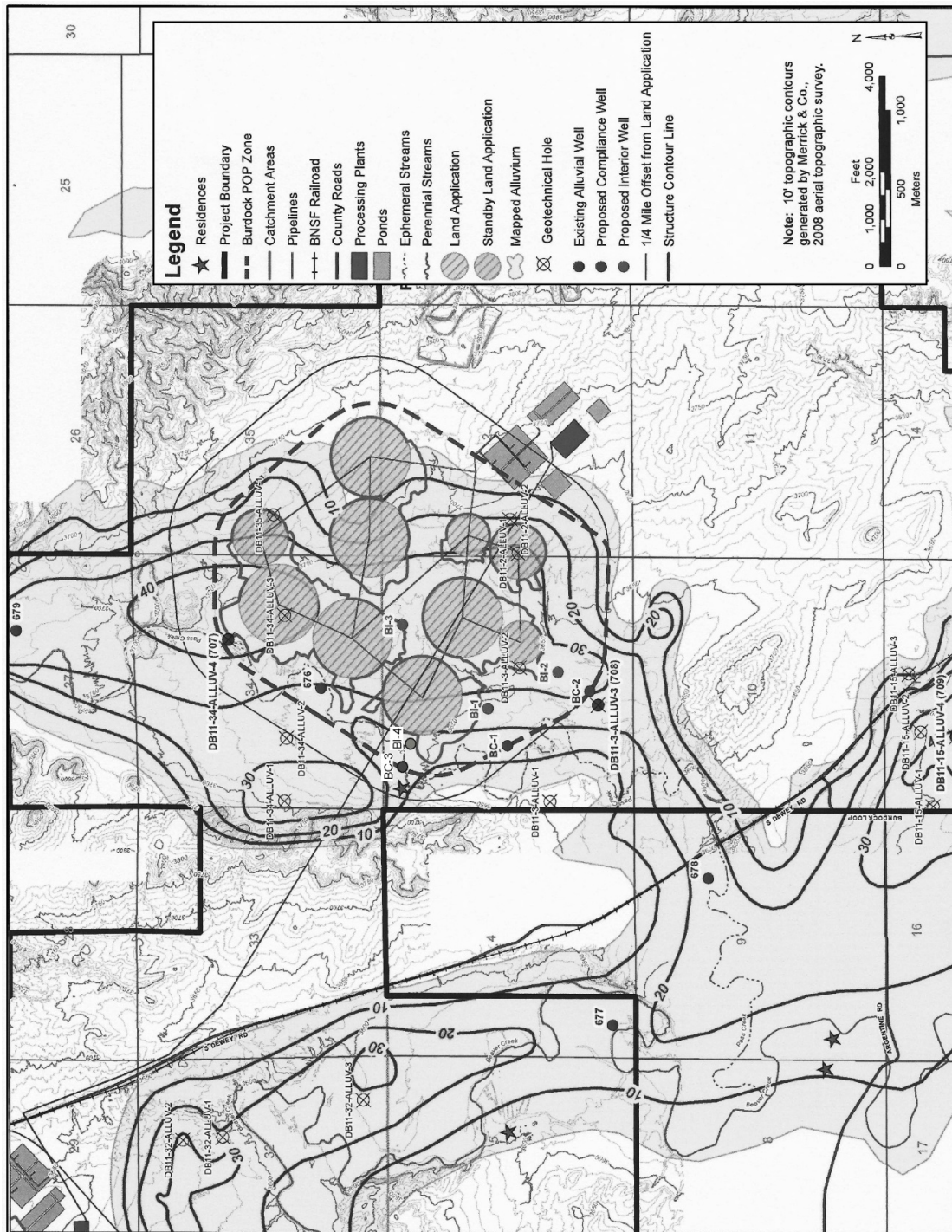


Figure 7.5-1. Map of Dewey Land Application Areas Showing the Perimeter of Operational Pollution and Proposed Alluvial Monitoring Wells Source: Powertech (2012a)





**Figure 7.5-2. Map of Burdock Land Application Areas Showing the Perimeter of Operational Pollution and Proposed Alluvial Monitoring Wells**  
 Source: Powertech (2012a, WWC, 2012)

**Table 7.5-1. Proposed Alluvial Monitoring Wells in the Dewey Area**

Monitoring Well Type	Well ID	Status
Compliance Wells	DC-1	Proposed
	DC-2	Proposed
	DC-3	Proposed
	DC-4	Proposed
Interior Wells	DI-1	Proposed
	DI-2	Proposed
	DI-3	Proposed
Other Wells	TBD	Proposed
	TBD	Proposed
	677	Existing

Source: Powertech, 2012a

**Table 7.5-2. Proposed Alluvial Monitoring Wells in the Burdock Area**

Monitoring Well Type	Well ID	Status
Compliance Wells	BC-1	Proposed
	BC-2	Proposed
	BC-3	Proposed
Interior Wells	BI-1	Proposed
	BI-2	Proposed
	BI-3	Proposed
	BI-4	Proposed
Other Wells	676	Existing
	678	Existing
	679	Existing
	707	Existing
	708	Existing

Source: Powertech, 2012a

requiring a minimum of one year of monthly ambient monitoring for the compliance wells and quarterly sampling of compliance wells until mining operations commence. During operations of land application systems, compliance, interior, and other wells will be sampled quarterly. All baseline and operational water samples will be analyzed for the parameters in Table 7.3-1.

For each compliance and interior well, baseline water quality for each parameter will be established as an arithmetic mean of baseline water samples plus one standard deviation of the sample data. Compliance limits for constituents in compliance wells will be established on a well-by-well basis as the human health standards in Administrative Rules of South Dakota (ARSD) 74:54:01:04 or baseline water quality. Out-of-compliance status will be defined in accordance with ARSD 74:54:02:28 as two consecutive samples that exceed the permitted allowable limit by two standard deviations. Interior wells will not have established compliance limits, but a contingency plan will be implemented if the monitored constituent concentrations increase (Powertech, 2012a).

#### 7.5.1.2 Bedrock Aquifer Monitoring

The applicant proposes to provide monitoring results from operational monitoring wells in the shallowest bedrock aquifer, which occurs in the Fall River Formation. These Fall River



monitoring wells are listed in Table 7.3-3 and depicted in Figure 7.2-4. Prior to ISR operations, each of the Fall River monitoring wells will be sampled quarterly for 1 year. During ISR operations, the Fall River monitoring wells will be sampled quarterly and analyzed for the parameters in Table 7.3-1.

### **7.5.1.3 Vadose Zone Monitoring**

The applicant proposes to install one suction lysimeter in each of the center pivot circles and catchment areas at both the Dewey and Burdock areas to obtain pore water samples from unsaturated soil. The suction lysimeters will be installed at depths of 2.4 to 3.7 m [8 to 12 ft]. Prior to operations of land application systems, pore water samples will be collected a minimum of four times within a 6-month period with no two samples taken in the same month. During operations, pore water samples will be collected once prior to each irrigation season, once during each irrigation season, and once after each irrigation season. Samples will be analyzed for the parameters in Table 7.3-1.

### **7.5.2 Surface Water**

The locations of stream sampling sites on Beaver and Pass Creeks are BVC11, BVC14, PSC11, and PSC12. These sites are listed in Table 7.3-2 and depicted in Figure 7.2-2. The upstream sites on Beaver Creek (BVC14) and Pass Creek (PSC12) are approximately at the boundary of the proposed license area and will represent ambient water quality. The downstream site on Beaver Creek (BVC11) is downstream of the Dewey land application area, and the downstream site on Pass Creek (PSC11) is downstream of the Burdock land application area. Samples for each sampling site will be collected monthly for 12 consecutive months prior to ISR operations. Grab samples will be collected from sites BVC11 and BVC14. Passive samplers will be installed at sites PSC11 and PSC12 to collect samples during ephemeral flow events. Water samples will be analyzed for the constituents listed in Table 7.3-1. During ISR operations, including operation of land application systems, grab samples will be collected quarterly from perennial stream sampling locations on Beaver Creek and passive samplers installed on Pass Creek will automatically collect samples following runoff events from April through October. Grab samples will be analyzed in the field for pH, conductivity, and temperature. All stream samples will be analyzed for pH, total and suspended solids, total hardness, chloride, sulfate, dissolved arsenic, cadmium, chromium, and selenium and the constituents listed in Table 7.3-1 along with dissolved and suspended uranium, Ra-226, Th-230, Pb-210, and Po-210 to monitor for impacts to surface water from uranium ISR operations.

The applicant has proposed operational monitoring of all impoundments within and adjacent to the project area downgradient of proposed ISR facilities (e.g., wellfields, plants, pipelines, and land application areas). Impoundments downstream of land application areas in the Dewey and Burdock areas are listed in Table 7.3-2 and depicted in Figure 7.2-2. Prior to operations, ambient water samples will be collected, when available, from the impoundments four times and analyzed for the constituents listed in Table 7.3-1. All the impoundments will be sampled on a quarterly basis throughout construction and operations and analyzed for the same constituent list described previously for stream sampling sites.

### **7.5.3 Process-Related Liquid Waste**

Grab samples of process-related liquid wastewater will be collected monthly during operation of each land application system and analyzed for the parameters listed in Table 7.3-1. In addition to the parameters in Table 7.3-1, monthly wastewater samples will be analyzed for compliance

with the 10 CFR Part 20, Appendix B radionuclide effluent discharge limits in Table 7.5-3. As discussed in SEIS Sections 2.1.1.1.6.2 and 4.5.1.1.2.2, SDDENR also regulates land application of treated wastewater, which requires the applicant to obtain a GDP permit and to comply with applicable state discharge requirements for land application of treated wastewater.

#### 7.5.4 Soil

Two baseline soil samples will be collected from each quadrant of each center pivot (eight total samples per pivot) prior to operation of land application systems. During operations, a minimum of two soil samples will be collected each year for each land application pivot active during the year. Both the baseline and operational samples will be collected at depths of 0–46 and 46–91 cm [0–18 and 18–36 in] and analyzed for the parameters in Table 7.5-4.

#### 7.5.5 Biomass

Samples of crops grown on three land application areas from each of the Dewey and Burdock sites will be collected at the end of each irrigation season during operations. If crops are not grown, samples of existing vegetation will be collected. Samples will be analyzed for the parameters in Table 7.5-5.

Livestock samples will be collected during operation of land application systems if livestock graze or consume crops grown on land application areas. The applicant will collect one grab sample per year taken at the time of slaughter and have it analyzed for the parameters in Table 7.5-5.

### 7.6 Class V Deep Injection Well Monitoring

This section describes the Class V deep injection well monitoring program the applicant proposed in its Class V underground injection control (UIC) permit application submitted to EPA (Powertech, 2011, Appendix 2.7-L). The proposed injection zones for the Class V deep injection wells are the Minnelusa Formation and the Deadwood Formation (Figure 3.5-5). The applicant estimates the need for disposal capacity of 1,135 Lpm [300 gpm] {about 1,635,120 L [432,000 gal] per day assuming 24 hour/7 day injection}. Two Class V injection wells are proposed in the Dewey area: one injecting into the Deadwood and one injecting into the Minnelusa. Two deep Class V injection wells are also proposed in the Burdock area: one injecting into the Deadwood and one injecting into the Minnelusa. In all, this totals four deep injection wells. If the disposal capacity for either the Deadwood Formation or the Minnelusa

**Table 7.5-3. U.S. Nuclear Regulatory Commission Radionuclide Discharge Limits for Land Application**

Radionuclide	μCi/ml	pCi/L
Pb-210	1E-8	10
Ra-226	6E-8	60
Uranium-natural	3E-7	300
Th-230	1E-7	100

Source: 10 CFR Part 20, Appendix B, Table 2, Column 2  
 Note: Compliance with 10 CFR Part 20, Appendix B, Table 2, Column 2 effluent discharge limits requires derivation of a limiting value based on the concentration each radionuclide in the effluent. The limiting value is derived as follows: determine, for each radionuclide in the mixture, the ratio between the concentration present in the mixture and the concentration otherwise established in Appendix B for the specific radionuclide when not in mixture. The sum of such ratios for all radionuclides in the mixture may not exceed "1" (i.e., "unity").

**Table 7.5-4. Soil Sampling Parameters**

<b>Parameter</b>
Conductivity, paste extract
pH, paste extract
Chloride, soluble
Chloride
Sulfate
Arsenic
Barium
Boron
Cadmium
Chromium
Lead
Mercury
Selenium
Silver
Sodium
Sodium Adsorption Ratio (SAR)
Vanadium
Nitrate as N, KCl extract
Uranium-natural
Ra-226
Th-230
Pb-210
Po-210

Source: Powertech, 2012a

**Table 7.5-5. Biomass Sampling Parameters**

<b>Constituent</b>
Uranium-natural
Ra-226
Th-230
Pb-210
Po-210
Selenium
Arsenic

Source: Powertech, 2012a

Formation is not as great as anticipated, the EPA UIC Class V permit will allow up to four Class V wells each at the Dewey and the Burdock sites to increase the disposal capacity. The applicant's preference is to utilize the deep injection wells for the disposal of all process waste fluids, but if the deep injection wells cannot accommodate the total volume of waste fluids, land application will be used to dispose of the volume of waste fluids unable to be accommodated by the deep injection wells. EPA will not authorize injection into the Class V deep injection wells unless the permittee demonstrates the wells are properly sited, such that confinement zones and proper well construction minimize the potential for migration of fluids outside of the approved injection zone.

The deep injection wells are Class V wells because (i) Class I disposal wells are prohibited in South Dakota by state statute and (ii) the deep injection wells proposed for injection into the Minnelusa Formation would be injecting into or above an underground source of drinking water.

(The definition for underground source of drinking water is found at 40 CFR Part 144.3 and p. 2-15 of this SEIS.) Although the deep injection wells are Class V wells, many of the protective requirements found at 40 CFR Part 146 Subpart B, Criteria and Standards Applicable to Class I Wells, will be included in the EPA UIC Class V Permit. Because Class V deep injection wells are being used for disposal rather than Class I wells, the injectate will have to be treated to remove radioactive constituents to below the radioactive waste standards at 10 CFR Part 20, Appendix B, Table II. The injectate would not need to be treated for injection into a Class I well. If the Total Dissolved Solids concentration in the proposed injection zone is below 10,000 mg/L [10,000 ppm], the injection zone is an underground source of drinking water. In that case, the applicant will be required to obtain an aquifer exemption from EPA, or the EPA UIC Class V permit will require liquid wastes to be treated to meet drinking water standards, or contaminant-specific background concentrations for constituents regulated under the Safe Drinking Water Act (SDWA).

A variety of data will be collected to monitor the deep injection well operations. This monitoring will use both periodic and continuous techniques. The EPA UIC Class V permit will require the annulus between the tubing and the long string of casings to be filled with a fluid and adequate pressure maintained on the annulus. The EPA UIC Class V permit will require installation and use of continuous recording devices to monitor injection pressure, flow rate and volume, and the pressure on the annulus between the tubing and the long string of casing as required under 40 CFR 146.13(b)(2). The continuous monitoring of the pressurized fluid-filled annulus will provide the necessary information for the internal mechanical integrity test required under 40 CFR 146.8(a)(1), which determines whether there is any significant fluid leak in the casing tubing and packer. The permit will also require a demonstration of external mechanical integrity pursuant to 40 CFR 146.8(a)(2) at least once every 5 years during the life of the well as required under 40 CFR 146.13(b)(3).

### **7.6.1 Injection Pressure Monitoring**

As required by 40 CFR 146.13(a)(1), injection pressure at the wellhead shall not exceed a maximum value, which shall be calculated so as to assure that the pressure in the injection zone during injection does not initiate new fractures or propagate existing fractures in the injection zone. In no case shall injection pressure initiate fractures in the confining zone or cause the movement of injection or formation fluids into an underground source of drinking water. A data acquisition system will be used to monitor injection rate, injection pressure, annulus pressure, and simultaneous differential pressure. Maximum, minimum, and average values for each of the four parameters, along with total volume, will be recorded at least once every 15 minutes. Pressure transducers located near the wellhead and downstream of any pumping devices will be used to measure pressures. Flow rate is to be measured utilizing an inline turbine meter and totalizer or equivalent. In the case of a manned operation, well operators will be required to visually inspect the recorder and computer on a weekly basis when injection occurs to verify proper operation.

A backup power source (battery) will be used to ensure continuous collection of operating and well alarm data for up to a minimum of 30 minutes should power failure occur. If a power failure persists past the ability of the battery systems to allow power, the wells will be shut in. Upon discovery of the shut in, readings will be recorded a minimum of once every day until power is restored to the monitoring equipment.

If any of the permit conditions are exceeded, including injection pressure or differential pressure between the annulus pressure and the injection pressure, a visual alarm light will be illuminated

at the well building. In addition, the computerized data acquisition system will be coupled to a telephone autodialer that will send a page to the operator to ensure that the condition is communicated. Upon an alarm condition, the operator will stop injection until the problem is identified and corrected and the system manually restarted.

### **7.6.2 Annulus Monitoring System**

The permittee plans to fill the annulus area between the protective casings and injection tubing strings with fresh water containing an approved corrosion inhibitor. Annulus pressure will be continuously monitored to detect any potential leaks in the tubing or casing strings, and annulus pressures will be maintained at more than 100 psi above the tubing pressure.

The proposed annulus monitoring system will consist of an annulus fluid tank with a level indicator or site glass, pressure transducers and gauges, a nitrogen regulator, and a nitrogen supply cylinder. Annulus pressure in this system will be maintained with a nitrogen blanket supplied from pressurized nitrogen cylinders. In the event of power failure, positive pressure can still be maintained on the annulus.

The annulus tank will have sufficient reservoir capacity to accommodate double the anticipated volume fluctuations due to temperature and pressure limitations. The pressurized nitrogen cylinders will be replaced and recharged as required. The annulus tank is to be equipped with a level indicator or a full length armored reflex sight glass, a pressure relief valve, and an independent liquid fill nozzle. Well operators will record the annulus tank level and any annulus fluid added to the system.

The annulus pressure will be recorded continuously for each well. Electronic pressure transducers will be placed in pressure taps on the annulus system and injection flow lines. A signal will be sent from these transducers to a digital recorder and/or a chart recorder. The automated control system data will be visually inspected a minimum of once daily for anomalies when the well is operating. As part of the process and controls, the monitoring system will record maximum, minimum, and average information. Differential pressures (the difference between the pressure applied to the annulus and the injection pressure) are to be obtained by comparison of simultaneous readings of the annulus and injection pressure transducer readings obtained for the wells.

In addition to the annulus pressure operating and monitoring requirements, an interlock system will be installed to prevent the well from being operated if permit conditions are exceeded or if unsafe conditions exist.

### **7.6.3 Mechanical Integrity Demonstration**

Under 40 CFR Part 146.8, periodic monitoring must be performed on both the internal and external mechanical integrity of the deep disposal wells to demonstrate (i) there is no significant leak in the casing, tubing, or packer and (ii) there is no significant fluid movement into an underground source of drinking water through vertical channels adjacent to the injection well bore.

### **7.6.3.1 Internal Mechanical Integrity Demonstration**

To demonstrate mechanical integrity for the casing, tubing and packer, the EPA UIC Class V permit will require monitoring of the tubing–casing annulus pressure with sufficient frequency to be representative while maintaining an annulus pressure different from atmospheric pressure measured at the surface. Monitoring the pressure changes in the sealed annulus space is a means of verifying the continued mechanical integrity of the well. The annulus pressure is to be continually monitored to detect any leaks in the tubing or casing.

### **7.6.3.2 External Mechanical Integrity Demonstration**

To demonstrate that there is no significant fluid movement into an underground source of drinking water through vertical channels adjacent to the injection well bore, the EPA UIC Class V permit will require one of the following logs to be recorded once each fifth calendar year: temperature, noise, or oxygen activation. If determined necessary because of operational or regulatory concerns, casing inspection logs may be conducted to investigate corrosion when tubing is already removed from the borehole during a workover or stimulation.

### **7.6.4 Injection Zone Pressure Monitoring**

The EPA UIC Class V permit will require monitoring of the pressure buildup in the injection zone annually, including shutting down the well for a time sufficient to conduct a valid observation of the pressure fall off as described under 40 CFR 146.13(d).

### **7.6.5 Injectate Monitoring**

The EPA UIC Class V permit will require the analysis of the injected fluids with sufficient frequency to yield representative data of their characteristics. If the proposed injection zones are demonstrated not to be underground sources of drinking water, the permit will require the injectate to be treated to meet radioactive waste standards at 10 CFR Part 20, Appendix B, Table II. If the proposed injection zones are underground sources of drinking water, the applicant will be required to obtain an aquifer exemption from EPA, or the permit will require the injectate to meet drinking water standards or contaminant-specific background concentrations for constituents regulated under the SDWA. Injectate characteristics will be monitored by collecting samples following procedures of a permittee-proposed waste analysis plan, which is reviewed and approved by EPA and becomes part of the permit requirements. At a minimum, the composition parameters listed in Table 7.6-1 will be monitored once quarterly for any quarterly period that fluid is injected.

## **7.7 References**

10 CFR Part 20. *Code of Federal Regulations*, Title 10, *Energy*, Part 20. “Standards for Protection Against Radiation.” Washington, DC: U.S. Government Printing Office.

10 CFR Part 20, Appendix B. *Code of Federal Regulations*, Title 10, *Energy*, Part 20. “Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs) of Radionuclides for Occupational Exposure; Effluent Concentrations; Concentrations for Release to Sewerage.” Washington, DC: U.S. Government Printing Office.

**Table 7.6-1. Composition Parameters for Class V  
Injectate Monitoring**

Test Analyte/Parameter*
pH
total dissolved solids
total suspended solids
specific gravity
arsenic
barium
bicarbonate alkalinity
calcium
chloride
iron
lead
mercury
Ra-226
selenium
sodium
sulfate
Th-230
uranium
vanadium
*All metal analyses under the EPA UIC Class V permit are for total metals.

10 CFR Part 40. *Code of Federal Regulations*, Title 10, *Energy*, Part 40, "Domestic Licensing of Source Material." Washington, DC: U.S. Government Printing Office.

10 CFR Part 40, Appendix A. *Code of Federal Regulations*, Title 10, *Energy*, Part 40, Appendix A. "Criteria Relating to the Operation of Uranium Mills and to the Disposition of Tailings or Wastes Produced by the Extraction or Concentration of Source Material from Ores Processed Primarily from their Source Material Content." Washington, DC: U.S. Government Printing Office.

40 CFR Part 144. *Code of Federal Regulations*, Title 40, *Protection of the Environment*, Part 144. "Underground Injection Control Program." Washington, DC: U.S. Government Printing Office.

40 CFR Part 146. *Code of Federal Regulations*, Title 40, *Protection of the Environment*, Part 146. "Underground Injection Control Program: Criteria and Standards." Washington, DC: U.S. Government Printing Office.

ARSD Section 74:54:01:04. "Standards for Groundwater of 10,000 mg/L TDS Concentration or Less." South Dakota Legislature Administrative Rules.

ARSD Section 74:54:02:28. "Out-of-Compliance Status." South Dakota Legislature Administrative Rules.

Mackin, P.C., D. Daruwalla, J. Winterle, M. Smith, and D.A. Pickett. NUREG/CR-6733, "A Baseline Risk-Informed Performance-Based Approach for *In-Situ* Leach Uranium Extraction Licensees." Washington, DC: NRC. September 2001.

NRC (U.S. Nuclear Regulatory Commission). "Draft License SUA-1600 for Powertech (USA), Inc." ML13052A722. Washington, DC: NRC. March 2013.

NRC. NUREG-1910, "Generic Environmental Impact Statement for *In-Situ* Leach Uranium Milling Facilities." ML091480244, ML091480188. Washington, DC: NRC. May 2009.

NRC. NUREG-1569, "Standard Review Plan for *In-Situ* Leach Uranium Extraction License Applications—Final Report." Washington, DC: NRC. June 2003.

NRC. "Regulatory Guide 4.14, Radiological Effluent and Environmental Monitoring at Uranium Mills, Rev. 1." Washington, DC: NRC. 1980.

Powertech [Powertech (USA) Inc.]. "Dewey-Burdock Project Groundwater Discharge Plan Custer and Fall River Counties, South Dakota." ML12195A039, ML12195A040. Edgemont, South Dakota: Powertech. March 2012a.

Powertech. "Dewey-Burdock Large Scale Mine Permit Application – Response to 10/31/2012 Procedural Completeness and Technical Review Comments." ML130320039 – Package. Edgemont, South Dakota: Powertech. 2012c.

Powertech. "Re: Powertech (USA) Inc.'s Supplemental Sampling Plan and Responses to Comments Regarding Draft License SUA-1600, Dewey-Burdock Project, Docket No. 40-9075, TAC No. J00606." Letter from R. Blubaugh, Vice President—Environmental, Health and Safety Resources, Powertech to R. Burrows, NRC. ML12305A056. October 19, 2012c.

Powertech. "Dewey-Burdock Project, Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota, Technical Report RAI Responses, June 2011." ML112071064. Greenwood Village, Colorado: Powertech. 2011.

Powertech. "Dewey-Burdock Project, Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota ER\_RAI Response August 11, 2010." ML102380516. Greenwood Village, Colorado: Powertech. 2010.

Powertech. "Dewey-Burdock Project, Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota—Environmental Report." Docket No. 040-09075. ML092870160. Greenwood Village, Colorado: Powertech. 2009a.

Powertech. "Dewey-Burdock Project, Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota—Technical Report." Docket No. 040-09075. ML092870160. Greenwood Village, Colorado: Powertech. 2009b.

Powertech. "Dewey-Burdock Project, Supplement to Application for NRC Uranium Recovery License Dated February 2009." Docket No. 040-09075. ML092870160. Greenwood Village, Colorado: Powertech. 2009c.



WWC (WWC Engineering). "Re: Responses to May 25, 2012 Preliminary Technical Comments Dewey-Burdock Project Groundwater Discharge Plan Application." Letter June 18) from J. Fritz, WWC Project Manager to M. Hicks, Senior Hydrologist, SDDENR. ML12213A154. 2012.



## 8 COST-BENEFIT ANALYSIS

### 8.1 Introduction

This chapter summarizes benefits and costs associated with the proposed action and the No-Action alternative. The proposed action is to issue the applicant, Powertech (USA) Inc., an U.S. Nuclear Regulatory Commission (NRC) license. The applicant will use the license for the construction, operation, aquifer restoration, and decommissioning of the proposed Dewey-Burdock uranium *in-situ* recovery (ISR) project. Section 4.11 of this Supplemental Environmental Impact Statement (SEIS) discusses the potential socioeconomic impacts of the proposed action.

Implementation of the proposed action will generate regional and local benefits and costs. The regional and local benefits of constructing and operating the proposed Dewey-Burdock ISR Project include increases in employment, economic activity, and tax revenues. The benefits of increased tax revenues will accrue primarily to Fall River and Custer Counties, South Dakota, and the surrounding towns of Edgemont, Hot Springs, and Custer. Increases in economic activity and employment may extend to Rapid City in neighboring Pennington County and the city of Newcastle in Weston County, Wyoming. Costs associated with the proposed Dewey-Burdock ISR Project will be, for the most part, limited to the area surrounding the site. Examples of these costs include changes to current land and water use, and increased road traffic.

### 8.2 Proposed Action (Alternative 1)

Under the proposed action, the NRC will issue the applicant an NRC license. With this license, the applicant will construct, operate, restore the aquifer, and decommission the proposed Dewey-Burdock ISR Project. Under the proposed action, the applicant is also seeking U.S. Bureau of Land Management (BLM) approval of its modified Plan of Operations subject to mitigation included in the license application and this SEIS. Following 2 years of site development and facility construction, there will be 8 years of wellfield and uranium recovery operations (see Figure 2.1-1). During the 8-year operations phase of the project, wellfield construction will continue as additional wellfields are sequentially developed along the uranium roll fronts in both the Dewey and Burdock areas. Wellfield restoration at the Dewey-Burdock site will begin immediately after production activities in the wellfields end. The applicant projects that restoration activities in the first wellfields will begin 2 years after production activities commence. Aquifer restoration activities, including restoration construction, stability monitoring, and regulatory approval of restoration, will continue for 11 years.

Some overlap between wellfield decommissioning and groundwater restoration activities is expected. Wellfield decommissioning is estimated to continue for 8 years. Decommissioning of the Burdock central processing plant and Dewey satellite facility will begin after aquifer restoration and wellfield decommissioning activities are complete. It is anticipated that these activities will take 2 years to complete (Powertech, 2009).

#### 8.2.1 Benefits of the Proposed Action

The principal socioeconomic benefit expected to result from the Dewey-Burdock ISR Project is an increase in employment opportunities in the region. The applicant expects to directly employ 86 workers during construction and 84 workers during operations of the proposed project

(Powertech, 2009). Fewer workers will be involved in aquifer restoration and decommissioning activities (Powertech, 2010). The applicant expects nine workers will be directly involved in aquifer restoration activities and nine workers will be directly involved in decommissioning activities. As discussed in SEIS Section 4.11.1, the construction workforce will most likely not relocate permanently to the area because of the short duration (1 to 2 years) of these activities. Workers are expected to be more likely to relocate near the facility during the operations, aquifer restoration, and decommissioning phases of the proposed project.

The majority of jobs are expected to be filled by workers from outside the region. A standard employment multiplier of 0.7<sup>1</sup> was used to calculate the expected influx of approximately 60 jobs (i.e., 86 jobs × 0.7 = 60) during construction, 59 jobs (i.e., 84 jobs × 0.7 = 59) during operations, 6 jobs during aquifer restoration (i.e., 9 jobs × 0.7 = 6), and 6 jobs during decommissioning (i.e., 9 jobs × 0.7 = 6) activities.<sup>1</sup>

The town nearest to the proposed project is Edgemont, with a population of 774 (USCB, 2012). However, employees supporting project activities might prefer to reside in larger surrounding communities such as Hot Springs, Custer, and Newcastle, which have populations of 3,711, 2,067, and 3,532, respectively (USCB, 2012). The influx of jobs created by the Dewey-Burdock ISR Project and the anticipated reduction in unemployment are expected to have a MODERATE beneficial impact to the businesses of Edgemont and a SMALL beneficial impact to the businesses of larger towns surrounding the proposed site, such as Hot Springs, Custer, and Newcastle.

In addition to job creation, the proposed project's operations and the addition of regionally based employees are expected to contribute to local, regional, and state revenues. Revenues are expected to increase through the purchase of goods and services and through the taxes levied on goods and services. Overall, the project is expected to generate \$13.54 million in total indirect business tax revenue over the lifetime of construction, operation, restoration, and decommissioning activities (Powertech, 2009). Sources of indirect business tax revenue include property taxes, sales taxes, and motor vehicle license charges.

The Special Tax Division of the Department of Revenue and Regulation of South Dakota levies a severance tax of 4.5 percent (South Dakota Codified Law 10-39A-1), as well as a 0.24 percent conservation tax (South Dakota Codified Law 10-39B-2), on the taxable value of the uranium produced from uranium milling and mining. The applicant's estimate of uranium resources to be recovered at the Dewey-Burdock ISR Project is 3.8 million kg [8.4 million lb] of uranium (as U<sub>3</sub>O<sub>8</sub>) (SRK Consulting, 2012). If the applicant fully recovers this quantity of uranium and sells it at market prices of approximately \$52.00 per pound (two-year average of monthly long-term prices from January 2011 to December 2013), the severance tax is expected to yield \$19,656,000 and the conservation tax is expected to yield \$1,048,320 in economic benefits over the life of the project. The State of South Dakota collects the severance tax and the conservation tax. The State of South Dakota returns 50 percent of the severance tax to the county where the mineral was produced.

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<sup>1</sup>The economic multiplier provides a statistical estimate of the total impact that is expected from a regional change in a given economic activity. The multiplier is a ratio of total change to initial change. The multiplier of 0.7 is used in these calculations because it is the standard employment multiplier for the milling/mining industry (Economic Policy Institute, 2003).

In addition, the proposed Dewey-Burdock ISR Project is expected to generate \$186,700,000 in value-added benefits over the life of the project (Powertech, 2009). These include employee wages and benefits; payments to self-employed individuals; payments from interest, rents, royalties, dividends, and profits; and excise and sales taxes paid on retail and commercial transactions.

### 8.2.2 Benefits From Uranium Production

The taxes to be generated by operations at the proposed Dewey-Burdock ISR Project will be dependent on yellowcake production levels and the number of persons employed in facility operations. The applicant projects 3.8 million kg [8.4 million lb] of uranium will be recovered. However, production of yellowcake will depend on the market price for yellowcake (as uranium) and production costs. Since 2002, the spot market price for uranium has fluctuated significantly, from a high of more than \$130 per pound in 2007 to a low of \$20 per pound in 2002. As of November 18, 2013, the price was \$36.00 per pound (UXC, 2013).

The project's potential benefits to the local community depend on the applicant's operating costs being lower than the future price of uranium. If the price of uranium falls below the costs of operation, then operations would likely be suspended or discontinued.

### 8.2.3 Costs to the Local Communities

Table 8.2-1 lists the towns within an 80-km [50-mi] radius of the proposed project. These towns are expected to provide the majority of the workers for the proposed project. The table also lists the population of the towns and the distances to the proposed project site. As stated in Section 8.2.1, the construction of the proposed project is expected to employ 86 workers, and if it is assumed that the majority of the construction employment requirements are filled by a workforce from outside the region, there could be an influx of 60 jobs ( $86 \text{ jobs} \times 0.7^2 = 60$ ). Because of the short duration of construction (1 to 2 years) and small size of the construction force, the impact to housing demand would be SMALL (see SEIS Section 4.11.1.1). Workers would not be expected to bring families and school-aged children with them; therefore, there would be a SMALL impact on education services and on health and social services (see SEIS Section 4.11.1.1).

As mentioned in SEIS Section 8.2.1, the proposed project is expected to employ 84 workers during the period of operations, 9 workers during the period of aquifer restoration, and 9 workers during the period of site decommissioning. As described in SEIS Section 4.11.1.2, employment types are expected to be more technical during operations, and

**Table 8.2-1. Towns Near the Proposed Dewey-Burdock *In-Situ* Recovery Project**

Town	Population (2010 Estimate)	Distance From Project in km [mi]
Edgemont, South Dakota	774	21 [13]
Custer, South Dakota	2,067	80 [50]
Hot Springs, South Dakota	3,711	64 [40]
Newcastle, Wyoming	3,532	64 [40]
Source: USCB (2012)		

<sup>2</sup>The multiplier of 0.7 is used in these calculations because it is the standard employment multiplier for the milling/mining industry (Economic Policy Institute, 2003).

as a result, the majority of the operational workforce is expected to be staffed from outside the region. Therefore, it is anticipated that there will be an influx of workers into the towns closest to the project area. Specifically, it is anticipated that there will be an influx of 59 workers ( $84 \text{ jobs} \times 0.7^3 = 59$ ) during operations, 6 jobs during aquifer restoration (i.e.,  $9 \text{ jobs} \times 0.7 = 6$ ), and 6 jobs during decommissioning (i.e.,  $9 \text{ jobs} \times 0.7 = 6$ ) activities.

It is also expected that workers moving from outside the region to communities within commuting distance of the Dewey-Burdock project site for employment opportunities will arrive with their families. The average household size in the State of South Dakota is 2.42 persons (USCB, 2012). Therefore, newly created jobs have the potential to increase the local population by as many as 172 persons ( $59 + 6 + 6 = 71 \text{ workers from outside the region} \times 2.42 \text{ persons per household} = 172 \text{ persons}$ ). The influx of workers and their families will increase the demand for housing and may spur an increase in the construction of new homes in towns surrounding the proposed site. It is anticipated that the impact of increased housing demand and construction may be MODERATE for small towns such as Edgemont. For larger towns such as Hot Springs, Custer, and Newcastle, which have more available housing, the impact will be SMALL.

The projected population growth from the proposed project will have a SMALL impact on education infrastructure and health and social services. As assessed in SEIS Section 4.11.1, the impact on schools and education-related services during operations, aquifer restoration, and decommissioning will be SMALL. As presented in SEIS Section 3.11.7, towns surrounding the proposed project have adequate medical facilities, social services, and police, fire, and emergency medical services to accommodate the projected project workforce and their families. NRC staff discussions with city and county planners indicate that current and planned upgrades to health care facilities and hospitals in the region will accommodate projected increases in population (NRC, 2009). Furthermore, as discussed in Section 4.11.1, local governments are expected to have the capacity to effectively plan for and manage increased demand for health and social services from workers and their families relocating to towns near the proposed project.

### **8.3 Evaluation of Findings of the Proposed Dewey-Burdock Project**

If NRC issues the applicant a license, it is anticipated that the Dewey-Burdock ISR Project will have a SMALL to MODERATE overall economic impact on the region of influence and will generate primarily regional and local benefits and costs. As discussed earlier, the regional benefits of the project are increased employment opportunities and increased economic activity that will add to tax revenues in the region. Increases in tax revenues are expected to bring the largest benefit to Fall River and Custer Counties, although economic benefits will most likely be shared by neighboring counties and communities in South Dakota and Wyoming. Social and economic costs associated with the Dewey-Burdock project will, for the most part, be limited to communities within commuting distance of the site. Table 8.3-1 summarizes the costs and benefits of the proposed Dewey-Burdock ISR Project.

### **8.4 No Action (Alternative 2)**

Under the No-Action alternative, NRC will not approve the license application for the proposed Dewey-Burdock ISR Project and the BLM will not approve the applicant's modified Plan of Operations. The No-Action alternative will result in the applicant not constructing and operating

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<sup>3</sup>Ibid.

**Table 8.3-1. Summary of Costs and Benefits of the Proposed Dewey-Burdock *In-Situ* Recovery Project**

<b>Cost-Benefit Category</b>	<b>Proposed Action</b>
	<b>Benefits</b>
Production Capacity	8.4 million pounds of yellowcake (as uranium)
Other Monetary: Severance and conservation taxes Indirect business tax revenues	\$20.7 million (estimated) \$13.54 million (estimated)
Nonmonetary benefits (50% of jobs would be from Custer and Fall River Counties)	86 jobs—during construction 60 jobs—local jobs from economic multiplier during construction  84 jobs—during operations 59 jobs—local jobs from economic multiplier during operations  9 jobs—during aquifer restoration 6 jobs—local jobs from economic multiplier during aquifer restoration  9 jobs—during decommissioning 6 jobs—local jobs from economic multiplier during decommissioning
	<b>Costs</b>
Education Infrastructure	SMALL
Health and Social Services	SMALL
Housing Demand	SMALL for larger towns (Hot Springs, Custer, Newcastle) MODERATE for Edgemont
Emergency Response	SMALL
Source: Powertech (2009, 2010); SRK Consulting, 2012	

the proposed project. No facilities, roads, or wellfields will be built, and no pipelines will be laid as described in SEIS Section 2.1.2. No uranium will be recovered from the subsurface orebody; therefore, injection, production, and monitoring wells will not be installed to operate the facility. No lixiviant will be introduced in the subsurface, and no buildings will be constructed to process extracted uranium or store chemicals involved in that process. Because no uranium will be recovered, neither aquifer restoration nor decommissioning activities will occur. No liquid or solid effluents will be generated. As a result, the proposed site will not be disturbed by proposed project activities and ecological, natural, and socioeconomic resources will remain unaffected. All potential environmental impacts from the proposed action will be avoided. Similarly, all project-specific socioeconomic impacts (e.g., employment, economic activity, population, housing, and local finance) will also be avoided.

## 8.5 References

Economic Policy Institute. "Updated Employment Multipliers for the U.S. Economy." ML12243A398. Washington, DC: Economic Policy Institute. 2003.

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NRC (U.S. Nuclear Regulatory Commission). "Site Visit to the Proposed Dewey-Burdock Uranium Project, Fall River and Custer Counties, South Dakota, and Meetings with Federal, State, and County Agencies, and Local Organizations, November 30–December 4, 2009." ML093631627. Washington, DC: NRC. 2009.

Powertech (Powertech (USA) Inc.). "Response to U.S. Nuclear Regulatory Commission Request for Additional Information Powertech (USA) Inc. Dewey-Burdock Project Environmental Review of Application for a U.S. Nuclear Regulatory Commission Source Material License, August 2010." Docket No. 040-09075. ML102238516. Greenwood Village, Colorado: Powertech. 2010.

Powertech. "Dewey-Burdock Project, Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota—Environmental Report." Docket No. 040-09075. ML092870160. Greenwood Village, Colorado: Powertech. 2009.

South Dakota Codified Law 10-39A-1. Severance Tax Imposed on Energy Minerals—Rate. South Dakota Legislature.

South Dakota Codified Law 10-39B-2. Imposition of Tax—Rate—Payment—Disposition—Collection. South Dakota Legislature.

SRK Consulting (SRK Consulting (U.S.) Inc.). "NI 43-101 Technical Report Preliminary Economic Assessment Dewey-Burdock Project." ML13165A150. Lakewood, Colorado: SRK Consulting. April 2012.

USCB (United States Census Bureau). "American Factfinder, Census 2000 and 2010, 2006–2010 American Community Survey 5-Year Estimate, State and County Quickfacts." ML12248A240. 2012.

UXC (The Ux Consulting Company). "Ux U<sub>3</sub>O<sub>8</sub> Prices." 2013. <<http://www.uxc.com/>> (July 21, 2013).



## 9 SUMMARY OF ENVIRONMENTAL IMPACTS

This chapter summarizes the potential environmental impacts of the proposed action and the No-Action alternative. The potential impacts of the proposed action are discussed in terms of (i) unavoidable adverse environmental impacts, (ii) irreversible and irretrievable commitments of resources, (iii) short-term impacts and uses of the environment, and (iv) long-term impacts and the maintenance and enhancement of productivity. The information is presented for each of the 13 resource areas that may be affected by the proposed Dewey-Burdock *In-Situ* Recovery (ISR) Project. This information addresses the impacts during each phase of the project (i.e., construction, operation, aquifer restoration, and decommissioning). The specific impacts are described in Table 9-1.

The following terms are defined in NUREG-1748 (NRC, 2003).

- Unavoidable adverse environmental impacts: applies to impacts that cannot be avoided and for which no practical means of mitigation are available
- Irreversible: involves commitments of environmental resources that cannot be restored
- Irretrievable: applies to material resources and will involve commitments of materials that, when used, cannot be recycled or restored for other uses by practical means
- Short-term: represents the period from preconstruction to the end of the decommissioning activities and, therefore, generally affects the present quality of life for the public
- Long-term: represents the period of time following the termination of the site license, with the potential to affect the quality of life for future generations

As discussed in Chapter 4, the significance of potential environmental impacts is categorized as follows:

**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

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

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

The alternatives and their environmental impacts are summarized in the following sections. Section 9.1 describes the environmental impacts from implementing the proposed action, and Section 9.2 describes the environmental impacts from implementing the No-Action alternative.

### 9.1 Proposed Action (Alternative 1)

Powertech (USA) Inc. (Powertech, referred to herein as the applicant) is seeking an NRC source material license for the construction, operation, aquifer restoration, and decommissioning of the proposed Dewey-Burdock ISR Project (Powertech, 2009a-c). Under

the proposed action, the U.S. Nuclear Regulatory Commission (NRC) would grant Powertech's request for a license. The proposed project will consist of processing facilities and sequentially developed wellfields sited in two contiguous areas: the Burdock area and the Dewey area.

Construction of the Dewey-Burdock ISR Project is expected to last about 2 years (see Figure 2.1-1). During this phase, the applicant will construct buildings, access roads, wellfields, pipelines, Class V injection wells, and potential land application areas to be used for liquid waste disposal. Operations are expected to last 8 years. Construction and operations activities would disturb approximately 98 ha [243 ac] if deep well disposal via Class V injection wells is used to dispose of treated wastewater and approximately 566 ha [1,398 ac] if land application is used to dispose of treated wastewater (Powertech, 2010).

During the operations phase, injection wells will be used to inject lixiviant (recovery) solutions into the orebody to recover uranium. Production wells will be used to recover the dissolved uranium, which then will be processed through the central plant. Finally, monitoring wells will be installed to monitor the performance of the wellfields and to mitigate potential excursions from the production zone.

Approximately 0.45 million kg [1 million lb] of  $U_3O_8$  (triuranium octoxide) would be produced per year. After operations at a wellfield cease, the applicant will have to begin aquifer restoration, which will ensure that water quality and groundwater use from surrounding aquifers is not impacted by the proposed action.

The aquifer restoration process is expected to last about 9 years. The methods selected for aquifer restoration will depend on the liquid waste disposal option. For the Class V deep injection well disposal option, the primary restoration method will be groundwater treatment using reverse osmosis with permeate injection (Powertech, 2011). If land application is used for liquid waste disposal, then groundwater sweep with injection of clean makeup water from the Madison Formation will be used to restore the production zone aquifer. During wellfield and facility decommissioning (expected to last 10 years), disturbed lands will be returned to their prior uses. Wells will be plugged and abandoned, and the land surface will be reclaimed.

The potential environmental impacts from the proposed action are summarized in Table 9-1.

## **9.2 No Action (Alternative 2)**

Under the No-Action alternative, NRC would not issue a license. The applicant will neither construct buildings, roads, or wellfields nor will the facility be operated at the proposed Dewey-Burdock ISR Project. Uranium ore will not be recovered from the site, and the applicant will not receive a license. Under the No-Action alternative, there will be no impact to any of the 13 resource areas from the proposed licensing action. There will be no unavoidable adverse environmental impacts attributable to the proposed action and no relationship between local short-term or long-term uses of the environment. Therefore, there will be no irreversible and irretrievable commitment of resources.

**Table 9-1. Summary of Environmental Impacts of the Proposed Action**

<b>Impact Category</b>	<b>Unavoidable Adverse Environmental Impacts</b>	<b>Irreversible and Irretrievable Commitment of Resources</b>	<b>Short-Term Impacts and Uses of the Environment</b>	<b>Long-Term Impacts and the Maintenance and Enhancement of Productivity</b>
Land Use (SEIS Section 4.2.1)	There will be a SMALL impact to land use. During construction and operation, the total amount of land affected by earthmoving activities to construct surface facilities, wellfields and associated infrastructure, and to build access roads will depend on the option used to dispose of liquid wastes. For Class V well injection, approximately 98 ha [243 ac] or 2 percent of the proposed license area will be disturbed. For land application, approximately 566 ha [1,398 ac] or 13 percent of the proposed license area will be disturbed. During decommissioning, land will be impacted by earthmoving activities to reclaim and reseed the affected areas.	No impact. There will be no irreversible and irretrievable commitment of land resources from implementing the proposed action. The duration of the project will be approximately 17 years after which time the land could be reclaimed and made available for other uses.	There will be a SMALL impact to land use from implementing the proposed action. Depending on the option used to dispose of liquid wastes, approximately 98 ha [243 ac] (Class V well injection) or 566 ha [1,398 ac] (land application) of the proposed license area will be unavailable for other uses such as grazing and recreation; oil and gas exploration could coexist with the applicant's proposed action.	There will be no long-term impact to land resources from implementing the proposed action. The land will be available for other uses at the end of the license period.
Transportation (SEIS Section 4.3.1)	During the construction and operation phases, there will be a SMALL increase in local traffic counts associated with project-related traffic on Dewey Road, the nearest road to the proposed project. The increased traffic	There will be an irreversible and irretrievable commitment of fuel for vehicle and equipment operation, heating, commuter traffic, and regional transport.	During construction and operations, there will be a SMALL impact due to increased traffic on Dewey Road, which will degrade the road surface, increase dust generation, and increase the	There will be no long-term impacts to transportation following license termination.

**Table 9-1. Summary of Environmental Impacts of the Proposed Action (Cont'd)**

Impact Category	Unavoidable Adverse Environmental Impacts	Irreversible and Irrecoverable Commitment of Resources	Short-Term Impacts and Uses of the Environment	Long-Term Impacts and the Maintenance and Enhancement of Productivity
	<p>will incrementally degrade the road surface, increase dust generation, and increase the potential for traffic accidents and wildlife and livestock kills. During all phases, there will be a SMALL increase in traffic on the more well-traveled regional roads.</p>		<p>potential for traffic accidents and wildlife and livestock kills. During operation, aquifer restoration, and decommissioning, there will be a SMALL increased accident risk from transporting yellowcake, ion-exchange resin, byproduct material, and hazardous chemicals. During construction, no short-term hazardous material transportation impacts will occur because no chemical or radioactive material will be transported.</p>	
<p>Geology and Soils (SEIS Section 4.4.1)</p>	<p>There will be a SMALL impact on geology and soils. The construction, operations, and decommissioning phases will disturb surface soils during construction of the central and satellite plants, development of the wellfields, laying of pipelines, and construction of new access roads. These impacts will be temporary, and at the end of the decommissioning phase topsoil will be replaced and reseeded.</p>	<p>Soil layers will be irreversibly disturbed by the proposed action; however, topsoil salvaged during the construction phase will be stored and replaced during decommissioning. Therefore, the potential impact will be SMALL. Reseeding and recontouring will mitigate the impact to topsoil.</p>	<p>There will be a SMALL impact to geology and soils. No significant matrix compression or ground subsidence is expected because the net withdrawal of fluid from the production zone aquifers will be about 3 percent or less. Up to 98 ha [243 ac] of topsoil if deep Class V well injection is used to dispose of liquid waste and up to 175 ha [433 ac] of</p>	<p>There will be no long-term impacts to geology and soils following license termination.</p>

**Table 9-1. Summary of Environmental Impacts of the Proposed Action (Cont'd)**

Impact Category	Unavoidable Adverse Environmental Impacts	Irreversible and Irretrievable Commitment of Resources	Short-Term Impacts and Uses of the Environment	Long-Term Impacts and the Maintenance and Enhancement of Productivity
			topsoil if land application is used to dispose of liquid waste will be stripped. Topsoil salvaged during the construction phase of the project will be replaced during the reclamation and reseeded processes.	
Surface Waters and Wetlands (SEIS Section 4.5.1.1)	There will be a SMALL impact to surface water and wetlands from the proposed action. The occurrence of surface water is limited, and surface water flow in channels is ephemeral except for perennial Beaver Creek. U.S. Army Corps of Engineers permits under Section 404 of the Clean Water Act will be required before conducting work in jurisdictional wetlands. The applicant will use best management practices and implement a storm water pollution management plan to ensure surface water runoff from disturbed areas meets NPDES permit limits.	There will be no irreversible and irretrievable commitment of either surface water or wetlands from implementing the proposed action. No drainage or body of water will be significantly altered by the proposed action. The impact to wetlands will be SMALL because stream flow is intermittent and the applicant will implement best management practices to control erosion, stormwater runoff, and sedimentation.	There will be a SMALL impact to surface waters and wetlands. The proposed action will not discharge to perennial or ephemeral surface water drainages.	No impact. The proposed action will not discharge to perennial or ephemeral surface water drainages.
Groundwater (SEIS Section 4.5.2.1)	There will be a SMALL impact on groundwater from implementing the proposed action by consumption of	There will be a SMALL impact on groundwater resources. Between 97 and 99.5 percent of	Short-term impacts to groundwater will include degradation of water quality in production zones	There will be no long-term impacts to groundwater resources. Both the State of South Dakota and NRC

**Table 9-1. Summary of Environmental Impacts of the Proposed Action (Cont'd)**

Impact Category	Unavoidable Adverse Environmental Impacts	Irreversible and Irretrievable Commitment of Resources	Short-Term Impacts and Uses of the Environment	Long-Term Impacts and the Maintenance and Enhancement of Productivity
	<p>groundwater, degradation of water quality in the ore production zone, and the drawdown in water levels in wells located outside the project boundaries that are drilled into the ore-bearing aquifer(s). The applicant will provide alternative water sources in the event of significant drawdown to private wells adjacent to the proposed project area. The establishment of an inward hydraulic gradient, as well as an applicant-installed groundwater monitoring network to detect potential vertical and horizontal excursions, will limit the potential for undetected groundwater excursions that could degrade groundwater quality.</p>	<p>groundwater used during the ISR process at the proposed project will be treated and reinjected into the subsurface and/or applied to land irrigation areas. Between 0.5 and 3 percent of groundwater will be consumed.</p>	<p>and the potential to draw down the water level in neighboring private wells. These impacts will be SMALL. The applicant will provide alternative water sources if water-level drawdowns affect water yields in domestic and livestock wells within and adjacent to the proposed project area.</p>	<p>require restoration of affected groundwater following operations. The groundwater quality will be restored to ensure that aquifers will not be affected. Although water levels will be affected in the short term, the water levels will eventually recover after operations and aquifer restoration are completed.</p>
<p>Ecological Resources (SEIS Section 4.6.1)</p>	<p>There will be SMALL to MODERATE impacts until vegetation has been reestablished, and then the impact will be SMALL. Construction and decommissioning of the proposed Dewey-Burdock Project will result in short-term loss (over the ISR facility</p>	<p>Vegetative communities directly impacted by earthmoving activities and wildlife injuries and mortalities will be irreversible. However, the implementation of mitigation measures, such as the use of fencing to limit wildlife</p>	<p>During any of the ISR phases, SMALL direct impacts to ecological resources could include injuries and fatalities to wildlife caused by either collisions with project-related traffic or habitat damage due to the removal of topsoil.</p>	<p>Some of the vegetative communities that exist within the proposed Dewey-Burdock Project could be difficult to reestablish through artificial plantings, and natural seeding could take many years resulting in</p>

**Table 9-1. Summary of Environmental Impacts of the Proposed Action (Cont'd)**

Impact Category	Unavoidable Adverse Environmental Impacts	Irreversible and Irretrievable Commitment of Resources	Short-Term Impacts and Uses of the Environment	Long-Term Impacts and the Maintenance and Enhancement of Productivity
	<p>lifecycle) of vegetation on approximately 98 ha [243 ac] if deep Class V well injection is used to dispose of liquid wastes and approximately 566 ha [1,398 ac] if land application is used to dispose of liquid wastes. The short-term loss of vegetation could stimulate the introduction and spread of undesirable and invasive, nonnative species, and displacement of wildlife species. During operations and aquifer restoration, use of fences will limit wildlife ingress and egress to wellfields</p>	<p>movement and the applicant's enforcement of speed limits, will reduce potential impacts to wildlife. Furthermore, areas impacted by earthmoving activities will be reclaimed and reseeded.</p>	<p>Habitat disruption will consist of scattered, confined drill sites for the deep Class V injection well option. Large transformation of the existing habitat would be a MODERATE impact during the decommissioning phase of the deep Class V injection well disposal option and during all facility lifecycle phases of the land application option. Wildlife could be temporarily displaced by increased noise and traffic during either waste disposal option. The applicant has committed to implement mitigation measures to reduce the potential impact to SMALL for wildlife species.</p>	<p>MODERATE long-term impacts. Wildlife species associated with those communities could experience SMALL to MODERATE long-term impacts if animal populations are reduced in number or replaced by other species with broader habitat requirements.</p>
<p>Meteorology, Climatology, and Air Quality (SEIS Section 4.7.1)</p>	<p>There will be a SMALL to MODERATE impact to air quality. During all four phases, the generation of air pollutants results in the degradation of air quality. Pollutant concentrations will be lower than NAAQS and PSD Class II regulatory thresholds expect for the PM<sub>10</sub> 24-hour</p>	<p>There will be no irreversible or irretrievable commitment of air resources from the proposed action.</p>	<p>There will be SMALL to MODERATE impacts. Fugitive dust generated from the construction phase and peak year (i.e., when all four phases occur simultaneously) has the potential to result in short-term, intermittent impacts in and</p>	<p>No impact. There will be no long-term effect on air quality either from the proposed project or following license termination.</p>

**Table 9-1. Summary of Environmental Impacts of the Proposed Action (Cont'd)**

Impact Category	Unavoidable Adverse Environmental Impacts	Irreversible and Irretrievable Commitment of Resources	Short-Term Impacts and Uses of the Environment	Long-Term Impacts and the Maintenance and Enhancement of Productivity
	<p>Class II PSD increment for the construction and peak year when all four phases occur simultaneously. Due to the level and nature of fugitive emissions, there is potential for intermittent impacts to localized areas in and around the proposed site. Project specific modeling results for the Wind Cave National Park (i.e., Class I PSD, visibility, and acid deposition) are below applicable thresholds.</p>		<p>around the site particularly when vehicles travel on unpaved roads. The effect will be localized and temporary. Use of mitigation measures, such as applying water for dust suppression, will limit fugitive dust emissions.</p>	
<p>Noise (SEIS Section 4.8.1)</p>	<p>There will be a SMALL impact. Two onsite dwellings (Daniel residence and Beaver Creek Ranch Headquarters) will experience noise above background levels due to their proximity to wellfields and land application areas. However, noise impacts at these residences will be short term, intermittent, and mitigated by sound abatement controls on operating equipment. Noise impacts to raptors will be mitigated by adhering to timing and spatial restrictions within</p>	<p>Not applicable.</p>	<p>There will be a SMALL impact on two onsite dwellings (Daniel residence and Beaver Creek Ranch Headquarters) due to their proximity to wellfields and land application areas. However, noise impacts at these residences will be short-term, intermittent, and mitigated by sound abatement controls on operating equipment.</p>	<p>No impact. There will be no noise impact following license termination.</p>



**Table 9-1. Summary of Environmental Impacts of the Proposed Action (Cont'd)**

Impact Category	Unavoidable Adverse Environmental Impacts	Irreversible and Irretrievable Commitment of Resources	Short-Term Impacts and Uses of the Environment	Long-Term Impacts and the Maintenance and Enhancement of Productivity
	specified distances of active raptor nests as determined by appropriate regulatory agencies (e.g., BLM, FWS, and SDGFP).			
Historic and Cultural Resources (SEIS Section 4.9.1)	Impact on historic and cultural resources during the ISR construction phase will be SMALL to LARGE. To mitigate the impact, NRC, BLM, SD SHPO, tribes, and the applicant will develop and execute an agreement that will formalize treatment plans for adversely impacted resources during construction. If NRHP-eligible sites cannot be avoided, then treatment plans will be developed. If other historic and cultural resources are encountered during the ISR lifecycle, the applicant is required by license condition to stop work. Work will not restart without authorization from the NRC, SD SHPO, and BLM.	If archaeological and historic sites cannot be avoided, or the impacts to these sites cannot be mitigated, this could result in an irreversible and irretrievable loss of cultural resources.	There will be a SMALL to LARGE impact on historic and cultural resources during the ISR construction phase. The development of an agreement between NRC, BLM, SD SHPO, tribes, and the applicant will address adverse impacts to cultural and historic sites and historic properties of traditional religious and cultural importance to Native American tribes. If any unidentified historic or cultural resources are encountered, the applicant is required by license condition to stop work. Work will not restart without authorization from the NRC, SD SHPO, and BLM.	If potential impacts from implementation of the proposed action are not mitigated, then long-term impacts to cultural and historic resources will result.
Visual and Scenic Resources (SEIS Section 4.10.1)	There would be a SMALL impact on the visual landscape. Visual impacts from drilling and earthmoving activities that generate fugitive	No impact.	There will be a SMALL short-term impact to the visual landscape from implementing the proposed action. The activities will be consistent with	No impact. There will be no impact on the visual landscape following license termination.

**Table 9-1. Summary of Environmental Impacts of the Proposed Action (Cont'd)**

Impact Category	Unavoidable Adverse Environmental Impacts	Irreversible and Irrecoverable Commitment of Resources	Short-Term Impacts and Uses of the Environment	Long-Term Impacts and the Maintenance and Enhancement of Productivity
	<p>dust will be short term. Mitigation measures will be implemented to reduce fugitive dust and visual impacts from buildings. Center pivot irrigation systems in proposed land application areas in the Dewey area will be visible to travelers on Dewey Road; however, Dewey Road is lightly traveled with few residences. Proposed activities will be consistent with the BLM VRM Class III and IV designation for the area.</p>		<p>the BLM VRM Class III and IV designation of the area and the existing natural resource exploration activities in the area.</p>	
Socioeconomics (SEIS Section 4.11.1)	<p>Implementing the proposed action will have a SMALL socioeconomic impact over the life of the project.</p>	<p>Not applicable.</p>	<p>Implementing the proposed action will have a SMALL impact on local communities.</p>	<p>Following license termination, workers who supported activities at the Dewey-Burdock site will need to find other employment. There will be a loss of revenue to nearby communities, Fall River and Custer Counties, and the state following license termination.</p>
Environmental Justice (SEIS Section 4.12.1)	<p>There will be no disproportionately high and adverse impacts to minority or low-income populations from the construction, operation, aquifer</p>	<p>Not applicable.</p>	<p>Implementing the proposed action will have a SMALL impact on environmental justice. There will be no disproportionately</p>	<p>There will be no long-term environmental justice impacts following license termination. While certain Native Americans have a</p>

**Table 9-1. Summary of Environmental Impacts of the Proposed Action (Cont'd)**

Impact Category	Unavoidable Adverse Environmental Impacts	Irreversible and Irretrievable Commitment of Resources	Short-Term Impacts and Uses of the Environment	Long-Term Impacts and the Maintenance and Enhancement of Productivity
	restoration, and decommissioning of the proposed Dewey-Burdock ISR Project. While certain Native Americans may have a heightened interest in cultural resources potentially affected by the proposed action, the impacts to Native Americans in this and other areas is not expected to be disproportionately high or adverse.		high and adverse impacts to minority or low-income populations from the construction, operation, aquifer restoration, and decommissioning of the proposed Dewey-Burdock ISR Project.	heightened interest in cultural resources potentially affected by the proposed action, the impacts to Native Americans in this and other areas is not expected to be disproportionately high or adverse. To the extent there might be adverse impacts to historic and cultural sites of interest to Native Americans, these impacts will be mitigated by an agreement that will formalize treatment plans during construction. If NRHP-eligible sites cannot be avoided, treatment plans will be developed. If other historic and cultural resources are encountered during the ISR lifecycle, the applicant is required by license condition to stop work. Work will not restart without authorization from the NRC, SD SHPO, and BLM.
Public and Occupational Health (SEIS Section 4.13.1)	There will be a SMALL impact on public and occupational health. Construction and decommissioning will generate fugitive dust emissions that will not result in a	Not applicable.	There will be a SMALL impact from radiological exposure. Dose calculations under normal operations showed that the highest potential dose within the	No impact. There will be no long-term impact to public and occupational health following license termination.

**Table 9-1. Summary of Environmental Impacts of the Proposed Action (Cont'd)**

Impact Category	Unavoidable Adverse Environmental Impacts	Irreversible and Irretrievable Commitment of Resources	Short-Term Impacts and Uses of the Environment	Long-Term Impacts and the Maintenance and Enhancement of Productivity
	significant dose to the public or site workers. The emissions from construction equipment will be of short duration and readily dispersed into the atmosphere.		proposed project area is 6 percent of the 1 mSv [100 mrem] per year public dose limit specified in NRC regulations. The radiological impacts from accidents will be SMALL for workers if procedures to deal with accident scenarios are followed, and SMALL for the public because of the facility's remote location. The nonradiological public and occupational health impacts from normal operations, accidents, and chemical exposures will be SMALL if handling and storage procedures are followed.	
Waste Management (SEIS Section 4.14.1)	Solid byproduct material generation and disposal from activities implemented during all postconstruction phases of the Dewey-Burdock ISR Project will result in SMALL impacts on available disposal capacity, because permitted facilities are available to accept the wastes. Disposal of treated liquid byproduct	The energy consumed during the ISR phases, the construction materials used that could not be reused or recycled, and the space used to properly handle and dispose of all waste types (i.e., wells for liquid wastes and permitted disposal space of solid wastes) will represent an	During all phases, hazards associated with handling and transport of wastes will represent a short-term and SMALL impact.	During all phases, permanent disposal of liquid wastes in onsite injection wells will represent a SMALL impact on the long-term productivity of the land allocated for these wells. Buildup of constituents in soil from potential land application of treated liquid wastes could affect productivity of irrigated land, but

**Table 9-1. Summary of Environmental Impacts of the Proposed Action (Cont'd)**

Impact Category	Unavoidable Adverse Environmental Impacts	Irreversible and Irretrievable Commitment of Resources	Short-Term Impacts and Uses of the Environment	Long-Term Impacts and the Maintenance and Enhancement of Productivity
	material using Class V injection, land application, or a combination of both will be conducted in accordance with NRC effluent discharge limits in 10 CFR Part 20, Appendix B and EPA (Class V well) or state (land application) permit conditions, and impacts will be SMALL. During decommissioning, the amount of nonhazardous solid waste will exceed available local landfill capacity and will result in MODERATE impacts unless local capacity is expanded prior to decommissioning or waste is shipped to a larger regional landfill; then impacts will be SMALL.	irretrievable commitment of resources, resulting in a SMALL to MODERATE impact.		proposed monitoring is expected to detect potential problems early, resulting in a SMALL impact.

### 9.3 References

10 CFR Part 20. *Code of Federal Regulations*, Title 10, *Energy*, Part 20. "Standards for Protection Against Radiation." Washington, DC: U.S. Government Printing Office.

NRC (U.S. Nuclear Regulatory Commission). NUREG-1748, "Environmental Review Guidance for Licensing Actions Associated With NMSS Programs." Washington, DC: NRC. August 2003.

Powertech (Powertech (USA) Inc.). "Dewey-Burdock Project, Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota, Technical Report RAI Responses, June 2011." ML112071064. Greenwood Village, Colorado: Powertech. 2011.

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Powertech. “Dewey-Burdock Project, Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota ER\_RAI Response August 11, 2010.” ML102380516. Greenwood Village, Colorado: Powertech. 2010.

Powertech. “Dewey-Burdock Project, Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota—Environmental Report.” Docket No. 040-09075. ML092870160. Greenwood Village, Colorado: Powertech. August 2009a.

Powertech. “Dewey-Burdock Project, Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota—Technical Report.” Docket No. 040-09075. ML092870160. Greenwood Village, Colorado: Powertech. August 2009b.

Powertech. “Dewey-Burdock Project, Supplement to Application for NRC Uranium Recovery License Dated February 2009.” Docket No. 040-09075. ML092870160. Greenwood Village, Colorado: Powertech. August 2009c.

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## 11 DISTRIBUTION LIST

The U.S. Nuclear Regulatory Commission (NRC) is providing copies of this final Supplemental Environmental Impact Statement (SEIS) to the organizations and individuals listed as follows. NRC will provide copies to other interested organizations and individuals upon request.

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Northern Cheyenne  
Natural Resources Director  
Lame Deer, MT

Bryan V. Brewer  
Oglala Sioux  
Tribal President  
Pine Ridge, SD

Mike Catches Enemy  
Oglala Sioux  
Tribal Historic Preservation Office  
Pine Ridge, SD

Cindy Gillis  
Oglala Sioux  
Tribal Attorney  
Rapid City, SD

Charles Murphy  
Standing Rock Sioux  
Tribal Chairman  
Fort Yates, ND

Waste'Win Young  
Standing Rock Sioux  
Tribal Historic Preservation Office  
Fort Yates, ND

Kevin Keckler  
Cheyenne River Sioux  
Tribal Chairman  
Eagle Butte, SD

Steve Vance  
Cheyenne River Sioux  
Tribal Historic Preservation Office  
Eagle Butte, SD

Cyril "Whitey" Scott  
Rosebud Sioux  
Tribal Chairman  
Rosebud, SD

Russell Eagle Bear  
Rosebud Sioux  
Tribal Historic Preservation Office  
Rosebud, SD

Thurman Cournoyer, Sr.  
Yankton Sioux  
Tribal Chairperson  
Wagner, SD

Lyle Miller  
Yankton Sioux  
Tribal Historic Preservation Office  
Marty, SD

Brandon Sauze, Sr.  
Crow Creek Sioux  
Tribal Chairman  
Ft. Thompson, SD

Wanda Wells  
Crow Creek Sioux  
Tribal Historic Preservation Office  
Ft. Thompson, SD

Darrell O'Neal, Sr.  
Northern Arapaho  
Tribal Chairman  
Fort Washakie, WY

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Darlene Conrad  
Northern Arapaho  
Tribal Historic Preservation Office  
Fort Washakie, WY

Floyd Azure  
Fort Peck Assiniboine Sioux  
Tribal Chairman  
Poplar, MT

Darrell "Curley" Youpee  
Fort Peck Assiniboine Sioux  
Tribal Historic Preservation Office  
Poplar, MT

Darwin Sinclair, Jr.  
Eastern Shoshone Tribe  
Tribal Chairman  
Fort Washakie, WY

Wilfred Ferris  
Eastern Shoshone  
Tribal Historic Preservation Office  
Fort Washakie, WY

Darrin Old Coyote  
Crow Nation of Montana  
Tribal Chairman  
Crow Agency, MT

Emerson Bullchief  
Crow Nation of Montana  
Tribal Historic Preservation Office  
Crow Agency, MT

William Big Day  
Crow Nation of Montana  
Burial Preservation Director  
Crow Agency, MT

Michael Jandreau  
Lower Brule Sioux  
Tribal Chairman  
Lower Brule, SD

Claire Green  
Lower Brule Sioux  
Tribal Historic Preservation Office  
Lower Brule, SD

Roger Trudell  
Santee Sioux Tribe of Nebraska  
Tribal Chairman  
Niobrara, NE

Rick Thomas  
Santee Sioux Tribe of Nebraska  
Tribal Historic Preservation Office  
Niobrara, NE

Robert Shepherd  
Sisseton-Wahpeton Tribe  
Tribal Chairman  
Agency Village, SD

Dianne Desrosiers  
Sisseton-Wahpeton Tribe  
Tribal Historic Preservation Office  
Agency Village, SD

Roger Yankton  
Spirit Lake Tribe  
Tribal Chairperson  
Fort Totten, ND

Darrell Smith  
Spirit Lake Tribe  
Tribal Historic Preservation Office  
Fort Totten, ND

Anthony Reider  
Flandreau–Santee Sioux  
Tribal Chairman  
Flandreau, SD

Carol Robertson  
Flandreau–Santee Sioux  
Tribal Historic Preservation Office  
Flandreau, SD

Gabe Prescott  
Lower Sioux Tribe  
Tribal President  
Morton, MN

Anthony Morse  
Lower Sioux Tribe  
Tribal Historic Preservation Office  
Morton, MN

## G. Tex Hall

Three Affiliated Tribes  
Tribal Chairman  
New Town, ND

## Elgin Crows Breast

Three Affiliated Tribes  
Tribal Historic Preservation Office  
New Town, ND

## Rebecca White

Ponca Tribe of Nebraska  
Tribal Chairwoman  
Niobrara, NE

## Gloria Hamilton

Ponca Tribe of Nebraska  
Tribal Historic Preservation Office  
Niobrara, NE

## Merle St. Claire

Turtle Mountain Chippewa Tribe  
Tribal Chairman  
Belcourt, ND

## Bruce F. Nadeau

Turtle Mountain Chippewa Tribe  
Tribal Historic Preservation Office  
Belcourt, ND

## Janice Prairie Chief-Boswell

Cheyenne and Arapaho Tribes  
Tribal Governor  
Concho, OK

## Margaret Anquoe

Cheyenne and Arapaho Tribes  
Tribal Historic Preservation Office  
Concho, OK

## Amen Sheridan

Omaha Tribe of Nebraska  
Tribal Chairman  
Macy, NE

## Calvin Harlan

Omaha Tribe of Nebraska  
Tribal Historic Preservation Office  
Macy, NE



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Marshall Gover  
Pawnee Nation of Oklahoma  
Tribal President  
Pawnee, OK

Gordon Adams  
Pawnee Nation of Oklahoma  
Tribal Historic Preservation Office  
Pawnee, OK

### **11.3 State Agency Officials**

Matt Hicks  
South Dakota Department of Environment and Natural Resources  
Pierre, SD

Mike Cepak  
South Dakota Department of Environment and Natural Resources  
Pierre, SD

Paige Olson  
State Historic Preservation Office  
Pierre, SD

Stan Michals  
South Dakota Game, Fish, & Parks Department  
Pierre, SD

Mike Fosha  
South Dakota State Historical Society, Archaeological Research Center  
Rapid City, SD

Roger Campbell  
Office of Tribal Government Relations  
Pierre, SD

Mary Cerney  
Governor's Office of Economic Development  
Pierre, SD

### **11.4 Local Agency Officials**

David Green  
Custer County Planning and Economic Development  
Custer, SD

Bill Curran  
Edgemont Area Chamber of Commerce  
Edgemont, SD

Lisa Scheinost  
Edgemont Area Chamber of Commerce  
Edgemont, SD

## **11.5 Other Organizations and Individuals**

Richard Blubaugh  
Powertech USA, Inc.  
Greenwood Village, CO

Mark Hollenbeck  
Powertech USA, Inc.  
Edgemont, SD

Eric Jantz  
New Mexico Environmental Law Center  
Santa Fe, NM

Christopher S. Pugsley, Esq.  
Thompson & Simmons, PLLC  
Washington, DC

Anthony Thompson  
Thompson & Simmons, PLLC  
Washington, DC

Jeffrey C. Parsons  
Western Mining Action Project  
Lysons, CO

Travis E. Stills  
Energy Minerals Law Center  
Durango, CO

Thomas J. Ballanco, Esq.  
Attorney for Dayton Hyde  
Pine Ridge, SD

David Frankel, Esq.  
Aligning for Responsible Mining  
Pine Ridge, SD

Bruce Ellison  
Law Office of Bruce Ellison  
Rapid City, SD

Charmaine White Face  
Defenders of the Black Hills  
Rapid City, SD

Lillias Jarding

The Lakota People's Law Project  
Rapid City, SD

Cindy Gillis

Counsel for the Oglala Sioux Tribe  
Gonzalez Law Firm  
Rapid City, SD

Martha Graham

SRI Foundation  
Rio Rancho, NM

Edgemont Public Library  
Edgemont, SD

Rapid City Public Library  
Rapid City, SD

Custer County Library  
Custer, SD

Weston County Library  
Newcastle, WY

Hot Springs Public Library  
Hot Springs, SD

Susan Henderson  
Edgemont, SD

Dayton Hyde

The Black Hills Wild Horse Sanctuary  
Hot Springs, SD



**APPENDIX A**  
**CONSULTATION CORRESPONDENCE**



## CONSULTATION CORRESPONDENCE

The Endangered Species Act of 1973, as amended, and the National Historic Preservation Act of 1966, as amended, require that Federal agencies consult with applicable State and Federal agencies and groups prior to taking action that may affect threatened and endangered species, essential fish habitat, or historical and archaeological resources. This appendix contains consultation documentation related to these federal acts.

**Table A-1. Chronology of Consultation Correspondence**

<b>Author</b>	<b>Recipient</b>	<b>Date of Letter</b>	<b>ADAMS Accession Number</b>
U.S. Nuclear Regulatory Commission (K. Hsueh)	Fish and Wildlife Conservation Office (P. Gober)	March 15, 2010	ML100331503
U.S. Nuclear Regulatory Commission (K. Hsueh)	Cheyenne River Sioux Tribe (J. Brings Plenty)	March 19, 2010*	ML100331999
U.S. Fish and Wildlife Service (S. Larson)	U.S. Nuclear Regulatory Commission (K. Hsueh)	March 29, 2010	ML100970556
U.S. Nuclear Regulatory Commission (K. Hsueh)	Oglala Sioux Tribe (T. Two Bulls)	September 8, 2010	ML102450647
Turtle Mountain Band of Chippewa	U.S. Nuclear Regulatory Commission	April 7, 2010	ML101100137
U.S. Nuclear Regulatory Commission (K. Hsueh)	Standing Rock Sioux Tribe (R. His Horse is Thunder)	September 10, 2010*	ML102520308
Three Affiliated Tribes, Mandan Hidatsa Arikara (P. "No Tears" Brady)	U.S. Nuclear Regulatory Commission (K. Hsueh)	September 20, 2010	ML102780369
Sisseton Wahpeton Oyate (D. Desrosiers)	U.S. Nuclear Regulatory Commission (H. Yilma)	October 1, 2010	ML103050026
Sisseton Wahpeton Oyate (D. Desrosiers)	U.S. Nuclear Regulatory Commission (K. Hsueh)	November 2, 2010	ML103200287
Rosebud Sioux Tribe (R. Eagle Bear)	U.S. Nuclear Regulatory Commission (K. Hsueh)	November 7, 2010	ML103270443
U.S. Nuclear Regulatory Commission (H. Yilma)	Lower Brule Sioux Tribe (C. Green)	November 12, 2010	ML103330215
Lower Brule Sioux Tribe (M. Jandreau)	U.S. Nuclear Regulatory Commission (K. Hsueh)	November 15, 2010	ML103340146
U.S. Nuclear Regulatory Commission (H. Yilma)	Yankton Sioux Tribe (L. Gravatt)	November 22, 2010	ML103330220
Yankton Sioux Tribe (L. Gravatt)	U.S. Nuclear Regulatory Commission (K. Hsueh)	December 3, 2010	ML110030430
Standing Rock Sioux Tribe (A. Swallow)	U.S. Nuclear Regulatory Commission (K. Hsueh)	December 8, 2010	ML110030700
U.S. Nuclear Regulatory Commission (K. Hsueh)	Advisory Council on Historic Preservation (J. Fowler)	December 15, 2010	ML103270171

**Table A-1. Chronology of Consultation Correspondence (Cont'd)**

<b>Author</b>	<b>Recipient</b>	<b>Date of Letter</b>	<b>ADAMS Accession Number</b>
Oglala Sioux Tribe (M. Catches Enemy and W. Mesteth)	U.S. Nuclear Regulatory Commission (K. Hsueh)	January 31, 2011	ML110340107
U.S. Nuclear Regulatory Commission (L. Camper)	Crow Tribe of Montana (C. Black Eagle)	March 4, 2011*	ML110550535
Crow Tribe (H.B. Two Leggins)	U.S. Nuclear Regulatory Commission (H. Yilma)	March 10, 2011	ML110690166
U.S. Nuclear Regulatory Commission (L. Camper)	Yankton Sioux Tribe (L. Gravatt)	May 12, 2011*	ML111320395
U.S. Nuclear Regulatory Commission (K. Hsueh)	Powertech (USA) Inc. (R. Blubaugh)	August 12, 2011	ML112170237
Powertech (USA) Inc. (R. Blubaugh)	U.S. Nuclear Regulatory Commission (K. Hsueh)	August 31, 2011	ML112700464
U.S. Nuclear Regulatory Commission (K. Hsueh)	Oglala Sioux Tribe (J. Laysbad)	October 20, 2011*	ML112440097
U.S. Nuclear Regulatory Commission (K. Hsueh)	Oglala Sioux Tribe (J. Laysbad)	October 28, 2011*	ML112980555
U.S. Bureau of Land Management (M. Atkins)	U.S. Nuclear Regulatory Commission (L. Camper)	November 22, 2011	ML113340322
U.S. Nuclear Regulatory Commission (K. Hsueh)	Tribal Historic Preservation Officers	January 19, 2012†	ML120330066
Sisseton Wahpeton Oyate (D. Desrosiers)	U.S. Nuclear Regulatory Commission (H. Yilma)	January 24, 2012	ML12031A279
U.S. Nuclear Regulatory Commission (K. Hsueh)	Tribal Historic Preservation Officers	March 6, 2012†	ML120670079
U.S. Nuclear Regulatory Commission (K. Hsueh)	Tribal Historic Preservation Officers	March 9, 2012†	ML120730509
U.S. Nuclear Regulatory Commission (L. Camper)	Apache Tribe of Oklahoma (L. Maynahonah)	March 19, 2012*	ML120600178
U.S. Nuclear Regulatory Commission (L. Camper)	Apache Tribe of Oklahoma (L. Maynahonah)	March 26, 2012*	ML120670319
U.S. Nuclear Regulatory Commission (K. Hsueh)	Tribal Historic Preservation Officers	April 5, 2012†	ML12130A067
U.S. Nuclear Regulatory Commission (H. Yilma)	Tribal Historic Preservation Officers	April 20, 2012‡	ML121180264
U.S. Nuclear Regulatory Commission (L. Camper)	Crow Creek Sioux Tribe (Mr. D. Big Eagle)	May 7, 2012*	ML121250102
U.S. Nuclear Regulatory Commission (L. Camper)	Oglala Sioux Tribe (J. Yellow Bird Steele)	May 23, 2012*	ML12143A185
U.S. Nuclear Regulatory Commission (K. Hsueh)	Northern Cheyenne Tribe (C. Fisher)	June 20, 2012*	ML12172A356
U.S. Nuclear Regulatory Commission (K. Hsueh)	Standing Rock Sioux Tribe (W. Young)	June 26, 2012*	ML12177A319



**Table A–1. Chronology of Consultation Correspondence (Cont'd)**

<b>Author</b>	<b>Recipient</b>	<b>Date of Letter</b>	<b>ADAMS Accession Number</b>
U.S. Nuclear Regulatory Commission (L. Camper)	Northern Arapaho Tribe (J. Shakespeare)	June 29, 2012*	ML12181A324
Powertech (USA) Inc. (R. Blubaugh)	U.S. Nuclear Regulatory Commission (H. Yilma)	July 20, 2012	ML12213A694
U.S. Nuclear Regulatory Commission (H. Yilma)	Tribal Historic Preservation Officers	August 7, 2012‡	ML12261A375
U.S. Nuclear Regulatory Commission (H. Yilma)	Tribal Historic Preservation Officers	August 9, 2012‡	ML12261A429
U.S. Nuclear Regulatory Commission (H. Yilma)	Tribal Historic Preservation Officers	August 20, 2012‡	ML12261A463
U.S. Nuclear Regulatory Commission (H. Yilma)	Tribal Historic Preservation Officers	August 21, 2012‡	ML12261A454
U.S. Fish and Wildlife Service (T. Quesinberry)	Center for Nuclear Waste Regulatory Analyses (A. Hester)	August 27, 2012	ML12240A317
Powertech (USA) Inc. (R. Blubaugh)	U.S. Nuclear Regulatory Commission (K. Hsueh)	August 29, 2012	ML12243A158
U.S. Nuclear Regulatory Commission (K. Hsueh)	Tribal Historic Preservation Officers	August 30, 2012‡	ML12261A470
U.S. Nuclear Regulatory Commission (K. Hsueh)	Tribal Historic Preservation Officers	September 18, 2012†	ML12264A594
U.S. Nuclear Regulatory Commission (K. Hsueh)	Powertech (USA) Inc. (R. Blubaugh)	October 4, 2012	ML12278A185
Powertech (USA) Inc. (R. Blubaugh)	U.S. Nuclear Regulatory Commission (K. Hsueh)	October 9, 2012	ML12285A425
U.S. Nuclear Regulatory Commission (L. Camper)	Crow Tribe of Montana (C. Black Eagle)	October 11, 2012*	ML12283A156
U.S. Nuclear Regulatory Commission (K. Hsueh)	Tribal Historic Preservation Officers	October 12, 2012†	ML12286A310
Standing Rock Sioux Tribe (T. Clouthier)	U.S. Nuclear Regulatory Commission (K. Hsueh)	October 15, 2012	ML12298A142
Sisseton Wahpeton Oyate (D. Desrosiers)	U.S. Nuclear Regulatory Commission (K. Hsueh)	October 18, 2012	ML12298A148
Rosebud Sioux Tribe (R. Eagle Bear)	U.S. Nuclear Regulatory Commission (K. Hsueh)	October 19, 2012	ML12298A155
Yankton Sioux Tribe (L. Gravatt)	U.S. Nuclear Regulatory Commission (H. Yilma)	October 20, 2012	ML12324A336
U.S. Nuclear Regulatory Commission (L. Camper)	Lower Brule Sioux Tribe (M. Jandreau)	October 26, 2012*	ML12292A101
U.S. Nuclear Regulatory Commission (K. Hsueh)	Tribal Historic Preservation Officers	October 31, 2012*	ML12306A195
Standing Rock Sioux Tribe (T. Clouthier)	Turtle Mountain Tribe (B. Nadeau)	November 1, 2012	ML12324A388
Standing Rock Sioux Tribe (T. Clouthier)	U.S. Nuclear Regulatory Commission (H. Yilma and K. Hsueh)	November 2, 2012	ML12324A369

**Table A–1. Chronology of Consultation Correspondence (Cont’d)**

<b>Author</b>	<b>Recipient</b>	<b>Date of Letter</b>	<b>ADAMS Accession Number</b>
Sisseton Wahpeton Oyate (D. Desrosiers)	U.S. Nuclear Regulatory Commission (H. Yilma)	November 6, 2012*	ML12324A349
U.S. Nuclear Regulatory Commission (L. Camper)	Rosebud Sioux Tribe (C. “Whitey” Scott)	November 16, 2012	ML12320A642
U.S. Nuclear Regulatory Commission (L. Camper)	Cheyenne River Sioux Tribe (K. Keckler)	December 14, 2012*	ML12335A175
Kadramas, Lee & Jackson (J. Turnbow)	The Louis Berger Group (R. Withrow)	December 17, 2012	ML13045A765
U.S. Nuclear Regulatory Commission (K. Hsueh)	Tribal Historic Preservation Officers	February 8, 2013†	ML13039A336
Standing Rock Sioux Tribe (T. Clouthier)	U.S. Nuclear Regulatory Commission (K. Hsueh)	February 20, 2013	ML13053A134
U.S. Nuclear Regulatory Commission (L. Camper)	Oglala Sioux Tribe (B. Brewer)	March 12, 2013*	ML13071A653
Oglala Sioux Tribe (B.V. Brewer, Sr.)	U.S. Nuclear Regulatory Commission (K. Hsueh)	March 22, 2013	ML13141A362
U.S. Nuclear Regulatory Commission (L. Camper)	Advisory Council on Historic Preservation (R. Nelson)	April 24, 2013	ML13017A077
U.S. Nuclear Regulatory Commission (L. Camper)	Oglala Sioux Tribe (B.V. Brewer)	May 1, 2013*	ML13122A044
Powertech (USA) Inc. (R. Blubaugh)	U.S. Nuclear Regulatory Commission (K. Hsueh)	June 3, 2013	ML13155A015
U.S. Fish and Wildlife Service (T. Quesinberry)	U.S. Nuclear Regulatory Commission (H. Yilma)	September 9, 2013	ML13256A314
U.S. Nuclear Regulatory Commission (K. Hsueh)	Tribal Historic Preservation Officers	November 6, 2013*	ML13256A402
U.S. Nuclear Regulatory Commission (K. Hsueh)	Advisory Council on Historic Preservation (J. Fowler)	November 13, 2013	ML13311B184

\*Similar letters were sent to tribes listed in SEIS Section 1.7.3.5.

†Letter sent via email to tribes listed in SEIS Section 1.7.3.5.

‡Email sent to tribes listed in SEIS Section 1.7.3.5.

March 15, 2010

Pete Gober  
Fish and Wildlife Conservation Office  
420 South Garfield Avenue, Suite 400  
Pierre, SD 57501-5408

SUBJECT: REQUEST FOR INFORMATION REGARDING ENDANGERED OR  
THREATENED SPECIES AND CRITICAL HABITAT FOR THE POWERTECH  
INC. PROPOSED DEWEY-BURDOCK IN-SITU RECOVERY FACILITY NEAR  
EDGEMONT, SOUTH DAKOTA (Docket 040-09075)

Dear Mr. Gober:

The U.S. Nuclear Regulatory Commission (NRC) has received an application from Powertech Inc. (Powertech) for a new radioactive source materials license to develop and operate the Dewey-Burdock Project located near Edgemont, South Dakota in Fall River and Custer Counties. The facility, if licensed, would use an *in-situ* recovery methodology to extract uranium at the Dewey-Burdock site. The proposed project area consists approximately of 10,580 acres (4,282 ha) located on both sides of Dewey Road (County Road 6463) and portions of Sections 1-5, 10-12, 14, and 15, Township 7 South, Range 1 East and Sections 20, 21, 27, 28, 29, and 30-35, Township 6 South, Range 1 East, Black Hill Meridian. A map showing the proposed project boundary is enclosed (Powertech Figure 1.4-1).

As established in Title 10 *Code of Federal Regulations* Part 51 (10 CFR 51), the NRC regulation that implements the National Environmental Policy Act of 1969, as amended, the agency is preparing a Supplemental Environmental Impact Statement (SEIS). In accordance with Section 7 of the Endangered Species Act, the SEIS will include an analysis of potential impacts to endangered or threatened species or critical habitat in the proposed project area. To support the environmental review, the NRC is requesting information from the U.S. Fish and Wildlife Service to facilitate the identification of endangered or threatened species or critical habitat that may be affected by the proposed project. After a careful review and assessment of all the comments received, the NRC will determine what additional actions are necessary to comply with Section 7 of the Endangered Species Act.

The Powertech Dewey-Burdock Project license application is publicly available in the NRC Public Document Room located at One White Flint North, 11555 Rockville Pike, Rockville, Maryland 20852, or from the NRC's Agency Wide Documents Access and Management System (ADAMS). The ADAMS Public Electronic Reading Room is accessible at <http://www.nrc.gov/reading-rm/adams.html>. The accession numbers for the Powertech application including the environmental report is ML092870160.

P. Gober

2

Please submit any information that you may have regarding this environmental review within 30 days of the receipt of this letter to NRC, Attention: Mr. Kevin Hsueh, Mail Stop T8F05, Washington, DC 20555. If you have any questions, please contact Ms. Haimanot Yilma of my staff by telephone at 301-415-8029 or by email at [Haimanot.Yilma@nrc.gov](mailto:Haimanot.Yilma@nrc.gov). Thank you for your assistance.

Sincerely,

*/RA/*

Kevin Hsueh, Chief  
Environmental Review Branch-B  
Environmental Protection and  
Performance Assessment Directorate  
Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Programs

Docket No.: 040-09075

Enclosure: Powertech Figure 1.4-1

cc:  
Stan Michals  
South Dakota Game Fish and Parks  
523 East Capitol Avenue  
Pierre, SD 57501

March 19, 2010

Joseph Brings Plenty, Chairman  
Cheyenne River Sioux Tribe  
P.O. Box 590  
Eagle Butte, SD 57625-0590

**SUBJECT: INVITATION FOR FORMAL CONSULTATION UNDER NATIONAL HISTORIC PRESERVATION ACT SECTION 106 AS WELL AS REQUEST FOR INFORMATION REGARDING TRIBAL HISTORIC AND CULTURAL RESOURCES POTENTIALLY AFFECTED BY THE POWERTECH INC. PROPOSED DEWEY-BURDOCK IN-SITU RECOVERY FACILITY NEAR EDMONT SOUTH DAKOTA**

Dear Chairman Plenty:

The U.S. Nuclear Regulatory Commission (NRC) has received an application from Powertech Inc. (Powertech) for a new radioactive source materials license to develop and operate the Dewey-Burdock Project located near Edgemont, South Dakota in Fall River and Custer Counties. The facility, if licensed, would use an *in-situ* recovery methodology to extract uranium at the Dewey-Burdock site. The proposed project area consists of approximately 10,580 acres (4,282 ha) located on both sides of Dewey Road (County Road 6463) and portions of Sections 1-5, 10-12, 14, and 15, Township 7 South, Range 1 East and Sections 20, 21, 27, 28, 29, and 30-35, Township 6 South, Range 1 East, Black Hill Meridian. A map showing the proposed project boundary is enclosed (Powertech Figure 1.4-1).

The South Dakota State Historic Preservation Officer identified the Cheyenne River Sioux Tribe as potentially attaching religious and cultural significance to historic properties in the project area. By this letter, the NRC invites the Cheyenne River Sioux Tribe to participate as a consulting party in the National Historic Preservation Act Section 106 process. If the Tribe would like to participate as a consulting party, please respond by writing to Mr. Kevin Hsueh.

As established in Title 10 Code of Federal Regulations Part 51 (10 CFR 51), the NRC regulation that implements the National Environmental Policy Act of 1969, as amended, the NRC is preparing a Supplemental Environmental Impact Statement (SEIS) for the proposed action. As part of the environmental review, the SEIS will include an analysis of potential impacts to historic and cultural properties and is therefore requesting input from the Cheyenne River Sioux Tribe to facilitate the identification of tribal historic sites or cultural resources that may be affected by the proposed action. Specifically, the NRC is interested in learning of any areas on the Dewey-Burdock site that you believe have traditional religious or cultural significance. After a careful review and assessment of all the comments received, the NRC will determine what additional actions are necessary to comply with 10 CFR 51 and 36 CFR 800, the implementing regulation for Section 106 of the National Historic Preservation Act.



J. B. Plenty

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The Powertech Dewey-Burdock Project license application is publicly available in the NRC Public Document Room located at One White Flint North, 11555 Rockville Pike, Rockville, Maryland 20852, or from the NRC's Agency Wide Documents Access and Management System (ADAMS). The ADAMS Public Electronic Reading Room is accessible at <http://www.nrc.gov/reading-rm/adams.html>. The accession numbers for the Powertech application including the Environmental report is ML092870160.

Please submit your request to be a consulting party as well as any information that you may have regarding this environmental review within 30 days of the receipt of this letter to NRC, Attention: Mr. Kevin Hsueh, Mail Stop T8F05, Washington, DC 20555. If you have any questions or comments, or need any additional information, please contact Ms. Haimanot Yilma of my staff by telephone at 301-415-8029, or email at [Haimanot.Yilma@nrc.gov](mailto:Haimanot.Yilma@nrc.gov).

Sincerely,

/RA/

Kevin Hsueh, Branch Chief  
 Environmental Review Branch-B  
 Environmental Protection and Performance  
 Assessment Directorate  
 Division of Waste Management  
 and Environmental Protection  
 Office of Federal and State Materials  
 and Environmental Management Programs

Enclosure:  
 Figure 1.4-1

cc w/enclosure:  
 D. Dupris



## United States Department of the Interior

### FISH AND WILDLIFE SERVICE

Ecological Services  
420 South Garfield Avenue, Suite 400  
Pierre, South Dakota 57501-5408

March 29, 2010

Mr. Kevin Hsueh  
Nuclear Regulatory Commission  
Mail Stop T8F05  
Washington, DC 20555

Re: Powertech Dewey-Burdock Project,  
Docket 040-09075, Custer and Fall River  
County, South Dakota

Dear Mr. Hsueh:

This letter is to provide environmental comments on your March 15, 2010, letter regarding the above referenced project which proposes granting a radioactive source materials license to develop and operate the Dewey-Burdock *in-situ* recovery facility near Edgemont, South Dakota. The Powertech Dewey-Burdock Project is proposed within portions of Sections 1-5, 10-12, 14 and 15, Township 7 South, Range 1 East, Fall River County, South Dakota, and Sections 20, 21, and 27-35, Township 6 South, Range 1 East, Custer County, South Dakota.

These comments have been prepared in accordance with provisions of the Fish and Wildlife Coordination Act (16 U.S.C. 661 et seq.) and the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.), as amended. This constitutes the report of the Department of the Interior on the proposed project and is to be used in your determination of 404 (b)(1) guidelines (40 CFR 230) and in your public interest review (33 CFR 320.4) as they relate to the protection of fish and wildlife resources.

The National Wetlands Inventory indicates that numerous wetlands exist within the proposed permit boundary area. Two maps are enclosed showing wetlands found within the two initial mine units. The locations of other wetlands within the proposed permit boundary can be accessed at <http://www.fws.gov/wetlands/Data/Mapper.html>.

The U.S. Fish and Wildlife Service (Service), in accordance with the National Environmental Policy Act of 1969 (42 U.S.C. 4321-4347) and other environmental laws and rules, recommends complete avoidance of these areas, if possible. If this is not possible, attempts should be made to minimize adverse impacts. Finally, if adverse impacts are unavoidable, then measures should be undertaken to replace the impacted areas.

The Fish and Wildlife Coordination Act and Executive Order 11990 (Protection of Wetlands) encourages the protection and conservation of wetlands. In reviewing projects that may impact wetlands, the Service encourages: 1) avoidance of wetlands, if possible, 2) minimization of impacts to wetlands if they cannot be avoided, and 3) replacement of wetland values that may be impacted by a project.

In accordance with section 7(c) of the Endangered Species Act, as amended, 16 U.S.C. 1531 et seq., we have determined that the following federally listed species may occur (this list is considered valid for 90 days) within Custer County:

<u>Species</u>	<u>Status</u>	<u>Expected Occurrence</u>
Whooping crane ( <u>Grus americana</u> )	Endangered	Migration.
Black-footed ferret ( <u>Mustela nigripes</u> )	Endangered	None.

The whooping crane generally migrates through the eastern portion of Custer County, and the black-footed ferret is currently only found in the Wind Cave National Park. We have no information to indicate that these species are located within the project boundaries.

Whooping cranes migrate through South Dakota on their way to northern breeding grounds and southern wintering areas. They occupy numerous habitats such as cropland and pastures; wet meadows; shallow marshes; shallow portions of rivers, lakes, reservoirs, and stock ponds; and both freshwater and alkaline basins for feeding and loafing. Overnight roosting sites frequently require shallow water in which they stand and rest. Additionally, should mining activities occur during spring or fall migration, the potential for disturbances to whooping cranes exists. Disturbance (flushing the birds) stresses them at critical times of the year. We recommend that you remain vigilant for these birds. There is little that can be done to reduce disturbance besides ceasing activities at sites where the birds have been observed. The birds normally do not stay in any one area for long during migration. Any whooping crane sightings should be reported to this office.

Fall River County does not have any federally listed species, but the greater sage-grouse (Centrocercus urophasianus) is a candidate species that historically occurred in the area and has a potential to be present within the proposed area of review.

The Service determined that the species is warranted for listing pursuant to the Endangered Species Act; however, efforts in that regard will be precluded in deference to higher priority species. This finding means that the greater sage-grouse is now a candidate species for future reclassification as a threatened or endangered species under the Endangered Species Act. The 12-Month Findings for Petitions to List the Greater Sage-Grouse (Centrocercus urophasianus) as Threatened or Endangered was published in the Federal Register 75: 13909-13958 on March 23, 2010.



Candidate species have no legal protection under the Endangered Species Act at the present time; however, some agencies may consider their status in their management efforts.

If the Nuclear Regulatory Agency or their designated representative determines that the project "may adversely affect" listed species in South Dakota, it should request formal consultation from this office. If a "may affect - not likely to adversely affect" determination is made for this project, it should be submitted to this office for concurrence. If a "no effect" determination is made, further consultation may not be necessary. However, a copy of the determination should be sent to this office. For more information regarding Federal action agency responsibilities as related to section 7 of the Endangered Species Act, please refer to the Service's Endangered Species Act Consultation Handbook, available online at <http://endangered.fws.gov/consultations/index.html>.

If changes are made in the project plans or operating criteria, or if additional information becomes available, the Service should be informed so that the above determinations can be reconsidered.

The Service appreciates the opportunity to provide comments. If you have any questions regarding these comments, please contact Terry Quesinberry of this office at (605) 224-8693, Extension 237.

Sincerely,



Scott Larson  
Acting Field Supervisor  
South Dakota Field Office

Enclosures

cc: Corps of Engineers/Regulatory; Pierre, SD

September 8, 2010

Mrs. Theresa Two Bulls  
Oglala Sioux Tribe  
P.O. Box 2070  
Pine Ridge, SD 57770-2070

SUBJECT: REQUEST FOR UPDATED TRIBAL COUNCIL MEMBERS FOR THE OGLALA  
SIOUX TRIBE

Dear President Two Bulls:

As established in Title 10 Code of Federal Regulations Part 51 (10 CFR 51), the U.S. Nuclear Commission (NRC) regulation implementing the National Environmental Policy Act of 1969, as amended, the NRC is preparing a Supplemental Environmental Impact Statement (SEIS) for the proposed action. As part of the environmental review, the SEIS will include an analysis of potential impacts of the proposed action to historic and cultural properties.

On March 19, 2010, the NRC sent a letter to your office inviting the Oglala Sioux to participate as a consulting party and requested information regarding tribal historic and cultural resources potentially affected by the proposed Dewey-Burdock ISR facility. This letter was also forwarded to the Cultural Resources Director, Michael Catches Enemy. The March 19<sup>th</sup> letter is enclosed, for your convenience.

The NRC Staff remains committed to receiving information from the Oglala Sioux concerning cultural and historical resources at the proposed Dewey-Burdock ISR facility. During the recent hearing process, the NRC staff was advised the Tribal Historic Preservation Officer and Cultural Resources Director at the Oglala Sioux tribe had changed. In an effort to ensure continued open and prompt communication between the Oglala Sioux tribe and the NRC, the NRC kindly requests the names and contact information for the new Tribal Historic Preservation Officer and the Cultural Resources Director.

T. Two Bulls

2

The NRC staff requests that you submit information regarding the new tribal officers of the Oglala Sioux tribe to the following address: Attention: Mr. Kevin Hsueh, Mail Stop T8F05, Washington, D.C. 20555. If you have any questions or comments, or need any additional information, please contact the environmental project manager, Ms. Haimanot Yilma by telephone at 301-415-8029, or email at [Haimanot.Yilma@nrc.gov](mailto:Haimanot.Yilma@nrc.gov).

Sincerely,

/RA/

Kevin Hsueh, Branch Chief  
Environmental Review Branch - B  
Environmental Protection and Performance  
Assessment Directorate  
Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Programs

cc: Counsel for the Oglala Sioux Tribe  
Western Mining Action Project  
P. O. Box 349  
Lyons, CO 80540  
Jeffrey C. Parsons

Counsel for the Oglala Sioux Tribe  
Gonzales Law Firm  
522 7<sup>th</sup> Street, Suite 202  
Rapid City, SD 57701  
Grace Dugan Esq



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

March 19, 2010

*Kade*



It is the determination of the Turtle Mountain Tribal Historic Preservation Office that this project will have no effect on historic properties of importance to the Turtle Mountain Band of Chippewa Indians. A determination of No Historic Property Affected is granted for the project to proceed.

Twila Martin-Kekabah, Chairperson  
 Turtle Mountain Band of Chippewa  
 P.O. Box 900  
 Belcourt, ND 58316

*[Signature]* 4-7-10  
 0101121574

SUBJECT: INVITATION FOR FORMAL CONSULTATION UNDER NATIONAL HISTORIC PRESERVATION ACT SECTION 106 AS WELL AS REQUEST FOR INFORMATION REGARDING TRIBAL HISTORIC AND CULTURAL RESOURCES POTENTIALLY AFFECTED BY THE POWERTECH INC. PROPOSED DEWEY-BURDOCK IN-SITU RECOVERY FACILITY NEAR EDMONT SOUTH DAKOTA

Dear Chairperson Martin-Kekabah:

The U.S. Nuclear Regulatory Commission (NRC) has received an application from Powertech Inc. (Powertech) for a new radioactive source materials license to develop and operate the Dewey-Burdock Project located near Edgemont, South Dakota in Fall River and Custer Counties. The facility, if licensed, would use an *in-situ* recovery methodology to extract uranium at the Dewey-Burdock site. The proposed project area consists of approximately 10,580 acres (4,282 ha) located on both sides of Dewey Road (County Road 6463) and portions of Sections 1-5, 10-12, 14, and 15, Township 7 South, Range 1 East and Sections 20, 21, 27, 28, 29, and 30-35, Township 6 South, Range 1 East, Black Hill Meridian. A map showing the proposed project boundary is enclosed (Powertech Figure 1.4-1).

The South Dakota State Historic Preservation Officer identified the Turtle Mountain Band of Chippewa as potentially attaching religious and cultural significance to historic properties in the project area. By this letter, the NRC invites the Turtle Mountain Band of Chippewa to participate as a consulting party in the National Historic Preservation Act Section 106 process. If the Band would like to participate as a consulting party, please respond by writing to Mr. Kevin Hsueh.

As established in Title 10 Code of Federal Regulations Part 51 (10 CFR 51), the NRC regulation that implements the National Environmental Policy Act of 1969, as amended, the NRC is preparing a Supplemental Environmental Impact Statement (SEIS) for the proposed action. As part of the environmental review, the SEIS will include an analysis of potential impacts to historic and cultural properties and is therefore requesting input from the Turtle Mountain Band of Chippewa to facilitate the identification of tribal historic sites or cultural resources that may be affected by the proposed action. Specifically, the NRC is interested in learning of any areas on the Dewey-Burdock site that you believe have traditional religious or cultural significance. After a careful review and assessment of all the comments received, the NRC will determine what additional actions are necessary to comply with 10 CFR 51 and 36 CFR 800, the implementing regulation for Section 106 of the National Historic Preservation Act.



September 10, 2010

Ron His Horse Is Thunder, Chairman  
Standing Rock Sioux Tribe  
P.O. Box D  
Ft. Yates, ND 58538-0522

SUBJECT: INVITATION FOR FORMAL CONSULTATION UNDER THE SECTION 106 OF  
THE NATIONAL HISTORIC PRESERVATION ACT

Dear Chairman Thunder:

As established in Title 10 *Code of Federal Regulations* Part 51 (10 CFR 51), the U.S. Nuclear Regulatory Commission (NRC) regulations that implement the National Environmental Policy Act (NEPA) of 1969, as amended, the NRC is preparing a Supplemental Environmental Impact Statement (SEIS) for the proposed Powertech Inc. Dewey-Burdock In-Situ Recovery (ISR) Facility near Edgemont, South Dakota. As part of the environmental review, the SEIS will include an analysis of potential impacts of the proposed action to historic and cultural properties.

On March 19, 2010, the NRC sent a letter to your office inviting the Standing Rock Sioux Tribe to participate as a consulting party and requested information regarding tribal historic and cultural resources potentially affected by the proposed Dewey-Burdock ISR facility. A copy of the March 19<sup>th</sup> letter is enclosed, for your convenience.

To date, the NRC has not received any response from your office regarding the Tribe's interest in becoming a consulting party for the proposed Dewey-Burdock ISR facility near Edgemont South Dakota.

The NRC again extends an invitation to the Standing Rock Sioux Tribe to participate as a consulting party for the proposed Dewey Burdock ISR facility. Specifically, the NRC is interested in learning of any areas on the proposed Dewey-Burdock site that you believe have traditional religious or cultural significance and whether there are specialized concerns or information known to the Tribe that should be considered by the staff during the development of the SEIS.

The NRC staff understands that the Tribe may raise issues in consultation that should be kept confidential and nonpublic; the staff is committed to maintaining confidentiality of said information.

After a careful review and assessment of all information and comments received, the NRC will determine what additional actions are necessary to comply with 10 CFR Part 51 and 36 CFR 800, the implementing regulations for Section 106 of the National Historic Preservation Act.

R. Thunder

2

If the Tribe would like to participate as a consulting party pursuant to Section 106, the Tribe should express its interest in participating and identify areas of concern, within 60 days of receipt of this letter, to ensure that the parties will have the opportunity to engage in meaningful and productive consultation. The Tribe should forward its response to the following address: Mr. Kevin Hsueh, Mail Stop T-8F05, Washington, DC. 20555.

If you have any questions or comments, or need any additional information, please contact the environmental Project Manager, Ms. Haimanot Yilma by telephone at 301-415-8029, or email at [Haimanot.Yilma@nrc.gov](mailto:Haimanot.Yilma@nrc.gov).

Sincerely,

/RA/

Kevin Hsueh, Branch Chief  
Environmental Review Branch B  
Environmental Protection and Performance  
Assessment Directorate  
Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Programs

Docket No.: 040-09075

Enclosure: Letter of March 19, 2010

cc: w/enclosure  
Waste' Win Young, THPO  
Standing Rock Sioux Tribe  
P.O Box D  
Fort Yates, ND 58538

**TRIBAL HISTORIC PRESERVATION***Mandan Hidatsa Arikara*

Perry 'No Tears' Brady, Director.

404 Frontage Road,

New Town, North Dakota 58763

Ph/701-862-2474 fax/701-862-2490

pbrady@mhanation.com

September 20, 2010

Mr. Kevin Hsueh,  
Mail Stop T-8FO5,  
Washington, DC 20555

Subject: Invitation for formal consultation under the section 106 of the National Historic  
Preservation ACT

Dear Mr. Hsueh

After review of the documentation provided by your Office, the Mandan Hidatsa Arikara Nations. Tribal Historic Preservation Office determines there will be 'No Adverse Affect/No Historic Properties Affected' in regard to any pre and post-historic relics, artifacts or sacred In addition, cultural resources in the proposed Project area.

We respectfully request to be notified should any cultural/tribal issue or others arise as the Project progresses.

Sincerely,

A handwritten signature in black ink, appearing to read "Perry Brady", is positioned above the typed name.

Perry "No Tears" Brady,  
Tribal Historic Preservation Officer  
Mandan Hidatsa Arikara Nations.

**DeweyBurdPubEm Resource**

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**From:** Dianne Desrosiers [DianneD@SWO-NSN.GOV]  
**Sent:** Friday, October 01, 2010 11:40 AM  
**To:** Yilma, Haimanot  
**Subject:** Consultation

Good morning,

My name is Dianne Desrosiers and I am the Tribal Historic Preservation Officer for the Sisseton Wahpeton Oyate in NE South Dakota. I am in receipt of your correspondence dated September 10, 2010, invitation for consultation.

At this time the Sisseton Wahpeton Oyate would like to participate in consultation for Section 106 of the NHPA, for the Dewey Burdock ISR facility. We will be sending our request to consult to Mr. Kevin Hsueh.

Thank you for your attention in this matter.





## Tribal Historic Preservation Office

P.O. Box 907  
205 Oak St. East, Suite 121  
Sisseton, SD 57262  
(605) 698-3584 phone  
(605) 698-4283 fax

November 2, 2010

**Kevin Hsueh, Branch Chief  
Environmental Review Branch B  
United States Nuclear Regulatory Commission  
Mail Stop T-8F05  
Washington, DC 20555**

***Re: Invitation for Formal Consultation Under the National Historic Preservation Act;  
Proposed Dewey Burdock In Situ Recovery Facility near Edgemont South Dakota***

Dear Mr. Hsueh,

We are in receipt of your correspondence dated September 20, 2010. *Invitation for Formal Consultation Under Section 106 of the National Historic Preservation Act.*

Thank you for inviting the Sisseton Wahpeton Oyate (SWO) to participate as a consulting party as the U.S. Nuclear Regulatory Commission (NRC) works to satisfy its statutory obligations under the National Historic Preservation Act (NHPA) of 1966 (as amended), and National Environmental Policy Act (NEPA) to review impacts to cultural and historic resources potentially impacted by the proposed Powertech, Inc. Dewey-Burdock In-Situ Leach Uranium Mine. As you are aware, the proposed mine is located within the traditional and treaty lands of the Great Sioux Nation, which includes the Dakota bands. The SWO is interested in working with the NRC to identify and protect the cultural and historic resources threatened by the project.

As you may be aware the project is in a high probability and highly sensitive area. The effects to the land and resources include not only site-specific physical impacts, but also broader landscape-level impacts along with more intangible impacts to the integrity of the area from cultural, historical, spiritual, and religious perspectives.

1

The area of potential effect is located within the traditional and treaty lands of the Great Sioux Nation and other nations which consider this area, traditional homelands. We are interested in working with the NRC to identify and protect the cultural and historic resources threatened by the project.

At this time the Sisseton Wahpeton Oyate is requesting formal group consultation with regard to the above mentioned project. I would encourage you to make every effort to contact tribes that place religious and cultural significance to properties within the Black Hills (APE) which they deem significant to their existence. In an earlier conversation with a representative from your office (Haimanot Yilma), I suggested contacting the Oglala Sioux Tribe to afford them the opportunity to host such a meeting at the Prairie Winds Casino (which is the tribal nation in closest proximity to the site) and invite tribes to this group consultation. This would offer tribes an opportunity to discuss and share information to better preserve areas of religious and cultural significance.

We look forward to meeting with you in the near future. Together, we will protect and preserve our irreplaceable cultural resources. If you have any questions, please contact our office.

Thank you for your attention in this matter.



Dianne Desrosiers  
Tribal Historic Preservation Officer

Cc: Rosebud Sioux Tribe THPO  
Oglala Sioux Tribe THPO  
Cheyenne River Sioux Tribe THPO  
Santee Sioux Tribe THPO  
Yankton Sioux Tribe THPO  
Northern Cheyenne, THPO  
Standing Rock Sioux Tribe THPO  
Crow Tribe THPO



Protecting the Land, Cultural,  
Heritage and Tradition for  
the Future Generation

### *Tribal Historic Preservation Office*

*P.O. Box 809  
Rosebud, South Dakota  
Telephone: (605) 747-4255  
Fax: (605) 747-4211  
Email: rstthpo@yahoo.com*



Russell Eagle Bear  
Officer

Kathy Arcoren  
Administrative Assistant

November 7, 2010

Kevin Hsueh, Branch Chief  
Environmental Review Branch B  
United States Nuclear Regulatory Commission  
Mail Stop T-8F05  
Washington, DC 20555

*Re: Invitation for Formal Consultation Under the National Historic Preservation Act;  
Proposed Dewey Burdock In Situ Recovery Facility near Edgemont South Dakota*

Dear Mr. Hsueh,

We are in receipt of your correspondence dated September 20, 2010. *Invitation for Formal Consultation Under Section 106 of the National Historic Preservation Act.*

Thank you for inviting the Rosebud Sioux Tribe (RST) to participate as a consulting party with the U.S. Nuclear Regulatory Commission (NRC). We realize that the NRC is attempting to work at satisfying its statutory obligations under the National Historic Preservation Act (NHPA) of 1966 (as amended), and National Environmental Policy Act (NEPA) to review impacts to cultural and historic resources potentially impacted by the proposed Powertech, Inc. Dewey-Burdock In-Situ Leach Uranium Mine. As you are aware, the proposed mine is located within the traditional homelands and treaty set aside lands of the Great Sioux Nation. The RST is **interested in working with the NRC to identify and protect the cultural and historic resources threatened by the proposed project.**

As you are undoubtedly aware, the proposed project is in a highly probable and sensitive area regarding cultural resources. The effects to the land and resources include not only site-specific physical impacts, but also broader landscape-level impacts including intangible and tangible impacts to the integrity of the area from cultural, historical, spiritual, and religious perspectives.

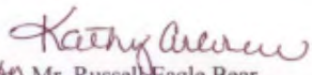
At this time the RST is requesting formal group consultation with regard to the above mentioned project. We encourage you to make every effort to contact tribes that place religious and cultural significance to properties within the Black Hills (APE) that they deem significant to their continuity and existence. We suggest contacting the Oglala Sioux Tribe (OST) to afford them the opportunity to host a meeting at the Prairie Winds Casino and invite tribes to this group

consultation. As a caveat to this suggestion, understand that the OST is the tribe nearest in physical proximity to the APE and what effects' one of our allies, effect's us all. This action would offer tribes an opportunity to discuss and share information to better preserve areas of religious and cultural significance.

We look forward to meeting with you in the near future. Together, we can and will protect and preserve our irreplaceable cultural resources. If you have any questions, please contact our office as soon as possible.

Thank you for your attention in this matter.

Sincerely,

  
for Mr. Russell Eagle Bear  
Tribal Historic Preservation Officer  
Rosebud Sioux Tribe  
PO Box 809  
Rosebud, South Dakota 57570  
Ph.- (605) 747-4255  
Email: rstthpo@yahoo.com

**DeweyBurdPubEm Resource**

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**From:** Yilma, Haimanot  
**Sent:** Friday, November 12, 2010 4:32 PM  
**To:** clairsgreen@yahoo.com  
**Cc:** DeweyBurdHrgFile Resource  
**Attachments:** Lower Brule Sioux.pdf

Ms. Green,

Per your request, attached please find the consultation letter sent to the Lower Brule Sioux Tribe on September 2010.

Thanks

Haimanot Yilma  
Project Manager  
FSME/DWMEP/EPPAD/ERB  
U.S Nuclear Regulatory Commission  
Phone: 301-415-8029  
email: [haimanot.yilma@nrc.gov](mailto:haimanot.yilma@nrc.gov)  
Mail Stop : T8H09





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

September 10, 2010

Michael Jandreau, Chairman  
 Lower Brule Sioux Tribe  
 P.O. Box 187  
 Lower Brule, SD 57548-0187

SUBJECT: INVITATION FOR FORMAL CONSULTATION UNDER THE SECTION 106 OF  
 THE NATIONAL HISTORIC PRESERVATION ACT

Dear Chairman Jandreau:

As established in Title 10 *Code of Federal Regulations* Part 51 (10 CFR 51), the U.S. Nuclear Regulatory Commission (NRC) regulations that implement the National Environmental Policy Act (NEPA) of 1969, as amended, the NRC is preparing a Supplemental Environmental Impact Statement (SEIS) for the proposed Powertech Inc. Dewey-Burdock In-Situ Recovery (ISR) Facility near Edgemont, South Dakota. As part of the environmental review, the SEIS will include an analysis of potential impacts of the proposed action to historic and cultural properties.

On March 19, 2010, the NRC sent a letter to your office inviting the Lower Brule Sioux Tribe to participate as a consulting party and requested information regarding tribal historic and cultural resources potentially affected by the proposed Dewey-Burdock ISR facility. A copy of the March 19<sup>th</sup> letter is enclosed, for your convenience.

To date, the NRC has not received any response from your office regarding the Tribe's interest in becoming a consulting party for the proposed Dewey-Burdock ISR facility near Edgemont South Dakota.

The NRC again extends an invitation to the Lower Brule Sioux Tribe to participate as a consulting party for the proposed Dewey Burdock ISR facility. Specifically, the NRC is interested in learning of any areas on the proposed Dewey-Burdock site that you believe have traditional religious or cultural significance and whether there are specialized concerns or information known to the Tribe that should be considered by the staff during the development of the SEIS.

The NRC staff understands that the Tribe may raise issues in consultation that should be kept confidential and nonpublic; the staff is committed to maintaining confidentiality of said information.

After a careful review and assessment of all information and comments received, the NRC will determine what additional actions are necessary to comply with 10 CFR Part 51 and 36 CFR 800, the implementing regulations for Section 106 of the National Historic Preservation Act.

M. Jandreau

2

If the Tribe would like to participate as a consulting party pursuant to Section 106, the Tribe should express its interest in participating and identify areas of concern, within 60 days of receipt of this letter, to ensure that the parties will have the opportunity to engage in meaningful and productive consultation. The Tribe should forward its response to the following address: Mr. Kevin Hsueh, Mail Stop T-8F05, Washington, DC. 20555.

If you have any questions or comments, or need any additional information, please contact the environmental Project Manager, Ms. Haimanot Yilma by telephone at 301-415-8029, or email at [Haimanot.Yilma@nrc.gov](mailto:Haimanot.Yilma@nrc.gov).

Sincerely,



Kevin Hsueh, Branch Chief  
Environmental Review Branch B  
Environmental Protection and Performance  
Assessment Directorate  
Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Programs

Docket No.: 040-09075

Enclosure: Letter of March 19, 2010

cc: w/enclosure  
Clair Green  
Cultural Resources  
Lower Brule Sioux Tribe  
P.O Box 187  
Lower Brule, SD 57548-0187



## LOWER BRULE SIOUX TRIBE

---

November 15, 2010

Kevin Hsueh, Branch Chief  
Environmental Review, Branch B  
Nuclear Regulatory Commission  
Mail Stop T-8F05  
Washington, DC. 20555

Dear Mr. Hsueh:

The Lower Brule Sioux Tribe requests to participate as a consulting party in both the NHPA Section 106 consultation as well as consultation on the Supplemental EIS for the Dewey-Burdock ISR facility near Edgemont South Dakota. Ms Clair Green, Lower Brule Cultural Resource/Public Information Office (605) 473-8037 is our contact for this project.

Thank you for your consideration.

Sincerely,

  
Michael B. Jandreau  
Chairman



**DeweyBurdPubEm Resource**

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**From:** Yilma, Haimanot  
**Sent:** Monday, November 22, 2010 5:15 PM  
**To:** gravattiana@yahoo.com  
**Cc:** Hsueh, Kevin  
**Subject:** NRC's Consultation letter for proposed Dewey-Burdock ISR facility near Edgemont, SD  
**Attachments:** Yankton Sioux Tribe.pdf

Ms. Gravatt,

Thank you for taking the time to speak with me today. Per our conversation just now and your request, I have attached the consultation letter sent on Sept 10, 2010. Please address your response to the attached letter to my Branch Chief Kevin Hsueh at the following address:

Mr. Kevin Hsueh,  
Mail Stop T-8HF05,  
Washington, DC 20555.

You can also find this information inside the attached letter.

Sincerely,

Haimanot Yilma  
Project Manager  
FSME/DWMEP/EPPAD/ERB  
U.S Nuclear Regulatory Commission  
Phone: 301-415-8029  
email: [haimanot.yilma@nrc.gov](mailto:haimanot.yilma@nrc.gov)  
Mail Stop : T8H09

---

**From:** Yilma, Haimanot  
**Sent:** Monday, November 22, 2010 5:01 PM  
**To:** Yilma, Haimanot  
**Subject:**



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

September 10, 2010

Robert Cournoyer, Chairman  
 Yankton Sioux Tribe  
 P. O. Box 248  
 Marty, SD 57361-0248

SUBJECT: INVITATION FOR FORMAL CONSULTATION UNDER THE SECTION 106 OF THE NATIONAL HISTORIC PRESERVATION ACT

Dear Chairman Cournoyer:

As established in Title 10 *Code of Federal Regulations* Part 51 (10 CFR 51), the U.S. Nuclear Regulatory Commission (NRC) regulations that implement the National Environmental Policy Act (NEPA) of 1969, as amended, the NRC is preparing a Supplemental Environmental Impact Statement (SEIS) for the proposed Powertech Inc. Dewey-Burdock In-Situ Recovery (ISR) Facility near Edgemont, South Dakota. As part of the environmental review, the SEIS will include an analysis of potential impacts of the proposed action to historic and cultural properties.

On March 19, 2010, the NRC sent a letter to your office inviting the Yankton Sioux Tribe to participate as a consulting party and requested information regarding tribal historic and cultural resources potentially affected by the proposed Dewey-Burdock ISR facility. A copy of the March 19<sup>th</sup> letter is enclosed, for your convenience.

To date, the NRC has not received any response from your office regarding the Tribe's interest in becoming a consulting party for the proposed Dewey-Burdock ISR facility near Edgemont, South Dakota.

The NRC again extends an invitation to the Yankton Sioux Tribe to participate as a consulting party for the proposed Dewey Burdock ISR facility. Specifically, the NRC is interested in learning of any areas on the proposed Dewey-Burdock site that you believe have traditional religious or cultural significance and whether there are specialized concerns or information known to the Tribe that should be considered by the staff during the development of the SEIS.

The NRC staff understands that the Tribe may raise issues in consultation that should be kept confidential and nonpublic; the staff is committed to maintaining confidentiality of said information.

After a careful review and assessment of all information and comments received, the NRC will determine what additional actions are necessary to comply with 10 CFR Part 51 and 36 CFR 800, the implementing regulations for Section 106 of the National Historic Preservation Act.

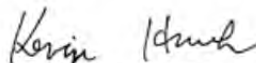
R. Cournoyer

2

If the Tribe would like to participate as a consulting party pursuant to Section 106, the Tribe should express its interest in participating and identify areas of concern, within 60 days of receipt of this letter, to ensure that the parties will have the opportunity to engage in meaningful and productive consultation. The Tribe should forward its response to the following address: Mr. Kevin Hsueh, Mail Stop T-8F05, Washington, DC. 20555.

If you have any questions or comments, or need any additional information, please contact the environmental Project Manager, Ms. Haimanot Yilma by telephone at 301-415-8029, or email at [Haimanot.Yilma@nrc.gov](mailto:Haimanot.Yilma@nrc.gov).

Sincerely,



Kevin Hsueh, Branch Chief  
Environmental Review Branch B  
Environmental Protection and Performance  
Assessment Directorate  
Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Programs

Docket No.: 040-09075

Enclosure: Letter of March 19, 2010

Box 248  
Marty, SD 57361



(605) 384-3804 / 384-3641  
FAX (605) 384-5687

December 3, 2010

Branch Chief Kevin Hsueh  
U.S. Nuclear Regulatory Commission  
Mail Stop T-8HF05  
Washington, DC 20555

Mr. Hsueh:

The Yankton Sioux Tribe is requesting a face to face consultation on all past and current projects at your earliest convenience. The Yankton Sioux Tribe will need to survey projects to protect Traditional Cultural Properties. We want to know what your position is on this. An archeological review is not the same as a TCP survey it is different in knowledge and methodology. We know we have properties of such within your project areas. There is nothing from the Yankton Sioux tribe that states no response means concurrence within 30 days. Please reach me at 1-605-384-3641 or email me at [gravattlana@yahoo.com](mailto:gravattlana@yahoo.com).

Respectfully,

A handwritten signature in blue ink, which appears to read "Lana M. Gravatt". The signature is written over a horizontal line.

Lana M. Gravatt  
Yankton Sioux Tribal Historic Preservation Officer

**DeweyBurdPubEm Resource**

---

**From:** Adrienne Swallow [aswallow@standingrock.org]  
**Sent:** Wednesday, December 08, 2010 3:46 PM  
**To:** Yilma, Haimanot  
**Cc:** Hsueh, Kevin  
**Subject:** Dewey-Burdock Project

Dear Mr. Hsueh,  
The Standing Rock Tribe is in receipt of your letter dated September 10, 2010 regarding our participation as a consulting party under Section 106 of the National Historic Preservation Act for the proposed Dewey Burdock In-Situ Recovery (ISR) facility near Edgemont, SD.

Please note that Ron His Horse is Thunder is no longer our Tribal Chairman and direct all future correspondence to our current Chairman, Charles W. Murphy.

We are not interested in becoming a consulting party for the proposed Dewey-Burdock ISR. In fact, we are opposed to the project because of its proximity to the Black Hills. The Black Hills are considered sacred by the Lakota and Dakota people and we are very concerned that there could be accidental environmental contamination of the area during the operation of in-situ recovery.

We are particularly concerned about contamination of groundwater. What steps will be taken to ensure that groundwater will not be contaminated before, during and after the mine has been completed? How will groundwater be restored to its original pre-mining condition? How will large volumes of waste water be disposed of? How will Native American cultural resources be protected? We hope there will be a satisfactory response to these concerns prior to construction.

We ask that prior to any ground disturbance, a Class III survey be conducted by a Tribal member.

Please keep us informed of all activities regarding the Dewey-Burdock In-Situ Recovery facility.

Sincerely,  
Adrienne Swallow  
Environmental Protection Specialist  
Standing Rock Sioux Tribe  
PO Box D  
Fort Yates, ND 58538  
701-854-8582  
cell: 701-226-0291  
fax: 701-854-3488  
[aswallow@standingrock.org](mailto:aswallow@standingrock.org)



December 15, 2010

Mr. John M. Fowler, Executive Director  
Advisory Council on Historic Preservation  
Office of Federal Agency Programs  
1100 Pennsylvania Ave, NW, Suite 803  
Washington, DC 20004

SUBJECT: POWERTECH INC. PROPOSED DEWEY-BURDOCK IN-SITU RECOVERY  
FACILITY NEAR EDMONT, SOUTH DAKOTA (DOCKET 040-09075)

Dear Mr. Fowler:

The U.S. Nuclear Regulatory Commission (NRC) has received an application from Powertech Inc. (Powertech) for a new radioactive source materials license to develop and operate the Dewey-Burdock Project located near Edgemont, South Dakota in Fall River and Custer Counties. The facility, if licensed, would use an *in-situ* recovery (ISR) methodology to extract uranium at the Dewey-Burdock site. The proposed project boundary consists of approximately 10,580 acres (4,282 ha) located on both sides of Dewey Road (County Road 6463) and portions of Sections 1-5, 10-12, 14, and 15, Township 7 South, Range 1 East and Sections 20, 21, 27, 28, 29, and 30-35, Township 6 South, Range 1 East, Black Hill Meridian. A map showing the proposed project boundary is enclosed (Powertech Figure 1.4-1).

As established in Title 10 *Code of Federal Regulations* Part 51 (10 CFR 51), the NRC regulation that implements the National Environmental Policy Act of 1969 (NEPA), as amended, the NRC is preparing a Supplemental Environmental Impact Statement (SEIS) for the proposed action. The SEIS will address the impacts associated with the construction, operation, and decommissioning of the proposed facility. As outlined in 36 CFR 800, to comply with Section 106 of the National Historic Preservation Act of 1966 through the requirements of the NEPA, the SEIS will include analyses of potential impacts to historic and cultural resources.

To enhance the scope and quality of our review and facilitate the identification of tribal historic sites and/or cultural resources, specifically, sites that may have traditional religious or cultural significance to Native American Tribes that may be interested in and/or affected by the proposed action, the NRC sent consultation letters to 17 tribes, including the Oglala Sioux, on March 19, 2010 and September 10, 2010. The NRC has also made additional contacts with tribal officials offering consultation and seeking information by other means such as telephone calls and emails.

To date, Turtle Mountain Band of Chippewa and Three Affiliated Tribes (Mandan, Hidatsa & Arikara Nation) responded in writing to the consultation letters and stated they anticipate no adverse effect on cultural resources by the proposed action. Fort Peck Assiniboine & Sioux; Sisseton-Wahpeton Oyate, Rosebud Sioux Tribe, and Lower Brule Sioux responded requesting formal consultation. Eastern Shoshone tribe informally indicated that they are interested in formal consultation. The NRC has not yet received responses from the Oglala Sioux; Cheyenne River Sioux; Crow Creek Sioux; Flandreau-Santee Sioux; Standing Rock Sioux; Yankton Sioux; Spirit Lake Tribe; Lower Sioux Indian Community; Northern Cheyenne; and Northern Arapaho tribes.

J.M. Fowler

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The NRC plans on issuing the draft SEIS in summer 2011; when the draft becomes available, a copy will be sent to your office for your review and comment. The NRC will also notify the 17 tribes when the draft SEIS is available and request their comments.

The Powertech Dewey-Burdock Project license application is publicly available in the NRC Public Document Room (PDR) located at One White Flint North, 11555 Rockville Pike, Rockville, Maryland 20852, or from the NRC's Agency Wide Documents Access and Management System (ADAMS). The ADAMS Public Electronic Reading Room is accessible at <http://www.nrc.gov/reading-rm/adams.html>. The accession numbers for the Powertech application including the Environmental Report is ML092870160.

If you have any questions or comments, or need any additional information, please contact Ms. Haimanot Yilma of my staff by telephone at 301-415-8029 or email at [haimanot.yilma@nrc.gov](mailto:haimanot.yilma@nrc.gov)

Sincerely,

/RA/

Kevin Hsueh, Branch Chief  
Environmental Review Branch B  
Environmental Protection  
and Performance Assessment Directorate  
Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Programs

Docket No.: 040-09075

Enclosure: Map

cc: Marian Atkins, Field Office Manager  
South Dakota Field Office - BLM  
310 Roundup Street  
Belle Fourche, SD 57717-1698

Gregory R. Fesko P.G.  
Coal Program Coordinator  
Branch of Solid Minerals - BLM  
Montana State Office  
5001 Southgate Drive  
Billings, MT 59001

**Oglala Sioux Tribe  
Tribal Historic Preservation Office**

P.O. Box 320, W. Hwy 18  
Pine Ridge, SD 57770  
Phone: (605) 867-5969  
Fax: (605) 867-2818  
[ostnrrathpo@gwtc.net](mailto:ostnrrathpo@gwtc.net)



**TRIBAL HISTORIC PRESERVATION ADVISORY COUNCIL:**  
Mr. Tom Bad Heart Bull - Oglala District  
Mr. Francis "Chubbs" Thunder Hawk - Porcupine District  
Mr. Garvard Good Plume, Jr. - Wakpamni District

**STAFF:**  
Tribal Historic Preservation Officer – Mr. Wilmer Mesteth  
Project Review Officer – Ms. Roberta Joyce Whiting  
Natural Resources Director – Mr. Michael Catches Enemy

January 31, 2011

Kevin Hsueh, Branch Chief  
Environmental Review Branch B  
Environmental Protection and Performance  
Assessment Directorate  
Division of Waste Management and  
Environmental Protection  
Office of Federal and State Materials and  
Environmental Management Programs  
United States Nuclear Regulatory Commission  
Mail Stop T-8F05  
Washington, DC 20555

Re: Invitation for Formal Consultation under the National Historic Preservation Act; Request for Information under the National Environmental Policy Act; Proposed Powertech Inc. Dewey-Burdock In-Situ Leach Uranium Mine (NRC Docket No. 040-09075)

Dear Mr. Hsueh:

Thank you for your letters dated September 8, 2010, and September 10, 2010, inviting the Oglala Sioux Tribe to participate as a consulting party as the U.S. Nuclear Regulatory Commission (NRC) works to satisfy its statutory obligations under the National Historic Preservation Act (NHPA) and National Environmental Policy Act (NEPA) to review impacts to cultural and historic resources potentially impacted by the proposed Powertech, Inc. Dewey-Burdock In-Situ Leach Uranium Mine. As you are aware, the proposed mine is located within the traditional and treaty lands of the Great Sioux Nation, which includes the Oglala Sioux Tribe. The Tribe is committed to working with the NRC to identify and protect the cultural and historic resources threatened by the project.

Currently, the Oglala Sioux Tribal Preservation Historic Office is directed by Mr. Wilmer Mesteth. The Tribal Historic Preservation Office looks forward to any support the NRC Staff can provide in facilitating this review, including providing the Tribe an ongoing opportunity to review and comment on the agency's review as it is developed. Please note that the responsibilities and resources of other federal agencies to protect the cultural and historical resources of the Oglala Sioux Tribe which are located on and near the adjacent Black Hills National Forest are also implicated by the location of this project, including the U.S. Forest Service and the Bureau of Land Management.

Page 1 of 3



From information obtained through the application submitted to the NRC by Powertech, Inc., the proposed Dewey-Burdock In-Situ Leach Uranium Mine project represents a substantial potential threat to the preservation of cultural and historic resources of the Oglala Sioux Tribe. These impacts include not only site-specific physical impacts, but also broader landscape-level impacts along with more intangible impacts to the integrity of the area from cultural, historical, spiritual, and religious perspectives.

Importantly, the impact from the proposed mine extends not just from the disturbance associated with the Dewey-Burdock site, which could be substantial in itself, but also the impacts associated with the foreseeable use of the Dewey-Burdock site as a regional uranium processing center for potential mining operations across the region. These broader effects are further compounded by the substantial impacts associated with the large open pit uranium mines at the project area that have been egregiously left entirely unreclaimed since the last uranium boom. It is critical for any credible cultural and historic resource impact analysis to consider the entirety of these past and reasonably foreseeable activities.

A review of the application materials submitted by Powertech to the NRC reveals an incomplete analysis. Nowhere does the application recognize the cumulative impacts associated with regional uranium development or past uranium development. Indeed, the applicant's materials represent that the cultural and historic impacts associated with the entire proposal, even when combined with reasonably foreseeable future and past actions, are "none." This conclusion is unsupported, and appears to have resulted in part from the incomplete methodology employed in reaching it. It appears that the review prepared by Powertech failed to include any direct input from any tribal sources, whether written or oral.

It should be noted that a primary source of credible information in this case are oral histories and ethnographic information of those knowledgeable about the impacted area, whether through personal, family, or ancestral connections. Instead, the application cites only to a handful of studies, most prepared for other projects within some undefined geographic proximity to the proposed mine site. Incorporation of all credible and relevant written and oral sources is necessary, with appropriate measures taken to respect the integrity and confidentiality of such information. In this case, the application fails to assess even the detailed information contained in sworn oral testimony during hearings at the early stages of the State of South Dakota permitting process. These same gaps in information bring into question the reliability and completeness of the application, including the site visit analysis conducted by Powertech. Indeed, the site-visit analysis itself was conducted without any tribal participation and identifies a significant number of archaeological, historical, and traditional cultural resources within the project area that have not yet been evaluated at all.

Critically, information on the historic and cultural significance of the proposed project area is not limited to that held by members of the Oglala Sioux Tribe. Rather, this area is within an area within which other Sioux tribes, in addition to the Cheyenne, Arapahoe, Crow, and Arikara Tribes, among others, also possess intimate cultural knowledge. As such, any credible impact review must assess the historic and cultural impacts associated with these other cultures. For example, the Oglala Sioux Tribal Historic Preservation Office is working toward establishing such a study, with culturally appropriate protocols to protect the information acquired and to incorporate necessary protections where information about such persons is involved in the collection of oral histories and ethnographies.

We look forward to working with the NRC on these important issues. To the fullest extent possible, we ask that the agency share any information that it has collected, and work with the Tribe to identify additional sources of information to include in its analysis. This request includes making available to the Tribe physical copies of all of the cited references in Powertech’s application materials, as well as any additional resources NRC Staff may have available. Further, the Tribe requests NRC’s help in facilitating a timely site visit and review so as to provide the Tribe an opportunity to conduct a full review of the cultural and historic resources at stake. Lastly, the Oglala Sioux Tribe requests that the NRC sponsor and conduct a regional meeting of Tribal Historic Preservation Officers from all affected tribes in order to encourage effective communication to the NRC.

Thank you for the invitation to conduct a thorough consultation process on this important matter.

Sincerely,



Michael Catches Enemy  
Natural Resources Director

Sincerely,



Wilmer Mesteth  
Tribal Historic Preservation Officer

Cc: Honorable President John Yellowbird Steele, Oglala Sioux Tribe  
Oglala Sioux Tribal Land & Natural Resources Committee  
SSR Law  
File



March 4, 2011

Cedric Black Eagle, Chairman  
Crow Tribe of Montana  
Baacheeitché Avenue  
P.O. Box 159  
Crow Agency, MT 59022

SUBJECT: INVITATION FOR FORMAL CONSULTATION UNDER SECTION 106 OF THE  
NATIONAL HISTORIC PRESERVATION ACT

Chairman Black Eagle:

The U.S. Nuclear Regulatory Commission (NRC) has received an application from Powertech Inc. (Powertech) for a new radioactive source materials license to develop and operate the Dewey-Burdock Project located near Edgemont, South Dakota in Fall River and Custer Counties. The facility, if licensed, would use an *in-situ* recovery methodology to extract uranium at the Dewey-Burdock site. The proposed project area consists of approximately 10,580 acres (4,282 ha) located on both sides of Dewey Road (County Road 6463) and portions of Sections 1-5, 10-12, 14, and 15, Township 7 South, Range 1 East and Sections 20, 21, 27, 28, 29, and 30-35, Township 6 South, Range 1 East, Black Hill Meridian. A map showing the proposed project boundary is enclosed (Powertech Figure 1.4-1).

The South Dakota State Historic Preservation Officer identified the Crow Tribe of Montana as potentially attaching religious and cultural significance to historic properties in the project area. By this letter, the NRC invites the Crow Tribe to participate as a consulting party in the National Historic Preservation Act Section 106 process. If the Tribe would like to participate as a consulting party, please respond to this letter.

In regards to the proposed project, the NRC is also engaged in an environmental review and is preparing a Supplemental Environmental Impact Statement (SEIS) pursuant to the National Environmental Policy Act. As part of this review, the SEIS will include an analysis of potential impacts to historic and cultural properties and is therefore requesting input from the Crow Tribe to facilitate the identification of tribal historic sites or cultural resources that may be affected by the proposed action. Specifically, the NRC is interested in learning of any areas on the Dewey-Burdock site that you believe have traditional religious or cultural significance.

The NRC staff understands that the Tribe may raise issues in consultation that should be kept confidential and nonpublic; the staff is committed to maintaining confidentiality of said information.

After a careful review and assessment of all information and comments received, the NRC will determine what additional actions are necessary to comply with 10 CFR Part 51 and 36 CFR 800, the implementing regulations for Section 106 of the National Historic Preservation Act. If the Tribe would like to participate as a consulting party pursuant to Section 106, the Tribe should express its interest in participating and identify areas of concern, within 60 days of receipt of this letter, to ensure that the parties will have the opportunity to engage in meaningful and productive consultation. The Tribe should forward its response to the following address: Mr. Larry Camper, Mail Stop T-8F05, Washington, DC 20555.

C. B. Eagle

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The Powertech Dewey-Burdock Project license application is publicly available in the NRC Public Document Room located at One White Flint North, 11555 Rockville Pike, Rockville, Maryland 20852, or from the NRC's Agency Wide Documents Access and Management System (ADAMS). The ADAMS Public Electronic Reading Room is accessible at <http://www.nrc.gov/reading-m/adams.html>. The accession numbers for the Powertech application including the Environmental report is ML092870160.

If you have any questions or comments, or need any additional information, please contact the Environmental Project Manager, Ms. Haimanot Yilma by telephone at 301-415-8029, or email at [Haimanot.Yilma@nrc.gov](mailto:Haimanot.Yilma@nrc.gov).

Sincerely,

/RA/ by K. McConnell for

Larry W. Camper, Director  
Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Programs

Docket No.: 040-09075

Enclosure:  
Figure 1.4-1

cc with enclosure:

Dale Old Horn, THPO,  
Crow Tribe of Montana  
Baacheeitché Avenue  
P.O. Box 159  
Crow Agency, MT 59022

Hubert Two Leggings  
Cultural Resource Officer  
Crow Tribe of Montana  
Baacheeitché Avenue  
P.O. Box 159  
Crow Agency, MT 59022

Marian Atkins  
Field Office Manager - BLM  
South Dakota Field Office  
310 Roundup Street  
Belle Fourche, SD 57717-1698

Gregory R. Fesko P.G.  
Coal Program Coordinator  
Branch of Solid Minerals - BLM  
Montana State Office  
5001 Southgate Drive  
Billings, MT 59001



**From:** Yilma, Haimanot  
**Sent:** Thursday, March 10, 2011 7:51 AM  
**To:** Miller, Debra; Rajapakse, Champa  
**Cc:** Hsueh, Kevin  
**Subject:** FW: Dewey-Burdock Project

Deb and / or Champa,

Can you please put this email in ADAMS and give me the ML number for my records. I am working from home today.

Kevin,

Just to let you know, Crow tribe of MT is interested in becoming a consulting party for Dewey. I will update the status report.

Thanks  
Haimanot

---

**From:** Yilma, Haimanot  
**Sent:** Thursday, March 10, 2011 7:46 AM  
**To:** 'Hubert Two Leggins'  
**Cc:** Yilma, Haimanot  
**Subject:** RE: Dewey-Burdock Project

Mr. Two Leggins

Thank you for responding to our invitation letter. This email is sufficient for us to know your interest in becoming a consulting party under the section 106 consultation process. I will share your interest with my management.

Regards,

Haimanot Yilma  
Project Manager  
301-415-8029

---

**From:** Hubert Two Leggins [<mailto:hubertt@crownations.net>]  
**Sent:** Wednesday, March 09, 2011 7:22 PM  
**To:** Yilma, Haimanot  
**Subject:** Dewey-Burdock Project

Hello Ms. Haimanot Yilma,

I accept the invitation for the formal consultation under section 106 of NHPA. The Crow Tribe has religious and cultural significance to the project area and wants to be a consulting party. I don't know if this is going to

Work for Mr. Larry Camper or if I need to send a separate letter to him please let me know.

Thank You

Hubert B. Two Leggins  
Crow Tribal Cultural Resource Director/Renewable Resource Supervisor  
P. O. Box 159  
Crow Agency, Mt. 59022  
(406) 638-3793 work  
(406) 678-1677 cell

[hubertt@crownations.net](mailto:hubertt@crownations.net)

May 12, 2011

Ms. Lana Gravatt  
Yankton Sioux Tribe  
P.O. Box 248  
Marty, SD 57631-0248

SUBJECT: INVITATION FOR INFORMAL INFORMATION-GATHERING MEETING  
PERTAINING TO THE DEWEY-BURDOCK, CROW BUTTE NORTH TREND,  
AND CROW BUTTE LICENSE RENEWAL, *IN-SITU* URANIUM RECOVERY  
PROJECTS

Dear Ms. Gravatt:

The U.S. Nuclear Regulatory Commission (NRC) staff would like to extend an invitation to the Yankton Sioux Tribe officials (Tribal Historic Preservation Officers and/or Cultural Resources Officers) to assist the NRC in the identification of tribal historic sites, traditional cultural properties, and cultural resources that may be affected by the actions proposed by Cameco Resources Inc. and Powertech Inc. We are extending this invitation because you indicated that you would like to be a consulting party. The NRC will hold an informal information-gathering meeting on June 7, 8, and 9, 2011, at the Prairie Wind Casino and Hotel on the Pine Ridge Reservation in South Dakota.

The information-gathering meeting will include a staff-to-staff session on June 8, 2011, at the Prairie Wind Casino and Hotel on the Pine Ridge Reservation and two days of site visits (June 7 and 9, 2011) to the proposed facilities. The NRC staff has coordinated with Cameco Resources Inc. and Powertech Inc. to arrange for visits to the proposed facilities. The itinerary for the site visit is included in Enclosure 4. Although attendance at the site visits is optional, Tribal representatives are encouraged to participate because the visits will provide an opportunity to tour an existing facility and to view the proposed project areas.

The NRC is in the process of conducting environmental reviews for a number of license applications involving in-situ uranium recovery facilities. These applications include Cameco Resources Inc.'s applications for Crow Butte North Trend and Crow Butte License Renewal, as well as Powertech (USA) Inc.'s application for Dewey-Burdock. The NRC is undertaking these reviews as part of our responsibilities under the National Environmental Policy Act (NEPA). Our reviews will culminate in the issuance of an Environmental Assessment, Environmental Impact Statement, or a Supplemental Environmental Impact Statement. These documents will include analyses of potential impacts to historic and cultural properties. In accordance with the National Historic Preservation Act regulation 36 CFR 800.8(c), we are coordinating our Section 106 review with our NEPA assessment. As part of our reviews, the NRC requests the input of Tribes concerned with the effects the proposed actions may have on historic and cultural properties, so their views may be considered in the decision-making process.

The NRC staff is interested in identifying areas within the Crow Butte sites and/or Dewey-Burdock site that have traditional religious or cultural significance to the Yankton Sioux Tribe of South Dakota, so these may be considered in our environmental reviews. Maps identifying the specific locations of each proposed project are enclosed for your reference (Enclosure 1).



L. Gravatt

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Digital copies of the publicly available archaeological surveys prepared for the Crow Butte Resources and Dewey-Burdock projects are enclosed. These reports are contained in 3 -diskettes (one for Crow Butte and two for Dewey-Burdock- Enclosure 3).

Please provide the NRC staff with copies of, or references to, documentary or published materials you like the staff to review.

NRC staff, in conjunction with the Oglala Sioux Tribe has prepared a tentative agenda for this meeting. The draft agenda is enclosed in this letter for your review (Enclosure 2).

Please identify any additional topics you would like to discuss and let us know by May 20, 2011, how many of your tribal representatives will be attending this meeting. We request your reply be addressed to Mr. Larry Camper, Mail Stop T-8F05, Washington, D.C. 20555. In order to attend the site visit, NRC must have your confirmation by this date to ensure adequate transportation is available for all participants. If possible, provide us with the name and job descriptions of tribal representatives who plan to participate. Ms. Haimanot Yilma and Mr. Nathan Goodman will follow up with you via a phone call to finalize meeting logistics.

The applicants will be providing roundtrip transportation between the Prairie Wind Casino and Hotel on the Pine Ridge Reservation and the Crow Butte and Dewey-Burdock sites. However, other travel costs associated with the June 7-9, 2011, meeting will not be covered.

If you have any questions regarding this meeting, please contact my staff members, Ms. Yilma (via email at [Haimanot.Yilma@nrc.gov](mailto:Haimanot.Yilma@nrc.gov) or via phone at 301-415-8029) or Mr. Goodman (via email at [Nathan.Goodman@nrc.gov](mailto:Nathan.Goodman@nrc.gov) or via phone at 301-415-2703).

Sincerely,

/RA/ APersinko for LCamper

Larry W. Camper, Director  
Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Programs

Docket No.: 040-09075

Docket No.: 040-08943

Enclosures:

1. Map of Crow Butte and Dewey-Burdock  
Proposed Project Areas/Boundary
2. Draft Agenda
3. Archeological Surveys of the Proposed  
Crow Butte & Dewey-Burdock Projects
4. Itinerary for Site Visits

cc: Chairman Robert Courmoyer



August 12, 2011

Mr. Richard Blubaugh  
VP-HS&E Resources  
Powertech (USA) Inc.  
5575 DTC Parkway  
Suite 140  
Greenwood Village, CO 80111

**SUBJECT: INFORMATION REQUIRED BY THE U.S NUCLEAR REGULATORY COMMISSION STAFF TO SATISFY ITS OBLIGATIONS UNDER SECTION 106 OF THE NATIONAL HISTORIC PRESERVATION ACT AND NATIONAL ENVIRONMENTAL POLICY ACT TO COMPLETE ITS REVIEW OF THE IMPACTS TO THE CULTURAL RESOURCES FROM THE PROPOSED DEWEY-BURDOCK PROJECT**

Dear Mr. Blubaugh:

The U.S. Nuclear Regulatory Commission (NRC) has received an application from Powertech (USA) Inc. for a new source material license to permit Powertech to operate the proposed Dewey-Burdock *In-Situ* recovery (ISR) facility. As part of our responsibilities under the National Environmental Policy Act (NEPA), the NRC is conducting an environmental review of Powertech's application. In addition to our NEPA review, the NRC must comply with the National Historic Preservation Act (NHPA). Under Section 106 of the NHPA and its implementing regulations (36 CFR. Part 800), the NRC must take into account the effects that issuing a license to Powertech would have on historic properties and afford the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment on the NRC's findings.

In order to comply with NEPA and Section 106 of the NHPA, the NRC must make reasonable and good faith efforts to identify historic properties within the area of potential effects for the proposed Dewey-Burdock ISR facility. Historic properties include properties of traditional religious and cultural importance to one or more Indian Tribes. Based on information gathered during a June 2011 meeting between the NRC and representatives from six Indian Tribes, and based on consultation with the South Dakota State Historic Preservation Officer (SHPO) and the ACHP, the NRC staff has determined that it requires additional information on Traditional Cultural Properties (TCPs) in the area of potential effect for the proposed Dewey-Burdock facility. The NRC staff needs this information not only to fulfill our obligations under Section 106 of the NHPA, but also to fulfill our obligation under NEPA that we assess potential impacts to cultural resources. This information on TCPs would be in addition to the extensive archeological surveys that Powertech has already submitted in support of its license application.

Although the NRC believes that a traditional cultural property survey of the area of potential effect is an effective method to identify these properties; information on TCPs can also be obtained in a variety of ways. For example, site visits by tribal representatives could be used to

R. Blubaugh

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identify TCPs, or an applicant could hire an archaeologist with experience identifying and evaluating potential TCPs. Alternatively, an applicant could use a combination of these or other methods.

The NRC requests that by August 31, 2011, Powertech submit a written plan for acquiring information on TCPs. Upon receipt of this TCP identification plan, the NRC will determine whether the actions outlined in the plan will provide information sufficient for the NRC to meet any applicable requirements under NEPA and the NHPA.

Attached to this letter for your possible use is a list of Indian Tribes that have expressed interest in historic properties in the area of potential effect for the proposed Dewey-Burdock facility.

Please submit your TCP identification plan to NRC, Attention: Mr. Kevin Hsueh, Mail Stop T8F05, Washington, DC 20555. If you have any questions or comments, or need any additional information, please contact Ms. Haimanot Yilma of my staff by telephone at 301-415-8029, or by email at [Haimanot.Yilma@NRC.gov](mailto:Haimanot.Yilma@NRC.gov).

Sincerely,

/RA/

Kevin Hsueh, Branch Chief  
Environmental Review Branch-B  
Environmental Protection and Performance  
Assessment Directorate  
Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Programs

Docket No. 040-09075

cc: See Attached List



RICHARD E. BLUBAUGH  
Vice President – Health Safety  
& Environmental Resources

**POWERTECH (USA) INC.**

August 31, 2011

Kevin Hsueh, Branch Chief  
Environmental Review Branch B  
Environmental Protection and Performance Assessment Directorate  
Division of Waste Management and Environmental Protection  
Office of Federal and State Materials and Environmental Management Programs  
U.S. Nuclear Regulatory Commission  
Mail Stop T8-FO5  
Washington, DC 20555-0001

Re: Powertech (USA) Inc.'s Response to NRC Request for National Historic  
Preservation Act Section 106 Information; Docket No. 040-09075

Dear Mr. Hsueh:

Attached please find a proposal, developed by SRI Foundation, to support Cameco  
Resources and Powertech (USA) Inc. efforts to collect National Historic Preservation Act  
Section 105 information required for the NRC evaluation of proposed Powertech (USA)  
Inc. operations at the proposed Dewey-Burdock Project.

Should you have any questions, please do not hesitate to contact the undersigned at (303)  
790-7528.

Respectfully yours,

Richard E. Blubaugh

Enclosure

cc: R.F. Clement, President and CEO

Thompson & Pugsley, PLLC  
1225 19<sup>th</sup> Street, NW  
Suite 300  
Washington, DC 20036



Draft Plan August 30, 2011

**Proposal from Cameco Resources and Powertech Inc.  
to the U.S. Nuclear Regulatory Commission**

*A plan for assisting NRC, as the Federal lead agency for Section 106, by gathering information about properties of religious and cultural significance to Federally-recognized Indian tribes that may be affected by their proposed undertakings*

Cameco Resources and Powertech Inc. (hereafter “the companies”) propose to carry out a phased program of information gathering with Indian tribes, as described below, in order to identify places of religious and cultural significance to those tribes that may be affected by the proposed Three Crow, Crow Butte, North Trend, Marsland (Cameco), and Dewey-Burdock (Powertech) projects. These efforts will be carried out in response to NRC’s letter of August 5, 2011, to John Schmuck at Cameco and of August 12, 2011 to Richard Blubaugh of Powertech, requesting additional information on historic properties in support of compliance with Section 106 of the National Historic Preservation Act of 1966 and its implementing regulation, 36 CFR part 800. The companies have secured the services of the SRI Foundation (SRIF) of Rio Rancho, NM to assist them in this effort. Unless otherwise indicated, all tasks below will be carried out by SRIF under the direction of the companies.

**Phase 1**

- Prepare a written plan detailing how the companies propose to proceed and a final list of tribes to be contacted. The companies will submit the plan and list of tribes for review by NRC (and by BLM and SHPOs if they wish to review).
- Define a general study area, encompassing all five proposed undertakings, and two proposed expanded areas of potential effects (APEs; 36 CFR §800.4(a)), one including all areas from which the Dewey-Burdock project will be visible and one encompassing all areas from which any of the four Cameco project areas will be visible. These expanded APEs will take into account the potential sensitivity of places of religious and cultural significance to indirect effects.
- Touch base with NRC review and cultural resource staff; Wyoming, South Dakota, and Nebraska State Historic Preservation Officers (SHPOs); and Bureau of Land Management (BLM) South Dakota Field Office personnel to introduce the information-gathering effort and SRIF staff, and secure agency input on how this effort should proceed. Among the issues to raise: the list of tribes to be contacted, proposed expanded APEs, Advisory Council on Historic Preservation (ACHP) involvement, SHPO preferences for reviewing documents, BLM’s preference for level of involvement, and available information about previously conducted ethnographic research.

