

Appendix F – 2023 Grassland Assessment

South Deuel Wind 2023 Grassland Assessment

DEUEL HARVEST WIND ENERGY SOUTH LLC

**South Deuel Wind
6/15/2024**

South Deuel Wind 2023 Grassland Assessment

prepared for

DEUEL HARVEST WIND ENERGY SOUTH LLC
South Deuel Wind
Deuel County, South Dakota

6/15/2024

prepared by

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LIST OF ABBREVIATIONS

<u>Abbreviation</u>	<u>Term/Phrase/Name</u>
CLU	Common Land Unit
ESA	Endangered Species Act
GIS	Geographic Information System
MET	Meteorological Tower
NAIP	National Agriculture Imagery Program
NLCD	National Land Cover Database
NWI	National Wetland Inventory
Project	South Deuel Wind
Project Area	34,339-acre area around the Project
SDGFP	South Dakota Game, Fish and Parks
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service

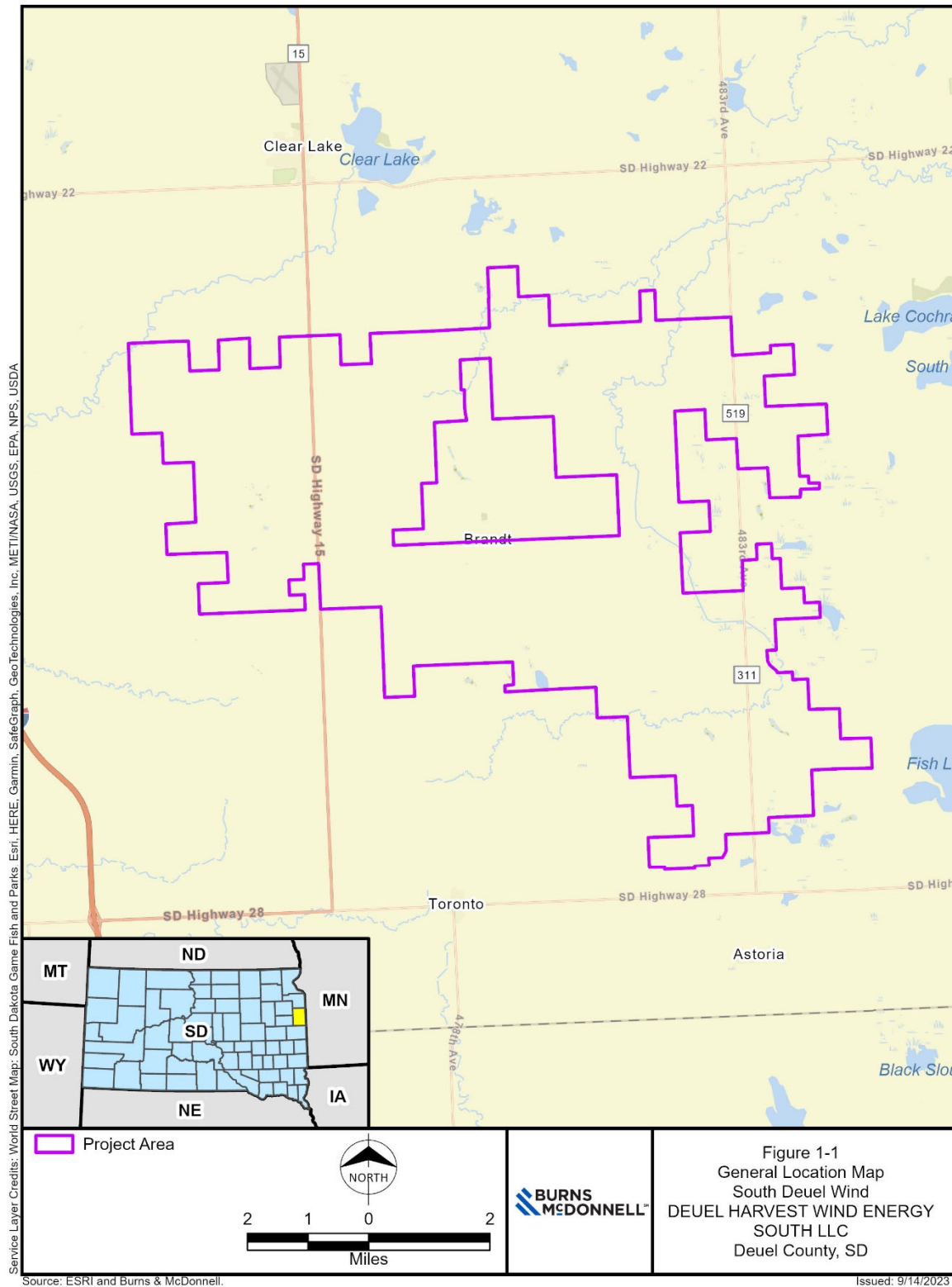
1.0 INTRODUCTION

Deuel Harvest Wind Energy South LLC plans to construct the South Deuel Wind Project (Project) in Deuel County, South Dakota. At the time of the assessment, the proposed Project include up to 86 proposed turbine locations (encompassing all 73 remaining proposed turbine locations), an approximately 6 mile long gen-tie line, associated access roads and underground collection circuits, a collector substation, an operations and maintenance facility, up to four meteorological (MET) towers (encompassing all three remaining proposed locations), laydown areas, and other appurtenant facilities. The Project is located approximately 3 miles south of Clear Lake, South Dakota (Figure 1-1). The objective of this assessment was to identify the location and quality of grassland areas in the Project Area and to determine the potential presence of any unbroken grassland. Unbroken grassland was defined as a native-dominated prairie that has never been converted or used for other land use types.

1.1 Project Area

The Project consisted of approximately 34,339 acres (Project Area) at the time of survey. The Project Area is located within Ecoregions 46k (Prairie Coteau) and 46m (Big Sioux Basin) of the Northern Glaciated Plains, which spans across the eastern edge of South Dakota (USEPA 2016) (Figure 1-1). Both ecoregions have historically supported both tallgrass and shortgrass prairies. These native grasslands however, have been predominantly converted to agricultural croplands (Bryce et al. 1996), with soybeans (*Glycine max*) and corn (*Zea mays*) as the dominant crops (Miller 1997).

Figure 1-1: Project Overview



2.0 METHODS

2.1 Desktop Analysis

Burns & McDonnell used information drawn from publicly available sources to conduct an initial Geographic Information System (GIS) review of the Project Area and identify potential grassland areas. The main dataset utilized in this analysis was “Quantifying Undisturbed (Native) Lands in Eastern South Dakota,” obtained from South Dakota State University (Bauman et al. 2016). To create this dataset, Bauman et al. first reviewed South Dakota Farm Service Agency’s Common Land Unit (CLU) data and National Agriculture Imagery Program (NAIP) county mosaic aerial imagery to remove any areas of current or former cropland from analysis. Bauman et al. then analyzed the remaining land in sections of approximately one square-mile to determine and remove areas with historic or current land disturbance. Finally, Bauman et al. utilized the South Dakota Department of Game, Fish, and Parks’ (SDGFP) Statewide Water Bodies layer to remove water bodies larger than 40 acres (Bauman et al. 2016).

This dataset was clipped to the Project Area and potential alternate infrastructure locations immediately outside the Project Area, and further refined utilizing National Land Cover Data (NLCD) (U.S. Department of Agriculture [USDA] Natural Resource Conservation Service 2017), National Agriculture Imagery Program (NAIP) aerial photography (USDA 2018), USFWS National Wetland Inventory (NWI) maps (USFWS 1981), multiple years, 1998 to 2021, of Google Earth imagery (Google Earth 2022), and USFWS easements obtained from the USFWS National Realty Tract Simplified data layer. The digital data was overlaid onto aerial imagery, and areas of clear human disturbance were eliminated from further consideration. Areas also determined to not be capable of supporting grassland vegetation were ponds, wetlands with low plant diversity, and areas showing evidence of disturbance, such as agriculture crop fields, and developed areas. As a result of the desktop review, areas appearing to contain intact/unbroken grasslands were identified and assigned a digital marker in the form of a grassland observation point. The grassland observation points were used to identify the areas that were to be included in the field survey.

2.2 Field Survey

To provide an estimate of the presence of potentially unbroken grasslands within the Project, a qualified ecologist and/or botanist Burns & McDonnell conducted a qualitative assessment of the 244 grassland observation points identified in the desktop analysis from October 10 to 12, 2022 and July 31 through August 1, 2023. This was accomplished by viewing vegetation from public roadways and taking photographs of each point (Appendix A). The areas evaluated were based on topography and visible areas from the public roadways (Burns & McDonnell 2018).

The grasslands at the observation points were evaluated for the presence of human disturbance and through a qualitative assessment for prairie vegetative species from the nearest public road (Table 4-1, Figure 4-1). Human disturbance was mainly defined by the use of vehicles within the grassland area, which could be attributed to mowing, haying, or movement from one agricultural field to the other. The grasslands observed were also classified as Type A and/or Type B, which are the type of habitats that sensitive species like the Dakota skipper and Poweshiek skipperling utilize (USFWS 2015). Type A grasslands include wet-mesic prairies with little topographic relief. Type B grasslands include native prairies that may have topographic relief as well as a high diversity and abundance of native forbs, little bluestem, big bluestem, and needle grasses. Classifications of the type of grassland at each observation point may include portions that include both Type A and Type B; however, the most visibly abundant type of grassland that could be assessed was used for designation.

Classification within each Type A and Type B grassland was estimated with a qualitative designation of “high”, “medium”, or “low” for the presence of human disturbance and the abundance of key native grasses and forbs. A classification of “low” was given when there was a high level of human disturbance and the vegetation was comprised of a relatively few native warm season grasses, or the dominant grass species appeared to be sod-forming, cool season that are common in areas used for pastureland or invasive species such as *Festuca* sp., *Typha* sp., and *Phalaris arundinacea*. Areas with the presence of human disturbance and relative high abundance of two or more of the following: little bluestem, big bluestem, sideoats grama (*Bouteloua curtipendula*), prairie dropseed (*Sporobolus heterolepis*), and needle grass species combined with the lack of a dominant sod-forming, cool season grass layer were given a classification of “medium”. Areas without any evidence of human disturbance and where blooming native forbs were observed and in relative high abundance in conjunction with the warm season grass species previously listed resulted in a classification of “high”. Areas identified as “low” and “medium” are considered broken grasslands, due to the level of human activity and the lack of native vegetation. Those areas identified as “high” are considered unbroken grasslands due to the dominance of native vegetation (SDSU 2022) and the lack of human disturbance.

3.0 RESULTS

The results of the grassland assessment of the 244 grassland observation points determined that the majority of the Project Area did not include potentially unbroken grassland (Table 4-1, Figure 4-1). Of the 244 grassland observation points, 138 were determined to be a “low” classification, 73 were determined to be a “medium” classification, and 11 were determined to be a “high” classification. Two observation points were inaccessible from public roads and 20 did not have grassland present and were therefore not given a classification.

The 11 grassland observation points within the Project Area classified as “high”, allowing the area to be classified as potentially unbroken grassland, totaled 335 acres or approximately 1 percent of the Project Area. (Figure 4-2; Figure B-1, Appendix B). The potentially broken grasslands, those classified as “low” or “medium”, and encompassed 4,788 acres, or approximately 14 percent of the Project Area (Figure 4-2; Figure B-1, Appendix B).

Table 3-1: Grassland Observation Points Classification

Grassland Observation Point	Classification of Grassland Surveyed	Qualitative Classification	Latitude	Longitude
1	Type A wetland	Low	44.6462	-96.7234
2	Type B upland	Low	44.6451	-96.7252
3	Type B upland	Low	44.6451	-96.7241
4	Type B upland	Medium	44.6451	-96.7204
5	Type A wetland	Medium	44.6451	-96.7164
6	Type B upland	Low	44.6594	-96.7134
7	Type B upland	Low	44.6595	-96.7100
8	Type A wetland	Low	44.6597	-96.7103
9	Type B upland	Low	44.6668	-96.7236
10	Grassland not present	N/A	44.6646	-96.7235
11	Type B upland	Low	44.6698	-96.7034
12	Type B upland	Low	44.6725	-96.7034
13	Type B upland	Low	44.6740	-96.7034
14	Type B upland	Low	44.6740	-96.7078
15	Type B upland	Low	44.6485	-96.7034
16	Grassland not present	N/A	44.6509	-96.7034
17	Grassland not present	N/A	44.6570	-96.7034
18	Grassland not present	N/A	44.6559	-96.7031
19	Type B upland	Low	44.6452	-96.6890
20	Not accessible from roads	N/A	44.6886	-96.7335
21	Type B upland	Low	44.6887	-96.7280
22	Type B upland	Low	44.7032	-96.7278
23	Type B upland	Low	44.7020	-96.7242
24	Type B upland	Medium	44.7032	-96.7212
25	Type B upland	Low	44.7032	-96.7436
26	Type B upland	Low	44.7033	-96.7417
27	Type B upland	Medium	44.7031	-96.7436
28	Type B upland	Medium	44.7031	-96.7411
29	Type B upland	Low	44.6886	-96.7184
30	Type B upland	Low	44.6886	-96.7177
31	Type B upland	Low	44.6886	-96.7074
32	Type B upland	Medium	44.7117	-96.7032

Grassland Observation Point	Classification of Grassland Surveyed	Qualitative Classification	Latitude	Longitude
33	Not accessible from roads	N/A	44.7088	-96.7033
34	Type B upland	Medium	44.7173	-96.7033
35	Type B upland	Low	44.7080	-96.6825
36	Type A wetland	Low	44.7031	-96.6785
37	Type B upland	Medium	44.7031	-96.6748
38	Type A wetland	Low	44.7033	-96.6743
39	Grassland not present	N/A	44.7033	-96.6727
40	Type B upland	Low	44.7031	-96.6685
41	Type B upland	Low	44.6887	-96.6678
42	Type B upland	Low	44.6888	-96.6625
43	Type B upland	Medium	44.6886	-96.6667
44	Type B upland	Low	44.6945	-96.6827
45	Type A wetland	Low	44.6742	-96.7034
46	Type B upland	Low	44.6743	-96.7032
47	Type B upland	Low	44.6754	-96.7032
48	Type B upland	Medium	44.6742	-96.6982
49	Type B upland	Low	44.6740	-96.7032
50	Type B upland	Low	44.6741	-96.6974
51	Type B upland	Low	44.6713	-96.7032
52	Grassland not present	N/A	44.6741	-96.6934
53	Type B upland	Low	44.6695	-96.6830
54	Grassland not present	N/A	44.6693	-96.6828
55	Type B upland	Low	44.6647	-96.7034
56	Type A wetland	Low	44.6598	-96.7034
57	Type A wetland	Low	44.6598	-96.7053
58	Grassland not present	N/A	44.6595	-96.6991
59	Type B upland	Low	44.6510	-96.6828
60	Type B upland	Low	44.6491	-96.6828
61	Type B upland	Low	44.6452	-96.6727
62	Type B upland	Medium	44.6853	-96.6828
63	Type B upland	High	44.6815	-96.6828
64	Type A wetland	Low	44.6813	-96.6832
65	Type A wetland	Low	44.6571	-96.6828

Grassland Observation Point	Classification of Grassland Surveyed	Qualitative Classification	Latitude	Longitude
66	Type B upland	Low	44.6452	-96.6558
67	Type B upland	Low	44.6450	-96.6576
68	Type B upland	Low	44.6450	-96.6547
69	Type B upland	Low	44.6336	-96.6626
70	Grassland not present	N/A	44.6450	-96.6468
71	Type B upland	Low	44.6421	-96.6426
72	Type B upland	Low	44.6409	-96.6426
73	Type B upland	Medium	44.6309	-96.6266
74	Type B upland	Medium	44.6308	-96.6226
75	Type B upland	Low	44.6307	-96.6222
76	Type A wetland	Low	44.6307	-96.6148
77	Type B upland	Low	44.6358	-96.6226
78	Type B upland	Low	44.6378	-96.6223
79	Type B upland	Low	44.6407	-96.6226
80	Type B upland	Medium	44.6451	-96.6225
81	Grassland not present	N/A	44.6426	-96.6221
82	Type A wetland	Low	44.6451	-96.6097
83	Type A wetland	Low	44.6452	-96.6102
84	Type B upland	Medium	44.6450	-96.6287
85	Type B upland	Medium	44.6544	-96.6425
86	Type B upland	Low	44.6523	-96.6426
87	Type B upland	Medium	44.6595	-96.6576
88	Type B upland	Low	44.6597	-96.6555
89	Type B upland	Low	44.6598	-96.6613
90	Type B upland	High	44.6596	-96.6684
91	Type B upland	Low	44.6743	-96.6711
92	Type B upland	Medium	44.6741	-96.6616
93	Type B upland	Low	44.6740	-96.6581
94	Type B upland	High	44.6743	-96.6576
95	Type B upland	Medium	44.6743	-96.6626
96	Type B upland	Medium	44.6740	-96.6521
97	Type B upland	Medium	44.6741	-96.6492
98	Type B upland	Medium	44.7033	-96.6397

Grassland Observation Point	Classification of Grassland Surveyed	Qualitative Classification	Latitude	Longitude
99	Type B upland	Low	44.7034	-96.6263
100	Grassland not present	N/A	44.7176	-96.6222
101	Type A wetland	Low	44.7177	-96.6208
102	Type B upland	Medium	44.7142	-96.6224
103	Type A wetland	Low	44.7156	-96.6224
104	Type A wetland	Low	44.7032	-96.6193
105	Type B upland	Medium	44.6893	-96.6026
106	Type A wetland	Low	44.7101	-96.6020
107	Type A wetland	Low	44.7085	-96.5821
108	Type B upland	Medium	44.7178	-96.5671
109	Type B upland	Low	44.7179	-96.5642
110	Type B upland	Medium	44.7179	-96.5562
111	Type B upland	Low	44.7180	-96.5416
112	Type B upland	Low	44.7108	-96.5417
113	Type B upland	Medium	44.7035	-96.5624
114	Type B upland	Low	44.7035	-96.5589
115	Type B upland	Medium	44.7033	-96.5630
116	Type B upland	Medium	44.7033	-96.5582
117	Type B upland	Low	44.6982	-96.5211
118	Type B upland	Low	44.7008	-96.5211
119	Type B upland	Low	44.7033	-96.5618
120	Grassland not present	N/A	44.6908	-96.5618
121	Type B upland	Low	44.6960	-96.5618
122	Type B upland	Medium	44.7013	-96.5619
123	Type B upland	Medium	44.7019	-96.5615
124	Type B upland	Low	44.7033	-96.5615
125	Type B upland	Low	44.6888	-96.5831
126	Type B upland	Low	44.6889	-96.5794
127	Type B upland	Medium	44.6886	-96.5810
128	Type B upland	Medium	44.6886	-96.5789
129	Type B upland	Medium	44.6858	-96.5820
130	Type B upland	Medium	44.6815	-96.5821
131	Type B upland	Low	44.6744	-96.5746

