This is a publicly available version of this document. Sensitive archaeological information such as location have been redacted from this report. Redactions appear as black boxes. If you have any questions about this report please contact Sarah Lopas, NHPA Section 106 Project Lead, at Sarah.Lopas@nrc.gov

A Cultural Resource Testing Plan for Sites 48LN740 and 48LN8940 as part of TerraPower, LLC's Natrium Demonstration Project, Lincoln County, Wyoming

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Project Title:	A Cultural Resource Testing Plan for Sites 48LN740 and 48LN8940 as part of TerraPower, LLC's Natrium Demonstration Project, Lincoln County, Wyoming		
Authors:	Mark Karpinski	**Report Date:**	April 2025
Agency(-ies):	United States Nuclear Regulatory Commission (NRC) and Wyoming State Historic Preservation Office (SHPO)		
Tetra Tech No.:	117-8198003		
Site Location:	The Project is situated approximately 5 miles south of the city of Kemmerer in Lincoln County, Wyoming. [redacted]		
Landownership:	Privately Held		
Abstract:	TerraPower, LLC is proposing the Natrium® advanced reactor demonstration project (Natrium Demonstration or Project) south of the community of Kemmerer in Lincoln County, Wyoming. The Class III cultural resource inventory deliverables for the Project were submitted to the NRC for review and determinations in January of 2025 (DBI_WY_2022_280; Karpinski 2025). The deliverables documented that historic properties site 48LN740 and site 48LN8940 were both located within the direct APE. The Project as currently planned would remove portions of 48LN740 contributing to the site's NRHP eligibility. Site 48LN8940 is located within the macro-corridor direct APE. The exact location of the electric transmission and water pipeline rights-of-way (ROW) has not yet been determined within the macro-corridor, but the developed ROWs may not be able to avoid the contributing portions of the site 48LN8940. Tetra Tech's effects assessment was the Project will have a potential **adverse effect** to the two historic properties under Section 106 of the NHPA. Wyoming SHPO reviewed and concurred with NRC's determination on January 29, 2025 (Currit 2025a). The timeframe to develop and approve a Memorandum of Agreement (MOA) for mitigating adverse effects could impact the Kemmerer Unit 1 project schedule. TerraPower requested Tetra Tech develop the following testing plan to further evaluate site 48LN740 to define the horizontal and vertical extent of the identified NRHP contributing subsurface cultural resource components by using geophysical remote sensing and auger test probes (ATPs). Based on the results of those efforts at 48LN740, the Project design will be evaluated and modified to avoid the NRHP contributing elements to support an NRC determination and SHPO concurrence that the Project will have no adverse effect to the historic property. Additionally, the portion of site 48LN8940 outside the direct APE will be ATP tested to determine if that portion of the site is contributing to the site's NRHP eligibility. If that portion of the site is found to be non-contributing, then the design of the electric transmission and water pipeline ROWs can proceed in that area and have no adverse effect to the site.		

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1.0 INTRODUCTION AND PROJECT BACKGROUND

TerraPower, LLC (TerraPower) is proposing the Natrium® advanced reactor demonstration project (Natrium Demonstration or Project) near the existing Naughton Power Plant south of the community of Kemmerer in Lincoln County, Wyoming. The Project Site consists of the reactor, energy storage system, and associated facilities to be constructed within this area. The full extent of impacts from the construction of these facilities are anticipated to occur within the Project Site. A final route has not been determined for the electric transmission line and water pipeline from the Project Site to the immediate vicinity of the Naughton Power Plant. Macro-corridors for each were defined to capture the potential range of feasible options for the routes. A common macro-corridor, water macro-corridor, and electrical macro-corridor encompass the extent of potential impacts that could occur during construction of the transmission lines and water pipeline.

Tetra Tech was contracted by Bechtel, a contractor of TerraPower, to conduct the appropriate Class III cultural resource inventory to assess the potential affects the Project could have to cultural resources as required by the National Historic Preservation Act (NHPA), the National Environmental Policy Act (NEPA), and the regulations of the Nuclear Regulatory Commission (NRC) for compliance with Section 106 of the NHPA. The cultural resource Areas of Potential Effects (APEs) (36 CFR §800.16(d)) were defined in collaboration with TerraPower, Bechtel, and Tetra Tech in conformance with Wyoming State Historic Preservation Office (SHPO) guidelines and standards (SHPO 2012, 2022a, 2022b). The direct APE for physical effects was defined as the combined 711-acre area that includes the Project Site and Macro-corridors.

The Class III cultural resource inventory deliverables were submitted to the NRC for review and determinations in January of 2025 (DBI_WY_2022_280; Karpinski 2025). The deliverables documented that historic properties site 48LN740 and site 48LN8940 were both located within the direct APE. The Project as currently planned would remove portions of 48LN740 contributing to the site's NRHP eligibility. Site 48LN8940 is located within the macro-corridor direct APE. The exact location of the electric transmission and water pipeline rights-of-way (ROW) has not yet been determined within the macro-corridor, but the developed ROWs may not be able to avoid the contributing portions of the site 48LN8940. Tetra Tech's effects assessment was the Project will have a potential **adverse effect** to the two historic properties under Section 106 of the NHPA. Wyoming SHPO reviewed and concurred with NRC's determination on January 29, 2025.

The timeframe to develop and approve a Memorandum of Agreement (MOA) for mitigating adverse effects could impact the Kemmerer Unit 1 project schedule. TerraPower requested Tetra Tech develop the following testing plan to further evaluate site 48LN740 to define the horizontal and vertical extent of the identified NRHP contributing subsurface cultural resource components by using geophysical remote sensing and auger test probes (ATPs). Based on the results of those efforts at 48LN740, the Project design will be evaluated and modified to avoid the NRHP contributing elements to support an NRC determination and SHPO concurrence that the Project will have no adverse effect to the historic property. Additionally, the portion of site 48LN8940 outside the direct APE will be ATP tested to determine if that portion of the site is contributing to the site's NRHP eligibility. If that portion of the site is found to be non-contributing, then the design of the electric transmission and water pipeline ROWs can proceed in that area and have no adverse effect to the historic property.

1.1 Project Location

The Project is situated approximately 5 miles south of the city of Kemmerer in Lincoln County, Wyoming. [redacted]

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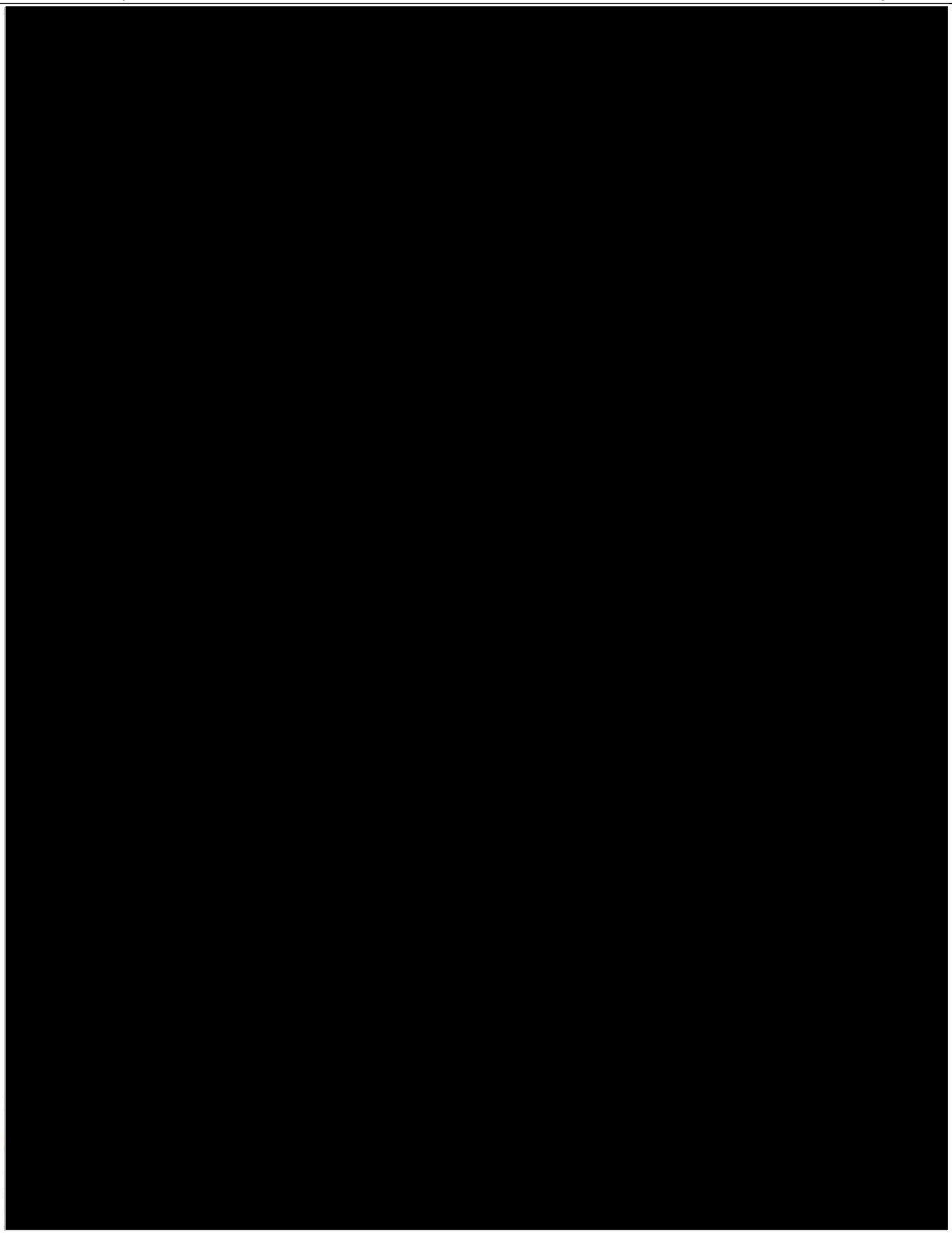

