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10 CFR §2.390 (b)(1)(i) Confidential
Information has been redacted.

A photograph of a landscape with rolling hills, a line of trees in the middle ground, and a clear blue sky. The foreground is filled with tall, dry grass.

**Cameco Resources
Marsland Expansion Area Uranium Project Addition
Cultural Resource Inventory
Dawes County, Nebraska**

ARCADIS Project No. CO001636.0001.00010

March 5, 2012

Prepared for:

Cameco Resources
Crawford, Nebraska

Nebraska State Historical Society/SHPO
Lincoln, Nebraska

Nebraska Department of Environmental Quality
Lincoln, Nebraska

Nuclear Regulatory Commission

Prepared by:

ARCADIS U.S., Inc.
189 N. Cedar St.
Buffalo, WY



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Natalie Graves, RPA
Field Director
Project Archaeologist



Adam Graves, Ph.D.
Certified Project Manager
Principal Investigator

This investigation was carried out in accordance with policies and regulations implementing Section 106 of the National Historic Preservation Act of 1966 (Public Law 89-665). The cultural resource inventory was undertaken to locate, identify, and document cultural resources that might be affected within the APE of the proposed undertaking, and to provide recommendations of eligibility to the National Register of Historic Places (NRHP) as specified in Title 36 of Codes of Federal Regulations (36 CFR 60.4). NRHP eligibility is evaluated in terms of the integrity of the resource, and: (a) its association with significant events, or patterns in history or prehistory; (b) its association with the specific contributions of individuals significant in our past; (c) its engineering, artistic, or architectural values; or (d) its information potential for important research questions in history or prehistory (National Park Service 1998). The implementing regulations of Section 106 state that, "The goal of consultation is to identify historic properties potentially affected by the undertaking, assess its effects and seek ways to avoid, minimize or mitigate any adverse effects on historic properties" (36 CFR 800.1b). Therefore, the management recommendations made by ARCADIS archaeologists focus primarily on the potential of the undertaking to pose an adverse effect to historic properties, as defined in 36 CFR 800.5.

This report was prepared to conform with the Nebraska State Historical Society Format, Guidelines, and Standards for Cultural Survey Reports.

**Marsland Expansion Area
Uranium Project Addition
Cultural Resource Inventory**

Environmental Division

Prepared for:
Cameco Resources

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Our Ref.:
CO001636.0001.00010

Authors:
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Date:
March 5, 2012

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27 March 2012

Natalie Graves
Arcadis
189 North Cedar Street
Buffalo, Wyoming 82834

Re: Marsland Expansion
Addition
Dawes Co., NE
H.P.#1105-021-01

Dear Ms. Graves:

The cultural resources survey report (Graves and Graves 2012) on the above referenced project has been reviewed by this office. We concur with the findings of the report that no archaeological, architectural, or historic context property resources will be affected by the proposed project. This review does not constitute the opinions of any Native American Tribes that may have an interest in Traditional Cultural Properties potentially affected by this project.

Sincerely,

A handwritten signature in black ink, appearing to read "Terry Steinacher".

Terry Steinacher
H.P. Archaeologist

Concurrence:

A handwritten signature in black ink, appearing to read "L. Robert Puschendorf".

L. Robert Puschendorf
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I. Project Information	1
A. Project Description and Project Area Surveyed (by Technique)	1
B. Survey Organization	1
C. Project Location	1
II. Environment	3
A. General Topographic Setting	3
B. Current Land Use	4
C. Flora	4
D. Soils	4
E. Ground Visibility	5
III. Survey Methods	5
A. Literature Review	5
B. Previous Survey Activity	5
C. Known Cultural Resources in the General Area	5
D. Survey Intervals and Coverage Patterns	6
IV. Results	6
A. Sites	6
B. Statement of Objectives	6
C. Further Work	6
V. References Cited	7

I. Project Information

A. Project Description and Project Area Surveyed (by Technique)

Cameco Resources (CR) contracted ARCADIS U.S., Inc. (ARCADIS) to complete a cultural resource inventory and report for the proposed Marland Expansion Area Uranium Project Addition (MEAUP) in Dawes County, Nebraska. The surface lands and minerals within the project area are privately owned. CR is preparing a Nuclear Regulatory Commission (NRC) License Amendment Application to allow in-situ uranium mining at its Marland Expansion Area site. A cultural survey and resulting report, then, is needed to comply with NRC NUREG-1569 Section 2.4 requirements; Nebraska Department of Environmental Quality, Title 122, Chapter 11 Sections 006.07 (determination of whether the facility is located on Indian lands, historic and/or archaeological sites); and the Nebraska State Historic Preservation Office (SHPO) National Historic Preservation Act Archeological Properties Section 106 Guidelines.

