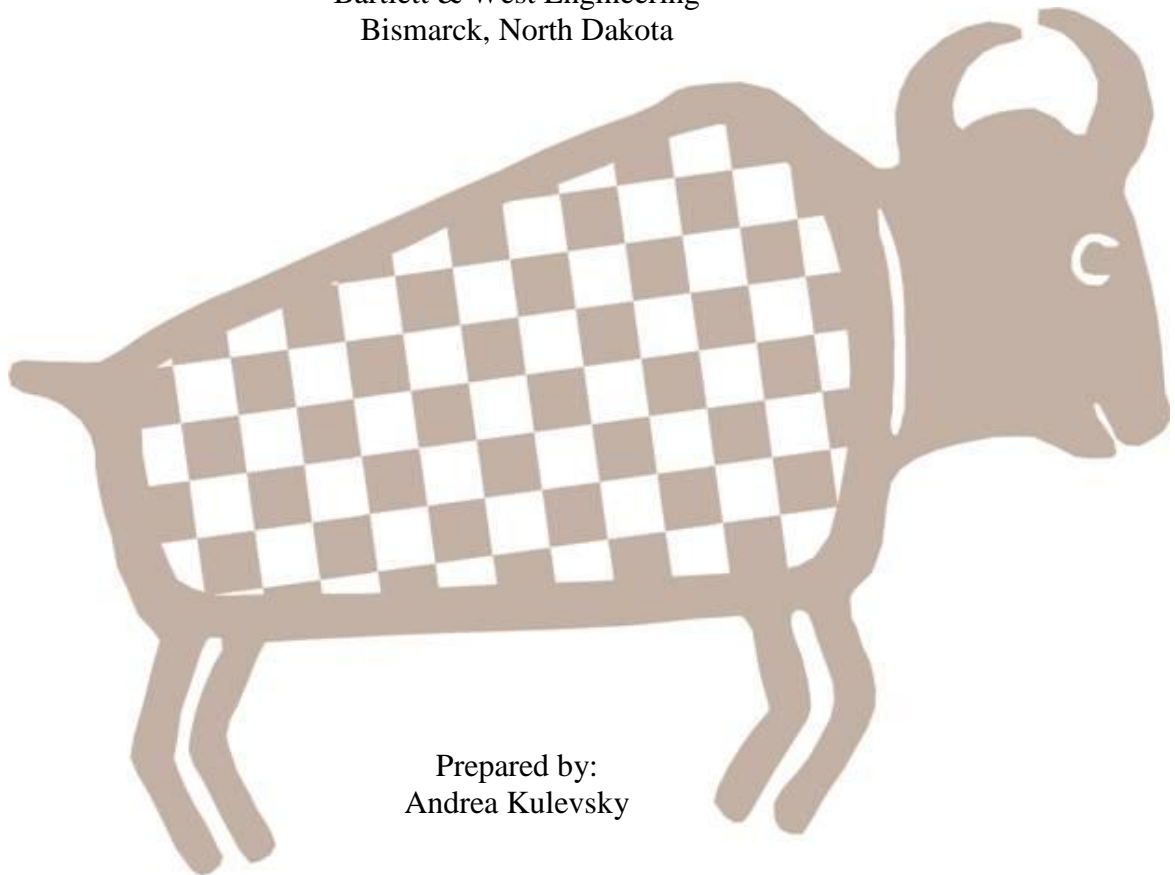


**ADDENDUM 1 TO:
BAKKENLINK PIPELINE: A CLASS II AND CLASS
III CULTURAL RESOURCE INVENTORY IN
BILLINGS, STARK, DUNN, MCKENZIE, AND
WILLIAMS COUNTY, NORTH DAKOTA**

SHPO Ref#: 11-0238

Prepared for:
Bartlett & West Engineering
Bismarck, North Dakota



Prepared by:
Andrea Kulevsky

Principal Investigator
Kimball M. Banks
Metcalf Archaeological Consultants, Inc.
Bismarck, North Dakota

June 2012

ABSTRACT

BakkenLink Pipeline, LLC, plans to build a crude oil pipeline in western North Dakota. The pipeline will be approximately 160 miles long and cross through Williams, McKenzie, Dunn, Stark, and Billings counties, North Dakota. The Bureau of Land Management is the lead federal agency for this undertaking and the North Dakota Public Service Commission is the lead state agency. Bartlett and West Engineering, the main engineering contractor for the undertaking, contracted with Metcalf Archaeological Consultants, Inc. to conduct a Class II and Class III cultural resources inventory of the proposed undertaking. The bulk of the inventory was completed between July 2011 and February 2012. Since that time, numerous reroutes have been planned and receipt points, pipe yards, and access roads have been added to the undertaking. This report details the results of the cultural resources inventory conducted between March 19 and May 22, 2012. A total of 2222 acres were inventoried and 22 sites and 35 isolated finds were recorded. Sixteen sites are prehistoric. The eligibility of these 16 sites to the National Register of Historic Places (NRHP) has not been determined so avoidance measures have been developed. Six sites are historic, and with one exception, are recommended as not eligible for inclusion on the NRHP so avoidance is not necessary with the exception of two abandoned segments of US Highway 85 road bed. The pipeline crosses the road bed at one location and one of the pipe yards is immediately adjacent to the other. This highway has been recorded in McKenzie County as 32MZ1560 and has been recommended as eligible for the National Register. Given the lack of integrity at both segments of highway, both are recommended to be non-contributing elements and no further work is recommended. Isolated finds are, by definition, not eligible for inclusion on the NRHP and no further work is recommended for them. Provided the recommendations contained in this document are followed, Metcalf Archaeological Consultants, Inc. recommends a finding of *No Historic Properties Affected* (36CFR800.4[d][1]) for this undertaking as surveyed, mapped, and documented herein.

Table of Contents

ABSTRACT.....	i
List of Figures.....	iv
List of Tables.....	iv
CHAPTER 1:.....	1
INTRODUCTION.....	1
Project Description.....	2
Project Location.....	3
Management Recommendations.....	6
CHAPTER 2:.....	9
METHODOLOGY.....	9
Introduction.....	9
Personnel.....	9
Field Conditions.....	9
Field Methods.....	9
CHAPTER 3:.....	12
RESULTS.....	12
Isolated Finds.....	12
Sites.....	13
32BI1108.....	14
32BI1109.....	17
32BI1110.....	19
32MZ1484.....	20
32MZ1647.....	20
32MZ2350.....	20
32MZ2351.....	22
32MZ2352.....	24
32MZ2353.....	26
32MZ2354.....	28
32MZ2355.....	30
32MZ2356.....	32
32MZ2357.....	34
32MZ2358.....	36
32MZ2359.....	38

32MZ2360.....	40
Other	42
32WI2164 and 32WI2167.....	42
32MZ1311.....	43
32MZ1473.....	43
32WI1238	43
CHAPTER 4:	46
SUMMARY & RECOMMENDATIONS	46
REFERENCES CITED.....	49
Appendix A.....	A-1
Geoarchaeology Results: Shovel Probes	A-2
Appendix B	B-1
Site Recommendations.....	B-2
Appendix C: Topographic Maps REDACTED	C-1

List of Figures

Figure 1: General Location of the Bakkenlink Pipeline	1
Figure 2: View to the south of shovel probes in [REDACTED] (Image 5-12-12-76).	11
Figure 3: View to the northwest of 32BI1108 (Image 3-30-46).	15
Figure 4: Sketch of 32BI1108.	16
Figure 5: View to the east over the feature at 32BI1109 (Image 4-17-292).	17
Figure 6: Sketch of 32BI1109.	18
Figure 7: Sketch of 32BI1110.	19
Figure 8: Sketch of 32MZ2350.	21
Figure 9: View to the north over Feature 1 at 32MZ2350 (Image 4-4-250).	22
Figure 10: Sketch of 32MZ2351.	23
Figure 11: View to the northeast over 32MZ2351 (Image 4-4-256). Feature 1 is in the foreground.	24
Figure 12: Sketch of 32MZ2352.	25
Figure 13: View to the east over 32MZ2352 (Image 4-5-12-1).	26
Figure 14: Sketch of 32MZ2353.	27
Figure 15: View to the west over the cairn at 32MZ2353 (Image 4-10-267).	28
Figure 16: Sketch of 32MZ2354.	29
Figure 17: View to the north over the depression at 32MZ2354 (Image 4-17-278).	30
Figure 18: Sketch of 32MZ2355.	31
Figure 19: View to the west over the feature and the site area at 32MZ2355 (Image 4-17-285).	32
Figure 20: Sketch of 32MZ2356.	33
Figure 21: View to the south over the “A” line shovel probes at 32MZ2356 (Image 5-1-12-306).	34
Figure 22: Sketch of 32MZ2357.	35
Figure 23: View to the east of 32MZ2357 (Image 5-1-ES-316).	36
Figure 24: Sketch of 32MZ2358.	37
Figure 25: View to the north over 32MZ2358 (Image 5-1-ES-317).	38
Figure 26: Sketch of 32MZ2359.	39
Figure 27: View to the east of 32MZ2359 (Image 5-1-ES-322).	40
Figure 28: Sketch of 32MZ2360.	41
Figure 29: Feature 1 at 32MZ2360, view to the north (Image 5-15-12-52).	42
Figure 30: Sketch of 32WI1238 and shovel probes.	44
Figure 31: View to the west of 32WI1238 and shovel probes (Image 4-17-276).	45

List of Tables

Table 1: Legal Locations of BakkenLink Reroutes, Access Roads, Pipe Yards, and Block Surveys.....	3
Table 2: Cultural Resources Along the BakkenLink Pipeline	7
Table 3: Isolated Finds on the BakkenLink Pipeline	12

Table 4: Recommendations for Cultural Resources Along the BakkenLink Pipeline..... 47

CHAPTER 1:

INTRODUCTION

BakkenLink Pipeline, LLC, (BLPL) proposes to construct and operate a crude oil pipeline to move petroleum from the Bakken oil field in western North Dakota to a railroad transshipment location near Fryburg in southwest North Dakota (Figure 1). According to the current construction plans, the pipeline will originate at a receipt point near Johnsons Corner (Arrow), pass through McKenzie, Billings, and Stark counties, and terminate at Fryburg. Future expansion plans may include: expanding the pipeline from Arrow to a collection facility approximately seven miles south of Tioga; constructing the Dunn Lateral which will extend from the main line near the vicinity of the junction of Highways 85 and Highway 200 east towards Killdeer; and expanding the pipeline to the vicinity of Baker, Montana and tying into the Keystone XL pipeline. Bartlett & West Engineering contracted with Metcalf Archaeological Consultants, Inc. (MAC) to conduct Class II and Class III cultural resources inventories for this undertaking. This report documents the results of the investigations.

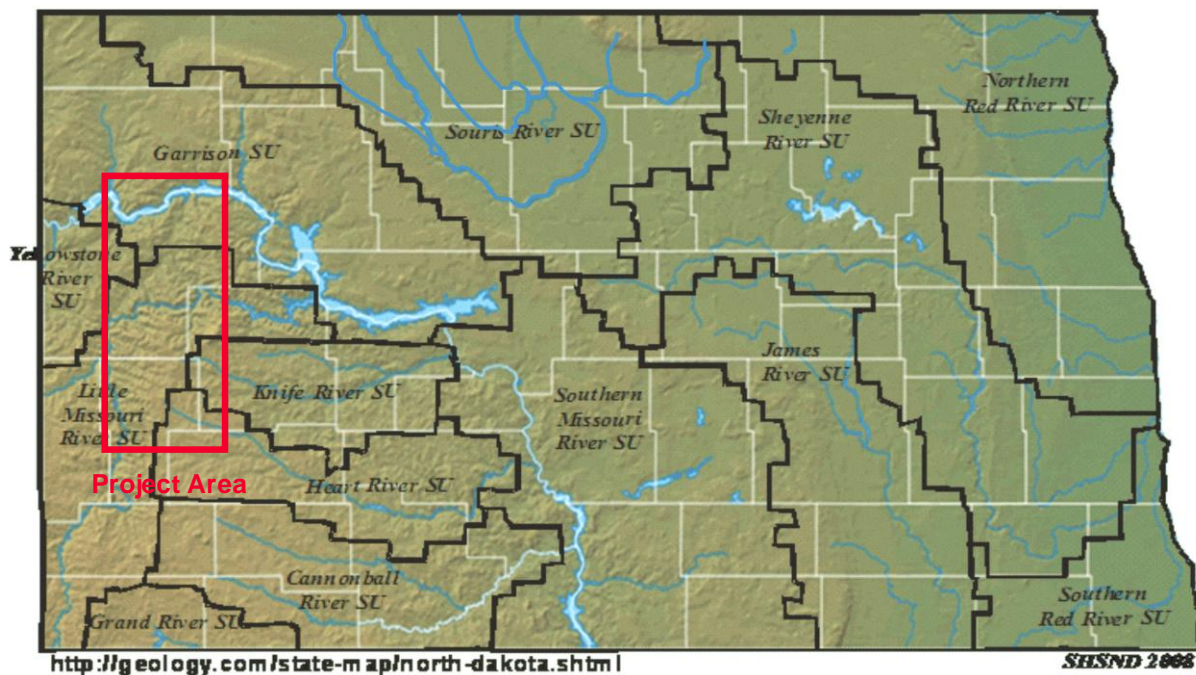


Figure 1: General Location of the Bakkenlink Pipeline

The pipeline crosses portions of the Little Missouri National Grasslands and land administered by the US Army Corps of Engineers. The Bureau of Land Management (BLM) is the lead federal agency. The Public Service Commission (PSC) is the lead state agency. The cultural resource investigations herein documented were undertaken to ensure compliance with the National Historic Preservation Act (NHPA [Public Law 89-665]) as amended and its implementing regulations (36 CFR Part 800).

The bulk of the cultural resources inventory has been reported in an earlier report (Kulevsky and Stine 2012) that focused on the area between Tioga and Fryburg. This addendum report documents cultural resource investigations conducted since February 2012. Investigations focused on the area between Arrow and Fryburg scheduled for 2012 construction; further work at one site, 32WI1238, north of Arrow, is also included. The investigations comprise the inventory of numerous reroutes, access roads, and blocks for receipt points and pipe yards.

Chapter 1 is an introduction to the project, including the project description and location. Project setting and cultural chronology are unchanged from the original survey report (Kulevsky and Stine 2012) and are not detailed; the reader is referred to that document for such information. Chapter 2 presents the methodology employed and personnel involved in the inventories. Chapter 3 details the results of the Class II and Class III inventory. Chapter 4 is a summary of results and recommendations. Appendix A is a report of the geoarchaeology of the pipeline route through the Little Missouri National Grasslands. Appendix B is a summary of recommendations for all cultural resources encountered during all inventory work associated with this project. Appendix C comprises 1:24,000 USGS maps on which the pipeline route, the results of the Class I files search, and the current investigations are plotted.

Project Description

The report by Kulevsky and Stine (2012) details results of the cultural resources inventory conducted for the BakkenLink pipeline between July 2011 and February 2012. The present document details results of work conducted from March 19 to May 22, 2012. The 2012 construction plans focus on the area between the Arrow receipt point near Johnsons Corner and the Fryburg terminus. Therefore, most of the work documented within this report is in that area. The cultural resource inventory comprises survey along the centerline, block surveys for ancillary facilities, and access roads.

Much of the work described herein involves reroutes along the centerline. Many of these reroutes were designed to meet landowner requests and are generally quite small. One reroute is quite extensive, moving the line in the vicinity of Watford City several miles further east to avoid the fast, ongoing development in that area. During the original inventory, the survey corridor was 200 feet wide. During this phase of work, the corridor width was initially 200 feet. At the request of Bartlett & West, the survey corridor was widened to 500 feet to allow ample room for small route variations. All centerline survey after April 17, 2012 involved a 500-foot wide corridor.

Block surveys for ancillary facilities were surveyed. These facilities include pipe yards and receipt points. In several locations, large blocks were inventoried to accommodate evolving land owner desires regarding route location. Block surveys ranged from 10 to 110 acres.

Finally, several access roads were inventoried. While numerous access roads are proposed, many are crowned and ditched, gravel or scoria covered roads, which will not be improved or otherwise altered to access the pipeline right-of-way. These roads were not inventoried. Unimproved two-tracks which will be used to access the right-of-way were inventoried. A 150-foot wide corridor was surveyed for access roads.

Project Location

Surveyed areas are listed in Table 1 and include areas in Billings, Dunn, McKenzie, Stark, and Williams counties, through the majority are in McKenzie county. The table identifies whether the areas are reroutes of the centerline, access roads, receipt points, pipe yards, and/or large blocks for areas where exact centerline locations had not yet been determined.

Table 1: Legal Locations of BakkenLink Reroutes, Access Roads, Pipe Yards, and Block Surveys					
T/R-S	Description	Survey Intensity	Size	Results	Map
	Centerline reroute	Class II	2140 m (7021 ft)		43
	Centerline reroute	Class II	175 m (574 ft)		43
	Centerline reroute	Class II	1920 m (6299 ft)		40
	Centerline reroute	Class II	1600 m (5249 ft)		40
		Class III	215 m x 152 m (705 ft x 500 ft)		
	Centerline reroute	Class III	690 m x 61 m (2264 ft x 200 ft)		41
	Centerline reroute	Class III	1755 m x 61m (5758 ft x 200 ft)		41
	Centerline reroute	Class II	800 m (2625 ft)		40
		Class III	960 m x 61 m (3150 ft x 200 ft)		
	Centerline reroute	Class II	1600 m (3805 ft)		40
	Centerline reroute	Class II	1915 m (6398 ft)		40
	Centerline reroute	Class III	1760 m x 61 m (5774 ft x 200 ft)	32SKx349 32SKx350	42
	Access road	Class III	1445 m x 46 m (4741 ft x 150 ft)		42
	Centerline reroute	Class III	1620 m x 61 m (5315 ft x 200 ft)	32SKx351	42
	Centerline reroute	Class II	110 m (361 ft)		42
	Centerline reroute	Class II	1565 m (5135 ft)		42
	Centerline reroute	Class II	1625 m (5331 ft)		42
	Centerline reroute	Class III	370 m x 152 m (1214 ft x 500 ft)		38
	Access road	Class III	195 m x 46m (640 ft x 150 ft)		39
	Centerline reroute	Class II	1070 m (3510 ft)		39
	Centerline reroute	Class II	440 m (1445 ft)		37
	Centerline reroute	Class II	1140 m (3740 ft)		37
		Class III	490 m x 61 m (1608 ft x 200 ft)	32BIx908	
	Centerline reroute	Class II	979 m (3213 ft)		37
	Access road	Class III	2147 m x 46 m (7044 ft x 150 ft)		34
	Access road	Class III	220 m x 46 m (722 ft x 150 ft)		35
	Centerline reroute	Class III	700 m x 152 m (2297 ft x 500 ft)	32BI1109	35
		Access road	Class III	230 m x 46 m (755 ft x 150 ft)	
	Pipe yard	Class III	82 acres	32BI1110	32
	Access road	Class III	140 m x 46 m (459 ft x 150 ft)		33
	Centerline reroute	Class III	2075 m x 61 m (6808 ft x 200 ft)		33
		Class III	410 m x 152 m (1345 ft x 500 ft)		

Table 1: Legal Locations of BakkenLink Reroutes, Access Roads, Pipe Yards, and Block Surveys

