

**WBI ENERGY TRANSMISSION, INC.  
NORTH BAKKEN EXPANSION PROJECT**

**Resource Report 6  
Revised Appendices**

- Appendix 6A, Summary of Oil and Gas Wells within 0.25 Mile of the Proposed Project
- Appendix 6B, Paleontological Assessment for the North Bakken Expansion Project, North Dakota

**NORTH BAKKEN EXPANSION PROJECT**

**Resource Report 6**

**APPENDIX 6A**

**Summary of Oil and Gas Wells  
within 0.25 Mile of the Proposed Project**

APPENDIX 6A					
North Bakken Expansion Project Summary of Oil and Gas Wells Within 0.25 Mile of the Proposed Project					
Facility/Milepost	Nearest Project Workspace	Distance From Workspace (feet)	Well Name	Well Operator/ Owner	Well Status
<b>Tioga-Elkhorn Creek</b>					
0.6	Tioga-Elkhorn Creek	853	TI-Larson-157-95 2536h-1	Hess Bakken Investments II, LLC	Active
0.9	Tioga-Elkhorn Creek	874	Tioga-Madison Unit I-111	Amerada Hess Corporation	Plugged and Abandoned
1.1	Tioga-Elkhorn Creek	496	Tioga-Madison Unit H-110	Amerada Hess Corporation	Plugged and Abandoned
1.5	Tioga-Elkhorn Creek	862	Tioga-Madison Unit H-108	Hess Bakken Investments II, LLC	Plugged and Abandoned
2.2	Tioga-Elkhorn Creek	591	Leroy Nelson Tract 3 2	Amerada Hess Corporation	DRY
5.2	Tioga-Elkhorn Creek	1196	Michael Douglas 8-5h	Murex Petroleum Corporation	Location
5.2	Tioga-Elkhorn Creek	2708	Eskeland Herfindahl 7-6h	Murex Petroleum Corporation	Active
5.3	Tioga-Elkhorn Creek	732	Jacque Lisset 5-8h	Murex Petroleum Corporation	Active
5.3	Tioga-Elkhorn Creek	1011	Beaver Lodge-Madison Unit O-29	Amerada Hess Corporation	Plugged and Abandoned
5.5	Tioga-Elkhorn Creek	471	Beaver Lodge-Madison Unit P-28 <sup>a</sup>	Amerada Hess Corporation	Plugged and Abandoned
5.7	Tioga-Elkhorn Creek	789	Beaver Lodge-Madison Unit O-27	Amerada Hess Corporation	Plugged and Abandoned
5.8	Tioga-Elkhorn Creek	571	BLMU P-27h	Hess Bakken Investments II, LLC	Plugged and Abandoned
5.8	Tioga-Elkhorn Creek	324	BLMU P-27ah	Hess Bakken Investments II, LLC	Inactive (Shut-In >= 3 months and <= 12 Months)
5.9	Tioga-Elkhorn Creek	879	Beaver Lodge-Madison Unit P-26	Amerada Hess Corporation	Plugged and Abandoned
6.0	Tioga-Elkhorn Creek	948	Beaver Lodge-Devonian Unit I-315	Hess Bakken Investments II, LLC	Abandoned (Shut-In > 12 months)
6.2	Tioga-Elkhorn Creek	939	BLMU O-25 Bh	Hess Bakken Investments II, LLC	Inactive (Shut-In >= 3 months and <= 12 Months)
6.2	Tioga-Elkhorn Creek	1155	Beaver Lodge-Madison Unit O-25a	Amerada Hess Corporation	Plugged and Abandoned
6.3	Tioga-Elkhorn Creek	572	Beaver Lodge-Madison Unit N-26	Amerada Hess Corporation	Plugged and Abandoned
6.6	Tioga-Elkhorn Creek	733	Beaver Lodge-Madison Unit M-25	Amerada Hess Corporation	Plugged and Abandoned
6.6	Tioga-Elkhorn Creek	1218	BLDU H-315	Hess Bakken Investments II, LLC	Plugged and Abandoned
6.8	Tioga-Elkhorn Creek	199	Beaver Lodge-Devonian Unit G-315	Hess Bakken Investments II, LLC	Plugged and Abandoned
6.8	Tioga-Elkhorn Creek	631	Beaver Lodge-Madison Unit L-26	Hess Corporation	Plugged and Abandoned

APPENDIX 6A (cont'd)					
North Bakken Expansion Project Summary of Oil and Gas Wells Within 0.25 Mile of the Proposed Project					
Facility/Milepost	Nearest Project Workspace	Distance From Workspace (feet)	Well Name	Well Operator/ Owner	Well Status
6.9	Tioga-Elkhorn Creek	611	Beaver Lodge-Ordovician Unit 7	Hess Bakken Investments II, LLC	Plugged and Abandoned
7.1	Tioga-Elkhorn Creek	722	Beaver Lodge-Madison Unit K-25	Hess Bakken Investments II, LLC	Plugged and Abandoned
7.2	Tioga-Elkhorn Creek	870	Nels Anderson 1	Amerada Hess Corporation	DRY
7.7	Tioga-Elkhorn Creek	307	Knutson-Walla Unit 1	Hunt Oil Company	Permit Now Cancelled
7.8	Tioga-Elkhorn Creek	1199	Josie Knutson 1	Hunt Oil Company	DRY
12.3	Tioga-Elkhorn Creek	1901	BI-Kerbaugh-156-96-3427h-1	Hess Bakken Investments II, LLC	Active
12.4	Tioga-Elkhorn Creek	349	BL-Olson-Lw-155-96-0310h-1	Hess Bakken Investments II, LLC	Location
12.4	Tioga-Elkhorn Creek	382	BL-Olson-155-96-0310h-5	Hess Bakken Investments II, LLC	Location
12.4	Tioga-Elkhorn Creek	415	BL-Olson-155-96-0310h-4	Hess Bakken Investments II, LLC	Location
12.4	Tioga-Elkhorn Creek	448	BL-Olson-155-96-0310h-3	Hess Bakken Investments II, LLC	Location
12.4	Tioga-Elkhorn Creek	481	BL-Olson-155-96-0310h-2	Hess Bakken Investments II, LLC	Location
12.5	Tioga-Elkhorn Creek	1832	Beaver Lodge-Devonian Unit B-308I	Hess Bakken Investments II, LLC	Abandoned (Shut-In > 12 months)
13.1	Tioga-Elkhorn Creek	1827	Beaver Lodge-Devonian Unit B-307	Hess Bakken Investments II, LLC	Plugged and Abandoned
13.1	Tioga-Elkhorn Creek	4467	Beaver Lodge-Madison Unit C-9	Amerada Hess Corporation	Plugged and Abandoned
13.1	Tioga-Elkhorn Creek	498	Halvor Davidson 1	C.W. Williams & O.D. Clark	DRY
13.3	Tioga-Elkhorn Creek	3209	Beaver Lodge-Madison Unit B-8	Amerada Hess Corporation	Plugged and Abandoned
14.0	Tioga-Elkhorn Creek	190	Beaver Lodge-Devonian Unit A-305	Hess Bakken Investments II, LLC	Abandoned (Shut-In > 12 months)
14.1	Tioga-Elkhorn Creek	594	Oford Boe 1	Amerada Hess Corporation	DRY
14.2	Tioga-Elkhorn Creek	1356	BL-Olson-155-96-1003h-1	Hess Bakken Investments II, LLC	Active
14.3	Tioga-Elkhorn Creek	990	BL-Olson-Lw-155-96-1003h-1	Hess Bakken Investments II, LLC	Permit Now Cancelled
14.3	Tioga-Elkhorn Creek	958	BL-Olson-155-96-1003H-2PNC	Hess Bakken Investments II, LLC	Permit Now Cancelled
14.3	Tioga-Elkhorn Creek	925	BL-Olson-155-96-1003H-3PNC	Hess Bakken Investments II, LLC	Permit Now Cancelled
14.3	Tioga-Elkhorn Creek	892	BL-Olson-155-96-1003H-4PNC	Hess Bakken Investments II, LLC	Permit Now Cancelled

APPENDIX 6A (cont'd)					
North Bakken Expansion Project Summary of Oil and Gas Wells Within 0.25 Mile of the Proposed Project					
Facility/Milepost	Nearest Project Workspace	Distance From Workspace (feet)	Well Name	Well Operator/ Owner	Well Status
14.3	Tioga-Elkhorn Creek	859	BL-Olson-155-96-1003H-5PNC	Hess Bakken Investments II, LLC	Permit Now Cancelled
14.3	Tioga-Elkhorn Creek	826	BL-Olson-155-96-1003H-6PNC	Hess Bakken Investments II, LLC	Permit Now Cancelled
16.6	Tioga-Elkhorn Creek	748	Hanson 27-22	Amerada Hess Corporation	DRY
17.1	Tioga-Elkhorn Creek	219	Boe 27-24	Amerada Hess Corporation	Permit Now Cancelled
17.5	Tioga-Elkhorn Creek	403	Brownell 34-11	Amerada Hess Corporation	DRY
18.0	Tioga-Elkhorn Creek	1917	Mortenson 33-44	Murex Petroleum Corporation	Plugged and Abandoned
19.2	Tioga-Elkhorn Creek	545	Woodrow 34x-32	XTO Energy Inc	Active
19.7	Tioga-Elkhorn Creek	707	Helen 11x-5	XTO Energy Inc	Active
19.8	Tioga-Elkhorn Creek	696	Woodrow N. Sveen Et Ux 1	Home-Stake Production Co.	DRY
21.9	Tioga-Elkhorn Creek	557	Kenneth 11x-17f	XTO Energy Inc	Confidential
21.9	Tioga-Elkhorn Creek	528	Kenneth 11x-17b	XTO Energy Inc	Confidential
21.9	Tioga-Elkhorn Creek	498	Kenneth 11x-17e	XTO Energy Inc	Confidential
21.9	Tioga-Elkhorn Creek	469	Kenneth 11x-17a	XTO Energy Inc	Confidential
22.4	Tioga-Elkhorn Creek	1526	Arley 21x-18b	XTO Energy Inc	Active
22.4	Tioga-Elkhorn Creek	1595	Arley 21x-18e	XTO Energy Inc	Active
22.4	Tioga-Elkhorn Creek	1572	Arley 21x-18a	XTO Energy Inc	Active
22.4	Tioga-Elkhorn Creek	1549	Arley 21x-18f	XTO Energy Inc	Active
26.2	Tioga-Elkhorn Creek	860	Lundstrom 44-36h	Encore Operating, L.P.	Permit Now Cancelled
26.2	Tioga-Elkhorn Creek	758	Ruby State Federal 34x-36d	XTO Energy Inc	Confidential
26.2	Tioga-Elkhorn Creek	774	Ruby State Federal 34x-36c	XTO Energy Inc	Confidential
26.2	Tioga-Elkhorn Creek	1174	Ruby State Federal 34x-36f	XTO Energy Inc	Active
26.2	Tioga-Elkhorn Creek	1176	Ruby State Federal 34x-36b	XTO Energy Inc	Active
26.2	Tioga-Elkhorn Creek	1184	Ruby State Federal 34x-36a	XTO Energy Inc	Active
26.2	Tioga-Elkhorn Creek	1189	Ruby State Federal 34x-36e	XTO Energy Inc	Active
26.2	Tioga-Elkhorn Creek	1180	Ruby State 34x-36g	XTO Energy Inc	Active

APPENDIX 6A (cont'd)					
<b>North Bakken Expansion Project Summary of Oil and Gas Wells Within 0.25 Mile of the Proposed Project</b>					
Facility/Milepost	Nearest Project Workspace	Distance From Workspace (feet)	Well Name	Well Operator/ Owner	Well Status
26.2	Tioga-Elkhorn Creek	765	Ruby State Federal 34x-36gxh	XTO Energy Inc	Confidential
26.2	Tioga-Elkhorn Creek	751	Ruby State Federal 34x-36h	XTO Energy Inc	Confidential
26.4	Tioga-Elkhorn Creek	507	Gunslinger Federal 16-1-12tf2h	Slawson Exploration Company, Inc.	Permit Now Cancelled
26.4	Tioga-Elkhorn Creek	468	Gunslinger Federal 5-1-12h	Slawson Exploration Company, Inc.	Not Completed (Drilled to TD, Awaiting Completion)
26.4	Tioga-Elkhorn Creek	429	Gunslinger Federal 7-1-12tfh	Slawson Exploration Company, Inc.	Not Completed (Drilled to TD, Awaiting Completion)
26.4	Tioga-Elkhorn Creek	507	Gunslinger Federal 6-1-12tfh	Slawson Exploration Company, Inc.	Not Completed (Drilled to TD, Awaiting Completion)
26.4	Tioga-Elkhorn Creek	390	Gunslinger Federal 4-1-12h	Slawson Exploration Company, Inc.	Inactive (Shut-In >= 3 months and <= 12 Months)
26.4	Tioga-Elkhorn Creek	351	Gunslinger Federal 15-1-12tf2h	Slawson Exploration Company, Inc.	Confidential
26.7	Tioga-Elkhorn Creek	802	Wold Federal 42-1-1h	Whiting Oil And Gas Corporation	Active
26.7	Tioga-Elkhorn Creek	795	Wold Federal 42-1-1tfh	Whiting Oil And Gas Corporation	Active
26.7	Tioga-Elkhorn Creek	791	Wold Federal 42-1-2h	Whiting Oil And Gas Corporation	Active
26.7	Tioga-Elkhorn Creek	789	Wold Federal 42-1-2tfh	Whiting Oil And Gas Corporation	Active
26.7	Tioga-Elkhorn Creek	790	Wold Federal 42-1-3h	Whiting Oil And Gas Corporation	Active
26.8	Tioga-Elkhorn Creek	825	Wold Federal 43-1-2tfh	Whiting Oil And Gas Corporation	Active
26.8	Tioga-Elkhorn Creek	818	Wold Federal 43-1-1h	Whiting Oil And Gas Corporation	Active
26.8	Tioga-Elkhorn Creek	814	Wold Federal 43-1-1tfh	Whiting Oil And Gas Corporation	Inactive (Shut-In >= 3 months and <= 12 Months)
26.8	Tioga-Elkhorn Creek	834	Wold Federal 43-1-2h	Whiting Oil And Gas Corporation	Active
27.2	Tioga-Elkhorn Creek	830	Wold Federal 44-1tfhu	Whiting Oil And Gas Corporation	Confidential
27.2	Tioga-Elkhorn Creek	786	Wold Federal 44-1-1h	Whiting Oil And Gas Corporation	Confidential
27.2	Tioga-Elkhorn Creek	743	Wold Federal 44-1-1tfh	Whiting Oil And Gas Corporation	Confidential
27.2	Tioga-Elkhorn Creek	700	Wold Federal 44-1-2h	Whiting Oil And Gas Corporation	Confidential
27.2	Tioga-Elkhorn Creek	657	Wold Federal 44-1-2tfh	Whiting Oil And Gas Corporation	Confidential

APPENDIX 6A (cont'd)					
North Bakken Expansion Project Summary of Oil and Gas Wells Within 0.25 Mile of the Proposed Project					
Facility/Milepost	Nearest Project Workspace	Distance From Workspace (feet)	Well Name	Well Operator/ Owner	Well Status
27.2	Tioga-Elkhorn Creek	615	Wold Federal 44-1-3h	Whiting Oil And Gas Corporation	Confidential
27.2	Tioga-Elkhorn Creek	572	Wold Federal 44-1-3tfh	Whiting Oil And Gas Corporation	Confidential
27.2	Tioga-Elkhorn Creek	531	Wold Federal 44-1-4h	Whiting Oil And Gas Corporation	Confidential
28.5	Tioga-Elkhorn Creek	1068	Gunslinger Federal 8-12-1tfh	Slawson Exploration Company, Inc.	Not Completed (Drilled to TD, Awaiting Completion)
28.5	Tioga-Elkhorn Creek	1068	Gunslinger Federal 14-12-1tf2h	Slawson Exploration Company, Inc.	Permit Now Cancelled
28.5	Tioga-Elkhorn Creek	1047	Gunslinger Federal 3-12-1h	Slawson Exploration Company, Inc.	Not Completed (Drilled to TD, Awaiting Completion)
28.5	Tioga-Elkhorn Creek	1027	Gunslinger Federal 9-12-1tfh	Slawson Exploration Company, Inc.	Not Completed (Drilled to TD, Awaiting Completion)
28.6	Tioga-Elkhorn Creek	1002	Gunslinger Federal 2-12-1h	Slawson Exploration Company, Inc.	Not Completed (Drilled to TD, Awaiting Completion)
28.6	Tioga-Elkhorn Creek	973	Gunslinger Federal 13-12-1tf2h	Slawson Exploration Company, Inc.	Permit Now Cancelled
28.6	Tioga-Elkhorn Creek	973	Gunslinger Federal 10-12-1tfh	Slawson Exploration Company, Inc.	Not Completed (Drilled to TD, Awaiting Completion)
28.6	Tioga-Elkhorn Creek	916	Gunslinger Federal 12-12-1tf2h	Slawson Exploration Company, Inc.	Confidential
28.6	Tioga-Elkhorn Creek	944	Gunslinger Federal 1-12-1h	Slawson Exploration Company, Inc.	Not Completed (Drilled to TD, Awaiting Completion)
28.6	Tioga-Elkhorn Creek	862	Gunslinger Federal 11-12-1tfh	Slawson Exploration Company, Inc.	Permit Now Cancelled
33.8	Tioga-Elkhorn Creek	442	Joshua Tree 1-34h	Zenergy, Inc	Permit Now Cancelled
34.7	Tioga-Elkhorn Creek	483	Thelen 5297 11-6 4b <sup>a</sup>	Oasis Petroleum North America LLC	Confidential
34.7	Tioga-Elkhorn Creek	608	Nikolai Federal 5297 11-6 6b <sup>a</sup>	Oasis Petroleum North America LLC	Location
34.7	Tioga-Elkhorn Creek	466	Thelen 5297 11-6 3tx <sup>a</sup>	Oasis Petroleum North America LLC	Confidential
34.7	Tioga-Elkhorn Creek	658	Wold 5297 11-6 2B <sup>a</sup>	Oasis Petroleum North America LLC	Location
34.7	Tioga-Elkhorn Creek	502	Thelen 5297 11-6 5t <sup>a</sup>	Oasis Petroleum North America LLC	Not Completed (Drilled to TD, Awaiting Completion)
34.7	Tioga-Elkhorn Creek	633	Nikolai Federal 5297 11-6 10bx <sup>a</sup>	Oasis Petroleum North America LLC	Location
34.8	Tioga-Elkhorn Creek	183	Wold 1-6h <sup>a</sup>	Zenergy, Inc	Permit Now Cancelled

