


United States Nuclear Regulatory Commission Official Hearing Exhibit	
In the Matter of: POWERTECH USA, INC. (Dewey-Burdock In Situ Uranium Recovery Facility)	
	ASLBP #: 10-898-02-MLA-BD01
	Docket #: 04009075
	Exhibit #: APP-003-00-BD01
	Admitted: 8/19/2014
	Rejected:
Other:	Identified: 8/19/2014 Withdrawn: Stricken:

APP-003

June 20, 2014

**UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION
ATOMIC SAFETY AND LICENSING BOARD**

Before Administrative Judges:

**William J. Froehlich, Chairman
Dr. Richard F. Cole, Special Assistant
Dr. Mark O. Barnett, Special Assistant**

In the Matter of:)	
POWERTECH USA, Inc.)	
(Dewey-Burdock Project)	Docket No. 40-9075-MLA
In Situ Uranium Recovery Facility))	ASLBP No. 10-898-02-MLA-BD01
)	
_____)	

WRITTEN TESTIMONY OF DR. L. ADRIEN HANNUS

TABLE OF CONTENTS

1.	WITNESS BACKGROUND INFORMATION	3
2.	CONTENTION 1A.....	7
2.1	The Level III Cultural Resources Study for the Dewey-Burdock Project Was Conducted to Comply with Established Federal and State Standards and Guidelines for Archeology and Historic Preservation	7
2.2	The Level III Cultural Resources Survey Was Conducted by Experienced and Qualified Personnel	10
2.3	The Level III Cultural Resources Survey Was Adequate for Its Intended Purpose.....	12
2.4	Subsurface Testing Was Performed as Appropriate	13
2.5	Areas Adjacent to Surface Waters Were Surveyed Adequately	15
2.6	The Level III Cultural Resources Survey Considered Past Use of the Project Area	15
2.7	The Level III Cultural Resources Survey Considered All Cultural Sites, Including Potential Burial Sites.....	16
3.	REFERENCES CITED.....	17
	AFFIDAVIT	19

LIST OF TABLES

Table 1.	Subsurface Testing Accomplished on Powertech Sites.....	14
----------	---	----

1. WITNESS BACKGROUND INFORMATION

Q.1. Please state your name, position and employer, including duration of employment.

A.1. L. Adrien Hannus. I have served as the Director of the Archeology Laboratory and Professor of Anthropology at Augustana College in Sioux Falls, South Dakota since 1982. My curriculum vitae is provided as Exhibit APP-004.

Q.2. Please state your education and work experience.

A.2. I have 45 years of archeological experience, specializing in prehistoric and historic cultural dynamics. My educational background includes a Ph.D. from the University of Utah, with an emphasis in archeology, and an M.A. in cultural anthropology from Wichita State University. As a cultural anthropologist, I worked closely in the 1970s with Lakota medicine men John Fire Lane Deer, Bill Schweigman Eagle Feather, and Joe Flying Bye, who bestowed a Sioux name upon me. Teaching and research interests include early human populations in the New World [specifically Clovis], historic Native American cultures of the Plains, and lithic analysis. In addition to accomplishing cultural and archeological fieldwork throughout the Great Plains and Rocky Mountain West, I have collaborated on projects in Egypt, Mexico, France, and Great Britain. I also served as an environmental archeologist in the natural gas industry, working primarily in the Central Plains.

Q.3. Please describe the Archeology Laboratory at Augustana College, including its mission and services provided.

A.3. The Archeology Laboratory (ALAC), established in 1982, is a cultural resource management and archeological research facility based on the campus of Augustana College in Sioux Falls, South Dakota. ALAC also works closely with the anthropology program at Augustana, which emphasizes ecological archeology. ALAC's professional archeologists provide a broad range of cultural resource management, historic, research, and preservation services. The services provided include:

- All phases of Section 106 (National Historic Preservation Act) compliance for both the private and public sectors, including records searches, field surveys, resource identification, National Register of Historic Places evaluation, analysis, and site mitigation.
- Cultural resource compliance to fulfill other federal, state, and local laws or permit requirements.
- Consultations with Native American tribes, the public, other consultants, and governmental offices.
- Development of Memorandums of Agreement.
- Preparation of National Register of Historic Places nominations.
- Description and analysis of a wide range of archeological materials including: stone tools and debitage, ceramics, faunal remains, human skeletal remains, and historic period artifacts.

- Remote sensing and GIS applications.
- Development of museum and interpretive exhibits.
- Editing and preparing of manuscripts for technical report, book, and scholarly journal dissemination.

