APP-042-B

POWERTECH (USA) INC.

Powertech (USA) Inc.
Dewey-Burdock Project
Class III Underground Injection Control Permit Application

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Prepared for

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List of Abbreviations and Acronyms

AEB	aquifer exemption boundary
ALARA	as low as reasonably achievable
AOR	Area of Review
ARSD	Administrative Rules of South Dakota
ASTM	ASTM International, formerly American Society for Testing and Materials
BLM	U.S. Department of the Interior, Bureau of Land Management
CFR	Code of Federal Regulations
CPP	central processing plant
DENR	South Dakota Department of Environment and Natural Resources
DES	Draft Environmental Statement
EFN	Energy Fuels Nuclear
EPA	U.S. Environmental Protection Agency
gpm	gallons per minute
ISR	*in-situ* recovery
IX	ion exchange
MCL	maximum contaminant level
mgd	million gallons per day
MIT	mechanical integrity testing
NEPA	National Environmental Policy Act
NRC	U.S. Nuclear Regulatory Commission
psi	pounds per square inch
psig	pounds per square inch gauge
PVC	polyvinyl chloride
QAPP	Quality Assurance Project Plan
QA/QC	quality assurance/quality control
RCRA	Resource Conservation and Recovery Act
RL	reporting limit
RO	reverse osmosis
SDCL	South Dakota Codified Laws
SDGF&P	South Dakota Department of Game, Fish and Parks
SDWA	Safe Drinking Water Act
SERP	Safety and Environmental Review Panel

List of Abbreviations and Acronyms (Continued)

TDS	total dissolved solids
TVA	Tennessee Valley Authority
UCL	upper control limit
UIC	Underground Injection Control
USDW	underground source of drinking water
USGS	U.S. Geological Survey

Glossary

Aquifer Exemption: The process by which an aquifer, or portion of an aquifer, that meets some of the criteria for an underground source of drinking water, for which protection under the Safe Drinking Water Act has been exempted under the criteria in 40 CFR § 146.4. Injection of fluids through a Class I, II, or III injection well into any aquifer that meets the classification as a USDW requires a demonstration that the aquifer is not currently serving a drinking water system and is not expected to do so in the future.

Bleed: Excess production or restoration solution withdrawn to maintain a cone of depression so native groundwater continually flows toward the center of the production zone.

Brine Solution: A concentrated solution containing dissolved minerals (usually greater than 100,000 mg/l), especially chloride salts.

Central Processing Plant: The main processing facility that includes an ion exchange system, elution and precipitation circuits, and filtering, washing, drying and packaging systems to produce yellowcake.

Confining Bed (layer): A geologic formation, group of formations, or a part of a formation of low permeability above or below an aquifer that confines groundwater flow within the aquifer.

Elution: The process of extracting (or eluting) one material from another by washing with a solvent (eluant) to remove adsorbed material (such as uranium) from an adsorbent such as an ion exchange resin.

Excursion: The exceedance of upper control limits for two or more excursion indicators in a monitor well.

Ion Exchange: A chemical process used to recover uranium from solution by the exchange of dissolved uranium ions between a lixiviant (leach solution) and a solid, either a mineral surface or, more commonly, a synthetic polymer resin.

Injection Well: A well used to inject lixiviant or restoration fluids into the production zone for uranium extraction or aquifer restoration.

***In-situ* Recovery (ISR):** The in-place recovery of a mineral resource without removing overburden or ore. This method of mining is typically accomplished by installing a well and

recovering the resource directly from the natural deposit by exposing it to the injection and recovery of the lixiviant that causes dissolution of the mineral.

Lixiviant: A solution composed of native groundwater and chemicals (such as oxygen and carbon dioxide) pumped underground to recover the uranium from the ore body.

Monitor Well: A well used to obtain water quality samples or measure groundwater levels.

Ore Body: The mapped extents of ore mineralization that is expected to be commercially producible. Also referred to as ore zone.

Ore Horizon: The vertical position of the ore mineralization within the host sand unit, formation, aquifer, or between two confining units. There may be more than one ore horizon within a host unit.

Picocurie: One one-trillionth (1/1,000,000,000,000) of a Curie: a measure of radioactivity based on the observed decay rate of approximately one gram of radium. The Curie was named in honor of Pierre and Marie Curie, pioneers in the study of radiation.

Pore Volume (PV): An indirect measurement of a unit volume of aquifer affected by ISR extraction. Pore volume is typically calculated by multiplying the surficial area of a well field by the ore horizon thickness by the porosity.

Production Well: Also known as 'extraction well' or 'recovery well' for ISR, usually located in the center of a 5- or 7-spot well pattern; used to pump the uranium-bearing solution to the surface for recovery of uranium.

Radionuclide: An unstable form of a nuclide that decays or disintegrates, spontaneously emitting radiation. Nuclide: a general term applicable to all atomic forms of an element. Nuclides are characterized by the number of protons and neutrons in the nucleus as well as by the amount of energy contained within the atom.

Safe Drinking Water Act (SDWA): The main federal law that ensures the quality of Americans' drinking water. The SDWA sets the framework for the UIC Program to control the injection of fluids. EPA and states implement the UIC Program, which sets standards for safe injection practices and bans certain types of injection.

Satellite Facility: A remote plant consisting of an ion exchange system, pumps, groundwater restoration equipment and transportation vehicles (tanker trucks) to transport loaded resins to the central processing plant.

Underground Source of Drinking Water (USDW): An aquifer or portion of an aquifer that supplies any public water system or that contains a sufficient quantity of ground water to supply a public water system, and currently supplies drinking water for human consumption, or that contains fewer than 10,000 mg/l total dissolved solids and is not an exempted aquifer.

Yellowcake: A mixture of uranium oxides that can vary in proportion and in color from yellow to orange to dark green (blackish) depending on the temperature at which the material was dried (level of hydration and impurities). Higher drying temperatures produce a darker, less soluble material. Yellowcake is commonly referred to as U_3O_8. This fine powder is packaged in drums and sent to a conversion plant that produces uranium hexafluoride (UF_6) as the next step in the manufacture of nuclear fuel.

Powertech (USA) Inc.
Dewey-Burdock Project
Class III Underground Injection Control
Permit Application

1.0 INTRODUCTION

Powertech (USA) Inc. (Powertech) proposes to produce uranium (U_3O_8 or yellowcake) at the Dewey-Burdock Project using *in-situ* recovery (ISR). This report has been developed to address the permitting requirements for a Class III Underground Injection Control (UIC) permit application in South Dakota. It is being submitted to the United States Environmental Protection Agency (EPA) to demonstrate that the Dewey-Burdock Project will meet the requirements of the UIC Program promulgated under the Safe Drinking Water Act (SDWA).

The SDWA was originally passed by Congress in 1974 to protect public health by regulating the nation's public drinking water supplies. It authorizes EPA to set national health-based standards to protect drinking water and its sources: rivers, lakes, reservoirs, springs, and public water supply wells. EPA, states and water districts work together to ensure protection against naturally-occurring and anthropogenic contaminants. The UIC Program found in 40 CFR Parts 144-147 is one such program designed to implement the SDWA by regulating underground injection practices to protect underground sources of drinking water (USDWs).

To fulfill these informational needs, the following attachments are included with this UIC permit application:

- A - Area of Review Methods (Section 2)
- B - Maps of Area and Area of Review (Section 3)
- C - Corrective Action Plan and Well Data (Section 4)
- D - Maps and Cross Section of USDWs (Section 5)
- F - Maps and Cross Sections of Geologic Structure of Area (Section 6)
- H - Operating Data (Section 7)
- I - Formation Testing Program (Section 8)
- J - Stimulation Program (Section 9)
- K - Injection Procedures (Section 10)
- M - Construction Details (Section 11)
- N - Changes in Injected Fluid (Section 12)
- O - Plans for Well Failures (Section 13)

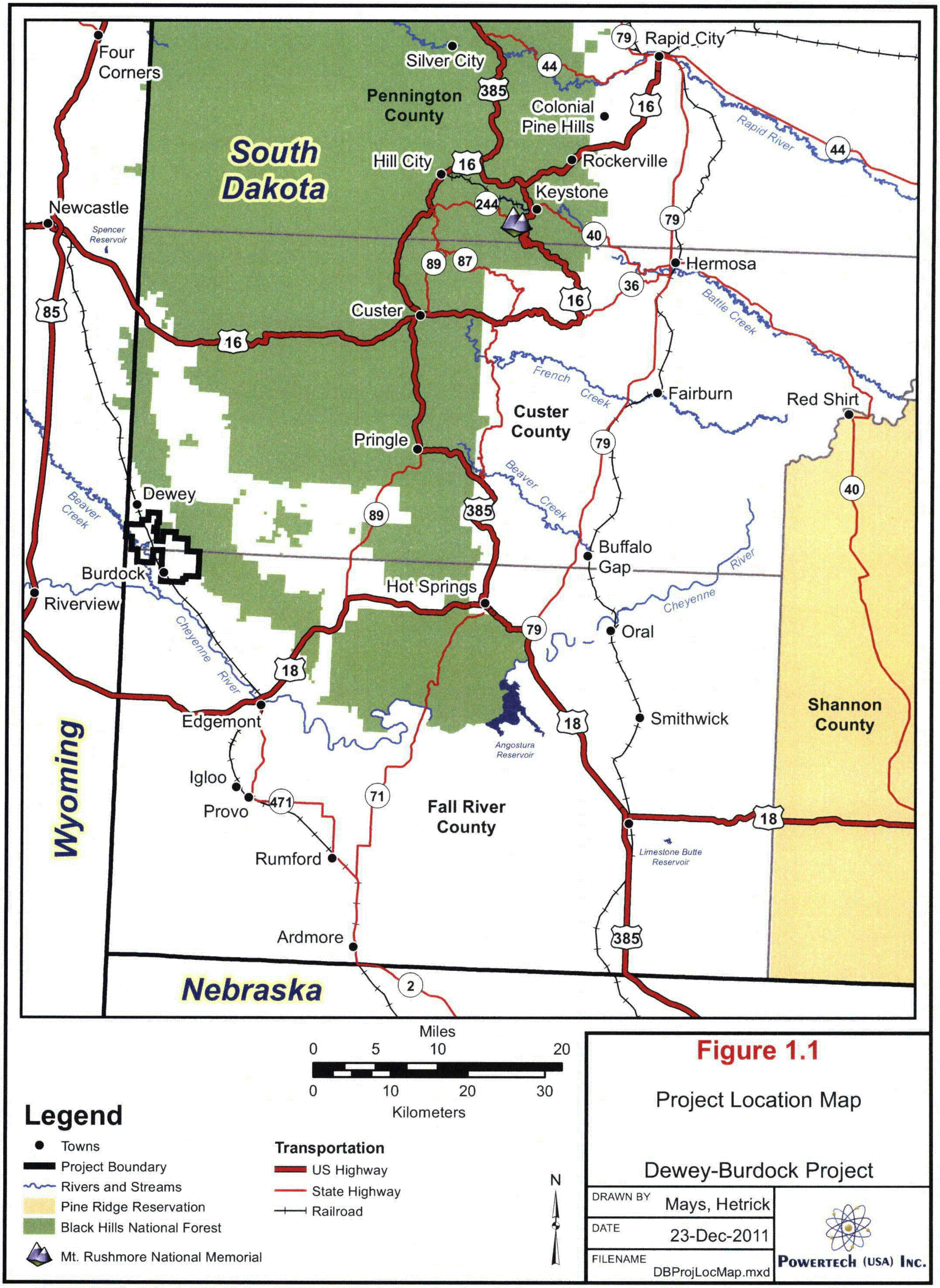
- P - Monitoring Program (Section 14)
- Q - Plugging and Abandonment Plan (Section 15)
- R - Necessary Resources (Section 16)
- S - Aquifer Exemption (Section 17)
- U - Description of Business (Section 18)

1.1 Project Overview

The Dewey-Burdock Project is located approximately 13 miles north-northwest of Edgemont, South Dakota, in an area encompassing portions of Fall River and Custer counties. The Dewey-Burdock Project area (project area) encompasses approximately 10,580 acres of mostly private land on both sides of S. Dewey Road (County Road 6463) and includes portions of Sections 1-5, 10-12, and 14-15, Township 7 South, Range 1 East and Sections 20-21 and 27-35, Township 6 South, Range 1 East, Black Hills Meridian. Approximately 240 acres are under control of the Bureau of Land Management (BLM) in portions of Sections 3 and 10-12. Figure 1.1 shows the project location and permit boundary.

The Dewey-Burdock Project is a proposed uranium ISR project. The uranium will be recovered by injecting groundwater fortified with oxidizing and complexing agents (oxygen and carbon dioxide) into a series of injection wells. The dissolved oxygen will oxidize the solid-phase uranium to a soluble valence state, and the dissolved carbon dioxide will form a complex with the soluble uranium ions so they remain in solution as the recovery solution is transported through the ore body. The recovery solution will be pumped by submersible pumps to the surface, where the uranium will be recovered via ion exchange (IX) and processed into the final product (U_3O_8 or yellowcake). After the uranium is removed, the groundwater will be refortified with oxygen and carbon dioxide and recirculated through the well fields. The uranium mineralization targeted for production is contained within the Inyan Kara Group, specifically within the Fall River Formation and Chilson Member of the Lakota Formation.

The eastern portion of the project area is called the Burdock area. It will include a series of ISR well fields and a central processing plant (CPP), which will be used to recover uranium from the Burdock well fields using IX and to process the uranium-loaded IX resin. The western portion of the project area is called the Dewey area. It will include a series of ISR well fields and a satellite facility, which will be used to recover uranium from the Dewey well fields using IX. The uranium-loaded IX resin will be transported from the satellite facility to the project CPP or to another licensed CPP for processing. Processing will include stripping the uranium from the loaded resin using a saltwater solution (elution), precipitating the dissolved uranium to form an


Four Corners
Silver City
Rapid City
Pennington County
Colonial Pine Hills
South Dakota
Hill City
Rockerville
Keystone
Rapid River
Newcastle
Spencer Reservoir
Hermosa
Custer
Battle Creek
French Creek
Fairburn
Red Shirt
Custer County
Pringle
Beaver Reservoir
Beaver Creek
Dewey
Burdock
Buffalo Gap
Cheyenne River
Riverview
Hot Springs
Oral
Edgemont
Smithwick
Shannon County
Wyoming
Igloo
Provo
Angostura Reservoir
Fall River County
Rumford
Limestone Butte Reservoir
Ardmore
Nebraska
Miles
0 5 10 20
0 10 20 30
Kilometers
Legend
Towns
Project Boundary
Rivers and Streams
Pine Ridge Reservation
Black Hills National Forest
Mt. Rushmore National Memorial
Transportation
US Highway
State Highway
Railroad
N
Figure 1.1
Project Location Map
Dewey-Burdock Project
DRAWN BY Mays, Hetrick
DATE 23-Dec-2011
FILENAME DBProjLocMap.mxd
POWERTECH (USA) INC.

insoluble uranium oxide (precipitation), and filtering, washing, drying, and packaging the dried uranium oxide product (yellowcake) into sealed containers.

Each ISR well field will be operated until uranium recovery is no longer economical. Powertech estimates that individual well field operating lives will be about 2 years, with multiple well fields typically in operation at any given time. Aquifer restoration will be completed following uranium recovery in each well field. During aquifer restoration, the groundwater in the well field will be restored in accordance with NRC requirements.