APPENDIX 6A (cont'd)					
North Bakken Expansion Project Summary of Oil and Gas Wells Within 0.25 Mile of the Proposed Project					
Facility/Milepost	Nearest Project Workspace	Distance From Workspace (feet)	Well Name	Well Operator/ Owner	Well Status
34.8	Tioga-Elkhorn Creek	1157	Wold Federal 15-33h	Oasis Petroleum North America LLC	Active
34.9	Tioga-Elkhorn Creek	1765	A. Johnson 5397 43-33 11b	Oasis Petroleum North America LLC	Drilling
36.9	Tioga-Elkhorn Creek	438	Dennis 1-12h <sup>a</sup>	Zenergy, Inc.	Permit Now Cancelled
37.0	Tioga-Elkhorn Creek	245	Vonnie 1-18h <sup>a</sup>	Zenergy, Inc.	Permit Now Cancelled
37.0	Tioga-Elkhorn Creek	1247	Rolfstrud Federal 18-19h	Oasis Petroleum North America LLC	Active
39.6	Tioga-Elkhorn Creek	1060	Mildred Nelson 4-25h	Oasis Petroleum North America LLC	Active
39.6	Tioga-Elkhorn Creek	629	Nelson 5298 14-26 11tx	Oasis Petroleum North America LLC	Active
39.6	Tioga-Elkhorn Creek	620	Nelson 5298 14-26 12bx	Oasis Petroleum North America LLC	Active
39.6	Tioga-Elkhorn Creek	606	Aagvik 5298 14-26 13bx	Oasis Petroleum North America LLC	Active
39.6	Tioga-Elkhorn Creek	602	Aagvik 5298 14-26 14tx	Oasis Petroleum North America LLC	Active
39.8	Tioga-Elkhorn Creek	663	Aagvik 5298 13-26 10t	Oasis Petroleum North America LLC	Active
39.8	Tioga-Elkhorn Creek	657	Aagvik 5298 13-26 11b	Oasis Petroleum North America LLC	Active
39.8	Tioga-Elkhorn Creek	653	Aagvik 5298 13-26 12t	Oasis Petroleum North America LLC	Active
39.8	Tioga-Elkhorn Creek	648	Nelson 5298 13-26 8b	Oasis Petroleum North America LLC	Active
39.8	Tioga-Elkhorn Creek	648	Nelson 5298 13-26 9t	Oasis Petroleum North America LLC	Active
39.8	Tioga-Elkhorn Creek	649	Nelson 5298 13-26 10b	Oasis Petroleum North America LLC	Active
41.7	Tioga-Elkhorn Creek	2060	Aagvik 5298 41-35 2tx	Oasis Petroleum North America LLC	Inactive (Shut-In >= 3 months and <= 12 Months)
41.7	Tioga-Elkhorn Creek	2027	Aagvik 5298 41-35 3bx	Oasis Petroleum North America LLC	Active
41.7	Tioga-Elkhorn Creek	1994	Aagvik 5298 41-35 4t	Oasis Petroleum North America LLC	Plugged and Abandoned
41.7	Tioga-Elkhorn Creek	1961	Aagvik 5298 41-35 5b	Oasis Petroleum North America LLC	Active
41.7	Tioga-Elkhorn Creek	1928	Aagvik 5298 41-35 6t	Oasis Petroleum North America LLC	Active
41.7	Tioga-Elkhorn Creek	3070	Johnsrud 1-34h	Zenergy, Inc.	Permit Now Cancelled
41.7	Tioga-Elkhorn Creek	2093	Aagvik 5298 41-35 15t	Oasis Petroleum North America LLC	Active
41.9	Tioga-Elkhorn Creek	480	Berquist 31x-2c	XTO Energy Inc.	Active



APPENDIX 6A (cont'd)					
North Bakken Expansion Project Summary of Oil and Gas Wells Within 0.25 Mile of the Proposed Project					
Facility/Milepost	Nearest Project Workspace	Distance From Workspace (feet)	Well Name	Well Operator/ Owner	Well Status
41.9	Tioga-Elkhorn Creek	498	Berquist 31x-2g	XTO Energy Inc.	Active
41.9	Tioga-Elkhorn Creek	516	Berquist 31x-2d	XTO Energy Inc.	Active
43.8	Tioga-Elkhorn Creek	449	Abercrombie 1-8-12 Mbh <sup>a</sup>	Burlington Resources Oil & Gas Company Lp	Confidential
43.8	Tioga-Elkhorn Creek	460	Abersom 1-8-12 Utfh -Ulw <sup>a</sup>	Burlington Resources Oil & Gas Company Lp	Confidential
43.8	Tioga-Elkhorn Creek	476	Abercrombie 2-8-12 Utfh <sup>a</sup>	Burlington Resources Oil & Gas Company Lp	Confidential
44.1	Tioga-Elkhorn Creek	1277	Johnsrud 21-13seh	XTO Energy Inc.	Inactive (Shut-In >= 3 months and <= 12 Months)
44.1	Tioga-Elkhorn Creek	1193	Rink 13-24h	Zenergy, Inc	Permit Now Cancelled
44.1	Tioga-Elkhorn Creek	1274	Johnsrud 21x-13axd	XTO Energy Inc.	Permit Now Cancelled
44.1	Tioga-Elkhorn Creek	1268	Johnsrud 21x-13e	XTO Energy Inc.	Confidential
44.1	Tioga-Elkhorn Creek	1271	Johnsrud 21x-13a	XTO Energy Inc.	Confidential
45.9	Tioga-Elkhorn Creek	1489	McCoy 44-23nwh	XTO Energy Inc.	Active
45.9	Tioga-Elkhorn Creek	1483	McCoy 44x-23g2	XTO Energy Inc.	Active
45.9	Tioga-Elkhorn Creek	1485	McCoy 44x-23d	XTO Energy Inc.	Inactive (Shut-In >= 3 months and <= 12 Months)
45.9	Tioga-Elkhorn Creek	1493	McCoy 44x-23h	XTO Energy Inc.	Active
46.0	Tioga-Elkhorn Creek	1384	Sax 41x-26c	XTO Energy Inc.	Inactive (Shut-In >= 3 months and <= 12 Months)
46.0	Tioga-Elkhorn Creek	1339	Sax 41x-26h	XTO Energy Inc.	Active
46.0	Tioga-Elkhorn Creek	1295	Sax 41x-26d	XTO Energy Inc.	Active
50.0	Tioga-Elkhorn Creek	331	Lundin 44x-11c <sup>a</sup>	XTO Energy Inc.	Inactive (Shut-In >= 3 months and <= 12 Months)
50.0	Tioga-Elkhorn Creek	334	Lundin 44x-11h <sup>a</sup>	XTO Energy Inc.	Active
50.0	Tioga-Elkhorn Creek	342	Lundin 44x-11d <sup>a</sup>	XTO Energy Inc.	Active
50.1	Tioga-Elkhorn Creek	504	Lundin 41-14swh <sup>a</sup>	XTO Energy Inc.	Active

APPENDIX 6A (cont'd)					
North Bakken Expansion Project Summary of Oil and Gas Wells Within 0.25 Mile of the Proposed Project					
Facility/Milepost	Nearest Project Workspace	Distance From Workspace (feet)	Well Name	Well Operator/ Owner	Well Status
50.1	Tioga-Elkhorn Creek	533	Lundin 41x-14g <sup>a</sup>	XTO Energy Inc.	Active
50.1	Tioga-Elkhorn Creek	736 <sup>a</sup>	Lundin 41x-14c	XTO Energy Inc.	Active
50.1	Tioga-Elkhorn Creek	637 <sup>a</sup>	Lundin 41x-14d	XTO Energy Inc.	Active
50.5	Tioga-Elkhorn Creek	828	Lundin 11-13seh	Newfield Production Company	Active
52.2	Tioga-Elkhorn Creek	739	Shafer State 1-23-3b <sup>a</sup>	Gulf Oil Corp.	DRY
52.6	Tioga-Elkhorn Creek	652	Hartel 1-26ha	Oasis Petroleum North America LLC	Active
52.6	Tioga-Elkhorn Creek	853	Hartel 1x-26h	Oasis Petroleum North America LLC	Inactive (Shut-In >= 3 months and <= 12 Months)
52.6	Tioga-Elkhorn Creek	1287	Hartel 1-26hb	Oasis Petroleum North America LLC	Active
55.4	Tioga-Elkhorn Creek	419	Johnson 16-34h	Oasis Petroleum North America LLC	Active
55.6	Tioga-Elkhorn Creek	1164	Broderson 13-35h	Oasis Petroleum North America LLC	Active
56.4	Tioga-Elkhorn Creek	989	Johnsrud 1-3	Pogo Producing Co.	Plugged and Abandoned
56.7	Tioga-Elkhorn Creek	1001	Betty Berg 1-11	Pogo Producing Co.	DRY
57.5	Tioga-Elkhorn Creek	289	Malm 149-98-11-2-1h	Newfield Production Company	Active
57.7	Tioga-Elkhorn Creek	313	Malm 149-98-14-23-1h	Newfield Production Company	Active
57.7	Tioga-Elkhorn Creek	381	Malm 149-98-11-2-7hlw	Newfield Production Company	Active
57.7	Tioga-Elkhorn Creek	337	Malm 149-98-11-2-6h	Newfield Production Company	Active
57.7	Tioga-Elkhorn Creek	921	Malm 149-98-14-23-4h	Newfield Production Company	Active
57.7	Tioga-Elkhorn Creek	422	Malm 149-98-14-23-5h	Newfield Production Company	Active
60.4	Tioga-Elkhorn Creek	466	Smokey 16-21 Swd	McKenzie Energy Partners, LLC	Active
60.6	Tioga-Elkhorn Creek	510	Knut Berg Trust 41-28hu	Whiting Oil And Gas Corporation	Active
60.6	Tioga-Elkhorn Creek	736	Knut Berg Trust 41-28h	Whiting Oil And Gas Corporation	Active
60.6	Tioga-Elkhorn Creek	637	Knut Berg Trust 41-28-2h	Whiting Oil And Gas Corporation	Active
<b>Line Section 25 Loop</b>					
0.1	Line Section 25 Loop	1128	Tioga-Madison Unit F-114	Amerada Hess Corporation	Plugged and Abandoned

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Facility/Milepost	Nearest Project Workspace	Distance From Workspace (feet)	Well Name	Well Operator/ Owner	Well Status
0.5	Line Section 25 Loop	446	Tioga-Madison Unit G-115	Amerada Hess Corporation	Plugged and Abandoned
0.8	Line Section 25 Loop	422	Tioga-Madison Unit F-116	Amerada Hess Corporation	Plugged and Abandoned
0.9	Line Section 25 Loop	891	Rehak 1 Swd	Landtech Enterprises, LLC	Active
1.2	Line Section 25 Loop	697	Tioga-Madison Unit E-117	Amerada Hess Corporation	Plugged and Abandoned
1.3	Line Section 25 Loop	774	Pederson 14-33	Hess Bakken Investments II, LLC	Plugged and Abandoned
1.4	Line Section 25 Loop	381	Pederson Fresh Water Facility 1	Hess Bakken Investments II, LLC	Plugged and Abandoned
1.6	Line Section 25 Loop	1287	Tioga-Madison Unit E-119	Amerada Hess Corporation	Plugged and Abandoned
1.7	Line Section 25 Loop	1262	Tioga-Madison Unit G-119	Hess Bakken Investments II, LLC	Plugged and Abandoned
1.7	Line Section 25 Loop	894	Ti-Syverson-157-95 1318h-1	Hess Bakken Investments II, LLC	Active
1.9	Line Section 25 Loop	397	Tioga-Madison Unit F-120	Amerada Hess Corporation	Plugged and Abandoned
2.2	Line Section 25 Loop	515	Tioga-Madison Unit G-121	Amerada Hess Corporation	Plugged and Abandoned
2.4	Line Section 25 Loop	1136	Tioga-Madison Unit F-122	Amerada Hess Corporation	Plugged and Abandoned
2.5	Line Section 25 Loop	1349	Tioga-Madison Unit H-122	Amerada Hess Corporation	Plugged and Abandoned
2.6	Line Section 25 Loop	444	H. Bakken 12-07h	Hess Bakken Investments II, LLC	Active
2.7	Line Section 25 Loop	299	Tioga-Madison Unit G-123	Amerada Hess Corporation	Plugged and Abandoned
3.0	Line Section 25 Loop	1679	Tioga-Madison Unit F-124	Hess Corporation	Plugged and Abandoned
3.0	Line Section 25 Loop	811	Tioga-Madison Unit H-124	Amerada Hess Corporation	Plugged and Abandoned
3.2	Line Section 25 Loop	709	Tioga-Madison Unit G-125	Hess Bakken Investments II, LLC	Plugged and Abandoned
3.4	Line Section 25 Loop	1316	Ti-Ives-157-95 0106h-1	Hess Bakken Investments II, LLC	Active
3.5	Line Section 25 Loop	351	Tioga-Madison Unit H-126	Amerada Hess Corporation	Plugged and Abandoned
3.8	Line Section 25 Loop	1114	Tioga-Madison Unit G-127	Hess Bakken Investments II, LLC	Plugged and Abandoned
4.0	Line Section 25 Loop	169	Tioga-Madison Unit H-128	Amerada Hess Corporation	Plugged and Abandoned
4.3	Line Section 25 Loop	845	Tioga-Madison Unit I-129	Hess Corporation	Plugged and Abandoned
4.5	Line Section 25 Loop	744	Tioga-Madison Unit H-130i	Hess Bakken Investments II, LLC	Plugged and Abandoned

APPENDIX 6A (cont'd)					
<b>North Bakken Expansion Project Summary of Oil and Gas Wells Within 0.25 Mile of the Proposed Project</b>					
Facility/Milepost	Nearest Project Workspace	Distance From Workspace (feet)	Well Name	Well Operator/ Owner	Well Status
4.8	Line Section 25 Loop	260	Tioga-Madison Unit I-131 Hr	Hess Bakken Investments II, LLC	Inactive (Shut-In >= 3 months and <= 12 Months)
4.9	Line Section 25 Loop	1344	Tioga-Madison Unit H-132	Hess Bakken Investments II, LLC	Abandoned (Shut-In > 12 months)
5.1	Line Section 25 Loop	1206	Tioga-Madison Unit J-132	Hess Bakken Investments II, LLC	Plugged and Abandoned
5.3	Line Section 25 Loop	607	Tioga-Madison Unit I-133	Amerada Hess Corporation	Plugged and Abandoned
5.4	Line Section 25 Loop	786	Ti-Stenbak- 158-95-2526h-7	Hess Bakken Investments II, LLC	Active
5.4	Line Section 25 Loop	751	Ti-Stenbak- 158-95-2526h-2	Hess Bakken Investments II, LLC	Active
5.4	Line Section 25 Loop	756	Ti-Stenbak- 158-95-2526h-3	Hess Bakken Investments II, LLC	Active
5.4	Line Section 25 Loop	761	Ti-Stenbak- 158-95-2526h-4	Hess Bakken Investments II, LLC	Active
5.4	Line Section 25 Loop	768	Ti-Stenbak- 158-95-2526h-5	Hess Bakken Investments II, LLC	Active
5.4	Line Section 25 Loop	777	Ti-Stenbak- 158-95-2526h-6	Hess Bakken Investments II, LLC	Active
5.6	Line Section 25 Loop	195	Tioga-Madison Unit J-134	Amerada Hess Corporation	Plugged and Abandoned
5.7	Line Section 25 Loop	504	TI-Blestrud-158-94-3029h-1	Hess Bakken Investments II, LLC	Permit Now Cancelled
5.7	Line Section 25 Loop	486	TI-Hilleren-158-95-2526h-2	Hess Bakken Investments II, LLC	Permit Now Cancelled
5.7	Line Section 25 Loop	473	TI-Blestrud-158-94-3029h-2	Hess Bakken Investments II, LLC	Permit Now Cancelled
5.7	Line Section 25 Loop	463	TI-Blestrud-158-94-3029h-3	Hess Bakken Investments II, LLC	Permit Now Cancelled
5.7	Line Section 25 Loop	465	TI-Hilleren-158-95-2526h-3	Hess Bakken Investments II, LLC	Permit Now Cancelled
5.8	Line Section 25 Loop	422	TI-Stenbak-158-95-2526h-1	Hess Bakken Investments II, LLC	Active
5.9	Line Section 25 Loop	1199	Tioga-Madison Unit I-135	Amerada Hess Corporation	Plugged and Abandoned
6.1	Line Section 25 Loop	67	Tioga-Madison Unit J-136	Hess Bakken Investments II, LLC	Plugged and Abandoned
6.3	Line Section 25 Loop	1504	Tioga-Madison Unit I-137	Amerada Hess Corporation	Plugged and Abandoned
6.3	Line Section 25 Loop	1738	TMU I-137ah	Hess Bakken Investments II, LLC	Abandoned (Shut-In > 12 months)
6.4	Line Section 25 Loop	998	Tioga-Madison Unit K-137	Amerada Hess Corporation	Plugged and Abandoned
6.6	Line Section 25 Loop	584	Tioga-Madison Unit J-138	Amerada Hess Corporation	Plugged and Abandoned
6.9	Line Section 25 Loop	241	Tioga-Madison Unit K-139	Amerada Hess Corporation	Plugged and Abandoned

APPENDIX 6A (cont'd)					
<b>North Bakken Expansion Project Summary of Oil and Gas Wells Within 0.25 Mile of the Proposed Project</b>					
Facility/Milepost	Nearest Project Workspace	Distance From Workspace (feet)	Well Name	Well Operator/ Owner	Well Status
7.1	Line Section 25 Loop	1293	Tioga-Madison Unit J-140	Hess Bakken Investments II, LLC	Abandoned (Shut-In > 12 months)
7.2	Line Section 25 Loop	1199	Tioga-Madison Unit L-140	Amerada Hess Corporation	Plugged and Abandoned
7.4	Line Section 25 Loop	265	Tioga-Madison Unit K-141	Hess Bakken Investments II, LLC	Abandoned (Shut-In > 12 months)
7.6	Line Section 25 Loop	1736	Tioga-Madison Unit J-142	Amerada Hess Corporation	Plugged and Abandoned
7.7	Line Section 25 Loop	769	Tioga-Madison Unit L-142	Amerada Hess Corporation	Plugged and Abandoned
7.9	Line Section 25 Loop	724	Tioga-Madison Unit K-143hr	Hess Bakken Investments II, LLC	Plugged and Abandoned
8.2	Line Section 25 Loop	333	Tioga-Madison Unit L-144	Hess Bakken Investments II, LLC	Plugged and Abandoned
8.4	Line Section 25 Loop	1172	Tioga-Madison Unit K-145	Amerada Hess Corporation	Plugged and Abandoned
8.5	Line Section 25 Loop	1414	Tioga-Madison Unit M-145	Amerada Hess Corporation	Plugged and Abandoned
8.7	Line Section 25 Loop	427	Tioga-Madison Unit L-146xhr	Hess Bakken Investments II, LLC	Inactive (Shut-In >= 3 months and <= 12 Months)
8.7	Line Section 25 Loop	167	Tioga-Madison Unit L-146	Amerada Hess Corporation	Plugged and Abandoned
9.0	Line Section 25 Loop	882	Tioga-Madison Unit M-147	Amerada Hess Corporation	Plugged and Abandoned
9.1	Line Section 25 Loop	778	Tioga-Madison Unit L-148	Amerada Hess Corporation	Plugged and Abandoned
9.4	Line Section 25 Loop	357	Tioga-Madison Unit M-149	Amerada Hess Corporation	Plugged and Abandoned
9.7	Line Section 25 Loop	1255	Tioga-Madison Unit N-150	Amerada Hess Corporation	Plugged and Abandoned
9.9	Line Section 25 Loop	433	Tioga-Madison Unit M-151	Hess Bakken Investments II, LLC	Plugged and Abandoned
10.2	Line Section 25 Loop	642	Tioga-Madison Unit N-152	Hess Bakken Investments II, LLC	Plugged and Abandoned
10.5	Line Section 25 Loop	464	Tioga-Madison Unit N-153	Amerada Hess Corporation	Plugged and Abandoned
11.0	Line Section 25 Loop	1726	Tioga-Madison Unit O-155	Amerada Hess Corporation	Plugged and Abandoned
11.3	Line Section 25 Loop	814	L. Hoiby 159-94-30d-19-4h	Petro-Hunt, L.L.C.	Active
11.3	Line Section 25 Loop	739	L. Hoiby 159-94-30d-19-5h	Petro-Hunt, L.L.C.	Active
11.4	Line Section 25 Loop	605	Clair Marie 1-30	Badger Oil Co.	DRY
11.6	Line Section 25 Loop	985	Tande 159-94-29c-20-3h	Petro-Hunt, L.L.C.	Active
11.9	Line Section 25 Loop	1374	Pollard A 1	Phillips Petroleum Company	DRY