T/R-S	Description	Survey Intensity	Size	Results	Map
	Centerline reroute	Class III	1085 m x 61 m (3560 ft x 200 ft)	32BI1108 32BIx907	33
		Class III	880 m x 61 m (2887 ft x 200 ft)		
	Centerline reroute	Class III	980 m x 61 m (3215 ft x 200 ft)		31
	Centerline reroute	Class III	1375 m x 61 m (4511 ft x 200 ft)	32DUx944	31
	Centerline reroute	Class III	1470 m x 152 m (4823 ft x 500 ft)		26
	Access road	Class III	866 m x 46 m (2841 ft x 150 ft)	32MZx1230	26, 27A
	Access road	Class III	130 m x 46 m (427 ft x 150 ft)		27
	Centerline reroute	Class III	1600 m x 152 m (5249 ft x 500 ft)	32MZ1647 32MZx1216 32MZx1217 32MZx1218 32MZx1219 32MZx1220 32MZx1221	27
	Centerline reroute	Class III	300 m x 152 m (984 ft x 500 ft)		27
	Dunn receipt point	Class III	20 acres	32MZx1222 32MZx1223	27
	Centerline reroute	Class III	620 m x 152 m (2034 ft x 500 ft)		
	Centerline reroute	Class III	750 m x 152 m (2461 ft x 500 ft)	32MZ2357 32MZ2358 32MZ2359	26
	Access road	Class III	810 m x 46 m (2657 ft x 150 ft)		25
	Centerline reroute	Class III	650 m x 152 m (2133 ft x 500 ft)		25
	Access road	Class III	640 m x 46 m (2100 ft x 150 ft)		
	Centerline reroute	Class III	2155 m x 61 m (7070 ft x 200)	32MZ1311 32MZ2360	22
	Centerline reroute	Class II	625 m (2050 ft)		22
	Centerline reroute	Class III	700 m x 61 m (2297 ft x 200 ft)	32MZx1227	22
	Centerline block	Class III	65 acres		22, 23
	Access road	Class III	3750 m x 46 m (12,303 ft x 150 ft)	32MZx1232	22, 23
	Access road	Class III	780 m x 46 m (2559 ft x 150 ft)		22
	Access road	Class III	64 m x 46 m (210 ft x 150 ft)		23
	Centerline reroute	Class III	1280 m x 152 m (4200 ft x 500 ft)	32MZ1473 32MZ1484 32MZx1210 32MZx1211 32MZx1212	
	Centerline reroute	Class III	1890 m x 152 m (6201 ft x 500 ft)	32MZx1209	23
	Centerline reroute	Class III	1609 m x 152 m (5280 ft x 500 ft)		20
	Centerline reroute	Class III	415 m x 152 m (1362 ft x 500 ft)	32MZ2355 32MZx1204	20
	Access road	Class III	495 m x 46 m (1624 ft x 150 ft)		20
	Centerline reroute	Class III	385 m x 61 m (1263 ft x 200 ft)		20

Table 1: Legal Locations of BakkenLink Reroutes, Access Roads, Pipe Yards, and Block Surveys

T/R-S	Description	Survey Intensity	Size	Results	Map
	Access road	Class III	585 m x 46 m (1919 ft x 150 ft)		21
	Centerline reroute	Class III	1600 m x 61 m (5249 ft x 200 ft)	32MZ1560	
	Centerline reroute	Class II	260 m (853 ft)		21
	Centerline reroute	Class III	136 m x 152 m (446 ft x 500 ft)	32MZ2356 32MZx1205 32MZx1206	
	Centerline block	Class III	110 acres	32MZ2354	
	Access road	Class III	870 m x 46 m (2854 ft x 150 ft)		
	Access road	Class III	2375 m x 46 ft (7792 ft x 150 m)		21
	Centerline reroute	Class II	1609 m (5280 ft)		21
	Centerline reroute	Class III	1609 m x 61 m (5280 ft x 200 ft)		18A
	Centerline reroute	Class III	1710 m x 61 m (5610 ft x 200 ft)		18A
	Centerline reroute	Class III	840 m x 61 m (2756 ft x 200 ft)		18A
	Centerline reroute	Class III	2355 m x 61 m (7726 ft x 200 ft)	32MZ2353	18A
	Centerline reroute	Class III	500 m x 61 m (1640 ft x 200 ft)		18
	Centerline reroute	Class III	1060 m x 61 m (3478 ft x 200 ft)		19
	Centerline reroute	Class II	815 m (2674 ft)		21
	Centerline reroute	Class III	810 m x 61 m (2657 ft x 200 ft)		
	Centerline reroute	Class III	1675 m x 61 m (5495 ft x 200 ft)		19
	Centerline reroute	Class III	1680 m x 61 m (5512 ft x 200 ft)		19
	Watford City receipt point	Class III	48 acres	32MZx1213 32MZx1224	19
	Centerline block	Class III	40 acres	32MZx1225 32MZx1226	
	Centerline reroute	Class III	235 m x 152 m (771 ft x 500 ft)		
	Centerline reroute	Class III	1915 m x 61 m (6283 ft x 200 ft)		
	Centerline reroute	Class III	1195 m x 61 m (3921 ft x 200 ft)	32MZ2361	
	Centerline reroute	Class III	655 m x 152 m (2149 ft x 500 ft)		19
	Centerline reroute	Class III	620 m x 152 m (2034 ft x 500 ft)		
	Centerline reroute	Class III	255 m x 61 m (837 ft x 200)		12
	Centerline reroute	Class III	230 m x 152 m (755 ft x 500 ft)		
	Pipe yard	Class III	37 acres	32MZx1228 32MZx1229	12
	Centerline reroute	Class III	1800 m x 61 m (5906 ft x 200 ft)	32MZ2350	13
	Centerline reroute	Class III	1609 m x 61 m (5280 ft x 200 ft)		13
	Centerline reroute	Class III	300 m x 152 m (984 ft x 500 ft)		
	Centerline reroute	Class III	326 m x 152 ft (1070 ft x 500 ft)		
	Centerline reroute	Class III	420 m x 152 m (1378 ft x 500 ft)		
	Centerline reroute	Class III	1609 m x 61 m (5280 ft x 200 ft)		12
	Centerline reroute	Class III	970 m x 152 m (3182 ft x 500 ft)	32MZx1207	
	Centerline reroute	Class III	1645 m x 61 m (5397 ft x 200 ft)		12

T/R-S	Description	Survey Intensity	Size	Results	Map
	Centerline reroute	Class III	845 m x 152 m (2772 ft x 500 ft)	32MZx1214	
	Centerline reroute	Class III	2080 m x 61 m (6824 ft x 200 ft)	32MZ2351	13
	Centerline reroute	Class III	1650 m x 61 m (5413 ft x 200 ft)		14
	Centerline reroute	Class III	1609 m x 61 m (5280 ft x 200 ft)		14
	Centerline reroute	Class III	1609 m x 61 m (5280 ft x 200 ft)		14
	Centerline reroute	Class III	1609 m x 61 m (5280 ft x 200 ft)		14
	Centerline reroute	Class III	1609 m x 152 m (5280 ft x 500 ft)	32MZx1215	
	Centerline reroute	Class III	1609 m x 61 m (5280 ft x 200 ft)	32MZ2352	15
	Centerline reroute	Class III	1680 m x 152 m (5512 ft x 500 ft)	32MZx1208	
	Access road	Class III	1100 m x 46 m (3609 ft x 150 ft)	32MZx1231	
	Centerline reroute	Class III	235 m x 61 m (771 ft x 200 ft)		13
	Access road	Class III	1140 m x 46 m (3740 ft x 150 ft)		15
	Centerline reroute	Class III	410 m x 61 m (1345 ft x 200 ft)		
	Centerline reroute	Class III	1070 m x 61 m (3510 ft x 200 ft)		16
	Access road	Class III	780 m x 46 m (2559 ft x 150 ft)		
	Centerline reroute	Class III	1735 m x 61 m (5629 ft x 200 ft)		16
	Centerline reroute	Class III	1609 m x 61 m (5280 ft x 200 ft)		16
	Site revisit			32MZ2167	5
	Site revisit			32MZ2164	5
	Probing			32WI1238	4

Management Recommendations

In all, 57 cultural resources were documented during this survey (Table 2). The resources include 35 prehistoric isolated finds, 16 prehistoric sites, and six historic sites. Additionally, one site that had been recorded along the ROW could not be relocated. The isolated finds are all recommended not eligible for inclusion on the National Register of Historic Places (NRHP). Two previously documented prehistoric sites have been tested for undertakings not associated with this project and found to be eligible for inclusion on the NRHP. They should be avoided. The eligibility of the remainder of the prehistoric sites has not been determined and avoidance recommendations for all of them are presented. The historic era sites are recommended not eligible for the NRHP, with the exception of Highway 85.

SITS #	Temp #	Location	Site Type	Site Description	Evaluation/Recommendation	Map
32BII108	MAC-BL-AK-45		Prehistoric	Cultural material scatter	Undetermined/Avoid*	33
32BII109	MAC-BL-AK-63		Prehistoric	1 cairn	Undetermined/Avoid*	35
32BII110	MAC-BL-DG-4		Historic	Highway 85	???	32
32BIx907	MAC-BL-AK-46		IF	4 flakes, 1 tool		33
32BIx908	MAC-BL-AK-47		IF	Chipped stone	Not eligible/NFW	37
32DUx944	MAC-BL-AK-55		IF	Chipped stone	Not eligible/NFW	31
32MZ1473			Prehistoric	Cultural material scatter	Undetermined/Avoid	23
32MZ1484			Prehistoric	Cultural material scatter	Eligible/Avoid	23
32MZ1560			Historic	Highway 85	???	21
32MZ1647			Prehistoric	Cultural material scatter	Eligible/Avoid	27
32MZ2164			Prehistoric	Stone features	No further work†	5
32MZ2167			Prehistoric	Stone circle	Undetermined/Avoid*	5
32MZ2350	MAC-BL-AK-48		Historic	Farmstead	Not eligible/NFW	13
32MZ2351	MAC-BL-AK-49		Prehistoric	Stone circles	Undetermined/Avoid*	13
32MZ2352	MAC-BL-AK-50		Historic	Farmstead	Not eligible/NFW	15
32MZ2353	MAC-BL-AK-54		Prehistoric	Cairn	Undetermined/Avoid*	18A
32MZ2354	MAC-BL-AK-56		Prehistoric	Eagle trapping pit(s)	Undetermined/Avoid*	21
32MZ2355	MAC-BL-AK-57		Historic	Depression	Not eligible/NFW	20
32MZ2356	MAC-BL-AK-59		Prehistoric	Cultural material scatter	Undetermined/Avoid*	21
32MZ2357	MAC-BL-AK-73		Prehistoric	Cultural material scatter	Undetermined/Avoid*	26
32MZ2358	MAC-BL-AK-74		Prehistoric	Cultural material scatter	Undetermined/Avoid*	26
32MZ2359	MAC-BL-AK-75		Prehistoric	Cultural material scatter	Undetermined/Avoid*	26
32MZ2360	MAC-BL-AK-90		Prehistoric	Eagle trapping pit(s)	Undetermined/Avoid*	20
32MZ2361	MAC-BL-BB-1		Historic	Dam	Not eligible/NFW	19
32MZx1204	MAC-BL-AK-58		IF	Chipped stone	Not eligible/NFW	20
32MZx1205	MAC-BL-AK-60		IF	Chipped stone	Not eligible/NFW	21
32MZx1206	MAC-BL-AK-61		IF	Chipped stone	Not eligible/NFW	21
32MZx1207	MAC-BL-AK-64		IF	Chipped stone	Not eligible/NFW	12
32MZx1208	MAC-BL-AK-65		IF	Chipped stone	Not eligible/NFW	15
32MZx1209	MAC-BL-AK-66		IF	Chipped stone	Not eligible/NFW	23
32MZx1210	MAC-BL-AK-67		IF	Chipped stone	Not eligible/NFW	23
32MZx1211	MAC-BL-AK-68		IF	Chipped stone	Not eligible/NFW	23
32MZx1212	MAC-BL-AK-69		IF	Chipped stone	Not eligible/NFW	23
32MZx1213	MAC-BL-AK-70		IF	Projectile Point	Not eligible/NFW	19
32MZx1214	MAC-BL-AK-71		IF	Projectile Point	Not eligible/NFW	12
32MZx1215	MAC-BL-AK-72		IF	Chipped stone	Not eligible/NFW	14

Table 2: Cultural Resources Along the BakkenLink Pipeline						
SITS #	Temp #	Location	Site Type	Site Description	Evaluation/Recommendation	Map
32MZx1216	MAC-BL-AK-76		IF	Chipped stone	Not eligible/NFW	27
32MZx1217	MAC-BL-AK-77		IF	Chipped stone	Not eligible/NFW	27
32MZx1218	MAC-BL-AK-78		IF	Chipped stone	Not eligible/NFW	27
32MZx1219	MAC-BL-AK-79		IF	Chipped stone	Not eligible/NFW	27
32MZx1220	MAC-BL-AK-80		IF	Chipped stone	Not eligible/NFW	27
32MZx1221	MAC-BL-AK-81		IF	Chipped stone	Not eligible/NFW	27
32MZx1222	MAC-BL-AK-82		IF	Chipped stone	Not eligible/NFW	27
32MZx1223	MAC-BL-AK-83		IF	Chipped stone	Not eligible/NFW	27
32MZx1224	MAC-BL-AK-84		IF	Chipped stone	Not eligible/NFW	19
32MZx1225	MAC-BL-AK-85		IF	Chipped stone	Not eligible/NFW	19
32MZx1226	MAC-BL-AK-86		IF	Chipped stone	Not eligible/NFW	19
32MZx1227	MAC-BL-AK-91		IF	Chipped stone	Not eligible/NFW	22
32MZx1228	MAC-BL-DG-1		IF	Chipped stone	Not eligible/NFW	12
32MZx1229	MAC-BL-DG-2		IF	Chipped stone	Not eligible/NFW	12
32MZx1230	MAC-BL-DG-89		IF	Chipped stone	Not eligible/NFW	26
32MZx1231	MAC-BL-DG-90		IF	Chipped stone	Not eligible/NFW	15
32MZx1232	MAC-BL-DG-5		IF	Chipped stone	Not eligible/NFW	22
32SKx349	MAC-BL-AK-51		IF	Chipped stone	Not eligible/NFW	42
32SKx350	MAC-BL-AK-52		IF	Chipped stone	Not eligible/NFW	42
32SKx351	MAC-BL-AK-53		IF	Chipped stone	Not eligible/NFW	42
32WI1238			Prehistoric	Stone circles	Undetermined‡	4
*Avoidance measures recommended in the body of the report						
IF = Isolated Find, NFW = No Further Work						
†Site not relocated						
‡Shovel probes indicate no significant cultural deposits between features; no recommendation about overall site significance						

CHAPTER 2:

METHODOLOGY

Introduction

The undertaking area of potential effects (APE) for the BakkenLink pipeline is a right-of-way (ROW) approximately 168.5 miles long and crosses five counties and private, federal, and state lands. Following the completion of the original Class II and Class III cultural resources inventory, reroutes and route variations continued to be developed. During the fieldwork detailed herein, approximately 47.4 miles of centerline was intensively inventoried. Another 11 miles were inventoried at a reconnaissance level only. Additionally, 402 acres were intensively inventoried in blocks for receipt points and pipe yards. Twenty access roads were also inventoried. The survey width of the centerline segments was 200 feet and segments surveyed after April 17, 2012 were 500 feet. Access road survey corridors were 150 feet wide. A total of 2222 acres were inventoried.

Personnel

The MAC crew included Kimball Banks, Principle Investigator; Ed Stine and Andrea Kulevsky, project directors; Debra Green, geoarchaeologist; and William Bluemle, Bill Christensen, Melissa Fitzpatrick, Matt Kinsey, Cat Cael, Jeremiah Hull, and Jillian Kleiner.

Field Conditions

Field conditions varied by geographic location. The ground cover consisted of pasture with both non-native and native prairie mixed grasses, forested areas, cultivated fields, and land enrolled in the Conservation Reserve Program (CRP). Ground surface visibility (GSV) varied by land use and ranged from 5 percent to 100 percent. In general, field work was conducted before both planting and winter wheat germination. In agricultural fields, GSV generally ranged from 80 to 100 percent. Ground surface visibility in pasture and CRP was lower, ranging from 5 to 40 percent. Although field work was conducted in late winter/early spring, there was no snow.

Field Methods

The cultural resource inventory conformed to *North Dakota SHPO Guidelines Manual for Cultural Resource Inventory Projects* (SHSND 2006). The Class III inventory methodology employed zigzag pedestrian transects spaced no more than 15 meters apart. The pipeline route was not staked; rather GPS data provided by Bartlett & West was loaded onto Magellan CX GPS units and used in the field to maintain location and record cultural resources. Field conditions and cultural resources were documented with digital photographs and in field notes.

Most areas were intensively inventoried. A small portion of the pipeline right-of-way was inventoried at a Class II level (reconnaissance) level. These areas include those of low potential to contain cultural resources (e.g. long, level plowed plains or areas too steep to retain intact sediments) and those over proposed horizontal directional drills (HDD), where there will be no ground or near ground level disturbance.

When a cultural resource was encountered, the immediate area was intensively scrutinized. Pin flags were used to mark artifacts and features. Based on the number of artifacts encountered, an in-field determination was made as to whether the area was a site or an isolated find. An area that contained five or fewer artifacts was defined as an isolated find; six or more artifacts or a feature constituted a site. Sketch maps were drawn and photographs taken of each sites. The site area was determined and mapped with a GPS unit. To the extent possible, attempts were made in the field to determine the NRHP eligibility of all cultural resources. All field notes, maps, and electronic photo images are on file at the MAC Bismarck office.

Areas with enhanced GSV, such as cutbanks, blowouts, animal trails, two-tracks, and animal back dirt piles, were closely examined. Shovel probes were excavated at select locations. Generally, probes were placed at the location(s) of cultural resources to determine whether they extended into the APE and to help determine how far the ROW would need to be moved to avoid cultural resources.

Shovel probes were also excavated at several locations thought to have a potential for cultural resources but where no resources were observed. One location was along a two-mile stretch through [REDACTED] within the Little Missouri National Grasslands in the rugged breaks near the Little Missouri River. Twenty-three shovel probes were excavated at various locations. Probing concentrated on high, flat ridgelines and low, flat benches adjacent to drainages, landforms known to have attracted prehistoric inhabitants.

One of these probes produced one KRF flake (32MZx1227). This positive probe was bracketed with three probes at ten-meter intervals. The three probes did not produce additional cultural material and indicate that the landform contains almost no Holocene deposits. The artifact was recovered from a layer of sheet-wash deposits and likely washed into its present location from a topographically higher position (Figure 2). Overall, the probes showed that soils here are generally thin to absent and that sediments are residuum, though there are pockets of deeper eolian deposits (Appendix A).

In the second area of shovel probes, in [REDACTED], along an existing two-track which the BLPL is considering using to access the pipeline right-of-way, a shovel probe was excavated adjacent to a surface isolated find (32MZx1232) to confirm that the location had little to no potential for buried cultural deposits. It is MAC's understanding that the BLPL no longer intends to use this access road. If plans change, additional work should be conducted along this access road. Such work should include evaluation of the four sites (32MZ1311, 32MZ1312, 32MZ1313, and 32MZ1314) that lie along or immediately adjacent to the road.

Shovel probes were also excavated in the vicinity of 32MZ2356. The site is eroding out of the cutbank at the top of the uplands on the north side of and overlooking the Little Missouri Valley. The probes were excavated to determine how far back (north) from the edge the site extends. Probing was positive for cultural materials and indicates that buried cultural deposits extend approximately 60 meters back from the valley edge (see site discussion below).