Liquid waste generated by the Dewey-Burdock Project will be treated and disposed by injection in Class V injection wells or by land application. Figures 1.2 and 1.3 depict the proposed facilities and potential well field areas in the two liquid waste disposal options (refer to Section 10.1 for a description of liquid waste disposal options).

1.2 Applicant Information

The Class III UIC permit application is submitted by Powertech (USA) Inc. or Powertech, which is the U.S.-based wholly owned subsidiary of the Powertech Uranium Corporation, a corporation registered in British Columbia. Powertech Uranium Corporation shares are publicly traded on the Toronto Stock Exchange as PWE and the Frankfurt Stock Exchange as P8A. Powertech Uranium Corporation owns 100 percent of the shares of Powertech. The corporate office of Powertech Uranium Corporation is located in Vancouver, British Columbia. Powertech is a U.S.-based corporation incorporated in the State of South Dakota. The addresses and telephone numbers for the general office (Colorado) and the local office (South Dakota) of the applicant are listed as follows:

Name and address of applicant:

Company:	Powertech (USA) Inc.
Signatory:	Richard Blubaugh
Title:	Vice President, Environmental Health & Safety Resources
Address:	5575 DTC Parkway, Suite #140 Greenwood Village, CO 80111
Telephone:	(303) 790-7528

Local representative or contact person:

Name:	Mark Hollenbeck, P.E.
Title:	Project Manager
Address:	Powertech (USA) Inc. 310 2nd Avenue P.O. Box 812 Edgemont, SD 57735
Telephone:	(605) 662-8308

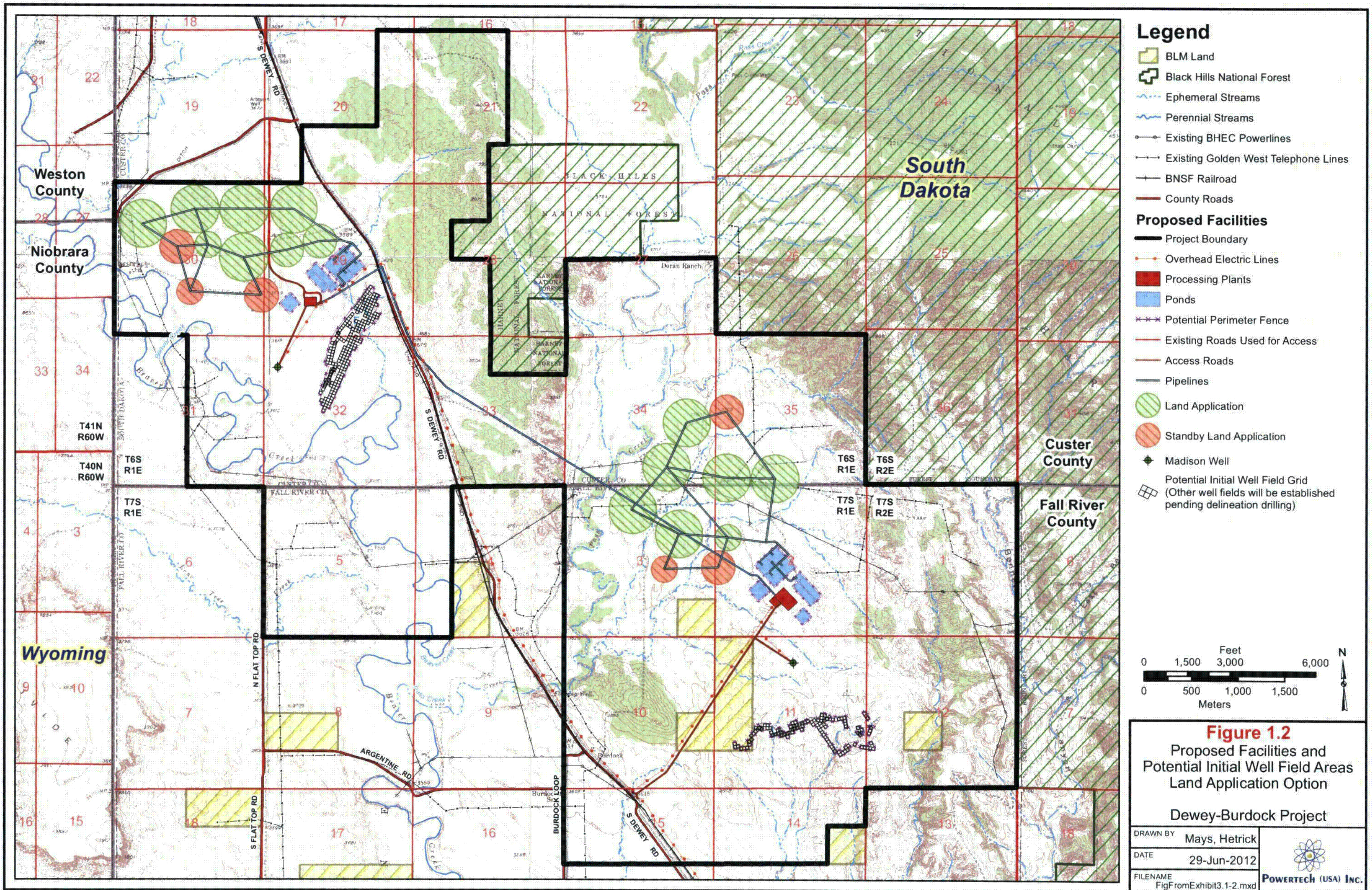


Figure 1.2
Proposed Facilities and Potential Initial Well Field Areas Land Application Option

Dewey-Burdock Project

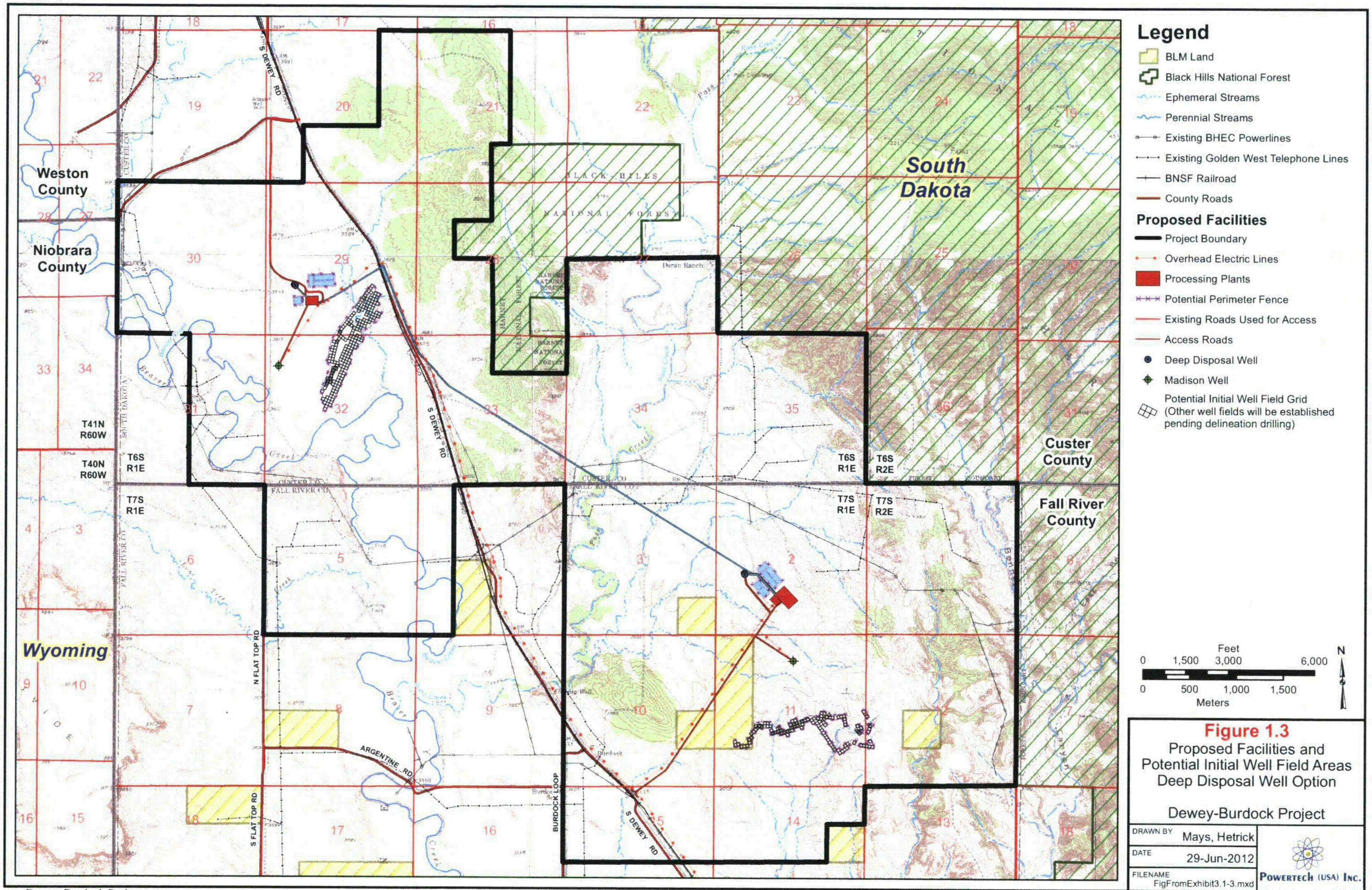


Figure 1.3
Proposed Facilities and Potential Initial Well Field Areas Deep Disposal Well Option

Dewey-Burdock Project

1.3 Project History

Uranium was first discovered in the Edgemont District in 1951 by professors from the South Dakota School of Mines and Technology (SDSMT). They mined about 500 pounds of ore and hauled it to the Union Carbide mill at Rifle, Colorado. The Atomic Energy Commission (AEC) announcement of a new district at Edgemont led to a boom of staking, mining, and dealing in the summer of 1952. By 1953 the AEC had built a buying station in Edgemont. In 1956 a 250-ton-per-day mill was built in Edgemont by a subsidiary of Susquehanna Western Inc. and soon expanded to 500 tons per day. In 1960 a vanadium circuit was added. Susquehanna Western Inc. provided mill feed from production from the Edgemont District (open pits and shallow underground operations in the Fall River Formation), some mines in the Powder River Basin and several mines in the northern Black Hills. The Edgemont mill operated through 1968.

In 1974, the Tennessee Valley Authority (TVA) bought the Edgemont mill and took control of Susquehanna Western's mines and exploration properties in the Edgemont District. TVA soon began extensive exploratory drilling in the Burdock portion of the project area. In 1967, Homestake Mining Company began exploration in the Dewey portion of the project area. In 1974, Wyoming Mineral Corporation (WMC) acquired the Dewey properties from Homestake. Besides WMC and TVA, other companies exploring in the district were Union Carbide, Federal Resources, and Kerr McGee. TVA consolidated the project area in 1978 by acquiring the Dewey portion from WMC and continued exploration until 1986. In total, over 4,000 exploration drill holes were completed in the project area.

In 1981 TVA completed a mine feasibility study on the project deposits. A draft environmental statement (DES) was prepared by TVA to address the potential impacts of a proposed underground mine in the project area, but the National Environmental Policy Act (NEPA) process was never completed by TVA. In 1994 Energy Fuels Nuclear (EFN) acquired the mineral interests within the project area. Their intention was to extract the uranium by ISR. EFN did no additional exploration drilling on the project. In 2000 the leases were dropped.

In 2005, Powertech acquired control of the property, which currently consists of approximately 10,580 acres. Since spring 2007, Powertech has drilled approximately 115 exploration holes, including 20 monitor wells on the project. Both the historical and recent drill holes have been used to generate the geologic model and delineate the extent of the mineralized sands.

1.4 Permitting Requirements

Powertech is currently working on obtaining all the necessary permits and licenses for the Dewey-Burdock Project. Table 1.1 presents the permits and licenses being obtained. In addition to the Dewey-Burdock Project, Powertech has one exploration permit in Colorado (Centennial Project) and two exploration permits in Wyoming (Dewey Terrace and Aladdin projects).

Table 1.1: Permits and Licenses for the Dewey-Burdock Project

Issuing Agency	Permit or License	Status
US EPA Region 8 8P-W-GW, UIC 1595 Wynkoop St Denver, CO 80202-1129	Class III UIC Permit	Submitted January 2009, revised this application
	Aquifer Exemption (Class III Wells)	Submitted January 2009, revised this application
	Class V UIC Permit	Submitted March 2010
US Nuclear Regulatory Commission TWFN, Mail stop: 8 F5 Washington, DC 20555-0001	Source and Byproduct Material License	Submitted August 10, 2009, Docket No. 40-9075
BLM Eastern Montana/Dakotas District 310 Roundup St Belle Fourche, SD 57717	Plan of Operations	Submitted October 2009
South Dakota Department of Environment and Natural Resources Joe Foss Building 523 E Capitol Pierre, SD 57501	Large Scale Mine Permit	Application in preparation
	Uranium Exploration Permit	Approved, Permit EXNI-404
	Special, Exceptional, Critical, or Unique Land Determination	Completed February 19, 2009
	Groundwater Discharge Plan (Land Application)	Submitted March 9, 2012
	Water Right (Madison Limestone)	Submitted June 11, 2012
	Water Right (Inyan Kara Group)	Submitted June 11, 2012
	Temporary Water Right for Testing	Approved January 2, 2008
	Temporary NPDES Permit for Testing	Approved December 5, 2007, Permit SDG 070626
	Air Quality Permit	In preparation
	NPDES Construction Stormwater Permit	Pending
	NPDES Industrial Stormwater Permit	Pending
	Public Water Supply System Construction Permit	Pending
	Class V UIC Septic Permit	Pending
Custer County 420 Mount Rushmore Road Custer, SD 57730-1934	Building Permit, Grading Permit, Floodplain Construction Permit (if applicable), Sign Permit and Septic System Permit	Pending
	Conditional Use Permit	Not Required
Fall River County 906 N. River Street Hot Springs, SD 57747	Building Permit, Grading Permit, Floodplain Construction Permit (if applicable), Sign Permit and Septic System Permit	Pending
	Conditional Use Permit	Not Required

1.5 Health, Safety, and Environmental Responsibilities

During operation of the facility, Powertech, via the company's Safety and Environmental Review Panel (SERP), will ensure that the facility will comply with all applicable laws and regulations. Powertech also will maintain the health and safety of the workers, general public, and the environment. This includes maintaining potential occupational and public exposures to ionizing radiation as low as reasonably achievable (ALARA). Additional information on the SERP, personnel responsible for radiation protection such as the radiation safety officer, and the management control program is found in the NRC license application (Powertech, 2009a).

2.0 ATTACHMENT A - AREA OF REVIEW METHODS

This attachment details the methods used to determine the Area of Review (AOR) for the Class III UIC permit application.

2.1 Introduction

The AOR is established to maximize the data to be described before an aquifer exemption is granted in order to prove the integrity of the injection zones and their relationship to surrounding USDWs. The AOR normally specified by the EPA is the area within ¼ mile from the proposed injection wells. However, Powertech chose a more extensive AOR in order to also satisfy the NRC review area guidance for groundwater resources (see Attachment B, Section 3). For the purposes of this report, the AOR will include the area within 2 kilometers or 1.2 miles from the proposed NRC license boundary.

