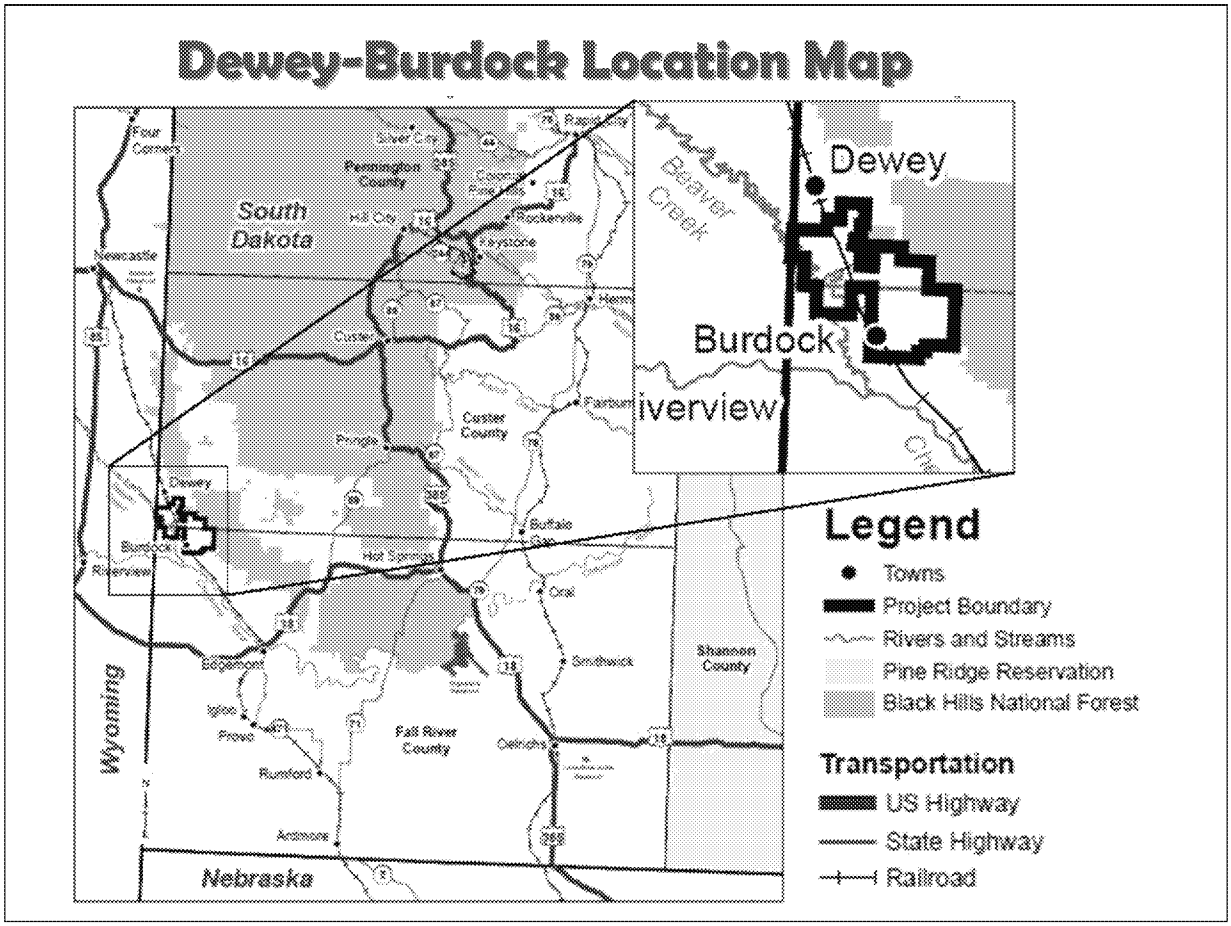
U.S. Environmental Protection Agency
Underground Injection Control Program

EPA Session:
Information on the Dewey-Burdock Uranium Site near Edgemont, South Dakota

Prepared for: The Standing Rock Sioux Tribe

May 5, 2016



The Dewey Burdock site is located in the SW corner of Custer County and the NW corner of Fall River County on the Wyoming/South Dakota border. In the southern Black Hills. About 45 miles west of the Pine Ridge Reservation. Very close to Cheyenne River which is a concern for Oglala Sioux and Cheyenne River Sioux Tribes since the Cheyenne River borders their reservations.

EPA Dewey-Burdock Permit Process

- EPA's Role
  - Underground Injection Control (UIC) Program & Regulatory Mission
  - UIC Permits
- UIC Permitting Process
  - Technical Analysis
  - Tribal Consultation
  - Draft Permits
  - Public Participation Process
- EPA Outreach
  - Public Hearings in SD
  - Additional Tribal Community Outreach
  - Continuing Tribal Consultation

EPA Dewey-Burdock Permit Process: Tribal Consultation

EPA's Policy is to consult on a government-to-government basis with federally recognized tribal governments when EPA actions and decisions may affect tribal interests.

The EPA views Consultation as a process of meaningful communication and coordination between EPA and tribal officials prior to EPA taking actions or implementing decisions that may affect tribes.

Current EPA Tribal Consultation Actions to Date and Plan for next steps:

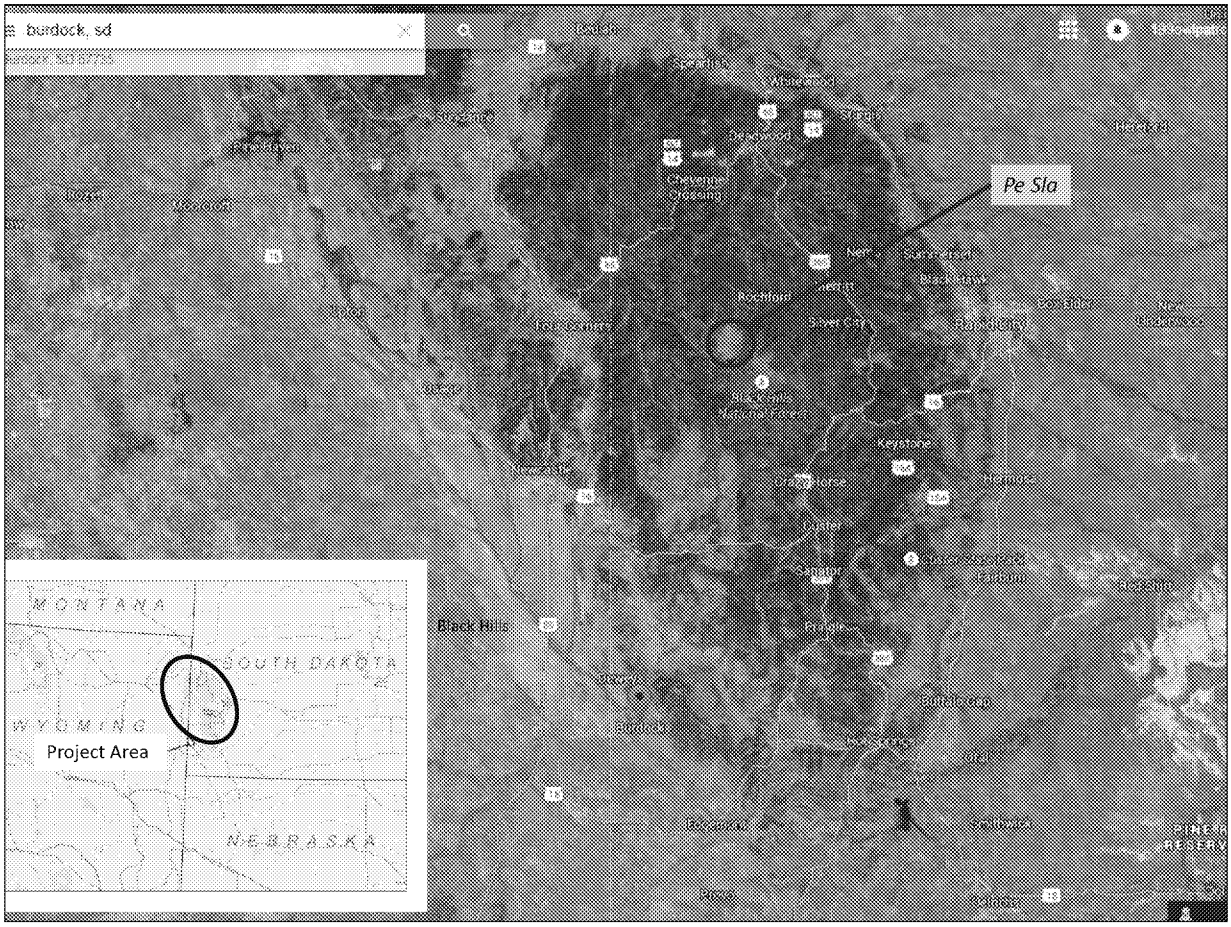
- Informational meetings with all Tribes with possible interest in site.
- "Inform & Educate" sessions to provide background information and opportunity for questions and discussion.
- Letters mailed November 25, 2015 providing notification of opportunity for formal consultation with EPA
- Receive back from Tribes notification of interest in formal government to government consultation with the EPA about the site.
- Formal Consultation opportunities before issuance of any draft permit decisions.
- Continuing consultation throughout the permitting process.