Finally, shovel probes were excavated at 32WI1238. The site, recorded earlier for this project, consists of two stone features approximately 25 meters (80 feet) apart. The site is on State School Lands and the State is reluctant to allow the pipeline centerline to be moved. The shovel probes were excavated to determine whether evidence of significant cultural deposits exist between the two features (see site discussion below).



Figure 2: View to the south of shovel probes in [REDACTED] (Image 5-12-12-76).

CHAPTER 3:

RESULTS

As stated, the cultural resources inventory resulted in the documentation of 57 cultural resources: 35 isolated finds, 16 prehistoric archaeological sites and six historic sites (see Table 2). Two sites were documented earlier as part of this project: 32WI1238 and 32MZ1311.

Isolated Finds

Thirty-five isolated finds (IF) were recorded, including 32MZx1227, which was recovered in a shovel probe (Table 3). All other isolates were surface finds. Isolates are by their nature not eligible for inclusion on the NRHP. All 35 isolates are therefore recommended as not eligible and no avoidance or other measures to avoid impacting the resources is necessary.

SITS #	Field Code	T/R-Sec	Description	Map
32BIx907	MAC-BL-AK-46		4 flakes, 1 tool	33
32BIx908	MAC-BL-AK-47		2 flakes, 1 tool	37
32DUx944	MAC-BL-AK-55		5 flakes	31
32MZx1204	MAC-BL-AK-58		1 flake	20
32MZx1205	MAC-BL-AK-60		1 flake	21
32MZx1206	MAC-BL-AK-61		4 flakes	21
32MZx1207	MAC-BL-AK-64		1 biface fragment	12
32MZx1208	MAC-BL-AK-65		1 biface fragment	15
32MZx1209	MAC-BL-AK-66		5 flakes	23
32MZx1210	MAC-BL-AK-67		1 flake tool	23
32MZx1211	MAC-BL-AK-68		3 flakes, 1 biface fragment	23
32MZx1212	MAC-BL-AK-69		2 flakes	23
32MZx1213	MAC-BL-AK-70		Projectile point (possible Pelican Lake)	19
32MZx1214	MAC-BL-AK-71		Projectile point (Besant)	12
32MZx1215	MAC-BL-AK-72		1 biface fragment	14
32MZx1216	MAC-BL-AK-76		2 flakes	27
32MZx1217	MAC-BL-AK-77		1 tested raw material	27
32MZx1218	MAC-BL-AK-78		3 flakes	27
32MZx1219	MAC-BL-AK-79		3 flakes	27
32MZx1220	MAC-BL-AK-80		2 flakes	27
32MZx1221	MAC-BL-AK-81		1 flake	27
32MZx1222	MAC-BL-AK-82		2 flakes	27
32MZx1223	MAC-BL-AK-83		4 flakes	27
32MZx1224	MAC-BL-AK-84		2 flakes	19
32MZx1225	MAC-BL-AK-85		3 flakes, 1 biface fragment	19
32MZx1226	MAC-BL-AK-86		1 flake, 1 biface fragment	19
32MZx1227	MAC-BL-AK-91		1 flake	22
32MZx1228	MAC-BL-DG-1		2 flakes	12
32MZx1229	MAC-BL-DG-2		1 flake	12
32MZx1230	MAC-BL-DG-89		1 flake	26
32MZx1231	MAC-BL-DG-90		1 flake	15
32MZx1232	MAC-BL-DG-5		1 flake	22

SITS #	Field Code	T/R-Sec	Description	Map
32SKx349	MAC-BL-AK-51		2 flakes, 1 biface fragment	42
32SKx350	MAC-BL-AK-52		2 flakes	42
32SKx351	MAC-BL-AK-53		1 flake	42

Sites

Twenty-two sites were recorded as part of the additional survey work. Six are historic and include three farmsteads or farm/ranch related features. Two consist of abandoned segments of US Highway 85, one in McKenzie County and crossed by the pipeline right-of-way, the other in Billings County and adjacent to a pipe yard. Except for Highway 85 (32MZ1560 and 32BI1110), all of the historic sites lack integrity and are recommended as not eligible for inclusion on the NRHP and do not need to be avoided. Highway 85 has previously been recommended eligible for inclusion on the NRHP, though no formal determination has been made. Both segments documented herein are abandoned and lack integrity. Therefore they are recommended to be non-contributing elements and no further work is recommended.

The remaining sixteen sites are prehistoric. Eight are cultural material scatters, two are sites that contain eagle trapping pits, and six contain stone features.

A review of selected eagle trapping sites in southwestern North Dakota and northwestern South Dakota and ethnographic reports of their use (Allen 1983) provides useful baseline data. Most of the following discussion is derived from that article. Bowers (2004), Howard (1953), and Wilson (1928) provide additional detail.

Eagle trapping pits range from 1.5 to 1.8 meters (5-6 feet) long and 1.2 to 1.5 meters (4-5 feet) wide, although many are rounded and approximately 1.8 to 2.1 (6-7 feet) in diameter. Generally, they are located on buttes and ridgelines, up to 20 meters (65 feet) from the edge and about 15 meters (49 feet) from the butte crest. Often the pits are rock lined with a stone ring around the pit, probably from stones unearthed during pit excavation. The pits are along the west, northwest, or southwest edges of buttes or ridgelines. Eagle trapping occurred when the wind was from the west. Ethnographic accounts specifically report that the pits should not be located on the east side of an escarpment as the eagle will pass overhead and not observe or come down to the bait.

Stone features play a prominent role in the archaeological record and/or as Traditional Cultural Properties (TCPs). Stone circles have a number of possible functions; they are most commonly thought to have been used to hold down the edges of tipis, but other less familiar, though significant, functions involving a variety of social/ceremonial activities are also possible. Cairns served a number of purposes, including but not limited to: protective covers for human burials and various kinds of caches, as commemorative markers, as points of reference on the landscape,

as offering piles, supports for post/pole structures, big game drive line markers, and the storage of selected rock for cooking construction and sweat bathing (Gregg *et al.* 1985: 94-95).

32BI1108

Site 32BI1108 is a large sparse lithic scatter that measures 200 meters east-west by 60 meters north-south (Appendix C: Map 33, Figures 3-4). The site is situated on a large rise and may continue to the northwest of the boundary as currently defined. Because of project constraints, the northwest extent of the site was not defined. The scatter is entirely within a plowed field with nearly 100 percent GSV at the time of the inventory. The rise has an excellent view shed, especially to the east, west, and south. Intact cultural deposits may be present beneath the plow zone, although it is likely that most of the deposits are disturbed.

Virtually all of the artifacts are Knife River flint (KRF). Debitage from all stages of reduction was observed, including core fragments and primary, secondary, and tertiary flakes. Integrity of the site has been reduced by plowing but the degree of disturbance is unknown. The eligibility of the site to the NRHP is undetermined. Subsurface testing would be necessary both to assess integrity and to determine whether significant cultural deposits exist. A route to the east-southeast of the site and off the landform on which it is located has been surveyed as a reroute.



Figure 3: View to the northwest of 32BI1108 (Image 3-30-46).

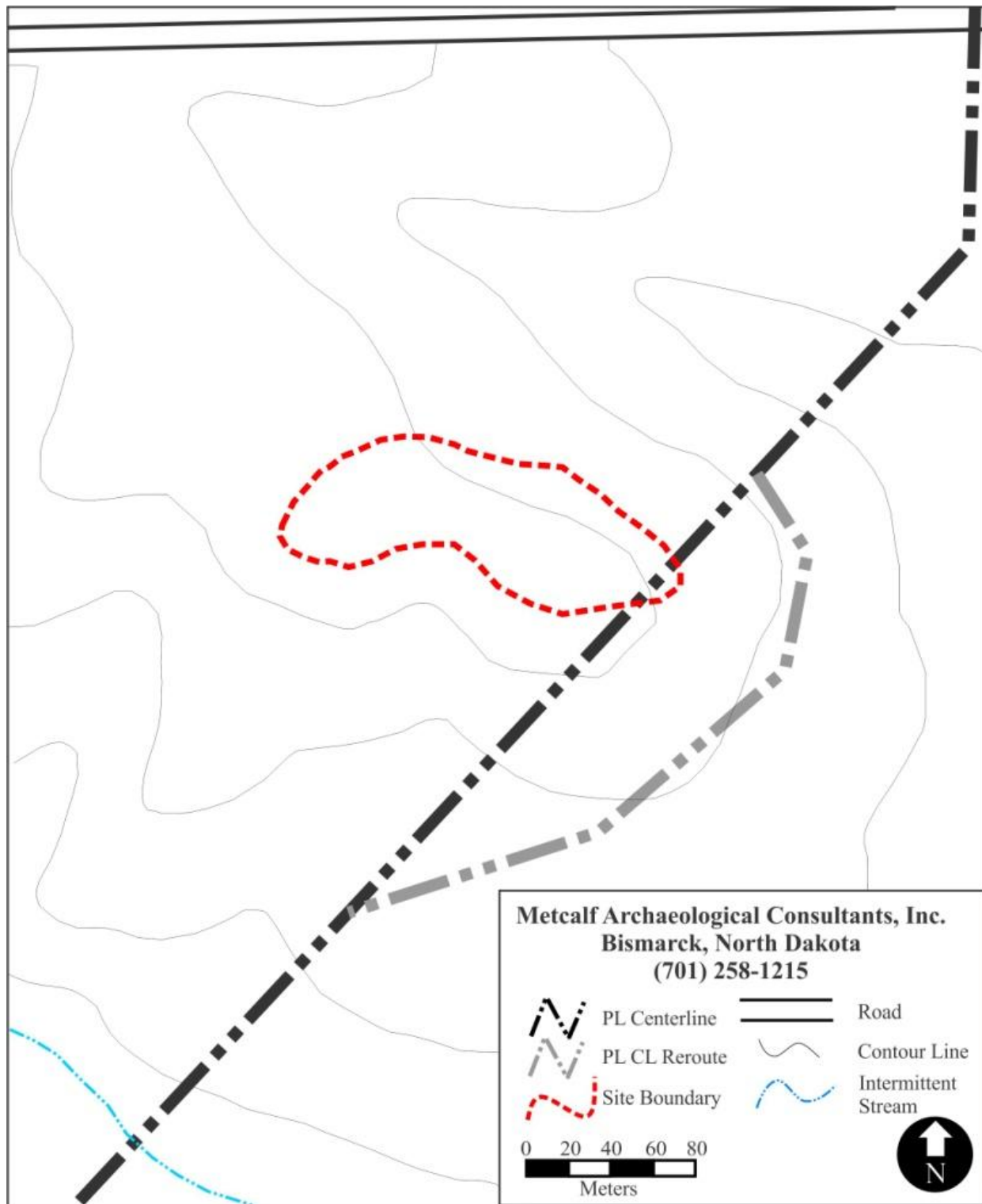


Figure 4: Sketch of 32BI1108.

32BI1109

Site 32BI1109 consists of a single cairn composed of 35 visible rocks, many of which are nearly completely sodded in (Appendix C: Map 35, Figures 5-6). The cairn measures three meters north-south by one meter east-west. The site is located on the top of a small, subdued rise in an area of gently rolling uplands. Integrity is excellent. There are no modern impacts other than erosion. The eligibility of the site to the NRHP is undetermined and subsurface investigation is necessary to determine eligibility. The site lies approximately 50 meters (165 feet) east of the centerline and 20 meters (66 feet) outside the construction right-of-way and will not be impacted by this undertaking.



**Figure 5: View to the east over the feature at 32BI1109
(Image 4-17-292).**

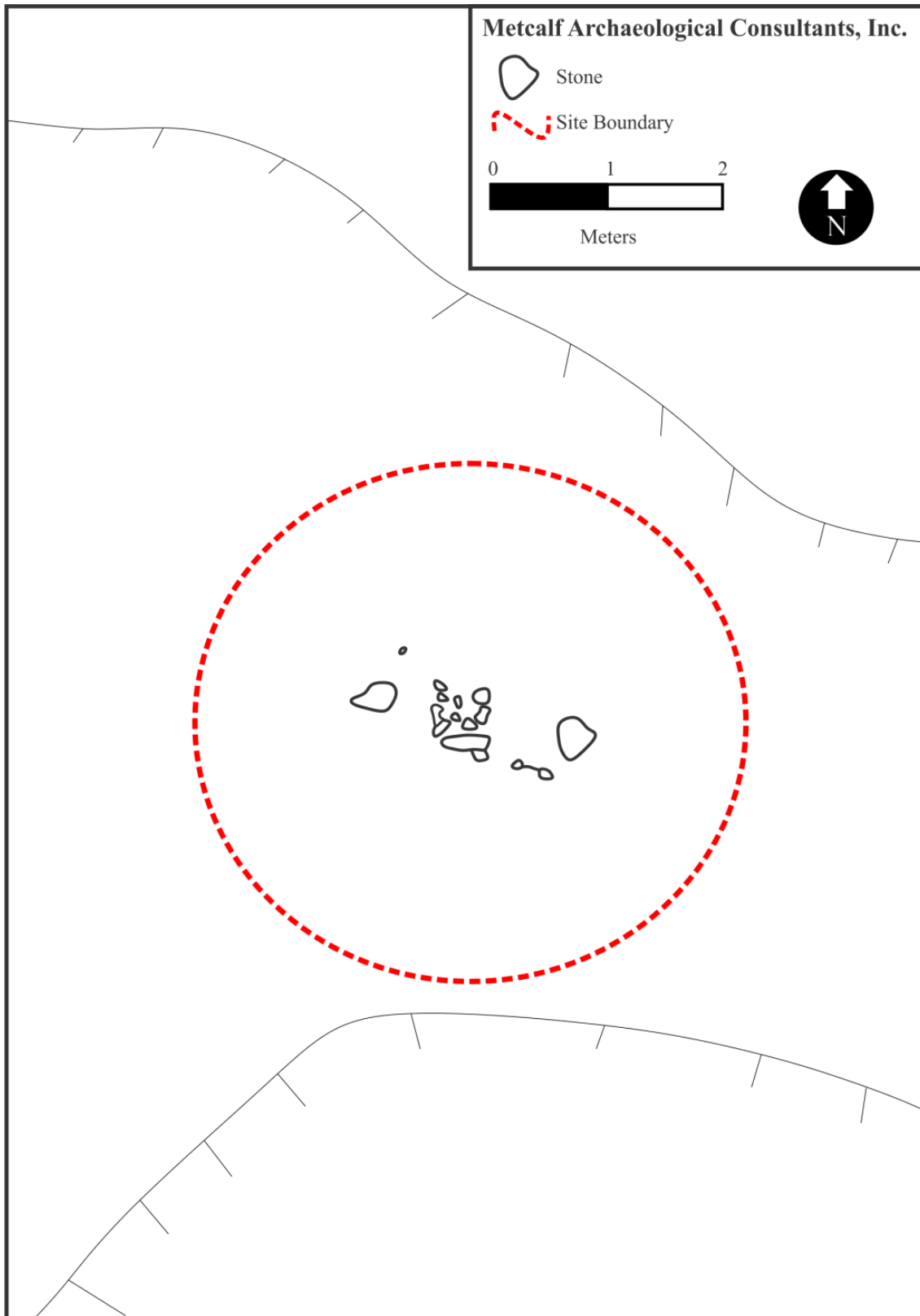


Figure 6: Sketch of 32BI1109.

32BI1110

Site 32BI1110 consists of an abandoned portion of US Highway 85 (Appendix C: Map 32, Figure 7). The highway has also been recorded in McKenzie County as 32MZ1560; that site form presents the historical context for the site. The road surface is constructed of gravel within an asphalt matrix. Vegetation has grown within the cracks, hiding approximately 40 percent of the road surface. Portions of the yellow center line are exposed in patchy segments. Ditches flank the road on both sides and a property fenceline parallels the road to the west. The road is 24 feet wide and the ditch is 19 feet wide.

While Highway 85 has been recommended eligible for inclusion on the NRHP, this road segment does not retain good integrity. The road has been abandoned for a significant period of time based on the severe asphalt cracks and heavy vegetation covering the surface. Given this segment's lack of integrity, it is recommended not to be a contributing element to the eligibility of the highway. This segment lies at the extreme western edge of the 80-acre block surveyed for a pipe yard and is not likely to be impacted by the construction of the pipeline.

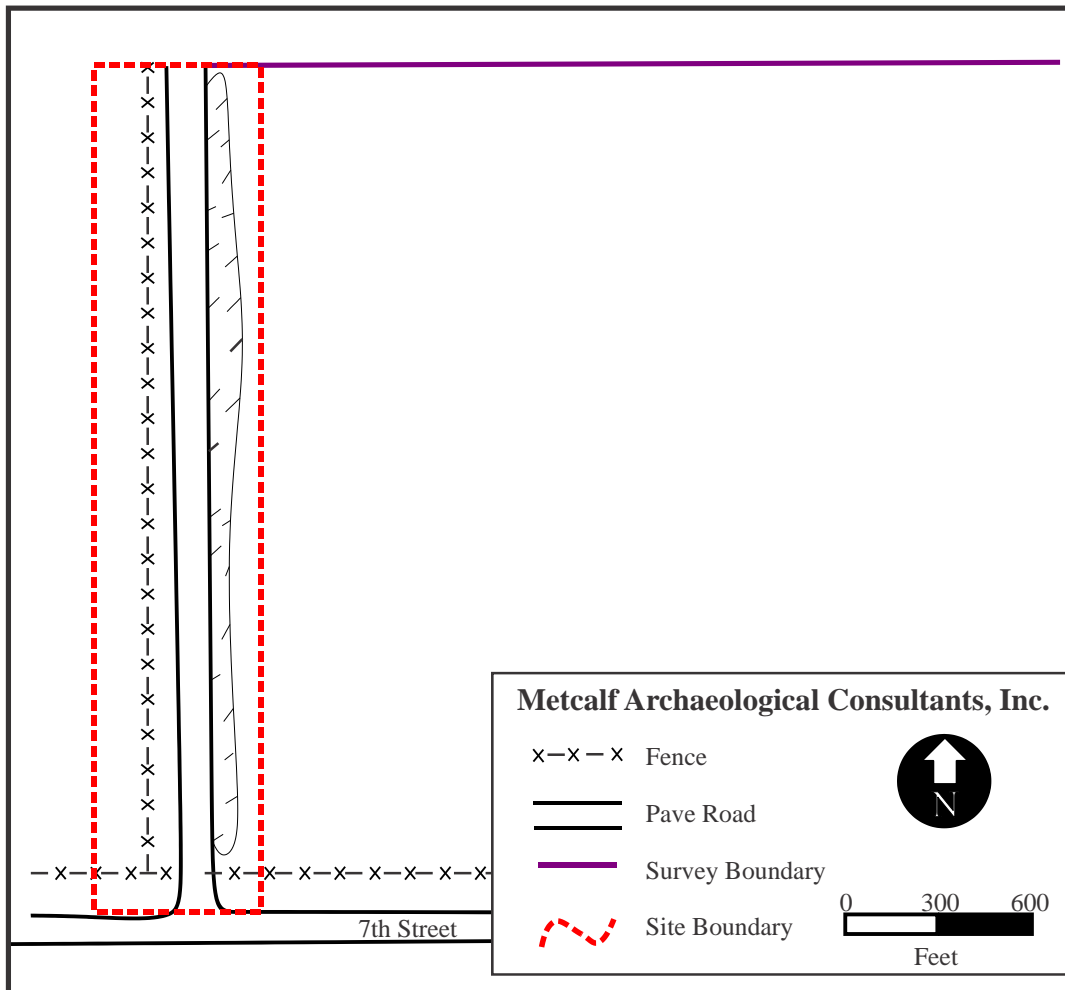


Figure 7: Sketch of 32BI1110.