ARCADIS submitted the "Cameco Resources Marland Expansion Area Uranium Project Cultural Resource Inventory" report and associated Nebraska Archeological Site Survey Forms to the Nebraska State Historic Preservation Society/State Historic Preservation Office on April 28, 2011, and SHPO concurrence was granted by the Deputy State Historic Preservation Officer on May 19, 2011. CR requested ARCADIS complete a field survey of an additional 160 acres in Section 36 T30N R51W completed during the original field investigation but not reported on until now.

B. Survey Organization and Fieldwork Dates

The CR MEAUP Addition includes 160 acres located in the northern portion of the project area in Section 36 T30N R51W field investigated by ARCADIS on February 19, 2011. Dr. Adam Graves served as Principal Investigator. Natalie Graves was field director. Crew members were Ashley Howder and Maureen Boyle. Survey of the additional 160 acres was completed over approximately 5 person-hours.

C. Project Location

The MEAUP Addition is located in the northern Nebraska Panhandle roughly 10 to 12 miles south of Crawford, Nebraska. The region is generally characterized as Pine Ridge country, but the site itself actually lies just south of the Pine Ridge escarpment, north of the Niobrara River, and over 30 miles northwest of the famous Nebraska Sand Hills. The project area can be found on the Belmont 1980 USGS 7.5' topographic quadrangle (**Figure 1**).

II. Environment

A. General Topographic Setting

The Pine Ridge escarpment covers more than one thousand square miles across far eastern Wyoming, northern Nebraska, and extreme southern South Dakota (Nebraska State Historical Society 2000). It is a ridge of steeply-eroded bluffs, ravines, badlands, and low hills with biotic communities that more closely resemble those of the Black Hills region nearly 100 miles north in South Dakota (Mellor 1916, Nebraska State Historical Society 2000). The Pine Ridge is a pine-dominated western forest within the grassland-dominated High Plains (Nebraska Legacy Project) (**Figures 2 and 3**). The escarpment is composed of sandstone, siltstone, and volcanic ash (Nebraska Legacy Project).

The Dawes Table is a relatively flat plain south of the Pine Ridge (**Figures 2 and 3**). As the high table landscape approaches the Niobrara, it is smoothed into rolling hills cut by broad drainages (Mellor 1916). Local deposits of dune sand are found north of the Niobrara (Mellor 1916). The soil of the Dawes Table is very uniform and residual in origin, deriving from the underlying Arikaree formation (Mellor 1916).



Figure 2. General overview of gently rolling uplands and tree-lined drainages in north portion of Marsland Expansion Area Uranium Project in Section 35 T30N R 51W and Section 36 T49N R79W, facing east. Photograph taken by Russ Collett on December 2, 2011



Figure 3. Project overview from SESW Section 36 T49N R79W, facing north. Photograph taken by Ashley Howder on February 19, 2011.

B. Current Land Use

Historically, the MEAUP has been the site of uranium testing, logging activities, and homesteading, as evidenced by testing locations, logging and drag scars, slash piles, and ranching and farming features and implements were observed across the area. The MEAUP Addition is currently used for livestock grazing thus domesticated and wild animal trampling and grazing and erosion presently impact the area.

C. Flora

The project area is located within the shortgrass prairie ecoregion of western Nebraska, the westernmost and driest part of the North American grasslands. Vegetation cover ranged from sparse to moderate, consisting of primarily short grasses and mixed grass prairie with some yucca throughout the MEAUP. The MEAUP Addition area includes the addition of cottonwoods, Ponderosa pine, and various sedges.