1

Draft Plan August 30, 2011

- Review NRC documentation concerning previous consultation with tribes and any NRC policies or protocols for tribal consultation.
- Touch base with company attorneys to identify any sensitive issues relative to current administrative appeals or future litigation.
- Revise the plan and the list of tribes to reflect NRC (and SHPO and BLM, if participating) comments.

#### **Phase 2**

- Assist the companies in developing joint or separate RFPs to secure the services of appropriate ethnographers to complete identification of properties of religious and cultural significance (36 CFR §800.3(c)(2)(B)(ii)) within the two APEs. Assistance may include identifying potential ethnographic consultants, developing scopes of work, and reviewing and commenting on proposals received.
- Develop a brief overview of Native American use and practices in the study area encompassing the companies' project areas to serve as a context; this overview will include information on types of traditional cultural properties typically encountered in this region.
- Develop a script for initial tribal contacts concerning the information-gathering project, and identify supporting materials to be included. The supporting materials may include maps of the projects and areas to be studied (the APEs), photographs of what developed in situ uranium recovery projects look like, an animation of how the in situ recovery process works, etc. Parameters: Information provided should be brief, clear, and nontechnical. Tribes will be provided with a choice among several possible levels of future participation ranging from "not interested in being consulted about these projects" through "would like to be informed about results of efforts to identify archaeological sites and traditional cultural places" through "wish to participate in field visits and ethnographic interviews." Tribes will be encouraged to offer any comments on the proposed areas to be studied.
- Submit script and materials for review by the companies
- Companies submit script and accompanying materials for review by NRC (and BLM if they wish to participate)
- Revise script and materials per NRC (and BLM) comments

#### **Phase 3**

- Make initial contacts with all tribes on the final list. Although NRC has already initiated consultation about these undertakings by letter, it would be most effective if the initial contact about this information-gathering effort were to come from NRC based on draft letters and materials provided by the companies and developed by SRIF. Alternatively, the information sent to the tribes could include copies of the



Draft Plan August 30, 2011

letters from NRC to the companies requesting that the companies gather additional information on traditional cultural properties.

- Follow up with the tribes as needed to secure a response and decision from as many tribes on the list as possible.
- Maintain a detailed record of tribal contacts and responses.
- Provide information to the companies and NRC about tribes wishing to participate in field visits and ethnographic interviews, tribes wishing to participate at lesser levels of consultation, and tribes not wishing to participate.
- Adjust boundaries of the two expanded APEs in response to tribal comments if needed, and coordinate this with SHPOs and NRC.
- Prepare draft letters for NRC's use (if they so wish) to formally invite the interested tribes to be consulting parties for the appropriate Section 106 undertaking or undertakings .

#### **Phase 4**

- Provide assistance to the companies in managing the ethnographic contracts: monitor schedules, recordkeeping, and results; assist contractors with any problems; review reports; ensure that contractors are gathering the needed information about identification, eligibility, effects, and potential measures to resolve any adverse effects.
- Provide monthly updates on the progress of the project to the companies for submission to NRC (and BLM if they wish to receive these reports).
- Communicate with those tribes who asked to be kept informed as the projects proceed.

#### **Phase 5**

- Assemble information from contractors and prepare eligibility recommendations (36 CFR §800.4(c)) for traditional cultural properties in the Cameco and Powertech APEs.
- The companies then submit these eligibility recommendations to NRC for consultation with SHPOs and tribes (and BLM if any properties are on BLM-managed lands).
- Assemble information from contractors, apply the criteria of adverse effect (36 CFR §800.5(a)), and prepare recommendations concerning the effects of in situ recovery development activities on eligible or listed historic properties within the APEs.
- The companies then submit these effect recommendations to NRC for consultation with SHPOs and tribes (and BLM if any properties are on BLM-managed lands).

Draft Plan August 30, 2011

**Optional Phase 6**

- If any adverse effects are identified during Phase 5, assist the company or companies and the NRC to complete consultations with BLM, the SHPO(s) and tribal consulting parties (and ACHP, if they choose to participate) to identify measures to resolve the adverse effects (36 CFR §800.6).
- Prepare a draft Section 106 agreement document (or documents, if multiple Section 106 undertakings are found to have adverse effects (36 CFR §800.6(c) or §800.14(b)(3)) and submit to NRC.

October 20, 2011

Mr. James Laysbad, THPO  
Oglala Sioux Tribe  
P.O. Box 320  
Pine Ridge, SD 57770

SUBJECT: TRANSCRIPT OF INFORMAL INFORMATION-GATHERING MEETING,  
PERTAINING TO THE DEWEY-BURDOCK, CROW BUTTE NORTH TREND,  
AND CROW BUTTE LICENSE RENEWAL *IN-SITU* URANIUM RECOVERY  
PROJECTS, HELD AT PRAIRIE WIND CASINO AND HOTEL ON JUNE 8, 2011;  
INFORMATION PERTAINING TO TRADITIONAL CULTURAL PROPERTIES;  
AND ATTACHED UNREDACTED PORTIONS OF ARCHEOLOGICAL SURVEYS

Dear Mr. Laysbad:

The U.S. Nuclear Regulatory Commission (NRC) extends its thanks to all the Tribal representatives who participated in the Information-Gathering Meeting and associated site visits. We would especially like to thank the Oglala Sioux Tribe for allowing the NRC to hold the meeting on the Pine Ridge Reservation and for hosting meetings. We would also like to thank Mr. Michael Catches Enemy, Oglala Sioux Natural Resources Officer, for serving as the Co-facilitator for the meeting. These efforts culminated in a productive meeting where all parties were able to share their respective viewpoints, comments, and concerns about the uranium recovery process and the facets of the NRC's technical and environmental review process for the *in-situ* recovery facilities.

Enclosed is a paper of the Official Transcript of the Information-Gathering Meeting. If you would like an electronic copy, please contact Ms. Haimanot Yilma or Mr. Nathan Goodman. Please note corrections were not made to the transcript to maintain its originality. If you believe your statements were misrepresented in the transcript, please advise the NRC staff and your comments will be added to the record.

Additionally, at the June 8, 2011 meeting, several Tribal Historic Preservation Officers (THPOs) requested unredacted versions of the archeological surveys submitted as part of the license application. In response to those requests and to facilitate government-to-government consultation, the NRC is enclosing a paper copy of the unredacted portions of the archeological surveys for the Dewey-Burdock, Crow Butte North Trend, and Crow Butte License Renewal projects for your review. A map of all archeological sites on the proposed Dewey-Burdock project area is also included.

As a reminder, this information is sensitive, and the NRC requests the proper storage of these documents, consistent with applicable laws and regulations pertaining to sensitive information.

At the June 8, 2011 meeting, a number of the tribal representatives requested more information on traditional cultural properties (TCPs) be collected. Based on those requests and in accordance



J. Laysbad

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with the requirement of 36 CFR 800.4 (a) the NRC staff has asked the applicants to provide information on how the proposed projects may affect TCPs. In order to address the NRC's request, the applicants may contact your office directly to seek your assistance on developing information on TCPs, in the near future. Once the NRC receives additional information regarding TCPs from the applicants, the NRC plans to distribute the information to all interested THPOs and State Historic Preservation Officers for review and comments.

If you have any questions regarding this letter, please contact my staff members, Ms. Yilma (via email at [Haimanot.Yilma@nrc.gov](mailto:Haimanot.Yilma@nrc.gov) or via phone at 301-415-8029) or Mr. Goodman (via email at [Nathan.Goodman@nrc.gov](mailto:Nathan.Goodman@nrc.gov) or via phone at 301-415-2703).

Sincerely,

/RA/

Kevin Hsueh, Branch Chief  
Environmental Review Branch-B  
Environmental Protection and Performance  
Assessment Directorate  
Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Programs

Docket No. 40-8943, 40-9075

Enclosures:

1. Official Transcript
2. Unredacted Portions of the Archeological Survey for Dewey-Burdock Project
3. Unredacted Portions of the Archeological Survey for Crow Butte North Trend Project
4. Unredacted Portions of the Archeological Survey for License Renewal Project
5. Archeological Sites on the Proposed Dewey-Burdock Project Area

cc:

Mr. Richard E. Blubaugh  
Vice President of Environmental Health  
and Safety Resources  
Powertech (USA), Inc.  
5575 DTC Parkway, Suite 140  
Greenwood Village, CO 80111

Paige Olson  
Review and Compliance Coordinator  
South Dakota State Historic Society  
900 Governors Drive  
Pierre, SD 57501

Jill Dolberg  
Nebraska State Historical Society  
P.O. Box 82554  
1500 R Street  
Lincoln, NE 68501

October 28, 2011

Mr. James Laysbad, THPO  
Oglala Sioux Tribe  
P.O. Box 320  
Pine Ridge, SD 57770

SUBJECT: INFORMATION RELATED TO TRADITIONAL CULTURAL PROPERTIES;  
PERTAINING TO THE DEWEY-BURDOCK, CROW BUTTE NORTH TREND,  
AND CROW BUTTE LICENSE RENEWAL *IN-SITU* URANIUM RECOVERY  
PROJECTS

Dear Mr. Laysbad:

The U.S. Nuclear Regulatory Commission (NRC) staff wants to update your office on NRC's ongoing consultation activities, per Section 106 of the National Historic Preservation Act (NHPA), for the proposed Dewey-Burdock and Crow-Butte projects. In response to requests for a survey of traditional cultural properties (TCPs) raised by many Tribal representatives at the June 8, 2011, Information Gathering Meeting, the NRC staff has determined that further work is needed to identify properties of religious and cultural significance to the Tribes. The staff has asked the applicants to undertake studies and surveys to provide the NRC with this information, as is permissible under 36 CFR § 800.2(c)(4).

Powertech (USA), Inc. and Cameco Resources, the respective applicants, have engaged the services of SRI Foundation (SRIF) of Rio Rancho, New Mexico to collect information concerning TCPs that may be located in the proposed Dewey-Burdock and Crow Butte project areas. Dr. Lynne Sebastian will direct these investigations for SRIF; Dr. Martha Graham will contact all consulting Tribes in the near future to develop a plan for gathering information. Attached to this letter are brief biographies of the SRIF lead researchers and a link to the SRIF website.

The NRC remains the lead in carrying out Tribal consultation efforts for both projects, pursuant to its obligation under the regulations of 36 CFR Part 800. Although the NRC has authorized the applicants and, thereby, SRIF, acting on the behalf of the applicants, to contact Tribes to obtain needed information, the NRC, nonetheless, remains legally responsible for all findings and determinations and for maintaining government-to-government relationships with the involved Indian Tribes. In keeping with that, the NRC staff will continue to be involved in consultation activities and will coordinate with SRIF and the Tribes, as necessary, to facilitate SRIF's informational gathering efforts. With that said, the NRC staff invites your office and Tribal leadership to work with SRIF as they reach out to you regarding the Oglala Sioux Tribe. Specifically:

- SRIF will contact all Tribes to determine: (1) if Tribes are interested in participating in field visits and ethnographic interviews, or (2) if the Tribes wish to conduct their own research, with facilitation provided by SRIF. If your office requests the services of an ethnographer or ethno-historian, SRIF will arrange for those services.

J. Laysbad

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- SRIF will coordinate with the NRC, the United States Bureau of Land Management (BLM) (for the proposed Dewey Burdock project), State Historic Preservation Officers (SHPOs), and interested Tribes to adjust boundaries of the area of potential effects (APE) if discussions with Tribes indicate that historic properties outside project boundaries may be affected.
- SRIF will assemble information gathered from interested Tribes, ethnographers, and ethno-historians, prepare preliminary eligibility recommendations for TCPs identified in the proposed Crowe Butte and Dewey-Burdock APEs, and submit the information to the NRC for consideration.
- NRC will review all information and comments provided by consulting parties and will apply the criteria of adverse effect found in 36 CFR § 800.5(a). Based on its review of the information, the NRC will prepare determinations concerning the effects of *in-situ* recovery development activities on eligible or listed historic properties within the APEs.
- The NRC will consult with SHPOs and Tribes, and BLM (when properties are located on BLM-managed lands) on the effect determinations before finalizing its position on such.
- If the NRC determines there are adverse effects to historic properties, the NRC will consult further with interested parties to develop methods to resolve adverse effects.

The NRC staff understands that information provided to SRIF and/or the NRC staff may be sensitive in nature and, as such, you may want the NRC and SRIF to treat provided information as confidential. Both the NRC and SRIF will protect any information identified as confidential, in accordance with 36 CFR § 800.11(c).

If you have any questions or have comments regarding this letter, please contact the following members of my staff: Ms. Haimanot Yilma (via email at [Haimanot.Yilma@nrc.gov](mailto:Haimanot.Yilma@nrc.gov) or via phone at 301-415-8029), or Mr. Nathan Goodman (via email at [Nathan.Goodman@nrc.gov](mailto:Nathan.Goodman@nrc.gov) or via phone at 301-415-2703).

Sincerely,

/RA/

Kevin Hsueh, Branch Chief  
Environmental Review Branch-B  
Environmental Protection and Performance  
Assessment Directorate  
Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Programs

Docket Nos. 40-8943, 40-9075

Enclosure: SRIF Biographies

cc: See Next Page



cc: With Enclosures:

Mr. John Schmuck  
Cameco Resources  
202 Carey Avenue, Suite 600  
Cheyenne, WY 82001

Ms. Jill Dolberg  
Nebraska State Historical Society  
P.O. Box 82554  
1500 R Street  
Lincoln, NE 68501

Mr. Richard E. Blubaugh  
Vice President of Environmental Health  
and Safety Resources  
Powertech (USA), Inc.  
5575 DTC Parkway, Suite 140  
Greenwood Village, CO 80111

Ms. Paige Olson  
Review and Compliance Coordinator  
South Dakota Historic Society  
900 Governors Drive  
Pierre, SD 57501

Mr. John Yellow Bird Steel, President  
Oglala Sioux Tribe  
P.O. Box 2070  
Pine Ridge, SD 57770-2070



## United States Department of the Interior



BUREAU OF LAND MANAGEMENT  
South Dakota Field Office  
310 Roundup Street  
Belle Fourche, South Dakota 57717-1698  
[www.blm.gov/mj](http://www.blm.gov/mj)

In Reply Refer To:  
3809 (MTC040)

Larry W. Camper, Director  
Division of Waste Management  
And Environmental Protection  
Office of Federal and State Materials  
And Environmental Management Programs  
Mail Stop T-8F5  
Washington, DC 20555

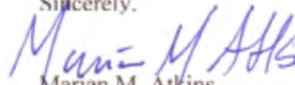
RE: BLM requests NRC consent as Lead Agency for the Cultural Section 106 Consultation for the Dewey Burdock In-situ Uranium Recovery Project, Custer and Fall River Counties, South Dakota

Dear Mr. Camper;

During recent NRC/BLM discussions regarding the Dewey Burdock In-situ Uranium Recovery Project, the topic of designating the NRC as lead agency for Section 106 Consultation regarding the Dewey Burdock Project was reviewed. Upon consideration, it is the position of the South Dakota Field Office that the NRC be designated as the lead Agency for the Cultural Section 106 review, and the South Dakota Field Office is seeking concurrence regarding the same.

Please contact me with any concerns you may have at the above address or at (605) 892-7001.

Sincerely,

  
Marian M. Atkins  
South Dakota Field Manger  
BLM

CC: Haimanot Yilma – NRC  
Richard Blubaugh – Powertech

UNITED STATES  
PARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT  
South Dakota Field Office  
310 Roundup Street  
Belle Fourche, South Dakota 57717

OFFICIAL BUSINESS  
PENALTY FOR PRIVATE USE, \$300



LARRY W. CAMPER  
Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Systems  
Mail Stop T-8F5  
Washington, DC 20555





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

January 19, 2012

Dear Tribal Historic Preservation Officers,

The U.S. Nuclear Regulatory Commission invites you to attend a government-to-government consultation on February 14<sup>th</sup> and 15<sup>th</sup>, 2012. The meeting will be part of the ongoing consultations under Section 106 of the National Historic Preservation Act (NHPA) associated with three separate applications NRC currently has under review: the Dewey Burdock project; the Crow-Butte North Trend project; and the Crow-Butte license renewal project.

The purpose of the meeting is to hear the views of interested Tribes about the general types and descriptions of historic properties of religious and cultural significance that may be affected by the proposed projects and how these places can be identified and evaluated as part of the ongoing environmental reviews for the above listed projects.

The NRC has identified certain categories of information that will be critical to our evaluation:

1. The general types and descriptions of historic properties of religious and cultural significance to the Tribes that the Tribes know or believe to be located in the three project areas;
2. The Tribes' views and approach on how best to identify and document these potential places;
3. The kinds of potential effects the Tribes believe that these places may be subject to as a result of the proposed projects; and
4. The kinds of measures the Tribes believe might enable NRC to develop a plan to avoid or minimize effects to these places.

The meeting will be held in the Lincoln Room at the Ramkota Best Western at 2111 N. LaCrosse Street, Rapid City, South Dakota, 57701. The NRC has set aside a block of 25 rooms under "NRC Group" for your convenience. Powertech (USA) Inc. and Cameco, Inc. (the applicants) will cover travel and per diem costs for two representatives from each Tribe. In addition, the applicants will also cover, beyond those costs already noted, the travel costs of any Tribal Chair or Tribal President, who chooses to attend. If the representatives from your Tribe are interested in being reimbursed for travel costs, please contact John Schmuck, Senior Permitting Manager for Cameco Resources, at 307-316-7587.

Enclosed is a proposed agenda for the meeting. If there are additional topics that your Tribe would like added to the agenda, please contact the NRC directly. The meeting will not be open to the public because of the sensitive nature of the cultural information to be discussed. The NRC understands confidentiality is necessary in order to protect sensitive information; therefore, methods needed to protect the information will be addressed based on feedback we receive from you.

Please provide the names of the Tribal representatives who are planning to attend the meeting to Haimanot Yilma and Nathan Goodman by February 7, 2012.

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Additionally, representatives of the applicants will attend the meeting to exchange relevant information with Tribal officials. The NRC will also allow time for the Tribes to caucus and for NRC, BLM, and Tribal representatives to engage in discussion.

If you have additional questions for the NRC staff, please don't hesitate to contact the project manager for the Dewey-Burdock project, Haimanot Yilma, via phone at 301-415-8029 or e-mail at [Haimanot.Yilma@nrc.gov](mailto:Haimanot.Yilma@nrc.gov) or the project manager for the Crow-Butte North Trend and Crow-Butte license renewal projects, Nathan Goodman, via phone at 301-415-2703 or e-mail at [Nathan.Goodman@nrc.gov](mailto:Nathan.Goodman@nrc.gov)

Thank you very much,



Kevin Hsueh, Branch Chief  
Environmental Review Branch  
Environmental Protection and  
Performance Assessment Directorate  
Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Programs

Enclosures (2):

- Enclosure 1: Proposed Meeting Agenda
- Enclosure 2: Initial List of Meeting Attendees



**DeweyBurdNonPubEm Resource**

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**From:** dianne desrosiers [dyandancer@yahoo.com]  
**Sent:** Tuesday, January 24, 2012 3:46 PM  
**To:** Goodman, Nathan; Yilma, Haimanot  
**Cc:** mgraham@srifoundation.org  
**Subject:** Re: Invitation Letter

Good afternoon,

I am writing to verify our participation in the upcoming meeting to be held in Rapid City. Jim Whitted and I are the Tribal representatives for the Sisseton Wahpeton Oyate. Thank you for your attention in this matter.

**Dianne Desrosiers**  
**Tribal Historic Preservation Officer**  
Sisseton Wahpeton Oyate  
PO Box 907  
205 Oak St. E, Suite 121  
Sisseton, SD 57262  
(605)698-3584 office

*"Every part of this Earth is sacred to my people. We are part of the earth and it is part of us". -Chief Seattle, 1854*

**From:** "Goodman, Nathan" <[Nathan.Goodman@nrc.gov](mailto:Nathan.Goodman@nrc.gov)>  
**To:** "Yilma, Haimanot" <[Haimanot.Yilma@nrc.gov](mailto:Haimanot.Yilma@nrc.gov)>; "Goodman, Nathan" <[Nathan.Goodman@nrc.gov](mailto:Nathan.Goodman@nrc.gov)>  
**Sent:** Thursday, January 19, 2012 3:50 PM  
**Subject:** Invitation Letter

Dear Tribal Historic Preservation Officers,

Attached to this e-mail, you will find three enclosures. The first is an invitation letter to a Tribal Consultation meeting to take place on February 14 and 15, 2012 from our supervisor, Kevin Hsueh. The second is a proposed agenda for the Consultation meeting. And the third is a list of attendees for the same Consultation meeting. If you have any questions or problems opening any of the enclosures, please contact Haimanot or myself.

Thank you,

Nathan Goodman and Haimanot Yilma

Nathan Goodman  
Project Manager  
FSME/DWMEP/EPPAD/ERB  
U.S. NRC  
301-415-2703  
[Nathan.Goodman@nrc.gov](mailto:Nathan.Goodman@nrc.gov)

Haimanot Yilma

Project Manager  
FSME/DWMEP/EPPAD/ERB  
U.S Nuclear Regulatory Commission  
Phone: 301-415-8029  
email: [haimanot.vilma@nrc.gov](mailto:haimanot.vilma@nrc.gov)  
Mail Stop : T8F05



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

March 6, 2012

Dear Tribal Historic Preservation Officers:

The NRC staff has received an email indicating a conflict for many Tribes with the previously suggested Section 106 meeting dates of March 14 and 15, 2012. In the same email, alternate dates of April 17 through 19 were suggested as possible dates to hold the next Section 106 meeting. Unfortunately, while the staff can accommodate those suggested dates, several of the other anticipated meeting participants already have prior commitments during those dates that cannot be rescheduled.

In an effort to move the Section 106 consultation forward and collect your input, the staff suggests the following:

As indicated in our email invitation on Tuesday, February 28, 2012:

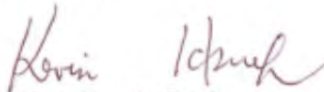
- The staff plans to forward the applicants' Statement of Work (SOW) for the proposed Crow Butte License Renewal, Crow Butte North Trend, and Dewey-Burdock projects by **March 9, 2012** for your review and consideration.
- The staff requests your draft SOW for the proposed Crow Butte License Renewal, Crow Butte North Trend, and Dewey-Burdock projects by **March 16, 2012**. This will allow the staff to promptly identify areas of agreement and disagreement with the applicants' proposed SOW. This will also allow the staff to identify for the applicants any areas in which they might consider revising their SOW. In brief, this will allow the consulting parties to continue working toward an acceptable SOW.
- The staff plans to review the SOWs submitted by you and the applicants, along with any additional input you or the applicants provide in the next several weeks, and prepare one comprehensive SOW for each of the proposed projects. The staff plans to circulate a comprehensive SOW for each of the projects to all consulting parties by **March 28, 2012**.
- The staff proposes having a 4 hour conference call to discuss the comprehensive SOWs during the week of April 9, 2012, or the week of April 16, 2012.

Based on the outcome of the conference call, if the parties determine another face-to-face meeting is warranted, the staff will arrange such a meeting based on the availabilities of all consulting parties.

2

If you have any questions or concerns about the above plan, please contact Mr. Nathan Goodman via email at [Nathan.goodman@nrc.gov](mailto:Nathan.goodman@nrc.gov), or Ms. Haimanot Yilma via email at [Haimanot.yilma@nrc.gov](mailto:Haimanot.yilma@nrc.gov).

Sincerely,



Kevin Hsueh, Chief  
Environmental Review Branch  
Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Programs



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

March 9, 2012

Dear Tribal Historic Preservation Officers:

On March 6, 2012, the U.S. Nuclear Regulatory Commission (NRC) staff informed you that we would soon be forwarding the applicants' Statement of Work (SOW) for the proposed Crow Butte North Trend, Crow Butte License Renewal, and Dewey-Burdock projects for your review and consideration. These three SOWs are attached. NRC staff would appreciate any comments you may have on the SOWs before NRC issues its comprehensive SOWs on March 28, 2012.

Additionally, on March 7, 2012, NRC staff received an e-mail from Sisseton-Wahpeton's Tribal Historic Preservation Officer (THPO) stating that Ben Rhodd, a consultant of the Rosebud Tribe, would be preparing an SOW for NRC's review. This e-mail also stated that the SOW would first be given to the Tribes for their review and concurrence. As NRC staff stated in the e-mail you received on March 6, 2012, we would ask that this SOW be provided to the staff by **March 16, 2012**.

While we appreciate you sharing with us your view of having face-to-face Section 106 consultation meetings, the regulations and guidance issued under the National Historic Preservation Act (NHPA) do not limit Section 106 consultation to face-to-face meetings. Nevertheless, NRC staff agrees that face-to-face group consultation is an important part of the Section 106 consultation process. As such, NRC staff would consider the possibility of having a third face-to-face meeting with the THPOs once it receives the SOW from the Tribes and has developed one comprehensive SOW for each of the three proposed projects.

NRC staff also believes that the consulting parties can continue to make progress on developing SOWs as we await the next face-to-face meeting. NRC staff has proposed a conference call to discuss the proposed SOWs we expect to soon receive from the Tribes and the applicants. NRC staff proposed two possible weeks for conference calls in its e-mail on March 6, 2012. NRC staff proposes to host a conference call either:

- On April 10, 2012 from 2:30 – 6:30 p.m. EST;
- On April 19, 2012 from 2:30 – 6:30 p.m. EST; or
- Both dates and times if the Tribes wish to have further discussions.

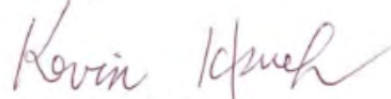
This conference call will give the consulting parties an early opportunity to comment on the proposed SOWs and to bring to the staff's attention any other issues related to the NHPA.



2

If you have any questions, please don't hesitate to contact the project manager for the Dewey-Burdock project, Ms. Haimanot Yilma via phone at 301-415-8029 or e-mail at [Haimanot.Yilma@nrc.gov](mailto:Haimanot.Yilma@nrc.gov), or the project manager for the Crow Butte North Trend and Crow Butte License Renewal projects, Mr. Nathan Goodman via phone at 301-415-2703 or e-mail at [Nathan.Goodman@nrc.gov](mailto:Nathan.Goodman@nrc.gov).

Sincerely,



Kevin Hsueh, Chief  
Environmental Review Branch  
Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Programs

Enclosures:

1. Crow Butte North Trend SOW
2. Crow Butte License Renewal SOW
3. Dewey-Burdock SOW

March 19, 2012

Mr. Louis Maynahonah, Chairman  
Apache Tribe of Oklahoma  
P.O. Box 1220  
Anadarko, OK 73005

SUBJECT: ONGOING SECTION 106 OF THE NATIONAL HISTORIC PRESERVATION  
ACT TRIBAL CONSULTATION LETTER FOR THE PROPOSED CROW BUTTE  
NORTH TREND, CROW BUTTE LICENSE RENEWAL, AND DEWEY-  
BURDOCK PROJECTS

Dear Chairman Maynahonah:

Enclosed please find a follow-up consultation letter to the Tribal Historic Preservation Officer pertaining to ongoing Tribal consultation for three proposed projects: Crow Butte North Trend, Crow Butte License Renewal, and Dewey-Burdock.

The U.S. Nuclear Regulatory Commission staff is transmitting this letter to you to keep you informed of all Section 106 activities that are underway for the three proposed projects.

If you have any questions or concerns, please contact my staff, Ms. Haimanot Yilma via email at [Haimanot.Yilma@nrc.gov](mailto:Haimanot.Yilma@nrc.gov) or phone at 301-415-8029 for the Dewey-Burdock project, or Mr. Nathan Goodman via email at [Nathan.Goodman@nrc.gov](mailto:Nathan.Goodman@nrc.gov) or phone at 301-415-8029 for the Crow Butte projects.

Sincerely,

/RA/

Larry W. Camper, Director  
Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Programs

cc: Mr. Lyman Guy

Enclosure:  
Invitation Letter

March 26, 2012

Mr. Louis Maynahonah, Chairman  
Apache Tribe of Oklahoma  
P.O. Box 1220  
Anadarko, OK 73005

SUBJECT: TRANSMITTAL OF TRANSCRIPTS AND ATTENDANCE LISTS FROM  
SECTION 106 CONSULTATION MEETINGS

Dear Chairman Maynahonah:

Enclosed please find a copy of the transcripts and attendance lists from the Section 106 Consultation meetings held in Rapid City, South Dakota on February 14 and 15, 2012.

During the February meetings, the U.S. Nuclear Regulatory Commission (NRC) and Bureau of Land Management (BLM) staff received the following key information:

- Tribes are concerned about confidentiality of any information they transmit to the NRC based on a recent undesirable experience with other consulting parties. Tribes expressed an interest in first developing a confidentiality agreement before submitting any Tribal Cultural Properties (TCP) studies to the NRC. A representative from Standing Rock Sioux Tribe volunteered to share a recent confidentiality agreement developed for another project to use as a starting point for Tribes, NRC and BLM when developing an agreement for the proposed Crow Butte License Renewal, Crow Butte North Trend, and Dewey-Burdock projects.
- Tribal Representatives requested that for future meeting invitations, the purpose be made clearer in order to ensure that Tribal participants have appropriate levels of decision-making authority.
- Tribal Representatives volunteered to develop project-specific Statements of Work (SOWs) to conduct TCP studies for the proposed Crow Butte License Renewal, Crow Butte North Trend, and Dewey-Burdock projects.
- Tribal Representatives requested another face-to-face meeting to go over the draft SOWs for each of the three projects. Tribal Representatives suggested March 14 and 15, 2012 as possible meeting dates. However, due to conflicts with many participating Tribal Representatives, this meeting did not occur. Further discussion is ongoing to schedule a teleconference instead, and potentially another face-to-face meeting.



L. Maynahonah

2

Please note that the transcripts are not publicly available as information discussed during the February meeting is protected under the National Historic Preservation Act (NHPA)<sup>1</sup> and the South Dakota Codified Laws<sup>2</sup>.

If you have any questions or concerns, please contact my staff, Ms. Haimanot Yilma via email at [Haimanot.Yilma@nrc.gov](mailto:Haimanot.Yilma@nrc.gov) or phone at 301-415-8029 for the Dewey-Burdock project, or Mr. Nathan Goodman via email at [Nathan.Goodman@nrc.gov](mailto:Nathan.Goodman@nrc.gov) or phone at 301-415-8029 for the Crow Butte projects.

Sincerely,

/RA/

Larry W. Camper, Director  
Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Programs

Enclosures:

1. Transcript of 2/14/12 Meeting
2. Transcript of 2/15/12 Meeting
3. Attendance List from 2/14/12 Meeting
4. Attendance List from 2/15/12 Meeting

cc: Mr. Lyman Guy

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<sup>1</sup> Section 304 of the National Historic Preservation Act of 1966, As amended through 2006 [16 U.S.C. 470w-3(a)] concerns the confidentiality of the location of sensitive historic resources:

(a) The head of a Federal agency or other public official receiving grant assistance pursuant to this Act, after consultation with the Secretary, shall withhold from disclosure to the public, information about the location, character, or ownership of a historic resource if the Secretary and the agency determine that disclosure may -

- (1) cause a significant invasion of privacy;
- (2) risk harm to the historic resources; or
- (3) impede the use of a traditional religious site by practitioners.

<sup>2</sup> The release of records pertaining to the location of archaeological sites is restricted under South Dakota Codified Laws (SDCL), specifically, SDCL § 1-20-21.2, Confidentiality of records pertaining to location of archaeological site—Exceptions.

Any records maintained pursuant to § 1-20-21 pertaining to the location of an archaeological site shall remain confidential to protect the integrity of the archaeological site.



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

April 5, 2012

Dear Tribal Historic Preservation Officers:

In a letter dated March 6, 2012, the U.S. Nuclear Regulatory Commission (NRC) staff informed you of our plans to forward comprehensive Statements of Work (SOWs) for the Crow Butte License Renewal, Crow Butte North Trend, and Dewey-Burdock projects to you by March 28, 2012. We planned to send the comprehensive SOWs after taking into account input from both the Applicants and the Tribes. Also in our March 6 letter, NRC staff stated its intent to forward the Applicants' SOWs to you, requested your comments on the Applicants' SOWs, and proposed a teleconference to discuss the comprehensive SOWs.

On March 7, 2012, NRC staff received an email from Sisseton-Wahpeton's Tribal Historic Preservation Officer stating that an SOW was being developed by the Tribes for NRC review.

On March 9, 2012, the NRC forwarded a copy of the Applicants' SOWs to you, and we reiterated our request to receive your SOW by March 16, 2012. The NRC also requested your comments on the Applicants' SOWs by March 28, 2012. To date, we have not received any input. For this reason, the NRC was unable to develop a comprehensive SOW for each of the three proposed projects.

In order to efficiently move the Section 106 process forward, the NRC suggests the following:

- Conduct a teleconference with all consulting parties (including the Applicants and SRIF) on **April 24, 2012 from 2:30 to 6:30 p.m. EST**. This teleconference will be a working meeting between the THPOs and NRC Staff. During this call, consulting parties would:
  - Use the Applicants' SOWs as a starting point and identify elements essential for developing a comprehensive SOW for each of the three proposed projects.
  - The goal is to have the consulting parties develop three comprehensive SOWs.
  - Schedule dates to conduct the TCP studies.

Alternatively, if the Tribes submit draft SOWs before April 19, 2012, NRC staff can use both SOWs to initiate our discussion. The staff will highlight areas where the SOWs are different so that the consulting parties can use those differences as a starting point to work toward a consensus in those areas.

2

The Applicants' contractor (SRIF) may contact you in the near future to discuss their SOWs that the NRC forwarded to you on March 9, 2012. The intent of their call would be to solicit your feedback on their SOW.

Please let us know if you are available to participate on the April 24, 2012 teleconference by **April 13, 2012**. If you have any questions, you can contact Ms. Haimanot Yilma by phone at 301-425-8029 or via email at [Haimanot.Yilma@nrc.gov](mailto:Haimanot.Yilma@nrc.gov) or Mr. Nathan Goodman by phone at 301-415-2703 or via email at [Nathan.Goodman@nrc.gov](mailto:Nathan.Goodman@nrc.gov).

Sincerely,



Kevin Hsueh, Chief  
Environmental Review Branch  
Environmental Protection  
and Performance Assessment Directorate  
Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Programs

**Rajapakse, Champa**

**From:** Goodman, Nathan  
**Sent:** Friday, April 20, 2012 11:01 AM  
**To:** Yilma, Haimanot; Goodman, Nathan  
**Subject:** Upcoming teleconference on April 24, 2012  
**Attachments:** Dewey-Burdock Draft SOW and figures .pdf; Crow Butte-NT and LR Draft SOW figures.pdf; Crow Butte-NT and LR Draft SOW text.pdf

Dear Tribal Historic Preservation Officers:

Haimanot and I would like to remind you of an upcoming teleconference with all consulting parties (including the Applicants, SRIF, BLM, and EPA Region 8) on **April 24, 2012 from 2:30 to 6:30 p.m. EST**. This teleconference will be a working meeting between the THPOs and all other consulting parties. The purpose of this teleconference is to continue NRC's ongoing Section 106 consultations for the proposed Crow Butte License Renewal, Crow Butte North Trend, and Dewey Burdock projects. The NRC staff is interested in identifying areas within the three project sites that have traditional religious or cultural significance to the Tribes, so these may be considered in our environmental reviews. During this teleconference, consulting parties would use the Applicants' SOWs as a starting point and identify elements essential for developing a comprehensive SOW for each of the three proposed projects and schedule dates to conduct the TCP studies. The goal is to have the consulting parties develop three comprehensive SOWs.

Below are the proposed agenda and teleconference phone number and passcode:

Welcome	Kevin Hsueh
Introductions	All
Purpose of meeting	Michelle Ryan
Discussion of Draft SOWs	Haimanot Yilma, Nathan Goodman
1) Crow Butte License Renewal	
2) Crow Butte North Trend	
3) Dewey-Burdock	

Possible discussion topics:

- Purpose
- Scope of Work
- Period of Performance
- Reports
- Deliverables Schedule
- Level of Effort

*Break –15 min (~4:30-4:45pm)*

Discussion of Draft SOWs continued	Haimanot Yilma, Nathan Goodman
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Summary of concerns and recommendations	Michelle Ryan
Next Steps	Haimanot Yilma, Nathan Goodman
Closing	Kevin Hsueh

Dial-in number: 1-800-369-1134  
Passcode: 65795

We would also like to note that the call will be recorded so that a transcript of the meeting can be made available to all parties.

On March 9, 2012, the NRC forwarded a copy of the applicants' SOWs to you for your review and consideration. For your convenience, we are attaching another copy of the three SOWs to this e-mail.

Please contact us by 5:00 PM EST Monday (April 23, 2012) if you are available to participate in the April 24, 2012 teleconference. If you have any questions, you can contact either of us by phone or e-mail, which are provided below.

Thank you,

Haimanot Yilma and Nathan Goodman

Nathan Goodman  
Project Manager  
FSME/DWMEP/EPPAD/ERB  
U.S. NRC  
301-415-2703  
[Nathan.Goodman@nrc.gov](mailto:Nathan.Goodman@nrc.gov)

Haimanot Yilma  
Project Manager  
FSME/DWMEP/EPPAD/ERB  
U.S. Nuclear Regulatory Commission  
Phone: 301-415-8029  
email: [haimanot.yilma@nrc.gov](mailto:haimanot.yilma@nrc.gov)  
Mail Stop : T8F05



May 7, 2012

Mr. Duane Big Eagle, Chairman  
Crow Creek Sioux Tribe  
P.O. Box 50  
Ft. Thompson, SD 57339-0050

SUBJECT: TRANSMITTAL OF APPLICANT'S DRAFT STATEMENT OF WORK  
REGARDING CROW BUTTE NORTH TREND, CROW BUTTE LICENSE  
RENEWAL, AND DEWEY-BURDOCK PROJECTS

Dear Chairman Big Eagle:

Enclosed please find a followup letter sent via email to the Tribal Historic Preservation Officers (THPOs) forwarding draft Statement of Works (SOWs) for Identification of Properties of Religious and Cultural Significance that the staff received from Cameco Resources Inc. and Powertech Inc. pertaining to the proposed Crow Butte License Renewal, Crow Butte North Trend, and Dewey-Burdock projects. The SOWs are also enclosed in this letter for your convenience.

In the enclosed letter, the U.S. Nuclear Regulatory Commission (NRC) staff also requested for the THPO's participation in a conference call to discuss the draft SOWs and any other issues related to National Historic Preservation Act (NPHA) as many interested tribes had a conflict with the previously suggested date of March 14 and 15, 2012 to host a face-to-face meeting. The NRC staff encourages the THPOs to continue the dialog with all consulting parties via a conference call in an effort to move the Section 106 consultation forward.

The NRC staff is transmitting this letter to you to keep you informed of all Section 106 activities that are underway for the proposed Crow Butte License Renewal, Crow Butte North Trend, and Dewey-Burdock projects.

D. Big Eagle

2

If you have any questions or concerns, please contact my staff, Ms. Haimanot Yilma via email at [Haimanot.Yilma@nrc.gov](mailto:Haimanot.Yilma@nrc.gov) or phone at 301-415-8029 for the Dewey-Burdock project, or Mr. Nathan Goodman via email at [Nathan.Goodman@nrc.gov](mailto:Nathan.Goodman@nrc.gov) or phone at 301-415-8029 for the Crow Butte projects.

Sincerely,

*/RA/*

Larry W. Camper, Director  
Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Programs

Enclosures:

1. Followup Letter
2. Draft SOWs

cc: Wanda Wells

May 23, 2012

Mr. John Yellow Bird Steele, President  
Oglala Sioux Tribe  
P.O. Box 2070  
Pine Ridge, SD 57770-2070

**SUBJECT: TRANSMITTAL OF A LETTER SENT TO THE TRIBAL HISTORIC PRESERVATION OFFICERS INVITING THEM TO ATTEND A TELECONFERENCE REGARDING THE CROW BUTTE NORTH TREND, CROW BUTTE LICENSE RENEWAL, AND DEWEY-BURDOCK PROJECTS**

Dear President Steele:

Enclosed please find a followup letter sent via email to the Tribal Historic Preservation Officers (THPOs). In the letter, the Nuclear Regulatory Commission (NRC) staff invited the THPOs to participate in a teleconference that was held on April 24, 2012. The participants in the teleconference included the NRC staff, representatives from eight Tribes, Bureau of Land Management, U.S. Environmental Protection Agency Region 8, and the South Dakota State Historic Preservation Officer.

The purpose of the April 24, 2012 teleconference was to discuss the draft Statements of Work (SOWs) for identification of historic properties of religious and cultural significance that the staff received from Cameco Resources Inc. and Powertech (USA) Inc. The draft SOWs pertain to the proposed Crow Butte License Renewal, Crow Butte North Trend, and Dewey-Burdock projects. The SOWs were developed taking into account information gathered during a prior Tribal consultation meeting held in Rapid City, South Dakota on February 14 and 15, 2012.

In the enclosed letter, the NRC staff also encouraged the THPOs to submit their own SOW for each project prior to the scheduled teleconference so that the consulting parties can use both the Tribes' and the applicants' documents to finalize a SOW for each project. This will allow the parties to move forward with the identification of historic properties that may be of religious or cultural significance to the Tribes. Based on the staff's review schedule for the three proposed projects mentioned above, the identification of such properties will need to be completed by the fall of 2012. To date, however, the staff has not received the Tribes' SOWs.

The NRC staff is transmitting this letter and attached correspondence to you to keep you informed of all Section 106 activities that are underway for the proposed Crow Butte License Renewal, Crow Butte North Trend, and Dewey-Burdock projects.



J. Yellow Bird Steele

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If you have any questions or concerns, please contact, Ms. Haimanot Yilma via email at [Haimanot.Yilma@nrc.gov](mailto:Haimanot.Yilma@nrc.gov) or phone at 301-415-8029 for the Dewey-Burdock project, or Mr. Nathan Goodman via email at [Nathan.Goodman@nrc.gov](mailto:Nathan.Goodman@nrc.gov) or phone at 301-415-8029 for the Crow Butte projects.

Sincerely,

/RA by Bill VonTill Acting for/

Larry W. Camper, Director  
Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Programs

Enclosure:  
Follow up Letter

cc: Wilmer Mesteth

June 20, 2012

Mr. Conrad Fisher  
Northern Cheyenne Tribe  
P.O. Box 128  
Lame Deer, MT 59043-0128

SUBJECT: TRANSMITTAL OF EVALUATIVE TESTING REPORT AND ASSOCIATED MAP

Dear Mr. Fisher:

Enclosed please find an Evaluative Testing Report of 20 Sites in the proposed Dewey-Burdock Uranium Recovery project boundary developed by the applicant (Powertech (USA) Inc.). The associated map is also attached for your convenience.

The U.S. Nuclear Regulatory Commission (NRC) is transmitting these documents to you per your request. Please note that some parts of the document and the Map are protected under the National Historic Preservation Act<sup>1</sup> and South Dakota Codified Laws<sup>2</sup>.

If you have any questions or concerns, please contact my staff, Ms. Haimanot Yilma via email at [Haimanot.Yilma@nrc.gov](mailto:Haimanot.Yilma@nrc.gov) or phone at 301-415-8029.

Sincerely,

/RA/

Kevin Hsueh, Chief  
Environmental Review Branch  
Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Programs

Enclosures:

1. Supplemental ARC report
2. ARC Map

cc: Chairman Leroy Spang  
Mr. Richard Blubaugh, Powertech (USA) Inc  
Mr. Gregory R. Fesko, BLM

<sup>1</sup> Section 304 of the National Historic Preservation Act of 1966, As amended through 2006 [16 U.S.C. 470w-3(a)] concerns the confidentiality of the location of sensitive historic resources:

(a) The head of a Federal agency or other public official receiving grant assistance pursuant to this Act, after consultation with the Secretary, shall withhold from disclosure to the public, information about the location, character, or ownership of a historic resource if the Secretary and the agency determine that disclosure may -

- (1) cause a significant invasion of privacy;
- (2) risk harm to the historic resources; or
- (3) impede the use of a traditional religious site by practitioners.

<sup>2</sup> The release of records pertaining to the location of archaeological sites is restricted under South Dakota Codified Laws (SDCL), specifically, SDCL § 1-20-21.2, Confidentiality of records pertaining to location of archaeological site—Exceptions. Any records maintained pursuant to § 1-20-21 pertaining to the location of an archaeological site shall remain confidential to protect the integrity of the archaeological site.

June 26, 2012

Ms. Waste'Win Young  
Standing Rock Sioux Tribe  
Tribal Historic Preservation Office  
P.O. Box D  
Fort Yates, ND 58538-0522

SUBJECT: TRANSMITTAL OF TRANSCRIPT FROM TELECONFERENCE CONDUCTED  
ON APRIL 24, 2012

Dear Ms. Young:

Enclosed please find a copy of the transcript from the teleconference conducted on April 24, 2012, pertaining to the proposed Crow Butte North Trend, Crow Butte License Renewal, and Dewey-Burdock projects. The participants in the call included staff from the U.S. Nuclear Regulatory Commission (NRC), the U.S. Environmental Protection Agency (EPA) Region 8, and the Bureau of Land Management (BLM); representatives of Powertech, Cameco, and SRI Foundation (SRIF) (applicant's contractor); the South Dakota State Historic Preservation Officer (SD SHPO); and representatives of eight Tribes (Northern Cheyenne, Oglala Sioux, Rosebud Sioux, Northern Arapaho, Sisseton-Wahpeton, Standing Rock Sioux, Yankton Sioux, and Cheyenne and Arapaho).

During the teleconference, the NRC staff sought feedback from the Tribes on the applicants' proposed Statements of Work (SOWs) for conducting Tribal Cultural Properties (TCP) studies. The staff had previously sent these SOWs to the Tribes on March 9, 2012. The consulting parties discussed the following aspects of the applicants' draft SOWs:

- o Adequacy of compensation for Tribal officials conducting the fieldwork.
- o Confidentiality of information gathered by the Tribes.
- o Amount of acreage to be covered during the fieldwork. Tribes requested 100% surveys of project areas. The Tribes agreed to send two Tribal officials to visit the project areas and determine the scope and extent of the fieldwork.
- o Tribal involvement in making eligibility determinations.
- o Next steps:
  - Two Tribal officials visit the project areas for initial work assessment;
  - Tribes develop SOWs based on these initial visits;
  - Tribes hold a teleconference to discuss their draft SOWs;
  - Tribes provide copies of draft SOWs to NRC after all Tribal members agree;
  - NRC distributes draft SOWs from Tribes to all other consulting parties including Tribes, applicants, and SHPO;
  - NRC schedules another meeting with all consulting parties to finalize SOWs; and
  - Applicants will provide dates for proposed field work.

W. Young

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Please note that the transcript of the April 24, 2012 teleconference is not publicly available and that information discussed during the call may be protected from disclosure by the National Historic Preservation Act (NHPA) and South Dakota Codified Laws.

If you have any questions or concerns, please contact my staff Haimanot Yilma via email at [Haimanot.yilma@nrc.gov](mailto:Haimanot.yilma@nrc.gov) or phone at 301-415-8029 for the Dewey-Burdock project or Nathan Goodman via email at [Nathan.goodman@nrc.gov](mailto:Nathan.goodman@nrc.gov) or phone at 301-415-8029 for the Crow Butte projects.

Sincerely,

*/RA/*

Kevin Hsueh, Chief  
Environmental Review Branch  
Environmental Protection and Performance  
Assessment Branch  
Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Programs

Enclosure:  
Transcript from April 24, 2012  
Teleconference

cc: Chairman Charles Murphy



June 29, 2012

Chairman Jim Shakespeare  
Northern Arapaho Business Committee  
P.O. Box 396  
Fort Washakie, WY 82514

SUBJECT: TRANSMITTAL OF EMAIL CORRESPONDENCE PERTAINING TO  
TELECONFERENCE CONDUCTED ON APRIL 24, 2012

Dear Chairman Shakespeare:

Enclosed please find email correspondence from U.S. Nuclear Regulatory Commission (NRC) staff to Tribal Historic Preservation Officers (THPOs) requesting Tribal participation for a teleconference on April 24, 2012. The NRC staff also included three draft Statements of Work (SOWs) to the email correspondence. The purpose of the teleconference was to discuss the draft SOWs for Identification of Properties of Religious and Cultural Significance received from Cameco Resources Inc. and Powertech Inc. pertaining to the proposed Crow Butte License Renewal, Crow Butte North Trend, and Dewey-Burdock projects. The SOWs were developed taking into account information gathered during the February 2012 Tribal consultation meeting. The applicant's SOWs were first forwarded to your office on March 9, 2012 for review and comment.

The NRC staff is transmitting this letter and attached email correspondence to you to keep you informed of all Section 106 activities for the proposed Crow Butte License Renewal, Crow Butte North Trend, and Dewey-Burdock projects.

If you have any questions or concerns, please contact Ms. Haimanot Yilma via email at [Haimanot.Yilma@nrc.gov](mailto:Haimanot.Yilma@nrc.gov) or by phone at 301-415-8029 for the Dewey-Burdock project, or Mr. Nathan Goodman via email at [Nathan.Goodman@nrc.gov](mailto:Nathan.Goodman@nrc.gov) or by phone at 301-415-8029 for the Crow Butte projects.

Sincerely,

/RA by Gregory Suber Acting for/

Larry W. Camper, Director  
Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Programs

Enclosures:

1. Followup Email
2. Draft SOWs

cc: Ms. Darlene Conrad



In Reply Refer To:

8100-R  
BAS

12-MT040-15

## United States Department of the Interior

BUREAU OF LAND MANAGEMENT  
South Dakota Field Office  
310 Roundup Street  
Belle Fourche, South Dakota 57717-1698  
<http://www.blm.gov/mt>



Date: July 20, 2012

Mr. Richard E. Blubaugh  
Vice President – Environmental Health & Safety Resources  
Powertech (USA) Incorporated  
5575 DTC Parkway, Suite 140  
Greenwood Village, CO 80111

RE: Cultural Resource review of Evaluative Testing of 20 Sites in the Powertech (USA) Inc. Dewey-Burdock Uranium Project Impact Areas: Volumes 1 and 2. For the Dewey-Burdock Uranium Recovery Project, Fall River and Custer Counties, South Dakota.

Dear Mr. Blubaugh:

We have reviewed the appropriate volumes of the National Historic Preservation Act, Section 106 cultural compliance reports presented by Archeology Laboratory, Augustana College, for evaluation of cultural resource sites inside areas of potential effect for the proposed Dewey-Burdock project area. The reports reviewed document formal evaluation of 20 cultural resource sites inside areas proposed for the project that could have effect. Of these 20 sites, one site is located in part on BLM administered surface land.

Site 39FA96 was found to be significantly affected by natural erosion and therefore does not possess adequate integrity, does not display workmanship or feeling, and it is not associated with an important historic event. Based on the information provided in the report the Bureau of Land Management (BLM) recommends adequate testing was completed on site 39FA96, the site's integrity has been severely affected by deflation. The portion on BLM administered land does not possess enough information to meet the National Register of Historic Places criteria for an eligible archaeological site; therefore, the BLM is in agreement with the determination for site 39FA96 on this portion, in that it is considered not eligible for nomination to the National Register of Historic Places. Information provided for the remaining 19 sites should be sufficient for the lead Federal Agency to make informed recommendations of eligibility on the historic properties.

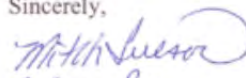
Mr. Richard E. Blubaugh

July 20, 2012

Page 2

Please let us know if you should need any additional information. I can be reached as Mr. Mitch Iverson (acting South Dakota Field Manager), (605) 892-7001 or email at [Mitchell\\_Iverson@blm.gov](mailto:Mitchell_Iverson@blm.gov) or contact our archaeologist, Brenda Shierts at (605) 723-8712 or [Brenda\\_Shierts@blm.gov](mailto:Brenda_Shierts@blm.gov).

Sincerely,

  
Acting SOR  
Marian M. Atkins  
South Dakota Field Manager

cc: Paige Olson, SD SHPO  
Gary Smith, BLM MSO Historic Preservation Officer  
Mark Sant, BLM MSO Tribal Coordinator  
Mr. Greg R. Fesko, P.G., BLM MSO Solid Minerals  
Haimanot Yilma, NRC, Project Manager Environmental Review Branch

**From:** [Yilma, Haimanot](#)  
**To:** [Yilma, Haimanot](#)  
**Cc:** [Goodman, Nathan](#)  
**Subject:** Part 1 of 2: Invitation for a Teleconference On Thursday August 9, 2012  
**Date:** Tuesday, August 07, 2012 5:37:00 PM  
**Attachments:** [AreaExample\\_120730.pdf](#)  
[Dewey-Burdock Draft SOW Map 2.pdf](#)  
[Dewey-Burdock Draft SOW Map 1.pdf](#)  
[Revised Scope of Work Dewey-Burdock Draft 3.docx](#)

Dear Tribal Historic Preservation Officers:

The NRC staff would like to invite you to participate in a teleconference on August 9, 2012 from 2:30 to 6:30 p.m. EST with all consulting parties (including the Applicant, SD SHPO, BLM, EPA Region 8, and SRIF, the applicant’s contractor). This teleconference will be a working level meeting between the THPOs and all other consulting parties.

The purpose of this teleconference is to finalize a Statement of Work (SOW) acceptable to all consulting parties and to establish a timeframe for conducting fieldwork to identify any historic properties of religious and cultural significance to the Tribes that may be affected by the proposed Dewey-Burdock Project.

Below are the proposed agenda and teleconference phone number and passcode:

<b>Welcome</b>	Kevin Hsueh
<b>Introductions</b>	All
<b>Purpose of the Meeting</b>	Jean Trefethen
<b>Discussion of Draft SOWs for the Dewey-Burdock Project</b>	Haimanot Yilma
<ul style="list-style-type: none"> <li>1) Tribes draft SOW</li> <li>2) Applicant’s revised draft SOW</li> </ul>	

**Possible Discussion Topics:**

- Purpose
- Scope of Work – amount of land to be surveyed and coverage rate (acres per person)
- Period of Performance – start and duration of the fieldwork
- Reports – content and confidentiality



- *Level of Effort – number of people and associated rates*
- **Deliverables Schedule**

*Break –15 min (~4:30-4:45pm EST)*

Discussion of Draft SOW continued	Haimanot Yilma
Summary of Concerns and Recommendations	Jean Trefethen
Next Steps	Jean Trefethen and Haimanot Yilma
Closing	Kevin Hsueh

Dial-in number: 1-800-779-3170  
Passcode: 3569215

The teleconference will be recorded and a transcript of the meeting will be provided to all consulting parties.

For your convenience, the Dewey Burdock SOW developed by the Tribes is attached for your review. We also attach the Applicant's revised SOW for the Dewey-Burdock Project for your review. The revised Dewey Burdock SOW addresses issues raised in Tribes' draft SOW for the Dewey-Burdock Project and incorporates information gathered during the April 24, 2012 teleconference with all consulting parties. The Applicant's original SOW for the Dewey-Burdock Project was forwarded to you on March 9, 2012.

The revised SOWs for the Crow Butte North Trend, Crow Butte License Renewal, Marsland and Three Crow Projects are also attached for your review. Although these revised SOWs are not on the teleconference agenda, the Applicant will be available to answer general questions.

Please contact me by 11 AM EST Thursday August 9, 2012, if you will participate in the teleconference. If you have any questions, please contact me by phone or e-mail.

Please note that because the size of the attachments, we had to send you the materials in two parts. Part 2 of this email will follow shortly.

Thank you,

Haimanot Yilma  
Project Manager  
FSME/DWMEP/EPPAD/ERB  
U.S Nuclear Regulatory Commission  
Phone: 301-415-8029  
email: haimanot.yilma@nrc.gov  
Mail Stop : T8F05

**From:** [Yilma, Haimanot](#)  
**To:** [Yilma, Haimanot](#)  
**Cc:** [Goodman, Nether](#)  
**Subject:** Reminder: Invitation for a Teleconference today August 9, 2012 from 2:30pm to 6:30pm (EST)  
**Date:** Thursday, August 09, 2012 10:17:00 AM

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Good Morning,

The NRC staff would like to remind you of the teleconference with all consulting parties (including the Applicant, SD SHPO, BLM, EPA Region 8, and SRIF, the applicant's contractor) scheduled for today **Thursday August 9, 2012 from 2:30 to 6:30 p.m. (EST)**.

This teleconference will be a working level meeting between the THPOs and all other consulting parties.

Below is the proposed agenda and teleconference phone number and passcode:

Dial-in number: 1-800-779-3170  
 Passcode: 3569215

#### Proposed Agenda

Welcome	Kevin Hsueh
Introductions	All
Purpose of Meeting	Jean Trefethen
Discussion of Draft SOW for Dewey-Burdock Project	Haimanot Yilma
1) Tribes draft SOW	
2) Applicant's revised draft SOW	

#### Possible Discussion Topics:

- Purpose
- Scope of Work – *amount of land to be surveyed and coverage rate (acres per person)*
- Period of Performance – *start and duration of the fieldwork*
- Reports – *content and confidentiality*
- Level of Effort – *number of people and associated rates*
- Deliverables Schedule

*Break –15 min (~4:30-4:45pm EST)*

<b>Discussion of Draft SOW (continued)</b>	Haimanot Yilma
<b>Summary of Concerns and Recommendations</b>	Jean Trefethen
<b>Next Steps</b>	Jean Trefethen and Haimanot Yilma
<b>Closing</b>	Kevin Hsueh

The teleconference will be recorded and a transcript of the meeting will be provided to all consulting parties.

Thank you.

Haimanot Yilma  
 Project Manager  
 FSME/DWMEP/EPPAD/ERB  
 U.S Nuclear Regulatory Commission  
 Phone: 301-415-8029  
 email: haimanot.yilma@nrc.gov  
 Mail Stop : T8F05

**From:** [Ylma, Haimanot](#)  
**To:** [Ylma, Haimanot](#)  
**Subject:** Proposed Agenda for August 21, 2012 Teleconference starting at 9:00 am (Central time)  
**Date:** Monday, August 20, 2012 12:15:00 PM  
**Attachments:** [Proposed Agenda for 8-21-12 call.docx](#)  
[Dewey-Burdock Draft SOW Map 3.pdf](#)  
[Revised Scope of Work Dewey-Burdock Draft 3.docx](#)  
[Dewey-Burdock Draft SOW Map 1.pdf](#)  
[Dewey-Burdock Draft SOW Map 2.pdf](#)

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Dear Tribal Historic Preservation Officers:

During the teleconference on August 9, 2012, the consulting parties that attended the call (including representatives from the Oglala Sioux, Cheyenne River Sioux, Crow Creek Sioux, Northern Arapaho, Northern Cheyenne, Rosebud Sioux, Santee Sioux, Sisseton-Wahpeton Oyate, Standing Rock Sioux, and Yankton Sioux tribes) agreed to participate in another teleconference on Tuesday, August 21, 2012 at 9:00 am (Central Time). As requested, the teleconference is scheduled for August 21, 2012 from 9:00 am to 1:00 pm (Central time). The teleconference can be extended for an additional 4 hours if more time is required to discuss the scope estimate details highlighted below. Attached please find the agenda and call-in information.

On Tuesday August 14, 2012 the Nuclear Regulatory Commission (NRC) staff shared the following with you:

- The position of both NRC and Bureau of Land Management (BLM) staff is that the field identification survey for the Dewey-Burdock Project should focus on the proposed initial disturbance (with additional buffers). This area appears in salmon on Map 3 of the revised Statement of Work (SOW) developed by the applicant and forwarded to you on August 7, 2012 by the NRC. This area measures approximately 2,637 acres. This revised SOW is included in this email for your convenience.
- The NRC and BLM staff agree with the Tribes' recommendation that a Programmatic Agreement (PA) be developed to ensure that additional field investigations will be conducted outside this 2,637-acre buffered impact area prior to any future disturbance (such as proposed land-application areas and/or utility line locations). If a license is granted, a requirement to abide by the terms of this PA would be included as a license condition.

In the August 14, 2012 email, the NRC staff also requested that Tribal Representatives review the revised SOW prepared by the applicant for a survey of the 2,637-acre buffered impact area. The NRC staff requested that your review focus on the following important scope estimate details:

- Estimated coverage rate for field identification (# of acres per person day).
- Start date and estimated duration of the field identification effort.
- Proposed report content and confidentiality requirements (to be prepared after the field identification has been completed).
- Number of people required for the field identification, with labor classifications (e.g., surveyor, crew leader, traditional cultural expert) and associated hourly rates.
- Report deliverable schedules.

The goal for the August 21, 2012 teleconference is to discuss these scope estimates listed above



and come to resolution on how to finalize the draft SOW. The NRC staff will incorporate changes discussed during the teleconference and distribute the revised SOW to all consulting parties for final review.

Dewey-Burdock is the first of three projects that will need field identification before the end of 2012 field season. For that reason, it is highly important that we schedule field identification for the Dewey-Burdock project as soon as possible.

Thank you

Haimanot Yilma  
Project Manager  
FSME/DWMEP/EPPAD/ERB  
U.S Nuclear Regulatory Commission  
Phone: 301-415-8029  
email: haimanot.yilma@nrc.gov  
Mail Stop : T8F05

**From:** [Yilma, Haimanot](#)  
**To:** [Yilma, Haimanot](#)  
**Subject:** Reminder: Invitation for a Teleconference today August 21, 2012 from 9:00 a.m. to 1:00 p.m. (Central time)  
**Date:** Tuesday, August 21, 2012 8:50:00 AM

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Good Morning,

The NRC staff would like to remind you of the teleconference with all consulting parties (including the Applicant, SD SHPO, BLM, EPA Region 8, and SRIF, the applicant's contractor) scheduled for today **Tuesday August 21, 2012 from 9:00 a.m. to 1:00 p.m. (Central time)**. This teleconference will be a working level meeting between the THPOs and all other consulting parties.

Below is the proposed agenda and teleconference phone number and passcode:

**Call-In Number:** 800-857-9707  
**Passcode:** 9409817

*Proposed Agenda*

<b>Welcome</b>	Kevin Hsueh
<b>Introductions</b>	All
<b>Purpose of Meeting</b>	Randy Withrow
<b>Discussion of Draft SOWs for the Dewey-Burdock Project</b>	Randy Withrow/ Haimanot Yilma / Lynne Sebastian

*Possible Discussion Topics:*

- Estimated coverage rate for field identification (# of acres per person day).
  - Start date and estimated duration of the field identification effort.
  - Proposed report content and confidentiality requirements (to be prepared after the field identification has been completed).
  - Number of people required for the field identification, with labor classifications (e.g., surveyor, crew leader, traditional cultural expert) and associated hourly rates.
  - Report deliverable schedules.
- Break –15 min (~11:30 - 11:45 am EST)*

<b>Discussion of Draft SOW (continued)</b>	Randy Withrow/ Haimanot Yilma/ Lynne Sebastian
<b>Summary of Concerns and Recommendations</b>	Randy Withrow

**Next Steps**

Randy Withrow and Haimanot  
Yilma

**Closing**

Kevin Hsueh

The teleconference will be recorded and a transcript of the meeting will be provided to all consulting parties.

**Thank You**

Haimanot Yilma  
Project Manager  
FSME/DWMEP/EPPAD/ERB  
U.S Nuclear Regulatory Commission  
Phone: 301-415-8029  
email: haimanot.yilma@nrc.gov  
Mail Stop : T8F05



**From:** Terry\_Quesinberry@fws.gov  
**Sent:** Monday, August 27, 2012 2:30 PM  
**To:** Amy Hester  
**Cc:** Yilma, Haimanot; James Prikryl  
**Subject:** Re: Follow Up for the Proposed Dewey-Burdock Insitu Recovery Project, Fall River and Custer Counties, South Dakota  
**Attachments:** pic27753.gif; FWS letter from 2010 pdf.pdf

Amy,

I do not have any updates/changes to the species you have listed. I expect that you will also address potential wetland impacts in the draft SEIS.

Thanks,

Terry Quesinberry

Fish and Wildlife Biologist  
 US Fish and Wildlife Service  
 South Dakota Ecological Services Office  
 Pierre, SD  
 Phone: (605) 224-8693, x234  
 FAX: (605) 224-9974

☞ Amy Hester <[ahester@swri.org](mailto:ahester@swri.org)>

Amy Hester  
 <[ahester@swri.org](mailto:ahester@swri.org)>

08/27/2012 12:45 PM

To: "Terry Quesinberry@fws.gov" <[terry\\_quesinberry@fws.gov](mailto:terry_quesinberry@fws.gov)>  
 cc: Haimanot Yilma <[haimanot.yilma@nrc.gov](mailto:haimanot.yilma@nrc.gov)>, James Prikryl  
 <[jprikryl@swri.org](mailto:jprikryl@swri.org)>

Subject: Follow Up for the Proposed Dewey-Burdock Insitu Recovery Project, Fall River and Custer Counties, South Dakota

Mr. Quesinberry,

This email is to follow up on the attached March 29, 2010 letter that your office sent to the Nuclear Regulatory Commission (NRC) regarding federally threatened or endangered species of concern for the proposed Dewey-Burdock in-situ recovery facility. The 2010 letter identified two endangered species, the whooping crane and black-footed ferret, and a candidate species, the Greater sage-grouse, that could potentially occur in the counties where the proposed project is located. As part of our independent analysis, NRC staff reviewed available Fish and Wildlife Service (FWS) documents and websites and determined that the Sprague's pipit (*Anthus spragueii*) is also a candidate bird species that could occur in the counties where the proposed project is located. We would like to confirm whether there are any additional species that the FWS has identified for this proposed project.

Based on our initial assessment, NRC staff determines that a biological assessment or Section 7 consultation under the Endangered Species Act are not warranted for this proposed project because no adverse effects to federally threatened, endangered, or candidate species are expected. The bases for our determination will be provided in the draft SEIS.

file:///P:/T.%20Quesinberry%20email.htm[8/27/2012 3:05:23 PM]

Thank you for providing any updated information you may have that should be included in the draft SEIS.

Amy Hester  
Research Scientist  
Center for Nuclear Waste Regulatory Analyses  
Southwest Research Institute  
6220 Culebra Road  
San Antonio, TX 78238  
210.522.5750  
<http://www.ged.swri.org/>  
(See attached file: *FWS letter from 2010 pdf.pdf*)



**RICHARD E. BLUBAUGH**  
Vice President – Health, Safety  
& Environmental Resources

**POWERTECH (USA) Inc.**

August 29, 2012

Kevin Hsueh, Branch Chief  
Environmental Review Branch-B  
Environmental Protection and Performance Assessment Directorate  
Division of Waste Management and Environmental Protection  
Office of Federal and State materials and Environmental Management Programs  
United States Nuclear Regulatory Commission  
Washington D.C. 20555-0001

**Re: August 12, 2011 letter from U.S. Nuclear Regulatory Commission (NRC) Staff to Powertech (USA) Inc. concerning information needed to complete Section 106 of the National Historic Preservation Act**

Dear Mr. Hsueh:

I am writing in regard to the above-referenced letter in which NRC Staff requested that, as part of its submissions in support of its license application (docket number 040-009075) for the proposed Dewey-Burdock In Situ Leach Uranium Recovery Project (Dewey-Burdock Project), Powertech (USA) Inc. (Powertech) provide NRC Staff with information regarding potential properties of religious and cultural significance (also referred to as “traditional cultural properties”) that might be affected by the proposed project.

Over the past year, Powertech has made every effort to comply with this request. First, Powertech hired third-party consultants (SRI Foundation or the Foundation) to identify and facilitate consultations with federally recognized Indian tribes (Tribes) that might ascribe religious and cultural significance to properties within the proposed project area. Once NRC Staff had informed the Tribes about its request to the applicants and explained the Foundation’s role, the Foundation began the first of many contacts with the Tribes on November 4, 2011 (see Attachment 1 for a record of tribal communications). The Foundation provided information about the proposed Dewey-Burdock Project and requested Tribal input as to appropriate methods for gathering the information needed by NRC Staff. The Tribes indicated that they needed to conduct an on-the-ground field investigation within the Project area, and that they wished to discuss how to proceed with this identification effort in a face-to-face meeting with NRC.

In partnership with Cameco Resources (which had received the same request for information from NRC), Powertech sponsored a two-day face-to-face Section 106 consultation meeting on February 14 and 15, 2012, among NRC Staff, Bureau of Land Management (BLM), Environmental Protection Agency (EPA), and representatives of the following federally recognized Indian tribes:

Cheyenne River Sioux Tribe  
Crow Creek Sioux Tribe  
Crow Tribe of Montana  
Eastern Shoshone Tribe  
Fort Peck

5575 DTC Parkway, Suite 140  
Greenwood Village, CO 80111 USA

Telephone: 303-790-7528  
Facsimile: 303-790-3885

Website: [www.powertechuranium.com](http://www.powertechuranium.com)  
Email: [info@powertechuranium.com](mailto:info@powertechuranium.com)

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Northern Arapaho Tribe  
Northern Cheyenne Tribe  
Oglala Sioux Tribe  
Rosebud Sioux Tribe  
Santee Sioux Tribe of NE  
Sisseton-Wahpeton Oyate  
Standing Rock Sioux Tribe  
Yankton Sioux Tribe

The purpose of this meeting, as established by NRC Staff, was to enable the federal agencies to hear from the Tribes what would be required in order for the Tribes to identify potential properties of religious and cultural significance to them within the Dewey-Burdock and Crow Butte/North Trend Project/license areas. No information about specific identification procedures was forthcoming during this meeting, but the Tribes in attendance proposed to provide NRC Staff with a scope of work (SOW) for the Dewey-Burdock and Crow Butte/North Trend identification efforts. The Tribes also indicated during the meeting that they would not work directly with either Powertech (USA) Inc. or its consultants.

In March of this year, Powertech, at the request of NRC Staff, developed an initial draft SOW for identification of potential properties of religious and cultural significance within the Dewey-Burdock license area. The purpose of this document was to serve as a point of departure for negotiations, along with the anticipated proposed SOW from the Tribes. NRC Staff sent Powertech's draft scope to the Tribes on March 9, 2012, and requested that the Tribes provide their promised proposed SOWs by March 16.

The Tribe's proposed SOW for the Dewey-Burdock Project was not received by NRC Staff until July 13, 2012. This SOW provided rates for items such as salaries, travel, overhead, and per diem; however, it did not provide any information on level of effort (e.g., number of field days, number of travel days, and number of crew members) which would have enabled Powertech to estimate the potential costs. NRC Staff's requests to the Tribes for clarification on level of effort issues subsequent to receipt of the Tribal SOW have been unsuccessful. On July 30, 2012, once again at the request of NRC Staff, Powertech provided a revised SOW for identification of potential properties of religious and cultural significance in the Dewey-Burdock Project area.

Powertech has participated in three conference calls sponsored by NRC and attended by BLM, EPA, and many of the Tribes on the list provided above. The first call was on April 24, 2012, the second on August 9, 2012, and the third on August 21, 2012. During the April 24<sup>th</sup> call, the Tribes requested that two tribal representatives be assisted in carrying out reconnaissance visits to both the Dewey-Burdock and Crow Butte/North Trend license areas, in order to secure information that would enable the Tribes to complete detailed proposed SOWs for these projects. Powertech accommodated this request, and the Dewey-Burdock Project reconnaissance visit took place on Saturday, May 26<sup>th</sup>. The purpose of each of these conference calls, as established by NRC Staff, was to secure input from the Tribes that would enable NRC Staff to develop a final SOW for identification of potential properties of religious and cultural significance. None of these calls succeeded in meeting this objective. In the absence of a mutually acceptable SOW, Powertech cannot contract with the Tribes or their representatives to secure the information requested by NRC to complete the identification phase of the Section 106 process.

I regret to inform you that after a year of substantial effort, Powertech is unable to provide the information on potential properties of religious and cultural significance that may be affected by the Dewey-Burdock Project as requested in your letter of August 12, 2011. Further, Powertech has concluded that additional efforts on our part are unlikely to be productive.

One of our primary concerns, from the beginning of this effort, has been to ensure that places of significance to the Tribes within Powertech's proposed Project area that may be affected by Project activities be identified so that Powertech can, to the extent possible, protect them from disturbance. To that end, Powertech is willing to support NRC Staff efforts to complete the Section 106 identification process by providing up to \$100,000 in funding for tribal representatives to carry out fieldwork and reporting activities as agreed upon in consultations among NRC, BLM, and the tribes, provided that the fieldwork is completed this fall. Powertech also will be happy to coordinate with NRC and BLM on providing access for tribal representatives to the project area in order to carry out the agreed upon work.

Respectfully yours,



Richard Blubaugh  
Vice President – Health, Safety and Environmental Resources

Enclosures

cc: R. F. Clement, Powertech  
John Mays, Powertech  
Mark Hollenbeck, Powertech  
Lynne Sebastian, SRI Foundation  
Martha Graham, SRI Foundation  
Haimanot Yilma, NRC  
Anthony Thompson, Esq.  
Christopher Pugsley, Esq.



**From:** [Ylma, Haimanot](#)  
**To:** [Ylma, Haimanot](#)  
**Subject:** Information Related to Section 106 Activity for Dewey-Burdock Proposed Project  
**Date:** Thursday, August 30, 2012 2:55:33 PM

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Dear Tribal Historic Preservation Officers:

The NRC staff wishes to thank all who participated in the teleconference held on August 21, 2012, to discuss the Applicant's revised Statement of Work (SOW). The consulting parties represented, included, the Oglala Sioux, Cheyenne River Sioux, Northern Cheyenne, Rosebud Sioux, Santee Sioux, Sisseton-Wahpeton Oyate, Standing Rock Sioux, Yankton Sioux tribes, EPA Region 8, BLM, NRC, Powertech Inc, Cameco Inc, SRIF (Powertech and Cameco's consultant) and Louis Berger (NRC contractor)

Participating Tribes requested an opportunity to further discuss and revise the SOW. The consulting parties agreed on the need to focus identification efforts on areas of potential ground disturbance (approximately 2637 acres). The parties also proposed developing a programmatic agreement (PA) to address any future ground disturbance.

Tribal Representatives agreed to meet with Mr. Randy Withrow (NRC contractor) and Mrs. Jean Trefethen (NRC staff), in Bismarck, North Dakota on September 5-6, 2012 to further discuss, and revise the SOW for the proposed Dewey Burdock project.

In the August 21, 2012 teleconference, tribal representatives requested adequate time be provided to record identified sites. Since majority of the sites, that might be present are confidential in nature, detailed description of the sites is not warranted. The NRC staff only requires enough information to determine eligibility pursuant to the NHPA regulations at 36 CFR 800.4 (c)(1). For these reasons, the NRC recommends the revised SOW be designed to meet, but not exceed, these information needs.

On August 29, 2012, the applicant sent a letter to the NRC that states "[in the absence of a mutually acceptable SOW, Powertech cannot contract with the Tribes or their representatives to secure the information requested by the NRC to complete identification phase of the section 106 process." (See, ML12243A158.) The applicant recognizes that "places of significance to the Tribes within Powertech's proposed Project area . . . may be affected by Project activities" and that through identification "Powertech can, to the extent possible, protect them from disturbance." The applicant is willing to provide funds up to \$100,000.00 for site identification, as long as work is completed by fall 2012. The applicant will coordinate access to the project area with NRC and the Tribes.

It is the NRC staff's understanding that the working group will develop a revised SOW during the September 5-6, 2012 meeting that will ensure completion of a field survey in the fall of 2012. The NRC requires the following information:

- Estimated coverage rate for field identification (# of acres per person day).
- Start date and estimated duration of the field identification effort.

- Proposed report content and confidentiality requirements.
- Number of people required for the field identification, with labor classifications (e.g., surveyor, crew leader, traditional cultural expert) and associated hourly rates.
- Report deliverable schedules.

The NRC staff encourages the Tribal Representatives to consider the offer provided by the applicant when revising the SOW (which should include the above requested information). If Tribal Representatives are unable to provide the requested information by the end of the September 5th and 6th, 2012 meeting to support completion of a field survey in the fall of 2012, the NRC and BLM staff will develop an alternative approach for identifying historic properties, and will move the Section 106 process forward.

If you have any question regarding this email, please contact me or Mr. Withrow.  
Thank you.

Haimanot Yilma  
Project Manager  
FSME/DWMEP/EPPAD/ERB  
U.S Nuclear Regulatory Commission  
Phone: 301-415-8029  
email: haimanot.yilma@nrc.gov  
Mail Stop : T8F05

Randy Withrow  
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900 50<sup>th</sup> Street | Marion, IA 52302  
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UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

September 18, 2012

Dear THPO:

**SUBJECT: REQUEST FOR A PROPOSAL WITH COST ESTIMATE; PROPOSED DEWEY BURDOCK IN-SITU RECOVERY PROJECT**

The NRC staff wishes to thank the tribal representatives from the Crow Nation, Oglala Sioux Tribe, Northern Cheyenne Tribe, Rosebud Sioux Tribe, Sisseton-Wahpeton Oyate, Standing Rock Sioux Tribe, and Yankton Sioux Tribe who participated in a project meeting with Jean Trefethen (NRC) and Randy Withrow (NRC contractor) in Bismarck, North Dakota on September 5, 2012. This meeting was scheduled following a teleconference held on August 21, 2012, during which participating tribes requested an opportunity to revise the applicant's proposed Statement of Work (SOW) for completing a Tribal Survey for the Dewey-Burdock Project.

It was the U.S. Nuclear Regulatory Commission (NRC) staff's understanding that this meeting would include an opportunity for a working group composed of NRC and tribal representatives to develop a revised SOW for completion of a field survey in the fall of 2012. Instead, tribal representatives provided NRC with a revised SOW (Enclosure 1) on September 3, 2012, just in advance of the meeting. At the September 5<sup>th</sup> meeting, most of the discussion actually involved several other topics of concern to the tribes.

Tribes requested NRC's written comment on four principal matters of concern prior to finalizing a scope of work for a field survey limited to the area of direct effect. The tribes' first three concerns involve general matters of compliance with the National Historic Preservation Act (NHPA) or other laws. The NRC staff believes it has previously addressed these issues in meetings, teleconferences and written correspondence with tribal representatives. Nonetheless, the staff will respond to the tribal representatives' concerns below.

- Tribes are concerned that the scope of the tribal survey will be limited to the area of immediate direct effects (2,637 acres) and that tribes would have no assurance that future development outside this area would be subject to proper review prior to construction. Tribal representatives requested a Programmatic Agreement be developed for the Dewey Burdock project to address the need for phased identification of historic properties, including places of traditional religious and cultural significance to tribes.



*Staff Response:* The NRC staff agrees that a Programmatic Agreement will need to be developed to address the phased identification and evaluation of historic properties. The need for a phased approach to identification and the advantages of developing a Programmatic Agreement for the Dewey Burdock project has been discussed in previous meetings. For example, during the February 14–15, 2012, consultation meeting, the parties discussed the phased identification and evaluation of historic properties on the Dewey-Burdock site. See Meeting Transcripts at the Agencywide Documents Access and Management System (ADAMS) Accession Nos. ML120590330 and ML120590341. Using a phased approach to comply with the NHPA is allowed by the regulations at 36 CFR § 800.14(b). The NRC staff will continue to consult with the tribes and other consulting parties as it develops a Programmatic Agreement.

- Tribes are concerned that potential indirect effects have not yet been fully addressed and requested that the NRC and Bureau of Land Management (BLM) continue consultation with tribes, the South Dakota State Historic Preservation Office (SD SHPO) and the Advisory Council on Historic Preservation (ACHP) to define the area of potential indirect effects and then determine what level of effort is needed to identify properties and assess effects in this area.

*Staff Response:* The NRC staff will continue to consult with BLM, SD SHPO, and the tribes on all issues arising under Section 106 of the NHPA, including potential indirect effects. The staff will also consult with ACHP as necessary. For approximately the past year, NRC staff has been involved in discussions with the tribes over how to identify historic properties that may be affected by the proposed Dewey-Burdock Project. The staff previously sent the tribes maps identifying the area of potential effect (APE) for the entire Dewey-Burdock Project. The staff also sent the tribes maps showing areas that may be affected during the first phase of the project. These maps identify the placement of buildings, potential wellfields, land application areas, and known archaeological sites (Enclosure 2). The tribes have therefore had the resources to provide input on what areas may be affected, either directly or indirectly, during the first phase of the Dewey-Burdock project. However, to date, tribal representatives have not provided input on specific areas that may be affected during the first phase of the project.

- Tribes expressed concern about the need for confidentiality of site information associated with completion of the tribal survey and the disposition of that information. Tribes requested that the NRC endorse the confidentiality provisions included in the SOW as revised on September 3, 2012.

*Staff response:* The NRC staff intends to keep survey information confidential to the fullest extent allowed by law. At the same time, the staff must have sufficient information to ensure that we can make an independent recommendation as to whether properties are eligible for inclusion on the National Register of Historic Places. The staff has discussed these issues with tribal representatives previously. See February 2012, Meeting Transcripts at ADAMS Accession Nos. ML110550535, ML120590330 and ML120590341. In the "Reporting" section of the information request (Enclosure 3), the staff proposes a method of reporting fieldwork intended to address the tribes' confidentiality concerns, while at the same time meeting the staff's information needs. We ask that you provide further input on confidentiality in your response to our information request.

In addition to these general NHPA-related concerns, the tribes requested the following action specific to NRC's request for a cost estimate to complete the survey:

- Tribes expressed concern that the daily coverage rates (acres per person/day) requested by NRC for cost estimating purposes might be incorrectly interpreted as a precedent for other survey efforts. Tribes requested that this be waived as a requirement for the purpose of estimating survey costs.

*Staff response:* Since February 2012, the staff has been trying to facilitate the development of an SOW under which the applicant would contract with the tribes for a survey of the proposed Dewey-Burdock site. The initial SOW from the applicant, which the staff sent to the tribes on May 7, 2012, included coverage rates. At the end of this letter, the staff renews our request for certain information from the tribes. If the tribes object to using coverage rates to estimate survey costs, NRC invites tribes to substitute an alternative means of estimating survey cost.

As we have stated previously, the staff's schedule for completing our NHPA review is tied to our schedule for completing our review under the National Environmental Policy Act (NEPA). Because our schedule calls for issuing our final NEPA document no later than May 2013, it is imperative that we proceed with identifying any NHPA-eligible properties before the end of the 2012 field season (*i.e.*, in the fall 2012).

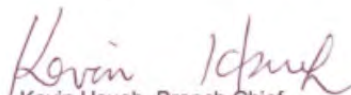
The staff respectfully requests that the participating tribes designate a preferred contractor to complete a cultural resources survey on their behalf and provide NRC with a written proposal with cost estimate based on the 2,637-acre area that may be disturbed during the first phase of the proposed Dewey Burdock project. For your convenience, the staff is enclosing a detailed request for information with this letter (Enclosure 3). This request repeats and consolidates the staff's prior requests for information from the tribes. *See, e.g.*, ADAMS Accession Nos. ML12143A185, ML12261A375, ML12261A429, and ML12261A476. The staff is also forwarding maps showing the location of the entire proposed project area and the proposed initial disturbed area (2,637-acre) to be surveyed. These maps were sent to you previously. *See* ADAMS Accession No. ML 12261A326.

The NRC staff requests that you submit the proposal with cost estimate stated above to Ms. Kellee Jamerson, NRC Project Manager, or Mr. Randy Withrow, NRC contractor, no later than close of business on October 1, 2012. The proposal can be submitted by email to

4

[Kellee.Jamerson@nrc.gov](mailto:Kellee.Jamerson@nrc.gov) or [nwithrow@louisberger.com](mailto:nwithrow@louisberger.com). Following the receipt of this information or after October 1, 2012, NRC and BLM will determine the path forward for identifying any NHPA-eligible properties before the end of the 2012 field season (*i.e.*, in the fall 2012).

Sincerely,



Kevin Hsueh, Branch Chief  
Environmental Review Branch  
Environmental Protection and Performance  
Assessment Directorate  
Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Programs

Enclosures:

1. Tribes Revised SOW from September 3, 2012
2. Powertech's Map Depicting Project Boundary and Proposed Known Disturbance (ML12261A326)
3. Detailed Request for Information (Request for Proposal w/Cost Estimate)



**Request for Proposal with Cost Estimate  
Tribal Survey for the Proposed Dewey Burdock Project  
September 18, 2012**

The U.S. Nuclear Regulatory Commission (NRC) staff requests a written proposal with cost estimate for a survey to identify places of traditional religious and cultural significance to tribes that may be affected by the first phase of the proposed Dewey Burdock Project. This request consolidates prior requests for information that the staff has made in emails, letters, teleconferences, and meetings with tribal representatives. See, e.g., ADAMS Accession Nos. ML12143A185, ML12261A375, ML12261A429, and ML12261A476.

The tribes' proposal with cost estimate should include a brief description of the work that will be completed for both field investigations and reporting. Please include the following specific information in your written proposal.

**Fieldwork:**

- Describe the size and composition of the survey crew (number of individuals and their titles).
- Provide a proposed start date and estimated duration of fieldwork (number of field days).
- Cost assumptions (including, for example, the estimated number of cultural features that will be recorded).

**Reporting:**

- Provide a schedule for completion of the following work products or deliverables.
  1. A non-confidential summary of fieldwork including a map showing where survey work was completed (this should not include specific site locations).
  2. A confidential final eligibility report that provides the location of all identified sites, a description of where each site is located in relationship to areas that will be directly impacted by planned operations, and recommendations regarding the eligibility of each site for listing in the National Register of Historic Places. The assessment of eligibility should include references to the appropriate eligibility criteria (36 CFR 60.4) and an assessment of how the site's integrity will be affected directly or indirectly by the proposed undertaking.
  3. A confidential report for use by the applicant showing the location of any eligible sites identified within the proposed Dewey Burdock license area. This report will be prepared once final determinations of eligibility have been completed and will only be shared with the applicant after tribes receive a confidentiality agreement signed by the applicant that limits use to appropriate personnel.

Enclosure 3

- 2 -

**Cost Estimate:**

Please provide a line-item budget that lists costs for estimated labor and related expenses for both fieldwork and reporting. For labor estimates, please include labor categories or titles, estimated number of hours for each category, and the associated hourly rates. For related expenses such as per diem or equipment rental, please include both the number of days and associated rates used to estimate total costs.

**Schedule:**

NRC requests that all field investigations be completed by the end of the 2012 field season (i.e., in fall 2012), and that a confidential eligibility report be completed no later than 60 days following completion of the field survey.

**Access and Safety:**

The applicant, Powertech (USA), will provide access to the properties, and a representative of Powertech (USA) will coordinate with Tribal preferred contractor in terms of access to land. The Powertech (USA) representative will utilize a GPS survey unit to identify all map locations selected by the Tribal preferred contractor for ground examination and will guide the Tribal personnel to the locations they select in the field. The Powertech (USA) representative will also serve as liaison with the local landowners.

**Insurance:**

All Tribal representatives who will be present during field work will be required to provide proof of liability insurance in the amount of \$500,000 or more, or sign an indemnification statement that will hold harmless both the landowner and Powertech (USA) from any accidents that may occur in the field.

**Contracting:**

NRC will not contract directly with the preferred contractor selected by participating tribes. NRC will forward the proposal to the project applicant for their consideration and contracting.

October 4, 2012

Richard Blubaugh  
Vice President – Health, Safety,  
and Environmental Resources  
Powertech (USA) Inc.  
5575 DTC Parkway, Suite 140  
Greenwood Village, CO 80111

SUBJECT: TRANSMITTAL OF TRIBES' PROPOSAL AND COST ESTIMATE FOR THE  
PROPOSED DEWEY-BURDOCK ISR PROJECT

Dear Mr. Blubaugh:

On September 27, 2012, the U.S. Nuclear Regulatory Commission (NRC) received a "Proposal with Cost Estimate for Traditional Cultural Properties Survey for Proposed Dewey Burdock Project" from Makoche Wowapi/Mentz-Wilson Consultants, LLP (enclosed).

The NRC requests that you review the enclosed proposal and provide us with any comments by October 10, 2012. To address the possibility that Powertech and Makoche Wowapi/Mentz-Wilson Consultants, LLP might be unable to reach an agreement regarding the proposal, the NRC asks that you also provide a list of alternative methods for identifying potential properties of traditional religious and cultural importance to tribes at the proposed Dewey-Burdock site.

Please note that the cost estimate and breakdown of field crew wages in the Tribes' proposal (pages 3 and 4) has been identified by the consultants as proprietary information and will not be shared with all the consulting parties. In addition, the proposal with cost estimate in its entirety is being withheld from public disclosure under 10 CFR 2.390.

Sincerely,

/RA/

Kevin Hsueh, Chief  
Environmental Review Branch  
Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Programs

Enclosure:  
Proposal with Cost Estimate



**RICHARD E. BLUBAUGH**  
Vice President – Health, Safety  
& Environmental Resources

**POWERTECH (USA) INC.**

October 9, 2012

Kevin Hsueh, Chief  
Environmental Review Branch  
Environmental Protection and Performance  
Assessment Directorate  
Office of Federal and State Materials and Environmental  
Management Programs  
US Nuclear Regulatory Commission  
Mailstop T8H09  
Washington, DC 20555-0001

**VIA Email and USPS**

**Re: Reply to October 4, 2012 Letter and SOW**

Dear Mr. Hsueh:

As we noted in our letter to you dated August 29, 2012, despite substantial efforts on our part over the past year, Powertech (USA) Inc. (Powertech) has been unable to secure information about properties of religious and cultural significance to federally recognized Indian tribes that may be affected by the proposed Dewey-Burdock Project. Powertech is willing to make every effort to avoid adversely affecting National Register-eligible properties of religious and cultural significance within the areas of disturbance for the Dewey-Burdock license boundary if NRC is able to identify such properties through the agency's government-to-government consultations with the interested Indian tribes.

As we also noted in the August 29 letter, Powertech is willing to support financially NRC's efforts to complete the agency's responsibilities under Section 106 of the National Historic Preservation Act up to the amount of \$100,000. We will take responsibility for disbursing these funds as NRC staff may direct to pay for field or ethnohistoric studies, tribal site visits, ethnographic interviews, or other efforts determined to be necessary by NRC.

Sincerely,

Richard E. Blubaugh

cc: R. F. Clement, President and CEO  
Thompson & Pugsley, PLLC  
Lynne Sebastian, SRI Foundation

5575 DTC Parkway, Suite 140  
Greenwood Village, CO 80111 USA

Telephone: 303-790-7528  
Facsimile: 303-790-3885

Website: [www.powertechuranium.com](http://www.powertechuranium.com)  
Email: [info@powertechuranium.com](mailto:info@powertechuranium.com)



October 11, 2012

Chairman Cedrick Black Eagle  
 Crow Tribe  
 Baacheeitche Avenue  
 P.O. Box 159  
 Crow Agency, MT 59022

SUBJECT: TRANSMITTAL OF CORRESPONDENCE PERTAINING TO REQUEST FOR  
 DETAILED INFORMATION FOR THE PROPOSED DEWEY-BURDOCK  
 IN-SITU RECOVERY PROJECT

Dear Chairman Black Eagle:

Enclosed please find correspondence sent via email from the U.S. Nuclear Regulatory Commission (NRC) staff to Tribal Historic Preservation Officers (THPOs) in response to concerns raised during a September 5-6, 2012, meeting in Bismarck, North Dakota. The letter requested a proposal with a cost estimate be submitted for the proposed Dewey-Burdock project. Included with the correspondence was the Tribes' revised Statement of Work and Powertech's maps depicting the project boundary and proposed known areas of disturbance.

The NRC staff is transmitting this letter and attached correspondence to you to keep you informed of all Section 106 activities for the proposed Dewey-Burdock ISR project.

If you have any questions or concerns, please contact Ms. Kellee Jamerson of my staff via email at [Kellee.Jamerson@nrc.gov](mailto:Kellee.Jamerson@nrc.gov) or by phone at 301-415-7649.

Sincerely,

/RA/

Larry W. Camper, Director  
 Division of Waste Management  
 and Environmental Protection  
 Office of Federal and State Materials  
 and Environmental Management Programs

Enclosure:  
 Letter w/Detailed Request for  
 Information (Request for Proposal  
 w/Cost Estimate)

cc: Hubert Two Leggings, THPO



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

October 12, 2012

Dear Tribal Historic Preservation Officer:

SUBJECT: TRANSMITTAL OF TRIBES' PROPOSAL WITH COST ESTIMATE FOR THE  
PROPOSED DEWEY-BURDOCK ISR PROJECT

On September 27, 2012, the U.S. Nuclear Regulatory Commission (NRC) received a "Proposal with Cost Estimate for Traditional Cultural Properties Survey for the Proposed Dewey Burdock Project" from Makoche Wowapi/Mentz-Wilson Consultants, LLP.

The NRC is aware of significant differences in the proposal submitted by Makoche Wowapi/Mentz-Wilson Consultants, LLP and the proposal<sup>1</sup> submitted by Powertech. The NRC anticipates that resolving these differences will not support completion of a field survey in the fall of 2012 for the Dewey-Burdock In-Situ Recovery (ISR) Project and for this reason it seeks alternatives.

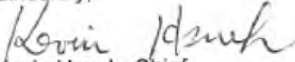
The NRC recognizes that there are additional methods for identifying potential properties of traditional religious and cultural importance to tribes at the proposed Dewey-Burdock site. Alternatives include opening the site to interested tribal specialists over a period of several weeks with payments to be made to individual tribes, or seeking ethnohistorical and ethnographic information from tribal specialists in interviews at tribal headquarters.

The NRC requests that you provide us with your ideas on alternative methods for identifying potential properties by close of business Friday, October 19, 2012.

Also, enclosed is Powertech's "Reply to October 4, 2012 Letter and Statement of Work (SOW)," dated October 9, 2012.

Please note that the cost estimate and breakdown of field crew wages in the Tribes' proposal (pages 3 and 4) has been identified by the consultants as proprietary information and will not be shared with all the consulting parties. In addition, the proposal with cost estimate in its entirety are being withheld from public disclosure under 10 CFR 2.390.

Sincerely,

  
Kevin Hsueh, Chief  
Environmental Review Branch  
Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Programs

Enclosures:

1. Proposal with Cost Estimate
2. Powertech letter dated 10/9/12 (ML12285A425)

<sup>1</sup> On August 7, 2012, the NRC forwarded Powertech's revised statement of work (SOW) dated July 30, 2012 (ML12261A333). The NRC received a letter dated August 29, 2012 from Powertech in response to an August 12, 2011 request concerning information needed to complete Section 10B (ML12243A156).



**T** RIBAL HISTORIC PRESERVATION OFFICE  
**S** TANDING ROCK SIOUX TRIBE  
 Administrative Service Center  
 North Standing Rock Avenue  
 Fort Yates, N.D. 58538  
 Tel: (701) 854-2120  
 Fax: (701) 854-2138

Kevin Hsueh, Chief  
 Environmental Review Branch  
 Division of Waste Management  
 and Environmental Protection  
 Office of Federal and State Materials  
 and Environmental Management Programs

October 15, 2012

Dear Mr. Hsueh,

The Standing Rock Sioux Tribe THPO (SRST-THPO) is in receipt of the Nuclear Regulatory Commissions' (NRC) letter dated October 12, 2012 regarding the Dewey-Burdock in-situ recovery project and the request to seek alternatives to field identification. We find this new request to be disappointing by the lead federal agency especially in light of other recent letters and emails to the tribes. In particular, with the following bullying by ultimatum tactics:

*The NRC staff encourages the Tribal Representatives to consider the offer provided by the applicant when revising the SOW (which should include the above requested information). If Tribal Representatives are unable to provide the requested information by the end of the September 5th and 6th, 2012 meeting to support completion of a field survey in the fall of 2012, the NRC and BLM staff will develop an alternative approach for identifying historic properties, and will move the Section 106 process forward.*

(quote from email sent to tribes by Haimanot Yilma on Aug. 30/12).

That quote alone represents one of many fundamental misunderstandings of the Section 106 process by the NRC. The offer by the applicant in this quote included a sum of money which in no way would suffice for field identification for the 10,000 acres that this undertakings area of potential effect technically is. This paltry sum would not even be sufficient for the 2700-3700 acres of direct effects that the applicant and federal agency only want surveyed. The SRST-THPO continues to maintain its position, supported by the law by the way, that only addressing the direct effects of a proposed undertaking does not fulfill a federal agencies responsibilities for section 106 considering that the area of potential effects for an undertaking are defined as both direct and indirect effects per 36CFR800.16 (d). The applicants' proposal, which is favored by the NRC, would place unrealistic expectations on our field crews that could never be met. Yet, here we are almost two months later, after having the tribes preferred contractor submit their cost estimate and we are in the exact same spot as we were in August. The NRC, by this letter, is yet again attempting to find an alternative to on the ground field identification. The only difference between the August email and the current letter is that the NRC is making a feeble attempt to

include the tribes in their discussion to not conduct proper on the ground field identification. The SRST-THPO whole-heartedly disagrees with this attempt to circumvent the 106 process on behalf of the applicants' and federal agencies timeline and budget. The following comments outline this disagreement.

The participating tribes have made a concerted and cooperative effort to work with the Nuclear Regulatory Commission on a proposal to address our concerns about the identification of historic properties of significance to tribes for this project. Meaningful conversation pertaining to proper field identification only began in February of 2012 at the meeting in Rapid City, SD, not June of 2011. Identification under Section 106 has, and continues to be, the tribe's primary concern.

The SRST-THPO has participated in the Section 106 process up to this point steadfastly and in good faith despite the many missteps in the process by the lead federal agency and the intrusive participation by the applicant and their third party consultants. The latter, at many times during these discussions, are perceived to be running the entire process in place of the lead federal agency and this recent letter and previous letters and communications only reinforces this perception.

36CFR800.2 (c) (2) (ii) specifies that:

Section 101 (d) (6) (b) of the act requires the agency official to consult with any Indian tribe or Native Hawaiian organization that attaches religious and cultural significance to historic properties that may be affected by an undertaking. This requirement applies regardless of the location of the historic property. Such Indian tribe or Native Hawaiian organization shall be a consulting party.

36CFR800.2 (c) (2) (ii) (A) further specifies that:

The agency official shall ensure that consultation in the section 106 process provides the Indian tribe or Native Hawaiian organization a reasonable opportunity to identify its concerns about historic properties, advise on the identification and evaluation of historic properties, including those of traditional religious and cultural importance, articulate its views on the undertakings effects on such properties, and participate in the resolution of adverse effects.

These two sections of the act specify the tribes' role as consulting parties within the process and the federal agency requirements for consultation with the tribes for every undertaking. The participating tribes have repeatedly stated that we require in field identification for historic properties of significance to tribes for this and all projects. That has been our requirement for this project ever since the informal field visits and information gathering session of June 2011. The participating tribes advised the NRC that identification efforts conducted by archaeologists were insufficient to address historic properties of significance to tribes. The tribes proved that these efforts were insufficient by visiting sites identified by the archaeologists and identifying numerous features that were missed that are significant to tribes. The tribes, applicant, NRC staff and the archaeologists were all present when these historic properties of significance were observed.

Were the tribes given a reasonable opportunity to advise, consult and identify concerns pursuant to 36CFR800.2 (c) (2) (ii) (A)? Yes in some ways the tribes were. Unfortunately, it all amounts to a check box that must be checked in the process when everything that is told to them during these consultations is being subsequently ignored. All of the information which was gathered pursuant to 36CFR800.4 (a) is



being subsequently ignored by this latest letter from the NRC to keep to federal and applicant timelines. The federal agency has stated that they intend to issue their record of decision for any EIS by May of 2013. The draft EIS is expected to be submitted for comments prior to December of 2012. This is the impetus in denying the tribes the opportunity to conduct a proper 100% survey of the entire area of potential effects. The applicant has repeatedly stated that funds would only be available for survey work up to the fall of 2012. Our historic properties of significance which will be destroyed by this project are in essence being held hostage by this process and by the applicant and federal agency. The 106 process should not be conducted to keep to an applicants and/or federal agencies timeline.

As stated in 36CFR800.1 (a):

The section 106 process seeks to accommodate historic preservation concerns with the needs of federal undertakings through consultation among the agency official and other parties with an interest in the effects of the undertaking on historic properties, commencing at the early stages of project planning. The goal of consultation is to identify historic properties potentially affected by the undertaking, assess its effects and seek ways to avoid, minimize or mitigate any adverse effects on historic properties.

The goal of the 106 process is not to keep to an applicants or federal agencies arbitrary external timeline. The section 106 process does not have a timeline for identification and consultation. In fact, the only reference to timing contained within the document pertaining to this issue is that the federal agency must complete the section 106 process prior to any approval for expenditure of Federal funds or prior to any issuance of any license (36CFR800.1 (c)). If the federal agency has not completed the section 106 process they cannot issue any license or commit any funds to that undertaking. Yet, the NRC continues to insist that it must be done now to keep to their external timelines for their record of decision and the applicant continues to pressure the federal agency by stating that funds are only available for work to be conducted during the fall of 2012 to keep to their timelines. This further reinforces the perception that it is the applicant who is in fact "running the show" as it were. The NRC's record of decision for an EIS should have no influence whatsoever on their completion of the 106 process. Yet, here we are as tribes reading ultimatum bullying tactics by a federal agency to ensure that an external arbitrary date is adhered to that has nothing whatsoever to do with the section 106 process. This is a classic example of what is considered to be not consultation in good faith.

36CFR800.4 (a) (3) specifies that the agency official shall:

Seek information, as appropriate, from consulting parties, and other individuals and organizations likely to have knowledge of, or concerns with, historic properties in the area, and identify issues relating to the undertaking's potential effects on historic properties; and

36CFR800.4 (a) (4) specifies that the agency official shall:

Gather information from any Indian tribe or Native Hawaiian organization identified pursuant to 800.3 (f) to assist in identifying properties, including those located off tribal lands, which may be of religious and cultural significance to them and may be eligible to the National Register, recognizing that an Indian tribe or Native Hawaiian organization may be reluctant to divulge specific information regarding the location, nature and activities associated with such sites.

It has already been established through 36CFR800.2 (c) (2) (ii) that the tribes are to be considered consulting parties for this undertaking and as such the federal agency must gather and seek information pertaining to historic properties from us and to identify issues relating to the undertakings potential effects on those historic properties. The tribe's primary concern with the effects of this undertaking to historic properties has been the insufficient identification efforts undertaken to identify historic properties of significance to tribes. In particular, if the project proceeds without field identification for our historic sites of significance; numerous sites will be impacted. The tribes have provided this information numerous times and even proven this statement in the field yet it is being ignored to stay true to an applicant's and federal agencies timeline. Our historic properties of significance should not be held hostage in this manner. It has been repeatedly stated over the past two months that the NRC will just move along with the project or that the applicant will not pay if field identification does not happen this fall. The October 12, 2012 letter also has the same bullying tactics through ultimatum contained within it by requesting a response by October 19<sup>th</sup>. If the tribes did not respond by October 19<sup>th</sup>, what were the NRC plans? Would they have just moved along with the BLM and applicant as they stated they would back in August, 2012? The SRST-THPO believes they would have. This is not good faith consultation to continue to try and bully tribes into accepting a proposal that is insufficient to even begin field identification efforts in the form of a 100% survey.

36CFR800.4 (b) requires that an agency official shall:

Based on the information gathered under paragraph [a] (*outlined above-for clarification*) of this section, and in consultation with the SHPO/THPO and any Indian Tribe or Native Hawaiian organization that might attach religious and cultural significance to properties within the area of potential effects, the agency official shall take the steps necessary to identify historic properties within the area of potential effects.

36CFR800.4 (b) (1) requires that the agency official shall:

The agency official shall make a reasonable and good faith effort to carry out appropriate identification efforts, which may include background research, consultation, oral history interviews, sample field investigations and field survey....

36CFR800.4 (b) (1) is precisely what the NRC is referring to when it states in the October 12, 2012 letter that:

The NRC recognizes that there are additional methods for identifying potential properties of traditional religious and cultural importance to tribes at the proposed Dewey-Burdock site. Alternatives include opening the site to interested tribal specialists over a period of several weeks with payments to be made to individual tribes, or seeking ethnohistorical and ethnographic information from tribal specialists in interviews at tribal headquarters.

The NRC is neglecting the requirements of 36CFR800.4 (b) that the level of effort contained within 36CFR800.4 (b) (1) is based upon the information gathered pursuant to 36CFR800.4 (a) and is to be conducted in consultation with the SHPO/THPO and Indian tribe or Native Hawaiian organization that might attach religious and cultural significance to properties within the area of potential effects. The SRST-THPO will, once again, for the numerous time during these consultations, state that in field identification in the form of a 100% survey of the area of potential effects for historic properties of significance to tribes by tribal personnel from the participating tribes is required for this project. The

current identification efforts have been proven to be insufficient at identifying historic properties of significance to tribes justifies our position.

It is not good faith consultation to flat out ignore what the tribes have been repeatedly stating for identification since June of 2011. The NRC is basically requesting alternatives to field identification due to an applicant's unwillingness to pay for a proper 100% survey of an undertakings area of potential effect for historic properties of significance to tribes. The applicant had no problem financially supporting other identification efforts such as the archaeologists during their Class III survey and subsequent intensive excavations at 20 sites. If the applicant is unwilling to financially support the tribes to conduct a proper survey for historic properties of significance to them; then the federal agency will not be able to complete the section 106 process and their request for a permit should be denied by the NRC. Our historic properties should not be held hostage in this process or irrevocably destroyed because an applicant is refusing to pay for a proper survey and a federal agency does not understand the section 106 process.

Alternatives include opening the site to interested tribal specialists over a period of several weeks with payments to be made to individual tribes, or seeking ethnohistorical and ethnographic information from tribal specialists in interviews at tribal headquarters.

This statement completely ignores everything that has been discussed with the NRC by the participating tribes since June of 2011. The preferred contractor chosen by the tribes was chosen because his company could conduct a proper survey for sites of significance to tribes and could ensure that the proper protocols for these sites would be followed. What the NRC is suggesting does not accomplish that. Who would ensure that the proper protocols for these sites were respected under the NRC's proposal? Who would be recording these sites? Who would conduct the surveys and ensure that all areas within the area of potential effects received coverage? Who would download and process all this data? Who would write the reports that the SOW requires? Who would fill out the site forms required by the State Historic Preservation Office? Where would all of this information be stored? Looking at the NRC's proposal at face value, the NRC just wants the tribes to send a few people out to walk around for a while and see whatever they happen to see wherever the applicant decides to take them and that will somehow suffice? The NRC's recent proposal makes absolutely no sense and would be a complete disservice to our sites of significance if it ever gets accepted. Once again, and hopefully for the last time, the SRST-THPO requires on the ground field identification by tribal personnel from the participating tribes in the form of a 100% survey of the entire area of potential effects to address our concerns that the current level of identification does not take into account our historic properties of significance. We have proven that the current level of identification is insufficient by showing NRC staff sites of significance to tribes that were missed by current (archaeological) efforts.

The NRC's time should be invested in ensuring that proper identification efforts are conducted (100% survey of the entire area of potential effects by tribal personnel from the participating tribes) and in securing the funds necessary to ensure that the identification efforts are financially supported. It should not be wasted on efforts that do nothing to address tribal concerns with historic properties of significance that the NRC has themselves witnessed and knows will be destroyed by this proposed project. Until such time as the NRC can secure the funds from the applicant (and not the paltry sum that will not be sufficient as currently proposed by the applicant) to properly conduct a 100% survey of the entire area of potential effects for historic properties of significance to tribes; the section 106 process is not complete and therefore no license or approval for expenditure of federal funds can be given.



The request for ideas for alternative methods for identifying historic properties of significance to tribes in lieu of an actual 100% field survey of the entire area of potential effects is denied based on the reasons outlined in this letter.

**The SRST-THPO maintains that the only level of effort that is sufficient for this project is on the ground 100% survey of the entire area of potential effects by tribal personnel from the participating tribes. We have stated this since June 2011 and anything less would not address our concerns for identification per 36CFR800.4.**

If the NRC wishes to pursue alternative methods during their level effort they are welcome to do so as a supplement to the 100% survey. However, this alternative method will never be agreed to by the SRST-THPO as a replacement for a 100% field survey of the area of potential effects or as the sole level of effort per 36CFR800.4 (b) (1). The SRST-THPO has stated repeatedly pursuant to the information gathered under 36CFR800.4 (a) that on the ground field identification of 100% of the area of potential effects by tribal members from the participating tribes is the minimum level of effort that must be conducted for this project.

The SRST-THPO is willing and open to send Tribal Cultural Specialists and Monitors into the field to identify sites (2012) as we always have been. This assumes that our concerns with the project area of potential effects as defined by 36CFR800.16 (d) to account for both the direct and indirect effects, issues pertaining to confidentiality of the resources and any other additional concerns which may come up in the interim are addressed.

Sincerely,  
STANDING ROCK SIOUX TRIBE



Terry Clouthier  
Tribal Archaeologist



## Tribal Historic Preservation Office

P.O. Box 907  
 205 Oak St. East, Suite 121  
 Sisseton, SD 57262

(605) 698-3584 phone  
 (605) 698-4283 fax

October 18, 2012

Kevin Hsueh, Chief  
 Environmental Review Branch  
 Division of Waste Management  
 and Environmental Protection  
 Office of Federal and State Materials  
 and Environmental Management Programs

RE: Dewey Burdock in-situ Recovery Project

Dear Mr. Hsueh,

The Sisseton Wahpeton Oyate THPO would like to state as a matter of record that we fully endorse the Standing Rock Sioux Tribal Historic Preservation Office letter submitted by Terry Cloutier, Standing Rock THPO archeologist, dated October 15, 2012. (See attached).

According to the DENR notice of -Large Scale Mining Permit Application/ Powertech states *"The total acreage within the proposed permit boundary is 10,580 acres. Powertech proposes to affect 2,528 to 3,792 acres depending upon whether deep well injection or the land application is used for wastewater disposal."* Sisseton Wahpeton Oyate along with Standing Rock Sioux Tribe and other tribes have been actively participating in the Section 106 process and have been clear in our needs to address the issues surrounding identification and a proper survey of the 10,580 acres since June of 2011. NRC and Powertech have continually made efforts to accelerate the process to meet their timeline, although meeting a timeline is not the goal of Section 106. In a recent teleconference the ACHP representatives reviewed the issues the tribes are having with Powertech and NCR and noted it as a case of *"an agency that is allowing an unproductive and potentially inappropriate dialog or negotiation to occur without inserting or conveying its own interests or commitments to do the work or to achieve an outcome regardless of the cost"*. This is not good faith consultation and we object to their wishes to force the tribes into accepting a proposal for an insufficient survey of only

the directly affected areas instead of the licensed 10,580 acres which is the permitted area which is our concern with NRC and a proper scope of work.

We assert along with other tribes that the Black Hills are an area of great significance to the Indigenous Nations and that there are irreplaceable historic properties of significance that exist in the proposed area that require protection. This is something that is clearly acknowledged in the 2008 submittal of a "Request for Determination of Special Exceptional, Critical, or Unique Lands and Intent to Operate" to the State of South Dakota. On Page 10 of this submittal, it states that a *Level III Cultural Resources Evaluation Powertech (USA) Incorporated's Proposed Dewey Burdock Uranium Project Locality within the Southern Black Hills, Custer and Fall River Counties, South Dakota by Kruse et al.* was conducted by the Archaeology Laboratory, Augustana College, Sioux Falls, SD. The report refers to the following:

*"The small number of Euro American sites documented was not unanticipated given the peripheral nature of the project area in relation to the Black Hills proper. The disparity existing between the number of Historic and prehistoric sites observed in the project area is also not unexpected; however, the sheer volume of sited documented in the area is noteworthy. The land evaluated as a part of the Level III cultural resources evaluation has an average site density of approximately 1 site per 8.1 acres. Even greater site densities were reported in 2000 during the investigation of immediately adjacent land parcels for the Dacotah Cement/Land exchange [Winham et al., 2001]."*

The importance of this issue and the knowledge of the existence of such historic properties in the area of concern have been made clear to the NRC when tribal representatives visited the sites previously identified by their archeologist. The tribal representatives identified numerous additional sites in that area that had been overlooked. These are issues that NRC must address under not only Section 106 of the NHPA, but also with the requirements under NEPA. Both obligations must be met before issuing a permit.

Sisseton Wahpeton Oyate-THPO also rejects the request for alternative methods for fulfilling 36CFR800.4(b) (1) and maintains that the only sufficient level of effort for this project is an on the ground 100% survey of the entire area of potential effects by tribal personnel from participating tribes.

Sincerely,



Dianne Desrosiers

Sisseton Wahpeton Oyate  
Tribal Historic Preservation Officer

**From:** [Lana Gravatt](#)  
**To:** [Yilma Haimanot](#)  
**Subject:** Response to NRC letter dated october 12,2012  
**Date:** Saturday, October 20, 2012 5:03:23 AM

---

Haimanot:

It is the determination of the Yankton Sioux Tribe Historic Preservation Office that the Nuclear Regulatory Commission (NRC) is in violation of Section 106 of the National Historic Preservation Act of 1966 (NHPA). NRC has not addressed the direct and indirect effects of the Dewey-Burdock in situ recovery project to date. The Yankton Sioux Tribe beleives this area to be an identified area within our history and culture as significant to our identity and spritual way of life. The identification efforts proposed by NRC have not been reasonable. In addition, the process has been rushed by your agency making it unrealistic for the tribes to acheive proper identification and evaluation...Further the Yantkon Sioux Tribe agrees and supports the Standing Rock Sioux Tribe Archeologist, Terry Clouthier in his response letter dated October 15,2012 addressed to Kevin Hsueh, Cheif Enviromental Review Branch Division of Waste Mangement and Enviromental Protection Office of Federal and State Materials and Environmental Management Programs.

This letter is in response to the NRC letter Dated October 12, 2012 requesting to seek alternatives to feild identification.

thank you

Lana M. Gravatt  
Tribal Historic Preservation officer  
Yankton Sioux Tribe S.D.



Protecting the Land, Cultural,  
Heritage and Tradition for  
the Future Generation

## Tribal Historic Preservation Office

P.O. Box 809  
Rosebud, South Dakota  
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Russell Eagle Bear  
Officer

Kathy Arcoren,  
Administrative Assistant

Kevin Hsueh, Chief  
Environmental Review Branch  
Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Programs

October 19, 2012

Dear Mr. Hsueh,

The Rosebud Sioux Tribe THPO (RST-THPO) is in receipt of the Nuclear Regulatory Commissions' (NRC) letter dated October 12, 2012 regarding the Dewey-Burdock in-situ recovery project and the request to seek alternatives to field identification. We find this new request to be disappointing by the lead federal agency especially in light of other recent letters and emails to the tribes. In particular, with the following bullying by ultimatum tactics:

*The NRC staff encourages the Tribal Representatives to consider the offer provided by the applicant when revising the SOW (which should include the above requested information). If Tribal Representatives are unable to provide the requested information by the end of the September 5th and 6th, 2012 meeting to support completion of a field survey in the fall of 2012, the NRC and BLM staff will develop an alternative approach for identifying historic properties, and will move the Section 106 process forward.*

(quote from email sent to tribes by  
Haimanot Yilma on Aug. 30/12).

That quote alone represents one of many fundamental misunderstandings of the Section 106 process by the NRC. The offer by the applicant in this quote included a sum of money which in no way would suffice for field identification for the 10,000 acres that this undertakings area of potential effect technically is. This paltry sum would not even be sufficient for the 2700-3700 acres of direct effects that the applicant and federal agency only want surveyed. The RST-THPO continues to maintain its position, supported by the law by the way, that only addressing the direct effects of a proposed undertaking does not fulfill a federal agencies responsibilities for section 106 considering that the area of potential effects for an undertaking are defined as both direct and indirect effects per 36CFR800.16 (d). The applicants' proposal, which is favored by the NRC, would place unrealistic expectations on our field crews that could never be met. Yet, here we are almost two months later, after having the tribes preferred contractor submit their cost estimate and we are in the exact same spot as we were in August. The NRC, by this letter, is yet again attempting to find an alternative to on the ground field identification. The only difference between the August email and the current letter is that the NRC is making a feeble attempt to include the tribes in their discussion to not conduct proper on the ground field identification.



The SRST-THPO whole-heartedly disagrees with this attempt to circumvent the 106 process on behalf of the applicants' and federal agencies timeline and budget. The following comments outline this disagreement.

The participating tribes have made a concerted and cooperative effort to work with the Nuclear Regulatory Commission on a proposal to address our concerns about the identification of historic properties of significance to tribes for this project. Meaningful conversation pertaining to proper field identification only began in February of 2012 at the meeting in Rapid City, SD, not June of 2011. Identification under Section 106 has, and continues to be, the tribe's primary concern.

The RST-THPO has participated in the Section 106 process up to this point steadfastly and in good faith despite the many missteps in the process by the lead federal agency and the intrusive participation by the applicant and their third party consultants. The latter, at many times during these discussions, are perceived to be running the entire process in place of the lead federal agency and this recent letter and previous letters and communications only re-inforces this perception.

36CFR800.2 (c) (2) (ii) specifies that:

Section 101 (d) (6) (b) of the act requires the agency official to consult with any Indian tribe or Native Hawaiian organization that attaches religious and cultural significance to historic properties that may be affected by an undertaking. This requirement applies regardless of the location of the historic property. Such Indian tribe or Native Hawaiian organization shall be a consulting party.

36CFR800.2 (c) (2) (ii) (A) further specifies that:

The agency official shall ensure that consultation in the section 106 process provides the Indian tribe or Native Hawaiian organization a reasonable opportunity to identify its concerns about historic properties, advise on the identification and evaluation of historic properties, including those of traditional religious and cultural importance, articulate its views on the undertakings effects on such properties, and participate in the resolution of adverse effects.

These two sections of the act specify the tribes' role as consulting parties within the process and the federal agency requirements for consultation with the tribes for every undertaking. The participating tribes have repeatedly stated that we require in field identification for historic properties of significance to tribes for this and all projects. That has been our requirement for this project ever since the informal field visits and information gathering session of June 2011. The participating tribes advised the NRC that identification efforts conducted by archaeologists were insufficient to address historic properties of significance to tribes. The tribes proved that these efforts were insufficient by visiting sites identified by the archaeologists and identifying numerous features that were missed that are significant to tribes. The tribes, applicant, NRC staff and the archaeologists were all present when these historic properties of significance were observed.

Were the tribes given a reasonable opportunity to advise, consult and identify concerns pursuant to 36CFR800.2 (c) (2) (ii) (A)? Yes in some ways the tribes were. Unfortunately, it all amounts to a check box that must be checked in the process when everything that is told to them during these consultations is being subsequently ignored. All of the information which was gathered pursuant to 36CFR800.4 (a) is being subsequently ignored by this latest letter from the NRC to keep to federal and applicant timelines.

The federal agency has stated that they intend to issue their record of decision for any EIS by May of 2013. The draft EIS is expected to be submitted for comments prior to December of 2012. This is the impetus in denying the tribes the opportunity to conduct a proper 100% survey of the entire area of potential effects. The applicant has repeatedly stated that funds would only be available for survey work up to the fall of 2012. Our historic properties of significance which will be destroyed by this project are in essence being held hostage by this process and by the applicant and federal agency. The 106 process should not be conducted to keep to an applicants and/or federal agencies timeline.

As stated in 36CFR800.1 (a):

The section 106 process seeks to accommodate historic preservation concerns with the needs of federal undertakings through consultation among the agency official and other parties with an interest in the effects of the undertaking on historic properties, commencing at the early stages of project planning. The goal of consultation is to identify historic properties potentially affected by the undertaking, assess its effects and seek ways to avoid, minimize or mitigate any adverse effects on historic properties.

The goal of the 106 process is not to keep to an applicants or federal agencies arbitrary external timeline. The section 106 process does not have a timeline for identification and consultation. In fact, the only reference to timing contained within the document pertaining to this issue is that the federal agency must complete the section 106 process prior to any approval for expenditure of Federal funds or prior to any issuance of any license (36CFR800.1 (c)). If the federal agency has not completed the section 106 process they cannot issue any license or commit any funds to that undertaking. Yet, the NRC continues to insist that it must be done now to keep to their external timelines for their record of decision and the applicant continues to pressure the federal agency by stating that funds are only available for work to be conducted during the fall of 2012 to keep to their timelines. This further reinforces the perception that it is the applicant who is in fact "running the show" as it were. The NRC's record of decision for an EIS should have no influence whatsoever on their completion of the 106 process. Yet, here we are as tribes reading ultimatum bullying tactics by a federal agency to ensure that an external arbitrary date is adhered to that has nothing whatsoever to do with the section 106 process. This is a classic example of what is considered to be not consultation in good faith.

36CFR800.4 (a) (3) specifies that the agency official shall:

Seek information, as appropriate, from consulting parties, and other individuals and organizations likely to have knowledge of, or concerns with, historic properties in the area, and identify issues relating to the undertaking's potential effects on historic properties; and

36CFR800.4 (a) (4) specifies that the agency official shall:

Gather information from any Indian tribe or Native Hawaiian organization identified pursuant to 800.3 (f) to assist in identifying properties, including those located off tribal lands, which may be of religious and cultural significance to them and may be eligible to the National Register, recognizing that an Indian tribe or Native Hawaiian organization may be reluctant to divulge specific information regarding the location, nature and activities associated with such sites.

It has already been established through 36CFR800.2 (c) (2) (ii) that the tribes are to be considered consulting parties for this undertaking and as such the federal agency must gather and seek information



pertaining to historic properties from us and to identify issues relating to the undertakings potential effects on those historic properties. The tribe's primary concern with the effects of this undertaking to historic properties has been the insufficient identification efforts undertaken to identify historic properties of significance to tribes. In particular, if the project proceeds without field identification for our historic sites of significance; numerous sites will be impacted. The tribes have provided this information numerous times and even proven this statement in the field yet it is being ignored to stay true to an applicant's and federal agencies timeline. Our historic properties of significance should not be held hostage in this manner. It has been repeatedly stated over the past two months that the NRC will just move along with the project or that the applicant will not pay if field identification does not happen this fall. The October 12, 2012 letter also has the same bullying tactics through ultimatum contained within it by requesting a response by October 19<sup>th</sup>. If the tribes did not respond by October 19<sup>th</sup>, what were the NRC plans? Would they have just moved along with the BLM and applicant as they stated they would back in August, 2012? The RST-THPO believes they would have. This is not good faith consultation to continue to try and bully tribes into accepting a proposal that is insufficient to even begin field identification efforts in the form of a 100% survey.

36CFR800.4 (b) requires that an agency official shall:

Based on the information gathered under paragraph [a] (*outlined above-for clarification*) of this section, and in consultation with the SHPO/THPO and any Indian Tribe or Native Hawaiian organization that might attach religious and cultural significance to properties within the area of potential effects, the agency official shall take the steps necessary to identify historic properties within the area of potential effects.

36CFR800.4 (b) (1) requires that the agency official shall:

The agency official shall make a reasonable and good faith effort to carry out appropriate identification efforts, which may include background research, consultation, oral history interviews, sample field investigations and field survey....

36CFR800.4 (b) (1) is precisely what the NRC is referring to when it states in the October 12, 2012 letter that:

The NRC recognizes that there are additional methods for identifying potential properties of traditional religious and cultural importance to tribes at the proposed Dewey-Burdock site. Alternatives include opening the site to interested tribal specialists over a period of several weeks with payments to be made to individual tribes, or seeking ethno-historical and ethnographic information from tribal specialists in interviews at tribal headquarters.

The NRC is neglecting the requirements of 36CFR800.4 (b) that the level of effort contained within 36CFR800.4 (b) (1) is based upon the information gathered pursuant to 36CFR800.4 (a) and is to be conducted in consultation with the SHPO/THPO and Indian tribe or Native Hawaiian organization that might attach religious and cultural significance to properties within the area of potential effects. The RST-THPO will, once again, for the numerous time during these consultations, state that in field identification in the form of a 100% survey of the area of potential effects for historic properties of significance to tribes by tribal personnel from the participating tribes is required for this project. The current identification efforts have been proven to be insufficient at identifying historic properties of significance to tribes justifies our position.

It is not good faith consultation to flat out ignore what the tribes have been repeatedly stating for identification since June of 2011. The NRC is basically requesting alternatives to field identification due to an applicant's unwillingness to pay for a proper 100% survey of an undertakings area of potential effect for historic properties of significance to tribes. The applicant had no problem financially supporting other identification efforts such as the archaeologists during their Class III survey and subsequent intensive excavations at 20 sites. If the applicant is unwilling to financially support the tribes to conduct a proper survey for historic properties of significance to them; then the federal agency will not be able to complete the section 106 process and their request for a permit should be denied by the NRC. Our historic properties should not be held hostage in this process or irrevocably destroyed because an applicant is refusing to pay for a proper survey and a federal agency does not understand the section 106 process.

Alternatives include opening the site to interested tribal specialists over a period of several weeks with payments to be made to individual tribes, or seeking ethno-historical and ethnographic information from tribal specialists in interviews at tribal headquarters.

This statement completely ignores everything that has been discussed with the NRC by the participating tribes since June of 2011. The preferred contractor chosen by the tribes was chosen because his company could conduct a proper survey for sites of significance to tribes and could ensure that the proper protocols for these sites would be followed. What the NRC is suggesting does not accomplish that. Who would ensure that the proper protocols for these sites were respected under the NRC's proposal? Who would be recording these sites? Who would conduct the surveys and ensure that all areas within the area of potential effects received coverage? Who would download and process all this data? Who would write the reports that the SOW requires? Who would fill out the site forms required by the State Historic Preservation Office? Where would all of this information be stored? Looking at the NRC's proposal at face value, the NRC just wants the tribes to send a few people out to walk around for a while and see whatever they happen to see wherever the applicant decides to take them and that will somehow suffice? The NRC's recent proposal makes absolutely no sense and would be a complete disservice to our sites of significance if it ever gets accepted. Once again, and hopefully for the last time, the SRST-THPO requires on the ground field identification by tribal personnel from the participating tribes in the form of a 100% survey of the entire area of potential effects to address our concerns that the current level of identification does not take into account our historic properties of significance. We have proven that the current level of identification is insufficient by showing NRC staff sites of significance to tribes that were missed by current (archaeological) efforts.

The NRC's time should be invested in ensuring that proper identification efforts are conducted (100% survey of the entire area of potential effects by tribal personnel from the participating tribes) and in securing the funds necessary to ensure that the identification efforts are financially supported. It should not be wasted on efforts that do nothing to address tribal concerns with historic properties of significance that the NRC has themselves witnessed and knows will be destroyed by this proposed project. Until such time as the NRC can secure the funds from the applicant (and not the paltry sum that will not be sufficient as currently proposed by the applicant) to properly conduct a 100% survey of the entire area of potential effects for historic properties of significance to tribes; the section 106 process is not complete and therefore no license or approval for expenditure of federal funds can be given.



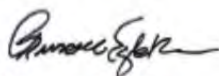
The request for ideas for alternative methods for identifying historic properties of significance to tribes in lieu of an actual 100% field survey of the entire area of potential effects is denied based on the reasons outlined in this letter.

The RST-THPO maintains that the only level of effort that is sufficient for this project is on the ground 100% survey of the entire area of potential effects by tribal personnel from the participating tribes. We have stated this since June 2011 and anything less would not address our concerns for identification per 36CFR800.4.

If the NRC wishes to pursue alternative methods during their level effort they are welcome to do so as a supplement to the 100% survey. However, this alternative method will never be agreed to by the RST-THPO as a replacement for a 100% field survey of the area of potential effects or as the sole level of effort per 36CFR800.4 (b) (1). The RST-THPO has stated repeatedly pursuant to the information gathered under 36CFR800.4 (a) that on the ground field identification of 100% of the area of potential effects by tribal members from the participating tribes is the minimum level of effort that must be conducted for this project.

The RST-THPO is willing and open to send Tribal Cultural Specialists and Monitors into the field to identify sites (2012) as we always have been. This assumes that our concerns with the project area of potential effects as defined by 36CFR800.16 (d) to account for both the direct and indirect effects, issues pertaining to confidentiality of the resources and any other additional concerns which may come up in the interim are addressed.

Sincerely,  
Rosebud Sioux Tribe



Mr. Russell Eagle Bear  
Rosebud Sioux Tribe  
Tribal Historic Preservation Officer  
PO Box 809  
Rosebud, SD 57570  
Ph. (605) 747-4255  
Email: rstthpo@yahoo.com

October 26, 2012

Chairman Michael Jandreau  
Lower Brule Sioux Tribe  
P.O. Box 187  
Lower Brule, SD 57548-0187

SUBJECT: TRANSMITTAL OF TRANSCRIPTS FROM AUGUST 9 AND AUGUST 21, 2012  
TELECONFERENCES

Dear Chairman Jandreau:

Enclosed please find copies of the transcripts from teleconferences held on August 9 and August 21, 2012 pertaining to the proposed Dewey-Burdock, Crow Butte North Trend, and Crow Butte License Renewal projects. The license applicants for the proposed actions are Powertech (USA) Inc. and Cameco Resources, respectively.

During the August 9, 2012 call, participants included representatives from Oglala Sioux, Cheyenne River Sioux, Crow Creek Sioux, Northern Arapaho, Northern Cheyenne, Rosebud Sioux, Santee Sioux, Sisseton-Wahpeton Oyate, Standing Rock Sioux, and Yankton Sioux, South Dakota State Historical Preservation Officer, Bureau of Land Management (BLM), Environmental Protection Agency (EPA) Region 8, Powertech, SRI Foundation (SRIF, applicant's contractor), Cameco, and U.S. Nuclear Regulatory Commission (NRC). During the call, the Tribes requested additional time to review the revised Statement of Work (SOW) and caucus amongst themselves before agreeing to the terms of the revised SOW for identifying properties of religious and cultural significance. All consulting parties agreed to participate in another teleconference on August 21, 2012.

Participants in the August 21, 2012 call included representatives from the NRC, EPA Region 8, BLM, Powertech, Cameco, SRIF, as well as Tribal representatives from Northern Cheyenne, Oglala Sioux, Rosebud Sioux, Sisseton-Wahpeton, Standing Rock Sioux, Yankton Sioux, Cheyenne River Sioux and Santee Sioux. During the teleconference, the NRC staff solicited feedback from the Tribes on the applicant's revised SOW to conduct the Traditional Cultural Properties' studies that the staff sent to the Tribes on August 7, 2012. The consulting parties discussed the following aspects of the applicant's revised draft SOW:

- o The need to focus identification efforts to proposed disturbance areas (~2700 acres for the Dewey-Burdock project).
- o The need to develop a Programmatic Agreement for any future work.

M. Jandreau

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- o Amount of acreage to be covered during the fieldwork. Tribes requested to have 100% survey of the proposed permit area. Tribes offered to revise their SOW and submit the revised SOW in time to support field identification in fall of 2012.
- o Adequacy of compensation for Tribal officials conducting the fieldwork.
- o Confidentiality of information gathered by the Tribes.
- o Tribal involvement in making eligibility determination.
- o Next steps for moving forward with Section 106 consultation process.
- o Tribes requested an opportunity to prepare a revised SOW responsive to concerns expressed during the August 21, 2012, teleconference.
- o NRC proposed to meet with Tribes in Bismarck, North Dakota on September 5-6, 2012 to discuss the SOW and develop a revised document.
- o NRC proposed to send out the Tribe's revised SOW to all consulting parties after the meeting in Bismarck, North Dakota.

Please note that the transcripts are not publicly available, as information discussed during the call is protected under the National Historic Preservation Act (NHPA)<sup>1</sup> and the South Dakota Codified Laws<sup>2</sup>.

<sup>1</sup> Section 304 of the National Historic Preservation Act of 1966, as amended through 2006 [16 U.S.C. 470w-3(a)] concerns the confidentiality of the location of sensitive historic resources:

(a) The head of a Federal agency or other public official receiving grant assistance pursuant to this Act, after consultation with the Secretary, shall withhold from disclosure to the public, information about the location, character, or ownership of a historic resource if the Secretary and the agency determine that disclosure may -

- (1) cause a significant invasion of privacy;
- (2) risk harm to the historic resources; or
- (3) impede the use of a traditional religious site by practitioners.

<sup>2</sup> The release of records pertaining to the location of archaeological sites is restricted under South Dakota Codified Laws (SDCL), specifically, SDCL § 1-20-21.2, Confidentiality of records pertaining to location of archaeological site—Exceptions.

Any records maintained pursuant to § 1-20-21 pertaining to the location of an archaeological site shall remain confidential to protect the integrity of the archaeological site.

M. Jandreau

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If you have any questions or concerns, please contact Kellee Jamerson ([Kellee.Jamerson@nrc.gov](mailto:Kellee.Jamerson@nrc.gov)) at 301-415-7649 for the Dewey-Burdock project or Nathan Goodman ([Nathan.Goodman@nrc.gov](mailto:Nathan.Goodman@nrc.gov)) at 301-415-2703 for the Crow Butte projects.

Sincerely,

*/RA/*

Larry W. Camper, Director  
Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Programs

Enclosures:

1. Transcript from August 9, 2012  
Teleconference
2. Transcript from August 21, 2012  
Teleconference

cc: See next page



cc w/enclosures:

Ms. Claire Green, THPO  
Lower Brule Sioux Tribe  
P.O. Box 187  
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Valois Shea  
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Paige Olson  
Review and Compliance Coordinator  
South Dakota State Historical Society  
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Pierre, SD 57501

Martha Graham  
Program Manager  
SRI Foundation  
333 Rio Rancho Drive, NE, Suite 103  
Rio Rancho, NM 87124





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

October 31, 2012

Dear Tribal Historic Preservation Officer:

SUBJECT: TRANSMITTAL OF SURVEY PROPOSAL FOR THE PROPOSED  
DEWEY-BURDOCK *IN-SITU* RECOVERY PROJECT

On October 12, 2012, the U.S. Nuclear Regulatory Commission (NRC) sent a letter to all consulting parties requesting suggested alternatives for identifying potential historic and cultural properties at the proposed Dewey-Burdock site that may be of interest to Tribes. This request was prompted by NRC's concern that Powertech and Makoche Wowapi/Mentz-Wilson Consultants, LLP would not be able to reach an agreement regarding an appropriate level of effort for completion of a tribal survey for the proposed Dewey-Burdock *In-Situ* Recovery (ISR) project.

The NRC would like to thank the Standing Rock Sioux Tribe, Sisseton-Wahpeton Oyate, Rosebud Sioux Tribe, Yankton Sioux Tribe, Three Affiliated Tribes of the MHA Nation, Cheyenne River Sioux Tribe, and the Turtle Mountain Band of Chippewa Indians for responding to this request.

On October 19, 2012, an alternative survey approach was submitted by the Turtle Mountain Band of Chippewa Indians in collaboration with the Three Affiliated Tribes and the consulting firm of Kadmas, Lee & Jackson. A copy of the proposal is enclosed for your review. The NRC believes the level of effort represented by the Kadmas, Lee & Jackson proposal is commensurate with the survey needs of the 2,637-acre area identified for potential direct effects. The NRC has decided to move forward with this proposal.

The NRC recognizes the importance of providing all interested Tribes with an opportunity to participate in this survey effort. Therefore, the NRC hereby invites each interested Tribe to provide a qualified representative to join the survey team. Powertech has agreed to provide financial support for one representative from each participating Tribe. This includes an honorarium of \$5,000 per Tribe, plus travel reimbursement and per diem for meals and lodging to be distributed at the Tribe's discretion to an individual participating in the fieldwork. Based on the enclosed proposal, the field survey is estimated to require three weeks.

Due to the lateness of the season, it is imperative that this work begin as soon as possible. Therefore, the NRC asks those Tribes who wish to participate in the survey to respond no later than November 7, 2012. Please respond by sending an email to Haimanot Yilma ([Haimanot.Yilma@nrc.gov](mailto:Haimanot.Yilma@nrc.gov)) and/or the NRC's contractor, Randy Withrow ([rwithrow@louisberger.com](mailto:rwithrow@louisberger.com)). If you have any questions or additional comments for the NRC, please forward them to either Haimanot or Randy.

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Please note that the enclosed revised proposal does not contain any proprietary information. The original proposal with cost estimate is being withheld from public disclosure under 10 CFR 2.390.

Sincerely,

A handwritten signature in dark ink, appearing to read "Kevin Hsueh", is written over the typed name.

Kevin Hsueh, Chief  
Environmental Review Branch  
Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Programs

Enclosure: Revised Proposal

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**From:** [Terence Cloutier](#)  
**To:** [Bruce Nadeau](#); [Waste Win Young](#)  
**Cc:** [Ylima Haimanot](#) ([ywithrow@louisberger.com](mailto:ywithrow@louisberger.com)); [dlanned@lsw-nsn.gov](#); [Russell Eagle Bear](#) ([reaglebear@yahoo.com](mailto:reaglebear@yahoo.com)); [Ben Rhodd](#) ([brhoddt1@yahoo.com](mailto:brhoddt1@yahoo.com)); [Conrad Fisher](#) ([conrad.fisher@cheyennation.com](mailto:conrad.fisher@cheyennation.com)); [Wanda Wells](#) ([wandawells@midstatesd.net](mailto:wandawells@midstatesd.net)); [Lana Gravatt](#) ([gravattiana@yahoo.com](mailto:gravattiana@yahoo.com)); [Clair Green](#) ([clairsgreen@yahoo.com](mailto:clairsgreen@yahoo.com)); [Jb Westoni](#) ([jfssst.org](mailto:jfssst.org)); [Elgin Crows Breast](#) ([redhawk@mhnanation.com](mailto:redhawk@mhnanation.com)); [Dennis Yellow Thunder](#) ([ostnrrafd@gwtc.net](mailto:ostnrrafd@gwtc.net)); [Fred Mousseau](#) ([ostnrrathpo@gwtc.net](mailto:ostnrrathpo@gwtc.net)); [Curly Youpee](#) ([cultres@nemontel.net](mailto:cultres@nemontel.net)); [James Whitted](#) ([jmswhitted@yahoo.com](mailto:jmswhitted@yahoo.com)); [Steve Vance](#) ([steve.vance@crst-nsn.gov](mailto:steve.vance@crst-nsn.gov))  
**Subject:** RE: FW: TRANSMITTAL OF SURVEY PROPOSAL FOR THE PROPOSED DEWEY-BURDOCK ISR PROJECT  
**Date:** Thursday, November 01, 2012 12:48:41 PM  
**Attachments:** [Dewey Burdock Oct 19th response with letters from NRC.pdf](#)

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Hi Bruce,

I'm not sure if you are up to date on the current status of this project and the attempts by the federal agency to apparently ignore the Section 106 process. It wouldn't surprise me if you were not given the lack of good faith consultation that this project exemplifies. In particular, there has been a concentrated effort by the federal agency to move this project along without addressing the pressing concerns that all of the consulting tribes currently have. Your office issued a no historic properties determination back in 2010 for this project and stated that you had no concerns at all with this project and that it would not affect any sites of significance for your tribe (stamped on a letter from March 19<sup>th</sup>, 2010). The fact that the NRC is now going with a proposal from your office at basically the 11<sup>th</sup> hour and ignoring all of the information that has been provided since 2011 further illustrates the lengths this federal agency will apparently go to not complete the Section 106 process in a good faith manner.

In particular, the consulting tribes that have been in consultation with the NRC and applicants for the past year and a half have issues with the following:

- Sites of significance to tribes cannot be identified by archaeologists. This was proven to them in the field during the meetings in June of 2011 when the consulting tribes visited the project area and showed the NRC sites that were missed by their archaeological consultants. The consulting tribes have requested a 100% survey of the entire area of potential effects (indirect and direct)- we have never waived on this. Yet, the current proposal will not conduct a 100% survey of the entire project area. A project area that constantly changes numbers from the entire license boundary (10000+acres) to 2673 acres to 3000+ acres depending on which disposal method is used.
- Information was given at a meeting in February 2012 illustrating that a predictive model cannot address the sites of concerns for the consulting tribes. This information was given directly to the Federal agencies involved in this project only and not to the applicant or any third party consultants. The current proposal that your office is involved in is a predictive model without actually naming it that. The NRC is ignoring the information they gained during the February 2012 meeting to keep to their and the applicants timeline for the EIS to be issued.
- The current proposal only addresses the direct area of potential effect of the project.



I'm not sure how familiar you are with the Section 106 process Bruce as I understand you are just recently appointed into your position and I apologize in advance if you are very familiar with the 106 process. 36CFR800.16 (d) defines the area of potential effects as both the indirect and direct effects that an undertaking may have on historic properties. This has been a sticking point for the consulting tribes. The applicant and the NRC only want to complete a survey for the direct effects. They are ignoring the law. The Scope of work submitted by the tribes addressed this concern and a PA was supposed to be developed to address the other 8000 acres that would need to be surveyed. They are continuing to ignore this and your current proposal allows them to do this.

- The NRC basically tried to move the 106 process forward without doing any identification efforts that are required by 36CFR800.4 per their letter of August 30, 2012. The only reason the letter from Oct 12 even came out was because the NRC was informed by the consulting tribes and by the ACHP that what they were trying to do was essentially illegal. There is no provision within 36CFR800.4 that allows them to stop consulting with the tribes for the identification efforts. The only place where they can terminate consultation is 36CFR800.7 for the resolution of adverse effects not during the identification phase. Once again, the NRC is apparently trying to find a way out of their Section 106 responsibilities.

Unfortunately, I could spend all day illustrating to you exactly how this federal agency is apparently trying to circumvent the 106 process but I will just stop here. I have attached the Standing Rock Sioux Tribes response to the October 12 letter which illustrates the points above. The ACHP is well aware of the issues involved in this project and unfortunately, the latest proposal by your office with the Three Affiliated Tribe and KJ does absolutely nothing to address these issues besides create another avenue for the federal agency to try and avoid the consulting tribes concerns. I truly wish that your office and the THPO office of the Three Affiliated Tribes had been involved in this process from the beginning of consultation back in June of 2011 so that these backdoor attempts by the federal agency to apparently drive the tribes apart could have been avoided.

As an aside, I urge your office to reconsider its current proposal and sit at the table with the tribes that have been consulting on this project since 2011 so that proper 106 procedures can be followed and not the feeble attempt at 106 compliance that is currently being conducted. The NRC specifically did not include the Three Affiliated Tribe or your office in the meeting of June 2011 due to the 2010 letters granting a no historic properties affected determination. Your offices have every right under the law to reenter the consultation process at any time, unfortunately, the way the NRC is conducting it – it is pitting your offices against the tribes who have been consulting for the past 1.5 years. This adversarial relationship that is apparently being encouraged by the NRC is not consultation in good faith by them. We should be united in our voice and opinions for this and all projects and not pitted against one another to circumvent the requirements for a federal law that they must follow.

If you have any questions about any of this – I would be more than happy to respond to them. 701

854 8510 although email is probably better as I will not be in the office later today

Terry Clouthier  
Standing Rock Sioux Tribe  
Tribal Archaeologist

**From:** Bruce Nadeau [mailto:brucefnadeau@gmail.com]  
**Sent:** Thursday, November 01, 2012 9:02 AM  
**To:** Waste'Win Young  
**Cc:** Haimanot.Yilma@nrc.gov; rwithrow@louisberger.com; Terence Clouthier; dianned@swo-nsn.gov; Russell Eagle Bear (reaglebear@yahoo.com); Ben Rhodd (brhodd1@yahoo.com); Conrad Fisher (conrad.fisher@cheyennation.com); Wanda Wells (wandawells@midstatesd.net); Lana Gravatt (gravattlana@yahoo.com); Clair Green (clairsgreen@yahoo.com); jb.weston@fsst.org; Elgin Crows Breast (redhawk@mhanation.com); Dennis Yellow Thunder (ostnrrafd@gwtc.net); Fred Mousseau (ostnrrathpo@gwtc.net); Curly Youpee (cultres@nemontel.net); James Whitted (jmswhitted@yahoo.com); Steve Vance (steve.vance@crst-nsn.gov)  
**Subject:** Re: FW: TRANSMITTAL OF SURVEY PROPOSAL FOR THE PROPOSED DEWEY-BURDOCK ISR PROJECT

Just a point of order.

The fact that the project area is part of Sioux Territory (Ft. Laramie Treaty) is a moot point. It seems to me just recently that Makoche Wowapi conducted a few TCP surveys in northwestern North Dakota on lands that are Chippewa and Three Affiliated Tribes territory under the 1904 Davis Agreement and Fort Laramie Treaty (MHA portion). Obviously respecting treaty boundaries wasn't a consideration then.

Sincerely,

Turtle Mountain Tribe THPO

On Wed, Oct 31, 2012 at 3:54 PM, Waste'Win Young <[wyoung@standingrock.org](mailto:wyoung@standingrock.org)> wrote:  
Just for the record. The Standing Rock Sioux Tribal Council passed a resolution in 2010 against working with KLJ because of comments made by a KLJ archeologist Brian O'Danacha in 2009 that "they should just bulldoze all this Indian shit." This is a documented incident.

In addition to this, Turtle Mountain and Three Affiliated Tribes have sites of significance that are different from the Dakota, Lakota and Nakota.

This area was classified as Sioux Territory under the Fort Laramie Treaties of 1851 and 1868.

Please forward this to Kevin.

Wasté Win Young  
Standing Rock Sioux Tribe  
Tribal Historic Preservation Officer  
[\(701\)-854-8645](tel:(701)854-8645) work  
[\(701\)-854-2138](tel:(701)854-2138) fax



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**From:** [Terence Clouthier](#)  
**To:** [Yilma Haimanot](#); [Bruce Nadeau](#); [Hsueh, Kevin](#); "Withrow, Randy"; [Jamerson, Kellie](#)  
**Cc:** [Waste\\*Win Young](#); [djanned@swc-nsn.gov](#); [Russell Eagle Bear](#) ([reaglebear@yahoo.com](mailto:reaglebear@yahoo.com)); [Ben Rhodd](#) ([brhodd1@yahoo.com](mailto:brhodd1@yahoo.com)); [Conrad Fisher](#) ([conrad.fisher@cheyennation.com](mailto:conrad.fisher@cheyennation.com)); [Wanda Wells](#) ([wandawells@midstatesd.net](mailto:wandawells@midstatesd.net)); [Lana Gravatt](#) ([gravattlana@yahoo.com](mailto:gravattlana@yahoo.com)); [Clair Green](#) ([dairsgreen@yahoo.com](mailto:dairsgreen@yahoo.com)); [J.Weston@fsst.org](#); [Elgin Crows Breast](#) ([redhawk@imhanation.com](mailto:redhawk@imhanation.com)); [Dennis Yellow Thunder](#) ([osttrrafd@gwtc.net](mailto:osttrrafd@gwtc.net)); [Fred Mousseau](#) ([osttrrafd@gwtc.net](mailto:osttrrafd@gwtc.net)); [Curly Youpee](#) ([cultres@nemontel.net](mailto:cultres@nemontel.net)); [James Whitted](#) ([jmswhitted@yahoo.com](mailto:jmswhitted@yahoo.com)); [Steve Vance](#) ([steve.vance@crst-nsn.gov](mailto:steve.vance@crst-nsn.gov)); [Valerie Hauser](#); [John Eddins](#)  
**Subject:** RE: FW: TRANSMITTAL OF SURVEY PROPOSAL FOR THE PROPOSED DEWEY-BURDOCK ISR PROJECT  
**Date:** Friday, November 02, 2012 3:32:29 PM

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Haimanot and Kevin,

This latest proposal does absolutely nothing to address the concerns that all of the participating tribes (well the tribes that were participating from June 2011 until this latest failure anyway) have with this project. From all appearances, your agency accepted the proposal because it went along with the applicants financial constraints. That is the only reason it was accepted as it is just another predictive model which we have repeatedly told you are insufficient to address our concerns. Yet, here you are, ignoring the information gathered pursuant to 36CFR800.4 (a) and accepting a predictive model. I will have a letter for you on Monday morning on THPO letterhead to explain to you for the millionth time how your agency has done nothing but fail the 106 process.

As I mentioned in my voice mail. If you issue your SEIS based off the work done on this latest proposal without addressing all of the concerns that have been brought up since June of 2011 - i will fight you every step of the way.

This is an utter failure on your agencies part to accept a proposal from a tribe at the 11th hour that does nothing to address the concerns that were brought up through information gathered pursuant 36CFR800.4 (a) and expect this proposal to show that a good faith effort was met per 36CFR800.4 (b) (1). Especially, considering that your own agency purposely kept them out of the consultation process based on their granting of a no historic properties affected determination back in 2010. They should have been at the table the entire time and not used to pit one tribe against the other as you are doing now. The fact that a federal agency is encouraging this kind of strife between tribes is alarming. Bringing them back in as the accepted proposal in concert with the letters that you have issued where you have been trying to ignore the tribes requests and "move the 106" process forward without all of the tribes who have actually consulted since 2011 is nothing but a slap in the face to every one of us. This just further enforces the opinion that your agency has no intention of negotiating in good faith for this project. All your agency is apparently concerned with is making sure a timeline is kept so you can issue your permit and that you don't anger your applicant.

I encourage your agency to reconsider its current position based on the letter of October 31, 2012 before this escalates further.

Have a good weekend

Terry

**From:** [Dianne Desrosiers](#)  
**To:** [Yilma Haimanot](#)  
**Cc:** [Valerie Hauser](#); [melson@achp.gov](mailto:melson@achp.gov); [Charlene Vaughn](#); [Jim Whitted \(jmswhitted@yahoo.com\)](mailto:Jim.Whitted@jmswhitted@yahoo.com); [WasteWin Young](#); [rstfhp@yahoo.com](mailto:rstfhp@yahoo.com); [Dennis Yellow Thunder \(ostnrraf@qwtc.net\)](#); [cphpo@lakotanetwork.com](mailto:cphpo@lakotanetwork.com); [wandawells@midstatesd.net](mailto:wandawells@midstatesd.net); [cultres@nemontel.net](mailto:cultres@nemontel.net)  
**Subject:** Response Letter  
**Date:** Tuesday, November 06, 2012 4:11:03 PM  
**Attachments:** [KevinHsuehNov6ResponseDOC.PDF](#)

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Good afternoon,

We are in receipt of your correspondence. To say we are disappointed is an understatement! If you recall the purpose of the Federal agency (your role) is to ensure that cultural resources are protected and preserved under the 36CFR Part 800. Its apparent the NRC's concern lies with the development of this uranium project and not protecting cultural resources which are significant to the participating tribes. Please see the attached letter from the Sisseton Wahpeton Oyate and forward to Kevin Hsueh (to whom this letter is addressed).

**Dianne Desrosiers**  
**Tribal Historic Preservation Officer**  
**Sisseton Wahpeton Oyate**  
**PO Box 907**  
**205 Oak St. E, Suite 121**  
**Sisseton, SD 57262**  
**(605)698-3584 office**  
**(605)698-4283 fax**

*"Every part of this Earth is sacred to my people. We are part of the earth and it is part of us".-Chief Seattle, 1854*



November 16, 2012

Mr. Cyril "Whitey" Scott, Chairman  
Rosebud Sioux Tribe  
P.O. Box 430  
Rosebud, SD 57570-0430

SUBJECT: NOTIFICATION OF THE ISSUANCE OF AND REQUEST FOR COMMENTS ON THE DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT FOR THE DEWEY-BURDOCK *IN-SITU* RECOVERY PROJECT IN FALL RIVER AND CUSTER COUNTIES, SOUTH DAKOTA, SUPPLEMENT TO THE GENERIC ENVIRONMENTAL IMPACT STATEMENT FOR *IN-SITU* LEACH URANIUM MILLING FACILITIES

Dear Chairman Scott:

The U.S. Nuclear Regulatory Commission (NRC) staff is reviewing a source materials license application submitted by Powertech (USA), Inc. for the construction, operation, aquifer restoration, and decommissioning of the proposed Dewey-Burdock *In-Situ* Recovery (ISR) Project. The facility is proposed to be located in Fall River and Custer Counties, South Dakota. The proposed facility, if licensed, would recover uranium by a process known as *In-Situ* recovery.

As part of the review process, the NRC has prepared a draft Supplemental Environmental Impact Statement (SEIS) (NUREG-1910, Supplement 4). The draft SEIS includes an analysis of relevant environmental issues, including potential impacts on historic and cultural resources, and documents the NRC staff's preliminary determination regarding the environmental impacts from the construction, operation, and decommissioning of the proposed Dewey-Burdock project.

The NRC staff is complying with its obligations under Section 106 of the *National Historic Preservation Act of 1966*, as amended (NHPA), using the process set forth in Title 36 of the *Code of Federal Regulations* (36 CFR) 800.8©. Pursuant to 36 CFR 800.8©, the NRC staff is using the preparation of the SEIS required by the National Environmental Policy Act of 1969, as amended (NEPA), to comply with its obligations under Section 106 of the NHPA. The NRC staff is using 36 CFR 800.8© in lieu of the procedures set forth in 36 CFR 800.3 through 36 CFR 800.6.

The NRC staff is enclosing the draft SEIS for your review and comment. Pursuant to 36 CFR 800.8©, we are requesting your comments on the draft SEIS and on our preliminary conclusions regarding historic and cultural resources. The NRC staff continues to work with the tribes and other consulting parties in order to identify properties at the Dewey-Burdock site that may be of religious or cultural significance to the tribes. If the staff obtains additional information concerning such properties, it will forward a summary of the information for your review and comment.

C. "Whitey" Scott

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Please provide any information, comments, or concerns you may have on the draft SEIS during the comment period, which ends on January 7, 2013 (or 45 days after the date of publication of the *Federal Register* notice). Comments should be submitted in writing either by mail to Cindy Bladey, Chief, Rules, Announcements and Directives Branch, Division of Administrative Services, Office of Administration, Mailstop TWB-05-B01M, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001 (include Docket ID: in the subject line) or on <http://www.regulations.gov> (after November 23, 2012) and search for documents filed under Docket ID NRC-2012-0277. The NRC staff will address your comments in the final SEIS.

If you have any questions or require additional information, please contact Ms. Haimanot Yilma, Project Manager, by phone at 301-415-8029 or by email at [Haimanot.Yilma@nrc.gov](mailto:Haimanot.Yilma@nrc.gov).

