

**A Class I and Class III Cultural
Resources Inventory of the Bear Paw
Energy Natural Gas Liquids Garden
Creek Pipeline, Private Lands,
McKenzie County, North Dakota**

Prepared for

E3 Environmental, LLC

Prepared by

SWCA Environmental Consultants

June 22, 2011

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McKenzie County, North Dakota**

Prepared for:

E3 Environmental, LLC
817 Vandalia Street
St. Paul, Minnesota 55114

Prepared by:

Carolyn Riordan, Judith R. Cooper, Stephanie Lechert, and Scott A. Slessman

Principal Investigator:

Judith R. Cooper

SWCA Environmental Consultants

116 North 4th Street, Suite 200
Bismarck, North Dakota 58501

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ABSTRACT

This report outlines the results of Class I and Class III cultural resources inventory conducted by SWCA Environmental Consultants (SWCA) between April 20 and May 27, 2011, on behalf of E3 Environmental, LLC (E3), for the proposed Bear Paw Energy, LLC (Bear Paw), Garden Creek Natural Gas Liquids Pipeline (Garden Creek) project. Bear Paw proposes to construct a 10-inch-diameter natural gas liquids (NGL) pipeline connecting the Garden Creek Gas Processing Plant, located northeast of Watford City, North Dakota, to the Riverview Terminal, located just southwest of Sidney, Montana. From the Riverview Terminal, the NGL would be shipped by rail. In its proposed entirety, the Garden Creek project is approximately 63.17 miles long—40.49 miles (non-contiguous) of pipe would cross private lands in McKenzie County, North Dakota; 13.72 miles (non-contiguous) would cross U.S. Forest Service lands (Dakota Prairie Grasslands, Little Missouri National Grasslands) in McKenzie County, North Dakota; and 8.96 miles would cross private lands in Richland County, Montana. The proposed pipeline would be constructed within a 95-foot-wide temporary construction right-of-way (ROW).

Although a cultural resources inventory was performed for the entire pipeline corridor, this report focuses on the portion of the project (40.49 miles) that crosses private lands in McKenzie County, North Dakota, and falls under the jurisdiction of the North Dakota Public Service Commission (NDPSC). E3 is assisting Bear Paw with their application to the NDPSC for a certificate of corridor compatibility and route permit for the project. E3 retained SWCA to complete a Class I and Class III cultural resources inventory for the project.

The Class III inventory includes a 250-foot-wide survey corridor centered on the 40.49-mile-long proposed pipeline centerline (1,280.07 acres). Additional areas totaling 8.98 acres were surveyed on private lands for access roads and to provide alternate alignment options and extra work space. In total, 1,289.05 acres were inventoried on private lands in North Dakota for the project.

Ten cultural resources were newly recorded: one is a prehistoric stone feature and depression (32MZ2204), one is a concentration of historical farm equipment (32MZ2202), one is a prehistoric stone feature site (32MZ2201), one is a historical trash dump (32MZ2203), one is a historical foundation and depression site (32MZ2200), three are isolated chipped stone finds (32MZ1131, 32MZ1132, and 32MZ1133), and two are isolated historical finds (32MZ1130 and 32MZ1129). Three previously recorded sites were re-identified and revisited for the project. Two are prehistoric lithic scatters (32MZ934 and 32MZ937) and one is a historic farmstead (32MZ879). Attempts were made to identify two previously known sites (32MZ938 and 32MZ1510) and four previously known isolated finds or site leads (32MZ361, 32MZ500, 32MZ506, and 32MZ510), but these were either not found or were found to be located outside the 250-foot-wide survey corridor and therefore not revisited, as was the case with 32MZ1510.

Six sites (32MZ879, 32MZ934, 32MZ938, 32MZ2200, 32MZ2202, and 32MZ2203) and five isolated finds (32MZ1129, 32MZ1130, 32MZ1131, 32MZ1132, and 32MZ1133) are recommended not eligible for listing in the National Register of Historic Places (NRHP). Two

of the sites that were newly recorded for the project (32MZ2201 and 32MZ2204) have been left unevaluated regarding their NRHP eligibility pending further work.

No further work is recommended for the following not eligible sites and isolated finds: 32MZ879, 32MZ934, 32MZ938, 32MZ2200, 32MZ2203, 32MZX1129, 32MZX1130, 32MZX1131, 32MZX1132, and 32MZX1133. Although recommended not eligible, SWCA recommends that the farm equipment recorded at 32MZ2202 be moved outside the construction corridor prior to pipeline construction to avoid undue impacts to the historic material.

For 32MZ2201 and 32MZ2204, both unevaluated stone feature sites, SWCA recommends that the pipeline be rerouted within the inventoried corridor and necked down to achieve at least 50 feet of avoidance. Furthermore, SWCA recommends that the edge of the necked-down construction corridor closest to each site be fenced to ensure that all construction activity and vehicle traffic remains within the approved corridor.

One site, 32MZ937, is recommended eligible for listing in the NRHP. The portion of the site that is within the proposed construction corridor falls within a previously disturbed corridor which is recommended as a non-contributing portion of the otherwise eligible resource. As proposed, the Garden Creek pipeline construction corridor would remain within the existing pipeline disturbance zone/non-contributing portion. Given the proximity of the proposed pipeline construction corridor to the site, SWCA recommends that edge of the construction corridor be fenced to ensure that all construction activity and vehicle traffic remains within the previously disturbed corridor and that an archaeological monitor be present during ground-disturbing activities adjacent to the site. With the above stipulations, it is recommended that a determination of *No Historic Properties Adversely Affected* and *No Significant Sites Adversely Affected* be granted for the project to proceed as planned.

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INTRODUCTION

SWCA Environmental Consultants (SWCA) conducted a Class III inventory between April 20 and May 27, 2011, on the behalf of E3 Environmental, LLC (E3), for the proposed Bear Paw Energy, LLC (Bear Paw), Garden Creek Natural Gas Liquids Pipeline (Garden Creek) project. Bear Paw proposes to construct a 10-inch-diameter natural gas liquids (NGL) pipeline connecting the Garden Creek Gas Processing Plant, located northeast of Watford City, North Dakota, to the Riverview Terminal, located just southwest of Sidney, Montana. From the Riverview Terminal, the NGL would be shipped by rail.

The Garden Creek project is approximately 63.17 miles long, spanning private lands in North Dakota, U.S. Forest Service (USFS) lands in North Dakota, and private lands in Montana (Figure 3). All told, 40.49 miles (non-contiguous) of pipe would cross private lands in McKenzie County, North Dakota; 13.72 miles (non-contiguous) would cross USFS lands (Dakota Prairie Grasslands, Little Missouri National Grasslands) in McKenzie County, North Dakota; and 8.96 miles would cross private lands in Richland County. The portion of the pipeline crossing private lands in North Dakota falls under the jurisdiction of the North Dakota Public Service Commission (NDPSC). E3 is assisting Bear Paw with their application to the NDPSC for a certificate of corridor compatibility and route permit for the project. E3 retained SWCA to complete a Class I and Class III cultural resources inventory for the project.

The proposed 10-inch pipeline would be constructed within a 95-foot-wide temporary construction right-of-way (ROW). The ROW would be slightly offset on the centerline, with 45 feet of construction ROW on one side of the centerline and 50 feet of construction ROW on the other. Portions of the pipeline follow an existing pipeline ROW (Lewis and Clark Pipeline) (Figures 1 and 2), while the remainder follows a greenfield corridor. Where the pipeline is co-located (on USFS lands and the private parcels interspersed between the USFS parcels), the pipeline centerline would be offset 10 feet from the existing Lewis and Clark Pipeline, and therefore the 95-foot-wide ROW would largely overlap with the existing pipeline disturbance. As proposed, additional disturbance would only occur on the northern and western side of the pipeline centerline, as the southern and eastern portion of the construction ROW is contained within the 50-foot-wide permanent ROW for the Lewis and Clark Pipeline.

Although a Class III cultural resources inventory was conducted for the entire proposed pipeline, this report presents the results of the survey performed on private lands in McKenzie County, North Dakota (40.49 miles). The Class III inventory includes a 250-foot-wide survey corridor centered on the 40.49-mile-long proposed pipeline centerline (1,280.07 acres). Additional areas totaling 8.98 acres were surveyed on private lands to provide alternate alignment options and extra work space. In total, 1,289.05 acres were inventoried on private lands in North Dakota for the project.



Figure 1. View of existing pipeline disturbance from the Lewis and Clark Pipeline within proposed project area, facing west.



Figure 2. View of existing pipeline disturbance (left side of photo) from the Lewis and Clark Pipeline within proposed project area, facing east.

The inventoried area discussed herein is situated on the U.S. Geological Survey (USGS) Schafer (1979), Watford City (1980), Arnegard (1979), Stock Butte (1960), Bear Butte (1976), Moline School (1975), Sather Lake (1976), Phillip Spring (1975), Sheep Creek (1975), and Sidney SE (1975), North Dakota, topographic quadrangles, as shown in Figures 2a through 2q. The inventoried area includes parcels in Sections 31, 32, 33, 34, and 35, Township (T) 151 North (N), Range (R) 98 West (W); in Section 6, T150N, R98W; Sections 1, 2, 11, 14, 15, 16, 21, 28, and 33, T150N, R99W; in Sections 4, 5, and 6, T149N, R99W; in Sections 1, 8, 9, 10, 11, 12, 16, 17, 18, and 19, T149N, R100W; in Sections 23, 24, 26, 27, 28, 32, and 33, T149N, R101W; in Sections 1, 2, 3, 4, 5, 6, 7, 8, and 9, T148N, R102W; in Sections 1, 12, 13, and 14, T148N, R103W; in Sections 8, 9, 10, 11, and 12, T147N, R104W; and Section 12, T147N, R105W (Figures 4a–4q).

For the cultural resources investigation, Judith Cooper served as Principal Investigator. Fieldwork was performed by Nicholas Smith, Chandler Herson, and Stephanie Lechert (all three permitted Principal Investigators by the State Historical Society of North Dakota), as well as by Carolyn Riordan, Celia Moret-Ferguson, Joshua Boyd, Vincent Wray, Lucy Meno, Jolene Schleicher, and Kevin Janni (all of SWCA). All field notes and photographs are on file at SWCA's Bismarck, North Dakota, office under project number 17173. The North Dakota Public Service Commission is the lead agency for the portion of the undertaking located on private lands in North Dakota.

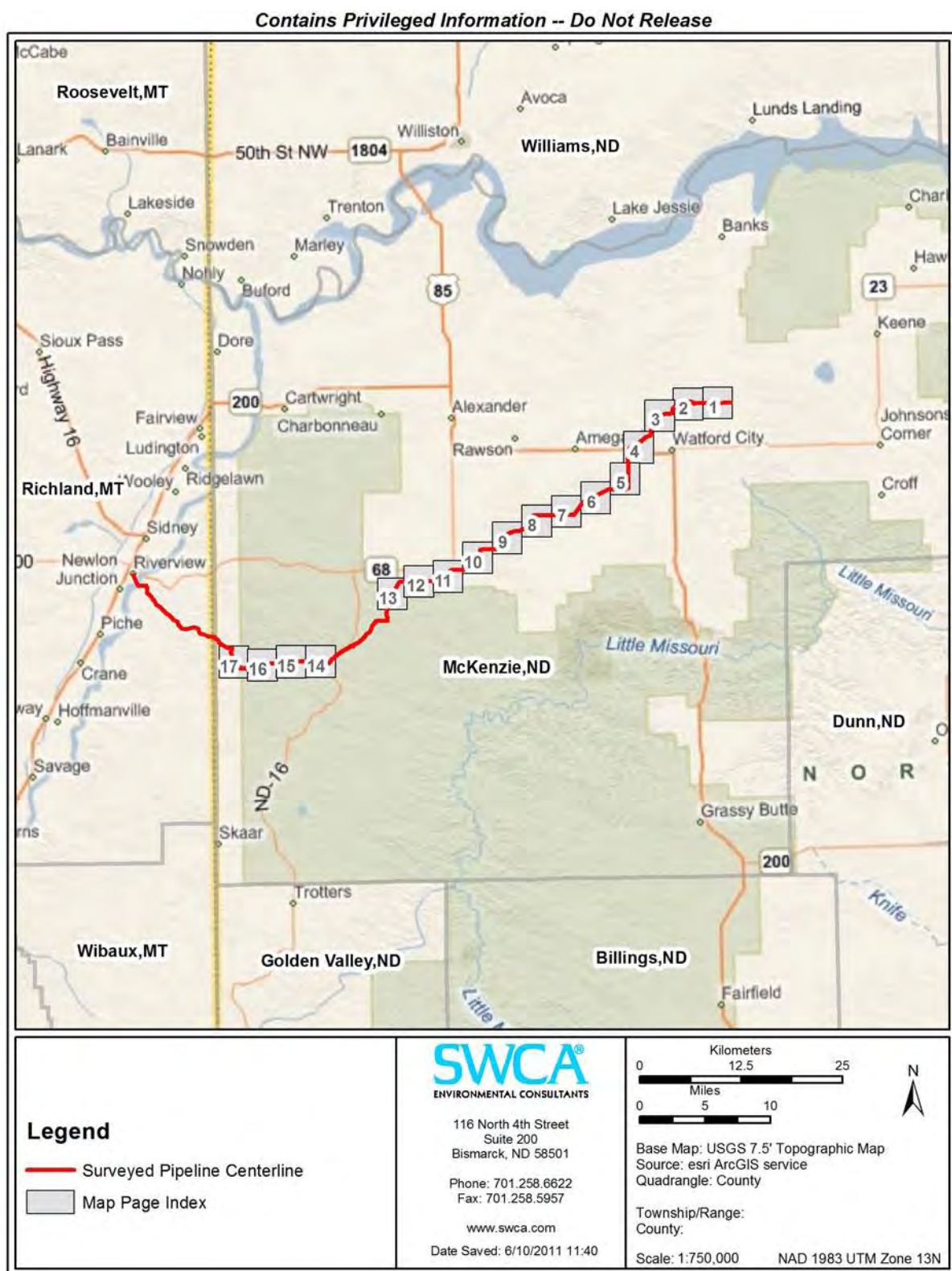


Figure 3. Project location map.

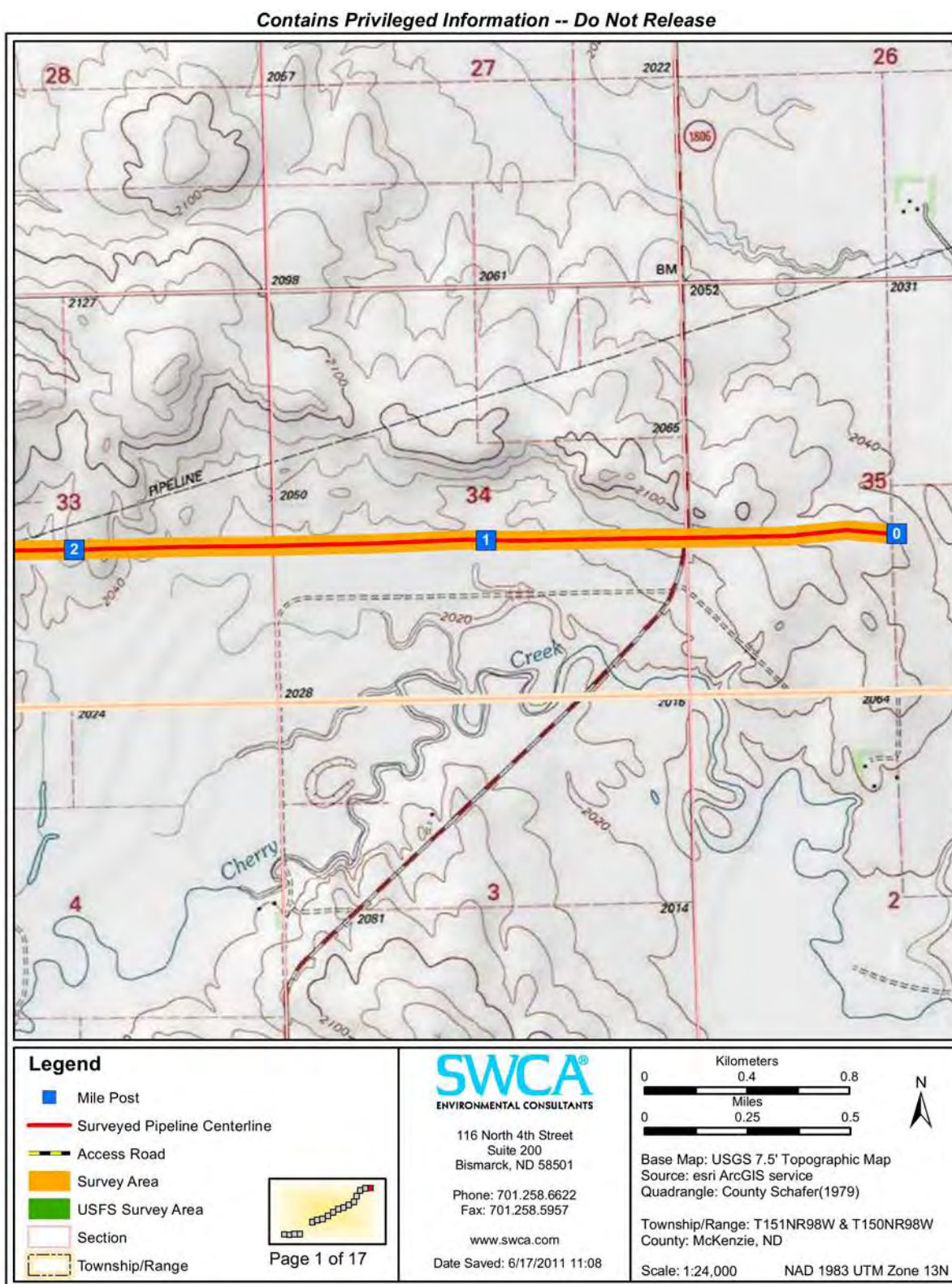


Figure 4a. Project area map 1 of 17.

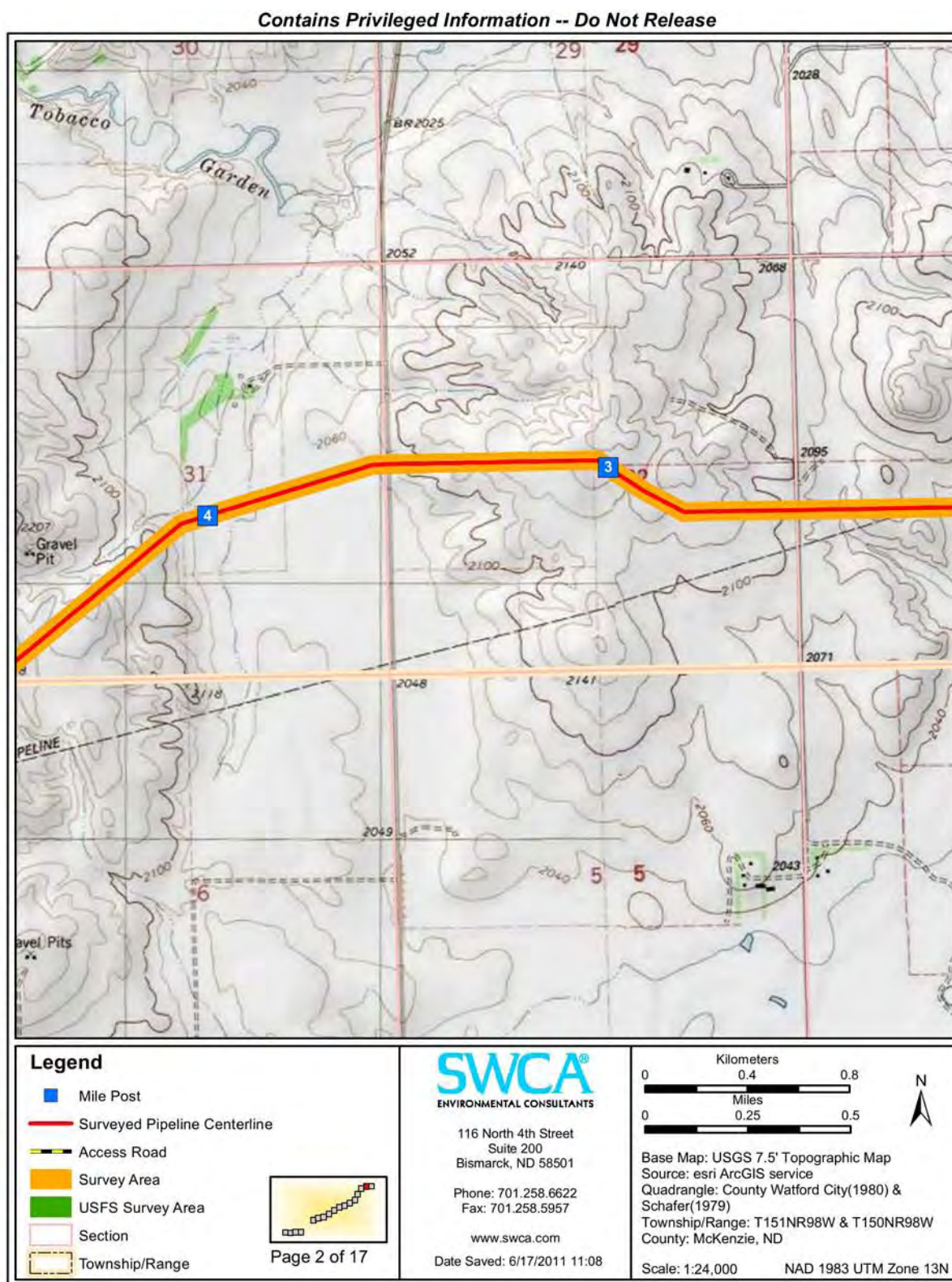


Figure 4b. Project area map 2 of 17.

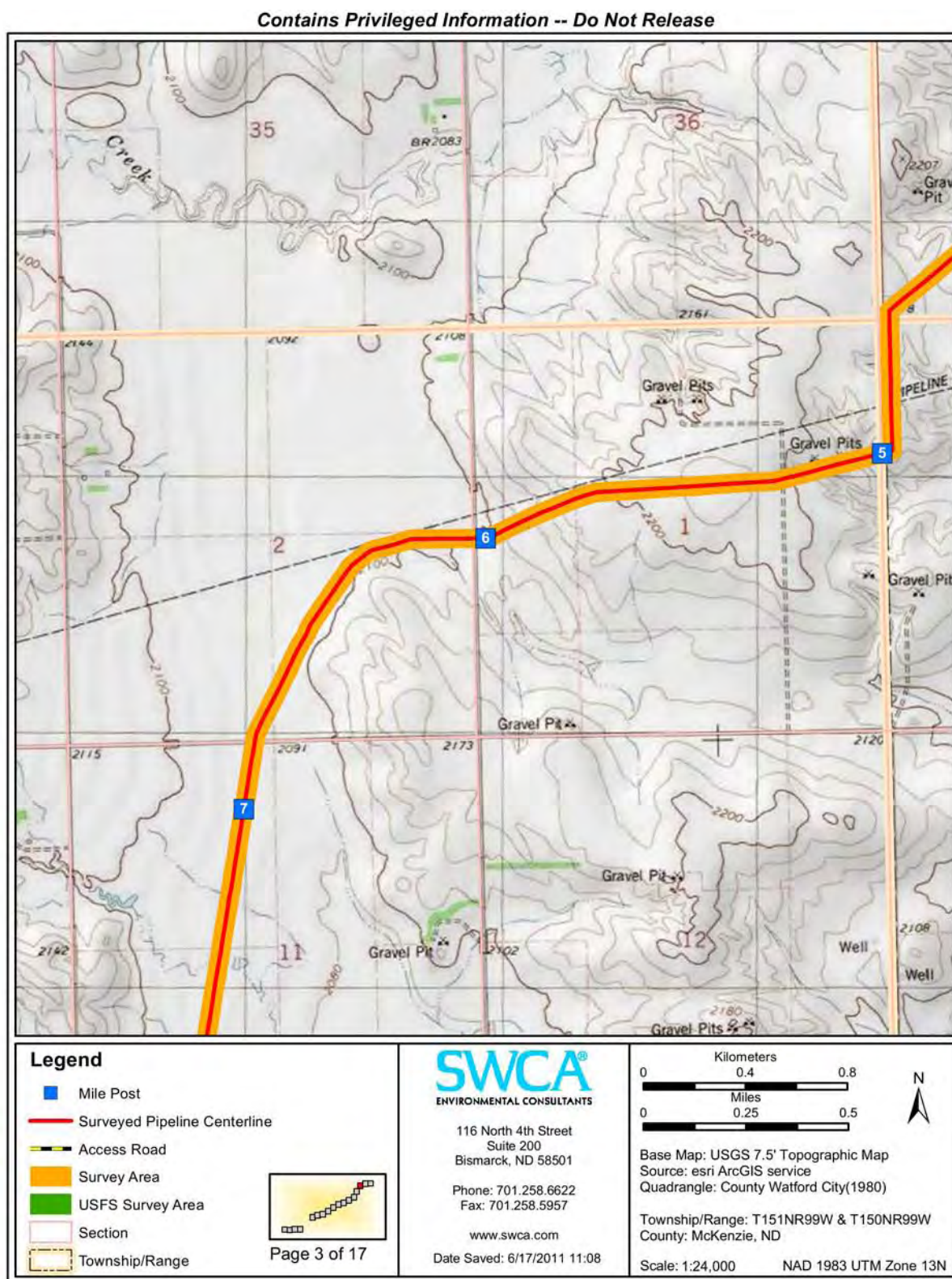


Figure 4c. Project area map 3 of 17.

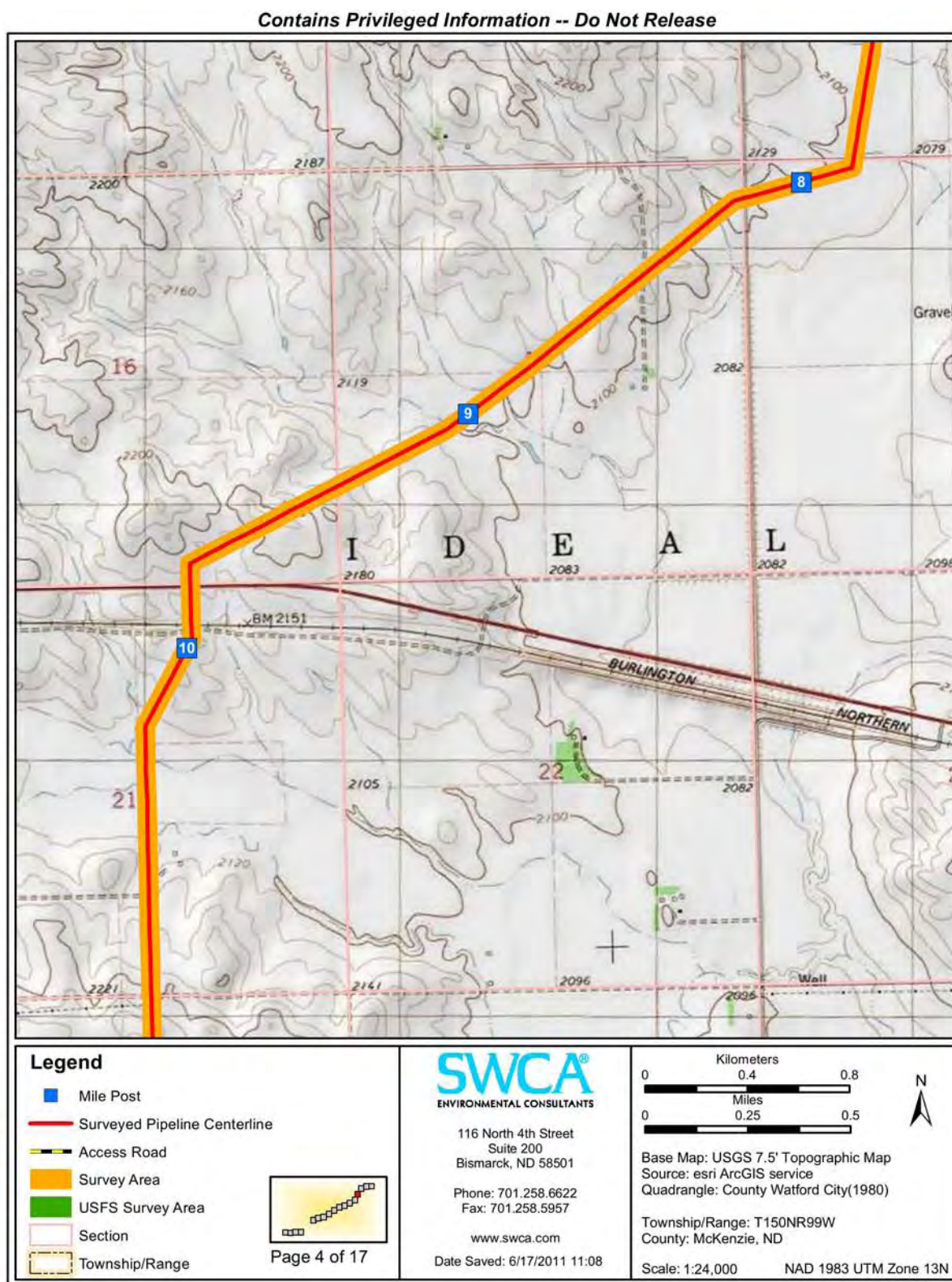


Figure 4d. Project area map 4 of 17.

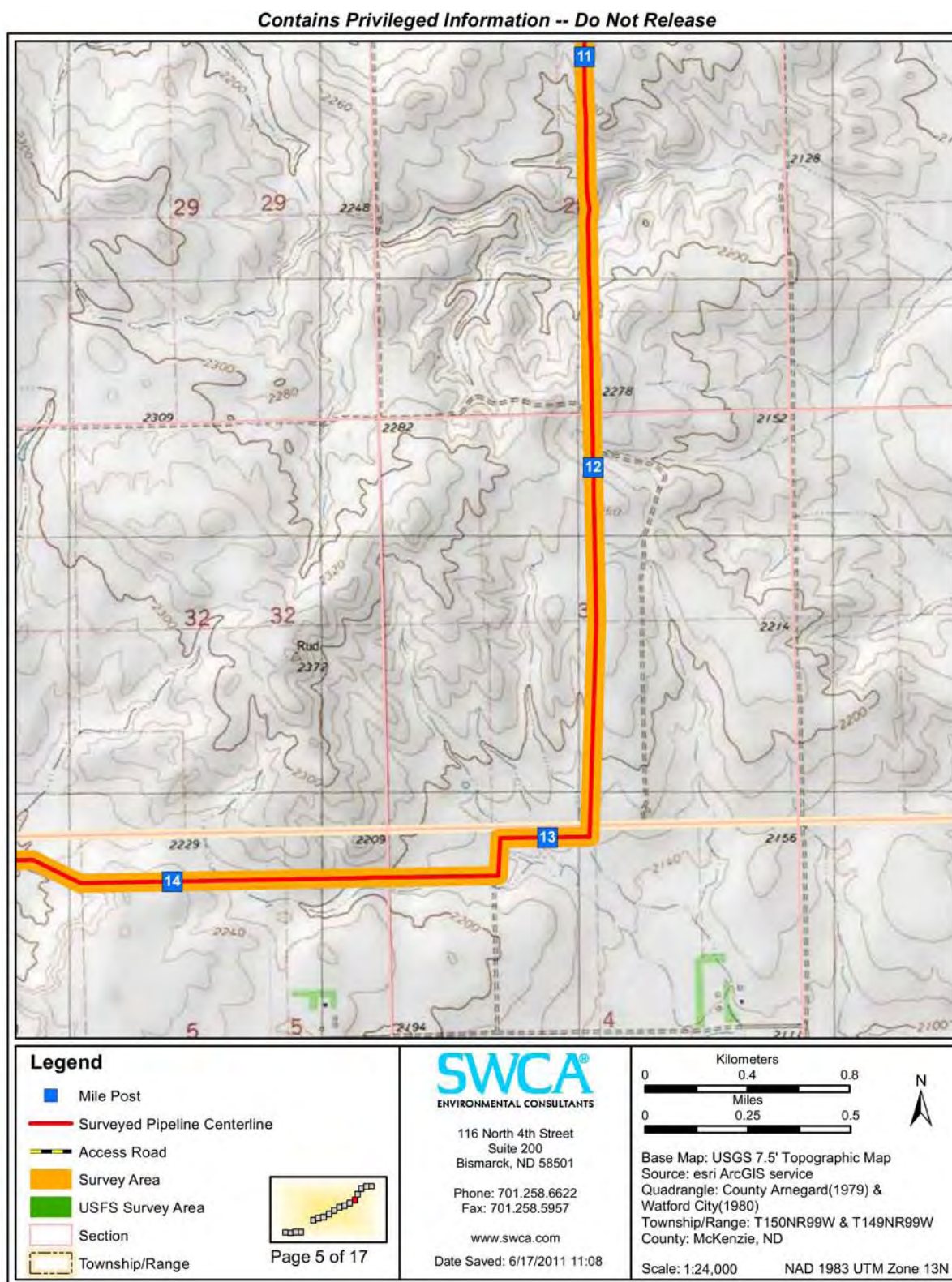


Figure 4e. Project area map 5 of 17.

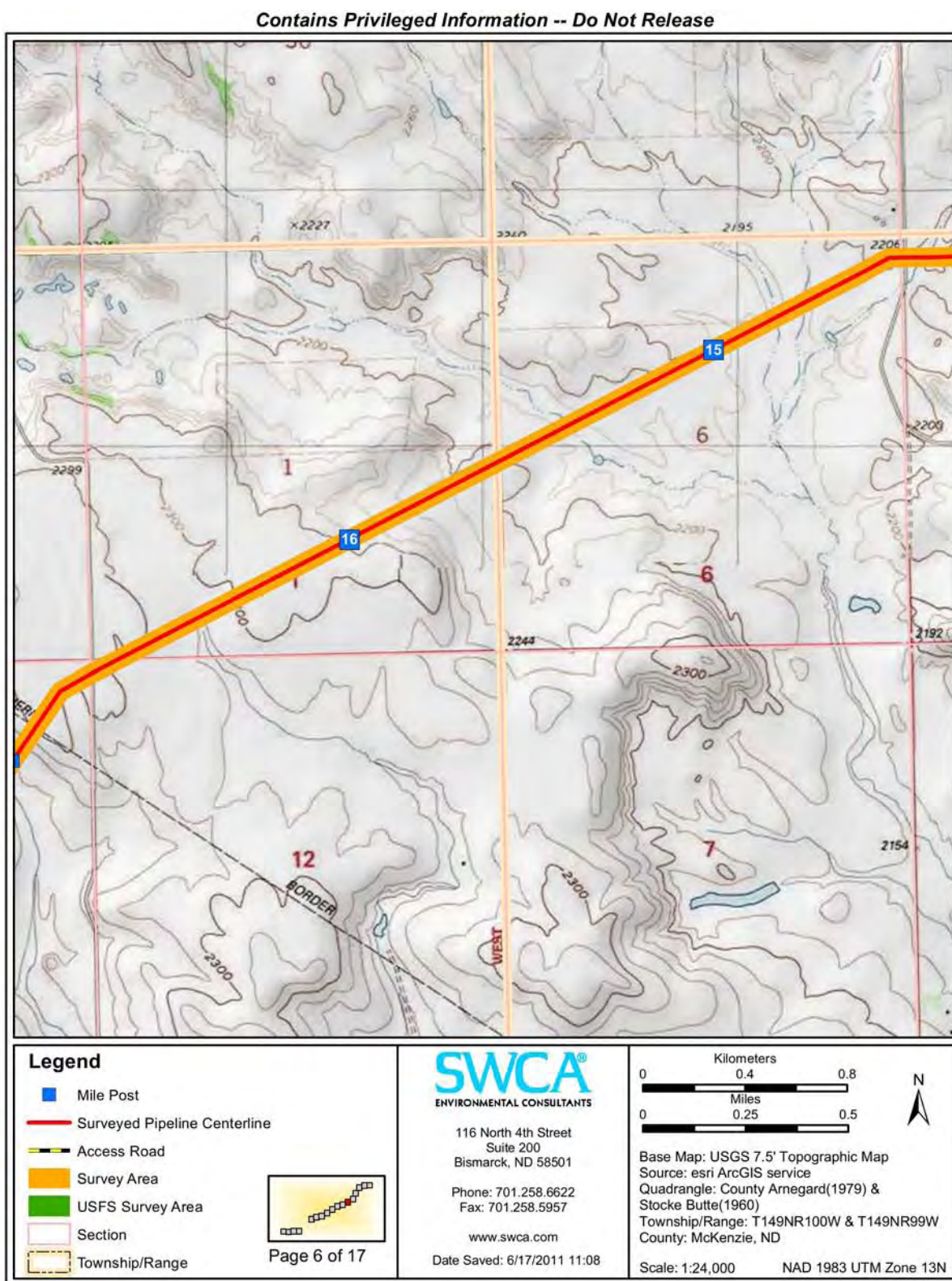


Figure 4f. Project area map 6 of 17.

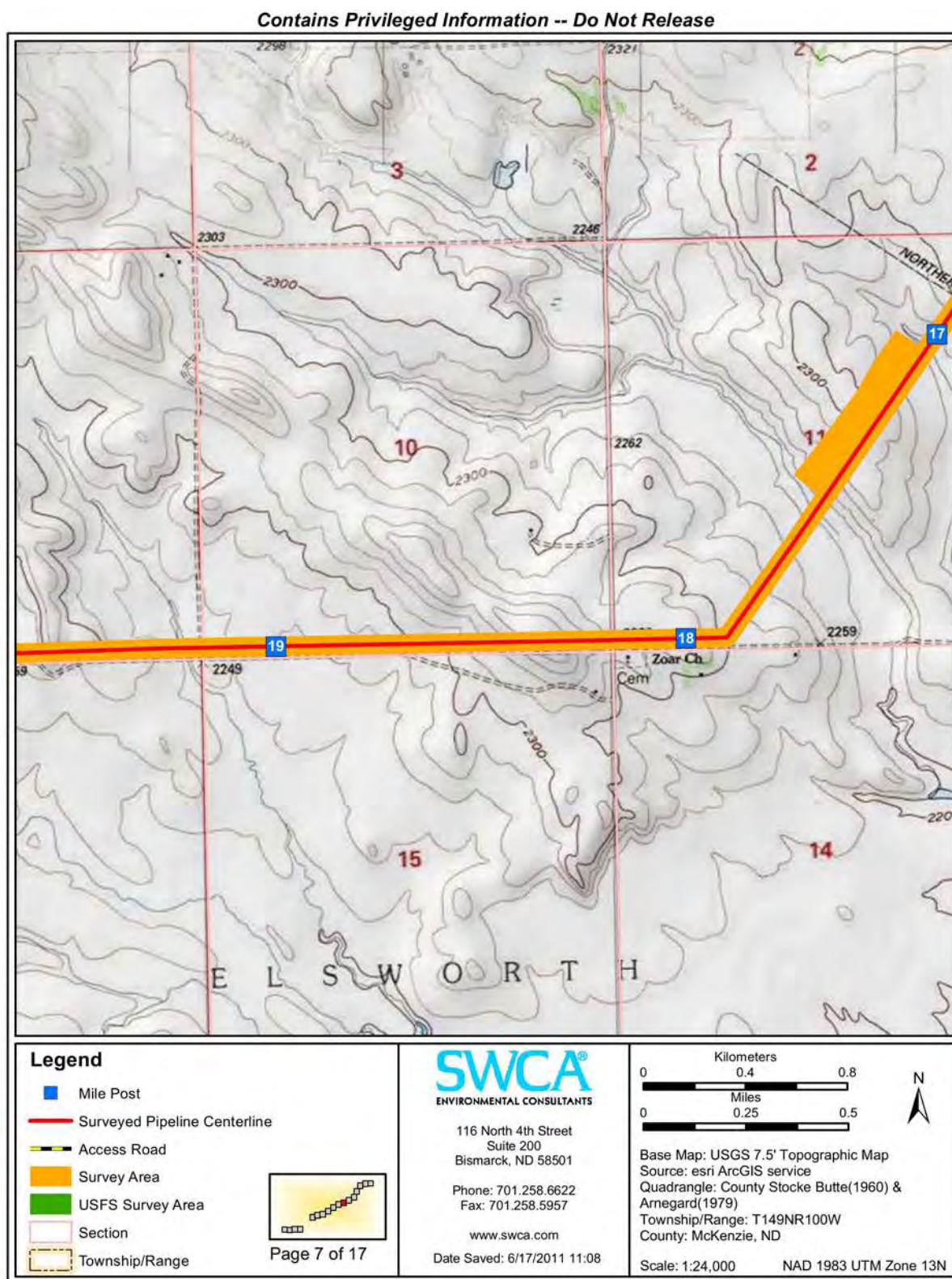


Figure 4g. Project area map 7 of 17.