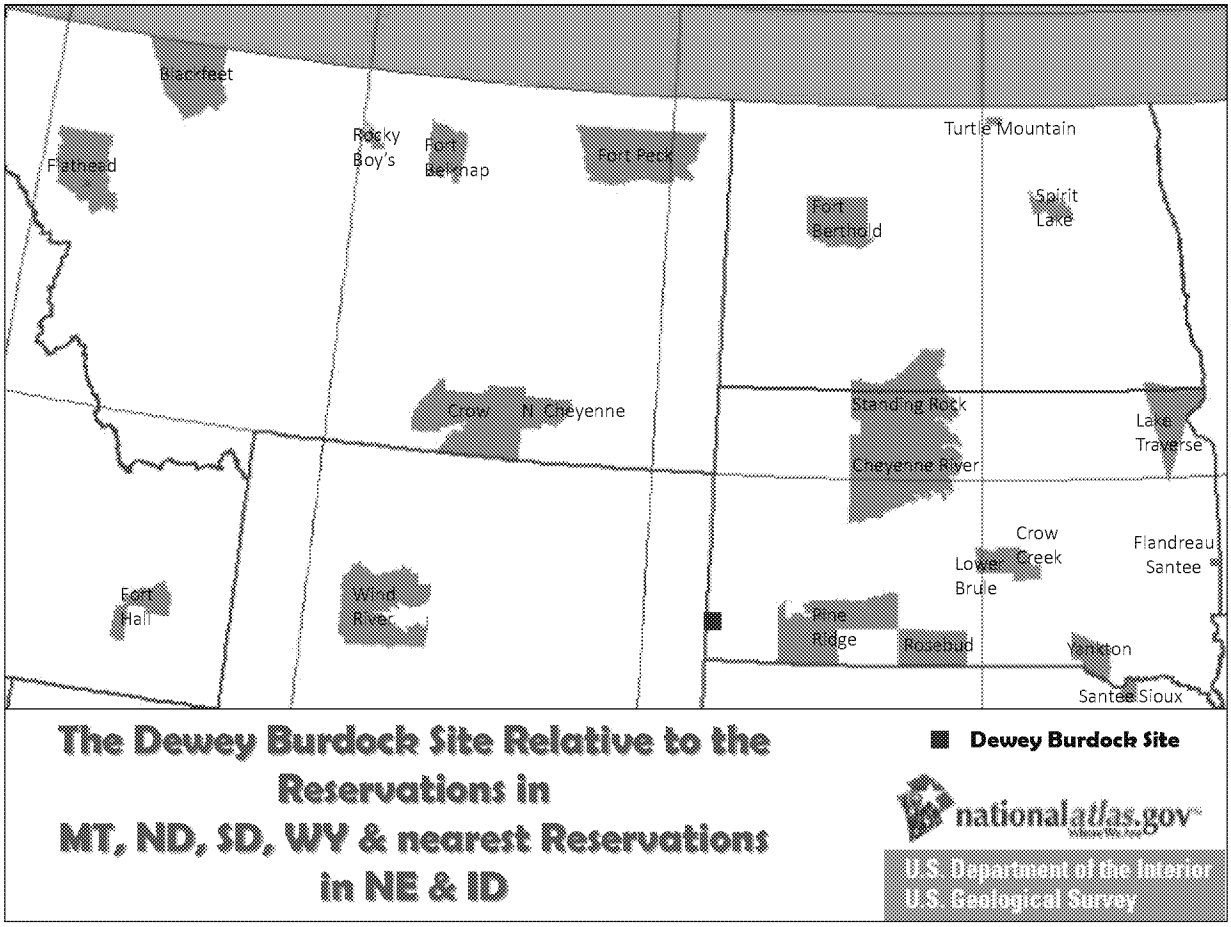
September 10, 2015, Bismarck meeting included THPOs from SD, ND and MT
Oklahoma Tribes include 1) Ponca, 2) Kiowa, 3) Apache, 4) Cheyenne & Arapaho.

Opportunities for Tribal Participation

Informal and Formal Government-to-Government Consultation

- Informal Opportunities:
  - Conference Calls or Web Conferences upon request
- Formal Opportunities:
  - Tribe may request formal consultation at any time.
- Participate in reviewing proposed permit and aquifer exemption decisions.
- Attend Public Hearings.
- Request additional informational web conferences.
- Request EPA to engage in community outreach.

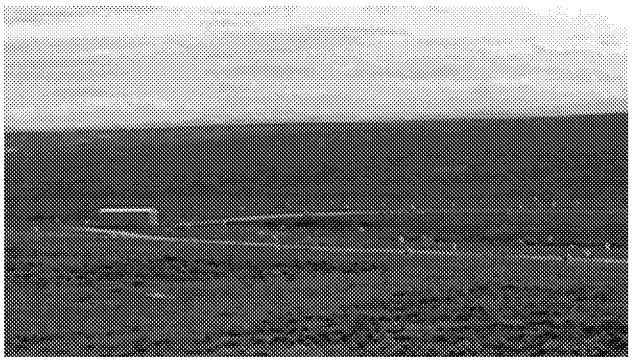

burdock, sd
Pe Sla
Black Hills
MONTANA
SOUTH DAKOTA
WYOMING
NEBRASKA
Project Area