32MZ1484

Site 32MZ1484 (Appendix C: Map 23) was tested in 2001 and found to be eligible for the NRHP (See NDCRS Site Form by Klinner 2001). Dense cultural deposits were found and the investigators suggest the site dates to the Late Prehistoric/Plains Village period. When MAC revisited 32MZ1484, it was found, essentially, as described in the site form. Boundaries are based on the maps from the testing. No cultural material was observed in the disturbed ROW of the existing pipeline. Based on those boundaries, it appears that if the construction corridor is necked down and placed adjacent to the existing pipeline, impact to the site can be avoided. Fencing and monitoring is also recommended.

32MZ1647

Site 32MZ1647 (Appendix C: Map 27) was originally recorded in 2004 and tested in 2006. Testing resulted in the recovery of a Scottsbluff projectile point (Paleoindian) as well as a hearth radiocarbon dated to 760 ±80 BP (Late Prehistoric). The site was recommended eligible for inclusion on the NRHP. Investigations focused on the north end of the site, to the north of the ½-section line and limited probing in the south portion of the site (and thus, nearest to the BakkenLink APE) indicated much sparser cultural deposits in this area (Hiemstra 2006). When MAC revisited the site, it was found to be much as described in the site form. The current undertaking can avoid impact to the site by keeping off the landform on which it is located. It is located within an area for which the survey ROW was 500 feet, so there is ample room for site avoidance by the undertaking.

32MZ2350

Site 32MZ2350, a historic site, consists of three features (Appendix C: Map 13, Figures 8-9). Two of the features, Feature 1 and Feature 2, are rock foundations surrounding depressions. Feature 1 is located on the east slope of a hill overlooking a north-south draw and is comprised of large granite stones approximately 30 to 70cm in diameter. The feature measures approximately 35 feet north-south by 25 feet east-west, with an entrance depression centered on the east side. The depression is approximately three feet deep. Feature 2 is located on top of a hill approximately 165 feet south of Feature 1. The feature is composed of granite stones approximately 25 to 40cm in diameter and is two and a half feet deep. Two large limestone boulders are within the foundation walls. One boulder is located in the north-northeast corner of the foundation and the other is located in the central portion of the east wall. A concentration of stones located near the east wall appears to represent a demolition episode. Feature 3 is a circular depression approximately 16 feet in diameter and three feet deep. The feature has a slight berm on its north and east edges. The features have been subject to some erosion and infilling. There is no evidence of any superstructures and no cultural material was observed. Feature 2 appears to have been disturbed through dismantling. The site retains integrity of location but lacks aspects of integrity of design, setting, materials, workmanship, feeling, and association. If there were once standing structures associated with the site, they have since been removed. The site is recommended as not eligible for inclusion on the NRHP.

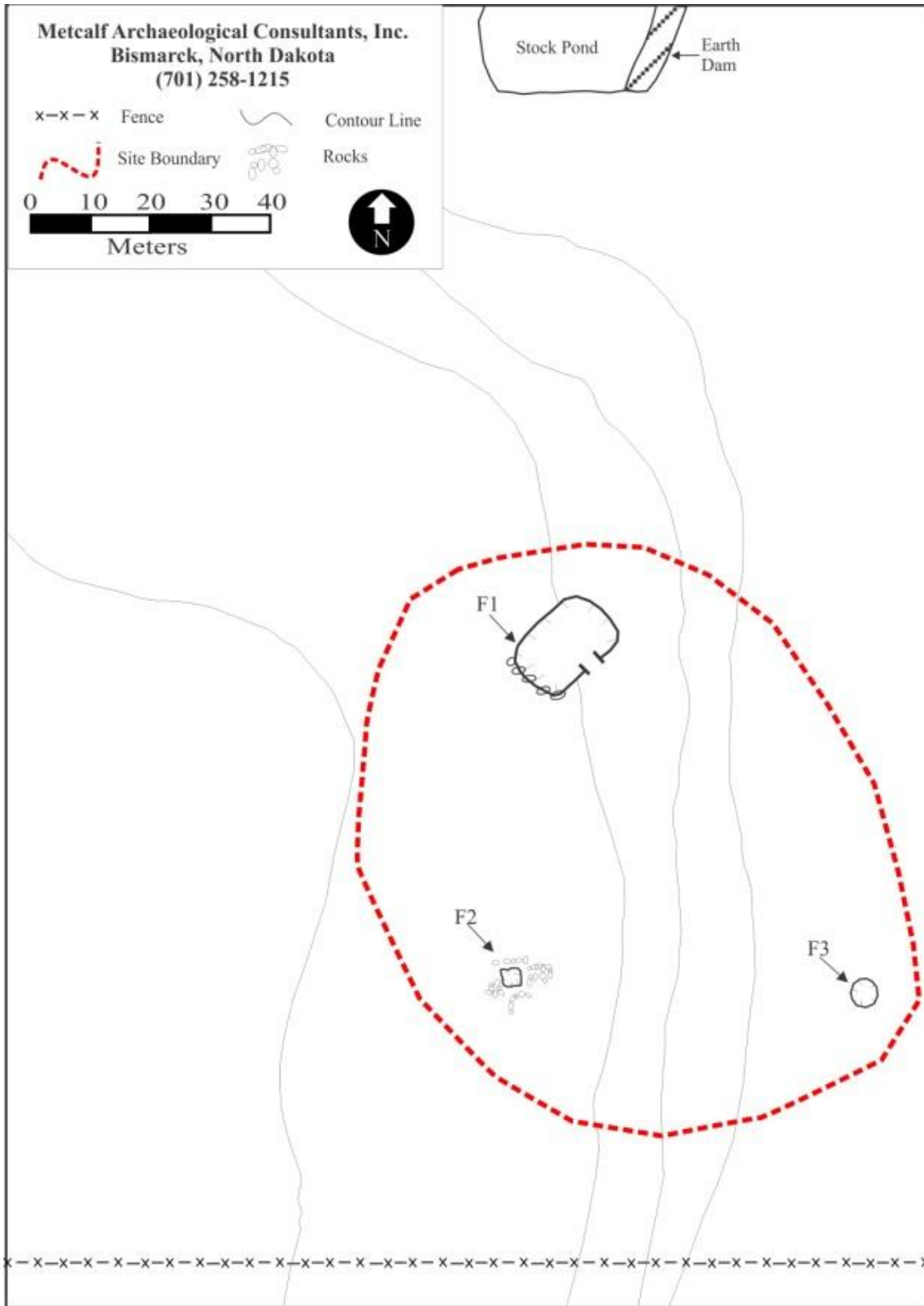


Figure 8: Sketch of 32MZ2350.



**Figure 9: View to the north over Feature 1 at 32MZ2350
(Image 4-4-250).**

32MZ2351

Site 32MZ2351 consists of three stone circles aligned west to east along a ridgeline (Appendix C: Map 13, Figures 10-11). The majority of stones are granite with some limestone and scoria. Feature 1 is at the west end of the site, is five meters in diameter, and is composed of 54 stones. Feature 2 is in the center of the site, is four and a half to five meters in diameter, and has 41 stones. The feature is approximately 10 meters east of Feature 1. Feature 3 is at the east end of the site, is five meters in diameter, and has 38 stones. The site has an excellent view north into the mouth of a draw half mile to one mile away. No cultural materials were identified. The site appears to be undisturbed and has good integrity. The eligibility of the site for inclusion on the NRHP has not been determined and until it has been evaluated, it should be avoided.

The site is located at the northern side of the ROW, approximately 10 meters (30 feet) from the centerline. Impact to the site can be avoided by necking down the corridor and fencing the site. The reroute at this location is adjacent to and north of the original route; there is therefore adequate room to the south for the full construction ROW if necking down is not desired.

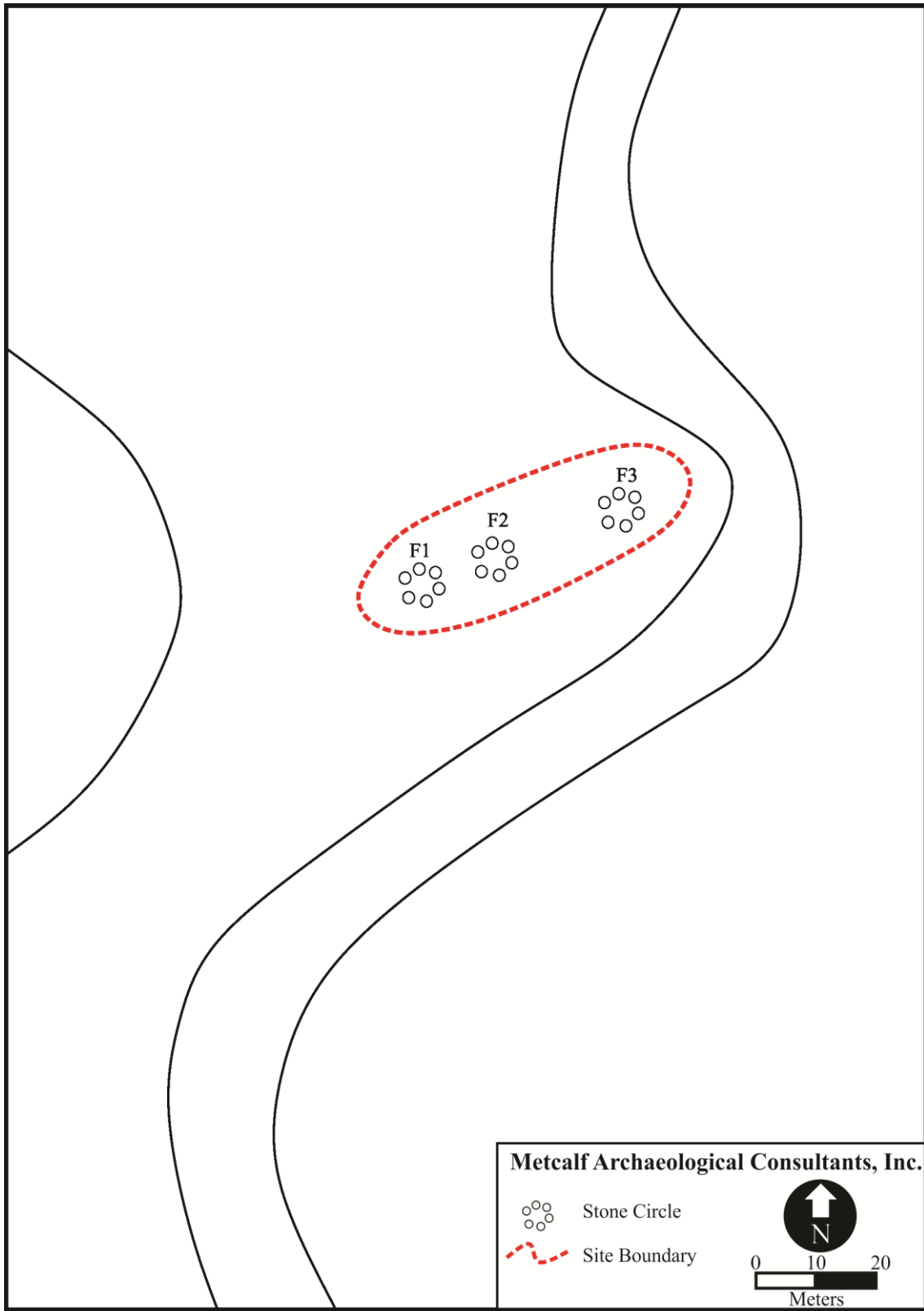


Figure 10: Sketch of 32MZ2351.



**Figure 11: View to the northeast over 32MZ2351 (Image 4-4-256).
Feature 1 is in the foreground.**

32MZ2352

Site 32MZ2352 consists of a square, single-coursed, rough-laid cobblestone foundation (Appendix C: Map 15, Figures 12-13). The foundation is approximately 20 feet north-south by 20 feet east-west. Individual stones measure approximately 30 to 70cm in diameter. The northern and southern walls of the foundation are barely discernible and cattle have disturbed the western and eastern walls. No superstructure or structural remnants are present. No cultural material was observed.

The site lacks integrity of design, workmanship, and materials as the superstructure has been removed and the foundation has been obscured by overgrowth. In addition, plowing and erosion have impacted the site boundaries. Significance, as specified in the NRHP guidelines, requires integrity of multiple factors, including but not limited to design, materials, and workmanship. This site is recommended as not eligible for the NRHP given the lack of integrity which precludes the potential to yield information important in history.

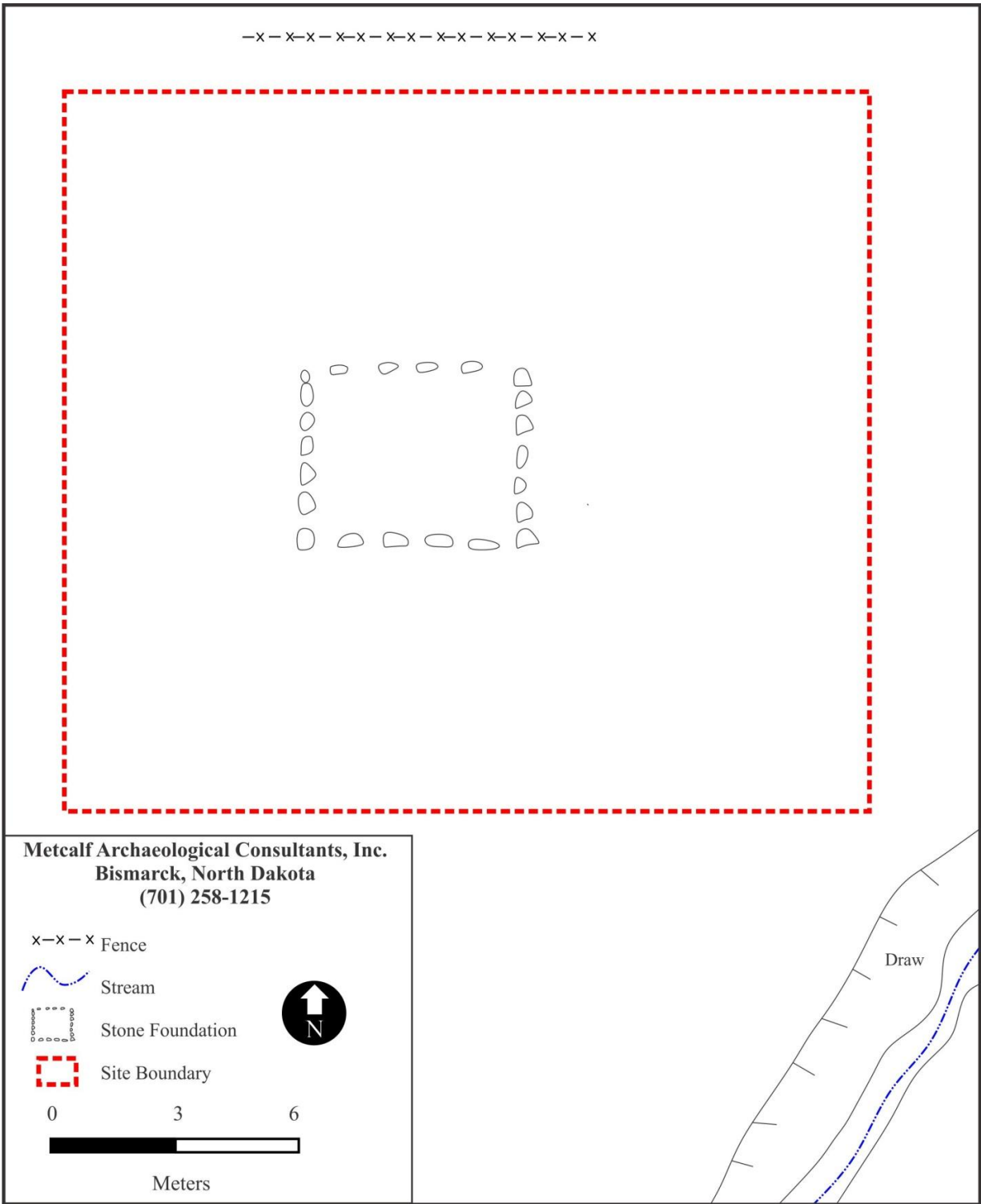


Figure 12: Sketch of 32MZ2352.



Figure 13: View to the east over 32MZ2352 (Image 4-5-12-1).

32MZ2353

Site 32MZ2353 consists of a single cairn on top of a small but prominent knoll or ridge (Appendix C: Map 18A, Figures 14-15). A small draw runs south of the site and a road lies to the north. The cairn is composed of 22 well-sodded and lichen-covered granite rocks and the feature is slightly mounded. The feature measures approximately one meter by half a meter. No cultural material was observed. The site has only been impacted by erosion and appears to retain integrity.

The site has not been evaluated for the NRHP but cairns are known to have served a multitude of purposes including capping caches and burials. Until it is evaluated, avoidance is recommended. The site lies approximately 30 meters (100 feet) from the centerline, outside the construction right-of-way, and will not be impacted by this undertaking. To help ensure this, fencing is recommended.

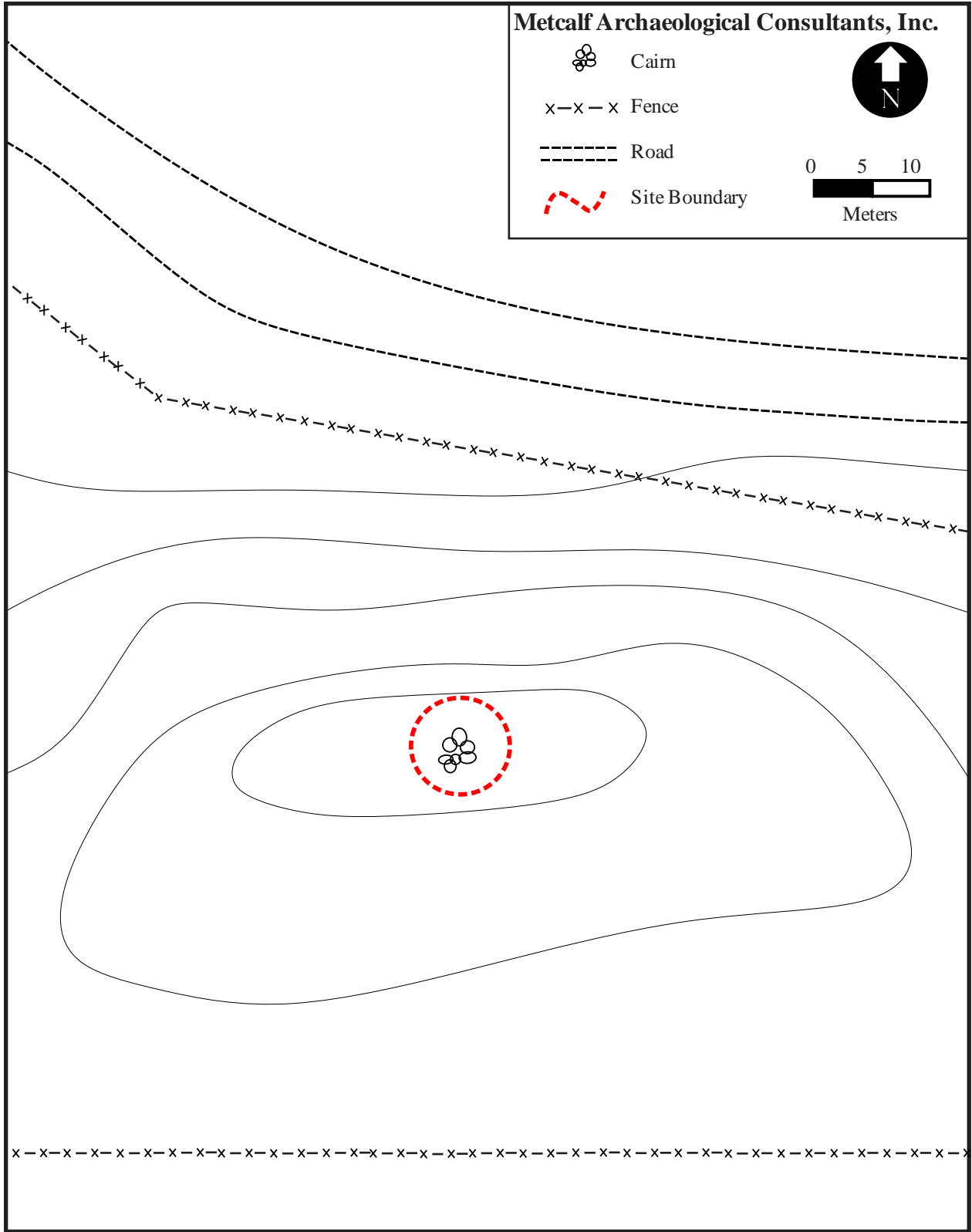


Figure 14: Sketch of 32MZ2353.