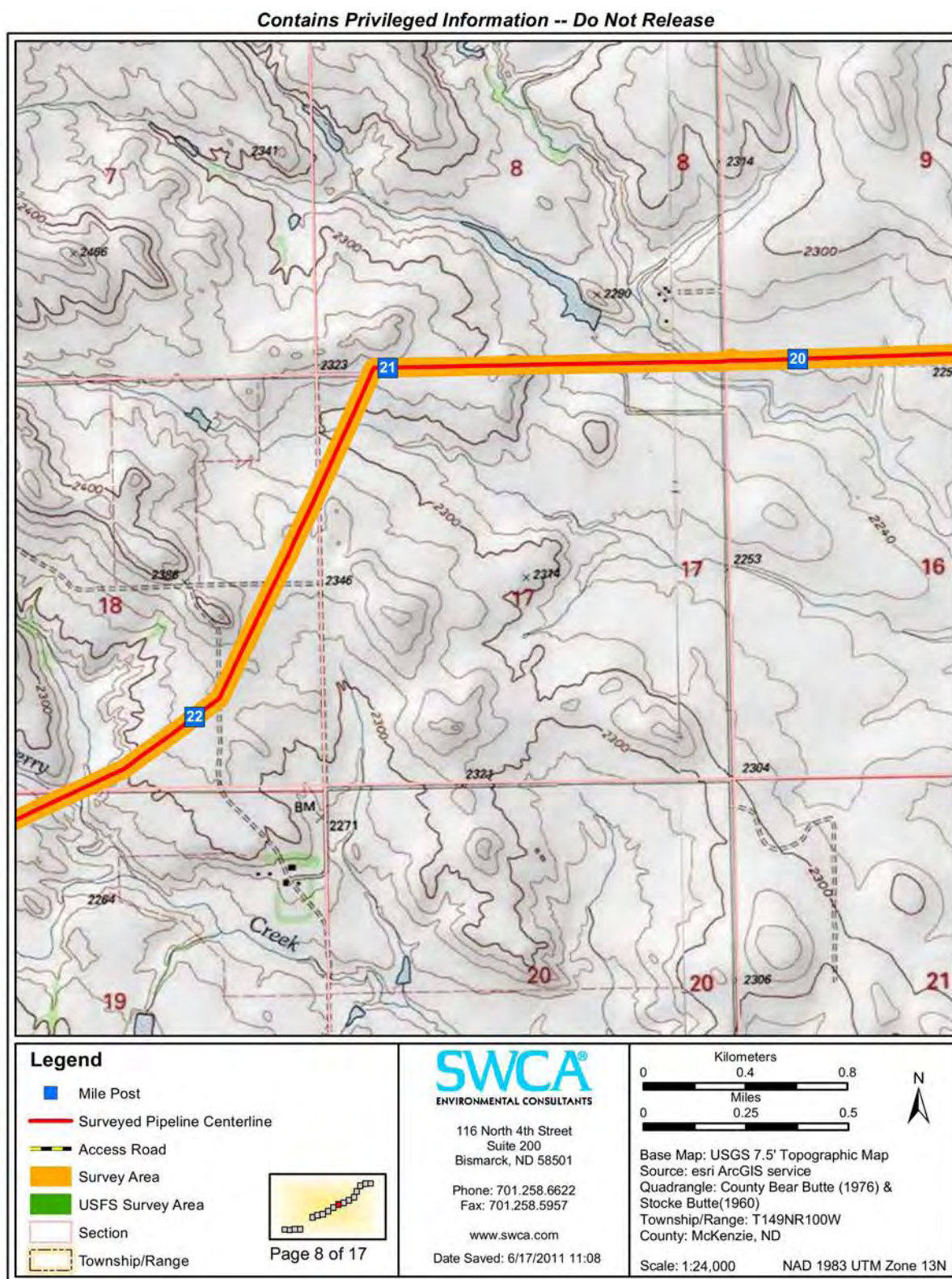


Figure 4h. Project area map 8 of 17.

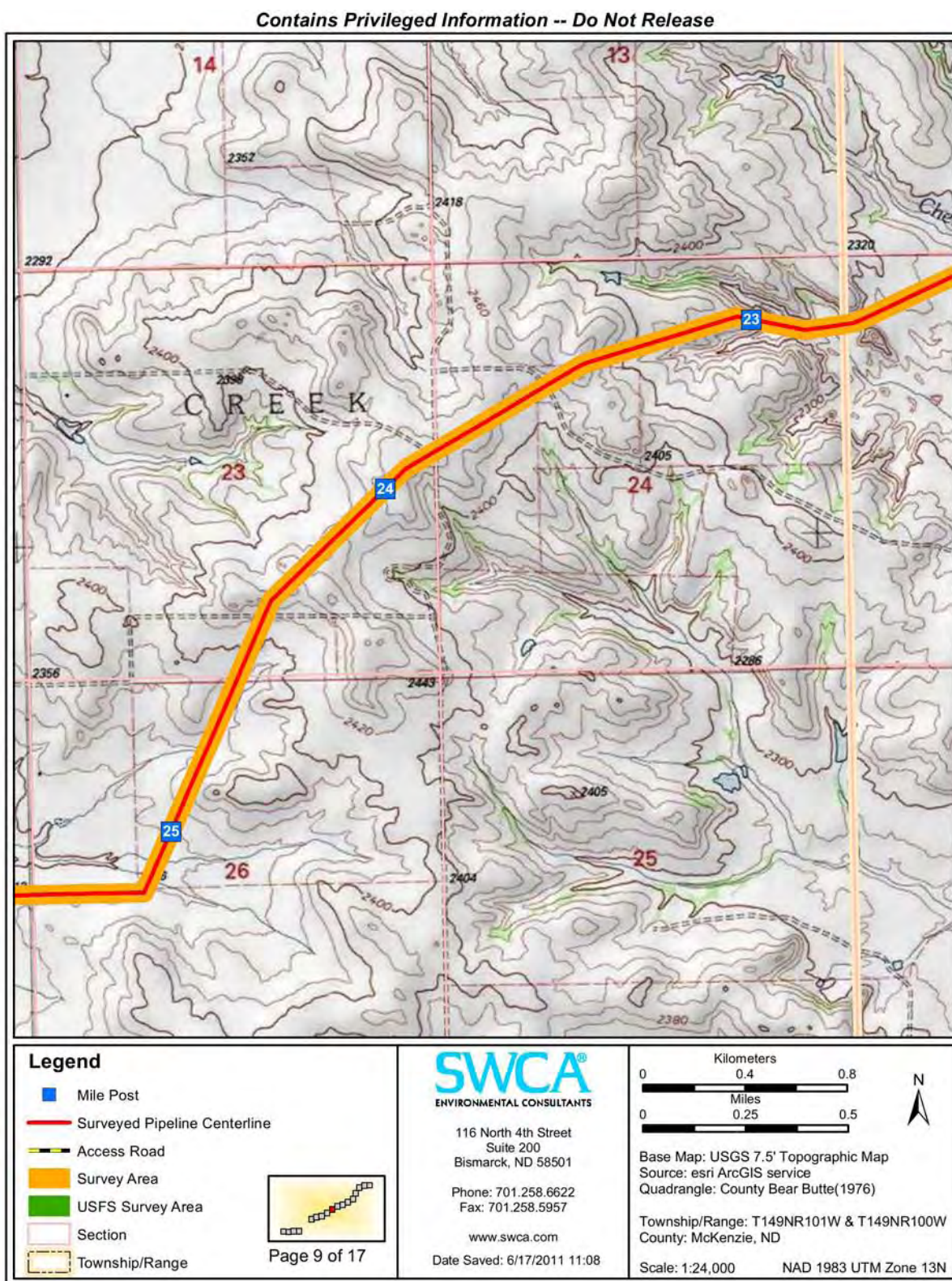


Figure 4i. Project area map 9 of 17.

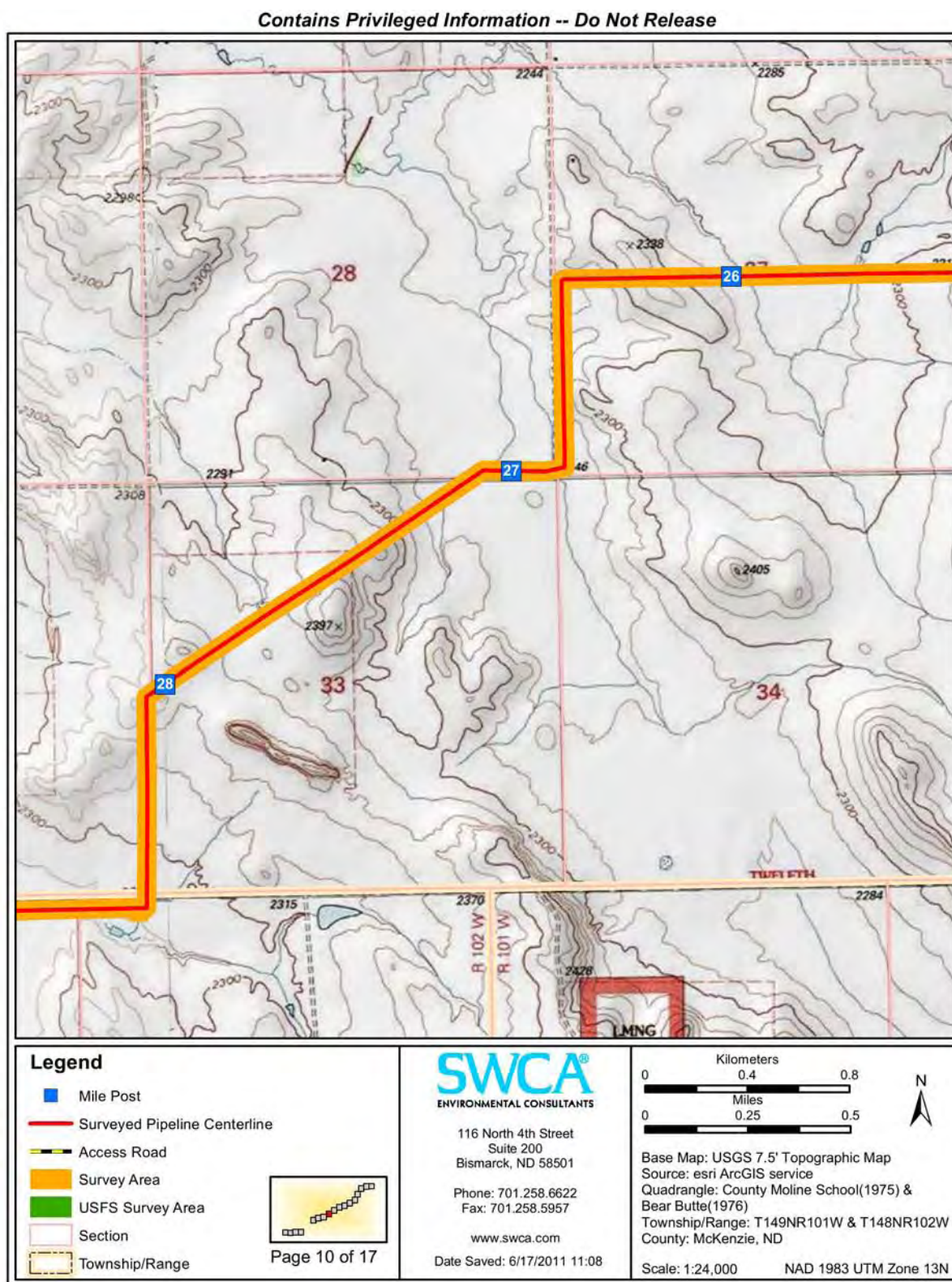


Figure 4j. Project area map 10 of 17.

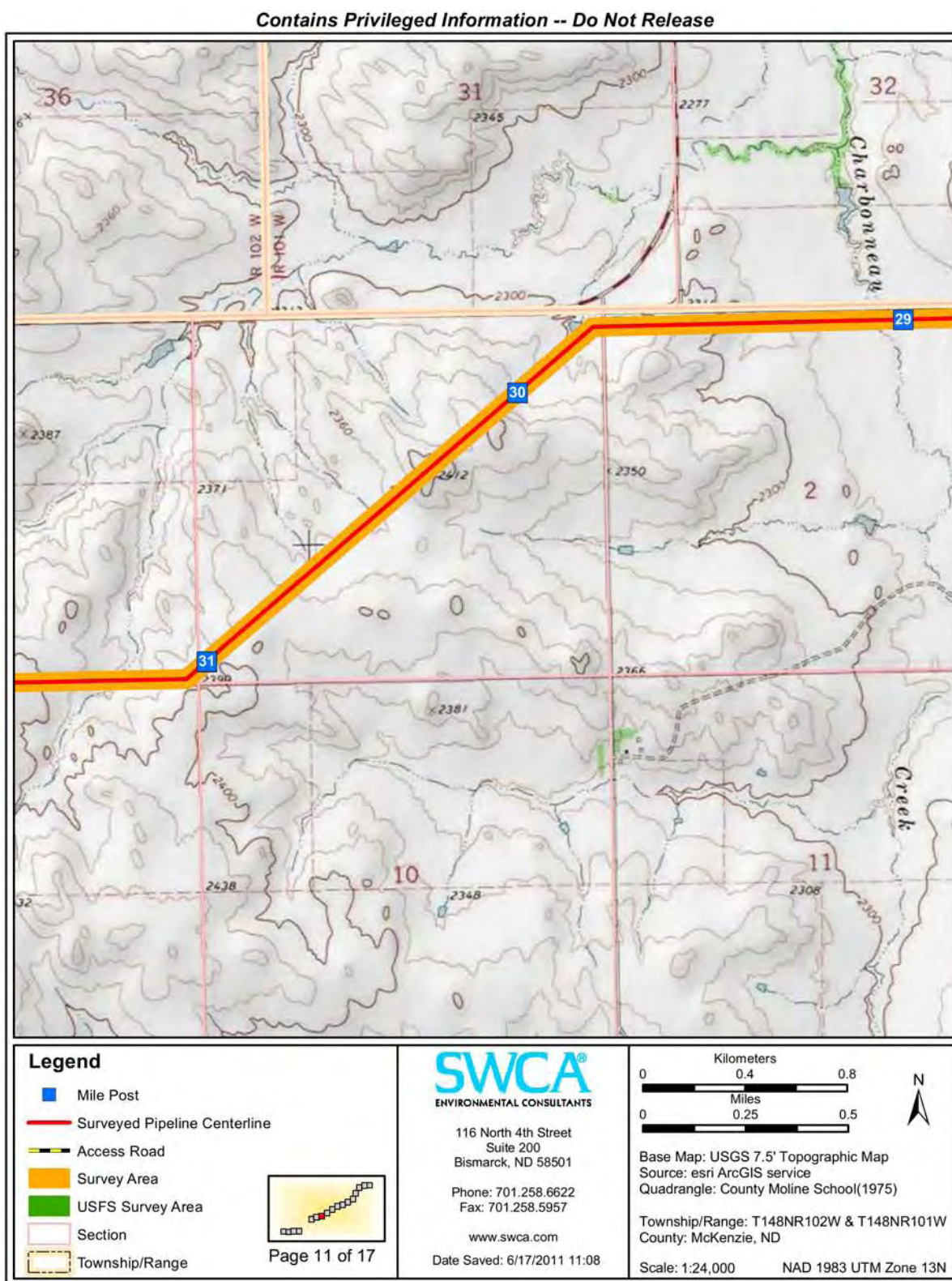


Figure 4k. Project area map 11 of 17.

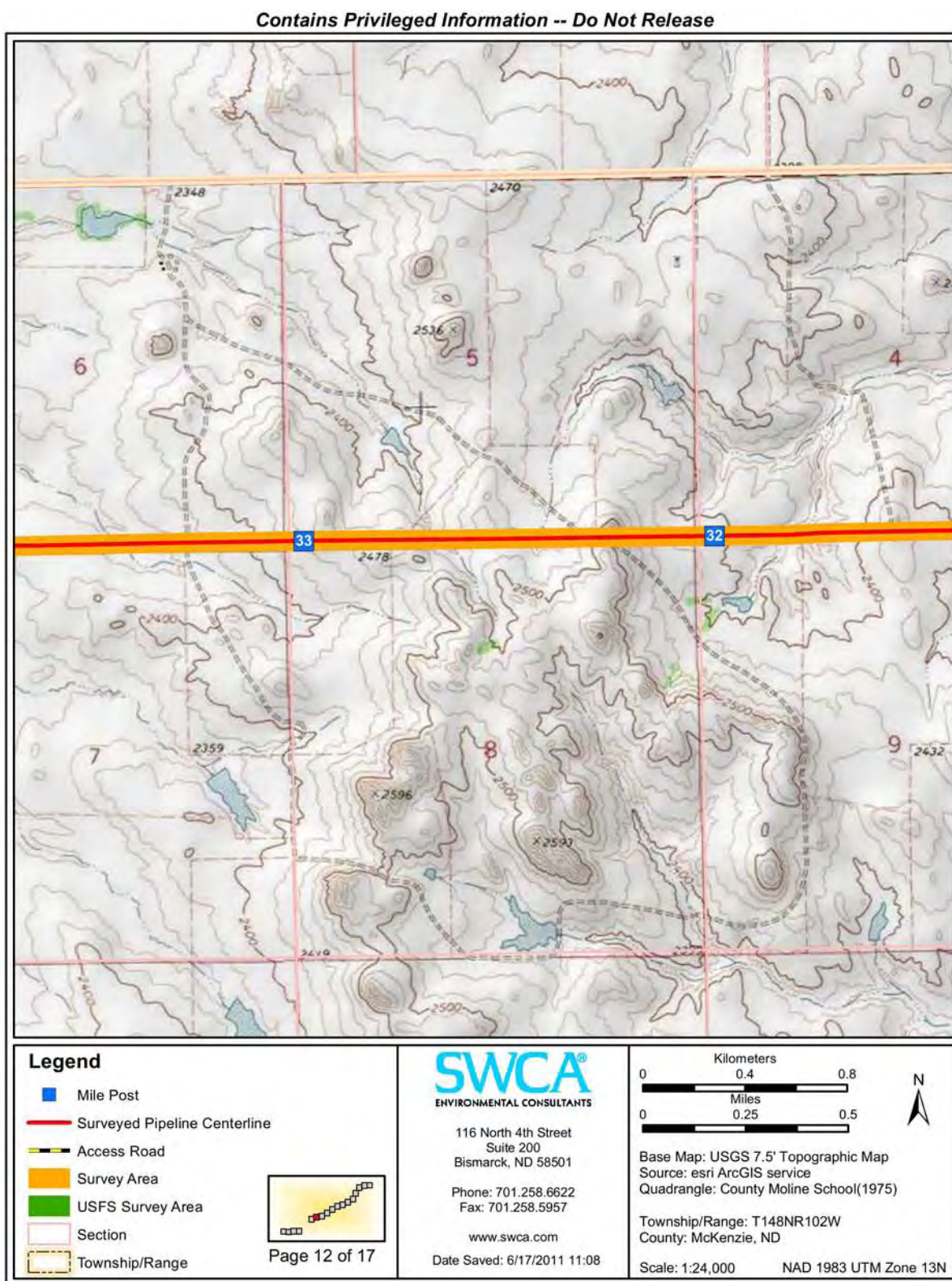


Figure 4I. Project area map 12 of 17.

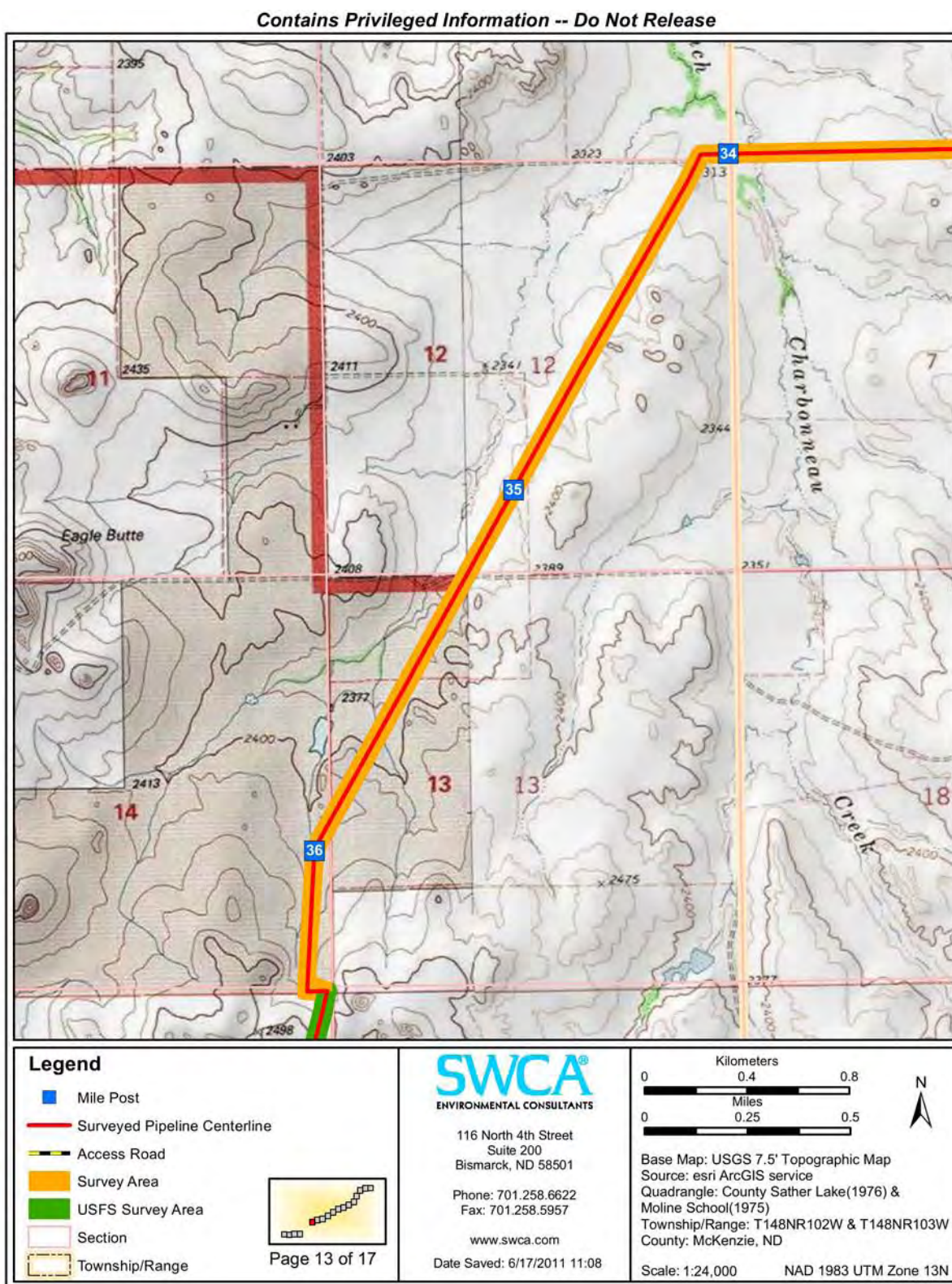


Figure 4m. Project area map 13 of 17.

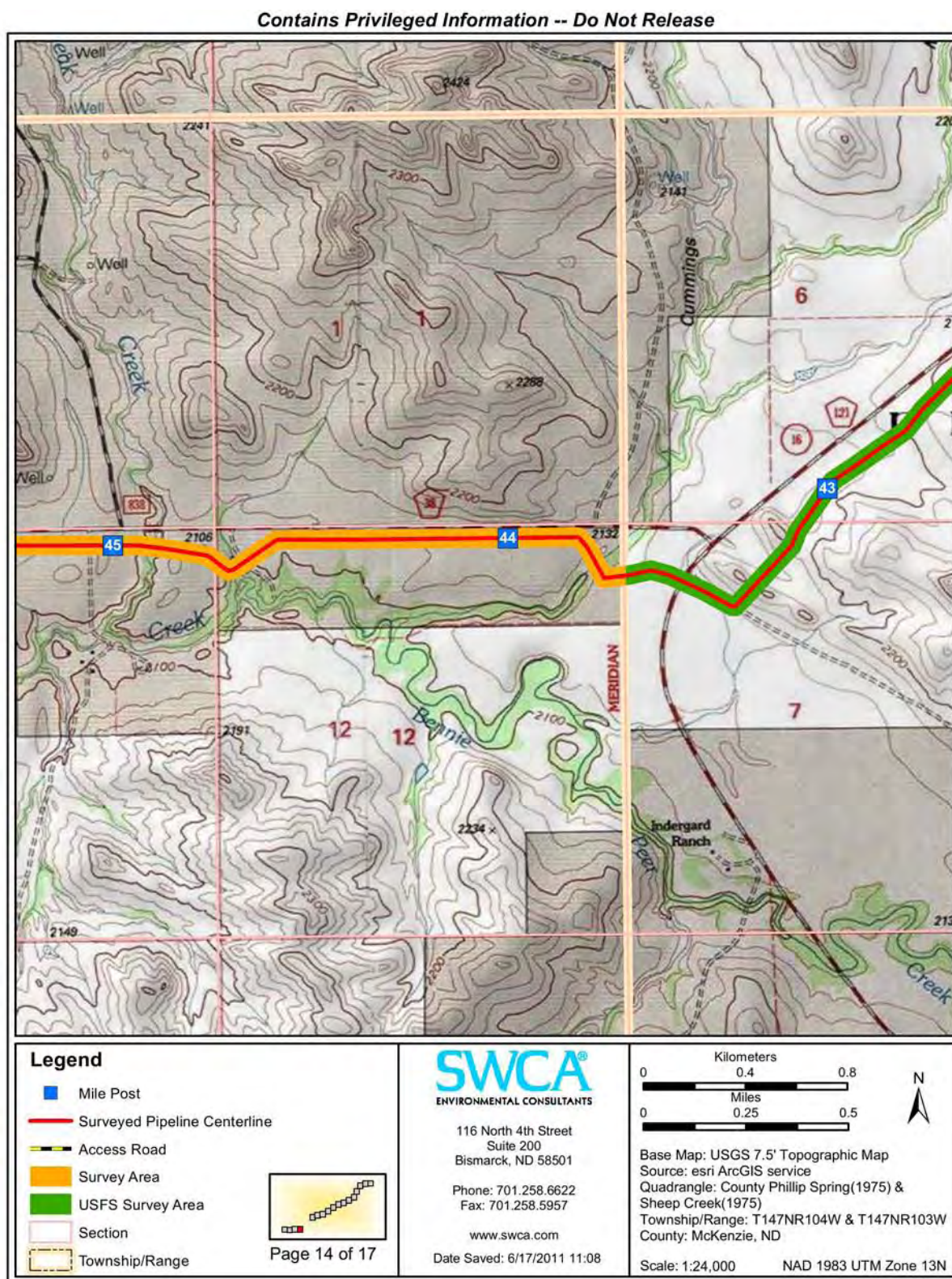


Figure 4n. Project area map 14 of 17.

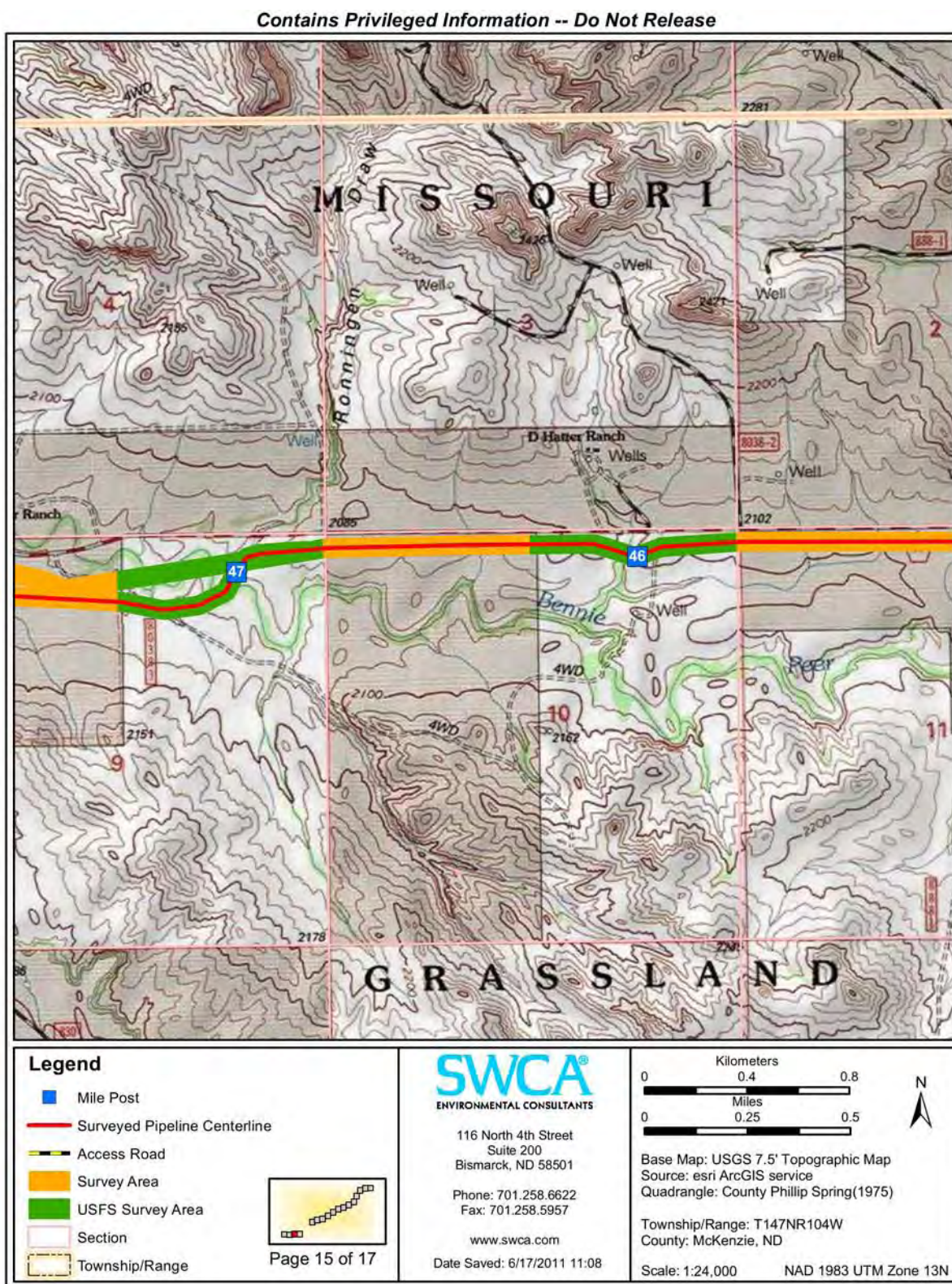


Figure 4o. Project area map 15 of 17.

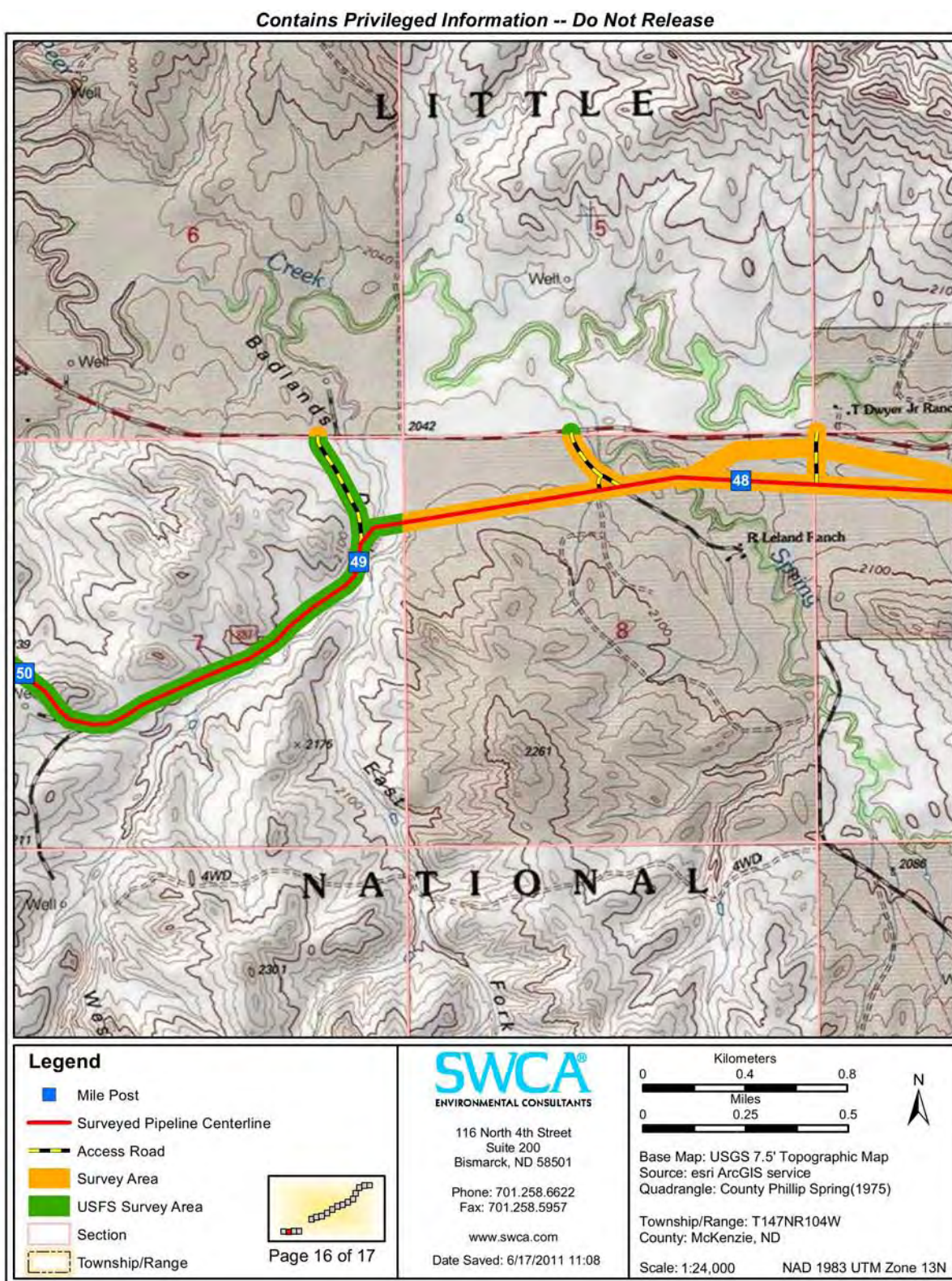


Figure 4p. Project area map 16 of 17.

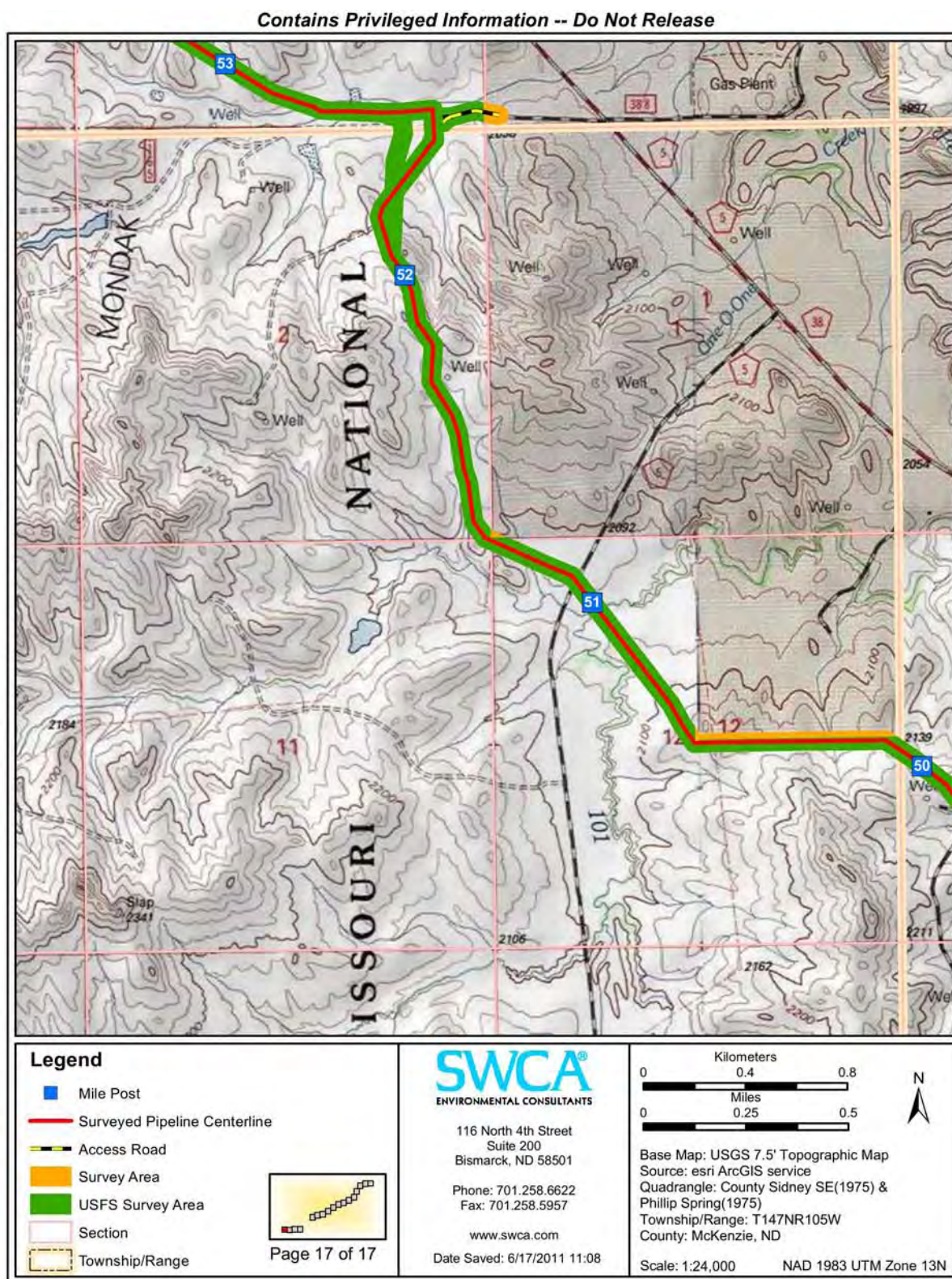


Figure 4q. Project area map 17 of 17.