Grassland Observation Point	Classification of Grassland Surveyed	Qualitative Classification	Latitude	Longitude
132	Type B upland	Low	44.6740	-96.5748
133	Type B upland	Low	44.6669	-96.5818
134	Type B upland	Low	44.6598	-96.5718
135	Type B upland	Low	44.6599	-96.5677
136	Type B upland	Medium	44.6574	-96.5618
137	Type B upland	Low	44.6524	-96.5615
138	Type B upland	Low	44.6496	-96.5613
139	Type B upland	Low	44.6453	-96.5614
140	Grassland not present	N/A	44.6452	-96.5590
141	Type B upland	Low	44.6452	-96.5516
142	Type B upland	Low	44.6403	-96.6023
143	Type B upland	Low	44.6397	-96.6021
144	Type B upland	Medium	44.6436	-96.6023
145	Grassland not present	N/A	44.6164	-96.5905
146	Type B upland	Low	44.6225	-96.5821
147	Type B upland	Medium	44.6241	-96.5821
148	Type A wetland	Low	44.6162	-96.5763
149	Type B upland	Low	44.6163	-96.5754
150	Type B upland	Low	44.6019	-96.5817
151	Type B upland	Low	44.6019	-96.5692
152	Type A wetland	Low	44.6595	-96.6259
153	Grassland not present	N/A	44.6595	-96.6291
154	Grassland not present	N/A	44.6595	-96.6355
155	Type A wetland	Low	44.6744	-96.5953
156	Type B upland	Medium	44.6814	-96.6023
157	Type B upland	Medium	44.6725	-96.5617
158	Type B upland	High	44.6703	-96.5616
159	Grassland not present	N/A	44.6525	-96.5416
160	Type B upland	High	44.6455	-96.5412
161	Type A wetland	Low	44.6497	-96.5411
162	Type B upland	Low	44.6454	-96.5368
163	Type B upland	Low	44.6455	-96.5318
164	Type B upland	Low	44.6454	-96.5296

Grassland Observation Point	Classification of Grassland Surveyed	Qualitative Classification	Latitude	Longitude
165	Type B upland	Low	44.6165	-96.5410
166	Type B upland	Low	44.6016	-96.5506
167	Type A wetland	Low	44.6016	-96.5527
168	Type B upland	Low	44.5978	-96.5616
169	Type B upland	Low	44.5988	-96.5615
170	Type B upland	Low	44.5966	-96.5613
171	Type B upland	Low	44.5896	-96.5815
172	Type B upland	Low	44.5875	-96.5814
173	Type B upland	Low	44.5875	-96.5779
174	Type A wetland	Low	44.5874	-96.5617
175	Type B upland	Low	44.5872	-96.5603
176	Type B upland	Medium	44.5852	-96.5613
177	Type B upland	High	44.5821	-96.5614
178	Type B upland	High	44.5813	-96.5614
179	Type B upland	Medium	44.5872	-96.5715
180	Type B upland	Low	44.5871	-96.5553
181	Type B upland	Low	44.5871	-96.5513
182	Type B upland	Low	44.5873	-96.5488
183	Type B upland	Low	44.5874	-96.5513
184	Type A wetland	Medium	44.5909	-96.5616
185	Type B upland	Low	44.5933	-96.5416
186	Type B upland	Low	44.5945	-96.5411
187	Type B upland	Medium	44.5906	-96.5411
188	Type B upland	Low	44.6003	-96.5415
189	Type B upland	Low	44.6017	-96.5288
190	Grassland not present	N/A	44.6017	-96.5261
191	Type A wetland	Low	44.6112	-96.5410
192	Type B upland	Medium	44.6454	-96.5485
193	Type B upland	Low	44.6618	-96.5416
194	Grassland not present	N/A	44.6697	-96.5402
195	Type A wetland	Low	44.6722	-96.5413
196	Type B upland	Low	44.6743	-96.5359
197	Type B upland	Low	44.6743	-96.5212

Grassland Observation Point	Classification of Grassland Surveyed	Qualitative Classification	Latitude	Longitude
198	Type B upland	Low	44.6742	-96.5506
199	Type B upland	High	44.6743	-96.5470
200	Type B upland	Medium	44.6744	-96.5542
201	Type A wetland	Low	44.6888	-96.5365
202	Type A wetland	Medium	44.6862	-96.5210
203	Type A wetland	Low	44.6834	-96.5211
204	Type B upland	Medium	44.6056	-96.5819
205	Type B upland	Medium	44.7179	-96.5612
206	Type B upland	Medium	44.7179	-96.5512
207	Type B upland	Low	44.6792	-96.5819
208	Type B upland	Medium	44.6790	-96.5820
209	Type B upland	Medium	44.6742	-96.5944
210	Type B upland	Low	44.7032	-96.6649
211	Type B upland	Medium	44.7032	-96.6732
212	Type B upland	High	44.7032	-96.6806
213	Type B upland	Medium	44.6745	-96.5287
214	Type B upland	Medium	44.6744	-96.5346
215	Type B upland	Medium	44.6744	-96.5388
216	Type B upland	High	44.6698	-96.5617
217	Type B upland	Medium	44.6742	-96.5673
218	Type B upland	Medium	44.6723	-96.5820
219	Grassland not present	N/A	44.6545	-96.5616
220	Type B upland	Medium	44.6576	-96.5415
221	Type B upland	Medium	44.6018	-96.5359
222	Type B upland	High	44.5891	-96.5411
223	Type B upland	Low	44.5872	-96.5667
224	Type B upland	Medium	44.6163	-96.5810
225	Type B upland	Medium	44.6201	-96.5818
226	Type B upland	Medium	44.6306	-96.5984
227	Type B upland	Medium	44.6336	-96.6226
228	Type B upland	Low	44.6885	-96.6626
229	Type B upland	Medium	44.6887	-96.6711
230	Type B upland	Low	44.6741	-96.6601

Grassland Observation Point	Classification of Grassland Surveyed	Qualitative Classification	Latitude	Longitude
231	Type B upland	Medium	44.6741	-96.65500
232	Type B upland	Medium	44.6565	-96.6224
233	Type B upland	Medium	44.6596	-96.6493
234	Type B upland	Medium	44.6597	-96.6728
235	Type B upland	Medium	44.7158	-96.6108
236	Type A wetland	Low	44.6392	-96.5488
237	Type B upland	Low	44.6428	-96.5310
238	Type A wetland	Low	44.6361	-96.5338
239	Type B upland	Low	44.6287	-96.6135
240	Type B upland	Medium	44.6275	-96.6088
241	Type B upland	Medium	44.6208	-96.5354
242	Type A wetland	Low	44.5999	-96.5212
243	Type B upland	Low	44.6267	-96.5801
244	Type B upland	Medium	44.6288	-96.6118

Figure 4-1: Classified Grassland Observation Points

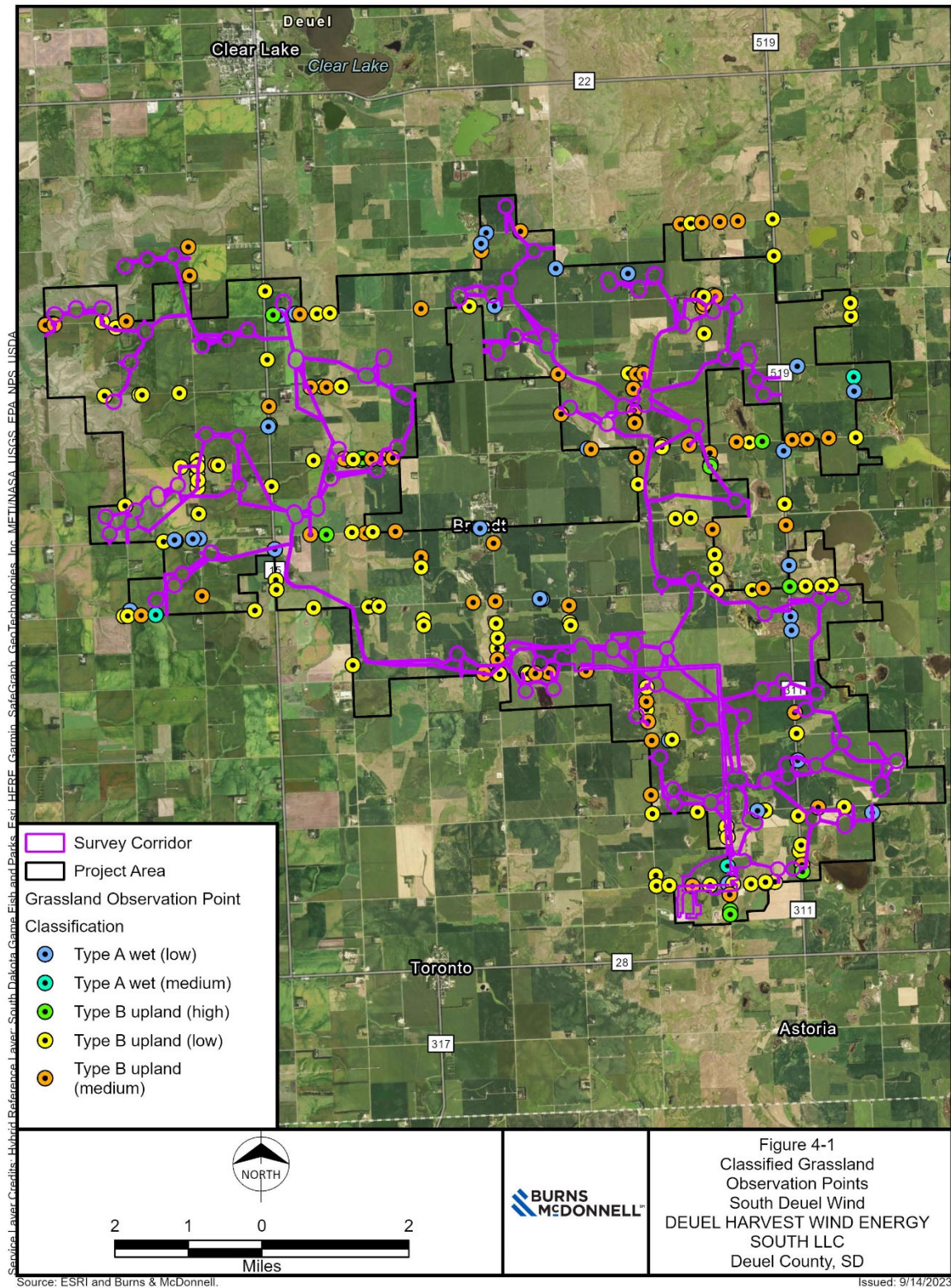
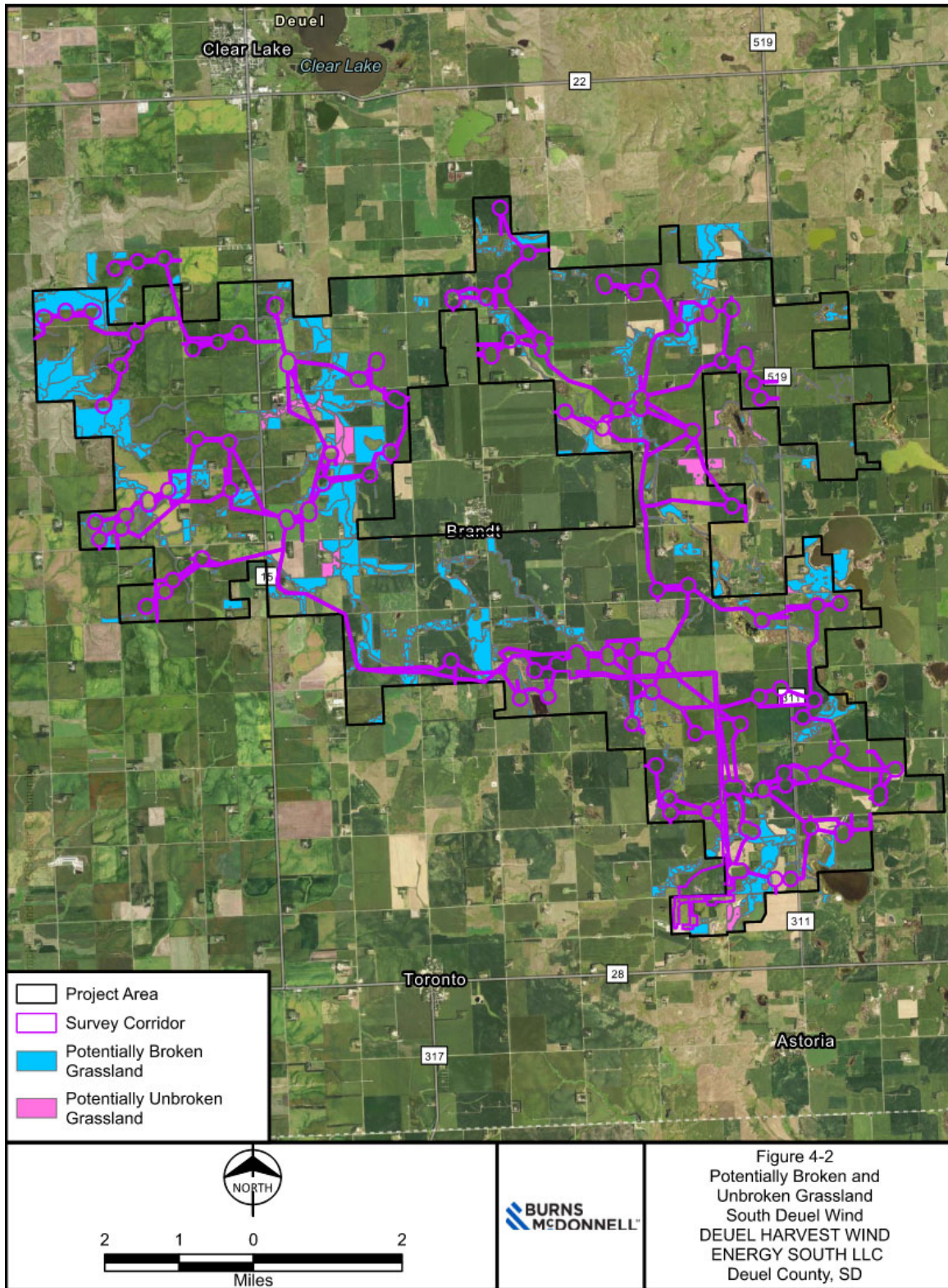


Figure 3-2: Potentially Broken and Unbroken Grassland



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APPENDIX A - SITE PHOTOGRAPHS



Photograph A-1: View of grassland observation point 1, facing east.



Photograph A-2: View of grassland observation point 2, facing north.

South Deuel Wind
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Site Photographs
October 10 – 12, 2022
Deuel County, SD



Photograph A-3: View of grassland observation point 3, facing north.



Photograph A-4: View of grassland observation point 4, facing north.

South Deuel Wind
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Site Photographs
October 10 – 12, 2022
Deuel County, SD



Photograph A-5: View of grassland observation point 5, facing north.



Photograph A-6: View of grassland observation point 6, facing east.

South Deuel Wind
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Site Photographs
October 10 – 12, 2022
Deuel County, SD



Photograph A-7: View of grassland observation point 7, facing south.



Photograph A-8: View of grassland observation point 8, facing north.

South Deuel Wind
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Site Photographs
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Deuel County, SD



Photograph A-9: View of grassland observation point 9, facing north.



Photograph A-10: View of grassland observation point 10 showing grassland NOT present, facing west.

South Deuel Wind
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Site Photographs
October 10 – 12, 2022
Deuel County, SD



Photograph A-11: View of grassland observation point 11, facing east.



Photograph A-12: View of grassland observation point 12, facing east.

South Deuel Wind
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Site Photographs
October 10 – 12, 2022
Deuel County, SD



Photograph A-13: View of grassland observation point 13, facing west.



Photograph A-14: View of grassland observation point 14, facing east.

South Deuel Wind
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Site Photographs
October 10 – 12, 2022
Deuel County, SD



Photograph A-15: View of grassland observation point 15, facing west.



Photograph A-16: View of grassland observation point 16, showing grassland NOT present, facing west.

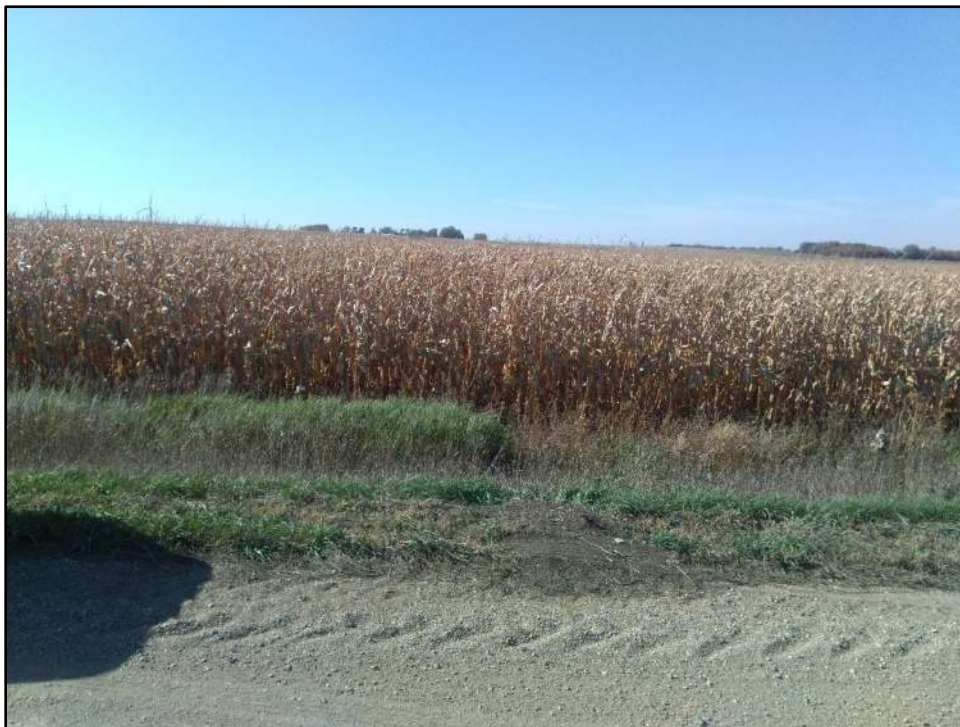
South Deuel Wind
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Site Photographs
October 10 – 12, 2022
Deuel County, SD



Photograph A-17: View of grassland observation point 17 showing grassland NOT present, facing west.