Figure 1. Project Study Area, Direct APE, and Sites to be Tested Locations.

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2.0 CULTURAL RESOURCE SITE BACKGROUNDS

The following section presents the background information for both sites as they were documented in the Class III cultural resource inventory deliverables (DBI_WY_2022_280; Karpinski 2025).

48LN740 – Multicomponent Artifact Scatter with Features, Eligible under Criterion D
Project Location: Direct and Indirect APEs

Site 48LN740 was previously recorded in 1982 by the Office of the Wyoming State Archaeologist (OWSA) for the [redacted] (DBI_WY_1999_7130; Birr et al. 1982). The documentation described the site within the then Project APE included 5,000 lithic artifacts and 6,000 pieces of heat altered rock (HAR). The site was tested, and project effects were mitigated in 1982 by completing 16 shovel tests, five 1 by 1 m units, and 30 10-by-10 m collection grids (Moe 1984). The site was revisited in 1994, and the site form updated by Mariah Associates, Inc., for the [redacted] (DBI_WY_1999_17749 and DBI_WY_1999_17750; McNees 1994). The updated form describes the site as a broad camp consisting of numerous tools, debitage, HAR, and features with a historic trash scatter. The site form stated that a grab sample surface collection of diagnostic projectile points was taken; however, no further information was provided on the form regarding which documented artifacts were collected. Tetra Tech could not evaluate the information value of the collected materials. Seventeen shovel tests were completed by Mariah Associates, Inc. [redacted] The tests did not encounter any evidence for subsurface cultural resource components.

Tetra Tech revisited the site in 2022 within the Project Study Area situated on privately held lands (**Figures 2 and 3**). Large sections of the site center were destroyed during the construction of [redacted] Tetra Tech conducted an updated documentation of the surface artifact assemblage and remapped the site boundary based on the current surface distribution. In 2023, OWSA revisited the site as a part [redacted] (DBI_WY_2023_586). OWSA notes in their report that no artifacts or features were noted [redacted] (Page and Kelley 2024, 66). OWSA updated the site boundary using an amalgamation of OWSA's 1984, Mariah Associates 1994, and Tetra Tech's 2022 site boundaries (Page and Kelley 2024, 65). The 2023 OWSA boundary is the current SHPO-approved boundary in the WyoTrack database. Tetra Tech has utilized the cumulative site documentations as part of Department of Energy (DOE)-directed cultural resource consultations for the Project components of the seismic testing (DBI_WY_2022_281), the Test and Fill Facility (DBI_WY_2023_418), and the Kemmerer Unit 1 preconstruction activities (DBI_WY_2024_515).

In 2024, Tetra Tech revisited the site again as part of the TFF supplemental analysis project (DBI_WY_2024_456) for DOE. The results of the inventory led to the expansion of the site boundary to include newly identified cultural resource material on the ground surface located on [redacted]. The material was within 30 m of the site boundary; therefore, per SHPO guidance, the boundary was extended to encompass the identified cultural material. Tetra Tech discovered part of the encountered cultural material was previously documented site 48LN2336, which is mis-plotted in the WyoTrack database. Site 48LN2336 was previously recorded in 1991 by the OWSA [redacted] (DBI_WY_1999_7130; Reiss 1991). The documentation described a small surface scatter of four pieces of quartzite debitage

and approximately five to ten scattered pieces of HAR. OWSA completed a single shovel test to a depth of 30 cm below ground surface. No cultural material was encountered within the shovel test. The available site form's topographic map plots the site in the [redacted] However, the site sketch places the site north of the intersection between the current [redacted] to the immediate east of the then proposed snow fence. In 2024 Tetra Tech found similar cultural material as documented in 1991 as site 48LN2336 to the east of the snow fence along with an unlabeled site datum. In 1994 Mariah Associates, Inc. documented the cultural material as part of their update of 48LN740 but misidentified the datum as belonging to the 1984 recording of 48LN740 and not the 1991 recording of 48LN2336 as depicted on the site form's sketch map. The site does not appear on Mariah Associates file search or maps presented in the Class III cultural resource report completed for the [redacted] (DBI_WY_1999_17749 and DBI_WY_1999_17750; Harding 1994). Site 48LN2336 appears not to have been reported on available SHPO records at the time the 1994 project was completed.

Site 48LN740 is located on an undulating alluvial plain within Cumberland Flats on [redacted]. Sediments are mostly alluvial and residual silt loams with moderately dense pebble- to boulder-sized gravels. The south-central portion of the site [redacted] has an area of low, anchored sand sheet deposits. Tetra Tech completed auger probe testing within the low anchored sand sheet and the results are detailed below. Vegetation is a sagebrush community with ground coverage averaging 35 percent. Observed site impacts include continued [redacted] along the [redacted] residual sediments and does not appear to be adversely affecting the site.

Based on Tetra Tech's 2024 cultural inventory and revisit, the current site boundary measures 929 by 349 meters and covers an area of 206,805 sq meters. In 2024 the site boundary was expanded to encompass cultural material observed on the [redacted]. **Table 1** describes the tools documented in 2022 and additional material found on the [redacted] in 2024. **Table 2** summarizes the debitage by material type and reduction stage documented in 2022 and additional material found on the [redacted] in 2024. A generalized scatter of approximately 200 pieces of granite and quartzite HAR occurs across the site. The identified features exposed on the ground surface documented in 2022 and within the expanded in 2024 boundary are almost all eroded thermal features along with one bison wallow (**Table 3**). In 2024 an eroded thermal feature (F-21) was documented on the [redacted]. The observed surface prehistoric assemblage is speculated to reflect a repeatedly occupied medium to long-term residential camp associated with one or more potential, but currently unknown, tasks by groups of varying size. Potential activities include, but are not limited to resource procurement, resource processing, and consumption along with tool manufacture. The site may have served as a central place for logistical forays by specific task groups into the surrounding area. The cumulative temporally diagnostic artifacts documented at the site to date include projectile points dating from the Early Archaic through the Late Prehistoric. The rest of the surface artifact assemblage and features are of common type and construction utilized for various activities dating across the prehistoric period.