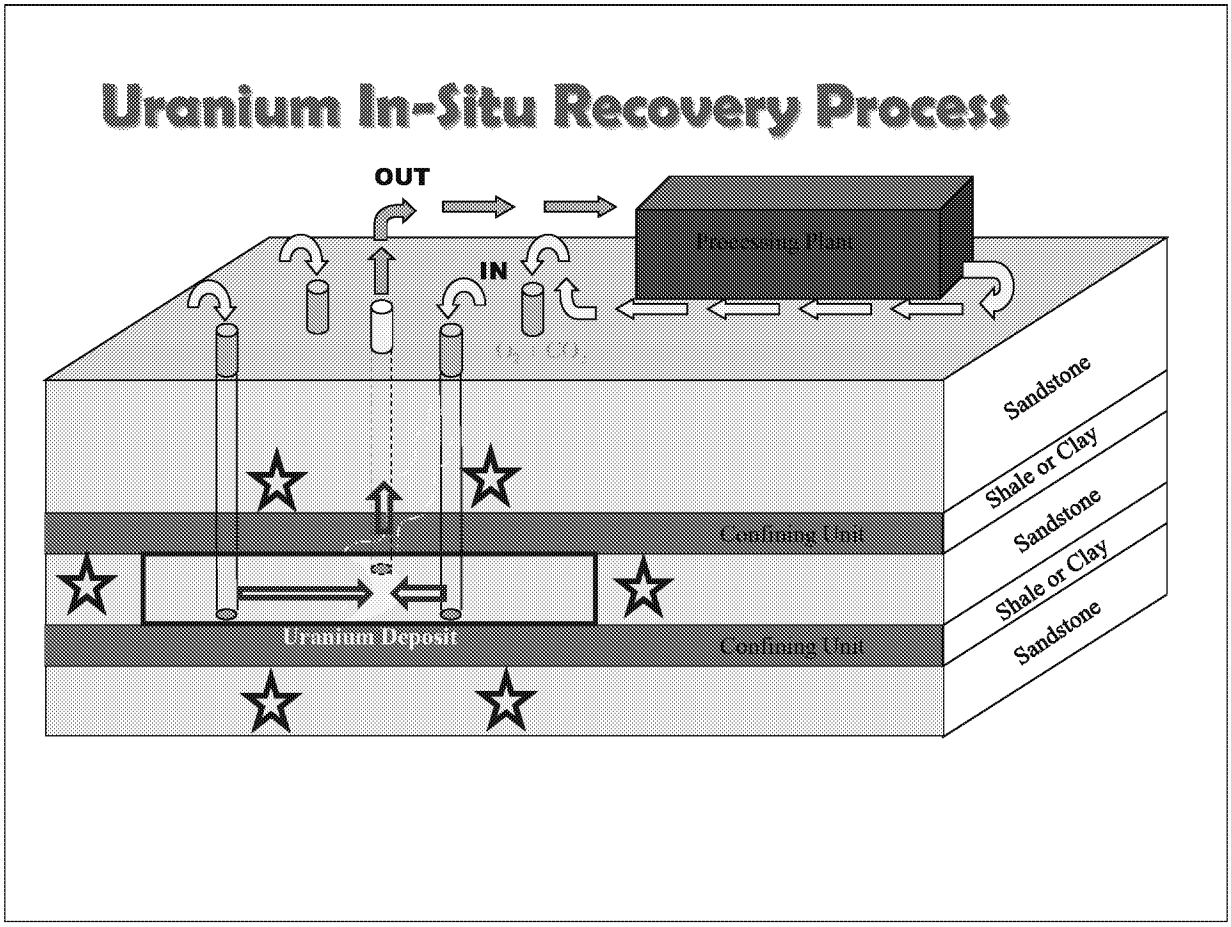
The Dewey Burdock site relative to the Reservations in MT, ND, SD, WY & nearest reservations in NE & ID

Dewey-Burdock Uranium In-Situ Recovery Site

- The Dewey-Burdock site will recover uranium using injection wells.
- There will be no open pits, underground mine workings or tailings piles.
- The uranium will be extracted from the ore deposit using an injected lixiviant.
- The uranium-bearing solution will be pumped to the surface using extraction wells.



Example of an In-Situ Uranium Recovery Site in WY



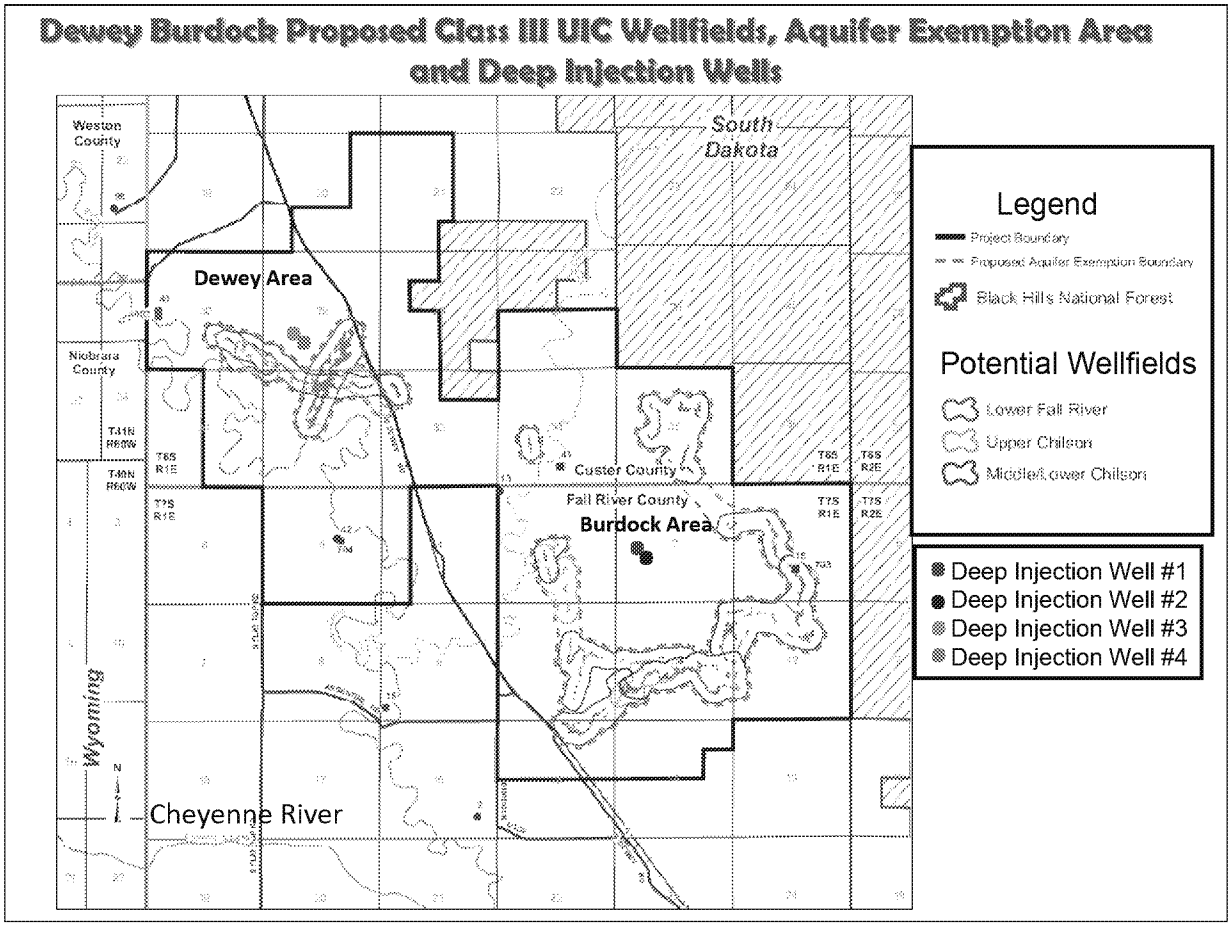
Typical five-spot pattern. In three dimensions, the wells follow the uranium deposit. Could be at different depths.
Blue box represents aquifer exemption boundary – this boundary outlines an aquifer that currently does not meet U.S. drinking water standards.
Goal with restoration process after mining is to get this zone back to baseline water quality.
Stars represent monitoring wells where we do not want to see any change in water quality.

Other Regulatory Agencies at the Dewey-Burdock Site

- The Nuclear Regulatory Commission issued a License for the entire site.
- The South Dakota Department of Environment and Natural Resources has proposed issuance of a Large Mine Permit for the entire site.
- The BLM approved a Plan of Operations for portions of the site on BLM land.
- The South Dakota Department of Environment and Natural Resources has proposed issuance of a groundwater discharge permit for the land application of treated ISR waste fluids.