PROJECT SETTING

TOPOGRAPHY

The project area is located in the glaciated Missouri Plateau and the River Breaks sections of the Great Plains physiographic province in western North Dakota (Fenneman 1931). The glaciated Missouri Plateau section is characterized by old plateaus and isolated mountains (Fenneman 1931).

For the portion of the proposed project area located on the Missouri Plateau in the northwest Great Plains ecoregion, the general topography of the proposed project area is fairly consistent—semiarid rolling plains of shale, siltstone, and sandstone with the occasional butte (Bryce et al. 1998) (Figure 5). Largely unaffected by glaciation, this ecoregion retains its original soils and complex drainage system (Bryce et al. 1998). The general topography of the portion of the proposed project area located on the River Breaks, in the northwest Great Plains ecoregion, consists of highly dissected hills and uplands bordering major rivers and associated alluvial plains (Bryce et al. 1998) (Figure 6). The river breaks form broken terraces and uplands that descend to the Missouri River and its major tributaries. They have formed particularly in soft, easily erodible strata, such as Pierre shale (Bryce et al. 1998). The northern and eastern half of the proposed pipeline project area is located on gently rolling plains and active agricultural fields, while the western and southern half consists of increasingly dissected terrain interspersed with active agricultural fields (Figure 7). The elevation ranges from approximately 2,195 to 2,539 feet (669 to 774 meters [m]), with the highest elevations in the northern portion of the project area, and the lowest elevations in the southern portion of the project area.



Figure 5. Project area overview depicting general topography towards eastern end of pipeline corridor, facing northeast.



Figure 6. Project area overview depicting general topography near the center section of the pipeline corridor, facing northeast.



Figure 7. Project area overview depicting general topography towards western end of pipeline corridor, facing west.

CLIMATE

The climate for northwest North Dakota is temperate. Based on climatic data collected from Watford City, North Dakota, between 1971 to 2000, January is the coldest month with a mean daily temperature of 8.2 degrees Fahrenheit (°F) while July is the warmest month with a mean daily temperature of 68.6°F (National Climatic Data Center [NCDC] 2009). Temperature extremes on record range from -43°F at the coldest to 111°F at the warmest. On average, 141 days are frost-free (28°F or above) and the average date of the first fall frost is September 25 and the average date of the last spring frost is May 6 (North Dakota Agricultural Statistics Service 2005). Per annum, Watford City receives 14.41 inches of precipitation (NCDC 2009). The wettest month is June, with an average of 3.05 inches of precipitation received; February is the driest, with only 0.39 inch of precipitation received on average. Thirty-five inches of snow are received annually, on average, with the highest accumulations (7.5 inches, on average) received in November (NCDC 2009). The highest monthly snow fall on record occurred in January at which time 22.3 inches of snow fell. Overall, northwest North Dakota, like much of the northwestern Great Plains, is characterized by a moderate to cool climate, with cold, dry winters and mild to warm, dry to moderately wet summers.

HYDROLOGY

The proposed pipeline crosses, from east to west, the following named waterways and their smaller unnamed intermittent tributaries: Cherry Creek, Antelope Creek, Charbonneau Creek, Bay Creek, Cummings Draw, Bennie Peer Creek, McPeak Creek, Ronnigen Draw, Spring Creek, Badlands Draw, and One-O-One Creek. The Bennie Peer Creek drains into the Yellowstone River approximately 10.55 miles northwest of the westernmost extent of the project area.

GEOLOGY

In general, the geology of the project area is characterized primarily by Oahe Formation-River Sediment. Oahe Formation-River Sediment consists of dark, obscurely bedded clay and silt (overbank sediment), generally overlying cross-bedded sand (channel sediment) on floodplains of modern streams up to 10 m (30 feet) thick (Clayton 1980). A minor portion of the project area is characterized by the Bullion Creek Formation. The Bullion Creek Formation consists of yellow-brown silt, sand, clay, sandstone, and lignite; river, lake, and swamp sediment, up to 200 m (600 feet) thick (Clayton 1980).

SOILS

Fifty-three soil series are present in the project area (Natural Resources Conservation Service [NRCS] 2011). The project area is dominated by well-drained alluvium and residuum found on hills, knolls, ridges, rises, alluvial flats, alluvial fans, and swales. Glacial till comprises a minor portion of the soils in the project area. Table 1 lists the soils within the project area.

Table 1. Summary of Soil Series within the Project Area

Soil Series	Parent Material	Drainage	Slope	Landform
Amor-Cabba loams	Residuum	Well drained	6%–9%	Knolls, ridges
Beisigl-Flasher loamy fine sands	Alluvium, Residuum	Somewhat excessively drained	6%–15%	Ridges
Beisigl-Flasher-Tally complex	Alluvium, Residuum	Well drained; somewhat excessively drained	9%–70%	Ridges
Belfield-Grail silty clay loams	Alluvium	Moderately well drained	0–2%	Alluvial flats; swales
Belfield-Savage silty clay loams	Alluvium	Well drained	2%–6%	Alluvial fans
Brandenburg-Cabba-Dogtooth complex	Eolian, Residuum	Excessively drained; well drained	15%–70%	Ridges, hills
Brandenburg-Searing-Dogtooth complex	Eolian, Alluvium, Residuum	Excessively drained; well drained	6%–15%	Ridges, hills
Cabba-Badland, outcrop complex	Residuum	Well drained	9%–70%	Ridges
Cabba-Chama-Havrelon silt loams	Alluvium, Residuum	Well drained	3%–70%	Ridges, floodplains
Cabba-Chama-Sen silt loams	Alluvium, Residuum	Well drained	9%–15%	Ridges, hills
Cabba-Sen-Chama silt loams	Alluvium, Residuum	Well drained	15%–70%	Ridges
Chama-Cabba-Sen silt loams	Alluvium, Residuum	Well drained	6%–9%	Knolls, hills
Chama-Sen-Cabba silt loams	Alluvium, Residuum	Well drained	3%–6%	Pediments
Cherry silt loam	Alluvium	Well drained	0–6%, 6%–9%	Alluvial fans
Cherry-Cabba silt loams	Alluvium, Residuum	Well drained	9%–40%	Alluvial fans, ridges
Daglum-Belfield complex	Alluvium	Moderately well drained	0–6%	Alluvial fans
Dogtooth-Janesburg silt loams	Alluvium, Residuum	Well drained	0–6%	Pediments
Dogtooth-Janesburg-Cabba complex	Alluvium, Residuum	Well drained	6%–30%	Hills, ridges
Dooley fine sandy loam	Eolian over glacial till	Well drained	0–6%	Flats, rises
Dooley-Zahl complex	Eolian over glacial till, Glacial till	Well drained	3%–6%, 6%–9%, 9%–15%	Knolls, ridges

Table 1. Summary of Soil Series within the Project Area (Continued)

Soil Series	Parent Material	Drainage	Slope	Landform
Farnuf loam	Alluvium	Well drained	0–2%, 2%–6%, 6%–9%	Alluvial flats, ridges, hills, divides, alluvial fans, and stream terraces
Flasher-Rock outcrop-Vebar complex	Residuum	Well drained; somewhat excessively drained	9%–70%	Hills, ridges
Golva silt loam	Alluvium	Well drained	2%–6%	Alluvial fans
Harriet silt loam	Alluvium	Poorly drained	0–2%	Drainageways, alluvial flats
Janesburg-Dogtooth silt loams	Residuum	Well drained	0–6%	Pediments
Korchea loam	Alluvium	Well drained	0–2%	Floodplains
Korchea loam, channeled	Alluvium	Well drained	0–2%	Floodplains
Korchea loam, channeled, wooded	Alluvium	Well drained	0–2%	Floodplains
Lawther silty clay	Alluvium	Well drained	0–2%	Alluvial flats, terraces
Manning fine sandy loam	Alluvium	Somewhat excessively drained	0–6%	Stream terraces and escarpments
Manning-Schaller-Wabek complex	Alluvium, Glaciofluvial deposits	Somewhat excessively drained; excessively drained	6%–25%	Ridges, stream terraces and escarpments
Maschetah silt loam	Alluvium	Well drained	0–2%, 2%–6%	Alluvial flats
Moreau silty clay	Residuum	Well drained	0–6%	Rises on uplands
Moreau-Wayden silty clays	Residuum	Well drained	6%–9%	Ridges on uplands
Niobell-Williams loams	Glacial Till	Moderately well drained; well drained	0–6%	Swales, rises
Noonan-Niobell-Williams loams	Glacial Till	Moderately well drained; well drained	0–6%	Rises, till plains
Reeder-Cabba loams	Residuum	Well drained	6%–9%	Ridges
Reeder-Farnuf loams	Alluvium, Residuum	Well drained	3%–6%	Rises
Regent-Janesburg complex	Residuum	Well drained	0–6%, 6%–9%	Rises, hills
Regent-Savage silty clay loams	Alluvium, Residuum	Well drained	3%–6%	Pediments, alluvial fans
Rhoades-Daglum complex	Alluvium	Moderately well drained	0–6%	Alluvial flats, alluvial fans

Table 1. Summary of Soil Series within the Project Area (Continued)

Soil Series	Parent Material	Drainage	Slope	Landform
Savage silty clay loam	Alluvium	Well drained	0–2%, 2%–6%, 6%–9%	Alluvial flats, alluvial fans, hills, terraces, ridges, divides, and knolls
Tally-Parshall fine sandy loams	Alluvium	Well drained	0–6%, 6%–9%	Alluvial fans, alluvial flats, ridges, escarpments, swales, hills, and stream terraces
Vebar-Flasher complex	Residuum	Well drained; somewhat excessively drained	3%–6%, 6%–9%	Rises, ridges
Vebar-Flasher-Tally complex	Alluvium, Residuum	Well drained; somewhat excessively drained	9%–15%	Hills, ridges
Williams-Bowbells loams	Alluvium, Glacial Till	Moderately well drained; well drained	3%–6%	Rises, swales
Williams-Zahl loams	Glacial Till	Well drained	3%–6%, 6%–9%	Ridges, knolls, till plains
Zahl-Beisigl-Tally complex	Alluvium, Glacial Till	Well drained; somewhat excessively drained	9%–15%	Knolls and ridges on till-mantled residual uplands
Zahl-Cabba-Maschetah complex	Alluvium, Glacial Till	Well drained	3%–70%	Ridges on till mantled residual uplands
Zahl-Cabba-Williams complex	Alluvium, Glacial Till	Well drained	9%–15%	Knolls and ridges on till-mantled residual uplands
Zahl-Williams loams	Glacial Till	Well drained	9%–15%, 15%–25%	Knolls, ridges
Zahl-Williams loams, dissected	Glacial Till	Well drained	15%–45%	Ridges on till plains
Zahl-Williams-Cabba complex	Alluvium, Glacial Till	Well drained	6%–9%	Knolls and ridges on till-mantled residual uplands

Source: NRCS (2011)

FLORA AND FAUNA

The project area is situated within the Northwestern Great Plains ecoregion, characterized by native grasslands over rolling plains. Grassland vegetation here is generally categorized as northern mixed prairie, a transition zone between short and tall grass prairie. The native rolling prairie is dominated by cool season mid-height grass species such as western wheat grass (*Agropyron smithii*), green needlegrass (*Stipa viridula*), and needle and thread (*Stipa comata*). Shortgrass species, primarily blue grama (*Bouteloua gracilis*), and cool season sedges (*Carex* spp.) are also present. Shrublands in the project area are typically composed of shrubs, grasses

and forbs and are classified as arid or mesic. Arid shrublands include big sagebrush (*Artemisia tridentata*), silver sagebrush (*Artemisia cana*), and skunkbrush (*Rhus trilobata*) and are generally associated with dry river terraces and/or upland sites. Mesic shrublands include snowberry (*Symphoricarpos occidentalis*), woods rose (*Rosa woodsii*) and shrubby cinquefoil (*Potentilla fruitcosa*) and are often found on north-facing slopes, in draw bottoms, and in shallow depressions. Riparian areas in the rolling prairie generally contain wetland species such as prairie cordgrass (*Spartina pectinata*), Baltic rush (*Juncus balticus*), three square bulrush (*Scirpus pungens*), and spikerush (*Eleocharis palustris*); and, within saline riparian areas, inland saltgrass (*Distichlis spicata* var. *stricta*) and plain bluegrass (*Poa arida*). Plains cottonwood (*Populus deltoides*) is found in the floodplains as well. The project area crosses patches of woodlands, primarily in the badlands characteristic of the southern and western portion of the project area. These woodlands contain green ash (*Fraxinus pennsylvanica*), snowberry, and chokecherry (*Prunus virginiana*). Rocky mountain juniper (*Juniperus scopularum*) is the dominant conifer woodland. Figures 8 and 9 show the vegetation communities observed within the project area.



Figure 8. Overview of the vegetation characteristic of the northern and eastern end of project area, facing east.



Figure 9. Overview of the vegetation characteristic of the southern and western end of project area, facing west.

Approximately 160 wildlife species are resident or seasonal visitors to the Yellowstone River ecosystem, and hundreds of native fish species. Some of the animal species that would have been common and available for human use in the Yellowstone River Valley area—both prehistorically and historically—include fur bearing mammals such as beaver (*Castor canadensis*), muskrat (*Ondatra zibethicus*), eastern cottontail (*Sylvilagus floridanus*), elk (*Cervus elaphus*), moose (*Alces alces*), mule deer (*Odocoileus hemionus*), white-tailed deer (*Odocoileus virginianus*), pronghorn (*Antilocapra americana*), and bison (*Bison bison*); and bird and waterfowl species such as mallard (*Anas platyrhynchos*), Canada goose (*Branta canadensis*), sharp-tailed grouse (*Pedioecetes phasianellus campestris*), golden eagle (*Aquila chrysaetos*), and bald eagle (*Haliaeetus leucocephalus*) (Seabloom et al. 1978). At present, federally listed threatened and endangered species that may reside in the area include whooping crane (*Grus Americana*), black-footed ferret (*Mustela nigripes*), piping plover (*Charadrius melodus*), interior least tern (*Sternula antillarum*), pallid sturgeon (*Scaphirhynchus albus*), and gray wolf (*Canis lupus*) (U.S. Fish and Wildlife Service 2010).

ENVIRONMENTAL CONSTRAINTS

Preservation (including both exposure and burial) of archaeological materials within or adjacent to the project area has been affected by numerous factors. These consist of natural erosion, including ongoing aeolian and colluvial processes, especially in portions of the project area that cross badlands; alluvial deposition along active stream channels; pipeline construction and maintenance; agricultural activities, including plowing and vehicle traffic; livestock grazing; vehicle traffic along two-track roads; road construction; fence line construction; and electrical transmission line construction.

In some places, these varied land uses have resulted in increased archaeological visibility through the surface exposure of buried materials and sediments (e.g., through plowing or pipeline trenching), and/or removal of overburden (e.g., through grading, crop removal, vehicle traffic, etc.) allowing for the identification of numerous sites and an interpretation of relatively high site density. For example, along the portions of the project area that follow an existing pipeline scar and cross agricultural fields, a higher number of sites are expected to be encountered compared to elsewhere along the corridor, due to the increased exposure of otherwise buried materials. In these areas, cultural material scatters, like lithic scatters, are expected to dominate, as plowing tends to expose these portable, yet durable, shallowly buried materials without causing significant damage to the artifacts themselves (although the spatial integrity of such sites are potentially significantly affected).

Conversely, these same activities also result in the destruction of other resources, such as sites containing stone features, hearths, and depressions. Plowing and grading activities tend to destroy, obscure, and/or disassemble such features and as a result, sites containing surface features are less likely to be identified along an existing pipeline scar and through agricultural fields.

For portions of the project area where native prairie remains, sites containing features are expected to dominate, as impacts to these areas have been minimal, generally limited to less destructive forces such as grazing and erosion (at least in the short-term). Such forces tend to have a less significant impact on surface features. On the other hand, cultural material scatters are difficult to identify in areas characterized by native prairie, as fewer factors have contributed to the exposure of shallowly buried materials. Additionally, bare ground visibility tends to be lower due to denser vegetation cover; as a result, smaller artifacts comprising cultural material scatters are more difficult to identify.

Finally, in other cases, the aforementioned impacts have resulted in the complete removal or destruction of archaeological materials. Therefore, site densities are expected to vary significantly across the proposed pipeline corridor as preservation is contingent on the complex interplay of multiple natural and human-induced factors.

CULTURAL HISTORICAL OVERVIEW

PREHISTORIC CONTEXTS

The following discussion incorporates a variety of sources to develop a prehistoric overview for the work conducted for this project and includes information from the Little Missouri River Study Unit (LMRSU), Garrison Study Unit (GSU), and the Yellowstone River Study Unit (YRSU) in which the project area is located (Gregg and Bleier 2008a). As of 2007, 2,329 archaeological sites had been identified in the LMRSU, the majority of which were identified on ridges (35.8 percent); hills, bluffs, and knolls (21.2 percent); and terraces (17.8 percent) (Gregg and Bleier 2008a). In the GSU, 3,303 archaeological sites were identified, the majority of which were identified on ridges (40.5 percent); hills, bluffs, and knolls (24.0 percent); and terraces (10.4 percent) (Gregg and Bleier 2008b). In the YRSU, 379 archaeological sites had been

identified, the majority of which were identified on ridges (37.5 percent); hills, bluffs, and knolls (26.1 percent); and terraces (19.0 percent) (Gregg and Bleier 2008c).

Paleoindian Tradition (ca. 11,500–7,900 years before present [B.P.])

Although speculation exists regarding the possibility of earlier habitation of the Great Plains, the Paleoindian tradition is the oldest of the region, and, in general, is associated with a hunting and gathering adaptation (Gregg 1985). The Paleoindian tradition is subdivided here into six main complexes: Clovis, Goshen, Folsom, Hell Gap/Agate Basin, Alberta/Cody, and Parallel Oblique Flaked. In total, 30 Paleoindian archaeological resources have been identified in the LMRSU, while only two have been identified in the YRSU (Gregg and Bleier 2008a, 2008c). Fourteen Paleoindian archaeological resources have been identified in the GSU (Gregg and Bleier 2008b). Paleoindian sites in the GSU include, but are not limited to, the Beacon Island site (32MN234A), the Beacon Island Agate Basin site (32MN234), the Moe site (32MN101), and 32ME946.

The Clovis complex (ca. 11,500–10,800 B.P.), defined by large, fluted lanceolate projectile points, is the earliest unequivocal complex in North America. Clovis artifacts have been found with megafauna, such as mammoth, in buried contexts in the Southwest and Great Plains (Grayson and Meltzer 2002); however, although megafauna were probably dietary constituents, it is debated to what degree Early Paleoindians pursued large game (Cannon and Meltzer 2004; Grayson and Meltzer 2002). Few Clovis sites have been recorded in the region and only one Clovis archaeological resource has been identified in the LMRSU (Gregg and Bleier 2008a). In the South Dakota Badlands, the Lange-Ferguson site yields the best evidence for proboscidean exploitation (Hannus 1990). Here, modified mammoth bones are directly associated with a flake and three projectile points that were recovered from deposits similar to those containing mammoth, indicating that Clovis hunter-gatherers either killed the animals or scavenged their carcasses (Hannus 1990). Skeletal remains from a single mammoth were unearthed during building construction in 1988 near Powers Lake within the GSU. These remains were shallowly buried, were not radiocarbon dated, and were not appraised for the potential of associated cultural remains (Gregg and Bleier 2008b). Few Clovis sites have been recorded in the region. Clovis artifacts were recovered from two sites: a single Clovis point base was recovered from 32ME946 (Floodman 1988) and Clovis points have been recovered from the Beacon Island Agate Basin site (Ahler 2003).

Goshen (ca. 10,900–10,100 B.P.) is a technological complex first identified at Hell Gap, Wyoming (Irwin 1967, 1971), but it is also found at Mill Iron, Montana, Carter-Kerr/McGee, Wyoming, and the Jim Pitts site, located in the South Dakota Black Hills (Sellet 2001). Goshen is poorly understood—the basally thinned, unfluted projectile points share affinities with both Clovis and Folsom, but are also similar to Southern Plains Plainview points. In stratified deposits, Goshen materials typically underlie Folsom (Frison et al. 1996). No Goshen material has been identified in the LMRSU or in the YRSU (Gregg and Bleier 2008a, 2008c). Plainview or Goshen points were recovered from the Moe site in the GSU (Gregg and Bleier 2008b).

The Folsom complex (ca. 10,900–10,200 B.P.) is typified by distinctive fluted lanceolate projectile points. With most large grazers extinct by Folsom times and grasslands dominating the Great Plains, bison populations flourished, providing resources for Folsom hunters (Frison

1991). However, many high-elevation Folsom sites also demonstrate broad diets of diverse small prey (Hill 2007). Probable structures recorded at the Mountaineer and Barger Gulch sites in Colorado suggest long-term occupations in mountain settings (Stiger 2006; Surovell and Waguespack 2007). In North Dakota, there are numerous documented Folsom sites (Gregg 1985), including the Bobtail Wolf (32DU955A), Big Black (32DU955C), and Young-Man-Chief (32DU955D) sites (Root 2000; Shifrin 2000; William 2000). These sites are interpreted as camps, quarries, and lithic workshops where Knife River flint was procured and used for tool production. In the LMRSU, three Folsom archaeological resources have been identified (Gregg and Bleier 2008a). In the GSU, Folsom points were recovered from the Moe site (32MN101) and Beacon Island Agate Basin site (32MN234) (Gregg and Bleier 2008b).

Both the Agate Basin (ca. 10,500–10,000 B.P.) and Hell Gap (ca. 10,000–9,500 B.P.) technocomplexes are typified by lanceolate projectile points with thick lenticular cross-sections (Frison 1991). Based on morphological similarities and stratigraphic evidence, Hell Gap is technologically descended from Agate Basin. Agate Basin and Hell Gap hunter-gatherers were probably specialized bison hunters. Sites like Agate Basin II (Hill 2001) and Casper (Todd et al. 1997) indicate more frequent extraction of marrow and within-bone nutrients, suggesting a greater focus on planning than previously evident. Some sites associated with this tradition have been recorded in North Dakota and South Dakota, but these mainly consist of isolated and surface finds (Gregg 1985). A Hell Gap/Agate Basin-style projectile point was identified at 32MZ1447 (Klinner and Wermers 2000).

Alberta (9800–9000 B.P.) is a poorly dated technology that probably descends from Hell Gap and is documented at the Hell Gap, Wyoming, and Hudson-Meng, Nebraska, sites (Agenbroad 1978; Frison 1991). Hudson-Meng is one of the largest documented bison kills and suggests that Alberta people focused on bison hunting (Agenbroad 1978); however, more recent work suggests that humans were not responsible for killing the bison and that they died of a natural event (Todd and Rapson 1999). The Cody Complex (9200–8800 B.P.), which includes stemmed/shouldered Eden and Scottsbluff projectile points and the distinctive Cody knife, apparently arose from Alberta (Frison 1991). These sites are widespread across the northwestern and central Great Plains, with components at the Wyoming Horner I, Finley, and Medicine Lodge Creek sites (Frison and Todd 1986; Frison and Walker 2007) and the Mammoth Meadows, Myers-Hindman, and MacHaffie sites in Montana (Davis 1993). Such sites indicate that Cody adaptations were diverse and utilized large fauna as well as small prey and floral resources (Frison et al. 1996; Galvan 2007). Alberta/Cody sites have been recorded in North Dakota and South Dakota. In fact, Hudson-Meng contains a substantial amount of Knife River flint, showing a strong connection to the Missouri River region. One site in the YRSU, 32WI102, has yielded a Scottsbluff projectile point (Gregg and Bleier 2008c).

The Parallel Oblique Flaked complex is a catch-all grouping of Paleoindian projectile point types (Gregg 1985) including Angostura, Milnesand, Browns Valley, Lusk, Allen, and Frederick; these range in age from around 9400 to 7900 B.P. All types are lanceolate with parallel oblique flaking. Bison kill-butcherries became rare on the northwestern and northern Great Plains after approximately 8000 B.P. (Frison 1998), perhaps due to severe ecological deterioration that could no longer support large bison populations. Complex surface and subsurface sites have been recorded in the Dakotas, including sites on the Missouri River. In the LMRSU, 14 archaeological

resources defined under the general “Plano” category have been identified (Gregg and Bleier 2008a). In the GSU, six archaeological resources defined under the general “Plano” category have been identified (Gregg and Bleier 2008b).

Plains Archaic Tradition (ca. 8000–1500 B.P.)

The transition from Paleoindian to Archaic is archaeologically visible as an abrupt shift to large notched projectile points (Frison 1991), perhaps indicating a shift from hand-thrown spears to atlatl propelled darts. This transition is also associated with warming/drying trends that prompted diverse subsistence adaptations among hunter-gatherers (Carlson 1994). Ground stone appears in the Archaic, suggesting a greater focus on processing floral resources. In conjunction with the appearance of pithouses and storage pits in the western intermontane basins, this suggests a shift in subsistence base, a reduction in overall residential mobility, and more predictable seasonal rounds (Frison 1991). In the LMRSU, 241 Archaic archaeological resources have been identified (Gregg and Bleier 2008a). In the GSU, 96 Archaic archaeological resources have been identified. Thirty-one of these are from unspecified associations (Gregg and Bleier 2008b). Important Archaic-age sites in the GSU include the Mondrian Tree site (32MZ58) and the Moe site (32MN101). In the YRSU, 28 Archaic archaeological resources have been identified (Gregg and Bleier 2008c).

The Logan Creek/Mummy Cave complex (5700–4000 B.P.) is the earliest example of large side-notched projectile points on the northern Great Plains. The blending of the Logan Creek and Mummy Cave names for this complex is due to varied nomenclature used among archaeologists regionally for similar archaeological complexes (Gregg 1985). Settlement types associated with this complex include bison kills, transient camps, and some stone circle sites. Twenty-three archaeological resources containing large side-notched projectile point varieties have been identified in the LMRSU (Gregg and Bleier 2008a). Four archaeological resources containing large side-notched projectile point varieties have been identified in the GSU (Gregg and Bleier 2008b). One archaeological resource containing a large side-notched projectile point has been identified in the YRSU (Gregg and Bleier 2008c).

The Oxbow complex (5600–3500 B.P.), typified by side-notched, deeply concave-based projectile points, is concentrated in northern Montana, Alberta, and Saskatchewan (Hannus 1994:180) but is also quite common in North Dakota and South Dakota, with numerous sites along the Missouri River and its tributary system. Oxbow subsistence apparently centered on bison and sites include bison impoundments and jumps, encampments on stream terraces, stone circles, and processing areas (Hannus 1994; Reeves 1969). However, numerous birds and small mammals were probably exploited (Aaberg et al. 2006:174). Some northern Great Plains sites further yield evidence of complex cultural behavior including bundle burials with elaborate grave goods (Bryan 1991). Fifteen Oxbow archaeological resources have been identified in the LMRSU (Gregg and Bleier 2008a), including three subsurface Oxbow projectile points that were found at 32MZ1184 (Borchert and Wermers 1994). Four Oxbow archaeological resources have been identified in the GSU (Gregg and Bleier 2008b). One Oxbow archaeological resource has been identified in the YRSU (Gregg and Bleier 2008c).

The McKean complex (ca. 4500–3400 B.P.) encompasses three distinct sub-phases—the McKean lanceolate, Duncan, and Hannah. The McKean complex is widespread across the Great Plains, and sites from this period can be found associated with bison kills, stone circles, lithic caching, and seasonal settlements (Frison 1991). Slab-lined pit hearths are common, as are ground stone artifacts suggesting a greater reliance on plant resources (Carlson 1994; Frison 1991). McKean complex sites often demonstrate evidence of lithic raw material exchange, including Swan River chert, Tongue River silicified sediment, and Knife River flint (Gregg 1985). In the LMRSU, 70 archaeological resources dating to the McKean complex have been identified (Gregg and Bleier 2008a), including four McKean Lanceolate points that were recovered from the Big Gulch-Chase site (32DU273) (Artz et al. 1983). In the GSU, 23 archaeological resources dating to the McKean complex have been identified (Gregg and Bleier 2008b). In the YRSU, seven archaeological resources dating to the McKean complex have been identified (Gregg and Bleier 2008c).

Pelican Lake (ca. 3000–2700 B.P.), typified by broad, thin, corner-notched projectile points, is likely a descendant of McKean and is found across the northern and central Great Plains (Frison 1991). This wide spatial distribution may indicate significant population growth in response to the favorable moist conditions of the Sub-Atlantic episode (Reeves 1983). Numerous communal bison kills, such as Head-Smashed-In (Frison 1991), indicate communal bison hunting, but this does not suggest it was an exclusive feature of their subsistence. Rather, Pelican Lake populations probably relied on a broad-based economy across diverse ecozones (Hannus 1994). Sixty-three Pelican Lake archaeological resources have been identified in the LMRSU (Gregg and Bleier 2008a). These include the Sunday Sage site (32BI22) and Ice Box Canyon Ridge site (32MZ38) (Simon and Borchert 1981a). Thirty-four Pelican Lake archaeological resources have been identified in the GSU (Gregg and Bleier 2008b). Eight Pelican Lake archaeological resources have been identified in the YRSU (Gregg and Bleier 2008c).

Plains Woodland Tradition (ca. 2000–450 B.P.)

Temporally overlapping with the Northwestern Plains Late Archaic, the Plains Woodland tradition is characterized by increased sedentism, garden horticultural activity, expanding regional exchange networks with eastern Woodland populations (Adena and Hopewell), and the elaboration of ceremonial activities and mortuary practices, specifically mound burials (Griffin 1967). Significant technological advances such as bow and arrow and ceramics use are also apparent (Gregg 1985); however, the fundamental subsistence strategies of the Plains Woodland did not drastically differ from their Archaic predecessors (Zimmerman 1985). It is assumed that this tradition saw the beginning of horticultural practices in the region. For the purposes of this study, the complexes that are classed as belonging to the Plains Woodland include Besant, Sonota, Laurel, Avonlea, Old Woman's, and Blackduck. Of the 184 Woodland sites in the GSU, 119 are unspecified, and 37 are Besant and/or Sonota age sites (Gregg and Bleier 2008b).

The Besant complex (ca. 2000–1500 B.P.), typified by small to medium-sized side-notched triangular projectile points, represents the earliest presence of ceramics in North Dakota, probably resulting from eastern woodland influence (Walde 2006). Besant ceramics are more common in the eastern half of the Dakotas; the vessels show a basic conoidal shape and suggest lump modeling manufacture with some coarse cording (Wood and Johnson 1973). Besant sites

show extensive use of Knife River flint (Reeves 1970). Site types include stone circle sites, habitations on stream and river terraces, and bison kills. Numerous communal kill sites, including the Ruby bison pound in Wyoming (Frison 1991), suggest that Besant people were sophisticated bison hunters. The Sonota complex (1850–1350 B.P.) appears to be a possible sub-complex of Besant, but differs in that burial mounds are common at Sonota sites (Reeves 1983; Wood 1967). These mounds include rectangular subfloor pits/tombs with dismembered bodies and, commonly, articulated bison remains (Johnson and Johnson 1998). The presence of associated exotic artifacts is often cited as evidence of Hopewell influence on Middle Plains Woodland populations (Johnson and Johnson 1998). In the LMRSU, 31 Besant/Sonota archaeological resources have been identified, including at the Sunday Sage site (32BI22) (Simon and Borchert 1981b) and at 32MZ333 (Floodman et al. 1982). In the GSU, 37 Besant/Sonota archaeological resources have been identified, including at 32DU2, the Twin Buttes site (32DU32/32ME617), and 32ME254 (Gregg and Bleier 2008b). In the YRSU, five Besant/Sonota archaeological resources have been identified, including at the 32MZ333 (Gregg and Bleier 2008c).

Sites from the Laurel complex (2100–850 B.P.) are generally found in the eastern portions of North Dakota, northern Minnesota, and southern Canada. Laurel pottery and mound building are fairly distinct, but lithics associated with this complex tend to be various and lack a particular style (Gregg 1985).

Avonlea complex (ca. 1800–1000 B.P.) sites occur across the northern Great Plains and are contemporaneous with Besant. This complex includes a variety of site types, including stone circles, bison kills, and rock shelter habitations (Reeves 1970). Avonlea represents the first regional complex to produce arrow points exclusively, suggesting a transition to bow and arrow technology (Frison 1988). Avonlea point types are small and indistinctly side-notched. Saskatchewan Basin Complex: Early Variant pottery is found at Avonlea sites (Byrne 1973). Avonlea subsistence in the north relied heavily on communal bison procurement, but in their southern range bison hunting was supplemented by smaller game (e.g., pronghorn), fish, and seasonal plant exploitation (Smith and Walker 1988). Avonlea sites are relatively rare in the Dakotas (Vickers 1994). In North Dakota, the Evans site (32MN301) contained Avonlea projectile points and ceramics (Schneider and Kinney 1978). Only seven Avonlea-aged archaeological resources have been identified in the LMRSU (Gregg and Bleier 2008a). A single Avonlea-aged archaeological resource was identified in the GSU (Gregg and Bleier 2008b). In the YRSU, four Avonlea complex archaeological resources have been identified (32MZ864, 32MZ1288, 32MZ1300, and 32MZ1422) (Gregg and Bleier 2008c).

Rare in North Dakota is the Old Woman's complex (A.D. 700–1300). This complex is contemporary with the Plains Village tradition, so it would seem likely that many associated sites would be granted the latter designation (Gregg 1985).

The Blackduck complex (A.D. 1150–450) derives from northern Minnesota and was concentrated in southern Manitoba. It is contemporary with both Avonlea and Old Woman's complexes, and with Extended and Terminal Middle Missouri traditions. Some evidence of possible Blackduck pottery has been found along the Missouri River, which suggests trade between the Missouri River villagers and the Blackduck people to the north (Joyes 1970).

Plains Village Tradition (ca. 1050–350 B.P.)

Lehmer (1971) defined the Plains Village tradition as possessing the following diagnostic traits: equal horticulture and hunting and gathering strategies; semi-permanent villages near the Missouri River floodplain; earth lodges; large storage and refuse pits; distinctive ceramics; abundant end scrapers and arrow points; bison scapula hoes; and a well-developed bone tool industry. The Plains Village Tradition is divided into the Middle Missouri tradition (A.D. 969–1500) and the Coalescent tradition (A.D. 1300–1650), discussed below. Only 23 Plains Village archaeological resources have been identified in the LMRSU (Gregg and Bleier 2008a). Fifteen Plains Village archaeological resources have been identified in the GSU (Gregg and Bleier 2008b). In the YRSU, only three Plains Village archaeological resources have been identified (Gregg and Bleier 2008c). The limited number of resources identified in the YRSU is likely due to this study unit being located outside of the geographic limits of most prehistoric Plains Village core areas (Gregg and Bleier 2008c).

Three primary Middle Missouri variants are recognized: Initial Middle Missouri (A.D. 969–1297), Extended Middle Missouri (A.D. 1075–1443), and Terminal Middle Missouri (A.D. 1300–1500) (Eighmy and LaBelle 1996). These represent a continuation and intensification of Northern Plains Woodland lifeways and their appearance coincides with the onset of the Medieval Warm Period (Bryson et al. 1970) when a moisture increase likely permitted horticulture in areas previously characterized by tenuous farming conditions (Wood 2001).

The Initial Middle Missouri Variant (IMMV) is thought to have developed as an outgrowth of the Great Oasis (Tiffany 2007) or via the arrival of eastern populations already exploiting a Plains Village lifeway (Lehmer 1971). The IMMV was concentrated in the southern portions of the Middle Missouri region and characterized by highly fortified villages of large, semi-subterranean rectangular houses (Lehmer 1971; Winham and Calabrese 1998). In the LMRSU, an Initial Middle Missouri deposit has been identified at site 32MZ380D (Jorstad et al. 1986:179).

The Extended Middle Missouri Variant (EMMV) is concentrated in the northern portions of the Middle Missouri region (Lehmer 1971). EMMV groups resided in small villages of semi-subterranean rectangular houses; southern villages were more often fortified than those in the north (Wood 2001). It is unclear whether the EMMV replaced the IMMV or represents a contemporaneous offshoot of the IMMV. Origins aside, it is assumed that IMMV populations were eventually absorbed into EMMV populations. The final expression of this tradition was the Terminal Middle Missouri (Winham and Calabrese 1998:282). These sites were concentrated in a smaller geographic area along the Missouri River in southern North Dakota and characterized by fewer but much larger villages (Wood 2001). Sites again contained long, rectangular semi-subterranean houses but were highly fortified (Wood 2001). A continuation of the Middle Missouri Tradition is recognized historically as the Siuwan-speaking Mandan and Hidatsa (Wood 2001).

The Coalescent period is temporally divided into Initial (650–350 B.P.), Extended (500–300 B.P.), and Post-Contact Coalescent (300 B.P.–Historic period) (Johnson 1998; Lehmer 1971). The Coalescent Tradition is thought to represent a geographic movement of Central Plains

Tradition village-dwelling populations to the Missouri River Valley in South Dakota (Blakeslee 1993). Central Plains Traditions might have migrated from Nebraska and Kansas in response to drought brought on by the Pacific climatic episode (Lehmer 1971). Similar to Middle Missouri Tradition groups, Coalescent populations practiced an economy split between mixed cultigen horticulture and bison hunting (Johnson 1998).

Initial Coalescent Variant sites are located on bluffs overlooking the Missouri River and its drainages in southern South Dakota. Populations lived in fortified villages consisting of subrectangular to circular/oval earth lodges and often surrounded by complex fortifications (Johnson 1998). Violence amongst Coalescent groups is evidenced at the Crow Creek site (39BF11) where approximately 486 individuals were killed in the village fortification ditch around 625 B.P. (Willey and Emerson 1993). Crow Creek is interpreted as evidence of internecine warfare amongst Initial Coalescent groups over land competition (Zimmerman and Bradley 1993) or, conversely, as evidence of warfare between immigrant Coalescent groups and resident Middle Missouri Tradition peoples (Johnson 1998). The Extended Coalescent Variant apparently descended from the Initial Coalescent sometime in the fifteenth century A.D. Sites are concentrated along the Missouri River and its tributaries in central and northern South Dakota (Krause 2001). Extended Coalescent sites are far more abundant than during the Initial Coalescent and are characterized by a dispersed, unfortified village structure of circular earth lodges (Johnson 1998; Krause 2001; Lehmer 1971). In the LMRSU, the Connell Ranch site (32BI439) has been identified as an Extended Coalescent bison butchering site (Metcalf et al. 1988). The Extended Coalescent Variant evolved into the Post-Contact Coalescent during the Protohistoric and Historic and the Coalescent Tradition is recognized as the Arikara (Krause 2001). The last post-contact village was Like-a-Fishhook Village, occupied by the Arikara, Mandan, and Hidatsa; it was abandoned in 1886 when groups were relocated to the Fort Berthold Indian Reservation (Smith 1972).

HISTORIC CONTEXTS

European Trade and Exploration (A.D. 1738–1858)

Perhaps the earliest attempts at exploring the northern Great Plains came as a result of the ventures of Pierre Gaultier de Varennes Siure de la Verendrye (Dill 1983). His travels from New France into North Dakota led him as far as the Missouri River (somewhere near Bismarck), and led to subsequent expeditions by his sons, which went farther south into South Dakota (near Pierre) and west towards the Black Hills. While the elder la Verendrye met the Mandan, his sons encountered the Arikara and other tribes in South Dakota. Their reports heightened interest in the region and the possibilities that existed for trade with its inhabitants.

Following the la Verendryes, a modest fur trade developed in the region, but until the expedition of Captains Meriwether Lewis and William Clark returned successfully from their voyage up the Missouri, the region was considered a wild unknown (Schulenberg 1957).