ALAC has been involved in archeological, paleoenvironmental, ethnohistorical, and historical studies for over 30 years. Our professionals have field experience throughout the Great Plains, Midwest, and Rocky Mountain West. Cultural resource management (Section 106 compliance) projects have been undertaken for a wide variety of public agencies and private sector clients including:

- Local and regional transportation entities.
- Energy and utility companies and cooperatives (e.g., wind, electric, gas, telephone, cell tower).
- Private developers.
- Mining industry.
- Rural water districts.
- State agencies (e.g., South Dakota Department of Game, Fish & Parks, South Dakota State Historic Preservation Office, South Dakota State Historical Society Archaeological Research Center, Department of Transportation).
- Municipalities (e.g., City of Sioux Falls Planning and Public Works, Des Moines Wastewater Reclamation Authority, various city industrial and recreational development projects).
- Federal agencies (e.g., U.S. Army Corps of Engineers, Bureau of Reclamation, Bureau of Indian Affairs, National Park Service, Bureau of Land Management, U.S. Forest Service).

These projects have encompassed a range of activities from smaller-scale literature searches, surveys, and test excavations to multi-year research undertakings and National Register nominations. ALAC's logistical and supervisory skills are well documented, as is timely and efficient completion of projects.

ALAC has also received grants from the South Dakota, Minnesota and Nebraska offices of Historic Preservation, the National Geographic Society, the Burlington Northern Foundation, the Daughters of the American Revolution, the Gannett Foundation, the David B. Jones Foundation and the L.S.B. Leakey Foundation.

In-house laboratory facilities are equipped to accomplish standard procedures. Specialized scientific equipment including high-powered microscopes, a mass spectrometer, and a scanning electron microscope are also available on campus. ALAC maintains an extensive library of books and scholarly journals in addition to an extensive collection of unpublished technical reports. These materials are augmented by holdings at the Center for Western Studies -- a major on-campus archival research center for the Great Plains.

ALAC runs a network of PC and Macintosh computers and laserwriter printers, with access to a campus main frame computer. ALAC maintains equipment and vehicles to outfit multiple survey and testing/mitigation crews. Trimble ProXT and ProXRS systems are used for sub-meter detailed surveying work. Maps are prepared using ArcView 10.1.

Special research interests of ALAC include:

- Interpretation of the 1000-year-old Mitchell Prehistoric Indian Village.
- Studies relating to research conducted within the Missouri River Trench in North and South Dakota.
- Paleoenvironmental reconstruction of the Great Plains through stable isotope analysis (C13) and archeological soils studies.
- Long-range geomorphologic and climatic reconstructions at the Lange/Ferguson (39SH33) Clovis mammoth kill/butchering locality in southwestern South Dakota.
- Synthesizing the prehistory of the Lower and Upper Big Sioux archeological regions in South Dakota.
- Study of settlement patterns in relation to drainages in general.

Q.4. Please describe the qualifications of ALAC personnel and denote which personnel had responsibilities on the Dewey-Burdock Project.

A.4. Please refer to A.1 and A.2 of this written testimony for a summary of my educational background and work experience. Following are synopses of ALAC personnel. Personnel with responsibilities on the Dewey-Burdock Project are designated with an asterisk (*).

Linda Palmer, M.A. – Project Manager, Field Director (Portion of Testing), Senior Archeologist, Primary Report Preparator*

Linda Palmer completed her M.A. in Anthropology at the University of Nebraska- Lincoln in 2001. She became a fulltime staff member at the Archeology Laboratory in 1997 and brings over 25 years of professional and avocational experience in Plains archeology to her position as senior archeologist. She also worked in Section 106 review and compliance while with the South Dakota State Historic Preservation Office. Palmer has acted as PI and Field Director on numerous projects, and routinely authors reports. Her areas of research and special interest include cultural resources management, human osteology, and Central and Northern Plains archeology.

Austin A. Buhta, M.A. – Staff Archeologist

Buhta received his B.A. in Anthropology (archeology emphasis) from the University of Minnesota, Twin Cities, and his M.A. in Maritime Archeology and History from the University of Bristol, United Kingdom. Buhta joined the staff of the Archeology Lab in 2005, and brings a strong background in archeology as well as museum techniques. He is well-grounded in electronic survey and mapping techniques and has strong report writing and computer skills. Buhta also has extensive experience with archival research and description and analysis of a broad array of material culture types.

Edward J. Lueck, M.A. – Senior Archeologist

Lueck has participated in a multitude of cultural resource surveys throughout the Plains region, with a focus on the Central Plains/Middle Missouri and bordering areas. He has authored and co-authored numerous reports and has conducted many detailed literature and records searches. He has also served as PI and Field Director on numerous projects. He obtained his M.A. from the University of Nebraska, Lincoln. His areas of research and special interest include cultural resources management, mortuary analysis, and Central and Northern Plains archeology.