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Table 1. Site 48LN740 Lithic Tool Descriptions

Tool Number	Description
PP-01	An obsidian side-notched projectile point proximal fragment measuring 2.2 by 1.3 by 0.3 cm. The point is most typologically similar to Uinta Side Notched type points dating from 1,200 to 800 B.P. (Kornfeld et al. 2010).
PP-02	A red quartzite stemmed projectile point proximal fragment measuring 3.6 by 2.4 by 0.5 cm. The point is too fragmentary to associate with a known temporal type.
PP-03	A brown chert corner-notched projectile point proximal fragment measuring 2.3 by 2.2 by 0.4 cm. The point is most typologically similar to Elko Corner-Notched style points that date from 3,500 to 1,400 B.P. (Holmer 1986).
PP-04	A complete obsidian corner-notched projectile point measuring 1.9 by 1.4 by 0.4 cm. The point is most typologically similar to Elko Corner-Notched style points that date from 3,500 to 1,400 B.P. (Holmer 1986).
PP-05	A gray chert corner-notched projectile point distal and medial fragment measuring 2.3 by 0.9 by 0.4 cm. The projectile points are most similar to Rosegate type which date from AD 500 to 1300 (Justice 2002).
PP-06	A complete gray and white chert side-notched projectile point proximal fragment measuring 3.9 by 1.8 by 0.5 cm. The point is too fragmentary to associate with a known temporal type.
PP-07	A brown chert corner-notched projectile point proximal fragment missing on corner. The point measures 2.0 by 1.7 by 0.3 cm. The projectile point fragment is either an Avonlea or Rosegate type, both of which roughly date from AD 500 to 1300 (Justice 2002; Kornfeld et al. 2010).
BI-01	A brown and tan chert late-stage biface medial fragment measuring 2.7 by 2.2 by 0.5 cm.
BI-02	A cream chert late-stage biface medial fragment measuring 1.4 by 0.9 by 0.2 cm.
BI-03	An obsidian late-stage biface medial fragment measuring 1.5 by 1.1 by 0.3 cm.
BI-04	A gray and brown chert late-stage biface measuring 1.2 by 0.9 by 0.2 cm.
BI-05	A tan and brown chert late-stage biface proximal fragment measuring 4.3 by 3.1 by 0.5 cm.
BI-06	A tan and brown chert late-stage biface proximal fragment measuring 2.2 by 1.2 by 0.5 cm.
BI-07	A gray and brown chert late-stage biface medial fragment measuring 3.1 by 3.1 by 0.4 cm.
BI-08	A complete brown chert early-stage biface with 20 percent cortex remaining on one side and measuring 3.7 by 2.0 by 0.6 cm.
BI-09	A brown chert late stage proximal/medial fragment measuring 3.9 by 3.5 by 0.8 cm.
BI-10 (1)	A brown chert early stage proximal fragment measuring 6.8 by 5.6 by 1.5 cm.
BI-11 (2)	A brown chert complete early stage biface measuring 4.5 by 4.0 by 1.5 cm.
BI-12 (3)	A yellow mottled chert late stage proximal fragment measuring 2.8 by 1.5 by 0.2 cm.
BI-13 (4)	A white and tan mottled chert late stage medial fragment measuring 4.8 by 3.4 by 1.0 cm.
BI-14 (5)	A gray and white mottled chert complete early stage biface measuring 6.0 by 4.4 by 2.2 cm.
MF-01	A yellow and gray chert primary flake with usewear on both lateral edges measuring 11.0 by 5.4 by 1.0 cm.
MF-02	A yellow and tan chert primary flake with usewear on all edges measuring 4.3 by 3.1 by 0.5 cm.
CH-01	A coarse-grained purple quartzite primary flake with evidence of bashing along one lateral margin measuring 10.0 by 6.0 by 2.7 cm.

Tool Number	Description
HS-01	A quartzite hammerstone with a circular indention and broken end measuring 8.0 by 9.2 by 6.0 cm.
GS-01	A sandstone unknown groundstone fragment with one moderately ground face measuring 8.6 by 6.4 by 2.3 cm.
GS-02	A sandstone mano with one moderately ground face measuring 14.0 by 11.5 by 2.5 cm.
GS-03	A granitic mano fragment with one well-ground face measuring 4.7 by 6.0 by 3.7 cm.

Table 2. Site 48LN740 Debitage

Raw Material	Tertiary	Secondary	Primary
Obsidian	0	3	0
Oolitic Chert	0	0	1
Brown Chert	12	30	38
White Chert	9	4	1
Red Chert	0	2	0
Variously Colored Chert	7	27	6
Quartzite	0	4	3

Table 3. Site 48LN740 Feature Descriptions

Feature Number	Description
F-01	Bison wallow measuring 2 by 3 m.
F-02	The feature is approximately 30 reddened, cracked, and crazed granite and quartzite cobble-sized gravels in a 1 by 1 m area.
F-03	The feature is approximately 30 reddened, cracked, and crazed granite and quartzite cobble-sized gravels in a 0.5 by 0.5 m area.
F-04	The feature is approximately 30 reddened, cracked, and crazed granite and quartzite cobble-sized gravels in a 0.5 by 0.5 m area.
F-05	The feature is approximately 20 reddened, cracked, and crazed sandstone and quartzite cobble-sized gravels in a 0.35 by 0.35 m area.
F-06	The feature is approximately 30 reddened, cracked, and crazed granite and quartzite cobble-sized gravels in a 0.5 by 0.5 m area.
F-07	The feature is approximately 10 reddened, cracked, and crazed granite and quartzite cobble-sized gravels in a 0.25 by 0.25 m area.
F-08	The feature is approximately 30 reddened, cracked, and crazed granite and quartzite cobble-sized gravels in a 0.5 by 0.5 m area.
F-09	The feature is approximately 10 reddened, cracked, and crazed granite and quartzite cobble-sized gravels in a 0.5 by 0.5 m area.
F-10	The feature is approximately 15 reddened, cracked, and crazed granite and quartzite cobble-sized gravels in a 0.25 by 0.25 m area.

Feature Number	Description
F-11	The feature is approximately 100 reddened, cracked, and crazed granite and quartzite cobble-sized gravels in a 1.1 by 1.1 m area.
F-12	The feature is approximately 100 reddened, cracked, and crazed granite and quartzite cobble-sized gravels in a 1 by 1 m area.
F-13	The feature is approximately 20 reddened, cracked, and crazed granite and quartzite cobble-sized gravels in a 0.35 by 0.35 m area.
F-14	The feature is approximately 50 reddened, cracked, and crazed granite and quartzite cobble-sized gravels in a 1.5 by 1.5 m area.
F-15	The feature is approximately 30 reddened, cracked, and crazed granite and quartzite cobble-sized gravels in a 0.5 by 0.5 m area.
F-16	The feature is approximately 50 reddened, cracked, and crazed granite and quartzite cobble-sized gravels in a 1.5 by 1.5 m area.
F-17	The feature is approximately 20 reddened and cracked granite and quartzite cobble-sized gravels in a 0.66 by 0.72 m area.
F-18	The feature is approximately 20 reddened and cracked granite and quartzite cobble-sized gravels in a 0.55 by 0.23 m area.
F-19	The feature is approximately 15 reddened and cracked granite and quartzite cobble-sized gravels in a 0.49 by 0.46 m area.
F-20	The feature is approximately 15 reddened and cracked granite and quartzite cobble-sized gravels in a 0.82 by 0.53 m area.
F-21	The feature is a concentration of between 15 to 20 quartzite and granite cobble size reddened and fractured rocks in a 1 by 1.5 m area.

The historic artifact component is scattered across the mapped extent of the site. The artifact assemblage includes common domestic consumer good types and styles of artifacts (**Table 4**). Based on the temporal range of the artifacts, the site was used sometime from the late 1800's to the late 1900's. Based on the artifacts, the historic component is the result of the known Euroamerican land use of the area. Native American groups had been forced out of this part of Wyoming by the time the site appears to have been used during the historic period. The temporal range and identified types reflect multiple activities over a broad temporal period, including but not limited to livestock grazing, land survey, resource prospecting, and/or recreation.

Table 4. Site 48LN740 Historic Artifact Assemblage

Artifact Type	Quantity	Comments
Cans		
Hole-in-top	6	Crushed and deteriorated; Type dates from 1885 to 1960's (Merritt 2014)
Round Sanitary	3	Type dates from 1904 to present (Merritt 2014)
Rectangular Sanitary	1	-
Paint Can	1	-
Tobacco Tin	1	Type dates from 1907 to 1988 (Merritt 2014)
Glass		
Amber	20	Various vessel fragments

Artifact Type	Quantity	Comments
Amethyst	20	Manufactured 1885 to 1920 (Merritt 2014)
Additional Common Artifacts		
Enamel bowl	2	-
Galvanized tub	1	-
Metal hardware	1	-

In 2022 Tetra Tech completed a grid of 35 ATPs within the anchored sand sheet present in the [redacted]. Overall, the probes encountered a single macro stratum of fine silty clay loam with sparse pebble-sized gravels and calcium carbonate flecking. The probes reached a maximum depth ranging from 40 to 90 cm below ground surface. Sixteen of the probes were positive for cultural material including charcoal flecking, debitage, burnt bone, and HAR fragments. The cultural material was encountered between 20 and 50 cm below ground surface. The positive auger probes are trending north to south across the sand sheet. Tetra Tech argues that at least the central portion of the aeolian deposits is likely to contain an intact buried cultural resource component of unknown age. The sediments across the rest of the site are eroded alluvial and residual silt loams with moderately dense pebble- to boulder-sized gravels. The sediments beyond the aeolian deposits were determined to not retain a significant potential to contain intact subsurface cultural resource deposits and no ATPs were completed in these areas.