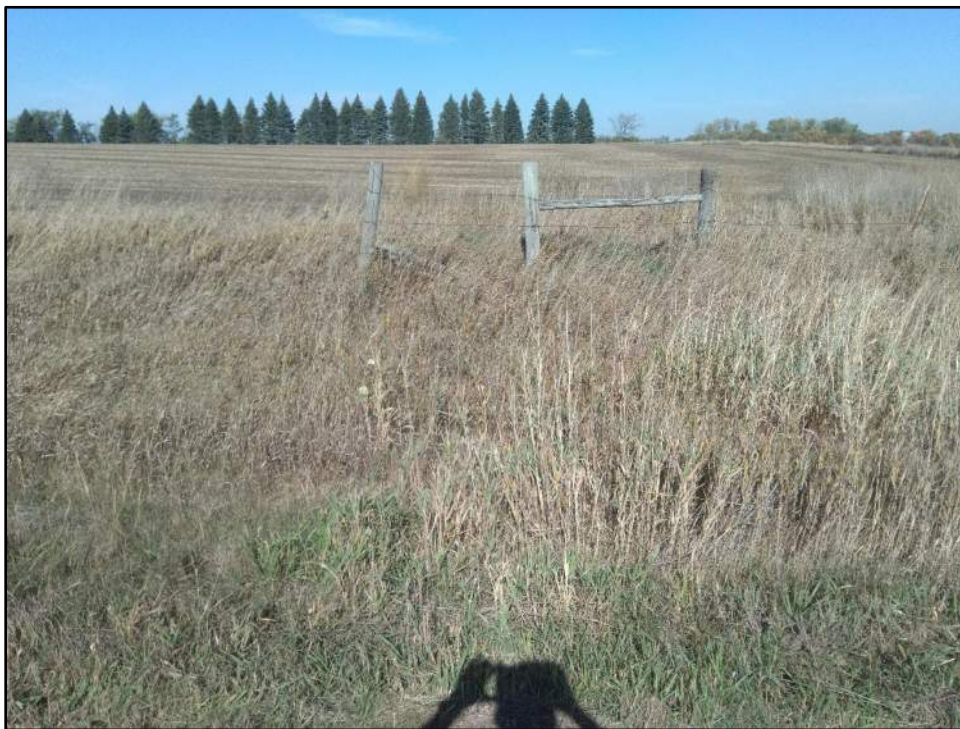


Photograph A-18: View of grassland observation point 18 showing grassland NOT present, facing west.

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Site Photographs
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Deuel County, SD



Photograph A-19: View of grassland observation point 19, facing north.



Photograph A-20: View of grassland observation point 21, facing north.

South Deuel Wind
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Site Photographs
October 10 – 12, 2022
Deuel County, SD



Photograph A-21: View of grassland observation point 22, facing east.



Photograph A-22: View of grassland observation point 23, facing north.

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Site Photographs
October 10 – 12, 2022
Deuel County, SD



Photograph A-23: View of grassland observation point 24, facing north.



Photograph A-24: View of grassland observation point 25, facing east.

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Site Photographs
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Photograph A-25: View of grassland observation point 26, facing east.



Photograph A-26: View of grassland observation point 27, facing east.

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Site Photographs
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Deuel County, SD



Photograph A-27: View of grassland observation point 28, facing north.



Photograph A-28: View of grassland observation point 29, facing north.

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Site Photographs
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Deuel County, SD



Photograph A-29: View of grassland observation point 30, facing north.



Photograph A-30: View of grassland observation point 31, facing east.

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Site Photographs
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Deuel County, SD



Photograph A-31: View of grassland observation point 32, facing north.



Photograph A-32: View of grassland observation point 34, facing north.

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Deuel County, SD



Photograph A-33: View of grassland observation point 36, facing north.



Photograph A-34: View of grassland observation point 37, facing east.

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Site Photographs
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Deuel County, SD



Photograph A-35: View of grassland observation point 38, facing north.

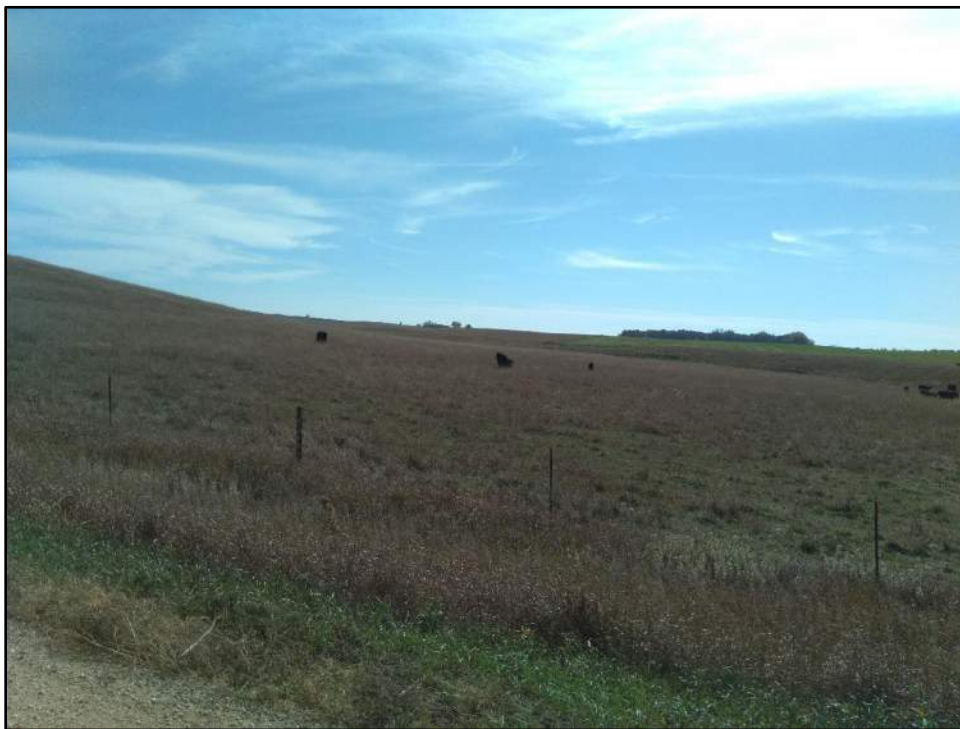


Photograph A-36: View of grassland observation point 39 showing grassland NOT present, facing east.

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Site Photographs
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Deuel County, SD



Photograph A-37: View of grassland observation point 40, facing north.



Photograph A-38: View of grassland observation point 41, facing north.

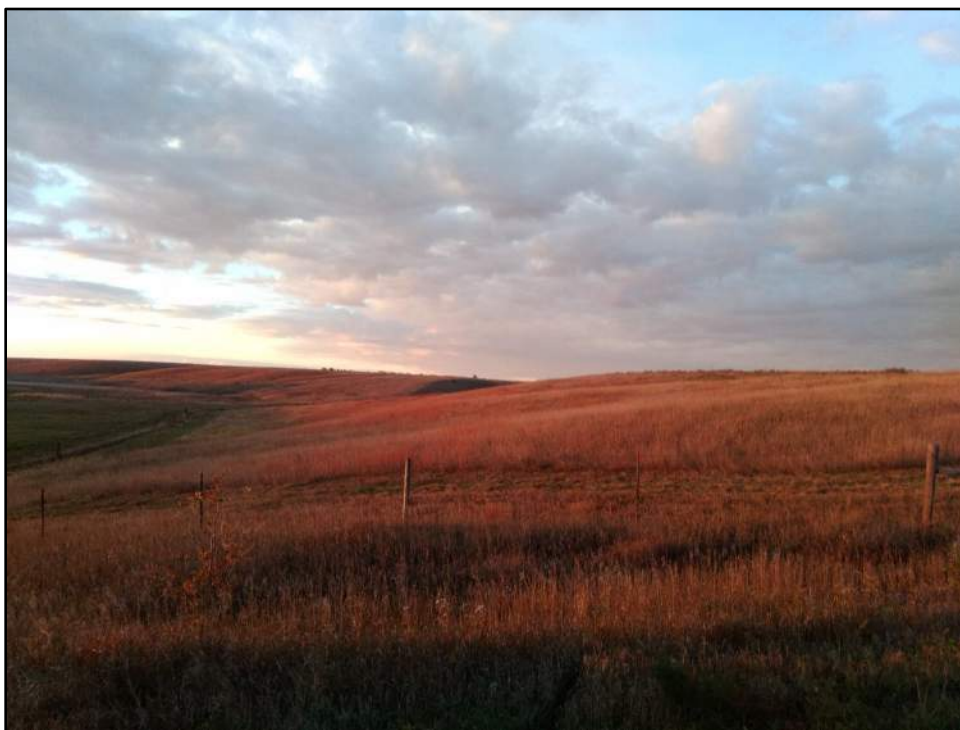
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Site Photographs
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Deuel County, SD



Photograph A-39: View of grassland observation point 42, facing east.



Photograph A-40: View of grassland observation point 43, facing north.

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Deuel County, SD



Photograph A-41: View of grassland observation point 44, facing north.



Photograph A-42: View of grassland observation point 45, facing north.

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Site Photographs
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Deuel County, SD



Photograph A-43: View of grassland observation point 46, facing east.



Photograph A-44: View of grassland observation point 47, facing east.

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Photograph A-45: View of grassland observation point 48, facing north.



Photograph A-46: View of grassland observation point 49, facing south.

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Site Photographs
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Deuel County, SD



Photograph A-47: View of grassland observation point 50, facing north.



Photograph A-48: View of grassland observation point 51, facing west.



Photograph A-49: View of grassland observation point 52 showing grassland NOT present, facing north.



Photograph A-50: View of grassland observation point 53, facing east.

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Site Photographs
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Deuel County, SD



Photograph A-51: View of grassland observation point 54 showing grassland NOT present, facing east.



Photograph A-52: View of grassland observation point 55, facing east.

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Site Photographs
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Photograph A-53: View of grassland observation point 56, facing south.



Photograph A-54: View of grassland observation point 57, facing north.

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Deuel County, SD



Photograph A-55: View of grassland observation point 58 showing grassland NOT present, facing north.



Photograph A-56: View of grassland observation point 59, facing east.

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Site Photographs
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Photograph A-57: View of grassland observation point 60, facing east.



Photograph A-58: View of grassland observation point 61, facing north.

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Deuel County, SD



Photograph A-59: View of grassland observation point 62, facing east.



Photograph A-60: View of grassland observation point 63, facing north.

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Site Photographs
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Deuel County, SD



Photograph A-61: View of grassland observation point 64 showing grassland NOT present, facing north.



Photograph A-62: View of grassland observation point 65, facing south.

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Site Photographs
October 10 – 12, 2022
Deuel County, SD



Photograph A-63: View of grassland observation point 66, facing north.



Photograph A-64: View of grassland observation point 67, facing south.



Photograph A-65: View of grassland observation point 68, facing north.



Photograph A-66: View of grassland observation point 69, facing east.

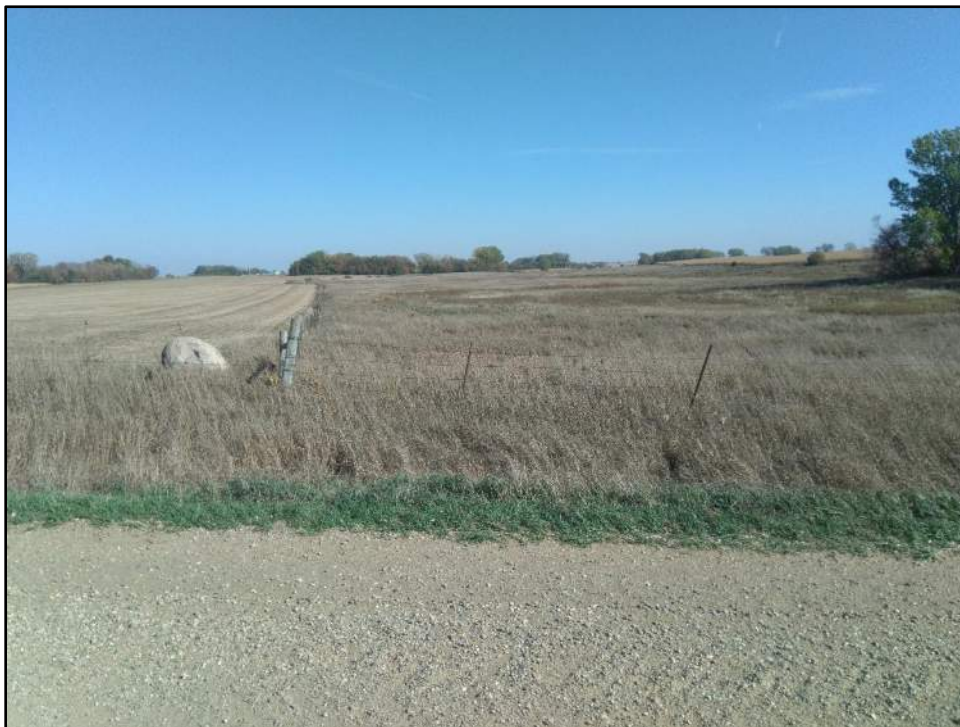
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Site Photographs
October 10 – 12, 2022
Deuel County, SD



Photograph A-67: View of grassland observation point 70 showing grassland NOT present, facing north.



Photograph A-68: View of grassland observation point 71, facing east.

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Site Photographs
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Deuel County, SD



Photograph A-69: View of grassland observation point 72, facing north.



Photograph A-70: View of grassland observation point 73, facing east.

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Site Photographs
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Deuel County, SD



Photograph A-71: View of grassland observation point 74, facing north.



Photograph A-72: View of grassland observation point 75, facing north.

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Site Photographs
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Deuel County, SD



Photograph A-73: View of grassland observation point 76, facing north.



Photograph A-74: View of grassland observation point 77, facing east.

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Site Photographs
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Deuel County, SD



Photograph A-75: View of grassland observation point 78, facing north.



Photograph A-76: View of grassland observation point 79, facing north.

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Deuel County, SD



Photograph A-77: View of grassland observation point 80, facing south.



Photograph A-78: View of grassland observation point 82, facing north.

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Deuel County, SD



Photograph A-79: View of grassland observation point 83, facing east.



Photograph A-80: View of grassland observation point 84, facing north.

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Deuel County, SD



Photograph A-81: View of grassland observation point 85, facing north.



Photograph A-82: View of grassland observation point 86, facing north.

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Site Photographs
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Deuel County, SD



Photograph A-83: View of grassland observation point 87, facing north.



Photograph A-84: View of grassland observation point 88, facing north.

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Deuel County, SD



Photograph A-85: View of grassland observation point 89, facing east.



Photograph A-86: View of grassland observation point 90, facing north.

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Site Photographs
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Deuel County, SD



Photograph A-87: View of grassland observation point 91, facing east.



Photograph A-88: View of grassland observation point 92, facing north.

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Deuel County, SD



Photograph A-89: View of grassland observation point 93, facing north.



Photograph A-90: View of grassland observation point 94, facing north.

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Site Photographs
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Deuel County, SD



Photograph A-91: View of grassland observation point 95, facing east.



Photograph A-92: View of grassland observation point 96, facing north.

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Deuel County, SD



Photograph A-93: View of grassland observation point 97, facing south.



Photograph A-94: View of grassland observation point 98, facing north.

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Site Photographs
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Deuel County, SD



Photograph A-95: View of grassland observation point 99, facing north.



Photograph A-96: View of grassland observation point 100 showing grassland NOT present, facing north.

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Site Photographs
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Deuel County, SD



Photograph A-97: View of grassland observation point 101, facing east.



Photograph A-98: View of grassland observation point 102, facing south.

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Site Photographs
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Deuel County, SD



Photograph A-99: View of grassland observation point 103 showing grassland NOT present, facing north.



Photograph A-100: View of grassland observation point 104, facing north.

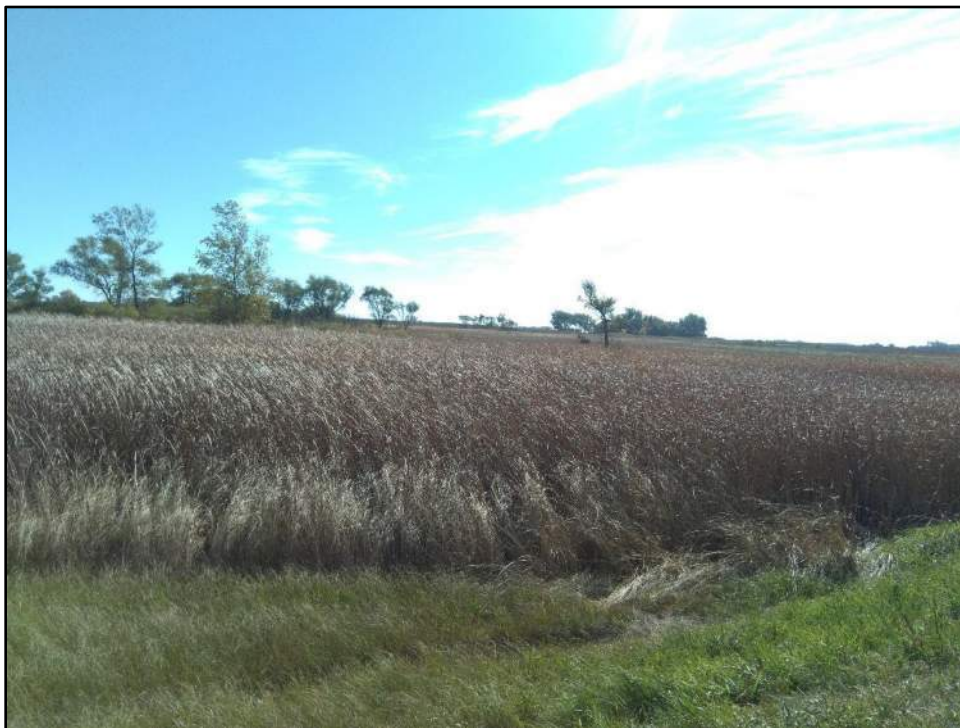
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Site Photographs
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Deuel County, SD



Photograph A-101: View of grassland observation point 105, facing north.



Photograph A-102: View of grassland observation point 106, facing east.

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Site Photographs
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Deuel County, SD



Photograph A-103: View of grassland observation point 107, facing north.



Photograph A-104: View of grassland observation point 108, facing south.

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Site Photographs
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Deuel County, SD



Photograph A-105: View of grassland observation point 109, facing north.