The abundance of data from TVA on prior pumping tests in and around the project area yields excellent regional hydrologic information. The historical TVA data and more recent Powertech baseline characterization data presented in this application demonstrate that the ore zone is isolated from USDWs by the presence of major confining units across the entire project area, including the Graneros Group, Fuson Shale, and the Morrison Formation. Geologic confinement, hydrogeologic characterization of each well field, design and operation of monitoring systems specific to each well field, and maintaining well field hydraulic control during production and aquifer restoration will prevent excursions and potential impacts to USDWs.

2.2 Area of Review Methods

The following attachments summarize the activities planned by Powertech and are described for the AOR.

- Chemistry of injected and formation fluids
  - Attachment H - Operating Data (Section 7)
  - Attachment K - Injection Procedures (Section 10)
  - Attachment N - Changes in Injected Fluid (Section 12)
  - Attachment S - Aquifer Exemption (Section 17)
- Hydrogeology
  - Attachment D - Maps and Cross Sections of USDWs (Section 5)
  - Attachment F - Maps and Cross Sections of Geologic Structure of Area (Section 6)

  - Attachment I - Formation Testing Program (Section 8)
  - Attachment S - Aquifer Exemption (Section 17)
- Groundwater use and dependence
  - Attachment B - Maps of Area and Area of Review (Section 3)
  - Attachment C - Corrective Action Plan and Well Data (Section 4)

The population and historical practices in the AOR are described in the following section.

2.3 Population and Land Use

There are five residences within the project area, including seasonal residences. Locations are depicted on Plate 3.1. Approximately 38 people reside within a 6.2-mile (10-km) radius of the center of the project area (Powertech, 2009a).

Land within the project boundary is predominantly privately owned (97.7 percent), with the remaining 2.3 percent managed by the BLM.

The predominant land use within the project area is agricultural production related to grazing (rangeland). Most of the land serves as grazing land for cattle and a few horses. Approximately 390 acres of land are irrigated for hay production along Beaver Creek. Outside of the project area but within the AOR, a small number of pigs are raised and some of the residences have vegetable gardens.

Historically, some of the land within the project area was used for mining. Between 1952 and 1964, approximately 1.5 million lb (680,400 kg) of U_3O_8 were produced from underground and open-pit mines in the Edgemont Uranium District (TVA, 1979). Additional information on historical mine workings is found in Section 3.2.

Recreational use within the project boundary is limited primarily to large game hunting. Within the project area, hunting is open to the public subject to landowner permission on approximately 5,700 acres. Approximately 240 acres are owned by the BLM. In addition, the South Dakota Department of Game, Fish and Parks (SDGF&P) leases around 3,000 acres annually of privately owned land that is designated as walk-in hunting areas. Fishing and other water-based recreational activities on streams within the project vicinity are limited due to low flows and turbid water conditions. Prior to commencement of operations Powertech will work with BLM, SDGF&P and private landowners to limit hunting within the project area to the extent practicable to assure worker safety.

S. Dewey Road, a gravel road leading northwest from Edgemont, serves as the main access to the project area. Other mostly unimproved gravel roads crisscross the project area at irregular intervals. A major line of the Burlington Northern Santa Fe Railroad crosses the center of the project area. This railroad is a primary transportation corridor for Powder River Basin coal. Dakota Minnesota & Eastern has plans to construct a new rail line south of the project area that will not directly affect the project area.

3.0 ATTACHMENT B - MAPS OF AREA AND AREA OF REVIEW

The map of the project area and AOR is provided as Plate 3.1. The proposed aquifer exemption boundary is provided on Figure 17.1 in Section 17. The information provided on Plate 3.1 is described below.

3.1 Area of Review

Plate 3.1 is a topographic map that covers the entire AOR and describes the following information:

- The proposed permit boundary/project area
- AOR boundary (discussed in Attachment A)
- Existing wells
- Surface bodies of water
- Historical mines (surface and subsurface)
- Residences
- Roads
- Faults

Wells depicted on Plate 3.1 are color coded to designate aquifer of completion and depth of completion. Powertech is aware of 18 domestic wells within the AOR (see Section 4.1), not all of which are drinking water wells or associated with currently inhabited or inhabitable residences. No drinking water wells are located within the requested aquifer exemption boundary and completed within the mineralized Inyan Kara Group (see Section 17.3).

No injection wells, intake structures, discharge structures, or hazardous waste treatment, storage, or disposal facilities have been identified in the AOR. Class V injection wells are proposed for the Dewey-Burdock Project as discussed in Section 10.1. There are no natural springs within the project area. There is, however, an isolated area in the southwest portion of the Burdock area, known as the "alkali area," where groundwater is discharging to the surface, presumably through unplugged or improperly plugged exploration boreholes. There are also two springs outside of the project area but within the AOR. These are discussed in Section 4.3. No quarries are located within the AOR; the nearest quarry is located on the GCC Dacotah property north of the project boundary.

Attachment C (Section 4) describes the inventory of existing wells, exploration drill holes, and oil and gas wells and test holes. The following section describes the historical mines in the AOR.

3.2 Historical Mine Workings

The first uranium mines in the Edgemont District were developed in the 1950s by prospectors who followed mineralized Fall River outcrops into the subsurface by driving declines into the mineralized sandstones. Susquehanna Western Inc. consolidated all mining operations in the district in the 1950s and operated underground mines, surface mines, and the Edgemont Mill.

There are historical uranium mine workings, including surface and underground mines, along the eastern portion of the project area. Underground workings are associated with four former, shallow underground uranium mines and two open-pit adits. The locations of historical surface and underground mining operations in the Triangle Mine area and the Darrow Mine area are depicted on Figure 3.1. Susquehanna Western Inc. often drove adits short distances into open-pit walls to recover additional uranium ore that was adjacent to the pit. These types of underground workings were common at historical surface mines and were considered to be extensions of the open-pit mining operations.

All of the underground workings within the project area are associated with open-pit remnants that are clearly visible or, in the case of the Triangle Mine, have been backfilled and partially reclaimed. There are no underground mines within the project area that are not associated with, adjacent to, or extensions of the open pits, all of which are within the upper Fall River Formation. The underground mines consisted of declines (downward sloping ramps) ranging in depth from 0 to 80 feet below land surface. The adits (horizontal tunnels) were driven into the sidewalls of the historical open-pit mines. All underground workings were conducted within sandstones of the Fall River Formation at or above the water table and above the Fuson Shale confining unit such that these workings did not penetrate or otherwise compromise the integrity of this confining unit. Refer to Section 6.2.2 for a description of confining units relevant to ISR. These workings will not be affected by Powertech's proposed ISR operations, since Powertech will not develop well fields within Fall River Formation sandstones in this portion of the project area (refer to Section 10.6) and the Fuson Shale confining unit is intact and undisturbed (refer to Section 6.2.2). The following discussion provides detailed information on the surface and underground workings.

<u>Triangle Mine Area</u>

As shown on Figure 3.1, the Triangle Mine was an open-pit mining operation along the northeastern border of the project area in the NE¼ Section 34, T6S, R1E. Immediately east of this open pit was the Triangle underground mine. Although maps of the Triangle underground workings are not available, Powertech has obtained a description of this operation through

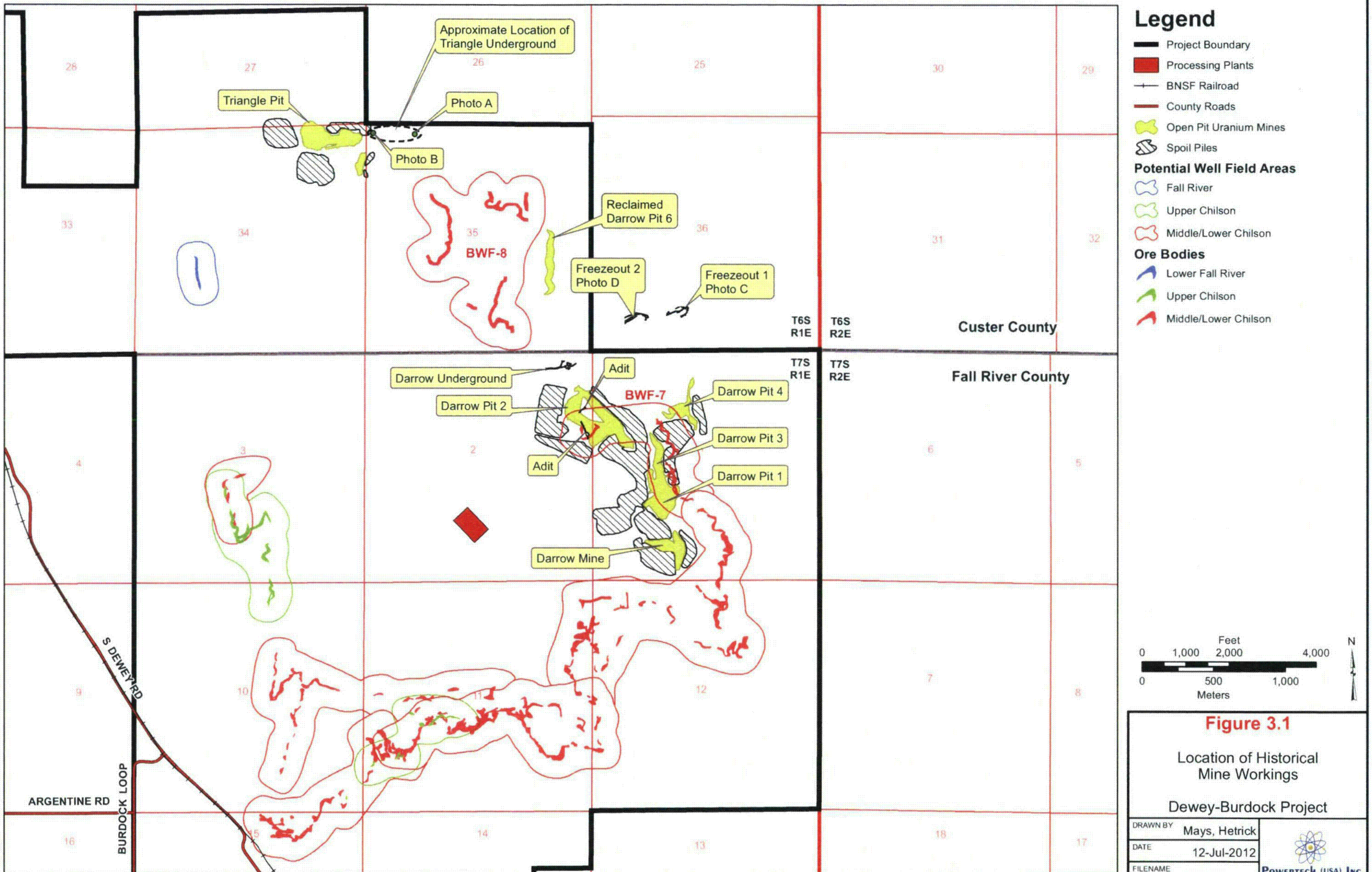


Figure 3.1

Location of Historical Mine Workings

Dewey-Burdock Project

DRAWN BY Mays, Hetrick
DATE 12-Jul-2012
FILENAME Mine-UGWorkings.mxd

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personal communication with Donald Spencer (2011), a local rancher who worked in this underground mine.

Mr. Spencer advised that he worked in the Triangle underground mine in 1957-58. He showed Powertech personnel the location of the decline that was used to access the mine. The decline is located approximately 1,000 feet southeast and updip of the eastern boundary of the Triangle open pit in the NW¼ Section 35, T6S, R1E (see Photo 3-A). Photo locations are depicted on Figure 3.1. As shown in the photo, the haulage road from the decline is still visible, but the entrance to the underground workings has been covered for safety reasons. There were about 1,000 feet of underground workings in the mine. The depth of these workings ranged from outcrop to 70 feet below ground surface. The mineralized sandstone of the Fall River Formation was unsaturated near the ground surface. Approximately 70 feet below the surface, the Fall River sands became saturated, resulting in 2-3 feet of water in the mine, requiring dewatering. Near the end of the underground workings, a vent shaft was installed approximately 400 feet from the eastern highwall of the Triangle open pit to provide air to the underground workings (see Photo 3-B). Powertech measured the depth to the bottom of this vent shaft in April 2011 and found it to be 68 feet below ground surface with approximately 3 feet of groundwater. Mr. Spencer stated that after the Triangle surface mine was completed, an adit was driven into the eastern wall of the pit to recover additional ore. This adit connected the open pit with the abandoned underground workings.

In 1960, Susquehanna Western Inc. began to develop the Triangle surface mine. A description of the mining zone was obtained through personal communication in 2011 with James F. Davis, the Susquehanna Western Inc. geologist who directed the delineation drilling for this mine (Davis, 2011). Mr. Davis stated a single mineralized front progressed from the underground mine area through the surface mine area in an east-west direction. In the western portion of the surface mine area, the trend abruptly turned to the north and the grade of the mineralization quickly diminished. The Triangle surface mine area is down-dip from the underground workings; therefore, the depth to the mining horizon increased steadily. Mr. Spencer recalls the depth of the Triangle open pit to have been approximately 120 feet below ground surface.

