

**Evaluative Testing of 20 Sites in the Powertech (USA) Inc. Dewey-Burdock Uranium
Project Impact Areas**

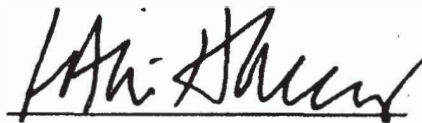
Black Hills Archeological Region

**Volume 2:
Appendices**

by

Linda Palmer and Jason Kruse

April 13, 2012



L. Adrien Hannus
Principal Investigator

Archeological Contract Series Number 251

Prepared by:

Archeology Laboratory, Augustana College
2032 S. Grange Ave.
Sioux Falls, SD 57105

Prepared for:

Powertech (USA) Incorporated
5575 DTC Parkway, STE 140
Greenwood Village, CO 80111

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 #: NRC-136-B-00-BD01
Identified: 8/19/2014
Withdrawn: Stricken:
Admitted: 8/19/2014
Rejected:
Other:



APPENDIX A

Maps

APPENDIX B

BLM Permit for Archeological Investigations and Field Work Authorization

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Authorization Number

FIELD WORK AUTHORIZATION

MT-040-M102859-1599

To Conduct Specific Cultural Resource Work under the Authority of
a Cultural Resource Use Permit Issued by the Bureau of Land Management
Pursuant to Sec. 302(b) of P.L. 94-539, October 21, 1976, 43 U.S.C. 1732
and Sec. 4 of P.L. 96-95, October 31, 1979, 16 U.S.C. 470cc

1. Permit Number and Date Issued	2. Name of Permittee
ISSUED: 09/30/11 EXPIRES: 09/30/12	Archeology Laboratory Augustana College

3. Mailing Address and Telephone Number

2032 S. Grange Avenue
(605) 274-5493--Office (605) 202-0173--cell

4. Nature of Authorized Cultural Resource Work

Limited Subsurface Testing of Sites on BLM Surface inside the Dewey-Burdock Uranium Project
Area, Fall River County, South Dakota.

5. Location of Authorized Work

a. Public Lands Involved BLM

b. Cultural Resource(s) Involved (if applicable)

Township 7 South, Range 1 East Sections 2, 3, 10 and 11.

6. Authorized Fieldwork Period

From: October 31, 2011

To: May 30, 2012

7. Name of Individual Responsible for Planning and Supervising Field Work
and Approving Reports, Evaluations, and Recommendations

L. Adrien Hannus, Linda Palmer, Jason Kruse, Austin A. Buhta, Edward Lueck

8. The individuals named in item 7 shall be present during the conducting of field work authorized herein, or shall notify the authorized officer of the need for any extended absence, and shall make provision that the work will be carried out under supervision of equal quality, by an individual approved by the authorized officer.

9. All terms and conditions of the permit continue to apply; any special conditions attached hereto have the same force and effect as conditions of the permit.
10. Permittee shall immediately notify the authorized officer of any change in items 3 through 7 above.

11. Approved

/s/ Marian Atkins

(Authorized Officer)

12. Date

10/31/11


Please use this number
when referring to this permit
Exp. Date (01/31/2008)
No. M 102859

DI Form 1991 (Rev. Sept. 2004)
(BOL No. 1024-0017)

United States Department of the Interior
PERMIT FOR ARCHEOLOGICAL INVESTIGATIONS

To conduct archeological work on Department of the Interior lands and Indian lands under the authority of:

- ☒ The Archaeological Resources Protection Act of 1979 (16 U.S.C. 470aa-mm) and its regulations (43 CFR 7);
☐ The Antiquities Act of 1906 (P.L. 59-209, 34 Stat. 225, 16 U.S.C. 431-435) and its regulations (43 CFR 7);
☐ Supplemental regulations (25 CFR 262) pertaining to Indian lands;
☒ Bureau-specific statutory and/or regulatory authority: **Federal Land Policy and Management Act (FLPMA)**