In 1807, Manuel Lisa established a short-lived post at the mouth of the Bighorn, and by 1809 his St. Louis Missouri Fur Company was building posts among most of the tribes all along the Missouri River. Other notable companies, such as the Northwest Company, Hudson Bay Company, the Columbia Fur Company, and the American Fur Company, soon followed suit

(Schulenberg 1957). The life of these posts tended to be short, but they did much to influence the tribes who frequented the Missouri River in both North Dakota and South Dakota. Fort Union—at the confluence of the Yellowstone and Missouri—was the last of the great posts, and its waning during the late 1850s saw the fur trade in the Dakotas in its last throes.

Post-Contact Tribal Overview (A.D. 1780–1900)

In addition to the tribes that arose from the Middle Missouri and Coalescent traditions (Mandan, Hidatsa, and Arikara), the northern Great Plains and the Missouri River were also used by countless other tribes since before European contact.

The Assiniboiné were known to frequent the northern Missouri River (mainly near the confluence with the Yellowstone), and were active in the fur trade throughout the eighteenth and nineteenth centuries. As well, the Cheyenne were pushed westward by the Chippewa during the middle of the eighteenth century and took up at least a temporary settlement period on the Missouri River. At least one earth lodge village has been attributed to the Cheyenne in eastern North Dakota, and some Cheyenne villages on the Missouri River were located between the Mandan to the north, and the Arikara to the south, where they built earth lodges and pursued horticulture and buffalo hunting (Schlesier 1968).

The Plains Cree and Plains Chippewa also frequented the northern Missouri—mainly near the confluence with the Yellowstone, but also near Fort Clark. Both tribes traded actively with the Mandan and Hidatsa. The Crow, although more westerly in their territory, were related to the Hidatsa and would often trade and visit with the Missouri River tribes (Schulenberg 1957).

Based on linguistic evidence, the Sioux (or Dakota) originated from the southwest Great Lakes region (DeMallie 2001a). The timing of the migration is unclear, but ceramic evidence suggests that the Dakota were living on the plains several centuries before the arrival of Europeans (Hanson 1998). Based on linguistics, it is thought that the Assiniboiné split from the Sioux sometime before the mid-seventeenth century (Hanson 1998). The Teton Dakota are divided into seven sub-tribes, including the Oglala, Brule, Sans Arc, Hunkpapa, Blackfeet, Miniconjou, and Two Kettles (Hanson 1998). According to DeMallie (2001a), by the mid-eighteenth century, the Teton Dakota hunted bison in the area east of the Missouri River, their movements limited in part by the Arikara stronghold along the Missouri River. However, a series of smallpox epidemics from 1771 to 1781 devastated the Arikara villages (Johnson 1998) and permitted the Teton Dakota to move west of the Missouri River. Like the Teton Dakota, the Yankton and Yanktonai Dakota occupied the prairies east of the Missouri River and north into Minnesota in the mid-seventeenth century (DeMallie 2001a). By the mid-nineteenth century, the Yankton and Yanktonai occupied the prairies east of the Missouri River from the mouth of the Big Sioux River in the south to the Red River in the north (DeMallie 2001b).

The Reservation Period began in the 1850s and continues to today. Fort Berthold Indian Reservation was created during the Fort Laramie Treaty of 1851, the boundaries of which were later redefined by executive orders of Ulysses S. Grant in 1870 and Rutherford B. Hayes in 1880 (Schneider 2001). By 1866, following the Treaty of Fort Berthold, members of the Mandan, Hidatsa, and Arikara (later the Three Affiliated Tribes) resided in Like-a-Fishhook Village (formed in 1845 by Mandan and Hidatsa leaders), located in the far southeast corner of the

reservation territory adjacent the fur trade post of Fort Berthold (Schneider 2001; Stewart 2001). By 1886, however, the village was abandoned as a result of overcrowding and tribal members relocated to individual homesteads dispersed throughout the reservation (Schneider 2001; Smith 1972). This time period contains numerous accounts of attempts of forced assimilation by the U.S. government—including government actions to stop tribal ceremonialism and forced boarding school education of Indian children (Schneider 2001). However, the tribes who lived on, and used, the Missouri River have persisted to the present as strong and vital people with a living culture which has survived for present and future generations.

In the LMRSU, 34 Hidatsa, one Sioux, and 15 unspecified historical Native American archaeological resources have been identified (Gregg and Bleier 2008a). In the GSU, five Hidatsa, one Arikara, one Chippewa, one Mandan, and 21 unspecified historic Native American archaeological resources have been identified (Gregg and Bleier 2008b). In the YRSU, one Hidatsa archaeological resource has been identified (Gregg and Bleier 2008c).

Homesteading in the Dakotas (A.D. 1860–1930)

The first homestead in North Dakota was filed in 1868, which was the only homestead filed until 1871. The true rush for homesteads did not take place until 1885. This rush was spurred by the extension of the Northern Pacific Railroad across the Red River from Minnesota (Works Progress Administration [WPA] 1950). Western North Dakota—including McKenzie County—did not see much settlement prior to the 1890s, and the major settlement of this region did not start in any great numbers until between 1900 and 1910. In general, those homesteaders who selected lands along the Missouri River were able to do some crop farming, but the majority of homesteads were arranged as ranch operations for sheep or cattle.

In addition to the homesteading, which brought an increasing number of people to western North Dakota, the discovery of large deposits of lignite coal further boosted interest in the development of McKenzie County and the surrounding area (WPA 1950). Although slow at first, the mining industry started to flourish during the 1930s; to this day it remains a major focus of activity which drives the economy of both the county and the state. In total, six historical Euro-American archaeological resources have been identified in the LMRSU (Gregg and Bleier 2008a). Eight historic Euro-American archaeological resources have been identified in the GSU (Gregg and Bleier 2008b). One historical Euro-American archaeological resource has been identified in the YRSU (Gregg and Bleier 2008c).

BACKGROUND RESEARCH

As part of the initial phase of this investigation, SWCA conducted a background search of archaeological and historical literature and records for the project area and surrounding 1-mile area (includes 0.5 mile on either side of the proposed pipeline centerline). Researchers searched relevant records holdings at the State Historical Society of North Dakota and other available sources for information regarding previously recorded historical and prehistoric sites located

within the project area. Background research was conducted on November 17 and 18, 2010, and January 18, 2011.

Results of the background search identified 57 previously recorded cultural resources within the surrounding 1-mile study area (Table 2). Of these cultural resources, 42 are prehistoric, 11 are historical, three are multi-component (containing both historical and prehistoric resources), and one is of unknown age. Of the prehistoric resources, 21 are cultural material scatter sites (32MZ0041, 32MZ0048, 32MZ0072, 32MZ0093, 32MZ0118, 32MZ0136, 32MZ0168, 32MZ0210, 32MZ0245, 32MZ0423, 32MZ0516, 32MZ0517, 32MZ0934, 32MZ0937, 32MZ0938, 32MZ1049, 32MZ1050, 32MZ1051, 32MZ1208, 32MZ1562, and 32MZ1705); two are rock feature sites (32MZ0880 and 32MZ1404); two are cultural material scatter and quarry/mine sites (32MZ0169 and 32MZ0242); and 17 are isolated chipped stone finds (32MZX0092, 32MZX0093, 32MZX0266, 32MZX0498, 32MZX0499, 32MZX0500, 32MZX0501, 32MZX0504, 32MZX0505, 32MZX0506, 32MZX0510, 32MZX0630, 32MZX0854, 32MZX0954, 32MZX0990, 32MZX0991, and 32MZX0992). Of the historical resources, three are cultural material scatter, depression, and foundation sites (32MZ0017, 32MZ0069, and 32MZ0160); two are cultural material scatter, depression, dump, earthworks, and foundation sites (32MZ0481 and 32MZ0879); one is a depression and machinery site (32MZ0515); one is a bridge (32MZ1118); one is a church and cemetery (32MZ1510); one is a depression and foundation site (32MZ0836); and two are quarry/mine site leads (32MZX0361 and 32MZX0362). All three multi-component resources are cultural material scatters (32MZ0217, 32MZ0360, and 32MZ1113). The remaining resource is a cairn of unknown age or cultural affiliation (32MZ1586).

Nine resources are crossed by the 250-foot-wide survey corridor (32MZ879, 32MZ934, 32MZ937, 32MZ938, 32MZ1510, 32MZX361, 32MZX500, 32MZX506, and 32MZX510). These are discussed in further detail below in the Inventory Results and Recommendations portion of this report. Locations of previously recorded resources are depicted in Appendix C.

One-hundred and sixty-six previous cultural resources inventories have been performed within the 1-mile-wide project area. A bibliographic listing of previous archaeological and historical studies for project lands in McKenzie County, North Dakota, is provided in Appendix A.

Table 2. Previously Recorded Cultural Resources in the Study Area

Site Number	Site Name	Site Type	Legal Location (Township/Range/ Section)	Cultural Affiliation	NRHP Eligibility Recommendation
32MZ0017	None	CM Scatter, Depression, Foundation	T147N/R104W/S04	Unknown Historic	Unevaluated
32MZ0041	Hay Stack Slope	CM Scatter	T147N/R103W/S08	Unknown Prehistoric	Unevaluated
32MZ0048	None	CM Scatter	T148N/R104W/S31	Archaic	Not Eligible
32MZ0069	None	CM Scatter, Depression, Foundation	T147N/R105W/S02	Unknown Historic	Unevaluated
32MZ0072	None	CM Scatter	T147N/R104W/S09	Unknown Prehistoric	Unevaluated
32MZ0093	None	CM Scatter	T148N/R105W/S36	Unknown Prehistoric	Unevaluated
32MZ0118	Cherry Creek	CM Scatter	T151N/R98W/S34	Unknown Prehistoric	Unevaluated
32MZ0136	None	CM Scatter	T148N/R105W/S36	Unknown Prehistoric	Unevaluated
32MZ0160	None	CM Scatter, Depression, Foundation	T147N/R104W/S12	Unknown Historic	Not Eligible
32MZ0168	None	CM Scatter	T148N/R103W/S23	Unknown Prehistoric	Not Eligible
32MZ0169	None	CM Scatter, Quarry/Mine	T148N/R103W/S24	Unknown Prehistoric	Not Eligible
32MZ0210	None	CM Scatter	T148N/R103W/S23	Unknown Prehistoric	Not Eligible
32MZ0217	None	CM Scatter	T147N/R104W/S10	Unknown Prehistoric and Historic	Potentially Eligible
32MZ0242	None	CM Scatter, Quarry/Mine	T147N/R104W/S12	Unknown Prehistoric	Not Eligible
32MZ0245	None	CM Scatter	T148N/R105W/S36	Unknown Prehistoric	Unevaluated
32MZ0360	None	CM Scatter	T147N/R103W/S05	Unknown Prehistoric and Historic	Unevaluated
32MZ0423	Vuylsteke Archaeolo- gical Area	CM Scatter	T147N/R104W/S11	Unknown Prehistoric	Unevaluated
32MZ0481	Crickette Homestead	CM Scatter, Depression, Dump, Earthworks, Foundation	T149N/R100W/S12	Historic 1908–1920	Unevaluated

Table 2. Previously Recorded Cultural Resources in the Study Area (Continued)

Site Number	Site Name	Site Type	Legal Location (Township/Range/ Section)	Cultural Affiliation	NRHP Eligibility Recommendation
32MZ0515	None	Depression, Machinery	T147N/R103W/S08	Unknown Historic	Unevaluated
32MZ0516	None	CM Scatter	T147N/R103W/S08	Unknown Prehistoric	Unevaluated
32MZ0517	None	CM Scatter	T147N/R103W/S08	Unknown Prehistoric	Not Eligible
32MZ0836	None	Depression, Foundation	T149N/R101W/S26	Historic 1912–1950	Not Eligible
32MZ0879	None	CM Scatter, Depression, Dump, Earthworks, Foundation	T150N/R99W/S28	Unknown Historic	Not Eligible
32MZ0880	None	Rock Feature	T150N/R99W/S16	Unknown Prehistoric	Unevaluated
32MZ0934	None	CM Scatter	T147N/R104W/S10	Unknown Prehistoric	Unevaluated
32MZ0937	None	CM Scatter	T147N/R104W/S11; T147N/R104W/S12	Late Prehistoric	Potentially Eligible
32MZ0938	None	CM Scatter	T147N/R104W/S12	Unknown Prehistoric	Unevaluated
32MZ1049	None	CM Scatter	T147N/R104W/S05	Late Prehistoric	Potentially Eligible
32MZ1050	None	CM Scatter	T147N/R104W/S04	Unknown Prehistoric	Unevaluated
32MZ1051	None	CM Scatter	T147N/R104W/S05	Pelican Lake and Late Prehistoric	Potentially Eligible
32MZ1113	None	CM Scatter	T147N/R104W/S10	Unknown Prehistoric and Historic	Unevaluated
32MZ1118	None	Bridge	T150N/R99W/S20; T150N/R99W/S21	Unknown Historic	Not Eligible
32MZ1208	None	CM Scatter	T147N/R105W/S02	Unknown Prehistoric	Unevaluated
32MZ1404	None	Rock Feature	T147N/R103W/S05	Unknown Prehistoric	Unevaluated
32MZ1510	Zoar Lutheran & Cemetery	Church, Cemetery	T149N/R100W/S14	Historic 1914–1997	Unevaluated
32MZ1562	None	CM Scatter	T148N/R103W/S23	Unknown Prehistoric	Not Eligible
32MZ1586	None	Cairn	T150N/R99W/S17	Unknown	Unevaluated

Table 2. Previously Recorded Cultural Resources in the Study Area (Continued)

Site Number	Site Name	Site Type	Legal Location (Township/Range/ Section)	Cultural Affiliation	NRHP Eligibility Recommendation
32MZ1705	None	CM Scatter	T147N/R103W/S05; T147N/R103W/S06	Unknown Prehistoric	Unevaluated
32MZ0092	IF-2	Isolated Chipped Stone	T147N/R104W/S11	Unknown Prehistoric	Not Eligible
32MZ0093	None	Isolated Chipped Stone	T147N/R104W/S06	Unknown Prehistoric	Not Eligible
32MZ0266	None	Isolated Chipped Stone	T149N/R99W/S05	Unknown Prehistoric	Not Eligible
32MZ0361	AML Location	Quarry/Mine	T149N/R99W/S05	Unknown Historic	Not Eligible
32MZ0362	O. Kay Mine	Quarry/Mine	T149N/R99W/S07	Historic 1945–1951	Not Eligible
32MZ0498	None	Isolated Chipped Stone	T147N/R104W/S06	Unknown Prehistoric	Not Eligible
32MZ0499	None	Isolated Chipped Stone	T147N/R104W/S08	Unknown Prehistoric	Not Eligible
32MZ0500	None	Isolated Chipped Stone	T147N/R104W/S11	Unknown Prehistoric	Not Eligible
32MZ0501	None	Isolated Chipped Stone	T147N/R105W/S01	Unknown Prehistoric	Not Eligible
32MZ0504	None	Isolated Chipped Stone	T148N/R102W/S06	Unknown Prehistoric	Not Eligible
32MZ0505	None	Isolated Chipped Stone	T148N/R103W/S01	Unknown Prehistoric	Not Eligible
32MZ0506	None	Isolated Chipped Stone	T148N/R103W/S12	Unknown Prehistoric	Not Eligible
32MZ0510	None	Isolated Chipped Stone	T150N/R99W/S28	Unknown Prehistoric	Not Eligible
32MZ0630	None	Isolated Chipped Stone	T147N/R104W/S08	Unknown Prehistoric	Not Eligible
32MZ0854	None	Isolated Chipped Stone	T147N/R104W/S02	Unknown Prehistoric	Not Eligible
32MZ0954	None	Isolated Chipped Stone	T149N/R99W/S04	Unknown Prehistoric	Not Eligible
32MZ0990	None	Isolated Chipped Stone	T148N/R105W/S36	Unknown Prehistoric	Not Eligible
32MZ0991	None	Isolated Chipped Stone	T148N/R105W/S36	Unknown Prehistoric	Not Eligible
32MZ0992	None	Isolated Chipped Stone	T147N/R104W/S06	Unknown Prehistoric	Not Eligible

CM = cultural material
NRHP = National Register of Historic Places

FIELDWORK METHODS

CLASS III INVENTORY METHODS

Fieldwork was designed so that project archaeologists could collect all appropriate and necessary data for the completion of the project report of results and recommendations, and to ensure accurate completion of site forms for all resources encountered.

In accordance with the scope of work, archaeologists surveyed the 250-foot-wide proposed pipeline survey corridor using parallel linear transects with spacing averaging 25 m and not exceeding 30 m. The ground surface was examined for artifacts, features, or other evidence of cultural occupation. Cut banks, eroded surfaces, and other areas with significant exposure were examined intensively throughout fieldwork, especially where previously recorded cultural resources existed. In areas with high vegetation cover and high probability of cultural resources, survey transects were reduced to 10 m spacing to maintain adequate visibility. Ground visibility during the project ranged from 0 to 15 percent, with areas of up to 100 percent, typically along the existing pipeline scar, in plowed fields, two-track roads, and near rodent burrows.

Where cultural resources were located, project archaeologists made an intensive effort to fully and accurately establish the extent and boundaries of newly and previously recorded sites. As such, sites were mapped using handheld submeter-accurate Trimble Global Positioning System (GPS) units. When detailed mapping or remapping was required, all linear site features, such as site boundaries, roads, and fence lines, as well as point features, such as the site datum, cultural features, artifact concentrations, diagnostic artifacts and tools, and other necessary data, were mapped using the Trimble GPS units for post-processing into ArcMap 9.0 shapefiles, and for plotting onto associated USGS 7.5-minute quadrangles to ensure accuracy and to produce required location maps of all sites and resources.

In addition to site mapping, project personnel photographed sites in overview and for other data collection needs. Associated features and diagnostic artifacts were described, measured, recorded using a handheld GPS unit, and photographed, as appropriate. Field personnel noted environmental setting, context, topography, and geographical location for each cultural resource.

EVALUATIVE SHOVEL TESTING METHODS

Evaluative site shovel testing is used to determine a site's significance under Criterion D of the National Register of Historic Places (NRHP) and to identify contributing and non-contributing portions of a site, if applicable (see detailed discussion of evaluation criteria, below). All archaeological investigative methods applied during the project meet the standards set forth by the North Dakota State Historical Preservation Office. Field methods included subsurface testing involving 30 × 30-centimeter (cm) shovel tests placed across the site or site vicinity to identify areas containing possible subsurface deposits in order to assist in evaluating NRHP eligibility. Shovel test locations were plotted in areas that displayed potential for buried deposits, such as depression features and bare ground areas that appeared

to have been subject to ground-disturbing activity. When possible, additional features (e.g., exposed road cuts, rodent burrows, etc.) were used to help determine the subsurface deposition to minimize impact to the site.

Shovel tests were excavated in levels of 10 cm below surface (cmbs) so that depths of discovery could be assigned to the nearest 10-cm interval. All matrix from the tests was screened through 1/8-inch metal hardware mesh. Efforts were made to ensure that the tests were excavated to bedrock or clearly archaeologically sterile soils.

Positive tests (those containing cultural material) were supplemented with additional adjacent tests, typically placed in four directions surrounding the positive test at half the distance from the standard testing grid interval used. Site-wide testing was terminated when sufficient evidence to demonstrate the presence of subsurface archaeological contexts was achieved, an eligibility recommendation could be made, and contributing and non-contributing portions of the site were defined. Although fully recorded, artifacts found within 20 cmbs are generally considered to be in the taphonomically active zone, not thought to necessarily demonstrate the potential for interpretable subsurface archaeological contexts.

In addition to recording cultural material identified in positive shovel tests, sediment descriptions were recorded for each observed stratigraphic unit. The color, sediment type, moisture content, and texture were recorded. The provenience of all test units was recorded and plotted on the site map. Upon completion, all shovel test units were backfilled and contoured across the ground surface. All artifacts were reburied in the shovel tests from which they were recovered.

SITE EVALUATION

SWCA evaluated sites and their significance, as defined by criteria set forth in 36 Code of Federal Regulations 60.4 (National Park Service 1991), which states:

The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:

- A) That are associated with events that have made a significant contribution to the broad patterns of our history; or
- B) That are associated with the lives of persons significant in our past; or
- C) That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- D) That has yielded or may be likely to yield information important in prehistory or history.

Sites not eligible for inclusion in the NRHP have lost integrity and are unlikely to contribute further data significant to knowledge of prehistory or history.

Prehistoric Archaeological Sites

Prehistoric lithic scatters/campsites (sites without any structures or association with known significant events or persons) recorded for the project generally will not contain NRHP discussion for Criteria A, B, or C. Instead, for NRHP recommendation purposes, these properties will be discussed for their potential to yield information significant to prehistory or the archaeological record under NRHP Criterion D. Special cases generally apply to Criterion A, where a prehistoric site type (such as a stone circle site) may not be recommended eligible for listing in the NRHP from an archaeological perspective, but may be considered important to cultures of Native American peoples.

Evaluation of the significance of archaeological sites under Criterion D considers general characteristics such as the nature, size, and diversity of the site assemblage; the potential presence or absence of subsurface cultural deposits; the nature of any features within the site (construction techniques, building materials, structural integrity); and the age range reflected by the site assemblage. Sites considered to be significant generally contain an assemblage of cultural remains that reflects sufficient diversity to permit identification of activities and to allow confirmation of the period of site use. Sites with the most potential to address research questions about human lifeways contain associated features, structures, and/or relatively intact and dateable artifacts.

Historical Archaeological Sites or Components

Historical sites containing or consisting of preserved features or structures are evaluated primarily under Criteria A, B, and C. Historical trash scatters lacking associated features or structures are primarily evaluated under Criterion D. In general, these types of sites represent ephemeral prospecting or stock management activities, but they lack identifiable or important association with specific persons or events of regional or national history (Criteria A and B), and they lack the formal and structural attributes necessary to qualify as eligible under Criterion C. The evaluation of significance of historical archaeological sites under Criterion D focuses on the capacity of the sites or components to yield significant information regarding knowledge of history during the period(s) of site significance. Evaluation of the significance of historical sites considers general characteristics such as the nature, size, and diversity of the site assemblage; the potential presence or absence of subsurface cultural deposits; the nature of any features within the site; construction techniques; building materials; structural integrity; and the age range reflected by the site assemblage.

Historical sites considered to be significant under Criterion D generally contain an assemblage of cultural remains that reflects sufficient diversity to permit identification of activities and to allow confirmation of the period of site use. Sites with the most potential to address research questions contain associated features, structures, and relatively intact and datable artifacts. Significant sites are those that could impart information not available solely from historical documents. Although archival research may provide an essential form of information, often historical records are inaccurate or incomplete. For example, examination

of construction techniques or household assemblages can provide information on economic slumps, reuse of structures for other than original purposes, and re-occupation cycles. As a result, insight may be gained into questions about human lifeways that are often asked in archaeology, but rarely specified directly in historical documentation.

Non-Archaeological Historical Sites or Components

Non-archaeological historical sites or sites with non-archaeological components are those primarily assessed for NRHP eligibility under Criteria A, B, or C, rather than Criterion D and typically are not subject to subsurface testing. Individual segments of significant historical sites are evaluated as contributing or non-contributing in terms of physical and environmental integrity. Examples of historical site types include linear historical features, such as transportation routes and water conduits, standing building and structure sites, and potentially extend to any historical feature on an otherwise archaeological site, such as Traditional Cultural Property (TCP) features. Historical and ethnographic sites evaluated for potential contribution to history or cultural traditions for reasons beyond their possible future research value tend to have different evaluation and management considerations than archaeological sites. Typically, the integrity of historical sites is addressed using the guidelines presented in National Register Bulletin 15 (National Park Service 1991), which defines the seven elements of integrity as location, design, materials, workmanship, setting, feeling, and association. As such, properties are basically evaluated in consideration of their physical integrity and the integrity of their surroundings. TCPs are also considered under the guidelines of National Register Bulletin 38 (Parker and King 1998).

INVENTORY RESULTS AND RECOMMENDATIONS

For the portion of the Garden Creek Pipeline project that crosses private lands in McKenzie County, North Dakota, SWCA archaeologists revisited and updated the records for three previously recorded sites; newly recorded five sites; and newly recorded five isolated finds. Attempts were made to identify two previously known sites and four previously known isolated finds or site leads, but these were either not found or were found to be located outside the 250-foot-wide survey corridor. The previously recorded sites that were updated include two prehistoric cultural material scatters (32MZ934 and 32MZ937) and one historical cultural material scatter, depression, dump, and foundation site (32MZ879). The newly recorded sites include one prehistoric stone circle and depression site (32MZ2204), one stone cairn site of unknown age (32MZ2201), one historical depression and rock feature site (32MZ2200), one historical trash dump (32MZ2203), and one scatter of historical farm equipment (32MZ2202). Among the newly recorded isolated finds is one projectile point (32MZX1132), two isolated lithic finds (IF-CMF-1 and 32MZX1133) and two isolated historical finds (IF-CH-CRB-1 and IF-CR-CRB-2). The sites not found include 32MZ938, a prehistoric lithic scatter that is thought to be partially destroyed, and 32MZ1510, a historical church and cemetery located outside the survey corridor. Four isolated finds or site leads (32MZX361, 32MZX500, 32MZX506, and 32MZX510) were previously identified in the survey corridor but were not identified during the current inventory. All sites and isolated finds are discussed below. North Dakota site and isolated find forms for each resource are detached in Appendix B. The locations of all resources are depicted on maps in Appendix C.

PREVIOUSLY RECORDED SITES

32MZ879 (Milepost [MP] 11.3)

Site Type:	Farmstead
Association:	Unknown Historic
Site Size:	427.3 by 195.6 feet (49,509.4 feet ²)
NRHP Recommendation:	Not Eligible
Management Recommendation/Project Effect:	No Further Work/No Effect

Site Description and Previous Recording

32MZ879 is a historical farmstead located on a spur extending east off of a north/south-trending ridge (Figure 10). An unnamed stream is located approximately 300 feet northwest of the site. Vegetation consists of native tall prairie grasses, allowing for less than 5 percent ground surface visibility. Surface sediments are a medium brown loam formed through aeolian, colluvial, and residual processes. Impacts to the site include grazing and erosion.

32MZ879 was originally recorded in 1987 by L. Blikre and T. Shaw as part of the MDU-Basin Charlie Creek to Williston transmission line survey. The site consisted of four features (a dugout, a foundation, and two depressions) and a historical cultural material scatter (Figure 11). The site lacked integrity, as the structures had been removed and the foundation was overgrown and decomposing. Though the site was thought to lack the necessary characteristics of an NRHP-eligible site, the site was left unevaluated regarding its eligibility pending historical research.



Figure 10. 32MZ879 site overview, facing northwest.

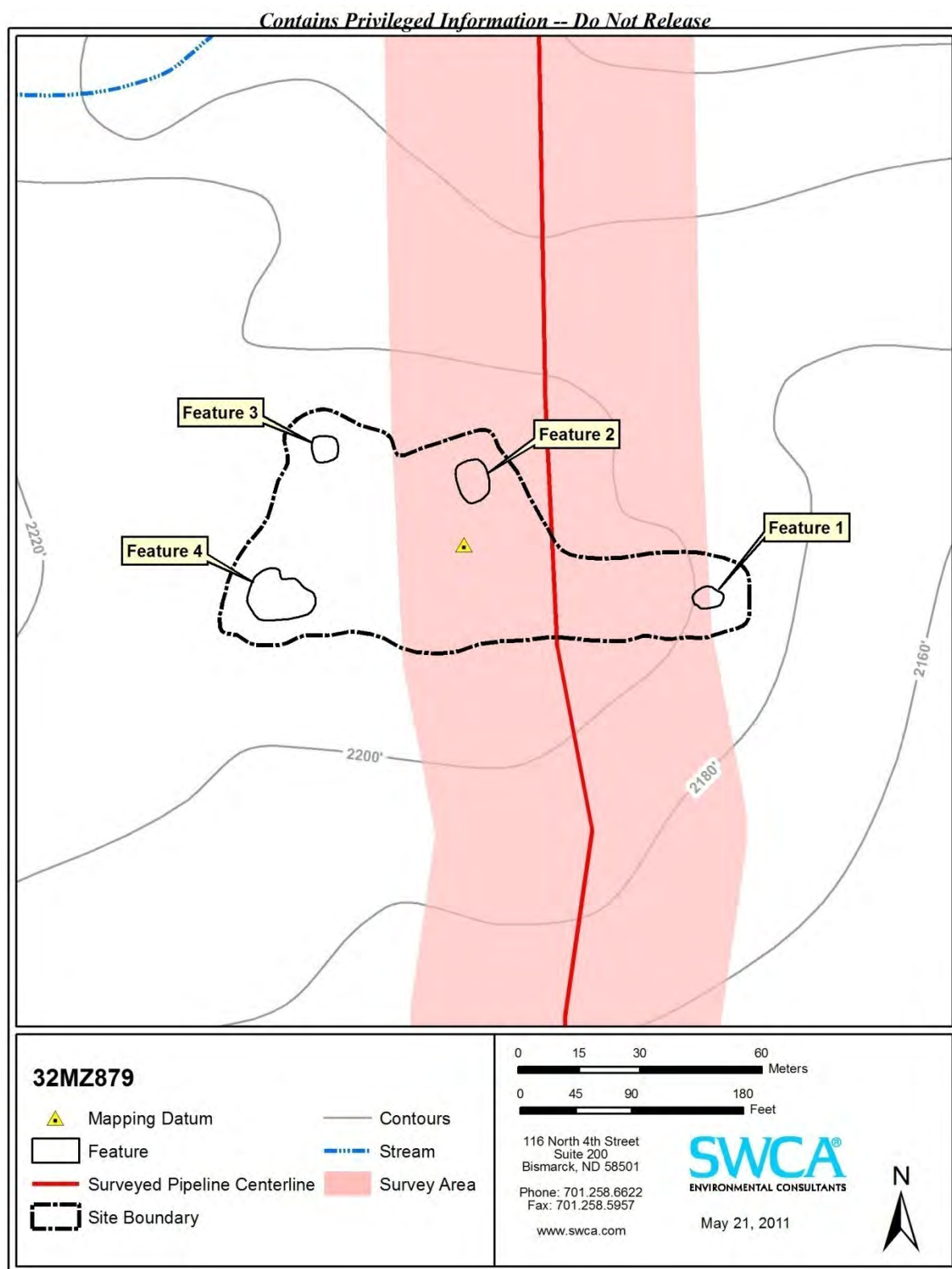


Figure 11. 32MZ879 site sketch map.

Survey Results

On April 26, 2011, SWCA archaeologists revisited 32MZ879. Three of the original features (Features 1, 2, and 3) were re-identified. Feature 1 is a dugout in the side of an east-facing hill slope measuring approximately 15 by 15 feet with a depth of approximately 5 feet at its deepest (Figure 12). Feature 2 is a stone-lined rectangular depression measuring approximately 25 feet by 20 feet (Figure 13). Feature 3 is a rectangular, raised earthen area with surrounding concrete foundation (Figure 14). An area was observed in the vicinity of Feature 4 (a depression) that appears to be the previously identified depression, but has since been backfilled. The original recording noted modern as well as historical dumping, suggesting Feature 4 remained in use and was likely filled in upon reaching capacity. All of the previously recorded cultural material scatter items were observed, except for the doll's head.



Figure 12. 32MZ879, Feature 1, dugout, facing northeast.



Figure 13. 32MZ879, Feature 2, stone foundation, facing east-northeast.



Figure 14. 32MZ879, Feature 3, concrete foundation, facing east.



Figure 15. 32MZ879, Feature 4, depression with cultural material scatter, facing north.

Historical Background

SWCA conducted historical research of the site location using Bureau of Land Management (BLM) General Land Office (GLO) records. In a search for the parcel on which the site is located, one patent was listed. The patent for the W $\frac{1}{2}$ of the NE $\frac{1}{4}$, and the S $\frac{1}{2}$ of the NW $\frac{1}{4}$ of Section 28, T150N, R99W, was granted to Andrew R. Anderson on February 10, 1913 (BLM 2010 [1913]:BLM Serial Number NDWLN 0006299). SWCA also searched U.S. Bureau of the Census (U.S. Census) records. Based on U.S. Census records, Anderson was 42 years old when the patent was granted. According to the 1910 U.S. Census, Anderson immigrated to the United States in 1901 from Sweden and worked as a farmer in 1910 (U.S. Census 1910:Roll T624 1144, Page 2B). It cannot be determined through the available records if he lived on the property. No further information was available for Andrew R. Anderson.

NRHP Eligibility Recommendation

32MZ879 is a historical farmstead site consisting of a foundation, a dugout, a depression, and a cultural material scatter. When initially recorded in 1987, the site was described as lacking integrity; however, the site was recommended unevaluated until historical research could be conducted. The site is currently in fair to poor condition, with impacts from grazing, erosion, continued trash dumping activities, and removal of the structures; however, no shovel testing was conducted. Historical research did not yield information to relate this site with a significant event or period of time, nor did it find any connection between the material at this site and any person or persons significant in local, state, or national history; therefore, the site is recommended not eligible for nomination to the NRHP under Criteria A and B. All buildings or structures at the site are no longer standing, nor do they represent their original

functional or artistic merits; therefore, SWCA recommends the site as not eligible under Criterion C. The disturbances to the site resulting from the continued dumping and agricultural activities have reduced the potential for intact interpretable subsurface deposits and therefore the site is recommended not eligible for NRHP nomination under Criterion D. Accordingly, SWCA recommends the site not eligible for nomination to the NRHP under any criteria.

Management Recommendation

The site is recommended not eligible under any NRHP criteria; therefore, no further work is recommended for 32MZ879.

32MZ934 (MP 46.3)

Site Type:	Cultural Material Scatter
Association:	Unknown Prehistoric
Site Size:	82.6 by 52.0 m (2,812.2 m ²)
NRHP Recommendation:	Not Eligible
Management Recommendation/Project Effect:	No Further Work/No Effect

Site Description and Previous Recording

32MZ934 is a sparse prehistoric lithic scatter located in an active agricultural field on an expansive terrace overlooking Bennie Peer Creek approximately 300 m to the south, in an area surrounded by buttes (Figures 16 and 17). Views of the area extend 360 degrees. County Road 38 and parallel east/west-trending transmission lines are located approximately 20 m north of the site. A north/south-trending fence line sits approximately 15 m east of the site and marks the beginning of USFS land to the east. The east/west-trending Lewis and Clark pipeline scar is immediately north of the site (see Figure 17). Based on previously documented cultural resources inventories, the Koch Hydrocarbon Northern Border Connection Pipeline (among other buried pipelines) may utilize this existing utility corridor as well. Vegetation includes cultivated wheat and allows for 90 to 100 percent ground surface visibility throughout. The soil is a dark brown clay loam deposited through aeolian and alluvial processes. The site is in very poor condition, impacted negatively by ongoing agricultural activities, vehicle traffic, and pipeline construction; therefore the site has poor integrity.

32MZ934 was originally recorded in 1988 by M. Floodman as part of the Koch Hydrocarbon Northern Border Connection Pipeline project. The site was described as a sparse prehistoric lithic scatter and consisted of 17 flakes, three cores, and two retouched flakes. The predominate material observed was Knife River flint, followed by gray porcellanite. No diagnostic artifacts were identified. The site was described as being in fair condition and had been disturbed by cultivation and possibly by previous pipeline construction to the north. The site was not shovel-tested but further work was recommended to assess subsurface deposits; therefore the site was unevaluated regarding its NRHP eligibility pending shovel testing.

In June 2010, Amy Leuchtmann and Sean Gordon of Kadrmas, Lee and Jackson (KLJ) revisited the site as part of the Lewis and Clark Replacement Pipeline project. Leuchtmann and Gordon noted the site was located in a plowed field with poor visibility. No cultural material was noted during the revisit. Despite absence of cultural material and noting the site's lack of spatial integrity due to repeated plowing, KLJ also left the site unevaluated regarding its NRHP eligibility.



Figure 16. 32MZ934 site overview, facing south.



Figure 17. 32MZ934 site overview from the southern edge of the site, facing north, showing existing pipeline scar in background adjacent to County Road 38 (red arrow indicates scar).

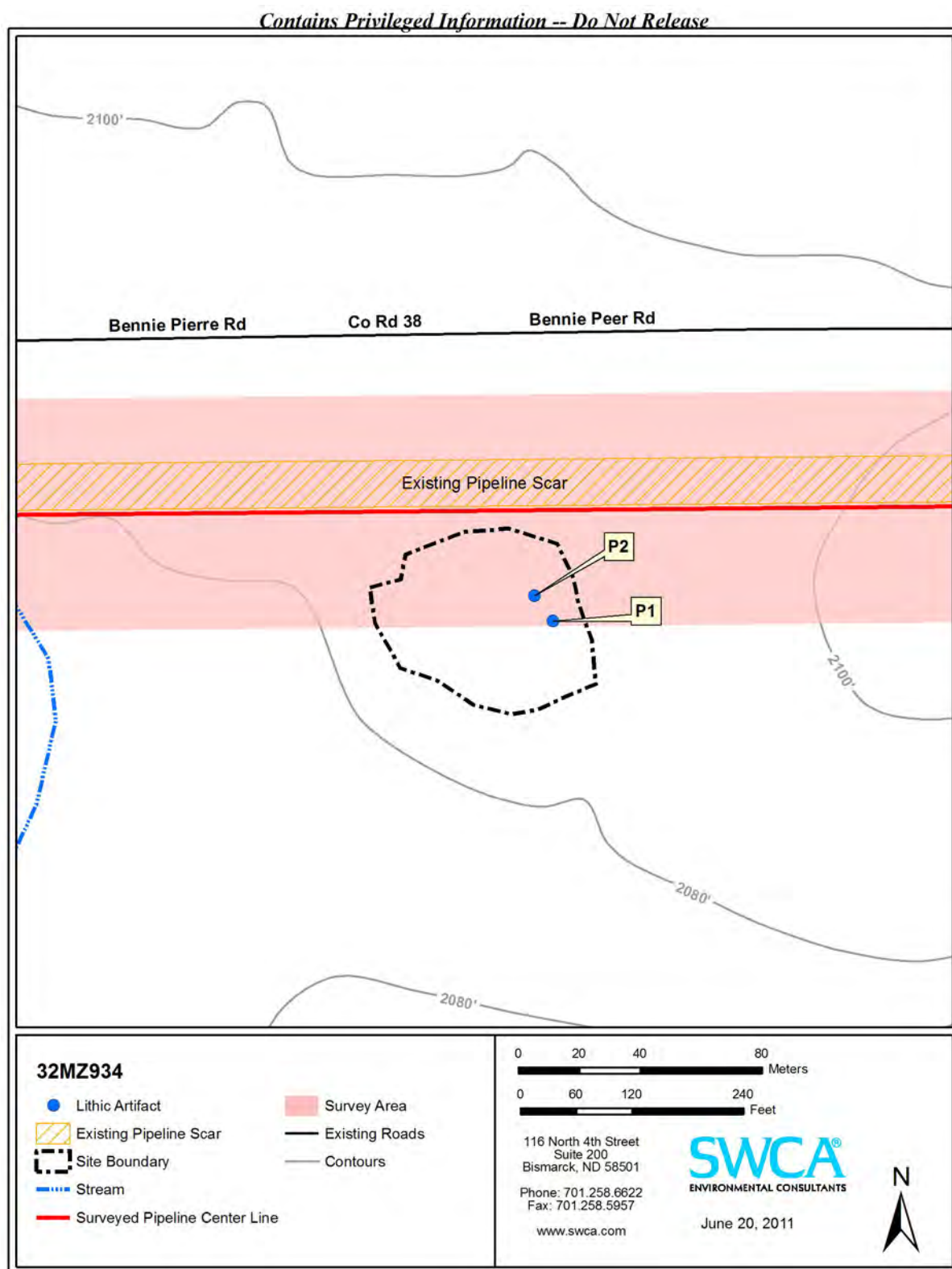


Figure 18. 32MZ934 site sketch map.