NRHP Eligibility, Effect, and Management Recommendations

Site 48LN740 was determined **eligible** for inclusion on NRHP under Criterion D in 1982 and 1994. The site retains integrity of location, materials, and association. The site was evaluated for inclusion on the NRHP in 2023 by OWSA as a part of [redacted] (DBI_WY_2023_586). WYDOT's consultation with SHPO resulted in a SHPO concurrence letter stating that the site is eligible for inclusion on the NRHP but the portion of 48LN740 within the [redacted] is **non-contributing** to the overall eligibility of the site (Currit 2024). Tetra Tech agreed with the prior NRHP determinations for the site as part of the DOE led Natrium TFF project (DBI_WY_2023_418) and the Kemmerer Power Station Unit 1 preconstruction activities project (DBI_WY_2024_515). For these inventories the eligibility determination was upheld by DOE and again concurred upon by SHPO. For the Kemmerer Power Station Unit 1 preconstruction activities project (DBI_WY_2024_515), SHPO also concurred that the eastern most portions of the site encompassed by the project direct APE were **non-contributing** to the overall eligibility of the site (Currit 2025b)

The late-1800's to the mid-1900's historic component cannot be attributed to a specific historic event or person. The historic component is most likely associated with Euroamericans as Native American tribes who utilized the region since contact with Euroamericans had been forcibly removed by the U.S. Government to reservations by 1868. The historical record from the late 1800's onward does not include documentation of continuing Native American utilization of the Cumberland Valley landscape. The historic component is **non-contributing** to the site's NRHP eligibility. The Early Archaic through Late Prehistoric artifact scatter components cannot be attributed to a specific historic event or person. Therefore, it is not eligible under Criteria A or B. The documented artifacts are of common type and design for the prehistoric and historic period across the region. It is not eligible under Criterion C. The site has been determined and concurred upon as eligible for inclusion on the NRHP under Criterion D. The completed ATPs proved that a

buried cultural resource component is likely present within the aeolian deposits in the south-central portion of the site. This portion of the site retains elements that the further study of those elements would contribute to research questions regarding prehistoric chronology, subsistence and resource processing practices, and spatial patterning spanning from the Early Archaic through the Late Prehistoric. The deposits are recommended as **contributing** to the site's NRHP eligibility. The remaining parts of the site consist of eroded alluvial and residual silt loams with moderately dense pebble- to boulder-sized gravels. Features in these portions of the site are all eroded HAR scatters lacking physical integrity. These parts of the site do not retain a significant potential to contain intact subsurface cultural resource deposits and are recommended as **non-contributing** to the site's NRHP eligibility.

The site is eligible for inclusion on the NRHP and meets the definition of a historic property. The Project direct APE as currently developed will remove contributing portions of the historic property to the east of Highway 189 and south of the railroad. Based on the Project plan, NRC determined and SHPO concurred in January of 2025 (Currit 2025a) it will have an **adverse effect** to the historic property.

Figure 2. Site 48LN740, Resource Overview, Facing Southwest. Beth Karpinski (5/14/2022). Unaltered.

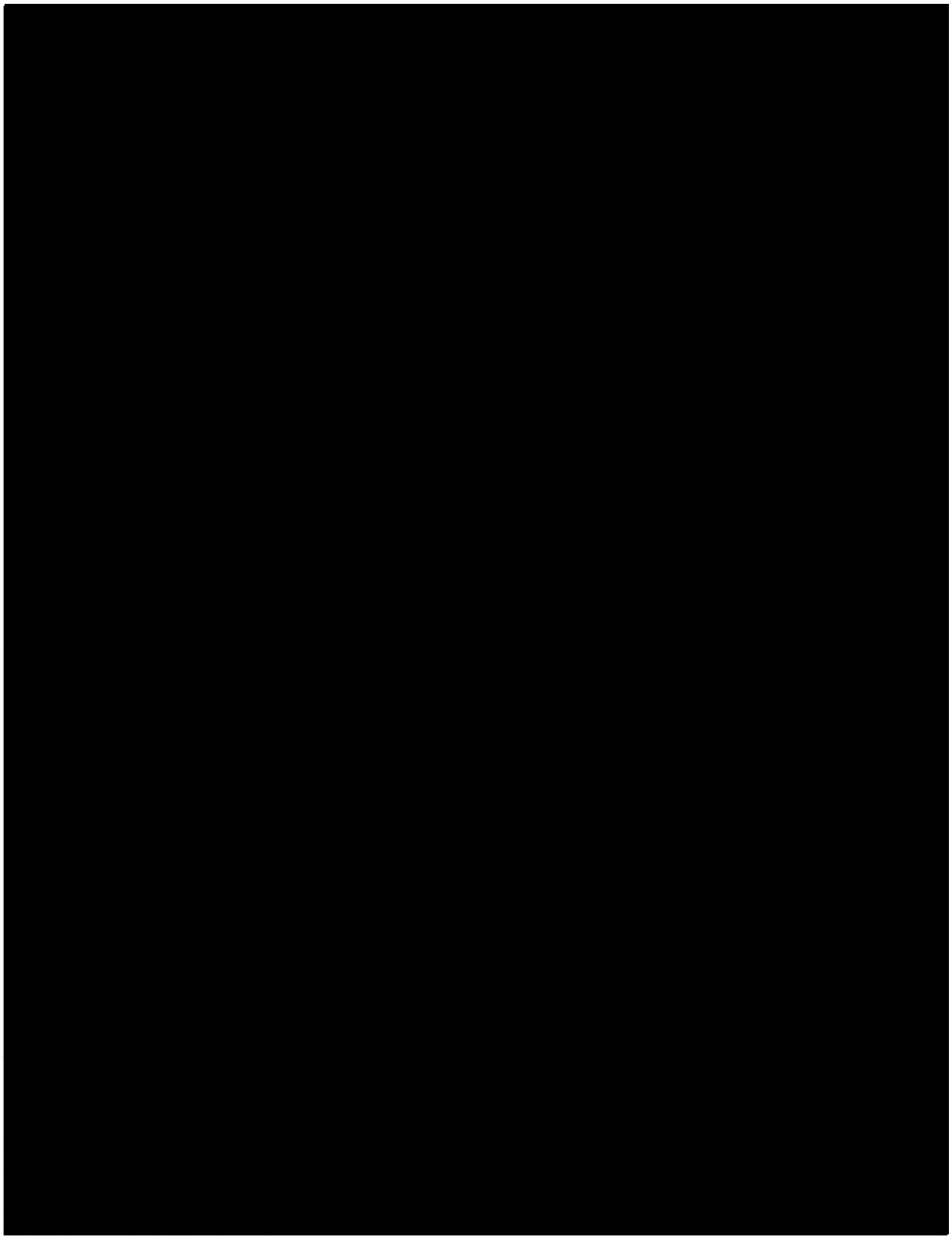

Figure 3. Site 48LN740, Site Sketch Map.

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48LN8940 – Multicomponent Artifact Scatter with Features, Eligible under Criterion D
Project Location: Direct APE

Site 48LN8940 is a multicomponent artifact scatter with features [redacted] in Cumberland Flats situated on privately held lands. Sediments are mostly an alluvial silt loam with sparse pebble- to cobble-sized gravels. In the central portion of the site are two low ridges with stabilized aeolian sand shadow deposits. The aeolian sediments were determined to have a potential to contain one or more intact cultural resource components; therefore, Tetra Tech completed ATPs of the deposits during recordation. Vegetation is a sparse sagebrush community with ground coverage averaging 25 percent. Observed impacts to the site include the deterioration of historic-era artifacts and the deflation of documented features on the ground surface by natural processes.

The site measures 319 by 190 m and covers an area of 60,974 sq m (**Figures 4 and 5**). The Late Archaic to Late Prehistoric-aged surface component is an extensive scatter of 16 lithic tools (**Table 5**), 76 pieces of debitage (**Table 6**), two debitage concentrations, and 13 eroded HAR features (**Table 7**). PP-01 is most typologically similar to Besant temporal type points dating approximately from AD 1 to 500 (Kornfeld et al. 2010). PP-02 is too fragmentary to associate with a known temporal type; therefore, its potential temporal associations are unknown.