1. Permit issued to: Archaeology Laboratory, Augustana College		2. Under application dated: September 6, 2011	
3. Address: 2032 South Grange Avenue Sioux Falls, SD 57105		4. Telephone number(s): 605-274-5493	
		5. E-mail address(es):	
6. Name of Permit Administrator: Dr. E. Adrien Hannas Telephone number(s): 605-334-7133 E-mail address(es): adrien.hannas@augie.edu		7. Name of Principal Investigator(s): Dr. E. Adrien Hannas, Linda Palmer Telephone number(s): E-mail address(es): linda.palmer@augie.edu	
8. Name of Field Director(s) authorized to carry out field projects: Austin A. Bubba, Edward Lasek, Jason Kruse		Telephone number(s): E-mail address(es):	
9. Activity authorized: Limited Testing and/or Collection for the Powertech (USA) Inc. company. Testing is in advance of the Dewey-Hardeck Uranium exploration.			
10. On lands described as follows: BLM administered lands in T7N, R1E, Section 10 and 11, South Dakota Field Office			
11. During the duration of the project: From September 30, 2011 To September 29, 2012			
12. Name and address of the curatorial facility in which collections, records, data, photographs, and other documents resulting from work under this permit shall be deposited for permanent preservation on behalf of the United States Government: Billings Curation Center, Montana State Office, Bureau of Land Management, Billings, Montana 59101. Billings Curation Center, Montana State Office, Bureau of Land Management, 5001 Southgate Drive, Billings, Montana 59101			
13. Permittee is required to observe the listed standard permit conditions and the special permit conditions attached to this permit. Yes			
14. Signature and title of approving official: 		15. Date: SEP 29 2011	

APPENDIX C

Radiocarbon Dating Results

Pediatric Research Institute
Elliottson Science Center, University of Illinois
601 S. E. 9th Avenue, Drive
Champaign, Illinois 61821



March 9, 2017

ISGS #	Sample #	Material	$\delta^{13}\text{C}$	^{14}C yr BP	\pm
6866	H1	Charcoal	-23.5	1310	70
6869	A4 H3-1	Charcoal	-23.9	1750	70
6870	A6 H6-1	Charcoal	-23.9	1600	70
6871	AD H5-1	Charcoal	-23.5	2030	70

Hong Wang

Director of Radiocarbon Dating Laboratory
Illinois State Geological Survey, Prairie Research Institute
University of Illinois at Urbana-Champaign
Tel-217-244-7692
hongwang@illinois.edu

JALIN RADIOCARBON CALIBRATION PROGRAM
Copyright 1984-2011 M Stuiver and PJ Reimer

*To be used in conjunction with:
Stuiver, M., and Reimer, P.J., 1993, Radiocarbon, 35, 2, 219.

Labcode001
Description
Radiocarbon Age 1310±70
Calibration data set: Intcal13.14c
* Reimer et al. 2009
One Sigma Ranges: (start:end) relative area
[cal BP 1335: cal BP 1242] 1.
Two Sigma Ranges: (start:end) relative area
[cal BP 1063: cal BP 1317] 1.

Labcode001
Description
Radiocarbon Age 1740±70
Calibration data set: Intcal13.14c
* Reimer et al. 2009
One Sigma Ranges: (start:end) relative area
[cal BP 1554: cal BP 1714] 1.
Two Sigma Ranges: (start:end) relative area
[cal BP 1522: cal BP 1822] 0.987159
[cal BP 1846: cal BP 1943] 0.012841

Labcode001
Description
Radiocarbon Age 1600±70
Calibration data set: Intcal13.14c
* Reimer et al. 2009
One Sigma Ranges: (start:end) relative area
[cal BP 1406: cal BP 1557] 1.
Two Sigma Ranges: (start:end) relative area
[cal BP 1346: cal BP 1619] 0.967609
[cal BP 1657: cal BP 1663] 0.031947
[cal BP 1665: cal BP 1671] 0.029165

Labcode001
Description
Radiocarbon Age 2030±70
Calibration data set: Intcal13.14c
* Reimer et al. 2009
One Sigma Ranges: (start:end) relative area
[cal BP 1998: cal BP 1914] 0.076219
[cal BP 1919: cal BP 2062] 0.858568
[cal BP 2067: cal BP 2107] 0.065214
Two Sigma Ranges: (start:end) relative area
[cal BP 1824: cal BP 2152] 0.993779
[cal BP 2174: cal BP 2288] 0.006221

Ranges marked with a * are subject to improvement on the end of the calibration data set

* PJ Reimer, MGL Baillie, R Bard, A Bayliss, JW Beck, PG Blackwell,
* C Bronk, Kromer, CE Buck, CE Burr, RL Edwards, M Friedrich, TM Grootes,
* JB Guilderson, I Hajdas, T Heaton, AJ Hogg, YA Hughson, PF Kaiser, R Kissel,
* FG McCormac, SM Manning, SM Reimer, DA Richards, JB Southon, S Talamo,
* CSM Turley, J van der Plicht, CE Weyhenmeyer (2009) Radiocarbon 51:1111-1150.