Survey Results

SWCA revisited 32MZ934 on May 13, 2011. The observed artifact assemblage included one modified flake (P1), one core (P2), and 13 pieces of lithic debitage (Figure 16). P1 is a Knife River flint modified flake that measures 45 × 19 × 9 millimeters (mm). The flake is modified along one edge and displays approximately 10 percent patination. P2 is a Knife River flint core that measures 55 × 40 × 35 mm and retains 5 percent cortex. The lithic assemblage consists of tertiary (n = 10) and secondary (n = 3) Knife River flint flakes. All size classes are represented, including size class 1 (less than 1 cm) (n = 1), size class 2 (1–2 cm) (n = 3), size class 3 (2–3 cm) (n = 4), size class 4 (3–4 cm) (n = 1), size class 5 (4–5 cm) (n = 3), and size class >5 (greater than 5 cm) (n = 1). No changes were made to the previous site boundary.

NRHP Eligibility Recommendation

32MZ934 is a sparse prehistoric lithic scatter located in an active agricultural field. The site was originally recorded by Floodman in 1988 and revisited by Leuchtmann and Gordon in 2010. During both visits the site was left unevaluated regarding its NRHP eligibility pending subsurface testing. At present, the site consists of a sparse scatter of lithic artifacts, none of which are temporally diagnostic. The site continues to be affected by agricultural activities and, given its proximity to County Road 38, may have been subjected to artifact removal by collectors. The recent east/west-trending pipeline scar is visible immediately north of the site.

Given the sparse nature of the artifact assemblage, the lack of temporally diagnostic artifacts, and the poor integrity of the site due to the significant amount of disturbance incurred within and around the site (pipeline construction, plowing, and vehicle traffic), SWCA concludes that the site's potential to contribute interpretable data important to the prehistory of the region is unlikely. The 1988 recording found only 17 flakes, 3 cores, and 2 flake tools and the revisit by KLJ in 2010 did not find any artifacts. SWCA's current investigation again found several flakes, a core, and a flake tool (very similar to the assemblage noted in 1988). The site is located in a plowed field that has been continuously cultivated for many years. If buried cultural material was present at this location, it would be expected to see materials dragged to the surface on a routine basis and it would also be expected to see the material assemblage on the surface to change with time. This has not been the demonstrated case at this location for over 20 years. The lack of any diagnostic artifacts (including pottery, projectile points, or evidence of dateable features/fire-cracked rock [FCR]) further indicates the low potential for 32MZ934 to provide information important to our understanding of prehistory in North Dakota. Based on these data and observations, SWCA recommends 32MZ934 not eligible for the NRHP under any criteria.

Management Recommendation

The proposed Garden Creek pipeline would be co-located with an existing pipeline corridor. The site is recommended not eligible and no further work is recommended.

32MZ937 (MP 44.7)

Site Type:	Cultural Material Scatter
Association:	Unknown Prehistoric
Site Size:	426.6 by 176.4 m (40,990.3 m ²)
NRHP Recommendation:	Eligible with Contributing and Non-Contributing Portions
Management Recommendation/Project Effect:	Restrict Construction to Existing Pipeline ROW, Fence Construction Corridor, and Monitor/No Adverse Effect

Site Description

32MZ937 is a prehistoric lithic scatter located on a flat plain overlooking Bennie Peer Creek (Figures 19 and 20). North Dakota Country Road 38 is located north of the site and buttes can be seen 360 degrees in the surrounding area. The east/west-trending Lewis and Clark pipeline scar crosses the northern portion of the site (Figure 20). Based on previously documented cultural resources inventories, the Koch Hydrocarbon Northern Border Connection Pipeline (among other buried pipelines) may utilize this existing utility corridor as well. Vegetation includes dandelion, fringed sage, and mixed tall grasses, allowing for a range of 10 to 40 percent ground surface visibility. The soil is a dark gray brown clay loam deposited through colluvial, Aeolian, and residual processes. The condition of the site varies. Overall the site has been significantly disturbed by erosion; agriculture; and livestock grazing, but is in fair condition. However, in the northern portion of the site, pipeline construction and associated vehicle traffic have significantly disturbed the site. The site is currently used as pasture.



Figure 19. 32MZ937 site overview, facing southwest.

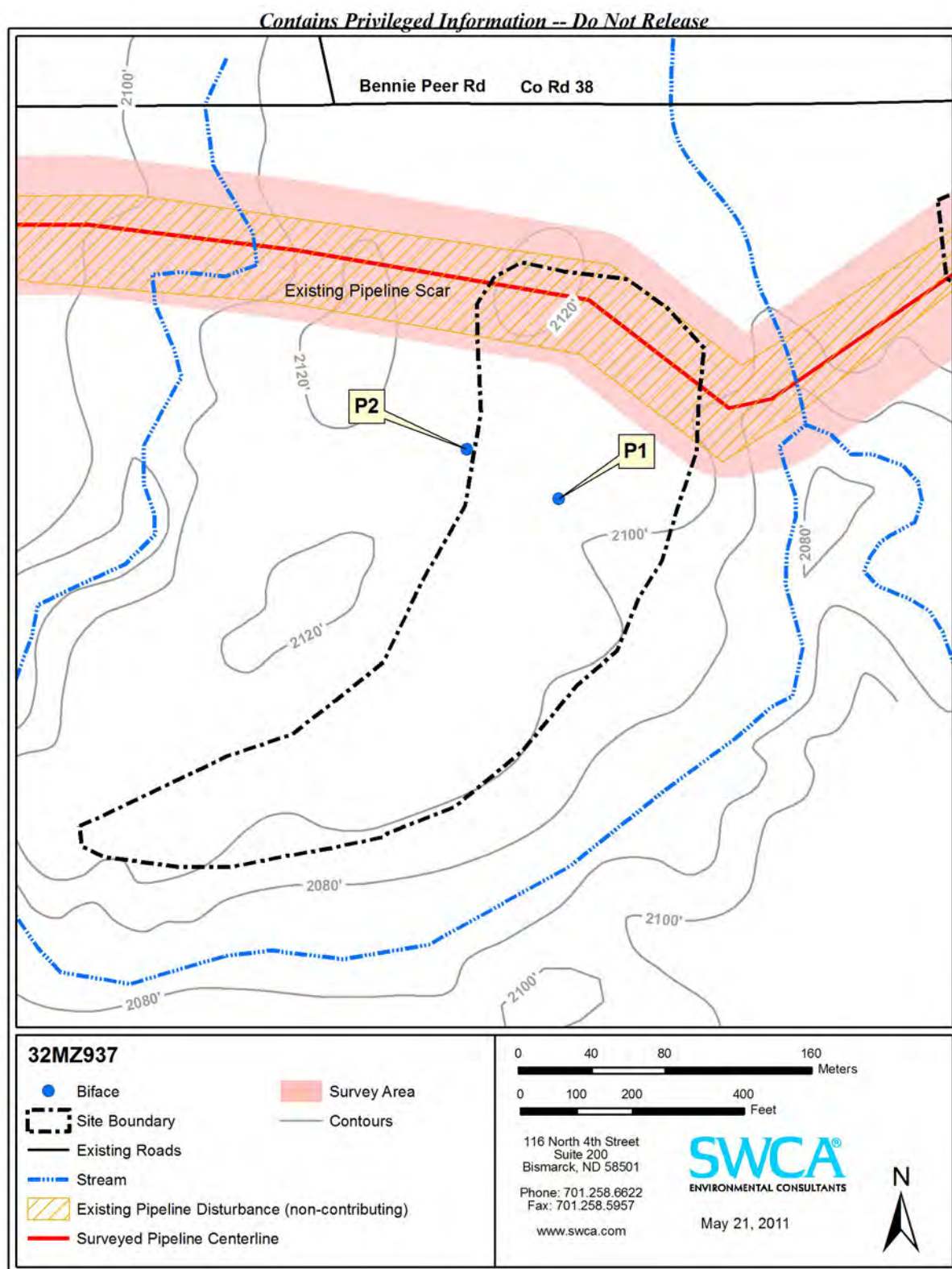


Figure 20. 32MZ937 site sketch map.

Previous Recording

32MZ937 was originally recorded in 1988 by M. Floodman as a part of the Koch Northern Border Connection Pipeline project. The 1988 recording describes the site as potentially very complex. At least 100 artifacts were estimated to be present at the site including five pottery sherds, one red porcellanite side-notched projectile point base fragment, one gray porcellanite biface, one Knife River flint endscraper, fire-cracked rock (FCR), and an uncounted number of flakes of Knife River flint, red porcellanite, gray porcellanite, chalcedony, chert, and petrified wood. The pottery sherds, projectile point, biface, and end-scraper were collected. Artifacts were also observed in a cut bank, located in the eastern portion of the site and extending 25 m north-south. The material in the cut bank included a burned earth zone and possible hearth, flakes, and bone. Floodman postulated that the site represented different occupations due to surface concentrations as well as the stratification of cultural layers observed in the cut bank. The 1988 recording indicated that the site had been impacted by cultivation and pipeline construction at the site's northern extent. Floodman recommended the site potentially eligible for nomination to the NRHP; testing was recommended to determine the extent and depth of the site.

In 1991 B. Olson revisited the site for another pipeline project and conducted shovel tests. The cut bank was examined and flakes were observed in the eroded portion, but none in situ. Additionally, flakes and one pottery sherd were observed on the surface in the previously disturbed pipeline scar in the northern portion of the site. The shovel tests were placed in the northeastern portion of the site; two yielded cultural material between 0 and 40 cmbs. Although the 1991 recording indicated that the site had not been fully tested, Olson agreed with Floodman that the site was potentially eligible for nomination to the NRHP.

Amy Leuchtmann and Sean Gordon, of KLJ, revisited the site in June 2010, as part of the Lewis and Clark Replacement Pipeline project. They noted the site was located in a plowed field with poor visibility. No cultural material was noted during the revisit. Despite noting the lack of the site's spatial integrity, KLJ agreed with Floodman and Olson's NRHP recommendations of potentially NRHP-eligible.

Survey Results

SWCA visited 32MZ937 on May 12, 2011. Although SWCA team members extensively surveyed the cut bank, no cultural material was observed; however, the bank has significantly eroded since the original recording in 1988. The observed artifact assemblage was limited to the site's surface and consisted of two bifaces (P1 and P2) and 21 pieces of lithic debitage (see Figure 20).

P1 is a gray porcellanite mid-stage biface that measures 55 × 40 × 9 mm. P2 is a Knife River flint late stage biface fragment that measures 25 × 27 × 7 mm. The flaked lithic assemblage includes predominately Knife River flint followed by gray porcellanite and chalcedony material types. All stages of lithic reduction were represented, including tertiary (n=10), secondary (n=7), and primary (n=4). The size classes observed include size class 1 (n=2), size class 2 (n=11), size class 3 (n=7) and size class >5 (n=1). The site continues to be affected

heavily by erosion. Additional impacts include pipeline construction across the northern portion of the site, associated vehicle traffic, and cattle grazing. These impacts most likely account for the reduction in observed cultural material both in the cut bank and on the site's surface. No changes were made to the previous site boundary.

NRHP Eligibility Recommendation

32MZ937 is a prehistoric lithic scatter originally recorded in 1998 by Floodman, revisited in 1991 by Olson, and revisited by Leuchtmann and Gordon in 2010. The site was originally documented as a complex site including five pottery sherds, one projectile point, one biface, one end-scraper, FCR, over 100 pieces of lithic debitage, bone, and a possible hearth. Artifacts were observed both on the surface and within a cut bank. In 1991 the observed cultural material was significantly less, although artifacts were observed on the surface, in the slough of a cut bank, and within varying depths of shovel tests. All three previous records recommend the site potentially eligible for inclusion in the NRHP; therefore, the site remained unevaluated regarding its NRHP eligibility.

SWCA revisited the site for the current project and observed continued disturbance to the site from grazing, cut-bank erosion, vehicle traffic, and pipeline construction in the northern portion of the site. Nevertheless, with the exception of pipeline construction, these disturbances may not have affected the previously identified buried cultural horizon. Therefore portions of the site have the potential to yield information important to the prehistory of the region. Based on the positive shovel tests in 1991, the presence of artifacts eroding from the cutbank during previous investigations, and the presence of diagnostic artifacts (projectile point, pottery, and a possible hearth), it is SWCA's opinion that 32MZ937 is eligible for the NRHP. Although SWCA did not conduct evaluative shovel testing at the site as majority of the site falls outside of the proposed project area, past investigations have demonstrated that a buried component is present that contains dateable/diagnostic information that can provide data to answer research questions regarding the prehistory of North Dakota. SWCA recommends 32MZ937 eligible for the NRHP under Criterion D. However, the northern portion of the site that is within the existing pipeline corridor has been disturbed by the construction of multiple previous pipelines and is therefore recommended as a non-contributing portion of the overall resource.

Management Recommendation

The proposed Garden Creek pipeline would be co-located with an existing pipeline corridor. Therefore, the proposed Garden Creek pipeline construction corridor would remain within the existing pipeline disturbance zone (non-contributing portion of the site). Given the proximity of the proposed pipeline construction corridor to the contributing portion of the site (the portion not previously impacted by construction), SWCA recommends that the southern edge of the construction corridor be fenced to ensure that all construction activities and vehicle traffic remain within the approved ROW.

NEWLY RECORDED SITES

32MZ2204 (MP 9.5)

Site Type:	Stone Circle and Depression
Association:	Unknown Prehistoric
Site Size:	48.5 by 17.6 m (645.2 m ²)
NRHP Recommendation:	Unevaluated
Management Recommendation/Project Effect:	Avoid, Reroute, Neck Down, and Fence/No Effect

Site Description

32MZ2204 is a prehistoric stone circle and depression site located atop a west-northwest/east-southeast-trending ridge within an area characterized by rolling plains (Figures 21 and 22). Within 100 m of the site to the north and south, elevation decreases significantly. An intermittent drainage runs approximately 0.25 mile to the northeast; U.S. Highway 85 is approximately 0.25 mile to the south; and Watford City can be seen to the east. A very faint two-track road bisects the top of the ridge, trending west-northwest/east-southeast. Vegetation on site consists of low-lying sagebrush, prairie smoke, western wheatgrass, small low-lying bunch grasses, and forbs. Bare ground surface visibility ranges from 0 to 15 percent. The soil is a brown clay loam deposited through residual and alluvial processes. The condition of the site is fair to poor as it has been affected by cattle grazing, vehicle traffic along the two-track road, and colluvial erosion.



Figure 21. 32MZ2204, site overview, facing west.

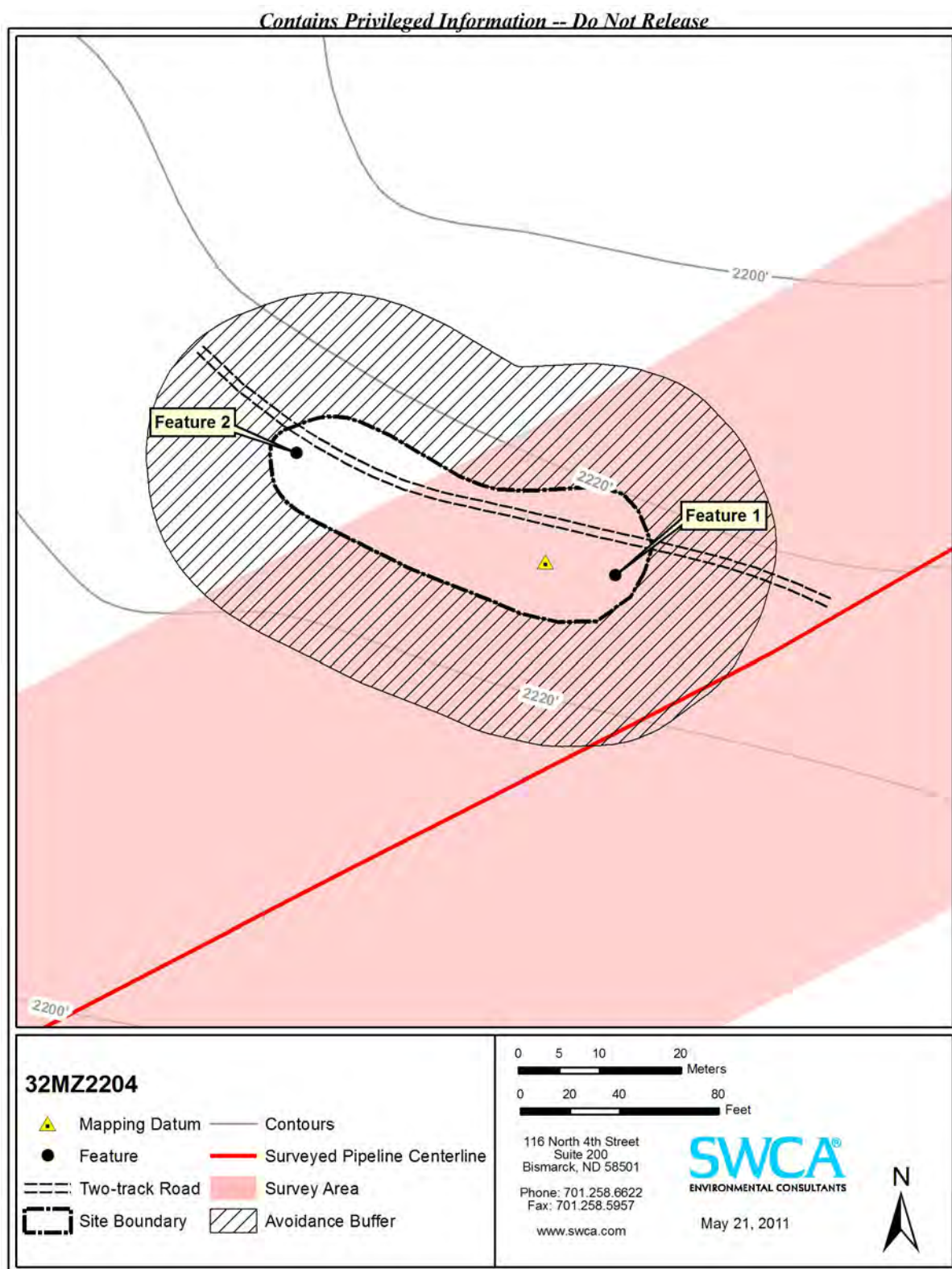


Figure 22. 32MZ2204 site sketch map.

Survey Results

SWCA newly recorded site 32MZ2204 on April 26, 2011. The site consists of one stone circle (Feature 1) and one depression (Feature 2).

Feature 1 is a moderately defined, circular, complete stone circle that measures 7.9 m north-south by 7.3 m east-west (Figure 23). The stone circle contains 56 moderately to deeply sodded stones ranging in size from 12 to 21 cm in maximum dimension. The stones exhibit approximately 80 percent lichen growth.



Figure 23. 32MZ2204 Feature 1, stone circle, facing south, with pin flags marking the feature boundary.

Feature 2 is a depression that measures 1.4 m north-south, 1.5 m east-west, and 30 cm in depth (Figure 24). The depression contains 26 granite stones in the bottom and along the northern wall. The stones range in size from 14 to 34 cm, are heavily sodded, and display 40 to 50 percent lichen growth. The two-track that bisects the site crosses through Feature 2.



Figure 24. 32MZ2204, Feature 2, depression, facing west, with tape measure extended to 1 m.

NRHP Eligibility Recommendation

32MZ2204 is a prehistoric stone circle and depression site. The site is in fair to poor condition, as it has been negatively impacted by cattle grazing, erosion, and vehicle traffic. While no subsurface testing was performed at the site due to the presence of cultural features that may be considered of a sacred nature, subsurface testing may yield important information necessary to refine temporal association. Accordingly, SWCA recommends the site remain unevaluated regarding its NRHP eligibility under Criterion D until subsurface testing can be conducted. The site is also considered unevaluated regarding its NRHP eligibility under Criterion A as a potential TCP. Therefore, tribal consultation is recommended.

Management Recommendation

SWCA recommends avoidance of 32MZ2204 pending subsurface testing and tribal consultation. SWCA recommends a 50-foot-wide avoidance buffer be placed around the site boundary (see Figure 22) and that the pipeline construction corridor be rerouted and necked-down so that all construction activities and vehicle traffic remain outside of this buffer zone. SWCA further recommends fencing of the western edge of the temporary construction corridor to ensure that all construction activities remain within the corridor.

32MZ2202 (MP 10.6)

Site Type:	Farm Equipment
Association:	Unknown Historic
Site Size:	194.3 by 72.2 feet (9,550.6 feet ²)
NRHP Recommendation:	Not Eligible
Management Recommendation/Project Effect:	Move Equipment Outside Corridor/No Effect

Site Description

32MZ2202 is a historical farm equipment scatter located on the northwest aspect of a low point surrounded by rolling plains (Figures 25 and 26). Several rolling hills converge at a low point just northwest of the site. The site is bisected and bounded on the south by two abandoned dirt roads that converge and lead to a nearby historical homestead approximately 160 m to the northeast, outside the project area. U.S. Highway 85 is approximately 1 mile north of the site. Vegetation consists of tall mixed prairie grasses and oak trees in the surrounding area. Less than 5 percent of the bare ground surface is visible. The soil is a fine brown loam with glacial till cobble inclusions. The site is in poor condition and has been heavily affected by erosion and the elements, as most of the artifacts are in fragments and partially buried.



Figure 25. 32MZ2202 site overview, facing north-northwest.

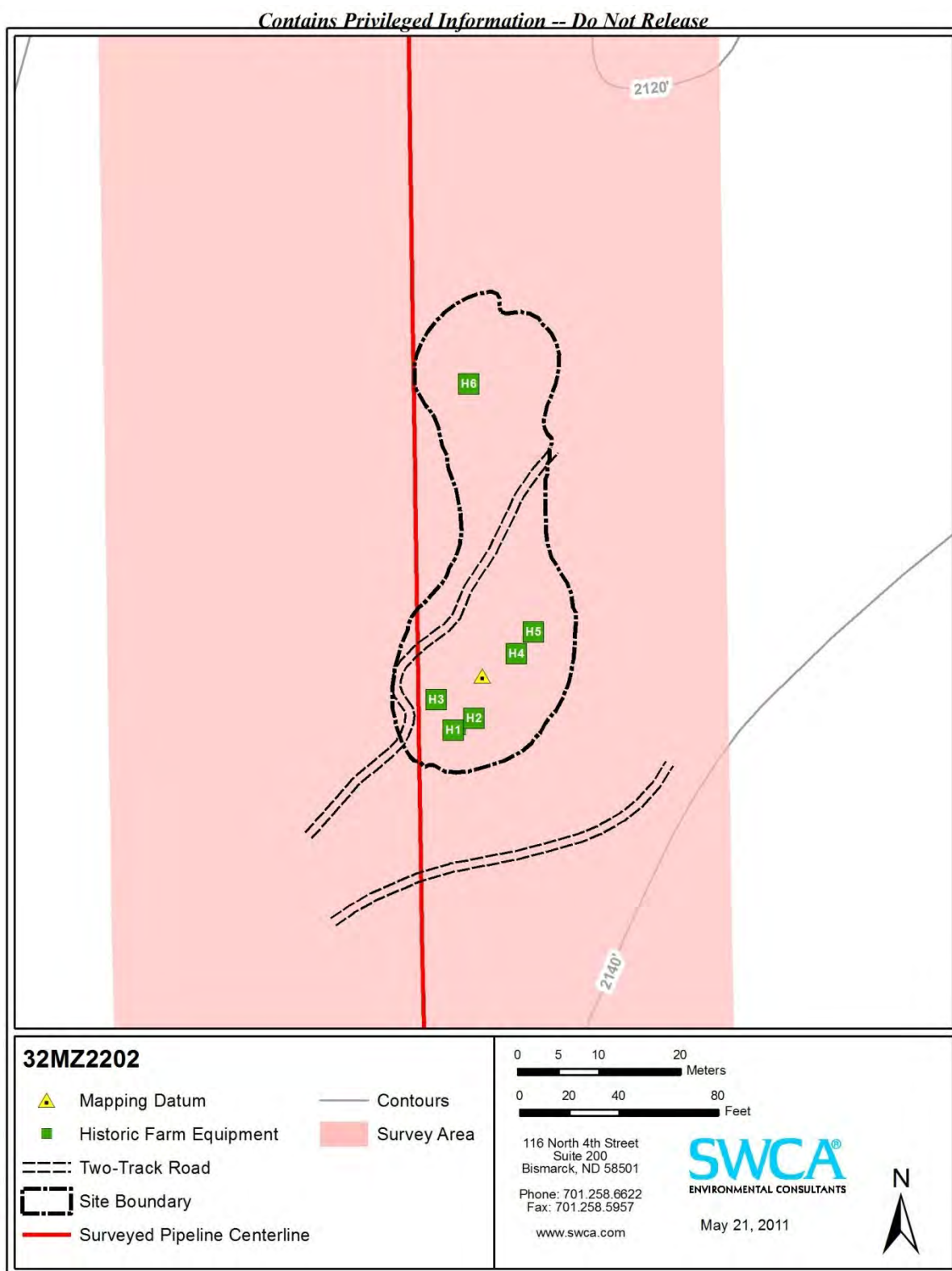


Figure 26. 32MZ2202 site sketch map.

Survey Results

SWCA newly recorded site 32MZ2202 on April 26, 2011. The site consists of six pieces of farm equipment (H1 to H6; see Figure 26).

H1 is a spike tooth harrow with no hitch attached (Figure 27). The harrow is built of metal and constructed of square nuts. It exhibits two sets of five rows of teeth and one lever. The artifact is partially buried. Two maker's marks are displayed on the harrow: one is an International Harvester Company (IHC) maker's mark and the other is an M inside a square box. The IHC was founded in 1902 from the merging of Deering Harvester Company, Plano Manufacturing Company, and the Champion Line and Milwaukee Harvester Company (Case IH Agriculture and Farm Equipment 2011) and later trademarked in 1909 (U.S. Patent Office 1909). IHC started manufacturing harrows in 1909 (Wendel 1997).



Figure 27. 32MZ2202, H1, IHC spike tooth harrow, close-up with tape extended to 3 feet.

H2 is a McCormick-Deering tractor (Figure 28). The tractor's engine displays the IHC maker's mark and has the firing order of 1-3-4-2 embossed on the engine block. The latest patent number for the engine is 2015, 546 and serial number F4-386484. The tractor itself retains rubber wheels and model number WB30137PT W30. Four cylinder engines were introduced on the McCormick-Deering tractors in 1917, and by the 1930s, rubber tires were available as well (Sanders 1996).



Figure 28. 32MZ2202, H2, McCormick-Deering tractor, facing northwest, with tape extended to 3 feet.



Figure 29. 32MZ2202, H3, John Deere rod weeder, close-up with tape extended to 3 feet.

H3 is a portion of a John Deere rod weeder (Figure 29). The rod weeder displays one wheel, one lever, and two u-shaped hooks. H3 is heavily sodded and partially buried by overgrown grasses.

H4 is a baler/hay press in poor condition (Figure 30). The baler displays an IHC maker's mark. The artifact is mostly buried and is in several disjointed pieces. The baler rods are made out of wooden dowels. One of the components of the baler contains a star-shaped cut-out in the metal. IHC began manufacturing balers in 1907 (Wendel 1997).



Figure 30. 32MZ2202, H4, ICH baler/hay press, facing east with tape measure extended to 3 feet.

H5 is a seed or grain drill (Figure 31). The hopper, spokes, and tire rims are all made out of wood and the drill displays remnants of red paint. The drill contains no maker's mark. The first known seed drills to be manufactured were by the F.F. Holbrook Company in 1850 (Wendel 1997). The majority of seed drill manufacturers had replaced the wooden tire and wooden hopper with iron by the early 1900s and by the 1920s the manufacture of wooden tires and hoppers was scarce (Wendel 1997).



Figure 31. 32MZ2202, H5, seed/grain drill, facing eas-southeast.

H6 is a moldboard and disc combination plow (Figure 32). It displays three disc blades and three moldboard plow blades. The artifact is approximately half buried and is constructed with large square nuts. The plow has retained two wheels and one small guide wheel. Disc plows were not manufactured until approximately 1915, when they started to replace the traditional mold board plow (Wendel 1997).



Figure 32. 32MZ2202, H6, moldboard and disc combination plow, facing south.

Historical Background

SWCA conducted historical background research for Section 21, T150N, R99W. According to the BLM GLO land patent search, the land in the N ½ of the SE ¼ of Section 21 was part of a 160-acre land claim patented to John O. Sathra on February 10, 1913, under the Original Homestead Act of 1862 (BLM 2010:Accession number 314483). A search of U.S. Census records indicates a date of birth for a John Oscar Sathra in 1885 in North Dakota (U.S. Census 1900:Roll T623, Page 10A). In 1900, 15-year-old John resided in eastern North Dakota, near the town of Mayville in Traill County. Whether this is the same individual as listed on the land patent is unknown. Likewise, it is unclear if the abandoned farm equipment is associated with the residence of John O. Sathra, or a later occupant of the property.

NRHP Eligibility Recommendation

32MZ2202 is a historical artifact scatter that consists of six pieces of farm equipment with no associated features. The site is in poor condition, having been affected by erosion and exposure to the elements. There is little potential for the site to contain a buried cultural component, as the observed artifacts were not heavily sodded and the site type is not one with which a buried cultural horizon is typically associated. The site likely represents a dumping episode of materials transported from another location.

The site is not associated with a significant event or period of time, nor is there any connection between material at the site and any person or persons significant to the history of the area or region. Therefore, the site is recommended not eligible for inclusion in the NRHP under either Criterion A or B. There are neither buildings nor structures present; therefore, SWCA recommends the site as not eligible under Criterion C. Additionally, the site lacks in situ artifacts and the presence of buried associated cultural material is highly unlikely. SWCA therefore recommends the site as not eligible under Criterion D. The site is unlikely to contribute additional information on the history of the region.

Management Recommendation

32MZ2202 is recommended not eligible under any NRHP criteria; however, to avoid undue impact to the equipment, SWCA recommends that the farm equipment be moved outside of the construction corridor prior to commencement of construction.

32MZ2201 (MP 17.2)

Site Type:	Stone Cairn
Association:	Unknown
Site Size:	10.0 by 10.0 m (19.5 m ²)/ 32.7 by 32.7 feet (210.3 feet ²)
NRHP Recommendation:	Unevaluated
Management Recommendation/Project Effect:	Avoid, Neck Down, and Fence /No Effect

Site Description

32MZ2201 is a stone cairn site located on the top of a hill in an area characterized by rolling grasslands (Figures 33 and 34). A north/south-trending fence line is approximately 50 m west of the site and bounds an agriculture field to the west. A north/south-trending dirt road is located approximately 540 m to the east. The vegetation consists of mixed prairie grasses and the bare ground surface visibility is approximately 10 percent. The soil is a dark brown loam deposited through aeolian and colluvial processes. The site is in good condition and has been minimally affected by grazing and surrounding agricultural activities.



Figure 33. 32MZ2201, site overview, facing southeast.

Survey Results

SWCA newly recorded 32MZ2201 on April 25, 2011. The site consists of a single stone cairn (Feature 1). Feature 1 is a circular-shaped cairn measuring 49 cm north-south and 40 cm east-west (Figure 33). The cairn retains good definition and consists of four visible heavily sodded cobbles ranging in size from 5 to 25 cm in maximum dimension.

Historical Research

SWCA conducted historical background research for Section 11, T149N, R100W. According to the BLM GLO land patent search, the land in the S $\frac{1}{2}$ of the NE $\frac{1}{4}$ of Section 11 was part of a 160-acre land claim patented to Glen Reibsamen on June 14, 1909, as a sale-cash entry (BLM 2010:Accession number 67070). Based on a search of census records covering the early twentieth century, there is no record of a Glen Reibsamen living in North Dakota; however, census records indicate that Glen C. Reibsamen, born in approximately 1883, lived

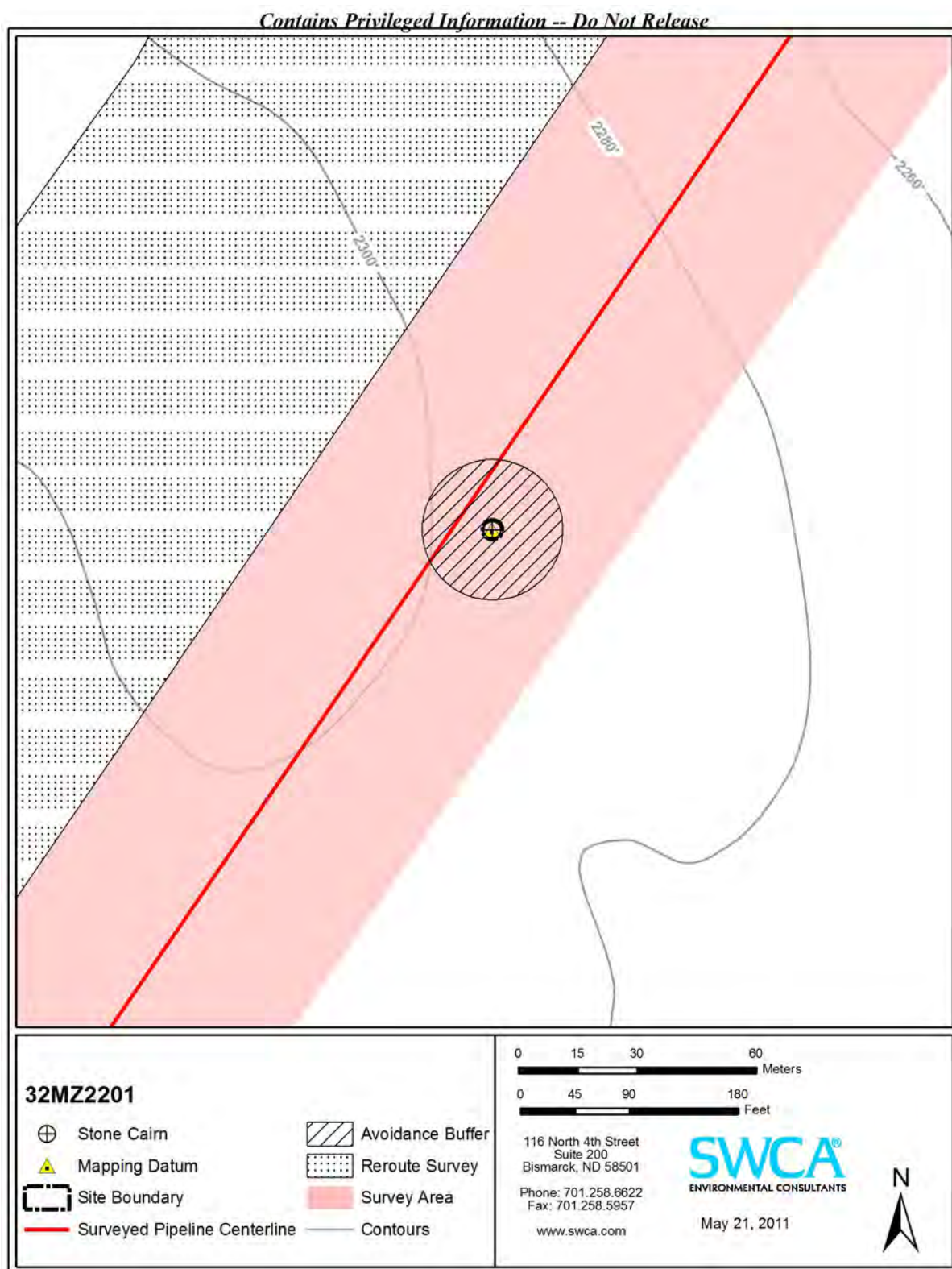


Figure 34. 32MZ2201 site sketch map.



Figure 35. 32MZ2201, Feature 1, stone cairn, facing northwest.

in Iowa throughout the early twentieth century (U.S. Census 1900:Roll T624, Page 8A). Genealogical records further indicate that after completing collegiate-level schooling and serving as a banker for approximately three years in Iowa, in 1908, Mr. Reibsamen claimed land in North Dakota, where he remained for nine months. After proving his claim, he returned to Iowa where he continued his career as a banker and eventually started the Reibsamen Peterman Real Estate and Loan Company (Schwarze 2001). It is unknown if the stone feature at 32MZ2201 is associated with the brief residence of Glen Reibsamen, or a later occupant of the property.

NRHP Eligibility Recommendation

32MZ2201 is a stone cairn site of unknown age. The stone cairn is heavily sodded, in good condition, and retains good integrity, having been minimally impacted by livestock grazing and agriculture in the surrounding area. While no subsurface testing was performed at the site due to the presence of cultural features that may be considered of a sacred nature, subsurface testing may yield important information necessary to refine temporal association. Accordingly, SWCA recommends the site remain unevaluated regarding its NRHP eligibility under Criterion D until subsurface testing can be conducted. The site is also considered unevaluated regarding its NRHP eligibility under Criterion A as a potential TCP. Therefore, tribal consultation is recommended.

Management Recommendation

SWCA recommends avoidance of 32MZ2201 pending subsurface testing and tribal consultation. SWCA recommends a 50-foot-wide avoidance buffer be placed around the site boundary (see Figure 34) and that the pipeline construction corridor be rerouted and necked-

down, as needed, so that all construction activities and vehicle traffic remain outside of this buffer zone. SWCA further recommends fencing of the eastern edge of the temporary construction corridor to ensure that all construction activities remain within the corridor. Additional area was surveyed to the west of the 250-foot-wide survey corridor to allow adequate room for rerouting around the site.

32MZ2203 (MP 21.6)

Site Type:	Trash Dump
Association:	Unknown Historic
Site Size:	101.8 by 99.6 feet (8,599.8 feet ²)
NRHP Recommendation:	Not Eligible
Management Recommendation/Project Effect:	No Further Work/No Effect

Site Description

32MZ2203 is a historical trash dump located atop and on the western and southern slope of a small rise in an area of gently rolling plains (Figures 36 and 37). The site is in a reclaimed agricultural field and is bounded on the south by an east/west-trending two-track road and parallel barbed-wire fence. An intermittent drainage is approximately 0.25 mile to the southeast and 137th Avenue NW is 160 m to the east. The on-site vegetation includes western wheatgrass, Kentucky blue grass, sagebrush, and prairie smoke. Ground surface visibility ranges from 0 to 100 percent, with an average of 15 percent. Soils are a medium brown clay loam deposited through colluvial and alluvial processes. The site is in good condition, as it has been minimally affected by livestock grazing and erosion.



Figure 36. 32MZ2203, site overview, facing southeast.