Jason M. Kruse, B.S. – Crew Chief (Survey, Portion of Site Testing), Staff Archeologist/GIS Specialist*

Kruse has worked as a field archeologist and GIS/GPS specialist throughout the Great Plains for almost 20 years. Kruse has broad experience in directing archeological field crews, analyzing artifacts, and writing Section 106 compliance reports. He has worked closely with Native American monitors on projects with tribal concerns. In 2004-2005, he worked as crew chief and GIS Specialist for the Cheyenne River Sioux Tribe during a Level III cultural resources inventory of 40,000 acres along the Missouri River. He has responsibility for maintaining ALAC's GIS system. Kruse earned a B.S. degree in anthropology from the University of South Dakota and is currently finishing course work for the master's degree. He recently served as field director and co-author of reports for several large-scale NeSHPO-sponsored projects.

Timothy V. Gillen, B.S. – Crew Chief (Survey), Staff Archeologist*

Gillen has been a member of the ALAC team since earning a B.S. degree in Anthropology from Kansas State University in 1990. He has directed and conducted all aspects of fieldwork, including work on a multitude of large scale survey and testing projects. He also undertakes public education and outreach activities for ALAC. He is skilled on both Macintosh and Windows operating systems and is competent with a variety of software, including word processing, spreadsheet, data management, accounting, and GIS survey and mapping programs. His research interests have focused on faunal and lithic analysis and developing a comparative faunal collection for ALAC.

Lynette Rossum, M.S. – Administrator and Technical Editor*

Rossum manages all administrative aspects of the ALAC operation and also serves as publications editor. She has also completed both academic and field training in archeology. She has participated in numerous field projects and undertakes various aspects of laboratory work. She completed an M.S. in Administrative Studies from the University of South Dakota in 1995. Rossum has served as administrator on a multitude of SHPO-sponsored projects in Nebraska, Minnesota, and South Dakota for over 30 years, many of which required matching fund documentation. Rossum is a founding member of the ALAC team and has managed all administrative aspects of the operation for over 30 years. She is experienced at grant writing and report preparation, and is Associate Editor of *South Dakota Archaeology*.

Q.5. Please provide examples of representative ALAC projects.

A.5. Exhibit APP-005 describes the client, date and scope of representative ALAC projects.

2. CONTENTION 1A

2.1 The Level III Cultural Resources Study for the Dewey-Burdock Project Was Conducted to Comply with Established Federal and State Standards and Guidelines for Archeology and Historic Preservation

Q.6. Please describe what professional standards were used by ALAC in the cultural resources survey conducted for the Dewey-Burdock Project.

A.6. The survey, documentation of sites, site evaluations, and technical reports were conducted according to the state-of-the art criteria for performing Level III cultural resources surveys and to comply with established federal regulations and guidelines including Advisory Council on Historic Preservation (ACHP) Section 106 Regulations (ACHP 2006, provided as Exhibit APP-006) and National Park Service (NPS) Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation (NPS 1983, provided as Exhibit APP-007). They were also conducted to comply with state standards and guidelines for archeology and historic preservation (SHPO 2005, provided as Exhibit APP-008). The basic guidelines to meet federal standards are summarized below:

Archival Research

Archival or background research is generally undertaken prior to any field survey.

Field Survey

The variety of field survey techniques available, in combination with the varying levels of effort that may be assigned, give great flexibility to implementing field surveys. It is important that the selection of field survey techniques and level of effort be responsive to the management needs and preservation goals that direct the survey effort.

Intensive survey is most useful when it is necessary to know precisely what historic properties exist in a given area or when information sufficient for later evaluation and treatment decisions is needed on individual historic properties. Intensive survey describes the distribution of properties in an area; determines the number, location and condition of properties; determines the types of properties actually present within the area; permits classification of individual properties; and records the physical extent of specific properties. An intensive survey should document:

1. The kinds of properties looked for;
2. The boundaries of the area surveyed;
3. The method of survey, including an estimate of the extent of survey coverage;
4. A record of the precise location of all properties identified; and

5. Information on the appearance, significance, integrity and boundaries of each property sufficient to permit an evaluation of its significance.

Reporting Identification Results

Reporting of the results of identification activities should begin with the statement of objectives prepared before undertaking the survey. The report should respond to each of the major points documenting:

1. Objectives;
2. Area researched or surveyed;
3. Research design or statement of objectives;
4. Methods used, including the intensity of coverage. If the methods differ from those outlined in the statement of objectives, the reasons should be explained.
5. Results: how the results met the objectives; result analysis, implications and recommendations; where the compiled information is located.

A summary of the survey results should be available for examination and distribution. Identified properties should then be evaluated for possible inclusion in appropriate inventories.

ALAC conducted a Level III cultural resources survey as defined by the South Dakota SHPO based on the federal standards:

Level III: 100 Percent survey. Level III surveys require a visual inspection of the project APE [Area of Potential Effect]. Survey transects must be no more than 30 meters (100 feet) apart. The report must explain survey methods and the rationale for their use, for instance, why the archaeologist did or did not conduct subsurface testing [Exhibit APP-008 at 9].

Q.7. Please describe how the Level III cultural resources survey was performed.