Figure 15: View to the west over the cairn at 32MZ2353 (Image 4-10-267).

32MZ2354

Site 32MZ2354 consists of a single depression approximately one and a half meters in diameter and 20cm deep (Appendix C: Map 21, Figures 16-17). The depression is situated at the edge of the Little Missouri Valley and has an expansive view to the south. This feature may be an eagle trapping pit. No cultural material was observed. The site retains excellent integrity; the only impact has been from erosion. The eligibility of the site has not been determined so the site should be avoided. The site was recorded within an 80-acre block, surveyed to allow ample room for planning the route. The site lies approximately 300 meters from (984 feet) the centerline as currently planned and will not be impacted by construction. No additional avoidance measures are recommended.

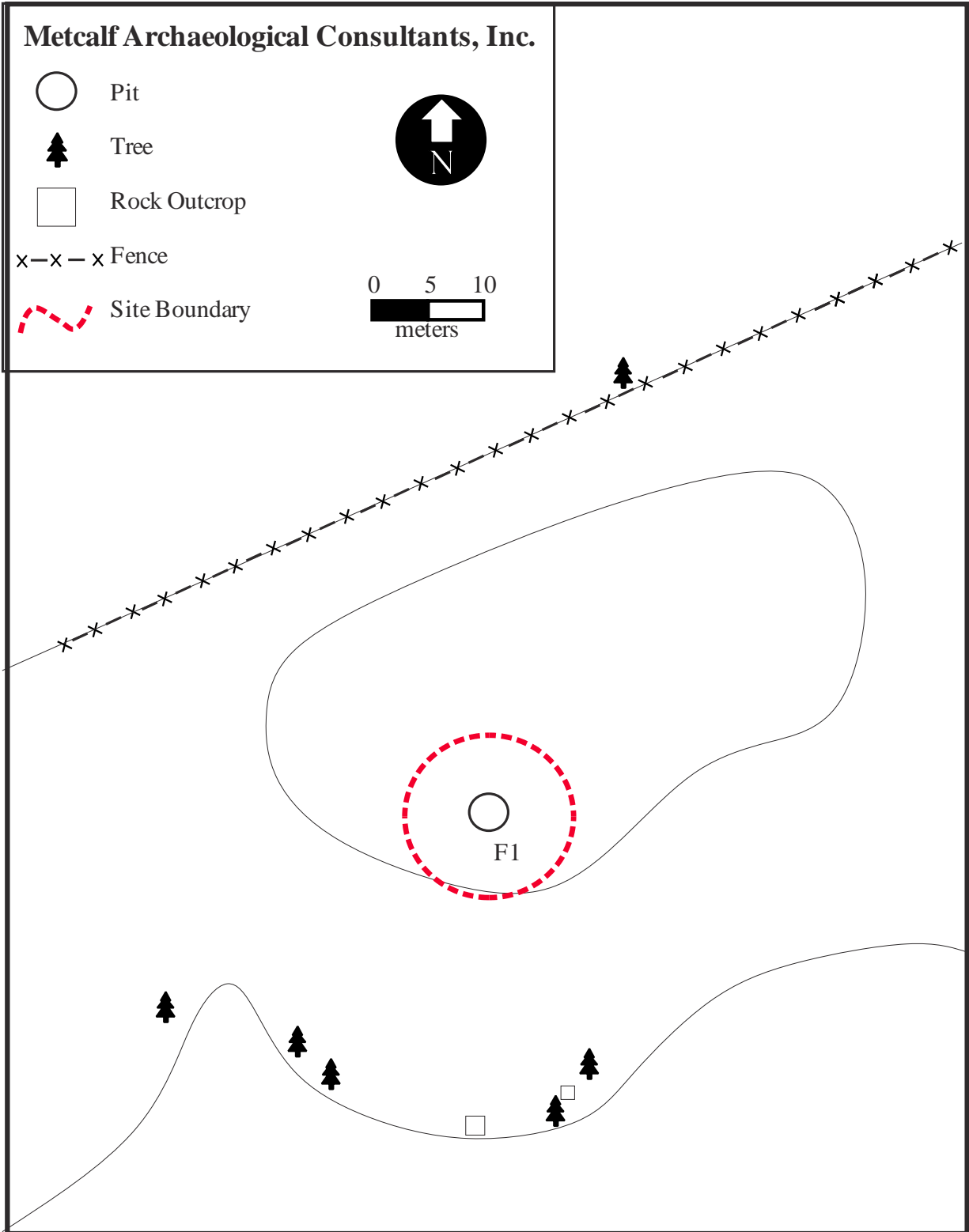


Figure 16: Sketch of 32MZ2354.



Figure 17: View to the north over the depression at 32MZ2354 (Image 4-17-278).

32MZ2355

Site 32MZ2355 consists of a dugout that is 13 feet in diameter and approximately three feet deep (Appendix C: Map 20, Figures 18-19). A boulder is on the east edge and a few pieces of cast iron, probably the remains of a stove, were observed at the bottom. The feature is partially filled; no superstructure or other building materials remain, and no cultural material was observed in the surrounding area. While the site retains integrity of location and setting, it lacks integrity of design, setting, materials, workmanship, feeling, and association. Dugouts are a common feature type across North Dakota and this feature is not in any way distinctive. This site is recommended as not eligible for inclusion on the NRHP and no further work is recommended.

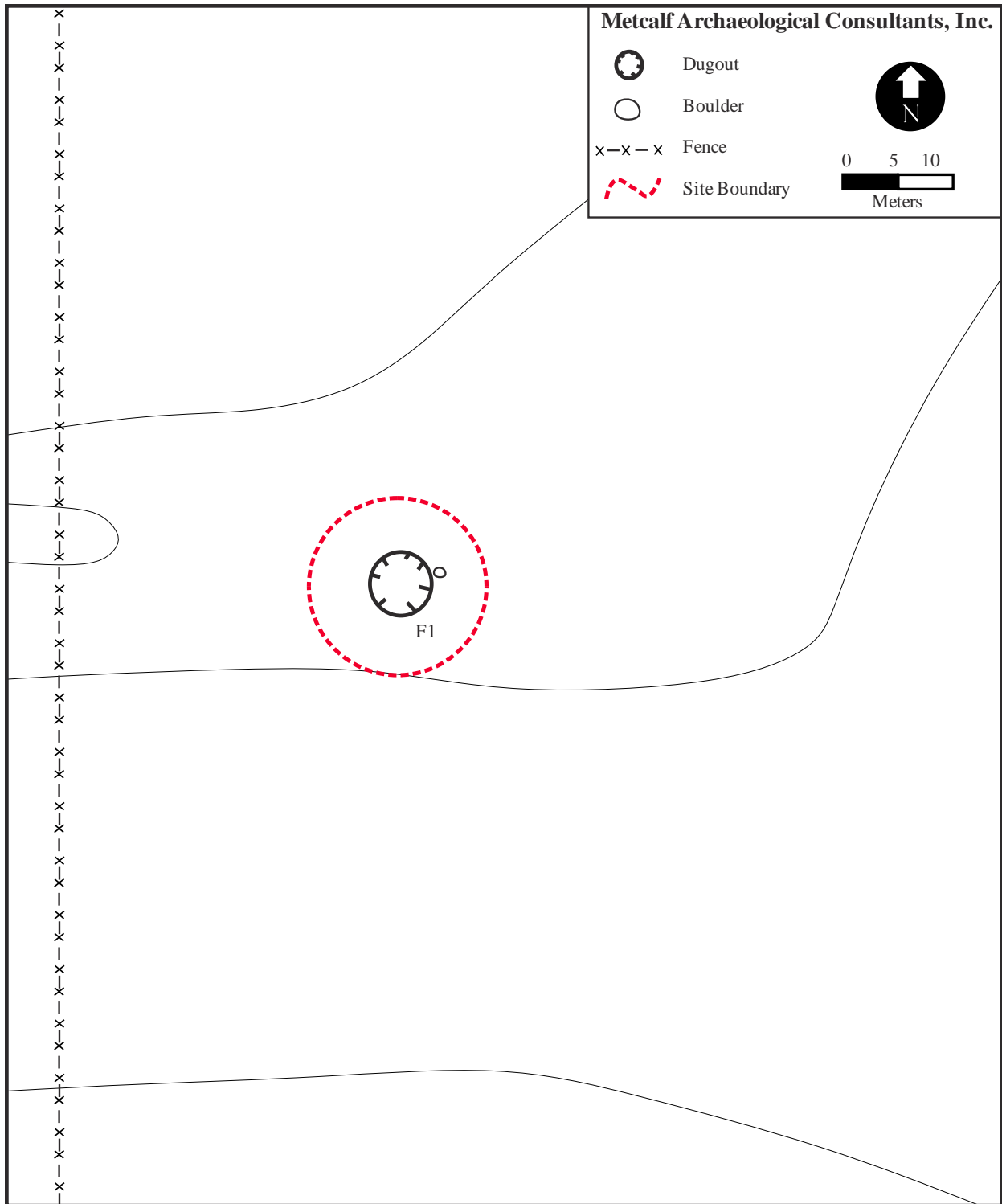


Figure 18: Sketch of 32MZ2355.



Figure 19: View to the west over the feature and the site area at 32MZ2355 (Image 4-17-285).

32MZ2356

Site 32MZ2356 is located on the rim of the Little Missouri Valley with land dropping away steeply to the south (Appendix C: Map 21, Figures 20-21). The site was initially defined based on artifacts observed eroding out of the cutbank at the edge of the valley rim. Subsequently, shovel probes were excavated to determine how far back (north) from the valley rim the site extends.

Seventeen shovel probes in two transects were excavated. One transect was along the centerline of the proposed pipeline, the other was perpendicular to the first. Probes were located at 10 meter intervals. Nine probes were positive, producing between one and 12 artifacts each. The profiles consist of up to 50cm of Holocene soils, with artifacts generally in the upper 20cm, but sometimes deeper. The probes indicate that the site extends approximately 70 meters north of the edge of the valley.

Surface artifacts include 15 pieces of debitage; all are KRF and comprise six secondary and nine tertiary flakes. Artifacts recovered from shovel probes include: one KRF biface fragment, one bone (tooth) fragment, one fire-cracked rock (in three pieces), 38 KRF flakes, two chalcedony flakes, and one porcellanite flake.

The site appears to have integrity of setting and association. Although erosion has impacted the southern edge of the site, the shovel probes indicate that soils are generally thin but intact and

that they contain cultural deposits. Eligibility has not been determined but the subsurface probing indicates that intact cultural material is present. Additional subsurface investigation is required to determine whether these deposits can yield information important to prehistory. Construction should avoid the site. The site is located near a terminus of a proposed horizontal directional drill (HDD) and this area is not scheduled for any open trench work, thus the undertaking will not impact the site. To help ensure this, fencing of the site is recommended.

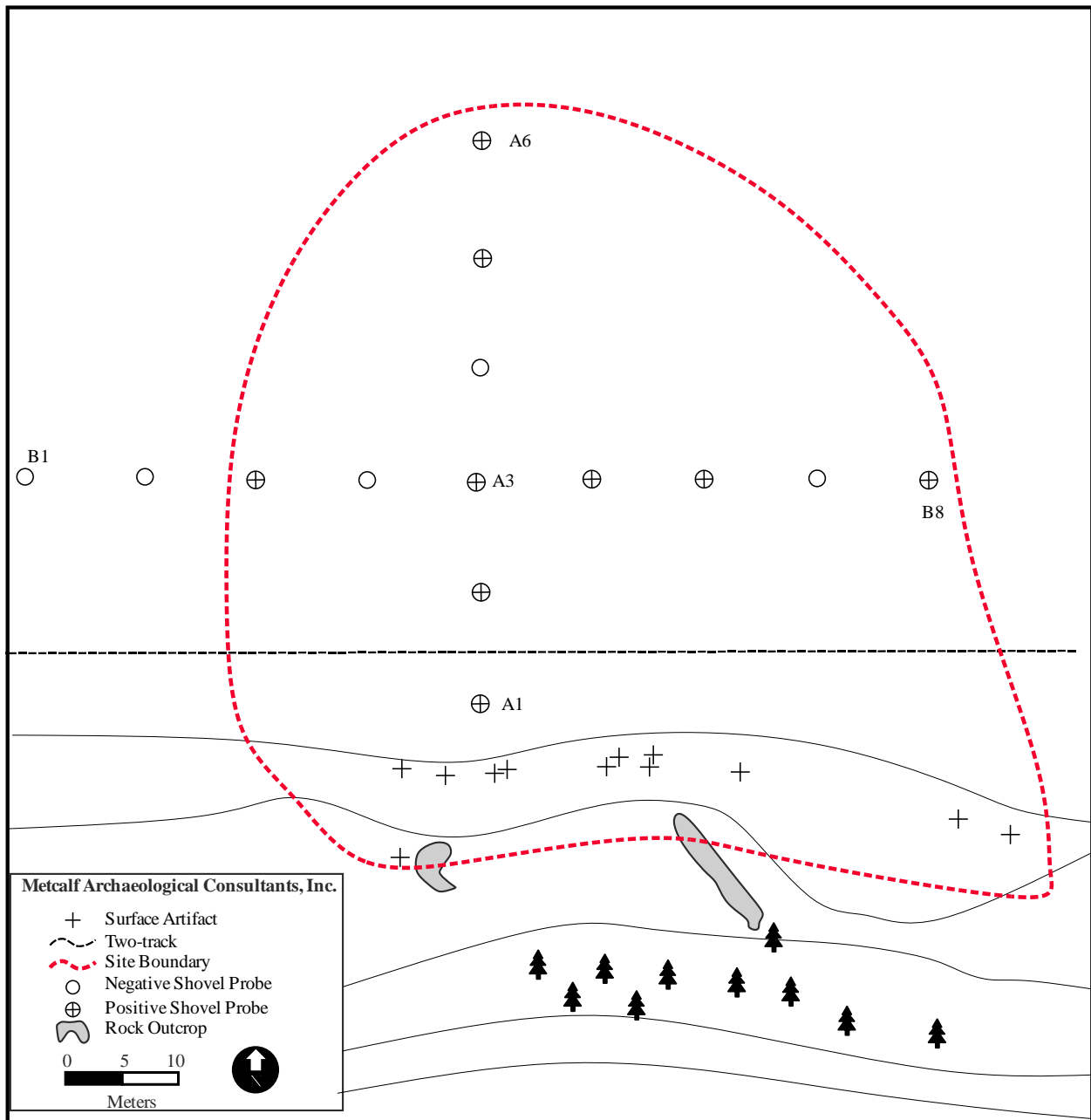


Figure 20: Sketch of 32MZ2356.



Figure 21: View to the south over the “A” line shovel probes at 32MZ2356 (Image 5-1-12-306).

32MZ2357

Site 32MZ2357 is a sparse lithic scatter with medium dense concentrations situated on a small ridge overlooking two seasonal drainages (Appendix C: Map 26, Figures 22-23). Observed cultural materials include: two pieces of KRF shatter, one KRF primary flake, eight KRF secondary flakes, 16 KRF tertiary flakes, one grey silicified sediment (not TRSS) tertiary flake, one quartzite tertiary flake, one KRF manuport/unmodified cobble, one broken KRF end scraper, and one bone fragment. The site is largely undisturbed and retains integrity. The eligibility of the site has not been evaluated, however, it may have buried cultural deposits. Subsurface testing is necessary to assess site significance and eligibility for the NRHP. Until significance has been determined, the site should be avoided. The site is located approximately 60 meters (200 feet) from centerline, and construction should not impact the site. To ensure this, the site should be fenced prior to construction.

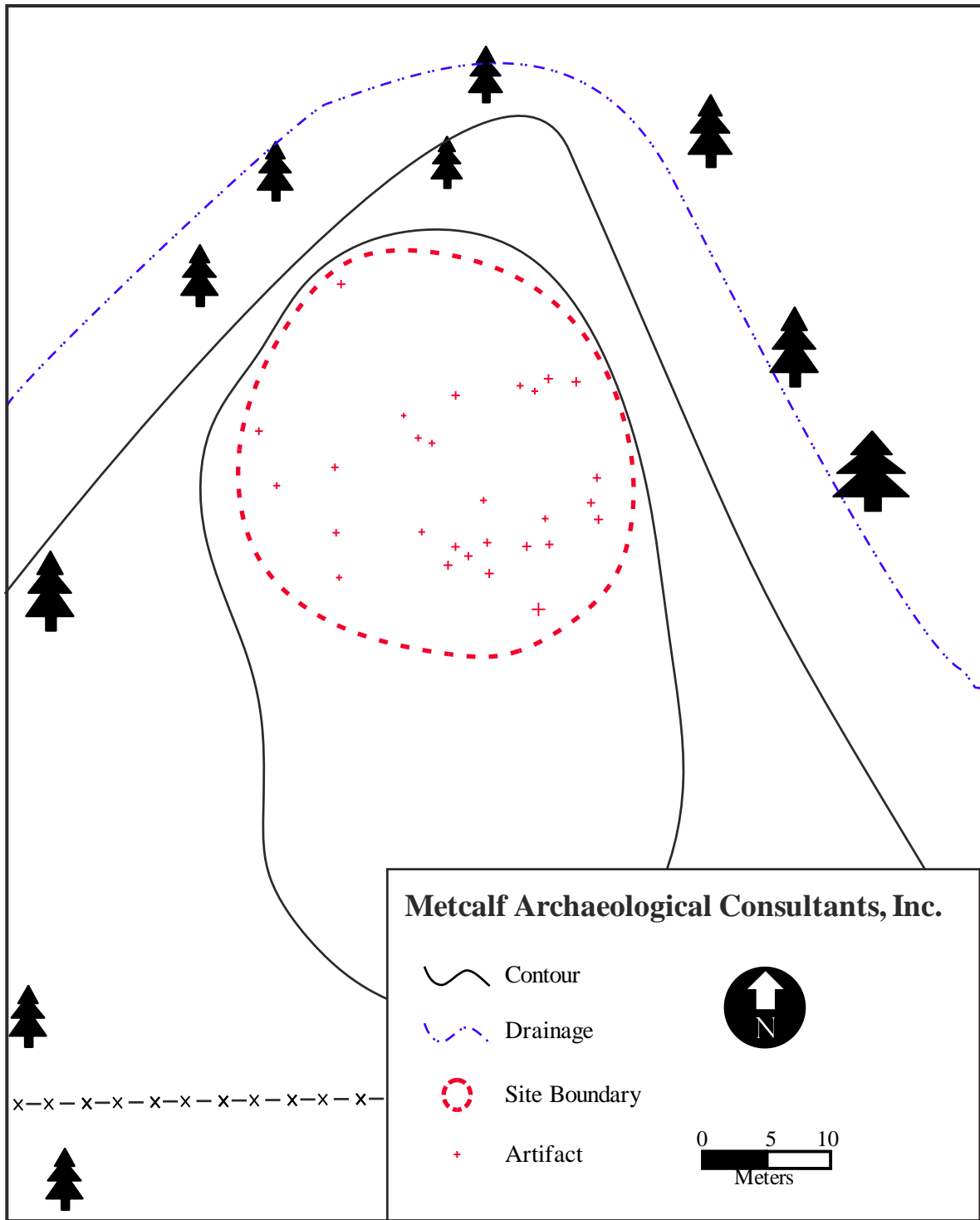


Figure 22: Sketch of 32MZ2357.