The EPA Region 8 UIC Program Has Received Permit Applications for Two Types of Injection Wells

1. A Class III Permit Application for the injection of lixiviant to mobilize uranium in the ore bodies.
2. A Class V Permit Application for the disposal of treated ISR waste fluids into deep wells.



Point out
SD WY Border
Custer and Fall River Counties
Dewey Area & Burdock Area
4 proposed wellfields in Dewey Area & 10 proposed wellfields in the Burdock Area.

Regulatory Authority of the Underground Injection Control Program at the Dewey Burdock Site

The UIC Program is authorized under the Safe Drinking Water Act to protect *Underground Sources of Drinking Water* from contamination resulting from injection activities.

Underground source of drinking water (USDW) means an aquifer or part of an aquifer which supplies drinking water or contains fewer than 10,000 mg/l total dissolved solids.

Regulatory Authority of the Underground Injection Control Program at the Dewey Burdock Site

UIC Program regulations specify the following requirements for injection wells:

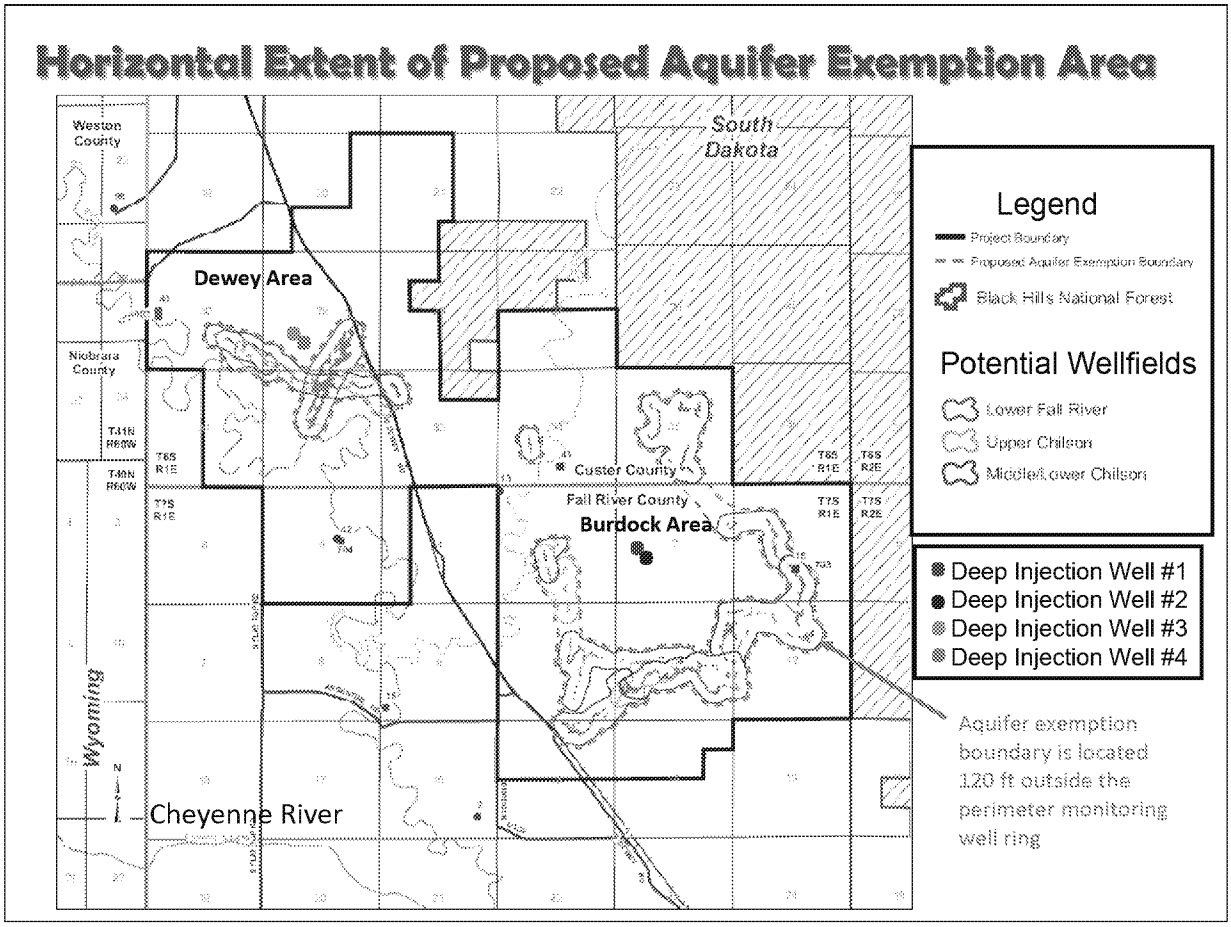
- construction,
- operation,
- monitoring,
- closure,
- financial assurance.

The EPA has been requested to Review an Aquifer Exemption

An Aquifer Exemption is required to inject into the Class III wells for uranium recovery.

An Aquifer Exemption is allowed under UIC regulations IF the USDW

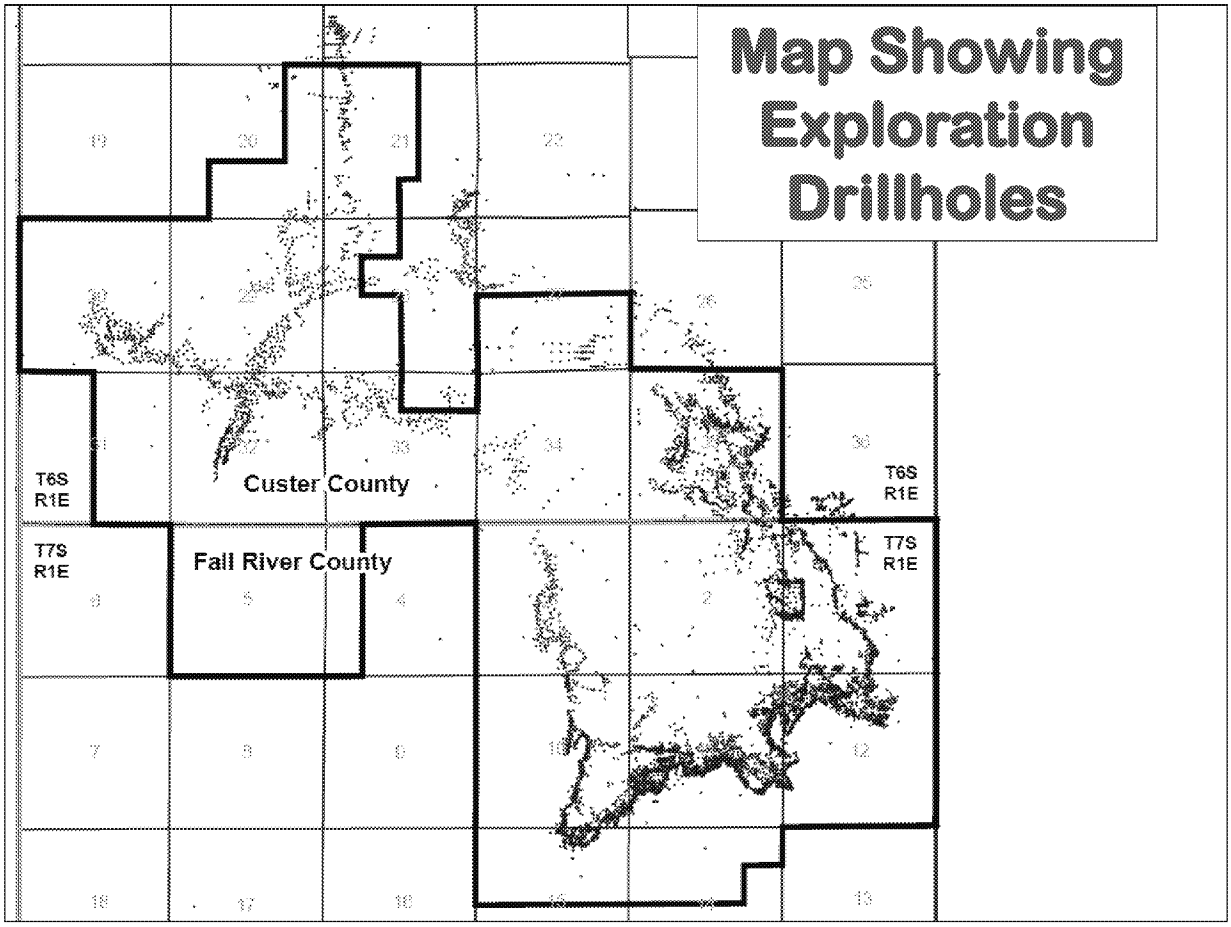
1. Does not currently serve as a source of drinking water and
2. Is mineral producing or can be demonstrated to contain commercially producible minerals.