A.7. ALAC conducted a Level III, 100 percent pedestrian survey (visual inspection) of the entire project APE. The initial survey (approximately 10,310.97 acres) was conducted during 2007 with additional survey (approximately 1300 acres) and site testing/evaluation (18 sites) in 2008, and site testing/evaluation (20 sites) in 2011. The APE was demarcated by Powertech personnel prior to field investigations. ALAC was provided with satellite imagery and USGS 7.5-minute series 1:24,000 scale topographic quadrangle maps highlighting the proposed project area and those land parcels requiring investigation.

The survey was conducted by means of parallel linear transects maintaining distances of 30 m (98.43 ft) or less between field personnel as mandated by the state (Exhibit APP-008 at 9). The area was in, and had been in, a drought, which resulted in excellent visibility of the ground surface due to scant vegetation. When sites were discovered, transect spacing was reduced from 30 meters down to five meters or less – in some cases finger-tip to finger-tip (approximately two

meters). The reduction in transect spacing was utilized to more effectively identify and record cultural material and features on the surface and to determine site boundaries. All cultural features, most artifacts observed at a site, and the site boundaries were plotted with the GPS. All cultural features discovered during the phases of field work were documented by photographing, GPS polygon, polyline, or point plotting, and full documentation in field notebooks.

In certain circumstances, an adjustment to the survey strategy was necessary in order to allow for a more detailed examination of areas possessing higher site location potential. Such locales included surfaces or landforms in an advanced erosional state (e.g., cutbanks, blowouts, ditches, animal/vehicle trails, rodent burrows), as well as those situated upon high terraces/terrace remnants above major established waterways. Survey transects in those locales were reduced to 10-15 m intervals.

The number of personnel in the field varied from session to session ranging from four to 11 during the survey in 2007 and from three to four during the survey and site testing in 2008 and 2011. At all times, the crew included a professional archeologist as crew chief.

Q.8. Please summarize the Level III survey results.

A.8. The Level III survey in 2007 documented 161 new archeological sites and relocated/revisited 26 previously recorded sites. Five historic standing structures and one bridge were also documented. ALAC recommended 97 archeological sites and two standing structures as not eligible for NRHP listing; three archeological sites and three standing structures were determined eligible for listing in the NRHP by the SHPO; and 87 archeological sites and the bridge needed further testing/evaluation.

The Level III additional survey in 2008 documented 29 new archeological sites. ALAC recommended 18 of these sites as not eligible for listing in the NRHP and further testing/evaluation for the other 11 sites.

Q.9. Please compare the Dewey-Burdock Project survey results with other Level III surveys performed by ALAC.

A.9. In the southwestern part of South Dakota, ALAC's most directly comparable surveys to the D-B survey include those conducted for the National Park Service in Badlands National Park in 1998 and 1999 and for GCC Dacotah Cement in 2000.

The Badlands survey (Hannus et. al 2003) covered approximately 6,500 acres; 163 new archeological sites were documented and nine previously recorded sites were relocated/ revisited. The project survey scope did not call for evaluation of any of the sites.

The GCC Dacotah Cement survey (Winham et. al 2001) covered approximately 3,600 acres and 197 sites were recorded. ALAC recommended 68 of the properties as eligible or potentially eligible (needing testing/evaluation). The remaining 129 sites were recommended as not eligible for listing.

ALAC also completed a Level III survey for the proposed DM&E railroad Powder River Basin expansion in Custer, Fall River, and Pennington counties, SD, in 2006 and 2007. Thirty

new sites were recorded along the narrow corridor and 20 sites were evaluated (Buhta and Kruse 2008).

ALAC has successfully completed numerous other large-scale surveys in South Dakota, Nebraska, and Minnesota (see Exhibit APP-005 for a select sample).

2.2 The Level III Cultural Resources Survey Was Conducted by Experienced and Qualified Personnel

Q.10. How do you respond to the allegation that “[t]he only Class III level archeological survey conducted in this case is the original survey by the students at Augustana College” (OST 2014 at 6)?

A.10. It is a blatant falsehood to imply that ‘Augustana students’ were responsible for conducting the survey and testing.

The qualifications of persons who supervised and conducted the Level III survey and testing are:

Principal Investigator

L. Adrien Hannus, Ph.D., Anthropology, University of Utah, see synopsis above and vita, 45 years experience

Project Manager/Field Director (Testing)/ Primary Report Preparator

Linda Palmer, M.A., Anthropology, University of Nebraska, Lincoln, see synopsis above, over 25 years experience

Crew Chief (Survey and some testing)

Jason Kruse, B.S., Anthropology, University of South Dakota, M.S. in progress, see synopsis above, almost 20 years experience

Crew Chief (Survey)

Tim Gillen, B.S., Anthropology, Kansas State University, see synopsis above, 24 years experience