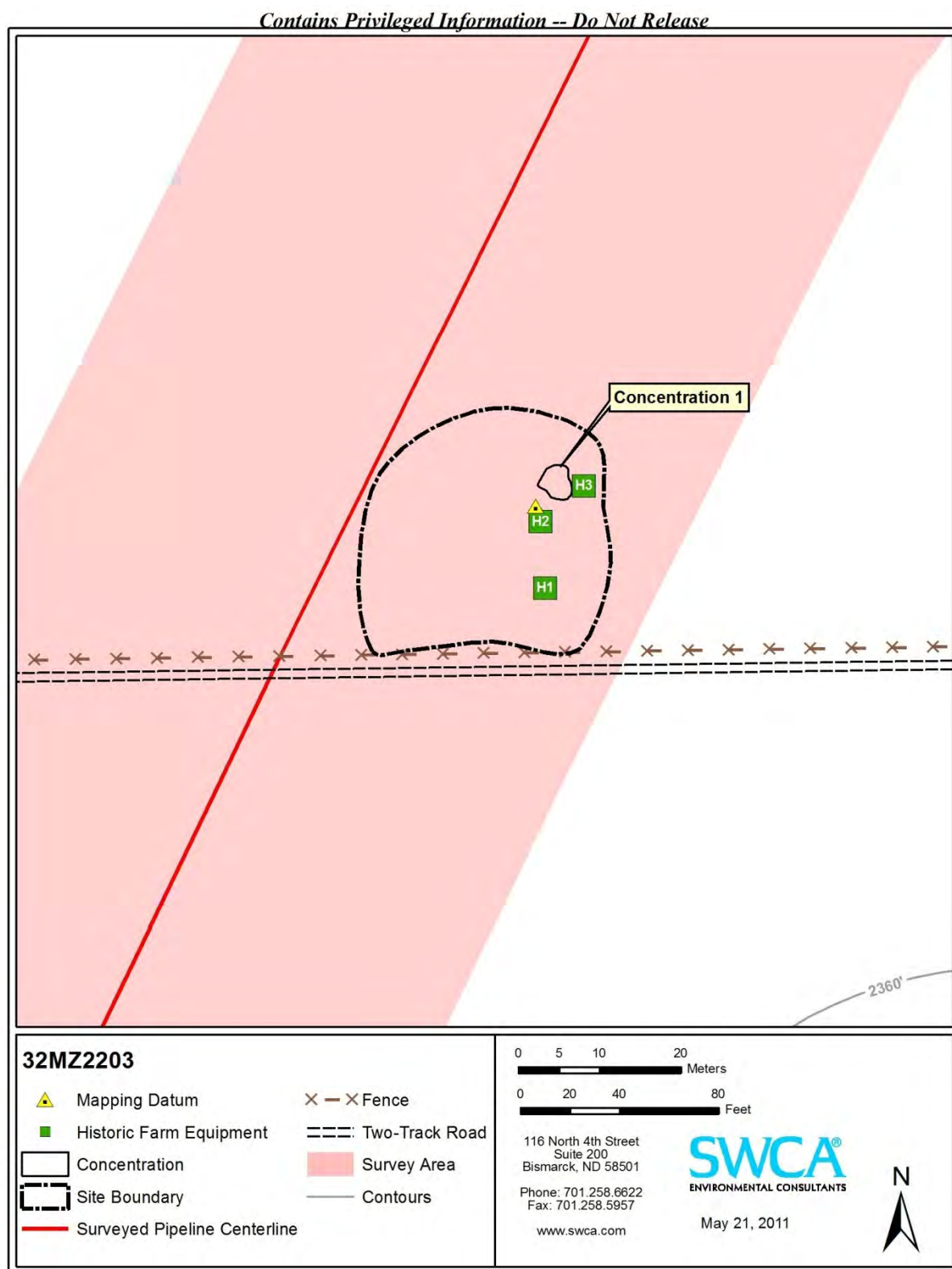


Figure 37. 32MZ2203, site sketch map.

Survey Results

SWCA newly recorded 32MZ2203 on April 25, 2011. The site consists of one concentration (Concentration 1), three pieces of historical farm equipment (H1, H2, and H3), and a scatter of glass, metal, and ceramics.

Concentration 1 is a dense scatter of historical artifacts (Figure 38). The scatter includes two large tangled bunches of chicken and barbed wire; five wooden fence posts; one bucket; one halved barrel with a threaded hole in the side, one barrel; six suspension springs; one wrought iron thresher engine; four windmill fan blades; one windmill head with fan blades attached; four metal wheel rims; one wrought iron stove top; one bucket seat; three metal doors with slats; and one stove pipe.



Figure 38. 32MZ2203, Concentration 1, facing south-southeast.

In addition to Concentration 1, the artifact assemblage consists of one piece of equipment of unknown function (H1), one thresher (H2), one mower (H3), 17 miscellaneous machine parts, 15 fragments of clear glass, nine fragments of aqua glass, 24 pieces of scrap metal, two base fragments of brown glass, one metal seat, three iron rods, and one crushed aluminum bucket.

H1 is a piece of equipment of unknown function (Figure 39). This piece of equipment was likely handmade after 1930, based on the type of metal drum from which it is partially constructed.



Figure 39. 32MZ2203, H1, handmade piece of equipment, facing west, with tape measure extended to 3 feet.

H2 is grain binder or reaping-binder (Figure 40). The INTERNATIONAL HARVESTER trademark is embossed on each of the mowing teeth and part of the frame is made of wood. The IHC was founded in 1902 from the merging of Deering Harvester Company, Plano Manufacturing Company, and the Champion Line and Milwaukee Harvester Company (Case IH Agriculture and Farm Equipment 2011) and later trademarked in 1909 (U.S. Patent Office 1909). By the 1920s McCormick binders seldom used wood in their construction (Wendel 1997); therefore, this particular binder was probably manufactured between 1909 and 1920.



Figure 40. 32MZ2203, H2, grain binder, facing southwest.

H3 is an IHC-McCormick Deering New Big 4 mower (Figure 41). This type of mower was made between 1909 and 1911, and was intended to be used with a team of draught horses for the harvesting of cereal grains, namely fodder grains (Sorensen 2008).



Figure 41. 32MZ2203, H3, mower, close-up.

Historical Background

SWCA conducted historical background research for Section 18, T149N, R100W. According to the BLM GLO land patent search, the land in the NE ¼ of Section 18 was part of a 160-acre land claim patented to Hilda Lynner on April 28, 1914, under the Original Homestead Act of 1862 (BLM 2010:Accession number 401244). A search of U.S. Census records indicates a date of birth for Hilda Lynner in 1899 in North Dakota (U.S. Census 1910:Roll T624, Page 4B), suggesting that she was approximately 15 years old at the time the original patent was issued. Hilda was of Norwegian descent. The use of the land or if Lynner lived on the property cannot be determined through the available records. No further information was available for Hilda Lynner.

NRHP Eligibility Recommendation

32MZ2203 is an historical dump and artifact scatter that consists of one artifact concentration, three pieces of farm equipment, and a sparse scatter of glass and metal with no associated features. The artifacts all post-date 1909. The site remains in good condition and retains good integrity; however, there is little potential for the site to contain a buried cultural component, as the observed artifacts were not heavily sodded and site type is not one with which a buried cultural horizon is typically associated. The site likely represents a dumping episode of materials transported from another location.

The site is not associated with a significant event or period of time, nor is there any connection between material at the site and any person or persons significant to the history of the area or region. Therefore, the site is recommended not eligible under either Criterion A or B. There are neither buildings nor structures present; therefore, SWCA recommends the site as not eligible under Criterion C. Additionally, as a trash dump, the site lacks in situ artifacts and the presence of buried associated cultural material is highly unlikely. SWCA therefore recommends the site as not eligible under Criterion D. The site is unlikely to contribute additional information on the history of the region.

Management Recommendation

The site is recommended not eligible under any NRHP criteria; therefore, no further work is recommended at 32MZ2203.

32MZ2200 (MP 28.6)

Site Type:	Depression, Rock Feature, and CM Scatter
Association:	Unknown Historic
Site Size:	41.2 by 35.5 feet (1,095.6 feet ²)
NRHP Recommendation:	Not Eligible
Management Recommendation/Project Effect:	No Further Work/No Effect

Site Description

32MZ2200 is a historical depression, rock alignment, and cultural material scatter on a low point in an area surrounded by rolling grasslands and agricultural fields (Figures 42 and 43). The site overlooks an unnamed intermittent stream to the southwest and a stock pond is located approximately 80 m south. Charbonneau Creek is located approximately 0.5 mile to the northwest. McKenzie County Road 30, an associated east/west-trending fence line, and a parallel power line are 35 m to the north. Vegetation includes wheat and brome grasses, allowing for 5 to 10 percent bare ground surface visibility at the time of recording. Surface soils are dominated by a dark brown clay loam formed through aeolian and residual processes. The site is in fair condition and has been impacted by erosion and agricultural activities.

Survey Results

SWCA newly recorded 32MZ2200 on April 23, 2011. The site consists of a historical depression (Feature 1) with an associated historical cultural material scatter; a rectilinear rock alignment (Feature 2); and a single brick.

Feature 1 is a depression measuring 6 × 10 feet and 2 feet in depth (Figure 44). The depression contains three pieces of clear window glass, five pieces of metal of unknown use, and one large stone slab measuring 3 × 3 feet. This feature likely represents a building foundation. Feature 2 is a rock alignment that measures 5.5 × 14.0 feet and consists of 15 cobbles (Figure 45). The feature is L-shaped and the northern edge abuts Feature 1. In addition, a single brick was observed outside of Features 1 and 2.

Shovel Test Results

Shovel testing was performed at the site on May 27, 2011, to evaluate the site's potential to contain intact and interpretable subsurface deposits. Eight shovel tests were excavated to a depth of 54 to 72 cmbs (Table 3). All were terminated when sterile soils were encountered. The dominant sediment encountered was clay loam which, in four of the tests, graded into clay at depths exceeding approximately 30 cmbs. Three of the eight shovel tests yielded cultural material. Shovel tests 3 and 7 revealed shallowly buried modern material. Shovel test 1 revealed non-diagnostic historical cultural material to a depth of 22 cmbs. However, because the artifacts were limited to the top 22 cm of sediment, within areas subject to bioturbation, plowing, and other surface impacts, it is likely that these deposits are disturbed.



Figure 42. 32MZ2200, site overview, facing northeast, showing McKenzie County Road 30, the fence line, and the power line in the background.

Contains Privileged Information -- Do Not Release

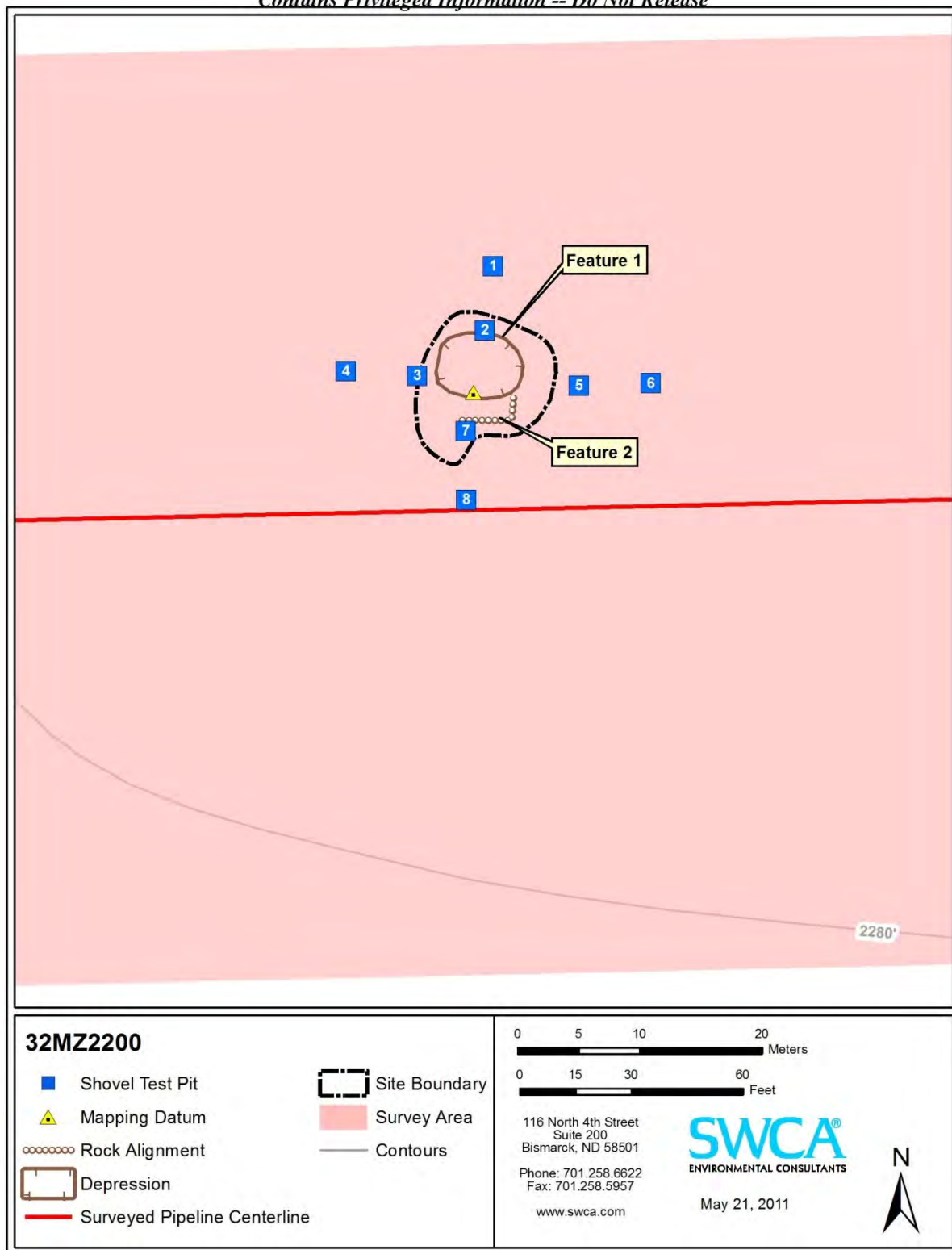


Figure 43. 32MZ2200, site sketch map.



Figure 44. 32MZ2200, Feature 1, depression, facing north.



Figure 45. 32MZ2200, Feature 2, rock alignment, with pin flags marking the feature's boundary.

Table 3. Shovel Test Results for 32MZ2200

Test Number	Diameter	Depth	Soil Matrix	Cultural Material
1	30 cm	72 cmbs	0–4 cmbs: dark brown clay loam 4–27 cmbs: reddish black clay loam 27–72 cmbs: light reddish brown clay loam Terminated due to sterile soils	8 cmbs: thin charcoal layer 9 cmbs: one bent, 3-inch wire nail 22 cmbs: one bent, 3-inch wire nail
2	30 cm	66 cmbs	0–14 cmbs: very dark brown/black silty loam 14–39 cmbs: dark brown clay 39–66 cmbs: light brown gray silty clay loam Terminated due to sterile soils	None
3	30 cm	65 cmbs	0–15 cmbs: dark brown clay loam 15–42 cmbs: brown silty clay loam 42–65 cmbs: brown gray clay loam Terminated due to sterile soils	5 cmbs: one modern nail
4	30 cm	67 cmbs	0–18 cmbs: very dark brown silty clay loam 18–41 cmbs: brown gray sandy clay loam 41–67 cmbs: light brown gray clay loam Terminated due to sterile soils	None
5	30 cm	57 cmbs	0–17 cmbs: very dark grayish brown clay loam 17–29 cmbs: dusky red clay loam 29–57 cmbs: weak red clay Terminated due to sterile soils	None
6	30 cm	55 cmbs	0–20 cmbs: black clay loam 20–29 cmbs: grayish brown clay loam 29–55 cmbs: light brownish gray clay Terminated due to sterile soils	None
7	30 cm	61 cmbs	0–20 cmbs: very dark brown silty clay loam 20–44 cmbs: brownish gray sandy clay loam 44–61 cmbs: light brown gray sandy clay Terminated due to sterile soils	2 cmbs: one modern machinery gear
8	30 cm	54 cmbs	0–20 cmbs: very dark brown silty clay loam 20–45 cmbs: brown clayey silt 45–54 cmbs: light grayish brown silty clay Terminated due to sterile soils	None

Historical Background

SWCA conducted historical background research for Section 1, T148N R102W. The BLM GLO land patent search did not yield any results regarding land ownership for this parcel of land.

NRHP Eligibility Recommendation

32MZ2200 is an historical site containing a depression, rock alignment, and cultural material scatter. The site is in fair condition and has been affected by erosion and agricultural practices. The site is not associated with a significant event or period of time, nor is there any connection between material at the site and any person or persons significant to the history of the area or region. Therefore, the site is recommended not eligible under either Criterion A or B. All buildings or structures at the site are no longer standing, nor do they represent their original functional or artistic merits; therefore, SWCA recommends the site as not eligible under Criterion C. Based on the results of the shovel testing, subsurface cultural material is limited in quantity, non-diagnostic, and restricted to the top 22 cmbs, in a zone subject to bioturbation and other surface disturbances. SWCA therefore recommends the site as not eligible under Criterion D. The site is unlikely to contribute additional information on the history of the region.

Management Recommendation

The site is recommended not eligible under all NRHP criteria; therefore, no further work is recommended at 32MZ2200.

ISOLATED FINDS

32MZX1131 (MP 18.4)

32MZX1131 is a prehistoric lithic isolated find located in a reclaimed agricultural field on the north-northeastern slope of a broad rise that overlooks rolling plains. Approximately 60 m to the south is 22nd Street NW, which runs east/west along with an associated fence line. A farmstead is located approximately 200 m to the southeast of the isolate. At the location of the find, vegetation includes bunch grasses and small forbs, allowing for approximately 50 percent ground surface visibility. Soil is a brown fine loam with an estimated 2 percent subangular surface cobble inclusions. The resource is in fair condition, as it sits in a previously plowed field.

SWCA newly recorded 32MZX1131 on April 25, 2011. The isolated find consists of one size class 2 tertiary white quartzite flake.

32MZX1131 is recommended not eligible for listing in the NRHP. By definition, isolated finds are considered to lack the historical integrity to be determined eligible for nomination to the NRHP. Therefore, no further work is recommended for this resource.

32MZX1130 (MP 21.6)

32MZX1130 is a historical ceramic isolated find located on the west slope of a low rise in an area surrounded by rolling plains. The isolate sits in a reclaimed agricultural field just north of 32MZ2203. An ephemeral drainage is located approximately 0.25 mile to the southeast and 137th Avenue NW is located approximately 450 feet to the east. Vegetation includes western wheatgrass, Kentucky blue grass, small sagebrush, and prairie smoke, allowing for approximately 15 percent bare ground visibility. Soil is a medium brown clay loam deposited

through alluvial processes. The resource is in fair condition and has been adversely affected by erosion, agricultural activities, and cattle grazing.

SWCA recorded 32MZX1130 on April 25, 2011. The isolate consist of a white salt-glazed stoneware mouth fragment of a jug or growler. The diameter of the mouth measures 1 $\frac{3}{4}$ inches, the neck height is approximately 1 inch, and the thickness of the vessel is $\frac{1}{4}$ inch. American salt-glazed stoneware was manufactured from 1705 to 1930 (Miller et al. 2000).

32MZX1130 is recommended not eligible for the NRHP. By definition, isolated finds are considered to lack the historical integrity to be determined eligible for nomination to the NRHP. Therefore, no further work is recommended for this resource.

32MZX1129 (MP 23.8)

32MZX1129 is a historical artifact isolated find located on the southeast slope of a hill amidst an area characterized by rolling grasslands. An intermittent southeast-trending drainage sits approximately 330 feet to the south and a north/south-trending two-track road is located approximately 3 feet to the east of the isolate. The area is flanked to the northeast and the southwest by agricultural fields. Vegetation includes western wheatgrass, Russian thistle, buffalo berry, crocuses, and wheat plants that have been blown in from the agriculture field to the north and east, allowing for approximately 10 percent bare ground visibility. The soil is light brown loamy clay deposited through alluvial processes. The resource is in fair condition and has been adversely affected by farming activities, vehicle traffic, and erosion.

SWCA newly recorded 32MZX1129 on April 25, 2011. The isolate consists of four fragments of clear glass representing a portion of a single vessel and a steel pipe. The glass fragments when put together read DURAGLAS in cursive script. This type of Duraglas was manufactured by the Owens-Illinois Glass Co. since September 4, 1940 (Toulouse 1971). The steel pipe is a threaded on both ends and measures 5 inches in length by 1 inch in diameter.

32MZX1129 is recommended not eligible for the NRHP. By definition, isolated finds are considered to lack the historical integrity to be determined eligible for nomination to the NRHP. Therefore, no further work is recommended for this resource.

32MZX1132 (MP 45.4)

32MZX1132 is a prehistoric lithic isolated find located in a cultivated wheat field in a low area between two rises, separated by a distance of approximately 0.5 mile. An ephemeral tributary of Bennie Peer Creek is approximately 80 m to the west and McKenzie County Road 38 and an accompanying east/west-trending fence line is 54 m to the north. Vegetation includes wheat chaff, and allows for approximately 60 percent bare ground surface visibility. Soil is a brown clay silt loam. The resource is in poor condition, and has been affected by agricultural practices.

SWCA recorded 32MZX1132 on May 12, 2011. The isolated find consist of one Knife River flint stemmed projectile point base fragment (Figure 46). The incomplete point measures 20 × 25 × 4 mm and has a neck width of 12 mm and a base height of 16 mm. The isolate displays

moderate patination on one side and heavy patination on the obverse (as shown in Figure 46). The fragment reveals an expanding stem with a shallowly notched base. The flaking pattern is random. Although indeterminate due to the fragmentary nature of the specimen, it is most similar in size and basal morphology to either a Duncan or Hanna projectile point type of the McKean Complex, dating to approximately 4,200 to 3,700 BP (Davis and Keyser 1999).



Figure 46. 32MZX1132, projectile point base.

32MZX1132 is recommended not eligible for inclusion in the NRHP. By definition, isolated finds are considered to lack the historical integrity to be determined eligible for nomination to the NRHP. Therefore, no further work is recommended for this resource.

32MZX1133 (MP 45.6)

32MZX1133 is a prehistoric lithic isolated find located in a previously plowed wheat field in a low flat area. North Dakota County Road 38 and an associated east/west-trending fence line are approximately 30 m north and Bennie Peer Creek is approximately 400 m south of the isolate. Vegetation includes cultivated wheat chaff and allows for an average of 60 percent bare ground surface visibility. Soil is a brown clay silt loam. The isolated find is in poor condition, as it has been negatively affected by agricultural activities.

SWCA recorded 32MZX1133 on May 12, 2011. The isolated find consists of one gray porcellanite tertiary size class 4 flake.

32MZX1133 is recommended not eligible for inclusion in the NRHP. By definition, isolated finds are considered to lack the historical integrity to be determined eligible for nomination to the NRHP. Therefore, no further work is recommended for this resource.

SITES NOT FOUND

32MZ938 (MP 44.6)

Site Type:	Cultural Material Scatter
Association:	Unknown Prehistoric
Site Size:	75 by 90 m (4,500 m ²) (previously recorded)
NRHP Recommendation:	Not Eligible
Management Recommendation/Project Effect:	No Further Work/No Effect

Site Description and Previous Recording

32MZ938 is a previously recorded prehistoric lithic scatter located on a flat plain overlooking Bennie Peer Creek, located approximately 90 m to the west (Figure 47 and 48). North Dakota Country Road 38 is located north of the site and buttes can be seen 360 degrees in the surrounding area. The southern portion of the site is currently used as pasture land, while the northern portion is agricultural fields. The Lewis and Clark pipeline scar crosses the previously defined site location. Vegetation includes dandelion, fringed sage, and mixed tall grasses, allowing for a range of less than 5 percent ground surface visibility in the pasture area, and up to as much as 90 percent in the agricultural field. The soil is a dark gray brown clay loam deposited through colluvial, aeolian and residual processes. The area has been impacted by agricultural activities, pipeline construction, and associated vehicle traffic at the sites northern extent.

32MZ938 is a cultural material scatter originally recorded in 1988 by M. Floodman as part of the Koch Hydrocarbon Northern Border Connection Pipeline survey. The scatter consisted of Knife River flint tools (two biface fragments and one retouched flake tool) and flakes; gray porcellanite tools (two retouched flake tools), core, and flakes; a petrified wood core; and Tongue River silicified sediment flake with utilization. Floodman recommended the site as potentially eligible for listing in the NRHP and suggested subsurface testing.

The site was revisited in 1991 by B. Olson as part of shovel testing for the Koch Pipeline. Twelve shovel tests were excavated within the proposed Koch pipeline corridor; only one was positive for any cultural material. The positive test consisted of one flake at 9 cmbs and a core fragment at 15 cmbs. For the portion of the site that had been tested, Olson recommended the site as not eligible for listing in the NRHP.

A. Leuchtmann and S. Gordon of KLJ revisited the site in June, 2010, as part of the Lewis and Clark Replacement Pipeline project. They noted the site was located in a plowed field with poor visibility. No cultural material was noted during the revisit. KLJ agreed with Olson's recommendation of not eligible for the portion of the site that had been tested, but noted the remainder of the site should be tested as well to determine its eligibility.



Figure 47. 32MZ938 site overview, facing west-northwest.

Survey Results

SWCA revisited 32MZ938 on May 12, 2011. In the portion of the site currently used as grazing pasture, bare ground surface visibility was low. Elsewhere, however, in the agricultural field and pipeline scar, visibility was much higher. Although SWCA team members extensively surveyed the site area, no cultural material was observed.

NRHP Eligibility Recommendation

32MZ938 is a prehistoric lithic scatter originally recorded in 1988 by Floodman, who recommended the site as potentially eligible for nomination to the NRHP pending subsurface testing. In 1991, Olson recommended the tested portion of the site as not eligible, but noted that because only a portion of the site had been, a definitive NRHP recommendation could not be made. Leuchtmann and Gordon agreed with Olson's NRHP recommendation during their 2010 revisit.

SWCA revisited the site for the current project and did not observe any cultural materials. The site has been continually disturbed by agricultural practices and pipeline construction and no evidence has been found of the site since the original 1988/1991 recording. Additionally, the original recording only found lithic artifacts (five tools, flakes, and two cores). Olson's 1991 testing revealed a single positive shovel test (out of twelve tests) through the central portion of the site. The material (a flake and a core) in the positive test was limited to the upper 15 cm of soil – all within the disturbed plow zone. Given the disturbance created by the construction of three pipelines through the northwestern portion of the site, the lack of diagnostic material at this location for over 20 years, and the extremely sparse lithic assemblage previously recorded at this location, SWCA recommends 32MZ938 not eligible under any criteria.

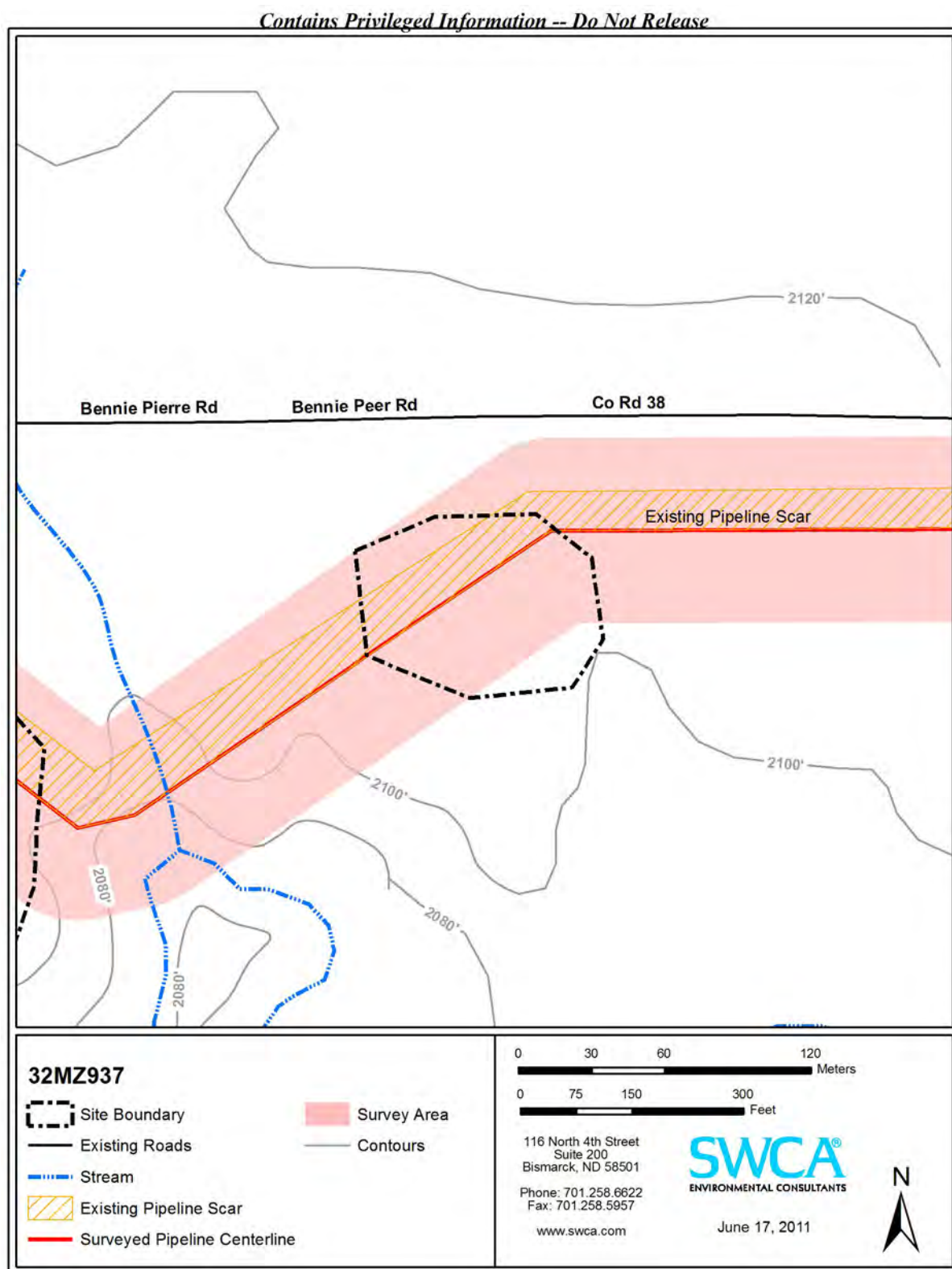


Figure 48. 32MZ938 site sketch map.

Management Recommendation

The proposed Garden Creek pipeline would be co-located with an existing pipeline corridor. The site is recommended not eligible and no further work is recommended.

32MZ1510 (MP 18.1)

The survey corridor crosses the previously digitized location of 32MZ1510, the historical Zoar Lutheran Church and cemetery. However, during survey, it was determined that the previously digitized boundary was far greater than the actual site area. The site was located across the road and several hundred feet south of the survey corridor. The site was therefore not revisited for the current survey and would not be affected by the pipeline construction.

Isolated Finds and Site Leads Not Re-Identified

Four isolated finds and site leads (32MZX361, 32MZX500, 32MZX506, and 32MZX510) were crossed by the survey corridor. None were able to be found during the current survey.

CONCLUSIONS

SWCA performed a Class III inventory for the proposed 63.17-mile-long Garden Creek pipeline between April 20 and May 27, 2011. The portion of the project that crosses private lands in McKenzie County, North Dakota (40.49 miles) falls under the jurisdiction of the NDPSC. E3 is assisting Bear Paw with their application to the NDPSC for a certificate of corridor compatibility and route permit for the project. E3 retained SWCA to complete a Class I and Class III cultural resources inventory for the project. Although a cultural resources inventory was performed for the entire pipeline corridor, the above report focuses on the portion of the project that crosses private lands in McKenzie County, North Dakota.

SWCA surveyed a 250-foot-wide survey corridor centered on the 40.49 -mile-long proposed pipeline centerline (1,280.07 acres) located on private lands in North Dakota. Additional areas totaling 8.98 acres were surveyed on private lands for access roads and to provide alternate alignment options and extra work space. In total, 1,289.05 acres were inventoried on private lands in North Dakota for the project.

During the course of the inventory, ten cultural resources were newly recorded: one is a prehistoric stone feature and depression (32MZ2204), one is a concentration of historical farm equipment (32MZ2202), one is a prehistoric stone feature site (32MZ2201), one is a historical trash dump (32MZ2203), one is a historical foundation and depression site (32MZ2200), three are isolated chipped stone finds (32MZX1131, 32MZX1132, and 32MZX1133), and two are isolated historical finds (32MZX1129 and 32MZX1130). Three previously recorded sites were re-identified and revisited for the project. Two are prehistoric lithic scatters (32MZ934 and 32MZ937) and one is a historic farmstead (32MZ879). Attempts were made to identify two previously known sites (32MZ938 and 32MZ1510) and four previously known isolated finds or site leads (32MZX361, 32MZX500, 32MZX506, and 32MZX510), but these were either not found or were found to be located outside the 250-foot-wide survey corridor and therefore not revisited, as was the case with 32MZ1510.

Six sites (32MZ879, 32MZ934, 32MZ938, 32MZ2200, 32MZ2202, and 32MZ2203) and five isolated finds (32MZX1129, 32MZX1130, 32MZX1131, 32MZX1132, and 32MZX1133) are recommended not eligible for listing in the NRHP. Two of the sites that were newly recorded for the project (32MZ2201 and 32MZ2204) have been left unevaluated regarding their NRHP eligibility pending further work.

No further work is recommended for the following not eligible sites and isolated finds: 32MZ879, 32MZ934, 32MZ938, 32MZ2200, 32MZ2203, 32MZX1129, 32MZX1130, 32MZX1131, 32MZX1132, and 32MZX1133. Although recommended not eligible, SWCA recommends that the farm equipment recorded at 32MZ2202 be moved outside the construction corridor prior to pipeline construction to avoid undue impacts to the historic material.

For 32MZ2201 and 32MZ2204, both unevaluated stone feature sites, SWCA recommends that the pipeline be rerouted within the inventoried corridor and necked down to achieve at least 50 feet of avoidance. Furthermore, SWCA recommends that the edge of the necked-down construction corridor closest to each site be fenced to ensure that all construction activity and vehicle traffic remains within the approved corridor.

One site, 32MZ937, is recommended eligible for listing in the NRHP. The portion of the site that is within the proposed construction corridor falls within a previously disturbed corridor which is recommended as a non-contributing portion of the otherwise eligible resource. As proposed, the Garden Creek pipeline construction corridor would remain within the existing pipeline disturbance zone/non-contributing portion. Given the proximity of the proposed pipeline construction corridor to the site, SWCA recommends that edge of the construction corridor be fenced to ensure that all construction activity and vehicle traffic remains within the previously disturbed corridor and that an archaeological monitor be present during ground-disturbing activities adjacent to the site. With the above stipulations, it is recommended that a determination of *No Historic Properties Adversely Affected* and *No Significant Sites Adversely Affected* be granted for the project to proceed as planned.