Figure 3.2 is an electric log from an historical exploration drill hole located approximately 200 feet north of the mined area. The gamma activity shown in the type log corroborates the portion of the Fall River sand that was mined in the Triangle Mine and its position relative to the Fuson Shale confining unit. The top of the mineralized sand unit in the type log is at a depth of 125 feet below ground surface. The single mineralized front present within this sand unit correlates to Powertech's F13 interval, which is the upper mineralized zone within the Lower

Photo 3-A: Former Triangle Underground Mine Decline

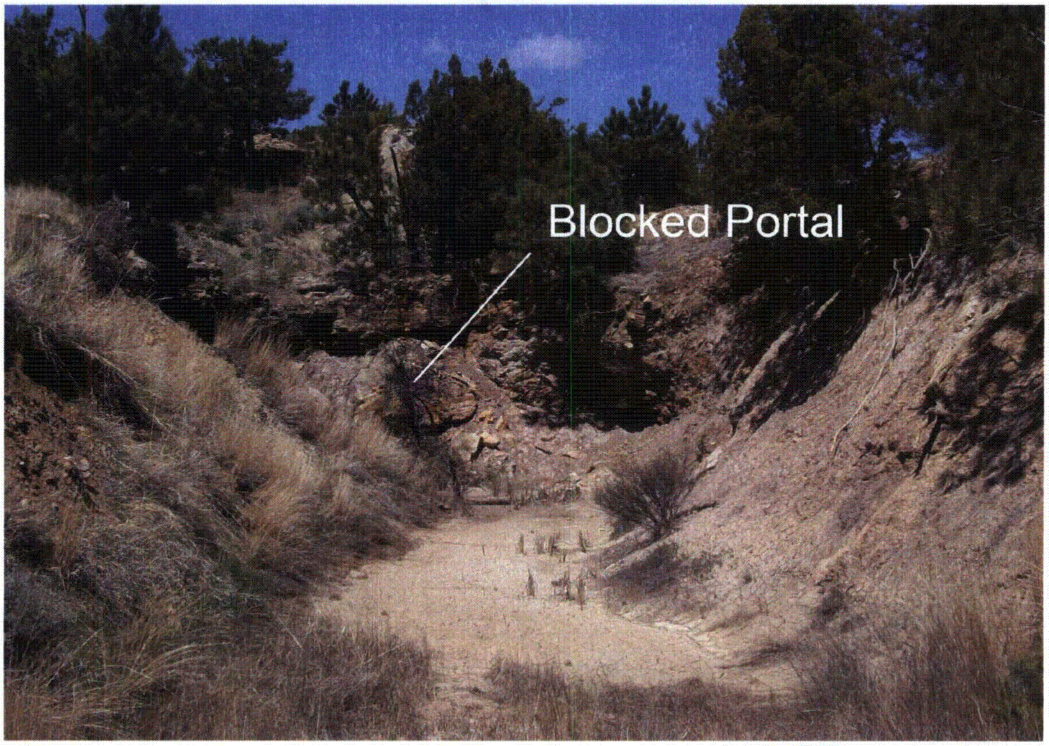

Photo 3-B: Triangle Underground Mine Vent Shaft

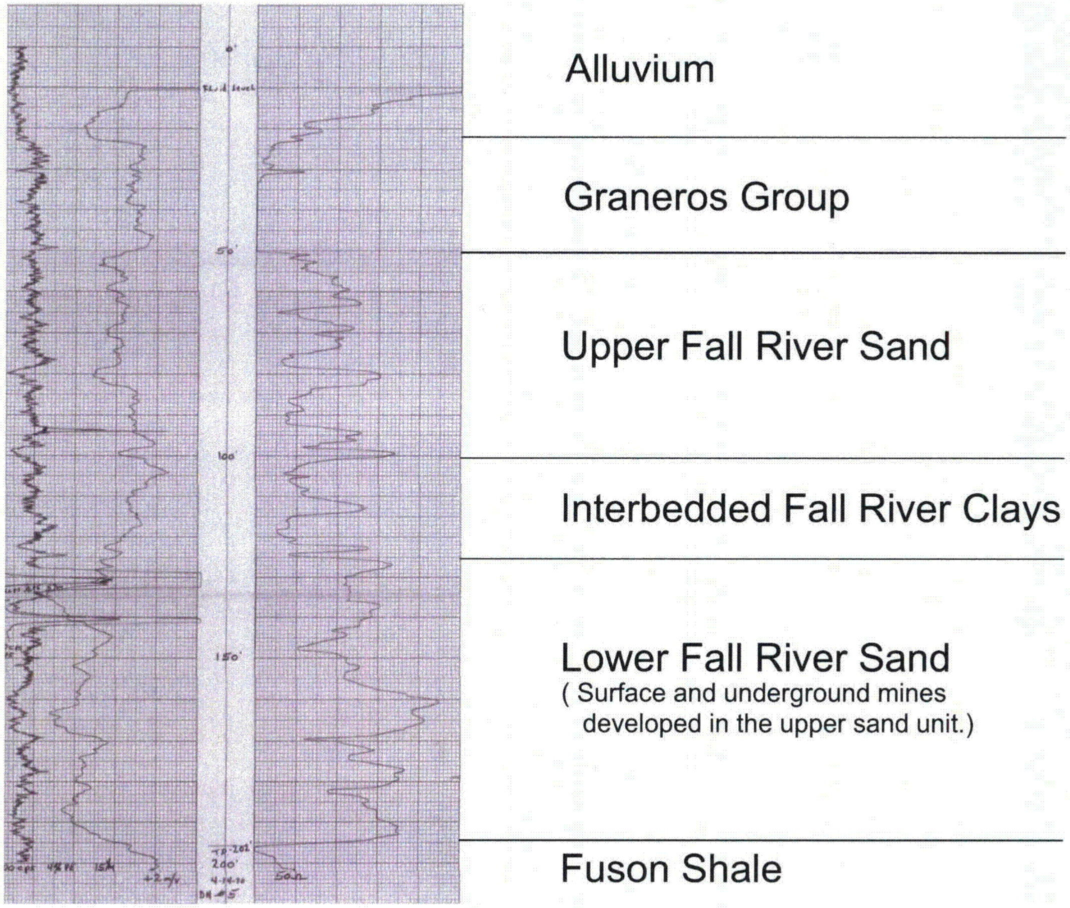

Figure 3.2

Type Log
Triangle Mine Area

Dewey-Burdock Project

DRAWN BY	R. Patton
DATE	24-Jul-2012
FILENAME	Mine-TriangleTypeLog.dwg

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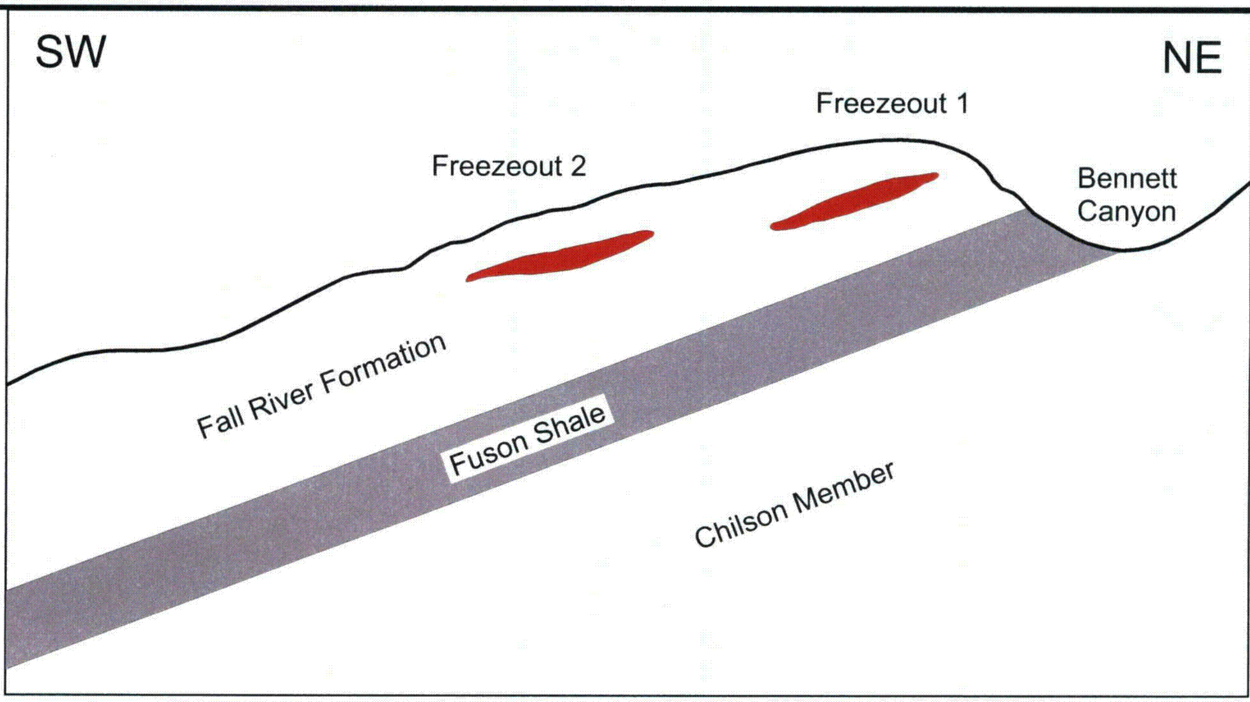
Fall River sand, the bottom of which is approximately 45 feet above the Fuson Shale. All mining took place well above the Fuson Shale, which averages 50 feet thick in this area. Accordingly, these historical mining operations did nothing to compromise the integrity of the Fuson Shale confining unit.

Darrow Mines Area

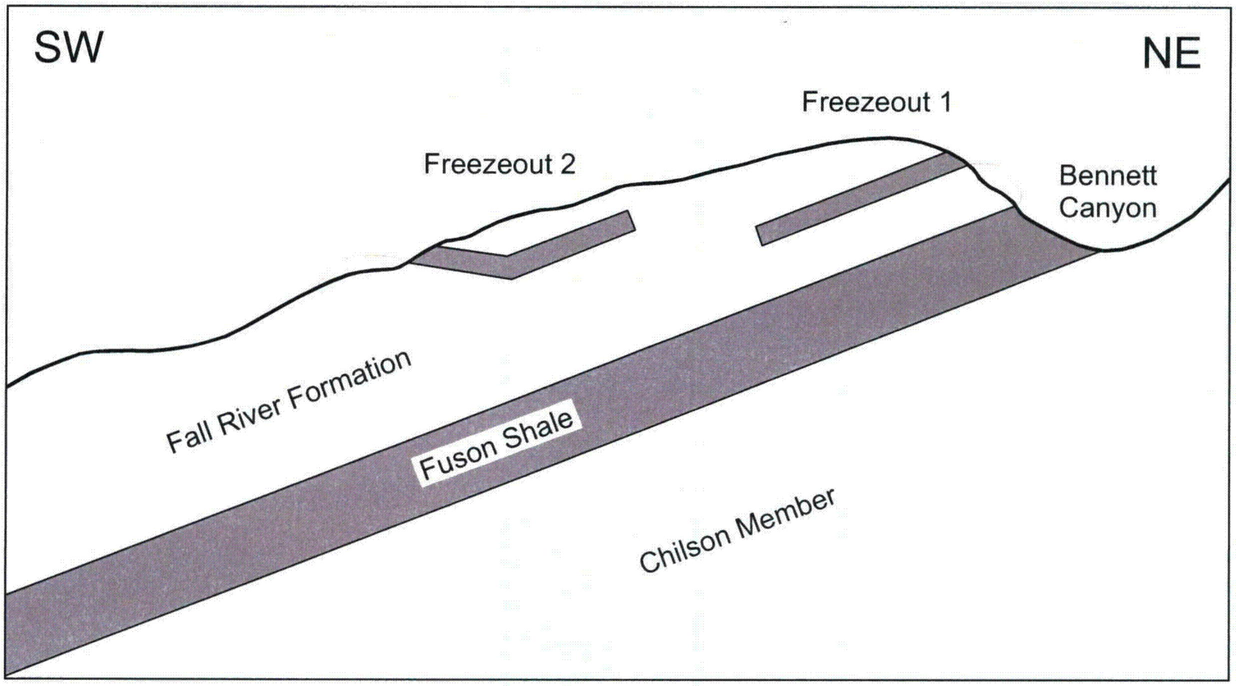
Figure 3.1 depicts the location of the Darrow Mine surface pits in the eastern portion of the project area. These pits were developed within unsaturated sandstones of the Fall River Formation at depths ranging from 50 to 90 feet below ground surface. As illustrated on Figure 3.1, the Freezeout underground mines were located approximately ½ mile north of the Darrow surface mines. These historical underground mines are outside of the project area in the SW¼ Section 36, T6S, R1E. Freezeout No. 1 and Freezeout No. 2 each have approximately 1,000 feet of underground workings. Plan view maps obtained from TVA show the underground workings at Freezeout No. 1 were accessed by two declines, and access to the workings of Freezeout No. 2 was provided by three declines. Photos 3-C and 3-D show the current condition of the declines for the Freezeout mines. The haulage roads are still visible but the access ways or portals to the underground workings have collapsed or have been covered. Figure 3.3 illustrates how these shallow underground mining operations were used to recover ore in this rugged terrain. It is important to note that the workings were above the water table and followed the dip of the mineralized sandstones. Accordingly, these mining operations did not intersect or compromise the integrity of the underlying Fuson Shale confining unit.

Figure 3.1 shows the location of the Darrow underground mine, approximately 500 feet northwest of Darrow Pit No. 2, in the NE¼ of Section 2, T7S, R1E. According to personal communication with Donald Spencer (2011), this underground mine consisted of approximately 1,200 feet of workings within a 250-foot x 700-foot area, which was also accessed by declines. The surface in this area has been reclaimed and all evidence of mining operations has been removed.

Figure 3.4 is a plan view map of the Darrow underground workings taken from a TVA drill hole map. This map shows the locations of many Susquehanna Western Inc. drill holes and air vents for the underground workings. Also shown on this map are five TVA drill holes, one of which is located less than 20 feet from one of the underground drifts. The electric log from this drill hole (DRA-36) is an excellent representation of the mining horizon in these underground workings and is shown in Figure 3.5. The gamma trace on this type log again corroborates that the top of the mining zone for this underground mine was at a depth of 73 feet below ground surface. The base of the mineralized sand lies 23 feet above the top of the Fuson Shale, which is more than 50 feet thick in this area. The Darrow underground mine workings were restricted to the



A. Shallow ore bodies in Fall River



B. Declines developed to access Fall River ore bodies.

Figure 3.3

Schematic - Underground Workings - Freezeout Mines

Dewey-Burdock Project

DRAWN BY	R. Patton
DATE	24-Jul-2012
FILENAME	Mine-FreezeoutUGWork.dwg

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Photo 3-C: Former Freezeout Mine Decline