Project Administrator and Technical Scientific Editor

Lynette Rossum, M.S., University of South Dakota, see synopsis above, 35 years experience

The qualifications of the field crew (composition of crew varied during course of the multi-year project) are:

William Ranney, M.A., University of Kansas, over 30 years experience

Edward Lueck, M.A., University of Nebraska, Lincoln, over 30 years experience

Linda Palmer, M.A., Anthropology, University of Nebraska, Lincoln (see above, participated in some survey and directed some testing), over 25 years experience

Alvin Grassrope, Lower Brule Sioux Tribe, some prior field experience as a tribal monitor for Burns & McDonnell and then ALAC on DM&E Railroad survey

Landon Karr, B.A. International Studies & Spanish; archeological field experience since 2005; now has Ph.D. in anthropology and teaches at Augustana College

Jessica Kleinschmidt, B.A., History & Anthropology, University of South Dakota 2007, with field experience at the University of SD and ARC since 2004

Andrew Ericson, B.A. Anthropology, Mercyhurst College, archeological field experience from 2001, including work for Denver Museum of Nature and Science

Juanita Short, archeological field experience beginning in 1990, previous employee of State Archaeological Research Center and Archaeological Technician for U.S. Forest Service from 1999-2005

Kayla Wiechmann, B.A., Augustana College, History & Anthropology with prior work experience for ALAC (began Powertech survey as a senior at Augustana; worked on testing after earning M.A. in Museum Studies from Johns Hopkins)

Carleton Bates, ALAC employee and former Augustana anthropology student, archeological field and lab experience beginning in 2001

Ed Fosha, part time ALAC employee with archeological field experience beginning in 1992; previously employed by State Archaeological Research Center and Bighorn National Forest

Amy Godsell, B.A., Augustana College, Anthropology, with field school, ALAC employee with prior experience

Morgan Tucker, B.A., Augustana College, Anthropology, with field school, ALAC employee with prior experience

Ellie Kunkel, Augustana College anthropology student with some prior field experience with ALAC

Laci Paul, anthropology student from University of South Dakota; recommended by Dr. Richard Fox, in whose archeology lab she worked

Q.11. Please describe the procedures used to conduct the field surveys and supervise field personnel.

A.11. Field work was generally done in ten-day sessions. Two days were used for travel and eight days (eight hours per day) were spent in the field surveying and/or testing sites. Eight field sessions were accomplished in 2007, eight in 2008, and five in 2011. Crew chiefs and field crew members varied throughout the sessions (see above), but the crew members at all times were under direct supervision of a qualified crew chief in the field. Debriefing and planning meetings

were held at ALAC at the beginning and end of each field session with the PI, project manager, crew chiefs, and project administrator. Regular phone and email communication was maintained during field sessions between crew chief and other supervisory personnel.

All cultural features discovered during the phases of field work were documented by photographing, GPS polygon, polyline, or point plotting, and full documentation in field notebooks (including detailed description, measurements, condition). Time to record specific features on a site could range from a half hour for a site with a single feature to several days, depending on the size and complexity of the site and the number of features within the site boundaries. All features were recorded under the direct supervision of the crew chief.

Q.12. Please respond to the allegation that the cultural resources survey was inadequate because it was not conducted by a Native American Tribe.

A.12. As previously stated above, the 100 percent survey, documentation of sites, site evaluations, and technical reports were completed by ALAC in compliance with established federal (ACHP 2006, NPS 1983) and state standards and guidelines for archeology and historic preservation (SHPO 2005). The data and documentation have been made available for review. The fact that the tribe did not conduct the study does not mean that an adequate archeological study was not completed by qualified investigators.

Q.13. Please respond to the allegation that the Sioux tribes visited the project area in June 2011 and showed the NRC sites that had been missed by its archeological consultants (Yellow Bird Steele 2012 at 2).

A.13. ALAC personnel were present during the tour in June 2011, which visited only sites that ALAC had previously recorded. If other sites were pointed out to NRC at that time, no one informed ALAC of it. The only instance involving ALAC was when a tribal member pointed out a “cairn” on a recorded site and asked if it had been recorded. (It had been recorded and also was later tested and determined to be rocks recently piled there by the current landowner.) At the same site with hearth feature remnants, it was clear that the majority of the group did not understand or recognize the eroding hearth features; they both walked across and stood on top of the features along the low ridge, and had to be asked to please not stand on them.

It might be worth noting, also, that the rapidly eroding, changing landscape will affect the status of archeological sites. Some previously recorded sites could, and have, literally disappeared and new sites could be exposed within a fairly short time frame.

2.3 The Level III Cultural Resources Survey Was Adequate for Its Intended Purpose

Q.14. How do you respond to the allegations that the proposed site has not yet been adequately surveyed with regard to its potential cultural resources; a significant number of archeological, historical, and traditional cultural resources on site have not been evaluated; a number of sites were found to be unevaluated and needing further work; and these sites cannot be counted as

either ineligible or eligible for inclusion on the NRHP (i.e., CI 2013 at 3, 6, OST 2013 at 5, Redmond 2010b)?