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APPENDIX A

List of Previous Studies

Table A1. Bibliographic Listing of Previous Archaeological and Historical Studies for Project Lands in McKenzie County, North Dakota

Manuscript Number	Title	Authors	Year
000178	Pasture 2, Allotment 3 Water Pipeline Survey, McKenzie Co., ND	J. Chatters	1977
000182	Pasture 3, Allotment 3, Stockwater Pipeline and Tank Survey, McKenzie Co., ND	J. Chatters	1977
000268	L. W. Veigel & Co. P.C., Project No. CRS 933(2), McKenzie County, Negative Declaration Survey Report	C. Dill	1976
000299	Preliminary Report on the Archaeological Investigation of 110 Site Location, Little Missouri Grasslands, Custer National Forest, Western North Dakota	L. Loendorf	1978
000312	Kerr McGee Corporation Federal #2-12 Well Pad and Access Road Survey, McKenzie Co., ND	J. Greer	1978
000321	Exeter Exploration Well #15-2-Federal Well Site Survey, McKenzie Co., ND	M. Metcalf, C. Zier	1978
000322	Shell Oil Company 44-31-31 USA, Well Pad and Access Road Survey, McKenzie Co., ND	J. Greer	1978
000323	Shell Oil Company 44-31-31-USA, Well Pad and Access Route Survey, McKenzie Co., ND	C. Muceus, R. Lawrence	1977
000324	Kerr-McGee Corporation Federal #1-12, Well Pad and Access Road Survey, McKenzie Co., ND	J. Greer	1978
000329	Exeter Exploration, Federal 7-2, Well Site Location Survey, McKenzie Co., ND	L. Loendorf	1978
000333	Brownlie, Wallace, Armstrong, Bander Fed 8-11, Well Location and Access Road Survey, McKenzie Co., ND	L. Lahren	n.d.
000337	Brownlie, Wallace, Armstrong, and Bander 10-44 Federal Well Site Survey, McKenzie Co., ND	Powers Elevation Co	1979
000339	Mon-Dak Oil Field Survey, McKenzie Co., ND	A. Keyser	1978
000342	Brownlie, Wallace, Armstrong, Bander Fed 8-23 Well Location and Access Road Survey, McKenzie Co., ND	L. Lahren	n.d.
000349	Brownlie, Wallace, Armstrong, Bander Fed 35-21, Well Location and Access Road Survey, McKenzie Co., ND	L. Lahren	1978
000352	Brownlie, Wallace, Armstrong, and Bander 5-31X Federal Well Pad Survey Report and Addendum, McKenzie Co., ND	M. Metcalf, C. Zier	1979
000362	Brownlie, Wallace, Armstrong, and Bander 5-11x Federal Well Pad and Access Route Survey, McKenzie Co., ND	M. McCoy, N. McCullough McCoy	1979
000391	Bander Oil Company 12-21 Allen-Fed Well Site and Access Road Survey, McKenzie Co., ND	L. Lahren	1978
000392	Brownlie, Wallace, Armstrong, Bander Fed #7-11, Well Location and Access Road Survey, McKenzie Co., ND	L. Lahren	1978
000393	Brownlie, Wallace, Armstrong, Bander Oil #35-43, Well Location and Access Road Survey, McKenzie Co., ND	L. Lahren	1978
000395	Brownlie, Wallace, Armstrong, Bander Fed #7-33, Well Location and Access Road Survey, McKenzie Co., ND	L. Lahren	1978
000396	Bander Oil Company 3-22 Federal, Well Pad and Access Road Survey, McKenzie Co., ND	J. Greer	1978
000397	Bander Oil Company 34-43 Federal, Well Pad and Access Road Survey, McKenzie Co., ND	J. Greer	1978

Table A1. Bibliographic Listing of Previous Archaeological and Historical Studies for Project Lands in McKenzie County, North Dakota (Continued)

Manuscript Number	Title	Authors	Year
000400	Shell Oil Company USA 21-26-79 Well Pad and Assumed Access Addendum Report, McKenzie Co., ND	J. Brechtel	1979
000404	Montana-Dakota Utilities Peterson 1-10 Proposed Pipeline Route Survey, McKenzie Co., ND	R. Fox	1978
000415	Bander Oil Company 2-44 Federal, Well Pad and Access Road Survey, McKenzie Co., ND	J. Greer	1978
000424	Bander Oil Company 8-43 Federal Well Pad and Access Road Survey, McKenzie Co., ND	J. Greer	1978
000434	Brownlie, Wallace, Armstrong, and Bander Federal, Well Pad Survey, McKenzie Co., ND	J. Greer	1978
000455	Brownlie, Wallace, Armstrong, and Bander 3-44 Federal, Well Pad and Access Road Survey, McKenzie Co., ND	J. Greer	1978
000465	Brownlie, Wallace, Armstrong, and Bander, Inc., 1-14 Federal, Well Pad and Access Road Survey, McKenzie Co., ND	J. Greer	1978
000466	Brownlie, Wallace, Armstrong and Bander, Inc., to 11-21-, 11-23, and 11-43 Federal Well Pad Accesses Survey, McKenzie Co., ND	B. Rippeteau	1980
000476	Brownlie, Wallace, Armstrong, & Bander, Inc. 1-12 Federal, Well Pad and Access Road Survey, McKenzie Co., ND	J. Greer	1978
000477	Brownlie, Wallace, Armstrong, & Bander, Inc. 2-22 Federal, Well Pad and Access Road Survey, McKenzie Co., ND	J. Greer	1978
000487	Brownlie, Wallace, Armstrong, & Bander Inc., 8-11 Federal, Well Pad and Access Road Survey, McKenzie Co., ND	J. Greer	1978
000497	Brownlie, Wallace, Armstrong, and Bander Inc. #8-23 Federal Well Pad and Access Road Survey, McKenzie Co., ND	J. Greer	1978
00557	An Intensive Cultural Resource Survey at the Shell USA 11-31-25 Tank Battery Site, McKenzie County, North Dakota	B. Rydalch, K. McConnell	1979
000558	Cultural Resource Inventories on Proposed Drilling Location, Pipelines and Access Roads on the Little Missouri National Grasslands, McKenzie Co., ND	A. Murray	1978
000560	Mon-Dak and Bicentennial Oil Fields Drilling Sites and Access Roads Survey, McKenzie Co., ND	A. Keyser	1978
000564	Pasture 2, Allotment 3, Survey, McKenzie Co., ND	A. Keyser	1978
000591	Shell Oil Co., USA 24-26-47, Well Pad and Access Route Survey, McKenzie Co., ND	M. Metcalf, C. Zier	1979
000611	Shell Oil Company USA #31-82 Well Pad Survey, McKenzie Co., ND	M. Metcalf	1979
000625	Shell Oil Company USA #42-27-80 Well Pad Survey, McKenzie Co., ND	M. Metcalf	1979
000626	Brownlie, Wallace, Armstrong, and Bander # 3-13 Federal Well Pad Survey Addendum Report, McKenzie Co., ND	M. Metcalf, C. Zier	1979
000629	U-V Industries 1-4 Federal Well Pad and Access Road Surveys, McKenzie Co., ND	M. Metcalf, C. Zier	1979
000630	U-V Industries 2-4 Federal Well Pad and Access Route Surveys, McKenzie Co., ND	M. Metcalf, C. Zier	1979
000631	U-V Industries 3-4 Federal Well Pad and Access Route Surveys, McKenzie Co., ND	M. Metcalf, C. Zier	1979

Table A1. Bibliographic Listing of Previous Archaeological and Historical Studies for Project Lands in McKenzie County, North Dakota (Continued)

Manuscript Number	Title	Authors	Year
000648	Shell Oil Company USA #24-32 Well Pad and Access Route Survey Addendum Report, McKenzie Co., ND	M. Metcalf, C. Zier	1979
000657	Shell Oil Company USA #44-31 Well Pad Survey, McKenzie Co., ND	M. Metcalf	1979
000658	Shell Oil Company USA #24-32 Well Pad and Access Route Survey, McKenzie Co., ND	M. Metcalf	1979
000697	U-V Industries, Inc., #4-4 Federal Well Pad and Access Route Survey, McKenzie Co., ND	M. McCoy, N. McCullough McCoy	1979
000700	McKenzie Electric Buried Cable From Shell 11-31 to Shell 31-32 Survey Report, McKenzie Co., ND	D. Kuehn	1979
000740	Shell Oil Company USA #31-31-82 Well Pad Survey and Addendum Report, McKenzie Co., ND	M. Metcalf, C. Zier	1979
000743	Brownlie, Wallace #9-41 Federal Resurvey of Well Pad and Access Route Addendum Report, McKenzie Co., ND	M. Metcalf, C. Zier	1979
000750	Brownlie, Wallace, Armstrong, and Bander #10-44 Federal Well Pad Survey and Access Route Survey Addendum Report, McKenzie CO., ND	M. Metcalf, C. Zier	1979
00780	Farmers Union Federal #12-8 Well Pad and Access Route Survey Report, McKenzie Co., ND	A. Simon, L. Loendorf	1979
000800	Shell Oil Company USA #11-31-25 Tank Battery Site Survey Report, McKenzie Co., ND	J. Greer	1979
000803	Marshall and Winston Spring Creek Federal 2, 3 and 4 Access Route Survey Report, McKenzie Co., ND	D. Kuehn	1979
000823	Brownlie, Wallace, Federal #2-41, Proposed Well Pad and Access Route Survey Report, McKenzie Co., ND	M. Metcalf, C. Zier	1979
00871	An Intensive Cultural Resource Survey of the Shell #11-31-25 Flowline, McKenzie County, North Dakota	B. Rydalch, K. McConnell	1979
000919	McKenzie REC Buried Cable Survey and Addendum Report, McKenzie Co., ND	A. Simon, L. Loendorf	1979
001015	Pennzoil Company Survey of Pennzoil-Depco 30-24 Access Road, McKenzie County, ND	J. Greer	1979
001059	An Intensive Cultural Resource Survey of the Shell USA 44-31-31 Flowline, McKenzie County, North Dakota	S. Lau, D. McKay	1980
001069	Brownlie, Wallace, Armstrong and Bander 2-43 Allen Federal Well Pad and Access Route Survey, McKenzie Co., ND	M. Tate	1980
001100	Brownlie, Wallace, et al, Proposed 5-42 Well Pad Location and Access Route Survey, McKenzie Co., ND	M. Metcalf, C. Zier	1980
001112	Brownlie, Wallace, Armstrong and Bander 2-23 Allen Federal Well Pad Survey, McKenzie Co., ND	C. Zier	1980
001113	Brownlie, Wallace, Armstrong and Bander 2-21 Allen Federal Well Pad and Access Route Survey, McKenzie Co., ND	C. Zier	1980
001116	Shell Oil Compnay #22-24 Well Pad and Access Route Survey and Addendum Report, McKenzie Co., ND	C. Zier, M. Tate	1980
001214	McKenzie Electric Coopertive, Inc., Buried Cable Survey, McKenzie Co., ND	A. Simon, L. Loendorf	1980
001224	Report on Limited Shovel Testing on the Proposed Brownlie, Wallace, Armstrong and Bander 9-41 Well Pad, McKenzie Co., ND	M. Tate	1980

Table A1. Bibliographic Listing of Previous Archaeological and Historical Studies for Project Lands in McKenzie County, North Dakota (Continued)

Manuscript Number	Title	Authors	Year
001272	Brownlie, Wallace, Armstrong & Bander 2-23 Allen Fed. Access Route Survey, McKenzie Co., ND	M. Tate	1980
001274	Brownlie, Wallace, Armstrong and Bander 5-23 Well Access Route Survey, McKenzie Co., ND	M. Tate	1980
001292	An Intensive Cultural Resource Survey of the Shell Salt Water Gathering System Pipeline, McKenzie County, North Dakota	J. Senulis	1980
001315	McKenzie Rural Electric Cooperative Survey of Burried Cable, McKenzie Co., ND	A. Simon, L. Loendorf	1980
001330	MDU Survey of Pipeline Right of Way in Mon-Dak Field, McKenzie Co., ND	A. Simon, L. Loendorf	1980
001360	McKenzie Electric Cooperative Survey of Buried Cable, McKenzie Co., ND	A. Simon, L. Loendorf	1980
001362	McKenzie Rural Electric Coopertive 115KV Transmission Line Survey, McKenzie Co., ND	A. Simon, L. Loendorf	1980
001409	BWAB Inc. Survey of 11-43-Federal-11-147-105 Well Location and Access Road, McKenzie Co., ND	B. Rippeteau	1980
001416	Shell Oil Company Survey of 13-4 USA Well Location and Access Routes, McKenzie Co., ND	B. Rippeteau	1980
001442	Brownlie, Wallace, et al, Proposed 2-41 Federal Well Location and Access Route Survey, McKenzie Co., ND	M. Metcalf, C. Zier	1979
001443	Brownlie, Wallace, Armstrong and Bander, Inc., 8-44 Well Pad Survey, McKenzie Co., ND	B. Rippeteau	1980
001485	Brownlie, Wallace, Armstrong, and Bander, Inc., 12-23 Federal Well Pad and Access Route Survey, McKenzie Co., ND	B. Rippeteau	1980
001503	An Intensive Cultural Resource Survey of the Shell Oil Cinnmon Pipeline R/W, McKenzie County, North Dakota	J. Senulis	1980
001581	Shell Oil Compnay B.W.A.B. 42-8 Well Location and Access Route Survey, McKenzie Co., ND	B. Rippeteau	1980
001646	Mondak Disposal Company Survey of Disposal Pipelines, McKenzie Co., ND	B. Rippeteau	1981
001694	Results of a Class III Cultural Resource Inventory Route and Alternates of the Proposed State Highway 16 Improvement, Golden Valley and McKenzie Counties, North Dakota	J. Logan, K. Good	1980
001714	Wesco Pipeline Company Flowline - Spring Creek Survey, McKenzie Co., ND	B. Rippeteau	1981
001729	Cultural Resource Mangement Report Shell 42-8, McKenzie Co., ND	B. Rippeteau	1981
001743	McKenzie Electric Cooperative, Inc., REC URD Lines Survey, McKenzie Co., ND	A. Simon, L. Loendorf	1981
001770	McKenzie Electric Coopertive, Inc., REC Line Survey, McKenzie Co., ND	A. Simon, L. Loendorf	1981
001776	Mondak Disposal Monitor of Section 5 Disposal Line, McKenzie Co., ND	B. Rippeteau	1981
001875	Addendum Shell 22-24 Battery, Testing Report, McKenzie Co., ND	B. Rippeteau	1980
001889	U.S.F.S. Air Monitoring Station Survey, McKenzie Co., ND	D. Maul	1980
001914	U.S.F.S. Survey of Dwyer Pipeline, McKenzie Co., ND	W. Allen	1981
001916	U.S.F.S. Dwyer Pipeline Survey, McKenzie Co., ND	W. Allen	1981

Table A1. Bibliographic Listing of Previous Archaeological and Historical Studies for Project Lands in McKenzie County, North Dakota (Continued)

Manuscript Number	Title	Authors	Year
002005	Cultural Resources Inventory, McKenzie County, North Dakota, Brownlie, Wallace, Armstrong, and Bander Federal 8-32	G. Moore	1981
002135	McKenzie REC Bennie Peer and Cheney Creek Electric Lines Survey, McKenzie Co., ND	D. Kuehn, A. Simon	1981
002211	REC Buried Cable - Proposed Route and Reroute Survey, McKenzie Co., ND	A. Simon, L. Loendorf	1979
002238	The Cultural Resource Survey of the Proposed Matador Bull Moose Pipeline in Portions of McKenzie County, North Dakota	A. Simon, L. Loendorf	1979
002319	Shell Oil Company #12-24 Tank Battery Survey, McKenzie Co., ND	C. Zier	1980
002322	Shell Oil Company 24-31-81 USA Addendum Survey Report, McKenzie Co., ND	Powers Elevation	1979
002350	Shell Oil Company 22-24 USA Access Route Survey Report, McKenzie Co., ND	B. Rippeteau	1981
002422	Brownlie, Wallace, Armstrong and Bander 12-23 Addendum Report on Limited Shovel Testing on the Proposed Well Pad, McKenzie Co., ND	B. Rippeteau	1980
002462	Cultural Resource Survey on the Little Missouri Buttes and Adjacent Areas, Western North Dakota and Appendix I, McKenzie, Stark, Billings & Slope Counties	L. Loendorf, et al.	1982
002470	Archaeological Test Excavation at the Ulsaker-Indergard Site (32MZ328), McKenzie County, North Dakota	C. Johnson, A. Simon	1981
002532	Cultural Resource Survey of the Proposed Later "B" Pipeline for the ND System in McKenzie Co., ND	Ecol. & Environment, Inc.	1982
002566	Northern Border Pipeline, North Dakota: Historic Sites Testing and Evaluation, Morton, Dunn, McKenzie & Williams Counties	W. Robeson, C. Parish	1981
002588	Northern Border Pipeline Historic Sites Testing Data, Morton, Dunn, McKenzie & Williams Counties, ND	W. Roberson	1981
003109	Brownlie, Wallace, Armstrong and Bander 2-43 Allen Fed., Access Road Survey, McKenzie Co., ND	M. Tate	1980
003202	Cultural Resource Inventory of Conservation Practice #08-01-79, McKenzie Co., ND	A. Murray	1979
003208	Cultural Resource Inventory; Brownlie, Wallace, Armstrong, and Bander 2-12 Federal, McKenzie Co., ND	A. Murray	1979
003331	Addendum Shell 24-31-81 USA, Re-Survey of 40 Acre Parcel Associated With Well Pad Locale, McKenzie Co., ND	M. Metcalf, C. Zier	1979
003335	Ecological Engineering Systems, Inc. Alexander Pipeline, McKenzie County, ND	G. Newberry	1984
003455	Archaeology of the Northern Border Pipeline, North Dakota: Vol. 2, Pts. 1-3 Survey and Background Information, McIntosh, Emmons, Morton, Stark, Mercer, Dunn, McKenzie, & Williams Co., ND	M. Root, M. Gregg	1983
003575	A Report on Archaeological Testing at Site 32MZ153 for the Proposed Matador Pipeline, McKenzie County, North Dakota	D. Kuehn	1985
003660	Cultural Resource Survey, Matador Pipeline Route-Phillips-Koch Gas Pipeline, Section 23, T148N, R103W, McKenzie County, North Dakota (UW#848)	L. Blikre	1985
003866	A Cultural Resource Inventory of the Proposed Matador Pipeline Route Phillips-Koch Gas Pipeline in Sections 23, 26, 27, 33 and 34, T148N, R130W, McKenzie County, North Dakota (UW#859)	R. Christensen, D. Kuehn	1985

Table A1. Bibliographic Listing of Previous Archaeological and Historical Studies for Project Lands in McKenzie County, North Dakota (Continued)

Manuscript Number	Title	Authors	Year
004316	The Red Wing Creek Extension Cultural Resources Inventory, McKenzie Co., ND (U-W#1010)	J. Borchert	1987
004495	Dwyer Pipeline, McKenzie Co., ND	M. Hill	1987
004506	MDU-Basin Charlie Creek To Williston 230 KV Electric Transmission Line, Williams & McKenzie Co., ND (UW#1016)	J. Borchert	1988
004724	A Cultural Resources Inventory of the Proposed Northern Border Connection Pipeline McKenzie County, North Dakota Vol. I & II	M. Floodman	1988
004750	A Cultural Resources Inventory of the Proposed Northern Border Connection Pipeline, Survey of Re-Routes McKenzie County, North Dakota	M. Floodman	1989
005030	Pasture 11-A1 Range Water Project McKenzie District, Little Missouri National Grasslands Sections 15, 19, 20, 21, 22, 28, 29 T148N R102W and Section 24 T148N R103W McKenzie County, North Dakota	M. Floodman	1990
005243	Dwyer Allotment Improvements McKenzie District, Little Missouri National Grasslands Section 4 & 5 T147N R104W and Section 33 T148N R104W McKenzie County, North Dakota	M. Floodman	1990
005244	Dwyer Pasture 3, Allotment 3 Pipeline and Tank McKenzie District, Little Missouri National Grasslands Section 31 T148N R103W & Section 06 T147N R103W McKenzie County, North Dakota	M. Floodman	1990
005412	US 85 - Watford City West, McKenzie Co., Class III Cultural Resources Inventory Report	K. Good	1991
005423	Koch Hydrocarbon Company, Northern Border Connection Pipeline (Additional Cultural Resources Inventory) McKenzie County, North Dakota	B. Olson	1991
005424	Koch Hydrocarbon Company, Northern Border Connection Pipeline Route through 32MZ938 & Adjacent to 32MZ937, Cultural Resources Inventory - McKenzie County, North Dakota	B. Olson	1991
005466	An Evaluation of 110 Archaeological and Historical Sites, McKenzie, Billings, Golden Vally, Bowman, and Slope Counties in the Little Missouri Grasslands of North Dakota	L. Loendorf	1978
005528	Greenwood Pastrue 2-3 Tank Location McKenzie District, Little Missouri National Grasslands, Section 23 T148N R103W, McKenzie County, North Dakota	M. Floodman	1991
005556	Cultural Resource Inventory of the Propsed McKenzie Gass Plant to Fort Buford Compressor Station Northern Border Connection Pipeline McKenzie County, North Dakota	B. Olson	1991
005755	Dwyer Allotment Range Water Projects McKenzie Distoric, Little Missouri National Grasslands Sec. 10 T147N R104W McKenzie County, North Dakota	M. Floodman	1992
005759	McKenzie County Road Project: Madison Reroute McKenzie District, Little Missouri National Grasslands Sec. 10 & 15 T158N R102W McKenzie County, North Dakota	M. Floodman	1992
005862	RTC Koch One-O-ONE Line McKenzie County, North Dakota	M. Tate	1992
005891	McKenzie County Madison Road Realignment McKenzie District, Little Missouri National Grasslands Sec. 10 & 15 T148N R104W McKenzie County, North Dakota	M. Floodman	1992
005920	Historic Bridges in North Dakota	L. Johnson, et al.	1992
006233	Pennington Dam Little Missouri National Grasslands, McKenzie District Section 2 T147N R105W McKenzie County, North Dakota	M. Floodman	1994

A Class I and Class III Cultural Resources Inventory of the Garden Creek Pipeline, McKenzie County, North Dakota; Private Lands

Table A1. Bibliographic Listing of Previous Archaeological and Historical Studies for Project Lands in McKenzie County, North Dakota (Continued)

Manuscript Number	Title	Authors	Year
006982	Reliable Exploration, Inc. Seismic Line Survey, McKenzie County, North Dakota: Results of a Class III Cultural Resources Inventory UW #1923	G. Wermers	1997
007071	Solid State Geophysical Box Car Butte 3-D Seismic Project McKenzie County, North Dakota: A Cultural Resources Inventory	G. Newberry	1997
007095	Reliable Exploration, Inc. Seismic Line Survey in Section 11 T148N, R103W, McKenzie County, ND UW #2020	G. Wermers	1997
007832	Whrung Gravel Pit: A Class III Cultural Resource Inventory, McKenzie County, ND	J. Morrison	2001
008177	A Class III Cultural Resource Inventory for the Headington Oil Company, L.P. Bennie Peer 3-D Seismic Project, McKenzie Co., ND	E. Schneider	2002
008303	Little Missouri National Grasslands Dam Rehabilitation Projects, Billings and McKenzie County, ND	M. Floodman	2002
008633	Headington Oil Co. Federal 23X-3 Well Pad and Access Road/Utility Corridor, McKenzie Co., ND UW #2407	G. Wermers	2003
008884	Williston to Charlie Creek: A Cultural Resource Inventory Along the Western Area Power Administration 115KV Transmission Line from the Williston Substation to the Charlie Creek Substation, Williams and McKenzie Counties, ND	B. Fandrich	2004
009076	McKenzie County Water Resource District Phase II: Results of Class II and III Cultural Resource Inventory of a Regional Water System in Portions of McKenzie Co., ND, Within the Little Missouri River, Yellowstone River & Garrison	J. Morrison	2002
009118	BR Federal Amy 14-8H: A Class III Pedestrian Survey in McKenzie Co., ND	W. Bluemle	2005
009287	McKenzie Federal 14-x31 Well Pad and Access Road: A Class III Cultural Resource Inventory, McKenzie Co., ND	D. Klinner	2005
009382	Cummings Draw 44-6H Well Pad and Access Road: A Class III Cultural Resource Inventory McKenzie Co., ND	P. Heiner, J. Morrison	2005
009384	Bay Creek 11-5H Well Pad and Access Road: A Class III Cultural Resource Inventory, McKenzie Co., ND	D. Klinner	2005
009385	Bay Creek #11-4H Well Pads and Access Roads: A Class III Cultural Resource Inventory, McKenzie, Co., ND	P. Heiner	2005
009404	Kodiak Federal 4-11H Well Pad and Access Road: A Class III Cultural Resource Inventory, McKenzie Co., ND	P. Heiner	2005
009512	Lyco Energy's 32-14-H Well Pad and Access Road: A Class III Cultural Resource Inventory in McKenzie Co., ND	D. Hiemstra	2005
009594	Tracy Federal 44x-4 Well Pad and Access Road: A Class III Cultural Resource Inventory, McKenzie Co., ND	D. Klinner	2006
009613	Reservation Telephone Cooperative Cable Improvements: A Class II Cultural Resource Inventory, McKenzie Co., ND	D. Klinner	2006
009658	44-2H McPeak Well Pad: A Class III Cultural Resource Inventory, McKenzie Co., ND	D. Klinner	2006
009728	Grizzly Federal 1-27H Well Pad and Access Roads: A Class III Cultural Resource Inventory, McKenzie Co., ND	D. Klinner, P. Heiner	2006
010128	Historic Bridges in North Dakota 2004 Revision	M. Hufstetler, J. Goff	2005
010159	Dwyer Federal 14X-1 Well Pad Survey, McKenzie CO., ND: A Class III Cultural Resource Inventory	C. Burns	2007

Table A1. Bibliographic Listing of Previous Archaeological and Historical Studies for Project Lands in McKenzie County, North Dakota (Continued)

Manuscript Number	Title	Authors	Year
010246	Titan Federal Well Pads and Access Road Survey: A Class III Cultural Resource Inventory, McKenzie Co., ND	W. Burns	2007
010247	Bell Fourche Pipeline Project: A Class III Cultural Resource Inventory, McKenzie CO., ND	W. Burns	2007
010561	Watfor Pit Expansion: A Class III Cultural Resource Inventory in McKenzie Co., ND	D. Reinhart	2008
011276	Highway 85 From ND Highway 200 to ND Highway 2: A Class III Cultural Resource Inventory, McKenzie and Williams Counties, ND	A. Leuchtmann	2009
011390	The Torstenson Material Source Area: A Class III Cultural Resource Inventory, McKenzie Co., ND	G. Jakel, W. Burns	2010
011711	Dwyer Federal #44x-1 Well Pad: A Class III Cultural Resource Inventory in McKenzie Co., ND	W. Burns	2010
011733	Lewis and Clark Replacement Pipeline: A Class III Cultural Resource Inventory McKenzie County, ND	B. O'Donnchadha	2010
011739	A Class I and Class III Cultural Resource Inventory of the Garden Creek Gas Plant, McKenzie Co., ND	N. Smith	2010

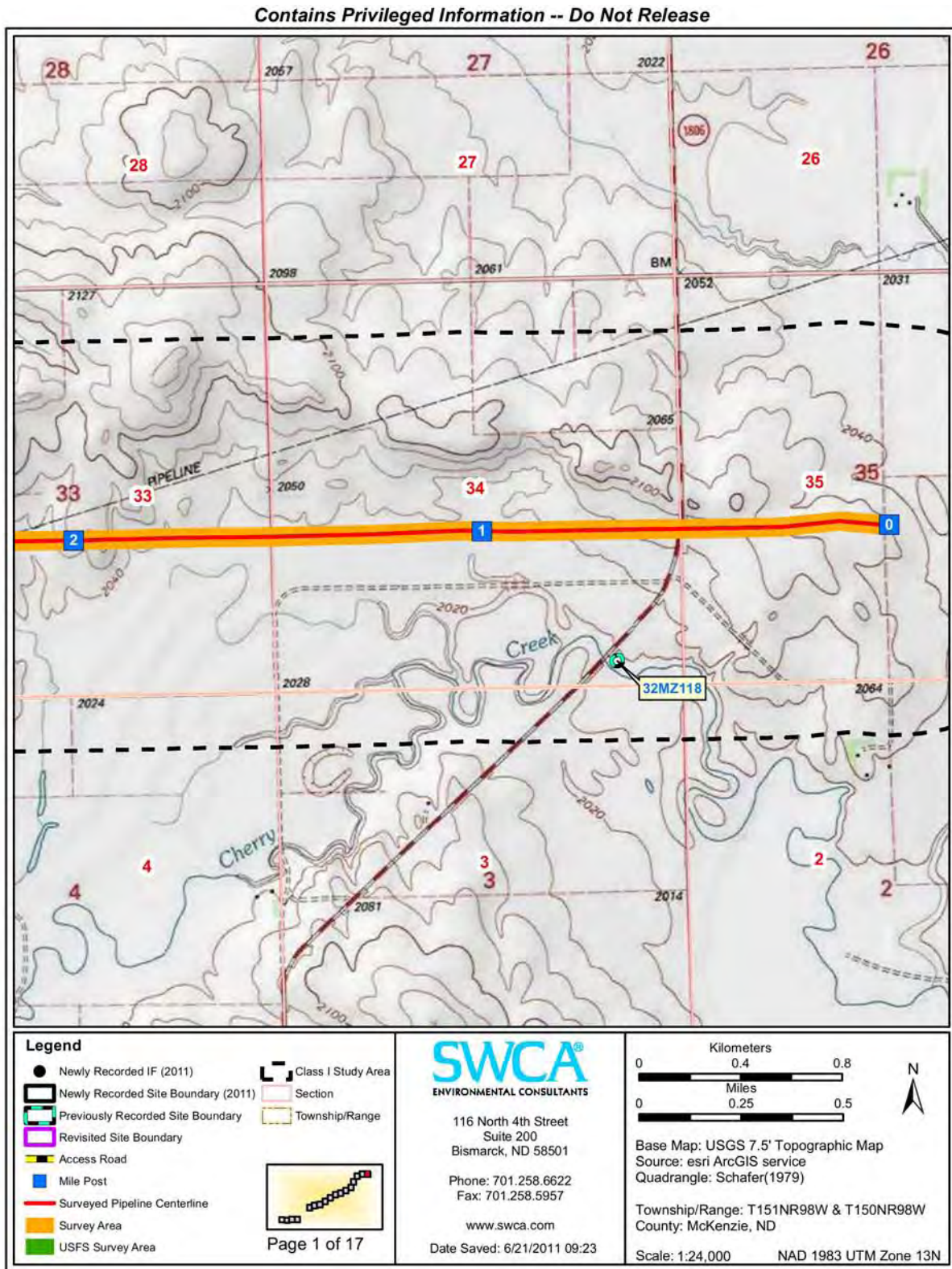
**APPENDIX B
(DETACHED)**

North Dakota Site Forms

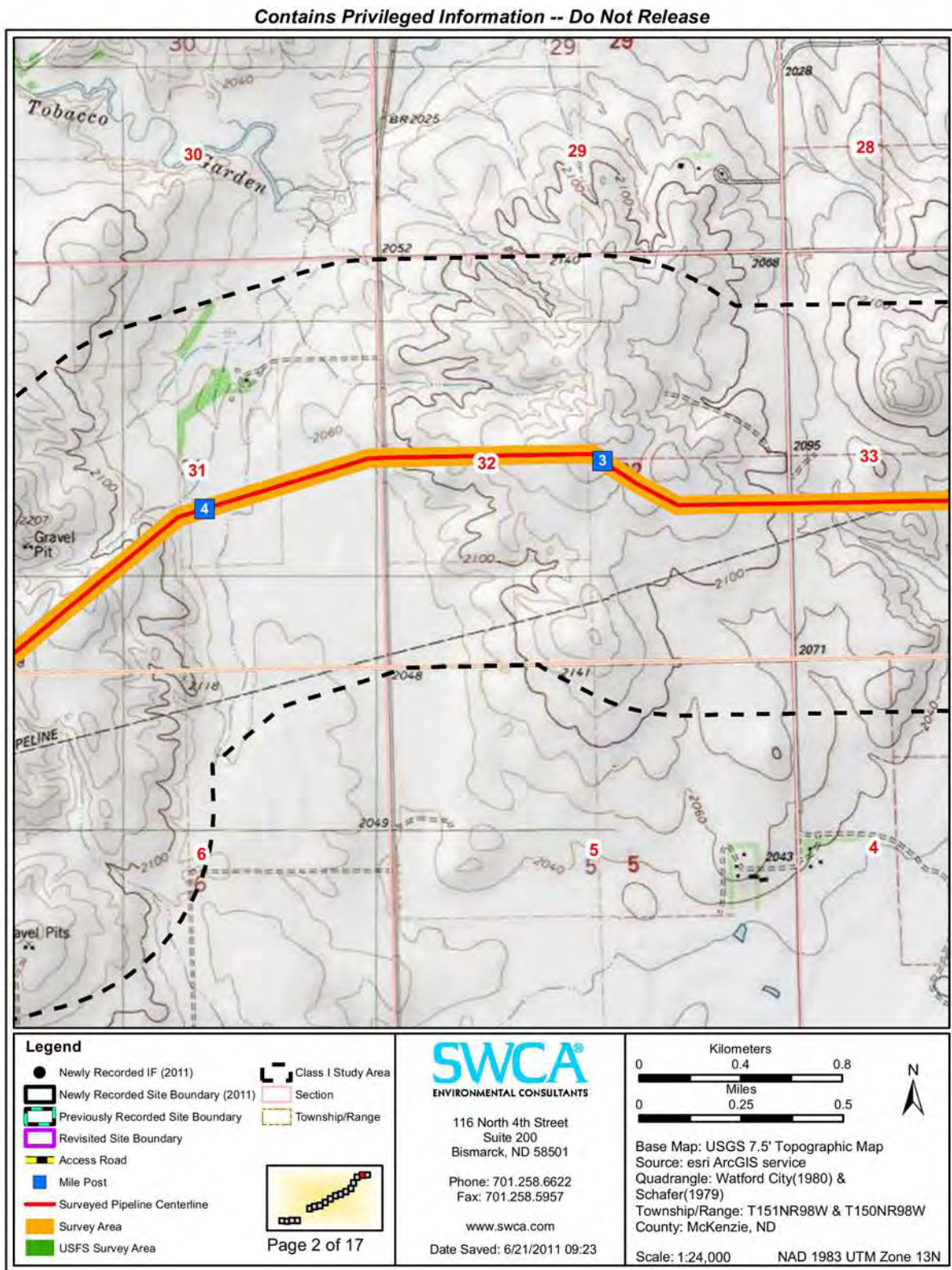
APPENDIX C

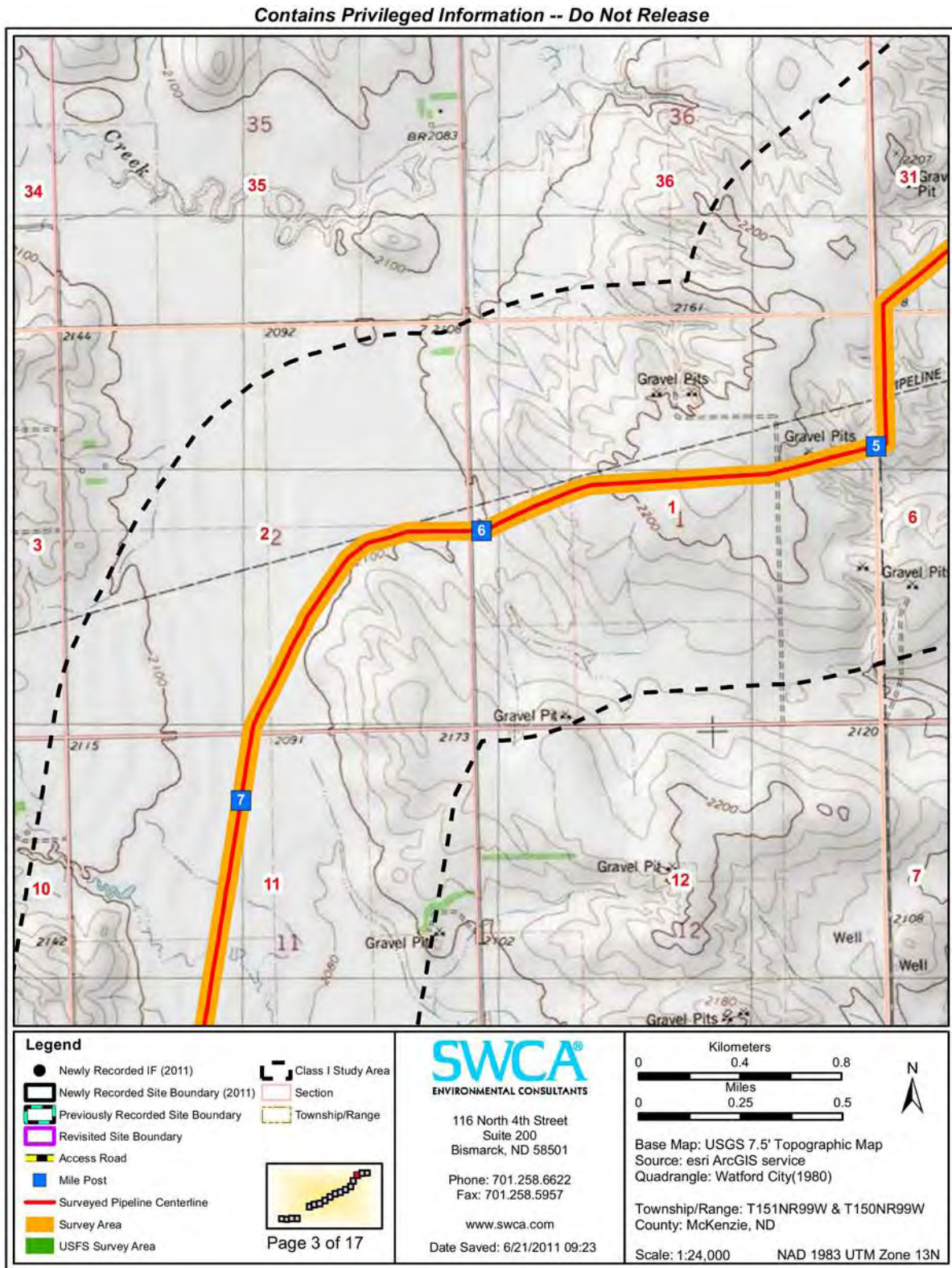
Resource Location Maps

A Class I and Class III Cultural Resources Inventory of the Garden Creek Pipeline, McKenzie County, North Dakota; Private Lands

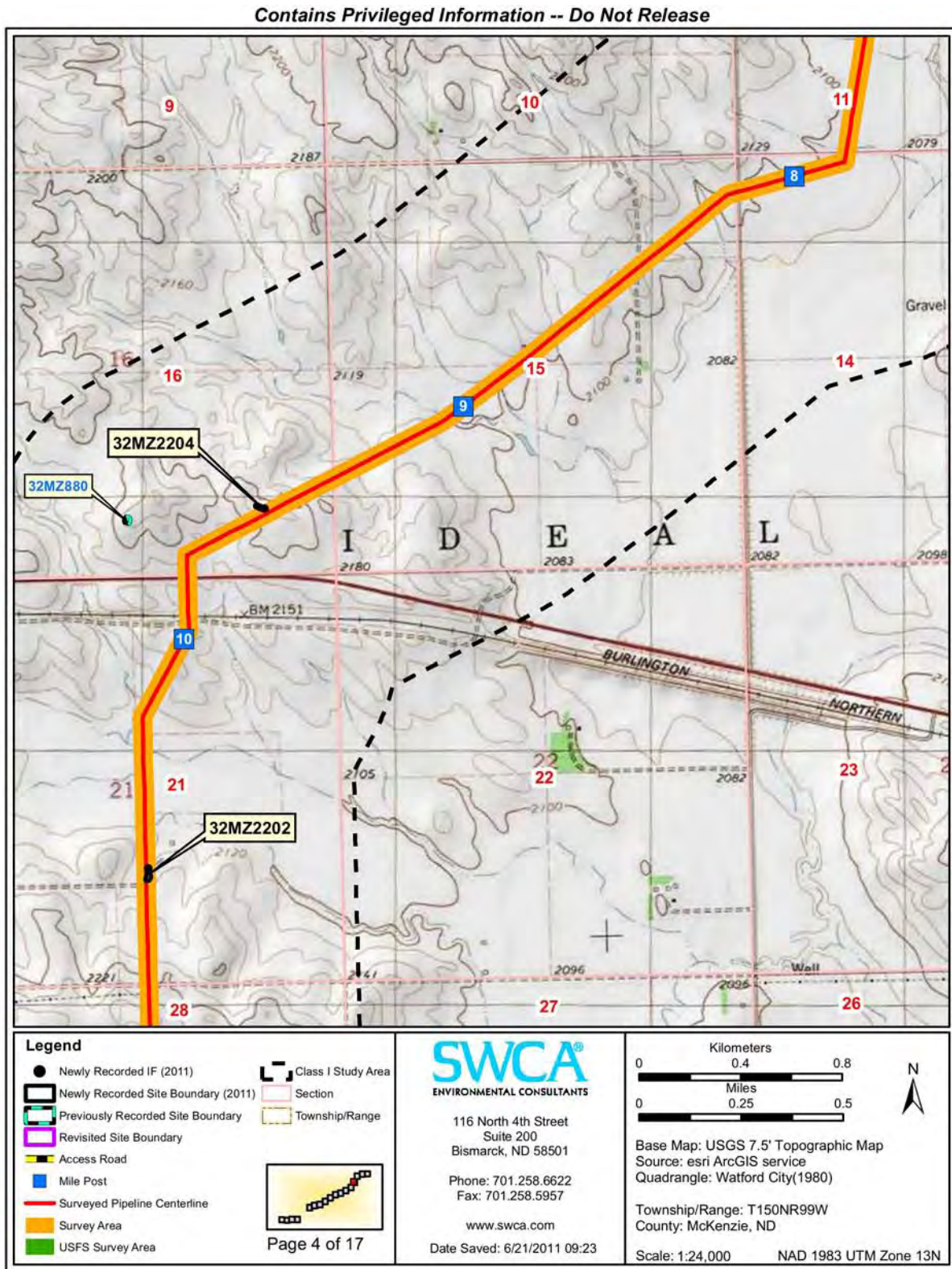


A Class I and Class III Cultural Resources Inventory of the Garden Creek Pipeline, McKenzie County, North Dakota; Private Lands