AE Boundary 120 feet outside of wellfield monitoring ring.
Point out:
SD WY Border
Custer and Fall River Counties
Dewey Area & Burdock Area
4 proposed wellfields in Dewey Area & 10 proposed wellfields in the Burdock Area.

UIC Regulations

- UIC regulations require the permittee to conduct considerable testing to provide EPA hydrogeological and other data before any injection wells are authorized to operate.
- The data must demonstrate vertical confinement to prevent movement of fluids out of the injection zone so that no USDWs are contaminated.
- The data must also demonstrate that it is possible to contain injection zone fluids horizontally to prevent contaminant migration into USDWs.



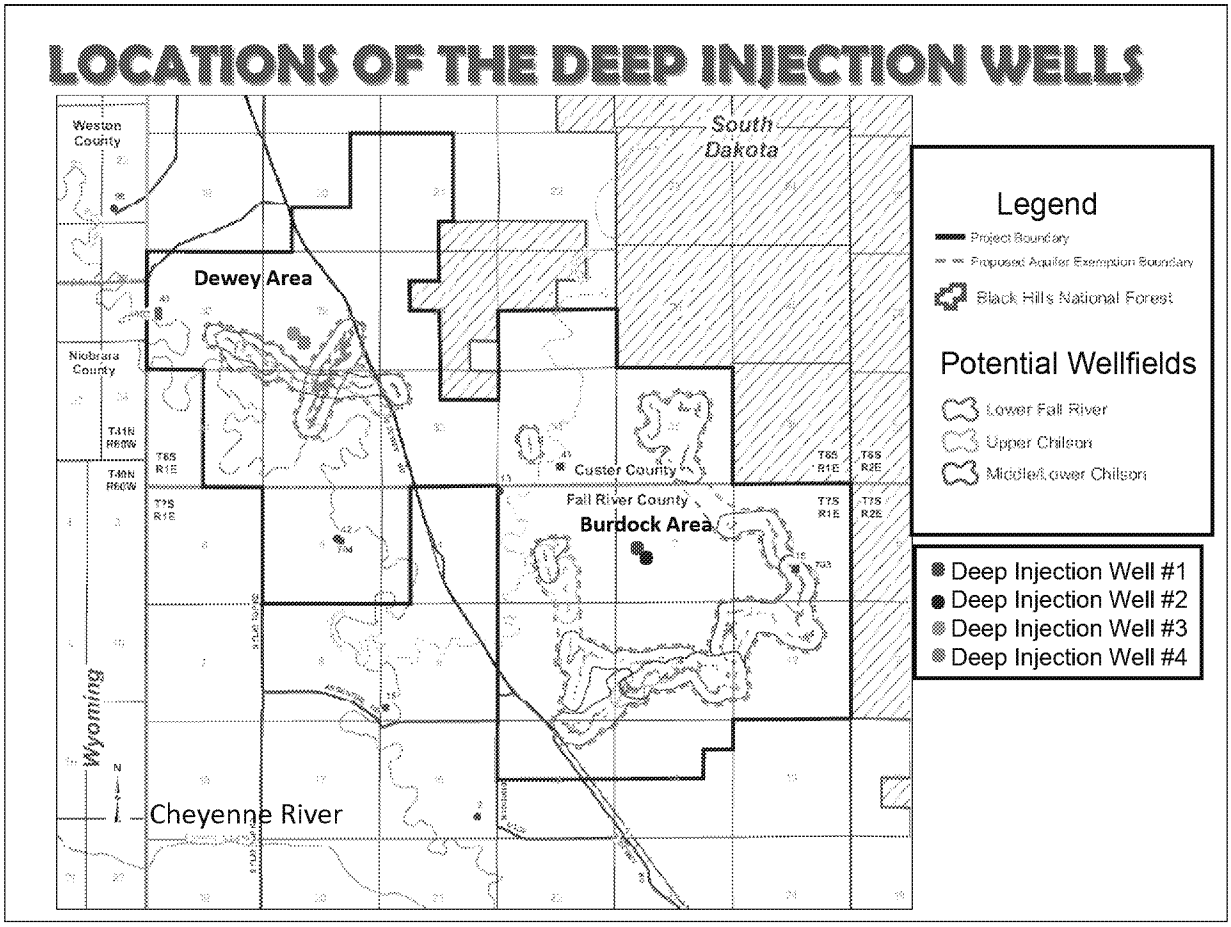
5932 drillholes 109 Powertech drilled

UIC Regulations

- UIC regulations require protection of USDWs around the AE area through extensive monitoring.
- UIC regulations require that no ISR process contaminants cross the aquifer exemption boundary during or after ISR operations.

UIC Regulations

- UIC regulations authorize enforcement action when UIC regulations and/or permit conditions are violated.
- Enforcement actions can include requirements for groundwater remediation activities if appropriate.



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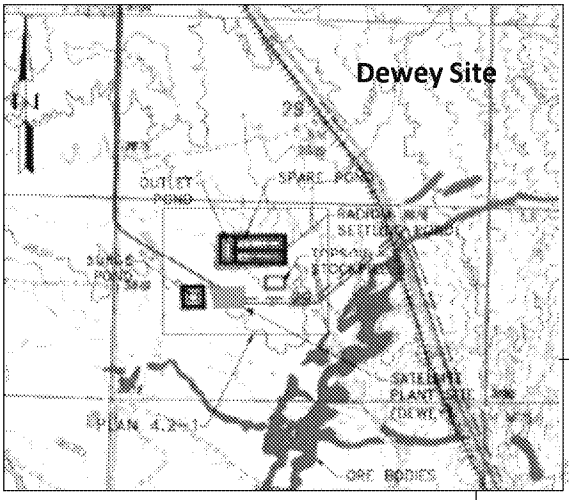
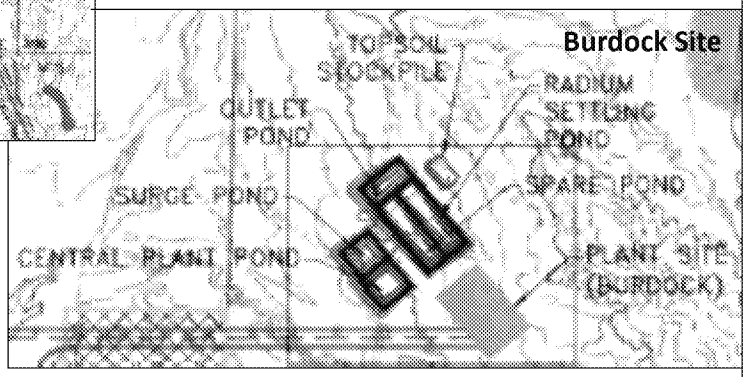
Treatment and Storage Ponds for Deep Well Injectate



Waste fluids from the uranium recovery process will the treated in the radium settling ponds. After radium removal, the treated water will be stored in the outlet ponds and surge ponds. There will also be a spare radium treatment pond for backup. After treatment, the water will flow to the deep injection wells.