LALIB RADIATION CALIBRATION PROGRAM*
Copyright 1986-2011 M. Stuiver and F.J. Reimer

*To be used in conjunction with:
Stuiver, M., and Reimer, F.J., 1993, Radiocarbon, 35, 215-230.

Labcode001
Description
Radiocarbon Age 13,0±10
Calibration data set: intcal09.14c
Reimer et al., 2009
One Sigma Ranges: [start:endi] relative area
[cal AD 652 : cal AD 775] 1.
Two Sigma Ranges: [start:endi] relative area
[cal AD 613 : cal AD 809] 1.

Labcode002
Description
Radiocarbon Age 1150±70
Calibration data set: intcal09.14c
Reimer et al., 2009
One Sigma Ranges: [start:endi] relative area
[cal AD 216 : cal AD 391] 1.
Two Sigma Ranges: [start:endi] relative area
[cal AD 97 : cal AD 104] 0.012511
[cal AD 121 : cal AD 470] 0.987489

Labcode003
Description
Radiocarbon Age 1600±70
Calibration data set: intcal09.14c
Reimer et al., 2009
One Sigma Ranges: [start:endi] relative area
[cal AD 393 : cal AD 544] 1.
Two Sigma Ranges: [start:endi] relative area
[cal AD 259 : cal AD 285] 0.020365
[cal AD 287 : cal AD 291] 0.001947
[cal AD 322 : cal AD 664] 0.967688

Labcode004
Description
Radiocarbon Age 2030±70
Calibration data set: intcal09.14c
Reimer et al., 2009
One Sigma Ranges: [start:endi] relative area
[cal BC 153 : cal BC 138] 0.00214
[cal BC 113 : cal AD 32] 0.858568
[cal AD 36 : cal AD 52] 0.079218
Two Sigma Ranges: [start:endi] relative area
[cal BC 339 : cal BC 129] 0.706222
[cal BC 203 : cal AD 124] 0.493779

Ranges marked with a * are suspect due to impingement on the end of the calibration data set

* F.J. Reimer, M.G.L. Baillie, E. Bard, A. Bayliss, J.W. Beck, P.G. Blackwell,
* C. Bronk Ramsey, C.B. Buck, G.S. Burr, R. Edwards, M. Friedrich, P.M. Grootes,
* T.F. Guilderson, I. Hajdas, T.J. Heaton, A.G. Hogg, K.A. Hughen, F.J. Kaiser, B. Kromer,
* P.O. McCormac, S.W. Manning, R.W. Reimer, D.A. Richards, J.D. Southon, B. Talamo,
* C.B. Turney, J. van der Plicht, C.E. Weyhenmeyer (2009) Radiocarbon 51:1111-1150