APPENDIX 6A (cont'd)					
North Bakken Expansion Project Summary of Oil and Gas Wells Within 0.25 Mile of the Proposed Project					
Facility/Milepost	Nearest Project Workspace	Distance From Workspace (feet)	Well Name	Well Operator/ Owner	Well Status
12.2	Line Section 25 Loop	204	North Tioga-Madison Unit K-3	Prosper Energy Corp.	Plugged and Abandoned
12.4	Line Section 25 Loop	783	Ole Tande 3	Murex Petroleum Corporation	Plugged and Abandoned
12.6	Line Section 25 Loop	832	North Tioga-Madison Unit K-5	Prosper Energy Corp.	Plugged and Abandoned
12.9	Line Section 25 Loop	172	North Tioga-Madison Unit L-6	Prosper Energy Corp.	Plugged and Abandoned
13.2	Line Section 25 Loop	2125	John C. Moberg 2	Phoenix Petroleum LLC	Active
13.3	Line Section 25 Loop	443	North Tioga-Madison Unit M-7	Prosper Energy Corp.	Plugged and Abandoned
13.3	Line Section 25 Loop	3181	North Tioga-Madison Unit O-7	Prosper Energy Corp.	DRY
13.6	Line Section 25 Loop	930	Arlo Moberg 2	Phoenix Petroleum LLC	Active
13.7	Line Section 25 Loop	1086	Producer's Corporation 159-94-17c-8-2h	Petro-Hunt, L.L.C.	Active
13.8	Line Section 25 Loop	564	State Moberg 1-17 1	Phoenix Petroleum LLC	Active
14.3	Line Section 25 Loop	620	North Tioga-Madison Unit M-11	Prosper Energy Corp.	Plugged and Abandoned
14.8	Line Section 25 Loop	1283	20501 Jv-P Battleview 1621 1-H	Petro-Hunt, L.L.C.	Active
<b>Line Section 30 Loop</b>					
0.1	Line Section 30 Loop	226	Justin Swd 1	Bosque Disposal Systems, LLC	Active
2.3	Line Section 30 Loop	746	Moe 2-1	Donald C. Slawson	Plugged and Abandoned
5.2	Line Section 30 Loop	374	Davidson 14x-34	Xto Energy Inc	Inactive (Shut-In >= 3 months and <= 12 Months)
7.8	Line Section 30 Loop	457	Tioga-Madison Unit G-109	Amerada Hess Corporation	Plugged and Abandoned
8.2	Line Section 30 Loop	861	Tioga-Madison Unit I-109	Amerada Hess Corporation	Plugged and Abandoned
<b>Tioga Compressor Lateral</b>					
0.0	Tioga Compressor Lateral	175	Tioga-Madison Unit E-113	Amerada Hess Corporation	Plugged and Abandoned
<b>Staging Areas</b>					
N/A	Weflen Staging Yard	6201	Tioga-Madison Unit B-122	Amerada Hess Corporation	Plugged and Abandoned
N/A	Weflen Staging Yard	5335	Tioga-Madison Unit C-123	Amerada Hess Corporation	Plugged and Abandoned

APPENDIX 6A (cont'd)					
North Bakken Expansion Project Summary of Oil and Gas Wells Within 0.25 Mile of the Proposed Project					
Facility/Milepost	Nearest Project Workspace	Distance From Workspace (feet)	Well Name	Well Operator/ Owner	Well Status
N/A	Weflen Staging Yard	6978	Tioga-Madison Unit B-124	Hess Corporation	Plugged and Abandoned
N/A	Weflen Staging Yard	4475	Tioga-Madison Unit D-124	Amerada Hess Corporation	Plugged and Abandoned
N/A	Weflen Staging Yard	5995	H. Bakken 11-11h	Hess Corporation	Permit Now Cancelled
N/A	Schmidt Yard	9002	State 1	Calvert Drilling & Producing Co.	Dry
N/A	Flatlands Yard 1	7612	Flatland 43-9-1h	Whiting Oil And Gas Corporation	Active
N/A	Flatlands Yard 1	7650	Flatland 43-9-1xh	Whiting Oil And Gas Corporation	Active
N/A	Flatlands Yard 1	7693	Flatland 9-9h	Whiting Oil And Gas Corporation	Plugged and Abandoned
N/A	Flatlands Yard 1	7496	TG-Flatland Swd	Tobacco Garden Swd Llc	Active
N/A	Flatlands Yard 1	7534	Flatland 43-9hu	Whiting Oil And Gas Corporation	Active
N/A	Flatlands Yard 1	7573	Flatland 43-9-2h	Whiting Oil And Gas Corporation	Active
N/A	Flatlands Yard 2	2658	Outlaw Wagon 14-23mbh-Ulw-A	Burlington Resources Oil & Gas Company Lp	Active
N/A	Flatlands Yard 2	2688	Outlaw Gap 14-23tfh-A	Burlington Resources Oil & Gas Company Lp	Inactive (Shut-In >= 3 months and <= 12 Months)
N/A	Flatlands Yard 2	2719	Outlaw Gap 14-23mbh-A	Burlington Resources Oil & Gas Company Lp	Inactive (Shut-In >= 3 months and <= 12 Months)
N/A	Flatlands Yard 2	2750	Outlaw Gap 24-23tfh-A	Burlington Resources Oil & Gas Company Lp	Inactive (Shut-In >= 3 months and <= 12 Months)
N/A	Flatlands Yard 2	2782	Outlaw Gap 24-23mbh-A	Burlington Resources Oil & Gas Company Lp	Inactive (Shut-In >= 3 months and <= 12 Months)
N/A	Lobell Yard	8820	Kristin Denise 16-21h	Murex Petroleum Corporation	Active
N/A	68th Street Yard	7740	Olson 32-28	Williams Exploration Co.	Dry
N/A	68th Street Yard	9321	Hove 12-28	Ranch Oil Company	Plugged and Abandoned
N/A	68th Street Yard	10492	Hove 24-21	Tiger Oil Company	Permit Now Cancelled
N/A	Boehm Staging Yard	2138	Flatland 24x-11	XTO Energy Inc.	Permit Now Cancelled
N/A	Delta Contractors Yard	19612	Watford Swd 1	Secure Energy Services USA, LLC	Active
N/A	Aux Sable Staging Yard	1599	TIOGA-MADISON UNIT G-111	AMERADA HESS CORPORATION	Plugged and Abandoned

APPENDIX 6A (cont'd)

**North Bakken Expansion Project  
Summary of Oil and Gas Wells Within 0.25 Mile of the Proposed Project**

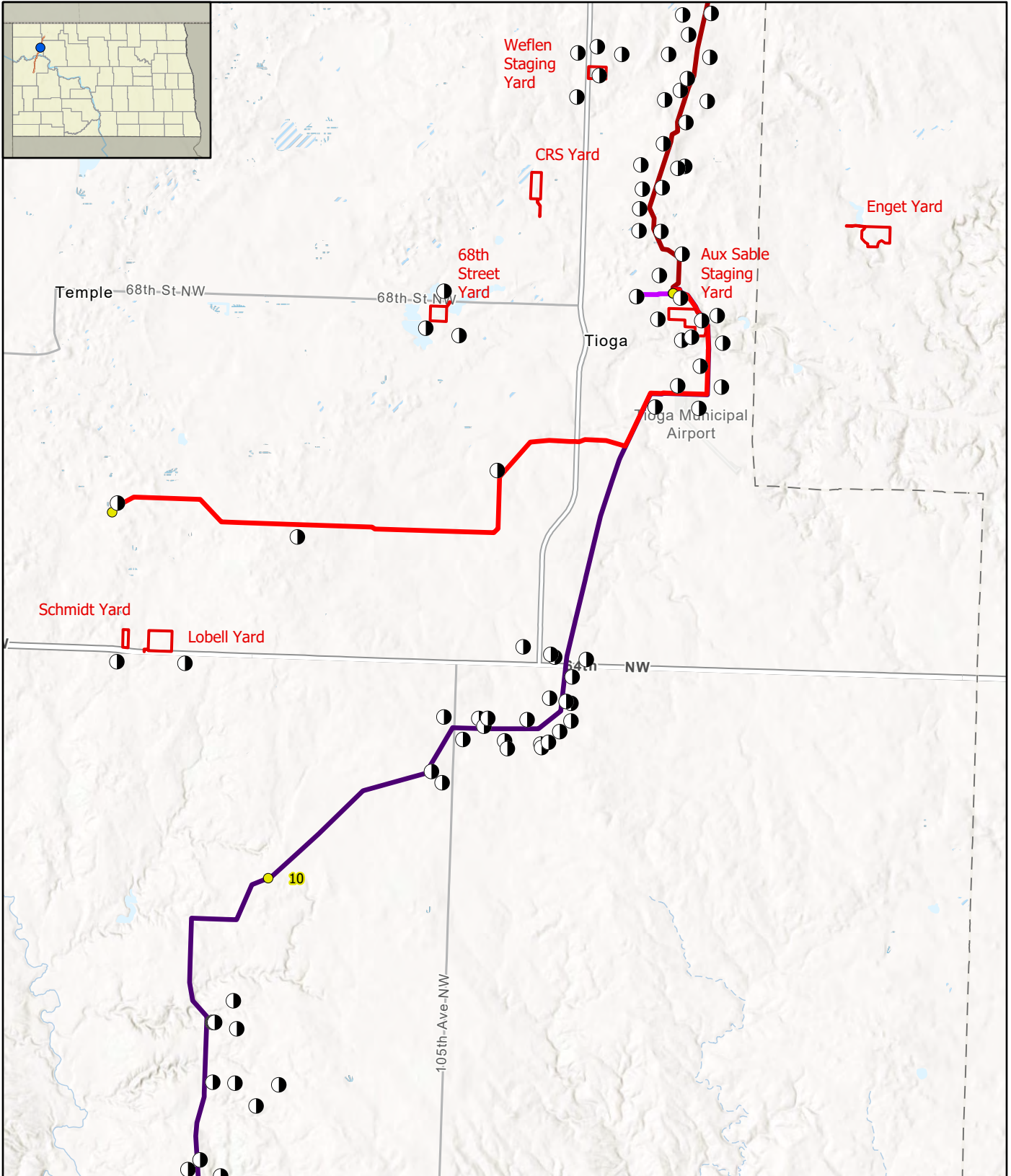
Facility/Milepost	Nearest Project Workspace	Distance From Workspace (feet)	Well Name	Well Operator/ Owner	Well Status
N/A	Aux Sable Staging Yard	984	PLANT DISPOSAL 2	HESS TIOGA GAS PLANT LLC	Active
N/A	Aux Sable Staging Yard	99	TIOGA-MADISON UNIT H-112	AMERADA HESS CORPORATION	Plugged and Abandoned
N/A	Aux Sable Staging Yard	1483	TIOGA-MADISON UNIT F-112	AMERADA HESS CORPORATION	Plugged and Abandoned
<b>Aboveground Facilities</b>					
N/A	Elkhorn Creek Compressor Station	1475	Wilson 31-6h	Burlington Resources Oil & Gas Company LP	Inactive (Shut-In >= 3 months and <= 12 Months)
N/A	Elkhorn Creek Compressor Station	1024	Pembroke Swd #1	E-Source Energy SWD, LLC	Active
N/A	Tioga Compressor Station	313	Tioga-Madison Unit G-113	Amerada Hess Corporation	Plugged and Abandoned
N/A	Lignite Tract	95551	Anderson 1	Phoenix Petroleum LLC	Active
N/A	Lignite Tract	96354	Lignite-Madison Unit 30	MCOR Oil & Gas Corp.	Plugged and Abandoned
N/A	Lignite Tract	97084	Lignite Gas Plant Swd Well 1	Citco	Plugged and Abandoned
N/A	Norse Transfer Station	993	Opee 1-23h	Continental Resources, Inc.	Active
N/A	104 <sup>th</sup> Ave NW Block Valve	1013	Beaver Lodge-Madison Unit O-25	Amerada Hess Corporation	Plugged and Abandoned

Source: North Dakota Department of Mineral Resources. 2020. Oil and Gas Division – Oil and Gas GIS Shapefiles. Available online at <https://www.dmr.nd.gov/OaGIMS/viewer.htm>. Downloaded August 2020.

<sup>a</sup> These wells are also located within 500 feet of an extra workspace (EWS) for a proposed guided bore roadway crossing. The distance from the guided bore EWS to the oil and gas wells ranges from 240 to 500 feet and, in all cases, is greater than the distance to the nearest Project workspace shown in this table.

Notes: NA = Not available.



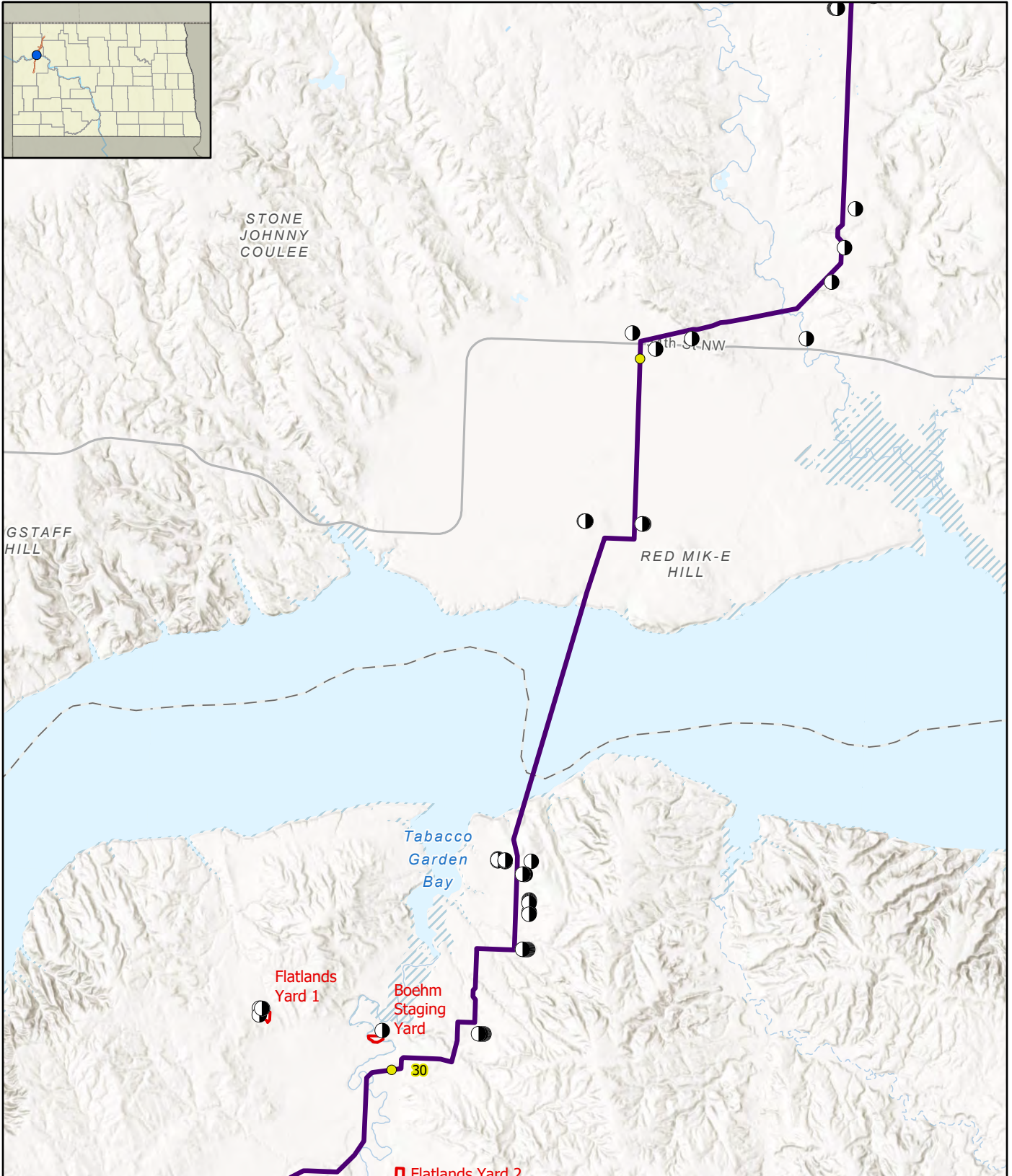


● Well (Oil/Gas)	— Proposed Line Section 25 Loop
● Milepost	— Proposed Line Section 30 Loop
□ Proposed Facility	— Proposed Tioga Compressor Lateral
	— Proposed Tioga-Elkhorn Creek

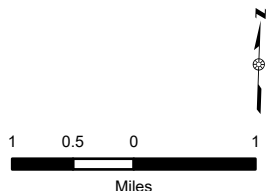
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Miles