The Burdock Area central plant pond will store brine from the reverse osmosis treatment process used during groundwater restoration before the brine is treated in the radium settling ponds.

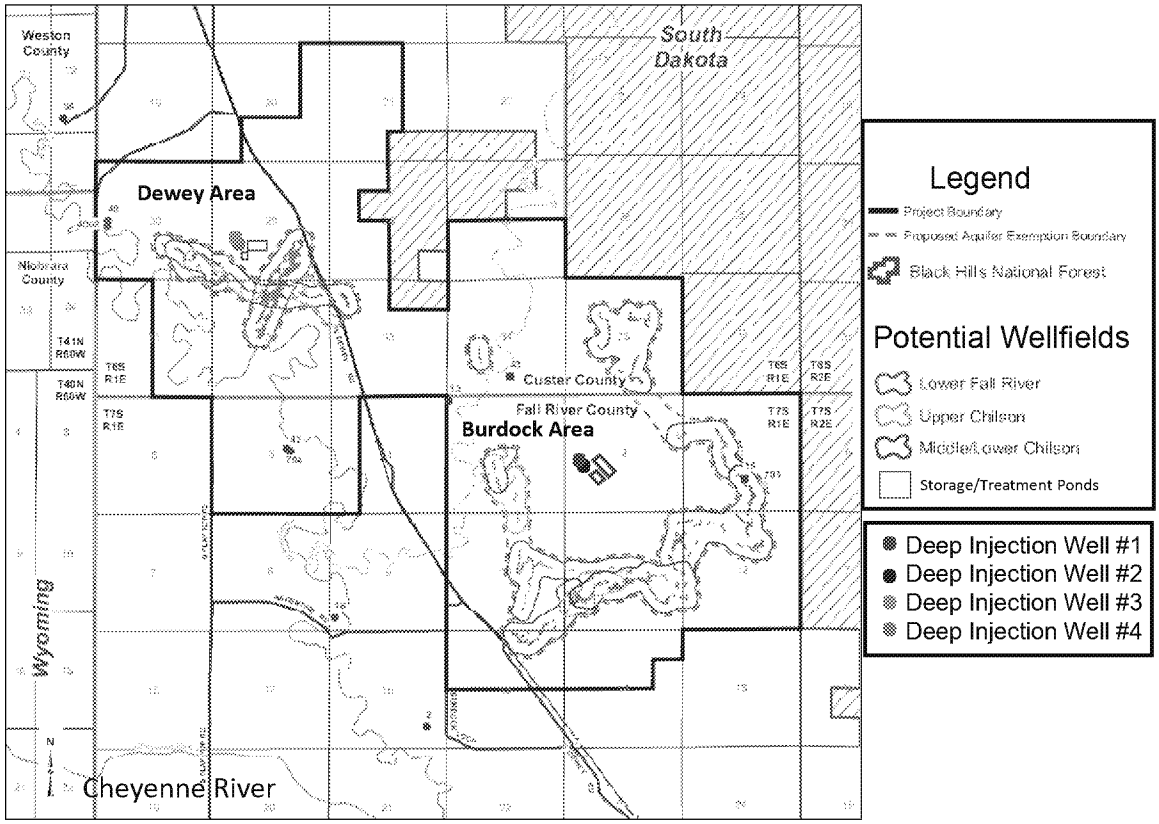


Figure 4. Map showing proposed locations for the ponds, the four currently proposed deep injection wells and the Class III wellfields.

Point out
SD WY Border
Custer and Fall River Counties
Dewey Area & Burdock Area
4 proposed wellfields in Dewey Area & 10 proposed wellfields in the Burdock Area.

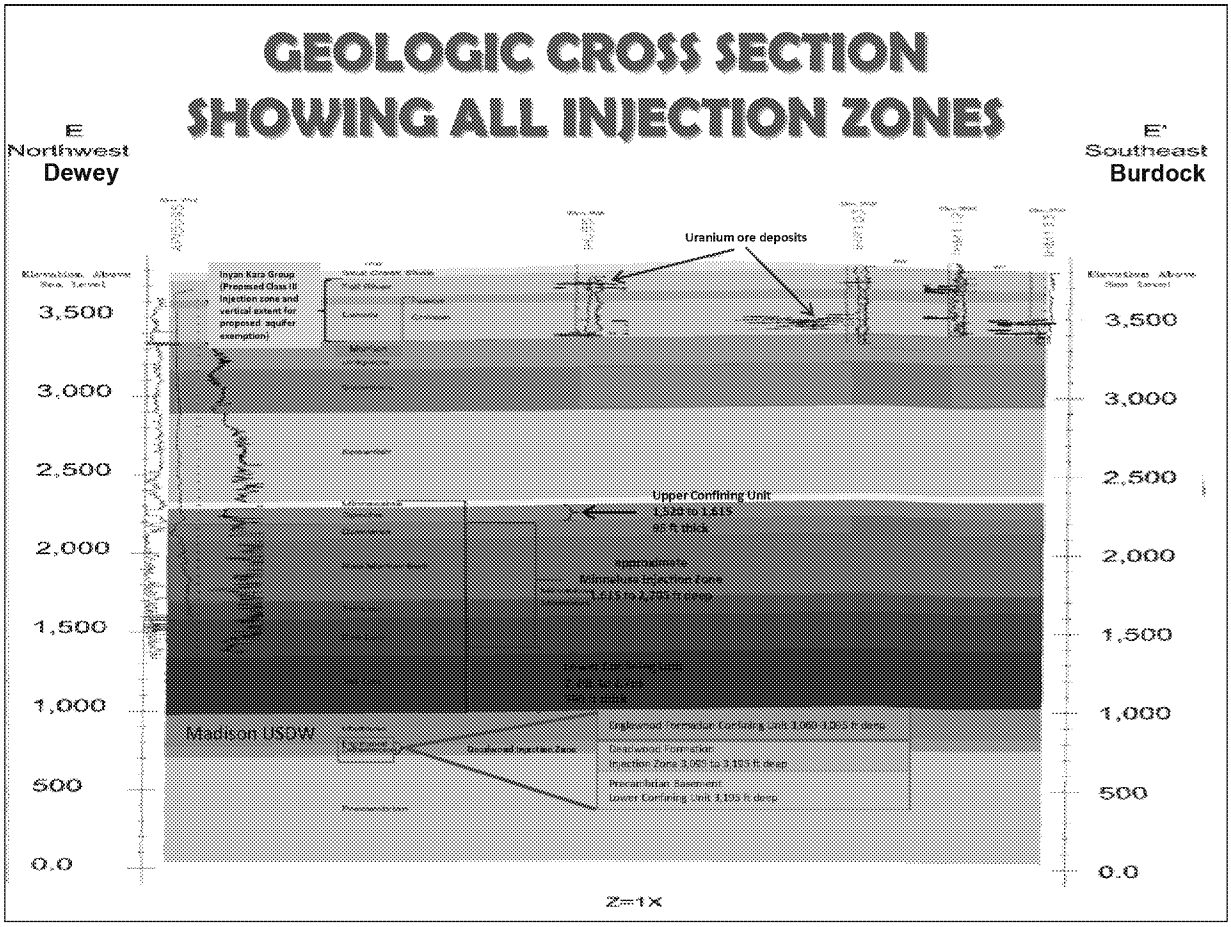


Figure 4. Stratigraphic Column at the Dewey Burdock Site Showing Proposed Injection Zones.
Enclosure to invitation letter

UIC Permitting Process

- After issuance of any draft permit and aquifer exemption decisions, there will be a 60 day public review and comment period.
- Other reviews required in UIC permitting process:
  - *Endangered Species Act,*
  - *National Historic Preservation Act 106 consultation,*
  - *Environmental Justice Analysis,*
  - *Cumulative effects of construction and operation of injection wells.*
- The EPA will hold at least two public hearings in South Dakota.
- The EPA will conduct additional outreach in Tribal communities upon request.