Photograph A-106: View of grassland observation point 110, facing east.

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Site Photographs
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Deuel County, SD



Photograph A-107: View of grassland observation point 111, facing north.



Photograph A-108: View of grassland observation point 112, facing north.

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Site Photographs
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Deuel County, SD



Photograph A-109: View of grassland observation point 113, facing east.



Photograph A-110: View of grassland observation point 114, facing east.

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Site Photographs
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Deuel County, SD



Photograph A-111: View of grassland observation point 115, facing north.



Photograph A-112: View of grassland observation point 116, facing north.

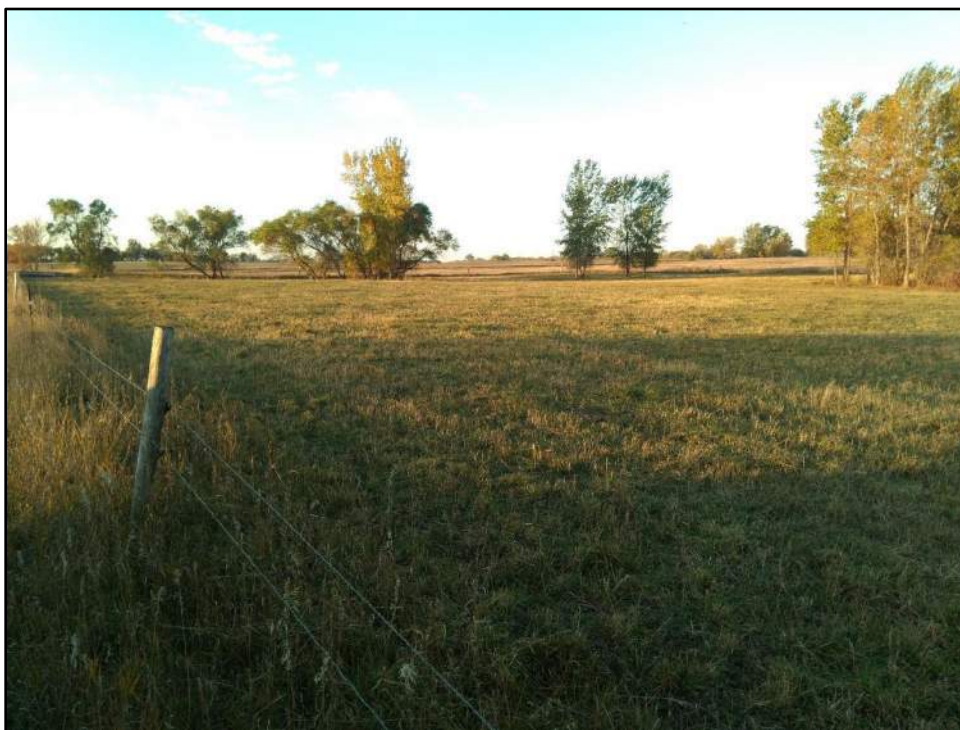
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Site Photographs
October 10 – 12, 2022
Deuel County, SD



Photograph A-113: View of grassland observation point 117, facing east.



Photograph A-114: View of grassland observation point 118, facing north.

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Site Photographs
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Deuel County, SD



Photograph A-115: View of grassland observation point 119, facing north.



Photograph A-116: View of grassland observation point 120 showing grassland NOT present, facing east.

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Site Photographs
October 10 – 12, 2022
Deuel County, SD



Photograph A-117: View of grassland observation point 121, facing north.



Photograph A-118: View of grassland observation point 122, facing north.

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Site Photographs
October 10 – 12, 2022
Deuel County, SD



Photograph A-119: View of grassland observation point 123, facing south.



Photograph A-120: View of grassland observation point 124, facing east.

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Site Photographs
October 10 – 12, 2022
Deuel County, SD



Photograph A-121: View of grassland observation point 125, facing north.



Photograph A-122: View of grassland observation point 126, facing north.

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Site Photographs
October 10 – 12, 2022
Deuel County, SD



Photograph A-123: View of grassland observation point 127, facing south.



Photograph A-124: View of grassland observation point 128 showing grassland NOT present, facing north.

South Deuel Wind
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Site Photographs
October 10 – 12, 2022
Deuel County, SD



Photograph A-125: View of grassland observation point 129, facing north.



Photograph A-126: View of grassland observation point 130, facing east.

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Site Photographs
October 10 – 12, 2022
Deuel County, SD



Photograph A-127: View of grassland observation point 131, facing east.



Photograph A-128: View of grassland observation point 132, facing north.

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Site Photographs
October 10 – 12, 2022
Deuel County, SD



Photograph A-129: View of grassland observation point 134, facing north.



Photograph A-130: View of grassland observation point 135, facing north.

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Site Photographs
October 10 – 12, 2022
Deuel County, SD



Photograph A-131: View of grassland observation point 136, facing north.



Photograph A-132: View of grassland observation point 137, facing north.

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Site Photographs
October 10 – 12, 2022
Deuel County, SD



Photograph A-133: View of grassland observation point 138, facing east.



Photograph A-134: View of grassland observation point 139, facing north.

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Site Photographs
October 10 – 12, 2022
Deuel County, SD



Photograph A-135: View of grassland observation point 140 showing grassland NOT present, facing north.



Photograph A-136: View of grassland observation point 141, facing north.

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Site Photographs
October 10 – 12, 2022
Deuel County, SD



Photograph A-137: View of grassland observation point 142, facing north.



Photograph A-138: View of grassland observation point 143, facing north.

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Site Photographs
October 10 – 12, 2022
Deuel County, SD



Photograph A-139: View of grassland observation point 144, facing east.



Photograph A-140: View of grassland observation point 145 showing grassland NOT present, facing east.

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Site Photographs
October 10 – 12, 2022
Deuel County, SD



Photograph A-141: View of grassland observation point 146, facing north.



Photograph A-142: View of grassland observation point 147, facing east.

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Site Photographs
October 10 – 12, 2022
Deuel County, SD



Photograph A-143: View of grassland observation point 148, facing east.



Photograph A-144: View of grassland observation point 149, facing north.

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Site Photographs
October 10 – 12, 2022
Deuel County, SD



Photograph A-145: View of grassland observation point 150, facing north.



Photograph A-146: View of grassland observation point 151, facing north.

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Site Photographs
October 10 – 12, 2022
Deuel County, SD



Photograph A-147: View of grassland observation point 152, showing grassland NOT present, facing east.



Photograph A-148: View of grassland observation point 153, showing grassland NOT present, facing north.



Photograph A-149: View of grassland observation point 154 showing grassland NOT present, facing north.



Photograph A-150: View of grassland observation point 155, facing north.



Photograph A-151: View of grassland observation point 156, facing north.



Photograph A-152: View of grassland observation point 157, facing north.

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Site Photographs
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Deuel County, SD



Photograph A-153: View of grassland observation point 158, facing south.



Photograph A-154: View of grassland observation point 160, facing north.

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Site Photographs
October 10 – 12, 2022
Deuel County, SD



Photograph A-155: View of grassland observation point 161, showing grassland NOT present, facing north.



Photograph A-156: View of grassland observation point 162, facing north.



Photograph A-157: View of grassland observation point 164, facing north.



Photograph A-158: View of grassland observation point 165, facing north.

South Deuel Wind
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Site Photographs
October 10 – 12, 2022
Deuel County, SD



Photograph A-159: View of grassland observation point 166, facing north.



Photograph A-160: View of grassland observation point 167, facing south.

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Site Photographs
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Deuel County, SD



Photograph A-161: View of grassland observation point 168, facing west.



Photograph A-162: View of grassland observation point 169, facing east.

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Site Photographs
October 10 – 12, 2022
Deuel County, SD



Photograph A-163: View of grassland observation point 170, facing north.



Photograph A-164: View of grassland observation point 171, facing east.

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Site Photographs
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Deuel County, SD



Photograph A-165: View of grassland observation point 172, facing north.



Photograph A-166: View of grassland observation point 173, facing north.

South Deuel Wind
DEUEL HARVEST WIND
ENERGY SOUTH LLC



Site Photographs
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Photograph A-167: View of grassland observation point 174, facing north.



Photograph A-168: View of grassland observation point 175, facing north.

South Deuel Wind
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Photograph A-169: View of grassland observation point 176, facing south.



Photograph A-170: View of grassland observation point 177, facing east.

South Deuel Wind
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Deuel County, SD



Photograph A-171: View of grassland observation point 178, facing east.



Photograph A-172: View of grassland observation point 180, facing south.

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Photograph A-173: View of grassland observation point 181, facing south.



Photograph A-174: View of grassland observation point 182, facing west.

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Photograph A-175: View of grassland observation point 183, facing north.



Photograph A-176: View of grassland observation point 184, facing west.

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Photograph A-177: View of grassland observation point 185, facing west.



Photograph A-178: View of grassland observation point 186, facing east.

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Photograph A-179: View of grassland observation point 187, facing north.



Photograph A-180: View of grassland observation point 188, facing south.

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Photograph A-181: View of grassland observation point 189, facing south.



Photograph A-182: View of grassland observation point 190, showing grassland NOT present.

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Photograph A-183: View of grassland observation point 191, facing east.



Photograph A-184: View of grassland observation point 193, facing south.

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Photograph A-185: View of grassland observation point 195, facing east.



Photograph A-186: View of grassland observation point 196, facing south.

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Photograph A-187: View of grassland observation point 197, facing west.



Photograph A-188: View of grassland observation point 198, facing south.

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Photograph A-189: View of grassland observation point 199, facing north.



Photograph A-190: View of grassland observation point 200, facing north.

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Photograph A-191: View of grassland observation point 201, facing south.



Photograph A-192: View of grassland observation point 202, facing west.

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Photograph A-193: View of grassland observation point 203, facing west.



Photograph A-194: View of grassland observation point 204, facing east.

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Photograph A-195: View of grassland observation point 205, facing south.



Photograph A-196: View of grassland observation point 206, facing south.

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Deuel County, SD



Photograph A-197: View of grassland observation point 207, facing east.



Photograph A-198: View of grassland observation point 208, facing east.

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Photograph A-199: View of grassland observation point 209, facing north.



Photograph A-200: View of grassland observation point 210, facing south.

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Deuel County, SD



Photograph A-201: View of grassland observation point 211, facing south.



Photograph A-202: View of grassland observation point 212, facing north.

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Deuel County, SD



Photograph A-203: View of grassland observation point 213, facing south.



Photograph A-204: View of grassland observation point 214, facing south.

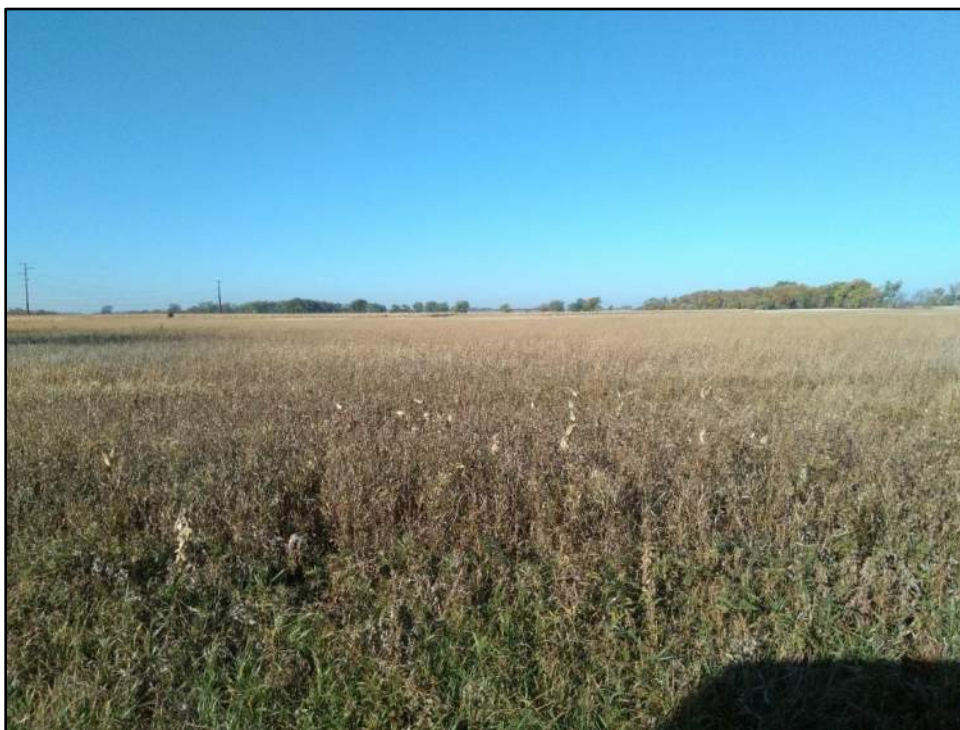
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October 10 – 12, 2022
Deuel County, SD



Photograph A-205: View of grassland observation point 215, facing south.



Photograph A-206: View of grassland observation point 216, facing west.

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Photograph A-207: View of grassland observation point 217, facing south.



Photograph A-208: View of grassland observation point 218, facing east.

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Photograph A-209: View of grassland observation point 220, facing west.



Photograph A-210: View of grassland observation point 221, facing south.

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Photograph A-211: View of grassland observation point 222, facing east.



Photograph A-212: View of grassland observation point 223, facing south.

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Photograph A-213: View of grassland observation point 224, facing north.



Photograph A-214: View of grassland observation point 225, facing west.

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Photograph A-215: View of grassland observation point 226, facing south.



Photograph A-216: View of grassland observation point 227, facing west.

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Photograph A-217: View of grassland observation point 228, facing south.



Photograph A-218: View of grassland observation point 229, facing south.

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Photograph A-219: View of grassland observation point 230, facing north.



Photograph A-220: View of grassland observation point 231, facing north.



Photograph A-221: View of grassland observation point 232, facing east.



Photograph A-222: View of grassland observation point 233, facing north.

South Deuel Wind
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Photograph A-223: View of grassland observation point 234, facing south.



Photograph A-224: View of grassland observation point 236, facing west.

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Deuel County, SD



Photograph A-225: View of grassland observation point 237, facing south.



Photograph A-226: View of grassland observation point 238, facing southwest.

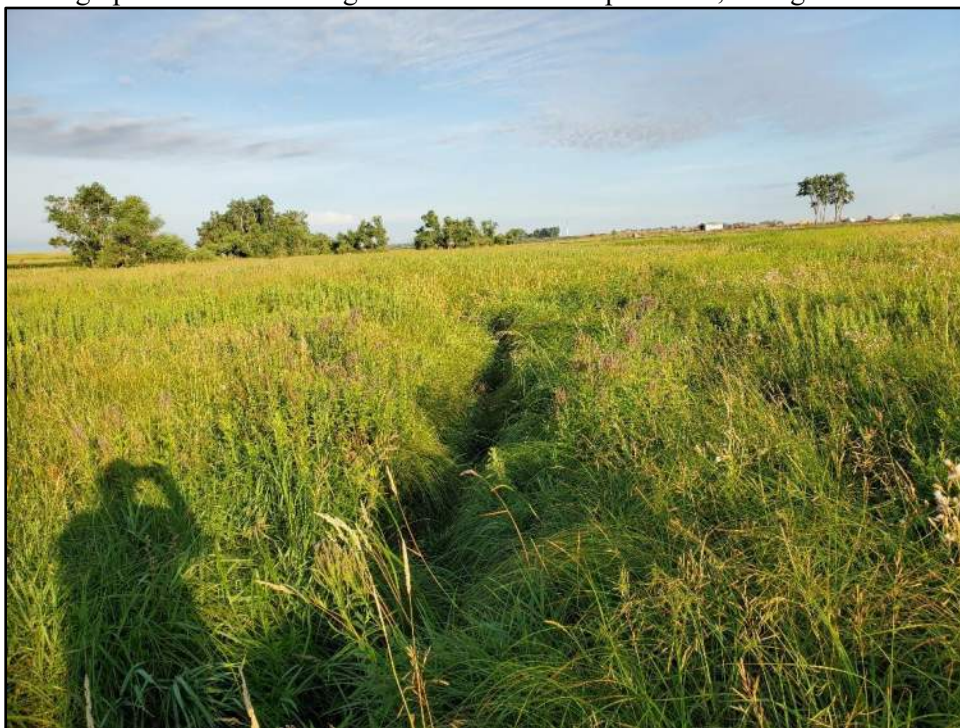
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Photograph A-229: View of grassland observation point 240, facing south.



Photograph A-230: View of grassland observation point 241, facing northwest.

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Photograph A-231: View of grassland observation point 242, facing west.



Photograph A-232: View of grassland observation point 243, facing east.