D. Soils

Sediments in the project area consist primarily of silt loam or clay loam over fine sandy loams, with depths and stratigraphy varying with topography across the project area. The predominant soil type in the MEAUP Addition area consists of several Alliance silt loam soil types located across the upland high plains and hill slopes that are deep, well-drained, sediments that consist of silt loam and/or silt clay loams overlying very fine sandy loam to approximately 60 inches below surface (NRCS <http://websoilsurvey.nrcs.usda.gov>). In the MEAUP Addition area there is some potential for stable intact sediments across the undulating uplands

above the large heavily dissected drainage system in the SW SW of Section 36 T30N R51W. Across this area, ARCADIS examined drainage and road cuts, animal mounds, and disturbance from erosion and livestock and elk that did not reveal evidence of buried cultural materials such as artifacts, charcoal, or stained sediments. In all other areas of the MEAUP Addition, exposed sandstone bedrock exposed across slopes and along drainages suggesting shallow sediment deposits.

E. Ground Visibility

Bare ground visibility varied from moderate to excellent throughout most of the MEAUP Addition area averaging 70 percent along the tree lined drainages and increasing to 90 percent along drainage cuts and rocky slopes above drainages. For most of the MEAUP Addition area, vegetation coverage provided good visibility for the discovery and documentation of cultural materials.

III. Survey Methods

A. Literature Review

Background research consisted of four literature and data searches, including: a files search and architectural/structures property search conducted through the Nebraska SHPO; review of the National Register of Historic Places (NRHP) database for Dawes County, Nebraska; review of the National Historic Landmark inventory (NHL); review of General Land Office (GLO) Plats; and local literature review.

B. Previous Survey Activity

No previous surveys or archaeological sites were revealed by the SHPO file search within the MEAUP Addition area.

C. Known Cultural Resources in the General Area

Eleven sites were revealed in the NRHP online database, none of which lie within ten miles of the MEAUP. These registered sites include: James Bordeaux Trading Post (DW00-002) listed 1972/03/16; Henry Wohlers Sr. Homestead (DW00-043) listed 2004/10/15; Chadron Commercial Historic District (DW03) listed 2007/3/27; Chadron State College Historic Buildings (DW03) listed 1983/09/08; Hotel Chadron (DW03-023) listed 2002/08/15; Dawes County Courthouse (DW03-081) listed 1990/07/05; Chadron Public Library (DW03-091) listed 1990/06/21; Crawford United States Post Office (DW04-007) listed 1992/05/11; Co-Operative Block Building (DW04-024) listed 1985/09/12; Fort Robinson and Red Cloud Agency (DW07) listed 1966/10/15; and Army Theater (DW07-147) listed 1988/07/07. The NHL review listed one landmark, the Fort Robinson and Red Cloud Agency, located 15 miles north northwest of the MEAUP.

Previous cultural inventories in the general area have identified prehistoric sites on broad ridges or hilltops and on benches and terraces near large drainages. Protohistoric and Historic sites within the general region, both long term and temporary, tend to be located near dependable water sources and on higher ridge tops. Regionally, these sites include trading posts, sites of Native American and Euro-American conflicts, U.S. Army outposts such as Fort Robinson, and historic homesteading and farming settlements.

D. Survey Intervals and Coverage Patterns

The MEAUP Addition area was inventoried using pedestrian transects spaced at a maximum of 30 meter intervals. Gridded east-west oriented transects were guided by handheld Global Positioning System (GPS) devices.

IV. Results

A. Sites and Isolated Finds

No new cultural resources were discovered during the field investigation of the MEAUP Addition area. One historic bridge (25DW362) was identified in Section 36 T30N R51W and reported within the original MEAUP report submitted on April 28, 2011. Historic site 25DW362 was recommended not eligible for listing on the NRHP with SHPO concurrence.

B. Statement of Objectives

ARCADIS archaeologists are very confident that the objectives of the inventory were met and have established there is little potential for subsurface cultural deposits within the MEAUP Addition area. This conclusion is based on excellent field conditions, knowledgeable crew, agency consultations, background research, and current inventory results.

C. Further Work

Due to the absence of significant cultural materials in the MEAUP Addition area and low potential for buried cultural materials within the MEAUP Addition area, no further work such as monitoring construction activities is recommended.

Given these results and management practices, ARCADIS recommends a finding of **no effect to historic properties** for construction of the proposed Cameco Resources Marsland Expansion Area Uranium Project Addition. In the event that cultural resources are encountered during construction activities, work should be halted immediately. Archaeologists at the Nebraska State Historical Society and Nebraska State Historic Preservation Office must be notified and consulted before construction continues.

V. References Cited

Natural Resources Conservation Services

2007 Electronic document, <http://websoilsurvey.nrcs.usda.gov>, accessed 1/26/2011.

Nebraska Legacy Project

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