A.14. ALAC has surveyed the entire project area (100 percent pedestrian) and documented the prehistoric and historic archeological sites. It is true that there are a number of sites that have not yet been evaluated to determine NRHP eligibility status. ALAC stated in its original report (Kruse et al. 2008, provided as Exhibit APP-009 at 7.18) that the eligibility status of a number of sites had not been determined and suggested a “phased identification and evaluation” approach as allowed under 36 CFR Part 800.4 [6] [2]. It is ALAC’s understanding that the sites will be evaluated and, if necessary, mitigated in phases prior to any additional areas being opened for mining or construction as set forth in the Programmatic Agreement (PA). ALAC can only evaluate archeological sites for NRHP eligibility; we have no way to evaluate traditional cultural properties or “tribal sites.”

As a result of the Level III survey in 2007 ALAC recommended 97 archeological sites and two standing structures as not eligible for NRHP listing; three archeological sites and three standing structures were determined eligible for listing in the NRHP by the SHPO; and 87 archeological sites and the bridge needed further testing/evaluation. Based on the additional survey in 2008, ALAC recommended 18 sites as not eligible for listing in the NRHP and further testing/evaluation for the other 11 sites. Since that time, NRC, the SHPO, and the tribes have had further discussion concerning final determinations. Those determinations are the official determinations at this point in the process, whether or not they differ from ALAC’s recommendations. It is our understanding that those final determinations are listed in the PA.

2.4 Subsurface Testing Was Performed as Appropriate

Q.15. How do you respond to the allegation that no subsurface testing has been done (e.g., Redmond 2010a, b and Redmond 2014)?

A.15. This statement is inaccurate. Subsurface testing was performed as shown in Table 1.

Q.16. Please explain how it was determined whether to conduct subsurface testing.

A.16. The erosion is so severe in much of the project area that in many cases a very limited number of tests reveals that there is virtually no intact soil and, therefore, the site has no integrity and is not eligible. If the artifacts are lying on exposed shale or bedrock, it is obvious there is no intact soil, and no testing should be necessary. If there is intact soil, only enough testing is done to establish whether there are intact subsurface cultural deposits or features that make the site capable of producing data important to address research questions within a particular historic context.

Table 1. Subsurface Testing Accomplished on Powertech Sites.

Site #	Year	Shovel Tests	50-x-50-cm Excavation Units	50-x-100-cm Excavation Units	50-x-150-cm Excavation Units	50-x-200-cm Excavation Units	1-x-1-m Excavation Units	Backhoe Trench
39CU251	2011	16					1	
39CU560	2008	1					1	
39CU3567	2008	6					3	
39CU3571	2008	4		1			1	
39CU3572	2008	11						
39CU3583	2008	17	1				3	
39CU3584	2008	20		1		1		
39CU3592	2008	2			1		4	
39CU3598	2008	6						
39CU3608	2011	2					1	
39CU3774	2011	7						
39CU3818	2008	9						
39FA96	2011	44					20	
39FA97	2008						2	
39FA251	2011	5					1	
39FA272	2011	11						
39FA273	2011	20						
39FA557	2011	1	1				3	
39FA584	2011	9						
39FA1869	2011	8						
39FA1885	2007 2008	1						1
39FA1887	2011	21		1				
39FA1891	2008	2						
39FA1893	2008	4						
39FA1894	2008	4						
39FA1895	2008	10		4			2	
39FA1898	2011	9						
39FA1901	2011	8						
39FA1905	2011	2						
39FA1907	2011	16						
39FA1908	2011	15						
39FA1909	2008	4						
39FA1911	2008	2					4	
39FA1914	2008	5						
39FA1916	2011	12						
39FA1941	2007 2011	4 35		1			4	
39FA1944	2007 2011	1 2						
39FA1953	2008	1						
39FA1954	2008	4						
39FA1955	2008	5						
39FA1957	2008	4						
39FA1958	2008	2						
39FA1959	2008	6						
39FA1961	2008	13						

Table 1. (Continued)

Site #	Year	Shovel Tests	50-x-50-cm Excavation Units	50-x-100-cm Excavation Units	50-x-150-cm Excavation Units	50-x-200-cm Excavation Units	1-x-1-m Excavation Units	Backhoe Trench
39FA1962	2008	20						
39FA1963	2008	1						
39FA1964	2008	6						
39FA1965	2008	1						
39FA1966	2008	7						

Q.17. Please address whether future subsurface testing may be required by the PA.

A.17. That is addressed in the PA. Refer also to A.14 of this written testimony, which describes how ALAC recommended a phased identification and evaluation approach as allowed under 36 CFR Part 800.4 [6] [2].