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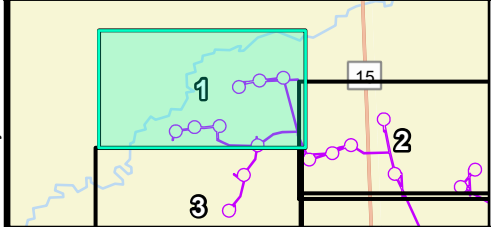
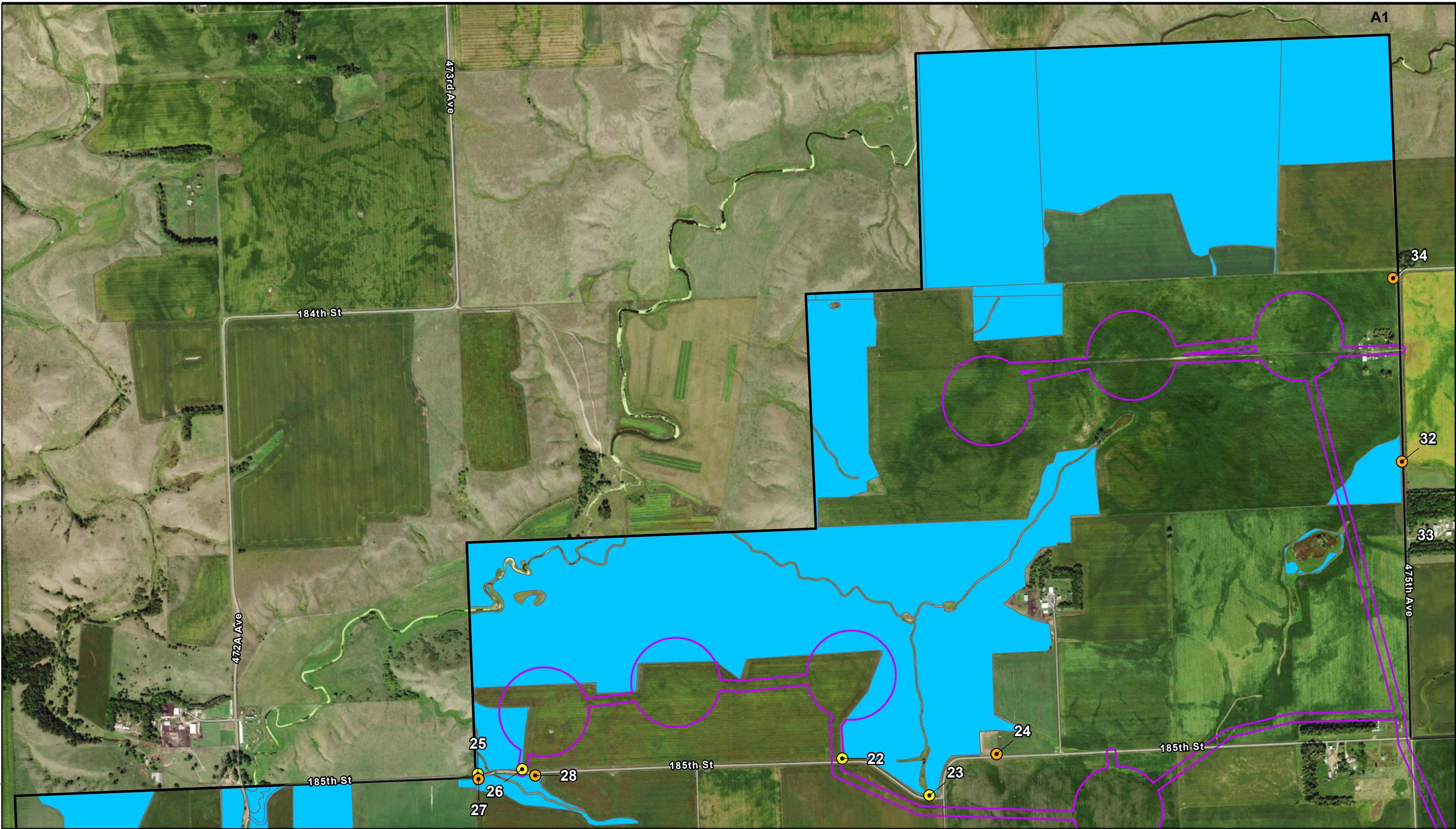
Site Photographs
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Photograph A-233: View of grassland observation point 244, facing south.

APPENDIX B - FIGURES

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- Project Area
- Survey Corridor
- Unbroken Grassland
- Broken Grassland

- Grassland Observation Point Classification
- Type B upland (high)
 - Type B upland (medium)

- Type B upland (low)
- Type A wet (low)
- Type A wet (medium)

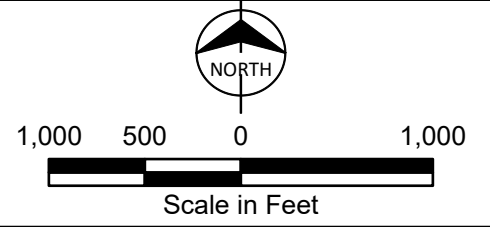
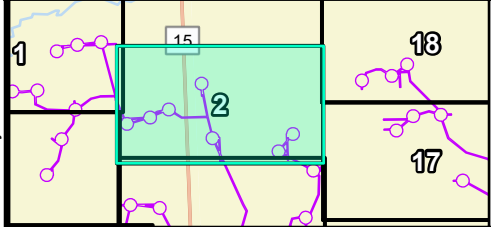
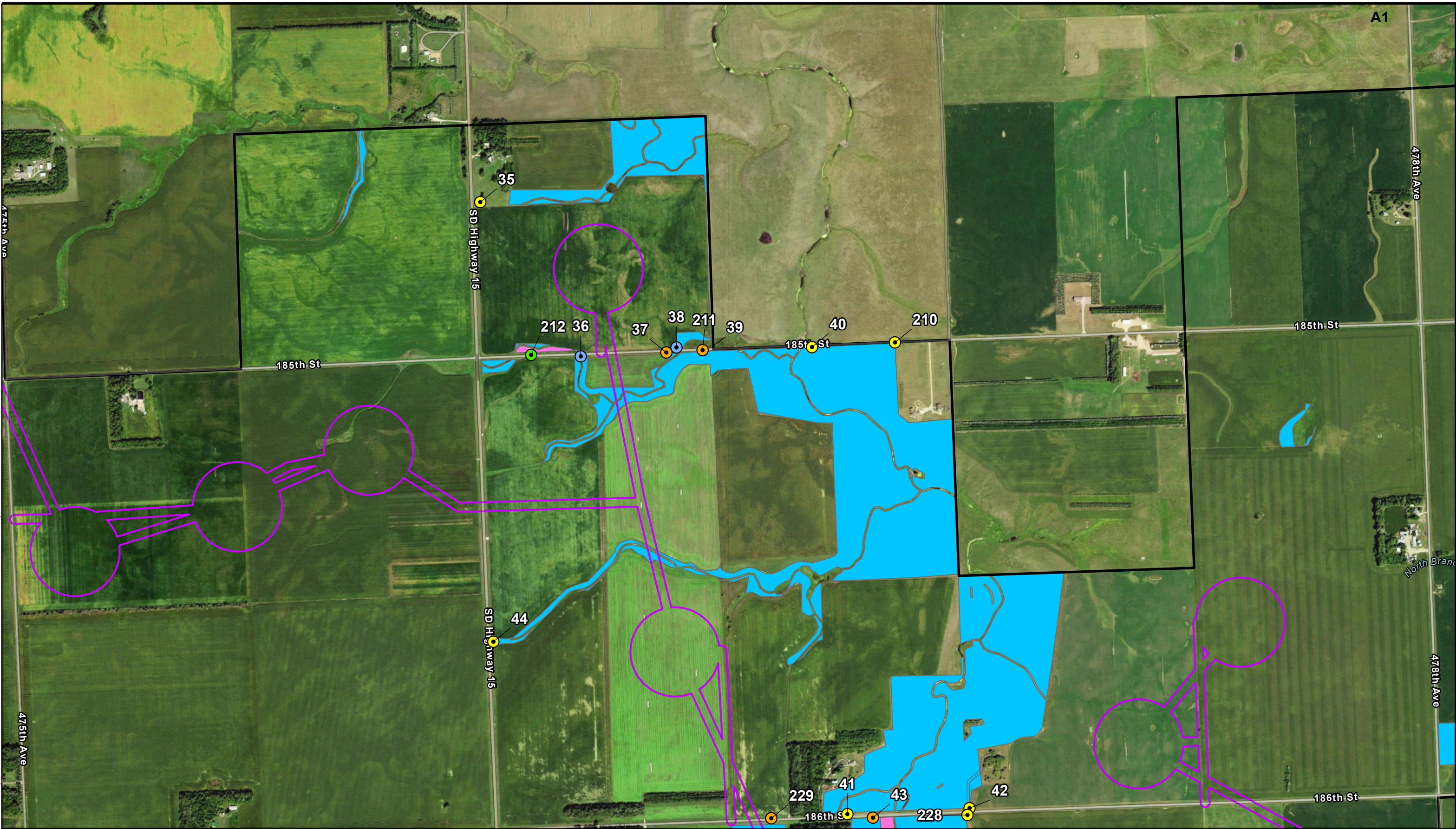


Figure B-1
Location Map of Potential
Broken and Unbroken Grassland
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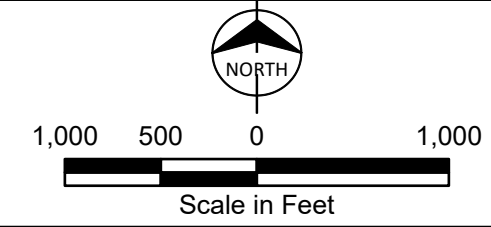
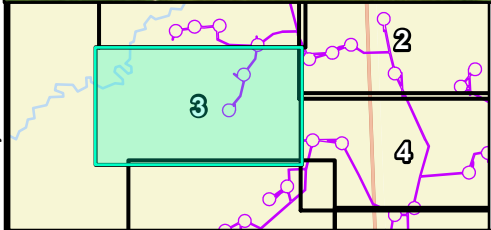
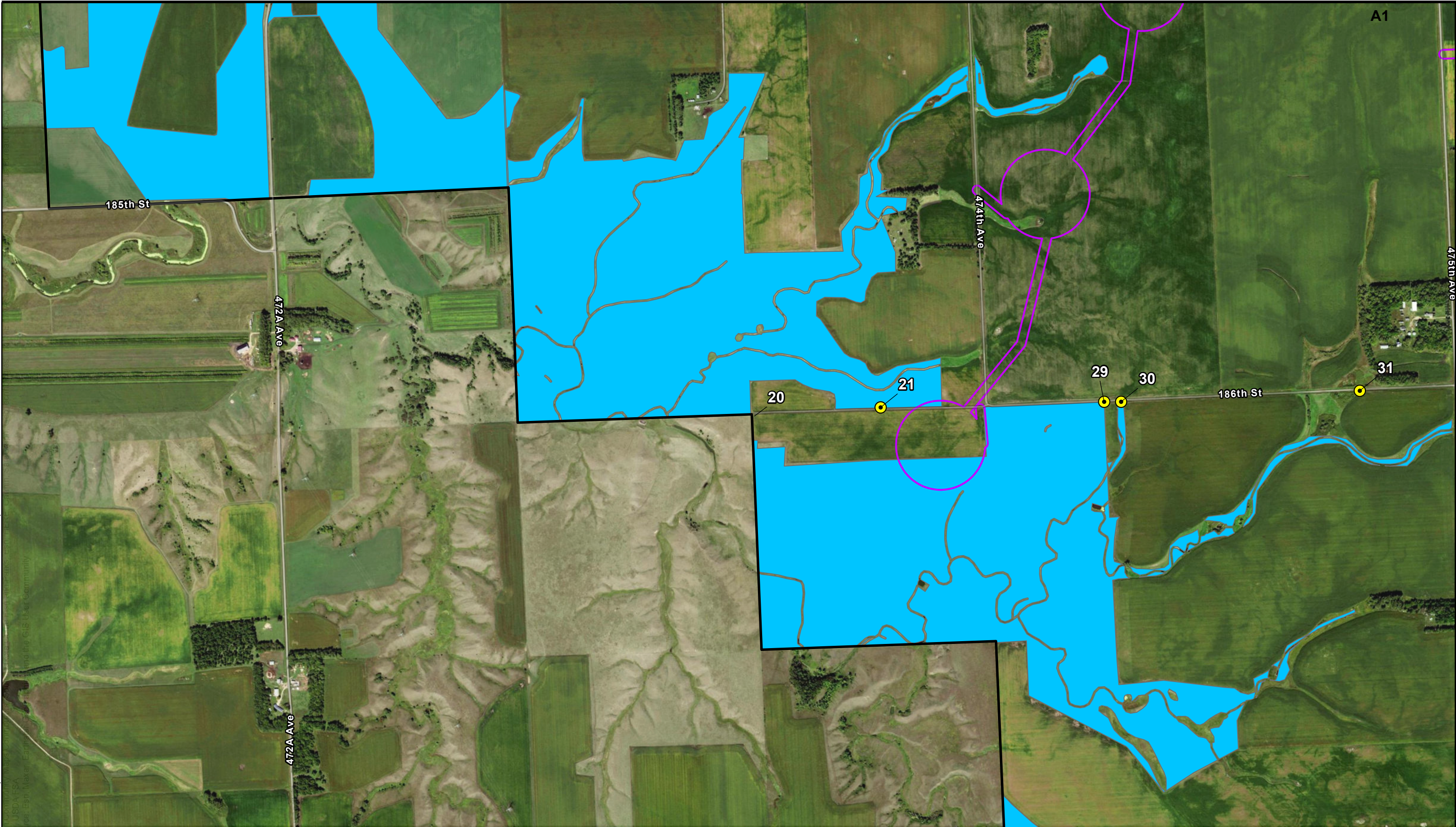


Figure B-1
Location Map of Potential
Broken and Unbroken Grassland
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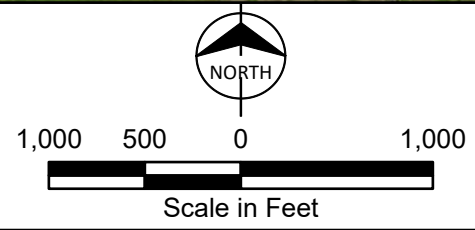
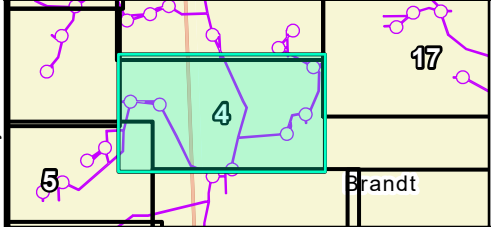
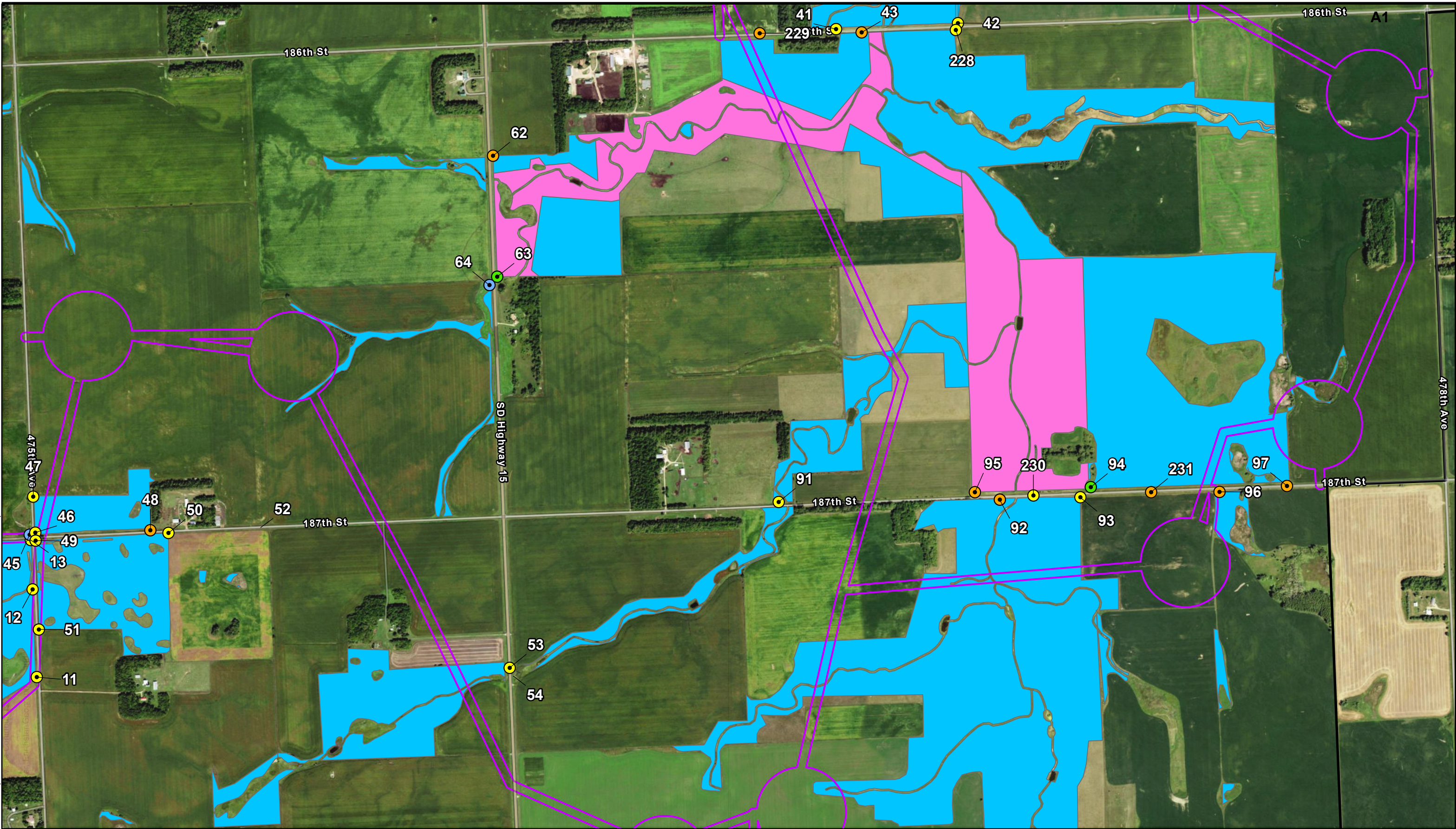