Table 5. Site 48LN8940 Lithic Tool Descriptions

Tool Number	Description
PP-01	A brown chert side-notched projectile point measuring 2.3 by 1.5 by 0.5 cm
PP-02	A brown chert corner-notched medial and proximal fragment measuring 2.8 by 2.2 by 0.5 cm
BI-01	A complete brown chert early stage biface measuring 4.6 by 4.1 by 0.5 cm
BI-02	A quartzite late stage biface medial fragment measuring 1.7 by 1.4 by 0.4 cm
BI-03	A complete brown chert late stage measuring 3.1 by 1.5 by 0.12 cm
BI-04	An oolitic chert early stage biface distal fragment measuring 4.0 by 3.6 by 0.9 cm.
BI-05	A complete purple chert early stage biface measuring 6.8 by 3.8 by 1.0 cm.
BI-06	An oolitic chert early stage biface distal fragment measuring 5.0 by 3.2 by 1.1 cm.
BI-07	A complete tan and brown chert early stage biface measuring 6.9 by 5.1 by 2.0 cm.
GS-01	A sandstone metate with one ground surface measuring 33.5 by 21.4 by 3.4 cm. The slightly ground area is 21 by 10.5 cm.
UT-01	A brown chert secondary flake with retouch on one edge measuring 2.7 by 2.1 by 1.0 cm
UT-02	A brown chert primary flake with retouch on one edge measuring 3.6 by 3.0 by 0.8 cm
SC-01	A brown chert primary flake scraper with retouch on the distal margin measuring 4.2 by 2.8 by 0.5 cm.
C-01	A complete gray quartzite core measuring 4.1 by 3.9 by 1.8 cm.
C-02	A complete oolitic chert core measuring 5.4 by 3.7 by 2.0 cm.
C-03	A complete gray quartzite core measuring 9.6 by 8.8 by 4.6 cm.

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Table 6. Site 48LN8940 Debitage

Raw Material	Tertiary	Secondary	Primary
Obsidian	1	1	0
Brown Chert	11	18	24
Chalcedony	1	2	1
Oolitic Chert	0	0	2
Cream, Brown, and Tan Chert	1	7	4
White Chert	0	0	1
Quartzite	0	0	2

Table 7. Site 48LN8940 Feature Descriptions

Feature Number	Description
F-01	The feature is approximately 25 reddened, cracked, and crazed sandstone and quartzite cobble-sized gravels in a 1.63 by 1.6 m area.
F-02	The feature is approximately 20 reddened, cracked, and crazed sandstone and quartzite cobble-sized gravels in a 1.15 by 0.84 m area.
F-03	A concentration of approximately 28 pieces of debitage in a 1 m area.
F-04	The feature is approximately 15 reddened, cracked, and crazed sandstone and quartzite cobble-sized gravels in a 0.86 by 0.33 m area.
F-05	The feature is approximately 20 reddened, cracked, and crazed sandstone and quartzite cobble-sized gravels in a 0.58 by 0.67 m area.
F-06	The feature is approximately 50 reddened, cracked, and crazed sandstone and quartzite cobble-sized gravels in a 2.05 by 1.34 m area.
F-07	The feature is approximately 20 reddened, cracked, and crazed sandstone and quartzite cobble-sized gravels in a 0.99 by 0.90 m area.
F-08	A concentration of 19 pieces of debitage in a 0.66 by 0.35 m area.
F-09	The feature is approximately 30 reddened, cracked, and crazed sandstone and quartzite cobble-sized gravels in a 1.84 by 1.75 m area.
F-10	The feature is approximately 25 reddened, cracked, and crazed sandstone and quartzite cobble-sized gravels in a 1.63 by 1.64 m area.
F-11	The feature is approximately 20 reddened, cracked, and crazed sandstone and quartzite cobble-sized gravels in a 1.22 by 0.97 m area.
F-12	The feature is approximately 25 reddened, cracked, and crazed sandstone and quartzite cobble-sized gravels in a 1.00 by 0.53 m area.
F-13	The feature is approximately 20 reddened, cracked, and crazed sandstone and quartzite cobble-sized gravels in a 1.39 by 1.66 m area.

The historic artifact component is a small artifact scatter. The artifact assemblage includes common domestic types and styles of artifacts for the region (**Table 8**). Based on the temporal range of the historic artifacts the site was used sometime from early 1900's to the late 1900's. Based on the artifacts, the historic component is the result of the known Euroamerican land use

of the area. Native American groups had been forced out of this part of Wyoming by the time the site appears to have been used during the historic period. The temporal range and identified types reflect multiple activities over a broad temporal period, including but not limited to livestock grazing, land survey, resource prospecting, and/or recreation.

Table 8. Site 48LN8940 Historic Artifact Assemblage

Artifact Type	Quantity	Comments
Cans		
Round Sanitary	3	Type dates from 1904 to present (Merritt 2014)
Rectangular Meat Tin	1	-
Tobacco Tin	1	Type dates from 1907 to 1988 (Merritt 2014)
External Friction Lid	2	-
Glass		
Amber	5	Various vessel fragments
Amethyst	11	Various vessel fragments
Additional Common Artifacts		
Wire	1	-
Cardboard	1	-

Tetra Tech completed a grid of 28 ATPs within the stabilized sand shadows in the central portion of the site. Overall, the probes encountered a fine silt clay loam with sparse pebble-sized gravels and calcium carbonate flecking to a maximum depth ranging from 60 to 150 cm below ground surface. Twelve of the ATPs were positive for cultural material including charcoal flecking, debitage, and HAR fragments between 20 and 50 cm below ground surface. The positive ATPs are mostly across the southern half of the sand shadow deposits with one in the northern portion of the deposits. Tetra Tech argues the entire aeolian deposit on the site likely contains an intact buried cultural resource component of unknown age.

NRHP Eligibility, Effect, and Management Recommendations

Site 48LN8940 was determined **eligible** for inclusion on NRHP under Criterion D in 2025 (Karpinski 2025). The Late Archaic prehistoric component cannot be associated with a specific known theme or activity; however, the component retains integrity of location, materials, and association. The historic component dates from early- to late-1900's but cannot be associated with a specific known theme or activity and is considered non-contributing to the site's NRHP eligibility. The site cannot be attributed to a specific historic event or person. Therefore, it is recommended not eligible under Criteria A or B. The documented artifacts are of common type and design for both the historic and prehistoric eras across the Wyoming Basin. The site is recommended not eligible under Criterion C. Twelve of the completed ATPs in the aeolian sediments in the central portion of the site yielded evidence of an intact subsurface cultural component of unknown age. Further investigation of the subsurface component in the deposits could yield additional information about the locality and regional prehistory. The site retains elements that further study would contribute to research questions regarding prehistoric chronology, subsistence and resource processing practices, and spatial patterning spanning from the Late Archaic through the Late Prehistoric. The site is recommended eligible under Criterion

D. The remaining portions of the artifact scatter occur on eroded alluvial and residual silt loams with moderately dense pebble- to boulder-sized gravels. Features in these portions of the site are all eroded heat-altered rock scatters lacking physical integrity.

The site is eligible for inclusion on the NRHP and meets the definition of a historic property. The Project direct APE macro-corridors as currently designed have a potential to remove the contributing portion of the historic property. Based on the Project plan, NRC determined and SHPO concurred in January of 2025 (Currit 2025a) it will have an **adverse effect** to the historic property.

Figure 4. Site 48LN8940, Resource Overview, facing Southwest. Beth Karpinski (4/27/2022). Unaltered.