Sincerely,

*/RA/  
AMohseni for LW Camper*

Larry W. Camper, Director  
Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Programs

Docket No.: 040-9075

Enclosure: Draft SEIS

cc: Mr. Russell Eagle Bear, THPO

December 14, 2012

Mr. Kevin Keckler, Chairman  
Cheyenne River Sioux Tribe  
P.O. Box 590  
Eagle Butte, SD 57625-0590

SUBJECT: RESPONSE TO COMMENTS RECEIVED REGARDING TRIBAL SURVEY,  
DEWEY-BURDOCK IN-SITU RECOVERY PROJECT

Dear Chairman Keckler:

The U.S. Nuclear Regulatory Commission (NRC) staff would like to thank all consulting parties for their responses to the staff's October 31, 2012 letter. In that letter, we announced our intent to move forward with a survey to identify properties of significance to tribes within the Dewey-Burdock Project's area of known disturbance. The survey approach was based on a proposal sponsored by the Turtle Mountain Band of Chippewa Indians and the Three Affiliated Tribes, and it was prepared by the consulting firm Kadramas, Lee and Jackson (KLJ). The approach would have involved a three-week field survey of the area of known disturbance led by tribal members affiliated with the Turtle Mountain Tribe and the Three Affiliated Tribes. As part of this approach, the NRC staff invited all interested tribes to provide a qualified representative to join the survey team and participate in the three-week field survey, with compensation for each individual's time and expenses.

The NRC staff received written responses from the Standing Rock Sioux Tribe, Rosebud Sioux Tribe, Oglala Sioux Tribe, Sisseton-Wahpeton Oyate, and Yankton Sioux Tribe objecting to the proposed survey. The tribes stated that the NRC staff's endorsement of the KLJ proposal ignored information previously provided by the tribes. Specifically, the tribes argued that a field survey is needed to identify sites significant to tribes; that the field survey must include the entire project area, not just the area directly affected by the proposed project; that the field survey must be conducted by qualified tribal representatives, not archaeologists; and that survey approaches based on predictive modeling are not appropriate for identifying tribal sites. The tribes further stated that the NRC was not consulting in good faith because it was ignoring information provided by consulting tribes, and because it endorsed a survey proposal submitted by tribes who had previously told the NRC that the project was unlikely to have an effect on places of significance to them.

The NRC staff would like to address the concerns of the five tribes who objected to the KLJ survey approach. The NRC staff endorsed KLJ's survey proposal in response to information provided by the consulting tribes themselves. In particular, the staff agreed with the tribes' recommendation that a field survey conducted by qualified tribal representatives is the preferred approach for identifying and evaluating properties of significance to tribes. KLJ's survey would have accomplished this goal because it would have provided an opportunity for all tribes to participate directly and independently in the identification and evaluation of historic properties at the Dewey-Burdock site.



K. Keckler

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The NRC staff disagrees with all of the other objections raised by the five tribes. Given the nature and scale of the proposed Dewey-Burdock Project, and the nature and extent of the project's potential direct and indirect effects on historic properties, the staff does not believe an intensive-level survey of the entire project area is warranted. The Section 106 regulations at 36 CFR 800.4(b) require that the NRC make a reasonable and good faith effort to identify historic properties that may be affected by the Dewey-Burdock project. *See also "Meeting the 'Reasonable and Good Faith' Identification Standard for Section 106 Review (November 10, 2011).* Further, Section 106 regulations expressly permit an agency to take a phased approach to complying with the National Historic Preservation Act. *See 36 CFR § 800.14(b).* The NRC staff anticipated that the type of survey proposed by KLJ and its tribal sponsors would have produced results sufficient to meet that standard. This is why our previous letter to the consulting tribes, dated September 18, 2012, requested proposals that focused on a field survey for the 2,637-acre area of known disturbance for the proposed Dewey-Burdock project.

The NRC staff also disagrees with the suggestion that differing opinions among consulting parties with regard to appropriate survey methodologies somehow constitutes a failure on our part to consult as required under Section 106. The staff's endorsement of the KLJ proposal came after 14 months of consultations with the tribes over the identification of potential properties at the Dewey-Burdock site. Since February 2012, the staff had been trying to facilitate a statement of work (SOW) between the applicant and the tribes, under which either the tribes themselves or a tribal contractor would lead a survey of the Dewey-Burdock site. However, the parties were unable to agree on a SOW and the NRC staff therefore asked the consulting parties for alternative approaches to identify properties at the Dewey-Burdock site. In response to the staff's request, KLJ submitted its proposal, which the NRC reviewed and circulated among the consulting parties for comment.

The NRC staff endorsed the KLJ proposal because it included a clear statement of survey methodology and used a team-centered approach led by tribal representatives from the Turtle Mountain Band and the Three Affiliated Tribes. The proposal included participation by both Tribal Historic Preservation Officers affiliated with the two sponsoring tribes. While it is true that the survey proposal was prepared by a private firm that offers archaeological survey services, it was the NRC staff's understanding that the field survey would in fact be led by tribal representatives, not KLJ archaeologists, and that the survey would be conducted for the specific purpose of identifying cultural sites of importance to all tribes who chose to participate in the survey. The fact that the survey proposal was sponsored by tribes who had previously stated they were unlikely to have concerns about the project says nothing about the qualifications of the individuals leading the survey. Additionally, to ensure that the survey produced results responsive to the specific interests and concerns of all consulting tribes, the NRC staff invited each tribe to provide its own representative to join the proposed survey team. It was the NRC staff's intent that this survey effort provide each participating tribe with an independent opportunity to identify cultural properties of interest to its members, gather relevant information, and provide independent recommendations regarding the National Register eligibility of those properties.

The NRC has recently learned that KLJ will be unable to conduct the survey described in its proposal. Accordingly, the NRC staff intends to move forward with an alternative field survey approach. The staff will provide the consulting parties with more information on this approach in the near future, and we will notify the consulting tribes of any opportunities to participate in the field survey.

K. Keckler

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With winter weather fast approaching, and with KLJ no longer able to support a field survey, it is apparent that the NRC staff will not be able to meet our goal of completing a survey before the end of 2012. We are therefore postponing survey efforts until the spring of 2013. The applicant will offer specific times in the spring of 2013 where the Dewey-Burdock site would be opened for interested tribes to perform on-the-ground surveys. As communicated during the teleconference held on August 21, 2012, as well as in our letter dated September 18, 2012, the proposed field survey will focus on the 2,637-acre area of known disturbance. In the coming weeks, the NRC staff will send specific plans for initiating the field survey in the spring of 2013.

The NRC staff would also like to initiate discussions regarding development of a programmatic agreement (PA) over the next several months to address remaining areas of consultation under Section 106 for the Dewey-Burdock project. NRC invites all interested consulting parties to provide information relevant to the development of the PA. Finally, the NRC staff would emphasize that we are committed to maintaining the confidentiality of site location information. To be clear, this information will not be disclosed to the public.

NRC's Project Manager Haimanot Yilma or NRC's consultant Randy Withrow will be contacting each of you to discuss potential meeting dates and suggested agenda items for our next conference call.

Thank you once again for your comments. We value your participation in this consultation process.

Sincerely,

*/RA/ A Mohseni for LCamper*

Larry W. Camper, Director  
Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Programs

cc: Steve Vance

**Miller, Debra**

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**From:** Withrow, Randy <rwithrow@louisberger.com>  
**Sent:** Monday, December 17, 2012 1:08 PM  
**To:** Yilma, Haimanot  
**Subject:** FW: Withdrawal of Proposal for Dewey-Burdock In-Situ Recovery Project

**Randy Withrow**  
Sr. Program Manager | Cultural Resources  
The Louis Berger Group, Inc.  
900 50<sup>th</sup> Street | Marion, IA 52302  
Office: 319.373.3043, ext. 3035  
Cell: 515.441.6497  
Fax: 319.373.3045  
[www.louisberger.com](http://www.louisberger.com)

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**From:** Jen Turnbow [<mailto:Jennifer.Turnbow@kljeng.com>]  
**Sent:** Thursday, December 06, 2012 11:38 AM  
**To:** Withrow, Randy  
**Subject:** Withdrawal of Proposal for Dewey-Burdock In-Situ Recovery Project

Randy,

We regretfully have to withdraw our proposal. This was a difficult decision for KLJ to reach. I have also discussed this with Powertech (USA) Inc.

Thank you again for the opportunity.

I have tried to call you today a couple of times; however, the phone lines just keep ringing. If you would like to discuss in more depth, please feel free to give me a call either on my direct line or on my cell phone.

Sincerely,

Jen

Jen Turnbow  
 KLJ  
701-355-8468 **Direct**  
701-471-7052 **Cell**  
701-355-8781 **Fax**  
128 Soo Line Drive  
Bismarck, ND 58501-3310  
[kljeng.com](http://kljeng.com)  
    





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

February 8, 2013

Dear Tribal Historic Preservation Officer:

As part of the U.S. Nuclear Regulatory Commission (NRC) staff's efforts to identify historic properties of religious and cultural significance to Native American Tribes that could be affected by the proposed Dewey-Burdock project, the NRC staff would like to extend an invitation to your Tribe to participate in a field survey as discussed in our December 14, 2012, letter (ML12335A175).

The NRC acknowledges that Native American Tribes possess special expertise in site identification of properties of cultural and religious significance and in assessing the significance of these properties to their individual Tribes. The NRC also acknowledges that the Tribes have expressed concerns about the potential impacts from the proposed Dewey-Burdock project on these properties. The NRC staff believes that a field survey is a reasonable means of identifying properties of cultural and religious significance at this site and therefore provides an opportunity to the Tribes to conduct this survey.

To implement the field survey in the spring 2013, the NRC staff has discussed site access and compensation with the applicant, Powertech (USA) Inc., and has made the following arrangements:

- Any Tribe interested in examining areas of their choosing within the proposed Dewey-Burdock license area may do so during the period of April 1 to May 1, 2013. Although Tribal representatives are encouraged to focus their efforts on those portions of the proposed license area that will actually be disturbed by the project, they may visit any place within the license boundary that they wish to examine within the allowable time.
- Powertech will provide funding and logistical support for these field surveys as described below. Participating Tribes should expect to work directly with Powertech to receive the compensation described.
- Powertech will provide \$125 per day per diem for a maximum of three Tribal representatives from each Tribe. In addition, reimbursement for mileage from Tribal headquarters to Edgemont, South Dakota and return will be available at a rate of \$0.55 per mile for up to two vehicles for each Tribe. Tribal representatives should plan to make their own arrangements for lodging in Edgemont.



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- Powertech will also provide an unconditional grant of \$10,000 to each Tribe choosing to participate in the field survey. This grant may be distributed at the Tribe's discretion to individuals participating in the field survey or to help defray other costs that the Tribe may incur in order to participate in this program and provide the information needed by NRC.
- Each Tribal representative will be provided a safety briefing and will be required to sign a release of liability in Powertech's favor before visiting the site.
- Powertech will provide daily transportation from Powertech's Edgemont office to the project area and will take the Tribal representatives as close as possible to any portions of the license area that they wish to examine. Powertech personnel will remain with the vehicles while the Tribal representatives carry out their field surveys and will provide additional transportation within the project area as required.

After completion of the field survey, all participating Tribes will present their findings in a written report to be submitted directly to the NRC by June 3, 2013. These reports will include the following: (1) a discussion of the field survey completed, including the areas examined; (2) a brief description of each individual property recorded; (3) a National Register of Historic Places evaluation of each individual property recorded; (4) any recommendations concerning criteria of eligibility for previously reported archaeological sites within the license area that may be visited during the field survey; and (5) recommendations for appropriate avoidance buffers or possible mitigation measures should any of the properties recommended as eligible be adversely affected by the proposed project. NRC does not require that property descriptions include interpretive information that Tribes may consider confidential. Information concerning the location of any identified properties of religious and cultural significance may be reported separately and directly to NRC as a confidential appendix to the survey report so that this information will not be disclosed to the public through NRC's NEPA compliance process. Site location information provided by Tribes as part of this confidential appendix will be protected from public disclosure consistent with Section 304 of the National Historic Preservation Act and other applicable laws.

In order for the NRC and Powertech to make the necessary arrangements for the Tribes to conduct these studies, the NRC must receive your Tribe's response to this letter on or before March 12, 2013. If you do not respond by March 12, 2013, the NRC will deem that to mean your Tribe has decided not to participate in this effort. If you decide to participate in the field survey, NRC will forward your response to Powertech to make the necessary arrangements.

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The NRC staff looks forward to working with you on the field survey. Should you have any questions for NRC staff, please contact either Ms. Haimanot Yilma ([Haimanot.Yilma@nrc.gov](mailto:Haimanot.Yilma@nrc.gov)), NRC Project Manager, at 301-415-8029, or Mr. Randy Withrow ([rwithrow@louisberger.com](mailto:rwithrow@louisberger.com)), NRC consultant, at 309-373-3043, ext. 3035.

Sincerely,



Kevin Hsueh, Chief  
Environmental Review Branch  
Environmental Protection and Performance  
Assessment Directorate  
Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Programs

Docket No. 040-09075



Kevin Hsueh, Chief  
Environmental Review Branch  
Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Programs

**T** RIBAL HISTORIC PRESERVATION OFFICE  
**S** TANDING ROCK SIOUX TRIBE  
Administrative Service Center  
North Standing Rock Avenue  
Fort Yates, N.D. 58538  
Tel: (701) 854-2120  
Fax: (701) 854-2138

February 20, 2013

Dear Mr. Hsueh,

The Standing Rock Sioux Tribe THPO (SRST-THPO) is in receipt of the Nuclear Regulatory Commissions' (NRC) letter dated February 08, 2013 regarding the Dewey-Burdock in-situ recovery project and the proposal for tribes to basically just walk around the proposed license boundary and not actually conduct a proper survey of the area. The SRST-THPO offers the following comments for this latest failure of your agencies ability to conduct good faith consultation and identification efforts. I understand that this process is frustrating for your agency given that your agency is essentially new to the 106 process even though the law has been in place since 1966. However, it is far more frustrating for the tribes who have major concerns with the direct and indirect impacts this project will have to our historic properties of significance and to our cultural and spiritual connections to those sites. These comments are not restricted to Dewey-Burdock, the SRST-THPO is fully aware that a similar proposal occurred for the Crow Butte facility and that it is being considered for the proposed Ross Uranium facility so please file these comments with all three projects.

First and foremost, your agency is required per 386CFR800.1 (c) to complete your section 106 compliance prior to any permit being issued. Your agency does not seem to understand this section at all. To be specifically clear on this; your agency and not the applicant, must fulfill Section 106 compliance as there has been a lot of confusion on this subject from your agency (please see letters from Sept and August of 2011). There are really only two options for your agency:

- your agency completes compliance with Section 106 and issue your permit or,
- your agency does not complete compliance with Section 106 and no permit can be issued.

The second option never seems to be brought up as it is obviously the least desirable of the two. There has been no compliance with Section 106 thus far in terms of even the identification of historic properties of significance to tribes and this latest proposal does very little to address this as will be explained later. The SRST-THPO will address this second option as it pertains to funding of the identification efforts further in this response.

Your agency has established a self-imposed deadline of May 2013 to issue your permit, however, according to Federal law you actually cannot issue this permit without completing your compliance with Section 106. There is no way your office can issue a permit with your self-imposed deadline of May 2013 and keep to the schedule you have outlined in your latest "proposal".

This latest proposal is, once again, tailored to only conform to fiscal restraints by the applicant and does not actually fulfill your agencies responsibilities to conduct proper identification efforts. The SRST-THPO has mentioned in previous letters (November 20, 2012) that it appears that everything for this project is tailored around the applicants' expense account. This current proposal is no different.

This current proposal is severely deficient in numerous ways. I have talked with the Advisory Council for Historic Preservation (ACHP) and State Historic Preservation Office (SHPO) about this proposal. I framed the discussion as if this proposal for a methodological framework were followed to conduct an archaeological survey. According to your current proposal to the tribes, you would ask various archaeological companies (up to 23 based on current consulting tribes to keep things fair and balanced) to accept a ten thousand dollar honorarium to each send up to three representatives to walk around the proposed undertakings license boundary for anywhere from one day to thirty days. There would be no specific methodology as to what was needed to be recorded or how and with no direction or real accountability as to how they conduct themselves in the field or where they conduct their field studies. The only requirement is that they submit a written report of what they found to NRC and somehow that will fulfill the identification efforts per 36CFR800.4. This would, in no way, shape or form fulfill the responsibilities for identification for archaeological sites within the Section 106 process. There is absolutely no way that any SHPO would accept this from an archaeological report yet you are asking the tribes to accept this methodology for their identification efforts. Your actions based on this current proposal are arbitrary and capricious.

This current proposal was issued with no tribal input that I am aware of. This can be said for the Crow Butte proposal as well. It is strictly the federal agencies ideas of what they believe will achieve a good faith effort at identification. It has been over a year since we last talked face to face apart from a quickie meeting tacked on to another meeting in Bismarck, ND. I urge the federal agency to begin face to face discussions with the consulting tribes including the tribes who recently joined the consultations efforts concerning these issues once again and not to continue with these ill-advised solo efforts.

Your agency is proposing that an honorarium from the applicant be given to each tribe in the amount of ten thousand dollars to essentially fund the activities of three individuals for a total of 30 days.  $10,000/3=3,333$ . So each individual would get 3,333. Dividing that by the number of days would equal  $3,333/30=111.1$  per day divide that by an 8 hour work day = 13.88 an hour. We previously rejected quotes of 25 dollars an hour that were submitted by the applicants scope of work and budget due to it being far too low compared to what tribal monitors make on the Great Plains and you now expect us to accept half of that? Hopefully, you will begin to see just how extremely deficient this current proposal is. As for any counter proposal that it could be used to fund only one individual, please don't bother. There is no way adequate identification and recording efforts could be completed as you proposed by one individual from each tribe who elects to participate in this manner. I also have serious doubts that three individuals with no direction could adequately complete what is required either. I am basing this statement entirely on the fact that I have visited the project area twice to "get a feel" for the density of sites in the area. The site density is high based upon my observations of unrecorded sites currently in the project area. This was confirmed by tribal representatives in the field during the June, 2011 meeting and again in consultation with Ben Rhodd while in the field with him on this project in May 2012. This



will require a considerable investment of time for identification and recording. This investment of time would be longer than is allowed within this current proposal.

Apparently the applicants fixed dollar amount of 100,000 is not as fixed as they make it sound. The current proposal, if all 23 consulting tribes were to accept ten thousand dollars, would cost 230,000 in honorariums alone. An additional 258,750 dollars in per diem plus an additional 15-20,000 in mileage costs would also be added to this total. This amounts to a little over 500,000 dollars that the applicant would be committing to this project. This, from my understanding, is still shy of the quote that was sent in by Makoche Wowapi, however, it is a lot more in the ball park of what an actual survey should cost but certainly far below what is necessary for the entire license boundary. I am also fully aware that the applicant apparently does not expect all of the tribes to accept this proposal or to accept the honorarium at any rate and by doing so they are likely going to save money on even the initial 100,000 fixed amount if not enough tribes agree. However, would a good faith effort be met by one or two tribes accepting this money? I respectfully submit that it would not. This current proposal is just short of a bribe disguised as a token identification effort. It calls into question the entire integrity of the 106 process.

If the applicant is unwilling to fund a proper survey for historic properties of significance to tribes, the federal agency cannot complete its Section 106 responsibilities and compliance and therefore no permit can be issued for this project. As I mentioned previously, this is never a consideration for the federal agency. It is considered along the same line as the no-action alternative within the NEPA process, in that it is there because it is required, however, it is subsequently ignored. The mandate at 36CFR800.1 (c) does not allow you to ignore this. As mentioned previously, you only have two options when it comes to Section 106.

The only good aspect that I have seen within the current proposal is that the NRC has apparently, finally, realized after almost two years of discussions that the undertaking is the entire license boundary and is not restricted to the area of direct effects. There is hope for your agency after all, unfortunately however, not under the auspices of the current proposal.

Once again, this amounts to another ultimatum that the tribes cannot and should not accept. There is no way any research conducted in this manner would be accepted for an archaeological survey by SHPO and we as THPO's should not accept it as being acceptable to conduct identification efforts for our sites of significance. Sites of significance that we know, for a fact, are within this projects license boundary.

A proper TCP survey following identification methods analogous to an archaeological survey that SRST-THPO together with other Tribes have endorsed has not been taken seriously and dismissed as cost-prohibitive. The fact that the applicant underestimated the amount of people, time and money required to meet this level of effort is not a reason to abandon identification efforts. NRC cannot walk away from their responsibility based on the applicants dream budget or schedule and claim to be working in good faith. Once again, we encourage the NRC to conduct proper identification efforts and not this current failure of a proposal.

Sincerely,  
STANDING ROCK SIOUX TRIBE



Terry Clouthier  
Tribal Archaeologist

March 12, 2013

Mr. Bryan Brewer, President  
Oglala Sioux Tribe  
P.O. Box 2070  
Pine Ridge, SD 57770-2070

SUBJECT: INVITATION FOR GOVERNMENT-TO-GOVERNMENT MEETING  
CONCERNING LICENSING ACTIONS FOR PROPOSED URANIUM  
RECOVERY PROJECTS

Dear President Brewer:

The U.S. Nuclear Regulatory Commission (NRC) is extending an invitation to you or your designated representatives for a one day government-to-government meeting on matters concerning licensing actions associated with proposed uranium recovery projects. The purpose of this government-to-government meeting is to discuss items of mutual interest related to NRC uranium recovery projects. The NRC staff respectfully suggests the period of May 6, 2013 through May 24, 2013, for this proposed meeting, at a convenient time and place. It is important to establish your availability and interest in participating in the government-to-government meeting by March 29, 2013, in order to facilitate planning.

The NRC proposed topics for this meeting include the NRC's licensing process for uranium recovery projects and field surveys to identify historic properties of cultural and religious significance at proposed uranium recovery project sites. The majority of the time allotted for the meeting will be available for direct government-to-government consultation. Please advise us if there are other specific topics related to uranium recovery which you would like to discuss during the meeting. The NRC management will be available to meet with tribal delegations in private meetings immediately following the general meeting and the following day. Please let us know of your interest in a private meeting so that a specific time to meet can be arranged.

The NRC is inviting the leaders of tribes with an interest in proposed uranium recovery projects. A complete listing of invited tribes is enclosed (Enclosure 1). For your convenience, a list of current uranium recovery projects under review is also enclosed (Enclosure 2).



B. Brewer

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We look forward to your feedback. Ms. Jill Caverly of my staff will be coordinating the meeting if you accept our invitation. She can be reached at 301-415-6699 or by email at [Jill.Caverly@nrc.gov](mailto:Jill.Caverly@nrc.gov).

Sincerely,

/RA/

Larry W. Camper, Director  
Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Programs

Enclosures:

1. Listing of Invited Tribes
2. List of Current Uranium Recovery Activities

cc: Richard Iron Cloud



## Oglala Sioux Tribe

### Office of the President

Pine Ridge Indian Reservation  
Post Office Box 2070  
Pine Ridge, South Dakota 57770  
Phone: 605.867.8420  
Fax 605.867.6076  
bryan@oglala.org



March 22, 2013

Kevin Hsueh, Chief  
Environmental Review Branch  
Division of Waste Management  
And Environmental Protection  
Office of Federal and State Materials  
And Environmental Management Programs

RE: Response to February 8, 2013 letter to Tribal Historic Preservation Officer

On behalf of the Oglala Sioux Tribe, I am writing to express objection to the Nuclear Regulatory Commission's (NRC) December 14, 2012 and February 8, 2013 letters regarding the survey proposal amendments to the Dewey-Burdock *In Situ* Recovery Project.

It is unfortunate that the NRC continues to push its sole justification for such measures are self-imposed timelines and cost restraints when proposing an April 1, 2013 – May 1, 2013 period for completing such a survey along with other Tribes invited to participate. The Oglala Sioux Tribe objects to the terms of the proposal at this time until our Tribal Administration can be made apprised of these new developments and until our contentions are formally addressed by NRC. We continue to have concerns over the scope of work methodology, limited costs and rudimentary cultural sensitivity and awareness on behalf of the NRC, direct and indirect effects on cultural resources and historical burial grounds, and privacy concerns for intellectual property.

Collaboratively, the Oglala Sioux Tribe to date, along with its allies within the Seven Council Fires, have dedicated time and energy towards informal discussions as well as Section 106 consultations on historic and cultural resources, and other concerns and issues surrounding this very sensitive area within our immediate aboriginal Sioux (Lakota, Dakota, Nakota) homelands and territories. The Oglala Sioux Tribe continues to assert its sovereignty and right to existence of Traditional Cultural Properties (TCP) on these lands within the proposed project area. These shared cultural resources and burial grounds with the Seven Council Fires is not something to take lightly or to be done so hastily.

The Oglala Sioux Tribe, at this time demands formal government-to-government consultation rather than the existing National Historic Preservation Act (NHPA) Section 106 consultation, which obviously not working as proposed. Please refer back to our Tribes' November 5, 2012 letter and its numbered contentions listed that were not specifically addressed in either the December 14, 2012 and February 8, 2013 letters, and without the written consent from the Seven Council Fires. There are internal processes that the Oglala Sioux Tribal government and its constituents must go through in order proceed forward on any type of project of this magnitude.

There are at this time too many uranium-related projects proposed that the NRC attempts to consult with the Tribes at the same time, and this convolutes the issues and contentions posed by the Tribes to each respective project. To receive notification of field work to be held April 1, 2013 in the February 8, 2013 letter indicating that negotiations ended between the applicant and proposed contractor for the Dewey-Burdock project does not allow sufficient time to receive the formal authorization from our Tribal Council and constituents. In addition, this unrealistic timeline does not consider other permitting processes currently pending (water rights and wastewater disposal permitting process currently occurring through the State of South Dakota). Until these can be resolved, it has difficult to see how we are to proceed with this section of the process in the identification of cultural resources in the project area.

Our Oglala Sioux Tribal Historic Preservation Office (OSTHPO) continues to serve as our regulatory arm of the Tribal government for historic preservation items and cannot be expected to act in both this capacity as well as a contractor to conduct such survey work. This NRC process initially asked the THPO's for assistance in drafting the scope of work, identifying a contractor with an official letter of support, and possibly identifying Tribal monitors from each representative Tribe with an official letter. To date, there has been nothing formal sent from the Oglala Sioux Tribe because initial information provided by NRC as to which Tribes were actually participating was incorrect. Our OSTHPO was provided incorrect information that the other Seven Council Fire's Tribes were going to participate in the survey, and actually they have confirmed they have not provided this written notification.

This continues to be an environmental justice issue with several federal laws not fully recognized and the NRC needs to do its own research as these are not being upheld appropriately. The Native American Graves Protection and Repatriation Act (NAGPRA) discusses language similar to the following that there are inter-cultural patrimonial considerations regarding the cultural landscape belonging to all respective Sioux Tribes, and not to one or a few Tribes. We understand that there are 23 Tribes being asked to participate with some accepting and some declining. Let it be understood that the Oglala Sioux Tribe actively stands by the other Seven Council Fires in trying to honor this process as best as possible and require a formal government-to-government consultation in order to move forward.

Sincerely,



Bryan V. Brewer, Sr.  
Tribal President  
Oglala Sioux Tribe

Cc: Oglala Sioux Tribal Council Members  
Wilmer Mesteth, Oglala Sioux Tribal Historic Preservation Officer  
Seven Council Fires THPO  
Charlene Dwin Vaughn, ACHP



April 24, 2013

Mr. Reid Nelson, Director  
Federal Agency Programs  
Advisory Council on Historic Preservation  
1100 Pennsylvania Avenue  
Suite 803  
Old Post Office Building  
Washington, DC 20004

SUBJECT: SECTION 106 ACTIVITIES FOR THE PROPOSED DEWEY-BURDOCK IN-SITU URANIUM RECOVERY PROJECT IN FALL RIVER AND CUSTER COUNTIES, SOUTH DAKOTA; INVITE PARTICIPATION IN THE SECTION 106 PROCESS AND REQUEST FOR GUIDANCE AND CLARIFICATION

Dear Mr. Nelson:

With this letter, the U.S. Nuclear Regulatory Commission (NRC) staff formally invites the Advisory Council on Historic Preservation (ACHP) to become an active consulting party in the Section 106 process for Powertech (USA) Inc.'s proposed Dewey-Burdock In-Situ Uranium Recovery Project in Fall River and Custer Counties, South Dakota (Map 1 shows the proposed project area). The NRC staff also provides the ACHP with an update on the staff's Section 106 consultation efforts for the Dewey-Burdock Project (Enclosure 2). A brief description of the NRC efforts to date follows (Enclosure 3). A chronology of the NRC staff's consultation efforts is detailed in the Enclosures.

The license boundary for the project encompasses 10,580-acres in Fall River and Custer Counties. Although the project site is 10,580-acres, the area of ground disturbance is considerably smaller. Only 243 acres will be used for wellfield development, construction of the central processing plant and satellite plants, installation of all associated piping, and road construction. An additional 2,394-acre of project land has been established as a buffer zone surrounding the wellfields and plant facilities. The area of potential effects (APE) for ground disturbance totals 2,637-acres (Map 3 shows the areas of potential impact). The remainder of the project area maybe subject to visual or auditory effects; these effects will be examined during the continued consultation efforts with all consulting Tribes.

Additional land disturbance may occur within the project boundary for waste disposal through land application methods and/or for power line development. The need for these actions is still unclear, and for this reason the precise locations of future disturbances are unknown. Therefore, the NRC staff plans to use a phased approach and develop a programmatic agreement (PA), as allowed by 36 CFR 800.4, to address sites that could be impacted by the land application disposal option, as well as land that would be disturbed for power line development (Map 2 shows the archeological sites). The NRC staff emphasizes that

R. Nelson

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development of future wellfields outside the area identified in the license application requires a separate license application and new NRC safety and environmental reviews, including a new Section 106 review. The NRC staff is consulting with 23 interested Tribes to identify and evaluate properties of traditional religious and cultural significance that may be affected by the proposed action. To date, the NRC staff has held three face-to-face meetings and three teleconferences with the Tribes. The NRC staff provided the Tribes with copies of the Class III Cultural Resource survey. The staff has also shared information with Tribes through numerous letters, emails and follow-up phone calls, in an effort to gather information about the location and National Register eligibility of properties within the proposed project area.

Several issues have arisen during meetings between tribal representatives and the NRC staff on which consensus has not been reached. Many of the consulting Tribes have stated that a close-interval (5 meters) pedestrian inventory or survey of the entire 10,580-acre project area is necessary to identify properties of religious and cultural significance that might be impacted by the proposed project. The Tribes expressed concerns about the future expansion of the project into areas beyond the 243-acre area of ground disturbance and its 2,394-acre buffer zone. The Tribes raised concerns that new areas may be developed within the Dewey-Burdock site without tribal consultation and continued NRC involvement. Recently, some Tribes have claimed that a close-interval pedestrian survey of the entire 10,580-acre project area is the only way the NRC can meet the reasonable and good faith standard for identification of historic properties of significance to the Tribes.

The NRC staff has considered the information provided by the Tribes, but we do not agree that an intensive pedestrian survey of the entire project area is necessary to identify and evaluate potential historic properties that may be affected by the project. The NRC staff notes that, under 36 CFR 800.4(b)(1), federal agencies consider several factors in determining what constitutes a "reasonable and good faith" effort for identifying historic properties. These include "past planning, research and studies, the magnitude and nature of the undertaking and the degree of federal involvement, the nature and extent of potential effects on historic properties, and the likely nature and location of historic properties within the APE." The regulation also states that this level of effort may include a variety of information-gathering approaches, including "sample field surveys."

The NRC staff believes an intensive survey for properties of traditional religious and cultural importance to Tribes is appropriate for the 2,637-acres that include the area of direct ground disturbance and its buffer zone. For that area, the impact to historic properties could be significant. While there is also some potential for effects on any historic properties that may lie outside the area of ground disturbance and its buffer zone—auditory or visual effects, for example—these effects should be limited, temporary and reversible. For this reason, the NRC staff believes that less intensive investigative approaches would be reasonable, prudent, and appropriate. The NRC staff's position is consistent with the nature of the undertaking at issue, the regulations at 36 CFR 800.4(b)(1) and 800.8, and ACHP guidance regarding the reasonable and good faith standard for property identification.



R. Nelson

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Since the NRC staff initiated the Section 106 process in March 2010, the staff has expended significant effort in trying to obtain information on any traditional religious and cultural properties that may be present at the Dewey-Burdock site. The staff's efforts, outlined in the enclosures to this letter, have offered multiple opportunities for interested Tribes to consult with the staff. The NRC staff believes that it has made a good faith and reasonable effort to reach out to interested Tribes to commence identification efforts for the proposed Dewey-Burdock site. To date, however, the staff has been unable to obtain tribal agreement regarding an approach for identifying potential properties at the site. Nor has the staff received any information from the consulting Tribes regarding any *known* properties at the site.

With respect to the field survey requested by the Tribes, NRC communicated with the consulting parties in December 2012 that Powertech will offer specific times in the spring of 2013 where the Dewey-Burdock site would be opened for interested Tribes to perform on-the-ground surveys. Although the NRC staff does not agree that an intensive pedestrian survey of the entire project area is necessary to identify and evaluate potential historic properties that may be affected by the project, in an effort to work collaboratively with all interested Tribes, the NRC staff sent an invitation letter to the Tribes on February 8, 2013 to conduct an on-the-ground field survey. The survey allows the Tribes to examine areas of their choosing within the 10,580-acre project boundary, but focus on the 2,637-acres (243-acre area of ground disturbance and its 2,394-acre buffer zone). The NRC staff would also like to initiate discussions regarding the development of a PA over the next several weeks to address remaining areas of consultation under Section 106 for the Dewey-Burdock project. The NRC staff believes that the level of survey efforts outlined above is reasonable and appropriate, and is consistent with 36 CFR 800.4(b)(1). After historic properties are identified, staff will follow 36 CFR 800.4(c)(1) to evaluate the significance of the properties.

The NRC appreciates any guidance from the ACHP regarding path forward as stated above to move the Dewey-Burdock Section 106 consultation forward.



R. Nelson

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If you have any questions regarding the content of this letter or the enclosures, please contact Ms. Haimanot Yilma of my staff at 301-415-8029 or by email at [Haimanot.Yilma@nrc.gov](mailto:Haimanot.Yilma@nrc.gov).

Sincerely,

/RA/

Larry W. Camper, Director  
Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Programs

Enclosures:

1. Maps 1-3
2. Summary of Tribal Consultation Activities
3. Section 106 Tribal Outreach Efforts

May 1, 2013

Mr. Bryan V. Brewer, President  
Oglala Sioux Tribe  
P.O. Box 2070  
Pine Ridge, SD 57770-2070

SUBJECT: UPDATE REGARDING PLANNED GOVERNMENT-TO-GOVERNMENT  
MEETING CONCERNING LICENSING ACTIONS FOR PROPOSED URANIUM  
RECOVERY PROJECTS

Dear President Brewer:

On March 12, 2013, the U.S. Nuclear Regulatory Commission (NRC) sent a letter extending an invitation to you or your designated representatives for a one day government-to-government meeting on matters concerning licensing actions associated with proposed uranium recovery projects. The purpose of this government-to-government meeting is to discuss items of mutual interest related to NRC uranium recovery projects.

Since that time, we have received input to the preferred timeframe and location and have selected the date of May 23, 2013, in Rapid City, South Dakota. The majority of the time allotted for the meeting will be available for direct government-to-government consultation. Additionally, NRC management will be available to meet with tribal delegations in private meetings immediately following the government-to-government meeting and the morning of May 24, 2013.

If you are interested in attending this meeting or would like more information, please feel free to contact Ms. Jill Caverly of my staff. She can be reached at 301-415-6699 or at [Jill.Caverly@nrc.gov](mailto:Jill.Caverly@nrc.gov). A complete listing of invited Tribes is enclosed (Enclosure 1). For your convenience, a list of current uranium recovery projects under review is also enclosed (Enclosure 2).

Sincerely,

/RA/

Larry W. Camper, Director  
Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Programs

Enclosures:

1. Listing of Invited Tribes
2. List of Current Uranium Recovery Activities

cc: Wilmer Mesteth

**POWERTECH (USA) INC.**

RICHARD E. BLUBAUGH  
Vice President-Health, Safety  
& Environmental Resources

June 3, 2013

Kevin Hsueh, Branch Chief  
Environmental Review Branch-B  
Division of Waste Management and Environmental Protection  
Office of Federal and State Materials and Environmental Management Plans  
Mail Stop T8F05  
Nuclear Regulatory Commission  
Washington, D.C. 20555-0001

VIA eMail & USPS

Re: Dewey-Burdock Project, Section 106 Process, Completion of TCP Field Survey,  
Docket No. 04009075, TAC No. J00606

Dear Mr. Hsueh:

This letter serves to confirm the completion of the Section 106 TCP identification component initially addressed in your letter dated August 12, 2011. In that letter, you requested that Powertech (USA) Inc. (Powertech) assist the NRC in obtaining information regarding properties (TCPs) of traditional religious and cultural importance to one or more Indian tribes. This information, the letter stated, was necessary to comply with NEPA and Section 106 of the NHPA. After working closely with NRC and our cultural resource consultants, SRI Foundation, for many months trying to develop a reasonable approach with the tribes, Powertech informed you via our letter dated October 9, 2012 that we were unable to secure such information. We also noted Powertech's willingness to support financially NRC's efforts to complete the agency's responsibilities in this regard.

Then in NRC's letter of February 8, 2013 to the tribes, NRC invited the interested tribes to participate in a field survey at the Dewey-Burdock project area during the month of April 2013. The letter also noted that Powertech would provide funding and logistical support for the field survey. With this letter, Powertech confirms the completion of this activity. Due to inclement weather in April, the field survey was extended to May 24<sup>th</sup>. Some information regarding tribal participation is included below for your information.

Of the twenty-three tribes invited, seven tribes participated in the field survey. Twenty Indian monitors/THPOs from the seven tribes surveyed the property for a total of 152 man-days (in field). The seven participating tribes are: Northern Cheyenne, Northern Arapaho, Crow Nation, Crow Creek Sioux, Cheyenne & Arapaho of Oklahoma, Santee Sioux and the Turtle Mountain Band of Chippewa. Special recognition goes to the Northern Cheyenne for the most man-days in the field. Collectively, the three monitors and THPO, Conrad Fisher, were in the field for 60 days. We trust the tribes' submitted report is representative of the time spent surveying the property.

5575 DTC Parkway, Suite 140  
Greenwood Village, CO 80111 USA

Telephone: 303-790-7528  
Facsimile: 303-790-3885

Website: [www.powertechuranlum.com](http://www.powertechuranlum.com)  
Email: [info@powertechuranlum.com](mailto:info@powertechuranlum.com)

Kevin Hsueh, NRC  
Dewey-Burdock 106 TCP Field Survey  
June 3, 2013  
Page two

Powertech has provided the agreed upon amounts for 1) unconditional grant of \$10,000 per tribe, 2) \$125/day per diem for up to 3 monitors, 3) mileage reimbursement at the rate of \$0.55/mile for two roundtrips from the tribal headquarters to Edgemont, SD, and transportation to and from the project area. Powertech believes it has assisted in this information gathering to the extent it was requested and agreed upon. We understand the tribes' reports are due June 24<sup>th</sup> and that the NRC has yet to fully evaluate the potential indirect effects from the project. Nevertheless, we are pleased that this phase of the Section 106 Process is completed and look forward to NRC's confirmation that the reports have been received.

We are disappointed that many of the Sioux tribes did not participate. However, we particularly appreciate the participation of the Crow Creek Sioux, the only South Dakota Sioux tribe to take part in the survey. It is our understanding that the Oglala Sioux had initially agreed to participate, then withdrew under the claim that they did not have time to meet with Council, and that these communications are posted on ADAMS. The Yankton Sioux also had initially indicated it would participate and then withdrew in early April.

We also appreciate that NRC's consultant, Randy Withrow (Louis Berger Group), was available for the tribes to consult throughout the survey period and that NRC Staff was also available the majority of the survey period. The combined efforts of the participating tribes, NRC and Powertech hopefully will be substantiated by reports that result in a prompt determination of potentially eligible sites, and ultimately an acceptable programmatic agreement.

Respectfully yours,



Richard Blubaugh

cc: R. F. Clement, President & CEO  
Lynne Sebastian, SRI Foundation  
Haimanot Yilma, NRC Project Manager

**From:** [Yilma, Haimanot](#)  
**To:** [Terry Quesinberry](#)  
**Cc:** [Natalie Gates](#); [Hester, Amy L.](#); [Charlene Bessken](#)  
**Subject:** RE: Follow Up for the Proposed Dewey-Burdock Insitu Recovery Project, Fall River and Custer Counties, South Dakota  
**Date:** Monday, September 09, 2013 2:25:00 PM  
**Attachments:** [image002.png](#)  
[image003.png](#)

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Mr. Quesinberry,

Thank you for your prompt response. We understand the formal Section 7 consultation does not address requirements of other federal acts such as Migratory Bird Treaty Act and/or Bald and Golden Eagle projection act. We have considered both of these acts during the development of our NEPA documents and have properly addressed the requirements of these acts in our final assessments.

Thank you again.

Sincerely,

Haimanot Yilma

---

**From:** Terry Quesinberry [mailto:[terry\\_quesinberry@fws.gov](mailto:terry_quesinberry@fws.gov)]  
**Sent:** Monday, September 09, 2013 11:51 AM  
**To:** Yilma, Haimanot  
**Cc:** Natalie Gates; Hester, Amy L.; Charlene Bessken  
**Subject:** RE: Follow Up for the Proposed Dewey-Burdock Insitu Recovery Project, Fall River and Custer Counties, South Dakota

Ms. Yilma,

I can confirm that no formal or informal Section 7 consultation is required based upon your determination and we have no records of any federally listed species in the area of the project. Please be aware that this does not apply to migratory birds or bald and golden eagles protected under the Migratory Bird Treaty Act and/or the Bald and Golden Eagle Protection Act.

**Terry Quesinberry**  
Fish and Wildlife Biologist  
U.S. Fish and Wildlife Service  
Ecological Services  
South Dakota Field Office  
Phone: (605) 224-8693, x234  
FAX: (605) 224-9974  
[terry\\_quesinberry@fws.gov](mailto:terry_quesinberry@fws.gov)

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**From:** Yilma, Haimanot [mailto:[Haimanot.Yilma@nrc.gov](mailto:Haimanot.Yilma@nrc.gov)]  
**Sent:** Monday, September 09, 2013 10:08 AM  
**To:** Terry Quesinberry  
**Cc:** Natalie Gates; Hester, Amy L. ([amy.hester@swri.org](mailto:amy.hester@swri.org))  
**Subject:** RE: Follow Up for the Proposed Dewey-Burdock Insitu Recovery Project, Fall River and Custer



Counties, South Dakota

Dear Mr. Quesinberry,

During the public comment period on the draft SEIS, the NRC received several public comments stating that we should have initiated formal Section 7 consultation with the Fish and Wildlife Service to determine impacts on listed threatened and endangered species. Based on our draft and final SEIS assessments, the proposed action would not affect federally listed threatened, endangered, or candidate species or critical habitat. Therefore, NRC staff concluded that no FWS biological opinion or formal Section 7 consultation is required.

Based on the information you provided below, we understand that a federal agency is not required to consult with FWS if the agency has determined an action will not affect listed species or critical habitat. We are confirming with you that our original assessment that no formal Section 7 consultation is required has not changed and is accurate. We are doing so in order to appropriately address the public comments we have received on this issue.

Sincerely,

Haimanot Yilma

---

**From:** Terry Quesinberry [[mailto:terry\\_quesinberry@fws.gov](mailto:terry_quesinberry@fws.gov)]  
**Sent:** Wednesday, September 04, 2013 2:35 PM  
**To:** Yilma, Haimanot  
**Cc:** Natalie Gates  
**Subject:** RE: Follow Up for the Proposed Dewey-Burdock Insitu Recovery Project, Fall River and Custer Counties, South Dakota

Ms. Yilma,

As our FAQ on consultation indicates ([Endangered Species Program | What We Do | Consultations | Frequently Asked Questions](#)) your determination of "no effect" or "will not affect" does not require concurrence.

**Must a Federal agency consult with the Services (i.e., receive concurrence) if it determines: a) no effect; b) beneficial effect; or c) not likely to adversely affect?**

A Federal agency is not required to consult with the Services if it determines an action will not affect listed species or critical habitat. A Federal agency is required to consult if an action "may affect" listed species or designated critical habitat, even if the effects are expected to be beneficial. In many cases, projects with overall beneficial effects still include some aspects that will adversely affect individuals of listed species and such adverse effects require formal consultation. If an agency determines that its action is not likely to adversely affect listed species or critical habitat, it can request the concurrence of the Services with this determination. If the Services agree, consultation is concluded with a concurrence letter

Terry Quesinberry  
Fish and Wildlife Biologist  
U.S. Fish and Wildlife Service  
Ecological Services  
South Dakota Field Office  
Phone: (605) 224-8693, x234



FAX: (605) 224-9974  
[terry\\_quesinberry@fws.gov](mailto:terry_quesinberry@fws.gov)

---

**From:** Yilma, Haimanot [mailto:[Haimanot.Yilma@nrc.gov](mailto:Haimanot.Yilma@nrc.gov)]  
**Sent:** Wednesday, September 04, 2013 11:50 AM  
**To:** [Terry.Quesinberry@fws.gov](mailto:Terry.Quesinberry@fws.gov)  
**Subject:** FW: Follow Up for the Proposed Dewey-Burdock Insitu Recovery Project, Fall River and Custer Counties, South Dakota

FYI

---

**From:** [Terry.Quesinberry@fws.gov](mailto:Terry.Quesinberry@fws.gov) [mailto:[Terry.Quesinberry@fws.gov](mailto:Terry.Quesinberry@fws.gov)]  
**Sent:** Monday, August 27, 2012 2:30 PM  
**To:** Amy Hester  
**Cc:** Yilma, Haimanot; James Prikryl  
**Subject:** Re: Follow Up for the Proposed Dewey-Burdock Insitu Recovery Project, Fall River and Custer Counties, South Dakota

Amy,

I do not have any updates/changes to the species you have listed. I expect that you will also address potential wetland impacts in the draft SEIS.

Thanks,

Terry Quesinberry

Fish and Wildlife Biologist  
 US Fish and Wildlife Service  
 South Dakota Ecological Services Office  
 Pierre, SD  
 Phone: (605) 224-8693, x234  
 FAX: (605) 224-9974

 Amy Hester <[ahester@swri.org](mailto:ahester@swri.org)>

Amy Hester  
 <[ahester@swri.org](mailto:ahester@swri.org)>

08/27/2012 12:45 PM

To: "[terry\\_quesinberry@fws.gov](mailto:terry_quesinberry@fws.gov)"  
 <[terry\\_quesinberry@fws.gov](mailto:terry_quesinberry@fws.gov)>  
 cc: Haimanot Yilma <[haimanot.yilma@nrc.gov](mailto:haimanot.yilma@nrc.gov)>,  
 James Prikryl <[jpnkryl@swri.org](mailto:jpnkryl@swri.org)>  
 Subject: Follow Up for the Proposed Dewey-Burdock  
 Insitu Recovery Project, Fall River and Custer  
 Counties, South Dakota

Mr. Quesinberry,

This email is to follow up on the attached March 29, 2010 letter that your office sent

to the Nuclear Regulatory Commission (NRC) regarding federally threatened or endangered species of concern for the proposed Dewey-Burdock in-situ recovery facility. The 2010 letter identified two endangered species, the whooping crane and black-footed ferret, and a candidate species, the Greater sage-grouse, that could potentially occur in the counties where the proposed project is located. As part of our independent analysis, NRC staff reviewed available Fish and Wildlife Service (FWS) documents and websites and determined that the Sprague's pipit (*Anthus spragueii*) is also a candidate bird species that could occur in the counties where the proposed project is located. We would like to confirm whether there are any additional species that the FWS has identified for this proposed project.

Based on our initial assessment, NRC staff determines that a biological assessment or Section 7 consultation under the Endangered Species Act are not warranted for this proposed project because no adverse effects to federally threatened, endangered, or candidate species are expected. The bases for our determination will be provided in the draft SEIS.

Thank you for providing any updated information you may have that should be included in the draft SEIS.

Amy Hester  
Research Scientist  
Center for Nuclear Waste Regulatory Analyses  
Southwest Research Institute  
6220 Culebra Road  
San Antonio, TX 78238  
210.522.5750  
<http://www.ged.swri.org/>  
(See attached file: *FWS letter from 2010 pdf.pdf*)

November 6, 2013

Ms. Janice Prairie Chief-Boswell, Governor  
Cheyenne and Arapaho Tribe  
100 Red Moon Circle  
P.O. Box 38  
Concho, OK 73022

SUBJECT: NOTIFICATION OF INTENTION TO SEPARATE THE NATIONAL HISTORIC PRESERVATION ACT SECTION 106 PROCESS FROM THE NATIONAL ENVIRONMENTAL POLICY ACT REVIEW FOR THE POWERTECH, INC. PROPOSED DEWEY-BURDOCK IN-SITU RECOVERY (ISR) FACILITY NEAR EDMONT, SOUTH DAKOTA (DOCKET 040-09075)

Dear Governor Chief-Boswell:

Since 2010, the U.S. Nuclear Regulatory Commission (NRC) staff has been consulting under the National Historic Preservation Act (NHPA) with your Tribe and other American Indian Tribes regarding historic sites that may be affected by the proposed Powertech Inc. Dewey-Burdock In-Situ Recovery (ISR) Project.<sup>1</sup> The NRC staff has had three face-to-face meetings and three teleconferences with Tribal representatives, and we have exchanged many emails, letters, and telephone calls.

In the spring of 2013, the Dewey-Burdock project site was made available for each consulting Tribe to conduct a field identification survey for any historic properties that may have traditional, religious or cultural significance to the Tribe. Seven Tribes elected to participate in these surveys: the Northern Arapaho, Northern Cheyenne, Turtle Mountain, Crow Creek Sioux, Cheyenne and Arapaho, Crow Nation, and Santee Sioux. Tribal representatives conducted the field surveys between April 2013 and May 2013.

When the NRC staff began consulting with the Tribes, it planned to coordinate its NHPA review with its review under the National Environmental Policy Act (NEPA).<sup>2</sup> The staff's extensive Section 106 consultation activities have, however, caused delays in the issuance of its NEPA documents. Other factors have also caused delays, and this year alone the staff has had to revise its estimate for release of its final NEPA document from May 2013 (estimate as of January 2, 2013) to January 2014 (estimate as of November 1, 2013). If the staff continues to

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<sup>1</sup> Letter to Tribal Leaders Requesting Additional Information Regarding Tribal Historic and Cultural Resources Potentially Affected by the Powertech Inc. Proposed Dewey-Burdock In-Situ Recovery Facility (March 19, 2010) (ADAMS Accession No. ML100331999) <http://adamswebsearch2.nrc.gov/webSearch2/main.jsp?AccessionNumber='ML100331999'>.

<sup>2</sup> Letter to Tribal Leaders and Tribal Historic Preservation Officers re Invitation for Informal Information Gathering Meeting Pertaining to Dewey Burdock, Crow Butte North Trend and Crow Butte License Renewal In Situ Uranium Recovery Projects (May 12, 2011) (ADAMS Accession Nos. ML111320251 and ML111320256) <http://adamswebsearch2.nrc.gov/webSearch2/main.jsp?AccessionNumber='ML111320251'> and <http://adamswebsearch2.nrc.gov/webSearch2/main.jsp?AccessionNumber='ML111320256'>.



J. Chief-Boswell

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coordinate its NHPA and NEPA reviews, this will further delay a document the staff had expected to issue months ago.

Because the staff's review under Section 106 is still in progress, while its NEPA review is near completion, the staff is now separating its Section 106 activities from its NEPA review. This will allow the staff to issue its final NEPA document, the vast majority of which concerns environmental impacts unrelated to cultural resources, while continuing to consult with interested Tribes on impacts to historic properties.

Separating the Section 106 review from the NEPA review will afford the NRC and other consulting parties ample time to prepare a Programmatic Agreement (PA) for the Dewey-Burdock Project. The PA will establish a methodology or process to resolve adverse effects on identified historic properties within the Dewey-Burdock ISR Project area. The PA will also address how properties identified in the future will be evaluated.

Although the staff is separating its reviews under Section 106 and NEPA, it will ensure the consulting parties have the opportunity to comment on the full range of impacts to cultural resources. Within the next few weeks, the staff intends to provide all consulting parties a summary of the results of the April–May 2013 field surveys conducted by Tribal representatives under the Section 106 process. The staff will also provide its analysis of impacts to identified sites and its preliminary determinations as to whether sites are eligible for inclusion on the National Register of Historic Places.

By January 2014, the NRC staff intends to issue its final NEPA document for the Dewey-Burdock Project. If consulting parties have comments related to the April–May 2013 field surveys that cannot be incorporated in the final NEPA document, the staff will ensure that they are considered under both Section 106 and NEPA. Depending on the information provided in the comments from the consulting parties, the staff will not only address the comments through the Section 106 process, but it may decide to supplement the final NEPA document. In any event, because the staff will not take any licensing action until it completes its review under Section 106, the staff will consider Tribal comments before making its licensing decision.

To move the Section 106 process forward, the NRC staff has provided all consulting parties, including the Tribes, a draft PA outline to begin development of the PA. The staff plans to host several teleconferences/webinars over the next several weeks to further discuss the PA. During the first teleconference with all consulting parties, a comprehensive schedule of the steps needed to complete the Section 106 process will be discussed.

J. Chief-Boswell

3

If you have any questions or comments, or need any additional information, please contact Ms. Haimanot Yilma of my staff by telephone at 301-415-8029 or by email at [Haimanot.Yilma@nrc.gov](mailto:Haimanot.Yilma@nrc.gov).

Sincerely,

/RA/

Kevin Hsueh, Chief  
Environmental Review Branch  
Environmental Protection  
and Performance Assessment Directorate  
Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Programs

Docket No.: 040-09075

cc: Marian Atkins, Field Office Manager  
South Dakota Field Office - BLM  
310 Roundup Street  
Belle Fourche, SD 57717-1698

Gregory R. Fesko  
P.G. Coal Program Coordinator  
Branch of Solid Minerals - BLM  
Montana State Office  
5001 Southgate Drive  
Billings, MT 59001

Margaret Anquoe, THPO

November 13, 2013

Mr. John M. Fowler, Executive Director  
Advisory Council on Historic Preservation  
Office of Federal Agency Programs  
1100 Pennsylvania Ave, NW, Suite 803  
Washington, DC 20004

SUBJECT: NOTIFICATION OF INTENTION TO SEPARATE THE NATIONAL HISTORIC PRESERVATION ACT SECTION 106 PROCESS FROM THE NATIONAL ENVIRONMENTAL POLICY ACT REVIEW FOR THE POWERTECH, INC. PROPOSED DEWEY-BURDOCK IN-SITU RECOVERY (ISR) FACILITY NEAR EDMONT, SOUTH DAKOTA (DOCKET NO. 040-09075)

Dear Mr. Fowler:

Since 2010, the U.S. Nuclear Regulatory Commission (NRC) staff has been consulting under the National Historic Preservation Act (NHPA) with American Indian Tribes regarding historic sites that may be affected by the proposed Powertech Inc. Dewey-Burdock In-Situ Recovery (ISR) Project.<sup>1</sup> The NRC staff had three face-to-face meetings and three teleconferences with Tribal representatives, and we exchanged many emails, letters, and telephone calls.

In the spring of 2013, the Dewey-Burdock project site was made available for each consulting Tribe to conduct a field identification survey for any historic properties that may have traditional, religious or cultural significance to the Tribe. Seven Tribes elected to participate in these surveys: the Northern Arapaho, Northern Cheyenne, Turtle Mountain, Crow Creek Sioux, Cheyenne and Arapaho, Crow Nation, and Santee Sioux. Tribal representatives conducted the field surveys between April 2013 and May 2013.

When the NRC staff began consulting with the Tribes, it planned to coordinate its NHPA review with its review under the National Environmental Policy Act (NEPA).<sup>2</sup> The NRC staff's extensive Section 106 consultation activities have, however, caused delays in the issuance of its NEPA documents. Other factors have also caused delays, and this year alone the NRC staff had to revise its estimate for release of its final NEPA document from May 2013 (estimate as of January 2, 2013) to December 2013 - January 2014 (estimate as of November 1, 2013). If the NRC staff continues to coordinate its NHPA and NEPA reviews, this will further delay a document the NRC staff had expected to issue months ago.

---

<sup>1</sup> Letter to Tribal Leaders Requesting Additional Information Regarding Tribal Historic and Cultural Resources Potentially Affected by the Powertech Inc. Proposed Dewey-Burdock In-Situ Recovery Facility (March 19, 2010) (ADAMS Accession No. ML100331999) <http://adamswebsearch2.nrc.gov/webSearch2/main.jsp?AccessionNumber='ML100331999'>.

<sup>2</sup> Letter to ACHP titled Powertech Inc. Proposed Dewey-Burdock In-Situ Recovery Facility near Edgemont, South Dakota. (December 15, 2010), (ADAMS Accession Nos. ML103270171) <http://adamswebsearch2.nrc.gov/webSearch2/main.jsp?AccessionNumber='ML103270171'>.



J. Fowler

2

Because the NRC staff's review under Section 106 is still in progress, while its NEPA review is near completion, the NRC staff is now separating its Section 106 activities from its NEPA review. This will allow the NRC staff to issue its final NEPA document, the vast majority of which concerns environmental impacts unrelated to cultural resources, while continuing to consult with interested Tribes on impacts to historic properties.

Although the NRC staff is separating its reviews under Section 106 and NEPA, it will ensure the consulting parties have the opportunity to comment on the full range of impacts to cultural resources. Within the next few weeks, the NRC staff intends to provide all consulting parties a summary of the results of the April–May 2013 field surveys conducted by Tribal representatives under the Section 106 process. The NRC staff will also provide its analysis of impacts to identified sites and its preliminary determinations as to whether sites are eligible for inclusion on the National Register of Historic Places.

The NRC staff intends to issue its final NEPA document for the Dewey-Burdock Project between December 2013 – January 2014 timeframe. If consulting parties have comments related to the April–May 2013 field surveys that cannot be incorporated in the final NEPA document, the NRC staff will ensure that they are considered under both Section 106 and NEPA. Depending on the information provided in the comments from the consulting parties, the staff will not only address the comments through the Section 106 process, but it may decide to supplement the final NEPA document. In any event, because the NRC staff will not take any licensing action until it completes its review under Section 106, the NRC staff will consider Tribal comments before making its licensing decision.

To move the Section 106 process forward, the NRC staff has provided all consulting parties, including the Tribes, a draft Programmatic Agreement (PA) outline to begin development of the PA. The NRC staff plans to host several teleconferences/webinars over the next several weeks to further discuss the PA. During the first teleconference with all consulting parties, a comprehensive schedule of the steps needed to complete the Section 106 process will be discussed.

J. Fowler

3

If you have any questions or comments, or need any additional information, please contact Ms. Haimanot Yilma of my staff by telephone at 301-415-8029 or by email at [Haimanot.Yilma@nrc.gov](mailto:Haimanot.Yilma@nrc.gov).

Sincerely,

/RA/

Kevin Hsueh, Chief  
Environmental Review Branch  
Environmental Protection  
and Performance Assessment Directorate  
Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Programs

Docket No.: 040-09075

cc: See next page

**APPENDIX B**  
**ALTERNATE CONCENTRATION LIMITS**



## ALTERNATE CONCENTRATION LIMITS

*In-situ* recovery (ISR) facilities operate by first extracting uranium from specific areas called wellfields. After uranium recovery has ended, the groundwater in the wellfield contains constituents that the lixiviant mobilized. Licensees shall commence aquifer restoration in each wellfield soon after the uranium recovery operations end (NRC, 2009). Aquifer restoration criteria for the site-specific baseline constituents are determined either for each individual well or as a wellfield average.

U.S. Nuclear Regulatory Commission (NRC) licensees are required to return water quality parameters to the standards in 10 CFR Part 40, Appendix A, Criterion 5B(5). As stated in the regulations: "5B(5)—At the point of compliance, the concentration of a hazardous constituent must not exceed—(a) The Commission approved background concentration of that constituent in the groundwater; (b) The respective value given in the table in paragraph 5C if the constituent is listed in the table and if the background level of the constituent is below the value listed; or (c) An alternate concentration limit (ACL) is established by the Commission."

For an ACL to be considered by the NRC, a licensee must submit a license amendment application to request an ACL. In this ACL license amendment request, the licensee must provide the basis for any proposed limits, including consideration of practicable corrective actions that limits are as low as reasonably achievable (ALARA), and information on the factors the Commission must consider. NRC will establish a site-specific ACL for a hazardous constituent as provided in Criterion 5B(5) if NRC finds the proposed limit ALARA, after considering practicable corrective actions, and determining that the constituent will not pose a substantial present or potential hazard to human health or the environment as long as the ACL is not exceeded.

To determine if the ACL does not pose a potential hazard to human health or the environment, NRC performs three risk assessments (NRC, 2003a). The first is a hazard assessment that evaluates the radiological dose and toxicity of the constituents in question and the risk to human health and environment. The second is an exposure assessment to examine the existing distribution of hazardous constituents, as well as potential sources for future releases and the potential consequences associated with the human and environmental exposure to the hazardous constituents. The last assessment is a corrective action assessment, which evaluates (i) all applicant proposed corrective actions; (ii) the technical feasibility of each proposed corrective actions; (iii) the costs and benefits associated with each proposed corrective action; and (iv) the preferred corrective action to achieve the hazardous constituent concentration, which is protective of human health and the environment.

To perform these assessments, the NRC staff uses a rigorous review process. Licensees must provide a comprehensive ACL amendment request that addresses groundwater and surface water quality and expected impacts on human health and the environment. Such information required in an amendment request pursuant to 10 CFR Part 40, Appendix A, Criterion 5B(6) includes the following factors:

- Potential adverse effects on groundwater quality, considering the following:
  - The physical and chemical characteristics of the waste in the licensed site including its potential for migration

- 
- The hydrogeologic characteristics of the facility and surrounding land
  - The quantity of groundwater and the direction of groundwater flow
  - The proximity and withdrawal rates of groundwater users
  - The current and future uses of groundwater in the area
  - The existing quality of groundwater, including other sources of contamination and their cumulative impact on the groundwater quality
  - The potential for health risks caused by human exposure to waste constituents
  - The potential damage to wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents
  - The persistence and permanence of the potential adverse effects
  - Potential adverse effects on hydraulically connected surface water quality, considering the following:
    - The volume and physical and chemical characteristics of the waste in the licensed site
    - The hydrogeologic characteristics of the facility and surrounding land
    - The quantity and quality of groundwater, and the direction of groundwater flow
    - The patterns of rainfall in the region
    - The proximity of the licensed site to surface waters
    - The current and future uses of surface waters in the area and any water quality standards established for those surface waters
    - The existing quality of surface water including other sources of contamination and the cumulative impact on surface water quality
    - The potential for health risks caused by human exposure to waste constituents
    - The potential damage to wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents
    - The persistence and permanence of the potential adverse effects

Although state “class of use” standards are not recognized in NRC’s regulations as restoration standards, these standards may be considered as one factor in evaluating ACL requests for ISR facilities located in South Dakota. Furthermore, in considering ACL requests, particular



importance is placed on protecting underground sources of drinking water (USDWs). The use of modeling and additional groundwater monitoring may be necessary to show that ACLs in ISR wellfields would not adversely impact USDWs. It must be demonstrated that the licensee has attempted to restore hazardous constituents in groundwater to background or a maximum contaminant level—whichever level is higher.

Before an ISR licensee is allowed to extract uranium, the U.S. Environmental Protection Agency (EPA) under 40 CFR 146.4 and in accordance with the Safe Drinking Water Act must issue an aquifer exemption covering the portion of the aquifer in which the uranium-bearing rock is located. EPA cannot exempt the portion of the aquifer unless it is found that “it does not currently serve as a source of drinking water” and “cannot now and will not in the future serve as a source of drinking water.” Due to these criteria, only impacts outside of the exempted aquifer are evaluated. In most cases, the water in aquifers adjacent to the uranium ore zones does not meet drinking water standards. The staff will not approve an ACL if it will affect any adjacent USDWs. Therefore, the impact of granting an ACL request is SMALL.

Further guidance for the review of ACLs for ISR facilities is being developed in a revision of NUREG–1569 (NRC, 2003a). Existing guidance for the review of ACLs for conventional mills is in NUREG–1620, “Standard Review Plan for the Review of a Reclamation Plan for Mill Tailings Sites Under Title II of the Uranium Mill Tailings Radiation Control Act of 1978” (NRC, 2003b).

## References

10 CFR Part 40. Appendix A. *Code of Federal Regulations*, Title 10, *Energy*, Part 40, Appendix A. “Criteria Relating to the Operations of Uranium Mills and to the Disposition of Tailings or Wastes Produced by the Extraction or Concentration of Source Material from Ores Processed Primarily from their Source Material Content.” Washington, DC: U.S. Government Printing Office.

40 CFR Part 146. *Code of Federal Regulations*, Title 40, *Protection of Environment*, Part 146. “Underground Injection Control Program: Criteria and Standards.” Washington, DC: U.S. Government Printing Office.

NRC (U.S. Nuclear Regulatory Commission). NUREG-1910, “Generic Environmental Impact Statement for In-Situ Leach Uranium Milling Facilities.” ML091480244, ML091480188. Washington, DC. NRC. May 2009.

NRC. NUREG–1569, “Standard Review Plan for *In-Situ* Leach Uranium Extraction License Applications.” Final Report. Washington, DC: NRC. June 2003a.

NRC. NUREG–1620, “Standard Review Plan for the Review of a Reclamation Plan for Mill Tailings Sites Under Title II of the Uranium Mill Tailings Radiation Control Act of 1978.” Final Report. Washington, DC: NRC. June 2003b.



**APPENDIX C**

**NONRADIOLOGICAL AIR QUALITY SUPPORTING DOCUMENTATION**



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# NONRADIOLOGICAL AIR QUALITY SUPPORTING DOCUMENTATION

## C1 Introduction

This appendix provides detailed nonradiological air emissions information associated with the proposed action. The information in this appendix consolidates and supplements information from several sources (Powertech, 2009, 2010a–c, 2012, 2013 and IML, 2013a–b), which is summarized in the final Supplemental Environmental Impact Statement (SEIS). This appendix is divided into five sections: Introduction (Section C1), Non-Greenhouse Gas Emissions and Modeling Results (Section C2), Greenhouse Gas Emissions (Section C3), Updates in the Nonradiological Air Emissions Estimates Between the Draft and Final SEIS (Section C4), and References (Section C5). As described in draft SEIS Section 4.7.1 (NRC, 2012), the emission inventory, modeling, and analyses in the final SEIS were to be updated or revised with the results of ongoing model development activities that were not complete at the time the draft SEIS was issued in November 2012. Section C5 provides a description of the updates.

While the U.S. Nuclear Regulatory Commission (NRC) is responsible for assessing the potential environmental impacts from the proposed action pursuant to the National Environmental Policy Act of 1969 (NEPA) as amended, NRC does not have the authority to develop or enforce regulations to control nonradiological air emissions from equipment licensees use. For the proposed Dewey-Burdock ISR Project, this authority rests with the South Dakota Department of Environment and Natural Resources (SDDENR). To ensure the air quality of South Dakota is adequately protected, in addition to addressing all NRC regulatory requirements pertaining to radiological emissions, NRC applicants and licensees must also comply with all applicable state and federal air quality regulatory compliance and permitting requirements.

The applicant submitted an air quality application to SDDENR in November, 2012 (see Table 1.6-1). Based on the information in the application, SDDENR determined that an air permit will not be required and that the proposed action will not be subject to Prevention of Significant Deterioration (PSD) requirements (SDDENR, 2013). However, SDDENR's regulatory determination did not include mobile and fugitive sources as categorized in this SEIS (see Table 2.1-5). Since mobile and fugitive sources compose the majority of the project emissions, NRC staff determined that the SEIS analysis would include mobile and fugitive emission sources, as well as stationary sources. NRC staff have characterized the magnitude of air effluents from the proposed project in part by comparing (i) the emission levels to PSD and Title V thresholds and (ii) the modeled concentrations to regulatory standards such as National Ambient Air Quality Standards (NAAQS). This characterization is meant to provide a context for understanding the magnitude of the proposed project's air effluents, which are mostly from mobile and fugitive sources rather than stationary sources. When considering the air effluent analysis in this SEIS, it is important to remember that the NRC analysis is for disclosure purposes and does not document or represent the formal SDDENR determination.

## C2 Non-Greenhouse Gas Emissions and Modeling Results

The non-greenhouse gas emissions discussion is divided into three sections. Section C2.1 addresses the emissions inventory that describes the amount or mass of pollutants generated by the proposed action. Section C2.2 discusses the combustion exhaust emissions from drill rigs. Section C2.3 addresses the air dispersion modeling that predicts pollutant concentrations based on the emissions inventory.

## C2.1 Emission Inventory

The non-greenhouse combustion emissions inventory addresses both stationary and mobile sources associated with the proposed action. With the exception of project year one, the stationary source emissions are assumed to be constant each year throughout the lifespan of the project. The stationary source mass flow rate emissions (i.e., tons per year) are presented in Table C–1. Mobile source emissions, which occur in each of the four phases of the proposed action, are presented in Table C–2. These two tables identify some individual sources and provide the associated emission levels. In addition, the mobile sources were categorized into one of two source classifications: construction and drilling field equipment or other mobile sources (i.e., light duty pickups and passenger vehicles). The construction and drilling field equipment source classification was further categorized into four emission vehicle types: deep well drill rigs, other drill rigs, water trucks, and other construction and drilling field equipment. The deep well drill rigs are used for drilling the Class V deep injection disposal wells. The other drill rigs are used for drilling the delineation, monitoring, production, and injection wells. The other construction and drilling field equipment classification includes sources such as bulldozers, graders, scrapers, cranes, forklifts, and backhoes. Table C–3 contains the detailed information used to calculate the mobile sources emission levels.

Table C–4 provides the fugitive dust emissions for both the onsite and offsite project-related vehicle travel on unpaved roads, as well as the wind erosion to disturbed land. Dust generated by wind blowing over land that has been disturbed is an example of wind erosion. The amount of fugitive emissions from wind erosion is a function of the amount of disturbed land. The amount of disturbed land varies depending on the option used for liquid waste disposal (i.e., deep well disposal or land application). The deep disposal well option will disturb approximately 39.5 ha [97.5 ac] of land while the land application option will disturb approximately 116.6 ha [288.2 ac] (IML, 2012). An emission factor was used to relate the amount of total suspended particles generated annually to the amount of land disturbed {i.e., 0.345 metric tons [0.38 short tons] of total suspended particles for each acre disturbed (Powertech, 2012)}. Total suspended particles include particles larger than  $PM_{10}$ . Here, 30 percent of total suspended particles is comprised of  $PM_{10}$  and 15 percent of  $PM_{10}$  is comprised of  $PM_{2.5}$  (Powertech, 2012). Appendix D of the Ambient Air Quality Final Modeling Protocol and Impact Analysis (IML, 2013a) contains additional details concerning the calculation of the fugitive dust emissions.

The following mitigation measures, which the applicant has committed to implement (Powertech, 2012 and IML, 2013a), have been incorporated into the calculation of the emission inventory

- Lowering the drill rig engine horsepower from 550 horsepower to 300 horsepower, except for the deep well drill rig
- Using Tier 1, or higher, drill rig engines and Tier 3, or higher, for construction equipment engines

**Table C-1. Nonradiological Combustion Emission Estimates Mass Flow Rates (Short Tons\* Per Year) From Stationary Sources for the Proposed Action†**

Emission Source	Quantity	Capacity		Operating Hours/Year	Emission Factors						Emissions (Tons/Year)						
		Value	Unit Nons		NOx ‡	CO ‡	PM10 ‡	PM2.5 ‡	SO2 ‡	TOC ‡	Units	NOx ‡	CO ‡	PM10 ‡	PM2.5 ‡	SO2 ‡	TOC ‡
Space Heater (propane)	4	6.5	gal/hr	4,368	13	7.5	0.7	0.7	0.02	1	lb/10 <sup>3</sup> gal	0.74	0.43	0.040	0.040	0.001	0.06
Dryer Thermal Fluid Heater (propane)	1	16	gal/hr	8,736	13	7.5	0.7	0.7	0.02	1	lb/10 <sup>3</sup> gal	0.91	0.52	0.049	0.049	0.001	0.07
Emergency Generator (propane)	2	9	gal/hr	13	13	7.5	0.7	0.7	0.02	1	lb/10 <sup>3</sup> gal	0.00	0.00	0.000	0.000	0.000	0.00
Suppression Diesel pump (diesel)	2	100	hp	13	0.031	0.00668	0.0022	0.0022	0.00205	0.00251	lb/hp-hr	0.04	0.01	0.003	0.003	0.003	0.00
<b>TOTAL</b>												1.69	0.96	0.092	0.092	0.005	0.13

Source: Modified from IML (2013a)

\*Source and appendix mass expressed in English units only (dual units used in SEIS text with metric being primary)

†Except for project year 1, stationary emissions are assumed to be constant over the project lifespan

‡NO<sub>x</sub> = nitrogen oxides, CO = carbon monoxide, PM10 = particulate matter 10 micrometers, PM2.5 = particulate matter 2.5 micrometers, SO<sub>2</sub> = sulfur dioxide, TOC = total organic carbon

**Table C-2. Nonradiological Combustion Emission Mass Flow Rate (Short Tons\* Per Year) From Mobile Sources for Various Phases of the Proposed Action**

Pollutant	Emission Vehicle	Phase						Source Classification
		Construction Facilities and Wellfield	Construction Wellfield Only	Operations	Aquifer Restoration	Decommissioning	0	
Particulate Matter PM <sub>10</sub>	Drill Rig	1.50	1.38	0	0	0	0	C&DFE†
	Deep Well Drill Rig	0.03	0.01	0	0	0	0	C&DFE
	Water Truck	0.34	0.29	0.02	0	0.02	0.02	C&DFE
	Other C&DFE‡	0.81	0.49	0.29	0	0.48	0.48	C&DFE
	Light Duty	0.29	0.19	0.50	0.08	0.12	0.12	Other mobile§
TOTAL	2.97	2.36	0.81	0.08	0.62	0.62		
Particulate Matter PM <sub>2.5</sub>	Drill Rig	1.46	1.34	0	0	0	0	C&DFE
	Deep Well Drill Rig	0.03	0.01	0	0	0	0	C&DFE
	Water Truck	0.32	0.28	0.02	0	0.02	0.02	C&DFE
	Other C&DFE	0.79	0.46	0.29	0	0.48	0.48	C&DFE
	Light Duty	0.28	0.19	0.48	0.09	0.10	0.10	Other mobile
TOTAL	2.88	2.28	0.79	0.09	0.60	0.60		
Sulfur Dioxide	Drill Rig	3.47	3.19	0	0	0	0	C&DFE
	Deep Well Drill Rig	0.08	0.02	0	0	0	0	C&DFE
	Water Truck	2.08	1.81	0.13	0	0.12	0.12	C&DFE
	Other C&DFE	2.71	1.86	1.45	0	2.00	2.00	C&DFE
	Light Duty	0.24	0.16	0.41	0.06	0.09	0.09	Other mobile
TOTAL	8.58	7.04	1.99	0.06	2.21	2.21		
Nitrogen Oxides	Drill Rig	25.58	23.55	0	0	0	0	C&DFE
	Deep Well Drill Rig	0.57	0.14	0	0	0	0	C&DFE
	Water Truck	6.70	5.8	0.45	0	0.37	0.37	C&DFE
	Other C&DFE	13.85	8.53	5.71	0	10.35	10.35	C&DFE
	Light Duty	4.38	2.9	7.74	1.23	1.69	1.69	Other mobile
TOTAL	51.08	40.92	13.9	1.23	12.41	12.41		
Carbon Monoxide	Drill Rig	31.70	29.18	0	0	0	0	C&DFE
	Deep Well Drill Rig	0.70	0.18	0	0	0	0	C&DFE
	Water Truck	5.81	5.03	0.39	0	0.32	0.32	C&DFE
Other C&DFE	8.06	5.48	4.02	0	5.72	5.72	C&DFE	



**Table C-2. Nonradiological Combustion Emission Mass Flow Rate (Short Tons\* Per Year) From Mobile Sources for Various Phases of the Proposed Action (Cont'd)**

Pollutant	Emission Vehicle	Phase					Source Classification
		Construction Facilities and Wellfield	Construction Wellfield Only	Operations	Aquifer Restoration	Decommissioning	
	Light Duty	2.78	1.83	4.9	0.78	1.07	Other mobile
	TOTAL	49.05	41.7	9.31	0.78	7.11	

Source: Modified from IML (2013a).  
 \*Source document and appendix table mass expressed in short tons only (dual units used in Supplement Environmental Impact Statement text with metric being primary).  
 †C&DFE = Construction and Drilling Field Equipment. Examples include drill rigs, bulldozers, graders, and scrapers.  
 ‡Other C&DFE represents construction and drilling field equipment other than drill rigs and water trucks.  
 §Other mobile = additional mobile sources (i.e., light duty pickups and light duty passenger vehicles) other than C&DFE.

**Table C-3. Tailpipe Emission Factors and Equipment Hours**

Basis For Equipment	Vehicle Parameters				Tailpipe Emission Factors (lb/hp-hr)											Total Equipment Hours per Year by Phase				
	Horsepower	Load Factor	Fuel		THC	NO <sub>x</sub>	CO	SO <sub>2</sub>	CO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	Formaldehydes	Constr.* Facilities/WFT	Constr. WF Only	Opst	Aquifer Rest.\$	Decom.			
Scrapper	462	40%	Diesel		0.00247	0.00661	0.00573	0.00205	1.15000	0.00033	0.00032	0.00046	1299				2601			
Bulldozer	410	40%	Diesel		0.00247	0.00661	0.00573	0.00205	1.15000	0.00033	0.00032	0.00046	433				867			
Compactor	315	40%	Diesel		0.00247	0.00661	0.00573	0.00205	1.15000	0.00033	0.00032	0.00046	433				867			
Motor Grader	297	40%	Diesel		0.00247	0.00661	0.00573	0.00205	1.15000	0.00033	0.00032	0.00046	1196	763	416		867			
Water Truck (1,500 gal)	325	40%	Diesel		0.00247	0.00661	0.00573	0.00205	1.15000	0.00033	0.00032	0.00046	15600	13520	1040		867			
Fueling Truck	325	40%	Diesel		0.00247	0.00661	0.00573	0.00205	1.15000	0.00033	0.00032	0.00046	130				520			
Heavy Duty Diesel Truck	325	40%	Diesel		0.00247	0.00661	0.00573	0.00205	1.15000	0.00033	0.00032	0.00046	2080	520	520		1388			
Logging Truck	325	25%	Diesel		0.00247	0.00661	0.00573	0.00205	1.15000	0.00033	0.00032	0.00046	8320	8320	2080					
Electrical Pole Truck	325	25%	Diesel		0.00247	0.00661	0.00573	0.00205	1.15000	0.00033	0.00032	0.00046	3466	3466						
Truck Mounted Drill Rig, Tier 1	300	59%	Diesel		0.00214	0.01512	0.01873	0.00205	1.15000	0.00089	0.00086	0.00046	19123	17602						
Deep Well Drill Rig, Tier 1	425	59%	Diesel		0.00214	0.01512	0.01873	0.00205	1.15000	0.00089	0.00086	0.00046	300	75						
Tractorhoe	268	40%	Diesel		0.00247	0.00661	0.00573	0.00205	1.15000	0.00033	0.00032	0.00046	3120	3120			1300			
Backhoe Loader	93	40%	Diesel		0.00247	0.00661	0.00573	0.00205	1.15000	0.00033	0.00032	0.00046	5200	5200			1300			
Tractor	351	40%	Diesel		0.00247	0.00661	0.00573	0.00205	1.15000	0.00033	0.00032	0.00046					650			
Resin-hauling Semi-Truck	530	40%	Diesel		0.00247	0.03100	0.00573	0.00205	1.15000	0.00033	0.00032	0.00046			160		650			
	430	40%	Diesel		0.00247	0.00661	0.00573	0.00205	1.15000	0.00033	0.00032	0.00046			1040					
Pump Pulling Truck	325	40%	Diesel		0.00247	0.00661	0.00573	0.00205	1.15000	0.00033	0.00032	0.00046			6240		2130			
Product Transport Truck	430	40%	Diesel		0.00247	0.00661	0.00573	0.00205	1.15000	0.00033	0.00032	0.00046			208					
Crane	516	25%	Diesel		0.00247	0.03100	0.00668	0.00205	1.15000	0.00220	0.00213	0.00046	694				693			
Forklift	100	25%	Diesel		0.00247	0.03100	0.00668	0.00205	1.15000	0.00220	0.00213	0.00046	9360	7720	2132		2079			
Manlift	50	25%	Diesel		0.00247	0.03100	0.00668	0.00205	1.15000	0.00220	0.00213	0.00046	4160		208		2772			
Cementier	90	59%	LPG		0.00009	0.00118	0.00668	0.00000	1.13636	0.00006	0.00006	0.00000	8320	8320			2130			
Welding Equipment	47	40%	LPG		0.00009	0.00118	0.00668	0.00000	1.13636	0.00006	0.00006	0.00000	9880							
HDPE Fusion Equipment	83	40%	LPG		0.00009	0.00118	0.00668	0.00000	1.13636	0.00006	0.00006	0.00000	6240							
Light Duty Pickup	265	25%	Gas		0.02200	0.01100	0.00696	0.00059	1.08000	0.00072	0.00070	0.00049	10000	6500	18736	2912	4000			

**Table C-3. Tailpipe Emission Factors and Equipment Hours (Cont'd)**

Basis For Equipment Tailpipe Emissions	Vehicle Parameters		Tailpipe Emission Factors (lb/tp-hr)										Total Equipment Hours per Year by Phase			
	Horse-power	Load Factor	Fuel	THC	NO <sub>x</sub>	CO	SO <sub>2</sub>	CO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	Formaldehydes	Constr* Facilities/WF	Constr WF Only	Ops†	Aquifer Rest‡	Decom
Light Duty Pickup Vehicle	150	25%	Gas	0.02200	0.01100	0.00696	0.00059	1.08000	0.00072	0.00070	0.00049	3575	2600	4388	813	1138

Source: Modified from IML (2013a)

\*Construction  
 †Wellfield  
 ‡Operations  
 §Restoration (aquifer)  
 ||Decommissioning  
 ¶Gasoline

**Table C–4. Total\* (Peak Year) Fugitive Dust Mass Flow Rate (Short Tons† Per Year) Estimates for All Phases and Sources‡**

Source	Phase	Particulate Matter PM10	Particulate Matter PM2.5
On-Site Fugitive Emission from Vehicle Travel	Construction—Facilities and Wellfield	194.77	19.477
	Construction—Wellfield Only	152.65	15.265
	Operation	100.86	10.086
	Aquifer Restoration	7.72	0.772
	Decommissioning	60.11	6.011
Off-Site Fugitive Emissions from Vehicle Travel	Construction—Facilities and Wellfield	56.91	5.691
	Construction—Wellfield Only	27.30	2.730
	Operation	41.87	4.187
	Aquifer Restoration	6.25	0.625
	Decommissioning	28.37	2.837
Wind Erosion§	Not applicable	32.8	4.9
<b>Total</b>		<b>457.93</b>	<b>47.413</b>
Source: Modified from IML (2013a).			
*Total accounts for when all four phases occur simultaneously and represents the highest amount of emissions the proposed action will generate in any one project year. Project year 1 only includes the construction phase (i.e., no overlap with other phases), and facilities construction only occurs in project year 1. Therefore, the construction—wellfield only—is used when calculating the total.			
†Source document and appendix table mass expressed in short tons only (dual units used in Supplemental Environmental Impact Statement text with metric being primary).			
‡Fugitive dust sources include on-site road, off-site road, and wind erosion (land application disposal).			
§ Annual values varied slightly over the project lifetime. Reported values are maximums. Minimum values could be as much as 2.8 short tons lower for PM10 and 0.4 short tons lower for PM2.5.			

- Requiring carpooling to reduce amount of emissions from commuter vehicles
- Watering unpaved roads for dust suppression

The emissions inventory is calculated using emission factors based on these commitments, which resulted in lower annual pollution levels relative to the initial inventory. Emission factors are values used to relate the levels of activities to the amounts of pollution produced. In this case the emission factor relates the amount of fuel consumed by the equipment to the mass of pollutants generated. The initial inventory is based largely on uncontrolled emission factors (i.e., emission factors based on older engines with greater emission in contrast to newer engines that meet stricter emission standards). The various tiers refer to a phased program of standards mandated by the Federal Government that requires newly manufactured engines to generate lower pollutant emission levels. Higher tier numbers mean stricter emission standards and lower pollutant levels. Table C–5 describes the effectiveness (i.e., the percent that the emissions are reduced) of the different tier levels based on the associated emission factors. The applicant committed to implement carpooling. Reducing the number of vehicles commuters use results in fewer emissions and lower pollutant levels. Table C–6 described the

**Table C–5. Effect of Using Updated Emissions Factors That Account for Pollution Controls for 300–600 Horsepower Engines**

Pollutant	Tier 0	Tier 1		Tier 2		Tier 3		Tier 4	
	Emission Factor g/hp-hr*	Emission Factor g/hp-hr	Percent Emissions Reduced From Tier 0 Levels†	Emission Factor g/hp-hr	Percent Emissions Reduced From Tier 0 Levels‡	Emission Factor g/hp-hr	Percent Emissions Reduced From Tier 0 Levels§	Emission Factor g/hp-hr	Percent Emissions Reduced From Tier 0 Levels
Nitrogen Oxides	8.38	6.0153	28	4.3351	48	2.5	70	0.276	97
Carbon Monoxide¶	2.7	1.3060	52	0.8425	69	0.8425	69	0.084	94
Particulate Matter PM <sub>10</sub> #	0.402	0.2008	50	0.1316	67	0.15	63	0.0092	98

Source: Modified from EPA (2004)

\*Table only expressed emission factors in units of g/hp-hr. Dual units were not calculated because the value of interest is the percent emissions, which is unitless.

†Calculated using the following equation:  $[1 - (\text{Tier 1 emission factor} / \text{Tier 0 emission factor})] * 100$

‡Calculated using the following equation:  $[1 - (\text{Tier 2 emission factor} / \text{Tier 0 emission factor})] * 100$

§Calculated using the following equation:  $[1 - (\text{Tier 3 emission factor} / \text{Tier 0 emission factor})] * 100$

||Calculated using the following equation:  $[1 - (\text{Tier 4 emission factor} / \text{Tier 0 emission factor})] * 100$

¶For carbon monoxide, the tier 2 and tier 3 emission standards are the same and the tier 2 and tier 3 emission factors used in the modeling are also the same values.

#For PM<sub>10</sub>, the tier 2 and tier 3 emission standards are the same. However, the tier 2 emission factor which is based on actual certification data is actually lower than the tier 3 emission factor which is based on the emission standard.

**Table C–6. Effectiveness (i.e., the Percent That the Emissions Are Reduced) of the Commuter Carpooling Implemented by the Applicant**

Project Phase	Number of Vehicles Without Carpooling	Number of Vehicles With Carpooling	Percent Commuter Emissions Reduced*
Construction—Facilities and Wellfield	57	22	61.4
Construction—Wellfield Only	42	16	61.9
Operation	60	27	55
Aquifer Restoration	6	5	16.7
Decommissioning	15	7	53.3
Total	180	77	57.2

Source: Modified from IML (2013a)

\*Calculated using the following equation:

$[(\text{\# vehicles without carpooling} - \text{\# vehicles with carpooling}) / \text{\# of vehicles without carpooling}] * 100$

effectiveness (i.e., the percent that the emissions are reduced) of the carpooling implemented by the applicant. A 60 percent reduction in the fugitive dust emissions associated with travel on unpaved roads within the proposed project boundary is incorporated into the inventory. The watering frequency of more than twice per hour is the basis for using the 60 percent control efficiency. Appendix D of the Ambient Air Quality Final Modeling Protocol and Impact Analysis (IML, 2013a) provides details for the project specific watering control of fugitive dust. The applicant also identified other mitigation techniques they would implement (see SEIS Table 6.2-1). However, these other mitigations were not incorporated in the calculation of the mobile source emissions inventory.

ISR phases may occur simultaneously. To account for overlapping phases, a total emission estimate was calculated by adding together the annual emissions for all four phases. This total or peak year estimate accounts for all four phases occurring simultaneously and represents the highest amount of emissions the proposed action would generate in any one project year. The stationary phase did not require a peak year calculation because the emissions are assumed to be constant over the project lifespan except for project year one (see Table 2.1-1). Table C-7 contains the peak year estimate for all sources and includes the stationary sources (See Table C-1), the mobile combustion emission sources (see Table C-2), and fugitive emissions from travel on unpaved roads and wind erosion (see Table C-4). The only phase being performed in project year one is construction. The construction phase in project year one consists of two main activities (i) facilities construction and (ii) well field construction. Facilities construction will be completed at the end of project year one. The construction phase associated with the remaining life of the project is limited to well field construction. Therefore, the peak year emission calculations, which account for overlapping phases, use the construction emission levels associated with the well field only.

The values in Table C-7 reveal that certain source categories generate the majority of emissions for certain pollutants. Table C-8 identifies the contribution (i.e., percent) of the various emission source categories to the various pollutants. For example, fugitive dust sources generate 99.1 percent of the total PM<sub>10</sub> particulate matter emissions and 92.5 percent of the PM<sub>2.5</sub> particulate matter emissions. The mobile combustion emission sources generate the majority of the sulfur dioxide (99.9 percent), nitrogen dioxide (97.6 percent), and carbon monoxide (98.4 percent) emissions. The highest emissions that the stationary sources contribute to any single pollutant are for nitrogen oxide at 2.4 percent.

**Table C-7. Total\* (Peak Year) Nonradiological Emission Mass Flow Rate (Short Tons† Per Year) Estimates for All Phases and Sources**

<b>Pollutant</b>	<b>Stationary Sources</b>	<b>Mobile Emission Sources</b>	<b>Fugitive Dust Sources‡</b>	<b>Peak Year Total</b>
Particulate Matter PM10	0.092	3.87	457.93	461.892
Particulate Matter PM2.5	0.092	3.75	47.41	51.252
Sulfur Dioxide	0.005	11.31	0	11.315
Nitrogen Oxides	1.69	68.46	0	70.15
Carbon Monoxide	0.96	58.90	0	59.86

Source: Modified from IML (2013a).  
 \*Total accounts for when all four phases occur simultaneously and represents the highest amount of emissions the proposed action will generate in any one project year. Project year 1 only includes the construction phase (i.e., no overlap with other phases), and facilities construction only occurs in project year 1. Therefore, the construction—wellfield only—is used when calculating the total.  
 †Source document and appendix table mass expressed in short tons only (dual units used in Supplemental Environmental Impact Statement text with metric being primary).  
 ‡Fugitive dust sources include on-site road, off-site road, and wind erosion (land application disposal).



**Table C–8. Percentage of Emission by Source for Various National Ambient Air Quality Standard Pollutants From All Sources (Stationary, Mobile, and Fugitive) When All Phases Occur Simultaneously (i.e., Peak Year\*)**

<b>Pollutant</b>	<b>Percentage From Stationary Sources</b>	<b>Percentage From Mobile Emission Sources</b>	<b>Percentage From Fugitive Dust Sources†</b>
Particulate Matter PM10	0.02	0.84	99.14
Particulate Matter PM2.5	0.19	7.32	92.50
Sulfur Dioxide	0.04	99.96	0
Nitrogen Oxides	2.41	97.59	0
Carbon Monoxide	1.60	98.40	0

Source: Modified from IML (2013a)  
 \*Total accounts for when all four phases occur simultaneously and represents the highest amount of emissions the proposed action will generate in any one project year. Project year 1 only includes the construction phase (i.e., no overlap with other phases), and facilities construction only occurs in project year one. Therefore, the construction—wellfield only—is used when calculating the total.  
 †Fugitive dust sources include on-site road, off-site road, and wind erosion (land application disposal)

## **C2.2 National Ambient Air Standards Pollutant Emissions From Drilling Activities**

Information in Table C–2 shows that the construction phase generates the most NAAQS pollutant emissions for combustion emissions from mobile sources compared to the other phases. Within the construction phase, the emission vehicle type that generates the most NAAQS pollutant emissions is the drill rig (see Table C–2). Drill rigs are used to bore the various wells associated with ISR activities. Five types of wells are proposed for this project: delineation wells, monitoring wells, production wells, injection wells, and Class V deep disposal wells. The type of drill rig required for the job can vary based on the type of well. The first four well types require rigs that can drill wells to a depth of less than 305 m [1,000 ft]. Class V deep disposal wells require drilling equipment suitable to reach depths of about 914 m [3,000 ft]. The emission estimates include the drilling of eight Class V deep disposal wells over the life of the project. In project year one, four Class V deep disposal wells would be drilled. After project year one, the emission estimates assume that no more than one Class V deep disposal well will be drilled in any single project year. For the pollutants in Table C–2, the percentage of combustion emissions from mobile sources from the construction phase compared to the other phases ranged from 60 to 71 percent depending on the particular pollutant. The percentage of combustion emissions from the drill rigs (excluding the deep well drill rig) compared to all of the construction phase combustion emissions from mobile sources ranged from 45 to 70 percent depending on the pollutant (see Table C–2). The percentage of emissions from the deep well drill rig compared to all of the construction phase mobile source emissions ranged from 0.28 to 0.44 percent depending on the pollutant (see Table C–2). The deep well drill rig emission contribution is relatively small because the proposed project only requires the drilling of up to eight Class V wells.

## **C2.3 Air Quality Modeling**

The air impact analysis included two types of modeling. The AERMOD dispersion model was used to predict NAAQS and PSD pollutant concentrations and the CALPUFF model was used to generate Air Quality Related Values for Wind Cave National Park. The two types of modeling results and associated analyses will be discussed separately.

### **C2.3.1 AERMOD**

Expressing the proposed project's emissions in concentrations can help characterize the magnitude of the emission levels because thresholds such as NAAQS and PSD increments are also expressed in concentrations. Table C-9 presents the peak year AERMOD modeling results with respect to the NAAQS and Table C-10 presents the results with respect to the PSD increments. Section C2.3.1 primarily addresses three topics concerning the AERMOD modeling: (i) how concentrations for individual phases are calculated from the peak year pollutant concentrations; (ii) how the values are generated for comparison to NAAQS and PSD increment when the form of the model results varies from the form of the threshold; and (iii) why the use of the AERMOD dry depletion option is appropriate in this SEIS.

The peak year concentrations are important because they account for emissions when all four phases occur simultaneously and represent the highest amount of emissions the proposed action would generate in any one project year. However, the SEIS analyses also examine emissions associated with individual phases. Pollutant concentrations associated with each phase during the peak year can be calculated by knowing the relative contribution from each phase. Table C-11 contains the percent of emissions by phase for various NAAQS pollutants from stationary, mobile, and fugitive sources when all phases occur simultaneously. As described in the notes in Table C-11, the calculations utilized the fact that certain source categories generate the majority of emissions for certain pollutants. As described in Section C2.1, the only phase conducted in project year one is construction and these emissions (presented in SEIS Table 2.1-2) include both facility and wellfield construction. In the subsequent project years when the phases can overlap, the construction phase only entails wellfield construction. Based on the information in Table 2.1-2, the project year one construction NAAQS pollutant emissions would be no more than about 23 percent greater than the construction emissions in the remaining project years. The pollutant concentrations for the construction phase (see Table C-12), operation phase (see Table C-13), aquifer restoration phase (see Table C-14), and decommissioning phase (see Table C-15) are calculated from the relative contribution of each phase in Table C-11 to the peak year concentrations in Table C-9.

In some cases, the form of the modeling results and the form of the NAAQS or PSD increment are not the same. The form expresses both the statistic (e.g., maximum, average, 98th percentile, etc.) and the time period (e.g., once per year, over 1 year, over 3 years, etc.) associated with the numerical value. The NAAQS will be addressed first followed by the PSD increments.

As described in the notes for Table C-9, the form of the model results for the NO<sub>2</sub> annual and SO<sub>2</sub> 3-hour values differ from the applicable NAAQS form. In this case, the annual statistic for the model results is the maximum annual result over a 3-year period, whereas the NAAQS

**Table C-9. Nonradiological Concentration Estimates (i.e., AERMOD Modeling Results) From Stationary, Mobile, and Fugitive Sources for the Peak Year\* Compared to the National Ambient Air Quality Standards (NAAQS)**

Pollutant	Averaging Time	Modeling Results		Background Concentration (ug/m <sup>3</sup> )	Total Concentration (ug/m <sup>3</sup> )	NAAQS Limit (ug/m <sup>3</sup> )	Additional or Detailed Values Available From the Modeling			
		Value (ug/m <sup>3</sup> )	Form†				Value 1 (ug/m <sup>3</sup> )	Value 2 (ug/m <sup>3</sup> )	Value 3 (ug/m <sup>3</sup> )	Form
Carbon Monoxide	1 hour	2,101.1	Not to be exceeded more than once per year	1,097.3	3,198.4	40,000	NA‡	NA	NA	NA
	8 hour	262.6	Not to be exceeded more than once per year	315.5	578.1	10,000	NA	NA	NA	NA
Nitrogen Dioxide	1 hour	156.9	98 <sup>th</sup> percentile, averaged over 3 years	5.6	162.5	187	191.6	159.8	119.2	98 <sup>th</sup> percentile for each of the individual modeled years
	Annual	1.1	Maximum average across 3 yearly values§	0.4	1.5	100	NA	NA	NA	NA
Particulate Matter PM2.5	24 hour	6.9	98 <sup>th</sup> percentile, averaged over 3 years	10.9	17.8	35	7.9	7.5	5.3	98 <sup>th</sup> percentile for each of the individual modeled years
	Annual	1.0	Annual mean, averaged over 3 years	4.8	5.8	12	NA	NA	NA	NA
Particulate Matter PM10 Initial Run	24 hour	187.2	Not to be exceeded more than once per year on average over 3 years	41.0	228.2	150	263.1	217.9	194.4	Three highest values over the 3-year period (values can occur in the same model year)
	Annual	8.8	Maximum annual result averaged over 3 years	NA	NA	None	NA	NA	NA	NA
Particulate Matter PM10 Final Run¶	24 hour	83.6	Not to be exceeded more than once per year on average over 3 years	41.0	124.6	150	116.1	94.6	84.2	Three highest values over the 3-year period (values can occur in the same model year)
	Annual	5.8	Maximum annual result averaged over 3 years	NA	NA	None	5.5	6.1	6.0	Maximum annual results for each of the individual modeling years#

**Table C-9. Nonradiological Concentration Estimates (i.e., AERMOD Modeling Results) From Stationary, Mobile, and Fugitive Sources for the Peak Year\* Compared to the National Ambient Air Quality Standards (NAAQS) (Cont'd)**

Pollutant	Averaging Time	Modeling Results		Background Concentration (ug/m <sup>3</sup> )	Total Concentration (ug/m <sup>3</sup> )	NAAQS Limit (ug/m <sup>3</sup> )	Additional or Detailed Values Available From the Modeling			
		Value (ug/m <sup>3</sup> )	Form†				Value 1 (ug/m <sup>3</sup> )	Value 2 (ug/m <sup>3</sup> )	Value 3 (ug/m <sup>3</sup> )	Form
Sulfur Dioxide	1 hour	48.3	99 <sup>th</sup> percentile of 1-hour daily maximum concentrations, averaged over 3 years	15.7	63.9	200	58.5	50.1	36.2	99 <sup>th</sup> percentile of 1-hour daily maximum for each of the individual years modeled
	3 hour	100.1	High 1 <sup>st</sup> high over any single calendar year**	20.9	121.0	1,300	NA	NA	NA	NA
	24 hour	12.6	High 1 <sup>st</sup> high over any single calendar year	NA	NA	None	NA	NA	NA	NA
	Annual	0.2	Maximum average across 3 yearly values	NA	NA	None	NA	NA	NA	NA

Source: Modified from IML (2013a) and Powertech (2013)

\*Peak year accounts for when all four phases occur simultaneously and represents the highest amount of emission the proposed action would generate in any one project year.

†The form expresses both the statistic (e.g., maximum, average, 98<sup>th</sup> percentile, etc) and the time period (e.g., once per year, over 1 year, over 3 years, etc.) associated with the numerical value. Unless otherwise noted, the modeling results form and the NAAQS form are the same.

‡NA = not available.

§The model result form (maximum annual average over a 3-year period) is not the same as the NAAQS form (maximum annual average over a single year)

|| Initial modeling run without dry depletion for all receptor locations.

¶Final modeling run with dry depletion for the top 50 receptor locations.

#The maximum annual result averaged over three years and each maximum single year average may occur at different receptors.

\*\*The model result form (the highest value over any single calendar year) is not the same as the NAAQS form (not to be exceeded more than once per year).

**Table C–10. Nonradiological Concentration Estimates (i.e., AERMOD Modeling Results) From Stationary, Mobile, and Fugitive Sources for the Peak Year\* Compared to the Prevention of Significant Deterioration (PSD) Increments**

Pollutant	Averaging Time	Modeling Results Form†	Class I Modeling Result ( $\mu\text{g}/\text{m}^3$ )	Allowable Class I PSD Increment ( $\mu\text{g}/\text{m}^3$ )	Class II Modeling Result ( $\mu\text{g}/\text{m}^3$ )	Allowable Class II PSD Increment ( $\mu\text{g}/\text{m}^3$ )
Carbon Monoxide	1 hour	High 1 <sup>st</sup> high over any single calendar year	19.48	None	2101.1	None
	8 hour	High 1 <sup>st</sup> high over any single calendar year	4.12	None	262.6	None
Nitrogen Dioxide	1 hour	98th percentile, averaged over 3 years	1.16	None	156.9	None
	Annual	Maximum average across 3 yearly values	0.01	2.5	1.1	25
Particulate Matter PM2.5	24 hour	98th percentile, averaged over 3 years	0.05	2	6.9	9
	Annual	Annual mean, averaged over 3 years	0.01	1	1.0	4
Particulate Matter PM10 Initial Run‡	24 hour	Not to be exceeded more than once per year on average over 3 years	1.95	8	187.2	30
	Annual	Maximum annual result averaged over 3 years	0.05	4	8.8	17
Particulate Matter PM10 Final Run§	24 hour	Not to be exceeded more than once per year on average over 3 years	NA	8	83.6	30
	Annual	Maximum annual result averaged over three years	NA	4	5.8	17
Sulfur Dioxide	1 hour	99th percentile of 1-hour daily maximum, averaged over 3 years	0.51	None	48.3	None
	3 hour	High 1 <sup>st</sup> high over any single calendar year	1.64	25	100.1	512
	24 hour	High 1 <sup>st</sup> high over any single calendar year	0.25	5	12.6	91
	Annual	Maximum average across 3 yearly values	0.00	2	0.2	20

Source: Modified from IML (2013a,b).

\*Year accounts for when all four phases occur simultaneously and represents the highest amount of emission the proposed action would generate in any one project year.

†The form expresses both the statistic (e.g., maximum, average, 98<sup>th</sup> percentile, etc.) and the time period (e.g., once per year, over one year, over 3 years, etc) associated with the numerical value. None of the modeling results forms in this table is the same as the PSD increment form (see Table 3.7-5).

‡Initial run without dry depletion for all receptor locations.

§Final run with dry depletion for the top 50 receptor locations.

|| NA = not available.

**Table C–11. Percentage of Emissions by Phase for Various National Ambient Air Quality Standard Pollutants From All Sources (Stationary, Mobile, and Fugitive) When All Phases Occur Simultaneously (i.e., a Peak Year\*)**

Pollutant	Primary Source†	Phase			
		Construction Wellfield Only	Operation	Aquifer Restoration	Decommissioning
Particulate Matter PM10	Fugitive Dust‡	41.1	33.0	4.8	21.1
Particulate Matter PM2.5	Fugitive Dust	40.5	32.7	5.5	21.2
Sulfur Dioxide	Mobile Source Combustion Emissions‡	62.3	17.6	0.5	19.6
Nitrogen Oxides	Mobile Source Combustion Emissions	59.8	20.3	1.8	18.1
Carbon Monoxide	Mobile Source Combustion Emissions	70.8	15.8	1.3	12.1

Source: Modified from IML (2013a)  
 \*Peak year accounts for when all four phases occur simultaneously and represents the highest amount of emission the proposed action would generate in any one project year.  
 †Primary source: The contribution (%) of each phase to the total or peak emission was based on the contribution (%) of each phase to the primary source as depicted in Table E. Fugitive dust was the primary source for PM10 (99.1%) and PM2.5 (92.5%). Mobile source combustion emissions were the primary source for sulfur dioxide (99.9%), Nitrogen dioxides (97.6%), and carbon monoxide (98.4%).  
 ‡Fugitive dust percentages calculated from values in Table F with wind erosion emissions evenly divided among phases (8.2 tons for PM10 and 1.225 tons for PM2.5).  
 §Mobile source combustion percentages calculated from values in Table B.

result is for a single year. This approach results in a  $3.3 \mu\text{g}/\text{m}^3$  value for the project level emission and a total concentration of  $3.7 \mu\text{g}/\text{m}^3$ . These values are included in Table 4.7-1. For the PSD increments with 3-hour time periods, the maximum allowable value may be exceeded during one such period per year (i.e., one exceedence per year). The form of the  $\text{SO}_2$  results is the highest value over any single calendar year. Clearly, if the highest value is below the PSD increment, then the second highest (i.e., the value indicating whether the increment is exceeded more than once) is also below the threshold. In this case, the model result for the single highest estimate for any single calendar year is used to compare against the NAAQS.

As described in the notes for Table C–10, none of the modeling result forms are the same as the PSD increment forms. The following text explains the basis for the values incorporated into Table 4.7-2 for comparison to the PSD increments. For the PSD increments with an annual time period, the maximum allowable increase cannot be exceeded over a single year (i.e., no exceedences). For the PSD increments with 3-hour and 24-hour time periods, the maximum allowable increase may be exceeded during one such period per year (i.e., one exceedence per year). The annual time period will be addressed first followed by the shorter time periods. Each of the four PSD pollutants has an annual allowable increment. The Class I thresholds apply to the Wind Cave National Park and the Class II thresholds applies to the remaining areas within the model domain. The annual statistic for the model results in Table C–10 for all four pollutants is equivalent to the maximum annual result over a three year period. The PSD increment is for a single year.



**Table C–12. Nonradiological Concentration Estimates (i.e., AERMOD Modeling Results) From Stationary, Mobile, and Fugitive Sources for the Construction Phase Compared to the National Ambient Air Quality Standard (NAAQS)**

Pollutant	Averaging Time	Modeling Results Form*	Modeling Results (ug/m <sup>3</sup> )	Background Concentration (ug/m <sup>3</sup> )	Total Concentration (ug/m <sup>3</sup> )	NAAQS Limit (ug/m <sup>3</sup> )	% of NAAQS Limit
Carbon Monoxide	1 hour	Not to be exceeded more than once per year	1487.6	1097.3	2548.9	40000	6.5
	8 hour	Not to be exceeded more than once per year	185.9	315.5	501.4	10000	5.0
Nitrogen Dioxide	1 hour	98 <sup>th</sup> percentile, averaged over 3 years	93.8	5.6	99.4	187	53.1
	Annual	Annual mean†	2.0	0.4	2.4	100	2.4
Particulate Matter PM2.5	24 hour	98 <sup>th</sup> percentile, averaged over 3 years	2.8	10.9	13.7	35	39.1
	Annual	Annual mean, averaged over 3 years	0.40	4.8	5.2	12‡	43.3
Particulate Matter PM10 Initial Final Run§	24 hour	Not to be exceeded more than once per year on average over 3 years	76.9	41.0	117.9	150	78.6
Particulate Matter PM10 Final Run	24 hour	Not to be exceeded more than once per year on average over 3 years	34.4	41.0	75.4	150	50.2
Sulfur Dioxide	1 hour	99 <sup>th</sup> percentile of 1-hour daily maximum concentrations	30.1	15.7	45.8	200	22.9
	3 hour	Not to be exceeded more than once per year	62.4	20.9	83.3	1300	6.4

Source: Modified from IML (2013a) and Powertech (2013)

\*The form expresses both the statistic (e.g., maximum, average, or 98th percentile) and the time period (e.g., once per year, over 1 year, or over 3 years) associated with the numerical value. Unless otherwise noted, the modeling results form and the NAAQS form are the same.

†Initial modeling form (maximum annual average over a three year period) is not the same as the NAAQS form (maximum annual average over a single year). The value in this table has a form that matches the NAAQS form and was calculated from the initial model result as described in Appendix C, Section C2.3.

‡The table identifies the primary standard limit. The secondary standard limit is larger (i.e., 15 µg/m<sup>3</sup>). Results that meet the primary standard will automatically meet the secondary standard.

§Initial modeling run without dry depletion for all receptor locations.

|| Final modeling run with dry depletion for the top 50 receptor locations.

Two approaches were used to generate values for comparison to annual Class II PSD increments. The first approach applies to PM<sub>10</sub> only. For the final PM<sub>10</sub> model run, Table C–9 (see the columns with the header "additional or detailed values available from the modeling") provides the maximum single year averages for each of the three years modeled. The highest value was 6.1 µg/m<sup>3</sup>, which can be directly compared to the PSD increment. The annual average over the three year period (5.8 µg/m<sup>3</sup>) was 95.1 percent of this single year

**Table C–13. Nonradiological Concentration Estimates (i.e., AERMOD Modeling Results) From Stationary, Mobile, and Fugitive Sources for the Operation Phase Compared to the National Ambient Air Quality Standard (NAAQS)**

Pollutant	Averaging Time	Modeling Results Form*	Modeling Results (ug/m <sup>3</sup> )	Background Concentration (ug/m <sup>3</sup> )	Total Concentration (ug/m <sup>3</sup> )	NAAQS Limit (ug/m <sup>3</sup> )	% of NAAQS limit
Carbon Monoxide	1 hour	Not to be exceeded more than once per year	332.0	1097.3	1429.3	40000	3.6
	8 hour	Not to be exceeded more than once per year	41.5	315.5	357.0	10000	3.6
Nitrogen Dioxide	1 hour	98 <sup>th</sup> percentile, averaged over 3 years	31.8	5.6	37.4	187	20.0
	Annual	Annual mean†	0.67	0.4	1.1	100	1.1
Particulate Matter PM2.5	24 hour	98 <sup>th</sup> percentile, averaged over 3 years	2.3	10.9	13.2	35	37.6
	Annual	Annual mean, averaged over 3 years	0.33	4.8	5.13	12‡	42.7
Particulate Matter PM10 Initial Final Run§	24 hour	Not to be exceeded more than once per year on average over 3 years	61.8	41.0	102.8	150	68.5
Particulate Matter PM10 Final Run	24 hour	Not to be exceeded more than once per year on average over 3 years	27.6	41.0	68.6	150	45.7
Sulfur Dioxide	1 hour	99 <sup>th</sup> percentile of 1-hour daily maximum concentrations	8.5	15.7	24.2	200	12.1
	3 hour	Not to be exceeded more than once per year	17.6	20.9	38.5	1300	3.0

Source: Modified from IML (2013a) and Powertech (2013)

\*The form expresses both the statistic (e.g., maximum, average, or 98th percentile) and the time period (e.g., once per year, over 1 year, or over 3 years) associated with the numerical value. Unless otherwise noted, the modeling results form and the NAAQS form are the same.

†Initial modeling form (maximum annual average over a three year period) is not the same as the NAAQS form (maximum annual average over a single year). The value in this table has a form that matches the NAAQS form and was calculated from the initial model result as described in Appendix C, Section C2.3.

‡The table identifies the primary standard limit. The secondary standard limit is larger (i.e., 15 ug/m<sup>3</sup>). Results that meet the primary standard will automatically meet the secondary standard.

§Initial modeling run without dry depletion for all receptor locations.

|| Final modeling run with dry depletion for the top 50 receptor locations.

highest value. These individual year values were not available from the initial PM<sub>10</sub> modeling run (or for the other pollutants). A value of 9.2 ug/m<sup>3</sup> was calculated for the value to compare to the PSD increment for the initial PM<sub>10</sub> modeling run by assuming that the annual average over the three year period was 95.1 percent of the single year highest value since this was the case for the PM<sub>10</sub> final modeling run. The second approach applies to PM<sub>2.5</sub>, NO<sub>2</sub>, and SO<sub>2</sub>. Assuming all of the emissions over the three year period occur in one year, the maximum

**Table C–14. Nonradiological Concentration Estimates (i.e., AERMOD Modeling Results) From Stationary, Mobile, and Fugitive Sources for the Aquifer Restoration Phase Compared to the National Ambient Air Quality Standard (NAAQS)**

Pollutant	Averaging Time	Modeling Results Form*	Modeling Results (ug/m <sup>3</sup> )	Background Concentration (ug/m <sup>3</sup> )	Total Concentration (ug/m <sup>3</sup> )	NAAQS Limit (ug/m <sup>3</sup> )	% of NAAQS limit
Carbon Monoxide	1 hour	Not to be exceeded more than once per year	27.3	1097.3	1124.6	40000	2.8
	8 hour	Not to be exceeded more than once per year	3.4	315.5	318.9	10000	3.2
Nitrogen Dioxide	1 hour	98 <sup>th</sup> percentile, averaged over 3 years	2.8	5.6	8.4	187	4.5
	Annual	Annual mean†	0.06	0.4	0.46	100	0.5
Particulate Matter PM2.5	24 hour	98 <sup>th</sup> percentile, averaged over 3 years	0.38	10.9	11.28	35	32.2
	Annual	Annual mean, averaged over 3 years	0.055	4.8	4.855	12‡	40.5
Particulate Matter PM10 Initial Final Run§	24 hour	Not to be exceeded more than once per year on average over 3 years	9.0	41.0	50.0	150	33.3
Particulate Matter PM10 Final Run	24 hour	Not to be exceeded more than once per year on average over 3 years	4.0	41.0	45.0	150	30.0
Sulfur Dioxide	1 hour	99th percentile of 1-hour daily maximum concentrations	0.24	15.7	15.94	200	7.8
	3 hour	Not to be exceeded more than once per year	0.50	20.9	21.4	1300	1.6

Source: Modified from IML (2013a) and Powertech (2013)

\*The form expresses both the statistic (e.g., maximum, average, or 98th percentile) and the time period (e.g., once per year, over 1 year, or over 3 years) associated with the numerical value. Unless otherwise noted, the modeling results form and the NAAQS form are the same.

†Initial modeling form (maximum annual average over a three year period) is not the same as the NAAQS form (maximum annual average over a single year). The value in this table has a form that matches the NAAQS form and was calculated from the initial model result as described in Appendix C, Section C2.3

‡The table identifies the primary standard limit. The secondary standard limit is larger (i.e., 15 ug/m<sup>3</sup>). Results that meet the primary standard will automatically meet the secondary standard.

§Initial modeling run without dry depletion for all receptor locations.

|| Final modeling run with dry depletion for the top 50 receptor locations.

possible value for a single year would be three times the annual average over the three year period. This approach results in the following values to compare to the Class II PSD increment: 3.0 ug/m<sup>3</sup> for PM<sub>2.5</sub>, 3.3 ug/m<sup>3</sup> for NO<sub>2</sub>, and 0.6 ug/m<sup>3</sup> for SO<sub>2</sub>.

Two approaches were used to generate values for comparison to annual Class I PSD increments. The first approach applies to all of the values except for the PM<sub>10</sub> final run.

**Table C–15. Nonradiological Concentration Estimates (i.e., AERMOD Modeling Results) From Stationary, Mobile, and Fugitive Sources for the Decommissioning Phase Compared to the National Ambient Air Quality Standard (NAAQS)**

Pollutant	Averaging Time	Modeling Results Form*	Modeling Results (ug/m <sup>3</sup> )	Background Concentration (ug/m <sup>3</sup> )	Total Concentration (ug/m <sup>3</sup> )	NAAQS Limit (ug/m <sup>3</sup> )	% of NAAQS limit
Carbon Monoxide	1 hour	Not to be exceeded more than once per year	254.2	1097.3	1351.5	40000	3.4
	8 hour	Not to be exceeded more than once per year	31.8	315.5	347.3	10000	3.5
Nitrogen Dioxide	1 hour	98th percentile, averaged over 3 years	28.4	5.6	34.0	187	18.2
	Annual	Annual mean†	0.60	0.4	1.0	100	1.0
Particulate Matter PM2.5	24 hour	98th percentile, averaged over 3 years	1.46	10.9	12.36	35	35.3
	Annual	Annual mean, averaged over 3 years	0.21	4.8	5.01	12‡	41.8
Particulate Matter PM10 Initial Final Run§	24 hour	Not to be exceeded more than once per year on average over 3 years	39.5	41.0	80.50	150	53.7
Particulate Matter PM10 Final Run	24 hour	Not to be exceeded more than once per year on average over 3 years	17.64	41.0	58.64	150	39.1
Sulfur Dioxide	1 hour	99th percentile of 1-hour daily maximum concentrations	9.47	15.7	25.2	200	12.6
	3 hour	Not to be exceeded more than once per year	19.62	20.9	40.52	1300	3.1

Source: Modified from IML (2013a) and Powertech (2013)

\*The form expresses both the statistic (e.g., maximum, average, or 98th percentile) and the time period (e.g., once per year, over 1 year, or over 3 years) associated with the numerical value. Unless otherwise noted, the modeling results form and the NAAQS form are the same.

†Initial modeling form (maximum annual average over a 3-year period) is not the same as the NAAQS form (maximum annual average over a single year). The value in this table has a form that matches the NAAQS form and was calculated from the initial model result as described in Appendix C, Section C2.3.

‡The table identifies the primary standard limit. The secondary standard limit is larger (i.e., 15 ug/m<sup>3</sup>). Results that meet the primary standard will automatically meet the secondary standard.

§Initial modeling run without dry depletion for all receptor locations.

|| Final modeling run with dry depletion for the top 50 receptor locations.

Assuming all of the emissions over the three year period occur in one year, the maximum possible value for a single year would be three times the annual average over the three year period. This approach results in the following values to compare to the Class I PSD increment:

0.15  $\mu\text{g}/\text{m}^3$  for  $\text{PM}_{10}$  initial run, 0.03  $\mu\text{g}/\text{m}^3$  for  $\text{PM}_{2.5}$ , 0.03  $\mu\text{g}/\text{m}^3$  for  $\text{NO}_2$ , and 0.0  $\mu\text{g}/\text{m}^3$   $\text{SO}_2$ . The final  $\text{PM}_{10}$  modeling run did not estimate Class I values because the final modeling run was only performed on the 50 highest values, which did not include any of the Class I receptors.

The value for the final modeling run, which implements the dry depletion option, will result in a lower value than the initial modeling run. Since the value for the initial modeling run used for the comparison to the PSD increment is below the threshold, the value for the final modeling run will also be below the PSD increment. Since there did not appear to be a readily available method to determine how much this value would drop when the dry depletion option is implemented, the initial run value was also used as the final run value.

For the PSD increments with 3-hour and 24-hour time periods, the maximum allowable increase may be exceeded during one such period per year (i.e., one exceedance per year). Approaches to identify an appropriate value for comparison varied based on the particular PSD increment. The form of the  $\text{SO}_2$  Class I and Class II results is the highest value over any single calendar year and all of these values are below the PSD increment. Clearly, if the highest value is below the PSD increment, then the second highest (i.e., the value indicating if the increment is exceeded more than once) is also below the threshold. In this case, the model results for the single highest estimate for any single calendar year is used for the value to compare against the PSD increment.

For the  $\text{PM}_{10}$  24-hour Class II values, the initial and final modeling results are available for the four highest values over the three year period. However, the information provided did not specify if these results occur in the same year or at the same location. The PSD increment applies to a single year at a single location. Because the fourth highest result over the three year period is about three times greater than the PSD increment, the assumption is that the second highest value in a single year at a single location would also exceed the increment. To provide a value for comparison to the increment, the fourth highest result over the three year period was selected as the value for comparison to the increment to reflect the assumption that the second highest value in a single year at a single location will exceed the increment.

For the  $\text{PM}_{10}$  24-hour Class I initial modeling results over a three year period, three Wind Cave receptors will have values that exceed the PSD increment with the highest first high value at 8.3, 8.23, and 8.20  $\mu\text{g}/\text{m}^3$  (IML, 2013b). The fourth highest values at these receptors during the three year period are 0.84, 1.66, and 0.79  $\mu\text{g}/\text{m}^3$ , respectively. It is reasonable to assume that the second highest value will not be more than 8  $\mu\text{g}/\text{m}^3$ , especially the second highest value for any single year at a single receptor (i.e., the PSD increment form). Since there did not appear to be a readily available method to determine a value for the PSD statistic, a value of 8  $\mu\text{g}/\text{m}^3$  was selected to indicate that the value will be around the PSD increment. NRC staff consider the use of this value acceptable because the PSD increment comparisons in this SEIS are for characterizing impacts rather than determining regulatory compliance. To generate the Class I  $\text{PM}_{10}$  24-hour final modeling value NRC staff assumed that the difference between the initial and final Class I results is the same as the difference between the initial and final Class II  $\text{PM}_{10}$  24-hours results. The final Class II result was 44.7 percent of the initial Class II result. Applying this percentage to the value used for the initial Class I results gives a value of 3.6  $\mu\text{g}/\text{m}^3$  for the final Class II  $\text{PM}_{10}$  24-hour result.

For the  $\text{PM}_{2.5}$  24-hour Class I model results, the highest first high value for a Wind Cave boundary receptor is at 0.45  $\mu\text{g}/\text{m}^3$  (IML, 2013b), which is below the applicable PSD increment. Clearly, if the highest value is below the PSD increment, then the second highest (i.e., the value

indicating if the increment is exceeded more than once) is also below the threshold. In this case, the model results for the single highest estimate are used for the value to compare against the PSD increment.

The PM<sub>2.5</sub> 24-hour Class II model results are available for the 98th percentile for each of the individual modeled years with the highest value at 7.9 µg/m<sup>3</sup> (IML, 2013a). The statistic for this modeled value (i.e., the 98th percentile for an individual year) would be lower than the statistic for the PSD increment (i.e., not to be exceeded more than once per year). Since there did not appear to be a readily available method to determine a value for the PSD statistic, the value from the modeling results (i.e., 7.9 µg/m<sup>3</sup>) was used. NRC staff acknowledge that the value for the PSD statistic would be higher than the value used in the comparison for the PSD increment (i.e., the modeling result value). NRC staff consider the use of the modeling result value acceptable for two reasons. First, as described in SEIS Section 4.7.1, the PSD increment comparisons in this SEIS are for characterizing impacts rather than determining regulatory compliance. Additionally, the SEIS issue at hand concerns the impacts associated with Class II, short term (i.e., 24-hour) fugitive dust emissions. Fugitive emissions consist of both PM<sub>10</sub> and PM<sub>2.5</sub> emissions and the Class II PM<sub>10</sub> 24-hour values used in this SEIS for comparison to the PSD increments already establish a basis for characterizing these impacts.

The final topic for Section C2.3.1 is why the use of the AERMOD dry depletion option is appropriate in this SEIS. The rationale described in this appendix is a summary of the rationale provided in the Ambient Air Quality Final Modeling Protocol and Impact Analysis (IML, 2013a).

Fugitive dust sources (i.e., travel on unpaved roads and wind erosion) account for 99.14% of the proposed project PM<sub>10</sub> emissions (see Table C–8). These types of fugitive emissions are considered ground-level sources. U.S. Environmental Protection Agency (EPA) studies (EPA 1994 and 1995) have established the tendency for ground-level fugitive dust to partially settle out within a short distance of the emission source. This deposition includes PM<sub>10</sub> (Countess, 2001). The mechanisms for particle deposition and settling include gravity, diffusion, and impaction. Failure to account for this partial settling can result in over predicting maximum 24-hour PM<sub>10</sub> concentrations. Studies cite the tendency of ISC3, the air dispersion model preceding AERMOD, to over predict maximum 24-hour PM<sub>10</sub> concentrations by a factor of four (Long 2011, Westbrook and Sullivan 2006, Pace 2005). For low-level emission plumes, AERMOD results have not been evaluated extensively by EPA for performance against measured data. A 2011 study (MMA, 2011) compared the AERMOD and ISC3 modeling results for the short-term particle concentrations from surface mining operations. The study reveals that AERMOD not only over predicts the fugitive dust concentrations over the short term (e.g., 24-hours), but it exceeds the ISC3 predictions at model receptors located from 100 m [109.4 yd] to 500 m [546.8 yd] from the sources of fugitive emissions.

The purpose of the dry depletion option in AERMOD is to account for the partial settling and deposition of PM<sub>10</sub> particles as the dust plume disperses away from the source. General guidelines (EPA, 2005) state that dry depletion may be directly included in a model when particulate matter sources can be quantified and dry deposition is a significant factor. NRC believes that the proposed Dewey-Burdock ISR Project meets these conditions. Source fugitive emissions are quantified (see Table C–4) and settling and deposition are anticipated to occur. Fugitive dust sources (i.e., travel on unpaved roads and wind erosion) account for 99.14 percent of the proposed project PM<sub>10</sub> emissions (see Table C–8). These types of fugitive emissions are considered ground-level sources, which are the type of fugitive dust emissions predicted to partially settle out within a short distance of the emission source. In addition, the initial AERMOD results show that the highest PM<sub>10</sub> 24-hour concentrations occur near the sources,



concentrations fall off rapidly with distance from the source. This suggests the likelihood of high concentration gradients, which are expected to produce meaningful diffusion based settling. There is precedent for using the AERMOD dry depletion option in an environmental impact statement (EIS) to model short-term impacts from fugitive dust emissions. In 2010, the U. S. Bureau of Land Management (BLM) prepared an EIS for a coal lease application in Utah in which the primary pollutant of concern was fugitive dust. Appendix K of that EIS (Marquez Environmental Services, Inc., 2010) describes how deposition and plume depletion were used in the refined analysis of PM<sub>10</sub> modeled emissions.

NRC staff acknowledge that the studies citing the tendency of the models to over predict PM<sub>10</sub> concentrations over the short term predate the latest version of AERMOD, which was used for this SEIS analysis. However, NRC staff consider that there is history of short-term model over prediction of PM<sub>10</sub> concentrations and that there is a modeling option available to address this situation. The project conditions meet the guidelines for implementing this modeling option. Additionally, there is precedent for the use of this option in other EIS analyses as noted above. Therefore, NRC staff considers it appropriate to base the impact magnitude decision in this SEIS on results that use the dry depletion option.

### **C2.3.2 CALPUFF**

The CALPUFF modeling was used to generate Air Quality Related Values (i.e., visibility and acid deposition) for the nearest Class I area, Wind Cave National Park. Table 4.7-3 presents the peak year visibility results and Table 4.7-4 presents the peak year acid deposition results. Section C2.3.2 addresses the rationale for excluding the PM<sub>10</sub> fugitive emission from the analysis used in this SEIS to determine the impact magnitude.

Over 99 percent of the Dewey-Burdock PM<sub>10</sub> emissions are from fugitive dust sources (see Table C-8). The sources generating fugitive dust are travel on unpaved roads and wind erosion. These sources are ground-level emission-sources. There is evidence and precedent that supports excluding ground-level, fugitive PM<sub>10</sub> emissions from the assessment of project impacts on visibility at Wind Cave National Park. The Ambient Air Quality Final Modeling Protocol and Impact Analysis (IML, 2013a) identifies a 2006 EIS from BLM for a gas development in southern Wyoming that excludes fugitive PM<sub>10</sub> emissions from the assessment of visibility impacts. The Ambient Air Quality Final Modeling Protocol and Impact Analysis (IML, 2013a) also cites the following text from Appendix F of this BLM EIS (TRC Environmental Corporation, 2006) explaining why the PM<sub>10</sub> emission were excluded from the visibility analysis and the PM<sub>2.5</sub> emissions were included.

“This assumption was based on supporting documentation from the Western Regional Air Partnership (WRAP) analyses of mechanically generated fugitive dust emissions that suggest that particles larger than PM<sub>2.5</sub> tend to deposit out rapidly near the emissions source and do not transport over long distances (Countess, 2001). This phenomenon is not modeled adequately in CALPUFF; therefore, to avoid overestimates of PM<sub>10</sub> impacts at far-field locations, these sources were not considered in the total modeled impacts.”

For clarification, the fugitive emissions from the gas development project were generated by travel on unpaved roads and fugitive dust generated from travel on unpaved roads is considered mechanically generated fugitive dust emissions.

### C3 Greenhouse Gas Emissions

Carbon dioxide emissions generated during each phase of the proposed project are presented in Table C–16. Combustion exhaust estimates for greenhouse gas emissions fall into three source categories. The first category consists of facility sources, which is further categorized into stationary sources and facility fugitive emissions from the uranium recovery process. With the exception of project year one, the stationary source emissions are assumed to be constant each year throughout the lifespan of the project. During the operation phase, relatively small amounts of carbon dioxide are released when acidifying pregnant eluate prior to precipitation of uranyl peroxide. Specifically, about half of the emissions are from the breakdown of uranyltricarboxylate and the other half from the breakdown of carbonate in the eluate. The second category consists of mobile sources, which include construction and drilling equipment and other mobile sources (e.g., commuter vehicles). The third category consists of indirect emissions from electricity consumption (i.e., emissions associated with the production of the electricity that the proposed project consumes).

### C4 Updates in the Nonradiological Air Emissions Estimates Between the Draft and Final SEIS

As described in draft SEIS Section 4.7.1 (NRC, 2012), the emission inventory, modeling, and analyses in the final SEIS were to be updated or revised with the results of ongoing model development activities that were not complete at the time the draft SEIS was issued in November 2012. Table C–17 compares modeling updates identified in the draft SEIS to the

**Table C–16. Annual Carbon Dioxide Estimates in Short Tons/Year\* for the Proposed Action**

Phase	Facility		Mobile Sources	Electrical Consumption	Total
	Stationary Sources†	Fugitive From Uranium Recovery Process			
Construction	1,586	0	4,398	597	6,581
Operation	1,586	485	1,643	24,358	28,072
Aquifer Restoration	1,586	0	121	7,369	9,076
Decommissioning	1,586	0	1,418	597	3,601
Peak Year‡	1,586	485	7,580	32,921	42,572§

Source: Modified from IML (2013a)  
 \*Sources document and appendix table mass expressed in short tons only (dual units used in the Supplemental Environmental Impact Statement with metric being primary).  
 †Except for project year 1, stationary emissions are assumed to be constant over the project lifespan. Therefore, the peak year calculation would only need to include the stationary source emission value one time rather than for each phase.  
 ‡Peak year accounts for when all four phases occur simultaneously and represents the highest amount of emissions the proposed action will generate in any one project year.  
 §This value is for the peak year total which only includes the stationary source emission value of 1,586 once (see Note †). This value is not the total of the individual phase totals in the column because each phase totals includes the stationary source emission value.

**Table C–17. Comparison of the Modeling Updates Identified in the Draft Supplemental Environmental Impact Statement (SEIS) To Be Included in the Final SEIS to the Modeling as Conducted in the Final SEIS**

<b>Update identified in the Draft SEIS</b>	<b>Response in the final SEIS</b>
Incorporate the revised fugitive dust emission inventory, including both the project-specific onsite and offsite emissions, into the air dispersion modeling.	The peak year emission inventory used in the modeling included fugitive dust sources (see Table 2.1-5). These fugitive dust emissions included project-specific onsite and offsite emissions (see Table 2.1-3).
Update the air dispersion modeling for National Ambient Air Quality Standard (NAAQS) compliance by (i) using the revised inventory and (ii) including the following information not provided in the initial modeling: PM <sub>2.5</sub> (annual and 24 hour), SO <sub>2</sub> (1 hour), and NO <sub>2</sub> (1 hour).	The peak year emission inventory used in the modeling is from the Ambient Air Quality Final Modeling Protocol and Impact Analysis (Inter-Mountain Labs, 2013a) (see Table 2.1-5) and the results included PM <sub>2.5</sub> (annual and 24 hour), SO <sub>2</sub> (1 hour), and NO <sub>2</sub> (1 hour) (see Table 4.7-1).
Update the air dispersion modeling for prevention of significant deterioration (PSD) compliance by (i) using the revised inventory, (ii) analyzing for both Class II (at site) and Class I (at Wind Cave National Park), and (iii) including modeling results for all of the pollutants and timeframes as described in 40 CFR 52.21.	The peak year emission inventory used in the modeling is from the Ambient Air Quality Final Modeling Protocol and Impact Analysis (Inter-Mountain Labs, 2013a) (see Table 2.1-5), included both Class II and Class I analyses (see Table 4.7-2), and included modeling results for all of the pollutants and timeframes as described in 40 CFR 52.21*
Provide modeling results for the Air Quality Related Values for the Wind Cave National Park.	Analyses included modeling results for the Air Quality Related Values of visibility (see Table 4.7-3) and acid deposition (see Table 4.7-4)
Revise the level of detail associated with the emission inventory, if needed, to accommodate for the air dispersion modeling associated with short timeframes (e.g., 1-hour or 24-hour averaging periods).	Appendix B of the Ambient Air Quality Final Modeling Protocol and Impact Analysis (Inter-Mountain Laboratories, Inc., 2013a) provides the basis for the timing and the source apportionment of emissions.
Use the appropriate emission inventory data for determining NAAQS or PSD modeling results for specific averaging times (e.g., an annual emission value may not be the appropriate information base for determining a 1-hour or 24-hour averaging time concentration).	Appendix B of the Ambient Air Quality Final Modeling Protocol and Impact Analysis (Inter-Mountain Laboratories, Inc., 2013a) provides the basis for the timing and the source apportionment of emissions.
Provide model receptor diagrams with the modeling analyses (i.e., identify the receptor locations where the pollutant concentrations were calculated).	Figures 4.7-1 and 4.7-2 display the AERMOD receptor placement (i.e. locations where pollutant concentrations were estimated). Figure 4.7-3 identifies the CALPUFF modeling domain and Figure 4.7-4 displays the receptor placement.
<p>Source: Modified from NRC (2012)</p> <p>*As noted in Table 4.7-2 none of the forms for the modeling results in Table C–10 are the same as the PSD increment forms. Values were generated as described in Appendix C Section C2.3.1 to create numbers appropriate to comparison to PSD increments.</p>	

modeling conducted and presented in this final SEIS. NRC staff consider that all of the updates identified in the draft SEIS are incorporated into the final SEIS. As discussed in Section C1, the applicant submitted an air quality application to SDDENR in November, 2012 (see Table 1.6-1). Based on the information in the application, SDDENR determined that an air permit will not be required and that the proposed action will not be subject to PSD requirements (SDDENR, 2013). NRC staff reiterates the important distinction that the SEIS analysis is for disclosure purposes and does not document or represent the formal SDDENR determination.

As described in draft SEIS Section 4.7.1 (NRC, 2012), the impact analysis in the final SEIS are based on the new modeling results. Table C–18 compares the draft SEIS and final SEIS impact assessments. The key consideration in determining the impact magnitude is the fugitive dust emissions. Fugitive dust emissions were not included in the air dispersion modeling in the draft SEIS. Since modeling in the final SEIS includes fugitive dust, quantitative values were available for the fugitive dust such as the PM<sub>10</sub> 24-hour concentrations. The inclusion of the fugitive dust emissions in the modeling results allows the final SEIS analysis to lower the impacts for the operation, aquifer restoration, and decommissioning phases from SMALL to MODERATE, to SMALL. There is no change to the peak year, construction phase, or cumulative impact assessments. The draft SEIS presented a conservative or bounding analysis relative to the final SEIS.

For information purposes, NRC staff will also present the impact analyses using the PM<sub>10</sub> modeling results that do not implement the AERMOD dry depletion option (i.e., the initial modeling run) and include the PM<sub>10</sub> emissions in the CALPUFF analysis. The total pollutant concentrations for the initial modeling run reveal that the concentrations for each of the NAAQS pollutants are below the NAAQS except for the PM<sub>10</sub> 24-hour estimate (see Table 4.7-1).

**Table C–18. Comparison of the Draft Supplemental Environmental Impact Statement (SEIS) and Final SEIS Air Quality Impacts Assessments**

Category	Draft SEIS	Final SEIS*	
		U.S. Nuclear Regulatory Commission Determination	Information Purposes
Peak year	SMALL to MODERATE	SMALL to MODERATE	LARGE†
Construction phase	SMALL to MODERATE	SMALL to MODERATE	SMALL to MODERATE
Operation phase	SMALL to MODERATE	SMALL	SMALL to MODERATE
Aquifer restoration phase	SMALL to MODERATE	SMALL	SMALL
Decommissioning phase	SMALL to MODERATE	SMALL	SMALL to MODERATE
Cumulative	MODERATE	MODERATE	LARGE†

Source: Modified from NRC (2012)  
 \*The final SEIS includes the NRC impact determination based on the final AERMOD results implementing the dry depletion option and excluding the PM<sub>10</sub> emissions from the CALPUFF visibility analysis. The final SEIS also includes, for informational purposes, the impact determination that does not implement dry depletion and includes the PM<sub>10</sub> emissions from the CALPUFF visibility analysis.  
 †Impact magnitude assumes without additional considerations. See final SEIS Section 5.7.1 for additional details.

Without additional consideration, NRC will characterize the initial modeling run results for the peak year concentrations as a LARGE impact (this also changes the cumulative impacts assessment to LARGE). An example of an additional consideration is the incorporation of mitigation into the emission inventory calculation such as water suppression for travel on unpaved roads beyond the boundary of the proposed project. NRC staff did not pursue such additional considerations because the peak year PM<sub>10</sub> 24-hour total pollution concentration for the final run (i.e., the information basis the NRC staff used to determine the SEIS impact conclusions) is below the NAAQS.

There are two changes concerning the incorporation of mitigation into the emission inventory between the draft and final SEIS. Subsequent to the draft SEIS, the applicant has committed to carpooling (IML, 2013a). Table C-6 presents the effectiveness (i.e. the percent that the emissions are reduced) of the commuter carpooling the applicant has committed to implementing. The other change is an increase from 50 percent to 60 percent for the control efficiency for the water suppression of fugitive dust. The basis of the increase in the control efficiency is provided in Appendix D of the Ambient Air Quality Final Modeling Protocol and Impact Analysis (IML, 2013a).

There are other changes in the emissions inventory and modeling between the draft and final SEIS. Some changes are attributed to the applicant. For example, the drill rig hours of operation were changed from values based solely on equipment availability (e.g., 10 hrs/day, 5 days/wk, 52 wks/yr) to operating times estimates. Other changes are attributed to staff from the EPA, SDDENR, and BLM who participated in the development of the modeling protocol (IML, 2013a). For example SDDENR staff provided a revised value for the baseline PM<sub>10</sub> ambient air concentrations presented in Table 3.7-3 accounting for controlled burns conducted very near the ambient monitoring locations by the National Park Service. For interested readers, an extensive list of such changes associated with the emission inventory and modeling is presented in Appendix H of the Ambient Air Quality Final Modeling Protocol and Impact Analysis (IML, 2013a).

## **C5           References**

40 CFR Part 52. Code of Federal Regulations, Title 52, "Requirements for Preparation, Adoption, and Submittal of Implementation Plans" Washington, DC: U.S. Government Printing Office.

Countess, R. "Methodology for Estimating Fugitive Windblown and Mechanically Resuspended Road Dust Emissions Applicable for Regional Scale Air Quality Modeling." ML13213A294. Westlake Village, California: Countess Environmental. 2001.

EPA (U.S. Environmental Protection Agency). Revision to the Guideline on Air Quality Models: Adoption of a Preferred General Purpose (Flat and Complex Terrain) Dispersion Model and Other Revisions; Final Rule." Title 40—Protection of Environment. 40 CFR Part 51. *Federal Register*. Vol. 70, No. 216. pp. 68218–68261. November 9, 2005.

EPA. "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling—Compression-Ignition." EPA420-P-04-009, NR-009c. Washington DC: EPA. April 2004.

EPA. "User's Guide for the Industrial Source Complex (ISC3) Dispersion Models." Volume II: Description of Model Algorithms. EPA-454-B-95-003b. Research Triangle Park, North Carolina: EPA. 1995.

EPA. "Development and Testing of a Dry Deposition Algorithm (Revised)." EPA-464/R-94-015. Research Triangle Park, North Carolina: EPA. 1994.

IML (Inter-Mountain Laboratories, Inc). "Ambient Air Quality Final Modeling Protocol and Impact Analysis Dewey-Burdock Project Powertech (USA) Inc., Edgemont, South Dakota." ML13196a061, ML13196a097, ML13196a118. Sheridan, Wyoming: IML Air Science. 2013a.

IML. "D-B 1st high PM10/PM2.5 for PSD discussion." E-mail (July 18) from R. Smith to B. Werling, Center for Nuclear Waste Regulatory Analyses, San Antonio, Texas. ML13213A273. Sheridan, Wyoming: Inter-Mountain Laboratories, Inc. 2013b.

IML. "Follow-Up on Dewey-Burdock Questions." Email (August 2) from R. Smith to Bradley Werling (Southwest Research Institute®). ML12216A215. Sheridan, Wyoming: IML. 2012.

Long, M.E. "Air Quality Modeling and Impacts on the Mining Industry: An Overview." ML13213A301. Cleveland, Ohio: Cliffs Natural Resources. 2012.

Marquez Environmental Services, Inc. "Appendix K: Air Resources Impact Assessment Technical Report for the Alton Coal Lease by Application Draft Environmental Impact Statement." ML13213A324. Golden Colorado. Marquez Environmental Services, Inc. 2010.

MMA (McVehil-Monnett Associates, Inc.). "Draft 'White Paper' Status of CAAA Section 234 Regulatory and Technical Issues Update." 2390-10. ML13213A342. Englewood, Colorado: MMA. 2011.

NRC (U.S. Nuclear Regulatory Commission). NUREG-1910 Supplement 4 - Volume 1, "Environmental Impact Statement for the Dewey-Burdock Project in Custer and Fall River Counties, South Dakota: Supplement to the Generic Environmental Impact Statement for *In-Situ* Leach Uranium Milling Facilities. Draft Report for Comment. Chapters 1 to 4." ML12312A039. Washington, DC: NRC. November 2012.

Pace, T.G. "Methodology to Estimate the Transportable Fraction (TF) of Fugitive Dust Emissions for Regional and Urban Scale Air Quality Analyses." ML13213A386. Washington, DC: U.S. Environmental Protection Agency. 2005.

Powertech (Powertech (USA) Inc.). "RE: Protocol received and attachment." Email (July 16) from J. Mays to Bradley Werling (Southwest Research Institute®). ML13275A290. Greenwood Village, Colorado: Powertech. 2013.

Powertech. "Dewey-Burdock Project Emissions Inventory Revisions." Email (July 31) from R. Blubaugh to Bradley Werling (Southwest Research Institute®). ML12216A220. Greenwood Village, Colorado: Powertech. 2012.

Powertech. "Response to the U.S. Nuclear Regulatory Commission's (NRC) Request for Additional Information for the Dewey-Burdock Uranium Project Environmental Report. Submitted August 11, 2009." ML102380516. Greenwood Village, Colorado: Powertech (USA) Inc. 2010a.



Powertech. "Powertech (USA), Inc.'s Responses to the U.S. Nuclear Regulatory Commission (NRC) Staff's Verbal and Email Requests for Clarification of Selected Issues Related to the Dewey-Burdock Uranium Project. Environmental Review Docket No. 40-9075, TAC No. J 00533." Letter (November 4) from R. Blubaugh, Vice President-Environmental Health and Safety Resources, Powertech, to R. Burrows, Project Manager, Office of Federal and State Materials and Environmental Management Programs. ML110820582. Greenwood, Colorado: Powertech. 2010b.

Powertech. "Powertech (USA), Inc.'s Responses to the U.S. Nuclear Regulatory Commission (NRC) Staff's Verbal Request for Clarification of Response Regarding Inclusion of Emissions from Drilling Disposal Wells; Dewey-Burdock Uranium Project. Environmental Review, Docket No. 40-9075, TAC No. J 00533." Letter (November 17) from R. Blubaugh, Vice President-Environmental Health and Safety Resources, Powertech, to R. Burrows, Project Manager, Office of Federal and State Materials and Environmental Management Programs. ML103220208. Greenwood, Colorado: Powertech. 2010c.

Powertech. "Dewey-Burdock Project, Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota—Environmental Report." ML092870160. Greenwood Village, Colorado: Powertech. 2009.

SDDENR (South Dakota Department of Environment and Natural Resources). "Powertech's Air Quality Application Submitted on November 5, 2012 for Its Proposed Operations in Edgemont, South Dakota." Letter (February 21) with enclosure (Statement of Basis) from K. Gestring to R. Blubaugh, Powertech USA. ML13213A282. Vermillion, South Dakota: SDDENR. 2013. TRC Environmental Corporation. "Appendix F: Air Quality Technical Support Document, Atlantic Rim Natural Gas Project and the Seminoe Road Gas Development Project, Wyoming." ML13213A389. Laramie, Wyoming: TRC Environmental Corporation. 2006.

Westbrook, J.A. and P.S. Sullivan. "Fugitive Dust Modeling With AERMOD for PM10 Emissions From a Municipal Waste Landfill." ML13213A396. San Diego, California: BlueScape Environmental and Sacramento, California: SCS Engineers. 2006.



**APPENDIX D**  
**ADDITIONAL DOCUMENTS RELATED TO HISTORIC AND**  
**CULTURAL RESOURCES**



Rapid City 026642.

4-1002-R.

**The United States of America,**

To all to whom these presents shall come, Greeting:

WHEREAS, a Certificate of the Register of the Land Office at **Rapid City, South Dakota,** has been deposited in the General Land Office, whereby it appears that, pursuant to the Act of Congress of May 20, 1862, "To Secure Homesteads to Actual Settlers on the Public Domain," and the acts supplemental thereto, the claim of **Emaline Richardson** has been established and duly consummated, in conformity to law, for the **west half of the southeast quarter of Section ten and the west half of the northeast quarter of Section fifteen in Township seven south of Range one east of the Black Hills Meridian, South Dakota, containing one hundred sixty acres,**

according to the Official Plat of the Survey of the said Land, returned to the GENERAL LAND OFFICE by the Surveyor-General:

NOW KNOW YE, That there is, therefore, granted by the UNITED STATES unto the said claimant the tract of Land above described; TO HAVE AND TO HOLD the said tract of Land, with the appurtenances thereof, unto the said claimant and to the heirs and assigns of the said claimant forever; subject to any vested and accrued water rights for mining, agricultural, manufacturing, or other purposes, and rights to ditches and reservoirs used in connection with such water rights, as may be recognized and acknowledged by the local customs, laws, and decisions of courts; and there is reserved from the lands hereby granted, a right of way thereon for ditches or canals constructed by the authority of the United States.

IN TESTIMONY WHEREOF, I, **Woodrow Wilson**

President of the United States of America, have caused these letters to be made Patent, and the seal of the General Land Office to be hereunto affixed.

GIVEN under my hand, at the City of Washington, the **TWENTY-THIRD** day of **JANUARY** in the year of our Lord one thousand nine hundred and **FIFTEEN** and of the Independence of the United States the one hundred and **THIRTY-NINTH.**

By the President:

By

*Woodrow Wilson*  
*M. C. Le Roy* Secretary,  
*J. L. Lamar*  
 Recorder of the General Land Office.

RECORD OF PATENTS: Patent Number

**455381**

6-2177



In Reply Refer To:

8100-R  
BAS

12-MT040-15

## United States Department of the Interior

BUREAU OF LAND MANAGEMENT  
South Dakota Field Office  
310 Roundup Street  
Belle Fourche, South Dakota 57717-1698  
<http://www.blm.gov/mt>



Date: July 20, 2012

Mr. Richard E. Blubaugh  
Vice President – Environmental Health & Safety Resources  
Powertech (USA) Incorporated  
5575 DTC Parkway, Suite 140  
Greenwood Village, CO 80111

RE: Cultural Resource review of Evaluative Testing of 20 Sites in the Powertech (USA) Inc. Dewey-Burdock Uranium Project Impact Areas: Volumes 1 and 2. For the Dewey-Burdock Uranium Recovery Project, Fall River and Custer Counties, South Dakota.

Dear Mr. Blubaugh:

We have reviewed the appropriate volumes of the National Historic Preservation Act, Section 106 cultural compliance reports presented by Archeology Laboratory, Augustana College, for evaluation of cultural resource sites inside areas of potential effect for the proposed Dewey-Burdock project area. The reports reviewed document formal evaluation of 20 cultural resource sites inside areas proposed for the project that could have effect. Of these 20 sites, one site is located in part on BLM administered surface land.


Site 39FA96 was found to be significantly affected by natural erosion and therefore does not possess adequate integrity, does not display workmanship or feeling, and it is not associated with an important historic event. Based on the information provided in the report the Bureau of Land Management (BLM) recommends adequate testing was completed on site 39FA96, the site's integrity has been severely affected by deflation. The portion on BLM administered land does not possess enough information to meet the National Register of Historic Places criteria for an eligible archaeological site; therefore, the BLM is in agreement with the determination for site 39FA96 on this portion, in that it is considered not eligible for nomination to the National Register of Historic Places. Information provided for the remaining 19 sites should be sufficient for the lead Federal Agency to make informed recommendations of eligibility on the historic properties.



Mr. Richard E. Blubaugh  
July 20, 2012  
Page 2

Please let us know if you should need any additional information. I can be reached as Mr. Mitch Iverson (acting South Dakota Field Manager), (605) 892-7001 or email at [Mitchell\\_Iverson@blm.gov](mailto:Mitchell_Iverson@blm.gov) or contact our archaeologist, Brenda Shierts at (605) 723-8712 or [Brenda\\_Shierts@blm.gov](mailto:Brenda_Shierts@blm.gov).

Sincerely,

  
*Marian M. Atkins*  
Acting SOR  
Marian M. Atkins  
South Dakota Field Manager

cc: Paige Olson, SD SHPO  
Gary Smith, BLM MSO Historic Preservation Officer  
Mark Sant, BLM MSO Tribal Coordinator  
Mr. Greg R. Fesko, P.G., BLM MSO Solid Minerals  
Haimanot Yilma, NRC, Project Manager Environmental Review Branch

SOUTH DAKOTA STATE HISTORIC PRESERVATION OFFICE  
 HISTORIC SITES SURVEY STRUCTURE FORM 06-01-2012



<u>SHPOID</u>	<u>SiteID</u>	<u>StructureID</u>
CU00000050	9202	13997

**SITE INFORMATION**

<u>*Survey Date:</u> 6/20/1988 12:00:00 AM	<u>*Quarter1:</u> SE
<u>*Surveyor:</u> Unknown	<u>*Quarter2:</u> SE
<u>*Property Address:</u> Unknown	<u>*Township:</u> 6S
<u>*County:</u> cu	<u>*Range:</u> 1E
<u>*City:</u> Dewey	<u>*Section:</u> 31
	<u>Acres:</u> 12.000
	<u>Quadname:</u> Twenty-one Divide

Legal Description:

Location Description: approx. 3 miles south of Dewey

<u>Owner Code1:</u> P	<u>Owner Name:</u> Andes, Clark
<u>Owner Code2:</u>	<u>Owner Address:</u> PO Box 560
<u>Owner Code3:</u>	<u>Owner City:</u> Black Hawk
	<u>Owner State:</u> SD
	<u>Owner Zip:</u> 57718

**HISTORIC SIGNIFICANCE**

<u>*DOE:</u> NR Eligible	<u>Register Name:</u> Young, Edna, and Ernest, Ranch
<u>*DOE Date:</u> 7/5/1990 12:00:00 AM	<u>Multiple Property Name:</u> Ranches of Southwestern Custer County
<u>Nomination Status:</u> NR listed	<u>SignificanceLevel1:</u> Local
<u>Listed Date:</u> 7/5/1990 12:00:00 AM	<u>SignificanceLevel2:</u> Local
<u>Ref Num:</u> 90000949	<u>NR Criteria 1:</u> A
<u>Period:</u> 1912-40	<u>NR Criteria 2:</u>
<u>Category:</u> District	<u>NR Criteria 3:</u>
<u>Historic District Rating:</u>	<u>NR Criteria 4:</u>

\* = REQUIRED FIELD

SOUTH DAKOTA STATE HISTORIC PRESERVATION OFFICE  
 HISTORIC SITES SURVEY STRUCTURE FORM 06-01-2012



**Significance Notes :** Significant in the area of Exploration/Settlement, because it represents the development of the legal homestead rancher in the southwestern corner of Custer County, SD. In particular, this ranch represents homesteading on more than one claim.

### STRUCTURE DETAILS

**\*Structure Name:** Bakewell Ranch

**Other Name:** Andes, Clark

**Date Of Construction:** 1912

**Significant Person:** Young, Ernie

**Cultural Affiliation:**

**Type:**

**Walls:** Stone

**Style:**

**Stories:**

**Roof Shape:** Gambrel

**Foundataion:**

**Roof Material:** Metal

**\*UTM Zone:** 14

**Occupied:**

**\*UTM Easting:** 92020.0106

**Accessible:**

**\*UTM Northing:** 4827170.3755

**Structural System:**

**Restricted:** N

**Altered/Moved Notes:**

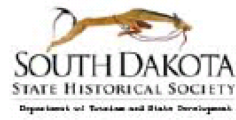
**Interior Notes:**

SOUTH DAKOTA STATE HISTORIC PRESERVATION OFFICE  
 HISTORIC SITES SURVEY STRUCTURE FORM 06-01-2012



**Physical Notes:** House (contributing) 1912. A sandstone masonry house, the material quarried from the nearby "racetrack" of the Black Hills formation. The gable ends are sheathed with white asphalt shingles, two shed roofed dormers, wood frame summer kitchen is attached to the NW, fenestrations irregular, a replica of an early shed roof porch was recent added. Bunkhouse (contributing) Stucco-covered wood frame, with a tin-clad gable roof.  
 Small House (contributing) One story, rectangular pen building, on a wood sill, sided in clapboard and tar paper, gable roof covered in tar paper. Privy (contributing) Wood frame, wood sill capped by a board-covered gable roof.  
 Granary (contributing) Rectangular pen wood frame, on stone piers, capped by a tin-covered shed roof.  
 Granary (noncontributing) A modern round metal bin with a conical metal roof.  
 Sheep wagon (contributing) Small frame building, with a segmental arch roof clad with tar paper. Once mounted on wheels, it was moved to pasture ranges to provide domestic shelter for persons who tended grazing sheep herds.  
 Garage (contributing) Wood frame building clad with stucco, resting on a stone foundation, capped by a tar paper-covered gable roof.  
 Small Garage (contributing) One- car garage, wood frame covered with stucco and capped by a tin-clad segmental arch roof.  
 Livestock Building (contributing) Wood frame, gable roof.  
 Oil Storage Building (contributing) Wood frame, gable roof.  
 Log Outbuilding (contributing) Rectangular outbuilding constructed of rough hewn logs with double vertical corner notches, chinked with plaster and cement, gable roof covered with sod.  
 Three Sheds (contributing) Rectangular pen, wood frame with shed roofs. Used for working livestock. Rectangular pen,

**Other Notes:** The Young Ranch illustrates the common western SD practice of creating a larger, more economically productive ranch by various family members homesteading several adjacent parcels. In 1908, Edna Petty Young received a patent for a parcel in the SW quarter of section 31. Four years later, her husband Ernest Young received a patent to the adjoining NE quarter. Throughout the 1920s, the two homesteaders continued to prove up contiguous and discontinuous claims in Custer County and in Niobrara County, WY. As late as 1942, Ida Kirby Young (Ernest's mother) received a patent to land in Wyoming. However, all of the permanent domestic and agricultural operations of the ranch took place on the nominated ranch site in Section 31. Originally from nearby Pringle, SD, the Youngs were principally cattle and sheep ranchers. Although with generally little success, they attempted to irrigate some of their land with overflow from Beaver Creek. In later years, Ernest Young also raised Appaloosa horses. Edna and Ernest Young's one daughter, Lena, earned a teaching certificate at the normal school in Spearfish, SD. Upon graduation, she returned to her parent's ranch and taught in the local schools. In 1965, the Young family sold the ranch to Robert and Lois Bakewell, who operated it on a nonresident basis for 15 years. Between 1980 and 1985, John Holmes leased the property. In 1985, Clark Andis purchased the property from the Bakewells.