Figure 23: View to the east of 32MZ2357 (Image 5-1-ES-316).

32MZ2358

Site 32MZ2358 is a sparse lithic scatter observed in a series of blowouts in lowlands (Appendix C: Map 26, Figure 24-25). Holocene soil is thin and patchy and where present, is approximately 5 to 15cm thick with hard pan below. The site probably extends to the southwest but due to project constraints was not fully investigated in that direction. Two projectile point fragments and an un-notched triangular point suggest the site is Plains Village. Observed artifacts include: seven pieces of shatter, five primary flakes, 13 secondary flakes, 28 tertiary flakes, one unifacially worked flake tool, two core fragments, two arrowhead-sized point fragments, and one un-notched triangular point. Site integrity has been compromised by erosion, as evidenced by the presence of numerous blowouts and sheet-wash from adjacent rises. The eligibility of the site has not been evaluated. Subsurface testing is needed to evaluate significance and integrity. The site should be avoided until its significance is determined. The site is approximately 45 meters (150 feet) off the centerline and will not be impacted by this undertaking.

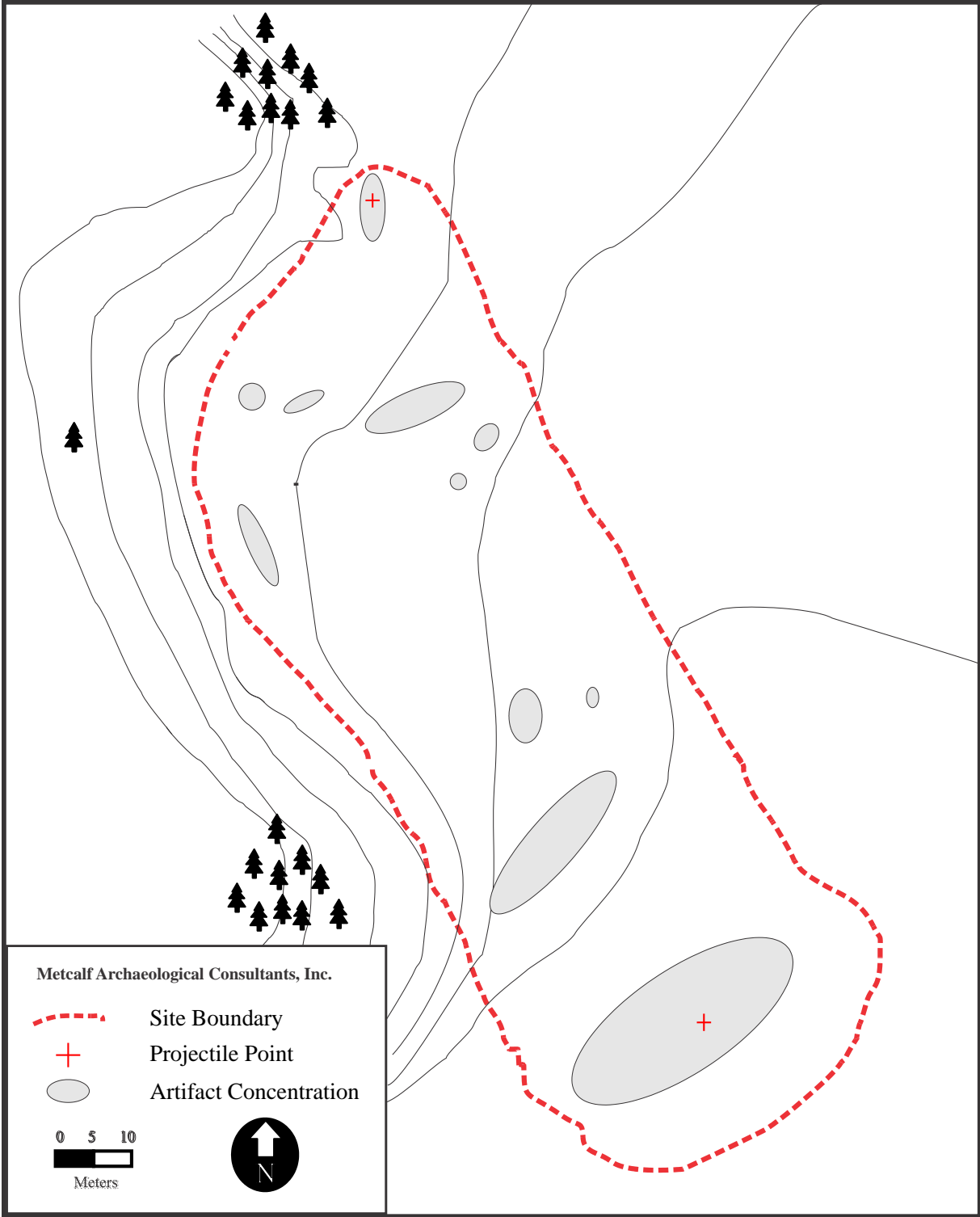


Figure 24: Sketch of 32MZ2358.



Figure 25: View to the north over 32MZ2358 (Image 5-1-ES-317).

32MZ2359

Site 32MZ2359 consists of a sparse lithic scatter at the base of a five to seven meter, east-facing slope and most artifacts were observed at the base of this slope (Appendix C: Map 26, Figures 26-27). Observed artifacts include: eight pieces of shatter, six primary flakes, nine secondary flakes, and 25 tertiary flakes. All but four of the artifacts are KRF. Tools include: one complete early stage biface, one mid-stage biface fragment, three retouched flakes, and three utilized flakes. All tools are KRF. Numerous blowouts with hardpan are present and the Holocene mantle is discontinuous. Where present, topsoil appears to be about 10 to 20cm deep. Whether the cultural material has washed out of the rise and re-deposited from on-going slumping of the rise or is more or less *in situ* is unclear. Recent slumping along the adjacent rise is evident and on-going. Erosion has compromised integrity but sufficient integrity may remain for NRHP eligibility. Testing may reveal intact cultural deposits. Subsurface testing is necessary to fully assess integrity and eligibility. Until significance is determined, the site should be avoided. The site lies immediately west of the proposed centerline. The site can be avoided by necking down and fencing the site.

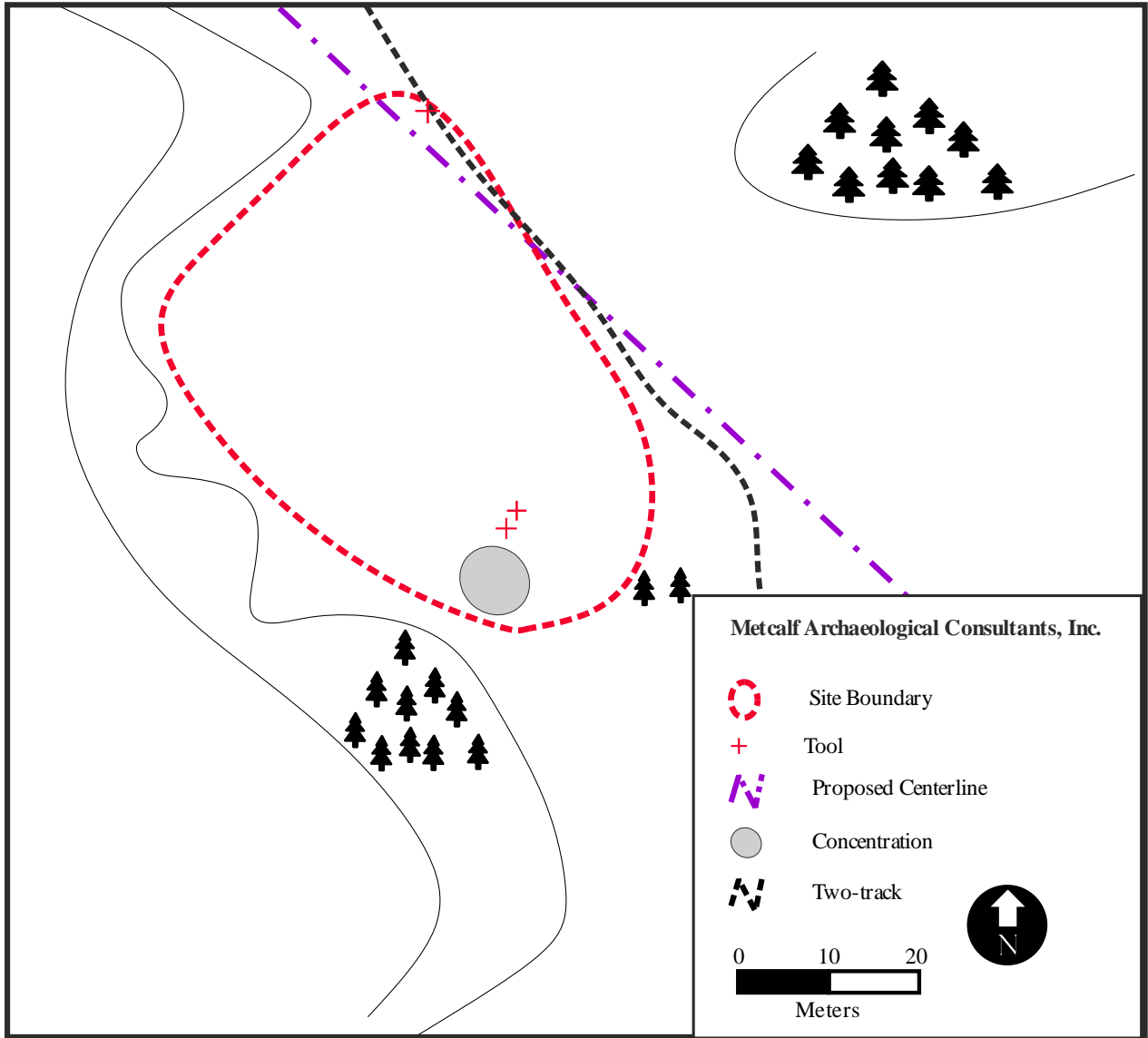


Figure 26: Sketch of 32MZ2359.



Figure 27: View to the east of 32MZ2359 (Image 5-1-ES-322).

32MZ2360

Site 32MZ2360 is located on a ridge near the head of a draw in the Little Missouri badlands (Appendix C: Map 20, Figures 28-29). The site consists of three eagle trapping pits. Features 1 and 2 are roughly oval and measure approximately two meters north-south by one meter east-west and 20cm deep. Feature 3 is roughly circular, approximately one and a half meters in diameter, and 15cm deep. No cultural material was observed. The site retains integrity of location and setting. The only disturbance has been some in-filling of the features. Eligibility has not been determined but the site may be important to area tribes. Construction should avoid the site. A reroute to the west of the site has been surveyed. To ensure the site is avoided, it should be fenced prior to construction.

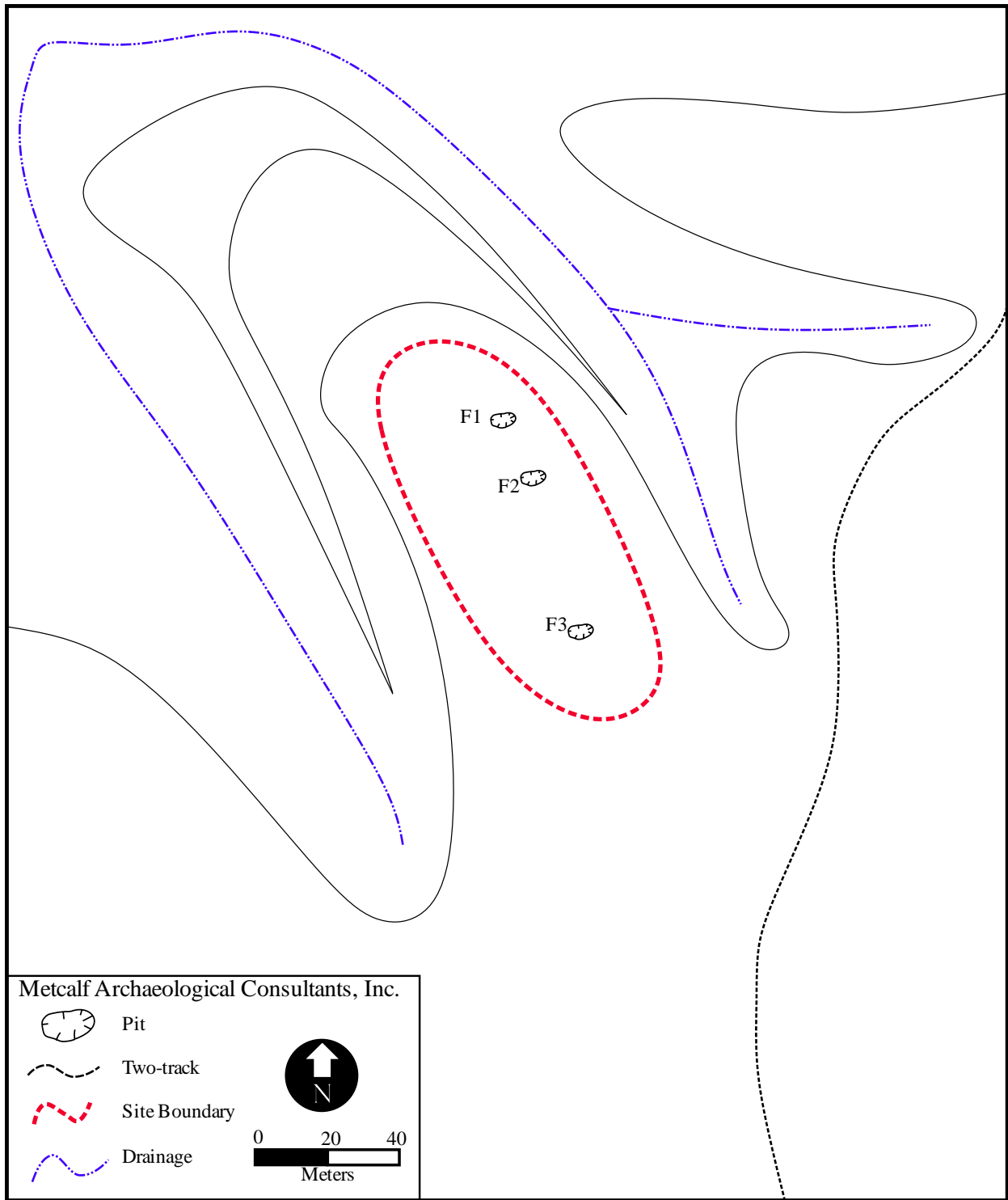


Figure 28: Sketch of 32MZ2360.



**Figure 29: Feature 1 at 32MZ2360, view to the north
(Image 5-15-12-52).**

Other

32WI2164 AND 32WI2167

Sites 32WI2164 and 32WI2167 were recorded after MAC's initial files search and not encountered during the survey as reported in Kulevsky and Stine 2012. On April 12, 2012, MAC personnel and Merv Floodman, the USFS Little Missouri Grasslands archaeologist, visited these sites.

One of these sites, 32MZ2164, was described as having two stone features. One feature is a rock alignment consisting of an unknown number of rocks forming a straight line approximately 22 meters long and running southwest to northeast. The other is an arc of nine stones forming what was described as a well-defined half-circle (See NDCRS Site Form by Shropshire and House 2010). Neither feature could be relocated. MAC recommends no further work at this location.

The other site, 32MZ2167, consists of a single stone circle. The circle was easily relocated and lies approximately 150 feet from the centerline and therefore, 50 feet outside the survey corridor and 100 feet outside the construction corridor. The site will not be impacted by this undertaking.

32MZ1311

Shovel probes were excavated at the edge of the landform on which 32MZ1311 is located. The site was most recently documented in Kulevsky and Stine 2012. Four probes were excavated; three produced five microflakes in mixed colluvial-eolian deposits typical of slope wash deposition. Because these artifacts are believed to be secondary deposits, the area where these flakes were recovered is thought to be a non-contributing portion of the site and MAC recommends that construction can proceed without negative impact to the site.

32MZ1473

Site 32MZ1473 lies within an area scheduled for HDD and will therefore not be impacted by this undertaking (Appendix C: Map 23) and was not investigated.

32WI1238

Site 32WI1238 was recorded earlier in this project (Appendix C: Map 4, Figures 30-31). The site is on State School Lands and because of restrictions, the pipeline company wishes to route the pipeline between the two features. Eight shovel probes were therefore excavated to determine whether significant cultural deposits exist between the two features. Three probes were placed in a transect between the two features and five probes were placed in a transect perpendicular to the first. Shovel probes 2 and 7 yielded three pieces of debitage consisting of two KRF flakes and one Swan River chert flake. The probes indicate that the Holocene soil ranges from 9 to 20cm thick, averaging 15cm. Although artifacts are present, their frequency does not suggest the presence of significant cultural deposits between the two features. This effort was not designed to and did not test the site as a whole. The effort was to establish whether significant cultural deposits are present between the two features. While no evidence of deposits between the two features was found, the significance and eligibility of the entire site remains undetermined. Given the lack of significant cultural deposits, MAC recommends necking down to 25 feet, fencing the features, and having an archaeologist monitor construction.