**Appendix 6A**  
**North Bakken Expansion Project**  
 Oil and Gas Wells Within 0.25 Mile of the Project  
 Page 1 of 9



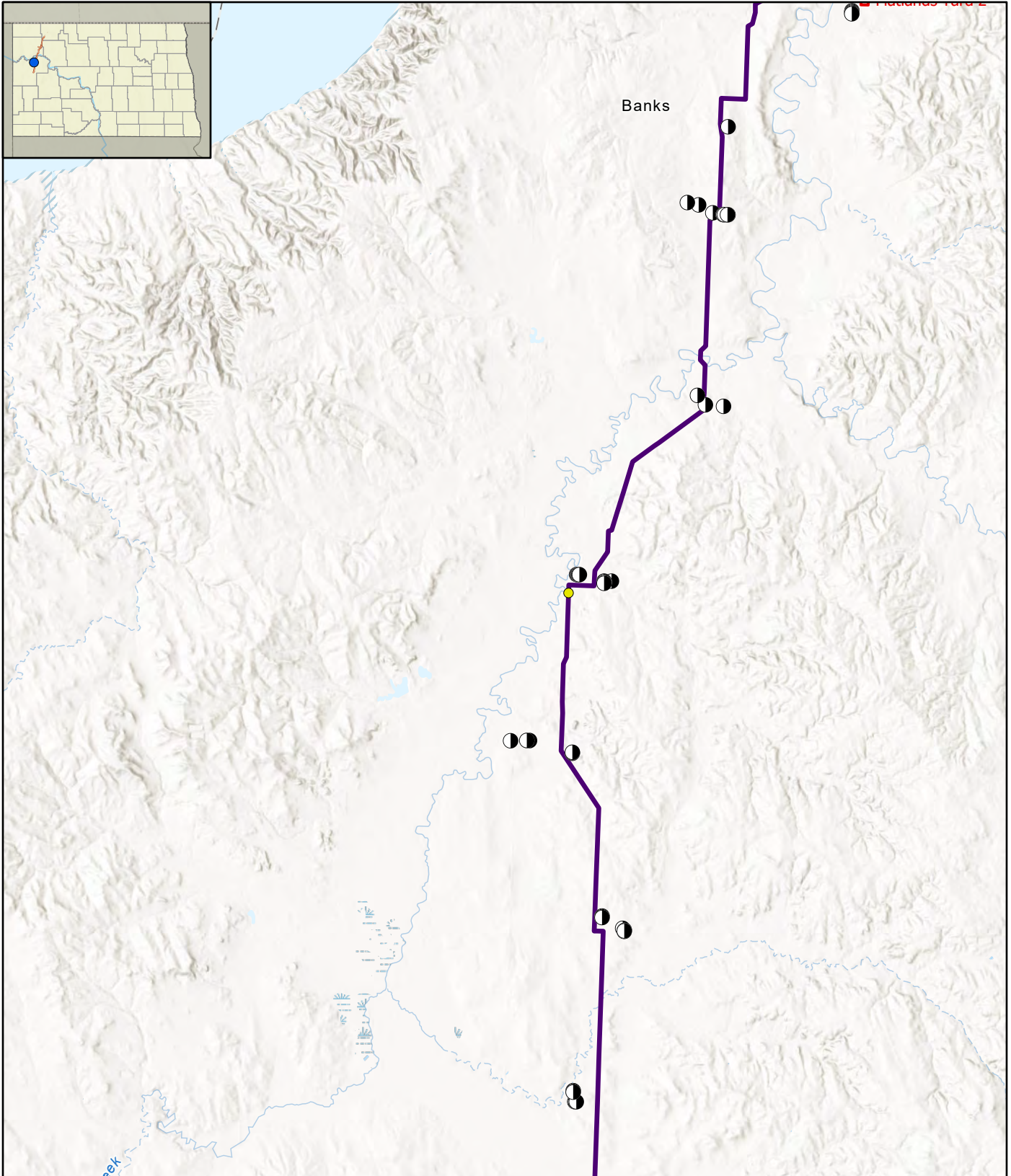


- Well (Oil/Gas)
- Milepost
- Proposed Facility
- Proposed Tioga-Elkhorn Creek

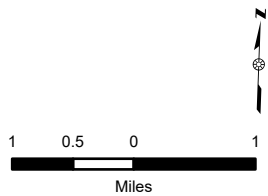


**Appendix 6A**  
**North Bakken Expansion Project**  
 Oil and Gas Wells Within 0.25 Mile of the Project  
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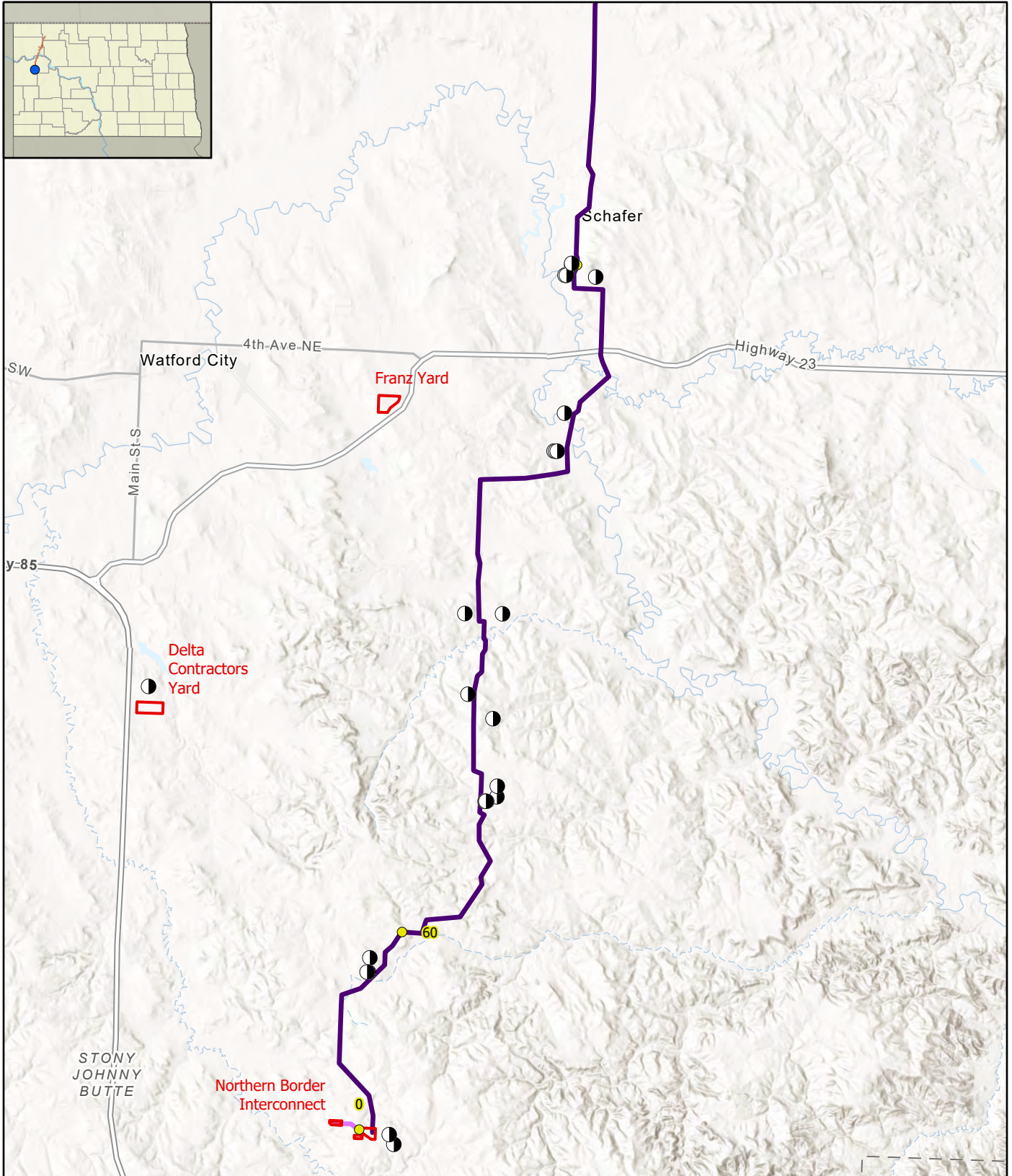


- Well (Oil/Gas)
- Milepost
- Proposed Facility
- Proposed Tioga-Elkhorn Creek



**Appendix 6A**  
**North Bakken Expansion Project**  
 Oil and Gas Wells Within 0.25 Mile of the Project  
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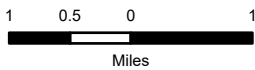
● Well (Oil/Gas)

● Milepost

□ Proposed Facility

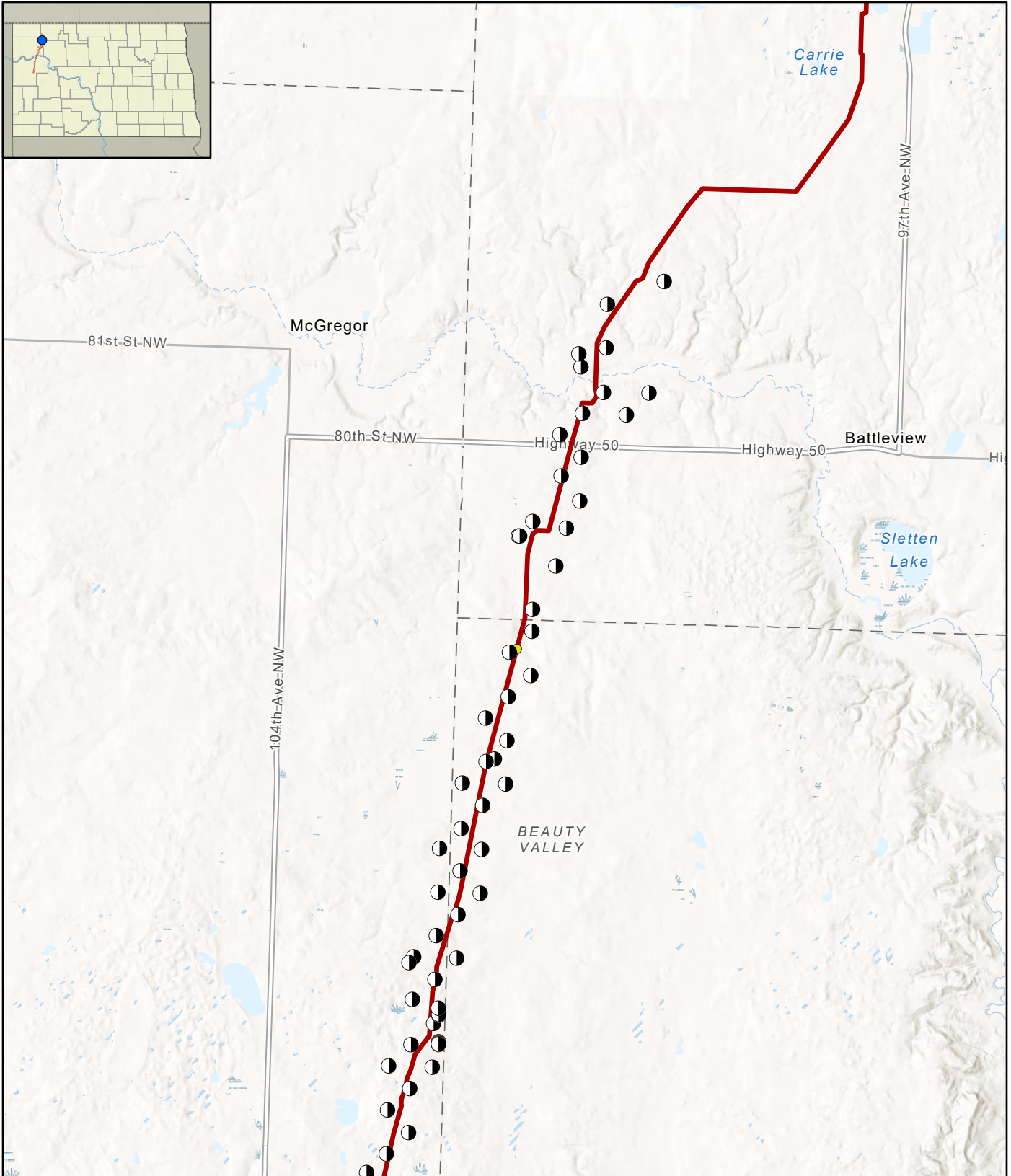
— Proposed Elkhorn Creek to Northern Border




— Proposed Tioga-Elkhorn Creek

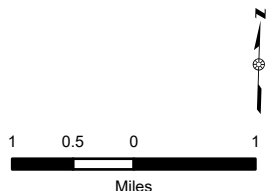


**Appendix 6A**  
**North Bakken Expansion Project**  
 Oil and Gas Wells Within 0.25 Mile of the Project  
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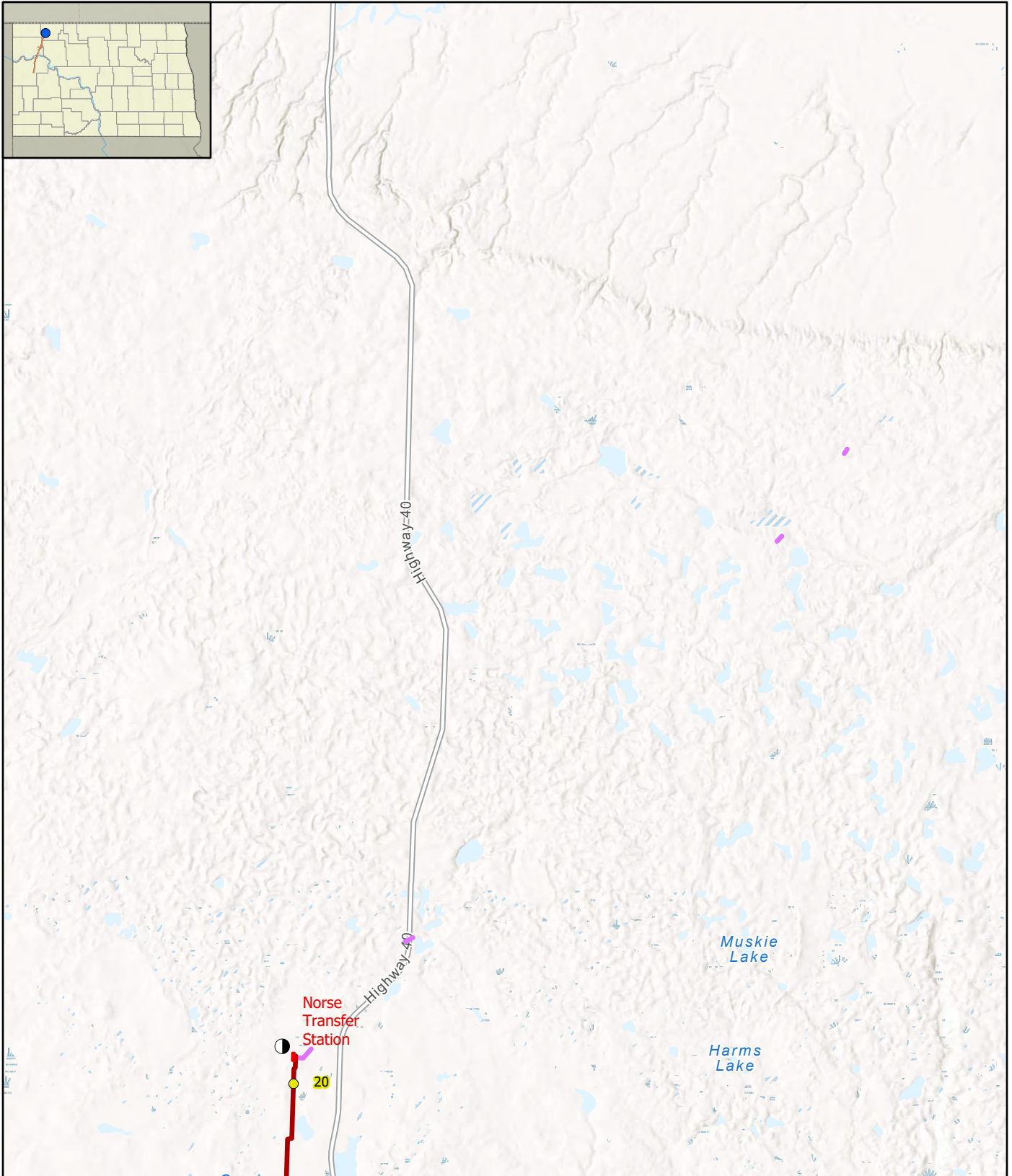








-  Well (Oil/Gas)
-  Milepost
-  Proposed Line Section 25 Loop

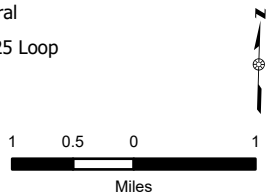


**Appendix 6A**  
**North Bakken Expansion Project**  
 Oil and Gas Wells Within 0.25 Mile of the Project  
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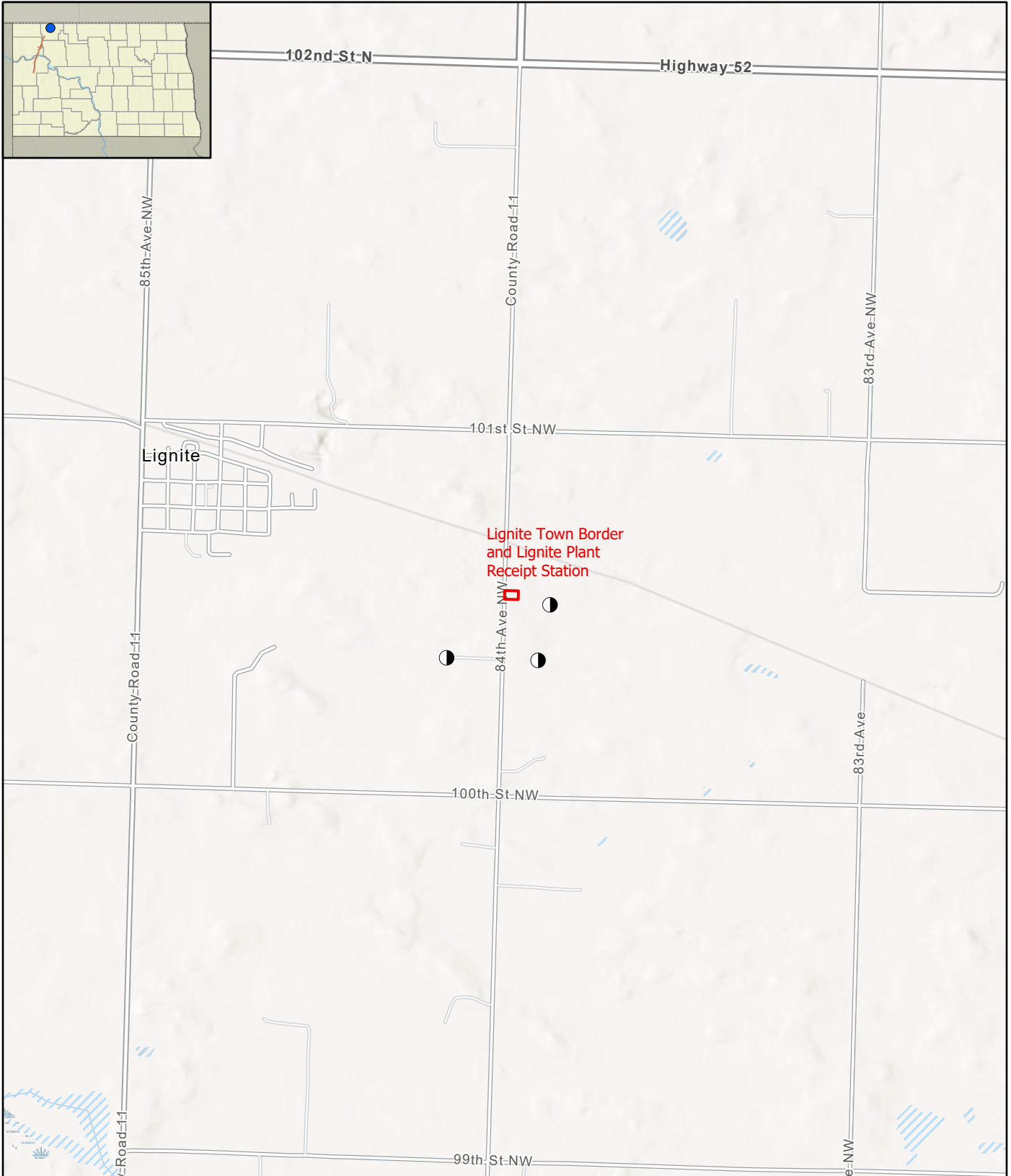


-  Well (Oil/Gas)
-  Milepost
-  Proposed Facility
-  Conoco Stoneview Lateral
-  Proposed Line Section 25 Loop
-  Proposed Uprate Site

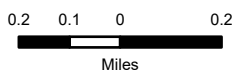


**Appendix 6A**  
**North Bakken Expansion Project**  
 Oil and Gas Wells Within 0.25 Mile of the Project  
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- Well (Oil/Gas)
- Proposed Facility

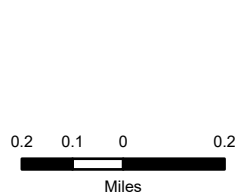


**Appendix 6A**  
**North Bakken Expansion Project**  
 Oil and Gas Wells Within 0.25 Mile of the Project  
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 Proposed Facility




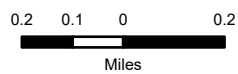
**Appendix 6A**  
**North Bakken Expansion Project**  
 Oil and Gas Wells Within 0.25 Mile of the Project  
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 Proposed Facility



**Appendix 6A**  
**North Bakken Expansion Project**  
 Oil and Gas Wells Within 0.25 Mile of the Project  
 Page 9 of 9



**NORTH BAKKEN EXPANSION PROJECT**

**Resource Report 6**

**APPENDIX 6B  
Paleontological Assessment for  
the North Bakken Expansion Project**



# Paleontological Assessment for the North Bakken Expansion Project, North Dakota

SEPTEMBER 2020

PREPARED ON BEHALF OF  
**WBI Energy Transmission**

PREPARED BY  
**SWCA Environmental Consultants**



# **PALEONTOLOGICAL ASSESSMENT FOR THE NORTH BAKKEN EXPANSION PROJECT, NORTH DAKOTA**

Prepared on behalf of

**WBI Energy Transmissions**

1250 West Century Avenue, Bismarck, ND 58503

Prepared by

**Georgia. E. Knauss, M.S., and Andrew Gerwitz, M.S.**

USDA Forest Service Authorization to Conduct Paleontological Resource Research or

Collections No. R1-DPG-MGM-FY19-01

Department of the Army Antiquities Act Permit No. DACW45-3-20-8008

**SWCA Environmental Consultants**

1892 South Sheridan Avenue

Sheridan, Wyoming 82801

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SWCA Paleontological Resources Report No. ND19-53975-01

September 2020



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# 1 INTRODUCTION

WBI Energy Transmission, Inc. (WBI Energy) proposes to construct and operate the North Bakken Expansion Project (or Project). The Project consists of an approximately 62.8-mile-long, 24-inch-diameter natural gas pipeline from new facilities at WBI Energy's existing Tioga Compressor Station near Tioga, North Dakota, to a new compressor station (Elkhorn Creek Compressor Station) southeast of Watford City, North Dakota (Figure 1). The Project also involves construction of approximately 0.3 mile of new 24-inch-diameter natural gas pipeline between the proposed Elkhorn Creek Compressor Station to a new interconnect with Northern Border Pipeline Company, approximately 20.3 miles of 12-inch-diameter natural gas pipeline looping along WBI Energy's Line Section 25, approximately 9.6 miles of 12-inch-diameter natural gas pipeline looping along WBI Energy's existing Line Section 30, and approximately 0.5 mile of 20-inch-diameter receipt lateral to the Tioga Compressor Station. Additionally, the Project includes the adding horsepower at the existing Tioga Compressor Station, uprates to WBI Energy's existing Line Section 25, and the installation of new and modifications to existing delivery, receipt, and transfer stations and lateral pipeline facilities along the pipeline routes; and the installation of block valves, pig launcher/receiver stations and other associated appurtenances. The project crosses United States Forest Service Little Missouri National Grasslands (USFS LMNG); United States Army Corps of Engineers (USACE); State of North Dakota; and private lands.