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Link to National Register Nomination:

<http://pdfhost.focus.nps.gov/docs/NRHP/Text/90000949.pdf>



**APPENDIX E**

**PUBLIC COMMENTS ON THE DRAFT SUPPLEMENTAL  
ENVIRONMENTAL IMPACT STATEMENT FOR THE DEWEY-BURDOCK  
*IN-SITU* RECOVERY PROJECT IN FALL RIVER AND CUSTER COUNTIES,  
SOUTH DAKOTA, AND U.S. NUCLEAR REGULATORY  
COMMISSION RESPONSES**





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## ABBREVIATIONS/ACRONYMS

ACHP	Advisory Council on Historic Preservation
ACL	alternate concentration limit
ADAMS	Agencywide Documents Access and Management System
AEA	Atomic Energy Act
ALAC	Archaeology Laboratory Augustana College
ALARA	as low as reasonably achievable
APE	area of potential effect
ARSD	Administrative Rules of South Dakota
ASLBP	Atomic Safety and Licensing Board Panel
bgs	below ground surface
BHAD	Black Hills Army Depot
BHNF	Black Hills National Forest
BLM	U.S. Bureau of Land Management
BMP	best management practice
CAB	Commission-approved background
CFR	<i>U.S. Code of Federal Regulations</i>
CEQ	Council on Environmental Quality
CWA	Clean Water Act
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation
Eco-SSLs	ecological soil screening guidance levels
EIS	environmental impact statement
EPA	U.S. Environmental Protection Agency
ER	environmental report
ESA	Endangered Species Act
FLPMA	Federal Land Policy and Management Act of 1976
FR	<i>Federal Register</i>
FWS	U.S. Fish and Wildlife Service
GDP	Groundwater Discharge Plan
GEIS	generic environmental impact statement
gpm	gallons per minute
HDPE	high-density polyethylene
IAEA	International Atomic Energy Agency
IML	Inter-Mountain Laboratories, Inc.
ISL	<i>in-situ</i> leach
ISR	<i>in-situ</i> recovery
IX	ion exchange
LSA	low specific activity

MCL	maximum contaminant level
MIT	mechanical integrity test
MOU	Memorandum of Understanding
mya	million years ago
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NEPA	National Environmental Policy Act
NFS	National Forest System
NHPA	National Historic Preservation Act of 1966, as amended
NMA	National Mining Association
NOA	Notice of Availability
NPDES	National Pollutant Discharge Elimination System
NRC	U.S. Nuclear Regulatory Commission
NRCS	Natural Resource Conservation Service
NRHP	National Register of Historic Places
PA	Programmatic Agreement
PBL	performance-based license
Powertech	Powertech (USA) Inc.
PSD	Prevention of Significant Deterioration
RAI	request for additional information
RCRA	Resource Conservation and Recovery Act
RO	reverse osmosis
RSO	Radiation Safety Officer
SARA	Superfund Amendments and Reauthorization Act
SDCL	South Dakota Codified Law
SDDENR	South Dakota Department of Environment and Natural Resources
SDDA	South Dakota Department of Agriculture
SDGFP	South Dakota Game, Fish, and Parks
SDNHP	South Dakota Natural Heritage Program
SD SHPO	South Dakota State Historic Preservation Office
SDWA	Safe Drinking Water Act
SEIS	supplemental environmental impact statement
SER	safety evaluation report
SERP	Safety and Environmental Review Panel
SOP	standard operating procedure
SWMP	stormwater pollution management plan
TCP	traditional cultural property
TDS	total dissolved solids
TEDE	total effective dose equivalent
TENORM	Technologically-Enhanced, Naturally-Occurring Radioactive Material
THPO	Tribal Historic Preservation Office
TVA	Tennessee Valley Authority
UCL	upper control limit
UIC	underground injection control

USACE	U.S. Army Corps of Engineers
USDOT	U.S. Department of Transportation
USDW	underground source of drinking water
USFS	U.S. Forest Service
USGS	U.S. Geological Survey
VRM	Visual Resource Management
WHO	World Health Organization



# **PUBLIC COMMENTS ON THE DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT FOR THE DEWEY-BURDOCK *IN-SITU* RECOVERY PROJECT IN FALL RIVER AND CUSTER COUNTIES, SOUTH DAKOTA, AND U.S. NUCLEAR REGULATORY COMMISSION RESPONSES**

## **E1 Overview**

On November 26, 2012, the U.S. Nuclear Regulatory Commission (NRC) staff published a notice in the *Federal Register* requesting public review and comment on the draft Environmental Impact Statement for the Dewey-Burdock *In-Situ* Recovery (ISR) Project in Custer and Fall Counties, South Dakota, Supplement to the Generic Environmental Impact Statement for *In-Situ* Leach (ISL) Uranium Milling Facilities (SEIS) (77 FR 70486) in accordance with 10 CFR Part 51, Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions. In publishing the notice for the draft SEIS, the NRC staff stated that the public comment period continues until January 10, 2013, which is the minimum 45-day comment period required under NRC regulations. The notice for the draft SEIS also stated that comments received after this date will be considered if it is practical to do so, but NRC is able to ensure consideration only for comments received on or before January 10, 2013. In this case, the NRC found it practical to consider comments received from individuals, agencies, and organizations submitted after the minimum 45-day comment period. NRC accepted all comments on the draft SEIS received on or before March 5, 2013 (99-day comment period). By electronic correspondence, 349 individuals and 31 agencies and organizations submitted 820 comments on the Dewey-Burdock draft SEIS. In addition to the public comment period, the public had the opportunity to request a hearing (75 FR 467). Hearing requests from the Consolidated Petitioners and the Oglala Sioux Tribe were received on March 8, 2010, and April 6, 2010, respectively (see SEIS Section 1.4.2). These hearing requests were granted by the NRC's Atomic Safety and Licensing Board Panel (ASLBP). The ASLBP is an independent NRC office, separate from the staff, with judges who are designated to preside over NRC hearings.

## **E2 Public Participation**

Public participation is an essential part of the NRC environmental review process. This section describes the process for public participation during the NRC staff's development of the SEIS. NRC conducted an open, public SEIS development process consistent with the requirements of the *National Environmental Policy Act of 1969* (NEPA) and NRC regulations. NRC staff met with federal, state, and local agencies and authorities, as well as public organizations, as part of a site visit to gather site-specific information. NRC provided a 45-day public comment period (until January 10, 2013) for agencies, organizations, and the general public to review the draft SEIS and provide comments, but accepted all public comments submitted on or before March 5, 2013 (99-day comment period).

### **E2.1 Notice of Intent to Develop the Supplemental Environmental Impact Statement**

The NRC staff published a Notice of Intent to prepare the SEIS in the *Federal Register* (75 FR 3261) on January 20, 2010, in accordance with NRC regulations.

## **E2.2 Public Participation Activities**

As described in SEIS Sections 1.4.2 and 1.7.3, NRC staff met with federal, state, tribal, and local agencies and authorities during the course of an expanded visit to the proposed Dewey-Burdock ISR Project site and vicinity. The purpose of this visit and these meetings was to gather additional site-specific information to help prepare the Dewey-Burdock ISR Project environmental review. As part of information gathering, the NRC staff also contacted potentially interested Native American tribes and local authorities, entities, and public interest groups in person and via email and telephone. Additional opportunities for public participation in the licensing process for the proposed Dewey-Burdock ISR Project are described in Section E5.8 of this appendix.

## **E2.3 Issuance and Availability of the SEIS**

On November 26, 2012, the NRC staff published a Notice of Availability of the draft SEIS in the *Federal Register* (77 FR 70486). In this notice, the NRC staff provided information on how to access or obtain a copy of the SEIS. Electronic versions of the SEIS and supporting information were made available through the NRC Agencywide Documents Access and Management System (ADAMS) accessible through the NRC website (<http://www.nrc.gov/readingrm/adams.html>). The public may examine and have copied, for a fee, the SEIS and other related publicly available documents from the NRC Public Document Room. Copies of the SEIS were also available at the following public libraries: Custer County, Weston County, Edgemont, Rapid City, Hot Springs, and Oglala Lakota College.

## **E2.4 Public Comment Period**

In the draft SEIS Notice of Availability published on November 26, 2012 (77 FR 70486), NRC stated that public comments on the draft SEIS should be submitted by January 10, 2013. Members of the public were invited and encouraged to submit related comments through different media. Comments could be submitted electronically to the federal rulemaking website. Written comments could be submitted by mail or fax. The Notice of Availability for the draft SEIS also stated that comments received after January 10, 2013, would be considered if it was practical to do so, but NRC would assure consideration only for comments received on or before January 10, 2013. NRC found it practical to consider comments received from individuals and organizations submitted after January 10, 2013. NRC accepted all comments on the draft SEIS received on or before March 5, 2013. By electronic correspondence, 349 individuals and 31 agencies and organizations submitted 820 comments on the Dewey-Burdock ISR SEIS.

## **E3 Comment Review Methods**

Each of these comments received from individuals, agencies, and organizations are included in the following comment summaries and addressed in the responses provided. Each comment was individually identified and responded to using a systematic approach, which involved identifying individual comments from the source documents, identifying form letters, consolidating comment information into a database, sorting comments by topic, and distributing for appropriate NRC staff review and response.

NRC staff reviewed all comment documents and identified, marked, and consecutively numbered individual (unique) comments in each document. Form letters were grouped together

and addressed as a single letter. Comment numbers followed a two-part numbering system separated by a hyphen. The three-digit number to the left of the hyphen is the document number. The six-digit number to the right of the hyphen is a consecutive unique-count number for each comment identified in a specific document. Table E3-1 lists all commenter names, their affiliations, and the document number assigned to the comment document. Table E3-2 provides this same information sorted by comment document number in the first column. A group name was created and used when multiple individuals or organizations signed a single comment document or when multiple identical letters were received (i.e. a form letter). Tables E3-3 through E3-6 identify the individuals and their affiliation for each unique group (Group A through D). Readers can use these tables to electronically search the report to locate comments submitted by specific individuals or to find individuals associated with comments described in Section E5.

In addition to the numbering, each unique comment was assigned a topic category (i.e., bin) to facilitate sorting and reviewing comments on similar topics. Bin categories aligned with the topics addressed in Section E5 of this appendix. Following the initial comment identification review, the identified comments were entered into a database that allowed individual comments to be sorted by topic and distributed to staff for further consideration. The NRC staff then continued sorting and reviewing all comments within specific topic categories, developed comment summaries and responses for this appendix, and made changes to the final SEIS, as appropriate, to address the public comments.

Based on the similarity of comments related to a specific topic, the NRC staff in many cases consolidated the same or similar comments within each topic to facilitate developing responses. This approach allowed multiple similar comments to be addressed with a single response to avoid duplication of effort and enhance readability of this report. A response has been provided for each comment or group of comments. Each response indicates whether the final SEIS was modified as a result of the comment.

## **E4 Major Issues and Topics of Concern**

The majority of comments received addressed specific items within the scope of the SEIS. Topics raised included, but were not limited to, historic, cultural, and Native American concerns; groundwater; surface water; ecology; air quality; and the purpose of and need for the Dewey-Burdock ISR Project.

Other comments addressed topics and issues that are not applicable to the SEIS, including general support or opposition to uranium recovery, the legacy of past uranium mining and milling, an evaluation of the NRC regulatory program or licensing process, and a comparison of the proposed Dewey-Burdock ISR Project financial assurance to previous restoration funding.

**Table E3-1. Public Commenter Name/Group With Affiliation and Comment Document Number**

<b>Last Name</b>	<b>First Name</b>	<b>Affiliation</b>	<b>Comment Document Number</b>
Abeyta	Loring	Public Citizen	033
Ames-Curtis	Juli	Public Citizen	075
Anawaty	Jillian	Public Citizen	073



**Table E3–1. Public Commenter Name/Group With Affiliation and Comment Document Number (Cont'd)**

<b>Last Name</b>	<b>First Name</b>	<b>Affiliation</b>	<b>Comment Document Number</b>
Anonymous A	Anonymous A	Public Citizen	108
Anonymous B	Anonymous B	Public Citizen	109
Anonymous C	Anonymous C	Public Citizen	110
Anonymous D	Anonymous D	Public Citizen	111
Anonymous E	Anonymous E	Public Citizen	112
Anonymous F	Anonymous F	Public Citizen	113
Anonymous G	Anonymous G	Public Citizen	114
Anonymous H	Anonymous H	Public Citizen	115
Ansorge	Kaiya	Public Citizen	027
Baker	Jerri	Public Citizen	025
Baldwin	Angelia D.	Nemsi Books and Winnetou Productions	018
Barnaud	Laurie	Public Citizen	081
Binns	Edward	Public Citizen	068
Bloomer	Jerry	Public Citizen	029
Blubaugh	Richard	PowerTech Inc.	128
Bobzien	Craig	United States Department of Agriculture	126
Bohan	Suzanne J.	U.S. Environmental Protection Agency	049
Bonner	Hazel	Prairie Hills Audubon Society	044
Brunner	Thomas	Public Citizen	107
Bunch	Dorothy	Public Citizen	021
Burnson	Cindy	Public Citizen	060
Burrus	Judiann	Public Citizen	074
Cammarata	Sheryl	Public Citizen	102
Carle	Mary Kay	Public Citizen	088
Carnes	Gary	Public Citizen	069
Cee	Susan Mary	Public Citizen	010
Chauncey	Laurie	Public Citizen	082
Cline	Teresa	Public Citizen	106
Craig-Davis	Colleen	Public Citizen	005
Crowley	Gabriella	Public Citizen	123
Cunningham	Mary	Public Citizen	086
Davis	Robin	Public Citizen	036
Davis	Jay	Coloradoans Against Resource Destruction	071
DiCesare	Francis	Public Citizen	023
Draeger	Richard	Public Citizen	100
Draves	Carter	Public Citizen	056
Ducheneaux	Bruce	Public Citizen	054
Dunsmore	Marcia	Public Citizen	035
Durrum	Kathy	Public Citizen	028
Durrum	Kathy	Public Citizen	079
Eagle Bull	Patty	Public Citizen	094

**Table E3–1. Public Commenter Name/Group With Affiliation and Comment Document Number (Cont'd)**

<b>Last Name</b>	<b>First Name</b>	<b>Affiliation</b>	<b>Comment Document Number</b>
Emanuel	Tom	South Dakota Peace & Justice Center	007
Emanuel	Tom	South Dakota Peace & Justice Center	120
Fields	Sarah	Uranium Watch	116
Fisher	Laurie	Public Citizen	083
Fort	Richard L.	ACTion for the Environment	016
Freborg	Andrew	Public Citizen	001
Freborg	Andrew	Public Citizen	002
Freborg	Andrew Michael	Public Citizen	052
Freborg	Andrew	Public Citizen	132
Frederick	Shirley	Public Citizen	103
Fritzmeier	Bob	Public Citizen	019
Furious	T.M.	Public Citizen	004
Gallmeyer	Linda Lee	Public Citizen	031
Geotas	Thea	Public Citizen	008
Goulet	Mary	Public Citizen	038
Group A	Group A	Form Letter	129
Group B	Group B	Form Letter	135
Group C	Group C	Form Letter	134
Group D	Group D	Form Letter	136
Halverson	Mary	Public Citizen	122
Hanson	Aileen	Public Citizen	050
Harvey	Edward	Public Citizen	022
Hawk Eagle	Inez	Public Citizen	070
Henderson	Susan	Public Citizen	047
Herman	William	Public Citizen	117
Hilding	Nancy	Prairie Hills Audubon Society	092
Hilding	Nancy	Prairie Hills Audubon Society	124
Hook	Alvin	Public Citizen	017
Hyde	Dayton	Institute of Range and the American Mustang	048
Johnson	Andy	Public Citizen	053
Jones	Robert	Missouri State University, Department of Psychology	020
Jones Jarding	Lilias	Clean Water Alliance	061
Juette	Ann	South Dakota Department of Agriculture, Division of Resource Conservation and Forestry	003
Katus	Jean	Public Citizen	024
Kelley	Don	Public Citizen	065
Kennedy	Corey	Public Citizen	062
Kiesling	Ed	Public Citizen	067

**Table E3–1. Public Commenter Name/Group With Affiliation and Comment Document Number (Cont'd)**

<b>Last Name</b>	<b>First Name</b>	<b>Affiliation</b>	<b>Comment Document Number</b>
Knudson	Rodney	Public Citizen	101
Lambert	Sylvia	Public Citizen	009
Lausch	Rachel	Public Citizen	097
Leas	Rebecca R.	Health Education and Disease Prevention	043
Leas	Rebecca R.	Health Education and Disease Prevention	098
LeBeau	Michelle	Public Citizen	090
Lepisto	Paul	Public Citizen	095
Lewis	Carole Ann	Public Citizen	006
Little Thunder	Karen	Public Citizen	077
Lord	Rebecca	Public Citizen	099
Marida	Patricia	Ohio Sierra Club Nuclear Free Committee	104
Marshall	Carla Rae	Cheyenne River Sioux Tribal member	055
Mason	DeLilly	Public Citizen	064
McGaa	Kyle	Oglala Sioux Tribal member	080
McGovern	Matt	Public Citizen	034
Miller	Jessica	Public Citizen	072
Miller	Mary L.	Public Citizen	089
Morgan-Mauro	Cherylann	Public Citizen	058
Muse	Christine	Public Citizen	059
Nauman	Charles	Public Citizen	057
Nolan	Suzan	Public Citizen	013
Nolan	Suzan	Public Citizen	105
Padilla	Nadine	Multicultural Alliance for a Safe Environment	091
Parsons	Jeffrey	Oglala Sioux Tribe	127
Pettigrew	Karen	Public Citizen	078
Rowe	Cheryl	Public Citizen	015
Sanderson	Mark	South Dakota Peace & Justice Center	037
Sanderson	Marsha	Public Citizen	085
Seamans	Paul	Public Citizen	096
Soli	K Soli	Public Citizen	076
Spotted Eagle	Faith	Ihanktonwan Treaty Steering Committee of the Ihanktonwan Treaty Council	130
Stevenson	Niki	Public Citizen	039
Stevenson	Norlan	Public Citizen	040
Stewart	Robert	Department of the Interior, Office of Environmental Policy and Compliance	046
Sundstrom	Linea	Public Citizen	032
Sundstrom	Linea	Public Citizen	084

**Table E3–1. Public Commenter Name/Group With Affiliation and Comment Document Number (Cont'd)**

Last Name	First Name	Affiliation	Comment Document Number
Swan	KL	Public Citizen	030
Swchweinle	Amy	Public Citizen	051
Tiffe	R.	Public Citizen	125
Uptain	Douglas	Public Citizen	066
Uptain	Mary Ellen	Public Citizen	087
Viviano	Pamela	Public Citizen	093
Vogt/Olson	Jay D./Paige	South Dakota State Historical Society, Department of Tourism	014
Walks Along	William	Northern Cheyenne Tribe, Natural Resources Department	042
Walsh	Brian	South Dakota Department of Environment and Natural Resources	119
Watt	Susan W.	Institute of Range and the American Mustang	011
Watt	Susan W.	Cheyenne Paints, Quarter Horses and Red Angus Cattle	012
Wieland	Leona	Public Citizen	121
Wilson	Jerry	Public Citizen	026
Wilson	Norma	Public Citizen	041
Wilson	Jerry	Uranium Committee, Living River Group, Sierra Club; County Commissioner-Clay County, South Dakota	045

**Table E3–2. Comment Document Number, Commenter Name/Group, Affiliation, and ADAMS Accession Number**

Comment Document Number	Last Name	First Name	Affiliation	ADAMS Accession Number
001	Freborg	Andrew	Public Citizen	ML13010A039
002	Freborg	Andrew	Public Citizen	ML13010A040
003	Juette	Ann	South Dakota Department of Agriculture, Division of Resource Conservation and Forestry	ML13010A038
004	Furious	T.M.	Public Citizen	ML13010A021
005	Craig-Davis	Colleen	Public Citizen	ML13010A041
006	Lewis	Carole Ann	Public Citizen	ML13010A033

**Table E3–2. Comment Document Number, Commenter Name/Group, Affiliation, and ADAMS Accession Number (Cont'd)**

<b>Comment Document Number</b>	<b>Last Name</b>	<b>First Name</b>	<b>Affiliation</b>	<b>ADAMS Accession Number</b>
007	Emanuel	Tom	South Dakota Peace & Justice Center	ML13010A020
008	Geotas	Thea	Public Citizen	ML13010A057
009	Lambert	Sylvia	Public Citizen	ML13010A095
010	Cee	Susan Mary	Public Citizen	MI13010A066
011	Watt	Susan W.	Institute of Range and the American Mustang	MI13010A090
012	Watt	Susan W.	Cheyenne Paints, Quarter Horses and Red Angus Cattle	ML13010A091
013	Nolan	Suzan	Public Citizen	ML13010A036
014	Vogt/Olson	Jay D./Paige	South Dakota State Historical Society, Department of Tourism	ML13010A059
015	Rowe	Cheryl	Public Citizen	ML13010A025
016	Fort	Richard L.	ACTion for the Environment	ML13010A094
017	Hook	Alvin	Public Citizen	ML13010A083
018	Baldwin	Angelia D.	Nemsi Books and Winnetou Productions	ML13010A096
019	Fritzmeier	Bob	Public Citizen	ML13011A092
020	Jones	Robert	Missouri State University, Department of Psychology	ML13010A086
021	Bunch	Dorothy	Public Citizen	ML13010A074
022	Harvey	Edward	Public Citizen	ML13010A062
023	DiCesare	Francis	Public Citizen	ML13010A099
024	Katus	Jean	Public Citizen	ML13010A064
025	Baker	Jerri	Public Citizen	ML13010A019
026	Wilson	Jerry	Public Citizen	ML13010A018
027	Ansorge	Kaiya	Public Citizen	ML13010A034
028	Durum	Kathy	Public Citizen	ML13010A032
029	Bloomer	Jerry	Public Citizen	ML13010A067
030	Swan	KL	Public Citizen	ML13010A056
031	Gallmeyer	Linda Lee	Public Citizen	ML13010A071
032	Sundstrom	Linea	Public Citizen	ML13010A024
033	Abeyta	Loring	Public Citizen	ML13010A058
034	McGovern	Matt	Public Citizen	ML13010A061
035	Dunsmore	Marcia	Public Citizen	ML13010A063
036	Davis	Robin	Public Citizen	ML12010A072
037	Sanderson	Mark	South Dakota Peace & Justice Center	ML13010A037
038	Goulet	Mary	Public Citizen	ML13010A065
039	Stevenson	Niki	Public Citizen	ML13010A068

**Table E3–2. Comment Document Number, Commenter Name/Group, Affiliation, and ADAMS Accession Number (Cont'd)**

<b>Comment Document Number</b>	<b>Last Name</b>	<b>First Name</b>	<b>Affiliation</b>	<b>ADAMS Accession Number</b>
040	Stevenson	Norlan	Public Citizen	ML13010A069
041	Wilson	Norma	Public Citizen	ML13010A093
042	Walks Along	William	Northern Cheyenne Tribe, Natural Resources Department	ML13017A006
043	Leas	Rebecca R.	Health Education and Disease Prevention	ML13010A030
044	Bonner	Hazel	Prairie Hills Audubon Society	ML13010A035
045	Wilson	Jerry	Uranium Committee, Living River Group, Sierra Club; County Commissioner-Clay County, SD	ML13017A016
046	Stewart	Robert	Department of the Interior, Office of Environmental Policy and Compliance	ML13010A031
047	Henderson	Susan	Public Citizen	ML13017A009
048	Hyde	Dayton	Institute of Range and the American Mustang	ML13010A097
049	Bohan	Suzanne J.	U.S. Environmental Protection Agency	ML13036A159
050	Hanson	Aileen	Public Citizen	ML13018A270
051	Swchweinle	Amy	Public Citizen	ML13018A346
052	Freborg	Andrew Michael	Public Citizen	ML13018A394
053	Johnson	Andy	Public Citizen	ML13018A254
054	Ducheneaux	Bruce	Public Citizen	ML13018A288
055	Marshall	Carla Rae	Cheyenne River Sioux Tribal member	ML13017A018
056	Draves	Carter	Public Citizen	ML13018A371
057	Nauman	Charles	Public Citizen	ML13017A017
058	Morgan-Mauro	Cherylann	Public Citizen	ML13018A289
059	Muse	Christine	Public Citizen	ML13018A258
060	Burnson	Cindy	Public Citizen	ML13018A372
061	Jones Jarding	Lilias	Clean Water Alliance	ML13018A268
062	Kennedy	Corey	Public Citizen	ML13018A257
064	Mason	DeLilly	Public Citizen	ML13018A281
065	Kelley	Don	Public Citizen	ML13018A294
066	Uptain	Douglas	Public Citizen	ML13018A252
067	Kiesling	Ed	Public Citizen	ML13017A012

**Table E3–2. Comment Document Number, Commenter Name/Group, Affiliation, and ADAMS Accession Number (Cont'd)**

<b>Comment Document Number</b>	<b>Last Name</b>	<b>First Name</b>	<b>Affiliation</b>	<b>ADAMS Accession Number</b>
068	Binns	Edward	Public Citizen	ML13018A373
069	Carnes	Gary	Public Citizen	ML13018A287
070	Hawk Eagle	Inez	Public Citizen	ML13018A290
071	Davis	Jay	Coloradoans Against Resource Destruction	ML13018A393
072	Miller	Jessica	Public Citizen	ML13018A345
073	Anawaty	Jillian	Public Citizen	ML13018A291
074	Burrus	Judiann	Public Citizen	ML13018A256
075	Ames-Curtis	Juli	Public Citizen	ML13018A262
076	Soli	K Soli	Public Citizen	ML13017A403
077	Little Thunder	Karen	Public Citizen	ML13018A260
078	Pettigrew	Karen	Public Citizen	ML13018A295
079	Durum	Kathy	Public Citizen	ML13017A005
080	McGaa	Kyle	Oglala Sioux Tribal member	ML13017A013
081	Barnaud	Laurie	Public Citizen	ML13022A247
082	Chauncey	Laurie	Public Citizen	ML13018A374
083	Fisher	Laurie	Public Citizen	ML13018A285
084	Sundstrom	Linea	Public Citizen	ML13018A390
085	Sanderson	Marsha	Public Citizen	ML13017A395
086	Cunningham	Mary	Public Citizen	ML13017A401
087	Uptain	Mary Ellen	Public Citizen	ML13018A251
088	Carle	Mary Kay	Public Citizen	ML13017A400
089	Miller	Mary L.	Public Citizen	ML13018A259
090	LeBeau	Michelle	Public Citizen	ML13018A282
091	Padilla	Nadine	Multicultural Alliance for a Safe Environment	ML13017A397
092	Hilding	Nancy	Prairie Hills Audubon Society	ML13018A385
093	Viviano	Pamela	Public Citizen	ML13017A402
094	Eagle Bull	Patty	Public Citizen	ML13018A381
095	Lepisto	Paul	Public Citizen	ML13018A344
096	Seamans	Paul	Public Citizen	ML13018A343
097	Lausch	Rachel	Public Citizen	ML13017A386
098	Leas	Rebecca R.	Health Education and Disease Prevention	ML13018A389
099	Lord	Rebecca	Public Citizen	ML13017A399
100	Draeger	Richard	Public Citizen	ML13018A269
101	Knudson	Rodney	Public Citizen	ML13017A011
102	Cammarata	Sheryl	Public Citizen	ML13017A388
103	Frederick	Shirley	Public Citizen	ML13017A015
104	Marida	Patricia	Ohio Sierra Club Nuclear Free Committee	ML13018A293
105	Nolan	Suzan	Public Citizen	ML13018A388



**Table E3–2. Comment Document Number, Commenter Name/Group, Affiliation, and ADAMS Accession Number (Cont'd)**

<b>Comment Document Number</b>	<b>Last Name</b>	<b>First Name</b>	<b>Affiliation</b>	<b>ADAMS Accession Number</b>
106	Cline	Teresa	Public Citizen	ML13018A255
107	Brunner	Thomas	Public Citizen	ML13018A284
108	Anonymous A	Anonymous A	Public Citizen	ML13018A292
109	Anonymous B	Anonymous B	Public Citizen	ML13018A375
110	Anonymous C	Anonymous C	Public Citizen	ML13018A376
111	Anonymous D	Anonymous D	Public Citizen	ML13018A377
112	Anonymous E	Anonymous E	Public Citizen	ML13018A378
113	Anonymous F	Anonymous F	Public Citizen	ML13018A379
114	Anonymous G	Anonymous G	Public Citizen	ML13018A382
115	Anonymous H	Anonymous H	Public Citizen	ML13018A383
116	Fields	Sarah	Uranium Watch	ML13018A386
117	Herman	William	Public Citizen	ML13017A393
119	Walsh	Brian	South Dakota Department of Environment and Natural Resources	ML13017A010
120	Emanuel	Tom	South Dakota Peace & Justice Center	ML13023A383
121	Wieland	Leona	Public Citizen	ML13030A281
122	Halverson	Mary	Public Citizen	ML13030A280
123	Crowley	Gabriella	Public Citizen	ML13030A282
124	Hilding	Nancy	Prairie Hills Audubon Society	ML13030A279
125	Tiffe	R.	Public Citizen	ML13028A039
126	Bobzien	Craig	United States Department of Agriculture	ML13030A283
127	Parsons	Jeffrey	Oglala Sioux Tribe	ML13032A215
128	Blubaugh	Richard	Powertech Inc.	ML13022A386
129	Group A	Group A	Form Letter	Group A
130	Spotted Eagle	Faith	Ihanktonwan Treaty Steering Committee of the Ihanktonwan Treaty Council	ML13028A038
131	Wilson	Mary S.	Standing Rock Sioux Tribe	ML13028A040
132	Freborg	Andrew	Public Citizen	ML13018A394
134	Group C	Group C	Form Letter	Group C
135	Group B	Group B	Form Letter	Group B
136	Group D	Group D	Form Letter	Group D

**Table E3–3. Group A Commenters—Comment Document Number, Commenter Name, Affiliation, and ADAMS Accession Number**

Comment Document Number	Commenter Name	Affiliation	ADAMS Accession Number
129	Cynthia Reed Dawn Iron Cloud Devaney Buffalo Austin L. Watkins Jr. Darrol Little White Man Bryan Hopkins Lyle Iron Horn Nancy Reimer Phinette Little White Man Robert Lee Ed Cromwell Jennifer Peterson Linda Allen Paula Long Fox Cathy Vetterman Barbara Jones George Hamus Morris Brewer Jr. Bonnie Keiswetter Kenna Eddy Carrie Carlson Marylin Bochert Rita Fraune Lori McNair Lind Styger Stacy Reetz Jean Nachtigall Vicki Buehler Leora Dappen Charles Cox Val d’Vonn Kathryn Weller-Lena Joe Dappan George Crocker Vicki Stratton Lea Foushee Barbara Cromwell Marsha Miller Gary Richards Elton Zorns Carl M. Davis Ard Richards Marc Lamphere Don Lorenzen Melinda Loy Judy Lorenzen Harold Storsue Marla Herman Ed Young Man Afraid of His	Public Citizens	ML13016A184

**Table E3–3. Group A Commenters—Comment Document Number, Commenter Name, Affiliation, and ADAMS Accession Number (Cont'd)**

Comment Document Number	Commenter Name	Affiliation	ADAMS Accession Number
	Horses Marlene Kills Warrior Warren Pourier Dawn Janis John Hammond Scott Brewer		
	Ken Carlson Victoria Carlson D. Remer Richard Jensen Laura Sowers Donald Roy Jensen David Masterson Grace Schuster Maxine Jensen Jacki Lockwood Jeanie Tiff Trip Williams Nate Merryman Savannah Merryman Tiffany Burgess Robert Schnose Kim Schnose Paula M. Swint Wayne Hace man Jose Trinidad Nancy Keith Hilda Armstrong Les Keith Geneva Janis David Purtill John Simmons Delise Simmons Sally Park Andrea Kramer Benjamin Kramer Donald E. Parker Sharon Parker Kellee Walton Jason Parker Julie Tomlinson Greg Langer	Public Citizens	ML13022A265
	Brian Bach Sarah Davis Raylene Marshall Aubrey Hall Donna Merwin Arlene Marshall	Public Citizens	ML13028A330

**Table E3–3. Group A Commenters—Comment Document Number, Commenter Name, Affiliation, and ADAMS Accession Number (Cont'd)**

Comment Document Number	Commenter Name	Affiliation	ADAMS Accession Number
	Richard Melvin Shaneesa Scheckel Stacy Young Bird Colette Keith Peggy Lopez Vanessa Little Bull Gloria Hill Marian Allison Dylan Brings Plenty Cheron Sittingen Susette Mahaffy Fran Linn Char Starr Steven and Lexxie Meyer Kenneth Curley Shannon M. Havens Priscilla Goodshield Pansy Wing Sylvia Ghost Renee West Wyatt Waters Patrick Archambeau Anola Bianas Sandy Fire Lightning Jim Bickett Jean McCann Mary Ellen Uptain Robert Iron Cloud Lynn Frazier Jill Jennewein Pat Koher Kay Allison Nathan Hawk Wing Benita Wheeler Jake Anderson A Iron Cloud Jr. Carla Marshall		
	Amy Lamphere Cody Jensen Thomas Tyson Gloria Sitting Crow T.L. Standing Soldier Heidi Wortel Jessamy Schwarz Nick Krebs Chas Jewett Sue Hey Lovely Fire Lightning Don Kelley	Public Citizens	ML13028A333

**Table E3–3. Group A Commenters—Comment Document Number, Commenter Name, Affiliation, and ADAMS Accession Number (Cont'd)**

Comment Document Number	Commenter Name	Affiliation	ADAMS Accession Number
	Judy Sharples Mark Iron Cloud Sue Timmons Mary Tyson Jessica Blake Wayne Hill Jeana Shaw Kathryn Ahart E B Jamio Shaw Jr. Deborah Wilson Ed McPherson Joanne Bear Wylie Waters Louis Long Mick Berry Alisa Lopez Ernestine Frazier Nilma Waters Stacy Twiggs Gretchen M Yoko Sugawara Annette Archambeau Kelsey Archambeau Kim Kelley Leonard Running Sherry Oswald Brenda Andersen Liz Sanderson Barb Anderson Micheal J. Andersen Dewayne Anderson Bruce Gunderson Robb Rasmussen Lexxie Meyer Steven Meyer		
	Amy Milner Sarah Peterson Jim Anderson Short Mahala Bach Tom Reed Carolann Schwarzenbach Eileen Ohliger Larry Jarding Susan Hixson Karla Larive John Willman Douglas Uptain	Public Citizens	ML13036A127

**Table E3–3. Group A Commenters—Comment Document Number, Commenter Name, Affiliation, and ADAMS Accession Number (Cont'd)**

<b>Comment Document Number</b>	<b>Commenter Name</b>	<b>Affiliation</b>	<b>ADAMS Accession Number</b>
	Vivan Jenkins Carol Merwin		
	Kathy Johnson	Public Citizen	ML13010A085
	William Porter Dan Alfxon Jim L'Esperance Bridget Gilbert Harold Arns Elsa Arns Georgia O'Connor	Public Citizens	ML13010A060
	Sandy Pederson	Public Citizen	ML13010A023
	Martha Aleman	Public Citizen	ML13010A029
	Katie Aleman	Public Citizen	ML13010A027
	Clarence Pederson	Public Citizen	ML13010A022
	Chris Aleman	Public Citizen	ML13010A028
	Denise Luisi	Public Citizen	ML13018A286
	Candance Ducheneauz	Public Citizen	ML13018A271
	Barbara Thayer	Public Citizen	ML13018A261

**Table E3–4. Group B Commenters—Comment Document Number, Commenter Name, Affiliation, and ADAMS Accession Number**

<b>Comment Document Number</b>	<b>Commenter Name</b>	<b>Affiliation</b>	<b>ADAMS Accession Number</b>
135	Emily Quick Bear Sandra Woodard Kelly Clown Catherine Jeffries Julia Woodard Nancy Peters	Public Citizens	ML13036A128
	Marvin Kammerer Denise C. Breton Darleen Bear Killer Loretta Draths Mary Joy Breton Brandon Bad Wound	Public Citizens	ML13028A213
	Florence Duran	Public Citizen	ML13010A026
	Gillard Goodvoiceflute	Public Citizen	ML13017A022
	Katherine Montague	Public Citizen	ML13017A023
	Merril Goodvoiceflute	Public Citizen	ML13017A019
	Pearl Barber	Public Citizen	ML13017A021
	Ricky Goodvoiceflute	Public Citizen	ML13017A020
	Clifford White Eyes Garvard Good Plume Charles Waters Janise (Badhorse) Larson	Public Citizens	ML13056A204
	Marie-Louise Jackson-Miller	Public Citizen	ML13071A343

**Table E3–5. Group C Commenters—Comment Document Number, Commenter Name, Affiliation, and ADAMS Accession Number**

<b>Comment Document Number</b>	<b>Commenter Name</b>	<b>Affiliation</b>	<b>ADAMS Accession Number</b>
134	Bonnie Cole	Public Citizen	ML13010A075
	Cathy Curry	Public Citizen	ML13010A079
	Gene Byrge	Public Citizen	ML13017A394
	Tim O’Grady	Public Citizen	ML13010A070
	Jennifer Fay	Public Citizen	ML13010A081
	Kathleen Collins	Public Citizen	ML13010A073
	Lindsey Tootle	Public Citizen	ML13010A082
	Lisa Silverstein	Public Citizen	ML13010A078
	Mary McCarty	Public Citizen	ML13010A084
	Melanie Sartuche	Public Citizen	ML13010A076
	Nanette Thurber	Public Citizen	ML13017A387
	Patti Riggert	Public Citizen	ML13017A389
	Robin Phelps	Public Citizen	ML13010A080
	Staci Sharp	Public Citizen	ML13017A390
	Thomas Cole	Public Citizen	ML13010A077
Renee Downs	Public Citizen	ML13017A392	
Amanda Byrge	Public Citizen	ML13017A391	

**Table E3–6. Group D Commenters—Comment Document Number, Commenter Name, Affiliation, and ADAMS Accession Number**

<b>Comment Document Number</b>	<b>Commenter Name</b>	<b>Affiliation</b>	<b>ADAMS Accession Number</b>
136	Candice Head-Dylla	Bluewater Valley Downstream Alliance	ML13018A384
	Taylor McKinnon	Center for Biological Diversity	
	Jay Davis	Coloradans Against Resource Destruction	
	Jennifer Thurston	Information Network for Responsible Mining	
	Diane D’Arrigo	Nuclear Information and Resource Service	
	Shannon Anderson	Powder River Basin Resource Council	
	Robert Tohe	Sierra Club Environmental Justice	
	Linda Modica	Sierra Club National Nuclear Free Campaign	
	Sarah M. Fields	Uranium Watch	



## E5 Comment Summaries and Responses

Detailed responses to comments are provided in this section. The structure of this section is based on the topics of comments provided. Within each topic-specific subsection, the detailed presentation of comment and response information includes the applicable comment identification numbers, comment summaries, and the NRC staff response.

### E5.1 General Opposition

**Comments:** 006-000001; 011-000002; 012-000002; 013-000001; 016-000001; 017-000001; 018-000001; 021-000001; 030-000001; 039-000001; 045-000001; 047-000001; 052-000002; 053-000001; 054-000001; 058-000001; 059-000001; 060-000001; 062-000001; 066-000001; 067-000001; 074-000001; 075-000001; 079-000004; 081-000008; 082-000002; 082-000003; 085-000001; 086-000001; 087-000001; 090-000001; 096-000001; 099-000001; 106-000004; 106-000005; 108-000001; 112-000001; 115-000001; 120-000001; 135-000003

Several commenters were strongly opposed to the proposed project. Some commenters stated that the proposed project will have detrimental impacts on the local community. Other commenters stated that a license to mine uranium should not be issued. One commenter stated that the proposed project poses a serious threat to the citizens of South Dakota. One commenter stated that the nuclear energy option is too risky for our country. Another commenter stated that the entire project is very environmentally risky. Another commenter stated that uranium mining in the Black Hills could potentially impact the tourism industry in the southern Black Hills area and any short-term financial gain is simply not worth the devastating long-term catastrophe that might occur with the proposed project.

**Response:** *NRC recognizes some commenters are not supportive of in-situ uranium recovery. Any decision about whether to allow uranium recovery operations as a general matter is, however, beyond the scope of the NRC staff's NEPA review for the Dewey-Burdock ISR Project. NRC staff has prepared the Dewey-Burdock SEIS consistent with its 10 CFR Part 51 regulations that implement NEPA and its guidance for conducting environmental reviews as found in NUREG-1748 (NRC, 2003).*

*No change was made to the SEIS beyond the information provided in this response.*

**Comments:** 021-000003; 042-000001; 042-000013; 064-000001; 067-000001; 070-000001; 077-000001; 078-000001; 079-000001; 080-000001; 087-000001; 088-000001; 089-000001; 103-000002; 105-000001; 106-000001; 107-000001; 109-000001; 110-000001; 111-000001; 113-000001; 123-000001; 125-000001

Several commenters were opposed to the proposed project based on concerns related to cultural and historic resources, Native American treaty rights, water resources (e.g., water supply and contamination), ecological resources, public participation activities, and human health and the environment.

**Response:** *NRC recognizes some commenters are not supportive of in-situ uranium recovery. The Dewey-Burdock SEIS was prepared in accordance with NRC guidance in NUREG-1748 (NRC, 2003) and is consistent with NRC's NEPA implementing regulations in 10 CFR Part 51. For detailed comments and responses on topics related to those expressed in the previous*

*general opposition comment, see the following sections in this comment response index: Cultural and Historic Resources (E5.24); Land Use (E5.17); Environmental Justice (E5.27); Groundwater Resources (E5.21); Ecology (E5.22); Public Involvement (E5.8); and Regulatory Issues and Process (E5.9).*

**Comments: 067-000001; 080-000002; 087-000001; 109-000001; 110-000001; 111-000001; 114-000001**

Several commenters stated that the applicant [Powertech (USA) Inc.] is a foreign company and, therefore, were opposed to the proposed project. One commenter questioned the right of a foreign company to conduct mining in the United States.

**Response:** *Powertech (USA) Inc. (Powertech) is the United States-based wholly owned subsidiary of the Powertech Uranium Corp., a corporation registered in British Columbia, Canada (Powertech, 2009a–c). For purposes of the proposed action, Powertech (USA) Inc. and not Powertech Uranium Corp. would be the licensee for the Dewey-Burdock ISR Project. Powertech (USA) Inc. owns and will operate all the company’s uranium properties in the United States, including the Dewey-Burdock ISR Project (Powertech, 2009a–c).*

*As a regulatory agency, NRC’s “federal action” at Dewey-Burdock is the decision of whether to grant or deny the applicant license request. This purpose and need statement also reflects that NRC is not the implementer or the funding entity for the proposed activity. As such, NRC has no role in a company’s business decision to submit a license application to operate an ISR facility at a particular location to extract uranium from a particular orebody.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comments: 036-000001; 134-000001; 136-000003; 136-000005**

Some commenters strongly opposed the proposed project and asked NRC to adopt the No-Action alternative.

**Response:** *NRC recognizes that some commenters are not supportive of in-situ uranium recovery. The alternatives analyzed in the draft SEIS include a consideration of the No-Action alternative as required under NEPA. Under the No-Action alternative, NRC will not issue a license to the applicant and an ISR facility will not be built or operated at the proposed project site. After weighing the potential environmental impacts and considering the alternatives (including the the No-Action alternative), the NRC staff determined that a source material license for the proposed action be issued, unless safety issues mandate otherwise. This determination is based on (i) NRC staff independent review of the license application, including the ER and supplemental documents the applicant submitted and responses to NRC staff requests for additional information; (ii) consultation with federal, state, tribal, and local agencies; (iii) NRC staff consideration of comments received on the draft SEIS; and (v) the impact assessments documented in the SEIS.*

*No change was made to the SEIS beyond the information provided in this response.*

### **E5.1.1           References**

10 CFR Part 51. *Code of Federal Regulations*, Title 10, *Energy*, Part 51. “Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions.” Washington, DC: U.S. Government Printing Office.

NRC (U.S. Nuclear Regulatory Commission). NUREG–1748, “Environmental Review Guidance for Licensing Actions Associated with NMSS Programs—Final Report.” Washington, DC: NRC. August 2003.

Powertech [Powertech (USA) Inc.]. “Dewey-Burdock Project, Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota—Environmental Report.” Docket No. 040-09075. ML092870160. Greenwood Village, Colorado: Powertech. August 2009a.

Powertech. “Dewey-Burdock Project, Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota—Technical Report.” Docket No. 040-09075. ML092870160. Greenwood Village, Colorado: Powertech. August 2009b.

Powertech. “Dewey-Burdock Project, Supplement to Application for NRC Uranium Recovery License Dated February 2009.” Docket No. 040-09075. ML092870160. Greenwood Village, Colorado: Powertech. August 2009c.

### **E5.2               General Support**

#### **Comment: 128-000001**

The commenter found that the SEIS successfully tiered off the “Generic Environmental Impact Statement (GEIS) for *In-Situ* Leach Uranium Milling Facilities” (NUREG–1910) and that the requested license should be granted.

**Response:** *NRC recognizes this comment. SEIS Section 1.4.1 discusses the relationship between the SEIS and the GEIS (NRC, 2009).*

*No change was made to the SEIS beyond the information provided in this response.*

#### **E5.2.1           Reference**

NRC (U.S. Nuclear Regulatory Commission). NUREG–1910, “Generic Environmental Impact Statement for *In-Situ* Leach Uranium Milling Facilities.” ML091480244, ML091480188. Washington, DC: NRC. May 2009.

### **E5.3               General Environmental Concerns**

#### **Comment: 002-000002**

The commenter stated that questionable development with even small but potentially damaging consequences to South Dakota, especially by a non-U.S. entity with a questionable track

record, should be strongly weighed. The commenter pointed out that exploitation of South Dakota citizenry in the area, wildlife, and land need to be guarded against.

**Response:** *NRC acknowledges that uranium recovery activities may impact individuals who live, work, and recreate in and around the proposed Dewey-Burdock ISR Project site. In addition, ecological, land, and water resources may be impacted. The Dewey-Burdock SEIS was prepared in accordance with NRC guidance in NUREG-1748 (NRC, 2003) and is consistent with NRC's NEPA-implementing regulations in 10 CFR Part 51. The environmental review documented in this SEIS addresses potential environmental impacts covering a variety of resource areas that can affect individuals and wildlife (see Chapter 4 of this SEIS). Because the comment was general in nature, no change was made to the final SEIS.*

*With regard to the applicant being a non-U.S. entity, Powertech (USA) Inc. is the United States-based wholly owned subsidiary of the Powertech Uranium Corp., a corporation registered in British Columbia, Canada (Powertech, 2009a-c). For purposes of the proposed action, Powertech (USA) Inc. and not Powertech Uranium Corp. would be the licensee for the Dewey-Burdock Project. Powertech (USA) Inc. owns and will operate all the company's uranium properties in the United States, including the Dewey-Burdock ISR Project (Powertech, 2009a-c).*

*No change was made to the SEIS beyond the information provided in this response.*

**Comments:** 005-000002; 016-000004; 019-000001; 048-000012; 051-000002; 061-000009; 072-000002; 079-000002; 081-000004; 091-000021; 095-000007; 100-000002; 104-000001; 106-000003; 120-000007; 136-000014

Several commenters expressed concerns that the applicant has never mined uranium or that the applicant lacks experience in uranium mining and the ISR process. Some commenters were concerned that the applicant would be unable to manage the environmental aspects of the proposed project considering their inexperience and that this should be discussed in the SEIS.

**Response:** *As part of the safety review for the proposed Dewey-Burdock ISR Project (conducted separately but coordinated with this SEIS), NRC assessed whether the applicant demonstrated that the proposed corporate organization and administrative procedures for the proposed project are consistent with 10 CFR 20.1101 and 10 CFR 40.32(b) and (c), which require that the applicant be qualified through training and experience to use source materials (NRC, 2013a). As described in the Safety Evaluation Report (SER), Section 5.1.3, NRC concluded that the applicant-provided organizational structure adequately defined the responsibilities and procedures with respect to principal operations, radiation safety programs, environmental and groundwater monitoring programs, quality assurance programs, and routine/nonroutine maintenance activities (NRC, 2013a).*

*As discussed in SER Section 5.1.3, the applicant has requested a performance-based license (PBL) and has proposed the establishment of a Safety and Environmental Review Panel (SERP) (NRC, 2013a). The SERP will evaluate, discuss, approve, and record any changes to standard operating procedures (SOPs), the facilities, or tests and experiments involving safety and the environment. SERP composition, responsibilities, and review procedures are appropriately detailed in the application (Powertech, 2009b). The SERP would consist of a minimum of three individuals: one member would have expertise in management and would have the authority to implement managerial and financial changes (e.g., the mine manager);*

*one member would have expertise in operations and would have the authority to make operational changes (e.g., the production superintendent); and one member would be the radiation safety officer (RSO). Others may be added to the SERP as appropriate to address specific technical/scientific aspects of changes (Powertech, 2009b).*

*The SERP will be responsible for monitoring any proposed change in the facility or its processes, making changes in procedures, and conducting tests or experiments not contained in the approved NRC license application (Powertech, 2009b). As such, the SERP will be responsible for ensuring that any such changes do not degrade essential safety or environmental commitments. The applicant will keep records of the SERP evaluations. The applicant will submit an annual report to NRC that describes all changes, tests, or experiments made pursuant to the PBL, including a summary of the reason for each change and the SERP evaluation of each change (Powertech, 2009b). The particular requirements for SERP composition and authority are presented in a standard license condition (NRC, 2013b).*

*Based on information provided in the applicant's license application (Powertech, 2009a–c), the NRC staff concluded in the SER that the proposed corporate organization and administrative procedures comply with 10 CFR 20.1101, which defines radiation protection program requirements. In addition, the requirements of 10 CFR 40.32(b) and (c) are also met as they relate to the proposed corporate organization and SERP functions (NRC, 2013a).*

*No change was made to the SEIS beyond the information provided in this response.*

**Comments: 008-000005; 029-000005; 073-000001**

Several commenters stated that the SEIS said that impacts are “small” in a number of instances because the applicant has said it will do certain things if problems develop. The commenters stated that the SEIS should not consider only the “best case” impacts, but should consider impacts of the problems found at other ISR projects.

**Response:** *Historical information on the problems that have occurred during operational activities of other ISR projects is discussed in Section 2.11 of the GEIS (NRC, 2009). These problems include spills and leaks, lixiviant excursions, and delays in restoring groundwater to acceptable standards. As documented in the draft SEIS, the applicant is required to (i) develop and implement emergency procedures for potential accidents, such as spills and leaks; (ii) design and implement monitoring programs and procedures to detect and recover lixiviant excursions; and (iii) comply with NRC regulations governing aquifer restoration after wellfield operations cease. The purpose of the required emergency procedures, monitoring programs, and regulations governing aquifer restoration is to avoid or minimize potential impacts on the environment. Because the comment was general in nature, no change was made to the final SEIS.*

**Comment: 032-000002**

The commenter stated that the complexity of the geology and hydrology of the project area demands a more detailed analysis than that outlined in the SEIS. The commenter also questioned the location and engineering of the disposal wells.

**Response:** *NRC staff agree that the geology and hydrology of the project area is complex, but disagree that the analysis of geology and hydrology in the draft SEIS is inadequate. The*

*geology and hydrology of the project area and the broader region are discussed in SEIS Sections 3.4 and 3.5, respectively. The potential environmental impacts from construction, operation, aquifer restoration, and decommissioning for the proposed Dewey-Burdock ISR Project are detailed in SEIS Sections 4.4 and 4.5, respectively. Because the comment was general in nature, no change was made to the final SEIS.*

*The proposed locations of Class V deep injection wells are shown in SEIS Figure 2.1-10. Design and construction of the Class V deep injection wells are discussed in SEIS Section 2.1.1.1.2.4.1 and schematically illustrated in SEIS Figure 2.1-11. Because the comment provided no specific reasons for questioning the location and engineering of the disposal wells, no change was made to the final SEIS.*

**Comment: 037-000001**

The commenter stated that the SEIS affirming the proposed Dewey-Burdock ISR Project in South Dakota is a premature decision which neglects newly emerging data. The commenter stated that NRC should consider more information that reflects our environmental, cultural, and historical concerns.

**Response:** *NRC prepared the Dewey-Burdock draft SEIS consistent with its regulations under 10 CFR Part 51 that implement NEPA and its guidance for conducting environmental reviews as found in NUREG-1748 (NRC, 2003). SEIS Section 4.9 describes impacts to historical and cultural resources that have been identified in the Dewey-Burdock area. SEIS Section 1.7.3.5 describes the ongoing consultation process under Section 106 of the National Historic Preservation Act of 1966 (NHPA). As discussed in SEIS Section 1.7.3.5, consultation involving NRC, the applicant, South Dakota State Historic Preservation Office (SD SHPO), U.S. Bureau of Land Management (BLM), Advisory Council on Historic Preservation (ACHP), and potentially affected Indian tribes is being conducted to determine (i) whether significant properties are present, (ii) whether properties will be disturbed by site activities, and (iii) what mitigation measures should be implemented. Prior to construction, an agreement between NRC, SD SHPO, BLM, ACHP, interested Native American tribes, the applicant, and other interested parties will be developed pursuant to 36 CFR 800.14(b)(2). The agreement will outline the mitigation process for each affected resource identified at the site pursuant to 36 CFR Part 800.8(c)(1)(v).*

**Comment: 044-000002**

The commenter stated that the time is not right to proceed with a licensing decision on the proposed Dewey-Burdock ISR Project because the SEIS did not contain enough information and needs to be fully expanded to cover major impacts of this type of facility, especially the full impact of an ISL mining facility here in the Black Hills.

**Response:** *NRC prepared the Dewey-Burdock draft SEIS consistent with its regulations under 10 CFR Part 51 that implement NEPA and its guidance for conducting environmental reviews as found in NUREG-1748 (NRC, 2003). SEIS Section 5.1.1.1 discusses past, current, and reasonably foreseeable future uranium recovery in the Black Hills region. SEIS Chapter 5 assesses the cumulative impacts of ISR in the Black Hills region.*

*Because the comment was general in nature, no change was made to the final SEIS.*

**Comments: 056-000001; 081-000001; 088-000001; 091-000001; 094-000001;  
097-000001; 099-000002**

Some commenters were concerned about the overall impacts to water, air quality, wildlife, human health, and cultural resources from the proposed project. One commenter stated that the limited scope of the project did not effectively take into account long-term effects on human health.

**Response:** *NRC acknowledges that uranium recovery activities may impact individuals who live, work, or recreate in and around the proposed Dewey-Burdock ISR Project site. The environmental review documented in this SEIS addresses potential environmental impacts covering a variety of resource areas that can affect individuals, including cumulative impacts. Because the comments were general in nature, no change was made to the final SEIS.*

**Comments: 095-000008; 092-000007**

Two commenters expressed concerns about how NRC analyzed impacts to resources areas.

**Response:** *The GEIS (NRC, 2009), which this final SEIS supplements, provides a starting point for NRC analyses for site-specific license applications for new ISR facilities, such as the Dewey-Burdock ISR application. The GEIS provides criteria for each environmental resource area to help determine the significance level for potential impacts (e.g., SMALL, MODERATE, or LARGE). The NRC staff applied these criteria to the site-specific conditions at the proposed Dewey-Burdock ISR Project. In addition, the NRC staff prepared the Dewey-Burdock draft SEIS consistent with its regulations under 10 CFR Part 51 that implement NEPA and its guidance for conducting environmental reviews as found in NUREG-1748 (NRC, 2003).*

*No change was made to the SEIS beyond the information provided in this response.*

**Comments: 057-000001; 085-000005; 083-000001; 098-000001; 100-000002;  
104-000001; 132-000002**

Several commenters expressed broad concerns over the environmental impacts of the uranium mining industry and, in particular, the experience of Powertech as an applicant.

**Response:** *Under the Atomic Energy Act (AEA), NRC has statutory authority to issue licenses for the possession and use of AEA-regulated radioactive materials and particular activities involving this material. Based on NRC's statutory authority, the proposed federal action is NRC's decision whether to grant or deny a private party's licensing application to conduct ISR operations to extract uranium and produce yellowcake at a particular site. The NRC staff initially relied on information the applicant provided as well as information and conclusions from NRC's safety review. NRC staff confirmed important attributes of the license application and environmental report through independent review and research activities; visits to the proposed site and vicinity; and consultations with appropriate federal, tribal, state, and/or local agencies. NRC understands and recognizes there are serious legacy issues resulting from the decades of uranium mining activities from the 1940s through the 1970s when waste from uranium mines was not cleaned up after mines were closed. NRC regulation of ISR facilities includes ensuring ISR operators take necessary measures to confine mobilized uranium and other constituents within the wellfield where the facility is operating, ensuring monitoring programs are in place to provide early detection of any migration of process fluids away from the wellfield, and enforcing*



*necessary corrective actions to prevent uranium from contaminating adjacent water sources to ensure the public is protected.*

*No change was made to the SEIS beyond the information provided in this response.*

### **E5.3.1 References**

10 CFR Part 20. *Code of Federal Regulations*, Title 10, *Energy*, Part 20. “Standards for Protection Against Radiation.” Washington, DC: U.S. Government Printing Office.

10 CFR Part 40. *Code of Federal Regulations*, Title 10, *Energy*, Part 40. “Domestic Licensing of Source Material.” Washington, DC: U.S. Government Printing Office.

10 CFR Part 51. *Code of Federal Regulations*, Title 10, *Energy*, Part 51. “Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions.” Washington, DC: U.S. Government Printing Office.

36 CFR Part 800. *Code of Federal Regulations*, Title 36, *Parks, Forests, and Public Property*, Part 800. “Protection of Historic Properties.” Washington, DC: U.S. Government Printing Office.

NRC (U.S. Nuclear Regulatory Commission). “Safety Evaluation Report for the Dewey-Burdock Project Fall River and Custer Counties, South Dakota, Materials License No. SUA-1600.” ML13052A182. Washington, DC: NRC. March 2013a.

NRC. “Draft License SUA-1600 for Powertech (USA), Inc.” ADAMS Accession No. ML13318A094. Washington, DC: NRC. March 2013b.

NRC. NUREG-1910, “Generic Environmental Impact Statement for *In-Situ* Leach Uranium Milling Facilities.” ML091480244, ML091480188. Washington, DC: NRC. May 2009.

NRC. NUREG-1748, “Environmental Review Guidance for Licensing Actions Associated with NMSS Programs—Final Report.” Washington, DC: NRC. August 2003.

Powertech. “Dewey-Burdock Project, Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota—Environmental Report.” Docket No. 040-09075. ML092870160. Greenwood Village, Colorado: Powertech. August 2009a.

Powertech. “Dewey-Burdock Project, Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota—Technical Report.” Docket No. 040-09075. ML092870160. Greenwood Village, Colorado: Powertech. August 2009b.

Powertech. “Dewey-Burdock Project, Supplement to Application for NRC Uranium Recovery License Dated February 2009.” Docket No. 040-09075. ML092870160. Greenwood Village, Colorado: Powertech. August 2009c.

## **E5.4 National Environmental Policy Act Process**

### **E5.4.1 U.S. Nuclear Regulatory Commission National Environmental Policy Act Process Implementation**

**Comments: 010-000001; 024-000002; 041-000005; 061-000005; 104-000002; 116-000002; 116-000005; 120-000006**

Several commenters stated that the NRC should not rely solely on the information provided by the applicant and should independently verify information before using it in the SEIS. The commenters also stated that a neutral outside source or a qualified examiner should review the analysis before a permit is granted.

**Response:** *The NRC developed the Dewey-Burdock SEIS in accordance with 10 CFR Part 51 requirements. The environmental review of the proposed Dewey-Burdock ISR Project was initiated with acceptance of the license applications submitted by Powertech for detailed technical review as stated in SEIS Section 1.6.1. The NRC staff used information contained in the applicant's license application and subsequent revisions to the application to initiate its review. The NRC staff independently verified information contained in the application as necessary and supplemented its reviews with materials collected through its own independent assessment, as well as information supplied by other reviewing agencies such as the U.S. Environmental Protection Agency (EPA) Region 8 and South Dakota Department of Environment and Natural Resources (SDDENR). The NRC staff also utilized information gathered during its site visit conducted in late 2009, where the staff met with local, state, and federal governments, and interested stakeholders. The NRC staff also solicited comments via newspaper ads and considered comments received while developing the SEIS. NRC outreach efforts are documented in SEIS Section 1.7. Furthermore, under Section 309 of the Clean Air Act, the EPA is responsible for independently reviewing and evaluating the potential environmental impacts of a proposed project. EPA reviewed the Dewey-Burdock draft SEIS and provided comments, which the staff addressed in the final SEIS. Additionally, the NRC staff issued the draft SEIS for public comment, and it has addressed stakeholders comments on the draft in the final SEIS.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comment: 127-000002**

The commenter stated that the use of generic references obfuscates the technical basis for the analysis and conclusions as to the potential impacts of the project to the point it violates the AEA and NEPA, and implementing regulations. See 10 CFR Part 51 (Appendix A to Subpart A, Note 1) (allowing incorporation by reference of material outside a NEPA document, but only "without impeding agency and public review of the action" and only where the material's content is "briefly described").

**Response:** *10 CFR 51 Appendix A to Subpart A (b) states: The techniques of tiering and incorporation by reference described respectively in 40 CFR 1502.20, 40 CFR 1508.28, and 40 CFR 1502.21 of the Council of Environmental Quality's (CEQ) NEPA regulations may be used as appropriate to aid in the presentation of issues, eliminate repetition, or reduce the size of an environmental impact statement.*

*Appendix A to Subpart A in 10 CFR Part 51 provides additional information on 40 CFR 1502.20 and 40 CFR 1502.21 requirements for tiering and incorporation by reference. Under these requirements, agencies are encouraged to tier their environmental impact statements (EIS) or incorporate by reference materials into their EIS in order to eliminate duplications of analysis and focus the agencies' analysis on the issues specific to the subsequent action as long as a brief summary of the information is provided in the environmental report and the staff only incorporates by reference material that is readily available for the public's review.*

*The draft SEIS for the Dewey-Burdock project followed the guidance provided in 10 CFR Part 51, Appendix A to Subpart A, as appropriate, when tiering information from the GEIS or incorporating by reference other studies (such as EPA's UIC Class V permitting reviews) for the SEIS impact assessment. Consistent with 10 CFR Part 51, Appendix A to Subpart A, the NRC staff briefly summarized the findings of the GEIS and clearly stated when additional site-specific analysis is required. The staff also provided summaries of studies conducted by other entities such as EPA Region 8 when incorporating materials by reference. In addition, NRC staff prepared the SEIS consistent with NRC style guide NUREG-1379 (NRC, 2009c) and followed the guidance provided in this NUREG when citing reference materials within the SEIS.*

*No changes were made to the final SEIS beyond the response to this comment.*

**Comment: 128-000029**

The commenter stated that it needs to be clear that the draft SEIS was prepared pursuant to 10 CFR Part 51 regulations and not NEPA.

**Response:** *The NRC staff prepared the draft SEIS consistent with the NRC's regulations in 10 CFR Part 51, which implement NEPA. Throughout the SEIS, the NRC staff states that the document was prepared to fulfill 10 CFR Part 51 requirements. One such example is in SEIS Section 1.6.1, "NRC Licensing Process," which states that the environmental review is conducted in accordance with the regulations in 10 CFR Part 51. No change was made to the SEIS beyond the information provided in this response.*

**Comment: 136-000009**

The commenter stated the GEIS was never issued as a final NEPA document with an official Record of Decision. The commenter stated the Dewey-Burdock SEIS cannot properly supplement the GEIS without a Record of Decision, as required by NRC regulations. As stated in the SEIS, the GEIS provides a "starting point" for the SEIS, revealing an over-reliance on the earlier document's scope and framing. The commenter noted that this fails to fully analyze the site-specific issues raised by the proposed action and the unique geologic and environmental concerns specific to the Dewey-Burdock areas.

**Response:** *As the commenter stated, 10 CFR 51.102(a) requires that a Commission decision on any action for which a final EIS has been prepared shall be accompanied by, or include, a concise public record of decision. Actions subject to this regulatory requirement include NRC decisions on specific applications to issue, renew or amend an NRC license. Issuance of the GEIS was not a binding decision on any action, and for that reason it did not trigger the 10 CFR 51.102(a) requirement to prepare a public record of decision.*

*NRC developed the GEIS 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 anticipating a further site-specific application to renew, amend, or issue an NRC license. NRC uses the GEIS as a starting point for conducting its NEPA review of a site-specific ISR license application. NRC evaluates site-specific data and information to determine whether an applicant's proposed activities and the characteristics at its site are consistent with those evaluated in the GEIS before determining which GEIS sections can be incorporated by reference, whether impact conclusions can be adopted in whole, and whether either additional data or analysis is needed to determine the environmental impacts for a specific resource area in the site-specific NEPA review.*

*NRC has always considered the license (if issued to the applicant), in addition to the entire publicly available record for a license application, as the agency's record of decision for a specific licensing action. These documents include: (i) the applicant's environmental report, (ii) the NRC staff's SER, and (iii) the NRC staff's final SEIS. NRC evaluates this information to determine whether the license application complies with the standards and requirements of the Atomic Energy Act of 1954, as amended, and the commission's regulations before granting a request to renew, amend or issue an NRC license. If the staff approves the Dewey-Burdock application, NRC will publish a notice in the Federal Register announcing its issuance of an ISR license to Powertech, and this notice will include the previous statement regarding NRC's record of decision for the Dewey-Burdock ISR SEIS.*

*No change was made to the SEIS beyond the information provided in this response.*

#### **E5.4.2 Adequacy of Information**

**Comments: 008-000001; 029-000001; 048-000004; 104-000003**

Some commenters mentioned that the draft SEIS was issued before all the relevant information was available. The commenters pointed out that the SEIS lists a number of things that the applicant should do before it starts its operation, such as air dispersion modeling, livestock radiation sampling, pump testing, creating wellfield operational plans, and setting up emergency procedures for truck accidents. The commenters stated that these activities should be completed before the SEIS is issued, so that the public can have full information on which to base its comments, and so that NRC can have full information on which to base its rating of various impacts. One commenter stated that the public must also have accurate information in order to make relevant comments.

**Response:** *With regard to the air impacts, the assessment in the draft SEIS was based on available information provided by the applicant, as well as independent reviews of data presented in the applicant's license application. NRC acknowledges that, when it issued the draft SEIS, the applicant had committed to revise the air emission inventory and perform additional air dispersion modeling (see SEIS Section 4.7.1). Updates to the inventory were made to improve the accuracy and provide the appropriate input for the National Ambient Air Quality Standards (NAAQS), Prevention of Significant Deterioration (PSD), and Air Quality Related Values modeling. The draft SEIS stated that the impact analysis in the final SEIS will be based on the new modeling results. The draft SEIS disclosed (i) the potential that the impact magnitude in the final SEIS could be different (i.e., lesser or greater) than that specified in the draft SEIS, (ii) example modeling results that would cause the NRC to reclassify the project impact, and (iii) that if during the process of revising the air modeling it is determined that any of*

*the topics for the update are not addressed as described in the draft SEIS, NRC shall provide justification for this change in the final SEIS. In summary, the draft SEIS provided the public an opportunity to comment on the existing NRC analysis and the process by which this analysis would be updated in the final SEIS.*

*The final SEIS does update the air analysis presented in the draft SEIS. Table C–18 of the final SEIS identifies the updates committed to in the draft SEIS and how they were address in the final SEIS. Details concerning the differences in the nonradiological air emissions estimates between the draft and final SEIS are described in Section C4 of the final SEIS and Appendix H of the Ambient Air Quality Final Modeling Protocol and Impact Analysis (IML, 2013). The final SEIS also updated the status of the formal air permitting process in which SDDENR determined that an air permit will not be required and the proposed project will not be subject to PSD requirements (SDDNER, 2013). As a result of the SDDENR determination, as described in final SEIS Section 4.7.1, NRC staff consider comparison of project level pollutant concentrations to PSD increments for disclosure purposes (e.g., indicating the type of project level emission the analysis should focus on for potential environmental impacts) rather than a regulatory concern.*

*The updated information in the final SEIS does not significantly change the staff’s analysis of air impacts as presented in the draft SEIS. To the contrary, as described in final SEIS Table C–19, the draft analysis bounds the final NRC analysis. Peak year, construction phase, and cumulative impact magnitudes in the draft and final SEISs were the same (i.e., SMALL to MODERATE). For the operation, aquifer restoration, and decommissioning phases, the draft SEIS impact magnitude of SMALL to MODERATE was reduced to SMALL in the final SEIS.*

*With regard to pump testing and wellfield operational plans, NRC requires applicants of ISR facilities to conduct delineation drilling and pump testing prior to operations in wellfields under PBL conditions. The applicant’s delineation drilling results and pumping test data for the proposed Dewey-Burdock ISR Project will be included in wellfield hydrogeologic data packages, which will be submitted to the SERP (established by NRC requirements) for review and approval (Powertech, 2011). The SERP will review the wellfield hydrogeologic test results and documentation to determine whether monitoring wells are hydrologically connected to the injection and production wells. The wellfield hydrogeologic data package and written SERP evaluation will be maintained onsite and be available for NRC review. By license condition, all wellfield hydrogeologic data packages must be submitted to NRC for review prior to operating each wellfield (NRC, 2013).*

*With regard to setting up emergency procedures for truck accidents, NRC requires applicants to develop emergency procedures for transportation accidents prior to conducting ISR operations. As described in SEIS 4.3.1.2.2, the applicant has committed to developing emergency response procedures for accidents involving yellowcake and for other transportation accidents that could occur during shipment to or from the proposed Dewey-Burdock ISR Project (Powertech, 2009a). The applicant also proposes to ensure its personnel and the carrier receive training on these emergency response procedures and that information about the procedures is provided to state and local agencies (Powertech, 2009a). Furthermore, to limit the risk of an accident involving resin or yellowcake transport, the applicant has proposed that all such materials will be transported in accordance with U.S. Department of Transportation (USDOT) and NRC regulations, handled as low specific-activity materials, and shipped using exclusive-use-only vehicles (Powertech, 2009a).*

*No change was made to the SEIS beyond the information provided in this response.*

**Comments: 061-000002; 092-000006**

The commenters stated that the following information is not available for review in the SEIS: (i) information on the Section 106 consultation is not complete; (ii) the byproduct waste site location is speculative, thus the SEIS presents inadequate information and this also affects transportation routes and traffic issues; (iii) the site for further yellow cake processing is not yet set, thus the SEIS presents inadequate information and this also affects transportation routes and traffic issues; (iv) information on emergency procedures for truck accidents; (v) information on air dispersion modeling; (vi) information on wetlands mitigation plans for compliance with Section 404; (vii) information on pump tests; and (viii) information on wellfield operational plans.

**Response:** *The NRC staff initially relies on information the applicant provides as well as information and conclusions from NRC's safety review. The NRC staff confirms important attributes of the license application and environmental report through visits to the proposed site location and vicinity; independent research activities; and consultations with appropriate federal, tribal, state, and local agencies. In the draft SEIS, the NRC staff presented its finding based on the available information it had at the time and specifically described the ongoing reviews or data collection requirements that will be included in the final SEIS. For example, for the ongoing air modeling effort that the applicant planned to complete before the issuance of the final SEIS, the NRC staff specifically identifies additional information or modeling results that will be included in the final SEIS (see draft SEIS Section 4.7.1). Similarly, for the byproduct waste site location, NRC licensing practice requires, by license condition, that applicants reach agreements with approved byproduct disposal facilities to accept for disposal all byproduct material generated by the proposed ISR facility. These agreements must be in place prior to starting operations that generate the byproduct material. NRC, therefore, does not require applicants to have the agreement in place when the license application is submitted. This disposal option was presented and analyzed in draft SEIS Section 4.14.*

*With regard to Section 106 consultation, SEIS Section 1.7.3.5 describes ongoing consultation involving NRC, the applicant, SD SHPO, BLM, and interested Indian tribes to determine (i) whether significant properties are present, (ii) whether properties will be disturbed by site activities, and (iii) what mitigation measures should be implemented. Prior to completing the consultation process, an agreement between NRC, SD SHPO, BLM, ACHP, interested Native American tribes, the applicant, and other interested parties will be developed in accordance with 36 CFR 800.14(b)(2). The agreement will outline the mitigation process for each affected resource identified at the site pursuant to 36 CFR 800.8(c)(1)(v). Results of the consultation will be presented in the final SEIS.*

*With regard to compliance with Section 404 of the Clean Water Act, U.S. Army Corps of Engineers (USACE) permits are required for placing fill, excavating, or using earthmoving equipment to clear land in jurisdictional wetlands. As a result of the USACE permitting process, impacts are expected to be mitigated through various mitigation options, such as banking and riparian/wetland enhancement. SEIS Section 3.5.2 describes wetlands that have been identified on the project site. As discussed in SEIS Section 4.5.1.1, the applicant has committed to seek authorization from USACE and comply with Section 404 permitting requirements before conducting work in jurisdictional wetlands identified in the project area (Powertech, 2009a).*

*The commenters stated that there was no information on transportation and traffic issues. However, SEIS Section 4.3.1.1.2 discusses issues related to transportation and traffic risks*

*including (i) potential radiological accident risks associated with ion-exchange resin and yellowcake product shipments; (ii) potential impacts from transportation of operational byproduct material shipments; (iii) potential impacts from transportation of incoming, onsite, and outgoing process chemical supplies; and (iv) emergency response procedures for truck accidents. With regard to setting up emergency procedures for truck accidents, NRC requires applicants to develop emergency procedures for transportation accidents prior to conducting ISR operations. As described in SEIS 4.3.1.2.2, the applicant has committed to developing emergency response procedures for yellowcake and other transportation accidents that could occur during shipment to or from the proposed Dewey-Burdock ISR Project (Powertech, 2009a). The applicant also proposes to ensure its personnel and the carrier receive training on these emergency response procedures and that information about the procedures is provided to state and local agencies (Powertech, 2009a). Furthermore, to limit the risk of an accident involving resin or yellowcake transport, the applicant has proposed that all such materials will be transported in accordance with USDOT and NRC regulations, handled as low specific-activity materials, and shipped using exclusive-use-only vehicles (Powertech, 2009a).*

*The commenters also stated that there was no information on pumping tests. As described in draft SEIS Section 2.1.1.1.2.3.3, prior to operation of wellfields at the proposed project, the applicant would design and implement pumping tests to evaluate and confirm hydraulic connection between the production zone and perimeter production zone monitor wells and hydraulic isolation between the production zone and overlying and underlying aquifers. The pumping test data would also be used to detect and identify leakage due to anomalies, such as improperly plugged exploration boreholes. In addition, the applicant would submit a wellfield hydrogeologic data package prior to operations in a wellfield. The data package would include results of delineation drilling, water quality data collected for establishment of Commission-approved background, and pump test results (see draft SEIS Section 2.1.1.1.2.3.4). The wellfield hydrogeologic data package for each new wellfield would be submitted to the SERP (established by NRC requirements) for review and approval (Powertech, 2011). The wellfield hydrogeologic data package and written SERP evaluation will be maintained onsite and be available for NRC review. By license condition, all wellfield hydrogeologic data packages must be submitted to NRC for review and written verification prior to operating each wellfield (NRC, 2013).*

*In summary, for each area the commenters identified, the draft SEIS discloses the reasonably foreseeable environmental impacts of the applicant's proposed activities and describes the assumptions underlying the staff's analyses.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comments: 127-000005; 127-000008**

The commenter stated that, throughout the draft SEIS, NRC proposes to allow Powertech to defer collection of critical data that is admittedly necessary to conduct a review of the project and the resulting impacts. According to the draft SEIS, substantial information related to baseline conditions at the site, and needed to assess the impacts of the proposed operations, is not proposed to even be collected or reviewed until long after the NEPA process has concluded. The commenter stated that this scheme is not allowable under NEPA. Under NEPA, an agency is required to "describe the environment of the areas to be affected or created by the alternatives under consideration." (see 40 CFR 1502.15). The commenter stated that establishment of the baseline conditions of the affected environment is a fundamental



requirement of the NEPA process. The commenter stated further CEQ regulations specifically prohibit an agency from failing to gather necessary data in order to assess the impacts associated with a proposal. 40 CFR 1502.22 imposes detailed requirements and justifications necessary for any agency to decline to provide necessary and relevant information. The commenter asserted that none of these tests have been acknowledged, let alone met, by the draft SEIS; nor could they likely be, as the test for not acquiring the relevant information turns on the cost to do so being “exorbitant.” In this case, this information is specifically planned to be acquired as part of the project development, but is simply being deferred until after the NEPA process. The commenter stated that deferring the gathering of such information until after the NEPA process based purely on the convenience to the operator, is not allowable.

**Response:** *As required by NEPA, the NRC staff did include a discussion of baseline conditions at the proposed Dewey-Burdock ISR Project in SEIS Chapter 3 (Affected Environment).*

*Baseline groundwater conditions are described in terms of baseline water quality. In compliance with 10 CFR Part 40, Appendix A, Criterion 7, the applicant is required to collect baseline water quality data at least one full year prior to license application submittal. A list of baseline water quality parameters acceptable to the NRC staff is provided in NUREG–1569, Table 2.7.3.1 (NRC, 2003b). As described in NUREG–1569, Section 2.5, the NRC staff verifies the accuracy of baseline water quality data by ensuring that the applicant’s procedures include (i) acceptable sample collection methods, (ii) a set of sampled parameters that is appropriate for the site and ISL extraction method, and (iii) collection of sample sets that are sufficient to represent natural spatial and temporal variations in water quality.*

*In compliance with 10 CFR Part 40, Appendix A, Criterion 7 and consistent with NUREG–1569, Section 2.5, the applicant provided baseline water quality data in the license application. The NRC staff discussed baseline groundwater quality sampling at the proposed Dewey-Burdock ISR Project site in SEIS Sections 3.5.3.5 and 3.12.1.4. As described in SEIS Section 3.5.3.5, the applicant conducted initial baseline groundwater sampling at 19 wells at the proposed Dewey-Burdock site on a quarterly basis from July 2007 through June 2008. From March 2008 through February 2009, the applicant included 12 additional wells sampled monthly. During this initial sampling, groundwater was sampled from different ore-bearing aquifers at locations within, upgradient, and downgradient of the proposed Dewey and Burdock ISR Project site. The locations of baseline groundwater sampling are shown in SEIS Figure 3.5-2. Additionally, baseline water quality sampling, methodologies, results, and conclusions are provided in the applicant’s environment report (Powertech, 2009a). The NRC staff used this information when drafting the affected environmental section of the SEIS as well as analyzing impacts of the proposed action.*

*As described in SEIS Section 7.3.1, the applicant will be required to conduct additional sampling if a license is granted to establish Commission-approved background groundwater quality before beginning operations in each proposed wellfield in accordance with 10 CFR Part 40, Appendix A, Criterion 5B(5). However, this does not mean that the NRC staff lacks sufficient baseline groundwater quality information to assess the environmental impacts of the proposed action*

*No change was made to the SEIS beyond the information provided in this response.*

### **E5.4.3 Adequacy of Impact Assessment**

#### **Comments: 008-000003; 028-000003**

Two commenters stated that the SEIS “dilutes” impacts by saying that the impacts are “small” because only part of the project area is involved. The commenters stated that the impacts are large to the affected areas, and that is what should be considered.

**Response:** *Through the NRC staff’s thorough review and assessment of the license application, the applicant’s responses to NRC requests for additional information, and information gathered during site visits, the NRC staff evaluates and determines impact significance levels associated with each resource area. As described in SEIS Section 4.1, NRC established a standard of significance (SMALL, MODERATE, LARGE) for assessing environmental impacts in the conduct of environmental reviews based on CEQ guidance (CEQ, 1997). When determining significance levels, the NRC staff takes into account not only the project area, but also areas outside the proposed permitted project area that may be impacted by various technical aspects of the project, such as groundwater usage, possibility of groundwater and surface water contamination, and impacts to ecological resources. This review process ensures the staff appropriately considered all available information before deciding on significance levels.*

*No change was made to the SEIS beyond the information provided in this response.*

#### **Comment: 093-000006**

The commenter pointed out that numerous times throughout the SEIS, it is stated that impacts are “small.” The commenter stated that these impacts may be small in the overall picture, but the impacts can be devastatingly large to the actual area impacted and often the reason for considering the impacts “small” is based solely on what the applicant says it will do in various situations. The commenter stated that the applicant has never developed or run an ISR uranium process, so there is no past history to prove the applicant can do what it says it will do. The commenter further stated that many of the things the applicant says it will do have already been proven by other ISR sites to not be possible, such as water restoration.

**Response:** *NRC prepared the draft SEIS in accordance with regulations in 10 CFR Part 51. These regulations implement the requirements of NEPA, as amended (Public Law 91-190), which requires the Federal Government to assess the potential environmental impacts of major federal actions that may significantly affect the human environment. In accordance with guidance in NUREG–1748, mitigation measures that could reduce adverse impacts or enhance beneficial impacts should be incorporated in the proposed action to the extent feasible (NRC, 2003c). The analysis should address the anticipated effectiveness of the mitigation measures in reducing adverse impacts or enhancing beneficial impacts. The mitigation measures the applicant proposed to reduce and minimize adverse environmental impacts at the proposed Dewey-Burdock ISR Project are summarized in SEIS Section 6.2. These mitigation measures are detailed in the Chapter 4 impact analyses for each resource area considered in the SEIS. Based on the potential impacts identified in Chapter 4 of this draft SEIS, the NRC staff identified additional potential mitigation measures for the proposed Dewey-Burdock ISR Project. These mitigation measures are summarized in SEIS Section 6.3.*

*With regard to aquifer restoration, GEIS Section 2.11 (NRC, 2009a) describes historical operation of ISR uranium recovery facilities, which includes discussion of aquifer restoration in GEIS Section 2.11.5. NRC staff examined available groundwater restoration data from three NRC-licensed ISR facilities (COGEMA's Irigaray/Christensen Ranch facility, PRI's Smith Ranch/Highland Uranium Project facility, and Crow Butte Resources' Crow Butte facility) (NRC, 2009b). The commenter is correct that, to date, restoration to background water quality for all constituents has proven to be not practically achievable at certain ISR sites (NRC, 2003a, 2004, 2005, 2009b). Information regarding ISR aquifer restorations at other NRC-licensed ISR facilities was added to SEIS Section 4.5.2.1.1.3.*

#### **E5.4.4 References**

10 CFR Part 40 Appendix A. *Code of Federal Regulations*, Title 10, *Energy*, Part 40 Appendix A. "Criteria Relating to the Operation of Uranium Mills and to the Disposition of Tailings or Wastes Produced by the Extraction or Concentration of Source Material from Ores Processed Primarily from their Source Material Content." Washington, DC: U.S. Government Printing Office.

10 CFR Part 51. *Code of Federal Regulations*, Title 10, *Energy*, Part 51. "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions." Washington, DC: U.S. Government Printing Office.

40 CFR Parts 1500-1508. *Code of Federal Regulations*, Title 40, *Protection of Environment*, Parts 1500-1508. "Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act." Washington, DC: U.S. Government Printing Office.

CEQ (Council on Environmental Quality). "Considering Cumulative Effects Under the National Environmental Policy Act." ML13343A349. Washington, DC: Executive Office of the President, CEQ. 1997.

IML (Inter-Mountain Laboratories, Inc.). "Ambient Air Quality Final Modeling Protocol and Impact Analysis Dewey-Burdock Project Powertech (USA) Inc., Edgemont, South Dakota." ML13196A061, ML13196A097, ML13196A118. Sheridan, Wyoming: IML, Inc., IML Air Science. 2013.

NRC (U.S. Nuclear Regulatory Commission). "Draft License SUA-1600 for Powertech (USA), Inc." ML13318A094. Washington, DC: NRC. March 2013.

NRC. NUREG-1910, "Generic Environmental Impact Statement for *In-Situ* Leach Uranium Milling Facilities." ML091480244, ML091480188. Washington, DC: NRC. May 2009a.

NRC. "Data on Groundwater Impacts at the Existing ISR Facilities." ML091770385. Washington, DC: NRC. 2009b.

NRC. NUREG-1379, Rev. 2, "NRC Editorial Style Guide." Washington, DC: NRC. May 2009c.

NRC. "Technical Evaluation Report: Review of Cogema Mining Inc.'s Irigaray Mine Restoration Report, Production Units 1 Through 9." Source Materials License SUA-1341. ML062570181. Washington, DC: NRC. 2005.

NRC. “Review of Power Resources, Inc.’s A-Wellfield Ground Water Restoration Report for the Smith Ranch–Highland Uranium Project.” ML041840700. Washington, DC: NRC. June 29, 2004.

NRC. “License Amendment 15, Crow Butte Resources *In-Situ* Leach Facility, License No. SUA–1534, Wellfield #1 Restoration Acceptance.” Letter (February 12) and Attachments from D. Gillen to M.L. Griffin. ML03044055. Washington, DC: NRC. 2003a.

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

NRC. NUREG–1748, “Environmental Review Guidance for Licensing Actions Associated With NMSS Programs.” Washington, DC: NRC. August 2003c.

Powertech [Powertech (USA) Inc.]. “Dewey-Burdock Project Emissions Inventory Revisions.” Email (July 31) from R. Blubaugh to Bradley Werling, Southwest Research Institute®, San Antonio, Texas. ML12216A220. Greenwood Village, Colorado: Powertech. 2012.

Powertech. “Dewey-Burdock Project, Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota, Technical Report RAI Responses, June, 2011.” ML112071064. Greenwood Village, Colorado: Powertech. 2011.

Powertech. “Dewey-Burdock Project, Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota—Environmental Report.” Docket No. 040-09075. ML092870160. Greenwood Village, Colorado: Powertech. August 2009a.

SDDENR (South Dakota Department of Environment and Natural Resources). “SDDENR Review of Powertech’s Air Quality Application Submitted on November 5, 2012 for Its Proposed Operations in Edgemont, South Dakota.” Letter (February 21) from K. Gestring, Natural Resources Engineer, SDDENR to R. Blubaugh, Vice President, Environmental Health and Safety Resources, Powertech (USA) Inc. Vermillion, South Dakota: SDDENR. 2013.

## **E5.5 Purpose, Need, and Scope of the Supplemental Environmental Impact Statement**

### **Comment: 053-000004**

The commenter noted that there isn’t a shortage of uranium and the demand for uranium is not growing since so few new nuclear power plants are planned or being built. The commenter stated that the U.S. does not need this additional mine which will only damage an important way of life.

**Response:** *As a regulatory agency, the proposed federal action for the proposed Dewey-Burdock ISR Project is the NRC decision of whether to grant or deny a source materials license to authorize Powertech to construct and operate an ISR facility. If NRC decides to grant the license request, the applicant must comply with NRC’s regulatory requirements as specified in the license, and any other relevant local, state or federal requirements. The NRC’s licensing decision is based on its safety evaluation review and environmental review of a license application. The applicant makes the business decision about whether there will be a market for*

*the uranium. As part of its licensing decision, the NRC staff does not analyze the market conditions or business decisions of the entity submitting a license request.*

*NRC acknowledges that uranium recovery activities may impact individuals who live, work, or recreate in and around the proposed Dewey-Burdock ISR Project site. The environmental review documented in the final SEIS addresses potential environmental impacts covering a variety of resource areas that can affect individuals.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comment: 091-000003**

The commenter stated that the applicant should clearly identify the corporate licensee for this project and justify the need for this project in light of the current moratorium on the licensing of new nuclear power plants following the 2011 Fukushima nuclear disaster in Japan.

**Response:** *As stated in Section 1.2.2 of the environmental report, Powertech (USA) Inc. is the wholly owned United States subsidiary of Powertech (USA) Uranium Corporation, a Canadian registered company based in Vancouver, British Columbia (Powertech, 2009). If NRC decides to grant the license request, the applicant, Powertech (USA) Inc., would hold the source materials license. The applicant must comply with NRC's regulatory requirements as specified in the license, and any other relevant local, state, or federal requirements to operate its facility.*

*The statement of purpose and need is found in SEIS Section 1.3 and is derived from the proposed federal action. As a regulatory agency, the proposed federal action is NRC's decision whether to grant or deny a private party's license application to conduct ISR operations to extract uranium and produce yellowcake at a particular site. As part of its licensing decision, the NRC staff does not analyze the market conditions or business decisions of the entity submitting a license request.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comment: 092-000005**

The commenter stated that when an agency decides to have only one "action alternative," it is quite often because the "purpose and need" is too narrow. The commenter noted that the draft SEIS states that the range of alternatives was determined by considering the purpose and need for the proposed action and the private party's objective in extracting uranium from a particular orebody. The commenter stated that an agency's choice to limit the range of alternatives studied in detail to one "action alternative" is therefore blamed on the "purpose and need" combined with the private party's objective. The commenter believes the agency wrongly interpreted the "purpose and need" of this draft SEIS to just be to propose the plan of the license application and the submitted Plan of Operations (which the commenter assumes is tiered to the license application). The commenter stated that one obvious way for an agency to slip past the strictures of NEPA is to contrive a purpose so slender as to define competing 'reasonable alternatives' out of consideration (and even out of existence).

**Response:** *NEPA requires Federal agencies to consider alternatives to their proposed federal actions and assess their environmental impacts. The statement of the purpose and need is found in SEIS Section 1.3 and is derived from the proposed federal action. Under the AEA,*

*NRC has statutory authority to issue licenses for the possession and use of AEA-regulated radioactive materials and particular activities involving this material. Based on its statutory authority, the proposed federal action is NRC's decision whether to grant or deny a source materials license that will allow Powertech to construct and operate an ISR facility. The purpose and need for the proposed federal action does consider the applicant's goals and objectives to extract uranium from a particular location, which helps define reasonable alternatives to the proposed federal action. As a result, NRC limited its detailed analysis to alternatives to accomplishing the objective of extracting uranium from the applicant's proposed site location, the No-Action alternative, and alternative liquid waste disposal options.*

*The alternatives to the proposed action are discussed in SEIS Section 2.1. SEIS Section 2.1.2 describes the No-Action alternative (i.e., denial of the license application). SEIS Section 2.2 provides a discussion of alternatives that were considered but were eliminated from detailed review and the reasons for their elimination. These alternatives were eliminated from detailed review because they either would not meet the purpose and need of the proposed project or would cause greater environmental impacts than the proposed action. SEIS Section 2.1.1.2 discusses alternative liquid waste disposal options. SEIS Section 4.14.1 discusses the impacts from alternative liquid waste disposal options.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comments: 104-000006; 120-000004**

The commenter stated that the SEIS covers only part of the project area, the impacts are large to the total affected area, and the SEIS must expand its scope.

**Response:** *The scope of the SEIS is described in SEIS Section 1.4. NRC staff prepared this SEIS to analyze the potential environmental impacts (i.e., direct, indirect, and cumulative impacts) of the proposed federal action and of reasonable alternatives to the proposed federal action. The scope of this SEIS considers both radiological and nonradiological (including chemical) impacts associated with the proposed action and its alternatives. This SEIS also considers unavoidable adverse environmental impacts, the relationship between short-term uses of the environment and long-term productivity, and irreversible and irretrievable commitments of resources.*

*In analyzing the potential environmental impacts of the proposed Dewey-Burdock ISR Project in SEIS Chapter 4, NRC considered not only the 4,282-ha [10,580-ac]-permit area, but depending on the specific resource area being analyzed, potentially affected areas outside the permit area. For example, the magnitude of transportation impacts from proposed construction activities was not only analyzed for local roads but for regional highways in the broader area of the proposed project site (see SEIS Section 4.3.1.1.1).*

*No change was made to the SEIS beyond the information provided in this response.*

**Comment: 117-000001**

A commenter questioned what would happen with the recovered uranium.

**Response:** *As described in SEIS Section 2.1.1.1.3.2.2, the applicant plans to convert the recovered uranium into yellowcake and ship it to licensed uranium conversion facilities for*

*further processing into fuel for commercial nuclear reactors. Conversion facilities are currently located in Metropolis, Illinois and Port Hope, Ontario, Canada.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comment: 124-000002**

The commenter opposed the proposed project due to the connected action of radioactive waste disposal. The commenter stated that when you dig the material up and use it, you will eventually have to dispose of it as radioactive waste. The commenter pointed out that America and other nations have not yet found a solution to radioactive waste disposal and the federal Government spends tax dollars storing radioactive waste as it searches for a solution. The commenter stated that “final” disposal and interim containment of “post consumer” radioactive waste needs to be discussed as a connected action and cumulative impact.

**Response:** *NRC acknowledges that the Federal Government and other nations are working on solutions for disposal of spent fuel and high-level waste generated at commercial nuclear power plants. Information on storage and disposal of radioactive waste can be found on the NRC website (<http://www.nrc.gov/waste.html>). NRC considers the final disposal and interim storage of spent fuel generated at commercial nuclear power plants to be beyond the scope of this SEIS. The scope of the SEIS is described in SEIS Section 1.4. NRC staff prepared this SEIS to analyze the potential environmental impacts (i.e., direct, indirect, and cumulative impacts) of the proposed action and of reasonable alternatives to the proposed action. The scope of this SEIS considers both radiological and nonradiological (including chemical) impacts associated with the proposed action and its alternatives. This SEIS also considers unavoidable adverse environmental impacts, the relationship between short-term uses of the environment and long-term productivity, and irreversible and irretrievable commitments of resources.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comment: 126-000012**

The commenter pointed out that the Executive Summary of the SEIS states that the project purpose and need for the proposed federal action is “to either grant or deny the applicant a license to use ISR technology to recover uranium and produce yellowcake at the proposed project.” The commenter then noted that SEIS Section 1.3 states that “The purpose and need for the proposed federal action is to provide an option that allows the applicant to recover uranium and produce yellowcake slurry at the proposed project site.” The commenter noted that these two statements are slightly different and it is unclear why the difference is presented; are there different impacts with production or transportation of yellowcake slurry versus yellowcake?

**Response:** *The NRC acknowledges the comment and recognizes that there is an error in the text. As described in SEIS Section 2.1.1.1.3.2.3, yellowcake slurry will be processed and dried to create the final product “yellowcake.” SEIS Section 1.3 should read as follows: “The purpose and need for the proposed action is to provide an option that allows the applicant to recover uranium and to produce yellowcake at the proposed Dewey-Burdock ISR Project site.”*

*SEIS Section 1.3 was revised to make the necessary corrections to the text.*



**Comment: 136-000014**

The commenter stated the Dewey-Burdock ISR Project is a speculative proposal that is uneconomical and will bring little benefit to the communities who bear its burdens. The commenter pointed out that the area's dominant industry is agriculture, which relies on clean ground water supplies to support livestock and produce crops. The commenter noted that the Black Hills and National Grasslands in proximity to the site provide recreational and tourist opportunities that are significant economic contributors to the region; these opportunities and activities are negatively impacted by the presence of uranium mining facilities. The commenter noted further that the uranium yellowcake market has been in a severe price depression since 1980 that shows little sign of abating and production activities in the United States have been reducing, not increasing, in the past year. The commenter stated that the domestic market is already adequately supplied by current production and controlled releases of the national stockpile by the U.S. Department of Energy.

**Response:** *The NRC staff evaluation of the costs and benefits of the proposed project are provided in SEIS Chapter 8. NRC staff anticipates that the proposed project will have a SMALL to MODERATE overall economic impact on the region of influence and will generate primarily regional and local benefits and costs. The benefits are increased employment opportunities and increased economic activity that will add to tax revenues. Social and economic costs associated with the proposed project are expected to be limited to communities within commuting distance of the site. Projected population growth is expected to have a SMALL impact on education infrastructure and health and social services. In the case of housing, the anticipated impact may be MODERATE for small towns such as Edgemont. For larger towns such as Hot Springs, Custer, and Newcastle, which have more available housing, the impact is expected to be SMALL.*

*As described in SEIS Section 3.2.1, land use within the proposed project area and adjacent lands is primarily agricultural, mainly for grazing cattle. No commercial crop production takes place within the proposed project area. The NRC staff evaluation of the impacts on groundwater resources is provided in SEIS Section 4.5.2. As described in SEIS Section 4.5.2.1.1.2.2, the applicant will remove all stock wells within 0.4 km [0.25 mi] of any wellfield from private use prior to operation of the wellfield. Furthermore, the applicant will remove stock wells from private use that could be adversely impacted by or could adversely impact ISR operations. The applicant will also assume control of all wells used for monitoring within the project area boundary and secure the wellheads to prevent unauthorized use. During operations, the applicant will monitor all stock wells within the project area (Powertech, 2011). In the event of significant drawdown or degradation of water quality in these wells, the applicant will provide alternative sources of water (e.g., a replacement well) to the well owner (Powertech, 2009a, 2011).*

*NRC recognizes that the Black Hills and the Buffalo Gap National Grasslands are in proximity to the proposed project site (see SEIS Section 3.2.2). As described in SEIS Section 4.8.1, NRC staff concluded that construction activities will have only SMALL and temporary noise impacts on these recreational areas because of decreasing noise levels with distance. Furthermore, as described in SEIS Section 4.10.1, the visual and scenic impacts at the proposed project will be consistent with the predominant Visual Resource Management (VRM) Class III and IV designations for the Nebraska-South Dakota-Wyoming Milling Region (BLM, 2000; NRC, 2009). Construction of above ground structures will consider topography to conceal plant facilities and infrastructure and mitigation measures (e.g., water application to control fugitive dust) will be*

*implemented to reduce impacts to visual and scenic resources (Powertech, 2009a). Therefore, NRC staff concluded that visual and scenic impacts from ISR facilities and equipment at the proposed project will be SMALL (see SEIS Section 4.10.1).*

*With regard to fluctuations in the uranium market and the adequacy of current uranium production for domestic needs, NRC's federal action for the proposed Dewey-Burdock ISR Project is the decision of whether to grant or deny the applicant license request. As part of that licensing decision, NRC does not analyze the market conditions or business decisions of the entity submitting a license request. As such, NRC has no role in a company's business decision to submit a license application to operate an ISR facility at a particular location to extract uranium from a particular orebody.*

*No change was made to the SEIS beyond the information provided in this response.*

### **E5.5.1 References**

BLM (U.S. Bureau of Land Management). "Newcastle Resource Management Plan." ML12209A101. Newcastle, Wyoming: BLM, Newcastle Field Office. 2000.

NRC (U.S. Nuclear Regulatory Commission). NUREG-1910, "Generic Environmental Impact Statement for *In-Situ* Leach Uranium Milling Facilities." ML091480244, ML091480188. Washington, DC: NRC. May 2009.

Powertech [Powertech (USA), Inc.]. "Dewey-Burdock Project, Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota—Environmental Report." Docket No. 040-09075. ML092870160. Greenwood Village, Colorado: Powertech. August 2009a.

Powertech. "Dewey-Burdock Project, Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota, Technical Report RAI Responses, June, 2011." ML112071064. Greenwood Village, Colorado: Powertech. 2011.

### **E5.6 Relationship to the Generic Environmental Impact Statement**

#### **Comment: 061-000004**

The commenter stated that the use of the GEIS for a specific location is not appropriate. The commenter noted that this is particularly the case at the Dewey-Burdock site, where the geology is not "average." The site is at the edge of a major uplift, with complex geology that is not fully understood. Formations that are underground on some portions of the site are above-ground on others. There are faults on either side of the project area. Breccia pipes are common in the area, and it is not possible for the applicant to completely rule out their presence in the project area. There are 4,000 old exploration holes, and some of them are leaking above ground. Past research indicates hydrological connections between aquifers in the immediate area due to past drilling and/or inadequate aquitard. The commenter stated that all geological data should be reviewed by an independent third party, and additional studies should be done, as indicated, before this project is considered further. Public hearings should be held that are specific to the unique issues presented by this proposed project.

**Response:** *As discussed in SEIS Section 1.4.1, the NRC staff prepared the Dewey-Burdock draft SEIS consistent with its regulations under 10 CFR Part 51 that implement NEPA and its guidance for conducting environmental reviews as found in NUREG–1748 (NRC, 2003). In addition, the GEIS provides a starting point for NRC NEPA analyses for site-specific license applications for new ISR facilities, such as the Powertech application for the proposed Dewey-Burdock ISR Project. This SEIS tiers and incorporates by reference from the GEIS relevant information, findings, and conclusions concerning potential environmental impacts.*

*The NRC site-specific analysis of the potential environmental impacts to geology and soils is found in SEIS Section 4.4, which considers site-specific information provided in the license application. The site-specific analysis determined that, for the proposed Dewey-Burdock ISR Project, the significance of potential impacts is expected to be SMALL. The site-specific determination draws on the evaluation found in GEIS Section 4.4.3 and NRC’s independent review of site-specific information provided in the license application documents (Powertech, 2009a–c) and applicant responses to NRC requests for additional information (Powertech, 2010a,b, 2011).*

*Regarding the hydrogeological issues raised in the comment, hydraulic communication (i.e., leakage) between the Fall River and Chilson aquifers through the intervening Fuson Shale in the Burdock area has been identified based on aquifer pumping tests and potentiometric surface differences (see SEIS Section 3.5.3.2). The applicant developed a numerical groundwater model using site-specific geologic and hydrologic information (Petrotek, 2012). Based on results of the numerical model, the applicant concluded that vertical leakage through the Fuson Shale is caused by improperly installed wells or improperly abandoned boreholes. NRC staff reviewed the applicant’s numerical groundwater model and calibration, and it determined that the model was appropriately developed and sufficiently calibrated. As discussed in SEIS Section 4.5.2.1.1.2.2, the applicant has committed to locating unknown boreholes and wells, and committed to plugging and abandoning historical wells and exploration holes, holes drilled by the applicant, and any wells that fail mechanical integrity tests (Powertech, 2011).*

*Furthermore, NRC staff consulted with multiple federal, tribal, state, and local agencies and/or entities during the preparation of the Dewey-Burdock draft SEIS to gather information on issues, concerns, and environmental impacts related to the proposed project. The NRC also sought public input through advertisements in six newspapers circulated near the proposed project site (Rapid City Journal, Edgemont Herald Tribune, Custer Chronicle, Hot Springs Star, Lakota Country Times, and the Native Sun) soliciting public comments on the proposed action; five comments were received from this effort.*

*No changes were made to the SEIS beyond the information provided in this response.*

**Comment: 127-000029**

The commenter pointed out that at the time the GEIS was issued substantial critical public comments regarding the process for the GEIS were lodged. The commenter stated that NRC appears to not have taken up a discussion of any of the critiques offered on that document. As such, reliance on the GEIS is not warranted. Because the GEIS itself did not comply with NEPA, both in process and in substance, it cannot be relied upon in this SEIS. The commenter stated that NRC must fully review the comments submitted on the GEIS and assess how those comments affect this SEIS. Failure to do so allows the agency to rely on the GEIS without

compliance with NEPA—a violation of NEPA that carries forward to the SEIS for the Dewey-Burdock proposal.

**Response:** *Both the GEIS and the Dewey-Burdock SEIS were prepared in accordance with NRC guidance in NUREG—1748 (NRC, 2003) and are consistent with NRC NEPA-implementing regulations at 10 CFR Part 51. The Dewey-Burdock ISR SEIS tiers and incorporates by reference from the GEIS relevant information, findings, and conclusions concerning potential environmental impacts as allowed by NRC NEPA-implementing regulations in 10 CFR Part 51.*

*No changes were made to the SEIS beyond the information provided in this response.*

**Comment: 128-000007**

The commenter suggested including a table (similar to Table 1.4-1) in order to compare the potential impacts in the SEIS with those evaluated for a typical ISR facility in the GEIS for each resource area.

**Response:** *In Chapter 4 of the SEIS, the potential impacts from construction, operations, aquifer restoration, and decommissioning of a typical ISR facility are summarized for each resource area in introductory GEIS phase summaries (NRC, 2009). Tables at the end of each resource area impact analysis in Chapter 4 of the SEIS summarize the potential impacts for each phase of the proposed project, which can be compared to the potential impacts described in the introductory GEIS phase summaries. No change was made to the SEIS beyond the information provided in this response.*

**Comment: 128-000027**

The commenter stated that SEIS Section 1.4.1 should emphasize that “tiering” is acceptable under CEQ regulations as well as NRC regulations. The commenter noted that this has been a source of controversy with interested stakeholders in the past and typically from opposition groups that do not support the use of the GEIS. The commenter stated that NRC staff should maintain its position on “tiering” as embodied in these regulations.

**Response:** *As discussed in SEIS Section 1.4.1, the GEIS provides a starting point for the NRC NEPA analyses for site-specific license applications for new ISR facilities. The Dewey-Burdock ISR Project SEIS tiers and incorporates by reference from the GEIS relevant information, findings, and conclusions concerning potential environmental impacts as allowed by NRC NEPA-implementing regulations in 10 CFR Part 51, Subpart A. As stated in GEIS Section 1.8, tiering (defined in 40 CFR 1508.28) is a procedure by which more specific or more narrowly focused environmental documents can be prepared without duplicating relevant parts of previously prepared, more general, or broader documents.*

*Because the comment was general in nature, no change was made to the SEIS beyond the information provided in this response.*

**Comment: 136-000008**

The commenter stated that NRC's 2009 GEIS for *in-situ* leach mining fails to provide a sound basis for developing the Dewey-Burdock SEIS. As context the commenter stated that the GEIS

has a number of significant flaws, including the lack of adequate alternatives analysis as required by NEPA, as well as an absence of investigation and analysis of the cumulative impacts of *in-situ* uranium mining. The commenter stated that the GEIS should be withdrawn and NRC should not consider a site-specific proposal that relies upon the GEIS as a foundational analysis. Impacts from *in-situ* uranium mining that are not properly considered in the GEIS include the reliable regularity of groundwater excursions that result in toxic and radioactive releases at *in-situ* operations; the prevalence of surface and pipeline spills and leaks; the inability of monitoring wells to detect excursions; the difficult obstacles that prevent successful remediation of excursions; the failure of ISL operations to restore aquifers to baseline conditions; the reliance upon alternative or relaxed water quality standards during reclamation and compliance periods; the lack of consideration of how contemporary mining activities are exacerbated by the legacy of problems from historic mining activities; and the long-lasting and permanent impacts to the drinking and agricultural water supplies; among others. The commenter added that the failure of federal and state agencies to adequately monitor, regulate and prevent these problems from recurring, again and again, is also a highly relevant issue that must be taken into consideration in any analysis. The commenter stated that both the GEIS and the Dewey-Burdock SEIS ignore our collective, national history of outright failure with in-situ uranium mining technologies and that the only reasonable decision that can emerge from this review must be informed by this history of failure.

**Response:** *NRC recognizes that some commenters object to certain analyses in either the GEIS or the Dewey-Burdock SEIS. As background, NRC held a 103-day public comment period for the draft GEIS from July 28, 2008 through November 7, 2008, at which time members of the public were invited to provide comments; this included eight public scoping meetings (NRC, 2009). NRC considered and responded to comments received on the draft GEIS in GEIS Appendix G [see Notice of Availability (NOA) published in the Federal Register on June 5, 2009 (74 FR 27052)]. Therefore, comments on the GEIS are beyond the scope of the proposed Dewey-Burdock ISR Project SEIS.*

*NRC evaluated historical information on ISR operations the NRC licensed (see GEIS Section 2.11) and considered this historical information to assess the potential environmental impacts from the construction, operation, aquifer restoration, and decommissioning of an ISR facility in specific geographic regions of the western United States. The Nebraska-South Dakota-Wyoming Uranium Milling Region, where the proposed Dewey-Burdock ISR Project would be located, is in one of these geographic regions (see GEIS Section 4.4).*

*As described in SEIS Section 1.4.1, this SEIS was prepared to fulfill the requirement under 10 CFR 51.20(b)(8) to prepare either an EIS or a supplement to an EIS for the issuance of a source material license for a uranium ISR facility. This SEIS supplements the GEIS, which provided a starting point for the NRC's NEPA analysis (documented here) of the applicant's license application for the proposed Dewey-Burdock ISR Project. The NRC site-specific NEPA analysis used detailed information and descriptions of the proposed ISR facility and activities, and the description of the affected environment at the site and vicinity as contained in the applicant's license application and other relevant sources (Powertech, 2009a–c, 2010a,b, 2011). For each of the resource areas evaluated in the SEIS, the NRC staff reviewed the information the applicant provided, validated the information as appropriate, and evaluated the impact to the environment in the SEIS.*

*No changes were made to the SEIS beyond the information provided in this response.*

### **E5.6.1           References**

10 CFR Part 51. *Code of Federal Regulations*, Title 10, *Energy*, Part 51. “Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions.” Washington, DC: U.S. Government Printing Office.

40 CFR Part 1508. *Code of Federal Regulations*, Title 40, *Protection of Environment*, Part 1508. “Terminology and Index.” Washington, DC: U.S. Government Printing Office.

74 FR 27052. *Federal Register*, Vol. 74, No. 107, p. 27052-27054. “Notice of Availability of Final Generic Environmental Impact Statement for *In-Situ* Leach Uranium Milling Facilities.” June 5, 2009.

NRC (U.S. Nuclear Regulatory Commission). NUREG–1910, “Generic Environmental Impact Statement for *In-Situ* Leach Uranium Milling Facilities.” ML091480244, ML091480188. Washington, DC: NRC. May 2009.

NRC. NUREG–1748, “Environmental Review Guidance for Licensing Actions Associated With NMSS Programs—Final Report.” Washington, DC: NRC. August 2003.

Petrotek (Engineering Corporation). “Numerical Modeling of Hydrogeologic Conditions, Dewey-Burdock Project, South Dakota.” ML12062A096. Littleton, Colorado: Petrotek. February 2012.

Powertech [Powertech (USA) Inc.]. “Dewey-Burdock Project, Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota, Technical Report RAI Responses, June, 2011.” ML112071064. Greenwood Village, Colorado: Powertech. 2011.

Powertech. “Dewey-Burdock Project, Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota ER\_RAI Response August 11, 2010.” ML102380516. Greenwood Village, Colorado: Powertech. 2010a.

Powertech. “Powertech (USA) Inc.’s Response to the NRC Staff’s Requests for Additional Information Concerning the Dewey-Burdock Project, Custer and Fall River Counties, South Dakota. ML110030730 Package. Greenwood Village, Colorado: Powertech. 2010b.

Powertech. “Dewey-Burdock Project, Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota—Environmental Report.” Docket No. 040-09075. ML092870160. Greenwood Village, Colorado: Powertech. August 2009a.

Powertech. “Dewey-Burdock Project, Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota—Technical Report.” Docket No. 040-09075. ML092870160. Greenwood Village, Colorado: Powertech. August 2009b.

Powertech. “Dewey-Burdock Project, Supplement to Application for NRC Uranium Recovery License Dated February 2009.” Docket No. 040-09075. ML092870160. Greenwood Village, Colorado: Powertech. August 2009c.

## **E5.7 Structure of the Supplemental Environmental Impact Statement**

### **Comment: 116-000001**

The commenter stated that, throughout the SEIS, the NRC makes reference to the Powertech application without providing a specific citation to the page or section of the referenced document; for example, “Powertech 2011.” The commenter noted that Powertech 2011 is hundreds of pages, making it almost impossible for a commenter to determine the source of the referenced material.

**Response:** *The NRC staff prepared the SEIS consistent with the NRC Editorial Style Guide NUREG–1379 (NRC, 2009). The staff followed NUREG–1379 guidance for identifying references in the text (see Editorial Style Guide, p. 41). Powertech’s submittals for the proposed action, which are available on the NRC website, contain tables of contents that can be used to identify sections and pages of the submittals where information referenced in the draft SEIS can be found. For example, if information concerning groundwater in Powertech, 2011 is referenced in the draft SEIS, this information is likely to be found in sections of the referenced document dealing with hydrology (e.g., surface water and groundwater), and the table of contents in the referenced document can be used to identify pages where the information may be found. No changes were made to the final SEIS beyond the response to this comment.*

### **Comments: 116-000003; 127-000001**

One commenter stated that the NRC staff’s use of citations to materials incorporated by reference into the draft SEIS is inadequate to justify the scientific conclusions presented. For example, for reference after reference, the document simply refers to “Powertech 2011” as a source for fundamental conclusions upon which the draft SEIS analysis is premised. The commenter stated many more examples exist throughout the entire draft SEIS where it is impossible to identify and assess the referenced materials. The commenter noted the generic citation to “Powertech 2011” is meaningless without more description and detail of where the information is contained in the document. The commenter pointed out that the Powertech 2011 submittal itself is made up of some 5,000 pages of documents. The commenter stated this problem exists with regard to the NRC’s reliance on other Powertech submittals as well, including those referenced as “Powertech 2009” and “Powertech 2010” among others. The commenter stated this lack of any specificity makes it virtually impossible to find the precise basis for conclusions made in the draft SEIS. Another commenter stated that the NRC website with a link to the Application Documents only leads to a list of the 2009 application documents. The commenter pointed out that in order to access subsequent application documents, one must search ADAMS, making public access to the application that much harder.

**Response:** *NRC staff followed guidance in NUREG–1379 Rev. 2 (NRC, 2009, NRC Editorial Style Guide) to identify references in the text. The style of referencing used in the draft SEIS is no different from the style of referencing in other EISs prepared by NRC or other federal agencies, such as BLM or EPA. NRC staff does not agree with the commenter that generic citations such as “Powertech, 2011” are meaningless without more description and detail of where the information is contained in the document. Powertech’s submittals for the proposed action, which are available on the NRC website, contain tables of contents that can be used to identify sections and pages of the submittals where information referenced in the draft SEIS can be found. For example, if information concerning groundwater in Powertech, 2011 is referenced*



*in the draft SEIS, this information is likely to be found in sections of the referenced document dealing with hydrology (e.g., surface water and groundwater), and the table of contents in the referenced document can be used to identify pages where the information may be found.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comment: 116-000034**

The commenter stated that the SEIS is an unnecessarily lengthy document, with much redundant information. The commenter stated it would have been better if all information regarding impacts related to each of the waste disposal alternatives were in the same section, rather than spread out in several sections.

**Response:** *NRC recognizes that the SEIS is a lengthy document. The NRC staff considered discussing the impact of waste disposal options in one section; however, due to the complexity of the subject matter, the staff elected to present the material separately to ensure the public can clearly follow and understand the impacts associated with each waste disposal method.*

*No changes were made to the final SEIS beyond the responses to this comment.*

**E5.7.1 Reference**

NRC (U.S. Nuclear Regulatory Commission). NUREG–1379, Rev. 2, “NRC Editorial Style Guide.” Washington, DC: NRC. May 2009.

**E5.8 Public Involvement**

**Comments: 034-000001; 056-000003; 061-000005; 067-000002; 081-000002; 081-000006; 091-000020; 104-000005; 129-000006**

Several commenters requested that public hearings be held. Two commenters requested that public meetings be held in the Black Hills so that members of the public can be fully informed on the project. One commenter stated that since all ponds, including radium settling ponds and areas where wastewater is applied to the land are threats to wildlife, particularly birds, it is critical that the NRC move slowly with ample public hearings in which company officials be clear and straightforward about the dangers present with *in-situ* leach uranium mining. Another commenter noted that the proposed project deserves more care and public awareness and participation before decisions are made that may directly affect the health of so many. One commenter stated that public hearings in the area have not been well advertised and questioned industry spokespersons who have represented the project as safe, simple, and regulated. Another commenter requested that public meetings be held to discuss planning for extreme weather events, including stormwater management plans, due to global climate changes. Another commenter stated that NRC has acted to reduce, rather than encourage, public input.

**Response:** *NRC recognizes that public participation is an essential part of the NEPA process. The public participation process for the Dewey-Burdock ISR SEIS is described in SEIS Section 1.4.2. This section indicates that a Notice of Opportunity to request a hearing on the proposed Dewey-Burdock ISR Project was published in the Federal Register on*

*January 5, 2010 (75 FR 467). Additionally, in January and February 2010, the NRC staff published an advertisement in six newspapers circulated near the proposed project area (Rapid City Journal, Edgemont Herald Tribune, Custer Chronicle, Hot Springs Star, Lakota County Times, and the Native Sun) soliciting public comments on the proposed action. In addition to the opportunities provided through development of the SEIS, NRC provided opportunities for public input during the NRC staff's safety review. Specifically, the NRC staff held six meetings or teleconferences with the applicant from 2008-2012; all of these interactions included an opportunity for the public to listen to the meetings and to ask questions.*

*Furthermore, NRC staff consulted with multiple federal, tribal, state, and local agencies and/or environmental entities during the preparation of the Dewey-Burdock ISR SEIS for consultation purposes and to gather information on issues, concerns, and environmental impacts related to the proposed Dewey-Burdock ISR Project (see SEIS Section 1.7.3).*

*NRC acknowledges that uranium recovery activities may impact individuals and wildlife in and around the proposed Dewey-Burdock ISR Project site. If NRC decides to grant the license request, the applicant must comply with NRC's requirements as specified in the license, and any other relevant local, state, or federal requirements to operate its facility. Compliance with NRC license conditions and relevant local, state and federal requirements ensures that the proposed project will be operated in a manner that is safe to public health and the environment. The environmental review documented in the SEIS addresses potential environmental impacts covering a variety of resource areas that can affect individuals and wildlife.*

*As described previously, NRC has provided multiple avenues for public involvement in its licensing process. No change was made to the SEIS beyond the information provided in this response.*

**Comments: 045-000007; 048-000009**

Two commenters stated that public hearings should be held after full information is available on the proposed project. One commenter stated that hearings held elsewhere during the writing of the NRC's GEIS are not adequate to this specific project.

**Response:** *NRC conducted a public scoping process for the GEIS, from which the Dewey-Burdock SEIS is tiered (NRC, 2009). The scoping process was used to identify significant issues to be studied in depth in the GEIS to help evaluate the environmental impacts on various resource areas and to identify other regulatory and consultation requirements for ISR facilities. NRC considers the GEIS to be a final environmental impact statement and the environmental review for a specific license application a supplement to the GEIS.*

*As discussed in SEIS Section 1.4.1, the GEIS provides a starting point for the NEPA analyses for site-specific license applications for new ISR facilities. The Dewey-Burdock SEIS tiers and incorporates by reference from the GEIS relevant information, findings, and conclusions concerning potential environmental impacts. This approach is consistent with the NRC's NEPA-implementing regulations in 10 CFR Part 51, Subpart A.*

*As described in the response to previous comments (034-000001; 056-000003; 061-000005; 067-000002; 081-000002; 081-000006; 091-000020; 104-000005; 129-000006), NRC has provided multiple avenues for public involvement in its licensing process.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comment: 091-000002**

The commenter stated that local public meetings should be held once all the necessary background information has been made available to the public in an accessible format.

**Response:** *In the NRC license review process, when an application is received, reviewed for completeness, and accepted for detailed review, NRC formally docket the application and publishes a NOA in the Federal Register, which announces the availability of the application and provides an opportunity for affected individuals or entities to request a hearing under the NRC formal hearing process. SEIS Section 1.4.2 indicates that a Notice of Opportunity to request a hearing on the proposed Dewey-Burdock ISR project was published in the Federal Register on January 5, 2010 (75 FR 467). NRC also published a Notice of Intent to prepare the SEIS on January 20, 2010 (75 FR 3261). The notices published in the Federal Register include the relevant identifying information for the license application so that an interested member of the public can view the application either electronically through NRC's ADAMS or in person by visiting the NRC Public Document Room.*

*As described in the response to previous comments (034-000001; 056-000003; 061-000005; 067-000002; 081-000002; 081-000006; 091-000020; 104-000005; 129-000006), NRC has provided multiple avenues for public involvement in its licensing process.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comment: 092-000002**

The commenter noted that it had sent in scoping comments on the GEIS and then reviewed the draft GEIS, about 4 years ago in November of 2008. The commenter stated that our address is in South Dakota where the activity takes place but that they did not remember seeing any notice in the postal mail in November, announcing the availability of the draft SEIS and heard about it from third parties. The commenter questioned the NRC notification procedures (e.g., whether NRC sends postal or email notices of the availability of supplements to folks who commented on the draft GEIS and who live in the state of the project). The commenter wanted to know if the Prairie Hills Audubon Society was sent a postal or e-mail notice. The commenter stated that if this was not done, this is another reason to give an extension—as obviously interested parties had to hear about it in a roundabout manner.

**Response:** *The GEIS, from which the Dewey-Burdock ISR SEIS is tiered, conducted a separate public scoping process and considered public comments to identify the scope of the GEIS for ISR facilities. The public participation process for the Dewey-Burdock ISR SEIS is described in SEIS Section 1.4.2. This section indicates that a Notice of Opportunity to request a hearing on the proposed Dewey-Burdock ISR project was published in the Federal Register on January 5, 2010 (75 FR 467). NRC also published a Notice of Intent to prepare this SEIS on January 20, 2010 (75 FR 3261). Additionally, in January and February 2010, the NRC staff published an advertisement in six newspapers circulated near the proposed project area (Rapid City Journal, Edgemont Herald Tribune, Custer Chronicle, Hot Springs Star, Lakota County Times, and the Native Sun) soliciting public comments on the proposed action.*

*On November 26, 2012, the NRC staff published a NOA of the draft SEIS for the proposed Dewey-Burdock ISR Project in the Federal Register (77 FR 70486) (see SEIS Section E2.3). In this notice, the NRC staff provided information on how to access or obtain a copy of the draft SEIS. Electronic versions of the draft SEIS and supporting information were made available through the NRC Agencywide Documents Access and Management System (ADAMS), which is accessible through the NRC's website at (<http://www.nrc.gov/readingrm/adams.html>).*

*SEIS Chapter 11 lists federal, state, and local agency officials, tribal government officials, and other organizations and individuals that were directly provided copies of the draft SEIS by NRC. This list was compiled based on the interest expressed by these agencies, organizations, and individuals regarding the proposed project after the Notice of Opportunity to request a hearing and the Notice of Intent to prepare the SEIS were issued in the Federal Register. For example, hearing requests from Consolidated Petitioners were received after the Notice of Opportunity was published (see SEIS Sections 1.4.2 and 1.6.1). The Consolidated Petitioners were made up of several individuals and organizations, and these individuals and organizations were provided copies of the draft SEIS. However, the NRC did not directly provide copies of the draft SEIS to all agencies, organizations, or individuals who provided scoping comments on the GEIS or public comments on the draft GEIS.*

*NRC believes that it has provided adequate notification to the public on the availability of the draft SEIS. In addition, NRC accepted all public comments submitted on the draft SEIS over a 99-day comment period (November 26, 2012 to March 5, 2013). This comment period exceeded the required 45-day public comment period (November 26, 2012 to January 10, 2013) specified in the Notice of Availability of the draft SEIS (77 FR 70486) for agencies, organizations, and the general public to review the draft SEIS and provide comments.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comment: 128-000028**

The commenter requested that SEIS Section 1.4.2 (Public Participation Activities) should mention that a significant part of public participation activities for development of the SEIS includes the public scoping meetings and extensive written public comments accepted during development of the GEIS.

**Response:** *NRC staff acknowledges that the public participation activities for development of the Dewey-Burdock SEIS included the public scoping meetings and extensive written public comments accepted during development of the GEIS (NRC, 2009). As described in SEIS Section 1.4.1, NRC accepted public comments on the scope of the GEIS from July 24, 2007 to November 30, 2007, and held three public scoping meetings in Albuquerque and Gallup, New Mexico, and Casper, Wyoming. In addition, NRC held eight public meetings to solicit comments on the draft GEIS, after its publication in July 2008. Written comments on the draft GEIS were accepted from July 28, 2008 until November 8, 2008. The purpose of the public meetings and written comment period was to provide an opportunity for the public and other stakeholders to identify key issues and concerns they believed should be addressed in an EIS for ISR facilities located in four specific regions of the western United States. The proposed Dewey-Burdock ISR Project is located in the Nebraska-South Dakota-Wyoming Uranium Milling Region, one of the regions considered in the GEIS (NRC, 2009). Text was added to SEIS Section 1.4.2 to clarify that a significant part of public participation activities for development of*

*the SEIS includes the public scoping meetings and extensive written public comments accepted during development of the GEIS.*

## **E5.8.1           References**

10 CFR Part 51. *Code of Federal Regulations*, Title 10, *Energy*, Part 51. “Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions.” Washington, DC: U.S. Government Printing Office.

75 FR 467. *Federal Register*, Vol. 75, No. 2, p. 467–471. “Notice of Opportunity for Hearing, License Application Request of Powertech (USA) Inc. Dewey-Burdock *In-Situ* Uranium Recovery Facility in Fall River and Custer Counties, SD, and Order Imposing Procedures for Access to Sensitive Unclassified Non-Safeguards Information (SUNSI) for Contention Preparation.” January 5, 2010.

75 FR 3261. *Federal Register*, Vol. 75, No. 12, p. 3261–3262, “Powertech (USA) Inc., Dewey-Burdock Project, New Source Material License Application, Notice of Intent To Prepare a Supplemental Environmental Impact Statement.” January 20, 2010.

77 FR 70468, *Federal Register*, Vol. 77, No 227, p. 70468-70469. “Supplemental Environmental Impact Statement for Proposed Dewey-Burdock *In-Situ* Uranium Recovery Project in Custer and Fall River Counties, SD.” November 26, 2012.

NRC (U.S. Nuclear Regulatory Commission). NUREG–1910, “Generic Environmental Impact Statement for *In-Situ* Leach Uranium Milling Facilities.” ML091480244, ML091480188. Washington, DC: NRC. May 2009.

## **E5.9               Regulatory Issues and Process**

### **E5.9.1           U.S. Nuclear Regulatory Commission Policies and Practices**

**Comments: 061-000001; 092-000003; 116-000004; 127-000003**

Several commenters pointed out that the most recent version of the proposed Dewey-Burdock ISR Project source material license (SUA-1600) was not available for public review before the end of the draft SEIS comment period (January 10, 2013). One commenter stated that release of a new draft within days of the close of the comment period on the draft SEIS, without notice or public distribution, does not provide a reasonable opportunity for the public to review and comment. Some commenters stated that this draft license may include changes to the proposed project and render conclusions in the draft SEIS based on the draft license stale. The commenters stated that, if this is the case, the draft SEIS should be withdrawn and supplemented to match the new draft license.

**Response:** *The NRC staff issued a second draft license to Powertech on January 4, 2013 (NRC, 2013b). This draft license is a revision of the draft license the staff initially issued to Powertech on July 31, 2012 (NRC, 2012). A draft license serves to inform an applicant of potential license conditions, highlighting certain issues that the applicant must address prior to and during operations. The revised draft license documented information received from Powertech since July 2012. Those revisions were based on information that was publicly available through ADAMS, including the applicant’s “Supplemental Preconstruction and*

*Preoperational Sampling Plan” dated October 19, 2012 (Powertech, 2012). The changes to the draft license do not affect the conclusions in the draft SEIS.*

*Issuing a draft license to Powertech is consistent with the staff’s practice in other uranium recovery licensing proceedings. The NRC staff further notes that, as with other uranium recovery proceedings at the NRC, there is no public comment period on the revised draft license. At the same time, members of the public should always feel free to contact the NRC staff regarding documents it issues. NRC staff value this input, and will take it into account to the extent practicable.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comment: 116-000008**

The commenter pointed out the draft SEIS stated that wellfield pump tests data “would be used to evaluate and confirm hydraulic connection between the production zone and perimeter production zone monitor wells and hydraulic isolation (i.e., confinement) between the production zone and overlying and underlying sand units, and it would be used to demonstrate that solutions can be controlled with typical wellfield bleed rates and to detect and identify leakage due to anomalies such as improperly plugged wells and exploration boreholes.” The commenter noted this is important data that would be used to demonstrate the feasibility of the proposed ISL project in the various wellfields and to demonstrate that solutions can be controlled is currently not available and, when available, will not be submitted directly to the NRC, nor (according to the SEIS) will it be made available for public review. The data will be evaluated by the SERP established by the licensee. The commenter noted that according to the SEIS, the licensee will only be required to maintain the data on site and be available for NRC review. The commenter stated the NRC would be handing over regulation of significant aspects of the ISR operation to the licensee and making sure that significant data regarding the hydrogeology of the wellfields is not made publicly available.

**Response:** *The commenter is correct in stating that wellfield hydrogeologic data packages will not be made available for public review. However, by license condition, all wellfield data packages must be submitted to NRC for review prior to operating each wellfield (NRC, 2013b).*

*Historically, NRC reviewed and approved all wellfield data packages. However, current Commission policy allows the applicant to use an in-house SERP to review and evaluate wellfield data packages under performance-based license (PBL) conditions. The SERP is composed of at least three members: one with expertise in management, one with expertise in operations, and the third being the RSO. NRC staff, however, has determined that a new licensee with no record of performance must submit its first wellfield package to NRC for review and approval. After NRC approval of an initial wellfield package, a licensee would have a template on which to model future packages.*

*As described in SEIS Section 2.1.1.1.2.3.4, the SERP will review the wellfield hydrogeologic test results to determine whether monitoring wells are hydrologically connected to the injection and production wells. In addition, the wellfield test results will be used to demonstrate that ISR solutions can be controlled with typical bleed rates and to identify and detect leakage due to anomalies such as improperly plugged wells and exploration boreholes (Powertech, 2011). By license condition, all wellfield hydrogeologic data packages must be submitted to NRC for review prior to operating each wellfield (NRC, 2013b). The hydrogeologic test packages for the*

*initial Burdock and Dewey area wellfields (i.e., B-WF1 and D-WF1) will be submitted to NRC for review and written verification. In addition, wellfields in the partially saturated portion of the Dewey-Burdock Project area, specifically wellfields B-WF6, B-WF7, and B-WF8 (see SEIS Figure 2.1-6), will be prohibited from operating until NRC staff have reviewed and approved the hydrogeologic data packages for those wellfields (NRC, 2013b).*

*Although not all data were available at the time the draft SEIS was issued, in the draft SEIS the NRC staff describes the measures that will be taken to obtain additional data. The NRC also describes the reasonably foreseeable environmental impacts of the Dewey-Burdock ISR Project and the license conditions or other mitigation measures under which Powertech would operate. Accordingly, even though Powertech will need to submit additional information if a license is granted, the draft SEIS presented sufficient information to inform the public and the NRC of the Dewey-Burdock's ISR Project's environmental impacts. The staff's approach in the Dewey-Burdock SEIS is consistent with that taken in other NRC licensing actions, where in many cases the applicant needs to submit additional information after a license is granted.*

*Text was revised in SEIS Section 2.1.1.1.2.3.4 to clarify NRC license conditions with respect to review and approval of wellfield data packages at the proposed Dewey-Burdock ISR Project.*

**Comment: 116-000009**

The commenter stated that information in the SEIS regarding the review of the wellfield data by the SERP and maintenance of the data at the Dewey-Burdock site is contradicted by the draft license (SUA-1600) dated July 31, 2012 (NRC, 2012). The commenter noted that License Condition 10.10 specifically directs the licensee to submit the wellfield packages to the NRC prior to conducting principal activities at each new wellfield. The commenter stated the draft license contains additional specific information regarding the data that was not included in the SEIS and certain assumptions that might not conform to, or reflect, information in the 2012 or 2013 draft license. The commenter stated that information in the SEIS should reflect the information contained in current draft license SUA-1600 (NRC, 2013b), which is currently not publicly available, as part of this NEPA review process.

**Response:** *NRC staff has determined that a new licensee with no record of performance must submit its first wellfield package to NRC for review and approval. After NRC approval of an initial wellfield package, a licensee would have a template on which to model future packages. Therefore, the applicant would be required by License Condition 10.10 to submit initial wellfield packages to NRC for review and approval prior to a wellfield being placed in operation. In wellfields where particular geologic features or groundwater flow behavior require the characterization of local field data and testing to determine whether ISR operations can meet regulatory requirements, the NRC staff may require review and approval of additional wellfield packages.*

*As discussed in the response to the previous comments (061-000001; 092-000003; 116-000004; 127-000003), the draft license that was issued on January 4, 2013 (NRC, 2013b) was a revision to the draft license initially issued on July 31, 2012 (NRC, 2012). The revised draft license documented information received from Powertech since July 2012. Those revisions were based on information that was publicly available through ADAMS, including the applicant's "Supplemental Preconstruction and Preoperational Sampling Plan" dated October 19, 2012 (Powertech, 2012). The changes to the draft license do not affect the conclusions in the draft SEIS.*



*Issuing a draft license to Powertech is consistent with the staff's practice in other uranium recovery licensing proceedings. As with other uranium recovery proceedings at the NRC, there is no public comment period on the revised draft license. At the same time, members of the public should always feel free to contact the NRC staff regarding documents it issues. NRC staff value this input, and will take it into account to the extent practicable.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comment: 116-000006; 116-000010**

The commenter stated that the NRC and BLM do not have all the baseline data necessary to characterize and evaluate the relevant impacts related to wellfield characteristics such as depth of the mineralized zone and confining units, potential barriers to groundwater flow, and thickness and grade of the ore deposit. The commenter stated that at this time the SEIS can only be a preliminary environmental assessment because "data that would demonstrate that solutions can be controlled with typical wellfield bleed rates" and data that would "detect and identify leakage due to anomalies such as improperly plugged wells and exploration boreholes" has not been collected and submitted to the NRC. The commenter stated that without this data any assumptions regarding the impacts to the groundwater from the operation of the proposed ISL are speculative and without a factual basis. The commenter stated the NRC cannot demonstrate that the ISL solutions can be controlled and does not have the required scientific basis for issuance of the license. The commenter stated the NEPA process is incomplete without the availability of baseline information necessary to evaluate the potential environmental impacts.

**Response:** *Current NRC policy allows the applicant to use an in-house SERP to review and evaluate wellfield data packages under PBL conditions. Under these conditions, the applicant will conduct delineation drilling and pumping tests prior to operating a new wellfield. The applicant's delineation drilling results and pumping test data will be included in wellfield hydrogeologic data packages, which will be submitted for review and evaluation to the SERP, which is established by NRC requirements (Powertech, 2011).*

*As described in SEIS Section 2.1.1.1.2.3.4, the SERP will review the wellfield hydrogeologic test results to determine whether monitoring wells are hydrologically connected to the injection and production wells. In addition, the wellfield test results will be used to demonstrate that ISR solutions can be controlled with typical bleed rates and to identify and detect leakage due to anomalies such as improperly plugged wells and exploration boreholes (Powertech, 2011). By license condition, all wellfield hydrogeologic data packages must be submitted to NRC for review prior to operating each wellfield (NRC, 2013b). The hydrogeologic test packages for the initial Burdock and Dewey area wellfields (i.e., B-WF1 and D-WF1) will be submitted to NRC for review and written verification. In addition, wellfields in the partially saturated portion of the Dewey-Burdock Project area, specifically wellfields B-WF6, B-WF7, and B-WF8 (see SEIS Figure 2.1-6), will be prohibited from operating until NRC staff have reviewed and approved the hydrogeologic data packages for those wellfields (NRC, 2013b).*

*NRC staff has prepared the Dewey-Burdock SEIS consistent with its 10 CFR Part 51 regulations that implement NEPA and its guidance for conducting environmental reviews as found in NUREG-1748 (NRC, 2003a). In the draft SEIS, NRC describes the reasonably foreseeable environmental impacts of the Dewey-Burdock ISR Project and the license*

*conditions or other mitigation measures under which Powertech would operate. Although not all data were available at the time the draft SEIS was issued, in the draft SEIS the NRC staff describes the measures that will be taken to obtain additional data. Accordingly, even though Powertech will need to submit additional information if a license is granted, the draft SEIS presented sufficient information to inform the public and the NRC of the proposed project's environmental impacts. The staff's approach in the Dewey-Burdock SEIS is consistent with that taken in other NRC licensing actions, where in many cases the applicant needs to submit additional information after a license is granted.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comments: 119-000011; 128-000058**

One commenter pointed out that SEIS Section 2.1.1.1.5.2 states that wellfield decommissioning and surface reclamation would be initiated when the regulatory agencies concur the groundwater in a wellfield has been adequately restored. The commenter requested that the regulatory agencies required to review and approve the groundwater restoration data be listed. Another commenter requested clarification on the statement in SEIS Section 2.1.1.1.5.2 that "agencies" are to sign off on restoration.

**Response:** *As described in SEIS Section 2.1.1.1.4.2, NRC will review and approve the groundwater restoration data and determine when the production area is restored. SEIS Section 2.1.1.1.5.2 was revised to indicate that wellfield decommissioning and surface reclamation will be initiated when NRC determines that the groundwater in a wellfield has been adequately restored and that the water quality is stable. After NRC determines the production area is restored, the applicant will implement a groundwater stability monitoring program for a minimum of 12 months. If the analytical results from the stability monitoring program meet the target restoration goals and do not exhibit significant increasing trends, the applicant will (i) submit supporting documentation to NRC showing that the restoration parameters have remained at or below the restoration standards and (ii) request that the wellfield be declared restored (Powertech, 2011).*

**Comment: 127-000023**

The commenter stated the NRC is willing to issue a license by allowing Powertech to have an unexpected discovery plan to mitigate or relocate if possible any historical or cultural resources that are found. The commenter stated that this plan has not been drafted or presented to the public or other governmental agencies for review and comment.

**Response:** *While NRC cannot impose mitigation outside its regulatory authority under the AEA, the NRC has identified additional mitigation measures in SEIS Table 6.3-1 that could potentially reduce impacts of the proposed Dewey-Burdock ISR Project. Prior to construction, the applicant has proposed to develop an Unexpected Discovery Plan that will outline the steps required in the event that unexpected historic or cultural resources are encountered. NRC staff notes that this is not a requirement being imposed upon the applicant but rather a disclosure of measures that could potentially reduce or avoid environmental impacts of the proposed project. Even though the applicant may submit an Unexpected Discovery Plan if a license is granted, the draft SEIS presented sufficient information to inform the public and the NRC of the proposed project's environmental impacts. The staff's approach in the Dewey-Burdock SEIS is consistent*

*with that taken in other NRC licensing actions, where in many cases the applicant needs to submit additional information after a license is granted.*

*No further changes were made to the SEIS beyond the information provided in this response.*

**Comment: 128-000008**

The applicant suggested adding an explanation of NRC staff's view that ISR processes are considered by the Commission to be "milling underground" per the Commission's decision in SRM-SECY-09-277, which is in contrast to BLM and South Dakota's view that ISR processes constitute "mining" to avoid any potential misunderstanding by the general public and even regulators other than NRC staff.

**Response:** *NRC recognizes that ISR processes are considered to be "milling underground" by the Commission and that BLM and the state of South Dakota view ISR processes to be "mining." Other than this comment, no other public comments were received concerning NRC's and other agencies views concerning the ISR process. Therefore, NRC staff do not consider an explanation of NRC's and other agencies differing views concerning the ISR process to be warranted. As the lead agency for preparing the SEIS for the proposed Dewey-Burdock ISR Project, NRC avoided using the term "mining" when describing the ISR process.*

*No change was made to the SEIS beyond the information provided in this response.*

**E5.9.2 Adequacy of U.S. Nuclear Regulatory Commission Regulations and Practices**

**Comment: 042-000011**

The commenter stated that the Northern Cheyenne Tribe supports technical arguments provided by Dr. Moran that impacted groundwater cannot be restored to acceptable standards as asserted by the applicant.

**Response:** *NRC is aware of the declaration of Dr. Moran before the NRC ASLBP and the arguments that impacted groundwater cannot be restored to acceptable standards (ASLBP, 2013). These arguments are based primarily on historical information from operating and closed ISR sites demonstrating an inability to restore all the constituents in groundwater to water quality standards as specified in 10 CFR Part 40, Appendix A, Criterion 5B(5).*

*NRC is also aware of the potential groundwater impacts at ISR facilities resulting from residual constituent concentrations exceeding water quality standards listed in 10 CFR Part 40, Appendix A, Criterion 5B(5) after the restoration of a production aquifer. Before operating an NRC-licensed ISR facility, the licensee is required to obtain an Underground Injection Control (UIC) permit from the U.S. Environmental Protection Agency (EPA) or an EPA-authorized state. The permit must exempt the portion of the aquifer subject to uranium recovery from classification as an underground source of drinking water (USDW).*

*NRC staff examined available groundwater restoration data from three NRC-licensed ISR facilities (COGEMA's Irigary/Christensen Ranch facility, PRI's Smith Ranch/Highland Uranium Project facility, and Crow Butte Resources' Crow Butte facility) (NRC, 2009b). NRC staff have approved 11 wellfield restorations at the 3 sites. The restoration data show that preoperational*

*concentrations are attainable for many parameters (50 to 70 percent of the 35 parameters commonly monitored) but are not attainable for other constituents; in particular, the major and trace cations with solubilities most susceptible to the oxidation state of the aquifer water (i.e., iron, manganese, arsenic, selenium, uranium, vanadium, and radium-226). However, for the approved restorations, the impacts to groundwater in the exempted aquifer met all regulatory standards for the state or EPA UIC program, met the quality designated for its class of use prior to ISR operations, have been shown to decrease in the future due to natural attenuation processes, and have been shown to meet drinking water standards at the perimeter of the exempted aquifer. Therefore, the impacts to the exempted aquifer for each of the approved restorations do not pose a threat to human health or the environment. This information on NRC-approved aquifer restorations at the NRC-licensed ISR facilities was added to SEIS Section 4.5.2.1.1.3.*

**Comment: 116-000028**

The commenter stated that the public has never accepted the concept of direct land disposal of radioactive wastes from uranium recovery or any other industrial process. The commenter stated that the standards in 10 CFR Part 20, Appendix B, should apply to planned deposition of radioactive and chemically contaminated wastes for irrigation purposes. The commenter stated further that the standards are not protective of the public, soils, surface water and groundwater, flora, and fauna.

**Response:** *NRC recognizes some commenters are not supportive of land application of treated wastewater. Land application is a disposal technique that uses agricultural irrigation equipment to broadcast wastewater on a relatively large area of land for subsequent evaporation. Land application is authorized, but has not been implemented, at several ISR facilities (NRC, 1995, 1998). Disposal of treated wastewater by land application at the proposed Dewey-Burdock ISR Project site will require treatment to meet NRC release requirements for radionuclides in 10 CFR Part 20, Appendix B, and SDDENR requirements imposed by a Groundwater Discharge Plan (GDP) permit (see SEIS Section 2.1.1.1.6.2). As described in SEIS Section 2.1.1.1.6.2, process solutions, wastewater disposal, or surface water runoff from the site will be required to meet GDP permit requirements, South Dakota groundwater quality standards as outlined in Administrative Rules of South Dakota (ARSD) 74:54:01, or surface water quality standards as outlined in ARSD 74:51:01, as appropriate. SEIS Section 7.5 describes the applicant's proposed land application monitoring program. As described in SEIS Section 7.5, water, soils, and vegetation will be monitored on a regular basis to ensure soil loadings and vegetation concentrations remain within GDP permit limits.*

*No change was made to the SEIS beyond the information provided in this response.*

**E5.9.3 U.S. Nuclear Regulatory Commission Licensing Process**

**Comment: 071-000001**

The commenter stated that safety issues should render an NRC no action for this project based on the problems NRC encountered with Powertech Uranium and safety-related issues. The commenter stated that review of the safety portion of the license application was suspended due to "significant deficiencies" following a review of Powertech's request for additional information (RAI) responses.

**Response:** *On August 10, 2009, the applicant [Powertech (USA) Inc.] submitted an application to NRC to develop and operate the proposed Dewey Burdock ISR Project (Powertech, 2009a–c). After beginning its review, the NRC staff requested additional information from the applicant. In response to the staff’s requests, the applicant provided revisions to the environmental and technical reports in correspondence dated August 11, 2010 (Powertech, 2010a), December 23, 2010 (Powertech, 2010b) and August 1, 2011 (Powertech, 2011). The NRC safety and environmental reviews considered the additional information the applicant provided as revisions to the initial license application and used this information to prepare the draft SEIS and SER. The final SER for the proposed Dewey-Burdock ISR Project was issued in March 2013 (NRC, 2013).*

*No change was made to the SEIS beyond the information provided in this response.*

**Comment: 075-000002**

The commenter stated that addressing safety issues is of utmost importance to the health of the citizens in Custer and Fall River Counties, South Dakota.

**Response:** *The safety portion of the staff’s review of the proposed Dewey-Burdock ISR Project is documented in the NRC SER (NRC, 2013). The SER includes an analysis to determine the applicant’s compliance with the applicable requirements and objectives set forth in 10 CFR Part 20 (Standards for Protection Against Radiation), Part 40 (Domestic Licensing of Source Material), and Appendix A (Criteria Relating to the Operation of Uranium Mills and the Disposition of Tailings or Wastes Produced by the Extraction or Concentration of Source Material from Ores Processed Primarily for their Source Material Content). The SER identified a number of facility-specific issues that require license conditions to ensure that the operation of the facility will be adequately protective of public health and safety. These specific conditions are found in SER Table 1-1, and the standard conditions applying to uranium recovery licenses are listed in SER Appendix A.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comment: 081-000001**

The commenter had grave concerns about the proposed project and limited scope of the SEIS. The commenter stated that uranium mining is not unfamiliar to residents of western North Dakota and South Dakota, nor to the physicians who treat cancer patients from this area. The commenter stated that uranium mining is potentially an enormous threat to our health, our families’ health, and to our agricultural way of life.

**Response:** *The potential environmental impacts to public and occupational health and safety from construction, operation, aquifer restoration, and decommissioning of the proposed Dewey-Burdock ISR Project are discussed in SEIS Section 4.13.1. The NRC SER includes an analysis to determine the applicant’s compliance with the applicable requirements and objectives set forth in 10 CFR Part 20 (Standards for Protection Against Radiation), Part 40 (Domestic Licensing of Source Material), and Appendix A (Criteria Relating to the Operation of Uranium Mills and the Disposition of Tailings or Wastes Produced by the Extraction or Concentration of Source Material from Ores Processed Primarily for their Source Material Content) (NRC, 2013). The SER identified a number of facility-specific issues that require license conditions to ensure that the operation of the facility will be adequately protective of*

*public health and safety. These specific conditions are found in SER Table 1-1, and the standard conditions applying to uranium recovery licenses are listed in SER Appendix A.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comment: 099-000003**

The commenter stated that for 50 years, since the agreement between the World Health Organization (WHO) and the International Atomic Energy Agency (IAEA), WHO has been suppressing information and not documenting the health risks of radiation. The commenter was strongly opposed to the expansion of uranium mining until IAEA and other government agencies make this information on the health and environmental risks of mining uranium readily available to people impacted. The commenter further stated that the permitting procedure should be delayed until NRC provides full disclosure of the health risks of all levels of radiation produced by *in-situ* leach mining of uranium.

**Response:** *NRC recognizes that some commenters are strongly opposed to the expansion of uranium mining due to health and environmental risks. In its role as a regulatory agency, NRC regulates radiological aspects of ISR projects to ensure public and occupational health and safety and protection of the environment. As part of the ISR permitting process and to ensure public and occupational health and safety, the NRC SER includes an analysis to determine the applicant's compliance with the applicable requirements and objectives set forth in 10 CFR Parts 20 (Standards for Protection Against Radiation) and 40 (Domestic Licensing of Source Material), and 10 CFR Part 40, Appendix A (Criteria Relating to the Operation of Uranium Mills and the Disposition of Tailings or Wastes Produced by the Extraction or Concentration of Source Material from Ores Processed Primarily for their Source Material Content) (NRC, 2013). It is beyond the scope of the SEIS to resolve broader and potentially international issues of radiation safety.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comment: 116-000011**

The commenter stated that wellfield hydrogeologic data packages must be submitted directly to the NRC and BLM for their review and evaluation prior to the final licensing and permitting decisions. The commenter stated data packages must be made available to the public for review and comment as part of the NEPA process, not after that process is complete. The commenter asserted data packages are necessary to evaluate the potential environmental impacts, necessary to develop necessary mitigative measures, necessary to determine cumulative impacts, and necessary to determine whether there will be unnecessary and undue degradation of the environment.

**Response:** *NRC staff has prepared the Dewey-Burdock SEIS consistent with its 10 CFR Part 51 regulations that implement NEPA and its guidance for conducting environmental reviews as found in NUREG-1748 (NRC, 2003a). Following the issuance of a source material license but prior to a wellfield being placed in operation, the NRC requires an applicant to submit hydrologic wellfield data packages for review and approval (see License Condition 10.10, NRC, 2013b). In the draft SEIS, NRC describes the reasonably foreseeable environmental impacts of the Dewey-Burdock ISR Project and the license conditions under which Powertech would operate. Accordingly, even though Powertech will need to submit*

*additional information if a license is granted, the draft SEIS presented sufficient information to inform the public and the NRC of the proposed project's environmental impacts. The staff's approach in the Dewey-Burdock SEIS is consistent with that taken in other NRC licensing actions, where in many cases the applicant needs to submit additional information after a license is granted.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comment: 116-000029**

The commenter stated information in License Condition 9.4 is woefully incomplete.

**Response:** *License Condition 9.4 in the draft source material license for the proposed Dewey-Burdock ISR Project (NRC, 2013b) addresses the conditions under which the licensee would have to request an amendment to their license in accordance with 10 CFR 40.44 for changes, tests, or experiments related to their facility and procedures described in the license application (as updated). This license condition also specifies how the licensee will make a determination regarding these conditions and provides requirements for record keeping associated with these determinations.*

*Since the commenter did not provide specific details on their concern with this license condition, the NRC staff cannot provide a detailed response.*

*No change was made to the SEIS beyond the information provided in this response.*

**E5.9.4 Groundwater Restoration Criteria and Methods**

**Comment: 061-000022**

The commenter noted that the draft SEIS states that standards set forth in the GEIS for aquifer restoration would be used and that these standards should be specified in the draft SEIS so that the public has the ability to learn about the proposed end quality of the water after mining. The commenter noted that statements that the water might be returned to background maximum contaminant levels (MCLs) or to NRC-approved alternate concentration limits (ACLs) is not informative. The commenter stated further that the limits the applicant will have to meet should be stated clearly and precisely up front, so the ability of the applicant to meet these limits can be judged by both the agency and the public.

**Response:** *As described in both GEIS Section 2.5 and SEIS Section 2.1.1.1.4, under NRC regulations, the licensee must restore the groundwater quality in the production zone aquifer to the water quality standards listed in 10 CFR Part 40, Appendix A, Criterion 5B(5). Specifically, under Criterion 5B(5), the concentration of a hazardous constituent must not exceed (i) the Commission-approved background (CAB) concentration of that constituent in groundwater; (ii) the respective MCL value in 10 CFR Part 40, Appendix A, Table 5C if the constituent is listed in the table and if the background level of the constituent is below the value listed; or (iii) an alternate concentration limit the NRC established. Under Criterion 5B(6), requests for ACLs would only be considered after a licensee has demonstrated that restoring the constituent at issue to either background or MCL values is not practical to achieve at a given site. Licensees may only propose for NRC consideration ACLs that present no significant hazard.*



*NRC may establish a site-specific ACL for a hazardous constituent if it finds that (i) the proposed limit is as low as reasonably achievable (ALARA) after considering practicable corrective actions and (ii) the constituent would not pose a substantial present or potential hazard to human health or the environment as long as the ACL is not exceeded. Additional 10 CFR Part 40, Appendix A, Criterion 5B(6) requirements for ACLs are discussed in SEIS Appendix B.*

*Aquifer restoration criteria are determined on a site-specific, wellfield-by-wellfield basis. Before beginning wellfield operations, the applicant must determine background water quality by sampling and analysis of water quality indicator constituents in the mineralized zone(s) and underlying and overlying aquifers across each wellfield (Powertech, 2009b). The applicant would establish target restoration goals [CAB concentrations per 10 CFR Part 40, Appendix A, Criterion 5B(5)] as a function of the average background water quality and the variability in each parameter based on statistical methods (Powertech, 2011). SEIS Section 7.3.1.1 describes these background water quality parameters and methods to be used to establish groundwater restoration targets for the proposed Dewey-Burdock ISR Project.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comments: 006-000003; 036-000004; 134-000002; 134-000004**

Several commenters were concerned about restoring groundwater quality. One commenter stated that ISL mining should not be allowed until uranium mining companies can prove that they can return the water quality back to baseline levels. Other commenters stated that any uranium mining company should prove that it can restore an aquifer to its baseline conditions. Another commenter stated that an applicant cannot guarantee that the water from our aquifers will be returned to as good if not a better state than when it started.