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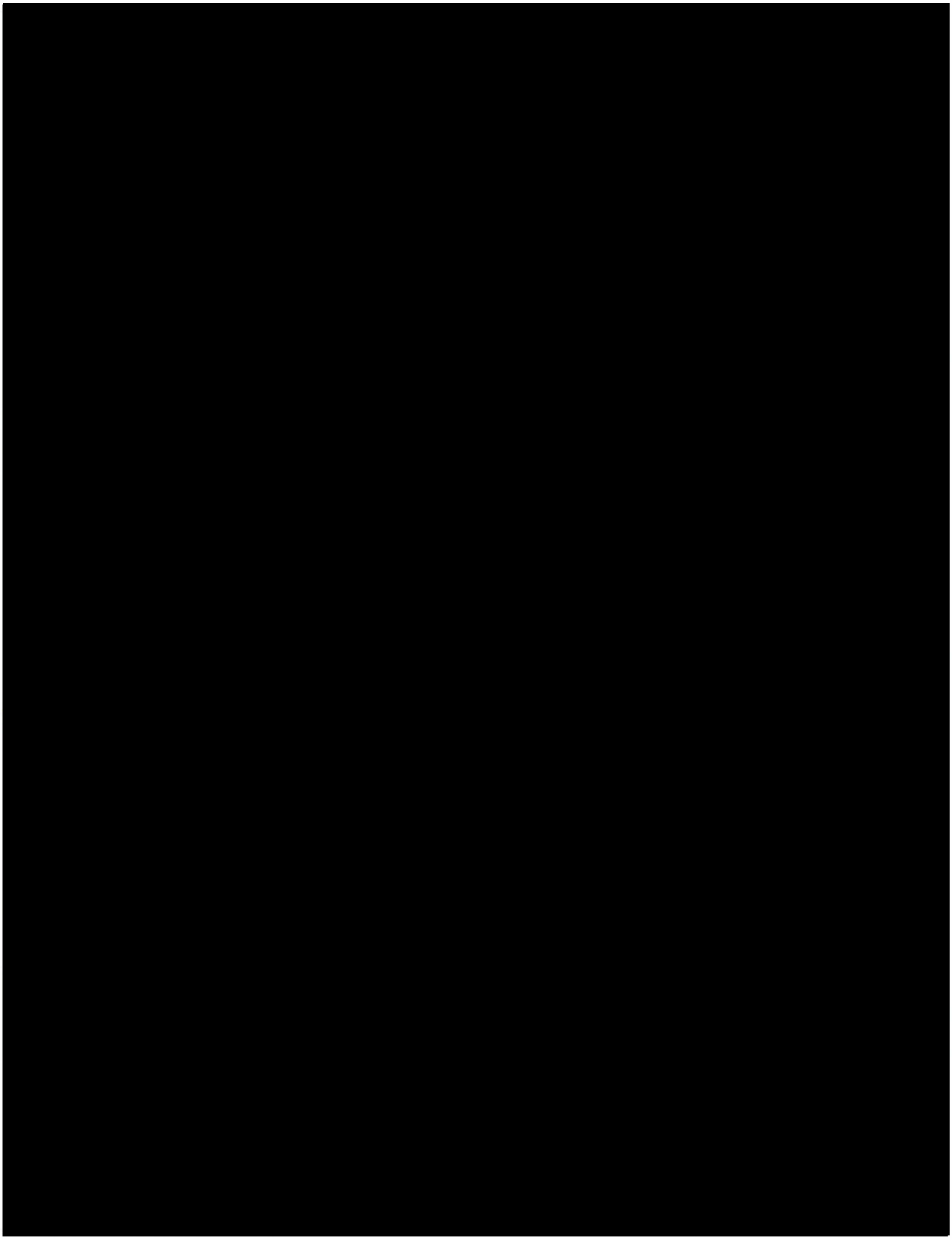

Figure 5. Site 48LN8940, Site Sketch Map.

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3.0 TESTING PLAN METHODOLOGY

Tetra Tech developed the following methodology based on our previous plan development and execution experience for undertakings with similar sites throughout the Wyoming Basin. Both site 48LN740 and 48LN8940 are largely similar multicomponent artifact scatters with features. Both are eligible for inclusion on the NRHP under Criterion D for the potential contributions the identified subsurface cultural resource components could make to our understanding of regional prehistory, including, but not limited to, chronology, subsistence and resource processing practices, and spatial patterning.

3.1 Geophysical Subcontractor and Methodology

Tetra Tech will be partnering with Cannon Heritage Consultants (CHC) to complete the geophysical remote sensing. CHC is a Utah-based cultural resource consultant with decades of experience working across the western United States. Principal Investigator Kenneth P. Cannon, PhD, RPA has over 25 years of experience in cultural resource management. George Crothers, PhD, RPA works for CHC as a lead geophysicist and is former associate professor at the University of Kentucky focused on applying geophysical analysis in archaeology. The company offers geophysical prospecting using several instruments including, but not limited, to: Magnetometer surveys which have been successfully applied to locating cultural anomalies that are of interest to archaeologists in both historic and prehistoric contexts. A resistivity meter is also used in conjunction with a magnetometer to provide a second line of evidence of likely cultural anomalies below the ground surface. Finally, Ground Penetrating Radar (GPR) is used to provide a time series and greater depth to subsurface visibility. The GPR survey provides a reading of disturbances in the soils that are not always depicted with magnetometer or resistivity analysis. These lines of assay provide a unique management tool to our clients that can facilitate and guide testing procedures to areas likely to contain archaeological resources.

Geophysical remote sensing in archaeology has a long tradition (for reviews see Clark 2001; Conyers and Goodman 1997; Weymouth and Huggins 1985), but its application remained largely with European researchers. In his seminal article, Kvamme (2003) brought the American archaeological community's attention to the power and potential for geophysical application to the archaeology of North America. Its application in North American archaeology has been steadily on the rise ever since. Today, its application extends beyond academic research and is now routine in many cultural resource management contexts (e.g., Ernenwein and Hargrave 2009).

Geophysical prospection provides two benefits to the archaeological community in the form of efficient and non-destructive survey. Geophysical surveys have the potential to provide detailed subsurface mapping over a large area. The surveys are often quite detailed and can provide non-destructive imagery of subsurface archaeological deposits unachievable through traditional archaeological methods. These qualities of geophysical survey, namely efficient survey and detailed non-destructive subsurface description, provide an intuitive utility of archaeo-geophysics for cultural resource management.

Tetra Tech in a collaboration with CHC, will use a combination of magnetometry and GPR as two complementary techniques most suitable for the Project. Magnetometry is a passive technique particularly useful for sensing thermoremanent signatures such as those produced by kilns, bricks, hearths, and fired areas, and more subtle features composed of magnetically enriched iron oxides that form in topsoil. GPR utilizes radar waves to measure the differential reflective properties of subsurface soil strata or buried features. Electromagnetic pulses are transmitted from an antenna, propagate through the ground, and reflect off buried discontinuities such as stratigraphic changes, rocks, foundations, graves, and pits.

To help define the horizontal and vertical extent of identified subsurface cultural components at site 48LN740, magnetometry will be used first over the aeolian deposits and at least a 5 m buffer surrounding the aeolian deposit. The area will be denuded of vegetation by hand using standard landscaping clippers, saws, and non-mechanical weed whackers prior to the geophysical surveys. Based on the magnetometry results, additional areas may be subjected to further denuding and magnetometry as determined by on-site investigators. Afterward, smaller portions of the areas subjected to magnetometry will be subject to GPR. The GPR will be used to further define cultural anomalies identified by magnetometry to help better characterize those anomalies as needed by the on-site investigators to fully understand the potential subsurface cultural component. By using geophysical remote sensing, the known contributing areas can be defined without the use of intensive destructive archaeological excavation practices. The result is leaving the components in a better state of preservation compared to traditional intensive archaeological testing methods.

The magnetometer survey will be conducted with a MAGNETO® MXPDA 5-channel gradiometer push-cart system. The MXPDA is designed to be integrated with RTK GPS for real-time coordinate location that geo-references all measurement points with an accuracy of ± 2 cm. The GPR survey will be conducted with a GSSI UtilityScan Compact GPR System. The UtilityScan features a 350 MHz frequency antenna with HyperStacking™ technology. HyperStacking is a real-time sampling technique patented by GSSI that improves receiver performance. It is a method of averaging the results of multiple individual scans that provides clearer images and better depth penetration in high-conductivity materials such as clayey soils.

3.2 Site 48LN740 - Geophysical Remote Sensing and ATP Testing

The current Project design has Site 48LN740 encompassed by the planned parking lot for Natrium facility (**Figure 6**). For the testing plan, the suggested testing areas will be the portions of 48LN740 [redacted]. As currently designed, most of the eastern half of the site, included contributing areas defined in 2022, would be removed by the Project causing an adverse effect. Based on the geophysical and ATP testing results outlined below, the Project design will be evaluated and modified to avoid the NRHP contributing areas of the site allowing for a re-evaluation of the potential Project affect to no adverse effect to the historic property.

3.2.1 Geophysical Remote Sensing

The geophysical remote sensing for 48LN740 will encompass the 2022 defined contributing area plus a 5 m buffer. The area will have tall vegetation hand removed prior to applying remote sensing equipment as outlined in **Section 3.1**. Additional remote sensing may be done as needed for any detected anomalies near the edge of the buffer that potentially suggest a subsurface cultural component could extend outside the 2022 defined contributing area and buffer. CHC will conduct initial reviews of the collected geophysical anomaly data in the field as it is collected. A sample of detected anomalies may be subject to ground truthing based on the initial reviews.