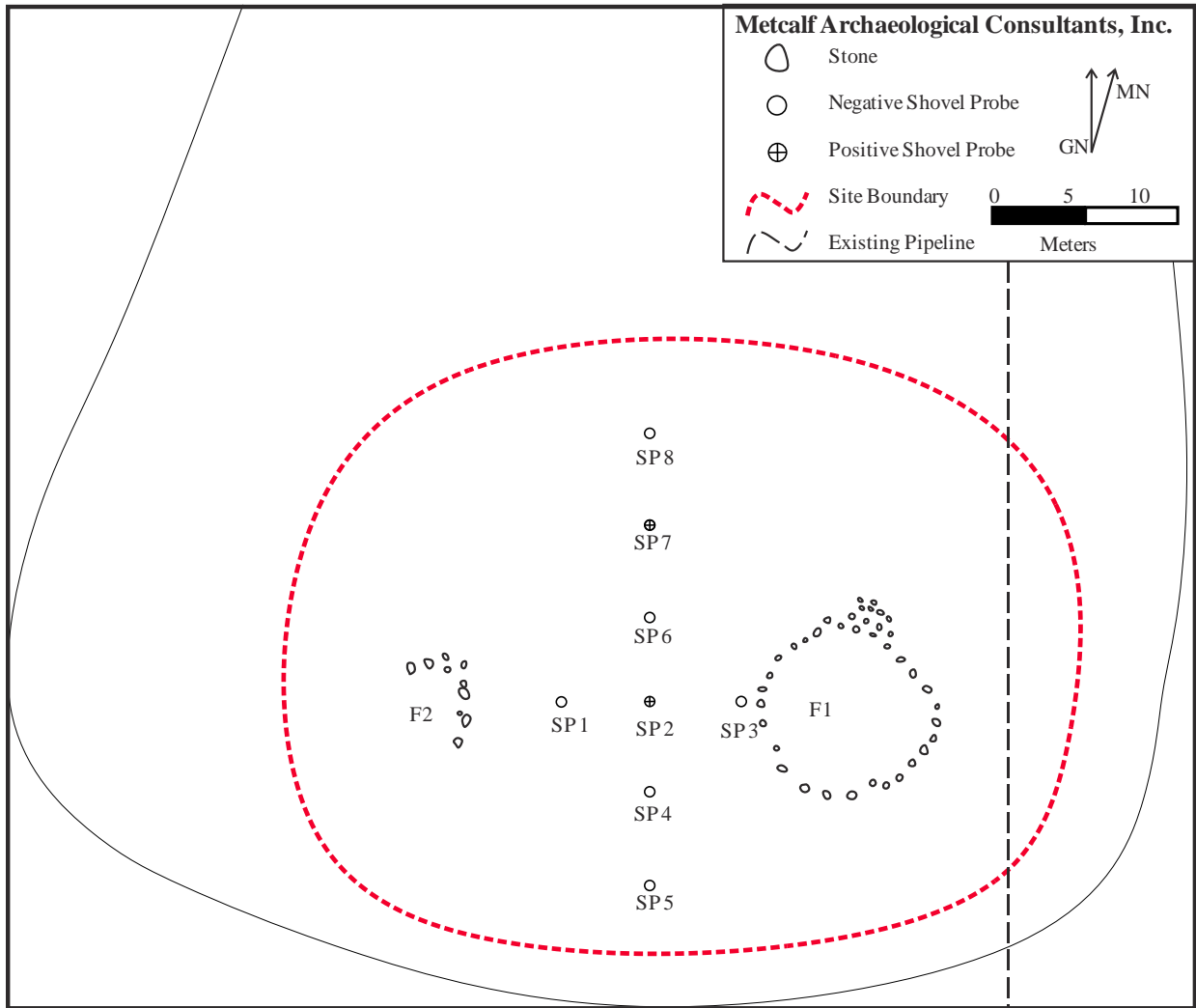


Figure 30: Sketch of 32W11238 and shovel probes.



Figure 31: View to the west of 32WI1238 and shovel probes (Image 4-17-276).

CHAPTER 4:

SUMMARY & RECOMMENDATIONS

In all, 57 cultural resources were documented during this phase of the inventory. Thirty-five are isolated finds, sixteen are prehistoric sites, and six are historic sites. Two sites that had been recorded near the current APE, after the files search, were also revisited. One site, 32WI2167, was relocated approximately 45 meters (150 feet) from the BakkenLink centerline and will not be impacted by this undertaking. The other site, 32WI2164, could not be relocated. Shovel probes were excavated at one previously recorded site, 32WI1238, to determine whether significant cultural deposits exist between two features. Shovel probes at another site, 32MZ2356, were used to determine the northern extent of the site and whether the excavations for the HDD were planned within the site area.

The isolated finds are recommended as not eligible for inclusion on the NRHP and no further work associated with these resources is recommended. Four of the historic sites are also recommended as not eligible, based primarily on a lack of integrity. One historic site, historic US Highway 85, has been previously recommended as eligible for the NRHP although no formal determination has been made and was encountered at two locations (32MZ1560 and 32BI1110). Both segments are recommended to be non-contributing elements because of their lack of integrity.

Two previously documented sites have been tested for projects not associated with this undertaking and have been found to be eligible for inclusion on the NRHP. The NRHP status of the remaining sixteen prehistoric sites has not been determined. Methods to avoid impact to all those sites have been identified. Table 4 summarizes the recommendations for cultural resources documented along the BakkenLink pipeline ROW during this phase of field work. See Appendix B for a complete listing of recommendations for all cultural resources documented during this project, including resources documented in both Kulevsky and Stine (2012) and this document.

It is MAC's understanding that the BLPL no longer intends to use the access road through the USFS Little Missouri National Grasslands in [REDACTED]. If plans change and the access road is to be used, the three sites along it should be tested prior to its use.

Provided that these recommendations are followed, a finding of *No Historic Properties Affected* (36CFR800.4[d][1]) is recommended for this undertaking as surveyed, mapped and documented herein.

Table 4: Recommendations for Cultural Resources Along the BakkenLink Pipeline						
SITS #	Temp #	Location	Site Type	NRHP Recommendation	Management Recommendation	Comments
32BI1108	MAC-BL-AK-45		Prehistoric	Undetermined	Avoid	Rerouted-the centerline is now approximately 50 meters from the site
32BI1109	MAC-BL-AK-63		Prehistoric	Undetermined	Avoid	The centerline is approximately 50 meters from the site; the undertaking will not impact the site
32BI1110	MAC-BL-DG-4		Historic	Not eligible	No further work	
32BIx907	MAC-BL-AK-46		IF	Not eligible	No further work	
32BIx908	MAC-BL-AK-47		IF	Not eligible	No further work	
32DUx944	MAC-BL-AK-55		IF	Not eligible	No further work	
32MZ1311			Prehistoric	Undetermined	Avoid	CL skirts a non-contributing portion of the site; neck down, fence, monitor
32MZ1473			Prehistoric	Undetermined	Avoid	HDD; will not be impacted
32MZ1484			Prehistoric	Elgible	Avoid	Place next to existing pipeline; fence, neck down, monitor
32MZ1647			Prehistoric	Eligible	Avoid	Stay to south edge of ROW, fence, monitor
32MZ2164			Prehistoric	Undetermined	No further work	Not relocated
32MZ2167			Prehistoric	Undetermined	Avoid	The centerline is approximately 45 meters from the site; the undertaking will not impact the site
32MZ2350	MAC-BL-AK-48		Historic	Not eligible	No further work	
32MZ2351	MAC-BL-AK-49		Prehistoric	Undetermined	Avoid	Neck down, fence, monitor
32MZ2352	MAC-BL-AK-50		Historic	Not eligible	No further work	
32MZ2353	MAC-BL-AK-54		Prehistoric	Undetermined	Avoid	The centerline is approximately 30 meters from the site; fence
32MZ2354	MAC-BL-AK-56		Prehistoric	Undetermined	Avoid	Approximately 300 meters from centerline; will not be impacted
32MZ2355	MAC-BL-AK-57		Historic	Not eligible	No further work	
32MZ2356	MAC-BL-AK-59		Prehistoric	Undetermined	Avoid	At HDD; fence
32MZ2357	MAC-BL-AK-73		Prehistoric	Undetermined	Avoid	Approximately 60 meters from centerline; will not be impacted
32MZ2358	MAC-BL-AK-74		Prehistoric	Undetermined	Avoid	Approximately 45 meters from centerline; will not be impacted
32MZ2359	MAC-BL-AK-75		Prehistoric	Undetermined	Avoid	Neck down/fence
32MZ2360	MAC-BL-AK-90		Prehistoric	Undetermined	Avoid	Avoidance route surveyed adjacent to site; fence, neck down, monitor
32MZ2361	MAC-BL-BB-1		Historic	Not eligible	No further work	

Table 4: Recommendations for Cultural Resources Along the BakkenLink Pipeline						
SITS #	Temp #	Location	Site Type	NRHP Recommendation	Management Recommendation	Comments
32MZx1204	MAC-BL-AK-58		IF	Not eligible	No further work	
32MZx1205	MAC-BL-AK-60		IF	Not eligible	No further work	
32MZx1206	MAC-BL-AK-61		IF	Not eligible	No further work	
32MZx1207	MAC-BL-AK-64		IF	Not eligible	No further work	
32MZx1208	MAC-BL-AK-65		IF	Not eligible	No further work	
32MZx1209	MAC-BL-AK-66		IF	Not eligible	No further work	
32MZx1210	MAC-BL-AK-67		IF	Not eligible	No further work	
32MZx1211	MAC-BL-AK-68		IF	Not eligible	No further work	
32MZx1212	MAC-BL-AK-69		IF	Not eligible	No further work	
32MZx1213	MAC-BL-AK-70		IF	Not eligible	No further work	
32MZx1214	MAC-BL-AK-71		IF	Not eligible	No further work	
32MZx1215	MAC-BL-AK-72		IF	Not eligible	No further work	
32MZx1216	MAC-BL-AK-76		IF	Not eligible	No further work	
32MZx1217	MAC-BL-AK-77		IF	Not eligible	No further work	
32MZx1218	MAC-BL-AK-78		IF	Not eligible	No further work	
32MZx1219	MAC-BL-AK-79		IF	Not eligible	No further work	
32MZx1220	MAC-BL-AK-80		IF	Not eligible	No further work	
32MZx1221	MAC-BL-AK-81		IF	Not eligible	No further work	
32MZx1222	MAC-BL-AK-82		IF	Not eligible	No further work	
32MZx1223	MAC-BL-AK-83		IF	Not eligible	No further work	
32MZx1224	MAC-BL-AK-84		IF	Not eligible	No further work	
32MZx1225	MAC-BL-AK-85		IF	Not eligible	No further work	
32MZx1226	MAC-BL-AK-86		IF	Not eligible	No further work	
32MZx1227	MAC-BL-AK-91		IF	Not eligible	No further work	
32MZx1228	MAC-BL-DG-1		IF	Not eligible	No further work	
32MZx1229	MAC-BL-DG-2		IF	Not eligible	No further work	
32MZx1230	MAC-BL-DG-89		IF	Not eligible	No further work	
32MZx1231	MAC-BL-DG-90		IF	Not eligible	No further work	
32SKx349	MAC-BL-AK-51		IF	Not eligible	No further work	
32SKx350	MAC-BL-AK-52		IF	Not eligible	No further work	
32SKx351	MAC-BL-AK-53		IF	Not eligible	No further work	
32WI1238	MAC-BL-AK-38		Prehistoric	Undetermined	Avoid	No evidence of significant cultural deposits between the features; neck down, fence features, monitor
IF = Isolated Find						

REFERENCES CITED

Allen, W. E.

1983 Eagle Trapping Along the Little Missouri River. *North Dakota History*. Vol. 50, No. 1. Pp 4-22.

Bowers, A.

2004 *Mandan Social and Ceremonial Organization*. University of Nebraska Press. Lincoln.

Gregg, Michael L., Cynthia Kordecki, David D. Kuehn, and Kenneth Vander Steen

1985 Southwest Pipeline Archeology: Initial Survey of Selected Tracts. Prepared for the North Dakota State Water Commission, Bismarck. Prepared by the University of North Dakota Archeological Research, Department of Anthropology, University of North Dakota, Grand Forks. Manuscript on file at the State Historical Society of North Dakota.

Hiemstra, D

2006 Grassy Butte Testing and Survey: A Cultural Resource Evaluation of 3 Sites and 1 Site Lead and A Cultural Resource Inventory of Access Roads and Realignment for the Proposed Rebuild of WAPA's Williston to Charlie Creek 115 kV Transmission Line in McKenzie County, North Dakota .

Howard, J. H.

1954 Yanktonai Dakota Eagle Trapping. *Southwestern Journal of Anthropology*. Vol. 10, No. 1, Pp 69-74.

State Historical Society of North Dakota (SHSND)

2006 *North Dakota SHPO Guidelines Manual for Cultural Resource Inventory Projects*. <http://history.nd.gov/hp/PDFinfo/ND%20SHPO%20Guidelines%20Manual.pdf>.

Wilson, G. L.

1928 Hidatsa Eagle Trapping. *Anthropological Papers of the American Museum of Natural History*. Vol. 30, Pt. 4, pp. 99-245.

Appendix A

Geoarchaeology Results: Shovel Probes

By Debra Green

Sediments and soils contain different, but complementary, information about the history of the BakkenLink landscapes. Although sediments and soils are created by different surficial processes, each term is often confused and misused. Sediments are unconsolidated particles that have been eroded from a location on the landscape, physically transported, and deposited to another location. The accumulation of sediment is indicative of unstable landscapes. Soils, in contrast, form in pre-existing sediments. As a surficial process, soil formation is dependent on climatic conditions favoring stable landscapes where mechanical and chemical weathering can alter the sedimentary deposit or bedrock into a vertical sequence of distinctive soil horizons.

Knowledge of the sediment-soil distributions in the project area is essential for assessing the potential for buried cultural resources. Information gleaned from geologic maps provides the baseline information necessary to determine different landform ages, environmental contexts of the sedimentary deposits, and the textural properties that can yield valuable information to evaluate the potential for *in situ* buried archaeological sites. Identifying the distribution of soil types provides a relative time marker and a greater surficial landscape resolution particularly on diverse depositional environments. The development of late Pleistocene-Holocene soils is contingent on the complex history of alluvial, colluvial, and eolian sedimentation, time, and climate. Thus, differential distributions of soils are indicators of landscape stability and are markers to identify in the field for the potential of intact buried archaeological sites in the diverse settings of the project area.

A total of twenty-four shovel probes (SP) were placed on ridges and small knolls that comprised a segment of the BakkenLink pipeline along the Forest Service access road. All but one of the probes was within the pipeline ROW. One of the shovel probes (SP13) was placed outside of the ROW next to the two-track access road where an isolated KRF flake was found. SP13 was dug to determine if buried cultural materials existed within the vicinity of the isolated flake. Shovel probes were labeled sequentially (SP1-SP21; SP4a-SP4d) and GPS points taken at each location. Geoarchaeological descriptions of the soil-sediment characteristics were conducted for each shovel probe and followed standard soil procedures including color, structure, consistence, texture, carbonate morphology, and horizon boundaries (Soil Survey Staff 1993; Birkeland 1999).

The results of the shovel probes indicate that the landforms within this segment of the pipeline ROW are mantled by a thin (10-20cm thick) eolian deposit (eolian I) overlying soft calcareous residuum bedrock (residuum I). The typical pedon profile for the APE consists of a dark brown (10YR2/2) to very dark brown (10YR3/2) fine sandy loam A horizon (0-10cm) with weak granular structure and an abrupt, smooth boundary. Underlying the eolian unit is a dark yellowish brown (10YR4/4) to pale brown (10YR6/3) fine loamy sand Ck or Cr horizon residuum soil derived from the soft calcareous sandstone bedrock of the Tertiary age Sentinel Butte Formation.

In SP4a, SP4b, SP5, SP6, the soil-sediment profile consists of a surface dark grayish brown (10YR3/1) silt loam A horizon (0-10cm) overlying a thin (5-10cm thick) brown (10YR5/3) to yellowish brown (10YR5/6) subsurface silt loam Bw horizon. The Bw horizon has a weak, fine, sub-angular, blocky structure with an abrupt, smooth boundary. Underlying the loess is the residuum soil derived from the soft calcareous sandstone. The soil formed in loess derived sediments on the shoulder segments of ridges and may represent remnants of the late Pleistocene-Holocene Oahe loess Formation (Clayton et al. 1976).

The potential for *in situ* buried cultural materials within the pipeline ROW along the Forest Service access road is low. The soils in most of the APE are residuum derived from Tertiary sandstone bedrock and are too old to contain buried archaeological materials. Only four shovel probes were positive for artifacts. Shovel probes SP4a, SP14, SP15, and SP21 all contained one KRF microflake within the upper 10cm of the soil profile. SP14, SP15, SP20, and SP21 are on a north sloping foot slope below site 32MZ1311.

The micro-size artifacts found in the four shovel probes were observed in colluvial-eolian mixed A horizons on the foot slope of the ridges. The colluvial-eolian sediments consisted of pea size angular platy sandstone and mudstone pebbles. The sediments are poorly-sorted in comparison to the eolian sediments that mantle the ridge tops and are typical of slope wash deposition. The eolian mantle has the potential to yield buried cultural materials, however the soils are shallow ranging in depth from 5-20cm in thickness. The weak development of the B horizon suggests that the eolian sediments are late Holocene in age.

Shovel Probe	Total Depth (cm)	Horizon Sequence	Unit	Soil Description
SP1	38	A-Cr	residuum	0-23cm A- (10YR2/2) very dark brown; sandy loam; weak fine granular structure, well sorted; abrupt smooth boundary; 23-38cm Cr- (10YR4/4) dark yellowish brown loamy sand; fine-grained decomposing bedrock.
SP2	30	A-Cr	eolian I	0-10cm AC (10YR5/3) brown; silty clay; massive structure; abrupt smooth boundary; 10-30cm Cr- (10YR4/4) dark yellowish brown loamy sand; fine-grained; few fine carbonate filaments decomposing bedrock.
SP3	27	A-Cr	residuum	0-13cm A- (10YR3/2) brown; sandy loam; weak fine granular structure, coarse-grained, moderately sorted; abrupt smooth boundary; 13-27cm Cr- (10YR7/1) light gray loamy sand; fine-grained decomposing bedrock.
SP4a	49	A-Bw-C	eolian - colluvial	0-23cm A- (10YR2/2) very dark brown silt loam; weak granular structure; few angular pebbles; abrupt smooth boundary; 23-36cm Bw- (10YR4/3) dark brown silt loam; weak fine sub-angular blocky structure; abrupt smooth boundary; 36-49cm C- (10YR4/4) dark yellowish brown loamy sand; fine-grained massive structure.

Table 1: Descriptions of Shovel Probe Soil Profiles				
Shovel Probe	Total Depth (cm)	Horizon Sequence	Unit	Soil Description
SP4b	44	A-Bw-C	eolian I	0-12cm A- (10YR2/2) very dark brown silt loam; weak granular structure; abrupt smooth boundary; 12-23cm Bw- (10YR4/3) dark brown silt loam; weak fine sub-angular blocky structure; abrupt smooth boundary; 23-44cm C- (10YR5/3) brown clay loam fine-grained, massive structure.
SP4c	39	A-C	eolian I	0-22cm A- (10YR3/3) dark brown silt loam; weak granular structure; abrupt smooth boundary; 22-39cm C- (10YR5/3) brown sandy loam fine-grained decomposing bedrock.
SP4d	35	A-Cr	eolian - colluvial	0-13cm A- (10YR2/2) very dark brown sandy loam; weak granular structure; few angular pebbles; abrupt smooth boundary; 13-35cm C- (10YR4/4) dark yellowish brown loamy sand; fine-grained decomposing bedrock.
SP5	33	A-Bw-Cr	eolian I	0-12cm A- (10YR4/2) very dark brown silt loam; weak granular structure; abrupt smooth boundary; 12-21cm Bw- (10YR4/4) dark yellowish brown silt loam; weak fine sub-angular blocky structure; abrupt smooth boundary; 21-33cm C- (10YR5/3) brown loamy sand; fine-grained decomposing bedrock.
SP6	33	A-Bw-Cr	eolian I	0-13cm A- (10YR2/2) very dark brown silt loam; weak granular structure; abrupt smooth boundary; 13-17cm Bw- (10YR4/3) dark brown silt loam; weak fine sub-angular blocky structure; abrupt smooth boundary; 17-33cm C- (10YR4/4) dark brown loamy sand; fine-grained decomposing bedrock.
SP7	38	A-Cr	residuum	0-20cm A- (10YR4/3) brown; sandy loam; weak fine granular structure, well sorted; abrupt smooth boundary; 20-38cm Cr- (10YR4/4) dark yellowish brown loamy sand; fine-grained decomposing bedrock.
SP8	29	A-Cr	residuum	0-12cm A- (10YR3/3) dark brown; sandy loam; weak fine granular structure, moderately sorted; abrupt smooth boundary; 12-29cm Cr- (10YR4/4) dark yellowish brown loamy sand; fine-grained decomposing bedrock.
SP9	24	A-C	residuum	0-3cm A- (10YR2/2) very dark brown; clay loam; weak fine granular structure; abrupt irregular boundary; 3-24cm C- (10YR4/4) dark yellowish brown clay loam; massive structure; decomposing bedrock.
SP10	33	A-C1-C2	residuum	0-5cm A- (10YR2/2) very dark brown; sandy loam; weak fine granular structure, well sorted; abrupt smooth boundary; 5-22cm C1- (10YR4/3) brown sandy loam; fine-grained, well sorted; abrupt broken boundary; 22-33cm C2- (10YR4/4) dark yellowish brown sandy loam; fine-grained, well sorted, massive structure.
SP11	34	A-C	residuum	0-2cm A- (10YR3/2) very dark brown; sandy loam; weak fine granular structure, well sorted; abrupt smooth boundary; 2-34cm C- (10YR5/3) brown sandy loam; fine-grained, well sorted, massive structure.
SP12	32	A-C	residuum	0-4cm A- (10YR3/2) dark brown; clay loam; weak fine granular structure; abrupt smooth boundary; 4-32cm C- (10YR4/3) brown sandy loam; fine-grained decomposing bedrock.