**Response:** *Under NRC regulations, the licensee must restore the groundwater quality in the production zone aquifer to the water quality standards listed in 10 CFR Part 40, Appendix A, Criterion 5B(5). Specifically, under Criterion 5B(5), the concentration of a hazardous constituent must not exceed (i) the CAB concentration of that constituent in groundwater; (ii) the respective MCL value in 10 CFR Part 40, Appendix A, Table 5C if the constituent is listed in the table and if the background level of the constituent is below the value listed; or (iii) an alternate concentration limit the NRC established. Under Criterion 5B(6), requests for ACLs would only be considered after a licensee has demonstrated that restoring the constituent at issue to either background or MCL values is not practical to achieve at a given site. Licensees may only propose, for NRC consideration, ACLs that present no significant hazard. NRC may establish a site-specific ACL for a hazardous constituent if it finds that (i) the proposed limit is ALARA after considering practicable corrective actions and (ii) the constituent would not pose a substantial present or potential hazard to human health or the environment as long as the ACL is not exceeded. Additional 10 CFR Part 40, Appendix A, Criterion 5B(6) requirements for ACLs are discussed in SEIS Appendix B. In addition, ACL application review procedures for NRC staff are described in the following documents: January 1996 Staff Technical Position: Alternate Concentration Limits for Title II Uranium Mills (NRC, 1996); NUREG-1620 (NRC, 2003b); and NUREG-1724 (NRC, 2000).*

*No change was made to the SEIS beyond the information provided in this response.*

**Comments: 022-000001; 047-000009; 053-000003; 065-000002; 093-000002; 093-000004;  
122-000001; 127-000015; 134-000002; 136-000002**

Several commenters expressed concerns that once the water is contaminated by ISR operations it cannot be fully restored, as witnessed in other ISR uranium facilities. One commenter stated that, based on research of the water quality impacts of *in-situ* leach uranium mining, no incidence where water quality was ever returned to its premining quality can be found. The commenter further stated that there are many instances where irrevocable degradation of water quality has occurred and that Christensen Ranch near Gillette, Wyoming, now has a radioactive level 70 times greater than it originally started out with. Some commenters stated that history shows that groundwater near ISL mines has not been returned to its original quality. Other commenters pointed out that NRC's own information from an internal 2009 review showed that aquifer restoration has never resulted in a return to premining baseline conditions at an *in-situ* uranium mining operation in the United States. Another commenter stated that levels of arsenic, molybdenum, selenium, vanadium, and uranium are often present at higher levels than baseline even after groundwater restoration. The commenter pointed out that the applicant does not propose any new methods for restoration, so the impact from this issue could be extremely grave. Another commenter stated that groundwater has never been restored to its original condition at any ISL uranium mine in the United States. Another commenter stated that the ISL industry's historic and ongoing inability to control aquifer contamination and restore groundwater impacted by ISR uranium mining must be acknowledged and competently addressed within the NEPA process.

**Response:** *NRC is aware of the potential groundwater impacts at ISR facilities resulting from residual constituent concentrations exceeding baseline concentrations after the restoration of a production aquifer. Before operating an NRC-licensed ISR facility, the licensee is required to obtain a UIC permit from EPA or an EPA-authorized state. The permit must exempt the portion of the aquifer subject to uranium recovery from classification as a USDW.*

*NRC staff examined available groundwater restoration data from three NRC-licensed ISR facilities (COGEMA's Irigary/Christensen Ranch facility, PRI's Smith Ranch/Highland Uranium Project facility, and Crow Butte Resources Crow Butte facility) (NRC, 2009b). NRC staff have approved 11 wellfield restorations at the 3 sites. The restoration data show that preoperational concentrations are attainable for many parameters (50 to 70 percent of the 35 parameters commonly monitored) but are not attainable for other constituents; in particular, the major and trace cations with solubilities most susceptible to the oxidation state of the aquifer water (i.e., iron, manganese, arsenic, selenium, uranium, vanadium, and radium-226). However, for the approved restorations, the groundwater in the exempted aquifer met all regulatory standards for the state or EPA UIC program and met the quality designated for its class of use prior to ISR operation. The impacts to groundwater have been shown to decrease in the future due to natural attenuation processes, and the groundwater has been shown to meet drinking water standards at the perimeter of the exempted aquifer. Therefore, the impacts to the exempted aquifer for each of the approved restorations do not pose a threat to human health and the environment. Information on NRC-approved aquifer restorations at NRC-licensed ISR facilities was added to SEIS Section 4.5.2.1.1.3.*

**Comment: 091-000017**

The commenter stated that a characterization of each affected aquifer following the *in-situ* leaching process should be performed to assess how each aquifer will be affected. The

commenter is concerned that uranium and other radiological and nonradiological constituents mobilized by the recovery process will remain mobile, thereby increasing the probability that they will migrate to other aquifers beyond the project site.

**Response:** *SEIS Section 2.1.1.1.4.2 describes the applicant's restoration monitoring and stabilization program. The applicant's restoration monitoring program will include taking samples from monitoring wells, overlying aquifer wells, and underlying aquifer wells every 60 days during the aquifer restoration phase (Powertech, 2009b). Aquifer restoration will be complete when the applicant demonstrates that water quality conditions have been restored in accordance with 10 CFR Part 40, Appendix A, Criterion 5B(5) requirements. These standards are either a CAB water quality; water quality equivalent to the MCLs provided in 10 CFR Part 40, Appendix A, Table 5C; or an ACL NRC established in accordance with Criterion 5B(6). After NRC determines the production area is restored, the applicant will implement a groundwater stability monitoring program for a minimum of 12 months. The results of the monitoring program determine whether the approved standards for each constituent have been met and whether any adjacent nonexempt aquifers are affected (Powertech, 2009b, 2011).*

*No change was made to the SEIS beyond the information provided in this response.*

**Comments: 116-000014; 116-000016**

The commenter was concerned about the process of establishing background water quality to determine whether aquifer restoration goals have been met in accordance with 10 CFR Part 40, Appendix A, Criterion 5B(5) requirements. The commenter stated that significant baseline data are not available and, therefore, the SEIS cannot provide a full discussion of the background water quality data and the relevant aquifer restoration goals. The commenter stated that at this time we do not know whether the relevant constituents fall above or below the MCLs in 10 CFR Part 40, Appendix A, Table 5C, and the projected groundwater quality standards that would be implemented as part of the aquifer restoration phase. The commenter further stated that background water quality samples should have been available so that the SEIS would include specific and detailed information regarding the excursion parameters and upper control limits (UCLs).

**Response:** *As described in SEIS Section 2.1.1.1.4, before beginning wellfield operations, the applicant must determine background water quality by sampling and analysis of water quality indicator constituents in the mineralized zone(s) and underlying and overlying aquifers across each wellfield (Powertech, 2009b). The applicant will establish target restoration goals [CAB concentrations per 10 CFR Part 40, Appendix A, Criterion 5B(5)] as a function of the average background water quality and the variability in each parameter based on statistical methods (Powertech, 2011). SEIS Section 7.3.1.1 describes these background water quality parameters and methods to be used to establish groundwater restoration targets for the proposed Dewey-Burdock ISR Project. The SEIS therefore presents information sufficient for the NRC and other reviewers to assess the environmental impacts of the proposed project.*

*As further described in SEIS Section 2.1.1.1.4, background water quality samples obtained from monitoring wells placed in the ore-bearing aquifers, as well as the underlying and overlying aquifers (where present), will be used to define excursion parameters and UCLs. UCLs must be established before ISR operations begin because they are used to control and manage any excursions that may occur during the ISR operation and restoration phases. Groundwater*

*monitoring for selected constituents, throughout the life of the proposed project, is discussed in SEIS Section 7.3.1.2.*

*NRC does not require ISR facility applicants to establish CAB water quality in production zone aquifers or UCLs for excursion parameters before NRC approves a source material license for the facility. The applicant is required to develop and implement a preoperational monitoring program to establish baseline radiological conditions at a proposed project in accordance with NRC regulations at 10 CFR Part 40, Appendix A, Criteria 7 and 7A. The results of the applicant's preoperational groundwater monitoring program are described in SEIS Sections 3.5.3.5 and 3.12.1.4. The applicant is also required to select UCLs that will be indicative of leachant migration from the wellfield. The constituents and parameters the applicant selected as leachant migration indicators, and for which UCLs will be set, are described in SEIS Section 7.3.1.2.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comment: 116-000015**

The commenter stated the SEIS fails to provide information regarding the relevant factors that might influence the ability of the aquifer to achieve background contaminant levels, or other levels, during aquifer restoration. As an example, the commenter stated that information regarding the success of ISL aquifer restoration in similar geological and hydrological conditions should have been provided and discussed.

**Response:** *NRC staff examined available groundwater restoration data from three NRC-licensed ISR facilities (COGEMA's Irigary/Christensen Ranch facility, PRI's Smith Ranch/Highland Uranium Project facility, and Crow Butte Resources Crow Butte facility) (NRC, 2009b). NRC staff has approved 11 wellfield restorations at the 3 sites. The restoration data show that preoperational concentrations are attainable for many parameters (50 to 70 percent of the 35 parameters commonly monitored) but are not attainable for other constituents; in particular, the major and trace cations with solubilities most susceptible to the oxidation state of the aquifer water (i.e., iron, manganese, arsenic, selenium, uranium, vanadium, and radium-226). However, for the approved restorations, the impacts to groundwater in the exempted aquifer met all regulatory standards for the state or EPA UIC program, met the quality designated for its class of use prior to ISR operations, have been shown to decrease in the future due to natural attenuation processes, and have been shown to meet drinking water standards at the perimeter of the exempted aquifer. Therefore, the impacts to the exempted aquifer for each of the approved restorations do not pose a threat to human health and the environment. Information on NRC-approved aquifer restorations at NRC-licensed ISR facilities was added to SEIS Section 4.5.2.1.1.3.*

**Comment: 128-000006**

The commenter suggested pointing to past restoration efforts to make it clear that restoration efforts typically reduce many or even most constituents to or below baseline/background but just not every constituent. The commenter also requested that the SEIS clearly and consistently state that the primary goal of aquifer restoration is to reduce hazardous constituents to or below baseline/background quality, because this frequently is the source of a great deal of misinformation and inaccuracies.

*Response: GEIS Section 2.11 (NRC, 2009a) describes historical operation of ISR uranium recovery facilities, which includes discussion of aquifer restoration in GEIS Section 2.11.5. NRC staff examined available groundwater restoration data from three NRC-licensed ISR facilities (COGEMA's Irigary/Christensen Ranch facility, PRI's Smith Ranch/Highland Uranium Project facility, and Crow Butte Resources Crow Butte facility) (NRC, 2009b). The commenter is correct that, to date, restoration to background water quality for all constituents has proven to be not practically achievable at licensed NRC ISR sites (NRC, 2003c, 2004, 2005, 2009b). Information regarding the success of ISR aquifer restorations at other NRC-licensed ISR facilities was added to SEIS Section 4.5.2.1.1.3.*

*As described in 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 of a wellfield to CAB water quality conditions or to standards consistent with NRC requirements at 10 CFR Part 40, Appendix A, Criterion 5B(5). These standards state that the concentration of a hazardous constituent must not exceed (i) the CAB concentration of that constituent in groundwater; (ii) the respective value in 10 CFR Part 40, Appendix A, Table 5C if the constituent is listed in the table and if the background level of the constituent is below the value listed; or (iii) an ACL the Commission establishes. SEIS Appendix B explains the process for granting an ACL. For proposed ACLs to be approved, they must be shown to protect human health at the site.*

*No change was made to the SEIS beyond the information provided in this response.*

#### **E5.9.5           References**

10 CFR Part 20. *Code of Federal Regulations*, Title 10, *Energy*, Part 20. "Standards for Protection Against Radiation." Washington, DC: U.S. Government Printing Office.

10 CFR Part 20 Appendix B. *Code of Federal Regulations*, Title 10, *Energy*, Part 20. "Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs) of Radionuclides for Occupational Exposure; Effluent Concentrations; Concentrations for Release to Sewerage." Washington, DC: U.S. Government Printing Office.

10 CFR Part 40, Appendix A. *Code of Federal Regulations*, Title 10, *Energy*, Part 40 Appendix A. "Criteria Relating to the Operation of Uranium Mills and to the Disposition of Tailings or Wastes Produced by the Extraction or Concentration of Source Material from Ores Processed Primarily from their Source Material Content." Washington, DC: U.S. Government Printing Office.

10 CFR Part 51. *Code of Federal Regulations*, Title 10, *Energy*, Part 51. "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions." Washington, DC: U.S. Government Printing Office.

ARSD (Administrative Rules of South Dakota). "Chapter 74:54:01. Groundwater Quality Standards." South Dakota Legislature Administrative Rules.

ARSD. "Chapter 74:51:01. Surface Water Quality Standards." South Dakota Legislature Administrative Rules.

ASLBP (Atomic Safety and Licensing Board Panel). “Supplemental Declaration of Dr. Robert E. Moran.” In the Matter of Powertech (USA) Inc., Dewey-Burdock *In-Situ* Uranium Recovery Facility. ML13029A368. Washington, DC: NRC. January 2013.

NRC (U.S. Nuclear Regulatory Commission). “Safety Evaluation Report for the Dewey-Burdock Project Fall River and Custer Counties, South Dakota, Materials License No. SUA–1600.” ML13052A182. Washington, DC: NRC. March 2013a.

NRC. “Draft License SUA–1600 for Powertech (USA), Inc.” ADAMS Accession No. ML13318A094. Washington, DC: NRC. March 2013b.

NRC. “Draft License SUA–1600 for Powertech (USA), Inc.” ADAMS Accession No. ML12207A480. Washington, DC: NRC. July 2012.

NRC. NUREG–1910, “Generic Environmental Impact Statement for *In-Situ* Leach Uranium Milling Facilities.” ML091480244, ML091480188. Washington, DC: NRC. May 2009a.

NRC. “Data on Groundwater Impacts at the Existing ISR Facilities.” ML091770385. Washington, DC: NRC. 2009b.

NRC. “Technical Evaluation Report: Review of Cogema Mining Inc.’s Irigaray Mine Restoration Report, Production Units 1 Through 9.” Source Materials License SUA–1341. ML062570181. Washington, DC: NRC. 2005.

NRC. “Review of Power Resources, Inc.’s A-Wellfield Ground Water Restoration Report for the Smith Ranch–Highland Uranium Project.” ML041840700. Washington, DC: NRC. June 29, 2004.

NRC. NUREG–1748, “Environmental Review Guidance for Licensing Actions Associated With NMSS Programs—Final Report.” Washington, DC: NRC. August 2003a.

NRC. NUREG–1620, “Standard Review Plan for the Review of a Reclamation Plan for Mill Tailings Sites Under Title II of the Uranium Mill Tailings Radiation Control Act of 1978.” Final Report. Washington, DC: NRC. 2003b.

NRC. “License Amendment 15, Crow Butte Resources *In-Situ* Leach Facility, License No. SUA–1534, Wellfield #1 Restoration Acceptance.” Letter (February 12) and Attachments from D. Gillen to M.L. Griffin. ADAMS Accession No. ML03044055. Washington, DC: NRC. 2003c.

NRC. NUREG–1724, “Standard Review Plan for the Review of DOE Plans for Achieving Regulatory Compliance at Sites With Contaminated Ground Water Under Title I of the Uranium Mill Tailings Control Act.” Draft Report. Washington, DC: NRC. June 2000.

NRC. “Environmental Assessment for Renewal of Source Material License No. SUA–1534—Crow Butte Resources Incorporated Crow Butte Uranium Project Dawes County, Nebraska.” Docket No. 40-8943. Washington, DC: NRC. February 1998.

NRC. “Staff Technical Position Alternate Concentration Limits for Title II Uranium Mills.” Washington, DC: NRC. January 1996.

NRC. “Environmental Assessment for Renewal of Source Materials License No. SUA–1511. Power Resources Incorporated Highland Uranium Project, Converse County, Wyoming.” Washington, DC: NRC. August 1995.

Powertech (Powertech (USA) Inc.). “Powertech (USA) Inc.’s Supplemental Sampling Plan and Responses to Comments Regarding Draft License SUA-1600, Dewey-Burdock Project, Docket No. 40-9075, TAC No. J00606.” Letter (October 19) from R. Blubaugh, Vice President—Environmental, Health and Safety Resources, Powertech to R. Burrows, NRC. ML12305A056. 2012.

Powertech. “Dewey-Burdock Project, Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota, Technical Report RAI Responses, June, 2011.” ML112071064. Greenwood Village, Colorado: Powertech. 2011.

Powertech. “Dewey-Burdock Project, Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota ER\_RAI Response August 11, 2010.” ML102380516. Greenwood Village, Colorado: Powertech. 2010a.

Powertech. “Powertech (USA) Inc.’s Response to the NRC Staff’s Requests for Additional Information Concerning the Dewey-Burdock Project, Custer and Fall River Counties, South Dakota.” ML110030730—Package. Greenwood Village, Colorado: Powertech. 2010b.

Powertech. “Dewey-Burdock Project, Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota—Environmental Report.” Docket No. 040-09075. ML092870160. Greenwood Village, Colorado: Powertech. August 2009a.

Powertech. “Dewey-Burdock Project, Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota—Technical Report.” Docket No. 040-09075. ML092870160. Greenwood Village, Colorado: Powertech. August 2009b.

Powertech. “Dewey-Burdock Project, Supplement to Application for NRC Uranium Recovery License Dated February 2009.” Docket No. 040-09075. ML092870160. Greenwood Village, Colorado: Powertech. August 2009c.

## **E5.10 Federal and State Agencies**

### **E5.10.1 Federal and State Agency Permitting**

#### **Comment: 061-000016**

The commenter stated that NRC should take into account the fact that the company has applied to the State of South Dakota for permits to pump 9,000 gpm for 20 years. With this amount of pumping, the commenter stated, there is a clear need for detailed and accurate information on how much water would be consumed by the proposed project and how much water would become wasted. The commenter stated that this information should be provided so that readers can determine the impacts of the project.

**Response:** *The NRC staff are aware that the applicant has submitted water appropriation permit applications to the State of South Dakota to withdraw water from the Inyan Kara and*



*Madison aquifers (see SEIS Table 1.6-1). The applicant's water appropriation permits are described next.*

*For the Inyan Kara aquifer, the application proposes a gross withdrawal (flow) rate of approximately 32,172 Lpm [8,500 gpm] or an estimated annual withdrawal of approximately 1,691 ha-m [13,710 ac-ft] (Powertech, 2012c). The net or consumptive use of water will be a small portion of the gross withdrawal rate. The applicant estimates that a maximum net withdrawal rate of 558 Lpm [170 gpm] or an annual withdrawal of 33.8 ha-m [274.2 ac-ft] will be required to achieve production goals. This net withdrawal represents about 2 percent of the gross withdrawal, with the other 98 percent being recirculated through the wellfields. Approval of the water appropriation permit would authorize a maximum net (consumptive) withdrawal rate from the Inyan Kara aquifer limited to 558 Lpm [170 gpm] and limit the net (consumptive) withdrawal volume from the Inyan Kara aquifer to 33.8 ha-m [274.2 ac-ft] of water annually (Powertech, 2012c).*

*For the Madison aquifer, the applicant proposes to appropriate up to 109.6 ha-m [888.8 ac-ft] of water annually at a peak diversion rate of 2,085 Lpm [551 gpm] (Powertech, 2012d). The water is to be used primarily for aquifer restoration following ISR recovery. The total amount of water that will be diverted from the Madison aquifer for the proposed project will depend on the liquid waste disposal method used as part of the ISR process. The use of land application to dispose of liquid wastes will require a diversion rate of 2,085 Lpm [551 gpm] from the Madison aquifer. The use of deep Class V injection wells to dispose of liquid wastes will require a diversion rate of 606 Lpm [160 gpm] from the Madison aquifer (Powertech, 2012d).*

*The previously outlined information regarding the applicant's water appropriation permit applications was added to SEIS Section 4.5.2.1.*

**Comment: 136 -000013**

The commenter pointed out that BLM is still reviewing the proposed Plan of Operations for the Dewey-Burdock site and it remains incomplete. Likewise, the commenter noted EPA has not completed its permitting reviews for the Class III and Class V well permits the project requires, and the information related to those reviews is also not complete. The commenter stated that the SEIS cannot provide an accurate and specific analysis of the project without being able to consider a final, authorized Plan of Operations and all the secondary permits that will be required.

**Response:** *The NRC staff recognizes that other applicable reviews are conducted concurrent with NRC's review of the license application. For that reason, the staff works closely with BLM, EPA, and SDDENR to incorporate by reference results of each agency's reviews in the SEIS. For example, as a cooperating agency, BLM was involved early in the development of the SEIS and had the chance to incorporate BLM-specific requirements into the draft SEIS. EPA also had the opportunity to review and comment on the preliminary draft SEIS to ensure reviews conducted by EPA are properly characterized and incorporated into the NEPA document before the draft SEIS was issued for public comment. The NRC staff also reviewed and incorporated available information from all applicable permitting reviews the SDDENR staff was conducting while developing the draft SEIS. The NRC staff recognizes that there are still outstanding permitting reviews being conducted by other federal and state agencies. For that reason, the proposed source material license for Powertech includes a license condition which prevents*

*Powertech from operating until all necessary permits and licenses are obtained from the appropriate regulatory authorities (NRC, 2012, License Condition 12.1).*

*No changes were made to the final SEIS beyond the response to this comment.*

## **E5.10.2 Roles of Federal and State Agencies**

**Comments: 006-000002; 045-000008; 048-000010; 061-000006; 081-000003; 095-000006; 100-000001; 103-000003**

Several commenters noted that South Dakota's legislature in 2011 passed legislation to eliminate the state's role in regulating *in situ* leach uranium mining and wanted to know whether the Federal Government is going to perform this critical role. One commenter stated that due to leniency in South Dakota law, there will be little or no oversight on this project. Another commenter stated that the State of South Dakota has decided to abdicate its responsibility to protect the water and lives of its people to outside government agencies. Another commenter asked what agency will do the inspections now that the South Dakota legislature suspended its rules that would require state inspection of the mine site and monitoring wells. Some commenters stated that the Federal Government's plan for monitoring the project should be clearly explained so that the public can determine whether the monitoring will be adequate to protect the environment and natural resources.

**Response:** *NRC is aware that the 2011 South Dakota Legislature tolled (put on hold/suspended) the South Dakota UIC Class III rules. As a result, EPA will be overseeing UIC Class III permitting in South Dakota. EPA's UIC Program found in 40 CFR Parts 144–147 implements the Safe Water Drinking Act (SDWA) by regulating underground injection practices to protect USDWs. The applicant submitted a UIC Class III permit application to EPA in 2008 and a revised UIC Class III permit application to EPA in 2012 (see SEIS Table 1.6-1; Powertech, 2012a). As described in SEIS Section 2.1.1.1.2.3.1, before ISR operations begin at the proposed Dewey-Burdock ISR Project, EPA must review and approve the applicant's UIC Class III permit application, which ensures that the proposed project meets the requirements of the UIC Program under the SDWA.*

*As described in SEIS Section 2.1.1.1.2.3.5, construction, development, and testing of production, injection, and monitoring wells will be conducted in accordance with EPA regulations under 40 CFR Part 146. Under EPA UIC regulations in 40 CFR 146.33, mechanical integrity test (MIT) results will be reported quarterly to EPA. In addition, MIT results will be maintained onsite and will be available for EPA and NRC inspection.*

*Chapter 7 of the SEIS describes required monitoring programs and the agencies that will be responsible for implementing and overseeing the monitoring programs. With regard to the ISR process, NRC will be responsible for radiological, physiochemical, and ecological monitoring (see SEIS Sections 7.2, 7.3, and 7.4). The physiochemical modeling program will include wellfield groundwater monitoring (e.g., excursion monitoring), wellfield and pipeline flow and pressure monitoring, and surface water monitoring. Ecological monitoring will include vegetation and wildlife monitoring. SDDENR and EPA will have primary responsibility for land application monitoring and Class V deep injection well monitoring, respectively (see SEIS Sections 7.5 and 7.6). Liquid wastes applied to land application areas or injected into deep Class V injection wells will be required to meet NRC release limits for radionuclides as specified in 10 CFR Part 20, Appendix B.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comment: 050-000001**

The commenter stated that the applicant could not prove to the Dakota Department of Environment and Natural Resources (SDDENR) that its ISL process would not contaminate groundwaters. The commenter stated that the applicant decided to take a route that does not require scrutiny from SDDENR and has not proved that it is able to meet reasonable standards for water and community safety with its ISR process.

**Response:** *NRC is aware that the applicant's UIC Class III permit application submitted to SDDENR in 2009 and its revised UIC Class III permit application submitted to SDDENR in 2010 were deemed incomplete (see SEIS Table 1.6-1) (SDDENR, 2009, 2010). NRC is also aware that the 2011 South Dakota Legislature tolled (put on hold/suspended) the South Dakota Class III UIC rules. As a result, EPA will be overseeing UIC Class III permitting in South Dakota. EPA's UIC Program found in 40 CFR Parts 144–147 implements the SDWA by regulating underground injection practices to protect USDWs. As described in SEIS Section 2.1.1.1.2.3.1, before ISR operations begin at the proposed Dewey-Burdock ISR Project, EPA must review and approve the applicant's UIC Class III permit application, which ensures that the proposed project meets the requirements of the UIC Program under the SDWA.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comments: 050-000002; 100-000001**

One commenter stated that in a 41-page letter, SDDENR found the UIC Class III permit the applicant submitted to be incomplete, stating, "In general terms, the application lacks sufficient detail to address fundamental questions related to whether the project can be conducted in a controlled manner to protect groundwater resources." The commenter stated that because the applicant is reaching out to a different entity this should not mean that a permit should be issued without providing sufficient detail on fundamental concerns that were requested by SDDENR. Another commenter noted that the applicant has twice failed to provide complete information on applications for injection well permits.

**Response:** *NRC is aware of SDDENR's technical comments and concerns with the applicant's UIC Class III permit application submitted in 2009 and its revised UIC Class III permit application submitted in 2010 (SDDENR, 2009, 2010). NRC is also aware that the 2011 South Dakota Legislature tolled (put on hold/suspended) the South Dakota Class III UIC rules. As a result, EPA will be overseeing UIC Class III permitting in South Dakota. EPA's UIC Program found in 40 CFR Parts 144–147 implements the SDWA by regulating underground injection practices to protect USDWs. The applicant submitted a UIC Class III permit application to EPA in 2008 and a revised UIC Class III permit application to EPA in 2012 (see SEIS Table 1.6-1). Before ISR operations begin at the proposed Dewey-Burdock ISR Project, EPA must review and approve the applicant's UIC Class III permit application, which ensures that the proposed project meets the requirements of the UIC Program under the SDWA (see SEIS Section 2.1.1.1.2.3.1).*

*Although EPA now has licensing authority over the applicant's UIC application, in developing the SEIS, the NRC staff has nonetheless reviewed and considered SDDENR's technical comments with the applicant's previously submitted UIC Class III permit applications (SDDENR,*

2009, 2010). *In addition, SDDENR provided comments on the draft SEIS, which are documented in this Appendix (SDDENR, 2013; ML13017A010). Based on NRC responses to these comments, revisions to the SEIS were made as necessary.*

*No additional changes were made to the SEIS beyond the information provided in this response.*

**Comment: 084-000005**

The commenter stated that if the applicant and regulators opt for surface disposal of the “liquid waste,” then EPA has no role in regulating the quality of that water. The commenter stated that the State of South Dakota would be responsible for monitoring the effects of spraying the liquid waste directly onto the ground surface. The commenter wanted to know what will prevent arsenic and radioactive materials from running off into alluvial and shallow groundwater. The commenter also wanted to know what remedy is offered if the liquid waste is actually liquid waste and not unpolluted water.

**Response:** *NRC recognizes that the State of South Dakota will regulate land application of treated wastewater. As described in SEIS Section 2.1.1.1.6.2, the applicant would need to obtain a GDP permit from SDDENR and comply with applicable state discharge requirements for land application of treated wastewater. The applicant submitted a GDP application to SDDENR for the proposed project in March 2012 (see SEIS Table 1.6-1) (Powertech, 2012b). SDDENR is currently reviewing the application. Process solutions, wastewater disposal, and surface water runoff from the site will be required to meet GDP permit requirements, South Dakota groundwater quality standards (ARSD 74:54:01) outside of EPA’s approved aquifer exemption boundary, or surface water quality standards (ARSD 74:51:01), as appropriate (see SEIS Section 2.1.1.1.6.2). NRC will require the applicant to treat liquid wastes applied to land application areas so they meet NRC release limit criteria for radionuclides, as referenced in 10 CFR Part 20, Appendix B (e.g., see SEIS Sections 4.4.1.2.2, 4.5.1.1.2.2, and 4.5.2.1.2.2.1).*

*The applicant’s land application monitoring program is detailed in SEIS Section 7.5. The monitoring plans include regular sampling of groundwater, surface water, process-related liquid waste, soil, and biomass to identify the presence of NRC- and SDDENR-regulated constituents. The monitoring program ensures beneficial uses will not be impaired and there will be no hazard to human health and the environment. Records of all sampling activities and analyses will be maintained onsite for NRC review, and periodic reports of all sampling and analyses will be submitted to SDDENR (Powertech, 2012b).*

*As described in SEIS Sections 4.5.1.1.2.1 and 4.5.1.1.2.2, because land application areas are located on flat topography (see Figure 2.1-11), runoff of treated liquid wastes applied to land irrigation areas is not expected. Potential runoff produced by snowmelt or precipitation in land application areas will be diverted to adjacent catchment areas and allowed to evaporate or infiltrate (Powertech, 2012b). The soil horizon found in the northwestern and central parts of the project area where land application areas are located is clayey (see SEIS Section 3.4.2), which will minimize infiltration and enhance evaporation. Furthermore, the applicant’s National Pollutant Discharge Elimination System (NPDES) permit requirements will ensure that surface runoff at the ISR facilities and irrigation fields will not contaminate surface water bodies and wetlands. Implementation of mitigation measures will control erosion, runoff, and sedimentation over the land application areas. In addition, the applicant will implement an emergency spill response plan to address cleanup of accidental spills and leaks.*

*No change was made to the SEIS beyond the information provided in this response.*

### **E5.10.3 Clarification of Other Federal/State Regulations and Practices**

#### **Comment: 049-000001**

The commenter stated that as presented in the draft EIS, the three waste disposal options will not meet the current regulatory requirements of 40 CFR Part 61, Subpart W, National Emission Standards for Radon Emissions From Operating Mill Tailings. This regulation allows for two impoundments (i.e., ponds) each one no more than 16 ha [40 ac]. No new impoundment can be built unless it meets the work practice standards in Subpart W. The commenter stated further an application for the construction of any new source or the modification of an existing source must be submitted to EPA for approval, in accordance with 40 CFR 61.07. Each pond must meet the requirements of 40 CFR 192.32(a), as referenced in 40 CFR 61.252(b)(1) (e.g., double liner, leak detection). The commenter noted NRC should ensure the facility design meet the regulatory requirements of 40 CFR Part 61, Subpart W, and document this in the final EIS. The commenter pointed out that EPA is currently considering revisions to 40 CFR Part 61, Subpart W that may result in changes to this requirement (<http://www.epa.gov/rpdweb/00/neshaps/subpartw/rulemaking-activity.html>).

**Response:** *The NRC staff acknowledges 40 CFR Part 61, Subpart W requirements associated with the use of ponds as part of wastewater disposal systems. As described in NRC Regulatory Guide 3.11 (NRC, 2008), siting and design of retention ponds at ISR facilities should consider the requirements of EPA's national emission regulations under 40 CFR Part 61, Subpart W. To ensure compliance with 40 CFR Part 61, Subpart W, the applicant may need to acquire an approval from EPA prior to commencing operations in any wellfield. NRC does not have a similar requirement for ISR facilities. However, if NRC were to grant Powertech a license based on the satisfactory compliance of NRC's regulatory requirements, Powertech is still responsible for obtaining other federal, state, and local permits or approvals, as necessary before commencing operations. The NRC staff has included a license condition which prohibits the licensee from commencing operations until the licensee obtains all necessary permits, licenses, or approvals from the appropriate regulatory authorities (NRC, 2013, License Condition 12.1).*

*Text was added to SEIS Sections 2.1.1.1.2.4.1 and 2.1.1.1.2.4.2 to (i) indicate that siting and design of retention ponds at ISR facilities should consider the requirements of EPA's national emission regulations under 40 CFR Part 61, Subpart W, and (ii) document that, by license condition, the applicant may need to acquire an approval from EPA prior to commencing operations in any wellfield to ensure compliance with 40 CFR Part 61, Subpart W.*

#### **Comment: 084-000001**

The commenter stated that the use of Class V wells is obviously an attempt to evade state laws prohibiting Class I disposal wells. The commenter stated that it is clear that the only reason these disposal wells are classified as Class V is because Class I wells are not allowed under South Dakota law. The commenter further stated that if the people of South Dakota want to allow Class I wells, they can change the law; otherwise the applicant should be required to obey both the letter and spirit of the law, rather than circumventing it by changing terminology.

**Response:** *NRC is aware that Class I disposal wells are prohibited in South Dakota (see ARSD 74:55:02:02). However, Class V disposal wells are allowed, subject to the provisions of South Dakota Codified Law (SDCL) 34A-2 governing the prevention of pollution of the waters of the state (see ARSD 74:55:02:03). As described in SEIS Section 2.1.1.1.2.4, liquid waste injected into potential Class V injection wells at the proposed Dewey-Burdock ISR Project site must not be hazardous or radioactive, as defined at 40 CFR 144.3. As further described in SEIS Section 2.1.1.1.6.2, an EPA UIC Class V permit would prohibit injection of any material at the proposed project defined as hazardous waste under Resource Conservation and Recovery Act (RCRA) regulations in 40 CFR 261.3.*

*The NRC would further note that, although the deep injection wells are Class V wells, many of the protective requirements found at 40 CFR Part 146, Subpart B (Criteria and Standards Applicable to Class I Wells) would be included in the EPA UIC Class V Permit (see discussion in SEIS Section 7.6). Because Class V deep injection wells are proposed to be used for disposal rather than Class I wells, the injectate will have to be treated to remove radioactive constituents to below the radioactive waste standards at 10 CFR Part 20, Appendix B, Table II (see SEIS Section 4.5.2.1.1.2.3). If the total dissolved solids (TDS) concentration in the proposed injection zone is below 10,000 mg/L [10,000 ppm], the injection zone is a USDW. In that case, to be injected into a USDW, the injectate will need to be treated to meet drinking water standards or to meet contaminant-specific background concentrations for constituents regulated under the SDWA.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comment: 116-000012**

The commenter noted that SEIS Section 2.1.1.1.2.3.5 should state the specific, applicable state or local regulations regarding the reclamation of mud pits.

**Response:** *NRC reviewed State of South Dakota rules and regulations governing the reclamation of mud pits associated with well construction. ARSD 74:29:11:15 establishes requirements for disposal of drill cuttings associated with in-situ mining. Text was added to SEIS Section 2.1.1.1.2.3.5 to document that rules governing disposal of drill cuttings are stipulated in ARSD 74:29:11:15.*

**Comment: 116-000013**

The commenter noted that SEIS Section 2.1.1.1.2.4.2 (Land Application Option) states that the applicant applied for the GDP permit in June 2012 and has yet to apply for the NPDES Permit. Since these permits have not been issued, significant information related to the treatment and discharge of water is not available for NRC and public review in the SEIS process.

**Response:** *The NRC staff recognizes that other applicable reviews were conducted concurrent with the NRC's review of the license application. For that reason, the staff works closely with BLM, EPA, and SDDENR to incorporate by reference in the SEIS the results of each agency's review. The applicant's GDP permit application was submitted to SDDENR in March 2012 (Powertech, 2012b). Since the issuance of the draft SEIS, SDDENR has conditionally approved the GDP permit and is awaiting a mandatory hearing to take place in October 2013 before finalizing their approval (see SEIS Table 1.6-1). The NRC staff has included all relevant information from the applicant's GDP permit application in the final SEIS. The applicant's*

*NPDES permit application has yet to be submitted to SDDENR (see SEIS Table 1.6-1). Therefore, NRC is unable to include relevant information from the NPDES permit application in the SEIS. However, as stated in Chapter 4 of the SEIS, the applicant is required to obtain construction and industrial stormwater NPDES permits in accordance with SDDENR regulations. The NPDES permit requirements control the amount of pollutants discharged to surface water bodies, such as streams, wetlands, and lakes.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comment: 119-000001**

The commenter pointed out that groundwater in the production zones will need to be restored to established ambient concentrations or the South Dakota Groundwater Quality standards (as referenced in South Dakota Administrative rule 74:54:01:04), whichever is higher.

**Response:** *NRC acknowledges that groundwater in production zone aquifers will have to be restored to established ambient concentrations or State of South Dakota groundwater quality standards in accordance with ARSD 74:54:01:04. Text was added to SEIS Sections 2.1.1.1.4 and 4.5.2.1.1.3 to document that groundwater in the production zones will be required to be restored to established ambient concentrations or South Dakota groundwater quality standards in accordance with ARSD 74:54:01:04.*

**Comment: 119-000004**

The commenter noted that SEIS Section 1.5 describes the State of South Dakota's authority over the ISR process but failed to document that in order for the applicant to operate the proposed ISR project in South Dakota, it will need to obtain water rights permits from SDDENR.

**Response:** *NRC acknowledges that the applicant will need water rights permits from SDDENR to operate the proposed Dewey-Burdock ISR Project. Text was added to SEIS Section 1.5 to document that SDDENR is in charge of issuing water rights permits needed to operate ISR projects in South Dakota.*

**Comment: 119-000005**

The commenter pointed out that Table 1.6-1 (Environmental Approvals for the Dewey-Burdock Project) indicates an application for a large-scale mine permit has not been submitted to SDDENR. The commenter noted that this is incorrect; the applicant submitted an application for a large-scale mine permit to SDDENR in September 2012.

**Response:** *NRC acknowledges that the applicant submitted a large-scale mine permit to SDDENR on September 28, 2012. Table 1.6-1 was revised to indicate that the large-scale mine permit application was submitted to SDDENR in September 2012.*

**Comment: 119-000006**

The commenter noted that the storage of chemicals, as discussed in SEIS Section 2.1.1.1.2.1, must comply with Superfund Amendments and Reauthorization Act (SARA) Title III reporting requirements. In addition, the commenter noted that gasoline and diesel storage tanks used at the site must comply with SDDENR's tank rules found in ARSD 74:56:01 and 74:56:03.



**Response:** *NRC acknowledges that storage of chemicals must comply with SARA Title III reporting requirements and gasoline and diesel storage tanks used at the site must comply with ARSD 74:56:01 and 74:56:03. Text was added to SEIS Sections 2.1.1.1.2.1 and 4.13.1.1.2.3 to clarify that storage of chemicals at the proposed project site must comply with SARA Title III reporting requirements and gasoline and diesel storage tanks must comply with ARSD 74:56:01 and 74:56:03.*

**Comment: 119-000007**

The commenter noted that in addition to plugging wells in accordance with EPA regulations, the applicant must comply with applicable plugging requirements in SDDENR's well construction standards listed in ARSD 74:02:04.

**Response:** *NRC acknowledges that the applicant must comply with applicable well plugging requirements in ARSD 74:02:04. Text was added to SEIS Section 2.1.1.1.2.3.5 to clarify that the applicant will be required to comply with applicable plugging requirements in SDDENR's well construction standards listed in ARSD 74:02:04.*

**Comment: 127-000021**

The commenter stated that the operation violates the 1872 Mining Law and the Administrative Procedure Act. The commenter noted that Powertech proposes to use lode mining claims for purposes entirely unrelated to the extraction of valuable minerals, despite the requirement that all lode mining claims contain valuable mineral deposits. In fact, the materials provided by Powertech to the BLM and EPA demonstrate that Powertech intends not to extract minerals from lode claims, but solely for deep disposal of toxic mining wastes. The commenter stated instead of applying only the "unnecessary or undue degradation" under 43 CFR Subpart 3809 to these operations, the BLM must apply its full panoply of *Federal Land Policy and Management Act of 1976* (FLPMA) authorities, including a public interest review and payment of fair market value.

**Response:** *As described in SEIS Section 3.2, the land the applicant acquired for uranium resource development within the proposed Dewey-Burdock ISR Project area consists of mining claims on 1,780 ha [4,220 ac] of federal mineral estate. The applicant will use lode mining claims to recover uranium resources on this land, and the applicant has secured the right to develop valuable minerals on this land through terms of the 1872 Mining Law. The commenter asserts that the applicant will use lode mining claims for deep disposal of toxic mining wastes; however, this is not the case. As described in SEIS Section 2.1.1.1.6.2, the applicant will be required to secure an EPA UIC Class V permit for disposal of liquid wastes into deep injection wells at the proposed project site.*

*As noted in SEIS Section 1.1, under 43 CFR Part 3800, Mining Claims Under the General Mining Laws, BLM is required to review the environmental impacts of federal actions on surface lands to ensure that there is no "unnecessary or undue degradation of public lands." To fulfill this requirement, the applicant submitted a Plan of Operations to BLM for the Dewey-Burdock ISR Project on August 26, 2009. The Plan of Operations was modified and resubmitted to BLM on January 28, 2011. With regard to the authority of the FLPMA, except as provided in Section 314 (Recordation of Mining Claims and Abandonment), section 603 (BLM Wilderness Study Areas), and Subsection (f) of Section 601 (California Desert Conservation Area), no provisions of the FLPMA in any way amend the Mining Law of 1872 or impair the rights of any*

*locators or claims under this Act, including, but not limited to, rights of ingress and egress. By regulation and otherwise, BLM takes any necessary actions to prevent unnecessary or undue degradation of the lands. However, nothing in FLPMA requires a validity determination before a Plan of Operations is approved.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comment: 128-000009**

The commenter suggested that the SDWA and UIC requirements for exempted aquifers and UIC permits be mentioned in the SEIS Executive Summary to demonstrate to interested stakeholders that ISR processes are stringently regulated.

**Response:** *NRC staff agree that it is important to clarify to interested stakeholders that ISR processes are stringently regulated. The UIC program regulates the design, construction, testing, operation, and closure of injection wells at ISR facilities. In addition, before operations begin, portions of aquifers designated for uranium recovery must be exempted from the USDW designation, in accordance with the SDWA. A description of these requirements was added to the section of the SEIS Executive Summary describing the ISR process.*

**Comments: 128-000047; 128-000216**

The commenter stated that the applicability of 40 CFR Part 61, Subpart W with regard to ponds at the proposed project is in dispute and that the statement indicating the applicant would need to acquire permits from EPA to comply with 40 CFR Part 61, Subpart W should be removed from the SEIS. The commenter also stated that NRC has regulations and guidance for evaporation ponds and should not have to take into account Subpart W requirements for such ponds. The commenter noted that statements in the SEIS indicating that evaporation ponds will be subject to 40 CFR Part 61, Subpart W requirements lends credence to EPA's current position that such regulations apply and results in unnecessary, duplicative regulatory oversight.

**Response:** *NRC recognizes that the applicability of regulations at 40 CFR Part 61, Subpart W to impoundments associated with liquid waste disposal at ISR facilities is in dispute between ISR operators and EPA. Subpart W is a radon emissions standard for operating uranium mill tailings. EPA is currently considering revisions to 40 CFR Part 61 that may result in changes in Subpart W requirements to include evaporation ponds and other types of ponds that could apply to ISR facilities (<http://www.epa.gov/rpdweb00/neshaps/subpartw/rulemaking-activity.html>). The commenter is correct that NRC has established basic design criteria for evaporation pond systems (10 CFR Part 40, Appendix A, Criteria 5A and 5E). In addition, NRC guidance in Regulatory Guide 3.11 recommends considering applicable EPA regulations in any impoundment design (NRC, 2008).*

*NRC has not been actively involved with EPA on its Subpart W rulemaking, and EPA has not asked NRC to be part of the Subpart W rulemaking. At this time, it is uncertain whether EPA will require the applicant to acquire an approval to comply with 40 CFR Part 61, Subpart W for proposed ponds associated with liquid waste disposal systems at the proposed Dewey-Burdock ISR Project site (see SEIS Sections 2.1.1.1.2.4.1 and 2.1.1.1.2.4.2).*

*No change was made to the SEIS beyond the information provided in this response.*

**Comments: 128-000149; 128-000150; 128-000171; 128-000240; 128-000261; 128-000262**

The commenter noted that the draft SEIS states if the proposed injection zones have TDS concentrations below 10,000 mg/L [10,000 ppm], the Class V UIC permit will require liquid wastes to be treated to meet background concentrations for constituents that already exceed drinking water standards. The commenter pointed out in the event that potential disposal zones contain water with less than 10,000 mg/L [10,000 ppm], the applicant may request that EPA grant an aquifer exemption for the injection zone within the requested area.

**Response:** *NRC acknowledges that the applicant plans to request EPA grant an aquifer exemption for the deep Class V injection zone if potential disposal zones contain water with TDS less than 10,000 mg/L [10,000 ppm]. Text was added and revised throughout the SEIS to clarify that if proposed Class V injection well zones are underground sources of drinking water {i.e., have TDS concentrations below 10,000 mg/L [10,000 ppm]} (i) the applicant will be required to obtain an aquifer exemption from EPA or (ii) the EPA UIC Class V permit will require liquid wastes to be treated to meet drinking water standards or contaminant-specific background concentrations for constituents regulated under the SDWA.*

**Comment: 136-000017**

The commenter stated that the lack of clarity regarding which regulatory agency will properly oversee the Dewey-Burdock Project is of great concern. Because the SEIS contemplates the use of EPA permitted Class V injection wells to dispose of the waste, the mine will not be regulated by on-the-ground staff in South Dakota; rather, it is likely to be subject to regulatory oversight from as far away as Denver. The commenter noted the very nature of *in-situ* mining operations underscores the need for close, regular monitoring by independent agencies, but it appears that is not the plan for Dewey- Burdock. The commenter stated that the lack of such close oversight will naturally result in increased problems and unmitigated contamination events.

**Response:** *GEIS Appendix B details all federal statutes, regulations, and executive orders potentially applying to the Dewey-Burdock ISR Project; SEIS Section 1.5 describes the applicable regulatory requirements pertaining to Uranium Recovery Facilities in South Dakota; and SEIS Section 1.6 describes NRC's licensing and permitting process. There is no one agency that is solely responsible for regulating the Dewey-Burdock site. SEIS Table 1.6-1 lists all required permits the applicant would have to obtain before commencing operations. For example, the applicant is required to obtain (i) a source material license from the NRC; (ii) UIC permits for injection and waste disposal wells from EPA; (iii) large-scale mine, GDP, and water appropriation permits from SDDENR; (iv) a Plan of Operations permit from BLM; and (v) building permits from Custer and Fall River Counties. Each permitting agency will have its own regulatory requirements as well as inspections and reporting criteria that an applicant would have to satisfy in order to receive a license or continue operations. In some instances, there will be duplicative requirements imposed on an applicant or licensee to ensure compliance with each regulatory agency. For example, Powertech will have to submit a complete wellfield package to both the NRC and EPA prior to injecting lixiviant into the ground. Each agency will then ensure the design and operation of the wellfields are protective of public health and safety and the environment. Under the SDDENR GDP permit requirements, Powertech is also required to implement a preoperational and operational sampling plan if the land application option is used to dispose of excess process fluid. Both these requirements are captured in Powertech's license as a condition for the Dewey-Burdock Project's continued operation.*

*Violation of any conditions specified in the license could result in increased inspections, fines, or suspension/termination of Powertech's license.*

*Specific preoperational operational and monitoring conditions, as well as excursion reporting and administrative controls are included in the Powertech source material license to ensure the facility operates safely. Redundant safety requirements by SDDENR, EPA, BLM, and other state and local governments also provides additional assurance the facility will be constructed and operated safely following applicable laws and regulations.*

*No changes were made to the final SEIS beyond the response to this comment.*

#### **E5.10.4      References**

10 CFR Part 20 Appendix B. *Code of Federal Regulations*, Title 10, *Energy*, Part 20. "Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs) of Radionuclides for Occupational Exposure; Effluent Concentrations; Concentrations for Release to Sewerage." Washington, DC: U.S. Government Printing Office.

40 CFR Part 61. *Code of Federal Regulations*, Title 40, *Protection of Environment*, Part 61. "National Emission Standards for Hazardous Air Pollutants (NESHAPS)." Washington, DC: U.S. Government Printing Office.

40 CFR Part 144. *Code of Federal Regulations*, Title 40, *Protection of the Environment*, Part 144. "Underground Injection Control Program." Washington, DC: U.S. Government Printing Office.

40 CFR Part 145. *Code of Federal Regulations*, Title 40, *Protection of the Environment*, Part 144. "State UIC Program Requirements." Washington, DC: U.S. Government Printing Office.

40 CFR Part 146. *Code of Federal Regulations*, Title 40, *Protection of the Environment*, Part 146. "Underground Injection Control Program: Criteria and Standards." Washington, DC: U.S. Government Printing Office.

40 CFR Part 147. *Code of Federal Regulations*, Title 40, *Protection of the Environment*, Part 146. "State, Tribal, and EPA-Administered Underground Injection Control Programs." Washington, DC: U.S. Government Printing Office.

40 CFR Part 192. *Code of Federal Regulations*, Title 40, *Protection of Environment*, Part 192. "Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings." Washington, DC: U.S. Government Printing Office.

40 CFR Part 261. *Code of Federal Regulations*, Title 40, *Protection of Environment*, Part 261. "Identification and Listing of Hazardous Waste." Washington, DC: U.S. Government Printing Office.

43 CFR Part 3800. *Code of Federal Regulations*. Title 43, *Public Lands: Interior*, Part 3800. "Mining Claims Under the General Mining Laws." Washington, DC: U.S. Government Printing Office.

43 CFR Subpart 3809. Code of Federal Regulations. Title 43, *Public Lands: Interior*, Subpart 3809. “*Subsurface Management*.” Washington, DC: U.S. Government Printing Office.

ARSD (Administrative Rules of South Dakota). “Chapter 74:02:04. Well Construction Standards.” South Dakota Legislature Administrative Rules.

ARSD. “Section 74:29:11:15. Disposal of Drill Cuttings.” South Dakota Legislature Administrative Rules.

ARSD. “Chapter 74:51:01. Surface Water Quality Standards.” South Dakota Legislature Administrative Rules.

ARSD. “Chapter 74:54:01. Groundwater Quality Standards.” South Dakota Legislature Administrative Rules.

ARSD. “Section 74:54:01:04. Standards for Groundwater of 10,000 mg/L TDS Concentration or Less.” South Dakota Legislature Administrative Rules.

ARSD. “Section 74:55:02:02. Class I and IV Disposal Wells Prohibited.” South Dakota Legislature Administrative Rules.

ARSD. “Section 74:55:02:03. Authorization of Class V Wells to Inject.” South Dakota Legislature Administrative Rules.

ARSD. “Chapter 74:56:01. Underground Storage Tanks (UST).” South Dakota Legislature Administrative Rules.

ARSD. “Chapter 74:56:03. Aboveground Stationary Storage Tanks (AST).” South Dakota Legislature Administrative Rules.

NRC (U.S. Nuclear Regulatory Commission). Regulatory Guide 3.11, “Design, Construction, and Inspection of Embankment Retention Systems at Uranium Recovery Facilities.” Rev. 3. Washington, DC: NRC. November 2008.

Powertech [Powertech (USA) Inc.]. “Dewey-Burdock Project Class III Underground Injection Control Permit Application.” ML122440623. Greenwood Village, Colorado: Powertech. 2012a.

Powertech. “Dewey-Burdock Project Groundwater Discharge Plan Custer and Fall River Counties, South Dakota.” ML12195A039, ML12195A040. Edgemont, South Dakota: Powertech. March 2012b.

Powertech. “Dewey-Burdock Project, Report To Accompany Inyan Kara Water Rights Permit Application Custer and Fall River Counties, South Dakota.” ML12192A022. Edgemont, South Dakota: Powertech. June 2012c.

Powertech. “Dewey-Burdock Project, Report To Accompany Madison Water Rights Permit Application Custer and Fall River Counties, South Dakota.” ML12193A239. Edgemont, South Dakota: Powertech. June 2012d.

SDCL (South Dakota Codified Law) Chapter 34A-2. "Water Pollution Control." South Dakota Legislature. South Dakota Codified Laws.

SDDENR (South Dakota Department of Environment and Natural Resources). "RE: South Dakota Department of Environment and Natural Resources Comments on the Supplemental Environmental Impact Statement for the Proposed Dewey-Burdock in-Situ Uranium Recovery Project in Custer and Fall River Counties, South Dakota." ML13017A010. Letter (January 10) to C. Bladely, NRC from S. Pirner. Pierre, South Dakota: SDDENR. 2013.

SDDENR. "RE: Underground Injection Control Permit Application, Dewey-Burdock Project, Fall River and Custer Counties, South Dakota." ML13165A146. Letter to R. Blubaugh, Powertech (USA), Inc. from B. Walsh, SDDENR, Pierre, South Dakota. April 19, 2010.

SDDENR. "RE: Underground Injection Control Permit Application, Dewey-Burdock Project, Fall River and Custer Counties, South Dakota." ML093440688. Letter (August 6) to R. Blubaugh, Powertech (USA), Inc. from G. Haag. Pierre, South Dakota: SDDENR. 2009.

## **E5.11 Cooperating Agencies and Consultations**

### **Comment: 042-000004**

The Northern Cheyenne Tribe was very concerned that NRC, the lead federal agency, has not properly consulted with Native American tribes under applicable provisions of Section 106 of the NHPA to identify properties of religious and cultural significance to Indian tribes that once inhabited the region; most recently, the Sioux and Northern Cheyenne people.

**Response:** *SEIS Section 1.7.3.5 presents the ongoing NHPA Section 106 consultation efforts the NRC staff has carried out to date. Since the issuance of the draft SEIS, the NRC staff has offered all interested tribes the opportunity to conduct a field survey within the proposed project boundary in order to identify properties of religious and cultural significance to them. The Northern Cheyenne Tribe was one of the seven tribes that took part in this field survey. Under the terms of the survey, the participating tribes have committed to submitting reports with their findings and their recommendations for avoidance or mitigation of sites. The NRC staff considered all sites that have been identified by the Northern Cheyenne Tribe and the other tribes that participated in the survey when the staff makes its cultural resource impact determination. The NRC staff documented this additional input from the tribes in the final SEIS at Section 3.9.3.2.2. The NRC staff also considered this additional tribal input in the assessment of impacts to historic and cultural resources in the final SEIS at Section 4.9.1.*

*No change was made to the SEIS beyond the information provided in this response.*

### **Comment: 042-000005**

The commenter, the Northern Cheyenne Tribe, stated that it is aware of the Oglala Sioux Tribe's petition to intervene and challenge NRC's consideration of Powertech's application to operate a proposed ISR uranium facility. The Northern Cheyenne Tribe stated that it stands in support of its allied Indian Nation's contentions in opposition to Powertech's application. The Northern Cheyenne Tribe stated that it supports the opinions and recommendations concerning Section 106 of NHPA submitted by the Oglala Sioux Tribe's Tribal Historic Preservation Office (THPO) and the scientific analyses and declarations made by Dr. Robert E. Moran, an expert in

hydrology contracted as a consultant by the Oglala Sioux Tribe for the purposes of drafting contentions to Powertech's application for an NRC license.

**Response:** *The NRC staff acknowledges the Northern Cheyenne Tribe's support of the Oglala Sioux Tribe's opinions and recommendations concerning the NHPA Section 106 process, as well as the NEPA technical reviews on the applicant's license application. The NRC staff has provided its responses to the Oglala Sioux's comments on both topics. Because there are no specific issues cited in the Northern Cheyenne's comment, no change was made to the SEIS beyond the information provided in this response.*

**Comment: 042-000009**

The Northern Cheyenne Tribe asserted that the NRC, the Tribe's trustee, has failed to appropriately consult with the tribe and other tribes who may be adversely impacted by this specific ISR project. The tribe stated that a comprehensive historic and cultural survey by various Indian tribes needs to be completed prior to the start of ISR project activities in the aboriginal and treaty territory where discovery of prehistoric artifacts and other cultural resources may impinge on tribal rights. The tribe pointed out that Powertech's application to NRC includes some evidence of a cultural resources investigation, which the tribes may not be able to verify as a comprehensive study simply because tribes have not participated in the cultural resource study(s) conducted by Powertech's contractor. The Northern Cheyenne Tribe did not participate in a historic or cultural resource study as part of the NEPA, Native American Graves Protection and Repatriation Act (NAGPRA), or NHPA processes required by federal statutes and implementing regulations. The tribe asserted that any historic and cultural study will invariably generate thousands of cultural artifacts in the region previously inhabited by respective Indian tribes including the Northern Cheyenne people. The tribe noted that because our ancestors lived in the proposed ISR project area there are sure to be burial grounds, ceremonial sites and camping sites. Failure by the NRC to involve the Northern Cheyenne Tribe in the analysis of sites identified by Powertech's contractor, or to conduct any ethnographic studies in tandem with a field studies involving tribal representatives further exacerbates the potential adverse impacts to Northern Cheyenne interests. The tribe pointed out that exclusion of our participation negatively affects our ability to protect our cultural resources. The tribe stated that it believes that the section in the SEIS for the Dewey-Burdock ISR project falls short in addressing the adverse impacts and mitigation required to protect the historic and cultural resources of the Northern Cheyenne Tribe.

**Response:** *SEIS Section 1.7.3.5 presents the NHPA Section 106 consultation efforts the NRC staff has carried out to date. Consultation concerning evaluation and effects determination is ongoing. Since the issuance of the draft SEIS, the NRC staff has offered all interested tribes the opportunity to conduct a field survey within the proposed project boundary in order to identify properties of religious and cultural significance to Indian tribes. The Northern Cheyenne Tribe was one of the seven tribes that took part in this field survey opportunity and submitted a report with their findings and recommendations for avoidance or mitigation, as appropriate. The NRC staff considered all sites that have been identified by the Northern Cheyenne Tribe and the rest of the tribes that participated in the survey in its cultural resource impact determination. The NRC staff documented this additional input from the tribes in the final SEIS at Section 3.9.3.2.2. The NRC staff also considered this additional tribal input in the assessment of impacts to historic and cultural resources in the final SEIS at Section 4.9.1.*

*No change was made to the SEIS beyond the information provided in this response.*



**Comment: 055-000002**

The commenter stated that it is imperative that Tribal Nations listed under the 1868 Fort Laramie Treaty to be included in the consultation as required by Government-to-Government Consultation protocol.

**Response:** *NRC is aware that longstanding land ownership disputes related to the 1868 Fort Laramie Treaty exist between the Native American tribes and the U.S. Government. In its role as a regulatory agency, NRC lacks the authority to resolve these issues. As required by 36 CFR 800, the staff has consulted and will continue to consult with interested Native American tribes to determine whether the proposed federal action will have an impact on historic properties. Section 1.7.3.5 details the staff's interactions thus far with Native American tribes.*

*No changes to the SEIS are needed based on this comment.*

**Comments: 091-000010; 127-000022**

One commenter stated that the proponent should identify all areas with potential cultural impacts. The commenter further stated that identification of all cultural, historical, and paleontological resources, along with appropriate mitigation measures, must comply with Section 106 of the NHPA. The commenter stated that Memoranda of Agreement may be required with the affiliated tribes for the mitigation of cultural impacts and that consultation with both state and tribal historic preservation offices should be conducted so that consistency is maintained. Another commenter stated that the draft SEIS violates NEPA and the NHPA because it fails to include a comprehensive analysis of cultural impacts. The commenter noted that despite the application having been pending for some 3 years, a competent cultural resource inventory of the site has yet to be done. The commenter stated that NRC should not have released the admittedly incomplete draft SEIS. The commenter further stated that the applicant had an obligation at the application stage to provide a competent analysis of cultural resources and it failed to do so.

**Response:** *The NRC staff's impact assessment of cultural resources in the draft SEIS was based on available information contained in the application, information gathered through consultation, and information obtained from independent research. The NRC staff developed the impact assessment for cultural resources based on archeological survey conducted by the applicant, and the staff explicitly stated in draft SEIS Section 3.9.4 that NHPA Section 106 consultation was ongoing with all interested tribes. The NRC staff stated further that information obtained from the Section 106 consultation would be disclosed for public review and included in the final SEIS.*

*As part of its obligations under Section 106 of the NHPA and the regulations at 36 CFR 800.2(c)(2)(B)(ii)(A), NRC must provide Indian tribes "a reasonable opportunity to identify its concerns about historic properties; advise on the identification and evaluation of historic properties and evaluation of historic properties, including those of religious and cultural importance; articulate their views on the undertaking's effects on such properties, and participate in the resolution of adverse effects." Following over 2 years of consultation with 23 tribes, the NRC staff provided an opportunity for all interested tribes to conduct a field survey {referred to by the tribes as traditional cultural property (TCP) survey} on the entire 4,282 ha [10,580 ac] of the proposed project area, including the area of direct disturbance {~809 ha [~2000 ac]} (NRC, 2013). In this invitation, the NRC staff explained that the applicant was*

*willing to cover field survey expenses, such as per diem and travel costs, as well as provide an unconditional grant to each tribe to offset other field-survey-related expenses. Seven tribes (Cheyenne and Arapaho, Northern Arapaho, Northern Cheyenne, Crow Creek Sioux, Crow Nation, Santee Sioux, and Turtle Mountain) participated in the field survey between April 2013 and May 2013.*

*To date, three tribes (Cheyenne and Arapaho, Northern Cheyenne, and Northern Arapaho) have submitted reports to the staff documenting sites they have identified as having religious and cultural importance and recommending avoidance/mitigation strategies. In addition, the Crow Nation provided NRC staff with a copy of field notes identifying several sites of interest to that tribe. The NRC staff documented this additional input from the tribes in the final SEIS at Section 3.9.3.2.2. The NRC staff also considered this additional tribal input in the assessment of impacts to historic and cultural resources in the final SEIS at Section 4.9.1.*

*No additional changes were made to the SEIS beyond the information provided in this response.*

**Comment: 120-000009**

One commenter stated that under Section 106 of the National Historic Preservation Act, the NRC is required to conduct consultation with Native American tribes to determine whether proposed federal actions will affect historic properties. According to Oglala Sioux Tribal Natural Resources Technician Dennis Yellow Thunder, “As far as the tribes are concerned, we want a TCP (Tribal Cultural Preservation) study done on the whole 10,000 acres, not just the 2,637-acre area of potential effect ... According to our treaties ... that’s still aboriginal homeland, and we don't agree with your going out there and disturbing ancestral homeland.” The commenter stated that there are more than 20 Native American tribes that might attach historic, cultural and religious significance to properties within the proposed Dewey-Burdock ISR Project boundaries.

**Response:** *The NRC staff agrees that the NHPA requires all federal agencies to consult with Native American tribes to determine the impact of a proposed federal action on historic properties. SEIS Section 1.7.3.5 presents the ongoing NHPA Section 106 consultation efforts the NRC staff has carried out to date. Following over 2 years of consultation with 23 Indian tribes, the NRC staff provided an opportunity for all interested tribes to conduct a field survey (referred to by the tribes as TCP survey) on the entire 4,282 ha [10,580 ac] of the proposed project area including the area of direct disturbance {~809 ha [2000 ac]} (NRC, 2013). In this invitation, the NRC staff explained that the applicant was willing to cover field survey expenses, such as per diem and travel costs, as well as provide an unconditional grant to each tribe to offset any field-survey-related expenses. The Oglala Sioux Tribe initially accepted the invitation (Oglala Sioux Tribe, 2013a,b); however, the Tribe later withdrew their initial acceptance, stating that they did not have not enough time to discuss the proposal with the Oglala Sioux Tribal Council (Oglala Sioux Tribe, 2013c,d).*

*No change was made to the SEIS beyond the information provided in this response.*

**Comment: 127-000041**

The commenter noted there is no indication that the National Park Service has been invited to participate as a cooperating agency or to otherwise participate in the air emissions analysis,

only a suggestion that such input will come after the draft SEIS comment period has closed. Draft SEIS at 4-112. The commenter noted that although the draft SEIS does not identify the specific “receptors,” the analysis of the air emissions and the impact on human health and environment must be provided for review and comment in a draft SEIS.

**Response:** *Although the National Park Service was not invited to participate as a cooperating agency, they had the opportunity to comment on the draft SEIS during the public comment period from Nov 26, 2012, through January 10, 2013.*

*The NRC staff performed its air impact assessment based on available information provided by the applicant as well as independent reviews of data presented in the application. In draft SEIS Section 4.7.1, the staff presented its findings and discloses information that will be forthcoming in the final SEIS. The staff discussed air impacts based on the best and worst-case results of air modeling efforts, ensuring the public had the opportunity to review and comment on the staff's preliminary findings.*

*No changes were made to the SEIS based on this comment.*

**Comment: 127-000043**

The commenter stated that the draft SEIS does not identify any attempt by the NRC to invite or to ensure the participation of all relevant cooperating agencies. The commenter claims that this allegedly unlawful approach insulates the NRC from the give-and-take NEPA analysis promotes among those agencies with jurisdiction and special expertise. Inviting the participation of “cooperating agencies” is necessary to examine the full range of infrastructure problems and environmental impacts. The commenter stated that the participation of these cooperating agencies will allow responsible federal and state agency personnel to voice their concerns and to work with other agencies to identify and address impacts, alternatives, and mitigation measures identified in other portions of these comments.

**Response:** *The NRC staff is working with BLM (as a formal cooperating agency) to develop one NEPA document for the proposed Dewey-Burdock ISR Project that both agencies can use to reach their licensing decisions. Although no formal agreement exists, the NRC staff has also worked closely with SDDENR, as well as EPA Region 8, as it developed the draft SEIS and plans to continue working with these agencies as it finalizes the SEIS. The NRC staff has also consulted with USACE; U.S. Forest Service (USFS); USGS; Federally-recognized tribes; South Dakota Game, Fish, and Parks (SDGFPP); SD SHPO; Edgemont Area Chamber of Commerce; and Custer County Planning and Economic Development during initial site visits in 2009. NRC consultation efforts with state, federal, local, and tribal governments are discussed in SEIS Section 1.7.3.*

*No changes were made to the SEIS based on this comment.*

**Comment: 128-000005**

The commenter suggested that the SEIS emphasize the substantial amount of effort that NRC staff and the applicant have engaged in with respect to the NHPA Section 106 consultation process. The commenter also suggested that NRC staff continue to engage in and complete the process in a timely manner.

**Response:** *SEIS Section 1.7.3.5 discusses the NRC's Section 106 consultation efforts between NRC, BLM, SD SHPO, ACHP, the applicant, and Native American tribes. Copies of consultation letters sent to each tribe are included in SEIS Appendix A. The NRC staff will continue to consult with BLM, SD SHPO, ACHP, the applicant, and the tribes on all issues arising under Section 106 of NHPA. Results of the consultation are presented in the final SEIS, and interested parties will have an opportunity to comment.*

**Comment: 128-000032**

One commenter suggested that NRC note that it is exempt under Executive Order 13175 (November 2000) from the Section 106 Tribal Consultation requirements (refer to p. 3-83 of the draft SEIS).

**Response:** *The NRC staff acknowledges the commenter's suggestion and has updated SEIS Section 1.7 per the recommendation.*

**Comment: 128-000115**

One commenter stated that as will be shown in comments to be submitted by the National Mining Association (NMA) in the near future, NRC staff's case-by-case approach to Tribal Consultation requires serious reconsideration. Regardless of whether the Commission is committed to the spirit of the Executive Order, NRC staff must act decisively as a "lead agency" and designate and achieve timeframes consistently no matter what project is being evaluated. Given that NRC is a fee recovery agency, the indecisiveness and unnecessarily cumbersome consultation processes penalize a license applicant because the applicant must pay for such actions. The commenter encouraged the Commission to examine the instant project as a good case study of how this results in inefficient regulation. For future projects, the commenter strongly encouraged NRC staff to engage in early consultation, whether through a mutually agreed upon programmatic agreement or other government-to-government agreement. The commenter stated that this is necessary for future projects so that meaningful and productive consultation may occur.

**Response:** *The NRC staff believes that it has improved its implementation of the NHPA Section 106 process over the last few years. For example, the staff has been cooperating with the BLM under the Memorandum of Understanding for both the proposed Dewey-Burdock and Ross ISR projects by jointly preparing the SEIS and conducting the Section 106 review for each project, thus gaining efficiency and minimizing duplicative efforts. Staff also facilitated field surveys for the proposed Crow Butte, Dewey Burdock, and Ross ISR projects so that the majority of the surveys were completed within 4 weeks.*

*The NRC staff recognizes the need for a predictable process for Section 106 reviews of uranium recovery projects that incorporates the experiences gained over the past few years so that these lessons can be applied to ongoing or upcoming Section 106 reviews. To this end, the NRC staff is in the process of developing a Section 106 guidance document. Based on the NRC staff's assessment, development of a Section 106 guidance document for uranium recovery would be more cost effective and timely, and may accomplish the same goals as those contemplated from a regional programmatic agreement.*

*As the lead federal agency reviewing Powertech's application for the Dewey-Burdock ISR Project, over the last several months the NRC staff has been working with all consulting parties*

during the section 106 process. The staff notes that tribes are sovereign governments and tribal consultations must recognize a government-to-government relationship. Further, consulting parties, including tribes, applicants, and South Dakota State Historical Preservation Officers (SD SHPOs), all have legitimate interests that need to be acknowledged and considered. As discussed previously, BLM is a cooperating agency in certain projects and its views and input also need to be considered and reflected in NRC's decision. In addition, the standard for conducting the Section 106 consultation process is to "make a reasonable and good faith effort" as outlined in the regulations issued by ACHP and codified in 36 CFR Part 800. In recent years there has been a significant increase in tribes' requests for NRC to conduct field identification of historic properties of religious and cultural significance. The NRC staff must balance the needs of all consulting parties with the requirements of 36 CFR Part 800 to ensure the "reasonable and good faith" standard is met. Based on the experience gained over the past few years, the staff believes that process improvements have been and will continue to be made and applied to ongoing and future projects.

No change was made to the SEIS beyond the information provided in this response.

**Comment: 136-000006**

One commenter stated that the cultural and historic resource analysis as required under Section 106 of the National Historic Preservation Act has not been completed. The commenter further stated that NRC must recognize the government-to-government consultation with the affected tribes that is required under this law. To date, there still is no complete inventory of the Dewey-Burdock site's cultural resources. The SEIS does not include a comprehensive analysis of the environmental impacts to these resources; the information is not available to do so. Supplementing the SEIS after the fact, once additional surveys are conducted, is inappropriate.

**Response:** *The NRC staff agrees that the NHPA requires all federal agencies to consult with Native American tribes to determine the impact of a proposed federal action on historic properties.*

*The NRC staff's impact assessment of cultural resources in the draft SEIS was based on available information contained in the application, information gathered through consultation, and information obtained from independent research. The NRC staff developed the impact assessment for cultural resources based on archeological surveys conducted by the applicant, and the staff explicitly stated in SEIS Section 3.9.4 that NHPA Section 106 consultation was ongoing with all interested tribes. The NRC staff stated further that information obtained from the Section 106 consultation will be disclosed for public review and included in the final SEIS. As part of its obligations under Section 106 of the NHPA and the regulations at 36 CFR 800.2(c)(2)(B)(ii)(A), NRC must provide Indian tribes "a reasonable opportunity to identify its concerns about historic properties, advise on the identification and evaluation of historic properties and evaluation of historic properties, including those of religious and cultural importance, articulate its views on the undertaking's effects on such properties, and participate in the resolution of adverse effects." Following extensive consultation with 23 tribes, the NRC staff provided an opportunity for all interested tribes to conduct a field survey (referred to by the tribes as TCP survey) on the entire 4,282 ha [10,580 ac] of the proposed project area, including the area of direct disturbance {~ 809 ha [~2000 ac]} (NRC, 2013). In this invitation, the NRC staff explained that the applicant was willing to cover field survey expenses, such as per diem and travel costs, as well as provide an unconditional grant to each tribe to offset any field-survey-related expenses. Seven tribes (Cheyenne and Arapaho, Northern Arapaho,*

*Northern Cheyenne, Crow Creek Sioux, Crow Nation, Santee Sioux, and Turtle Mountain) participated in the field survey between April 2013 and May 2013. To date, three tribes (Cheyenne and Arapaho, Northern Arapaho, and Northern Cheyenne) have provided reports documenting sites identified as having religious and cultural importance and recommending avoidance/mitigation strategies. In addition, the Crow Nation provided NRC staff with a copy of field notes identifying several sites of interest to that tribe. The NRC staff documented this additional input from the tribes in the final SEIS at Section 3.9.3.2.2. The NRC staff also considered this additional tribal input in the assessment of impacts to historic and cultural resources in the final SEIS at Section 4.9.1.*

*No additional changes made to the SEIS beyond the information provided in this response.*

### **E5.11.1      References**

36 CFR Part 800. *Code of Federal Regulations*, Title 36, *Parks, Forests, and Public Property*, Part 800. "Protection of Historic Properties." Washington, DC: U.S. Government Printing Office.

NRC (U.S. Nuclear Regulatory Commission). "Transmittal of Letter to the THPOs for the Proposed Dewey-Burdock Project." ML13039A336. Email to Tribal Historic Preservation Officers. Washington, DC: NRC. 2013.

Oglala Sioux Tribe. "Re: Field Survey in the Spring 2013." Email (March 12) from R.J. Whiting, Project Review Officer, Tribal Historic Preservation Office, Oglala Sioux Tribe to H. Yilma, U.S. Nuclear Regulatory Commission. ML13078A388. 2013a.

Oglala Sioux Tribe. "Re: Field Survey for Dewey-Burdock." Email (March 13) from R.J. Whiting, Project Review Officer, Tribal Historic Preservation Office, Oglala Sioux Tribe to H. Yilma, U.S. Nuclear Regulatory Commission. ML13078A384. 2013b.

Oglala Sioux Tribe. "Re: Field Survey for Dewey-Burdock." Email (March 15) from R.J. Whiting, Project Review Officer, Tribal Historic Preservation Office, Oglala Sioux Tribe to H. Yilma, U.S. Nuclear Regulatory Commission. ML13116A412. 2013c.

Oglala Sioux Tribe. "Re: Response to February 8, 2013 Letter to Tribal Historic Preservation Officer." Letter (March 22) from B.V. Brewer, Sr., Tribal President, Oglala Sioux Tribe to K. Hsueh, U.S. Nuclear Regulatory Commission. ML13141A362. 2013d.

### **E5.12      Supplemental Environmental Impact Statement Schedule**

**Comments: 004-000001; 007-000001; 009-000001; 011-000001; 012-000001; 015-000001; 026-000001; 032-000001; 043-000001; 055-000001; 056-000002; 061-000003; 092-000001; 093-000001; 116-000035; 127-000004**

Several commenters requested the comment period on the Dewey-Burdock ISR SEIS be extended to provide interested stakeholders sufficient time to adequately review the SEIS. Some commenters referred to the large size of the draft SEIS and the need for more time to prepare thoughtful and complete comments. Commenters also noted the comment period overlapped with seasonal holidays in November and December (Thanksgiving and Christmas/New Years), thus reducing the time to review the document. One commenter stated

that there was a lack of time for the public to review information purported to be relied upon in the draft SEIS and stated that, as a result, the document must be republished with the commensurate additional public comment period.

**Response:** *On November 26, 2012, the NRC staff published a Federal Register notice (77 FR 70486) requesting public review and comment on the “Supplemental Environmental Impact Statement for the Proposed Dewey-Burdock In-Situ Uranium Recovery Project in Custer and Fall River Counties, South Dakota.” In publishing the Notice of Availability for the draft SEIS, the NRC staff stated that the public comment period would continue until January 10, 2013, which is consistent with the 45-day comment period required under NRC regulations [10 CFR 51.73]. The Notice of Availability for the draft SEIS also stated that comments received after this date would be considered if it was practical to do so, but NRC would be able to assure consideration only for comments received on or before January 10, 2013. NRC found it practical to consider comments received from individuals and organizations submitted after the minimum 45-day comment period. NRC accepted all comments on the draft SEIS received on or before March 5, 2013 (99-day comment period). By electronic correspondence, 349 individuals and 31 agencies and organizations submitted 820 comments on the Dewey-Burdock ISR SEIS.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comments: 018-000002; 048-000001; 095-000001**

The commenters stated that the SEIS should not have been issued until a thorough study of the cultural and historical sites on the proposed project area was completed and considered by the Native American communities.

**Response:** *As part of its obligations under Section 106 of the NHPA and the regulations at 36 CFR 800.2(c)(2)(B)(ii)(A), NRC must provide Indian tribes “a reasonable opportunity to identify its concerns about historic properties, advise on the identification and evaluation of historic properties and evaluation of historic properties, including those of religious and cultural importance, articulate its views on the undertaking’s effects on such properties, and participate in the resolution of adverse effects.” As discussed in SEIS Section 1.7.3.5, consultation under Section 106 of the NHPA involving NRC, the applicant, SD SHPO, BLM, and affected Indian tribes is ongoing to determine (i) whether significant properties are present, (ii) whether properties will be disturbed by site activities, and (iii) what mitigation measures should be implemented.*

*Following extensive consultation with 23 tribes, the NRC staff provided an opportunity for all interested tribes to conduct a field survey (referred to by the tribes as TCP survey) on the entire 4,282 ha [10,580 ac] of the proposed project area, including the area of direct disturbance {~ 809 ha [~2000 ac]} (NRC, 2013). Seven tribes (Cheyenne and Arapaho, Northern Arapaho, Northern Cheyenne, Crow Creek Sioux, Crow Nation, Santee Sioux, and Turtle Mountain) participated in the field survey between April 2013 and May 2013. To date, three tribes (Cheyenne and Arapaho, Northern Arapaho, and Northern Cheyenne) have provided reports documenting sites identified as having religious and cultural importance and recommending avoidance/mitigation strategies. In addition, the Crow Nation provided NRC staff with a copy of field notes identifying several sites of interest to that tribe. The NRC staff documented this additional input from the tribes in the final SEIS at Section 3.9.3.2.2. The NRC staff also*



*considered this additional tribal input in the assessment of impacts to historic and cultural resources in the final SEIS at Section 4.9.1.*

*No additional changes made to the SEIS beyond the information provided in this response.*

### **E5.12.1      References**

10 CFR Part 51. *Code of Federal Regulations*, Title 10, *Energy*, Part 51. “Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions.” Washington, DC: U.S. Government Printing Office.

77 FR 70486. *Federal Register*, Vol. 77, No. 227, p. 70486-70487. “Supplemental Environmental Impact Statement for Proposed Dewey-Burdock In-Situ Uranium Recovery Project in Custer and Fall River Counties, SD.” November 26, 2012.

### **E5.13      Description of Proposed Action**

#### **E5.13.1      Facilities and Wellfields**

##### **Comment: 091-000019**

The commenter stated that all proposed and existing facilities and holding ponds should be located on maps for the public stakeholders.

**Response:** *The locations of proposed facilities and infrastructure for the deep Class V injection well disposal option are shown on SEIS Figure 2.1.10, and the locations of proposed facilities and infrastructure for the land application disposal option are shown on SEIS Figure 2.1.12. The location of proposed wellfields in relation to the central processing plant in the Burdock area and the satellite facility in the Dewey area is shown on SEIS Figure 2.1-6.*

*No change was made to the SEIS beyond the information provided in this response.*

##### **Comments: 049-000002; 136-000020**

One commenter stated that for both proposed liquid waste disposal options (i.e., deep Class V injection wells and land application) double liners are planned for the radium settling, spare, and central plant ponds, and single pond liners are specified for the remaining ponds. The commenter further stated that according to both 40 CFR Part 61, Subpart W and 10 CFR Part 40, Appendix A, Criteria 5A, 5E, and 13, the impoundments must incorporate the basic groundwater protection standards specified by 40 CFR Part 192, Subpart D (i.e., a minimum of double liners for ponds utilized for recovery operations). Another commenter stated that the applicant, in its design of surface facilities, proposes an inadequate containment system for handling produced water and waste streams. The commenter stated that in addition to the radium settling ponds, the outlet and surge ponds and the central plant brine pond should all have double liner containment systems.

**Response:** *As described in SEIS Section 2.1.1.1.2.4.1 for the deep Class V injection well option and SEIS Section 2.1.1.1.2.4.2 for the land application option, radium settling, spare, and central plant ponds will be constructed with a lining system consisting of the following: (i) an 80-mil high-density polyethylene (HDPE) primary liner; (ii) a 60-mil HDPE secondary liner; and*

*(iii) a 0.3-m [1-ft]-thick clay liner below the secondary liner; (iv) a geonet drainage layer sandwiched between the primary and secondary HDPE liners; and (v) a leak detection sump and access port system (Powertech, 2009c). All other ponds will be constructed with a lining system consisting of a 40-mil HDPE liner underlain by a 0.3-m [1-ft]-thick clay liner. Therefore, all ponds constructed for liquid waste handling at the proposed project will be double lined in compliance with 40 CFR Part 192, Subpart D.*

*Text was added to SEIS Sections 2.1.1.1.2.4.1 and 2.1.1.1.2.4.2 to indicate that NRC reviewed the pond design and determined that it meets 10 CFR Part 40, Appendix A criteria, which conform to generally applicable standards in 40 CFR Part 192, Subpart D (i.e., a minimum of double liners for ponds utilized for recovery operations).*

**Comments: 128-000015; 128-000239**

The commenter stated that the language used to describe the construction of storage ponds in the SEIS is inconsistent with information in the referenced licensed application document (namely Powertech, 2009c).

**Response:** *NRC staff acknowledges the inconsistency in the language used to describe the construction of storage ponds in the SEIS. As described in Powertech (2009c), storage ponds that contain treated water will include a single, geosynthetic liner underlain by a clay liner and, unlike radium settling ponds, will not include underdrains or leak detection systems. The SEIS was revised, where appropriate, to correctly describe storage pond construction.*

**Comment: 128-000041**

The commenter suggested modifying the description of an excursion in SEIS Section 2.1.1.1.2.3.2 to state that an excursion happens “at a monitoring well.”

**Response:** *NRC staff acknowledge that excursions are detected at monitoring wells. Text was added to SEIS Section 2.1.1.1.2.3.2 to clarify that an excursion happens or is detected at a monitoring well.*

**Comment: 128-000045**

The commenter pointed out that the SEIS fails to mention that by license condition all wellfield hydrogeologic data packages will be submitted to NRC for review and written verification.

**Response:** *NRC acknowledges that by license condition all wellfield hydrogeologic data packages must be submitted to NRC for review and written verification (NRC, 2013a). Text was added to the SEIS, where appropriate, to clarify that by NRC license condition all wellfield hydrogeologic data packages must be submitted to NRC for review and written verification prior to operating a wellfield.*

**E5.13.2 In-Situ Recovery Process**

**Comment: 091-000015**

The commenter stated that in order to identify possible ground and surface water contaminants of concern, as well as potential excursions from the project site, the SEIS should disclose all

chemicals used, their geochemical and radiological characteristics, and expected impacts to the geochemical and radiological balance of the affected aquifers, both short and long term.

**Response:** *The chemicals used in the ISR extraction process and during aquifer restoration at the proposed Dewey-Burdock ISR Project are listed in SEIS Section 4.13.1.1.2.3. None of these chemicals contain radioactive elements. SEIS Section 2.1.1.1.3 describes how these chemicals will be used in uranium mobilization and processing at the proposed project. During the uranium recovery process, the groundwater in the production zone becomes progressively enriched in uranium and other metals that are typically associated with uranium in nature (NRC, 2009a). The most common metals are arsenic, selenium, vanadium, iron, manganese, and radium. These and other constituents, such as chloride, which is introduced by the ion exchange resin system, are removed from the groundwater during aquifer restoration after uranium recovery is completed.*

*As described in 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 of a wellfield to CAB water quality conditions or to standards consistent with NRC requirements at 10 CFR Part 40, Appendix A, Criterion 5B(5). These standards state that the concentration of a hazardous constituent must not exceed (i) the CAB concentration of that constituent in groundwater; (ii) the respective value in 10 CFR Part 40, Appendix A, Table 5C if the constituent is listed in the table and if the background level of the constituent is below the value listed; or (iii) an ACL the Commission establishes. SEIS Appendix B explains the process for granting an ACL. For proposed ACLs to be approved, they must be shown to protect human health at the site.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comment: 128-000051**

The commenter requested removal of “well development water” and “pumping test water” from the list of liquid waste streams identified in SEIS Section 2.1.1.1.3.3 as being handled in the same manner as production bleed. The commenter noted that pumping test water generated prior to ISR operations in a given wellfield and well development water taken from wells prior to using them for ISR operations is considered as Technologically Enhanced, Naturally Occurring Radioactive Material (TENORM).

**Response:** *NRC staff acknowledge that well development water and pumping test water generated prior to ISR operations is considered TENORM and would not be handled in the same manner as production bleed. In SEIS Section 2.1.1.1.3.3, “well development water” and “pumping test water” were removed from the list of liquid waste streams to be handled in the same manner as production bleed.*

**Comment: 061-000016**

The commenter stated that there is a lack of specificity about the percentage of water used in the project that will be consumed as bleed. The commenter stated that there is a huge difference between 0.5 percent of the water being consumed and 3 percent of that amount being consumed. The commenter pointed out that the draft SEIS later says that as much as 17 percent could become bleed water during restoration, which would be going on for much of the project’s life.

**Response:** As described in the SEIS, the applicant plans to maintain a typical bleed rate of 0.875 percent during ISR operations; however, bleed rates may vary from 0.5 to 3 percent to ensure a cone of depression is maintained and that no production fluids are released from the production zone (see SEIS Sections 2.1.1.1.3.1.2, 2.1.1.1.3.3, and 4.5.2.1.1.2.2) (Powertech, 2009a, 2011). As described in SEIS Section 2.1.1.1.4.1.3, a 1 percent bleed rate will typically be used to maintain hydraulic control of wellfields during aquifer restoration (Powertech, 2011). However, higher bleed rates may be required to recover flare (i.e., outward spreading) of lixiviant from the wellfield pattern areas during aquifer restoration. If necessary, the applicant has proposed to increase the restoration bleed by withdrawing up to one pore volume of water through groundwater sweep over the course of aquifer restoration, which would result in an average restoration bleed of approximately 17 percent (Powertech, 2011). In summary, the varying estimates for bleed rates take into account various scenarios that may occur during ISR operations and aquifer restoration; the SEIS thereby satisfies NEPA by disclosing the full range of potential environmental impacts.

No change was made to the SEIS beyond the information provided in this response.

**Comment: 061-000017**

The commenter stated that estimates of how much water will be consumed, whether as bleed or after reverse osmosis (RO), should be presented in terms that the general public can understand, rather than as a flow rate. The commenter further stated that the public, which is the draft SEIS's intended audience, understands gallons of water and has little familiarity with gallons per minute.

**Response:** NRC staff recognizes that amounts of water consumed during ISR operations and aquifer restoration (e.g., bleed rates and liquid waste flow rates) are presented in terms of a flow rate [i.e., gallons per minute (gpm)] in the SEIS. Well capacity or the amount of water that a well (either domestic or industrial) can produce is typically reported in gpm, rather than as a total volume (e.g., gallons). The NRC staff disagree that the general public is unfamiliar with gpm or that the public does not understand the term gpm. In any event, converting gpm to flow in total gallons can be done by multiplying gpm by the length of time which a person seeks to determine the gallons of water used. For example, multiplying by 60 (60 min/hr) gives the hourly flow and multiplying by 1,440 (1,440 min in 24 hr) gives the daily flow.

No change was made to the SEIS beyond the information provided in this response.

**Comment: 091-000016**

The commenter stated that a mass balance analysis should be performed to assess the total volume of lixiviant mixture which will be injected into each aquifer to extract the uranium, the volume of water and lixiviant removed from each aquifer following the induced chemical reactions, and the volume of treated wastewater which will be reinjected into an aquifer or discharged to the surface.

**Response:** As described in SEIS Section 2.1.1.1.2.3.1, the applicant estimates that at full production, wellfields in the proposed project area will operate at an average production flow rate of 15,140 Lpm [4,000 gpm] (Powertech, 2011). The typical production flow rate will be approximately 9,084 Lpm [2,400 gpm] from the Burdock wellfields and approximately 6,056 Lpm [1,600 gpm] from the Dewey wellfields (Powertech, 2011). The applicant's projected production

bleed for the proposed project would be approximately 0.875 percent of the total production flow rate, or approximately 79.5 Lpm [21 gpm] at the Burdock wellfields and approximately 53 Lpm [14 gpm] at the Dewey wellfields (Powertech, 2011). As described in SEIS Section 2.1.1.1.3.1.2, lixiviant injection and production in a wellfield would continue until uranium recovery is uneconomical. Therefore, the total volume of lixiviant mixture that will be injected and removed from each aquifer will depend on the length of operation of all the wellfields completed in each aquifer. Likewise, the volume of treated wastewater that will be reinjected into deep aquifers via Class V injection wells or applied to land application areas will also depend on the length of operation of all the wellfields completed in each aquifer. The applicant estimates that the operational life of the project will be 8 years.

In summary, the SEIS provides adequate information to assess the potential total volumes of lixiviant that will be injected and produced at the proposed project and the potential total volumes of wastewater that would be reinjected into deep Class V injection wells or applied to land application areas. A figure was added to SEIS Section 2.1.1.1.3.3 to document estimated water balances for the operations and aquifer restoration phases of the proposed project.

No other changes were made to the SEIS in response to this comment.

**Comment: 049-000011**

The commenter noted that SEIS Section 2.1.1.1.4.1 (Groundwater Restoration Methods) states that mine unit restoration and reclamation will be performed concurrently with production from adjacent operating units. The commenter expressed concerns that both the production process and the restoration process may use the same RO treatment units, which could lead to excursions due to interruptions in reclamation activities. The commenter recommended that the final SEIS include a more complete description of the RO treatment capacity and associated RO production and reclamation operational design capacity.

**Response:** During the operations phase of the proposed Dewey-Burdock project, wastewater will be (i) redirected back to the central processing plant for ion-exchange treatment to remove uranium, (ii) mixed with barium chloride, and (iii) discharged into lined settling ponds (i.e., radium removal ponds) (see SEIS Section 2.1.1.1.6.2) (Powertech, 2009b, 2010, 2011). Following radium removal processing, the treated wastewater will be injected into the Class V deep injection wells or applied to land application areas. Although aquifer restoration of a wellfield will be performed concurrently with production from adjacent operating wellfields, the applicant is not proposing to treat wastewater from an operating wellfield by RO before discharge to the radium settling ponds. As described in SEIS Section 2.1.1.1.4.1, the applicant is only proposing to use RO treatment during aquifer restoration for the Class V injection well disposal option. As further described for the deep Class V injection well option in SEIS Section 2.1.1.1.4.1.1, the total liquid waste flow rate would be approximately 746 Lpm [197 gpm] during concurrent uranium production and aquifer restoration and approximately 568 Lpm [150 gpm] during aquifer restoration alone (Powertech, 2011).

No change was made to the SEIS beyond the information provided in this response.

**Comment: 049-000012**

The commenter noted that the draft SEIS states that the aquifer restoration process will use six pore volumes and suggested disclosing the approximate pore volume amount and the amount of time required for each pore volume to be replaced.

**Response:** *The applicant estimated that the pore volume affected in the first year of production will be approximately 49.2 million L [13 million gal], assuming an active wellfield area of approximately 8.1 ha [20 ac] (Powertech, 2011). The restoration composite (6 pore volumes), or volume of groundwater to be extracted during groundwater restoration, is estimated to be approximately 295 million L [78 million gal]. At a restoration flow rate of 1,892 Lpm [500 gpm], the applicant estimated that approximately 0.3 years would be required to restore an 8.1-ha [20-ac] wellfield area (i.e., remove 6 pore volumes). Text was added to SEIS Section 2.1.1.1.4.1 to disclose the approximate pore volume amount and the approximate amount of time required for aquifer restoration of a wellfield area at the proposed project.*

**Comments: 048-000011; 095-000005**

Some commenters noted that 30 percent of the water treated through the RO process will become waste and that the impacts of the removal of this water from local aquifers should be discussed more clearly.

**Response:** *As described in SEIS Sections 2.1.1.1.4.1 and 4.5.2.1.1.3, the applicant's primary method of aquifer restoration for the Class V injection well disposal option consists of groundwater treatment with RO treatment and permeate injection (Powertech, 2009b, 2011). The RO reject, or brine, undergoes radium removal in the radium settling ponds and then disposal in one or more Class V injection wells. The total liquid waste flow rate will be approximately 746 Lpm [197 gpm] during concurrent uranium production and aquifer restoration and approximately 568 Lpm [150 gpm] during aquifer restoration alone (Powertech, 2011). The wastewater would not be reinjected back into the wellfields. Instead, makeup water from the Madison aquifer will be injected into the wellfields at a rate sufficient to maintain the restoration bleed. This rate will typically be 1 percent of the restoration flow unless groundwater sweep is used in conjunction with RO treatment with permeate injection, in which case the restoration bleed will average approximately 17 percent as described in SEIS Section 2.1.1.1.4.1.3.*

*As described in SEIS Section 4.5.2.1, in June 2012 the applicant submitted a water appropriation permit application to use Madison aquifer water at the proposed project (Powertech, 2012b). The water permit application for the Madison aquifer proposes to appropriate 109.6 ha-m [888.8 ac-ft] of water annually, at a withdrawal rate of 2,085 Lpm [551 gpm] (Powertech, 2012b). This water would be used primarily during the aquifer restoration phase of the project. Based on a review of the application, which included an analysis of water availability and existing water rights, SDDENR concluded that (i) there is reasonable probability that unappropriated water is available in the Madison aquifer to supply the proposed appropriation; (ii) approval of the application will not result in average annual withdrawals from the Madison aquifer that exceed the average annual recharge to the aquifer; and (iii) there is a reasonable probability that withdrawal proposed in the application can be made without impacting existing rights, including domestic users (SDDENR, 2012).*

*If the applicant cannot secure a water appropriation for use of Madison aquifer water, the applicant will have to either identify an alternative source of water to meet aquifer restoration*

*water requirements or reduce pumping rates to meet the estimated sustainable net extraction rate from the Inyan Kara aquifer, which is estimated to be at least 556 Lpm [147 gpm] for 2 years and 363 Lpm [96 gpm] for 8 years (see SEIS Sections 4.5.2.1.1.1 and 4.5.2.1.1.2.2). Reducing the pumping rate will extend the aquifer restoration phase (Powertech, 2010). After production and restoration are complete and groundwater withdrawals are terminated, groundwater levels will tend to recover with time (NRC, 2009a). Thus, the potential long-term environmental impact from consumptive use during the restoration phase at the proposed project for the Class V injection well disposal option will be SMALL.*

*No change was made to the SEIS beyond the information provided in this response.*

### **E5.13.3 Historic Operational Experience: Excursions, Spills, and Leaks**

**Comments: 042-000011; 093-000002; 127-000013**

One commenter stated that NRC and BLM must address the critique of Dr. Moran, consultant for the Oglala Sioux Tribe, concerning lack of evidence of the ability to contain contamination once ISL mining begins. The Northern Cheyenne Tribe also noted and cited support for the technical arguments provided by Dr. Moran that toxic mining fluids and mobilized constituents cannot be contained within the mine production zone as asserted by the applicant. Another commenter stated that there are numerous major problems with past and existing ISL sites throughout the United States, including the excessive number of leaks, spills, and excursions of contaminated injection and production fluids at existing ISL mines.

**Response:** *NRC is aware of the declaration of Dr. Moran before the NRC ASLBP and the arguments that toxic mining fluids and mobilized constituents cannot be contained within the ISR production zone (ASLBP, 2013). These arguments are based primarily on historical information from operating and closed ISR sites.*

*NRC is also aware of the potential groundwater impacts at ISR facilities resulting from migration or excursions of production fluids toward surrounding aquifers. Before operating a NRC-licensed ISR facility, the licensee is required to obtain a UIC permit from EPA or an EPA-authorized state. The permit must exempt the portion of the aquifer subject to uranium recovery from classification as an Underground Source of Drinking Water (USDW).*

*Historical information on excursions that have occurred at operating ISR facilities are discussed in GEIS Section 2.11.4 (NRC, 2009a). This information indicates that most horizontal excursions can be recovered quickly (weeks to months) by fixing and reconditioning wells and adjusting pumping rates in the wellfields (NRC, 2009a). Vertical excursions tended to be more difficult to recover than horizontal excursions, and in a few cases a well could remain on excursion status for a period of as much as 8 years. In these cases, the excursion was believed to be due to improperly abandoned wells from earlier exploratory programs before UIC program regulations were established. As discussed in SEIS Section 4.5.2.1.1.2.2, the applicant will use available information and best professional practices—including historical records, color infrared imagery, field investigations, and potentiometric surface evaluation—to locate or detect improperly plugged boreholes or wells in the vicinity of potential wellfield areas at the proposed Dewey-Burdock site. In addition, the applicant will use pumping test results conducted as part of routine wellfield hydrogeologic package development to identify improperly plugged wells and exploration boreholes (Powertech, 2011).*



*NRC staff also analyzed the environmental impacts from both horizontal and vertical excursions that occurred at three NRC-licensed ISR facilities (COGEMA's Irigary/Christensen Ranch facility, PRI's Smith Ranch/Highland Uranium Project facility, and Crow Butte Resources Crow Butte facility) (see SEIS Section 4.5.2.1.1.2.2) (NRC, 2009b). In that analysis, which considered a total of 60 events, NRC staff found that, for most of the events, the licensees were able to control and reverse the excursions through pumping and extraction at nearby wells. Most excursions were short-lived, although a few continued for several years. In all cases, however, no impacts occurred to nonexempted portions of the aquifer (NRC, 2009b).*

*Historical occurrences of spills and leaks at operating ISR facilities are discussed in GEIS Section 2.11.2 (NRC, 2009a). Spills at operating ISR facilities have been predominantly caused by the failure of joints, flanges, and unions of pipelines and at wellheads. Licensees of ISR facilities are expected to establish immediate spill responses through onsite standard operating procedures (e.g., NRC, 2003, Section 5.7). As part of the monitoring requirements at ISR facilities, licensees must report spills to the NRC within 24 hours. This is followed by a written report addressing items such as the conditions leading to the spill, the corrective actions taken, and the results achieved. In addition, regular inspection and monitoring that licensees must conduct minimizes the potential for spills and leaks through early detection.*

*No change was made to the SEIS beyond the information provided in this response.*

#### **E5.13.4 Uranium Resource Estimate**

##### **Comment: 128-000040**

The commenter pointed out that the uranium resource estimate for the proposed Dewey-Burdock ISR Project was updated in the April 17, 2012, Dewey-Burdock Project NI 43-101 Technical Report (SRK Consulting, 2012). The current estimate is 10.16 metric tons [11.2 million short tons] of ore, averaging 0.198 percent U<sub>3</sub>O<sub>8</sub>. At an estimated recovery rate of 75 percent, the estimate of recoverable uranium is 3.8 million kg [8.4 million lb] U<sub>3</sub>O<sub>8</sub>. The commenter suggested updating the uranium resource estimate in the SEIS to reflect more recent information.

**Response:** *The NRC staff acknowledges that the uranium resource estimate for the proposed project was updated in the April 17, 2012, Dewey-Burdock Project NI 43-101 Technical Report (SRK Consulting, 2012). The SEIS was revised, where appropriate, to reflect the updated uranium resource information.*

#### **E5.13.5 Alternative Liquid Waste Disposal Options**

##### **Comment: 116-000017**

One commenter noted that draft SEIS Section 2.1.1.2 (Alternative Liquid Waste Disposal Options) references applicable land disposal, deep well injection, and offsite discharge standards and regulations, but fails to provide a comparison of the specific standards. The commenter stated that the SEIS fails to identify all of the expected radiological and nonradiological constituents in the liquid effluents that could be discharged to the environment via deep well injection, land application, or direct discharge. The commenter expressed the view that the draft SEIS does not provide sufficient information to make an informed comparison of the environmental impacts of the various liquid effluent disposal alternatives.

**Response:** *The analysis of alternative liquid waste disposal options in the draft SEIS compares the potential environmental impacts of liquid waste disposal options. In evaluating the potential impacts of specific options, the section references some key regulations that apply to each option and the text describes their role in limiting potential impacts. NRC staff tried to provide sufficient information to allow a reader to understand important regulatory controls applicable to each option while also limiting unnecessary detail. Because the regulatory requirements and programs described in the analysis are varied and address specific and different aspects of the waste management options, the NRC staff believe a comparison of the regulations applicable to each option evaluated is not necessary to support an evaluation of the potential impacts of each option.*

*The characteristics of the proposed liquid wastes are summarized in draft SEIS Section 2.1.1.1.6.2 (Liquid Wastes). That section refers to liquid waste containing both chemical and radiological constituents and cites the applicant's safety documentation for details. The cited reference (Powertech, 2011) contains a table of expected constituents and concentrations in wastewater, although it is limited to the Class V deep disposal option. In response to this comment, the description of waste characteristics in Section 2.1.1.1.6.2 was revised by retaining the reference to the wastewater quality information for the Class V disposal option and adding a reference for land application wastewater quality that was provided in the applicant's GDP (Powertech, 2012a). The surface water discharge method was included in the analysis as a point of comparison; however, because it is not included in the proposal, there is no estimated wastewater quality. Based on a comment SDDENR submitted to NRC (119-000013), if a permit for surface water discharge was requested, SDDENR would propose an NPDES permit that would require no discharge of process wastewater. Therefore, surface water discharge is likely not a viable option but is retained in the analysis as a point of comparison with the other evaluated options. The NRC staff do not agree with the commenter that Section 2.1.1.2 provides insufficient information; rather, the analysis in Section 2.1.1.2 provides an informative comparison of the potential environmental impacts of the different liquid waste management options based on an assessment of a variety of factors.*

**Comment: 116-000018**

The commenter stated that it supports the use of evaporation ponds for the evaporation of liquid wastes. The commenter stated that other disposal options involve one or more of the following: (i) treatment to remove radium and uranium, which might not be effective; (ii) discharge contaminants that are not subject to a discharge standard; (iii) contamination of large areas for land disposal of liquid effluents; (iv) removal of only some hazardous constituents (radium, uranium, and zinc) prior to discharge or land application; (v) potential for aquifer contamination through deep well disposal and land application; (vi) unknown impacts of animal consumption of feed irrigated with contaminated ISL waste water; and (vii) unknown impacts from human consumption of animals that have fed on alfalfa irrigated with ISL waste water.

**Response:** *NRC staff acknowledges that the commenter supports the use of evaporation ponds for the disposal of liquid wastes at the proposed project. As described in SEIS Section 2.1.1.2.1, one commonly used method for disposal of liquid wastes involves pumping liquids into one or more ponds and allowing natural solar radiation to reduce the volume through evaporation. The waste streams are not always treated prior to being discharged into evaporation ponds, and radionuclides and other metals are concentrated as the liquids*

*evaporate. The effectiveness of evaporation ponds depends on evaporation rates and how quickly liquid wastes are generated.*

*During the winter months in South Dakota, where temperatures are generally below freezing, ponds could ice over, thereby reducing evaporation to zero. To maintain year-round liquid disposal capability using evaporation ponds at the proposed Dewey-Burdock ISR Project facilities, the applicant would likely need to have either sufficient storage capacity or at least one other disposal option available. As noted in SEIS Section 2.1.1.2.1, the applicant currently does not consider evaporation ponds a viable liquid waste disposal option at the proposed Dewey-Burdock site (Powertech, 2009b). This is due to unfavorable climatic conditions at the site; notably, the short period of high temperatures, long periods of sub-freezing temperatures, and strong winds.*

*To the extent the commenter implies that the liquid waste disposal options proposed by the applicant (namely deep Class V well injection, land application, or a combination of these methods; see SEIS Section 2.1.1.6.2) are unacceptable, the commenter provides no context, information, or assessments to demonstrate that the assertions listed above will adversely impact human health and the environment at the proposed project site. For example, the commenter asserts that discharge contaminants will not be subject to discharge standards. However, as described throughout the SEIS, liquid waste disposed in deep Class V injection wells or by land application will be subject to NRC release limits under 10 CFR Part 20, Appendix B, for discharge of radionuclides to the environment. In addition, land application will be carried out under a GDP approved by SDDENR, which would require land application operations to meet applicable state groundwater quality standards.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comment: 116-000026**

The commenter believes that land application of liquid ISR wastes is not an acceptable alternative. The commenter stated that the SEIS failed to adequately assess the short-term and long-term impacts of land disposal on human health and the environment. The commenter asserted that the SEIS improperly relied on assumptions that monitoring and conformance with existing, though inadequate, regulatory standards would be protective of public health and safety and the environment.

**Response:** *NRC recognizes some commenters are not supportive of land application of treated liquid wastes. Land application is a disposal technique that uses agricultural irrigation equipment to broadcast wastewater on a relatively large area of land for subsequent evaporation. Land application is authorized, but has not been implemented, at several ISR facilities (NRC, 1995; 1998). Disposal of treated wastewater by land application at the proposed Dewey-Burdock ISR Project site will require treatment to meet NRC release requirements for radionuclides in 10 CFR Part 20, Appendix B and SDDENR requirements imposed by a GDP permit (see SEIS Section 2.1.1.6.2). As described in SEIS Section 2.1.1.6.2, process solutions, wastewater disposal, or surface water runoff from the site will be required to meet GDP permit requirements, South Dakota groundwater quality standards as outlined in Rules of ARSD 74:54:01, or surface water quality standards as outlined in ARSD 74:51:01. SEIS Section 7.5 describes the applicant's proposed land application monitoring program. As described in SEIS Section 7.5, water, soils, and vegetation will be monitored on a regular basis to ensure soil loadings and vegetation concentrations remain within GDP permit limits.*

*SEIS Chapter 4 discusses construction, operations, aquifer restoration, and decommissioning impacts from disposal of liquid wastes via land application for each of the 13 resource area assessed in the SEIS. The commenter asserts that the impact analyses of land disposal of liquid ISR wastes on human health and the environment presented in the draft SEIS rely on inadequate regulatory standards. However, the commenter provides no information or assessments to demonstrate that current regulatory standards (e.g., release limits for radionuclides in 10 CFR Part 20, Appendix B) are not protective of human health and the environment.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comments: 119-000013; 128-000074; 128-000217**

SDDENR provided comments on Section 2.1.1.2.2 of the draft SEIS, which explores the option of liquid waste disposal by permitted discharge to surface waters. SDDENR referred to EPA effluent guidelines regulating the discharge of wastewater from new *in-situ* recovery facilities in 40 CFR 440.34 that prohibit the discharge of process wastewater to navigable waters. It noted that the draft SEIS indicates the applicant could not discharge to navigable waters because of the effluent guidelines, but it could discharge to nonnavigable waters under a state-issued NPDES permit. SDDENR explained the South Dakota rules adopt the effluent guidelines by reference, substituting “waters of the state” for “navigable waters of the U.S.” and that EPA requires SDDENR to incorporate applicable effluent guidelines into state-issued NPDES permits. Further, SDDENR explained that any surface water discharge from the Dewey-Burdock facility would be expected to reach Beaver Creek, which is a classified fishery that meets the definition of waters of the state. SDDENR therefore stated that if surface water discharge was proposed, it would propose an NPDES permit that would require no discharge of process wastewater. However, SDDENR also noted its understanding that the applicant is not currently proposing a surface water discharge of process water and that the draft SEIS is only exploring possible options.

The applicant also requested that statements in SEIS Section 2.1.1.2.2 be revised to address a perceived internal inconsistency. It noted that the draft SEIS states EPA does not permit surface discharge of ISR liquid waste per 40 CFR Part 440, but then states that such liquid waste must be pretreated before it is discharged. A similar discussion exists in SEIS Section 4.14.1.4.2. They also requested clarification of the definition of the “zero-release surface water discharge permit” from SDDENR that is mentioned in the cited draft SEIS text.

**Response:** *In response to this comment, the NRC staff have added text to Section 2.1.1.2.2 to (i) reference the SDDENR comment, (ii) convey that the prohibition on discharge of process wastewater would likely apply to any proposed surface discharge, and (iii) add that, although an unlikely option, the surface water discharge analysis was retained to provide a point of comparison with commonly used liquid waste disposal methods.*

*Regarding the applicant’s perceived inconsistency in the text, the discussion of pretreatment of waste before discharge is described for discharges to nonnavigable waters, whereas the no discharge permit requirement applies to discharges to navigable waters. Because the text is clear as written, no further changes were made in response to this comment. Regarding the details of a “zero-release” permit, the applicant should review the summary of the previously*

mentioned SDDENR comment (119-000013) for additional clarification or contact SDDENR for more information.

**Comment: 127-000026**

The commenter expressed the view that the draft SEIS fails to adequately address disposal options should the Class V UIC permit be denied. The draft SEIS states that “if EPA does not grant the applicant a UIC permit, the applicant would need to rely solely on the proposed land application or seek an NRC license amendment to approve another disposal option before it initiated operations.” The commenter stated that the draft SEIS must detail these other potential disposal plans as part of its discussion of impacts, alternatives analysis, and discussion of mitigation.

**Response:** *The draft SEIS text the commenter cited is within an introductory paragraph of Section 2.1.1.2 (Alternative Liquid Waste Disposal Options). That section summarizes and compares the potential environmental impacts of two additional liquid waste disposal options: evaporation ponds and surface water discharge. As stated in the draft SEIS, these additional disposal options are not planned or proposed by the applicant, but are included for the purpose of comparing other possible options for managing liquid wastes. The disposal options evaluated in Section 2.1.1.2 reflect the currently available options for disposal of the proposed liquid byproduct material at the proposed site. Therefore, no additional plans or options exist that could be added to the section. No changes were made to the SEIS in response to this comment.*

**Comment: 128-000073**

The commenter requested in draft SEIS Table 2.1-8 that NRC define the asterisk, which is used under climatic influences for the Class V injection well option.

**Response:** *In response to this comment, a reference was added to Table 2.1-8 to support the estimation of CO<sub>2</sub> emissions from a deep injection well.*

**E5.13.6 References**

10 CFR Part 40 Appendix A. *Code of Federal Regulations*, Title 10, *Energy*, Part 40 Appendix A. “Criteria Relating to the Operation of Uranium Mills and to the Disposition of Tailings or Wastes Produced by the Extraction or Concentration of Source Material from Ores Processed Primarily from their Source Material Content.” Washington, DC: U.S. Government Printing Office.

40 CFR Part 61. *Code of Federal Regulations*, Title 40, *Protection of Environment*, Part 61. “National Emission Standards for Hazardous Air Pollutants (NESHAPS).” Washington, DC: U.S. Government Printing Office.

40 CFR Part 192. *Code of Federal Regulations*, Title 40, *Protection of Environment*, Part 192. “Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings.” Washington, DC: U.S. Government Printing Office.

40 CFR Part 440. *Code of Federal Regulations*, Title 40, *Protection of Environment*, Part 440. “Ore Mining and Dressing Point Source Category.” Washington, DC: U.S. Government Printing Office.

ARSD (Administrative Rules of South Dakota). "Section 74:55:02:02. Class I and IV Disposal Wells Prohibited." South Dakota Legislature Administrative Rules.

ASLBP (Atomic Safety and Licensing Board Panel). "Supplemental Declaration of Dr. Robert E. Moran." In the Matter of Powertech (USA) Inc., Dewey-Burdock In Situ Uranium Recovery Facility. ML13029A368. Washington, DC: NRC. January 2013.

NRC (U.S. Nuclear Regulatory Commission). "Draft License SUA-1600 for Powertech (USA), Inc." ADAMS Accession No. ML13318A094. Washington, DC: NRC. March 2013a.

NRC. "NRC Staff's Answer to Contentions on Draft Supplemental Environmental Impact Statement." ML13066B030. Washington, DC: NRC. March 2013b.

NRC. NUREG-1910, "Generic Environmental Impact Statement for *In-Situ* Leach Uranium Milling Facilities." ML091480244, ML091480188. Washington, DC: NRC. May 2009a.

NRC. "Data on Groundwater Impacts at the Existing ISR Facilities." ML091770385. Washington, DC: NRC. 2009b.

NRC. NUGEG-1569, "Standard Review Plan for *In-Situ* Leach Uranium Extraction License Applications—Final Report." Washington, DC: NRC. June 2003.

Powertech [Powertech (USA) Inc.]. "Dewey-Burdock Project Groundwater Discharge Plan Custer and Fall River Counties, South Dakota." ML12195A039, ML12195A040. Edgemont, South Dakota: Powertech. March 2012a.

Powertech. "Dewey-Burdock Project, Report To Accompany Madison Water Rights Permit Application Custer and Fall River Counties, South Dakota." ML12193A239. Edgemont, South Dakota: Powertech. June 2012b.

Powertech. "Dewey-Burdock Project, Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota, Technical Report RAI Responses, June, 2011." ML112071064. Greenwood Village, Colorado: Powertech. 2011.

Powertech. "Dewey-Burdock Project, Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota ER\_RAI Response August 11, 2010." ML102380516. Greenwood Village, Colorado: Powertech. 2010.

Powertech. "Dewey-Burdock Project, Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota—Environmental Report." Docket No. 040-09075. ML092870160. Greenwood Village, Colorado: Powertech. August 2009a.

Powertech. "Dewey-Burdock Project, Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota—Technical Report." Docket No. 040-09075. ML092870160. Greenwood Village, Colorado: Powertech. August 2009b.

Powertech. "Dewey-Burdock Project, Supplement to Application for NRC Uranium Recovery License Dated February 2009." Docket No. 040-09075. ML092870160. Greenwood Village, Colorado: Powertech. August 2009c.

SDDENR (South Dakota Department of Environment and Natural Resources). "Report to the Chief Engineer on Water Permit Application No. 2685-2, Powertech (USA) Inc., November 2, 2012." ML13165A160. Pierre, South: SDDENR. November 2012.

SRK Consulting. "NI 43-101 Technical Report Preliminary Economic Assessment Dewey-Burdock Project." ML13165A150. Lakewood, Colorado: SRK Consulting (U.S.) Inc. April 2012.

## **E5.14 Financial Assurance**

**Comments: 005-000002; 006-000004; 016-000004; 019-000001; 022-000002; 027-000003; 047-000011; 048-000012; 051-000002; 072-000002; 079-000002; 081-000004; 084-000004; 095-000007; 104-000001; 106-000003; 136-000014**

Several commenters were concerned that the applicant is inadequately funded to properly operate an ISR project and to manage and clean up damage to the environment resulting from the proposed project. Some commenters stated that the applicant is not financially solvent. Other commenters stated that the applicant does not have the resources to create a mine and its lack of funding is an important variable in managing the environmental aspects of the proposed project and should be discussed in the SEIS. One commenter wanted to know who is going to pay for the cleanup and damage to the health of the environment, residents, and wildlife. Another commenter wanted to know who would assume liability for problems created by the proposed project. One commenter asked who will pay for a remedy if/when the applicant declares bankruptcy and leaves. Another commenter asked why taxpayers should pay to further clean up an already distressed area. One commenter questioned whether the applicant has the ability to fund cleanup of a worst case scenario.

**Response:** *NRC does not analyze the business decision of a private entity to submit a license request as part of its licensing decision. As a regulatory agency, NRC's "federal action" at Dewey-Burdock is the decision whether to grant or deny the applicant's license request. The purpose and need statement in the SEIS reflects that NRC is not the implementer or the funding entity for the proposed project. As such, NRC has no role in a company's business decision to submit a license application to operate an ISR facility at a particular location to extract uranium from a particular orebody.*

*At the same time, NRC considers financial surety to be an important issue that the applicant must address for any site-specific license. The NRC licensing decision is based on the safety evaluation review and environmental review of a license application. The evaluation of applicant financial assurance is considered part of the NRC's safety review (NRC, 2013a). SEIS Section 2.1.1.1.8 describes financial surety and refers to the regulations in 10 CFR Part 40, Appendix A, Criterion 9 and SDCL 45-6B, which require an applicant or licensee to set aside sufficient funds prior to operations to cover the costs for a third party to conduct decommissioning, reclamation of disturbed areas, waste disposal, and groundwater restoration. A surety arrangement is made to cover these costs in the event of licensee default.*

*An initial surety estimate must cover the first year of operation and NRC and SDDENR will require annual revisions to the surety estimate to reflect existing operations and planned construction or operations the following year. The NRC safety evaluation provides a detailed*



*review of the initial surety estimate for the proposed Dewey-Burdock ISR Project (NRC, 2013a). To terminate an NRC license, a licensee is required to develop a site-specific decommissioning plan that the NRC must review and approve before decommissioning can begin. The NRC staff review of the decommissioning plan includes both a safety and environmental review. The licensee would address financial surety as part of the site-specific review for the decommissioning plan. NRC annually reviews a licensee's financial surety estimate to assess the effects from inflation, expansions in operations, changes in engineering design, completion of decommissioning activities, and experience in aquifer restoration. NUREG-1569 describes how to estimate the costs (NRC, 2003).*

*No change was made to the SEIS beyond the information provided in this response.*

**Comment: 069-00022**

The commenter stated that if effective treatment of contaminated water became feasible in the future, it would be at significantly higher costs. The commenter stated that a fund should be created by the company to pay such future costs or compensate for other environmental impacts.

**Response:** *SEIS Section 2.1.1.1.8 describes financial surety and refers to the regulations in 10 CFR Part 40, Appendix A, Criterion 9 and SDCL 45-6B, which require an applicant or licensee to set aside sufficient funds prior to operations to cover the costs for a third party to conduct decommissioning, reclamation of disturbed areas, waste disposal, and groundwater restoration. A surety arrangement is made to cover these costs in the event of licensee default.*

*SEIS Section 2.1.1.1.4 describes aquifer restoration activities within wellfields. Aquifer restoration ensures water quality in production zone and surrounding aquifers will not be adversely impacted by the uranium recovery operations. In accordance with 10 CFR Part 40, Appendix A, Criterion 5B(5), NRC requires that groundwater quality in the exempted ore-bearing aquifer be restored to (i) a CAB concentration; (ii) the MCLs listed in 10 CFR Part 40, Appendix A, Table 5C, for constituents listed in Table 5C and if the background level of the constituents falls below the listed value; or (iii) a Commission-established ACL, if the constituent background level and the values listed in Table 5C are not reasonably achievable. The ACL development is described in SEIS Appendix B. These groundwater quality standards will be implemented, as part of the aquifer restoration phase, to ensure public health and safety. The applicant will also be required to provide financial sureties to cover the costs of both planned and delayed restoration programs, in accordance with 10 CFR Part 40, Appendix A, Criterion 9. NRC reviews financial sureties annually.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comment: 091-00009**

The commenter stated that an adequate financial assurance analysis should be performed that lists all sources of data. The commenter stated that consultation with affected environmental justice communities in the Black Hills, with other uranium districts throughout the United States, and with EPA could assist with the required analysis.

**Response:** *SEIS Section 2.1.1.1.8 describes financial surety and refers to the regulations in 10 CFR Part 40, Appendix A, Criterion 9 and SDCL 45-6B, which require an applicant or licensee to set aside sufficient funds prior to operations to cover the costs for a third party to*

*conduct decommissioning, reclamation of disturbed areas, waste disposal, and groundwater restoration. The applicant financial assurance and applicant decommissioning plan is evaluated in detail as part of the NRC safety review (NRC, 2013a).*

*Section 6.5 of the NRC SER provides a detailed review of the initial surety estimate for the proposed Dewey-Burdock ISR Project (NRC, 2013a). Cost estimates provided in Powertech's application were based on available information and standard industry practices at the time of the application (Powertech, 2011). Such information sources include the 2009 RS Means handbooks, vendor quotes, and other calculations. Electrical power costs provided by the applicant were based on analyses of power costs and then rounded upward. Disposal costs assume that solid byproduct material will be disposed at the Energy Fuels, Inc. White Mesa mill in Blanding, Utah. The applicant has also committed to provide NRC staff with copies of financial assurance-related information submitted to the State of South Dakota and/or EPA, including a copy of the financial assurance review or final financial assurance package (Powertech 2011). Based on the information provided in the application and the staff's review of the decommissioning cost estimate for the proposed Dewey-Burdock ISR Project, the staff concluded that the amount of the proposed financial assurance and its methods of estimation are acceptable and consistent with 10 CFR Part 40, Appendix A, Criterion 9. NRC annually reviews a licensee's financial surety estimate to assess the effects from inflation, expansions in operations, changes in engineering design, completion of decommissioning activities, and experience in aquifer restoration. NUREG-1569 describes how to estimate the costs (NRC, 2003).*

*No change was made to the SEIS beyond the information provided in this response.*

**Comment: 091-000021**

The commenter stated that the applicant's lack of experience with *in situ* leach mining and management of related environmental impacts could lead to a rapid startup of operations that later becomes intermittent due to financial shortfalls in a weak company. The commenter stated that the likelihood this scenario could occur merits scrutiny of the applicant's financial stability in order to protect the public from another "zombie" mining operation whose owner is financially unable to continue operations or pay for reclamation and necessary mitigation measures to safeguard the public health and welfare. The commenter stated that we can no longer afford to bail out more failed projects for the nuclear industry—the additional burden on the federal budget and taxpayers is simply too great.

**Response:** *NRC considers financial surety to be an important issue that the applicant must address for any site-specific license. SEIS Section 2.1.1.1.8 describes financial surety and refers to the regulations in 10 CFR Part 40, Appendix A, Criterion 9 and SDCL 45-6B, which require an applicant or licensee to set aside sufficient funds prior to operations to cover the costs for a third party to conduct decommissioning, reclamation of disturbed areas, waste disposal, and groundwater restoration. A surety arrangement is made to cover these costs in the event of licensee default. The evaluation of applicant financial assurance is considered as part of the NRC's safety review (NRC, 2013a).*

*An initial surety estimate is required to cover the first year of operation. NRC and SDDENR will require annual revisions to the surety estimate to reflect existing operations and planned construction or operation the following year. To terminate an NRC license, a licensee is required to develop a site-specific decommissioning plan that NRC must review and approve*

*before decommissioning can begin. The NRC staff review of the decommissioning plan comprises both a safety and environmental review. The licensee would address financial surety as part of the site-specific review for the decommissioning plan. NRC annually reviews a licensee's financial surety estimate to assess the effects from inflation, expansions in operations, changes in engineering design, completion of decommissioning activities, and experience in aquifer restoration. NUREG-1569 describes how to estimate the costs (NRC, 2003).*

*No change was made to the SEIS beyond the information provided in this response.*

**Comments: 100-000002; 101-000001**

One commenter stated that the applicant has no prior track record, and considering failures of other experienced companies in the area like Nebraska and Wyoming, it is unlikely this poorly capitalized company will be able to follow through on any continuing cleanup operations. Another commenter stated that the proposed mining operation is fraught with too many risks for the people living in the area; unless the bond is a significant amount of money in comparison to the value of the product mined, the applicant does not sufficiently share in the risk.

**Response:** *SEIS Section 2.1.1.1.8 describes financial surety and refers to the regulations in 10 CFR Part 40, Appendix A, Criterion 9 and SDCL 45-6B, which require an applicant or licensee to set aside sufficient funds prior to operations to cover the costs for a third party to conduct decommissioning, reclamation of disturbed areas, waste disposal, and groundwater restoration. A surety arrangement is made to cover these costs in the event of licensee default. The evaluation of applicant financial assurance is considered as part of the NRC's safety review (NRC, 2013a).*

*No change was made to the SEIS beyond the information provided in this response.*

**Comment: 128-000072**

The commenter requested clarification on how NRC staff plan to deal with the possession of the financial assurance instrument itself, including whether NRC, the State of South Dakota, or another entity (e.g., standby trust) will hold the financial assurance instrument.

**Response:** *The surety bond for the proposed Dewey-Burdock ISR Project will be independently calculated by the NRC with input from SDDENR as defined in a pending Memorandum of Understanding (MOU) between the two agencies (NRC, 2013c). The MOU will include a provision for the NRC to hold the state's portion of the bond. Provisions will also specify that NRC and SDDENR jointly manage the bond in terms of adjusting it as site conditions change over the project life and releasing it as portions of the facility are decommissioned and reclaimed. Text was added to SEIS Section 2.1.1.1.8 to document that the NRC would hold the state's portion of the surety bond for the proposed project.*

### **E5.14.1      References**

10 CFR Part 40 Appendix A. *Code of Federal Regulations*, Title 10, *Energy*, Part 40 Appendix A. "Criteria Relating to the Operation of Uranium Mills and to the Disposition of Tailings or Wastes Produced by the Extraction or Concentration of Source Material from Ores Processed Primarily from their Source Material Content." Washington, DC: U.S. Government Printing Office.

NRC (U.S. Nuclear Regulatory Commission). "Safety Evaluation Report for the Dewey-Burdock Project Fall River and Custer Counties, South Dakota, Materials License No. SUA-1600." ML13052A182. Washington, DC: NRC. March 2013a.

NRC. "Draft License SUA-1600 for Powertech (USA), Inc." ADAMS Accession No. ML13318A094. Washington, DC: NRC. March 2013b.

NRC. NUREG-1569, "Standard Review Plan for *In-Situ* Leach Uranium Extraction License Applications—Final Report." Washington, DC: NRC. June 2003.

NRC. "Subject: Memorandum of Understanding between the South Dakota Department of Environment and Natural Resources and the U.S. Nuclear Regulatory Commission." Letter to S. Pirner, South Dakota Department of Environment and Natural Resources from A. Persinko, U.S. Nuclear Regulatory Commission. ML13259A006. Washington, D.C.: NRC. August 2013c.

Powertech (Powertech (USA) Inc.). "Dewey-Burdock Project, Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota, Technical Report RAI Responses, June, 2011." ML112071064. Greenwood Village, Colorado: Powertech. 2011.

### **E5.15      Alternatives**

#### **Comment: 020-000003**

The commenter stated that the "SMALL" designation belies a lack of consideration of specific anchors for this scale. As an example, the commenter stated that future inhabitants (stakeholders without voices) will be left to deal with tons of wastes that could be avoided by distributed energy generation. The commenter noted that if such energy production processes were included in the continuum of "SMALL to LARGE," most reasonable people would argue that large-scale uranium mining would not belong on the "SMALL" end.

**Response:** *NRC established a standard of significance for assessing environmental impacts in the conduct of environmental reviews based on the CEQ regulations, as described in the NRC guidance in NUREG-1748 (NRC, 2003). This scale (SMALL-MODERATE-LARGE) accounts for the impacts that the proposed action will have on the environment. The scale does not account for the impacts that different energy generation methods will have on the environment. Moreover, based on a consideration of the purpose and need for the proposed action, NRC did not consider distributed energy generation (i.e., generation of electricity from small energy sources) to be a reasonable alternative to the proposed action (see SEIS Section 2.2).*

*No change was made to the SEIS beyond the information provided in this response.*

**Comment: 061-000008**

The commenter stated that the draft SEIS fails to consider all reasonable alternatives to the proposed project. The commenter stated that the draft SEIS only considers the extremes of doing the project or not doing the project. The commenter stated that several other alternatives include: reclaiming the existing uranium mine on the project area before proceeding; successful reclamation in one mined area before any additional area was mined; removing the BLM land from the project area; or allowing only one processing plant.

**Response:** *NEPA requires Federal agencies to consider alternatives to their proposed federal actions and assess their environmental impacts. Reasonable alternatives for a particular federal action are defined by the proposed federal action and the purpose and need for the proposed federal action. The statement of the purpose and need is found in SEIS Section 1.3 and is derived from the proposed federal action. As discussed in SEIS Section 2.1, NRC considered reasonable alternatives, including the No-Action alternative, not approving the license application, and approving the license application. SEIS Section 2.2 provides a discussion of alternatives that were considered but were eliminated from detailed review and the reasons for their elimination. These alternatives were eliminated from detailed review because they either would not meet the purpose and need of the proposed project or would cause greater environmental impacts than the proposed action. SEIS Section 2.1.1.2 discusses alternative liquid waste disposal options.*

*With regard to the other alternatives suggested by the commenter, the commenter fails to provide information or an assessment showing that the alternatives it identifies are feasible. An alternative might not be feasible for a variety of reasons, including a failure of the alternative to meet the project's purpose and need. For example, the commenter's alternative of successful reclamation of a mined area before any additional area is mined would require the licensee to suspend ISR operations for at least one year and likely longer. As explained in the draft SEIS Section 2.1.1.1.4.2, at least one year is required to establish the stability of aquifer restoration in a wellfield. Historically, aquifer restoration at ISR facilities has taken much longer than one year (see GEIS Section 2.11.5).*

*No change was made to the SEIS beyond the information provided in this response.*

**Comment: 092-000004**

The commenter stated that the draft SEIS joins with the GEIS in having only one action alternative and one "no action" alternative. The commenter stated that this range of alternatives is totally inadequate and that another action alternative is needed. The commenter pointed out that the draft SEIS reviews various potential alternatives rejected from detailed studies. None of these rejected potential alternatives were alternatives that proposed stricter safeguards—such as more safety measures, better quality construction materials, and more monitoring. For example, in an aggressive pro-safety version, containment ponds could be designed to handle more water - such as change a 25 year precipitation event high water mark for a 100-year precipitation event high water mark. The commenter suggested that NRC could go through various mitigations and up the standards to be met.

**Response:** *The proposed federal action and the purpose and need for the proposed federal action define the range of reasonable alternatives. Reasonable alternatives considered in a*

*site-specific environmental review depend on the proposed action and site conditions. As described in SEIS Section 2.1, NRC considered reasonable alternatives including the proposed action and the No-Action alternative. SEIS Section 2.2 describes other alternatives considered and the reason why they were eliminated from detailed analysis. SEIS Section 2.1.1.2 discusses alternative liquid waste disposal options. In summary, the NRC considered numerous alternatives to the proposed action; some of these alternatives were reasonable and discussed in detail in the SEIS, while others were not reasonable and for that reason eliminated from detailed review.*

*While the NRC staff considered numerous alternatives to the proposed action in its environmental review, the only alternative within the NRC's statutory authority is to grant or deny the license application to conduct ISR operations and extract uranium and produce yellowcake at a particular site. While under NEPA the NRC would examine a reasonable alternative that the NRC may not have regulatory authority to impose. In order to be considered reasonable, an alternative must meet the purpose and need of the proposed project. The NRC will not accept a proposed purpose and need if it has been unduly narrowed, but the NRC also allows deference to a business decision of an applicant. If the NRC grants the license request, the applicant must comply with NRC's regulatory requirements as specified in the license, and any other relevant local, state, or federal requirements.*

*No changes were made to the final SEIS beyond the information provided in this response.*

**Comment: 127-00020**

The commenter stated that numerous unexplored and unreviewed alternatives exist. For instance, the NRC should consider an alternative that precludes adoption of any ACLs for ground water restoration. The commenter pointed out that this is a reasonable alternative, as this is the law in places such as Colorado. Further, the commenter suggested that NRC should consider an alternative of allowing the proponent to move forward with mining of additional well-fields only upon a demonstration that it has operated without excursions and has restored and demonstrated long-term stability of restoration in previously-mined wellfields. Along these lines, the commenter suggested that NRC should consider an alternative of allowing operations at either the Dewey or Burdock areas only upon a demonstration that the other area has been successfully mined without excursion and with full, stable, restoration, and only allowing uranium extraction to occur in areas of the aquifers demonstrated to be confined—and disallow any extraction from aquifers, or portions of aquifers, for which the applicant has not yet demonstrated confined conditions.

**Response:** *NEPA requires Federal agencies to consider alternatives to their proposed federal actions as well as to assess their environmental impacts. Reasonable alternatives for a particular federal action are defined by the proposed federal action and the purpose and need for the proposed federal action. The statement of the purpose and need is found in SEIS Section 1.3 and is derived from the proposed federal action. As the regulatory agency, the proposed federal action is an NRC decision to either grant or deny the license application. The purpose and need for the proposed federal action does consider the applicant's goals and objectives to extract uranium from a particular location, which helps define the reasonable alternatives to the proposed action.*

*As discussed in SEIS Section 2.1, the NRC considered reasonable alternatives, including the No-Action alternative, not approving the license application, and approving the license*

*application. SEIS Section 2.2 provides a discussion of alternatives that were considered but were eliminated from detailed review and the reasons for their elimination. These alternatives were eliminated from detailed review because they either would not meet the purpose and need of the proposed project or would cause greater environmental impacts than the proposed action. SEIS Section 2.1.1.2 discusses alternative liquid waste disposal options.*

*With regard to the alternatives suggested by the commenter, the commenter fails to address whether these types of alternatives are feasible for ISR operations generally or whether they are consistent with operations at the Dewey-Burdock site specifically. An alternative might not be feasible for a variety of reasons, including a failure of the alternative to meet the project's purpose and need. For example, the commenter's suggestion of an alternative prohibiting the use of ACLs overlooks the purpose of ACLs, which is to address situations in which restoring groundwater to background conditions or MCLs would not be practicable. The commenter's suggestion of an alternative precluding ISR operations in new wellfields or project areas until the licensee has restored and demonstrated long term stability of aquifer restoration in prior wellfields or project areas would require the licensee to suspend ISR operations for at least one year and likely longer. As explained in the draft SEIS Section 2.1.1.1.4.2, at least one year is required to establish the stability of aquifer restoration in a wellfield. Historically, aquifer restoration at ISR facilities has taken much longer than 1 year (see GEIS Section 2.11.5). The commenter's suggestion of an alternative preventing operations in portions of aquifers that have not yet been shown to be confined overlooks that a license condition has been proposed for such a situation (see SEIS Section 4.5.2.1.1.2.2). The potentially unconfined aquifers are in Burdock area proposed wellfields B-WF6, B-WF7, and B-WF8. License Condition 10.10.B prohibits the applicant from operating these wellfields without NRC review and approval (NRC, 2013).*

*No changes were made to the final SEIS beyond the information provided in this response.*

**Comment: 128-000076**

The commenter noted that the requirement to consider alternatives (as stated in SEIS Section 2.2) is described as part of NEPA regulations. The commenter pointed out that NRC staff is incorrect in this characterization as the agency's requirements for environmental reviews, including the consideration of alternatives, are found at 10 CFR Part 51, which is the Commission's interpretation of CEQ regulations. The commenter suggested that the statement should be revised accordingly.

**Response:** *NEPA requires Federal agencies to consider alternatives to their proposed federal actions as well as assess their environmental impacts. The Dewey-Burdock SEIS was prepared in accordance with NRC guidance in NUREG-1748 (NRC, 2003) and is consistent with the NRC's NEPA- implementing regulations at 10 CFR Part 51. As noted in 10 CFR 51.10, the regulations in Part 51 implement Section 102(2) of NEPA in a manner that is consistent with the NRC's domestic licensing and related regulatory authority under the Atomic Energy Act of 1954, as amended. Part 51 also reflects the Commission's policy to voluntarily take account of CEQ regulations for implementing the procedural provisions of NEPA [40 CFR Parts 1500-1508]. NRC staff acknowledge the comment; however, no changes were made to the SEIS beyond the information provided in this response.*



### **E5.15.1 References**

10 CFR Part 51. *Code of Federal Regulations*, Title 10, *Energy*, Part 51. “Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions.” Washington, DC: U.S. Government Printing Office.

40 CFR Parts 1500-1508. *Code of Federal Regulations*, Title 40, *Protection of Environment*, Parts 1500-1508. “Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act.” Washington, DC: U.S. Government Printing Office.

NRC (U.S. Nuclear Regulatory Commission). “Draft License SUA–1600 for Powertech (USA), Inc.” ADAMS Accession No. ML13318A094. Washington, DC: NRC. March 2013.

NRC. NUREG–1748, “Environmental Review Guidance for Licensing Actions Associated with NMSS Programs—Final Report.” Washington, DC: NRC. August 2003.

### **E5.16 History and Legacy of Uranium Mining**

#### **Comments: 045-000006; 047-000010**

One commenter stated that Edgemont, South Dakota is already heavily contaminated with radioactivity from the Dewey-Burdock open pit uranium activities pre-1970 and the uranium mill once located in Edgemont on the Cheyenne River. The commenter also stated that the Cheyenne River and its tributaries are exhibiting elevated radioactivity, the Angostura Dam in Fall River County has deformed fish, and the cancer and multiple sclerosis rate in Edgemont is huge compared to national figures. The commenter stated further that these elevated rates and their causes and the Angostura Dam water quality and potential impacts should be considered before granting a permit. Another commenter stated that it would be nice to clean up the mess from the past before we proceed.

**Response:** *NRC staff understands and recognizes there are serious legacy issues from decades of mining and recovery activities from the 1940s through the 1970s when waste from uranium mines was not cleaned up after the mines/mills were shut down. In 1978, Congress promulgated statutes that required cleanup of the abandoned mills, with specific roles for the U.S. Department of Energy (DOE), NRC, and EPA. Since 1978, NRC has regulated uranium recovery (milling) facilities, but not uranium mining or abandoned uranium mine sites. Historically, with NRC oversight, the ISR and milling industry has not had these same legacy issues. For a more complete description of the legacy issue, see GEIS Appendix G, Section G5.17 (NRC, 2009).*

*No change was made to the SEIS beyond the information provided in this response.*

#### **E5.16.1 Reference**

NRC (U.S. Nuclear Regulatory Commission). NUREG–1910, “Generic Environmental Impact Statement for *In-Situ* Leach Uranium Milling Facilities.” ML091480244, ML091480188. Washington, DC: NRC. May 2009.

## **E5.17 Land Use**

### **E5.17.1 Oil and Gas Test Wells**

#### **Comment: 049-000004**

The commenter questioned information presented in SEIS Section 3.2.3 on oil and gas test wells in the project area. The commenter stated that two wells within the Burdock area have been plugged and abandoned, and one has been recompleted as a stock watering well. In addition, the commenter understands that of the 10 oil and gas test wells located within 2 km [1.25 mi] of the project boundary, 8 have been plugged and abandoned and 2 have been recompleted as stock watering wells. The commenter recommended that the final SEIS identify the location of these oil and gas and recompleted stock wells, along with an evaluation of the plugging, abandonment, and recompletion records to assess whether the wells are likely to create a communication pathway across aquifers.

**Response:** *The locations of 3 oil and gas test wells within the Burdock area and 10 oil and gas test wells located within 2 km [1.25 mi] of the project boundary are shown in SEIS Figure 3.2-4. A search of the SDDENR databases on oil, gas, and injection wells in Fall River and Custer Counties (SDDENR, 2013) indicated that all the oil and gas test wells shown in SEIS Figure 3.2-4 were dry holes that were plugged and abandoned. A review of the permit files for each of these wells indicated that one of the oil and gas wells within the Burdock area (40 047 20065) and two of the oil and gas test wells located within 2 km [1.25 mi] of the project boundary (40 047 05090 and 40 047 05093) have been recompleted as stock watering wells. Evaluation of the plugging, abandonment, and recompletion records for these wells indicate that they produce water from either the Sundance, or Fall River, or Lakota Formations. Text was revised in SEIS Section 3.2.3 to document that one of the oil and gas wells within the Burdock area (40 047 20065) and two of the oil and gas test wells located within 2 km [1.25 mi] of the project boundary (40 047 05090 and 40 047 05093) have been recompleted as stock watering wells.*

### **E5.17.2 National Forest System Lands**

#### **Comment: 126-000001**

The commenter stated that the proposed ISR facilities and project area are not proposed on National Forest System (NFS) lands, but are directly adjacent to these lands in southwestern Custer and Fall River Counties in South Dakota. The commenter stated that because NFS land is generally upslope from the project, it is generally expected there may be little impact to these lands that border the project area. The commenter also stated that proper implementation, monitoring, and oversight by the appropriate regulatory agencies are a key to the project's success.

**Response:** *The locations of NFS lands in relation to the proposed project area are shown in SEIS Figure 3.2-2. As described in SEIS Section 3.2.2, NFS lands (i.e., the Black Hills National Forest) are directly adjacent to the proposed project area and other NFS lands are nearby (e.g., the Buffalo Gap National Grassland). The potential environmental impacts on land use of implementing the proposed project are described in SEIS Section 4.2. Monitoring programs to verify compliance with standards for protection of the public and environment beyond the proposed project boundary are described in Chapter 7 of the SEIS. Regulatory agencies*

*providing oversight for the various ISR activities and monitoring programs at the proposed project are discussed in Chapters 2 and 7 of the SEIS.*

*No change was made to the SEIS beyond the information provided in this response.*

### **E5.17.3 Treaty and Land Ownership Rights**

**Comments: 080-000004; 130-000001; 131-000001; 135-000001**

Several commenters expressed concerns regarding treaty and land ownership rights. The commenters noted that the proposed Dewey-Burdock ISR Project area is contained within the boundaries of the Great Sioux Nation and the Cheyenne and Arapaho Nations recognized in the Fort Laramie Treaty of 1868. Therefore, tribal land ownership rights and trust responsibilities relating to the larger Sioux Nation and Cheyenne and Arapaho Nations as defined in the Treaty of 1868 are being ignored. One commenter stated that the entire area is still the legal land holding of the Great Sioux Nation and the Cheyenne and Arapaho Nations. Some commenters stated that until the issue of legal land title is finalized, no actions of any kind should be taken in the geographic area outlined in the 1868 Fort Laramie Treaty without the express permission of the members of the Great Sioux Nation and the Cheyenne and Arapaho Nations.

**Response:** *NRC is aware that longstanding land ownership disputes related to the 1868 Fort Laramie Treaty exist between Native American tribes and the U.S. Government. In its role as a regulatory agency, NRC lacks the authority to resolve these issues. As discussed in SEIS Section 1.7.3.5, NRC is conducting consultation under Section 106 of the NHPA with the SD SHPO, BLM, and THPOs to determine whether the proposed project will affect historic properties. NRC is consulting with affected tribal governments to address concerns regarding the proposed project, including potentially affected places of religious or cultural significance. As described in SEIS Section 3.9.3, places of religious and cultural significance can include a variety of uses important to Native Americans, including archaeological sites, burial grounds, hunting and gathering areas, caves and shelters, ceremonial activities, memorials, monuments, trails, sacred sites, and stone alignments, cairns, and circles.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comments: 130-000001; 135-000001**

The commenters stated that the 1868 Fort Laramie Treaty is still legal and binding as recently evidenced by the enforcement of Article 1 of the treaty in *Lavetta Elk vs. the United States* (2009). One commenter also stated that the 1980 Supreme Court decision [*United States vs. Sioux Nation of Indians*, 448 U.S. 371 (1980)] reiterates the fact that the land outlined in the 1868 Fort Laramie Treaty still belongs to the Great Sioux Nation and the Cheyenne and Arapaho Nations.

**Response:** *NRC is aware that the United States Court of Federal Claims ruled that the plaintiff in this case (*Lavetta Elk*) was entitled to monetary relief from the United States under Article 1 of the Fort Laramie Treaty of 1868. Article 1 provides that if “bad men” among the whites commit “any wrong” upon the person or property of any Sioux, the United States will reimburse the injured person of the loss sustained. NRC is also aware that in the case of the United States vs. Sioux Nation of Indians, 448 U.S. 371 (1980), the Supreme Court held that (i) the enactment by Congress of a law allowing the Sioux Nation to pursue a claim against the United States that*

*had been previously adjudicated did not violate the doctrine of separation of powers, and (ii) the taking of property that was set aside for the use of the tribe required just compensation, including interest. NRC recognizes that longstanding land ownership disputes related to the 1868 Fort Laramie Treaty exist between Native American Tribes and the U.S. Government. In its role as a regulatory agency, NRC lacks the authority to resolve these issues.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comment: 120-000008**

The commenter stated that the question of ownership of the Black Hills, including the land on which the applicant intends to operate its mine, has still not been settled. The commenter noted that *United States vs. Sioux Nation of Indians* (1980) established that the 1877 seizure of the Black Hills was a direct contravention of the 1868 Fort Laramie Treaty, and that South Dakota's tribes were owed substantial damages. The commenter noted that the tribes rejected a \$105 million settlement and the issue remains a matter of legal dispute. The commenter stated that the Oglala Sioux Tribe passed a resolution against the applicant's mining of the Dewey-Burdock site and has been intervening in an NRC hearing over the past several years—a clear sign that the legal claimants to this land do not approve of the applicant's plans for resource exploitation. The commenter stated that the treaty rights of affected Native American tribes should be fully honored.

**Response:** *NRC is aware that in the case of the United States vs. Sioux Nation of Indians, 448 U.S. 371 (1980), the Supreme Court held that (i) the enactment by Congress of a law allowing the Sioux Nation to pursue a claim against the United States that had been previously adjudicated did not violate the doctrine of separation of powers and (ii) the taking of property that was set aside for the use of the tribe required just compensation, including interest. NRC recognizes that longstanding land ownership disputes related to the 1868 Fort Laramie Treaty exist between Native American Tribes and the U.S. Government. In its role as a regulatory agency, NRC lacks the authority to resolve these issues.*

*No change was made to the SEIS beyond the information provided in this response.*

**E5.17.4 Reference**

SDDENR (South Dakota Department of Environment and Natural Resources). South Dakota Oil, Gas, and Injection Well Database. 2013. <[http://www.sddenr.net/oil\\_gas/](http://www.sddenr.net/oil_gas/)> (17 July 2013).

**E5.18 Transportation**

**Comment: 126-000013**

The commenter (USFS) noted that in the SEIS executive summary the construction and operations impacts to traffic on Dewey Road were described as small to moderate. The commenter stated that there needs to be a clear articulation of impacts, pointing to the Dewey Road's gravel surface and remote location. The commenter referred to additional dust and traffic impacts to Dewey Road documented in the Dewey Conveyor draft EIS. The commenter further noted that Dewey Road crosses NFS land, with an easement to Custer County.

**Response:** *In response to the comment, the NRC staff edited the transportation impact analysis section in the draft SEIS executive summary to clarify the remote location and unpaved gravel surface of Dewey Road and more directly associate which impacts are considered SMALL and which are considered MODERATE.*

*The transportation impact analysis in Section 4.3 of the draft SEIS cited the Dewey Conveyor draft EIS (BLM, 2009) for information about Dewey Road traffic estimates; however, based on responses to another comment (see the following set of comments), this information was replaced with more recent Fall River County traffic survey data for Dewey Road.*

**Comments:** 128-000010; 128-000011; 128-000078; 128-000085; 128-000225

The applicant provided new traffic count information for Dewey Road collected by the Fall River County Highway Department and related comments identifying the sections of the draft SEIS that would need to be updated including the executive summary and SEIS Section 3.3. The applicant noted that the Dewey Road traffic count cited in the draft SEIS was based on a prior draft EIS that reported an estimate from a Custer County Highway Department employee. The applicant characterized the source data as not being based on a count but the low end of an estimate made in 2008 by the Custer County employee because no records of traffic counts were available. The applicant provided updated traffic count information from Fall River County based on a 48-hour traffic count on Dewey Road conducted December 19–21, 2012, which produced a 24-hour average daily traffic count of 225 vehicles (Powertech, 2013).

**Response:** *The NRC staff agrees with the applicant's characterization of the traffic count information in the draft SEIS. Because of the remote location of the road, traffic count data were limited and the best available information was used in the draft SEIS. Because the new data from Fall River County are based on actual measurements, they are an improvement over the information used in the draft SEIS. Therefore, NRC has replaced the draft SEIS traffic estimate with the 2012 data from Fall River County (Powertech, 2013) and updated all applicable text and tables of Chapters 3, 4, 5, and 9 to reflect the new information. The new data combined with the applicant's reduction in proposed commuter traffic based on a commitment to a new carpooling policy reduce the significance of the NRC conclusions about traffic impacts on Dewey Road during construction and operations phases from MODERATE to SMALL.*

**Comments:** 128-000069; 128-000070; 128-000122; 128-000123; 128-000124; 128-000125; 128-000127; 128-000128; 128-000129; 128-000130; 128-000134; 128-000135; 128-000136; 128-000137; 128-000138; 128-000139; 128-000140; 128-000143; 128-000144; 128-000145; 128-000223; 128-000225

The applicant identified that the estimated number of commuting workers and associated traffic described in Chapter 2 of the draft SEIS (Table 2.1-7) was updated based on the implementation of a new carpooling policy, which would reduce the number of vehicles needed to transport workers to the site. Additional comments from the applicant identified various sections of the draft SEIS that would need to be updated to incorporate the new information into text, tables, and footnotes in Chapter 2 (SEIS Section 2.1.1.1.7), Chapter 4 (SEIS Sections 4.3.1.1 and 4.3.1.2), and Chapter 5 (SEIS Section 5.3). The applicant further suggested revision to the table title and headings in Chapters 2 and 4 to convey "Estimated Daily Vehicle Trips (Round Trips)" rather than one-way trips.

**Response:** *Based on the applicant’s commitment to implement a carpooling policy to reduce traffic from commuting workers, the NRC staff revised the commuting worker traffic estimates and related impact analyses for construction, operations, aquifer restoration, and decommissioning phases in response to this comment. The revisions were made to text and tables in Sections 2.1.1.1.7, 4.3.1.1, 4.3.1.2, 5.3, Chapter 9 and the Executive Summary. The new proposed commuter traffic combined with updated local traffic count data reduced the significance of the NRC conclusions about traffic impacts on Dewey Road during construction and operations phases from MODERATE to SMALL (the impacts for other phases remained unchanged and SMALL). The NRC staff also, revised the headings and footnotes of the relevant tables in Chapters 2 and 4 to clarify that the tables contain proposed vehicle trip estimates.*

**Comments:** 128-000126; 128-000131; 128-000132; 128-000133; 128-000141; 128-000142; 128-000146; 128-000221; 128-000224; 128-000266

The applicant requested revision to the transportation impact conclusions in the following sections of the draft SEIS based on the requested changes to the existing road traffic estimates: Chapter 4 for construction (SEIS Sections 4.3.1.1.1 and 4.3.1.2.1), operations (SEIS Sections 4.3.1.1.2 and 4.3.1.2.2), and aquifer restoration (SEIS Section 4.3.1.1.3); the summary table (Table 4.3-5); Chapter 5 for the cumulative impacts assessment (Table 5.1-5 and SEIS Section 5.3); and the Chapter 9 impact summary table (Table 9-1).

**Response:** *In response to the comments that led to revisions to existing Dewey Road traffic estimates and the proposed worker commuting traffic, NRC updated all text and tables in the executive summary and Chapters 3, 4, 5, and 9 of the draft SEIS that are affected by these changes. The new proposed commuter traffic combined with updated local traffic count data reduced the significance of the NRC conclusions about traffic impacts on Dewey Road during construction and operations phases from MODERATE to SMALL (the impacts for other phases remained unchanged and SMALL).*

#### **E5.18.1                      References**

BLM (U.S. Bureau of Land Management). “Draft Environmental Impact Statement, Dewey Conveyor Project.” DOI–BLM–MT–040–2009–002–EIS. ML12209A089. Belle Fourche, South Dakota: BLM Field Office, U.S. Department of Interior. January 2009.

Powertech [Powertech (USA) Inc.]. “Comments from Powertech (USA) Inc. on the Dewey-Burdock Project Draft Supplemental Environmental Impact Statement, Docket ID NRC-2012-0277, Attachment A, December 2012 Dewey Road Traffic Study Results.” Letter (January 8) to C. Bladey, U.S. Nuclear Regulatory Commission from R. Blubaugh. Docket No. 040-09075. ML13022A386. Greenwood Village, Colorado: Powertech. 2013.

#### **E5.19                      Geology and Soils**

##### **E5.19.1                  Characterization of Producing and Confining Units**

**Comments:** 023-000001; 047-000008

One commenter stated that fracturing of the so-called impervious layers may result from flushing high pressure water and chemical mixes through the ore strata during the ISR process.

The commenter was concerned that this will allow radioactive contaminants to reach clean aquifers. Another commenter stated that the huge demand for water for the project will pull water from underground sources outside the 10,500-ac project area. The commenter stated that the resulting pressures from drilling and reinjecting the water into the wells after extraction of uranium will irrevocably damage the underground structures, leading to greater communication between the Inyan Kara and Madison aquifers.

**Response:** *As described in SEIS Section 4.4.1.1.2, the ISR process and lixiviant chemistry will not remove rock matrix material in the ore-bearing sandstones. The removal of uranium from the target sandstones in the initial wellfields at the proposed project will occur at depths ranging from approximately 122 to 244 m [400 to 800 ft] below ground surface (bgs) in the Dewey area and approximately 61 to 122 m [200 to 400 ft] bgs in the Burdock area (Powertech, 2009c). Therefore, no significant matrix compression leading to subsidence or collapse of overlying rock strata will result from the proposed uranium recovery operations.*

*Dewatering of the source uranium formations (i.e., the Fall River Formation and Chilson member of the Lakota Formation) during ISR operations is not expected. Hydrogeologic characteristics of the uranium source formations (i.e., formation thicknesses and potentiometric surfaces, as described in SEIS Section 3.5.3.2) and results of aquifer pumping tests at estimated production flow rates (see SEIS Section 4.5.2.1.1.2.2) indicate that drawdown in nearby wells will be SMALL. Because dewatering of uranium source formations is not expected, water in underlying aquifers, such as the Madison aquifer, is not expected to be drawn into the production zone. In addition, the Inyan Kara aquifer is underlain by a 30-m [100-ft]-thick section of the impermeable Morrison Formation, which hydrologically isolates the Inyan Kara aquifer from deeper aquifers (see SEIS Section 4.5.2.1.1.2.1).*

*No change was made to the SEIS based on the portions of the comment addressed above.*

*Regarding the commenter's last point, the applicant's Class III UIC permit application states that injection pressure at the wellhead will be calculated to ensure that the pressure in the production zone does not initiate fractures (Powertech, 2012). Maximum estimated injection pressures will be calculated as the lowest value of the following: (i) the lowest value of maximum allowable wellhead pressure for all injection wells connected to the header house based on fracture pressure calculations; (ii) the manufacturer-specified maximum operating pressure for the well casing; or (iii) the manufacturer-specified operating pressure of the injection piping and fittings. In accordance with 40 CFR 144.28(f)(6)(i), this pressure is too low to initiate new fractures or propagate existing fractures in the injection or confining zone. Text was added to SEIS Section 4.4.1.1.2 to document that maximum injection pressures in a Class III well will not initiate fractures in the production zone or confining units.*

## **E5.19.2 Black Hills Geology**

### **Comment: 128-000086**

The commenter questioned the statement in SEIS Section 3.4.1.1 that ore-bearing stratigraphic units in the Black Hills represent the Jurassic and Triassic periods because economically significant discoveries are limited to the Lower Cretaceous Inyan Kara Group.

**Response:** *The NRC staff acknowledge that economically significant uranium ore deposits in the Black Hills are contained within strata of the Lower Cretaceous Inyan Kara Group*



*(Chenoweth, 1988). The reference to “ore-bearing” was removed in the statement in SEIS Section 3.4.1.1 so that the statement correctly reads as follows: “Stratigraphic units present in the Black Hills represent the Cretaceous, Jurassic, and Triassic Periods [65–145 million years ago (mya), 149–199 mya, and 200–251 mya, respectively] (Figure 3.4-2).”*

**Comment: 128-000090**

The commenter stated that information concerning the thickness of the Fuson Member of the Lakota Formation does not include information contained in Gott, et al. (1974). Gott, et al. (1974) estimated that the Fuson Member has an average thickness of 30 m [100 ft] in the southern Black Hills.