Figure B-1
Location Map of Potential
Broken and Unbroken Grassland
South Deuel Wind
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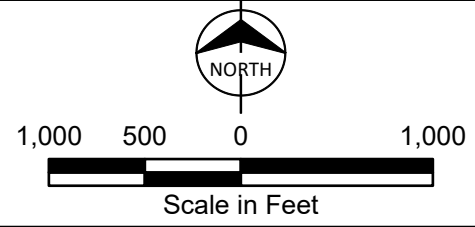
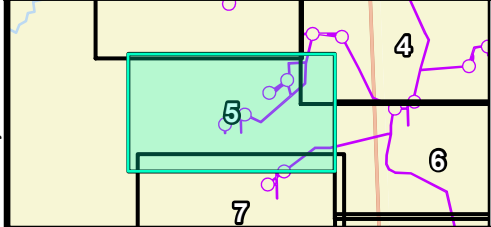
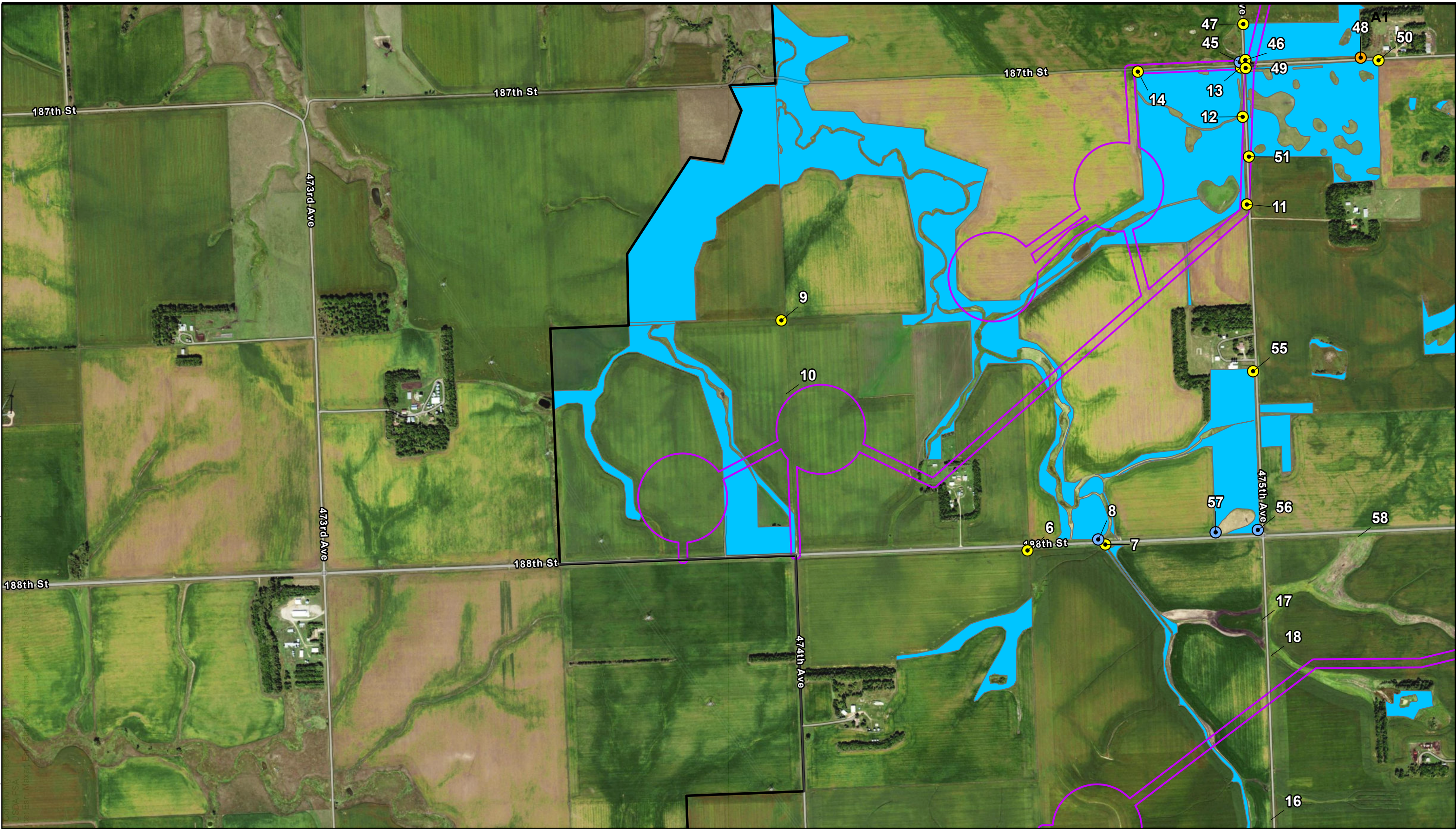


Figure B-1
Location Map of Potential
Broken and Unbroken Grassland
South Deuel Wind
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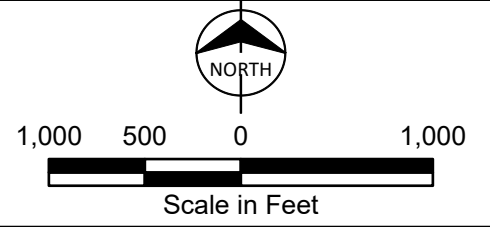
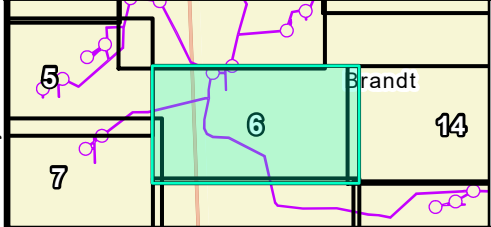
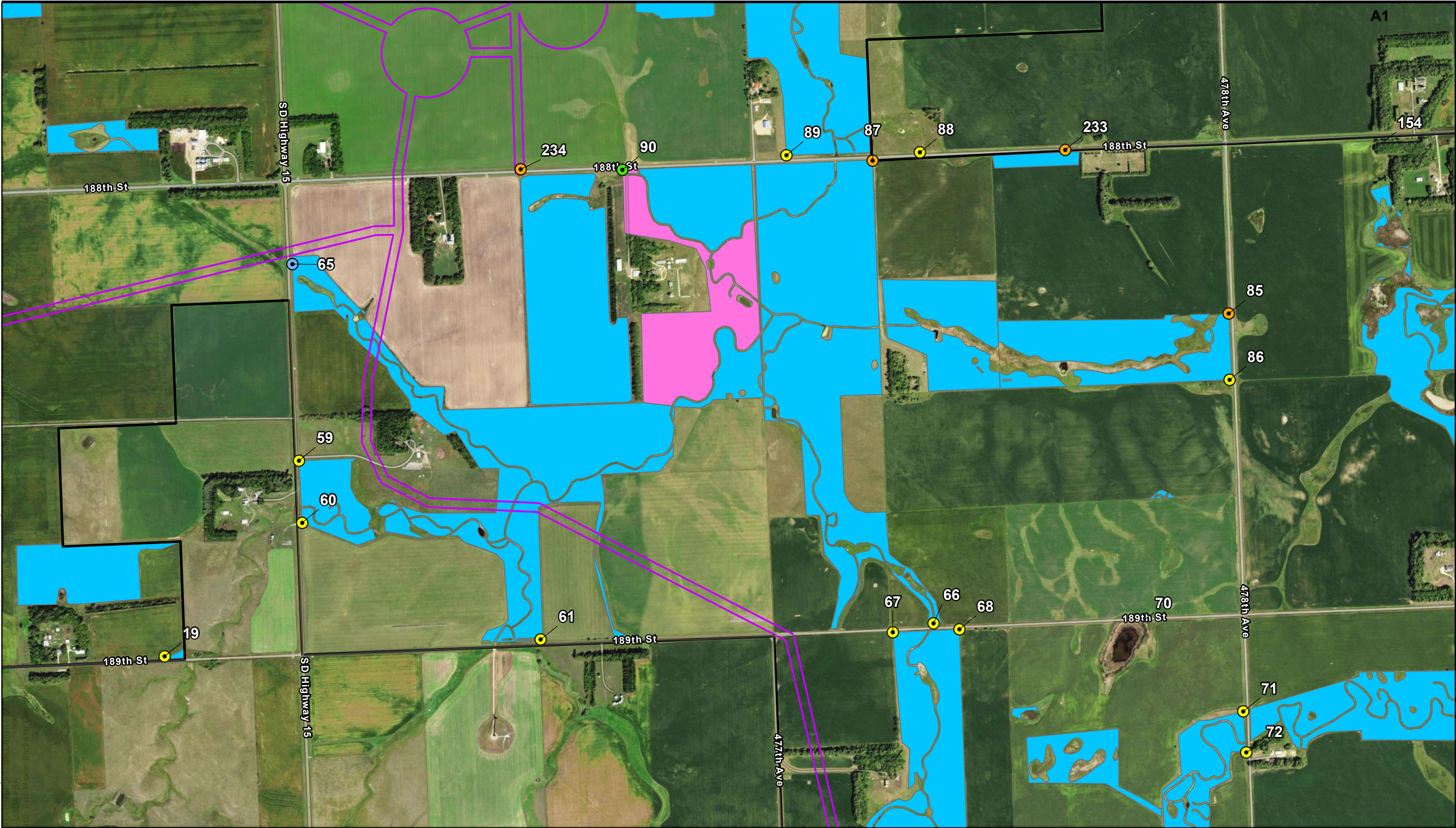


Figure B-1
Location Map of Potential
Broken and Unbroken Grassland
South Deuel Wind
DEUEL HARVEST WIND ENERGY SOUTH
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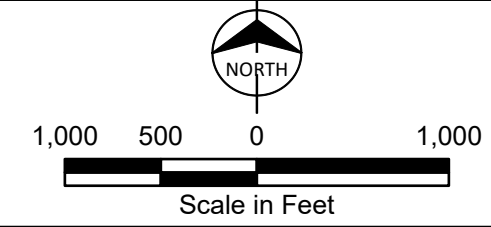
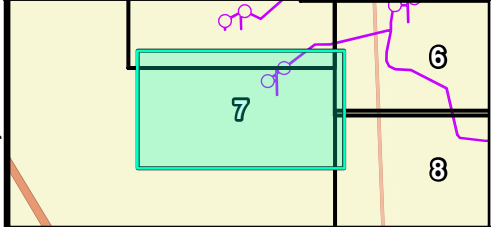
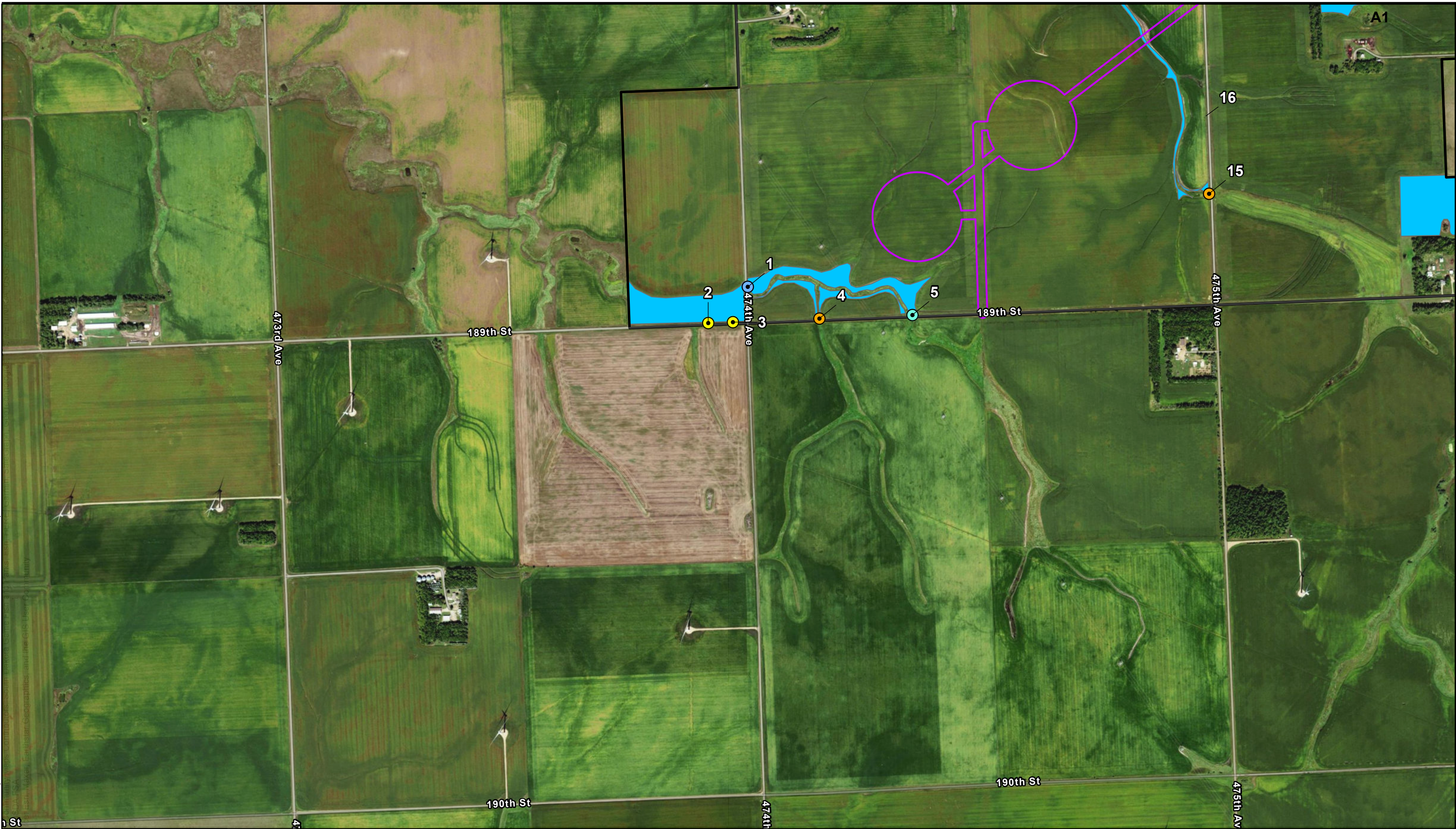


Figure B-1
Location Map of Potential
Broken and Unbroken Grassland
South Deuel Wind
DEUEL HARVEST WIND ENERGY SOUTH
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- Project Area
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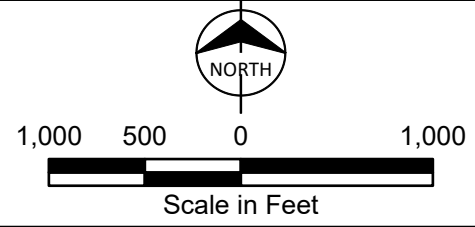
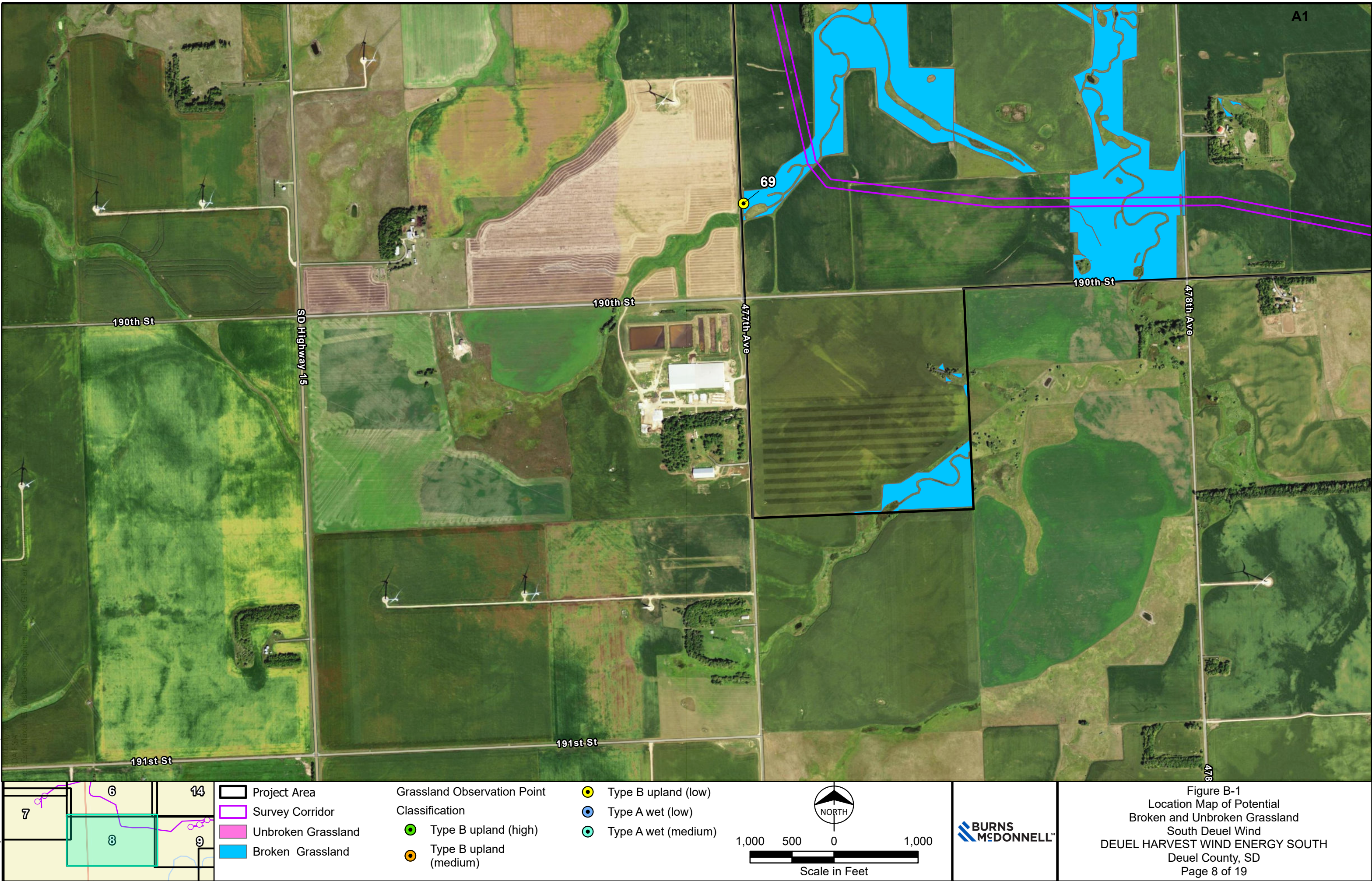
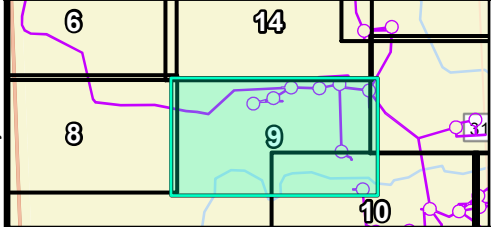
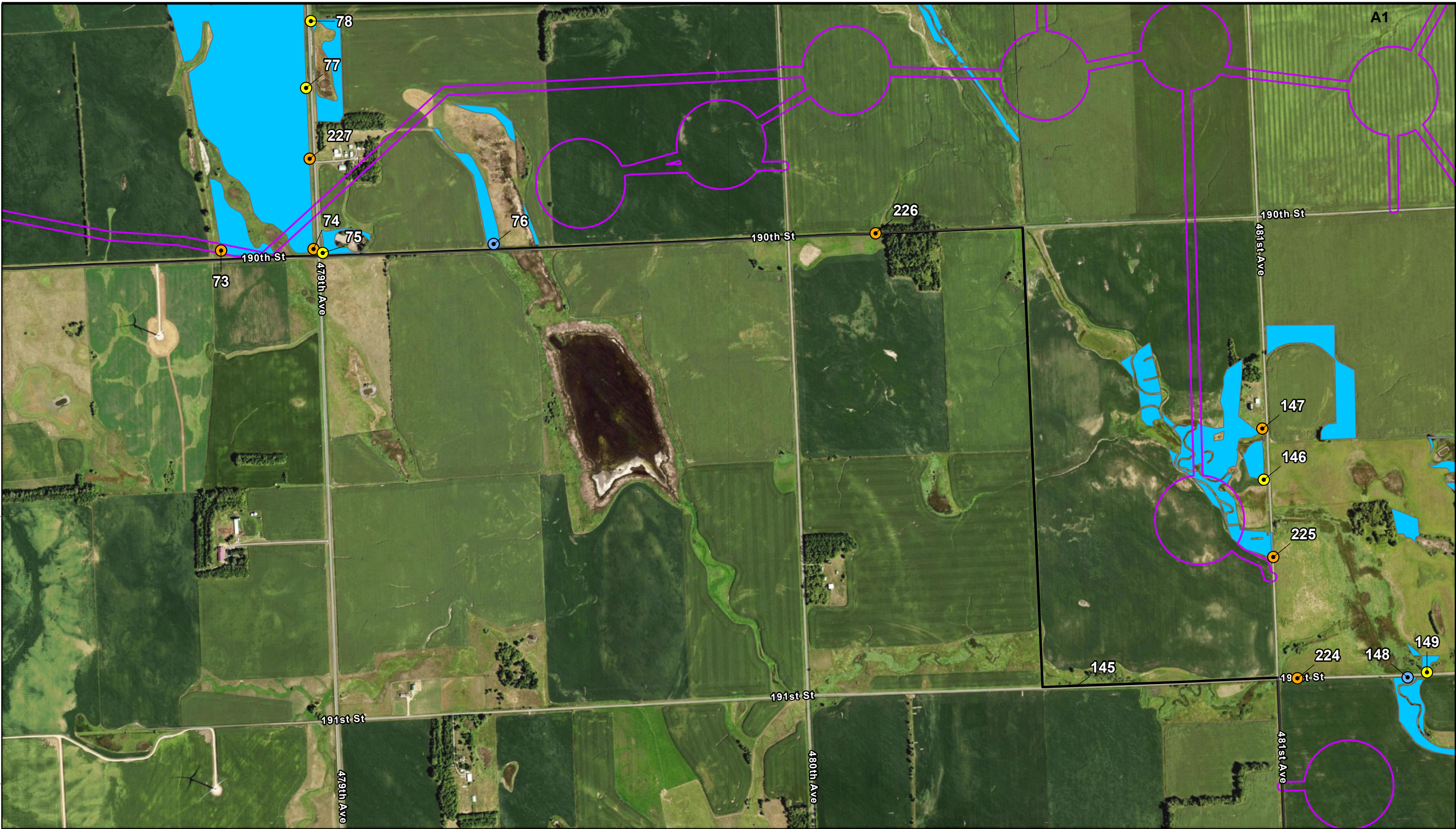