Environmental Resources Management (ERM) is assisting WBI with various aspects of the Project, including agency consultations, environmental surveys, and acquisition of environmental permits necessary for the Project. ERM contracted with SWCA Environmental Consultants (SWCA) to conduct a paleontological resource assessment for the Project. This report presents the results of the assessment, which included an analysis of existing data and partial field survey.

Based on state scale geologic mapping (Clayton et al. 1980), the Project crosses the Paleocene-age Fort Union Formation (e.g., Sentinel Butte and Bullion Creek Members) and multiple Quaternary surficial and glacial deposits of the Oahe and Colharbor Formations. These units were ranked according to the USFS's Paleontological Resources Rapid Assessment System (PRRAS) (USFS 2013) and according to the BLM's Potential Fossil Yield Classification (PFYC) System (BLM 2016) to determine the areas requiring field survey. Using the PRRAS, the USFS determined that paleontological resources are present or are most likely to exist only in the Paleocene-age geologic unit (PRRAS code 2); accordingly, the BLM (2015) considers the unit to have high potential (PFYC 4) for containing scientifically significant paleontological resources.

In accordance with existing federal and state laws, regulations, and policies a detailed paleontological analysis of public lands was conducted. SWCA and ERM refined the survey area through discussions with the USFS, USACE, and North Dakota State Paleontologist; a review of detailed geologic maps (Carlson 1985; Clayton 1972; Freers 1970, 1973); and aerial imagery review, looking for exposures of paleontologically sensitive geologic units. As a result of the pre-survey desktop analysis and coordination with the North Dakota State Paleontologist (Boyd 2019) paleontological surveys were not required or recommended for North Dakota State lands. SWCA limited the paleontological field survey (or reconnaissance) to portions of the proposed pipeline corridor where the route passes through the LMNG and USACE land, adjacent to and south of Lake Sakakawea in Sections 1, 12, 13, and 14, Township (T) 153 North (N), Range (R) 97 West (W); Section 36, T154N, R97W; and Section 18, T154, R96W, McKenzie and Williams Counties, North Dakota (Figure 2).

The objectives of the assessment are to provide paleontological surface clearance through a pedestrian examination of select survey areas and to provide information which was used to formulate recommendations for Project construction. SWCA paleontologist Andrew N. Gerwitz conducted this survey on October 23, 2019, under U.S. Department of Agriculture Forest Service Authorization to Conduct Paleontological Resources Research or Collection No. R1-DPG-MGM-FY19-01 and Department of the Army Antiquities Act Permit No. DACW45-3-20-8008. Copies of these authorizations (or permits) are provided in Appendixes A and B, respectively.

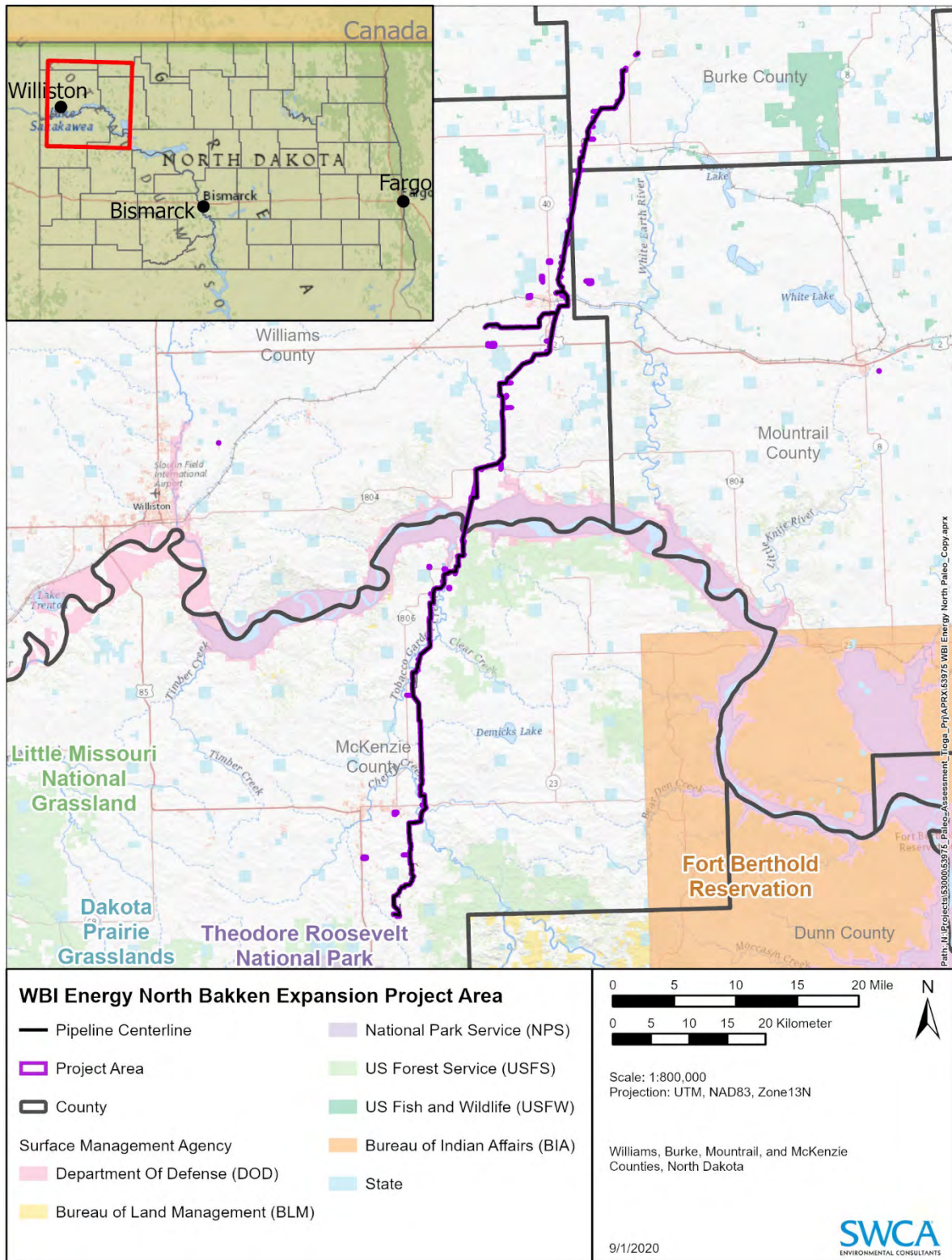


Figure 1. Overview map of the North Bakken Expansion Project.

## **2 DEFINITION AND SIGNIFICANCE OF PALEONTOLOGICAL RESOURCES**

Fossils are defined as any fossilized remains, traces, or imprints of organisms preserved in or on the earth's crust. They are considered non-renewable resources because the organisms they represent no longer exist, and such resources, if destroyed, cannot be replaced. As defined in 36 Code of Federal Regulations (CFR) 291, paleontological resources are any fossilized remains, traces, or imprints of organisms, preserved in or on the earth's crust, that are of paleontological interest, and that provide information about the history of life on earth. The term does not include any materials associated with an archaeological resource (as defined in Section 3[1] of the Archaeological Resources Protection Act of 1979 [16 United States Code 470bb(1)]; or any cultural item (as defined in Section 2 of the Native American Graves Protection and Repatriation Act [25 United States Code 3001]).

Fossils are important scientific and educational resources that paleontologists use to study taphonomic processes. Paleontologists also use the morphologic information that fossils provide to reconstruct phylogenetic relationships of extinct and extant organisms; to study evolution, extinction, and speciation patterns; to reconstruct ancient environments and paleobiogeographic relationships; and to provide relative geologic dates through biochronology and biostratigraphy. As objects of national significance, paleontological resources must be preserved for the inspiration and benefit of the people of the United States. The value of fossils may be greatly diminished or lost entirely in the absence of proper management. The USACE, USFS, and State of North Dakota recognize their responsibility to manage and protect that part of the fossil record which occurs on public land as a national legacy for future generations.

While more than one significance criteria maybe used to determine fossil importance, the USFS defined significant paleontological resources as those possessing scientific importance due to distinguishing characteristics of identity, context, or preservation. Significant paleontological resources include invertebrate, plant, and vertebrate fossils which further paleontological knowledge about the history of life on earth. Scientific importance may be attributed to the actual fossil specimen, to fossil context (location in time and space, intimate association with other evidence of scientific significance), or to fossil preservation. Paleontological resources are deemed significant by meeting any one of the criteria discussed below (modified from USFS 2005).

### **Specimen-Based Criteria**

- Represents an unknown or undescribed/unnamed taxon.
- Represents a rare taxon, or rare morphological/anatomical element or feature (rareness criterion comprises either absolute rareness in the fossil record, or contextual rareness as described below).
- Exhibits a remarkable type or quality of preservation (unaltered hard parts, evidence or preservation of soft tissue, preservation in amber or ice).

### **Context-Based Criteria**

- Intimate association with other evidence of scientific significance, providing new ecological, environmental, or behavioral information.
- Evidence that extends or constrains the geographic or temporal distribution of a species or higher-level taxonomic group, providing new information about evolution.

### **3 GUIDANCE AND METHODS**

This section describes the guidance and methods SWCA used to perform paleontological work for the project.

#### **3.1 Authorities and Standards**

SWCA conducted the paleontological analysis of existing data and the field survey in accordance with the following regulations for paleontological resources management on state, USACE, and USFS lands in the Project area and following best practices for paleontological resource assessment and management, as outlined in Murphey et al. (2019), BLM Manual H-8720-1 (1998), and BLM Instructional Memorandum (IM) 2009-011 (BLM 2008), IM 2012-141 (2012), and IM2016-124 (2016).

There are no state or federal laws applicable to paleontological resources management or preservation on private lands in the state of North Dakota. Paleontological resources from private or split-estate lands are the property of the surface-estate owner, and their disposition shall take place in accordance with the agreement between the surface landowner and the project proponent. Surface owners are encouraged to consider the scientific value of finds made on their lands and to donate potentially important finds to a public museum for the benefit of society.

Chapters 43-04 and 54-17.3 of the North Dakota State Century and Administrative Codes include state level-requirements for the assessment and management of paleontological resources on lands owned by the state or its political subdivisions. These statutes 1) define vertebrate fossils as paleontological resources unless they are determined to be insignificant by the state geologist and 2) note that invertebrate, plant, and trace fossils are not paleontological resources unless they are determined to be significant by the state geologist. Additionally, these statutes require a permit for identifying or evaluating paleontological resources to satisfy state or federal requirements or for investigating, excavating, collecting, or otherwise recording paleontological resources on state lands.

The National Environmental Policy Act (NEPA) of 1970 (Public Law 91-190; 31 Statute 852; 42 United States Code 4321–4327) requires the consideration of important natural aspects of our national heritage during the assessment of the environmental consequences of proposed projects with federal land or in some cases federal oversight. In addition, the USACE, like other federal land managing agencies, the USACE issues permits for paleontological investigations and mitigation on lands under their jurisdiction (United States Code Annotated 54 U.S.C.A § 320302). Conditions applicable to permits for examination, excavation, and gathering of objects of antiquities on USACE land include that authorization be limited to qualified individuals working to increase knowledge of the objects and that collected objects be permanently preserved in a public museum, but remain the property of the United States Government. Applicable specifically to USFS lands within the project, in 2009, the Paleontological Resources Preservation Act (PRPA) became law; the PRPA is codified in Title VI of the Omnibus Public Lands Management Act of 2009 (Public Law 11-011, VI, Subtitle D). The PRPA states that the Secretaries of the Interior and Agriculture shall use scientific principles and expertise to manage and protect paleontological resources on federal land (Section 6302). The PRPA incorporates many of the recommendations of the Secretary of the Interior’s May 2000 report, *Assessment of Fossil Management on Federal and Indian Lands* (U.S. Department of the Interior 2000), which details actions to formulate a consistent paleontological resources management framework. With the passage of the PRPA, Congress

defined paleontological resources and reaffirmed that paleontological resources collected from federal land (e.g., BLM, BOR, USFS) are federal property. The PRPA provides the following.

- The establishment of a program to increase public awareness about the significance of paleontological resources.
- A definition for casual collecting.
- Minimum requirements for paleontological resource–use permit issuance (terms, conditions, and applicant qualifications).
- Criminal and civil penalties for the illegal sale, transport, theft, or vandalism of paleontological resources from federal land; required forfeiture of such paleontological resources; and an option to offer rewards for information that leads to the finding of a civil violation or conviction of a criminal violation.
- Requirements for curation of paleontological resources in approved repositories.
- Direction that information concerning the nature and specific location of a paleontological resource is exempt from disclosure under 5 United States Code 552 and any other applicable law unless otherwise specified.

In 2015, the U.S. Department of Agriculture completed the Paleontological Resources Preservation Final Rule (36 CFR 291) and it was published in the *Federal Register* (U.S. Department of Agriculture 2015). The purpose of 36 CFR 291 is to implement provisions of the PRPA. It contains the primary information related to the preservation of paleontological resources on USFS administered land; as a result, some of the previously cited rules and regulations are no longer applicable. For example, the definition for paleontological resources was removed from 36 CFR 261.2.

## **3.2 Assessment of Paleontological Potential**

Historically the USFS used the Fossil Yield Potential Classification (FYPC) system for assessing the potential for paleontological resources of a specific area without a full on-site evaluation (e.g., field surveys or monitoring of ground disturbance) (USFS 2005). The BLM currently using a similar ranking system, the PFYC, in which the BLM has assigned a PFYC ranking (1–5) to each geological unit (formation, member, or other distinguishable units) at the most detailed mappable level based on the taxonomic diversity and abundance of previously recorded scientifically significant paleontological resources associated with the unit and the potential for future discoveries, with a higher-class number indicating higher potential (BLM 2016). Additional rankings are provided for geological units of unknown potential (U), water (W), and ice (I). The PFYC system is not intended to be applied to specific paleontological localities or small areas within units. Although significant localities may occasionally exist in a geological unit, a few widely scattered important fossils or localities do not necessarily indicate a higher class; instead, the relative abundance of significant localities is intended to be the major determinant for the class assignment. The PFYC system provides baseline guidance for predicting, assessing, and mitigating paleontological resources in areas of development.

In 2013, the FYPC system was abandoned by the USFS in response to PRPA paleontological resource management mandates and it was replaced by the PRRAS which designed by USFS paleontologists to generate indicators of paleontological resources on USFS land (USFS 2013). In short, the PRRAS is based on the fundamental assumption that mapped geology adequately represents the distribution of paleontological resources; and that the distribution of paleontological resources in geologic units is fundamentally related to objective attributes such as lithology and geologic age.

The PRRAS assigns a code (0, 1, or 2) to each geologic unit (formation, member, or other distinguishable unit) at the most detailed mappable level. The three PRRAS codes are as follows.

- PRRAS code 0: paleontological resources absent or unlikely to occur
- PRRAS code 2: paleontological resources present or likely to occur
- PRRAS code 1: likelihood of paleontological resource occurrence unknown

This system provides baseline guidance for predicting and assessing paleontological resources in areas of proposed development. The coding of geologic units is not a substitute for field surveys. The PRRAS focuses attention on areas where paleontological resource management is merited and where field surveys should be required to inventory, monitor, and ensure paleontological resource protection. A 1:500,000-scale North Dakota Geological Survey map (Clayton et al. 1980) indicates that the project would cross multiple Quaternary units and the Paleocene-age Fort Union Formation; these units are assigned a PRRAS code of 0 and 2, respectively, by the USFS and PFYC values of 2 to 3 and 4, respectively by the BLM (Table 1).

**Table 1. Mapped Geologic Units within the Project Area (1:500,000-scale map)**

Geologic Unit	Map Symbol	Age	Typical Fossils	PRRAS Code	PFYC Value
Oahe Formation; river sediments and windblown sand (post glacial sediments)	Qor, QTou	Holocene to Pleistocene to Pliocene	Few, such as bison bones, known. Pleistocene deposits may contain mineralized or partially mineralized remains. Holocene deposits are too young to contain in-situ fossils.	0	2
Coleharbor Formation; multiple glacial deposits including Offshore Sediments (ice-walled lake); River Sediment (uncollapsed river, and collapsed), Glacial Sediment (collapsed, collapsed/draped transition, draped on older surface)	Qcoh, Qcrf, Qcrh, Qccu, Qccr, Qcch, Qcdc, Qcdn	Holocene and Pleistocene	Few known. Pleistocene deposits may contain mineralized or partially mineralized remains. Holocene deposits are too young to contain in-situ fossils.	0	3
Sentinel Butte Formation	Ts	Paleocene	Vertebrates: mammals, turtles Invertebrates: mollusks Plants: fruit, leaf impressions, silicified wood.	2	4
Bullion Creek Formation (prior to 1977 generally mapped as part of the Tongue River Formation)	Tb	Paleocene	Vertebrates: mammals, turtles Invertebrates: mollusks Plants: fruit, leaf impressions, silicified wood	2	4

Note: Geologic units are listed approximately in descending stratigraphic order from youngest to oldest. Typical fossil information is summarized from the author's personal experience and literature review.