National Historic Preservation Act

EPA's plans for addressing NHPA obligations:

- Consider the effects of the whole undertaking on historic properties, not just EPA-regulated activities.
- Consult with tribes (and others) during our review.
- Tribes possess special expertise in assessing eligibility of historic properties that possess religious and cultural significance.
- Seek Tribal input on identification of traditional cultural properties, determination of adverse affects and ways to mitigate the adverse affects.

EPA has the option of designating NRC as the lead for this process, or of conducting the review ourselves.

- The EPA is reviewing the historic properties information developed in the NRC process.
- This information is available to the public at http://adams.nrc.gov/ehd.

Ways in which Tribal Officials Can Be Involved in the UIC Permitting Process

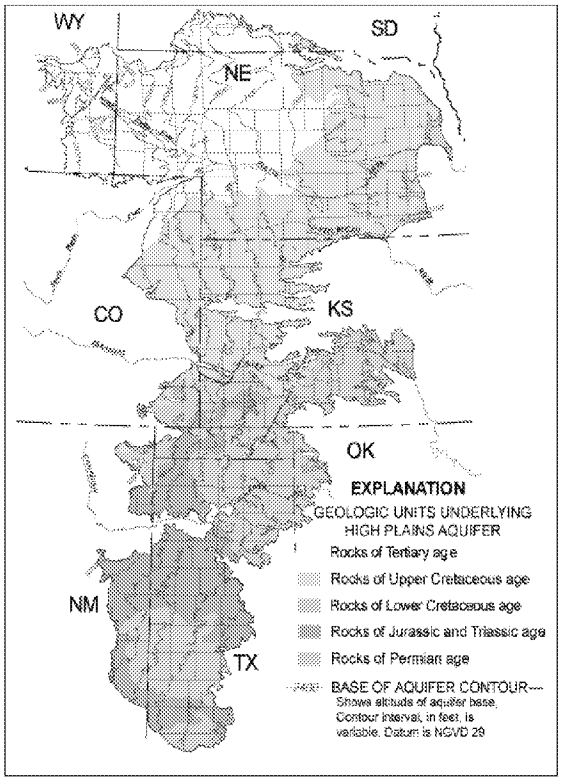
- Participate in informal and formal government to government consultation.
- Request informational web conferences on topics of concern.
- Participate in the review of the proposed permit and aquifer exemption decisions.
- Attend public hearings.

Provide info about requested web conferences to date, those conducted & those planned.

Issues Identified through Informal Consultation so far . . .

- Will there be any impacts to the Ogallala Aquifer?
- What are the impacts to places where medicinal or ceremonial plants will be gathered?
- Impacts to groundwater
- Impacts to surface water

Extent of the Ogallala Aquifer?



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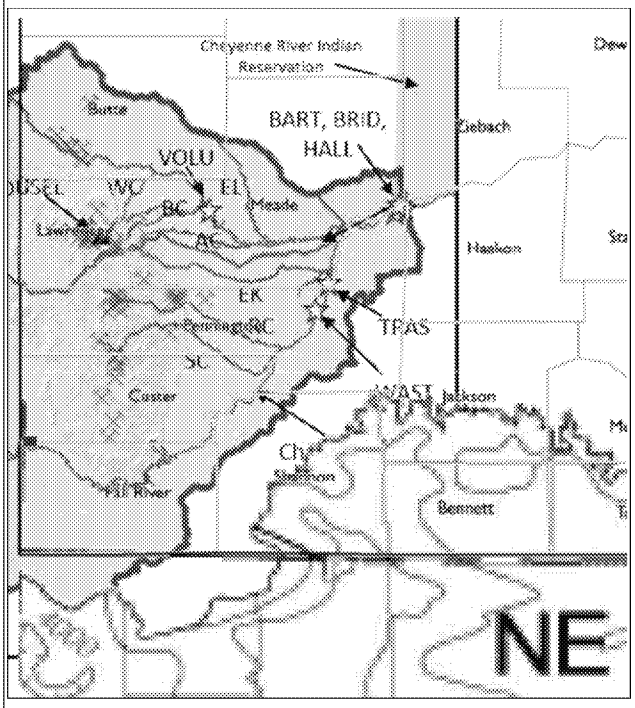
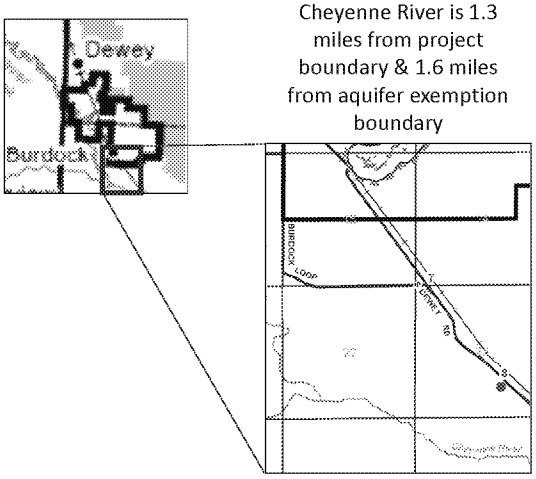