2.5 Areas Adjacent to Surface Waters Were Surveyed Adequately

Q.18. Please respond to the allegation that areas near surface waters were not adequately surveyed (W. Mesteth 2010 at 2, Redmond 2010a).

A.18. It is an established archeological dictum that landscapes adjacent to water sources possess a high site potential. The Level III survey was a 100 percent survey, and all water sources within the project area were examined. Any exposed cut banks along water sources were examined, and any high potential site areas along water sources (e.g., terraces, hilltops) were examined utilizing tighter transects spaced 5-15 m apart.

2.6 The Level III Cultural Resources Survey Considered Past Use of the Project Area

Q.19. Please respond to the allegation that the site may not have been surveyed adequately with respect to past use of the site by the Oglala, Brule, Minnecoujou, Sicangu, Hunkpapa, Izipaco, Siha Sapa, Ooinunpa, Yanctonai, Arapaho (both North and South), Cheyenne (both North and South), Pawnee (at least the Skidi), Omaha, and Crow (Redmond 2012 at 2).

A.19. Numerous tribes are historically associated with the project area. Despite the significant body of historic documentation regarding tribal groups throughout western South Dakota, very little physical evidence is manifested within the archeological record of the area. Data that would allow us to link late archeological complexes with historically known tribes are generally inadequate.

The archeological evidence from this project indicates that there was a spike in the use of the area by Native American peoples during the Late Archaic time period (2500-1000 Y.B.P.). Based on diagnostic materials and radiocarbon dates, thirty-nine of the sites date to that time period or before. Only five sites are associated with the time between the Late Archaic and the beginning of Euroamerican settlement (Historic time period) and only one of the five sites (39CU3615) is clearly Protohistoric (300-150 Y.B.P.), which would be the time period associated with historically known tribes that may have utilized the area. The archeological

materials documented on that site (lithic flakes and one tinkler) cannot be associated with a specific tribe. There were a number of artifact scatter sites recorded during the project on which no datable/diagnostic items were observed. Those sites cannot be linked with any particular time period.

Q.20. Please respond to the allegation that mining activity is likely to adversely impact the cultural resources of the Oglala Sioux Tribe (W. Mesteth 2010 at 4).

A.20. The only sites the mining will “adversely affect” in Section 106 terminology are those eligible for listing in the NRHP. As previously stated, 100 percent of the project area was surveyed at transects spaced a maximum of 30 m apart. High potential locales within the project area and site areas were surveyed with transects spaced from 2-15 m apart. Any exposed cut banks along water sources were thoroughly examined. The survey documented all observed archeological sites within the project area. That methodology fulfills the SHPO standards for a Level III survey.

The landscape comprising the D-B project area is highly erodible, and significant tracts are already heavily deflated. The extent of this erosion is evidenced by the large number of sites recommended by ALAC as not eligible for listing on the NRHP due to their location on severely deflated landforms. This equates to approximately half of the total number of identified sites in the project area. Notable exceptions to these deflated localities include the valleys and terraces along Beaver and Pass creeks, as well as some places within, and adjacent to, some of the more heavily-wooded areas.

The mitigation measures in the PA seem acceptable for addressing adverse impacts to eligible archeological sites. ALAC does not know what is applicable for addressing impacts to the tribal sites that are not also archeological sites.

2.7 The Level III Cultural Resources Survey Considered All Cultural Sites, Including Potential Burial Sites

Q.21. Please describe how the Level III cultural resources survey addressed potential burial sites.

A.21. The purpose of a Level III survey is to examine the project area for all cultural sites that may be on the landscape, including burials. However, it is not a search specifically for burials. Typically a potential burial site will be indicated by a depression, a mound, or possibly a cairn or rock outline or, in the case of more recent historic burials, a marker or fenced enclosure. In any given area, it is always possible that there are unmarked burials with no surface manifestation. If such burials exist, they will not be located by means of a pedestrian survey. There is also no archeological trace left behind if scaffold burials or tree burial practices were used in the area hundreds or thousands of years ago by Native American peoples.

As a precaution ALAC recommended that cairns and three additional areas of possible Euroamerican graves be avoided (Exhibit APP-009 at 7.16). These include site 39FA1902 (a linear pile of limestone blocks associated with collapsed fence enclosure remnants), site

39CU3587 (two adjacent, cobble-lined features associated with collapsed fence enclosure remnants), site 39CU96 (which was later tested and found to be a rock-covered historic hunter's campfire and not a burial), and ten sites containing cairns.

3. REFERENCES CITED

Advisory Council on Historic Preservation (ACHP)

- 2006 *Section 106 Regulations: Text of ACHP's Regulations, "Protection of Historic Properties: (36CFR Part 800) (incorporates amendments effective Aug. 5, 2004)."* <http://www.achp.gov/work106.html> . Advisory Council on Historic Preservation, Washington, D.C.