Source for geologic units: Clayton et al. 1980

### 3.3 Desktop Analysis Methods

SWCA conducted background research for the Project area to identify known fossil resources therein and nearby in the same geological formation. SWCA's research included geological map and literature reviews, previous locality data searches, coordination with the USFS, USACE, and North Dakota State Paleontologist, and discussion with paleontologists conducting active research in the area. In addition, SWCA requested access to paleontological records maintained by the USFS National Zone Paleontologist and the North Dakota Geologic Survey State Fossil Collection to 1) determine whether any previously recorded fossil localities exist in the project area, 2) assess the potential for disturbance of these localities during construction, and 3) evaluate the paleontological sensitivity of the project area.

### **3.4 Field Survey Methods**

Paleontological field surveys are required on public land with geologic units with high potential for containing important paleontological resources. SWCA designed the paleontological field survey to determine the surface presence of previously unknown significant vertebrate fossils and/or noteworthy invertebrate, plant, or trace fossils, and to evaluate potential adverse impacts to subsurface paleontological resources during construction. The pedestrian survey covered an approximately 300-foot-wide corridor along a 2.30-mile-long section of the pipeline within the USFS LMNG and on USACE lands along the shoreline of Lake Sakakawea. No surveys took place on State of North Dakota lands. North Dakota State Paleontologist Dr. Clint Boyd (2019) confirmed via email communication with SWCA that North Dakota State lands in the analysis area (Sections 24 and 36, T. 158 N., R. 95 W.; Section 6, T. 157 N., R. 94 W.; Sections 19 and 31, T. 158 N., R. 94 W.; Sections 25 and 36, T. 155 N., R. 92 W.) have surficial exposures limited to Quaternary-age sediments (=low paleontological potential) and noted that there are no previously documented localities in these areas; and therefore saw no need for field reconnaissance (or survey) of these state managed lands. Following the initial surveys a portion of the project crossing USFS LMNG lands was relocated. Most of the modified area is vegetation with no bedrock exposures. One drainage with small areas of potential exposed bedrock, in the northwestern corner of Section 13, T. 153 N., R. 97 W., is within the final project area. This drainage will be bored, and disturbance here will primarily be within the subsurface. Based on the results of the original field survey, few previous finds in this portion of the LMNG, and the lack of bedrock exposures in the final project area USFS McKenzie Ranger District Minerals and Lands Supervisor Cale Bickerdyke (2020) confirmed in a telephone conversation with ERM that additional survey of the relocated project area on LMNG is not required.

Surveyors inspected the survey area for 1) surface fossils, 2) exposures of potentially fossiliferous rock, and 3) areas in which construction would expose or otherwise affect fossiliferous rock. Exposures of paleontologically sensitive geological units received a thorough pedestrian survey. A visual review from a distance is appropriate only for areas in which the absence of bedrock exposures can be visually confirmed from that distance.

SWCA's standard operating procedure is to record all fossils discovered during field surveys as significant fossil localities (SFLs) or non-significant fossil occurrences (NFOs). An SFL requires documentation of the location, identification, and description of the qualifying significant paleontological resources along with their geological context and may require avoidance or mitigation of impact from project activities. The presence of highly weathered, fragmentary, or otherwise unidentifiable fossils is recorded as an NFO to communicate the presence of fossils in a manner that avoids unnecessarily triggering avoidance or mitigation measures. NFOs typically consist of more than five fragments of turtle shell, unidentifiable bone and tooth fragments, and/or unidentifiable plant fossils and fragments of fossilized wood. In addition, SWCA used a Geode global positioning system (GPS) unit to record points for locations of surface fossils with essentially no individual importance because of their poor preservation, lack of identifiable features, or commonality. Although such surface fossils include no resources that require full documentation, those locations are useful in determining the potential of the survey area to contain subsurface fossils. Fossil locality data are sensitive and are exempt from the Freedom of Information Act.

With the completion of the field survey, SWCA made recommendations for the project area. Typical post-survey recommendations include one or more of the recommendations listed in Table 2.

**Table 2. Types of Post-Survey Paleontological Recommendations**

<b>Recommendation</b>	<b>Description</b>
Clearance	If adverse impacts on paleontological resources are anticipated to be nonexistent or below the level of significance for a given surface-disturbing action in a given area based on pre-field survey research and/or field survey or monitoring results and if no further consideration of paleontological resources is deemed necessary, immediate paleontological clearance is recommended. A clearance recommendation can be made for an entire project area or any portion thereof (including surface and/or subsurface), depending on paleontological sensitivity.
Fossil Collection	If isolated small, medium, or large fossils are discovered within a project area during field surveys or mitigation monitoring and if they are determined to be scientifically significant, they should be collected. This may involve simply collecting a fully exposed fossil from the ground surface, or may involve a systematic excavation, depending on the nature of the fossil discovery. Excavations should be designed to minimize construction delays while properly collecting the fossil and associated data according to professional paleontological standards. Depending on land ownership, curation agreements, and the size of a planned excavation, additional authorizations may be required prior to fieldwork. For all extensive discoveries, a detailed locality-specific plan should be completed prior to initiating a full excavation and collection.
Avoidance	If the cost of locality collection or other mitigation to the project schedule or budget is determined to be too high or if permanent damage to the resource caused by surface disturbance is considered to be unavoidable, avoiding or rerouting the portion of the project that intersects the fossil locality may be necessary to prevent adverse impacts on the resource. Avoidance should also be considered if a known fossil locality appears to contain critical scientific information that should be left undisturbed for subsequent scientific evaluation. Avoidance for later scientific research is the typical mitigation recommendation made for extensive scientifically significant paleontological discoveries.
Monitoring	<p>If significant (well-preserved, uncommon, and/or identifiable) paleontological resources are known to exist in an area or if there is a high likelihood that subsurface fossils are present in geologic formations or members thereof within a given project area based on prior field surveys, museum records, or scientific or technical literature, paleontological monitoring of construction excavations (e.g., surface-disturbing actions) should be recommended. Monitoring involves systematic inspections of graded cut slopes, trench sidewalls, spoils piles, and other rock or surficial sediment surfaces exposed during excavation for the presence of fossils and the collection and documentation of these fossils before they are destroyed by further ground-disturbing actions.</p> <p>There are two types of monitoring: standard (or on-site) monitoring and spot-check monitoring. Standard, or on-site, monitoring requires the presence of a monitor at all times that applicable surface disturbance is occurring and is typically required in the most paleontologically sensitive areas. Spot-check monitoring involves the non-continuous examination of excavations or spoil piles during project activities instead of maintaining the continuous monitoring of operations. This type of monitoring is typically used in areas with moderate paleontological potential or areas with surface cover where a low volume of geologic units with higher potential may be disturbed.</p>

## **3.5 Distribution of Data**

SWCA will submit electronic copies of this report and associated electronic shapefiles to ERM; USACE Garrison Project Office representatives Todd Lindquist, Project Manager, and Richard Rogers, Archeologist; and LMNG McKenzie Ranger District representatives Barbara A. Beasley, USFS Paleontologist, and Cale E. Bickerdyke, Minerals and Lands Supervisor. SWCA will also maintain an electronic file of the report with relevant field notes, maps, and other data on SWCA's corporate server.

## **4 RESULTS**

This section presents the results of SWCA's paleontological work for the project.

### **4.1 Literature Search Results**

The Project area is in the central portion of the Williston Basin, starting north of the Killdeer Mountains and traveling north, east of Watford City, and along the southern shore of Lake Sakakawea before



continuing north-northeast and ending southwest of Lignite, North Dakota. Although at least two geologic units, the Paleocene-age Fort Union Formation and surficial deposits of Pleistocene to Holocene age, underlie the full Project area, paleontological survey was limited to the portions of the project area that overlap of the Fort Union Formation. The fossils contained within the Paleocene age sediments, together with the sediments in which they are preserved, provide evidence of the history of life in the western interior of North America during the earliest Cenozoic. These units were deposited in a terrestrial setting after the Western Interior Seaway, which had covered much of central North America during the Cretaceous, underwent its final major regressive depositional cycle, and strand line, estuarine, beach, and marine sediments gave way to fully terrestrial predominantly alluvial and floodplain deposits. From Quaternary to recent times, the landscape was altered as the result of erosion by water and wind, and the modern topography was formed.

The following sections provide a summary of the geologic and paleontological information for the Fort Union Formation, previously determined by multiple agencies to have high potential for containing scientifically important paleontological resources (PRRAS Code 2; PFYC 4), and a basic overview of Quaternary units, which have moderate to low potential for containing important paleontological resources, in relation to the project area.

#### **4.1.1 Fort Union Group (or Formation)**

Although recognized by the U.S. Geological Survey (USGS) as a formation, the Fort Union is recognized by the North Dakota Geological Survey (NDGS) as a group, and is divided into the Ludlow, Cannonball, Slope, Bullion Creek (or Tongue River), and Sentinel Butte formations (Hartman et al. 2002). The Fort Union Group (or Formation) is an expansive ‘unit’ and has been mapped using surficial exposures and well logs in Montana, South Dakota, Wyoming, North Dakota, and Colorado.

The Bullion Creek and Sentinel Butte formations are mapped within the Project area (Carlson 1985, Clayton et al. 1980, Freers 1970). The following subsections describe the stratigraphy, fossils, and paleontological sensitivity of these two units. In general, the Bullion Creek is composed of light-colored rocks (bright colored siltstone and mudstones), while the Sentinel Butte is darker gray and the boundary between the two is often noted by a lignite or “clinker” if it has burned. The Fort Union is conformably underlain by the Hell Creek Formation (mapped using well log data; Freers 1970), and unconformably overlain in the study area by Quaternary surficial deposits. Minor exposures of the Golden Valley Formation, composed of brightly colored beds, lie conformably on the Sentinel Butte Formation approximately 20 miles southeast of the Project area.

##### **4.1.1.1 BULLION CREEK FORMATION (OR TONGUE RIVER FORMATION)**

Exposed throughout western North Dakota and westward into Montana as far as the Cedar Creek anticline (Clayton et al. 1977), the Bullion Creek is recognized by the NDGS as a formation, while the USGS considers it an informal member of the Fort Union Formation (Group). The type area is near Bullion Butte, in Golden Valley County, North Dakota. The name Bullion Creek was proposed in 1977 for rocks that were previously thought to be equivalent to all or a portion of the Tongue River Formation (Clayton et al. 1977). However, this nomenclature is not widely accepted, as a review of recent literature revealed that several authors have reverted to attributing these beds to the Tongue River Formation (Hunter and Hartman 2004; Peppe 2010). The Bullion Creek Formation consists of yellow-brown siltstone, claystone, sandstone, and lignite beds (usually 1 to 4 meters thick) which were deposited in a variety of environments including deltas, rivers, and lakes (Clayton et al. 1977). Although sandstones comprise a small percentage of the formation, sandstone beds form prominent features, usually preserved as recognizable channel deposits composed of cross-stratified, fine- to medium-grained lenticular sandstone bodies. The Bullion Creek Formation has a maximum thickness of approximately 600 feet (183 meters) in

subsurface logs near the middle of the Williston Basin and thins to the east and west (Clayton et al. 1980; Clayton et al. 1977). It conformably underlies the Sentinel Butte Formation and unconformably overlies the Slope Formation (“Rhame Bed”) in the western part of North Dakota, and the Cannonball Formation in the central portion of the state.

Fossil from the Bullion Creek Formation include mammals, reptiles, fish, fossil trackways, invertebrates, and plants (Hanks et al. 2002; Erickson 1991; Hartman 1984). There are several highly productive vertebrate fossil localities from the Bullion Creek Formation. Wannagan Creek, the best-known Bullion Creek locality, was first collected in 1971 by the Science Museum of St. Paul and has produced thousands of fossil vertebrates including a famous reptilian fauna (Erickson 1982a, 1982b, 1991). The Judson locality is an important mammal-rich locality which was for a time thought to be within the Slope Formation (Hartman and Kihm 1991; Kihm and Hartman 2004). Fossils collected indicate that the Bullion Creek is of Torrejonian and Tiffanian North American Land Mammal Age (NALMA) (Hartman and Kihm 1995). Fossils are relatively abundant in the Bullion Creek Formation.

#### **4.1.1.2 SENTINEL BUTTE FORMATION**

The Sentinel Butte is considered to be a member of the Fort Union Formation by the U.S. Geological Survey but is regarded as a formation of the Fort Union Group by the NDGS. In North Dakota the Fort Union Formation has been divided into the Ludlow, Cannonball, Slope, Bullion Creek (or Tongue River), and Sentinel Butte formations (Hartman et al. 2002). The Fort Union Group (or Formation) is an expansive ‘unit’ and has been mapped using surficial exposures and well logs in Montana, South Dakota, Wyoming, North Dakota, and Colorado. In northwestern North Dakota the Fort Union Group is conformably underlain by the Hell Creek Formation (mapped using well log data; Freers 1970) and unconformably overlain in a small portion of the Project area by Quaternary surficial deposits. All these sedimentary units were deposited in a terrestrial setting after the Western Interior Seaway, which had covered much of central North America during the Cretaceous, underwent its final major regressive depositional cycle, and strand line, estuarine, beach, and marine sediments gave way to fully terrestrial, predominantly alluvial and floodplain deposits. From Quaternary to recent times, the landscape was altered as the result of erosion by water and wind, and the modern topography was formed.

The Sentinel Butte type area is located along the northeastern slope of Sentinel Butte in Golden Valley County, North Dakota (Clayton et al. 1977). The rocks of the Sentinel Butte Formation consist primarily of poorly cemented gray-brown claystone, mudstone, siltstone, sandstone, and lignite with locally present, isolated, well-lithified channel sandstone beds. The rocks of the Sentinel Butte are differentiated from the conformably underlying Bullion Creek by lying above the HT Butte lignite (sometimes clinker) marker bed (where present); drab color compared to the bright yellowish-brown of the Bullion Creek; weathering to steep, narrow gullies, as compared to smooth slopes of the Bullion Creek; and prevalence of fossil wood (Biek and Gonzalez 2001). These sediments were deposited in lakes, rivers, and swamps. While buried, some of the rocks within the Sentinel Butte Formation were baked as adjacent coal seams burned. These individual baked “clinker” beds can reach a thickness of 40 feet (12 meters [m]) and vary depending on their mineral composition and grain size; coal thickness, and length, quality; and type of burn (Biek and Gonzalez 2001). The total thickness of the Sentinel Butte Formation varies from 600 to 750 feet (183 to 229 m) (Clayton et al. 1980). At least four marker beds are recognized within the Sentinel Butte; these include the “blue” bentonitic bed and the low and high yellow markers.

Mammal fossils, including a number of specimens of *Titanoides* (Pantodonta), are known from the lower Sentinel Butte Formation (Hartman and Kihm 1991). The mammal fossils collected from the Red Springs Quarry in central North Dakota indicate a late Tiffanian North American Land Mammal Age for the Sentinel Butte Formation (Kihm et al. 1993). In addition to the mammals, other vertebrate fossils are known and have been collected from the Sentinel Butte Formation; however, many of these fossils are

known from unpublished fossil collections located primarily in the North Dakota State Fossil Collection (Hoganson 2012). A soft-shell turtle death assemblage was collected by the NDGS and was the subject of an unpublished master's thesis (Kays 1999). Several molluscan fossil localities were also found near the Red Springs Quarry and are known from elsewhere in west-central North Dakota (Hartman 1984). While leaves and other plant fossils including fruits have been documented during stratigraphic studies and collections have been made from a few well-preserved and diverse silicified floras including Almont (Morton County, North Dakota) and Beicegel Creek (McKenzie County, North Dakota), these collections remain largely unpublished (Crane et al. 1990; Stull et al. 2012; Pigg et al. 2008; Pigg and DeVore 2005). Silicified wood as indicated above is prominent within the formation, and much of it has been referred to as conifer (Taxodiaceae, sequoia family), including those specimens analyzed within two units in the lower Sentinel Butte, which preserve silicified stumps in upright position and are exposed in the southern portion of Theodore Roosevelt National Park (Fastovsky and McSweeney 1991).

#### **4.1.2 Quaternary Deposits**

Two Quaternary deposits underly the Project area, the glacial derived Coleharbor Formation and post glacial Oahe Formation (Clayton et al. 1980). Both units are divided into multiple subunits, yet these subdivisions are not true lithostratigraphic units as the inferred geologic history of the units has had no bearing on their definitions. For example, the Coleharbor Formation hummocky collapse topography (Qccu, Qccr, and Qcch) has been subdivided based on its three most conspicuous variables: slope angles, presence or absence of ring-shaped hummocks, and presence or absence of transverse ridges. The Coleharbor Formation is 600 feet thick in places and composed of offshore ice-walled-lake sediments (up to 200 feet thick), river sediments (up to 100 feet thick), and glacial sediments (up to 100 feet). The Oahe Formation river sediments (Qor) of dark, obscurely bedded clay and silt (overbank sediment) overlying cross-bedded channel sand are a maximum of 30 feet thick and the partially older (Pliocene) windblown sand (QTou) are limited to a thickness of 10 feet (Clayton et al. 1980).

In general the Coleharbor is distinguished from other Pleistocene deposits in North Dakota by the presence of pebbles derived from the Canadian Shield and the lower Paleozoic formations fringing the Canadian Shield; in contrast, the Pleistocene deposits of southwestern North Dakota contain pebbles derived from the Black Hills and the Rocky Mountains and from local Paleocene formations. As currently recognized, the Oahe Formation includes sediment of all grain sizes above the Coleharbor Group, though originally limited to only silt. The Oahe differs from the Coleharbor in lacking glacial sediment. The Coleharbor in most outcrops can be distinguished from the overlying Oahe Formation (Holocene) by the absence of diffuse organic material.

Pleistocene-age surficial deposits, particularly alluvium, may contain mineralized or partially mineralized animal bones, invertebrates, and plant remains of paleontological significance. Except for some caves, hot springs, and tar deposits, these fossils typically occur in low density and usually consist of scattered and poorly preserved remains. Erratics and glacial outwash vary in thickness and glacial outwash sands and gravels have produced fossils including those of plants (spruce and aspen), animals including the giant ground sloth (*Megalonyx jeffersonii*), horses, deer, *Bison latifrons*, and insects (Hoganson and Murphy 2003). However, most deposits of Pleistocene age in North Dakota contain few fossils and are considered to have low paleontological sensitivity. Holocene-age alluvium and colluvium may contain the unfossilized remains of modern taxa but are too young to contain in situ fossils.

## 4.2 Records Search Results

According to the USFS (Beasley 2019), the North Dakota State Paleontologist (Boyd 2019), and published literature, the survey area contains no fossil localities but at least three previously recorded fossils localities are within 1 mile of the Project (Table 3); however, the project would not cross any of those localities.