APPENDIX D

Artifact Catalogs

APPENDIX E

Updated Site Forms

APPENDIX F

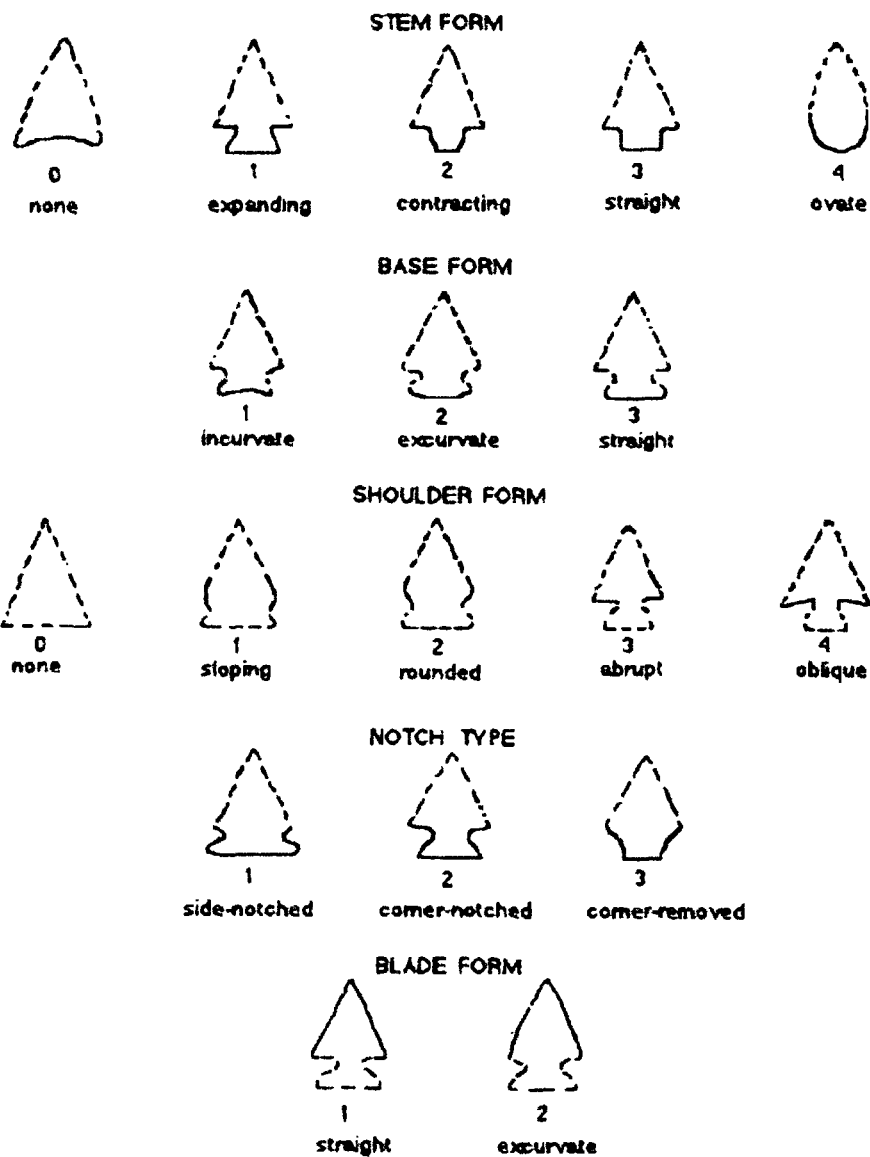
Architectural Historian Report on Site 39CU3619 Structures