Determining which geophysical anomalies to sample is a complex process that relies on expert understanding of what a given geophysical anomaly is likely to represent. The first step in the sample selection process is the elimination of some geophysical anomalies. For example, strong dipolar magnetic anomalies are almost certainly associated with ferrous metal objects associated with modern activity, rather than an iron-rich geologic specimen. Such objects are common in agricultural fields and near fences or other modern infrastructure. Similarly, negative magnetic anomalies suggest sediment concentrations with low organic content relative to the surrounding matrix. The most likely explanation for these anomalies is turbation processes that move

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sediments stratigraphically upward. Natural geologic and biologic processes are the most likely agents. Several animal burrows, including one active badger burrow, occur across the portion to be investigated for 48LN740. The burrowing activity has likely occurred since burrowing animals were present in the region; therefore, the likelihood of such anomalies could be high.

The selection process for ground truthing anomalies begins with identifying and numbering discrete geophysical anomalies. The attributes of the anomalies of magnetic values and radar amplitude will then be used to identify which have the highest potential for representing cultural features. Given the 2022 ATP testing results, high potential anomalies within the defined 2022 contributing area near positive ATPs will be deprioritized for ground truthing investigations. The anomalies will be assumed to be cultural and will be preserved as identified. No further investigation will occur unless the Project cannot avoid affecting the anomaly. Anomalies to be prioritized for ground truthing will be based on the anomaly type and its location outside the 2022 contributing area but within the 5 m buffer and/or extended investigation area based on in field analysis of the results.

Ground truthing will consist of a two-step investigation. First, ATP's will be completed in the immediate vicinity of the anomaly to try and encounter evidence like artifacts that the feature may be cultural in origin without affecting the feature. If evidence of the anomaly being cultural in origin is found, no further work will be completed for the anomaly and the defined contributing area for the site will be extended. Second, if no evidence is found that could be used to classify the anomaly as cultural in origin, a 1 by 1 m test unit manually excavated in 10 cm arbitrary levels within natural stratigraphy over the anomaly. All sediment removed from the unit will be sifted through ¼-inch wire mesh screen. The unit will be excavated to the depth of the anomaly. The anomaly will be horizontal exposed to allow for evaluation regarding if it is cultural or not in origin. The anomaly will be documented as it is exposed, but it will not be excavated or sampled. Once the nature of the anomaly has been determined, the unit will be carefully backfilled. No sample collection of ground truthed features will be conducted during this task.

3.2.2 ATP Testing

The ATPs outside the 2022 defined contributing area will be completed in a grid pattern across the suggested testing area spaced at 10 m (32 ft) intervals. The ATPs will be excavated utilizing ratcheting bucket hand augers measuring at least 100 centimeters (cm) in length with a 7 cm diameter bucket. All excavated sediment will be sifted through ¼-inch wire mesh screen. ATPs will be completed to a depth of 10 cm into residual sediments unless they encounter an inhibiting factor such as a rock before then. Positive tests will have four radials completed in cardinal directions at 5 m spacing from the positive test. Additional radials at a tighter interval spacing may be utilized as needed based on the encountered material. Each completed ATP will be documented using standard forms developed by Tetra Tech and mapped using appropriate means including, but not limited to, GPS and/or georeferenced mapping. Once completed, all excavated sediment would be returned to the excavated hole. No sample collection of encountered features will be conducted during the testing.

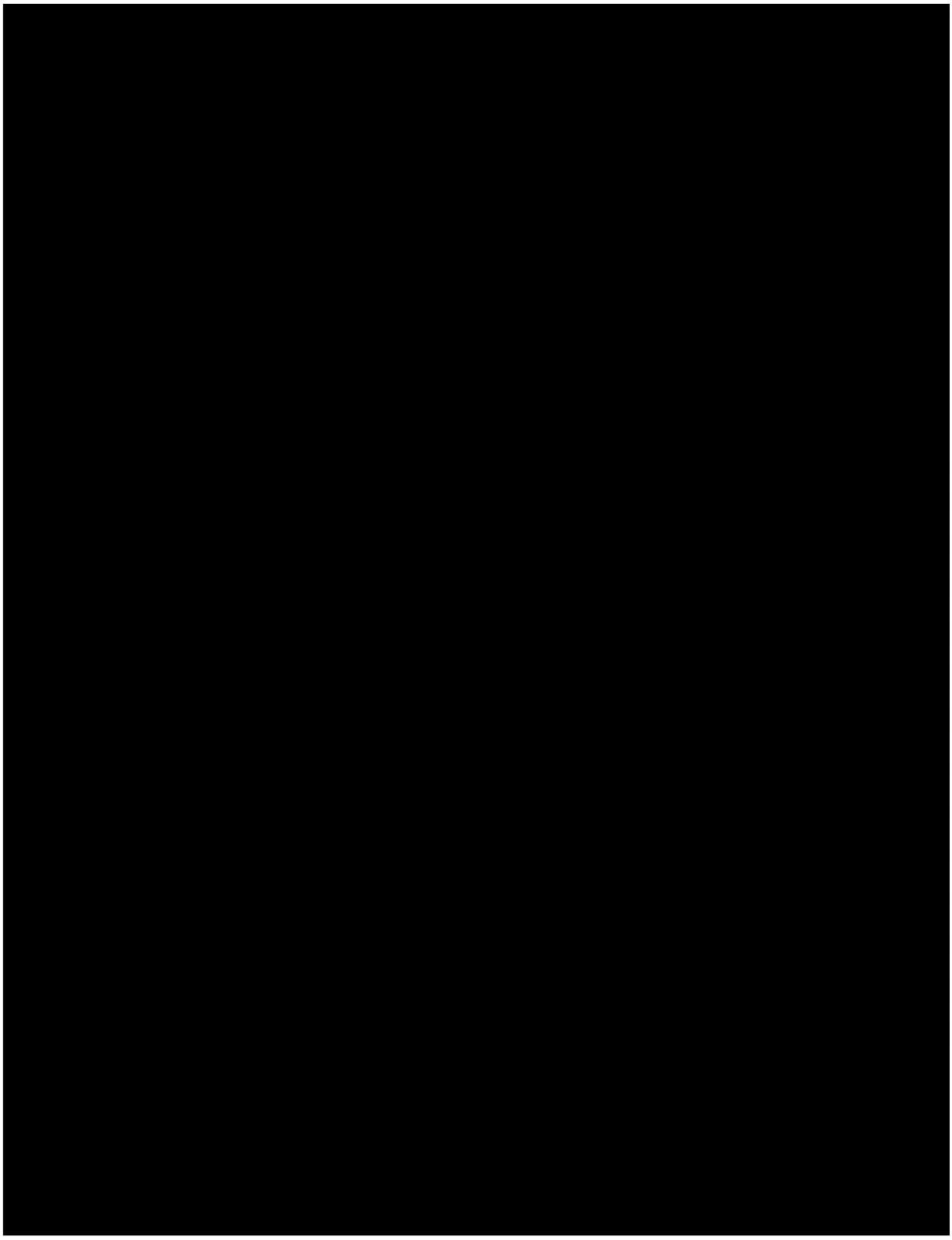

Figure 6. Site 48LN740, Site Sketch Map and Proposed Testing Area.

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3.3 Site 48LN8940 - ATP Testing

Site 48LN8940 is located within the direct APE within the Class III cultural resource inventoried [redacted] (Karpinski 2025). The exact location of the [redacted] TerraPower would like to further investigate the site to determine if the [redacted] can [redacted] in a manner to have no adverse effect on the historic property. The portion of the site outside the direct APE within the [redacted] will be ATP tested to determine any elements are present in that part of the site that contributes to the site's NRHP eligibility (**Figure 7**).

The ATPs will be completed in a grid pattern across the suggested testing area spaced at 10 m (32 ft) intervals. The ATPs will be excavated utilizing ratcheting bucket hand augers measuring at least 100 cm in length with a 7 cm diameter bucket. All excavated sediment will be sifted through ¼-inch wire mesh screen. ATPs will be completed to a depth of 10 cm into residual sediments unless they encounter an inhibiting factor such as a rock before then. Positive tests will have four radials completed in cardinal directions at 5-m spacing from the positive test. Additional radials at a tighter interval spacing will be utilized as needed based on the encountered material. Each completed ATP will be documented using standard forms developed by Tetra Tech and mapped using appropriate means including, but not limited to, GPS and/or georeferenced mapping. Once completed, all excavated sediment would be returned to the excavated hole. No sample collection will be conducted of an encountered feature during the testing.