Ogallala Aquifer

Cheyenne River Basin

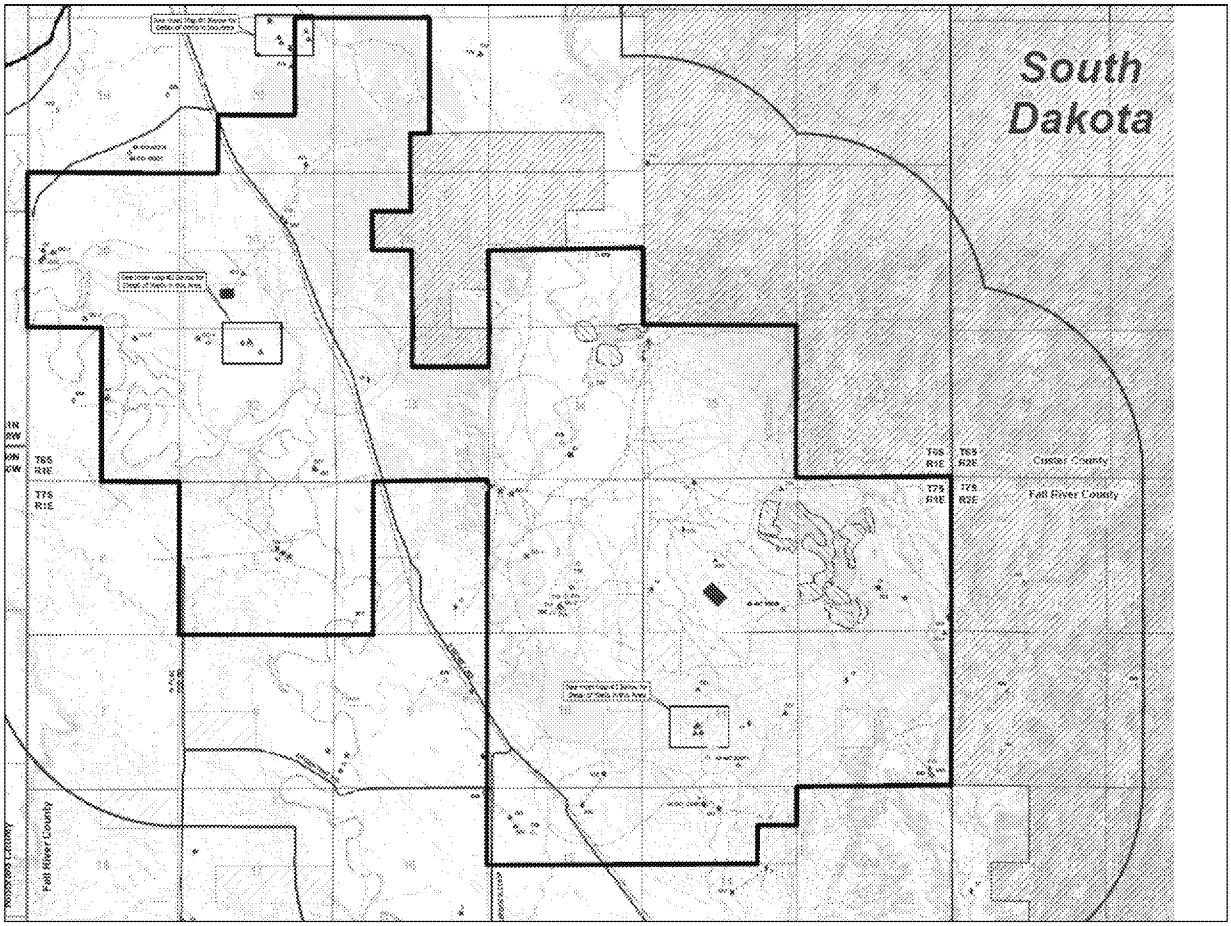
Dewey-Burdock Site

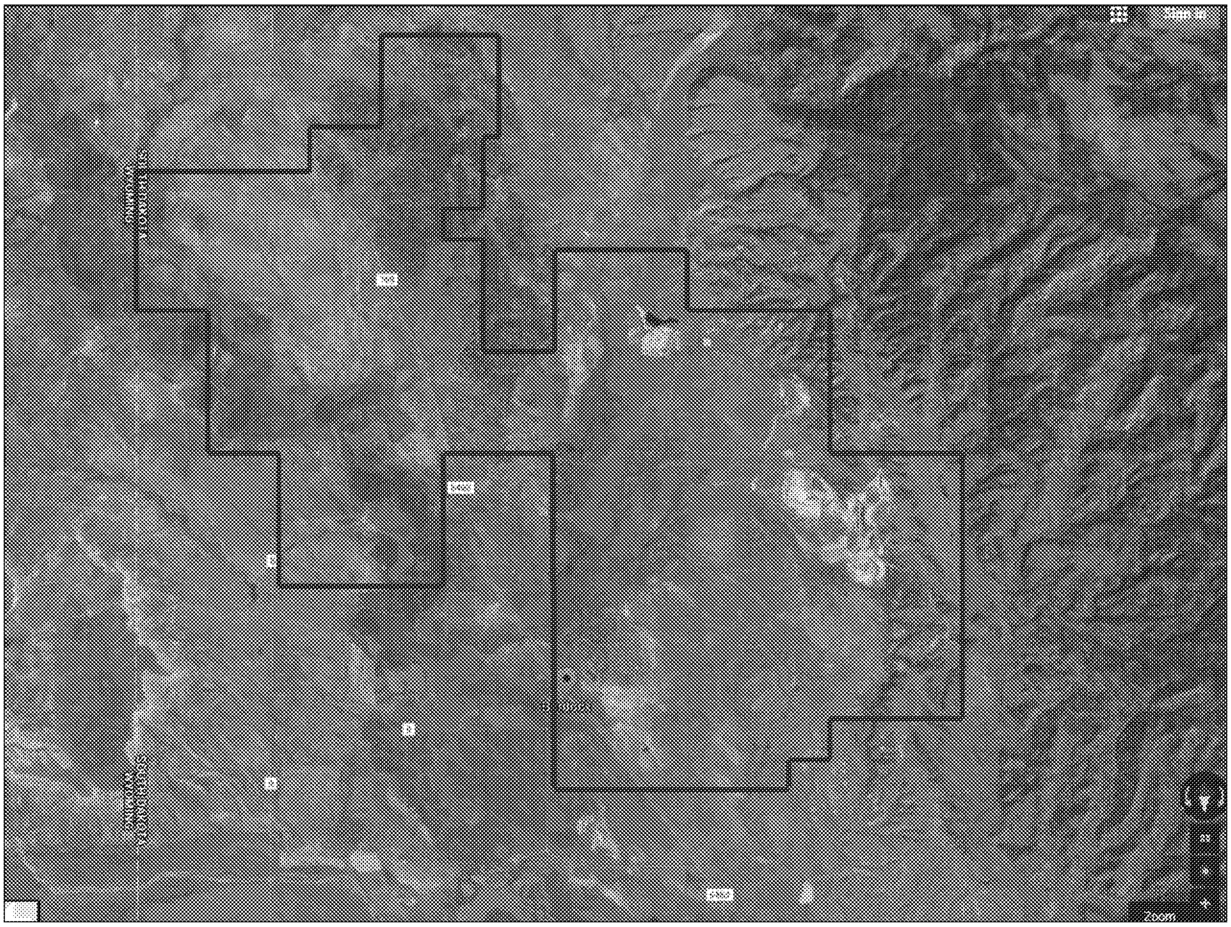


Cheyenne River is 1.3 miles from project boundary & 1.6 miles from aquifer exemption boundary

Issues Identified through Informal Consultation

- Will there be any impacts to the Ogallala Aquifer?
- What are the impacts to places where medicinal or ceremonial plants will be gathered?
- Impacts to groundwater
- Impacts to surface water


South Dakota
T6S R1E
T7S R1E
T6S R2E
T7S R2E
Custer County
Fall River County
Fall River County


SOUTH DAKOTA
WYOMING
SOUTH DAKOTA
WYOMING

Issues Identified through Informal Consultation

- Will there be any impacts to the Ogallala Aquifer?
- What are the impacts to places where medicinal or ceremonial plants will be gathered?
- Impacts to groundwater – very stringent permit requirements
- Impacts to surface water

Issues Identified through Informal Consultation

- Will there be any impacts to the Ogallala Aquifer?
- What are the impacts to places where medicinal or ceremonial plants will be gathered?
- Impacts to groundwater
- Impacts to surface water – UIC area permit regulation requires the EPA to look at cumulative effects of the construction and operation of the additional injection wells.

Questions & Discussion

Contact Information

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Dewey-Burdock Project Lead
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303-312-6276

Tribal Cultural Survey – Spring of 2013

Seven Tribes participated in the field survey at the proposed Dewey-Burdock site:

1. The Santee Sioux Tribe,
2. The Northern Cheyenne Tribe,
3. The Turtle Mountain Band of Chippewa Indians,
4. The Crow Creek Sioux Tribe,
5. The Cheyenne and Arapaho Tribes of Oklahoma,
6. The Crow Nation, and
7. The Northern Arapaho Tribe

- 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 additional locations.
- In total, the tribal survey teams identified and investigated 71 tribal sites.
- These features include isolated artifact finds, animal bone concentrations, stone circles, cairns, and possible fasting sites.
- 5 features were identified during the field survey as possible gravesites.