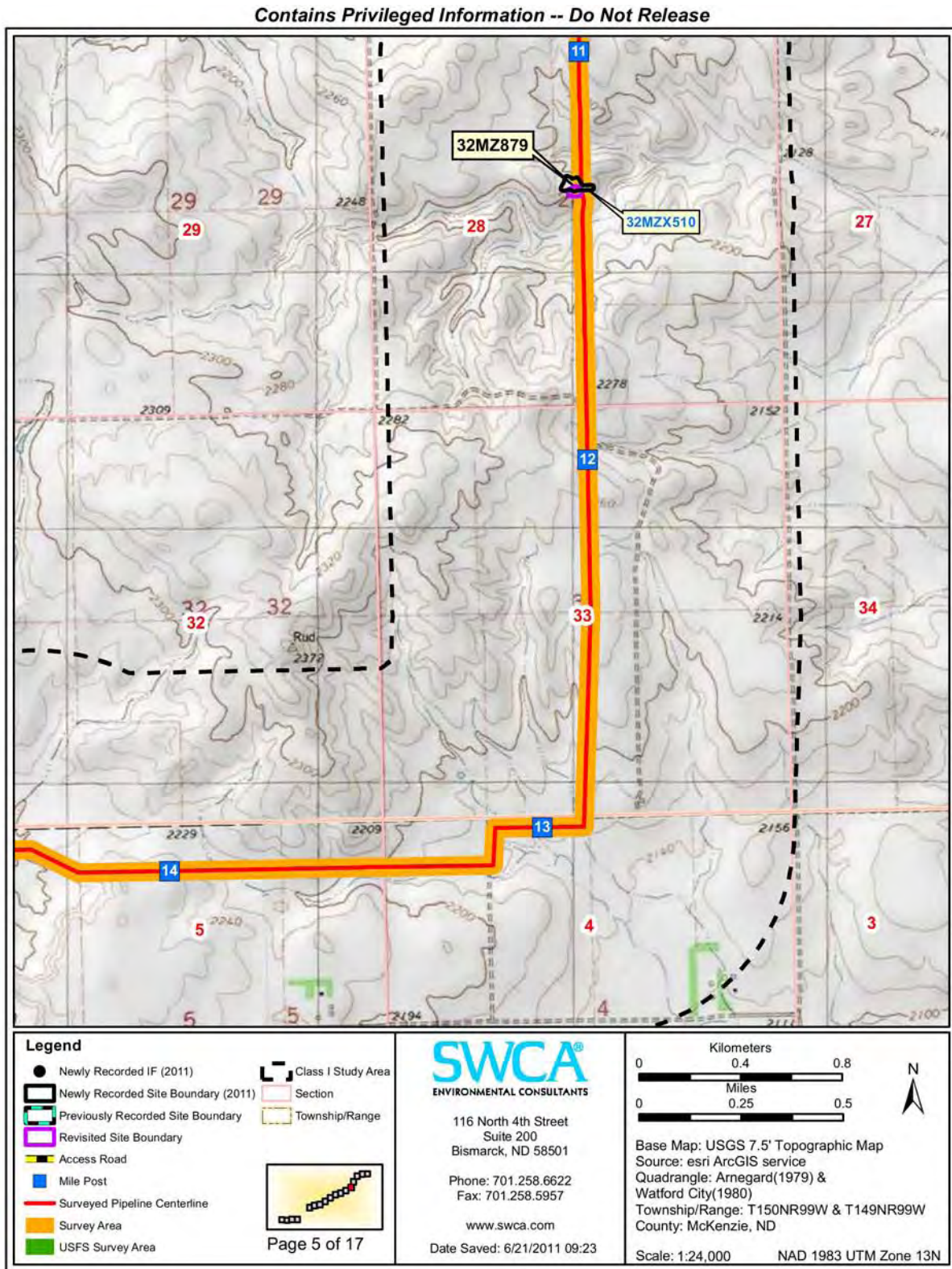




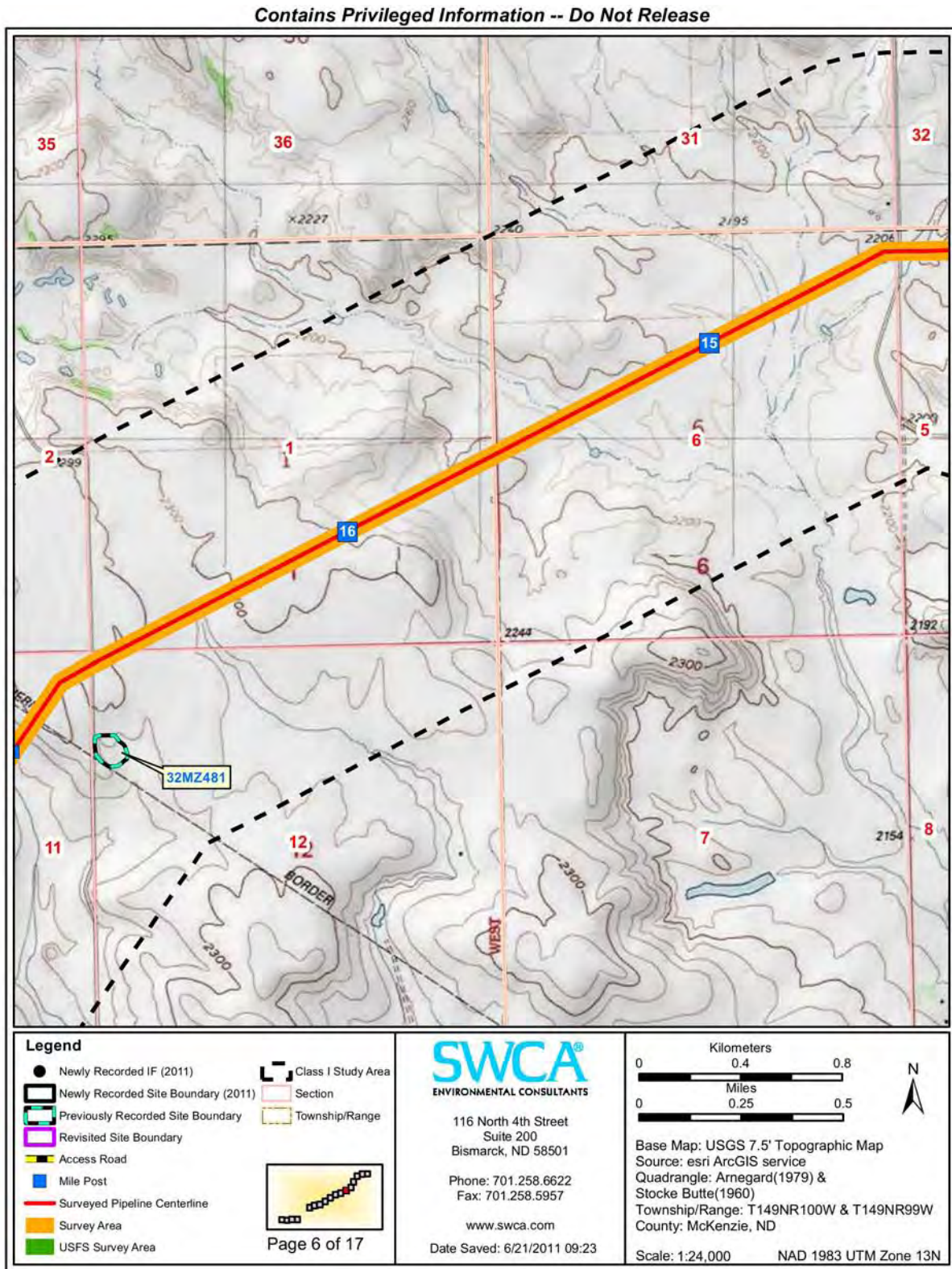
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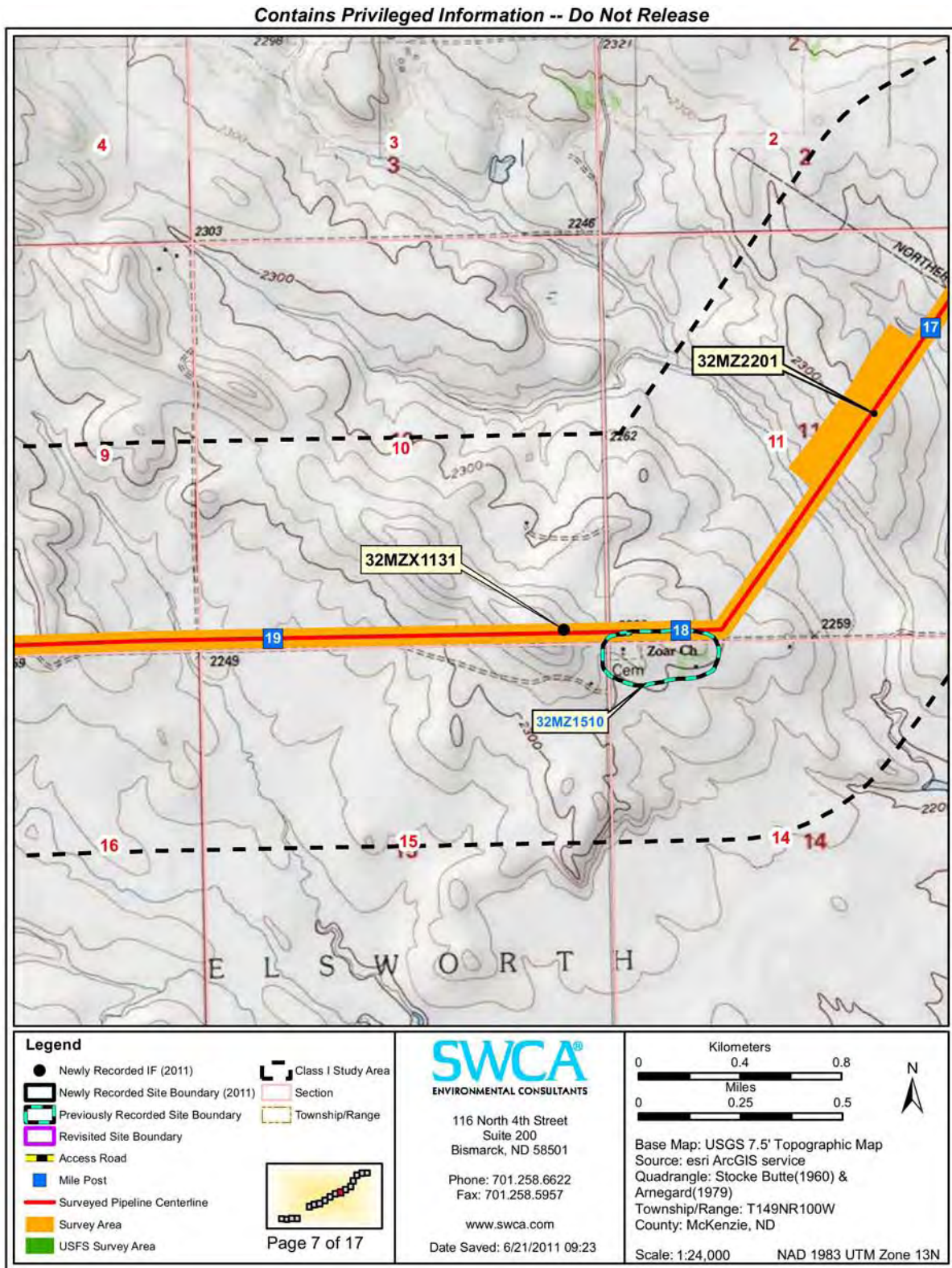
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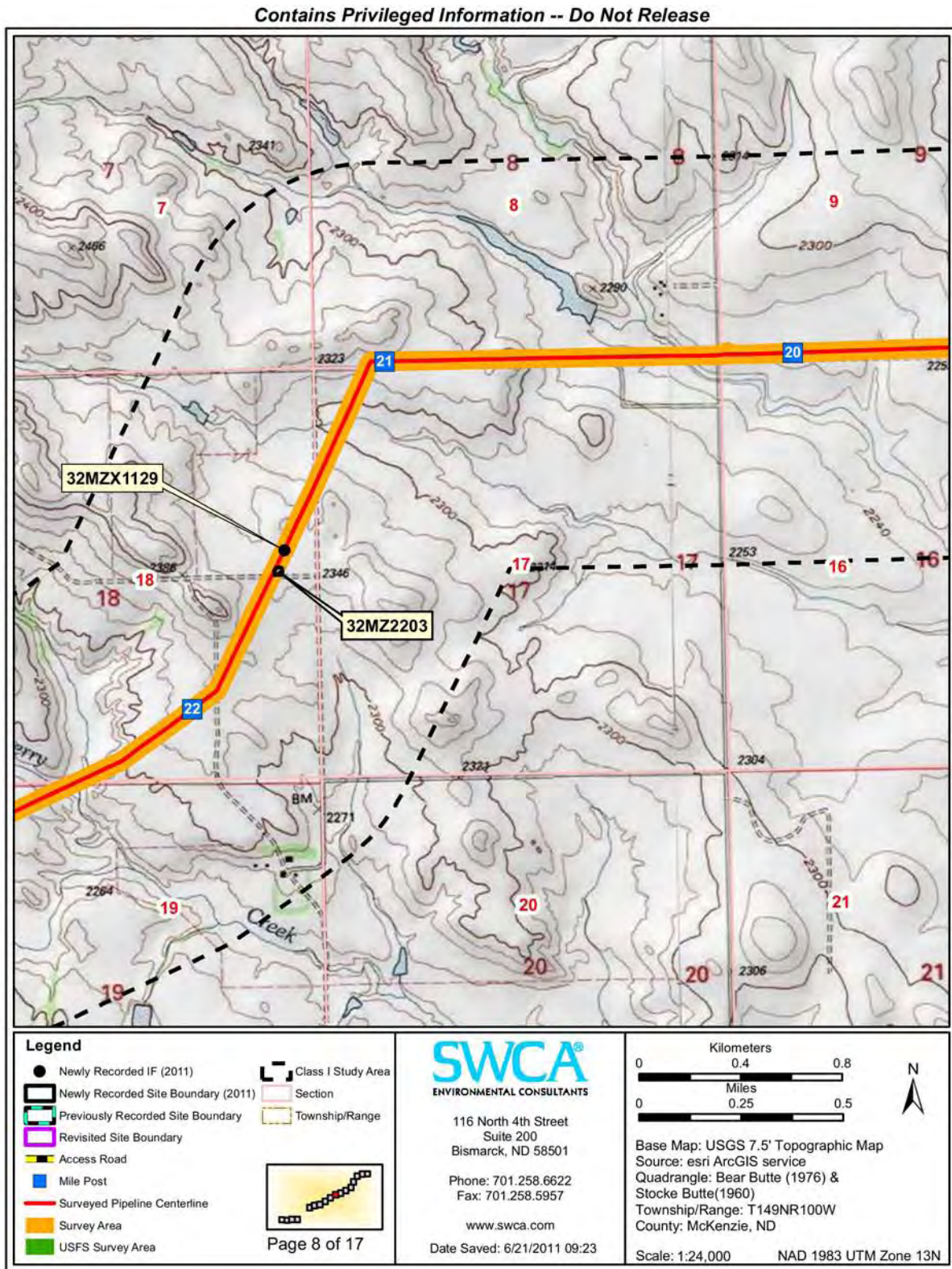
A Class I and Class III Cultural Resources Inventory of the Garden Creek Pipeline, McKenzie County, North Dakota; Private Lands



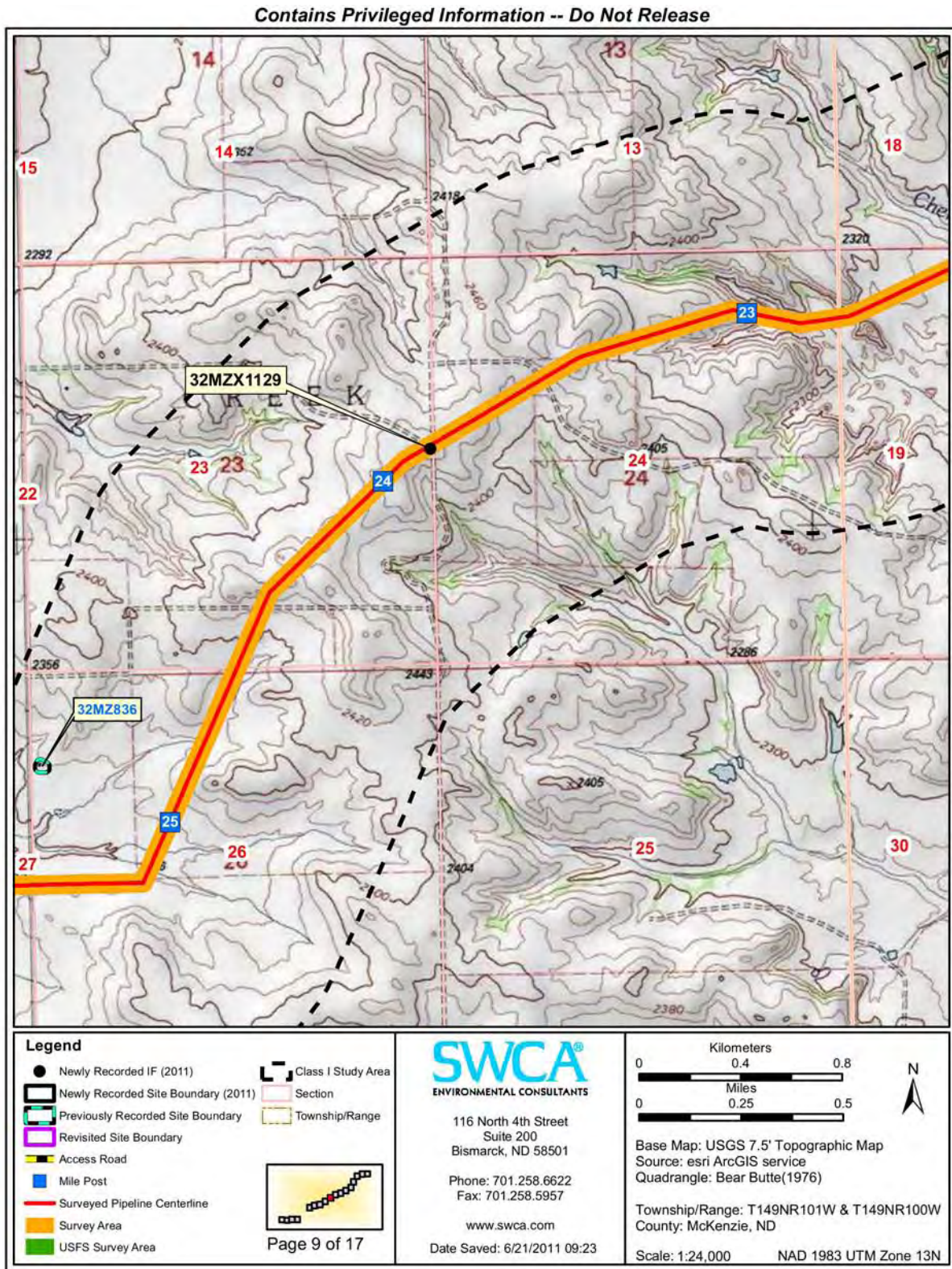
A Class I and Class III Cultural Resources Inventory of the Garden Creek Pipeline, McKenzie County, North Dakota; Private Lands



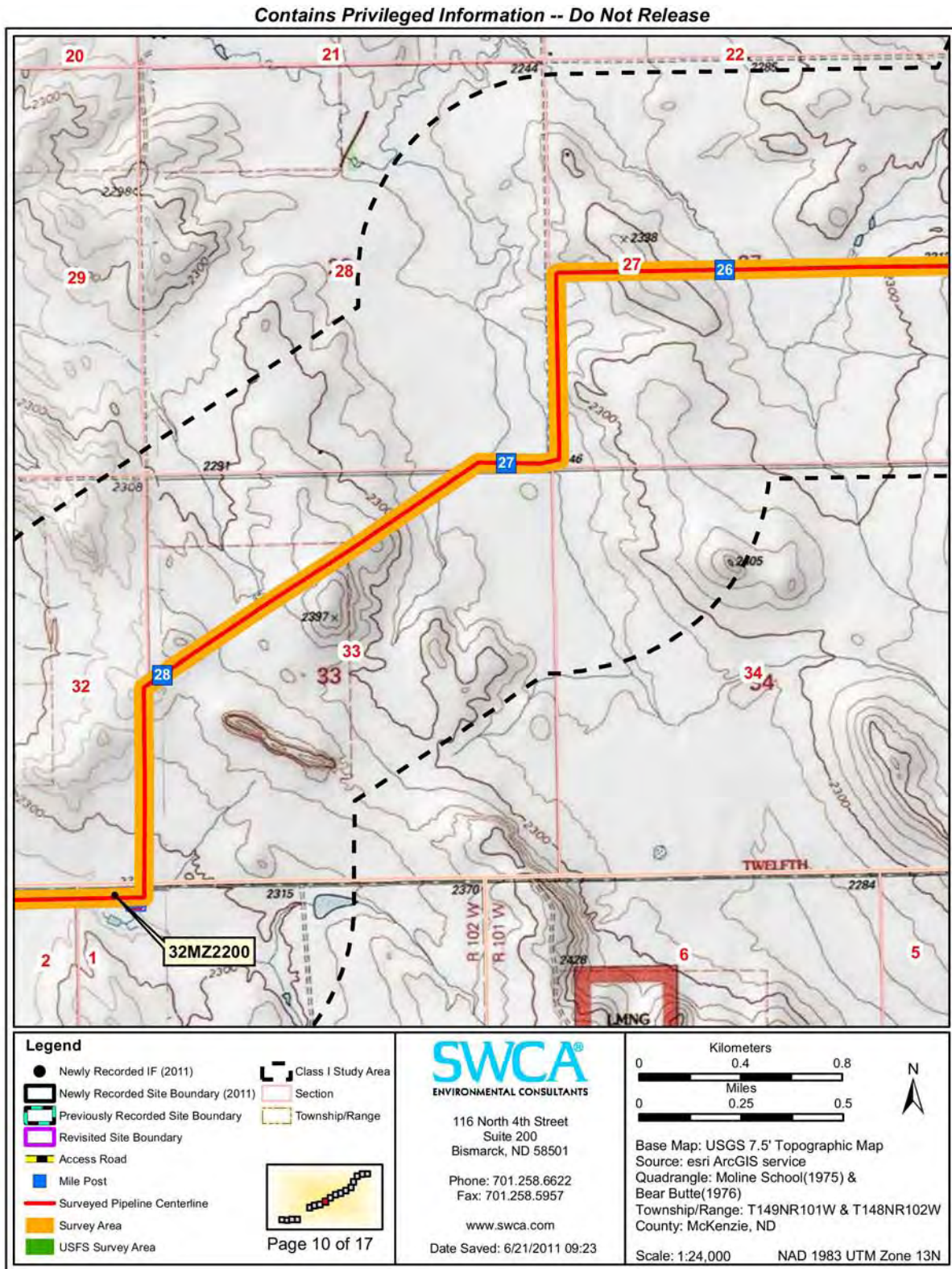
A Class I and Class III Cultural Resources Inventory of the Garden Creek Pipeline, McKenzie County, North Dakota; Private Lands



A Class I and Class III Cultural Resources Inventory of the Garden Creek Pipeline, McKenzie County, North Dakota; Private Lands

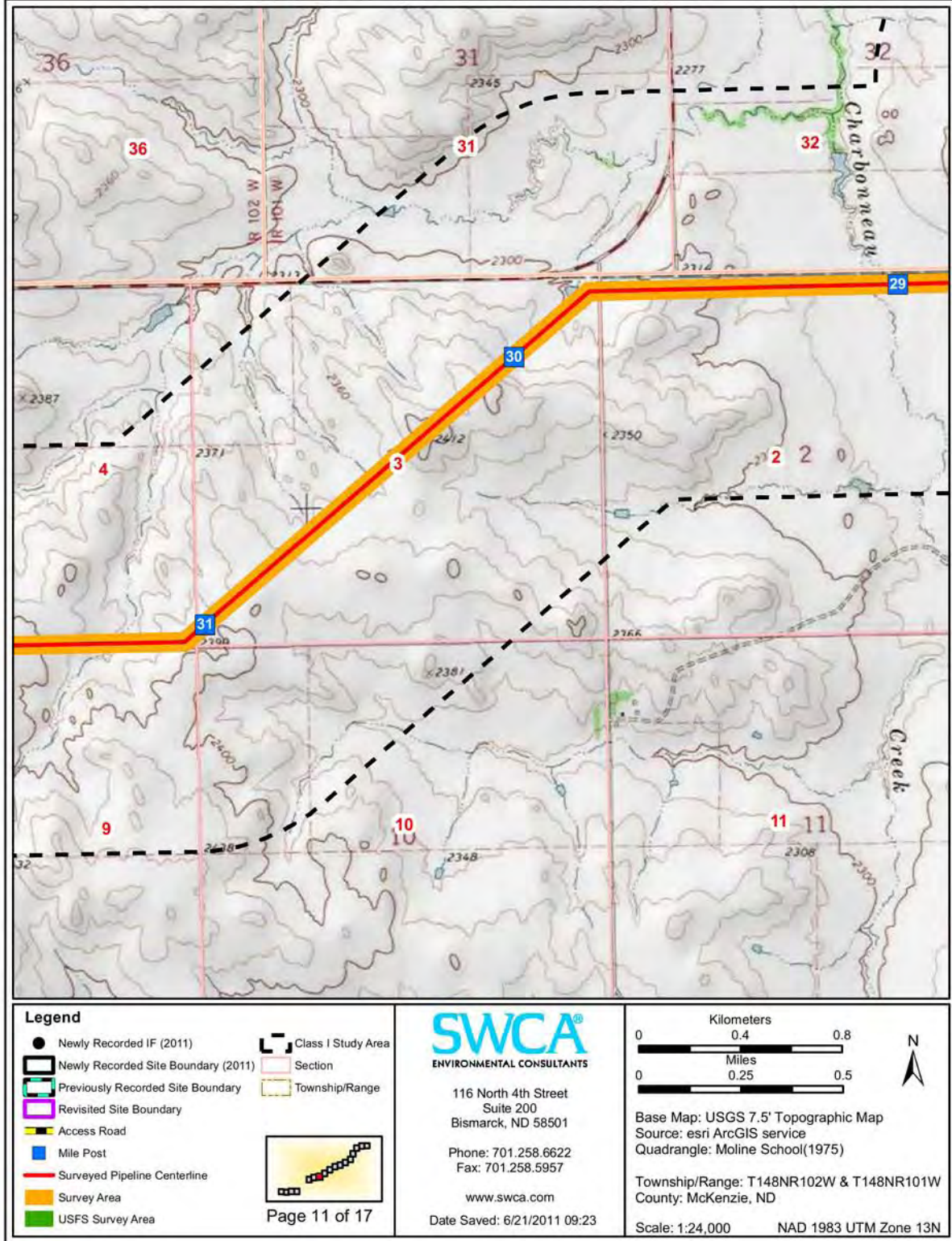


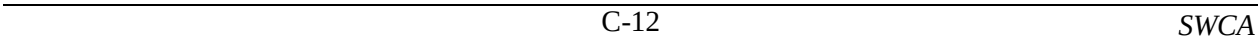
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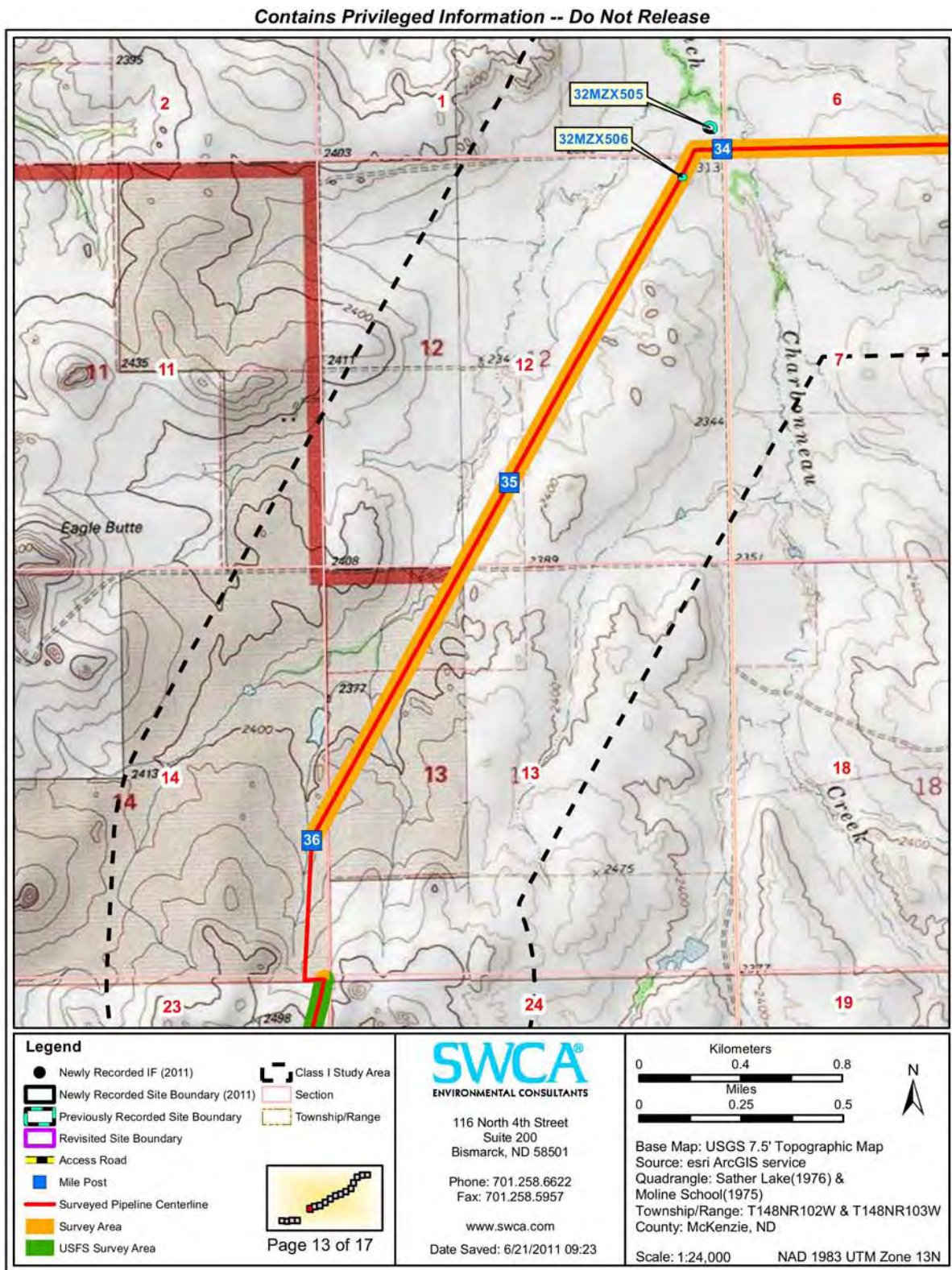


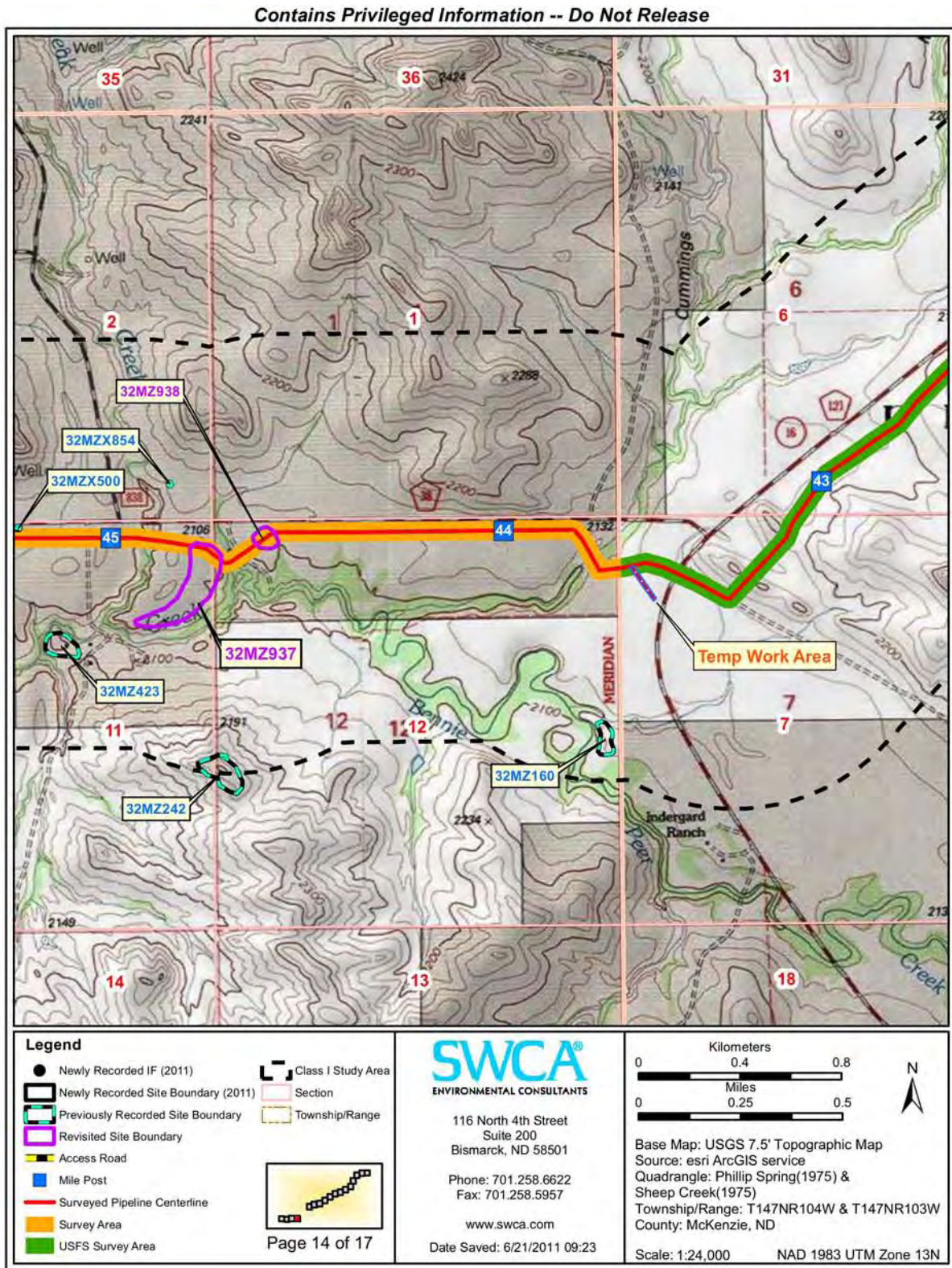
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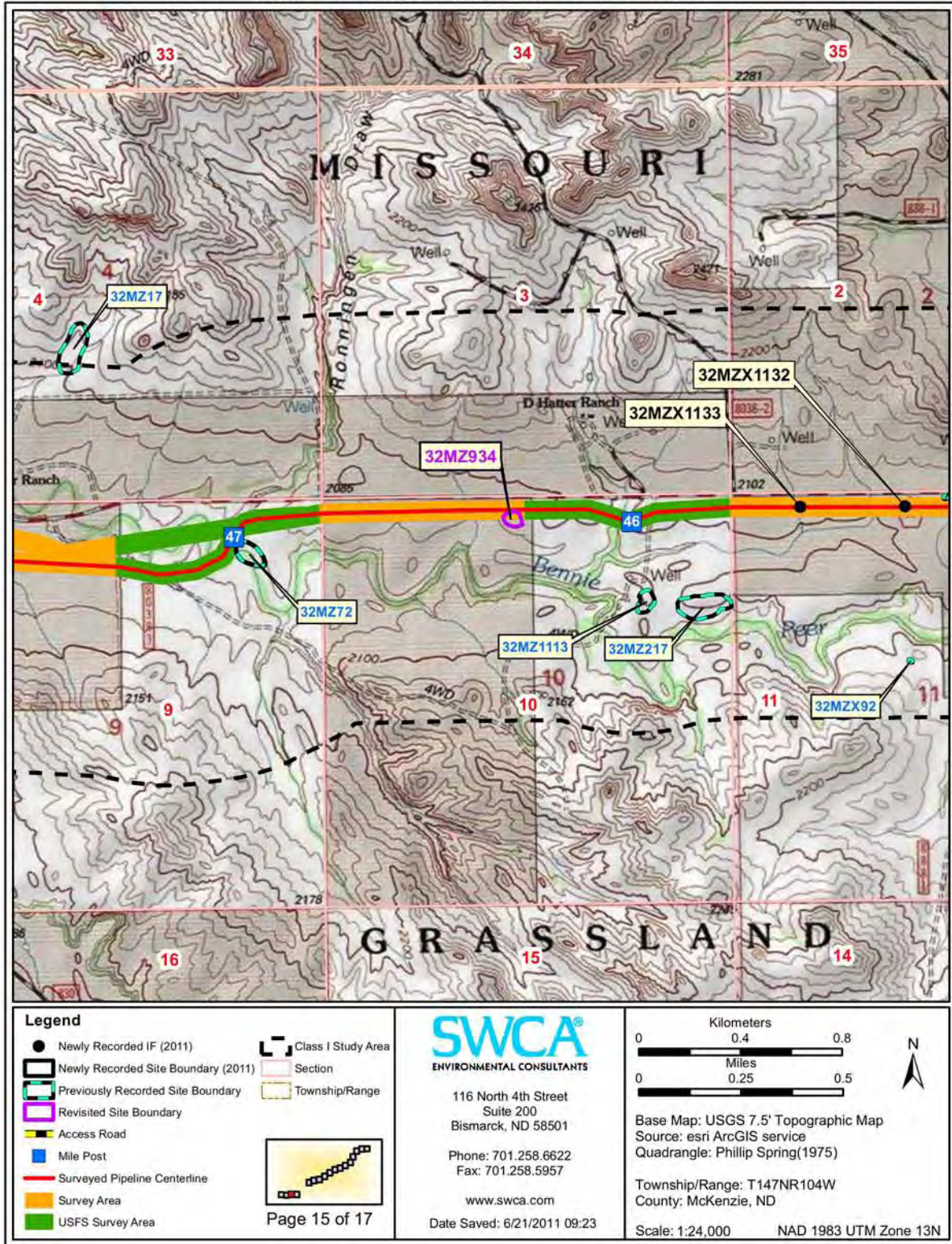






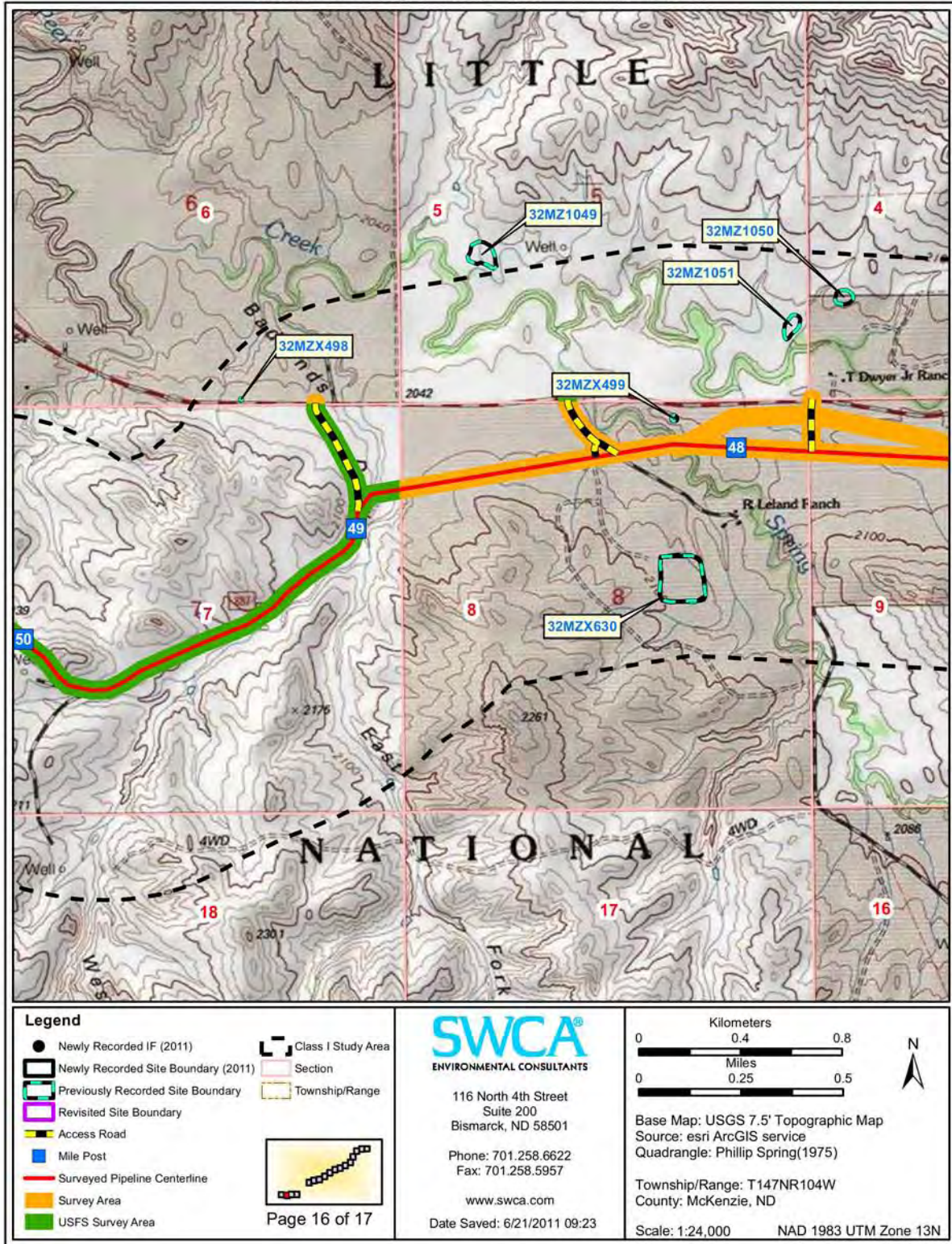


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