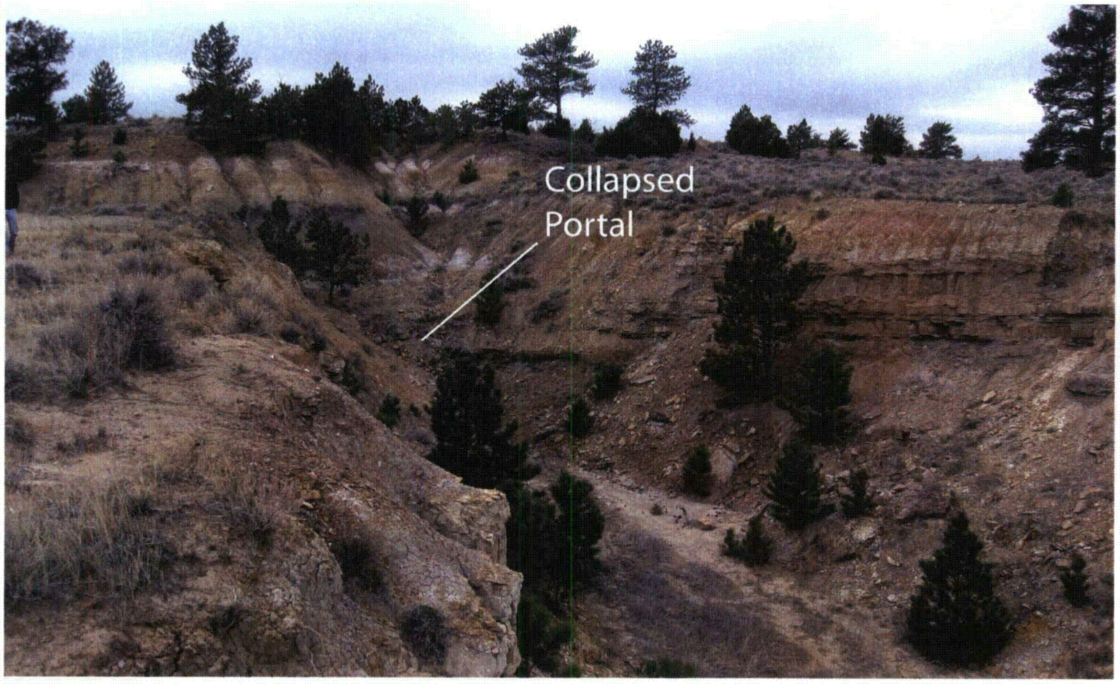
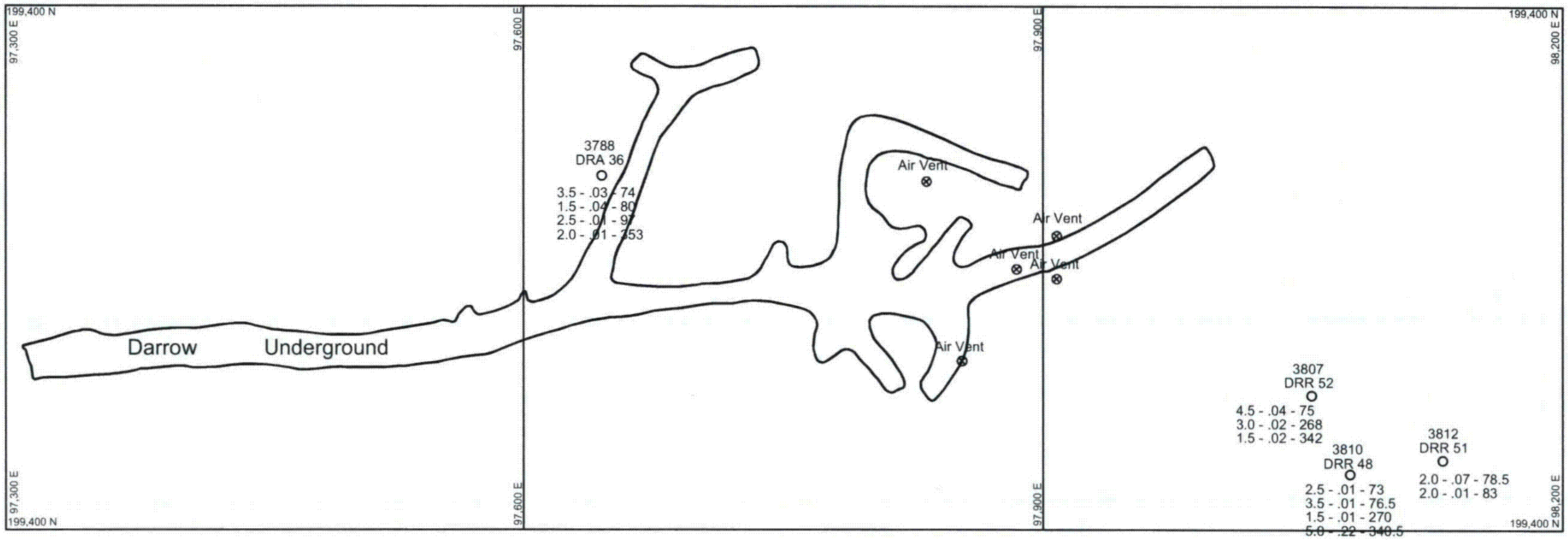
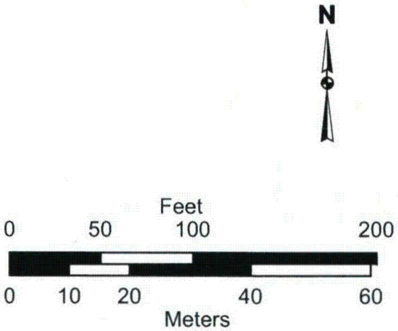


Photo 3-D: Former Freezeout Mine Decline





Legend

DRR 52 o Boreholes

Source: TVA drill hole map

Figure 3.4

Plan View - Darrow Underground Mine

Dewey-Burdock Project

DRAWN BY	R. Patton
DATE	24-Jul-2012
FILENAME	Mine-DarrowPlanView.dwg

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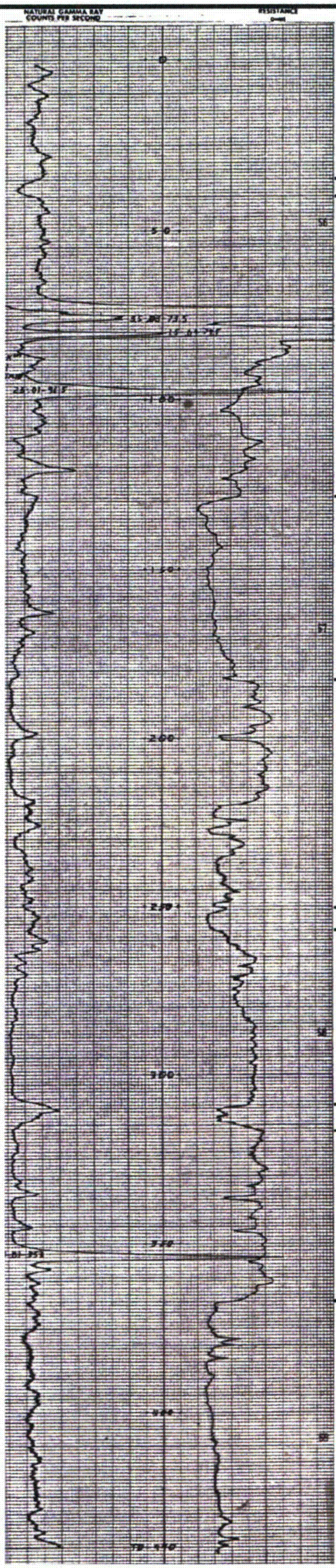

Figure 3.5

Type Log
Darrow Underground

Dewey-Burdock Project

DRAWN BY	R. Patton
DATE	24-Jul-2012
FILENAME	Mine-DarrowUGTypeLog.dwg

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mineralized sand interval, and these mining operations did not intersect or compromise the integrity of the underlying Fuson Shale confining unit.

Maps obtained from TVA show the locations of two adits within Darrow Pit No. 2 in the NE¼ Section 2, T7S, R1E (Figure 3.1). Although not classified as underground mines, these adits consisted of two separate horizontal tunnels that were driven into the pit walls in order to access additional uranium ore that was not recovered in the surface mining operations. These two adits total approximately 650 feet of workings. Because of the horizontal nature of the adits, these workings were conducted at elevations equal to or above the elevation of the bottom of the pit and were considered to be an extension of the surface mining operations. These small operations did not intersect or compromise the integrity of the underlying Fuson Shale confining unit.

As demonstrated above, neither the surface mining activity nor the shallow underground workings intersected or compromised the integrity of the underlying Fuson Shale confining unit. Cross section F-F' (Plate 6.18) illustrates the continuous Fuson Shale confining unit throughout this area. In addition, outcrop examinations of the Fuson Shale in Bennett Canyon, ½-mile up-dip from the Darrow Mine area, reveal the presence of continuous, low-permeability mudstones and shales.

4.0 ATTACHMENT C - CORRECTIVE ACTION PLAN AND WELL DATA

This attachment details the inventory of water wells, monitor wells, exploration drill holes, and oil and gas wells located within the AOR. It also describes Powertech's corrective action plan to prevent movement of ISR fluids into USDWs.

4.1 Well Inventory

Historical records and field investigations conducted within the 2-km (1.2-mile) AOR were used to develop the well inventory. An initial investigation of the wells was completed in 2007, and additional surveys were conducted in 2011 to evaluate the use and condition of the wells. A total of 109 wells have been identified within the AOR. There also are 27 wells with historical records that currently are not present at the surface and 17 wells with historical records that have been visually confirmed as plugged and abandoned. Appendix A contains the well inventory summary tables, and Appendix B contains the detailed well inventory, well completion records and associated documentation. Plate 3.1 depicts existing wells within the AOR.

Table 1 in Appendix A summarizes the well inventory. Listed wells have one of the following uses:

Domestic: Are currently used or reasonably can be expected to be used for domestic water use (e.g., drinking, washing, sanitary use, etc.), including wells which also are used for livestock watering. This category also includes formerly used domestic wells which through agreements with Powertech no longer will be used as drinking water wells (18 wells)

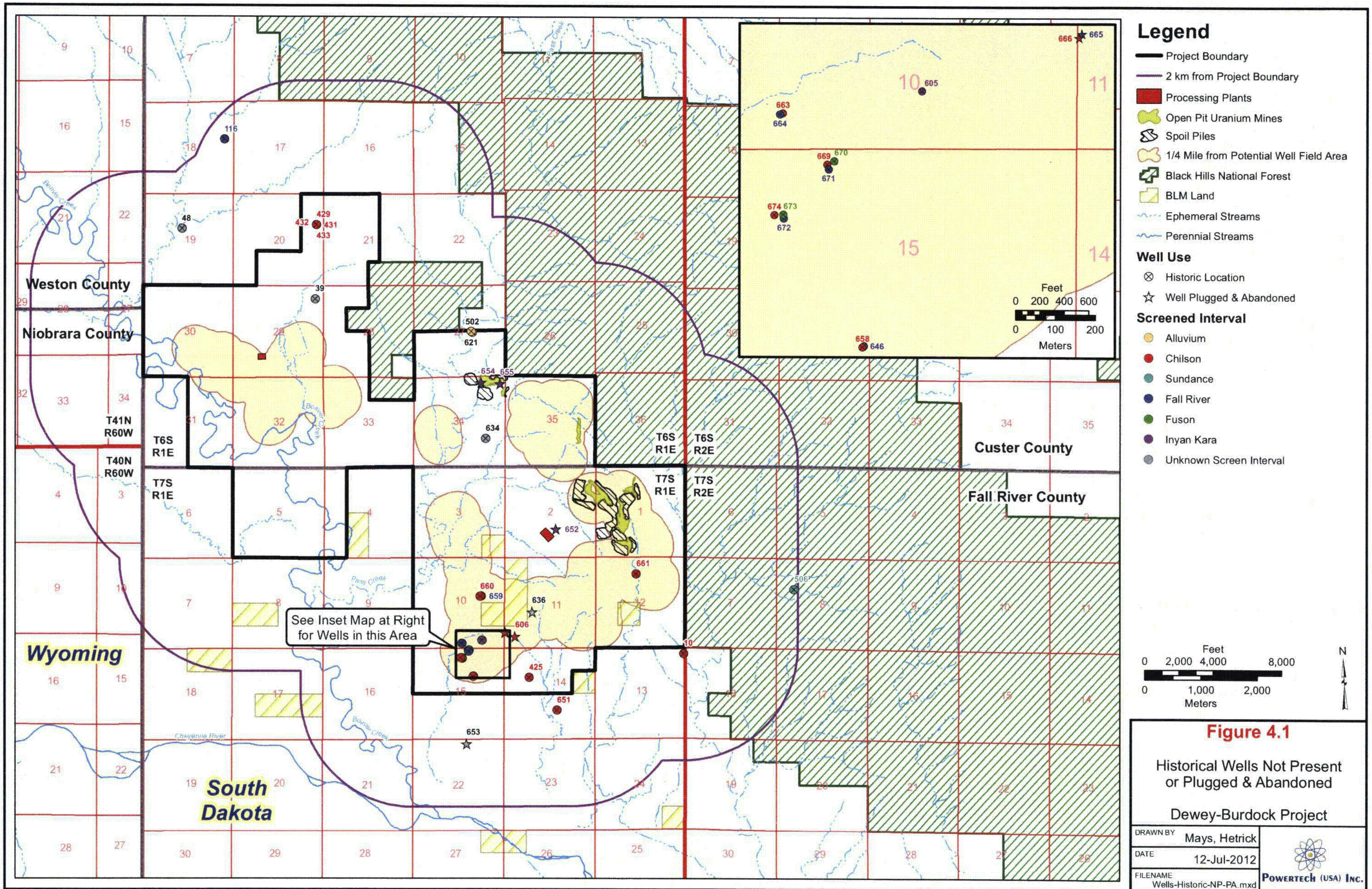
Stock: Watering of livestock is sole use; well cannot be used for domestic water use (i.e., no piping to domestic water system, etc.) (43 wells)

Irrigation: Permitted to be used for irrigation (1 well)

Monitor: Sole use is for monitoring (47 wells)

Table 2 in Appendix A lists the wells identified in historical records that were not evident at the surface during the field investigations. These wells are depicted on Figure 4.1. Several of these wells are suspected of being plugged and abandoned. Powertech will continue to search for these wells. During design of well fields, pump testing will be designed to locate any such wells and to detect any potential impacts from such wells on the ISR operations.

Table 3 in Appendix A lists all of the wells within the AOR that have been confirmed by Powertech to have been plugged and abandoned. Each well was visually inspected, and it has been determined that cement was placed within the well bores.



Legend
Project Boundary
2 km from Project Boundary
Processing Plants
Open Pit Uranium Mines
Spoil Piles
1/4 Mile from Potential Well Field Area
Black Hills National Forest
BLM Land
Ephemeral Streams
Perennial Streams
Well Use
Historic Location
Well Plugged & Abandoned
Screened Interval
Alluvium
Chilson
Sundance
Fall River
Fuson
Inyan Kara
Unknown Screen Interval
Weston County
Niobrara County
Custer County
Fall River County
Wyoming
South Dakota
T41N R60W
T40N R60W
T6S R1E
T7S R1E
T6S R2E
T7S R2E
See Inset Map at Right for Wells in this Area
Feet
0 2,000 4,000 8,000
0 1,000 2,000
Meters
Feet
0 200 400 600
0 100 200
Meters
Figure 4.1
Historical Wells Not Present or Plugged & Abandoned
Dewey-Burdock Project
DRAWN BY Mays, Hetrick
DATE 12-Jul-2012
FILENAME Wells-Historic-NP-PA.mxd
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4.2 Oil and Gas Well Inventory

No formerly producing or actively producing oil and gas wells exist within the project boundary or within the AOR. Within the AOR, the locations of 12 plugged and abandoned oil test wells have been identified, 3 of which are within the project area. The locations of these abandoned test wells are depicted on Plate 3.1.

4.3 Exploration Drill Hole Inventory

As typical of a site proposed for ISR uranium extraction, historical exploration holes are present within the project area. Appendix C summarizes the available information for historical drill holes within one mile of the project area, including TVA and Powertech drill holes. While the exploration drill hole inventory area is slightly smaller than the AOR (1-mile inventory versus 1.2-mile AOR), it extends well beyond the area potentially affected by ISR operations and the area where exploration holes could potentially impact ISR operations. Exploration hole locations are depicted on Figure 4.2.

4.3.1 Evaluation of Potential Discharges to Alluvium through Unplugged Exploration Holes

Powertech performed extensive investigation into all surface water features within the project area. This included field investigations during the initial baseline monitoring period and the use of color infrared (CIR) imagery. All surface water features and sources of groundwater flow to the surface are believed to have been identified within the project area.

With one exception, groundwater discharging to the ground surface is limited to flowing artesian wells, which will be controlled and mitigated as described in the correction action discussed below. The only feature identified that was indicative of groundwater discharge from exploration boreholes at or near surface was the "alkali area" in the southwestern corner of the Burdock portion of the project area (N/2 NE/4 Section 15, T7S, R1E). This is an area of known discharge from the Fall River and Chilson to the surface through abandoned exploration holes documented by TVA. The significance of this area as it relates to ISR operations will be evaluated further after NRC license issuance during delineation drilling and well field-scale pumping tests prior to any well field development.