**Response:** *The NRC staff acknowledge that information from Gott, et al. (1974) concerning the thickness of the Fuson Member is not included in SEIS Section 3.4.1.2. Text was added to include the information on the thickness of the Fuson Member from Gott, et al. (1974).*

**E5.19.3 Dewey-Burdock Geology**

**Comment: 128-000089**

The commenter pointed out the statement in SEIS Section 3.4.1.2 that aquifer pumping tests indicate a hydraulic connection between the Lakota and Fall River Formations through the intervening Fuson Shale resulting from unidentified structural features or old unplugged exploration holes does not reflect the more current interpretation of the historical pumping tests and recent numerical modeling.

**Response:** *The NRC staff acknowledge that a numerical groundwater model using site-specific geologic and hydrologic information has been developed (Petrotek, 2012). Based on results of the numerical model, the applicant concluded that vertical leakage through the Fuson Shale is caused by improperly installed wells or improperly abandoned boreholes. NRC staff reviewed the applicant’s numerical groundwater model and calibration, and it determined that the model was appropriately developed and sufficiently calibrated. Text was added to SEIS Section 3.4.1.2 providing information on the applicant-developed numerical groundwater model.*

**Comment: 128-000095**

The commenter suggested adding a discussion at the end of SEIS Section 3.4.1.2 that addresses breccias pipes.

**Response:** *The NRC staff recognize that breccias pipes are not discussed in SEIS Section 3.4.1.2 (Dewey-Burdock Geology). A discussion addressing breccias pipes at the proposed project area was added at the end of SEIS Section 3.4.1.2.*

**E5.19.4 References**

40 CFR Part 144. *Code of Federal Regulations*, Title 40, *Protection of the Environment*, Part 144. “Underground Injection Control Program.” Washington, DC: U.S. Government Printing Office.

Chenoweth, W.L. “Geology and Production History of the Uranium Deposits in the Northern Black Hills, Wyoming—South Dakota.” *Eastern Powder River Basin, Wyoming Geological Association, 39<sup>th</sup> Annual Field Conference Guidebook*. Casper, Wyoming: Wyoming Geological Association. pp. 263–270. 1988.

Gott, G.B., D.E. Wolcott, and C.G. Bowles. “Stratigraphy of the Inyan Kara Group and Localization of Uranium Deposits, Southern Black Hills, South Dakota and Wyoming.” ML120310042. U.S. Geological Survey Water Resources Investigation Report 93-4008. 1974.

Petrotek (Engineering Corporation). “Numerical Modeling of Hydrogeologic Conditions, Dewey-Burdock Project, South Dakota.” ML12062A096. Littleton, Colorado: Petrotek. February 2012.

Powertech [Powertech (USA) Inc.]. “Dewey-Burdock Project Class III Underground Injection Control Permit Application.” ML122440623. Greenwood Village, Colorado: Powertech. 2012.

Powertech. “Dewey-Burdock Project, Supplement to Application for NRC Uranium Recovery License Dated February 2009.” Docket No. 040-09075. ML092870160. Greenwood Village, Colorado: Powertech. August 2009c.

## **E5.20 Surface Water and Wetlands**

### **E5.20.1 Baseline Characterization**

#### **Comments: 042-000010; 127-000013**

One commenter noted that NRC and BLM must address the critique of Dr. Moran, consultant for the Oglala Sioux Tribe, concerning lack of baseline surface water data collection and characterization. The Northern Cheyenne Tribe also stated that it agrees with the majority of the contentions in the declaration of Dr. Robert E. Moran before the NRC’s ASLBP. Specifically, the Northern Cheyenne Tribe noted assertions by Dr. Moran in the declaration that the SEIS is deficient with respect to baseline surface water characterization.

**Response:** *NRC is aware of the declaration of Dr. Moran before the ASLBP and the assertions that the SEIS is deficient with respect to baseline surface water characterization (ASLBP, 2013). SEIS Section 3.5.1 describes the results of baseline or preoperational surface water quality sampling at the proposed project. The applicant collected surface water samples monthly between July 2007 and June 2008 from perennial and ephemeral streams upstream and downstream of the proposed Dewey-Burdock ISR Project (Powertech, 2009a). The applicant followed guidance in NUREG–1569 (NRC, 2003) and NRC Regulatory Guide 4.14 (NRC, 1980) to establish preoperational or baseline surface water quality conditions at the proposed site (Powertech, 2009a, 2011). SEIS Section 3.5.1 also describes the results of the applicant’s floodplain modeling on the stream channels of Beaver Creek, Pass Creek, and smaller ephemeral drainages within the proposed project area. This modeling was performed to determine the extent of inundation from a simulated 100-year flood (Powertech, 2009b, 2011).*

*In response to the comments, text was added to SEIS Section 3.5.1 to indicate that the applicant followed guidance in NUREG–1569 (NRC, 2003) and NRC Regulatory Guide 4.14 (NRC, 1980) to establish preoperational or baseline surface water quality conditions at the proposed site.*

*No additional changes were made to the SEIS beyond the information provided in this response.*

## **E5.20.2 Impacts of Flooding**

**Comments: 008-000004; 029-000004; 041-000001; 044-000003; 048-000003; 061-000010; 095-000002; 104-000007; 120-000002; 136-000020**

Several commenters pointed out that flooding is common in Custer and Fall River Counties, and these commenters were concerned that the potential impacts of flooding on surface facilities were not adequately addressed and analyzed. Some commenters stated that the SEIS included the impacts of a 100-year flood, some facilities are allowed within the 100-year flood boundaries, and a 500-year flood should be considered. One commenter stated that given the future uncertainties over global climate change, it is insufficient to analyze the ability of stormwater management features for the 24-hour, 100-year flood event and that these features should be analyzed for the 500-year event. Other commenters stated that because we are currently experiencing some drastic vacillations in climate, it is important for our regulatory agencies to limit such projects to flood-free zones or disallow facilities from being constructed in the 100-year flood boundaries. Another commenter stated that bulk storage tanks are to be protected only against a 25-year event, while other facilities assume a 100-year flood, and some mining-related activity is allowed within the 100-year floodplain.

**Response:** *The applicant performed floodplain modeling on the stream channels of Beaver Creek, Pass Creek, and smaller ephemeral drainages within the proposed project area to determine the extent of inundation from a simulated 100-year flood and evaluate potential adverse impacts to facilities from flooding (see SEIS Section 3.5.1) (Powertech, 2009b, 2011). Most surface facilities including the Burdock central processing plant, Dewey satellite facility, and storage tanks for chemicals and petroleum products will be located outside the 100-year floodplain. As described in SEIS Section 2.1.1.1.2, bulk storage tanks for processing chemicals, such as sulfuric and/or hydrochloric acid, sodium hydroxide, and hydrogen peroxide, will be placed in concrete secondary containment basins, designed to contain 110 percent of the tank volume, and will be designed to withstand a 25-year, 24-hour storm event. All gasoline and diesel storage tanks will be located aboveground and within secondary containment structures, designed and constructed to meet EPA requirements.*

*NRC recognizes that some surface facilities (e.g., storage ponds), infrastructure (e.g., access roads, plant-to-plant pipeline), and wellfields will be within the 100-year floodplain (see SEIS Section 3.5.1). As described in SEIS Section 4.5.1.1.1.1, the applicant has proposed a system of structures, such as straw bales, collector ditches, and engineered diversion structures or berms, to protect facilities and infrastructure from flood damage and avoid discharges from storage ponds within the 100-year flood inundation boundary (Powertech, 2011). As further described in SEIS Section 4.5.1.1.1.1, measures to protect against flooding and avoid discharges in the wellfields include (i) locating above-grade wellfield infrastructure outside the 100-year flood inundation boundary, (ii) constructing diversion or erosion control structures to divert flow and protect any wellheads placed within the 100-year inundation boundary, and (iii) sealing all wellheads to withstand brief periods of submergence. In addition, all pipelines, including the proposed plant-to-plant pipeline, will be buried below the frost line and, therefore, will not be impacted by flooding (Powertech, 2011).*

*To evaluate whether future changes in climate might change the analysis of potential impacts of flooding on surface facilities, the NRC staff reviewed a report from the U.S. Global Change Research Program entitled “Global Climate Change Impacts in the United States” (GCRP, 2009). The NRC staff found that the projected changes in climate over the estimated 20-year duration of the proposed project (see SEIS Figure 2.1-1) were limited in degree and unlikely to significantly change the intensity of potential impacts evaluated in the SEIS. For example, the projected changes in precipitation were discussed for the latter part of this century (years 2080 through 2099); these changes were estimated to be 10 to 15 percent above current values for the area of South Dakota where the proposed site would be located. Changes during the next 20 years would be expected to be much less than the values reported for the end of the century. The report did not suggest that over the next 20 years there would be significant increases in precipitation. The small, predicted increases in precipitation over the next 20 years are not expected to change the analysis of potential impacts to surface facilities at the proposed project. Therefore, the staff’s analyses of whether stormwater management features, such as holding ponds, will be able to withstand a 24-hour, 100-year flood event, and whether bulk storage tanks will be protected against a 25-year flood event, are adequate to determine the impacts of flooding at the proposed project.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comment: 049-000003**

The commenter pointed out the draft SEIS states that some of the wastewater storage ponds and wellfields are within the 100-year floodplain as shown in Figure 3.5-3 and recommended including an evaluation of options to avoid discharge from these facilities during flood events in the final SEIS.

**Response:** *The NRC staff recognize that some surface facilities (e.g., storage ponds), infrastructure (e.g., access roads, plant-to-plant pipeline), and wellfields will be within the 100-year floodplain (see SEIS Section 3.5.1). As described in SEIS Section 4.5.1.1.1.1, the applicant has proposed a system of structures, such as straw bales, collector ditches, and engineered diversion structures or berms to protect facilities and infrastructure from flood damage and avoid discharges from storage ponds within the 100-year flood inundation boundary (Powertech, 2011). In addition, all ponds will be designed to store the amount of water discharged to them while maintaining 0.9 m [3 ft] of freeboard (see SEIS Sections 2.1.1.1.2.4.1 and 2.1.1.1.2.4.2). As further described in SEIS Section 4.5.1.1.1.1, measures to protect against flooding and avoid discharges in the wellfields include (i) locating above-grade wellfield infrastructure outside the 100-year flood inundation boundary, (ii) constructing diversion or erosion control structures to divert flow and protect any wellheads placed within the 100-year inundation boundary, and (iii) sealing all wellheads to withstand brief periods of submergence. In addition, all pipelines, including the proposed plant-t--plant pipeline, will be buried below the frost line and, therefore, will not be impacted by flooding (Powertech, 2011).*

*No change was made to the SEIS beyond the information provided in this response.*

### **E5.20.3 Concerns About Contamination**

#### **Comment: 093-000005**

The commenter stated that the potential impact for contamination of surface water should be carefully researched and reviewed because the project area is a major habitat for many threatened or endangered wildlife species and more common wildlife that will be negatively affected by surface contamination of their drinking water.

**Response:** *The potential environmental impacts to surface waters from construction, operation, aquifer restoration, and decommissioning activities associated with the proposed project are discussed in SEIS Section 4.5.1.1. The applicant is required to obtain construction and industrial stormwater NPDES permits from SDDENR to control the amount of pollutants that can enter surface water bodies, such as streams and lakes. Liquid effluents will not be discharged to running or standing surface waters. The applicant will implement a surface water pollution management plan and spill prevention and cleanup procedures to ensure that surface water runoff will not contaminate surface waters (Powertech, 2009a). Automated sensors will monitor the injection process to detect potential pipeline leaks and well ruptures that could result in a surface discharge.*

*The applicant proposes to treat liquid wastes applied to potential land application areas so they meet NRC release limit criteria for radiological contaminants, as referenced in 10 CFR Part 20, Appendix B, Table 2, Column 2 (see Table 7.5-3) (Powertech, 2011). SDDENR also regulates land application of treated wastewater, requiring the applicant to obtain a GDP and comply with applicable state discharge requirements for land application of treated wastewater. The GDP must comply with regulations prohibiting surface runoff from permitted land application areas, which ensures that any pollutants originating from the land application areas are contained.*

*Based on the impact analyses documented in SEIS Section 4.5.1.1, NRC determined that the potential environmental impacts to surface waters from construction, operations, aquifer restoration, and decommissioning of the proposed project will be SMALL.*

*No change was made to the SEIS beyond the information provided in this response.*

#### **Comment: 121-000001**

The commenter stated that the process used to retrieve uranium would pollute surface water with radioactive materials and heavy metals, making it dangerous to humans and all life.

**Response:** *Under the applicant's proposal, ISR methods will be used to extract uranium from sandstone-hosted uranium orebodies in the Fall River Formation and the Chilson Member of the Lakota Formation that make up the Inyan Kara Group. The extracted uranium will be loaded onto ion exchange (IX) resin at a central processing plant in the Burdock area and a satellite facility in the Dewey area. All processing of the uranium-loaded IX resin, including elution (stripping uranium off the resin), precipitation, drying, and packaging of the final "yellowcake" product, will take place at the Burdock central processing plant. The applicant proposes the following options (discussed in SEIS Section 2.1.1.1.6.2) for the disposal of liquid wastewater generated during uranium recovery: deep well disposal via Class V injection wells, land application, or a combination of deep well disposal via Class V injection wells and land application.*

*Prior to conducting ISR activities at the proposed project, the applicant is required to obtain construction and industrial stormwater NPDES permits in accordance with SDDENR regulations in ARSD Chapter 74:52 (see SEIS Section 4.5.1.1.1.1). The NPDES permit requirements for discharges to surface water, as established in ARSD 74:52, will control the amount of pollutants that can enter surface water bodies, such as streams, wetlands, and lakes. As part of the NPDES permit, the applicant will implement a stormwater management plan (SWMP) to control stormwater runoff during construction and to ensure that surface water runoff from disturbed areas will not contaminate surface waters and wetlands (Powertech, 2009a). The NPDES permit and SWMP will remain in effect over the life of the project. SWMP control measures will (i) minimize disturbance of surface areas, drainage channels, and vegetation; (ii) employ grading to direct runoff away from water bodies; (iii) use riprap at intersections to make bridges and culverts more effective; (iv) stabilize slopes; (v) avoid unnecessary off-road travel; (vi) provide rapid response cleanup procedures and training for potential spills; (vii) require storage of hazardous materials and chemicals in bermed or curbed areas; (viii) place surface piping outside identified 100-year floodplain levels; and (ix) build curbs around facilities and structures to control process fluid spills.*

*No change was made to the SEIS beyond the information provided in this response.*

#### **E5.20.4 Wetlands**

##### **Comment: 046-000001**

The commenter noted that the draft SEIS refers to measures that will be taken to protect jurisdictional wetlands [i.e., those wetlands defined by USACE for administration of Section 404 permits under the (Clean Water Act)]. However, protections for nonjurisdictional wetlands were not specifically discussed in the draft SEIS. The commenter stated that NEPA and Executive Order 11990 (Protection of Wetlands), respectively, direct federal agencies to avoid and mitigate environmental impacts and to protect and conserve wetlands. Therefore, the commenter recommended that measures be taken to protect both jurisdictional and nonjurisdictional wetlands from project impacts.

**Response:** *The potential impacts to surface waters and wetlands at the proposed project site and the mitigation measures that will be taken to protect both jurisdictional and nonjurisdictional wetlands are described in SEIS Section 4.5.1. Although not specifically indicated in the impact analysis, all of the impacts to surface waters and mitigation measures that will be taken to protect surface waters also apply to nonjurisdictional and jurisdictional wetlands.*

*Note that unless specified as a jurisdictional wetland, all references to “wetlands” in the SEIS include both nonjurisdictional and jurisdictional wetlands. SEIS Section 4.5.1 was revised to explicitly indicate that impacts to surface waters and mitigation measures that will be taken to protect surface waters also apply to wetlands.*

##### **Comment: 049-000015**

The commenter noted that according to the draft SEIS, the Dewey-Burdock project could potentially impact waters of the U.S. subject to CWA jurisdiction, such as Pass and Beaver Creeks and ephemeral tributaries to Pass and Beaver Creeks as indicated by the USACE. The USACE issues CWA Section 404 permits for the discharge of dredged and fill material into waters of the U.S., including wetlands. The commenter pointed out that the draft SEIS explains

that siting wellfields within jurisdictional wetlands and crossing tributaries upstream of jurisdictional wetlands may require the applicant to obtain USACE permits before construction activities. The commenter stated USACE may be required to conduct additional environmental impact analyses to support issuance of CWA Section 404 permits associated with the project. The commenter recommended including more specific information in the final SEIS such as the status of the USACE permitting process for the Dewey-Burdock project, specific acreages of wetlands that could be impacted, and identification of mitigation for impacts, including riparian/wetlands that may be banked or enhanced.

**Response:** *As described in SEIS Section 1.7.3.2, the applicant requested that USACE evaluate the proposed Dewey-Burdock ISR Project site to determine whether jurisdictional waters of the United States are present in August 2008. In January 2009, USACE documented the presence of 20 wetlands within the proposed project area and determined that 4 were jurisdictional waters; these are Beaver Creek, an unnamed tributary to Beaver Creek, Pass Creek, and an unnamed tributary to Pass Creek (Powertech, 2009b, Appendix 3.5–H). As discussed in SEIS Section 4.5.1.1.1.1, the applicant has committed to seek authorization from USACE and comply with Section 404 permitting requirements before conducting work in jurisdictional wetlands identified in the project area (Powertech, 2009a). NRC staff met with USACE staff on December 2, 2009, in Pierre, South Dakota, to discuss wetlands and surface water bodies within and in the vicinity of the proposed Dewey-Burdock ISR Project site (see SEIS Section 1.7.3.2). NRC acknowledges that USACE may conduct additional environmental impact analyses to support issuance of CWA Section 404 permits associated with project activities. At this time, the applicant has not applied for a Section 404 permit. Therefore, USACE has not conducted any additional Section 404 permitting activities at the proposed project site, such as determining specific acreages of wetlands that could be impacted or identifying mitigation measures to be implemented to minimize wetland impacts. Text was added to SEIS Section 4.5.1.1.1.1 to document the current status of the USACE Section 404 permitting process for the proposed project.*

#### **E5.20.5 Contributing Drainages and Springs**

**Comment: 091-000019**

The commenter stated that the size and location of all contributing drainages within the project area should be mapped for the public stakeholders.

**Response:** *The size and locations of watersheds within the region surrounding the proposed project site are shown on SEIS Figure 3.5-1. The locations of major tributaries, including Beaver Creek, Pass Creek, and the Cheyenne River, are shown in SEIS Figure 3.5-2. The locations of minor tributaries within the project area that drain into Beaver Creek, Pass Creek, and the Cheyenne River are shown in SEIS Figures 3.5-3 and 4.5-1. No change was made to the SEIS beyond the information provided in this response.*

**Comment: 126-000005**

The commenter noted that the SEIS mentions Cascade Springs and Keith Springs, but there is no spring named Keith. The commenter pointed out that Cascade Springs is located at the J.H. Keith recreation area and suggested that references to Keith Springs be removed.



**Response:** NRC acknowledges that there is no Keith Springs and that Cascade Springs is located at the J.H. Keith Cascade Springs recreation area. References to Keith Springs were removed from the SEIS Sections 1.7.3.3 and 5.5.2 and text was revised in SEIS Sections 1.7.3.3 and 5.5.2 to indicate that Cascade Springs is located on the USFS-managed J.H. Keith Cascade Springs recreation area.

#### **E5.20.6 Impacts to Surface Water From Land Application**

**Comment: 092-000013**

The commenter requested that the SEIS discuss the effects of land application of treated wastewater on surface waters in the area. Specifically, the commenter wanted to know whether water tables will be higher or ponds or wetlands will be higher due to land disposal of wastewater in the area.

**Response:** The potential impacts to surface waters and wetlands from land application of treated wastewater at the proposed project are discussed in SEIS Section 4.5.1.1.2.2. Runoff of treated liquid wastes applied to land application areas is not expected, because land application areas at the proposed project are located on flat topography (see SEIS Figure 2.1-11). In addition, proposed land application areas are located outside the applicant-modeled 100-year flood inundation boundaries of Beaver Creek and Pass Creek (see SEIS Section 3.5.1). Potential runoff produced by snowmelt or precipitation in land application areas will be diverted to adjacent catchment areas and allowed to evaporate or infiltrate (Powertech, 2012). Implementation of mitigation measures associated with the applicant's SWMP will control erosion, runoff, and sedimentation from land application areas, as part of the NPDES permit.

Water tables of production zone aquifers are not expected to be affected by land disposal of wastewater. As described in SEIS Section 4.5.2.1.2.2.1, In the Dewey area, the proposed land application sites in the Dewey area are over confined portions of the Fall River and Chilson aquifers and away from their outcrop areas. In the Burdock area, the easternmost irrigation fields are located downdip of the outcrop area of the Fall River aquifer. The minimum estimated thickness of the Graneros Group in this area is 7.6 m [25 ft] (see Figures 2.1-12 and 3.5-7). Therefore, treated liquid waste applied to the easternmost land application areas is unlikely to recharge the Fall River aquifer due to the presence of the overlying Graneros Group shale. For the rest of the proposed land application sites, the impacts to groundwater will be localized and limited to near-surface (alluvial) aquifers, if they exist underneath the proposed irrigation fields, because alluvial aquifers are separated from the underlying Fall River aquifer by the low permeability, 61-m [200-ft]-thick Skull Creek shale. No change was made to the SEIS beyond the information provided in this response.

#### **E5.20.7 Clarification of Beaver Creek Water Quality**

**Comment: 119-000014**

The commenter pointed out that the beneficial use classification for Beaver Creek has been changed from cold water marginal fish life propagation (as indicated in SEIS Section 3.5.1) to warm water semipermanent fish life propagation.

**Response:** NRC acknowledges that, in accordance with ARSD 74:51:03:08, Beaver Creek in South Dakota is classified as suitable for the same beneficial uses as the Cheyenne River,

*which includes warm water semipermanent fish life propagation. Text in SEIS Section 3.5.1 was revised to indicate that Beaver Creek is suitable for the same uses as the Cheyenne River in accordance with ARSD 74:51:03:08.*

**Comment: 119-000015**

The commenter pointed out that the 2008 reporting cycle for impairment for Beaver Creek (as described in SEIS Section 3.6.2) has been updated. The commenter stated that based on the 2012 list of impaired and threatened waters under Section 303(d) of the CWA. Beaver Creek is only impaired for pH and fecal coliform and not specific conductivity and total dissolved solids as specified in the 2008 reporting cycle.

**Response:** *NRC acknowledges that the CWA Section 303(d) list for Beaver Creek has been recently updated (EPA, 2012) and indicates that Beaver Creek is impaired for pH and fecal coliform. Text in SEIS Section 3.6.2 was revised to indicate that, for the 2012 reporting cycle, the areas of impairment for Beaver Creek are pH and fecal coliform.*

**E5.20.8 References**

10 CFR Part 20 Appendix B. *Code of Federal Regulations*, Title 10, *Energy*, Part 20. “Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs) of Radionuclides for Occupational Exposure; Effluent Concentrations; Concentrations for Release to Sewerage.” Washington, DC: U.S. Government Printing Office.

ARSD (Administrative Rules of South Dakota). “Section 74.51.03.08, Cheyenne River and Certain Tributaries’ Uses.” South Dakota Legislature Administrative Rules.

ARSD. “Chapter 74:52. Surface Water Discharge Permits.” South Dakota Legislature Administrative Rules.

ASLBP (Atomic Safety and Licensing Board Panel). “Supplemental Declaration of Dr. Robert E. Moran.” In the Matter of Powertech (USA) Inc., Dewey-Burdock In Situ Uranium Recovery Facility. ML13029A368. Washington, DC: NRC. January 2013.

EPA (U.S. Environmental Protection Agency). “South Dakota, Beaver Watershed.” 2012. <[http://ofmpub.epa.gov/waters10/attains\\_impaired\\_waters.impaired\\_waters\\_list?p\\_state=SD&p\\_cycle=2012](http://ofmpub.epa.gov/waters10/attains_impaired_waters.impaired_waters_list?p_state=SD&p_cycle=2012) > (16 April 2013).

GCRP (U.S. Global Climate Change Research Program). *Global Climate Change Impacts in the United States*. New York City, New York: Cambridge University Press. 2009.

NRC (U.S. Nuclear Regulatory Commission). “NRC Staff’s Answer to Contentions on Draft Supplemental Environmental Impact Statement.” ML13066B030. Washington, DC: NRC. March 2013.

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

NRC. “Regulatory Guide 4.14, Radiological Effluent and Environmental Monitoring at Uranium Mills, Rev. 1.” Washington, DC: NRC. 1980.

Powertech [Powertech (USA) Inc.]. “Dewey-Burdock Project Groundwater Discharge Plan Custer and Fall River Counties, South Dakota.” ML12195A039, ML12195A040. Edgemont, South Dakota: Powertech. March 2012.

Powertech. “Dewey-Burdock Project, Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota, Technical Report RAI Responses, June, 2011.” ML112071064. Greenwood Village, Colorado: Powertech. 2011.

Powertech. “Dewey-Burdock Project, Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota—Environmental Report.” Docket No. 040-09075. ML092870160. Greenwood Village, Colorado: Powertech. August 2009a.

Powertech. “Dewey-Burdock Project, Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota—Technical Report.” Docket No. 040-09075. ML092870160. Greenwood Village, Colorado: Powertech. August 2009b.

## **E5.21 Groundwater Resources**

### **E5.21.1 Concerns About Groundwater Consumptive Use**

**Comments: 001-000001; 010-000002; 016-000003; 023-000002; 025-000002; 033-000002; 040-000001; 047-000004; 051-000001; 053-000002; 069-000001; 072-000003; 081-000007; 084-000002; 091-000005; 103-000001; 104-000009; 120-000005; 122-000001; 129-000002; 136-000004**

Several commenters were concerned about groundwater consumption at the proposed project. The commenters were concerned primarily about (i) the amounts of groundwater that will be removed from local and regional aquifers and (ii) impacts of groundwater consumption on the affected environment (e.g., domestic and public water supply, agricultural use, tourism, public health). Some commenters were concerned that the impacts of removal of water from local aquifers are not adequately discussed and assessed. One commenter stated that water is a scarce resource in the area where the proposed mining will occur and mining would severely reduce the availability of these waters for beneficial uses. Some commenters stated that the proposed project’s demand for water is alarming and ranchers, farmers, and the state of South Dakota is in the middle of a drastic drought. Another commenter stated that it is up to the state to ensure that the aquifers are not irreparably depleted.

**Response:** *In South Dakota, all groundwater is the property of the people of the state and, with the exception of limited domestic use, a water rights permit from SDDENR is required to withdraw water from an aquifer. The water rights permit ensures that unappropriated water is available in the aquifer for the use and withdrawal amount specified in the permit. In June 2012, the applicant submitted water appropriation permit applications to use Inyan Kara aquifer and Madison aquifer water at the proposed Dewey-Burdock ISR Project (Powertech, 2012a,b). Following are descriptions of the applicant’s water rights permits and an analysis of the potential impacts of groundwater consumptive use at the proposed project on the Inyan Kara and Madison aquifers.*

*The water rights permit application for the Inyan Kara aquifer proposes to appropriate up to 33.8 ha-m [274.2 ac-ft] of water annually (Powertech, 2012a). This water would be used primarily for the ISR process during the operations phase of the proposed project, which will*

*continue for approximately 8 years (Powertech, 2009a). The application proposes a gross withdrawal (pumping) rate of 32,172 Lpm [8,500 gpm] (Powertech, 2012a). The consumptive use of water will be a small portion of the gross withdrawal rate. As described in the application, approximately 2 percent of the water {558 Lpm [170 gpm]} is production bleed, which will be disposed of as liquid waste (Powertech, 2012a). The remaining water (approximately 98 percent) will be recirculated and reinjected back into the aquifer as part of the ISR process. Based on a review of the water permit application, which included an analysis of water availability and existing water rights, SDDENR concluded (i) approval of the application will not result in average annual withdrawals from the Inyan Kara aquifer that exceed the average annual recharge to the aquifer; (ii) there is reasonable probability that there is at least 33.8 ha-m/yr [274.2 ac-ft/yr] of unappropriated water available from the aquifer; (iii) SDDENR Water Rights Program observation well data indicate that unappropriated water is available from the Inyan Kara aquifer; and (iv) there is a reasonable probability that the withdrawals proposed in the application can be made without unlawful impairment of existing water rights or domestic wells (SDDENR, 2012a). Text was added to SEIS Section 4.5.2.1 to document SDDENR's review and analysis of the applicant's water permit application for the Inyan Kara aquifer.*

*The water permit application for the Madison aquifer proposes to appropriate 109.6 ha-m [888.8 ac-ft] of water annually, at a withdrawal rate of 2,085 Lpm [551 gpm] (Powertech, 2012b). This water would be used primarily during the aquifer restoration phase of the project. The amount of water that will be withdrawn from the Madison aquifer will depend on the liquid waste disposal method that will be used as part of the ISR process. The use of land application will require a diversion rate of 2,085 Lpm [551 gpm], and using deep Class V injection wells will require a withdrawal rate of 606 Lpm [160 gpm] (Powertech, 2012b). Based on a review of the application, which included an analysis of water availability and existing water rights, SDDENR concluded that (i) there is reasonable probability that unappropriated water is available in the Madison aquifer to supply the proposed appropriation; (ii) approval of the application will not result in average annual withdrawals from the Madison aquifer that exceed the average annual recharge to the aquifer; and (iii) there is a reasonable probability that the withdrawal proposed in the application can be made without impacting existing rights, including domestic users (SDDENR, 2012b). Text was added to SEIS Section 4.5.2.1 to document SDDENR's review and analysis of the applicant's water permit application for the Madison aquifer.*

*As discussed in SEIS Section 4.5.2.1.1.1, the applicant estimates that groundwater consumption during construction at the Dewey and Burdock areas will be  $8.25 \times 10^7$  L [ $21.8 \times 10^6$  gal] and  $1.16 \times 10^8$  L [ $30.6 \times 10^6$  gal], respectively (Powertech, 2010). If the water appropriation permit to use Madison aquifer water is granted, the applicant will rely less on local water supplies in the permit area. In that case, environmental impacts on local aquifers (e.g., the Inyan Kara aquifer) and domestic and livestock wells from consumptive water use during construction will be SMALL.*

*If a permit to appropriate water from the Madison aquifer is denied, water use from local shallow aquifers during construction could impact domestic and livestock wells if the applicant does not take necessary measures to mitigate impacts. For example, the applicant estimates consumptive groundwater use during construction to be the same as that currently being withdrawn for domestic and livestock use from the Inyan Kara aquifer within 2 km [1.2 mi] of the Dewey-Burdock site (see SEIS Section 4.5.2.1.1.2.2). However, the applicant has committed to removing all existing domestic wells within the project area from private use prior to ISR operations (Powertech, 2011). This process will begin during the construction phase and, therefore, the current usage rate from the Inyan Kara within the proposed project area will*

decline. In addition, results of numerical groundwater simulations indicate the Inyan Kara aquifer can sustain net extraction rates of up to 556 Lpm [147 gpm] over the 2-year construction phase (Petrotek, 2012). This equates to total groundwater consumption of  $5.83 \times 10^8$  L [ $1.54 \times 10^8$ ] gal. Therefore, the NRC staff anticipate that the potential impact to shallow local aquifers and domestic and livestock wells from consumptive water use during the construction phase of the proposed project will be SMALL. Text was added to SEIS Sections 4.5.2.1.1.1 and 4.5.2.1.2.1 to document results of the applicant's numerical groundwater simulations.

As described previously, the applicant's water permit application to SDDENR for groundwater use from the Madison aquifer proposes to appropriate 109.6 ha-m [888.8 ac-ft] or  $1.09 \times 10^9$  L [ $28.9 \times 10^7$  gal] of water annually (Powertech, 2012b). If this permit is granted, the applicant will rely largely on Madison aquifer water during the operations phase of the project. Otherwise, the applicant will pump water from the Inyan Kara Group aquifers to meet operational needs at an estimated sustainable rate of 151 to 246 Lpm [40 to 65 gpm] (Powertech, 2009a, 2010). Results of numerical groundwater simulations indicate the Inyan Kara aquifer can sustain net extraction rates of up to 363 Lpm [96 gpm] over the 8-year operations phase (Petrotek, 2012). Based on the previous analysis, NRC staff concluded that the environmental impacts on local aquifers and domestic and livestock wells from consumptive water use during ISR operations will be SMALL. Text was added to SEIS Sections 4.5.2.1.1.2.2 and 4.5.2.1.2.2.2 to document the results of numerical groundwater simulations the applicant conducted.

As described in the applicant's water rights permit application for the Madison aquifer, the amount of water that will be withdrawn from the Madison for use during aquifer restoration will depend on the liquid waste disposal method that will be used as part of the ISR process. Land application use will require a diversion rate of 2,085 Lpm [551 gpm], and using deep Class V injection wells will require a withdrawal rate of 606 Lpm [160 gpm]. As described in SEIS Sections 4.5.2.1.1.3, the total liquid waste flow rate during concurrent uranium production and aquifer restoration for the deep Class V injection well disposal option will be approximately 746 Lpm [197 gpm] and approximately 568 Lpm [150 gpm] for aquifer restoration alone. As described in SEIS Section 4.5.2.1.2.3, the typical liquid waste flow rates for the land application option will be approximately 2,070 Lpm [547 gpm] during concurrent uranium production and aquifer restoration and approximately 1,892 Lpm [500 gpm] during aquifer restoration alone. The wastewater would not be reinjected back into the wellfields. Instead, makeup water from the Madison aquifer will be injected into the wellfields at a rate sufficient to maintain the restoration bleed. This rate will typically be 1 percent of the restoration flow unless groundwater sweep is used in conjunction with RO treatment with permeate injection, in which case the restoration bleed will average approximately 17 percent, as described in SEIS Section 2.1.1.4.1.3.

If the applicant cannot secure an appropriation for use of Madison aquifer water, the applicant will have to either identify an alternative source of water to meet aquifer restoration requirements or reduce pumping rates to meet the sustainable net extraction rate from the Inyan Kara aquifer, which is estimated to be at least 556 Lpm [147 gpm] for 2 years and 363 Lpm [96 gpm] for 8 years based on numerical modeling (see SEIS Sections 4.5.2.1.1.1 and 4.5.2.1.1.2.2) (Petrotek, 2012). Reducing the pumping rate will extend the aquifer restoration phase (Powertech, 2010). After production and restoration are complete and groundwater withdrawals are terminated, groundwater levels will tend to recover with time (NRC, 2009a). Thus, the potential long-term environmental impact from consumptive use during the restoration phase at the proposed project for the Class V injection well disposal option will be SMALL. Text

*was added to SEIS Sections 4.5.2.1.1.3 and 4.5.2.1.2.3, to document the results of numerical groundwater simulations the applicant conducted.*

*Based on SDDENR's review and analysis of the applicant's water rights permits for the Inyan Kara and Madison aquifers (SDDENR, 2012a,b) and the results of the groundwater consumptive use impact analysis presented previously and in SEIS Section 4.5.2.1, NRC finds that groundwater consumptive use associated with ISR activities at the proposed project site will have SMALL impacts on the Inyan Kara and Madison aquifers.*

## **E5.21.2 Concerns About *In-Situ* Recovery and Groundwater Contamination**

**Comments: 001-000001; 052-000001; 132-000001**

The commenter stated that there is a strong potential for radioactive uranium residue contamination to be leached back into the Inyan Kara and Madison aquifers. Other commenter stated that the proposed project poses a large and unacceptable risk to groundwater from toxic uranium ore residues.

**Response:** *NRC recognizes that during the uranium recovery process the groundwater in the production zone aquifers (i.e., the Fall River and Chilson aquifers that make up the Inyan Kara aquifer) will become enriched in uranium. Uranium dissolution and mobilization occurs when lixiviant (leaching solution) is injected into the orebody and uranium-laden solutions are recovered (see SEIS Section 2.1.1.1.3.1). As described in SEIS Section 2.1.1.1.4, after ISR operations cease, the licensee must restore the groundwater quality in the production zone aquifer to the water quality standards listed in 10 CFR Part 40, Appendix A, Criterion 5B(5). Specifically, under Criterion 5B(5), the concentration of a hazardous constituent must not exceed (i) the CAB concentration of that constituent in groundwater; (ii) the respective MCL value in 10 CFR Part 40, Appendix A, Table 5C, if the constituent is listed in the table and if the background level of the constituent is below the value listed; or (iii) an alternate concentration limit established by the NRC. Under Criterion 5B(6), requests for ACLs would only be considered after a licensee has demonstrated that restoring the constituent at issue to either background or MCL values is not practical to achieve at a given site. Licensees may only propose for NRC consideration ACLs that present no significant hazard. NRC may establish a site-specific ACL for a hazardous constituent if it finds that (i) the proposed limit is ALARA after considering practicable corrective actions and (ii) the constituent would not pose a substantial present or potential hazard to human health or the environment as long as the ACL is not exceeded.*

*Water from the Madison aquifer will be used primarily during the aquifer restoration phase of the project (see SEIS Section 2.1.1.1.4.1 and SEIS Figure 2.1-14). The Madison aquifer does not contain uranium mineralization. The water withdrawn from the Madison aquifer for use at the proposed project will not be reinjected back into the Madison aquifer. In addition, water withdrawn from the Inyan Kara aquifer during ISR operations will not be reinjected or disposed of in the Madison aquifer. Therefore, there is no potential for radioactive uranium residue contamination to be leached back or introduced into the Madison aquifer.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comments: 001-000002; 010-000003; 013-000002; 018-000005; 023-000001; 028-000001; 039-000002; 047-000003; 051-000001; 053-000002; 059-000002; 060-000002; 069-000001; 083-000002; 091-000006; 095-000003; 104-000009; 106-000002; 120-000005; 121-000001; 122-000001; 129-000001; 136-000001**

Several commenters were concerned that the ISR process will contaminate (pollute) groundwater and that the SEIS did not address groundwater contamination. One commenter stated that there is no such thing as guaranteed safeguards, and a risk of toxic contamination to vital aquifers in a pristine natural area is not something that should be entertained. Some commenters stated that the process used to retrieve uranium would pollute groundwater with radioactive materials and heavy metals, making it dangerous to humans and all life. Another commenter stated that huge quantities of radioactivity, arsenic, selenium, heavy metals, phosphates, sulfates, iron, and other contaminants are present in the ground to be mined, which over time in rising concentrations will destroy water quality. Some commenters were concerned about possible contamination and adverse effects on health. Another commenter stated that shallow uranium mining by injection of chemicals would mobilize heavy metals and radioactivity, which will not feasibly be removed or treated effectively, making groundwater unusable.

**Response:** *NRC recognizes that during the uranium recovery process the groundwater in the production zone becomes progressively enriched in uranium and other metals typically associated with uranium (NRC, 2009a). The most common metals are arsenic, selenium, vanadium, iron, manganese, and radium. Uranium dissolution and mobilization occurs when lixiviant (leaching solution) is injected into the orebody and uranium-laden solutions are recovered (see SEIS Section 2.1.1.1.3.1).*

*As described in SEIS Section 2.1.1.1.2.3.1, before ISR operations begin, the portion of the aquifer(s) designated for uranium recovery must be exempted from the USDW designation, in accordance with the SDWA and pursuant to 40 CFR Part 146. An aquifer or aquifer portion that meets the criteria for a USDW may be determined to be an “exempted aquifer” if (i)(a) it does not currently serve as a source of drinking water and (b) it cannot now and will not in the future serve as a source of drinking water because it is mineral-, hydrocarbon-, or geothermal-energy-producing or (ii) it can be demonstrated by an applicant as part of a permit application for a Class III operation to contain minerals that, considering their quantity and location, are expected to be commercially producible. Hence, groundwater in exempted aquifers cannot be considered a source of drinking water even after aquifer restoration is complete.*

*The applicant proposes to implement an operational groundwater monitoring program that meets the requirements of 10 CFR Part 40, Appendix A, Criteria 7 and 7A (see SEIS Section 2.1.1.1.3.1.3). This program will be designed to detect and correct any condition that could lead to the unintended spread of uranium-bearing lixiviant either horizontally or vertically outside of the production zone, which could lead to an excursion (Powertech, 2009a). The purpose of the groundwater monitoring program is to ensure that groundwater quality in aquifers outside exempted zones is not impacted by ISR operations. The applicant’s groundwater monitoring program is detailed in SEIS Section 7.3.1.2.*

*As described in SEIS Section 2.1.1.1.4, after ISR operations cease, the licensee must restore the groundwater quality in the production zone aquifer to the water quality standards listed in 10 CFR Part 40, Appendix A, Criterion 5B(5). Specifically, under Criterion 5B(5), the concentration of a hazardous constituent must not exceed (i) the CAB concentration of that*



*constituent in groundwater; (ii) the respective MCL value in 10 CFR Part 40, Appendix A, Table 5C if the constituent is listed in the table and if the background level of the constituent is below the value listed; or (iii) an alternate concentration limit the NRC established. Under Criterion 5B(6), requests for ACLs would only be considered after a licensee has demonstrated that restoring the constituent at issue to either background or MCL values is not practical to achieve at a given site. Licensees may only propose for NRC consideration ACLs that present no significant hazard. NRC may establish a site-specific ACL for a hazardous constituent if it finds that (i) the proposed limit is ALARA after considering practicable corrective actions and (ii) the constituent would not pose a substantial present or potential hazard to human health or the environment as long as the ACL is not exceeded.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comments: 045-000004; 065-000001; 093-000002; 124-000001; 136-000018**

Several commenters were concerned about cross-contamination between aquifers. One commenter stated that considering the considerable cross-contamination among local aquifers (enhanced by widespread bores from earlier mining efforts), the project has an unwarranted risk to the water supplies on which local human and other animal life depend. Another commenter noted that below the Inyan Kara aquifer lie the Minnelusa and Madison aquifers, which are vital to future life in the area. The commenter was concerned that the *in-situ* process will threaten these vital aquifers. Several commenters were concerned about contamination of other aquifers due to faults and improperly plugged exploratory holes. Another commenter stated that the Minnelusa aquifer is hydraulically connected to the Inyan Kara aquifer and the Madison, yet the SEIS does not adequately analyze the risks of vertical migration of contaminants and transfer between aquifers.

**Response:** *The Inyan Kara aquifer is underlain by a 30-m [100-ft]-thick section of the impermeable Morrison Formation, which hydrologically isolates the Inyan Kara aquifer from deeper aquifers (see SEIS Section 4.5.2.1.1.2.1). However, as described in SEIS Section 4.5.2.1.1.2.2, Tennessee Valley Authority (TVA) drilled several thousand exploratory boreholes within the proposed Dewey-Burdock ISR Project area, which penetrate the Inyan Kara aquifer to the Morrison Formation (Powertech, 2010). These boreholes may provide a pathway to aquifers below production zone confining units, such as deep aquifers below the Morrison Formation, although few exploration holes penetrated the entire thickness of the Morrison Formation (Powertech, 2011). Before developing wellfields, the applicant commits to properly plugging and abandoning or mitigating any historical wells and exploration holes that may potentially impact the control and containment of wellfield solutions within the proposed wellfield (Powertech, 2011). The applicant will use available information and best professional practices—including historical records, color infrared imagery, field investigations, and potentiometric surface evaluation—to locate or detect improperly plugged boreholes or wells in the vicinity of potential wellfield areas. In addition, the applicant will use the results of pumping test results conducted as part of routine wellfield hydrogeologic package development to identify improperly plugged wells and exploration boreholes (Powertech, 2011).*

*As described in SEIS Sections 3.4.1.2 and 3.4.3, regionally there are collapse features, faults, and other features that may provide communication between aquifers, such as the Inyan Kara, Minnelusa, and Madison. However, there is no evidence such features exist within the project area. For example, the Dewey Fault is located approximately 1.6 km [1 mi] north of the proposed Dewey-Burdock permit area (see SEIS Figure 3.4-3). The Dewey Fault is a nearly*

*vertical northeast-to-southwest-trending normal fault with a combined displacement and drag of approximately 152 m [500 ft] on the north side. Given the location and displacement characteristics of this fault, there will be no effect on proposed site activities.*

*As described in SEIS Section 3.5.3.1, the Minnelusa aquifer has been considered to be in hydraulic connection with the Inyan Kara aquifer through breccia pipes (Gott, et al., 1974). Breccia pipes are collapsed structures caused by dissolution of gypsum (calcium sulfate,  $\text{CaSO}_4 \cdot \text{H}_2\text{O}$ ) and anhydrite (anhydrous calcium sulfate,  $\text{CaSO}_4$ ) within the Minnelusa Formation in the Black Hills area. As described in SEIS Section 3.4.1.2, the areal extent of dissolution in the Minnelusa Formation is limited to within a few kilometers [miles] downgradient from the Minnelusa outcrop. USGS has mapped the probable maximum downgradient limit of dissolution, which is approximately 8 km [5 mi] northeast of the proposed project area (Braddock, 1963). The applicant conducted detailed geologic mapping throughout proposed operating areas at the proposed Dewey-Burdock site and found no indication of breccia pipes (Powertech, 2009c, 2011). In addition, water elevations in major aquifers in the Dewey-Burdock project area increase with depth. This provides an upward hydraulic gradient for groundwater flow across the major aquifers and limits the potential for downward migration (see SEIS Sections 3.5.3.1 and 4.5.2.1.1.2.2).*

*The Madison aquifer underlies the Minnelusa Formation and is the most important aquifer in the region, supplying municipal water for numerous communities, including Rapid City and Edgemont (see SEIS Section 3.5.3.4). As described in SEIS Section 3.5.3.1, confining layers are present at the base of the Minnelusa. However, in some locations, these confining layers may be absent or provide ineffective confinement; this could enhance hydraulic connection between the Minnelusa aquifer and the underlying Madison aquifer (Naus, et al., 2001). SDDENR concluded, based on water levels in the Minnelusa and Madison observation wells in the proposed Dewey-Burdock ISR Project area, that there is a distinct difference in the potentiometric surfaces of the two aquifers (SDDENR, 2012b). These differences indicate that the Minnelusa and Madison aquifers are hydraulically separated in the vicinity of the proposed project area (SDDENR, 2012b).*

*No change was made to the SEIS beyond the information provided in this response.*

**Comments: 047-000002; 076-000001**

One commenter pointed out that the Madison aquifer is the source of water for her ranch, the town of Edgemont, and the water system at Provo, all of which are in the direct flow path of contaminants that will be injected into the wells at the proposed project. The commenter was concerned that over time the Madison will be horribly contaminated. Another commenter noted that if uranium mining in southwestern South Dakota is allowed, then the Madison and Ogallala aquifers are guaranteed to be polluted.

**Response:** *NRC recognizes that groundwater in regional aquifers, such as the Madison aquifer, flows radially outward from the Black Hills, which results in a northeast to southwest regional flow direction in the general vicinity of the proposed Dewey-Burdock ISR Project (see SEIS Sections 3.5.3.1 and 3.5.3.2). Therefore, groundwater in deep aquifers (e.g., the Madison aquifer) and shallow aquifers (e.g., the Inyan Kara aquifer) beneath the proposed project site is traveling toward ranches southwest of the proposed project site, the town of Edgemont, and the water system at Provo. However, the Inyan Kara aquifer, in which the applicant plans to conduct ISR operations, is underlain by a 30-m [100-ft]-thick section of the impermeable*

*Morrison Formation. This section of the Morrison Formation hydrologically isolates the Inyan Kara aquifer from deeper aquifers, such as the Madison aquifer (see SEIS Section 4.5.2.1.1.2.1). In addition, water elevations in major aquifers in the Dewey-Burdock project area increase with depth, which provides an upward hydraulic gradient for groundwater flow across the major aquifers and limits the potential for downward migration of contaminants from the Inyan Kara to the Madison aquifer (see SEIS Sections 3.5.3.1 and 4.5.2.1.1.2.2).*

*The Ogallala aquifer is not part of the regional aquifer system in southwestern South Dakota, where the proposed Dewey-Burdock ISR project would be located (see SEIS Section 3.5.3.1). As discussed in Section 3.4.4.3 of the GEIS, the Ogallala aquifer is part of the High Plains aquifer system that underlies the Nebraska portion of the Nebraska-South Dakota-Wyoming Uranium Milling Region (NRC, 2009a). Therefore, there is no potential for ISR activities in southwestern South Dakota to pollute water in the Ogallala aquifer.*

*To prevent contamination of groundwater outside the production zone at the proposed project, the applicant will be required to implement an operational groundwater monitoring program that meets the requirements of 10 CFR Part 40, Appendix A, Criteria 7 and 7A (see SEIS Section 2.1.1.1.3.1.3). This program will be designed to detect and correct any condition that could lead to the unintended spread of uranium-bearing lixiviant either horizontally or vertically outside of the production zone, which could lead to an excursion (Powertech, 2009a). The purpose of a groundwater monitoring program is to ensure that groundwater quality in aquifers outside exempted zones is not impacted by ISR operations. The applicant's groundwater monitoring program is detailed in SEIS Section 7.3.1.2.*

*Furthermore, water from the Madison aquifer will be used primarily during the aquifer restoration phase of the project (see SEIS Section 2.1.1.1.4.1 and SEIS Figure 2.1-14). The water withdrawn from the Madison aquifer for use at the proposed project will not be reinjected back into the Madison aquifer. In addition, water withdrawn from the Inyan Kara aquifer during ISR operations will not be reinjected or disposed of in the Madison aquifer. Therefore, there is no potential for contaminated water to be introduced into the Madison aquifer.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comment: 047-000005**

The commenter stated that the applicant asserts the current water in the proposed project area is brackish and therefore it is no problem to inject further contaminants. The commenter stated that this is huge problem because in its natural state water does not contain the full measure of lethal contaminants such as radioactivity in high levels and arsenic. The commenter implies that further injection of contaminants will cause water to become highly toxic. The commenter stated further that a permanent exemption from the SDWA should not be granted to the applicant.

**Response:** *SEIS Section 3.5.3.5 describes the results of baseline or preoperational groundwater sampling of wells at the proposed Dewey-Burdock ISR Project (Powertech, 2009a). The results found that 28 out of 31 groundwater samples exceeded the MCLs for primary drinking water standards as provided by EPA regulations at 40 CFR Part 141. Of 25 groundwater samples collected from the proposed ore-bearing aquifer (i.e., the Fall River and Chilson aquifers), 23 exceeded the MCLs for primary drinking water standards as provided by EPA regulations at 40 CFR Part 141; hence, groundwater from the proposed ore-bearing*

*aquifer within the permit boundaries will not be used in public water systems and is unsuitable for private domestic use without treatment.*

*NRC recognizes that during the uranium recovery process the groundwater in the production zone becomes progressively enriched in uranium and other metals typically associated with uranium (NRC, 2009a). The most common metals are arsenic, selenium, vanadium, iron, manganese, and radium. Uranium dissolution and mobilization occurs when lixiviant (leaching solution) is injected into the orebody and uranium-laden solutions are recovered (see SEIS Section 2.1.1.1.3.1).*

*As described in SEIS Section 2.1.1.1.2.3.1, before ISR operations begin, the portion of the aquifer(s) designated for uranium recovery must be exempted from the USDW designation, in accordance with the SDWA and pursuant to 40 CFR Part 146. An aquifer or aquifer portion that meets the criteria for a USDW may be determined to be an “exempted aquifer” if (i)(a) it does not currently serve as a source of drinking water and (b) it cannot now and will not in the future serve as a source of drinking water because it is mineral-, hydrocarbon-, or geothermal-energy-producing or (ii) it can be demonstrated by an applicant as part of a permit application for a Class III operation to contain minerals that, considering their quantity and location, are expected to be commercially producible. Hence, groundwater in exempted aquifers cannot be considered a source of drinking water supply even after aquifer restoration.*

*No change was made to the SEIS beyond the information provided in this response.*

### **E5.21.3 Drawdown**

#### **Comments: 075-000003; 093-000003**

One commenter stated that there is strong evidence this facility will drastically deplete the water table and leave residents without a safe, clean source of water. Another commenter stated that there is a potential impact for aquifer depletion due to the extremely high consumptive use of water during the ISR operations and restoration phases, which has the potential to draw down the aquifers.

**Response:** *In South Dakota, all groundwater is the property of the people of the state and, with the exception of limited domestic use, a water rights permit from SDDENR is required to withdraw water from an aquifer. The water rights permit ensures that unappropriated water is available in the aquifer for the use and withdrawal amount specified in the permit. In June 2012, the applicant submitted water appropriation permit applications to use Inyan Kara aquifer and Madison aquifer water at the proposed Dewey-Burdock ISR Project (see Table 1.6-1).*

*The water permit application for the Inyan Kara aquifer proposes to appropriate up to 33.8 ha-m [274.2 ac-ft] of water annually (Powertech, 2012a). This water would be used primarily for the ISR process during the operations phase of the proposed project, which will continue for approximately 8 years (Powertech, 2009a). The application proposes a gross withdrawal (pumping) rate of 32,172 Lpm [8,500 gpm] (Powertech, 2012a). The consumptive use of water will be a small portion of the gross withdrawal rate. As described in the application, approximately 2 percent of the water {558 Lpm [170 gpm]} is production bleed, which will be disposed of as liquid waste (Powertech, 2012a). The remaining water (approximately 98 percent) is recirculated and reinjected back into the aquifer as part of the ISR process.*

*Based on a review of the water permit application, which included an analysis of water availability and existing water rights, SDDENR concluded (i) approval of the application will not result in average annual withdrawals from the Inyan Kara aquifer that exceed the average annual recharge to the aquifer; (ii) there is reasonable probability that there is at least 33.8 ha-m/yr [274.2 ac-ft/yr] of unappropriated water available from the aquifer; (iii) SDDENR Water Rights Program observation well data indicate that unappropriated water is available from the Inyan Kara aquifer; and (iv) there is a reasonable probability that the withdrawals proposed in the application can be made without unlawful impairment of existing water rights or domestic wells (SDDENR, 2012a). Text was added to SEIS Section 4.5.2.1 to document SDDENR's review and analysis of the applicant's water permit application for the Inyan Kara aquifer.*

*SEIS Section 4.5.2.1.1.2.2 describes the results of drawdown estimates in the Fall River and Chilson aquifers during ISR operations. The estimates are based on numerical modeling developed from site-specific parameters and calibrated to historical pumping test data (Petrotek, 2012). The results found that the maximum drawdown outside the project area resulting from projected ISR operations will be approximately 3.65 m [12 ft] in the Fall River aquifer and 3.05 m [10 ft] in the Chilson aquifer (Petrotek, 2012). As further described in SEIS Section 4.5.2.1.1.2.2, the numerical simulations were for net extraction rates resulting from a gross production pumping rate of 30,280 Lpm [8,000 gpm] {twice the applicant's estimated proposed pumping rate of 15,140 Lpm [4,000 gpm]}, a 1 percent production bleed rate, and the use of groundwater sweep during aquifer restoration. Therefore, the drawdown estimates represent the maximum anticipated drawdown amount for nearby domestic and livestock wells. The NRC staff analyzed the hydrogeologic characteristics of the Fall River and Chilson aquifers (i.e., formation thicknesses and potentiometric surfaces) and concluded that these estimated drawdowns will have a SMALL impact on nearby wells located in the Fall River and Chilson aquifers. Text was added to SEIS Section 4.5.2.1.1.2.2 to document the results of the applicant's numerical modeling.*

*The water permit application for the Madison aquifer proposes to appropriate 109.6 ha-m [888.8 ac-ft] water annually at a withdrawal rate of 2,085 Lpm [551 gpm] (Powertech, 2012b). This water would be used primarily during the aquifer restoration phase of the project. The amount of water that will be withdrawn from the Madison aquifer will depend on the liquid waste disposal method that will be used as part of the ISR process. The use of land application will require a diversion rate of 2,085 Lpm [551 gpm], and using deep Class V injection wells will require a withdrawal rate of 606 Lpm [160 gpm] (Powertech, 2012b). Based on a review of the application, which included an analysis of water availability and existing water rights, SDDENR concluded that (i) there is reasonable probability that unappropriated water is available in the Madison aquifer to supply the proposed appropriation; (ii) approval of the application will not result in average annual withdrawals from the Madison aquifer that exceed the average annual recharge to the aquifer; and (iii) there is a reasonable probability that withdrawal proposed in the application can be made without impacting existing rights including domestic users (SDDENR, 2012b). Text was added to SEIS Section 4.5.2.1 to document SDDENR's review and analysis of the applicant's water permit application for the Madison aquifer.*

*Because a significant amount of make-up water could originate from the Madison aquifer, local drawdown of this aquifer could be substantial. A review of South Dakota's water rights permits database indicated that the City of Edgemont has four permits for Madison aquifer wells and is permitted for 4.621 Lpm [1,221 gpm] from the Madison aquifer (SDDENR, 2012c). Other nearby cities, including Custer and Hot Springs, do not draw water from the Madison aquifer (SDDENR, 2012c). As part of the SER for the proposed Dewey-Burdock ISR Project, NRC staff*

*constructed a three-layer model to evaluate the effects of a large withdrawal from the Madison aquifer (NRC, 2013a). The model included one well at the Dewey-Burdock ISR Project operating at 1,892 Lpm [500 gpm] and two wells in the City of Edgemont operating at 4,621 Lpm [1,221 gpm]. Results of the analysis indicate the Edgemont wells would produce a large cone of depression that encompasses the Dewey-Burdock ISR Project, if these wells operated constantly (conservative assumption) (see SER Figure 3.1-1). When the Dewey-Burdock well is operating full time (conservative assumption), the Dewey-Burdock well superimposes its cone of depression onto the Edgemont wells (SER Figure 3.1-2). However, based on the staff's review of the steady-state potentiometric surface maps and Madison aquifer drawdown, the drawdown induced by constant pumping of the Dewey-Burdock well does not appear to affect the operation of the Edgemont wells. Therefore, the proposed maximum Madison withdrawals at the Dewey-Burdock project do not appear to affect water supplies in the City of Edgemont, South Dakota.*

*No additional changes were made to the SEIS.*

**Comment: 128-000161**

The commenter pointed out that drawdown estimates of production zone aquifers during operations at the proposed project have been updated (Petrotek, 2012) and suggested revising this information in the SEIS.

**Response:** *NRC acknowledges that drawdown estimates for the Fall River and Chilson aquifers have been updated (Petrotek, 2012). The updated drawdown estimates are based on numerical modeling using site-specific parameters and calibrated to historical pumping test data. NRC staff reviewed the applicant's numerical model and calibration, and determined that the model was appropriately developed and sufficiently calibrated. Text in SEIS Section 4.5.2.1.1.2.2 was revised to reflect the updated drawdown estimates for the Fall River and Chilson aquifers presented in Petrotek (2012).*

**Comments: 128-000017; 128-000079; 128-000175; 128-000176; 128-000177**

The commenter noted that the statement is made in the draft SEIS that "If contaminants are drawn into production zones within the Chilson aquifer from abandoned open pit mines through the hydraulically connected Fall River aquifer during aquifer restoration, the impacts will be MODERATE." The commenter noted that mitigation measures will be in place to ensure that drawdown-induced migration of potential contaminants does not affect aquifer restoration goals. The commenter also noted that any drawdown-induced migration of contaminants that occurs during operations and aquifer restoration would be detected by the groundwater monitoring network. Once detected, the procedures used to address an excursion would be applied to mitigate further migration of the contaminants (such as modifying injection/recovery rates). Therefore, the commenter questioned the conclusion in the draft SEIS that the potential impacts to groundwater quality from aquifer restoration will be MODERATE and suggested that the magnitude be changed to SMALL.

**Response:** *NRC acknowledges that mitigation measures will be in place to ensure that drawdown-induced migration of potential contaminants does not affect aquifer restoration goals. These mitigation measures are described in SEIS Section 4.5.2.1.1.3. For example, NRC will require the applicant to conduct hydrogeological characterization and aquifer pumping tests in each wellfield to examine the hydraulic integrity of the Fuson Shale, which separates the*

*Chilson and Fall River aquifers. NRC will also require by license condition that the applicant provide the results of the hydrogeological characterization and aquifer pumping tests for review and written verification before any proposed wellfields are developed (NRC, 2013b). The applicant has also committed to locating unknown boreholes or wells identified through aquifer pump testing, and committed to plugging and abandoning historical wells and exploration holes, holes drilled by the applicant, and any wells that fail mechanical integrity tests (Powertech, 2011). These requirements and commitments will ensure that contaminants are hydrologically isolated in the exempted portion of the ore-bearing aquifers during restoration.*

*As further described in SEIS Section 4.5.2.1.1.3, hydraulic communication (leakage) between the Fall River and Chilson aquifers through the intervening Fuson Shale in the Burdock area has been identified based on aquifer pumping tests (see SER Section 2.4.3.4) and potentiometric surface differences (see SEIS Section 3.5.3.2). Because leakage may occur through the Fuson Shale, a potential exists for drawdown-induced migration of radiological contaminants from abandoned open pit mines in the Burdock area (e.g., Triangle Pit mine) from the Fall River aquifer into the hydraulically connected Chilson aquifer. To address uncertainties in the confining properties of the Fuson Shale in the Burdock area, the NRC staff will require by license condition that the applicant propose a monitoring well network for the Fall River aquifer in the Burdock area for those wellfields in which the Chilson aquifer is the production zone (NRC, 2013b). The proposed monitoring well network will be submitted to NRC staff for review and written verification at least 60 days prior to construction. In addition, by license condition, wellfields in the vicinity of the abandoned mine pits in the Burdock area, specifically wellfields B-WF6, B-WF7, and B-WF8 (see Figure 2.1-6), will be prohibited from operating until NRC staff have reviewed and approved the hydrogeologic data packages for those wellfields (NRC,2013b).*

*Based on the license conditions and applicant commitments discussed in the preceding paragraphs, the potential for contaminants from abandoned open pit mines in the Burdock area to be drawn through the Fuson Shale into production zones within the Chilson aquifer during aquifer restoration would be expected to be SMALL. Therefore, NRC agrees with the commenter's suggestion that the magnitude of potential impacts to groundwater quality from aquifer restoration should be changed to SMALL. Text was revised in the SEIS to indicate that the potential for contaminants from abandoned open pit mines in the Burdock area to be drawn through the Fuson Shale into production zones within the Chilson aquifer during aquifer restoration will be SMALL.*

#### **E5.21.4 Aquifer Exemption and Baseline Water Quality**

##### **Comments: 042-000010; 127-000013**

One commenter noted that NRC and BLM must address the critique of Dr. Moran, consultant for the Oglala Sioux Tribe, concerning lack of baseline groundwater data collection and characterization. The Northern Cheyenne Tribe also stated that it agrees with the majority of the contentions in the declaration of Dr. Robert E. Moran, consultant for the Oglala Sioux Tribe, before the NRC's ASLBP. Specifically, the Northern Cheyenne Tribe noted assertions by Dr. Moran in the declaration that the SEIS is deficient with respect to baseline groundwater and hydrogeological characterizations.

**Response:** *NRC is aware of the declaration of Dr. Moran before the ASLBP and the assertions that the SEIS is deficient with respect to baseline groundwater and hydrogeological*



*characterizations (ASLBP, 2013). NRC disagrees that the draft SEIS is deficient with respect to baseline groundwater and hydrogeological characterization. SEIS Section 3.5.3.5 describes the results of baseline or preoperational groundwater quality sampling at the proposed project. The applicant followed guidance in NUREG–1569 (NRC, 2003) and NRC Regulatory Guide 4.14 (NRC, 1980) to establish preoperational or baseline groundwater quality conditions at the proposed site (Powertech, 2009a, 2011). Aquifer characteristics and hydraulic properties of major aquifers comprising the regional aquifer system are described in SEIS Section 3.5.3.1. Aquifer characteristics and hydraulic properties of aquifer systems in the vicinity of the proposed project, including uranium-bearing aquifers, are described in SEIS Section 3.5.3.2. Results of pumping tests conducted at the proposed project are also described in SEIS Section 3.5.3.2. Estimates of maximum drawdown outside the project area resulting from projected ISR operations are presented in SEIS Section 4.5.2.1.1.2.2. These estimates are based on numerical modeling developed from site-specific hydrogeological parameters and calibrated to historical pumping test data (Petrotek, 2012).*

*In response to previous comments, text was added to SEIS Section 3.5.3.5 to indicate that the applicant followed guidance in NUREG–1569 (NRC, 2003) and NRC Regulatory Guide 4.14 (NRC, 1980) to establish preoperational or baseline groundwater quality conditions at the proposed site.*

*No other changes were made to the SEIS beyond the information provided in this response.*

**Comment: 081-000004**

The commenter stated that the applicant has applied for a “permanent exemption” from the SDWA and that this information is not being presented to the public.

**Response:** *Table 1.6-1 of the SEIS provides a status of environmental approvals for the Dewey-Burdock Project including the applicant’s application for an aquifer exemption and UIC Class III permit. The applicant’s Class III permit application for the Dewey-Burdock ISR Project (Powertech, 2012c) is publicly available on EPA’s website and NRC’s ADAMS website (ML122440623).*

*No change was made to the SEIS beyond the information provided in this response.*

**Comment: 116-000016**

The commenter stated that water quality data are necessary to determine whether the aquifer could serve as a future source of drinking water and whether the aquifer is eligible for a drinking water source exemption. The commenter stated this information should be available and analyzed in the NEPA process.

**Response:** *SEIS Section 3.5.3.5 describes the results of the applicant’s preoperational or baseline groundwater sampling program. The results found that 28 out of 31 groundwater samples exceeded the MCLs for primary drinking water standards as provided by EPA regulations at 40 CFR Part 141. Of 25 groundwater samples collected from the proposed ore-bearing aquifer (i.e., the Fall River and Chilson aquifers), 23 exceeded the MCLs for primary drinking water standards as provided by EPA regulations at 40 CFR Part 141. Hence, groundwater from the proposed ore-bearing aquifer within the permit boundaries will not be used in public water systems and is unsuitable for private domestic use without treatment.*

*As described in SEIS Section 3.5.3.5, before ISR operations begin, the portion of the aquifer(s) designated for uranium recovery must be exempted from the USDW designation, in accordance with the SDWA and pursuant to 40 CFR Part 146. A USDW is defined as an aquifer or its portion that supplies any public water system, or that 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 mg/L [10,000 ppm] total dissolved solids, and which is not an exempted aquifer. An aquifer or aquifer portion that meets the criteria for a USDW may be determined to be an “exempted aquifer” if it does not currently serve as a source of drinking water and it cannot now and will not in the future serve as a source of drinking water because it is mineral-, hydrocarbon-, or geothermal-energy-producing, or can be demonstrated by a permit applicant as part of a permit application for a Class III operation to contain minerals that, considering their quantity and location, are expected to be commercially producible. The applicant, therefore, must obtain an aquifer exemption from EPA as a precondition to initiating ISR operations.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comment: 127-000010**

The commenter stated that as a precondition to conducting modeling and analysis, NRC and BLM must confirm that a credible scientific method is employed to establish an accurate baseline groundwater quality. The commenter stated that no details with regard to methodology of acquiring baseline are described in the draft SEIS. The commenter stated that valid statistical methods and a systematic grid covering all horizons of the aquifer must be employed with respect to baseline groundwater quality collection. This includes water quality information throughout the vertical extent of the affected aquifers and a spatially representative sampling protocol to provide the necessary information on groundwater characteristics outside of the proposed mining zone. Finally, the commenter stated that any proposed methodology that seeks to average site conditions is inappropriate, as it results in a baseline plan which is inappropriately skewed toward demonstrating a lower overall water quality.

**Response:** *The applicant must develop and implement a preoperational (baseline) monitoring program to establish baseline conditions at a proposed project in accordance with NRC regulations at 10 CFR Part 40, Appendix A, Criteria 7 and 7A. The results of the applicant’s preoperational groundwater monitoring program are described in SEIS Section 3.5.3.5.*

*Consistent with Regulatory Guide 4.14 (NRC, 1980), the applicant conducted initial baseline groundwater sampling of wells at the proposed Dewey-Burdock ISR Project over a 1-year period (July 2007 through June 2008) to establish baseline water quality before operations begin (see SEIS Section 3.5.3.5). The baseline study sampled 19 groundwater wells quarterly: 14 were existing wells and 5 wells were newly drilled. The existing wells consisted of 8 domestic wells and 6 stock watering wells. Three of these existing wells are located upgradient of the proposed uranium recovery areas. Groundwater sampling was undertaken in a number of aquifers: 4 wells in the Fall River Formation, 7 wells in the Lakota Formation (Chilson Member), 2 wells in the Inyan Kara Group made up of the Fall River or Chilson, 1 well in the underlying Sundance formation, and 5 wells in the alluvium. The applicant conducted monthly sampling of an additional 12 wells from March 2008 to February 2009. Six of these wells were located in the Dewey area and 6 in the Burdock area. A set of Fall River and Chilson wells was sampled within areas upgradient and downgradient of proposed uranium*

*recovery areas in both the Dewey and Burdock areas. The locations of all groundwater sampling sites are shown in SEIS Figure 3.5-2.*

*The applicant included descriptions of the sampling programs and parameters analyzed, as well as summaries of the data results (Powertech, 2009a, 2011). Based on the number of samples collected and parameters analyzed, the applicant has acquired sufficient baseline groundwater quality data to satisfy 10 CFR Part 40, Appendix A, Criterion 7. The information the applicant presented is also consistent with review procedures and acceptance criteria for establishing baseline groundwater quality in NUREG-1569 (NRC, 2003).*

*No change was made to the SEIS beyond the information provided in this response.*

**Comment: 136-00021**

The commenter stated that the baseline groundwater study, comprising data from 19 wells, should be fully completed before the SEIS is finalized and that the existing baseline data are inadequate to fully plan for mitigation and controls. The commenter noted that the majority of monitoring data from these wells showed elevated levels of uranium, radium, gross alpha, and radon from historic mining activities. The commenter stated that rather than detailing mitigation and addressing the complexity of water contamination problems at the site, NRC glosses over these facts and makes a doubtful determination that the majority of impacts will be “small” and acceptable.

**Response:** *The results of the applicant’s preoperational groundwater monitoring program are described in SEIS Section 3.5.3.5. The applicant developed and implemented a preoperational (baseline) monitoring program to establish baseline conditions at a proposed project in accordance with NRC regulations at 10 CFR Part 40, Appendix A, Criteria 7 and 7A.*

*Consistent with Regulatory Guide 4.14 (NRC, 1980), the applicant conducted initial baseline groundwater sampling of wells at the proposed Dewey-Burdock ISR Project over a 1-year period (July 2007 through June 2008) to establish baseline water quality before operations begin (see SEIS Section 3.5.3.5). The baseline study sampled 19 groundwater wells quarterly: 14 were existing wells and 5 wells were newly drilled. Eight domestic wells and six stock watering wells were sampled, and three of these existing wells are located upgradient of the proposed uranium recovery areas. Groundwater sampling was undertaken in a number of aquifers: four wells in the Fall River Formation, seven wells in the Lakota Formation (Chilson Member), two wells in the Inyan Kara Group made up of the Fall River or Chilson, one well in the underlying Sundance formation, and five wells in the alluvium. The applicant conducted monthly sampling of an additional 12 wells from March 2008 to February 2009. Six of these wells were located in the Dewey area and six in the Burdock area. A set of Fall River and Chilson wells was sampled within areas upgradient and downgradient of proposed uranium recovery areas in both the Dewey and Burdock areas. The locations of all groundwater sampling sites are shown in Figure 3.5-2. Based on the number of samples collected and parameters analyzed, the applicant has acquired sufficient baseline groundwater quality data to satisfy 10 CFR Part 40, Appendix A, Criterion 7. The information the applicant presented is also consistent with review procedures and acceptance criteria for establishing baseline groundwater quality in NUREG-1569 (NRC, 2003).*

*NRC is aware that the initial baseline groundwater sampling results found that a majority of the groundwater samples exceeded the MCLs for primary drinking water standards as provided by*

*EPA regulations at 40 CFR Part 141 (see SEIS Section 3.5.3.5). The commenter implies that the exceeded MCLs are due to past mining activities. Although this may be the case for groundwater in alluvial aquifers at the site, samples that exceeded MCLs in production zone groundwater at the site are likely due primarily to the presence of uranium orebodies in the Inyan Kara aquifer.*

*The commenter further implies that NRC should address and mitigate the complexity of water contamination problems at the site based on the baseline groundwater sampling results. However, it is not NRC's regulatory or the applicant's legal responsibility to mitigate existing groundwater contamination at the site. The purpose of baseline groundwater sampling is to establish preoperational conditions at the site. As described in SEIS Section 2.1.1.1.4, the purpose of the aquifer restoration phase of the ISR process is to return groundwater quality within the production zone of wellfields to the preoperational water quality conditions or to standards consistent with NRC requirements at 10 CFR Part 40, Appendix A, Criterion 5B(5).*

*No change was made to the SEIS beyond the information provided in this response.*

#### **E5.21.5 Pump Testing and Hydrogeologic Test Packages**

**Comment: 116-000007; 127-000006; 127-000007**

Some commenters were concerned that water quality data collection and aquifer pump testing will only be conducted after license issuance. One commenter stated that all feasible pump tests and other data collection and analyses must be undertaken as part of the NEPA process in order to determine the potential impacts of the project. The commenter stated that NRC and BLM cannot use deferral of the gathering of significant baseline data to comply with baseline data collection. Another commenter pointed out the draft SEIS admits that the NRC staff has yet to require the applicant to design proposals for nonproduction monitoring wells designed to detect leaks of toxic materials above and below the target orebodies. The commenter stated that despite the critical importance of these monitoring wells, and their design and placement, the draft SEIS proposes that the design and placement of such wells will be determined only after a "pump test" is complete (see SEIS Section 2.1.1.1.2.3.3). The commenter also stated that the draft SEIS admits these pump tests have yet to even be designed, let alone carried out so that the public has the opportunity to comment on the actual plans proposed for this facility.

The commenter stated that this scheme deprives reviewing parties any opportunity to review or comment on these plans and assess the potential impacts associated with the proposed mining operation. The commenter stated further that this scheme violates NEPA's requirement that the affected environment be described in the NEPA document and within the NEPA process.

**Response:** *Current NRC policy allows the applicant to use an in-house SERP to review and evaluate wellfield data packages under PBL conditions. Under these conditions, the applicant will conduct delineation drilling and pumping tests prior to operating a new wellfield. The applicant's delineation drilling results and pumping test data will be included in wellfield hydrogeologic data packages, which will be submitted for review and evaluation to the SERP, which is established by NRC requirements (Powertech, 2011).*

*Under PBL conditions at the proposed Dewey-Burdock ISR Project, NRC will require the applicant to conduct delineation drilling, pump testing, and background groundwater sampling prior to operations in wellfields (see SEIS Sections 2.1.1.1.2.3.2 and 2.1.1.1.2.3.3). The*

*applicant's nonproduction zone monitoring plan, which includes a production zone perimeter monitoring well ring and overlying and underlying monitoring wells, will be designed for each wellfield according to the site-specific lithology and hydrology of the production zone of each wellfield. As described in SEIS Section 2.1.1.1.2.3.4, the applicant's delineation drilling results and pumping test data for the proposed Dewey-Burdock ISR Project will be included in wellfield hydrogeologic data packages, which will be submitted for review and evaluation to the SERP, which is established by NRC requirements (Powertech, 2011). The SERP will review the wellfield hydrogeologic test results and documentation to determine whether monitoring wells are hydrologically connected to the injection and production wells. The wellfield hydrogeologic data package and written SERP evaluation will be maintained onsite and be available for NRC review. By license condition, all wellfield hydrogeologic data packages must be submitted to NRC for review and written verification prior to operating each wellfield (NRC, 2013b).*

*NRC disagrees with the commenters' assertion that the draft SEIS is deficient with respect to baseline groundwater and hydrogeological characterization. SEIS Section 3.5.3.5 describes the results of baseline or preoperational groundwater quality sampling at the proposed project. The applicant followed guidance in NUREG-1569 (NRC, 2003) and NRC Regulatory Guide 4.14 (NRC, 1980) to establish preoperational or baseline groundwater quality conditions at the proposed site (Powertech, 2009a, 2011). Aquifer characteristics and hydraulic properties of major aquifers comprising the regional aquifer system are described in SEIS Section 3.5.3.1. Aquifer characteristics and hydraulic properties of aquifer systems in the vicinity of the proposed project, including uranium-bearing aquifers, are described in SEIS Section 3.5.3.2. Results of pumping tests conducted at the proposed project are also described in SEIS Section 3.5.3.2. Estimates of maximum drawdown outside the project area resulting from projected ISR operations are presented in SEIS Section 4.5.2.1.1.2.2. These estimates are based on numerical modeling developed from site-specific hydrogeological parameters and calibrated to historical pumping test data (Petrotek, 2012).*

*No change was made to the SEIS beyond the information provided in this response.*

#### **E5.21.6 Liquid Waste Disposal in Deep Aquifers**

##### **Comment: 048-000002**

The commenter stated that house wells and livestock wells all share the same aquifer that is to be used to inject the wastewater from the project.

**Response:** *The applicant plans to inject process-related wastewater into the Deadwood and Minnelusa Formations that lie below the Morrison Formation (Powertech, 2011, Appendix 2.7-L). The Deadwood and Minnelusa Formations do not supply water wells or livestock wells in the Dewey-Burdock area and are not considered to be USDWs locally (Powertech, 2011, Appendix 2.7-L).*

*The Inyan Kara aquifer and the Madison aquifer are considered to be underground sources of drinking water within and surrounding the proposed Dewey-Burdock ISR Project area. Based on an inventory of private wells within a 2-km [1.2-mi] radius of the proposed project site, 33 wells obtain water from the Fall River aquifer, 41 wells obtain water from the Chilson aquifer, and 17 wells obtain water from an unknown component of the Inyan Kara aquifer (see SEIS Section 4.5.2.1.1.2.1) (Powertech, 2011). These wells serve as water supplies for livestock,*

*domestic purposes (e.g., drinking water), and monitoring. The Sundance and Unkpapa aquifers are minor aquifers, supplying local domestic and livestock water within the proposed project area (Powertech, 2009a, 2011). As described in SEIS Section 3.5.3.4, the Madison aquifer is the most important aquifer in the region, supplying municipal water for numerous communities, including Rapid City and Edgemont, South Dakota.*

*In summary, the Deadwood and Minnelusa Formations, which will be used for disposal of wastewater for the deep Class V injection waste disposal option, are not used for domestic, municipal, or livestock water supply in the Dewey-Burdock area. The Inyan Kara, Sundance, Unkpapa, and Madison aquifers are used for water supply in the Dewey-Burdock area, but these aquifers will not be used for disposal of wastewater at the proposed project.*

*No change was made to the SEIS beyond the information provided in this response.*

#### **E5.21.7 Site Characterization**

##### **Comment: 049-000008**

The commenter pointed out that the Whitewood and Winnipeg Formations, as depicted in Figure 3.5-5, are not present at the proposed Dewey-Burdock project area and, therefore, are not part of the confining zone separating the overlying Madison aquifer from the Deadwood Class V deep well UIC injection zone. The commenter recommended updating the SEIS to ensure the Deadwood upper confining zone is clearly identified as the Englewood Formation and does not include the Whitewood and Winnipeg Formations.

**Response:** *The NRC staff acknowledge that the Whitewood and Winnipeg Formations, as depicted in Figure 3.5-5, are not present in the southern Black Hills, where the proposed Dewey-Burdock ISR Project is located. Text was added to SEIS Section 3.5.3.1 to clearly identify the Englewood Formation as the upper confining unit to the Deadwood aquifer at the proposed Dewey-Burdock project area.*

##### **Comment: 061-000019**

The commenter pointed out that the draft SEIS fails to recognize the artesian nature of water at the site. According to the applicant's environmental report, there are 12 flowing wells from the Fall River Formation and 14 from the Lakota Formation within 2 km [1.2 mi] of the proposed project site (Powertech, 2009a). The commenter stated this is important information that should be included in the document that the public will use in considering the environmental impacts of the proposed project.

**Response:** *NRC acknowledges that the SEIS does not document the artesian nature of wells completed in the Fall River and Chilson aquifers within 2 km [1.2 mi] of the proposed project site. Text was added to SEIS Section 4.5.2.1.1.2.2 to document that 12 flowing wells from the Fall River aquifer and 14 flowing wells from the Chilson aquifer are present within 2 km [1.2 mi] of the proposed project site as documented in the applicant's environmental report (Powertech, 2009a).*

**Comment: 128-000034**

The commenter suggested adding additional discussion in Section 1.7.3.4 regarding USGS research involving reactive transport modeling at the proposed Dewey-Burdock Project. As described in a presentation by Raymond Johnson, a USGS hydrologist, at the May 2–3, 2012, National Mining Association (NMA)/NRC Uranium Recovery Workshop in Denver, Colorado, research completed to date includes two publications: (i) a USGS open-file report containing geochemical data (Johnson, 2012); and (ii) reactive transport modeling to simulate the geochemistry of uranium roll-front deposition, current groundwater conditions, ISR processes, aquifer restoration, and long-term groundwater quality after aquifer restoration (Johnson, 2011). The commenter that initial results from the reactive transport modeling presented at the NMA/NRC Uranium Recovery Workshop indicate the presence of strongly reducing conditions downgradient of the uranium deposits that will restrict the migration of mobilized uranium (and other dissolved constituents) away from the wellfields.

**Response:** *The NRC recognizes that USGS is conducting reactive transport modeling using the Dewey-Burdock ISR Project. The purpose of the modeling is to support the conceptual understanding of uranium roll-front formation, groundwater geochemistry, and long-term groundwater quality at uranium ISR sites (Johnson, 2011). NRC also acknowledges that initial results of the USGS reactive transport modeling presented at the NMA/NRC Uranium Recovery Workshop indicate the presence of reducing conditions downgradient of the uranium deposits. Furthermore, NRC agrees that uranium (and other dissolved constituents) mobilized by the ISR process will tend to precipitate (thereby restricting uranium migration) upon encountering reducing conditions downgradient of the uranium deposit. However, NRC believes—and USGS has acknowledged (Johnson, 2011)—that the reactive transport simulations require further refinement using site-specific conditions before being used to predict groundwater quality during and after uranium ISR activities at a specific site. These refinements would include information on current groundwater conditions, the ISR process (e.g., the chemistry of lixiviants), flow velocities, and solid-phase geochemistry (mineralogy and reducing capacity) of the producing formation. To date, USGS has not published any reactive transport simulation results using Dewey-Burdock site-specific information that could be used in assessing the environmental impacts at the proposed project site.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comments: 128-000102; 128-000172; 128-000228**

The commenter noted the statement in SEIS Sections 3.5.3.1, 4.5.2.1.1.2.3, and 5.5.2 that confining layers between the Minnelusa and Madison Formations may be absent or provide ineffective confinement. The commenter pointed out that while regionally there are collapse features, faults, and other features that may provide communication between the Minnelusa and the Madison Formations, there is no evidence for such features within the project area. The commenter referred to the Report to the Chief Engineer on the Madison water appropriation permit application prepared by SDDENR, which stated that water levels of SDDENR-Water Rights observation wells in the area indicate very distinct potentiometric surfaces in the Minnelusa and Madison Formations, and suggest the aquifers are hydraulically separated (SDDENR, 2012b).

**Response:** *NRC acknowledges that SDDENR's Report to the Chief Engineer on the Madison Formation water appropriation permit includes information on water levels in Minnelusa and Madison observation wells in the area which indicates a difference in the potentiometric*



*surfaces and suggests the aquifers are hydraulically separated in the vicinity of the proposed project area (SDDENR, 2012b). Text in SEIS Sections 3.5.3.1 and 4.5.2.1.1.2.3 was revised to point out that information SDDENR compiled on water levels in the Minnelusa and Madison observation wells indicates that the aquifers are hydraulically separated in the vicinity of the proposed project area.*

**Comment: 128-000103**

The commenter disagreed with the statement in SEIS Section 3.5.3.1 that the Minnelusa Formation is considered to be in hydraulic connection with the Inyan Kara aquifer through breccia pipes on a regional scale.

**Response:** *Based on information on breccia pipes presented in SEIS Section 3.4.1.2, NRC agrees that the limit of collapsed breccia in the Minnelusa Formation does not extend into the Inyan Kara Group either regionally or within the proposed project area. Text in SEIS Section 3.5.3.1 was revised to include information from SEIS Section 3.4.1.2, which indicates that the probable maximum downgradient limit of collapsed breccias is approximately 8 km [5 mi] northeast of the proposed project area (Braddock, 1963).*

**Comments: 128-000107; 128-000226**

The commenter noted that the discussion on leakage through the Fuson Shale in SEIS Sections 3.5.3.2 and 5.4 does not reflect the more current interpretation of the historical pumping tests and recent numerical modeling (e.g., Petrotek, 2012).

**Response:** *NRC acknowledges that the discussion on leakage through the Fuson Shale in SEIS Section 3.5.3.2 does not include interpretation of recent numerical modeling the applicant developed (Petrotek, 2012). Text describing the applicant's recent numerical modeling and interpretation of the modeling results was added to SEIS Sections 3.5.3.2 and 5.4.*

**E5.21.8 Aquifer Recharge**

**Comment: 084-000002**

The commenter stated that it is not at all clear to what extent the aquifers will be depleted and how long it will take to recharge them. The commenter wanted to know how long it will take to recharge aquifers. The commenter also wanted to know what time span the model suggests for recharge and what happens when annual precipitation is less than 10 inches for several years in a row. The commenter stated the SEIS asserts that the aquifers are sealed off from one another by layers of impermeable shale and, that being the case, wanted to know how water ever makes its way back into the aquifer. The commenter further asked what the remedy would be if the water in these aquifers is drawn down to a level that cannot be recharged in a reasonable amount of time, or ever.

**Response:** *As described in SEIS Section 3.5.3.1, groundwater recharge paths for aquifers in the Black Hills include precipitation at the outcrop, streamflow losses, and water flow across aquifers where confining layers are absent or ineffective. The Inyan Kara aquifer is recharged primarily by precipitation at the outcrop. SEIS Figure 3.4-3 shows where the Fall River and Lakota Formations, which make up the Inyan Kara Group Formation, are exposed at the surface within and to the north and east of the proposed project area.*

*As discussed previously, the applicant submitted water appropriation permit applications to use Inyan Kara aquifer and Madison aquifer water at the proposed Dewey-Burdock ISR Project in June 2012 (Powertech, 2012a,b). Based on a review of the water permit applications, which included an analysis of water availability and existing water rights, SDDENR concluded that approval of the applications will not result in average annual withdrawals from the Inyan Kara and Madison aquifers that exceed the average annual recharge to the aquifer (SDDENR, 2012a,b). Text was added to SEIS Section 4.5.2.1 to document SDDENR's review and analysis of the applicant's water permit application for the Inyan Kara aquifer.*

*The applicant estimates that the maximum drawdown outside the project area resulting from projected ISR operations will be approximately 3.65 m [12 ft] in the Fall River aquifer and 3.05 m [10 ft] in the Chilson aquifer (see SEIS Section 4.5.2.1.1.2.2) (Petrotek, 2012). The estimates are based on numerical modeling developed from site-specific parameters and calibrated to historical pumping test data. The NRC staff analyzed the hydrogeologic characteristics of the Fall River and Chilson aquifers (i.e., formation thicknesses and potentiometric surfaces) and concluded that these estimated drawdowns will have a SMALL impact on nearby wells located in the Fall River and Chilson aquifers. The numerical modeling also indicated that water levels will recover to near preoperational levels within 1 year after groundwater withdrawals cease (Petrotek, 2012). These estimates are based on historical annual precipitation rates. Precipitation ranges from 30 to 71 cm/yr [12 to 28 in/yr] in the Black Hills; therefore, if annual precipitation is less than 25 cm [10 in] for several years in a row, the time it takes for water levels to recover to preoperational levels will be longer than 1 year.*

*No additional changes were made to the SEIS in response to this response.*

**Comment: 126-000007**

The commenter noted that the SEIS discusses the fact that some of the land application plots in the Burdock area are situated over the recharge area for the Fall River aquifer (see SEIS Section 4.5.2.1.2.2.1). The commenter recommended that if land application is used for disposal of liquid wastes, the plots be reconfigured so they are not located over the recharge area for the Fall River aquifer.

**Response:** *NRC reevaluated the location of land application plots (i.e., center pivot irrigation areas) with respect to the position of the outcrop area of the Fall River Formation in the Burdock area (see SEIS Figures 2.1-12 and 3.5-7). In the Burdock area, the easternmost irrigation fields are located downdip of the outcrop area of the Fall River aquifer. The minimum estimated thickness of the Graneros Group in this area is 7.6 m [25 ft]. Due to the presence of the overlying Graneros Group shale, treated liquid waste applied to the easternmost land application areas is unlikely to recharge the Fall River aquifer. In SEIS Section 4.5.2.1.2.2.1, text was revised to indicate the easternmost irrigation fields will be situated downdip of the outcrop area of the Fall River aquifer and that the minimum estimated thickness of the Graneros Group in this area is 7.6 m [25 ft].*

*Regarding the recommendation that plots be reconfigured to avoid recharge areas, the NRC role is to review the proposal that is submitted and evaluate compliance with NRC safety regulations and the potential environmental impacts of that proposal. NRC can condition the license, if granted, to address any specific safety compliance concerns identified during the safety review of the license application. The potential for groundwater contamination from proposed land application activities was evaluated in SER Section 7.3.2.3 (NRC, 2013a), which*

*concluded there was no risk of groundwater contamination from the proposed land application and did not include any conditions to change the location of the land application areas.*

*No additional changes were made to the SEIS in response to the comment.*

#### **E5.21.9 Impacts to Surrounding Aquifers and Springs**

##### **Comment: 126-000002**

The commenter stated that it is generally expected that impacts to the aquifers under NFS land may be limited. The commenter pointed out that NFS lands are upgradient from the project and the NFS land surface is the recharge zone for the aquifer. The commenter noted the statement in the SEIS, “Most of the water withdrawn from the aquifer is returned to the aquifer.” The commenter stated that based on the disclosures in the SEIS, proposed water withdrawal from the aquifer is expected to have limited impact, if any, on the aquifer located under NFS lands.

**Response:** *NRC acknowledges that impacts to the aquifers under NFS land will be limited. As illustrated in SEIS Figure 3.2-1, parcels of the Black Hills National Forest (BHNF) border the proposed project area to the east and northeast. As described in SEIS Sections 3.5.3.1 and 3.5.3.2, groundwater flow moves outward radially from the Black Hills, which results in a northeast-to-southwest local and regional groundwater flow direction at the proposed project site. As illustrated in SEIS Figure 3.4-3, the Fall River and Lakota Formations are exposed at the land surface on BHNF lands east and northeast of the proposed project area. These surface exposures are areas of recharge for the Fall River and Lakota aquifers. As described in SEIS Section 4.5.2.1.1.2.2, most of the water withdrawn from the aquifer during the ISR process is returned to the aquifer. Therefore, impacts to aquifers beneath NFS lands are expected to be minimal.*

*No change was made to the SEIS beyond the information provided in this response.*

##### **Comment: 126-000003**

The commenter pointed out that the SEIS makes note of a meeting (held on December 3, 2009) between NRC and USFS during which USFS expressed concerns about the project’s potential impact on Cascade Springs. The commenter noted that Cascade Springs discharges groundwater from the Madison and/or Minnelusa aquifers, which are also present in the project area. Water from the Madison aquifer will be used in the project as process water, and the Minnelusa aquifer has the potential to be used for the disposal of liquid wastes via deep well injection. The commenter pointed out that SEIS Section 5.5.2 discusses the potential impact on Cascade Springs and concludes the proposed project will have a small impact on groundwater discharge at the springs. The commenter was in general agreement that the project may have little impact on Cascade Springs because Cascade Springs is 40 km [25 mi] east-southeast from the proposed project and not downgradient. However, the commenter stated that there is some uncertainty and asked whether NRC would consider monitoring water quantity and quality at Cascade Springs, and what actions might be taken if changes traceable to the project are detected.

**Response:** *NRC recognizes that USFS expressed concerns about the proposed project’s potential impact on Cascade Springs during a meeting held between NRC and USFS on December 3, 2009 (see SEIS Section 1.7.3.3). As described in SEIS Section 3.5.3.1,*

*regional groundwater flow moves outward radially from the Black Hills, which results in a northeast-to-southwest regional flow direction in the vicinity of the proposed project site. As described in SEIS Section 5.5.2, Cascade Springs is 40 km [25 mi] east-southeast of the proposed Dewey-Burdock project site. Because Cascade Springs is far removed and upgradient of the proposed Dewey-Burdock project with respect to groundwater flow, it is expected that withdrawals of water from the Madison aquifer for operations and aquifer restoration and disposal of liquid wastes via deep well injection into the Minnelusa aquifer will have no impact on groundwater quantity or quality at Cascade Springs. Therefore, NRC has no plans to monitor for water quantity or quality at Cascade Springs.*

*Text was added to SEIS Section 5.5.2 to clarify that (i) Cascade Springs is upgradient of the proposed Dewey-Burdock project site with respect to regional groundwater flow and (ii) it is expected that withdrawals of water from the Madison aquifer for operations and aquifer restoration and potential disposal of liquid wastes via deep Class V injection wells into the Minnelusa aquifer will have no impact on groundwater quantity or quality at Cascade Springs.*

**Comments: 126-000004; 126-000011**

The commenter provided a map showing the locations of seven livestock wells located on the BHNF and private land near the proposed project area which draw water from the Inyan Kara aquifer. Two of these wells are located within 2 km [1.2 mi] of the proposed project boundary, and the remaining five wells are located approximately 2.4 to 8 km [1.5 to 5 mi] from the proposed project boundary. The commenter further stated that the groundwater section of SEIS Table 9-1 (Summary of Environmental Impacts of the Proposed Action) states that “an applicant-installed ground monitoring network to detect potential vertical and horizontal excursions, will limit the potential for undetected groundwater excursions that could degrade groundwater quality” and “the applicant will provide alternative water sources in the event of significant drawdown to private wells adjacent to the proposed project area.” In the event that groundwater quantity (e.g., significant well water drawdown) and/or quality would be negatively impacted such that livestock are unable to fully utilize these existing wells during any phase of the project, the commenter asked that an alternative source of water be made available for those livestock on NFS land.

**Response:** *NRC recognizes that livestock wells are located on BHNF and private land near the proposed project area and that two of these wells are within 2 km [1.2 mi] of the proposed project boundary. SEIS Section 4.5.2.1.1.2.2 describes drawdown estimates in the Fall River and Chilson aquifers during ISR operations. The estimates are based on numerical modeling developed from site-specific parameters and calibrated to historical pumping test data (Petrotek, 2012). The results found that the maximum drawdown outside the project area resulting from projected ISR operations will be approximately 3.65 m [12 ft] in the Fall River aquifer and 3.05 m [10 ft] in the Chilson aquifer (Petrotek, 2012). As further described in SEIS Section 4.5.2.1.1.2.2, the numerical simulations were for net extraction rates resulting from a gross production pumping rate of 30,280 Lpm [8,000 gpm] {twice the applicant’s estimated proposed pumping rate of 15,140 Lpm [4,000 gpm]}, a 1 percent production bleed rate, and the use of groundwater sweep during aquifer restoration. Therefore, the drawdown estimates represent the maximum anticipated drawdown amount for nearby domestic and livestock wells. The NRC staff analyzed the hydrogeologic characteristics of the Fall River and Chilson aquifers (i.e., formation thicknesses and potentiometric surfaces) and concluded that these estimated drawdowns will have a SMALL impact on nearby wells located in the Fall River and*

*Chilson aquifers. Text was added to SEIS Section 4.5.2.1.1.2.2 to document the results of the applicant's numerical modeling.*

*As required by NRC license condition, a licensee must take preventive measures to reduce the likelihood and consequences of potential excursions, which may result in contamination to nearby wells (see SEIS Section 4.5.2.1.1.2.2). A ring of monitoring wells within and encircling the production zone is required for early detection of horizontal excursions. The applicant's groundwater monitoring program is detailed in SEIS Sections 2.1.1.1.3.1.3 and 7.3.1.2. If excursions are detected in the monitoring well ring, corrective actions to either stop or reverse the fluid movement (i.e., excursions) are required. The applicant will need to modify wellfield operations, as necessary, to correct the excursion. As described in SEIS Section 2.1.1.1.3.1.3, corrective actions to stop or reverse an excursion may include increasing sampling frequency to weekly, increasing the pumping rates (and thus the net bleed) of production wells in the area of the excursion, and pumping individual wells to enhance recovery of extraction solutions. If these actions do not effectively retrieve the excursion within 60 days, the applicant is required by license condition to suspend injecting lixiviant into the production zone adjacent to the excursion until the excursion is retrieved and the upper control limit parameters are not exceeded.*

*No additional changes were made to the SEIS in response to this comment.*

**Comment: 126-000006**

The commenter noted that the SEIS states that during the construction phase, if the water appropriation permit is denied, it could significantly impact domestic and livestock wells, as the project would then need to take water from the Inyan Kara aquifer (see SEIS Section 4.5.2.1.1.1). The commenter believes most of the livestock wells on nearby NFS land draw water from the Inyan Kara aquifer. The commenter further noted the SEIS states that if this were to happen, it would be necessary to identify an alternate source of water or reduce pumping rates to reduce the impacts to water quantity.

**Response:** *NRC recognizes that livestock wells are located on BHNF and private land near the proposed project area and that two of these wells are within 2 km [1.2 mi] of the proposed project boundary. As described in SEIS Section 4.5.2.1.1.1, the applicant estimates that groundwater consumption during construction at the Dewey and Burdock areas will be  $8.25 \times 10^7$  L and  $1.16 \times 10^8$  L [ $21.8 \times 10^6$  gal and  $30.6 \times 10^6$  gal], respectively (Powertech, 2010). Results of numerical groundwater simulations indicate the Inyan Kara aquifer can sustain net extraction rates of up to 556 Lpm [147 gpm] over the 2-year construction phase (Petrotek, 2012). This equates to total groundwater consumption of  $5.83 \times 10^8$  L [ $1.54 \times 10^8$  gal]. Therefore, the NRC staff anticipate that there will be no impact to shallow local aquifers and domestic and livestock wells from consumptive water use during the construction phase of the proposed project. Text was added to SEIS Section 4.5.2.1.1.1 to document the results of the applicant's numerical modeling.*

**Comments: 128-000157; 128-000165; 128-000178; 128-000181**

The commenter questioned statements that MODERATE impacts to shallow local aquifers (i.e., the Inyan Kara aquifer) will occur during the construction and operations phases of the project if the Madison water appropriation permit is denied. The commenter stated that the SEIS failed to consider two important issues that will reduce impacts: (i) the applicant's

commitment to remove all domestic wells within the project area prior to operations, and (ii) results of numerical groundwater simulations that indicate the Inyan Kara aquifer can sustain net extraction rates of 556 Lpm [147 gpm] for a period of 2 years and 363 Lpm [96 gpm] for 8 years.

**Response:** *NRC acknowledges that the applicant's commitment to remove domestic wells within the project area prior to operations (Powertech, 2011). NRC also acknowledges that updated estimates of sustainable Inyan Kara aquifer pumping rates based on recent numerical modeling results (Petrotek, 2012) were not included in the impact analyses of construction phase consumptive water use. Text was added to SEIS Sections 4.5.2.1.1.1 and 4.5.2.1.2.1 to describe (i) the applicant's commitment to remove all existing domestic wells within the project area from private use prior to operations, and (ii) results of numerical groundwater simulations that indicate the Inyan Kara aquifer can sustain net extraction rates of up to 556 Lpm [147 gpm] over the 2-year construction phase of the project. Text was also added to SEIS Sections 4.5.2.1.1.2.2 and 4.5.2.1.2.2.2 to describe the results of numerical groundwater simulations that indicate the Inyan Kara aquifer can sustain net extraction rates of up to 363 Lpm [96 gpm] over the 8-year operations phase of the project. Based on the inclusion of these issues in the impact analysis, the NRC staff removed statements that MODERATE impacts to shallow local aquifers will occur during the construction phase of the project if the Madison water appropriation permit is denied. However, the removal of these statements did not change the overall NRC staff conclusion that the impacts to groundwater during the construction phase will be SMALL.*

#### **E5.21.10 Exploratory Boreholes and Confinement**

##### **Comment: 127-000011**

The commenter noted that there is evidence that historic drill holes provide a conduit for groundwater migration. For example, the draft SEIS states that in the southwest corner of the Burdock area there is "groundwater discharging to the ground surface from the Fall River aquifer and Chilson aquifer through improperly plugged exploratory boreholes." The commenter stated that this information necessitates a more detailed review of the issue of historic wells or boreholes and requires that any feasible pump tests or other analysis be performed as part of the NEPA process, with necessary opportunities for public and agency review and comment, in order to assess the potential impacts of the project. Additionally, the commenter stated that the draft SEIS identifies areas where the Fall River aquifer proposed to be mined is not hydrologically confined. The commenter stated that rather than requiring the collection of data necessary to determine the potential impacts of mining this unconfined aquifer, NRC instead suggests that "the applicant has committed, as part of the license condition, to conduct additional hydrogeological investigations ..." The commenter stated that this lack of baseline data collection as part of the NEPA process severely undermines the public's ability to understand and evaluate the potential impacts of the operation.

**Response:** *NRC is aware that there is one area in the southwest corner of the Burdock area, known as the "alkali flats" or the "alkali area," where groundwater is discharging to the ground surface from the Fall River aquifer and Chilson aquifer (Chilson Member of the Lakota Formation) through improperly plugged exploratory boreholes (see SEIS Section 3.5.1) (Powertech, 2011). As described in SEIS Section 4.5.2.1.1.2.2, TVA drilled several thousand exploratory boreholes within the proposed Dewey-Burdock ISR Project area. SEIS Section 3.4.1.2 provides additional information concerning the historical and recent exploratory boreholes drilled at the proposed Dewey-Burdock site. As discussed in SEIS Section 3.5.3.2,*

*groundwater in the Fall River and Chilson aquifers is under artesian conditions (i.e., has an upward hydraulic gradient); therefore, groundwater would be expressing itself at the ground surface if unplugged borings were still conduits. Furthermore, state regulations were in place governing exploration hole plugging at the time the historical exploration occurred. In the technical report (Powertech, 2009b), the applicant stated that, based on infrared photography data, there is little evidence of unplugged boreholes. Other than the alkali flats area in the southwest part of the Burdock area, no other pond areas or springs appear in infrared photography data of the Dewey-Burdock site. There is no other evidence indicating that previously unplugged borings are current groundwater flow pathways (Powertech, 2011). The NRC staff concur that, other than the alkali pond, no evidence indicates that previously unplugged borings are current groundwater flow pathways.*

*As described in SEIS Section 4.5.2.1.1.2.2, before developing wellfields, the applicant has committed to properly plugging and abandoning or mitigating any historical wells and exploration holes that may potentially impact the control and containment of solutions within the proposed wellfield (Powertech, 2011). The applicant will use available information and best professional practices—including historical records, color infrared imagery, field investigations, and potentiometric surface evaluation—to locate or detect improperly plugged boreholes or wells in the vicinity of potential wellfield areas. In addition, the applicant will use pumping test results conducted as part of routine wellfield hydrogeologic package development to identify improperly plugged wells and exploration boreholes (Powertech, 2011). NRC has determined that the applicant has presented a satisfactory plan for identifying and addressing unplugged borings during operations to avoid potential groundwater migration.*

*With regard to conducting ISR activities in hydrologically unconfined aquifers, the applicant has indicated that it currently has no plans to conduct ISR operations in Fall River orebodies in the eastern portion of the project area where the Fall River is geologically unconfined and partially saturated (see SEIS Section 3.5.3.3) (Powertech, 2011). This will restrict the proposed ISR operations to confined portions of the underlying hydrogeologic system. However, the applicant is considering ISR operations in partially saturated (i.e., hydrologically unconfined) portions of the underlying Chilson aquifer in the eastern part of the project area (Powertech, 2010, 2011). The applicant has committed, as a condition to any NRC license it receives, to conduct additional hydrogeological investigations (e.g., delineation drilling and pump testing) prior to wellfield development. These additional investigations will be designed to accurately measure and identify partially saturated portions of the Chilson aquifer and thereby confirm whether sufficient potentiometric head {greater than 15.2 m [50 ft]} is available to perform normal ISR operations (Powertech, 2010, 2011). Note that it is NRC policy to impose license conditions as part of a source material license to address uncertainties or gaps in information that could potentially result in adverse impacts to the environment. In this case, the license condition will ensure that data necessary to evaluate the potential impacts of mining in unconfined portions of the Chilson aquifer will be collected prior to wellfield development, thereby confirming that normal ISR operations in the aquifer can be performed safely.*

*No change was made to the SEIS beyond the information provided in this response.*



### **E5.21.11 Miscellaneous Groundwater Comments**

#### **Comment: 084-000004**

The commenter noted that the SEIS states the applicant will provide landowners with new wells or water supplies. The commenter wanted to know what water source new wells will tap and whether the applicant will truck in water for domestic use and livestock.

**Response:** *Water sources for new wells within and in the vicinity of the proposed project include the Madison, Unkpapa, and Sundance aquifers. As described in SEIS Sections 3.5.3.2 and 3.5.3.4, the Unkpapa and Sundance aquifers are beneath the Morrison Formation and are minor aquifers supplying local domestic and livestock water within the proposed project area (Powertech, 2009a, 2011). The Madison aquifer is the most important aquifer in the region, supplying municipal water for numerous communities, including Edgemont (see SEIS Section 3.5.3.4). Powertech (2011, Figure TR RAI P&R-10-2) provides an example of a replacement well, which shows the use of the proposed project Madison well to supply water by pipeline to local livestock tanks. No change was made to the SEIS beyond the information provided in this response.*

### **E5.21.12 References**

10 CFR Part 40 Appendix A. *Code of Federal Regulations*, Title 10, *Energy*, Part 40 Appendix A. "Criteria Relating to the Operation of Uranium Mills and to the Disposition of Tailings or Wastes Produced by the Extraction or Concentration of Source Material from Ores Processed Primarily from their Source Material Content." Washington, DC: U.S. Government Printing Office.

40 CFR Part 141. *Code of Federal Regulations*, Title 40, *Protection of the Environment*, Part 141. "National Primary Drinking Water Regulations." Washington, DC: U.S. Government Printing Office.

40 CFR Part 146. *Code of Federal Regulations*, Title 40, *Protection of the Environment*, Part 146. "Underground Injection Control Program: Criteria and Standards." Washington, DC: U.S. Government Printing Office.

ASLBP (Atomic Safety and Licensing Board Panel). "Supplemental Declaration of Dr. Robert E. Moran." In the Matter of Powertech (USA) Inc., Dewey-Burdock In Situ Uranium Recovery Facility. ML13029A368. Washington, DC: NRC. January 2013.

Braddock, W.A. Geology of the Jewel Cave SW Quadrangle Custer County, South Dakota. U.S. Geological Survey Bulletin 1063-G. Washington, DC: U.S. Government Printing Office. 1963. <<http://pubs.usgs.gov/bul/1063g/report.pdf>> and <<http://pubs.usgs.gov/bul/1063g/plate-20.pdf>> (08 April 2013).

Gott, G.B., D.E. Wolcott, and C.G. Bowles. "Stratigraphy of the Inyan Kara Group and Localization of Uranium Deposits, Southern Black Hills, South Dakota and Wyoming." ML120310042. U.S. Geological Survey Water Resources Investigation Report 93-4008. 1974.

Johnson, R.H. "Geochemical Data from Groundwater at the Proposed Dewey-Burdock Uranium *In-Situ* Recovery Mine, Edgemont, South Dakota." U.S. Geological Survey, Open-File Report 2012-1070, 11 pp. 2012.

Johnson, R. H. “Reactive Transport Modeling for the Proposed Dewey-Burdock Uranium *In-Situ* Recovery Mine, Edgemont, South Dakota, USA.” *International Mine Water Association, Mine Water—Managing the Challenges*. 2011

Naus, C.A., D.G. Driscoll, and J.M. Carter. “Geochemistry of the Madison and Minnelusa Aquifers in the Black Hills Area, South Dakota.” U.S. Geological Survey Water Resources Investigation Report 01-4129. ML12240A265. 2001.

NRC (U.S. Nuclear Regulatory Commission). “Safety Evaluation Report for the Dewey-Burdock Project Fall River and Custer Counties, South Dakota, Materials License No. SUA-1600.” ML13052A182. Washington, DC: NRC. March 2013a.

NRC. “Draft License SUA-1600 for Powertech (USA), Inc.” ADAMS Accession No. ML13318A094. Washington, DC: NRC. March 2013b.

NRC. “NRC Staff’s Answer to Contentions on Draft Supplemental Environmental Impact Statement.” ML13066B030. Washington, DC: NRC. March 2013c.

NRC. NUREG-1910, “Generic Environmental Impact Statement for *In-Situ* Leach Uranium Milling Facilities.” ML091480244, ML091480188. Washington, DC: NRC. May 2009a.

NRC. “Site Visit to the Proposed Dewey-Burdock Uranium Project, Fall River and Custer Counties, South Dakota, and Meetings with Federal, State, and County Agencies, and Local Organizations, November 30–December 4, 2009.” ML093631627. Washington, DC: NRC. 2009b.

NRC. NUREG-1569, “Standard Review Plan for *In-Situ* Leach Uranium Extraction License Applications—Final Report.” Washington, DC: NRC. June 2003.

NRC. “Regulatory Guide 4.14, Radiological Effluent and Environmental Monitoring at Uranium Mills, Rev. 1.” Washington, DC: NRC. 1980.

Petrotek (Engineering Corporation). “Numerical Modeling of Hydrogeologic Conditions, Dewey-Burdock Project, South Dakota.” ML12062A096. Littleton, Colorado: Petrotek. February 2012.

Powertech [Powertech (USA) Inc.]. “Dewey-Burdock Project, Report to Accompany Inyan Kara Water Rights Permit Application Custer and Fall River Counties, South Dakota.” ML12192A022. Edgemont, South Dakota: Powertech. June 2012a.

Powertech. “Dewey-Burdock Project, Report to Accompany Madison Water Rights Permit Application Custer and Fall River Counties, South Dakota.” ML12193A239. Edgemont, South Dakota: Powertech. June 2012b.

Powertech. “Powertech (USA) Inc. Dewey-Burdock Project Class III Underground Injection Control Permit Application.” ML122440623. Greenwood Village, Colorado: Powertech. July 2012c.

Powertech. “Dewey-Burdock Project, Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota, Technical Report RAI Responses, June, 2011.” ML112071064. Greenwood Village, Colorado: Powertech. 2011.

Powertech. “Dewey-Burdock Project, Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota ER\_RAI Response August 11, 2010.” ML102380516. Greenwood Village, Colorado: Powertech. 2010.

Powertech. “Dewey-Burdock Project, Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota—Environmental Report.” Docket No. 040-09075. ML092870160. Greenwood Village, Colorado: Powertech. August 2009a.

Powertech. “Dewey-Burdock Project, Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota—Technical Report.” Docket No. 040-09075. ML092870160. Greenwood Village, Colorado: Powertech. August 2009b.

Powertech. “Dewey-Burdock Project, Supplement to Application for NRC Uranium Recovery License Dated February 2009.” Docket No. 040-09075. ML092870160. Greenwood Village, Colorado: Powertech. August 2009c.

SDDENR (South Dakota Department of Environment and Natural Resources). “Report to the Chief Engineer on Water Permit Application No. 2686-2, Powertech (USA) Inc., November 2, 2012.” ML13165A168. Pierre, South Dakota: SDDENR. November 2012a.

SDDENR. “Report to the Chief Engineer on Water Permit Application No. 2685-2, Powertech (USA) Inc., November 2, 2012.” ML13165A160. Pierre, South Dakota: SDDENR. November 2012b.

SDDENR. “South Dakota Water Rights Permitting Database.” 2012c.  
<<http://denr.sd.gov/des/wr/dbwrsearch.aspx>> (11 April 2012).

## **E5.22 Ecology**

### **E5.22.1 General Comments on Threatened and Endangered Species**

**Comments: 005-000003; 018-000004; 021-000002; 031-000001; 048-000007; 051-000004; 061-000014; 079-000003; 091-000012; 092-000008; 092-000015; 093-000005; 095-000004**

Several commenters expressed concern that threatened and endangered species could be negatively impacted. Commenters are also concerned that there are not adequate protection measures for threatened and endangered species suggested in the draft SEIS. Some commenters specifically identified potential impacts to bald eagles, black-footed ferrets, whooping cranes, Sprague’s pipits, piping plovers, and Greater sage-grouse.

**Response:** *NRC describes the occurrence of and potential impacts to Greater sage-grouse, an upland game bird, other sensitive species in the area, and threatened and endangered species in SEIS Sections 3.6.1.2.2, 3.6.3, 3.8, 4.6.1.1.1.2, 4.6.1.1.1.4, 4.6.1.1.3, 4.6.1.1.4, 4.6.1.2.1, 4.6.1.2.2, 4.6.1.2.3, 4.6.1.2.4, 4.8, 4.8.1, 4.8.1.1.1, 4.8.1.1.2, 4.8.1.1.3, 4.8.1.1.4, 4.8.1.2.1, 4.8.1.2.2, 4.8.1.2.3, 4.8.1.2.4, 5.6.1, and 5.6.3. SEIS Section 3.6.3 states that results of wildlife surveys (Powertech, 2009a) and U.S. Fish and Wildlife Service (FWS) correspondence (FWS, 2010, 2012b, 2013a) have not identified federally listed threatened or endangered species on or within a 1.6-km [1-mi] radius of the proposed Dewey-Burdock ISR Project site. SEIS Chapter 6 describes mitigation measures that could be implemented to control and minimize potential*

*adverse impacts to threatened and endangered species (if threatened and endangered species are discovered later). Additional mitigation measures to minimize adverse impacts to threatened and endangered species will be developed as part of the SDDENR large-scale mine permit in consultation with the applicant, NRC, SDGFP, and BLM (Powertech, 2012a). The applicant (Powertech) is actively working on an avian monitoring and mitigation plan FWS, SDDENR, and SDGFP that will be approved before construction activities begin and will be incorporated into the SDDENR large-scale mine permit. The avian monitoring and mitigation plan will include mitigation measures to protect all birds, including whooping cranes and raptors. The SDDENR recommends that the large-scale mine permit require that the applicant notify SDGFP if species or critical habitat of species designated as threatened or endangered on state or federal lists are discovered within the permit area; however, final SDDENR permit conditions may change based on the final determination by the SDDENR hearing board. The SDDENR also recommends that the large-scale mine permit include other wildlife protection mitigation measures to limit impacts to wildlife. These recommendations include fencing and/or mesh around ponds, provisions to deter small and large animals, and avian deterrent systems (Powertech, 2012a). In addition, the SDDENR recommends that the large-scale mine permit require that revegetation success be equivalent to vegetative cover in reference areas using SDDENR-approved statistical methods (Powertech, 2012a).*

*The Greater sage-grouse is not currently designated as a threatened or endangered species; however, FWS will consider the Greater sage-grouse on an annual basis for reclassification as a threatened or endangered species. Candidate species receive no statutory protection under the Endangered Species Act. The applicant must follow the Endangered Species Act and protect species or critical habitat of species designated as federally threatened or endangered.*

*Piping plover are not known or believed to be present in Fall River and Custer Counties, and, according to FWS (2013b) and USGS (2013), plover do not breed or winter in the vicinity of proposed project area. Therefore, NRC staff did not include a detailed description of the piping plover life history and habitat needs.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comments: 041-000003; 092-000017**

Two commenters requested that impacts to certain sensitive species be considered in the SEIS.

**Response:** *NRC describes the potential occurrence of and potential impacts to bald eagles, Greater sage-grouse, whooping cranes, and rare amphibians in SEIS Sections 3.6.1.2, 3.6.1.2.2, 3.6.1.2.3, 3.6.3, 3.8, 4.6.1.1.1.2, 4.6.1.1.1.4, 4.6.1.1.2, 4.6.1.1.3, 4.6.1.1.4, 4.6.1.2.1, 4.6.1.2.2, 4.6.1.2.3, 4.6.1.2.4, 4.8, 4.8.1, 4.8.1.1.1, 4.8.1.1.2, 4.8.1.1.3, 4.8.1.1.4, 4.8.1.2.1, 4.8.1.2.2, 4.8.1.2.3, 4.8.1.2.4, 5.6.1, and 5.6.3. No additional information was provided for NRC consideration. Therefore, no changes were made to the SEIS beyond the information provided in this response.*

#### **E5.22.2 Concerns About Black-Footed Ferrets**

**Comments: 036-000002; 134-000003**

Two commenters expressed concern about the potential impacts the proposed project could have on the black-footed ferrets that have been reintroduced in the area.

**Response:** NRC describes the reintroduction of black-footed ferrets in South Dakota in SEIS Sections 3.6.3 and 4.6.1.1.1.4 and assesses whether the proposed action could adversely affect the value of prairie dog habitat as a future reintroduction site for the black-footed ferret. Because FWS has no information to indicate that ferrets are located within the project boundaries, and for the reasons explained in SEIS Section 4.6.1.1.1.4, NRC staff conclude that the proposed project construction would not directly affect current or future ferret populations.

No change was made to the SEIS beyond the information provided in this response.

### **E5.22.3 Comments About Greater Sage-Grouse**

#### **Comment: 128-000192**

The commenter questioned the relevance of discussing the Greater sage-grouse in SEIS Section 4.6.1.1.1.2 (Construction Impacts on Wildlife). Because the species does not occur within 6.4 km [4 mi] of the project boundary and the habitat is not optimal for Greater sage-grouse, the commenter suggests the paragraph be deleted.

**Response:** SEIS Section 4.6.1.1.1.2 (Construction Impacts on Wildlife, Upland Game Birds) states that Greater sage-grouse (*Centrocercus urophasianus*) could potentially occur in the proposed project area but are not reported to be present within 6.4 km [4 mi] of the proposed project boundary. Saying that Greater sage-grouse are not reported to be present is not the same, however, as saying that they do not have the potential to be present in the habitat. For this reason, NRC considers the description of potential impacts to Greater sage-grouse, an upland game bird, from construction of the proposed project to be appropriate. No change was made to the SEIS beyond the information provided in this response.

#### **Comment: 136-000016**

The commenter makes two general statements regarding the Greater sage-grouse. First, the commenter stated that a lek is located on the project site and should be protected. Second, the commenter stated that BLM is currently developing a conservation plan to protect sage-grouse, and that NRC should not make a decision for this proposed action before the BLM plan is finished and all recommendations from the plan are incorporated into the SEIS.

**Response:** NRC staff recognizes that a statement in SEIS Section 3.6.1.2.2 regarding the nearest sage grouse lek should be revised. In fact, as stated in SEIS Section 3.6.3, Greater sage-grouse were not observed during the applicant surveys, grouse are not reported to occur within 6.4 km [4 mi] of the proposed project boundary, and the nearest sage-grouse lek is located almost 8 km [5 mi] west of the project boundary in Wyoming. SEIS Section 3.6.1.2.2 was revised to correct the location of the nearest sage-grouse lek.

The commenter is correct that BLM is developing a National Greater Sage-Grouse Planning Strategy (BLM, 2012a). This planning process is recognized in SEIS Section 4.6.1.1.1.2 as an ongoing effort between FWS and BLM. In light of this unresolved planning effort, while preparing the SEIS the NRC consulted with BLM, a cooperating agency for the development of the SEIS. SEIS Sections 4.6.1.1.1.1 and 4.6.1.1.1.2 include the most recent, working BLM mitigation and reclamation guidelines and BLM-recommended seasonal wildlife mitigations (BLM, 2012b,c). It is not necessary for NRC to delay the decision for this project, because the

*potential impacts and mitigations for Greater sage-grouse protection are sufficiently incorporated into NRC's analysis.*

*No change was made to the SEIS beyond the information provided in this response.*

#### **E5.22.4 Comments About the Endangered Species Act**

**Comments: 104-000008; 127-000033; 127-000035; 091-000012**

Three commenters asserted that the SEIS does not comply with the Endangered Species Act (ESA). One commenter stated that offsite disposal locations and associated transportation routes also require ESA consultations. One commenter stated that NRC must also consult with state agencies, and could also consult with tribal agencies.

**Response:** *NRC prepared the Dewey-Burdock draft SEIS consistent with its regulations under 10 CFR Part 51 that implement NEPA; its guidance for conducting environmental reviews as found in NUREG-1748 (NRC, 2003); and Section 7 of the ESA, as amended. SEIS Section 1.7.1 describes the correspondence between NRC staff and FWS as recently as September 9, 2013, confirming that the whooping crane and black-footed ferret are the only federally threatened or endangered species that may occur in Custer and Fall River Counties, but are not known to be present at the project site (FWS, 2013a). A copy of the correspondence between NRC staff and FWS is provided in SEIS Appendix A. As discussed in SEIS Section 4.6.1.1.1.4, cranes and ferrets were not observed during the baseline wildlife surveys conducted for the project. Because these species are not present and NRC concluded that the proposed project will not affect or result in a direct effect to these species, NRC is not required to initiate formal consultations with FWS under Section 7 of the ESA.*

*SEIS Section 1.7.3 describes correspondence between NRC staff and several federal and state agencies, as well as tribal governments, that contributed to the development of this SEIS. BLM, as a cooperating agency for this SEIS, informed NRC staff about sensitive BLM- and state-listed species, as described in SEIS Section 3.6.3, and recommended timing stipulations for certain avian species to protect their populations and habitats (SEIS Section 4.6.1.1.1.2). Measures to minimize adverse impacts to wildlife that would also benefit threatened and endangered species will be developed as part of the SDDENR large-scale mine permit in consultation with the applicant, NRC, SDGFP, and BLM (Powertech, 2012a). For example, as previously stated in Section E.5.22.5, the applicant (Powertech) is actively working on an avian monitoring and mitigation plan with FWS, SDDENR, and SDGFP that will be approved before construction activities begin and will be incorporated into the SDDENR large-scale mine permit. The avian monitoring and mitigation plan will include mitigation measures to protect all birds, including whooping cranes and raptors. The SDDENR recommends that the large-scale mine permit to require that the applicant notify SDGFP if species or critical habitat of species designated as threatened or endangered on state or federal lists are discovered within the permit area; however, final permit conditions may change based on the final determination by the hearing board. The SDDENR also recommends that the large-scale mine permit include other wildlife protection mitigation measures to limit impacts to wildlife. These recommendations include fencing and/or mesh around ponds, provisions to deter small and large animals, and avian deterrent systems (Powertech, 2012a).*

*NRC acknowledges that the applicant has proposed pursuing an agreement with the White Mesa site in San Juan County, Utah, for disposal of solid byproduct material (see SEIS*

*Section 3.13.2). The White Mesa site is an existing conventional mill site that has a tailings disposal area licensed by the State of Utah to accept byproduct material. The Dewey-Burdock project would use existing transportation routes to transport solid byproduct material to the White Mesa site. NRC determines that because these activities do not jeopardize the continued existence of any listed species or adversely modify critical habitat, Section 7 consultation with FWS is not required.*

*No change was made to the SEIS beyond the information provided in this response.*

#### **E5.22.5 Impacts to Terrestrial Ecology and Wildlife**

##### **Comment: 036-000003**

The commenter requested that NRC study the impacts on the wild horse herds in the area.

**Response:** *Under the Wild Free-Roaming Horses and Burros Act of 1971, each agency is responsible for management of horses and burros on lands they administer in accordance with respective policies and management plans. BLM and USFS manage wild horse and burro herd populations in several western states, excluding South Dakota. Because BLM- and USFS-managed areas are not present in South Dakota, wild horses and burros are not gathered for adoption or transfer to long-term pastures. Wild horses and burros have virtually no natural predators, and their herd sizes can double about every 4 to 5 years. BLM does not control the 5,261-ha [13,000-ac] Black Hills Wild Horse Sanctuary in Hot Springs, South Dakota, or any land on Indian reservations in the state where wild horse herds may be located. SDGFP does not have a management plan that considers wild horses and burros. If wild free-roaming horses or burros stray onto privately owned land, the land owner can request the animals be removed by the appropriate agency. Members of the public cannot kill or capture wild free-roaming horses and burros.*

*During the SEIS development, NRC staff corresponded with several state and federal agencies and tribal governments (SEIS Section 1.7). Wild horses and burros were not reported as part of the applicant's baseline wildlife surveys and were not identified as species of concern to the state and federal agencies and tribal governments NRC staff contacted during the SEIS development. Therefore, NRC staff do not expect any potential impacts on wild horses and burros. Because the commenter did not provide additional information for NRC consideration or incorporation into the SEIS, no change was made to the SEIS beyond the information provided in this response.*

##### **Comment: 128-000193**

The commenter requested revising SEIS Section 4.6.1.1.1.2 (Construction Impacts on Wildlife) to indicate that reclaimed rangeland forage capacity for big game will be reduced "temporarily."

**Response:** *NRC recognizes that the language in SEIS Section 4.6.1.1.1.2 does not specify the number of years it would take to reclaim rangeland forage capacity for big game, because the length of time may vary based on many factors. However, saying that forage capacity would be reduced "temporarily" after the life of the ISR facility, as the commenter suggests, may misrepresent the actual time it could take until growth on the revegetated rangeland areas*



*becomes productive enough to support big game. Appendix 6.4-D of the SDDENR large-scale mine permit application provides the reclamation performance criteria to establish the success of revegetation for agricultural and horticultural cropland and rangeland disturbed during the project (Powertech, 2012a). The reclamation performance criteria document explains that SDDENR will evaluate rangeland pursuant to ARSD 74:29:07:20 prior to bond release. ARSD 74:29:07:20 states that reclamation is complete when the reclaimed range is capable of withstanding proper (animal) stocking rates for two consecutive years prior to bond release. NRC staff revised SEIS Section 4.6.1.1.1.2 to convey that the SDDENR large-scale mine permit will require that, prior to bond release, reclaimed rangeland be capable of withstanding proper (animal) stocking rates for two consecutive years after the life of the ISR facility.*

**Comment: 132-000005**

The commenter questions what the potential impact on wildlife would be for this project.

**Response:** *SEIS Section 4.6 and associated subsections provide the NRC staff's analysis of potential impacts on wildlife and vegetation from the proposed project. Because the comment did not provide specific information on potential impacts to wildlife from the proposed project, no changes were made to the SEIS.*

**Comment: 136-000015**

The commenter stated that the proposed project will cause undue impacts to wildlife and loss of important habitat, and that the SEIS does not provide any mitigation measures to protect wildlife.

**Response:** *In SEIS Section 4.6 and associated subsections, the NRC staff analyzes the potential impacts on vegetation and wildlife species the commenter identifies, and provides mitigation measures to either reduce or avoid adverse effects. The mitigation measures the applicant proposed to reduce and minimize adverse impacts on ecological resources at the proposed Dewey-Burdock ISR Project are summarized in SEIS Section 6.2. Although NRC has limited authority to impose mitigation measures limiting impacts on ecological resources, the NRC staff identified additional potential mitigation measures to protect wildlife; these measures are summarized in SEIS Section 6.3. In addition, the applicant is required to adhere to ecological mitigative measures in the SDDENR large scale-mine permit and the GDP permit (Powertech, 2012a,b). Because the SEIS sufficiently discusses the potential impacts on ecology from the proposed project and potential mitigation measures, no changes were made to the SEIS.*

**E5.22.6 Comments About Ponds**

**Comment: 128-000187**

The commenter pointed out that the applicant (Powertech) has not committed to using netting on ponds.

**Response:** *NRC identified mitigation measures in SEIS Table 6.3-1 that could be implemented to limit impacts on wildlife, including covering vent pipes with netting. NRC staff recognize that the applicant has not committed to using netting on ponds. As described in SEIS Section 1.7.3.7, during the SEIS consultation and coordination process, SDGFP suggested two*

*measures to mitigate effects on bird populations: (i) testing to determine the toxicity of constituents in the evaporation ponds and (ii) using netting and fencing to restrict wildlife access to exposed ponds. The applicant is actively working on an avian monitoring and mitigation plan with FWS, SDDENR, and SDGFP before construction activities begin and incorporated into the SDDENR large-scale mine permit (Powertech, 2012a). The SDDENR regulatory requirements relating to surface water ponds are contained in ARSD 74:29:11:23 (In-Situ Leach Mining: Pond and Surface Impoundment Design and Construction Requirements). SDDENR requires migratory bird and wildlife protection provisions for surface water ponds. The SEIS Executive Summary and Sections 4.6 and 4.6.1.1.1 were revised in response to this comment.*

#### **E5.22.7 Impacts on Aquatic Species**

##### **Comment: 128-000205**

The commenter requested revising SEIS Table 4.6-5 to reflect that there would be SMALL impacts on aquatic species under the combined Class V injection wells and land application column.

**Response:** *NRC staff acknowledge that it's finding of SMALL impacts to aquatic species for the combined Class V injection wells and land application options was not documented in SEIS Table 4.6-5. NRC revised SEIS Table 4.6-5 to reflect that there would be SMALL impacts on aquatic species under the combined Class V injection wells and land application column.*

#### **E5.22.8 Vegetation Comments**

##### **Comments: 128-000189; 003-000003**

Two commenters suggested revising SEIS Section 4.6.1.1.1.1.1 (Construction Impacts on Vegetation) to reflect updated and corrected information. Further, the South Dakota Department of Agriculture (SDDA) requested that a weed management plan be developed using the University of South Dakota Weed Control guidance, and that the plan be approved by the SDDA and county weed and pest boards.

**Response:** *The applicant submitted a revised Noxious Weed Control Plan in April 2013 as Appendix 6.4-C of its SDDENR large-scale mine permit application (Powertech, 2012a). The plan references the 2013 South Dakota State University Weed Control guidance for pasture and range land (Moechnig, et al., 2012) and states that herbicide application will be performed by a South Dakota-certified licensed pesticide applicator. The plan was reviewed and approved by the Custer and Fall River County Weed and Pest Boards.*

*SEIS Table 6.2-1 lists applicant-proposed mitigation measures, including implementing weed control as needed to limit the spread of noxious, invasive, and nonnative species on disturbed areas. SEIS Table 6.3-1 lists NRC-identified mitigation measures, including the use of BLM- and SDDENR-approved weed control techniques. NRC staff suggest that SDDA review the plan as part of the approval process.*

*In response to this comment, SEIS Sections 4.6.1.1.1.1.1 and 4.15 were revised to provide accurate and updated weed control information.*

**Comment: 003-000001**

SDDA requests that reclamation and revegetation on private land follow the United States Department of Agriculture, Natural Resources Conservation Service (NRCS) South Dakota Field Office Technical Guide standards.

**Response:** *NRC is not bound by NRCS guidelines and does not have statutory authority to impose revegetation requirements on private land. SEIS Section 2.1.1.1.5.5 states that final revegetation will consist of seeding the area with a seed mixture approved by SDDENR, the local conservation district, BLM, and landowners. SEIS Section 4.6.1.1.1.1 explains that as soon as condition allow the applicant commits to reestablishing vegetation in disturbed areas with a native seed mixture and rate (provided in SEIS Table 4.6-2) approved by BLM, the local conservation district, and SDDNER. The same reclamation seed mix information, and consultation letters from the landowners and Custer and Fall River Counties approving the seed mix, are provided in Appendix 6.4–A of the SDDENR large-scale mine permit application (Powertech, 2012a). NRCS concurrence with the seeding plan provided in Appendix 6.4–B of the SDDENR large-scale mine permit application (Powertech, 2012a). SDDENR will determine when revegetation is complete and when the conditions for bond release have been met. Additional details may be included in the NRC site reclamation plan, which the licensee would submit at least 12 months before any planned final site decommissioning begins. Because the SEIS appropriately discusses these issues, no changes were made to the SEIS.*

**Comments: 003-000002; 116-000032**

The SDDA requests that a vegetation inventory be conducted prior to construction for areas of proposed disturbance, and that disturbed areas be restored and reclaimed with the same vegetation types and plant communities. Another commenter also has concerns about reestablishment of native vegetation and states that there is no discussion of test plots or the time needed to determine the success of revegetation.

**Response:** *As stated in SEIS Sections 2.1.1.1.5.2 and 2.1.1.1.5.6, wellfield decommissioning and surface reclamation would be initiated as production and restoration activities are completed in each wellfield. The applicant plans to decommission wellfields sequentially for approximately 8 years, including revegetation of disturbed areas. The schedule for the proposed action is provided as SEIS Figure 2.1-1, which shows decommissioning activities beginning in project year 8 and extending through project year 17. SEIS Tables 4.6-1 and 4.6-4 provide the amount of land disturbance by vegetation type for each activity planned for the Class V injection well disposal option and the land application option, respectively. Figures 4.6-1 and 4.6-3 depict the associated planned activities in relation to the vegetation communities.*

*NRC staff acknowledge that reestablishment of shrubland communities in arid environments could take many years and certain vegetative communities, such as sagebrush, could be difficult to reestablish through artificial plantings. However, revegetation by the applicant in a phased (sequential) schedule would increase the rate at which an area is able to recover from disturbance. The applicant commits to active revegetation of disturbed areas as soon as practicable with an SDDENR-, NRCS- and BLM-approved seed mixture to prevent the establishment of competitive weeds and restore habitat to native species. NRC does not have statutory authority to impose revegetation requirements upon a licensee. However, as stated in*

*SEIS Section 4.13.1.1.4, the applicant would be required to provide a land reclamation plan to NRC for review and approval within 12 months before wellfield reclamation begins.*

*Appendix 6.4–D of the SDDENR large-scale mine permit application provides the reclamation performance criteria to establish the success of revegetation for agricultural and horticultural cropland and rangeland disturbed during the project (Powertech, 2012a). The applicant submitted the reclamation performance criteria to SDDENR in October 2012, when the NRC staff was finalizing the draft SEIS. The reclamation performance criteria describe using reference areas outside of the project area to determine revegetation efforts of disturbed areas within the project area. The final bond release criteria will demonstrate total vegetative cover, livestock carrying capacity, species composition, and reclamation sustainability in accordance with South Dakota codified laws and administrative rules.*

*In April 2013, SDDNER issued recommended conditions as part of the large-scale mine permit. SDDNER recommends that the large-scale mine permit include (i) the collection of baseline vegetation data within land application areas, (ii) concurrent and interim reclamation in all areas where mining or land disturbance is completed, (iii) revegetation success be equivalent to vegetative cover in reference areas using SDDENR-approved statistical methods, and (iv) that a post closure bond be held for 30 years after to reclamation bond is released to in part ensure revegetation success. However, final permit conditions may change based on the final determination by the hearing board. SEIS Section 2.1.1.1.5.5 states that SDDENR will determine when revegetation is complete and when the conditions for bond release have been met. As stated in SEIS Section 2.1.1.1.5, the licensee must comply with reclamation requirements on BLM-administered land in accordance with 43 CFR Part 3800 to ensure that there is no unnecessary or undue degradation of public surface lands. This information does not affect the staff's analysis of environmental impacts; however, SEIS Sections 4.6.1.1.1.1, 4.6.1.1.4, and 4.6.1.2.4 were revised with updated information.*

**Comment: 092-000016**

One commenter asked whether wastewater will be applied on native plants and whether rare plants would be affected by the proposed project.

**Response:** *NRC staff recognize that the SEIS description of baseline vegetation surveys conducted for the proposed project does not explicitly mention rare plants. SEIS Section 3.6.1.1 states that threatened and endangered plant species were not encountered during the applicant's vegetation survey of the project area or within a 0.8-km [0.5-mi] perimeter around the area. According to the vegetation baseline survey procedures in Appendix 3.5-A of the application (Powertech, 2009, Section 6.14), plant species listed in the South Dakota Natural Heritage Program (SDNHP) were included in the survey, which includes rare species (SDGFP, 2009). The applicant's GDP states that irrigated crops within the land application areas may include native vegetation, alfalfa, or salt-tolerant wheat grass (Powertech, 2012b, Section 5.5). SEIS Sections 2.1.1.1.6.2, 4.5.1.1.2.1, and 4.6.1.2.1 were revised to state that, under the land application option, the applicant intends to irrigate native vegetation, alfalfa, and salt-tolerant wheatgrass in the land application areas.*

**Comment: 128-000155**

The commenter pointed out that the land application crop list for the proposed project has been revised and suggests revising the SEIS accordingly.

**Response:** NRC staff recognize the applicant's GDP states that irrigated crops within the land application areas may include native vegetation, alfalfa, and salt-tolerant wheatgrass (Powertech, 2012b, Section 5.5). NRC staff revised SEIS Sections 2.1.1.1.6.2, 4.5.1.1.2.1, and 4.6.1.2.1 in response to this comment.

**E5.22.9      References**

10 CFR Part 51. *Code of Federal Regulations*, Title 10, *Energy*, Part 51. "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions." Washington, DC: U.S. Government Printing Office.

43 CFR Part 3800. *Code of Federal Regulations*, Title 43, *Public Lands: Interior*, Part 3800. "Mining Claims Under the General Mining Laws." Washington, DC: U.S. Government Printing Office.

ARSD (Administrative Rules of South Dakota). "Section 74:29:07:20. Rangeland." South Dakota Legislature Administrative Rules.

ARSD. "Section 74:29:11:23. In Situ Leach Mining: Pond and Surface Impoundment Design and Construction Requirements." South Dakota Legislature Administrative Rules.

BLM (U.S. Bureau of Land Management). "Greater Sage-Grouse Conservation." Billings, Montana: BLM. Last updated March 7, 2012a. <<http://www.blm.gov/mt/st/en/prog/wildlife/sagegrouse.html>> (13 June 2013).

BLM. "Mitigation and Reclamation Guideline." E-mail (June 25) from M. Iverson, BLM, Acting Field Manager, South Dakota Field Office, to A. Hester, CNWRA, Southwest Research Institute®, San Antonio, Texas with attachments. ML12250A802. Belle Fourche, South Dakota: BLM. 2012b.

BLM. "Appendix E Wildlife Stipulations." E-mail (June 25) from M. Iverson, BLM, Acting Field Manager, South Dakota Field Office, to A. Hester, CNWRA, Southwest Research Institute®, San Antonio, Texas: Belle Fourche, South Dakota: BLM. ML12250A838. June 25, 2012c.

FWS (U.S. Fish and Wildlife Service). "Re: Follow Up for the Proposed Dewey-Burdock *In-Situ* Recovery Project, Fall River and Custer Counties, South Dakota." Email (September 9) Terry Quesinberry, Fish and Wildlife Biologist. ML13256A314. Pierre, South Dakota: FWS. 2013a.

FWS. "Species Profile, Piping Plover (*Charadrius melodus*)." U.S. Fish and Wildlife Service. 2013b. <<http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B079>> (03 June 2013).

FWS. "Re: Follow Up for the Proposed Dewey-Burdock *In-Situ* Recovery Project, Fall River and Custer Counties, South Dakota." Email (August 27) Terry Quesinberry, Fish and Wildlife Biologist. ML12240A317. Pierre, South Dakota: FWS. 2012.

Moechnig, M., D. Deneka, L. Wrage, M. Rosenberg. “2013 Weed Control, Pasture and Range.” Publication: 03-3020-2012. Brookings, South Dakota: South Dakota State University Extension. October 2012 <<http://igrow.org/up/resources/03-3020-2012.pdf>> (07 June 2013).

NRC (U.S. Nuclear Regulatory Commission). NUREG–1748, “Environmental Review Guidance for Licensing Actions Associated with NMSS Programs—Final Report.” Washington, DC: NRC. August 2003.

Powertech [Powertech (USA) Inc.]. “Dewey-Burdock Large Scale Mine Permit Application—Response to 10/31/2012 Procedural Completeness and Technical Review Comments.” ML130320039—Package. Edgemont, South Dakota: Powertech. 2012a.

Powertech. “Dewey-Burdock Project Groundwater Discharge Plan Custer and Fall River Counties, South Dakota.” ML12195A039, ML12195A040. Edgemont, South Dakota: Powertech. March 2012b.

Powertech. “Dewey-Burdock Project, Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota—Environmental Report.” Docket No. 040-09075. ML092870160. Greenwood Village, Colorado: Powertech. August 2009.

SDGFP (South Dakota Game, Fish, and Parks). “Rare, Threatened or Endangered Plants Tracked by the South Dakota Natural Heritage Program.” November 2009. <<http://gfp.sd.gov/wildlife/threatened-endangered/rare-plant.aspx>> (12 June 2013).

USGS (U.S. Geological Survey). “North Dakota’s Federally Listed Endangered, Threatened, and Candidate Species—1995, *Piping Plover* (*Charadrius melodus*).” Last updated February 2, 2013. <<http://www.npwrc.usgs.gov/resource/wildlife/nddanger/species/charmelo.htm>> (03 June 2013).

## **E5.23 Meteorology, Climate, and Air Quality**

### **E5.23.1 Air Impact Assessment**

#### **Comment: 049-000013**

In response to statements in the draft SEIS that additional air modeling using an updated emission inventory would be included in the final SEIS, the commenter stated that it could not fully review the staff’s analysis because complete modeling results were not presented in the draft SEIS. The commenter concurred with the NRC approach to provide revised information in the final SEIS and recommended that if the final SEIS analyses predict adverse impacts, NRC identify mitigation, control measures, and design features to address these impacts.

**Response:** *Air dispersion modeling and the associated impact analysis have been updated for the final SEIS. The staff based its analysis in the draft SEIS on information available at the time the document was issued acknowledging, in draft SEIS Section 4.7.1, that additional information would be included in the final SEIS. Although the more recent information was not available at the time the draft SEIS was developed, when the NRC staff considers this new information in the final SEIS, the impact analysis does not significantly change from what was presented in the draft SEIS. To the contrary, as described in final SEIS Table C-19, the draft analysis bounds*

*the final NRC analysis. Peak year, construction phase, and cumulative impact magnitudes in the draft and final SEISs were the same (i.e., SMALL to MODERATE). For the operations, aquifer restoration, and decommissioning phases, the draft SEIS impact magnitude of SMALL to MODERATE was reduced to SMALL in the final SEIS. NRC staff recognize that the commenter concurs with the approach to revise the air dispersion modeling and impact analysis in the final SEIS as described in draft SEIS Section 4.7.1. Regarding mitigation measures, Section 6.2 of this final SEIS discusses applicant-proposed air quality mitigation, and SEIS Section 6.3 discusses potential air quality mitigation measures the NRC identified.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comments: 075-000004; 127-000036; 127-000041**

One commenter stated that the draft SEIS does not use current air emissions information, does not identify the various types of receptors, and does not analyze the impacts on these receptors. Another commenter stated that the proposed project will greatly affect Wind Cave, one of the largest cave systems in the world, which is located at Wind Cave National Park in Fall River County.

**Response:** *NRC acknowledges that, when the staff issued the draft SEIS, the applicant had committed to update the air emissions information before the final SEIS was prepared (see SEIS Section 4.7.1). The air impact assessment documented in the draft SEIS was based on available information provided by the applicant, as well as independent reviews of data presented in the license application.*

*As described in draft SEIS Section 4.7.1, NRC staff characterized air impacts by comparing project-specific air emissions to regulatory thresholds and standards, including NAAQS and PSD thresholds. Primary NAAQS are established to protect public health, and secondary NAAQS are established to protect public welfare by safeguarding against environmental and property damage. A purpose of PSD standards, as described in draft SEIS Section 3.7.2, is to ensure that air quality in attainment areas remains good. By comparing project emissions to regulatory standards that protect people and the environment, NRC staff consider whether the air quality analyses in the SEIS address the impacts to various receptors. Various project-specific receptors are identified throughout the draft SEIS, including those identified in Figures 2.1-3, 2.1-12, and 3.2-1. Portions of draft SEIS Sections 3.7.2, 4.7.1, and 5.7.1 identify and analyze impacts to one specific receptor: Wind Cave National Park. To clarify the connection between the NAAQS and the types of receptors these standards address, text in SEIS Section 3.7.2 was supplemented to specify the purpose of primary and secondary NAAQS.*

**Comment: 127-000012**

The commenter pointed out that, with regard to air impacts, the draft SEIS states the applicant committed to perform additional air dispersion modeling before the final SEIS is prepared. The commenter stated that deferral of data gathering with respect to air is no more justifiable than for water. The commenter stated that further presentation of new data in a final EIS, without disclosing it in a draft and providing for public review and comment, violates NEPA's public disclosure and participation requirements.



**Response:** *The air impact assessment in the draft SEIS was based on available information provided by the applicant, as well as independent reviews of data presented in the applicant's license application. NRC acknowledges that, when it issued the draft SEIS, the applicant had committed to revise the air emission inventory and perform additional air dispersion modeling (see SEIS Section 4.7.1). Updates to the inventory were made to improve the accuracy and provide the appropriate input for the NAAQS, PSD, and Air Quality Related Values modeling. The draft SEIS stated that the impact analysis in the final SEIS will be based on the new modeling results. The draft SEIS disclosed i) the potential that the impact magnitude in the final SEIS could be different (i.e., lesser or greater) than that specified in the draft SEIS, ii) example modeling results that would cause the NRC to reclassify the project impact, and iii) that if during the process of revising the air modeling it is determined that any of the topics for the update are not addressed as described in the draft SEIS, NRC shall provide justification for this change in the final SEIS. In summary, the draft SEIS provided the public an opportunity to comment on the existing NRC analysis and the process by which this analysis would be updated in the final SEIS.*

*The final SEIS does update the air analysis presented in the draft SEIS. Table C-18 of the final SEIS identifies the updates committed to in the draft SEIS and how they were address in the final SEIS. Details concerning the differences in the nonradiological air emissions estimates between the draft and final SEIS are described in Section C4 of the final SEIS and Appendix H of the Ambient Air Quality Final Modeling Protocol and Impact Analysis (IML, 2013). The final SEIS also updates the status of the formal air permitting process in which SDDENR determined that an air permit will not be required and the proposed project will not be subject to PSD requirements (SDDNER, 2013). As a result of this SDDENR determination and as described in final SEIS Section 4.7.1, NRC staff consider comparison of project level pollutant concentrations to PSD increments for disclosure purposes (e.g., indicating the type of project level emission the analysis should focus on for potential environmental impacts) rather than to identify a regulatory concern. The updated information considered when developing the final SEIS does not significantly change the staff's analysis of air impacts as presented in the draft SEIS. To the contrary, as described in final SEIS Table C-19, the draft analysis bounds the final NRC analysis. Peak year, construction phase, and cumulative impact magnitudes in the draft and final SEISs were the same (i.e., SMALL to MODERATE). For the operations, aquifer restoration, and decommissioning phases, the draft SEIS impact magnitude of SMALL to MODERATE was reduced to SMALL in the final SEIS.*

*No change was made to the SEIS based on this comment.*

**Comments: 127-000037; 127-000039; 127-000040**

The commenter expressed concern that the draft SEIS does not appropriately analyze for radiological and nonradiological emissions over varying wind conditions. Specific assertions included the following:

- Average wind speed data, even based on hourly measurements, mask the effects of wind gusts, so narrower intervals should have been used.
- The draft SEIS methodology is not compliant with any accepted methodology.

- The draft SEIS makes no mention of the foreseeable impacts of major wind storm events, including tornadoes, on the facility or the dispersion of emissions from the facility.

**Response:** *The NRC staff adequately addressed impacts from radiological and nonradiological emissions in the draft SEIS utilizing accepted methodology for air impact analysis. As stated in draft SEIS Section 4.7.1, nonradiological air impacts around the site (i.e., near-field modeling) were assessed using the AERMOD dispersion model. Additionally, surface meteorological data, such as wind speed, from the site as well as the National Weather Service station at Custer were used as input to the AERMOD dispersion model (Powertech, 2010). As detailed in EPA guidelines (EPA, 2005), the use of hourly meteorological data as input for air dispersion modeling is a commonly accepted practice and AERMOD is EPA's preferred air dispersion model for near-field analyses. Because the draft SEIS analyses obtained results from the AERMOD model (EPA's preferred air dispersion model) and included meteorological data collected over time, the nonradiological analysis in the draft SEIS used an appropriate approach to characterize air impacts which considers wind speed variation. The nonradiological analysis in the final SEIS also complies with an accepted methodology and appropriately accounts for variations in wind speed.*

*The air impact analyses in the final SEIS now include modeling results for the Air Quality Related Values for the Wind Cave National Park (i.e. far-field modeling). As described in the July 2013 air modeling protocol (IML, 2013), the CALPUFF air dispersion model was used for this far-field modeling. The July 2013 air modeling protocol also documents the following information concerning the nonradiological air dispersion models:*

- *AERMOD is EPA's preferred air dispersion model for near-field analyses.*
- *CALPUFF is EPA's preferred air dispersion model for far-field analyses.*
- *EPA recommends that the modeled meteorological time period be long enough to ensure that the worst-case meteorological conditions are adequately represented in the model.*
- *The meteorological data used for the final SEIS for both models were based on 3 years of hourly wind data, which complies with EPA's recommendation concerning the modeled meteorological time period.*

*Because the final SEIS's analyses follow the EPA guidance on air modeling, no additional change is warranted to this impact assessment.*

*For radiological emission impact analysis, the MILDOS computer code developed by Argonne National Laboratory, was used to calculate offsite radiation doses from operating uranium recovery facilities such as ISR facilities (See SEIS 4.13.1.1.2.1). The MILDOS computer code was designed as a primary licensing and evaluation tool and provides basic input to critical licensing, regulatory, and policy decisions. NRC staff use it to perform routine radiological impact and compliance evaluations for various uranium recovery operations. As stated in the applicant's environmental report (Powertech, 2009, Section 4.14.2.3.10), the MILDOS model uses site-specific meteorological data (including wind patterns and speeds) to evaluate the impacts of radiological air emissions. MILDOS input requirements are described in the User's Guide (Argonne National Laboratory, 1998). Meteorological input data include the annual average fractional frequency of occurrence of wind speed, wind direction, and atmospheric*

*stability. Data are supplied for 16 wind directions; 6 wind speed classifications, and 6 atmospheric stability categories. Because of the way the SEIS analyses utilize the MILDOS model, as described in this comment response, NRC staff believe that the radiological analysis in the draft and final SEIS complies with an accepted methodology and appropriately accounts for variations in wind speed.*

*The evaluation of impacts to the proposed facility from wind storm events, including tornadoes, is addressed in the Dewey-Burdock SER (NRC, 2013, Section 7.3.7), which states:*

- *The greatest risk from natural events at the proposed Dewey-Burdock ISR Project is a tornado that disperses yellowcake.*
- *Accidents from tornadoes pose low cancer risks because conservatively modeled doses to the public are very low.*
- *The risk of a tornado is very low, and no design or operational changes are necessary to mitigate the potential risks.*

*Above, the commenter suggests that the draft SEIS makes no mention of the foreseeable impacts of major wind storm events, including tornadoes, on the dispersion of emissions from the facility. As described in SEIS Section 2.1.1.1.6.1, however, most of the air emissions are generated by mobile sources rather than traditional stationary sources. This includes the vast majority of the fugitive dust, which is generated by vehicles traveling on unpaved roads. NRC staff expect that during major wind storms, including tornadoes, many of the operators of these mobile sources would cease activities that produce air emissions. NRC staff believe that the important factor when examining the relationship of storm events to facility air emissions would be the reduction or elimination of emission levels, rather than any potential change to how these reduced pollutant levels were dispersed.*

*No change was made to the SEIS based on this comment.*

**Comments: 128-000018; 128-000269**

The commenter disagreed with statements in the draft SEIS that the proposed action would contribute to visibility impacts at Wind Cave National Park. The commenter specified that the term “contribute” meant a modeled impact that exceeded a particular quantitative threshold and inferred that the term contribute indicated that the impact magnitude would be greater than small. The commenter stated that the draft SEIS based this conclusion on the modeling results from a similar project. Using information from this similar project, the commenter argued that the proposed Dewey-Burdock ISR Project would not contribute to visibility impacts at Wind Cave National Park.

**Response:** *In the draft SEIS the term “contribute” was not intended to mean that modeled air impacts exceeded a quantitative threshold. Rather, the term contribute in the draft SEIS simply meant that the proposed project generates the types of pollutants associated with visibility impacts. In the draft SEIS the term contribute does not equate to an impact greater than SMALL. Text in draft SEIS Section 5.7.1 states, “The proposed Dewey-Burdock ISR Project would contribute to visibility impacts, but the magnitude of the impact would be SMALL.” NRC staff acknowledge that modeling results from the similar project used in the draft SEIS could be*

*used to build a case that the proposed Dewey-Burdock ISR Project would not contribute (i.e., exceed the specified qualitative threshold) to visibility impacts at Wind Cave National Park. However, the revised impact assessment in the final SEIS is not based on the modeling from a similar project. The impact analysis in the final SEIS has been updated based on this new modeling that is site-specific to the Dewey-Burdock Project and replaces the modeling results from the similar project.*

*No change was made to the SEIS based on this comment.*

**Comment: 128-000207**

The commenter stated that the Dewey-Burdock potential air quality impacts should be bound by the SMALL impact magnitude designated in the GEIS rather than the SMALL to MODERATE range designated in the draft SEIS because the proposed project meets the three conditions identified in the GEIS. The commenter indicated that the emission and activity levels for the Dewey-Burdock ISR Project are higher than those evaluated in the GEIS, but asserted that any differences in impacts would be marginal and not worthy of reclassification to a greater impact magnitude.