**Table 3. Previously Recorded Fossil Localities within 1 Mile of the Project**

Fossil Locality ID	Source (Collector or Researcher)	Section	Township	Range	Ownership	Geologic Unit	Description	Comment
L1136/USGS 10103	Hartman 1984	31	154N	96W	USFS	Fort Union, Bullion Creek or Sentinel Butte Formation	Snail ( <i>Viviparus</i> sp.)	Location accurate to legal location and is outside project disturbance area
Not provided	Kihm 2012; previous project request	1	148N	99W	Private	Sentinel Butte Formation	Mollusks (clams and snail fragments)	Location accurate to legal location and is outside project disturbance area
Not provided	NDGS	24	160N	94W	Private	Fort Union	Plant	Location accurate to legal location and is outside project disturbance area

Notes: NDGS = North Dakota Geological Survey and State Fossil Collection

## 4.3 Field Survey Results

This section presents the results of the pedestrian field survey for the project, which SWCA performed on October 23, 2019, in accordance with resource best practices and USFS and USDA standards. During the field survey, SWCA documented no fossil localities but did record, in separate locations, multiple isolated and poorly preserved fossils consisting of one invertebrate shell cast and multiple plant fragments. Figure 2 depicts the survey area, which is limited to USFS- and USACE-administered land, and Tables 4 and 5 summarize the survey results. Photographs of the USFS portion of the survey area are provided as Figures 3 through 6, and photographs of the USACE portion of the survey area and representative fossils are provided as Figures 7 through 11. SWCA did observe fossils, unidentifiable plant material and a weathered and incomplete internal mollusk cast in ex-situ blocks and small pieces of silicified wood, within the USACE portion of the survey area, due the fossils being poorly preserved, eroded, and representatives of common taxonomic groups they are determined not to be important paleontological resources and were not fully document. No other paleontological resources (or fossils) were observed during field survey

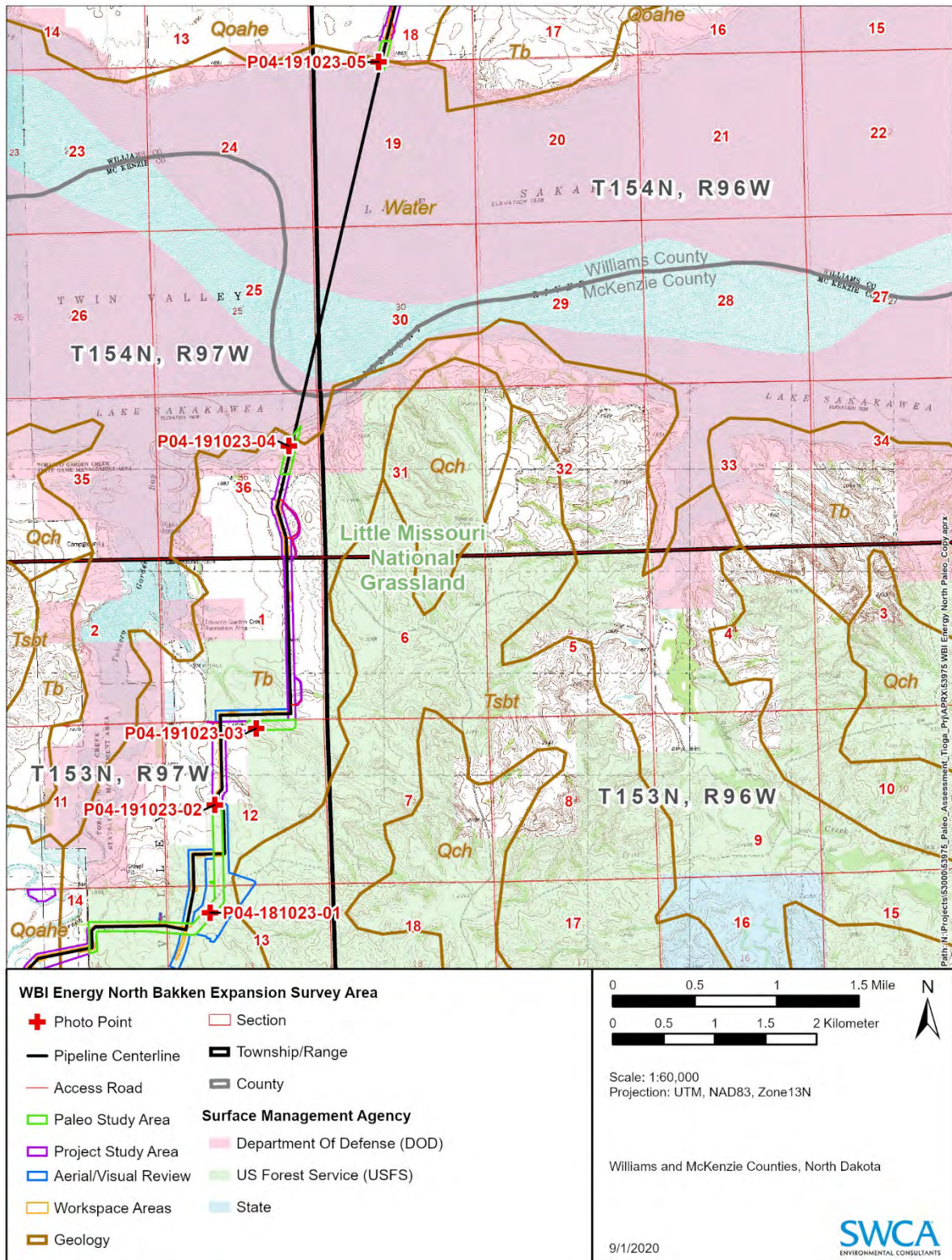


Figure 2. Paleontological survey area map for the portion of the North Bakken Expansion Project (geologic units from Clayton et al. 1980).

**Table 4. Survey Summary USFS Little Missouri National Grasslands**

<b>Project Name</b>	North Bakken Expansion Project					
<b>Project Description</b>	Paleontological pedestrian field survey for the proposed North Bakken Expansion Project					
<b>Managing Land Agency</b>	Forest Service USFS Region 1 Dakota Prairie Grassland, Little Missouri National Grassland, McKenzie Ranger District					
<b>Location (PLSS<sup>1</sup>)</b>	Sections 1, 12, 13, and 14, T153N, R97W					
<b>Topographic Map</b>	Tobacco Garden (1979)					
<b>Geological Map</b>	Clayton, L., S.R. Moran, and J.P. Bluemle. 1980. Geologic Map of North Dakota. U.S. Geological Survey, Scale 1:500,000 Carlson, C.G. 1985. Geology of McKenzie County, North Dakota. North Dakota Geological Survey, B-80, Part I.					
<b>Previously Mapped Geological Formation</b>	<b>Age</b>	<b>Geological Unit State Map (Clayton et al. 1980)</b>	<b>Geological Unit County Maps (Carlson 1985)</b>	<b>PRRAS Code</b>	<b>PFYC Value</b>	
	Holocene and Pleistocene	-	Coleharbor group Qct, till facies	0	3	
	Paleocene	-	Sentinel Butte Formation (Tsb)	2	4	
	Paleocene	Bullion Creek Formation (Tb)	Bullion Creek Formation (Tongue River Formation, Ttr)	2	4	
<b>Principal Investigator</b>	Georgia E. Knauss	<b>USFS Authorization</b>	R1-DPG-MGM-FY19-01			
<b>Surveyor(s)</b>	Andrew N. Gerwitz					
<b>Survey Date(s)</b>	October 23, 2019	<b>Total Acres Surveyed</b>	69.37; an additional 98.81 acres was cleared through visually field observation and reviews of aerial imagery for project areas modified after pedestrian survey			
<b>Area Surveyed</b>	Drainage channels and cuts along approximately 2.1 pipelines miles, from mileposts 27.3 to 27.7 and Mileposts 28.2 to 29.9.					
<b>Topography</b>	The project area is on gradually sloping valley sides toward the Missouri River and wave-cut platforms along the shoreline of Lake Sakakawea. Much of the project area is heavily vegetated with grasses and trees and features limited outcrop exposures along drainage cuts. Elevation within the survey area ranges from 1,880 to 1,838 feet above mean sea level.					
<b>Bedrock Exposure Status</b>	< 5%: weathered exposures on small mounds, buttes with steep slopes, and cuts in drainages lacking in vegetation					
<b>Geological Description (in approximate stratigraphic ascending order from bottom to top)</b>	<b>Unit</b>	<b>Lithology</b>	<b>Abbreviation</b>	<b>Description</b>	<b>Estimated Thickness (meters)</b>	<b>New Localities</b>
	1	Topsoil / glacial till	Qct	Medium-brown, mostly covered by vegetation; cobbles and gravels eroding out on the surface	1-3	-
	0	Silty mudstone	Tsb/Tb	Light-gray to light-tan weathered, small mounds, buttes with steep slopes and cuts in drainages lacking in vegetation	2	-
<b>Nearest Previously Documented Fossil Locality</b>	L1136/ USGS 10103: snail ( <i>Viviparus</i> sp.), located less than 1 mile from survey area; exact location is unknown, only the legal description to the nearest section was readily available					
<b>Previously Documented Fossil Localities within Survey Area</b>	N/A					
<b>Fossil Localities Discovered During the Survey</b>	NFOs: 0 SFLs: 0					
<b>Status of New Specimens</b>	No collection; as no scientifically important specimens		<b>Repository of New Specimens</b>	N/A		

<sup>1</sup> PLSS = Public Land Survey System.



**Figure 3. Vegetated drainage in southern portion of survey area in Little Missouri National Grasslands without outcrops of Fort Union Formation; surface exposures revealed hills to be glacial till (P04-191023-01). Direction: southwest.**



**Figure 4. An example of vegetated drainage, terraces, and small hills mapped as alluvium and glacial till deposits of the Coleharbor Formation that underly the Project within the Little Missouri National Grasslands (P04-191023-02). Direction: south.**



**Figure 5. Localized exposures of typical Fort Union Formation light-grayish tan mudstone with some silty gravelly horizons along drainage edge on Little Missouri National Grasslands (P04-191023-03) within the survey area, but south of the proposed pipeline corridor. Direction: northeast.**



**Figure 6. Localized exposures of typical Fort Union Formation in head cuts and blowouts along drainage edge on Little Missouri National Grasslands (P04-191023-03) south of the proposed pipeline corridor. Direction: northwest.**



**Table 5. Survey Summary USACE Lands**

<b>Project Name</b>	North Bakken Expansion Project					
<b>Project Description</b>	Paleontological pedestrian field survey for the proposed North Bakken Expansion Project					
<b>Managing Land Agency</b>	USACE, Garrison Project Office					
<b>Location (PLSS)</b>	Section 36, T154N, R97W and Section 18, T154, R96W					
<b>Topographic Map</b>	Red Mike (1972), Tobacco Garden Bay (1979)					
<b>Geological Map</b>	Clayton, L., S.R. Moran, and J.P. Bluemle. 1980. Geologic Map of North Dakota. U.S. Geological Survey, Scale 1:500,000 Carlson, C.G. 1985. Geology of McKenzie County, North Dakota. North Dakota Geological Survey, B-80, Part I. Freers, T.F. 1970. Geology of Williams County, North Dakota. North Dakota Geological Survey, B-48, Part I.					
<b>Previously Mapped Geological Formation</b>	<b>Age</b>	<b>Geological Unit State Map (Clayton et al. 1980)</b>	<b>Geological Unit County Maps (Carlson 1985; Freers 1970)</b>	<b>PRRAS Code</b>	<b>PFYC Value</b>	
	<u>Northside of Lake Sakakawea</u>					
	Holocene and Pleistocene	Oahe Formation (QTou), windblown Oahe sand and of older formations	Sand Dunes (SD), non-glacial area of aeolian deposits (low mounds of sand and blowouts)	0	2	
	<u>Southside of Lake Sakakawea</u>					
	Pleistocene	-	Coleharbor Group (Qct), till facies	0	2	
	Paleocene	Bullion Creek Formation (Tb)	-	2	4	
<b>Principal Investigator</b>	Georgia E. Knauss	<b>USACE Authorization</b>		DACW45-3-20-8008		
<b>Surveyor(s)</b>	Andrew N. Gerwitz					
<b>Survey Date(s)</b>	October 23, 2019	<b>Total Acres Surveyed</b>		15.38		
<b>Area Surveyed</b>	Shorelines and wave-cut cliff exposures along southern shore of Lake Sakakawea along approximately 2.7 pipelines miles, from mileposts 22.1 to 25.8.					
<b>Topography</b>	The project would pass south of Lake Sakakawea, and USACE-owned land consists of small rolling hills and a steep wave-cut approximately 50-foot-tall cliffs along the shorelines of Lake Sakakawea. The tops of the cliffs are vegetated, with little to no exposures along rolling hills. Elevation within the survey area ranges from 1,880 to 1,838 feet above mean sea level.					
<b>Bedrock Exposure Status</b>	80%: weathered exposed in small nobs and cuts in drainages lacking vegetation, and in blowouts on the flat surface					
<b>Geological Description (in approximate stratigraphic ascending order from bottom to top)</b>	<b>Unit</b>	<b>Lithology</b>	<b>Geologic Abbreviation</b>	<b>Description</b>	<b>Estimated Thickness (meters)</b>	<b>New Localities</b>
	1	Topsoil, sand dunes, and alluvial floodplain	QTou/SD, Qct	Medium-brown, mostly covered by vegetation; transported cobbles and gravels eroding out on the surface	1.0-3.0	-
	0	Silty mudstones with lignite	Tb (or possibly Sentinel Butte)	Light-gray to light-tan weathered, observed in small nobs and cuts in drainages lacking vegetation	14.5	-
<b>Nearest Previously Documented Fossil Locality</b>	L1136/ USGS 10103: snail (Viviparus sp.), located less than 1 mile from survey area; exact location is unknown, only the legal description to the nearest section was readily available					
<b>Previously Documented Fossil Localities within Survey Area</b>	N/A					
<b>Fossil Localities Discovered During the Survey</b>	NFOs: 0 SFLs: 0					
<b>Status of New Specimens</b>	No collection; as no scientifically important specimens			<b>Repository of New Specimens</b>	N/A	

\* PLSS = Public Land Survey System.



**Figure 7. Fort Union Formation exposed along the southern shoreline of Lake Sakakawea on USACE land. Light gray to buff silty mudstones with some small woody coal horizons (P04-191023-04). Direction: west.**



**Figure 8. Fort Union Formation sediments and glacial till reworked talus deposits along northern shoreline of Lake Sakakawea on USACE land (P04-191023-05). Direction: north.**



**Figure 9. Unidentifiable Fort Union Formation fossilized plant material in a light-gray mudstone block, which, before undergoing erosion, originated near a woody coal horizon along the southern shoreline of Lake Sakakawea on USACE land (Section 36, T. 154 N., R. 97 W.). Scale in centimeters.**



**Figure 10. Charcoaled wood and plant material from dark-purplish brown woody coal horizon in the Fort Union Formation exposure shown in Figure 6. Scale in centimeters.**



Figure 11. Isolated weathered ex-situ silicified wood fragment found along southern shoreline of Lake Sakakawea on USACE land (Section 36, T. 154 N., R. 97 W.). Scale in centimeters.



Figure 12. Isolated ex-situ mollusk internal cast found along northern shoreline of Lake Sakakawea on USACE land (Section 18, T. 154 N., R. 96 W.). Scale in centimeters.

## **5 RECOMMENDATIONS**

SWCA documented no localities during the field survey; however, thick vegetation covered much of the survey area at the time of the survey, and personnel found isolated weathered fossils where good exposure existed. It is understood that some monitoring may be required by the USFS paleontologists due to the potential for scientifically important paleontological resources in the geologic units underlying portions of the project area. SWCA recommends paleontological clearance for activity on the ground surface throughout the paleontological study area, including the driving of vehicles through and around the proposed disturbance areas. While, pipeline trench depth is anticipated to be five to six feet below current ground surface, SWCA also recommends subsurface clearance for the paleontological study area. No scientifically significant paleontological resources were documented within the survey areas, the anticipated depth to unweathered Union Formation (=Sentinel Butte and/or Bullion Creek) is anticipated to be a couple feet or more for much of the area, some of the areas with potential unweathered bedrock closer to the ground surface will be bored (disturbance will not be visible); therefore planned construction is anticipated to result in limited subsurface disturbance of these units within the survey areas.

WBI should instruct all project personnel that if crews discover any mineralized bones or other potential fossils during construction activities and a paleontological monitor is not present, the fossils should be left in place untouched, and the Environmental Inspector or Construction Foreman and a qualified and appropriately permitted (e.g., USFS, USACE, and/or State of North Dakota) paleontologist should be contacted immediately to assess the discovery and make further recommendations.

Generally, SWCA recommends that for future surface- and subsurface-disturbing actions that disturb paleontologically sensitive geological units, potential effects to significant paleontological resources should be evaluated and mitigated as appropriate before and during construction.

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## **APPENDIX A**

**Copy of USFS Authorization to Conduct  
Paleontological Resources Research or Collection  
No. R1-DPG-MGM-FY19-01**



Office Use Only

Authorization Number:  
R1-DPG-MGM-FY19-01

FS-2800-22B (REV-02/17)

OMB 0596-0082

UNITED STATES DEPARTMENT OF AGRICULTURE  
FOREST SERVICE

Authorization to Conduct Paleontological Resources Research or Collection

Authorities: 16 U.S.C. §470aaa through 16 U.S.C. §470aaa-11; Organic Administration Act June 4, 1897; 36 CFR 291.13-291.23

Georgia Knauss of SWCA Environmental Consultants, hereinafter called the permittee, is hereby authorized to use, subject to the terms and conditions of this permit, National Forest System land identified within the: Dakota Prairie Grasslands. The permittee is authorized to conduct activities as specified below in the permitted area described as: SWCA paleontology crew will conduct a pedestrian survey for paleontological resources. This authorization allows for emergency surface paleontological collection when determined by the permittee is needed.

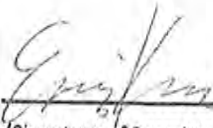

The permittee is authorized to conduct the following activities in the permitted area as described above: Sections 12, 13, and 14 T153N; R97W located on the McKenzie Ranger District.

Permit Terms and Conditions

1. This permit expires on December 31, 2019, unless the Agency extends it in writing before that date.
2. The permittee must notify the Agency not less than 30 days, but not more than 60 days, prior to starting the project and entering on Forest Service lands.
3. All paleontological resources that are collected from National Forest System lands under permit will remain the property of the United States.
4. The collection will be preserved in an approved repository, to be made available for scientific research and public education.
5. Specific locality data will not be released by the permittee or repository unless authorized in accordance with 36 CFR 291.6, or as otherwise agreed to in another agreement.
6. The permittee recognizes that the area within the scope of the permit may be subject to other authorized uses.
7. The permittee must conform to all applicable Federal, State, and local laws.
8. The permittee must assume responsibility for all work conducted under the permit and the actions of all persons conducting this work.
9. The permit cannot be transferred.
10. The permittee cannot modify the permit without the approval of the authorized officer.
11. The permittee must comply with all timelines established in the permit, and must request modification of the permit if those timelines cannot be met.
12. The permittee or other persons named on the permit must be on site at all times when field work is in progress and will have a copy of the signed permit on hand.
13. The permittee will comply with any vehicle or access restrictions, safety or environmental restrictions, or local safety conditions or restrictions.
14. The permittee will report suspected resource damage or theft of paleontological or other resources to the authorized officer in a timely manner after learning of such damage or theft.
15. The permittee will acknowledge the Forest Service in any report, publication, paper, news article, film, television program or other media resulting from work performed under the permit.