4.3.1.1 CIR Imagery

To evaluate possible groundwater discharge to the alluvium within the Beaver and Pass Creek drainages, CIR satellite imagery was obtained from the National Agriculture Imagery Program (NAIP) of the USDA Farm Services Agency for the project area and vicinity. The imagery was photographed in 2010 and produced with a resolution of one meter. CIR imagery is commonly used to delineate areas of active vegetative growth; in semiarid regions such as the project area,

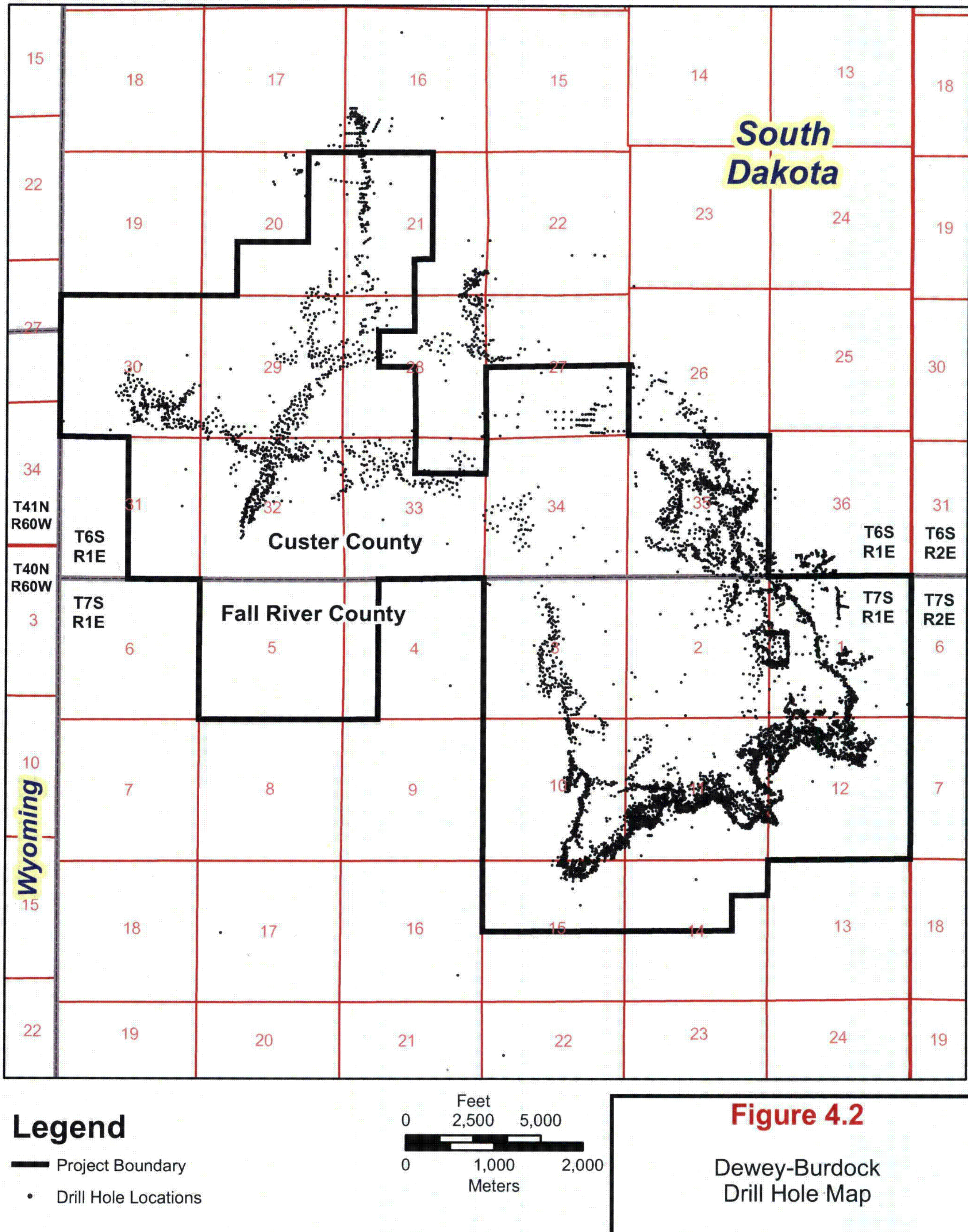

Figure 4.2

Dewey-Burdock Drill Hole Map

Dewey-Burdock Project

DRAWN BY	Bonner, Hetrick
DATE	29-Jun-2012
FILENAME	ExploreDrillHoles.mxd

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such areas are often indicative of enhanced water supply, such as occurs with irrigation or subirrigation.

CIR imagery for the project area and vicinity is presented in Figure 4.3. The CIR imagery was examined visually for any anomalies that may suggest groundwater discharge at or near the surface, such as from upward flow through an open borehole or a natural spring. Within the project area, there are several flowing artesian wells that at times are allowed to discharge groundwater to the surface. These areas are generally visible on the CIR imagery. The alkali area had a noticeable signature on CIR (ponded water surrounded by discolored soil) and is depicted on Figures 4.4 and 4.5.

The CIR imagery clearly shows two springs outside the project area near the town of Dewey along the Dewey Fault (Figure 4.6). These locations were later verified by Powertech personnel and the springs were sampled for water quality analysis. Results of those samples indicate the spring water most closely resembles Fall River water quality; those data clearly distinguish the spring water from the alluvium and Unkpapa. The results of this investigation strongly support the use of CIR data to identify areas of groundwater discharge, and with the exception of the alkali area support the lack of such discharge from exploration boreholes within the project area. Powertech will continue to use CIR imagery to assess the potential for groundwater discharge to the surface or alluvium within the project area. The obvious evidence of groundwater discharge in the alkali area suggests that if similar situations existed at other locations in the project area they would be readily detectable.

4.3.1.2 Potentiometric Surface Evaluation

Powertech also evaluated areas where the potentiometric surfaces of the Fall River and Chilson are above ground surface as an indicator of the potential for groundwater discharge to the alluvium. Those areas within the Beaver Creek and Pass Creek drainages where the potentiometric surfaces for the Fall River and Chilson are above the ground surface are depicted on Figures 4.7 and 4.8, respectively. Note that the potentiometric surfaces are anticipated to be above ground surface to the west and southwest of the areas depicted on Figures 4.7 and 4.8; the boundaries shown in these directions are due to lack of data. The potential for groundwater discharge to alluvium from an operating well field is limited to those areas where the well field overlaps alluvium and the potentiometric surface of the Fall River or Chilson is above the base of the alluvium.

4.3.1.3 Alluvial Drilling Program

An alluvial drilling program was completed in May 2011 to further address potential discharge to alluvium from underlying aquifers. Nineteen borings were drilled into the alluvium along Beaver

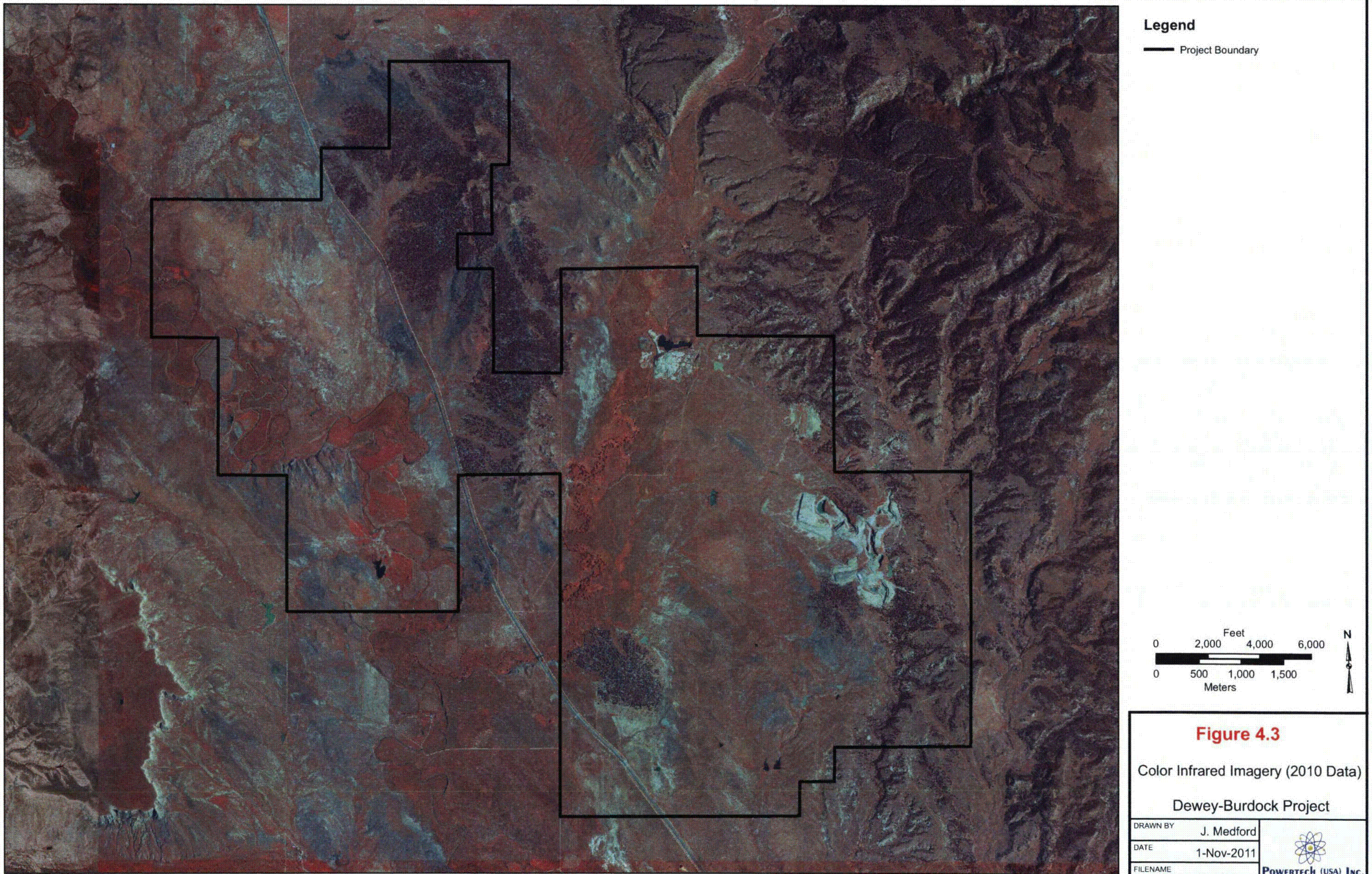

Figure 4.3

Color Infrared Imagery (2010 Data)

Dewey-Burdock Project

DRAWN BY	J. Medford
DATE	1-Nov-2011
FILENAME	2011_DB_Fig_2.7-22.mxd

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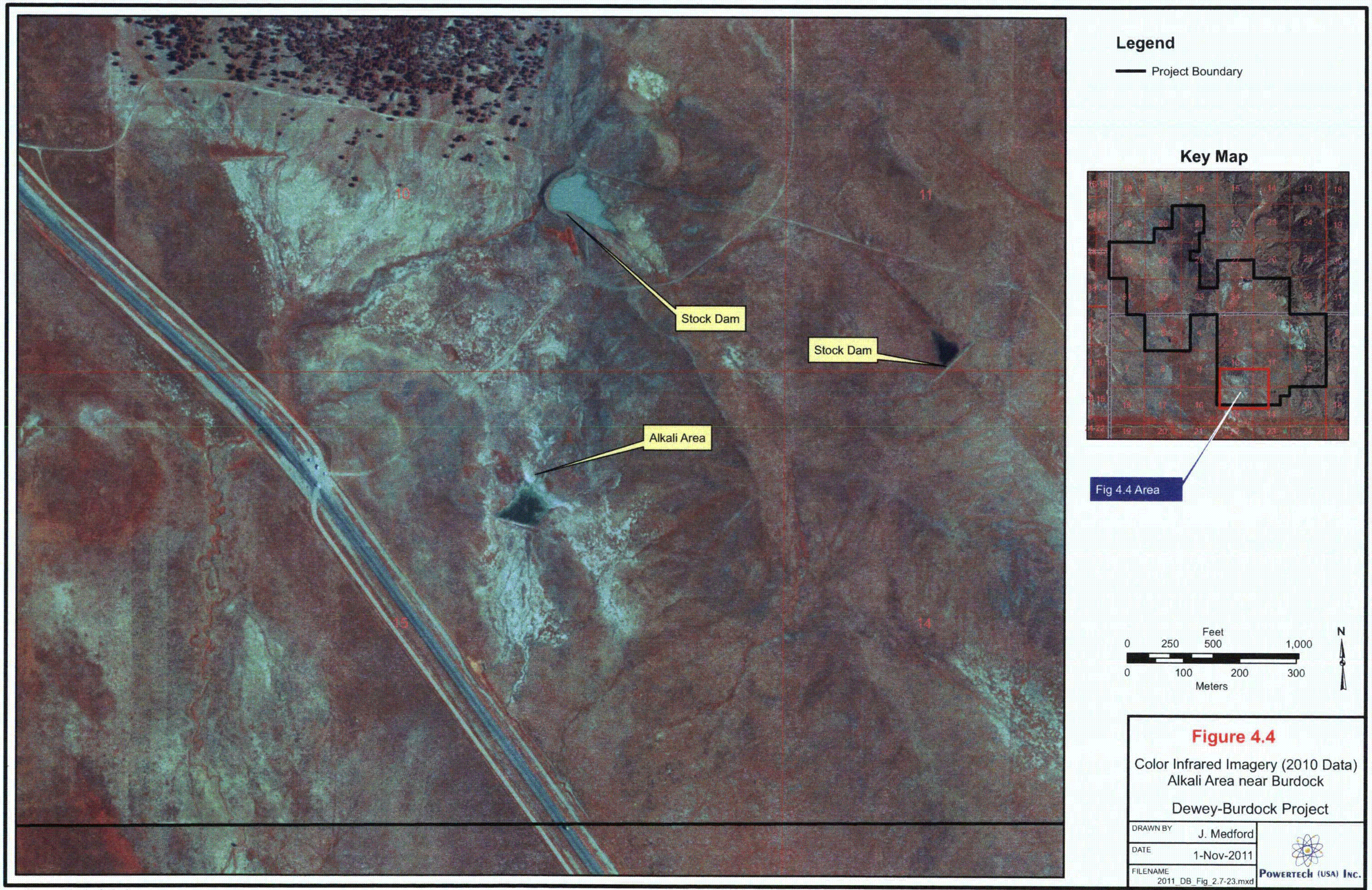

Figure 4.4
Color Infrared Imagery (2010 Data)
Alkali Area near Burdock
Dewey-Burdock Project