Figure B-1
Location Map of Potential
Broken and Unbroken Grassland
South Deuel Wind
DEUEL HARVEST WIND ENERGY SOUTH
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- Type B upland (high)
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- Type A wet (low)
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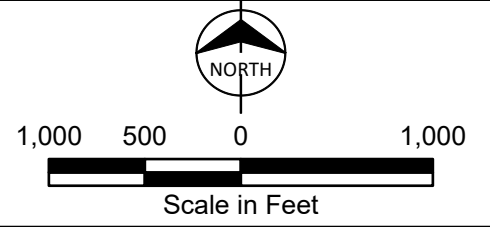
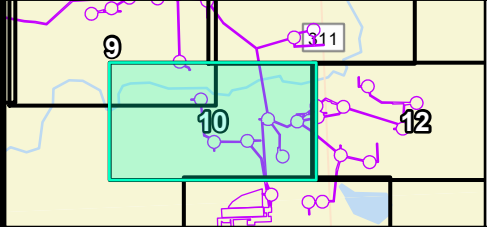
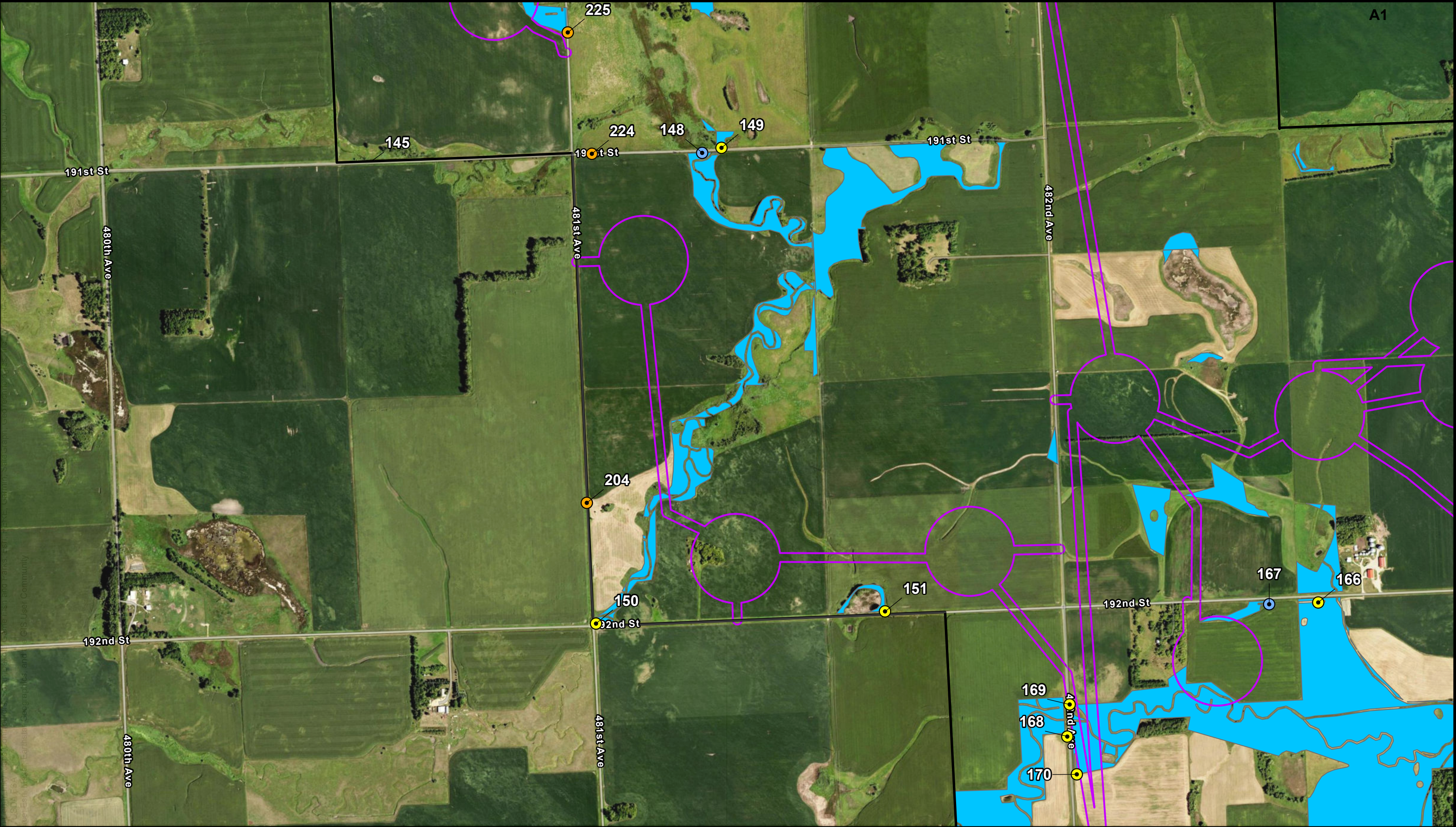


Figure B-1
Location Map of Potential
Broken and Unbroken Grassland
South Deuel Wind
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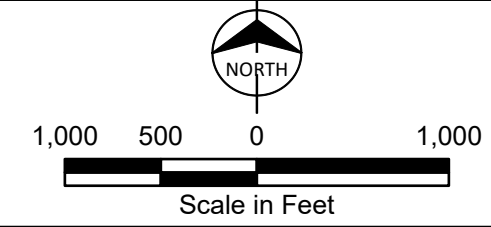
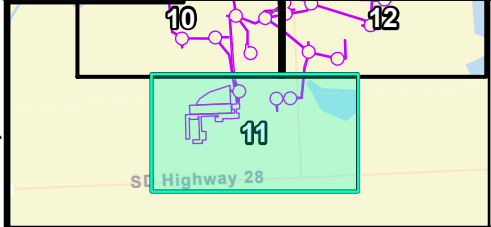
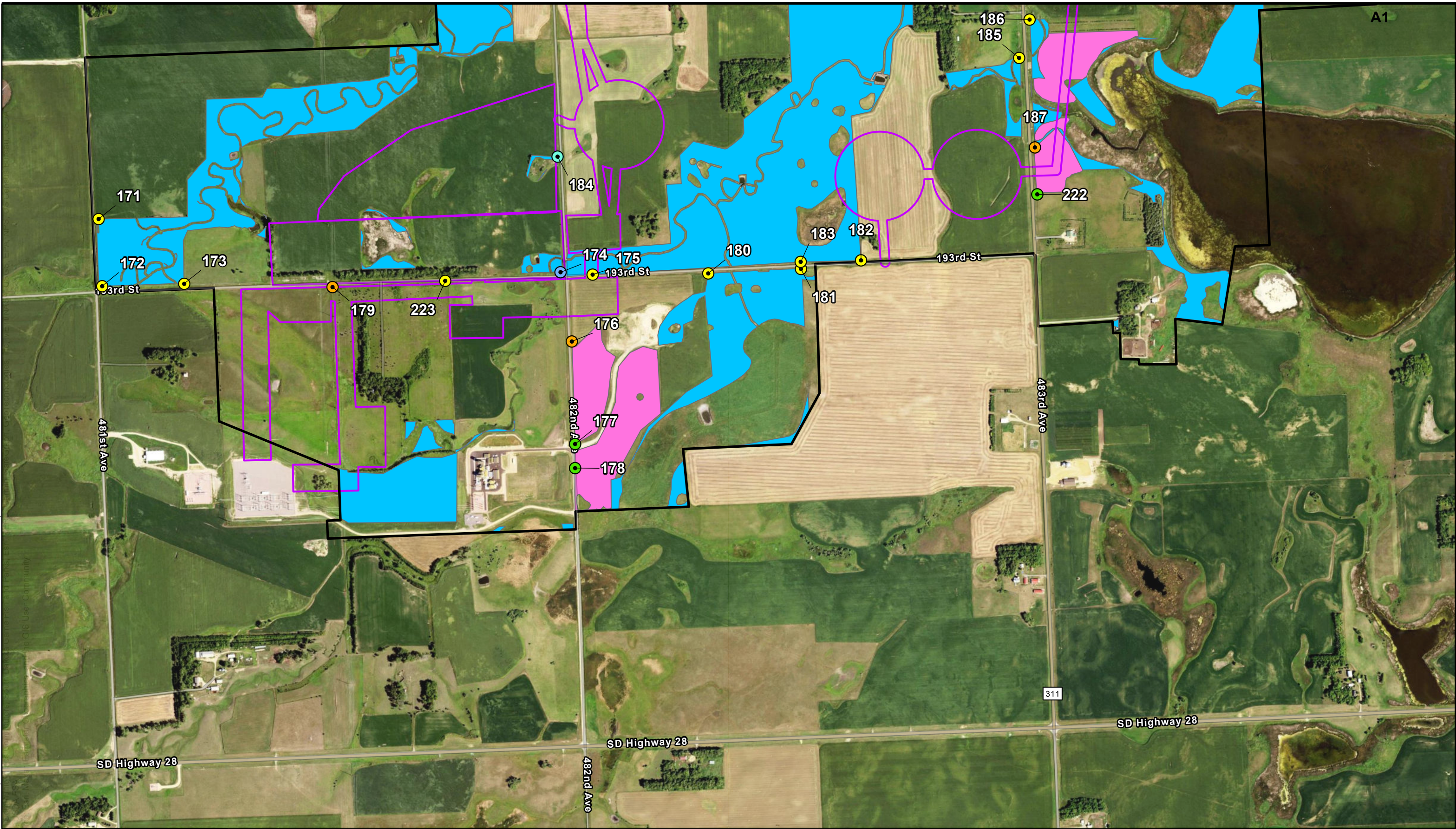


Figure B-1
Location Map of Potential
Broken and Unbroken Grassland
South Deuel Wind
DEUEL HARVEST WIND ENERGY SOUTH
Deuel County, SD
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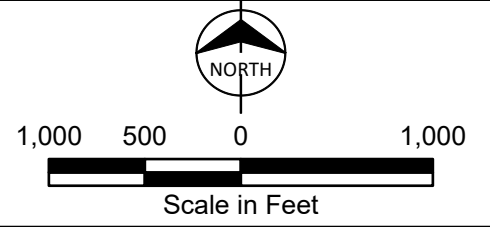
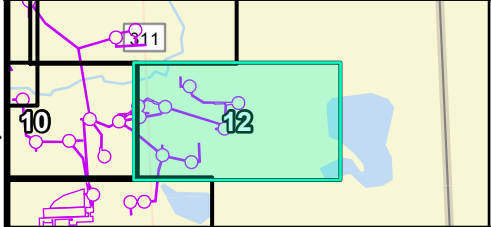
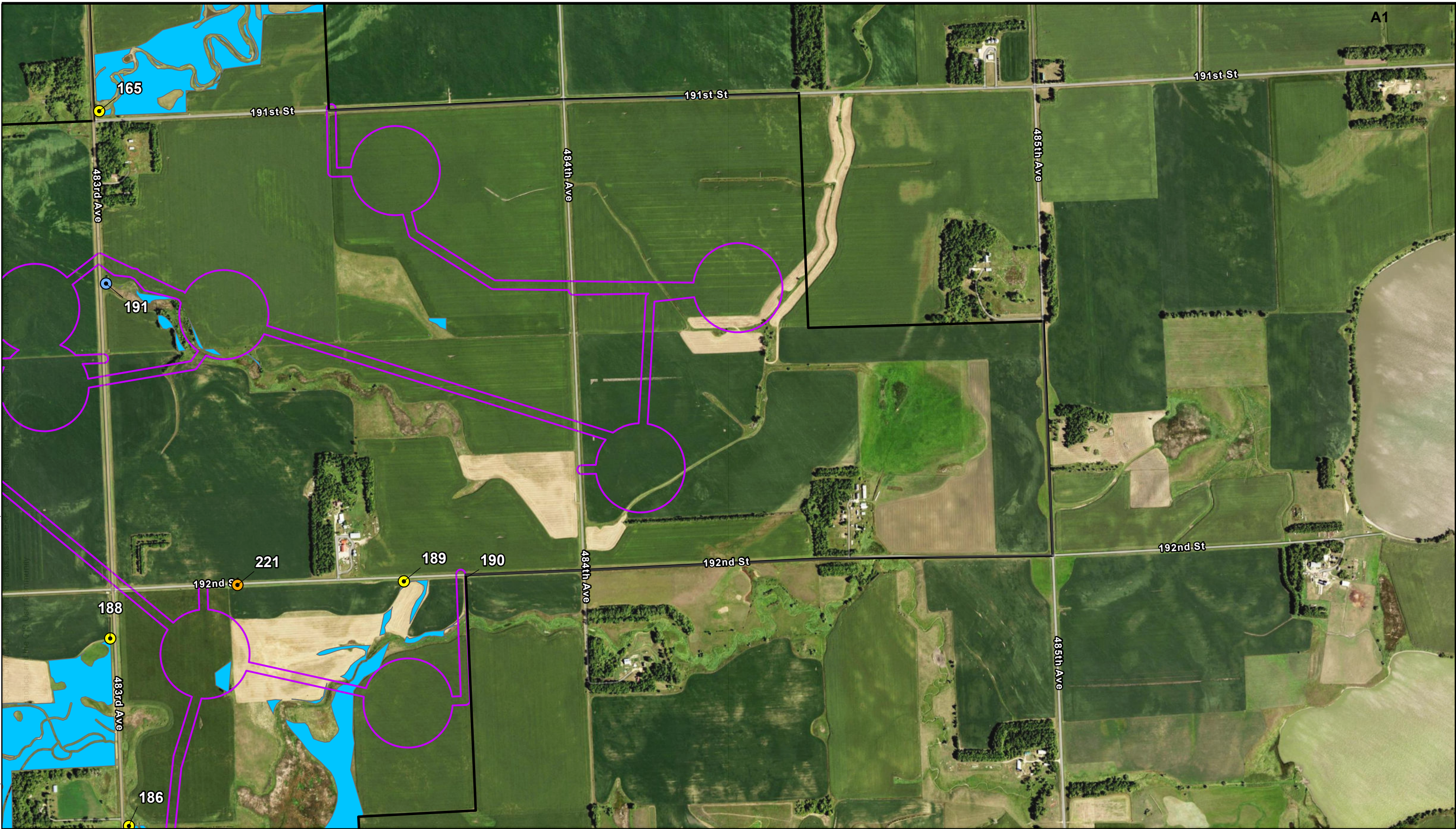


Figure B-1
Location Map of Potential
Broken and Unbroken Grassland
South Deuel Wind
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- Project Area
- Survey Corridor
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- Broken Grassland

- Grassland Observation Point Classification
- Type B upland (high)
 - Type B upland (medium)

- Type B upland (low)
- Type A wet (low)
- Type A wet (medium)

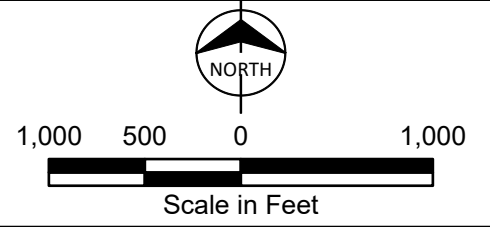
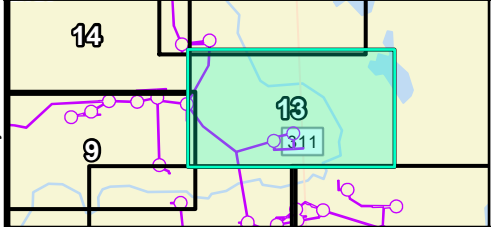


Figure B-1
Location Map of Potential
Broken and Unbroken Grassland
South Deuel Wind
DEUEL HARVEST WIND ENERGY SOUTH
Deuel County, SD
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Path: Z:\Clients\ENS\Inventory\134150_Deuel\SouthEnv\Studies\Geospatial\DataFiles\ArcDocs\2022 Grassland and Butterfly GIS_update\Deuel_Butterfly.aprx 10/5/2023
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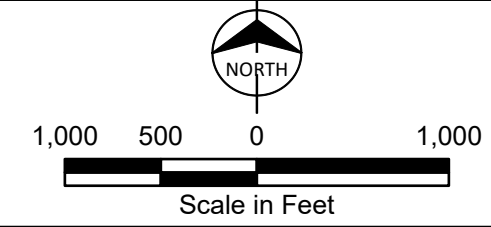