**Response:** *Meeting the three conditions stated in GEIS Section 4.4.6 does not automatically mean that the site-specific impact magnitude will be categorized as SMALL. This is why the GEIS text identifying the three conditions starts with the phrase "In general." As described in draft SEIS Section 4.7.1, NRC staff concluded that the site-specific conditions at the proposed Dewey-Burdock ISR Project are not bounded by the GEIS because the emission and activity levels for the Dewey-Burdock project are greater than those analyzed in the GEIS.*

*NRC disagrees with the commenter that the Dewey-Burdock impact magnitude would be essentially the same as the GEIS impacts. The estimated annual particulate (i.e., fugitive dust) emissions level cited in GEIS Table 2.7-2 and used as input for air dispersion modeling to calculate ambient air concentrations was 10.0 metric tons [11.0 short tons]. In draft SEIS Table 2.1.3, the estimated annual particulate emissions level from stationary and mobile combustion emission sources for all phases was 4.9 metric tons [5.4 short tons] and in draft SEIS Table 2.1-5 the estimated annual fugitive dust emission level for all phases was 481.8 metric tons [531.1 short tons]. Considering that the Dewey-Burdock estimated fugitive emissions are about 50 times greater than those analyzed in the GEIS, NRC staff determined that the GEIS air quality analysis did not apply to the proposed Dewey-Burdock ISR Project and that the Dewey-Burdock impact assessment would be based on project-specific emission levels. As described in draft SEIS Section 4.7.1, due to the level and nature of the estimated Dewey-Burdock fugitive emissions, there is a potential for noticeable localized dust emissions, particularly when vehicles travel on unpaved roads. At times, the fugitive emission would result in a MODERATE impact on air quality, so the overall impact would range from SMALL to MODERATE for the peak year and all phases.*

*As described in draft SEIS Section 4.7.1, the fugitive dust emissions from SEIS Table 2.1-5 were not included in the draft SEIS modeling results. This draft SEIS section also identifies several aspects of the air impact analyses that have since been updated in the final SEIS, including the incorporation of an updated fugitive dust emission inventory into the air dispersion modeling. Based on the site specific air modeling results presented in the final SEIS, NRC staff conclude in the final SEIS that, at times, fugitive dust emissions would result in a MODERATE*

*impact on air quality, so the overall impact would range from SMALL to MODERATE for the peak year and construction phase (see final SEIS Table C–19).*

*No change was made to the SEIS based on this comment.*

**Comment: 128-000211**

The commenter disagrees with the assessment in draft SEIS Sections 4.7.1.1.3 and 4.7.1.2.3 that at times the fugitive emissions during the aquifer restoration phase would result in a MODERATE impact on air quality. The commenter believes that the impacts would be SMALL based on the combustion (0.09 ton/year) and fugitive (11.8 ton/year) annual particulate emission levels.

**Response:** *First, the commenter did not include emissions from wind erosion in the annual emission inventory total. As described in draft SEIS Sections 4.7.1.1.3 and 4.7.1.2.3, wind erosion emission levels can generate up to an additional 29.7 metric tons [32.7 short tons] of PM<sub>10</sub>. Second, the assessment in the draft SEIS is not based solely on the annual emission levels but also on the nature of the fugitive emissions. As stated in draft SEIS Sections 4.7.1.1.3 and 4.7.1.2.3, the assessment considers the sporadic nature of these emissions and concludes that the impact would be MODERATE at times because of short-term, intermittent, localized dust emissions and the overall impact would range from SMALL to MODERATE.*

*As described in draft SEIS Section 4.7.1, fugitive dust emissions were not included in the draft SEIS modeling results. This draft SEIS section also identifies several aspects of the air impact analyses that have since been updated in the final SEIS, including the incorporation of an updated fugitive dust emission inventory into the air dispersion modeling. Based on the site specific air modeling results (i.e., pollutant concentrations) presented in the final SEIS, NRC staff conclude in the final SEIS that the aquifer restoration phase impact would result in a SMALL impact on air quality (see SEIS Section 4.7.1). As indicated in final SEIS Table C–19, the draft analysis bounds the final NRC analysis*

*No change was made to the SEIS based on this comment.*

**Comment: 128-000270**

The commenter asserts that the pro-rata approach described in draft SEIS Appendix C, Section C–2 that accounts for both the relative magnitudes of the inventoried emissions (i.e., the revised inventory relative to the initial inventory) and the relative magnitude of the emissions from the various project phases ignores a fundamental principle of dispersion modeling—the spatial relationship between emission sources and model receptors. The commenter further asserts that the final modeling will eliminate the need to make such pro-rata approximations.

**Response:** *As described in draft SEIS Appendix C, Section C–2, a pro-rata approach was used in two cases. This response addresses each case separately.*

*In the first case, the pro-rata approach was used because the modeling results presented in the draft SEIS were not directly generated from the revised emission inventory. Instead, multiplication factors derived from the differences between the initial and revised emission inventory amounts were used to calculate the peak year modeling results for the revised*

*inventory from the initial modeling results. As described in draft SEIS Section 4.7.1, the modeling results in the final SEIS have been directly generated from the revised, final inventory. Therefore, NRC staff agree that there is no longer a need to use a pro-rata approach in the final SEIS to generate the peak year modeling results because the revised, final emission inventory now serves as the input for the air dispersion model.*

*In the second case, the pro-rata approach was used because the modeling results for the revised emission inventory in the draft SEIS were generated for the peak year (i.e., when all phases occur simultaneously) and the pollutant concentrations associated with each phase during the peak year were calculated from the relative contribution (i.e., percentage) of each phase to the total emission inventory. As described in draft SEIS Section 4.7, modeling the peak year is important because it accounts for the highest amount of project emissions. As documented in the July 2013 modeling protocol (IML, 2013), the revised modeling was limited to a peak year analysis of project year 7, which would have the highest inventory emission levels and where all four project phases would occur simultaneously. The final SEIS uses the pro-rata approach to characterize the impacts for individual phases. NRC staff acknowledge that the results using the pro-rata approach may not be as accurate as the results from directly modeling each phase. However, the key component of the air analysis (i.e., the maximum project emissions from the peak year) was analyzed using air dispersion modeling, and the pro-rata approach to characterize individual phase contributions to the overall impact is an appropriate option.*

*No change was made to the SEIS based on this comment.*

**Comment: 128-000271**

The commenter stated that draft SEIS Appendix C, Table C–1 appears to contain the original (i.e., old) emission inventory numbers and that the information in the table only covers the operations phase rather than all phases, as indicated by the table title.

**Response:** *The information in draft SEIS Appendix C, Table C–1 pertains to stationary source emissions and was current when the draft SEIS was being prepared. As described in the draft SEIS in one of the Table C–1 footnotes and text in Section C2.1, stationary source emissions for the inventory presented in the table were limited to (i.e., only occurred in) the operation phase. Therefore, the emissions in Table C–1 would be considered to cover all project-associated stationary emissions.*

*Table C–1 has been updated in the final SEIS, along with the modeling results that use the emission inventory from Table C–1 as an input. Draft SEIS Section 4.7.1 documents the need to update the emission inventory in support of the modeling for the final SEIS. During the development of the final air emission inventory, many changes were made to improve accuracy and provide the appropriate input for the NAAQS, PSD, and Air Quality Related Values modeling. For example, rather than attributing all stationary sources to the operations phase, the inventory in the final SEIS assumes stationary source emission to be constant over the project lifespan except for project year one which has no stationary emissions. Details concerning the updates in the nonradiological air emissions estimates between the draft and final SEIS are described in Section C4 of the final SEIS and Appendix H of the Ambient Air Quality Final Modeling Protocol and Impact Analysis (IML, 2013).*

*No change was made to the SEIS based on this comment.*

**Comment: 018-000006**

The commenter stated that the SEIS does not address contamination from airborne yellowcake dust.

**Response:** *The SEIS addresses contamination from airborne yellowcake dust. SEIS Section 4.1.3.1.1.2.1 explains that for normal operations the applicant plans to use a rotary vacuum dryer and that emissions other than radon are not expected. SEIS Section 4.13.1.1.2.2 presents an overview of radiological accident scenarios evaluated in the GEIS (NRC, 2009), along with site-specific application to the proposed Dewey-Burdock ISR Project. The accident scenarios evaluated include a yellowcake dryer accident release. No change was made to the SEIS beyond the information provided in this response.*

**Comments: 023-000003; 047-000007**

Two commenters expressed concern about possible impacts from airborne dispersion of contaminants from ISR activities. Both commenters identified water from settling or evaporation ponds as possible sources. One commenter identified additional sources, including wastewater discharged into drainage or accidental release (e.g., a transportation mishap or pipe breakage). Commenters identified possible methods for dispersion, which included wind and movements of wildlife, livestock, and people in areas where contamination is present.

**Response:** *For normal operations, SEIS Section 2.1.1.1.6.2, Table 2.1-8 explains that liquid wastewaters, regardless of the disposal option (Class V injection well, evaporation ponds, land application, and discharge to surface waters), are regulated for nonradiological and radiological contaminants. The applicant must also obtain construction and industrial stormwater NPDES permits from SDDENR to control the amount of pollutants that can enter surface water bodies, such as streams and lakes. Liquid effluents will not be discharged to running or standing surface waters.*

*SEIS Chapter 7 describes the monitoring that will be conducted to identify the presence of NRC-and SDDENR-regulated constituents and verify compliance with these standards, which are designed to protect worker health and safety in operational areas and protect the public and environment beyond the facility boundary. Monitoring is conducted on the process-related liquid waste as well as other environmental media, such as air, soil, sediment, and surface water. Fencing would reduce the opportunity for either people or animals to disturb areas where ISR activities and wastewaters are located. Fencing would be present around the general facility (see SEIS Section 2.1.1.1.2.1), as well as the ponds (see SEIS Section 2.1.1.1.2.4.2). Netting around the ponds to further restrict wildlife access is another mitigation measure that was suggested (see SEIS Section 1.7.3.7).*

*The applicant is actively working on an avian monitoring and mitigation plan with FWS, SDDENR, and SDGFP that will be approved before construction activities begin and will be incorporated into the large-scale mining permit issued by SDDENR. The avian monitoring and mitigation plan will include mitigation measures to protect all birds. The SDDENR recommends that the large-scale mine permit include other wildlife protection mitigation measures to limit impacts to wildlife. These recommendations include fencing and/or mesh around the ponds, provisions to deter small and large animals, and avian deterrent systems. In addition, the amounts of contaminants in the liquid wastewater exposed to the environment will be regulated to levels that are protective of the public and the environment, and access to the*

*facilities and ponds will be controlled to reduce access by people and wildlife. In sum, the NRC has fully considered impacts related to the airborne dispersion of contaminants from liquid wastewater sources.*

*SEIS Section 4.13.1.1.2.2 presents an overview of radiological accident scenarios evaluated in the GEIS, along with site-specific application to the proposed Dewey-Burdock ISR Project. This assessment considered three types of accidents, representing the sources containing the higher levels of radioactivity for all aspects of operations:*

- *Thickener failure or spill from a tank or pipe leak*
- *Pregnant lixiviant and loaded resin spills from a tank or pipe leak*
- *Yellowcake dryer accident release*

*SEIS Section 4.3 of the draft SEIS presented an overview of the potential for and consequences from accidents involving radioactive material shipments (yellowcake product, ion-exchange resins, byproduct materials) evaluated in GEIS Section 4.4.2.2, along with site-specific application to the proposed Dewey-Burdock ISR Project. Accordingly, the draft SEIS addressed concerns about impacts from transportation accidents.*

*No change was made to the SEIS beyond the information provided in this response.*

#### **E5.23.2 Air Permitting, Regulations, and Standards**

##### **Comment: 049-000014**

The commenter requested that the final SEIS include the updated annual PM2.5 NAAQS standard, which EPA revised in December 2012.

**Response:** *NRC acknowledges that the annual PM2.5 NAAQS standard was updated (EPA, 2012) after the publication of the draft SEIS. Text in SEIS Section 3.7.2, including Table 3.7-4, was revised to reflect the updated standard.*

##### **Comment: 128-000206**

The commenter stated that an application was submitted on November 1, 2012, to SDDENR with the purpose of receiving a formal air quality permitting exemption. The commenter suggested that text in SEIS Chapter 4 be updated to reflect this and provided specific language for this update.

**Response:** *NRC acknowledges that SDDENR sent a letter to the applicant providing a response to the applicant's air quality permitting exemption request for the proposed Dewey-Burdock ISR Project (SDDENR, 2013). Based on information contained in the applicant's request, SDDENR determined that the applicant will not be required to obtain an air permit. Text was revised in SEIS Sections 1.6.2 (Table 1.6-1), 2.1.1.1.6.1.1, and 4.7.1 describing the SDDENR response to the applicant's air quality exemption request.*



**Comment: 128-000208**

The commenter argues that the three criteria for classifying ISR impact magnitudes identified in GEIS Section 4.4.6 do not explicitly mention Prevention of Significant Deterioration (PSD) standards. The commenter therefore suggests that the draft SEIS oversteps the GEIS criteria when stating that the revised modeling results to be included in the final SEIS will consider PSD standards when determining the impact magnitude.

**Response:** *Meeting the three conditions stated in GEIS Section 4.4.6 does not automatically mean that the site-specific impact magnitude will be categorized as SMALL. This is why the GEIS text identifying the three conditions starts with the phrase “In general.” The GEIS analysis in Section 4.4.6 includes comparison of ISR emissions levels to PSD standards. For the Dewey-Burdock Project, comparisons to PSD standards are supported by the GEIS analysis and are appropriate for consideration in site-specific analyses.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comment: 128-000210**

The commenter asserts that the draft SEIS indicates the proposed Dewey-Burdock ISR Project will be classified as a major source under the Clean Air Act permitting program and subject to Title V permitting. The commenter further asserts that statements in the draft SEIS that fugitive road dust estimates exceed the Title V or operating permit threshold for classification as a major source are inaccurate. Finally, the commenter identifies a typographical error (i.e., “air permit” should be “criteria air pollutant”) on draft SEIS, p. 2-46.

**Response:** *Statements in the draft SEIS that compare project emission levels, which are predominately from mobile sources, to major source and Title V thresholds, which apply to stationary sources, do not mean that NRC believes the Dewey-Burdock ISR Project will be classified as a major source and subject to Title V permitting. Draft SEIS Section 4.7.1 states that SDDENR is the regulatory authority which makes such determinations. In SEIS Section 2.1.1.1.6.1, NRC staff acknowledge major source classification and Title V permitting apply to stationary sources. Throughout SEIS Section 4.7.1, the analysis compares Dewey-Burdock stationary source emission levels to major source and Title V thresholds and states NRC staff’s opinion that the proposed project would not be classified as a major source or subject to Title V permitting. As described in draft SEIS Section 4.7.1, project emission levels are compared to major source and Title V thresholds to characterize and provide a context for understanding the magnitude of air effluents from the proposed project.*

*In this case, statements that fugitive road dust estimates exceed major source thresholds present an accurate comparison of the two numbers. The commenter’s assertion of inaccuracy does not relate to the actual numerical values; rather, the commenter objects to mobile source estimates being compared to stationary source thresholds as addressed in the previous paragraph. This issue is addressed previously in this comment response.*

*NRC staff concur with the commenter that the specified text on draft SEIS p. 2-46 should be revised (i.e., “air permit” should be “criteria air pollutant”). This was the only portion of the SEIS revised in response to this comment.*

### **E5.23.3 Comments About Wind Direction and Snowfall**

#### **Comments: 127-000040; 128-000112; 128-000209**

Several commenters identified text in the draft SEIS that incorrectly states the predominant wind direction is from the southeast rather than the northwest. One commenter stated that this error and the use of incomplete meteorological data (i.e., the use of annual wind rose data rather than monthly or seasonal wind data) fails to adequately support the explanation of radiological contamination at the site attributed to windblown dust from the southeast.

**Response:** *Text in SEIS Sections 2.1.1.1.6.1.1, 3.7.1.2 and 4.7.1.1.1 was revised to indicate that the predominant wind direction is from the northwest. Text in SEIS Section 3.7.1.2 was also supplemented to indicate that east-southeast winds are also common (Powertech, 2009). This supplementary text in SEIS Section 3.7.1.2 provides appropriate support for the explanation of radiological contamination at the site being attributed to windblown dust from the southeast. Based on these changes, the text in SEIS Sections 3.12.1.1 and 3.12.2 was revised to remove references to the predominant wind direction.*

#### **Comment: 128-000113**

The commenter stated that the text in draft SEIS Section 3.7.1.3 was misleading when characterizing the amount of snow in March and suggested revised language.

**Response:** *The language in SEIS Section 3.7.1.3 was revised to address this concern.*

### **E5.23.4 Comments About Climate Change**

#### **Comment: 092-000012**

The commenter requested that the SEIS discuss how the addition of the artificial bodies of water from the proposed Dewey-Burdock ISR Project relates to the effects of protracted unusual weather (e.g., too wet, too dry, too hot) associated with climate change on species that need water bodies. As an example, the commenter asks whether birds will adapt new migratory paths or take advantage of dependable artificial water bodies at the site if climate change creates a climate that dries up natural water bodies.

**Response:** *SEIS Section 3.7.2 characterizes expected changes in temperature and precipitation in the Great Plains due to climate change. Climate change impacts are typically considered on large scales (e.g., regional), and scientists recognize the need to refine the ability to project climate change at local scales (GCRP, 2009). Therefore, NRC staff acknowledge the difficulty in trying to specify precisely what the proposed project area would experience.*

*As described in SEIS Section 2.1.1.1.2.4.1, the applicant proposes to build nine artificial ponds that will occupy a total of 2.75 ha [6.8 ac] in the Dewey area and a total of 3.36 ha [8.3 ac] in the Burdock area. However, SEIS Section 4.6.1.1.1 states that to reduce impacts to wildlife, the applicant will use fencing to restrict access to exposed ponds. Netting around the ponds to further restrict wildlife access is another mitigation measure that was suggested (see SEIS Section 1.7.3.7). The applicant is actively working on an avian monitoring and mitigation plan with FWS, SDDENR, and SDGFP that will be approved before construction activities begin and will be incorporated into the large-scale mining permit from SDDENR. The avian monitoring*

*and mitigation plan will include mitigation measures to protect all birds. The SDDENR recommends that the large-scale mine permit include other wildlife protection mitigation measures to limit impacts to wildlife. These recommendations include fencing and/or mesh around the ponds, provisions to deter small and large animals, and avian deterrent systems (Powertech, 2012).*

*The description of the affected environment in SEIS Section 3.5.1 identifies the surface waters in and around the Dewey-Burdock area. Two main streams pass through the proposed project area: Beaver Creek (perennial) and Pass Creek (ephemeral). Pass Creek joins Beaver Creek southwest of the proposed project area. Approximately 4 km [2.5 mi] south of the confluence of Beaver and Pass Creeks, Beaver Creek flows into the Cheyenne River. Because of the implementation of controls to restrict wildlife access to the ponds (e.g., fencing) and the proximity of other surface water bodies in and around the proposed Dewey-Burdock Project site, any impacts on species reliant on surface water resulting from protracted unusual weather would be similar with or without the addition of the artificial ponds.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comment: 128-000230**

For the following reasons, the commenter disagrees with the draft SEIS statement on p. 5-41, lines 31–33 that the proposed Dewey-Burdock project will have a MODERATE incremental effect on climate and air quality when added to all other past, present, and reasonably foreseeable future actions in the study area:

- The specified text invites confusion because of the way in which it characterizes the concepts of incremental impacts (i.e., project impacts) and cumulative impacts together in the same sentence.
- The MODERATE incremental impact described in the specified text contradicts the ISR impact magnitude for non-greenhouse gases described in draft SEIS Section 4.7.1 (SMALL to MODERATE) and GEIS Section 4.4.6 (SMALL), as well as the ISR greenhouse gas impact magnitude specified in draft SEIS Section 5.7.2 (SMALL).

**Response:** *NRC staff acknowledge that the draft SEIS statement on p. 5-41 lines 31–33 should be revised to address concerns the commenter identified about clarity and consistency. Specifically, text in draft SEIS Section 5.7.1 was revised to*

- *Better distinguish the impact magnitudes associated with the proposed action and the cumulative impacts*
- *Better reflect the SMALL to MODERATE language for the non-greenhouse gas assessment expressed in draft SEIS Section 4.7.1*
- *Delete references to the greenhouse gas impact magnitude in draft SEIS Section 5.7.1 because greenhouse gas emission is addressed separately in draft SEIS Section 5.7.2*

*NRC staff acknowledge that the non-greenhouse gas impact magnitude described in the draft SEIS (SMALL to MODERATE) varies from that described in the GEIS (SMALL). However, text*

*in draft SEIS Section 4.7.1 already explains this difference. NRC staff concluded that the site-specific conditions at the proposed Dewey-Burdock ISR Project are not bounded by the GEIS, because the emission and activity levels for the proposed Dewey-Burdock ISR Project are greater than those analyzed in the GEIS. NRC staff determined that the Dewey-Burdock impact assessment would be based on project-specific emission levels. Based on the site specific air modeling results, NRC staff concluded in the final SEIS Section 4.7.1 that, at times, the fugitive emission would result in a MODERATE impact on air quality, and the overall impact would range from SMALL to MODERATE. No change was made to the SEIS in response to this aspect of the comment.*

*As described in draft SEIS Section 5.7.1, the fugitive dust emissions and Air Quality Related Values were not included in the draft SEIS modeling results. Draft SEIS Section 4.7.1 identifies several aspects of the air impact analyses that have been updated in the final SEIS, including the incorporation of an updated fugitive dust emission inventory and Air Quality Related Values into the air dispersion modeling.*

#### **E5.23.5      References**

Argonne National Laboratory. "MILDOS-AREA User's Guide (Draft)." ML12165A157. Lemont, Illinois: Argonne National Laboratory. 1998.

EPA (U.S. Environmental Protection Agency). "National Ambient Air Quality Standards (NAAQS)." ML13165A153. Washington, DC: EPA. 2012.

EPA. Revision to the Guideline on Air Quality Models: Adoption of a Preferred General Purpose (Flat and Complex Terrain) Dispersion Model and Other Revisions; Final Rule." Title 40—Protection of Environment. 40 CFR Part 51. *Federal Register*. Vol. 70, No. 216. pp. 68218–68261. November 9, 2005.

GCRP (U.S. Global Change Research Program). *Global Climate Change Impacts in the United States*. Washington, DC: Cambridge University Press. 2009.

IML (Inter-Mountain Laboratories, Inc.). "Ambient Air Quality Final Modeling Protocol and Impact Analysis Dewey-Burdock Project Powertech (USA) Inc., Edgemont, South Dakota." ML13196A061, ML13196A097, ML13196A118. Sheridan, Wyoming: IML, IML Air Science. 2013.

NRC (U.S. Nuclear Regulatory Commission). "Safety Evaluation Report for the Dewey-Burdock Project Fall River and Custer Counties, South Dakota Materials License No. SUA-1600." Docket No. 40-9075, Powertech (USA) Inc. ML 13052A182. Washington, DC: NRC. 2013.

NRC. NUREG-1910, "Generic Environmental Impact Statement for *In-Situ* Leach Uranium Milling Facilities." ML091480244, ML091480188. Washington, DC: NRC. May 2009.

Powertech [Powertech (USA) Inc.]. "Dewey-Burdock Large Scale Mine Permit Application—Response to 10/31/2012 Procedural Completeness and Technical Review Comments." ML130320039—Package. Edgemont, South Dakota: Powertech. 2012.

Powertech. “Response to the U.S. Nuclear Regulatory Commission’s (NRC) Request for Additional Information for the Dewey-Burdock Uranium Project Environmental Report. Submitted August 11, 2009.” ML102380516. Greenwood Village, Colorado: Powertech. 2010a

Powertech. “Dewey-Burdock Project, Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota—Environmental Report.” Docket No. 040-09075. ML092870160. Greenwood Village, Colorado: Powertech. August 2009.

SDDENR (South Dakota Department of Environment and Natural Resources). “SDDENR Review of Powertech’s Air Quality Application Submitted on November 5, 2012 for Its Proposed Operations in Edgemont, South Dakota.” Letter (February 21) from K. Gestring, Natural Resources Engineer, SDDENR to R. Blubaugh, Vice President, Environmental Health and Safety Resources, Powertech (USA) Inc. Vermillion, South Dakota: SDDENR. 2013.

## **E5.24 Historic and Cultural Resources**

### **E5.24.1 Impacts to Historic, Cultural, and Sacred Places**

**Comments: 008-000002; 016-000002; 018-000002; 024-000001; 029-000002; 035-000001; 041-000004; 048-000001; 072-000004; 095-000001; 104-000004; 129-000003; 132-000004**

Several commenters stated that cultural and historical impacts are not considered properly and relevant information is still not available. One commenter stated that the SEIS did not adequately address possible cultural and historic impacts. Some commenters stated that the proposed project has not taken into account enough historical and cultural impacts in the SEIS. Another commenter stated that historical and cultural sites have not yet been thoroughly studied. One commenter expressed concern that the SEIS was issued prior to a thorough study of cultural and historical sites on and near the proposed project area. Another commenter stated that relevant information is lacking on the impacts on the local cultures. Some commenters stated that a large number of cultural and historical sites which have not been properly studied would be harmed, destroyed, or irredeemably contaminated.

**Response:** *The NRC staff’s assessment of cultural resources in the draft SEIS was based on available information contained in the application, information gathered through consultation, and information obtained from independent research. The NRC staff developed the impact assessment for cultural resources based on archeological surveys conducted by the applicant, and the staff explicitly stated in draft SEIS Sections 1.7.3.5 and 3.9.4 that NHPA Section 106 consultation was ongoing with all interested tribes. As discussed in draft SEIS Section 1.7.3.5, consultation involving NRC, the applicant, SD SHPO, BLM, and interested Indian tribes is being conducted to determine (i) whether historic properties of significance to Indian tribes are present, (ii) whether historic properties will be disturbed by site activities, and (iii) what mitigation measures should be implemented to protect historic properties. Prior to construction, an agreement between NRC, SD SHPO, BLM, ACHP, interested Native American tribes, the applicant, and other interested parties will be developed in accordance with 36 CFR 800.14(b)(2). The agreement will outline the mitigation process for affected resources identified at the site pursuant to 36 CFR 800.8(c)(1)(v).*

*As part of its obligations under Section 106 of the NHPA and the regulations at 36 CFR Part 800.2(c)(2)(B)(iii)(A), NRC must provide Indian tribes “a reasonable opportunity*

*to identify its concerns about historic properties, including those of religious and cultural importance, articulate their views on the undertaking's effects on such properties, and participate in the resolution of adverse effects.” Following over 2 years of consultation with 23 tribes, the NRC staff provided an opportunity for all interested tribes to conduct a field survey on the entire 4,282 ha [10,580 ac] of the proposed project area (NRC, 2013). Seven tribes (Cheyenne and Arapaho, Northern Arapaho, Northern Cheyenne, Crow Creek Sioux, Crow Nation, Santee Sioux, and Turtle Mountain) participated in the field survey between April 2013 and May 2013. To date, three tribes (Cheyenne and Arapaho, Northern Cheyenne, and Northern Arapaho) have submitted reports to the staff documenting sites they have identified as having religious and cultural importance and recommending avoidance/mitigation strategies. The NRC staff documented this additional input from the tribes in the final SEIS at Section 3.9.3.2.2. The NRC staff also considered this additional tribal input in the assessment of impacts to historic and cultural resources in the final SEIS at Section 4.9.1.*

*No additional changes were made to the SEIS beyond the information provided in this response.*

**Comment: 019-000003**

The commenter stated that much more consideration needs to be given to the cultural and historical impacts of such a project. Lakota treaty rights would be involved in the proposed project area. The commenter stated further that Native American tribes need to be consulted about environmental impacts to the Black Hills which they look on as sacred.

**Response:** *The NRC staff has evaluated the impacts to cultural and historical resource while developing the draft SEIS and has presented its preliminary impact assessment in SEIS Sections 3.9 and 4.9. As discussed in draft SEIS Section 1.7.3.5, consultation involving NRC, the applicant, SD SHPO, BLM, and interested Indian tribes was conducted to determine (i) whether historic properties of significance to Indian tribes are present, and (ii) whether historic properties will be disturbed by site activities. Consultation continues on what mitigation measures should be implemented to protect historic properties.*

*As part of its obligations under Section 106 of the NHPA and the regulations at 36 CFR Part 800.2(c)(2)(B)(iii)(A), NRC must provide Indian tribes “a reasonable opportunity to identify its concerns about historic properties, including those of religious and cultural importance, articulate their views on the undertaking's effects on such properties, and participate in the resolution of adverse effects.” Following over 2 years of consultation with 23 tribes, the NRC staff provided an opportunity for all interested tribes to conduct a field survey on the entire 4,282 ha [10,580 ac] of the proposed project area (NRC, 2013). Seven tribes (Cheyenne and Arapaho, Northern Arapaho, Northern Cheyenne, Crow Creek Sioux, Crow Nation, Santee Sioux, and Turtle Mountain) participated in the field survey between April 2013 and May 2013. To date, three tribes (Cheyenne and Arapaho, Northern Cheyenne, and Northern Arapaho) have submitted reports to the staff documenting sites they have identified as having religious and cultural importance and recommending avoidance/mitigation strategies. The NRC staff also has gotten field notes from the Crow Nation not including eligibility determination and recommended mitigation strategies. The NRC staff documented this additional input from the tribes in the final SEIS at Section 3.9.3.2.2. The NRC staff also considered this additional tribal input in the assessment of impacts to historic and cultural resources in the final SEIS at Section 4.9.1.*

*The NRC is aware of the Sioux Nation's continued claim to the lands that were formerly part of the Great Sioux Nation established by the Fort Laramie Treaty of 1868 and the Supreme Court's 1980 ruling on the issue. NRC is also aware that longstanding treaty disputes exist between Native American tribes and the U.S. government. In its role as a regulatory agency, NRC lacks the authority to resolve these issues. These concerns are outside the Dewey-Burdock licensing review. As discussed previously, the NRC has undertaken consultation with Native American tribes who hold the Black Hills sacred through the NHPA Section 106 process. The NRC staff has evaluated the impacts to cultural and historical resource while developing the draft SEIS and has presented its impact assessment in sections 3.9 and 4.9 of the draft SEIS. As required by 36 CFR Part 800, the staff has consulted and will continue to consult with interested Native American Tribes to determine whether the proposed federal undertaking action will have an impact to historic properties. Section 1.7.3.5 details the staff's interactions thus far with Native American Tribes. Text was added to SEIS Section 1.7.3.5 to document NHPA Section 106 consultation activities since the draft SEIS was issued in November, 2012.*

*No additional changes were made to the SEIS beyond the information provided in this response.*

**Comment: 020-000002**

The commenter stated that people with greater knowledge of history and culture in this region should be directly solicited with respect to cultural heritage impacts.

**Response:** *As part of its obligations under Section 106 of the NHPA and the regulations at 36 CFR Part 800.2(c)(2)(B)(iii)(A), NRC must provide Indian tribes "a reasonable opportunity to identify its concerns about historic properties, including those of religious and cultural importance, articulate their views on the undertaking's effects on such properties, and participate in the resolution of adverse effects." SEIS Section 1.7.3.5 describes consultation activities NRC undertook with tribal governments. Consultation correspondence associated with the Section 106 process is presented in Appendix A.*

*NRC staff formally initiated the Section 106 consultation process for the proposed Dewey-Burdock ISR Project by contacting 20 tribal governments by letters dated March 19, 2010 (NRC, 2010a). Additional invitations to consult with NRC concerning the proposed project were sent to tribes on September 10, 2010, and March 4, 2011 (NRC, 2010b, 2011). NRC staff invited the tribes to participate as consulting parties in the NHPA Section 106 process and sought their assistance in identifying places of religious and cultural significance and cultural resources that may be affected by the proposed action.*

*Following over 2 years of consultation with 23 tribes, the NRC staff provided an opportunity for all interested tribes to conduct a field survey on the entire 4,282 ha [10,580 ac] of the proposed project area (NRC, 2013). Seven tribes (Cheyenne and Arapaho, Northern Arapaho, Northern Cheyenne, Crow Creek Sioux, Crow Nation, Santee Sioux, and Turtle Mountain) participated in the field survey between April 2013 and May 2013. To date, three tribes (Cheyenne and Arapaho, Northern Cheyenne, and Northern Arapaho) have submitted reports to the staff documenting sites identified as having religious and cultural importance and recommending avoidance/mitigation strategies. The NRC staff also has gotten field notes from the Crow Nation not including eligibility determination and recommended mitigation strategies. The NRC staff documented this additional input from the tribes in the final SEIS at Section 3.9.3.2.2. The NRC*

*staff also considered this additional tribal input in the assessment of impacts to historic and cultural resources in the final SEIS at Section 4.9.1.*

*No additional changes were made to the SEIS beyond the information provided in this response.*

**Comment: 033-000001**

The commenter stated that critical issues have not been adequately addressed, such as the impact on historic and, as yet, unevaluated indigenous burial grounds that are in direct proximity to the construction area.

**Response:** *NRC acknowledges burials that have not yet been evaluated for eligibility for listing on the NRHP have been identified within the proposed project area (see SEIS Table 4.9-2). One of the burials (site number 39FA1902) is located approximately 152 m [500 ft] from the proposed Burdock central processing plant and will be protected by a buffer zone and fencing.*

*The other burials (site number 39CU3587) are located outside areas of ISR activities. These burials will be avoided, and no impact is anticipated.*

*As part of its obligations under Section 106 of the NHPA and the regulations at 36 CFR Part 800.2(c)(2)(B)(iii)(A), NRC must provide Indian tribes “a reasonable opportunity to identify its concerns about historic properties, including those of religious and cultural importance, articulate their views on the undertaking’s effects on such properties, and participate in the resolution of adverse effects.” Following over 2 years of consultation with 23 tribes, the NRC staff provided an opportunity for all interested tribes to conduct a field survey on the entire 4,282 ha [10,580 ac] of the proposed project area, including the area of direct disturbance {~809 ha [~2,000 ac] (NRC, 2013). Seven tribes (Cheyenne and Arapaho, Northern Arapaho, Northern Cheyenne, Crow Creek Sioux, Crow Nation, Santee Sioux, and Turtle Mountain) participated in the field survey between April 2013 and May 2013. To date, three tribes (Cheyenne and Arapaho, Northern Cheyenne, and Northern Arapaho) have submitted reports to the staff documenting sites identified as having religious and cultural importance and recommending avoidance/mitigation strategies. The NRC staff also has gotten field notes from the Crow Nation not including eligibility determination and recommended mitigation strategies. The NRC staff documented this additional input from the tribes in the final SEIS at Section 3.9.3.2.2. The NRC staff also considered this additional tribal input in the assessment of impacts to historic and cultural resources in the final SEIS at Section 4.9.1.*

*No additional changes were made to the SEIS beyond the information provided in this response.*

**Comments: 042-000006; 042-000007**

The commenter stated that the Northern Cheyenne Tribe is concerned that the proposed action may undermine its significant effort to protect the environment and human health of its tribal members who make annual pilgrimages to the Bear Butte (Noahvose), a sacred and holy place of worship for the Cheyenne people since time immemorial. The commenter stated that Bear Butte is located in Meade County, South Dakota, in close proximity to the proposed 4,280-ha [10,580-ac] development area. The commenter stated that the proposed project’s adverse impacts include potential contamination of surface and groundwater that flows in a northeasterly



direction toward Bear Butte (Noahvose) and 243 ha [600 ac] of tribal land surrounding this sacred mountain.

**Response:** *As described in SEIS Section 3.5.1, streams (Beaver Creek and Pass Creek) and their tributaries flow in a south to southeast direction through the proposed project area before flowing into the Cheyenne River. The Cheyenne River flows east into South Dakota, passes Edgemont, and skirts the southern end of the Black Hills, passing through the Angostura Reservoir. East of the Black Hills, it flows northeast along the northwestern boundary of the Pine Ridge Indian Reservation and Badlands National Park. The Cheyenne River flows into the Missouri River at Lake Oahe, approximately 50 km [32 mi] north-northwest of Pierre, South Dakota.*

*Groundwater in regional aquifer systems in southwestern South Dakota flows radially outward from the Black Hills toward the surrounding plains, which results in a northeast-to-southwest regional flow direction in the general vicinity of the proposed project site (see SEIS Section 3.5.3.1). As described in SEIS Section 3.5.3.2, groundwater in local aquifer systems in the vicinity of the proposed project flows from northeast to southwest consistent with regional groundwater flow. For example, potentiometric surfaces for the Fall River and Chilson aquifers indicate groundwater flows from northeast to southwest (Powertech, 2009b).*

*NRC staff does not anticipate any potential adverse impacts to Bear Butte resulting from potential contamination of surface water and groundwater at the proposed project. As noted previously, groundwater in both regional and local aquifers systems in the vicinity of the proposed project flows in a northeast to southwest direction. Bear Butte is located more than 100 km [62 mi] north-northeast of the proposed project site, and is therefore upgradient of the proposed project with respect to groundwater flow. With respect to surface water flow, the Cheyenne River is more than 50 km [31 mi] east of Bear Butte and flows northeast before emptying into the Missouri River at Lake Oahe 240 km [150 mi] east of Bear Butte.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comments: 130-000002; 135-000002**

The commenters stated that the geographic area that the applicant plans to use in this project contains innumerable cultural sites as evidenced in the SEIS; however, the explanation for the sites was taken from non-Indian experts, not from Native American people themselves. One commenter stated that the people of the Sioux, Cheyenne, and Arapaho Nations, as well as other Native American nations across North and Central America, consider the Black Hills to be a major sacred place and certain areas of the Black Hills were used to bring the bones of deceased relative back to the Black Hills. The commenter stated that the geographic area the Dewey-Burdock ISR Project plans to use was formerly a cemetery. The commenter stated that due to the potential for exploitation of the site (as many Native American grave sites were robbed, not just for artifacts but for the actual bones), there is a great reluctance to state that this area is a grave site. The commenter also stated that there are innumerable graves, tipi rings, sweat lodge circles, traditional gathering sites, and sacred places to pray located in the area planned to be used by the applicant.

**Response:** *SEIS Section 4.9.1 describes impacts to historic and cultural resources that have been identified in the Dewey-Burdock area. The NRC staff developed the impact assessment for cultural resources based on archeological surveys conducted by the applicant, and the staff*

*explicitly stated in draft SEIS Sections 1.7.3.5 and 3.9.4 that NHPA Section 106 consultation was ongoing with all interested tribes. As discussed in draft SEIS Section 1.7.3.5, consultation involving NRC, the applicant, SD SHPO, BLM, and interested Indian tribes was conducted to determine (i) whether historic properties of significance to Indian tribes are present, and (ii) whether historic properties of significance to tribes will be disturbed by site activities. Consultation continues on what mitigation measures should be implemented to protect historic properties. The NRC staff stated further that information obtained from the Section 106 consultation will be disclosed for public review and included in the final SEIS.*

*As part of its obligations under Section 106 of the NHPA and the regulations at 36 CFR Part 800.2(c)(2)(B)(iii)(A), NRC must provide Indian tribes “a reasonable opportunity to identify its concerns about historic properties, including those of religious and cultural importance, articulate their views on the undertaking’s effects on such properties, and participate in the resolution of adverse effects.” Following over 2 years of consultation with 23 tribes, the NRC staff provided an opportunity for all interested tribes to conduct a field survey on the entire 4,282 ha [10,580 ac] of the proposed project area (NRC, 2013). Seven tribes (Cheyenne and Arapaho, Northern Arapaho, Northern Cheyenne, Crow Creek Sioux, Crow Nation, Santee Sioux, and Turtle Mountain) participated in the field survey between April 2013 and May 2013. To date, three tribes (Cheyenne and Arapaho, Northern Cheyenne, and Northern Arapaho) have submitted reports to the staff documenting sites they have identified as having religious and cultural importance and recommending avoidance/mitigation strategies. The NRC staff also has gotten field notes from the Crow Nation not including eligibility determination and recommended mitigation strategies. The NRC staff documented this additional input from the tribes in the final SEIS at Section 3.9.3.2.2. The NRC staff also considered this additional tribal input in the assessment of impacts to historic and cultural resources in the final SEIS at Section 4.9.1.*

*No additional changes were made to the SEIS beyond the information provided in this response.*

**Comment: 131-000003**

The commenter stated that it is critically important that impacts to cultural resources are fully considered and given due weight in the NEPA process and that Section 106 and NEPA be coordinated in accordance with the governing federal regulations [36 CFR 800.8(a)(3)] rather than brushed aside or postponed until after the licensing decision has already been made.

**Response:** *SEIS Section 4.9.1 describes impacts to historical and cultural resources that have been identified in the Dewey-Burdock area. NRC evaluated the results of historic and cultural resource surveys and evaluative testing, which the applicant conducted prior to submission of the license application. NRC made recommendations of whether these properties are eligible for inclusion on the NRHP (see SEIS Section 4.9.1). NRC applied the criteria found in the NHPA-implementing regulations at 36 CFR 60.4(a)–(d) in making its National Register eligibility recommendations.*

*SEIS Section 1.7.3.5 describes the ongoing tribal consultation activities conducted under Section 106 of the NHPA. The NHPA Section 106 review process is outlined in ACHP regulations at 36 CFR Part 800. 36 CFR 800.8(a)(3) states agency officials should ensure that preparation of an EIS includes identification of historic properties, assessments of effects upon them, and consultation leading to resolution of any adverse effects. As discussed in SEIS*

*Section 1.7.3.5, consultation involving NRC, the applicant, SD SHPO, BLM, and interested Indian tribes was conducted to determine (i) whether significant historic properties of significance to Indian tribes are present, and (ii) whether properties will be disturbed by site activities. Consultation continues on what mitigation measures should be implemented.*

*As part of its obligations under Section 106 of the NHPA and the regulations at 36 CFR Part 800.2(c)(2)(B)(iii)(A), NRC must provide Indian tribes “a reasonable opportunity to identify its concerns about historic properties, including those of religious and cultural importance, articulate their views on the undertaking’s effects on such properties, and participate in the resolution of adverse effects.” Following over 2 years of consultation with 23 tribes, the NRC staff provided an opportunity for all interested tribes to conduct a field survey on the entire 4,282 ha [10,580 ac] of the proposed project area (NRC, 2013). Seven tribes (Cheyenne and Arapaho, Northern Arapaho, Northern Cheyenne, Crow Creek Sioux, Crow Nation, Santee Sioux, and Turtle Mountain) participated in the field survey between April 2013 and May 2013. To date, three tribes (Cheyenne and Arapaho, Northern Cheyenne, and Northern Arapaho) have submitted reports to the staff documenting sites identified as having religious and cultural importance and recommending avoidance/mitigation strategies. The NRC staff also has gotten field notes from the Crow Nation not including eligibility determination and recommended mitigation strategies. The NRC staff documented this additional input from the tribes in the final SEIS at Section 3.9.3.2.2. The NRC staff also considered this additional tribal input in the assessment of impacts to historic and cultural resources in the final SEIS at Section 4.9.1.*

*No additional changes were made to the SEIS beyond the information provided in this response.*

**Comment: 136-000005**

The commenter stated that the No-Action alternative should be selected in order to prevent the unmitigated impacts the Dewey-Burdock project will place on sites that hold cultural and historic resources important to a number of Native American tribes, including the closest affected group, the Oglala Sioux Tribe. The commenter also stated that the proposal faces an insurmountable obstacle toward general acceptance by failing to recognize the religious and spiritual importance of the Black Hills region to many Native American people, including the Lakota, Crow, Cheyenne, Arapaho, Kiowa, Comanche, and Apache peoples.

**Response:** *The NRC recognizes the Black Hills hold religious and cultural importance to tribal groups and their descendants, including the Apache, Arapaho, Arikara, Assiniboine, Cheyenne, Crow, Hidatsa, Kiowa, Mandan, Pawnee, Ponca, Sioux, and Shoshone tribes. SEIS Section 3.9.3 discusses sites of religious and cultural significance to the Tribes. The identification and evaluation of places of religious and cultural significance to Native American tribes within the proposed Dewey-Burdock ISR Project area is addressed through the NHPA Section 106 consultation process as described in SEIS Sections 1.7.3.5 and 4.9.1. As discussed in SEIS Section 1.7.3.5, consultation involving NRC, the applicant, SD SHPO, BLM, and interested Indian tribes was conducted to determine (i) whether historic properties of significance to Indian tribes, and (ii) whether properties will be disturbed by site activities. Consultation continues on what mitigation measures should be implemented. Prior to construction, an agreement between NRC, SD SHPO, BLM, ACHP, interested Native American tribes, the applicant, and other interested parties will be developed in accordance with*

36 CFR 800.14(b)(2). *The agreement will outline the mitigation process for each affected resources identified at the site pursuant to 36 CFR 800.8(c)(1)(v). As part of its obligations under Section 106 of the NHPA and the regulations at 36 CFR Part 800.2(c)(2)(B)(iii)(A), NRC must provide Indian tribes “a reasonable opportunity to identify its concerns about historic properties, including those of religious and cultural importance, articulate their views on the undertaking’s effects on such properties, and participate in the resolution of adverse effects.” Following over 2 years of consultation with 23 tribes, the NRC staff provided an opportunity for all interested tribes to conduct a field survey on the entire 4,282 ha [10,580 ac] of the proposed project area (NRC, 2013). Seven tribes (Cheyenne and Arapaho, Northern Arapaho, Northern Cheyenne, Crow Creek Sioux, Crow Nation, Santee Sioux, and Turtle Mountain) participated in the field survey between April 2013 and May 2013. To date, three tribes (Cheyenne and Arapaho, Northern Cheyenne, and Northern Arapaho) have submitted reports to the staff documenting sites identified as having religious and cultural importance and recommending avoidance/mitigation strategies. The NRC staff also has gotten field notes from the Crow Nation not including eligibility determination and recommended mitigation strategies. The NRC staff documented this additional input from the tribes in the final SEIS at Section 3.9.3.2.2. The NRC staff also considered this additional tribal input in the assessment of impacts to historic and cultural resources in the final SEIS at Section 4.9.1.*

*No additional changes were made to the SEIS beyond the information provided in this response.*

#### **E5.24.2 Area of Potential Effect**

##### **Comment: 014-000001**

The commenter (SD SHPO) stated that it appears from the draft report that NRC has not fully identified the area of potential effects (APE). The commenter pointed out that 36 CFR Part 800.16(d) defines APE as “the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The area of potential effects is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking.” The commenter stated that the indirect effects of the project need to be addressed.

**Response:** *NRC acknowledges that in accordance with the provisions of the NHPA, NRC is required to make a reasonable effort to identify historic properties in the APE. As described in SEIS Section 3.9, the APE for the review of the proposed Dewey-Burdock ISR Project is the area that may be directly or indirectly impacted by the construction, operation, aquifer restoration, and decommissioning of the proposed action. The APE for the proposed project coincides with the extent of potential ground disturbance resulting from proposed facility construction and operational activities. The project area may also be subject to visual and auditory effects.*

*The extent of the APE for facility construction and operations will depend on the disposal option used at the proposed project to dispose of liquid waste. As described in SEIS Section 2.1.1.1.2.4, the applicant plans to dispose of liquid wastes generated during uranium recovery operations through deep injection wells, land application, or a combination of both methods. The APE for facility construction and operations for all the liquid waste disposal*

options totals 1,067 ha [2,637 ac] (Figure 3.9-1). This area includes a 969-ha [2,394-ac] buffer zone surrounding 98.3-ha [243-ac] of projected areas for the plant facilities, wellfields, ponds, roads, and pipelines. If land application is used for liquid waste disposal, the APE for facility construction and operations will include an additional maximum area of approximately 506 ha [1,250 ac] surrounding proposed land application areas (Figure 3.9-1). Text and a figure were added to appropriate sections of the final SEIS to fully identify the APE for facility construction and operations.

*In addition to considering the effects of facility construction and operations on historic properties, 36 CFR 800.5(a)(1) requires that federal agencies consider indirect effects, such as visual and auditory intrusions. To satisfy Section 106 review requirements, NRC conducted an assessment of the proposed project's visual and auditory effects on historic properties. This assessment obtained information about the location and historic significance of all known historic properties located within a 4.8-km [3-mi] radius of the tallest buildings within the proposed central and satellite processing facilities at the Dewey-Burdock site. The potential effects of visual and auditory intrusions associated with project construction and operation were considered for each property where aspects of setting contribute to the property's historic significance. A line-of-sight analysis was performed to assess visual effects. Other existing environmental factors, such as auditory effects, were also evaluated as part of this assessment. Results of the visual and auditory effects assessment are presented in final SEIS Sections 3.9.3.3 and 4.9.1, and NRC staff considered this information in its assessment of impacts to historic and cultural resources at Section 4.9.1 of the final SEIS.*

*No additional changes were made to the SEIS beyond the information provided in this response.*

**Comment: 014-000002**

The commenter (SD SHPO) stated that it is its understanding that the NRC has not completed the identification of historic properties. The commenter noted that without defining the APE, it is difficult to know whether NRC is making a reasonable and good faith effort to carry out identification efforts.

**Response:** *As discussed in SEIS Section 1.7.3.5, efforts to identify and evaluate properties of religious and cultural significance to tribes were completed and these results are presented in SEIS Sections 3.9.3.2.2 and 4.9.1, Section 106 consultation is ongoing concerning avoidance and mitigation measures to be undertaken; discussions are underway to prepare a Programmatic Agreement (PA) to resolve these outstanding issues. As part of the consultation, NRC interacted with BLM, SD SHPO, and the tribes on various issues arising under Section 106 of the NHPA, including site surveys to identify historic properties directly affected by ISR activities. The survey approach adopted for the Dewey-Burdock project offered tribes access to the entire 4,282-ha [10,580-ac] project area. However, as described previously, the APE for facility construction and operations coincides with the extent of potential ground disturbance resulting from proposed project activities and will depend on the disposal option used to dispose of treated wastewater. For the Class V injection well disposal option, the APE for facility construction and operations totals 1,067 ha [2,637 ac]. For the land application disposal option, the APE for facility construction and operations includes an additional area of approximately 506 ha [1,250 ac] surrounding the proposed land application areas. Text and a figure were added to appropriate sections of the final SEIS to fully identify the APE for facility construction and operations.*

*Following over 2 years of consultation with 23 tribes, the NRC staff provided an opportunity for all interested tribes to conduct a field survey on the entire 4,282 ha [10,580 ac] of the proposed project area (NRC, 2013). Seven tribes (Cheyenne and Arapaho, Northern Arapaho, Northern Cheyenne, Crow Creek Sioux, Crow Nation, Santee Sioux, and Turtle Mountain) participated in the field survey between April 2013 and May 2013. To date, three tribes (Cheyenne and Arapaho, Northern Cheyenne, and Northern Arapaho) have submitted reports to the staff documenting sites identified as having religious and cultural importance and recommending avoidance/mitigation strategies. The NRC staff also has gotten field notes from the Crow Nation not including eligibility determination and recommended mitigation strategies. The NRC staff documented this additional input from the tribes in the final SEIS at Section 3.9.3.2.2. The NRC staff also considered this additional tribal input in the assessment of impacts to historic and cultural resources in the final SEIS at Section 4.9.1.*

*All consulting parties have agreed that further consultation is required to address survey efforts for identifying properties indirectly affected by ISR activities. As noted in SEIS Section 1.7.3.5, the ISR activities may indirectly impact properties beyond the proposed license area. To satisfy Section 106 review requirements under 36 CFR 800.5(a)(1), which requires that federal agencies consider indirect effects, NRC conducted an assessment of the proposed project's visual and auditory effects on historic properties. This assessment obtained information about the location and historic significance of all known historic properties located within a 4.8-km [3-mi] radius of the tallest buildings within the proposed central and satellite processing facilities at the Dewey-Burdock site. The potential effects of visual and auditory intrusions associated with project construction and operation were considered for each property where aspects of setting contribute to the property's historic significance. A line-of-sight analysis was performed to assess visual effects. Other existing environmental factors, such as auditory effects, were also evaluated as part of this assessment. Results of the visual and auditory effects assessment are presented in final SEIS Sections 3.9.3.3 and 4.9.1, and NRC staff considered this information in its assessment of impacts to historic and cultural resources at Section 4.9.1 of the final SEIS.*

*No additional changes were made to the SEIS beyond the information provided in this response.*

**Comment: 014-000003**

The commenter (SD SHPO) stated that until the APE is adequately defined and a reasonable and good faith effort is made to identify historic properties, it is unclear whether the mitigation measures identified in the document are adequate. The commenter further stated that it is unclear whether the mitigation measures were developed in consultation with identified consulting parties pursuant to 36 CFR 800.8(c)(1)(v).

**Response:** *As discussed in SEIS Section 1.7.3.5, consultation involving NRC, the applicant, SD SHPO, BLM, and Indian tribes is being conducted to determine (i) whether significant historic properties of significance to Indian tribes are present, and (ii) whether properties will be disturbed by site activities. Consultation continues on what mitigation measures should be implemented. Prior to construction, an agreement between NRC, SD SHPO, BLM, ACHP, interested Native American tribes, the applicant, and other interested parties is being developed in accordance with 36 CFR 800.14(b)(2). The agreement will outline the mitigation process for each affected resource identified at the site pursuant to 36 CFR 800.8(c)(1)(v).*

*The survey approach adopted for the Dewey-Burdock project offered tribes access to the entire 4,282-ha [10,580-ac] project area. However, as described previously, the APE for facility construction and operations coincides with the extent of potential ground disturbance resulting from proposed project activities and will depend on the disposal option used to dispose of treated wastewater. For the Class V injection well disposal option, the APE for facility construction and operations totals 1,067 ha [2,637 ac]. For the land application disposal option, the APE for facility construction includes an additional area of approximately 506 ha [1,250 ac] surrounding the proposed land application areas. Text and a figure were added to appropriate sections of the final SEIS to fully identify the APE for facility construction and operations.*

*Following over 2 years of consultation with 23 tribes, the NRC staff provided an opportunity for all interested tribes to conduct a field survey on the entire 4,282 ha [10,580 ac] of the proposed project area (NRC, 2013). Seven tribes (Cheyenne and Arapaho, Northern Arapaho, Northern Cheyenne, Crow Creek Sioux, Crow Nation, Santee Sioux, and Turtle Mountain) participated in the field survey between April 2013 and May 2013. To date, three tribes (Cheyenne and Arapaho, Northern Cheyenne, and Northern Arapaho) have submitted reports to the staff documenting sites identified as having religious and cultural importance and recommending avoidance/mitigation strategies. The NRC staff also has gotten field notes from the Crow Nation not including eligibility determination and recommended mitigation strategies. The NRC staff documented this additional input from the tribes in the final SEIS at Section 3.9.3.2.2. The NRC staff also considered this additional tribal input in the assessment of impacts to historic and cultural resources in the final SEIS at Section 4.9.1.*

*As further discussed in SEIS Section 1.7.3.5, all consulting parties agreed consultation addressing survey efforts for identifying properties indirectly affected by ISR activities would be conducted. As noted in SEIS Section 1.7.3.5, the ISR activities may indirectly impact properties beyond the proposed license area. To satisfy Section 106 review requirements under 36 CFR 800.5(a)(1), which requires that federal agencies consider indirect effects, NRC conducted an assessment of the proposed project's visual and auditory effects on historic properties. This assessment obtained information about the location and historic significance of all known historic properties located within a 4.8-km [3-mi] radius of the tallest buildings within the proposed central and satellite processing facilities at the Dewey-Burdock site. The potential effects of visual and auditory intrusions associated with project construction and operation were considered for each property where aspects of setting contribute to the property's historic significance. A line-of-sight analysis was performed to assess visual effects. Other existing environmental factors, such as auditory effects, were also taken into account as part of this assessment. Results of the visual and auditory effects assessment are presented in final SEIS Sections 3.9.3.3 and 4.9.1, and NRC staff considered this information in its assessment of impacts to historic and cultural resources at Section 4.9.1 of the final SEIS.*

*No additional changes were made to the SEIS beyond the information provided in this response.*

### **E5.24.3 Traditional Cultural Properties**

#### **Comment: 014-000005**

The commenter (SD SHPO) pointed out that in SEIS Section 3.9.3, it is unclear whether "tribal historic sites" refers to precontact archaeology sites, places of religious and cultural

significance, or traditional cultural properties. The commenter recommended using the terms defined in 36 CFR 800.16.

**Response:** *NRC acknowledges that the term “tribal historic sites” is inconsistent with language used in 36 CFR Part 800 (Protection of Historic Properties). Reference to “tribal historic sites” in final SEIS Section 3.9.4 was changed to “places of religious and cultural significance.”*

**Comment: 014-000006**

The commenter (SD SHPO) stated that the document referred to in draft SEIS Section 3.14 titled “Overview of Places of Traditional and Cultural Significance, Cameco/PowerTech Project Areas,” by SRI Foundation should be made available to the consulting parties identified in 36 CFR 800.2.

**Response:** *The document titled “Overview of Places of Traditional and Cultural Significance, Cameco/PowerTech Project Areas,” by SRI Foundation is available on ADAMS (<http://www.nrc.gov/reading-rm/adams.html>) using accession number ML12262A113, as listed in SEIS Section 3.14 (References). It is available to all participants in the Section 106 consultation process.*

**E5.24.4 National Register for Historic Places Recommendations and Mitigation**

**Comment: 014-000007**

The commenter (SD SHPO) noted mitigation described in SEIS Section 4.9.1.1.1 that includes fencing known historic sites and making their locations known to employees is not recommended.

**Response:** *NRC acknowledges that applicant-proposed mitigation that includes fencing known historic sites and making their locations known to employees is not recommended. Text indicating that the applicant will fence known historic properties and make their locations known to employees was removed from SEIS Section 4.9.1.1.1.*

**Comment: 014-000008**

The commenter (SD SHPO) concurred with the following recommendation in draft SEIS Tables 4.9-1, 4.9-2, and 4.9-3.

- Properties 39CU271, 39CU0577, 39CU0578, 39CU0584, 39CU0586, 39CU0588, 39CU0590, 39CU0593, 39CU2733, 39CU2735, 39CU2738, 39CU3592, and 39FA1941 should be considered eligible for listing on the National Register for Historic Places (NRHP) for Criterion D.
- Property CU-025-00002 should be considered eligible for listing on the NRHP for Criterion A.
- Property 39CU2000/39FA2000 should be considered eligible for listing on the NRHP for Criteria A and C.



- The Edna and Ernest Young Ranch and Bakewell Ranch are both listed on the NRHP
- Properties 39FA0096, 39FA0778, 39FA1862, 39FA1863, 39FA1881, 39FA1890, 39FA1902, 39FA1920, 39FA1927, 39CU0530, 39CU3564, 39CU3587, 39CU3620, and 39CU3624 have not been evaluated for listing on the NRHP and are considered unevaluated for listing on NRHP.

The commenter (SD SHPO) did not concur with the following recommendation in SEIS Table 4.9-2.

- Property 39CU3584 should be considered unevaluated for listing on the NRHP until all of the NRHP criteria have been applied.

**Response:** *NRC acknowledges that the SD SHPO concurs with the recommendations in draft SEIS Tables 4.9-1, 4.9-2, and 4.9-3 with the exception of property 39CU3584 in draft SEIS Table 4.9-2. NRC agrees with SD SHPO that 39CU3584 should be considered unevaluated for listing on the NRHP. Text was revised in Table 4.9-2 and SEIS Section 4.9.1.2.1 to indicate that site 39CU3584 will be considered unevaluated until all the NRHP criteria for the site have been determined.*

**Comment: 042-000003**

The commenter stated that the Northern Cheyenne Tribe has reviewed numerous documents provided by NRC that factually indicate at least 18 historic sites listed in the NRHP or eligible for listing are in the ISR project area. The commenter stated that there also exist unevaluated historic burial sites and many other unevaluated sites within the project area.

**Response:** *NRC acknowledges that at least 18 historic sites listed in the NRHP or eligible for listing have been identified within the ISR project area. Identification of these sites was made prior to submission of a license application as part of the historic and cultural surveys (see SEIS Section 4.9.1). NRC acknowledges that unevaluated historic burial sites and many other unevaluated sites have been identified within the project area (see draft SEIS Section 4.9.1 and Tables 4.9-2 and 4.9-3). Recommended measures to mitigate impacts to unevaluated historic burials and other unevaluated sites are described in draft SEIS Section 4.9.1.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comment: 131-000004**

The commenter (Standing Rock Sioux Tribe) stated decision makers should be aware that reliance on mitigation strategies is misleading at best. When it comes to cultural resources of significance to tribes, mitigation of affected resources is much easier said than done and tribal representatives have concerns that as with the identification of cultural resources, the agency and applicant have in their planning also underestimated this challenge as well. The commenter stated that mitigation strategies have not yet been discussed let alone agreed upon. The commenter objected to the archeological approaches to mitigation alluded to in the draft SEIS when it comes to resolving adverse effects to historic resources. These mitigation measures involve things such as data recovery and testing through excavation, which do not address or alleviate the loss of the historic resources valued by tribal communities and

individuals. Instead these mitigation measures contribute to the misrepresentation, exploitation, and degradation of tribal cultural beliefs and practices.

**Response:** *As discussed in draft SEIS Section 1.7.3.5, consultation involving NRC, the applicant, SD SHPO, BLM, and interested Indian tribes is being conducted to determine (i) whether historic properties of significance to Indian tribes are present, and (ii) whether historic properties will be disturbed by site activities. Consultation continues on what mitigation measures should be implemented to protect historic properties. Consultation on programmatic agreement between NRC, SD SHPO, BLM, ACHP, interested Native American tribes, the applicant, and other interested parties is being developed in accordance with 36 CFR 800.14(b)(2). The agreement will outline the mitigation process for affected resources identified at the site pursuant to 36 CFR 800.8(c)(1)(v). In general, the least intrusive mitigation measures are undertaken to protect cultural and historic resources. Native American tribes typically recommend avoidance of areas of religious and cultural significance to tribes and NRC and the applicant are committed to protecting by avoidance wherever possible.*

*As described in draft SEIS Section 3.9.2.1, unevaluated archaeological sites identified during field investigations conducted prior to submission of the license application will undergo archaeological testing and mitigation, where appropriate, prior to ground-disturbing activities. Testing includes data recovery and excavation and will be conducted to determine site eligibility for the NRHP. In general, the least intrusive mitigation measures are undertaken to protect cultural and historic resources. Native American tribes typically recommend avoidance of areas of religious and cultural significance to tribes and NRC and the applicant are committed to protecting by avoidance wherever possible.*

*No additional changes were made to the SEIS in response to this comment.*

#### **E5.24.5      References**

36 CFR Part 60. *Code of Federal Regulations, Title 36, Parks, Forests, and Public Property, Part 60, Section 4. "Criteria for Evaluation."* Washington, DC: U.S. Government Printing Office.

36 CFR Part 800. *Code of Federal Regulations, Title 36, Parks, Forests, and Public Property, Part 800. "Protection of Historic Properties."* Washington, DC: U.S. Government Printing Office.

NRC (U.S. Nuclear Regulatory Commission). "Transmittal of Letter to the THPOs for the Proposed Dewey-Burdock Project." ML13039A336. Email to Tribal Historic Preservation Officers. Washington, DC: NRC. 2013.

NRC. "Letter (March 4) Invitations for Formal Consultation Under the Section 106 of the National Historic Preservation Act to Crow Tribe (ML110550535), Ponca Tribe (ML110550372), and Santee Sioux Tribe (ML110550172)." Washington, DC: NRC. 2011.

NRC. "Request for Additional Information Regarding Tribal Historic and Cultural Resources Potentially Affected by the Powertech (USA) Inc. Proposed Dewey-Burdock *In-Situ* Recovery Facility." ML100331999. Washington, DC: NRC. March 19, 2010a.

NRC. Letter (September 10) “Invitations for Formal Consultation Under the Section 106 of the National Historic Preservation Act to Cheyenne River Sioux Tribe (ML102520239), Crow Creek Sioux Tribe (ML102520156), Eastern Shoshone Tribe (ML102520553), Flandreau-Santee Sioux Tribe (ML102520194), Lower Brule Sioux Tribe (ML102520220), Lower Sioux Indian Community (ML102520486), Mandan, Hidatsa, and Arikara Nation (ML102520368), Northern Arapaho Tribe (ML102520520), Northern Cheyenne Tribe (ML102520504), Rosebud Sioux Tribe (ML102520282), Sisseton-Wahpeton Oyate (ML102520298), Spirit Lake Tribe (ML102520393), Standing Rock Sioux Tribe (ML102520308), Yankton Sioux Tribe (ML102520319), and Oglala Sioux Tribe (ML102520395).” Washington, DC: NRC. 2010b. Powertech [Powertech (USA) Inc.]. “Dewey-Burdock Project, Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota—Technical Report.” Docket No. 040-09075. ML092870160. Greenwood Village, Colorado: Powertech. August 2009b.

## **E5.25 Visual and Scenic**

### **Comment: 005-000001**

The commenter was concerned about the proposed project in western South Dakota and its potential negative impact on the beauty of the area.

**Response:** *Potential impacts to visual and scenic resources from construction, operation, aquifer restoration, and decommissioning of the proposed project are presented in SEIS Section 4.10. As discussed in this section, impacts to visual and scenic resources will come primarily from the use of equipment such as drill rigs; dust and other emissions from such equipment; and land clearing and grading associated with construction of processing buildings and access roads. Based on the remote location of the proposed project site, the short-term nature of construction activities (1 to 2 years), and the mitigation measures, such as dust suppression, that will be used to reduce potential visual and scenic impacts, the NRC staff concluded in the draft SEIS that visual and scenic impacts from ISR facilities and equipment will be SMALL. Furthermore, once decommissioning and reclamation activities are complete, the visual landscape will be returned to preoperational conditions.*

*No change was made to the SEIS beyond the information provided in this response.*

### **Comment: 128-000020**

The commenter stated that center pivot irrigation systems are common in western South Dakota and suggested that the common use of these systems effectively mitigates their potential impact on visual and scenic resources.

**Response:** *As described in SEIS Section 4.10.1.2, center pivot irrigation systems in the Dewey area of the proposed project site will be visible to travelers along Dewey Road if land application is used for liquid waste disposal. Potential environmental impacts of the proposed project are based on site-specific conditions. Therefore, if visible to nearby residents or travelers, center pivot irrigations systems will have a potential impact on visual and scenic resources. The common use of these systems in western South Dakota does not mitigate their potential impact on visual and scenic resources at the proposed project site.*

*No change was made to the SEIS beyond the information provided in this response.*

## **E5.26 Socioeconomics**

### **Comments: 006-000005; 061-000015**

One commenter stated that the applicant cannot guarantee 80–100 jobs to only residents of South Dakota or that the mining will continue for 10–20 years. Another commenter stated that the draft SEIS provides inaccurate information on the source of project workers. The commenter stated the draft SEIS says that workers will come from nearby towns in Fall River and Custer Counties and from Newcastle, Wyoming. The commenter stated the applicant has said that most of the jobs will be appropriate for graduates of the South Dakota School of Mines in Rapid City. The commenter stated further that most people in the counties noted in the draft SEIS do not have college degrees, much less degrees in engineering and chemistry. The commenter stated that the agency needs to do more research and provide accurate information on where project workers will come from.

**Response:** *The NRC acknowledges there is no guarantee that jobs created at the Dewey-Burdock facility will be filled only by South Dakota or Wyoming residents or that the facility, if licensed, will operate for 20 years. However, due to the types of skilled and unskilled employees needed, it is expected that jobs will be filled locally. The projected schedule for construction, operation, aquifer restoration, and decommissioning activities for the proposed project is shown in SEIS Figure 2.1-1. As described in SEIS Section 4.11.1, the applicant expects to directly employ 86 workers during the 1-to-2 year construction phase and 84 workers during the 8-year operations phase of the proposed project (Powertech, 2009). The construction workforce will be made up predominantly of skilled trades (e.g., carpenters, electricians, welders, plumbers) and unskilled workers sourced from nearby communities and counties. As described in SEIS Section 4.11.1.2.1, because of the highly technical nature of ISR operations (requiring professionals in the areas of health physics, chemistry, laboratory analysis, geology and hydrogeology, and engineering), the majority (approximately 70 percent) of the workforce during operations is expected to be staffed from outside the region (NRC, 2009). Fewer workers are expected to be involved in aquifer restoration and decommissioning activities (Powertech, 2010). The applicant expects nine workers to be directly involved in aquifer restoration activities and nine workers to be directly involved in decommissioning activities. Because aquifer restoration and decommissioning will be short term [i.e., extending a combined 6 to 7 years after operations cease (Powertech, 2009)], workers performing aquifer restoration and decommissioning activities will likely be sourced from the operations phase workforce and any additional workers will likely be drawn from the local area.*

*No change was made to the SEIS beyond the information provided in this response.*

### **Comments: 128-000021; 128-000077; 128-000215; 128-000222; 128-000233**

The commenter questioned the conclusion that the positive impacts on local finance will be SMALL during the operations phase of the proposed project (see SEIS Section 4.11.1.2.5). The commenter stated that by making reasonable assumptions regarding the price of yellowcake and considering the counties' share of severance taxes, sales and use taxes, and property taxes on production and facilities, it is likely that beneficial impacts on local taxes and employment will at least meet the draft SEIS definition of MODERATE (i.e., sufficient to alter noticeably, but not destabilize, important attributes of the local economy). The commenter stated further that certainly these impacts will be more than SMALL (i.e., effects are not

detectable or so minor that they will neither destabilize nor noticeably alter any important attribute of the local economy).

**Response:** *NRC reassessed the magnitude of beneficial impacts on local finance that the proposed project will have on Custer and Fall River Counties. Based on consideration of the size of the operations workforce in relation to the total labor forces in Custer and Fall River Counties (see SEIS Section 3.11.4), the price of yellowcake, and the share of severance taxes, sales and use taxes, and property taxes on production and facilities that will be collected and returned to Custer and Fall River Counties, NRC concludes that the impacts on local finance during ISR operations will be positive and SMALL to MODERATE. Text was revised throughout the SEIS to indicate that the impact on local finance during ISR operations will be positive and SMALL to MODERATE.*

**Comment: 128-000075**

The commenter suggested adding a discussion of the potential benefits that would not occur under the No-Action alternative. These include job creation; contribution to local, regional, and state revenues; and contribution toward domestic energy independence.

**Response:** *NRC acknowledges the comment. Text has been added to SEIS Section 4.11.2 to reflect the commenter's suggestion.*

**Comment: 128-000234**

The commenter questioned the statement in SEIS Section 5.12 that resource extraction is one of the two primary economic bases in Custer and Fall River Counties. The commenter pointed out that SEIS Section 3.11.4 describes how the largest employment sector for these two counties is government, and the largest private sector employment involves leisure-hospitality-trade-transportation-utilities and education-health services.

**Response:** *NRC acknowledges that resource extraction is not a primary economic base in Custer and Fall River Counties. Text was revised in SEIS Section 5.12 to state that the economic base of the study area includes ranching, government, tourism, and resource extraction.*

**E5.26.1 References**

NRC (U.S. Nuclear Regulatory Commission). NUREG–1910, “Generic Environmental Impact Statement for *In-Situ* Leach Uranium Milling Facilities.” ML091480244, ML091480188. Washington, DC: NRC. May 2009.

Powertech [Powertech (USA) Inc.]. “Dewey-Burdock Project, Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota ER\_RAI Response August 11, 2010.” ML102380516. Greenwood Village, Colorado: Powertech. 2010.

Powertech. “Dewey-Burdock Project, Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota—Environmental Report.” Docket No. 040-09075. ML092870160. Greenwood Village, Colorado: Powertech. August 2009.

## **E5.27 Environmental Justice**

### **E5.27.1 Impacts to Native American Tribes**

**Comments: 002-000001; 052-000003; 132-000003; 136-000007**

Several commenters stated that it is of interest that the potentially dangerous and environmentally devastating uranium mine is proposed where the greatest danger would be posed to the nearby Native American population, which has little voice, resources to adequately evaluate risks, and little or no chance of any economic benefit. The commenters stated further that if long-term damage or danger exists, this population has limited access to media and few resources to adequately combat exploitation and depredation of its land and health. Another commenter stated that the Dewey-Burdock proposal raises essential questions of fairness about its siting and location, as the SEIS failed to consider alternative locations, but does consider instead the permanent burial of radioactive waste at a site held sacred by indigenous people.

**Response:** *The NRC is not responsible for siting potential ISR facilities or other licensed facilities. Private companies interested in uranium recovery identify locations for potential ISR facilities based on the presence of uranium orebodies. As described in SEIS Section 1.7.3.5, the NRC staff is consulting with Native American groups as part of the NEPA process and the NHPA Section 106 historical and cultural process for the proposed Dewey-Burdock ISR Project. As an independent regulatory agency, NRC is specifically exempted from the provisions of Executive Order 13175, "Consultation and Coordination with Indian Tribal Governments." However, the NRC exercises its regulatory authority in a manner consistent with the fundamental precepts expressed in Executive Order 13175 and has adopted agency practices that ensure consultation and cooperation with Indian tribal governments. The NRC also complies with the NHPA Section 106 regulatory requirements in 36 CFR Part 800 regulations that require federal agencies to consult with federally recognized tribes before making a decision on a federal undertaking. To fulfill its obligation under NEPA and Section 106 of the NHPA, the NRC consults with tribal governments that have an interest in, or may be affected by NRC regulatory actions. Consultations include government-to-government meetings between tribal and NRC leadership and between tribal staffs and NRC staff; issues addressed include the ISR licensing process, the development of the SEIS, the identification and evaluation of places of religious and cultural significance to Indian tribes, and mitigation strategies to protect these sites under Section 106 of the NHPA.*

*The SEIS used CEQ guidance to assess whether the proposed project might cause disproportionately high and adverse human health or environmental effects on minority and low-income populations, including Native American tribes (CEQ, 1997). Based on the information and the analysis of human health and environmental impacts presented in SEIS Section 4.12, NRC concludes in the SEIS that minority and low-income populations will not be subject to disproportionately high and adverse impacts from the construction, operations, and decommissioning of the proposed ISR facility and aquifer restoration at the Dewey-Burdock site. While certain Native Americans may have a heightened interest in cultural resources potentially affected by the proposed action, the impacts to Native Americans in this and other areas are not expected to be disproportionately high or adverse.*

*Text was added to SEIS Section 1.7.3.5 to document NHPA Section 106 consultation activities since the draft SEIS was issued in November, 2012.*

**Comment: 042-000002**

The commenter noted the Northern Cheyenne Tribe is concerned that the proposed action could have significant disproportionate impact to the tribe and its members, and urged NRC to thoroughly evaluate and mitigate potential adverse impacts. The commenter pointed out that disproportionate impacts are likely because the tribe's nearby land around Bear Butte, in Meade County, South Dakota, and the burial sites for Northern Cheyenne people killed in the January 9, 1879 "outbreak" from Fort Robinson (near Chadron, Nebraska) are within the 10,580 ac in the proposed ISR project area.

**Response:** *The SEIS used CEQ guidance to assess whether the proposed project might cause disproportionately high and adverse human health or environmental effects on minority and low-income populations, including Native American tribes (CEQ, 1997). Based on the information and the analysis of human health and environmental impacts presented in SEIS Section 4.12, NRC concludes in the SEIS that minority and low-income populations will not be subject to disproportionately high and adverse impacts from the construction, operations, and decommissioning of the proposed ISR facility and aquifer restoration at the Dewey-Burdock site. While certain Native Americans may have a heightened interest in cultural resources potentially affected by the proposed action, the impacts to Native Americans in this and other areas are not expected to be disproportionately high or adverse.*

*With regard to potential impacts on tribal land around Bear Butte, in Meade County, South Dakota, Bear Butte is located more than 100 km [62 mi] north-northeast of the proposed project site. Because of its distance from the proposed project site, no disproportionately high or adverse impacts to Native Americans residing on tribal lands around Bear Butte are expected.*

*With regard to impacts on burial sites for Northern Cheyenne people killed in the 1879 "outbreak" from Fort Robinson, the NRC staff offered all interested tribes the opportunity to conduct a field survey within the proposed project boundary in order to identify properties of religious and cultural significance to them (see SEIS Section 1.7.3.5). The Northern Cheyenne Tribe was one of the seven tribes that took part in this field survey. Under the terms of the survey, the participating tribes committed to submitting reports with their findings and their recommendations for avoidance or mitigation of sites. The NRC staff considered all sites identified by the Northern Cheyenne Tribe and the other tribes that participated in the survey when the staff made its cultural resource impact determination, which is found in SEIS Section 4.9.1.*

*Text was added to SEIS Section 1.7.3.5 to document NHPA Section 106 consultation activities since the draft SEIS was issued in November, 2012.*

**Comment: 044-000001**

The commenter was concerned about environmental justice and the effects of the *in-situ* leach mining. The commenter noted that the Black Hills is sacred to Native Americans and its impact on them is a primary concern.

**Response:** *The SEIS used CEQ guidance to assess whether the proposed project might cause disproportionately high and adverse human health or environmental effects on minority and low-income populations, including Native American tribes (CEQ, 1997). Based on the*

*information and the analysis of human health and environmental impacts presented in SEIS Section 4.12, NRC concludes in the SEIS that minority and low-income populations, including Native American tribes, will not be subject to disproportionately high and adverse impacts from the construction, operations, and decommissioning of the proposed ISR facility and aquifer restoration at the Dewey-Burdock site.*

*As further discussed in SEIS Section 4.12, Native American tribes in the Black Hills region believe that preserving and maintaining access to sacred lands is essential to both cultural and spiritual aspects of traditional Native American societies of the northern plains. The identification and evaluation of places of religious and cultural significance to Native American tribes within the proposed Dewey-Burdock ISR Project area is addressed through the NHPA Section 106 consultation process (see SEIS Sections 1.7.3.5 and 4.9.1). Mitigation measures to minimize adverse impacts to cultural and historic resources are being developed in consultation with the applicant, NRC, SD SHPO, ACHP, Native American tribes (tribal government or designated THPO), and other government agencies (e.g., BLM). In general, the least intrusive mitigation measures are undertaken to protect cultural and historic resources. Native American tribes typically recommend avoidance of areas of religious and cultural significance to tribes and NRC and the applicant are committed to protecting by avoidance wherever possible.*

*Text was added to SEIS Section 1.7.3.5 to document NHPA Section 106 consultation activities since the draft SEIS was issued in November, 2012.*

**Comment: 020-000001**

The commenter stated that the project is proposed for an area that is of great cultural significance to a stakeholder group (Native American tribes) that has been notoriously excluded from government decisions. The commenter stated that the “SMALL” designation would not be supported by many of the people who live on nearby reservations and who were forced out of the sacred lands surrounding the proposed project. The commenter further stated that because of historical exclusion, it is ethically essential that the agency proactively engage in a more thorough discussion with affected groups, rather than relying on “comment periods.”

**Response:** *The NRC recognizes the importance of its obligation to consult with Indian tribes on places of religious and cultural significance to tribes. The NRC invited and considered the comments made on this topic by tribes and the public on these places; however, our efforts extended beyond receiving and considering information during the comment period. The NRC staff consulted with 23 federally-recognized tribes since the staff began review of the proposed Dewey-Burdock ISR Project license application in 2009 (see SEIS Section 1.7.3.5). The NRC staff's outreach efforts to date are discussed in SEIS Section 1.7.3.5 and SEIS Appendix A. As part of the consultation under Section 106 of the NHPA, the staff held three face-to-face meetings and three teleconferences with tribal representatives. In April – May 2013, interested tribes conducted a month long pedestrian field survey to identify and evaluate sites and assess potential impacts to sites of religious and cultural importance. The NRC staff completed its evaluation of identified sites and assesses impacts to historic and cultural resources and documented its findings at SEIS Section 4.9.1. The NRC continues to work closely with all interested tribes in the preparation of a PA to address avoidance and mitigation measures.*

*Text was added to SEIS Section 1.7.3.5 to document NHPA Section 106 consultation activities since the draft SEIS was issued in November 2012.*



**Comment: 080-000003**

The commenter stated that the Oglala Sioux Tribal Council has not been given sufficient time to make a proper environmental impact assessment. The commenter stated that this is a violation of human rights, personal and tribal property, and EPA regulations against South Dakota, Oglala Lakotans, and Americans by disregarding their respective rights to make decisions over their sovereign, personal, and common lands.

**Response:** *The Oglala Sioux Tribe submitted comments to NRC on the draft SEIS for the proposed Dewey-Burdock ISR Project on January 15, 2013 (Adams Accession No. ML13032A215; comment document number 127 in Tables E3-1 and E3-2). NRC staff reviewed and addressed fully the comments made by Oglala Sioux Tribal Council. Revisions to the SEIS were made to respond to these comments.*

*Since December 2009 when the staff first visited the proposed project area to meet with federal, state, tribal, and local agencies (NRC, 2009b), the staff has extended an invitation to the Oglala Sioux Tribe in order to hear the tribe's concerns regarding the proposed project and its potential impacts to religious and cultural properties important to northern plain tribes. Over the last 3 years, the staff consulted with the Oglala Sioux Tribe as well as other northern plain tribes that are either interested in or could be affected by the proposed project. Throughout the consultation process, the staff has discussed and disseminated information concerning the staff's ongoing environmental reviews. For example, in June 2011, the staff held its first face-to-face meeting with all interested tribes, including the Oglala Sioux (see SEIS Section 1.7.3.5). At this meeting, the staff discussed (i) the NRC regulatory process, (ii) the in-situ uranium recovery process, (iii) the area where the proposed project will take place, and (iv) the results of the applicant's archeological survey. The staff also provided an opportunity for the tribes to visit the site so that they can see firsthand where the proposed facility would be built in relation to the Black Hills National Forest (BHNF). Since its first fact-to-face meeting, the staff has had numerous exchanges via letters, email, phone calls, and additional face-to-face meetings with all interested tribes, including the Oglala Sioux. During these exchanges the staff continuously sought information from the tribes that could help the staff with its environmental impact assessment, including impacts to cultural and historic resources that are important to the tribes.*

*The identification and evaluation of places of religious and cultural significance to Native American tribes within the proposed Dewey-Burdock ISR Project area is being addressed through the NHPA Section 106 consultation process as described in SEIS Sections 1.7.3.5 and 4.9.1. As discussed in SEIS Section 1.7.3.5, consultation involving NRC, the applicant, SD SHPO, BLM, and interested Indian tribes is being conducted to determine (i) whether cultural and historic resources of properties of religious and cultural significance significant properties are present, (ii) whether the proposed site activities will have a significant impact on these resources, and (iii) what mitigation measures can be implemented to avoid, minimize, or mitigate adverse impacts. Currently the parties are discussing development of a programmatic agreement in accordance with 36 CFR 800.14(b)(2). The agreement will outline the mitigation process for affected resources identified at the site pursuant to 36 CFR 800.8(c)(1)(v)..*

*Text was added to SEIS Section 1.7.3.5 to document NHPA Section 106 consultation activities since the draft SEIS was issued in November, 2012.*

**Comments: 091-000007; 136-000007**

One commenter stated that the Dewey-Burdock proposal raises many troubling implications for the burden it places on minority and low-income populations. The commenter stated that from a national perspective, the legacy of uranium mining and milling has disproportionately burdened Native American populations across the western United States, as most productive deposits were located on Native American lands. Another commenter stated that lessons learned from impacted environmental justice communities that are destined to live with the long-term impacts of air, soil, and groundwater contamination from previous uranium developments can provide NRC with guidance on future regulatory actions needed to protect the public health and safety. The commenter stated further that allowing the project proponent to heap additional adverse impacts on an area that remains subject to legacy contamination of any kind places a disproportionately adverse impact on the region's environmental justice communities.

**Response:** *The SEIS used CEQ guidance to assess whether the proposed project might cause disproportionately high and adverse human health or environmental effects on minority and low-income populations, including Native American tribes (CEQ, 1997). Based on the information and the analysis of human health and environmental impacts presented in SEIS Section 4.12, NRC concludes in the SEIS that minority and low-income populations, including Native American tribes, will not be subject to disproportionately high and adverse impacts from the construction, operations, and decommissioning of the proposed ISR facility and aquifer restoration at the Dewey-Burdock site.*

*In 1978, Congress promulgated statutes requiring cleanup of the abandoned uranium mills and established specific roles for DOE, NRC, and EPA. Since 1978, NRC has regulated uranium recovery (milling) facilities, but the NRC does not have the authority for the regulation of abandoned uranium mine sites. Under the regulatory oversight of the NRC, the ISR and milling industry has avoided the environmental damage associated with legacy sites. NRC staff recognizes there are significant legacy issues resulting from decades of mining and milling activities from the 1940s through the 1970s when waste from uranium mines was not subject to the NRC decommissioning and reclamation requirements that are in force today. The DOE Office of Legacy Management oversees the reclamation of legacy uranium sites and DOE coordinates these activities with the EPA, BLM, and other federal and state agencies. For a more complete description of the legacy issues, see GEIS Appendix G, Section G5.17 (NRC, 2009).*

*No change was made to the SEIS beyond the information provided in this response.*

**Comments: 127-000032; 136-000007**

One commenter stated that additional and serious environmental justice issues are raised by the assumption that these solid 11e.(2) byproduct materials will be sent to San Juan County, Utah. The commenter notes census data show that San Juan County, Utah is composed of 49 percent "American Indian and Native Alaska persons." The commenter also noted that "White persons not Hispanic" only comprise 44.2 percent of San Juan County's population and 29.4 percent of the county population lives below the poverty line. Another commenter noted that the SEIS mentions the possibility of transporting waste for final disposal to the White Mesa mill in Blanding, Utah. The commenter pointed out that this mill is located near a reservation and already places significant burdens and impacts upon a neighboring Native American community in one of the poorest counties in the southwest.

**Response:** NRC acknowledges that the applicant proposes to pursue an agreement with the White Mesa site in San Juan County, Utah, for disposal of solid byproduct material (see SEIS Section 3.13.2). NRC also acknowledges that San Juan County's population is composed of 49 percent American Indian and Native Alaska persons (USCB, 2010). The White Mesa site in Blanding, Utah is an existing conventional mill site that has a tailings disposal area licensed by the State of Utah to accept 11e.(2) byproduct wastes. The amount of solid byproduct material generated by an ISR facility, such as the proposed Dewey-Burdock ISR Project, is only a small fraction of the tailings generated and disposed of at a conventional mill site. In addition, the proposed Dewey-Burdock ISR project would be only one of many ISR projects disposing of solid byproduct material at the White Mesa site. Therefore, the addition of ISR byproduct material from the proposed Dewey-Burdock ISR Project to the White Mesa disposal site is not considered significant. For this reason, NRC does not anticipate significant environmental justice impacts to Native American populations will result from the potential disposal of solid byproduct material from the proposed project at the White Mesa site.

No change was made to the SEIS beyond the information provided in this response.

#### **E5.27.2 Traditional Cultural Properties and Treaty Rights**

**Comments: 008-000007; 029-000007; 035-000001; 041-000004; 048-000006; 051-000003; 057-000002; 072-000004; 095-000001**

Several commenters stated that the SEIS does not acknowledge environmental justice, cultural, and historical concerns that include Lakota treaty rights to the proposed project area and the fact that a number of Native American tribes consider the Black Hills to be sacred. One commenter stated that the Lakota claim treaty rights to the proposed project area, and they, along with the Cheyenne and other indigenous nations, consider the Black Hills to be sacred. Another commenter stated that the project is on land that, by a Supreme Court ruling, belongs to the Native Lakota and they must be given the consideration of their rightful historic and sacred regard for this land. Another commenter stated that the region's history, with topics such as Native Americans, burial sites, and treaty lines needs to be taken into consideration and fully studied.

**Response:** The NRC is aware of the Sioux Nation's continued claim to the lands that were formerly part of the Great Sioux Nation established by the Fort Laramie Treaty of 1868 and the Supreme Court's 1980 ruling on the issue. NRC is also aware that longstanding treaty disputes exist between Native American tribes and the U.S. government. In its role as a regulatory agency, NRC lacks the authority to resolve these issues. These concerns are outside the Dewey-Burdock licensing review. The NRC has undertaken consultation with Native American tribes who hold the Black Hills sacred through the NHPA Section 106 process. The NRC staff has evaluated the impacts to cultural and historical resource while developing the draft SEIS and has presented its preliminary impact assessment in sections 3.9 and 4.9 of the draft SEIS. As required by 36 CFR 800, the staff has consulted and will continue to consult with interested Native American Tribes to determine whether the proposed federal undertaking action will have an impact to historic properties. Section 1.7.3.5 details the staff's interactions thus far with Native American Tribes. No changes to the SEIS are needed based on this comment.

During the Dewey-Burdock environmental review, NRC conducted NHPA consultations with state and Tribal Historic Preservation Offices to take into account whether the proposed ISL facility could affect historic properties. NRC also consulted with affected tribal governments to

*consider topics of concern regarding specific ISL proposals including potentially affected places of cultural significance. As described in the historic and cultural resource sections of SEIS Chapter 3, places of cultural significance can include a variety of religious and cultural uses, including ceremonial activities, shrines, burial grounds, hunting and gathering areas, caves and shelters, springs, trails, and archaeological sites. Draft SEIS Section 3.9.3 discusses the religious and cultural importance of the Black Hills to tribal groups and their descendants, including the Sioux, Cheyenne, and Arapaho tribes.*

*As discussed in SEIS Section 4.12, Native American tribes in the Black Hills region believe that preserving and maintaining access to sacred lands is essential to both cultural and spiritual aspects of traditional Native American societies of the northern plains. The identification and evaluation of places of religious and cultural significance to Native American tribes within the proposed Dewey-Burdock ISR Project area was addressed through the NHPA Section 106 consultation process as described in SEIS Sections 1.7.3.5 and 4.9.1. The NHPA Section 106 review process is outlined in regulations the ACHP issued in 36 CFR Part 800. Mitigation measures to minimize adverse impacts to cultural and historic resources are being developed in consultation with the applicant, NRC, SD SHPO, ACHP, Native American tribes (tribal government or designated THPO), and other government agencies (e.g., BLM). The Section 106 consultation process provides an avenue for potentially affected Native American tribes to become consulting parties with regard to heritage interests related to the proposed project site. Potential impacts to sites of religious or cultural significance to tribes will be reduced through mitigation strategies developed during Section 106 consultations and the preparation of a programmatic agreement.*

*Text was added to SEIS Section 1.7.3.5 to document NHPA Section 106 consultation activities since the draft SEIS was issued in November, 2012.*

**Comments: 010-000004; 136-000005**

One commenter stated that Lakota treaty rights are being ignored. Another commenter stated that the Black Hills are subject to formal treaty rights of the Lakota people under the Fort Laramie Treaty of 1868.

**Response:** *The NRC is aware of the Sioux Nation's continued claim to the lands that were formerly part of the Great Sioux Nation established by the Fort Laramie Treaty of 1868 and the Supreme Court's 1980 ruling on the issue. NRC is also aware that longstanding treaty disputes exist between Native American tribes and the U.S. government. In its role as a regulatory agency, NRC lacks the authority to resolve these issues. These concerns are outside the Dewey-Burdock licensing review. The NRC has undertaken consultation with Native American tribes who hold the Black Hills sacred through the NHPA Section 106 process. The NRC staff evaluated the impacts to cultural and historical resource while developing the draft SEIS and has presented its preliminary impact assessment in sections 3.9 and 4.9 of the draft SEIS. As required by 36 CFR 800, the staff consulted with interested Native American Tribes to determine and assess the impact to historic properties of the proposed federal undertaking action. Section 1.7.3.5 details the staff's interactions thus far with Native American Tribes. Text was added to SEIS Section 1.7.3.5 to document NHPA Section 106 consultation activities since the draft SEIS was issued in November 2012.*

*The NRC staff documented input from the tribes on the identification and evaluation of historic properties in the final SEIS at Section 3.9.3.2.2. NRC staff considered this tribal input in the assessment of impacts to historic and cultural resources in the final SEIS at Section 4.9.1.*

**Comment: 091-000011**

The commenter stated that the SEIS did not discuss the cultural importance of the Black Hills to the Sioux, Cheyenne, and Arapaho Nations, or the impact of an 1868 treaty between these tribal nations and the United States on cultural, land, and water resources in the Black Hills. The commenter stated that the 1868 Fort Laramie Treaty, the United States Constitution, and principles of international law (United Nations Declaration on the Rights of Indigenous Peoples) require a free, prior, and informed consent of the tribal nation signatories to the 1868 Fort Laramie Treaty before this project can be licensed.

**Response:** *The NRC is aware of the Sioux Nation's continued claim to the lands that were formerly part of the Great Sioux Nation established by the Fort Laramie Treaty of 1868 and the Supreme Court's 1980 ruling on the issue. NRC is also aware that longstanding treaty disputes exist between Native American tribes and the U.S. government. In its role as a regulatory agency, NRC lacks the authority to resolve these issues and issues of indigenous peoples under international law. These concerns are outside the Dewey-Burdock licensing review. The NRC has undertaken consultation with Native American tribes who hold the Black Hills sacred through the NHPA Section 106 process. The NRC staff evaluated the impacts to cultural and historical resource while developing the draft SEIS and has presented its preliminary impact assessment in Sections 3.9 and 4.9 of the draft SEIS. As required by 36 CFR 800, the staff has consulted and will continue to consult with interested Native American Tribes to determine whether the proposed federal undertaking action will have an impact to historic properties. Section 1.7.3.5 details the staff's interactions thus far with Native American Tribes.*

*During the Dewey-Burdock environmental review, NRC conducted NHPA consultations with state and Tribal Historic Preservation Offices to take into account whether the proposed ISL facility could affect historic properties. NRC also consulted with affected tribal governments to consider topics of concern regarding specific ISL proposals including potentially affected places of cultural significance. As described in the historic and cultural resource sections of SEIS Chapter 3, places of cultural significance can include a variety of religious and cultural uses including ceremonial activities, shrines, burial grounds, hunting and gathering areas, caves and shelters, springs, trails, and archaeological sites. Draft SEIS Section 3.9.3 discusses the religious and cultural importance of the Black Hills to tribal groups and their descendants, including the Sioux, Cheyenne, and Arapaho tribes.*

*Text was added to SEIS Section 1.7.3.5 to document NHPA Section 106 consultation activities since the draft SEIS was issued in November 2012.*

**Comment: 061-000020**

The commenter stated that the draft SEIS grievously mischaracterizes the environmental justice impacts of the proposed project. The commenter stated that while acknowledging the sacred nature of the Black Hills to the Lakota and other Great Plains peoples, the draft SEIS places this status with historical concerns, but this concern is not historical. The commenter stated that the Black Hills are sacred to native people and is an active environmental justice issue. The commenter noted the draft SEIS states that impacts would be no different for Native Americans

than for other groups and this is patently false. The commenter stated that the violation of one's religious center—one's Jerusalem, for a comparison—is clearly a large environmental justice impact, and one that will not be experienced by non-Indian populations.

**Response:** *Native American tribes are subsets of the general public residing around the proposed Dewey-Burdock ISR Project site. As discussed in SEIS Section 4.12.1, all populations, regardless of their status, will be exposed to the same health and environmental effects associated with ISR activities at the proposed project site. Therefore, short-term impacts to Native American tribes will be no different from those other populations experience near in the vicinity of the proposed project area.*

*As described in SEIS Section 3.9.3, Native American tribes in the Black Hills region believe that preserving and maintaining access to sacred lands is essential to both cultural and spiritual aspects of traditional Native American societies of the northern plains. The identification and evaluation of places of religious and cultural significance to Native American tribes within the proposed Dewey-Burdock ISR Project area was addressed through the NHPA Section 106 consultation process as described in SEIS Section 4.9.1. Mitigation measures to minimize adverse impacts to cultural and historic resources are being developed in consultation with the applicant, NRC, SD SHPO, ACHP, Native American tribes (tribal government or designated THPO), and other government agencies (e.g., BLM, ARC). NRC believes that the Section 106 consultation provides an appropriate avenue to identify and mitigate Native American environmental justice concerns associated with the Black Hills.*

*There will be no long-term environmental justice impacts following license termination. While certain Native Americans have a heightened interest in cultural resources potentially affected by the proposed action, the impacts to Native Americans in this and other areas is not expected to be disproportionately high or adverse. To the extent there might be adverse impacts to historic and cultural sites of interest to Native Americans, these impacts will be mitigated by an agreement that will formalize treatment plans during construction. If NRHP-eligible sites cannot be avoided, treatment plans will be developed. If other historic and cultural resources are encountered during the ISR lifecycle, the applicant will be required by license condition to notify appropriate authorities (NRC, 2013; License Condition 9.8).*

*No change was made to the SEIS beyond the information provided in this response.*

**Comment: 131-000002**

The commenter strongly disagreed with the analysis and conclusions drawn from the environmental justice section of the draft SEIS. The commenter pointed to the statement in SEIS Section 4.12.2 that “Environmental justice impacts to Native American tribes will primarily be no different than those experienced by other populations within the vicinity of the project area.” The commenter stated that limiting the analysis to populations within the vicinity of the project area flies in the face of CEQ 1997 guidance cited at the front of the section “In assessing cultural and aesthetic environmental impacts, impacts that uniquely affect geographically dislocated or dispersed minority or low-income populations or American Indian tribes are considered” (see SEIS Section 4.12). The commenter stated that the fact is, regardless of how close we live to the project area, the loss of these significant sites and the degradation of this land does affect the Standing Rock Sioux Tribe and the citizenry of the other consulting tribes uniquely and more than other populations; the Standing Rock Sioux Tribe and other Native American tribes are the ones that hold this land sacred and the proposed project threatens the

burial places of our ancestors as well as places that are fundamental to the spiritual practices that define and sustain us as people.

**Response:** *The SEIS used CEQ guidance to assess whether the proposed project might cause disproportionately high and adverse human health or environmental effects on minority and low-income populations, including Native American tribes (CEQ, 1997). Based on the information and the analysis of human health and environmental impacts presented in SEIS Section 4.12, NRC concludes in the SEIS that minority and low-income populations, including Native American tribes, will not be subject to disproportionately high and adverse impacts from the construction, operations, and decommissioning of the proposed ISR facility and aquifer restoration at the Dewey-Burdock site. There will be no long-term environmental justice impacts following license termination. While certain Native Americans may have a heightened interest in cultural resources potentially affected by the proposed action, the impacts to Native Americans in this and other areas is not expected to be disproportionately high or adverse. To the extent there might be adverse impacts to historic and cultural sites of interest to Native Americans, these impacts will be mitigated by an agreement that will formalize treatment plans during construction. If NRHP-eligible sites cannot be avoided, treatment plans will be developed. If other historic and cultural resources are encountered, the applicant will be required by license condition to notify appropriate authorities (NRC, 2013; License Condition 9.8).*

*As described in SEIS Section 3.9.3, Native American tribes in the Black Hills region believe that preserving and maintaining access to sacred lands is essential to both cultural and spiritual aspects of traditional Native American societies of the northern plains. The identification and evaluation of places of religious and cultural significance to Native American tribes within the proposed Dewey-Burdock ISR Project area is addressed through the NHPA Section 106 consultation process as described in draft SEIS Sections 1.7.3.5 and 4.9.1. Mitigation measures to minimize adverse impacts to cultural and historic resources are being developed in consultation with the applicant, NRC, SD SHPO, ACHP, Native American tribes (tribal government or designated THPO), and other government agencies (e.g., BLM, ARC). As part of the Section 106 process and in consultation with SD SHPO, NRC identified interested and potentially affected Native American tribes that attach historical, cultural, and religious significance to the site within the proposed project area. These tribes are listed in draft SEIS Sections 1.7.3.5 and 3.9.3 and include not only tribes from South Dakota but from North Dakota, Minnesota, Montana, Wyoming, and Nebraska. Therefore, NRC has followed CEQ 1997 guidance and appropriately identified and considered geographically dislocated or dispersed American Indian tribes in assessing cultural and aesthetic environmental impacts.*

*Text was added to SEIS Section 1.7.3.5 to document NHPA Section 106 consultation activities since the draft SEIS was issued in November, 2012.*

### **E5.27.3      References**

36 CFR Part 800. *Code of Federal Regulations, Title 36, Parks, Forests, and Public Property, Part 800. "Protection of Historic Properties."* Washington, DC: U.S. Government Printing Office.

CEQ (Council on Environmental Quality). "Considering Cumulative Effects Under the National Environmental Policy Act." ML13343A349. Washington, DC: Executive Office of the President, CEQ. 1997.

NRC (U.S. Nuclear Regulatory Commission). "Draft License SUA-1600 for Powertech (USA), Inc." ML13318A094. Washington, DC: NRC. March 2013.

NRC. NUREG-1910, "Generic Environmental Impact Statement for *In-Situ* Leach Uranium Milling Facilities." ML091480244, ML091480188. Washington, DC: NRC. May 2009a.

NRC. "Site Visit to the Proposed Dewey-Burdock Uranium Project, Fall River and Custer Counties, South Dakota, and Meetings with Federal, State, and County Agencies, and Local Organizations, November 30–December 4, 2009." ML093631627. Washington, DC: NRC. 2009b.

USCB (U.S. Census Bureau). "State and County QuickFacts." 2010.  
<<http://quickfacts.census.gov/qfd/states/49/49037.html>> (17 July 2013).

## **E5.28 Public and Occupational Health and Safety**

### **Comment: 042-000008**

The commenter stated that the "Fort Robinson Run," with a route directly through the project area, is in commemoration of the Northern Cheyenne outbreak from the old military fort on January 9, 1879. The commenter was concerned that the youth and others involved in the annual run would be potentially exposed to toxic materials and other hazards resulting from the permitting of the Dewey-Burdock ISR mining and processing facilities.

**Response:** *A schedule of the Fort Robinson Run can be viewed and downloaded at the following website: <http://yellowbirdinc.org>. The route of the Fort Robinson Run does not pass directly through the proposed Dewey-Burdock project area. Runners participating in the Fort Robinson Run pass through Hot Springs, Pringle, and Custer on State Highway 385, which is approximately 40 km [25 mi] east of the proposed project site (see SEIS Figure 3.3-1).*

*The potential impacts to public health and safety from construction, operation, aquifer restoration, and decommissioning of the proposed Dewey-Burdock ISR project are discussed in SEIS Section 4.13.1. The impact analysis evaluated the potential radiological and nonradiological impacts to the public health and safety for normal and accident conditions. For example, estimates of total effective dose equivalent (TEDE) from normal operations of the proposed project indicated that the 10 CFR part 20 public dose limit of 1 mSv/yr [100 mrem/yr] would not be exceeded at the proposed project boundary (see SEIS Section 4.13.1.1.2.1). Based on its assessment, NRC determined that the potential radiological and nonradiological impacts to public health and safety will be SMALL for each phase of the ISR facility lifecycle. Therefore, the NRC staff does not expect participants of the Fort Robinson Run to be exposed to radiological or toxic materials associated with ISR activities at the proposed Dewey-Burdock ISR Project site.*

*No change was made to the SEIS beyond the information provided in this response.*

### **Comment: 061-000018**

The commenter stated that the draft SEIS does not estimate worker exposure to radon or other radioactive contaminants. The commenter further stated that statements are made that radon



will dissipate by the time it reaches the property boundary and that other radioactive contaminants will be kept at an ALARA level. The commenter stated that these statements duck the environmental issue—human exposure—which will occur both outside and in buildings and that this issue should be considered in the SEIS.

**Response:** As described in SEIS Section 4.13.1.1.2.1, the GEIS provides a summary of doses to occupationally exposed workers at ISR facilities (see GEIS Section 4.2.11.2.1). As stated, doses will be similar regardless of the facility's location and are well within the 10 CFR Part 20 annual occupational dose limit of 0.05 Sv [5 rem] per year. The largest annual average dose to a worker at a uranium recovery facility over a 10-year period [1994–2006] was 0.007 Sv [0.7 rem]. More recently, the maximum total dose equivalents reported for 2005 and 2006 were 0.00675 and 0.00713 Sv [0.675 and 0.713 rem]. Similarly, the average and maximum worker exposure to radon and radon daughter products ranged from 2.5 to 16 percent of the occupational exposure limit of 4 working-level months. Because estimates of annual worker exposure at the proposed Dewey-Burdock facility are projected to be well below the 10 CFR Part 20 annual occupational dose, NRC staff concluded in the SEIS that the radiological impacts to workers during normal operations will be SMALL.

The planned ISR facility design and operations at the proposed Dewey-Burdock site are consistent with the projects analyzed in the GEIS. As described in SEIS Section 4.13.1.1.2.1, the applicant is required to implement an NRC-approved radiation protection program to protect occupational workers and ensure that radiological doses are ALARA. Worker exposure to radon and other radioactive contaminants are reviewed in depth in the safety review of the proposed Dewey-Burdock ISR Project (NRC, 2013). This review includes a description of the applicant's in-plant radiation monitoring program and worker exposure calculations. The applicant's radiation protection program includes commitments for implementing management controls, engineering controls, radiation safety training, radon monitoring and sampling, and audit programs (Powertech, 2011). To mitigate radiological exposure to workers, the applicant will (i) install ventilation designed to limit worker exposure to radon; (ii) install gamma exposure rate monitors, air particulate monitors, and radon daughter product monitors to verify that expected radiation levels are met; and (iii) conduct work area radiation and contamination surveys to help prevent and limit the spread of contamination (Powertech, 2009).

SEIS Section 2.1.1.1.6.1.2 describes the sources of radon gas emissions at the proposed project and indicates that radon gas disperses quickly into the air. The potential consequences of radiological emissions during normal operations at the proposed Dewey-Burdock ISR Project are described in SEIS Section 4.13.1.1.2.1. Sources of radon emanation the applicant identified and modeled included land application of treated wastewater, wellfield operations, central processing plant operations, and resin transfers in the satellite facility (Powertech, 2009). The applicant described its implementation of the computer code MILDOS that was used to model radiological impacts on human and environmental receptors (e.g., air and soil) using site-specific data that included Rn-222 release estimates, meteorological and population data, and other parameters. The estimated radiological impacts from routine site activities were compared to applicable public dose limits in 10 CFR Part 20 {1 mSv/yr [100 mrem/yr]}, as well as to baseline radiological conditions (see SEIS Section 3.12.1).

No change was made to the SEIS beyond the information provided in this response.

## **E5.28.1      References**

10 CFR Part 20. *Code of Federal Regulations*, Title 10, *Energy*, Part 20. “Standards for Protection Against Radiation.” Washington, DC: U.S. Government Printing Office.

NRC (U.S. Nuclear Regulatory Commission). “Safety Evaluation Report for the Dewey-Burdock Project Fall River and Custer Counties, South Dakota, Materials License No. SUA–1600.” ML13052A182. Washington, DC: NRC. March 2013.

Powertech [Powertech (USA) Inc.]. “Dewey-Burdock Project, Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota, Technical Report RAI Responses, June, 2011.” ML112071064. Greenwood Village, Colorado: Powertech. 2011.

Powertech. “Dewey-Burdock Project, Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota—Environmental Report.” Docket No. 040-09075. ML092870160. Greenwood Village, Colorado: Powertech. August 2009.

## **E5.29      Waste Management**

### **E5.29.1      Liquid Waste Comments**

**Comments: 005-000004; 019-000002; 024-000003; 048-000008; 061-000014; 079-000003; 092-000009; 092-000010; 092-000011; 093-000005; 095-000004; 104-000008; 127-000034; 128-000187; 129-000004**

A number of commenters expressed concerns about the potential for wildlife impacts from proposed liquid waste management options, including deep well injection, land application of treated wastewater, and the use of liquid waste storage ponds. One commenter expressed the view that a detailed analysis of potential wildlife impacts was not included in the draft SEIS. Other commenters asked about the toxicity of proposed wastewater solutions to wildlife and birds from both short-term and long-term exposures. One commenter was concerned about the potential for contamination of surface water and associated habitat from these waste management practices. Other commenters expressed concerns that waste storage ponds could provide attractive habitat for wildlife and birds and asked about measures that would be taken to protect wildlife and birds from exposure to pond solutions.

**Response:** *In response to both the general and specific concerns expressed by commenters about the potential for impacts to wildlife from proposed liquid waste management options including deep well injection, land application of treated wastewater, and the use of storage ponds, the NRC staff has made improvements to the ecological impact analysis in final SEIS Sections 4.6.1.1.2, 4.6.1.1.3, 4.6.1.2.2, and 4.6.1.2.3. These improvements include clarifying the description of wastewater characteristics, providing documentation of the potential toxicity of proposed wastewater to wildlife, documenting additional details of the required controls that would limit contamination of surface water and wildlife habitat, and including additional description of the potential for waste storage ponds to attract wildlife and the measures that would be taken to protect wildlife from exposure to pond solutions. The following paragraphs provide detailed responses to the specific concerns expressed by the commenters and describe the details of the additional information incorporated into the final SEIS.*

*Regarding the level of detail of the impact analysis in the draft SEIS, the NRC staff agree with the commenter that a detailed analysis of potential wildlife impacts from proposed waste management options was not provided in the draft SEIS. A detailed analysis of wildlife impacts was not needed because the regulatory oversight and associated controls that would be required by state and federal permitting would limit the range of potential impacts. The SDDENR mine permit will establish monitoring requirements and action levels for trace metal concentrations in soils, vegetation, surface water, and groundwater that are protective of the environment. The SDDENR will review monitoring data and impose corrective actions if action levels are exceeded. Additionally, SDDENR will evaluate the environmental fate and transport of land-applied wastewater in detail prior to operation, as part of its permitting and oversight processes. If SDDENR finds the waste management activities could impact wildlife, it will impose additional conditions on the applicant to mitigate impacts and protect the environment. In response to these comments on the draft SEIS, the NRC staff added more detailed information and clarified the description of potential impacts to wildlife from the proposed liquid waste management activities in the ecological impact analysis in final SEIS Sections 4.6.1.1.2, 4.6.1.1.3, 4.6.1.2.2, and 4.6.1.2.3.*

*Regarding the characteristics of proposed wastewater, the detailed technical information was not included in the draft SEIS because it was documented in detail in the referenced license application technical report. In the technical report (Powertech, 2009b, Tables 4.2-7 and 7.3-8) and in its South Dakota GDP (Powertech, 2012, Table 5.8-2), the applicant described the expected chemical constituents and estimated concentrations in wastewater for the proposed land application activities. The list of chemical constituents includes arsenic, barium, cadmium, chromium, lead, and selenium. These constituents are present in the wastewater because during the uranium recovery process, the groundwater extracted from the production zone is enriched in metals that are typically associated with uranium in nature. In response to the comment, the NRC staff provided more detailed references to the wastewater characteristics documentation in the final SEIS.*

*Regarding the toxicity of proposed wastewater solutions, the applicant estimated average concentrations of constituents in wastewater for land application in its GDP submitted to SDDENR (Powertech, 2012, Table 5.8-2). Selenium, in particular, was identified by the FWS as a constituent of concern in ISR wastewater because of low wildlife health effects thresholds in some sensitive species when compared with concentrations of selenium measured in ISR wastewater (FWS, 2007). The wildlife health effects thresholds described here establish the concentration of a chemical in water that is known to cause health effects in wildlife based on scientific studies.*

*In response to the public comments on the draft SEIS, the NRC staff compared the applicant's estimated wastewater concentrations with EPA chronic (long-term) exposure-based water quality criteria (guidance) established for the protection of aquatic life and found the estimated concentrations of cadmium, chromium, lead, and selenium exceed the EPA criteria. The applicant's estimated concentrations of both cadmium and lead also exceed the acute (short-term) exposure-based EPA water quality aquatic life criteria (EPA, 2013a). Additionally, the applicant's estimated concentrations of selenium exceed levels referenced by FWS (2007) as hazardous to aquatic birds. Based on this comparison, the NRC staff concludes that direct chronic and acute exposure of sensitive species to the applicant's estimated cadmium, lead, and selenium concentrations in wastewater could adversely impact exposed wildlife.*

*However, the NRC staff considers that such chronic direct wildlife exposure to undiluted wastewater is unlikely because of the applicant's proposed wastewater controls (e.g., pond design, spill and leak detection and mitigation, pressure monitoring, and runoff control). In addition, SDDENR permitting requirements limit direct contact that aquatic life and terrestrial wildlife will have with wastewater solutions. The SDDENR controls include controlling access to wastewater with fencing, implementing an avian protection plan for pond operations, and requiring no-runoff and no-ponding conditions for land application that would limit direct terrestrial wildlife exposures and migration of wastewater to aquatic life habitat areas such as nearby surface water.*

*Wastewater storage ponds present an additional opportunity for wildlife, primarily migratory birds, to have direct contact with wastewater solutions. The only detailed wildlife field study of an ISR wastewater irrigation system observed only limited use of a wastewater storage reservoir by birds (FWS, 2000). In the event that additional treatment is need to lower wastewater constituent concentrations or additional wildlife access controls for ponds are needed to protect wildlife, SDDENR has the authority to require these actions be implemented by the applicant.*

*While direct wastewater exposures will be limited, as noted in the GEIS and draft SEIS, land application could lead to accumulation of trace metal constituents in soils. In response to the public questions about potential hazards to wildlife from waste management activities, the NRC staff also evaluated the applicant's estimated steady-state soil concentrations of trace metals from proposed land application with published EPA ecological soil screening guidance levels (Eco-SSLs) (EPA, 2010). Eco-SSLs were developed to support screening analyses to identify potential ecological concerns at superfund sites that may need further, more detailed evaluation (e.g., ecological risk assessment). While Eco-SSLs were developed for superfund sites, EPA envisions that any federal, state, tribal, or private environmental assessment can use the values to screen soil contaminants (EPA, 2003). The applicant's estimated steady-state soil concentrations of trace metals (Powertech, 2009b, Table 7.3-8) exceeded EPA Eco-SSLs for cadmium, lead, and selenium. This analysis suggests the land application activities described by the applicant have the potential to accumulate specific trace metal constituents in soils at levels that could impact wildlife. Soil constituents can also be taken up in plants. They may remobilize and transport to nearby surface water and shallow groundwater; however, transport of these constituent will involve dilution. Therefore, plants, groundwater, and surface water containing concentrations of trace metals provide additional routes of exposure to wildlife. The SDDENR mine permit will establish monitoring requirements and action levels for trace metal concentrations in soils, vegetation, surface water, and groundwater that are protective of the environment. The SDDENR will review monitoring data and impose corrective actions if action levels are exceeded. Additionally, SDDENR will evaluate the environmental fate and transport of land-applied wastewater in detail (including environmental concentrations, pathways and food chains, and bioaccumulation) prior to operation as part of its permitting and oversight processes. If SDDENR finds the waste management activities could impact wildlife, it will impose additional conditions on the applicant to mitigate impacts and protect the environment.*

*In summary, some of the chemical constituent concentrations in proposed wastewater solutions and in land application area soils estimated by the applicant exceed levels known to cause impacts to wildlife. NRC staff concludes impacts to individual animals are possible even with the practices proposed by the applicant and the SDDENR regulatory controls that will be imposed by permit conditions. SDDENR permit conditions include: monitoring; setting action level; and requiring corrective actions in situations where existing controls do not adequately*

*limit all direct exposures of wildlife to undiluted wastewater solutions. However, the NRC concludes the direct exposure of wildlife to wastewater solutions will be limited and, under current regulatory controls, environmental concentrations of wastewater constituents are unlikely to reach levels that would lead to destabilization of wildlife populations. In response to the comments, NRC has revised the ecological impact analyses in Sections 4.6.1.1.2, 4.6.1.1.3, 4.6.1.2.2, and 4.6.1.2.3 of the final SEIS to be consistent with the information provided in this response.*

**Comments: 023-000002; 035-000002**

A commenter noted the draft SEIS indicates approximately one-third of the groundwater treated during aquifer restoration will be wastewater. The commenter asked where this wastewater will be disposed and what will it contain. Another commenter stated this amount of wastewater in a generally arid zone is appalling and asked whether this wastewater would be contaminated and poses a threat to wildlife (and also humans).

**Response:** *The aquifer restoration wastewater referred to by the commenter is applicable to only the Class V deep disposal option where RO water treatment would be used. Therefore, the NRC comment response focuses on the wastewater from the Class V waste disposal option. Details of the Class V deep disposal option aquifer wastewater treatment are documented in SEIS Sections 2.1.1.1.4.1.1 and 2.1.1.1.6.2 and therefore will not be repeated here. Additional details about a Class V disposal well are provided in SEIS Section 2.1.1.2.4.1.*

*Regarding the characteristics of the wastewater, the RO brine waste stream is an intermediate waste stream that is mixed with other waste streams during its production and management. Therefore, information on both the brine waste stream and the combined waste stream that would be disposed in a Class V well are described in this response.*

*The RO brine waste stream would contain the same constituents identified for wastewater streams in the GEIS (NRC, 2009, Table 2.7-3) and the applicant's Class V deep well injection permit application (Powertech, 2010). The listed constituents include arsenic, calcium, chloride, magnesium, sodium, radium, thorium, and uranium.*

*As described in draft SEIS Section 2.1.1.1.6.2, during aquifer restoration under the Class V deep well disposal option, the applicant proposes to combine the concentrated wastewater from RO with the combined liquid wastewater stream that is pumped into radium settling ponds, prior to deep well injection. Because radium settling is the last proposed treatment step prior to disposal, the NRC staff expect the concentration of chemical constituents in the radium settling ponds to be the same as the injectate that will be pumped into the proposed Class V deep wells. The applicant described the characteristics of the injectate in its Class V UIC deep well permit application (Powertech, 2010) and its response to NRC RAIs (Powertech, 2011, Table TR RAI P&R-14d-1). The listed constituents include arsenic, carbonate, bicarbonate, sodium, selenium, radium-226, sulfate, thorium-230, natural uranium, gross alpha activity, and gross beta activity.*

*The draft SEIS documented the consumptive water use from proposed aquifer restoration under the Class V deep well injection option (where RO water treatment is proposed) in the impact analysis in that section. That analysis noted that after production and restoration are complete and groundwater withdrawals are terminated, groundwater levels would tend to recover with time. The analyses therefore concluded the potential long-term environmental impact from consumptive use during the restoration phase would be SMALL. Additionally, the applicant must apply for a water appropriation permit before groundwater could be used. The SDDENR*

*permit review considers whether the aquifer is capable of supporting the proposed water use, whether the proposed use is a beneficial use, and whether the proposed use is in the public interest, pursuant to South Dakota Codified Law Chapter 46-2A (SDDENR, 2013). Because draft SEIS Section 4.5.2.1.1.3 already includes an analysis of consumptive water use, no additional changes were made to that analysis in the draft SEIS in response to this comment.*

*To evaluate the potential hazards to wildlife the NRC staff compared the applicant's estimated concentrations of chemical constituents in the wastewater with aquatic-life and wildlife health effects thresholds. An aquatic life health effects threshold is a concentration of a chemical constituent in water that has been shown to cause health effects in aquatic life based on scientific studies. Selenium, in particular, was identified by the FWS as a constituent of concern in ISR wastewater because of low wildlife health effects thresholds in some sensitive species when compared with concentrations of selenium measured in ISR wastewater (FWS, 2007). The wildlife health effects thresholds described here establish the concentration of a chemical in water that is known to cause health effects in wildlife based on scientific studies. In response to the public comments on the draft SEIS the NRC staff compared the applicant's estimated wastewater concentrations with EPA chronic (long-term) exposure-based water quality criteria (guidance) established for the protection of aquatic life (EPA, 2013a) and found the estimated concentrations of arsenic and selenium in the proposed injectate exceed the current EPA criteria. Additionally, the applicant's estimated concentrations of selenium exceed levels referenced by FWS (2007) as hazardous to aquatic birds. Based on this comparison, the NRC staff concludes that direct chronic exposure of sensitive species to the applicant's estimated arsenic and selenium concentrations in wastewater (undiluted) could adversely impact exposed individuals. However, NRC staff considers that such chronic direct wildlife exposure to undiluted wastewater is unlikely because the applicant's proposed wastewater controls (e.g., pond design, leak detection and mitigation, pressure monitoring) and SDDENR permitting requirements limit direct contact that aquatic life and terrestrial wildlife will have with wastewater solutions. The SDDENR controls include controlling access to wastewater with fencing and implementing an avian protection plan for pond operations.*

*Wastewater storage ponds present an additional opportunity for wildlife, primarily migratory birds, to have direct contact with wastewater solutions. The only detailed wildlife field study of an ISR wastewater irrigation system observed only limited use of a wastewater storage reservoir by birds (FWS, 2000). In the event that additional treatment to lower wastewater constituent concentrations or additional wildlife access controls for ponds are needed to protect wildlife, SDDENR has the authority to require these actions be implemented by the applicant. In response to the concerns about impacts to wildlife, NRC has revised the ecological impact analyses in SEIS Sections 4.6.1.1.2, 4.6.1.1.3, 4.6.1.2.2, and 4.6.1.2.3 to be consistent with the information provided in this response.*

*Regarding the potential hazards to humans from exposure to wastewater, the applicant's aforementioned wastewater constituent concentrations exceed EPA national primary drinking water standards (EPA, 2013b) developed to protect public health. The selected disposal method (Class V deep well) is permitted only if it will isolate the wastewater from public drinking water supplies and therefore maintain safety. As described in SEIS Section 4.14.1.1.2, when evaluating permit applications for Class V wells, EPA considers the characteristics of the operation, the material proposed to be injected, and the surrounding environment and determines whether the proposed injection would endanger public health or the environment. Because this information is already in the SEIS, no further changes were made in response to this portion of the comment.*

**Comments: 045-000002; 045-000003; 061-000021; 095-000003**

A number of commenters expressed concerns about land application and the potential for migration of wastewater constituents to adjacent areas or *Waters of the State*. One commenter questioned the claim that there would be no runoff from land application. The commenter noted that land application is proposed for an area of more than 405 ha [1,000 ac] in an area prone to torrential downpours and requested this be studied more carefully and that mitigation measures be properly designed and explained. Other commenters expressed similar concerns about the potential for remobilization of contaminants by rain events.

**Response:** *Statements in the draft SEIS concerning runoff from land application areas were based on SDDENR GDP and mine permit conditions that are expected to be imposed on the applicant and are retained in the final SEIS. The GDP and mine permits will prohibit ponding and runoff of wastewater solutions during land application activities. SDDENR will also require catchment basins adjacent to land application areas to capture surface runoff from rain events. These permit conditions serve to limit direct exposure of wildlife to effluents and restrict the migration of wastewater solutions outside of land application areas. Wastewater constituents deposited onto soils during land application may be subject to secondary remobilization, that is, they may be moved by large rain events. However, such rains would significantly dilute the concentration of constituents and movement of rain runoff would be restricted by the catchment basins resulting in an overall lower impact. Monitoring of the land application areas, catchment basins, and the surrounding environment would be required and allow regulators to evaluate changes from baseline conditions. Corrective actions will be implemented, as needed, to protect safety or the environment. Information concerning the movement of land application solutions including runoff is presented in SEIS Section 4.5.1.1.2.*

**Comments: 047-000006; 083-000002**

One commenter asked about Powertech's plans to manage wastewater and requested the impact on humans, livestock, wildlife, groundwater, deep aquifers, and the Cheyenne River Basin be fully studied to include water sample testing before this permit is granted. Another commenter expressed a general concern about contamination of wastewater.

**Response:** *The staff evaluated the environmental impacts (including impacts to livestock, wildlife, and water resources including surface water and groundwater) of the applicants plan to manage wastewater. As described in SEIS Section 4.14.1.1.2, the applicant proposes to treat the liquid byproduct material waste stream onsite by removing radium and uranium by means of radium settling and ion exchange (see also SEIS Section 2.1.1.1.6.2). These treatment processes reduce radionuclide activities to below the established NRC limits for protection of public health and safety under 10 CFR Part 20, Appendix B, Table 2, Column 2. Treated water will be disposed of either by injecting the material into a deep Class V disposal well, applying wastewater to land, or using a combination of both methods (Powertech, 2011). As stated in SEIS Section 2.1.1.1.6.2, the applicant must meet applicable EPA and NRC requirements before injection in a deep Class V injection well begins. SEIS Sections 4.14.1.1.2, 4.14.1.1.3, 4.14.1.2.2, and 4.14.1.2.3 state that NRC will require (i) liquid byproduct material to be treated prior to injection or land application, and (ii) treatment systems must be constructed, operated, and monitored to ensure requirements in 10 CFR Part 20, Subparts D and K and Appendix B are met. As described in SEIS Sections 2.1.1.1.6.2 and 4.14.1.2.2, the land application disposal option is subject to a GDP approved by SDDENR (Powertech, 2012). In accordance with*

*SDDENR permit requirements, the applicant's land application operations must meet all applicable NRC safety and state groundwater quality standards.*

*The applicant will be required to monitor effluents for impacts on the environment. Regular reporting of results to the NRC and other regulatory agencies is required so the agencies can verify compliance with requirements are being met and require corrective actions if requirements are not met. NRC inspections and enforcement action provides additional assurance that plans and procedures are followed, equipment functions as expected, and safety standards are met. Detailed descriptions of inspection and enforcement programs are discussed in the response to comment 116-000027. Draft SEIS Chapter 7 provides detailed descriptions of various monitoring programs, including those required for land application (SEIS Section 7.5) and Class V deep well injection (SEIS Section 7.6).*

*The NRC staff response to comments about impacts of proposed land application activities on wildlife, which is also generally applicable to livestock, is provided in the response to Comment 005-000004, and is not repeated here.*

*The impacts to surface water are evaluated in SEIS Sections 4.5.1.1.2 and 4.5.1.2.2. This analysis addresses the potential to impact nearby surface waters including Beaver Creek and Pass Creek and also applies to more distant surface waters such as the Cheyenne River. For the deep well disposal option, this analysis evaluated geologic and hydrologic information and concluded that there is no evidence of any hydraulic connection between surface waters near the site and proposed aquifers for the Class V injection well disposal option. For either waste disposal option, the analysis also considered measures taken by the applicant to limit the impacts to surface waters from operations including (i) no planned surface water discharges of processing effluents; (ii) use of concrete slabs and berms at the central plant and satellite facility to contain and control accidental spills; (iii) identification and plugging of improperly sealed boreholes that may impact surface waters; (iv) detention and treatment of runoff from facilities to ensure that runoff does not contaminate surface waters; and (v) efforts to minimize the potential for stormwater runoff impacts including diversion and catchment areas. The applicant has also committed to implement mitigation measures to control erosion and sedimentation, as part of Stormwater Management Plan. The applicant will implement an emergency response plan to identify and clean up accidental spills and leaks. Additionally, pipelines will be buried to avoid freezing, and pipeline pressure will be monitored to detect leaks. Based on the preceding considerations, the NRC staff concluded the impacts to surface waters would be SMALL.*

*Based on the above cited attributes of the proposal including the regulatory and permitting requirements, impacts on humans, livestock, wildlife, groundwater, deep aquifers, and the Cheyenne River Basin will be SMALL, although displacement of habitat by the proposed facility is expected to have temporarily MODERATE impacts to wildlife. Because the SEIS already include an analysis of these impacts, no additional changes were made to the SEIS in response to this comment.*

**Comment: 049-000010**

A commenter suggested the discharge limits in SEIS Table 7.5-3 are not consistent with the regulatory requirement in 10 CFR Part 20, Appendix B, Table 2, because (as indicated in Note 4 of that table) the applicable limits for known mixtures of radionuclides would be determined by applying a sum of fraction rule that is described as follows: "The limiting values should be derived as follows: determine, for each radionuclide in the mixture, the ratio between the



concentration present in the mixture and the concentration otherwise established in Appendix B for the specific radionuclide when not in mixture. The sum of such ratios for all the radionuclides in the mixture may not exceed '1' (i.e., 'unity')."

**Response:** *Draft SEIS Table 7.5-3 correctly summarizes the effluent concentration limits from 10 CFR Part 20, Appendix B, Table 2; however, the commenter is correct that, for known mixtures of radionuclides, the unity rule must be applied to demonstrate compliance with these effluent concentration limits. Footnotes were added to Table 7.5-3 to (i) clarify that the limits presented are for individual radionuclides and that, for mixtures, the unity rule would apply and (ii) provide a description of the unity rule.*

**Comment: 084-000006**

A commenter suggested the hazardous waste was renamed "liquid waste" so that it can be disposed of in Class V wells.

**Response:** *Consistent with the approach used in the GEIS (NRC, 2009), wastes and effluents are initially categorized by the physical form of the waste material (e.g., liquid, solid, gaseous, or airborne) because each waste type must be managed differently and must comply with different regulatory and permit requirements. The use of the term "liquid waste" in the SEIS is not intended to convey any specific regulatory meaning.*

*The regulatory definition for the waste to be disposed in a Class V well is "byproduct material," as defined by NRC regulations at 10 CFR 40.4. As discussed in SEIS Section 2.1.1.1.6.2, byproduct material is not solid waste, according to the definition at 40 CFR 261.4(a)(4). Therefore byproduct material is not regulated as hazardous waste under RCRA regulations. EPA regulations at 40 CFR 261.4(a) list materials that are not defined as solid waste [see 40 CFR 261.4(a)(4)]. Included in the list of non-solid waste materials are source material, special nuclear material, and byproduct material as defined by the Atomic Energy Act of 1954, as amended, 42 U.S.C. 2011 et seq (see Section 11e.2 of the Act). The classification as a solid waste under RCRA is the first step in classifying a material as a hazardous waste. Therefore, because byproduct material does not meet the RCRA definition of solid waste it does not meet the definition of hazardous waste under EPA regulations. Neither "liquid wastes" nor "wastewater" are classified by EPA as hazardous waste. Under EPA regulations, properly treated "wastewater" may be disposed of in Class V wells.*

*In evaluating the environmental impacts of disposing of byproduct material by a Class V deep injection well in SEIS Section 4.14.1.1.2, the NRC staff considered the applicant's proposal to obtain adequate disposal capacity and compliance with requirements of an EPA Class V disposal permit, NRC effluent limits, and other NRC safety regulations. The NRC staff concluded that the waste management impacts from the disposal of liquid byproduct material via deep Class V injection wells during the ISR operation phase will be SMALL.*

*Because this is a direct response to the comment, no further changes to the SEIS were made in response to this comment.*

**Comment: 116-000021**

A commenter requested the draft SEIS should include a list of the hazardous levels and radioactive waste thresholds found at 10 CFR Part 20, Subparts D and K, and Appendix B, Table 2, Column 2.

**Response:** *The regulations the commenter mentioned are incorporated by reference in the SEIS. These requirements are voluminous and readily available to the public on the NRC website (<http://www.nrc.gov/reading-rm/doc-collections/cfr/part020/>) and on other federal government websites. Therefore, the NRC staff determined that including the detailed requirements in the SEIS is unnecessary. In response to this comment, no additional changes were made to the SEIS.*

**Comment: 116-000022**

A commenter suggests SEIS Section 4.4.1.2.2 provides no basis for the SMALL impact conclusion to geology and soils nor provides an assessment of cumulative impacts. The referenced draft SEIS section describes the potential impacts of land application of wastewater including increased salinity of soils and the potential for radiological and other constituents (e.g., selenium and other metals) that could accumulate in the soils and vegetation.

**Response:** *The commenter is correct that the SEIS described the potential impacts of land application of wastewater on soils including, increased soil salinity and the potential for accumulation of radiological and other constituents in soils. While these processes are expected to occur from the proposed land application activities, the significance of these impacts is related to the magnitude of the accumulation over time and whether soil concentrations of radiological and chemical constituents would exceed levels of concern for protection of public health and the environment. The SMALL impact conclusion in SEIS Section 4.4.1.2.2 is based on NRC and SDDENR regulation and oversight of land application activities. This oversight, as described in SEIS Section 4.4.1.2.2, requires the applicant to treat wastewater to meet applicable NRC and SDDENR limits and requires environmental monitoring to verify that radiological and chemical constituents deposited on soils are within allowable limits. If limits are exceeded, the NRC and SDDENR have the authority to impose corrective actions that may be necessary to remediate soils and ensure future compliance with limits. Because of the NRC and SDDENR monitoring and oversight functions, the NRC staff concluded that impacts will be SMALL. No additional changes were made to the SEIS in response to this comment.*

**Comments: 116-000023; 127-000028**

A commenter expressed the concern that the draft SEIS fails to evaluate the environmental impacts to other sites where ISL wastes have been applied to land. The commenter requested the SEIS include a full assessment of the long-term impacts from other ISL waste land application programs. Another commenter noted the draft SEIS fails to properly account for impacts to wildlife resulting from land application of ISL wastes. The commenter cited prior comments to NRC from FWS (FWS, 2007) that did not recommend land application using center pivot irrigation for the disposal of *in-situ* mining wastewater. The commenter also cited a prior FWS field study that studied environmental concentrations and potential hazards to wildlife of selenium and other trace elements at an *in-situ* leach wastewater land application operation in Wyoming (FWS, 2000). The commenter requested the SEIS must fully account for these

impacts and present credible evidence and scientific evaluation addressing why the concerns do not apply to the proposed Dewey-Burdock project. The commenter noted the applicant identified several federal and state endangered species but failed to state how they will be affected by the projects waste via land application. The commenter expressed the view that anything short of a full review would violate NEPA requirements to take a hard look at impacts.

**Response:** *The GEIS described the potential for impacts of land application of treated ISR wastewater, including the accumulation of constituents in soils (NRC, 2009). The GEIS is incorporated by reference in the SEIS. The GEIS documented potential impacts to wildlife from exposure to uranium recovery solutions that include trace metals such as selenium. These analyses refer to state permitting requirements. If SDDENR grants the applicant's GDP and mine permits, permit conditions will be imposed to protect the environment from the accumulation of chemical constituents (including trace metals) in the land application areas and from the migration of constituents outside the application areas. The SEIS analyzes the potential impacts to wildlife from the storage and discharge of chemical constituents and concluded that the SDDENR permitting programs and conditions on the permits will mitigate environmental impacts to wildlife. The NRC staff added information and clarified the potential impacts to wildlife from liquid waste management activities in the ecological impact analysis in SEIS Sections 4.6.1.1.2, 4.6.1.1.3, 4.6.1.2.2, and 4.6.1.2.3.*

*The SEIS impact analyses focus on the proposed action currently under review, as required by NEPA and its implementing regulations. The GEIS specifically analyzed decades of NRC experience with licensing and regulating ISR facilities, including facilities using disposal of wastewater by land application. The operating experience at licensed facilities using land application identified buildup of constituents in soils and the environment and this was described in Section 4.2.12.2 of the GEIS. The NRC recognized in the GEIS and the SEIS that wastewater constituents may buildup in soils and the localized environment. For this reason, both the GEIS and the SEIS stated that site-specific monitoring programs are required. Monitoring wastewater for accumulation of constituents allows for early detection of problems and the imposition of corrective actions to limit environmental impacts.*

*The commenters refer to a FWS study of ISR wastewater irrigation fields (FWS, 2000). The study specifically analyzed the bioaccumulation of selenium at levels to which wildlife species are sensitive. The FWS referenced the 2000 study in its scoping comments on the GEIS that concerned land application of wastewater (FWS, 2007). The FWS comments on the GEIS discussed a general concern that irrigation with wastewater containing higher level of selenium may have significant impacts on sensitive wildlife species (FWS 2007). Monitoring records of the Wyoming ISR site show wide variability in wastewater selenium concentrations; levels ranged as high as 10 times the concentrations expected at the Dewey-Burdock facility. The average concentration of selenium at the Wyoming ISR site examined by FWS was two times the levels projected for land application wastewater at the Dewey-Burdock site.*

*Increased regulatory attention to selenium accumulation in plants in the years following the FWS analysis resulted in additional wastewater treatment being required by the State of Wyoming as part of corrective actions. These treatment measures significantly lowered concentrations of selenium in irrigation wastewater with concurrent reductions in environmental selenium concentrations in the active land application fields (Golder and Associates Inc., 2012). Because selenium concentrations in plants remain elevated in the inactive field (Golder and Associates Inc., 2012), Wyoming required additional corrective actions (WDEQ, 2012). The Wyoming experience raised awareness of the accumulation of wastewater constituents from*

*land application, has provided field data and experience with corrective actions, and illustrates the importance of timely corrective action.*

*The SEIS acknowledges the potential for buildup of wastewater constituents in the environment as an impact. In addition, the description of the hazards to wildlife from land application and wastewater storage has been revised.*

**Comment: 116-000024**

A commenter expressed a view that assurances the applicant will monitor soils and sediments for contamination in land application areas and keep effluent within water quality standards does not mean the quality of soil will not deteriorate over time. The commenter noted the draft SEIS fails to assess the short-term and long-term impacts of land application of liquid wastes on the soil quality, vegetation, and native and domestic animals that will consume the vegetation on the irrigated land, and on the animals (including humans) that will consume the native and domestic animals that will consume the irrigated vegetation. The commenter further noted the draft SEIS does not provide a description of the various food chains and how they will be impacted over time.

**Response:** *The comment does not take into account that NRC and SDDENR require monitoring of the land application areas. Monitoring requirements are part of NRC and SDDENR regulatory oversight activities and are described in the soil impact analysis in SEIS Section 4.4.1.2.2 and 2.1.1.1.6.2. NRC will require liquid wastes applied to land application areas be treated. Treated wastewater must meet the NRC release limit criteria for radionuclides found in 10 CFR Part 20, Appendix B. NRC also imposes by license condition preoperational and operational sampling of land application areas and the surrounding environment. The results of operational sampling must be reported to NRC semi-annually and the NRC staff evaluates existing conditions against preoperational results and imposes corrective actions, as necessary.*

*SEIS Section 2.1.1.1.6.2 states that land application will be carried out under a GDP and mine permit through SDDENR (Powertech, 2012). The GDP and the mine permit require that land application operations meet SDDENR standards for the protection of the environment, including groundwater, soils, vegetation, biota, and wildlife. SDDENR permitting and regulatory oversight activities require the analysis of environmental pathways prior to starting land application operations. Both NRC and SDDENR have authority to impose corrective actions and to pursue enforcement actions for the violation of regulatory standards and permit conditions during operations.*

*Monitoring and NRC and SDDENR oversight will be on-going for the life of the project. These activities limit short-term and long-term impacts to the environment. SEIS Section 2.1.1.1.5 describes decommissioning and reclamation activities that must be undertaken once operations cease. These activities will mitigate potential impacts to soils and restore vegetation prior to termination of the NRC license. The SEIS has been changed to reflect NRC reliance on SDDENR permitting, monitoring programs, and oversight of the land application operations to limit and mitigate environmental impacts.*

**Comments: 116-000027; 127-000027**

Regarding the proposed land application of treated wastewater, a commenter noted (citing draft SEIS p. 2-49), that the draft SEIS does not detail the water quality expected from the operation, nor provide any details of the anticipated effectiveness of the proposed water treatment proposals. The commenter further noted the draft SEIS does not provide details regarding plans should the unreviewed water treatment plan not perform as expected and that such gaps are not allowed by NEPA. The commenter suggested the effectiveness of any treatment plan directly affects the anticipated impacts of the proposal and that simply stating that Powertech “would” clean the water to standards, without any detailed analysis, does not meet NEPA’s analytical requirements. Another commenter noted that draft SEIS Section 4.4.1.2.3 states during aquifer restoration the applicant will continue routine soil monitoring for contamination of land application areas and must ensure that effluent limits are met; however, the SEIS provides no information regarding the mitigative measures that would have to be implemented if the radionuclide contaminant levels exceed the release standards in 10 CFR Part 20, Appendix B. The commenter suggested the SEIS improperly equates monitoring with assurances that no contamination will occur above established standards. The commenter recommended the SEIS fully describe the mitigative measures that must be taken if radionuclide contaminant levels exceed the release standards and if there is other degradation of the lands impacted by wastewater application.

**Response:** *Wastewater quality for land application is provided in the applicant’s GDP application materials (Powertech, 2012, Table 5.8-2). This information has been added to SEIS Section 2.1.1.1.6.2. Constituents in the wastewater include chloride, sodium, sulfate, arsenic, cadmium, chromium, lead, magnesium, molybdenum, selenium, radium-226, thorium-230, and uranium. The effectiveness of RO and radium settling treatment methods are described in the GEIS (NRC, 2009, Sections 2.5.3 and 2.7.2). Wastewater quality must comply with NRC discharge limits and SDDENR permit conditions. Noncompliance with NRC or SDDENR standards may be subject to enforcement actions if limits were exceeded.*

*The NRC inspections and enforcement actions taken in response to regulatory violations are described in detail in the GEIS (NRC, 2009, Section 1.7.1). NRC inspections evaluate management organization and internal controls, training of personnel, radiation protection programs, facilities and equipment, environmental protection, radioactive materials, radioactive waste management, and whether effluent constituent levels are ALARA. Inspections occur at least annually, although NRC inspectors may increase the inspection frequency based on licensee performance. Inspections may be announced or unannounced; however, the general policy for non-reactor facilities is to use unannounced inspections unless this results in the NRC using its inspectors inefficiently. In addition to conducting inspections, the NRC staff reviews semiannual effluent and environmental monitoring reports submitted by the licensee. The NRC also reviews and assesses all reported incidents at ISL facilities (e.g., spills, excursions, and other reportable events) and requires corrective actions.*

*NRC inspections may identify violations that are subject to enforcement actions. The NRC inspection process focuses on compliance with NRC requirements. The NRC encourages prompt self-identification of non-compliance and through the enforcement process requires the development of comprehensive correction action plans. When licensees, contractors, and their employees fail to meet NRC regulatory requirements enforcement sanctions may be imposed. The NRC considers the number and severity of violations in determining the appropriate enforcement sanctions for a licensee. Licensees, employees, and contractors who engage in*

*deliberate misconduct or who deliberately submit incomplete or inaccurate information to NRC are subject to significant enforcement sanctions, which may involve civil penalties and legally binding orders.*

*This information is incorporated by reference in the SEIS.*

**Comment: 119-000012**

A commenter, citing SEIS Section 2.1.1.1.6.2 that indicates laboratory chemicals would be part of the plant wastewater stream, requested the SEIS list the laboratory chemicals and projected quantities stored at the site.

**Response:** *The proposed onsite laboratory and chemicals used and stored in the laboratory were not described in detail in the license application or the draft SEIS. However, NRC staff expects the facility will house a small chemistry lab, will store and use small quantities of common laboratory reagents, and will comply with all applicable state and federal regulations for chemical storage and disposal.*

*As described in SEIS Section 2.1.1.1.6.2, materials that are defined as hazardous waste are required to be stored and disposed in accordance with EPA regulations. Materials that are defined as liquid byproduct material can be combined with other liquid byproduct material wastewater, treated, and disposed by Class V deep well or land application if applicable permits are granted as described in SEIS Section 2.1.1.1.6.2. Detailed information on the expected combined liquid byproduct material wastewater constituents and the estimated concentrations is provided in license application documentation (Powertech, 2011, 2012). The projected quality of wastewater to be disposed of in deep Class V injection wells was described in the applicant's response to NRC RAIs (Powertech, 2011, Table TR RAI P&R-14d-1). The expected wastewater quality for land application is provided in the applicant's GDP (Powertech, 2012, Table 5.8-2). This reference information was added to SEIS Section 2.1.1.1.6.2. Because the SEIS analysis focuses on the quality of the wastewater that will be disposed, the water quality of only the combined wastewater stream (i.e., the result of adding all individual contributing waste streams) was described in the SEIS, and, therefore, no additional changes were made in response to this comment.*

**Comment: 127-000025**

A commenter expressed concerns about the applicant's proposed use of RO to treat wastewater streams prior to disposal in a deep disposal well citing the draft SEIS description in SEIS Sections 2.1.1.1.4.1.1, 3.13.1, and 4.4.1.1.3. The commenter noted the draft SEIS does not competently account for the extent of the waste that will be generated, claiming that the draft SEIS Sections 2.1.1.1.4.1.1 and 4.4.1.1.3 state, without any support, that Powertech will recover 70 percent of the treated water as usable permeate. However, the commenter claims, citing a University of North Dakota State University Extension Service report (NDSU, 1992), that according to government estimates, RO can result in a loss of up to 95 percent of the liquid, which would be left in the waste, leaving a more significant waste stream than analyzed in the draft SEIS. The commenter further asserted the aforementioned University of North Dakota report stated that RO is also prone to fail if not meticulously maintained, and it is not advised for larger volumes of water due to the significant water loss and waste associated with the process. The commenter requested the draft SEIS accurately review the applicant's plan regarding waste disposal to analyze and compensate for these factors.

**Response:** *Regarding the magnitude of waste that would be created by the proposed application of RO treatment of wastewater, the allegedly missing information is in the GEIS (NRC, 2009). The GEIS discusses the RO process and related chemical processes (GEIS Section 2.5.3), the use of RO in aquifer applications (GEIS Sections 2.5, 4.2, 4.3, 4.5), impacts on groundwater and waste management (GEIS Sections 4.2.12.2, 4.2.4.2, 4.3.4.2.3), and recovery rates for treated water reused as permeate (GEIS Sections 2.5.3 and 4.3.4.2.3). In addition, Powertech provided information on these processes in Sections 4.15.1 and 4.6.2.4 of its Environmental Report (Powertech, 2009a).*

*To support their assertion that RO technology is prone to failure, the commenter cites a report from the University of North Dakota State University. The report analyzes problems with consumer products intended for home use involving small-scale RO technology. The commenter does not provide support for why equipment used in products used in the home are relevant to the equipment used in IRS facilities in general or specifically proposed for the Dewey-Burdock facility. Furthermore, the staff evaluated the equipment proposed by the applicant and find it meets the industry standards for this equipment. The NRC staff understand that RO technology must be properly maintained and operated to maintain its effectiveness and along these lines the applicant proposed to operate the RO system using the necessary pretreatment, including multi-media or sand filters and feed conditioning (Powertech, 2009b, p. 3-47).*

*Overall, the commenter identified a need for clear referencing of supporting information contained in the GEIS. The commenter has not provided any new information that requires additional review or analysis in the SEIS. In response to this comment, citations to the applicable GEIS section were added to the SEIS where the recovery rate for RO is mentioned. In addition, a description of the applicant's proposed pretreatment of wastewaters destined for treatment by the RO system, including multi-media or sand filters and feed conditioning was added to the description of RO treatment in SEIS Section 2.1.1.1.6.2.*

**Comment: 128-000067**

The commenter stated that the reference to RCRA regulations in SEIS Section 2.1.1.1.6.2 should be removed because it is not relevant to liquid waste generated during operations or restoration, because 11e.(2) byproduct material is specifically exempt from RCRA.

**Response:** *The statement in the draft SEIS referenced by the commenter describes an EPA permitting requirement for a Class V deep injection well, not NRC regulatory requirements for liquid waste. Because the permitting requirement is correctly described no changes were made to the SEIS.*

**Comment: 128-000068**

The commenter stated that the list of crops that may be grown on the land application areas and growing season described in SEIS Section 2.1.1.1.6.2 do not match the updated information in the groundwater discharge plan application (Powertech, 2012). The applicant suggested the SEIS be revised as follows:

*“Treated wastewater will be pumped through center pivot sprinklers during the growing season, which is approximately April through October (Powertech, 2011). The applicant anticipates that irrigated crops may include native*

*vegetation, alfalfa, and salt-tolerant wheatgrass (Powertech, 2012). During periods when soils are frozen or snow covered the use of land application, treated liquid waste will be stored temporarily in ponds located either near the Burdock central plant or the Dewey satellite facility (Powertech, 2011, 2012a)."*

**Response:** *The NRC staff verified that the information updates were described in the cited documents and revised the final SEIS.*

**Comment: 128-000148**

The commenter requests clarification of the statement made in SEIS Section 4.4.1.1.2 and throughout the draft SEIS that "The NRC will require liquid wastes injected into potential Class V injection wells at the proposed project to be treated to concentrations below hazardous levels and radioactive waste thresholds at 10 CFR Part 20, Subparts D and K, as wells [sic] as Appendix B, Table 2, Column 2." The commenter noted in the June 2011 TR RAI responses (Powertech, 2011 source in the Chapter 4 references), Powertech committed to treating the liquid waste injected into the Class V wells to meet the 10 CFR Part 20, Appendix B, Table 2, Column 2 release limits; however, Powertech has not committed to treating to Subparts D and K standards. The commenter further indicated this commitment is not in the EPA Class V UIC permit application, nor has compliance with Subparts D and K been discussed with NRC or EPA in various meetings during the licensing/permitting process. The commenter also offered that it is not clear how Subparts D and K apply to any potential Class V injection activities because Subpart D applies to dose limits for members of the public, who would not be exposed to the Class V injectate, and Subpart K applies to sanitary sewers and incineration, which does not appear to apply to Class V injection wells.

**Response:** *Waste management activities must comply with the requirements of 10 CFR Part 20 including, Subparts D (Radiation Dose Limits for Individual Members of the Public) and K (Waste Disposal). In the draft SEIS, the NRC staff discussed compliance with the effluent limits in 10 CFR Part 20, Appendix B in the following context. 10 CFR Part 20, Subpart D requires that deep well disposal or land application systems be operated so that the public dose limits are not exceeded either by the migration or accumulation of radioactive constituents during land application or deep well disposal. Similarly, 10 CFR 20.2002 and 10 CFR 20.2007 of Subpart K require NRC approval of disposal procedures, as well as compliance with other federal, state, and local regulations governing the disposal of toxic and hazardous materials. The NRC staff revised statements in the SEIS concerning 10 CFR Part 20, Subparts D and K and clarified the applicability of the regulations to the proposed facility.*

**Comment: 128-000204**

The commenter stated that the expected liquid waste flow rates described in SEIS Section 4.6.1.2.3 apply to the entire proposed project area and not to each land application system. The commenter suggested revising the statement to read,

*"The expected liquid waste flow rate for the entire project will be ..."*

In addition, the commenter stated that the peak land application rate is not directly comparable to the peak wastewater generation rate, because there will be times of the year that land application will not be used. Therefore, the commenter suggested changing the sentence to read,



*“The maximum expected liquid waste flow rate of 2,070 Lpm [547 gpm] is less than the expected annual land application disposal capacity, which is estimated to be 1,173 Lpm [310 gpm] for each of the proposed land application areas or 2,347 Lpm [620 gpm] for the combined (Dewey and Burdock) land application areas.”*

**Response:** *The NRC staff has reviewed and agrees with the proposed corrections and clarifications. The recommended text was added to the impact analysis in SEIS Section 4.6.1.2.3. The NRC staff also added a reference to the applicant’s groundwater discharge plan (GDP) (Powertech, 2012) for the design average annual application rate (i.e., land application disposal capacity) of 1,173 Lpm [310 gpm] for each land application area. The design average annual application rate was also added to SEIS Sections 2.1.1.1.4.1.2 and 2.1.1.1.2.4.2. The impact analyses in SEIS Sections 4.14.1.2.2 and 4.14.1.2.3, which relies on this information were also revised.*

**Comment: 128-000260**

The commenter recommended revising the statement in SEIS Section 7.6 for consistency with SEIS Section 2.1.1.1.2.4.1 to reflect that 300 gallons per minute is the maximum anticipated injection rate, not the per well disposal rate. The commenter recommended revising the statement as follows:

*“The applicant estimates the need for disposal capacity of 1,135 liters per minute [300 gallons per minute] or about 1,635,300 liters [432,000 gallons] per day assuming 24 hour/7 day injection.”*

**Response:** *The NRC staff made the requested correction in SEIS Section 7.6 and the language is now consistent with the maximum injection rate described in SEIS Section 2.1.1.1.2.4.1.*

**Comment: 136-000019**

A commenter expressed the view that the option for disposal of wastewater by land application to support irrigation of alfalfa or other crops is not sensible. The commenter asserted that current regulations for wastewater standards are inadequate to protect of human health. The commenter requested the final SEIS exclude this disposal option from consideration.

**Response:** *Both NRC and SDDENR require compliance with wastewater standards which are part of broader regulatory programs designed to protect public health and safety and the environment. These programs include monitoring within and beyond land application areas so changes in the environment can be monitored and corrective actions taken if public health and safety or the environment is endangered. The commenter suggested the regulations are inadequate but did not mention which regulations or describe any inadequacies. Therefore, no changes were made to the SEIS.*

**E5.29.2 Solid Waste Comments**

**Comments: 116-000020; 127-000030**

One commenter requested the SEIS should identify the type, name, and location of the licensed disposal facility for soils contaminated by spills and leaks. The commenter stated it was not

reasonable to assume the applicant could dispose of this material at the White Mesa Mill and suggested NRC require the applicant to make arrangements for disposal of this material prior to construction and operation of the Dewey-Burdock Project. Another commenter expressed the view that NEPA demands onsite creation and storage of the solid byproduct material must be fully analyzed in a draft SEIS along with an analysis of the plan for offsite shipment and disposal of the waste. The commenter stated the draft SEIS did not analyze the impacts or potential mitigation measures for a range of alternatives available for storing and disposal of solid byproduct material during operations and during decommissioning and closure. The commenter also suggested that although some amount of byproduct material will be created during the operations phase, particularly related to maintenance, repair, and the rolling closure of wellfields, the anticipated type and amount of wastes are not identified in the draft SEIS beyond a generic reference (citing draft SEIS p. 2-10). Further, the commenter noted the draft SEIS does not analyze the impacts or alternative plans to store solid byproduct material. The commenter suggested the draft SEIS contains only a vague intent to ship these materials to the Energy Fuels facility near Blanding, Utah, and the Ute Mountain Ute Community at White Mesa. The commenter noted the draft SEIS does not reveal that Energy Fuels does not have a disposal cell that is currently licensed to accept direct disposal of such wastes at any of the Canadian company's U.S. holdings. The commenter also expressed a concern that no suitable onsite locations for disposal of solid byproduct material were revealed or analyzed in the draft SEIS.

**Response:** *For solid byproduct material disposal (which includes soils contaminated by spills and leaks exceeding NRC release limits), as described in SEIS Section 3.13.2, if an NRC license is granted, NRC staff will require, by license condition, an agreement to be in place before operations begin to ensure the availability of sufficient disposal capacity. The applicant has identified the White Mesa site as the disposal location for solid byproduct material, but a disposal agreement is not yet in place (Powertech, 2011). The White Mesa site, an operating conventional uranium mill in Blanding, Utah, is permitted to construct an additional 1,452,654 m<sup>3</sup> [1,900,000 yd<sup>3</sup>] of tailings impoundment capacity (UDEQ, 2010a). In accordance with its license, White Mesa may not receive more than 3,823 m<sup>3</sup> [5,000 yd<sup>3</sup>] of ISR wastes from any single source (UDEQ, 2010b). In the NRC Safety Evaluation Report, the NRC proposed a license condition (No. 12.6) that requires a disposal agreement with a licensed disposal facility be in place before the start of operations at Dewey-Burdock (NRC, 2013).*

*The generation, storage, transport, and disposal of solid byproduct material at the proposed ISR site have been analyzed by the NRC staff and no unresolved safety or environmental issues remain. SEIS Section 2.2 provides a detailed objective analysis of reasonable alternatives to the proposed action. Alternatives to the disposal of solid byproduct material such as on-site disposal were not considered reasonable based on the low volume of solid byproduct material requiring disposal, the cost and time commitments required to license a conventional tailings impoundment, and NRC licensing criteria in 10 CFR Part 40, Appendix A, Criterion 2. Criterion 2 states that to avoid proliferation of small waste disposal sites and thereby reduce perpetual surveillance obligations, byproduct material from in-situ extraction operations must be disposed at existing large mill tailings sites unless the costs and environmental impacts of such offsite disposal is impracticable or the advantages of onsite burial clearly outweigh the benefits of reducing the perpetual surveillance obligations. No additional changes were made in response to this comment.*

**Comments: 127-000031; 127-000035**

A commenter asserted the SEIS must include disclosure ananalysis of reasons why the past and present management of the White Mesa Mill have been unable to meet state and federal standards. The commenter asserts data from the Mine Safety Health Administration website identify violations that resulted in tens of thousands of dollars in fines. The commenter also notes ongoing groundwater contamination and offsite air deposition of radioactive materials at the White Mesa Mill must also receive NEPA analysis. The commenter notes that because NRC relies on White Mesa as the disposal site for the wastes, the agency must analyze impacts associated with the operation and disposal of Powertech wastes at the White Mesa location. In another comment, the same commenter requested many other impacted and listed species be examined in a correlated ESA consultation and NEPA analysis that is based on a project area for the license that includes the assumed Utah disposal and the transportation routes. The commenter noted that Section 7 consultation with FWS must be engaged based on a full range of foreseeable impacts of the licensing action, including the confirmed need for off-site disposal of solid radioactive materials during operation and closure.