Legend

Project Boundary

Key Map

Scale: None

Figure 4.5

Photograph of Alkali Area, Looking South, near Burdock

Dewey-Burdock Project

DRAWN BY	J. Medford
DATE	1-Nov-2011
FILENAME	2011_DB_Fig_2.7-24.mxd

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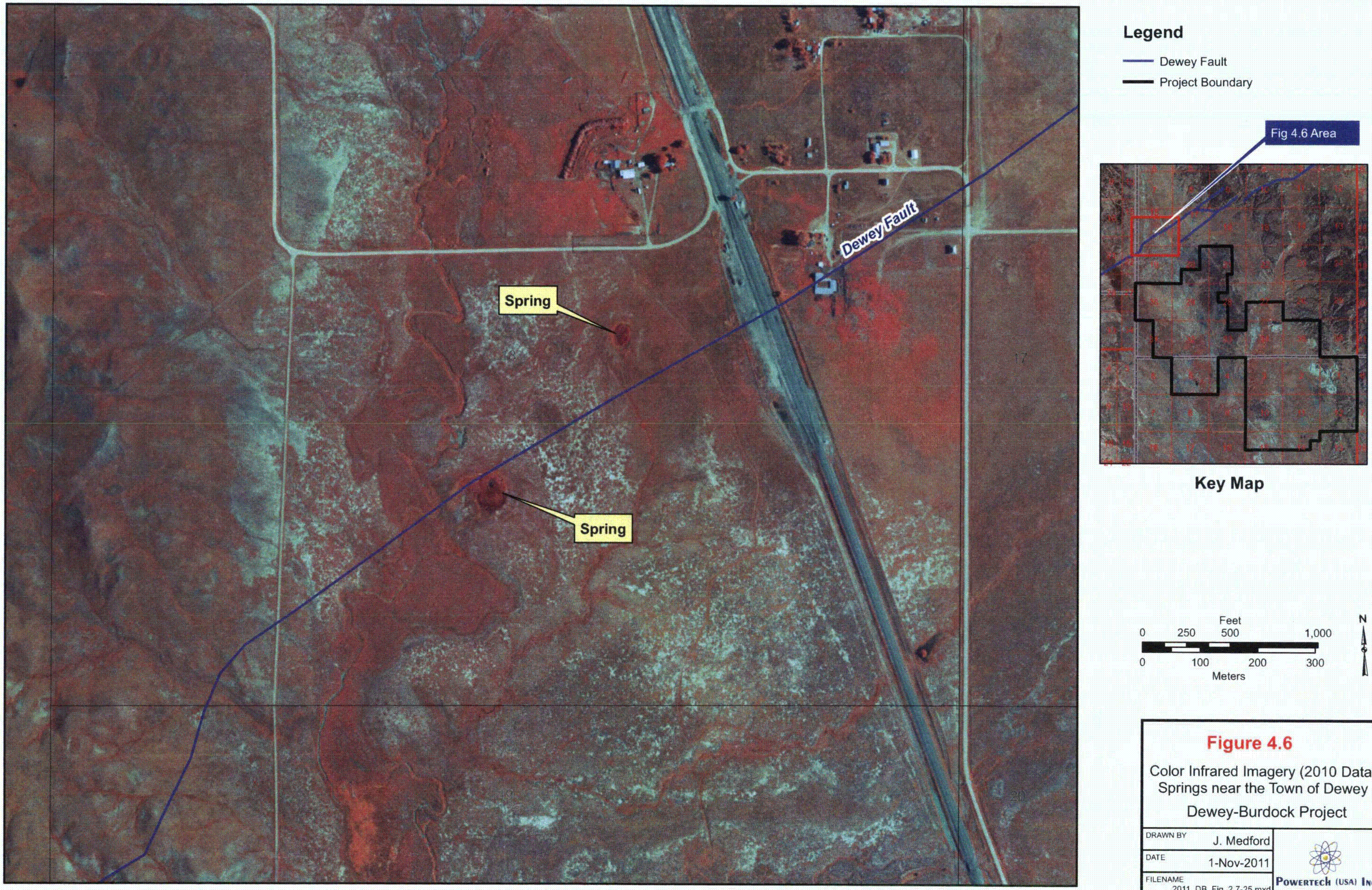

Figure 4.6

Color Infrared Imagery (2010 Data)
Springs near the Town of Dewey

Dewey-Burdock Project

DRAWN BY	J. Medford
DATE	1-Nov-2011
FILENAME	2011_DB_Fig_2.7-25.mxd

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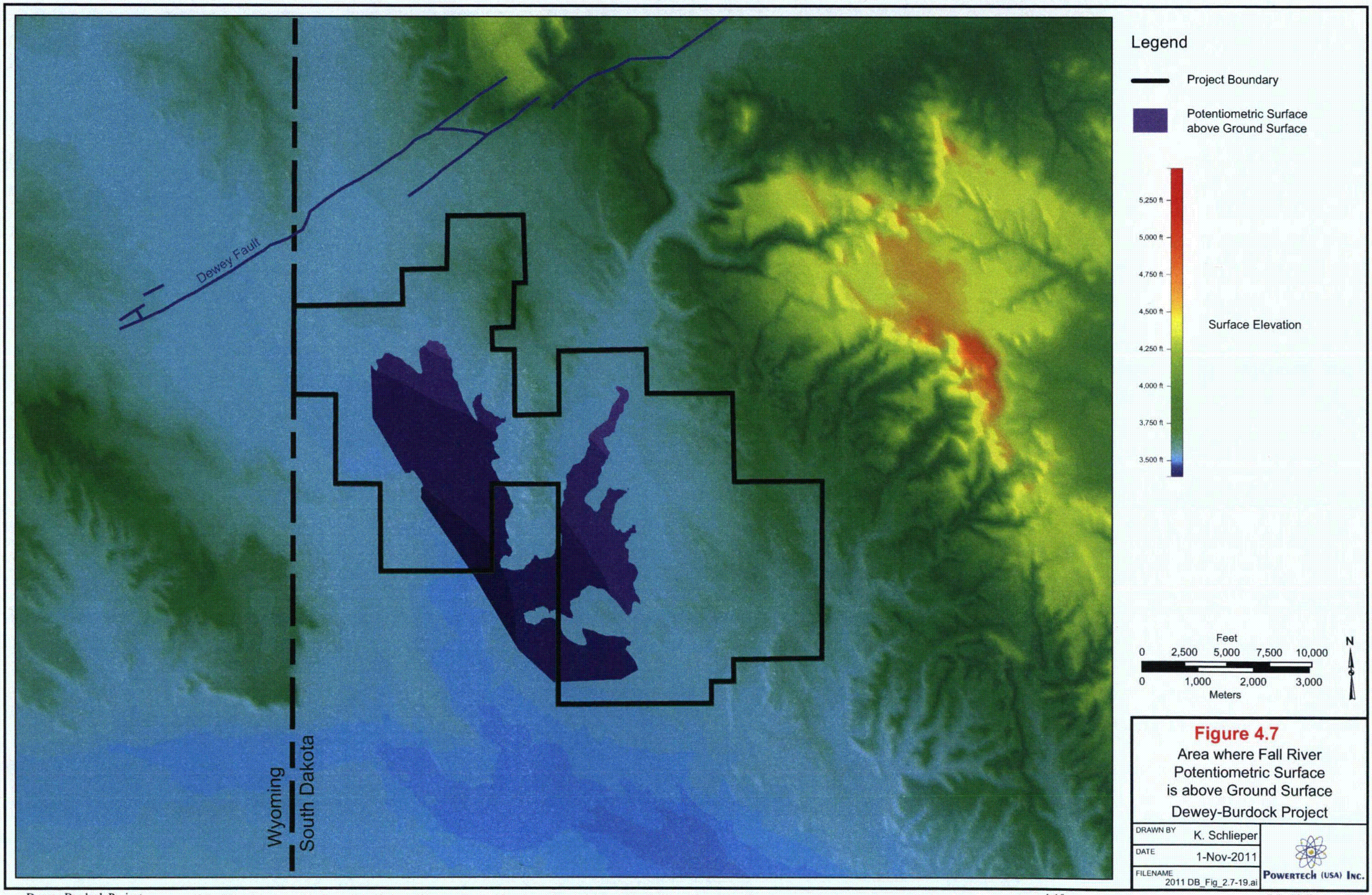

Figure 4.7
Area where Fall River Potentiometric Surface is above Ground Surface
Dewey-Burdock Project

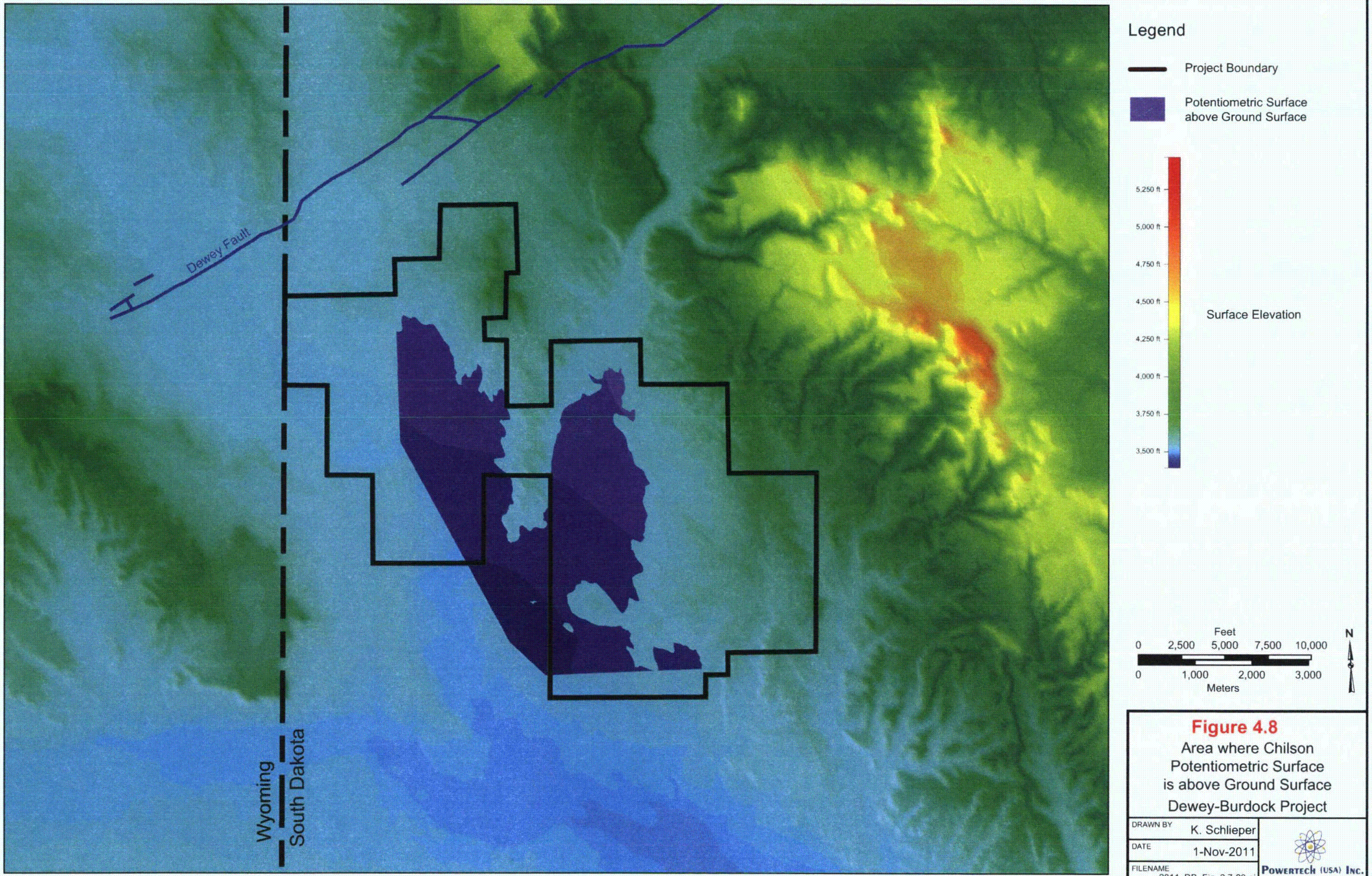

Figure 4.8
Area where Chilson Potentiometric Surface is above Ground Surface
Dewey-Burdock Project

DRAWN BY	K. Schlieper
DATE	1-Nov-2011
FILENAME	2011_DB_Fig_2.7-20.ai

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Creek and Pass Creek, many of which were dry. Three borings were completed as alluvial monitor wells. The thickness of the saturated alluvium at these wells ranged from 10 to 12 feet. The alluvium in the Pass Creek drainage is up to 50 feet thick; in the Beaver Creek drainage, the alluvium is up to 30 feet thick.

Results of the alluvial drilling program (occurrence/lack of water, potentiometric levels and water quality data) did not indicate any areas of discharge to the alluvium from underlying aquifers but rather were consistent with limited recharge occurring from surface waters in the upland portions of the project area. Figure 4.9 depicts the potentiometric surface of the Pass Creek and Beaver Creek alluvium.

The results from the May 2011 alluvial drilling program in the Beaver Creek and Pass Creek drainages are consistent with the historical field observations in that neither the past field investigations nor the recent drilling program identified any areas other than the "alkali area" noted above where there was evidence to suggest groundwater is discharging into the alluvium or at the ground surface from the underlying bedrock formations.

4.3.1.4 Well Field Delineation Drilling and Pump Testing

Further evaluation during the planned delineation drilling and well field-scale pump testing prior to the development of each well field will demonstrate adequate confinement to prevent potential upward groundwater movement through unplugged or improperly plugged boreholes or natural geologic features (refer to Section 8.2.3).

4.4 Corrective Action

Powertech will use the best available information and best professional practices to locate boreholes or wells in the vicinity of potential well field areas, including historical records, use of color infrared imagery, field investigations, and potentiometric surface evaluation and pump testing conducted for each well field as part of the development of well field hydrogeologic data packages (refer to Section 8.2.4) and injection authorization data packages (refer to Section 8.2.5). As with other ISR facilities, Powertech anticipates that some unplugged holes or wells may be encountered during well field development. Consistent with standard industry operating practices and experience, the following describes the procedures Powertech will implement to detect and mitigate any unplugged holes or wells that have the potential to impact the control and containment of well field solutions.

Powertech has committed to NRC to properly plugging and abandoning or mitigating any of the following should they pose the potential to impact the control and containment of well field solutions within the project area (Powertech, 2011):

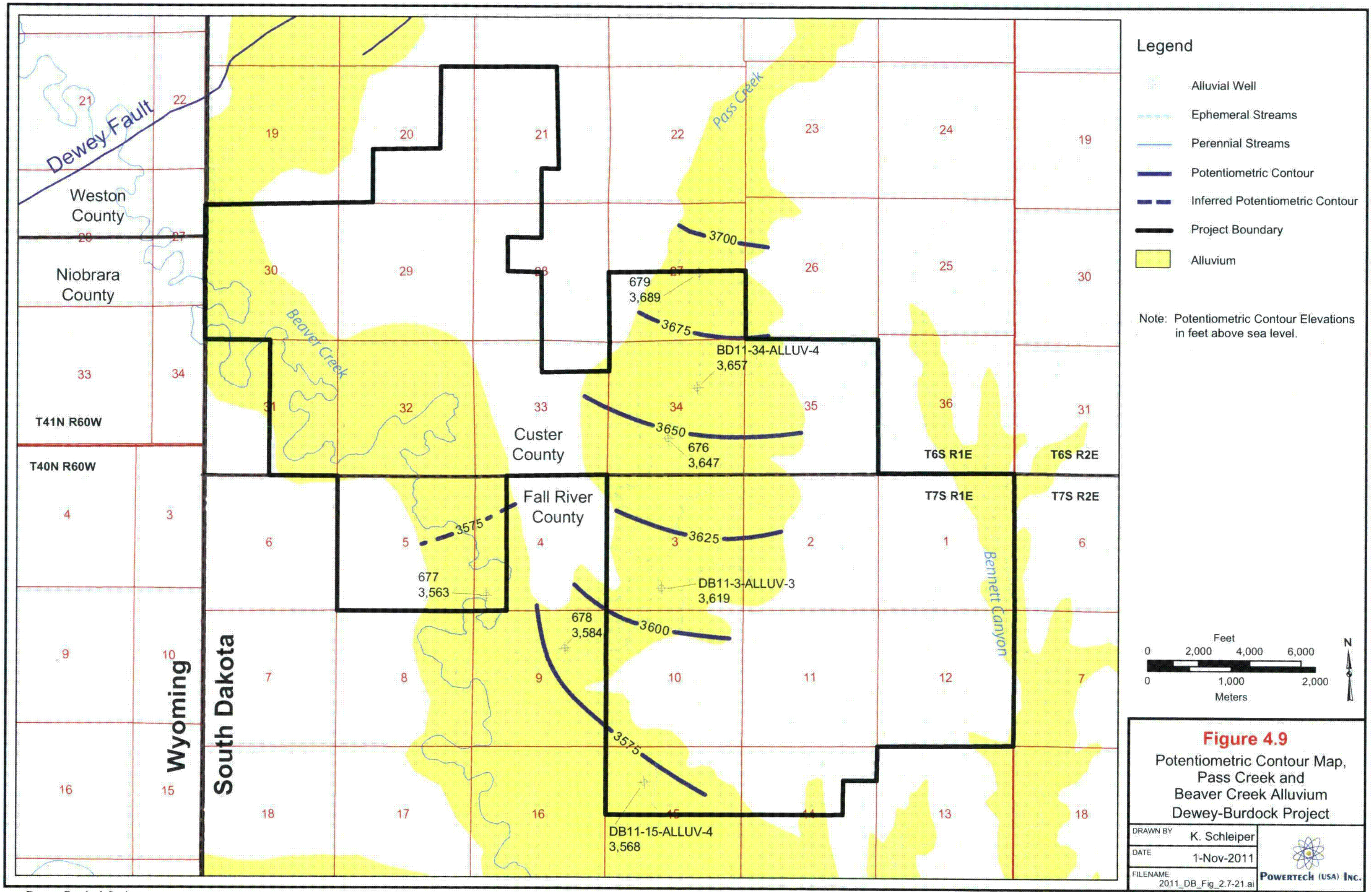

Figure 4.9
Potentiometric Contour Map, Pass Creek and Beaver Creek Alluvium Dewey-Burdock Project

DRAWN BY K. Schleiper
DATE 1-Nov-2011
FILENAME 2011_DB_Fig_2.7-21.ai
POWERTECH (USA) INC.