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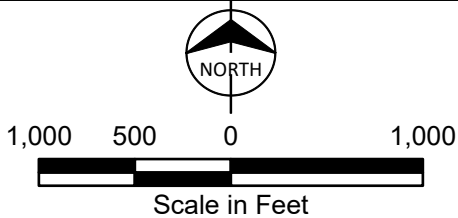
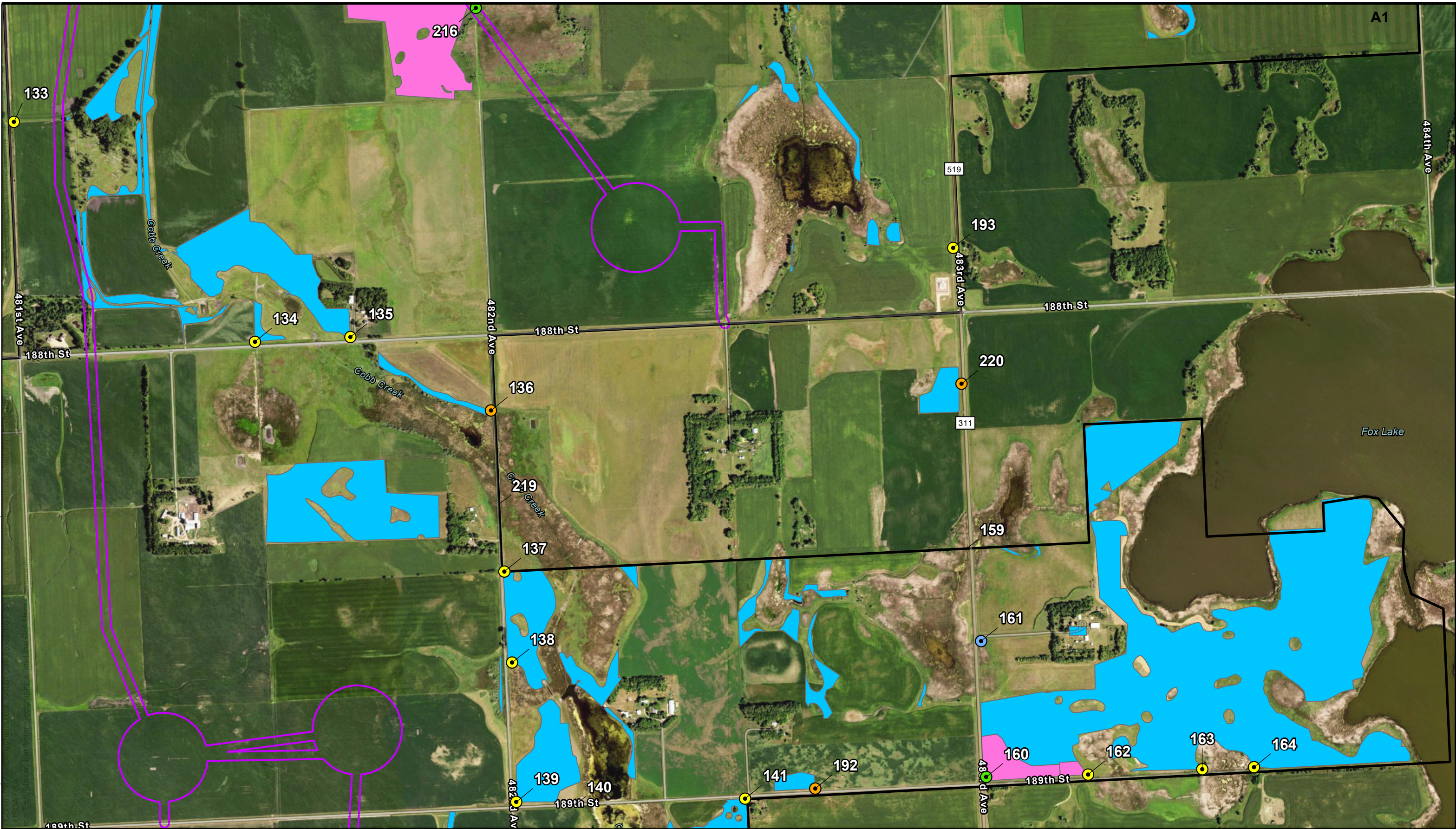


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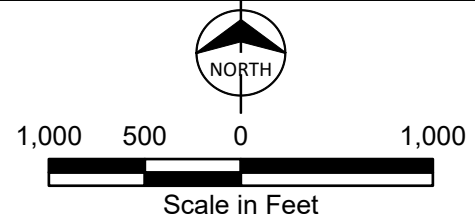
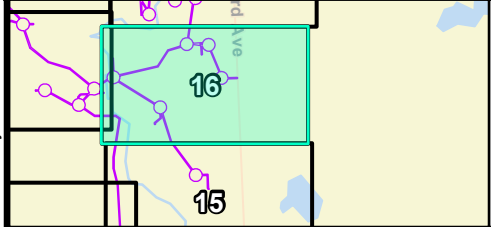
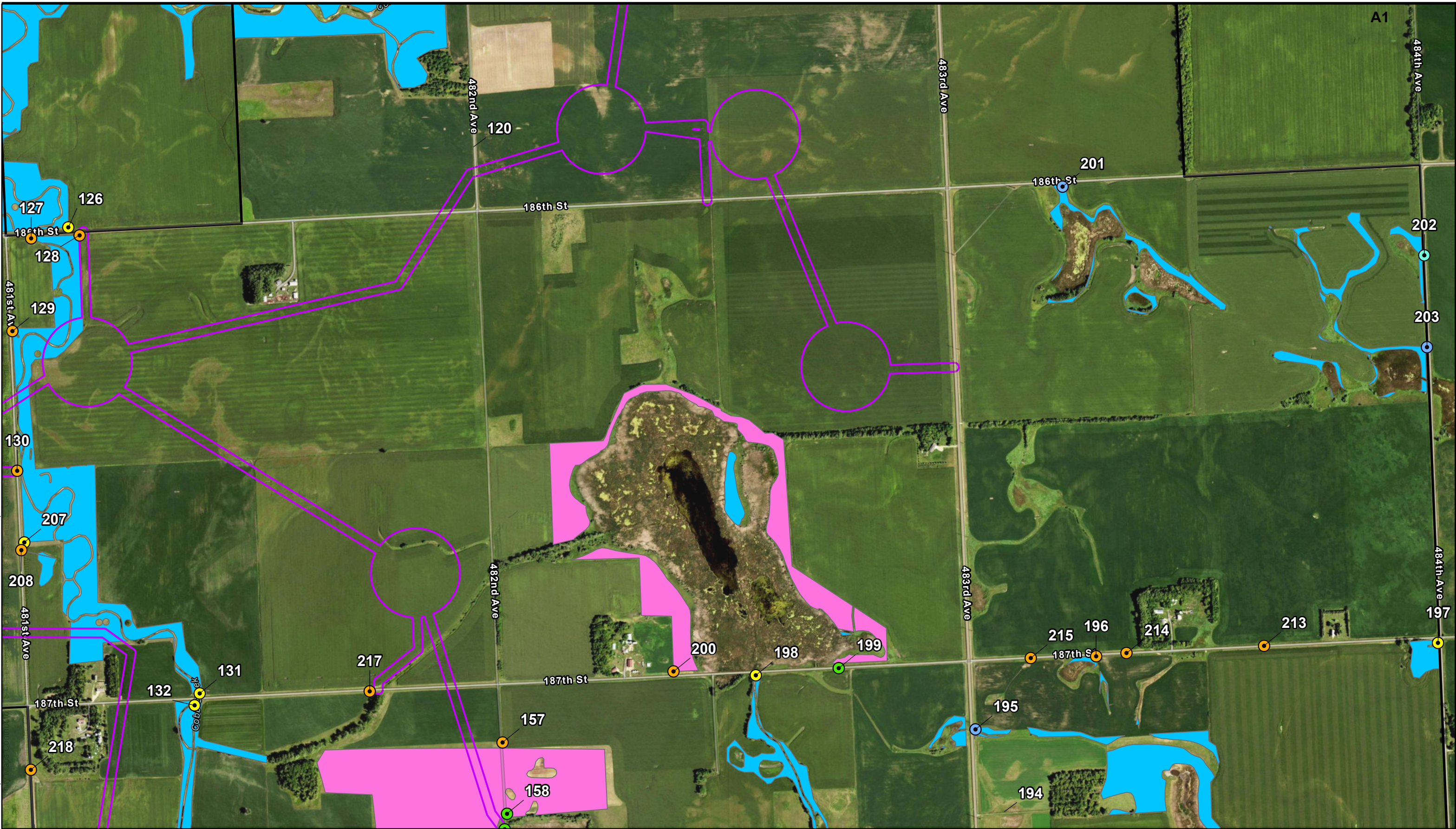


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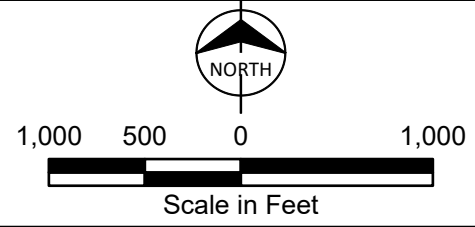
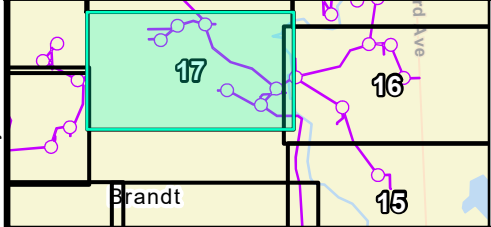


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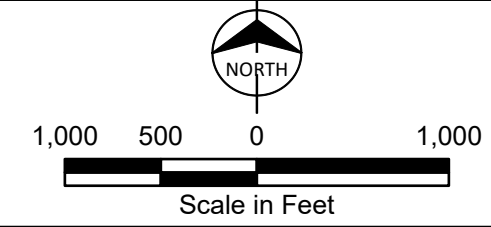
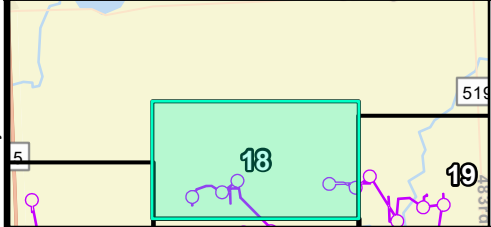
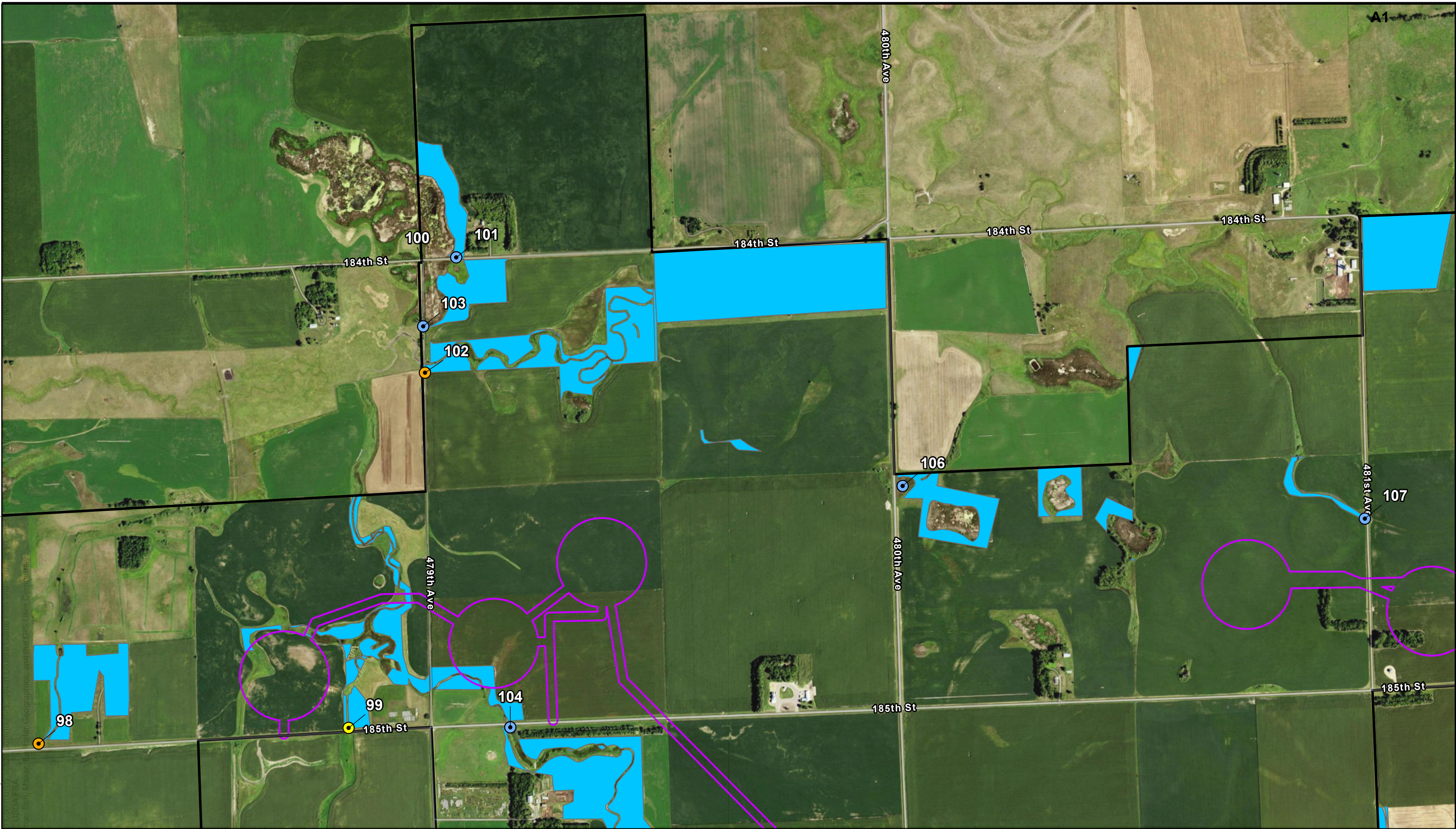


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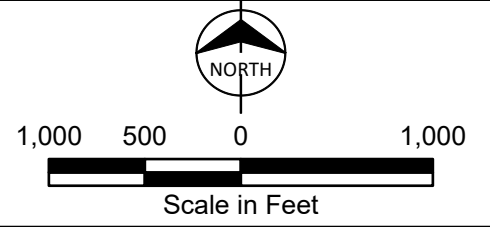
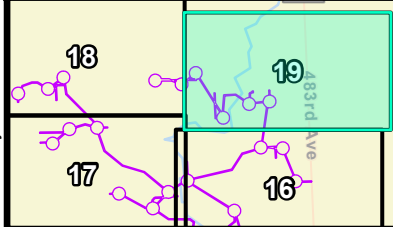
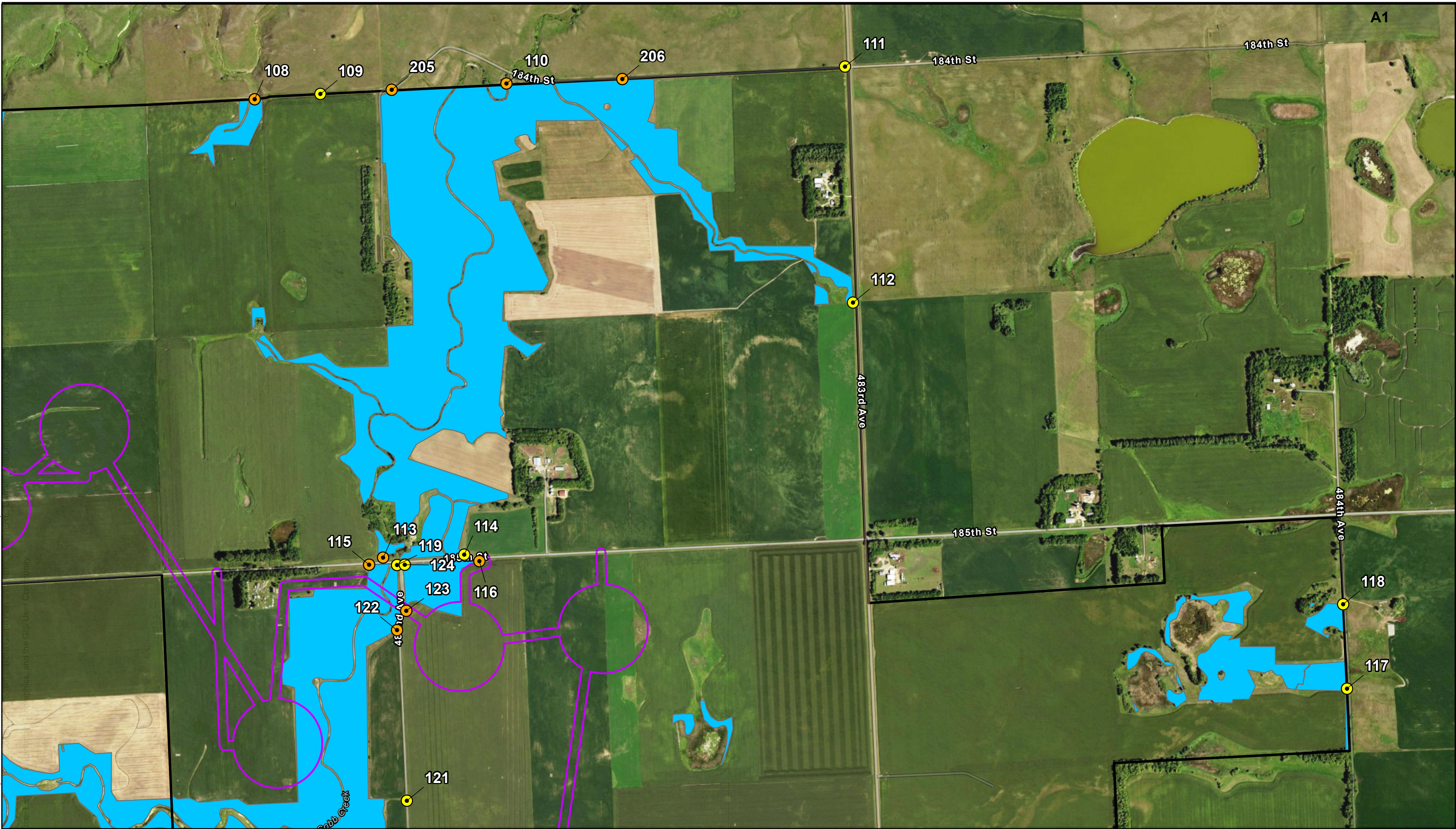


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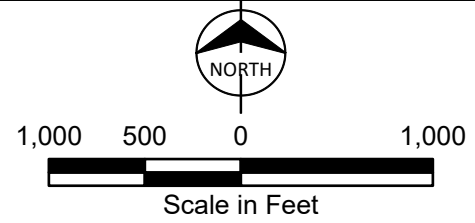


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