Buhta, A. A., and J. M. Kruse

- 2008 *A Level III Cultural Resources Evaluation of the Proposed Dakota, Minnesota & Eastern Railroad Corporation's Powder River Basin Expansion Project Corridor, Custer, Fall River, and Pennington Counties, South Dakota.* Archeological Contract Series No. 206. Archeology Laboratory, Augustana College, Sioux Falls, South Dakota. Submitted to Surface Transportation Board, Washington, DC.

Consolidated Intervenor (CI)

- 2013 New Contentions Based on DSEIS, ADAMS Accession No. ML13026A010, January 25, 2013.

Hannus, L. A., R. P. Winham, E. S. Cassells, E. J. Lueck, L. Palmer, L. Rossum, and K. Winham

- 2003 *The Archeology of Badlands National Park, South Dakota.* Archeological Contract Series No. 175. Archeology Laboratory, Augustana College, Sioux Falls, South Dakota. Submitted to the National Park Service, Midwest Archeological Center, Lincoln, Nebraska.

Kruse, J. M., T. V. Gillen, J. R. Bozell, L. Palmer, and A. A. Buhta

- 2008 *A Level III Cultural Resources Evaluation of Powertech (USA) Incorporated's Proposed Dewey Burdock Uranium Project Locality within the Southern Black Hills, Custer and Fall River Counties, South Dakota.* Archeological Contract Series No. 216. Archeology Laboratory, Augustana College, Sioux Falls, South Dakota. Submitted to Powertech (USA) Incorporated, Centennial, Colorado.

Mesteth, W.

- 2010 Declaration of Wilmer Mesteth, Oglala Sioux Tribe THPO, ADAMS Accession No. ML100960642, Exhibit 7 to Oglala Sioux Tribe Petition to Intervene and Request for Hearing.

National Park Service (NPS)

- 1983 *Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation.* http://www.nps.gov/history/local-law/arch_stnds_0.htm.

Oglala Sioux Tribe (OST)

- 2014 Statement of Contentions Following Issuance of Final Supplemental Environmental Impact Statement, ADAMS Accession No. ML14077A004, March 17, 2014.
- 2013 List of Contentions Based on the Draft Supplemental Environmental Impact Statement, ADAMS Accession No. ML13026A004, January 25, 2013.

Redmond, Louis

- 2014 Letter from Louis Redmond, Read Feather Archeology, to David Frankel, ADAMS Accession No. ML14104A146, April 11, 2014, attachment to Consolidated Intervenor's Reply to Applicant and NRC Staff Answers to Contentions on Final SEIS.
- 2012 Letter from Louis Redmond, Read Feather Archeology, to Thomas Cook, Aligning for Responsible Mining, ADAMS Accession No. ML13026A011, November 29, 2012, attachment to Consolidated Intervenor's New Contentions Based on DSEIS.
- 2010a Letter from Louis Redmond, Read Feather Archeology, to David Frankel, ADAMS Accession No. ML101200674, January 14, 2010, attachment to Consolidated Petitioner's Request for Leave to File a New Contention Based on SUNSI Material.
- 2010b Evaluation of a Report by Augustana College for Powertech Inc. dated 3/2008, ADAMS Accession No. ML101200676, April 21, 2010, attachment to Consolidated Petitioner's Request for Leave to File a New Contention Based on SUNSI Material.

South Dakota State Historic Preservation Office (SHPO)

- 2005 *Guidelines for Cultural Resource Surveys and Survey Reports in South Dakota (For Review and Compliance)*, South Dakota State Historical Society Office of History, Pierre.

Winham, R. P., E.J. Lueck, L. Palmer, and F. Sellet

- 2001 *An Intensive (Class III) Cultural Resources Inventory Survey of the Dacotah Cement Land Exchange Proposal with the Bureau of Land Management in Southwestern Custer County, South Dakota*. Archeological Contract Series No. 164. Archeology Laboratory, Augustana College, Sioux Falls, South Dakota. Submitted to Dacotah Cement, Rapid City, South Dakota.

Yellow Bird Steele, J.

- 2012 Letter to NRC Refusing to Accept Dewey-Burdock TCP Survey Proposal, attachment to OST List of Contentions Based on the Draft SEIS, ADAMS Accession No. ML13026A005, November 5, 2012.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of:

POWERTECH USA, Inc.

(Dewey-Burdock Project
In Situ Uranium Recovery Facility)

)
)
)
)
)
)
)

Docket No. 40-9075-MLA
ASLBP No. 10-898-02-MLA-BD01

AFFIDAVIT OF DR. L. ADRIEN HANNUS

I declare under penalty of perjury that my statements in prefiled Exhibits APP-003 (Dr. Adrien Hannus Initial Testimony) and APP-004 (Dr. Adrien Hannus CV) are true and correct to the best of my knowledge and belief.



Dr. L. Adrien Hannus

Executed in Sioux Falls, SD
this 19 day of June, 2014