1) Historical wells and exploration holes
2) Holes drilled by Powertech for the purposes of delineation and exploration
3) Any wells failing mechanical integrity testing (MIT) including those installed by Powertech and those installed before Powertech

Powertech will attempt to locate with best professional practices any presently unknown boreholes or wells in the vicinity of every potential well field. Historical records will be used to determine the presence of previous boreholes and wells. Pump testing conducted as part of routine well field hydrogeologic package development will use an array of monitor wells designed to detect and locate effects of any unknown boreholes or wells. The pump testing also will be designed to provide sufficient hydrogeologic data to demonstrate that the well field design and monitoring systems are sufficient to control and detect any potential excursions. Details of the pump testing program are provided in Section 8.2.3.

Should any drill hole or well at or near potential well fields be suspected of being improperly plugged and abandoned, Powertech will use best professional practices to precisely locate and re-enter the suspected problem hole with a drill rig or tremie pipe. Powertech will evaluate mitigation alternatives including plugging and abandoning the hole or well with grout as described below. Powertech may enter the well with logging equipment prior to plugging and abandoning the well to confirm that the well poses a potential problem.

It is not surprising that there is little evidence of unplugged drill holes in the project area, even though there is a long history of mineral exploration in this area and much of this occurred prior to enactment of modern laws and regulations governing plugging and abandoning drill holes. This is because of the well-known natural tendency of drill holes to seal themselves by collapsing, caving and swelling of the formations through which the holes are drilled. During exploration, drill holes must be logged promptly after drilling in order to minimize the risk of losing logging tools or losing the ability to access the full depth of the holes due to the processes described above. During the pump testing that will be done for each well field, special attention will be paid to known or suspected locations of exploration holes to detect evidence of interaquifer communication that might be the result of unplugged drill holes.

4.4.1 Well Replacement Procedures

During the design of each potential well field, all nearby water supply wells will be evaluated for the potential to be impacted by ISR operations or the potential to interfere with ISR operations. If needed, this evaluation will also include groundwater modeling. The results of the evaluation will be contained within a well replacement plan described in the hydrogeologic data package for each well field.

At a minimum, all domestic wells within the project area and all stock wells within ¼ mile of well fields will be removed from private use, or, at a minimum, removed from drinking water use. Depending on the well condition, location and screen depth, Powertech may continue to use the well for monitoring or plug and abandon the well.

During operations, the monitor well ring will provide advance warning before any wells outside the ring have potential to be impacted. Operational monitoring of existing water supply wells is described in Section 14.3 (Attachment P).

The well owner will be notified in writing prior to removing any well from private use. Powertech will work with the well owner to determine whether a replacement well or alternate water supply is more appropriate. Lease agreements for the entire project area currently allow Powertech to remove and replace water supply wells as needed. The standard language from the lease agreements pertaining to removing wells from private use is provided below. (Note: all lease agreements formerly held by Denver Uranium have been assigned to Powertech.)

> DENVER URANIUM shall compensate LESSOR for water wells owned by LESSOR at the execution of this lease, as follows: Any such water which falls within an area to be mined by DENVER URANIUM, shall be removed from LESSOR's use. Prior to removal, DENVER URANIUM shall arrange for the drilling of a replacement water well or wells, outside of the mining area, in locations mutually agreed upon between LESSOR and DENVER URANIUM, as may be necessary to provide water in a quantity equal to the original well and of a quality which is suitable for all uses the original water well served at the time such well was removed from LESSOR's use.

Replacement wells will be located an appropriate distance from the potential well fields and will target an aquifer outside of the ore zone that provides water in a quantity equal to that of the original well and of a quality which is suitable for the same uses as the original well, subject to the lease agreement and South Dakota water law.

An example of a potential water supply replacement is provided in Figure 4.10, which shows use of the proposed project Madison well to supply water by pipeline to local stock tanks.

4.4.2 Wells to Be Removed from Use

Powertech has committed to NRC to remove all existing domestic wells within the project area from private use prior to ISR operations, or, at a minimum, from drinking water use. Depending on the well condition, location and screen depth, Powertech may continue to use the wells for monitoring or plug and abandon the wells.

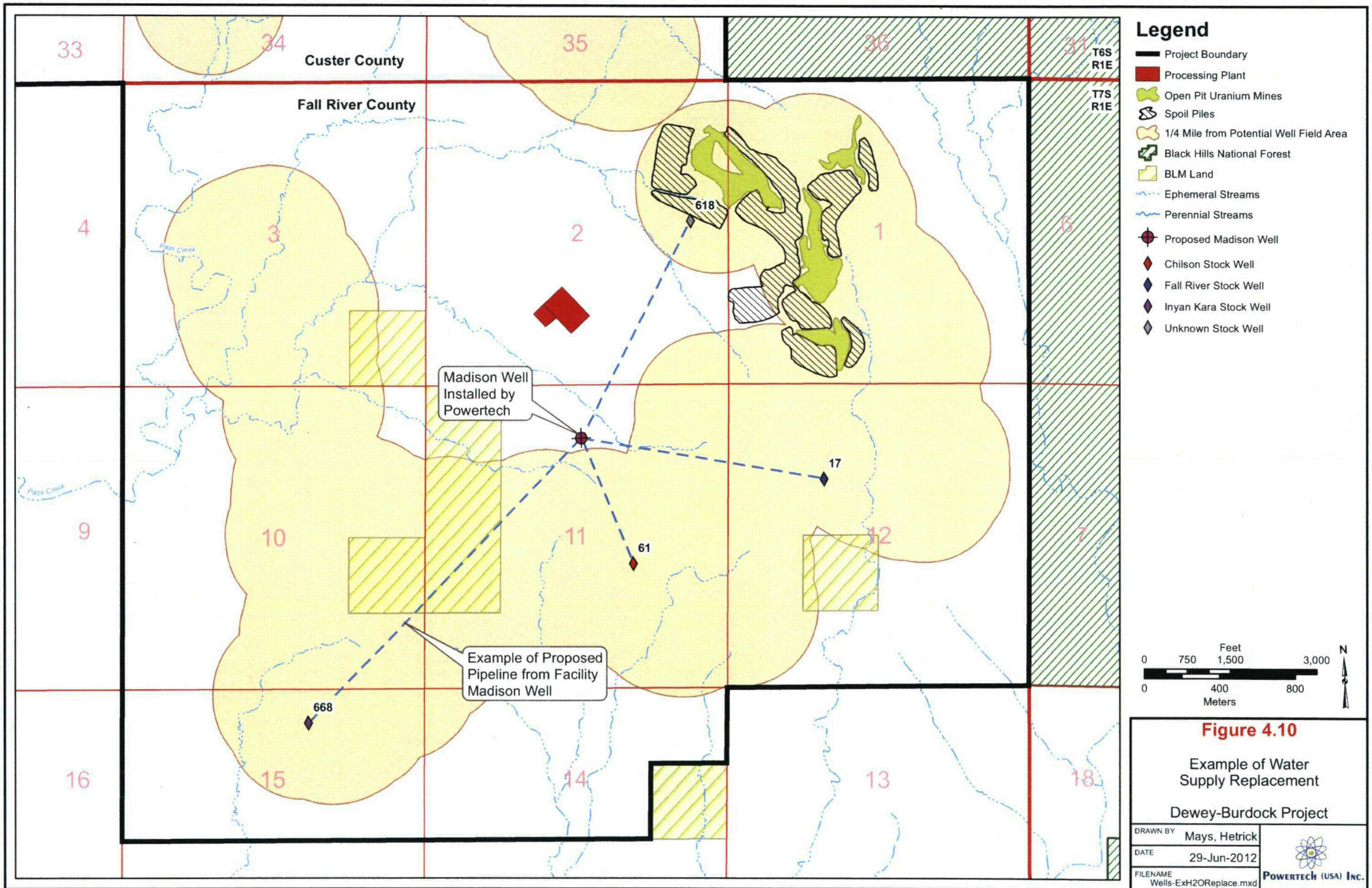

Figure 4.10

Example of Water Supply Replacement

Dewey-Burdock Project

DRAWN BY Mays, Hetrick
DATE 29-Jun-2012
FILENAME Wells-ExH2OReplace.mxd

POWERTECH (USA) INC.

Stock wells within the project area will be evaluated as potential well fields are designed. At a minimum all stock wells that are within ¼ mile of any well field will be removed from private use prior to operation of that well field. In addition, stock wells that could be adversely affected by or could adversely affect ISR operations will be removed from private use.

Figure 4.11 shows the location of all domestic and stock wells currently anticipated to be removed from private use. All of these wells are anticipated to be removed from all private use except well 16, which will be removed from drinking water use as described in Section 17.3.

Prior to ISR operations, Powertech will assume control of all wells within the project area boundary listed as "monitor" in Appendix A, Table 1. These will be secured at the well heads to prevent unauthorized access.

4.4.3 Plugging and Abandonment Procedures

Powertech's standard operating procedures will include plugging and abandoning all boreholes completed during the process of exploration and delineation drilling. Any wells installed by Powertech which fail MIT and cannot be repaired also will be plugged and abandoned. Plugging and abandonment procedures are discussed in Section 15 (Attachment Q).

4.4.4 Mitigation and Avoidance

Boreholes or wells which may potentially impact control of well field operations will be evaluated using pump test data and groundwater modeling. Should it be determined that it is not possible to mitigate potential adverse impacts from any unplugged borehole or well that is discovered, the affected well field will be designed to minimize any potential impacts. The monitoring system will be designed to demonstrate well field control. This may include monitor wells in addition to those provided for normal well field operations.

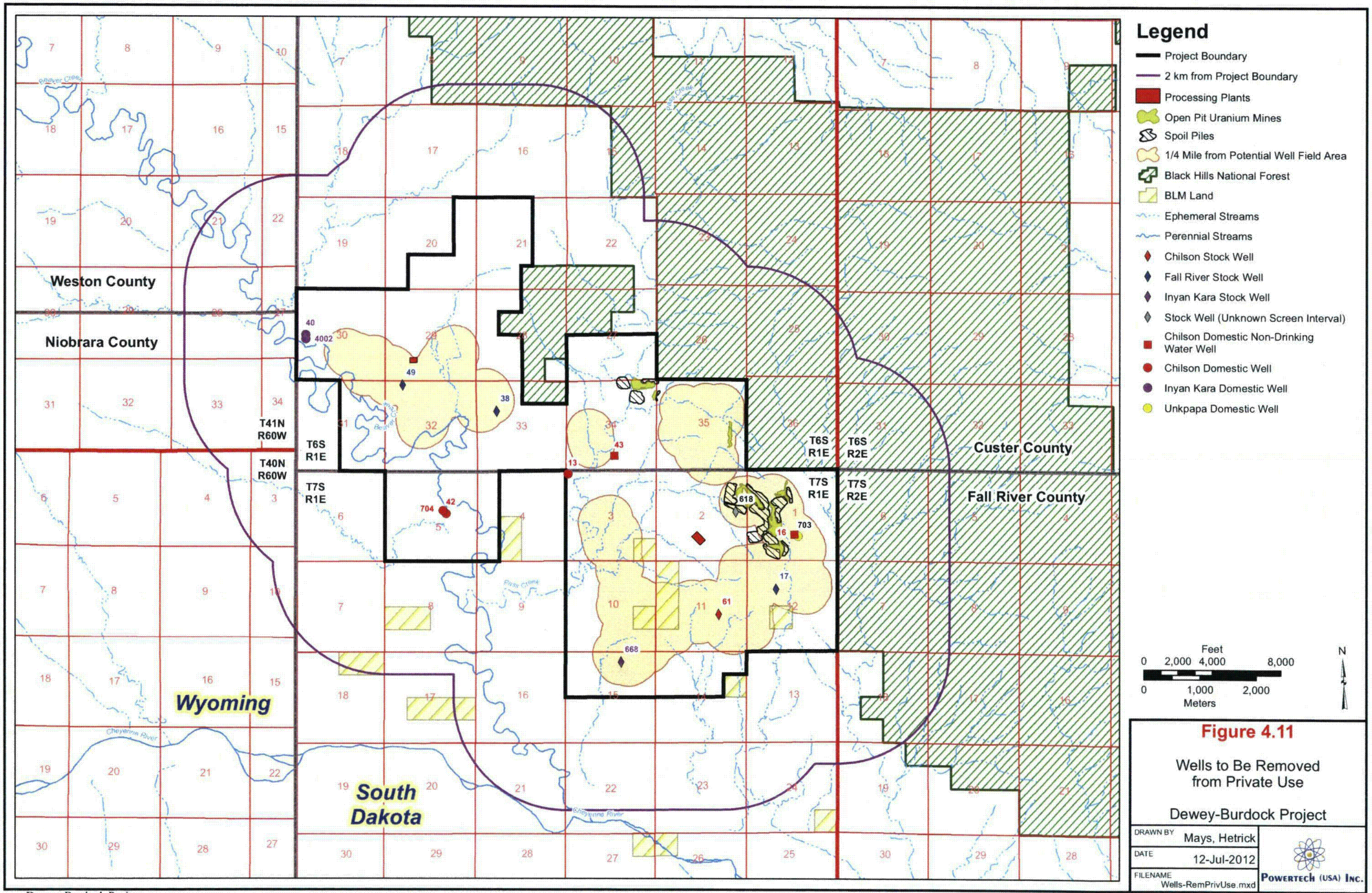

Figure 4.11

Wells to Be Removed from Private Use

Dewey-Burdock Project