Table 1: Descriptions of Shovel Probe Soil Profiles				
Shovel Probe	Total Depth (cm)	Horizon Sequence	Unit	Soil Description
SP13	53	A-C	eolian I	0-12cm A- (10YR2/1) black silt loam; weak fine granular structure; clear smooth boundary; 12-49cm A2- (10YR3/1) dark gray silt loam; weak fine granular structure; abrupt smooth boundary; 49-53cm C- (10YR5/3) brown loamy sand; fine-grained decomposing bedrock.
SP14	44	A-AC-C	eolian - colluvial	0-12cm A- (10YR3/2) dark brown sandy loam; weak granular structure; few angular pebbles; abrupt smooth boundary; 12-27cm AC- (10YR3/2) dark brown loamy sand; weak granular structure; abrupt smooth boundary; 27-44cm C- (10YR4/4) dark yellowish brown loamy sand; fine-grained decomposing bedrock.
SP15	41	A-C	eolian - colluvial	0-22cm A- (10YR3/2) dark brown sandy loam; weak granular structure; few angular pebbles; abrupt smooth boundary; 22-41cm C- (10YR4/4) dark yellowish brown loamy sand; fine-grained well sorted; massive structure.
SP16	50	A-AC-C	residuum	0-19cm A- (10YR3/2) dark brown loamy sand; weak granular structure; abrupt smooth boundary; 19-32cm AC- (10YR4/1) dark gray loamy sand; weak granular structure; abrupt smooth boundary; 32-50cm C- (10YR4/4) dark yellowish brown loamy sand; fine-grained, well sorted; massive structure.
SP17	36	A-AC-C	residuum	0-12cm A- (10YR3/2) dark brown clay loam; weak granular structure; clear smooth boundary; 12-16cm AC- (10YR3/3) dark brown sandy loam; weak granular structure; abrupt smooth boundary; 16-36cm C- (10YR4/4) dark yellowish brown loamy sand; fine-grained, well sorted; massive structure.
SP18	38	A-C	eolian I	0-7cm A- (10YR2/1) black silt loam; weak fine granular structure; abrupt smooth boundary; 7-38cm C- (10YR4/2) dark grayish brown loamy sand; fine-grained, well sorted; massive structure.
SP19	35	A-C	eolian I	0-21cm A- (10YR3/2) dark brown silty clay; massive structure; abrupt smooth boundary; 21-35cm C- (10YR4/2) dark grayish brown loamy sand; fine-grained, well sorted; massive structure.
SP20	33	A-C	colluvial-residuum	0-18cm A- (10YR3/2) dark brown sandy loam; weak fine granular structure; few angular pebbles; clear irregular boundary; 18-33cm C- (10YR4/4) dark yellowish brown loamy sand; fine-grained, well sorted; massive structure.
SP21	32	A-C	eolian - colluvial	0-16cm A- (10YR3/2) dark brown sandy loam; weak granular structure; few angular pebbles; clear irregular boundary; 16-32cm C- (10YR4/4) dark yellowish brown loamy sand; fine-grained well sorted; massive structure.

References

Birkeland, P.W.

1999 *Soils and Geomorphology*. Oxford University Press, New York.

Clayton, L., S. R. Moran, and W. B. Bickley

1976 *Stratigraphy, chronology, and climate implications of late Quaternary upland silt in North Dakota*. Grand Forks: North Dakota Geological Survey, Miscellaneous Series 54.

Soil Survey Division Staff

1993 *Soil Survey Manual*. U.S. Government Printing Office, Washington, D.C.

Appendix B

Site Recommendations

Table B-1 presents recommendations for all sites recorded during cultural resource inventories for the BakkenLink pipeline project. These recommendations include fencing of the following sites to avoid impact during construction:

- 32MZ2353
- 32WI1246

MAC recommends that the construction ROW be necked down, the sites fenced, and an archaeologist be present to monitor during construction at the following sites:

- 32MZ1311
- 32MZ1484
- 32MZ1647
- 32MZ2311
- 32MZ2313
- 32MZ2317
- 32MZ2351
- 32MZ2359
- 32MZ2360
- 32WI132
- 32WI138
- 32WI1238
- 32WI1243

Not all of these sites are within areas included in the 2012 construction plans and future routing decisions may result in changing recommendations at these locations.

Additionally, MAC had previously drawn up testing plans for three sites (32MZ1461, 32MZ2303 and 32MZ2304). Testing at two of those sites (32MZ1461 and 32MZ2303) had been completed before the BLPL made the decision to not include the Dunn Lateral in the 2012 construction phase. A report detailing the results of the testing is pending.

In addition to the recommendations for specific sites, MAC recommends monitoring of all areas to be trenched in the floodplain of the Little Missouri River. Alluvial areas such as this have the potential to contain deeply buried cultural deposits. We understand that across most of the Little Missouri bottomlands, HDD will be employed, however, small areas of the bottomlands will be trenched.

Finally, it is our understanding that the BLPL does not currently intend to use the two-track through the Little Missouri National Grasslands (see main body of report for location). That road crosses or is immediately adjacent to four unevaluated sites (32MZ1311, 32MZ1312, 32MZ1313, and 32MZ1314); if plans should change and the road will be utilized, those sites should be evaluated and mitigated as necessary, before any improvements to the road occur.

Table B-1: Recommendations for All Cultural Resources Along the BakkenLink Pipeline						
SITS #	Temp #	Location	Site Type	NRHP Recommendation	Management Recommendation	Comments
32BI453*			Prehistoric	Undetermined	No further work	Shovel probed; all negative; no evidence of site in ROW
32BI1098*	MAC-BL-AK-3		Historic	Not eligible	No further work	
32BI1099*	MAC-BL-AK-4		Prehistoric	Undetermined	Avoid	Rerouted-the centerline is now approximately 80 meters from the site
32BI1100*	MAC-BL-ES-8		Prehistoric	Undetermined	Avoid	Restrict construction to the east side of the section line fence
32BI1108	MAC-BL-AK-45		Prehistoric	Undetermined	Avoid	Rerouted-the centerline is now approximately 50 meters from the site
32BI1109	MAC-BL-AK-63		Prehistoric	Undetermined	Avoid	The centerline is approximately 50 meters from the site; the undertaking will not impact the site
32BI1110	MAC-BL-DG-4		Historic	Not eligible	No further work	
32BIx896*	MAC-BL-AK-2		IF	Not eligible	No further work	
32BIx897*	MAC-BL-AK-5		IF	Not eligible	No further work	
32BIx898*	MAC-BL-AK-16		IF	Not eligible	No further work	
32BIx899*	MAC-BL-AK-17		IF	Not eligible	No further work	
32BIx900*	MAC-BL-ES-1		IF	Not eligible	No further work	
32BIx901*	MAC-BL-ES-4		IF	Not eligible	No further work	
32BIx902*	MAC-BL-ES-5		IF	Not eligible	No further work	
32BIx903*	MAC-BL-ES-6		IF	Not eligible	No further work	
32BIx904*	MAC-BL-ES-7		IF	Not eligible	No further work	
32BIx907	MAC-BL-AK-46		IF	Not eligible	No further work	
32BIx908	MAC-BL-AK-47		IF	Not eligible	No further work	
32DU1703*	MAC-BL-AK-40		Prehistoric	Undetermined	Avoid	--Along the Dunn Lateral, which is not in the 2012 construction plan --The site can be avoided within 200-foot ROW; neck down, fence, monitor
32DUx925*	MAC-BL-AK-26		IF	Not eligible	No further work	
32DUx944	MAC-BL-AK-55		IF	Not eligible	No further work	
32MZ859*			Prehistoric	Undetermined	Avoid	The APE is now miles from the site (Watford City reroute)
32MZ1311*			Prehistoric	Undetermined	Avoid	CL skirts a non-contributing portion of the site; neck down, fence, monitor
32MZ1312*			Prehistoric	Undetermined	Avoid	Rerouted-the centerline is now approximately 50 meters from the site

Table B-1: Recommendations for All Cultural Resources Along the BakkenLink Pipeline						
SITS #	Temp #	Location	Site Type	NRHP Recommendation	Management Recommendation	Comments
32MZ1313*			Prehistoric	Undetermined	Avoid	Rerouted-the centerline is now approximately 100 meters from the site
32MZ1314*			Historic	Eligible	Avoid	Rerouted-the centerline is now approximately 40 meters from the site
32MZ1461*			Prehistoric	Undetermined	Test	--Along the Dunn Lateral, which is not in the 2012 construction plan --Testing completed, portion of site tested will be recommended non contributing (report pending)
32MZ1473			Prehistoric	Undetermined	Avoid	HDD; will not be impacted
32MZ1484			Prehistoric	Eligible	Avoid	Place next to existing pipeline; neck down, fence, monitor
32MZ1560*	MAC-BL-AK-28		Historic	Eligible	Restore grade/re-contour post-construction	
32MZ1647			Prehistoric	Eligible	Avoid	Stay to south edge of ROW, fence, monitor
32MZ2164			Prehistoric	Undetermined	No further work	Not relocated
32MZ2303*	MAC-BL-AK-8		Prehistoric	Undetermined	Test	--Along the Dunn Lateral, which is not in the 2012 construction plan --Testing completed, portion of site tested will be recommended non contributing (report pending)
32MZ2304*	MAC-BL-ES-11		Prehistoric	Undetermined	Test	Along the Dunn Lateral, which is not in the 2012 construction plan
32MZ2307*	MAC-BL-AK-6		Prehistoric	Undetermined	Avoid	The site is approximately 30 meters from the centerline; restrict construction to the east side of the ½ section line fence
32MZ2308*	MAC-BL-AK-15		Historic	Not eligible	No further work	
32MZ2309*	MAC-BL-AK-20		Historic	Not eligible	No further work	
32MZ2310*	MAC-BL-AK-21		Historic	Not eligible	No further work	
32MZ2311*	MAC-BL-AK-23		Prehistoric	Undetermined	Avoid	Neck down, fence, monitor
32MZ2312*	MAC-BL-AK-25		Prehistoric	Undetermined	Avoid	Rerouted-the centerline is now approximately 300 meters from the site
32MZ2313*	MAC-BL-AK-27		Prehistoric	Undetermined	Avoid	Neck down, fence, monitor
32MZ2314*	MAC-BL-AK-30		Prehistoric	Undetermined	Avoid	The current centerline is approximately 550 meters from the site

Table B-1: Recommendations for All Cultural Resources Along the BakkenLink Pipeline						
SITS #	Temp #	Location	Site Type	NRHP Recommendation	Management Recommendation	Comments
32MZ2315*	MAC-BL-AK-31		Prehistoric	Undetermined	Avoid	The current centerline is approximately 650 meters from the site
32MZ2316*	MAC-BL-AK-32		Prehistoric	Undetermined	Avoid	The current centerline is approximately 250 meters from the site
32MZ2317*	MAC-BL-ES-10		Prehistoric	Undetermined	Avoid	--Along the Dunn Lateral, which is not in the 2012 construction plan --Keep to the south of the 200 foot ROW; neck down and fence, monitor
32MZ2350	MAC-BL-AK-48		Historic	Not eligible	No further work	
32MZ2351	MAC-BL-AK-49		Prehistoric	Undetermined	Avoid	Neck down, fence, monitor
32MZ2352	MAC-BL-AK-50		Historic	Not eligible	No further work	
32MZ2353	MAC-BL-AK-54		Prehistoric	Undetermined	Avoid	The centerline is approximately 30 meters from the site; fence
32MZ2354	MAC-BL-AK-56		Prehistoric	Undetermined	Avoid	Approximately 300 meters from centerline; will not be impacted
32MZ2355	MAC-BL-AK-57		Historic	Not eligible	No further work	
32MZ2356	MAC-BL-AK-59		Prehistoric	Undetermined	Avoid	At HDD; fence
32MZ2357	MAC-BL-AK-73		Prehistoric	Undetermined	Avoid	Approximately 60 meters from centerline; will not be impacted
32MZ2358	MAC-BL-AK-74		Prehistoric	Undetermined	Avoid	Approximately 45 meters from centerline; will not be impacted
32MZ2359	MAC-BL-AK-75		Prehistoric	Undetermined	Avoid	Neck down, fence, monitor
32MZ2360	MAC-BL-AK-90		Prehistoric	Undetermined	Avoid	Avoidance route surveyed adjacent to site; fence, neck down, monitor
32MZ2361	MAC-BL-BB-1		Historic	Not eligible	No further work	
32MZx1181*	MAC-BL-AK-7		IF	Not eligible	No further work	
32MZx1182*	MAC-BL-AK-9		IF	Not eligible	No further work	
32MZx1183*	MAC-BL-AK-10		IF	Not eligible	No further work	
32MZx1184*	MAC-BL-AK-11		IF	Not eligible	No further work	
32MZx1185*	MAC-BL-AK-18		IF	Not eligible	No further work	
32MZx1186*	MAC-BL-AK-19		IF	Not eligible	No further work	
32MZx1187*	MAC-BL-AK-22		IF	Not eligible	No further work	
32MZx1188*	MAC-BL-AK-24		IF	Not eligible	No further work	
32MZx1189*	MAC-BL-AK-29		IF	Not eligible	No further work	
32MZx1190*	MAC-BL-AK-39		IF	Not eligible	No further work	
32MZx1191*	MAC-BL-AK-41		IF	Not eligible	No further work	

Table B-1: Recommendations for All Cultural Resources Along the BakkenLink Pipeline						
SITS #	Temp #	Location	Site Type	NRHP Recommendation	Management Recommendation	Comments
32MZx1192*	MAC-BL-AK-42		IF	Not eligible	No further work	
32MZx1204	MAC-BL-AK-58		IF	Not eligible	No further work	
32MZx1205	MAC-BL-AK-60		IF	Not eligible	No further work	
32MZx1206	MAC-BL-AK-61		IF	Not eligible	No further work	
32MZx1207	MAC-BL-AK-64		IF	Not eligible	No further work	
32MZx1208	MAC-BL-AK-65		IF	Not eligible	No further work	
32MZx1209	MAC-BL-AK-66		IF	Not eligible	No further work	
32MZx1210	MAC-BL-AK-67		IF	Not eligible	No further work	
32MZx1211	MAC-BL-AK-68		IF	Not eligible	No further work	
32MZx1212	MAC-BL-AK-69		IF	Not eligible	No further work	
32MZx1213	MAC-BL-AK-70		IF	Not eligible	No further work	
32MZx1214	MAC-BL-AK-71		IF	Not eligible	No further work	
32MZx1215	MAC-BL-AK-72		IF	Not eligible	No further work	
32MZx1216	MAC-BL-AK-76		IF	Not eligible	No further work	
32MZx1217	MAC-BL-AK-77		IF	Not eligible	No further work	
32MZx1218	MAC-BL-AK-78		IF	Not eligible	No further work	
32MZx1219	MAC-BL-AK-79		IF	Not eligible	No further work	
32MZx1220	MAC-BL-AK-80		IF	Not eligible	No further work	
32MZx1221	MAC-BL-AK-81		IF	Not eligible	No further work	
32MZx1222	MAC-BL-AK-82		IF	Not eligible	No further work	
32MZx1223	MAC-BL-AK-83		IF	Not eligible	No further work	
32MZx1224	MAC-BL-AK-84		IF	Not eligible	No further work	
32MZx1225	MAC-BL-AK-85		IF	Not eligible	No further work	
32MZx1226	MAC-BL-AK-86		IF	Not eligible	No further work	
32MZx1227	MAC-BL-AK-91		IF	Not eligible	No further work	
32MZx1228	MAC-BL-DG-1		IF	Not eligible	No further work	
32MZx1229	MAC-BL-DG-2		IF	Not eligible	No further work	
32MZx1230	MAC-BL-DG-89		IF	Not eligible	No further work	
32MZx1231	MAC-BL-DG-90		IF	Not eligible	No further work	
32SKx340*	MAC-BL-AK-1		IF	Not eligible	No further work	
32SKx341*	MAC-BL-ES-2		IF	Not eligible	No further work	
32SKx349	MAC-BL-AK-51		IF	Not eligible	No further work	
32SKx350	MAC-BL-AK-52		IF	Not eligible	No further work	
32SKx351	MAC-BL-AK-53		IF	Not eligible	No further work	
32WI132*			Prehistoric	Undetermined	Avoid	Fence features, monitor

Table B-1: Recommendations for All Cultural Resources Along the BakkenLink Pipeline						
SITS #	Temp #	Location	Site Type	NRHP Recommendation	Management Recommendation	Comments
32WI338*			Prehistoric	Undetermined	Avoid	Neck down, fence features, monitor
32WI1215*	MAC-BL-AK-13		Historic	Not eligible	No further work	
32WI1237*	MAC-BL-AK-12		Prehistoric	Undetermined	Avoid	Rerouted-the centerline is now approximately 60 meters from the site
32WI1238†	MAC-BL-AK-38		Prehistoric	Undetermined	Avoid	No evidence of significant cultural deposits between the features; neck down, fence features, monitor
32WI1239*	MAC-BL-AK-14		Prehistoric	Undetermined	Avoid	Rerouted-the centerline is now approximately 100 meters from the site
32WI1240*	MAC-BL-AK-33		Historic	Not eligible	No further work	
32WI1241*	MAC-BL-AK-34		Prehistoric	Undetermined	Avoid	Rerouted-the centerline is now approximately 110 meters from the site
32WI1242*	MAC-BL-AK-35		Prehistoric	Undetermined	Avoid	Rerouted-the centerline is now approximately 50 meters from the site
32WI1243*	MAC-BL-AK-36		Prehistoric	Undetermined	Avoid	The site is at the edge of the survey ROW- neck down and fence; monitor
32WI1244*	MAC-BL-AK-37		Historic	Not eligible	No further work	
32WI1245*	MAC-BL-AK-43		Prehistoric	Undetermined	Avoid	Rerouted-the centerline is now approximately 30 meters from the site; fence the nearest features
32WI1246*	MAC-BL-MK-1		Prehistoric	Undetermined	Avoid	The site is at the edge of the survey ROW- fence
*Cultural resource documented in Kulevsky and Stine 2012;						
†Cultural resource documented in both Kulevsky and Stine 2012 and this document						
IF = Isolated Find						

**Appendix C:
Topographic Maps
REDACTED**