If the tested portion of the site is found to have no elements that would make it contributing to the site's NRHP eligibility, TerraPower will re-route the direct APE for the [redacted] If contributing elements are found in the tested part of the site, TerraPower will investigate a potential larger [redacted]. Additional Class III cultural resource inventories will be conducted at the later date for the fully [redacted].

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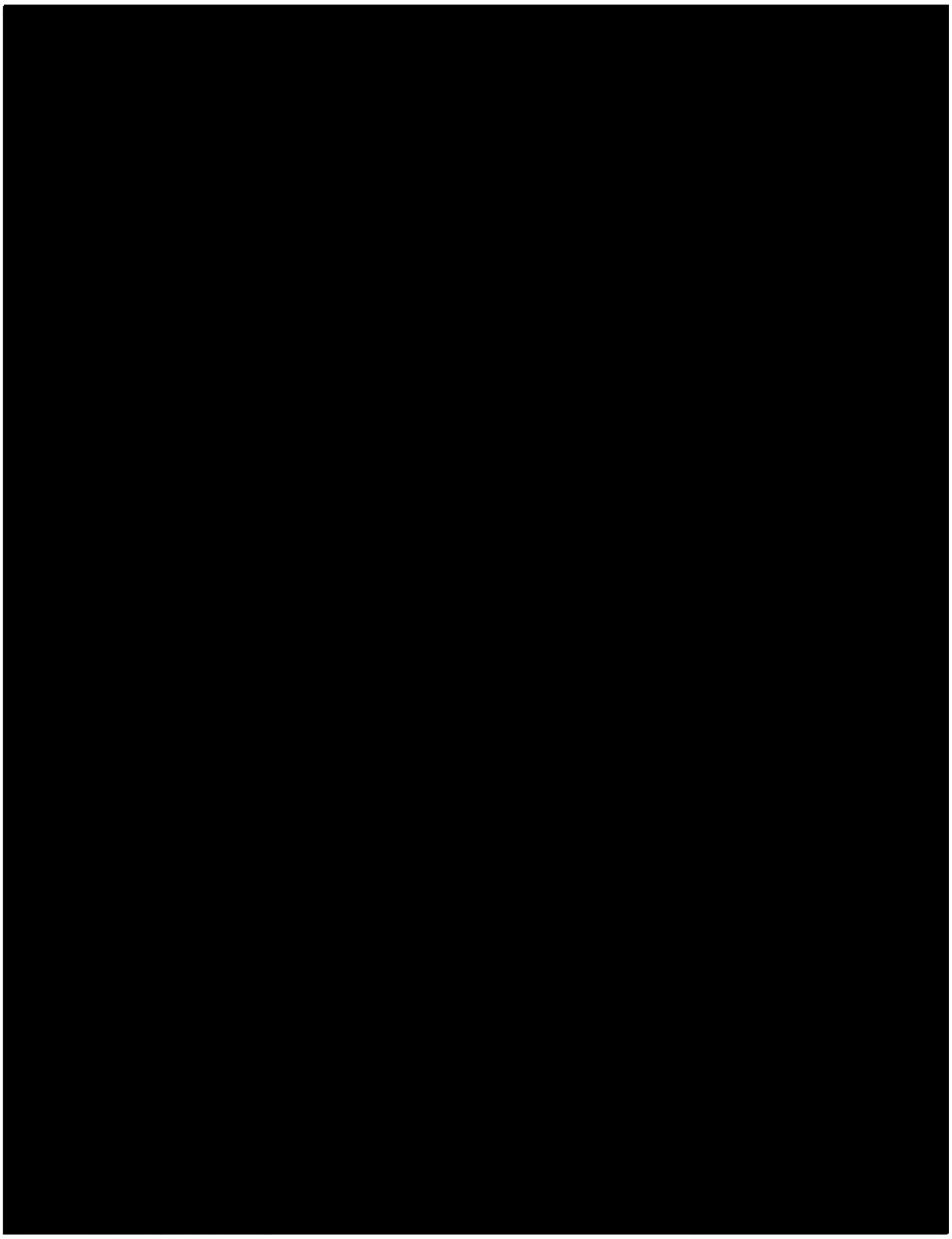

Figure 7. Site 48LN8940, Site Sketch Map and Proposed Testing Area.

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3.4 Collection and Curation Methodology

All cultural artifacts encountered during subsurface testing at either site will be collected and cataloged using Tetra Tech's internal documentation forms. The artifacts will be bagged and temporarily curated at Tetra Tech's secure Salt Lake City office facilities. Once the testing and reporting has been completed and accepted by NRC and SHPO, Tetra Tech will prepare the collected material for curation per the University of Wyoming Archaeological Repository (UWAR) guidelines. Tetra Tech will coordinate with the respective landowner for the site where the artifacts were collected for guidance regarding curation. The landowner has the final say regarding whether the collected artifacts will be returned to them or can be sent to UWAR for curation. TerraPower is responsible for costs associated with curation of collected material at UWAR. Once the appropriate landowner for collected material has decided how artifacts from their lands will be curated, Tetra Tech will complete the curation of the artifacts.

3.5 Inadvertent Human Remains Discovery Methodology

The incidental discovery of human remains and/or funerary objects will be handled in accordance with the State of Wyoming Protocol for Consultation, Repatriation, and Reinterment of Human Remains from State and Private Lands in Wyoming (W.S. § 7-4-106). Though not anticipated, if human remains and/or funerary objects are encountered all work within a 30 m (100 ft) radius of the discovery will be halted. After the discovery is secured and work halted, the discoverer will immediately notify the Archaeological Monitor, TerraPower Senior Manager, and Bechtel TFF Construction Manager. The Bechtel TFF ES&H Lead will then immediately notify the Lincoln County Sheriff's Office ((307) 877-3971). The NRC will also be notified of the discovery once the finding has been secured from further disturbance and the above contacts have been notified.

The Sheriff's office will determine whether the discovery is forensic in nature. Law enforcement will determine, in consultation with the coroner, state Archaeologist, a physical anthropologist, or other professional familiar with human skeletal anatomy if the remains are definitively human. Forensic findings will be handled under the direction of the Sheriff's office and Coroner. If the find is determined by law enforcement to be non-forensic, then the Coroner will notify the State Archaeologist. The State Archaeologist will be responsible for assessing the remains to determine A) appropriate documentation, B) cultural affiliation, and C) possible recovery means. The State Archaeologist would contact appropriate Tribal entities if the remains are determined to be of Native American cultural affiliation. Non-tribal affiliated remains will be handled as outlined in Section 7 of State of Wyoming's Protocol for Consultation, Repatriation, and Reinterment of Human Remains from State and Private Lands in Wyoming. Tribally affiliated remains will be handed as outlined in Section 8 of State of Wyoming's Protocol for Consultation, Repatriation, and Reinterment of Human Remains from State and Private Lands in Wyoming.

The State Archaeologist in coordination with the county Coroner shall notify the landowner of exhumation. If the State Archaeologist determines that the remains are Native American, the State Archaeologist shall notify the Eastern Shoshone and Northern Arapaho Tribes before exhumation. If the Coroner, and, if applicable, representative of the Eastern Shoshone and Northern Arapaho Tribes determine that exhumation is appropriate, absent extraordinary circumstances, exhumation shall be completed not more than six (6) business days from the date the Coroner notifies the State Archaeologist of the archaeological human burial discovery to protect the safety and integrity of the remains (W.S. § 7-4-106).

4.0 TECHNICAL REPORTING AND DISSEMINATION

Tetra Tech will produce a professional technical report that meets all NRC and SHPO standards and requirements. Tetra Tech's report will be organized and scaled as appropriate to clearly present the information gathered during testing. The report will include supporting figures, photographs, and tables as needed. The CHC geophysical technical report will be attached to Tetra Tech's as an appendix. Tetra Tech will provide a summary of CHC's report in relation to the Project. The results will include an updated effects assessment for each site based on the results and possible modification in Project design. Additionally, an updated Wyoming site form will be completed for each site within the WyoTrack Investigation developed for the testing. The general report outline will be the following:

- Overview of the Project
- Testing Methodology
- Testing Results
- Analysis of All Findings
- Conclusions and Discussion
- Appendix A – Cannon Heritage Consultants Geophysical Report
- Additional Appendices as appropriate

The technical report deliverables will be provided to TerraPower and Bechtel for review. Once reviewed, the deliverables will be provided to NRC for review. NRC will then pass the deliverables on to SHPO via WyoTrack for review and concurrence. If the results of the testing support and the agencies agree the Project will have no adverse effect to historic properties, the Project will proceed without needing to complete the MOA process.

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