Bibliography

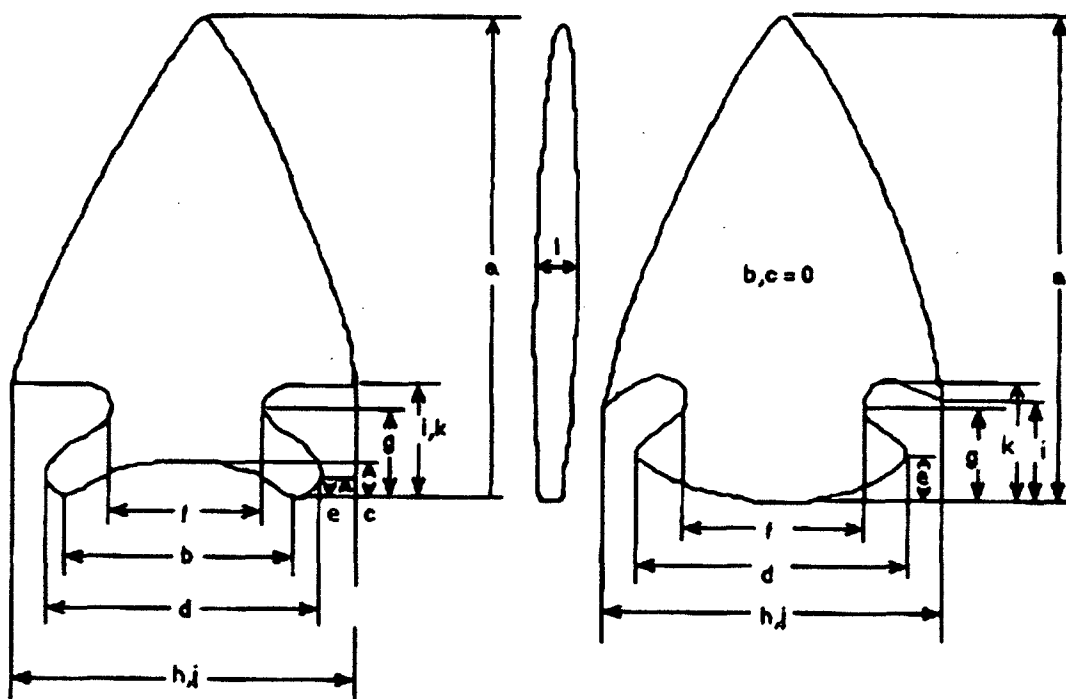
- Ancestry.com. N.p., n.d. Web. 25 Feb. 2012. <<http://www.ancestry.com/>>.
- Brooks, Allyson, and Steph Jacon. "Homesteading and Agricultural Development Context." Vermillion, South Dakota: South Dakota State Historical Preservation Center, 1994. N. pag. Print
- The Bureau of Land Management. U.S. Department of the Interior- Bureau of Land Management. U.S. Department of the Interior, Mar. Web. 27 Feb. 2012. <http://www.blm.gov/wo/st/en.html>
- The Edgemont Centennial Book Committee. Edgemont- The River, the Rails and the Ranch Land. Edgemont, South Dakota: Edgemont Herald Tribune, 1989. 379-80. Print.
- Martin, Stacy. "Fall River County Ownership Map." Fall River County, South Dakota GIS Maps. N.p., 11 Nov. 2011. Web. 29 Feb. 2012. <http://fallriver.sdcounties.org/files/2010/12/Landowner-Book2011_1.pdf>.
- The Schneider Corporation. Beacon. The Schneider Corporation, 2012. Web. 28 Feb. 2012. <<http://beacon.schneidercorp.com/>>.
- Spencer, Donald. Telephone interview. 28 Feb. 2012.
- Spencer, Kathryn, and Bessie Darrow. "Recollection of Albert Richardson." Editorial. Bits and Pieces : 10-12. Print.
- Sundstrom, Jessie Y., and Mrs. Carl H. Sundstrom. Custer County History to 1976. N.p.: The Society, 1977. 361-62. Print.
- U.S. Department of Interior, 1992, Manual for State Historic Preservation Review Boards. U.S. Department of Interior, Washington D.C.
- U.S. Department of Interior, 1997, National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation. U.S. Department of Interior, Washington D.C.
- Vogel, Robert C. "Common Farm Barns of South Dakota, 1857-1958." National Register of Historic Places Multiple Property Documentation Form. 2007.

APPENDIX G

Projectile Point Analysis Forms



Projectile point forms (adapted from Ahler 1971:23).



- A. Total Length
- B. Basal Contact Width
- C. Basal Center Point Length
- D. Proximal Haft Element Width
- E. Proximal Haft Element Length
- F. Distal Haft Element Width

- G. Distal Haft Element Length
- H. Blade Base Width
- I. Shoulder to Base Length
- J. Maximum Width
- K. Total Haft Element Length
- L. Maximum Thickness

Projectile point measurements (adapted from Ahler 1971:23).

PROJECTILE POINTS

FORM A

SPECIMEN	STEM FORM	BASE FORM	SHOULDER FORM	NOTCH TYPE	BLADE FORM	MATERIAL TYPE	WEIGHT (grams)
39FA96, 11-1-11	n/a	3	n/a	n/a	1	Porcellanite -10R-4/2, weak red	2.4
39FA96, 11-2-11	1	3	3	2	1	Chalcedony – 7.5YR-2.5/2, very dark brown	3.8
39FA1887	3	3	3	2	1	Jasper-2,5YR 3/2, dusky red	1.5

- unobtainable

n/a not applicable

PROJECTILE POINTS

FORM B

SPECIMEN	MEASUREMENTS (mm)												CULTURAL/TECHNO COMPLEX
	A	B	C	D	E	F	G	H	I	J	K	L	
39FA96 -11-1-11	<u>21.16</u>	12.25	n/a	18.33	n/a	n/a	n/a	22.28	n/a	22.28	n/a	4.4	Late Paleo
39FA96 11-2-11	<u>34.42</u>	8.43	n/a	15.09	2.2	14.45	5.00	22.25	6.2	22.25	6.2	4.46	Late Prehistoric corner-notched
39FA1887	<u>20.05</u>	x	1.20	x	x	11.20	4.45	14.45	5.05	14.45	5.05	3.35	Late Prehistoric, Plains side-notched

Underlined = Specimen incomplete along this dimension

x = Measurement unobtainable

n/a = Not applicable