**Response:** *The White Mesa Mill site is a conventional uranium and vanadium mill site in operation since the late 1970s. The White Mesa site includes a conventional mill facility that crushes and processes ores using chemical leaching agents for uranium recovery. Tailings impoundments are used for disposal of byproduct material from these operations. The operation of the White Mesa facility is regulated by the State of Utah and the mining operations are regulated by the Federal Mine Safety Health Administration. Active enforcement of requirements by these agencies including notices of violations, imposition of fines, detailed follow-up analyses of potential problems, and requiring necessary corrective actions are important aspects of maintaining safety and protection of the environment and is not a valid reason for requesting additional analysis by the NRC. Additionally, from the perspective of NEPA, the operation of the White Mesa facility is outside the scope of the Dewey-Burdock environmental review and further analysis would not inform the NRC or interested stakeholders on the environmental impacts of granting a license to Dewey-Burdock because (i) the White Mesa site is an independent operating uranium mill under active regulatory oversight that does not rely on the granting of the Dewey Burdock ISR Project license for its existence, (ii) the proposed use of the tailings impoundment at White Mesa to dispose of ISR byproduct material is authorized by the White Mesa operating permit as long as specific conditions are met, (iii) the amount of solid byproduct material generated by Dewey-Burdock that would be disposed at White Mesa is a small fraction of the available capacity at White Mesa (see response to comment 116-000020), and (iv) the permitted limit of accepting no more than 3,823 m<sup>3</sup> [5,000 yd<sup>3</sup>] of byproduct material from any ISR facility limits the overall cumulative impact of disposing of additional ISR byproduct material at the facility. Based on the preceding factors, the staff concluded expanding the impact analysis to include past and present operations at the White Mesa uranium mill would not inform the description of the potential impacts associated with the proposed action. In response to the comment, no changes were made in the final SEIS.*

*Regarding the commenter's request for a new Section 7 consultation, the commenter does not assert that impacts to wildlife from transport and disposal of solid byproduct material from the Dewey-Burdock ISR project require a broad consultation with the FWS. However, the results of the NRC consultation with the FWS are described in SEIS Section 3.6.3. Therefore, no additional changes were made to the SEIS in response to this comment.*

**Comment: 128-000066**

Regarding the text box on draft SEIS p. 2-48, the commenter requested the NRC staff change the definition of solid byproduct material to avoid including all solid wastes and only include solid waste that does not meet the NRC criteria for unrestricted release and which must be disposed at a licensed disposal site. The commenter provided as an example that the solid drill cuttings resulting from well field construction are not byproduct material, but rather are considered TENORM as described in the Commission's decision on the Hydro Resources, Inc. Crownpoint Uranium Project (CLI-06-14, 63 NRC 510, 518-520, May 16, 2000). The commenter requested that this language be revised to exclude such solid wastes from the definition of "solid byproduct material."

**Response:** *NRC staff agrees the definition of solid byproduct material in the text box on SEIS, p. 2-48 is overly broad. The NRC definition of byproduct material has been clarified in the SEIS. The NRC definition of byproduct material found in 10 CFR 40.4 applies to solid wastes generated at the proposed facility that do not meet the requirement for unrestricted use and that must be disposed of in a licensed disposal facility.*

**E5.29.3 General Waste Management Comments**

**Comment: 042-000012**

The Northern Cheyenne Tribe cited and noted agreement with the majority of the arguments made before the NRC ASLBP by Dr. Robert E. Moran, consultant for the Oglala Sioux Tribe, concerning the technical aspects of Powertech's application to the NRC for an ISR license for the Dewey-Burdock *In-Situ* uranium project. The Northern Cheyenne Tribe shared the concern that the Powertech application does not provide an adequate presentation of the potential impacts associated with waste disposal from the proposed ISR mining operations, either by the proposed deep well injection method or surface land application.

**Response:** *In response to this comment, the NRC staff reviewed Dr. Moran's statements pertaining to the potential impacts associated with waste disposal from the proposed ISR mining operations. Dr. Moran asserted that the draft SEIS did not (i) consider concerns expressed by other Federal and State agencies; (ii) quantify water used in all project phases or take into account water consumed by waste disposal practices; and (iii) provide detailed chemical analyses of liquid wastes to be disposed of by deep well injection, land application, and evaporation. Additionally, Dr. Moran cited EPA guidance (2008) to assert that land application is not an approved method for disposal of ISR wastes. Dr. Moran also challenged the applicant's assertion that irrigation pivots have been used to dispose of wastes via surface application with no deleterious effect on the environment. Dr. Moran cited the experience at various facilities, including the Highland ISR facility, where excessive selenium buildup in irrigated soils resulted in enforcement actions by the Wyoming Department of Environmental Quality.*

*Regarding the concerns expressed by other federal agencies, Dr. Moran claimed that the draft SEIS insufficiently addressed concerns regarding (i) potential risks to wildlife (including waterfowl) from exposure to wastewater in surface impoundments; (ii) accumulated wastewater constituents in soils from irrigation and applicable mitigation measures, including evaluating toxicity of wastewater; (iii) the use of access restrictions such as fencing and netting; and (iv) monitoring of soils to identify buildup of salts and metals. The impact analyses in the draft*

*SEIS did, in fact, take into account each of these potential impacts. In response to comments concerning these potential impacts, however, the NRC staff has revised the ecological impact analysis in final SEIS Sections 4.6.1.1.2, 4.6.1.1.3, 4.6.1.2.2, and 4.6.1.2.3. These revisions include (i) clarifying the description of wastewater chemical characteristics, (ii) providing documentation of the potential toxicity of proposed wastewater to wildlife, (iii) documenting additional details of the required controls that would limit contamination of surface water and wildlife habitat, and (iv) including additional description of the potential for waste storage ponds to attract wildlife and the measures that would be taken to protect wildlife from exposure to pond solutions.*

*Regarding the quantification of water use, the response to Comment 091-000016 provides a detailed description of how water use, including wastewater, was evaluated in the SEIS and changes that have been made to the SEIS in response to comments.*

*Dr. Moran also cited to EPA guidance (2008) in asserting that land application is not an approved method for disposal of ISR wastes. The NRC staff reviewed the publication and found the topic of the report is TENORM. TENORM includes conventional mine wastes that are regulated by EPA but are defined differently from the byproduct material which is produced by ISR facilities and regulated by NRC. The report also contains examples of licensed ISR facilities that have been approved to dispose of treated wastewater by land application.*

*Dr. Moran also challenged the applicant's characterization of the land application experience at various sites, including the Highland ISR Facility, as having no deleterious effect on the environment. The NRC staff is familiar with the experience at the Highland site. At Highland, land application of wastewater has resulted in elevated concentrations of selenium. This resulted in the Wyoming Department of Environmental Quality requiring corrective actions at the site. These corrective actions included additional wastewater treatment and development of an ecological risk assessment to evaluate potential wildlife impacts. The objective of these corrective actions is to mitigate the potential environmental impacts of the elevated selenium concentrations in soils. The corrective actions have been partially successful, but the work is ongoing.*

*The NRC Staff has considered whether the experience at Highland may be relevant to the proposed Dewey-Burdock facility. The monitoring records of the Highland irrigation site show wide variability in wastewater selenium concentrations; levels ranged as high as 10 times the concentrations expected at the Dewey-Burdock facility. The average concentration of selenium at the Highland site was two times the levels projected for land application wastewater at the Dewey-Burdock site. The Highland experience raised awareness of the accumulation of wastewater constituents from land application, has provided field data and experience with corrective actions, and illustrates the importance of timely corrective action.*

*Although Dr. Moran objected to the applicant's characterization of the Highland experience, the applicant's statements were not incorporated into the SEIS. Accordingly, the Staff did not revise the SEIS in response to this part of Dr. Moran's comments.*

#### **E5.29.4 Regulation of Waste and Disposal Methods**

**Comment: 119-000002**

SDDENR mentioned the draft SEIS includes liquid waste options of (i) Class V wells only, (ii) land application only, and (iii) a combination of land application and Class V wells, yet it has included a proposed condition in the recommended South Dakota GDP that the land application method can only be used if there is insufficient capacity available in the Class V wells.

**Response:** *In response to this comment, the NRC staff clarified the statements describing the liquid waste disposal options in SEIS Sections 2.1.1.1.2.4, 2.1.1.1.6.2, and 4.1. The revised SEIS states that SDDENR may permit land application only if the applicant demonstrates there is insufficient disposal capacity in Class V wells to contain the liquid waste generated at the proposed facility.*

**Comment: 119-000003**

SDDENR noted that the draft SEIS refers to a Groundwater Discharge Permit in numerous places; however, these references should be revised to refer to Groundwater Discharge Plan. They stated the GDP consists of three permits: construction, water quality variance, and groundwater discharge.

**Response:** *GDP refers an application to SDDENR for three permits: construction, water quality variance, and groundwater discharge. In response to this comment, NRC staff changed references to the groundwater discharge permit and GDP to groundwater discharge plan and GDP throughout the SEIS.*

**Comment: 119-000009**

A commenter noted with regard to draft SEIS Section 2.1.1.1.2.4.1 (Deep Class V Injection Well Option); if inspections reveal pond leakage or releases, SDDENR must also be notified within 24 hours in accordance with ARSD 74:34:01:04. They noted this section also discusses effluent water quality limits on land application wastewater and that SDDENR is also proposing effluent water quality limits as part of the recommended GDP.

**Response:** *In response to the comment, the NRC staff inserted a statement into SEIS Section 2.1.1.1.2.4.1 that SDDENR must be notified of any pond leakage or releases within 24 hours. Text was also added to SEIS Section 2.1.1.1.2.4.2 referring to SDDENR proposed limits in the GDP for land application wastewater.*

**Comment: 119-000010**

A commenter noted draft SEIS Section 2.1.1.1.2.4.2 (Land Application Option) Page 2-27, states land application will not occur during winter months and lists November through March as an example. It commented that under the recommended GDP, land application of liquid wastewater is restricted by soil conditions (i.e., frozen or snow covered soil) rather than specific months of the year.

**Response:** *The NRC staff revised SEIS Section 2.1.1.1.2.4.2 to reflect the SDDENR permit conditions that limits the use of land application is based on soil conditions; land application will be prohibited on frozen or snow-covered soils.*

#### **E5.29.5 Characteristics of Wastes Generated by In-Situ Recovery**

##### **Comment: 119-000008**

A commenter noted that draft SEIS Section 2.1.1.1.2.4 (Liquid Waste Disposal Systems) includes descriptions of several wastewater types (such as laundry water) that are more appropriately septic wastes. It further noted that only wastewaters identified in Powertech's GDP application may be discharged through the land application system. It listed these wastewaters to include production bleed; groundwater generated during aquifer restoration; affected groundwater generated during well development; and liquid process waste, such as resin transfer water and brine. It also noted that plans and specifications for small onsite wastewater systems must be submitted to SDDENR for approval prior to construction.

**Response:** *In response to the comment, NRC staff revised SEIS Sections 2.1.1.1.2.4 and 2.1.1.1.6.2 to reflect that SDDENR limits wastes discharged through the land application system to only those wastewaters identified by the applicant in its GDP. The list of liquid wastes in the draft SEIS is based on the information the applicant submitted to NRC in its license application, as supplemented, by responses to RAIs (Powertech, 2011). The NRC staff assumes that all liquid waste types defined as byproduct material may contain process solutions or traces of yellowcake and this could include laundry water containing these constituents. Under the NRC definition of liquid waste, laundry water containing byproduct materials is not septic wastewater. No additional changes to the draft SEIS were made in response to the comment about liquid waste types.*

*The NRC is not directly involved in the SDDENR permitting process. If the GDP does not include a complete listing of wastes that are planned to be discharged via land application, it is the applicant's responsibility to ensure the facility operates in compliance with SDDENR requirements. Regarding the comment about SDDENR approval of onsite wastewater systems, SEIS Section 2.1.1.1.6.2 already describes the SDDENR requirement to apply for a septic system permit and therefore no changes were made in response to that comment.*

#### **E5.29.6 References**

10 CFR Part 20 Appendix B. *Code of Federal Regulations*, Title 10, *Energy*, Part 20. "Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs) of Radionuclides for Occupational Exposure; Effluent Concentrations; Concentrations for Release to Sewerage." Washington, DC: U.S. Government Printing Office.

10 CFR Part 40. *Code of Federal Regulations*, Title 10, *Energy*, Part 40. "Domestic Licensing of Source Material." Washington, DC: U.S. Government Printing Office.

40 CFR Part 261. *Code of Federal Regulations*, Title 40, *Protection of Environment*, Part 261. "Identification and Listing of Hazardous Waste." Washington, DC: U.S. Government Printing Office.

ARSD (Administrative Rules of South Dakota). Section 74:34:01:04. Reporting of known discharges -- Reportable quantities. South Dakota Legislature Administrative Rules.

EPA (U.S. Environmental Protection Agency). "National Recommended Water Quality Criteria, Aquatic Life Criteria Table." Washington DC: EPA. June 11, 2013a. <<http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm#R>> (27 June 2013).

EPA. "National Primary Drinking Water Regulations: List of Contaminants and their (MCLs)." Washington DC: EPA. June 3, 2013b. <<http://water.epa.gov/drink/contaminants/index.cfm#List>> (7 October 2013).

EPA. "ECO-SSL." Washington DC: EPA. 2010. <<http://www.epa.gov/ecotox/ecossl/>> (27 June 2013).

EPA. "Technical Report on Technologically Enhanced Naturally Occurring Radioactive Materials from Uranium Mining, Volume 1: Mining and Reclamation Background." EPA 402-R-08-005. Washington, DC: EPA. April, 2008. <<http://www.epa.gov/rpdweb00/docs/tenorm/402-r-08-005-voli/402-r-08-005-v1.pdf>> (7 October 2013).

EPA. "Release of Guidance for Developing Ecological Soil Screening Levels (Eco-SSLs) and Eco-SSLs for Nine Contaminants." Memorandum (December 29) from M.L. Horinko to Superfund National Policy Managers, Regions 1–10, RCRA Senior Policy Advisors, Regions 1–10. OSWER 9285.7-55. Washington, DC: EPA. 2003.

FWS (U.S. Fish and Wildlife Service). "U.S. Fish and Wildlife Service Comments on NRC Notice of Intent To Prepare a Generic Environmental Impact Statement for Uranium Milling Facilities (GEIS)." Letter (September 5) to P. Bubar from M. Stempel. ML072540098. Washington, DC: U.S. Department of the Interior, FWS. 2007.

FWS. "Selenium in a Wyoming Grassland Community Receiving Wastewater from an *In-Situ* Uranium Mine." Contaminant Report Number: R6/715C /00. Cheyenne, Wyoming: U.S. Department of Interior, FWS. September 2000.

Golder Associates Inc. "Unsaturated Soil Modeling and Ecological Risk Assessment for Soils Under Irrigation: Cameco Resources Smith Ranch-Highlands Facility." 123-81622. ML13002A141, ML13002A142. Lakewood, Colorado: Golder Associates Inc. November 16, 2012.

NDSU (North Dakota State University). "Treatment Systems for Household Water Supplies: Reverse Osmosis." AE-1047. Fargo, North Dakota: NDSU. February 1992.

NRC (U.S. Nuclear Regulatory Commission). "Draft License SUA-1600 for Powertech (USA), Inc." ML13318A094. Washington, DC: NRC. March 2013.

NRC. NUREG-1910, "Generic Environmental Impact Statement for *In-Situ* Leach Uranium Milling Facilities." ML091480244, ML091480188. Washington, DC: NRC. May 2009.

Powertech [Powertech (USA) Inc.]. "Dewey-Burdock Project Groundwater Discharge Plan Custer and Fall River Counties, South Dakota." ML12195A039, ML12195A040. Edgemont, South Dakota: Powertech. March 2012.



Powertech. “Dewey-Burdock Project, Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota, Technical Report RAI Responses, June, 2011.” ML112071064. Greenwood Village, Colorado: Powertech (USA) Inc. 2011.

Powertech. “Dewey-Burdock Project, Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota ER\_RAI Response”. Appendix WR–7, Waste Analysis Plan of March 2010, p. 2-1. ML102380516. Greenwood Village, Colorado: Powertech . August 2010.

Powertech. “Dewey-Burdock Project, Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota–Environmental Report.” Docket No. 040-09075. ML092870160. Greenwood Village, Colorado: Powertech. August 2009a.

Powertech. “Dewey-Burdock Project, Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota—Technical Report.” Docket No. 040-09075. ML092870160. Greenwood Village, Colorado: Powertech. August 2009b.

SDCL (South Dakota Codified Law). “Chapter 46-2A, Administration Procedure for Appropriation of Water.” South Dakota Legislature.

SDDENR (South Dakota Department of Environment and Natural Resources). “Summary of SD Water Laws and Rules.” Pierre, South Dakota: SDDENR. July 2013.

<<http://denr.sd.gov/des/wr/summary.aspx#Appropriative>> (10 July 2013).

UDEQ (Utah Department of Environmental Quality). “Division of Radiation Control; Denison Mines (USA) Corp.; Review of License Amendment Request and Environmental Report for Cell 4B; Safety Evaluation Report; Under UAC R313-24 and UAC R317-6.” ML12241A232. Salt Lake City, Utah: State of Utah Department of Environmental Quality, Division of Radiation Control. 2010a.

UDEQ (State of Utah Department of Environmental Quality). “Radioactive Materials License No. UT1900479.” ML12241A243. Salt Lake City, Utah: UDEQ, Division of Radiation Control. 2010b.

WDEQ (Wyoming Department of Environmental Quality). “RE: 2011-2012 Annual Report (AR) Review, Permit 603, Cameco Resources (CR).” (Comment 21). Letter (November 16) to Mr. K. Garoutte, Cameco Resources from Pam Rothwell, Land Quality Division. Cheyenne, Wyoming: WDEQ. 2012.

## **E5.30 Cumulative Impacts**

### **E5.30.1 The Supplemental Environmental Impact Statement Does Not Adequately Address Cumulative Impacts**

#### **Comment: 136-000010**

The commenter stated that NRC has failed to analyze the cumulative impacts of *in-situ* uranium mining in both the GEIS and SEIS. The commenter stated that cumulative impacts of *in-situ* uranium mining, problematic enough on their own, are exacerbated by the previous era of conventional uranium mining in the South Dakota-Wyoming-Nebraska region. The commenter noted the SEIS describes instances of historic contamination affecting surface areas and

groundwater supplies that are already documented at the Dewey-Burdock project area, caused by open pit mining that occurred on an adjacent site in the Cold War era. The commenter stated that the Angostura Reservoir is downstream of the site and receives surface waters that will be impacted by the mine, as well as a recharge that is affected by underground hydrology of the region. The commenter stated that the reservoir was subjected to a uranium mill tailings spill in 1962 and is still being monitored for the impacts, which could be exacerbated by the start of new mining.

**Response:** *Both the GEIS and SEIS analyze the cumulative impacts of in-situ uranium mining. As discussed in SEIS Section 5.5.1, leaching and transport of contaminants from overburden waste piles associated with past conventional uranium mining in the eastern part of the proposed Dewey-Burdock site may impact surface waters and wetlands in the Beaver Creek and Pass Creek watersheds. As described in SEIS Section 3.5.1, water from these watersheds flows into the Cheyenne River, which in turn empties into the Angostura Reservoir. For these and other reasons discussed in SEIS Section 5.5.1, NRC determined that the cumulative impact on surface water and wetlands within the surface water study area resulting from past, present, and reasonably foreseeable future actions is MODERATE to LARGE. Text explaining that water from the Beaver and Pass Creek watersheds flows into the Cheyenne River, which empties into the Angostura Reservoir, was added to SEIS Section 5.5.1. As further described in SEIS Section 5.5.1, NRC concluded that the proposed Dewey-Burdock Project will have a SMALL incremental effect on surface water and wetlands when added to all other past, present, and reasonably foreseeable future actions in the surface water study area. As described in SEIS Section 4.5.1, potential impacts to surface waters at the proposed Dewey-Burdock site will be mitigated through proper planning and design of facilities and infrastructure, the use of proper construction methods, and implementation of best management practices (BMPs). Prior to initiating ISR operations at the proposed project, the applicant must also obtain a construction and industrial stormwater NPDES permit from SDDENR. The NPDES permit will include plans and programs for spill prevention and cleanup, erosion mitigation, and runoff control.*

*With regard to the underground hydrology of the region, regional groundwater flow moves outward radially from the Black Hills, which results in a northeast to southwest regional flow direction in the vicinity of the proposed Dewey-Burdock project site (see SEIS Section 3.5.3.1). The Angostura Reservoir is located east of the proposed project site. Therefore, it is expected that potential disposal of liquid wastes via deep Class V injection wells into deep aquifers will have no impact on Angostura Reservoir water quality. In addition, the applicant's excursion monitoring program will ensure protection of water quality in aquifers underlying production zone aquifers.*

*No additional changes were made to the SEIS.*

**Comment: 136-000012**

The commenter stated that the cumulative impacts of deep-injection waste disposal into the region's aquifers, not only by uranium mining but by other extractive industries, have not been adequately analyzed in the SEIS. The commenter stated that EPA has allowed more than 1,500 exemptions to energy companies to inject waste into aquifers, allowing them to become permanently and irreparably unfit as drinking water sources; altogether, 100 aquifers have been polluted in this manner. The commenter stated that this includes deep waste injections occurring at the nearby Crow Butte facility in Nebraska, Christensen Ranch in Wyoming, and

other *in-situ* uranium mines in the region. The commenter stated further that NRC is considering the deep injection waste disposal at the Dewey-Burdock site even though this technique has been prohibited in South Dakota by state law.

**Response:** *The cumulative impacts of deep injection waste disposal into the region's aquifers by uranium mining and other extractive industries have been closely considered in the SEIS. As discussed in SEIS Section 5.5.2, deep well injection of process-related water is a disposal method ISR and oil production facilities use. For deep well disposal in South Dakota, the applicant must obtain UIC permits for the targeted deep aquifer from EPA. As part of the review process for deep well injection UIC permits, EPA evaluates the suitability of the proposed deep injection wells and would only grant a permit if the deep disposal practice is safe for public health and safety and will not impact potential underground sources of drinking water.*

*NRC is aware that Class I disposal wells are prohibited in South Dakota (ARSD 74:55:02:02). However, Class V disposal wells are allowed subject to the provisions of SDCL 34A-2 governing the prevention of pollution of the waters of the state (see ARSD 74:55:02:03). As described in SEIS Section 2.1.1.1.2.4, liquid waste injected into potential Class V injection wells at the proposed Dewey-Burdock ISR Project site must not be hazardous or radioactive, as defined at 40 CFR 144.3. As further described in SEIS Section 2.1.1.1.6.2, an EPA UIC Class V permit*

*would prohibit injection of any material at the proposed project defined as hazardous waste in RCRA regulations in 40 CFR 261.3. Although the deep injection wells are Class V wells, many of the protective requirements found at 40 CFR Part 146, Subpart B, Criteria and Standards Applicable to Class I Wells, will be included in the EPA UIC Class V Permit (see discussion in SEIS Section 7.6). Because Class V deep injection wells are being used for disposal rather than Class I wells, the injectate will have to be treated to remove radioactive constituents to below the radioactive waste standards at 10 CFR Part 20, Appendix B, Table II (see SEIS Section 4.5.2.1.1.2.3). If the total dissolved solids concentration in the proposed injection zone is below 10,000 mg/L [10,000 ppm], the injection zone is an underground source of drinking water. In that case, to be injected into the zone, the injectate will need to be treated to meet drinking water standards, or contaminant-specific background concentrations for constituents regulated under the SDWA.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comment: 127-000042**

The commenter states that the draft SEIS should be reissued with a clearly articulated project lifetime and a cumulative impacts analysis that corresponds with the lifetime of the project and the associated project impacts. As an example, the commenter asserts that the global warming analysis should describe the carbon disposal capacity of the Earth's atmosphere (i.e., similar to the solid waste disposal capacity discussion in draft SEIS p. 3-106) and do so over the lifetime of the project rather than just the arbitrary 10 years analyzed in the SEIS.

**Response:** *The cumulative effects methodology used in the analyses for all resource areas, as described in SEIS Section 5.1.2, identifies the time period for the cumulative analysis (i.e., 2009 to 2030) and directly associates this time period with the project lifetime. Language in SEIS Section 5.7.2 describing the temperature and precipitation changes associated with climate change over a 10-year period were not meant to indicate that the cumulative effects analysis*

*was limited to 10 years rather than the project lifetime. Text in SEIS Sections 3.7.2 and 5.7.2 was revised to clarify that the analyses cover the project lifetime.*

*The text in SEIS Section 3.13.2 to which the commenter refers addresses the disposal of nonhazardous solid wastes. This text identifies two landfills the application proposes to utilize and specifies the annual amounts of waste received at these landfills, as well as the disposal capacity of these individual landfills. Quantifying the capacity for these facilities is straightforward because this value is specified in the permit for operating the landfill. NRC staff reviewed the report entitled “U.S. Global Change Research Program Global Climate Change Impacts in the United State” (GCRP, 2009) and concluded there is no consensus on a clearly defined carbon disposal capacity for the Earth’s atmosphere. NRC staff has not conducted the analysis the commenter suggested because of the lack of a clearly defined carbon disposal capacity. NRC considers the analysis approach described in draft SEIS Section 5.7.2 appropriate.*

*No change was made to the SEIS to this aspect of the comment beyond the information provided in this response.*

### **E5.30.2 Past, Present, and Reasonably Foreseeable Future Actions**

#### **Comment: 091-000008**

The commenter stated that a cumulative impacts analysis must be done to consider whether further additional impacts, no matter how slight, will tip the balance toward wholesale pollution of the public water resources in this region. The commenter noted that under the NEPA guidance promulgated by CEQ, the environmental impacts of this project must be added to other past, present, and reasonably foreseeable activities in the region. The commenter stated that these activities include oil, gas, and coal developments and destroyed resources from other projects within the mineral district; short- and long-term socio-economic impacts; and environmental justice impacts.

**Response:** *SEIS Section 5.1.2 describes the approach that NRC uses to address cumulative impacts in a site-specific EIS. This approach is based on cumulative impacts assessment guidance CEQ developed, which provides examples and assumptions that agencies might use to determine the appropriate level of detail in analyzing the potential cumulative effects for a given resource area. The CEQ guidance does not prescribe a particular approach, nor does it presume a particular outcome (e.g., an impact significance level) in the site-specific EIS.*

*With regard to the cumulative impacts on public water resources in the region, the impact to surface and groundwater resources was evaluated within an 80-km [50-mi] radius of the proposed Dewey-Burdock ISR Project (see SEIS Section 5.5). The 80-km [50-mi] radius for the water resources study area encompasses the watersheds—including the Beaver Creek, Upper Cheyenne, and Angostura Reservoir watersheds—that would be potentially impacted by past, present, and reasonably foreseeable future actions (see SEIS Figure 3.5-1). As discussed in SEIS Section 5.5.2, rural population growth, oil and gas exploration development, and ISR uranium extraction are expected to be the primary activities contributing to the cumulative impact on groundwater resources within the 80-km [50-mi] radius of the Dewey-Burdock site. The incremental impacts of the proposed Dewey-Burdock ISR Project on these activities are discussed and analyzed in SEIS Section 5.5.2. The cumulative impacts of the proposed project*

*on socioeconomic resources and environmental justice are discussed and analyzed in SEIS Sections 5.11 and 5.12, respectively.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comment: 136-000011**

The commenter stated that the SEIS failed to consider the development of the Dewey-Burdock ISR Project and the central processing plant as a regional toll facility for uranium production. The commenter noted that it is likely that the processing plant, if it is constructed, would receive uranium leachate from other producers in the Black Hills region. The commenter stated that the proliferation of additional mining operations in the South Dakota-Wyoming-Nebraska region that could be created by a regional processing plant has not been considered in the SEIS cumulative impacts analysis, even though regional processing activities would have profound implications for water supplies, waste disposal, transportation and hauling, land disturbance, air quality, and many other environmental issues.

**Response:** *Existing and potential uranium recovery operations within the Nebraska-South Dakota-Wyoming Milling Region, where the proposed Dewey-Burdock Project would be located, are described in SEIS Section 5.1.1.1 and listed in SEIS Table 5.1-1. As described in SEIS Section 5.1.1.1, other potential uranium orebodies in the region include Dewey Terrace in Niobrara and Weston Counties, Wyoming; and Aladdin in Crook County, Wyoming (Powertech, 2009). Dewey Terrace is just west of the proposed Dewey-Burdock ISR Project in Weston and Niobrara Counties, Wyoming (see SEIS Figure 5.1-3). The uranium orebodies at Dewey Terrace are a continuation of the mapped orebodies at the Dewey-Burdock site (Powertech, 2009). To date, the applicant has not submitted a letter of intent to NRC for either Dewey Terrace or Aladdin. Therefore, NRC has no specific information that the applicant plans to go forward with these projects. It is also uncertain whether, if either project went forward, the applicant would seek to operate these projects as satellite facilities and ship uranium-loaded resins from Dewey Terrace or Aladdin to the proposed Dewey-Burdock site for processing into yellowcake. In addition, NRC has no specific information that other uranium companies would seek to operate ISR projects as satellite facilities and ship uranium-loaded resins from these projects to the proposed Dewey-Burdock site for processing into yellowcake.*

*No change was made to the SEIS beyond the information provided in this response.*

**E5.30.3 Inclusion of Other Projects in the Cumulative Impacts Analysis**

**Comments: 061-000023; 126-000008**

Two commenters noted that other projects should be included in the cumulative impact analyses. One commenter stated that information in SEIS Section 5.1.1 appears to be accurate, but believed two other projects should be included in the analysis. The first is the Southern Black Hills Water System project. The commenter pointed out that the Southern Black Hills Water System Board, a private corporation, has begun construction of a water pipeline to convey potable water from a well north of Hot Springs, South Dakota, to clients living south of Pringle, South Dakota. This area lies to the north and east of Edgemont and the proposed Dewey-Burdock ISR Project area in Custer County. The second is the proposed rare earth element mine north of Sundance, Wyoming. The commenter pointed out that the proponent of this project, Rare Element Resources, Inc, has submitted a draft plan of operations to the

Forest Service for review. The proposal is expected to include an open pit mine on NFS lands administered by the Black Hills National Forest and a processing plant some 40 miles to the south at Upton, Wyoming. The commenter stated that it is unclear exactly what effects this proposal could have, but the effects to surface water and groundwater could be an issue. The other commenter stated that the consideration of cumulative impacts should also include the proposed rare earths mine.

**Response:** *NRC is aware of the Southern Black Hills Water System project, which is included in the analysis of cumulative groundwater impacts from the proposed Dewey-Burdock ISR Project in SEIS Section 5.5.2. Text was revised in SEIS Section 5.5.2 to provide updated information the commenter provided on the Southern Black Hills Water System project.*

*NRC is also aware of the proposed rare earth element mine north of Sundance, Wyoming. The rare earth element mine, as well as a proposed processing plant at Upton, Wyoming, was not included in the cumulative impacts analysis of this final SEIS because they are located outside the cumulative impact study area for the proposed Dewey-Burdock ISR Project. In addition, the decision to exclude these proposed facilities was based on differences in surface and groundwater conditions at the Sundance and Upton sites and those at Dewey-Burdock. The proposed Dewey-Burdock ISR Project and the proposed rare earth element mine are located in different watersheds: the Dewey-Burdock site is located in the Beaver Creek watershed and the rare earth element mine in the Upper Belle Fourche watershed. Groundwater in regional aquifers, such as the Madison aquifer, flows radially outward from the Black Hills, resulting in a northeast-to southwest regional flow direction in the general vicinity of the proposed Dewey-Burdock ISR Project (see SEIS Sections 3.5.3.1 and 3.5.3.2). Therefore, groundwater in deep aquifers (e.g., the Madison aquifer) and shallow aquifers (e.g., the Inyan Kara aquifer) beneath the proposed Dewey-Burdock site travels southwest. The rare earth element mine north of Sundance, Wyoming and the proposed processing plant at Upton, Wyoming, are located northwest of the proposed Dewey-Burdock site. Therefore, groundwater in aquifers underlying the proposed Dewey-Burdock site would flow away from the Sundance and Upton facilities.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comment: 061-000023**

The commenter stated that the draft SEIS notes that there is the possibility that the processing facilities at Dewey-Burdock could be used for other projects. The commenter stated that, in fact, the applicant has said that it would like its facilities to be used regionally. The commenter stated that the draft SEIS mentions, but does not really consider, the use of Dewey-Burdock's processing facilities for other proposed Powertech projects. The commenter noted that there are at least six uranium companies active on the western side of the Black Hills. The commenter stated that while it is known one company plans to build its own processing facilities, the intentions of the others are not public, as far as the commenter knows. The commenter stated that the remaining companies, and any others the public doesn't know about, may also want to use the Dewey-Burdock facilities. The commenter stated that this possibility should be researched and considered in the SEIS, with its attendant transportation, worker exposure, water use, and other impacts. The commenter stated that consideration of cumulative impacts should include past uranium mining in the region.

**Response:** Existing and potential uranium recovery operations within the Nebraska-South Dakota-Wyoming Milling Region, where the proposed Dewey-Burdock Project would be located, are described in SEIS Section 5.1.1.1 and listed in SEIS Table 5.1-1. As described in SEIS Section 5.1.1.1, the applicant has identified other potential uranium orebodies in the region at Dewey Terrace in Niobrara and Weston Counties, Wyoming; and at Aladdin in Crook County, Wyoming (Powertech, 2009). Dewey Terrace is just west of the proposed Dewey-Burdock ISR Project, in Weston and Niobrara Counties, Wyoming (see SEIS Figure 5.1-3). The uranium orebodies at Dewey Terrace are a continuation of the mapped orebodies at the Dewey-Burdock site (Powertech, 2009). To date, the applicant has not submitted a letter of intent to NRC for either Dewey Terrace or Aladdin. NRC therefore has no specific information that the applicant plans to go forward with these projects. It is also uncertain whether, if either project went forward, the applicant would seek to operate these projects as satellite facilities and ship uranium-loaded resins from Dewey Terrace or Aladdin to the proposed Dewey-Burdock site for processing into yellowcake. In addition, NRC has no specific information that other uranium companies would seek to operate ISR projects as satellite facilities and ship uranium-loaded resins from these projects to the proposed Dewey-Burdock site for processing into yellowcake.

Past, present, and future ISR facilities in the vicinity of the proposed Dewey-Burdock ISR Project and within the broader region are discussed within the context of cumulative impacts for each resource area considered in the SEIS (see SEIS Sections 5.2 through 5.14). This discussion was based on available information presented in SEIS Section 5.1.1.1. Due to its proximity to the proposed Dewey-Burdock ISR Project site, the potential Dewey-Terrace project was discussed in more detail for each resource area considered in the SEIS.

No change was made to the SEIS beyond the information provided in this response.

**Comment: 127-000018**

The commenter stated that despite the project proponent's inclusion of the Dewey Terrace and Aladdin projects in the application, the draft SEIS mentions these mining projects only briefly in the "affected environment" portion of the document with no analysis of the impacts. The commenter noted that this omission is glaring in light of the acknowledgment that the Aladdin project is only 8 miles away and the applicant's aggressive advancement of the Aladdin and Dewey Terrace projects. The commenter stated that other mining development in and around the Black Hills region must be evaluated, including the Cameco operations in Nebraska and the proposed Bear Lodge rare earth element mine.

**Response:** NRC acknowledges that the potential Dewey Terrace and Aladdin projects are mentioned in the affected environment portion of the draft SEIS (see SEIS Section 3.2.3). NRC disagrees that the draft SEIS fails to analyze the impacts of the potential Dewey Terrace and Aladdin projects. The environmental impacts of the proposed Dewey-Burdock ISR Project on past, present, and reasonably foreseeable ISR projects, including the Dewey Terrace and Aladdin projects are appropriately assessed with respect to cumulative impacts in draft SEIS Chapter 5.

Existing and potential uranium recovery operations within the Nebraska-South Dakota-Wyoming Milling Region, where the proposed Dewey-Burdock Project is located, are described in SEIS Section 5.1.1.1 and listed in SEIS Table 5.1-1. These facilities include the Cameco operations in Nebraska, as well as the applicant's potential ISR projects at Dewey Terrace in Niobrara and Weston Counties, Wyoming, and at Aladdin in Crook County, Wyoming (Powertech, 2009).

*Dewey Terrace is just west of the proposed Dewey-Burdock ISR Project in Weston and Niobrara Counties, Wyoming (see SEIS Figure 5.1-3). The uranium orebodies at Dewey Terrace are a continuation of the mapped orebodies at the Dewey-Burdock site (Powertech, 2009). To date, the applicant has not submitted a letter of intent to NRC for either Dewey Terrace or Aladdin. NRC therefore has no specific information that the applicant plans to go forward with these projects. It is also uncertain whether, if either project went forward, the applicant would seek to operate these projects as satellite facilities and ship uranium-loaded resins from Dewey Terrace or Aladdin to the proposed Dewey-Burdock site for processing into yellowcake. In addition, NRC has no specific information that other uranium companies would seek to operate ISR projects as satellite facilities and ship uranium-loaded resins from these projects to the proposed Dewey-Burdock site for processing into yellowcake.*

*Past, present, and future ISR facilities in the vicinity of the proposed Dewey-Burdock ISR Project and within the broader region are discussed within the context of cumulative impacts for each resource area considered in the SEIS (see SEIS Sections 5.2 through 5.14). This discussion was based on available information presented in SEIS Section 5.1.1.1. Due to its proximity to the proposed Dewey-Burdock ISR Project site, the potential Dewey Terrace project was discussed in more detail for each resource area considered in the SEIS.*

*As described previously, NRC is aware of the proposed rare earth element mine north of Sundance, Wyoming. However, the rare earth element mine was not included in the cumulative impacts analysis, because the proposed mine north of Sundance, Wyoming, and proposed processing plant at Upton, Wyoming, are outside the cumulative impact study area for the proposed Dewey-Burdock ISR Project. For several reasons, the study excludes these projects. For example, the proposed Dewey-Burdock ISR Project and the proposed rare earth element mine are located in different watersheds. The proposed Dewey-Burdock ISR Project is located in the Beaver Creek watershed, whereas the rare earth element mine is located in the Upper Belle Fourche watershed. With respect to groundwater, groundwater in regional aquifers, such as the Madison aquifer, flows radially outward from the Black Hills, which results in a northeast-to-southwest regional flow direction in the general vicinity of the proposed Dewey-Burdock ISR Project (see SEIS Sections 3.5.3.1 and 3.5.3.2). Therefore, groundwater in deep aquifers (e.g., the Madison aquifer) and shallow aquifers (e.g., the Inyan Kara aquifer) beneath the proposed Dewey-Burdock site is travelling southwest, whereas the rare earth element mine north of Sundance, Wyoming, and the proposed processing plant at Upton, Wyoming, are located northwest of the proposed Dewey-Burdock site. Groundwater from aquifers underlying the proposed Dewey-Burdock site would therefore flow away from groundwater underlying the rare earth element mine north of Sundance and the proposed processing plant at Upton.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comment: 127-000019**

The commenter was concerned about the cumulative impacts associated with the Black Hills Ordnance Depot. The commenter stated that the issues of soil and groundwater contamination associated with this site are well documented. The commenter stated that the cumulative impact analysis must address potential exacerbation of groundwater contamination associated with chemicals from the depot caused by the proposed Dewey-Burdock project, including groundwater pumping both for mining purposes and for freshwater use, along with deep well injection.



**Response:** *NRC recognizes that there are concerns related to soil and groundwater contamination associated with the former Black Hills Army Depot (BHAD). NRC reviewed information regarding the BHAD to determine whether proposed operations at the Dewey-Burdock ISR Project could mobilize contamination from BHAD and subsequently harm public health or the environment (NRC, 2013).*

*The former BHAD is located in Fall River County, South Dakota, approximately 48 km [30 mi] southwest of Hot Springs, South Dakota, and approximately 22.5 km [14 mi] south of the Dewey-Burdock ISR Project. The BHAD was established in 1942 and remained in continuous operation until 1967. It consisted of approximately 8,537 ha [21,095 ac] of land and was used to store, maintain, demilitarize, and issue conventional and chemical munitions. Three areas are associated with chemical munitions and chemical agent disposal: BG-1, BG-2, and the Chemical Plant Area (USACE, 2012).*

*Rock units beneath the former BHAD include Paleozoic and Mesozoic shale, limestone, and sandstone approximately 1,219 m [4,000 ft] thick (USACE, 1992). These sedimentary rock units overlie a Precambrian basement consisting of igneous and metamorphic rocks (USACE, 1992). Surface geologic units at the BHAD consist of the Pierre Shale, Niobrara Shale, and Carlile Shale, each of which is exposed at different parts of the former depot (USACE, 1992). Underlying this shale sequence are sediments of the Inyan Kara Group.*

*The most likely mechanism by which the Dewey-Burdock ISR Project could affect contaminant migration at the former BHAD is by changing the groundwater gradients of the Inyan Kara aquifers during pumping to redirect groundwater toward the Dewey-Burdock ISR Project. However, the Inyan Kara aquifers must first be contaminated with constituents from the former depot in order for such a change in groundwater gradients to be of any consequence. USACE reported chlorinated solvents and fuel residues were discovered in shallow groundwater samples; however, no groundwater contamination was discovered in the BG-1 and BG-2 areas (USACE, 2012). According to USACE, the Fall River aquifer is approximately 335 m [1,100 ft] deep at the former BHAD and is overlain by thick sequences of shales (USACE, 1992). Any surface contamination would not penetrate such a thick shale sequence and contaminate the Fall River aquifer. Furthermore, the Fall River aquifer is artesian in this area (USACE, 1992). Therefore, if the overlying shales were perforated, water would move upward toward the ground surface, essentially preventing contamination from migrating downward into the aquifer. Considering the isolated nature of the Inyan Kara aquifers and the lack of significant groundwater contamination at the site, the staff determine that proposed operations at the Dewey-Burdock ISR Project will have no effect on site conditions at the former BHAD.*

*An assessment of the potential impacts that groundwater pumping at the proposed Dewey-Burdock ISR Project could have on existing groundwater contamination at the former BHAD was added to SEIS Section 5.5.2.*

#### **E5.30.4 References**

10 CFR Part 20 Appendix B. *Code of Federal Regulations*, Title 10, *Energy*, Part 20. "Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs) of Radionuclides for Occupational Exposure; Effluent Concentrations; Concentrations for Release to Sewerage." Washington, DC: U.S. Government Printing Office.

40 CFR Part 144. *Code of Federal Regulations*, Title 40, *Protection of the Environment*, Part 144. “Underground Injection Control Program.” Washington, DC: U.S. Government Printing Office.

40 CFR Part 146. *Code of Federal Regulations*, Title 40, *Protection of the Environment*, Part 146. “Underground Injection Control Program: Criteria and Standards.” Washington, DC: U.S. Government Printing Office.

40 CFR Part 261. *Code of Federal Regulations*, Title 40, *Protection of Environment*, Part 261. “Identification and Listing of Hazardous Waste.” Washington, DC: U.S. Government Printing Office.

ARSD (Administrative Rules of South Dakota). “Section 74:55:02:02. Class I and IV Disposal Wells Prohibited.” South Dakota Legislature Administrative Rules.

ARSD. “Section 74:55:02:03. Authorization of Class V Wells To Inject.” South Dakota Legislature Administrative Rules.

GCRP (U.S. Global Change Research Program). *Global Climate Change Impacts in the United States*. Washington, DC: Cambridge University Press. 2009.

NRC (U.S. Nuclear Regulatory Commission). “Safety Evaluation Report for the Dewey-Burdock Project Fall River and Custer Counties, South Dakota, Materials License No. SUA-1600.” ML13052A182. Washington, DC: NRC. March 2013.

Powertech [Powertech (USA) Inc.]. “Dewey-Burdock Project, Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota—Technical Report.” Docket No. 040-09075. ML092870160. Greenwood Village, Colorado: Powertech. August 2009.

SDCL (South Dakota Codified Law) Chapter 34A-2. “Water Pollution Control.” South Dakota Legislature. South Dakota Codified Laws.

USACE (U.S. Army Corps of Engineers). “Final Work Plan for Black Hills Army Depot Remedial Investigation and Feasibility Study at Fall River County, South Dakota.” ML13053A152. Huntsville, Alabama: USACE. 2012.

USACE. “Final Archives Search Report, Preliminary Assessment of Ordnance Contamination at the Former Black Hills Army Depot, South Dakota.” ML13053A145. Huntsville, Alabama: USACE. 1992.

## **E5.31 Mitigation Measures**

### **Comment: 003-000004**

The commenter stated that throughout the SEIS, BMPs are suggested. The commenter requested that the SEIS identify the source of those BMPs and identify the practices with specificity.

**Response:** *Mitigation measures and BMPs are discussed in SEIS Chapter 6. Mitigation measures are those actions or processes that will be implemented to control and minimize potential adverse impacts from construction, operation, aquifer restoration, and decommissioning of the proposed Dewey-Burdock ISR Project.*

*The GEIS described potential mitigation measures that a licensee might use to reduce potential adverse impacts associated with construction, operation, aquifer restoration, and decommissioning of an ISR facility (NRC, 2009). Potential mitigation measures can include general BMPs and more site-specific management actions. BMPs are processes, techniques, procedures, or considerations that can be used to effectively avoid or reduce potential environmental impacts. While BMPs are not regulatory requirements, they can overlap and support such requirements. BMPs will not replace any NRC requirements or other federal, state, or local regulations.*

*The mitigation measures the applicant proposed to reduce and minimize adverse environmental impacts at the proposed Dewey-Burdock ISR Project are summarized in SEIS Section 6.2. These mitigation measures are described in greater detail in the Chapter 4 impact analyses for each resource area considered in the SEIS. Based on the potential impacts identified in Chapter 4 of this draft SEIS, the NRC staff identified additional potential mitigation measures for the proposed Dewey-Burdock ISR Project. These mitigation measures are summarized in SEIS Section 6.3.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comment: 061-000007**

The commenter stated that the draft SEIS says that project impacts will be “small” in a number of instances only because the applicant has said it will do various things. The commenter stated that this limits the consideration of impacts, because it means the draft SEIS only considers the “best case” scenarios that include the successful use of mitigation strategies. The commenter stated that mitigation strategies are not clearly defined in the draft SEIS, and according to the USGS, mitigation has never restored an aquifer to baseline conditions. The commenter stated that under these circumstances, the draft SEIS should consider not only the “best case” scenarios, but should also consider the impacts of problems typically found at ISL uranium mines—leaks, spills, excursions, and water contamination after remediation has stopped. The commenter stated that the public and the environment should be protected based on “worst case” scenarios and if that cannot be done, the project should not be allowed to move forward, and the No-Action alternative should be selected.

**Response:** *Mitigation measures are described in SEIS Chapter 6. Mitigation measures are those actions or processes that will be implemented to control and minimize potential adverse impacts from construction, operation, aquifer restoration, and decommissioning of the proposed Dewey-Burdock ISR Project. Under 40 CFR 1508.20, CEQ defines mitigation to include activities that (i) avoid the impact altogether by not taking a certain action or parts of a certain action; (ii) minimize impacts by limiting the degree or magnitude of the action and its implementation; (iii) rectify the impact by repairing, rehabilitating, or restoring the affected environment; (iv) reduce or eliminate the impact over time by preservation and maintenance operations during the life of the action; and (v) compensate for the impact by replacing or providing substitute resources or environments.*

*In accordance with guidance in NUREG–1748, mitigation measures that could reduce adverse impacts or enhance beneficial impacts should be incorporated in the proposed action to the extent feasible (NRC, 2003). The analysis should address the anticipated effectiveness of the mitigation measures in reducing adverse impacts or enhancing beneficial impacts. The analysis should also analyze any residual impacts or unavoidable adverse impacts that may remain after mitigation measures have been applied, as well as any further impacts caused by the mitigation measures themselves.*

*The mitigation measures the applicant proposed to reduce and minimize adverse environmental impacts at the proposed Dewey-Burdock ISR Project are summarized in SEIS Section 6.2. These mitigation measures are described in greater detail in the Chapter 4 impact analyses for each resource area considered in the SEIS. Based on the potential impacts identified in Chapter 4 of this draft SEIS, the NRC staff identified additional potential mitigation measures for the proposed Dewey-Burdock ISR Project. These mitigation measures are summarized in SEIS Section 6.3.*

*SEIS Chapter 9 analyzed the potential impacts of the proposed project in terms of (i) unavoidable adverse environmental impacts, (ii) irreversible and irretrievable commitments of resources, (iii) short-term impacts and uses of the environment, and (iv) long-term impacts and the maintenance and enhancement of productivity. These terms are defined in NUREG–1748 (NRC, 2003). Unavoidable adverse environmental impacts are those impacts that cannot be avoided and for which no practical means of mitigation are available. Irreversible impacts involve commitments of environmental resources that cannot be restored. Irretrievable impacts involve material resources and commitments of materials that, when used, cannot be recycled or restored for other uses by practical means. Short-term impacts represent the period from preconstruction to the end of decommissioning activities, and, therefore, generally affect the present quality of life for the public. Long-term impacts represent the period of time following the termination of the site license and have the potential to affect the quality of life for future generations. The SEIS analysis addresses the impacts during each phase of the project (i.e., construction, operation, aquifer restoration, and decommissioning) for each of the 13 resource areas that could be affected by the proposed project. The specific impacts are described in SEIS Table 9-1.*

*With regard to aquifer restoration and the impacts of problems typically found at ISR uranium mines, GEIS Section 2.11 describes information from historical operation of ISR facilities (NRC, 2009). This information includes a discussion of spills and leaks, groundwater use, excursions, and aquifer restoration.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comment: 092-000014**

The commenter requested that the inspection routine for all the “BMPs” that are supposed to prevent runoff from the land that get land application of wastewater be reviewed.

**Response:** *Any stormwater control BMPs implemented to prevent runoff from land application areas will be inspected in accordance with the requirements of the construction and industrial stormwater control NPDES water discharge permits SDDENR issued. The applicant’s NPDES water discharge application has not yet been submitted to SDDENR (see SEIS Table 1.6-1).*

*Therefore, NRC cannot review or comment on the inspection routine that the NPDES permit will require.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comment: 116-000005**

The commenter pointed out that the operations impact summary for geology and soils in the Executive Summary of the SEIS states that “Potential soil contamination in proposed land application areas will be mitigated by implementing soil collection and monitoring procedures.” The commenter stated that monitoring is not “mitigation” and that monitoring only identifies problems and levels of contamination that would need to be mitigated. The commenter stated that all the monitoring in the world will not serve to mitigate or remediate ground and surface water contamination from ISR operations. The commenter noted that stating an impact will be “mitigated” is not the same as evaluating the nature and extent of the impact and its environmental impact.

**Response:** *NRC acknowledges that monitoring is not mitigation and that monitoring only identifies problems and levels of contamination that would need to be mitigated. Text was revised in the operations impact summary for Geology and Soils in the Executive Summary to state, “Potential soil contamination in proposed land application areas will be monitored by implementing soil collection and sampling procedures.”*

**Comment: 119-000016**

The commenter stated that parts of Table 6.2-1 (Summary of Mitigation Measures Proposed by Powertech) describing proposed mitigation measures for spills and leaks should include the following mitigation measure: “In accordance with South Dakota Administrative Rule (ARSD) 74:34:01:04, all regulated substance spills that occur at the site must be reported to SDDENR and remediated in accordance with state requirements.”

**Response:** *NRC acknowledges that SEIS Table 6.2-1 should include reference to ARSD 74:34:01:04. The following mitigation measure was added to parts of SEIS Table 6.2-1 describing proposed mitigation measures for spills and leaks: “In accordance with Administrative Rule of South Dakota (ARSD) 74:34:01:04, all regulated substance spills that occur at the site must be reported to SDDENR and remediated in accordance with state requirements.”*

**Comments: 127-000014; 127-000016**

The commenter stated that to the extent NRC and BLM rely on mitigation for any impacts, such mitigation must be specifically spelled out, at least in reasonable detail, and the effectiveness of the proposed mitigation must be analyzed. The commenter stated further that to comply with NEPA, each mitigation measure must be detailed with specific description, supporting data, and analysis of process and effectiveness within the context of a draft NEPA document. The commenter stated that as it stands, NRC and BLM must conduct this necessary work, then re-issue the draft SEIS for meaningful public and agency review.

**Response:** *Draft SEIS Chapter 6 provided a list of the mitigation measures proposed for each resource area. As noted in draft SEIS Section 6.1, this list was intended only as a summary of mitigation measures that the applicant has proposed to reduce and minimize environmental*

*impacts at the proposed project. Each of these mitigation measures was discussed in the environmental impact analyses in Chapter 4 of the draft SEIS and the effectiveness of each measure was evaluated and applied to an environmental impact determination.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comment: 127-000024**

The commenter stated that the SEIS repeatedly relies upon state and other federal agencies to require appropriate mitigation measures to lessen impacts, and uses those permitting processes to simply defer analysis of impact to these other agencies.

**Response:** *Relying upon state and other federal agency permitting processes to require appropriate mitigation measures to lessen impacts is appropriate in a NEPA analysis. To avoid and reduce environmental impacts, NRC imposes BMPs, mitigation measures, and management actions through license conditions. However, the NRC can only establish license conditions within the limits of the authority granted by Congress. By license condition, NRC also requires applicants of ISR facilities to obtain all necessary permits and licenses from the appropriate regulatory authorities prior to operating any facility (NRC, 2013, License Condition 12.1). Mitigation may be imposed as a requirement other agencies establish through required permits the proposed Dewey-Burdock ISR Project must obtain.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comment: 128-000237**

The commenter stated that NRC should include as often as possible the use of “mandatory license conditions” as a mitigation measure for ISR projects, including the proposed Dewey-Burdock ISR Project. The commenter noted that if these license conditions did not serve as mitigation measures, NRC simply will have issued the requested license without any such conditions. The commenter stated that failure to account for these conditions seemingly ignores the AEA mandate that the Commission can (i) issue the license as requested, (ii) issue the license as requested with conditions, or (iii) deny the requested license.

**Response:** *Mitigation measures are described in SEIS Section 6.1. Mitigation measures are those actions or processes that will be implemented to control and minimize potential adverse impacts from construction, operation, aquifer restoration, and decommissioning of the proposed Dewey-Burdock ISR Project. Potential mitigation measures can include general BMPs and more site-specific management actions. As described in SEIS Section 6.1, NRC may establish requirements for management actions by identifying license conditions. These conditions are written specifically into the NRC source material license and then become commitments that are enforced through periodic NRC inspections (NRC, 2013). Text was revised in SEIS Section 6.1 to add a reference to the draft NRC source material license for the proposed Dewey-Burdock ISR Project (NRC, 2013), where standard and site-specific license conditions for the proposed project are listed.*

**Comment: 128-000241**

The commenter suggested removing the proposed mitigation measure on managing drilling fluid in the geology and soils resource area of SEIS Table 6.3-1 for the following reasons: (i) the

proven and effective procedure is to wait until the mud dries through evaporation and then backfill the mud pits; (ii) there has never been evidence of groundwater contamination from previous ISR operations that did not follow the proposed mitigation measures; (iii) the drilling mud itself contains additives to prevent water loss and seal the borehole such that the resulting drilling mud will create a low permeability mud pit lining; and (iv) all disturbed areas, including mud pits, will be surveyed for potential contamination during decommissioning.

**Response:** *The NRC staff acknowledge the commenter's reasons for suggesting that the staff remove the mitigation measure on managing drilling fluid from SEIS Table 6.3-1. The purpose of SEIS Table 6.3-1 is to identify additional mitigation measures that could potentially reduce impacts. As described in SEIS Section 6.3, the additional mitigation measures listed in SEIS Table 6.3-1 are not requirements being imposed upon the applicant. For the purposes of NEPA, and consistent with 10 CFR 51.71(d) and 51.80(a), NRC is disclosing measures that could potentially reduce or avoid environmental impacts of the proposed project.*

*No change was made to the SEIS beyond the information provided in this response.*

### **E5.31.1      References**

10 CFR Part 51. *Code of Federal Regulations*, Title 10, *Energy*, Part 51. "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions." Washington, DC: U.S. Government Printing Office.

40 CFR Part 1508. *Code of Federal Regulations*, Title 40, *Protection of the Environment*, Part 1508. "*Terminology and Index*." Washington, DC: U.S. Government Printing Office. ARSD (Administrative Rules of South Dakota). "Section 74:34:01:04. Reporting of Known Discharges—Reportable Quantities." South Dakota Legislature Administrative Rules.

NRC (U.S. Nuclear Regulatory Commission). "Draft License SUA-1600 for Powertech (USA), Inc." ADAMS Accession No. ML13318A094. Washington, DC: NRC. March 2013.

NRC. NUREG-1910, "Generic Environmental Impact Statement for *In-Situ* Leach Uranium Milling Facilities." ML091480244, ML091480188. Washington, DC: NRC. May 2009.

NRC. NUREG-1748, "Environmental Review Guidance for Licensing Actions Associated With NMSS Programs." Washington, DC: NRC. August 2003.

### **E5.32      Monitoring**

#### **Comment: 045-000005**

The commenter stated that in the southern Black Hills the layers are stair stepped with shale layers between and likely wider connections between rock layers. The commenter wanted to know whether the site is suitable for mining and whether individual layers can be mined without getting excursions into the aquifers.

**Response:** *As discussed in GEIS Section 8.3.1.2, monitoring wells are situated around the ISR wellfields, in the aquifers overlying and underlying the ore-bearing production aquifers, and within the wellfields (NRC, 2009). Wells are placed in these locations to ensure the early detection of potential horizontal and vertical excursions of lixivants. Monitoring well placement*

*is based on what is known about the nature and extent of the confining layer and the presence of drill holes, hydraulic gradients and aquifer transmissivity, and well abandonment procedures used in the region. The ability of a monitoring well to detect groundwater excursions is influenced by several factors, such as the thickness of the aquifer, the distance between the monitoring wells and the wellfield, the distance between the adjacent monitoring wells, the frequency of groundwater sampling, and the magnitude of changes in lixiviant migration indicator parameters. As a result, the spacing, distribution, and number of monitoring wells at a given ISR facility are site-specific. The factors that control the spacing, distribution, and number of monitoring wells are detailed in GEIS Section 8.3.1.2 (NRC, 2009).*

*The applicant's monitoring well design is described in SEIS Sections 2.1.1.1.2.3.2 and 7.3.1.2. The monitoring ring and overlying and underlying monitoring wells will be designed for each wellfield according to site-specific lithology and hydrologic testing of the production zone(s) of each wellfield. To ensure administrative approval, the applicant would present each wellfield monitoring well program and the results of hydrologic testing to NRC and EPA before operating each wellfield (Powertech, 2009a). After the required hydrologic tests are complete, it may be necessary to revise the location or number of wells proposed. Each wellfield will be handled on a case-by-case basis in consultation with NRC and EPA.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comment: 049-000005**

The commenter noted that SEIS Section 7.3.1.1 (Background Groundwater Sampling) states that the applicant can establish background groundwater quality before beginning operations by sampling "four times for baseline characterization, a minimum of 14 days between sampling events." The commenter was concerned that this stipulation may result in the applicant not addressing seasonal variability, thus introducing uncertainty between the subsets of wells being sampled. The commenter recommended a more complete sampling schedule across a calendar year to better capture seasonal variability.

**Response:** *As stated in NUREG-1569, Section 5.7.8.3, background groundwater quality sampling programs should provide enough data to adequately evaluate natural spatial and temporal variations in preoperational water quality (NRC, 2003). At least four independent sets of samples should be collected, with adequate time between sets to represent any preoperational temporal variations. The applicant's proposed sampling frequency for establishing background groundwater quality (four times with a minimum of 14 days between sampling events) is generally consistent with the acceptance criteria in NUREG-1569 (NRC, 2003). To ensure that sampling events capture temporal variations in background water quality {as specified in NUREG-1569, Section 5.7.8.3 (NRC, 2003)}, text was added to SEIS Section 7.3.1.1 stating that the applicant will be expected to sample wells over sufficiently spaced intervals to indicate seasonal variability.*

**Comment: 049-000007**

The commenter stated that in the description of the overlying nonproduction zone monitoring wells in SEIS Section 7.3.1.2, only overlying wells above the Skull Creek Shale are included. The commenter stated that the Skull Creek Shale is only one of the possible upper confining units for ore zones at the site above which overlying aquifers will be monitored, and that the only geologic unit that will be monitored above the Skull Creek is the alluvium. The commenter



recommended that, rather than include an incomplete description of overlying nonproduction monitor wells in SEIS Section 7.3.1.2, the final SEIS should include more specific overlying confining unit information.

**Response:** *NRC has added text to SEIS Section 7.3.1.2 to include a more complete description of overlying nonproduction monitor wells and more specific information on overlying confining units at the proposed project site.*

**Comment: 049-000009**

The commenter noted that draft SEIS Section 4.5.1.1.2.2 states that the applicant proposes to treat liquid wastes applied to land application areas so they meet NRC release limit criteria for radiological contaminants, as referenced in 10 CFR Part 20, Appendix B, Table 2, Column 2 which are listed in draft SEIS Table 7.5-3. The commenter further stated that Table 7.5-3 only presents a list of radionuclide material discharge limits and does not include many of the metals found in 10 CFR Part 20, Appendix B, Table 2, Column 2. The commenter recommended that Table 7.5-3 be expanded to include metals such as arsenic, cadmium, fluoride, lead, mercury, and selenium, which have been found to be elevated in other ISR operations.

**Response:** *NRC staff would clarify that 10 CFR Part 20, Appendix B, Table 2, Column 2 lists only NRC release-limit criteria for radiological contaminants. Release limits for metals, such as arsenic, cadmium, fluoride, lead, mercury, and selenium, are not listed in 10 CFR Part 20, Appendix B, Table 2, Column 2. As discussed in SEIS Sections 2.1.1.1.6.2 and 4.5.1.1.2.2, SDDENR also regulates land application of treated wastewater. SDDENR requires the applicant to obtain a GDP permit and comply with applicable state discharge requirements for land application of treated wastewater. Process solutions, wastewater disposal, or surface water runoff from the site will be required to meet GDP permit requirements, South Dakota groundwater quality standards (ARSD 74:54:01) for areas outside of EPA's approved aquifer exemption boundary, or surface water quality standards (ARSD 74:51:01).*

*No change was made to the SEIS beyond the information provided in this response.*

**Comment: 049-000010**

The commenter stated that the discharge limits in draft SEIS Table 7.5-3 are not consistent with the regulatory requirement set forth in 10 CFR Part 20, Appendix B, Table 2. According to this requirement, "the limiting value should be derived as follows: determine, for each radionuclide in the mixture, the ratio between the concentration present in the mixture and the concentration otherwise established in Appendix B for the specific radionuclide when not in mixture. The sum of such ratios for all the radionuclides in the mixture may not exceed '1' (i.e., 'unity')." The commenter pointed out that according to Table 7.5-3, the allowable sum of ratios for land application is 4. The commenter requested that the final SEIS ensure the limit is consistent with the regulatory requirement or provide an explanation as to why the limit is not applicable.

**Response:** *NRC acknowledges that compliance with the discharge limits listed in Table 7.5-3 will require calculation of a limiting value based on the concentration of each radionuclide in the effluent. A footnote was added to Table 7.5.3 stating that "Compliance with 10 CFR Part 20, Appendix B, Table 2, Column 2 effluent discharge limits requires derivation of a limiting value based on the concentration of each radionuclide in the effluent. The limiting value is derived as follows: determine, for each radionuclide in the mixture, the ratio between the concentration*

*present in the mixture and the concentration otherwise established in Appendix B for the specific radionuclide when not in mixture. The sum of such ratios for all the radionuclides in the mixture may not exceed '1' (i.e., 'unity')."*

**Comment: 061-000013**

The commenter stated that before any land application occurs, the liquid waste should be tested for arsenic, which commonly occurs with uranium in this area, and for selenium, which has bio-accumulated at other land application sites and is toxic to animals.

**Response:** *As part of the applicant's land application monitoring program, samples of process-related liquid wastewater will be collected monthly during operation of each land application system and analyzed for the parameters listed in SEIS Table 7.3-1 (see SEIS Section 7.5.3). The constituents listed in SEIS Table 7.3-1 include arsenic and selenium.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comments: 025-000001; 045-000008; 048-000010; 072-000001; 095-000006**

The commenter stated that the draft SEIS is not complete and does not take into account many important factors, including the need for full information on how the Federal Government plans to monitor the project because South Dakota does not regulate ISR mining. Another commenter stated that it has come to his/her attention that the applicant will have little or no monitoring. Other commenters stated that the Federal Government's plans for monitoring the project should be clearly explained so that the public can determine whether the monitoring will be adequate to protect the environment and our natural resources.

**Response:** *SEIS Chapter 7 describes required monitoring programs and the agencies that will be responsible for implementing and overseeing the monitoring programs. With regard to the ISR process, NRC will be responsible for radiological, physiochemical, and ecological monitoring (see SEIS Sections 7.2, 7.3, and 7.4). The physiochemical modeling program will include wellfield groundwater monitoring (e.g., excursion monitoring), wellfield and pipeline flow and pressure monitoring, and surface water monitoring. Ecological monitoring will include vegetation and wildlife monitoring. SDDENR and EPA will have primary responsibility for land application monitoring and Class V deep injection well monitoring, respectively (see SEIS Sections 7.5 and 7.6). However, liquid wastes applied to land application areas or injected into deep Class V injection wells will be required to meet NRC release limits for radionuclides as specified in 10 CFR Part 20, Appendix B.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comment: 091-000018**

The commenter stated that monitoring plans for all affected aquifers and ponds should be made available for public review and comment, and all monitoring efforts need to extend beyond the project closure date.

**Response:** *The applicant's operational surface water, groundwater, and physiochemical monitoring plans for surface water and groundwater are described in SEIS Sections 7.2.4, 7.2.5, and 7.3. The applicant's land application monitoring plan, which includes aquifer and surface*

*water monitoring, is described in SEIS Section 7.5. The applicant's Class V deep injection well monitoring plan, which includes injectate monitoring, is described in SEIS Section 7.6.*

*As described in SEIS Section 2.1.1.1.4.2, after NRC determines the production aquifer is restored, the applicant will implement a groundwater stability monitoring program for a minimum of 12 months. The results of the monitoring program determine whether the approved standards for each constituent have been met and whether any adjacent nonexempt aquifers are affected (Powertech, 2009b, 2011). Over the 12-month minimum stability monitoring period, there will be an initial sampling event at the beginning of the stability monitoring period, followed by (i) sampling of perimeter monitor wells in the production zone and monitor wells in the overlying and underlying aquifers once every 60 days for the UCL indicator excursion parameters of chloride, total alkalinity, and conductivity and (ii) sampling of production zone wells quarterly. If the analytical results from the stability monitoring program meet the target restoration goals and do not exhibit significant increasing trends, the applicant will (i) submit supporting documentation to NRC showing that the restoration parameters have remained at or below the restoration standards and (ii) request that the wellfield be declared restored (Powertech, 2011).*

*No change was made to the SEIS beyond the information provided in this response.*

**Comment: 116-000019**

The commenter stated that the SEIS failed to include any information regarding initial radiological surveys of the drilling area and mud pit to determine background and that a postconstruction radiological survey should be required to ensure that no contaminants from the drill hole remain on the surface. The commenter stated that any surface contamination above background should be removed and appropriately disposed of.

**Response:** *SEIS Section 3.12.1 presents the applicant's preoperational radiological monitoring program, which was developed and implemented in accordance with NRC regulations at 10 CFR Part 40, Appendix A, Criteria 7 and 7A. The purpose of the program is to establish baseline radiological conditions at the proposed project site. Results of the baseline radiological monitoring program provide data on radiological conditions that will be used to evaluate future impacts of routine facility operations or accidental or unplanned releases, if a license is issued. The applicant's preoperational monitoring program included a gamma-ray survey to map, characterize, and quantify baseline radiation levels and radionuclide concentrations in soils throughout the proposed project area.*

*As described in SEIS Section 2.1.1.1.5.1, the applicant has committed to conducting land cleanup in accordance with 10 CFR Part 40, Appendix A, Criterion 6(6) and SDDENR regulations (Powertech, 2011). Radiation surveys will be conducted to determine whether any contaminated areas exist. As noted in SEIS Section 2.1.1.1.5.1, the most likely areas of contaminated soils will be wellfield surfaces and mud pits, surface impoundment bottoms and berms, process building areas, storage yards, transportation routes for uranium recovery products or contaminated materials, and pipeline runs. Areas near deep Class V disposal wells and areas used for land application of treated water will also be surveyed and decontaminated as necessary. NRC will review and approve survey and sampling results. Contaminated soil will be removed and disposed of as byproduct material at a licensed disposal facility.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comment: 116-000025**

The commenter stated that NRC must require long-term monitoring and evaluation of the land application program, including radiological and nonradiological soil contaminant levels, salinity, soil permeability, vegetation sampling, and other soil and vegetation quality parameters to determine the impacts of land application over time.

**Response:** *The applicant's proposed land application monitoring program, as described in the applicant's GDP permit submitted to SDDENR (Powertech, 2012), is presented in SEIS Section 7.5. As described in SEIS Section 7.5, soil and vegetation sampling will be conducted during the operation of land application areas. As discussed in SEIS Section 4.4.1.2.4, land application areas will be included in decommissioning surveys to ensure that soil concentration limits do not exceed the standards in 10 CFR Part 40, Appendix A, Criterion 6(6). SEIS Section 2.1.1.1.5 describes decommissioning activities that will be undertaken to return the site to its previous land use. For land application areas, these activities include radiological surveys and cleaning up and restoring disturbed areas. Any contaminated soils will be disposed of in licensed disposal facilities.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comment: 119-000017**

The commenter stated that SEIS Table 7.3-1 (Background Water Quality Parameters and Indicators for Operational Groundwater Monitoring) should include radon and radium-228.

**Response:** *SEIS Table 7.3-1 includes all the water quality parameters and indicators listed in NUREG-1569 (NRC, 2003, Table 2.7.3-1). As noted in the footnotes of NUREG-1569, Table 2.7.3-1, if site initial sampling indicates the presence of thorium-232, then radium-228 should be considered in the baseline sampling or an alternative sampling methodology may be proposed.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comment: 119-000018**

The commenter pointed out that SDDENR's recommended GDP includes a condition requiring a minimum of 1 year of monthly ambient monitoring for the compliance point wells and quarterly sampling until mining operations commence.

**Response:** *NRC acknowledges that the SDDENR's GDP will include a condition requiring a minimum of 1 year of monthly ambient monitoring for the compliance point wells and quarterly sampling until mining operations commence. Text was added to SEIS Section 7.5.1.1 describing an SDDENR GDP condition that will require a minimum of 1 year of monthly ambient monitoring for the compliance point wells and quarterly sampling until mining operations commence.*

**Comment: 126-000010**

The commenter stated that SEIS Section 7.3.12 (Groundwater Quality Monitoring) discusses, in part, the spacing and number of production zone monitoring wells, but does not discuss the actual construction details of the monitoring wells. The commenter noted that long well screen lengths may cause dilution of depth-specific parameters during sampling and thereby provide inaccurate information about whether an excursion of lixiviant has occurred. The commenter further noted that depending on the parameters to be monitored and the thickness of the production zone, it may be necessary to construct nested wells at some locations.

**Response:** *SEIS Sections 2.1.1.1.2.3.2 and 2.1.1.1.2.3.5 describe the placement and construction of monitoring wells. Figure 2.1-9 provides a schematic of a typical construction design for a monitoring well at the proposed project. As described in SEIS Section 2.1.1.1.2.3, delineation drilling data will provide detailed lithologic information to map production zones targeted for ISR operations and define the overlying and underlying sand units and confining layers to be monitored. The delineation drilling data will be used to determine the location and screened intervals of pumping and monitor wells for each wellfield during pumping tests (see SEIS Section 2.1.1.1.2.3.3).*

*SEIS Section 2.1.1.1.2.3.2 describes the need for construction of nested wells at the proposed project site. For example, in some areas of the proposed project site, multiple orebodies are vertically stacked within the Fall River Formation or the Chilson Member of the Lakota Formation with no substantial confining layers between the orebodies. In these areas, the perimeter production zone monitor wells will be screened across the full thickness of the stacked orebodies and the orebodies treated as a single production zone (Powertech, 2011). In other areas of the project site, stacked orebodies within the Fall River and Chilson Member are separated by low permeability units that may act as localized confining units (Powertech, 2011). If delineation drilling and pump testing demonstrate that localized confining units provide hydraulic separation between orebodies within one of the primary production units (e.g., the Fall River or Chilson), then monitor wells could be located and screened only within the portion of the unit in which the orebody is located (Powertech, 2011).*

*No change was made to the SEIS beyond the information provided in this response.*

**E5.32.1 References**

10 CFR Part 20 Appendix B. *Code of Federal Regulations*, Title 10, *Energy*, Part 20. “Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs) of Radionuclides for Occupational Exposure; Effluent Concentrations; Concentrations for Release to Sewerage.” Washington, DC: U.S. Government Printing Office.

10 CFR Part 40 Appendix A. *Code of Federal Regulations*, Title 10, *Energy*, Part 40 Appendix A. “Criteria Relating to the Operation of Uranium Mills and to the Disposition of Tailings or Wastes Produced by the Extraction or Concentration of Source Material from Ores Processed Primarily from their Source Material Content.” Washington, DC: U.S. Government Printing Office.

ARSD (Administrative Rules of South Dakota). “Chapter 74:54:01. Groundwater Quality Standards.” South Dakota Legislature Administrative Rules.

ARSD. “Chapter 74:51:01. Surface Water Quality Standards.” South Dakota Legislature Administrative Rules.

NRC (U.S. Nuclear Regulatory Commission). NUREG–1910, “Generic Environmental Impact Statement for *In-Situ* Leach Uranium Milling Facilities.” ML091480244, ML091480188. Washington, DC: NRC. May 2009.

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

Powertech [Powertech (USA) Inc.]. “Dewey-Burdock Project Groundwater Discharge Plan Custer and Fall River Counties, South Dakota.” ML12195A039, ML12195A040. Edgemont, South Dakota: Powertech. March 2012.

Powertech. “Dewey-Burdock Project, Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota, Technical Report RAI Responses, June, 2011.” ML112071064. Greenwood Village, Colorado: Powertech (USA) Inc. 2011.

Powertech. “Dewey-Burdock Project, Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota—Environmental Report.” Docket No. 040-09075. ML092870160. Greenwood Village, Colorado: Powertech. August 2009a.

Powertech. “Dewey-Burdock Project, Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota—Technical Report.” Docket No. 040-09075. ML092870160. Greenwood Village, Colorado: Powertech. August 2009b.

### **E5.33 Costs and Benefits**

#### **Comments: 128-000022; 128-000264**

The commenter stated that the SEIS does not mention the benefits of the uranium production from the proposed project for domestic energy independence, which has been stated by the President’s Administration and the Congress as a national scale benefit versus a local/regional benefit.

**Response:** *As described in SEIS Chapter 8, the implementation of the proposed action will generate primarily regional and local costs and benefits. Although not stated explicitly, the section on the purpose and need for the proposed action (see the SEIS Executive Summary and SEIS Section 1.3) explains that uranium resources are needed to produce fuel for commercially operating nuclear power reactors.*

*No change was made to the SEIS beyond the information provided in this response.*

#### **Comment: 128-000263**

The commenter questioned the use of a daily spot price for uranium versus a long-term price, which could significantly impact the estimates of severance taxes and conservation taxes in the cost/benefit analysis presented in SEIS Chapter 8.

**Response:** NRC acknowledges using a long-term price rather than a daily spot price will provide a more accurate estimate of severance taxes and conservation taxes in the cost/benefit analysis. NRC staff used data on uranium prices compiled by the Ux Consulting Company to estimate a 2-year average uranium price from January 2011 to December 2013 (UXC, 2013). This estimated price (\$52.00/lb) was used to estimate the severance taxes and conservation taxes in the cost/benefit analysis presented in SEIS Chapter 8.

#### **E5.33.1 Reference**

UXC (The Ux Consulting Company). "Ux U<sub>3</sub>O<sub>8</sub> Prices." 2013. <<http://www.uxc.com/>> (17 July 2013).

#### **E5.34 Accidents and Wildfires**

**Comments: 006-000006; 008-000006; 018-000003; 027-000002; 029-000006; 041-000002; 048-000005; 061-000011; 073-000002; 120-000003; 129-000005**

Several commenters were concerned about the impacts of wildfires on the proposed project. One commenter stated that it has been scientifically proven that wildfires crossing an *in-situ* mining site spread the contaminants far and wide. Some commenters stated that impacts of wildfires, which are common in the immediate area of the proposed project, should be considered, including potential impacts if a fire strikes mining, pipelines, overhead powerlines, and processing buildings. One commenter stated that due to forest fires, this may be a risky project that could cost the U.S. Government lots of money to clean up after a fire or other unforeseen event. Another commenter stated that the probability of wildfire should be considered as both a safety issue and an environmental issue. The commenter stated that fires in the area are typically caused by lightning, but may also be caused by vehicles. The commenter stated that the impacts of a wildfire on wellheads, electrical lines, header houses, and the central and satellite processing plants should be studied. The commenter stated that resulting information and a strong mitigation strategy that recognizes that wildfires cannot always be prevented, turned, or stopped should be included in the SEIS. Other commenters stated that the draft SEIS failed to address the impact of local wildfires and that the impacts of wildfire on a uranium processing plant need to be studied.

**Response:** NRC recognizes that wildfires are common in the immediate area of the proposed project. NRC assessed potential accidents, including wildfires, as part of its review for the safety evaluation report (SER) (NRC, 2013a). To protect facilities from wildfires, all facility buildings at the proposed Dewey-Burdock ISR Project will be located within an area that is maintained in a vegetation-free state using crushed aggregate or asphalt surface and appropriate weed-control measures (Powertech, 2011). This will create a buffer zone or firebreak to prevent fire from damaging equipment that could lead to a chemical accident. Within wellfield areas, vegetation will be controlled around each header house and around each wellhead cover to reduce the amount of combustible material adjacent to these structures (Powertech, 2011). In the event of an approaching wildfire, wellfield operations will be shut down and facilities evacuated until the danger to personnel has passed. Prior to restarting operations, any damage caused by wildfire will be assessed and remediated. The applicant will maintain firefighting equipment onsite and provide training for local emergency response personnel on the specific hazards present in the proposed project area (Powertech, 2011). The applicant will also develop and implement an emergency response plan in accordance with

*U.S. Occupational Safety and Health Administration regulations at 29 CFR Part 1910 (Powertech, 2011). This plan will include descriptions of notification and evacuation procedures, personal protective equipment, general firefighting safety rules, reporting procedures, and electrical and gas emergencies. Based on its review of potential accidents, NRC staff concluded in the SER that the applicant's assessment of wildfires is acceptable (NRC, 2013a). Based on the analysis in the SER, the NRC staff finds that the environmental impacts from wildfires affecting the proposed Dewey-Burdock ISR Project would be SMALL.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comments: 061-000012; 091-000013**

One commenter stated that in addition to the potential impacts of a loss of electricity due to fire, the potential impacts of ice, a vehicle accident, and wind on overhead power lines should be considered. Another commenter stated that emergency management measures to protect the public health and safety should be clearly developed by the project proponent and should include all reasonably foreseeable accidents which might result in a release of radioactive source material. The commenter noted that wildfires and high velocity flash flooding are common seasonal occurrences in the Black Hills.

**Response:** *NRC assesses whether the applicant has adequately addressed potential accidents as part of its review for the SER. As part of its accident analysis for the proposed Dewey-Burdock ISR Project, NRC assessed the following accident scenarios in the SER: chemical accidents, groundwater contamination, wellfield spills, transportation (vehicle) accidents, radioactive waste accidents, natural disasters (tornadoes, freezing temperatures, wind storms, and winter storms), processing plant releases, fires and explosions, and wildfires (NRC, 2013a). The applicant has committed to implementing emergency response procedures and training employees on what actions to perform in the event of an accident (Powertech, 2011). The applicant will develop and implement an emergency response plan in accordance with provisions of 29 CFR Part 1910 (Powertech, 2011). Based on detailed review of the information provided in the application, NRC concluded in the SER that the applicant's designs, plans, and training are acceptable and are in compliance with 10 CFR 40.32(c), which requires that the applicant's proposed equipment, facilities, and procedures be adequate to protect health and minimize danger to life and property. NRC notes that SOPs regarding accidents are required as part of a standard license condition (NRC, 2013b). NRC will also review SOPs prior to and during the preoperational inspection. Based on the analysis in the SER, the NRC staff finds that the environmental impacts from vehicle accidents, natural disasters (tornadoes, freezing temperatures, flooding, wind storms, and winter storms), and wildfires affecting the proposed Dewey-Burdock ISR Project would be SMALL.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comment: 091-000014**

The commenter stated that an adequate analysis of transportation impacts for both radiological and nonradiological accidents along the proposed transportation route for the finished uranium product must be performed on behalf of all members of the public that will be subject to involuntary exposure along the transportation route.



**Response:** SEIS Section 4.3.1 assesses impacts related to transportation and traffic risks along transportation routes including (i) potential radiological accident risks associated with ion-exchange resin and yellowcake product shipments; (ii) potential impacts from transportation of operational byproduct material shipments; and (iii) potential impacts from transportation of incoming, onsite, and outgoing process chemical supplies. NRC requires applicants to develop emergency procedures for transportation accidents prior to conducting ISR operations. As described in SEIS 4.3.1.1.2, the applicant has committed to developing emergency response procedures for yellowcake and other transportation accidents that could occur during shipment to or from the proposed Dewey-Burdock ISR Project (Powertech, 2009). The applicant also proposes to ensure its personnel and the carrier receive training on these emergency response procedures and that information about the procedures is provided to state and local agencies

(Powertech, 2009, 2011). Furthermore, to limit the risk of an accident involving resin or yellowcake transport, the applicant has proposed that all such materials will be transported in accordance with USDOT and NRC regulations, handled as low specific-activity (LSA) materials, and shipped using exclusive-use-only vehicles (Powertech, 2009). The applicant has committed to using a specialized third-party transportation company to transport the yellowcake from the project to a conversion facility. Specific routes are to be determined based on agreements made within the transportation company's contract. This company will meet all safety controls and regulations referred to in 10 CFR 71.5, "Transportation of licensed material" (Powertech, 2009). Based on the transportation impact analysis in SEIS Section 4.3.1, the NRC staff conclude that the environmental impacts of transportation accidents involving yellowcake product shipments from the proposed Dewey-Burdock ISR Project would be SMALL.

No change was made to the SEIS beyond the information provided in this response.

#### **E5.34.1 References**

10 CFR Part 40. *Code of Federal Regulations*, Title 10, *Energy*, Part 40. "Domestic Licensing of Source Material." Washington, DC: U.S. Government Printing Office.

10 CFR Part 71. *Code of Federal Regulations*, Title 10, *Energy*, Part 71. "Packaging and Transportation of Radioactive Material." Washington, DC: U.S. Government Printing Office.

29 CFR Part 1910. *Code of Federal Regulations*, Title 29, *Labor*, Part 1910. "Occupational Safety and Health Standards." Washington, DC: U.S. Government Printing Office.

NRC (U.S. Nuclear Regulatory Commission). "Safety Evaluation Report for the Dewey-Burdock Project Fall River and Custer Counties, South Dakota, Materials License No. SUA-1600." ML13052A182. Washington, DC: NRC. March 2013a.

NRC. "Draft License SUA-1600 for Powertech (USA), Inc." ADAMS Accession No. ML13318A094. Washington, DC: NRC. March 2013b.

Powertech [Powertech (USA) Inc.]. "Dewey-Burdock Project, Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota, Technical Report RAI Responses, June, 2011." ML112071064. Greenwood Village, Colorado: Powertech. 2011.

Powertech. “Dewey-Burdock Project, Application for NRC Uranium Recovery License Fall River and Custer Counties, South Dakota—Technical Report.” Docket No. 040-09075. ML092870160. Greenwood Village, Colorado: Powertech. August 2009.

## **E5.35 Editorial**

### **E5.35.1 Editorial—Grammatical**

**Comments:** 128-000013; 128-000049; 128-000055; 128-000082; 128-000084; 128-000120; 128-000218; 128-000235; 128-000244; 128-000267

Commenters suggested corrections for typographical errors, misspellings, and grammatical mistakes in the SEIS.

**Response:** *Proposed changes were made when appropriate. Where a commenter proposed changes to correct inaccuracies or inconsistencies, the NRC staff checked the commenter’s statements for accuracy prior to incorporating any new information in the SEIS.*

### **E5.35.2 Editorial—Technical**

**Comments:** 049-000006; 119-000019; 119-000020; 126-000009; 128-000014; 128-000016; 128-000019; 128-000023; 128-000025; 128-000026; 128-000031; 128-000035; 128-000036; 128-000037; 128-000038; 128-000039; 128-000043; 128-000044; 128-000046; 128-000048; 128-000050; 128-000052; 128-000053; 128-000054; 128-000057; 128-000059; 128-000065; 128-000071; 128-000080; 128-000083; 128-000087; 128-000088; 128-000091; 128-000092; 128-000093; 128-000094; 128-000096; 128-000097; 128-000098; 128-000099; 128-000100; 128-000101; 128-000104; 128-000105; 128-000106; 128-000108; 128-000109; 128-000110; 128-000111; 128-000114; 128-000116; 128-000117; 128-000118; 128-000119; 128-000121; 128-000147; 128-000151; 128-000152; 128-000153; 128-000154; 128-000155; 128-000156; 128-000158; 128-000159; 128-000160; 128-000163; 128-000166; 128-000167; 128-000168; 128-000169; 128-000170; 128-000173; 128-000174; 128-000179; 128-000180; 128-000182; 128-000183; 128-000184; 128-000185; 128-000186; 128-000212; 128-000213; 128-000214; 128-000015; 128-000219; 128-000220; 128-000229; 128-000232; 128-000236; 128-000238; 128-000242; 128-000245; 128-000247; 128-000248; 128-000249; 128-000250; 128-000251; 128-000252; 128-000253; 128-000254; 128-000255; 128-000256; 128-000257; 128-000258; 128-000259; 128-000260; 128-000265; 128-000268

Commenters suggested changes to the text to correct inaccuracies, inconsistencies, or proposed text to clarify information in the SEIS.

**Response:** *Proposed changes were evaluated and made when appropriate. Where a commenter proposed changes to correct inaccuracies or inconsistencies, the NRC staff checked the commenter’s statements for accuracy prior to incorporating any new information in the SEIS.*

**Comment: 014-000004**

The commenter pointed out that there is no State of South Dakota law that assumes the NRHP eligibility of the two historic railroads identified at the proposed Dewey-Burdock site in SEIS Section 3.9.2.1.

**Response:** *NRC acknowledges that no State of South Dakota law exists for determining the NRHP eligibility for railroads. In SEIS Section 3.9.2.1, the staff removed the reference to South Dakota law when describing the NRHP eligibility of the two historic railroad sites at the proposed project site.*

**Comments: 128-000188; 128-000191; 128-000193; 128-000194; 128-000195; 128-000196; 128-000197; 128-000198, 128-000199; 128-000200; 128-000201; 128-000202; 128-000203**

The commenter suggested that minor revisions be made to the terrestrial resources sections of the SEIS that do not change the technical content of the SEIS.

**Response:** *SEIS Sections 4.6.1.1.1.1.2, 4.6.1.1.1.1.4, 4.6.1.1.2, 4.6.1.2.1, and 4.6.1.2.2, were revised in response to the commenter's suggestions.*

**E5.35.3 Editorial—Programmatic**

**Comments: 128-000030; 128-000033**

Commenters suggested global changes to the text to clarify policy and programmatic issues in the SEIS.

**Response:** *Proposed changes were evaluated and made when appropriate. Where a commenter proposed changes to correct inaccuracies or inconsistencies, the NRC staff checked the commenter's statements for accuracy prior to incorporating any new information in the SEIS.*

**Comment: 128-000002**

The commenter stated that the entire SEIS needs to use the word “potential” when discussing impacts or effects in its assessment of the proposed Dewey-Burdock ISR Project. Given that the SEIS assesses impacts or effects that may or may not result from the construction, operation, restoration, and decommissioning phases of the proposed project, the use of the term “potential” is appropriate.

**Response:** *NRC staff acknowledges that the word “potential” was not used throughout the SEIS when discussing the impacts that may result from the construction, operation, aquifer restoration, and decommissioning phases of the proposed project. However, the introductory paragraphs leading into the impact analyses for each resource area in SEIS Chapter 4 used the word “potential” to describe the impacts assessed for each resource area during construction, operation, aquifer restoration, and decommissioning. Likewise, the introductory paragraph leading into the section summarizing the environmental impacts of the proposed project in the Executive Summary of the SEIS used the word “potential” to describe the impacts during construction, operations, aquifer restoration, and decommissioning for each resource area.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comment: 128-000003**

The commenter stated that the tense of the language used in the SEIS should be checked to ensure that the analysis reads correctly. The commenter suggested that in most cases the present tense should be used. Specifically, the commenter pointed out that the SEIS is inconsistent in its use of “would” versus “will,” and that “will” is the correct tense to use in the vast majority of cases.

**Response:** *NRC staff reviewed the tense used throughout the SEIS and, where appropriate, changed the tense.*

**Comment: 128-000004**

The commenter stated that the term “solid [or liquid] byproduct material” should not be used in the SEIS, but rather “solid [or liquid] 11e.(2) byproduct material”.

**Response:** *As described in SEIS Section 1.1, the SEIS uses the term “byproduct material” instead of “11e.(2) byproduct material” to describe the waste stream generated by the ISR process. The SEIS uses this terminology to be consistent with the definition in 10 CFR 40.4.*

*No change was made to the SEIS beyond the information provided in this response.*

**Comment: 128-000024**

The commenter requested that the nomenclature used to describe the materials license issued to acquire, possess, and transfer source and byproduct material be used consistently throughout the document.

**Response:** *According to NRC regulations in 10 CFR Part 40, the applicant is issued a “source material license.” NRC reviewed the nomenclature used to describe the materials license issued to the applicant throughout the SEIS and, where appropriate, revised the text to be consistent with the term “source material license” in 10 CFR Part 40.*

**Comment: 128-000246**

The commenter stated that it needs to be emphasized that, as is the case with all uranium recovery facilities, the regulatory guide series from the early 1980s (e.g., Regulatory Guide 4.14, NRC, 1980) applies to ISR facilities “as appropriate.” The commenter noted that these regulatory guides were not created for ISR facilities, but rather for conventional uranium mills; thus, this point needs to be made clear in the SEIS.

**Response:** *NRC acknowledges that guidance in the regulatory guide series of the early 1980s is only applicable to ISR facilities, where appropriate. Text was added to SEIS Section 7.2 to emphasize that, although created for conventional uranium mills, guidance in Regulatory Guide 4.14 (NRC, 1980) applies to ISR facilities, as appropriate.*

**E5.35.4      References**

10 CFR Part 40. *Code of Federal Regulations*, Title 10, *Energy*, Part 40. “Domestic Licensing of Source Material.” Washington, DC: U.S. Government Printing Office.

NRC (U.S. Nuclear Regulatory Commission). “Regulatory Guide 4.14, Radiological Effluent and Environmental Monitoring at Uranium Mills.” Rev. 1. Washington, DC: NRC. 1980.



**APPENDIX F**

**SUMMARY REPORT REGARDING THE TRIBAL CULTURAL SURVEYS  
COMPLETED FOR THE DEWEY-BURDOCK URANIUM *IN-SITU*  
RECOVERY PROJECT**





# SUMMARY REPORT REGARDING THE TRIBAL CULTURAL SURVEYS COMPLETED FOR THE DEWEY-BURDOCK URANIUM *IN-SITU* RECOVERY PROJECT

## Tribal Cultural Survey Participants

Since 2010, the U.S. Nuclear Regulatory Commission (NRC) staff has been consulting under the National Historic Preservation Act of 1966, as amended (NHPA) with various Native American Tribes regarding historic sites that may be affected by the proposed Powertech Inc. Dewey-Burdock *In-Situ* Recovery (ISR) Project.<sup>1</sup> The NRC staff has held three face-to-face meetings and three teleconferences with tribal representatives, and exchanged many emails, letters, and telephone calls.

In December 2012, the NRC staff advised all consulting tribes that the Dewey-Burdock site would be open for interested tribes conduct on-the-ground surveys in the spring of 2013.<sup>2</sup>

On February 8, 2013, the NRC staff contacted 23 tribes interested in the proposed Dewey-Burdock ISR Project and invited the 23 tribes to participate in a field survey of the project area for the purpose of identifying properties of religious and cultural significance to tribes. In the spring of 2013, the Dewey-Burdock project site was made available for each consulting tribe to conduct a field identification survey for any historic properties that may have traditional, religious or cultural significance to the tribe. The NRC invited interested tribes to investigate any areas within the 4,282-ha [10,580-ac] Dewey-Burdock license area during the month of April 2013. Financial support was offered for as many as three representatives from each tribe and each tribe was invited to develop and implement its own survey methodology. Tribes were asked to respond to NRC no later than March 12, 2013.

The NRC Staff received written or verbal responses from 18 of 23 interested tribes in advance of the March 12, 2013 deadline. Seven tribes expressed interest in the survey offer and were able to participate in the field survey (Northern Cheyenne Tribe, Santee Sioux Tribe, Northern Arapaho Tribe, Turtle Mountain Band of Chippewa Indians, Crow Creek Sioux Tribe, Crow Nation, Cheyenne and Arapaho Tribes of Oklahoma). Five tribes did not reply to the invitation (Omaha Tribe, Lower Sioux Indian Community, Fort Peck Tribes, Eastern Shoshone Tribe, Cheyenne River Sioux Tribe). Six tribes declined to participate in the field survey or stated they were unable to participate due to other commitments, but expressed continued interest in participating in consultation for the project (Three Affiliated Tribes, Lower Brule Tribe, Ponca Tribe, Flandreau Santee Sioux Tribe, Pawnee Nation, Spirit Lake Sioux Tribe). Four tribes declined to participate based on stated concerns about the survey approach (Standing Rock Sioux Tribe, Rosebud Sioux Tribe, Sisseton-Wahpeton Oyate, Yankton Sioux Tribe). The Standing Rock Sioux Tribe specifically stated that survey invitation did not provide or allow for an appropriate survey methodology. The Rosebud Sioux Tribe stated that it was "*not in favor of the offer as set by Powertech nor is Rosebud interested in conducting a survey on the APE*

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<sup>1</sup>Letter to Tribal Leaders Requesting Additional Information Regarding Tribal Historic and Cultural Resources Potentially Affected by the Powertech Inc. Proposed Dewey-Burdock *In-Situ* Recovery Facility (March 19, 2010) (ML100331999) <<http://adamswebsearch2.nrc.gov/webSearch2/main.jsp?AccessionNumber=ML100331999>>.

<sup>2</sup>Letter to Tribal Leaders Responding to Comments Received regarding Tribal Survey, Dewey-Burdock ISR project. (December 14, 2013) (ML12335A175) <[https://adamsxt.nrc.gov/WorkplaceXT/IBMgetContent?vslid={389C91E7-8786-4A5A-81D1-3CB65331519D}&objectType=document&id={2EE3F8FC-01CC-4C19-9A45-DAB53D64C77E}&objectStoreName=Main.\\_\\_.Library](https://adamsxt.nrc.gov/WorkplaceXT/IBMgetContent?vslid={389C91E7-8786-4A5A-81D1-3CB65331519D}&objectType=document&id={2EE3F8FC-01CC-4C19-9A45-DAB53D64C77E}&objectStoreName=Main.__.Library)>.

*lands solely.*” The Rosebud Sioux Tribe also asked the NRC to publicly acknowledge their decision not to participate. Finally, the Oglala Sioux Tribe initially announced its intention to participate in the April survey, but withdrew its acceptance because the tribal council had not been briefed before the survey was scheduled to begin.

### **Survey Dates and Survey Methods**

The Tribal Cultural Survey for the Dewey-Burdock project area was formally initiated on Tuesday, April 2, 2013 with a kick-off meeting near Edgemont, South Dakota led by NRC staff. Representatives from the Northern Cheyenne Tribe, Crow Nation, Santee Sioux Tribe, Turtle Mountain Band of Chippewa Indians, U.S. Bureau of Land Management (BLM), South Dakota State Historic Preservation Office (SD SHPO), and Powertech USA attended the meeting. The NRC staff welcomed all participants and provided all meeting participants with detailed maps of the entire project area showing the locations of all known archaeological sites, previously disturbed lands, and proposed construction areas. Survey participants were also provided with lists of National Register of Historic Places (NRHP) listed and eligible archaeological sites, archaeological sites with burial locations, and archaeological sites known to include one or more stone features. NRC staff also distributed written guidance for reporting survey results to the NRC upon completion of the field survey and a written policy statement regarding site confidentiality (Attachment 1). The NRC staff also provided participants with copies of the Advisory Council on Historic Preservation (ACHP) regulations “Protection of Historic Properties” (36 CFR Part 800) as well as the U.S. National Park Service National Register Bulletin 38, “Guidelines for Evaluating and Documenting Traditional Cultural Properties”. Kick off meeting participants discussed and accepted the proposed reporting guidance and confidentiality policy. Tribal representatives requested a list of known sites located within the footprint of the proposed construction area. The NRC staff and tribal representatives worked together to compile a list of known archaeological sites using project maps. Tribal representatives used the rest of the meeting as a work session to discuss survey needs and priorities and to develop strategies for implementing the field survey. Four survey priorities were established. Survey efforts would focus on review of (1) known burial sites, (2) areas proposed for ground disturbance, (3) NRHP-listed or eligible sites, and (4) areas with potential to be affected by the proposed land application option. The participating tribes also agreed to collaborate and conduct the survey work as a single team.

The field survey began on April 3, 2013. NRC reproduced site maps showing the location of stone features identified and recorded by Powertech’s archaeological consultant. These maps were distributed to all members of the survey team for reference during the field investigations. The NRC Section 106 consultant (The Louis Berger Group, Inc.) provided global positioning system (GPS) equipment and two-way radios for daily use by the tribal survey team. This equipment facilitated recording of field discoveries and team logistics, and allowed communication among survey team members, as well as, communication between survey members and Powertech representatives. Powertech provided all vehicle transportation for the survey team within the project area. NRC staff and its consultant worked with the tribal survey team members on a daily basis throughout the survey period.

The field survey was conducted in two phases between April 2, 2013 and May 23, 2013. A heavy snowfall event on April 9, 2013 forced survey work to be suspended for a period of several weeks. Survey work resumed on April 30, 2013 and continued through May 23, 2013. A summary of the survey dates and participation by representatives of different tribes is provided in Table F-1.

**Table F-1. Summary of Tribal Cultural Survey Activity and Participation During  
April–May 2013**

	April 2	April 3	April 4	April 5	April 6	April 7	April 8	April 30	May 1	May 2	May 3	May 4	May 5	May 6	May 7	May 8	May 9	May 14	May 15	May 16	May 23
Northern Cheyenne Tribe	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
Santee Sioux Tribe	X	X	X	X			X														
Turtle Mountain Band of Chippewa	X	X	X	X	X		X	X	X	X											
Northern Arapaho Tribe								X	X	X	X	X	X	X	X	X	X				
Cheyenne & Arapaho Tribes of OK								X	X												X
Crow Creek Sioux Tribe								X	X	X			X	X	X	X					
Crow Tribe	X																	X	X	X	

The tribal survey teams were provided access to the entire license area and survey teams examined approximately 95 percent of the entire project area within the license boundary. Areas with open pit uranium mines and spoil piles from past mining activity were toured by vehicle but were not subject to pedestrian survey due to the low potential for locating undisturbed sites. The survey team focused their survey efforts on those portions of the license area that met the four priorities established at the beginning of the survey. Several relatively small parcels situated primarily along the outside margins of the license boundary were also excluded from pedestrian survey. Areas not examined were the following:

- The south-central portion of Section 1 east of the open pit mines {approximately 40.5 ha [100 acres]}
- Portions of Section 10 southwest of Dewey Road and in the northeast quarter of the section {approximately 40.5 ha [100 ac]; outside the limits of proposed disturbance}
- Portions of Section 15 southwest of Dewey Road where pastured livestock were a concern {approximately 61 ha [150 ac]; outside the limits of proposed disturbance; Northern Cheyenne and Turtle Mountain representatives were able to visit two recorded archaeological sites located in this area}

- Portions of Section 21 along the north and east license boundaries {approximately 40.5 ha [100 ac]; outside the limits of proposed disturbance}
- Portions of the southeast quarter of Section 31 {approximately 65 ha [160 ac]; outside the limits of proposed disturbance}

Of these unsurveyed areas, only those portions of Section 1 that were previously disturbed by mining activity will be affected by project construction and operations (i.e., deep disposal wells and potential land application).

The field surveys were directed by survey team personnel who identified survey priorities and selected areas for field survey on a daily basis. Decisions concerning survey priorities were adjusted to wet weather conditions that temporarily limited vehicle access to more remote locations. Access to portions of Sections 29, 30, 31, and 32 was restricted due to the presence of an active bald eagle nest at the start of the survey. Because the survey took place while hatchlings were present in the nest, the project sponsor arranged for a trained biologist to monitor the nest on May 6<sup>th</sup>, during which time two survey team members from the Northern Arapaho Tribe examined this area. The survey was completed without disrupting the nesting eagles. Generally, the field surveys were conducted using conventional transect survey methods with individual team members following parallel transects across designated survey areas. Transect intervals between individual surveyors were variable and typically ranged anywhere from 20 to 100 m [66 to 328 ft] with surveyors sometimes following a zig-zag-like path along individual transects as a way to improve overall coverage. Transect intervals were varied to accommodate work in areas with dense timber and in steep or deeply dissected terrain where it was either difficult or impossible to maintain visual contact between individual surveyors.

Team members following transect surveys alerted fellow team members when a discovery was made and all or part of the survey team would gather to explore the immediate location of the find. The locations of new discoveries were recorded using GPS equipment capable of recording site locations with sub-meter accuracy. Photographs were taken and descriptive notes were recorded.

Some team members unable to participate in the transect surveys opted to visit previously recorded archaeological sites with priority given to those that included burials and/or stone features. Site maps were used to relocate features of interest to surveyors. Features were flagged for inspection by the rest of the survey team.

### **Summary of Tribal Survey Reports**

The NRC staff requested that participating tribes provide NRC with a brief written report summarizing the results of their survey work by June 24, 2013, 30 days after the completion of the field survey. On May 31, 2013, the NRC consultant prepared an updated set of detailed project maps showing the 144 GPS locations recorded by the tribes during the Tribal Cultural Survey. Maps were provided in multiple formats including printed copies of the detailed project maps used by the survey teams. The NRC also provided map information in pdf format and two electronic formats designed to permit interactive use of both survey data and project information with free software applications available by download from internet websites, namely ArcGIS Explorer (GIS shapefile) and Google Earth (kml. format). These applications allow a user to view map information, but also have the capability of viewing overlapping data

sets, including tribal site locations, known archaeological sites, and proposed construction areas. Written instructions were provided to assist users with the download procedures and software applications. The NRC consultant was available to assist tribal reviewers, if needed. A set of 81 captioned photographs showing site locations and features were also provided to all participants.

Tribal concerns about maintaining the confidentiality of site locations, as well as the cultural interpretations or meanings associated with culturally significant sites were accommodated by the NRC. The NRC staff suggested tribes prepare two versions of their reports. One report with a brief summary of the work suitable for public disclosure, but without specific information regarding site locations and cultural interpretation would be submitted. A second confidential report specifically prepared to permit the NRC staff to make formal determinations of NRHP eligibility, pursuant to NRC's federal compliance responsibilities under Section 106 of the NHPA. The NRC requested that the confidential reports include information about site locations, recommendations on the NRHP eligibility of each site, and recommendations for the size of appropriate protective buffers, and other mitigation measures to reduce adverse effects to eligible properties.

All participating tribes requested additional time to prepare their survey reports and NRC staff agreed to those extensions and offered additional support if needed. The NRC consultant contacted participating tribes after June 24, 2013, to inquire about the status of the report preparation process and offer additional support as needed. Supplemental electronic copies of the May 31, 2013 information package were resent by email to several of the participating tribes.

The NRC staff received detailed written reports with NRHP eligibility recommendations from three of the seven tribes who participated in the tribal cultural survey (Northern Arapaho Tribe, Northern Cheyenne Tribe, Cheyenne and Arapaho Tribes of Oklahoma). The Crow Nation provided NRC staff with a copy of field notes identifying several sites of interest to that tribe. A brief summary of each tribe's comments and recommendations is provided below. A detailed list of sites identified during the tribal cultural survey with management recommendations is included as Attachment 2. The tribal cultural survey reports and maps with site locations identified during the survey are on file at the NRC and at the respective tribal office of the tribe that prepared the report.

As described above, GPS equipment was used to record the location of 144 places of interest and other new discoveries identified by the survey teams. A descriptive label provided by the survey team was applied to each reading as it was recorded in the field. To track and correlate individual site locations the NRC assigned a unique number to each GPS reading identifying "tribal sites" as TS001, TS002, and so forth. These tribal site numbers are used throughout this summary and the final Supplemental Environmental Impact Statement (SEIS), and provide a means to reference specific new discoveries and correlate them to specific tribal comments and recommendations.

#### Northern Cheyenne Tribe

The Northern Cheyenne Tribe submitted its written report entitled "A Tribal Cultural Survey of the Dewey Burdock Proposed Uranium Mine Permit Area in South Western South Dakota" to the NRC staff on July 25, 2013. The Northern Cheyenne Tribal Historic Preservation Office (THPO) provided written clarification in response to NRC comments on September 17, 2013.

The Northern Cheyenne Tribal report included a summary of survey methods, results and NRHP-eligibility recommendations. Tribal Cultural Heritage Forms for 10 specific cultural properties identified or investigated during the survey were attached to the report. Each form contained recommendations on the NRHP-eligibility of each site with reference to the applicable eligibility criteria deemed appropriate by the tribe.

- NHRP recommendations for 10 specific sites visited during the survey: one site (39FA1902) was identified as having no interest to the tribe; three sites (39FA1881, 39FA1926, 39FA1922) were recommended as NRHP-eligible under Criteria A and D; and six sites (39FA1862, 39FA1927, 39FA0096, 39FA3567, 39FA584, NC-1) were recommended as NRHP-eligible under Criterion A and recommended for avoidance (Note: Site NC-1 correlates with Tribal Site 006 as listed in Attachment 2).
- The tribe also recommended that all or portions of some sections of the proposed project area be considered NRHP-eligible under Criterion A and be avoided “because of multiple sites or new discoveries” reported within these portions of the project area.

#### Northern Arapaho Tribe

The Northern Arapaho Tribal Historic Preservation Office submitted its written report, “Dewey Burdock Project, Custer County, Fall River County, Edgemont, South Dakota” to the NRC staff on June 24, 2013. The THPO provided written responses to NRC requests for additional clarification on August 22, August 24, and September 16, 2013. The report included a description of the project, the project setting, a detailed tribal history, a detailed description of survey activities organized by date and illustrated with maps and photographs, and recommendations for mitigation. The report provides descriptive comments and interpretations for 42 specific sites. Recommendations regarding NHRP-eligibility were provided for four specific site locations, as well as two broader areas of concern.

The Northern Arapaho Tribe recommends that TS047, TS080-089, TS006, and 39CU0584 be considered eligible for listing in the NRHP under criteria A and C and that these areas be avoided. The tribe further recommended specific avoidance zones or buffer zones for these sites ranging in size from 137 m [450 ft] for TS080-089 and 39CU0584 to 0.4 km [0.25 mi] for TS047 and TS006. The tribal report also referenced an area east of TS047 that included culturally significant sites and warranted avoidance. The tribe later clarified this reference on September 16, 2013, stating that two tribal sites were located south, not east of TS047; these are TS040 and TS041/TS042.

- The tribe identified portions of one section within the project site as of particular concern to the tribe, due to the “large number of Traditional Cultural properties” present. The tribe recommends the sites in this area be considered eligible for listing in the NRHP under criteria A and C and that the area be avoided. Avoidance is recommended for pedestrian traffic as well as disturbance by heavy machinery. Places of significance include sites 39FA1922, 39FA1923, and 39FA1926 and these sites were expanded with the identification of new features in the tribal survey; these include TS014-TS018, TS067-TS074, TS076-TS078, and TS142-TS143.
- The tribe identified a portion of another section within the site as an area of concern because of the presence of sensitive cultural sites. The tribe recommends these sites

be considered eligible for listing in the NRHP under criteria A and C and that the area be avoided. Avoidance is recommended for pedestrian traffic as well as other forms of disturbance. Places of significance include sites 39CU0459, 39CU3600, 39CU3604, 39CU3620 and these sites were expanded with the identification of new features in the tribal survey; these include TS106-TS111, TS114-115 and TS121-TS122.

- Site 39FA1927 is considered to be a modern site and is of no interest to the Tribe.

#### Cheyenne and Arapaho Tribes of Oklahoma

The Cheyenne and Arapaho Tribes of Oklahoma Tribal Historic Preservation Office submitted its written report, "Cheyenne and Arapaho Tribes Report on Dewey-Burdock Survey, June 24, 2013" to the NRC Staff on June 24, 2013. The THPO provided verbal responses to NRC's request for additional clarifications on August 22 and September 13, 2013 and a written comment on September 19, 2013. The report included a summary of the survey activities organized by date and supplemented with photographs of site features taken during the field survey.

- The tribe recommended that the Site 39CU3567 be considered eligible for listing in the NRHP under Criterion D, and recommended a 300 m [984 ft] avoidance buffer zone be provided.
- The tribe recommended that TS006 be considered NRHP-eligible under Criterion D with 600 m [1,968 ft] of avoidance buffer. The NRC confirmed with the THPO that a photograph of the feature at TS006 is incorrectly identified as 39FA1902 in the report. TS006 identifies the location of this significant feature.
- The tribe recommended that the stone feature at site TS009 be considered NRHP-eligible under Criterion D and suggested a 300 m [984 ft] buffer zone be established. The report mislabeled the feature as a possible hearth at 39FA0096. The associated photograph is a feature located at TS009. The THPO confirmed this and recommended the feature be considered NRHP-eligible.
- The tribe recommended site 39FA1927 as NRHP-eligible under Criterion D and suggested a buffer of 300 m [984 ft] be established. This site includes three individual cairn features described in the report; three other cairn features were identified as part of this site.
- The tribe recommended that site 39FA1922 be considered not eligible for the NRHP, but asked that the site be protected with a 300 m [984 ft] buffer zone. The tribe recommends site avoidance because of the presence of features recognized as potentially significant to other tribes.
- The tribe noted the location of a possible prayer/offering site in one section of the site. The location was photographed, but no specific site location was recorded. Based on information provided by a tribal elder on September 19, 2013, the THPO amended its report, recommending that the site be considered eligible for listing in the NRHP under

Criterion D and recommended that a 300-m [984-ft] protective buffer be established to protect the site. It will be necessary to relocate this site in order to avoid it.

- The tribe refers to a “historic campsite” and recommends that its location be noted as a place of potential interest to other tribes. A conversation with one of the tribe’s survey team members confirms this location corresponds to TS028. An NRHP eligibility recommendation was not made because the site has not been visited by tribal members to evaluate its significance.
- The tribal report also refers to a steep ridge with disturbed rock formations. Based on a conversation with the author of the report, the NRC staff believes this area is adjacent to 39FA1863. No recommendations for NHRP eligibility were provided by the tribe for this area. Several recorded archaeological sites are located on this ridge, which is located outside the license boundary.

### Crow Nation

The Crow Nation Tribal Historic Preservation Office submitted its written report, “Crow Tribal Historical Preservation Office, CTHPO, June 26, 2013, Weekly Report” to the NRC staff on June 27, 2013. The report refers to 16 sites identified by two survey representatives. Five sites, 39FA1927, 39FA1922, 39FA1923, 39FA1881 and TS080-089, are of interest to the tribe. Although the NRC assumes the Crow Nation considers the five sites to be culturally significant, the Crow Nation has not provided specific recommendations on their NRHP-eligibility. In addition, no recommendations were made on appropriate treatment of the sites if they were subject to adverse effects.

### **Summary of the Tribal Cultural Survey Findings and Tribal Recommendations**

The tribal survey teams identified new artifact discoveries or cultural features of interest to tribes at 24 previously reported archaeological sites as well as 47 other locations representing as many as 71 tribal sites. A number of the 47 new discoveries identified by tribes are situated near the boundaries of known archaeological sites and could reasonably be considered part of those sites if the current archaeological site boundaries were expanded to include them. Other new discoveries occur in close proximity to one another and may be culturally related.

Most of the new discoveries identified in the tribal cultural surveys are described in this report as individual tribal sites. When tribes indicated cultural relationships exist between new discovered features and known archaeological sites or between groups of individual tribal cultural features, this information is provided in the summary in Table F–2 and the list of tribal sites in Attachment 2.

### *Tribal Review of Previously Reported Archaeological Sites*

Tribal survey teams recorded 81 cultural features within the boundaries of 24 known archaeological sites. Some of the cultural features recorded by tribal survey teams correspond to features identified in the archaeological surveys; however, many represent new discoveries. Tribal survey teams provided specific recommendations for four (4) archaeological sites that were investigated without identifying new cultural features.



**Table F–2. Summary of Tribal Recommendations for Recorded Archaeological Sites**

South Dakota Site Number	Northern Cheyenne Tribe	Northern Arapaho Tribe	Cheyenne and Arapaho Tribes	Crow Nation
39CU0459	Eligible: A	Eligible: A, C		
39CU0584	Eligible: A	Eligible: A, C		
39CU3567	Eligible: A		Eligible: D	
39CU3600	Eligible: A	Eligible: A, C		
39CU3602	Eligible: A			
39CU3604	Eligible: A	Eligible: A, C		
39CU3607	Eligible: A			
39CU3620		Eligible: A, C		
39FA0096	Eligible: A			
39FA1862	Eligible: A			
39FA1881	Eligible: A, D			Place of interest
39FA1890	Eligible: A			
39FA1902	No Interest	No Interest		
39FA1922*	Eligible: A, D	Eligible: A, C	Not Eligible	Place of interest
39FA1923*	Eligible: A	Eligible: A, C		Place of interest
39FA1926	Eligible: A, D	Eligible: A, C		
39FA1927	Eligible: A	Not Eligible	Eligible: D	Place of interest
39FA1952	Eligible: A			

\*Sites 39FA1922 and 39FA1923 are located on BLM property. All others are on private land.

Tribal survey teams collectively recommended that 17 known archaeological sites be considered eligible for listing in the NRHP under one or more eligibility criteria. Tribal recommendations are summarized in Table F–2. Sites 39FA0096, 39FA1890, 39FA1862 (outside APE), 39CU3607, 39CU3602, and 39FA1952 were recommended as NRHP-eligible under Criterion A. Sites 39CU0459, 39CU0584, 39CU3600, 39CU3604, 39CU3620, and 39FA1923 were recommended as NRHP-eligible under criteria A and C. Sites 39CU3567, 39FA1881, and 39FA1927 were recommended as NRHP-eligible under criteria A and D. Sites 39FA1922 and 39FA1926 were recommended as NRHP-eligible under criteria A, C, and D.

No sites were specifically classified as “not eligible,” although Site 39FA1902 was specifically identified as being of no interest to the Northern Cheyenne and Northern Arapaho tribes. Site 39FA1902 marks the location of a historic artifact scatter and a possible gravesite; it is likely an historic homestead. Northern Cheyenne and Northern Arapaho representatives examined the possible gravesite and because of the presence of broken concrete among the stones, they determined it was not likely of tribal origin. Survey teams recorded information about their visits to other sites for consideration by the THPOs; however, no NRHP eligibility recommendations were offered by tribal survey teams for other previously recorded archaeological sites.

#### *Tribal Sites: New Discoveries*

A total of 47 new discoveries were recorded as a result of the tribal cultural survey. Forty-four (44) of the 47 new discoveries are individual tribal sites or cultural features and were assigned individual survey numbers. Three tribal sites represent cultural features within a single site. For example, 11 GPS readings were taken to record the location of individual stones that make up a

single stone feature (TS080-TS089, TS098). Five associated tribal features (TS007-TS011) make up another tribal site. Another cultural feature assigned duplicate survey numbers (TS041 and TS042).

Twelve (12) of the 47 newly discovered cultural features were identified outside the license boundary. These features include five (5) discoveries on private land (TS024, TS061, TS062, TS075, TS079), five (5) discoveries on BLM property (TS125, TS126, TS127, TS128, TS129), and two discoveries on U.S. Forest Service (USFS) property (TS106, TS107). Sites TS107 and TS125 were identified as a possible gravesites. TS106 and TS107 were recommended eligible for listing in the NRHP under criteria A and C. No eligibility recommendations were provided for the other 10 cultural features or sites. Thirty-five (35) of the 47 new discoveries were identified within the project's license boundary. Ten (10) of these tribal sites were recommended as NRHP- eligible under one or more eligibility criteria. TS002, TS118, and TS120 were recommended as eligible under Criterion A. TS145 is recommended as eligible under Criterion D. TS007-011 is recommended as eligible under Criteria A and D. TS040, TS041-TS042, TS047, and TS080-T089, TS098 are recommended as eligible under Criteria A and C. TS006, a gravesite, is recommended as eligible under Criteria A, C, and D.

NRHP recommendations were not provided for 25 of the 35 new discoveries recorded within the project license boundary (TS003, TS005, TS023, TS028, TS030, TS036, TS037, TS048, TS049, TS050, TS051, TS052, TS063, TS064, TS065, TS066, TS090, TS091, TS092, TS093, TS094, TS095, TS097, TS131, TS144). These features include isolated artifact finds, animal bone concentrations, stone circles, cairns, and possible fasting sites. TS023, TS048, TS049, TS050, and TS131 were identified during the field survey as possible gravesites. NRC recommends avoidance of these sites because these sites may contain human remains, even though tribes may not consider these locations eligible for listing in the NRHP.

**U.S. Nuclear Regulatory Commission’s Determinations of Eligibility and Effect**

The NRC presents its initial NHRP-eligibility determinations and assessments of effects on historic properties and places of religious and cultural significance to tribes in Table F–3. NRC evaluated the results of the tribal cultural survey and the eligibility recommendations provided by the THPOs for the Northern Cheyenne Tribe, the Northern Arapaho Tribe, the Cheyenne and Arapaho Tribes of Oklahoma, and the Crow Nation in making the determinations and assessments. NRC assessment of effect in Table F–3 was determined with regard to the area of potential effect (APE) for facility construction and operations as described in SEIS Section 3.9.2. NRC assessment of visual effects on historic and cultural properties is presented in SEIS Sections 3.9.3.3 and 4.9.1.

<b>Table F–3. U.S. Nuclear Regulatory Commission Determinations of Eligibility and Assessment of Effect on Historic Properties. (DDW = Deep Disposal Well Option; LA = Land Application Option).</b>					
<b>State Site Number</b>	<b>Tribal Survey Number(s)</b>	<b>Tribal Features</b>	<b>U.S. Nuclear Regulatory Commission’s National Register of Historic Places Determination</b>	<b>Assessment of Effect*</b>	<b>Comments</b>
39CU0251	TS096	Stone circle	Not eligible	No effect	

<b>Table F-3. U.S. Nuclear Regulatory Commission Determinations of Eligibility and Assessment of Effect on Historic Properties (Cont'd). (DDW = Deep Disposal Well Option; LA = Land Application Option).</b>					
<b>State Site Number</b>	<b>Tribal Survey Number(s)</b>	<b>Tribal Features</b>	<b>U.S. Nuclear Regulatory Commission's National Register of Historic Places Determination</b>	<b>Assessment of Effect*</b>	<b>Comments</b>
39CU0271	TS019 TS035 TS130	Cairn; possible gravesite; earth paint	Eligible Criterion D	No effect	Avoid as possible gravesite
39CU0459	TS108-111	Cairn; stone circle; fasting/prayer circles	Eligible Criterion A	No effect	The boundary for 39CU0459 also includes two smaller artifact scatters: 39CU0461 and 39CU0528
39CU0584	TS043-046, TS053, TS132-140	Possible medicine wheel, four directions marker, burial, fasting site, cairns, stone circle, hearth	Eligible Criterion A	No effect	Avoid as possible gravesite.
39CU3567	TS031-033, TS141	Three stone circles, scattered hearth	Eligible Criterion A	Potential adverse effect (LA)	
39CU3572	TS034	Stone circles; possible medicine wheel	Not eligible	No effect	
39CU3574	TS021-022	Stone circle, scraper	Not eligible	No effect	
39CU3576	TS020	Tested cobble	Not eligible	No effect	
39CU3584	TS025-027, TS-029	Cairn alignment, stone circle	Unevaluated	No effect	
39CU3593	TS055	Cairn	Not eligible	No effect	
39CU3596	TS054	Disturbed	Not eligible	No effect	
39CU3600	TS114-115	Two fasting/prayer circles	Eligible Criterion A	No effect	
39CU3602	TS119	Scattered hearth	Eligible Criterion A	No effect	
39CU3604	TS121-122	Fasting/prayer circles	Eligible Criterion A	No effect	
39CU3607	TS116-117	Chert core and flake	Eligible Criterion A	No effect	

<b>Table F-3. U.S. Nuclear Regulatory Commission Determinations of Eligibility and Assessment of Effect on Historic Properties (Cont'd). (DDW = Deep Disposal Well Option; LA = Land Application Option).</b>					
<b>State Site Number</b>	<b>Tribal Survey Number(s)</b>	<b>Tribal Features</b>	<b>U.S. Nuclear Regulatory Commission's National Register of Historic Places Determination</b>	<b>Assessment of Effect*</b>	<b>Comments</b>
39CU3620		Cairn, prayer/ fasting circle	Eligible Criterion A	No effect	Partly located on U.S. Forest Service (USFS) property; possibly associated with TS106 and TS107
39FA0096	TS001, TS004, TS013	Hearth, earth paints	Unevaluated	Potential adverse effect (DDW/LA)	
39FA1862	TS112-113	Stone circles	Eligible Criterion A	No effect	Located outside license boundary
39FA1881		Cairn	Eligible Criterion A	No effect	
39FA1890	TS012	Two cairns	Eligible Criterion A	No effect	
39FA1902		Artifact scatter; well/cistern; burial, road	Unevaluated	No effect	
39FA1922	TS014-017	Three stone circles, possible medicine wheel	Unevaluated	No effect	Located on U.S. Bureau of Land Management (BLM) property
39FA1923	TS018, TS142-143	Two cairns	Unevaluated	No effect	Located on BLM property
39FA1926	TS067-074, TS076-078	Six stone circles	Eligible Criterion A	No effect	
39FA1927		Six cairns	Eligible Criterion A	No effect	
39FA1952	TS123-124	Scattered hearth, flake	Eligible Criterion A	No effect	
39FA1962	TS056-060	Cairn, stone circles	Not eligible	No effect	
39FA1964	TS099-105	Two hearths, alignment, four fasting/prayer circles	Not eligible	No effect	
	TS002	Stone circle	Eligible Criterion A	No effect	

<b>Table F-3. U.S. Nuclear Regulatory Commission Determinations of Eligibility and Assessment of Effect on Historic Properties (Cont'd). (DDW = Deep Disposal Well Option; LA = Land Application Option).</b>					
<b>State Site Number</b>	<b>Tribal Survey Number(s)</b>	<b>Tribal Features</b>	<b>U.S. Nuclear Regulatory Commission's National Register of Historic Places Determination</b>	<b>Assessment of Effect*</b>	<b>Comments</b>
	TS003	Buffalo bones	Not eligible	No effect	Not a cultural site
	TS005	Flake	Not eligible	No effect	Isolated find
	TS006	Cairn	Eligible Criterion A	No effect	Avoid as gravesite
	TS007-011	Four stone circles, alignment	Eligible Criterion A	Potential adverse effect (DDW/LA)	TS007-TS011 are considered a single site
	TS023	Burial	Not eligible	No effect	Avoid as possible gravesite
	TS024	Stone circle	Not evaluated; outside area of potential effect (APE)	No effect	Outside license boundary
	TS028	Three stone circles; campsite; ceremonial site	Not eligible	No effect	
	TS030	Stone circle	Not eligible	No effect	
	TS036	Small cairn or marker	Not eligible	No effect	
	TS037	Small cairn	Not eligible	No effect	
	TS040	Ceremonial site	Eligible Criterion A	No effect	
	TS041-042	Ceremonial site	Eligible Criterion A	No effect	
	TS047	Ceremonial site	Eligible Criterion A	No effect	
	TS048	Burial	Not eligible	No effect	Avoid as possible gravesite
	TS049	Burial	Not eligible	No effect	Avoid as possible gravesite
	TS050	Burial	Not eligible	No effect	Avoid as possible gravesite
	TS051	Fasting site	Not eligible	No effect	
	TS052	Stone circle	Not eligible	No effect	

<b>Table F-3. U.S. Nuclear Regulatory Commission Determinations of Eligibility and Assessment of Effect on Historic Properties (Cont'd). (DDW = Deep Disposal Well Option; LA = Land Application Option).</b>					
<b>State Site Number</b>	<b>Tribal Survey Number(s)</b>	<b>Tribal Features</b>	<b>U.S. Nuclear Regulatory Commission's National Register of Historic Places Determination</b>	<b>Assessment of Effect*</b>	<b>Comments</b>
	TS061	Stone circle	Not evaluated; outside APE	No effect	Located just outside license boundary
	TS062	Effigy	Not evaluated; outside APE	No effect	Located 600 m [1,968 ft] outside license boundary
	TS063	No identification	Not eligible	No effect	
	TS064	Stone circle	Not eligible	No effect	
	TS065	Fasting site	Not eligible	No effect	
	TS066	Cairn	Not eligible	No effect	
	TS075	Cairn	Not evaluated; outside APE	No effect	Located 60 m [196 ft] outside license boundary
	TS079	Stone circle	Not evaluated; outside APE	No effect	Located 230 m [754 ft] outside license boundary
	TS080-089, TS098	Alignment and Arc; ceremonial site; pipe ceremony location	Eligible Criterion A	Potential adverse effect (DDW/LA)	
	TS090	Cairn	Not eligible	No effect	Located outside but near 39CU3622
	TS091	Ceremonial site	Not eligible	No effect	Located outside but near 39CU3621
	TS092	Cairn	Not eligible	No effect	
	TS093	Possible cairn	Not eligible	No effect	
	TS094	Cairn	Not eligible	No effect	
	TS095	Disturbed cairn (modern survey marker)	Not eligible	No effect	

<b>Table F-3. U.S. Nuclear Regulatory Commission Determinations of Eligibility and Assessment of Effect on Historic Properties (Cont'd). (DDW = Deep Disposal Well Option; LA = Land Application Option).</b>					
<b>State Site Number</b>	<b>Tribal Survey Number(s)</b>	<b>Tribal Features</b>	<b>U.S. Nuclear Regulatory Commission's National Register of Historic Places Determination</b>	<b>Assessment of Effect*</b>	<b>Comments</b>
	TS097	Cairn	Not eligible	No effect	
	TS106	Fasting circle	Eligible Criterion A	No effect	Located on USFS property 40 m [131 ft] outside license boundary. Possibly associated with 39CU3620.
	TS107	Possible gravesite and fasting circle	Eligible Criterion A	No effect	Located on USFS property 60 m [196 ft] outside license boundary. Avoid as possible gravesite. Possibly associated with 39CU3620.
	TS118	Hearth	Eligible Criterion A	No effect	
	TS120	Hearth	Eligible Criterion A	Potential adverse effect (DDW.LA)	
	TS125	Burial	Not evaluated; outside APE	No effect	Located on BLM property 60 m [196 ft] outside license boundary
	TS126	Staff	Not evaluated; outside APE	No effect	Located on BLM property 180 m [590 ft] outside license boundary

<b>Table F-3. U.S. Nuclear Regulatory Commission Determinations of Eligibility and Assessment of Effect on Historic Properties (Cont'd). (DDW = Deep Disposal Well Option; LA = Land Application Option).</b>					
<b>State Site Number</b>	<b>Tribal Survey Number(s)</b>	<b>Tribal Features</b>	<b>U.S. Nuclear Regulatory Commission's National Register of Historic Places Determination</b>	<b>Assessment of Effect*</b>	<b>Comments</b>
	TS127	Fasting site	Not evaluated; outside APE	No effect	Located on BLM property 200 m [656 ft] outside license boundary
	TS128	Fasting site	Not evaluated; outside APE	No effect	Located on BLM property 200 m [656 ft] outside license boundary
	TS129	Fasting site/ring	Not evaluated; outside APE	No effect	Located on BLM property 290 m [951 ft] outside license boundary
	TS131	Possible grave	Not eligible	No effect	Avoid as possible gravesite
	TS144	Cairn	Not eligible	No effect	
	TS145	Prayer/offering location	Unevaluated	Potential adverse effect (DDW/LA)	Site location was not recorded by GPS but is known to be within a 32.4-ha [80-ac] parcel. Would require relocation to assess potential for site avoidance.
<p>*Assessment of effect was determined with regard to the APE for facility construction and operations as described in Supplemental Environmental Impact Statement (SEIS) Section 3.9.2. An assessment of visual effects on historic and cultural properties is presented in SEIS Sections 3.9.3.3 and 4.9.1.</p>					



## ATTACHMENT 1

### Reporting and Confidentiality

#### Document for public disclosure.

A brief report summarizing:

- Fieldwork completed
- Brief description of each property

Maps should show the areas where field survey was performed but should not show specific site locations.

#### Confidential Report.

Information in the confidential report will be withheld from public disclosure in accordance with Section 304 of the National Historic Preservation Act (see below).

This report should include the following information:

- Site locations (coordinates or plotted on maps).
- Assessment of each property's eligibility for listing in the NRHP. Tribes need not disclose specific information regarding the religious or cultural meaning attached to each property, but should provide a recommendation regarding each site's NRHP eligibility, that refers to one or more criteria for eligibility (Criteria A, B, C, or D), as appropriate.
- Recommendations for protective buffers around eligible sites, and possible mitigation measures.

This information will be reviewed by NRC to identify adverse effects to eligible properties and will not be shared with other consulting parties except to consider alternatives for site avoidance.

After completion of the evaluation process and determination of effect, NRC will provide the applicant only with location information for affected properties in order to protect, mitigate, or avoid them with recommendations provided by tribes.

The applicant will sign a confidentiality agreement limiting use of this information to appropriate company personnel involved in project design, operations, and land management.

**36 CFR Section 304**

*[16 U.S.C. 470w-3(a) — Confidentiality of the location of sensitive historic resources]*

(a) The head of a Federal agency or other public official receiving grant assistance pursuant to this Act, after consultation with the Secretary, shall withhold from disclosure to the public, information about the location, character, or ownership of a historic resource if the Secretary and the agency determine that disclosure may —

- (1) cause a significant invasion of privacy;
- (2) risk harm to the historic resources; or
- (3) impede the use of a traditional religious site by practitioners.

*[16 U.S.C. 470w-3(b) — Access Determination]*

(b) When the head of a Federal agency or other public official has determined that information should be withheld from the public pursuant to subsection (a) of this section, the Secretary, in consultation with such Federal agency head or official, shall determine who may have access to the information for the purpose of carrying out this Act.

*[16 U.S.C. 470w-3(c)—Consultation with the Advisory Council]*

(c) When the information in question has been developed in the course of an agency's compliance with section 106 or 110(f) of this Act, the Secretary shall consult with the Council in reaching determinations under subsections (a) and (b) of this section.

**ATTACHMENT 2**

F-4. List of Properties Recorded and Reviewed by the Tribal Cultural Survey (DDW = Deep Disposal Well Option; LA = Land Application Option)											
Tribal Survey Number	State Site Number	Tribal Features	National Register of Historic Places (NRHP)/Site Management Recommendations						Potential Direct Effect	U.S. Nuclear Regulatory Commission's NRHP Determination	Comments
			Archaeology Laboratory Augustana College (ALAC)	Northern Cheyenne	Northern Arapaho	Cheyenne and Arapaho Tribes	Crow Nation				
TS001, TS004, TS013	39FA0096	Hearth, earth paints	Not eligible	Eligible, Criterion A; Avoidance	Reported burial is considered a historic hearth (5/8/2013)				DDW LA	Unevaluated	Archaeologists recorded 39FA0096 as an occupation site with artifact scatter, nonfarm ruins; dump; and burial
TS002		Stone circle		Avoidance	Stone circle (5/8/2013)				No direct effect	Eligible, Criterion A	
TS003		Buffalo bones		Avoidance					DDW	Not eligible	Not a cultural site
TS005		Flake		Avoidance					DDW	Not eligible	Isolated find
TS006		Cairn		Eligible, Criterion A; Burial—avoidance (referenced in report as NC-1)	Eligible, Criteria A and C; avoidance with "no surface occupation" within 0.4 km [0.25 mi] surrounding the site; burial site, cairns, fasting pit or eagle trap (5/8/2013)	Eligible, Criterion D; avoidance with no less than 600 m [1,968 ft] protective buffer			No direct effect	Eligible Criterion A	Avoid as gravesite

F-4. List of Properties Recorded and Reviewed by the Tribal Cultural Survey (Cont'd) (DDW = Deep Disposal Well Option; LA = Land Application Option)											
Tribal Survey Number	State Site Number	Tribal Features	National Register of Historic Places (NRHP)/Site Management Recommendations						Potential Direct Effect	U.S. Nuclear Regulatory Commission's NRHP Determination	Comments
			Archaeology Laboratory Augustana College (ALAC)	Northern Cheyenne	Northern Arapaho	Cheyenne and Arapaho Tribes	Crow Nation				
TS007-011		Stone circle, alignment		Avoidance	Unusual alignment and tipi ring; stone circle/fasting site (5/8/2013)	Eligible, Criterion D; avoidance with no less than 300 m [984 ft] protective buffer		No direct effect	Eligible Criterion A	TS007-TS011 may be considered a single site	
TS012	39FA1890	Two Cairns	Unevaluated	Eligible, Criterion A; avoidance	Two cairns (5/8/2013)			No direct effect	Eligible, Criterion A	ALAC recorded 39FA1890 as artifact scatter and cairn	
TS014-017	39FA1922	Three stone circles, possible medicine wheel	Unevaluated	Eligible, Criteria A, D; avoidance	Eligible, Criteria A and C; Avoidance; possible medicine wheel with associated stone circles (4/30/2013)	Not Eligible, but avoid with no less than 300 m [984 ft] buffer	Place of Interest to Tribe; Medicine Wheel and Tipi Ring	No direct effect	Unevaluated	Located on BLM property; ALAC recorded 39FA1922 as artifact scatter and stone circle	
TS018, TS142-143	39FA1923	Two cairns	Unevaluated	Avoidance	Eligible, Criteria A and C; avoidance; cairn (4/30/2013)		Place of Interest to Tribe; Cairn	No Direct Effect	Unevaluated	Located on BLM property; archaeologists recorded 39FA1923 as artifact scatter; one cairn may be a modern monument	

F-4. List of Properties Recorded and Reviewed by the Tribal Cultural Survey (Cont'd) (DDW = Deep Disposal Well Option; LA = Land Application Option)											
Tribal Survey Number	State Site Number	Tribal Features	National Register of Historic Places (NRHP)/Site Management Recommendations						Potential Direct Effect	U.S. Nuclear Regulatory Commission's NRHP Determination	Comments
			Archaeology Laboratory Augustana College (ALAC)	Northern Cheyenne	Northern Arapaho	Cheyenne and Arapaho Tribes	Crow Nation				
TS019 TS035 TS130	39CU0271	Cairn; possible gravesite; earth paint	Eligible Criterion D		"Gravesite" (5/2/2013)				No direct effect	Eligible Criterion D	Archaeologists recorded 39CU0271 as occupation site with a hearth feature; avoid as possible gravesite
TS020	39CU3576	Tested cobble	Not eligible					LA	LA	Not eligible	Archaeologists recorded 39CU3576 as artifact scatter
TS021-022	39CU3574	Stone circle, scraper	Unevaluated		Stone circles (5/2/2013)			No direct effect	No direct effect	Not eligible	Archaeologists recorded 39CU3574 as artifact scatter with hearth feature
TS023		Burial			Identified as possible gravesite (5/2/2013)			No direct effect	No direct effect	Not eligible	Avoid as possible gravesite
TS024		Stone circle						No direct effect	No direct effect	Not evaluated; outside APE	Outside license boundary
TS025-027, TS-029	39CU3584	Cairn alignment, stone circle	Not eligible		Stone circles and alignment of cairns (5/1/2013 and 5/9/2013)			LA	LA	Unevaluated	Archaeologists recorded 39CU3584 as artifact scatter and cairn feature
TS028		Three stone circles; campsite; ceremonial site			Three tipi rings; southeast of 39CU3584 (5/1/2013)		Recommend recording location as a point of interest to tribes.	LA	LA	Not eligible	
TS030		Stone circle						LA	LA	Not eligible	

F-4. List of Properties Recorded and Reviewed by the Tribal Cultural Survey (Cont'd) (DDW = Deep Disposal Well Option; LA = Land Application Option)											
Tribal Survey Number	State Site Number	Tribal Features	National Register of Historic Places (NRHP)/Site Management Recommendations						Potential Direct Effect	U.S. Nuclear Regulatory Commission's NRHP Determination	Comments
			Archaeology Laboratory Augustana College (ALAC)	Northern Cheyenne	Northern Arapaho	Cheyenne and Arapaho Tribes	Crow Nation				
TS031-033, TS141	39CU3567	Three stone circles, scattered hearth	Not eligible	Eligible, Criterion A; avoidance	stone circles, disturbed stone circles, scattered hearth (5/2/2013)	Eligible, Criterion D; avoidance with no less than 300 m [984 ft] protective buffer		LA	Eligible Criterion A	Archaeologists recorded 39CU3567 as artifact scatter and stone circle feature	
TS034	39CU3572	Stone circles; possible medicine wheel	Not eligible		Several stone rings or possible medicine wheels (5/2/2013)			DDW LA	Not eligible	Archaeologists recorded 39CU3572 as artifact scatter and stone circle feature	
TS036		Small cairn or marker						No direct effect	Not eligible		
TS037		Small cairn						No direct effect	Not eligible		
TS040		Ceremonial site			Stone circles and cairns on ridge (5/2/2013)			No Direct Effect	Eligible, Criterion A		
TS041-042		Ceremonial site			Stone circles and cairns on ridge (5/2/2013)			No direct effect	Eligible, Criterion A		

F-4. List of Properties Recorded and Reviewed by the Tribal Cultural Survey (Cont'd) (DDW = Deep Disposal Well Option; LA = Land Application Option)											
Tribal Survey Number	State Site Number	Tribal Features	National Register of Historic Places (NRHP)/Site Management Recommendations						Potential Direct Effect	U.S. Nuclear Regulatory Commission's NRHP Determination	Comments
			Archaeology Laboratory Augustana College (ALAC)	Northern Cheyenne	Northern Arapaho	Cheyenne and Arapaho Tribes	Crow Nation				
TS043-046, TS053, TS132-140	39CU0584	Possible medicine wheel, four directions marker, burial, fasting site, cairns, stone circle, hearth	Eligible	Eligible, Criterion A; avoidance	Eligible, Criteria A and C; avoidance with "no surface occupation" area of 137 m [450 ft] surrounding the site; possible medicine wheel, burial, fasting site, cairns, stone circle, hearth, (5/3/2013 and 5/9/2013)				No direct effect	Eligible, Criterion A	Archaeologists recorded 39CU0584 as an occupation site with burial feature; avoid as gravesite
TS047		Ceremonial site			Eligible, Criteria A and C; Avoidance with "no surface occupation" area of 0.4 km [0.25 mi] surrounding this site; referenced as "ceremonial site on hill in Section 21" (5/2/2013);				No direct effect	Eligible, Criterion A	
TS048		Burial							No direct effect	Not eligible	Avoid as possible burial location
TS049		Burial							No direct effect	Not eligible	Avoid as possible burial location

F-4. List of Properties Recorded and Reviewed by the Tribal Cultural Survey (Cont'd) (DDW = Deep Disposal Well Option; LA = Land Application Option)										
Tribal Survey Number	State Site Number	Tribal Features	National Register of Historic Places (NRHP)/Site Management Recommendations					Potential Direct Effect	U.S. Nuclear Regulatory Commission's NRHP Determination	Comments
			Archaeology Laboratory Augustana College (ALAC)	Northern Cheyenne	Northern Arapaho	Cheyenne and Arapaho Tribes	Crow Nation			
TS050		Burial						Not eligible	Avoid as possible burial location	
TS051		Fasting site						Not eligible		
TS052		Stone circle						Not eligible		
TS054	39CU3596	Disturbed	Not eligible					Not eligible	Archaeologists recorded 39CU3596 as an artifact scatter	
TS055	39CU3593	Cairn	Not eligible		cairn (5/4/13)		DDW LA	Not eligible	Archaeologists recorded 39CU3593 as an artifact scatter	
TS056-060	39FA1962	Cairn, stone circles	Not eligible		Cairn and disturbed stone circles (5/7/2013); cairn may be a historic marker (5/4/2013)		No direct effect	Not eligible	Archaeologists recorded 39FA1962 as an artifact scatter with a stone circle and cairn	
TS061		Stone circle					No direct effect	Not evaluated; outside APE	Located just outside license boundary	
TS062		Effigy					No direct effect	Not evaluated; outside APE	Located 600 m [1,968 ft] outside license boundary	
TS063		No identification					No direct effect	Not eligible		
TS064		Stone circle					No direct effect	Not eligible		



F-4. List of Properties Recorded and Reviewed by the Tribal Cultural Survey (Cont'd) (DDW = Deep Disposal Well Option; LA = Land Application Option)											
Tribal Survey Number	State Site Number	Tribal Features	National Register of Historic Places (NRHP)/Site Management Recommendations						Potential Direct Effect	U.S. Nuclear Regulatory Commission's NRHP Determination	Comments
			Archaeology Laboratory Augustana College (ALAC)	Northern Cheyenne	Northern Arapaho	Cheyenne and Arapaho Tribes	Crow Nation				
TS065		Fasting site			Small cairn (5/5/2013)				Not eligible		
TS066		Cairn						No direct effect	Not eligible		
TS067, TS068-074, TS067-078	39FA1926	Six stone circles	Unevaluated	Eligible, Criteria A, D; avoidance	Eligible, Criteria A and C; avoidance; tipi rings on or near 39FA1926 (5/5/2013)			No direct effect	Eligible Criterion A	Archaeologists recorded 39CU1926 as an artifact scatter	
TS075		Cairn						No direct effect	Not evaluated; outside APE	Located 60 m [196 ft] outside license boundary	
TS079		Stone circle						No direct effect	Not evaluated; outside APE	Locate 230 m [754 ft] outside license boundary	
TS080-089, TS098		Alignment and Arc; ceremonial site; pipe ceremony location			Eligible, Criteria A and C; avoidance with "no surface occupation" within 137 m [450 ft] surrounding the site; ceremonial Site: alignment and Arc (5/6/2013 and 5/9/2013)		Place of Interest to Tribe; pipe ceremony location	DDW LA	Eligible Criterion A		
TS090		Cairn						No direct effect	Not eligible	Located outside but near 39CU3622	

F-4. List of Properties Recorded and Reviewed by the Tribal Cultural Survey (Cont'd) (DDW = Deep Disposal Well Option; LA = Land Application Option)											
Tribal Survey Number	State Site Number	Tribal Features	National Register of Historic Places (NRHP)/Site Management Recommendations						Potential Direct Effect	U.S. Nuclear Regulatory Commission's NRHP Determination	Comments
			Archaeology Laboratory Augustana College (ALAC)	Northern Cheyenne	Northern Arapaho	Cheyenne and Arapaho Tribes	Crow Nation				
TS091		Ceremonial site							No direct effect	Not eligible	Located outside but near 39CU3621
TS092		Cairn							No direct effect	Not eligible	
TS093		Possible cairn							DDW LA	Not eligible	
TS094		Cairn							DDW LA	Not eligible	
TS095		Disturbed cairn (modern survey marker)							DDW LA	Not eligible	
TS096	39CU0251	Stone Circle	Not eligible						DDW LA	Not eligible	Archaeologists recorded 39CU0251 as an artifact scatter with a hearth feature
TS097		Cairn							No direct effect	Not eligible	
TS099-105	39FA1964	Two hearths, alignment, four fasting/prayer circles	Unevaluated		stone circles (5/7/13)				No direct effect	Not eligible	Archaeologists recorded 39FA1964 as an artifact scatter with hearth and cairn features
TS106		Fasting circle		Avoidance	Eligible, Criteria A and C; avoidance				No direct effect	Eligible Criterion A	Located on USFS property 40 m [131 ft] outside license boundary; possibly associated with 39CU3620

F-4. List of Properties Recorded and Reviewed by the Tribal Cultural Survey (Cont'd) (DDW = Deep Disposal Well Option; LA = Land Application Option)											
Tribal Survey Number	State Site Number	Tribal Features	National Register of Historic Places (NRHP)/Site Management Recommendations						Potential Direct Effect	U.S. Nuclear Regulatory Commission's NRHP Determination	Comments
			Archaeology Laboratory Augustana College (ALAC)	Northern Cheyenne	Northern Arapaho	Cheyenne and Arapaho Tribes	Crow Nation				
TS107		Possible gravesite and fasting circle		Avoidance	Eligible, Criteria A and C; avoidance				Eligible Criterion A	Located on USFS property 60 m [196 ft] outside license boundary; avoid as possible gravesite; possibly associated with 39CU3620.	
TS108-111	39CU0459	Cairn; stone circle; fasting/prayer circles	Unevaluated	Avoidance	Eligible, Criteria A and C; and fasting/prayer circles with offerings (5/7/2013)				Eligible Criterion A	Archaeologists recorded 39CU0459 as an artifact scatter with a hearth feature; the boundary for 39CU0459 also includes two smaller artifact scatters: 39CU0461 and 39CU0528	
TS112-113	39FA1862	Stone circles	Unevaluated	Eligible, Criterion A; avoidance					Eligible Criterion A	Archaeologists recorded 39FA1862 as an artifact scatter with a cairn and stone circle; located outside license boundary	
TS114-115	39CU3600	Two fasting/prayer circles	Unevaluated	Avoidance	Eligible, Criteria A and C; avoidance; fasting/prayer circles (5/7/2013)				Eligible Criterion A	Archaeologists recorded 39CU3600 as an artifact scatter with a stone alignment	

F-4. List of Properties Recorded and Reviewed by the Tribal Cultural Survey (Cont'd) (DDW = Deep Disposal Well Option; LA = Land Application Option)											
Tribal Survey Number	State Site Number	Tribal Features	National Register of Historic Places (NRHP)/Site Management Recommendations						Potential Direct Effect	U.S. Nuclear Regulatory Commission's NRHP Determination	Comments
			Archaeology Laboratory Augustana College (ALAC)	Northern Cheyenne	Northern Arapaho	Cheyenne and Arapaho Tribes	Crow Nation				
TS116-117	39CU3607	Chert core and flake	Not Eligible	Avoidance					Eligible, Criterion A	Archaeologists recorded 39CU3607 as an artifact scatter with a hearth feature	
TS118		Hearth		Avoidance					Eligible, Criterion A		
TS119	39CU3602	Scattered hearth	Unevaluated	Avoidance					Eligible, Criterion A	Archaeologists recorded 39CU3602 as an artifact scatter with a hearth feature.	
TS120		Hearth		Avoidance					Eligible, Criterion A		
TS121-122	39CU3604	Fasting/prayer circles	Unevaluated	Avoidance	Eligible, Criteria A and C; avoidance; fasting/prayer circles (5/7/2013)				Eligible Criterion A	Archaeologists recorded 39CU3604 as an artifact scatter with hearth and stone circle features.	
TS123-124	39FA1952	Scattered hearth, flake	Unevaluated	Avoidance					Eligible, Criterion A	Archaeologists recorded 39FA1952 as an artifact scatter with a hearth feature.	
TS125		Burial							Not evaluated; outside APE	Located on BLM property 60 m [196 ft] outside license boundary	
TS126		Staff							Not evaluated; outside APE	Located on BLM property 180 m [590 ft] outside license boundary	

F-4. List of Properties Recorded and Reviewed by the Tribal Cultural Survey (Cont'd) (DDW = Deep Disposal Well Option; LA = Land Application Option)										
Tribal Survey Number	State Site Number	Tribal Features	National Register of Historic Places (NRHP)/Site Management Recommendations					Potential Direct Effect	U.S. Nuclear Regulatory Commission's NRHP Determination	Comments
			Archaeology Laboratory Augustana College (ALAC)	Northern Cheyenne	Northern Arapaho	Cheyenne and Arapaho Tribes	Crow Nation			
TS127		Fasting site						No direct effect	Not evaluated outside APE	Located on BLM property 200 m [656 ft] outside license boundary
TS128		Fasting site						No direct effect	Not evaluated outside APE	Located on BLM property 200 m [656 ft] outside license boundary
TS129		Fasting site/ring						No direct effect	Not evaluated outside APE	Located on BLM property 290 m [951 ft] outside license boundary
TS131		Possible grave			2 possible gravesites (5/2/13)			No direct effect	Not eligible	Avoid as possible gravesite
TS144		Cairn						DDW LA	Not eligible	
	39FA1902	Artifact scatter; well/cistern; burial, road	Unevaluated	Historic Grave; No Interest to Tribe	Historic gravesite; not significant to Tribe			LA	Unevaluated	
	39FA1881	cairn	Unevaluated	Eligible, Criteria A, D, avoid by 30.5 m [100 ft]			Place of Interest to Tribe; Cairn	No direct effect	Eligible, Criterion A	
	39FA1927	Six cairns	Unevaluated	Eligible, Criterion A; avoidance	Not Eligible; possible sheepherder markers	Eligible Criterion D; avoid with no less than 300 m [984 ft] protective buffer	Place of Interest to Tribe; Buffalo Jump alley way	No direct effect	Eligible, Criterion A	

F-4. List of Properties Recorded and Reviewed by the Tribal Cultural Survey (Cont'd) (DDW = Deep Disposal Well Option; LA = Land Application Option)										
Tribal Survey Number	State Site Number	Tribal Features	National Register of Historic Places (NRHP)/Site Management Recommendations					Potential Direct Effect	U.S. Nuclear Regulatory Commission's NRHP Determination	Comments
			Archaeology Laboratory Augustana College (ALAC)	Northern Cheyenne	Northern Arapaho	Cheyenne and Arapaho Tribes	Crow Nation			
	39CU3620	Cairn, Prayer/ fasting circle	Unevaluated		Eligible Criteria A and C; cairn and prayer/fasting circle (5/7/2013)			No direct effect	Eligible Criterion A	Partly located on USFS property; archaeologists recorded Site 39CU3620 as an artifact scatter with hearth; possibly associated with TS106 and TS107
TS145		Prayer/ offering location				Eligible Criterion D; avoid with 300 m [984 ft] protective buffer (4/30/2013)		DDW LA	Unevaluated	Site location was not recorded by GPS but is known to be within a 32.4-ha [80-ac] parcel; would require relocation for avoidance

Explanatory Note: A total of 144 cultural features or site numbers were recorded using GPS equipment over the course of the survey work. These are TS001 through TS144. Two site numbers (TS038 and TS039) represent test readings and do not correspond with any cultural features. Eighty-one (81) recorded sites correspond to features within the boundaries of 24 previously recorded archaeological sites. The remaining 61 sites correspond to 47 newly discovered cultural features. Duplicate readings were recorded for one newly discovered site (TS041 and TS042). Five (5) associated tribal features (TS007-TS011) make up another tribal site. Eleven (11) GPS readings were taken to record the location of individual stones that make up a single stone feature (TS080-TS089 and TS098). The remaining 44 GPS readings correspond to 44 individual cultural features. TS145 was added when the Cheyenne and Arapaho Tribes identified the location of an additional site not recorded by GPS.

**BIBLIOGRAPHIC DATA SHEET**

(See instructions on the reverse)

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Division of Waste Management and Environmental Protection  
Office of Federal and State Materials and Environmental Management Programs  
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Washington, DC 20555-0001

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Same as above

10. SUPPLEMENTARY NOTES

11. ABSTRACT (200 words or less)

By letter dated August 10, 2009, Powertech (USA), Inc. (Powertech, the applicant) submitted a source material license application to the U.S. Nuclear Regulatory Commission (NRC) for the Dewey-Burdock in-situ recovery (ISR) Project. Powertech is proposing to construct, operate, conduct aquifer restoration, and decommission an ISR facility at the Dewey-Burdock ISR Project site, located in Fall River and Custer Counties, South Dakota. The NRC staff evaluated site-specific data and information to assess whether the applicant-proposed activities were consistent with activities considered in NUREG-1910, "Generic Environmental Impact Statement for In-Situ Leach Uranium Milling Facilities" (GEIS) and determined which GEIS data and analyses could be incorporated by reference and what resource areas required site-specific review. The final SEIS describes the environment potentially affected by the proposed site activities, describes the potential environmental impacts, and describes Powertech's environmental monitoring program and proposed mitigation measures. The NRC staff has reviewed and considered comments received on the draft SEIS when developing the final SEIS. Comments received on the draft SEIS and associated responses can be found in Appendix E.

12. KEY WORDS/DESCRIPTORS (List words or phrases that will assist researchers in locating the report.)

Uranium Recovery  
In-Situ Recovery Process  
Uranium  
Environmental Impact Statement  
Supplemental Environmental Impact Statement  
Powertech Inc. (USA)  
Dewey-Burdock Project

13. AVAILABILITY STATEMENT

unlimited

14. SECURITY CLASSIFICATION

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15. NUMBER OF PAGES

16. PRICE



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**Environmental Impact Statement for the Dewey-Burdock Project in  
Custer and Fall River Counties, South Dakota**

**January 2014**