16. The permittee will comply with the timeline established in the permit for providing a complete list to the authorized officer of specimens collected and the current location of the specimens<sup>1</sup>.
17. The permittee will provide scheduled reports to the authorized officer within the timeline established in the permit<sup>2</sup>.
18. The permittee will be responsible for all costs for the proposed activity, including fieldwork, preparation, identification, cataloging, and storage of collections, unless otherwise arranged through a specific agreement.
19. The permittee will comply with the tasks required by the authorized officer, even in the event of permit expiration, suspension, or revocation.
20. Additional stipulations, terms, and conditions as required by the authorized officer and/or the agency may be appended.
21. The permittee must provide the final report by December 31, 2019 to Cale E. Bickerdyke (cale.bickerdyke@usda.gov) and Barb Beasley (barbara.beasley@usda.gov).
22. Permittee will check in at the McKenzie RD Office prior to beginning field work to provide vehicle ID and receive any safety or other info deemed necessary by the District Ranger.
23. Report any Heritage resources according to the district archeologist instructions.
24. Report suspected unauthorized fossil collection immediately to the District Ranger.
25. Images destined for social media taken by the field crew should have the GPS locator turned off or GPS info removed before posting on social media; only if social media posting is allowed by the Georgis Knauss, Principal Field Leader.
26. North Dakota Geological Survey, North Dakota Heritage Museum, Bismarck, North Dakota, is the official repository for paleontological specimens collected during this authorization.

A copy of this permit must be carried in the field whenever field work is in progress and an individual named in line 8 of the *Application for Authorization* is responsible in the field for compliance with all permit terms and conditions.

Georgia Knauss, Paleontology Lead Project Manager, SWCA Environmental Consultants	Nancy Veres, MRD, DPG  McKenzie District Ranger
 _____ (Signature of Permittee)	 _____ (Signature of Agency Signing Officer)
7/26/2019 _____ (Date)	7-29-19 _____ (Date)

<sup>1</sup> The attached Paleontological Specimen Data Form may facilitate transmittal of required specimen and repository information. Use of this form by the applicant/permit holder is optional.

<sup>2</sup> The attached Paleontological Investigation Report Form may facilitate the applicant/permit holder's transmittal of required documentation pertaining to the authorized paleontological study. Use of this form by the applicant/permit holder is optional.

**BURDEN & NON-DISCRIMINATION STATEMENT**

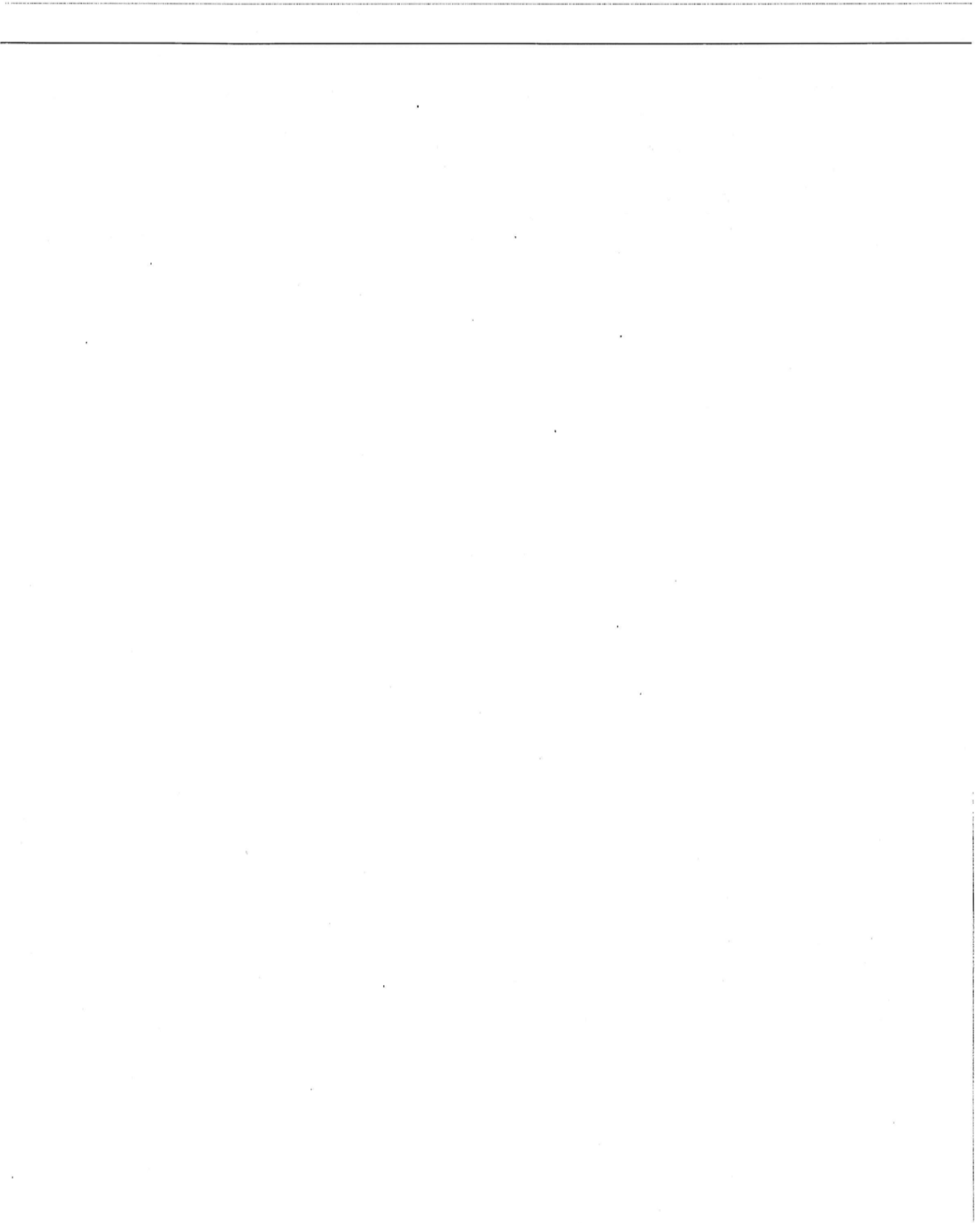
According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0596-0082. The time required to complete this information collection is estimated to average 1 minute per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, and marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative

means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at 202-720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, 1400 Independence Avenue, SW, Washington, DC 20250-9410 or call (800) 975-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

The Privacy Act of 1974 (5 U.S.C. 552a) and the Freedom of Information Act (5 U.S.C. 552) govern the confidentiality to be provided for information received by the Forest Service.



## **APPENDIX B**

**Copy of Department of The Army  
Antiquities Act Permit  
No. DACW45-3-20-8008**







**DEPARTMENT OF THE ARMY**  
CORPS OF ENGINEERS, OMAHA DISTRICT  
1616 CAPITOL AVENUE  
OMAHA NE 68102-4901

REPLY TO  
ATTENTION OF  
REAL ESTATE DIVISION

FILE: 405-80a, DACW45-3-20-8008, Garrison Project, North Dakota SWCA Environmental Consultants

September 15, 2019

Georgia Knauss  
SWCA Environmental Consultants  
116 N 4<sup>th</sup> Street, Suite 200  
Bismarck, ND 58501

Dear Ms. Knauss:

Enclosed is a fully executed copy of Permit No. DACW45-3-20-8008. The permit authorizes SWCA Environmental Consultants to conduct the examination of ruins, the excavation of archeological sites, and the gathering of objects of antiquity on certain lands within the Garrison Project, North Dakota. This area is more specifically described in the enclosed permit.

In accordance with Special Conditions h and j. of the Permit, it is required that the Garrison Operations Project Manager, Mr. Todd Lindquist, and the Garrison Project Archeologist, Mr. Richard Rogers, be contacted prior to commencement of any fieldwork being conducted. You may contact them in writing at the Garrison Project Office, P.O. Box 527, Riverdale, North Dakota 58565, or call or email them at (701) 654-7702, [todd.j.lindquist@usace.army.mil](mailto:todd.j.lindquist@usace.army.mil) and (701) 654-7744, [Richard.r.rogers@usace.army.mil](mailto:Richard.r.rogers@usace.army.mil). Please ensure that individuals conducting the field work carry a copy of the permit, a copy of this letter and any subsequent amendments to the permit while working on Garrison Project lands.

If you have any questions, please write to me at the above address or telephone Taryn Kjelstrup of my staff at (701) 654-7709

Sincerely,

**ORIGINAL SIGNED**

Rick L Noel  
Chief, Civil Branch, Real Estate Division  
Real Estate Contracting Officer

Enclosures

Copies Furnished (w/encl):

CENWO-PMA (Barnum)  
CENWO-ODT-N (Kruger)  
CENWO-REC (Kjelstrup)  
CENWO-ODG-A (Rogers)

**DEPARTMENT OF THE ARMY**

**ANTIQUITIES ACT PERMIT**

NAME OF PROJECT OR INSTALLATION: North Bakken Expansion Project, Garrison Project, North Dakota

(Please use this number when referring to this permit.)

NO. DACW45-3-20-8008

To conduct monitoring work upon public lands owned or controlled by the Department of the Army under the United States Code Annotated 54 U.S.C.A § 320302, effective December 19, 2014.

1. PERMIT ISSUED TO: SWCA Environmental Consultants

DATE: September 15, 2019

2. NAME, ADDRESS AND OFFICIAL STATUS OF PERSON:

a. In general charge: Georgia Knauss  
SWCA Environmental Consultants  
116 N 4<sup>th</sup> Street, Suite 200  
Bismarck, ND 58501

b. In actual charge: Andrew Gerwitz, Daigo Yamamura, Vicki Meyers, Shawna Johnson

3. USER APPLICATION DATE: June 24, 2019

4. AUTHORIZES: Surveys and limited testing of lands described below in No. 5 and shown on the attached map. To excavate, collect, and make extensive collections on specific sites described below in No. 5. Mitigation paleontology, surveys, limited collection/salvage of fossils discovered during construction.

5. ON LANDS DESCRIBED AS FOLLOWS: Those portions of Sections 13, 24, and 36, Township 154 North, Range 97 West, and Sections 18, 19, 30, and 31, Township 154 North, Range 96 West of the 5<sup>th</sup> Principle Meridian, Williams and McKenzie Counties, North Dakota, situated within the Garrison Project Boundary (shown on Exhibit "A").

6. FOR PERIOD: September 15, 2019 - December 31, 2021

7. MATERIALS COLLECTED UNDER THIS PERMIT WILL BE DEPOSITED FOR PERMANENT PRESERVATION IN THE: Any collection of specimens will follow standard accepted practices for conservation and preservation of vertebrate fossils including use of consolidants, protective barriers and field jackets of plaster/burlap, or casting bandages. All fossil recovered will be transferred to an accredited state or federal repository designated by SWCA Environmental Consultants and approved by the USACE for additional conservation, curation, and indefinite storage. All documentation will be provided to the USACE.

OR IN OTHER ACCREDITED INSTITUTIONS UNDER SUITABLE LOAN AGREEMENTS. A COPY OF CURRENT, VALID CURATION AGREEMENT MUST BE KEPT ON FILE WITH DISTRICT COMMANDER.

## 8. CONDITIONS

This permit is subject to the provisions of the United States Code Annotated 54 U.S.C.A § 320302, effective December 19, 2014, and the following conditions:

a. Archaeological resources shall be analyzed and recorded in the field. Collection and laboratory analysis of cultural resource material is prohibited, except where as authorized by the Omaha District Commander in consultation with affected parties. In such a case, the permittee will specify in the application when laboratory analysis is anticipated.

b. Collections of archaeological resources, artifacts and other material removed from public lands under the provisions of this permit remain the property of the United States Government and may be recalled at any time for use of the Department of the Army or other agencies of the Federal Government.

c. The following individual(s) are authorized to be in direct charge of field work conducted under this permit:

(1) Andrew Gerwitz, Daigo Yamamura, Vicki Meyers, Shawna Johnson

d. The person(s) in direct charge of field work shall be on-site at all times when work is in progress. Failure to comply with all permit stipulations will result in the removal of a subject's name(s) from the approved list of persons-in-direct charge.

e. During the course of the activities conducted under this permit, the District Commander, or his representative and/or affected tribes shall have access to the study area of this permit, and during or after completion of this work shall have the right to inspect all data that is recovered.

f. The use of any information (not limited to: press releases, videotaping, articles, reports) obtained as a result of this permit must be coordinated with, and approved by, the Omaha District Commander in advance, after consultation with affected parties. This restriction is in effect both during and after this permit expires. Any invitations to the public to participate in activities happening on USACE lands are prohibited.

g. All field notes, records, photographs, and other data related to this permit will be made accessible to the USACE Archaeologist for review.

h. Temporary stakes and/or flagging used to identify sites shall be removed upon completion of the project unless otherwise authorized.

i. Vehicular activity shall be restricted to existing roads and trails unless otherwise authorized by the appropriate land manager(s) and/or affected tribes.

j. Disturbed areas shall be kept to a minimum size consistent with the purpose of the scope of work and/or work plan.

k. Permittee shall take adequate precautions to prevent livestock, wildlife, and the public from injury in any pit or trench.

l. All test holes shall be backfilled.

## **SPECIAL CONDITIONS**

a. This permit shall not be exclusive in character, and there is hereby reserved unto the Government the right to use, lease or permit the use of said land or any part thereof for any purpose.

b. All costs to obtain this permit shall be borne by the permittee.

c. Under no circumstances will Indian grave(s) or burial ground(s) under the jurisdiction of the Omaha District be investigated. In the event that an inadvertent discovery is made, all fieldwork shall cease immediately, the site shall be secured and the remains protected. The notification procedures found in the attached contact list shall be followed immediately.

d. All excavated areas shall be restored by filling in the excavation and otherwise leaving the area in a near to original condition as practicable.

e. The permittee shall conduct all operations in such a manner as to prevent the erosion of the land, pollution of the water resources, and damage to the watershed, and to do all things necessary to prevent or reduce to the fullest extent the scarring of the lands.

f. Any findings of mined or processed precious metals or other treasure trove in the area covered by this permit are the exclusive property of the Government, and shall not be removed from the site without specific written permission from the Department of the Army.

g. Copies of the final report will be submitted to the District Commander.

h. Before undertaking any work on lands administered by the Department of Army, clearances should be obtained from the official in charge of the area. Clearance requirements for any future work shall include a work plan or research design. At a minimum, clearance will require the permittee to notify the local project manager and the appropriate land manager(s) in writing or email of any activity that will be performed, obtain prior approval for any excavation that will be done, and identification of times and dates that personnel will be on-site.

i. Before undertaking any work on Omaha District lands within the exterior boundaries of any Indian reservation, clearance shall be obtained first from the respective tribe, THPO (Tribal Historical Preservation Office)/CPO (Cultural Preservation Office) offices, tribal cultural resource office and then from the Bureau of Indian Affairs official having immediate jurisdiction over the property.

j. The permittee is responsible for notifying all affected parties of any activity that will be performed, obtaining prior approval for any fieldwork that will be performed, and identification of times and dates that personnel will be on-site via email.

k. The permittee is required to have on-site at all times, a copy of their permit and scope of work or work plan.

l. Non-compliance of any conditions of this permit, subject the permittee to prosecution under the United States Code Annotated 54 U.S.C.A § 320302.

**Immediately Cease Work & Secure Site**  
**Contact the Corps EOC**  
**(402) 995-2674**

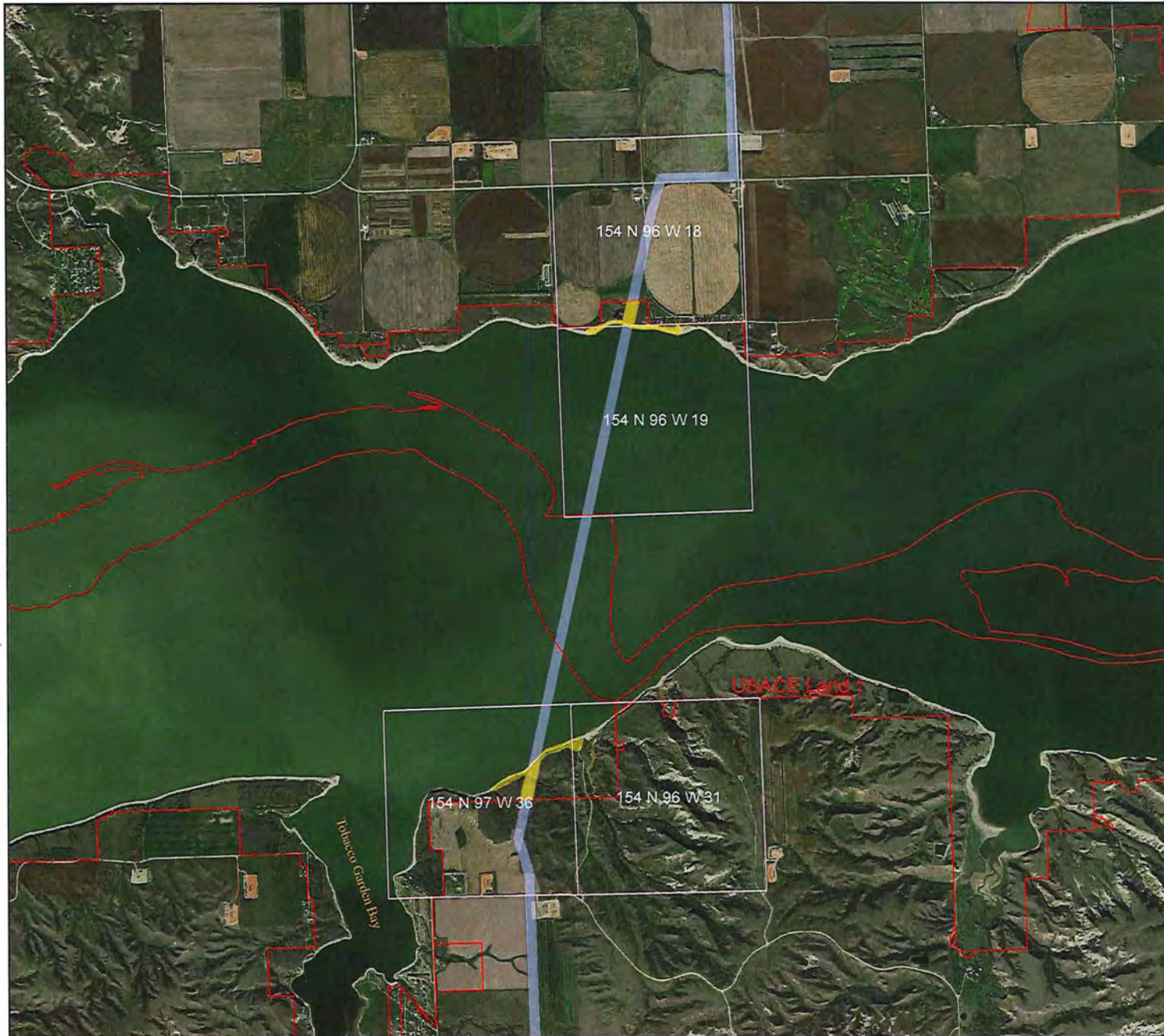


**Contact Operations Project Manager**  
**Garrison Project Office**  
Todd Lindquist, (701) 654-7702



**Contact Appropriate Archeologist**  
**Garrison Project Office**  
Richard Rogers  
Office: (701) 654-7744  
Cell: (701) 301-0018

**SWCA Antiquities Act Permit WBI Energy North Bakken  
Expansion 1:48,000**



**Legend**

- D USACE Boundary
- Additional Survey Area
- Survey Corridor




N



1 inch = 4,000 feet

Disclaimer: The user shall be responsible for the accuracy of the data and the results of the analysis. The user shall be responsible for the accuracy of the data and the results of the analysis. The user shall be responsible for the accuracy of the data and the results of the analysis.

USACE CD-GA	
Produced By M. J. ...	 <b>US Army Corps of Engineers</b> ® Omaha District
Production Date 07 Aug 2019	
Revised By	
Revised On	
File Location	

**EXHIBIT "A" MADE A PART OF  
AND ATTACHED TO LICENSE  
NO. DACW45-3-20-8008**